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ELECTRICAL SYSTEM

Item	Number	Rating
Fuse		
Main	—	20 amp
Headlight	—	10 amp
Taillight	—	10 amp
Battery	—	12 volt, 14 amp hour
Replacement bulbs		
Headlight	—	40/50 watt
Tail/brake light	SAE 1157	8/27 watt
Directional		
Front	SAE 1034	23 watt
Rear	SAE 1073	23 watt
Instrument lights	SAE 57	3.4 watt
Running light	SAE 1034	8 watt

ENGINE TORQUE SPECIFICATIONS

Item	Foot-pounds	Newton meters
Cylinder head bolts		
6mm	6-9	8-12
12mm	33-40	45-54
Camshaft locknut	58-72	79-98
Camshaft sprocket bolts	12-14	16-19
Crankshaft end cap bolts	14-17	19-23
Rod bearing cap nuts	20-23	27-31
Cooling fan bolt	14-18	19-24
Oil filter bolt	14-18	19-24
Alternator rotor bolt	58-72	79-97
Clutch center nut	58-72	79-97
Radiator drain bolt	1-2	1.4-2.7

FRAME TORQUE SPECIFICATIONS

Item	Foot-pounds	Newton meters
Steering stem	65-87	88-117
Fork top bridge	7-9	9-12
Handlebar holder	13-18	18-24
Fork bottom bridge	13-18	18-24
Front axle nut	40-47	54-64
Front axle holder nut	13-18	18-24
Rear axle nut	40-47	54-64
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TUNE-UP SPECIFICATIONS

Cylinder head bolts	
12mm	33-40 ft.-lb. (45-54 N•m)
6mm	6-9 ft.-lb. (8-12 N•m)
Valve clearance (cold)	
Intake	0.003 in. (0.08mm)
Exhaust	0.004 in. (0.10mm)
Timing (Capacitor discharge ignition)*	Non-adjustable
Idle speed	1,100 ± 100 rpm
Compression pressure (cold)	171 ± 20 psi (12 ± 2.0 kg/cm ²)

SPARK PLUGS

Type	U.S.A.	Canada (Resistor Type)
Standard	NGK D8EA ND X24ES-U	NGK DR8ES-L ND X24ESR-U
Cold climate	NGK D7EA ND X22ES-U	— —
High speed	NGK D9EA ND X27ES-U	— —

Gap for all plugs is 0.024-0.028 in. (0.5-0.7mm)

ADJUSTMENTS

Item	Inch	mm
Clutch lever free play	3/8-1/2	10-20
Rear brake pedal free play	3/4-1 1/4	20-30
Throttle grip free play	0.08-0.24	2-6 (grip rotation)
Rear brake light switch (pedal travel)	3/4	20

TIRES

Front pressure	24 psi (1.75 kg/cm ²)
Rear pressure	
Up to 200 lb. (90 kg)	28 psi (2.0 kg/cm ²)
Up to 330 lb. (150 kg)*	36 psi (2.5 kg/cm ²)
Size	
Front	3.25 S19-4PR
Rear	3.75 S18-4PR

*Vehicle maximum load limit

FLUIDS

Item	Type	Quantity
Engine oil		
All temperatures	SAE 10W-40	3.2 U.S. qt. (3.0 liter)
Above 59° F (15° C)	SAE 30	
32°-59° F (0°-32° C)	SAE 20 or 20W	
Below 32° F (0° C)	SAE 10W	
Fork oil	Automatic transmission fluid (ATF)	4.2-4.6 oz. (125-135cc)
Brake fluid	DOT 3	Upper level line
Final drive oil		
Above 41° F (5° C)	Hypoid gear oil, SAE 90	5.8 oz. (170cc)
Below 41° F (5° C)	Hypoid gear oil, SAE 80	
Coolant	Ethylene glycol for aluminum engines	Radiator and engine: 1.9 U.S. qt. (1.8 liter)
		Reserve tank: 0.26 U.S. qt. (0.25 liter)
Coolant/water ratio		
Above -25° F (-32° C)		45/55 coolant/water
Above -34° F (-37° C)		50/50 coolant/water
Above -48° F (-44° C)		55/45 coolant/water
Fuel-Low lead or regular	86 octane (pump) 91 octane (research)	4.5 U.S. gal. (17.0 liter) total 0.90 U.S. gal. (3.5 liter) reserve

CHAPTER ONE

GENERAL INFORMATION

This book provides maintenance and repair information for the Honda CX500.

Read the following service hints to make the work as easy and pleasant as possible. Performing your own work can be an enjoyable and rewarding experience.

1.1

MANUAL ORGANIZATION

This manual provides service information and procedures for the Honda CX500. All dimensions and capacities are expressed in English units familiar to U.S. mechanics as well as in metric units.

This chapter provides general information and specifications. See **Table 1** at the end of this chapter. It also discusses equipment and tools useful both for preventive maintenance and troubleshooting.

Chapter Two provides methods and suggestions for quick and accurate diagnosis and repair of problems. Troubleshooting procedures discuss typical symptoms and logical methods to pinpoint the trouble.

Chapter Three explains all periodic lubrication and routine maintenance necessary to keep your bike running well. Chapter Three also includes recommended tune-up procedures, eliminating the need to constantly consult chapters on the various assemblies.

Subsequent chapters describe specific systems such as the engine, transmission, and electrical system. Each chapter provides disassembly, repair, and assembly procedures in simple step-by-step form. If a repair is impractical for a home mechanic, it is so indicated. It is usually faster and less expensive to take such repairs to a dealer or competent repair shop. Specifications concerning a particular system are included at the end of the appropriate chapter.

Some of the procedures in this manual specify special tools. In all cases, the tool is illustrated either in actual use or alone. A well-equipped mechanic may find that he can substitute similar tools already on hand or he can fabricate his own.

The terms **NOTE**, **CAUTION**, and **WARNING** have specific meanings in this manual. A **NOTE** provides additional information to make a step or procedure easier or clearer. Disregarding a **NOTE** could cause inconvenience, but would not cause damage or personal injury.

A **CAUTION** emphasizes areas where equipment damage could result. Disregarding a **CAUTION** could cause permanent mechanical damage; however, personal injury is unlikely.

A **WARNING** emphasizes areas where personal injury or even death could result from negligence. Mechanical damage may also occur. **WARNINGS are to be taken seriously.** In

some cases, serious injury or death has resulted from disregarding similar warnings.

Throughout this manual keep in mind two conventions. "Front" refers to the front of the bike. The front of any component such as the engine is the end which faces toward the front of the bike. The "left" and "right" side refer to positions from the perspective of a person sitting on the bike facing forward. For example, the shift lever is on the left side. These rules are simple, but even experienced mechanics occasionally become disoriented.

1.2

SERVICE HINTS

Most of the service procedures covered are straightforward and can be performed by anyone reasonably handy with tools. It is suggested, however, that you consider your own capabilities carefully before attempting any operation involving major disassembly of the engine.

Some operations, for example, require the use of a press. It would be wiser to have these performed by a shop equipped for such work than to try to do the job yourself with makeshift equipment. Other procedures require precision measurements. Unless you have the skills and equipment required, it would be better to have a qualified repair shop make the measurements for you.

Repairs go much faster and easier if your machine is clean before you begin work. There are special cleaners, like Gunk Cycle Degreaser, for washing the engine and related parts. Just brush or spray on the cleaning solution, let it stand, then rinse it away with a garden hose. Clean all oily or greasy parts with cleaning solvent as you remove them.

WARNING

Never use gasoline as a cleaning agent. It presents an extreme fire hazard. Be sure to work in a well-ventilated area when using cleaning solvent. Keep a fire extinguisher, rated for gasoline fires, handy in any case.

Special tools are required for some repair procedures. These may be purchased at a dealer, rented from a tool rental dealer, or may

be fabricated by a mechanic or machinist, often at a considerable savings.

Much of the labor charge for repairs made by dealers is for the removal and disassembly of other parts to reach the defective unit. It is frequently possible to perform the preliminary operations yourself and then take the defective unit in to the dealer for repair at considerable savings.

Once you have decided to tackle the job yourself, read the entire section in this manual which pertains to it, making sure you have identified the proper one. Study the illustrations and text until you have a good idea of what is involved in completing the job satisfactorily. If special tools are required, make arrangements to get them before you start. It is frustrating and time-consuming to get partly into a job and then be unable to complete it.

Simple wiring checks can be easily made at home; but knowledge of electronics is almost a necessity for performing tests with complicated electronic testing gear.

During disassembly of parts, keep a few general cautions in mind. Force is rarely needed to get things apart. If parts are a tight fit, like a bearing in a case, there is usually a tool designed to separate them. Never use a screwdriver to pry apart parts with machined surfaces such as crankcase halves and valve covers. You will mar the surfaces and end up with leaks.

Make diagrams wherever similar-appearing parts are found. For instance, case cover bolts are often not the same length. You may think you can remember where everything came from — but mistakes are costly. There is also the possibility that you may be sidetracked and not return to work for days or even weeks — in which interval carefully laid out parts may have become disturbed.

Tag all similar internal parts for location and mark all mating parts for position. Record number and thickness of any shims as they are removed. Small parts such as bolts can be identified by placing them in plastic sandwich bags. Seal and label the bags with masking tape.

Wiring should be tagged with masking tape and marked as each wire is removed. Again, do not rely on memory alone.

Disconnect battery ground (negative) cable before working near electrical connections and before disconnecting wires. Never run the engine with the battery disconnected; the alternator could be seriously damaged.

Protect finished surfaces from physical damage or corrosion. Keep gasoline and brake fluid off painted surfaces.

Frozen or very tight bolts and screws can often be loosened by soaking with penetrating oil, like WD-40 or Liquid Wrench, then sharply striking the bolt head a few times with a hammer and punch (or screwdriver for screws). Avoid heat unless absolutely necessary, since it may melt, warp, or remove the temper from many parts.

Avoid flames or sparks when working near a charging battery or flammable liquids such as brake fluid or gasoline.

No parts, except those assembled with a press fit, require unusual force during assembly. If a part is hard to remove or install, find out why before proceeding.

Cover all openings after removing parts to keep dirt, small tools, etc., from falling in.

When assembling two parts, start all fasteners, then tighten evenly.

Clutch plates, wiring connections, and brake pads and discs should be kept clean and free of grease and oil.

When assembling parts, be sure all shims and washers are replaced exactly as they came out.

Whenever a rotating part butts against a stationary part, look for a shim or washer. Use new gaskets if there is any doubt about the condition of old ones. Generally you should apply gasket cement to one mating surface only so the parts may be easily disassembled in the future. A thin coat of oil on gaskets helps them seal effectively.

Heavy grease can be used to hold small parts in place if they tend to fall out during assembly. However, keep grease and oil away from electrical components or brake pads and discs.

High spots may be sanded off a piston with sandpaper, but emery cloth and oil do a much more professional job.

Carburetors are best cleaned by disassembling them and soaking the parts in a commercial carburetor cleaner. Never soak gaskets and rubber parts in these cleaners. Never use wire to

clean out jets and air passages; they are easily damaged. Use compressed air to blow out the carburetor only if the float has been removed first.

A baby bottle makes a good measuring device for adding oil to forks and transmissions. Get one that is graduated in ounces and cubic centimeters.

Take your time and do the job right. Do not forget that a newly rebuilt motorcycle engine must be broken in the same as a new one. Keep rpm's within the limits given in your owner's manual when you get back on the road.

4.3

SAFETY FIRST

Professional motorcycle mechanics can work for years and never sustain a serious injury. If you observe a few rules of common sense and safety, you can enjoy many hours servicing your own machine. You could hurt yourself or damage the bike if you ignore these rules.

1. Never use gasoline as a cleaning solvent.
2. Never smoke or use a torch in the vicinity of flammable liquids, such as cleaning solvent in open containers.
3. Never smoke or use a torch in an area where batteries are being charged. Highly explosive hydrogen gas is formed during the charging process.
4. If welding or brazing is required on the machine, remove the fuel tank to a safe distance, at least 50 feet away. Welding on gas tanks requires special safety procedures and must be performed by someone skilled in the process.
5. Use the proper sized wrenches to avoid damage to nuts and injury to yourself.
6. When loosening a tight or stuck nut, be guided by what would happen if the wrench should slip. Protect yourself accordingly.
7. Keep your work area clean and uncluttered.
8. Wear safety goggles during all operations involving drilling, grinding, or use of a cold chisel.
9. Never use worn tools.
10. Keep a fire extinguisher handy and be sure it is rated for gasoline and electrical fires.

1.4 PARTS REPLACEMENT

Honda makes frequent changes during a model year — some minor, some relatively major. When you order parts from the dealer or other parts distributor, always order by engine and chassis number. Write the numbers down and carry them with you. Compare new parts to old before purchasing them. If they are not alike, have the parts manager explain the difference to you.

1.5 EXPENDABLE SUPPLIES

Certain expendable supplies are also required. These include grease, oil, gasket cement, wiping rags, cleaning solvent, and distilled water. Ask your dealer for the special locking compounds, silicone lubricants, and other products which make motorcycle maintenance simpler and easier. Solvent is available at most service stations and distilled water for the battery is available at most supermarkets.

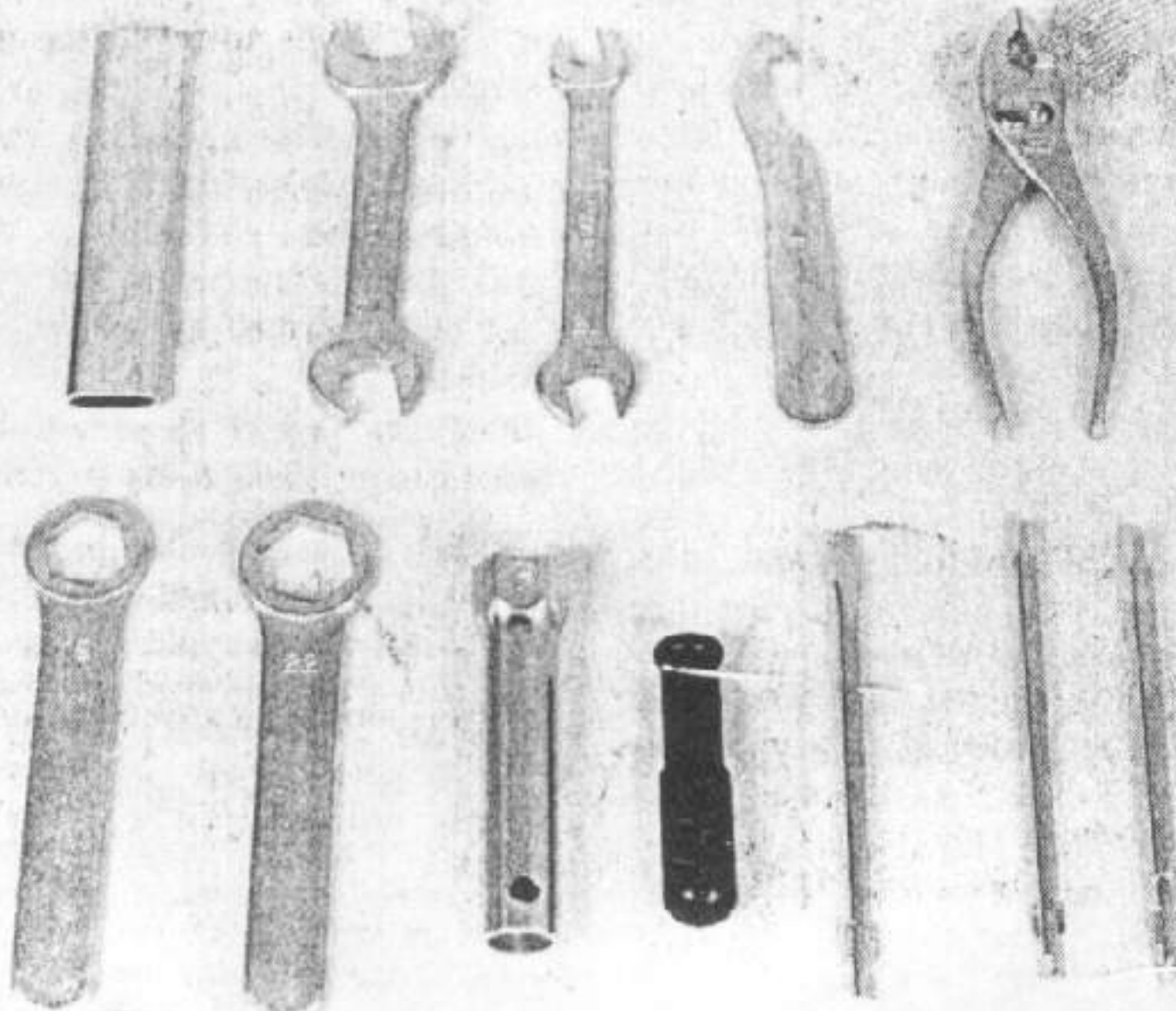
1.6 TOOLS

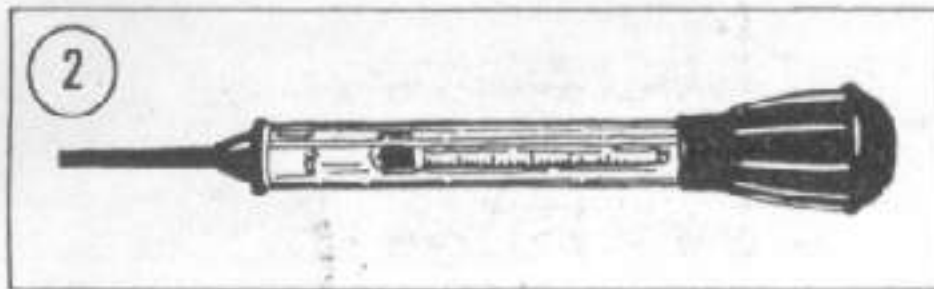
To properly service your motorcycle, you will need an assortment of ordinary hand tools. As a minimum, these include:

- a. Combination wrench
- b. Socket wrenches
- c. Plastic mallet
- d. Small hammer
- e. Snap ring pliers
- f. Phillips screwdrivers
- g. Slot screwdrivers
- h. Impact driver
- i. Pliers
- j. Feeler gauges
- k. Spark plug gauge
- l. Spark plug wrench
- m. Drift

An original equipment tool kit, like the one shown in Figure 1, is available through most

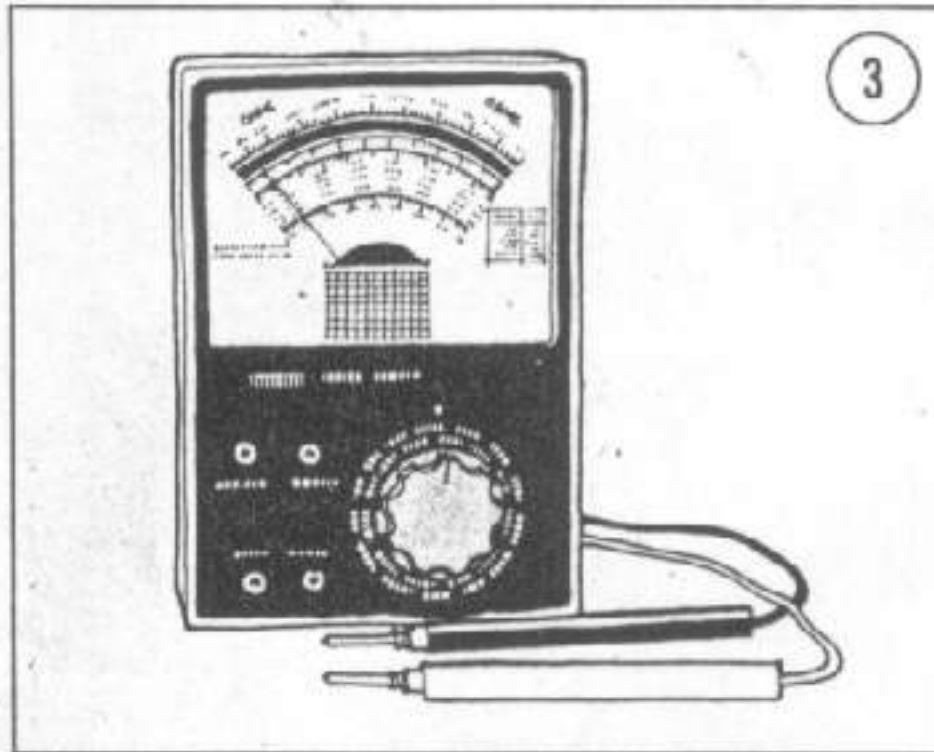
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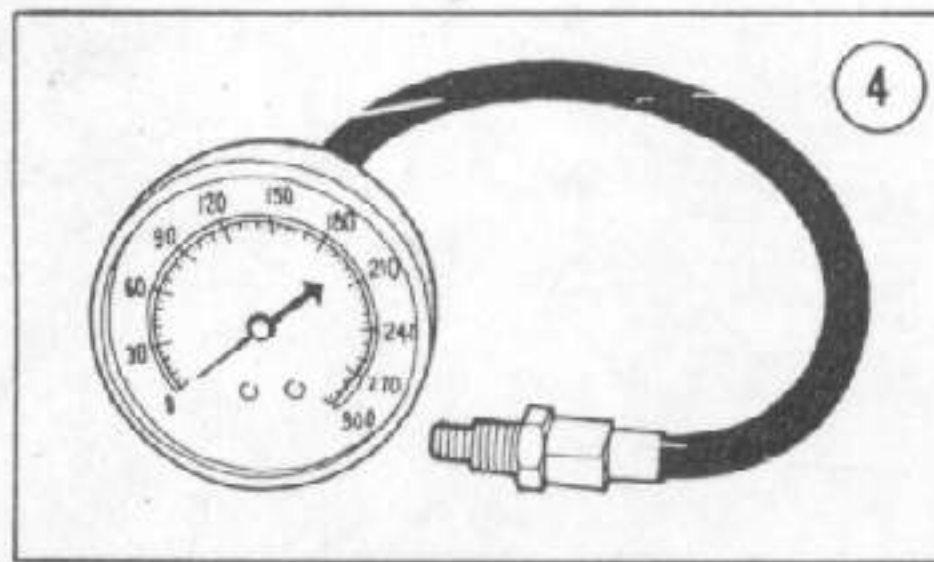
Honda dealers and is suitable for most minor servicing.

Engine tune-up and troubleshooting procedures require a few more tools, described in the following sections.



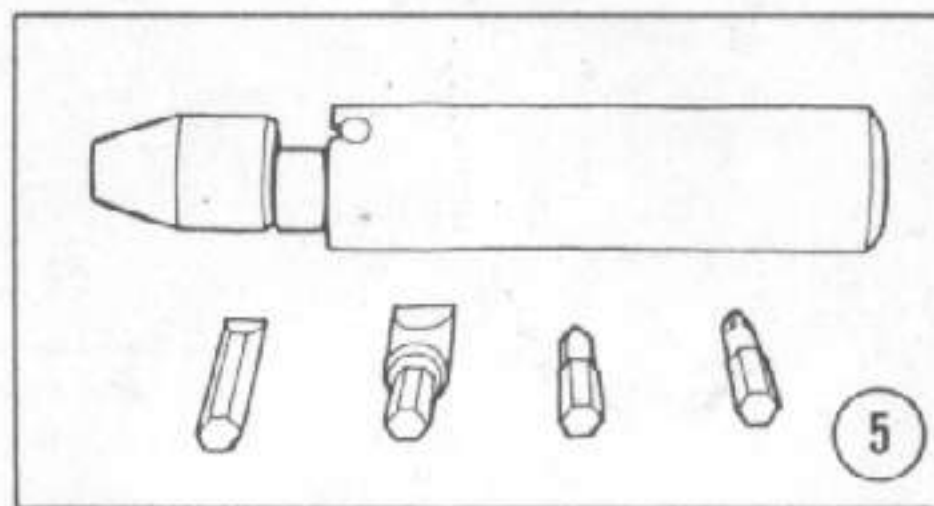
Hydrometer

This instrument measures state of charge of the battery, and tells much about battery condition. Such an instrument is available at any auto parts store and through most larger mail order outlets. A satisfactory one costs less than \$3. See Figure 2.



Multimeter or VOM

This instrument (Figure 3) is invaluable for electrical system troubleshooting and service. A few of its functions may be duplicated by locally fabricated substitutes, but for the serious hobbyist, it is a must. Its uses are described in the applicable sections of this book. Prices start at around \$20 at electronics hobbyist stores and mail order outlets.

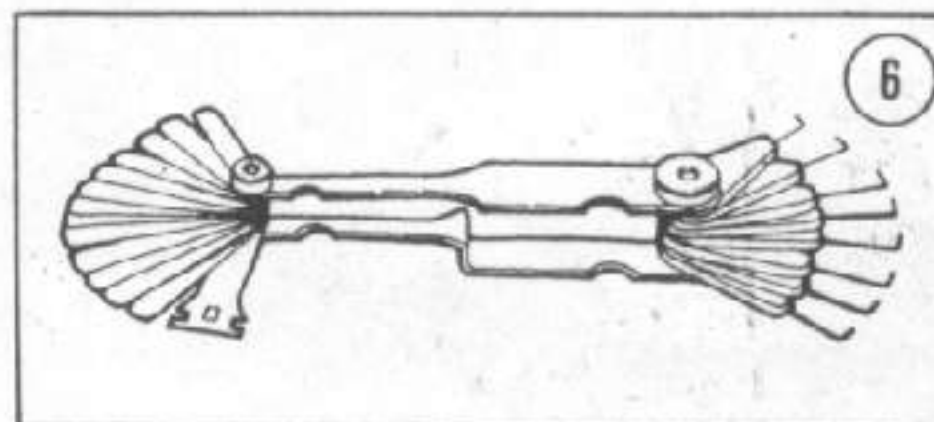


Compression Gauge

An engine with low compression cannot be properly tuned and will not develop full power. A compression gauge measures engine compression (Figure 4). Less expensive ones start around \$5 and are available at auto accessory stores or by mail order from large catalog order firms.

Impact Driver

This tool makes removal of engine components easy, and eliminates damage to bolt heads. Good ones run about \$15 at larger hardware stores. See Figure 5.



Ignition Gauge

This tool has round wire gauges for measuring spark plug gap. See Figure 6.

Strobe Timing Light

This instrument is necessary for tuning. By flashing a light at the precise instant the cylinder fires, the position of the flywheel at that instant can be seen. Marks on the flywheel

are lined up with the crankcase mark while the engine is running.

Suitable lights range from inexpensive neon bulb types (\$2-3) to powerful xenon strobe lights (\$20-40). See **Figure 7**. Neon timing lights are difficult to see and must be used in dimly lit areas. Xenon strobe timing lights can be used outside in bright sunlight. Both types work on this motorcycle; use according to the manufacturer's instructions.

Other Special Tools

A few other special tools may be required for major service. These are described in the appropriate chapters and are available from Honda dealers.

1.7

SERIAL NUMBERS

You must know the model serial number for registration purposes and when ordering special parts.

The frame serial number is stamped on the right side of the steering head (**Figure 8**) and on the VIN plate on the left side of the steering head. The engine number is stamped on the lower left-hand side of the crankcase (**Figure 9**).

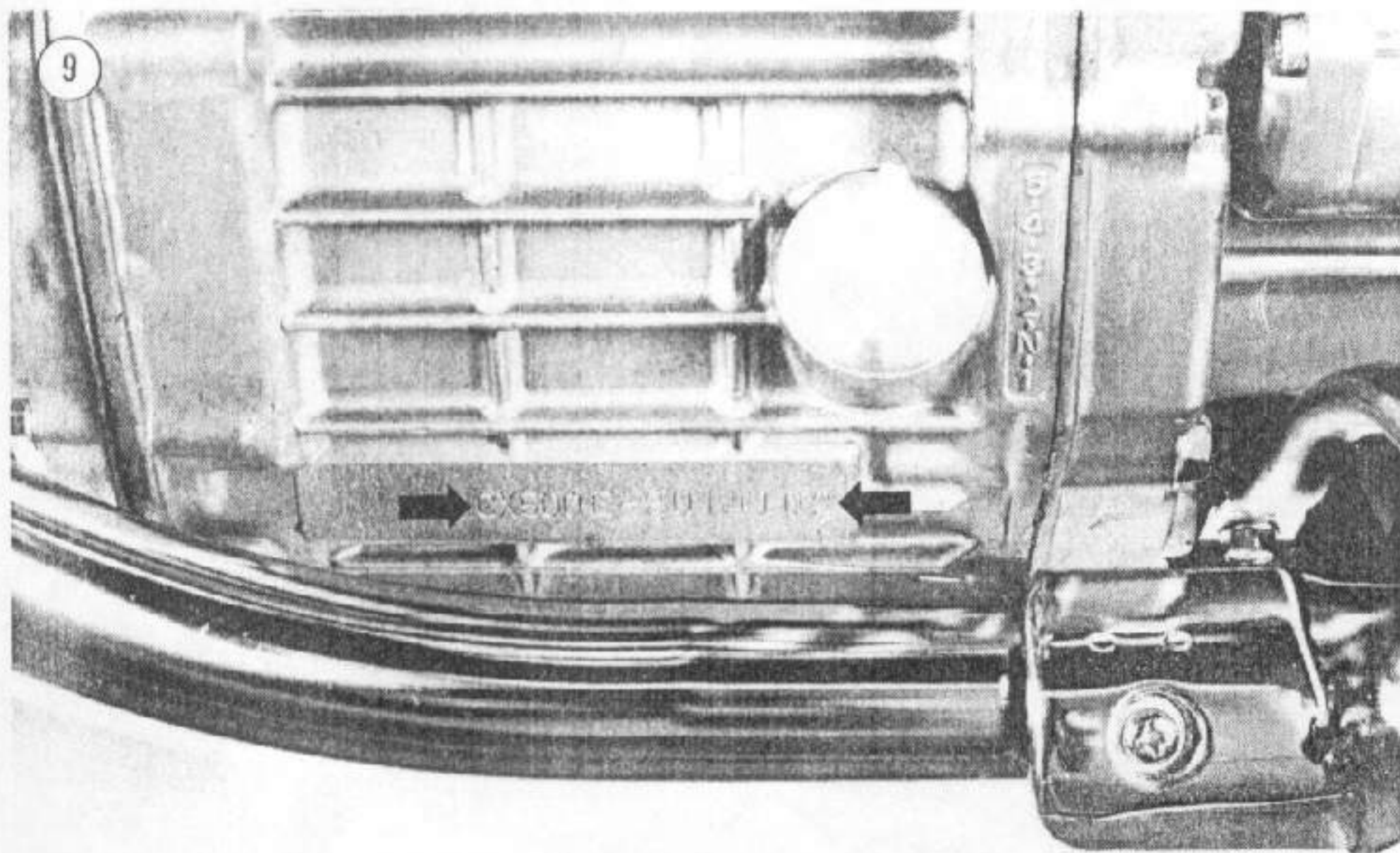
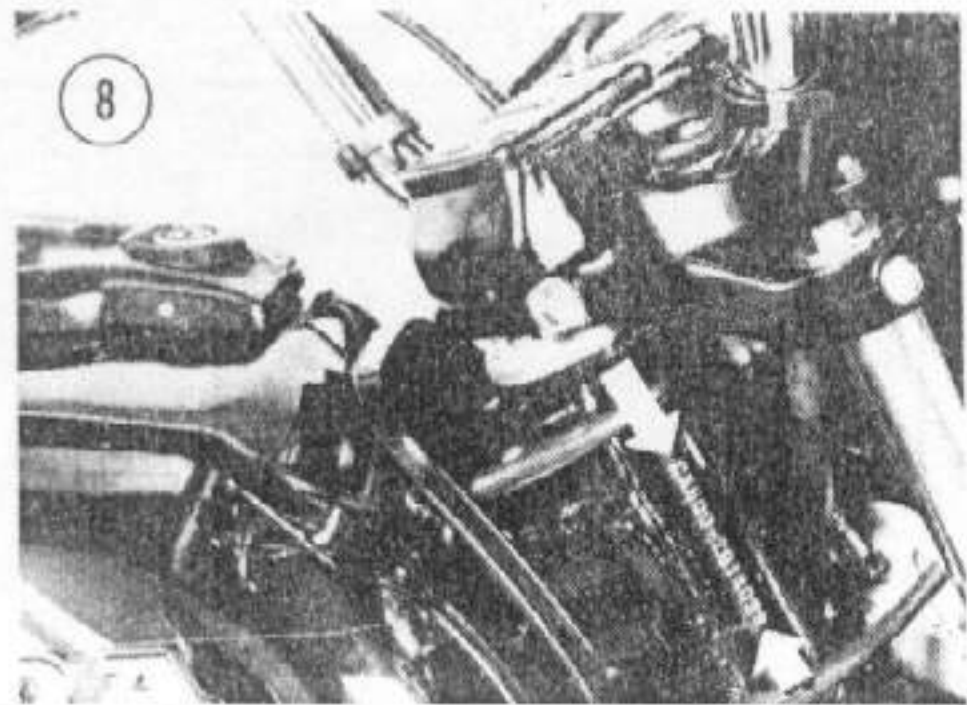
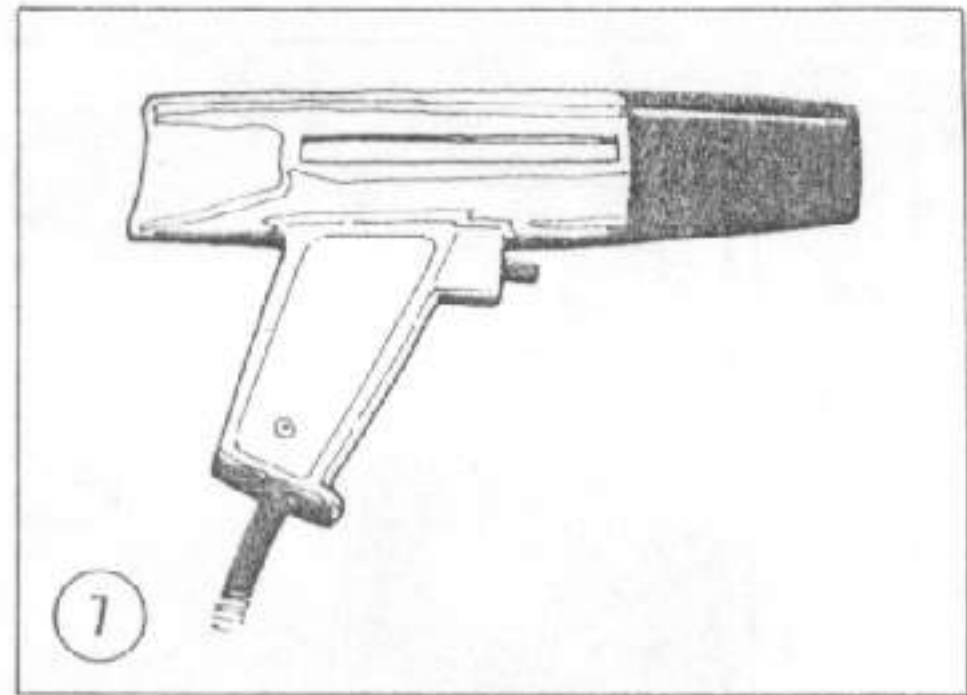


Table 1 GENERAL SPECIFICATIONS

Engine type	Liquid cooled, 4-stroke, OHV, 80° V-twin
Bore and stroke	3.071 × 2.047 in. (78 × 52mm)
Displacement	30.3 cu. in. (497cc)
Compression ratio	10:1
Carburetion	2 Keihin 35mm constant velocity
Ignition	Capacitor discharge ignition (CDI)
Lubrication	Wet sump, filter oil pump
Clutch	Wet, multi-plate (7)
Transmission	5-speed, constant mesh
Transmission ratios	
1st	2.733
2nd	1.850
3rd	1.416
4th	1.148
5th	0.931
Final reduction ratio	3.091
Starting system	Electric starter
Wheelbase	57.3 in. (1,455mm)
Steering head angle	26°5' from vertical
Trail	3.9 in. (100mm)
Front suspension	Telescopic forks, 5.5 in. (13.9mm) travel
Rear suspension	Swing arm, 5-way adjustable shock absorbers 3.3 in. (85mm) travel
Front tire	3.25 S19-4PR
Rear tire	3.75 S18-4PR
Ground clearance	15.9 in. (150mm)
Seat height	31.9 in. (810mm)
Overall height	46.3 in. (1,176mm)
Overall width (handlebar)	34.1 in. (865mm)
Overall length	86.0 in. (2,185mm)
Fuel capacity	
Main	3.6 U.S. gal. (13.6 liter)
Reserve	0.9 U.S. gal. (3.5 liter)
Engine oil capacity	3.2 U.S. qt. (3.0 liter)
Cooling system capacity	1.0 U.S. qt. (1.8 liter)
Front fork oil capacity	
Dry	4.7 oz. (135cc)
Refill	4.4 oz. (125cc)

CHAPTER TWO

TROUBLESHOOTING

Diagnosing mechanical problems is relatively simple if you use orderly procedures and keep a few basic principles in mind.

The troubleshooting procedures in this chapter analyze typical symptoms, and show logical methods of isolating causes. These are not the only methods. There may be several ways to solve a problem, but only a systematic, methodical approach can guarantee success.

Never assume anything. Do not overlook the obvious. If you are riding along and the bike suddenly quits, check the easiest, most accessible problem spots first. Is there gasoline in the tank? Is the shutoff valve in the ON or RESERVE position? Has a spark plug wire fallen off? Check ignition switch. Sometimes the weight of keys on a key ring may turn the ignition off suddenly.

If nothing obvious turns up in a cursory check, look a little further. Learning to recognize and describe symptoms will make repairs easier for you or a mechanic at the shop. Describe problems accurately and fully. Saying that "it won't run" isn't the same as saying "it quit on the highway at high speed and wouldn't start," or that "it sat in my garage for three months and then wouldn't start."

Gather as many symptoms together as possible to aid in diagnosis. Note whether the engine lost power gradually or all at once, what color

smoke (if any) came from the exhaust, and so on. Remember that the more complicated a machine is, the easier it is to troubleshoot because symptoms point to specific problems.

After the symptoms are defined, areas which could cause the problems are tested and analyzed. Guessing at the cause of a problem may provide the solution, but it can easily lead to frustration, wasted time, and a series of expensive, unnecessary parts replacement.

You do not need fancy equipment or complicated test gear to determine whether repairs can be attempted at home. A few simple checks could save a large repair bill and time lost while the bike sits in a dealer's service department. On the other hand, be realistic and do not attempt repairs beyond your abilities. Service departments tend to charge heavily for putting together a disassembled engine that may have been abused. Some won't even take on such a job — so use common sense, don't get in over your head.

2.1

OPERATING REQUIREMENTS

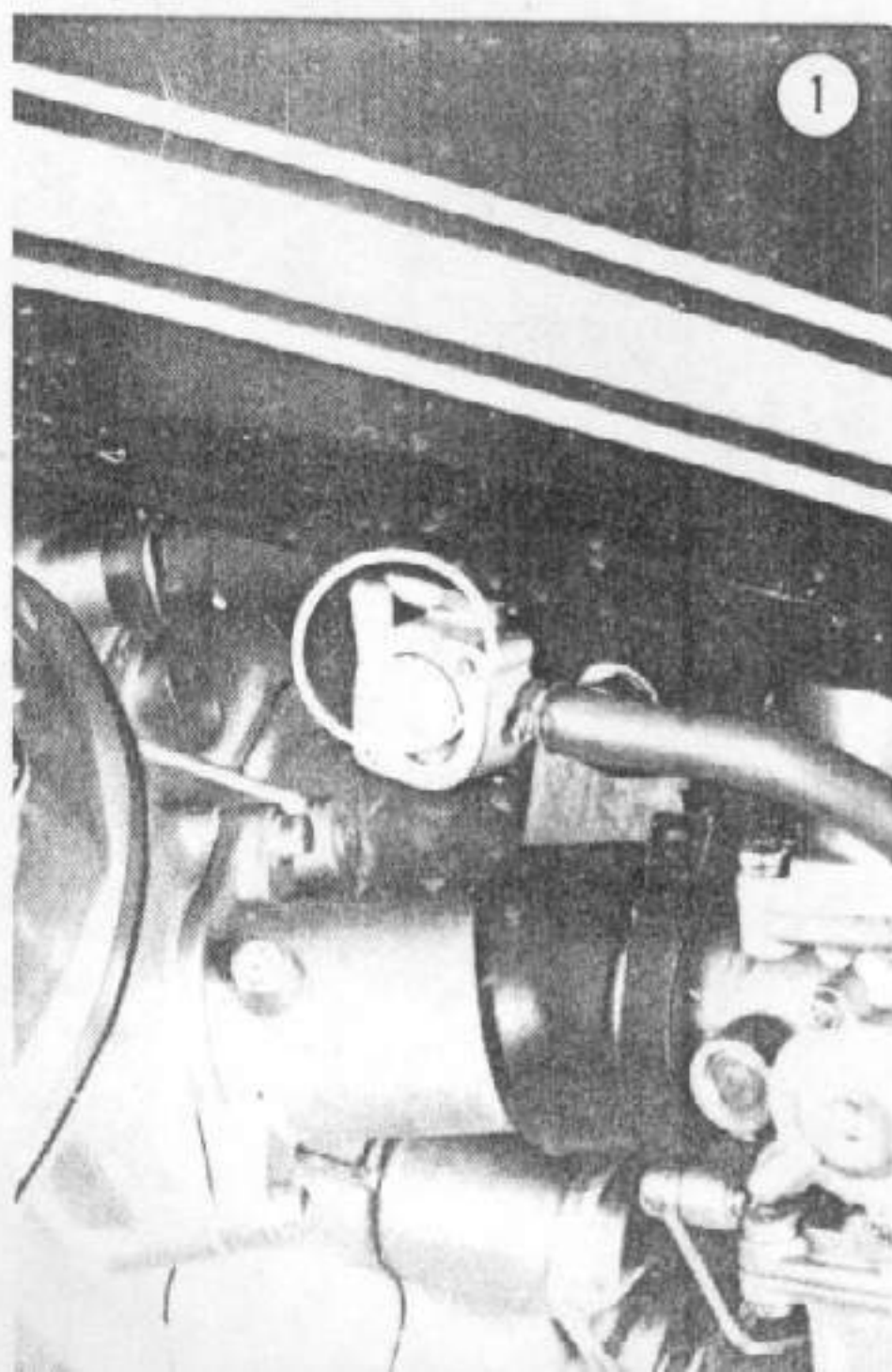
An engine needs three basics to run properly: correct gas/air mixture, compression, and a spark at the right time. If one or more are missing, the engine won't run. The electrical system is the weakest link of the three basics. More

problems result from electrical breakdowns than from any other source. Keep that in mind before you begin tampering with carburetor adjustments and the like.

If a bike has been sitting for any length of time and refuses to start, check the battery for a charged condition first, and then look to the gasoline delivery system. This includes the tank, fuel shutoff valve, lines, and the carburetors. Rust may have formed in the tank, obstructing fuel flow. Gasoline deposits may have gummed up carburetor jets and air passages. Gasoline tends to lose its potency after standing for long periods. Condensation may contaminate it with water. Drain old gas and try starting with a fresh tankful.

2.2 TROUBLESHOOTING INSTRUMENTS

Chapter One lists many instruments needed along with detailed instructions on their use.



2.2 EMERGENCY TROUBLESHOOTING

When the bike is difficult to start or won't start at all, it does not help to grind away at the starter or kick the tires. Check for obvious problems even before getting out your tools. Go down the following list step-by-step. Do each one; you may be embarrassed to find your kill switch off, but that is better than wearing out your leg or wearing your battery down with the starter. If the bike still will not start, refer to the appropriate troubleshooting procedures which follow in this chapter.

1. Is there fuel in the tank? Do not trust the fuel gauge. Remove the filler cap and rock the bike; listen for fuel sloshing around.

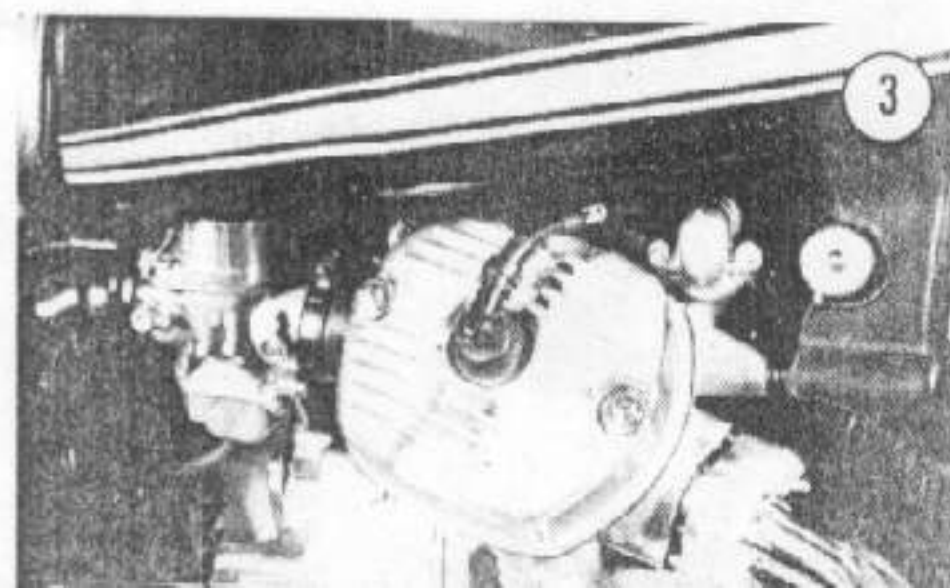
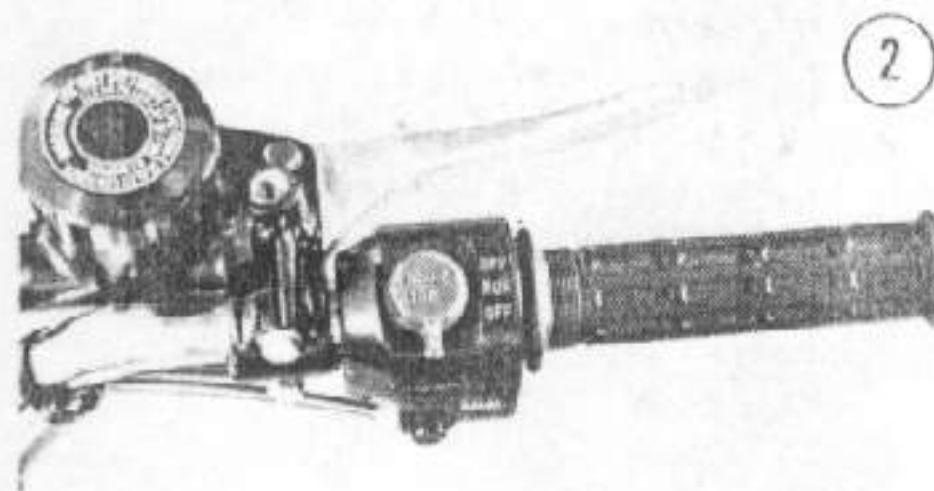
WARNING

Do not use an open flame to check in the tank. A serious explosion is certain to result.

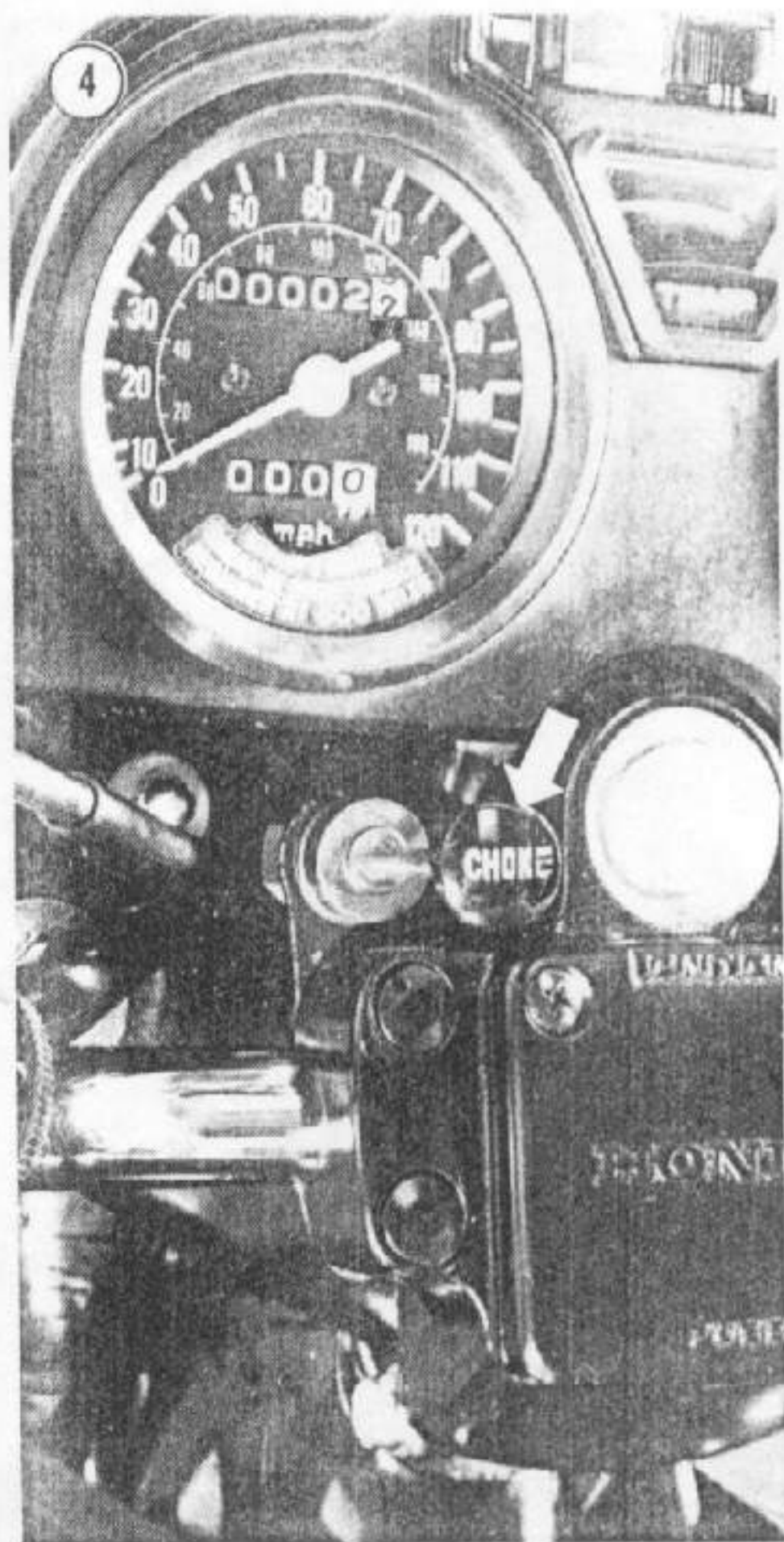
2. Is the fuel shutoff valve on? Turn it to RESERVE (Figure 1) to be sure that you get the last remaining gas.

3. Is the kill switch on? (Figure 2).

4. Are spark plug wires on tight? (Figure 3).



5. Is the choke in the right position? It should be pulled out for a cold engine and pushed in for a warm engine (Figure 4).
6. Is the battery dead? Check it with a hydrometer.
7. Has the main fuse (Figure 5) blown? Replace it with a good one.
8. Is the transmission in NEUTRAL or the clutch lever pulled in? The starter will not operate with the bike in gear without pulling in the clutch lever or having the transmission in the NEUTRAL position.
9. Is the vent hole in the fuel cap clogged (Figure 6)? If so, clean it out.

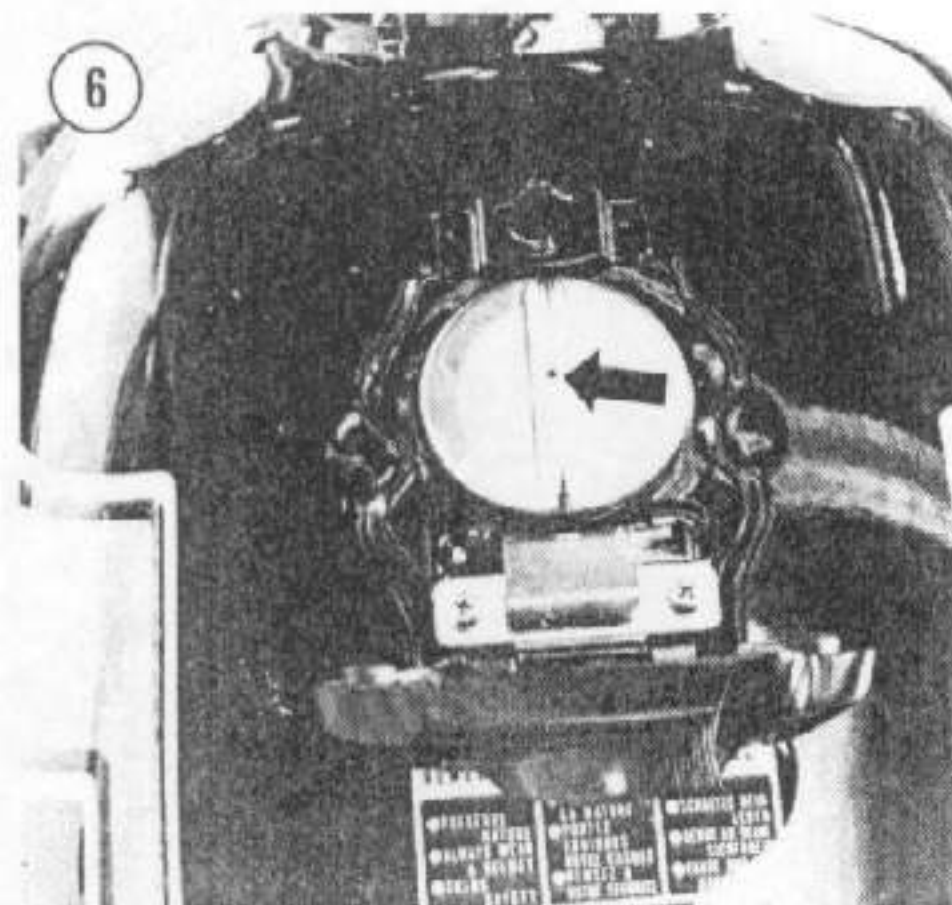
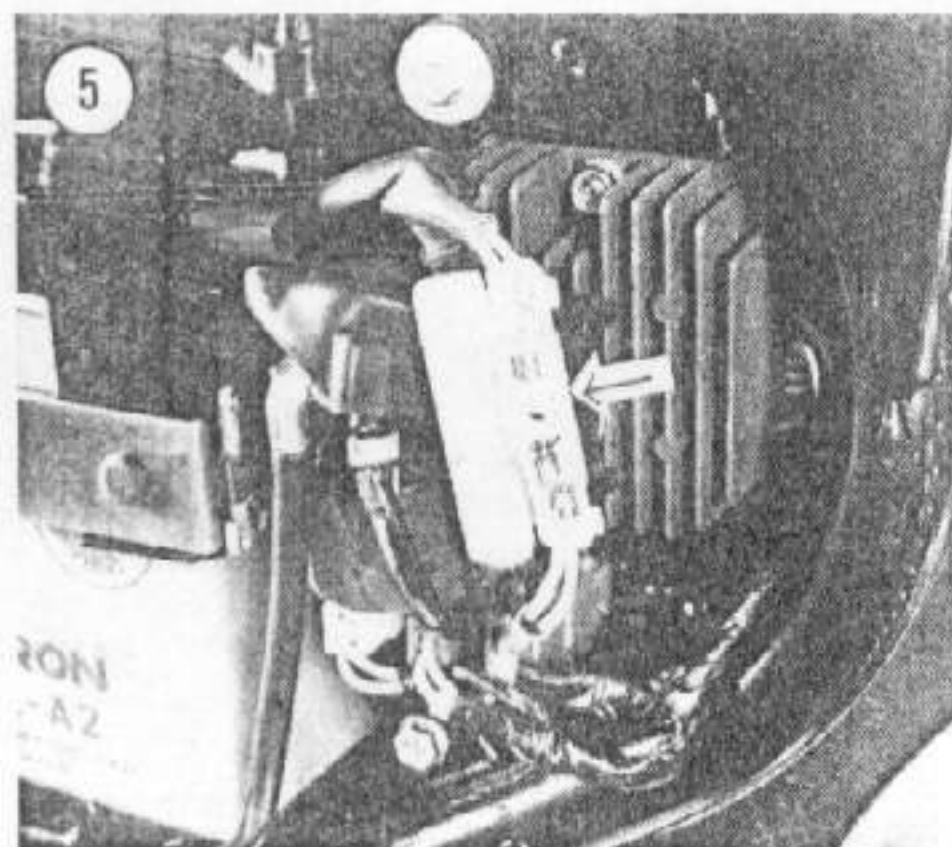


2.3 STARTER

Starter system troubles are relatively easy to isolate. The following are common symptoms and cures.

1. *Engine cranks very slowly or not at all* — If the headlight is very dim or not lighting at all, most likely the battery or its connecting wires are at fault. Check the battery condition using the procedures described in Chapter Eight. Check the wiring for breaks, shorts, and dirty connections.

If the battery and connecting wires check good, the trouble may be in the starter, starter solenoid, or wiring. To isolate the trouble, short the 2 large starter solenoid terminals together (not to ground); if the starter cranks



normally, check the starter solenoid wiring as described under symptoms 2 and 3. If the starter still fails to crank properly, remove the starter and test it. Refer to Chapter Seven.

2. *Starter only operates when clutch lever is pulled in, even in neutral* — If neutral light comes on normally, the diode is shorted; a shorted diode will not prevent the starter from operating.

If neutral light does not come on in NEUTRAL, but engine starts when clutch lever is pulled in, the neutral switch is defective or the connecting wire is open.

3. *Starter operates while transmission is in gear without pulling in the clutch lever* — The neutral switch or connecting wire is shorted to ground.

4. *Starter will not operate while transmission is in gear with the clutch lever pulled in* — The clutch lever switch or connecting wire is shorted to ground.

5. *Starter engages, but will not disengage when ignition switch is released* — This trouble is usually caused by a sticking starter solenoid.

2.4

CHARGING SYSTEM

Troubleshooting an alternator system is somewhat different from troubleshooting a generator. For example, *never* short any terminals to ground on the alternator or the voltage regulator/rectifier. The following symptoms are typical of alternator charging system troubles.

1. *Battery requires frequent charging* — The charging system is not functioning or is undercharging the battery. Test the alternator and voltage regulator/rectifier as described in Chapter Seven.

2. *Battery requires frequent additions of water or lamps require frequent replacement* — The alternator is probably overcharging the battery. Check voltage regulator/rectifier as described in Chapter Seven.

2.5

ENGINE

These procedures assume that the starter cranks the engine over normally. If not, refer to *Starter* section in this chapter.

2.5.A.

Poor Performance

1. *Engine misses erratically at all speeds* — A cause for intermittent trouble like this can be difficult to find. The fault could be in the ignition system, exhaust system (exhaust restriction), or fuel system. Follow troubleshooting procedures for these systems carefully to isolate the trouble.

2. *Engine misses at idle only* — Trouble could exist anywhere in ignition system. Refer to *Ignition System* in Chapter Seven. Trouble could exist in the carburetor idle circuits.

3. *Engine misses at high speed only* — Trouble could exist in the fuel system or ignition system. Check the fuel lines, etc., as described under *Fuel System* troubleshooting. Also check spark plugs and wires. Refer to *Ignition System* in Chapter Seven.

4. *Poor performance at all speeds, lack of acceleration* — Trouble usually exists in ignition or fuel system. Check each with the appropriate troubleshooting procedure.

5. *Excessive fuel consumption* — This can be caused by a wide variety of seemingly unrelated factors. Check for clutch slippage, brake drag, and defective wheel bearings. On models with *automatic transmission*, check engine oil level. The engine oil is used in the torque converter also and it may be low. Check ignition and fuel system as described later.

2.6

ENGINE NOISES

1. *Valve clatter* — This is a light to heavy tapping sound from under the valve covers. Usually caused by excessive valve clearance. Adjust clearance as described under *Valve Clearance Adjustment* in Chapter Three. If noise persists, disassemble the rocker arm mechanism as described under *Rocker Assemblies* in Chapter Four. Look for broken springs, worn rocker arms, and shafts.

2. *Knocking or pinging during acceleration* — Caused by using a lower octane fuel than recommended. May also be caused by poor fuel available at some "discount" gasoline stations. Pinging can also be caused by spark plugs of the wrong heat range. Refer to *Correct Spark Plug Heat Range* in Chapter Three.

3: *Slapping or rattling noises at low speed or during acceleration* — May be caused by piston slap, i.e., excessive piston-cylinder wall clearance.

4. *Knocking or rapping while decelerating* — This noise is usually caused by excessive rod bearing clearance.

5. *Persistent knocking and vibration* — This is usually caused by excessive main bearing clearance.

6. *Rapid on-off squeal* — Could be caused by a compression leak around cylinder head gaskets or spark plugs.

2.7

EXCESSIVE VIBRATION

This can be difficult to find without disassembling the engine. Usually this is caused by loose engine mounting hardware or worn engine or transmission bearings.

2.8

LUBRICATION TROUBLES

1. *Excessive oil consumption* — May be caused by worn rings and bores. Overhaul is necessary to correct this; see Chapter Four. May also be caused by worn valve guides or defective valve guide seals. Also check for exterior leaks.

2. *Oil pressure lamp does not light when ignition switch is on* — The oil pressure sending switch is located on the engine front cover above the clutch housing (Figure 7). To gain access to it, remove the radiator as described under *Radiator Removal/Installation* in Chapter Eight. Check that the wire is connected to the sender and makes good contact. Pull off wire and ground it. If the lamp lights, replace the sender. If the lamp does not light, replace the lamps.

3. *Oil pressure lamp lights or flickers when engine is running* — This indicates low or complete loss of oil pressure. *Stop the engine immediately*; coast to a stop with the clutch disengaged. This may simply be caused by a low oil level, or an overheating engine. Check the oil level. Check for a shorted oil pressure sender with an ohmmeter or other continuity tester. Listen for unusual noises indicating bad bearings, etc. Do not restart the engine until you know why the light went on and the problem has been corrected.

2.9

FUEL SYSTEM

Fuel system troubles must be isolated to the carburetor, fuel tank, fuel shutoff valve or fuel lines. These procedures assume that the ignition system has been checked and properly adjusted.

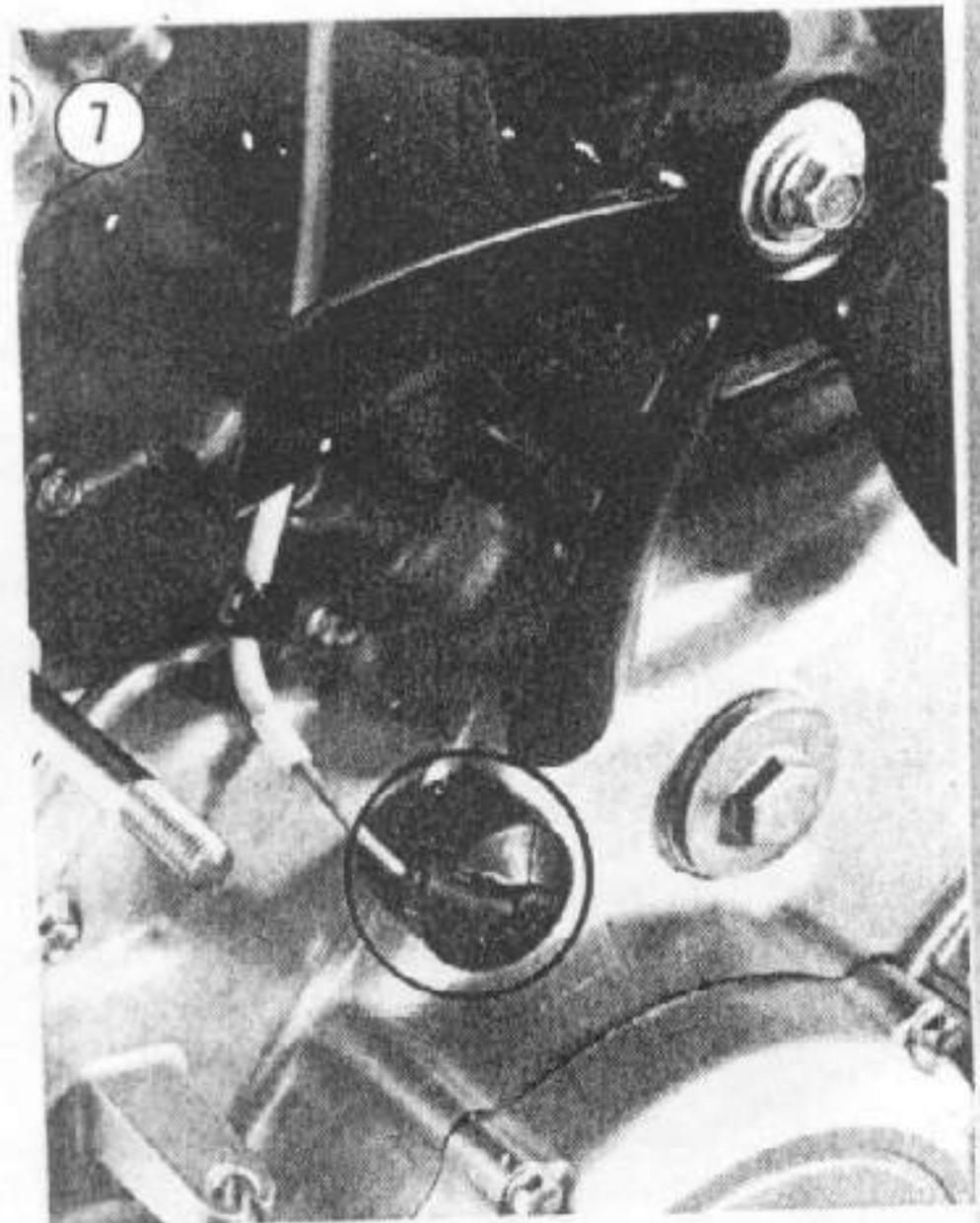
1. *Engine will not start* — First determine that the fuel is being delivered to the carburetor. Turn the fuel shutoff valve to the OFF position, remove the flexible fuel line to the carburetor. Place the loose end onto a small container, turn the shutoff valve to the ON or RESERVE position. Fuel should run out of the tube. If it does not, remove the shutoff valve and check for restrictions within it or the fuel tank. Refer to Chapter Six.

2. *Rough idle or engine miss with frequent stalling* — Check carburetor adjustment. See Chapter Three.

3. *Stumbling when accelerating from idle* — Check idle speed adjustment. See Chapter Three.

4. *Engine misses at high speed or lacks power* — This indicates possible fuel starvation. Clean main jets and float needle valves.

5. *Black exhaust smoke* — Black exhaust smoke means a badly overrich mixture. Check



that manual choke disengages. Check idle speed. Check for leaky floats or worn float needle valves. Also check that jets are proper size.

2.10

CLUTCH

1. *Slippage* — This is most noticeable when accelerating in a high gear at relatively low speed. To check slippage, shift to 2nd gear and release the clutch as if riding off. If the clutch is good, the engine will slow and stall. If the clutch slips, continued engine speed will give it away.

Slippage results from insufficient clutch lever free play, worn discs or pressure plate, or weak springs.

2. *Drag or failure to release* — This trouble usually causes difficult shifting and gear clash, especially when downshifting. The cause may be excessive clutch lever free play, warped or bent pressure plate or clutch disc, or broken or loose linings.

3. *Chatter or grabbing* — A number of things can cause this trouble. Check tightness of engine mounting bolts. Also check lever free play.

2.11

TRANSMISSION

Transmission problems are usually indicated by one or more of the following symptoms:

- a. Difficulty shifting gears
- b. Gear clash when downshifting or when shifting from high to low
- c. Slipping out of gear
- d. Excessive noise in NEUTRAL
- e. Excessive noise in gear

Transmission symptoms are sometimes hard to distinguish from clutch symptoms. Be sure that the clutch is not causing the trouble before working on the transmission. Refer to Chapter Five.

2.12

BRAKES

1. *Brake lever or pedal goes all the way to its stop* — There are numerous causes for this including excessively worn linings or pads, air in the hydraulic system, leaky brake lines, leaky calipers, or leaky or worn master cylinder. Check for leaks and thin brake linings or pads. Bleed the brakes. If this does not cure the trou-

ble, rebuild the calipers and/or master cylinder. Also improper rod adjustment may be a cause.

2. *Spongy lever* — Normally caused by air in the system; bleed the brakes.

3. *Dragging brakes* — Check for swollen rubber parts, due to improper brake fluid or contamination, and obstructed master cylinder bypass port. Clean or replace defective parts. Check for broken or weak return springs.

4. *Hard lever or pedal* — Check brake linings or pads for contamination. Also check for a restricted brake line and hose and a brake pedal that might need lubrication.

5. *High speed fade* — Check for glazed or contaminated brake linings or pads. Ensure that recommended brake fluid is installed. Drain entire system and refill if in doubt.

6. *Pulsating lever or pedal* — Check for out-of-round drum or excessive brake disc runout. Undetected accident damage is also a frequent cause of this.

2.13

LIGHTING SYSTEM

Bulbs which continuously burn out may be caused by excessive vibration, loose connections that permit sudden current surges, poor battery connections, or installation of the wrong type bulb.

A majority of light and horn or other electrical accessory problems are caused by loose or corroded ground connections. Check those first, and then substitute known good units for easier troubleshooting.

2.14

FRONT SUSPENSION AND STEERING

1. *Too stiff or too soft* — Make sure forks have not been leaking and oil is correct. If in doubt, drain and refill as described under *Front Forks* in Chapter Nine.

2. *Leakage around seals* — There should be a light film of oil on fork tubes. However, large amounts of oil on tubes means the seals are leaking. Replace seals as described under *Front Fork Seal Replacement* in Chapter Nine.

3. *Fork action is rough* — Check for bent tube.

4. *Steering wobbles* — Check for correct steering head bearing tightness as described under *Steering Head Adjustment* in Chapter Nine.

CHAPTER THREE

PERIODIC MAINTENANCE AND LUBRICATION

Regular maintenance is the best guarantee of a trouble-free, long lasting motorcycle. An afternoon spent now, cleaning and adjusting, can prevent costly mechanical problems in the future and unexpected breakdowns on the road.

The procedures presented in this chapter can be easily carried out by anyone with average mechanical skills. The operations are presented step-by-step; if they are followed, it is difficult to go wrong.

3.1 ROUTINE CHECKS

The following simple checks should be performed at each stop at a service station for gas.

3.1.1 Engine Oil Level

Refer to *Checking Engine Oil Level* under *Periodic Lubrication* in this chapter.

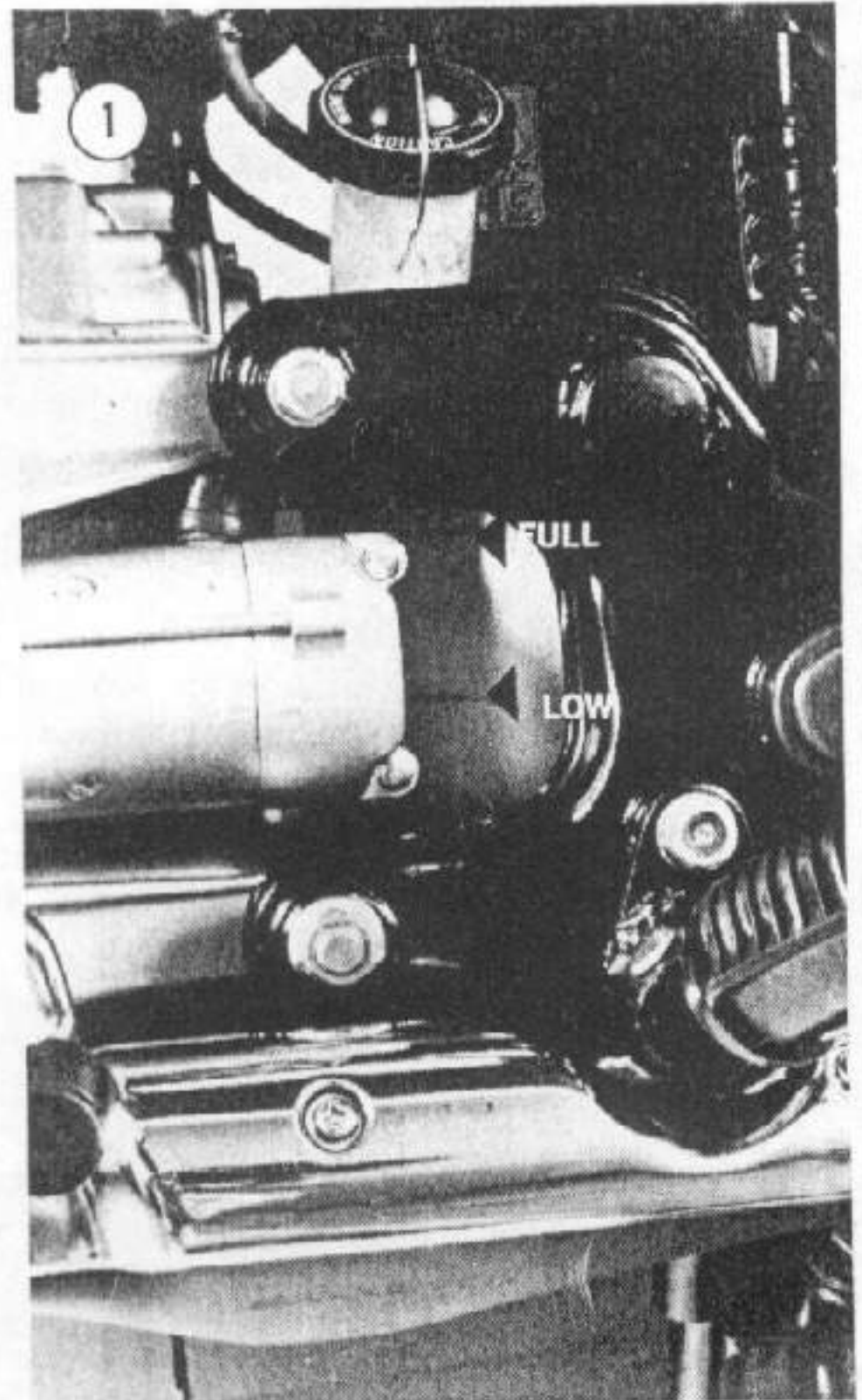
3.1.2 Coolant Level

Check the coolant level when the engine has warmed up to normal operating temperature.

Check level in the recovery tank (Figure 1). Top it up if the level is below the FULL mark.

WARNING

Do not remove the radiator pressure cap when the engine is hot. The coolant is



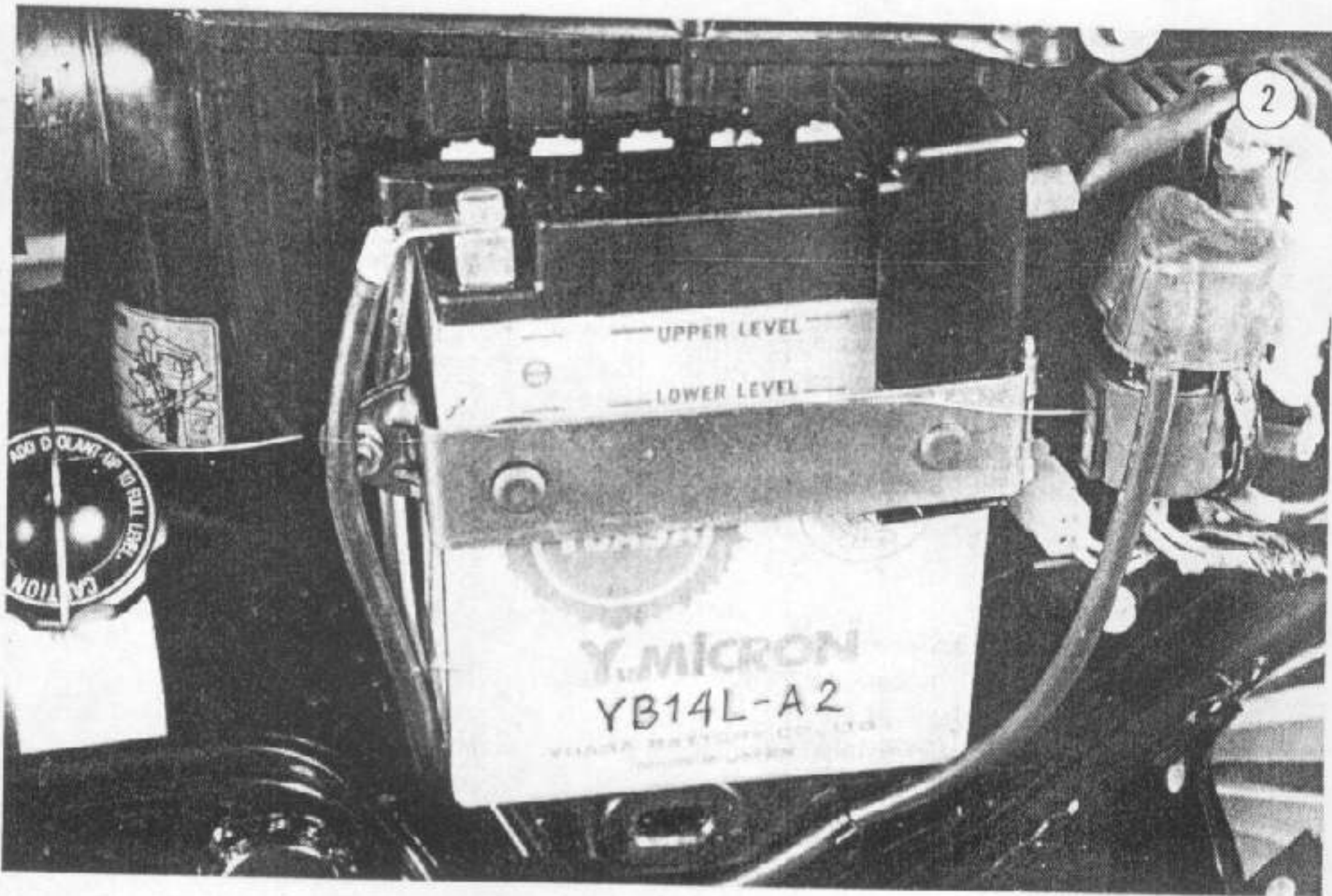


Table 1 TIRE PRESSURES

Load	Front	Rear
Rider only Up to 200 lb. (90 kg)	24 psi (1.75 kg/sq. cm)	28 psi (2.00 kg/sq. cm)
Rider and passenger and/or luggage Up to 330 lb. (150 kg)*	24 psi (1.75 kg/sq. cm)	36 psi (2.50 kg/sq. cm)
*Vehicle maximum load limit		

extremely hot and under pressure and can scald you.

**3.4.3
General Inspection**

1. Quickly examine the engine for signs of oil, fuel, or coolant leakage.
2. Check the tires for imbedded stones. Pry them out with your ignition key.
3. Make sure all lights work.

NOTE: At least check the brakelight. It can burn out anytime. Motorists cannot stop as quickly as you and need all the warning you can give.

**3.4.4
Tire Pressure**

Tire pressure must be checked with the tires cold. Correct tire pressure depends a lot on the load you are carrying. See **Table 1**.

**3.4.5
Battery**

Remove the left-hand side cover and check battery electrolyte level. The level must be between the upper and lower level marks on the case (**Figure 2**). For complete details see *Battery — Checking Electrolyte Level* in this chapter.

Check the level more frequently in hot weather.

3.2

SERVICE INTERVALS

The services and intervals shown in **Table 2** are recommended by the factory. Strict adherence to these recommendations will go a long way toward insuring long service from your Honda.

For convenience of maintaining your motorcycle, most of the services shown in the table are described in this chapter. However, some procedures which require more than minor disassembly or adjustment are covered elsewhere in the appropriate chapter.

3.3

TIRES

3.3.1

Pressure

Tire pressure should be checked and adjusted to accommodate rider and luggage weight. A simple, accurate gauge (**Figure 3**) can be purchased for a few dollars and should be carried in the motorcycle tool kit. The appropriate tire pressures are shown in **Table 1**.

3.3.2

Inspection

Check tread for excessive wear, deep cuts, imbedded objects such as stones, nails, etc. If you find a nail in a tire, mark its location with a light crayon before pulling it out. This will help locate the hole in the inner tube. Refer to *Tire Changing* in Chapter Nine.

Check local traffic regulations concerning minimum tread depth. Measure with a tread depth gauge (**Figure 4**) or small ruler. Honda recommends replacement when the front tread depth is $\frac{1}{16}$ in. (1.5mm) or less and rear tread depth is $\frac{3}{32}$ in. (2mm) or less. Tread wear indicators appear across the tire when tread reaches minimum safe depth. Replace the tire at this point.

3.4

BATTERY

3.4.1

Checking Electrolyte Level

The battery is the heart of the electrical system. It should be checked and serviced as indicated. The majority of electrical system troubles can be attributed to neglect of this vital component.

The electrolyte level may be checked with the battery installed. However, it is necessary to

remove the left-hand side panel (**Figure 5**). The electrolyte level should be maintained between the two marks on the battery case (**Figure 2**). If the electrolyte level is low, it is a good idea to remove the battery so that it can be thoroughly serviced and checked.

1. Remove the left-hand side panel (**Figure 5**).

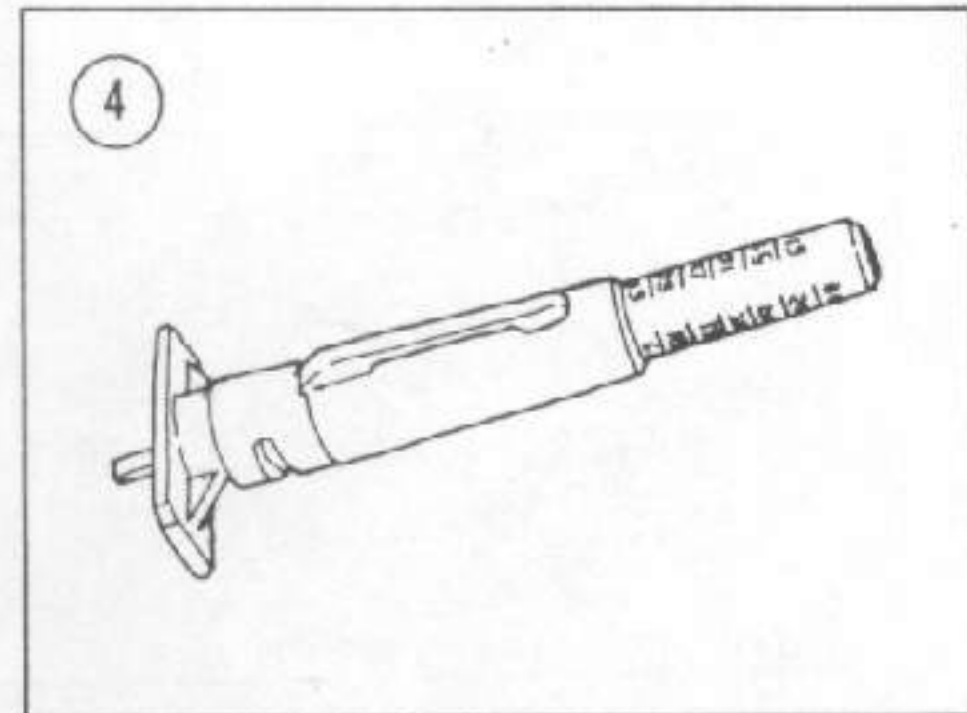
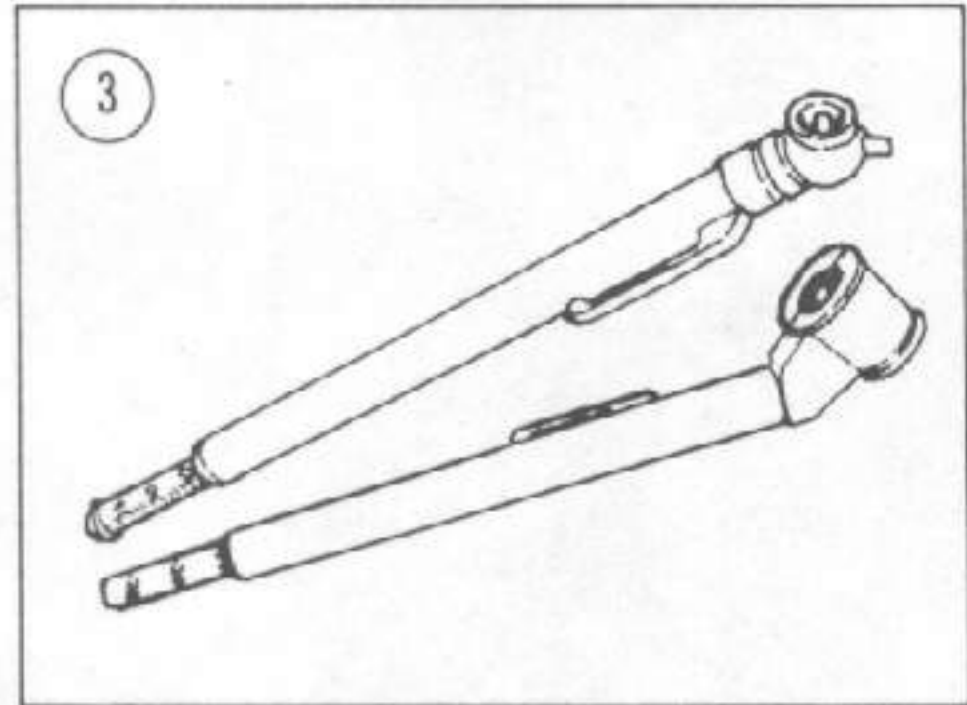


Table 2 SERVICE INTERVALS

<p>Every Month</p>	<ul style="list-style-type: none"> • Check tire pressure and condition. • Check battery electrolyte level.
<p>Every 250 Miles</p>	<ul style="list-style-type: none"> • Check engine oil level. • Check coolant level in recovery tank.
<p>Every 1,800 Miles</p>	<ul style="list-style-type: none"> • Check brake fluid in master cylinder. • Lubricate all control cables with oil. • Adjust brake (disc brake is non-adjustable).
<p>Every 3,600 Miles</p>	<ul style="list-style-type: none"> • Tune-up engine. • Check crankcase breather tubes. • Clean air cleaner element. • Inspect spark plugs; regap if necessary. • Check carburetor idle speed. • Adjust camshaft chain tensioner. • Check clutch free play adjustment. • Check rear brake pedal free play adjustment. • Examine disc brake pads for wear. • Check valve clearance. • Inspect throttle operation. • Check engine mounts for side play. • Check all suspension components. • Lubricate rear brake pedal pivot. • Inspect wheels. • Inspect fuel lines for chafed, cracked, or swollen ends.
<p>Every 7,200 Miles</p>	<ul style="list-style-type: none"> • Change engine oil. • Replace oil filter. • Replace spark plugs. • Inspect cooling system and hoses. • Inspect steering head and bearings. • Replace air cleaner element. • Check oil level in final drive unit. • Change fluid in front forks. • Check stoplight switch operation. • Inspect brake system. • Inspect throttle operation. • Lubricate final drive joint. • Check all nuts, bolts, and fasteners.
<p>Every 10,800 Miles</p>	<ul style="list-style-type: none"> • Repack wheel bearings with grease. • Dismantle and clean both carburetors.
<p>Every 21,000 Miles</p>	<ul style="list-style-type: none"> • Drain and replace coolant. • Drain and replace final drive lubricant. • Drain and replace disc brake fluid.



2. Remove negative electrical cable (ground) from the battery (Figure 6).
3. Remove the nut (Figure 7) securing the retaining strap and pivot the strap out of the way.
4. Remove the positive electrical cable (A, Figure 8) and the breather tube (B, Figure 8).
5. Pull the battery out and remove it.

CAUTION

Be careful not to spill battery electrolyte on painted or polished surfaces. The liquid is highly corrosive and will damage the finish. If it is spilled, wash it off immediately with soapy water and thoroughly rinse with clean water.

6. Remove the caps from the battery cells and add distilled water to correct the level. *Never add electrolyte (acid) to correct the level.*
7. After the level has been corrected and the battery allowed to stand for a few minutes, check the specific gravity of the electrolyte in each cell with a hydrometer (Figure 9). Follow the manufacturer's instructions for reading the instrument.

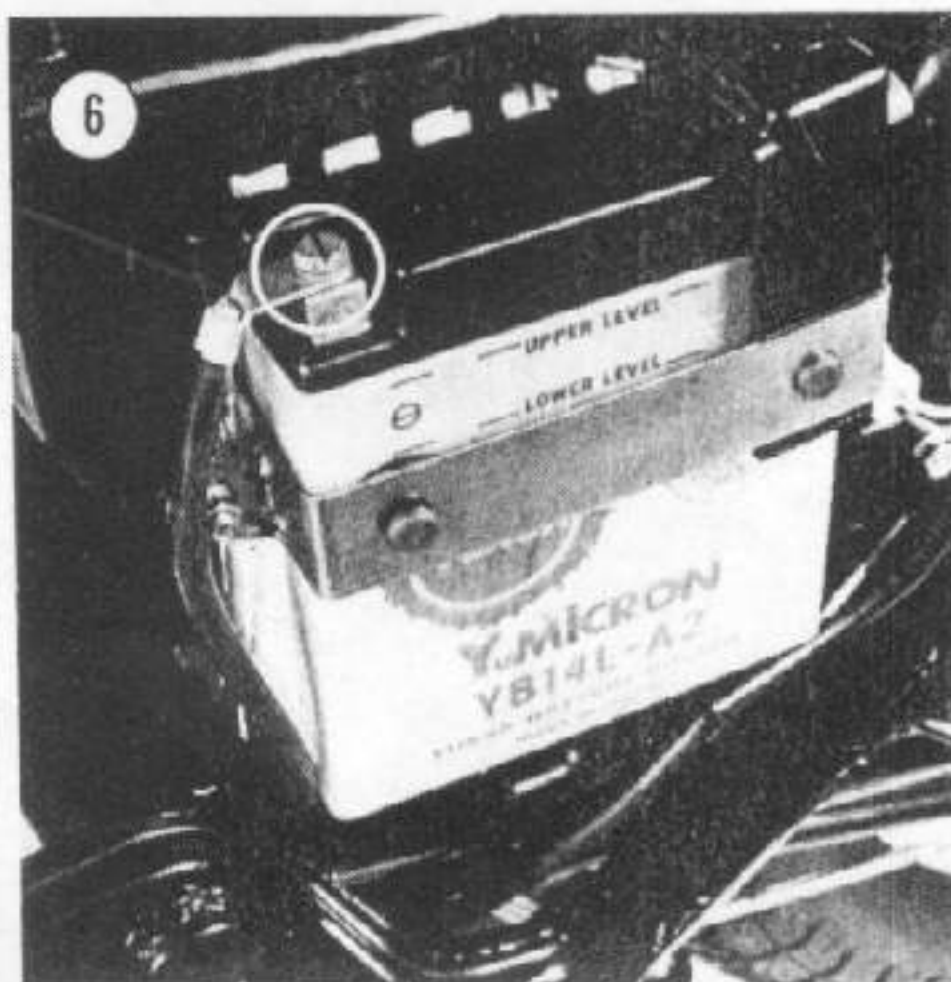
3.4.2

Testing

Hydrometer testing is the best way to check battery condition. Use a hydrometer with numbered graduations from 1.100 to 1.300 rather than one with color-coded bands. To use the hydrometer, squeeze the rubber ball, insert

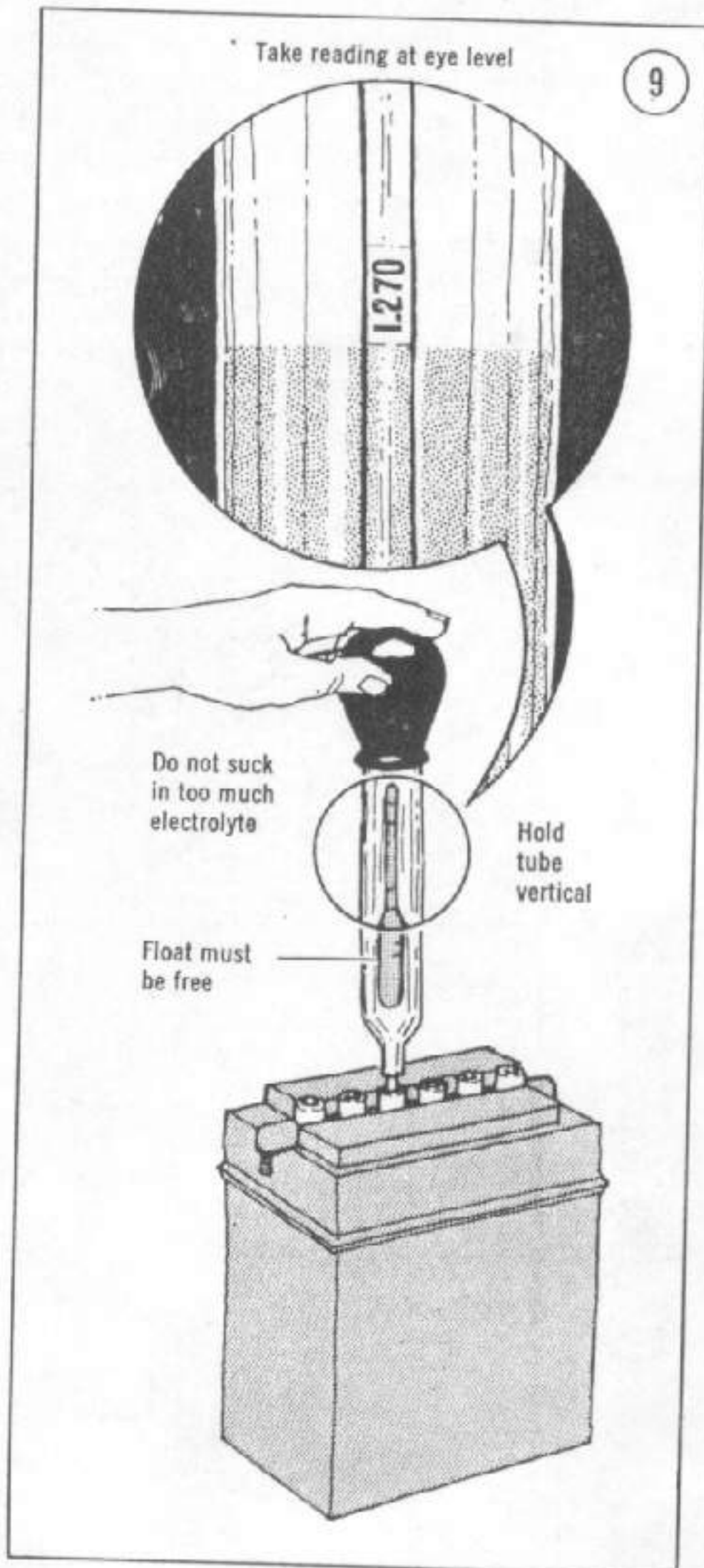
the tip in the cell and release the ball. Draw enough electrolyte to float the weighted float inside the hydrometer. Note the number in line with surface of the electrolyte; this is the specific gravity for this cell. Return the electrolyte to the cell from which it came.

The specific gravity of the electrolyte in each battery cell is an excellent indication of that cell's condition. A fully charged cell will read 1.275-1.280, while a cell in good condition may read from 1.250-1.280. A cell in fair condition reads from 1.225-1.250 and anything below 1.225 is practically dead.



Specific gravity varies with temperature. For each 10° that electrolyte temperature exceeds 80°F, add 0.004 to reading indicated on hydrometer. Subtract 0.004 for each 10° below 80°F.

If the cells test in the poor range, the battery requires recharging. The hydrometer is useful for checking the progress of the charging operation. Table 3 shows approximate state of charge.



3.4.3 Charging

CAUTION

Always remove the battery from the motorcycle before connecting charging equipment.

WARNING

During charging, highly explosive hydrogen gas is released from the battery. The battery should be charged only in a well-ventilated area, and open flames and cigarettes should be kept away. Never check the charge of the battery by arcing across the terminals; the resulting spark can ignite the hydrogen gas.

1. Connect the positive (+) charger lead to the positive battery terminal and the negative (-) charger lead to the negative battery terminal.
2. Remove all vent caps from the battery, set the charger at 12 volts, and switch it on. If the output of the charger is variable, it's best to select a low setting — 1½ to 2 amps.
3. After battery has been charged for about 8 hours, turn off the charger, disconnect the leads and check the specific gravity. It should be within the limits specified in Table 3. If it is, and remains stable after one hour, the battery is charged.
4. Clean the battery terminals, case, and tray and reinstall them in the motorcycle, reversing the removal steps. Coat the terminals with Vaseline or silicone spray to retard decomposition of the terminal material. Install the breather tube without any kinks or sharp bends. It must be clear in order to dissipate the gas normally given off by the battery.

Table 3 STATE OF CHARGE

Specific Gravity	State of Charge
1.110 - 1.130	Discharged
1.140 - 1.160	Almost discharged
1.170 - 1.190	One-quarter charged
1.200 - 1.220	One-half charged
1.230 - 1.250	Three-quarters charged
1.260 - 1.280	Fully charged

3.5

PERIODIC LUBRICATION

3.5.1

Checking Engine Oil Level

Engine oil level is checked with the dipstick located on the left-hand side of the crankcase (Figure 10).

1. Start the engine and allow it to run for a couple of minutes.
2. Shut off the engine and allow the oil to settle. Remove the dipstick, wipe it clean, reinsert it, *do not screw it in*. Remove it and check level. The motorcycle must be level for a correct reading.
3. The level should be between the 2 lines (Figure 11) but not above the upper one. If necessary, add the recommended weight of oil (Figure 12) to correct the level. Install the dipstick, and tighten it securely.

3.5.2

Changing Engine Oil and Filter

The factory recommends oil change intervals every 7,200 miles. The filter should be changed with every other oil change. This assumes that the motorcycle is operated in moderate climates. In extreme cold climates, oil should be changed every 30 days. The time interval is more important than the mileage interval because acids formed by gasoline and water vapor from combustion will contaminate the oil even if the motorcycle is not run for several months. Also, if the motorcycle is operated

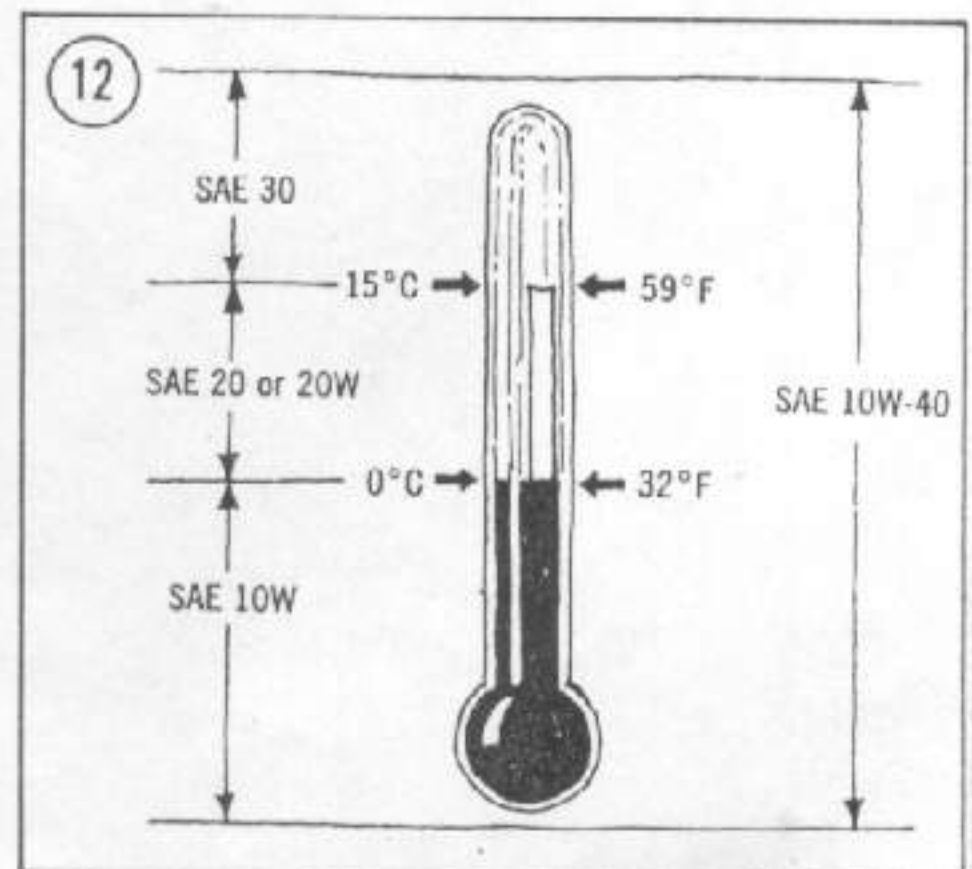
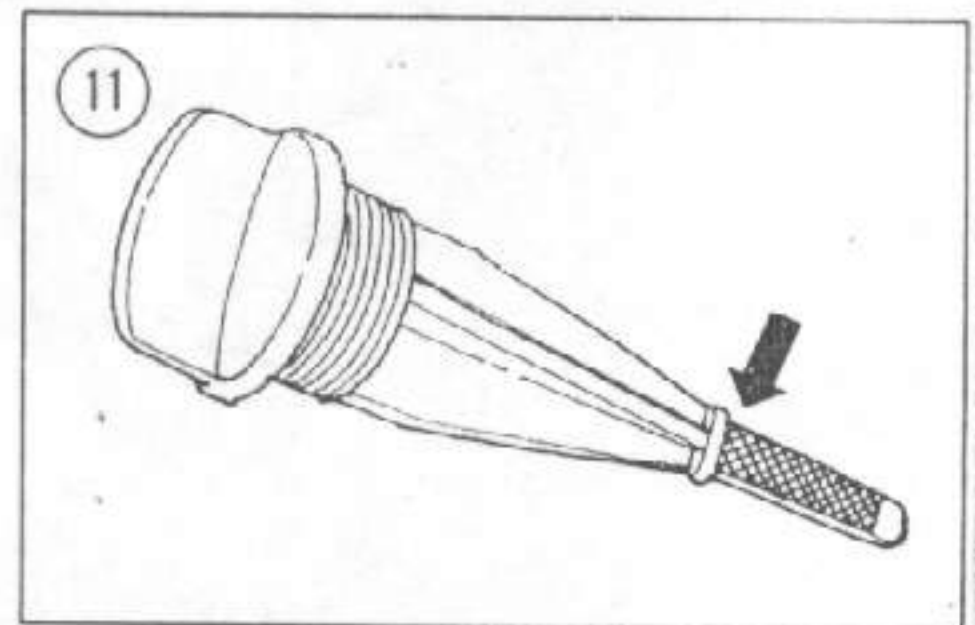
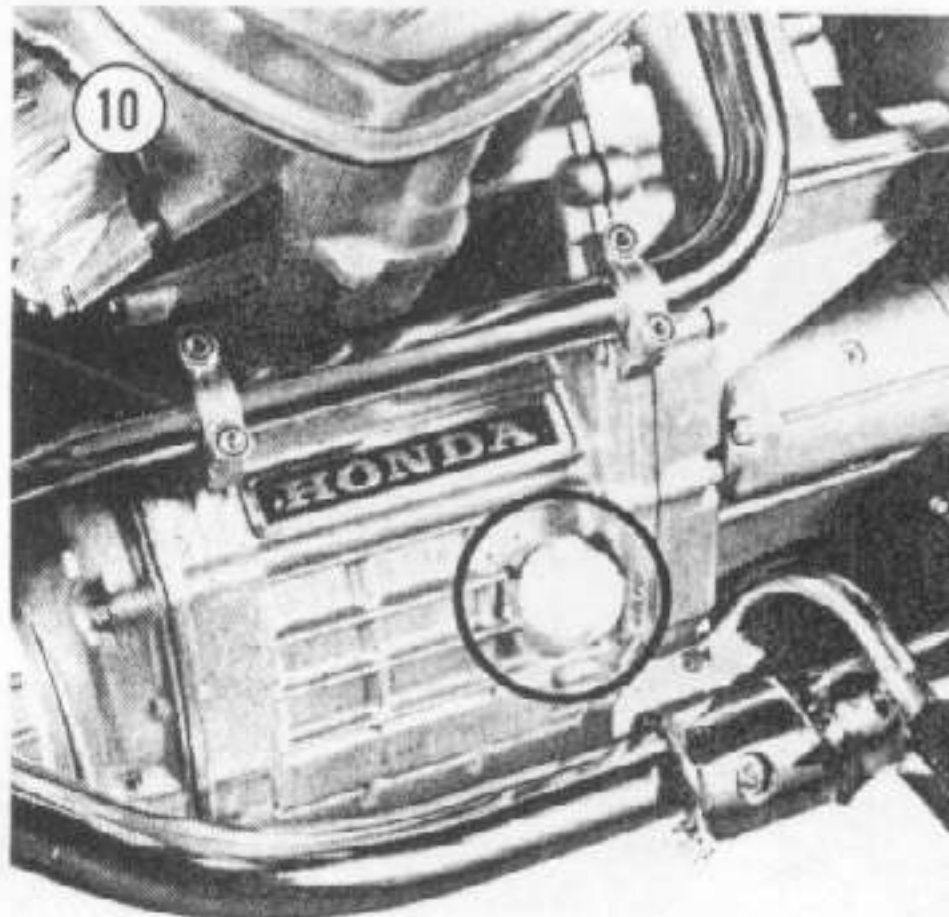
under dusty conditions the oil will get dirty more quickly and should be changed more frequently than recommended.

Use only a detergent oil with a API rating of SE or better. The quality rating is stamped on top of the can. Try always to use same brand of oil. Oil additives are not recommended.

Refer to Figure 12 for the correct weight of oil to use under different temperatures.

1. Place the motorcycle on the centerstand.
2. Start the engine and run it until it reaches normal operating temperature, then turn it off.
3. Place a drip pan under the crankcase and remove the drain plug (A, Figure 13) with a 17mm wrench. Remove dipstick (Figure 10); this will speed up the flow of oil.
4. Let it drain for at least 15-20 minutes.

NOTE: Before removing the filter cover, thoroughly clean off all road dirt and oil around it.



5. To remove the oil filter, unscrew the bolt securing the filter cover (B, Figure 13) to the crankcase.

6. Remove the cover and the filter, discard the old filter and clean out the cover and the bolt with cleaning solvent and dry thoroughly. Remove all solvent residue.

7. Inspect the O-ring (A, Figure 14) on the bolt and the seal (B, Figure 14) on the cover. Replace any if damaged or deteriorated.

NOTE: Prior to installing the cover, clean off the mating surface of the

crankcase — do not allow any road dirt to enter into the oil system.

8. Insert the bolt into the cover and install the spring and washer (Figure 15). Insert the filter and reinstall into the crankcase.

9. Tighten the filter cover bolt to 14-18 ft.-lb. (19-24 N•m) and install the drain plug.

10. Fill the crankcase with the correct weight (Figure 12) and quantity of oil.

NOTE: The capacity is approximately 3.2 qt. (3.0 liters).

11. Screw in the dipstick and start the engine, let it idle at moderate speed and check for leaks.

12. Turn off the engine and check for correct oil level.

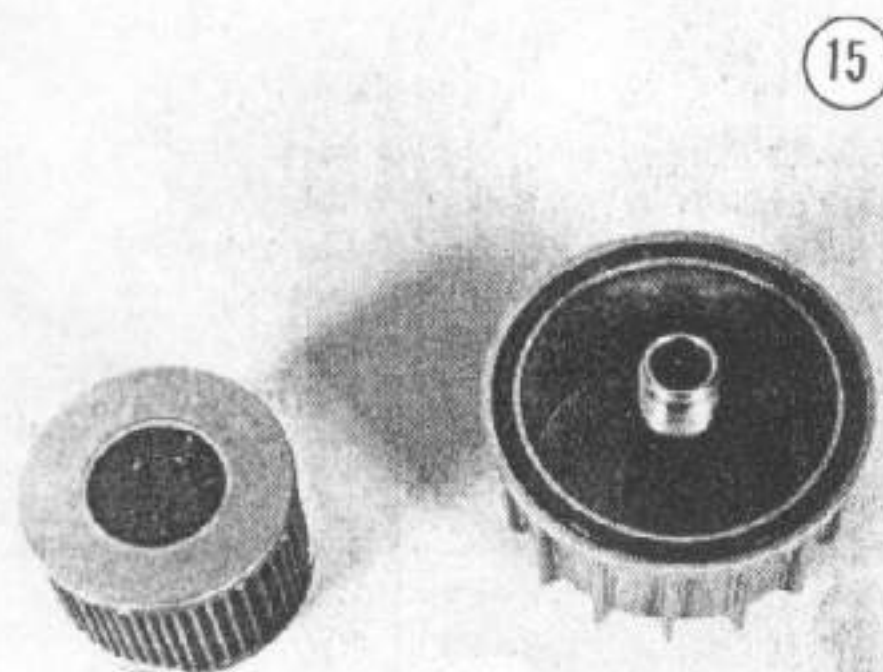
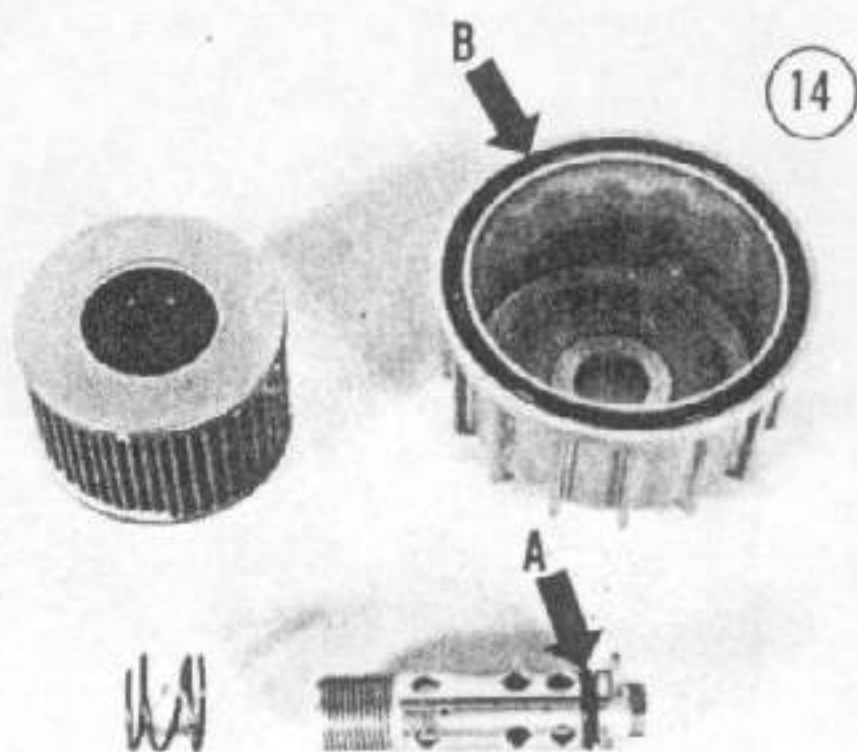
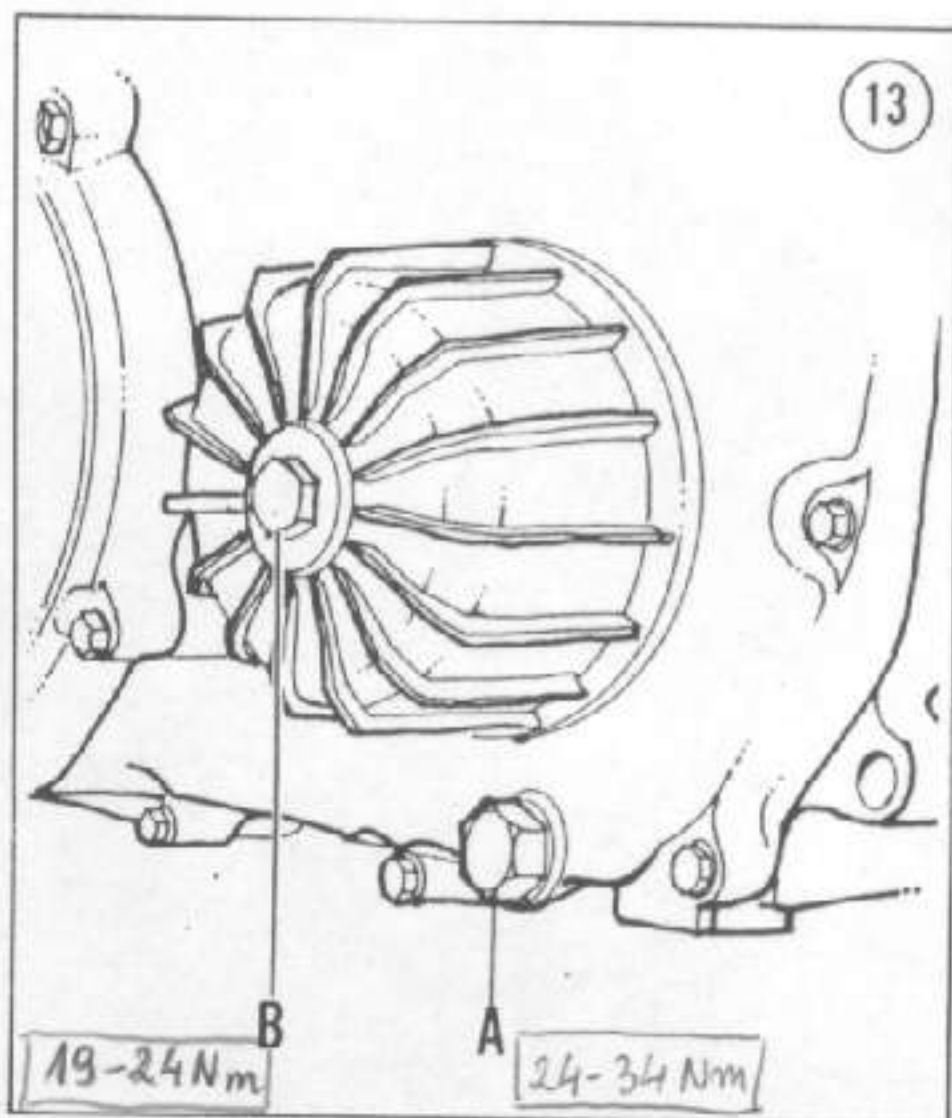
13. Remove the dipstick and wipe it clean. Reinsert it, but *do not screw it in*. Remove it and check level. Maintain the level between the upper and lower marks (Figure 11).

3.5.3

Front Forks

The damping oil in the front fork should be changed every 7,200 miles or at any time excessive bouncing of the front end indicates a low oil level. There is no practical way of checking and correcting the level; each fork leg must contain exactly 4.6 oz. (135cc) of damping oil if front suspension is to operate correctly.

It is necessary to completely disassemble the forks to change the oil. Refer to *Front Fork Disassembly/Assembly* in Chapter Nine.



3.5.4.

Final Drive

Every 7,200 miles, check the oil level in the final drive. Rest the bike on the centerstand on level ground. Remove the cap (Figure 16). The level should just reach the bottom of the hole. Top up if necessary with the lubricant recommended in Table 4.

At the same interval, inject a small amount of multipurpose grease into the Zerk fitting (Figure 17). Use a small hand-held grease gun. See Table 4.

3.6

PERIODIC MAINTENANCE

The hydraulic brake fluid level in the disc brake master cylinder should be checked every month or 1,800 miles and the brake pads should be checked for wear. Bleeding the hydraulic system, servicing the master cylinder, caliper, and disc and also replacing brake pads are covered in Chapter Eleven.

3.6.1

Front Disc Brake Fluid Level

1. Clean the outside of the reservoir cap thoroughly with a dry rag and unscrew it. Remove the washer and diaphragm.
2. The fluid level in the reservoir should be up to the upper level line (Figure 18). If necessary, correct the level by adding fresh brake fluid.

WARNING

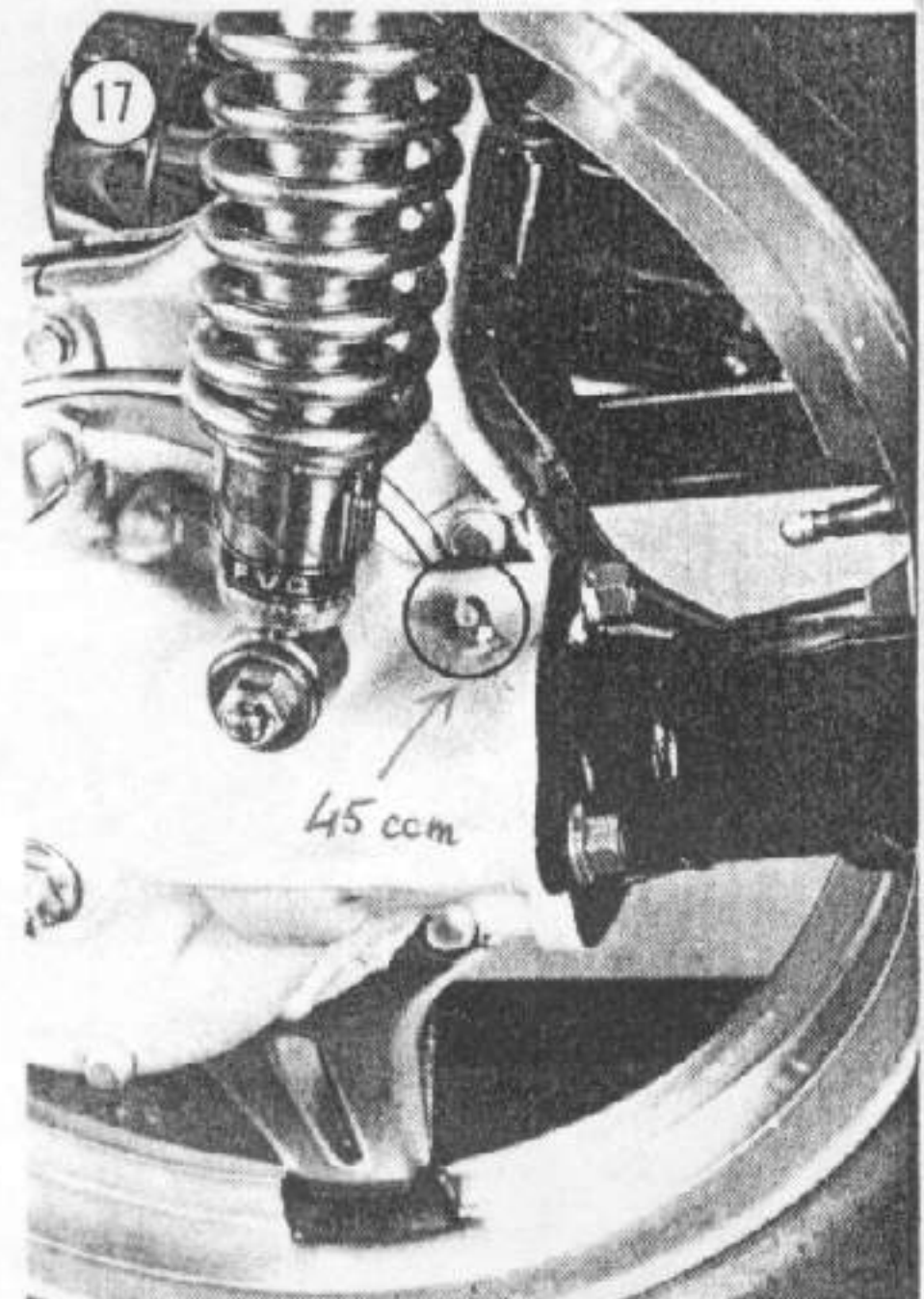
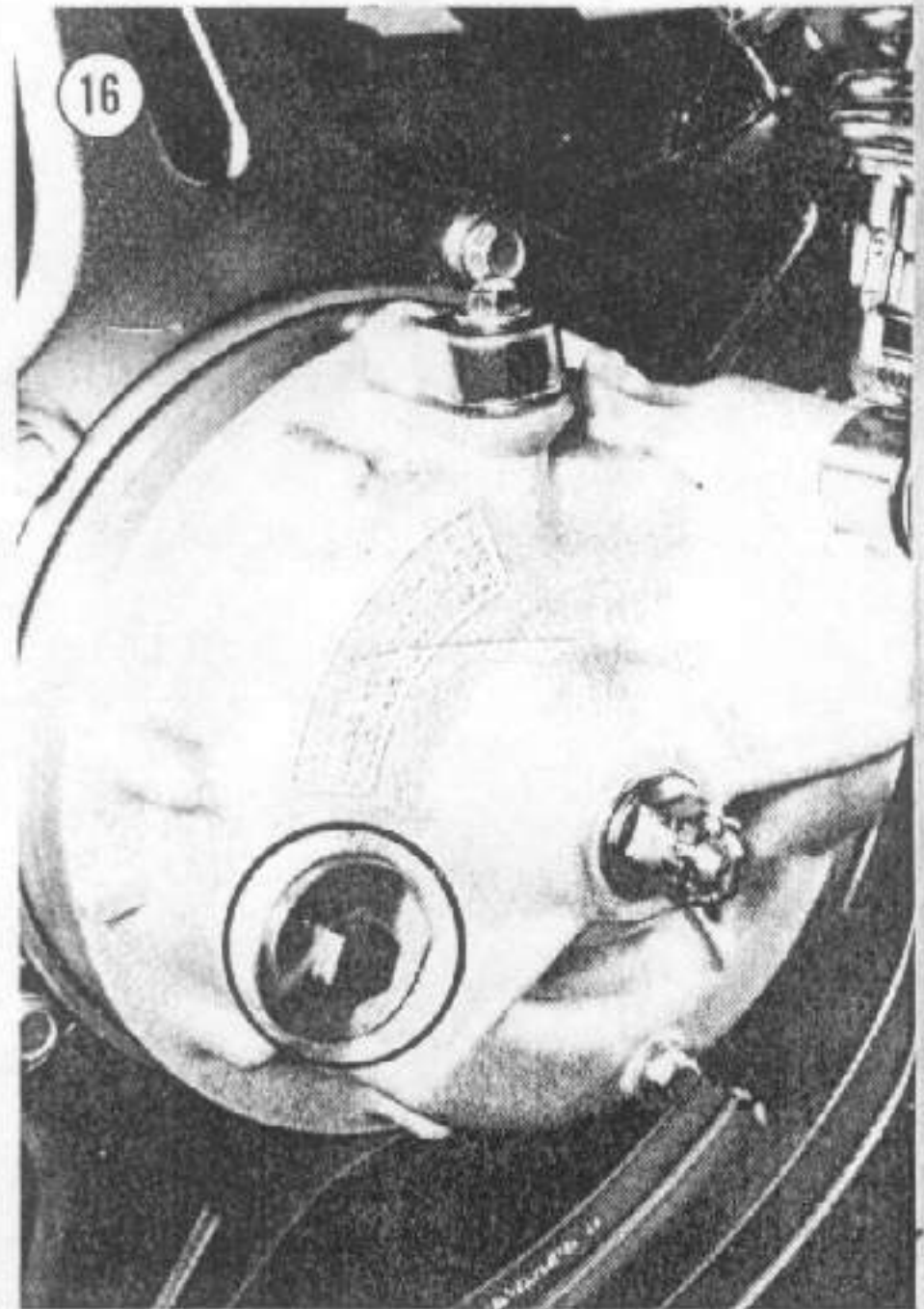
Use brake fluid clearly marked "DOT 3" only. Others may vaporize and cause brake failure.

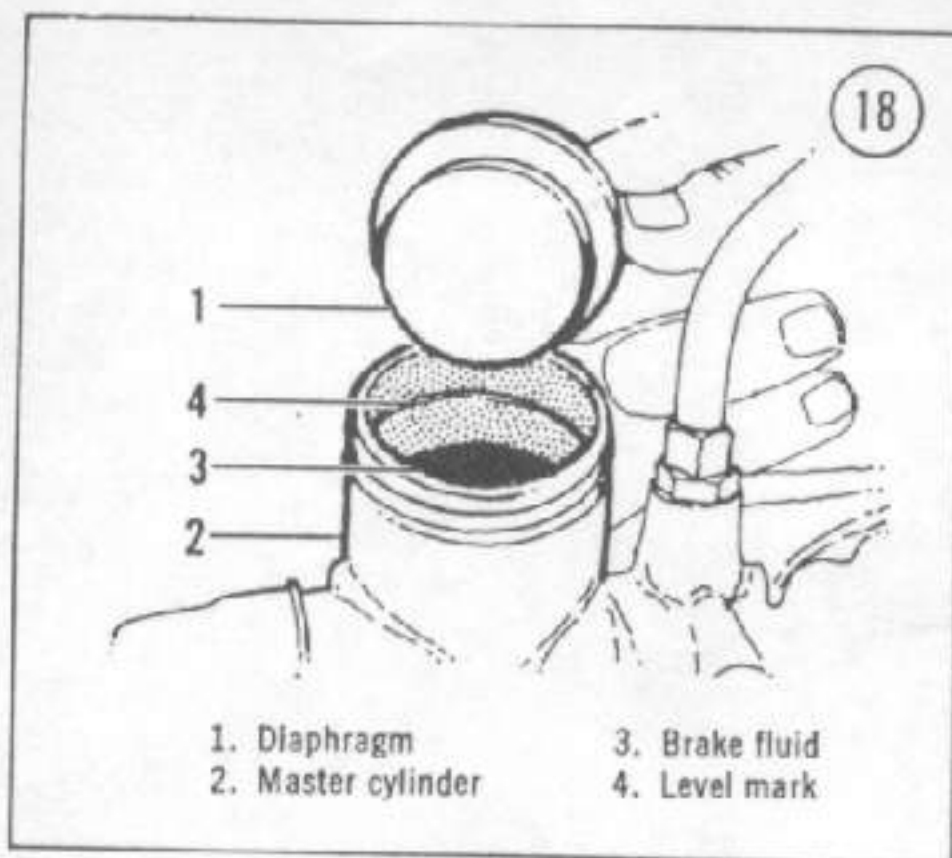
CAUTION

Be careful not to spill brake fluid on painted or plated surfaces as it will destroy the surface. Wash immediately with soapy water and rinse thoroughly.

Table 4 FINAL DRIVE LUBRICANTS

Temperature	Type	Capacity
Above 41 °F (5 °C)	Hypoid gear oil SAE 90	5.8 oz. (170cc)
Below 41 °F (5 °C)	Hypoid gear oil SAE 80	5.8 oz. (170cc)
Zerk fitting	Molybdenum disulfide grease	1.5 oz. (45cc)





3. Reinstall the washer, diaphragm, and cap. Make sure that the cap is screwed on tightly.

3.6.2

Front Disc Brake Lines

Check brake lines between the master cylinder and the brake caliper. If there is any leakage, tighten the connections and bleed the brakes as described under *Bleeding the System* in Chapter Eleven. If this does not cure the leak, or if a line is obviously damaged, cracked or chafed, replace the line and bleed the brake.

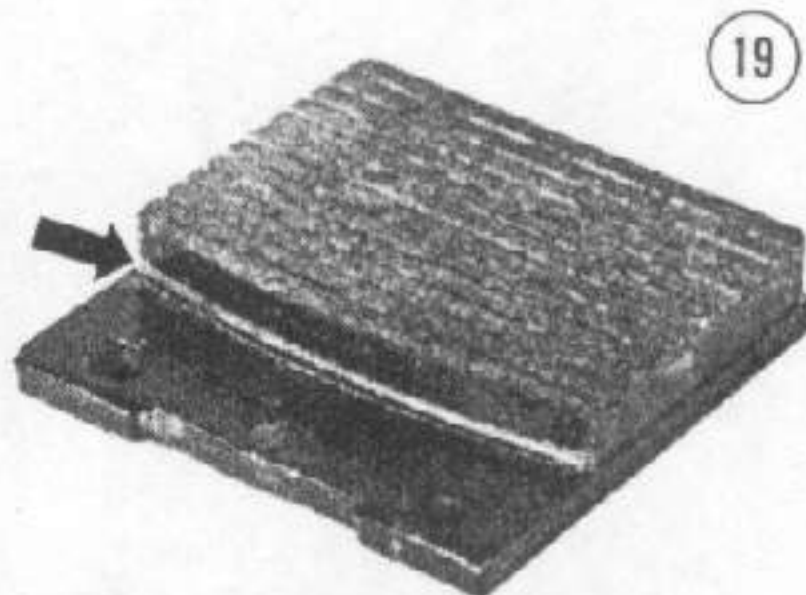
3.6.3

Front Disc Brake Pad Wear

Inspect the brake pads for excessive or uneven wear, scoring, and oil or grease on the friction surface. If the pads are worn to the red line (**Figure 19**) they must be replaced.

NOTE: Always replace both pads at the same time.

If any of these conditions exist, replace the pads as described under *Brake Pad Replacement* in Chapter Eleven.



3.6.4

Front Disc Brake Fluid Change

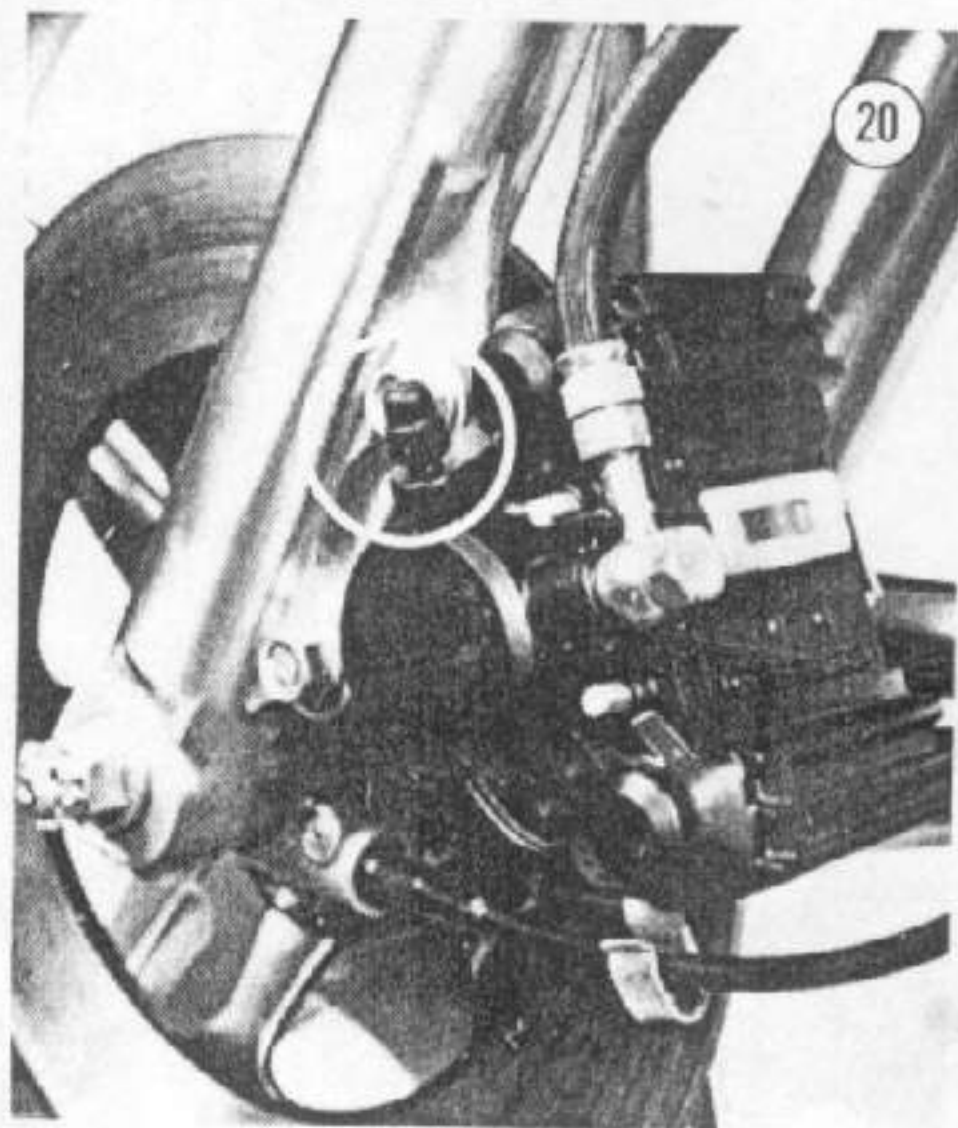
Every time you remove the reservoir cap, a small amount of dirt and moisture enters the brake fluid. The same thing occurs if a leak occurs, or any part of the hydraulic system is loosened or disconnected. Dirt can clog the system and cause unnecessary wear. Water in the fluid vaporizes at high temperatures, impairing the hydraulic action and reducing brake performance.

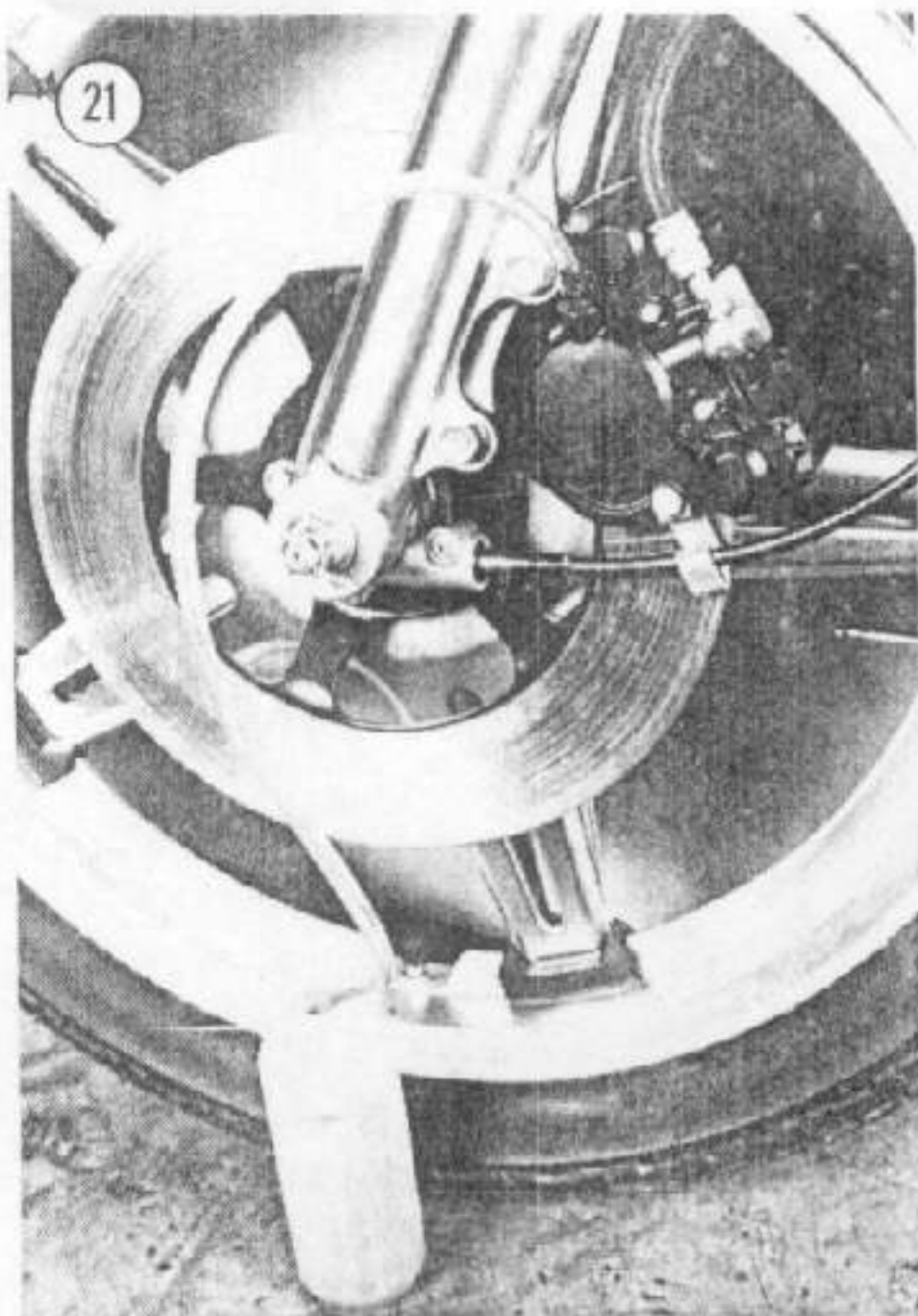
To maintain peak performance, change the brake fluid every 21,000 miles or 2 years.

1. Remove dust cap from the caliper bleeder valve (**Figure 20**) and connect a small hose. Place free end of hose in a container (**Figure 21**).
2. Open the bleeder valve with a wrench about half a turn.
3. Squeeze the brake lever several times to force out as much brake fluid as possible. Close the bleeder valve.

WARNING

Do not reuse brake fluid which has been drained from a brake system.





4. Fill the reservoir with new brake fluid, install the cap and bleed the system as described under *Bleeding the System* in Chapter Eleven.

WARNING

Use brake fluid clearly marked "DOT 3" only. Others may vaporize and cause brake failure.

3.6.5

Front Disc Brake Adjustment

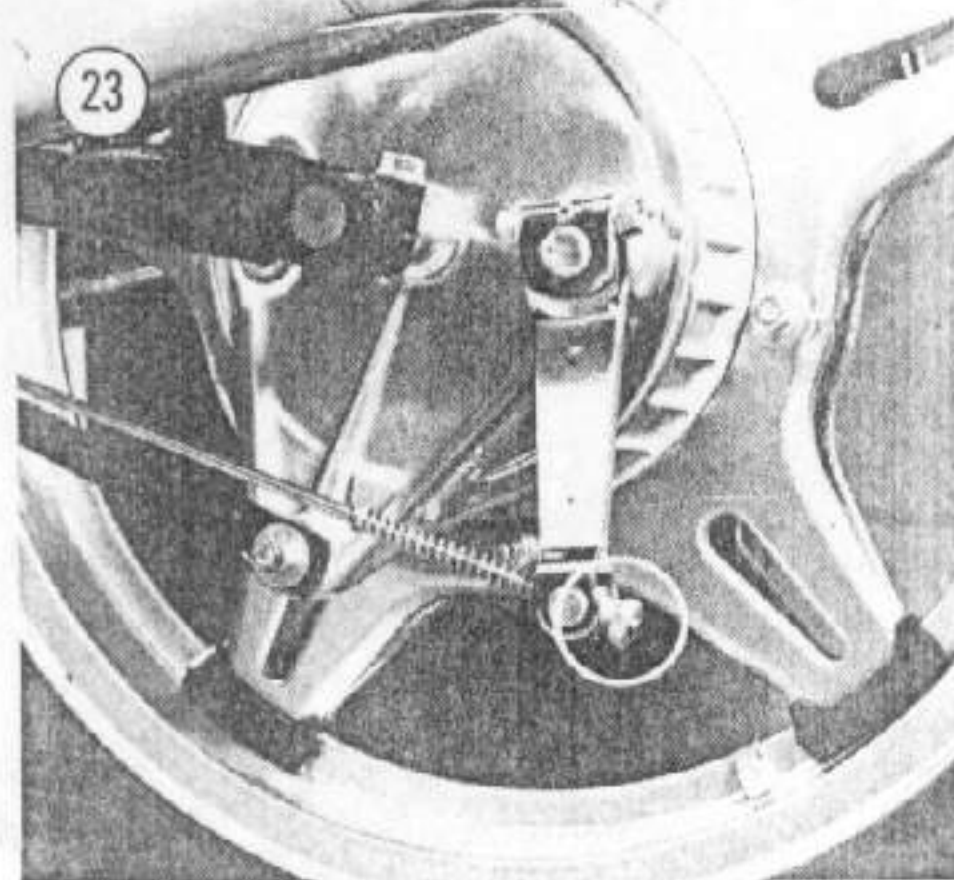
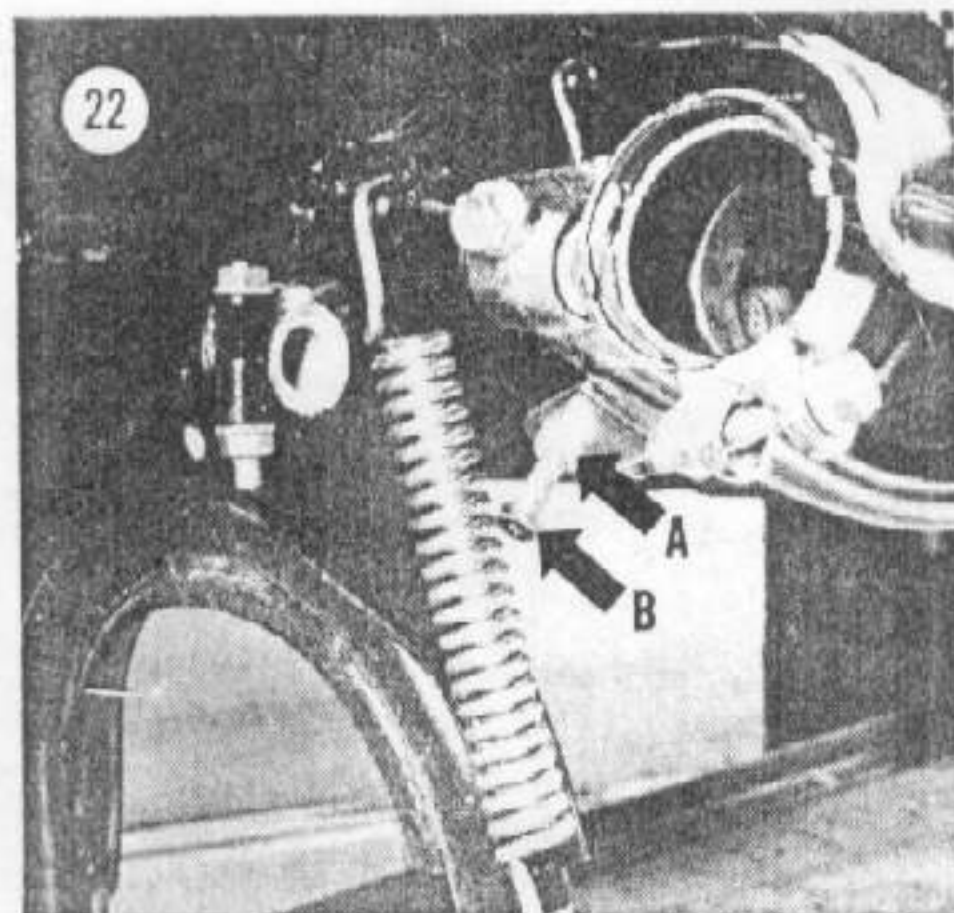
The front disc brake requires no adjustment, but the pads and fluid should be inspected as described under *Front Disc Brake* in this chapter.

3.6.6

Rear Brake Adjustment

The rear brake pedal should be adjusted so that there is $\frac{1}{4}$ - $1\frac{1}{4}$ in. (20-30mm) of brake pedal movement required to actuate the brake, but it must not be so closely adjusted that the brake shoes contact the drum with the pedal relaxed.

1. Place the motorcycle on the centerstand.
2. Loosen the locknut (A, Figure 22) and turn the adjustment bolt (B, Figure 22) until the

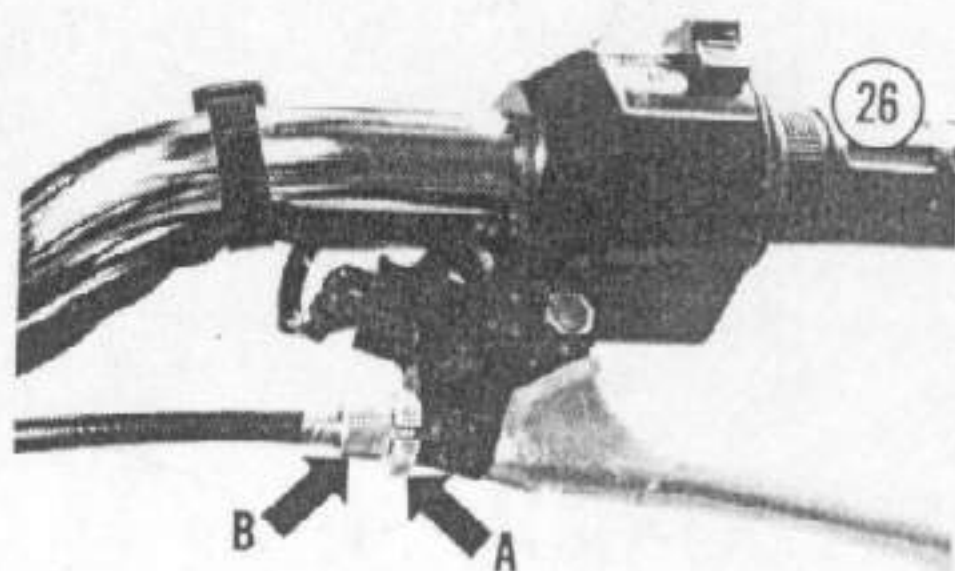
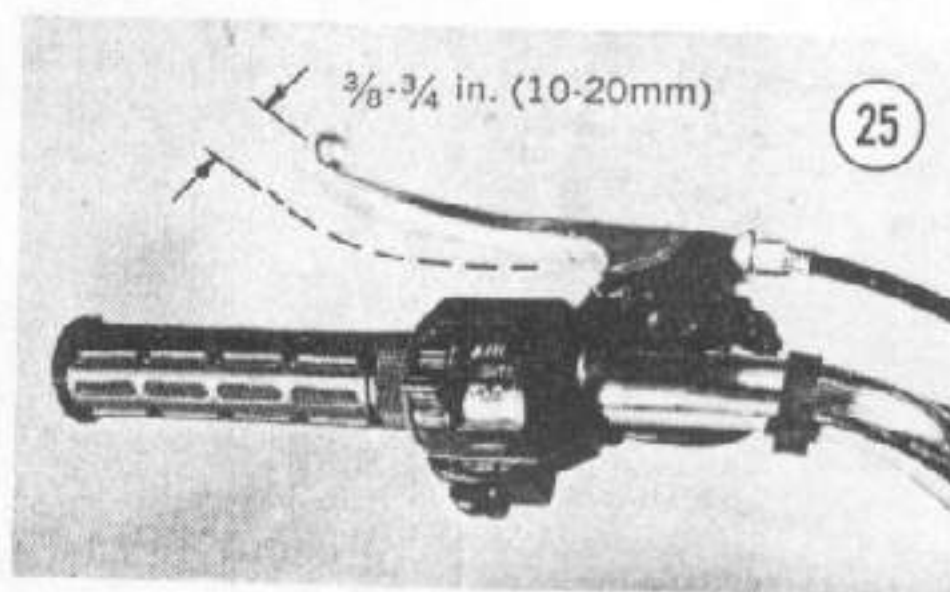
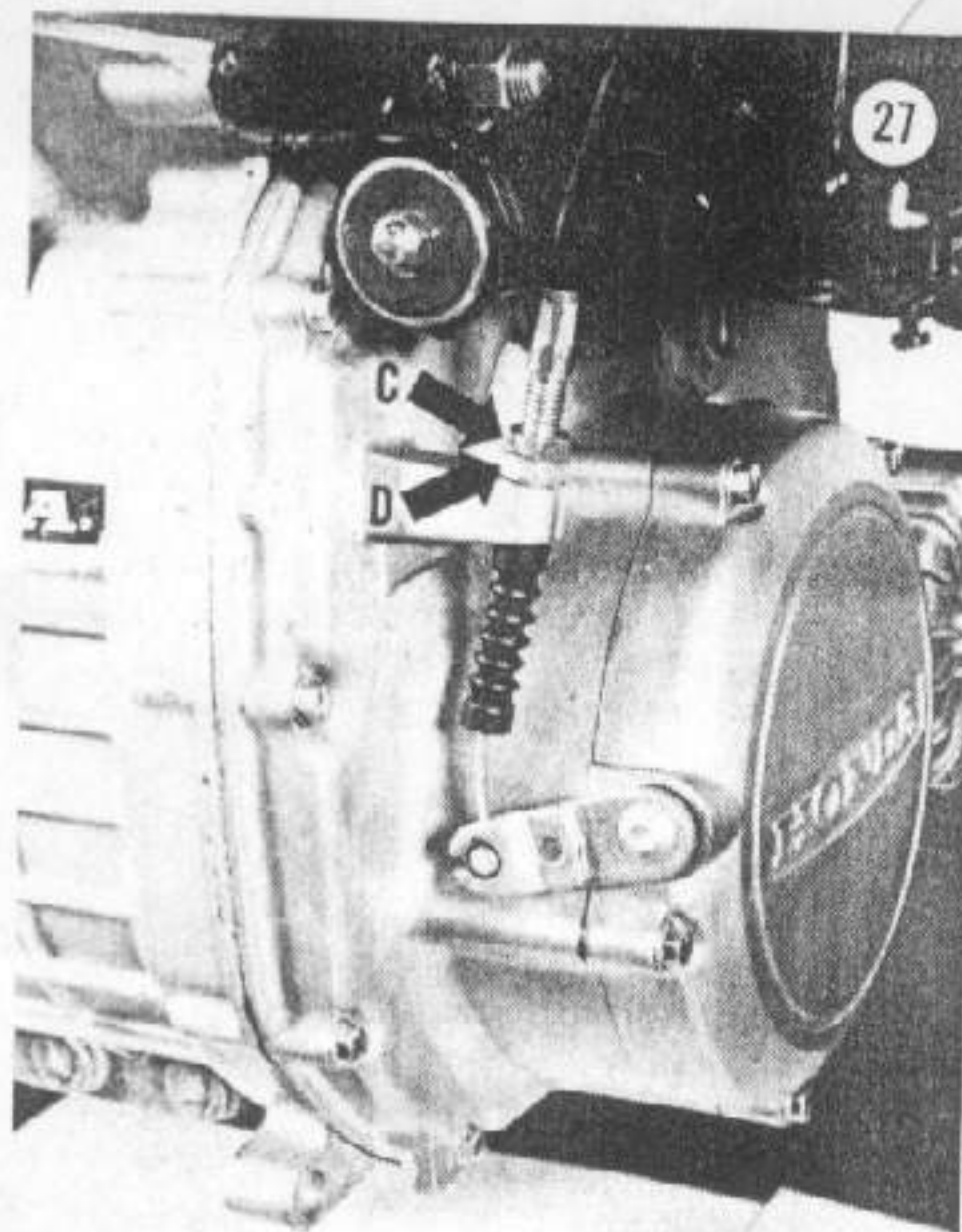
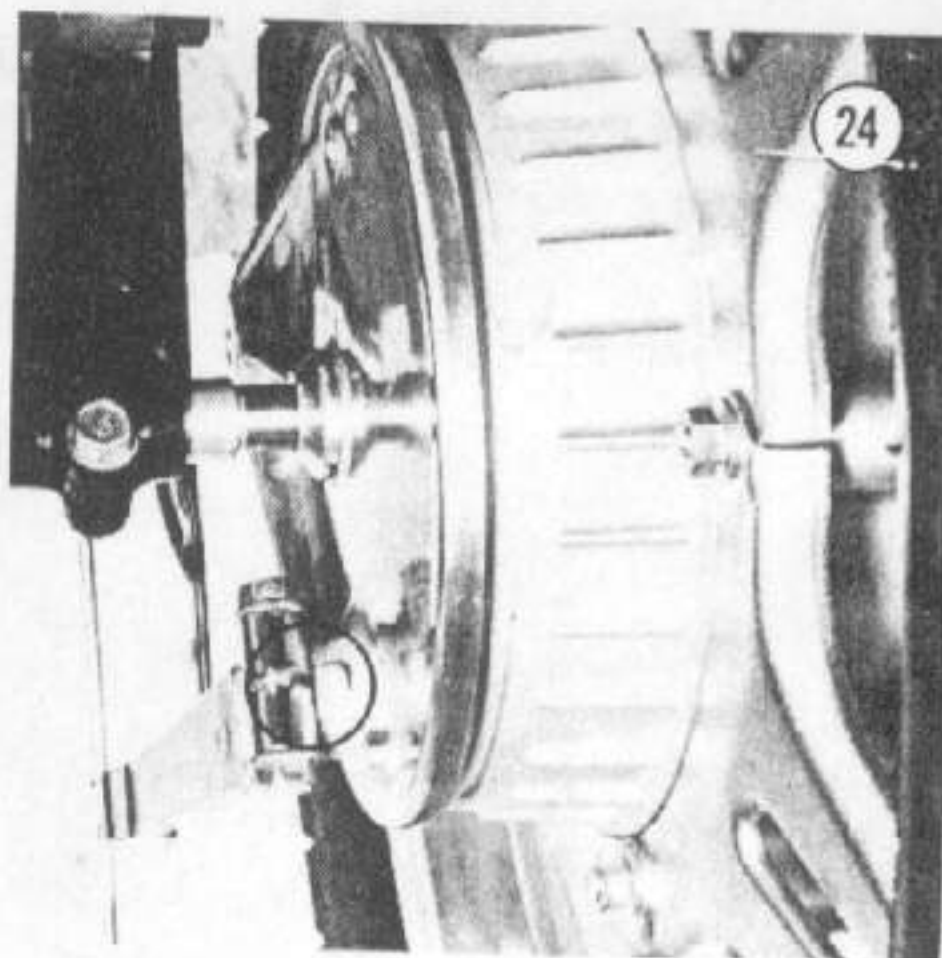


brake pedal is horizontal. Tighten the locknut and adjust switch as described under *Rear Brake Light Switch Adjustment* in Chapter Seven.

3. At the brake plate on the wheel, adjust the nut (Figure 23) on the brake rod until the correct amount of free play can be achieved.

NOTE: Be sure that the adjustment nut is properly seated on the brake arm pin after adjustment is complete.

4. When the two arrows (Figure 24) on the brake arm and brake plate align, the brake shoes must be replaced. Refer to Chapter Eleven.



3.6.7.
Clutch Free Play Adjustment

In order for the clutch to fully engage and disengage, there must be $\frac{3}{8}$ - $\frac{3}{4}$ in. (10-20mm) free play at the lever end (Figure 25).

1. Loosen the locknut (A, Figure 26) and turn the adjuster (B, Figure 26) in or out to obtain the correct amount of free play. Tighten the locknut (A).

2. Start the engine, pull the clutch lever in and shift into first gear. If shifting is difficult, if bike creeps when stopped, or if the clutch slips accelerating in high gear the clutch will have to be adjusted at the clutch housing.

3. At the clutch lever, loosen the locknut (A, Figure 26) and screw the adjuster (B, Figure 26) in all the way toward the hand grip. Tighten the locknut (A).

4. At the clutch housing, loosen the locknut (C, Figure 27) and turn the adjuster (D, Figure 27) in or out to obtain the correct amount of free play and tighten the locknut (C).

5. If necessary, do some final adjusting at the clutch lever as described in Step 1.

6. Road test the bike to make sure the clutch fully disengages when the lever is pulled in; if it does not, the bike will creep in gear when stopped. Also, make sure that clutch fully engages; if it does not, clutch will slip, particularly when accelerating in high gear.

CAUTION

Do not screw the adjuster out so that there are more than 0.3 in. (8mm) of threads exposed between it and the locknut.

3.6.8

Throttle Operation/Adjustment

The throttle grip should have 0.08-0.24 in. (2-6mm) rotational play (**Figure 28**). If adjustment is necessary, loosen the pull cable locknut (A, **Figure 29**) and turn the adjuster (B, **Figure 29**) in or out to achieve the proper play. Tighten the locknut (A).

Check the throttle cables from grip to carburetors. Make sure they are not kinked or chafed. Replace them if necessary.

Make sure that the throttle grip rotates smoothly from fully closed to fully open. Check at center, full left, and full right positions of the steering.

3.6.9

Cooling System Inspection

Every 7,200 miles, check the following items.

1. Have radiator cap and the system pressure tested. This can be done at your Honda dealer or most service stations. The radiator cap relief pressure should be 12.8 ± 2.1 psi (0.9 ± 1.5 kg/cm²). The radiator and cooling system should be pressurized up to, but not exceeding, 14.9 psi (1.05 kg/cm²). The system should be able to maintain this pressure for at least 6 seconds. Replace or repair any part that fails this test.

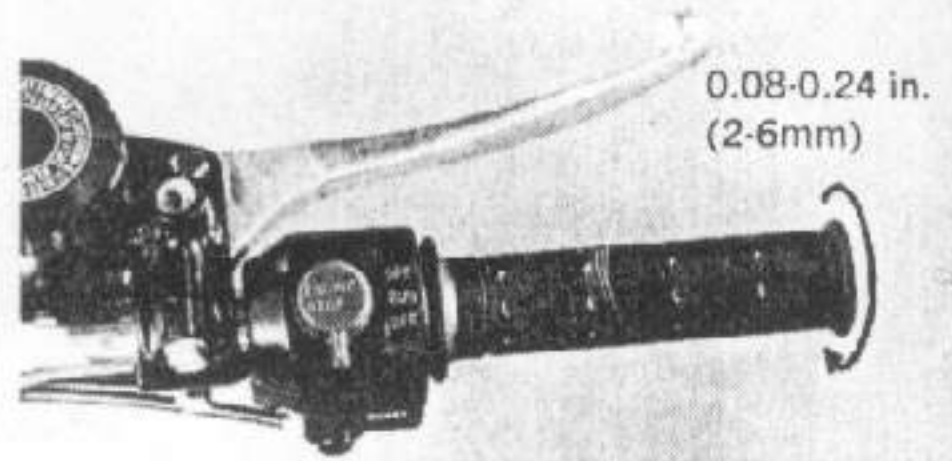
CAUTION

Test pressure exceeding that specified may damage the radiator.

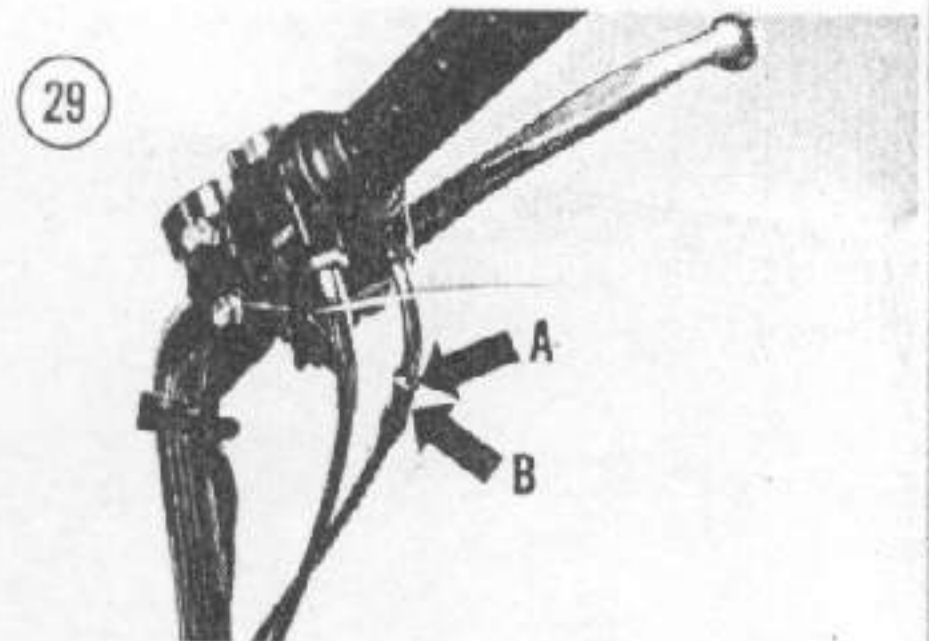
2. Check the specific gravity of coolant with an antifreeze tester to ensure adequate temperature and corrosion protection. The system must have at least a 50/50 mixture of antifreeze to water. Never let the mixture become less than 40/60 or corrosion protection will be impaired.
3. Check all hoses to make sure they are not damaged or deteriorated. Replace them if questionable. Make sure that clamps are tight. See **Figures 30, 31 and 32**.

NOTE: Figure 32 is shown with the engine removed. It is not necessary to remove the engine to perform this inspection.

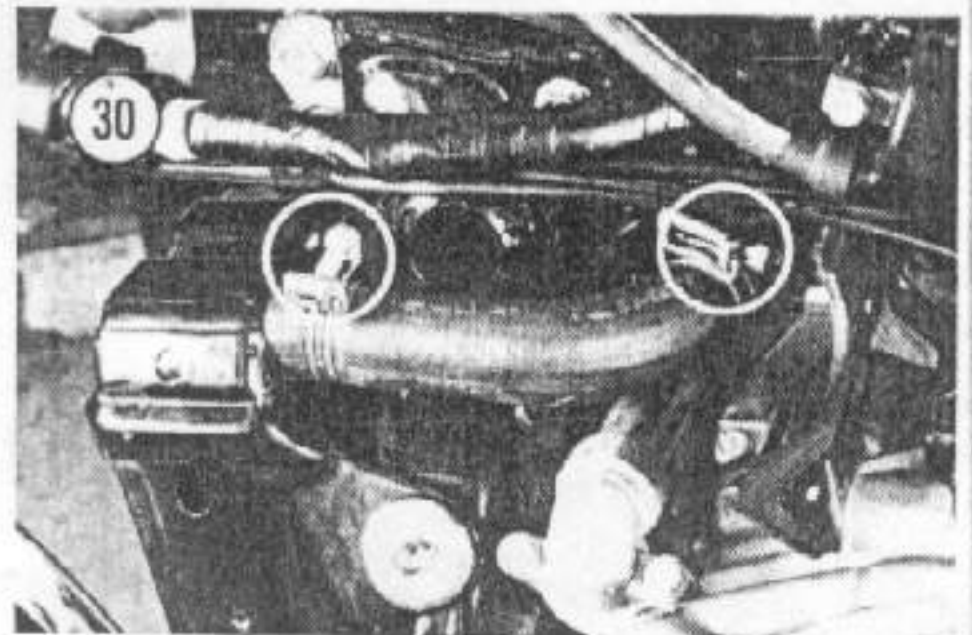
4. Clean the front of radiator. Remove the 4 screws (**Figure 33**) securing the radiator screen. Remove road dirt and bugs which limit air flow through the radiator.



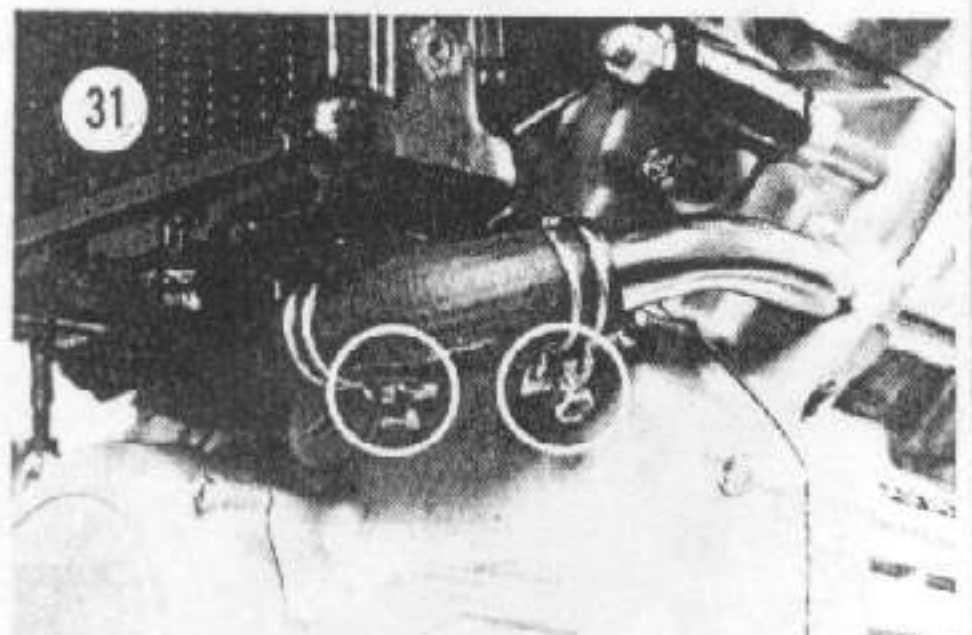
28



29



30



31

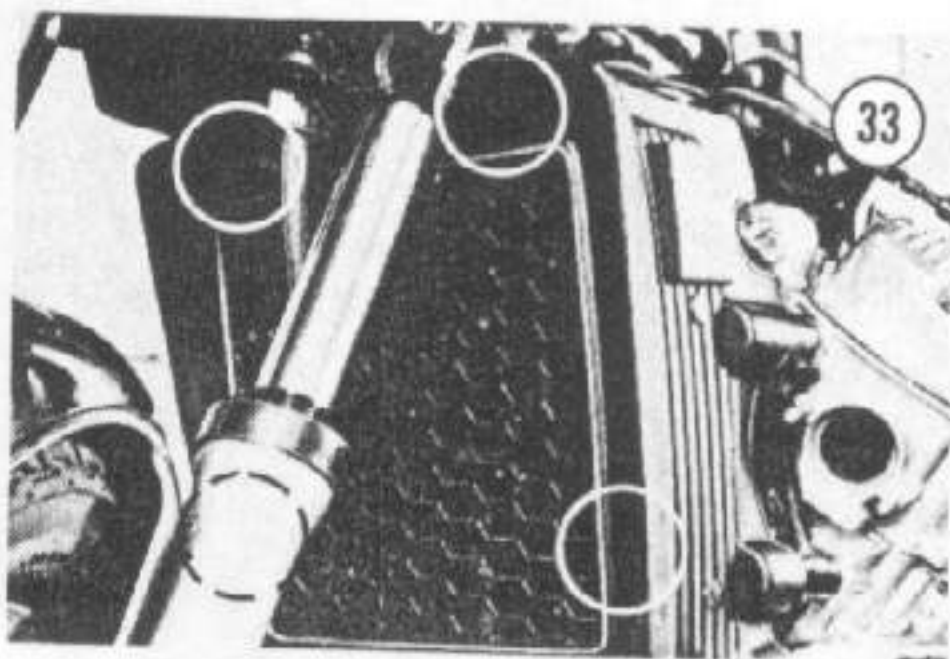
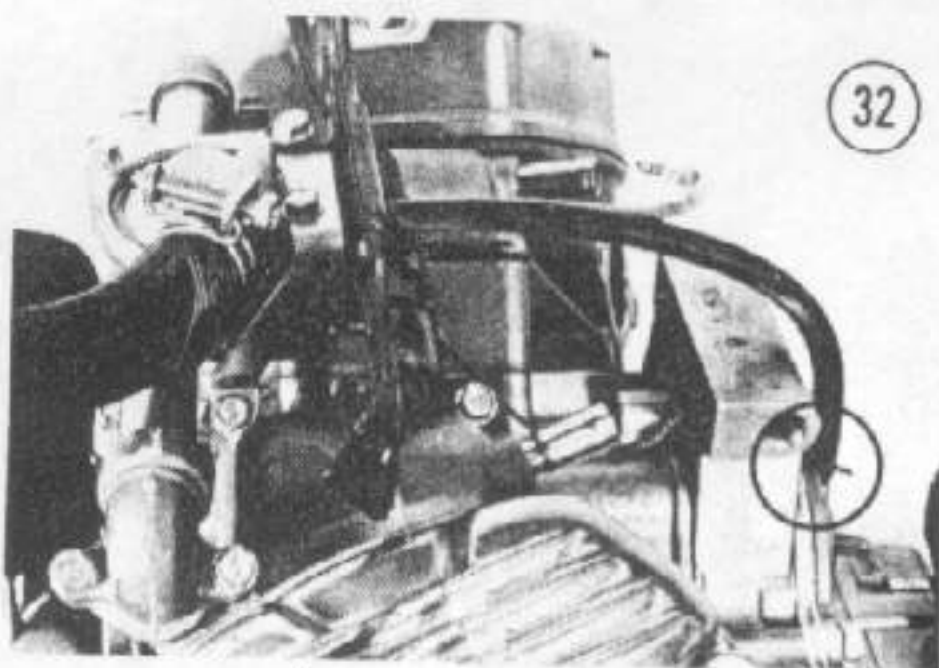
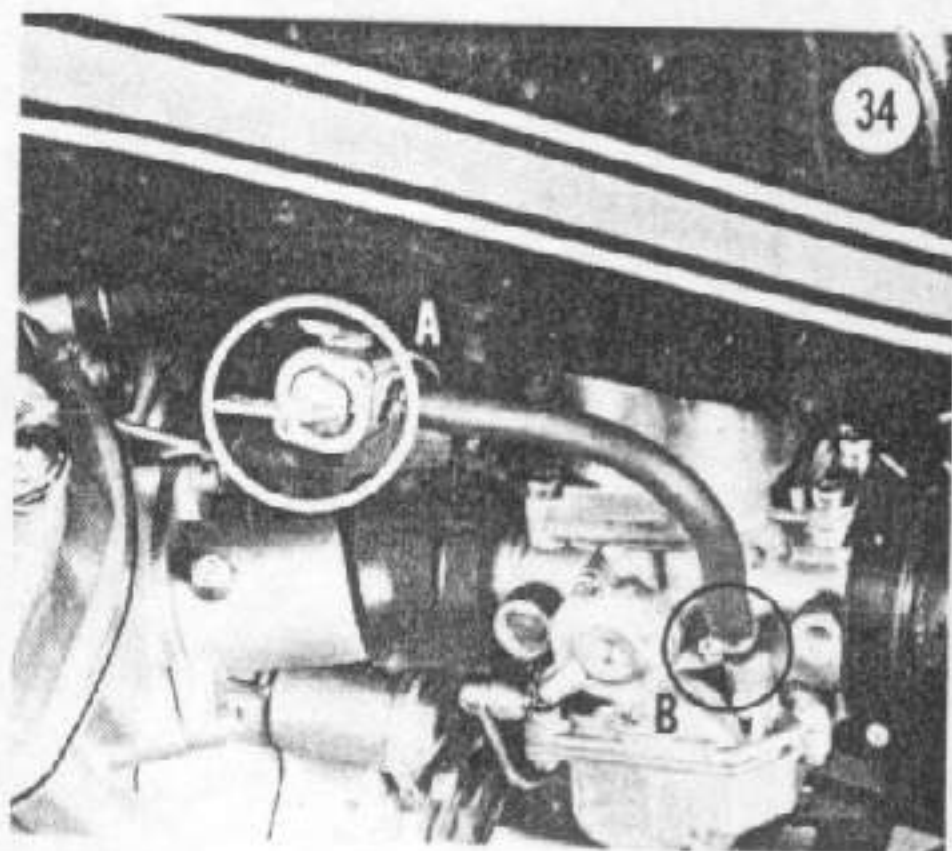


Table 5 ANTIFREEZE PROTECTION

Temperature	Antifreeze-to-Water Ratio
Above -25°F (-32°C)	45/55
-34°F (-37°C)	50/50
-48°F (-44.5°C)	55/45



3.6.10
Coolant Change

The coolant should be completely drained and refilled with at least 50/50 mixture of ethylene glycol antifreeze and water, every 21,000 miles or two years, whichever comes first.

CAUTION

Use only a high quality ethylene glycol antifreeze specifically labeled for aluminum engines.

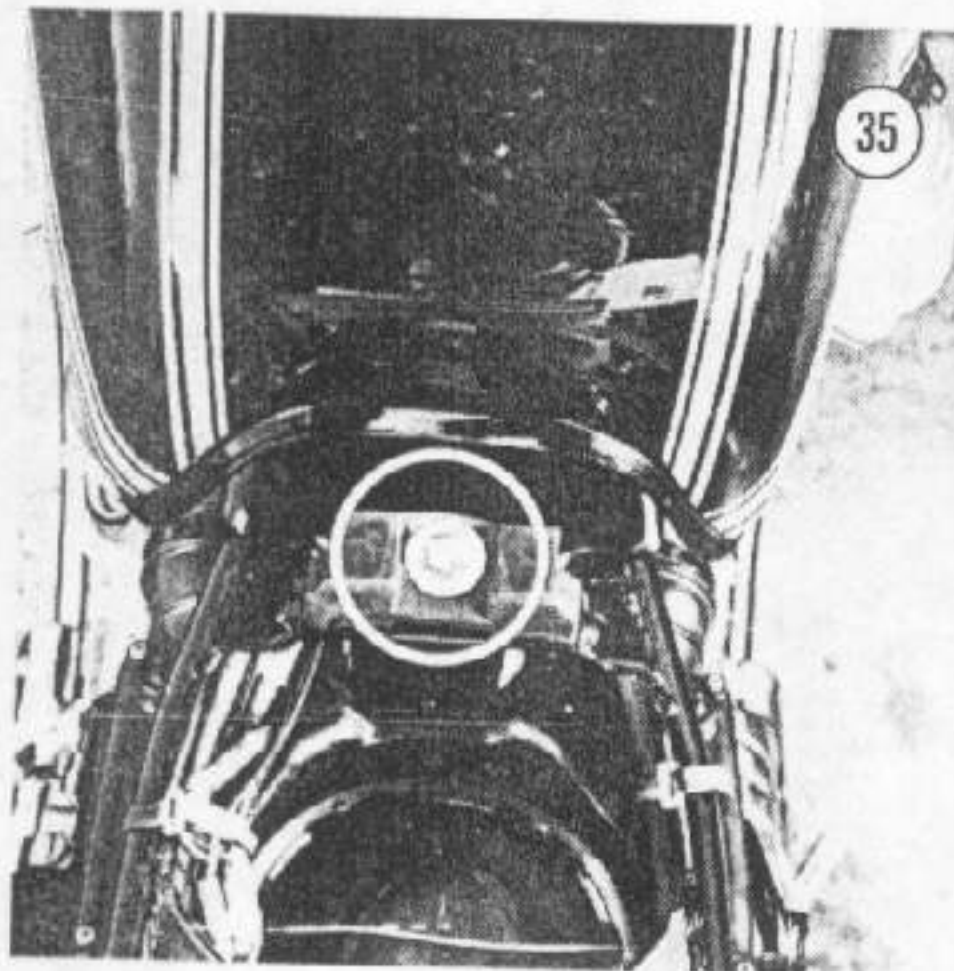
In areas where freezing temperatures occur, add a higher percentage of antifreeze to protect the system to temperatures far below those likely to occur. Table 5 lists the recommended amount of antifreeze to protect the CX500 at various temperatures.

The following procedure must be performed when the engine is cool.

CAUTION

Antifreeze can damage painted surfaces. If it does come in contact with any, rinse the area immediately with clean water.

1. Remove the seat.
2. Turn the fuel shutoff valve to the OFF position (A, Figure 34) and remove the fuel line to the carburetors (B, Figure 34).
3. Remove rear bolt and rubber pad (Figure 35) securing the fuel tank at the rear, slide the tank to the rear, and remove it.



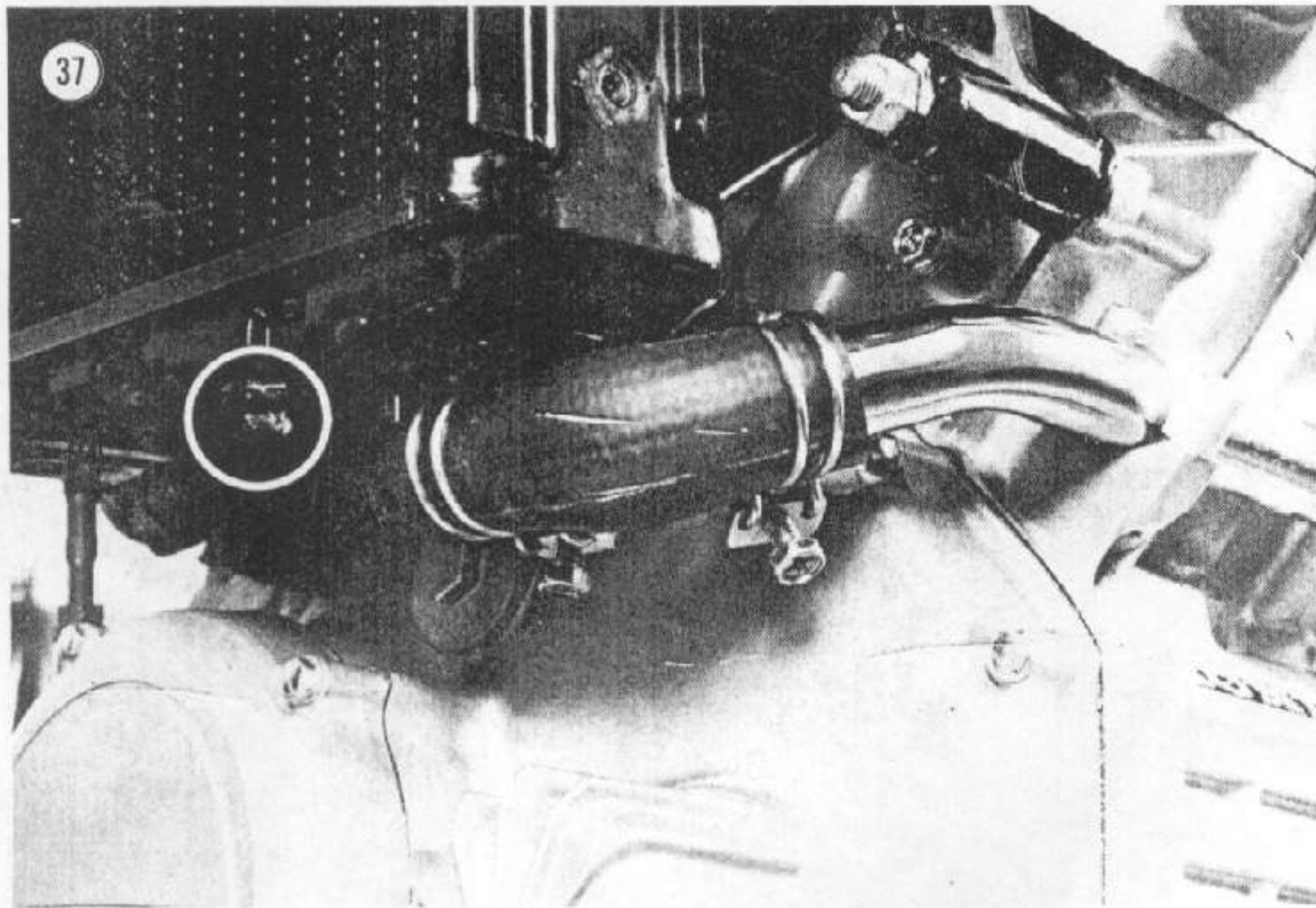
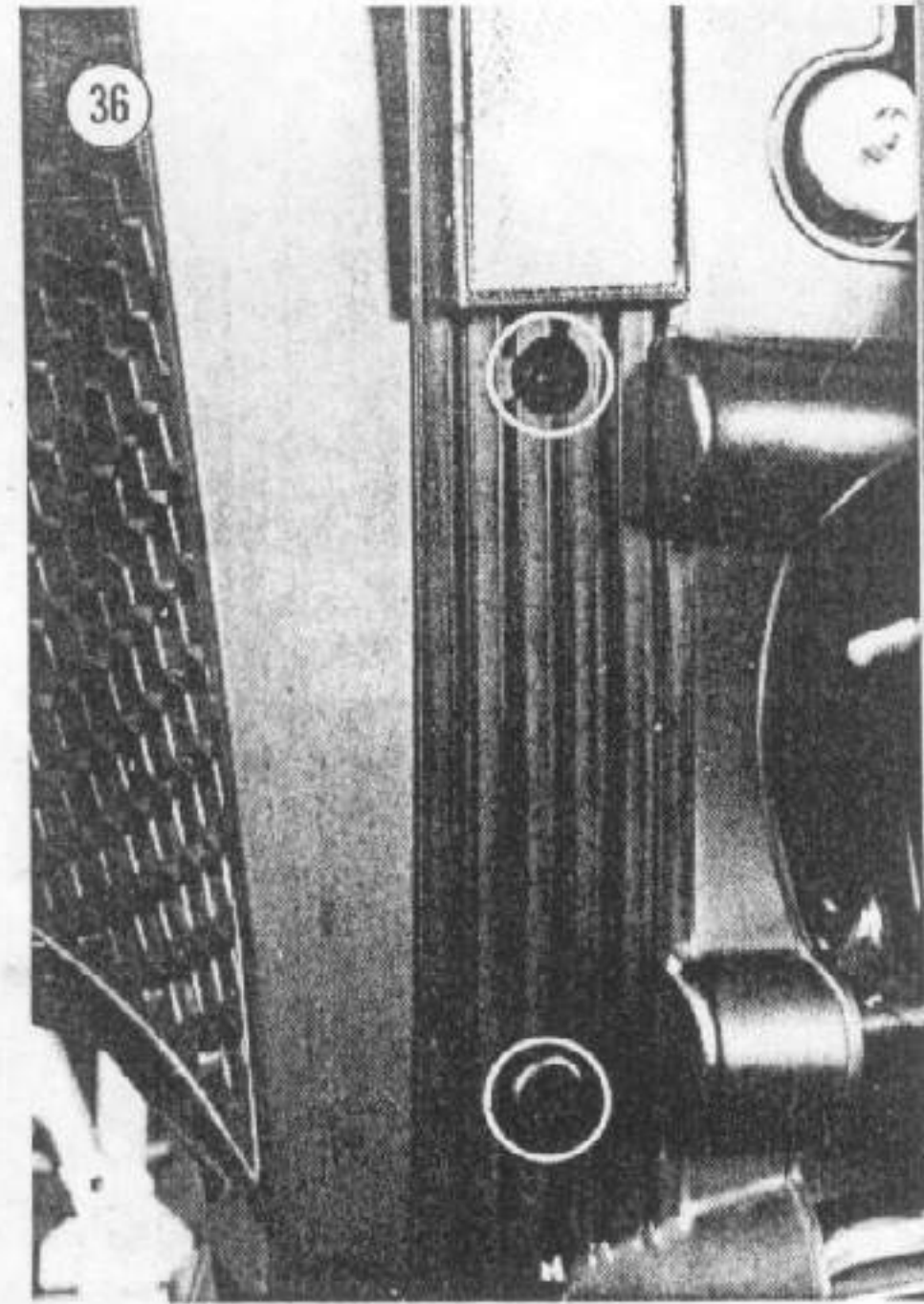
NOTE: *Figure 35 is shown with the exhaust system removed for clarity. It is not necessary to remove it.*

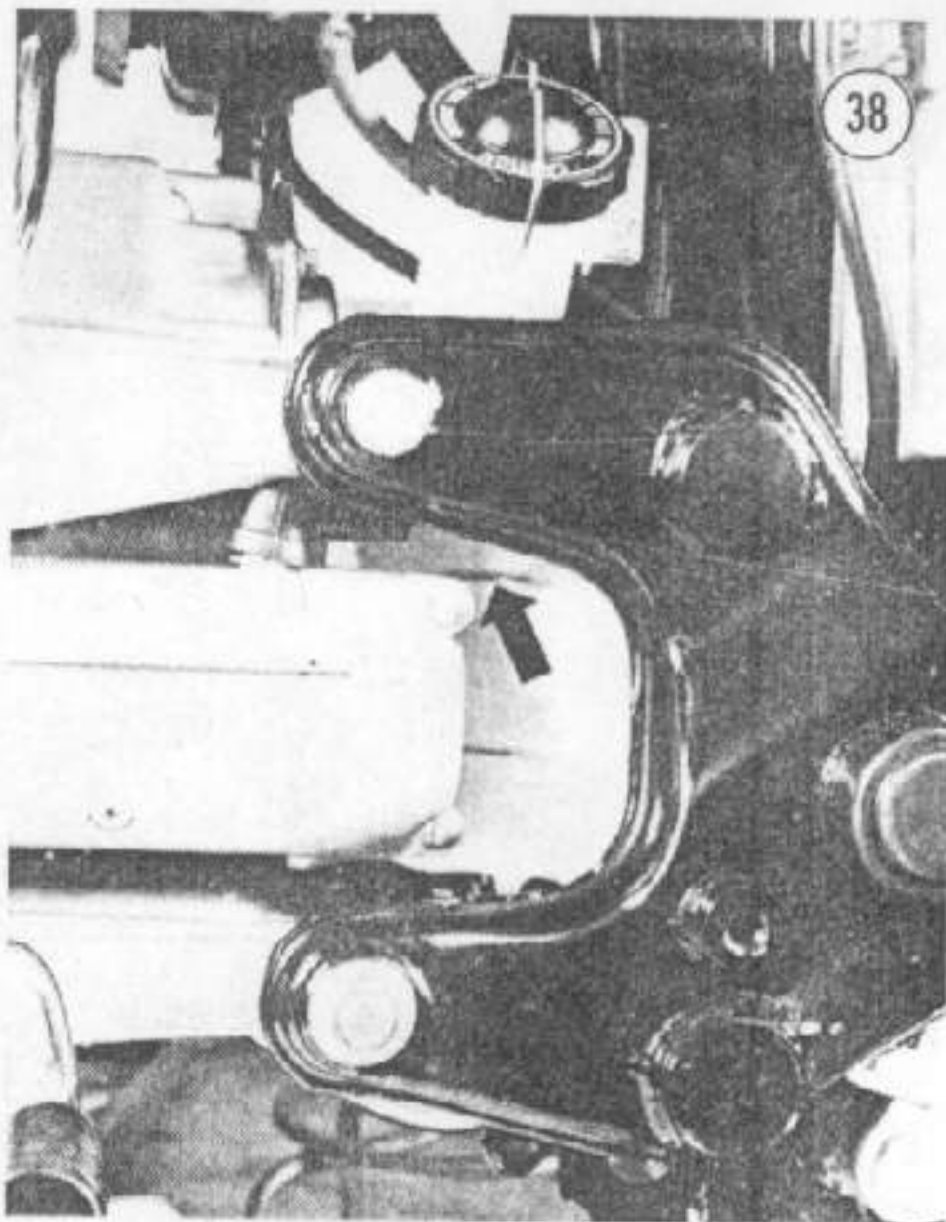
4. Remove the rubber plugs and screws, 2 on each side, (Figure 36) securing the radiator shroud. Slide the shroud forward and down and remove it.
5. Place a drip pan under the radiator and remove the drain plug (Figure 37).
6. Remove the radiator cap. This will speed up the draining process. Let coolant completely drain. Install the drain plug.
7. Remove the hose from the bottom of the recovery tank and completely drain the tank and hose. Install the hose.
8. Fill the radiator through the radiator filler neck, not the recovery tank. Use the recommended mixture of antifreeze. See Table 5.

WARNING

Keep hands and tools away from the fan while the engine is running.

9. Temporarily install the fuel tank and start the engine. Let it run at idle speed to remove





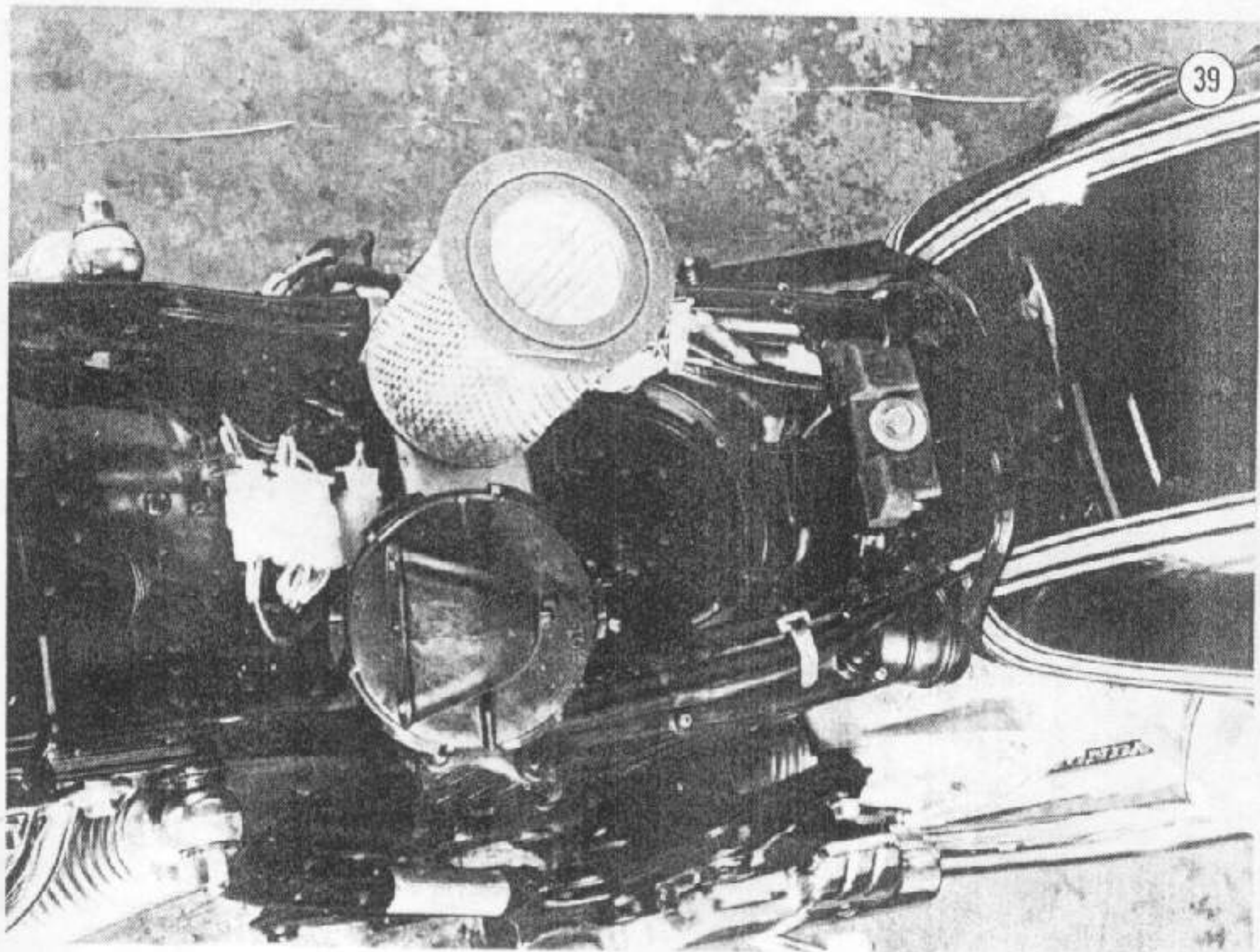
any air from the system. Add additional coolant to the radiator if the level drops. Remove the fuel tank.

10. Install the radiator cap tightly.
11. Fill the recovery tank to the FULL mark (Figure 38).
12. Install the radiator shroud, the fuel tank, and the seat.

3.6.11 Air Cleaner

The air cleaner element must be cleaned every 3,600 miles and replaced every 7,200 miles. It should be cleaned and changed more frequently if the bike is ridden in dusty areas.

1. Remove the seat.
2. Remove the air cleaner cover by turning it *counterclockwise*.
3. Remove the air cleaner element (Figure 39).
4. Clean the element by tapping it lightly to loosen the dirt and dust. Apply compressed air to it to remove remaining dust.



5. Wipe out the interior of air box (Figure 40) with a shop rag and cleaning solvent. Remove any foreign matter that may have passed through a broken element.

6. Install by reversing the removal steps. Be sure to install the cover with the top mark facing to the front of the bike.

3.6.12

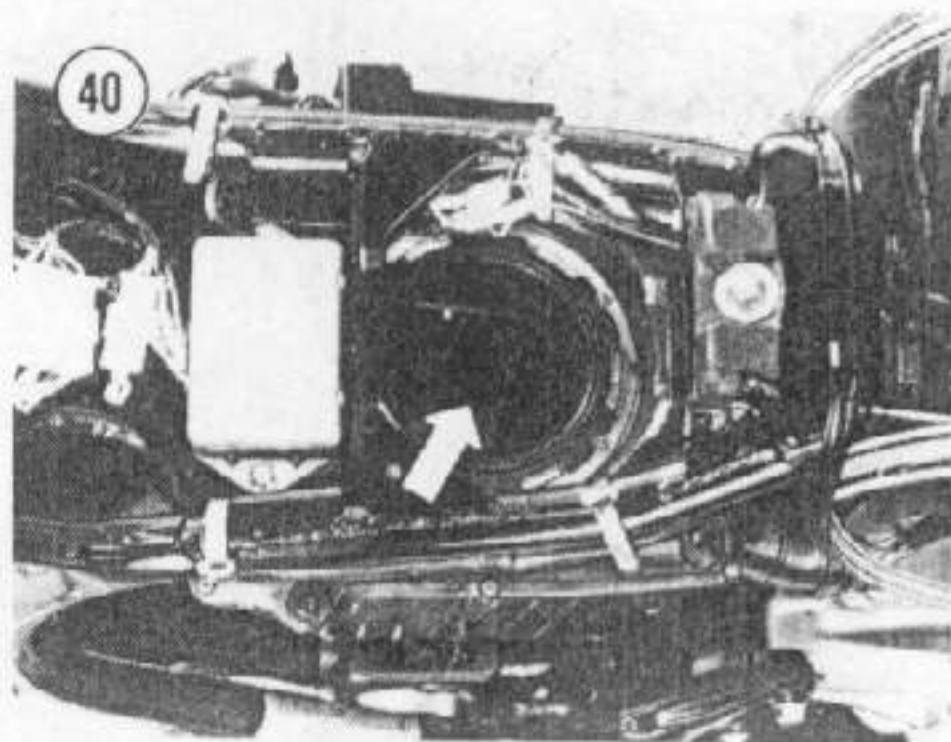
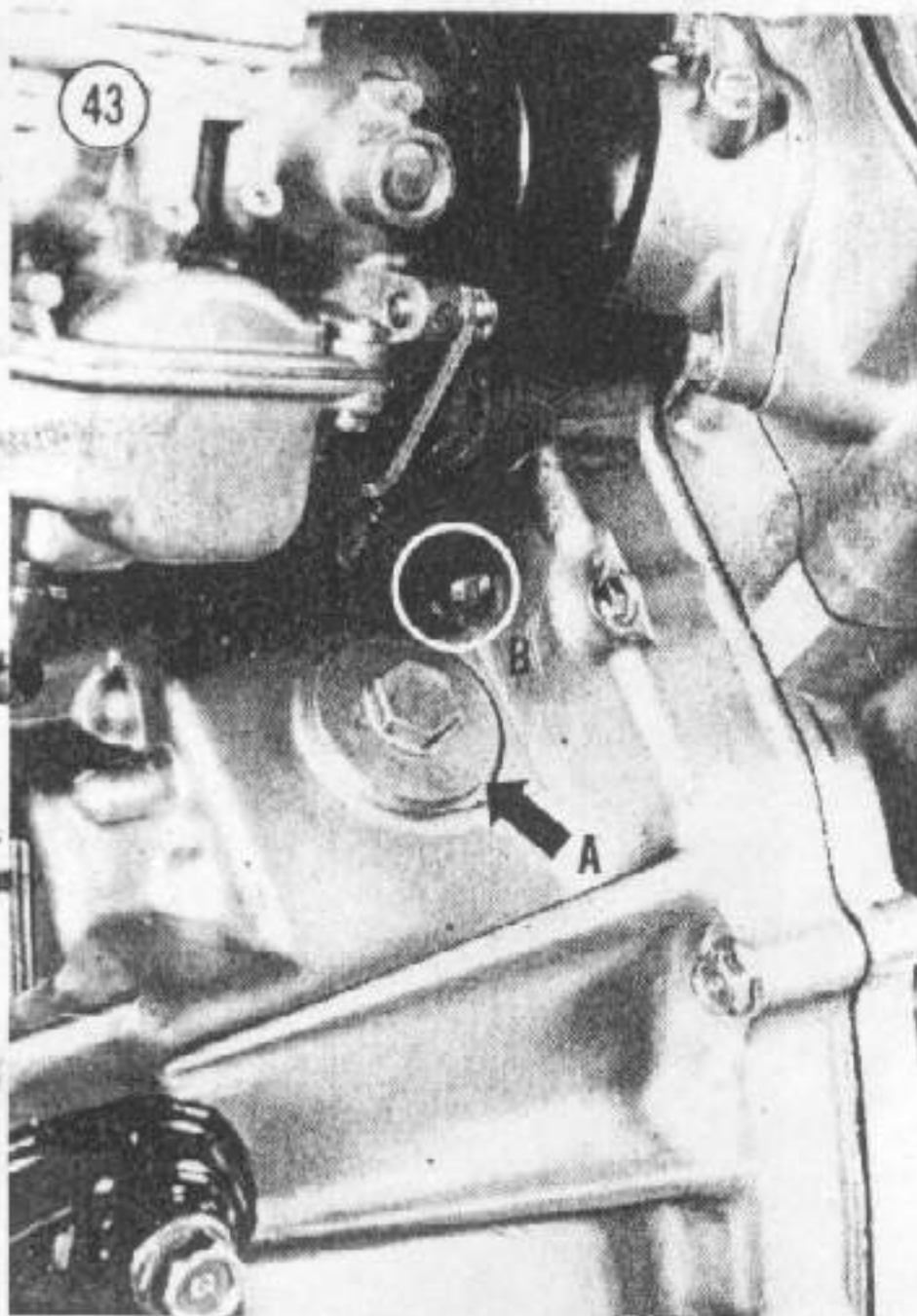
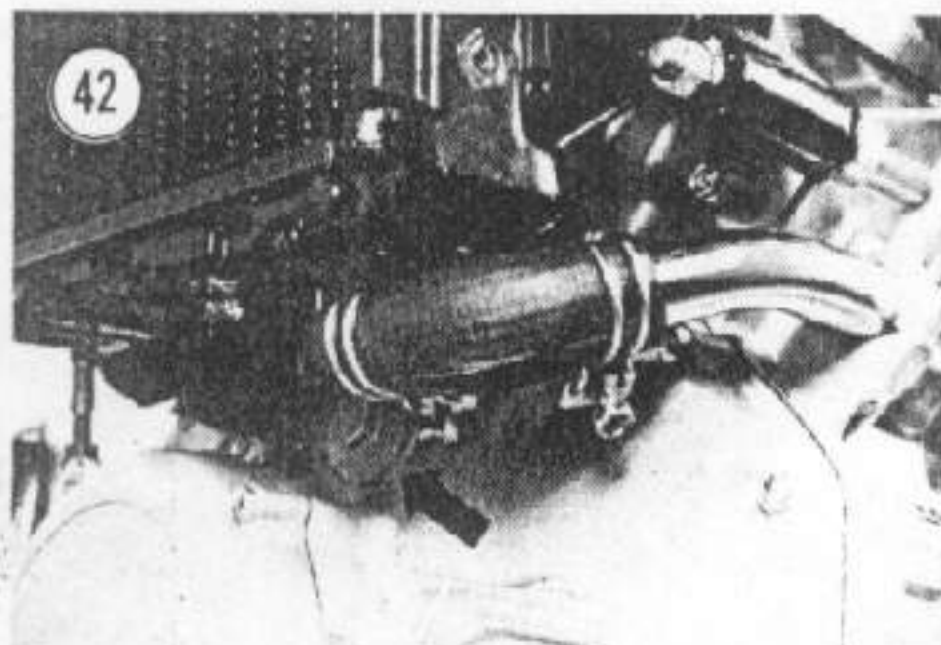
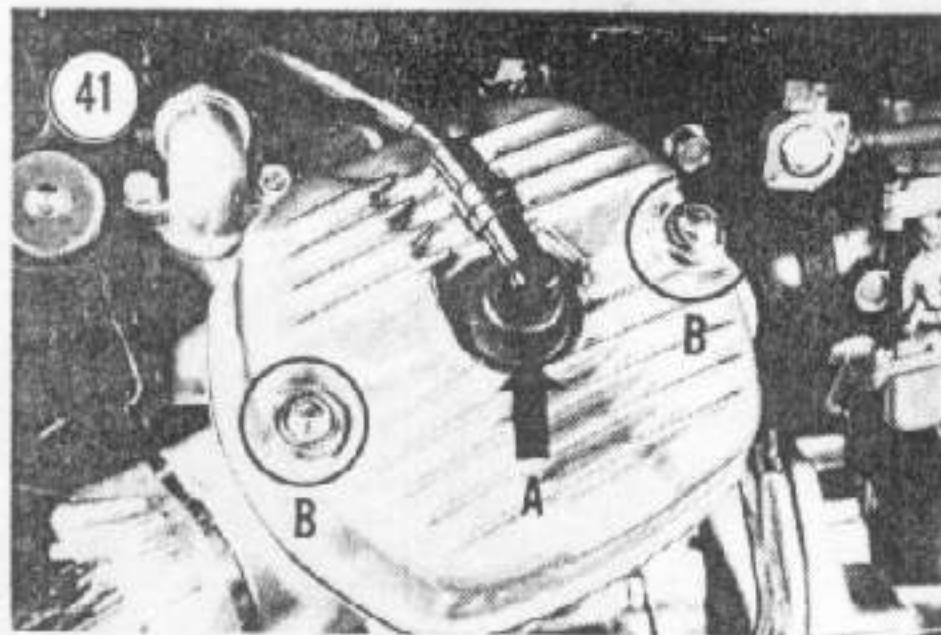
Wheel Bearings

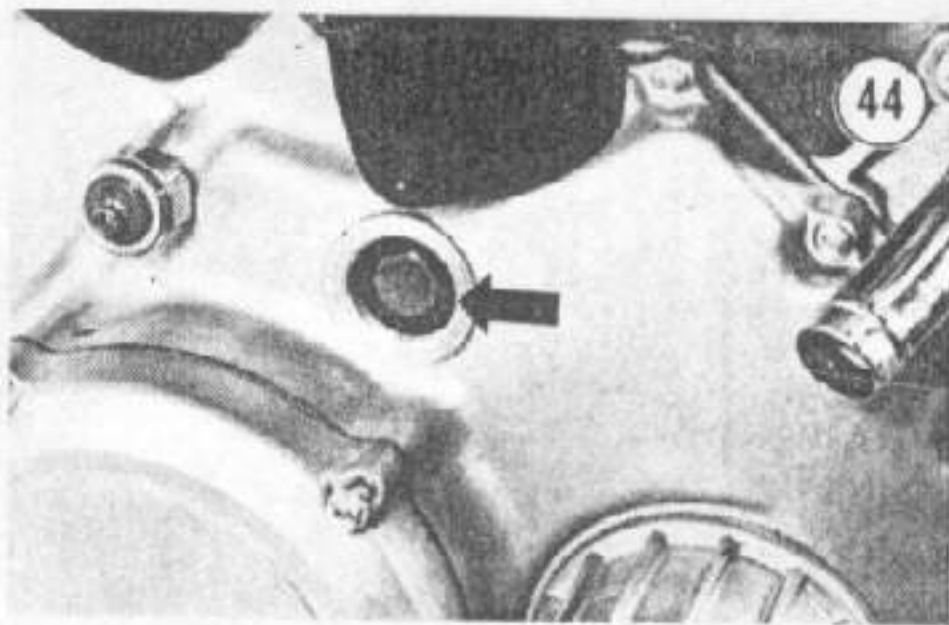
The wheel bearings should be cleaned and repacked every 10,800 miles. The correct service procedures are covered in Chapters Nine and Ten.

3.6.13

Camshaft Chain Adjustment

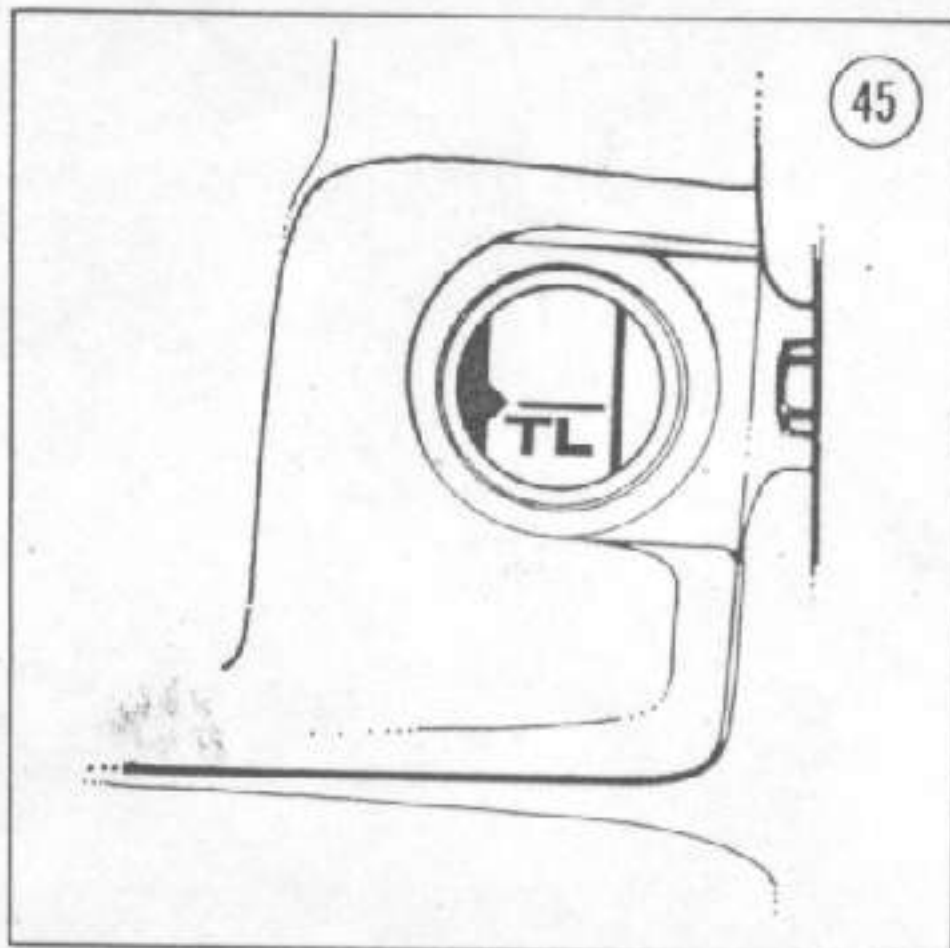
1. Place the bike on the centerstand.
2. Remove the seat.
3. Remove rear bolt and rubber pad (Figure 35) securing the fuel tank at the rear. Slightly lift it up at the rear — do not remove it.
4. Remove the rubber plugs and screws, 2 on each side (Figure 36) securing the radiator shroud. Slide the shroud forward and down and remove it.
5. Remove the left-hand spark plug wire and cap (A, Figure 41).
6. Remove the 2 bolts securing the left-hand valve cover (B, Figure 41) and remove it.
7. Remove the crankshaft front cover cap (Figure 42).
8. Remove the timing inspection hole cover cap (A, Figure 43).
9. Rotate the crankshaft *clockwise* until the left-hand piston is at top dead center (TDC) on





the compression stroke. Use the bolt on the front of the crankshaft (Figure 44) for turning with a suitable size socket.

NOTE: A cylinder at TDC will have both its rocker arms loose, indicating that the exhaust valves and intake valves are closed.



10. Make sure that the TL mark on the alternator rotor aligns with the index mark on the crankcase (Figure 45).

11. Loosen the cam chain tensioner lock bolt (B, Figure 43). The camshaft chain tensioner will automatically adjust to the correct tension.

12. Tighten lock bolt (B, Figure 43) securely.

13. Install all items removed by reversing the above steps.

3.6.14

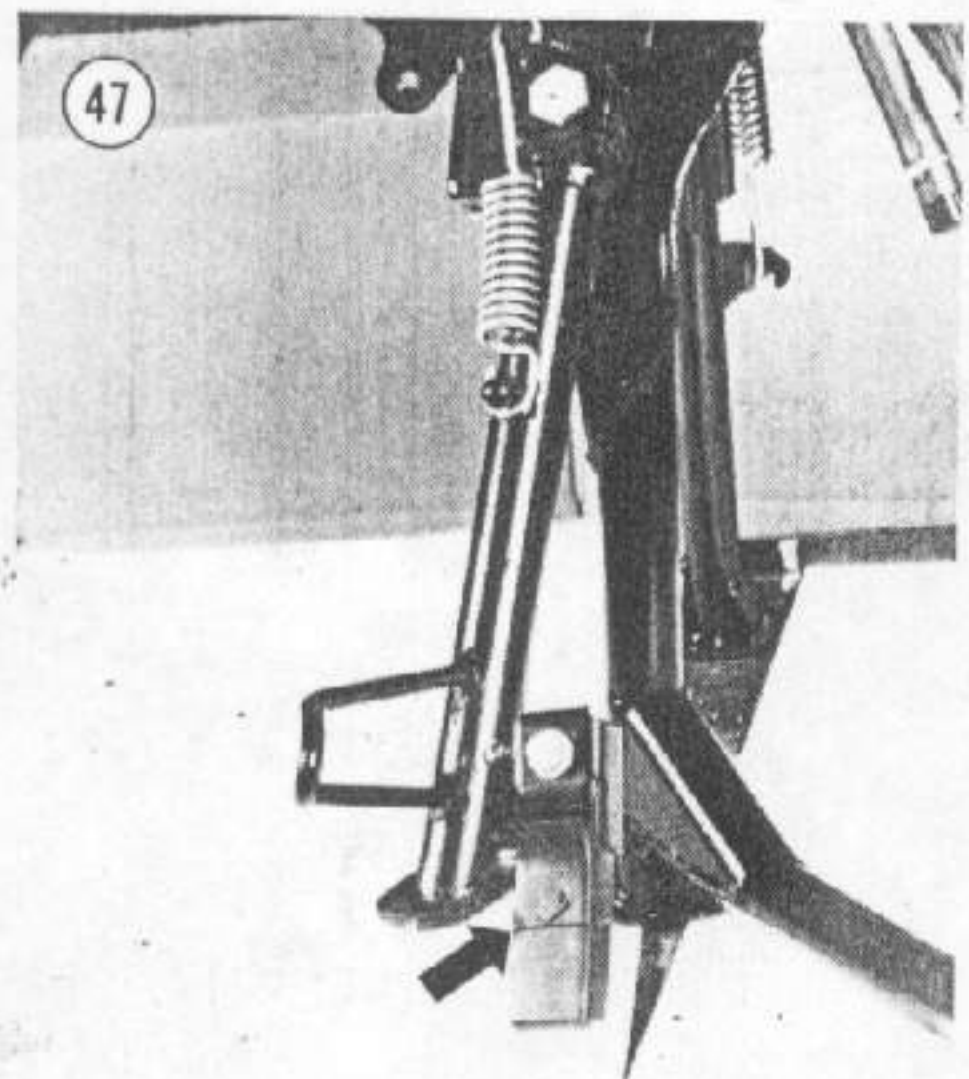
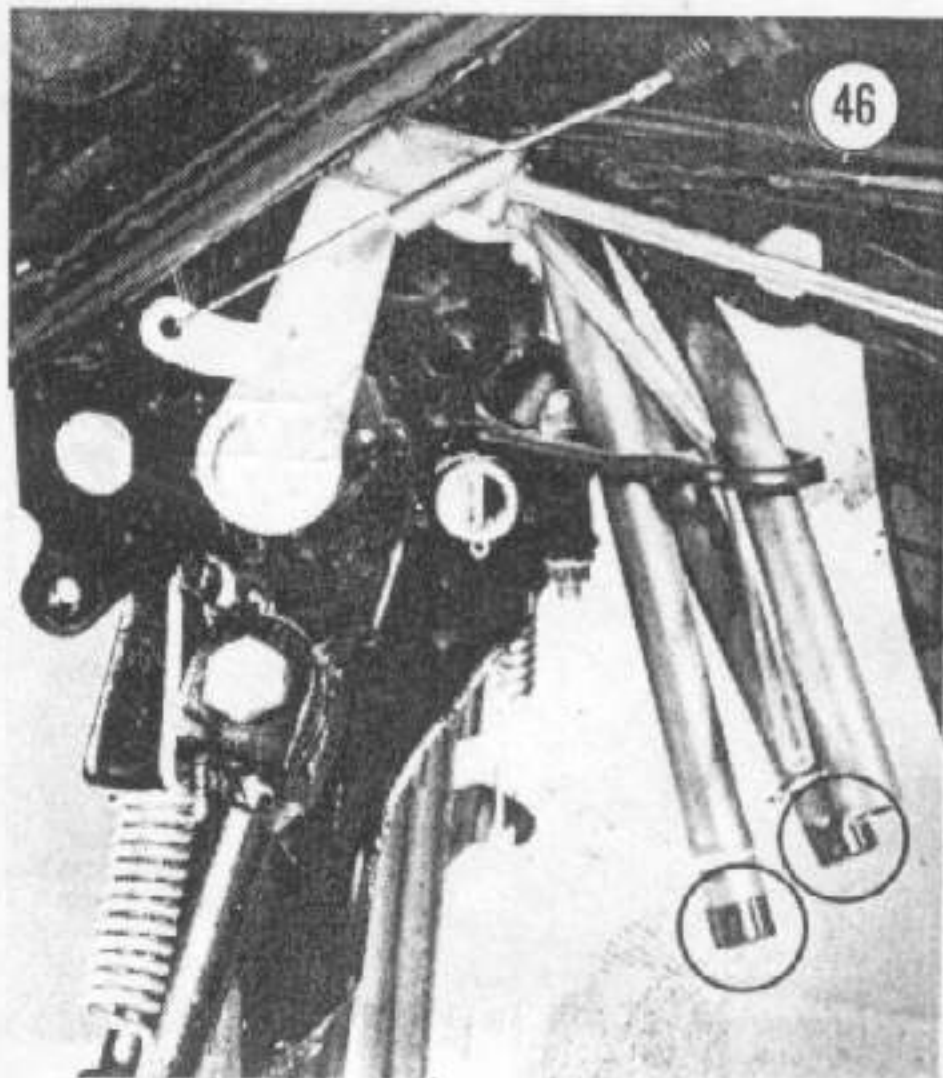
Crankcase Breather

Every 3,600 miles, or sooner if a considerable amount of riding is done at full throttle or in the rain, remove the 2 drain plugs (Figure 46) and drain out all residue. Install the caps.

3.6.15

Side Stand Rubber

The rubber tip on the side stand kicks the stand up if you should forget. If it wears down to the molded line (Figure 47), replace the rubber as it will no longer be effective.



3.7 TUNE-UP

A complete tune-up should be performed every 3,600 miles of normal riding. More frequent tune-ups may be required if the motorcycle is ridden primarily in stop-and-go traffic.

The spark plugs should be routinely replaced at every other tune-up or if the electrodes show signs of erosion. In addition, this is a good time to clean the air cleaner element. Have the new parts on hand before you begin.

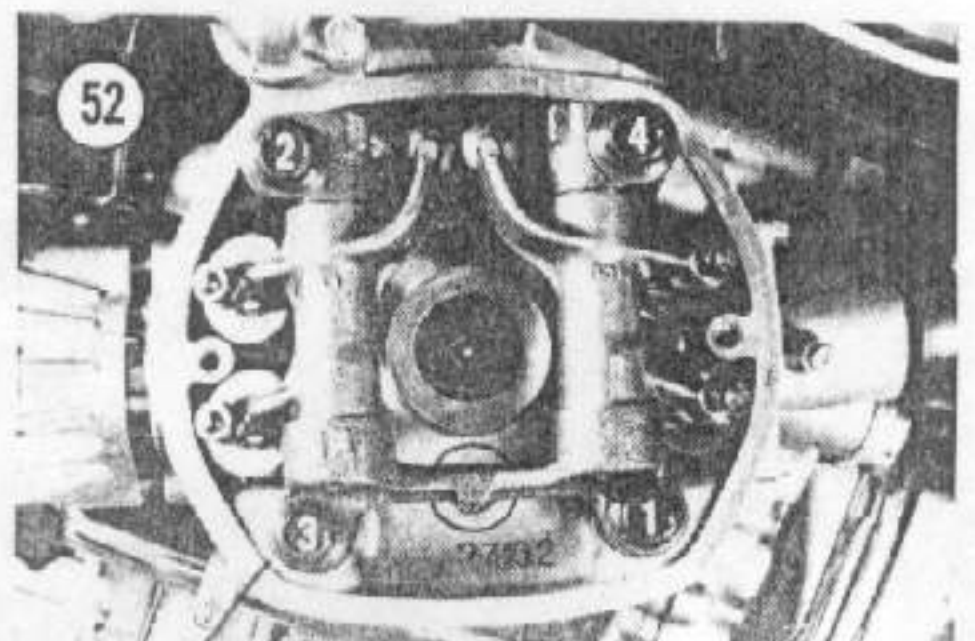
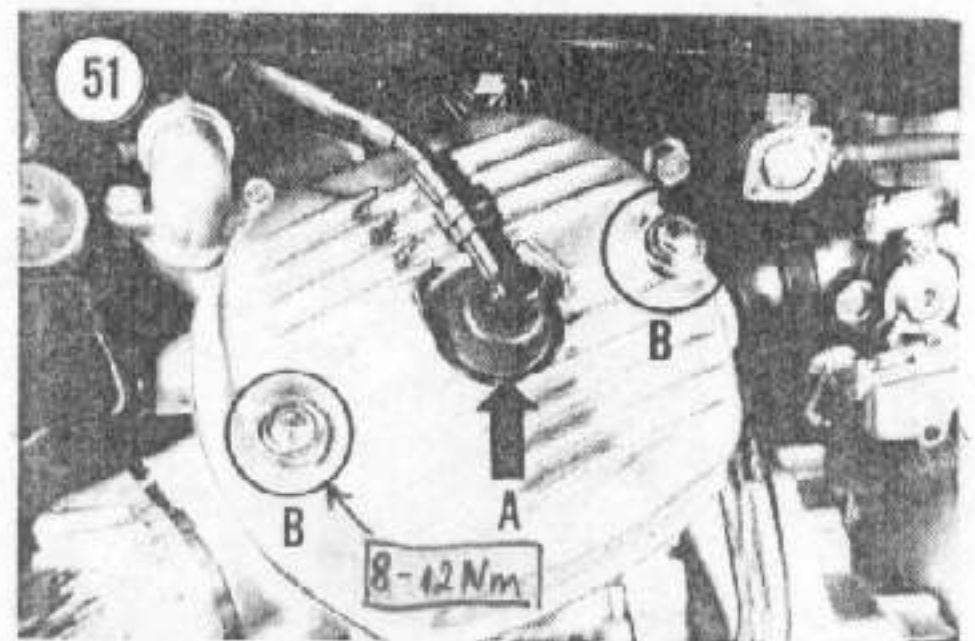
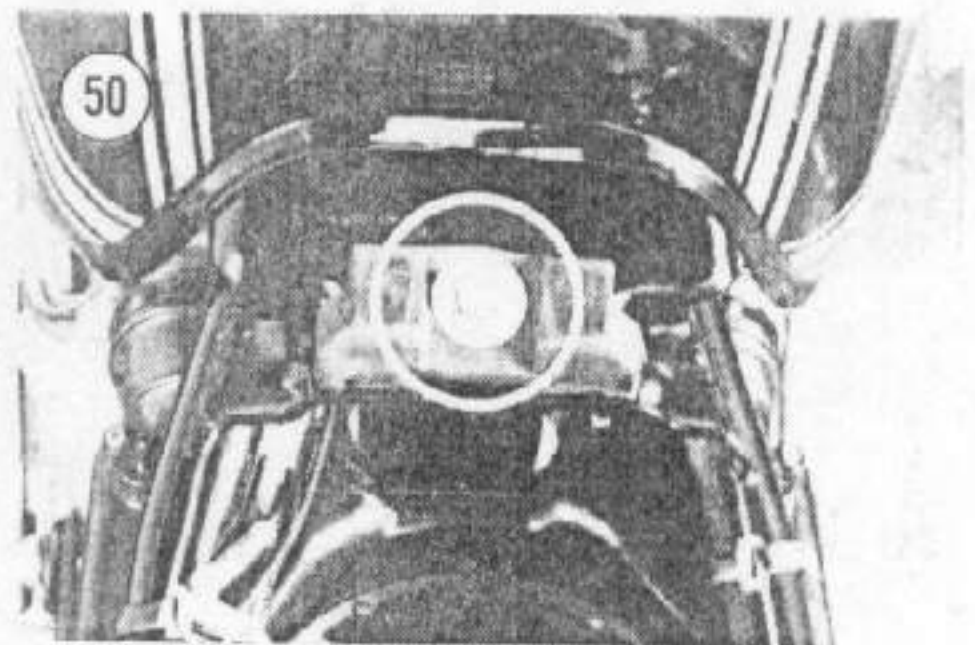
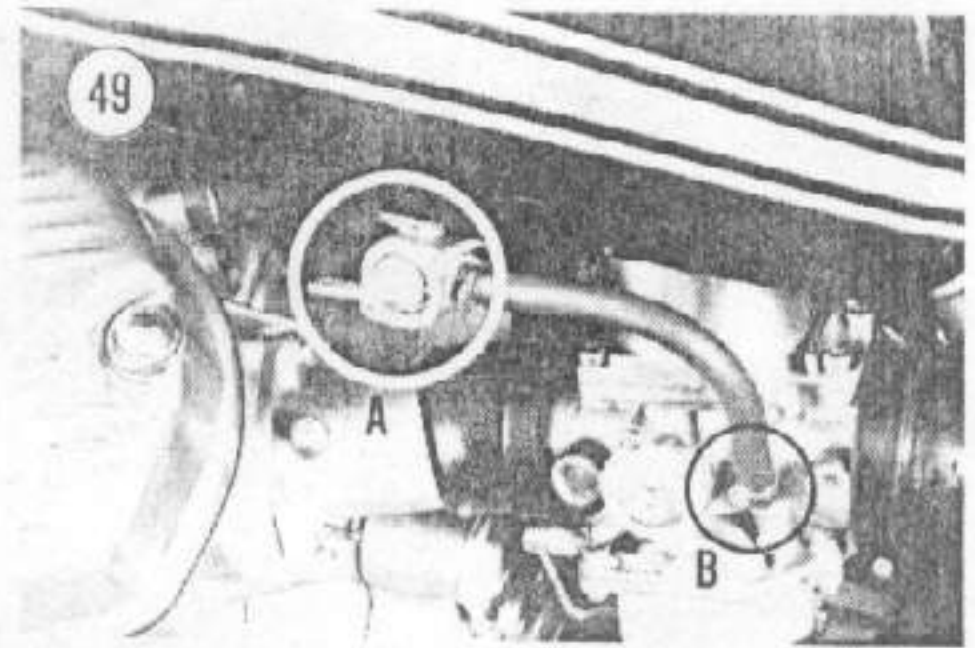
Because different systems in an engine interact, the procedures should be done in the following order:

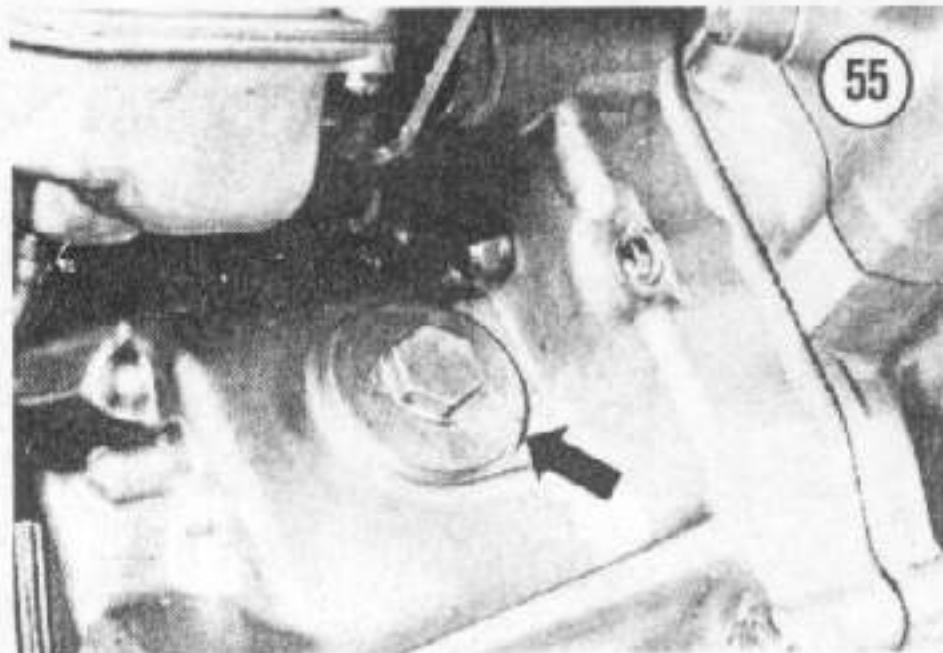
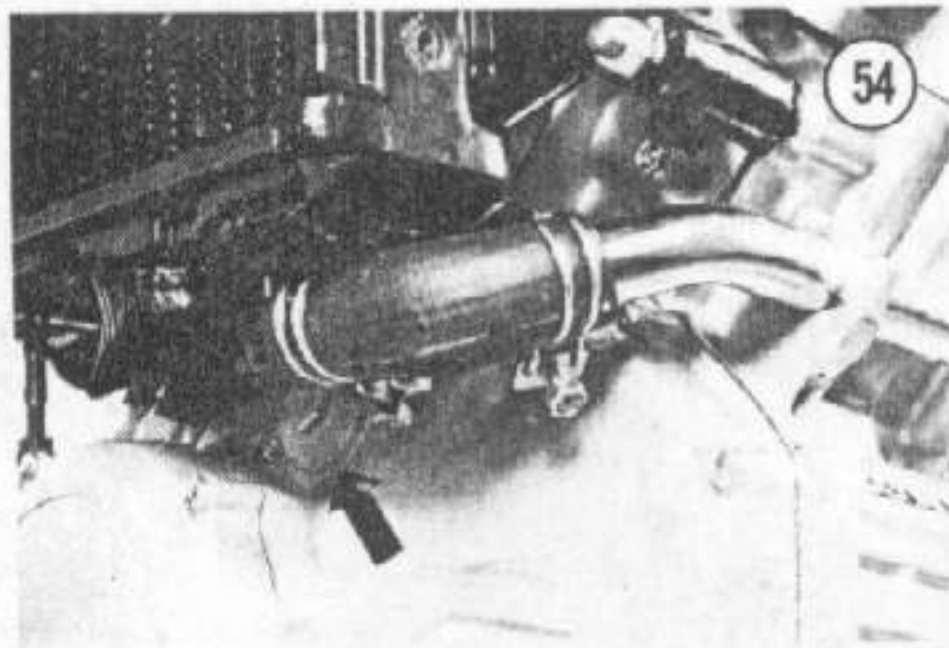
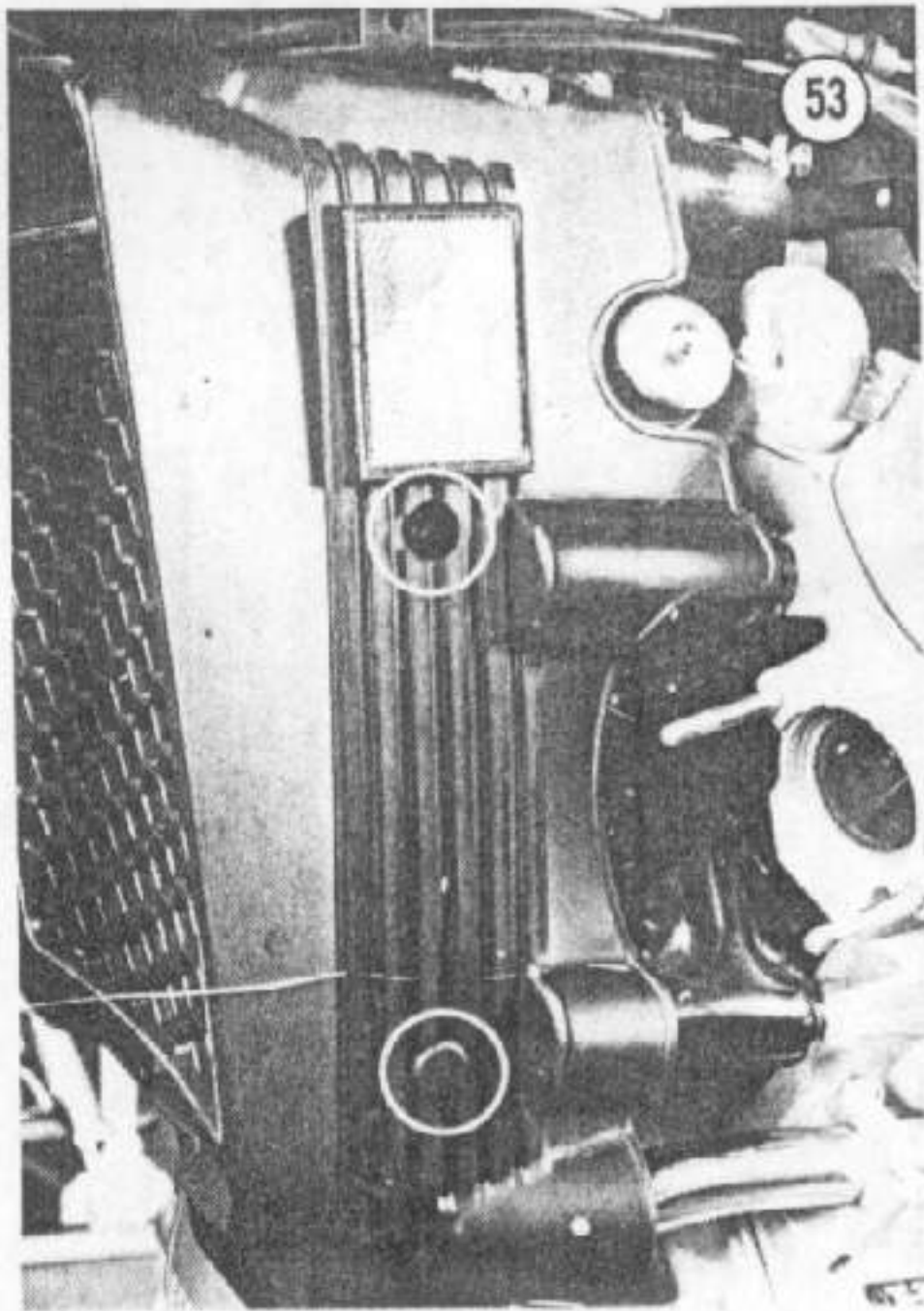
- Tighten the cylinder head bolts
- Adjust the valve clearances
- Check the ignition system
- Adjust the carburetors

3.9.4

Cylinder Head Bolts

- Place the bike on the centerstand and remove right- and left-side covers (Figure 48).
- Remove the seat.
- Turn the fuel shutoff valve to the OFF position (A, Figure 49) and remove the fuel line to the carburetors (B, Figure 49).
- Remove the rear bolt and rubber pads (Figure 50) securing the fuel tank at the rear, slide the tank to the rear and remove it.
- Remove both spark plug wires and caps (A, Figure 51).
- Remove the bolts (B, Figure 51) securing the valve covers and remove them.
- Tighten the bolts in the sequence shown in Figure 52. Torque the bolts to 33-40 ft.-lb. (45-54 N•m). The fuel tank and valve covers





should be left off at this time for the following procedures.

3.7.2

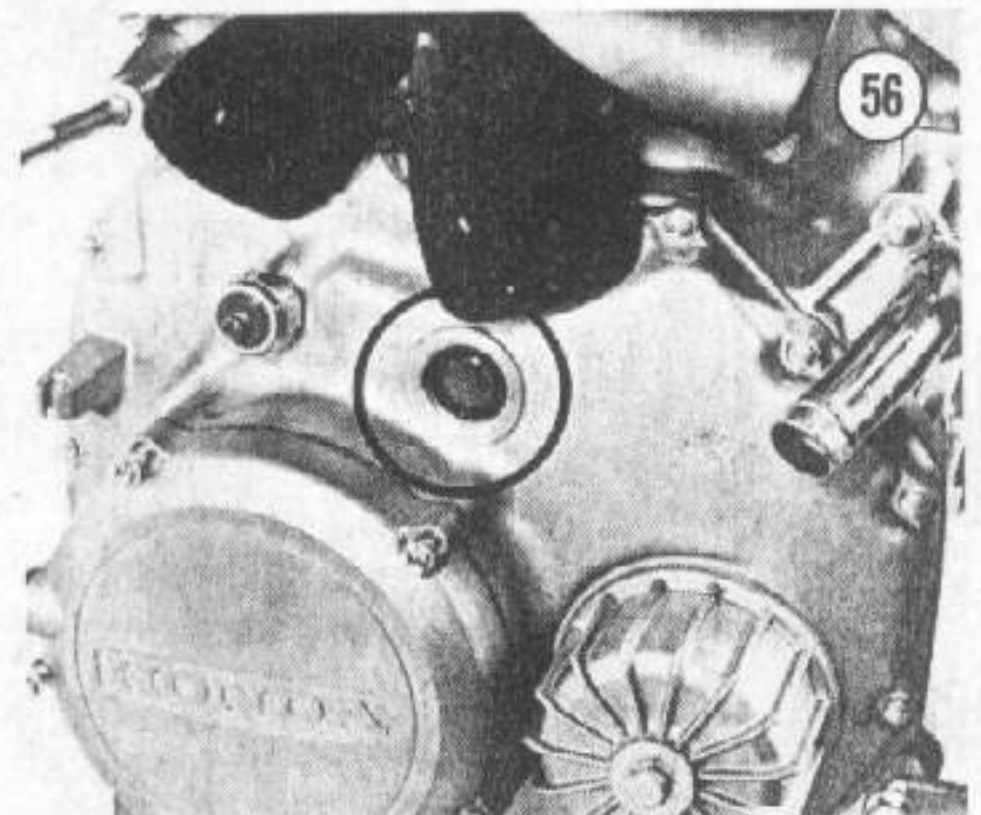
Valve Clearance Adjustment

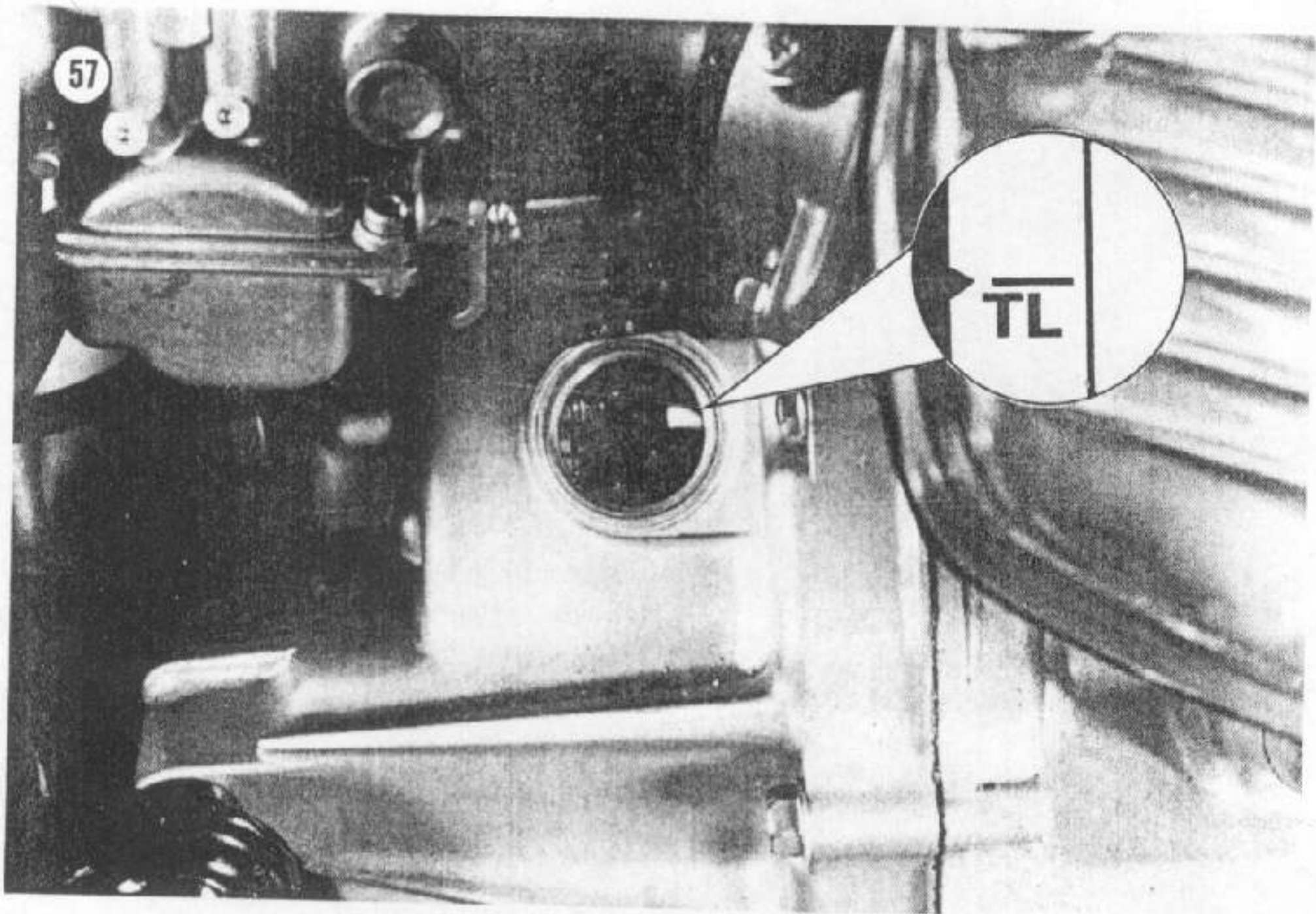
Valve clearance adjustment must be made with the engine cold. The intake valve clearance is 0.003 in. (0.08mm) and the exhaust valve clearance is 0.004 in. (0.10mm).

1. Remove the spark plugs from the cylinder heads.
2. Remove the rubber plugs and screws, 2 on each side (Figure 53), securing the radiator shroud. Slide the shroud forward and down and remove it.
3. Remove the crankshaft front cover cap (Figure 54).
4. Remove the timing inspection hole cover cap (Figure 55).
5. Rotate the crankshaft *clockwise* until the left-hand piston is at top dead center (TDC) on the compression stroke. Use the bolt on the front of the crankshaft (Figure 56) for turning with a suitable size socket.

NOTE: A cylinder at TDC will have both its rocker arms loose, indicating that the exhaust valves and intake valves are closed.

6. Make sure that the TL mark on the alternator rotor aligns with the index mark on the crankcase (Figure 57).
7. Check the clearance of all 4 valves on that cylinder by inserting a flat feeler gauge between





the adjusting screw and the valve stem. When the clearance is correct, there will be a slight resistance on the feeler gauge when it is inserted and withdrawn.

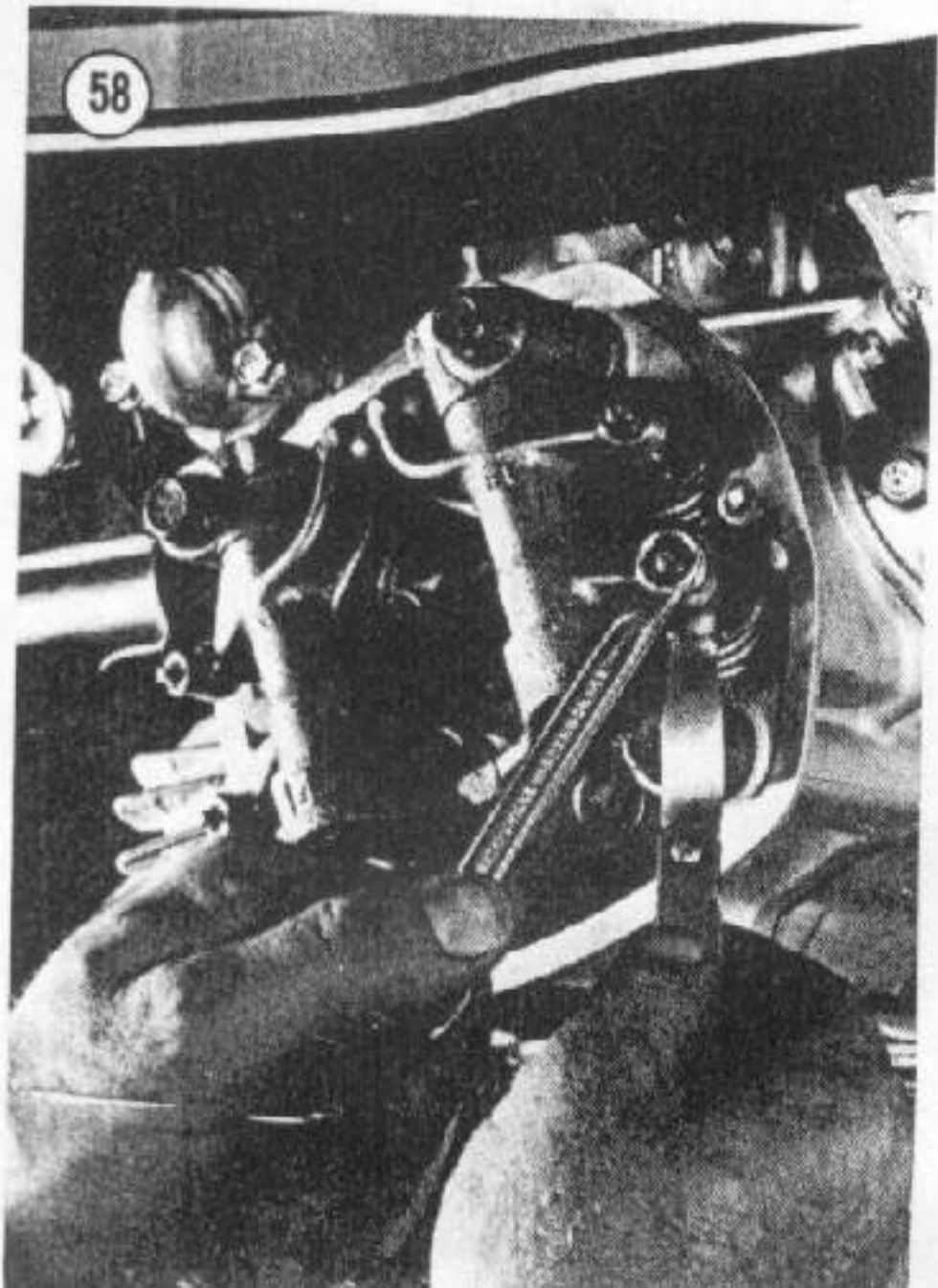
8. To correct the clearance, back off the locknut and screw the adjuster in or out far enough until a slight resistance can be felt on the gauge. Hold the adjuster to prevent it from turning further and tighten locknut (**Figure 58**). Recheck the clearance to make sure the adjuster did not turn after the correct clearance was achieved.

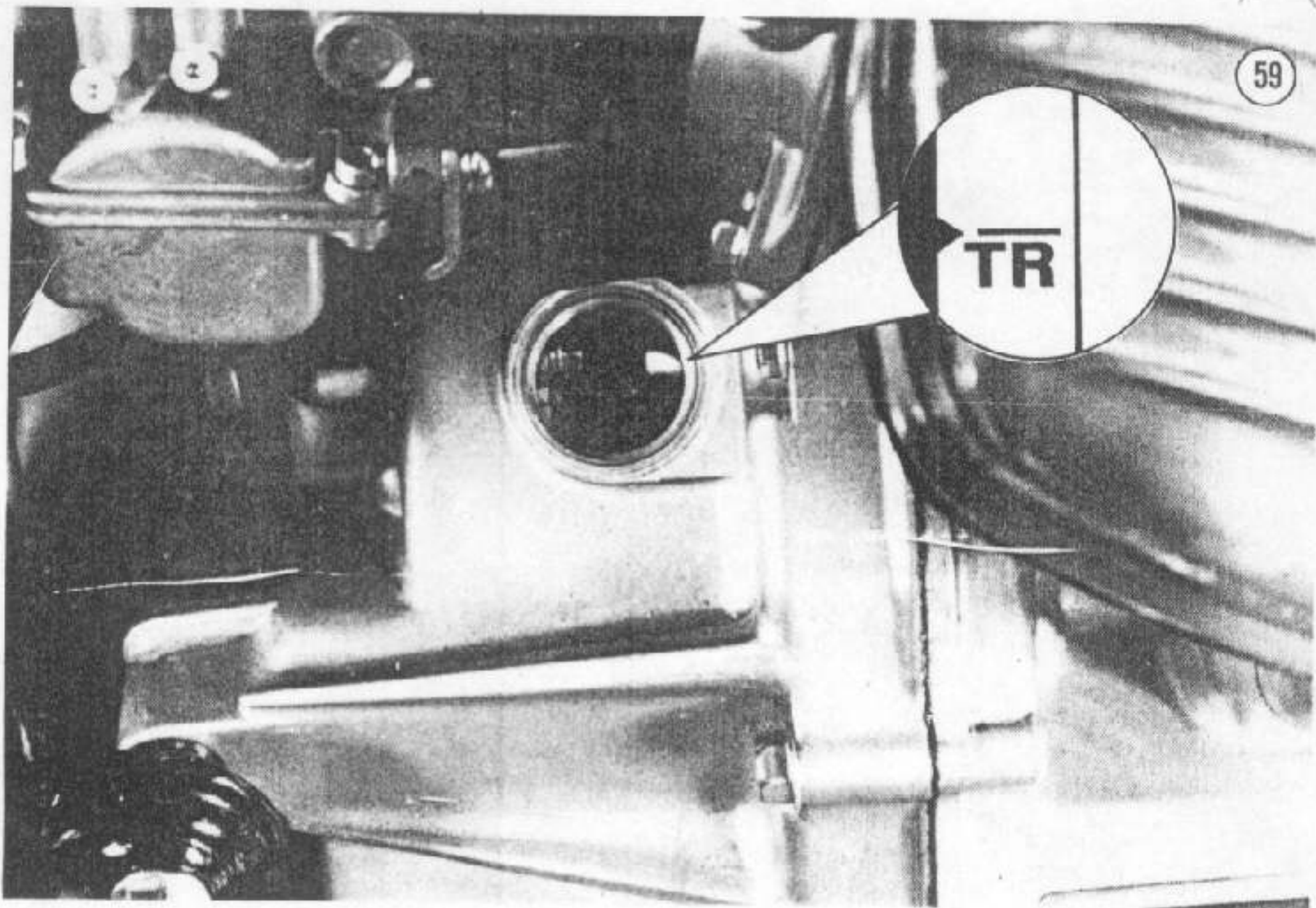
9. Rotate the crankshaft *clockwise* until the TR mark on the alternator rotor aligns with the mark on the crankcase (**Figure 59**). The right-hand cylinder must be at TDC on the compression stroke (see **NOTE** after Step 5).

10. Repeat Steps 7 and 8 for the right-hand cylinder valves.

11. When all clearances have been checked and adjusted, install all items removed by reversing the above steps.

NOTE: Prior to installing the valve covers, coat the rubber bushings on the





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3



60

bolts with engine oil. Make sure the gaskets are in good condition and in place (Figure 60).

3.7.3

Compression Test

Every 6,000 miles, check cylinder compression. Record the results and compare them at the next 6,000 mile check. A running record will

show trends in deterioration so that corrective action can be taken before complete failure.

The results, when properly interpreted, can indicate general cylinder, piston ring, and valve condition.

1. Warm the engine to normal operating temperature. Ensure that the choke valve and throttle valve are completely open.
2. Remove the spark plugs.
3. Connect compression tester to one cylinder following manufacturer's instructions.
4. Have an assistant crank the engine over until there is no further rise in pressure.
5. Remove the tester and record the reading.
6. Repeat Steps 3-5 for the other cylinder.

When interpreting the results, actual readings are not as important as the difference between the readings. Both readings should be from about 171 ± 20 psi (12 ± 2.0 kg/cm²). A maximum difference of 57 psi (4 kg/cm²) between the 2 cylinders is acceptable. Greater differences indicate worn or broken rings, leaky or sticky valves, blown head gaskets or a combination of all.

If compression reading does not differ between cylinders by more than 10 psi, the rings and valves are in good condition.

If a low reading (10% or more) is obtained on one of the cylinders, it indicates valve or ring trouble. To determine which, pour about a teaspoon of engine oil through the spark plug hole onto the top of the piston. Turn the engine over once to clear some of the excess oil, then take another compression test and record the reading. If the compression returns to normal, the valves are good but the rings are defective on that cylinder. If compression does not increase, the valves require servicing. A valve could be hanging open but not burned or a piece of carbon could be on a valve seat.

3.7.4

Correct Spark Plug Heat Range

Spark plugs are available in various heat ranges, hotter or colder than plugs originally installed at the factory.

Select plugs of a heat range designed for the loads and temperature conditions under which the bike will run. Use of incorrect heat ranges can cause seized pistons, scored cylinder walls, or damaged piston crowns.

In general, use a hot plug for low speeds, low loads, and low temperatures. Use a cold plug for high speeds, high engine loads, and high temperatures.

In areas where seasonal temperature variations are great, the factory recommends a "two-plug system" — a cold plug for hard summer riding and a hot plug for slower winter operation. Refer to Table 6.

The reach (length) of a plug is also important. A longer than normal plug could interfere with the valves and pistons causing permanent and severe damage. Refer to Figure 61.

3.7.5

Spark Plug Cleaning and Replacement

Spark plugs should be inspected and cleaned every 3,600 miles and replaced every 7,200 miles or sooner if necessary.

1. Grasp the spark plug leads as near the cap as possible and pull them off the plugs.
2. Blow away any dirt and moisture that has accumulated in the spark plug wells. Clean out the drain hole (Figure 62) in each head.

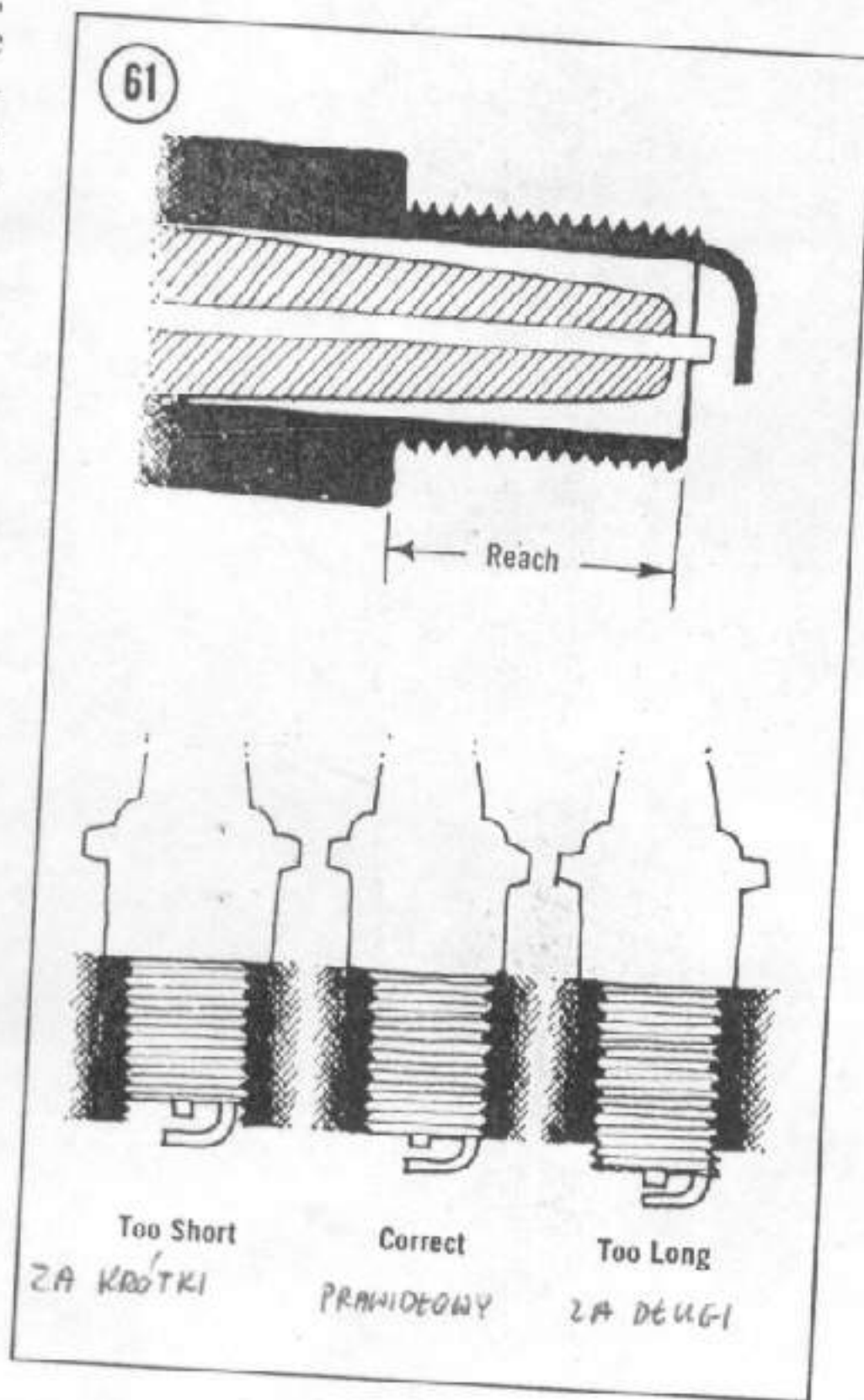


Table 6 SPARK PLUG HEAT RANGE

	NGK	ND	AC	CHAMPION
U.S. Models				
Standard	D8EA	X24ES-U	S121 XL	A-8Y
Cold climate	D7EA	X22ES-U	S123 XL	R-8, R-6
High speed	D9EA	X27ES-U	—	—
Canadian Models				
Standard	DR 8ES-L	X24ESR-U	—	—

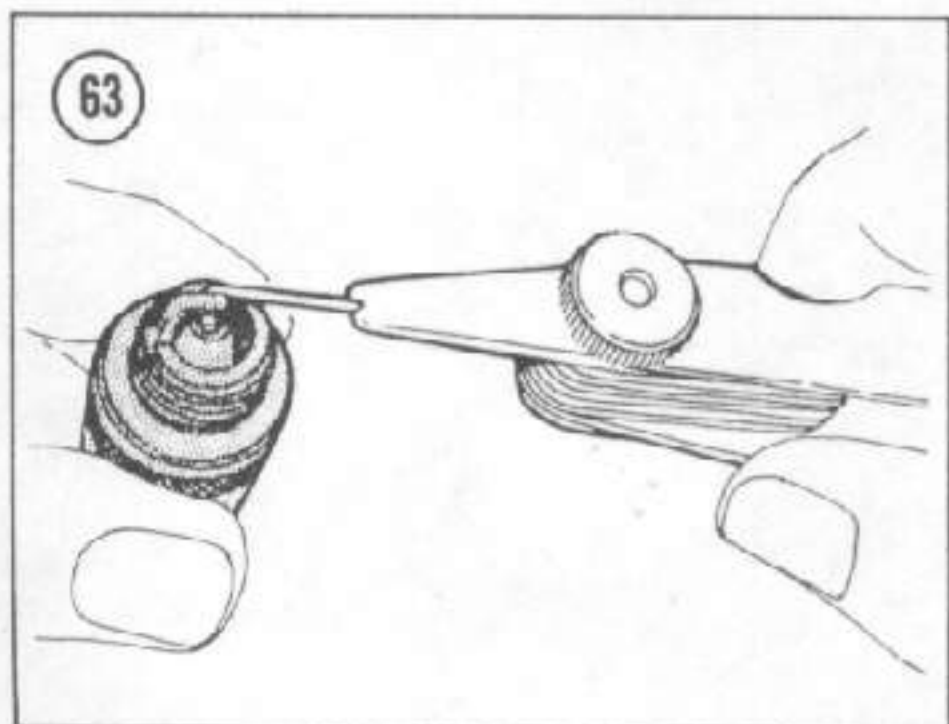
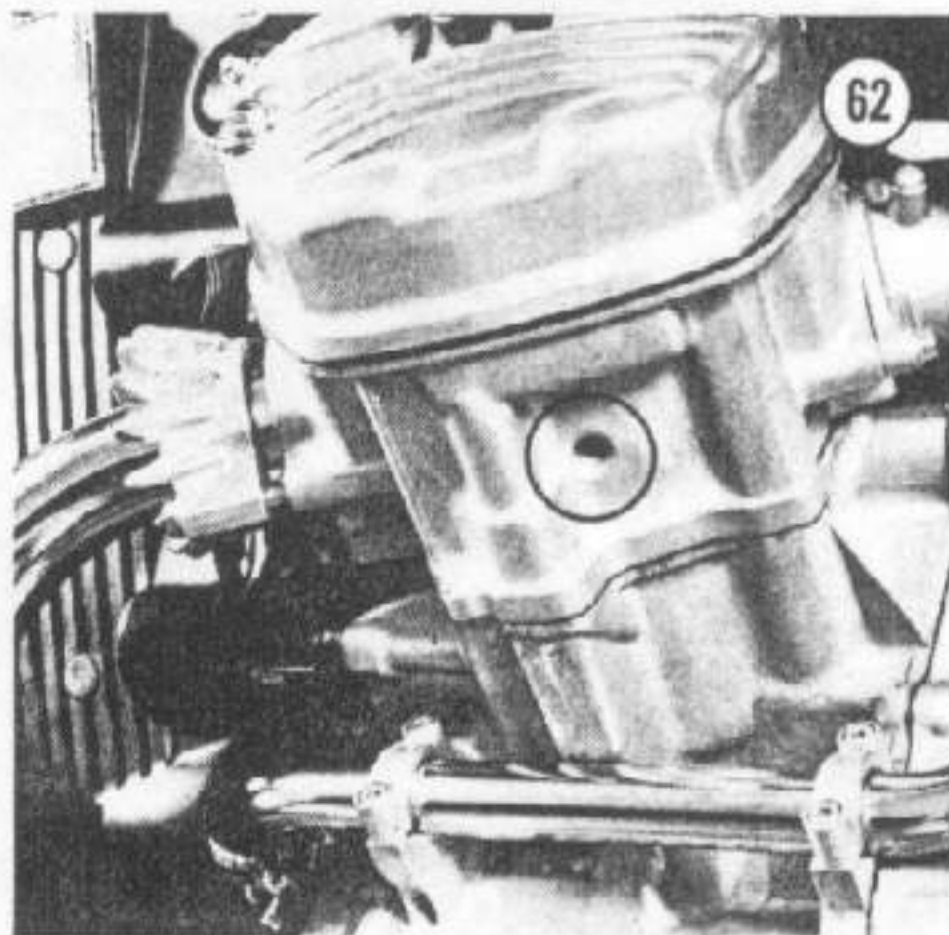
CAUTION

Dirt could fall into the cylinders when the plugs are removed, causing serious engine damage.

3. Remove spark plugs with a spark plug wrench.

NOTE: If plugs are difficult to remove, apply penetrating oil, like WD-40 or Liquid Wrench, around base of plugs and let it soak in about 10-20 minutes.

4. Inspect spark plugs carefully. Look for plugs with broken center porcelain, excessively eroded electrodes, and excessive carbon or oil fouling. Replace such plugs. If deposits are light, plugs may be cleaned in solvent with a wire brush or cleaned in a special spark plug sandblast cleaner.



5. Gap plugs to 0.024-0.028 in. (0.6-0.7mm) with a wire feeler gauge. See **Figure 63**.

6. Install plugs with a *new* gasket. First, apply a *small* drop of oil to threads. Tighten plugs finger-tight, then tighten with a spark plug wrench an additional 1/2 turn. If you must reuse an old gasket, tighten only an additional 1/4 turn.

NOTE: Do not overtighten. This will only squash the gasket and destroy its sealing ability.

3.4.6

Reading Spark Plugs

Much information about engine and spark plug performance can be determined by careful examination of the spark plugs. This information is only valid after performing the following steps.

1. Ride the bike a short distance at full throttle in any gear.
2. Turn the kill switch to OFF before closing the throttle and simultaneously pull in the clutch; coast to a stop.
3. Remove the spark plugs and examine them. Compare them to those shown in **Figure 64**.

If insulator is white or burned, the plug is too hot and should be replaced with a colder one.

A too-cold plug will have sooty deposits ranging in color from dark brown to black. Replace with a hotter plug and check for too-rich carburetion or evidence of oil blow-by at the piston rings.

If any one plug is found unsatisfactory, discard both.

3.4.7

Capacitor Discharge Ignition

The Honda CX500 is equipped with a capacitor discharge ignition (CDI). This system, unlike a battery or magneto ignition system, uses no breaker points or other moving parts.

Since there are no components to wear, adjusting the ignition timing is not necessary even after engine disassembly. The timing should not change for the life of the bike.

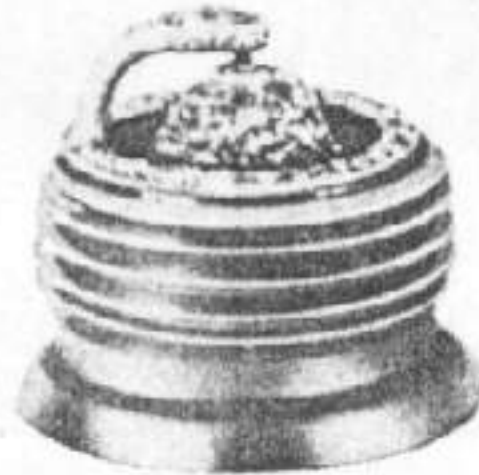
Two items that could cause the timing to vary are the CDI unit and/or the alternator. Check the timing with the following procedure; if it is incorrect, check out both of these units as described in Chapter Eight.

SPARK PLUG CONDITION

64

**NORMAL**

- Identified by light tan or gray deposits on the firing tip.
- Can be cleaned.

**GAP BRIDGED**

- Identified by deposit buildup closing gap between electrodes.
- Caused by oil or carbon fouling. If deposits are not excessive, the plug can be cleaned.

**OIL FOULED**

- Identified by wet black deposits on the insulator shell bore electrodes.
- Caused by excessive oil entering combustion chamber through worn rings and pistons, excessive clearance between valve guides and stems, or worn or loose bearings. Can be cleaned. If engine is not repaired, use a hotter plug.

**CARBON FOULED**

- Identified by black, dry fluffy carbon deposits on insulator tips, exposed shell surfaces and electrodes.
- Caused by too cold a plug, weak ignition, dirty air cleaner, too rich a fuel mixture, or excessive idling. Can be cleaned.

**LEAD FOULED**

- Identified by dark gray, black, yellow, or tan deposits or a fused glazed coating on the insulator tip.
- Caused by highly leaded gasoline. Can be cleaned.

**WORN**

- Identified by severely eroded or worn electrodes.
- Caused by normal wear. Should be replaced.

**FUSED SPOT DEPOSIT**

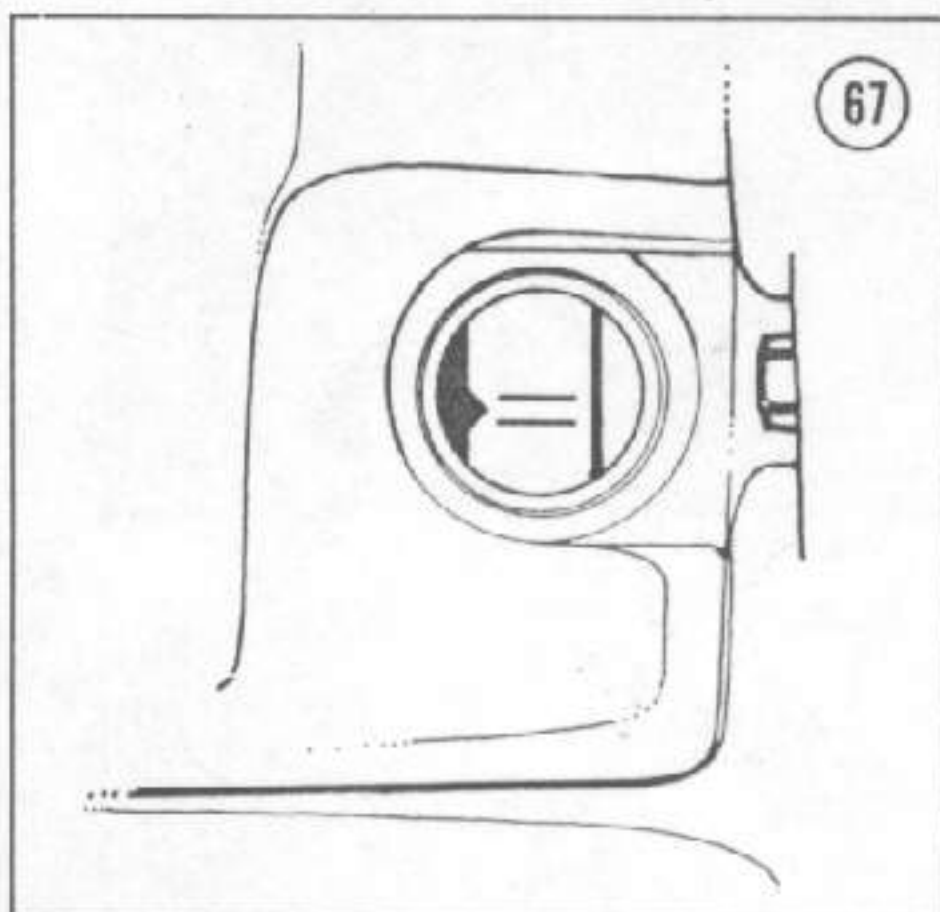
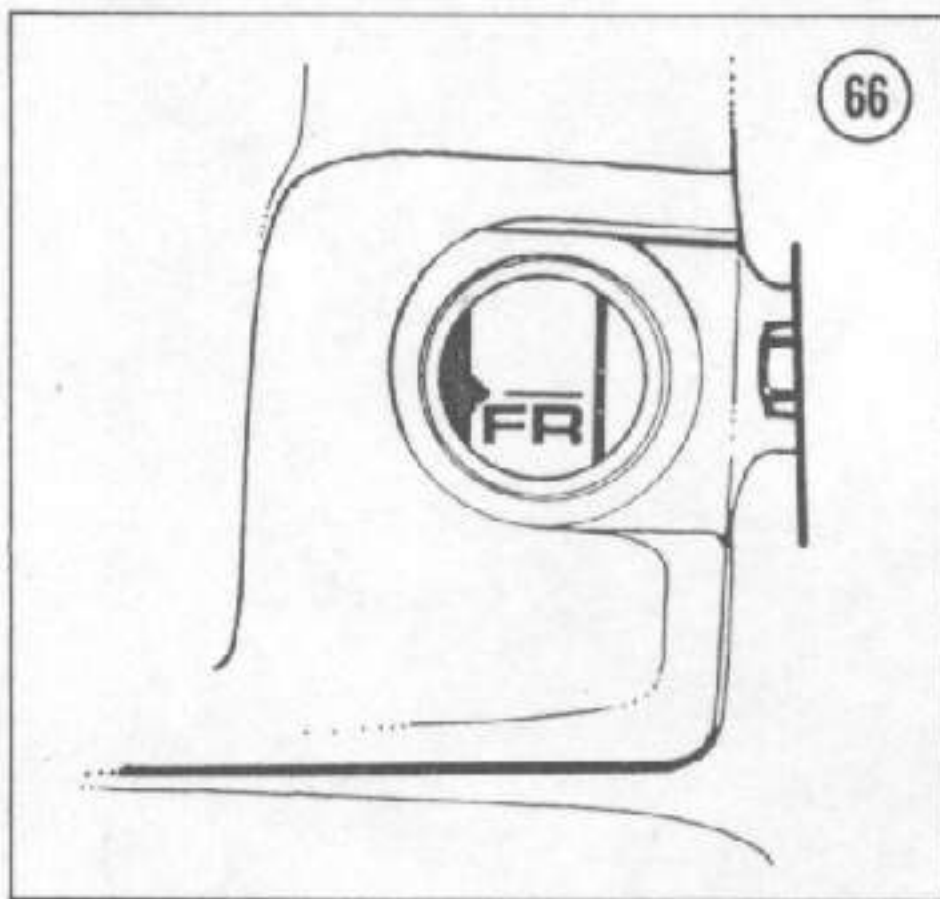
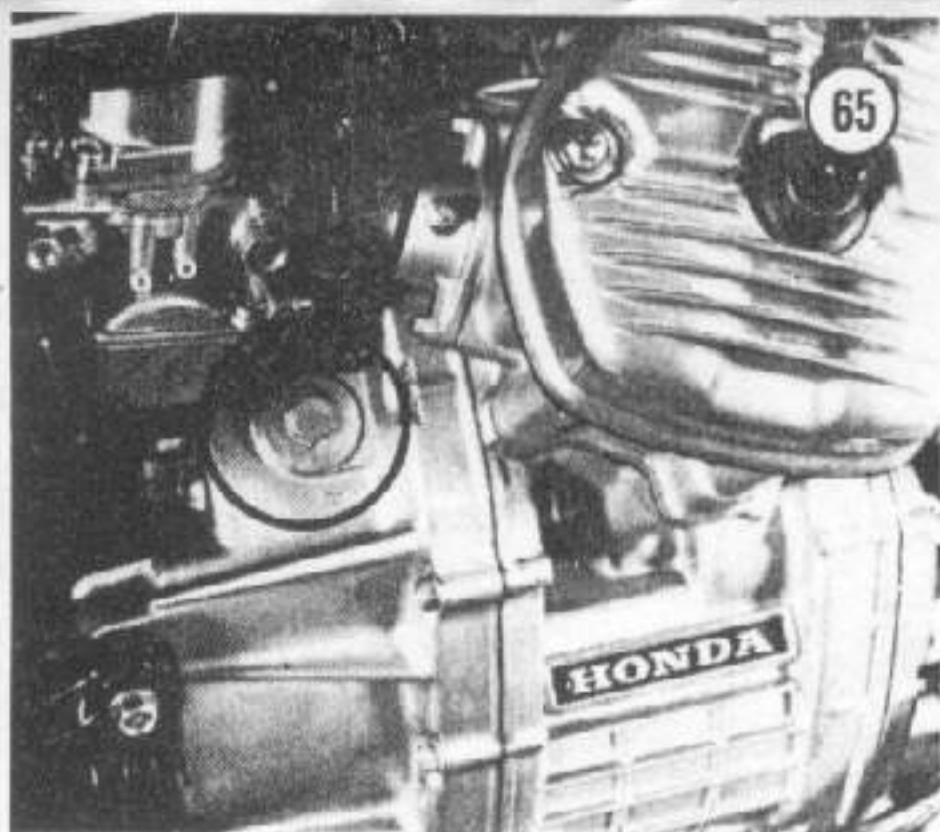
- Identified by melted or spotty deposits resembling bubbles or blisters.
- Caused by sudden acceleration. Can be cleaned.

**OVERHEATING**

- Identified by a white or light gray insulator with small black or gray brown spots and with bluish-burnt appearance of electrodes.
- Caused by engine overheating, wrong type of fuel, loose spark plugs, too hot a plug, or incorrect ignition timing. Replace the plug.

**PREIGNITION**

- Identified by melted electrodes and possibly blistered insulator. Metallic deposits on insulator indicate engine damage.
- Caused by wrong type of fuel, incorrect ignition timing or advance, too hot a plug, burned valves, or engine overheating. Replace the plug.



The only other item that could affect ignition timing is the pulser stator alignment in the rear engine cover. This is a very remote possibility but it is worth checking out if all else fails. Refer to Step 16 and related NOTE, *Alternator Removal/Installation* in Chapter Seven. The two screws may have worked loose causing the pulser stator to shift.

NOTE: Before starting on this procedure, check all electrical connections related to the ignition system. Make sure all connections are tight and free of corrosion and that all ground connections are tight.

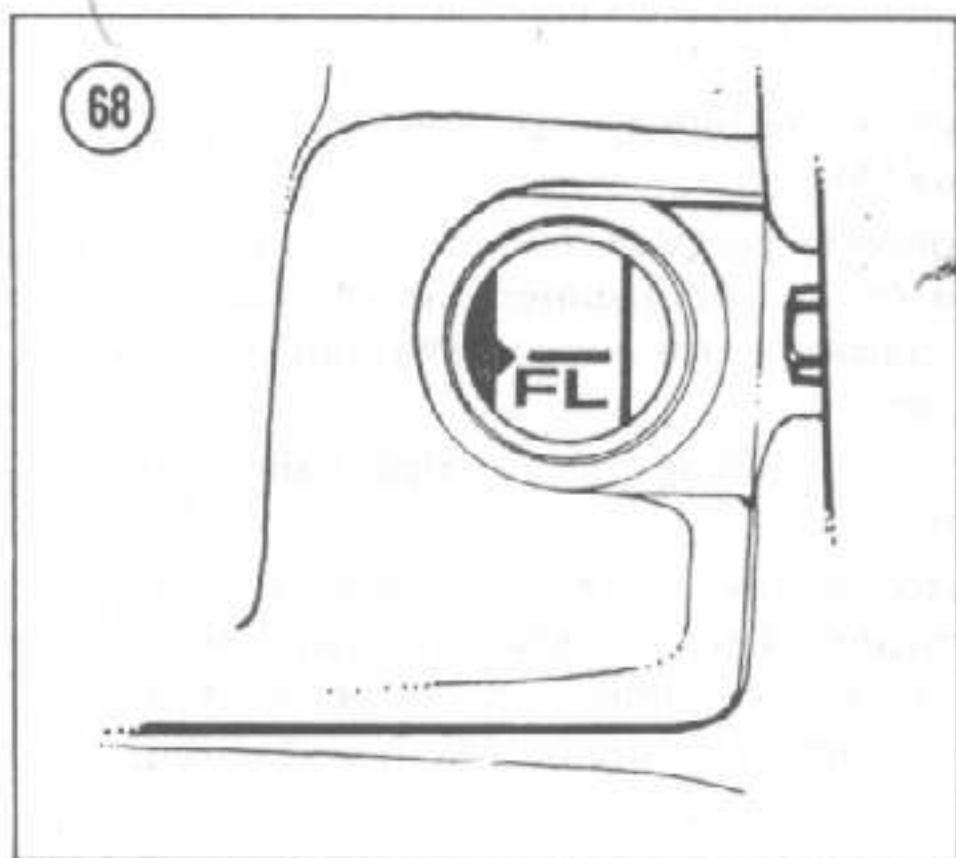
1. Remove the timing inspection hole cover cap (Figure 65).
2. Connect a portable tachometer to the engine following the manufacturer's instructions. The bike's tachometer is not correct enough at very low rpm.
3. Attach a timing light to right-hand spark plug lead.
4. Place the bike on the centerstand and start the engine. Let it warm up and idle at $1,100 \pm 100$ rpm; adjust if necessary as described under *Carburetor Idle Speed Adjustment* in this chapter.
5. Direct the timing light to the timing marks on the alternator flywheel. The timing is correct if the FR on the alternator flywheel aligns with the index mark on the crankcase (Figure 66).
6. Increase engine speed and check that the advance timing marks (Figure 67) align with the index mark on the crankcase at 5,000-6,000 rpm.
7. Repeat Steps 2-5 for the left-hand cylinder. In Step 4 the timing is correct if the FL on the alternator flywheel aligns with the index mark on the crankcase (Figure 68).

3.7.8

Carburetor Idle Adjustment

Carburetor idle adjustment should be checked every 3,600 miles.

Before making this adjustment, the air cleaner must be clean and the engine must have adequate compression; see *Compression Test* in this chapter. Otherwise this procedure cannot be done properly.



1. Start the engine and let it warm up to operating temperature. Make sure the choke knob is all the way in and open (**Figure 69**).
2. Connect a portable tachometer to the engine following the manufacturer's instructions.

NOTE: The correct idle speed is $1,100 \pm 100$ rpm. The bike's tachometer is not correct enough at very low rpm.

3. Rotate black idle adjust screw (**Figure 70**), located between the 2 carburetors, *clockwise* to increase idle speed and *counterclockwise* to decrease idle speed.

3.8 STORAGE

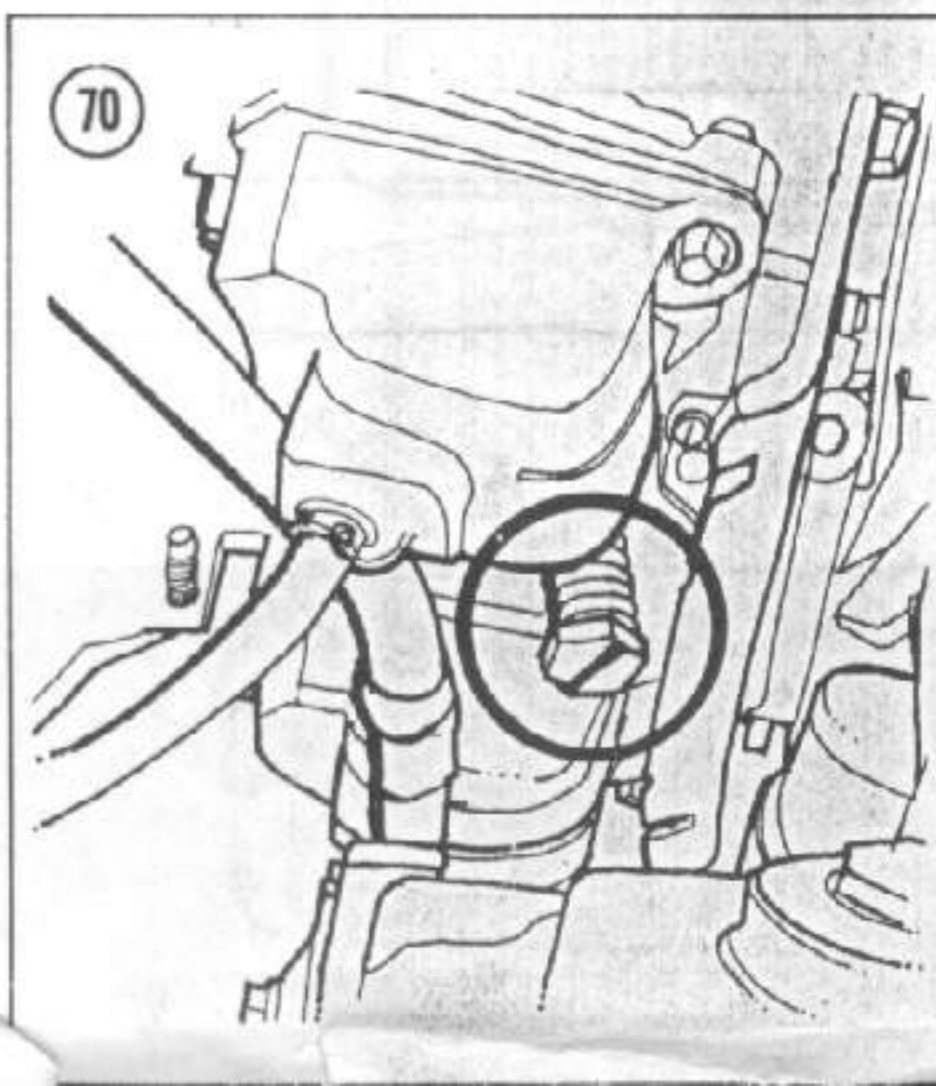
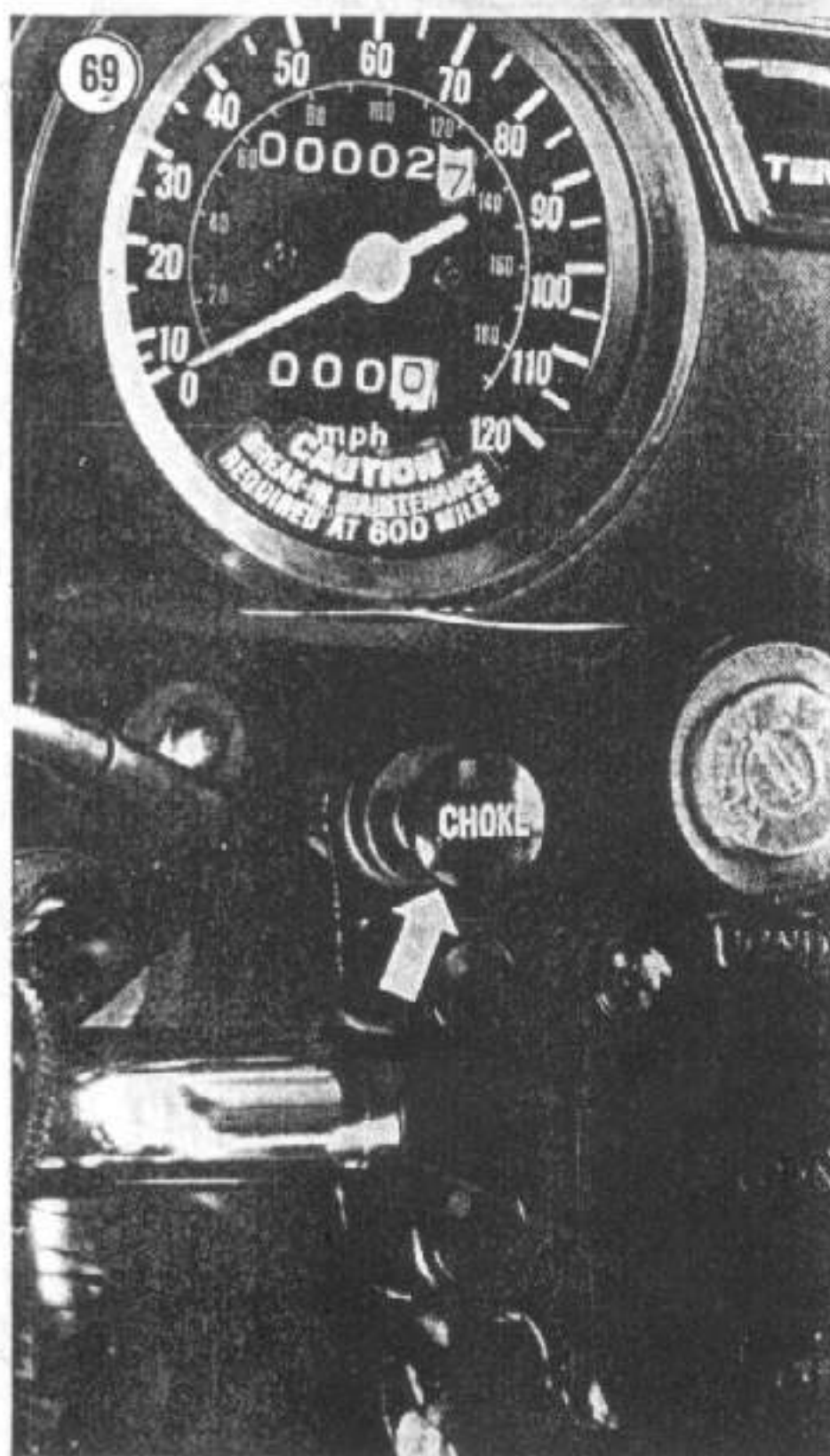
Several months of inactivity can cause serious problems and general deterioration of your bike. This is especially important in areas with extremely cold winters. During the winter, you should prepare your bike carefully for "hibernation."

3.8.1

Selecting a Storage Area

Most cyclists store their bikes in their home garage. If you do not have a garage, there are other facilities for rent or lease in most areas. When selecting an area, consider the following points.

1. The storage area must be dry; there should be no dampness or excessive humidity. A heated area is not necessary, but it should be insulated to minimize extreme temperature variations.



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2. Avoid buildings in industrial areas where factories are liable to emit corrosive fumes. Also avoid buildings near large bodies of salt water.
3. Avoid buildings with large window areas. If this is not possible, mask the window to keep direct sunlight off the bike.
4. Select an area where there is a minimum risk of fire, theft, or vandalism. Check with your insurance agent to make sure that your insurance covers the bike where it is stored.

3.8.2

Preparing Bike for Storage

Careful preparation will minimize deterioration and make it easier to restore the bike to service later. Use the following procedure.

1. Wash the bike completely. Make certain to remove any road salt which may have accumulated during the first weeks of winter. Wax all painted and polished surfaces, including any chromed areas.
2. Run the engine for 20-30 minutes to stabilize oil temperature. Drain oil, regardless of mileage since last oil change. Replace the oil filter and fill engine with normal quantity of fresh oil.
3. Remove battery and coat cable terminals with petroleum jelly. If there is evidence of acid spillage in the battery box, neutralize with baking soda, wash clean, and repaint the damaged area. Store the battery in a warm area and recharge it every 2 weeks.
4. Drain all gasoline from fuel tank, interconnecting hoses, and carburetors. Leave fuel petcock in the RESERVE position. As an alternative,

a fuel preservative may be added to the fuel. This preservative is available from many motorcycle shops and marine equipment suppliers.

5. Remove spark plugs and add a small quantity of oil to each cylinder. Turn the engine a few revolutions by hand to distribute the oil and install the spark plugs.
6. Check tire pressures. Move machine to storage area and store it on the centerstand.
7. Drain the entire cooling system as described under *Changing Coolant*. A label or tag should be firmly attached in a conspicuous place, for example, taped over the instruments or ignition switch, indicating the system is empty.

Rather than leave the system empty, a better way is to refill the system with an ethylene glycol antifreeze solution. Be sure it is rated for year-round protection and made expressly for aluminum engines. Dilute the antifreeze to protect well below the lowest temperature likely in the area. Ethylene glycol is also an effective corrosion inhibitor. This same mixture may be left in the system when the engine is returned to service and only replaced prior to each storage period. Refer to **Table 5**.

3.8.3

After Storage

Before starting the engine after storage, remove the spark plugs and squirt a small amount of fuel into the cylinder to help remove the oil coating. Install the spark plug but do not connect the spark plug wires. Turn the engine over a few times, then reconnect the spark plug wires and start the engine.

CHAPTER FOUR

ENGINE

The engine is a liquid-cooled, 4-stroke, 80° V-twin with four overhead valves per cylinder. Two main bearings support the counterbalanced crankshaft. The camshaft, driven by a Hy-Vo chain, operates the valves via short pushrods and upper and lower rocker arms. Both sets of valves in each cylinder are operated by their own single rocker arm. Each valve has its own adjuster.

The oil pump supplies oil under pressure throughout the engine and is chain driven by the crankshaft.

This chapter provides complete service and overhaul procedures for the Honda CX500. **Tables 1-6**, at the end of this chapter, provide complete specifications for the engine. Although the clutch and transmission are mounted within the engine, they are covered separately in Chapter Five to simplify the presentation of this material.

4.1

ENGINE PRINCIPLES

Figure 1 explains how the engine works. This will be helpful when troubleshooting or repairing your engine.

4.2

SERVICING ENGINE IN FRAME

The following components can be serviced while the engine is mounted in the frame:

- a. Cylinder heads
- b. Upper rocker arm assemblies
- c. Oil filter
- d. Clutch
- e. Carburetors
- f. Electrical systems — except for the alternator
- g. Radiator and thermostat

It is recommended that prior to engine removal and disassembly, the majority of parts be removed from the engine while it is still in the frame.

4.3

ENGINE

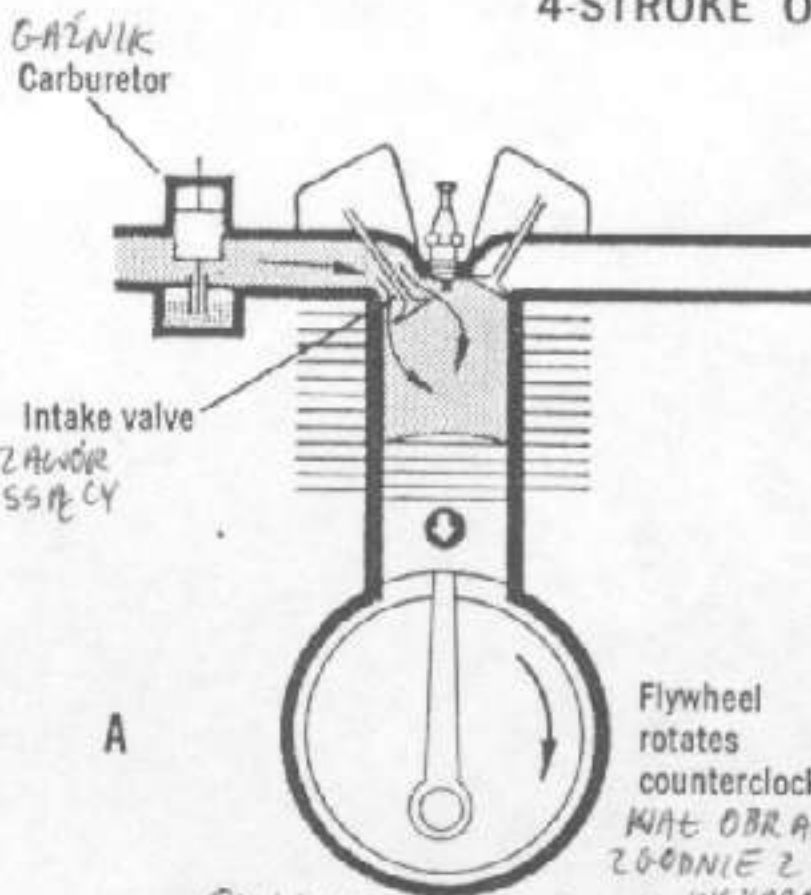
4.3.1

Removal/Installation

1. Place the bike on the centerstand. Remove the right- and left-hand side covers (**Figure 2**) and accessories such as fairings and crash bars.
2. Disconnect negative battery lead (**Figure 3**).
3. Remove the seat.

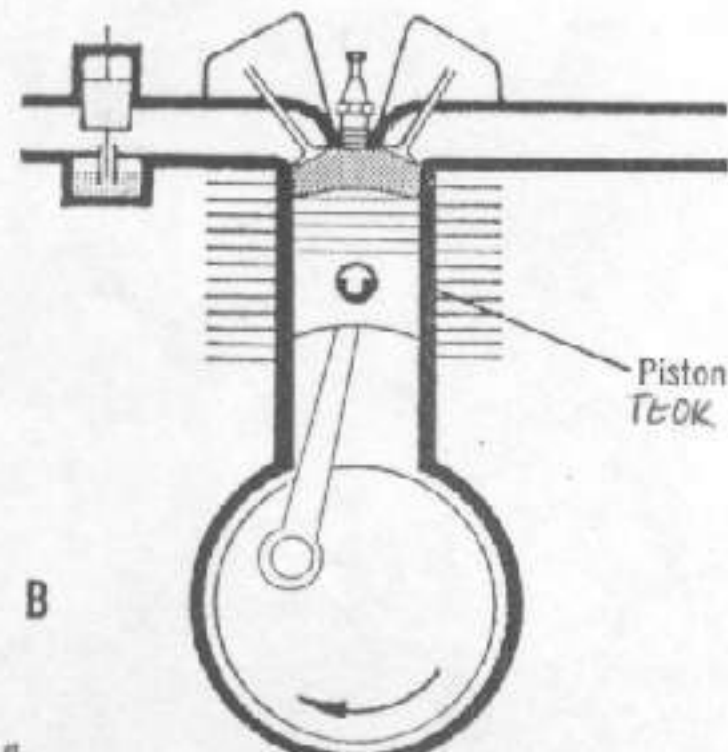
CYKLE PRACY SILNIKA CZTEROSUWOWEGO
4-STROKE OPERATING PRINCIPLES

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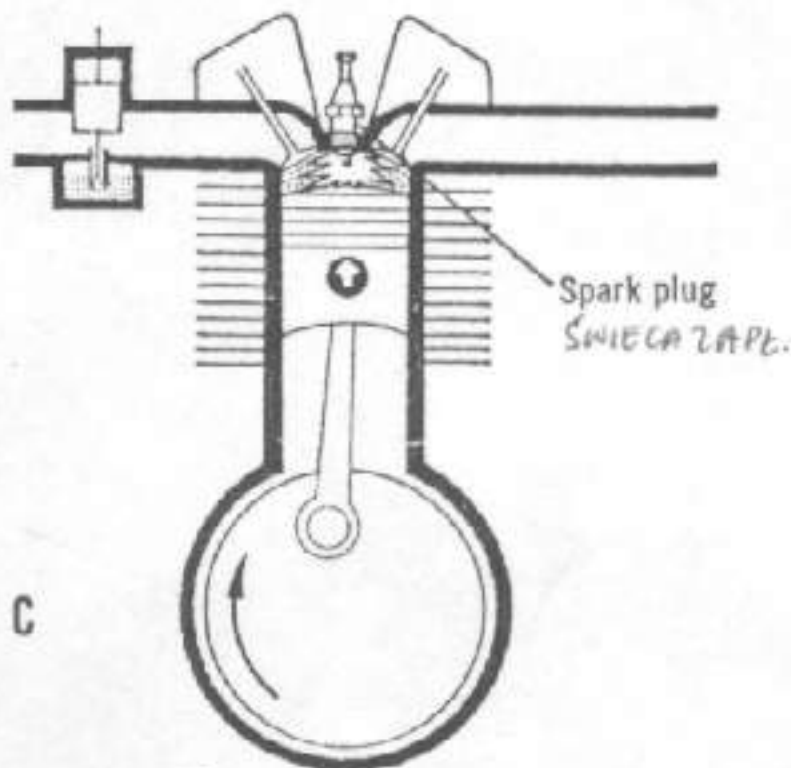
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As the piston travels downward, the exhaust valve is closed and the intake valve opens, allowing the new fuel/air mixture from the carburetor to be drawn into the cylinder. When the piston reaches the bottom of its travel (BDC), the intake valve closes and remains closed for the next revolution-and-a-half of the crankshaft.



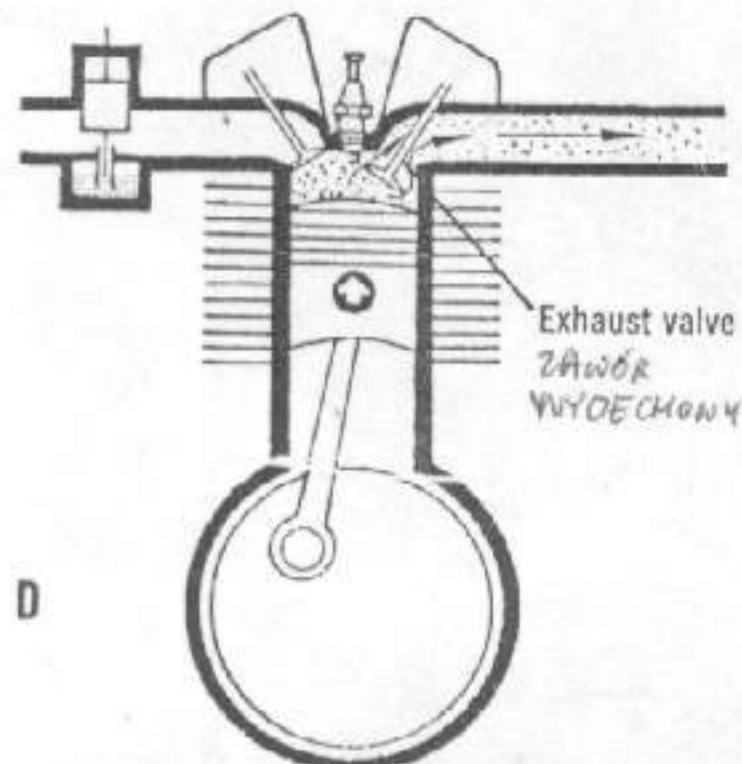
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While the crankshaft continues to rotate, the piston moves upward, compressing the fuel/air mixture.



SUW PRACY

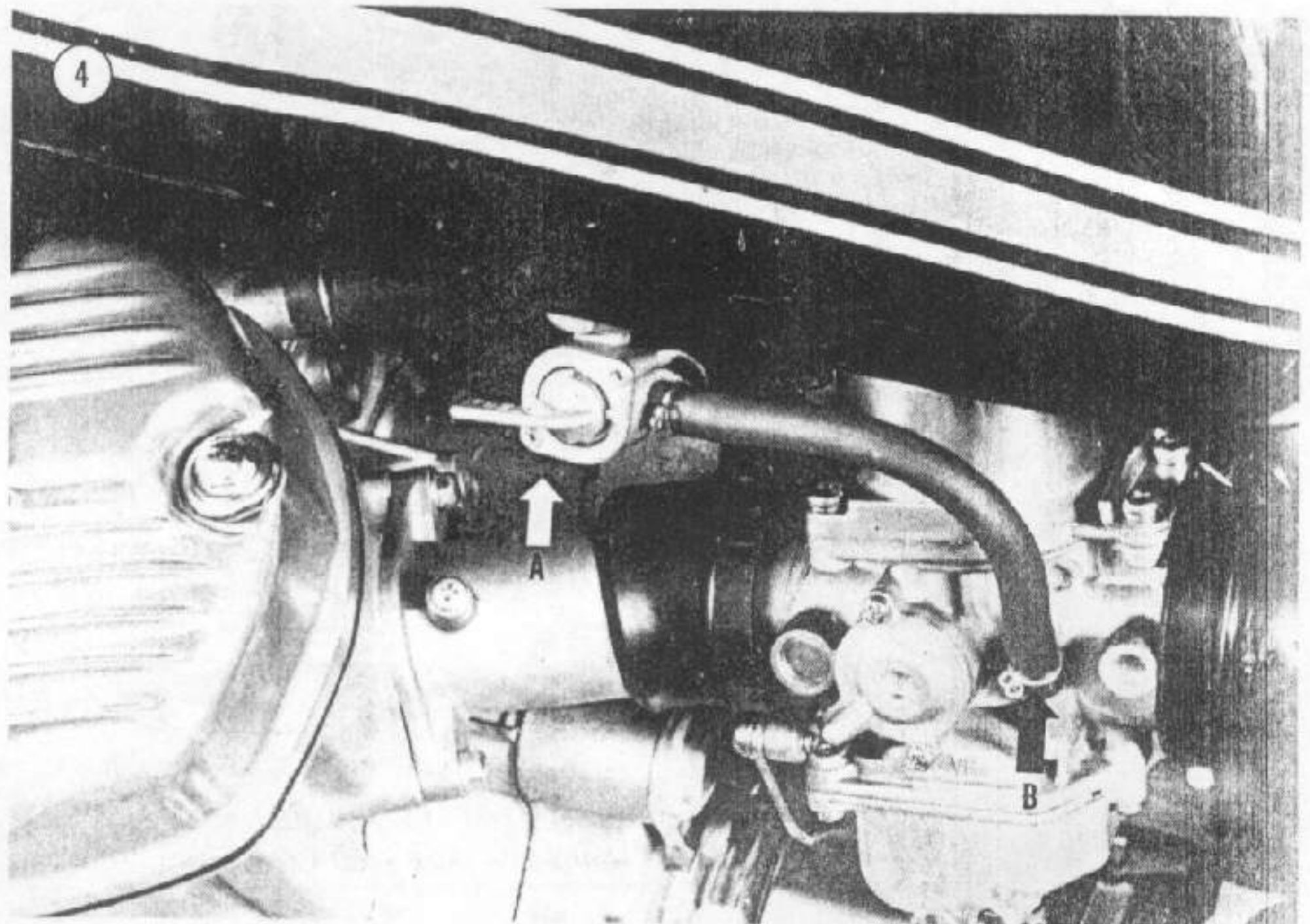
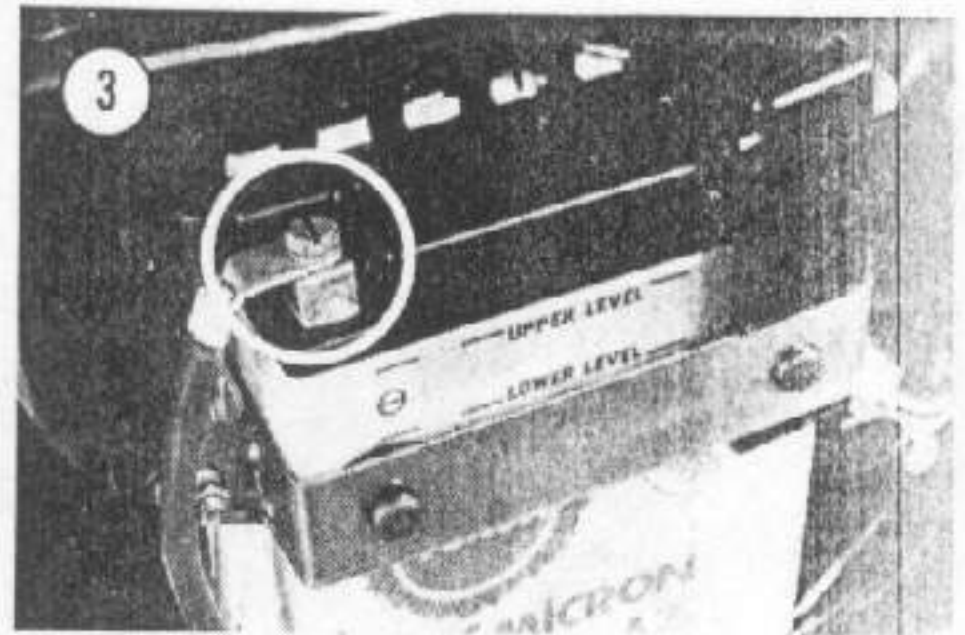
As the piston almost reaches the top of its travel, the spark plug fires, igniting the compressed fuel/air mixture. The piston continues to top dead center (TDC) and is pushed downward by the expanding gases.

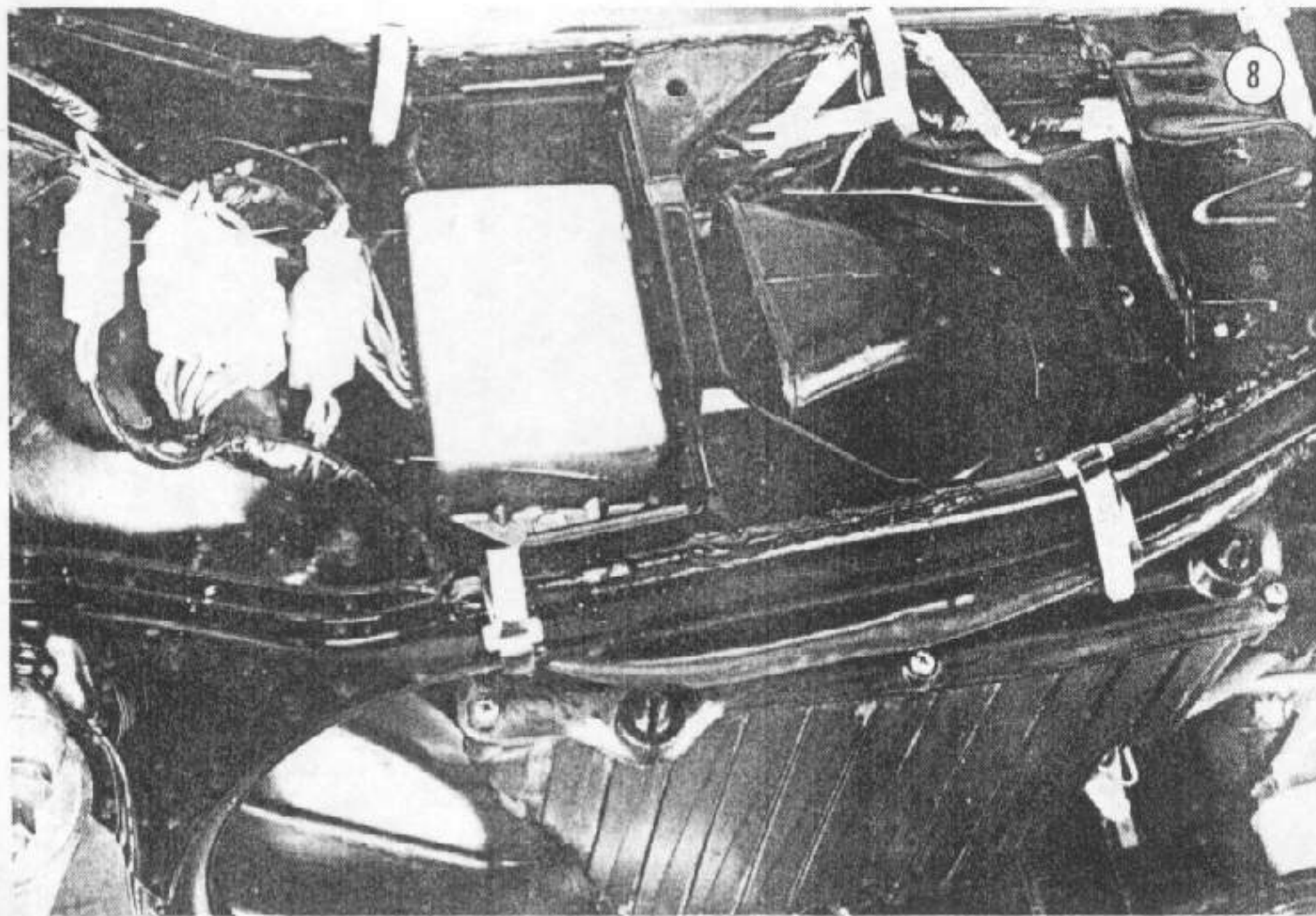
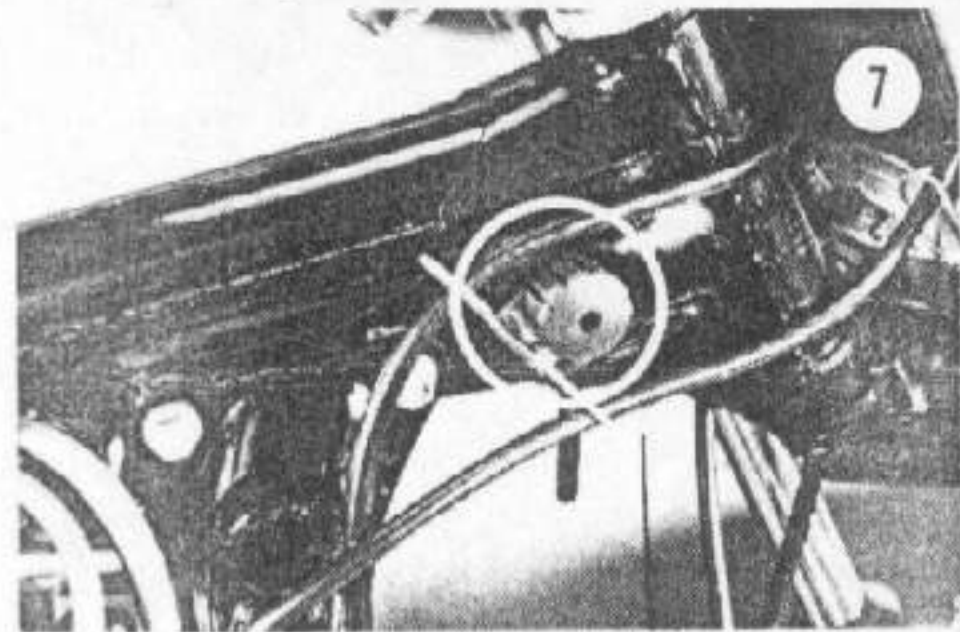
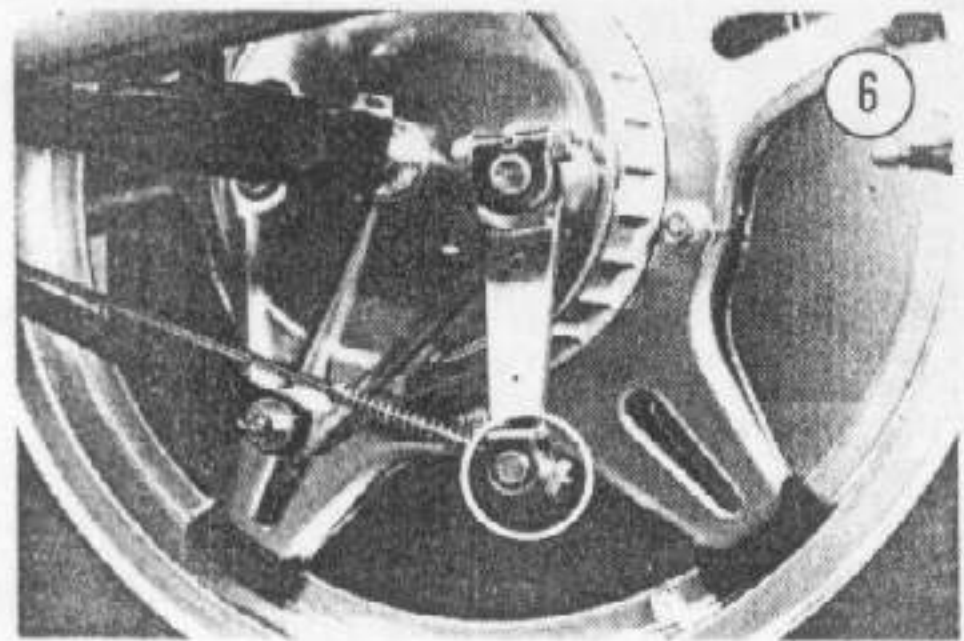
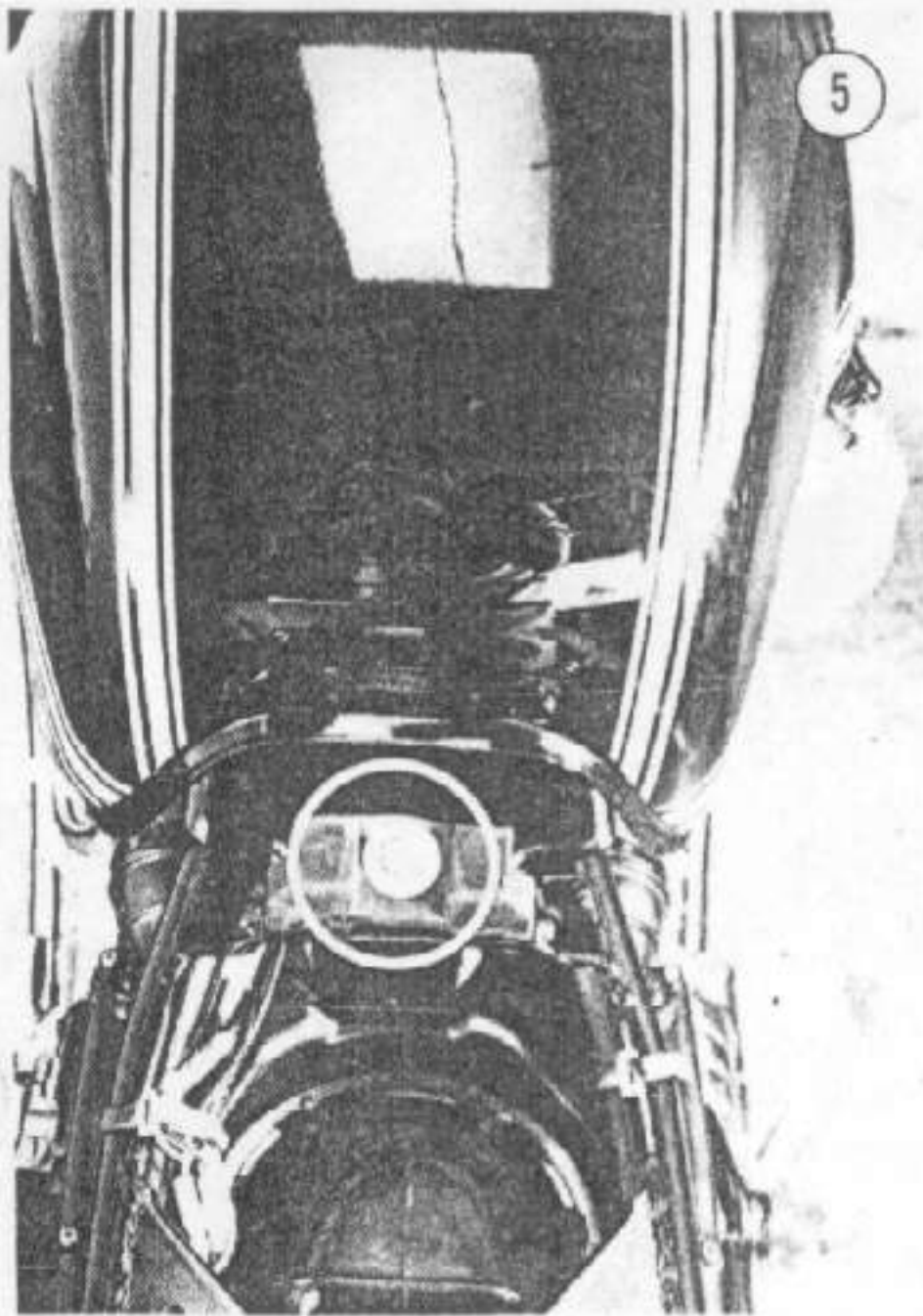


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When the piston almost reaches BDC, the exhaust valve opens and remains open until the piston is near TDC. The upward travel of the piston causes the exhaust gases to be pushed out of the cylinder. After the piston has reached TDC, the exhaust valve closes and the cycle starts all over again.

4. Turn the fuel shutoff valve to the OFF position (A, Figure 4), and remove the fuel line from the carburetors (B, Figure 4).
5. Remove rear bolt and rubber pad (Figure 5) securing the fuel tank at the rear, slide the tank to the rear and remove it.
6. Remove the exhaust system as described under *Exhaust System Removal/Installation* in Chapter Six.
7. Drain the cooling system and remove the radiator and shroud as described under *Radiator Removal/Installation* in Chapter Eight.
8. Drain the engine oil as described under *Changing Engine Oil and Filter* in Chapter Three.
9. Loosen rear brake adjuster screw (Figure 6) and pivot the brake pedal arm down.
10. Remove the fuel tank rubber mounts and right-hand cable clip (Figure 7).
11. Remove the wiring harness clips. Disconnect the coil electrical connectors (pink — right-hand coil, yellow — left-hand coil) from the CDI unit. See Figure 8.





4

12. Disconnect all electrical connectors at the terminal blocks (**Figure 8**). Disconnect the thermostat and oil pressure sending unit electrical cables.

13. Remove the through bolts securing the coils to the frame (**A, Figure 9**) and remove the coils.

14. Pull the wiring harness clear of the frame.

CAUTION

Do not pull hard on the harness as damage will occur to the wires and connectors.

15. Remove the 3 bolts and nuts (**B, Figure 9**) securing the upper engine mounting plates and remove them.

16. Remove the crankcase breather tubes (**Figure 10**) from the heads.

17. Remove the 2 upper bolts and nuts (**A, Figure 11**) securing the front engine cradle to the frame. The front bolt secures the electrical clip on the left-hand side.

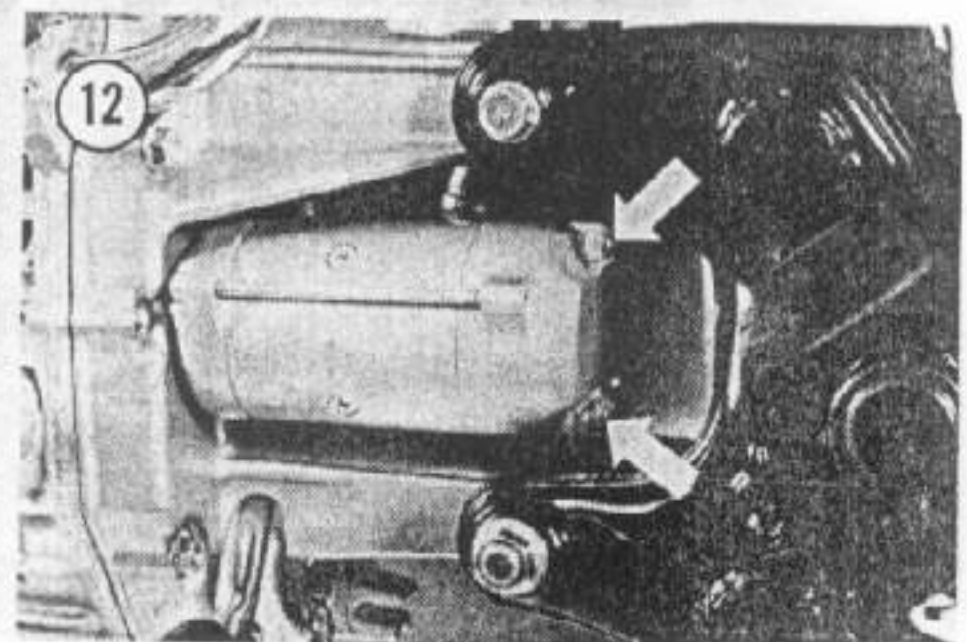
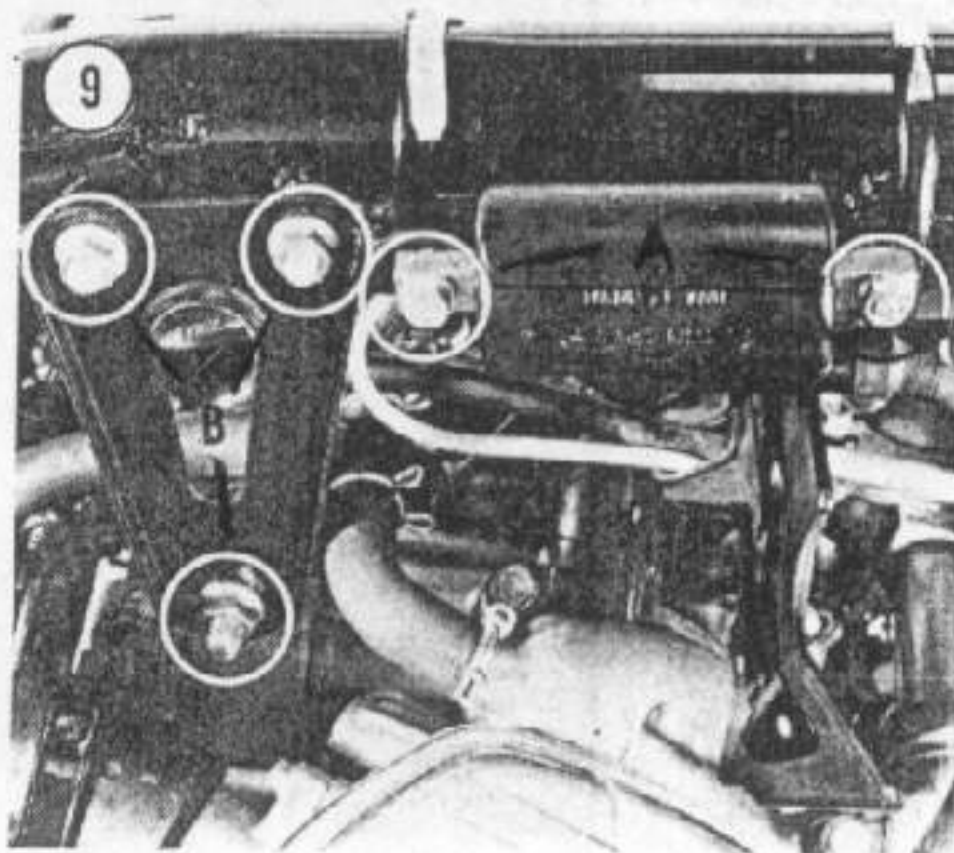
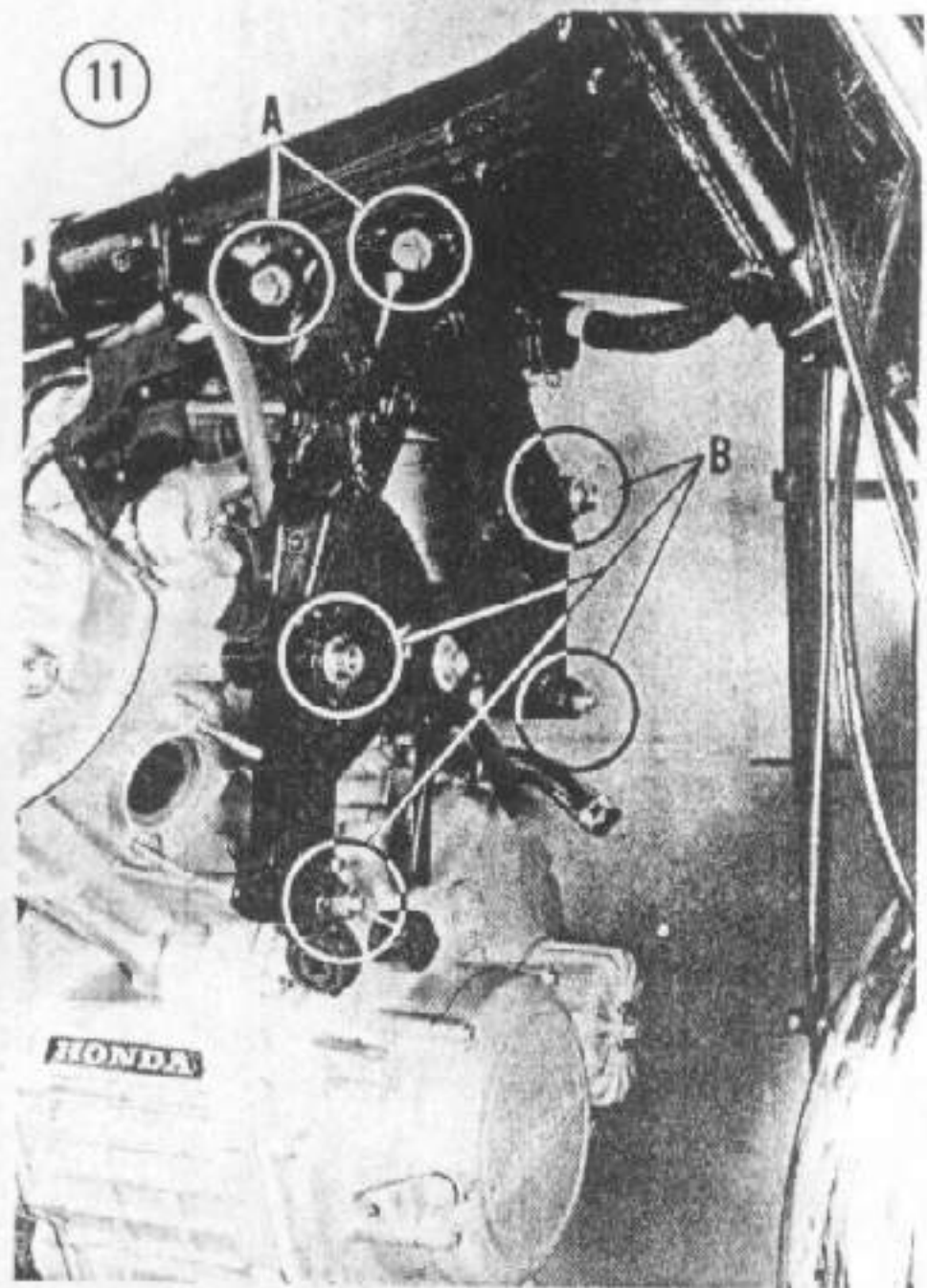
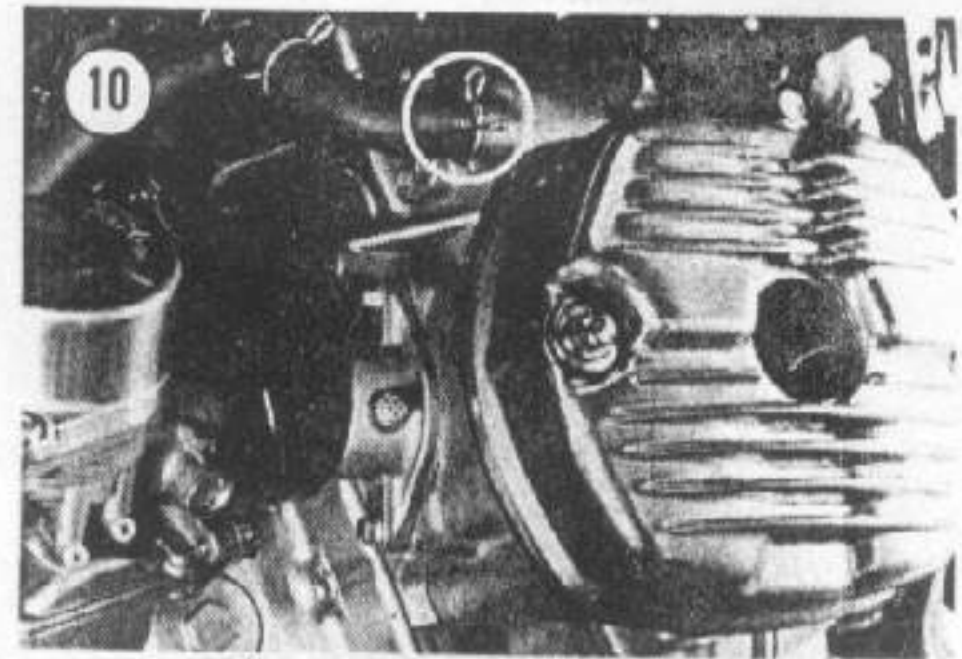
18. Remove the 2 upper bolts and 2 lower nuts (**B, Figure 11**) securing the front engine cradle to the engine and remove it.

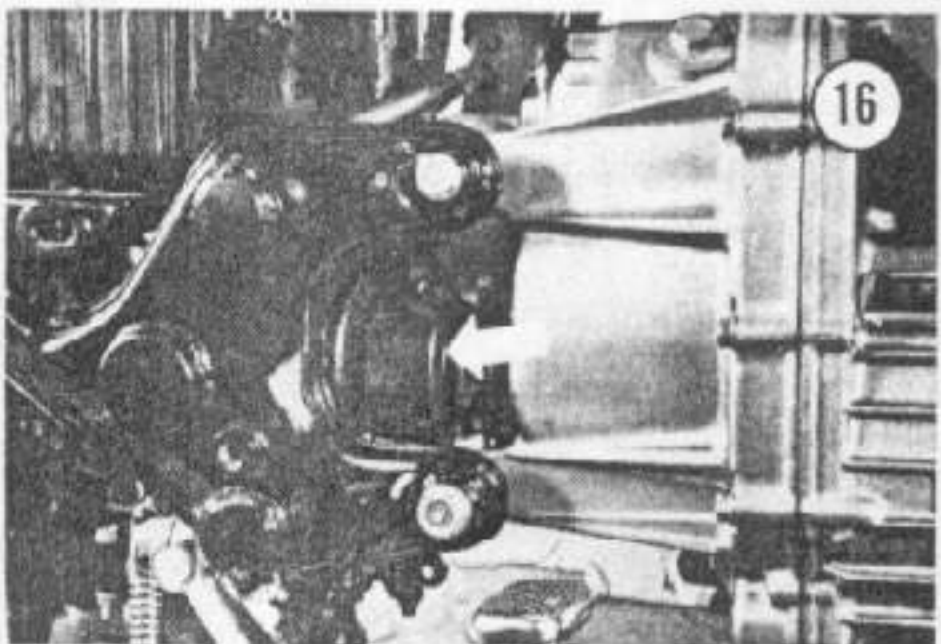
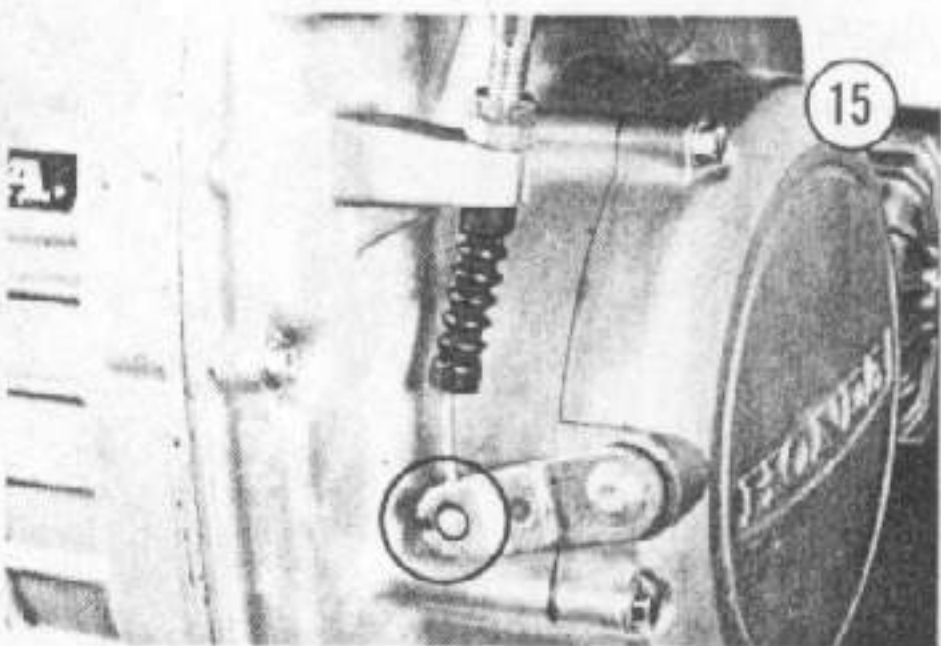
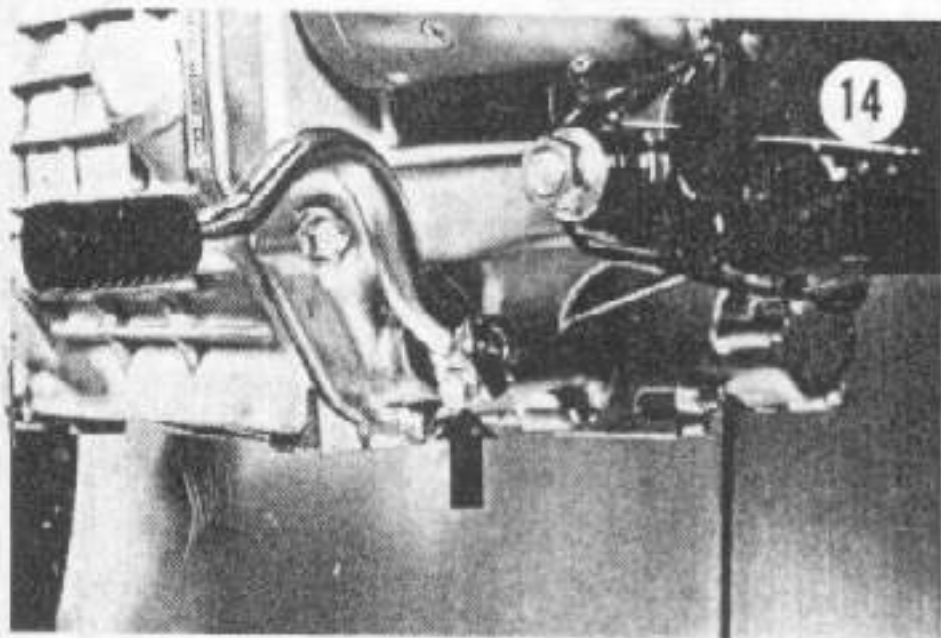
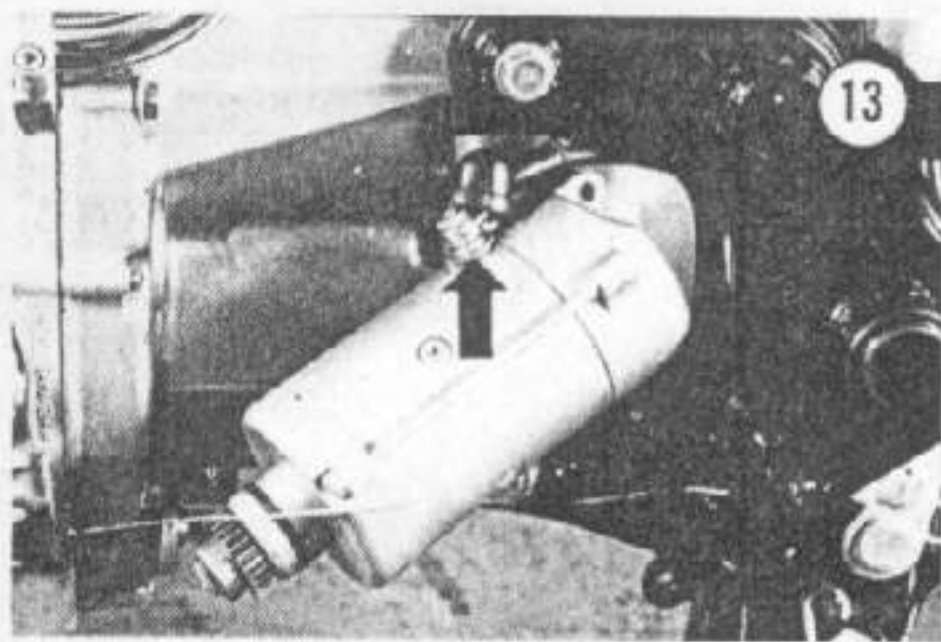
19. Remove carburetors as described under *Carburetor Removal/Installation* in Chapter Six.

20. Remove the 2 bolts (**Figure 12**) securing the starter motor to the crankcase. Pull it to the rear, rotate it slightly and pivot it down.

21. Disconnect the electrical cable (**Figure 13**) and remove the starter.

22. Loosen the bolt securing the shift lever (**Figure 14**) and remove the shift lever.





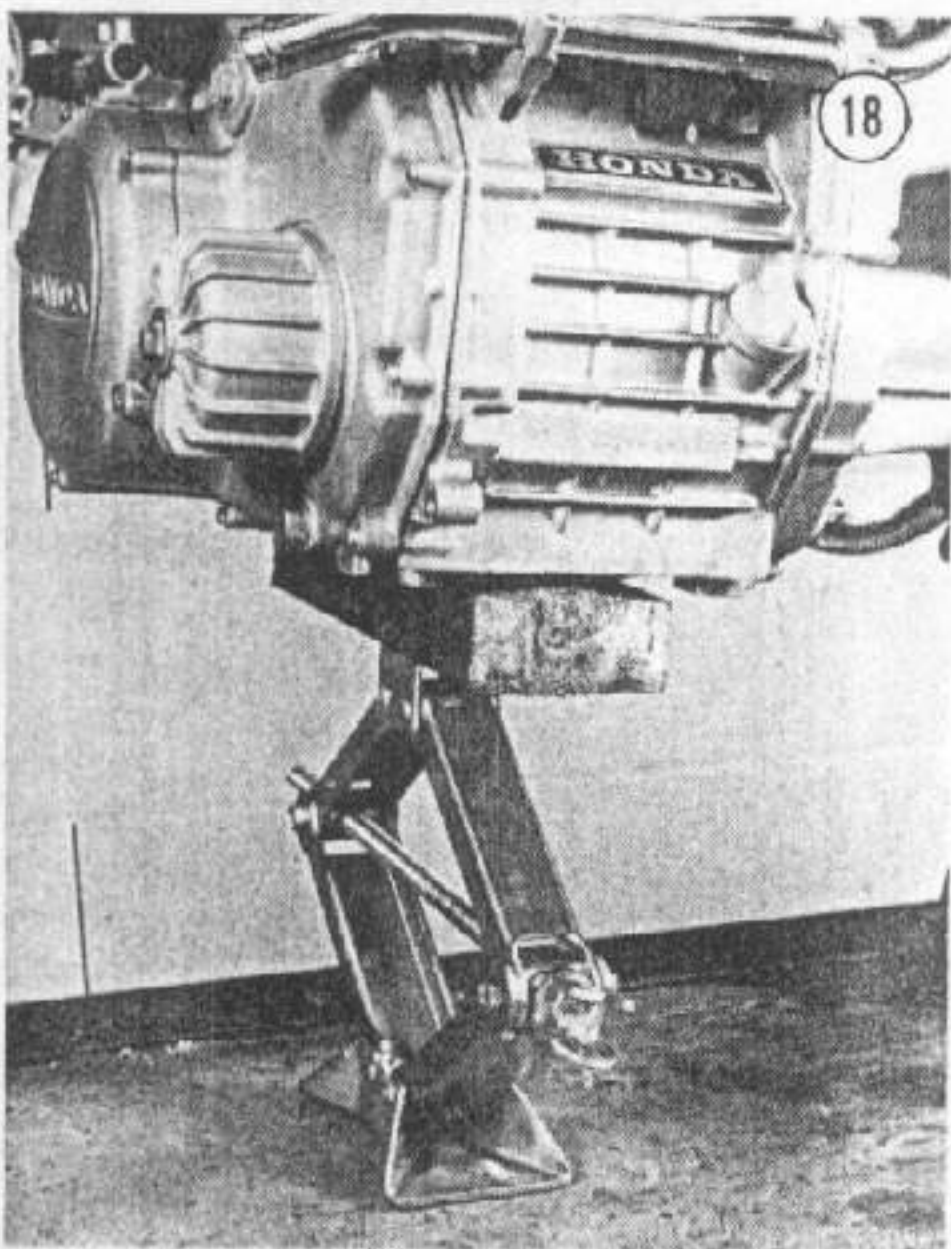
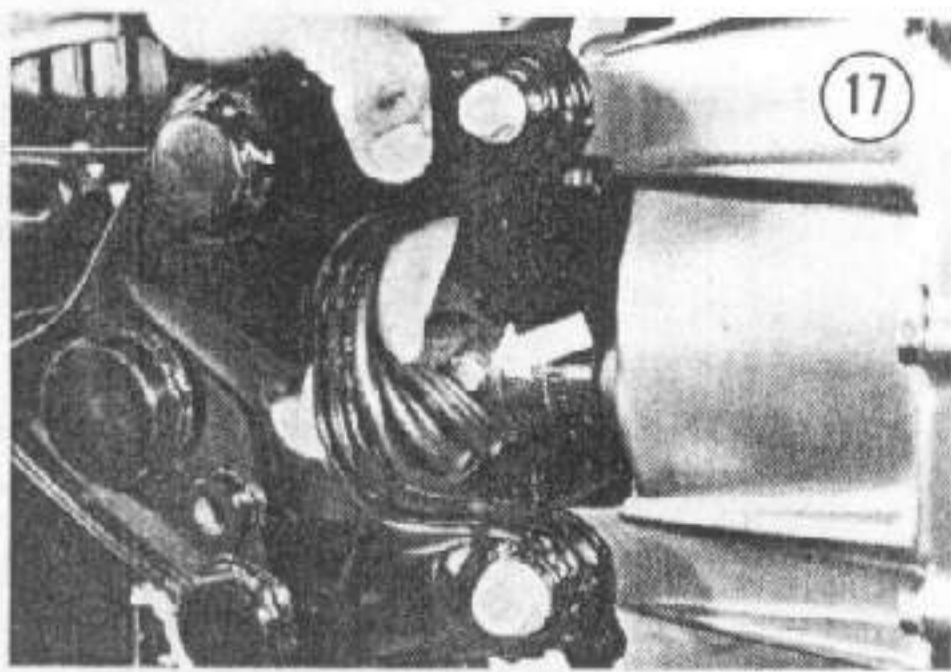
23. Loosen the tachometer cable set bolt and withdraw the cable from the engine.

24. Disconnect the clutch cable at the clutch housing (Figure 15).

25. Pull back the rubber protective boot (Figure 16) on the drive shaft and remove the locating bolt (Figure 17).

26. Take a final look all over the engine to make sure everything has been disconnected.

27. Place a suitable size jack, with a piece of wood on it to protect the crankcase, under the engine (Figure 18). Apply a *small amount* of jack pressure up on the engine.



CAUTION

The following steps can be performed by one person but it is advisable to have an assistant to stabilize the engine during the removal from the drive shaft and from the frame. The engine weighs 141 lbs. (64kg).

28. Loosen the 2 upper short bolts and nuts and lower long through bolt and nut (**Figure 19**) securing the rear of the engine. Leave the upper ones in place until the lower bolt is withdrawn. Remove the upper bolts, slide the engine straight forward slowly until the splines of the drive shaft are completely disengaged.

CAUTION

To prevent damage to the splines, never remove the engine part way or let it get cocked during removal. Be sure the splines are completely disengaged before lowering the jack.

29. Lower the jack and remove the engine from the frame. Place it in an engine stand or set it on a workbench for disassembly.
30. Install by reversing the removal steps.

31. Be sure the engine is properly aligned with the drive shaft. Slide the engine rearward slowly on the jack, making sure the splines are aligned. Do not let the engine get cocked or the splines will be damaged.

32. Torque all bolts and nuts to torque values in **Table 5**.

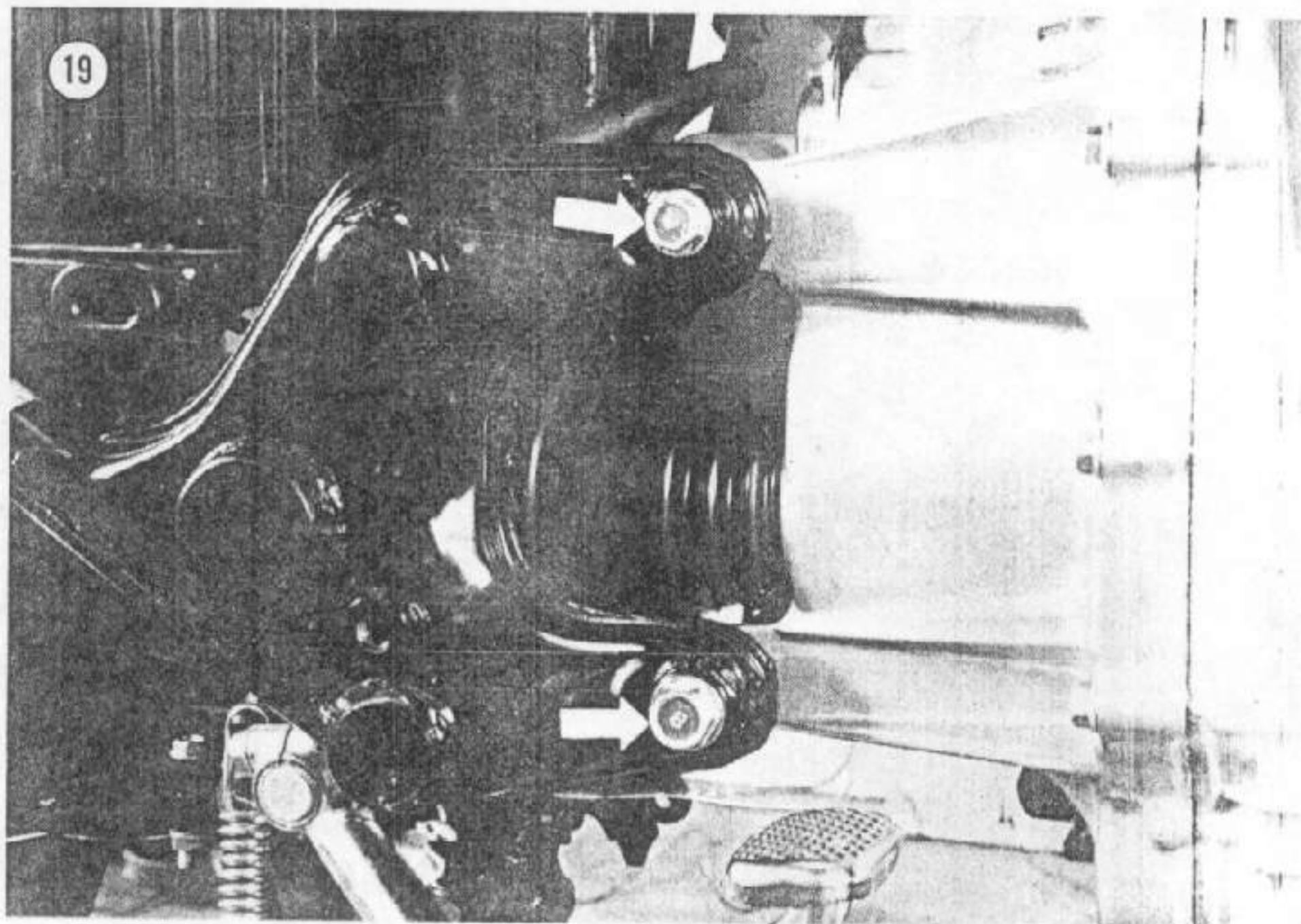
33. Fill the engine with the recommended type and quantity of engine oil and coolant. Refer to **Chapter Three**.

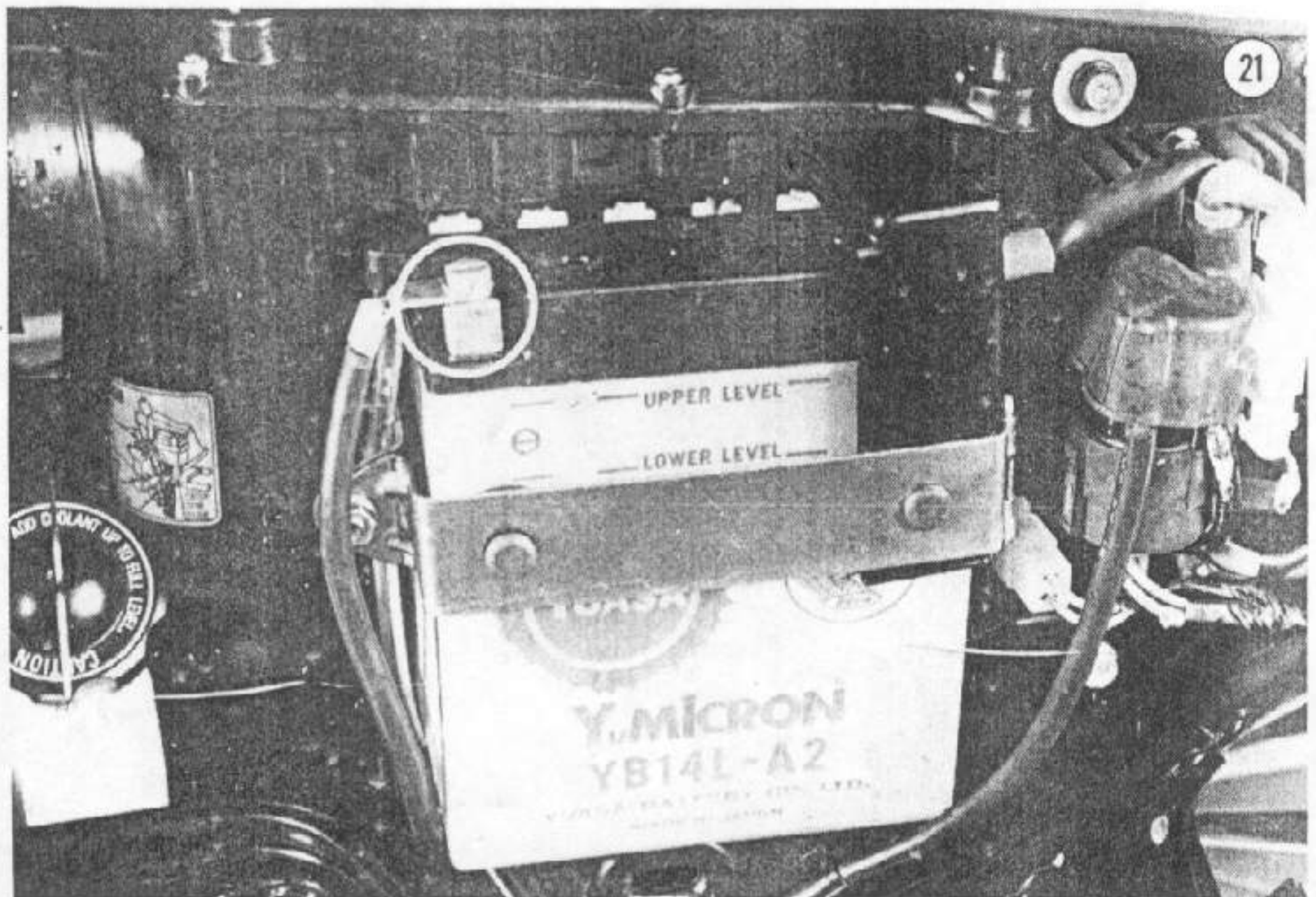
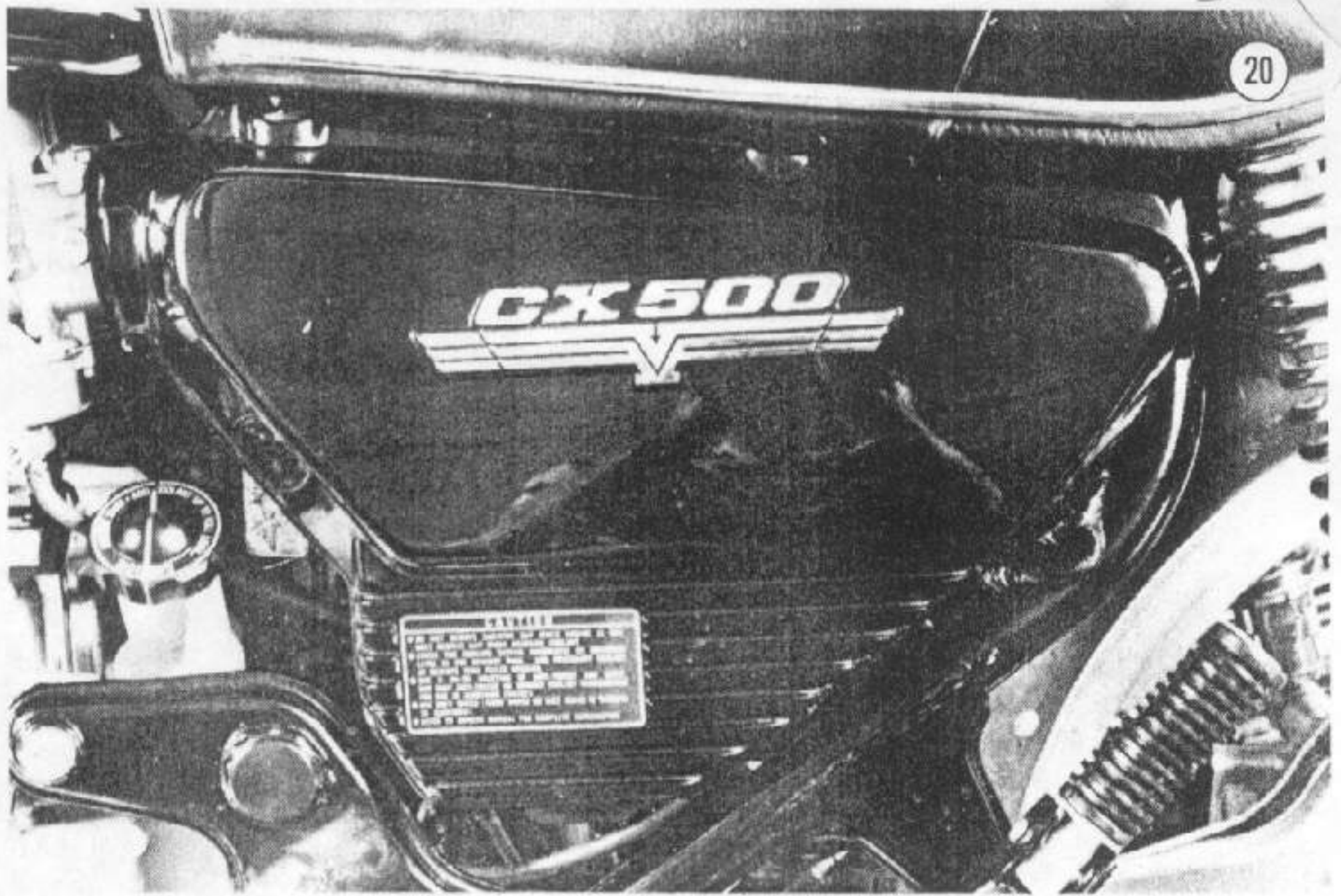
34. Start the engine and check for leaks.

4.4**CYLINDER HEAD****4.4.1****Removal**

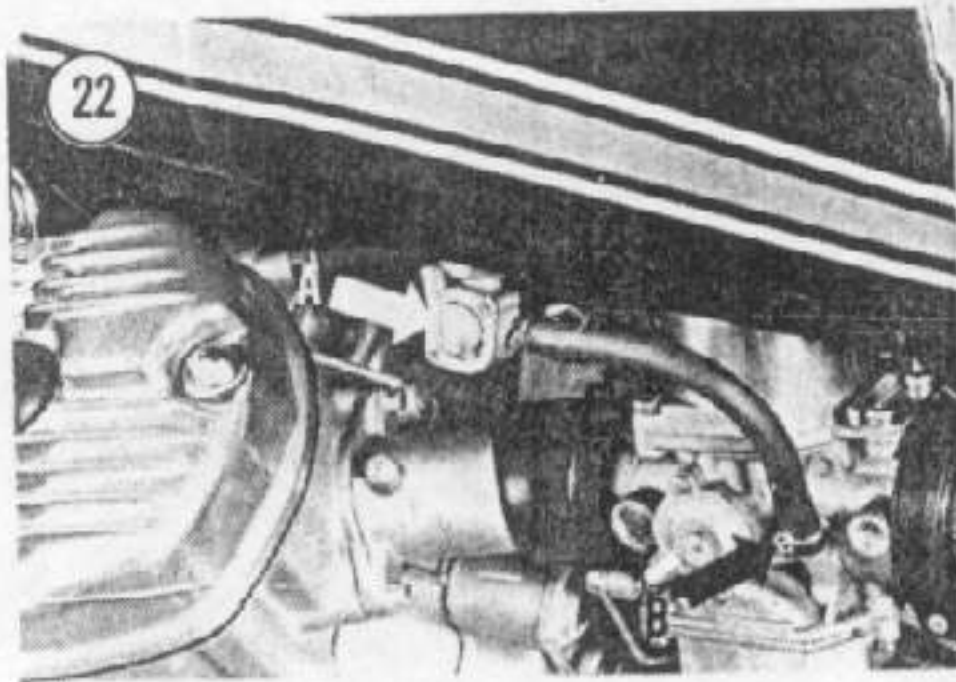
The cylinder heads can be removed with the engine in the frame. The engine must be lowered prior to removing the heads.

1. Place the bike on the centerstand. Remove the right- and left-hand side covers (**Figure 20**) and accessories such as fairings and crash bars.
2. Remove the seat. Disconnect the negative battery lead (**Figure 21**).

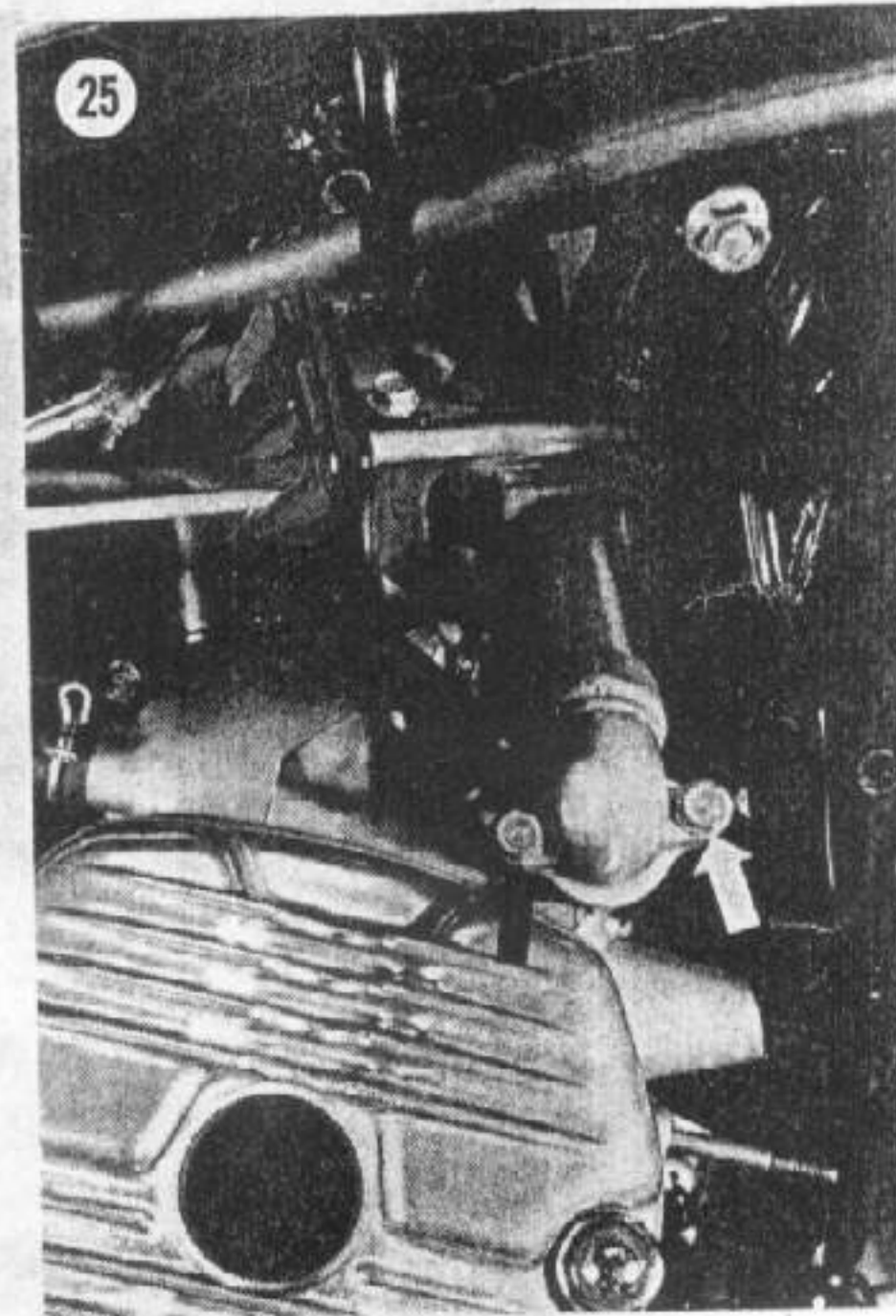
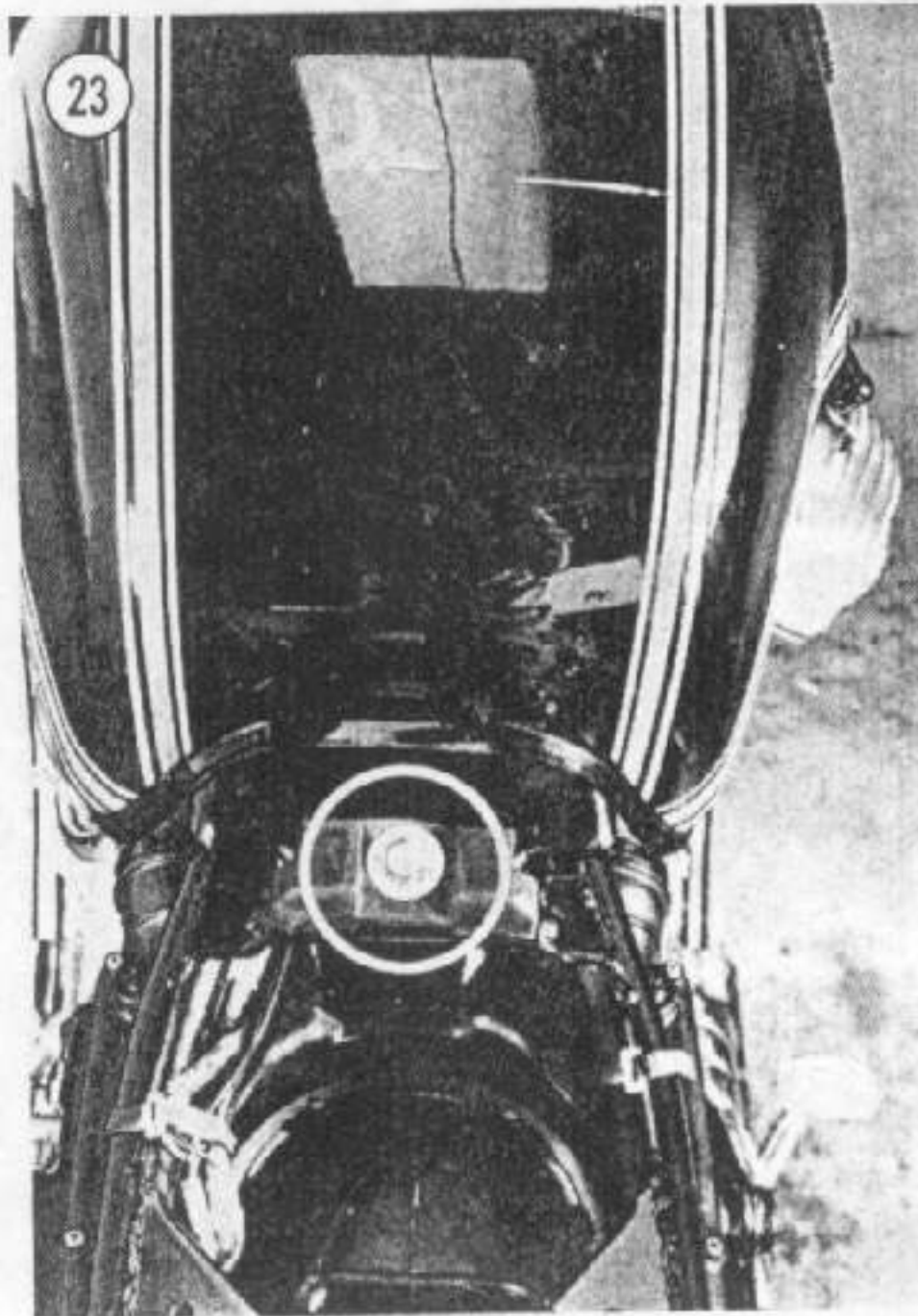
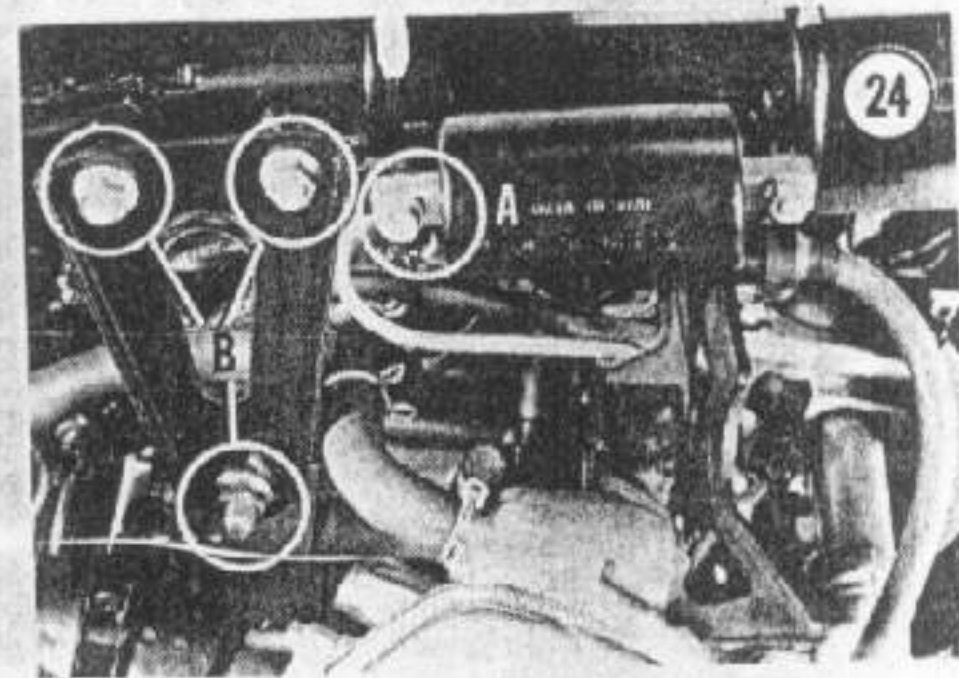




3. Turn the fuel shutoff valve to the OFF position (A, Figure 22) and remove the fuel line to the carburetors (B, Figure 22).
4. Remove rear bolt and rubber pad (Figure 23) securing the fuel tank at the rear, slide the tank to the rear and remove it.
5. Remove the exhaust system as described under *Exhaust System Removal/Installation* in Chapter Six.
6. Drain the cooling system as described under Steps 4-6, *Coolant Change* in Chapter Three.



7. Remove the coils' rear attachment bolt (A, Figure 24) and 3 bolts and nuts (B, Figure 24) securing the upper engine mounting plates and remove them.
8. Remove the air dam attachment bolts and remove the dam.
9. Disconnect the thermostat switch and oil pressure sending unit electrical cables.
10. Remove 4 bolts, 2 on each side (Figure 25), securing the thermostat housing and outlet pipes to the heads.



11. Remove the small rubber hose from the top of the water pump (Figure 26).

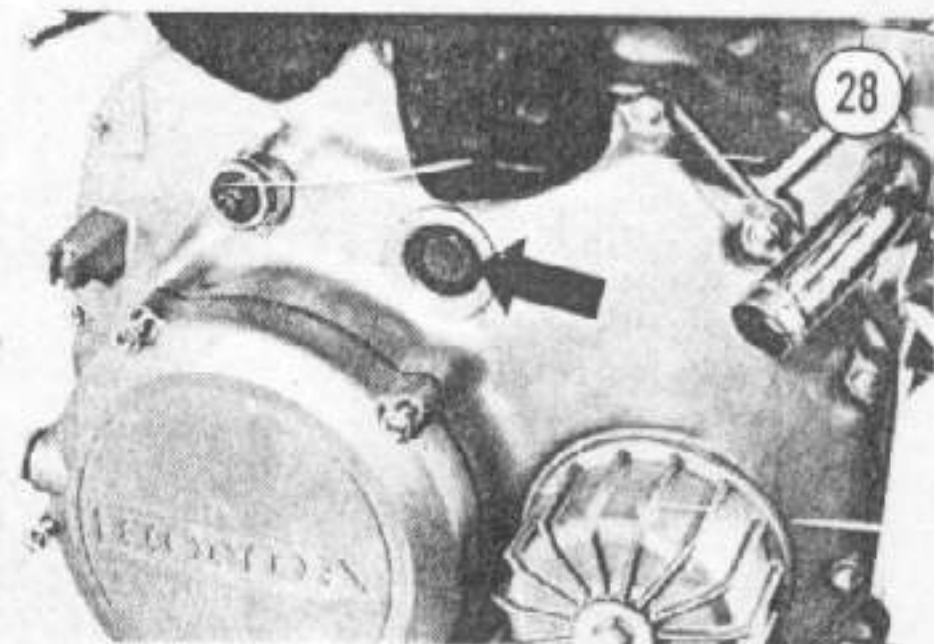
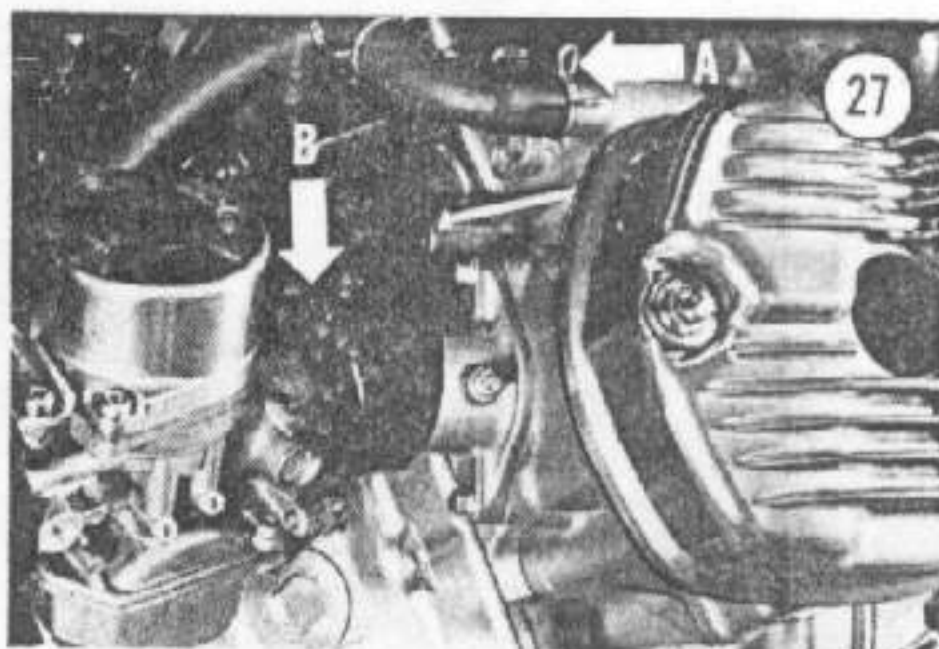
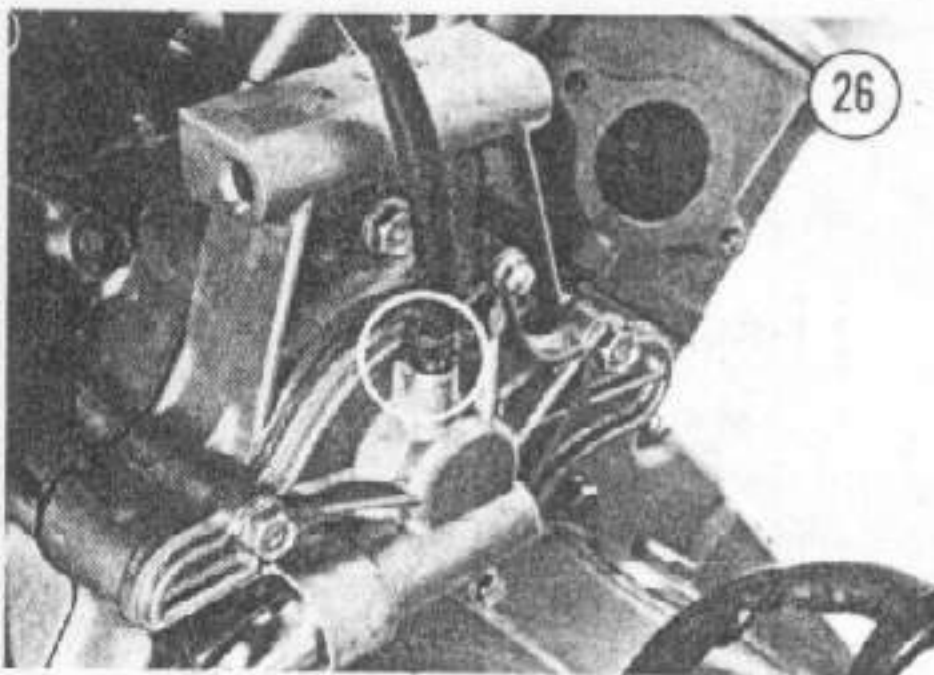
NOTE: Figure 26 is shown with the engine removed for clarity only.

12. Remove the thermostat assembly.

13. Remove the spark plug leads.

14. Remove the crankcase breather tubes (A, Figure 27) from the heads.

15. Remove the valve covers and loosen the carburetor band screw (B, Figure 27).



NOTE: Steps 16-21 are shown with the engine removed for clarity.

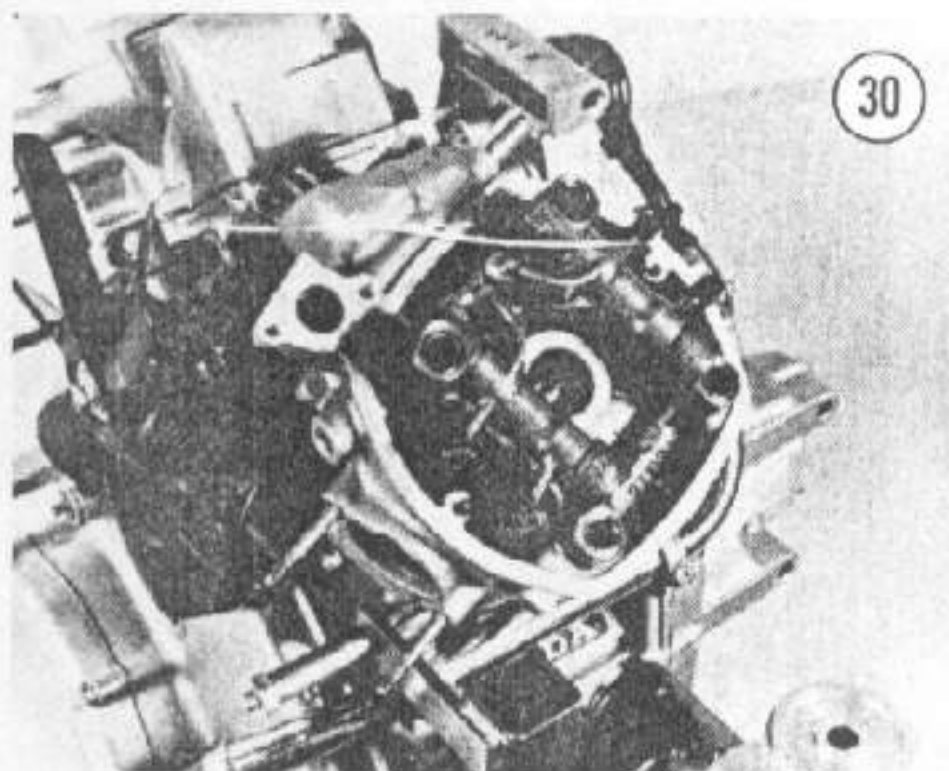
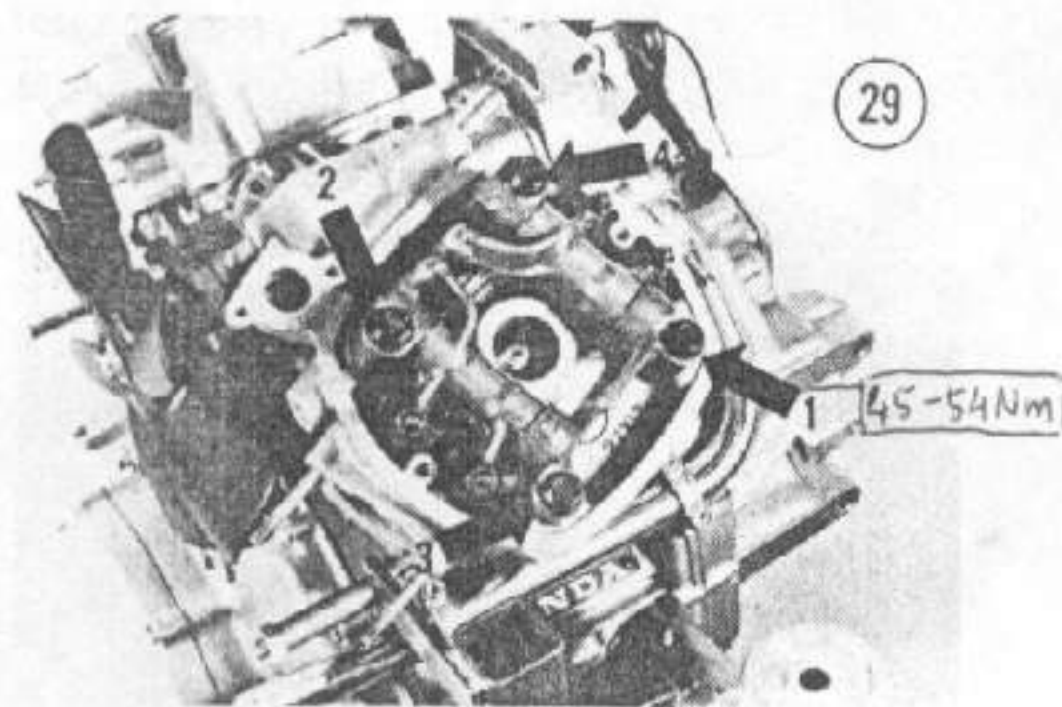
16. Rotate the crankshaft clockwise until the left-hand piston is at top dead center (TDC) on the compression stroke. Use the bolt on the front of the crankshaft (Figure 28) for turning with a suitable size socket.

NOTE: A cylinder at TDC will have both its rocker arms loose, indicating that the exhaust valves and intake valves are closed.

17. Remove the 2 short 6mm bolts toward the centerline of the engine on the left-hand cylinder.

18. Remove the 4 left-hand cylinder head bolts, using the sequence shown in Figure 29. Loosen the bolts in two or more steps to avoid warping the head.

19. Remove rocker arm assembly (Figure 30) and the pushrods (A, Figure 31).



NOTE: Do not lose the 2 locating dowels (B, Figure 31).

20. Loosen the head by tapping around the perimeter with a rubber or plastic mallet. Do not use a metal hammer.

21. Remove the cylinder head.

22. Remove the cylinder head gasket, 2 locating dowels (A, Figure 32) and the oil control orifice (B, Figure 32).

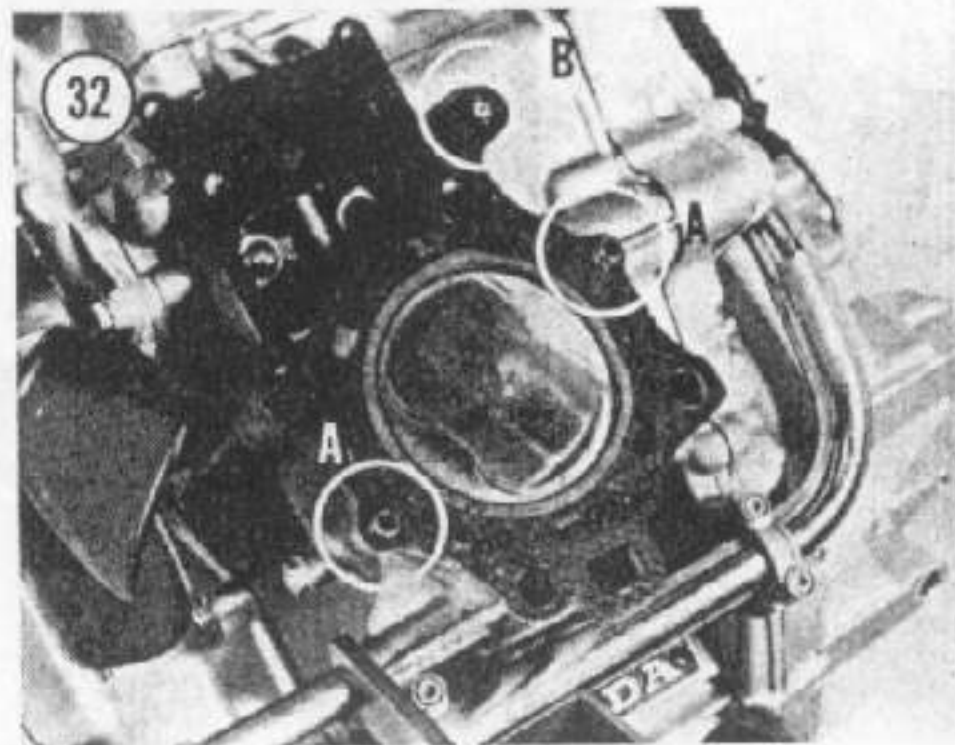
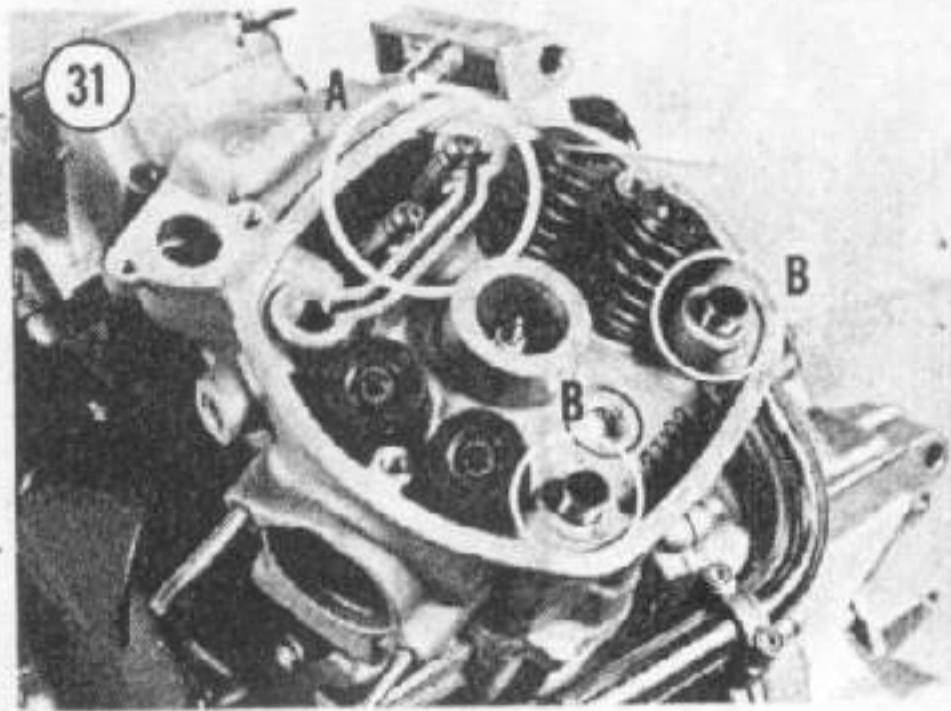
23. To remove the right-hand head, repeat Steps 16-21. In Step 16, rotate the crankshaft clockwise until the right-hand piston is at TDC.

4.4.2

Inspection

1. Remove all traces of gasket material from the head and cylinder mating surfaces.

2. Without removing the valves, remove all carbon deposits from the combustion chambers with a wire brush. A blunt screwdriver or chisel may be used if care is taken not to damage the head or valves.



3. After all carbon is removed from the combustion chamber and valve intake and exhaust ports, clean the entire head in solvent.

4. Clean away all carbon on the piston crowns. Do not remove the carbon ridge at the top of the cylinder bore.

5. Check for cracks in the combustion chamber and exhaust ports. A cracked head must be replaced.

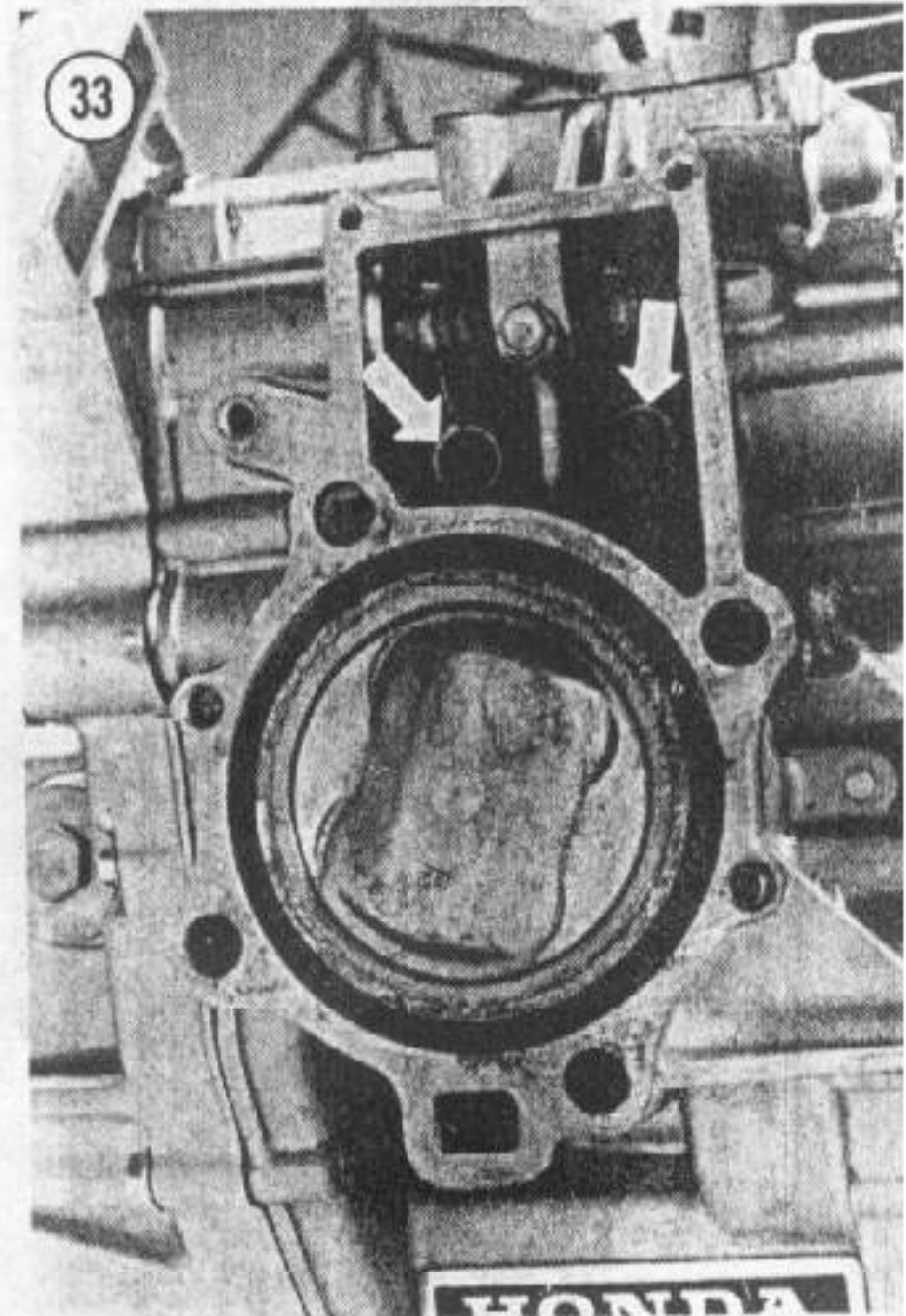
6. Check the condition of the valves and valve guides as described under *Valve and Valve Seats* in this chapter.

4.4.3

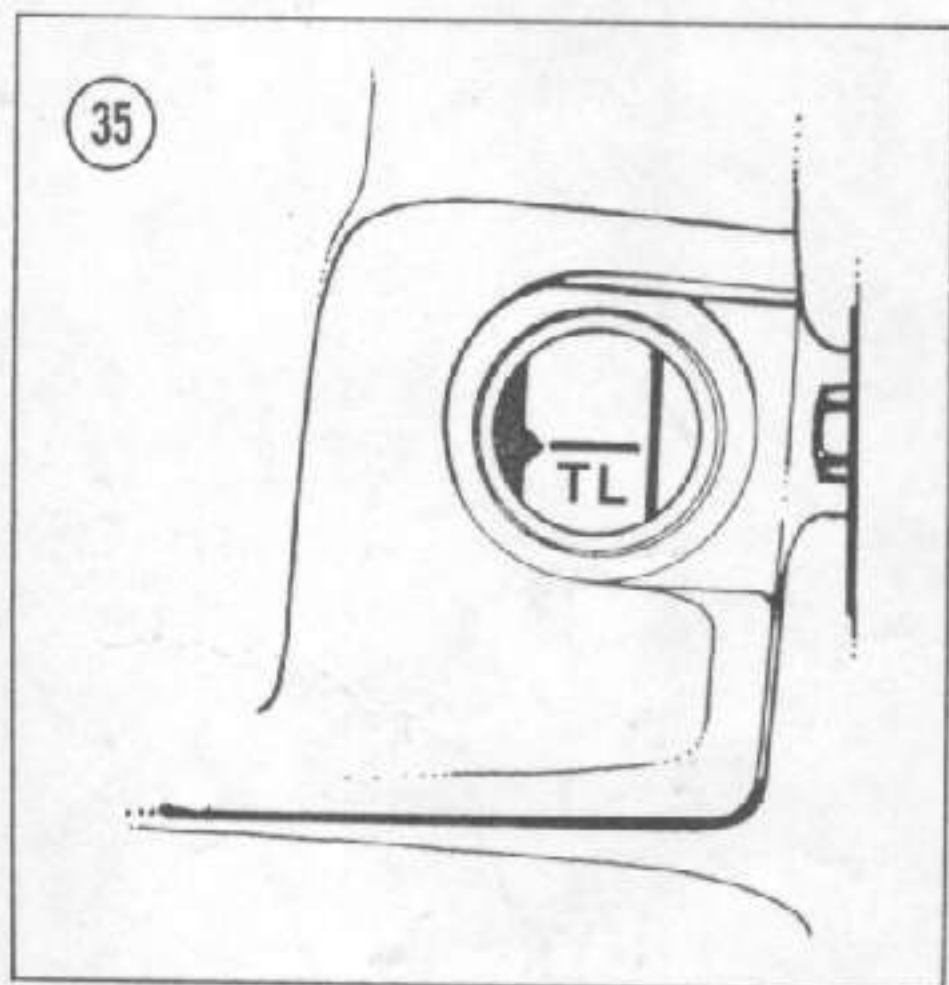
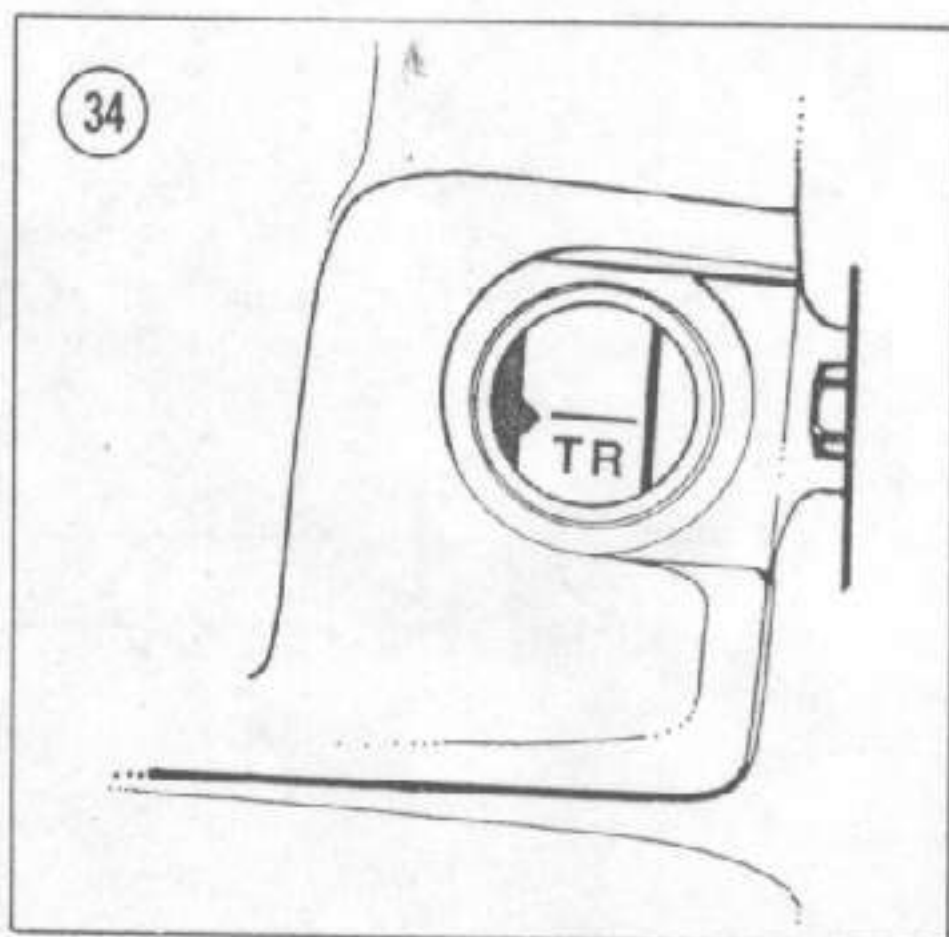
Installation

Prior to installation of the head, make sure that the cylinder is at top dead center (TDC).

NOTE: A cylinder at TDC will have the piston at the top of its stroke, both lower rocker arms (Figure 33) will be at the farthest down position, and the timing mark on the alternator rotor (TR for right-hand cylinder, Figure 34, and TL for the left-hand cylinder, Figure 35) will align with the index mark on the crankcase.



1. Install a new head gasket, 2 locating dowels (A, Figure 32) and the oil control orifice (B, Figure 32).
2. Install the cylinder head.
3. Apply molybdenum disulfide grease to both ends of the pushrods.
4. Install the pushrods (A, Figure 31) into the lower rocker arm retainers.
5. Install the 2 locating dowels (B, Figure 31).
6. Loosen the valve adjusting screws. Install the rocker arm assembly (Figure 30). Be sure the 2 locating dowels (Figure 36) on the bottom of the assembly are in position.



7. Install the 4 cylinder head bolts. Tighten the bolts in the sequence shown in Figure 29, tighten in 2 to 3 steps to a final torque of 33-40 ft.-lb. (45-54 N•m).
8. Install the short 6mm bolts and torque to 6-8 ft.-lb. (8-11 N•m).

CAUTION

Before proceeding, rotate the crankshaft several revolutions with a wrench on the bolt shown in Figure 28. If there is any binding, stop. Determine the cause before assembling beyond this point.

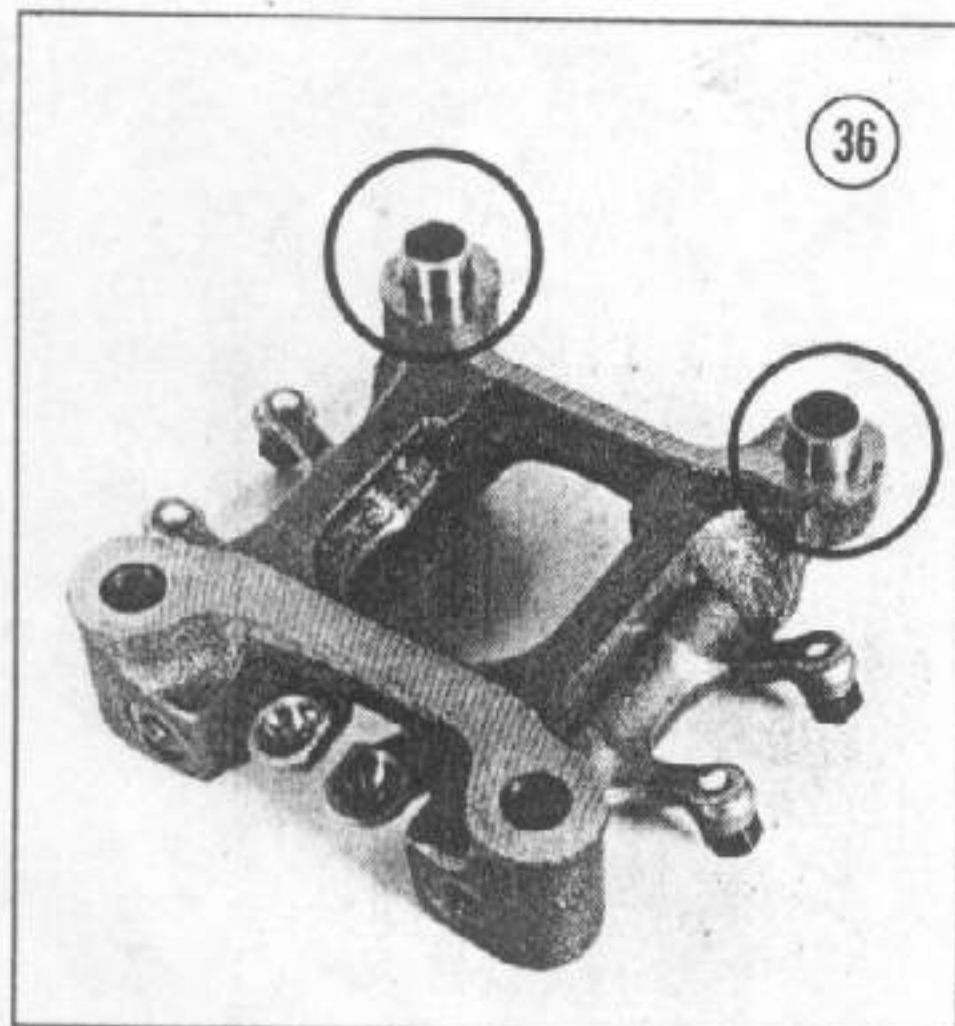
9. Complete the installation by reversing Removal Steps 1-15.
10. Adjust the valves as described under *Valve Clearance Adjustment* in Chapter Three.
11. Torque all bolts and nuts to torque values in Table 5.
12. Fill the engine with the recommended type and quantity of engine oil and coolant. Refer to Chapter Three.
13. Start the engine and check for leaks.

4.5

4.5.1 VALVE AND VALVE SEATS

Removal

1. Remove cylinder heads as described under *Cylinder Head Removal*.



2. Compress springs with a valve spring compression tool (Figure 37), remove the valve keepers and release compression.
3. Remove the valve spring caps, springs, and valves (Figure 38).

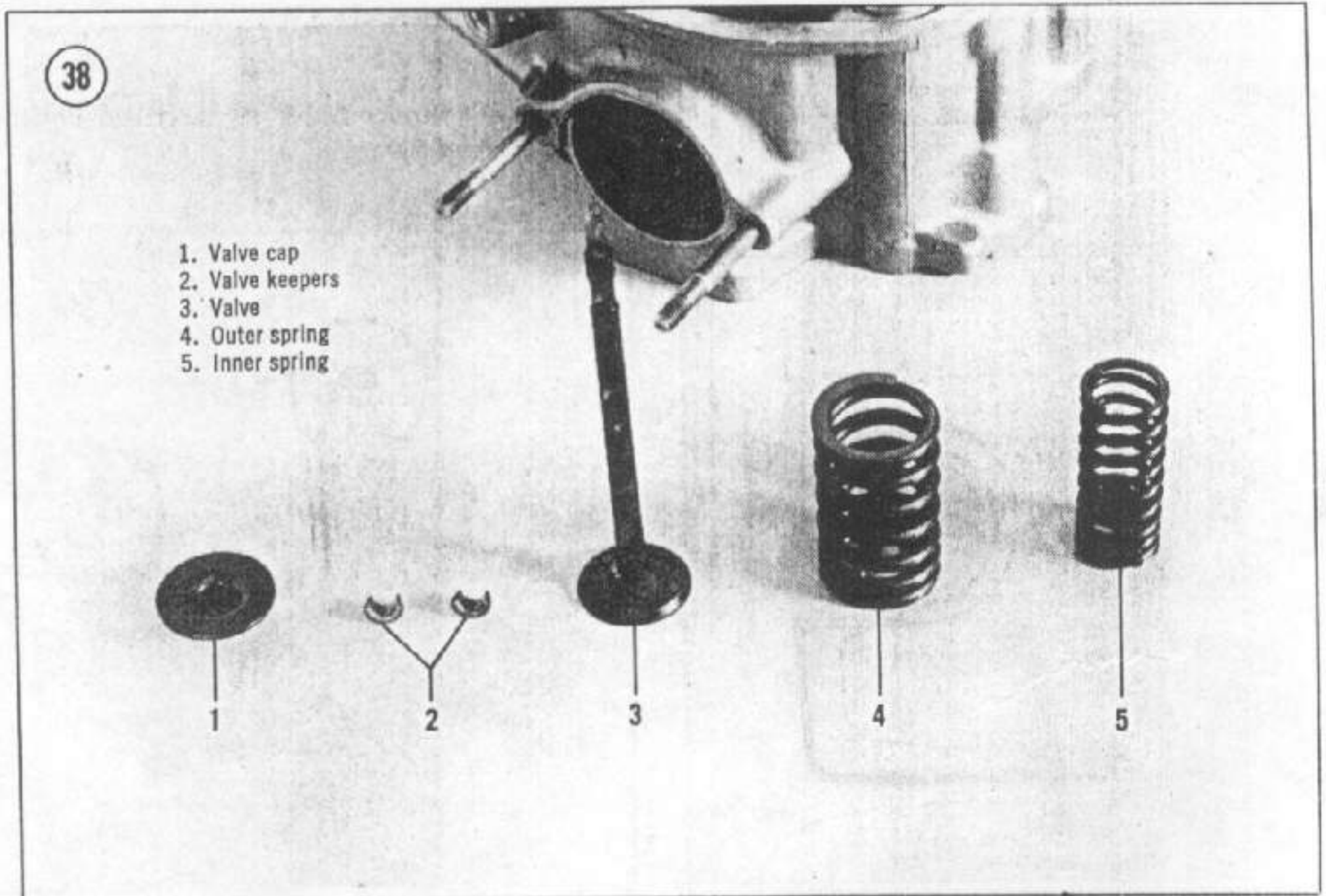
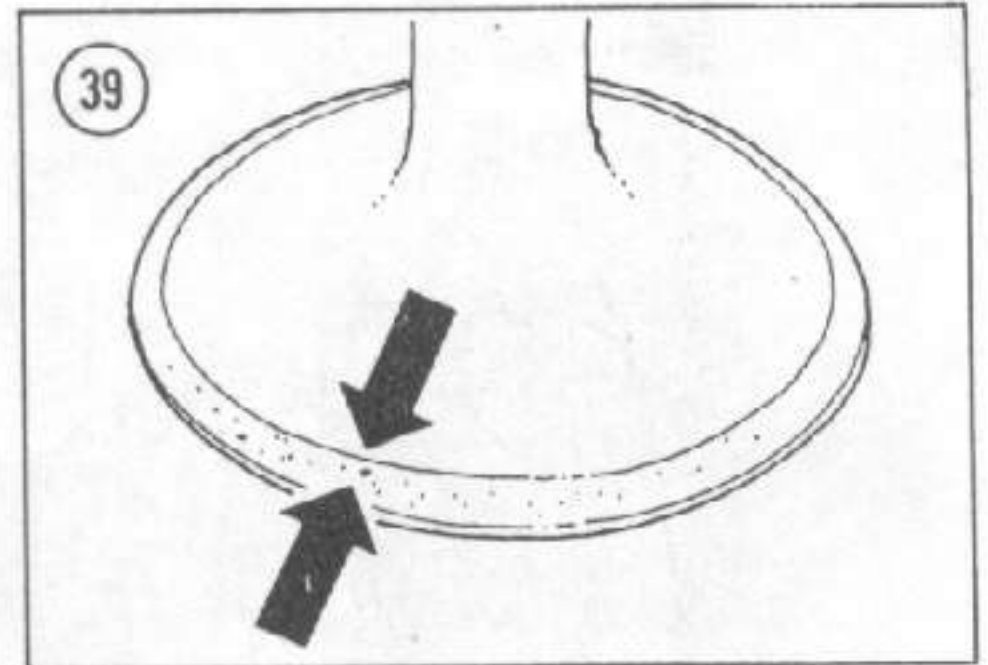
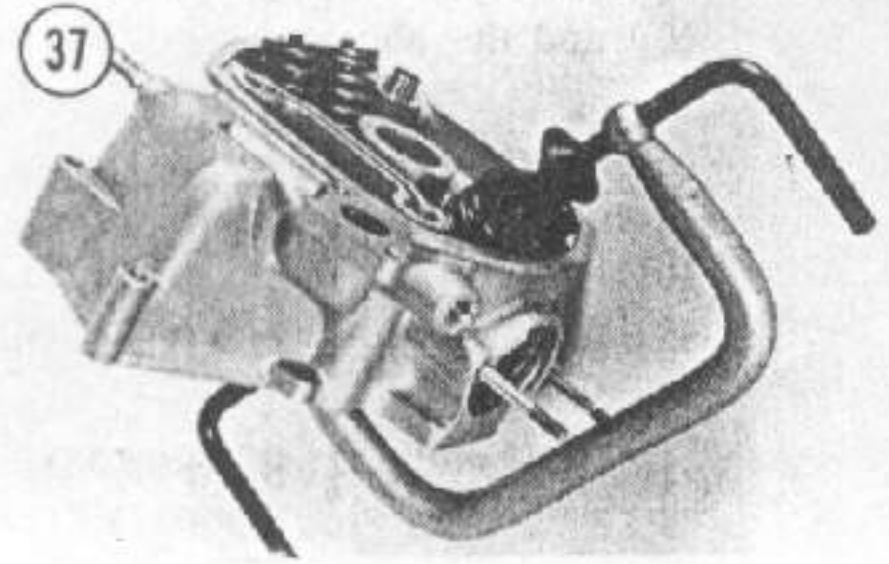
CAUTION

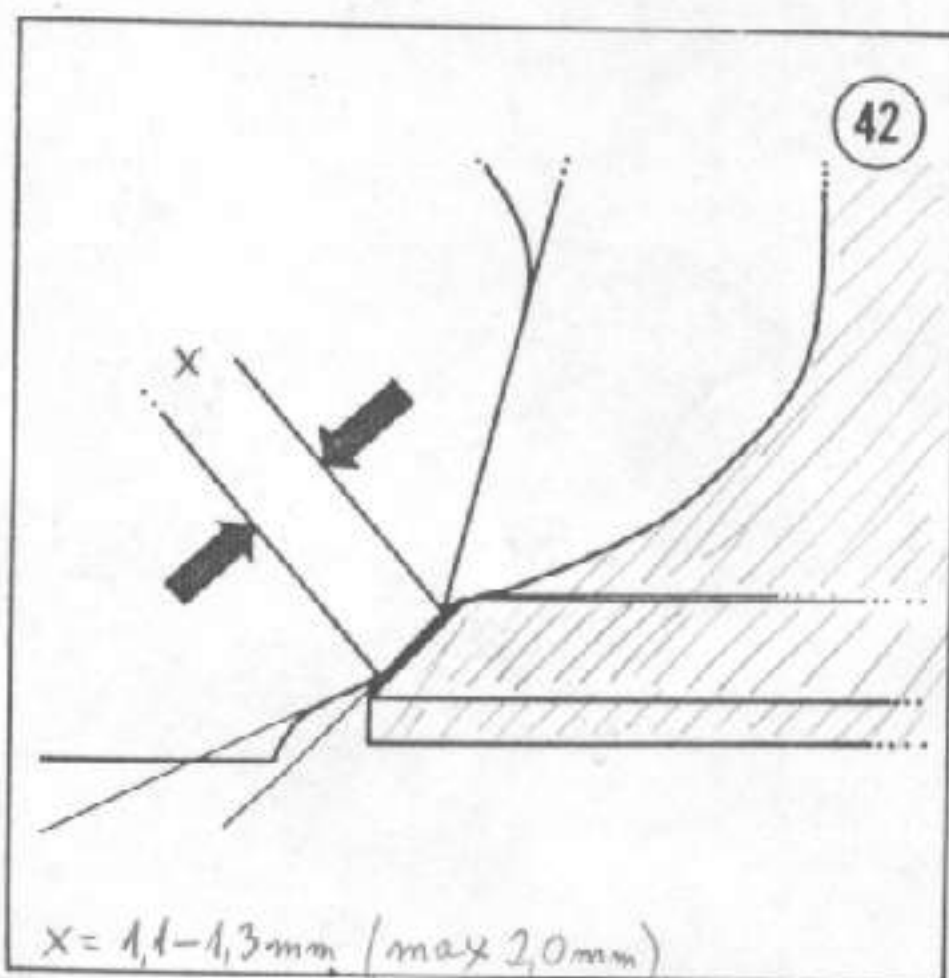
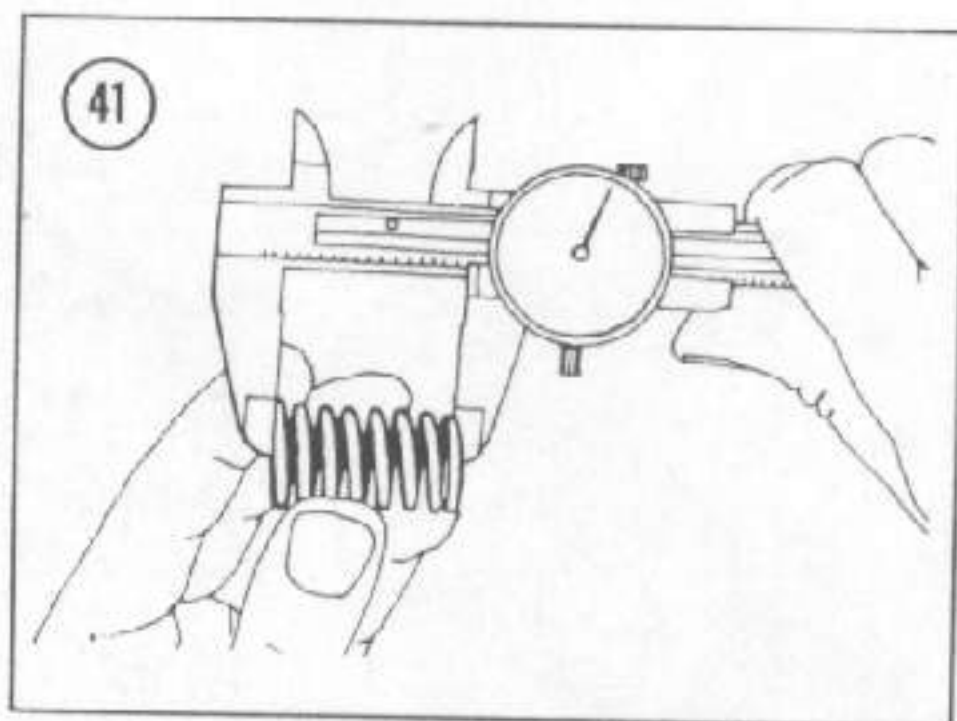
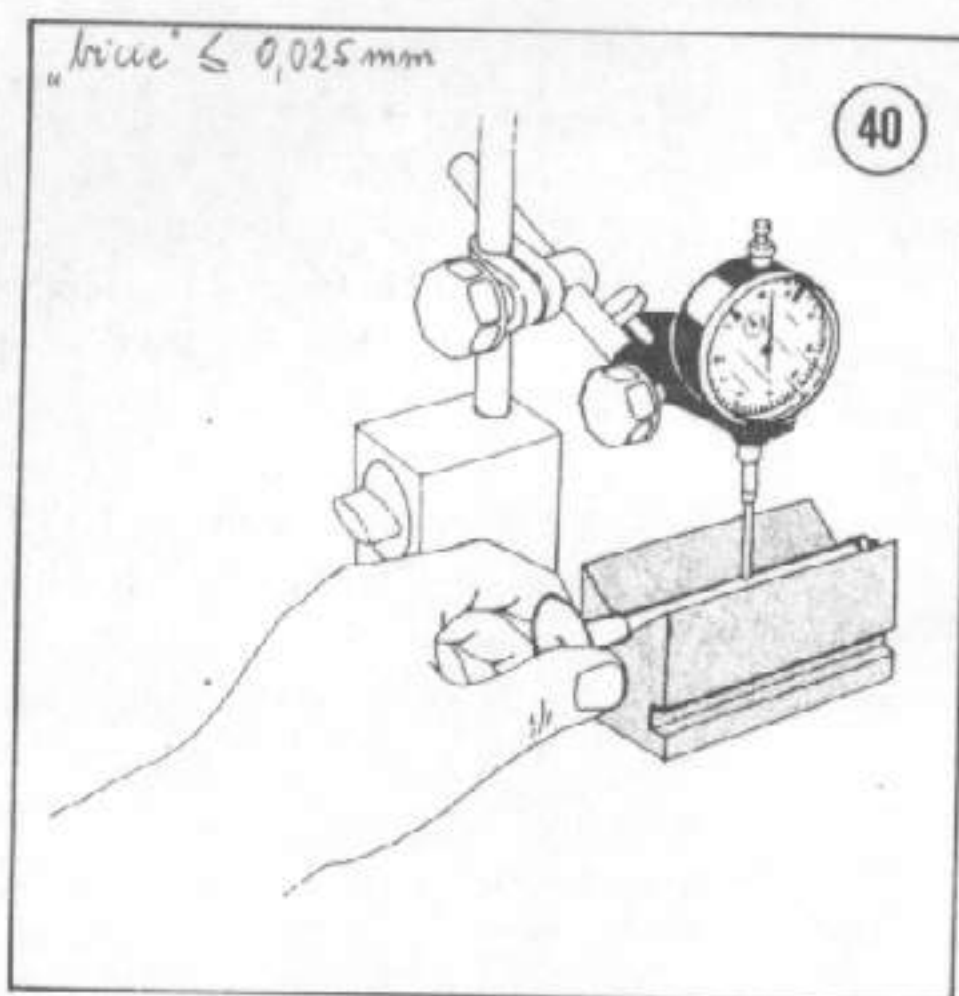
Remove any burrs from the valve stem grooves before removing the valve. Otherwise the valve guides will be damaged.

4.5.2

Inspection

1. Clean valves with a wire brush and solvent.
2. Inspect the contact surface of each valve for burning (Figure 39). Minor roughness and pitting can be removed by lapping valve as described under *Valve Lapping* in this chapter. Excessive unevenness to the contact surface is an indication that the valve is not serviceable. Contact surface of the valve may be ground on a valve grinding machine, but it is best to replace a burned or damaged valve with a new one.
3. Inspect the valve stems for wear and roughness and measure the vertical runout of the





valve stem as shown in **Figure 40**. The runout should not exceed 0.001 in. (0.025mm).

3. Measure the valve stems for wear. Compare with specifications in **Table 6** at the end of the chapter.

4. Remove all carbon and varnish from the valve guides with a stiff spiral wire brush.

5. Insert each valve in its guide. Hold the valve just slightly off its seats and rock it sideways. If it rocks more than slightly, the guide is probably worn and should be replaced. As a final check, take the head to a dealer and have the valve guides measured.

6. Measure the valve spring heights with a vernier caliper (**Figure 41**). All should be of length specified in **Table 6** without bends or other distortions. Replace defective springs.

7. Check the valve spring retainer and valve keepers. If they are in good condition, they may be reused.

8. Inspect and measure valve seats (**Figure 42**). Compare with specifications in **Table 6** at end of the chapter. If the seats are too wide, too narrow, or worn or burned, they must be reconditioned. This should be performed by your dealer or local machine shop, although the procedure is described later in this section. Seats and valves in near-perfect condition can be reconditioned by lapping with fine carborundum paste. Lapping, however, is always inferior to precision grinding.

4.5.3

Installation

1. Coat the valve stems with molybdenum disulphide paste and insert them into cylinder head.

2. Install bottom spring retainers and new seals.

3. Install valve springs, with the narrow pitch end (end with coils closest together) facing the head, and upper valve spring retainers.

4. Push down on upper valve spring retainers with the valve spring compressor and install valve keepers.

4.5.4

Valve Guide Replacement

When guides are worn so that there is excessive stem-to-guide clearance or valve tip-

ping, they must be replaced. Replace all, even if only one is worn. This job should only be done by a Honda dealer as special tools are required.

4.5.5

Valve Seat Reconditioning

This job is best left to your dealer or local machine shop. They have the special equipment and knowledge for this exacting job. You can still save considerable money by removing the cylinder head and taking just the head to the shop.

4.5.6

Valve Lapping

Valve lapping is a simple operation which can restore the valve seal without machining if the amount of wear or distortion is not too great.

1. Coat the valve seating area in the head with a lapping compound such as carborundum or Clover Brand.
2. Insert the valve into the head.
3. Wet the suction cup of the lapping stick (**Figure 43**) and stick it onto the head of the valve. Lap the valve to the seat by rotating the lapping stick in both directions. Every 5 to 10 seconds, rotate the valve 180° in the seat; continue lapping until the contact surfaces of the valve and the valve seat are a uniform grey. Stop as soon as they are, to avoid removing too much material.
4. Thoroughly clean the valves and cylinder head in solvent to remove all grinding compound. Any compound left on the valves or the cylinder head will end up in the engine and will cause damage.

4.6

UPPER ROCKER ARM ASSEMBLIES

The upper rocker arms are activated by pushrods which are driven by a secondary set of rocker arms that ride on the camshaft.

The upper rocker arm assemblies can be removed with the engine in the frame but the cylinder heads have to be removed.

4.6.1

Removal/Installation

Remove and install the cylinder heads as described under *Cylinder Head Removal/Installation* in this chapter.

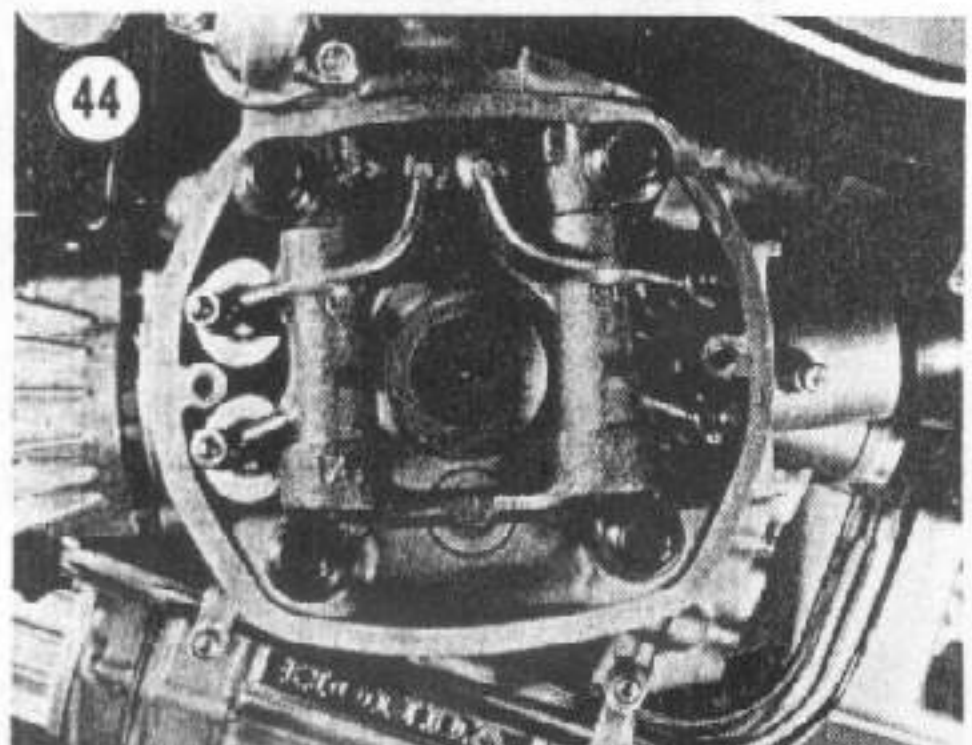
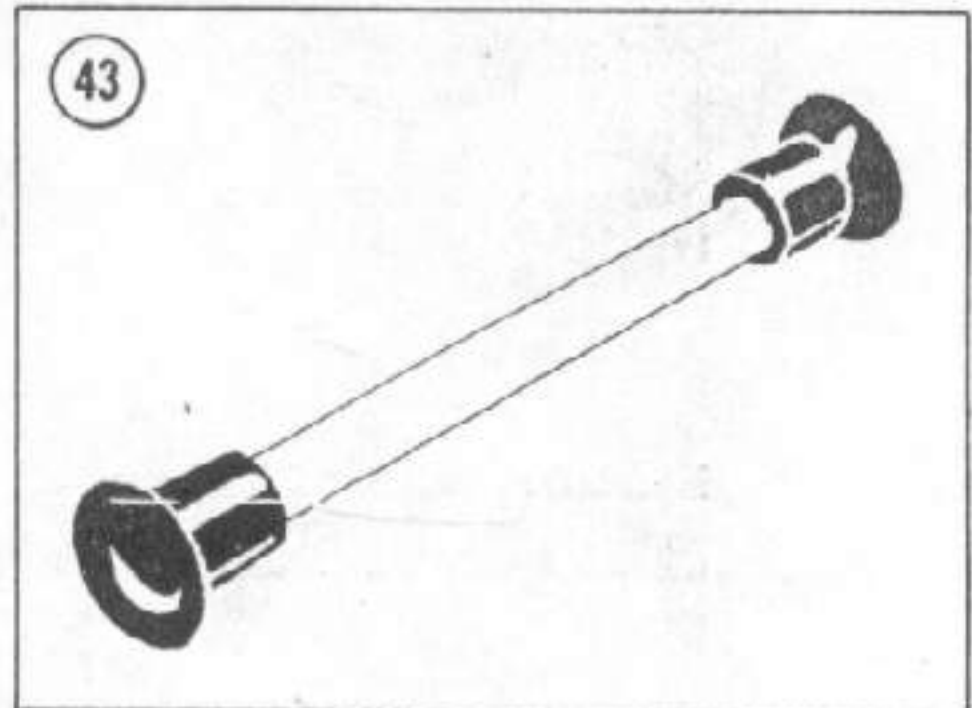
4.6.2

Disassembly/Assembly

It is important that all parts be assembled in their original positions. Refer to **Figure 44**. Therefore, before disassembling, mark the parts in some way to remind you later.

Refer to **Figure 45** for this procedure.

1. Push one of the rocker shafts out of the holder.
2. Remove the spring washer and rocker arm.
3. Push the other rocker shaft out and remove the spring washer and rocker arm.
4. Clean all the parts thoroughly in cleaning solvent.
5. Carefully inspect the rocker arm bore and bearing surfaces for signs of wear or scoring. Measure the inside diameter of the rocker arm bore (A, **Figure 46**) with a micrometer and check against measurements given in **Table 6**. Replace them if defective.
6. Inspect the rocker shafts for signs of wear or scoring. Measure the outside diameter (B,



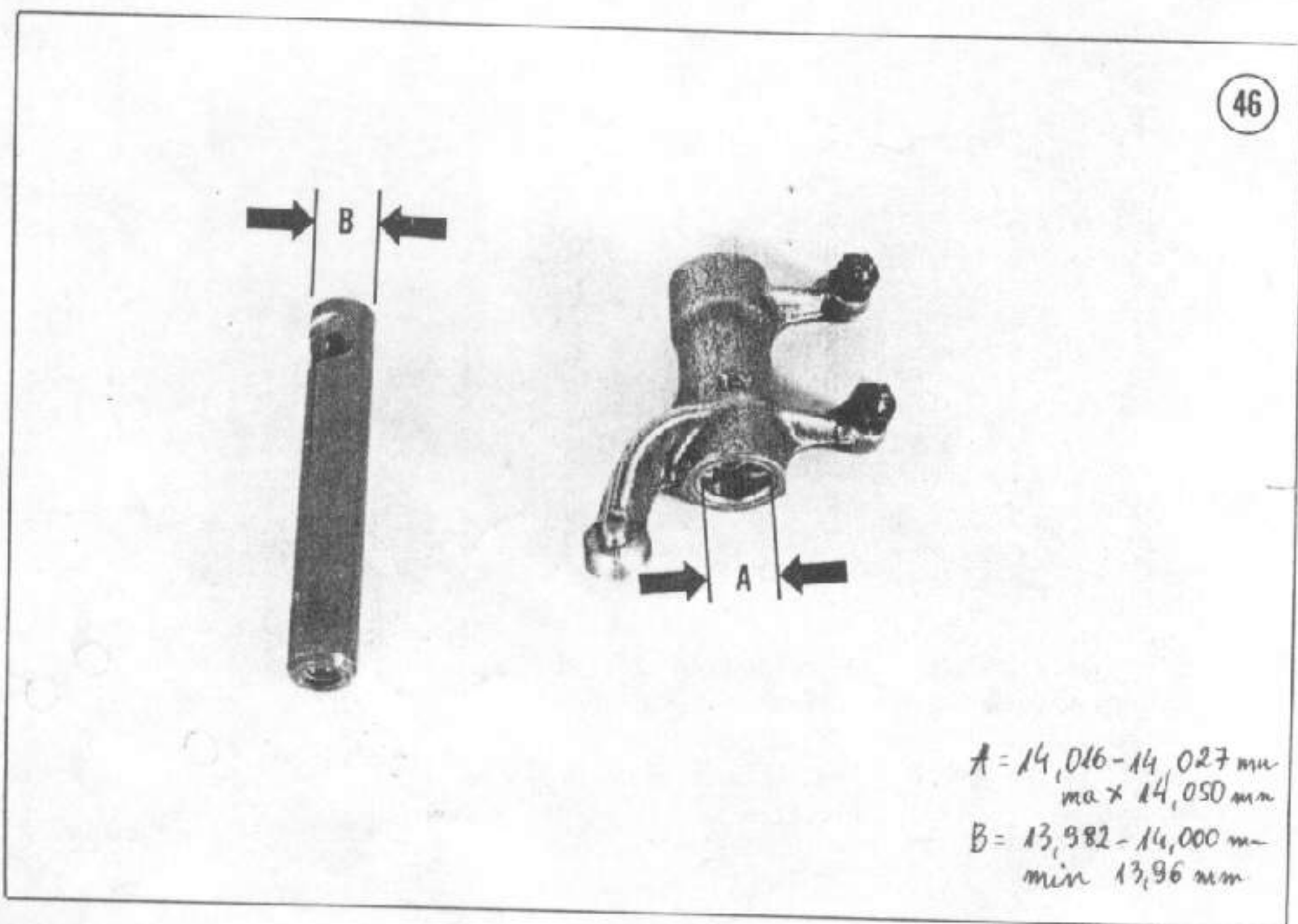
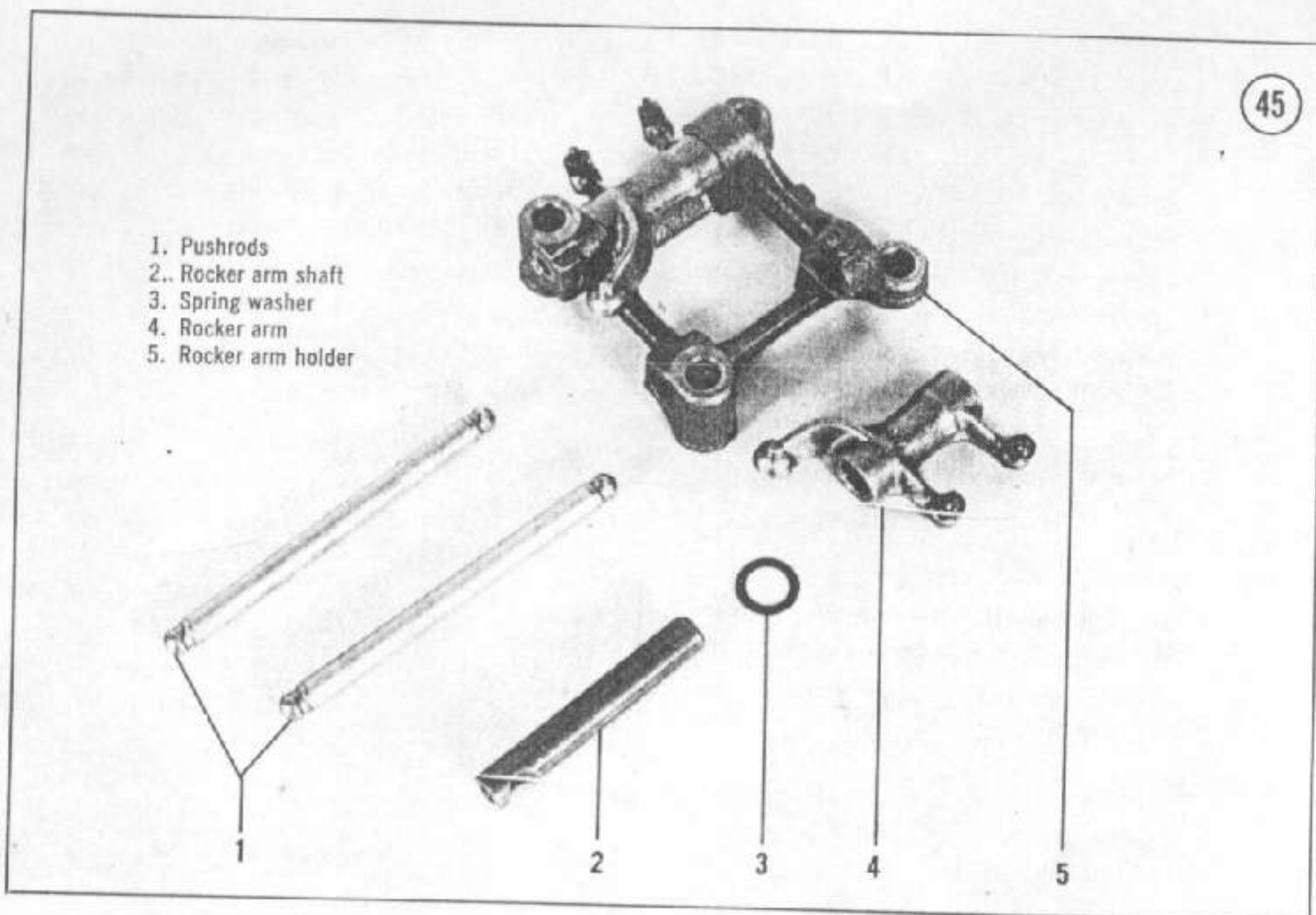


Figure 46) with a micrometer and check against the measurements given in Table 6. Replace them if defective.

7. Check the spring washers for breakage or distortion. Replace if necessary.
8. Coat the rocker shafts, holder bores, and rocker arm bores liberally with assembly oil or clean engine oil.
9. Slide the rocker shaft into the holder while assembling the rocker arm and spring washer.

NOTE: Be sure to install the rocker shaft with the locating notch toward the side of the head where the pushrods are located.

10. Rotate the shaft so the notch aligns with the hole in the holder for the cylinder head bolt.

4.7

CAMSHAFT

The camshaft is driven by a Hy-Vo chain off of the timing sprocket on the crankshaft.

Due to problems encountered with the bolt securing the stationary cam chain guide on all 1978 models, the factory has modified the affected parts. They consist of a new stationary cam chain guide and its securing bolt, a small set plate, and a new tensioner cover. *These parts must be installed on all 1978 models CX500's — frame serial No. 2000001 — 2034366 inclusive.* Subsequent models are equipped at the factory with the modified parts.

CAUTION

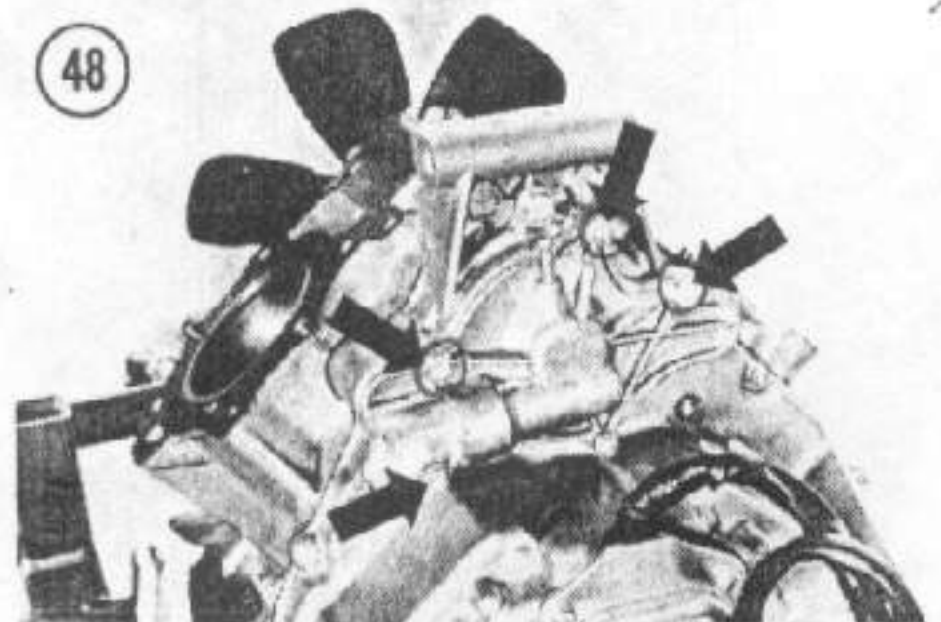
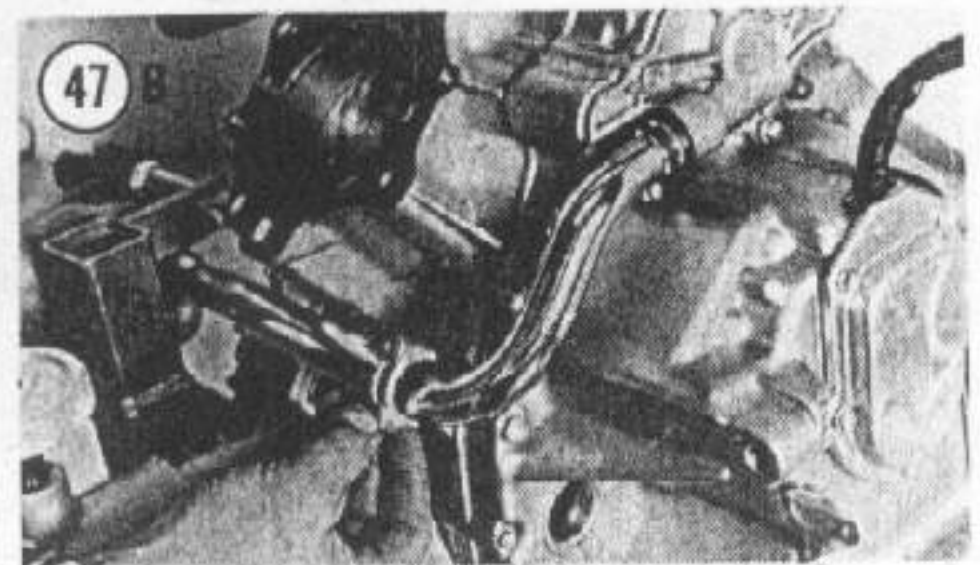
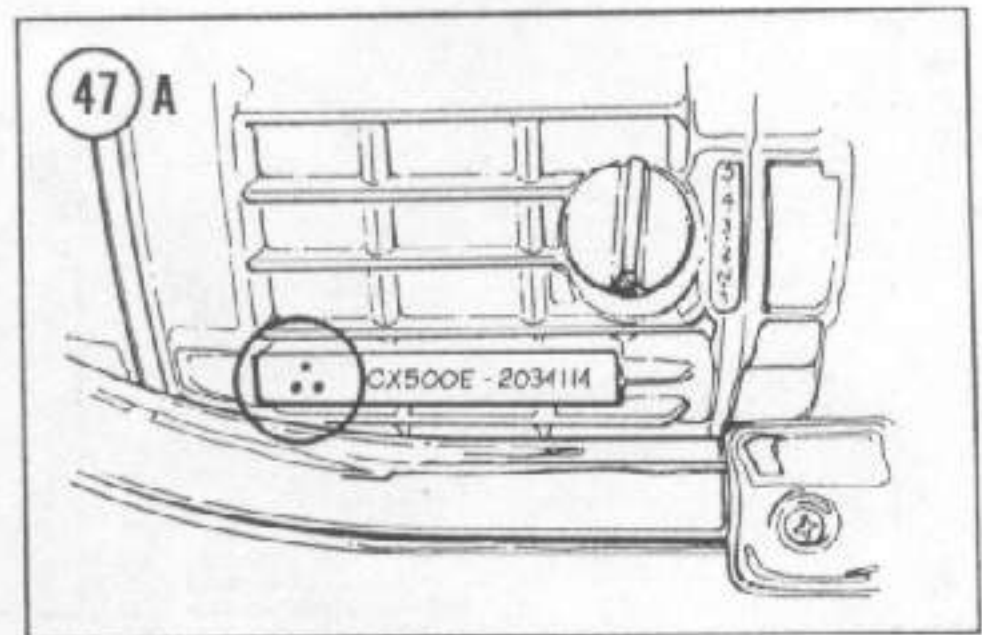
If the bolt securing the cam chain guide works loose the engine will develop a ticking noise. Prolonged operation with the loose bolt will cause the bolt to break, increasing engine noise. If the bike is ridden beyond this point the cam chain may break, locking up the engine, possibly causing total loss of control of the bike.

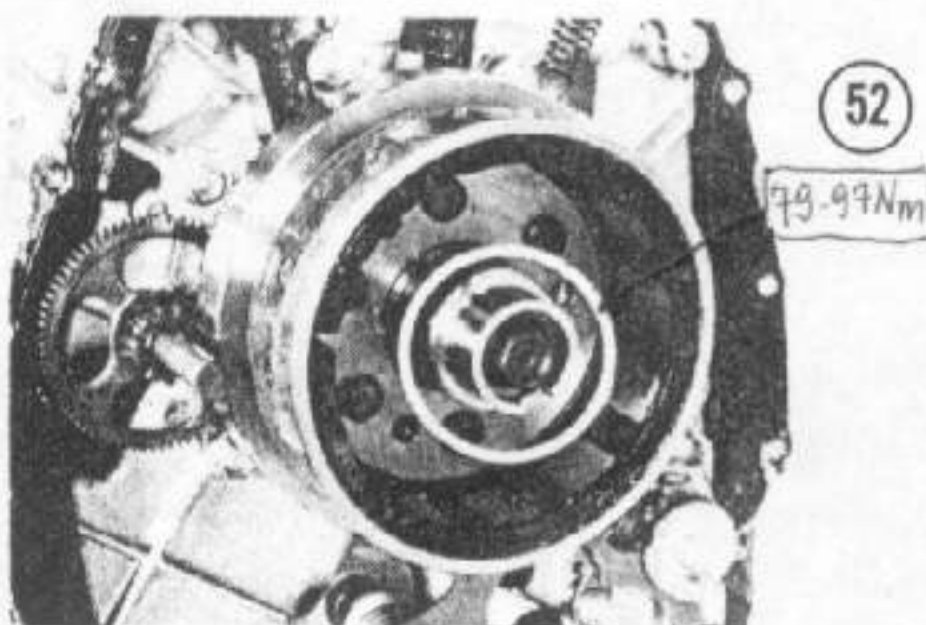
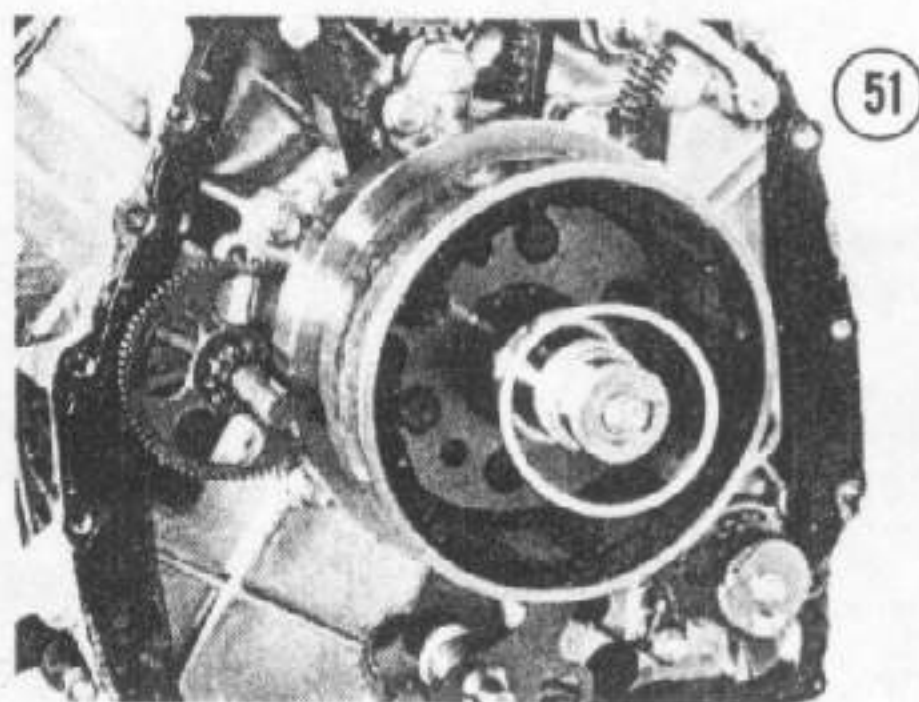
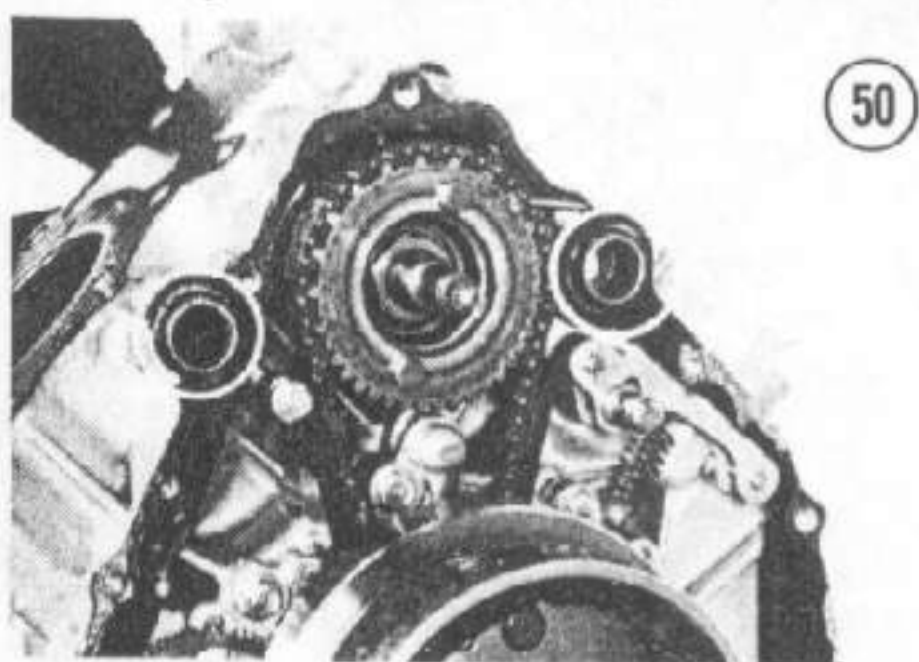
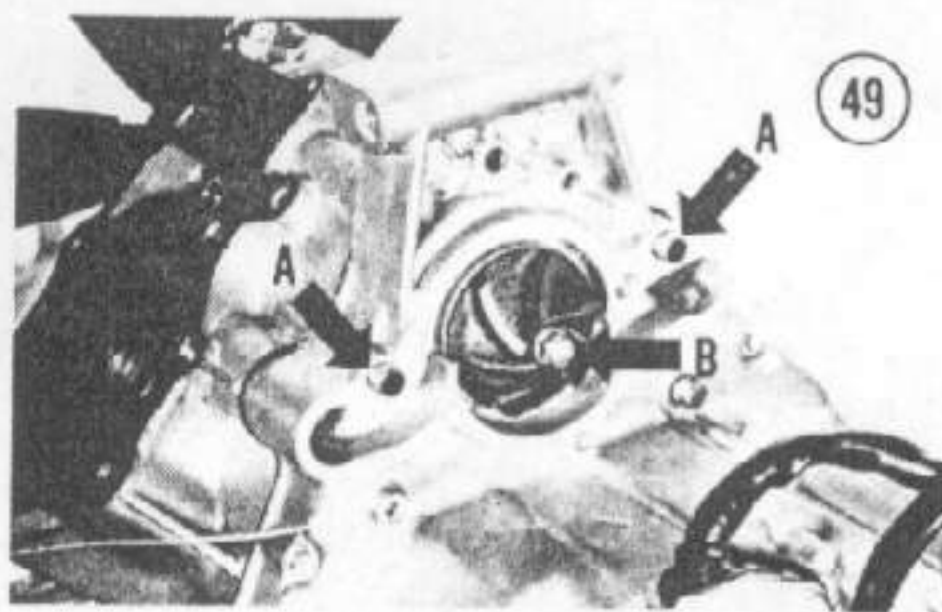
All 1978 models that have been corrected with the new parts are supposed to be identified by the Honda dealer that performed the work. The identification consists of three marks in a triangular configuration (Figure 47A) on the left side of the engine serial number plate, located on the lower left-hand side of the crankcase.

In the following procedure, Figures 56 and 58 are shown with the new modified parts. If either the set plate or the tensioner cover on your bike does not look like the ones shown, consult your Honda dealer for correct parts replacement.

4.7.4 Removal

1. Remove the engine as described under *Engine Removal/Installation* in this chapter. Remove the cylinder heads as described under *Cylinder Head Removal* in this chapter.
2. Remove the 2 clamps securing the water pipe to cylinder block (Figure 47B) and remove it.





3. Remove the 5 bolts (Figure 48) securing the water pump housing and remove it.

NOTE: Do not lose the 2 locating dowels (A, Figure 49).

4. Remove the cap nut and copper washer (B, Figure 49) securing the water pump impeller and remove it.

5. Remove the 17 bolts securing the rear engine cover and remove the cover.

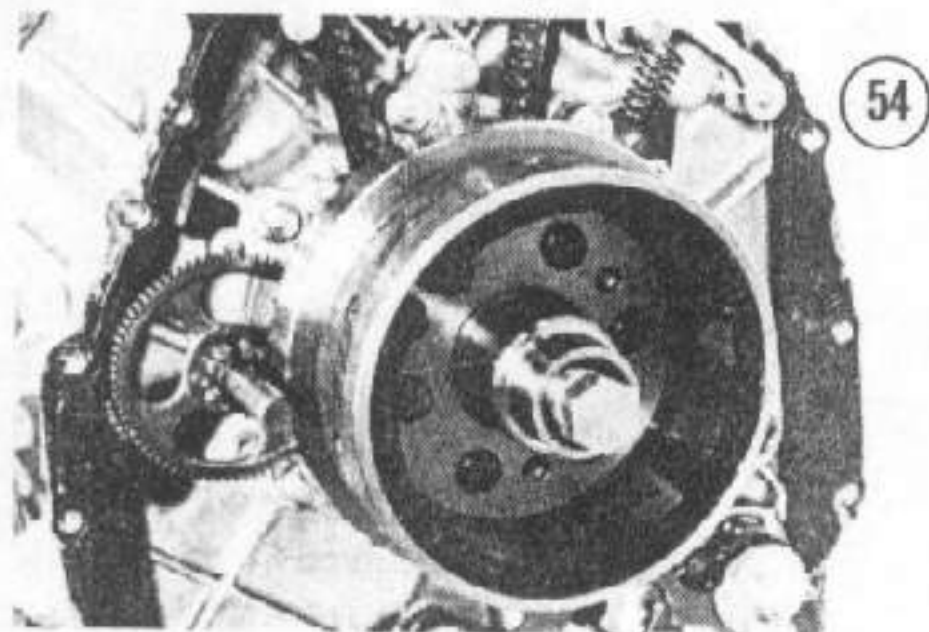
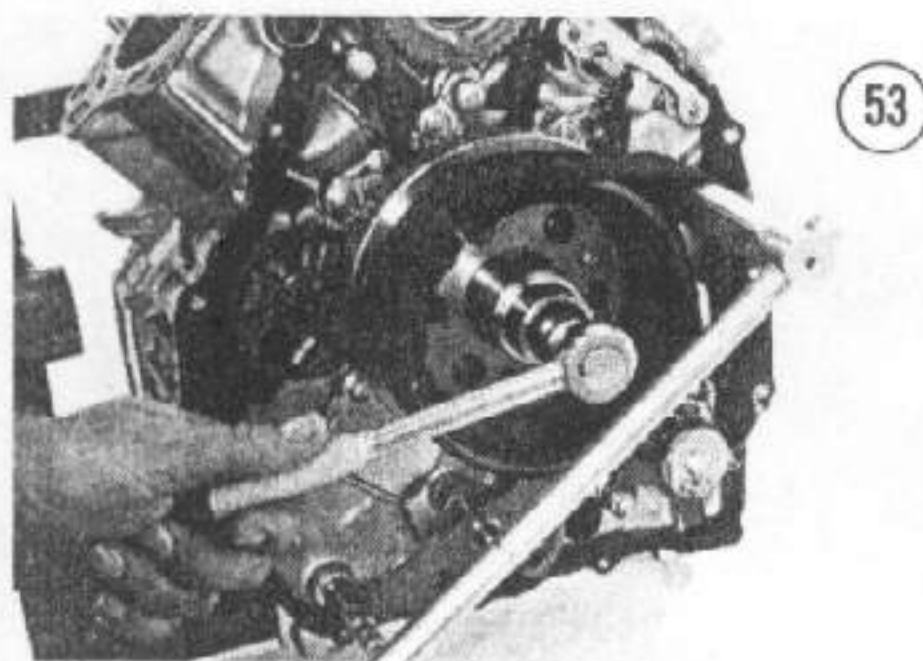
NOTE: Do not lose the 2 locating dowels and O-rings (Figure 50).

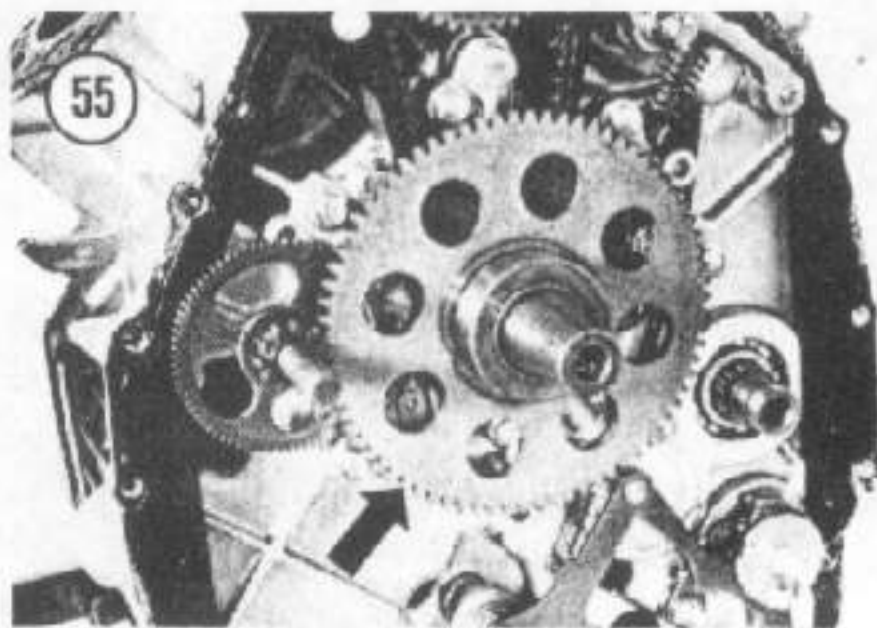
6. Remove the bolt (Figure 51) securing the alternator pulser rotor and remove the rotor.

7. Remove the bolt (Figure 52) securing the alternator rotor to the crankshaft with a socket.

NOTE: To prevent the flywheel from turning while removing the bolt, secure it with a strap wrench as shown in Figure 53.

8. Screw a flywheel puller in all the way until it stops (Figure 54).





9. Rotate the puller *clockwise* until the flywheel disengages from the crankshaft. Remove the flywheel, starter gear (Figure 55) and the needle bearing (Figure 56).

CAUTION

Be careful not to damage the pulser pickup (Figure 57) on the outer surface of the flywheel.

10. Remove the chain tensioner spring (A, Figure 58).

11. Remove the 4 bolts (B, Figure 58) securing the tensioner cover and remove it.

CAUTION

If the tensioner cover on the bike does not look like the one shown in Figure 58; refer to detailed information at the beginning of this procedure for correct parts replacement.

12. Unscrew chain tensioner bolt (Figure 59) and slide the tensioner assembly off of the 2 locating pins (Figure 60).

13. Remove the bolt (A, Figure 60) securing the stationary cam chain guide and remove it and the small set plate.

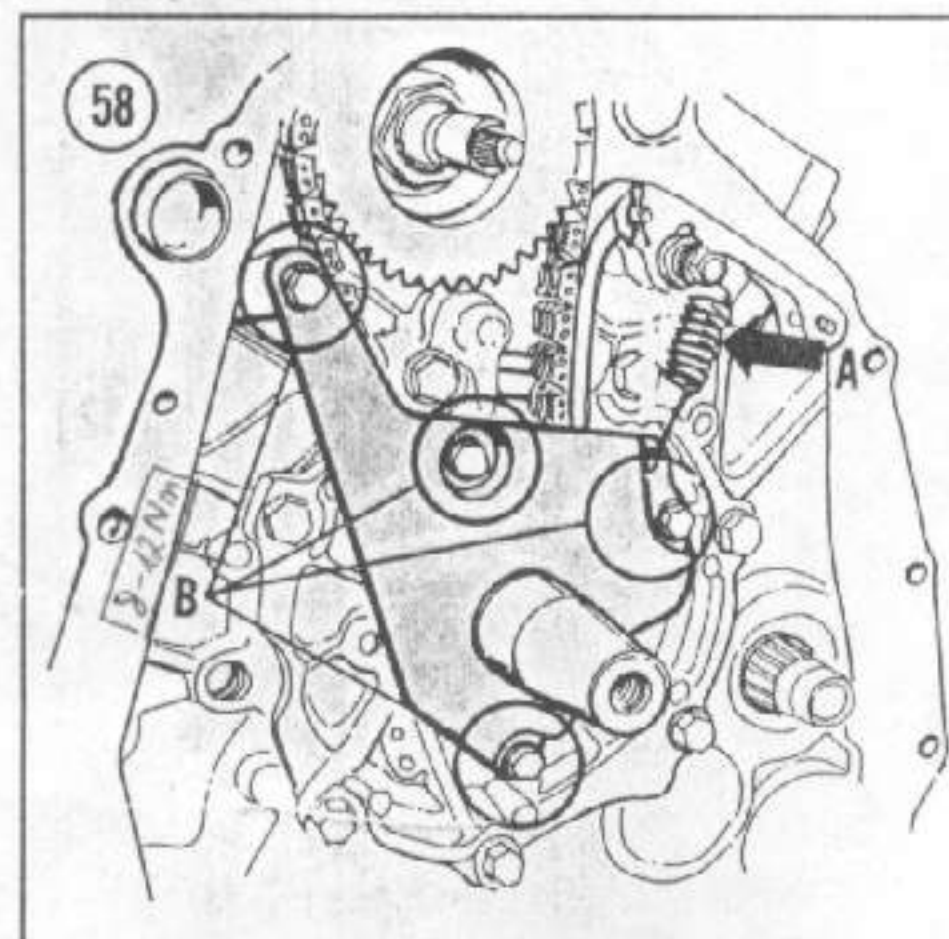
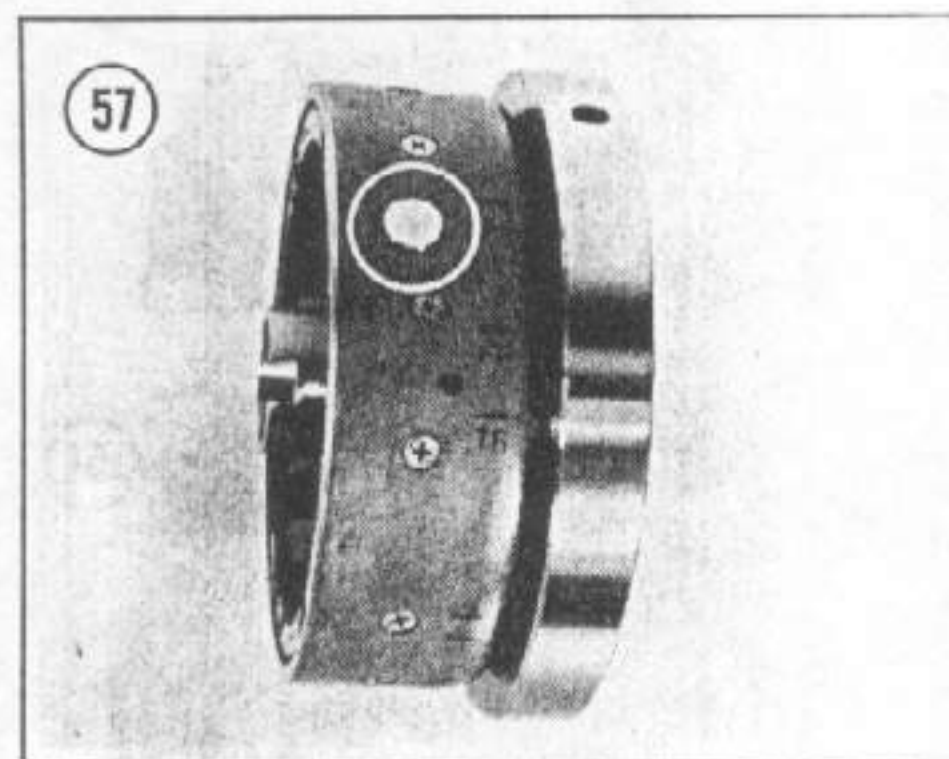
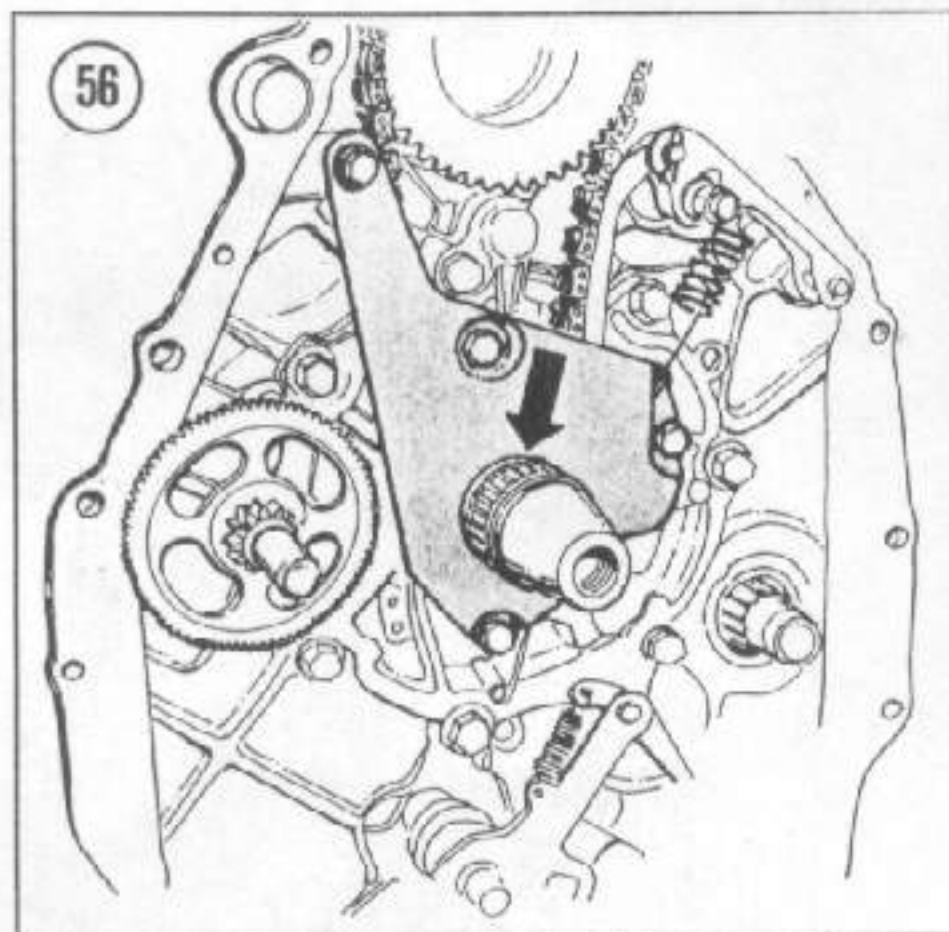
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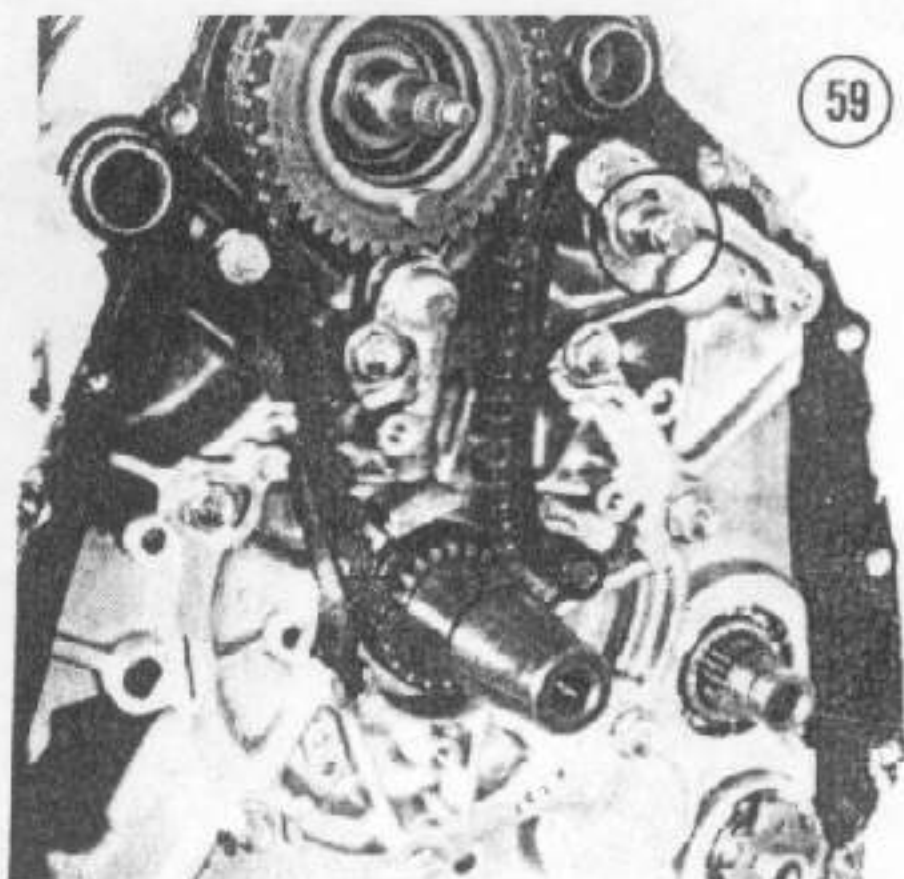
If the bike is not equipped with the small set plate, refer to detailed information at the beginning of this procedure for correct parts replacement.

14. Remove the 2 bolts (Figure 61) securing the cam sprocket to the camshaft.

15. Remove the sprocket and chain (Figure 62).

16. Remove the 27mm nut (Figure 63) securing the cam sprocket boss with a deep socket. Remove the nut, washer, and sprocket boss.

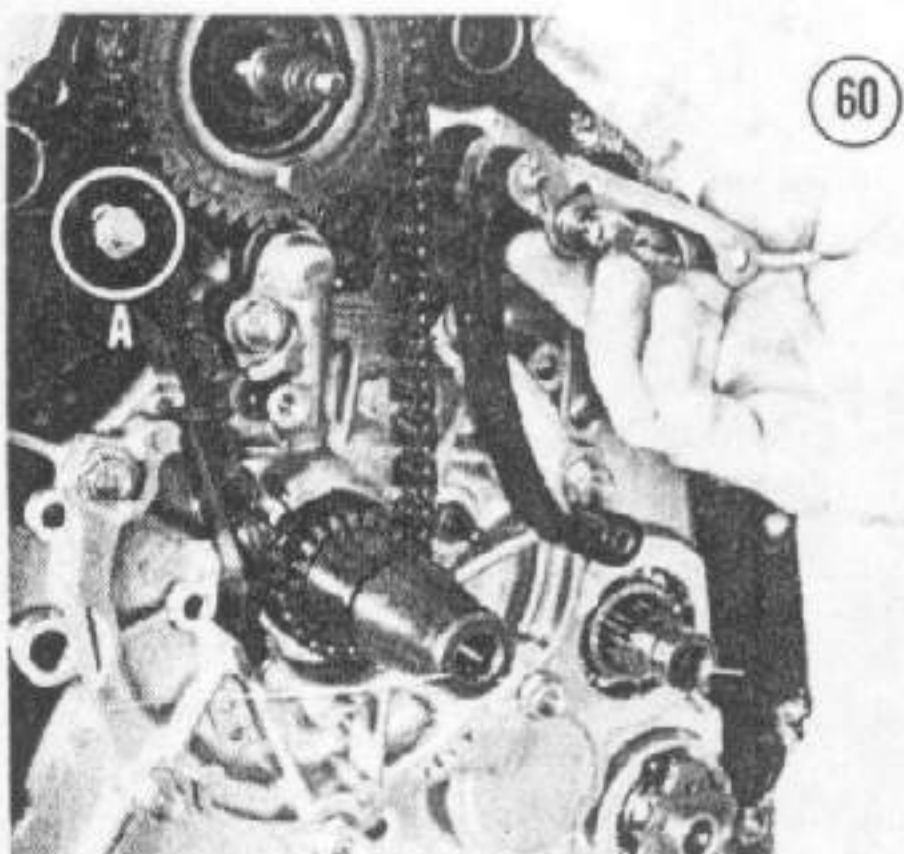




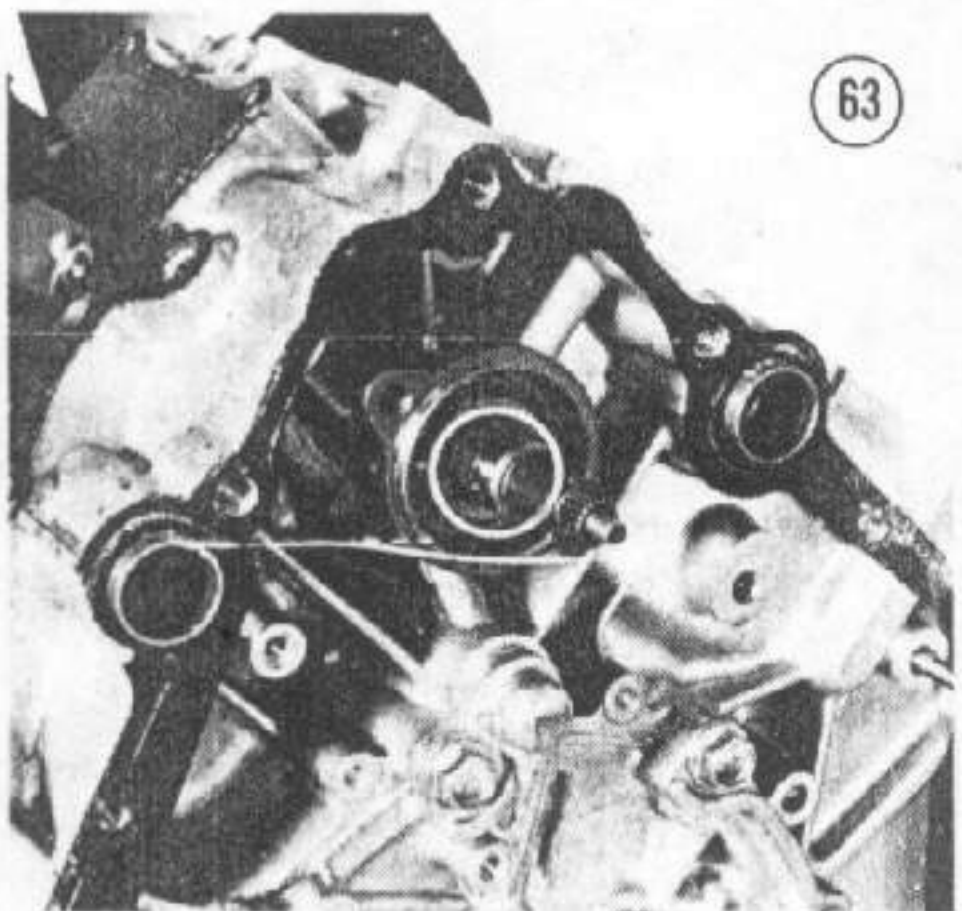
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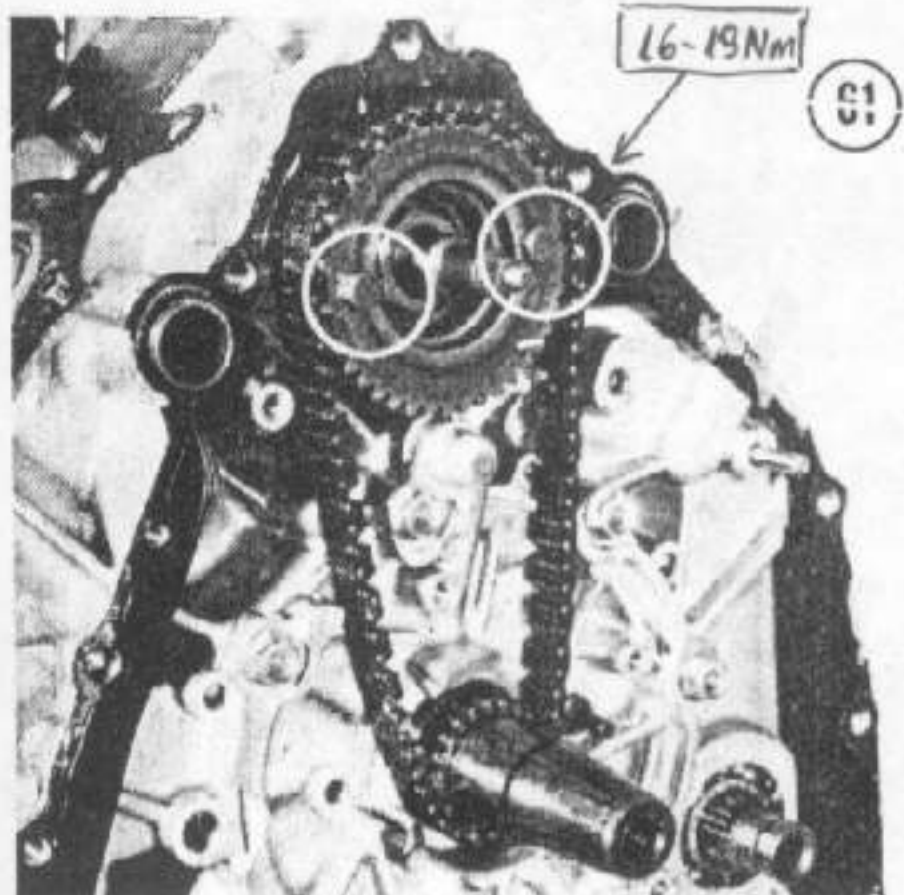
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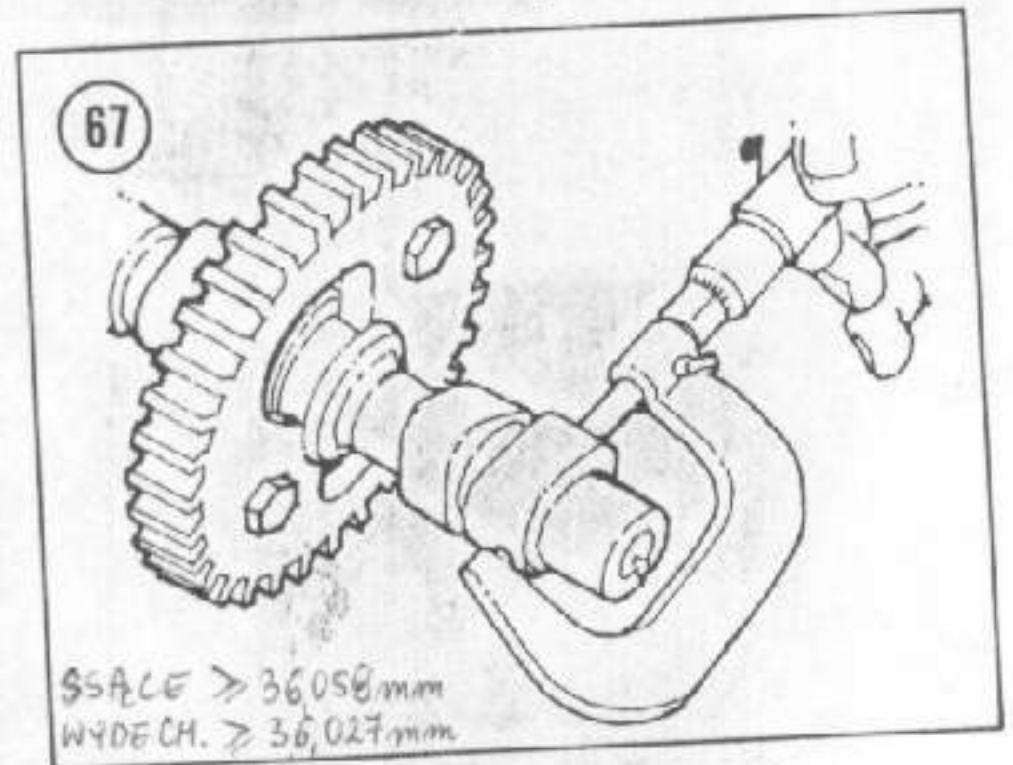
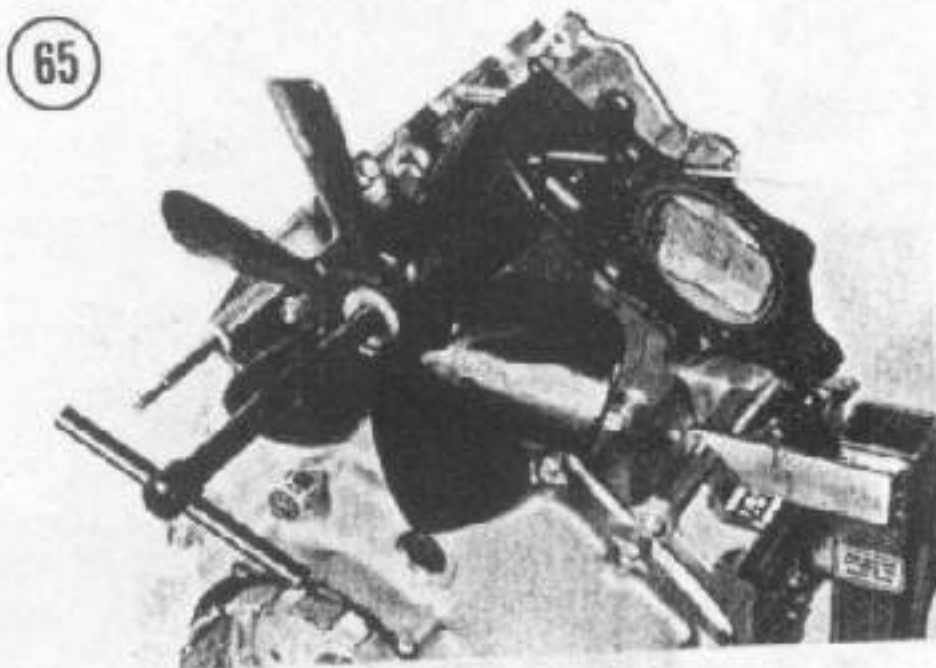
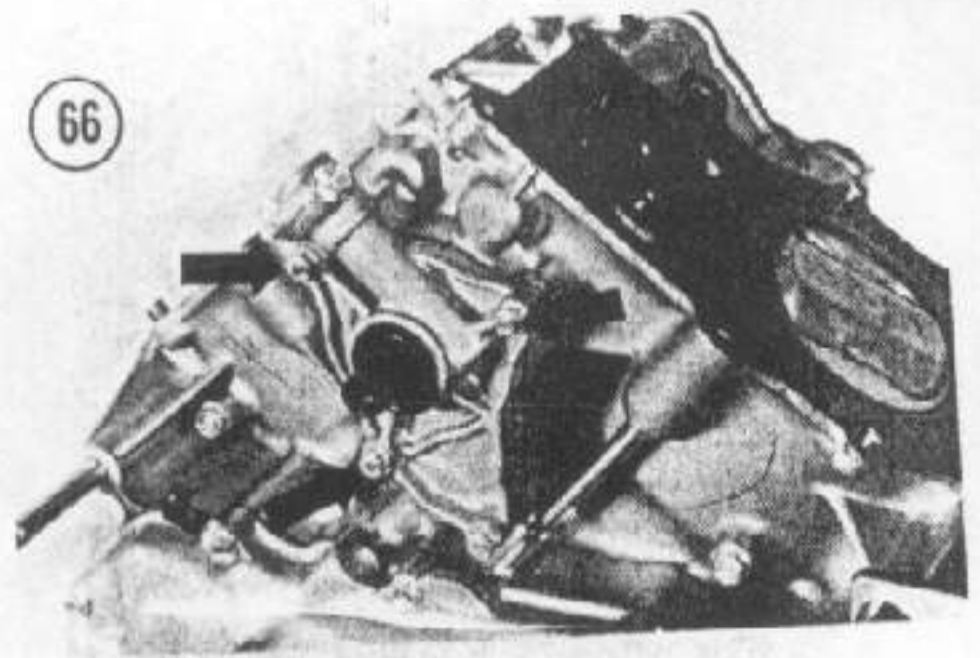
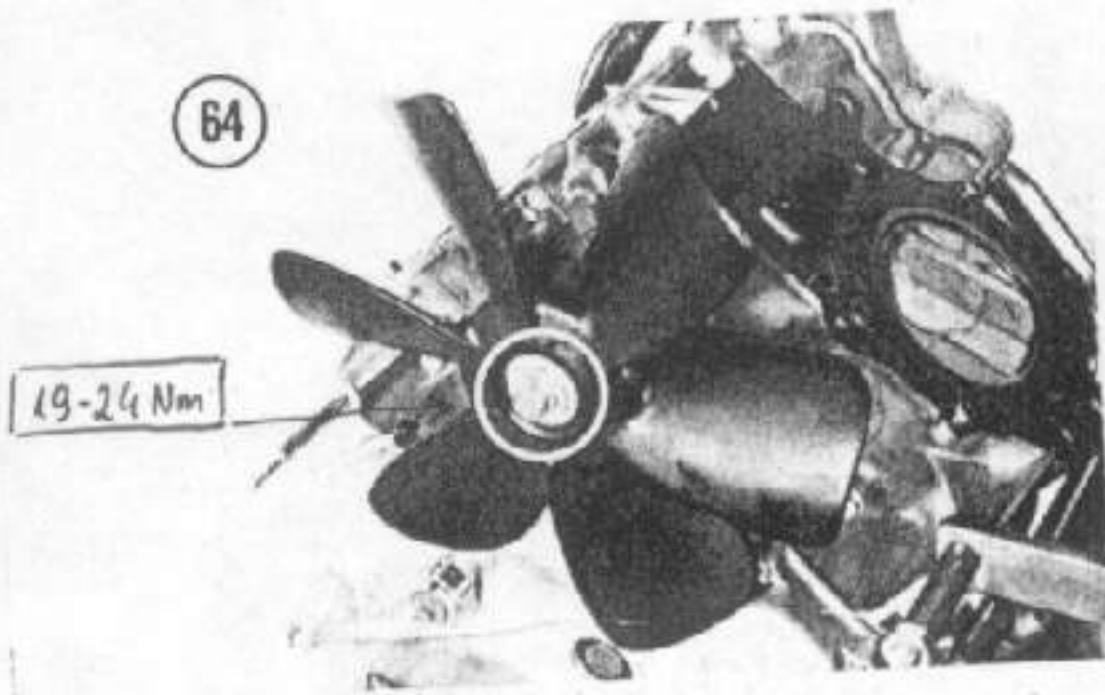


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17. Remove the bolt (Figure 64) on the fan.
18. Remove the fan with a puller (Figure 65). Screw in the puller until the fan disengages; remove the puller and the fan.
19. Remove the 3 bolts (Figure 66) securing the camshaft holder and tachometer drive, and remove it.
20. Withdraw the camshaft and thrust washer from the front of the engine.

CAUTION

Raise all lower rocker arms up off of the cam during removal. Use a piece of wire to hold them up.



4.7.2

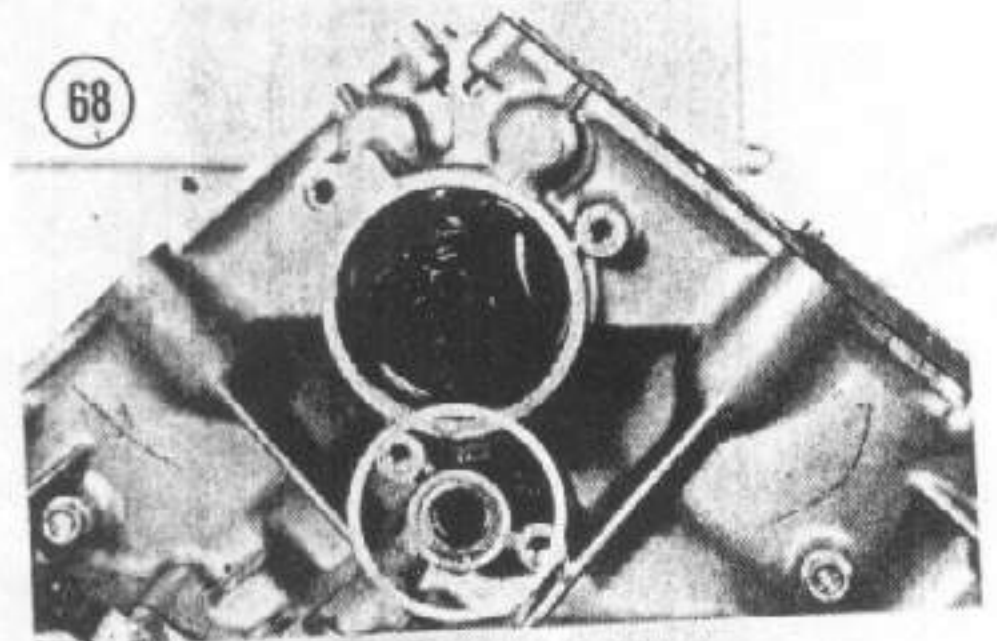
Camshaft Inspection

1. Check the bearing journals for wear and scoring.
2. Check cam lobes for wear. The lobes should not be scored and the edges should be square. Slight damage may be removed with a silicon carbide oilstone. Use No. 100-120 grit initially, then polish with a No. 280-320 grit.
3. Measure the height of each cam lobe with a micrometer as shown in Figure 67. Replace the shaft if worn beyond the serviceable limit (measurements less than those given in Table 6).
4. Check camshaft bearing bores in the camshaft holder and the cylinder block. Measure the inside diameter with a micrometer and check against measurements given in Table 6. Bores should not be excessively worn or scored.

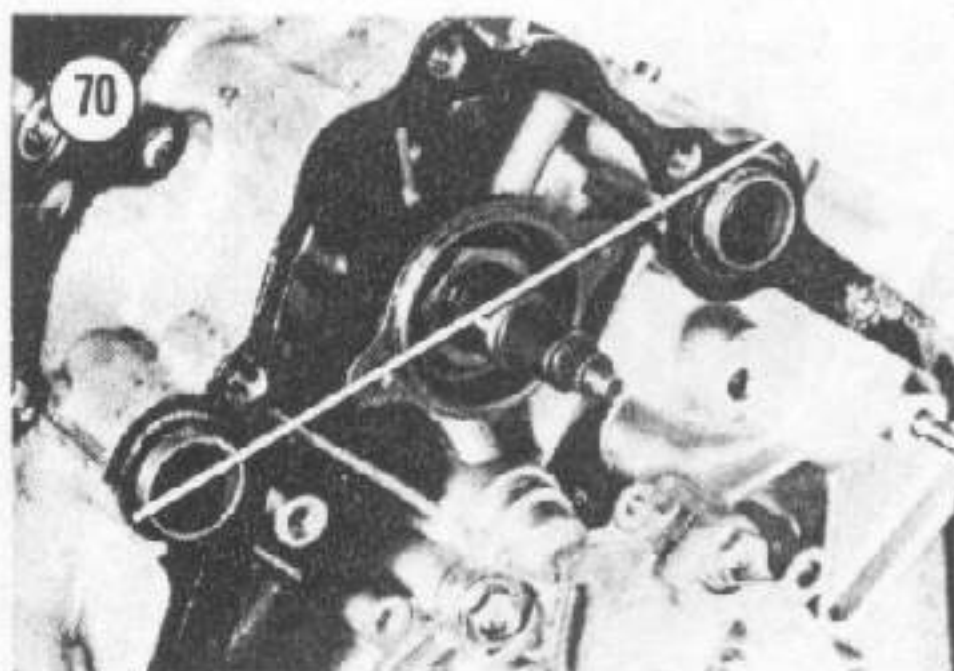
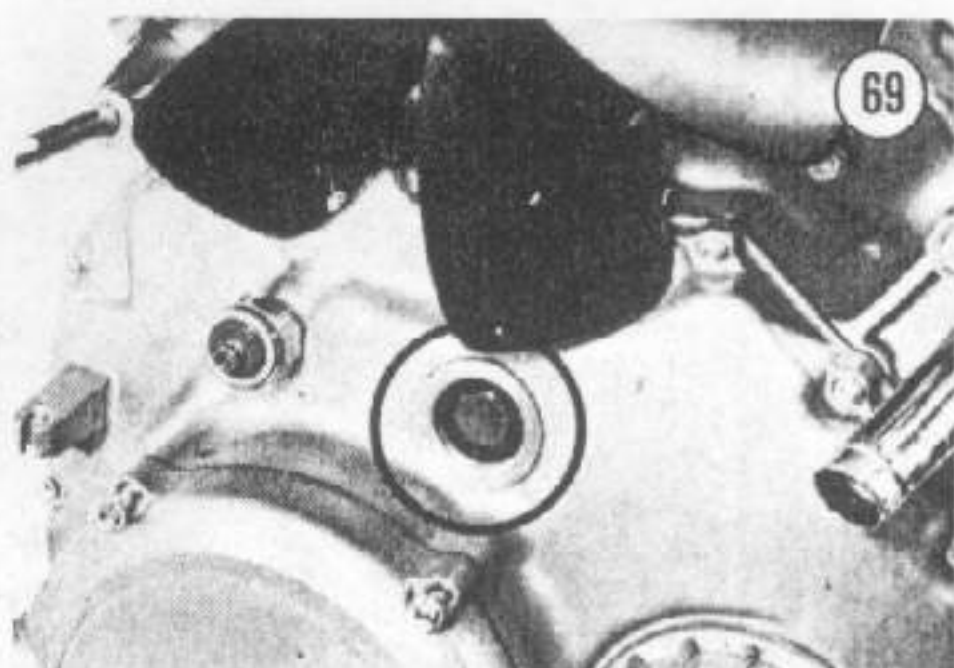
4.7.3

Installation

1. Lubricate the camshaft journals with molybdenum disulfide grease and apply assembly oil to the cam lobes.



2. Install the thrust washer to the end of the camshaft.
3. Insert the camshaft from the front of the engine.
4. Install the O-ring and collar (Figure 68). Inspect the gasket on the camshaft holder, if its condition is in doubt, replace it.
5. Lubricate the camshaft holder oil seal with engine oil and install the holder (Figure 65).
6. Install the fan and the bolt (Figure 63).



7. Install the camshaft sprocket boss. Align the cutout with the locating pin on the camshaft.

8. Install the lockwasher, with the mark OUTSIDE facing out, and the locknut. Torque the nut to 58-72 ft.-lb. (79-98 N•m).

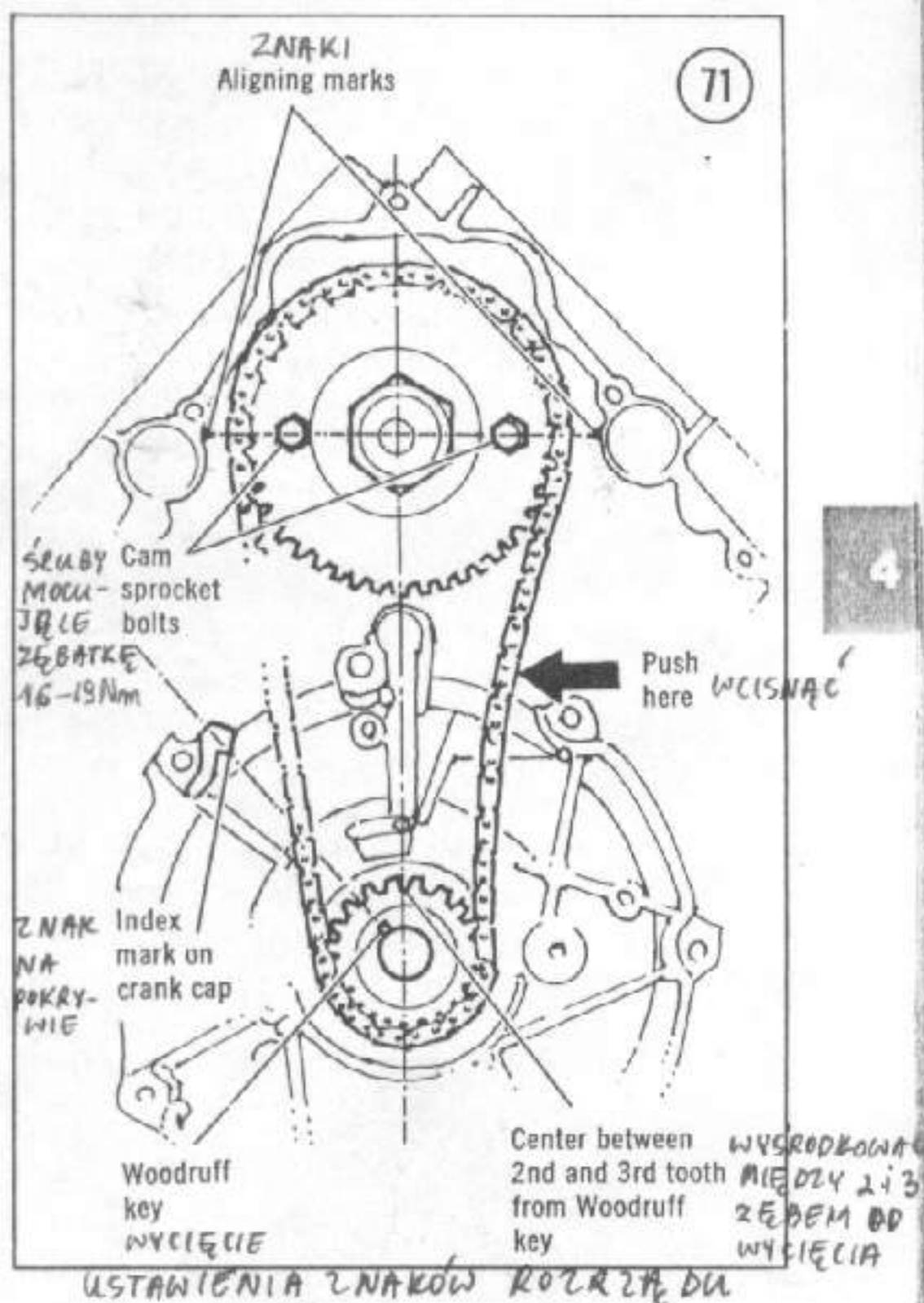
9. Rotate the crankshaft until the left-hand piston is at top dead center (TDC). Use the bolt on the front of the crankshaft (Figure 69) for turning with a suitable size socket.

10. Verify that the piston is at TDC by checking the following:

- The holes in the camshaft sprocket boss (Figure 70) are horizontal and align with the punch marks on the cylinder block. Also refer to Figure 71.
- Check that the Woodruff key on the crankshaft is aligned with the index mark on the crankshaft cap (Figure 71).

11. Install the camshaft sprocket and chain (Figure 61).

12. Install the 2 bolts (Figure 60) and tighten them to 12-14 ft.-lb. (16-19 N•m).



13. After the chain has been installed, press on the chain on the right-hand side so that the tensioner side of the chain is tight. Check again that all items in Figure 71 are aligned as shown. Proper valve timing depends on the proper relationship of all of these parts.

CAUTION

Very expensive damage to the engine could result from improper installation. Before proceeding, rotate the crankshaft several revolutions with a wrench on the bolt shown in Figure 69. If there is any binding, stop. Determine the cause before assembling beyond this point.

14. Install the set plate (Figure 72A) on the guide bolt boss.

NOTE: Make sure it will not interfere with the installation of the new rear engine cover gasket.

15. Install the cam chain stationary guide.
16. Install the cam chain tensioner onto the 2 locating pins (**Figure 72B**).
17. Install the lock bolt and O-ring (**Figure 59**). *Do not tighten the bolt at this time.*
18. Install the tensioner cover and center it to ensure even clearance around the crankshaft. Install the 3 lower 6 X 16mm flange bolts and upper left-hand 6 X 30mm flange bolt (B, **Figure 58**). Tighten all 4 bolts to 6-9 ft.-lb. (8-12 N•m). Install the chain tensioner spring (A, **Figure 58**).
19. Install the needle bearing (**Figure 56**), starter gear (**Figure 55**), and the alternator rotor. Install the rotor bolt (**Figure 52**) and tighten it to 58-72 ft.-lb. (79-97 N•m).

NOTE: *To prevent the flywheel from turning while tightening the bolt, secure it with a strap wrench as shown in **Figure 53**.*

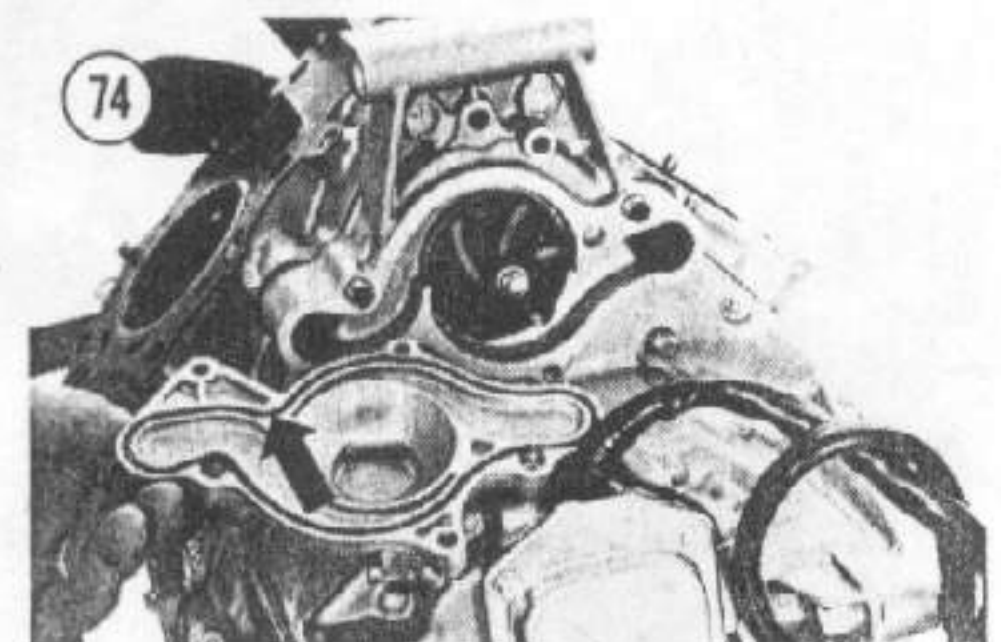
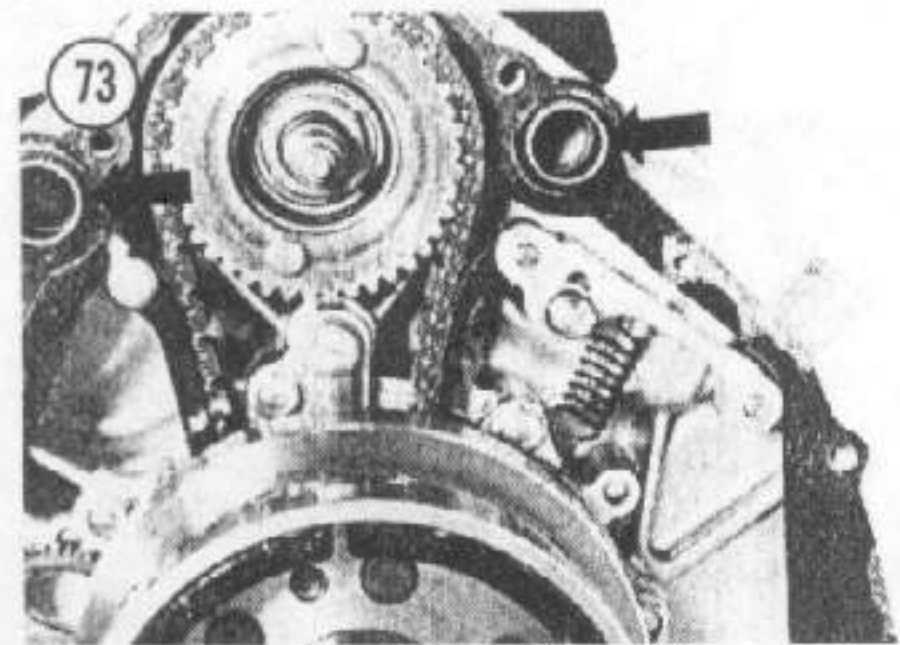
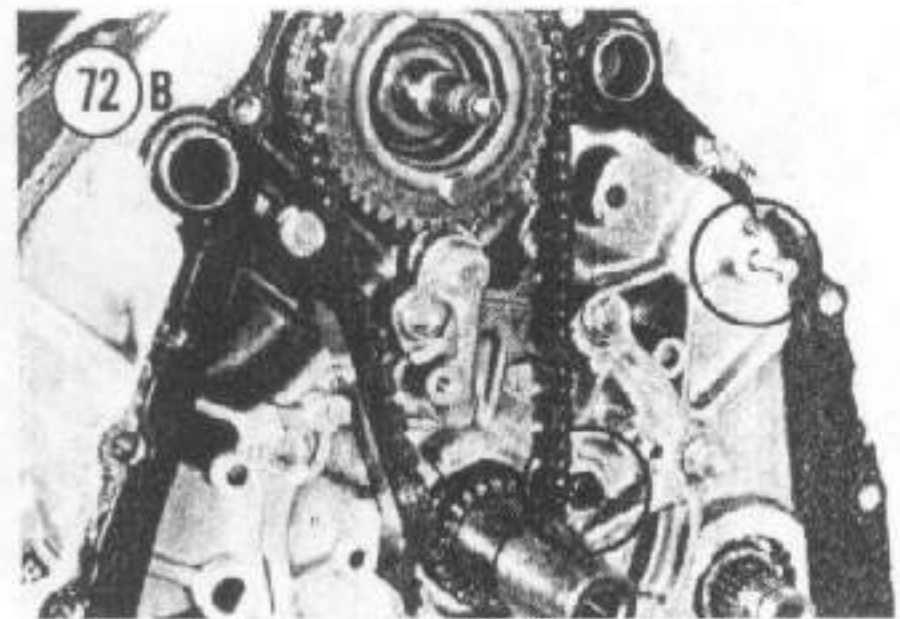
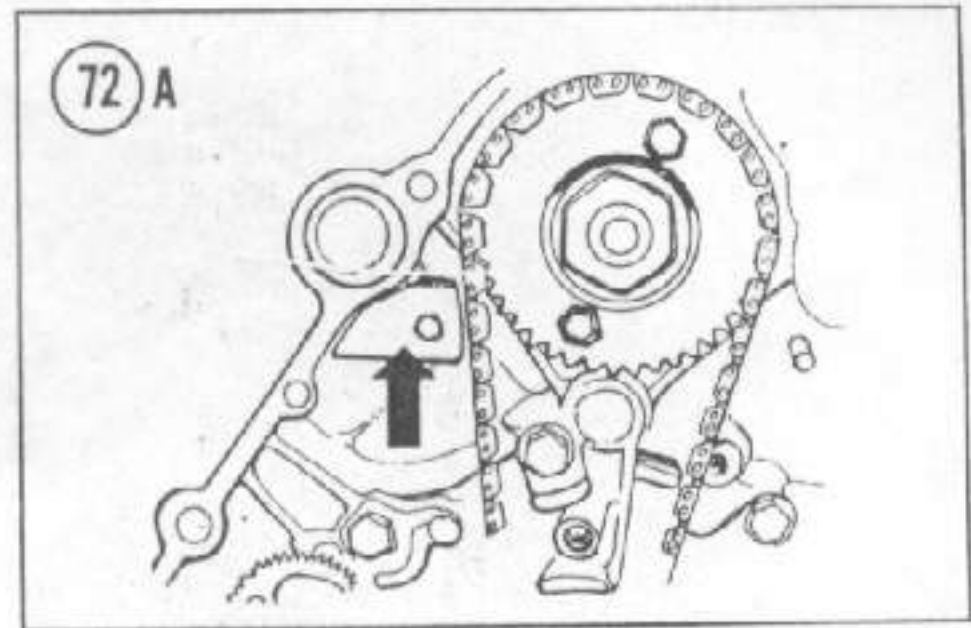
20. Install alternator pulser rotor (**Figure 51**).

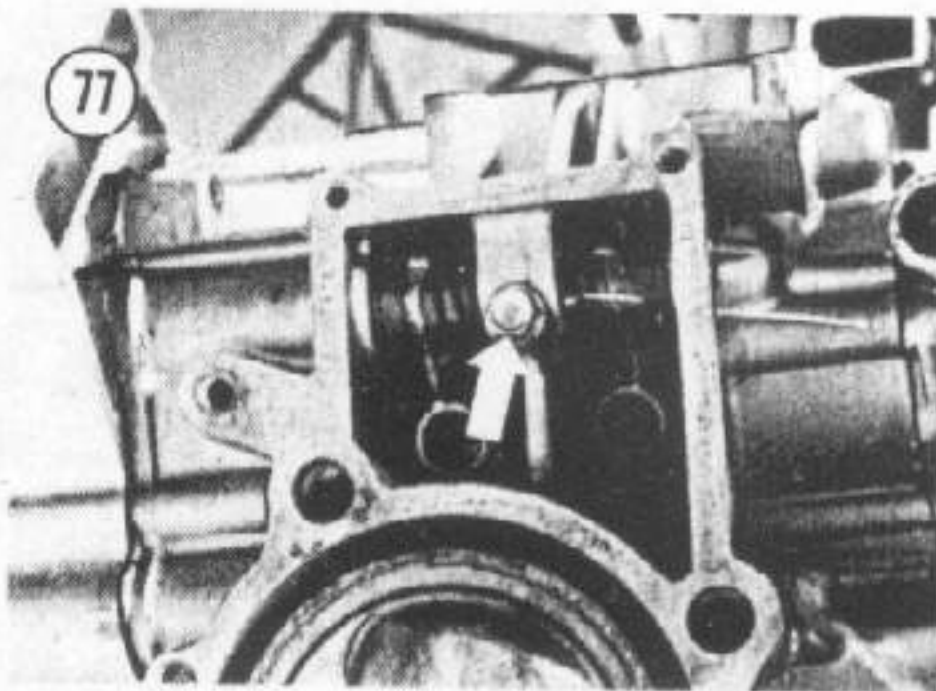
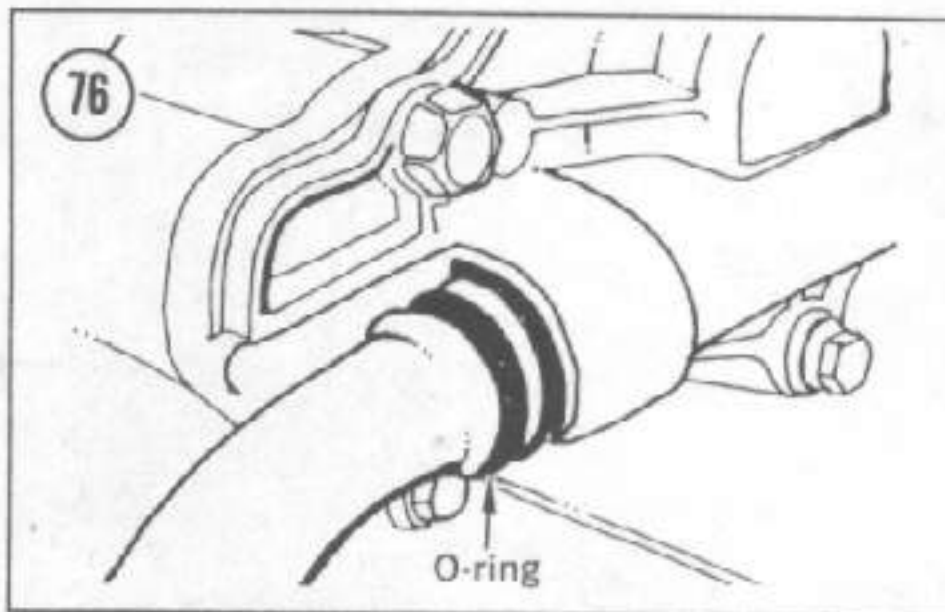
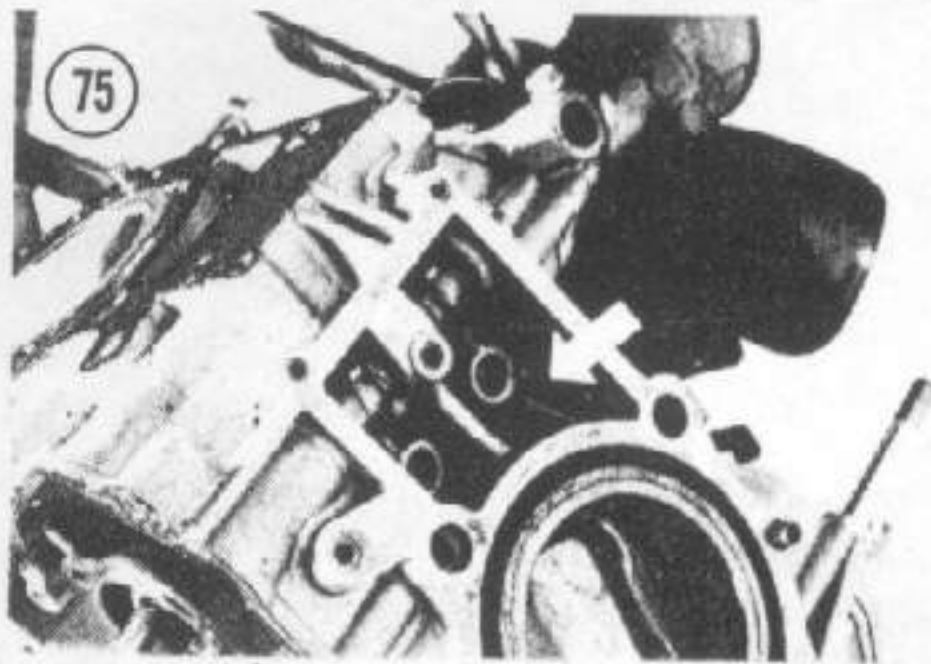
NOTE: *Align the rotor locating tab with notch in the flywheel when installing the rotor.*

21. Install the 2 locating dowels and O-rings (**Figure 73**), a new rear engine cover gasket and install the rear engine cover.
22. Install the water pump impeller, copper washer, and cap nut (B, **Figure 49**).
23. Make sure 2 locating dowels (A, **Figure 49**) are in place.
24. Inspect the O-ring seal (**Figure 74**) on the water pump housing. If it is cracked or deteriorated, replace it. Make sure it is properly seated in the groove, and install the housing.
25. Pour about 3¼ oz. (100cc) of clean engine oil into the oil pockets (**Figure 75**) in the lower rocker arm area.
26. Install the water pipe and clamps to the cylinder block.

NOTE: *Be sure the O-ring is properly seated between the 2 ribs on the water pipe (**Figure 76**).*

27. Install the cylinder heads as described under *Cylinder Head Installation* in this chapter.





28. Install the engine as described under *Engine Removal/Installation* in this chapter.

29. Adjust the valve clearance as described under *Valve Clearance Adjustment* in Chapter Three.

30. Adjust the camshaft chain tension as described under *Camshaft Chain Adjustment* in Chapter Three.

31. Start the engine and check for leaks.

4.8

CAMSHAFT CHAIN AND TENSIONER

4.8.1 Replacement

In order to replace the camshaft chain and/or the camshaft chain tensioner, it is necessary to remove the engine from the frame and disassemble it.

Remove the camshaft chain and/or the tensioner as described in Steps 1-14, *Camshaft Removal* in this chapter.

Install by following Steps 9-29, *Camshaft Installation* in this chapter.

4.9

LOWER ROCKER ARM ASSEMBLIES

The lower rocker arms ride on the camshaft and activate the pushrods.

In order to gain access to the lower rocker arms it is necessary to remove the engine from the frame and disassemble it.

4.9.1 Removal/Installation

It is important that all parts be assembled in their original positions. Therefore, before disassembling, mark the parts in some way to remind you later.

1. Remove all parts as described in Steps 1-14, *Camshaft Removal* in this chapter.

2. Remove the rocker arm shaft lock bolts (Figure 77).

3. Screw in a 6mm bolt into the end of the rocker arm shaft (Figure 78) and withdraw the rocker shaft.

4. Remove the rocker arms and springs.

5. Remove the other rocker arm shaft, and remove the rocker arms and springs.

6. Clean all the parts thoroughly in cleaning solvent.
7. Carefully inspect the rocker arm bore and bearing surfaces for signs of wear or scoring. Measure the inside diameter of the rocker arm bore with a micrometer and check the measurements given in **Table 6**. Replace them if defective.
8. Inspect the rocker shafts for signs of wear or scoring. Measure the outside diameter with a micrometer and check against the measurements given in **Table 6**. Replace them if found defective.
9. Check the springs for breakage or distortion. Replace if necessary.
10. Coat the rocker shafts and rocker arm bores liberally with assembly oil or clean engine oil.
11. Install the rocker arms and springs into the cylinder block with the pushrod cup offset in *toward* the lock bolt (**Figure 79**).
12. Install the rocker arm shaft with the threaded end facing the rear of the engine, toward the camshaft sprocket.
13. Rotate the rocker arm shaft with a screwdriver until the notch aligns with the lock bolt hole. Install the lock bolt.
14. Complete installation by following Steps 9-29, *Camshaft Installation* in this chapter.

4.10

PISTONS AND CONNECTING RODS

For removal of pistons and connecting rods it is necessary to remove the engine from the frame and disassemble it.

4.10.1

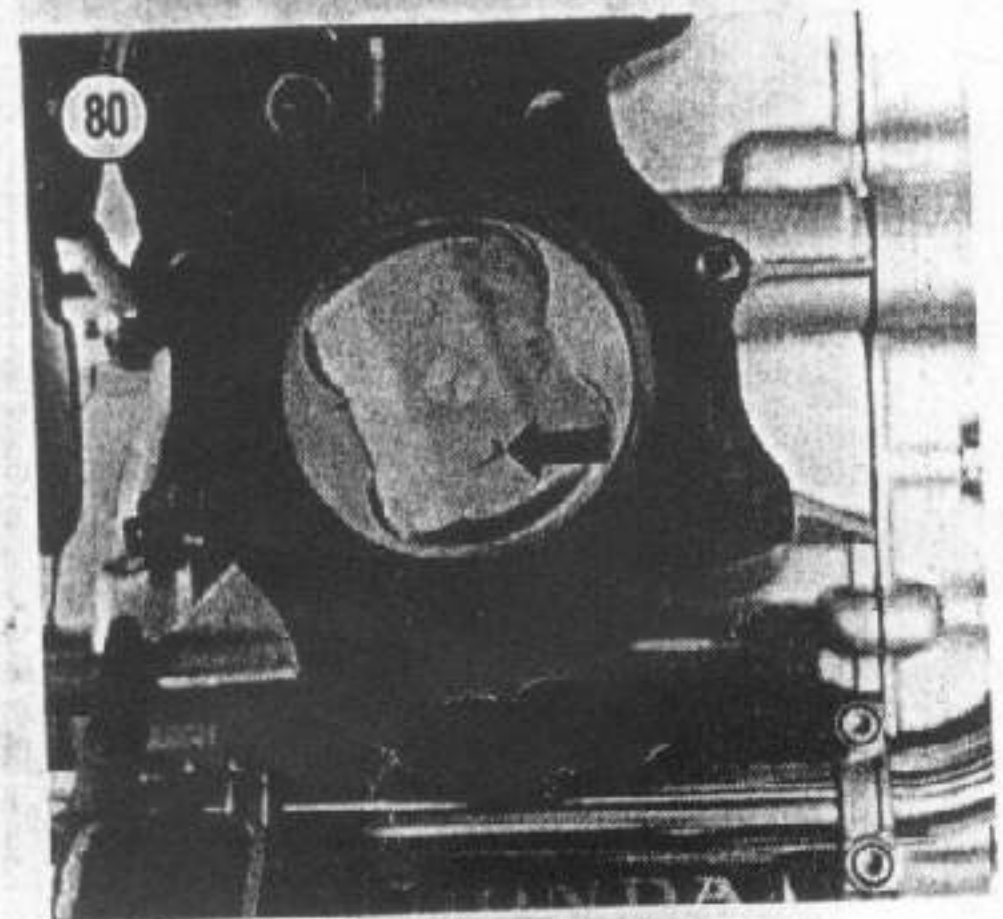
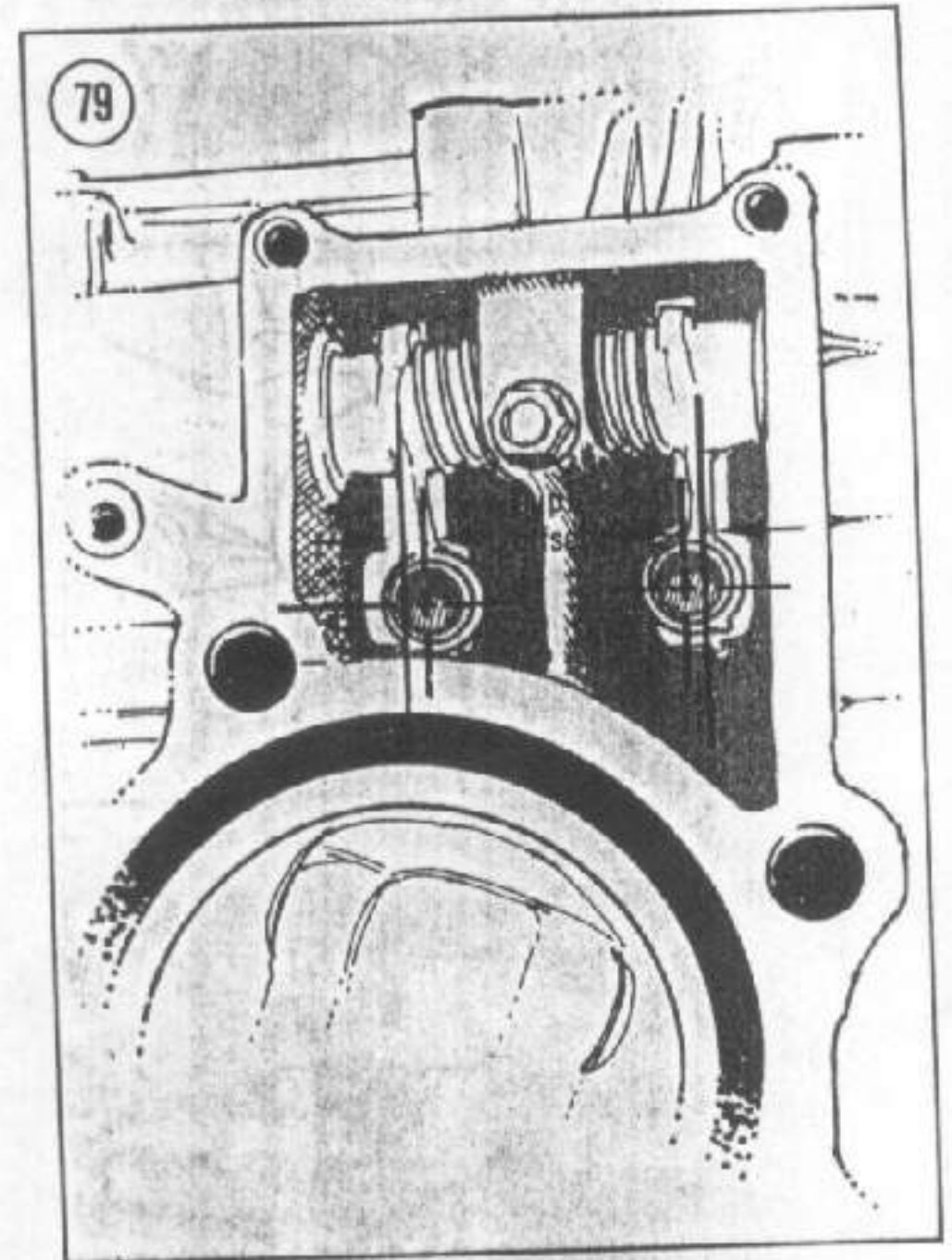
Removal

1. Remove the engine as described under *Engine Removal/Installation* in this chapter.
2. Remove the cylinder heads as described under *Cylinder Head Removal/Installation* in this chapter.
3. Remove the clutch as described under *Clutch Removal/Installation* in Chapter Five.
4. Remove the oil pump as described under *Oil Pump Removal/Installation* in this chapter.
5. Remove the transmission as described under *Transmission Removal/Installation* in Chapter Five.

6. Lightly mark the top of the piston with a L and R (**Figure 80**) so that they will be installed into the correct cylinder.

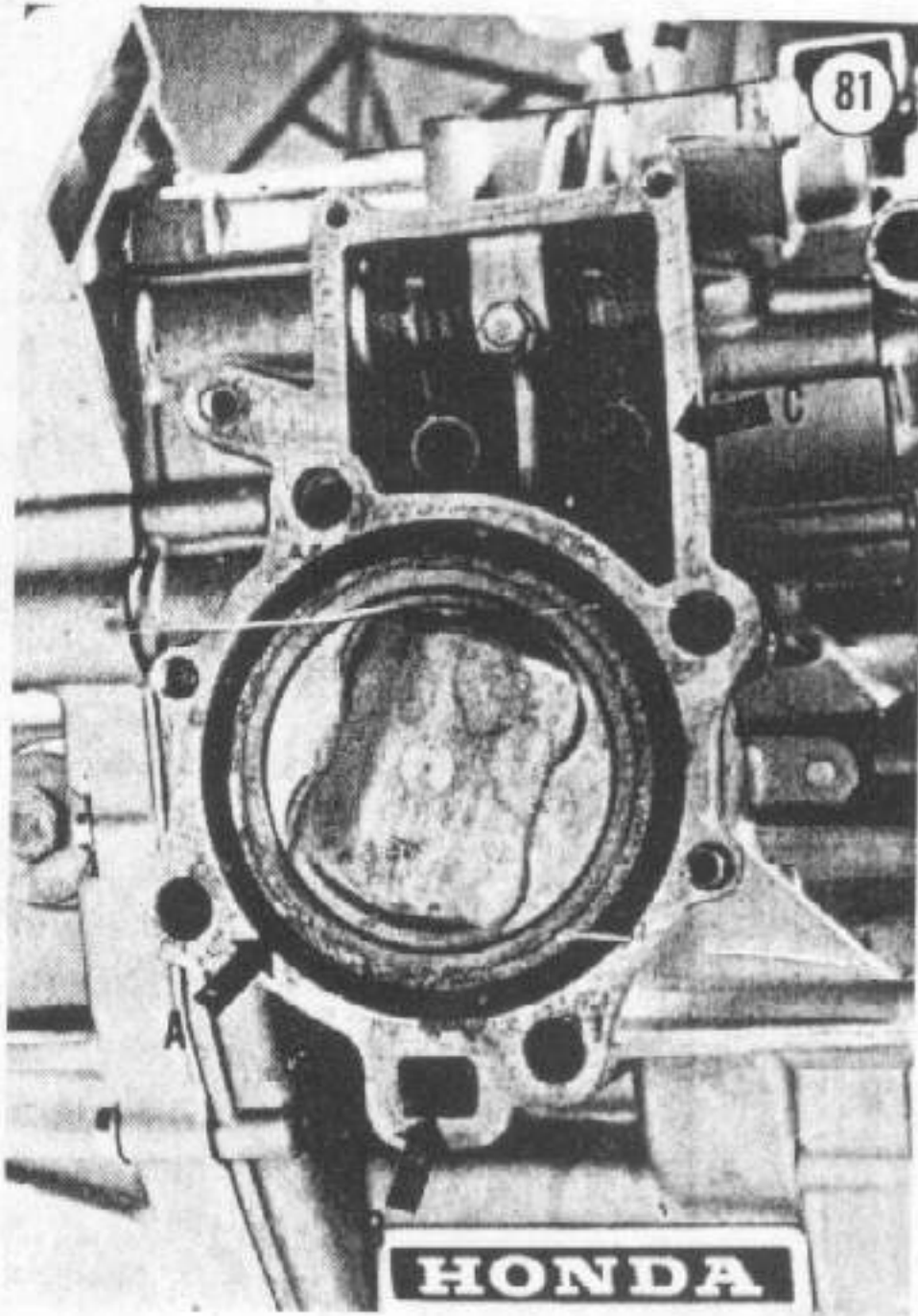
NOTE: The L and R relate to the engine as it sits in the bike frame.

7. Scrape all deposits from the top of the cylinder.



8. Rotate the crankshaft until one of the pistons is at the bottom of its travel. Place an oil-soaked cloth into the cylinder and over the piston to collect the cuttings, then remove the ridge and/or deposits from the upper edge of the cylinder bore with a ridge remover.

9. Turn crankshaft until that piston is at top dead center (TDC), remove cloth and cuttings.



CAUTION

Make sure none of the cuttings fall into the water jacket (A), crankcase breather passageway (B), or lower rocker arm area (C, Figure 81).

10. Repeat for the other cylinder.

11. Rotate the crankshaft until the piston being removed is at bottom dead center (BDC).

12. Remove the bearing cap nuts and bearing cap (Figure 82). Immediately after removal, mark the cap with a L or R so it will be installed on the correct connecting rod.

WARNING

Protect your hands while working in the lower cylinder block area as there are a lot of sharp edges, especially in the area of rod cap removal (Figure 83).

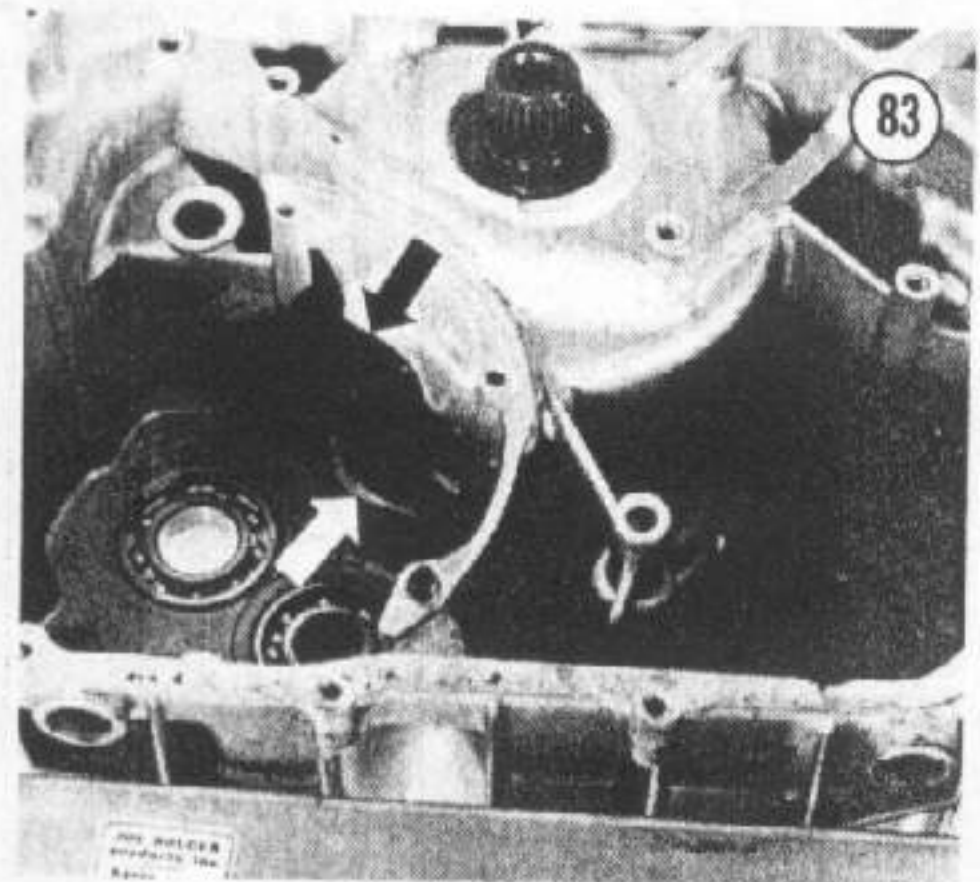
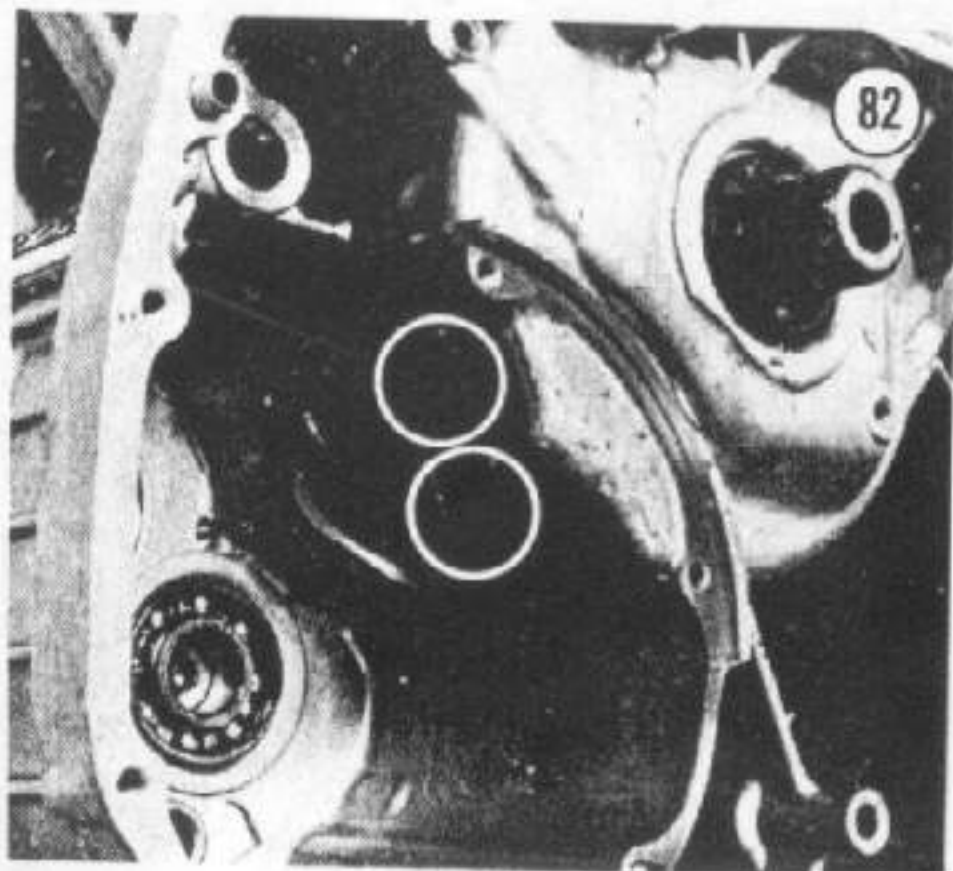
13. Slowly rotate the crankshaft until the piston is at TDC. Push up on the rod studs enough to push the piston out of the bore so it can be withdrawn from the top. Remove the piston/rod assembly.

14. Repeat Steps 11-13 for the other piston.

15. Remove bearing inserts from the connecting rods and bearing caps. Mark the backs of the bearings with the correct cylinder (L or R) and whether they were upper or lower bearings.

CAUTION

Bearing inserts may be reused if they are in good condition, but they must be re-installed in their original position.



4.10.2

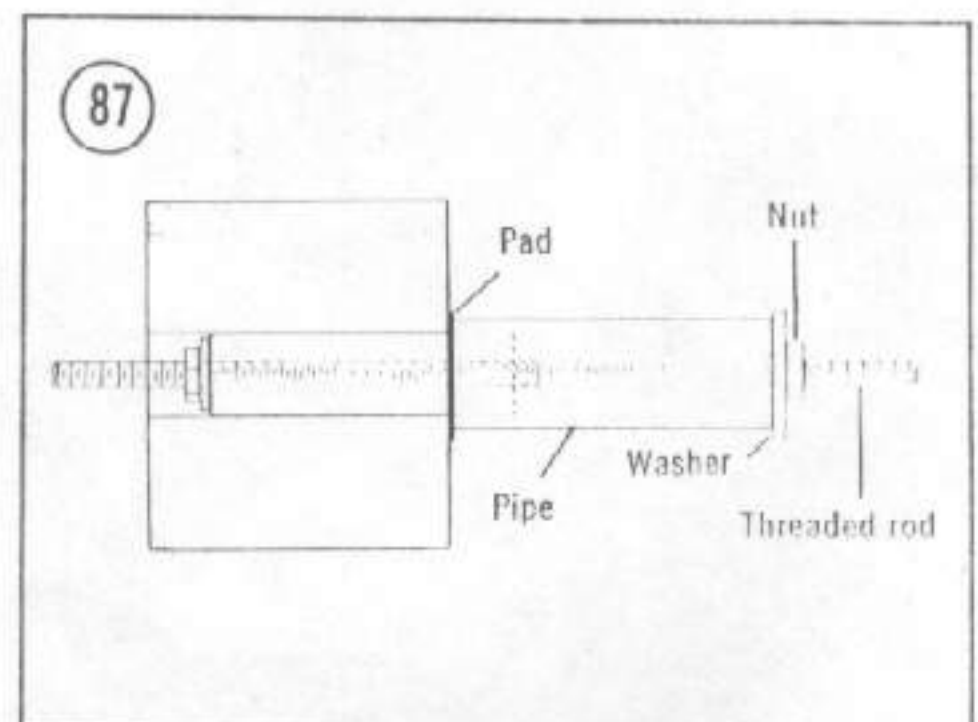
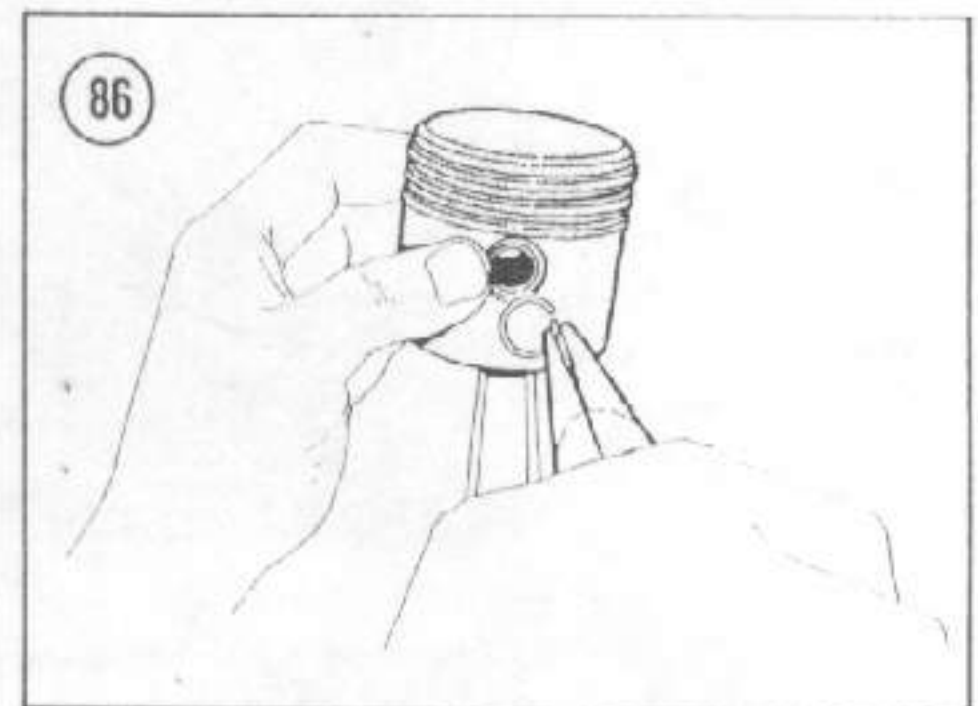
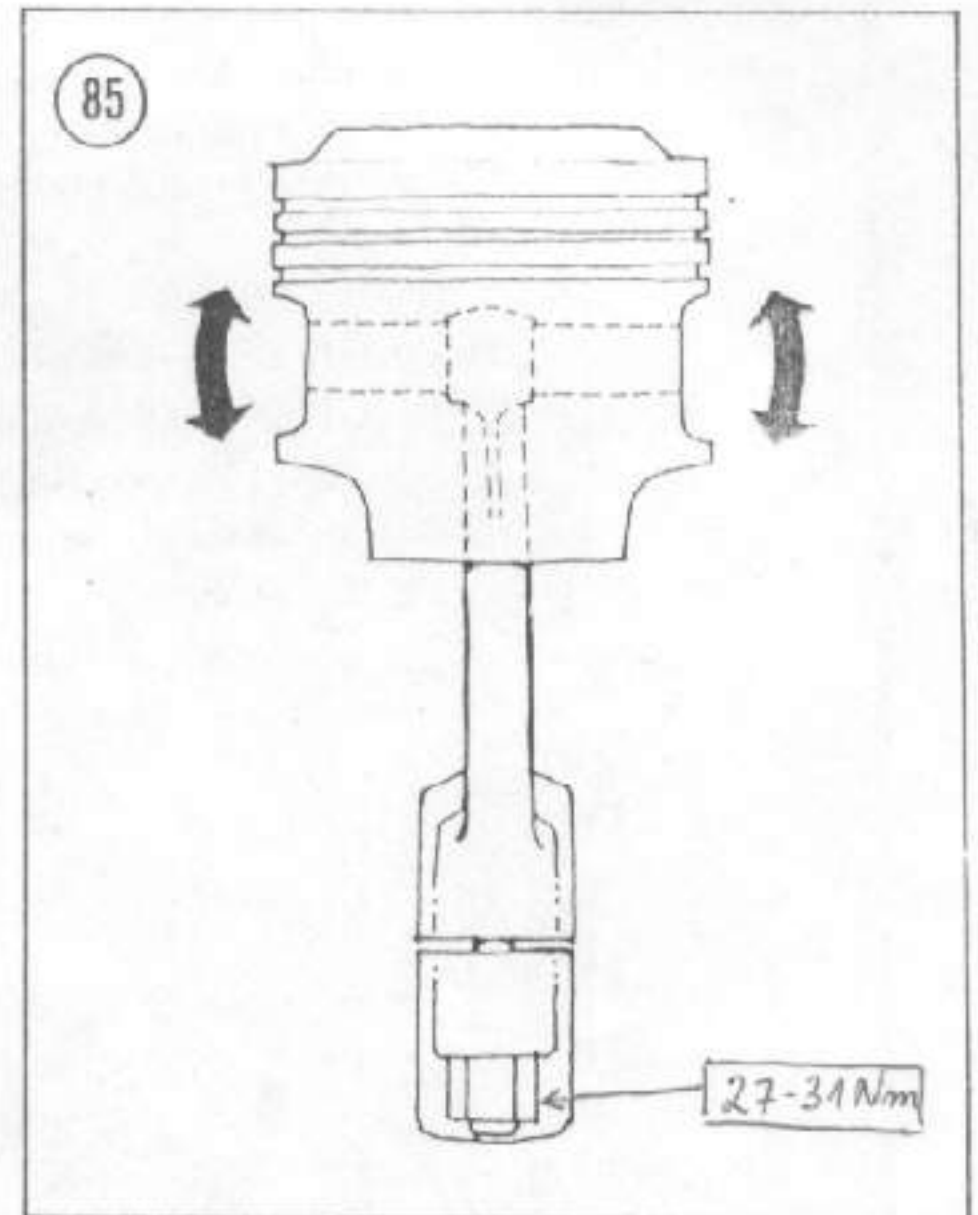
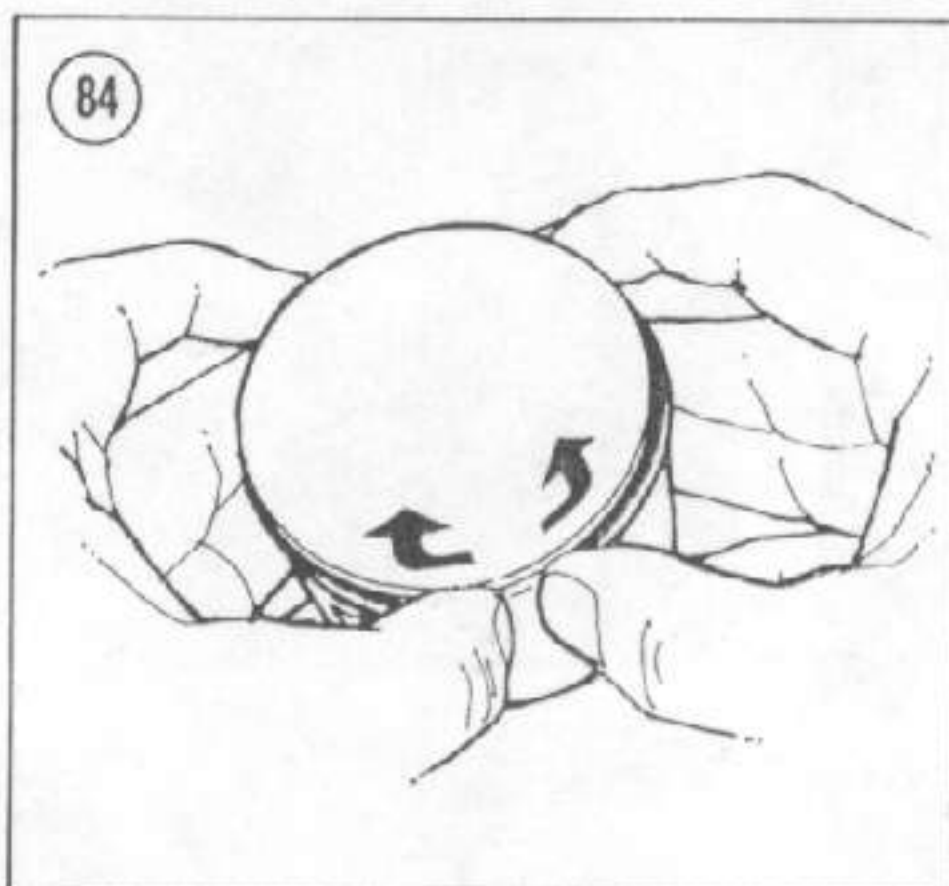
Disassembly

1. Remove the top ring first by spreading the ends with your thumbs just enough to slide it up over the piston (**Figure 84**). Repeat for the remaining rings.
2. Before removing the piston, hold the rod tightly and rock the piston as shown in **Figure 85**. Any rocking motion (do not confuse with the normal sliding motion) indicates wear on the wrist pin, rod bushing, pin bore, or more likely, a combination of all three. Mark the piston, pin, and rod so that they will be reassembled into the same set.
3. Remove the circlips from the wrist pin bores (**Figure 86**).
4. Heat the piston and pin with a small butane torch. The pin will probably drop right out. If not, heat the piston to about 140°F (60°C), i.e., until it is too warm to touch, but not excessively hot. If the pin is still difficult to push out, use a homemade tool as shown in **Figure 87**.

4.10.3

Piston Inspection

1. Carefully clean the carbon from the piston crown with a chemical remover or a soft scraper. *Do not* remove or damage the carbon ridge around the circumference of the piston above the top ring. If the pistons, rings, and cylinders are found to be dimensionally correct and can be reused, removal of the carbon ring from the tops of pistons or the carbon ridges from the tops of cylinder will promote excessive oil consumption.



WARNING

The rail portions of the oil scraper can be very sharp. Be careful when handling them in order to avoid cut fingers.

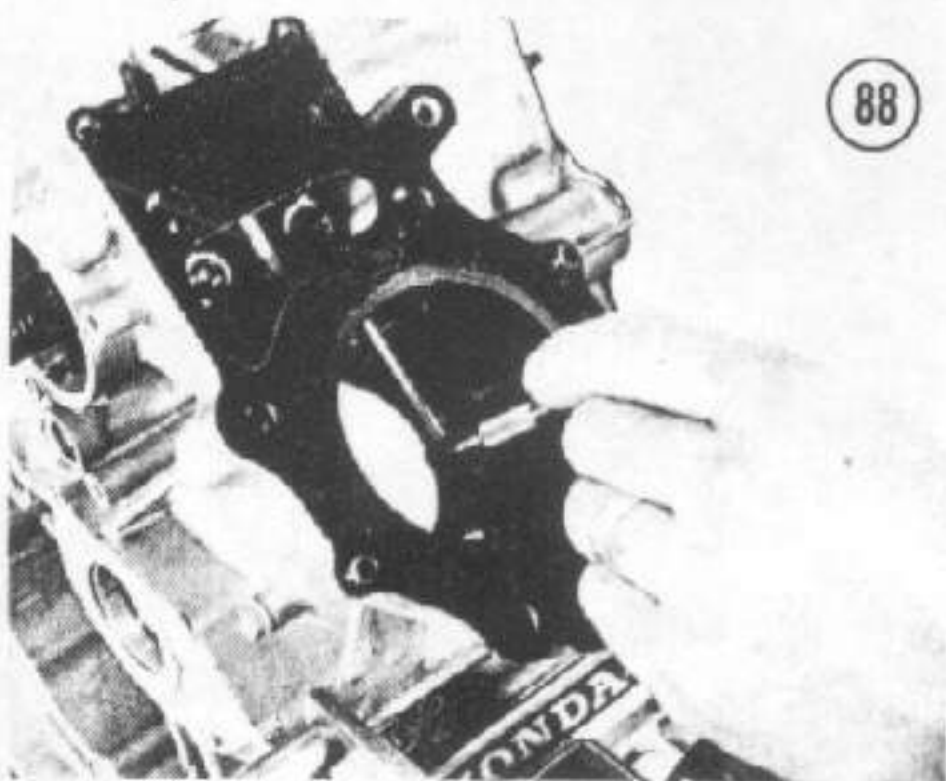
CAUTION

Do not wire brush piston skirts.

2. Examine each ring groove for burrs, dented edges, and wide wear. Pay particular attention to the top compression ring groove, as it usually wears more than the others.
3. Measure piston-to-cylinder clearance as described under *Piston Clearance* in this chapter.
4. If damage or wear indicates piston replacement, select a new piston as described under *Piston Clearance* in this chapter.
5. Measure any parts marked in Step 2 of the *Piston Removal* procedure with a micrometer and dial bore gauge to determine which part or parts are worn. Check against measurements given in **Table 6**. Any machinist can do this for you if you do not have micrometers. Replace piston/pin set as a unit if either or both are worn.

4.10.4**Piston Clearance**

1. Make sure the piston and cylinder walls are clean and dry.
2. Measure the inside diameter of the cylinder bore at a point $\frac{1}{2}$ in. (13mm) from the upper edge with a bore gauge (**Figure 88**).
3. Measure the outside diameter of the piston at a point $\frac{3}{8}$ in. (15mm) from the lower edge of



the piston 90° to the piston pin axis (**Figure 89**). Check against measurement given in **Table 6**.

4.10.5**Connecting Rod Inspection**

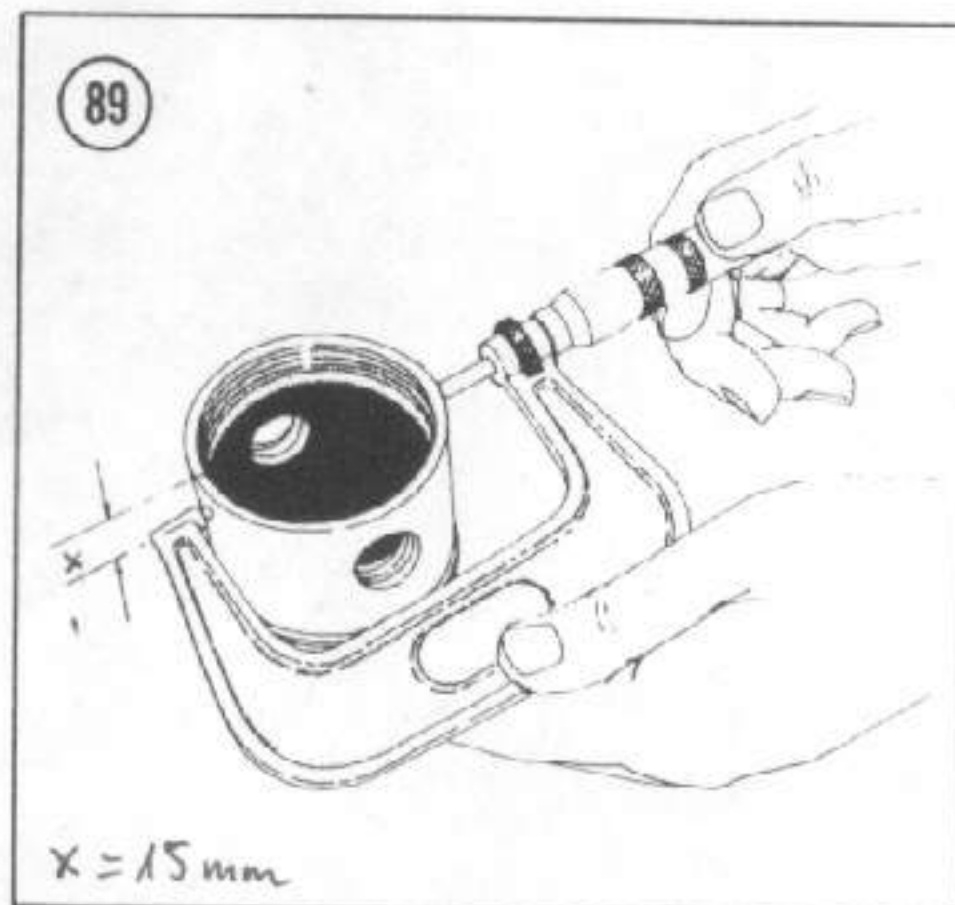
1. Check each rod for obvious damage such as cracks and burns.
2. Check the piston pin bushing for wear or scoring.
3. Take the rods to a machine shop and have them check alignment for twisting and bending.
4. Examine the bearing inserts for wear, scoring, or burning. They are reusable if in good condition. Make a note of the bearing size (if any) stamped on the back of the insert if the bearing is to be discarded; a previous owner may have used undersize bearings.
5. Check bearing clearance and connecting rod side play as described under *Connecting Rod Bearing and Crankpin Inspection*.

4.10.6**Connecting Rod Bearing and Crankpin Inspection**

1. Due to the confined space of the cylinder block in the area of the connecting rod cap, it is suggested that the crankshaft be removed as described under *Crankshaft Removal/Installation* in this chapter.
2. Install bearing inserts in the rod and cap.

CAUTION

If the old bearings are reused, be sure that they are installed in their exact original locations.



3. Wipe bearing inserts and crankpins clean. Check again that inserts and crankpins are in good condition.
4. Place a piece of Plastigage on one crankpin parallel to the crankshaft.
5. Install rod cap and tighten nuts to 20-23 ft.-lb. (27-31 N•m).

CAUTION

Do not rotate crankshaft while Plastigage is in place.

6. Remove rod cap.
7. Measure width of flattened Plastigage according to the manufacturer's instructions. Measure at both ends of the strip. A difference of 0.001 in. (0.025mm) or more indicates a tapered crankpin, indicating that the crankshaft must be reground or replaced.
8. Reassemble the connecting rod (separate from crankshaft) with the bearings in place. Measure bearing ID with inside micrometers.
9. Measure the OD of the crankpin journal with micrometers. Also check the crankpin size code

letter. The inner letter (Figure 90) is for the crankpin journals (outer letters are for the main journals).

10. Select new bearings by cross referencing the crankpin journal OD (and letter code), horizontal column **Table 1**, to the dimension of the ID of the rod bearing, vertical column **Table 1**. Where the two columns intersect, the new replacement bearing color is indicated. **Table 2** gives the bearing color and thickness.

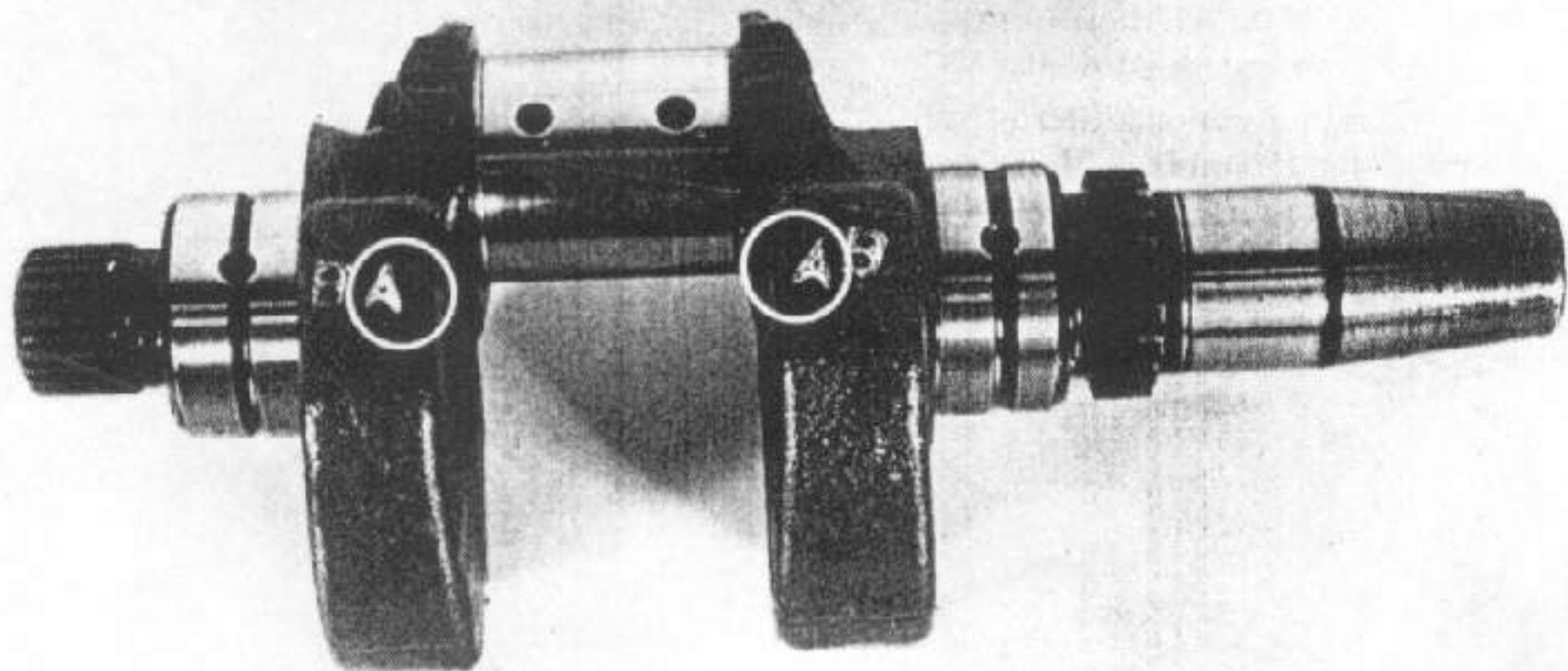
11. After new bearings are installed, the clearance should be checked. Recommended clearance for new bearings should be 0.008-0.0017 in. (0.020-0.044mm). Used bearing clearance must not exceed 0.0031 in. (0.08mm).

12. Repeat Steps 8-11 for the other rod.

13. Measure the inside diameter of the small ends of the connecting rods with an inside dial gauge. Check against measurements given in **Table 6**.

14. Lubricate bearings and crankpins and install rods and rod caps onto the crankshaft. Tighten the nuts to 20-23 ft.-lb. (27-31 N•m).

90



15. Rotate the crankshaft to be sure bearings are not too tight.

16. Insert feeler gauge between connecting rods. Side clearance should be between 0.006-0.007 in. (0.15-0.17mm). Replace any rod that exceeds the service limit of 0.014 in. (0.350mm).

17. Remove the connecting rods.

4.10.7

Assembly

1. Coat the connecting rod bushing, piston pin, and piston holes with assembly lubricant.

2. Place the piston over the connecting rod. If you are reusing the same pistons and connecting rods, match the pistons to the rod from which it came and orient it in the same way.

CAUTION

With the oil hole in the connecting rod facing up, the left-hand (L) piston must be assembled with the IN mark to the left side of the connecting rod and the right-hand (R) piston must be assembled with the IN mark to the right side of the con-

necting rod. See Figure 91. Failure to do so will result in major engine damage.

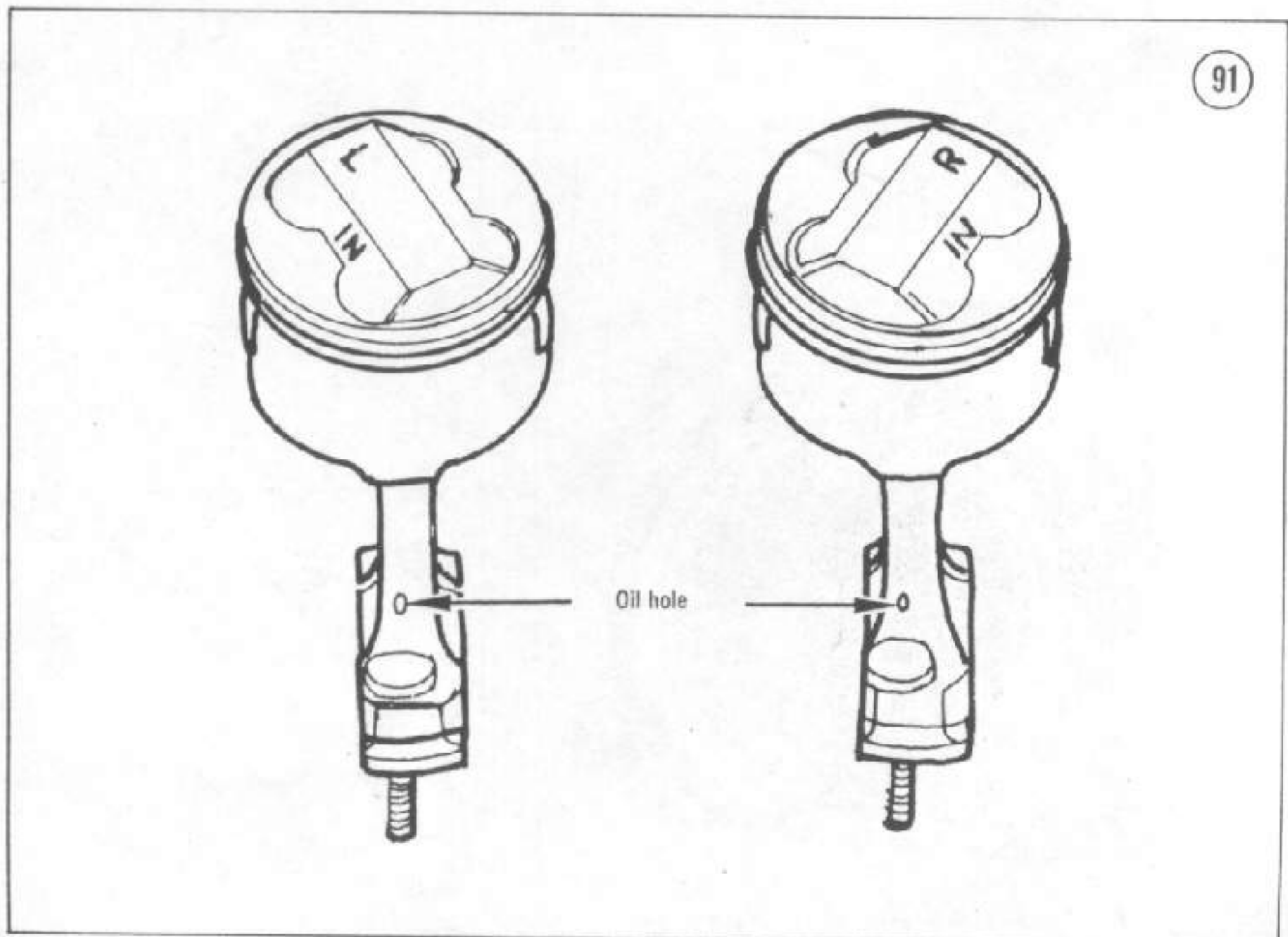
3. Insert the piston pin and tap it with a plastic mallet until it starts into the connecting rod bushing. If it does not slide in easily, heat the piston until it is too warm to touch but not excessively hot (140°F or 60°C). Continue to drive the piston in while holding the piston so that the rod does not have to take any shock. Otherwise, it may be bent. Drive the pin in until it is centered in the rod. If pin is still difficult to install, use the homemade tool (Figure 87) but eliminate the piece of pipe.

4. Install rings as described in Steps 3-8 under *Piston Ring Replacement*.

5. Insert bearing shells in connecting rod in the bearing cap with the locating tangs locked into place.

CAUTION

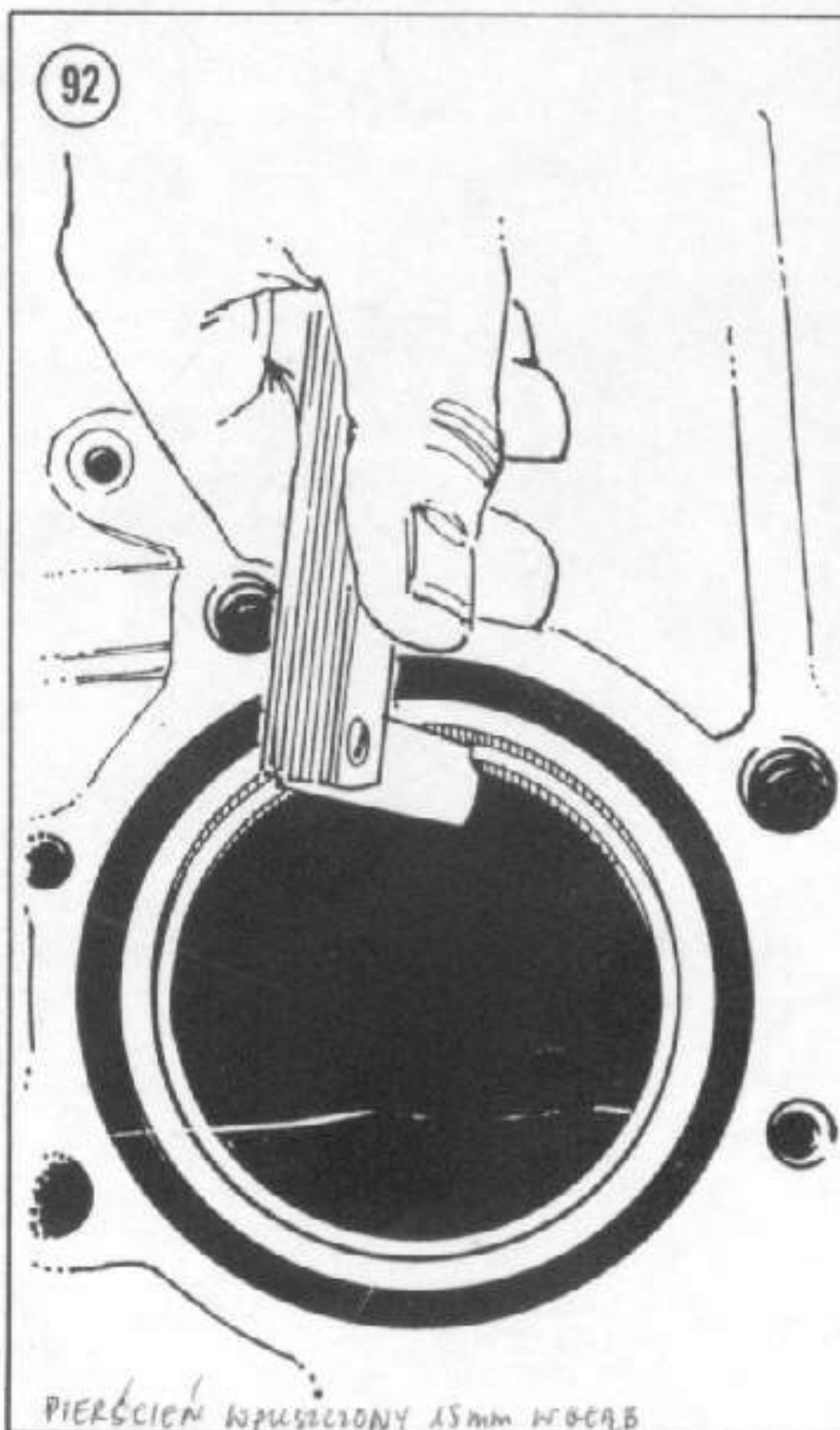
*If old bearings are reused, be sure they are installed in their exact original locations. Refer to marks made in Step 15, *Pistons and Connecting Rods-Removal*.*



4.10.8

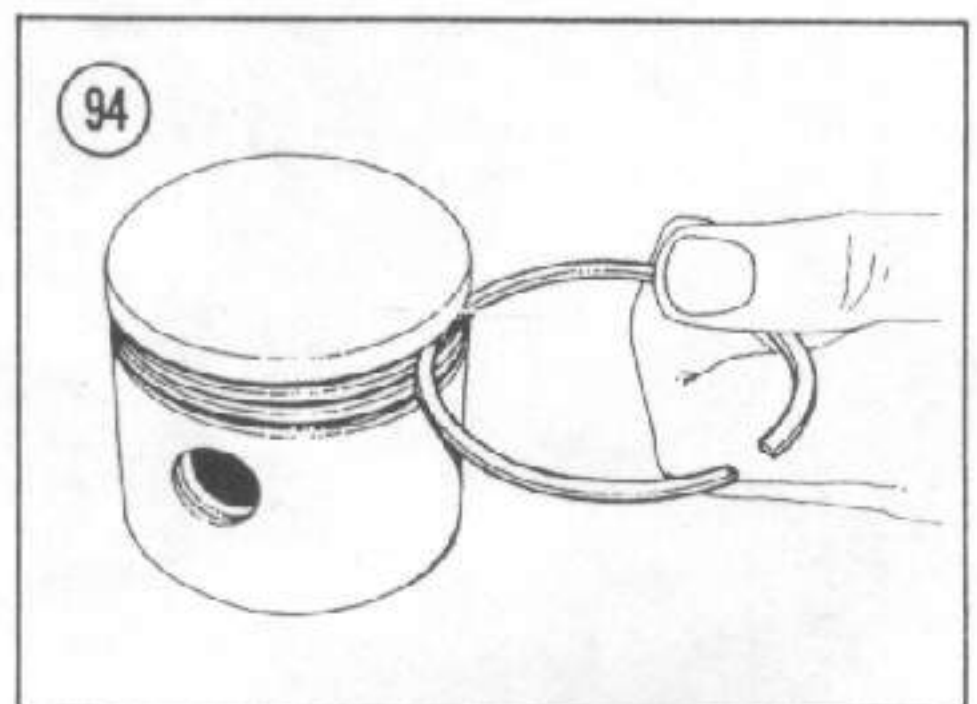
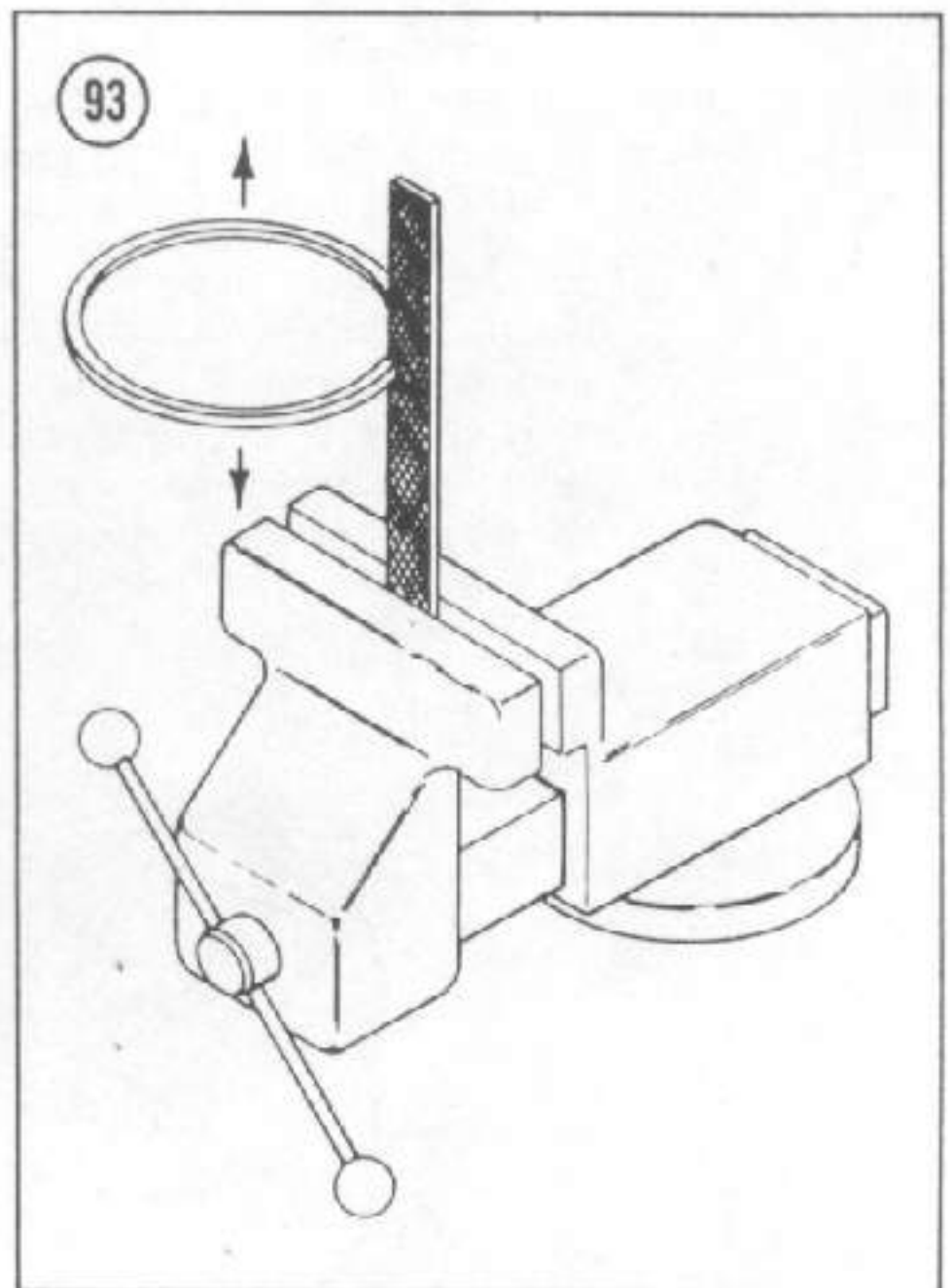
Piston Ring Replacement

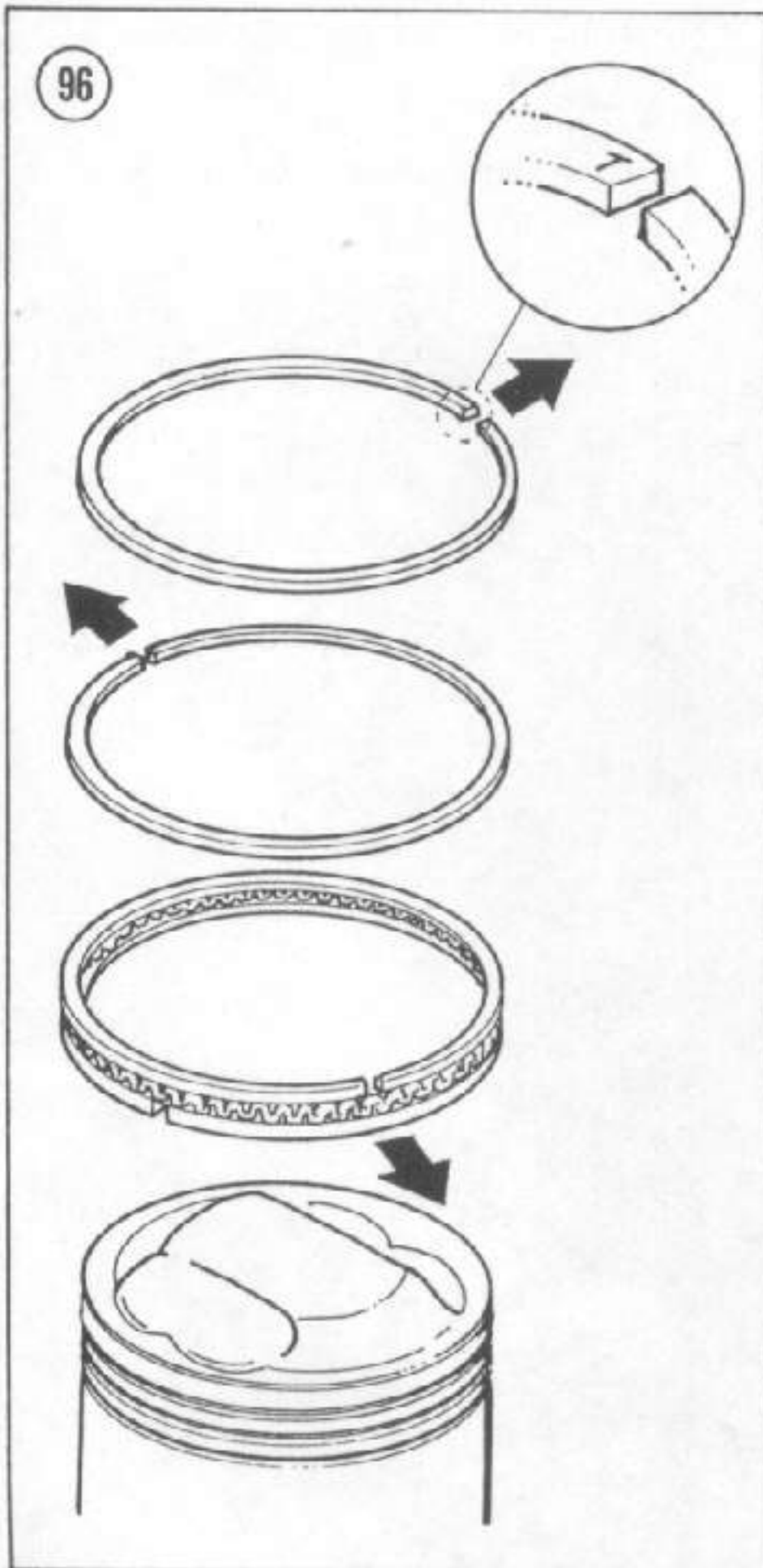
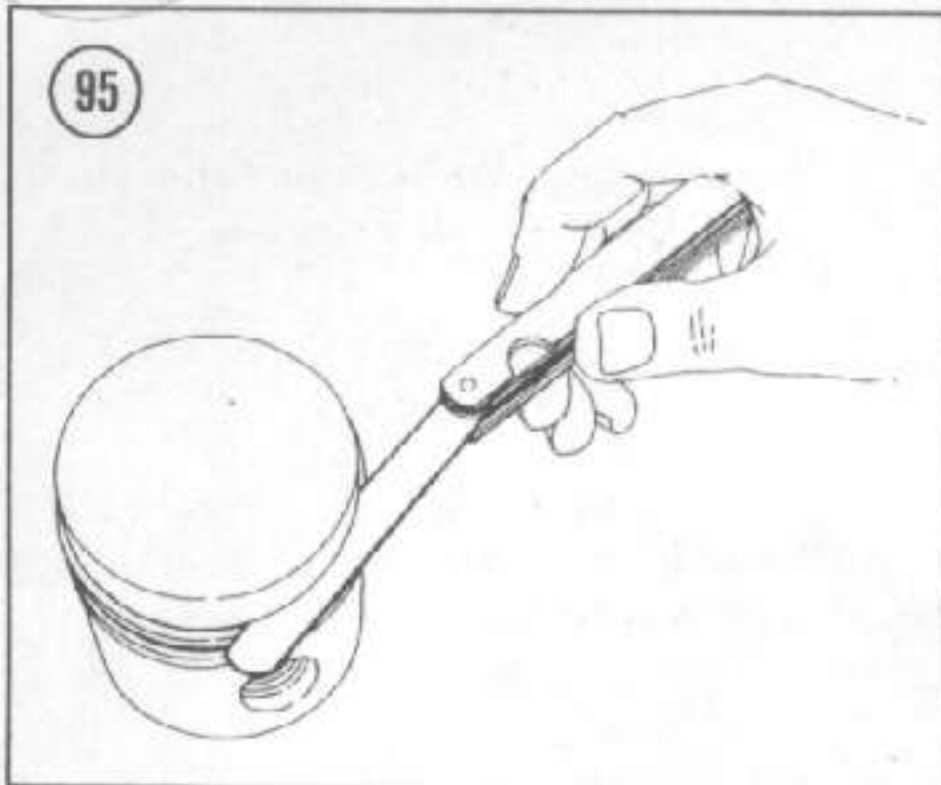
1. Remove old rings with a ring expander tool or by spreading the ring ends with your thumbs and lifting the rings up evenly (**Figure 84**).
2. Carefully remove all carbon from the ring grooves. Inspect grooves carefully for burrs, nicks, or broken and cracked lands. Recondition or replace piston if necessary.
3. Check end gap of each ring. To check ring, insert the ring into the bottom of the cylinder bore and square it with the wall by tapping with the piston. The ring should be in about $\frac{5}{8}$ in. (15mm). Insert a feeler gauge as shown in **Figure 92**. Compare gap with **Table 6**. If the gap is smaller than specified, hold a small file in a vise, grip the ends of the ring with your fingers, and enlarge the gap. See **Figure 93**.
4. Roll each ring around its piston groove as shown in **Figure 94** to check for binding. Minor binding may be cleaned up with a fine cut file.



NOTE: Install all rings with their markings facing up.

5. Install oil ring in oil ring groove with a ring expander tool or spread the ends with your thumbs.
6. Install 2 compression rings carefully with a ring expander tool or spread the ends with your thumbs.
7. Check side clearance of each ring as shown in **Figure 95**. Compare with specifications in **Table 6**.





8. Distribute ring gaps around piston as shown in **Figure 96**. The important thing is that the ring gaps are not aligned with each other when installed.

4.10.9

Piston and Connecting Rod Installation

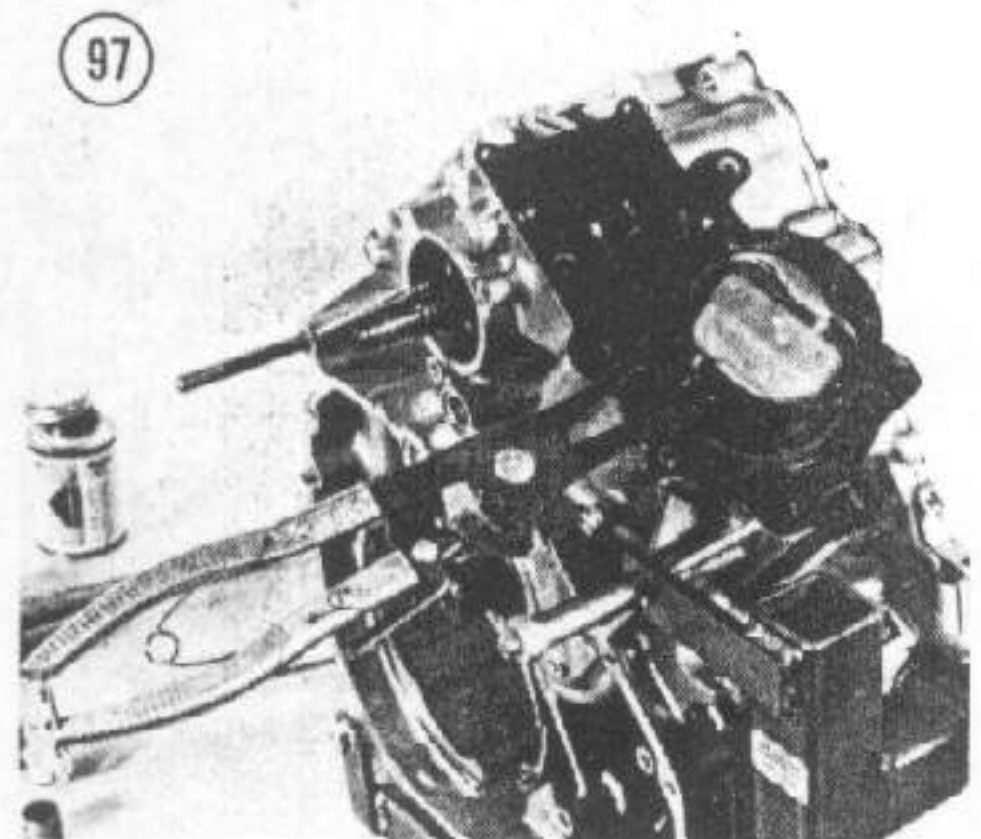
1. Install the crankshaft as described under *Crankshaft Installation* in this chapter.
2. Make certain that the rod bolt threads are clean, and lightly oil them.
3. Lubricate the rod bearings with molybdenum disulphide grease.
4. Rotate the crankshaft to TDC for the left-hand cylinder.
5. Lightly oil the cylinder bore and piston with clean engine oil.
6. Insert the piston/connecting rod assembly in through the top of the cylinder block.
7. Apply a ring compressor to the piston (**Figure 97**).

CAUTION

Install the piston with the IN mark to the rear of the engine.

8. Insert the piston into the cylinder while guiding the connecting rod onto the crankshaft journal.

NOTE: Jiggle the rod back and forth slightly so the sharp edge of the bearing insert will not gouge the crankshaft journal.



9. Install the connecting rod cap and nuts.

CAUTION

Be sure to install the correct rod cap, marked "L" during the removal steps.

10. Tighten the nuts in two or three steps to a final torque of 20-23 ft.-lb. (27-31 N•m).

WARNING

Protect your hands while working in the lower cylinder block area as there are a lot of sharp edges, especially in the area of the rod cap installation (Figure 83).

11. Repeat Steps 4-10 for the right-hand cylinder.

CAUTION

Before proceeding, rotate the crankshaft several revolutions with a wrench on the bolt shown in Figure 69. If there is any binding, stop. Determine the cause before assembling beyond this point.

12. Complete installation by reversing Steps 1-5, *Pistons and Connecting Rods — Removal* in this chapter.

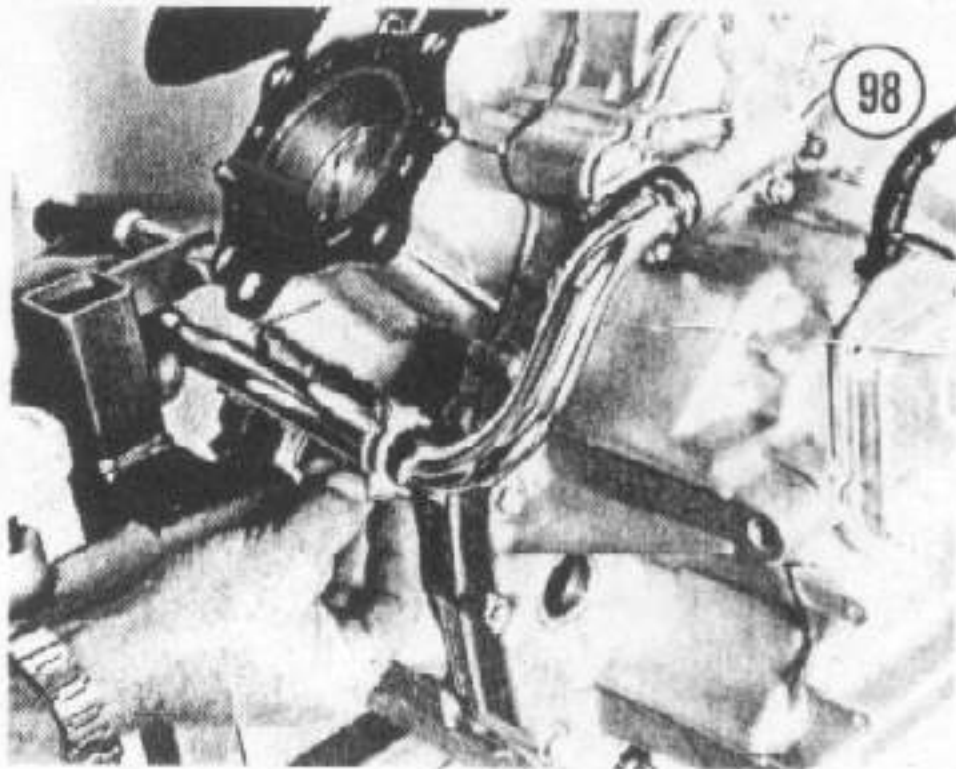
13. Fill the engine with the recommended type and quantity of engine oil and coolant. Refer to Chapter Three.

14. Start the engine and check for leaks.

4.10

ALTERNATOR

For removal of the alternator it is necessary to remove the engine from the frame and partially disassemble it.



4.11.1
Removal/Installation

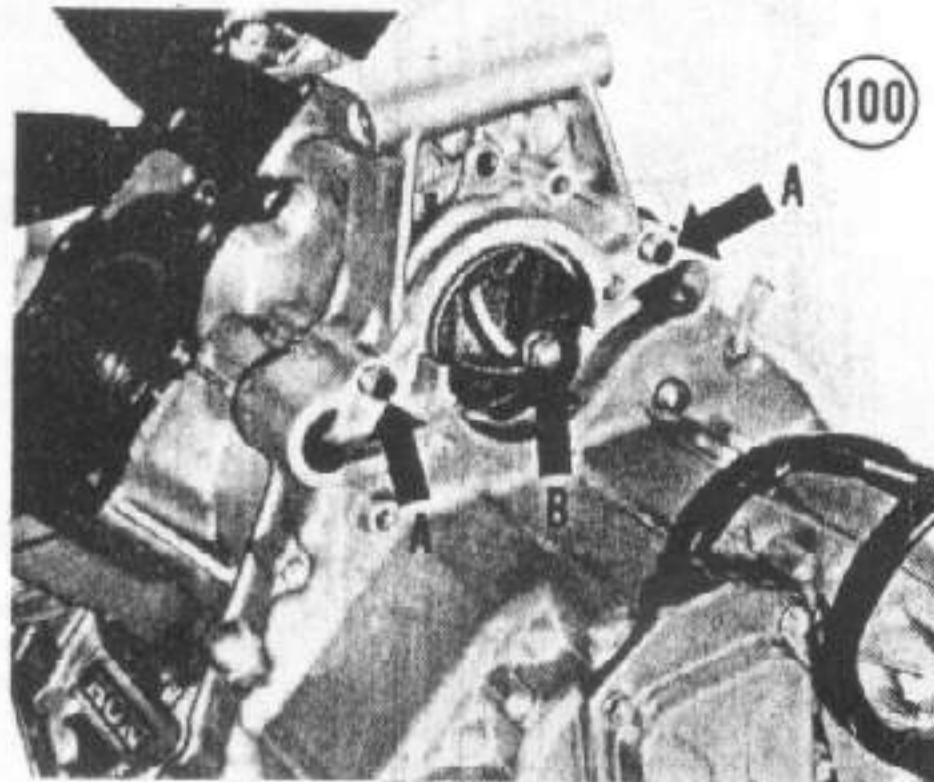
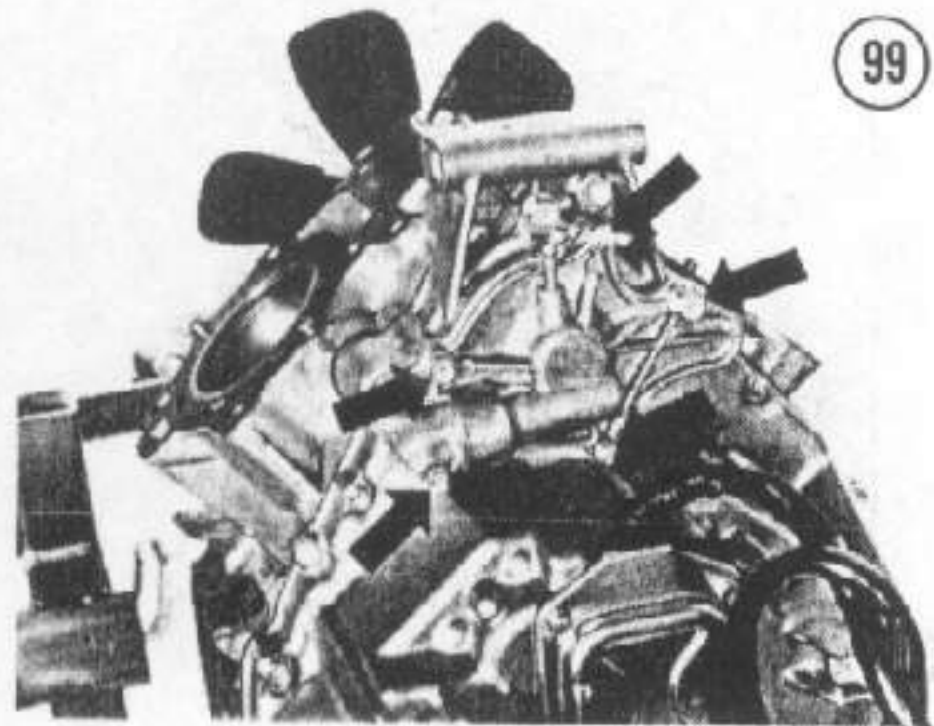
1. Remove the engine as described under *Engine Removal/Installation* in this chapter.

NOTE: The following figures are shown with the cylinder heads removed, it is not necessary to remove them for this procedure.

2. Remove the 2 clamps securing the water pipe to the cylinder block (Figure 98) and remove it.
3. Remove the 5 bolts securing the water pump housing (Figure 99) and remove it.

NOTE: Do not lose the 2 locating dowels (A, Figure 100).

4. Remove the cap nuts and copper washer (B, Figure 100) securing the water pump impeller and remove it.
5. Remove the 17 bolts securing the rear engine cover and remove it.



NOTE: Do not lose the 2 locating dowels and O-rings (Figure 101).

6. Remove the bolt (Figure 102) securing the alternator pulser rotor and remove it.

7. Remove the bolt (Figure 103) securing the alternator rotor (flywheel) to the crankshaft with a socket.

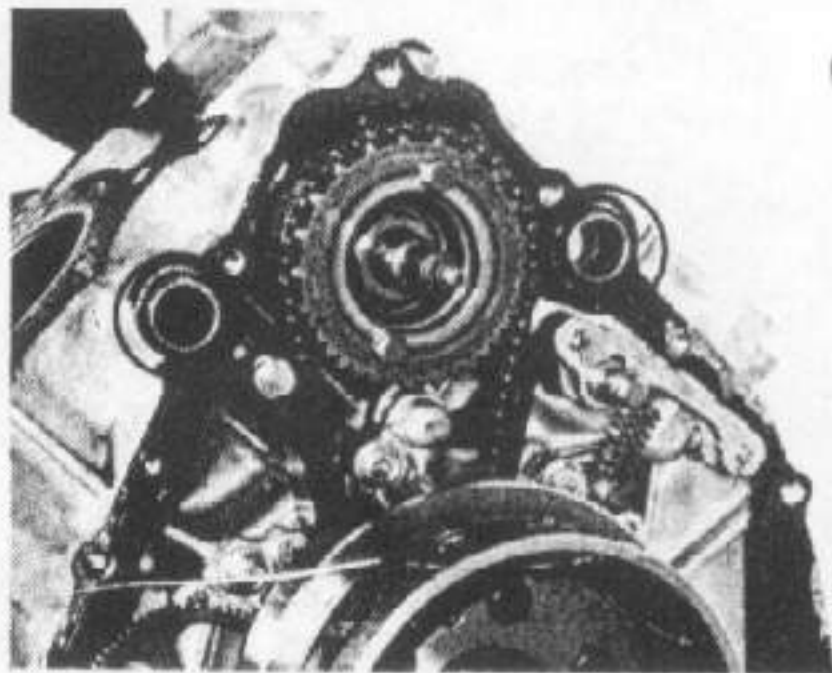
NOTE: To prevent the flywheel from turning while removing the bolt, secure it with a strap wrench as shown in Figure 104.

8. Screw a flywheel puller in all the way until it stops (Figure 105).

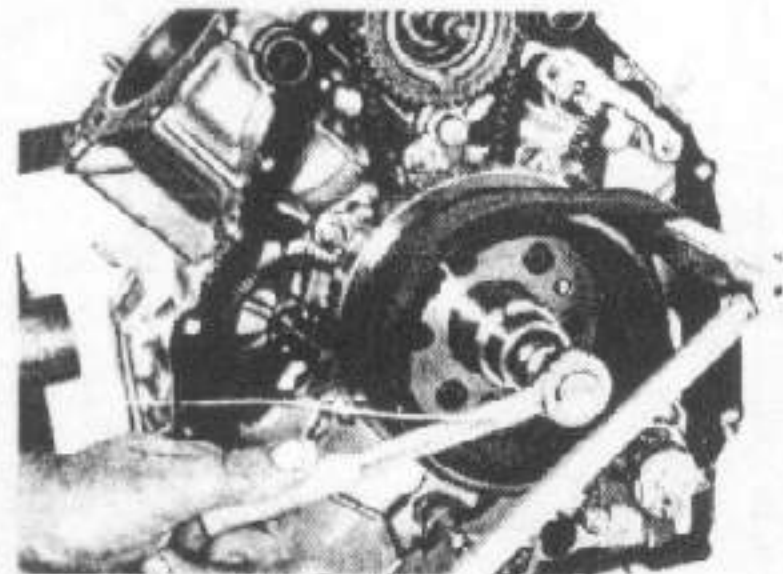
9. Rotate the puller clockwise until the flywheel disengages from the crankshaft. Remove the flywheel, starter gear (Figure 106) and the needle bearing (A, Figure 107).

CAUTION

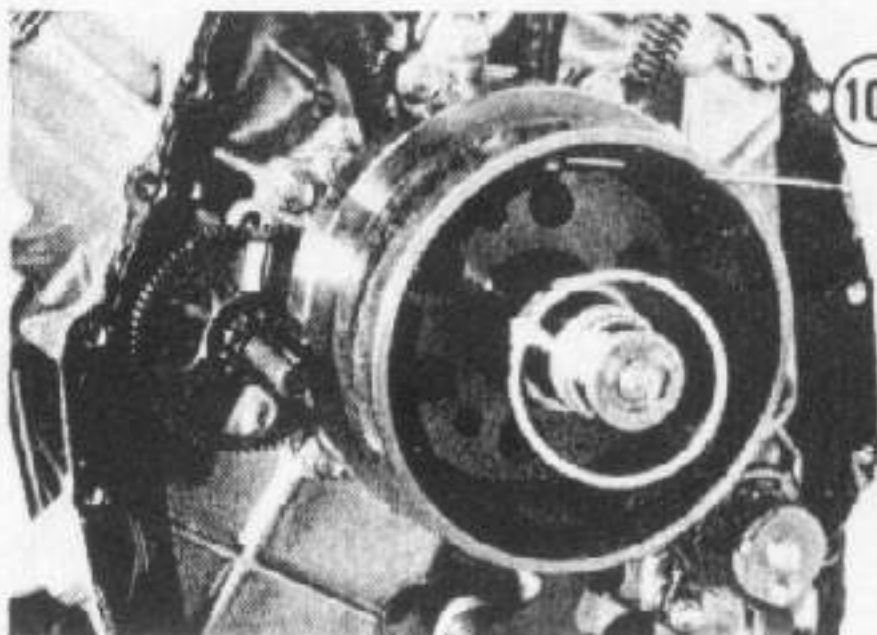
If the tensioner cover (B, Figure 107) on the bike does not look like the one shown, refer to detailed information, regarding factory replacement parts, at the beginning of the Camshaft section in this chapter.



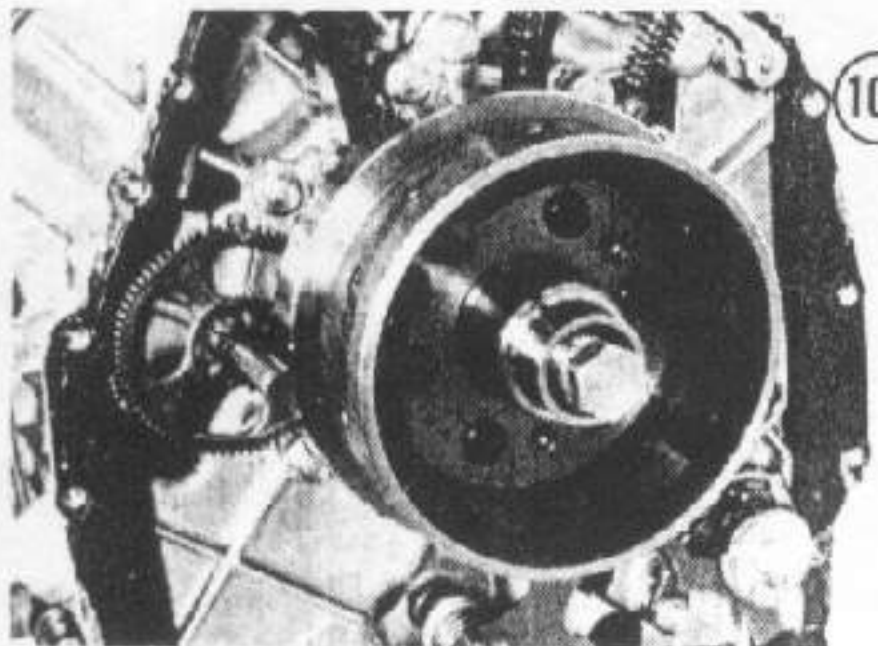
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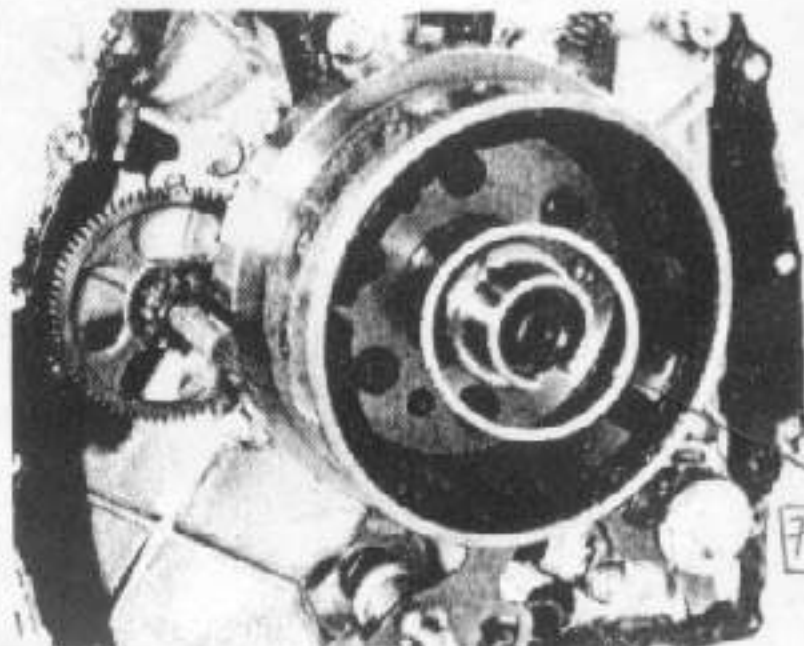
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102

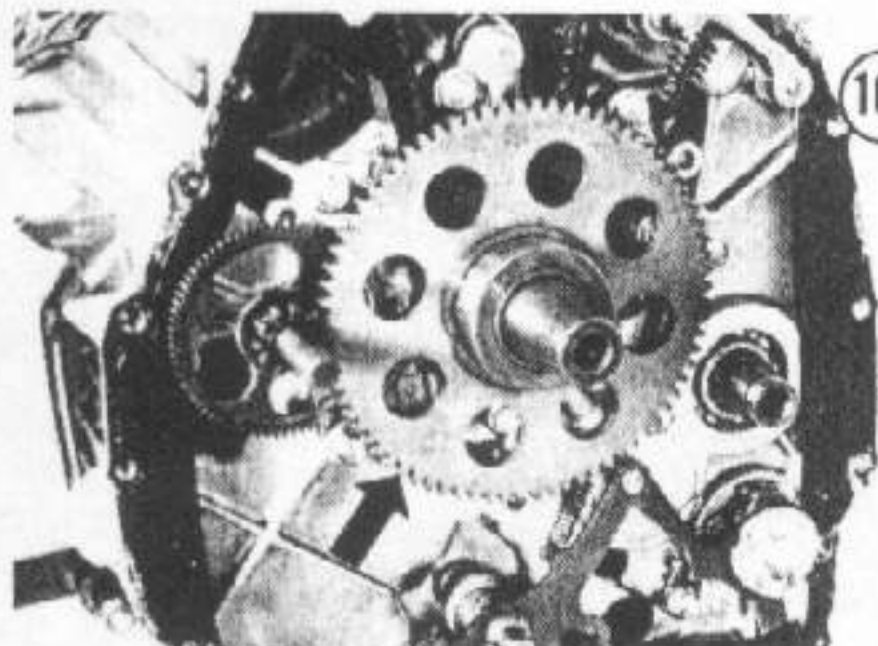


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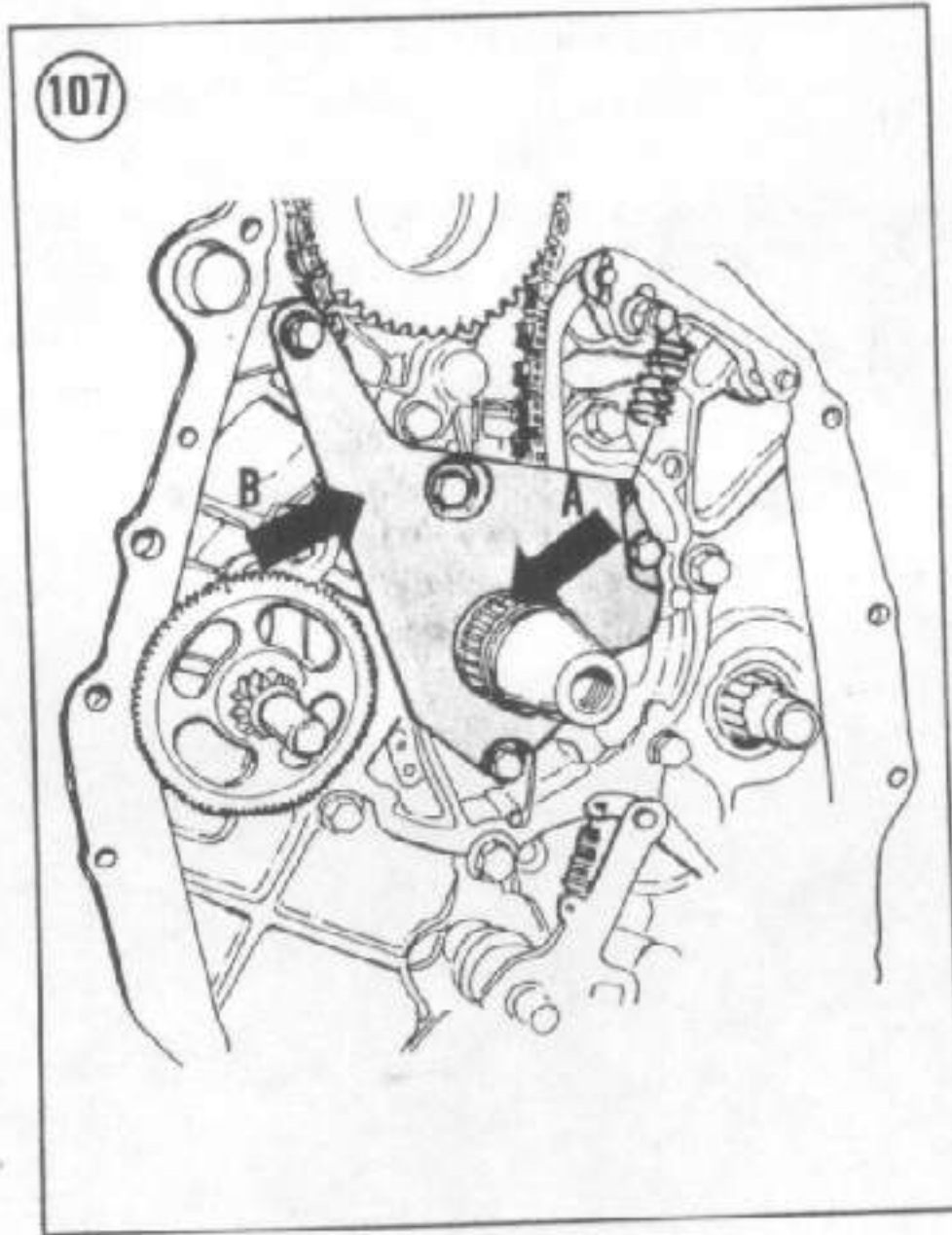
103

79-97Nm

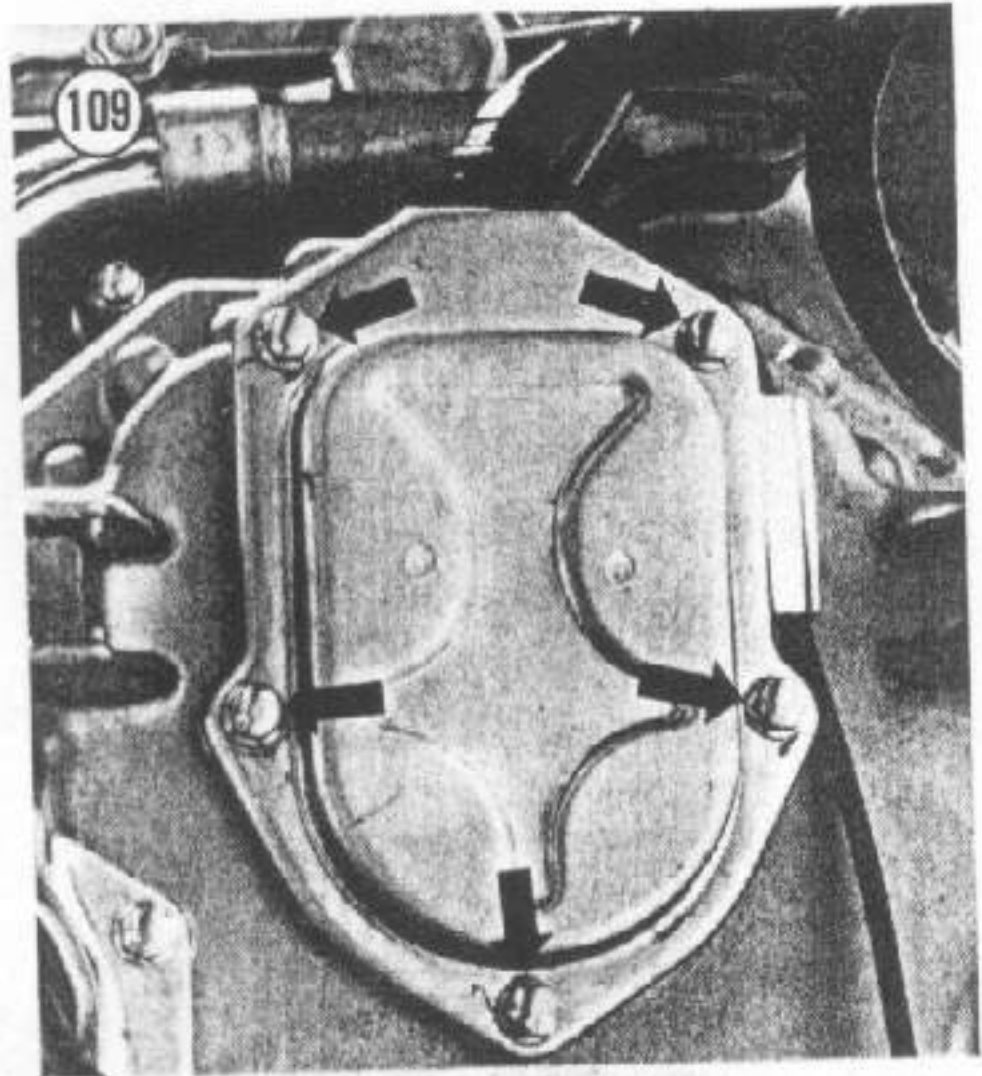
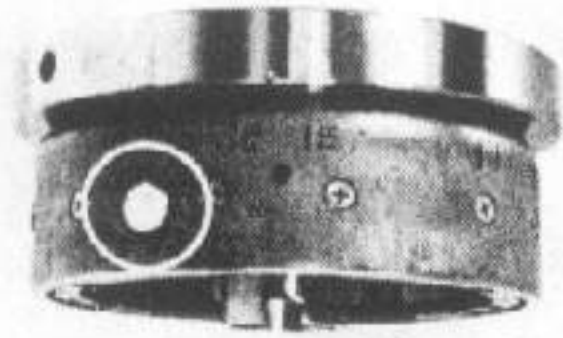


106

4



108

**CAUTION**

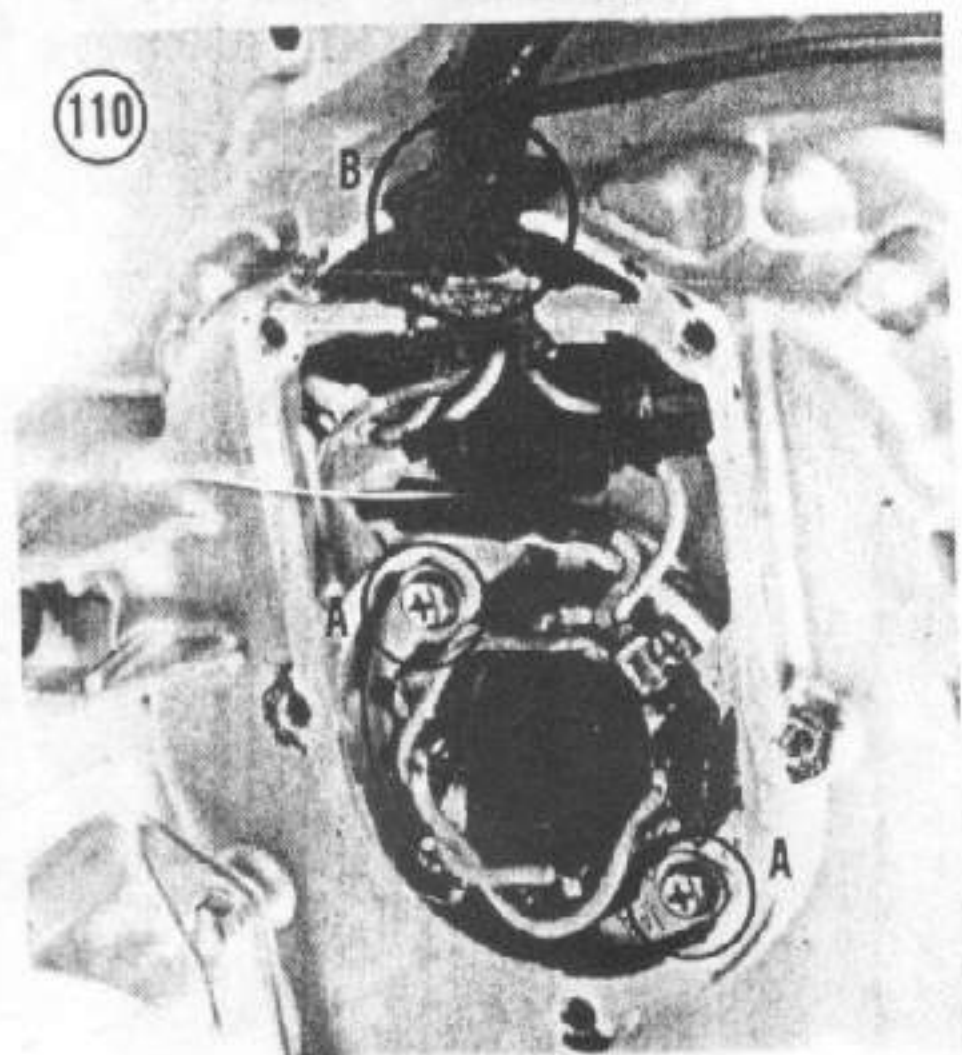
Be careful not to damage the pulser pickup (Figure 108) on the outer surface of the flywheel.

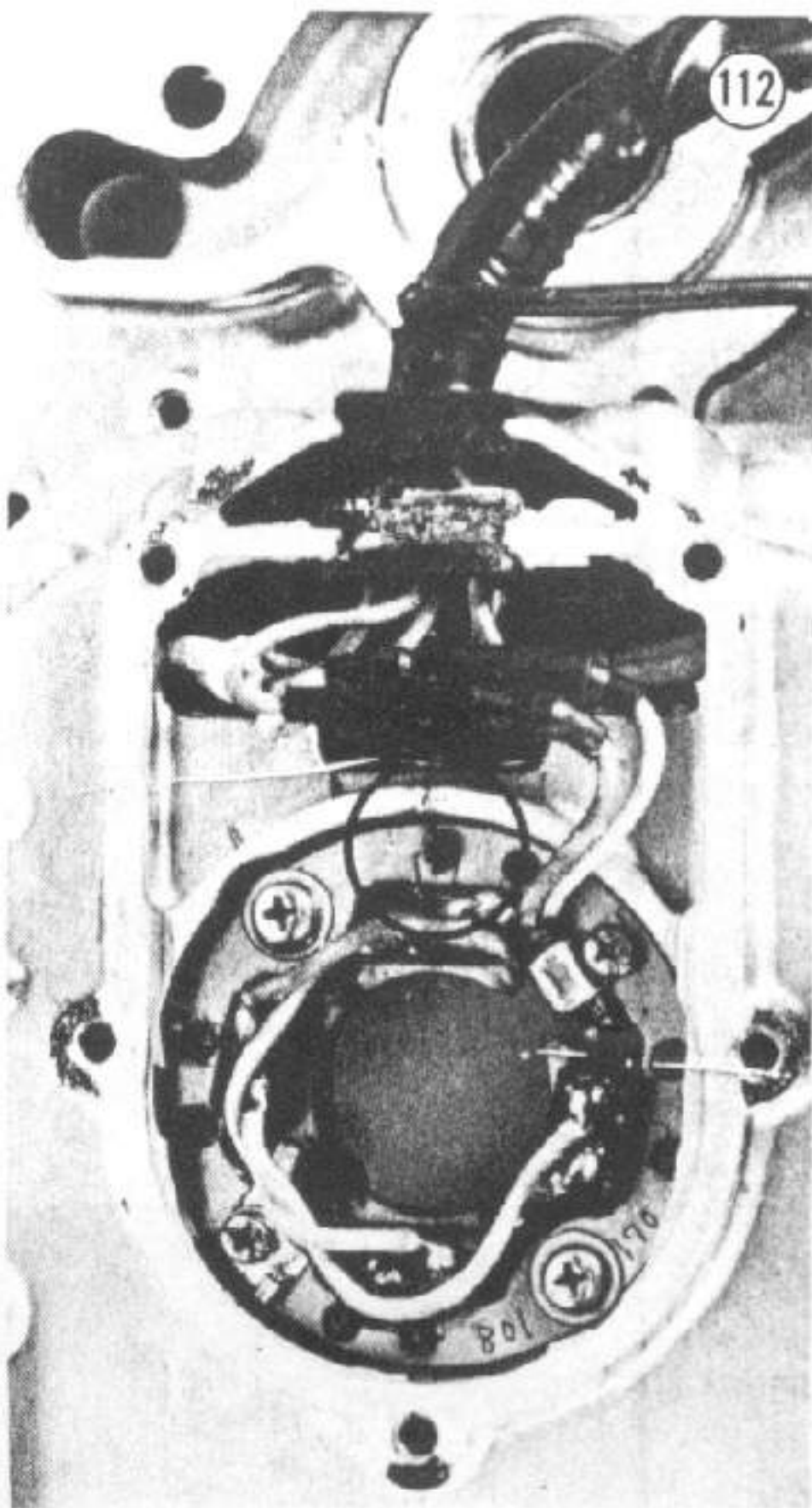
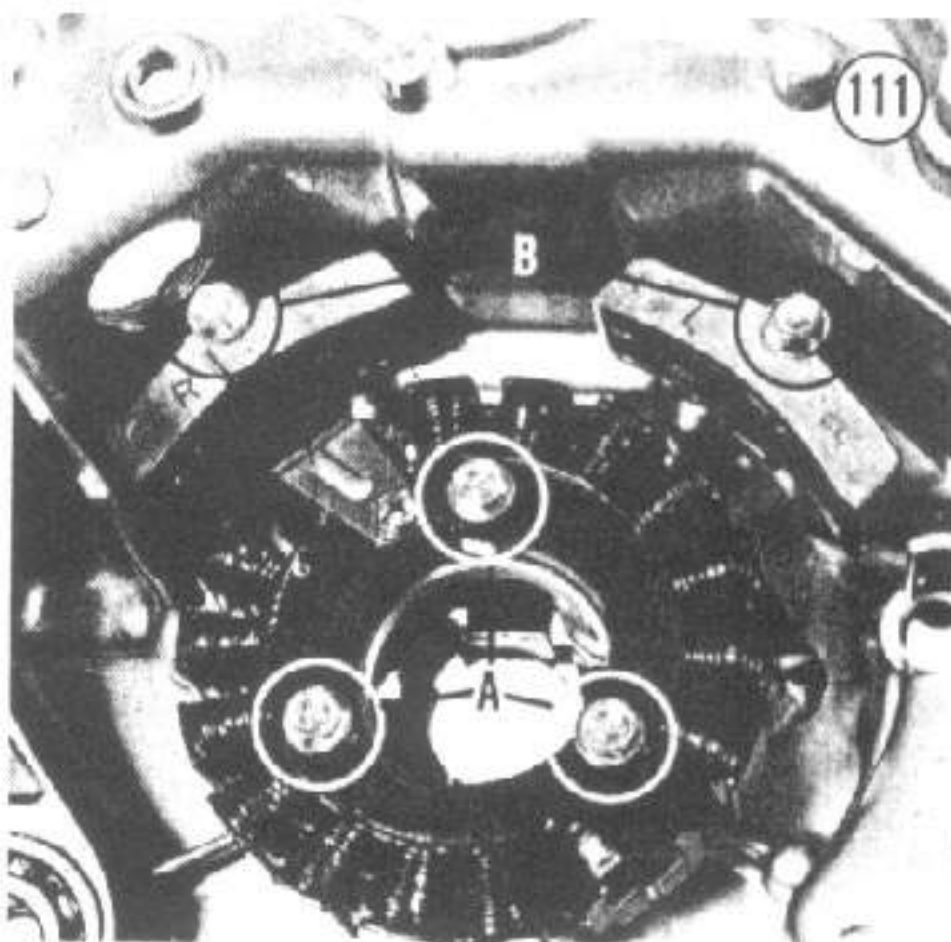
10. Remove the 5 bolts (Figure 109) securing the CDI pulser cover and remove it.
11. Disconnect the electrical wires at the pulser stator, remove the 2 screws (A, Figure 110) securing the pulser stator and remove it. Pull the rubber grommets (B, Figure 110) out of the rear engine cover.
12. Remove the 3 bolts (A, Figure 111) securing the alternator stator and the 2 bolts (B, Figure 111), securing the right and left pulsers.
13. Carefully pull the electrical wires through the hole in the rear engine cover.

CAUTION

Do not pull too hard on the stator as it may damage electrical connections where the wires attach to the stator.

14. Install by reversing these removal steps and secure the alternator rotor bolt to 58-72 ft.-lb. (79-97 N•m). Be sure that the Woodruff key, on the crankshaft, is in place and correctly seated prior to installing the rotor.





NOTE: To prevent the flywheel from turning while installing the bolt, secure it with a strap wrench as shown in Figure 104.

15. Be sure the rubber grommet (B, Figure 110) is securely in place and that none of the electrical wires are pinched between the stator and the rear engine cover. Make sure the wires are correctly routed.

16. Install the pulser stator and align the index mark on the stator and the rear engine cover (Figure 112).

NOTE: If the marks are not aligned properly, the ignition timing will be incorrect. Do not try to modify ignition timing by altering the alignment of these marks. This is not the purpose of these marks — they are to be always aligned correctly.

17. Install the pulsers with their holding tabs facing to the right-hand side, toward the timing inspection hole.

4.11.2

Inspection

The alternator rotor (flywheel) is permanently magnetized and cannot be remagnetized. If it is dropped, the magnetism can be lost. There is no way to check it except by replacing it with a good one.

4.12

OIL PUMP

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

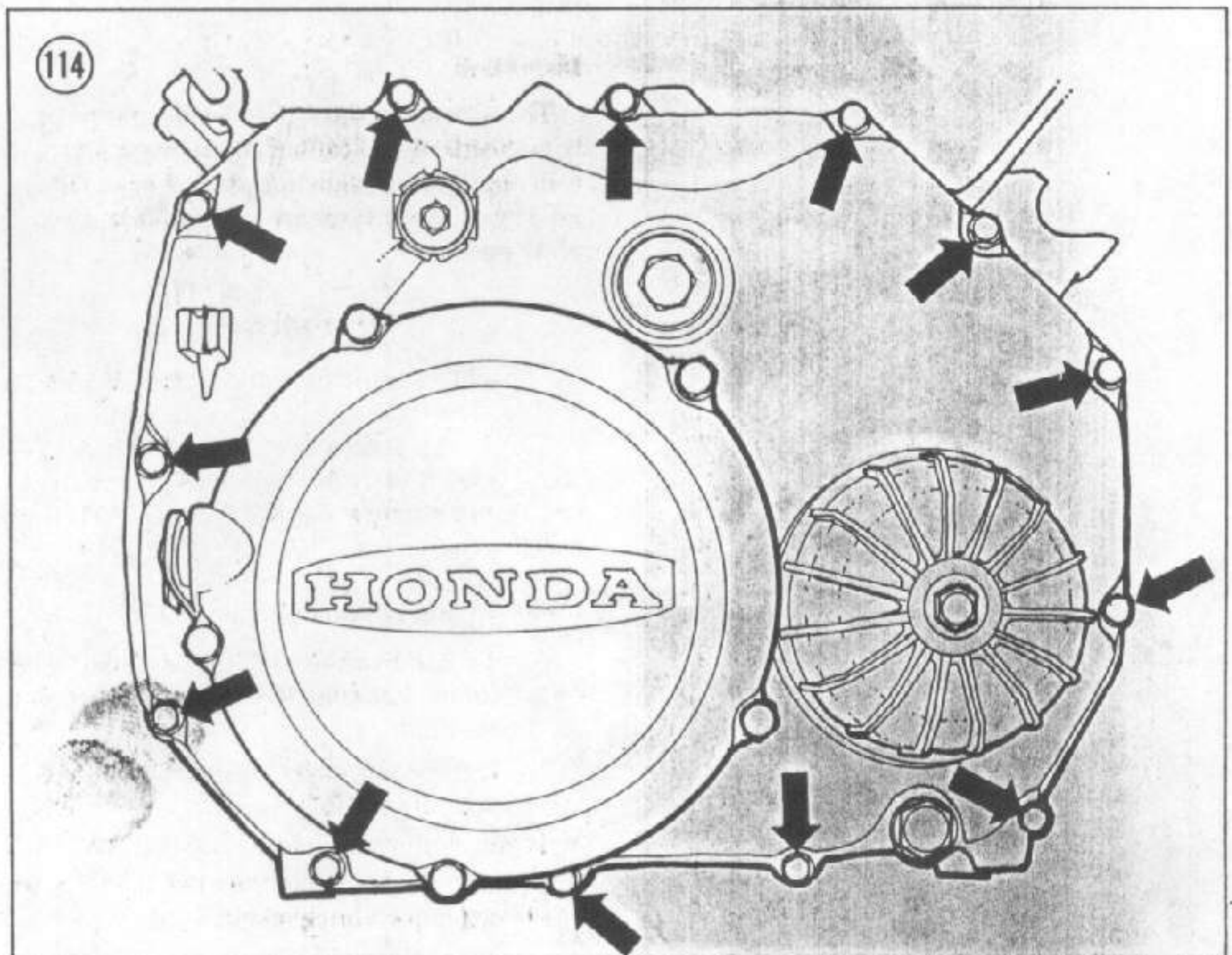
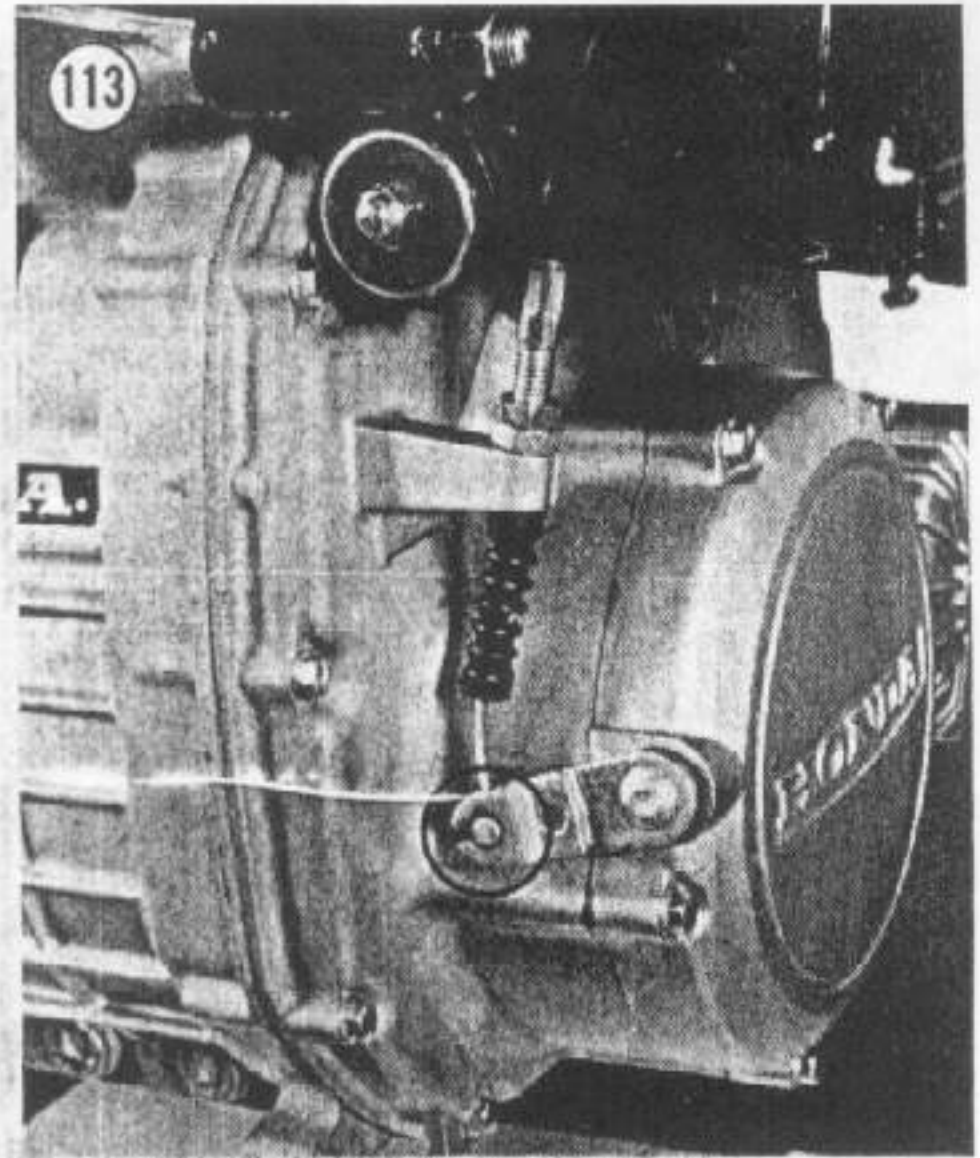
This sequence is shown with the engine and clutch assembly removed for clarity. It is not necessary to remove them to perform this procedure.

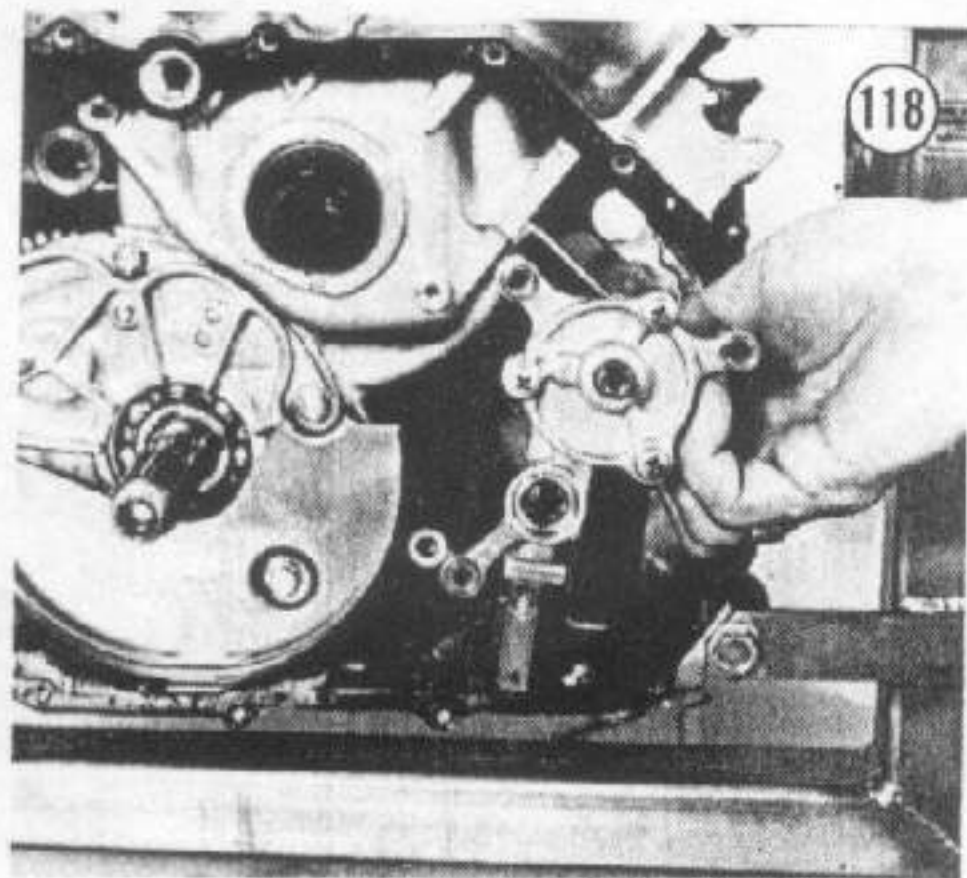
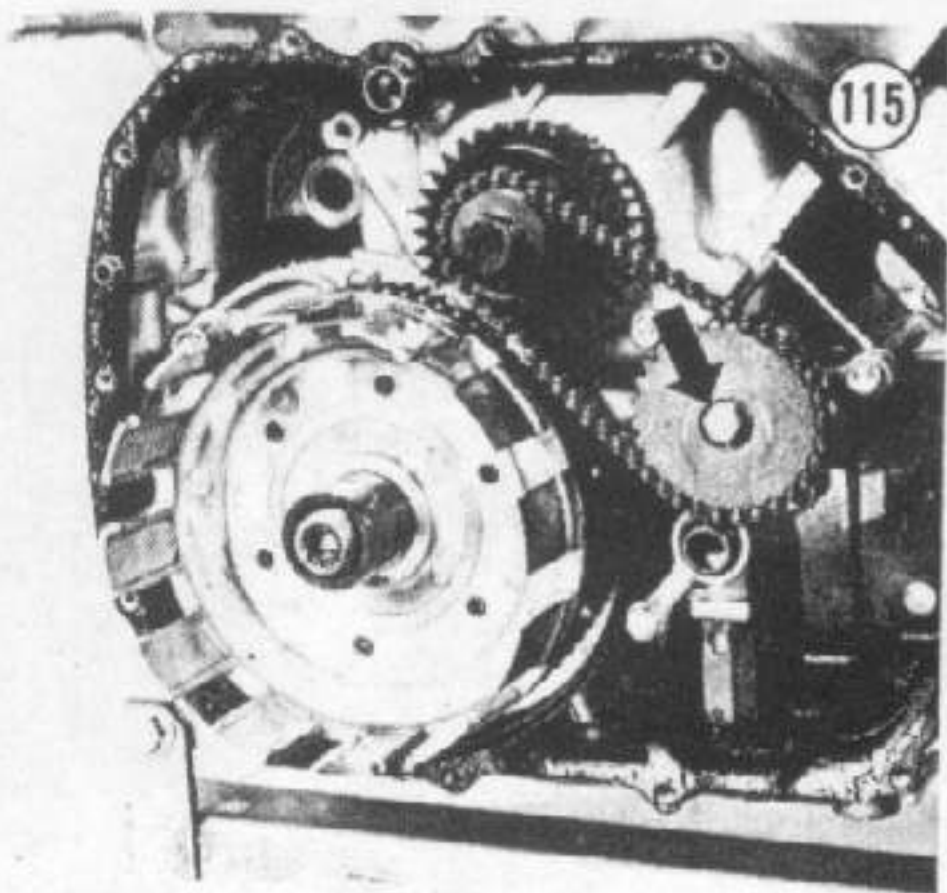
4.12.A

Removal/Installation

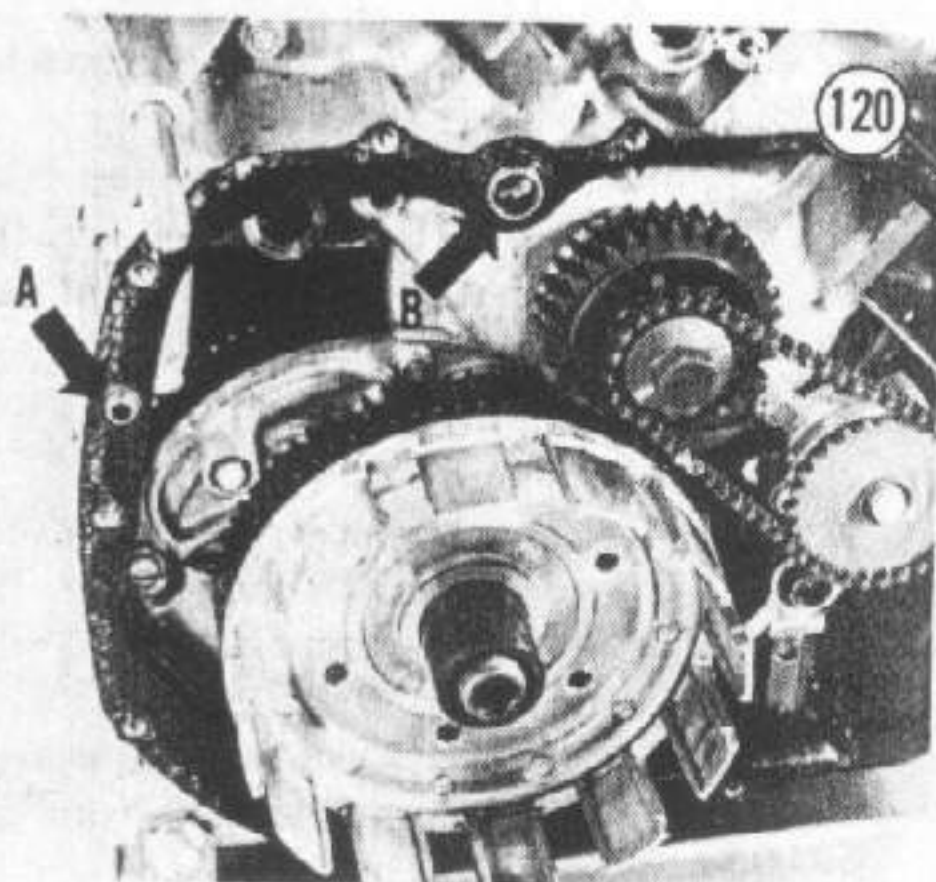
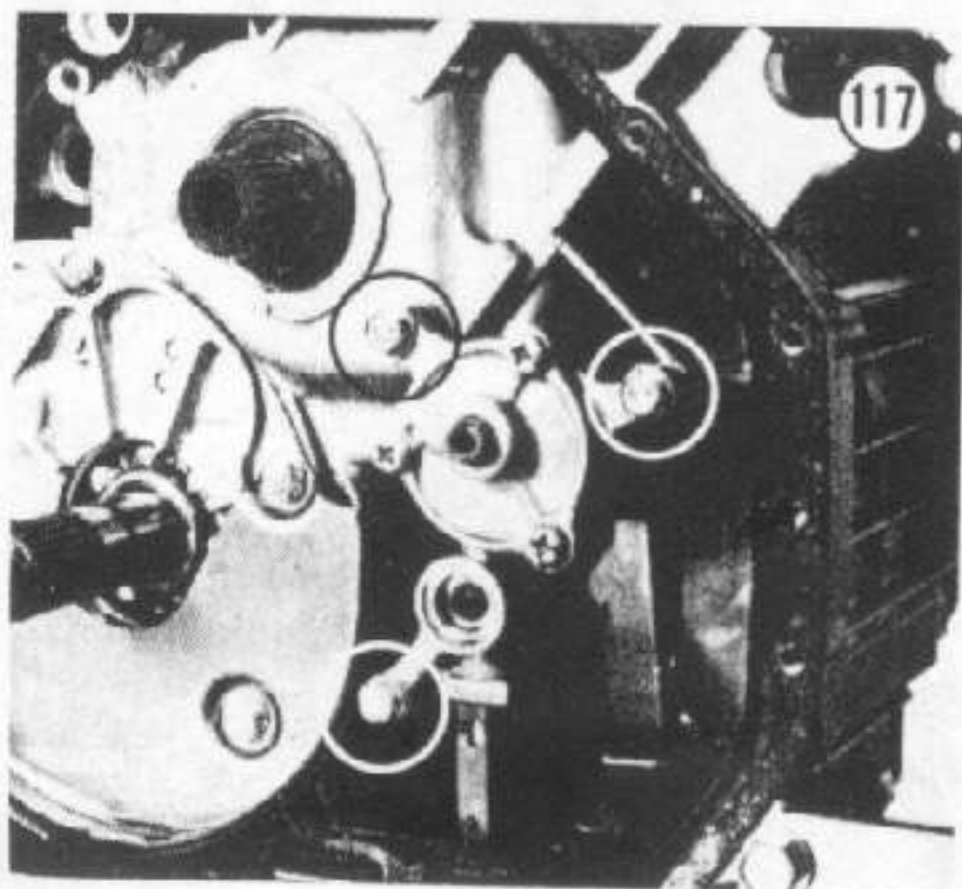
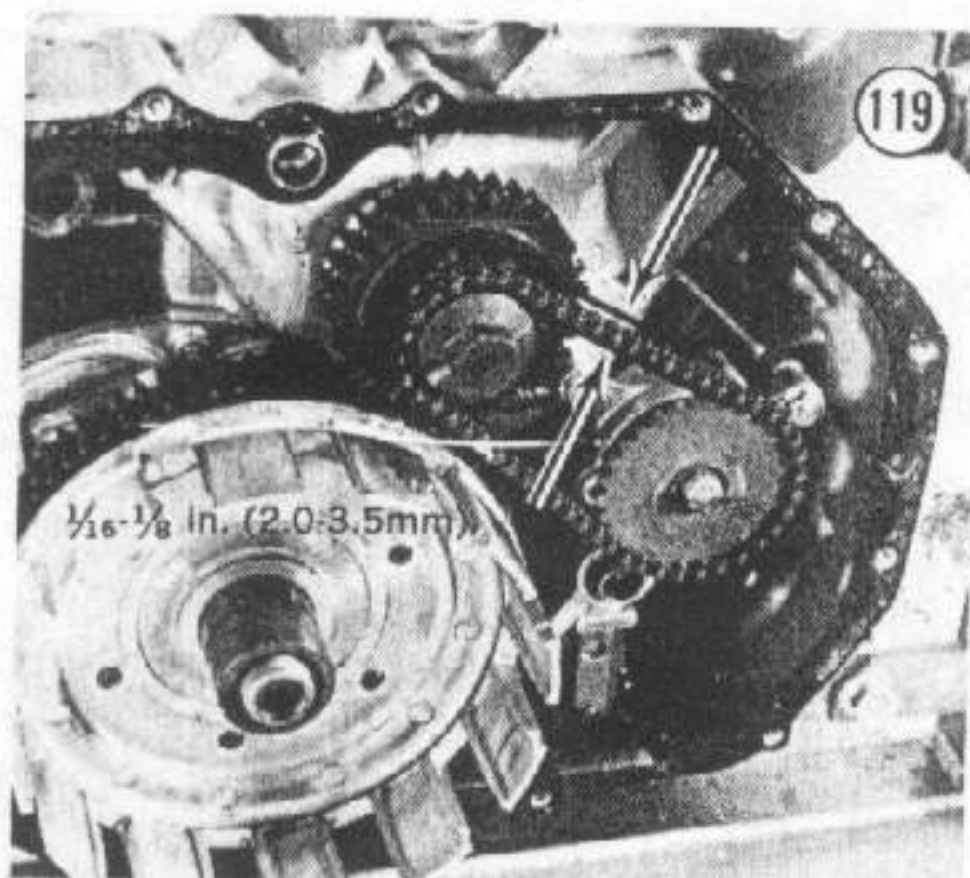
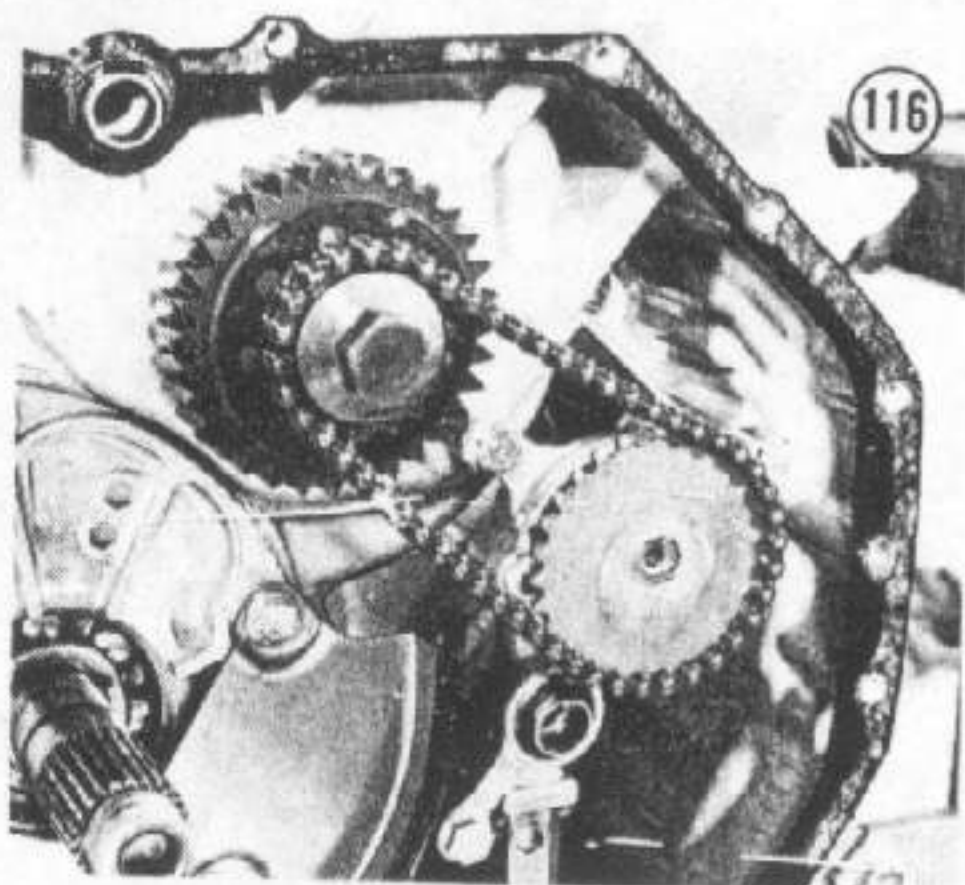
1. Remove the radiator assembly as described under *Radiator Removal/Installation* in Chapter Eight.
2. Disconnect the electrical wire from the oil pressure sending switch.
3. Drain the engine oil as described under *Changing Oil and Filter* in Chapter Three.
4. Remove the clutch cable from the clutch lever (Figure 113).

5. Remove the 13 bolts (Figure 114) securing the front engine cover and remove it.
6. Remove the bolt securing the oil pump drive sprocket (Figure 115).
7. Remove sprocket and drive chain (Figure 116).
8. Remove the 3 bolts (Figure 117) securing the oil pump assembly and remove it (Figure 118).
9. Install by reversing these removal steps.
10. Adjust the drive chain tensioner to $\frac{1}{16}$ - $\frac{1}{8}$ in. (2.0-3.5mm). See Figure 119. Adjust by loosening the top bolt (A, Figure 119) and pivot the oil pump assembly to the right or left until the correct slack is achieved; tighten the bolt.
11. Use a new gasket and make sure the small locating dowel (A, Figure 120) and the large dowel and O-ring (B, Figure 120) are in place.
12. Fill the engine with the recommended type and quantity of engine oil and coolant. Refer to Chapter Three.
13. Start the engine and check for leaks.

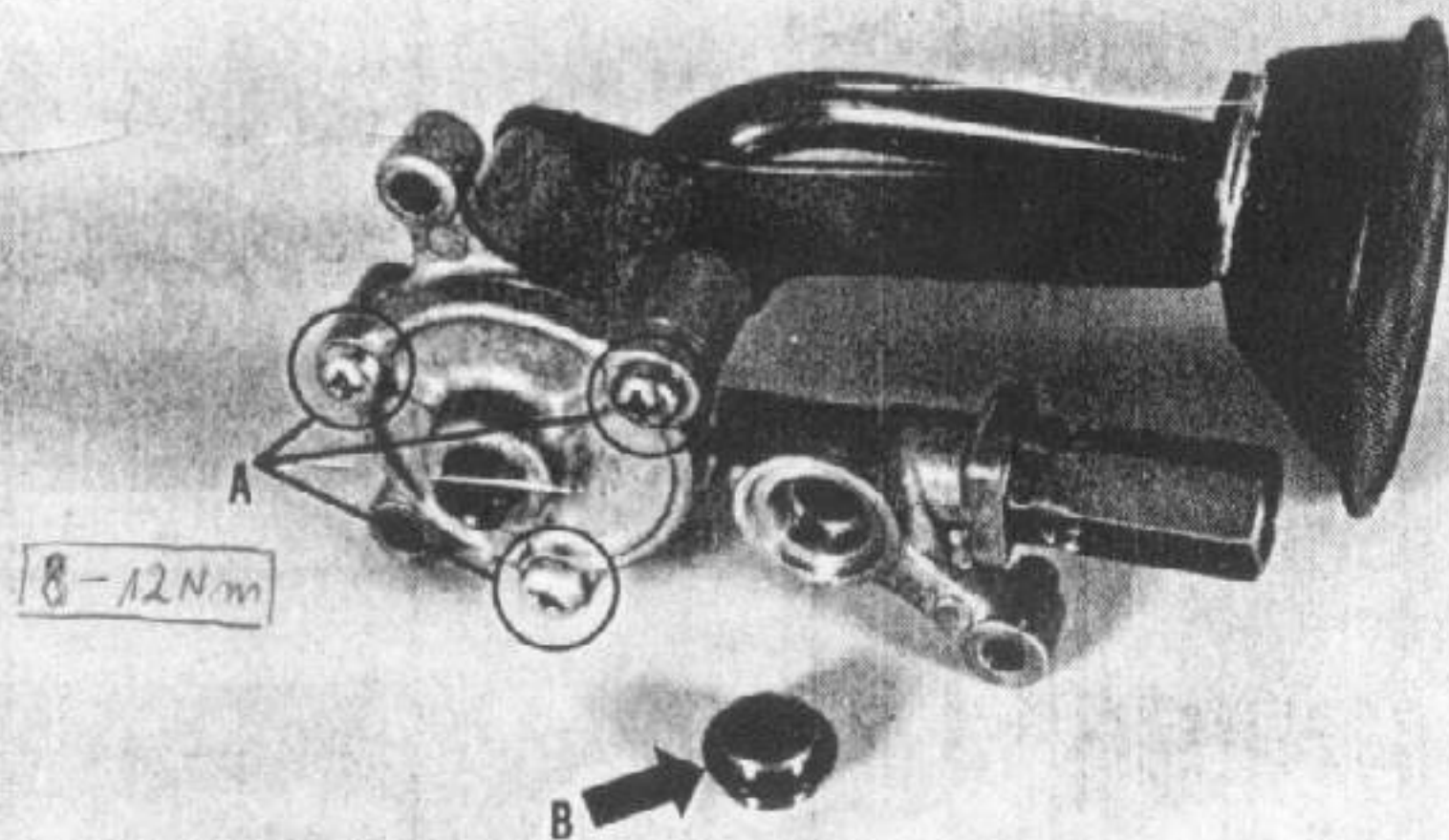




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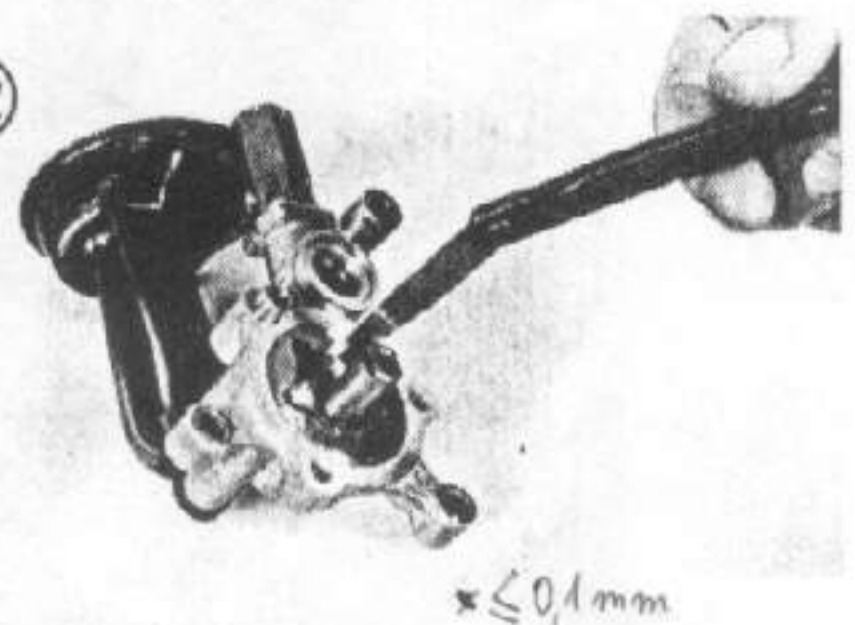
121



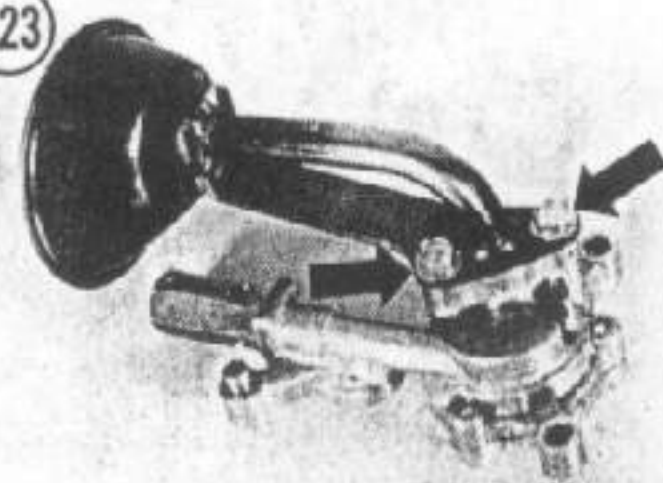
4.12.2 Inspection

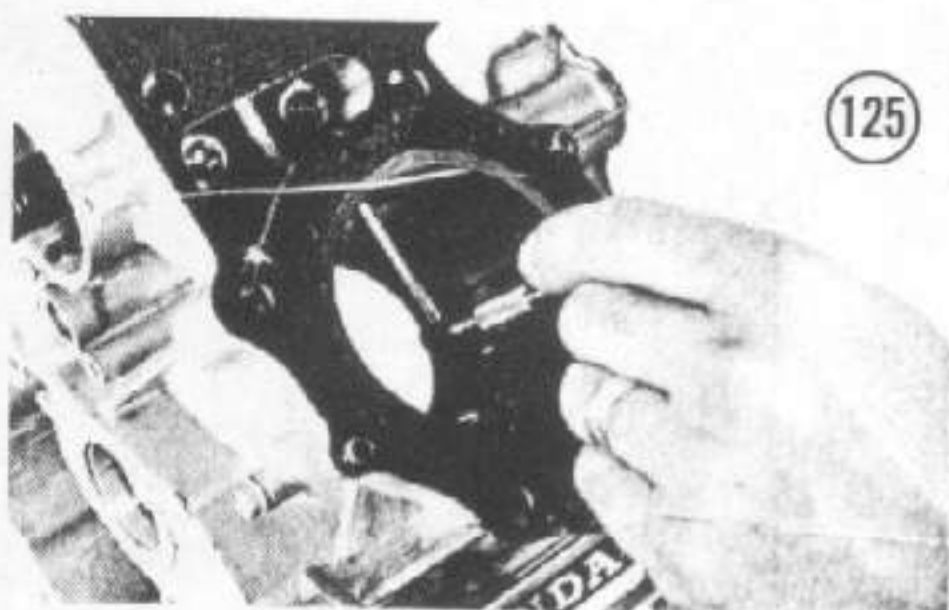
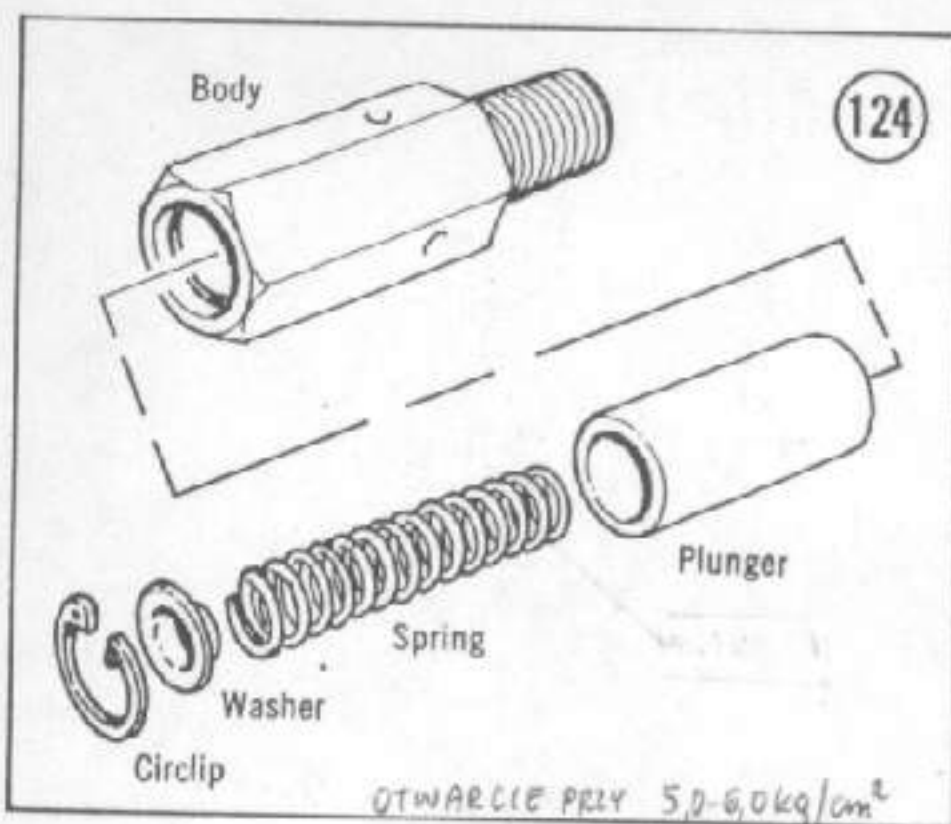
1. Check the housing for cracks. Replace if necessary.
2. Remove the 3 screws (A, Figure 121) securing the cover and remove it.
3. Measure the clearance between the outer rotor and the body with a flat feeler gauge. If the clearance is 0.014 in. (0.35mm) or greater, the worn part must be replaced.
4. Measure the clearance between the inner and outer rotor with a flat feeler gauge (Figure 122). If the clearance is 0.004 in. (0.10mm) or greater, the worn part must be replaced.
5. Remove the 2 bolts (Figure 123) securing the pick-up assembly and remove it.
6. Clean the pick-up assembly in cleaning solvent and thoroughly dry with compressed air. Inspect the screen; if damaged, it should be replaced.
7. Make sure the O-ring (B, Figure 121) is in good condition; if the condition is doubtful, replace it.

122



123



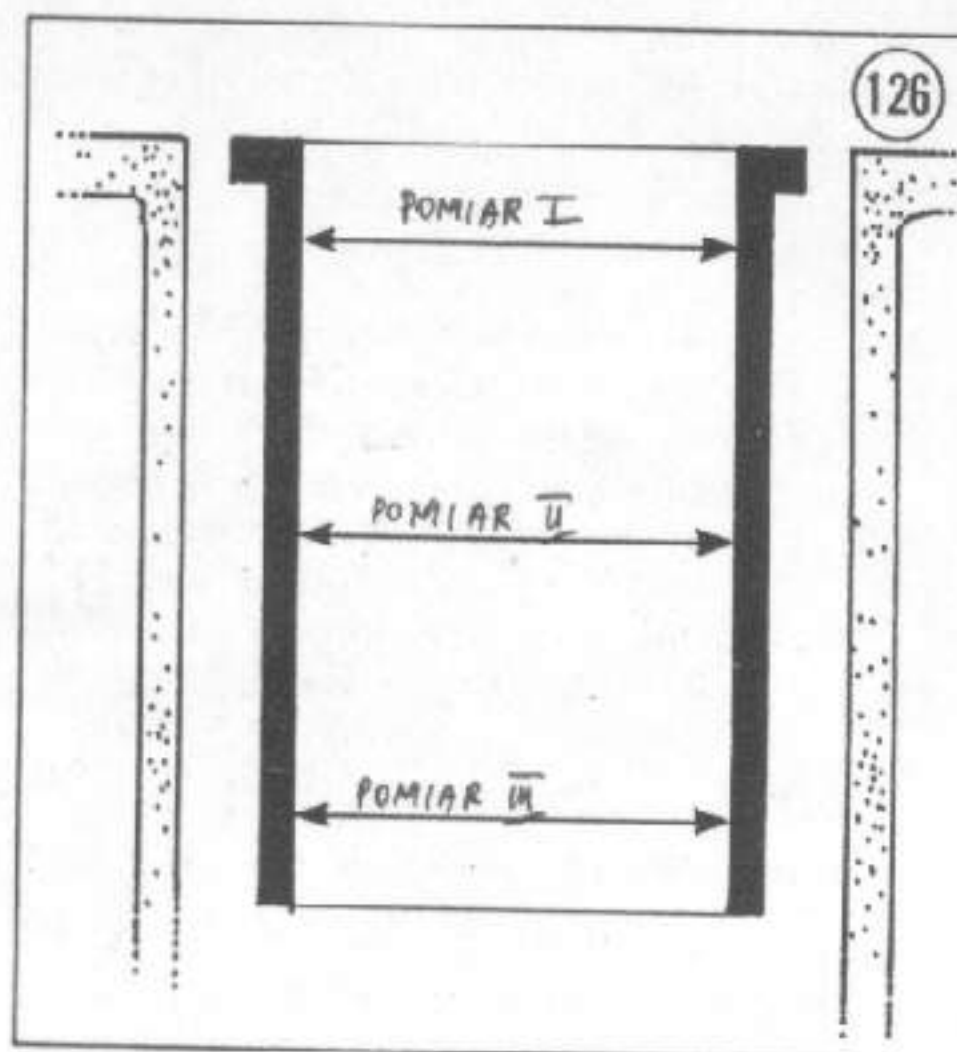


4.13
OIL PRESSURE
RELIEF VALVE

4.13.1 Removal/Inspection/Installation

To gain access to the relief valve, follow the removal steps of *Oil Pump Removal/Installation* in this chapter.

1. Unscrew the relief valve from the oil pump.
2. From the backside of the valve, push on the plunger; it should move freely. It will take some effort to push it, though, as it would normally open at 71-85 psi (5.0-6.0 kg/cm²).
3. If it will not move, remove the circlip, washer, spring, and plunger (Figure 124) from the body.
4. Wash all parts in solvent and dry with compressed air. Make sure the relief holes in the body are clean.
5. If the spring is broken or the plunger body damaged, the entire unit should be replaced.
6. Coat all parts with assembly oil; reassemble and install on the oil pump.



7. Complete installation by reversing the removal steps of the oil pump.

4.14

CYLINDER BLOCK/CRANKCASE

To perform the following steps, turn to the procedure in this chapter for the major assembly indicated, e.g., cylinder head, and perform the removal procedure. To assemble, reverse the disassembly sequence and perform the installation procedure for the major assembly involved.

1. Remove the engine from the frame.
2. Remove the cylinder heads.
3. Remove the clutch.
4. Remove the transmission.
5. Remove the oil pump.
6. Remove the alternator.
7. Remove the camshaft, chain, tensioner, and lower rocker arm assemblies.
8. Remove the shift mechanism.
9. Remove the piston and connecting rod assemblies.
10. Remove the crankshaft.

4.14.1

Cylinder Inspection

Measure the cylinder bores, with a cylinder gauge (Figure 125) or inside micrometer, at the points shown in Figure 126.

Measure in 2 axes — in line with the wrist pin and at 90° to the pin. If the taper or out-of-round are 0.004 in. (0.10mm) or greater, the cylinders must be rebored to the next oversize and new pistons installed.

NOTE: *The new pistons should be obtained first before the cylinders are bored so that pistons can be measured; slight manufacturing tolerances must be taken into account to determine the actual size and the working clearance. Piston-to-cylinder clearance should not exceed the service limit of 0.004 in. (0.10mm).*

4.14.2

Cylinder Block Inspection

1. Remove all traces of gasket material from all surfaces. Thoroughly clean the block with cleaning solvent and dry with compressed air.

NOTE: *Be sure to remove all traces of solvent, as residue will contaminate the engine's oil and cooling systems.*

3. Check the condition of the transmission ball-bearings, the camshaft and crankshaft bearings. Replace if necessary.

4. Check the block for indications of cracks and fatigue. Also check for imperfections in the sealing surfaces of the front and rear engine cover.

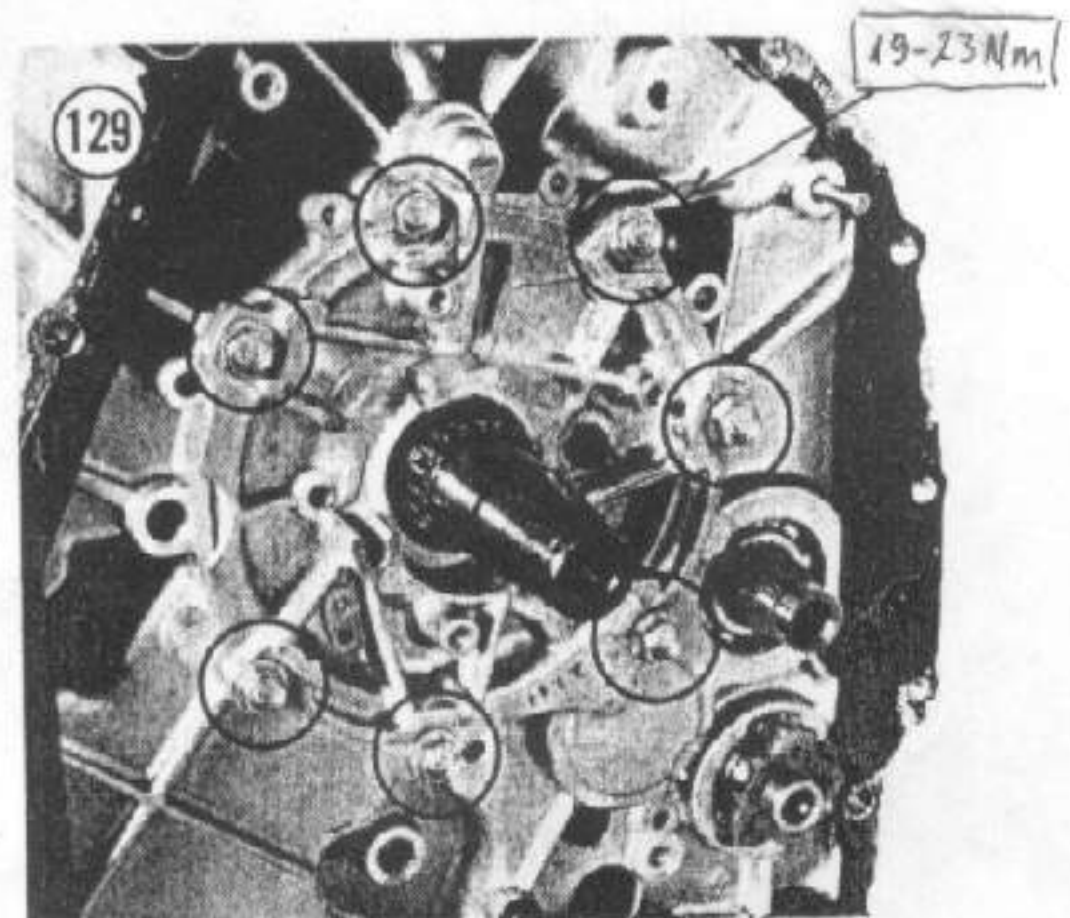
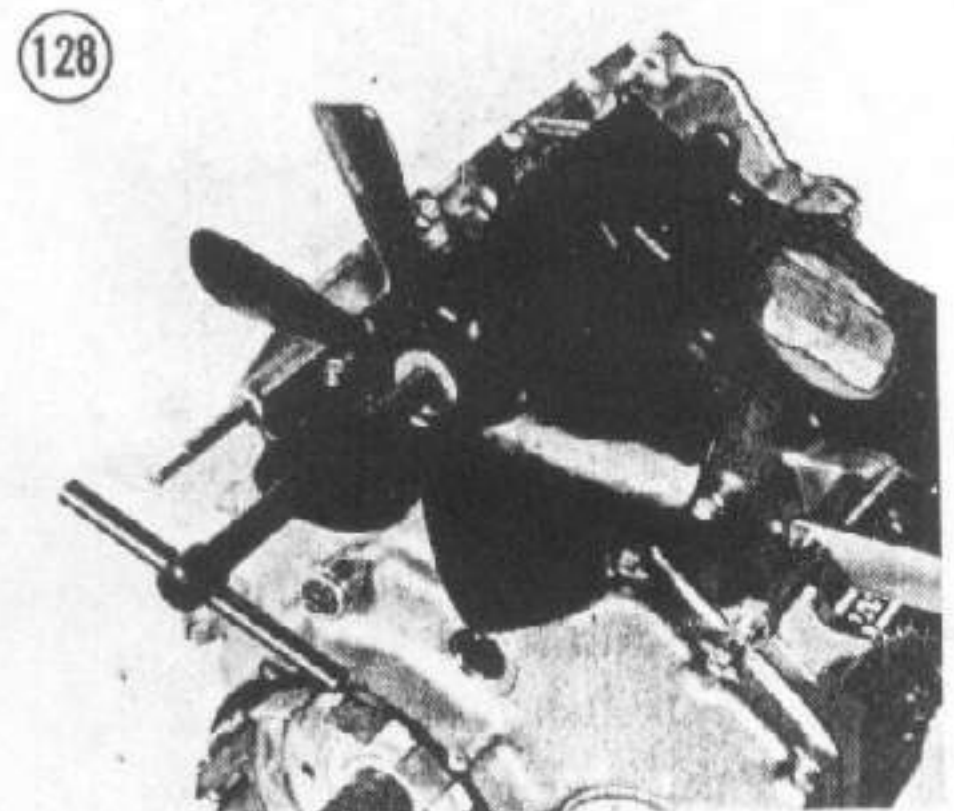
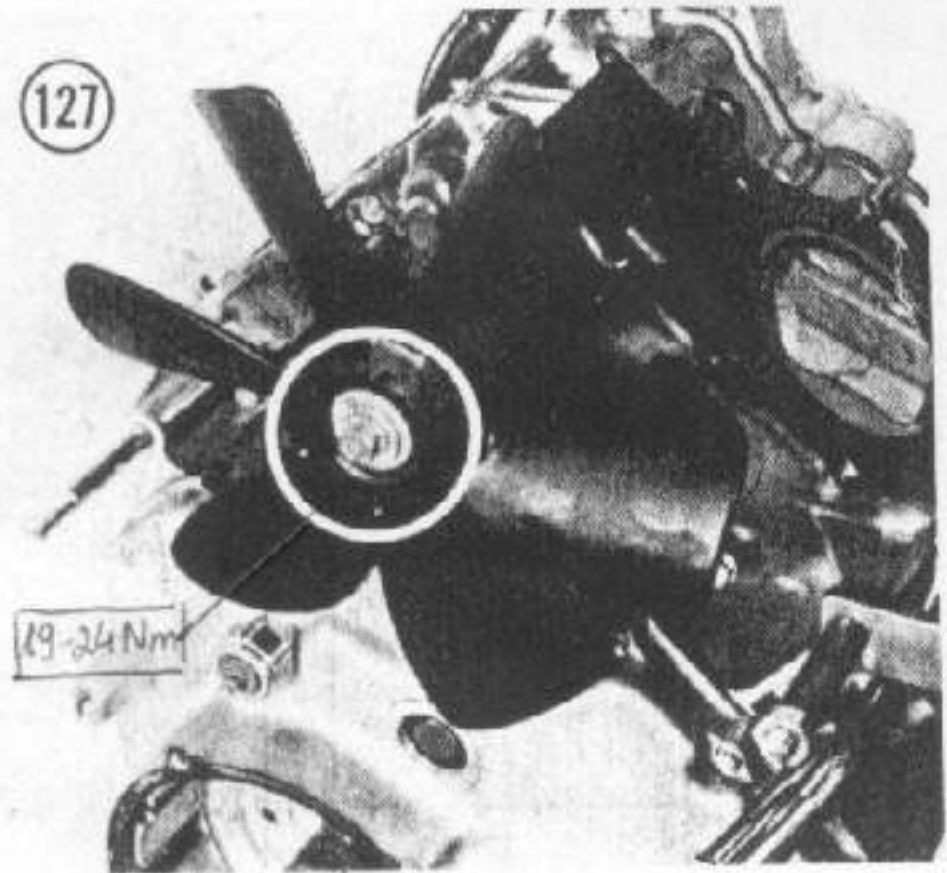
4.15

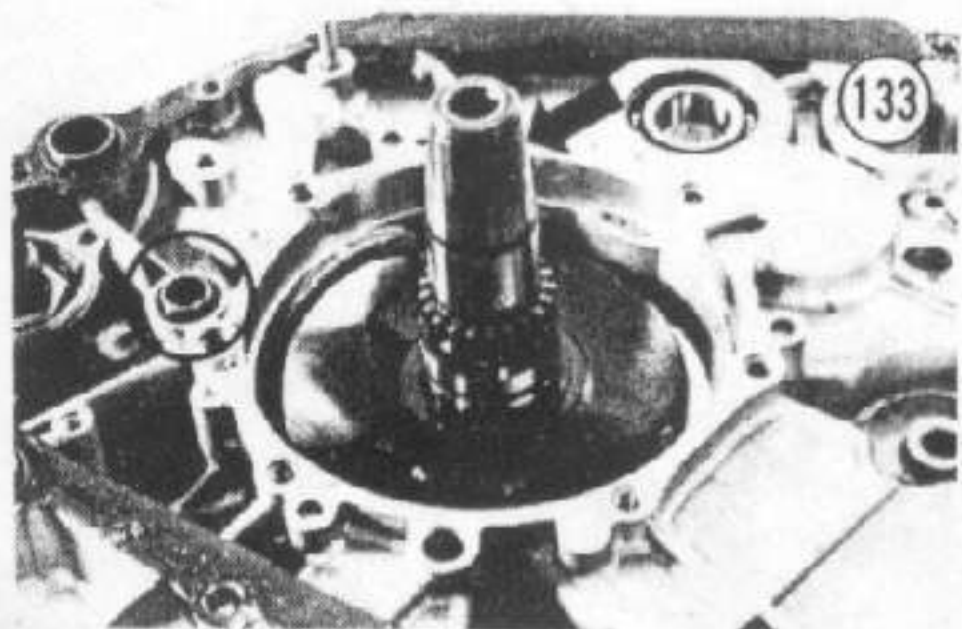
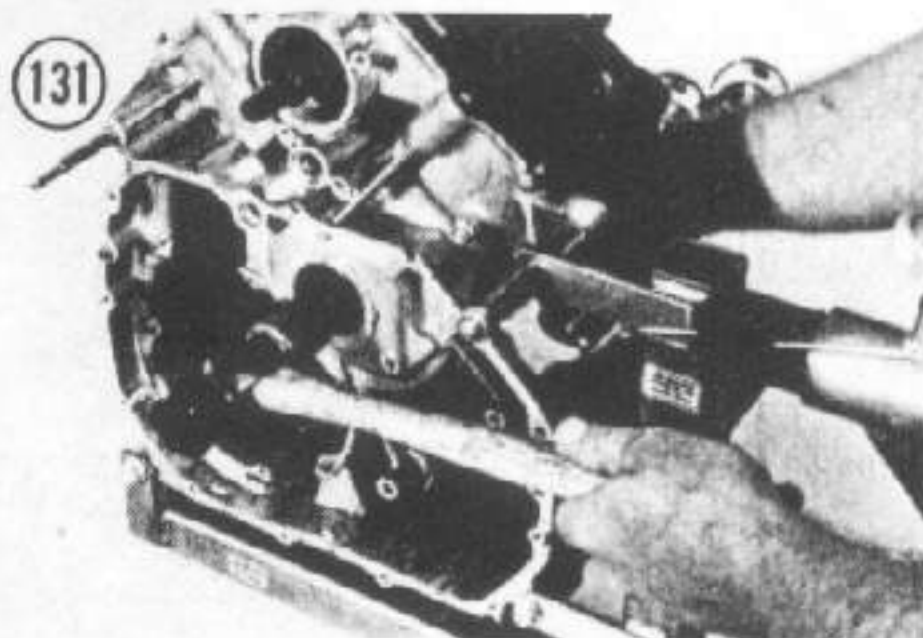
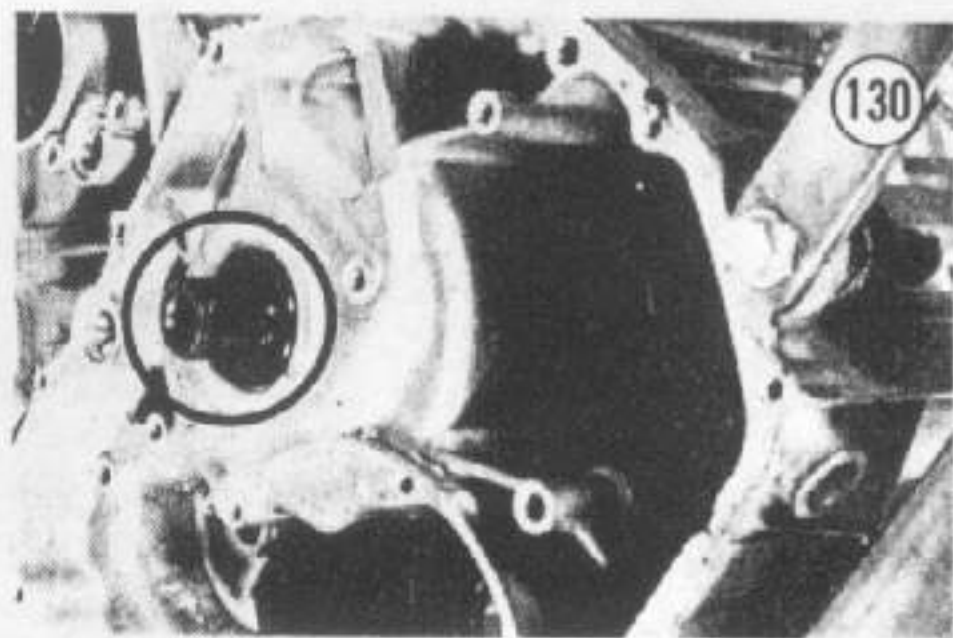
CRANKSHAFT

4.15.1

Removal

1. Remove the engine as described under *Engine Removal/Installation* in this chapter.
2. Remove the cylinder heads, pistons, and connecting rod assemblies as described under *Pistons and Connecting Rods Removal/Installation* in this chapter.
3. Remove the alternator and camshaft chain as described in Steps 1-14, *Camshaft Removal* in this chapter.
4. Remove the bolt on the fan (**Figure 127**).
5. Remove the fan with a puller (**Figure 128**). Screw in the puller until the fan disengages; remove the puller and fan.
6. Remove the 7 bolts (**Figure 129**) securing the crankshaft cap and remove it.





- CAUTION**
Prior to removing the crankshaft and cap, wrap the splines of the primary timing gear (Figure 130) with vinyl tape to prevent damage to the splines.
7. Carefully tap the crankshaft and cap assembly out of the cylinder block with a plastic or rubber mallet (Figure 131).

CAUTION
Do not use a metal hammer as it will damage the splines and end of shaft.

4.45.2 Installation

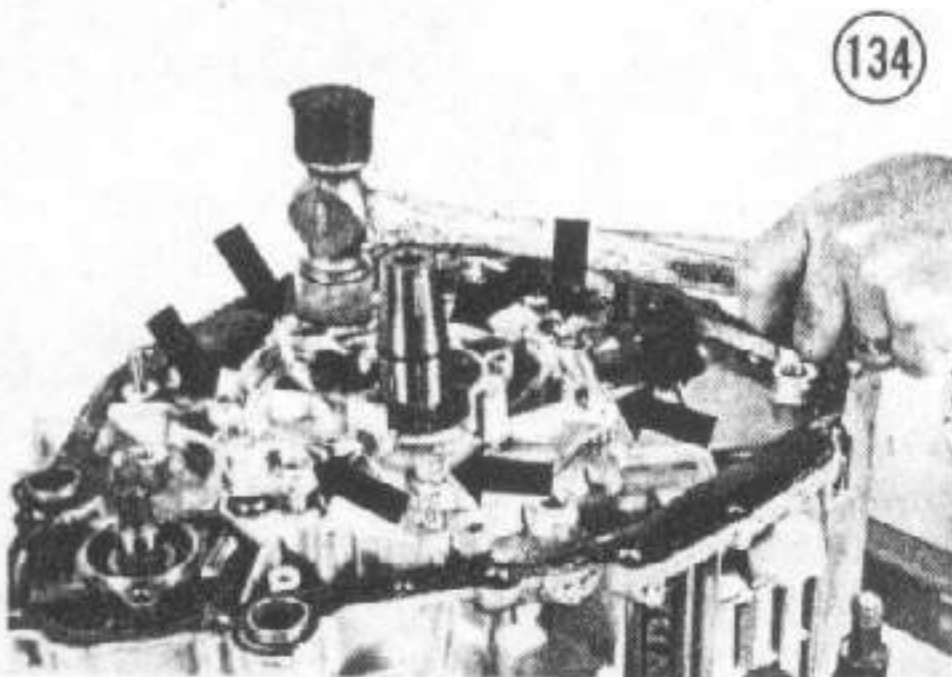
1. Coat the bearing surfaces of the crankshaft and cap (Figure 132) with molybdenum disulfide grease.
2. Install the crankshaft in the cylinder block (Figure 133).

CAUTION
Be sure that the primary timing gear splines (Figure 130) are still wrapped with vinyl tape; if not, retape.

NOTE: Be sure the dowel and O-ring are in place (Figure 133).

3. Install the crankshaft cap on partway and start all 7 bolts (Figure 134). They are used to guide the cap on so it will not get tilted during installation.
4. Tap around the perimeter of the cap with a plastic or rubber mallet (Figure 135) until it is completely seated.

CAUTION
Do not use a metal hammer as it will damage the cap.



5. Tighten cap bolts to 14-17 ft.-lb. (19-23 N•m).

CAUTION

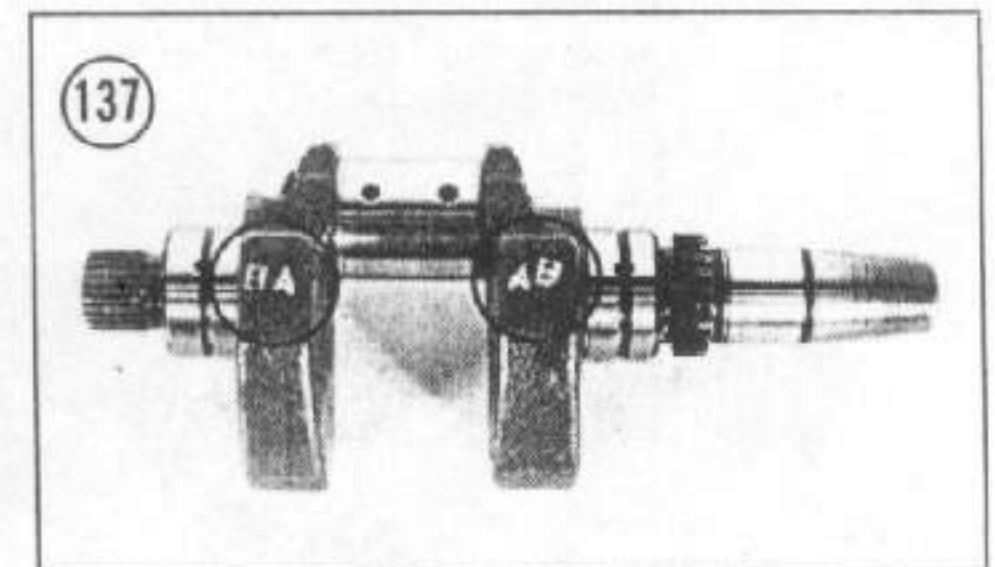
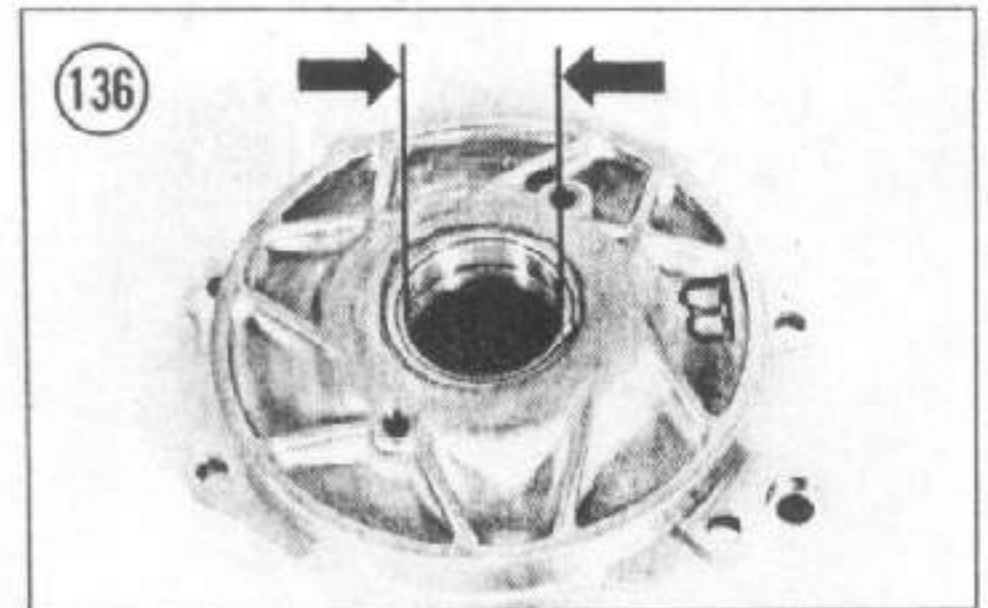
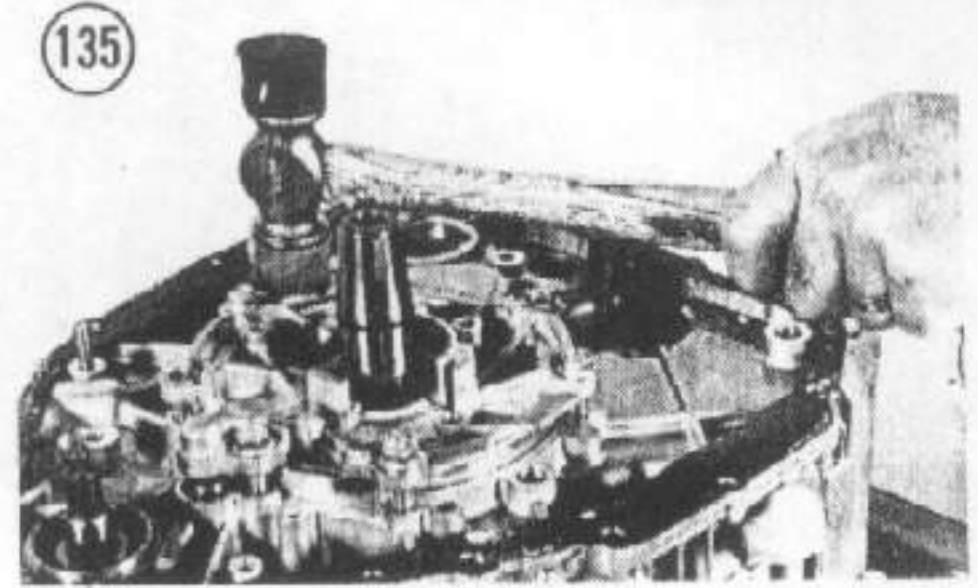
After tightening the bolts, rotate the crankshaft. Make sure it rotates freely, if not, tap the end with a plastic mallet which should free it.

6. Complete assembly by reversing Steps 1-5, *Crankshaft Removal*.
7. Tighten all bolts and nuts to torque values in **Table 4**.

4.15.3

Crankshaft Inspection

1. Clean crankshaft thoroughly with solvent. Clean oil holes with rifle cleaning brushes; flush thoroughly and dry with compressed air. Lightly oil all journal surfaces immediately to prevent rust.
2. Carefully inspect each journal for scratches, ridges, scoring, nicks, etc. Very small nicks and scratches may be removed by grinding — a job for a machine shop.
3. If the surface finish on all journals is satisfactory, take the crankshaft to your dealer or local machine shop. They can check out-of-roundness, taper, and wear on the journals. They can also check crankshaft alignment and inspect for cracks. Check against measurements given in **Table 6**.
4. Check the bearing inserts for evidence of wear, abrasion, and scoring. If the bearings are good, they may be reused. If either insert is questionable, replace both of them.
5. Measure the inner diameter (ID) of the cylinder block bearing support and the crankshaft cap bearing support (**Figure 136**) with inside micrometers.
6. Determine the main journal outer diameter code letters (**Figure 137**). The outer letters are for the main journals (inner letters are for the crankpins).
7. Select new bearings by cross referencing the main journal codes (A or B), vertical column in **Table 3**, to the dimensions taken of the bearing support ID, horizontal column in **Table 3**. Where the two columns intersect the new replacement bearing color will be indicated. **Table 4** gives the bearing color and thickness.



8. After the new bearings are installed the clearance should be checked. Recommended clearance for new bearings is 0.0008-0.0017 in. (0.020-0.044mm). Used bearings must not exceed 0.0031 in. (0.08mm).

4.16

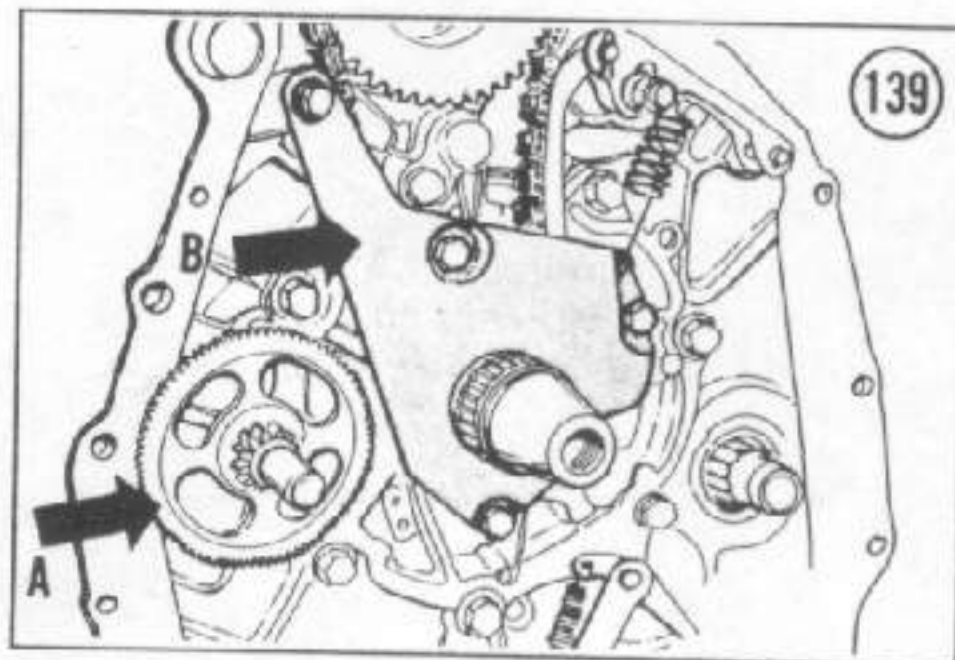
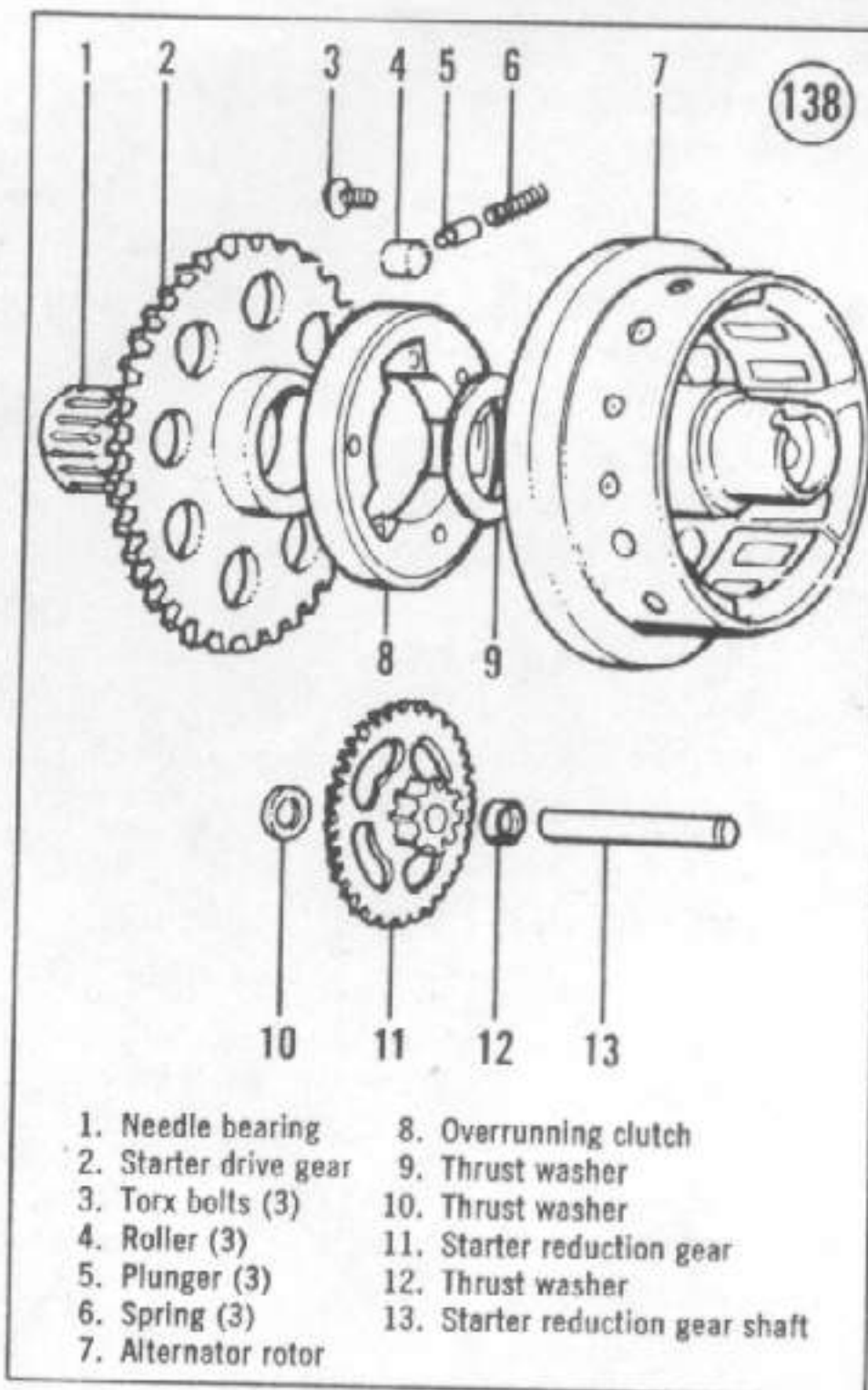
**STARTER GEARS
AND CLUTCH**

Refer to **Figure 138** for this procedure.

4.16.1

Removal/Installation

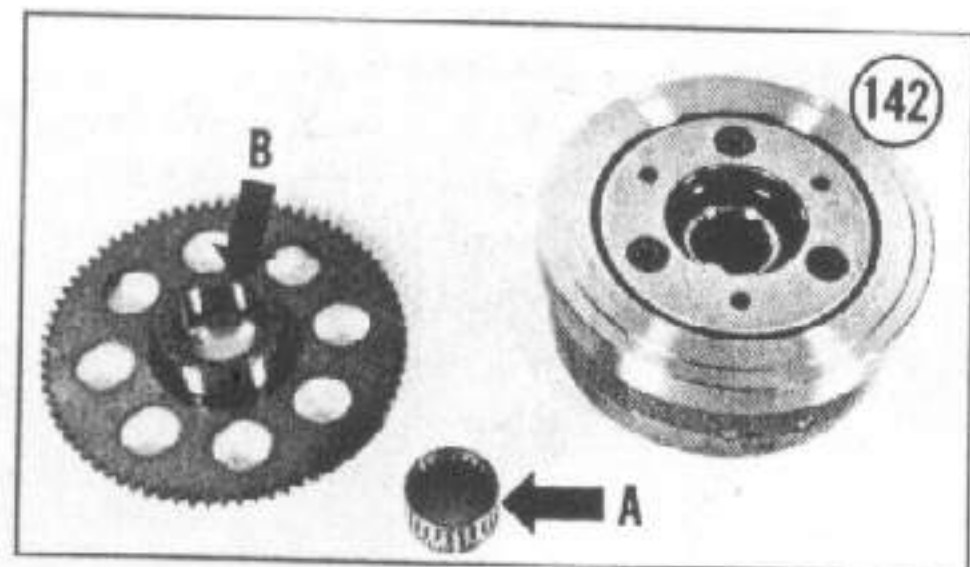
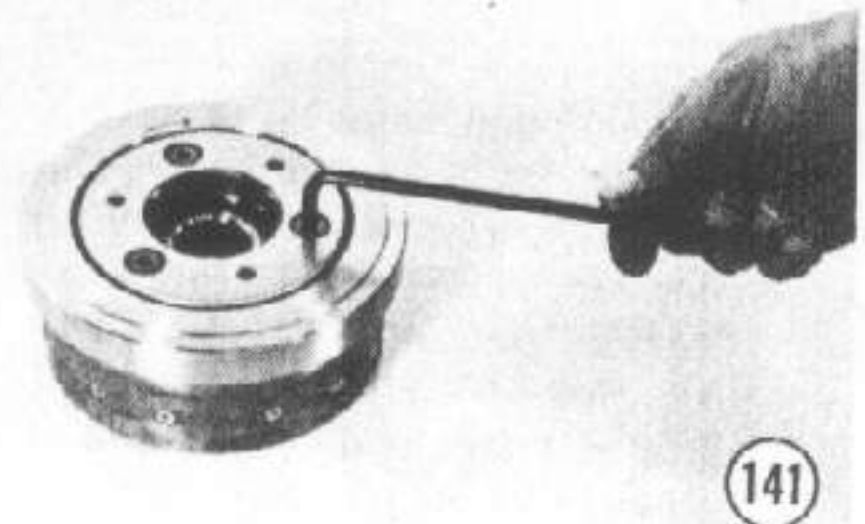
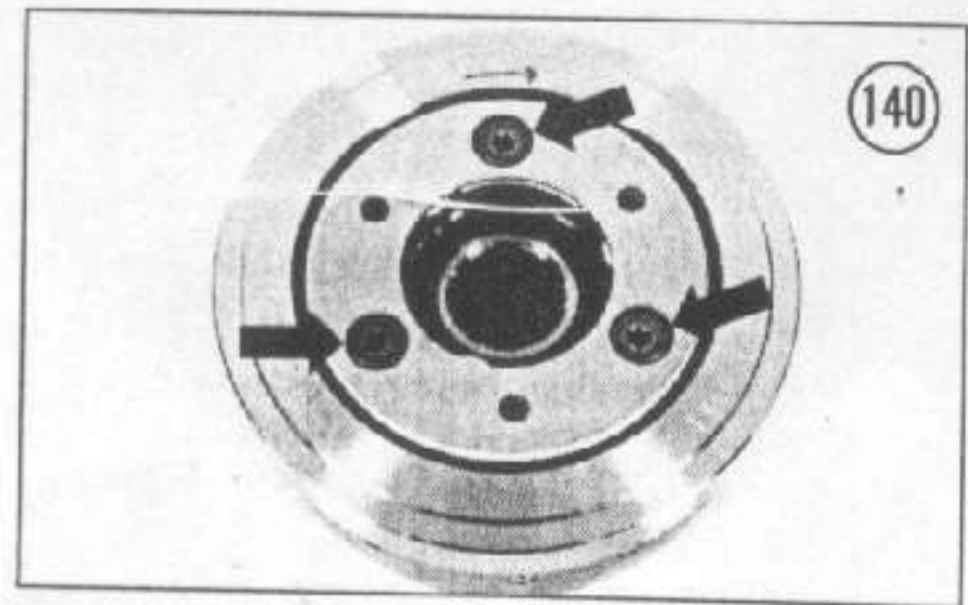
1. Remove alternator as described in Steps 1-9, *Alternator Removal/Installation*, this chapter.



2. Remove starter reduction gear (A, Figure 139) and thrust washers.

CAUTION

If the tensioner cover (B, Figure 139) on the bike does not look like the one shown, refer to detailed information, regarding factory replacement parts, at the beginning of the Camshaft section in this chapter.



3. Remove the 3 Torx bolts (Figure 140) securing the starter clutch to the alternator flywheel. Discard the Torx bolts; do not reuse them.

NOTE: A special tool is required for removal of the Torx bolts. The size is T-40 and is available in the Allen wrench configuration as shown in Figure 141 or a configuration similar to a screwdriver. These tools are manufactured by Proto and Apex and are available at most large hardware, automotive, or motorcycle supply stores.

4. Inspect the gears for chipped or missing teeth. Look for uneven or excessive wear on the gear faces. Replace if necessary.

5. Check the rollers in the starter clutch for uneven or excessive wear, replace as a set if any are bad.
6. Check the condition of the bearing (A, **Figure 142**) and the bearing race in the gear (B, **Figure 142**). Replace either if necessary.
7. Install by reversing these removal steps. Apply Loctite Lock 'N' Seal, or equivalent, to new Torx bolts prior to installation and torque them to 14-17 ft.-lb. (19-23 N•m).

4.17

BREAK-IN

Following cylinder servicing (boring, honing, new rings, etc.) and major lower end work, the engine should be broken in just as though it were new. The performance and service life of the engine depend greatly on a careful and sensible break-in.

For the first 500 miles no more than one-third throttle should be used and speed should be varied as much as possible within the one-third throttle limit. Prolonged, steady running at one speed, no matter how moderate, is to be avoided, as is hard acceleration.

Following the 500-mile service increasingly more throttle can be used, but full throttle should not be used until the motorcycle has

covered at least 1,000 miles, and then it should be limited to short bursts until 1,500 miles have been logged.

The mono-grade oils recommended for break-in and normal use provide a bedding pattern for rings and cylinders superior to that of multi-grade oils. As a result, piston ring and cylinder bore life are greatly increased. During this period, oil consumption will be higher than normal. It is therefore important to frequently check and correct the oil level. At no time, during break-in or later, should the oil level be allowed to drop below the bottom line on the dipstick; if the oil level is low, the oil will become overheated resulting in insufficient lubrication and increased wear.

4.17.1

500-Mile Service

It is essential that oil and filter be changed after the first 500 miles. In addition, it is a good idea to change the oil and filter at the completion of break-in (about 1,500 miles) to ensure that all of the particles produced during break-in are removed from the lubrication system. The small added expense may be considered a smart investment that will pay off in increased engine life.

Table 1 CONNECTING ROD BEARING SELECTION

Crankpin journal size code letter and dimension	Letter A: 1.5745-1.5748 in. (39.992-40.000mm)	Letter B: 1.5742-1.5745 in. (39.984-39.992mm)	Letter C: 1.5739-1.5742 in. (39.976-39.984mm)
Connecting rod ID code number and dimension	Color Identification		
No. 1: 1.6929-1.6932 in. (43.000-43.008mm)	Pink	Yellow	Green
No. 2: 1.6932-1.6935 in. (43.008-43.016mm)	Yellow	Green	Brown
No. 3: 1.6935-1.6939 in. (43.016-43.024mm)	Green	Brown	Black

Table 2 CONNECTING ROD BEARING THICKNESS

Color	Bearing Thickness	
	Inches	Millimeters
Black	0.0592-0.0593	1.503-1.507
Brown	0.0590-0.0592	1.499-1.503
Green	0.0588-0.0590	1.495-1.499
Yellow	0.0587-0.0588	1.491-1.495
Pink	0.0585-0.0587	1.487-1.491

Table 3 MAIN JOURNAL BEARING SELECTION

Crankcase/Cap Bearing Support ID	Main Journal OD Code Letter	
	A	B
1.8504-1.8508 in. (47.000-47.010mm)	Brown	Black
1.8508-1.8517 in. (47.010-47.020mm)	Black	Blue

Table 4 MAIN JOURNAL BEARING THICKNESS

Color	Inches	Millimeters
Brown	0.0783-0.0787	1.989-1.999
Black	0.0785-0.0789	1.994-2.004
Blue	0.0787-0.0791	1.999-2.009

Table 5 ENGINE TORQUE SPECIFICATIONS

Item	Foot-pounds (ft.-lb.)	Newton meters (N•m)
Cylinder head bolts		
6mm	6-9	8-12
12mm	33-40	45-54
Camshaft locknut	58-72	79-98
Camshaft sprocket bolts	12-14	16-19
Crankshaft end cap bolts	14-17	19-23
Rod bearing cap nuts	20-23	27-31
Cooling fan bolt	14-18	19-24
Oil filter bolt	14-18	19-24
Alternator rotor bolt	58-72	79-97
Clutch center nut	58-72	79-97
Radiator drain bolt	1-2	1.4-2.7

4

4.18

Table 6 ENGINE SPECIFICATIONS

Item	Specifications (new)	Wear Limit
General		
Number of cylinders	2	
Bore X stroke	3.071 × 2.047 in. (78 × 52mm)	
Displacement	30.3 cu.in. (496cc)	
Compression ratio	10:1	
Compression pressure (cold)	171 ± 20 psi (12 ± 2 kg/cm ²)	
Cylinders		
Bore	3.0708-3.0714 in. (78.000-78.015mm)	3.0748 in. (78.10mm)
Cylinder/piston clearance	—	0.004 in. (0.10mm)
Out of round	—	0.004 in. (0.10mm)
Warpage	—	0.004 in. (0.10mm)
Pistons		
Diameter	3.068-3.069 in. (77.940-77.960mm)	3.065 in. (77.860mm)
Clearance in bore	—	0.004 in. (0.10mm)
Wrist pin bore	0.8268-0.8271 in. (21.002-21.008mm)	0.828 in. (21.040mm)
Wrist pin outer diameter	0.8265-0.8268 in. (20.994-21.000mm)	0.8261 in. (20.984mm)
Ring end gap		
Top	0.004-0.012 in. (0.1-0.3mm)	0.024 in. (0.60mm)
Second	0.004-0.012 in. (0.1-0.3mm)	0.024 in. (0.60mm)
Oil control ring	0.012-0.35 in. (0.3-0.9mm)	0.043 in. (1.10mm)
Ring side clearance		
Top	0.0006-0.0020 in. (0.015-0.050mm)	0.004 in. (0.10mm)
Second	0.0006-0.0020 in. (0.015-0.050mm)	0.004 in. (0.10mm)
Crankshaft		
Main bearing journal oil clearance	0.0008-0.0023 in. (0.020-0.060mm)	0.0033 in. (0.085mm)
Connecting Rods		
Side clearance	0.006-0.007 in. (0.150-0.170mm)	0.0138 in. (0.350mm)
Bearing clearance (large end)	0.0008-0.0017 in. (0.02-0.04mm)	0.003 in. (0.080mm)
Wrist pin inner diameter	0.8276-0.8283 in. (21.020-21.041mm)	0.8294 in. (21.068mm)
Camshaft		
Valve timing		
Intake	Opens 6° BTDC, closes 46° ABDC	—
Exhaust	Opens 46° BBDC, closes 6° ATDC	—
Cam lobe height		
Intake	1.4585 in. (37.046mm)	1.4196 in. (36.058mm)
Exhaust	1.4573 in. (37.015mm)	1.4184 in. (36.027mm)

(continued)

Table 6 ENGINE SPECIFICATIONS (continued)

Item	Specification (new)	Wear Limit
Cam holder inner diameter	0.866-0.867 in. (22.000-22.021mm)	0.868 in. (22.050mm)*
Cam block journal inner diameter	1.023-1.024 in. (26.000-26.021mm)	1.026 in. (26.050mm)
Valves		
Valve stem clearance		
Intake	—	0.004 in. (0.10mm)
Exhaust	—	0.004 in. (0.10mm)
Valve guide inner diameter		
Intake	0.259-0.261 in. (6.600-6.620mm)	0.264 in. (6.70mm)
Exhaust	0.259-0.261 in. (6.600-6.620mm)	0.264 in. (6.70mm)
Valve stem outer diameter		
Intake	0.2591-0.2594 in. (6.580-6.590mm)	0.257 in. (6.54mm)
Exhaust	0.2579-0.2583 in. (6.550-6.560mm)	0.2575 in. (6.54mm)
Valve seat width	0.04-0.05 in. (1.1-1.3mm)	0.08 in. (2.0mm)
Upper and Lower Rocker Arm Assembly		
Rocker arm bore inner diameter	0.5518-0.5522 in. (14.016-14.027mm)	0.553 in. (14.05mm)
Rocker shaft outer diameter	0.5505-0.5512 in. (13.982-14.000mm)	0.549 in. (13.96mm)
Upper rocker arm holder inner diameter	0.5512-0.5522 in. (14.00-14.027mm)	0.553 in. (14.05mm)
Valve Springs		
Free length (inner)		
Intake	1.98 in. (50.3mm)	1.91 in. (48.5mm)
Exhaust	1.98 in. (50.3mm)	1.91 in. (48.5mm)
Free length (outer)		
Intake	1.98 in. (50.3mm)	1.91 in. (48.5mm)
Exhaust	1.98 in. (50.3mm)	1.91 in. (48.5mm)
Length under load (inner)		
Intake	1.49 in. @ 25.4 lb. (37.9mm @ 11.5 kg)	1.49 in. @ 23.2 lb. (37.9mm @ 10.5 kg)
Exhaust	1.49 in. @ 25.4 lb. (37.9mm @ 11.5 kg)	1.49 in. @ 23.2 lb. (37.9mm @ 10.5 kg)
Length under load (outer)		
Intake	1.57 in. @ 61.7 lb. (39.9mm @ 28.5kg)	1.566 in. @ 58.4 lb. (39.8mm @ 26.5 kg)
Exhaust	1.57 in. @ 61.7 lb. (39.9mm @ 28.5 kg)	1.566 in. @ 58.4 lb. (39.8mm @ 26.5 kg)

CHAPTER FIVE

CLUTCH AND TRANSMISSION

5.1
CLUTCH

The clutch on the Honda CX500 is a wet multi-plate type which operates immersed in the engine oil.

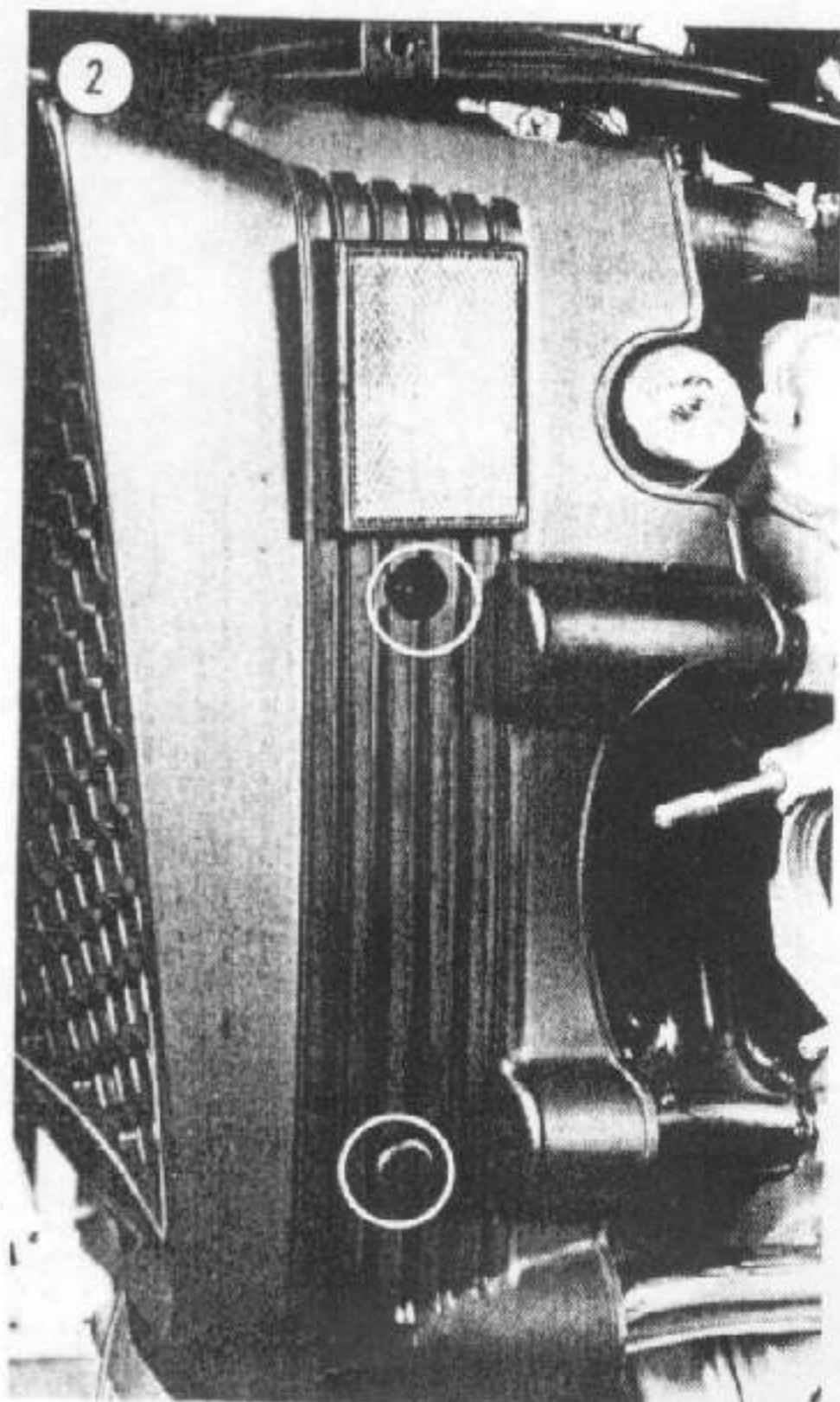
All clutch parts can be removed with the engine in the frame. This sequence is shown with the engine assembly removed for clarity; it is not necessary to remove it to perform this procedure.

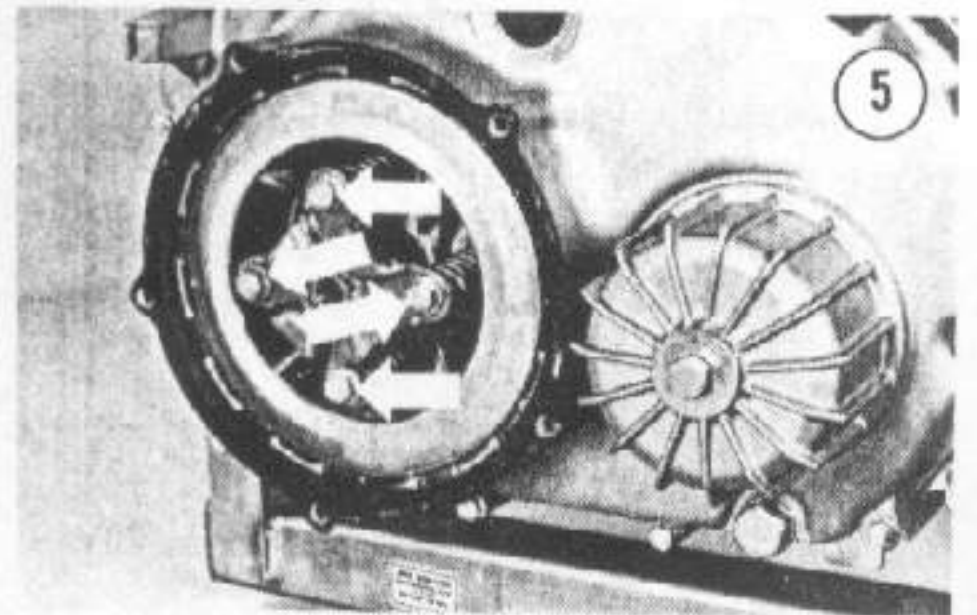
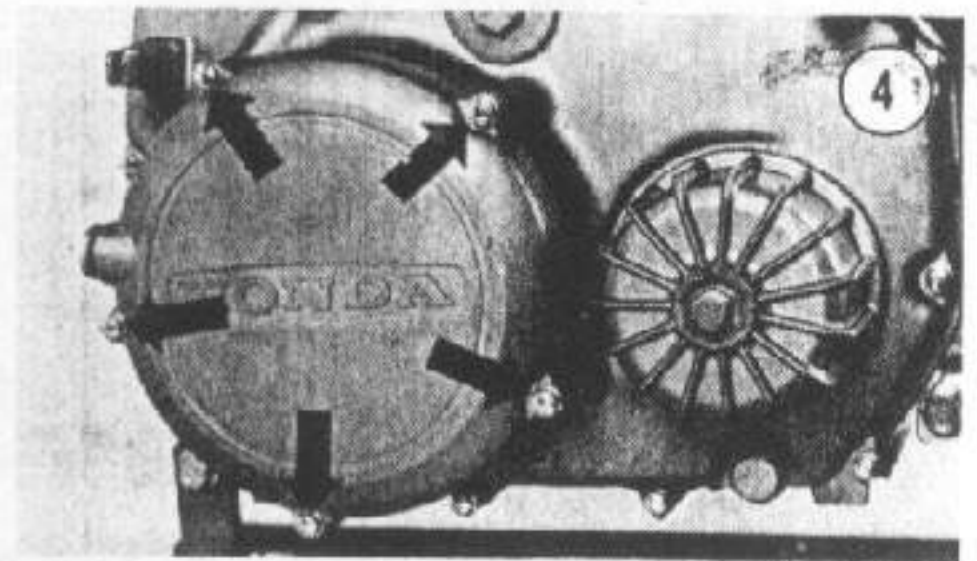
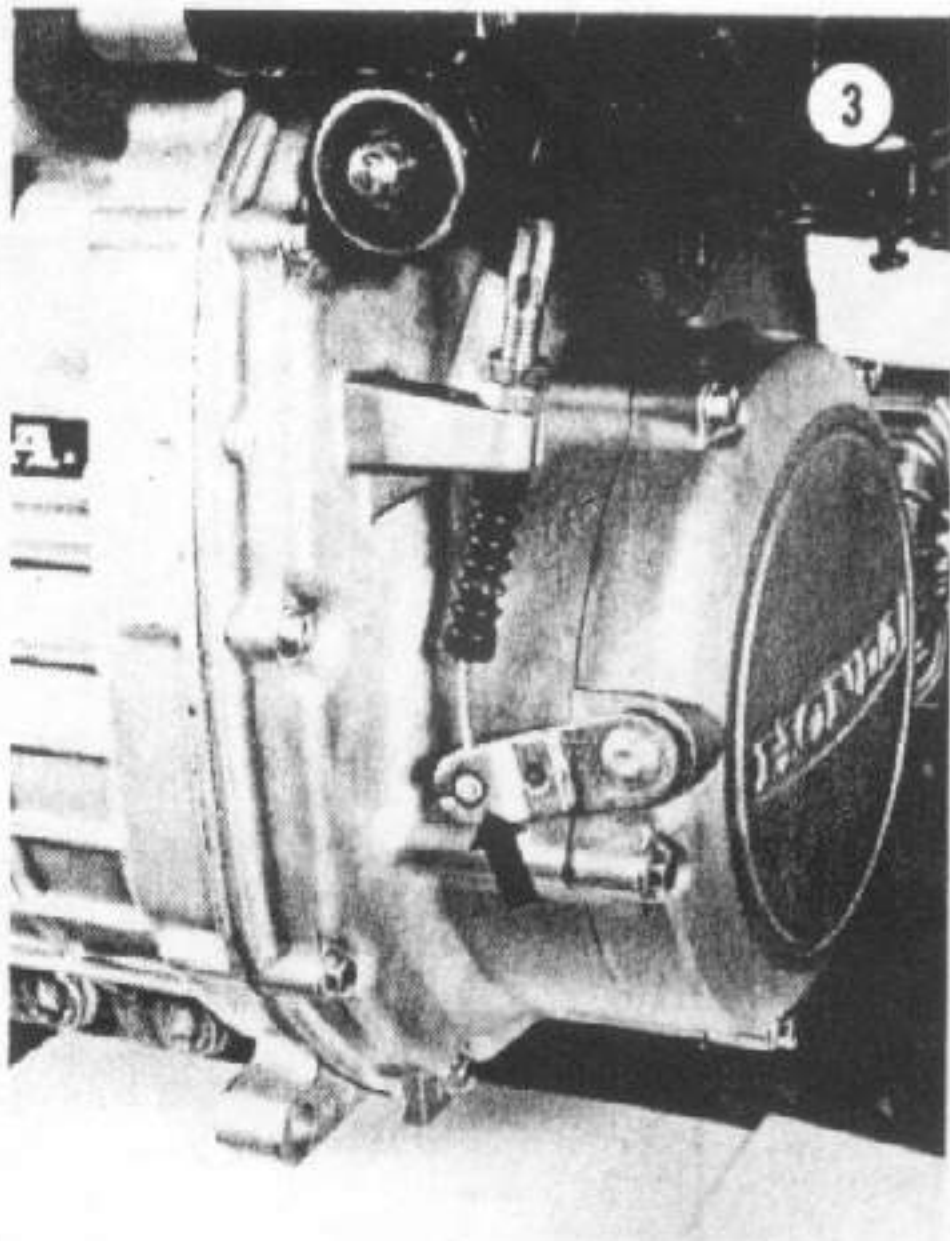
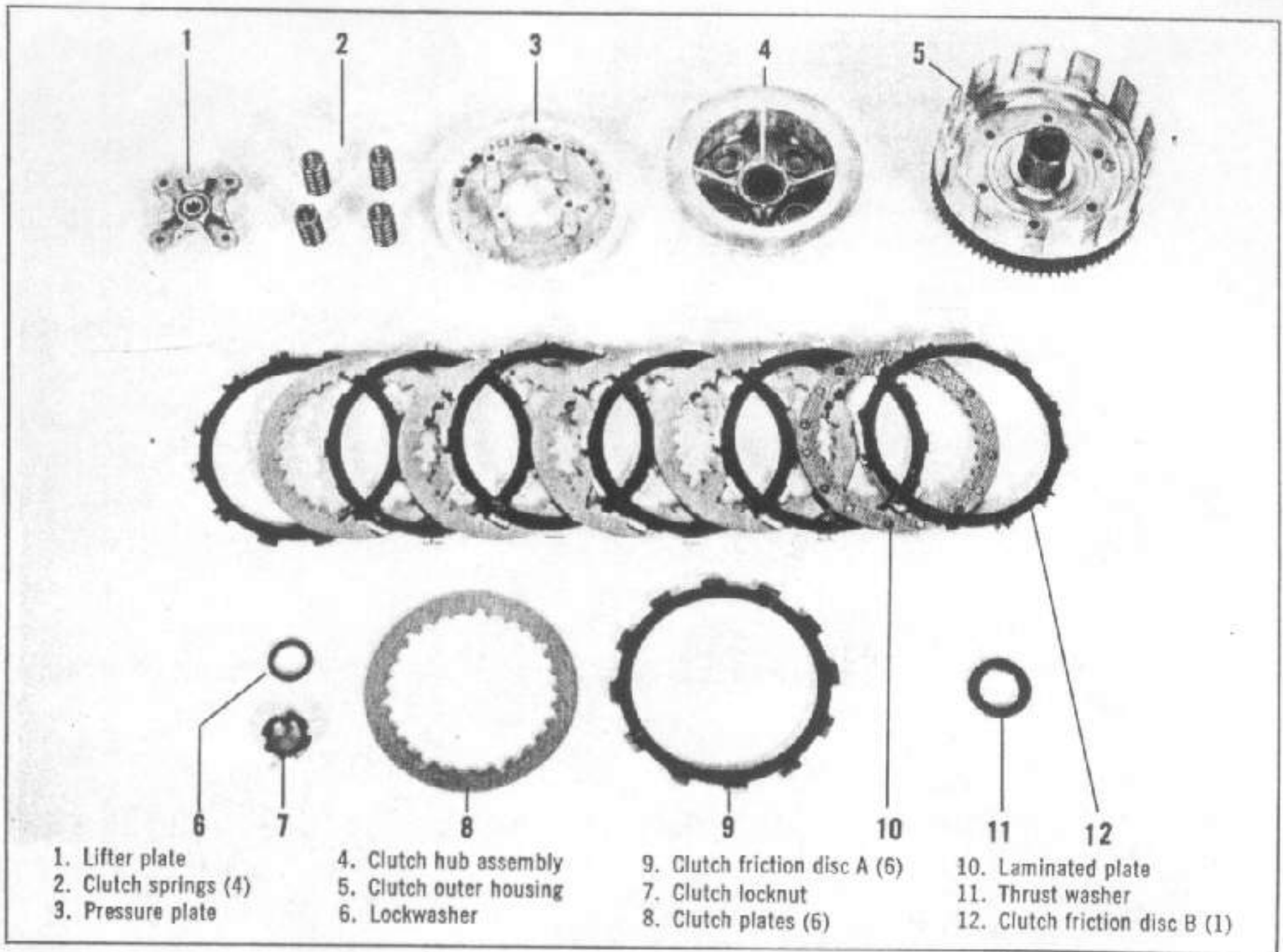
Figure 1 shows all clutch parts.

5.4.1

Removal

1. Place the bike on the centerstand.
2. Drain the engine oil as described under *Changing Oil and Filter* in Chapter Three.
3. Remove the exhaust system as described under *Exhaust System Removal/Installation* in Chapter Six.
4. Remove the rubber plugs and screws, 2 on each side (**Figure 2**) securing the radiator shroud. Slide the shroud forward and down and remove it.
5. Disconnect the clutch cable at the clutch housing (**Figure 3**).
6. Remove the 5 bolts (**Figure 4**) securing the clutch cover and remove it.
7. Remove the 4 bolts, in a crisscross pattern, securing the lifter plate and bearing (**Figure 5**).





5

8. Remove the 4 springs (Figure 6).
9. Loosen the clutch locknut with a drift and a hammer (Figure 7); remove it and the lockwasher.
10. Remove the clutch hub, the 6 clutch plates, the 7 friction discs, and the pressure plate as an assembly (Figure 8).

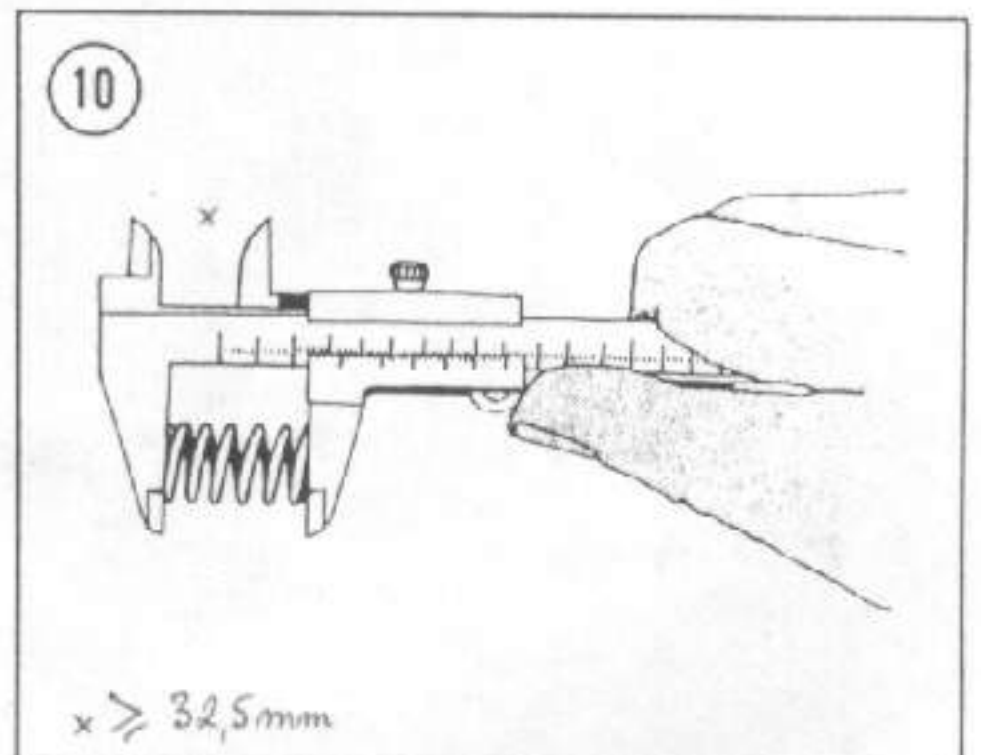
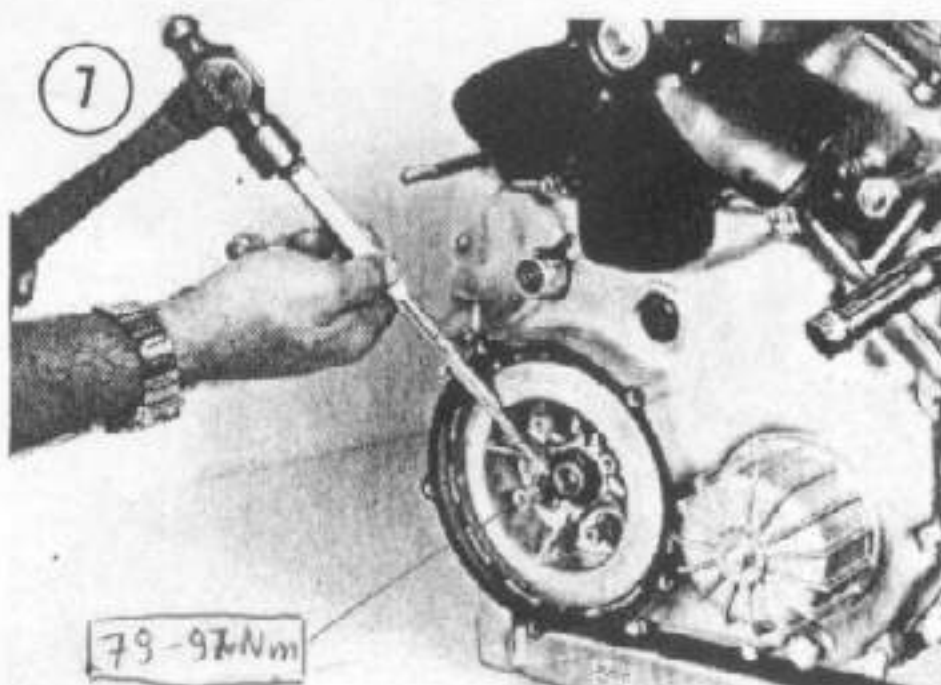
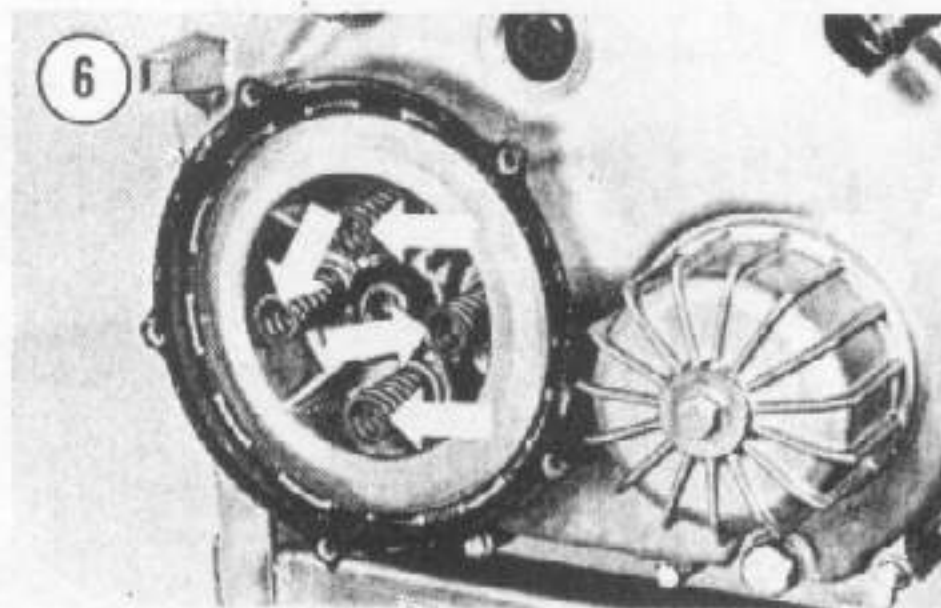
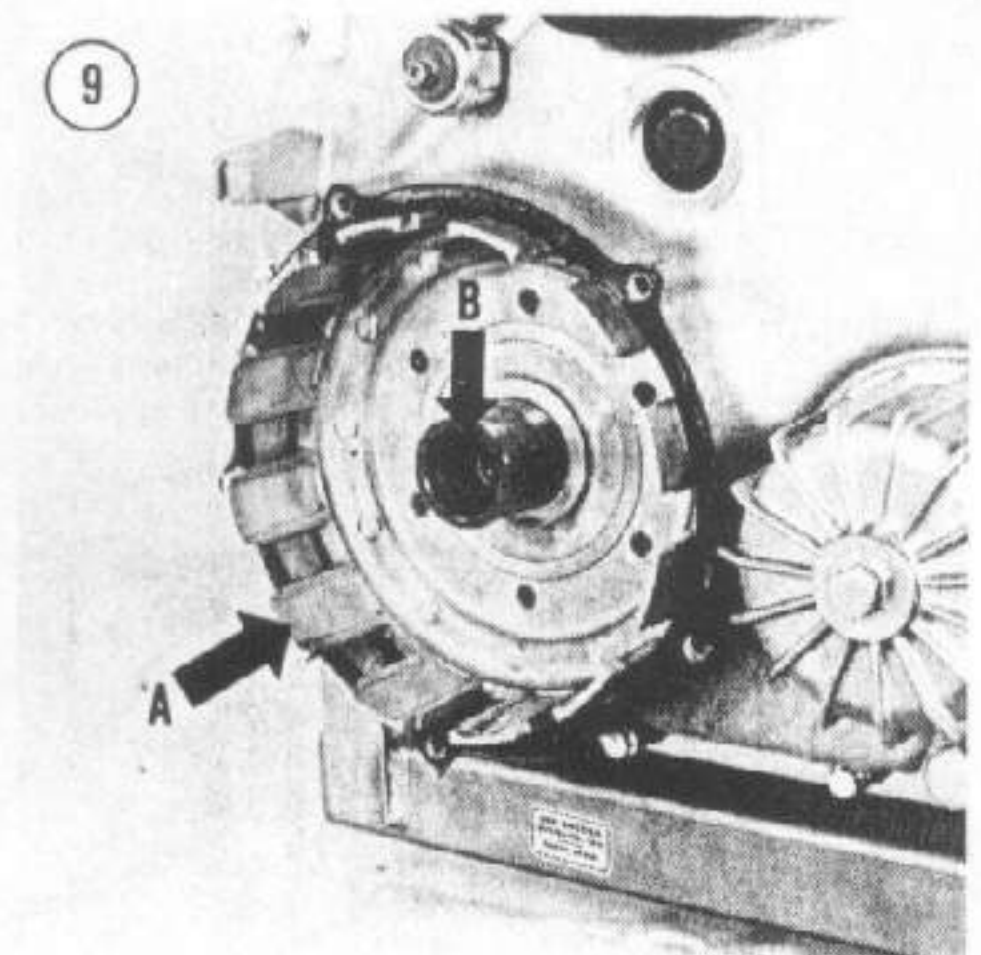
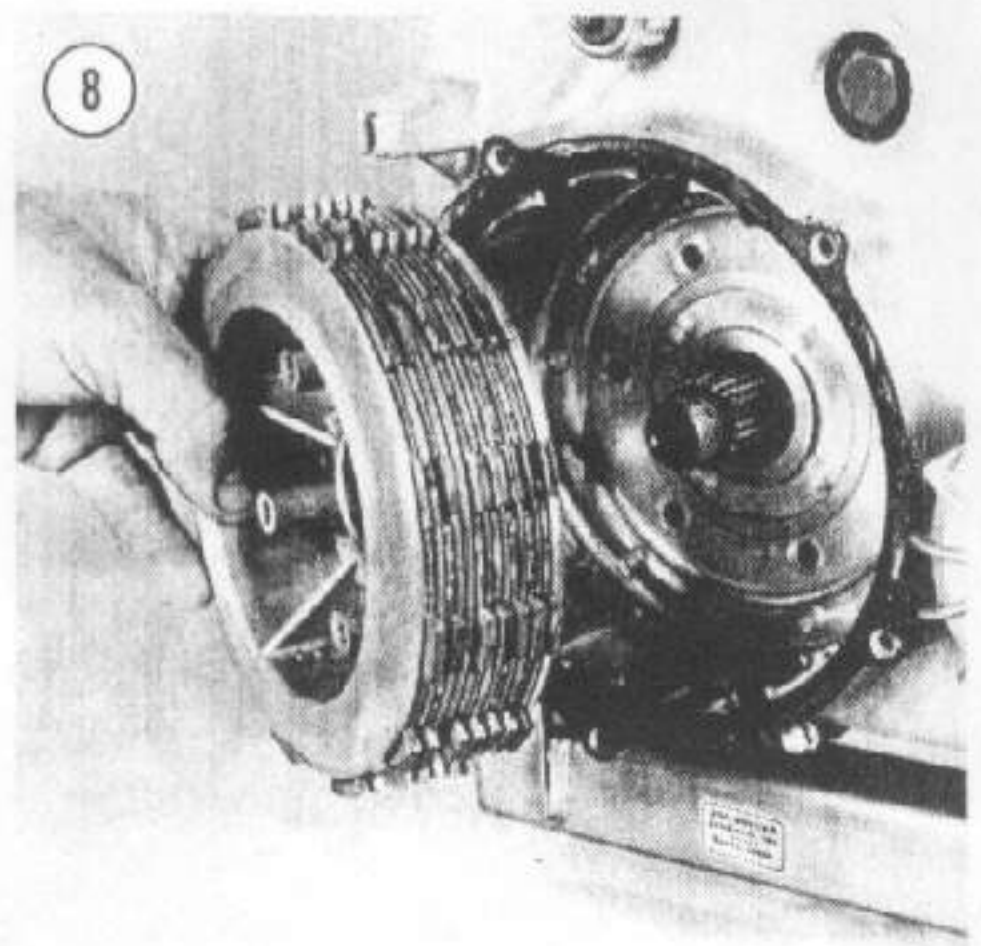
NOTE: The outermost friction disc ("B" disc) is thicker than the other 6 friction discs. Remember this when installing them.

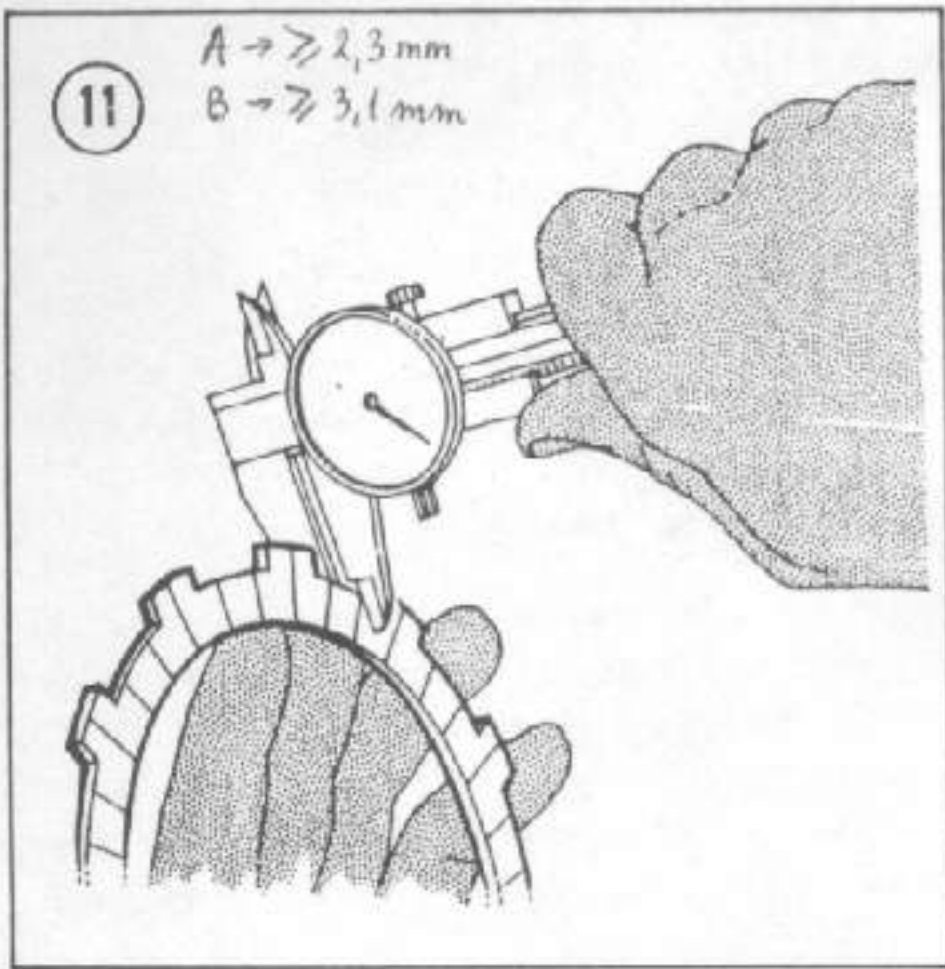
11. Remove the outer housing (A, Figure 9) and the bushing (B, Figure 9).
12. Remove the thrust washer.

5.4.2

Inspection

1. Clean all clutch parts in petroleum-based solvent such as kerosene and thoroughly dry with compressed air.
2. Measure the free length of each clutch spring as shown in Figure 10. New springs measure 1.3346 in. (33.90mm). Replace the springs that are 1.2795 in. (32.5mm) or less.





3. Measure the thickness of each friction disc at several places around the disc as shown in **Figure 11**. Compare them to the measurements in **Table 1**. Replace any that are worn to the wear limit. The "B" disc is the outermost friction disc, located against the clutch hub.

4. Check all other parts for signs of wear or other damage. Replace any parts as necessary.

5.4.3.

Installation

Install by reversing the removal steps and noting the following steps. Refer to **Figure 1** for this procedure.

1. After installing the thrust washer, outer clutch housing and the pressure plate, alternate the 6 thin friction discs ("A" disc) and the 6 clutch plates as shown in **Figure 12**. The thicker

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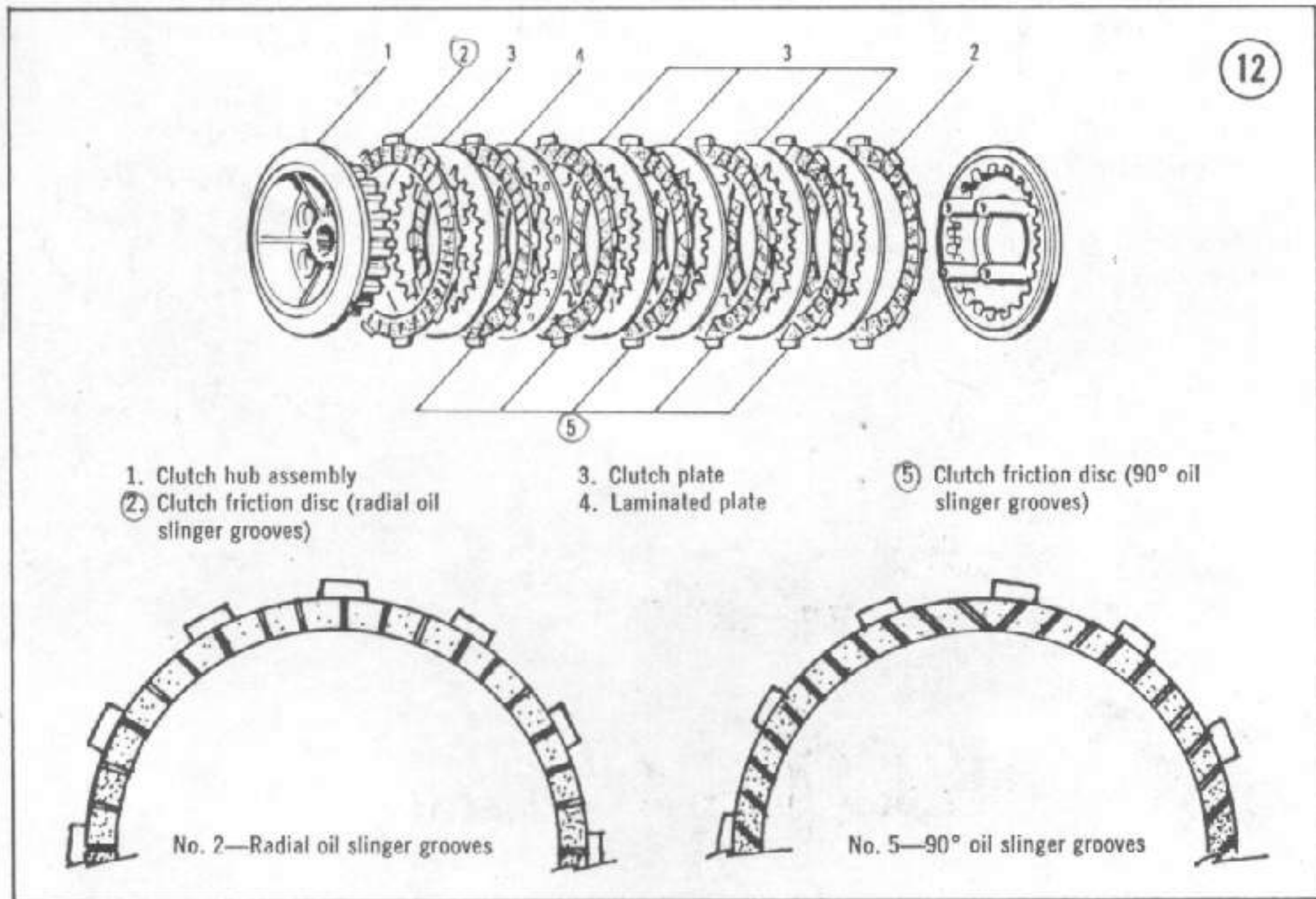


Table 1 CLUTCH DISC THICKNESS

Type/Quantity	New	Wear Limit
A disc (6)	0.106 in. (2.7mm)	0.091 in. (2.3mm)
B disc (1)	0.138 in. (3.5mm)	0.122 in. (3.1mm)

friction disc ("B" disc) is the last one to be installed and the thicker laminated plate is the next to last to be installed.

NOTE: Note direction of oil slinger grooves in friction discs. See Figure 12.

CAUTION

The clutch plates and discs must be installed in sequence shown in Figure 12 or the clutch will be damaged.

2. Install the lockwasher and locknut. Torque the nut to 58-72 ft.-lb. (79-97 N•m).
3. Adjust the clutch cable as described under *Clutch Cable Adjustment* in Chapter Three.
4. Fill the engine with the recommended type and quantity of engine oil; refer to Chapter Three.

5.2

CLUTCH CABLE

5.2.1

Removal/Installation

In time, the cable will stretch to the point where it is no longer useful and will have to be replaced.

1. Loosen the adjusting nut (Figure 13) and disconnect the cable from the hand lever.

2. Loosen the locknut and adjusting nut (A, Figure 14) at the front engine cover.
3. Disconnect the bottom end of the cable (B, Figure 14) from the operating lever.

NOTE: Prior to removing the cable, make a drawing of the cable routing through the frame. It is very easy to forget how it was, once it has been removed. Replace it exactly as it was, avoiding any sharp turns.

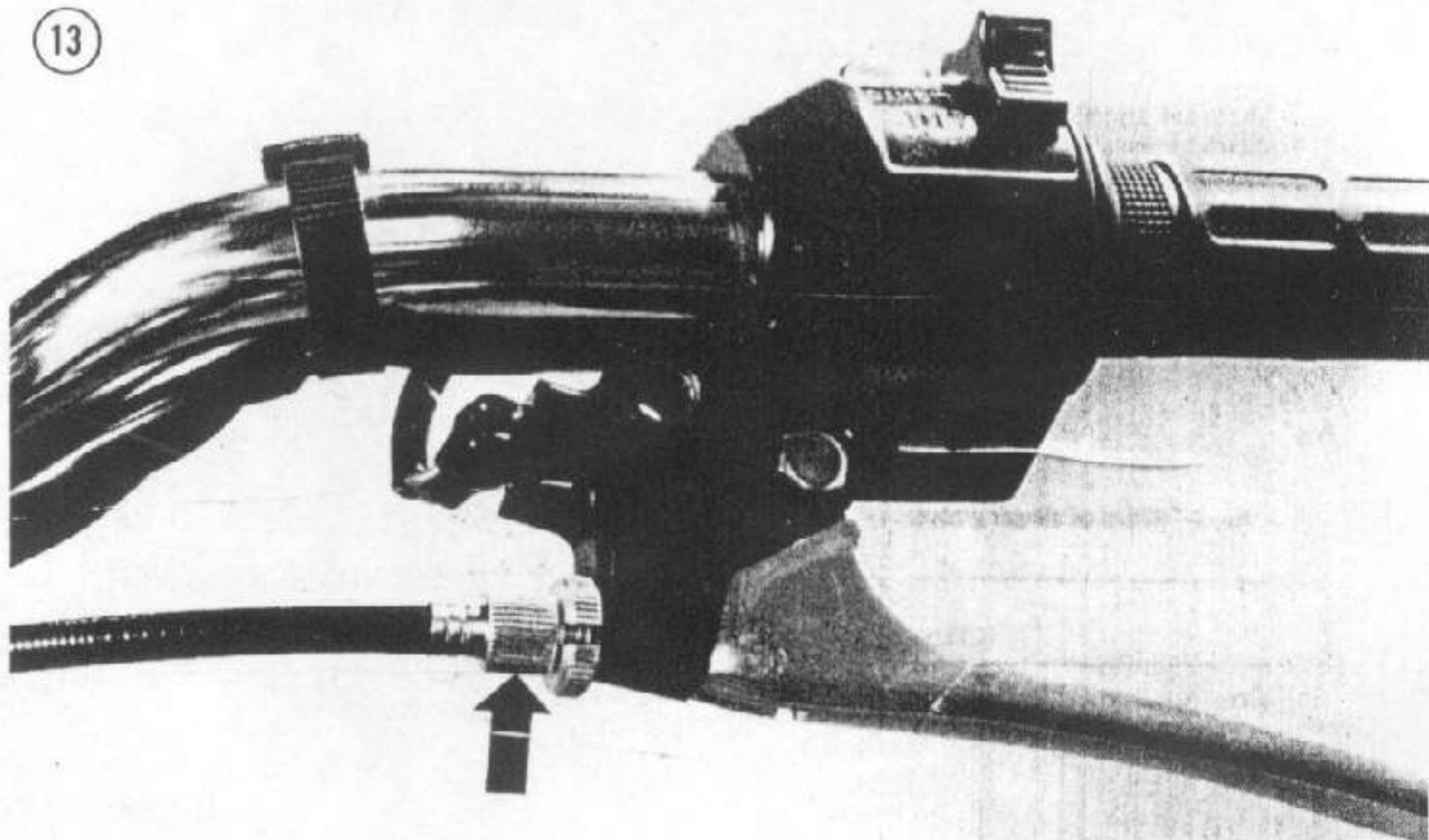
4. Remove the rubber plugs and screws, 2 on each side (Figure 2) securing the radiator shroud. Slide the shroud forward and down and remove it.
5. Remove the cable from the frame and replace with a new one. Install the radiator shroud.
6. Adjust the cable free play as described under *Clutch Free Play Adjustment* in Chapter Three.

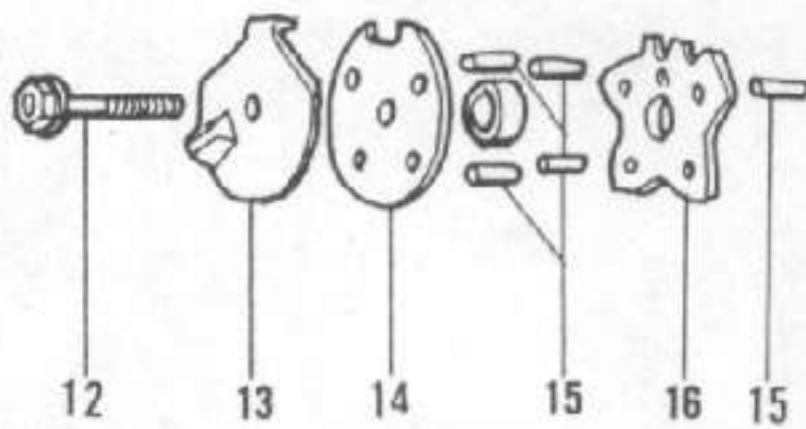
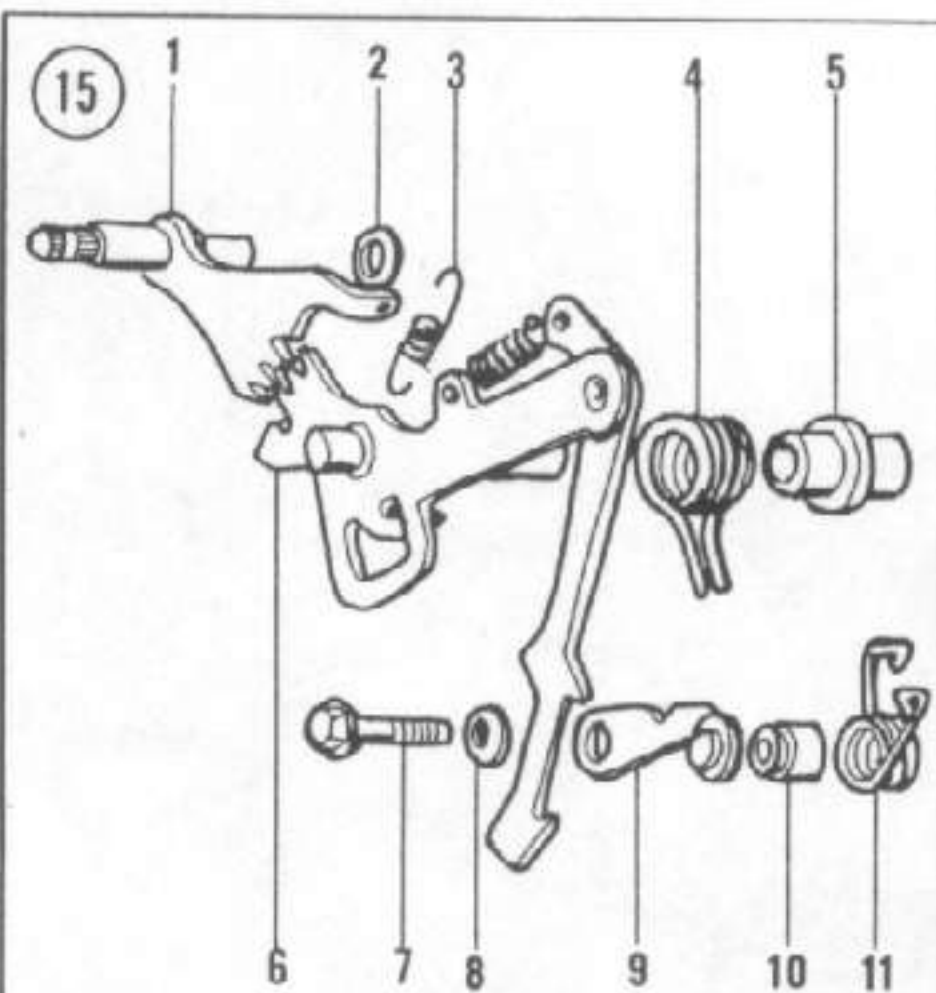
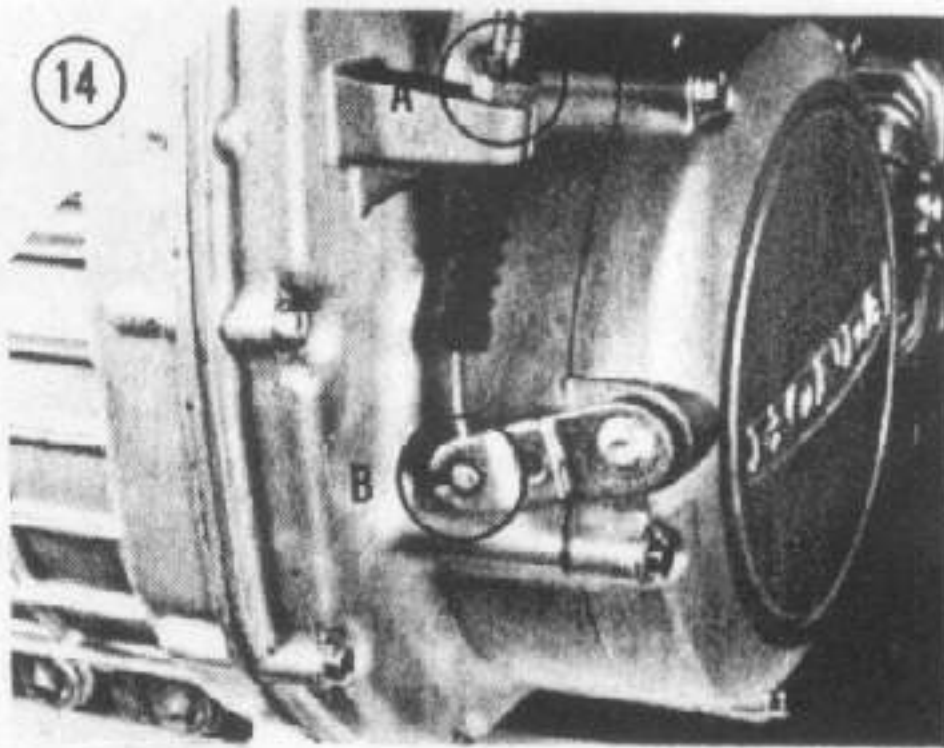
5.3

SHIFTING MECHANISM

The engine must be removed from the frame and partially disassembled to gain access to the shifting mechanism.

Refer to **Figure 15** for this procedure.



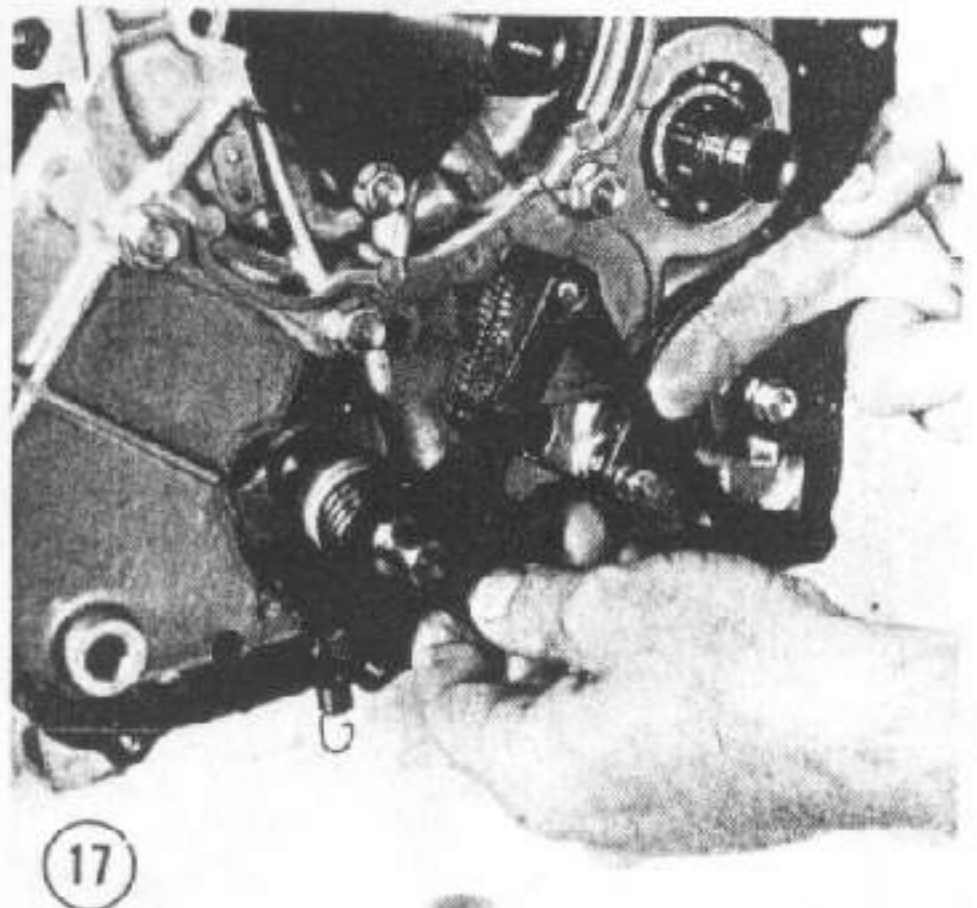
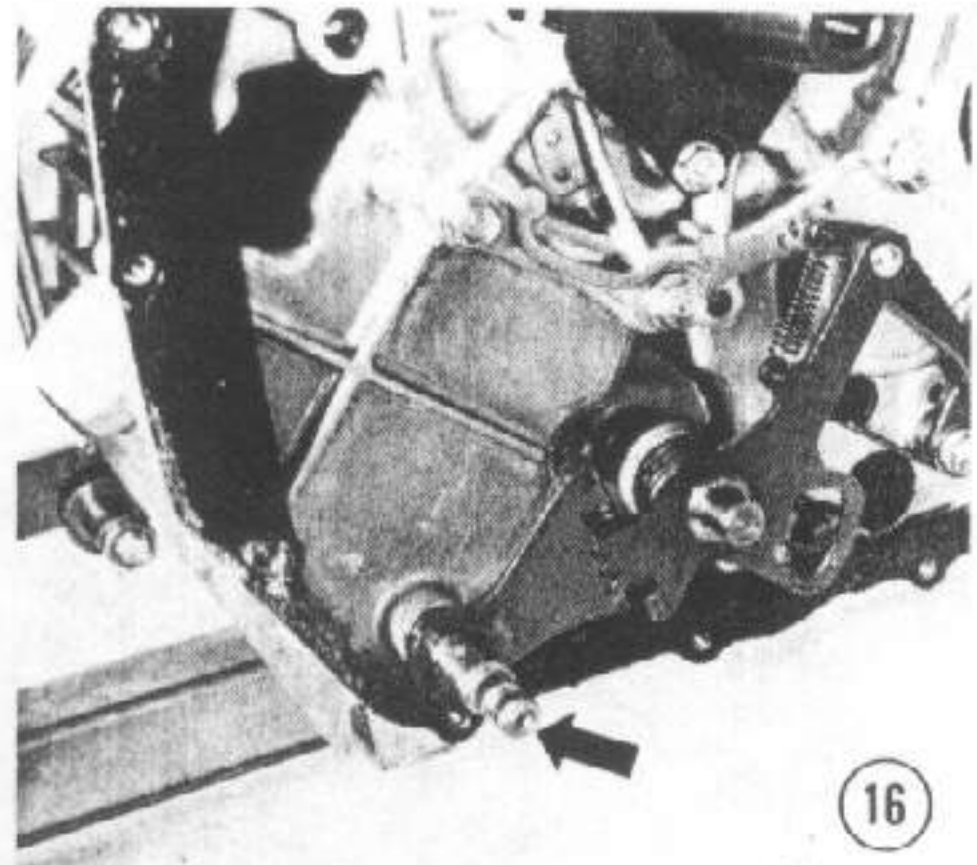


SHIFTING MECHANISM
MECHANIZM ZMIANY BIEGDW

- | | |
|----------------------------|--------------------------|
| 1. Shift lever arm | 9. Shift pawl |
| 2. Shift lever arm bushing | 10. Spacer |
| 3. Shift lever arm spring | 11. Shift pawl spring |
| 4. Gearshift return spring | 12. Bolt |
| 5. Shift spindle collar | 13. Neutral switch plate |
| 6. Shift arm/shift spindle | 14. Center plate |
| 7. Bolt | 15. Shift drum pins (5) |
| 8. Washer | 16. Shift drum cam plate |

5.3.4
Removal/Installation

1. Remove the engine as described under *Engine Removal/Installation* in Chapter Four.
2. Remove the alternator as described under *Alternator Removal/Installation* in Chapter Four.
3. Shift transmission to neutral position.
4. Remove the shift lever arm and spindle (Figure 16).
5. Push the gear shift arm away from the shift drum and remove the gear shift arm, spindle return spring, and spindle collar (Figure 17).
6. Loosen approximately 3 to 4 turns, the bolt securing the detent arm (Figure 18).



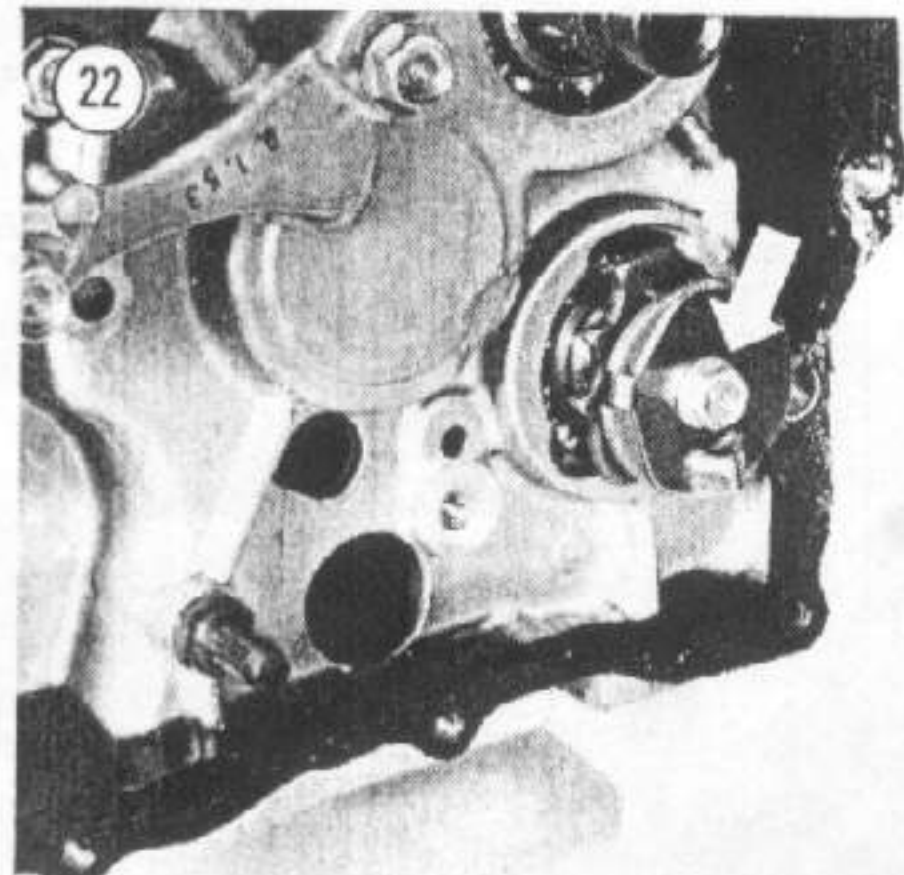
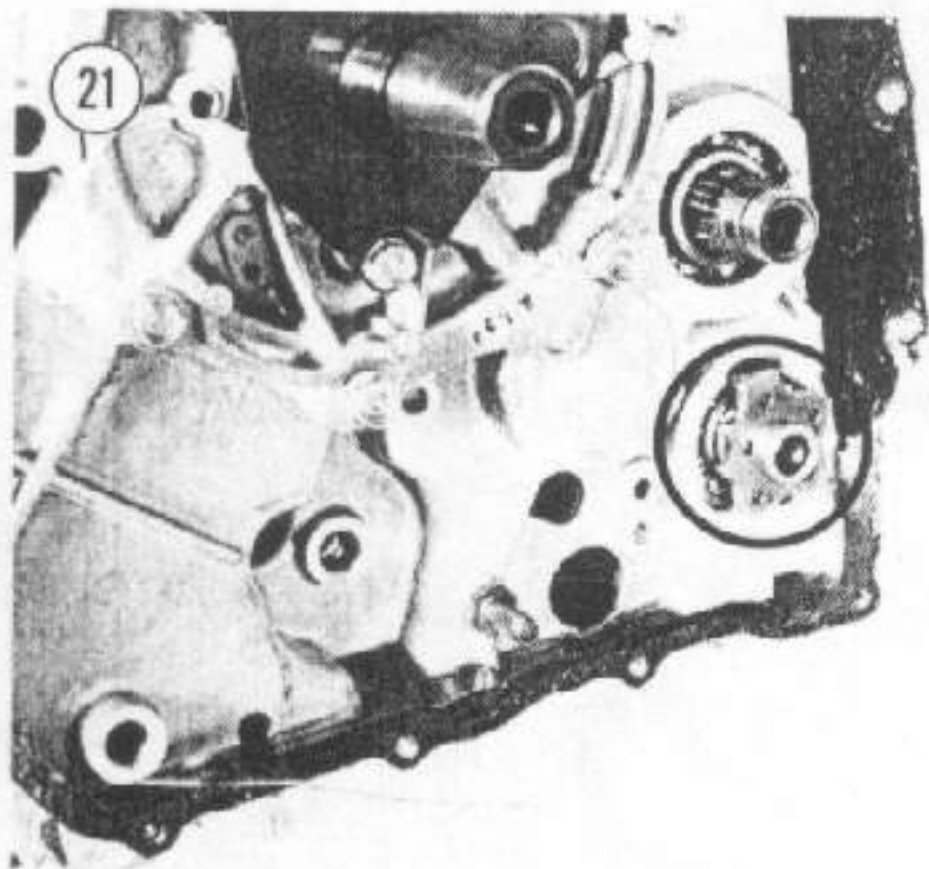
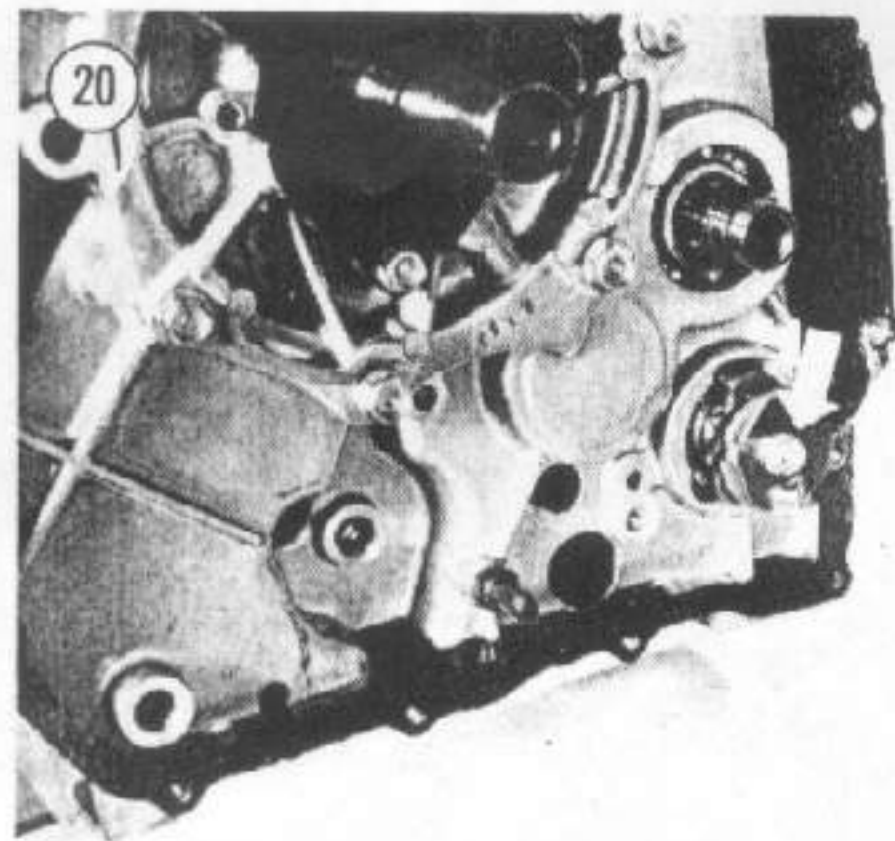
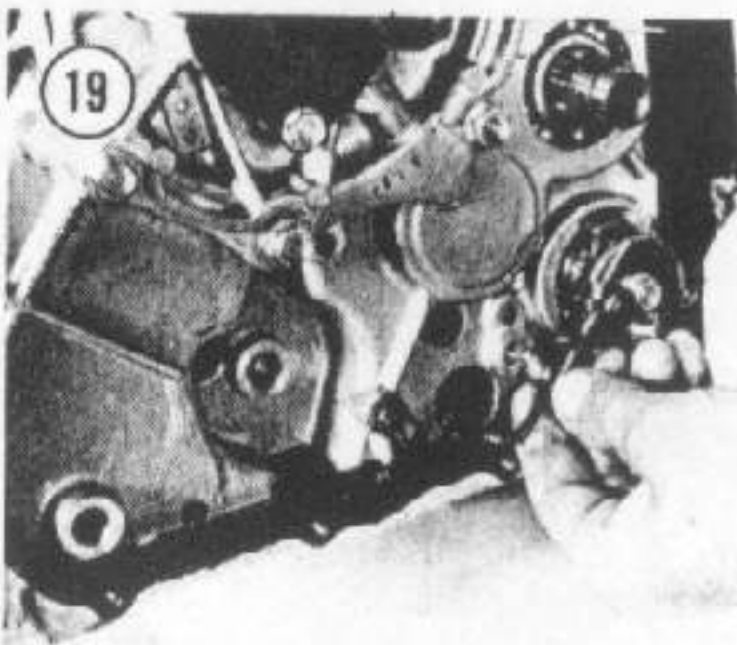
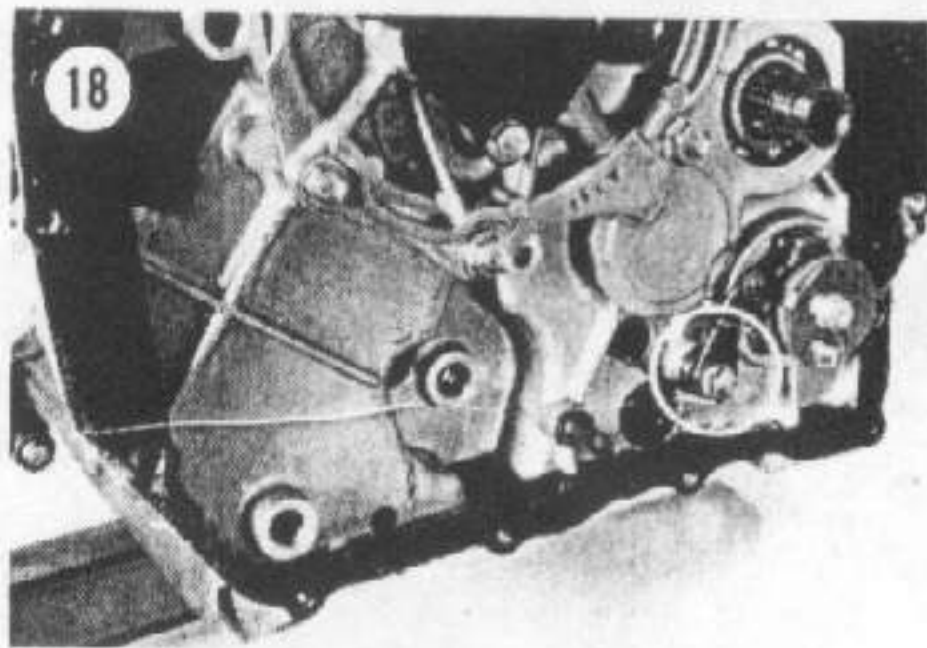
7. Flip the pawl out and off of the cam plate, remove bolt and remove the pawl and spring (Figure 19).
8. Remove the bolt securing the cam plate (Figure 20) and remove it.
9. Remove the cam (Figure 21) and the 5 pins.
10. Install by reversing these removal steps. Apply Loctite Lock 'N' Seal to the 6mm bolt securing the cam plate (Figure 22).
11. Make sure the transmission is still in the neutral position. Make sure the teeth on the shift lever (A, Figure 23) and the gear shift lever (B, Figure 23) mesh properly.
12. Fill the engine with the recommended type and quantity of engine oil and coolant; refer to Chapter Three.
13. Start the engine and check for leaks.

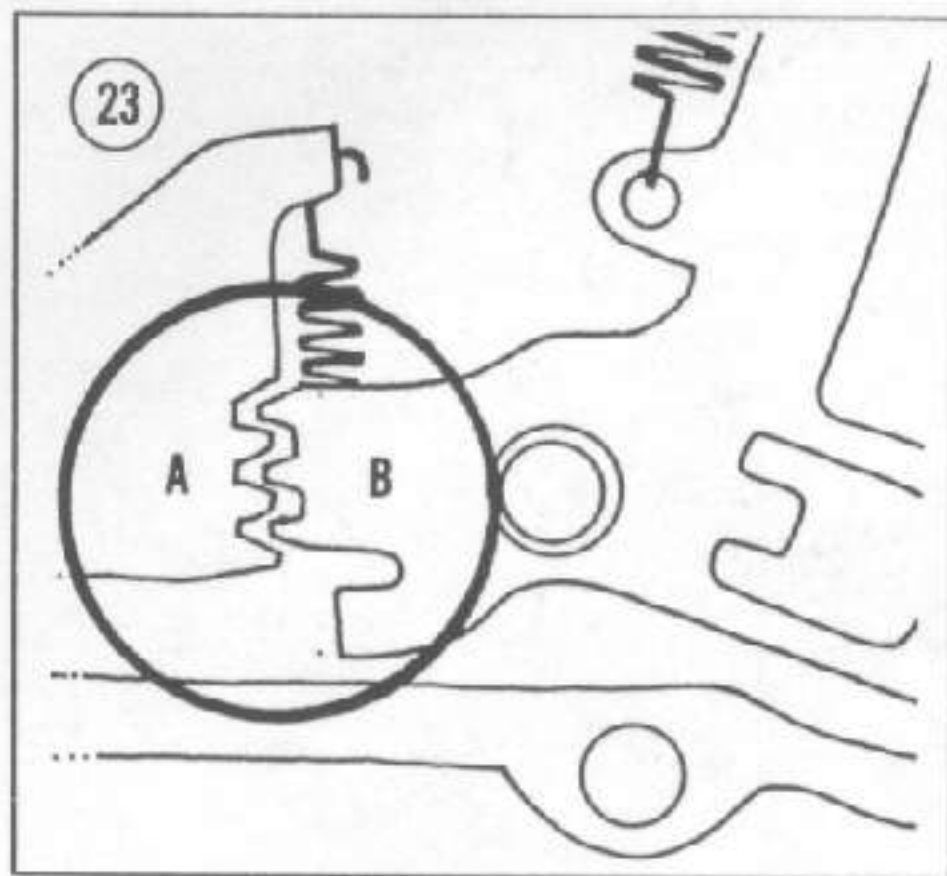
5.4

TRANSMISSION

The transmission is a 5-speed constant mesh type; all components are shown in Figure 24.

Transmission specifications are covered in Table 2.



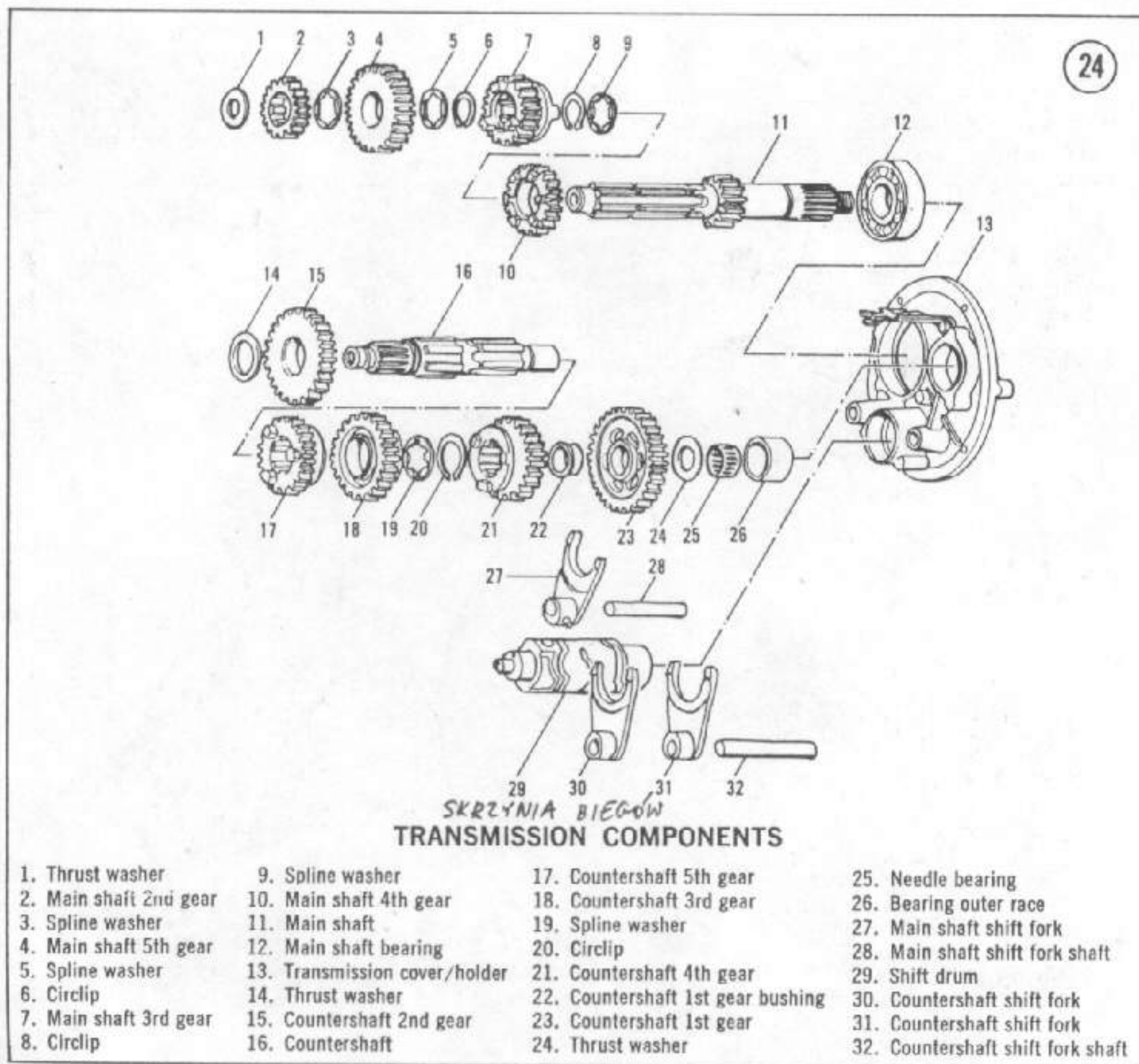


5.4.1

Disassembly

1. Remove the engine as described under *Engine Removal/Installation* in Chapter Four.
2. Remove the shifting mechanism as described under *Shifting Mechanism Removal/Installation* in this chapter.
3. Remove the clutch assembly as described under *Clutch Removal/Installation* in this chapter.
4. Remove the 13 bolts (Figure 25) securing the front engine cover and remove it.

NOTE: Figures 26 and 27 are shown with the oil pump assembly removed. It is not necessary to remove it to perform this procedure.

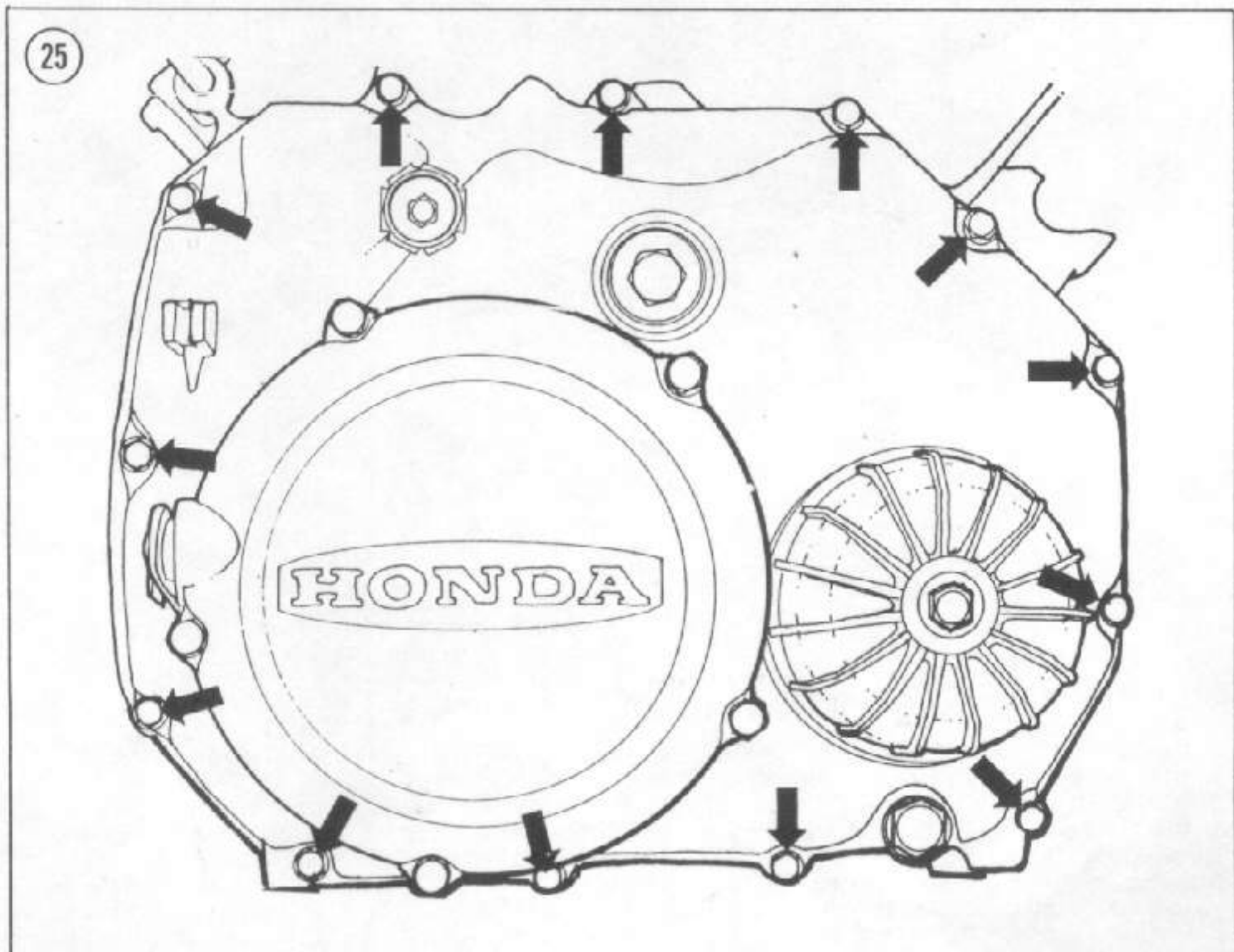


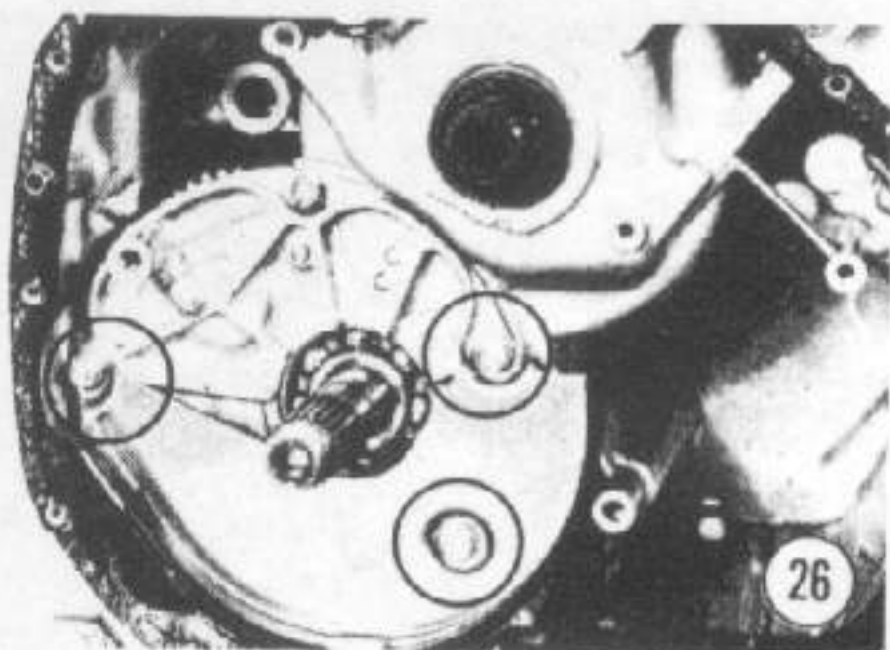
- | | | | |
|------------------------|-------------------------------|-----------------------------------|-----------------------------------|
| 1. Thrust washer | 9. Spline washer | 17. Countershaft 5th gear | 25. Needle bearing |
| 2. Main shaft 2nd gear | 10. Main shaft 4th gear | 18. Countershaft 3rd gear | 26. Bearing outer race |
| 3. Spline washer | 11. Main shaft | 19. Spline washer | 27. Main shaft shift fork |
| 4. Main shaft 5th gear | 12. Main shaft bearing | 20. Circlip | 28. Main shaft shift fork shaft |
| 5. Spline washer | 13. Transmission cover/holder | 21. Countershaft 4th gear | 29. Shift drum |
| 6. Circlip | 14. Thrust washer | 22. Countershaft 1st gear bushing | 30. Countershaft shift fork |
| 7. Main shaft 3rd gear | 15. Countershaft 2nd gear | 23. Countershaft 1st gear | 31. Countershaft shift fork |
| 8. Circlip | 16. Countershaft | 24. Thrust washer | 32. Countershaft shift fork shaft |

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Table 2 5-SPEED TRANSMISSION SPECIFICATIONS

Item	Standard Value	Wear Limit
Main shaft outer diameter	0.9819-0.9826 in. (24.940-24.959mm)	0.9823 in. (24.95mm)
Countershaft outer diameter		
At 1st gear location	0.7869-0.7874 in. (19.987-20.000mm)	0.7858 in. (19.96mm)
At 2nd gear location	1.0811-1.0819 in. (27.459-27.480mm)	1.0799 in. (27.43mm)
At 3rd and 4th gear location	0.9826-0.9835 in. (24.959-24.980mm)	0.9815 in. (24.93mm)
At 5th gear location	1.2579-1.2586 in. (31.950-31.975mm)	1.2526 in. (31.91mm)
1st gear bushing		
Outer diameter	0.9443-0.9451 in. (23.984-24.005mm)	0.9429 in. (23.95mm)
Inner diameter	0.7882-0.7890 in. (20.020-20.041mm)	0.7898 in. (20.06mm)
Gear-to-bushing clearance		0.006 in. (0.15mm)





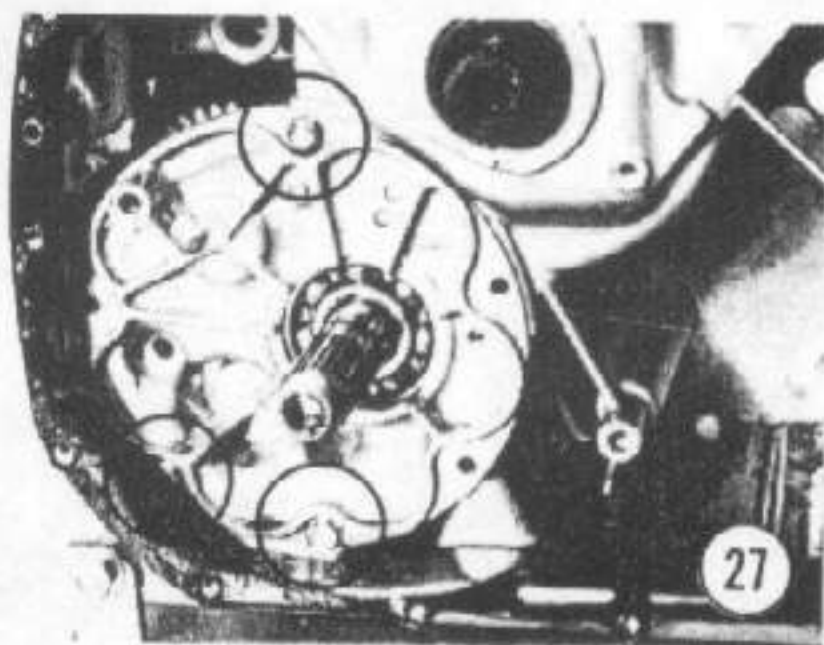
5. Remove the 3 bolts (Figure 26) securing the oil splash shield and remove it.

6. Remove the 3 remaining bolts (Figure 27) securing the transmission cover/holder.

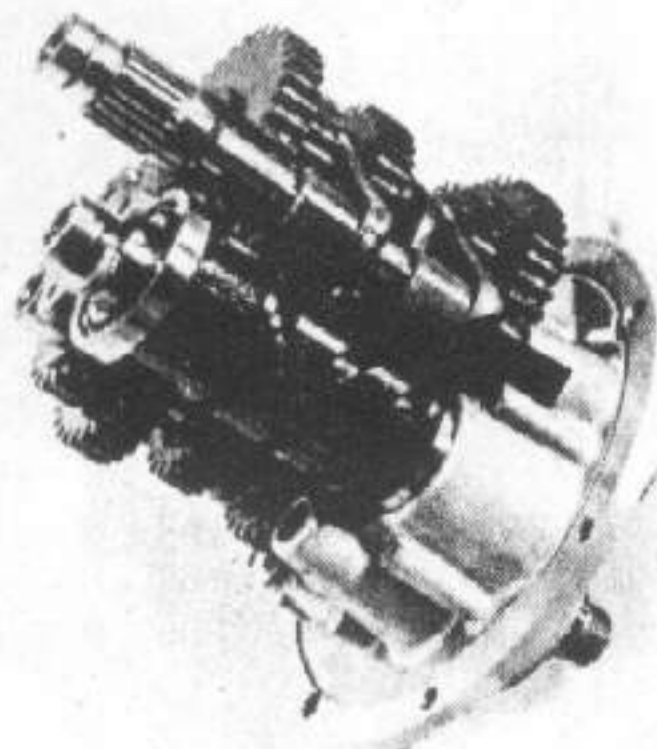
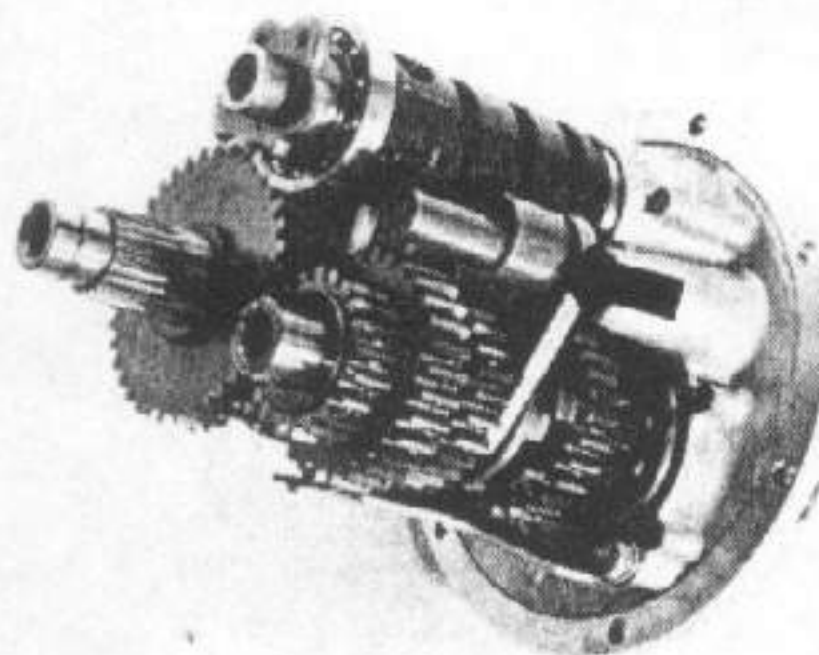
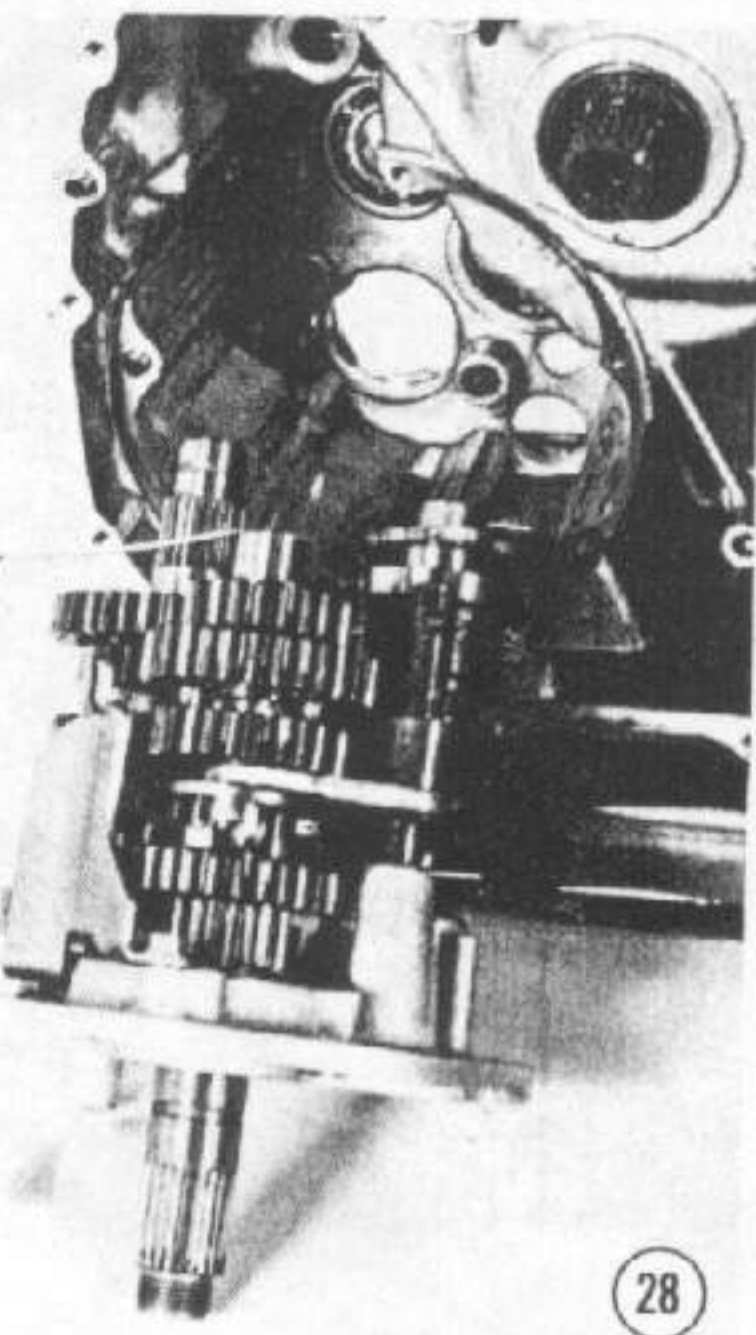
7. Carefully pull the transmission assembly out of the cylinder block. It will come out as a complete assembly (Figure 28).

CAUTION

After removal, hold the assembly upright, with the cover to the bottom, as some of the parts may fall out.



8. Remove the 2 shift fork assemblies (Figures 29 and 30).



9. Remove the shift drum (Figure 31).
10. Remove countershaft assembly (Figure 32).
11. Remove main shaft assembly (Figure 33).

5.4.2

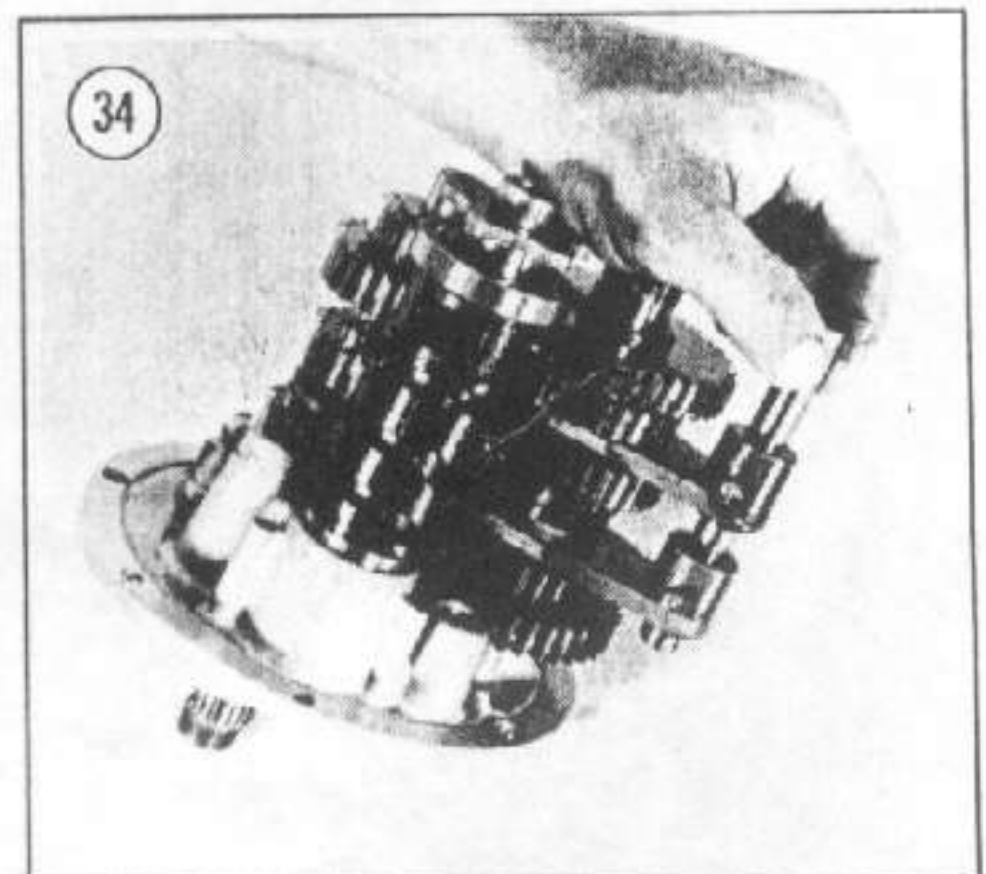
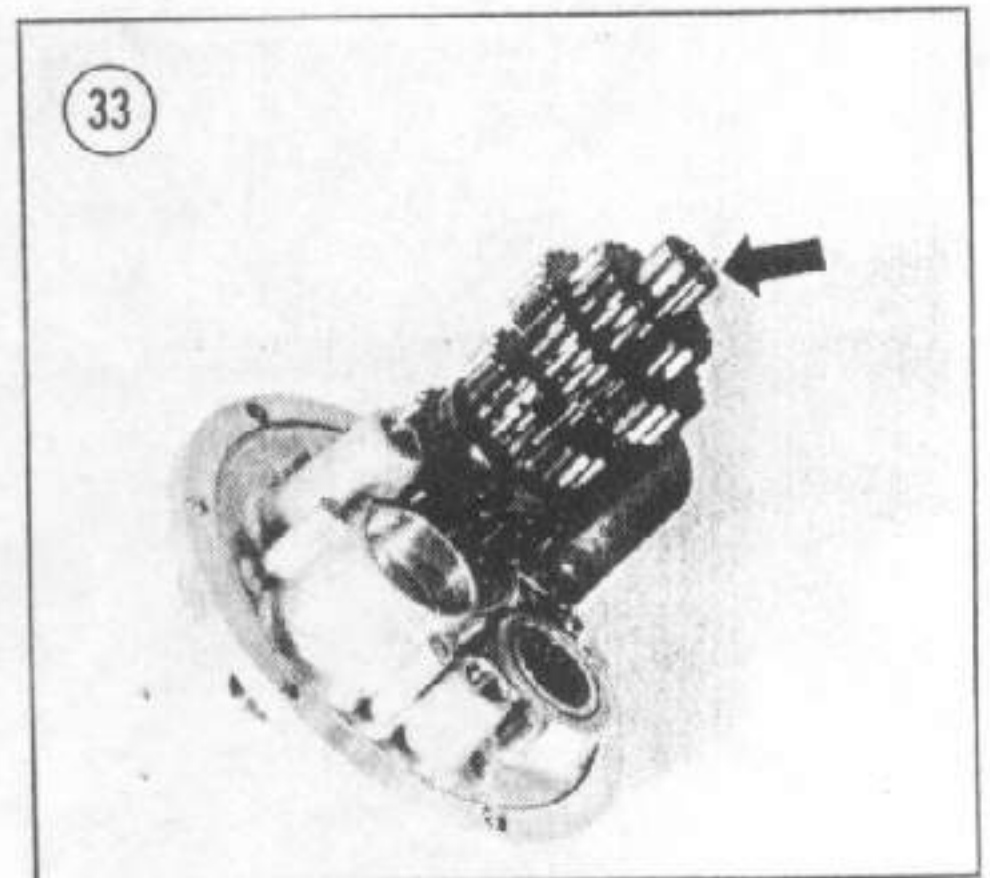
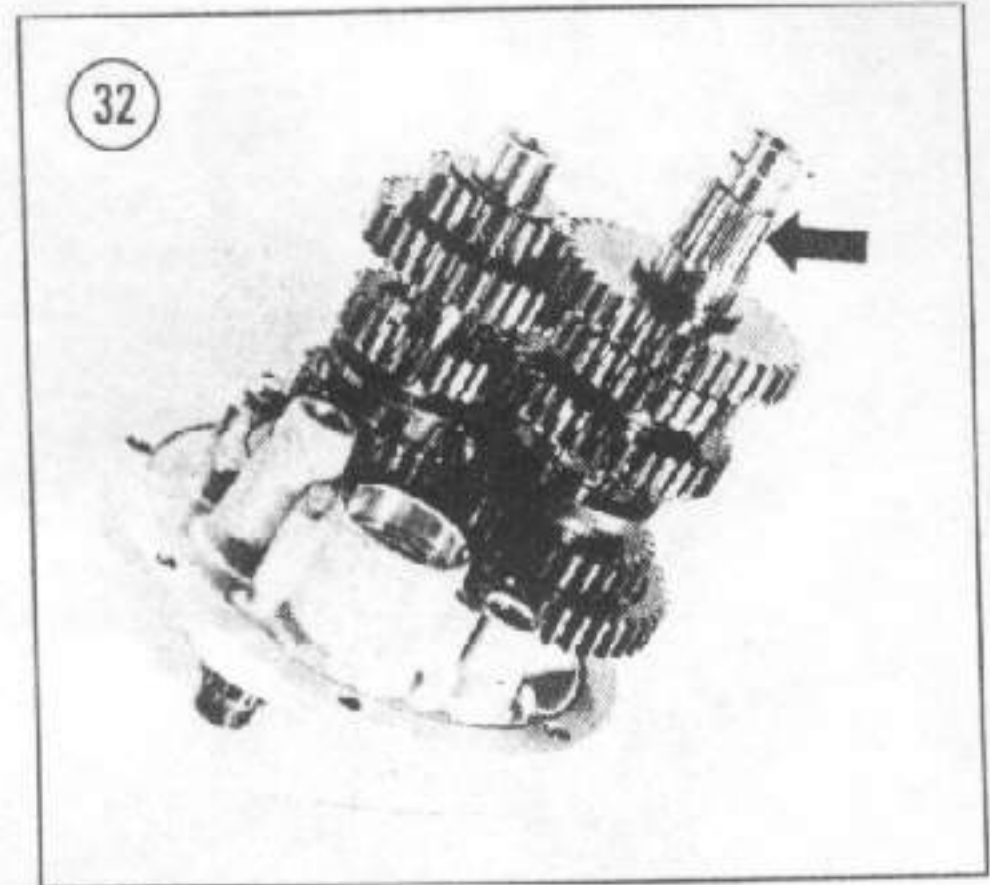
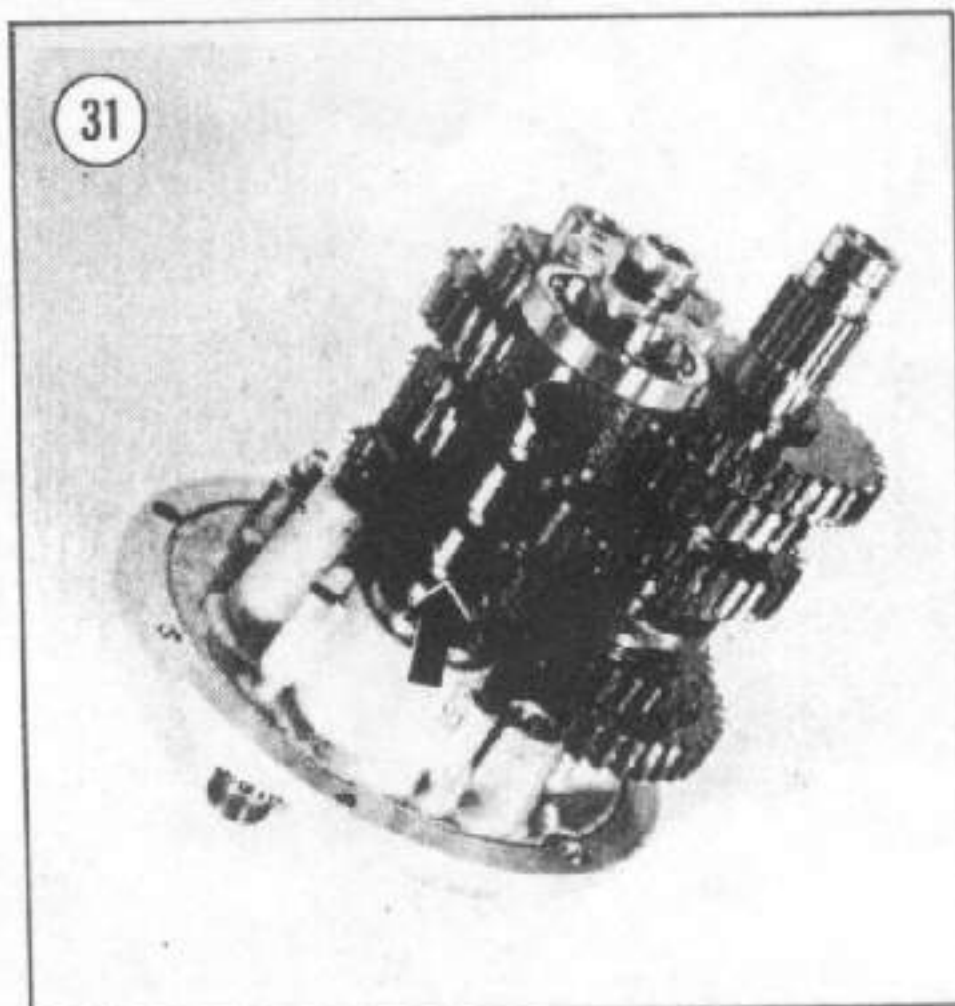
Assembly

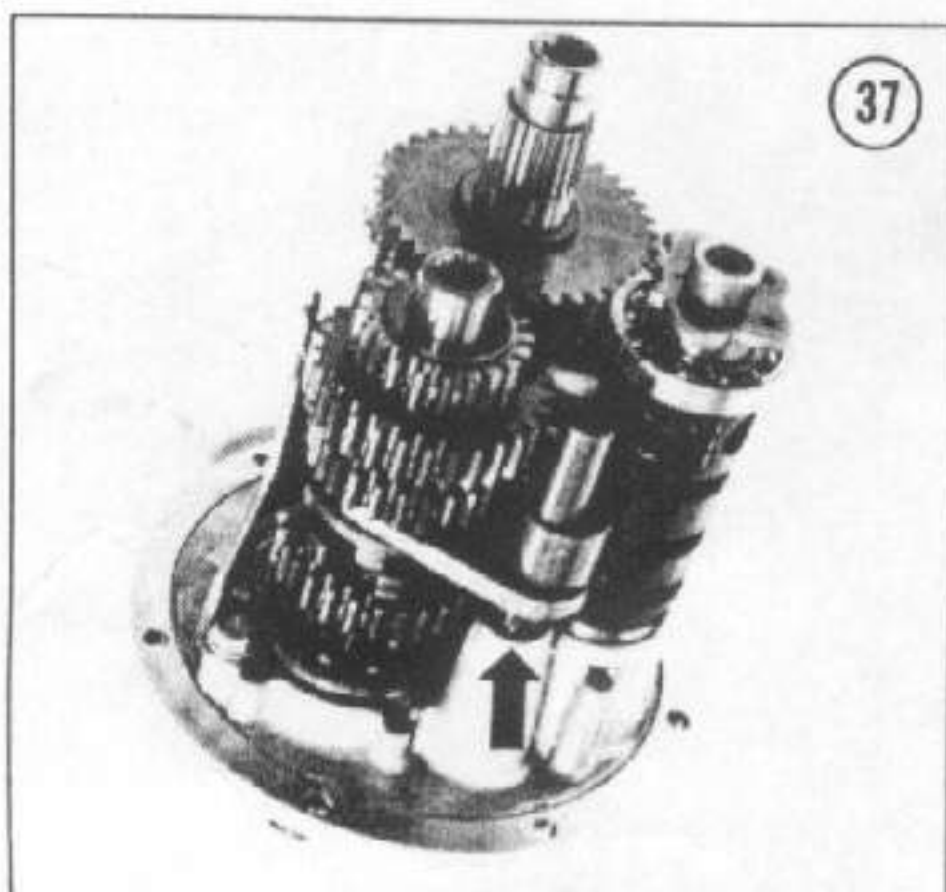
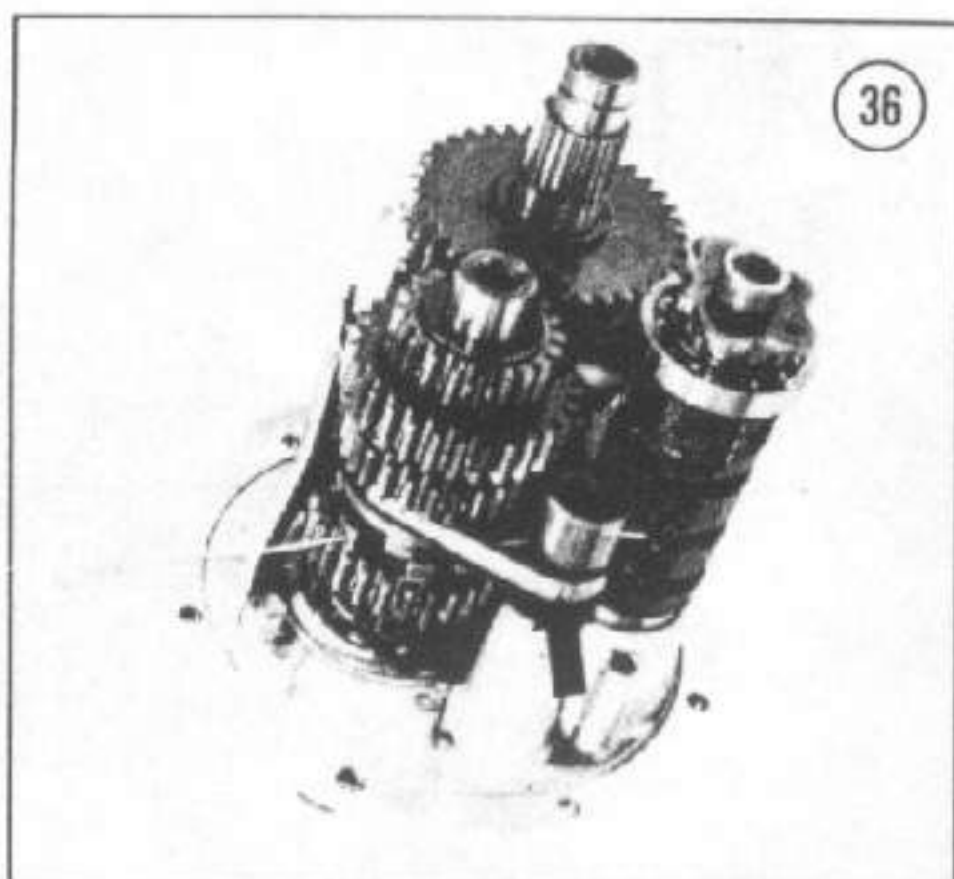
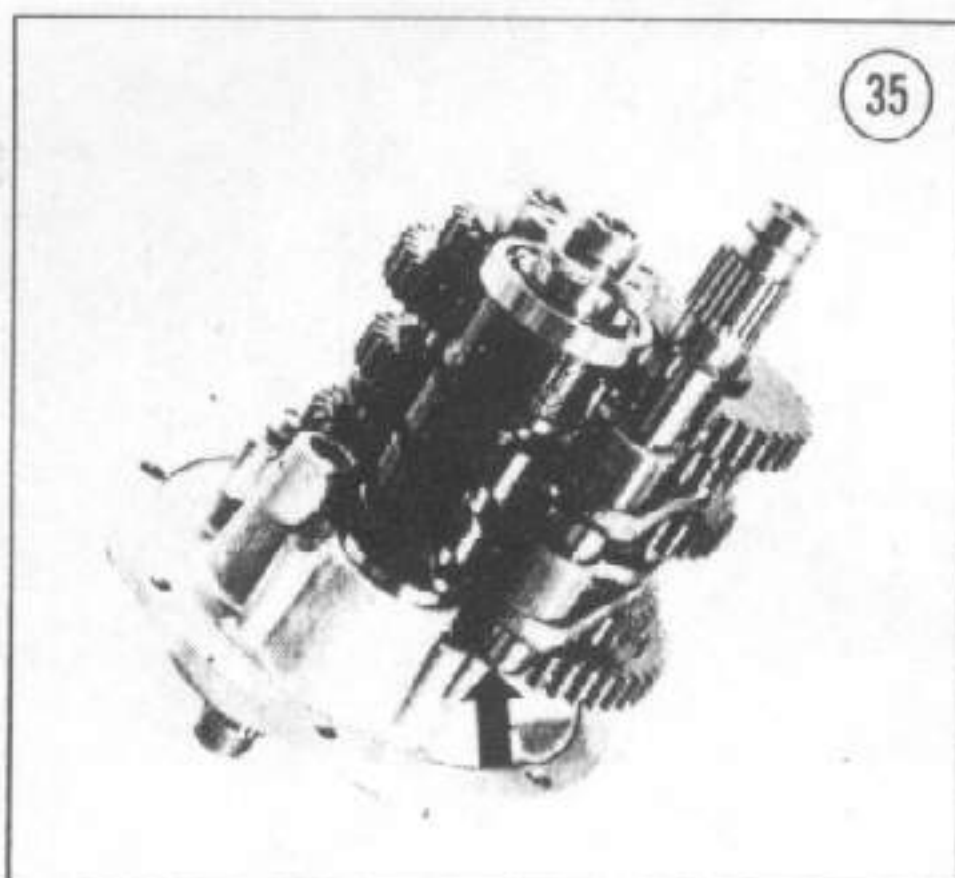
Prior to assembly, coat all bearings and bearing surfaces with assembly oil.

1. Install the main shaft assembly (Figure 33) and countershaft assembly (Figure 32) into the transmission cover/holder.

NOTE: Hold the thrust washer in place while installing the countershaft.

2. Tap on the ends of both shafts with a plastic or rubber mallet to make sure the shafts are completely seated.
3. Install the shift drum (Figure 31).
4. Slide the countershaft shift forks onto the long shaft. Insert the shift forks into the gears (Figure 34) and install the shaft into the transmission cover/holder (Figure 35).
5. Engage the main shaft shift fork onto the gear (Figure 36). Insert the short shaft onto the shift fork and into the transmission cover/holder (Figure 37).
6. Place transmission into neutral position.
7. Insert the transmission assembly into the cylinder block. Press the cover/holder into place while rotating the main shaft.





8. Install only the 3 bolts shown in **Figure 38**, securing the cover/holder.

9. Install the 3 bolts (**Figure 39**) securing the oil splash shield.

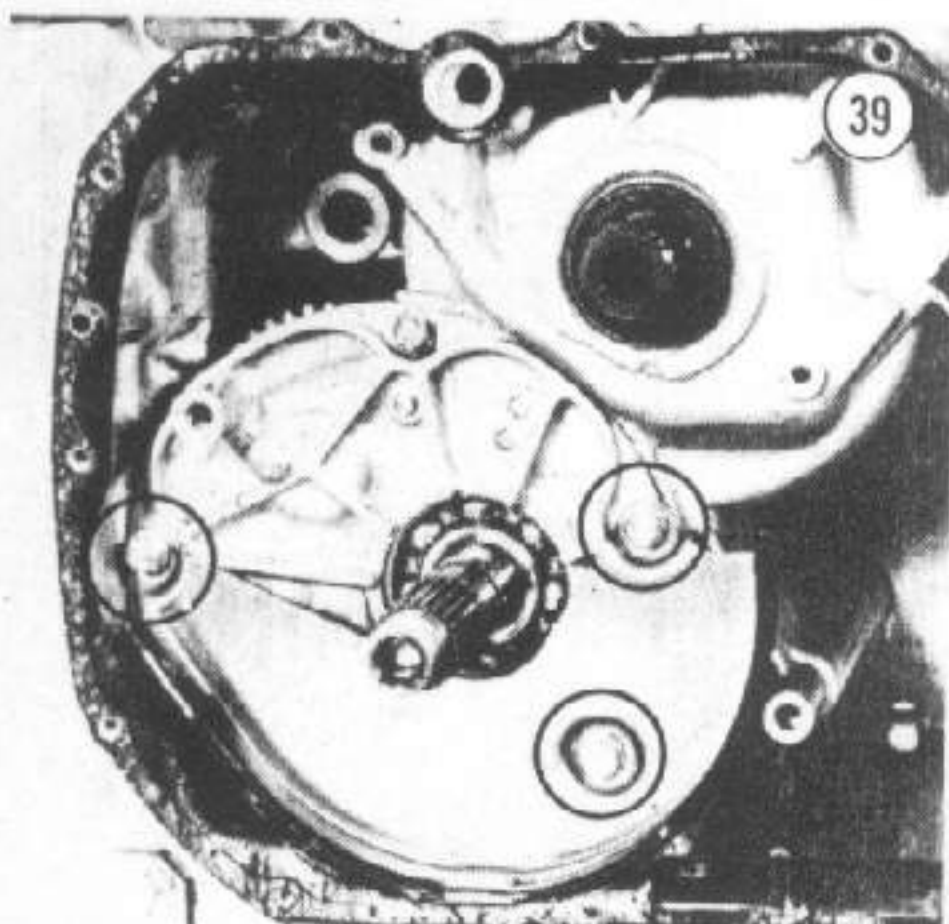
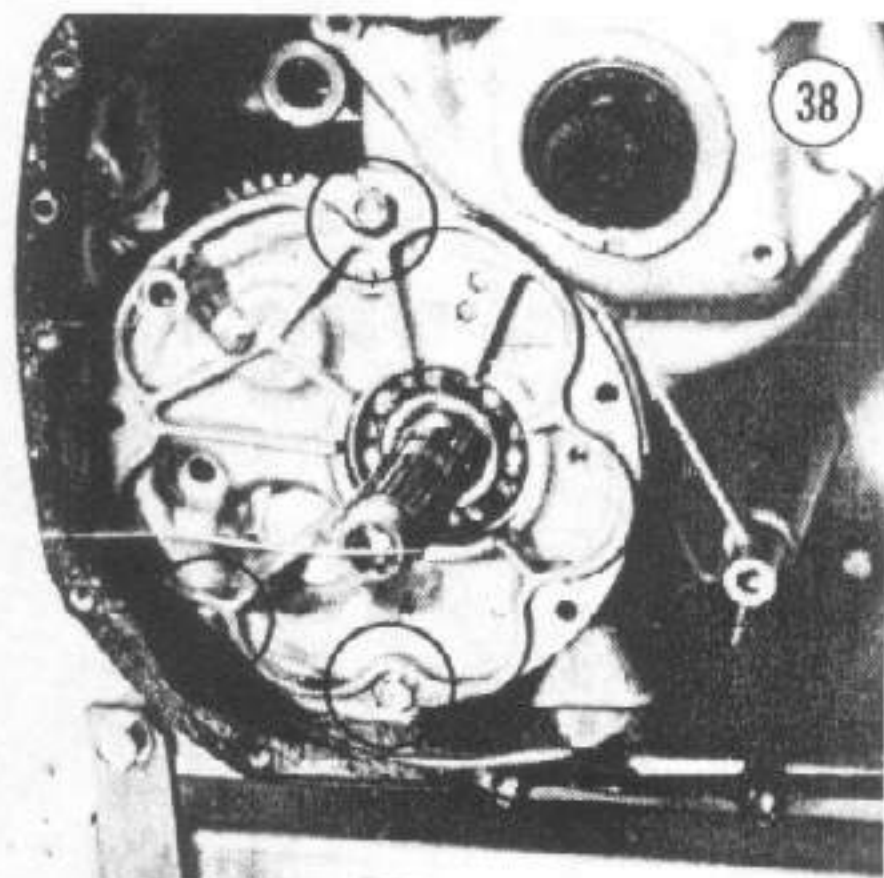
10. Install the front engine cover, using a new gasket, and the clutch assembly and the shift mechanism.

11. Install the engine.

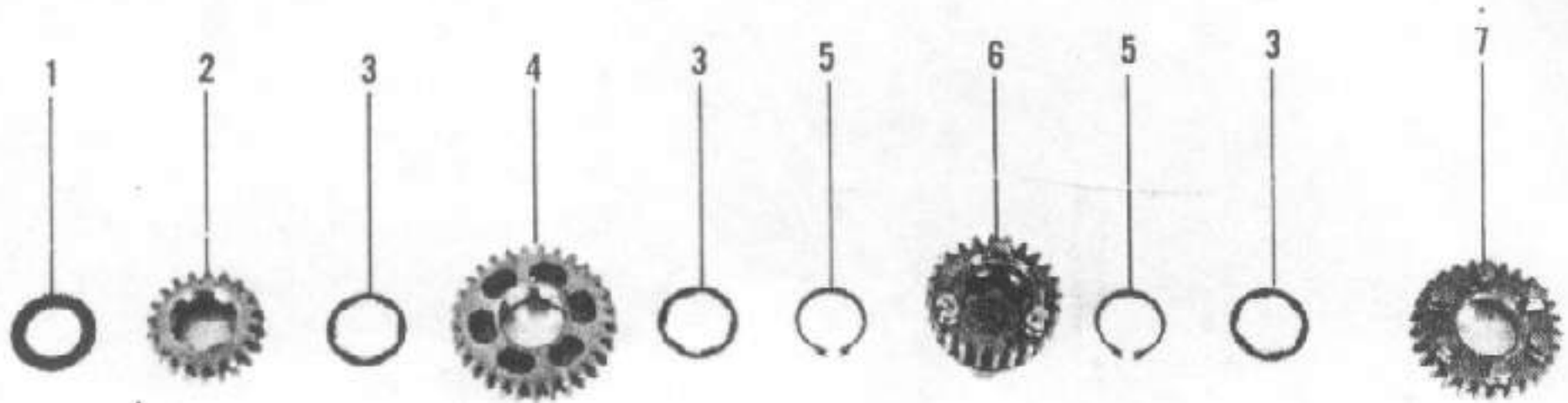
12. Adjust the clutch cable as described under *Clutch Free Play Adjustment* in Chapter Three.

13. Fill the engine with the recommended type and quantity of engine oil and coolant; refer to Chapter Three.

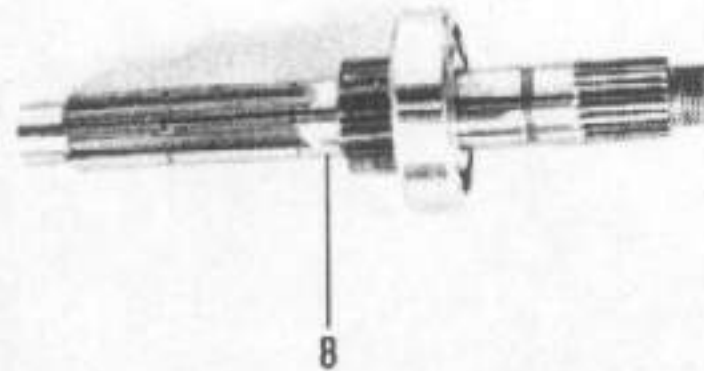
14. Start the engine and check for leaks.



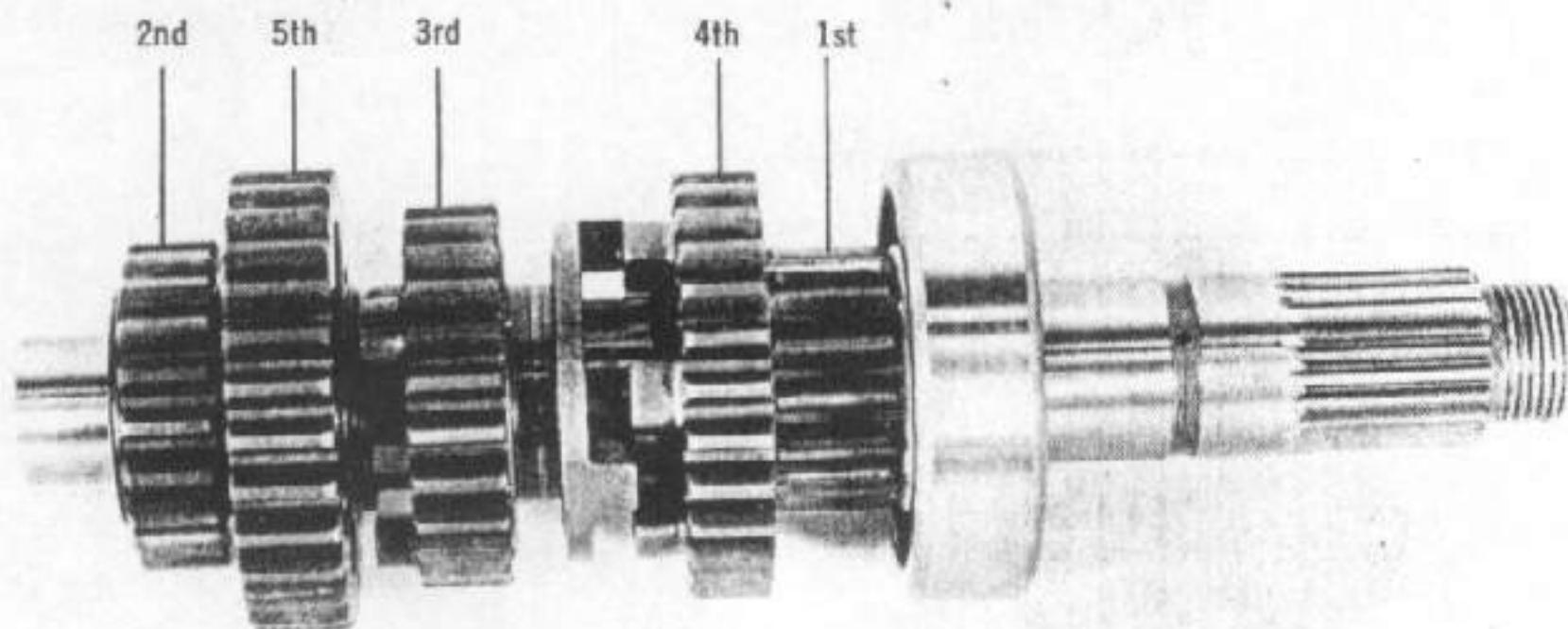
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1. Thrust washer
2. 2nd gear
3. Splined thrust washer
4. 5th gear
5. Circlip
6. 3rd gear
7. 4th gear



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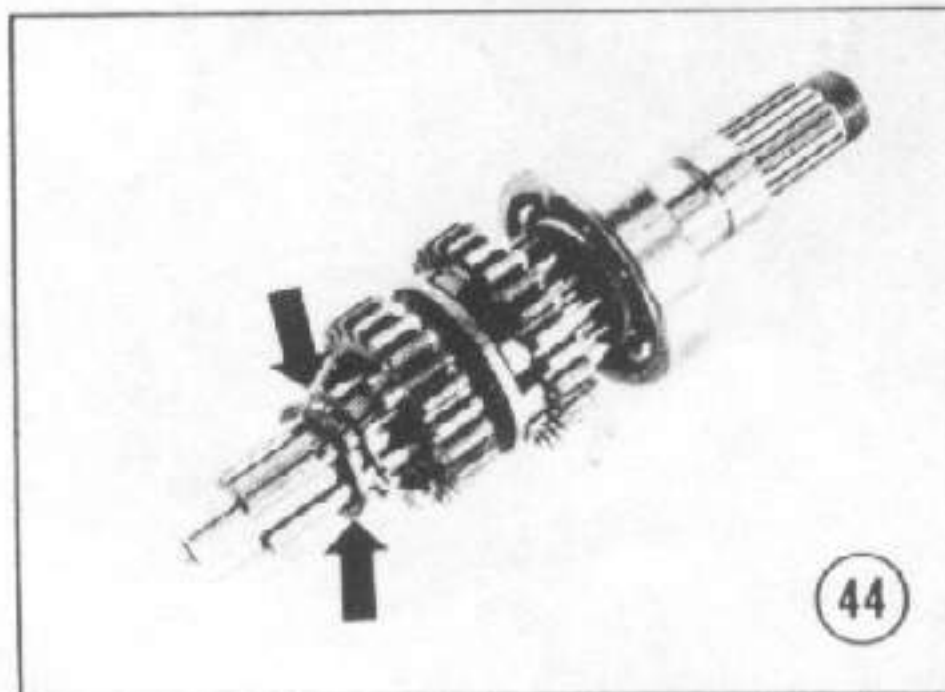
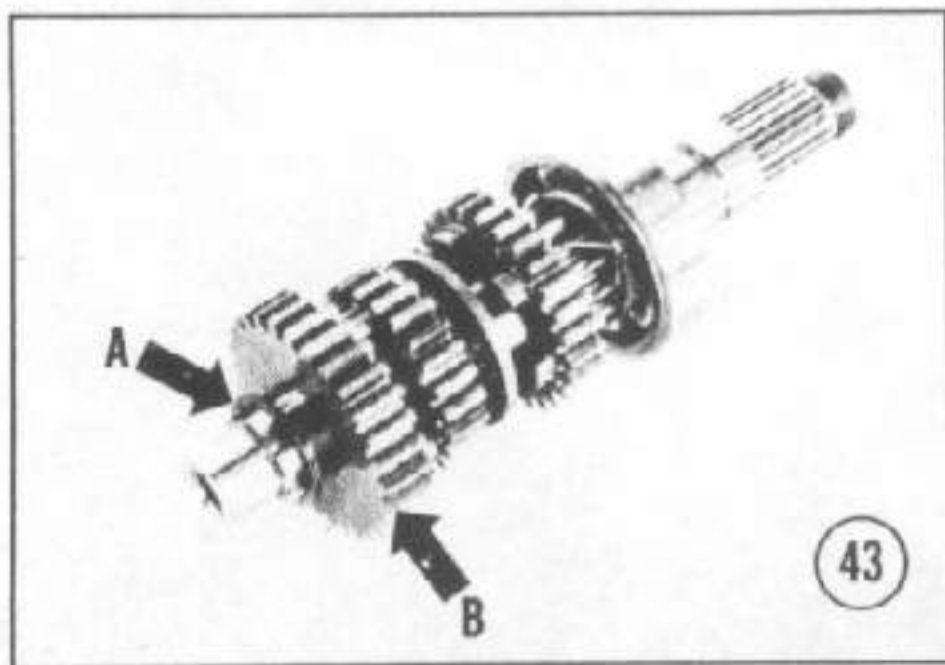
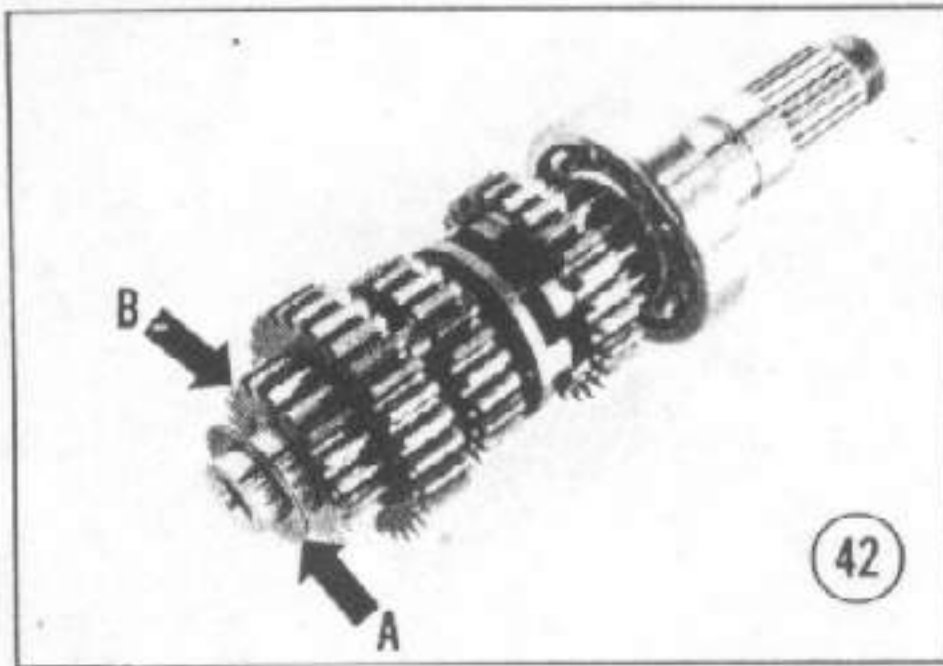


5.4.3

Main Shaft Disassembly

Refer to Figures 40 and 41 for this procedure.

1. Slide off the thrust washer (A, Figure 42) and 2nd gear (B, Figure 42).
2. Remove spline washer (A, Figure 43) and 5th gear (B, Figure 43).
3. Remove the spline washer and circlip (Figure 44).
4. Slide off 3rd gear (Figure 45).

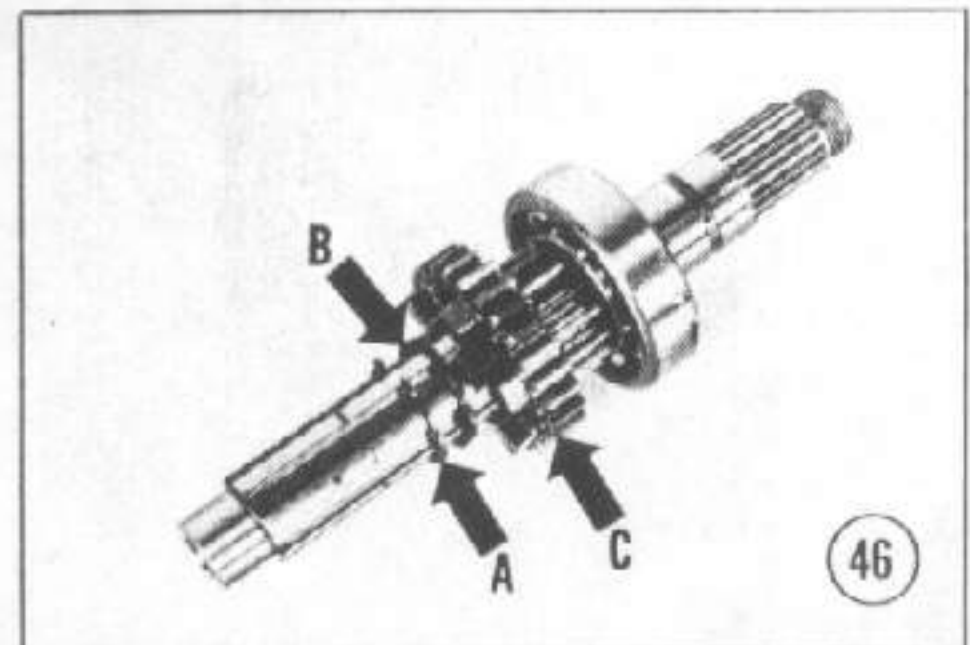
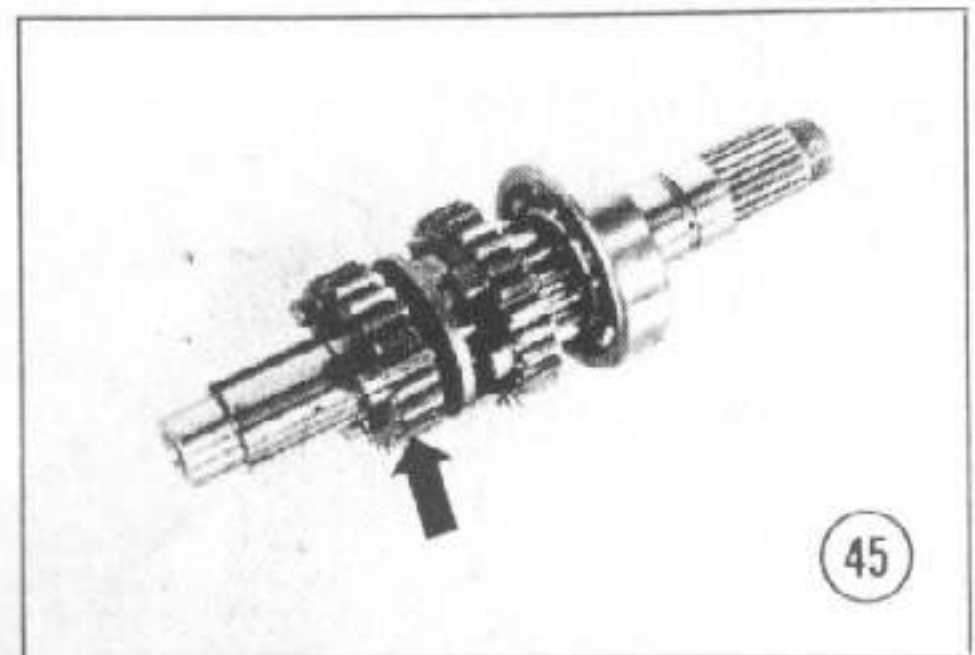


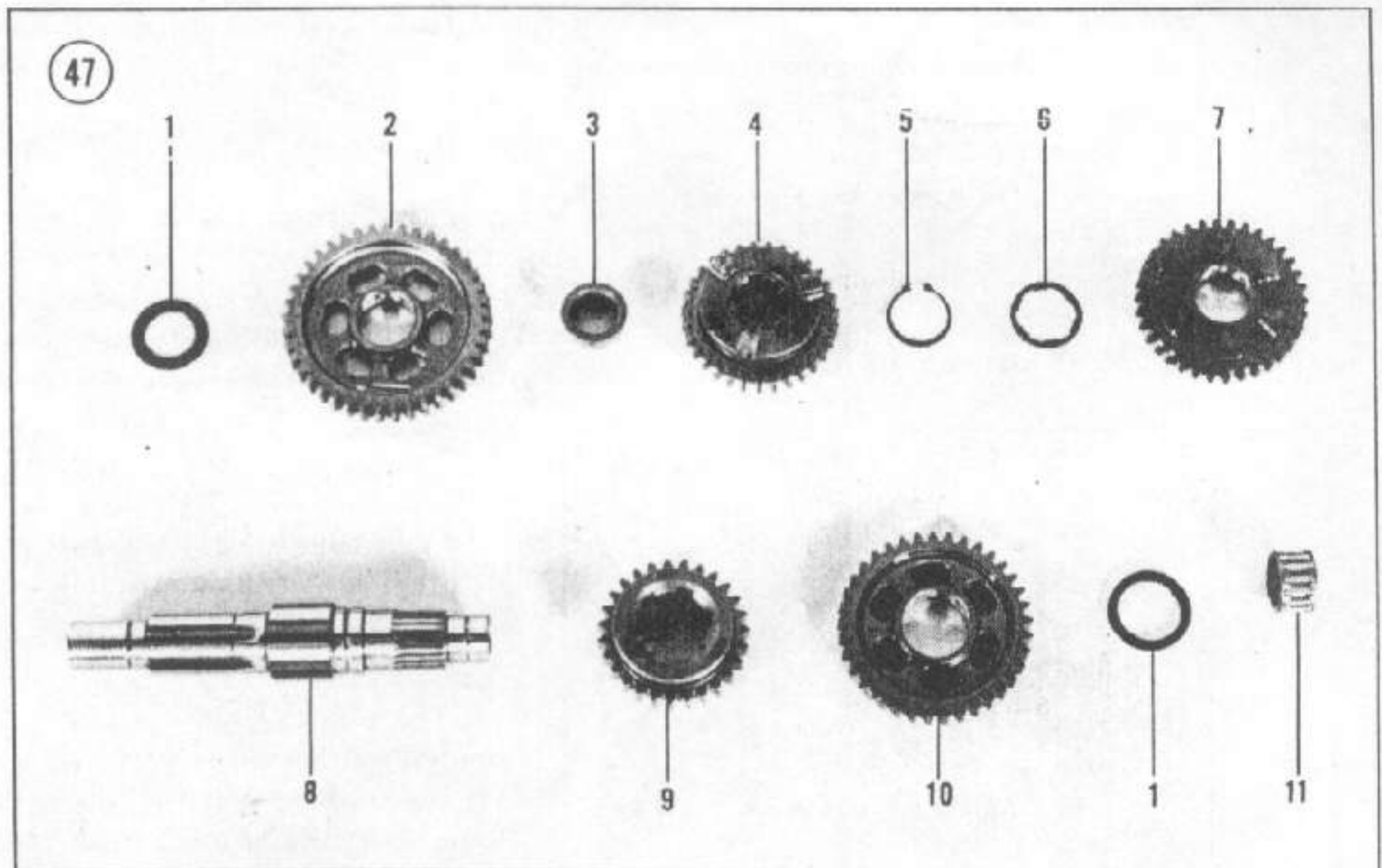
5. Remove the circlip (A, Figure 46), spline washer (B, Figure 46), and slide off 4th gear (C, Figure 46).

6. If necessary, remove the ball bearing from the shaft.
7. Clean all parts in solvent and thoroughly dry.
8. Check each gear for excessive wear, burrs, pitting, chipped or missing teeth. Make sure the lugs on ends of gears are in good condition.

NOTE: Defective gears should be replaced, and it is a good idea to replace the mating gear on the countershaft even though it may not show as much wear or damage.

9. Make sure that all gears slide smoothly on the main shaft splines.
10. Check the bearing. Make sure it operates smoothly with no signs of wear or damage.
11. Assemble by reversing the removal steps. Refer to Figure 40 for correct positioning of gears. Make sure all snap rings are correctly seated in main shaft grooves.

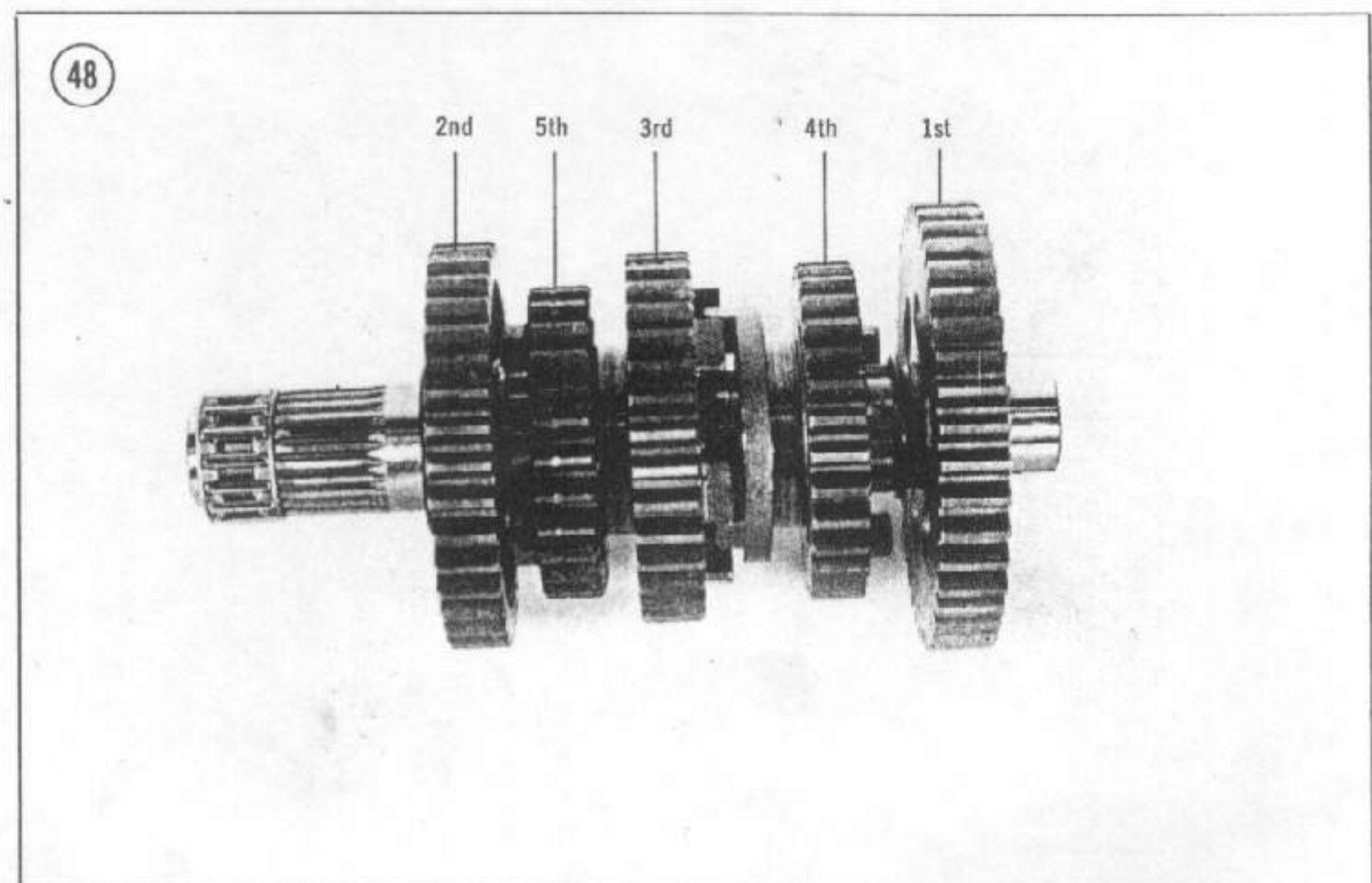


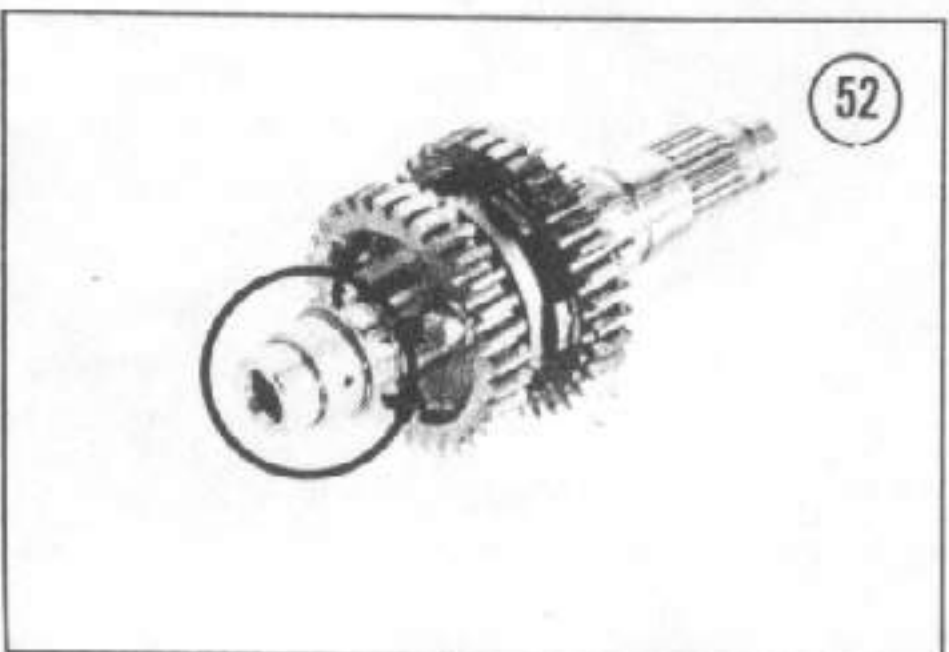
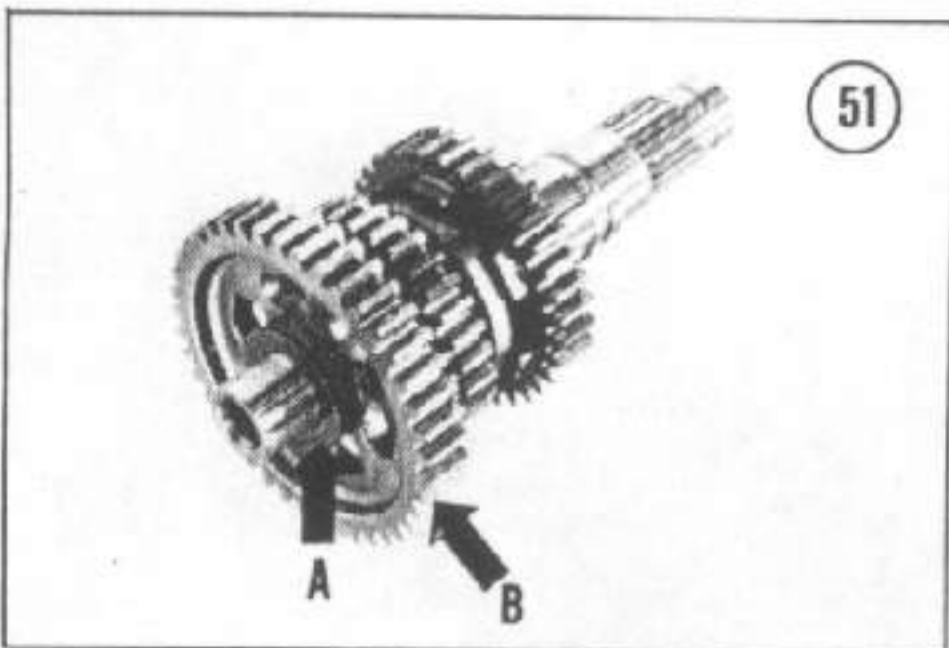
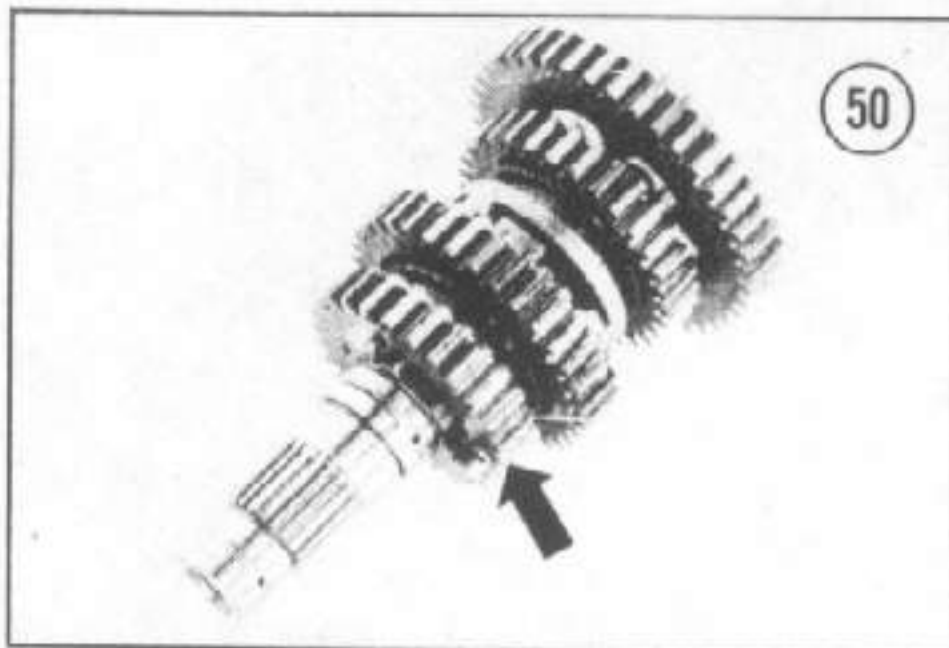
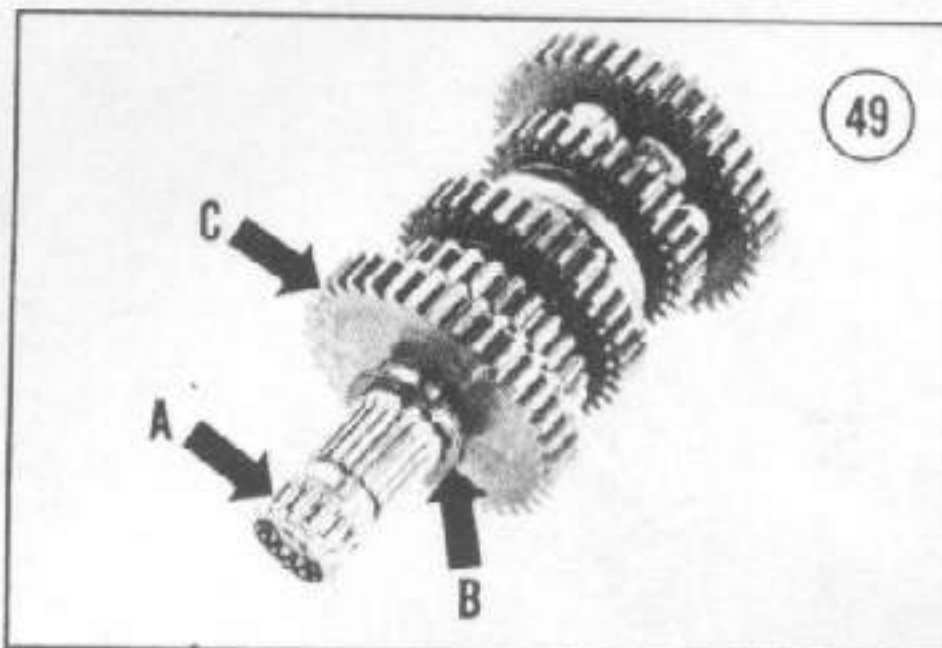


1. Thrust washer
2. 1st gear
3. 1st gear collar
4. 4th gear

5. Circlip
6. Splined thrust washer
7. 3rd gear
8. Countershaft

9. 5th gear
10. 2nd gear
11. Needle bearing

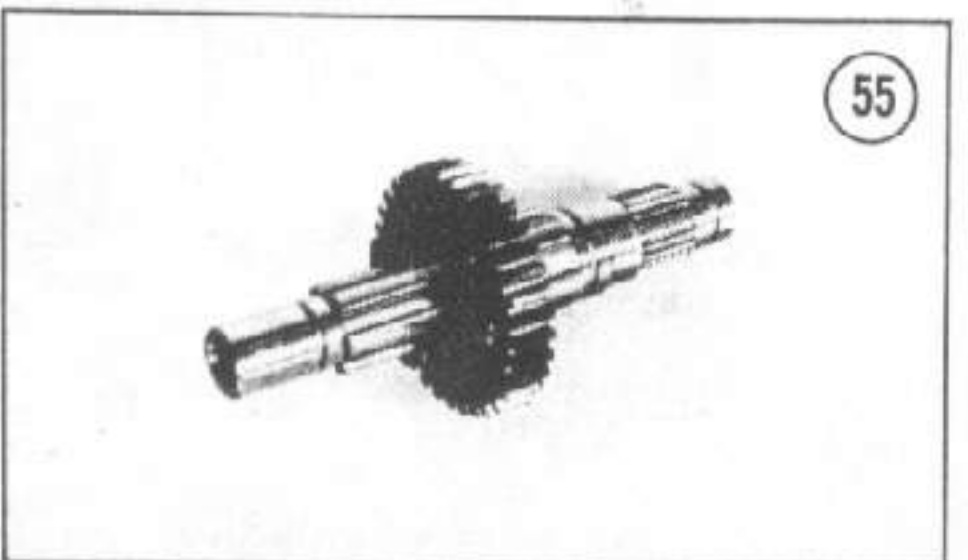
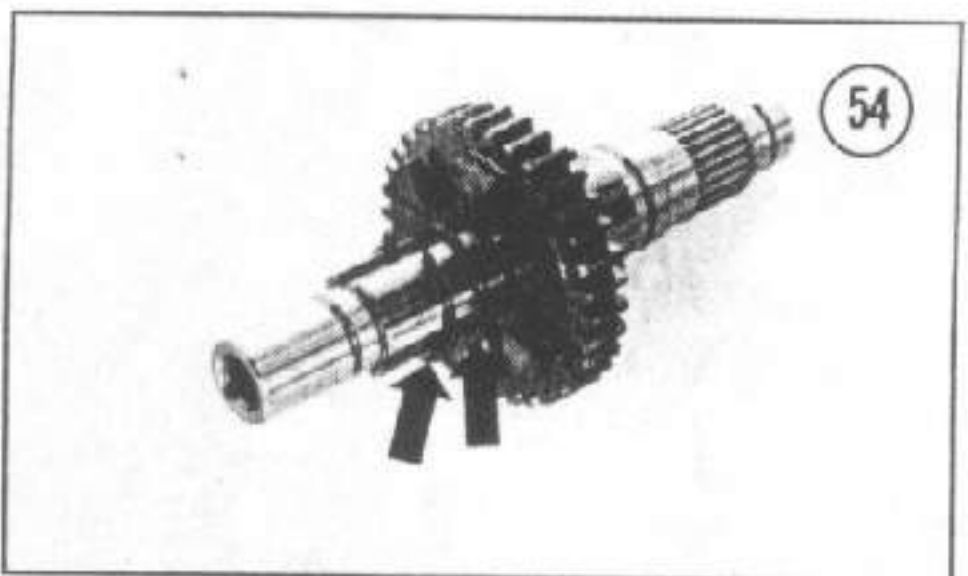
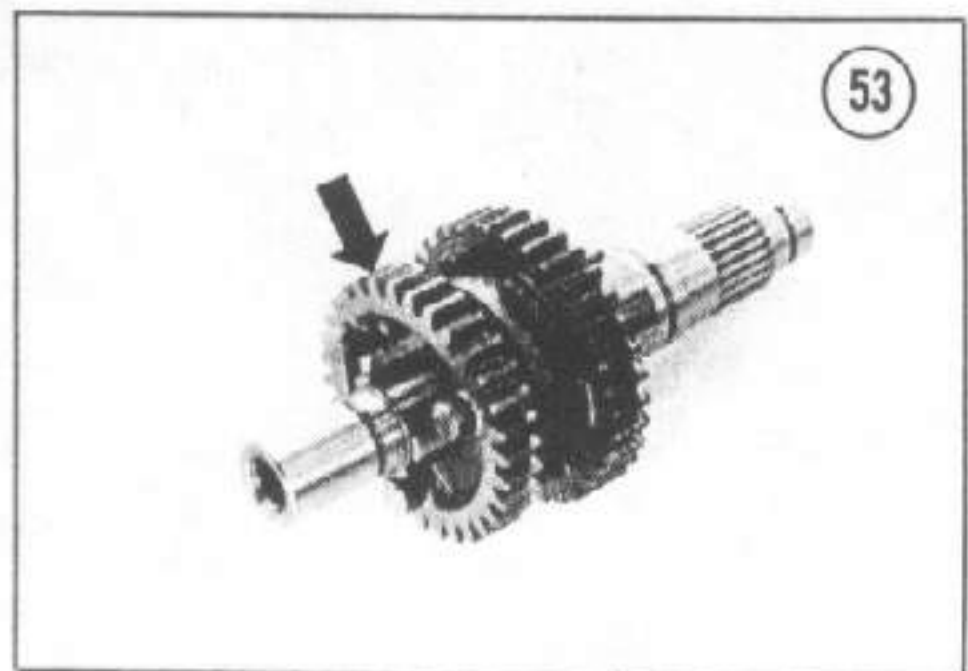




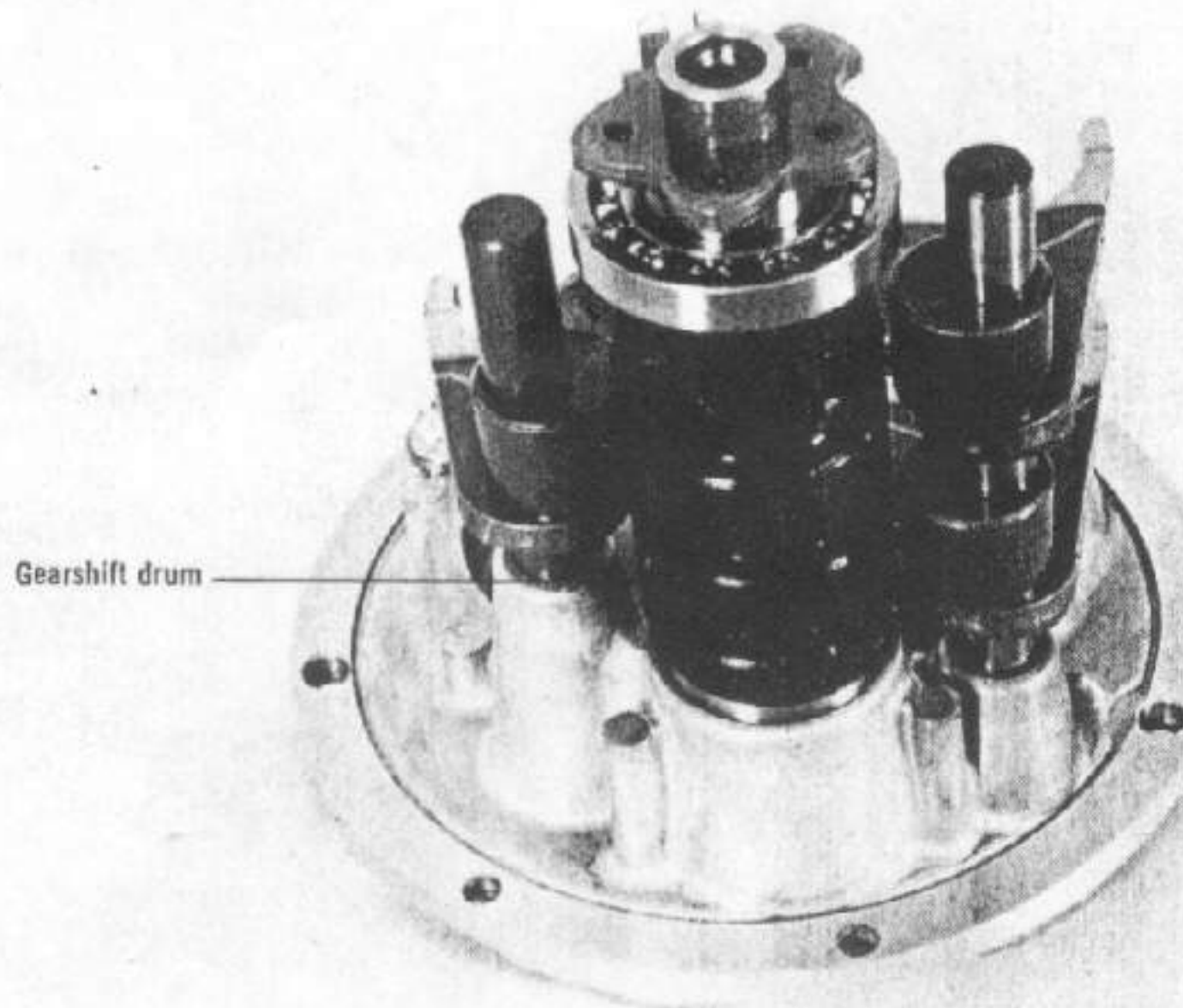
5.4.4 Countershaft Disassembly

Refer to Figures 47 and 48 for this procedure.

1. Slide off the needle bearing (A, Figure 49), thrust washer (B, Figure 49) and 2nd gear (C, Figure 49).
2. Slide off 5th gear (Figure 50).
3. Slide off the thrust washer (A, Figure 51) and 1st gear (B, Figure 51).
4. Remove the 1st gear collar (Figure 52).
5. Slide off 4th gear (Figure 53).
6. Remove the circlip and thrust washer (Figure 54).
7. Slide off 3rd gear (Figure 55).



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8. Clean all parts in solvent and thoroughly dry.
9. Check each gear for excessive wear, burrs, pitting, and for chipped or missing teeth. Make sure that the lugs on the ends of the gears are in good condition.

NOTE: Defective gears should be replaced, and it is a good idea to replace the mating gear on the main shaft even though it may not show as much wear or damage.

10. Make sure that all gears slide smoothly on the countershaft splines.
11. Assemble by reversing the removal steps. Refer to **Figure 48** for correct positioning of gears. Make sure that the snap ring is correctly seated in the countershaft groove.

5,5

GEARSHIFT DRUM AND FORKS

Refer to **Figures 56 and 57** for this procedure.

5.5.1.

Disassembly/Assembly

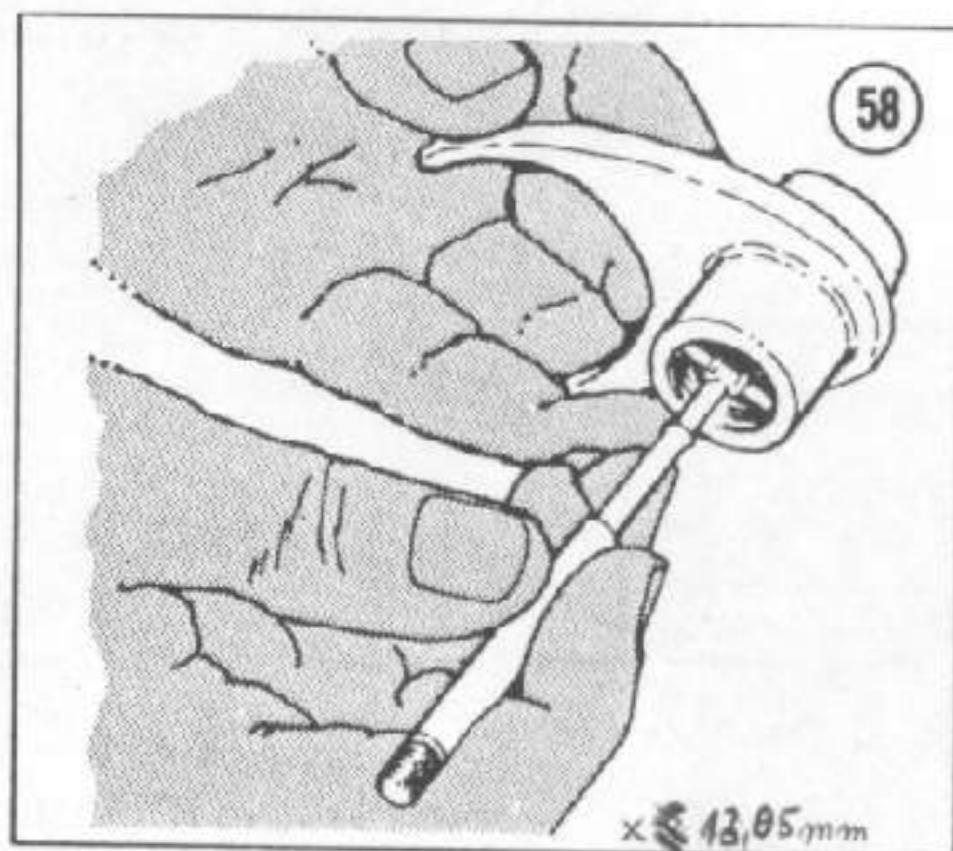
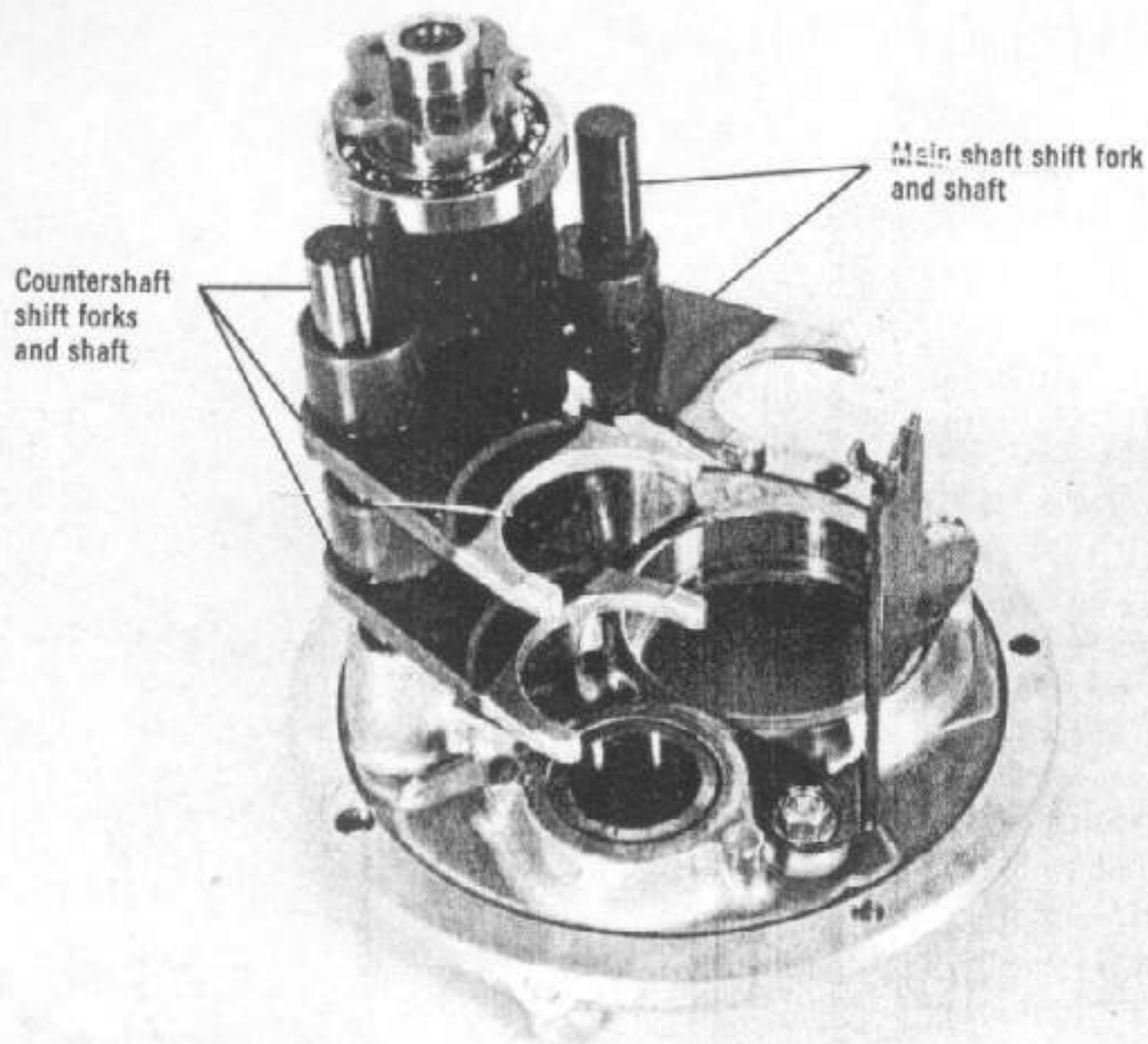
1. Perform Steps 1-9, *Transmission Disassembly* in this chapter.
2. Wash all parts in solvent and thoroughly dry.
3. Inspect as described later and assemble by performing Steps 3-14, *Transmission Assembly* in this chapter.

5.5.2.

Inspection

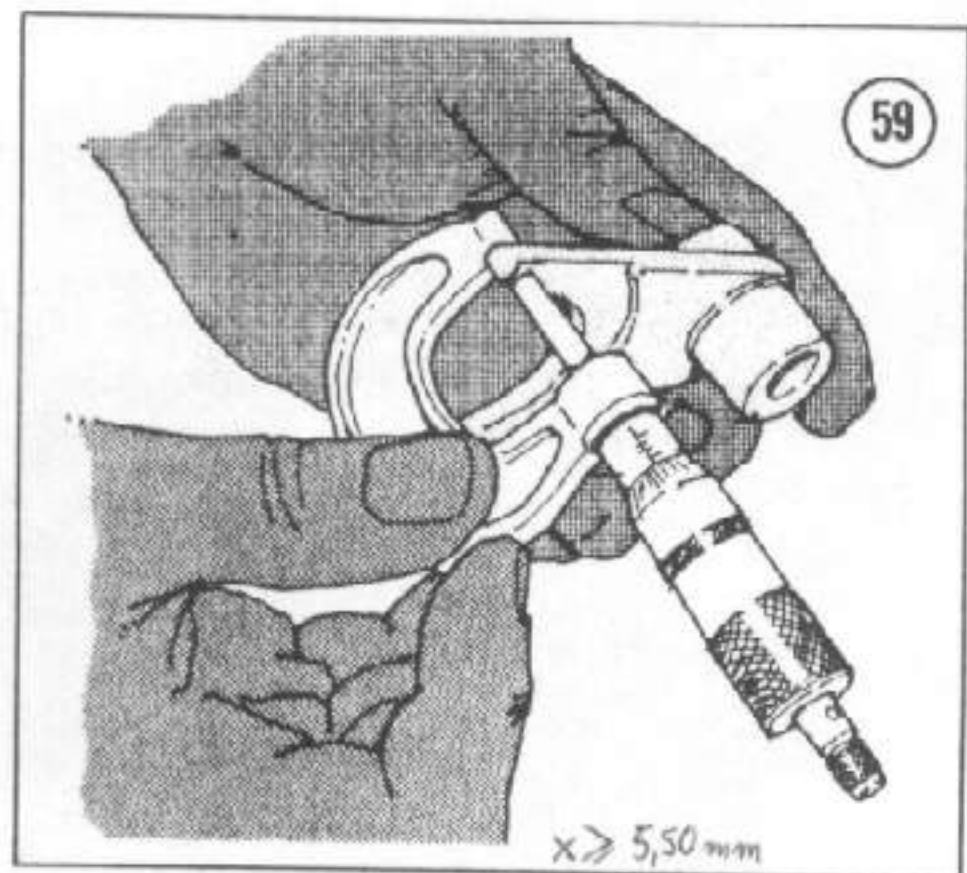
1. Measure the inside diameter of the shift forks with an inside micrometer (**Figure 58**). Replace the ones worn beyond the wear limits given in **Table 3**.
2. Measure the width of the gearshift fingers with a micrometer (**Figure 59**). Replace the ones worn beyond the wear limit given in **Table 3**.

NOTE: Check for any arc shaped wear marks (Figure 60) on the shift forks. If this is apparent, the shift fork has come in contact with the gear, indicating the



fingers are worn beyond use, and it must be replaced.

3. Measure the outside diameter of the shift fork shafts with a micrometer. Replace the ones worn beyond the wear limits given in Table 3.
4. Check the shift drum bearing (A, Figure 61). Make sure it operates smoothly without signs of wear or damage.



5. Check the grooves in the shift drum (B, Figure 61) for wear and chipping; replace if necessary.
6. Inspect the condition of all bearing surfaces (Figure 62) in the transmission cover/holder. Replace it if any are in questionable condition.
7. Inspect the bearings in the cylinder block. If necessary replace the main bearing (A, Figure

63) and countershaft bearing (B, **Figure 63**). Also check the condition of the shift drum bearing cavity (C, **Figure 63**).

5.6

FINAL SHAFT

Do not try to disassemble the final shaft, as a press is required for this operation.

5.6.1.

Removal/Installation

1. Remove the engine as described under *Engine Removal/Installation* in Chapter Four.

NOTE: The following figures are shown with the cylinder heads removed. It is not necessary to remove them for this procedure.

2. Remove the 2 clamps securing the water pump pipe to the cylinder block (**Figure 64**) and remove it.

3. Remove the 5 bolts securing the water pump housing (**Figure 65**) and remove it.

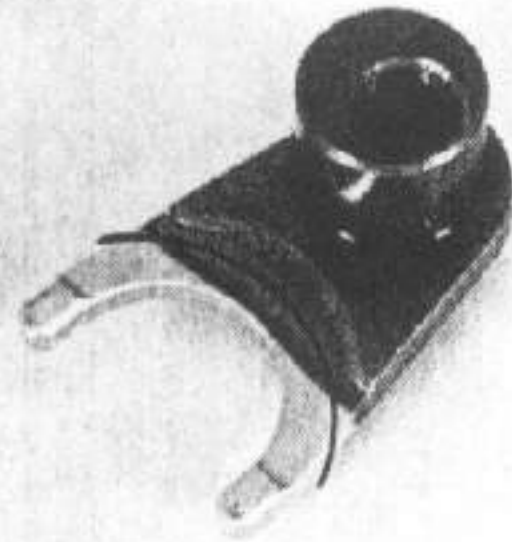
*NOTE: Do not lose the 2 locating dowels (A, **Figure 66**).*

4. Remove the cap nut and copper washers (B, **Figure 66**) securing the water pump impeller and remove it.

5. Remove the 17 bolts securing the rear engine cover and remove it.

*NOTE: Do not lose the 2 locating dowels and O-rings (**Figure 67**).*

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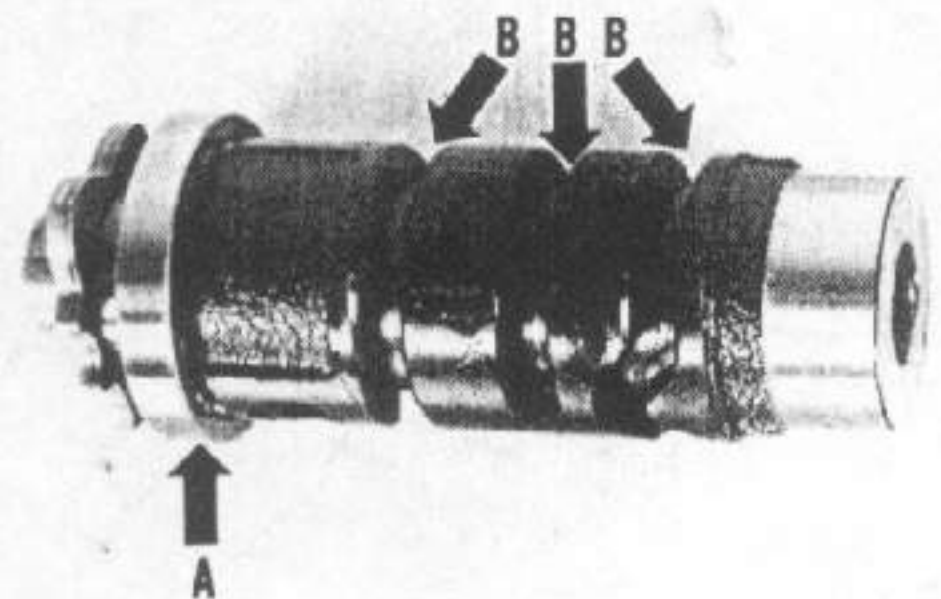
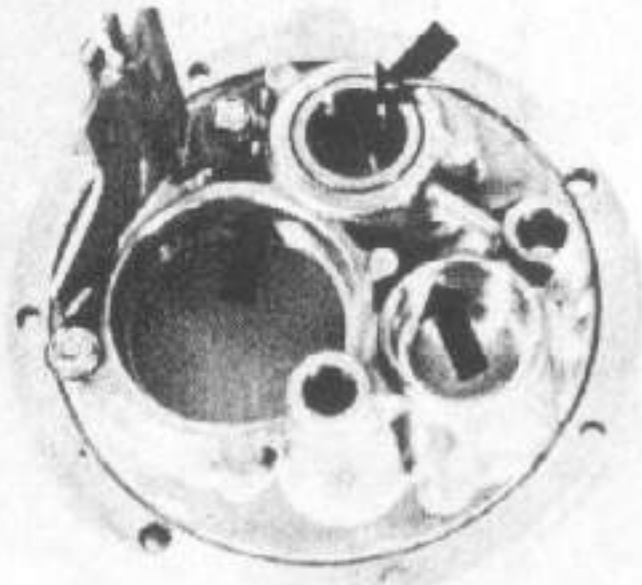


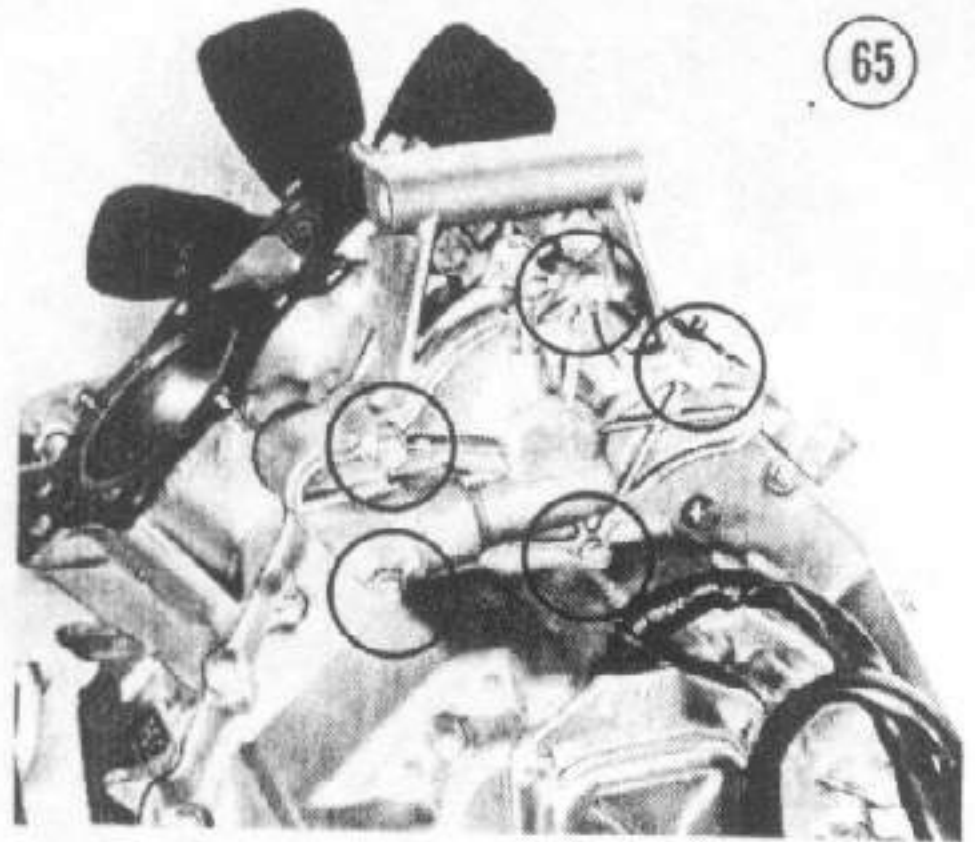
Table 3 GEARSHIFT DRUM AND FORK SPECIFICATIONS

Item	Standard Value	Wear Limit
Shift drum outer diameter	1.3760-1.3770 in. (34.950-34.975mm)	1.374 in. (34.90mm)
Case inner diameter	1.3780-1.3789 in.	1.380 in. (35.05mm)
Shift fork Finger width	0.233-0.236 in. (5.93-6.00mm)	0.217 in. (5.50mm)
Inner diameter	0.5118-0.5125 in. (13.000-13.018mm)	0.514 in. (13.05mm)
Shift fork shaft outer diameter	0.5105-0.5112 in. (12.966-12.984mm)	0.510 in. (12.95mm)

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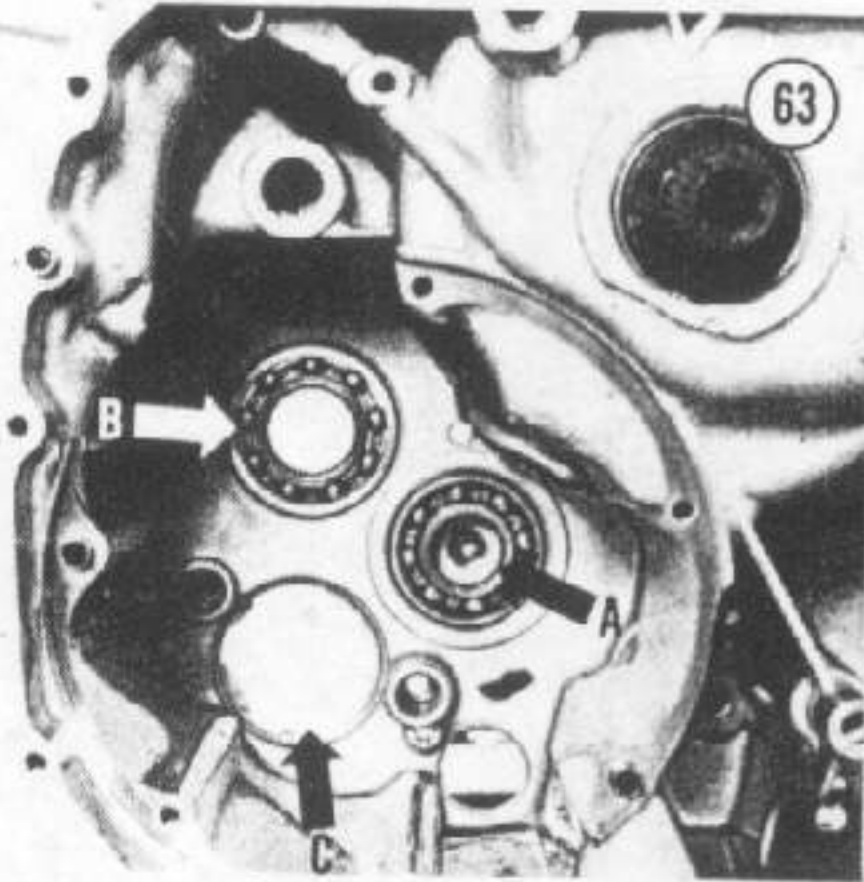


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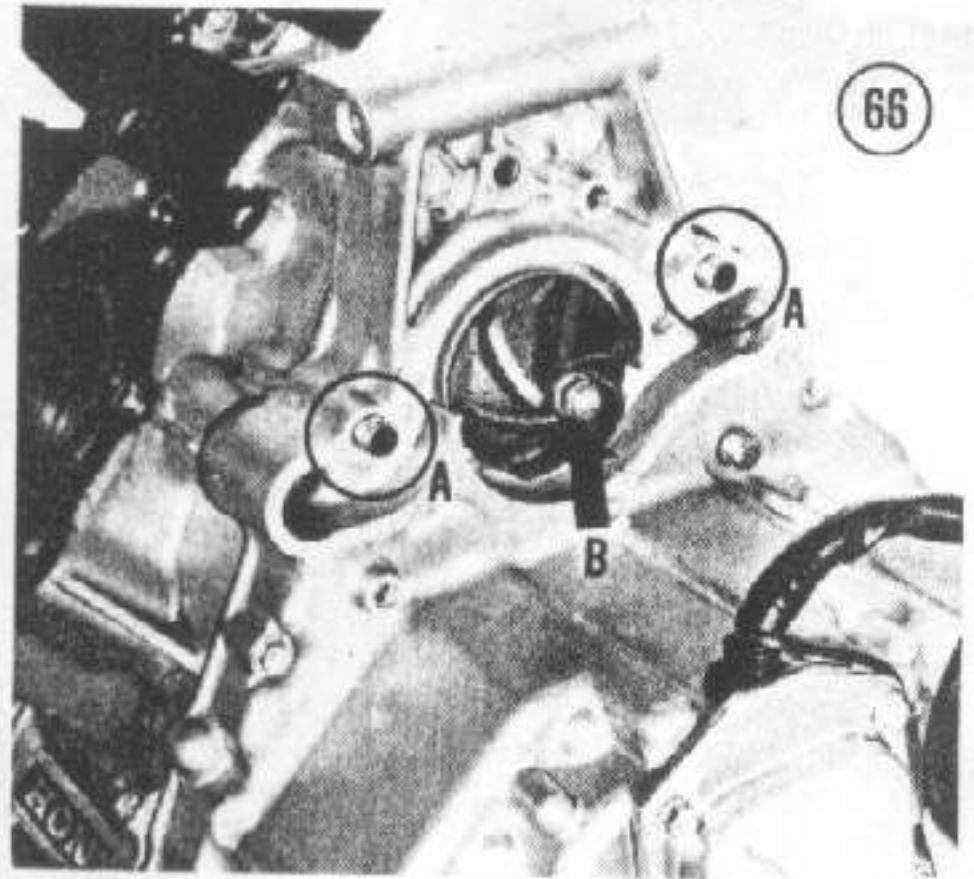


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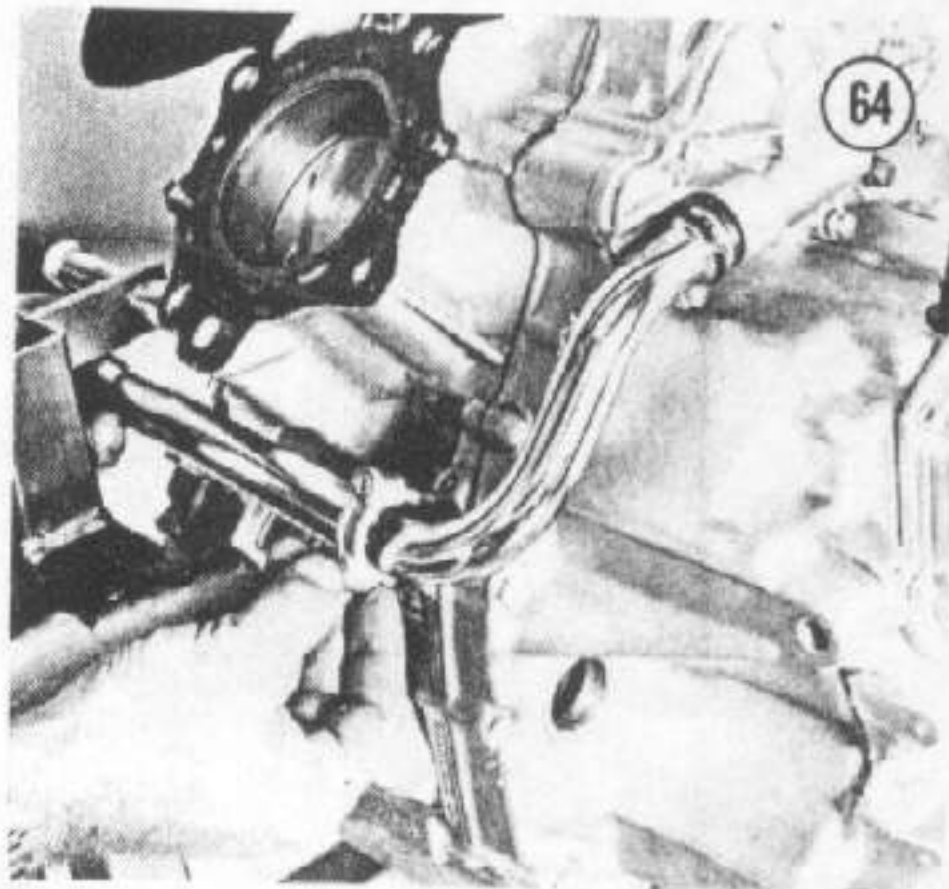
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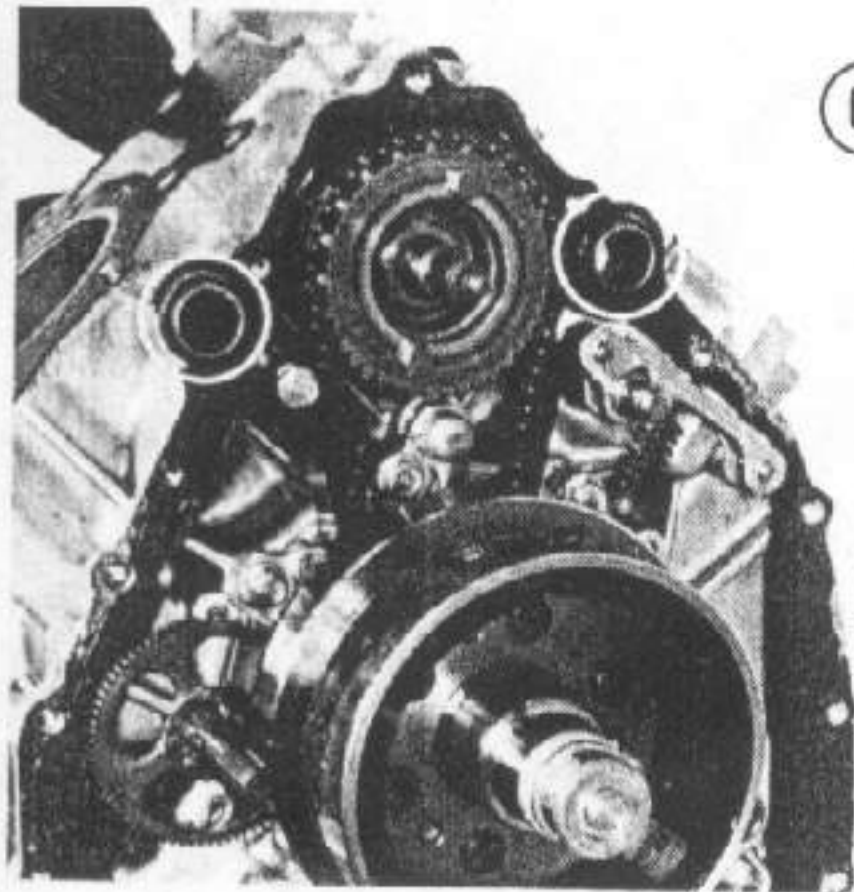
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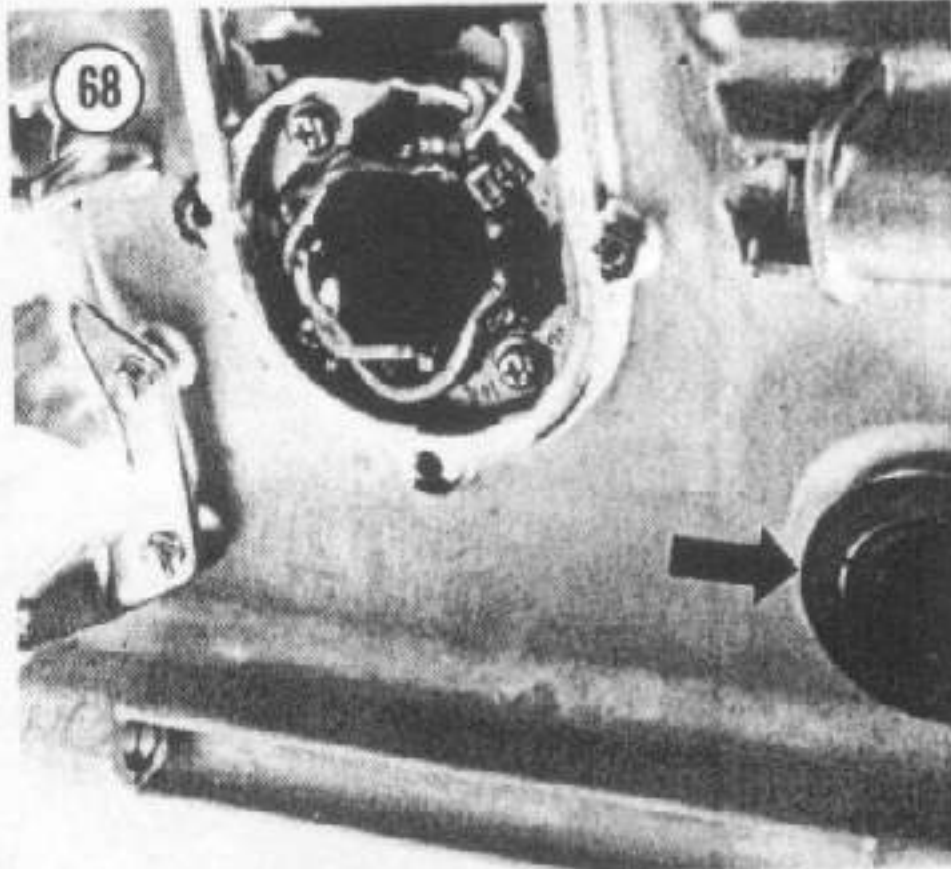


6. Withdraw final shaft from inside the rear engine cover.
7. Install by reversing these removal steps.

5.6.2

Inspection

1. Inspect condition of the oil seal (Figure 68) in the rear engine cover. Replace if necessary.

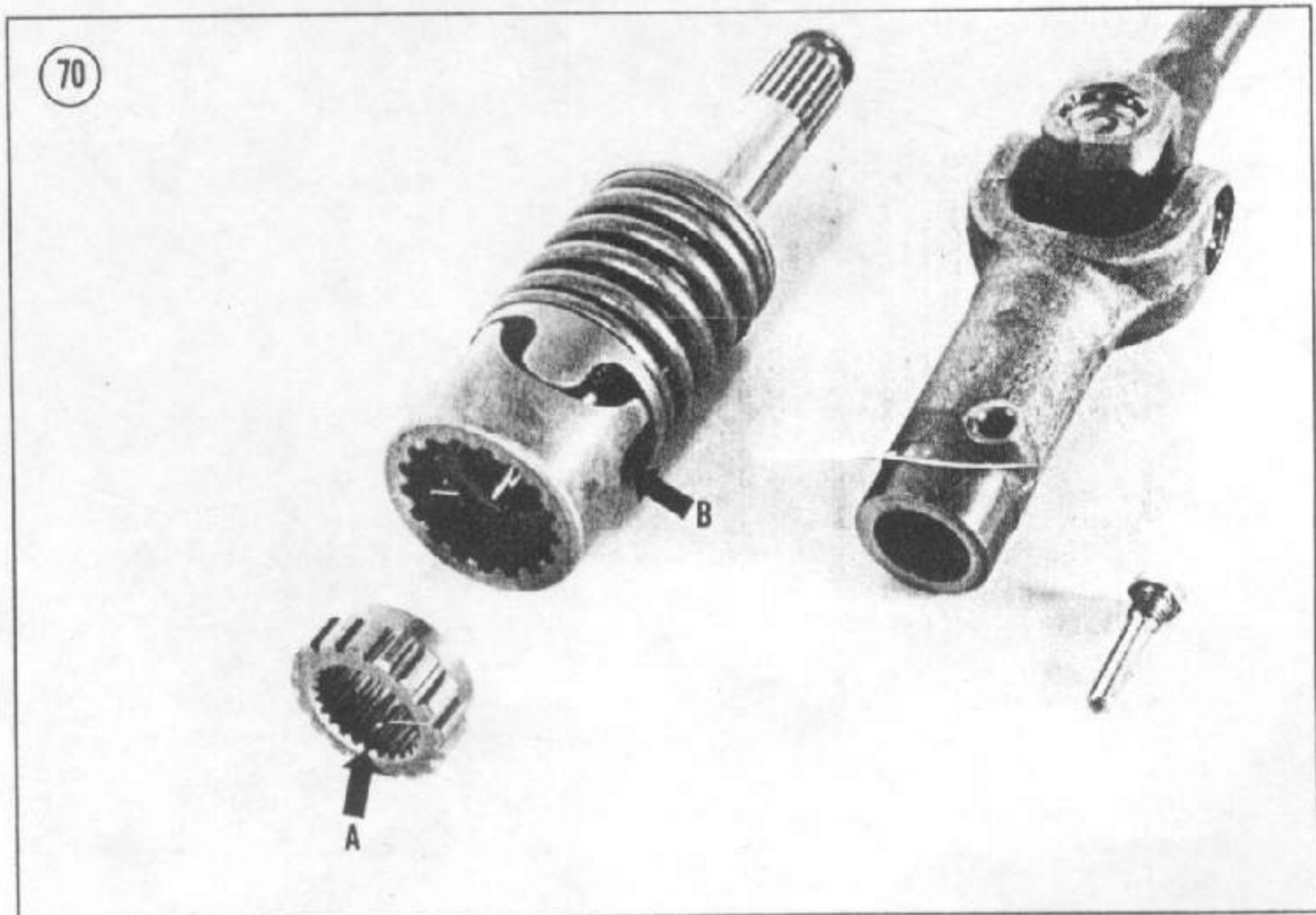
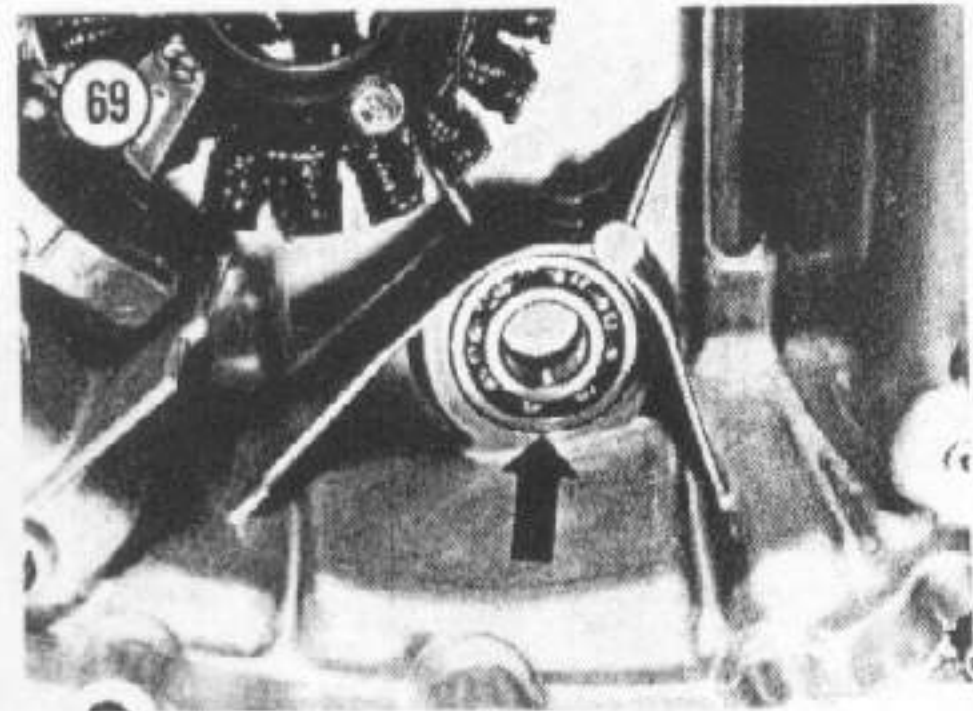


2. Check the condition of the bearing in the rear engine cover (Figure 69). Make sure that it rotates freely. If not, it should be replaced.

3. Check inner and outer splines (A, Figure 70) for wear or damage.

4. Inspect the ramp surfaces (B, Figure 70) for wear or galling.

5. If any parts of the final shaft need repair take it to your Honda dealer for repair or replacement.



CHAPTER SIX

FUEL AND EXHAUST SYSTEMS

6

The fuel system consists of the fuel tank, shutoff valve, fuel filter, two Keihin constant velocity carburetors and an air cleaner.

The exhaust system consists of two exhaust pipes, a common collector and two mufflers.

This chapter includes service procedures for all parts of the fuel and exhaust systems.

6.1

AIR CLEANER

The air cleaner must be cleaned every 3,600 miles and replaced every 7,200 miles, or more frequently in dusty areas.

Service of the air cleaner is described in Chapter Three.

6.2

CARBURETORS

6.2.1.

Basic Principles

An understanding of the function of each of the carburetor components and their relationship to one another is a valuable aid for pinpointing a source of carburetor trouble.

The carburetor's purpose is to supply and atomize fuel and mix it in correct proportions with air that is drawn in through the air intake. At the primary throttle opening — at idle — a small amount of fuel is siphoned through the pilot jet by the incoming air. As the throttle is opened further, the air stream begins to siphon

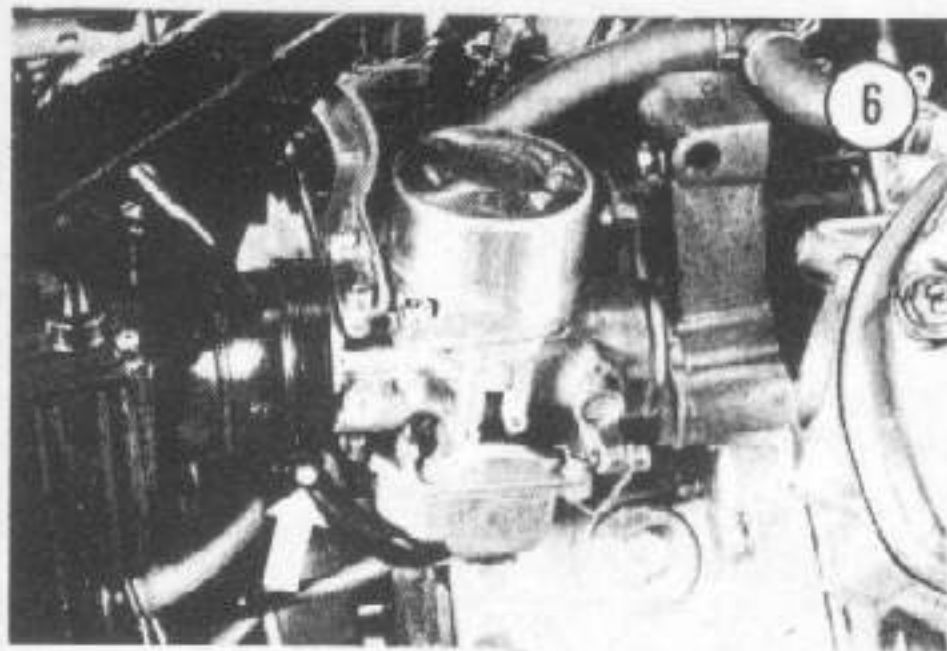
fuel through the main jet and needle jet. The tapered needle increases the effective flow capacity of the needle jet as it is lifted with the air slide in that it occupies decreasingly less of the area of the jet. In addition, the amount of cutaway in the leading edge of the throttle slide aids in controlling the fuel/air mixture during partial throttle openings.

At full throttle, the carburetor venturi is fully open and the needle is lifted far enough to permit the main jet to flow at full capacity.

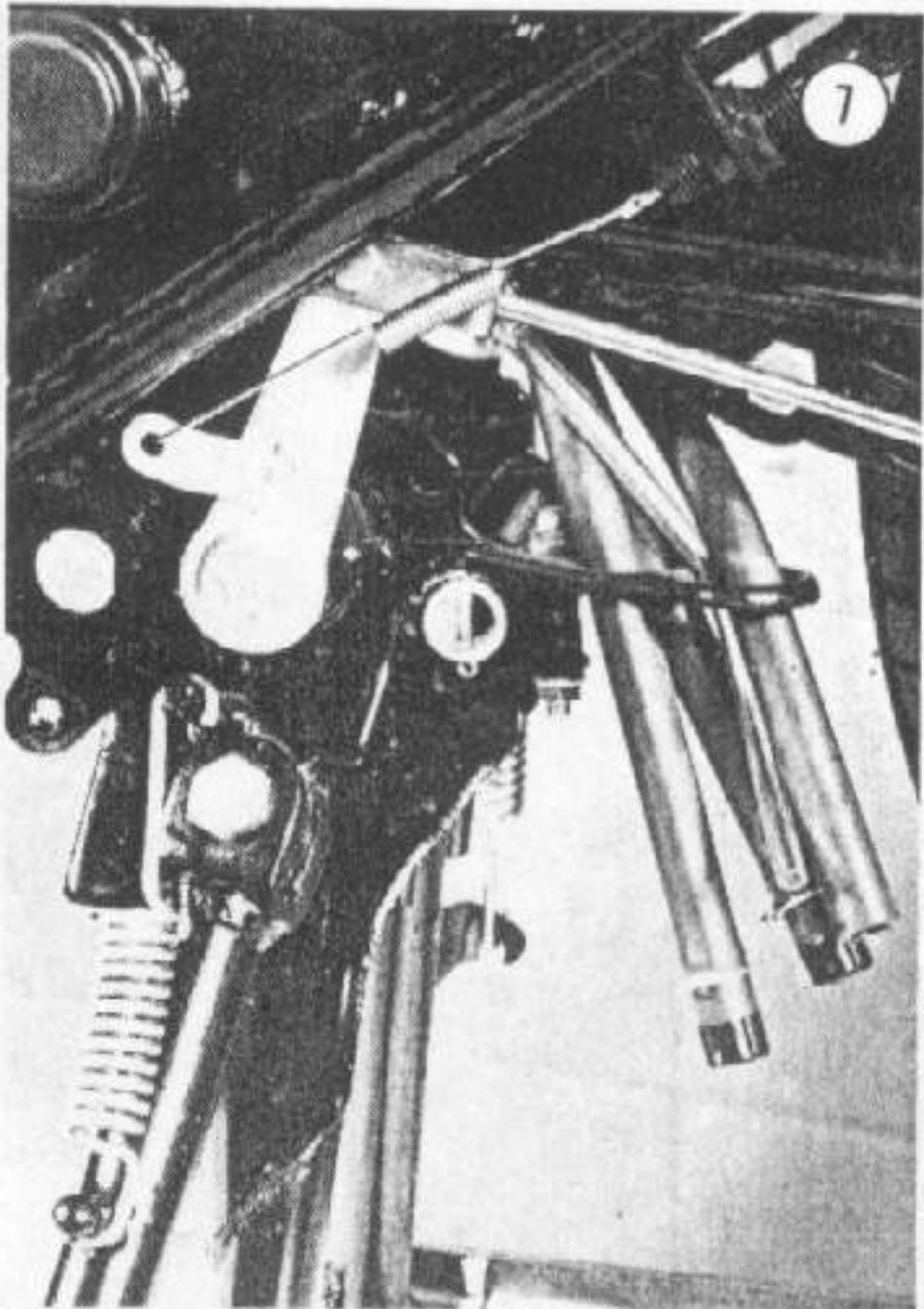
6.2.2.

Service

The carburetor service recommended at 10,000-mile intervals involves routine removal, disassembly, cleaning, and inspection. Alterations in jet size, throttle slide cutaway, changes in needle position, etc., should be attempted only if you're experienced in this type of "tuning" work; a bad guess could result in costly engine damage or, at the very least, poor performance. If after servicing the carburetors and making the adjustments described in Chapter Three, the motorcycle does not perform correctly (and assuming that other factors affecting performance are correct, such as ignition timing and condition, valve adjustment, etc.), the motorcycle should be checked by a Honda dealer or a qualified performance tuning specialist.



6. Loosen the clamping screws on the rear rubber boots (Figure 6) and slide the clamps away from the carburetors.



7. Pull the loose ends of the drain tubes free from the clamp (Figure 7) on the left-hand side near the kickstand.

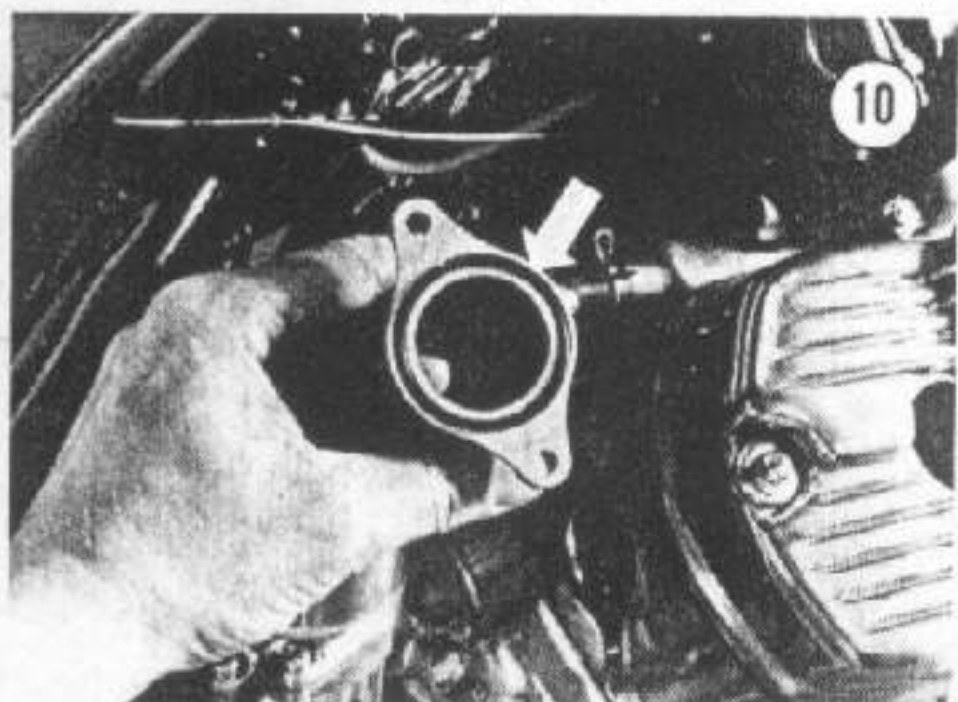
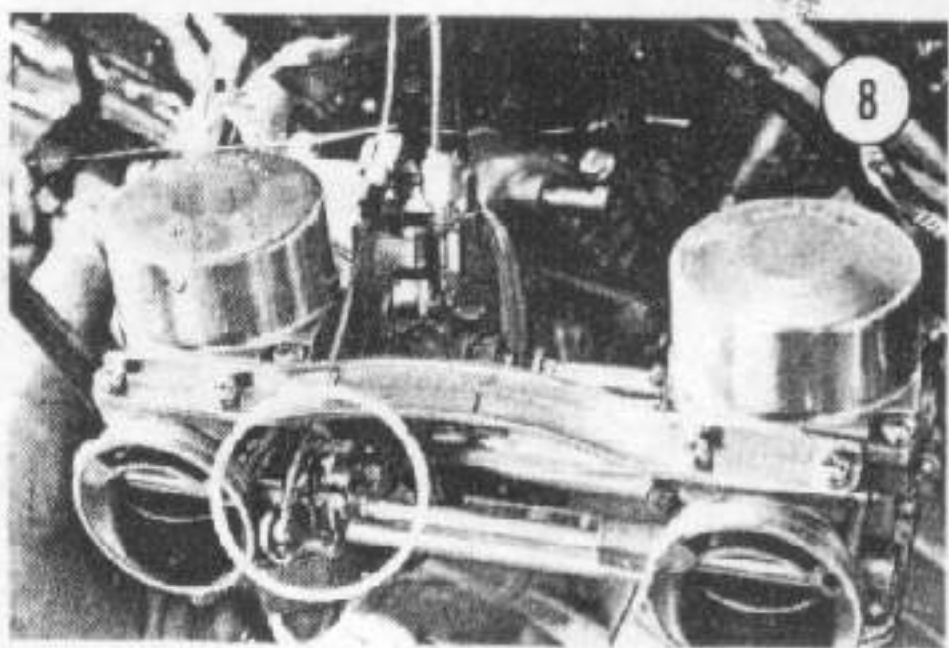
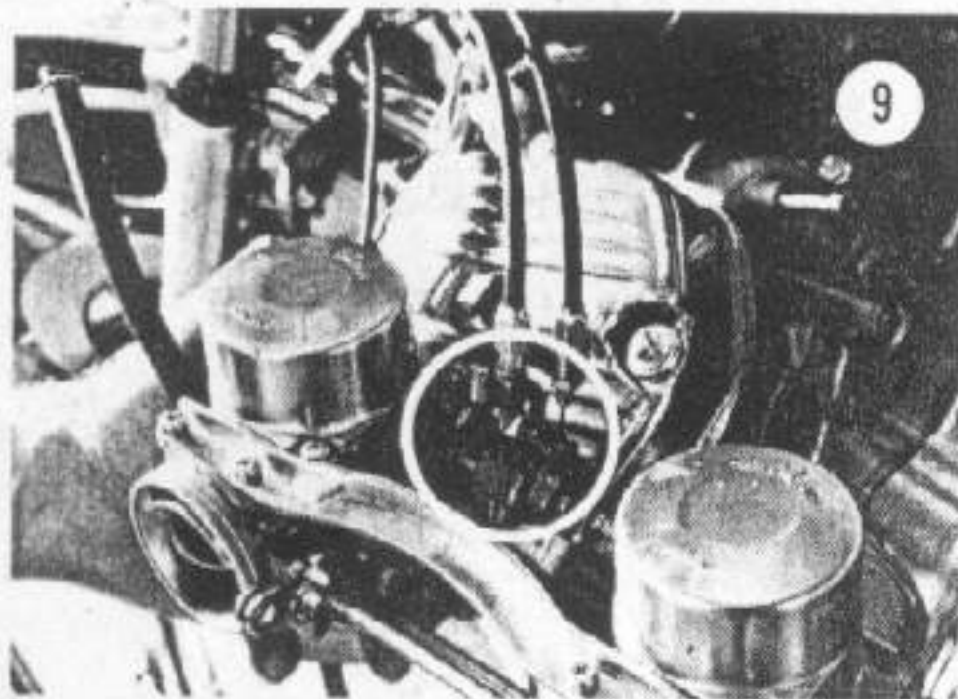
8. Pull the carburetor assembly to the left and remove the choke (Figure 8) and throttle cables (Figure 9).

9. Install by reversing the removal steps. Do not mix the PULL and PUSH throttle cables when installing them.

10. Be sure the O-ring gasket (Figure 10) in the front intake tubes are correctly seated in the groove prior to and during installation. If necessary, hold them in place with a small amount of non-hardening gasket sealer.

CAUTION

If the O-ring is not correctly seated it will allow a vacuum leak, thus leaning out the fuel/air mixture. This can cause serious damage to the intake valves.



6.2.4.

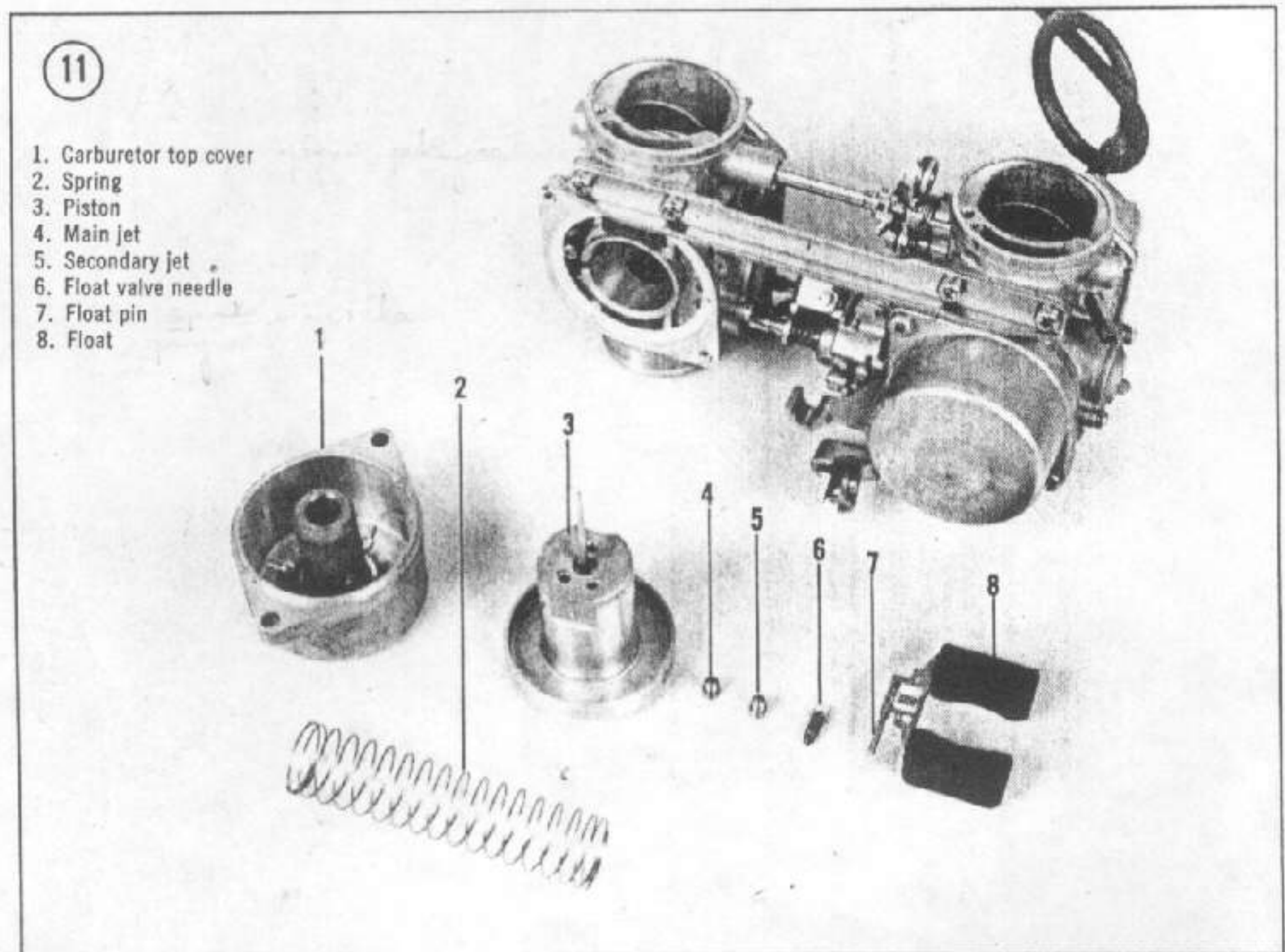
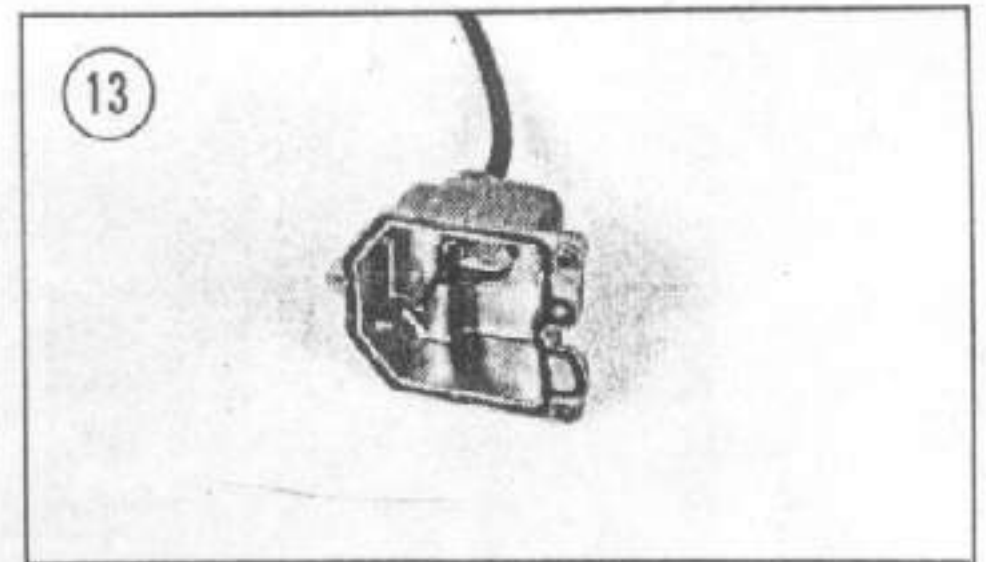
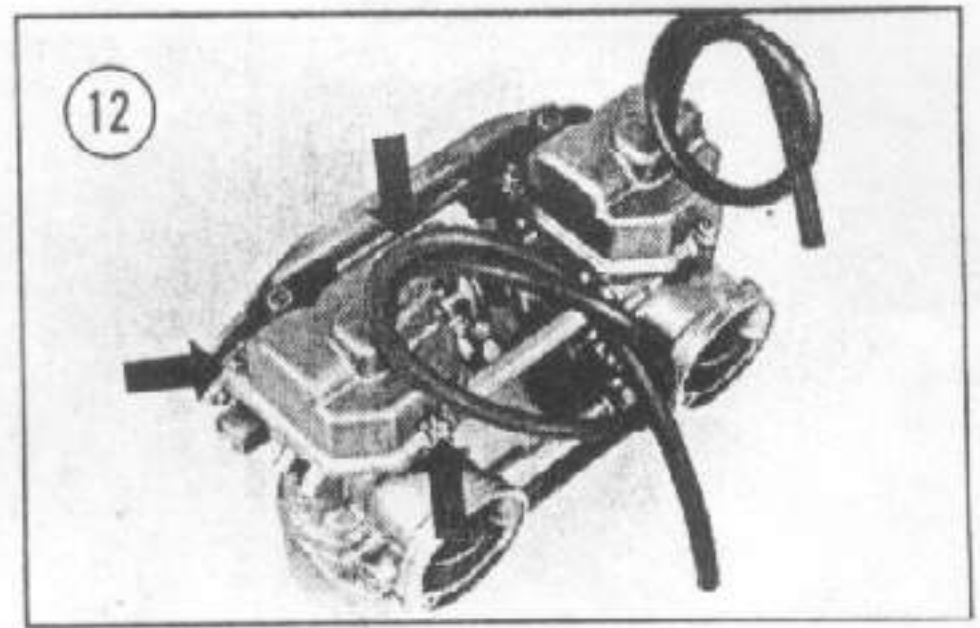
Disassembly/Assembly

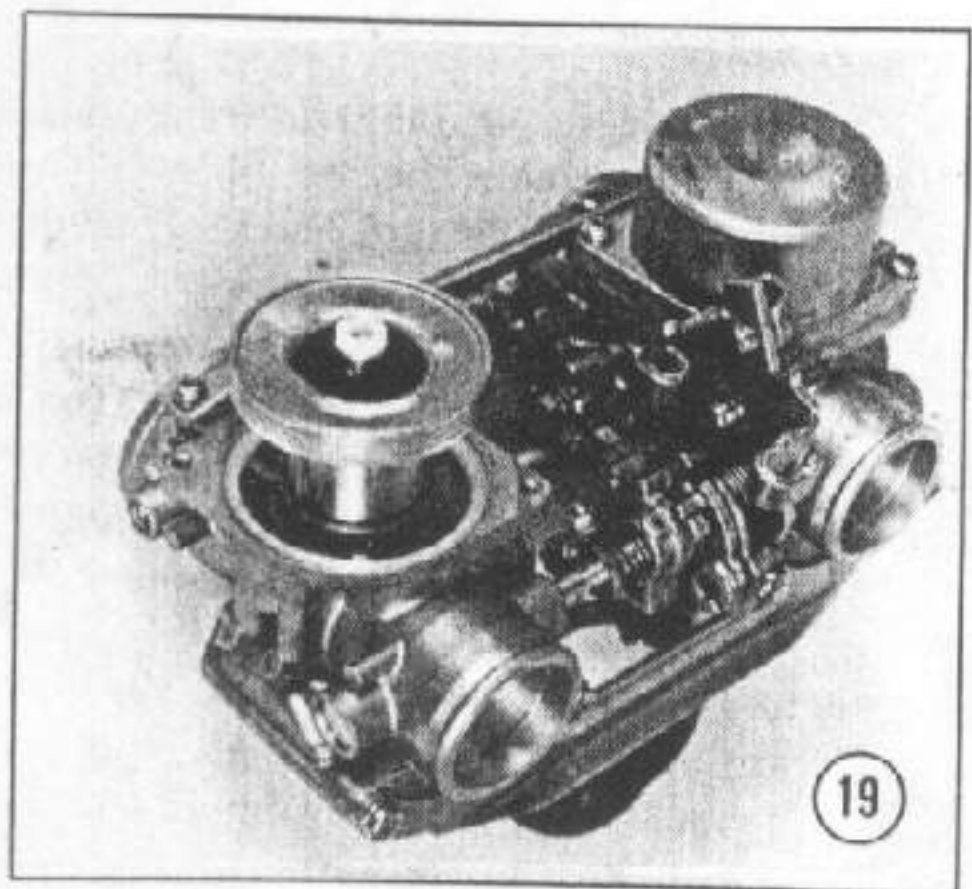
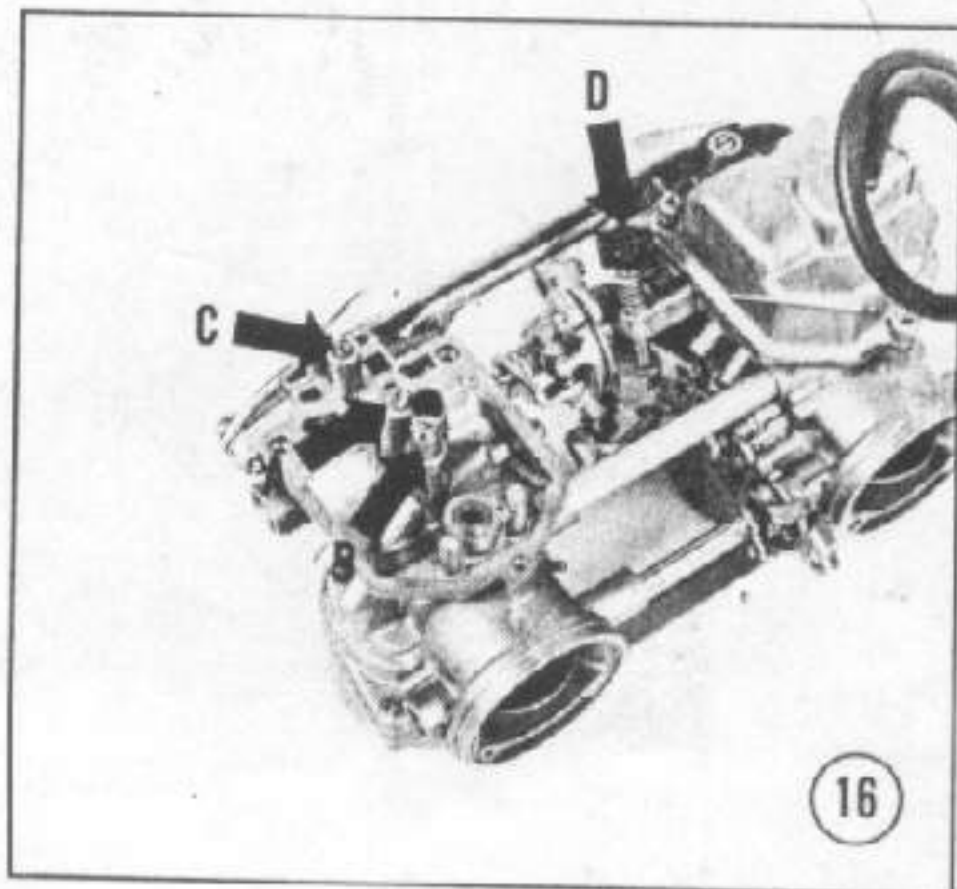
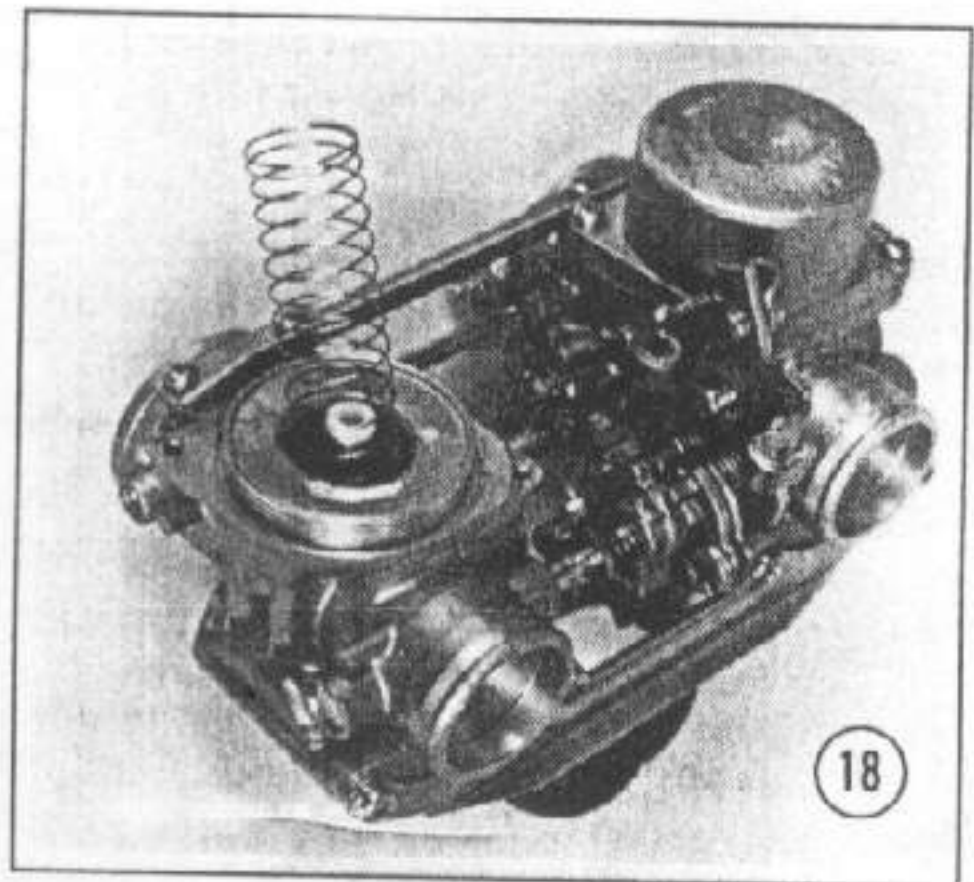
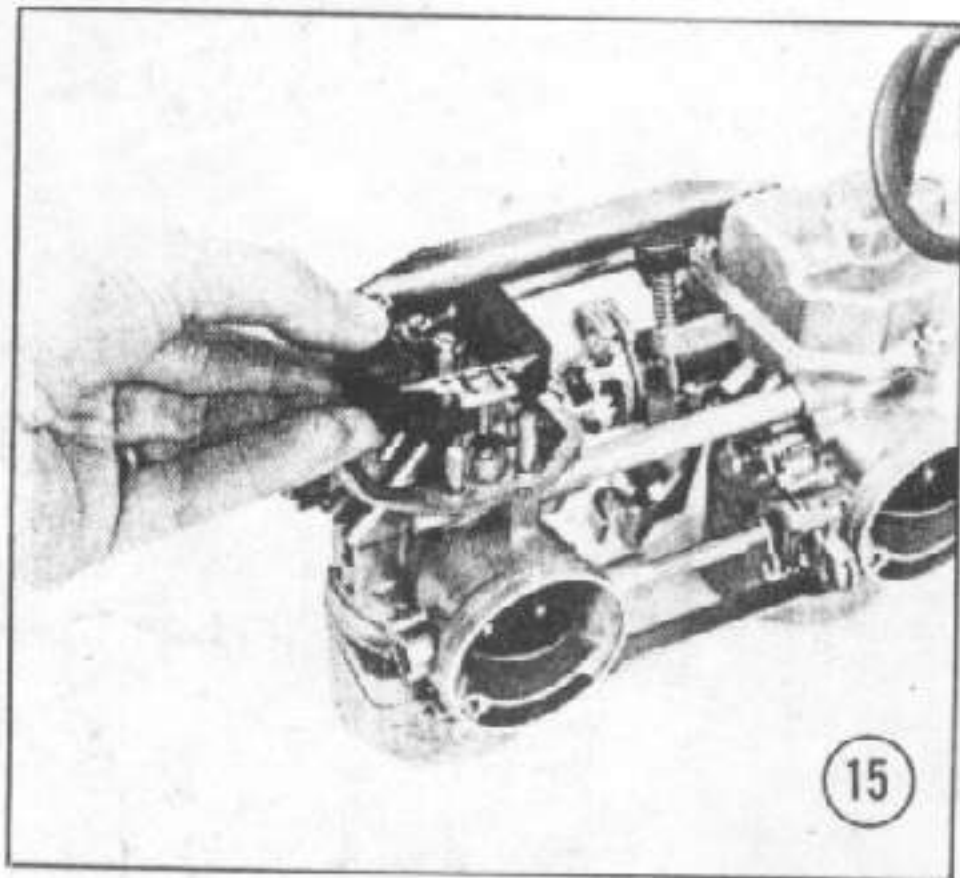
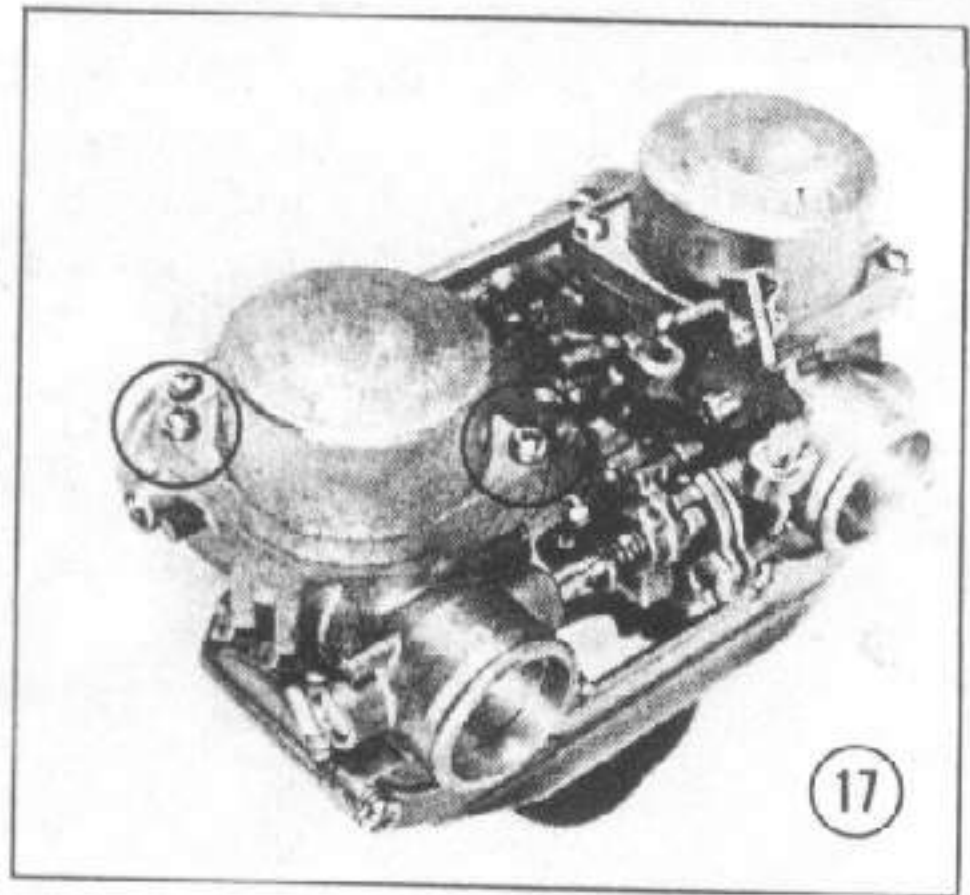
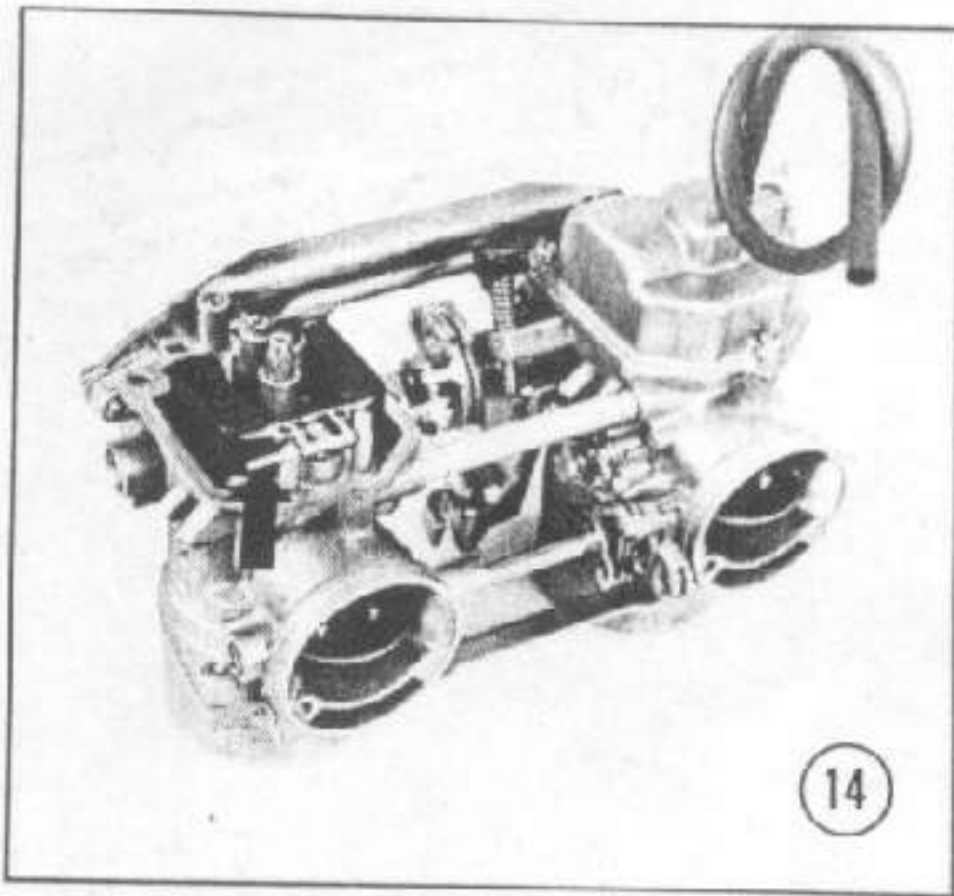
Refer to Figure 11 for this procedure.

1. Remove the 3 screws securing the float bowl to the main body (Figure 12).
2. Lift the bowl off and remove the gasket and the overflow line (Figure 13).
3. Carefully push out the float pin (Figure 14).
4. Lift the float bowl assembly and the float valve needle out of the main body (Figure 15).
5. Unscrew the main jet (A, Figure 16) and the secondary jet (B, Figure 16).

NOTE: Do not remove or adjust the mixture jet or slow jet (C, Figure 16).

6. Remove the idle adjust screw and spring (D, Figure 16).
7. Remove the 2 screws securing the top cover to the main body (Figure 17) and remove the cover.
8. Carefully pull out the spring (Figure 18) and the piston (Figure 19).





6

CAUTION

Do not bend the needle on the piston.

NOTE: Further disassembly is neither necessary nor recommended. If throttle shafts, choke shafts, or butterflies are damaged, take the body to your dealer for replacement.

9. Repeat Steps 1-8 for the other carburetor. Do not intermix the parts — keep them separated.

10. Clean all parts, except rubber or plastic parts, in a good grade of carburetor cleaner. Follow the manufacturer's instructions for correct soak time (usually about ½ hour).

NOTE: It is recommended that one carburetor be cleaned at a time to avoid the interchange of parts.

11. Remove the parts from the cleaner and blow dry with compressed air. Blow out the jets with compressed air. *Do not* use a piece of wire to clean them as minor gouges in a jet can alter the flow rate and upset the fuel/air mixture.

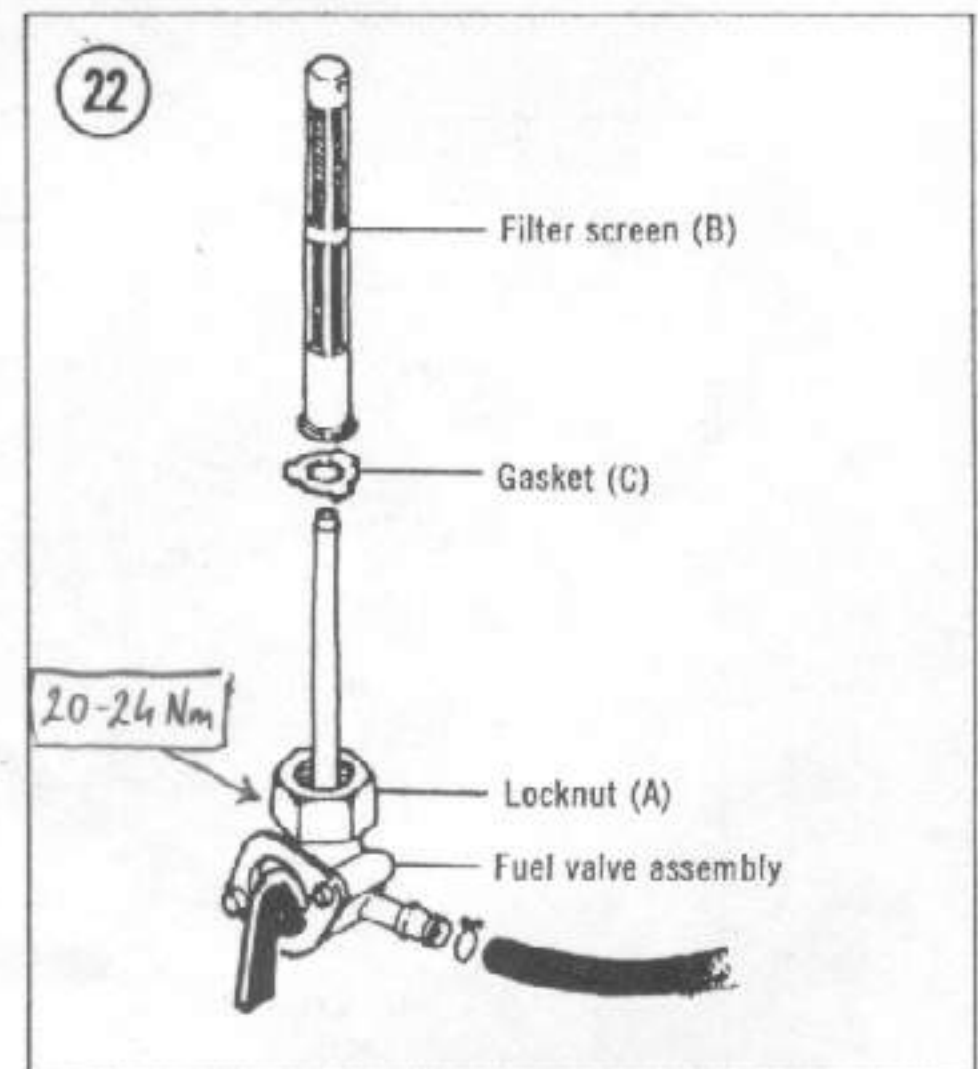
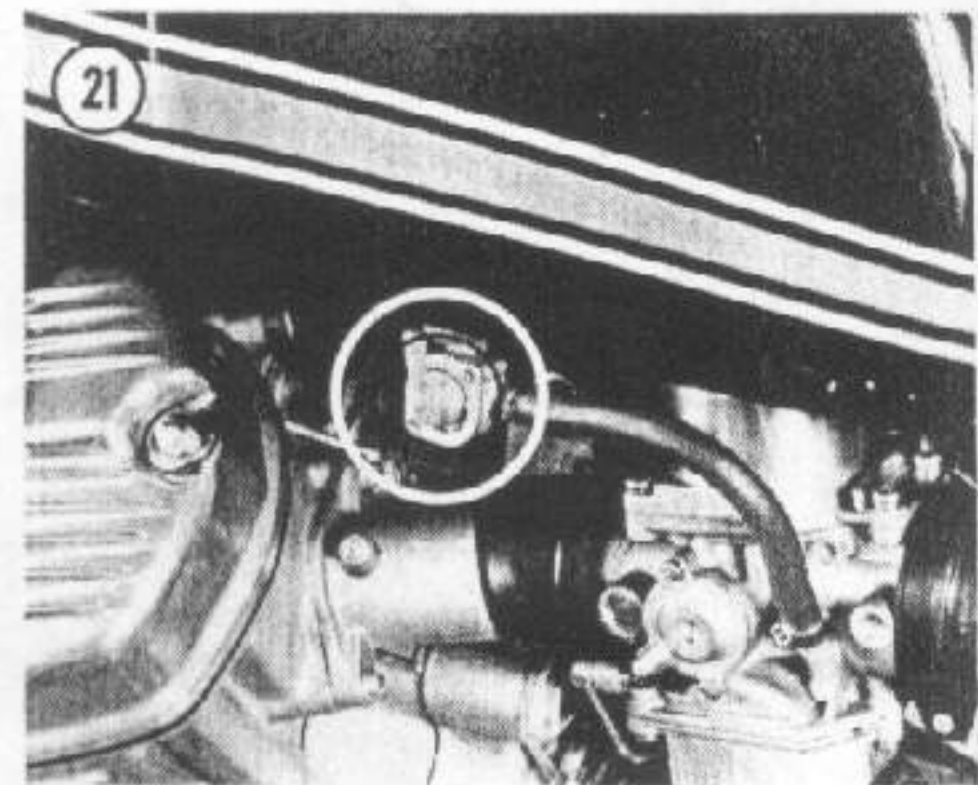
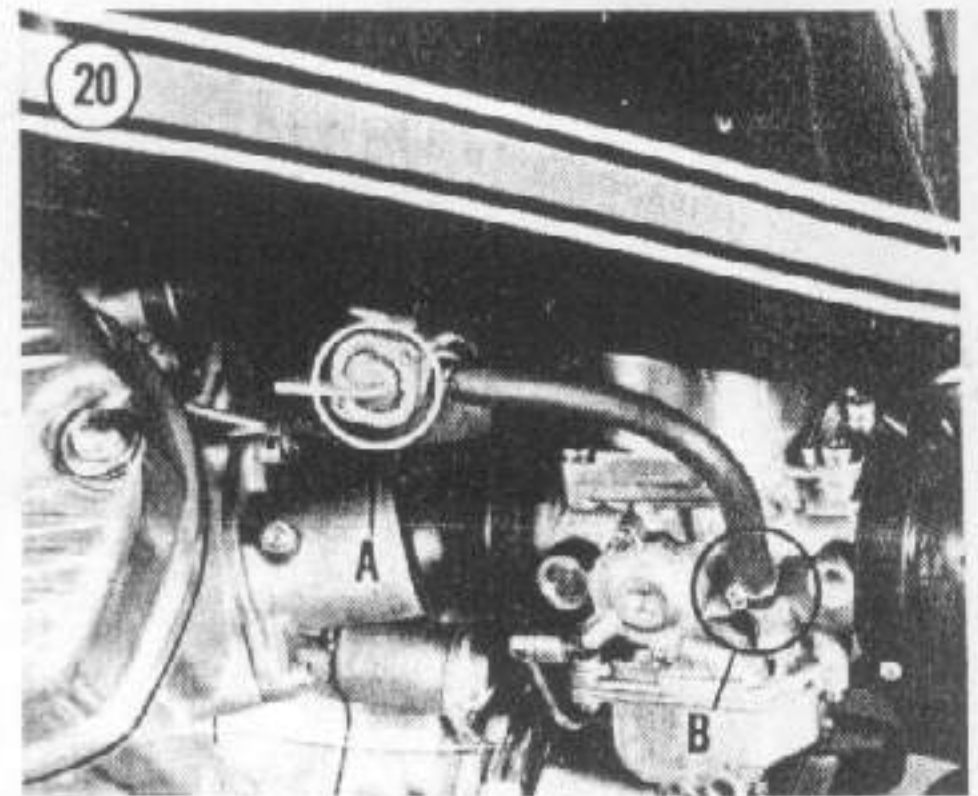
12. Assemble by reversing the disassembly steps.

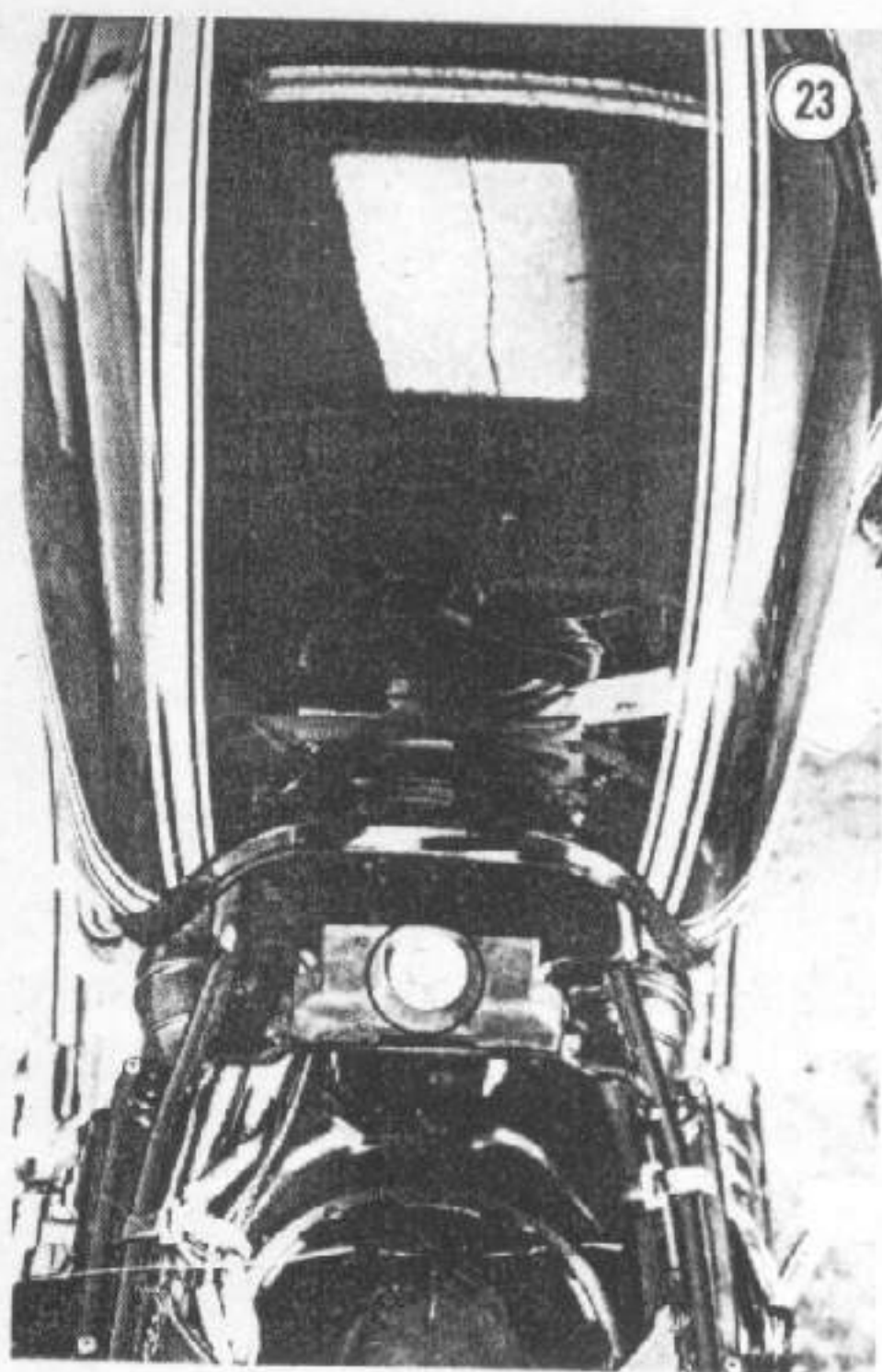
6.3

6.3.1. FUEL SHUTOFF VALVE

Removal/Installation

1. Turn the shutoff valve to the OFF position (A, Figure 20) and remove the flexible fuel line to the carburetor (B, Figure 20).
2. Place the loose end into a clean, sealable metal container. This fuel can be reused if it is kept clean.
3. Open the valve to the RESERVE position (Figure 21) and remove the fuel fill cap. This will allow air to enter the tank and speed up the flow of fuel. Drain the tank completely.
4. Remove the fuel shutoff valve by unscrewing the locknut from the tank (A, Figure 22).
5. After removing the valve, insert a corner of a clean shop rag into the opening in the tank to stop the dribbling of fuel onto the engine and frame.
6. Remove the fuel filter (B, Figure 22) from the shutoff valve. Clean it with a medium soft toothbrush and blow out with compressed air. Replace it if defective.





7. Install by reversing the removal steps. Do not forget the gasket (C, Figure 22) between the valve and the tank. Tighten the locknut to 15-18 ft.-lb. (20-24 N•m).

6.4

FUEL TANK

6.4.1.

Removal/Installation

1. Remove the seat.
2. Turn the fuel shutoff valve to the OFF position (Figure 20), and remove the fuel line to the carburetors.
3. Remove rear bolt and rubber pad (Figure 23) securing the fuel tank at the rear, slide the tank to the rear, and remove it.
4. Install by reversing the removal steps.

6.4.2.

Sealing (Pin Hole Size)

A small pin hole size leak can be sealed with the use of a product called Thextonite Gas Tank Sealer Stick or equivalent. Follow the manufacturer's instructions.

6.4.3

Sealing (Small Hole Size)

This procedure requires the use of the chemical *trichloroethylene*, which is *flammable and toxic*.

If you feel unqualified to accomplish it, take the tank to your dealer and let him seal the tank.

WARNING

Before attempting any service on the fuel tank be sure to have a fire extinguisher rated for gasoline or chemical fires within reach. Do not smoke or work where there are any open flames. The work area must be well ventilated.

1. Remove the tank as described under *Fuel Tank Removal/Installation* in this chapter.
2. Mark the spot on the tank where the leak is visible with a grease pencil.
3. Turn the fuel shutoff valve to the RESERVE position and blow the interior of the tank *completely dry* with compressed air.
4. Turn the fuel shutoff valve to the OFF position and pour about 1 qt. (1 liter) of trichloroethylene into the tank, install the fuel fill cap and shake the tank vigorously one or two minutes. This is used to remove all fuel residue.
5. Drain the trichloroethylene solution into a safe storable container. This solution may be reused.
6. Remove the fuel shutoff valve by unscrewing the fitting from the tank. If necessary, plug the tank with a cork or tape it closed with duct tape.
7. Again blow the tank interior *completely dry* with compressed air.
8. Position the tank so that the point of the leak is located at the lowest part of the tank. This will allow the sealant to accumulate at the point of the leak.
9. Pour the sealant into the tank (a silicone rubber base sealer like Pro-Tech Fuel Tank Sealer, or equivalent may be used). This is available at most motorcycle supply stores.
10. Let tank sit in this position for at least 48 hours.
11. After the sealant has dried, install the fuel shutoff valve, turn it to the OFF position and refill the tank with fuel.

12. After the tank has been filled, let it sit for at least two hours and recheck the leak area.
13. Install the tank on the motorcycle.

6.5

CRANKCASE BREATHER SYSTEM

In order to comply with air pollution standards the Honda CX500 is equipped with a crankcase breather system (Figure 24). The system draws the blow-by gases generated in the crankcase, and recirculates them into the fuel/air mixture and into the engine to be burned.

6.5.1.

Inspection

Make sure the hose clamps (Figure 25) are tight at the cylinder heads and check the hoses for deterioration. Replace if necessary. Check that the hoses are not clogged or crimped.

NOTE: Figure 25 is shown with the engine upper mounting plates removed for clarity only.

Remove the plugs (Figure 26) from the 2 drain hoses and clean out all residue.

NOTE: Be sure to install the plugs and clamps.

6.6

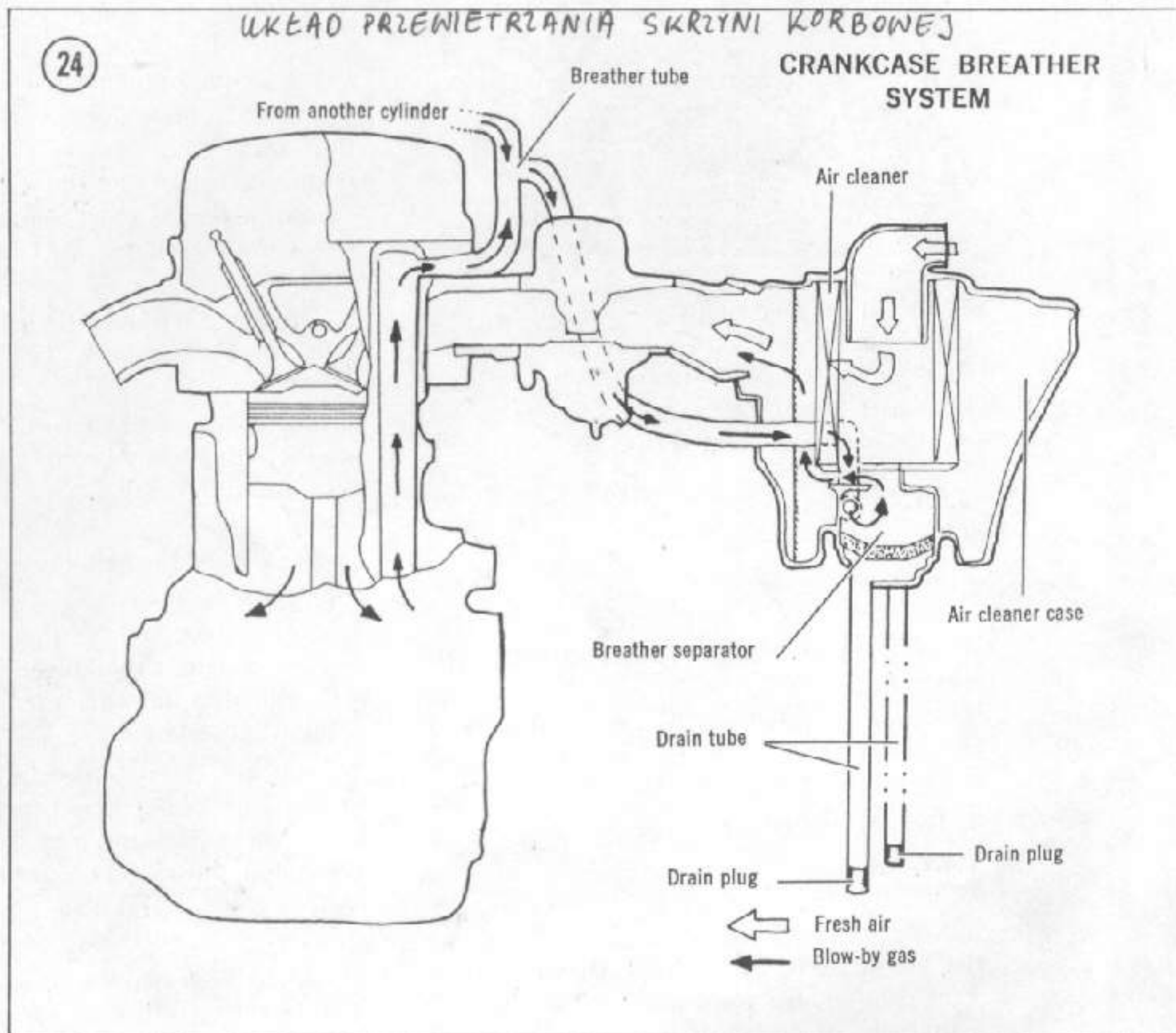
EXHAUST SYSTEM

The exhaust system consists of two exhaust pipes, a common collector, and two mufflers.

6.6.1.

Removal/Installation

1. Loosen the clamps securing the mufflers (A, Figure 27) to the collector. Remove bolts securing the rear footpegs and the mufflers (B,



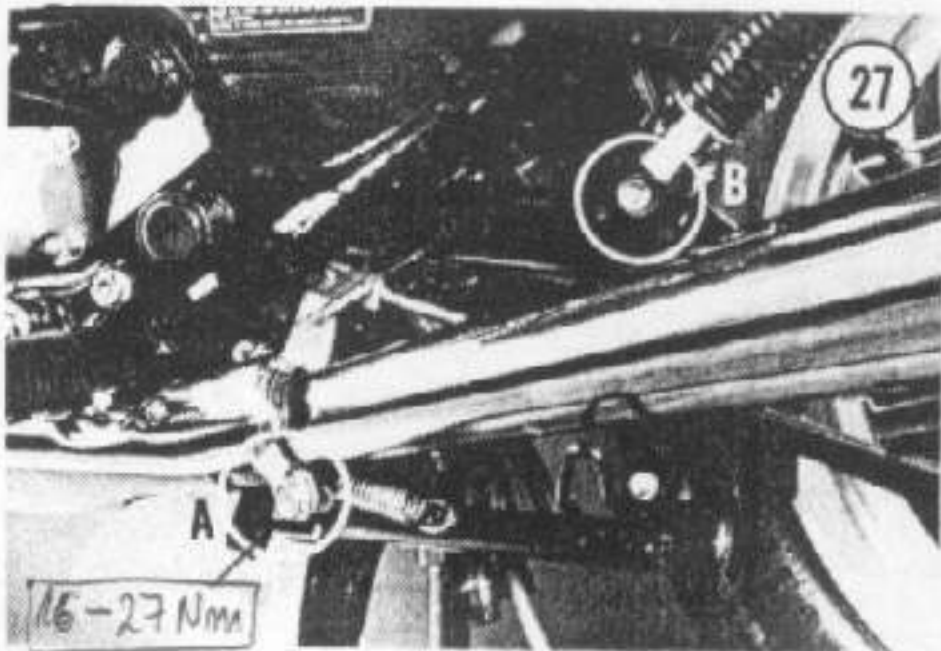
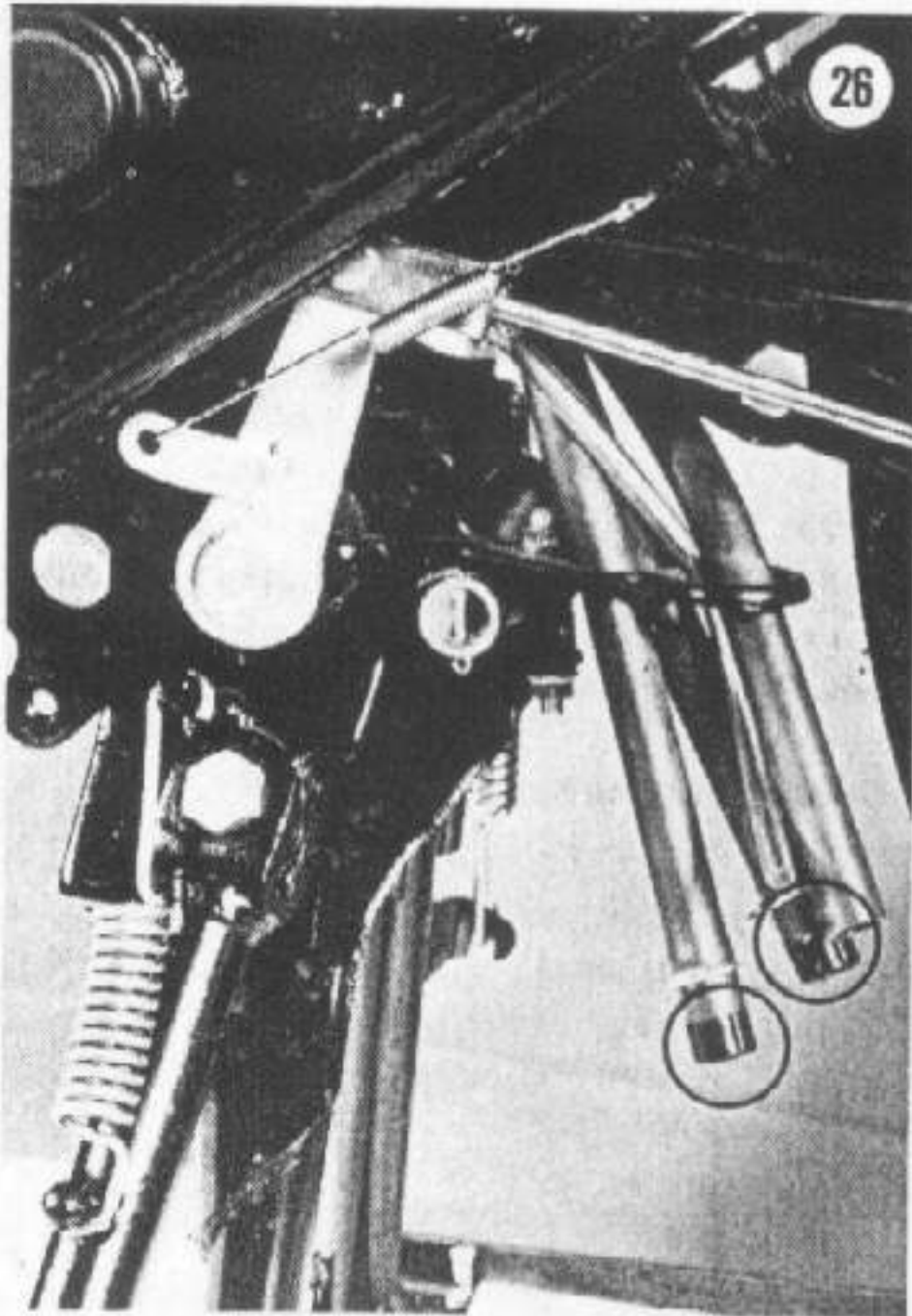
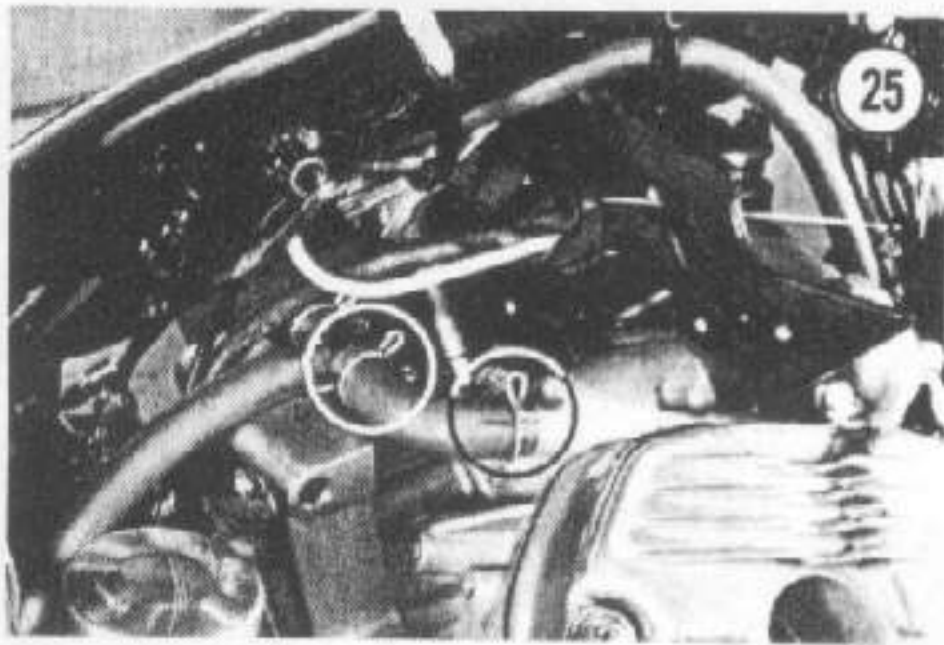


Figure 27). Slide the mufflers out of the collector and remove them.

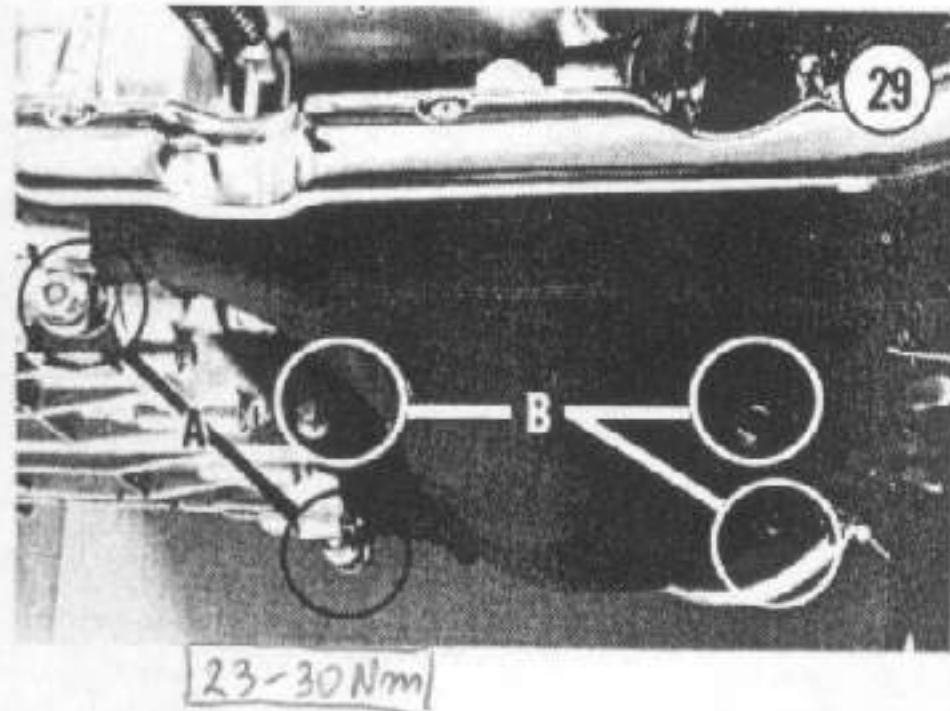
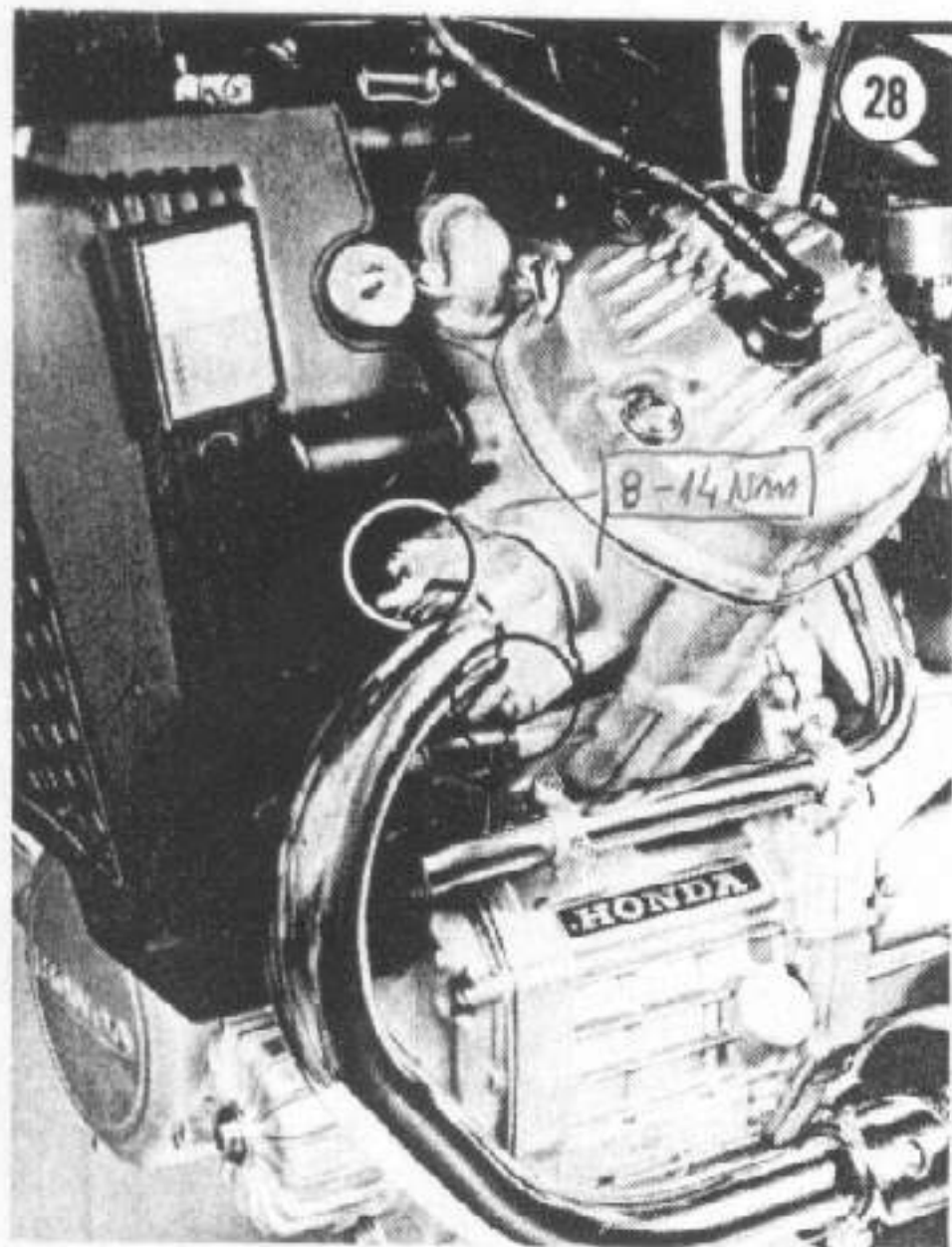
2. Remove the 4 nuts and washers (Figure 28) securing the exhaust pipe flanges to the cylinder heads.

3. Loosen the clamps (A, Figure 29) securing the exhaust pipes to the collector inlet.

4. Remove the bolts on each side (B, Figure 29) securing the collector to the crankcase.

5. Pull the collector down and forward until the exhaust pipes are free from the cylinder heads and remove.

6. Install by reversing the removal steps.



6

CHAPTER SEVEN

ELECTRICAL SYSTEM

The electrical system includes the following systems (each is described in detail in this chapter):

- a. Charging system
- b. Ignition system
- c. Lighting system
- d. Directional signals
- e. Horn

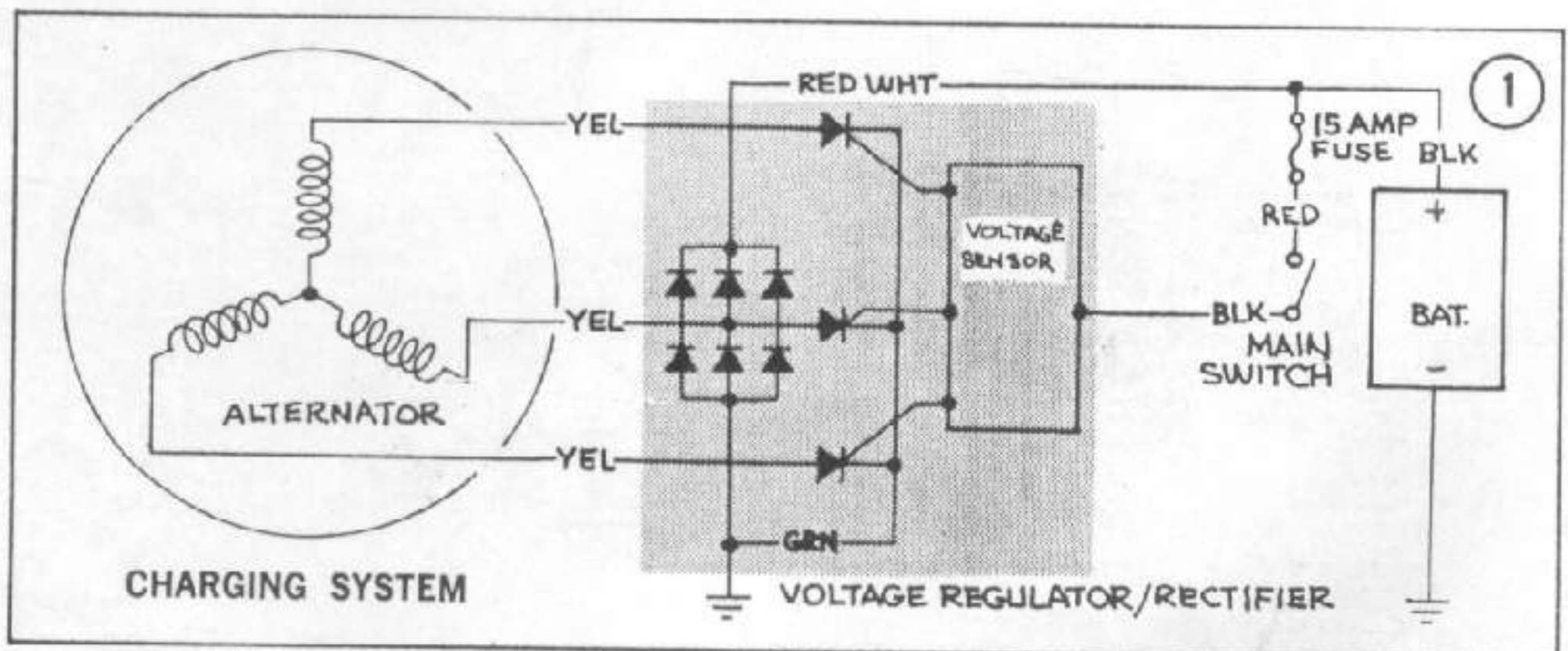
7.1 CHARGING SYSTEM

The charging system consists of the battery, alternator, and voltage regulator/rectifier (Figure 1).

The alternator generates an alternating current (AC) which the rectifier converts to direct current (DC). The regulator maintains the voltage to the battery and load (lights, ignition, etc.) at a constant voltage regardless of variations in engine speed and load.

7.1.1. Testing Charging System

Whenever a charging system trouble is suspected, make sure the battery is good before going any further. Clean and test the battery as described under *Battery Testing* in Chapter Three. Warm up engine prior to performing the test.



UKŁAD ŁADOWANIA

REGULATOR NAPIĘCIA/PROSTOWNIK

YEL - żółty

REDWHT - czerwono-biały

GRN - zielony

RED - czerwony

To test the charging system, connect a 0-15 DC voltmeter to battery as shown in **Figure 2**. Connect the positive voltmeter terminal to the positive battery terminal and the negative voltmeter terminal to ground.

NOTE: Do not disconnect either the positive or negative battery cables; they are to remain in the circuit as is.

Connect a 0-10 DC ammeter in line with the main fuse as shown in **Figure 3**. Use alligator clips on the test leads for good electrical connections. Pivot one end of the fuse out of the fuse holder and attach the positive ammeter terminal to the exposed end of the fuse. Attach the negative ammeter terminal to the exposed fuse clip within the fuse holder.

NOTE: During the test if the needle of the ammeter reads in the opposite direction on the scale, reverse the polarity of the test terminals.

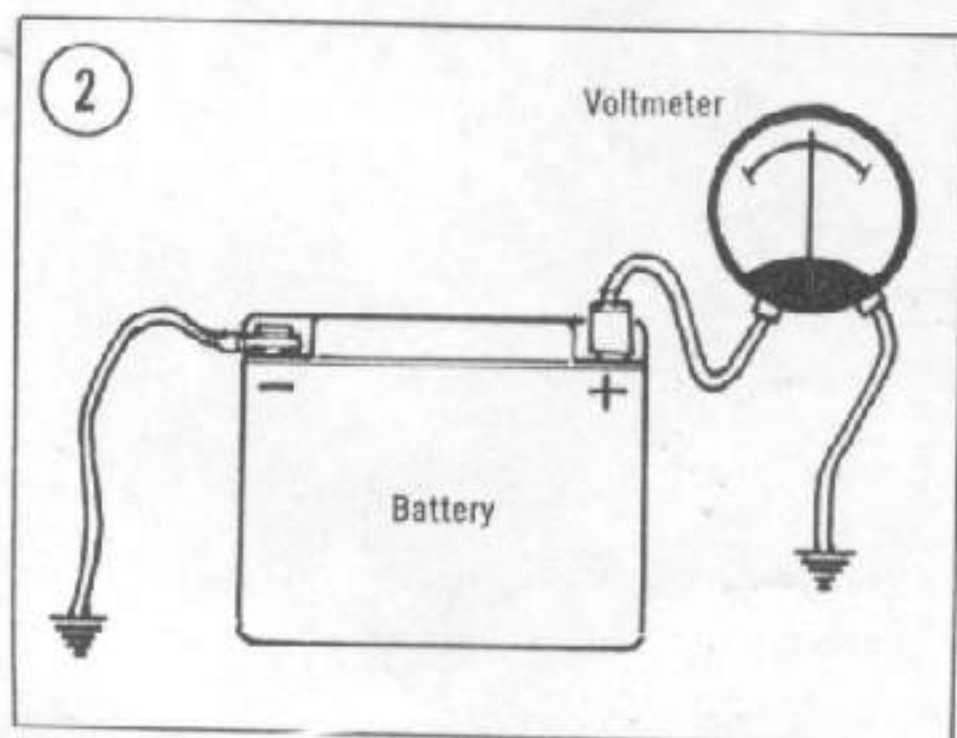
CAUTION

In order to protect the ammeter, always run the test with the fuse in line in the circuit.

CAUTION

Do not try to test the system by connecting an ammeter between the positive battery terminal and the starter cable. The ammeter will burn out when the electric starter is operated.

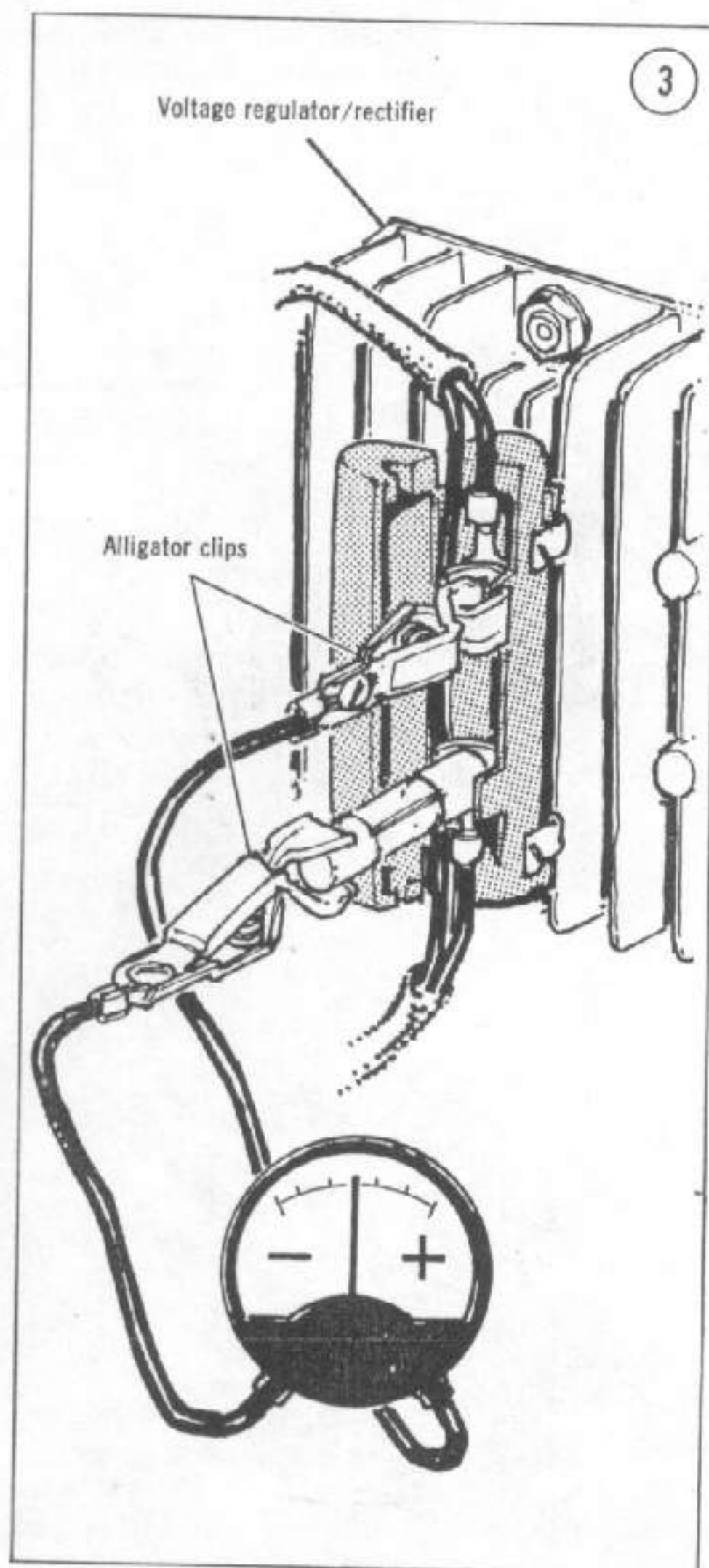
Start the engine and run at 5,000 rpm. Minimum charging current should be 5 amperes. Voltage should read 14.5 volts.



NOTE: All test measurements are to be made with the headlight on high beam.

If the charging current is considerably lower than specified, check the alternator and voltage regulator/rectifier. Less likely is that the charging current is too high; in that case, the regulator is probably at fault.

Test the separate charging system components as described under the appropriate heading in the following section.



7.2

BATTERY

7.2.1.

Care, Inspection, and Testing

For complete battery information refer to *Battery* in Chapter Three.

7.3

ALTERNATOR

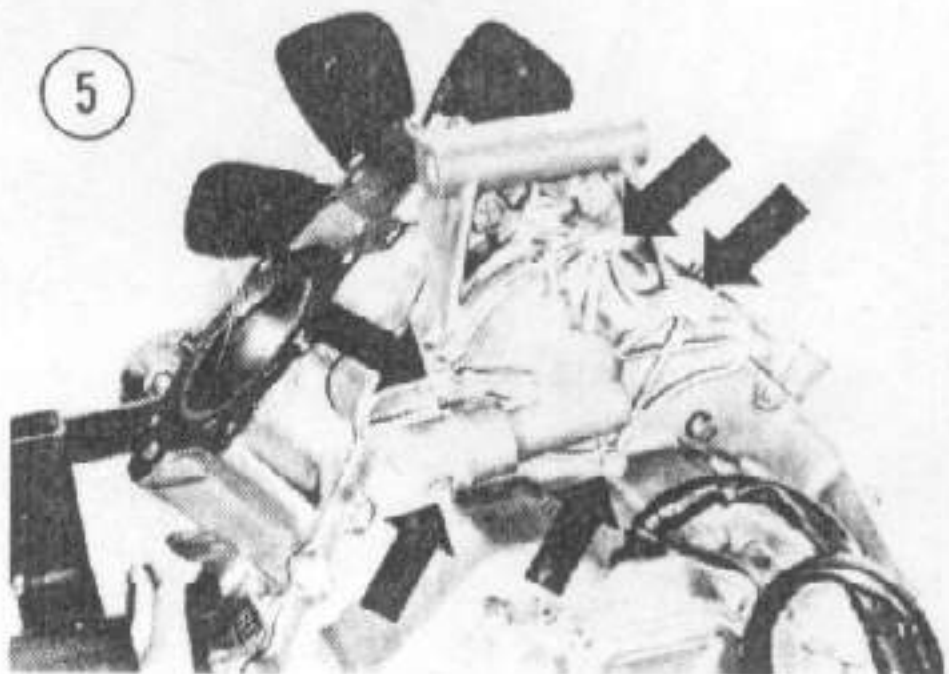
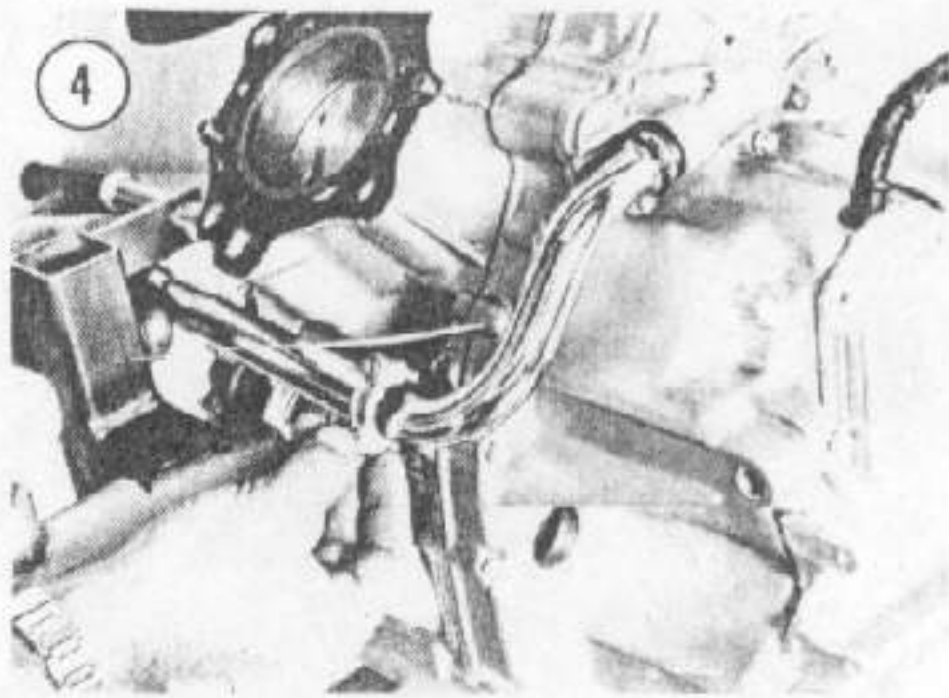
An alternator is a form of electrical generator in which a magnetized field called a rotor revolves within a set of stationary coils called a stator. As the rotor revolves, alternating current is induced in the stator. The current is then rectified and used to operate the electrical accessories on the motorcycle and for charging battery. The rotor is permanently magnetized.

7.3.1.

Removal/Installation

1. Remove the engine as described under *Engine Removal/Installation* in Chapter Four.

NOTE: Figures 4-18 are shown with the cylinder heads removed. However, it is not necessary to remove them for this procedure.



2. Remove the 2 clamps securing the water pump pipe to the cylinder block (Figure 4) and remove it.

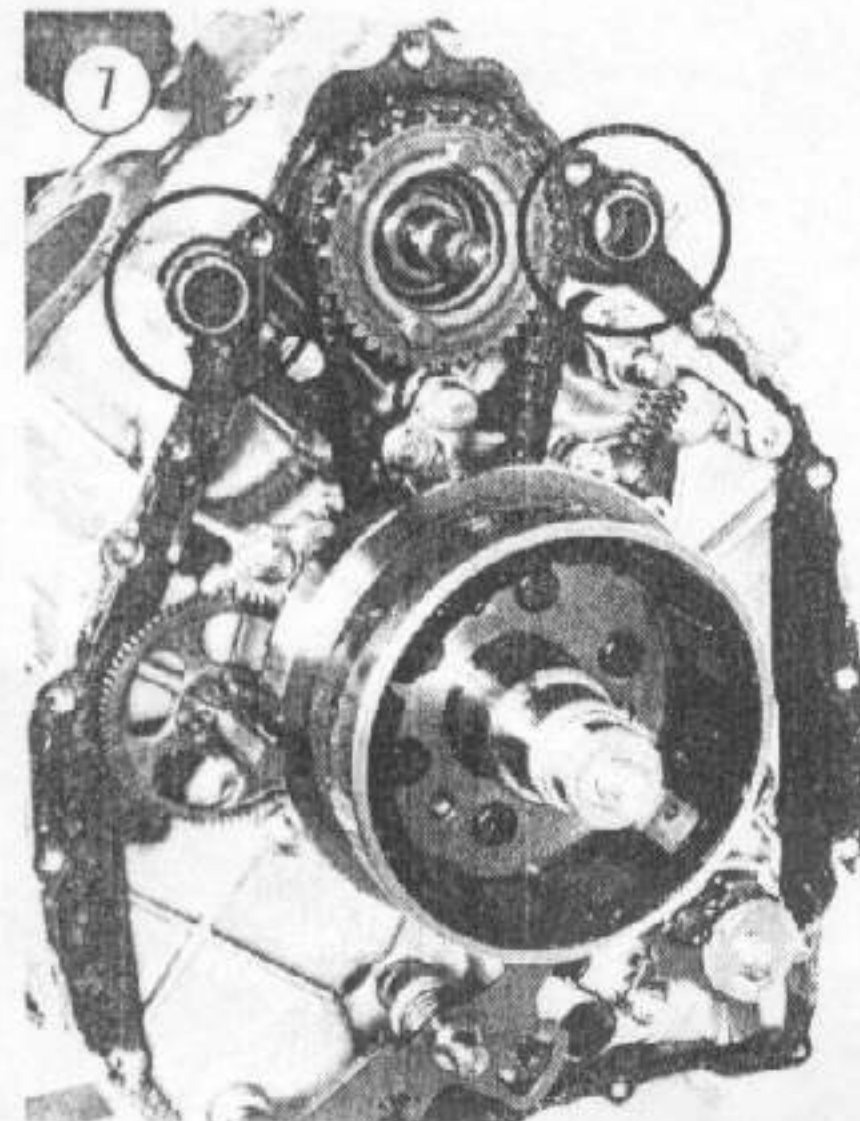
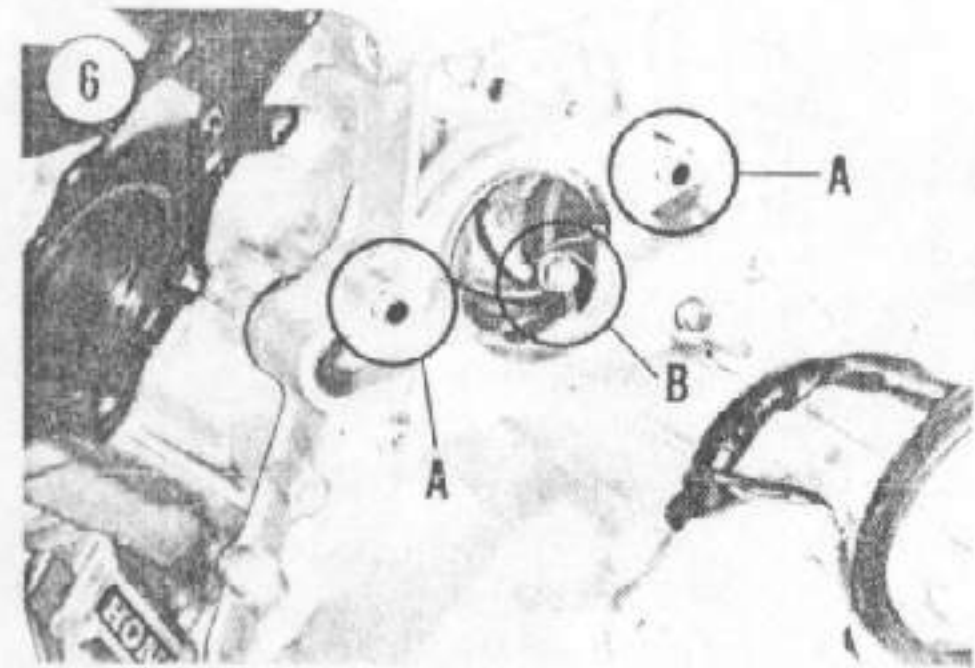
3. Remove the 5 bolts securing the water pump housing (Figure 5) and remove it.

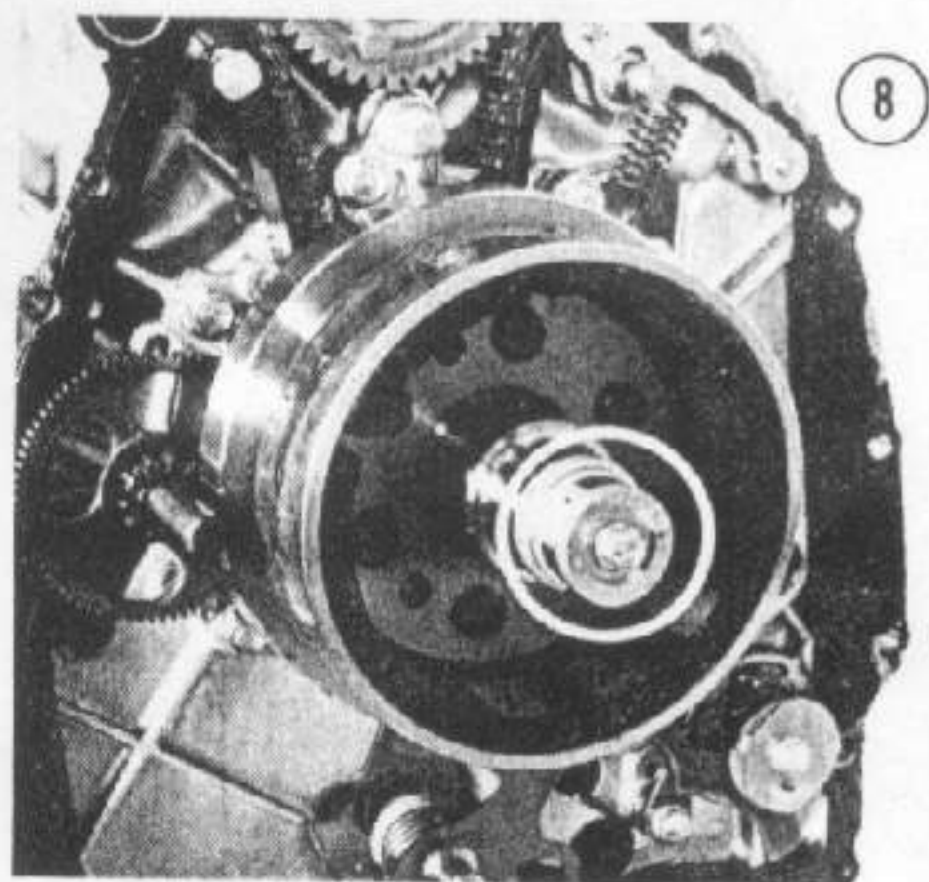
NOTE: Do not lose the 2 locating dowels (A, Figure 6).

4. Remove the cap nuts and copper washers (B, Figure 6) securing the water pump impeller and remove it.

5. Remove the 17 bolts securing the rear engine cover and remove it.

NOTE: Do not lose the 2 locating dowels and O-rings (Figure 7).





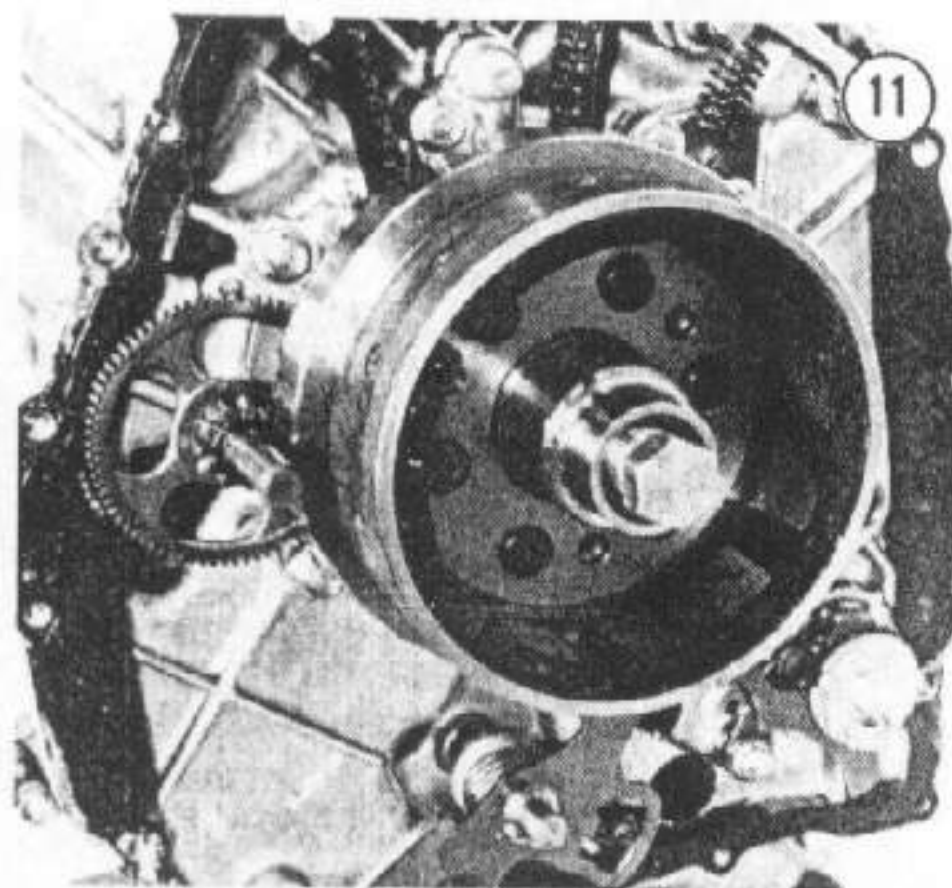
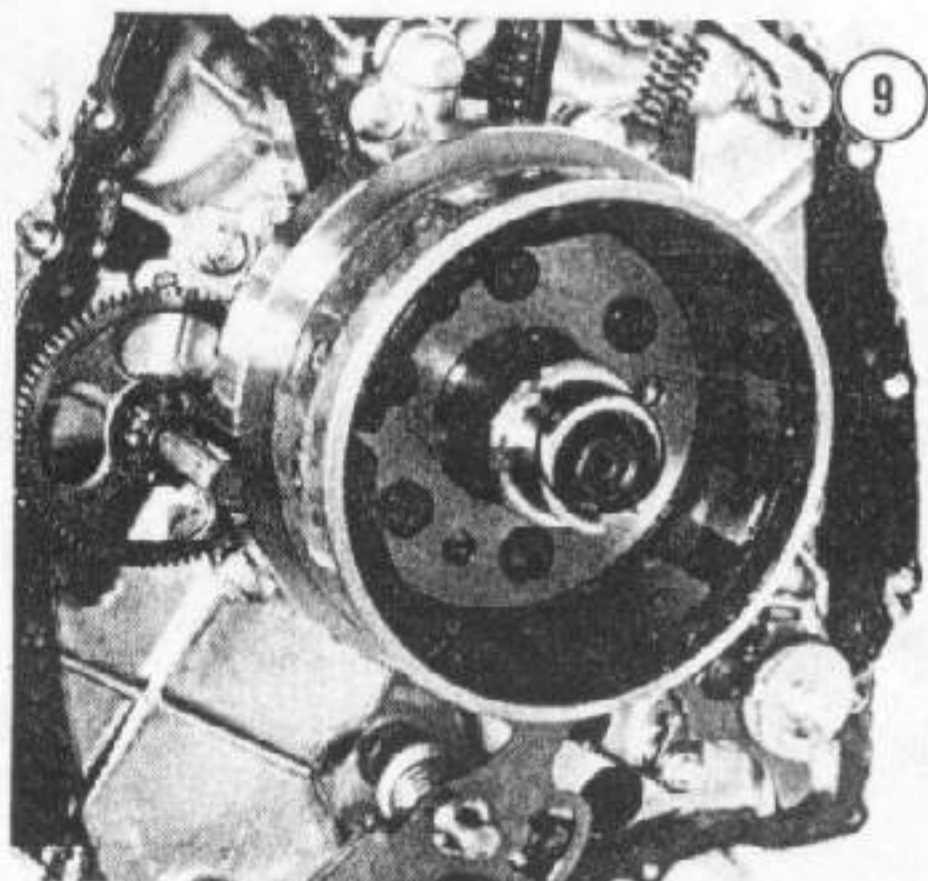
6. Remove the bolt (Figure 8) securing the alternator pulser rotor and remove it.

7. Remove the bolt (Figure 9) securing the alternator rotor (flywheel) to the crankshaft with a socket.

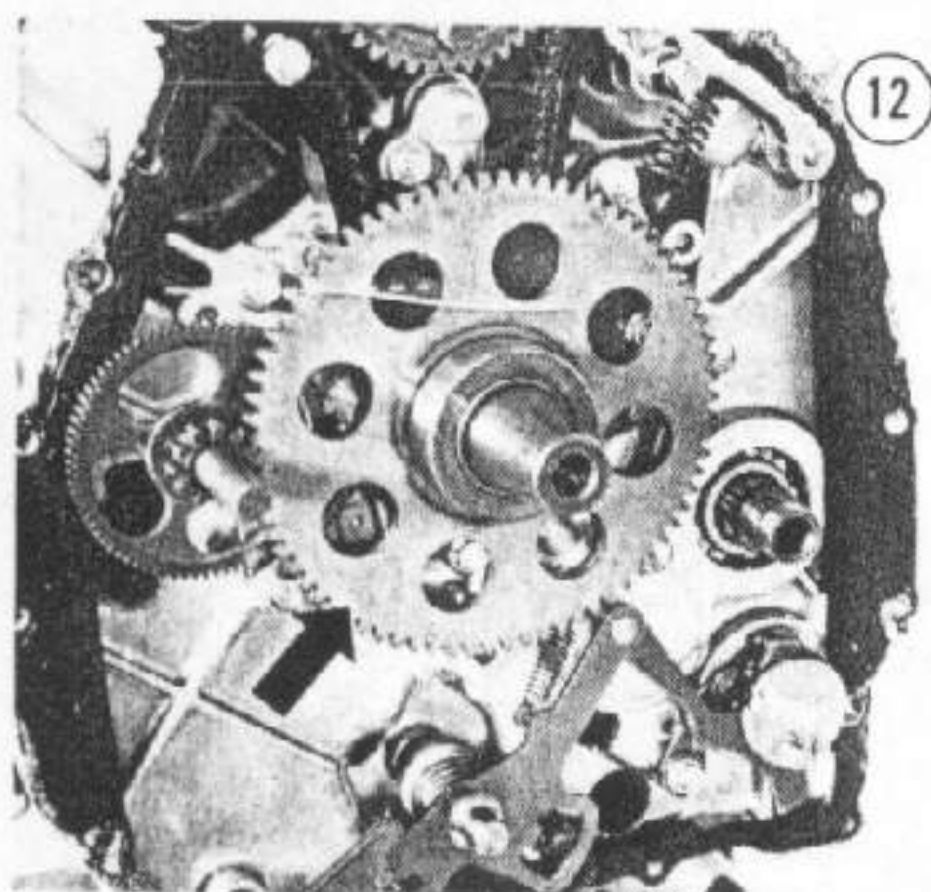
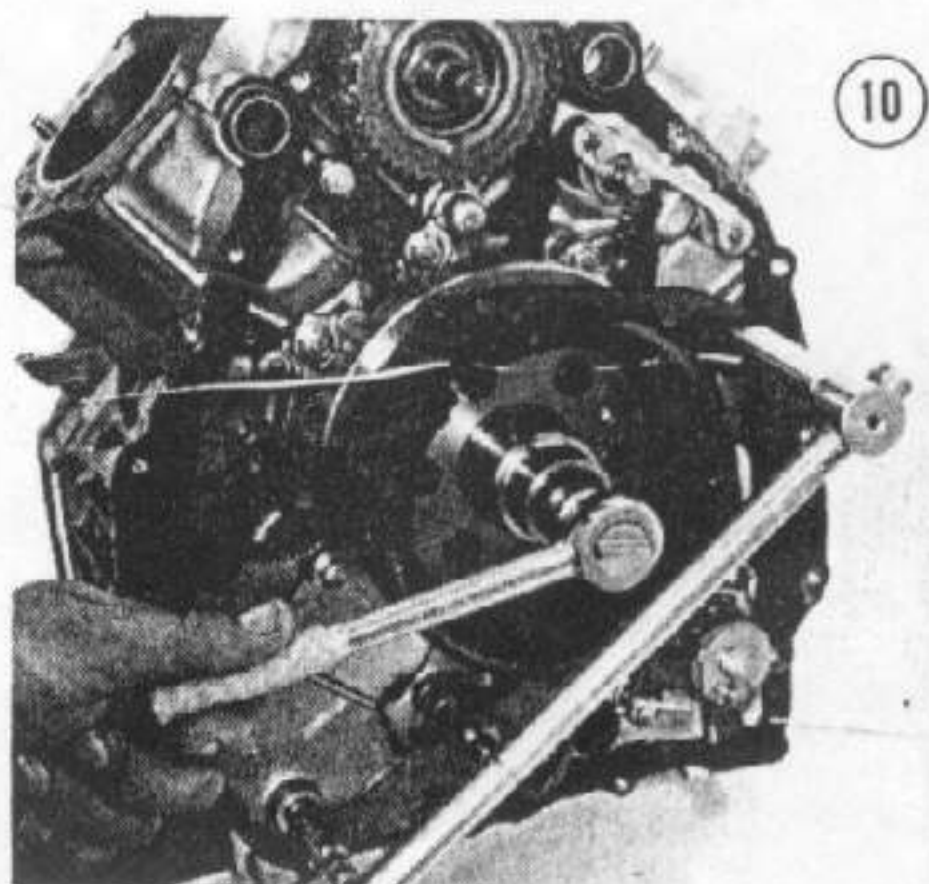
NOTE: To prevent the flywheel from turning while removing the bolt, secure it with a strap wrench as shown in Figure 10.

8. Screw a flywheel puller in all the way until it stops (Figure 11).

9. Rotate the puller clockwise until the flywheel disengages from the crankshaft. Remove the flywheel, starter gear (Figure 12), and the needle bearing (Figure 13).



7



and the needle bearing (A, Figure 13).

CAUTION

Honda recalled all 1978 CX500's to correct a serious cam tensioner problem. If your tensioner cover does not look like the one shown in B, Figure 13, your bike has not been modified. Refer to the Camshaft procedure in Chapter Four for more details.

CAUTION

Be careful not to damage the pulser pickup (Figure 14) on the outer surface of the flywheel.

10. Remove the 5 bolts (Figure 15) securing the CDI pulser cover and remove it.

11. Disconnect the electrical wires at the pulser stator, remove the 2 screws (A, Figure 16) securing the pulser stator and remove it. Pull the rubber grommet (B, Figure 16) out of the rear engine cover.

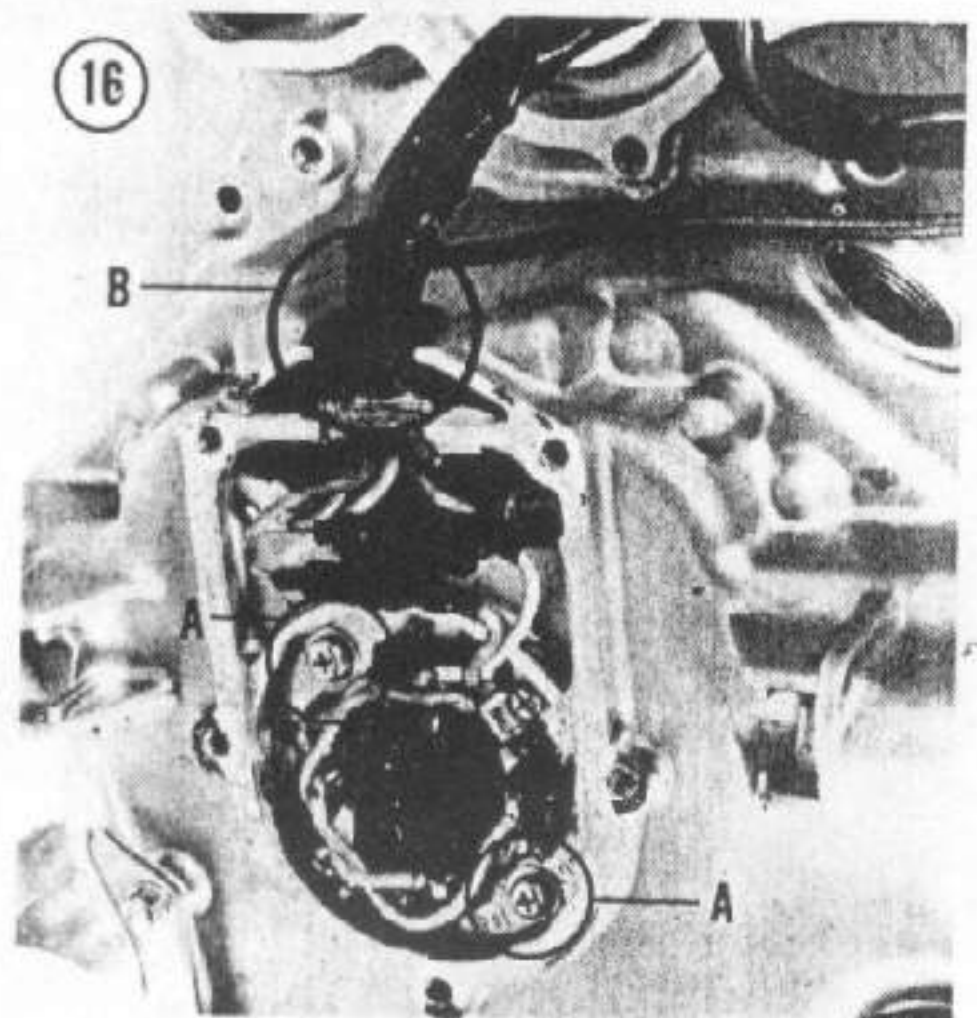
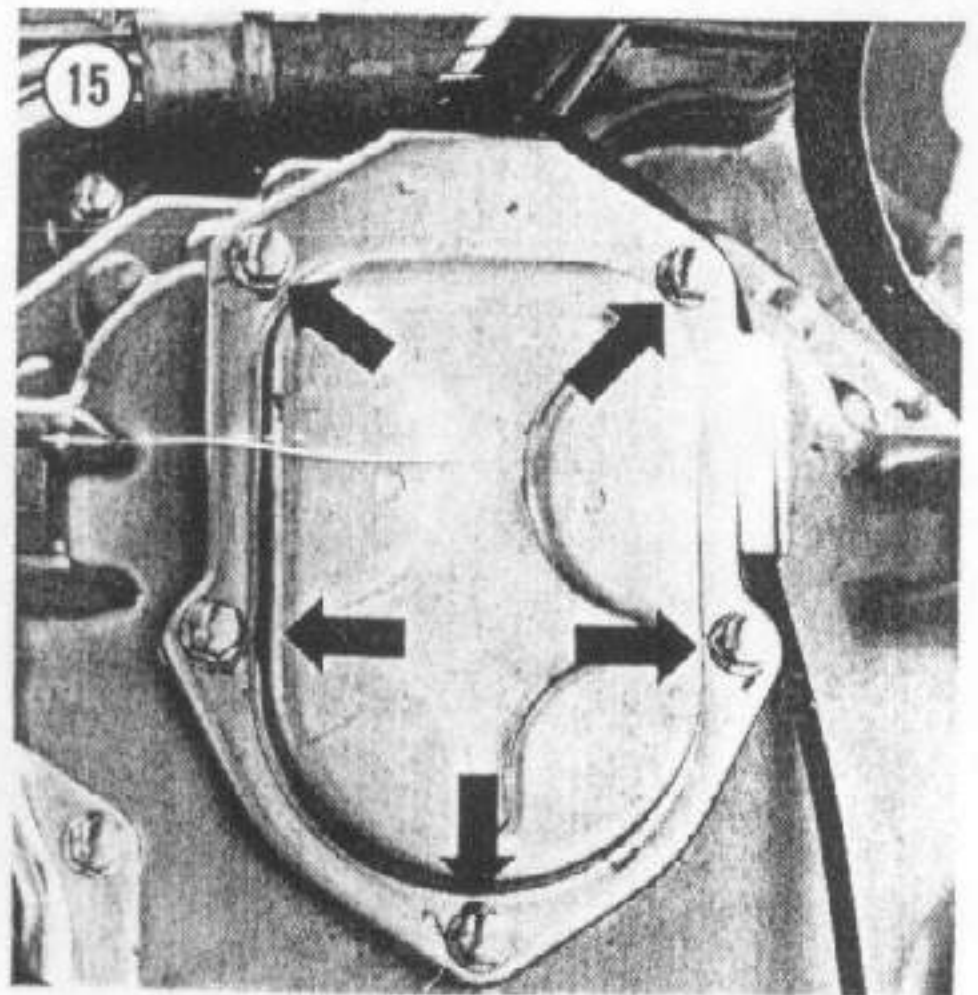
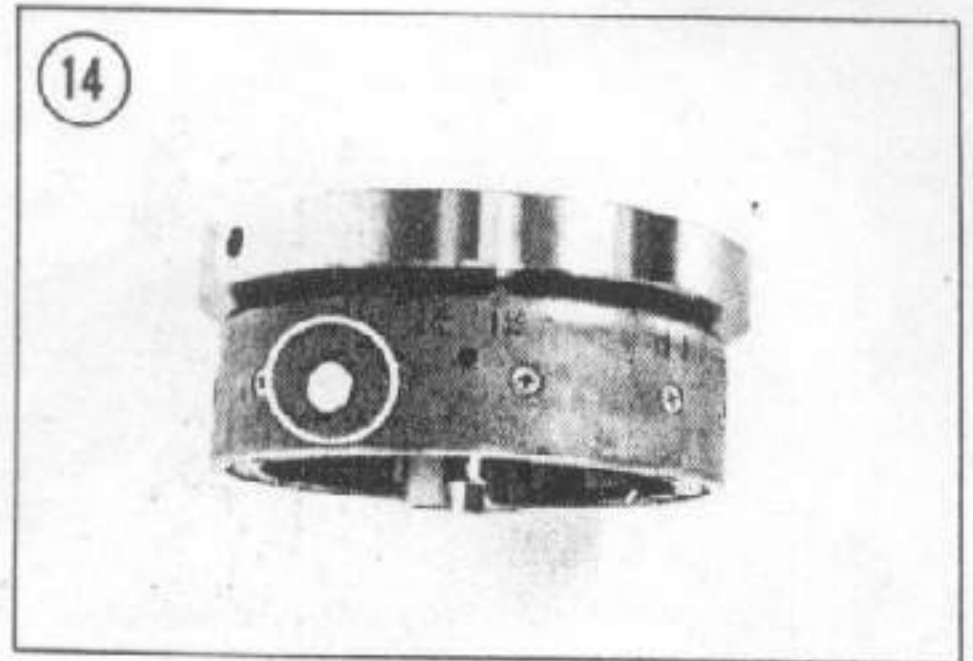
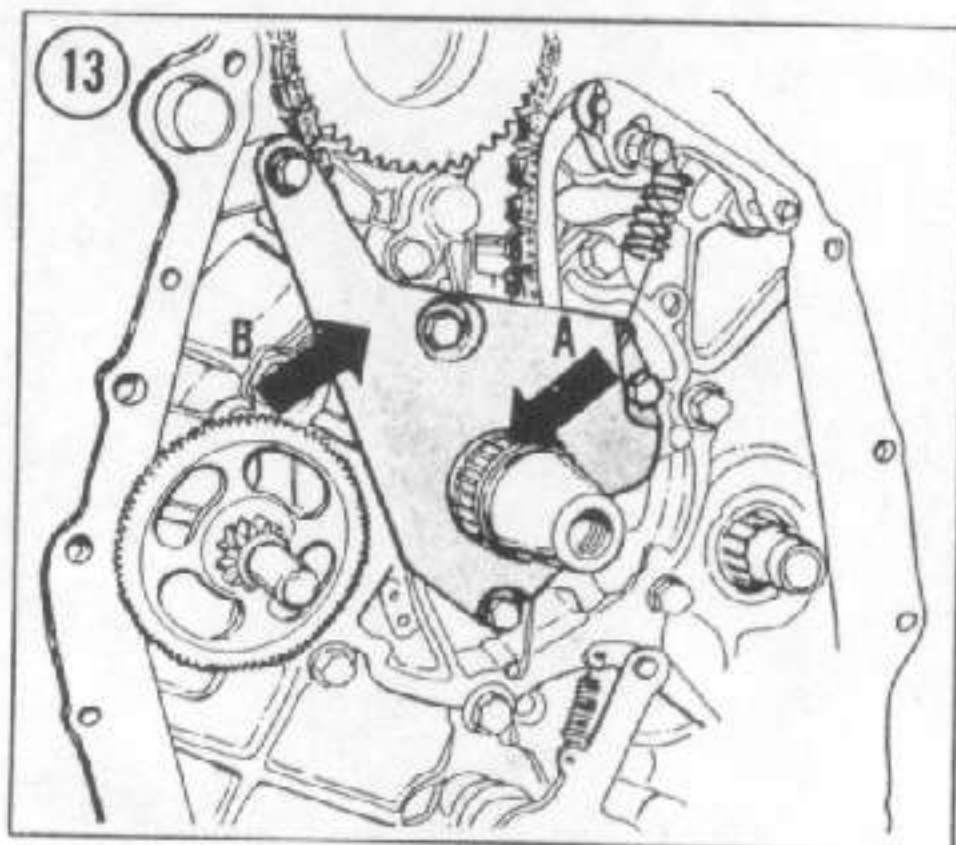
12. Remove the 3 bolts (A, Figure 17) securing the alternator stator and the 2 bolts (B, Figure 17) securing the right and left pulsers.

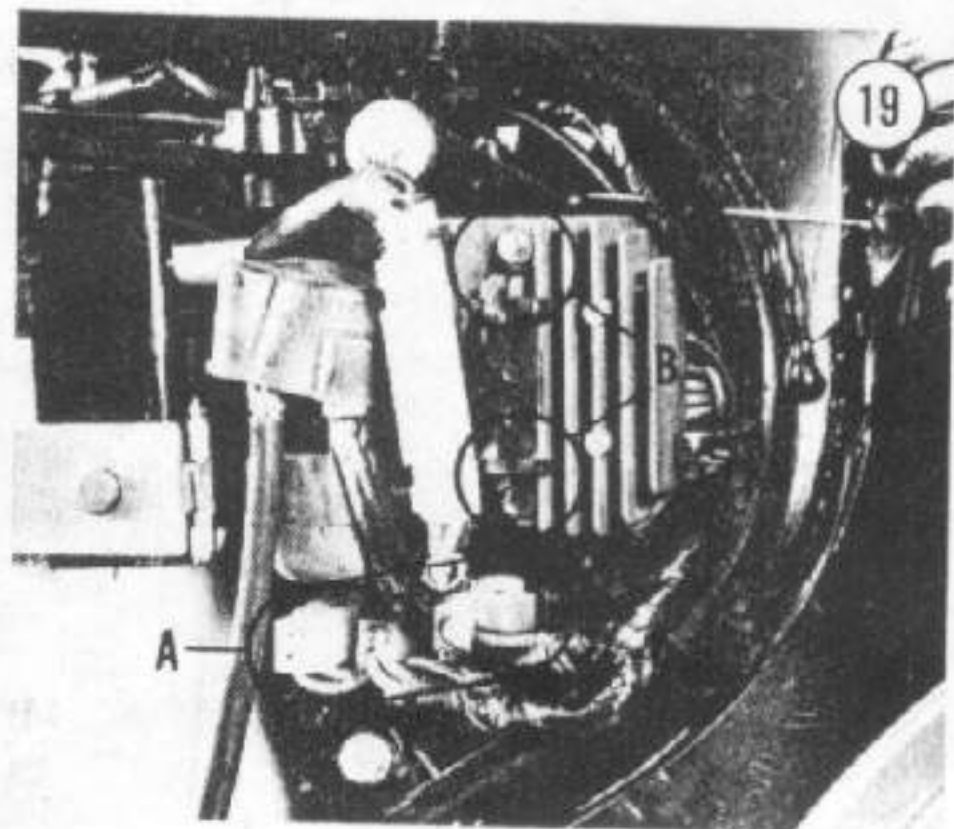
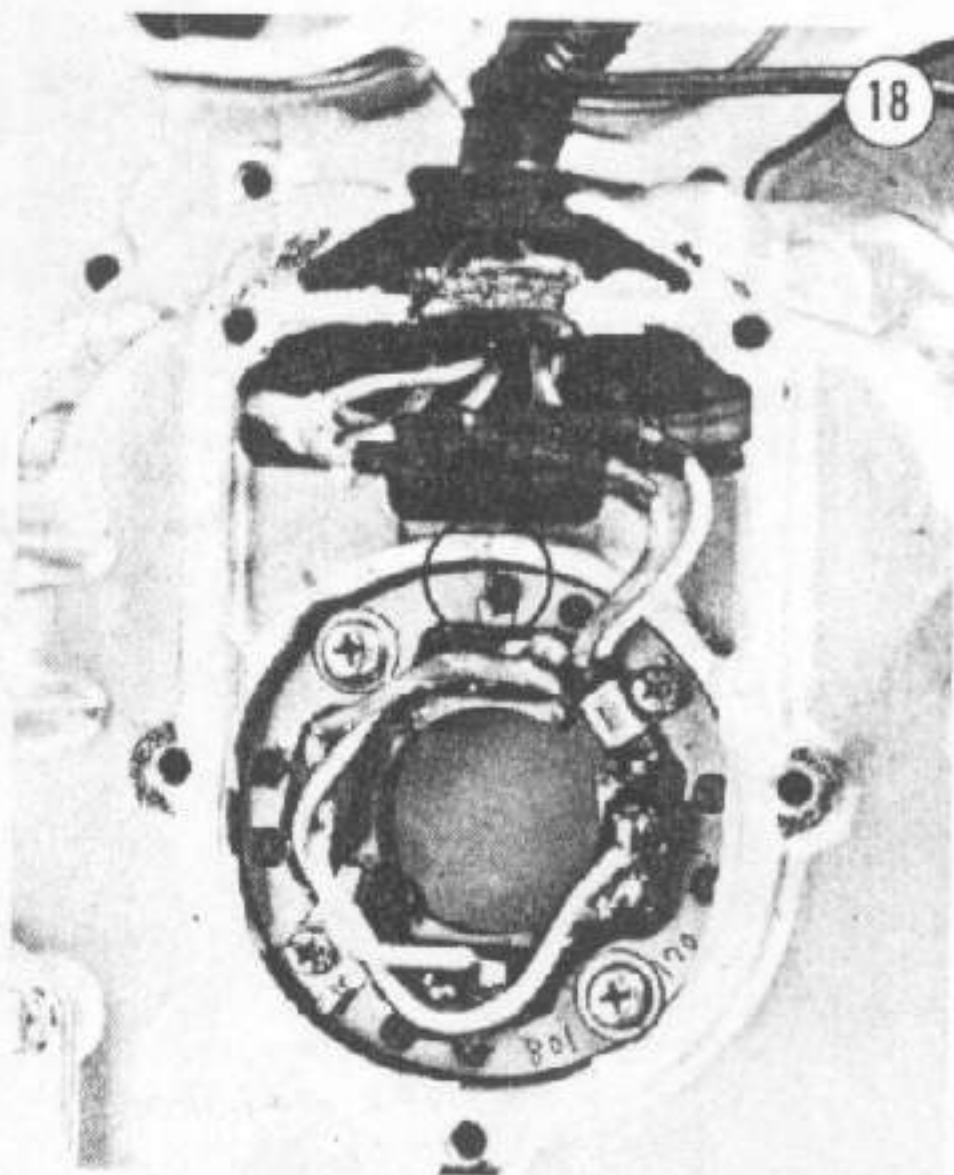
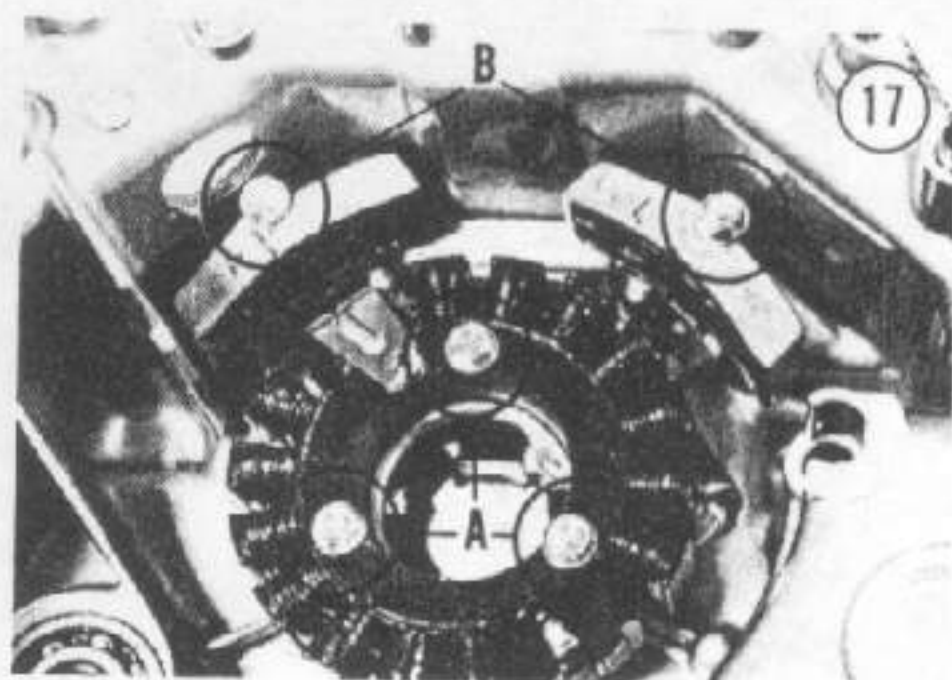
13. Carefully pull the electrical wires through the hole in the rear engine cover.

CAUTION

Do not pull too hard on the stator as it may damage electrical connections where the wires attach to the stator.

14. Install by reversing these removal steps and secure the alternator rotor bolt to 58-72 ft.-lb. (79-97 N•m). Be sure that the Woodruff key,





on the crankshaft, is in place and correctly seated prior to installing the rotor.

NOTE: To prevent the flywheel from turning while installing the bolt, secure it with a strap wrench as shown in Figure 10.

15. Be sure the rubber grommet (B, Figure 16) is securely in place and that none of the electrical wires are pinched between the stator and the rear engine cover. Make sure the wires are correctly routed.

16. Install the pulser stator and align the index mark on the stator and the rear engine cover (Figure 18).

NOTE: If these marks are not aligned properly the ignition timing will be incorrect. Do not try to modify ignition timing by altering the alignment of these marks. This is not the purpose of these marks — they are to be always aligned correctly.

17. Install the pulsers with their holding tabs facing to the right-hand side, facing toward the timing inspection hole.

7.3.2

Alternator Stator Testing

Disconnect the stator electrical leads at the voltage regulator/rectifier (A, Figure 19). Use an ohmmeter and measure the resistance between the terminals and check against values listed in Table 1. Replace the stator if the readings exceed the values given in this table.

7.3.3

Alternator Rotor Testing

The rotor is permanently magnetized and cannot be tested except by replacement with a rotor known to be good. A rotor can lose magnetism from old age or a sharp blow. If

Table 1 ALTERNATOR ROTOR RESISTANCE

Terminals	Value
Green — Blue	77-95
Green — White	387-473
Orange and Light Blue — Green	95-116
Orange and Light Blue/Red — Green	81-99

Note: Set ohmmeter to X 10.

defective, the rotor must be replaced; it cannot be remagnetized.

7.4

VOLTAGE REGULATOR/RECTIFIER

7.4.1. Removal/Installation

1. Remove the left-hand side cover.
2. Disconnect negative battery lead (Figure 20).
3. Remove the 2 bolts securing the voltage regulator/rectifier to the panel (B, Figure 19).
4. Disconnect wires from voltage regulator/rectifier and remove it.
5. Install by reversing the removal steps.

7.4.2. Testing

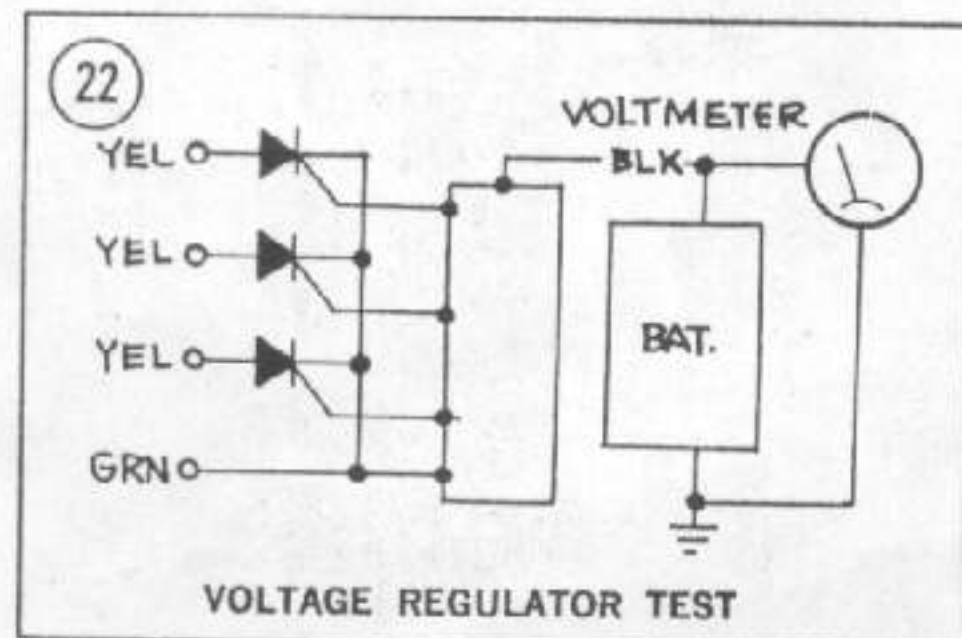
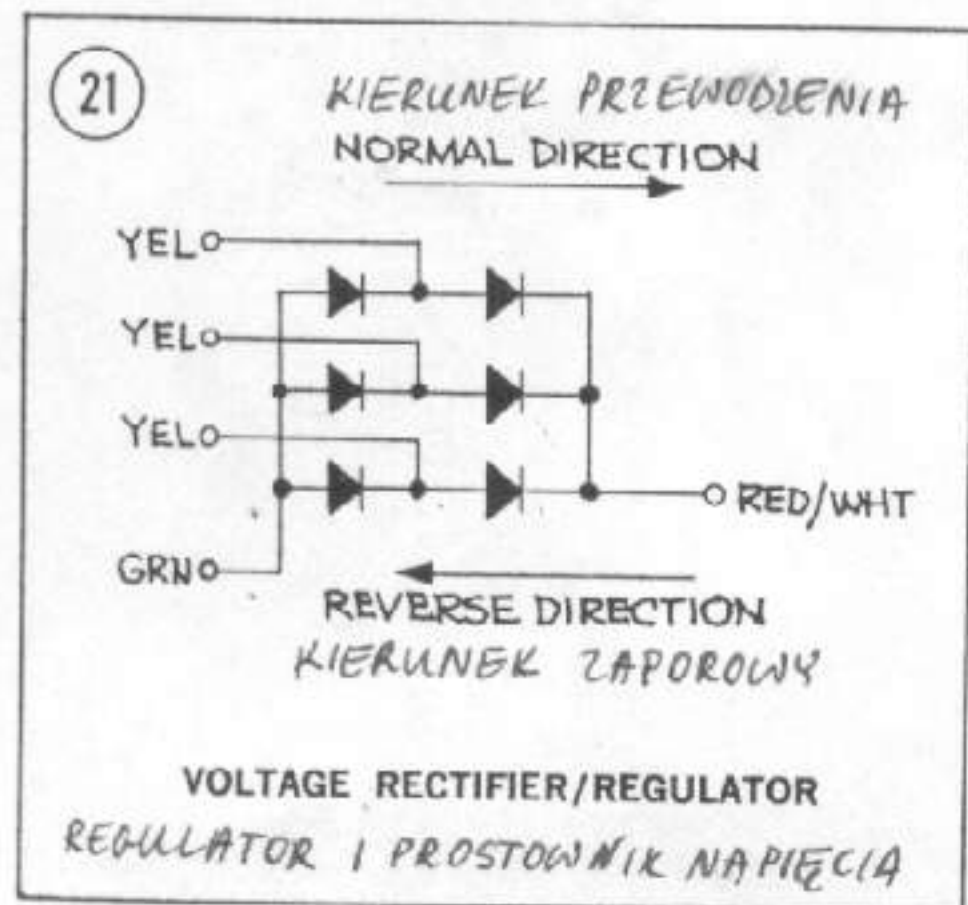
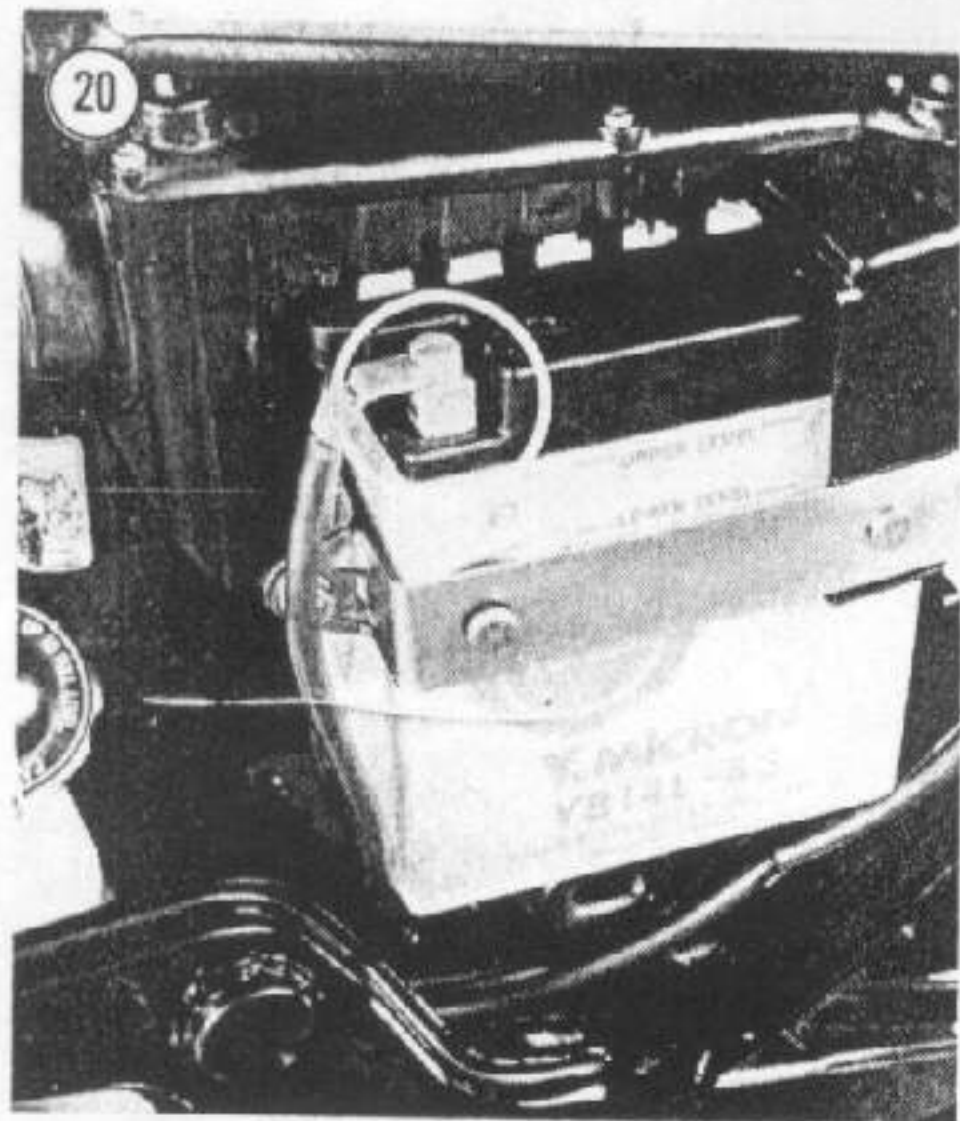
To test the voltage regulator/rectifier, disconnect the plugs from the harness (A, Figure 19). Make the following measurements, using an ohmmeter set to RX10. Refer to Figure 21 for this test.

1. Connect either ohmmeter lead to the green rectifier lead. Connect the other ohmmeter lead to each of the yellow leads. These 3 measurements must be the same, either all very high resistance ($2000\ \Omega$ minimum) or very low resistance ($5-40\ \Omega$). If one or more differ, the voltage regulator/rectifier is bad and the entire unit must be replaced.
2. Reverse ohmmeter leads and repeat Step 1. This time, the readings must also be the same, but just the opposite from the measurements in Step 1. For example, if all readings in Step 1 were low, all readings in this step must be high, and vice-versa. Replace the voltage regulator/rectifier if these measurements are not correct.
3. Connect either ohmmeter lead to the red/white voltage regulator/rectifier lead. Connect the other ohmmeter lead to each of the yellow leads. These 3 measurements must be the same, either all very high or all very low. Replace the voltage regulator/rectifier if these measurements are not correct.

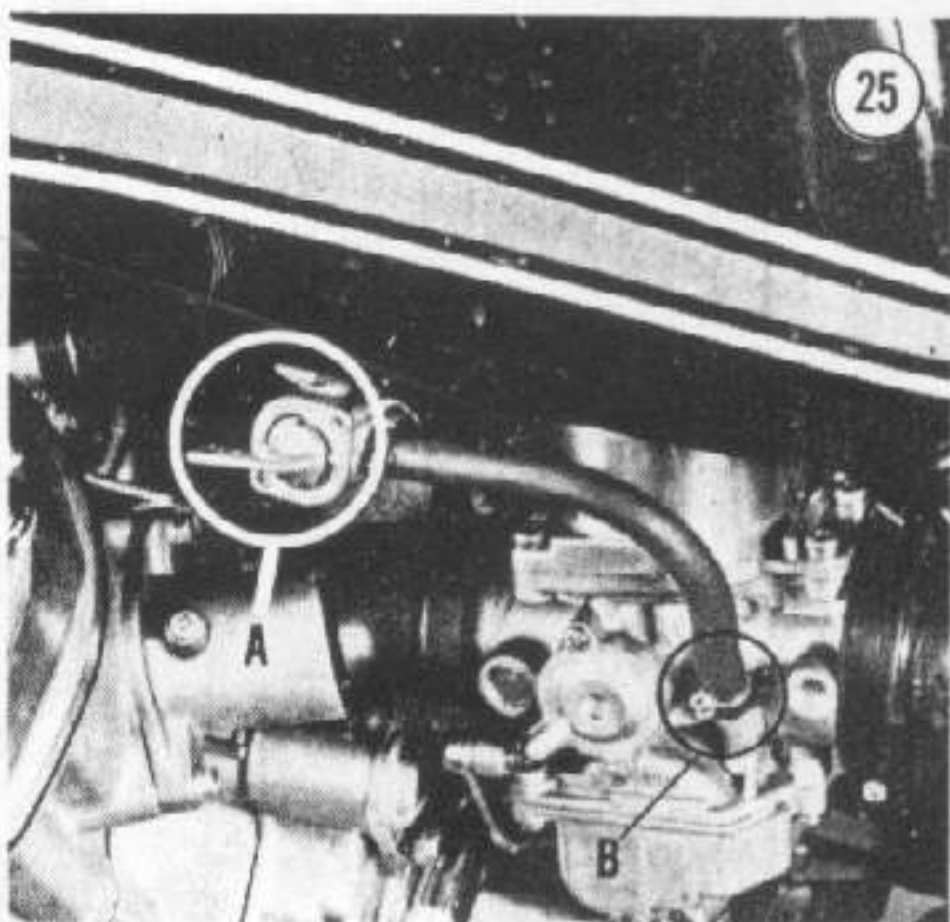
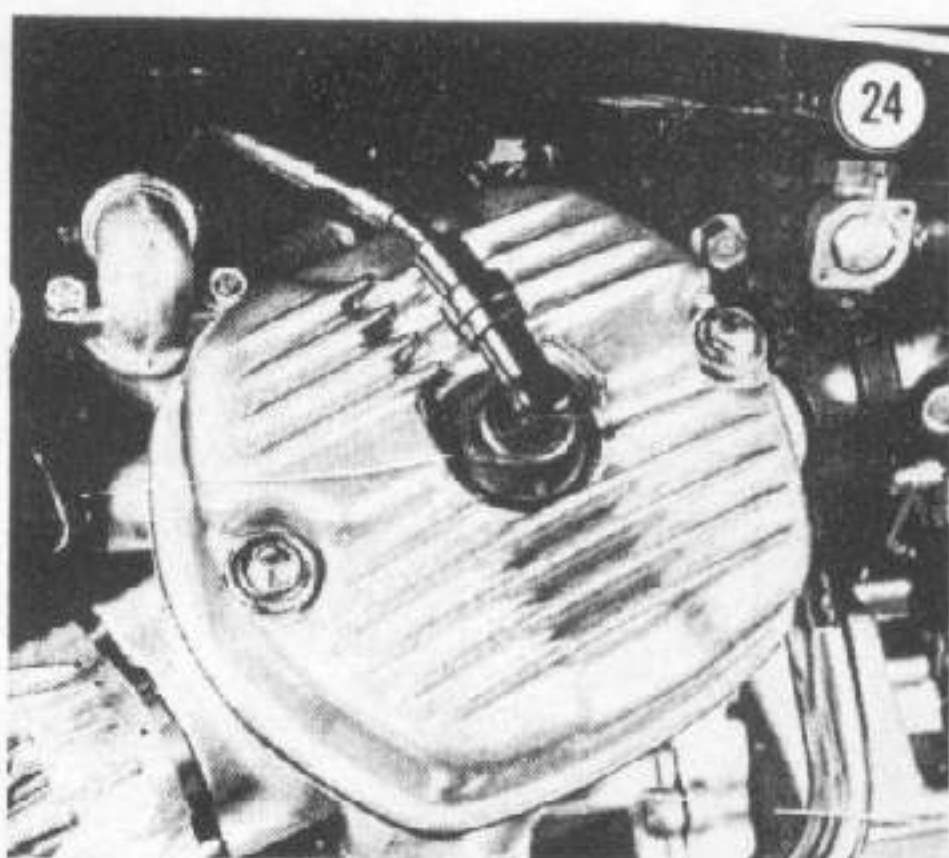
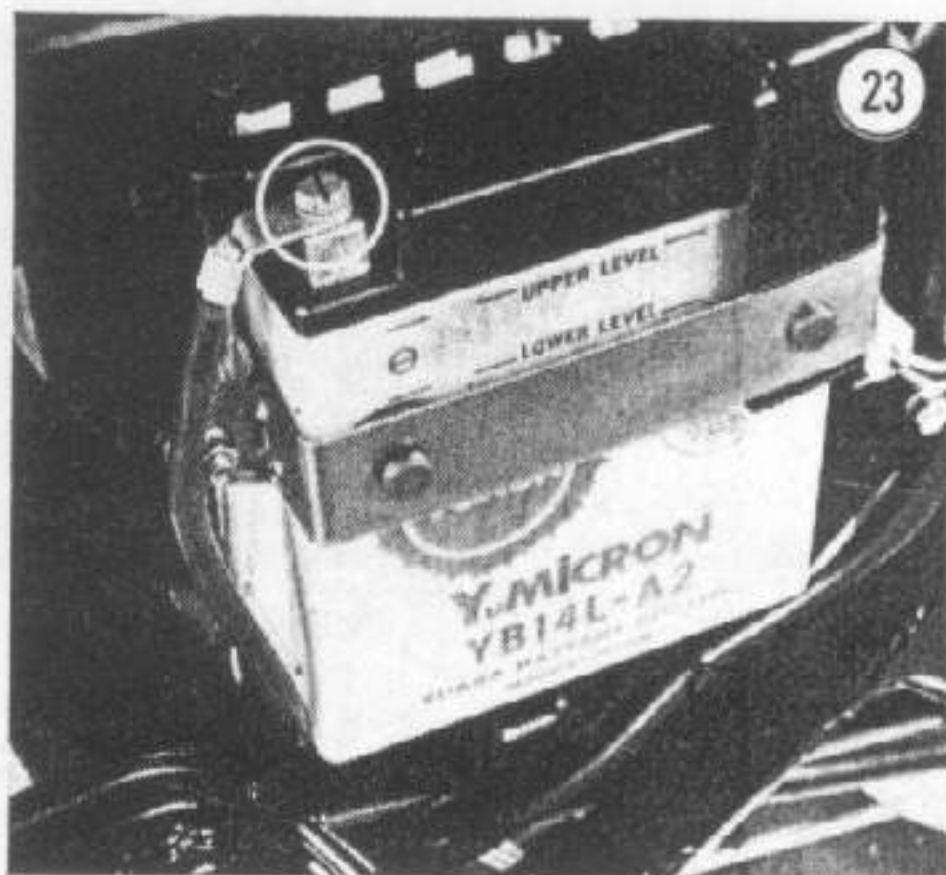
7.4.3

Voltage Regulator Performance Test

Connect a voltmeter across the battery (Figure 22). Start the engine and let it idle; increase engine speed until the voltage going to the battery reaches 14.0-15.0 volts. At this point, the voltage regulator must divert the cur-



YEL - żółty GRN - zielony RED/WHT - czerwono-biały



rent to ground. If this does not happen, the voltage regulator/rectifier must be replaced.

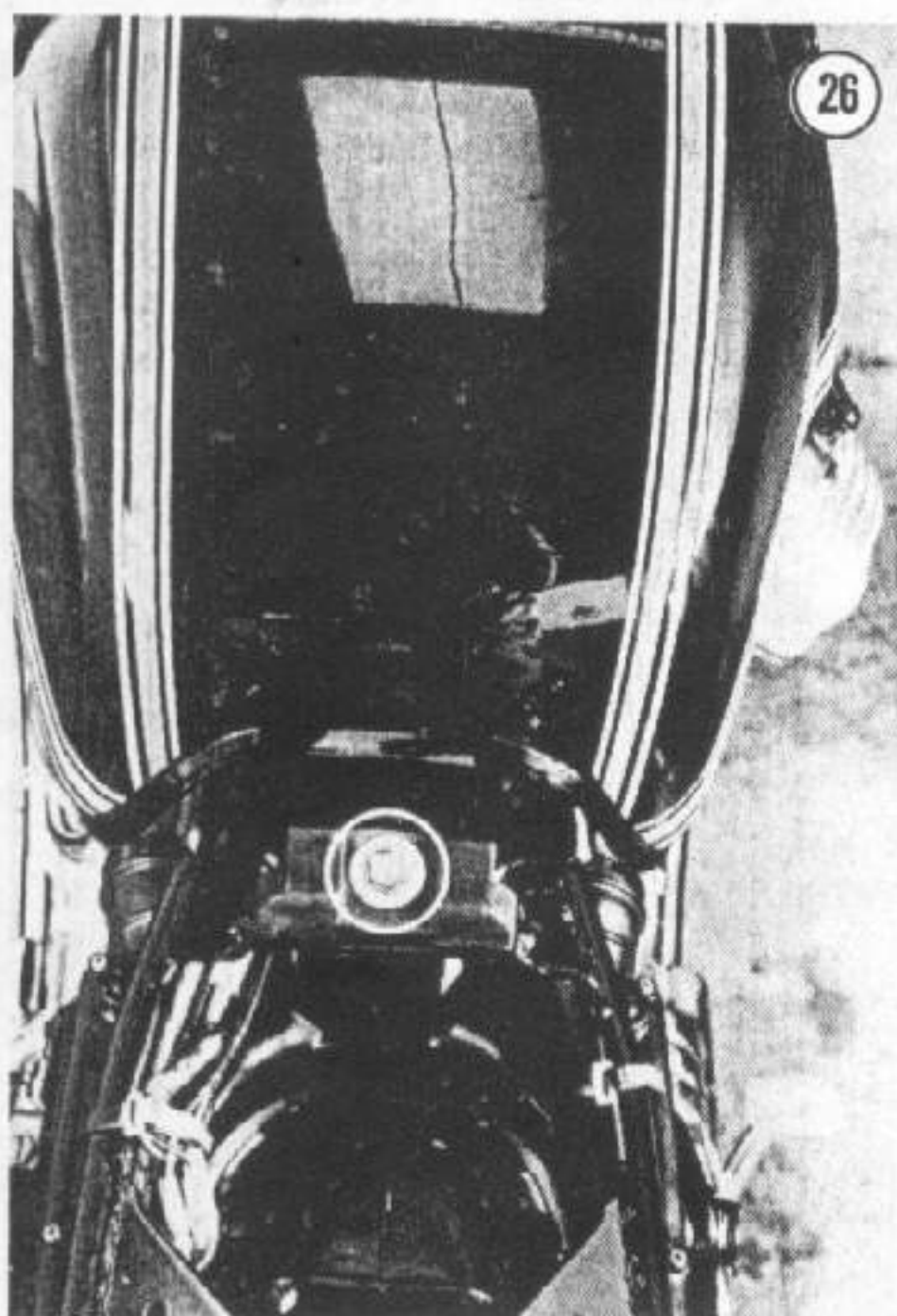
7.5 IGNITION SYSTEM

The ignition system consists of an ignition coil, a capacitor discharge ignition (CDI) unit and spark plugs.

7.6 IGNITION COIL

7.6.1. Removal/Installation

1. Remove the seat. Disconnect the negative battery lead (Figure 23). Disconnect the spark plug leads (Figure 24).
2. Turn the fuel shutoff valve to the OFF position (A, Figure 25) and remove the fuel line to the carburetors (B, Figure 25).
3. Remove rear bolt and rubber pad (Figure 26) securing the fuel tank at the rear. Slide the tank to the rear and remove it.
4. Disconnect the coil electrical connectors (pink — right-hand coil, yellow — left-hand coil) from the CDI unit. See Figure 27.



5. Remove the 2 bolts (Figure 28) securing the coils to the frame and remove them.
6. Install by reversing the removal steps. Make sure to route the spark plug wires to the correct cylinder. The right-hand coil to the right-hand spark plug and the left-hand coil to the left-hand spark plug.

7.6.2.
Testing

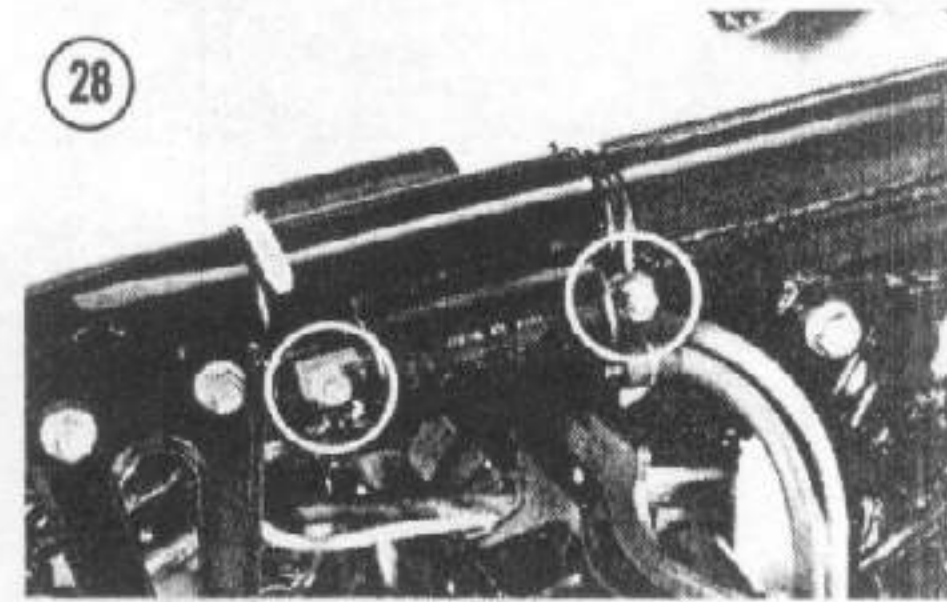
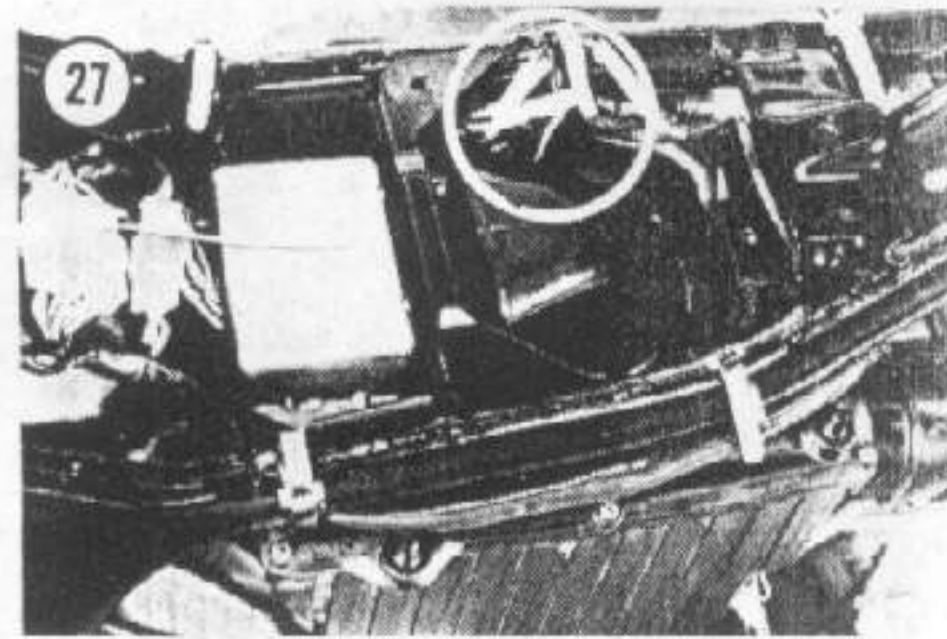
The only certain test for a suspected coil is to replace it with a known good coil. Interchange the two coils and see if the symptoms change.

7.7

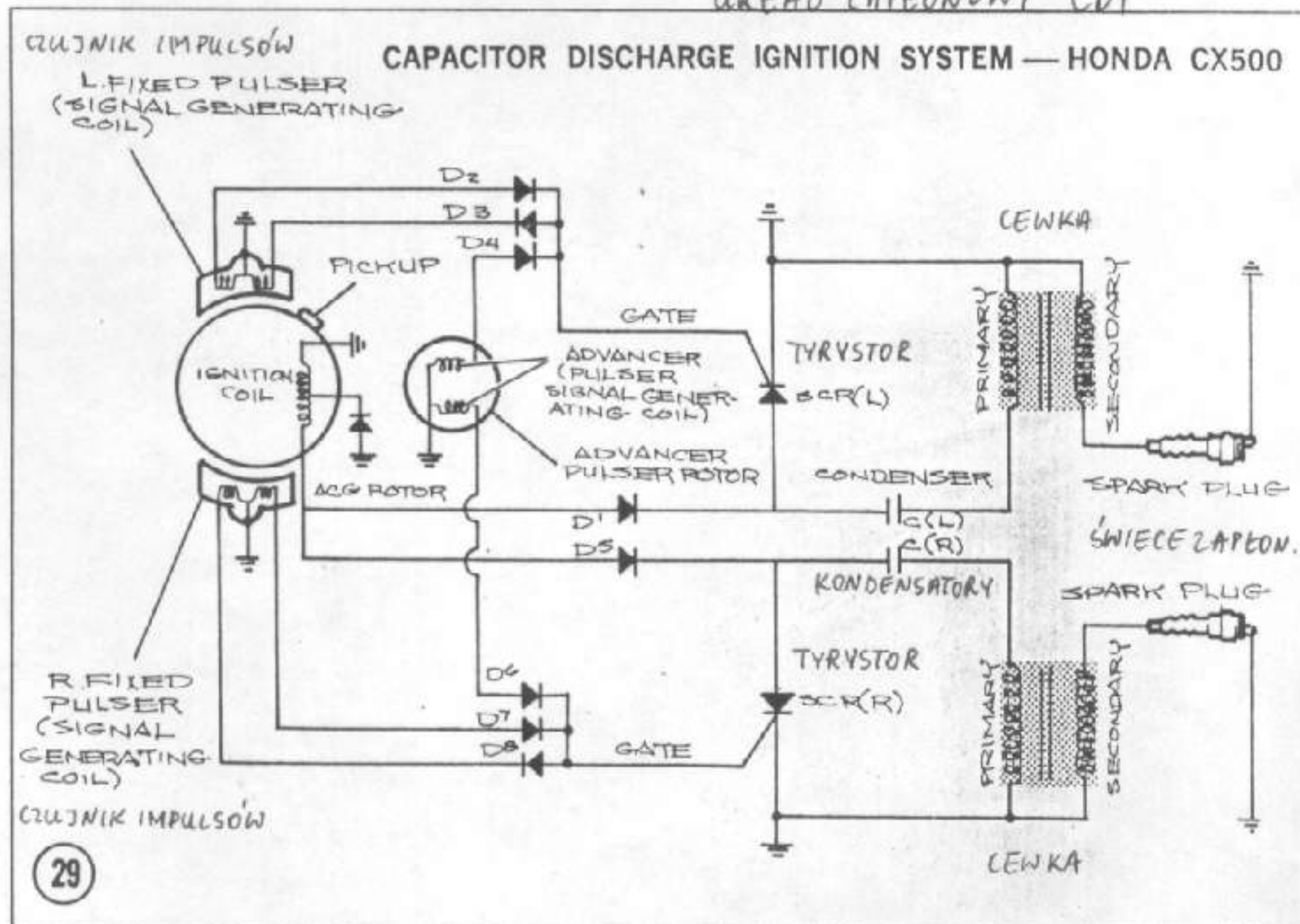
CAPACITOR DISCHARGE IGNITION

The Honda CX500 is equipped with a capacitor discharge ignition (CDI) system. This solid state system, unlike conventional ignition systems, uses no breaker points or other moving parts. Figure 29 illustrates the capacitor discharge system.

Alternating current from the alternator is rectified and used to charge the capacitor. As the piston approaches the firing position, a



UKŁAD ZAPŁONOWY CDI



pulse from the signal coil is rectified, shaped, and then used to trigger the silicon controlled rectifier (SCR) which in turn allows the capacitor to discharge quickly into the primary circuit of the ignition coil, where the voltage is stepped up in the secondary circuit to a value sufficient to fire the spark plug.

7.7.1.

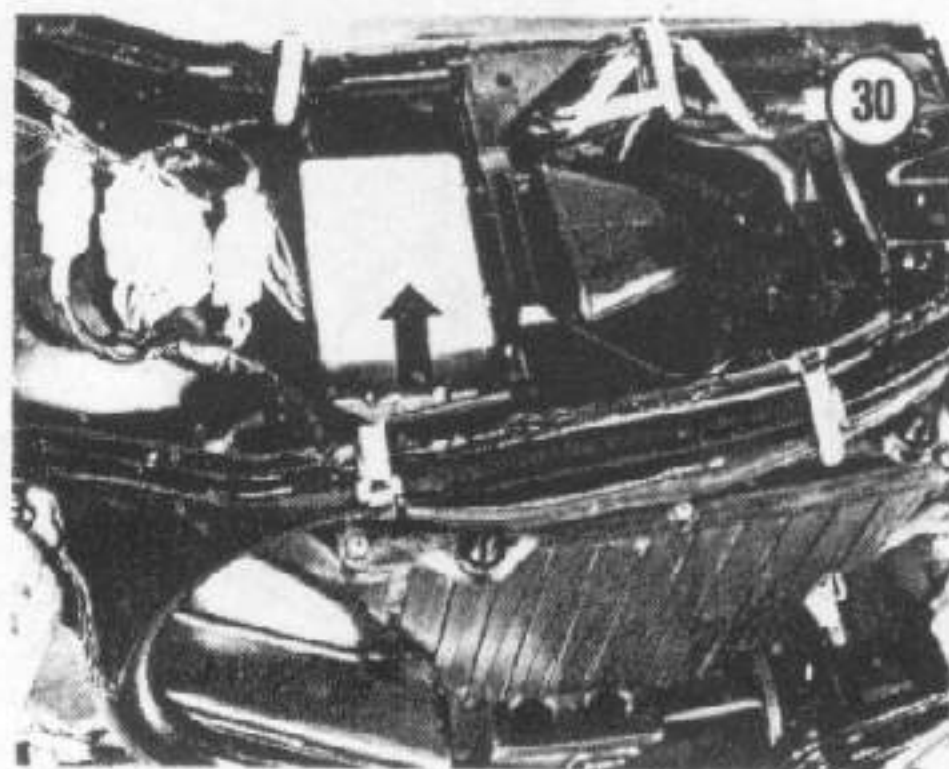
CDI Cautions

Certain measures must be taken to protect the capacitor discharge system. Instantaneous damage to the semiconductors in the system will occur if the following precautions are not observed.

1. Never connect the battery backward. If battery polarity is wrong, damage will occur to the voltage regulator/rectifier, alternator, and CDI system.

Table 2 CDI TROUBLESHOOTING

Symptom	Probable Cause
Weak spark	Low battery
	Poor connections (clean and tighten)
	High voltage leakage (replace defective wire)
	Defective coil
No spark	Discharged battery
	Fuse burned out
	Wiring broken
	Defective coil
	Defective signal generating coil (replace)



2. Do not disconnect the battery when the engine is running. A voltage surge will occur which will damage the voltage regulator/rectifier and possibly burn out the lights.

3. Keep all connections between the various units clean and tight. Be sure that the wiring connectors are pushed together firmly.

4. Do not substitute another type of ignition coil or battery.

5. Each unit is mounted with a rubber vibration isolator. Always be sure that the isolators are in place when replacing any units.

7.7.2

CDI Troubleshooting

Problems with the capacitor discharge system fall into one of the following categories. See Table 2.

a. Weak spark

b. No spark

7.7.3

CDI Testing

Tests may be performed on the CDI unit (Figure 30) but a good one may be damaged by someone unfamiliar with test equipment. To play it safe, have the tests performed by your Honda dealer or substitute a suspected unit with one known to be good.

7.8

SPARK PLUGS

The spark plugs recommended by the factory are usually the most suitable for your machine. If riding conditions are mild, it may be advisable to go to spark plugs one step hotter than normal. Unusually severe riding conditions may require slightly colder plugs. See Chapter Three for details.

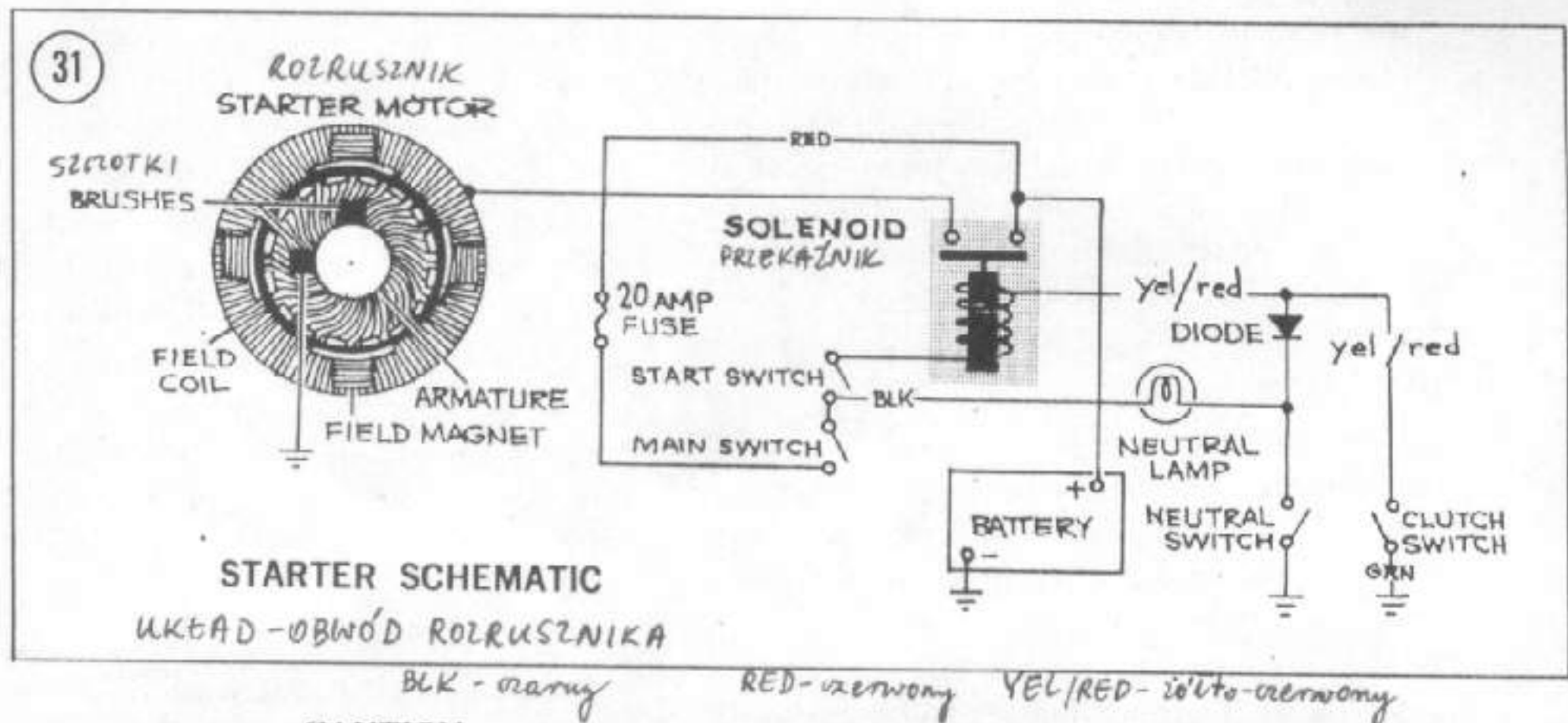
7.9

STARTING SYSTEM

The starting system consists of the starting motor, starter solenoid and the starter button.

The layout of the starter system is shown in Figure 31. There are no provisions for a kickstarter on the CX500.

When the starter button is pressed, it engages the solenoid switch that closes the circuit. The electricity flows from the battery to the starter motor.



CAUTION

Do not operate the starter for more than 5 seconds at a time. Let it rest for approximately 10 seconds, then use it again.

The starter gears are covered in detail under *Starter Gears and Clutch* in Chapter Four.

4.9.1.

Starter Removal/Installation

1. Turn the ignition switch to the OFF position. Remove the left-hand side cover (Figure 32) and remove the negative battery cable from the battery (Figure 33).
2. Remove the 2 bolts (Figure 34) securing the starter to the crankcase. Pull it to the rear, rotate it slightly and pivot it down.
3. Disconnect the electrical cable (Figure 35) and remove the starter.
4. Install by reversing these removal steps. Take care when installing motor into crankcase. Make sure that gears mesh properly.

7.10

STARTER

7.10.1

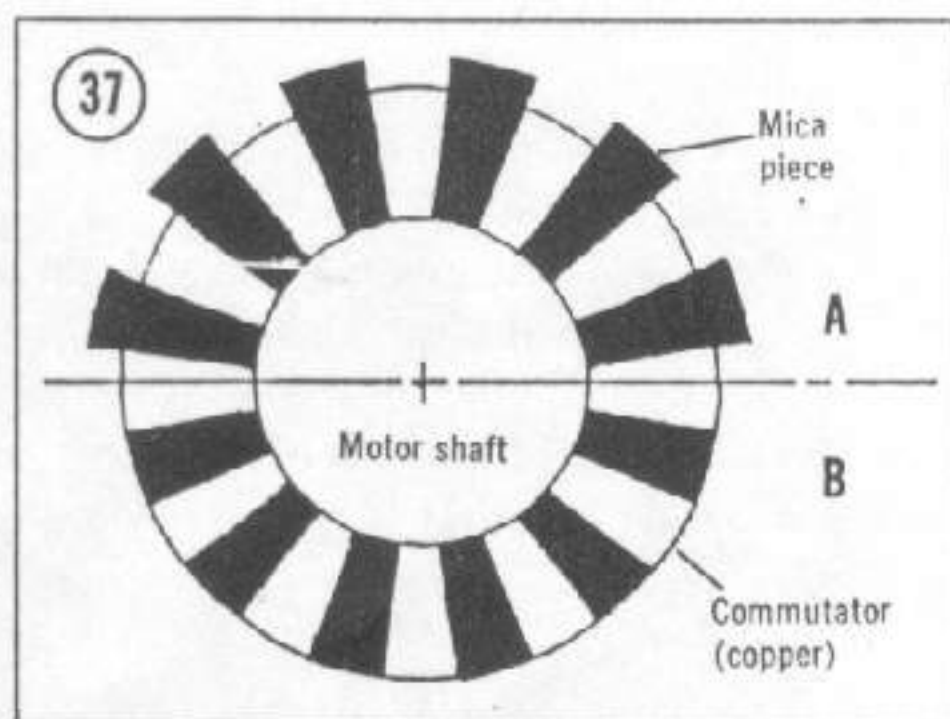
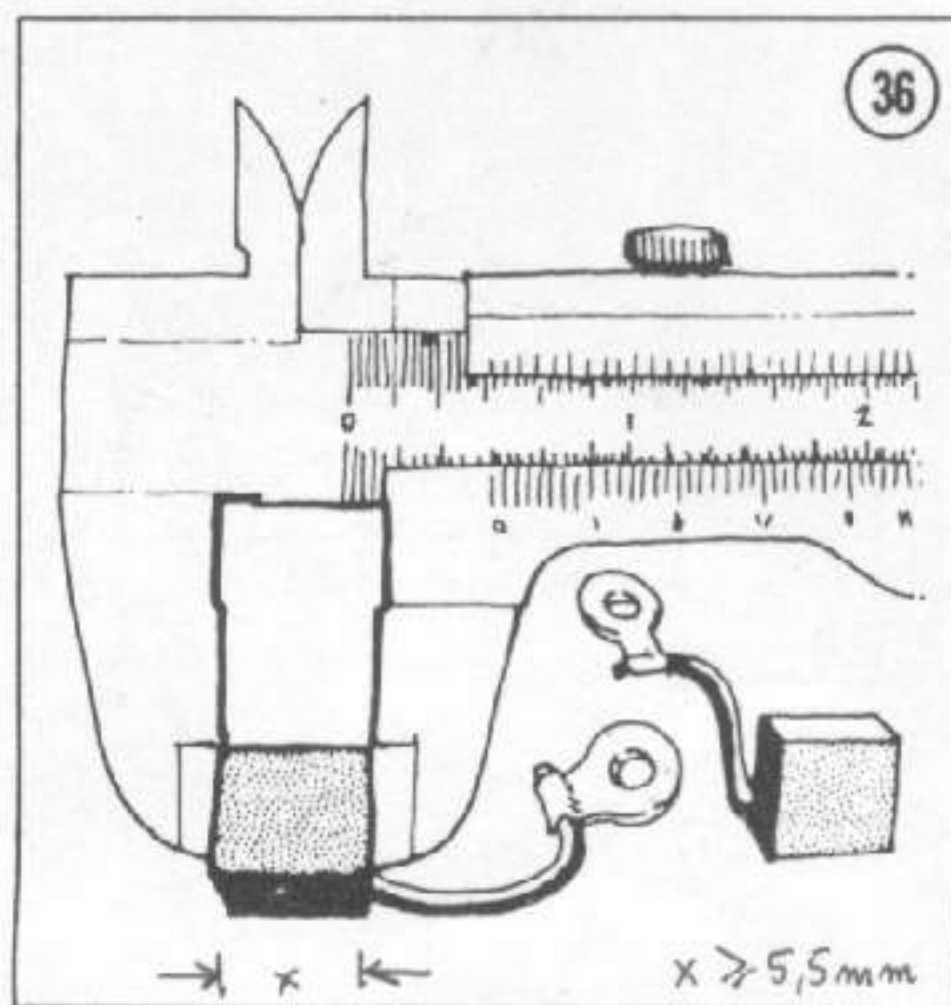
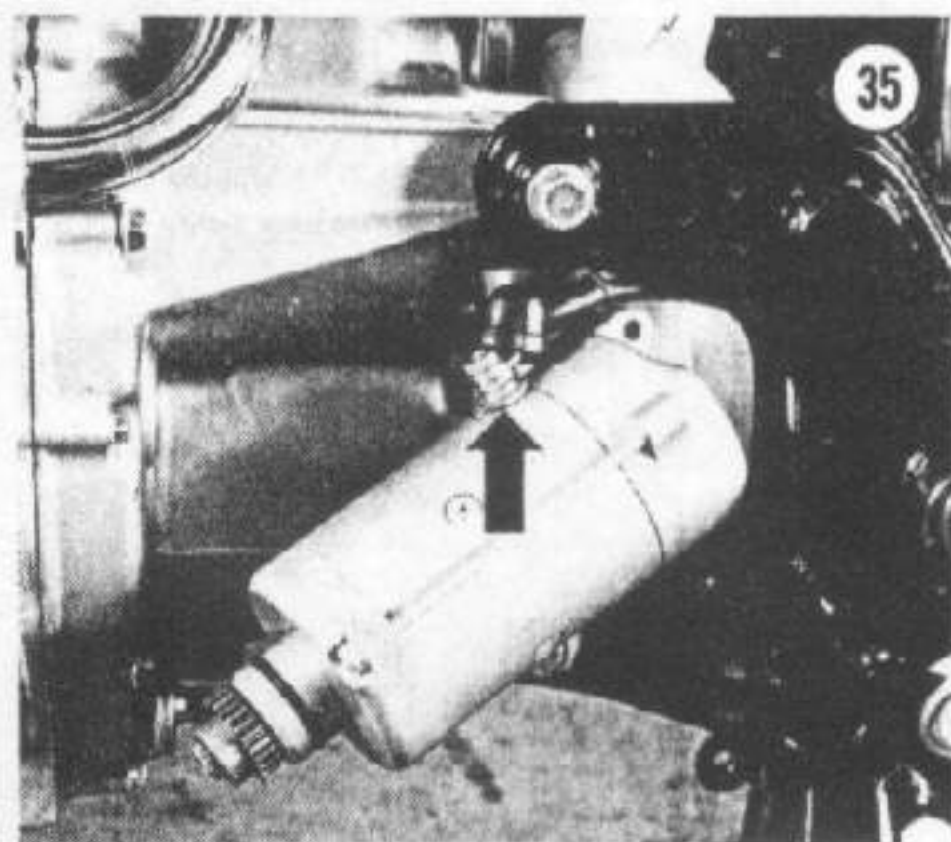
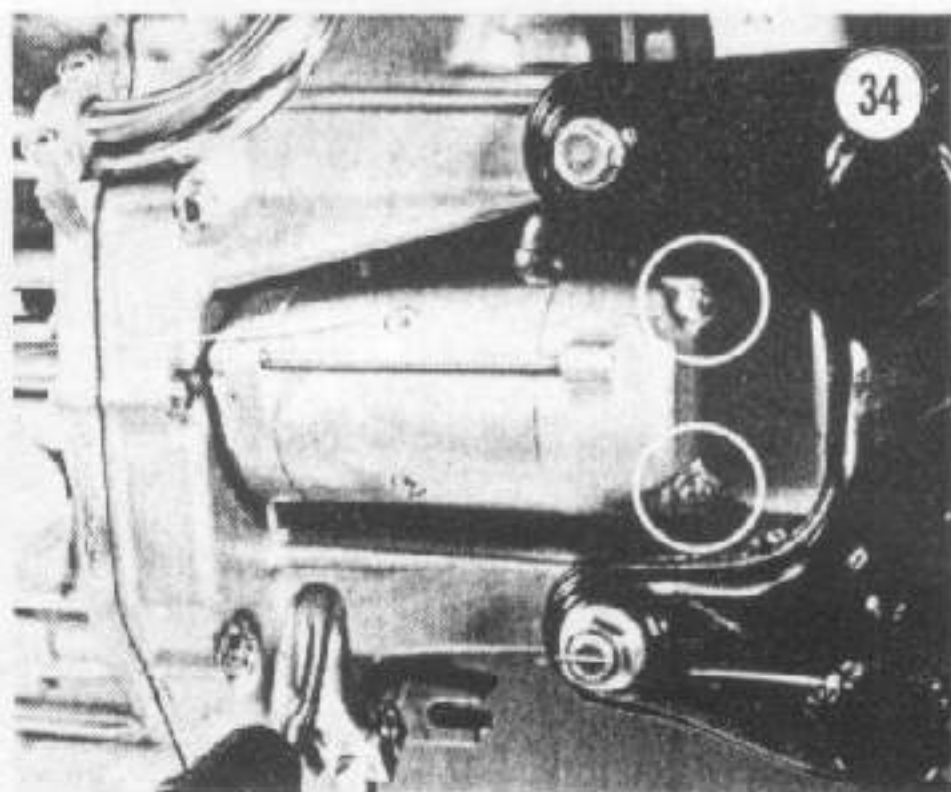
Disassembly/Assembly

The overhaul of a starter motor is best left to an expert. This section shows how to determine if the unit is defective.

1. Remove the starter motor case screws and separate the case.

NOTE: Write down how many thrust washers are used and install the same number when reassembling the starter.





2. Clean all grease, dirt, and carbon dust from the armature, case, and end covers.

CAUTION

Do not immerse brushes or the wire windings in solvent or the insulation might be damaged. Wipe the windings with a cloth lightly moistened with solvent and dry thoroughly.

3. Remove the brushes and use a vernier caliper (Figure 36) to measure the length of the brush. If it is worn beyond 0.21 in. (5.5mm), it should be replaced.

4. Inspect the condition of the commutator (Figure 37). The mica in the normal commutator (A) is cut below the copper. A worn commutator (B) is also shown; the copper is worn to the level of the mica. A worn commutator can be undercut, but it requires a specialist. Take the job to your Honda dealer or motorcycle electrical repair shop.

5. Inspect the commutator bars for discoloration. If a pair of bars are discolored, that indicates grounded armature coils.

6. Check the electrical continuity between pairs of armature bars and between the commutator bars and the shaft mounting (Figures 38 and 39). If there is a short, the armature should be replaced.

7. Inspect the field coil by checking continuity from the cable terminal to the motor case. Also check from the cable terminal to the brush wire. If there is a short or open, the case should be replaced.

8. Assemble the case together; make sure that the punch marks on the case and covers align.

7.10.2

Starter Solenoid

Removal/Installation

1. Turn the ignition switch to the OFF position.
2. Remove the left-hand side cover (Figure 32) and remove negative battery cable (Figure 33).
3. Slide up the rubber boot (Figure 40) and disconnect the electrical wires from the switch.
4. Pull the solenoid out of the rubber mount.
5. Install by reversing the removal steps.

7.11

LIGHTING SYSTEM

The lighting system consists of the headlight, taillight/brakelight combination, directional signals, warning lights, and speedometer and tachometer illumination lights. Table 3 lists replacement bulbs for these components.

7.11.1

Headlight Replacement

1. Remove 2 mounting screws (A, Figure 41) on each side of the headlight housing.
2. Pull the trim bezel and sealed beam unit out and disconnect the electrical connector from the sealed beam.
3. Remove the 2 retaining screws (A, Figure 42) and the adjusting bolt, nut, and spring (B, Figure 42). Remove the inner rim and remove the sealed beam.
4. Install by reversing the removal steps. *Don't forget the spring on the adjusting bolt.*
5. Adjust the headlight as described under *Headlight Adjustment* in this chapter.

7.11.2

Headlight Adjustment

Adjust headlight horizontally and vertically according to Department of Motor Vehicle regulations in your area.

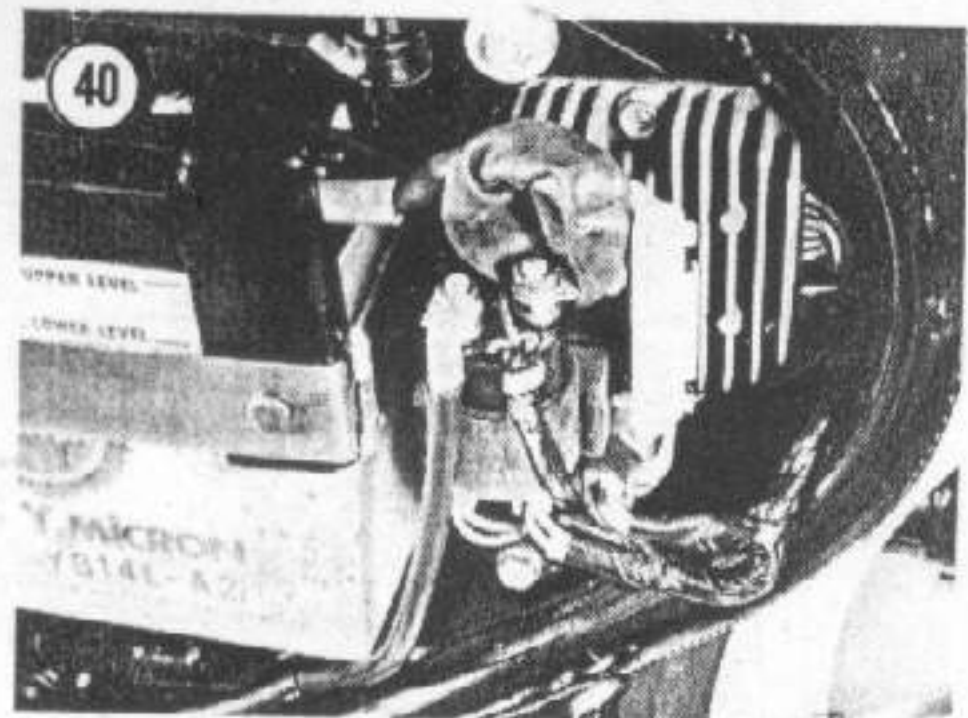
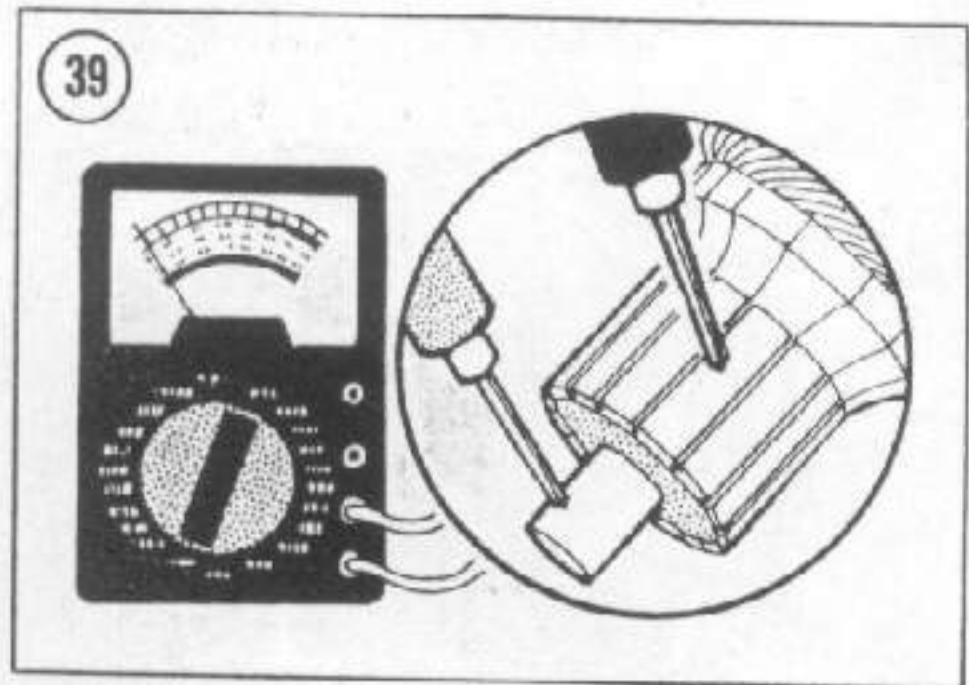
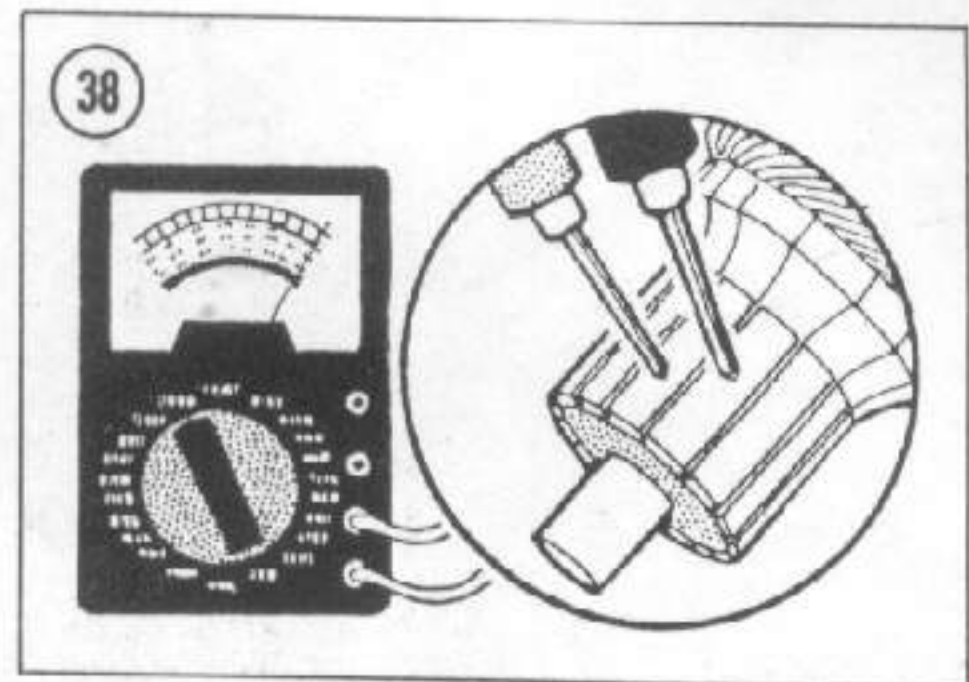
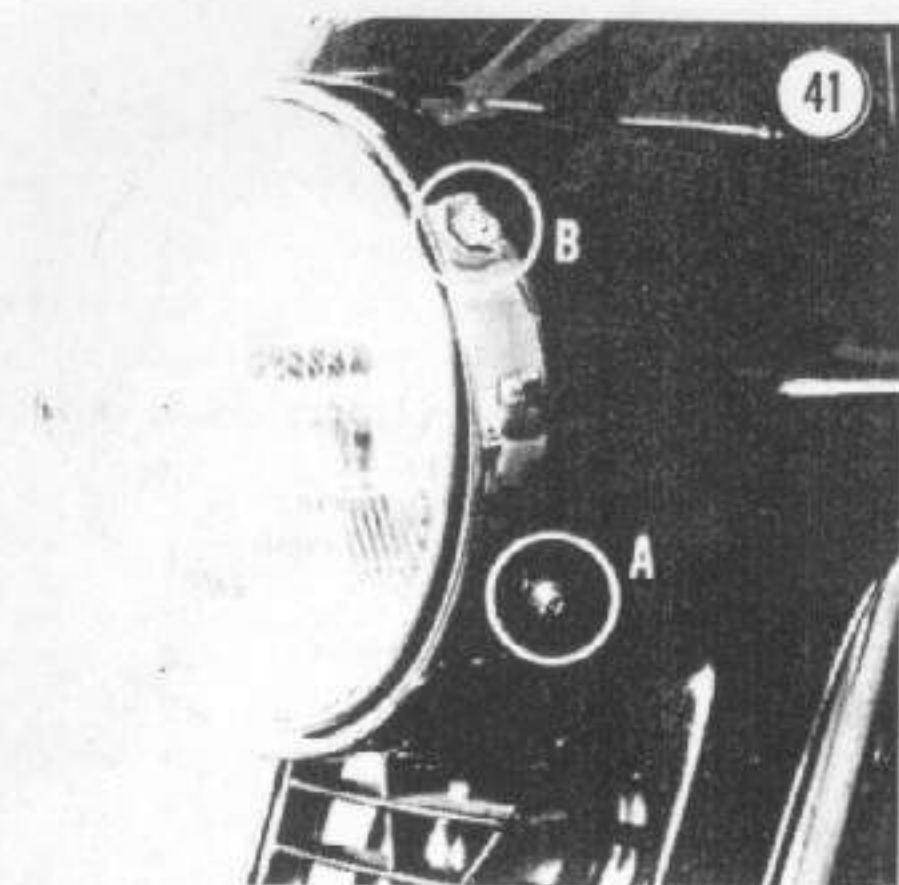


Table 3 LIGHT BULB REPLACEMENT

Item	Number	Wattage	Candle Power
Headlight	—	40/50	—
Tail/brakelight	SAE 1157	8/27	3/32
Directional signals			
Front	SAE 1034	23	32
Rear	SAE 1073	23	32
Instrument lights	SAE 57	3.4	2
Running light	SAE 1034	8	3



To adjust headlight horizontally, turn the upper left-hand screw (B, **Figure 41**). To adjust vertically, turn the lower right-hand screw.

7.11.3

Taillight Replacement

Remove the 2 screws securing the lens and remove it. Wash out the inside and outside of the lens with a mild detergent and wipe dry. Wipe off the reflective base surrounding the bulb with a soft cloth. Replace the bulb and install the lens; do not overtighten the screws or the lens may crack.

7.11.4

Directional Signal Light Replacement

Remove the 2 screws securing the lens and remove it. Wash the inside and outside of the lens out with a mild detergent. Replace the bulb and install the lens; do not overtighten the screws or the lens may crack.

7.11.5

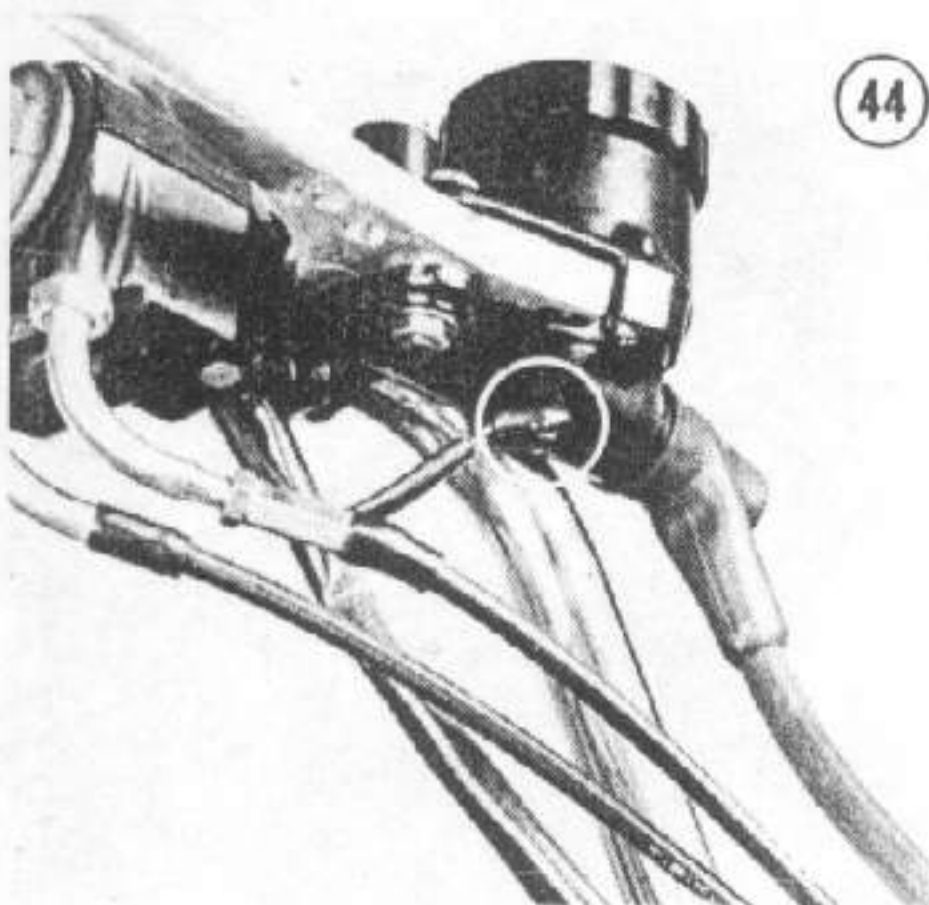
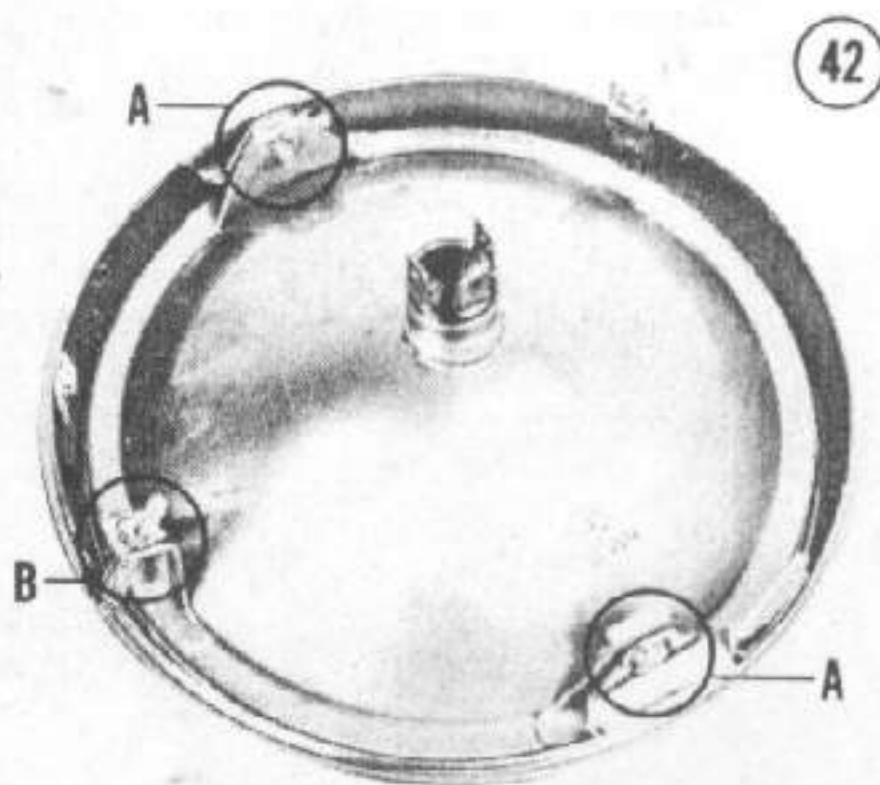
Speedometer, Tachometer Illumination Light, and Indicator Light Replacement

Remove the 2 screws (**Figure 43**) securing the headlight nacelle; pull it down and out. Remove the upper portion to gain access to the bulbs. Pull the bulb holder out and replace the bulb(s).

7.11.6

Front Brake Light Switch Replacement

Pull back on the rubber boot (**Figure 44**). Pull the electrical wires from the connectors, remove the switch and replace it.



7.11.7**Rear Brake Light Switch Replacement**

1. Remove the left-hand side cover.
2. Unhook the spring from the brake arm.
3. Unscrew the switch housing and locknut from the bracket (**Figure 45**).
4. Pull up the rubber boot and remove the electrical wires.
5. Replace the switch; reinstall and adjust as described under *Rear Brake Light Switch Adjustment* in this chapter.

7.11.8**Rear Brake Light Switch Adjustment**

1. Turn the ignition switch to the ON position.
2. Depress the brake pedal. Light should come on just as the brake begins to work.
3. To make the light come on earlier, hold the switch body and turn adjusting locknut (**Figure 45**) clockwise as viewed from the back. Turn the nut counterclockwise to delay the light.

NOTE: Some riders prefer the light to come on a little early. This way, they

can tap the pedal without braking to warn drivers who follow too closely.

7.11.9**Flasher Relay Replacement**

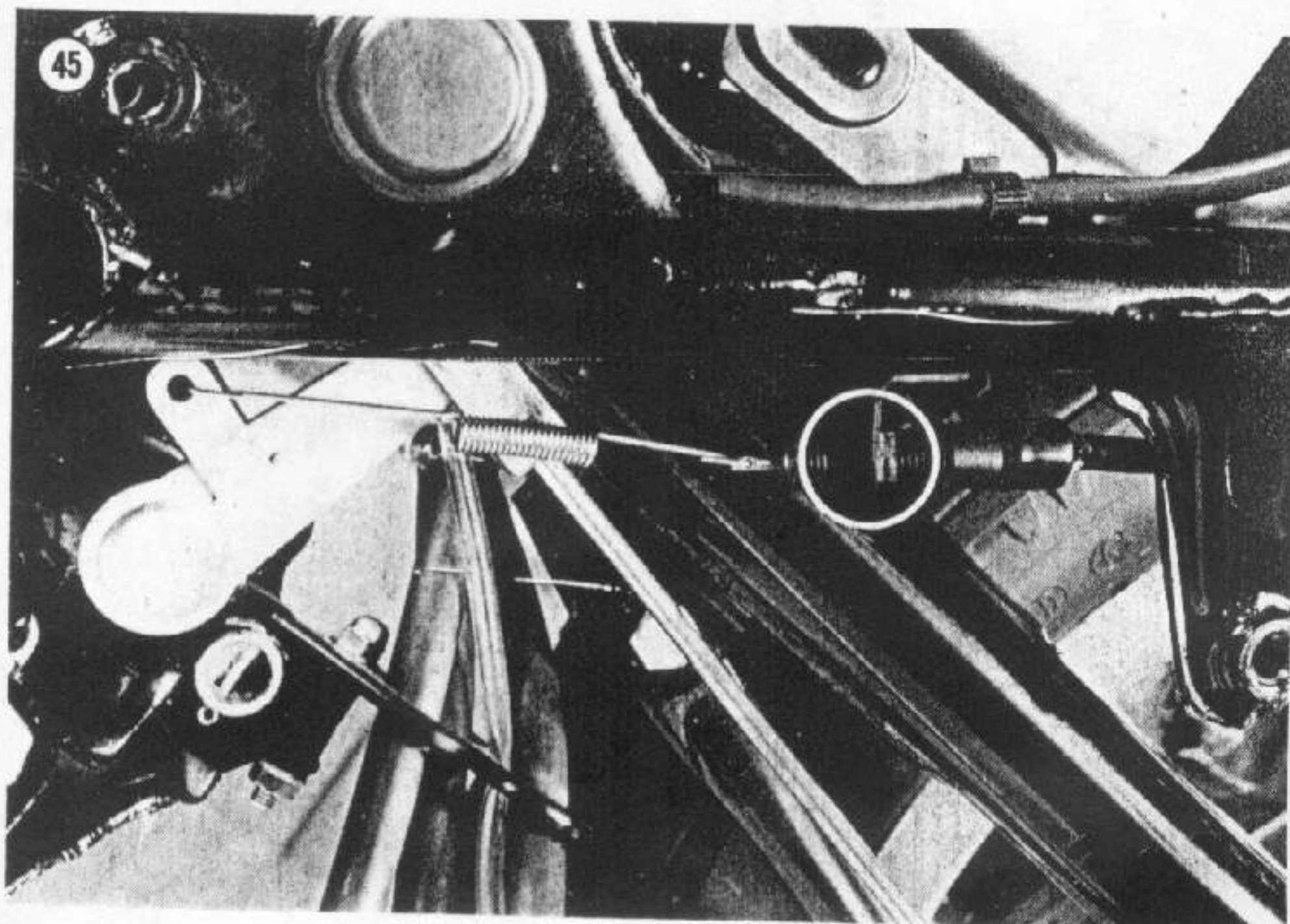
The flasher relay is located inside the headlight nacelle. Remove 2 screws (**Figure 43**) securing the nacelle, pull it down and out. Remove the wires from the bad unit and transfer wires to new relay. Install the nacelle.

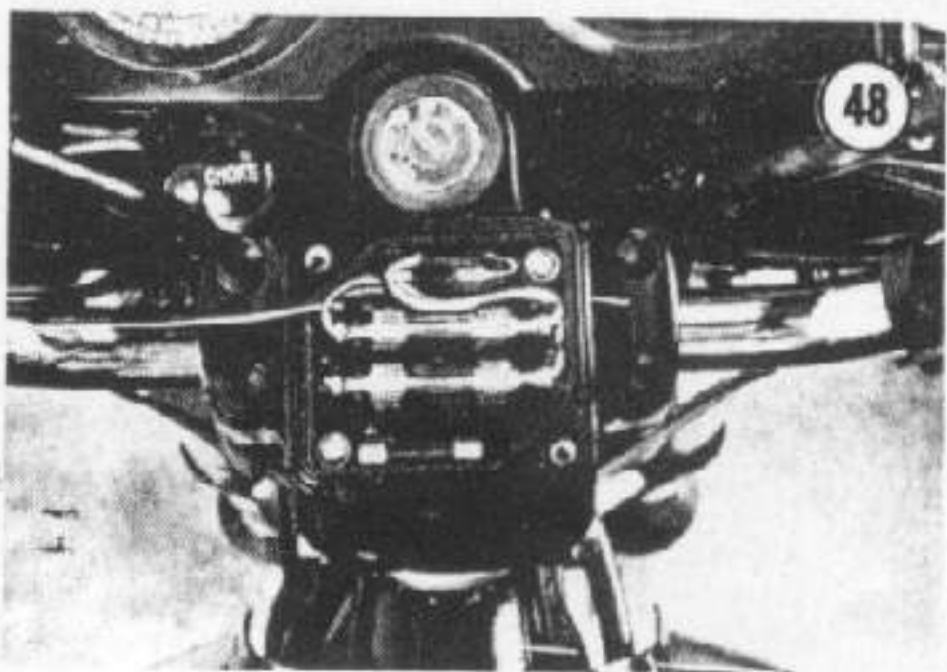
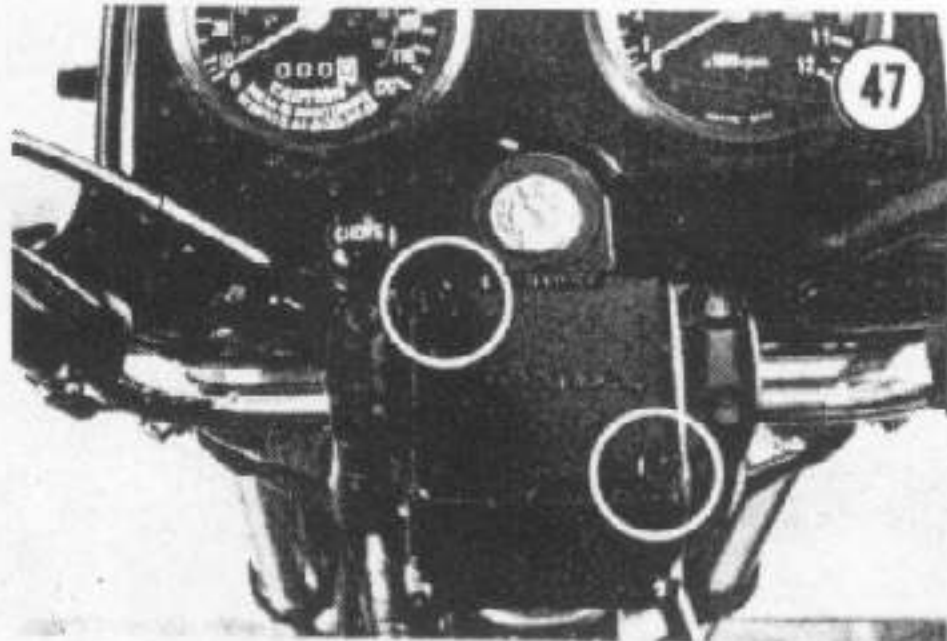
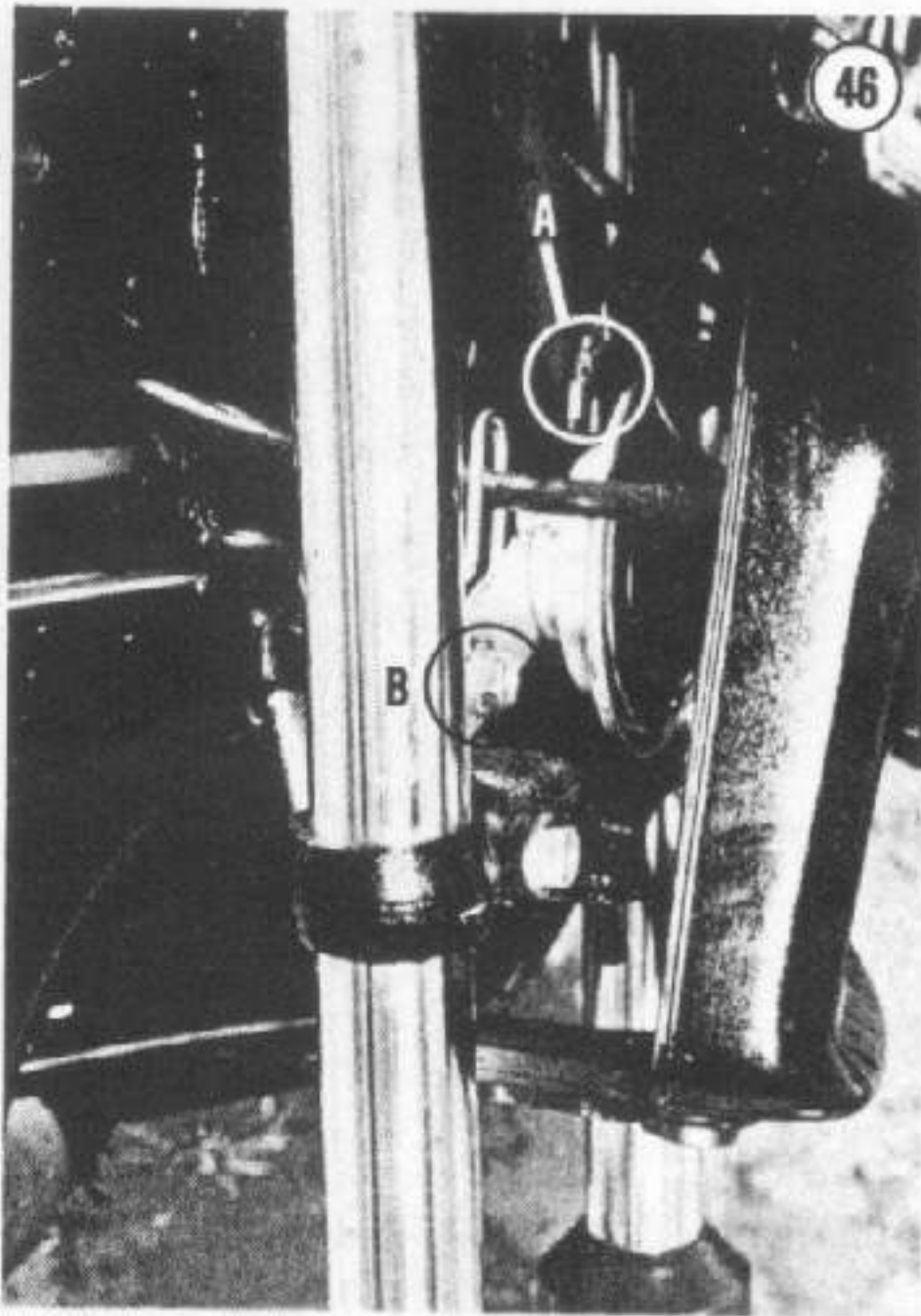
7.11.10**Horn Replacement**

1. Remove the 2 screws (**Figure 43**) securing the headlight nacelle; pull it down and out.
2. Disconnect horn connector (A, **Figure 46**) from the electrical harness.
3. Remove the bolt (B, **Figure 46**) securing the horn to the bracket and remove it.
4. Installation is the reverse of these steps.

7.11.11**Horn Testing**

1. Disconnect the horn wires from the harness.
2. Connect the horn wires to a 12-volt battery. If it is good, it will sound. If not, replace it.





7.12 FUSES

There are three fuses used on the CX500. Two are located in the fuse box (Figure 47) at base of the handlebars. Remove the 2 screws and remove the cover (Figure 48). These are for headlight (10A) and taillight/brakelight (10A).

The main fuse (20A) is located under the left-hand side cover, next to the voltage regulator/rectifier (Figure 49).

Inside each fuse compartment is a spare fuse; *always* carry spare fuses.

Whenever a fuse blows, find out the reason for failure before replacing the fuse. Usually, the trouble is a short-circuit in the wiring. This may be caused by worn-through insulation or a disconnected wire shorting to ground.

CAUTION

Never substitute tinfoil or wire for a fuse. Never use a higher amperage fuse than specified. An overload could result in fire and complete loss of the bike.

7.13

WIRING DIAGRAM

A wiring diagram is included at the end of this book.



CHAPTER EIGHT

COOLING SYSTEM

8.1

COOLING SYSTEM

The pressurized cooling system consists of the radiator, water pump, thermostat, camshaft driven fan (running at one half the engine speed), and coolant recovery tank. **Figure 1** shows all components of the cooling system.

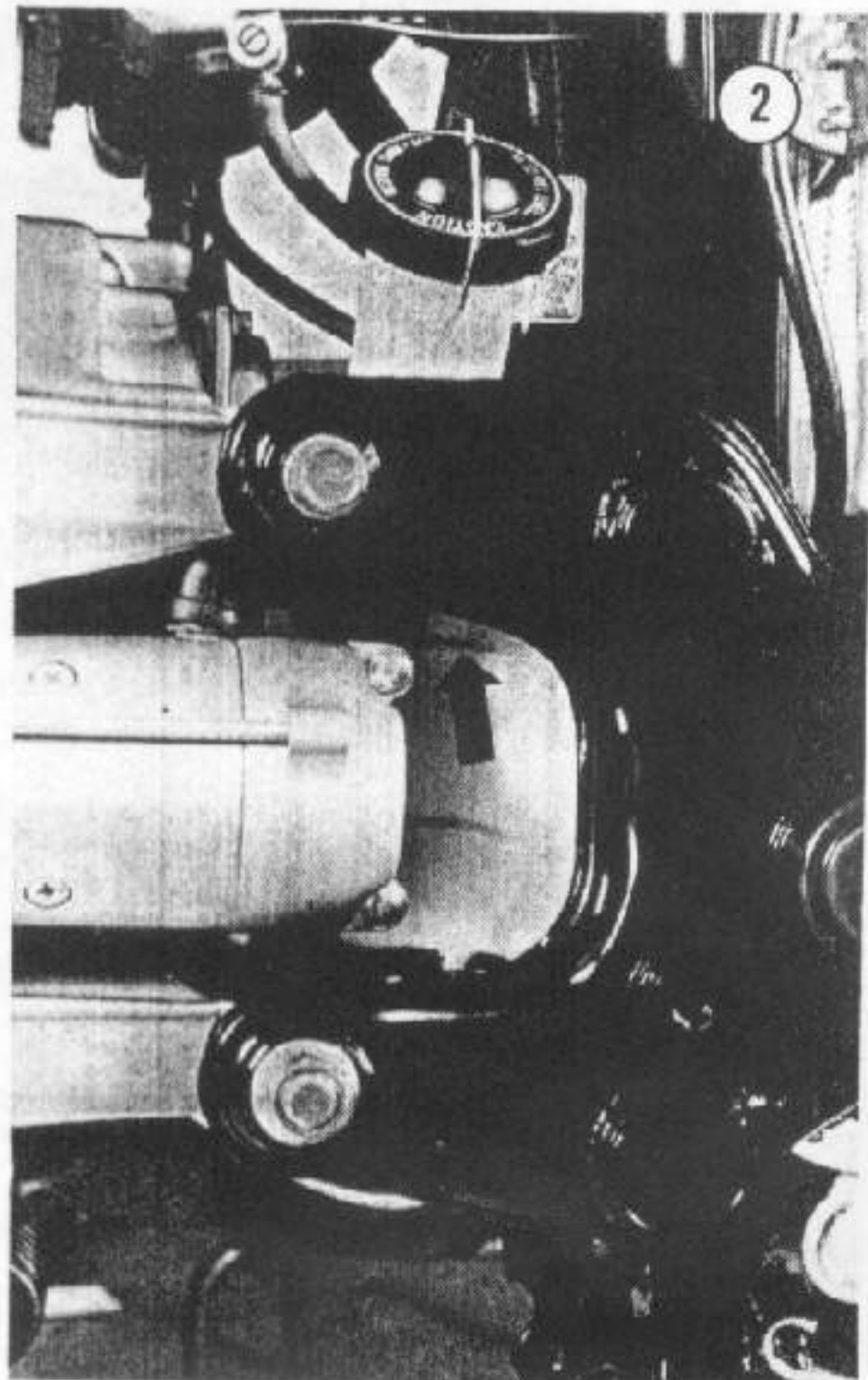
The system uses a 11-15 psi (0.75-1.05 kg/cm²) radiator filler cap and is designed to operate with a 180°F (82°C) thermostat, located on top of the cylinder block just behind the fan.

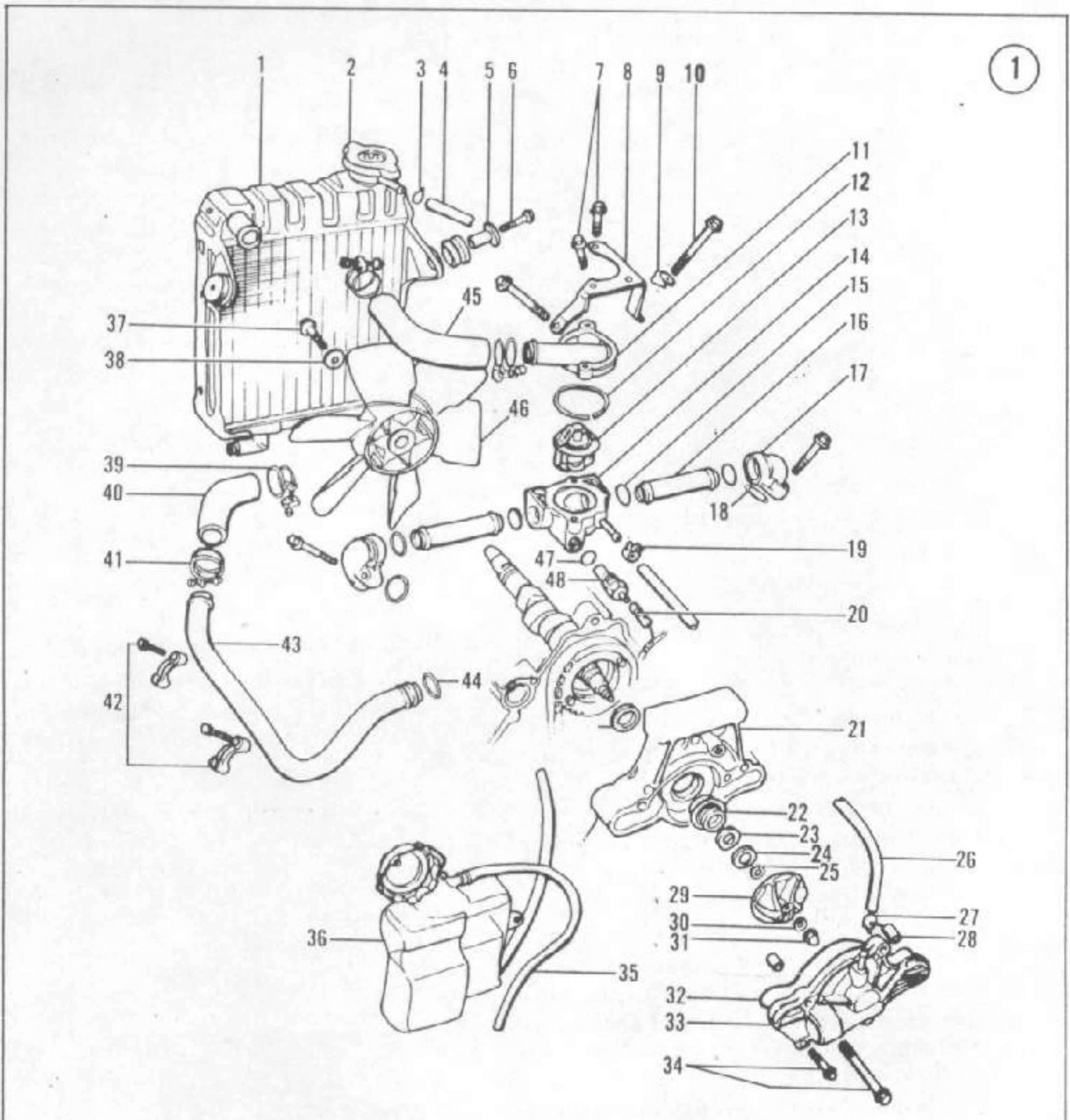
The centrifugal vane impeller water pump requires no particular care and the components can be serviced.

It is important that the coolant level be kept to the FULL mark on the coolant recovery tank (**Figure 2**).

CAUTION

Drain and flush the cooling system with fresh water every 21,000 miles or 2 years, whichever comes first. Refill with a 50/50 mixture of a high quality ethylene glycol antifreeze and water (-20°F/-29°C coolant minimum). Do not reuse old coolant as it deteriorates with use. Do not operate with fresh water only (even in climates where anti-freeze is not required). This is important





COOLING SYSTEM
UKRAD CHEODZENIA

- | | | | |
|-----------------------------------|---|------------------------|------------------------------|
| 1. Radiator | 13. Thermostat | 24. Rubber seal | 36. Coolant recovery tank |
| 2. Radiator cap | 14. Thermostat housing | 25. Collar | 37. Bolt |
| 3. Clamp | 15. O-ring (4) | 26. Bypass hose | 38. Washer |
| 4. Overflow hose | 16. Water pipe (2) | 27. Clamp | 39. Clamp (4) |
| 5. Radiator mounting assembly (3) | 17. Elbow (2) | 28. Locating dowel (2) | 40. Radiator lower hose |
| 6. Bolt (3) | 18. O-ring (2) | 29. Impeller | 41. Clamp |
| 7. Bolts (3) | 19. Clamp (2) | 30. Copper washer | 42. Water pipe clamp |
| 8. Thermostat bracket | 20. Temperature sending unit electrical connector | 31. Cap nut | 43. Water pipe |
| 9. Spacer | 21. Water pump housing | 32. O-ring | 44. O-ring |
| 10. Bolt (2) | 22. Water seal | 33. Water pump cover | 45. Radiator upper hose |
| 11. Thermostat cover | 23. Seal washer | 34. Bolts (6) | 46. Fan |
| 12. Thermostat gasket | | 35. Overflow hose | 47. Seal |
| | | | 48. Temperature sending unit |

because the CX500 engine is all aluminum; it will not rust but it will oxidize and have to be replaced. Refer to Coolant Change in Chapter Three.

This chapter describes repair and replacement of cooling system components. **Table 1** at the end of the chapter lists all of the cooling system specifications. For routine maintenance of the system, refer to Chapter Three.

WARNING

Do not remove the radiator cap when the engine is hot. The coolant is very hot and is under pressure. Severe scalding could result if the coolant comes in contact with your skin.

The engine and cooling system must be cool prior to servicing *any component* in the system.

8.1.1.

Cooling System Check

Two checks should be made before disassembly if a faulty cooling system is suspected.

1. Run the engine until it reaches operating temperature. While the engine is running, a pressure surge should be felt when the upper radiator hose is squeezed.
2. If substantial coolant loss is noted, the head gasket might be blown in one of the cylinders. In extreme cases sufficient coolant will leak into a cylinder when the bike is left standing for several hours so that engine cannot be turned by the starter. White smoke (steam) might also be observed at the muffler(s) when the engine is running. Coolant may also find its way into the oil. Check the dipstick; if it looks like a "chocolate malt" there is coolant in the system. If so, correct the cooling problem immediately.

CAUTION

After the cooling system is corrected, drain and thoroughly flush out the oil system to eliminate all coolant residue. Refill with fresh engine oil, refer to Chapter Three.

8.1.2.

Pressure Check

If the cooling system requires repeated filling, it probably has a leak. The following procedure requires a cooling system pressure tester.

The check can be made by a Honda dealer or a service station.

The radiator cap should be tested for 11-15 psi (0.75-1.05 kg/cm²). During the radiator test, if a leak is found in a hose, replace the hose and pressure test the system again. If a leak is found in the radiator core or in the top or bottom tank, remove radiator as described under *Radiator Removal/Installation* in this chapter. Have the radiator repaired by a shop specializing in radiator repair. When the radiator has been reinstalled, pressure test the system again to make sure all components are tight.

8.2

RADIATOR

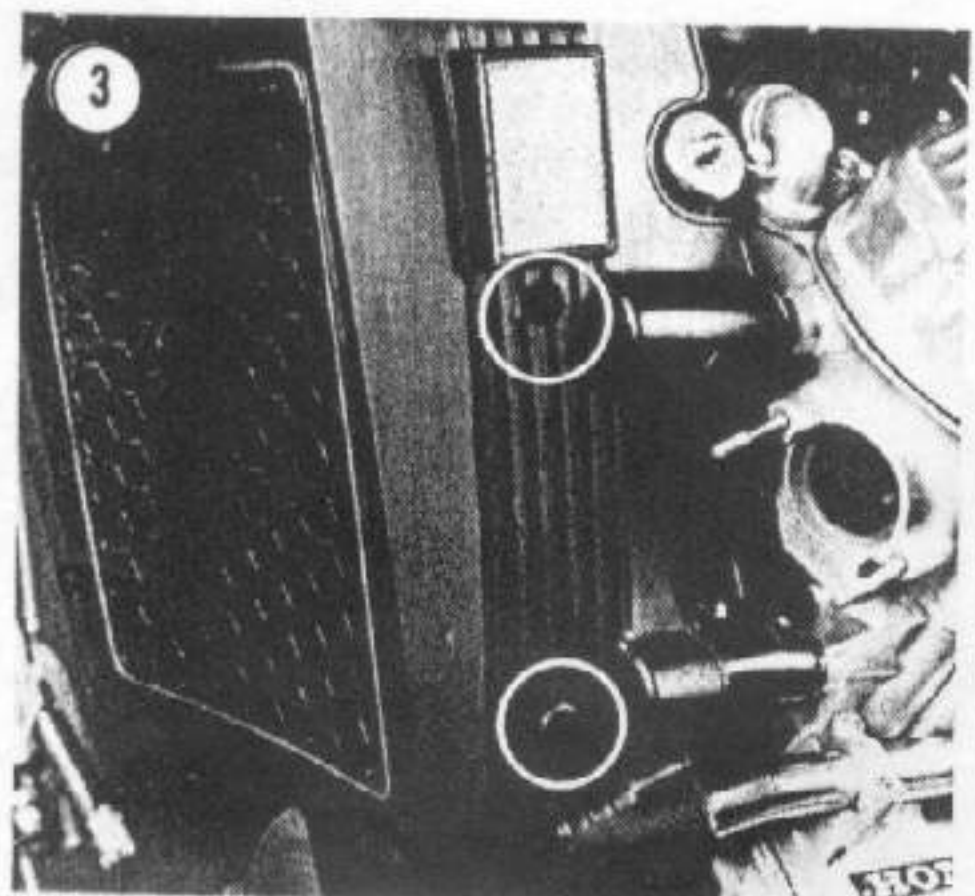
8.2.1.

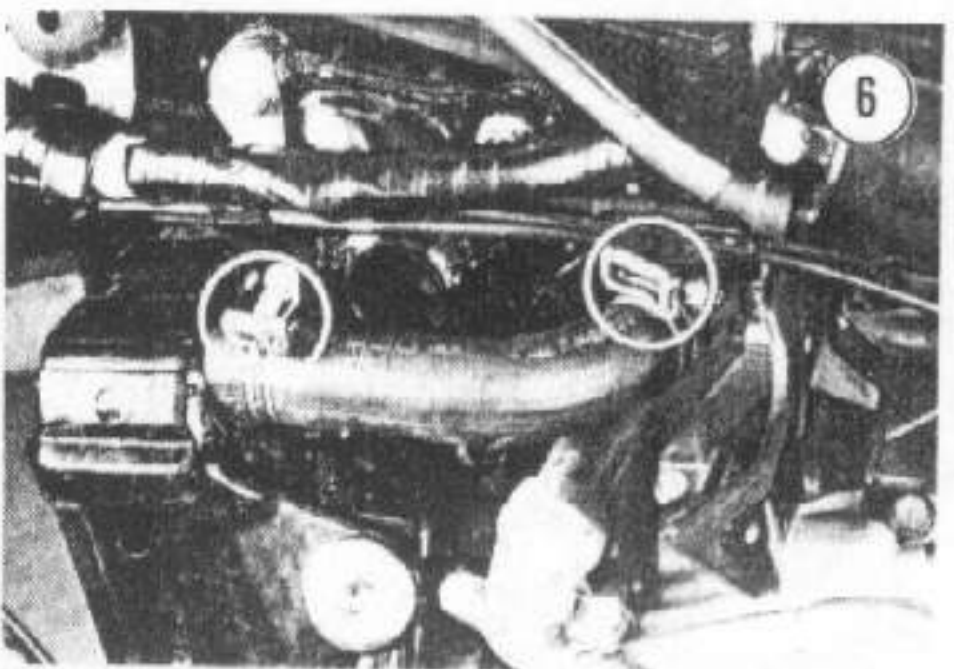
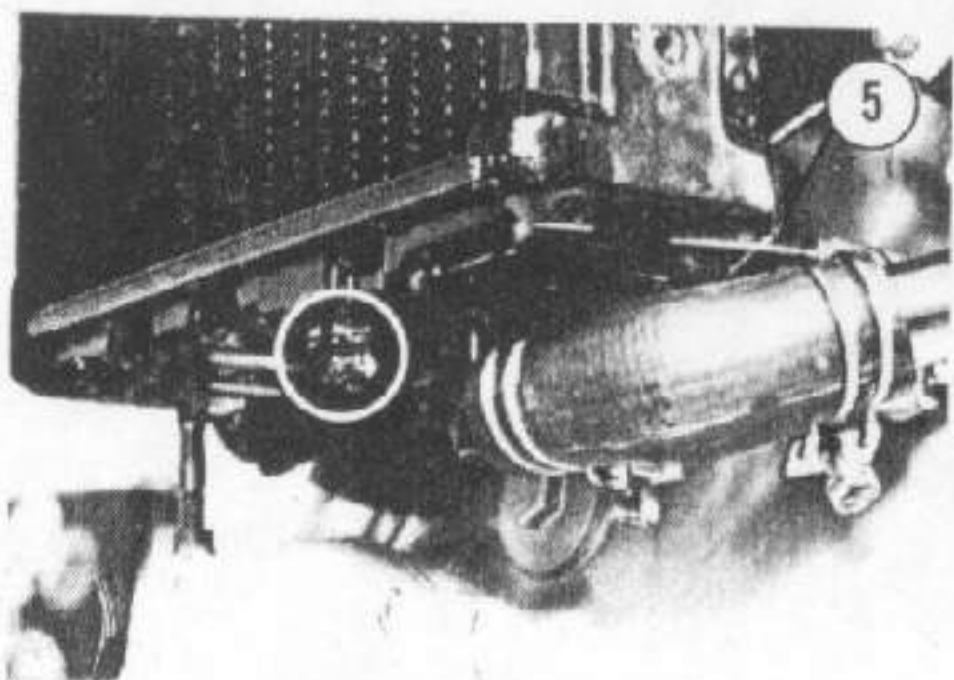
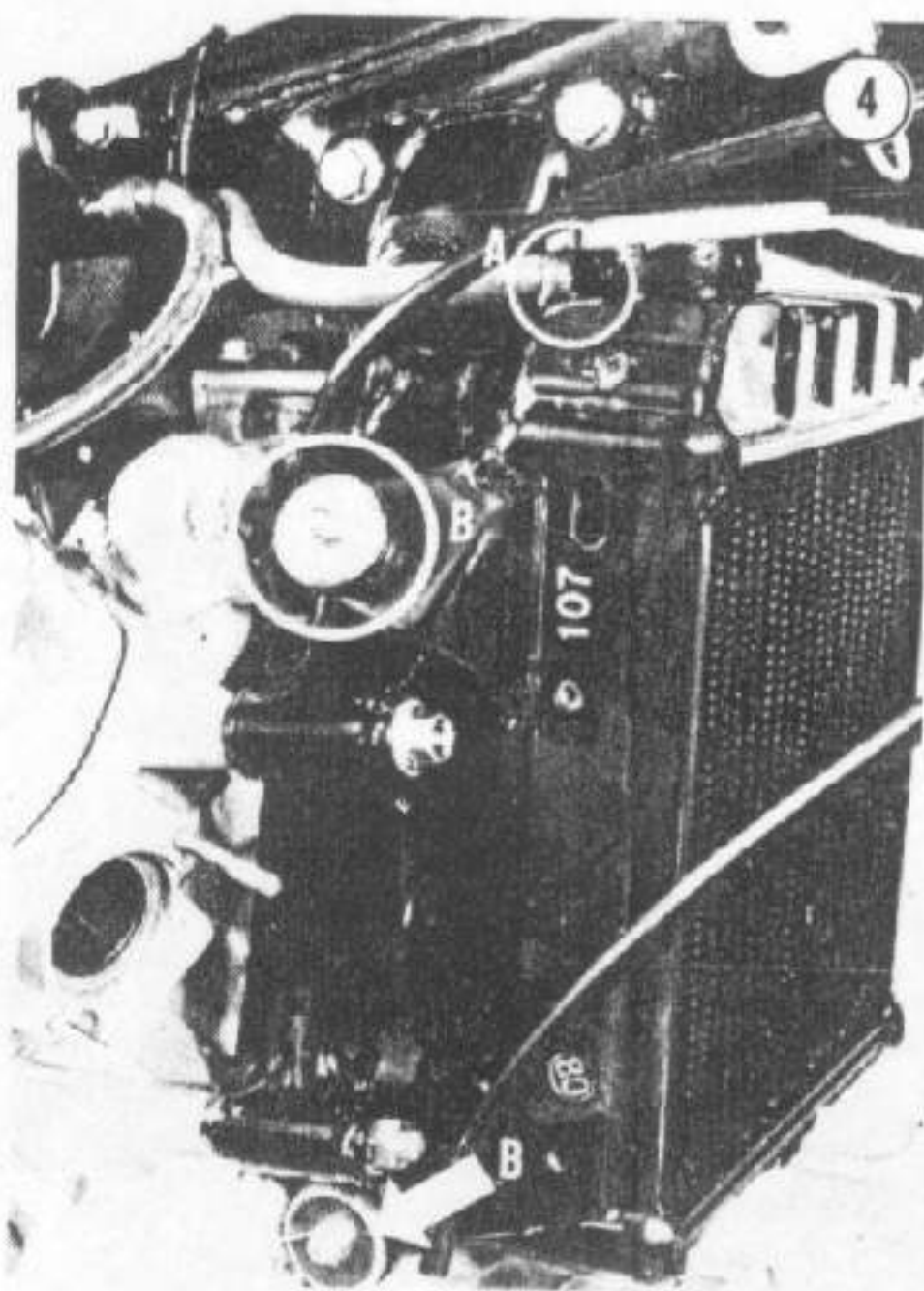
Removal/Installation

1. Remove the exhaust system as described under *Exhaust System Removal/Installation* in Chapter Six.
2. Remove the seat and the fuel tank.
3. Remove the rubber plugs, screws, and metal spacers, 2 on each side (**Figure 3**) securing the radiator shroud in place.

NOTE: Do not lose the 4 metal spacers; they may stick in the shroud after removal.

4. Slide the shroud forward and down and remove it.
5. Remove the overflow tube at the radiator cap (**A, Figure 4**).





6. Place a drip pan under the radiator and remove the drain plug (**Figure 5**) at the base of the radiator. Remove the radiator cap; this will speed up the draining process. Completely drain the radiator; reinstall the drain plug and radiator cap.

7. Loosen the clamps on the upper (**Figure 6**) and lower (**Figure 7**) radiator hoses. Do not remove the hoses at this time.

8. Remove the upper and lower mounting bolt assemblies. See **Figure 8** and **B, Figure 4**.

9. Pull the radiator out at the bottom, slide it down and out of the bike frame. The hoses may stay either with the radiator or the engine.

CAUTION

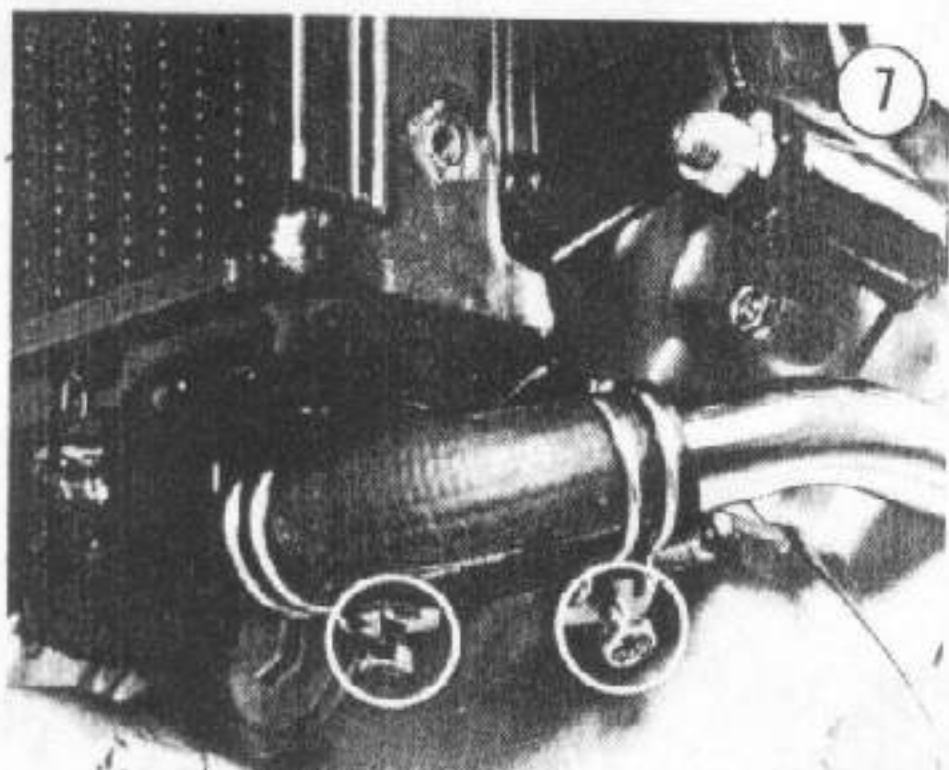
Care must be taken when handling the radiator to avoid damaging the cooling fins and tubes.

10. After the radiator has been removed, inspect the fan shroud (**Figure 9**) for damage. Straighten it out or replace it if necessary.

11. Install by reversing these removal steps. Be sure to use the metal spacer with the screws when installing the shroud.

12. Fill radiator with recommended type and quantity of coolant; refer to Steps 8-11, *Coolant Change* in Chapter Three.

13. Install the fuel tank and seat, start the engine and check for leaks.



8.2.2. Inspection

Flush off the exterior of the radiator with a garden hose. Spray from both the front and back to remove all road dirt and bugs. Use a whisk broom or stiff paintbrush to remove any stubborn dirt.

Straighten out any bent cooling fins with a broad tipped screwdriver or putty knife.

CAUTION

Do not press too hard or the cooling fins and tubes will be damaged.

Check for cracks or signs of leakage (usually a moss-green colored residue) at the filler neck, the inlet and outlet hose fittings, and the upper and lower tank seams. See Figure 10. If radiator condition is in question, have it checked as described under *Pressure Check* in this chapter. It can be checked with the radiator removed from the bike.

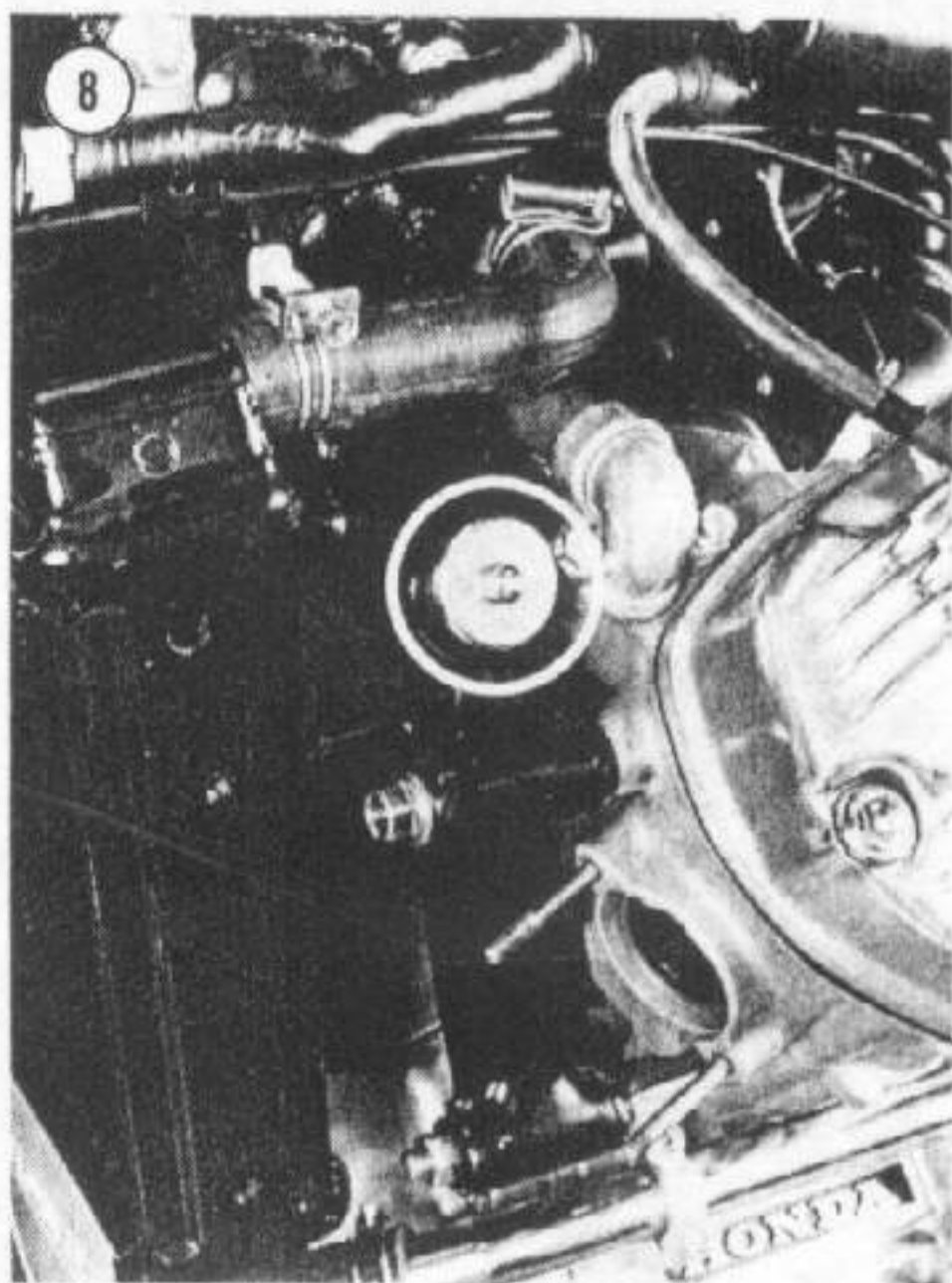
8.3

FAN

8.3.1.

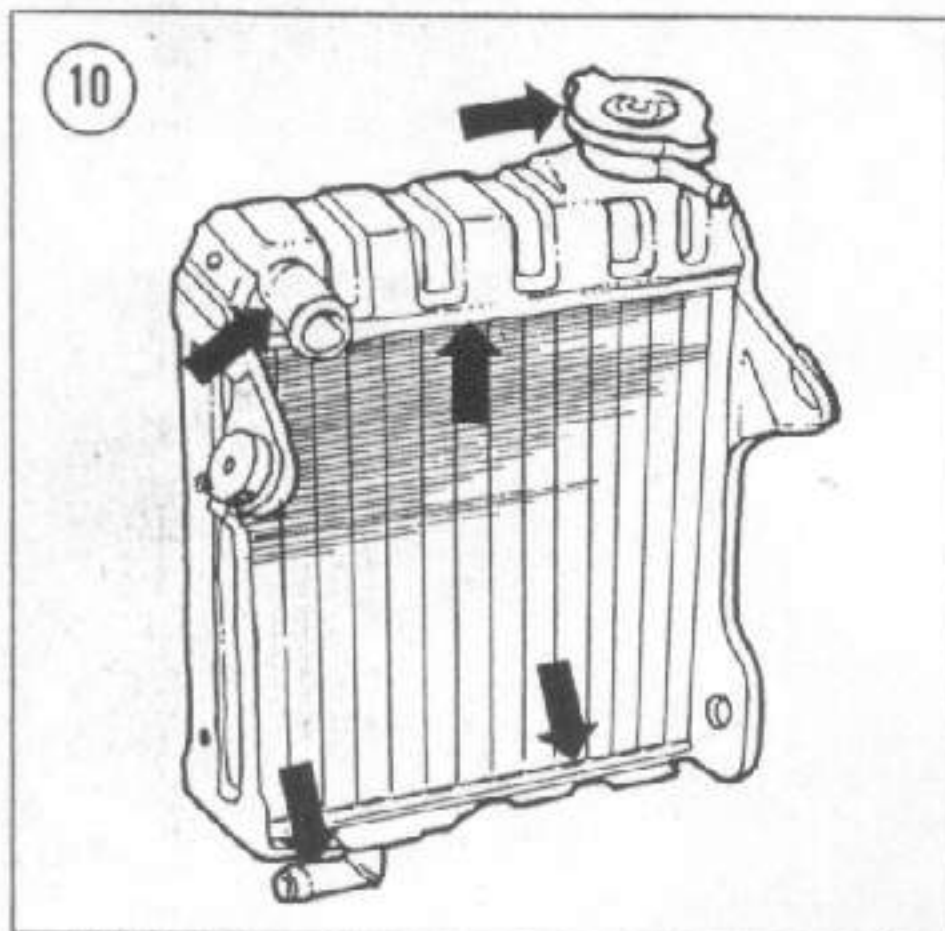
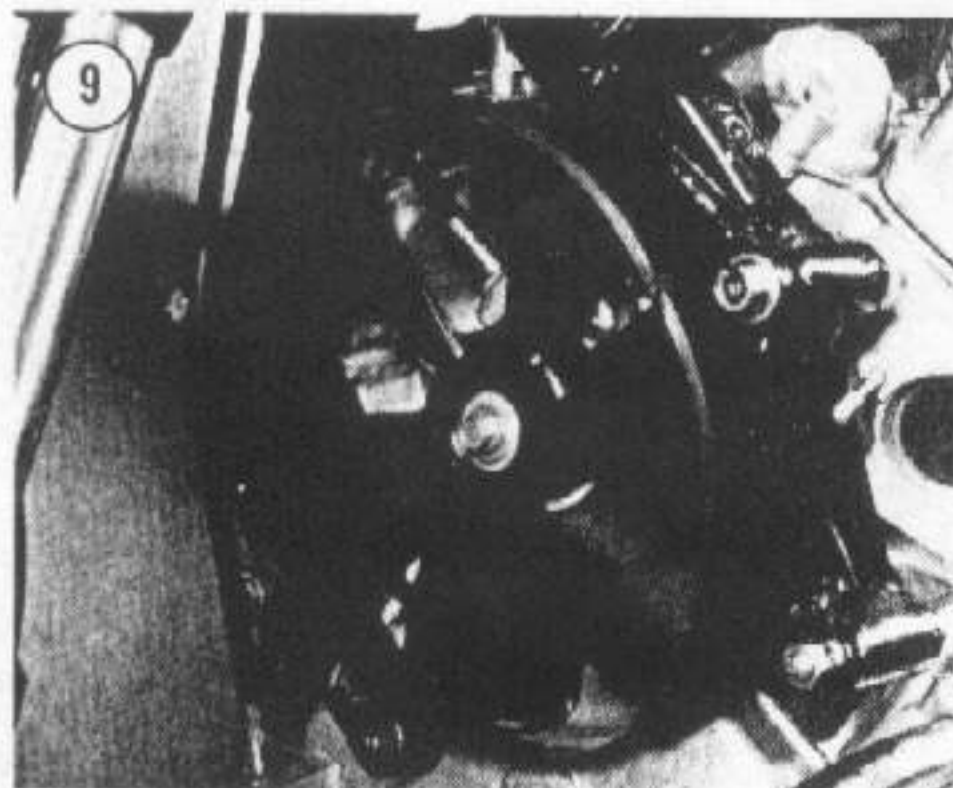
Removal/Installation

1. Remove the radiator as described under *Radiator Removal/Installation* in this chapter.



NOTE: Figures 11 and 12 are shown with engine removed for clarity only.

2. Remove the bolt (Figure 11) on the fan.
3. Remove fan with a puller (Figure 12). Screw in the puller until the fan disengages; remove the puller and the fan.
4. Inspect the fan blades. If any show signs of fatigue or cracking, the fan should be replaced. Severe damage can be done to the radiator if a blade breaks loose when the engine is running.
5. Install by reversing these removal steps. Torque the fan bolt to 14-18 ft.-lb. (19-24 N•m).
6. Refill the cooling system with the recommended type and quantity of coolant; refer to Steps 8-11, *Coolant Change* in Chapter Three.



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THERMOSTAT

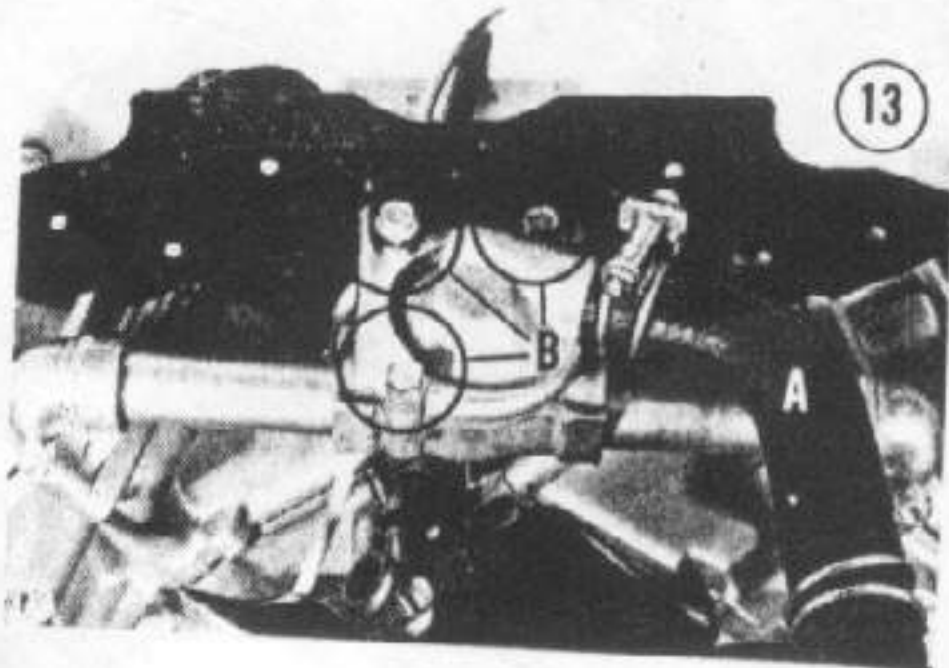
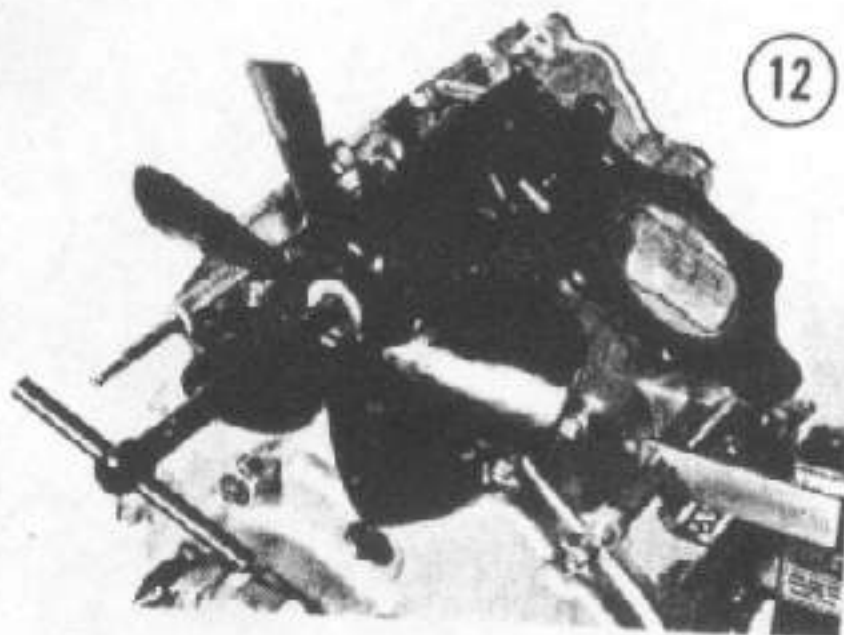
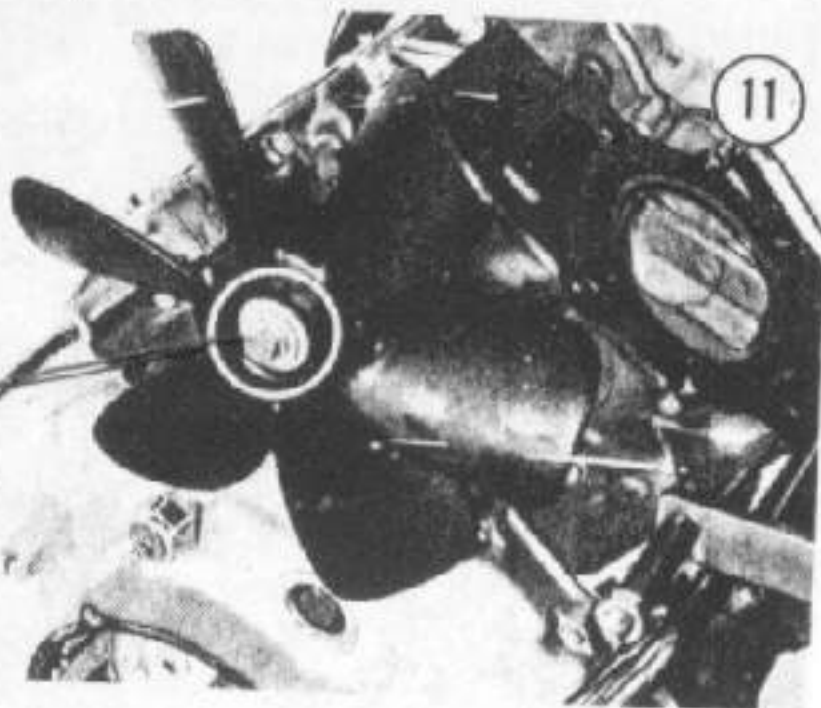
Refer to Figure 1 for this procedure.

8.4.1.

Removal/Installation

1. Remove the radiator as described under *Radiator Removal/Installation* in this chapter.
2. Remove the fan as described under *Fan Removal/Installation* in this chapter.

NOTE: Figure 13 is shown with the engine removed for clarity. It is not



necessary to remove it to perform this procedure.

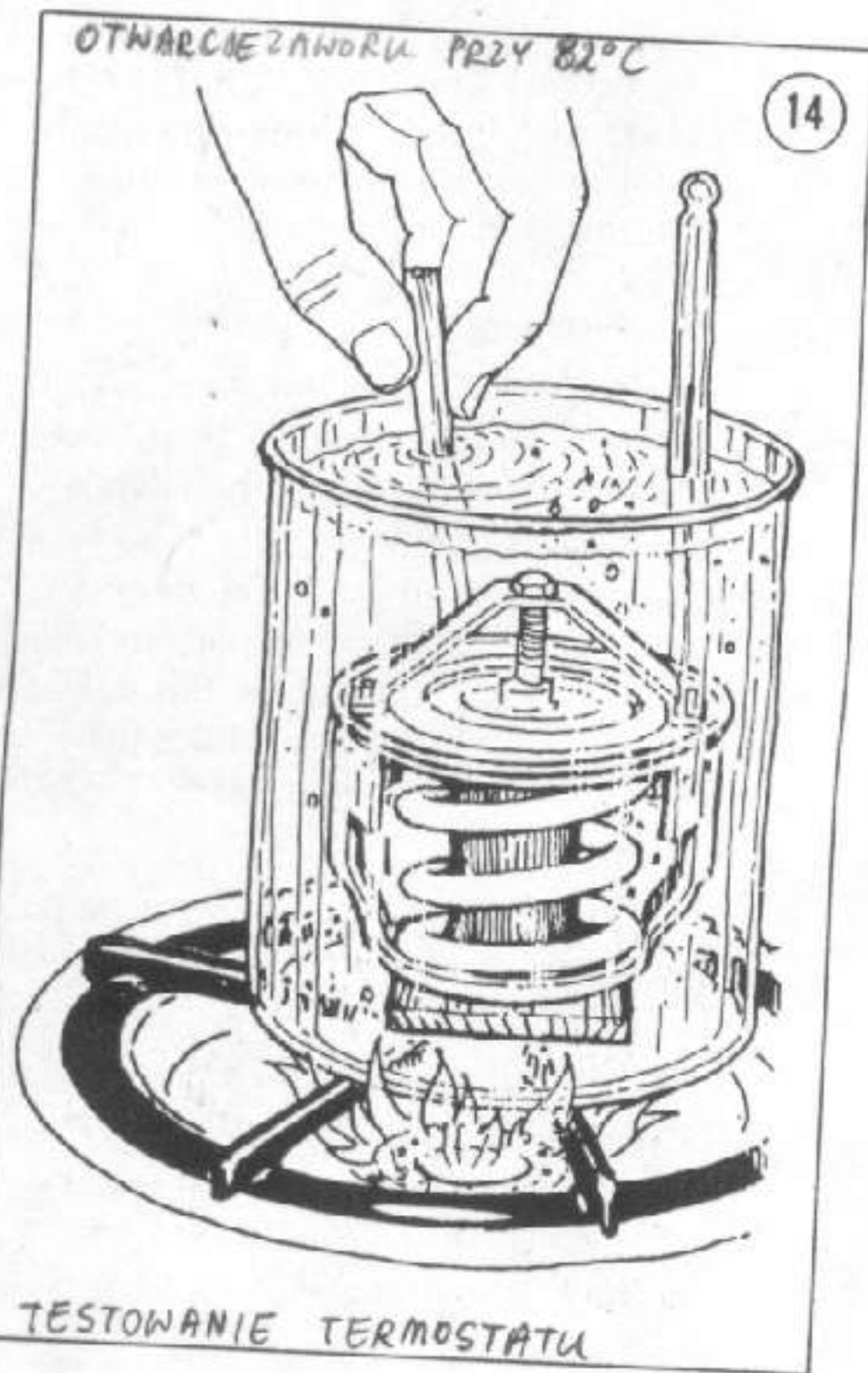
3. Remove upper radiator hose (A, Figure 13).
4. Remove the bolts securing the air dam and thermostat bracket (B, Figure 13). Remove the air dam and the bracket.
5. Remove the water outlet housing and gasket.
6. Lift out the thermostat.
7. Install by reversing these removal steps. Use a new gasket.

8.4.2.

Thermostat Testing

Test the thermostat to insure proper operation. It should be replaced if it remains open at normal room temperature.

Place thermostat, on a small piece of wood, in a pan of water (Figure 14). Gradually heat and continue to stir the water until it reaches 180°F (82°C). At this temperature the thermostat valve should open.



NOTE: Valve operation is sometimes sluggish; it usually takes 3-5 minutes for the valve to work properly.

If valve fails to open, it should be replaced. Be sure to replace it with one with the same temperature rating.

8.5

COOLANT CHANGE

The coolant should be completely drained and refilled with at least a 50/50 mixture of ethylene glycol antifreeze and water every 21,000 miles or 2 years, whichever comes first. Refer to *Coolant Change* in Chapter Three.

CAUTION

Use only a high quality ethylene glycol antifreeze labeled specifically for aluminum engines.

8.6

RADIATOR HOSES

Hoses deteriorate with age and should be replaced periodically or whenever they show signs of cracking or leakage. To be safe, replace the hoses every 21,000 miles or 2 years, whichever comes first. The spray of hot coolant from a cracked hose can injure the rider. Loss of coolant can also cause the engine to overheat causing damage.

8.6.A.

Replacement

1. Remove the radiator shroud and drain the coolant as described in Steps 1-9, *Radiator Removal/Installation* in this chapter.
2. Remove the hoses. If a hose is difficult to remove, do not pull too hard as you may damage the hose fitting. Try to rotate it with your hand as you pull. If this does not work, cut the hose lengthwise with a sharp knife and peel it off the fitting.

CAUTION

Do not press hard when cutting on the radiator fitting as it is brass and will damage easily.

3. Install the hoses by reversing these steps.
4. Refill the cooling system with the recommended type and quantity of coolant; refer to Chapter Three.
5. Start the engine and check for leaks.

8.7

WATER PUMP

Refer to Figure 1 for this procedure.

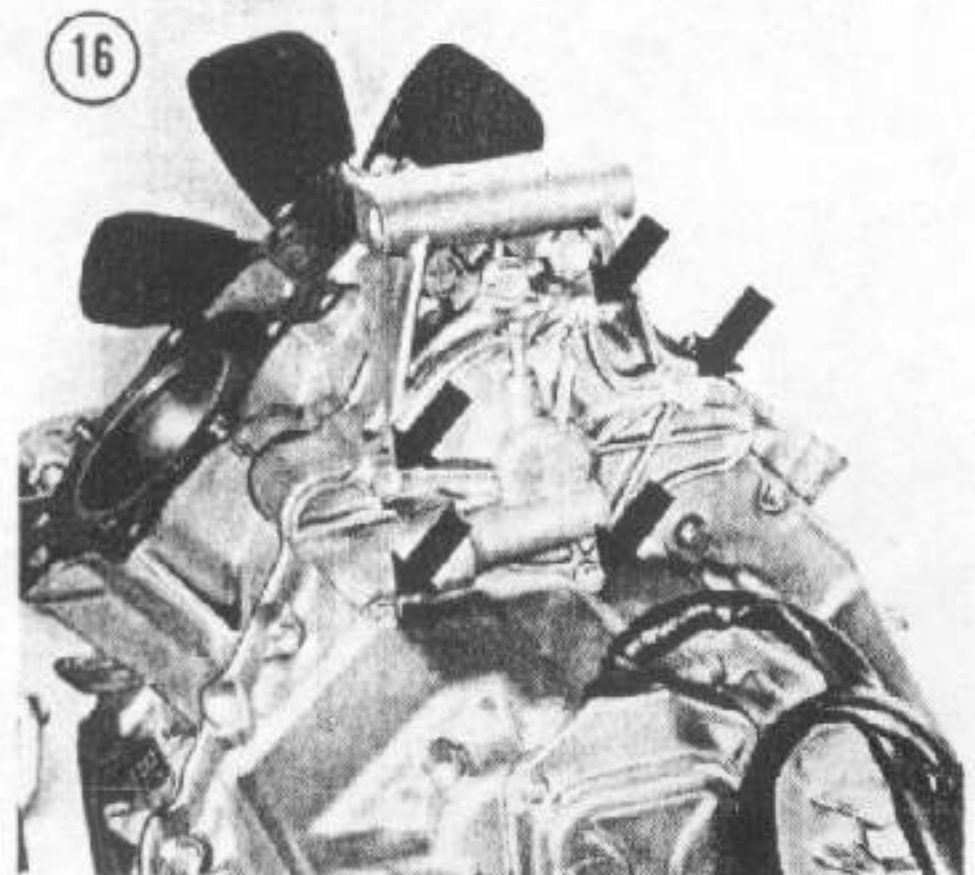
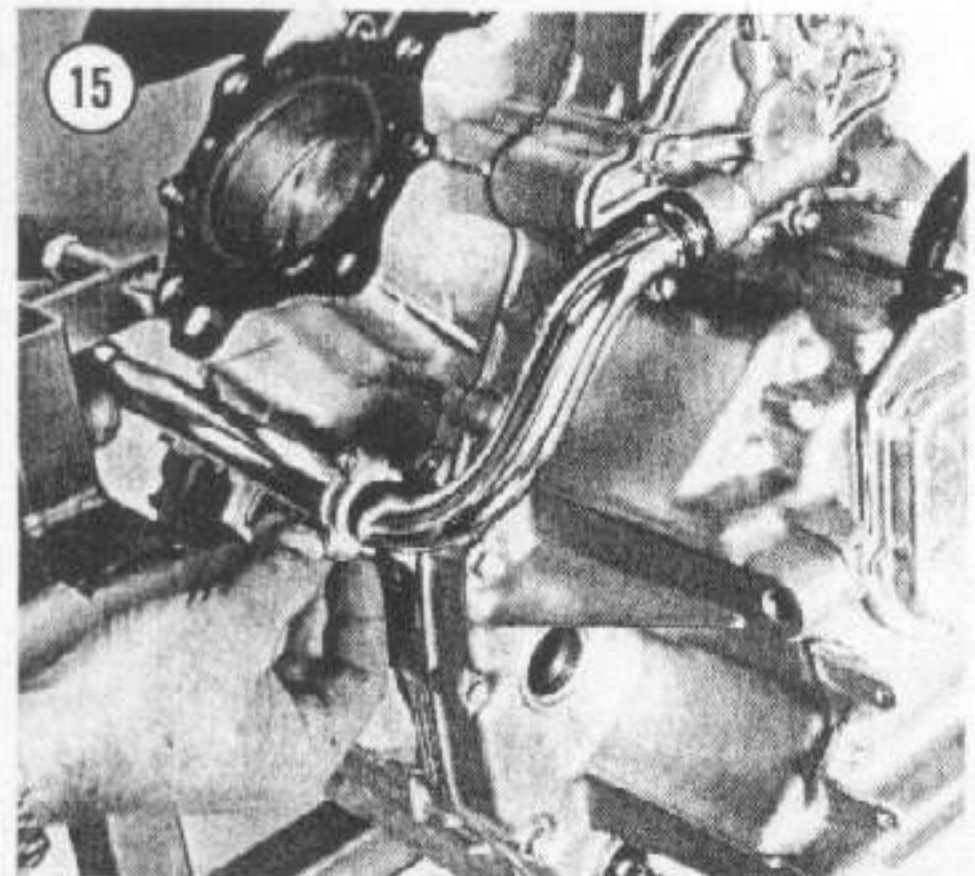
8.7.A.

Removal/Installation

1. Remove the engine as described under *Engine Removal/Installation* in Chapter Four.

NOTE: The following procedure is shown with the cylinder heads removed. However, it is not necessary to remove them for this procedure.

2. Remove the 2 clamps securing the water pipe to the cylinder block (Figure 15) and remove it.
3. Remove the 5 bolts (Figure 16) securing the water pump housing and remove it.



NOTE: Do not lose the 2 locating dowels (A, Figure 17).

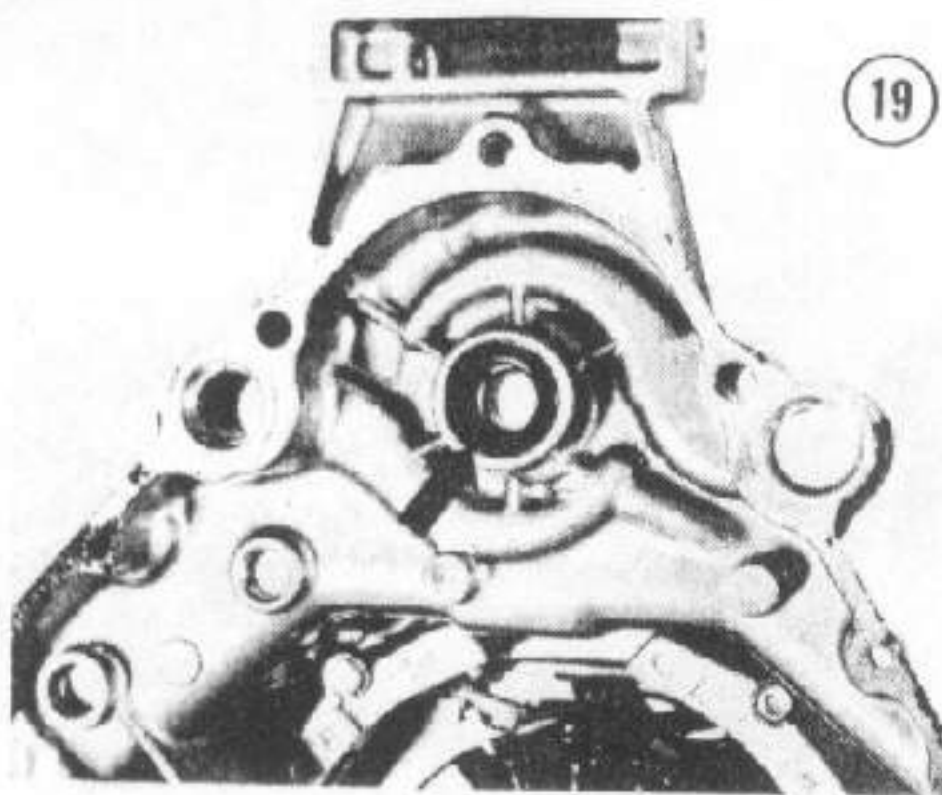
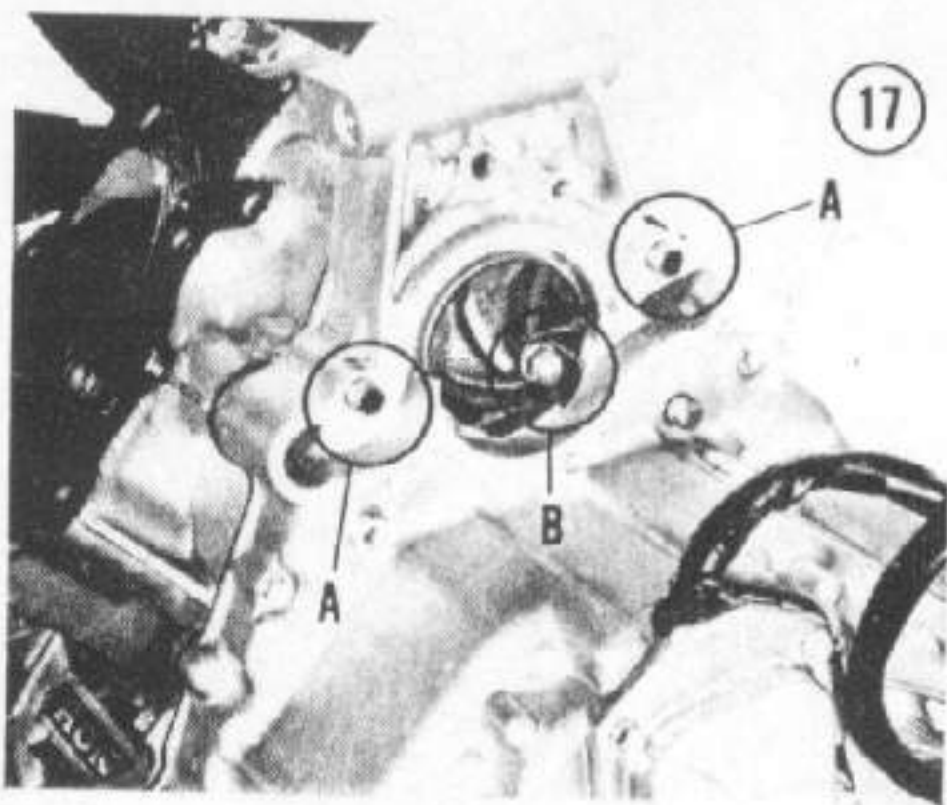
4. Remove the cap nut and copper washer (B, Figure 17) securing the water pump impeller and remove it.
5. Remove the 17 bolts securing the rear engine cover and remove it.

NOTE: Do not lose the 2 locating dowels and O-rings (Figure 18).

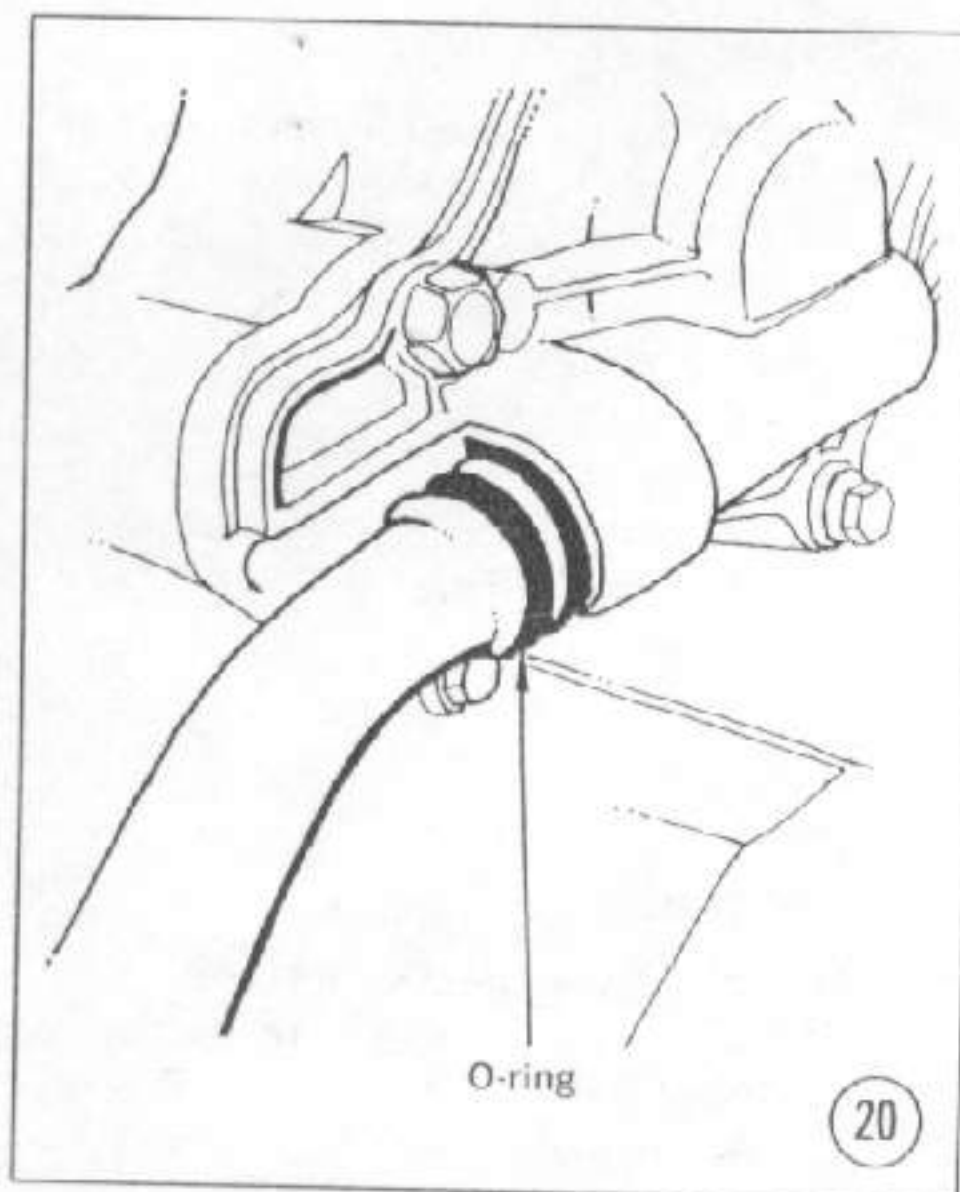
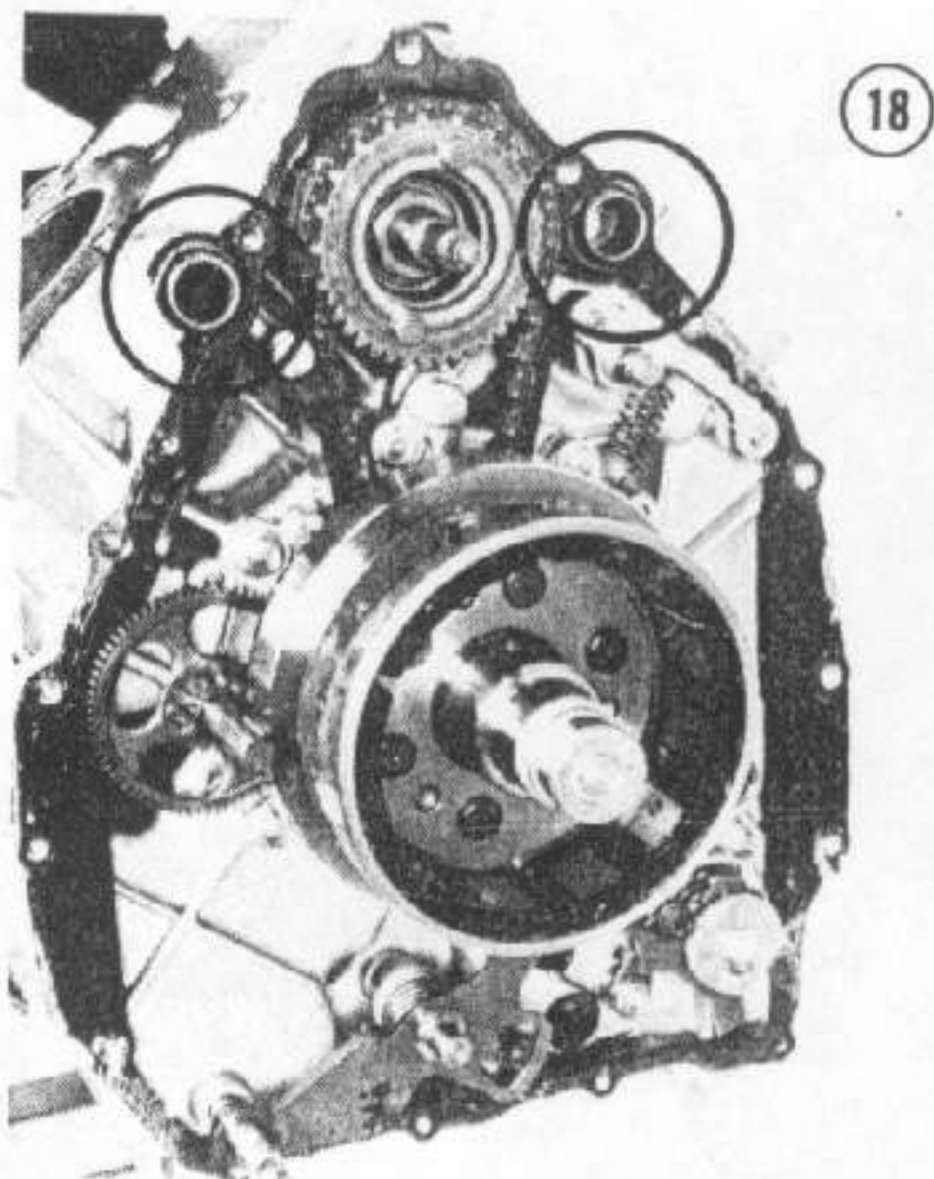
6. Inspect the seal in the rear engine cover (Figure 19). Replace if necessary.

NOTE: If there is water in the oil, one likely cause is a leaky seal in the rear engine cover

7. Install by reversing these removal steps. Torque impeller cap nut to 6-9 ft.-lb. (8-12 N•m).
8. When installing the water pipe, be sure the O-ring is properly seated between the 2 ribs on the water pipe (Figure 20).
9. Refill the cooling system with the recommended type and quantity of coolant, refer to Chapter Three.



8



8.8

Table 1 COOLING SYSTEM SPECIFICATIONS

Radiator cap relief pressure	10.7-14.9 psi (0.75-1.05 kg/cm ²)
Freezing point (hydrometer test)	
Water-to-antifreeze ratio	
55/45	-25°F (-32°C)
50/50	-34°F (-37°C)
45/55	-48°F (-44.5°C)
Cooling capacity	
Radiator and engine	1.9 U.S. qt. (1.9 liter)
Recovery tank	0.26 U.S. qt. (0.25 liter)
Total system	2.17 U.S. qt. (2.05 liter)
Thermostat	
Begins to open	176°-183°F (80°-84°C)
Fully open	199°-205°F (93°-97°C)
Valve lift	0.315 in. @ 203°F (8mm @ 95°C)
Boiling point — with 50/50 mixture	
Cap on, pressurized	258°F (125.6°C)
Unpressurized	226°F (107.7°C)

CHAPTER NINE

FRONT SUSPENSION AND STEERING

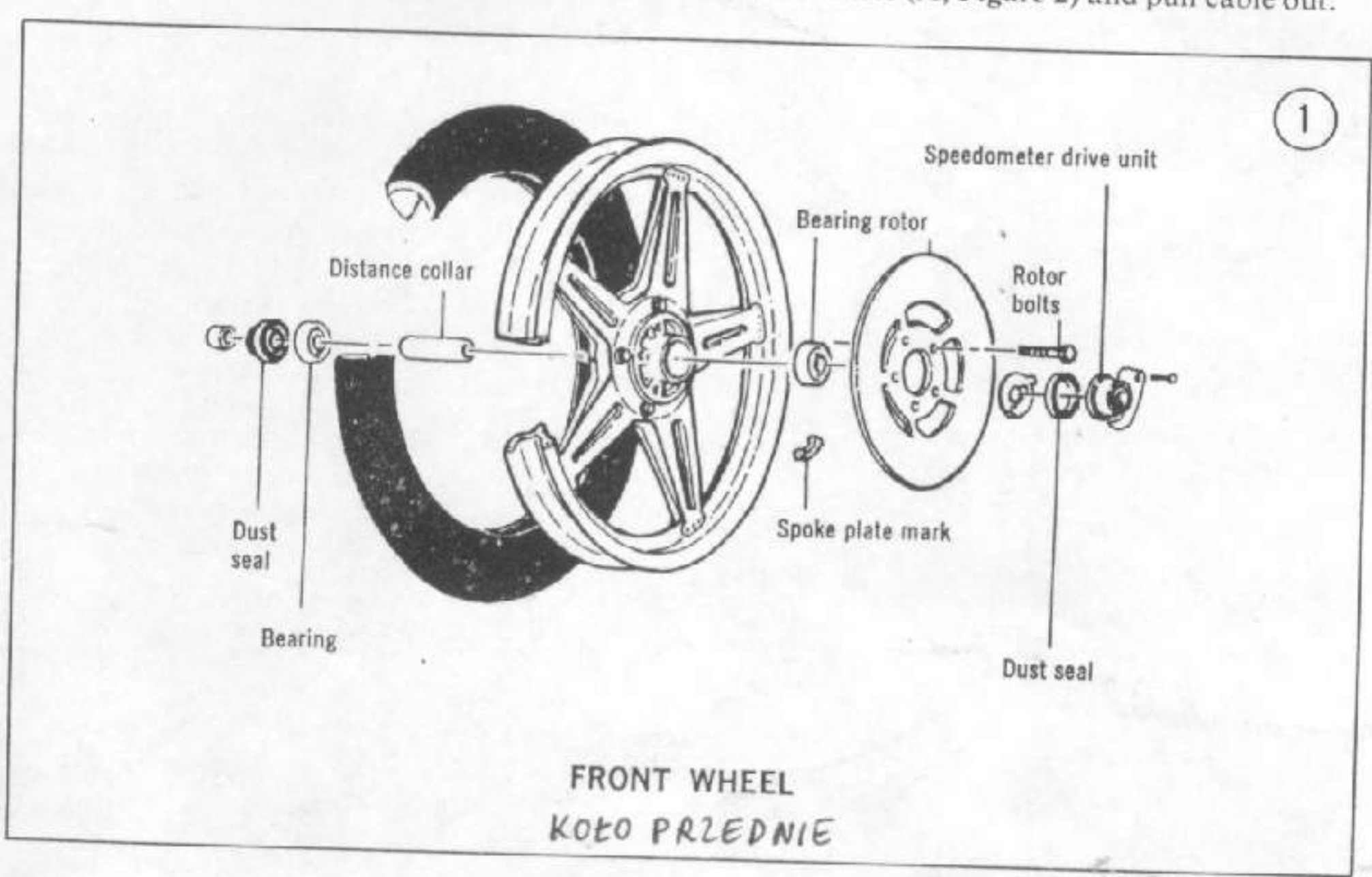
This chapter describes repair and maintenance of the front wheel, forks, and steering components.

9.1 FRONT WHEEL

Refer to Figure 1 for this procedure.

9.1.1. Removal

1. Place a wooden block under the crankcase to lift the front of the motorcycle off the ground.
2. Remove the setscrew securing the speedometer cable (A, Figure 2) and pull cable out.



FRONT WHEEL
KOŁO PRZEDNIE

MIAL-31

9

- Remove the axle nut cotter pin (B, Figure 2) and discard it.

CAUTION

Never reuse a cotter pin.

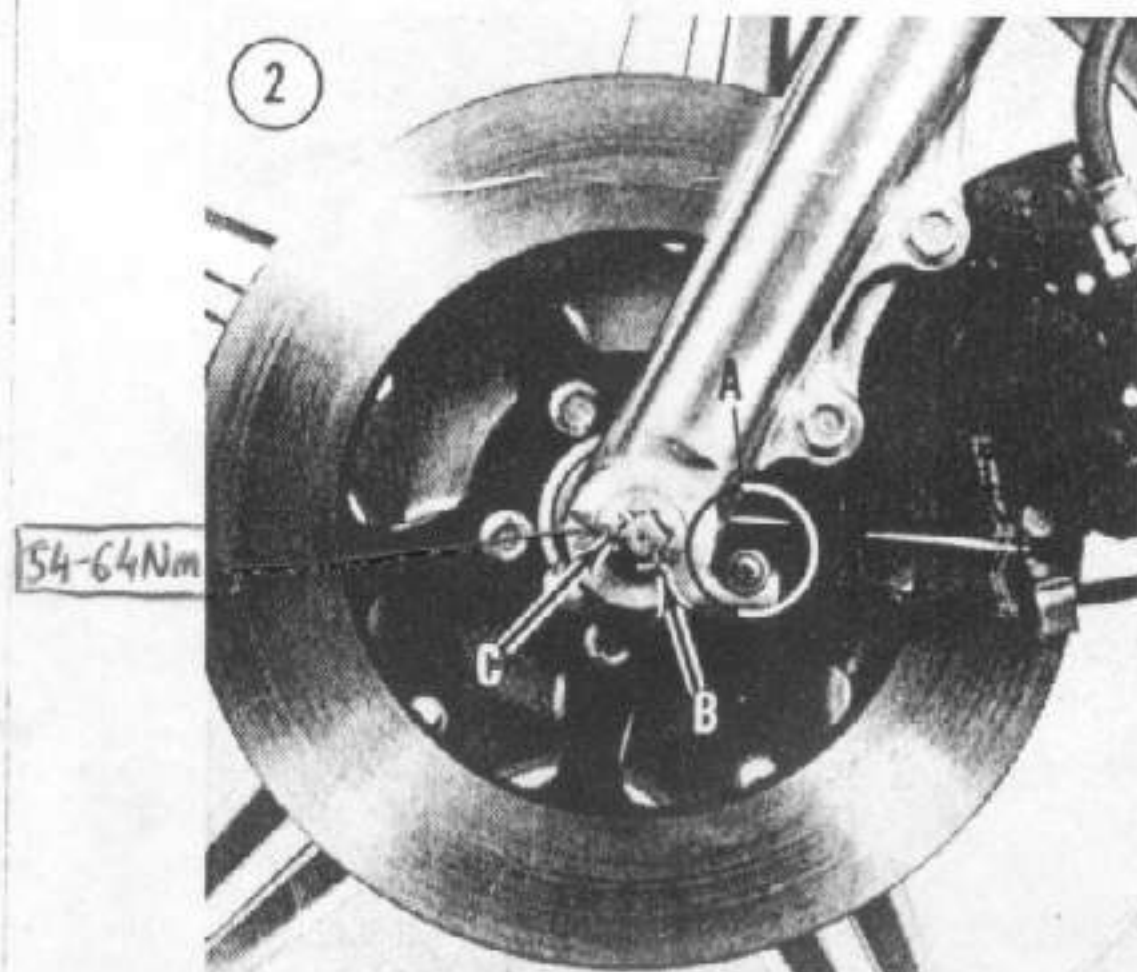
- Remove the axle nut (C, Figure 2).
- Remove the 2 nuts securing the front axle holder (Figure 3) and remove it.
- Push the axle out from the left side, with a drift or screwdriver, and remove it.
- Remove the wheel; pull the wheel forward to disengage the disc from the caliper.

NOTE: Insert a piece of wood in the caliper in place of the disc. That way, if brake lever is inadvertently squeezed, the piston will not be forced out of the cylinder. If this does happen, the caliper might have to be disassembled to reseat the piston, and the system will have to be bled. By using the wood, bleeding the brake is not necessary when installing the wheel.

9.4.2**Installation**

- Carefully insert the disc between the pads when installing the wheel.
- Insert the axle from the right-hand side and install the axle holder and the 2 flat washers, lockwashers, and nuts (Figure 3).

NOTE: Install the axle holder with the arrow facing forward and the end of the



axle flush with the outer surface of the fork.

- Tighten the holder nuts to 13-18 ft.-lb. (18-24 N•m).
- Install the axle nut and torque to 40-47 ft.-lb. (54-64 N•m). Install a *new* cotter pin.

CAUTION

Never reuse a cotter pin, always install a new one.

- Insert the speedometer cable and install the setscrew (A, Figure 2).

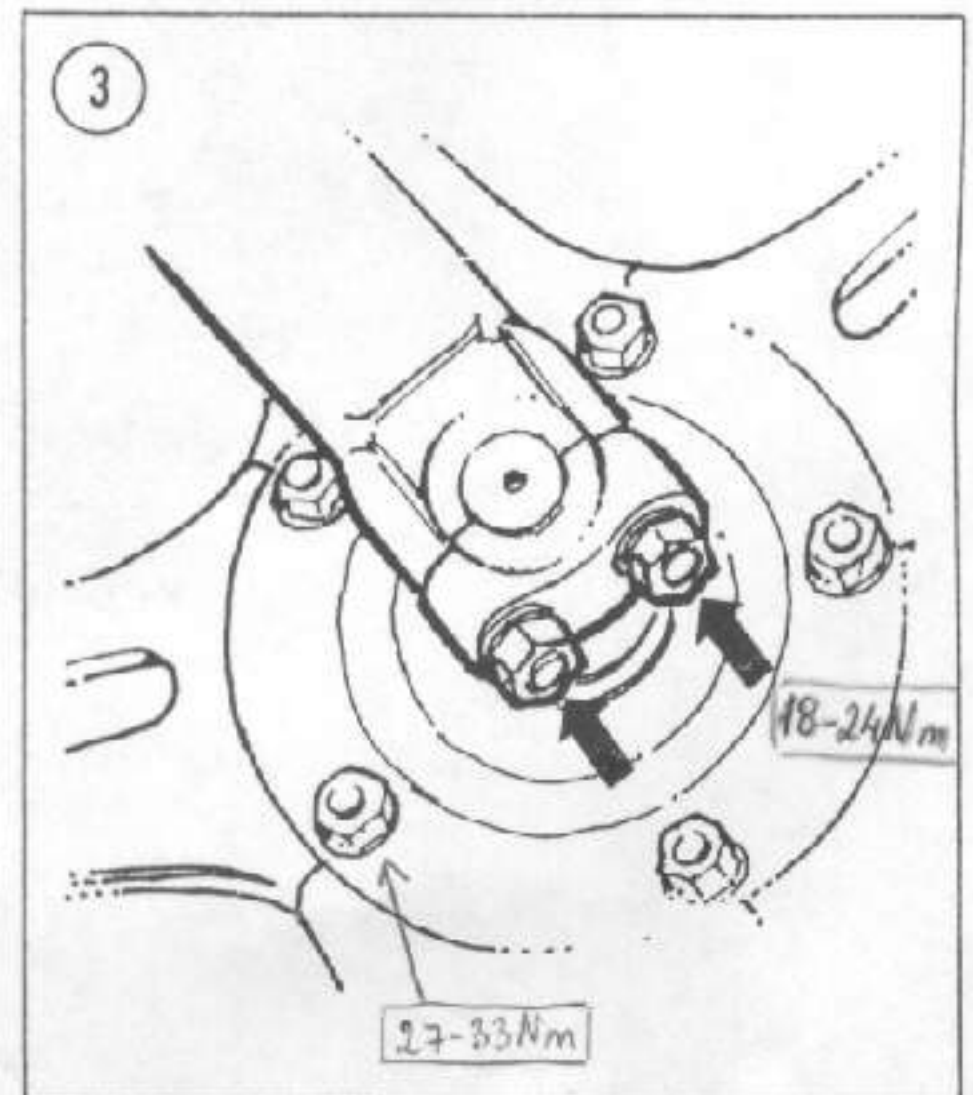
NOTE: Rotate the wheel slowly when inserting the cable so that it will engage properly.

- After the wheel is installed, completely rotate it; apply the brake several times to make sure it rotates freely.

9.4.3.**Inspection**

Measure the wobble and runout of the wheel rim with a dial indicator as shown in Figure 4. The standard value for both wobble and runout is 0.02 in. (0.5mm). The maximum permissible limit is 0.08 in. (2mm).

If the runout exceeds the limit, it will have to be replaced as the ComStar wheel cannot be serviced.



9.2

FRONT HUB

9.2.1.

Disassembly

1. Remove the front wheel as described under *Front Wheel Removal* in this chapter.
2. Remove the dust seal.
3. Remove the 5 bolts securing the brake rotor and remove it if necessary.
4. Remove the left-hand bearing.
5. Remove the axle spacer.
6. Remove the right-hand bearing.

9.2.2.

Inspection

1. Clean bearings thoroughly in solvent and dry with compressed air. Do not let the bearing spin while drying.
2. Clean the inside and outside of the hub with solvent. Dry with compressed air.
3. Turn each bearing by hand. Make sure bearings turn smoothly. Check balls for evidence of wear, pitting, or excessive heat (bluish tint). Replace bearings if necessary; always replace them as a complete set.
4. Check the axle for wear and straightness. Use V-blocks and a dial indicator as shown in **Figure 5**. If the runout is 0.008 in. (0.2mm) or greater, the axle must be replaced.

9.2.3.

Assembly

1. Pack the bearings thoroughly with multipurpose grease. Work the grease in between the balls thoroughly.
2. Pack the wheel hub and axle spacer with multipurpose grease.

3. Install the right-hand bearing.
4. Press in the axle spacer.
5. Install the left-hand bearing.

NOTE: Install the bearings with the sealed side facing outward.

CAUTION

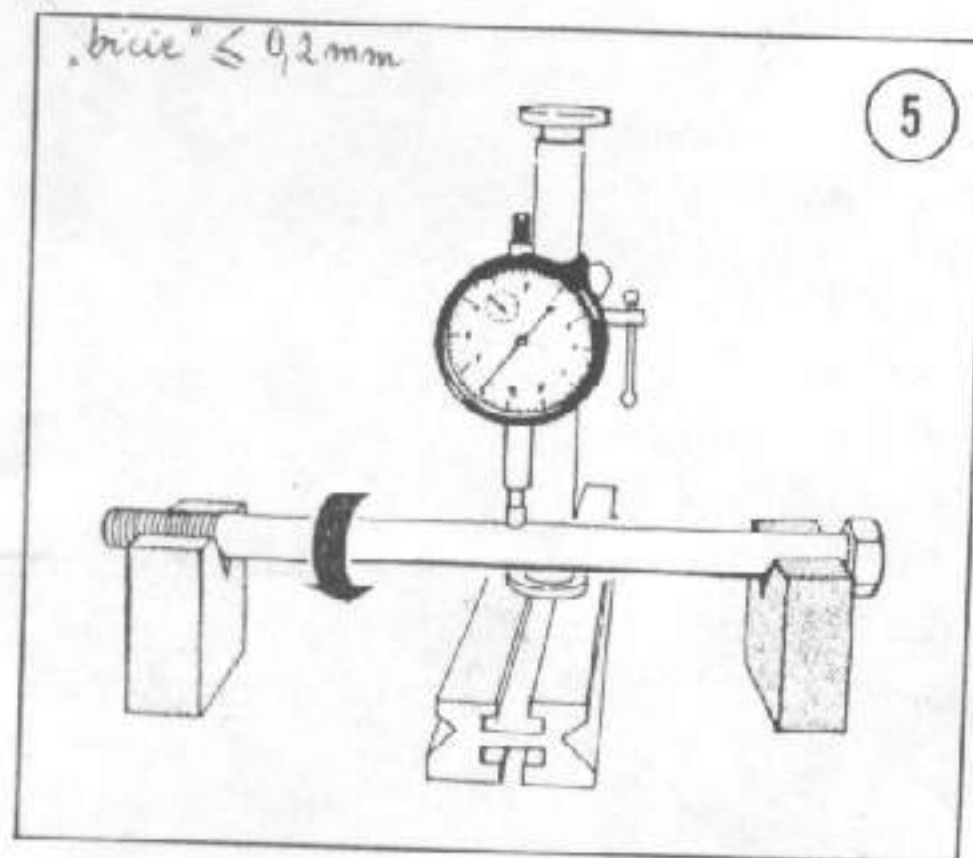
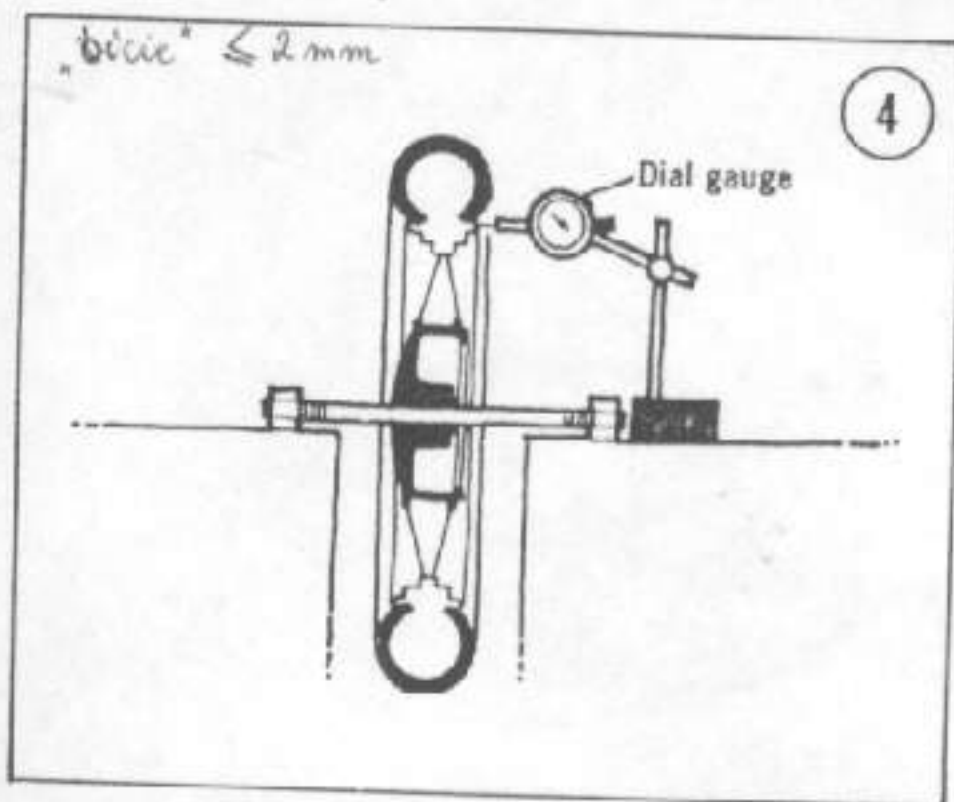
Tap the bearings squarely into place and tap on the outer race only. Do not tap on the inner race or the bearing might be damaged. Be sure that the bearings are completely seated.

6. Lubricate the dust seal with grease.
7. Install the dust seal and collar in the right-hand side.
8. Install the speedometer gear retainer in the hub on the left-hand side.
9. Lubricate the oil seal and install it.
10. Disassemble the speedometer gear box and lubricate the gears and sliding faces with multipurpose grease. Reassemble it.
11. Install brake rotor, if removed, and tighten the bolts to 20-24 ft.-lb. (27-33 N•m).
12. Install the speedometer gear into the hub. Align the tangs of the gear with the notches in the wheel retainer.

9.3

WHEEL BALANCING

An unbalanced wheel results in unsafe riding conditions. Depending on the degree of unbalance and the speed of the motorcycle, the



rider may experience anything from a mild vibration to a violent shimmy which may even result in loss of control.

On the ComStar wheels, weights are attached to the rim. A kit of Tape-A-Weight, or equivalent may be purchased from most motorcycle supply stores. This kit contains test weights and strips of adhesive-backed weights that can be cut to desired weight and attached directly to the rim.

Before you attempt to balance the wheel, check to be sure that the wheel bearings are in good condition and properly lubricated and that the brakes do not drag. *The wheel must rotate freely.*

1. Remove the wheel as described under *Front Wheel Removal* in this chapter.
2. Mount the wheel on a fixture such as the one in **Figure 6** so it can rotate freely.
3. Give the wheel a spin and let it coast to a stop. Mark the tire at the lowest point.
4. Spin the wheel several more times. If the wheel keeps coming to rest at the same point, it is out of balance.
5. Tape a test weight to the upper (or light) side of the wheel.
6. Experiment with different weights until the wheel, when spun, comes to rest at a different position each time.
7. Remove the test weight and install the correct size adhesive-backed weight.

9.4

TIRE CHANGING

The rim of the ComStar wheel is aluminum and the exterior appearance can easily be damaged. Special care must be taken with tire irons when changing a tire to avoid scratches and gouges to the outer rim surface.

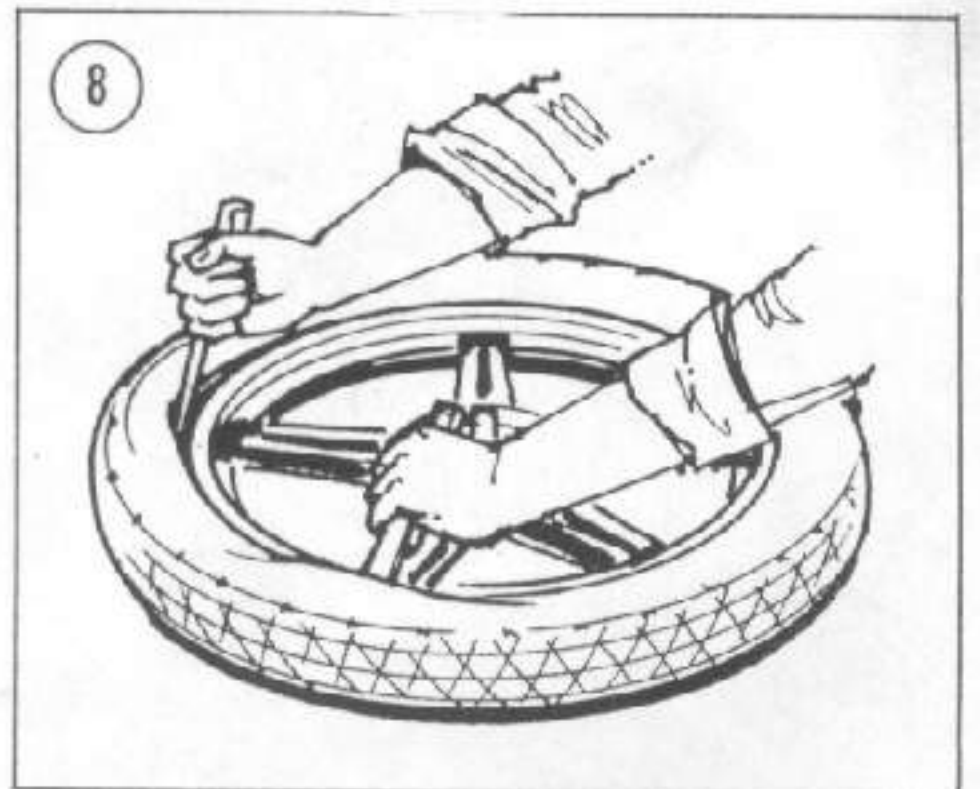
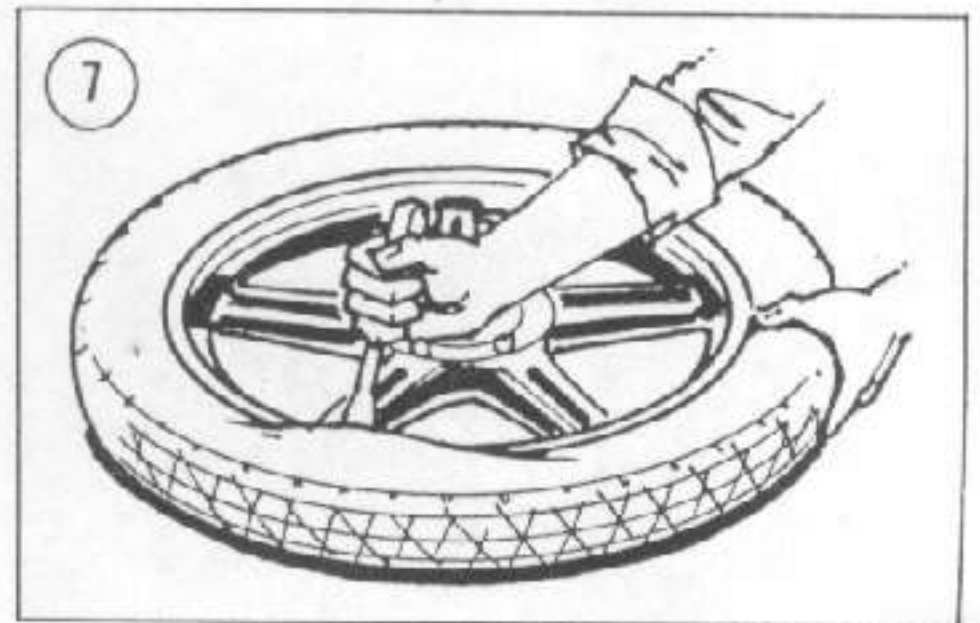
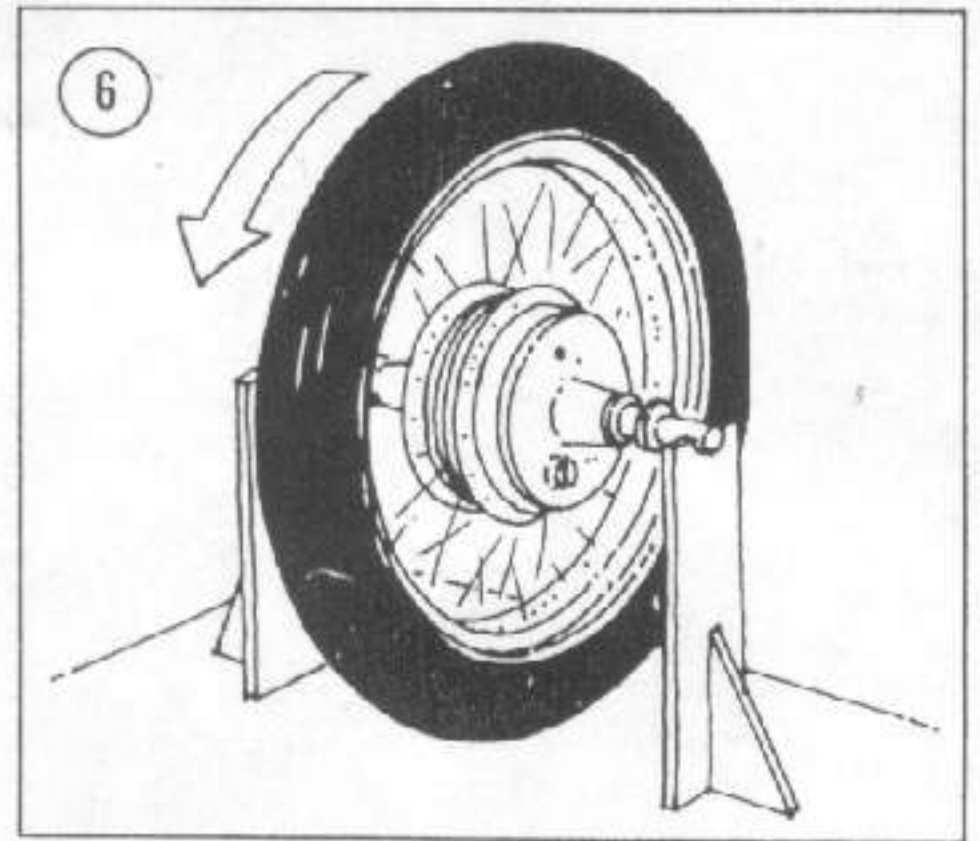
9.4.1.

Removal

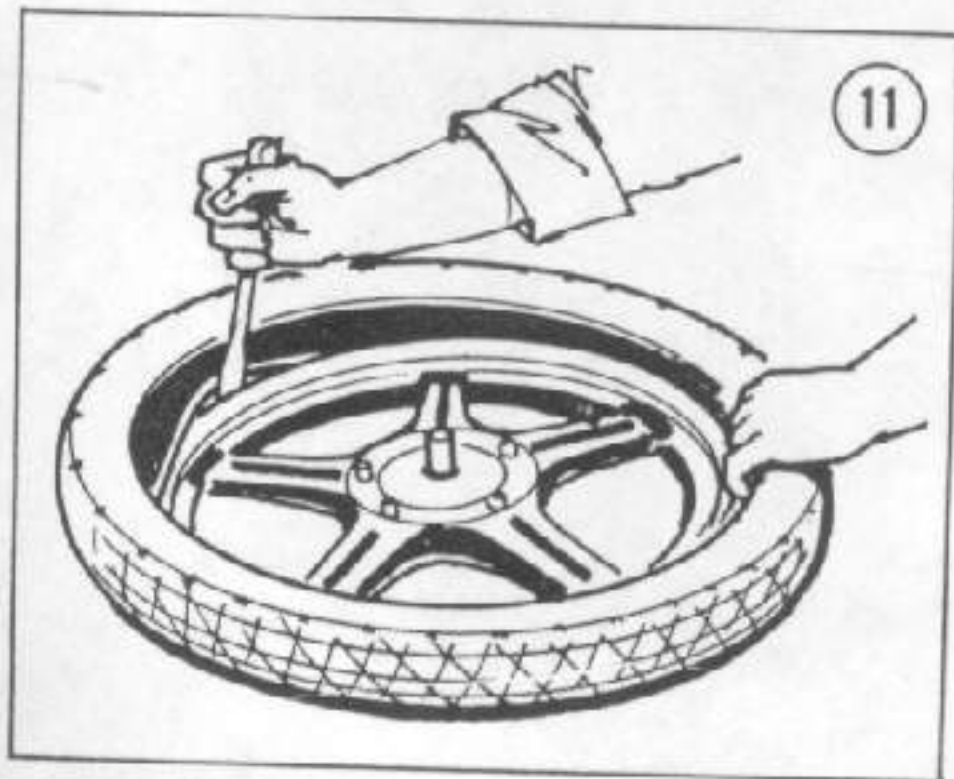
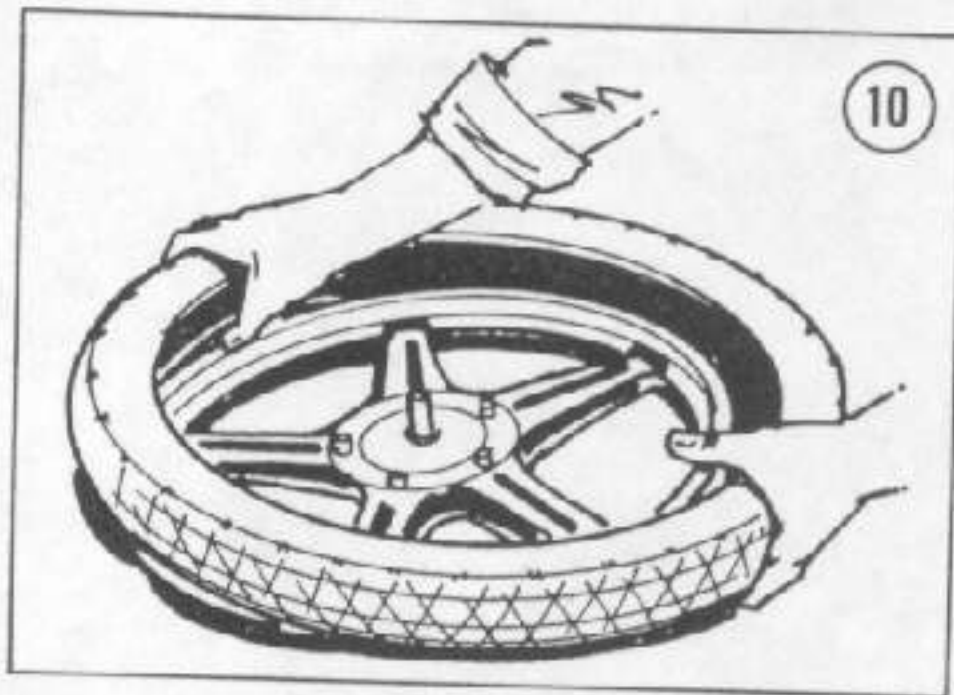
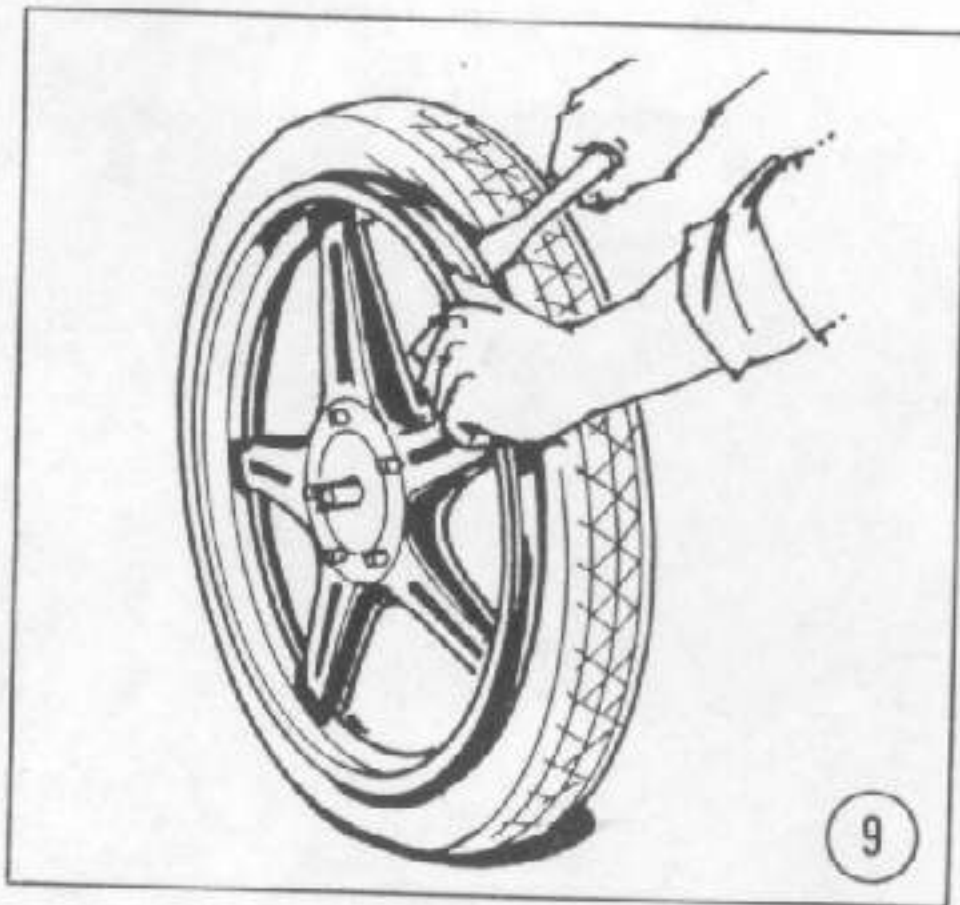
1. Remove the valve core to deflate the tire.
2. Press the entire bead on both sides of the tire into the center of the rim.
3. Lubricate the beads with soapy water.
4. Insert the tire iron under the bead next to the valve (**Figure 7**). Force the bead on the opposite side of the tire into the center of the rim and pry the bead over the rim with the tire iron.

5. Insert a second tire iron next to the first to hold the bead over the rim. Then work around the tire with the first tire iron, prying the bead over the rim (**Figure 8**).

6. Stand the tire upright. Insert a tire iron between the second bead and the side of the rim



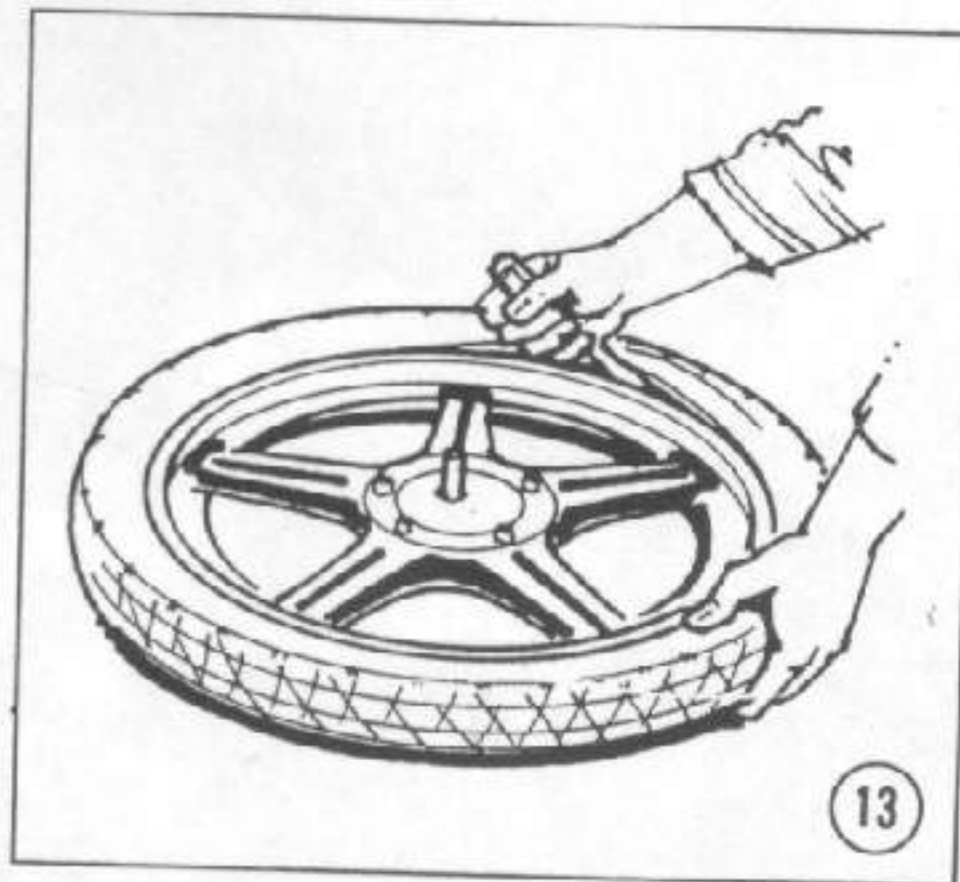
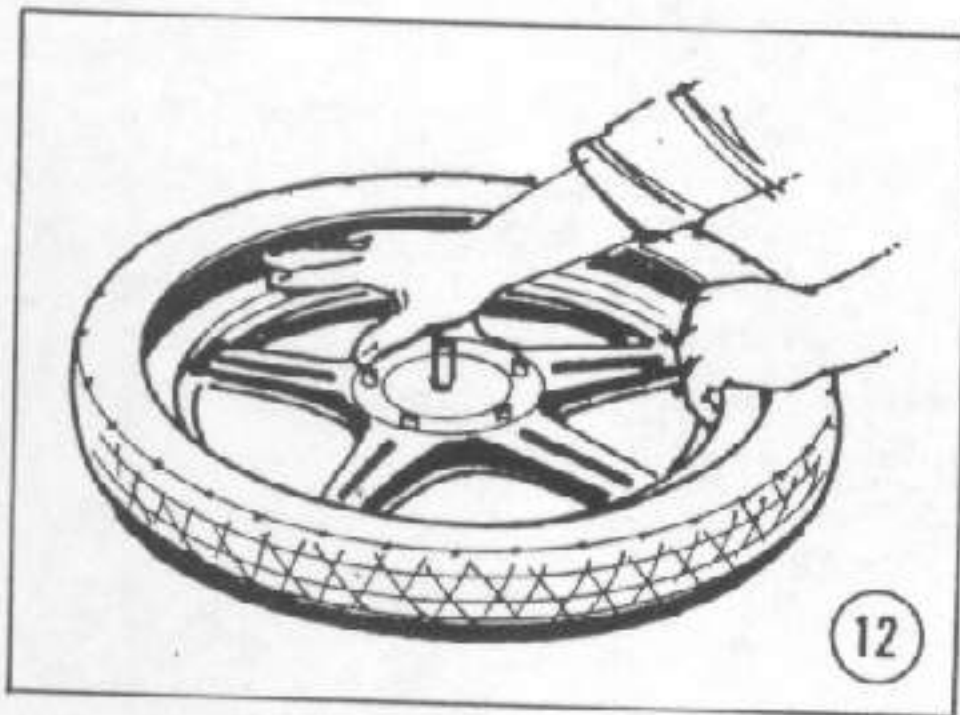
that the first bead was pried over (Figure 9). Force the bead on the opposite side from the tire iron into the center of the rim. Pry the second bead off the rim, working around as with the first.



9.4.2.

Installation

1. Carefully check the tire for any damage, especially inside.
2. A new tire may have balancing rubbers inside. These are not patches and should not be disturbed. A colored spot near the bead indicates a lighter point on the tire. This should be placed next to the valve or midway between the 2 rim locks if they are installed.
3. Lubricate the tire beads and rim with soapy water.
4. Press the lower bead into the rim center on each side of the valve, working around the tire in both directions (Figure 10). Use a tire iron for the last few inches of bead (Figure 11).
5. Press the upper bead into the rim opposite the valve (Figure 12). Pry the bead into the rim on both sides of the initial point with a tire iron, working around rim to the valve (Figure 13).



6. Check the bead on both sides of the tire for even fit around the rim. Inflate the tire slowly to seat the beads in the rim. It may be necessary to bounce the tire to complete the seating. Inflate to the required pressure. Balance the wheel as described previously.

9.5

HANDLEBAR

9.5.4.

Removal/Installation

1. Remove the 2 bolts (Figure 14) securing the master cylinder and lay it on the fuel tank. It is not necessary to remove the hydraulic brake line.

CAUTION

Cover the fuel tank with a heavy cloth or plastic tarp to protect it from accidental spilling of brake fluid. Wash any brake fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse thoroughly.

2. Slacken the clutch cable (Figure 15) and disconnect it from the hand lever.

3. Separate the 2 halves of the start switch assembly. Disconnect the throttle cables from the twist grip (Figure 16).

4. Remove the rear view mirrors and clamps securing electrical cables to the handlebar.

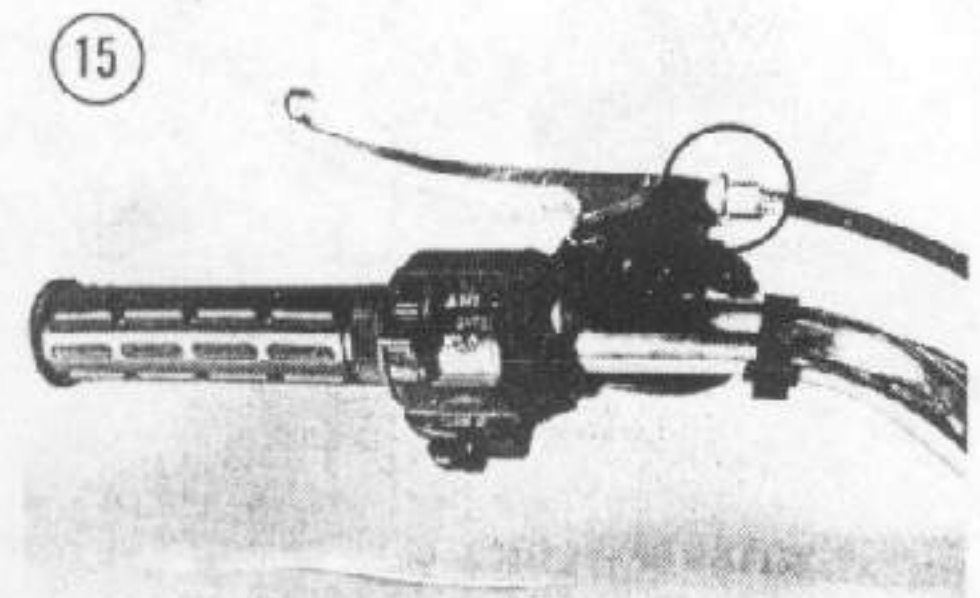
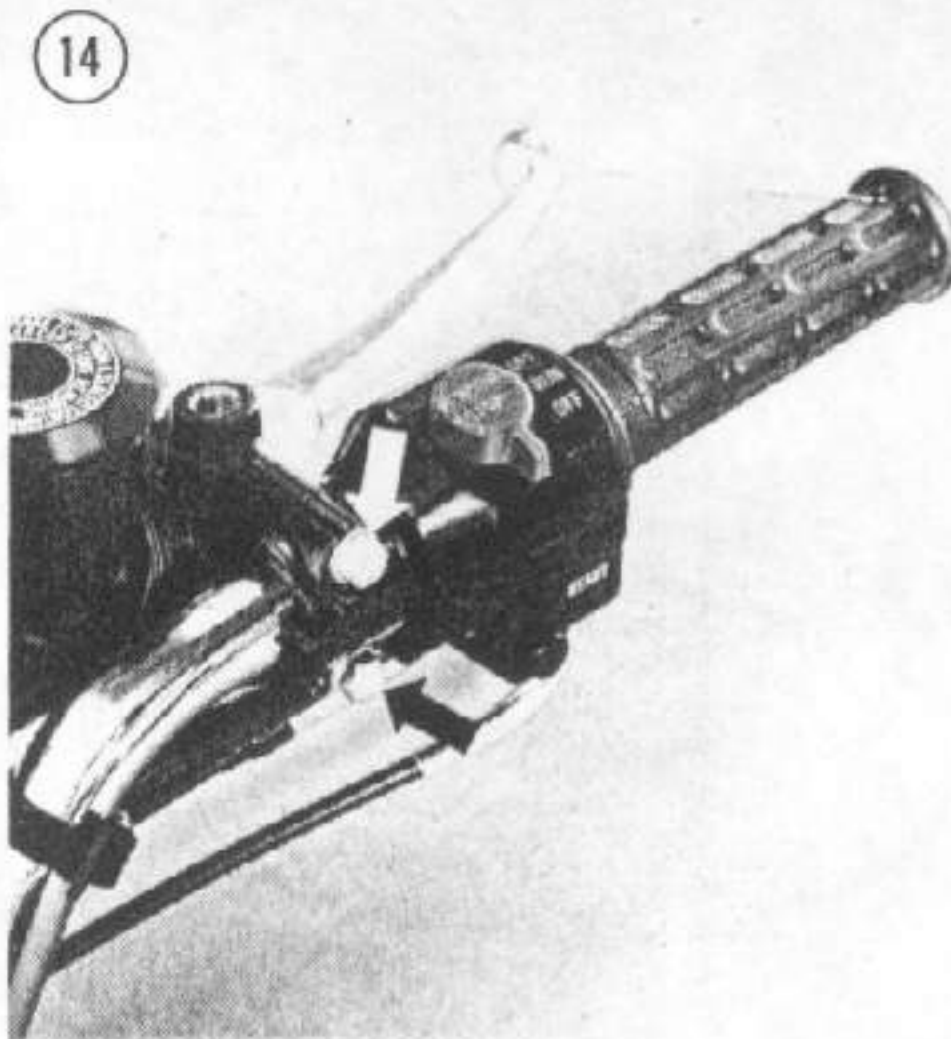
5. Remove the 4 rubber plugs (A, Figure 17) and 4 Allen bolts (B, Figure 17) securing the fuse/handlebar holder and remove it. Lay it over the fuel tank or the headlight nacelle.

6. Lift off the handlebars.

7. Install by reversing these steps. Align the punch marks on the handlebar with the line that separates the upper and lower fuse/handlebar holder.

8. Tighten the forward 2 Allen screws of the fuse/handlebar holder first, then the rear. Tighten to a torque of 13-18 ft.-lb. (18-24 N•m).

9. Align the punch mark on the handlebar with the lug on the master cylinder holder.



9.6

STEERING HEAD

9.6.4. Disassembly

Refer to Figure 18 for this procedure.

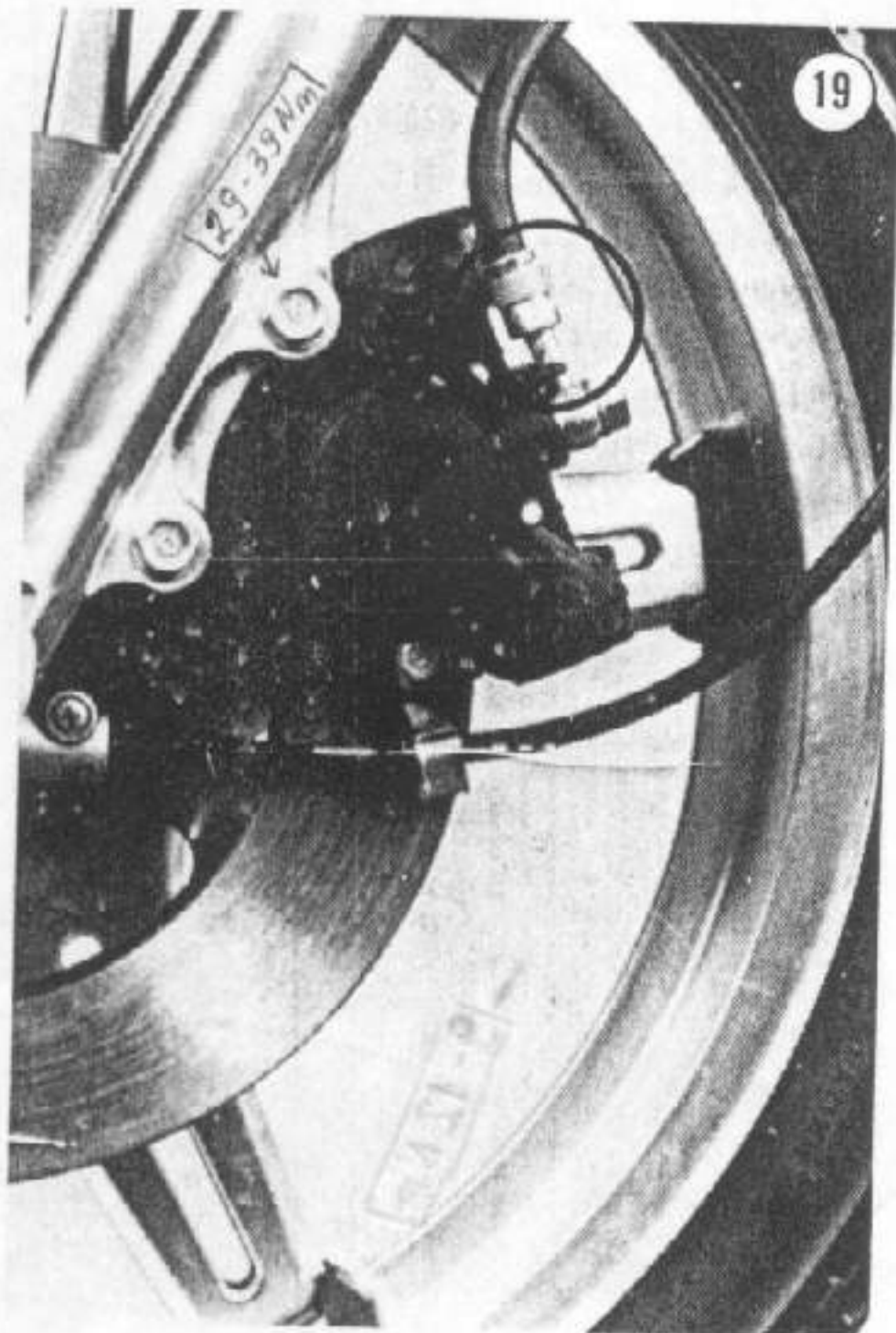
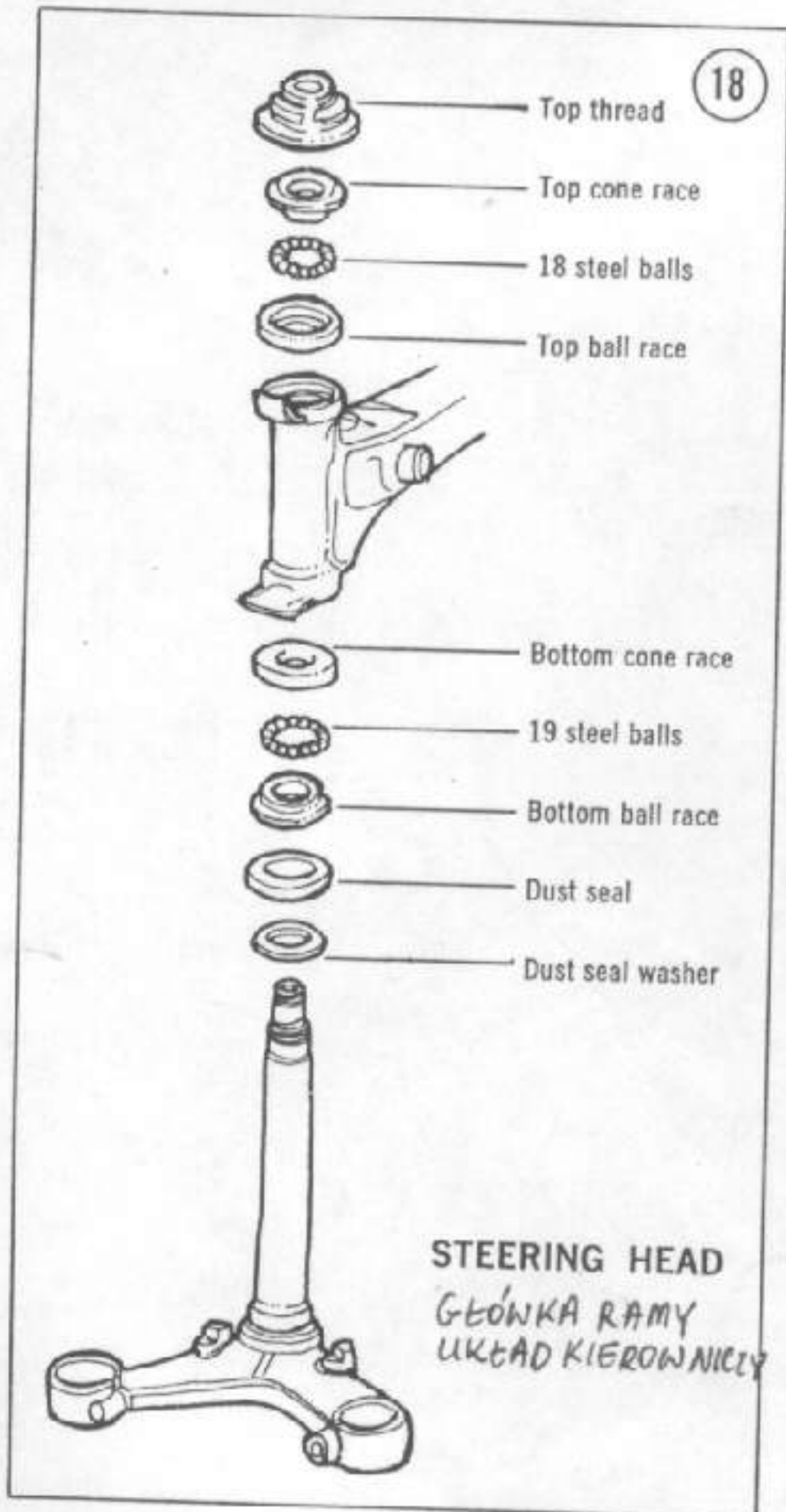
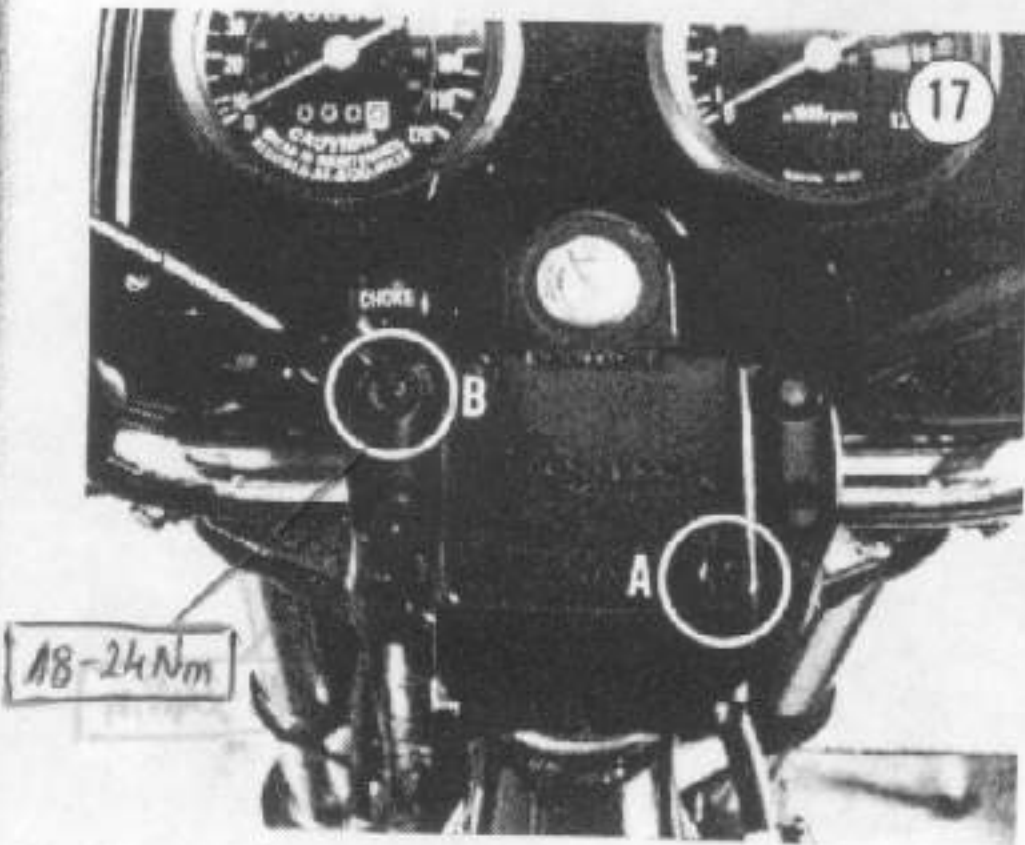
1. Remove the front wheel as described under *Front Wheel Removal* in this chapter.
2. Disconnect hydraulic brake line (Figure 19) at the caliper. Plug all exposed ends to prevent brake fluid spillage and to keep dirt and moisture out of the brake system.

CAUTION

Do not spill brake fluid on painted or plated surfaces as it will ruin the finish. If you do spill it, wash the area immediately with soapy water and thoroughly rinse off.

Remove the bracket securing the hydraulic brake line to fork tube.

3. Remove the headlight nacelle assembly.
4. Remove the handlebar as described under, *Handlebar Removal/Installation*, this chapter.
5. Unscrew the steering stem nut.



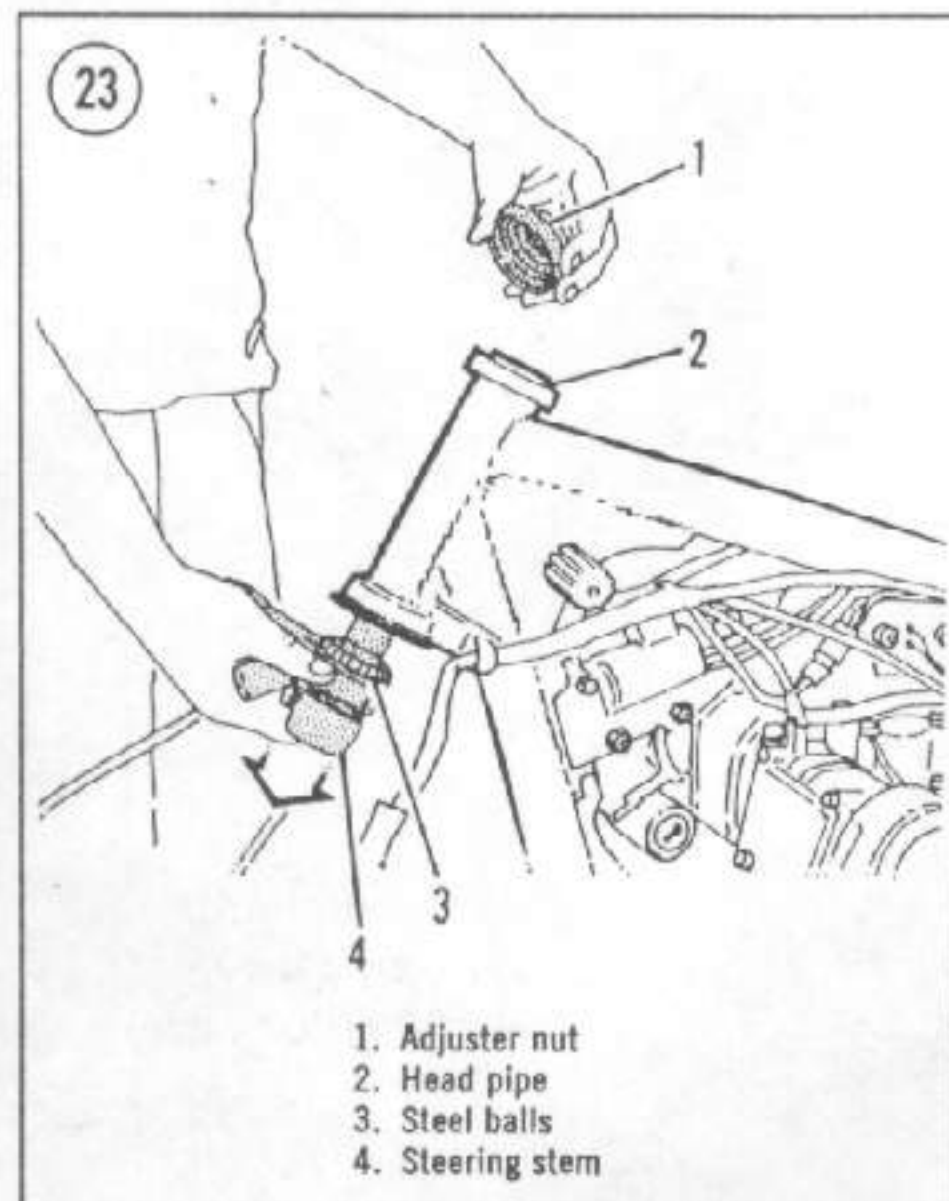
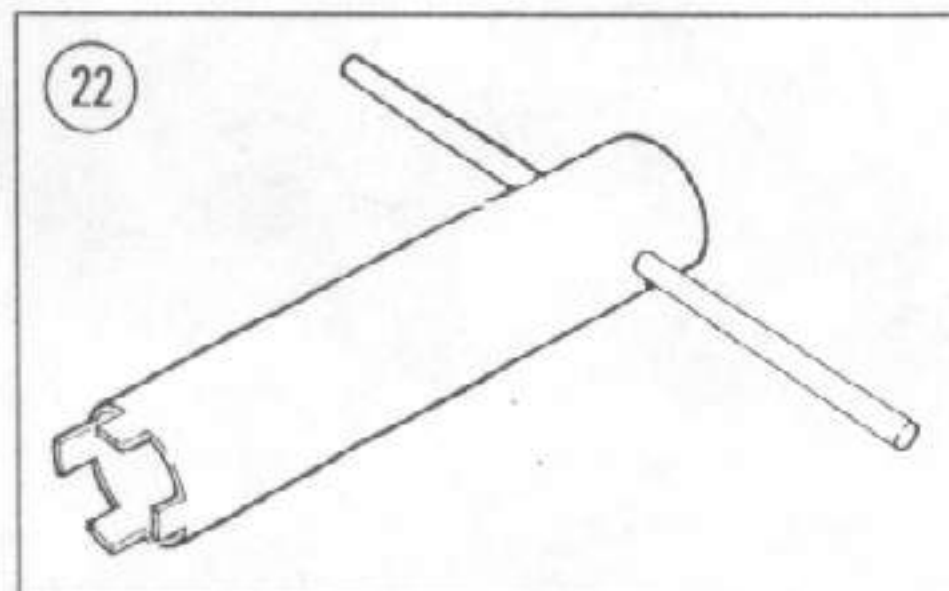
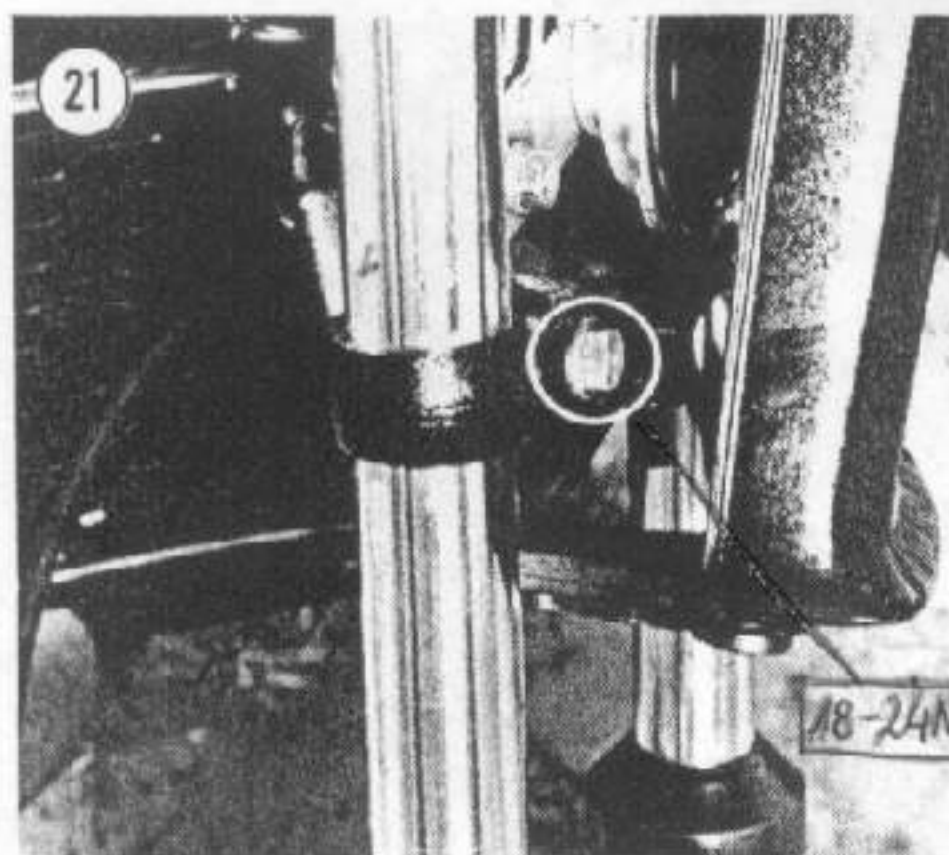
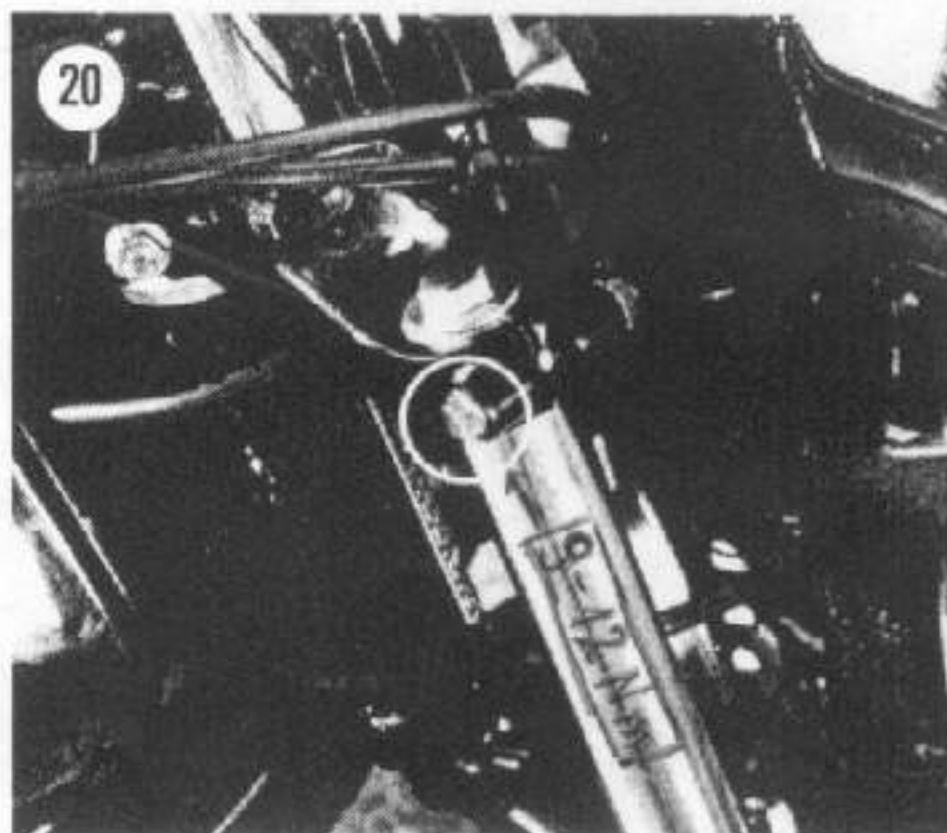
6. Loosen upper fork bridge bolts (Figure 20).
7. Loosen lower fork bridge bolts (Figure 21).
8. Slide entire fork and fender assembly out.
9. Remove the top fork bridge.
10. Remove the adjuster nut with the pin spanner, provided in the CX500 tool kit, or use an easily improvised unit (Figure 22).
11. Have an assistant hold a large pan under the steering stem to catch the loose ball-bearings and carefully lower the steering stem (Figure 23).

NOTE: There are 37 balls total — 18 on the top and 19 on the bottom.

9.6.2.

Inspection

1. Clean the bearing races in the steering head, the steering stem races and all the ball-bearings with solvent.
2. Check for broken welds on the frame around the steering head.
3. Check each of the balls for pitting, scratches, or discoloration indicating wear or corrosion. *Replace them in sets if any are bad.*
4. Check upper and lower races in the steering head. See *Bearing Race Replacement* if races are pitted, scratched, or badly worn.
5. Check steering stem for cracks. Check bearing race on stem for pitting, scratches, or excessive wear.
6. Check inside of steering head adjuster (top ball race) for pitting, scratches, or excessive wear.

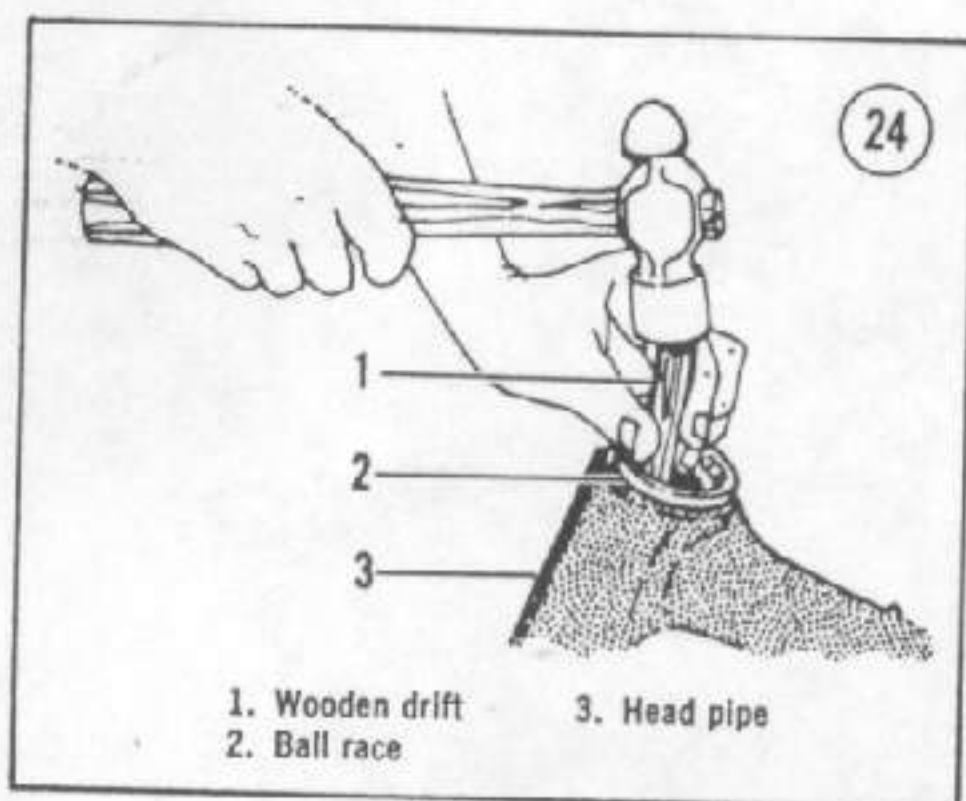


9.6.3.

Bearing Race Replacement

The headset and steering stem bearing races are pressed into place. Because they are easily bent, do not remove them unless they are worn and require replacement. Take old races to the dealer to ensure exact replacement.

To remove a headset race, insert a hardwood stick into the head tube and carefully tap the



race out from the inside (Figure 24). Tap all around the race so that neither the race nor the head tube are bent. To install a race, fit it into the end of the head tube. Tap it slowly and squarely with a block of wood (Figure 25).

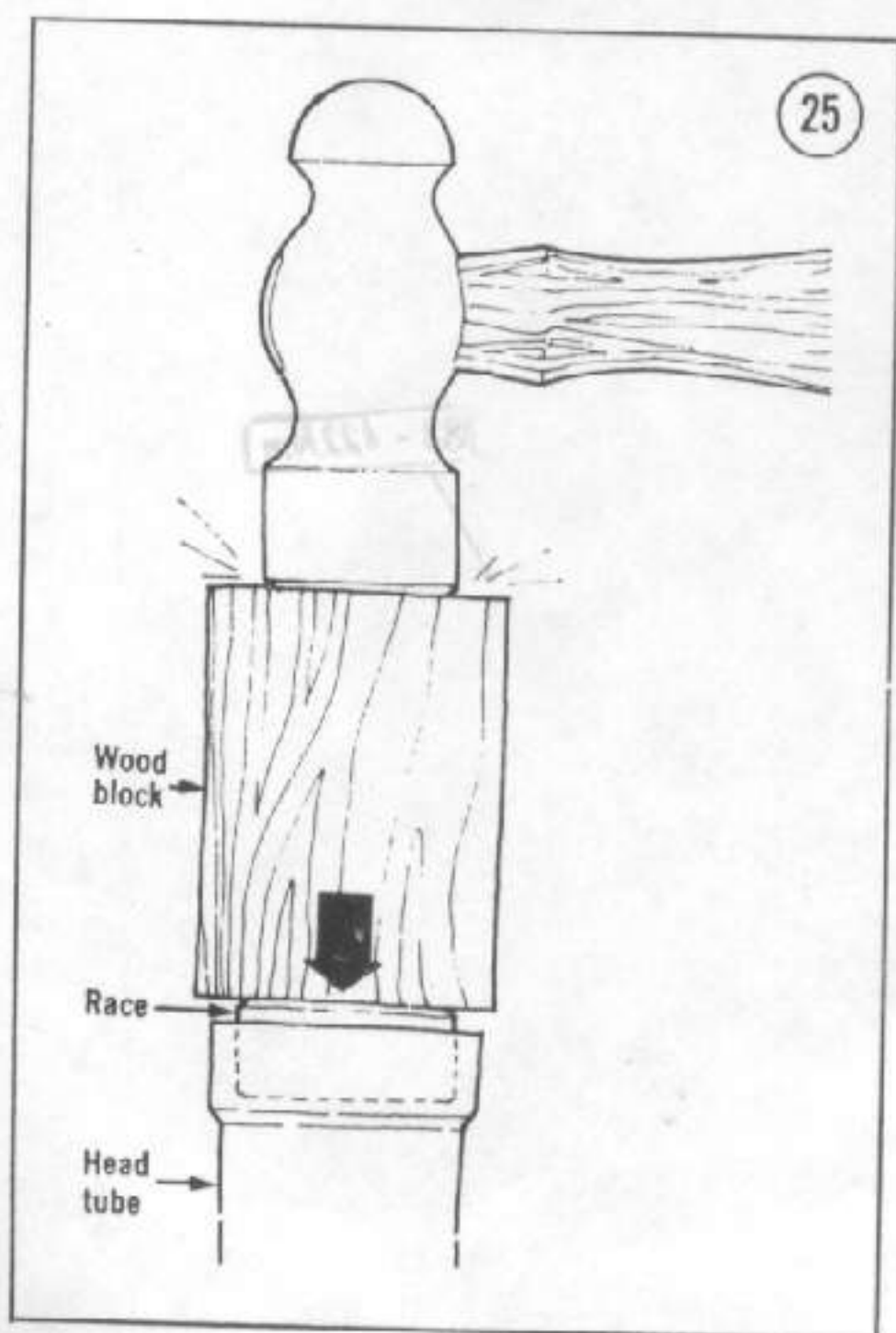
NOTE: The upper and lower races are different. Be sure that you install them at the proper ends of the head tube.

9.6.4.

Steering Stem Race and Dust Seal Removal/Installation

To remove the steering stem race, try twisting and pulling it up by hand. If it will not come off, carefully pry it up with a screwdriver, while working around in a circle, prying a little at a time. Remove the dust seal and the washer.

Install the washer and new dust seal. Slide the race over the steering stem with the bearing surface pointing up. Tap the race down with a piece of hardwood; work around in a circle so that the race will not be bent. Make sure it is seated squarely and all the way down.



9.6.5

Assembly

Refer to Figure 18 for this procedure.

1. Make sure the steering head and stem races are properly seated.
2. Install bottom bearing race cone over steering stem. Slide it down as far as possible.
3. Apply a coat of grease to bottom race cone and fit 19 ball bearings around it (Figure 26). The grease will hold them in place.
4. Fit 18 ball bearings into top race (Figure 27) in head tube. Grease will hold them in place.
5. Insert steering stem into head tube. Hold it firmly in place.
6. Install top bearing race cone.
7. Screw steering stem adjuster nut onto stem.
8. Tighten adjuster firmly to seat bearings. Use the pin spanner or tool shown in Figure 22.
9. Loosen adjuster until there is noticeable play in stem.
10. Tighten adjuster enough to remove all play, both horizontal and vertical (Figure 28), yet leaving it loose enough so that the assembly will turn to the locks under its own weight after an initial assist.

11. Install the top fork bridge.
12. Install the fork and fender assembly.
13. Tighten lower fork bridge bolts and torque them to 13-18 ft.-lb. (18-24 N•m).
14. Tighten the upper fork bolts and torque them to 7-9 ft.-lb. (9-12 N•m).
15. Install the steering stem nut and torque to 65-90 ft.-lb. (88-122 N•m).
16. Install the handlebar and headlight nacelle.

NOTE: Torque the 4 bolts securing the handlebar to 13-18 ft.-lb. (18-24 N•m).

17. Install the brake caliper assembly, torque attachment bolts to 22-29 ft.-lb. (29-39 N•m).
18. Install the front wheel as described under *Front Wheel Installation* in this chapter.
19. Bleed the brake as described under *Bleeding the System* in Chapter Eleven.

9.6.6.

Steering Stem Adjustment

If play develops in the steering system, it may only require adjustment. However, don't take a chance on it. Disassemble the stem and look for possible damage. Then reassemble and adjust as described in Steps 9-11, *Steering Head Assembly* in this chapter.

9.7

FRONT FORKS

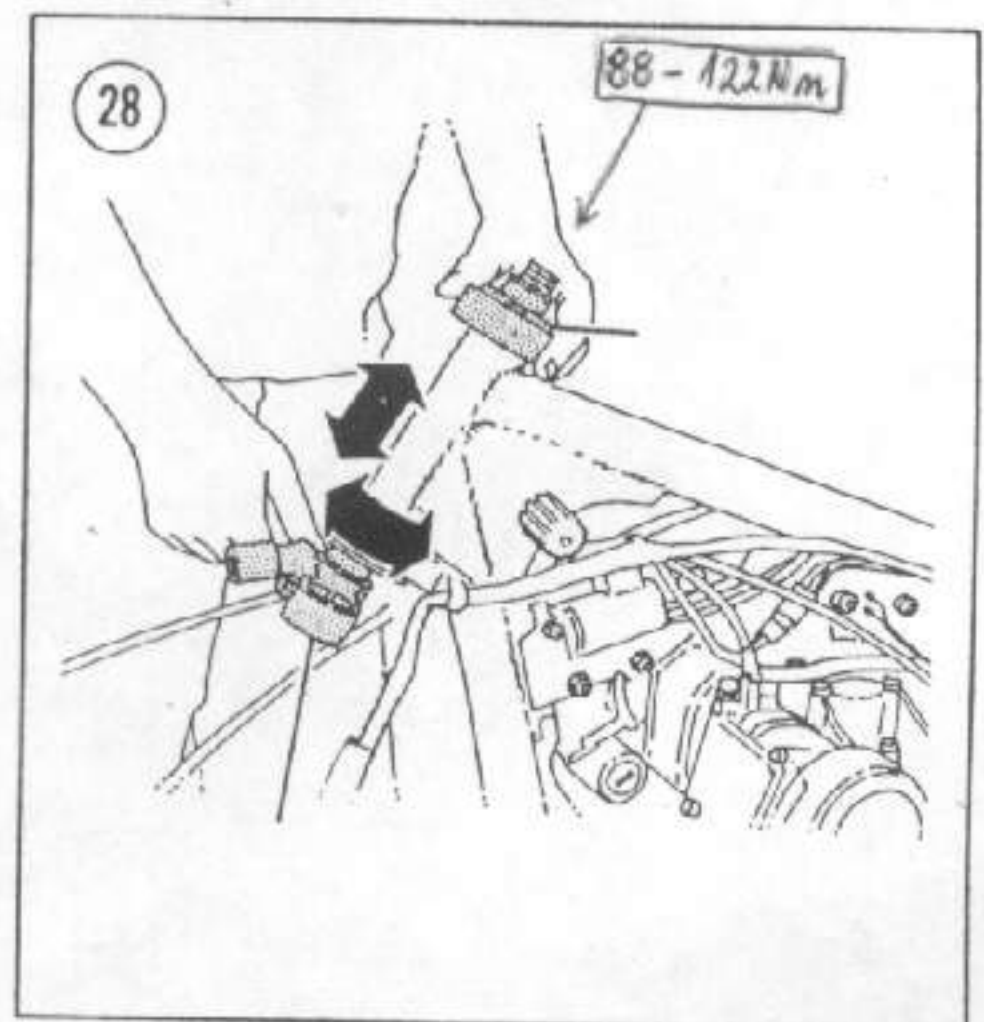
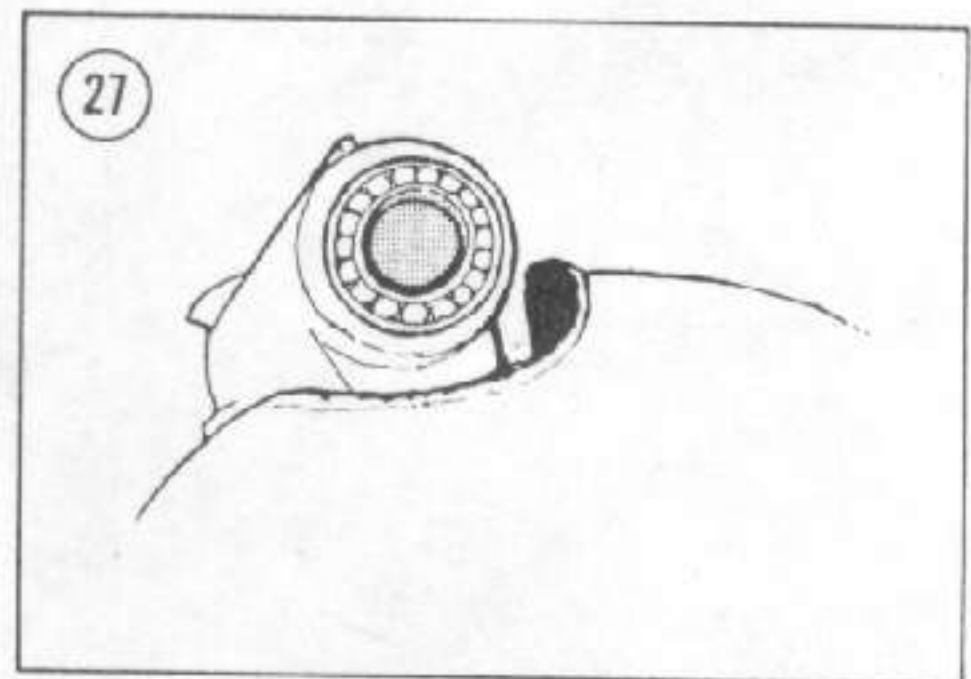
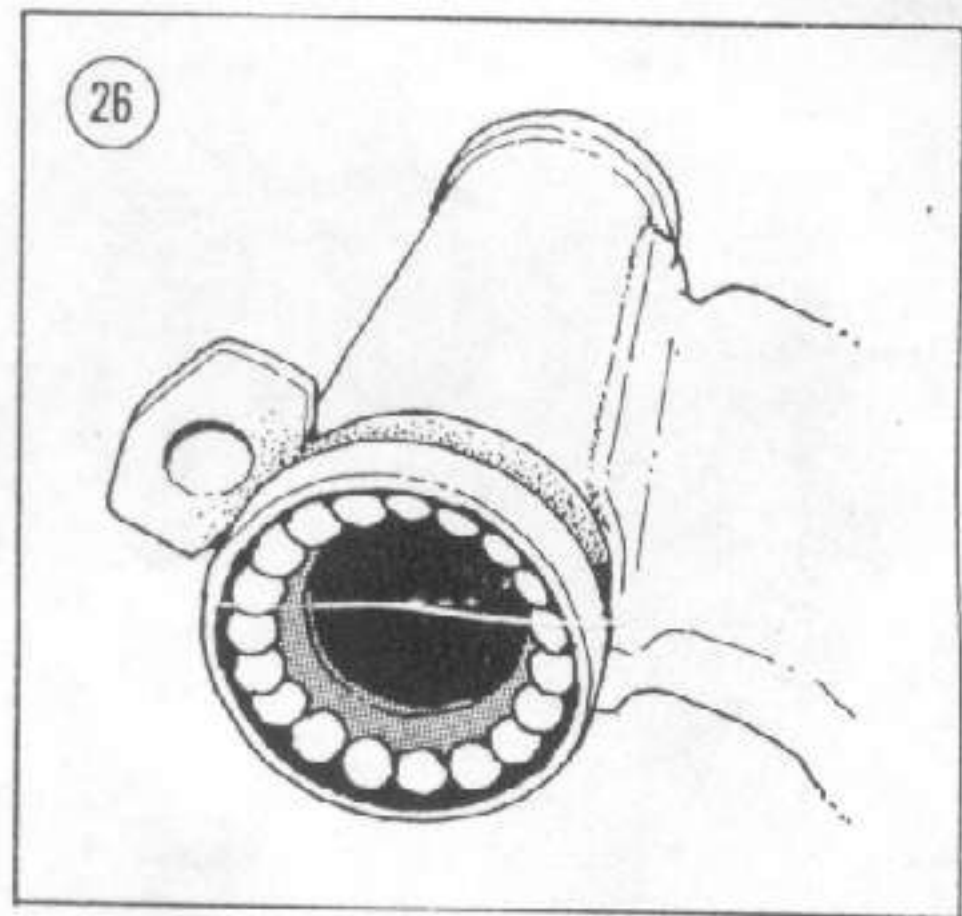
The Honda front suspension consists of a spring-controlled, hydraulically dampened telescopic fork. Before suspecting major trouble, drain the fork oil and refill with the proper type and quantity; refer to Chapter Three. If you still have trouble, such as poor dampening, tendency to bottom out or top out, or leakage around rubber seals, then follow the service procedures in this section.

To simplify forks service and to prevent the mixing of parts, the legs should be removed, serviced, and reinstalled individually.

9.7.1.

Removal/Installation

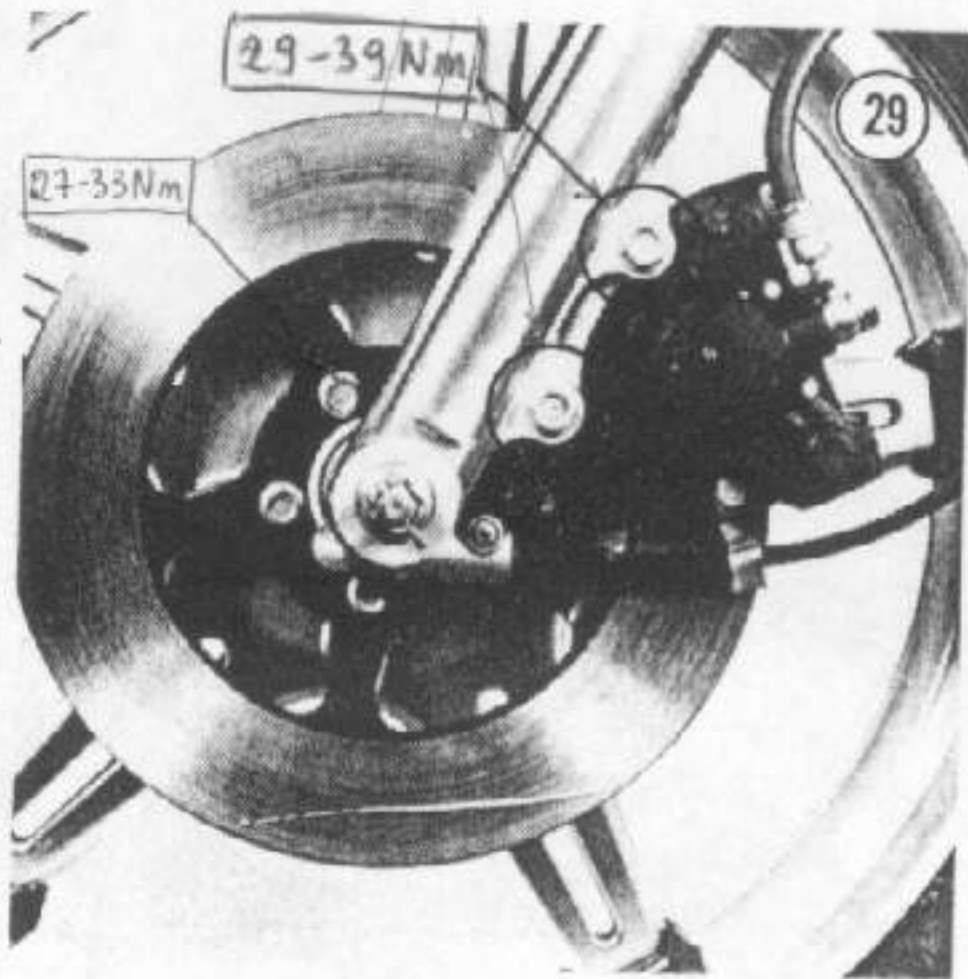
1. Remove the front wheel as described under *Front Wheel Removal* in this chapter.
2. Remove the bolts securing the front fender and remove it.



3. Remove the 2 bolts securing the brake caliper assembly to the fork leg (Figure 29) and lift the caliper off. Tie it up with wire to keep tension off the brake line.

NOTE: Insert a piece of wood in the caliper in place of the disc. That way, if the brake lever is inadvertently squeezed

the piston will not be forced out of the cylinder. If it does happen the caliper might have to be disassembled to reseal the piston, and the system will have to be bled. By using the wood, bleeding the brake is not necessary when installing the wheel.



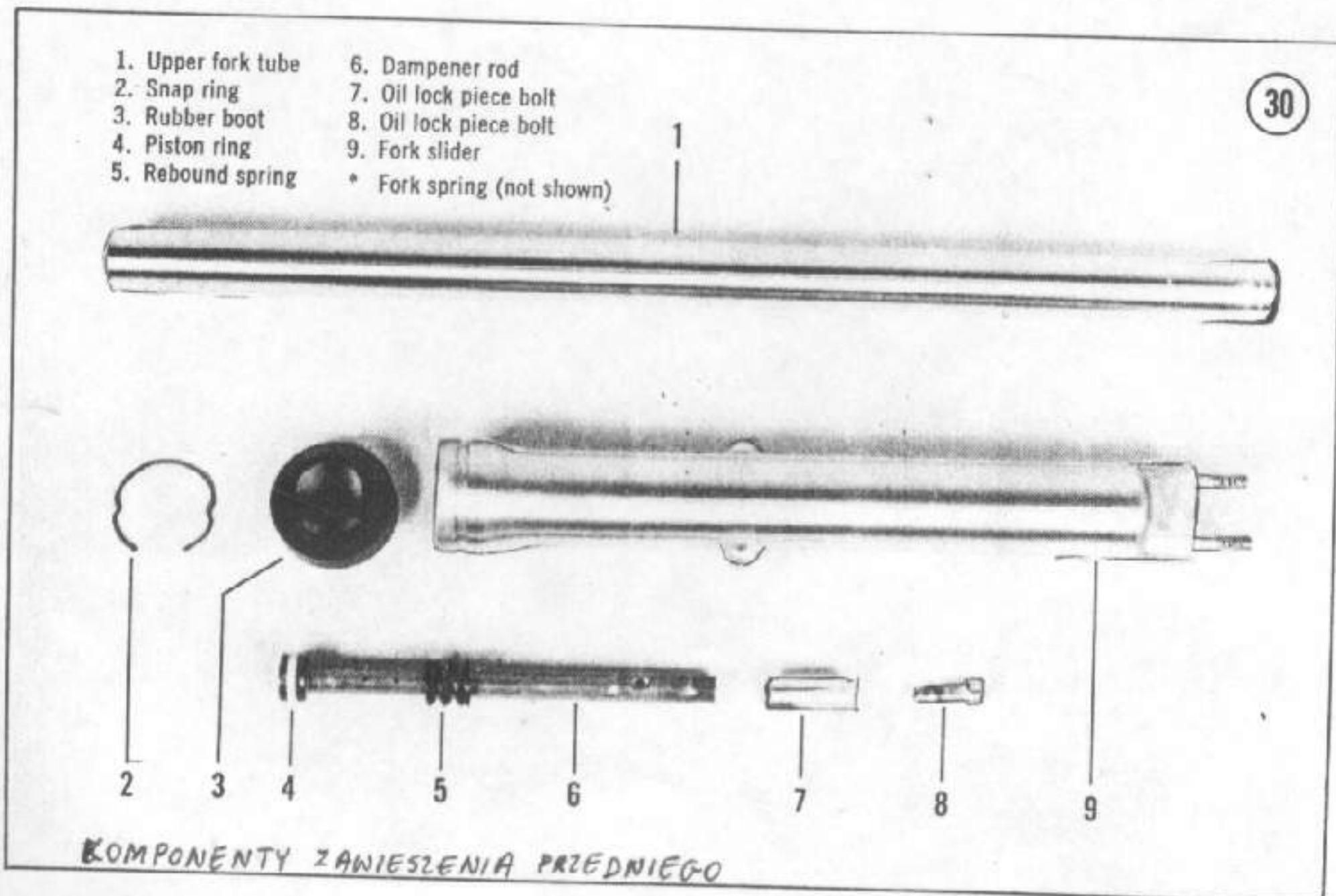
4. Loosen the lower fork bridge bolt (Figure 21).
5. Loosen the upper fork bolt (Figure 20).
6. Remove the fork tube. It may be necessary to slightly rotate the tube while removing it.
7. Install by reversing removal steps. Torque the upper fork bolts (Figure 20) to 7-9 ft.-lb. (9-12 N•m), lower fork bridge bolts (Figure 21) to 13-18 ft.-lb. (18-24 N•m) and the disc brake caliper assembly bolts (Figure 29) to 22-29 ft.-lb. (29-39 N•m).

9.7.2.

Disassembly

Refer to Figure 30 for this procedure.

1. Hold the fork tube in a vise with soft jaws. Keep the slider end lower than the top end.



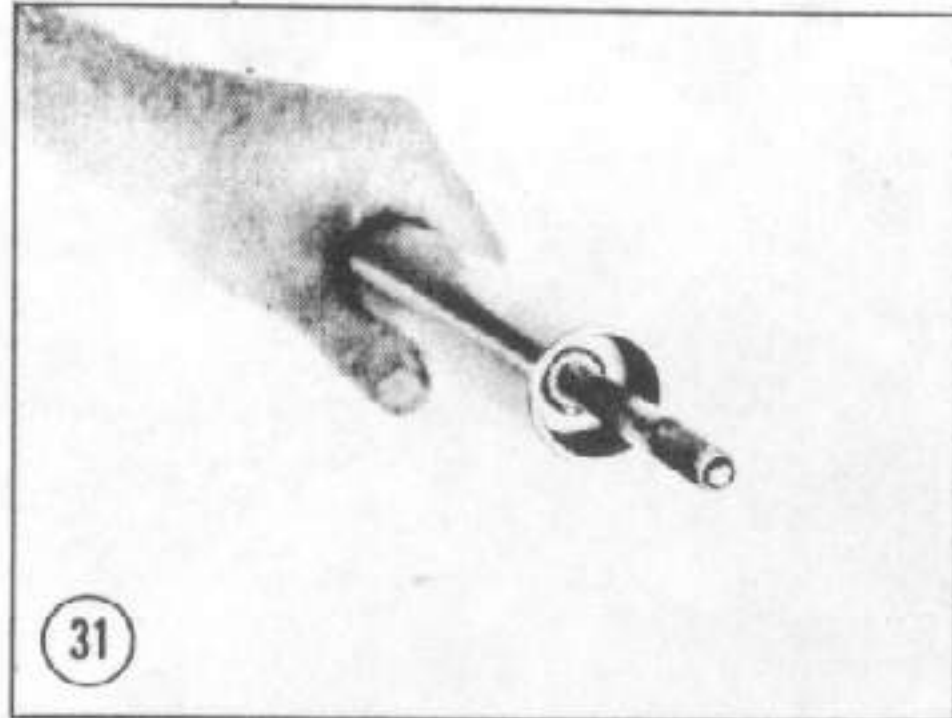
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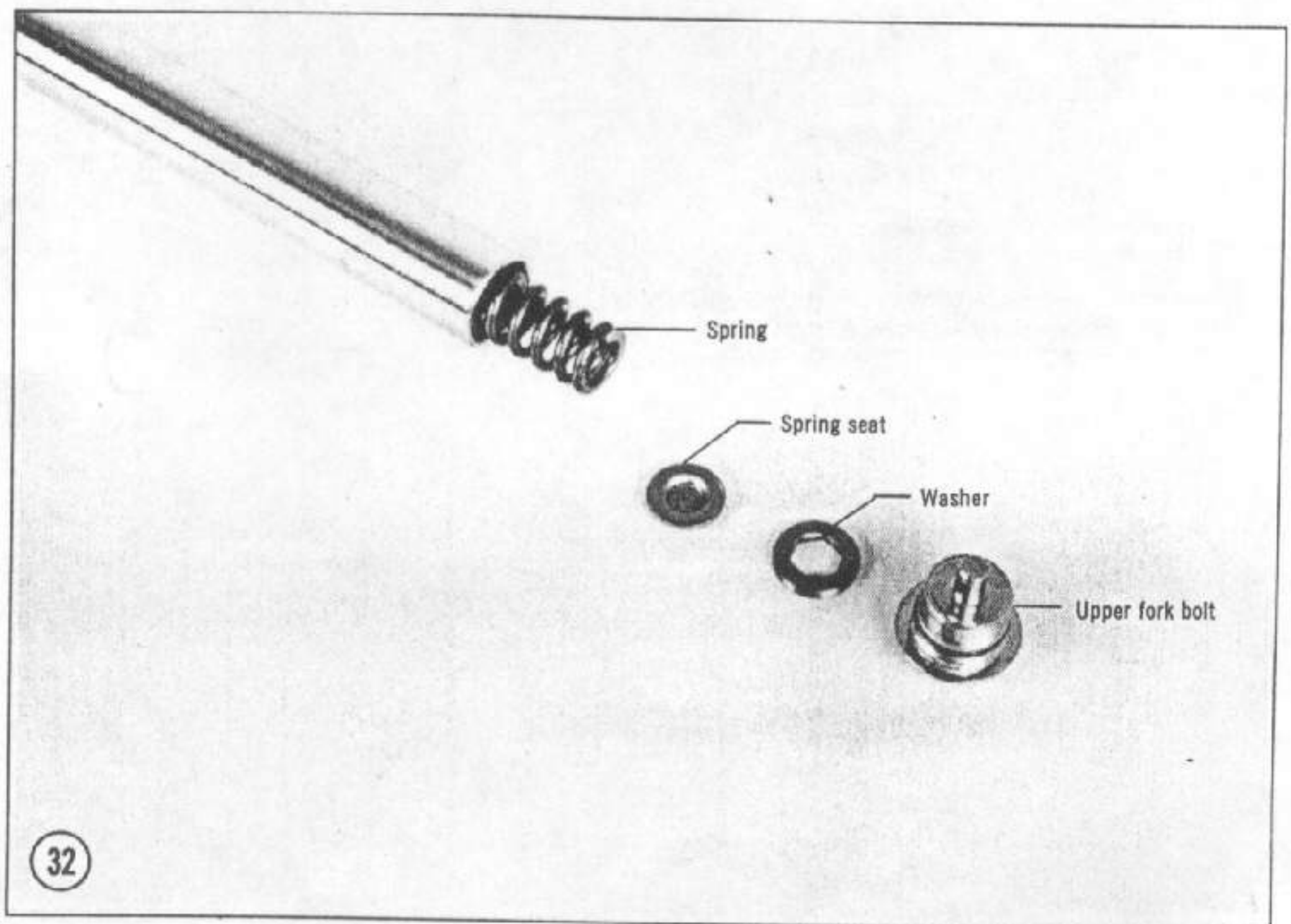
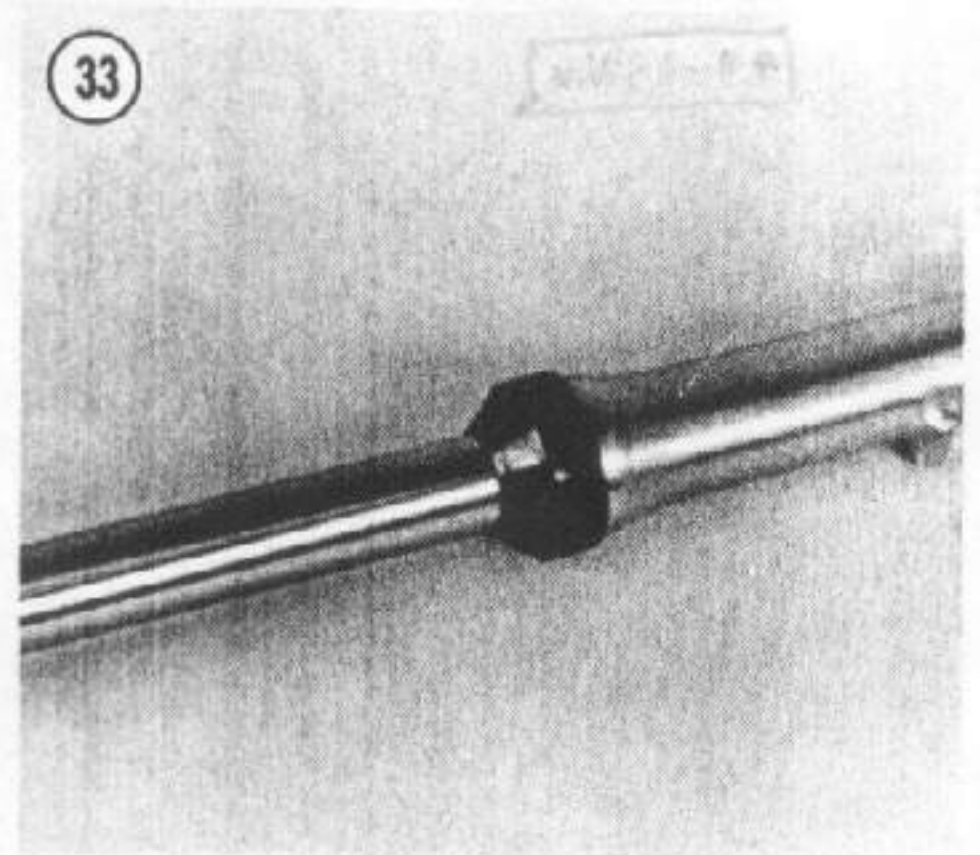
WARNING

Be careful when removing the top bolt as the spring is under pressure.

2. Remove the top bolt from the fork. Use a 14mm Allen wrench or insert the head of a 14mm bolt (Figure 31) into the socket and turn it with Vise Grips.
3. Remove the washer, spring seat and spring (Figure 32).



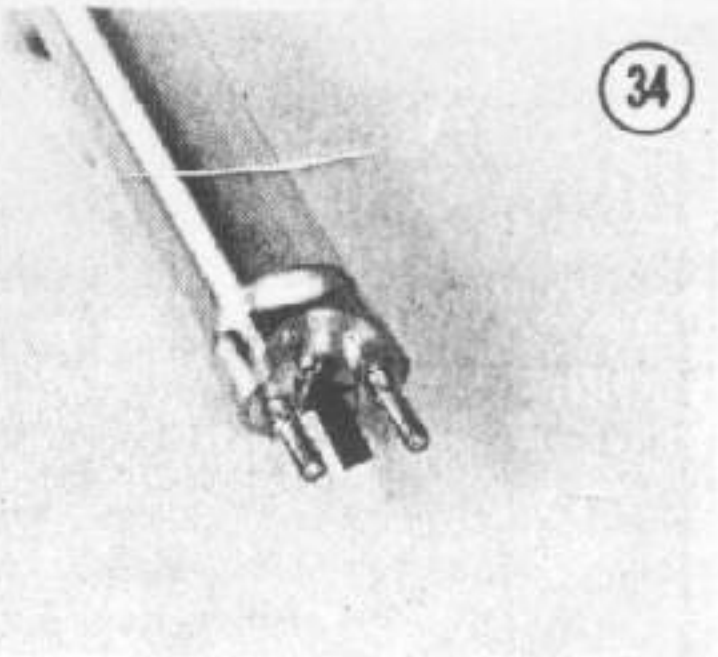
4. Remove the fork from vise and pour the oil out and discard. Pump the fork several times by hand to get most of the oil out.
5. Remove the rubber boot (Figure 33) out of the notch in the slider and slide it off of the fork tube.
6. Clamp the slider in a vise with soft jaws.



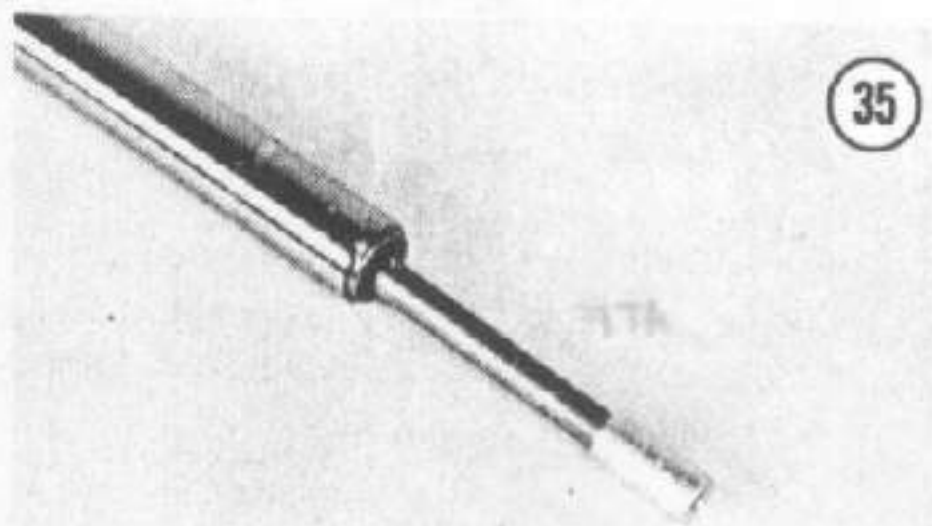
7. Remove the 6mm Allen bolt (Figure 34) at the bottom of the slider and pull the fork tube out of the slider.
8. Remove the oil lock piece (Figure 35), the dampener rod and rebound spring (Figure 36).
9. Remove snap ring and oil seal (Figure 37).

CAUTION

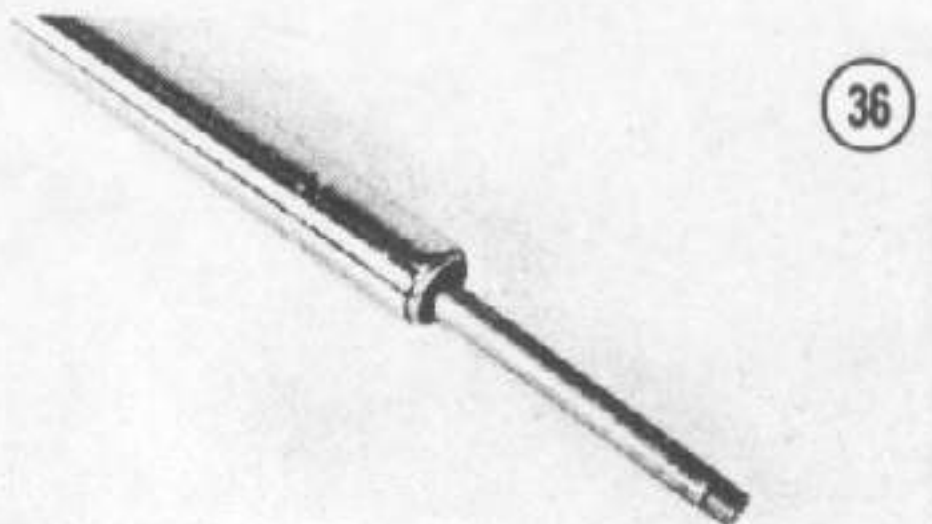
Use a dull screwdriver blade to remove oil seal. Do not damage the outer or inner surface of the slider.



34



35

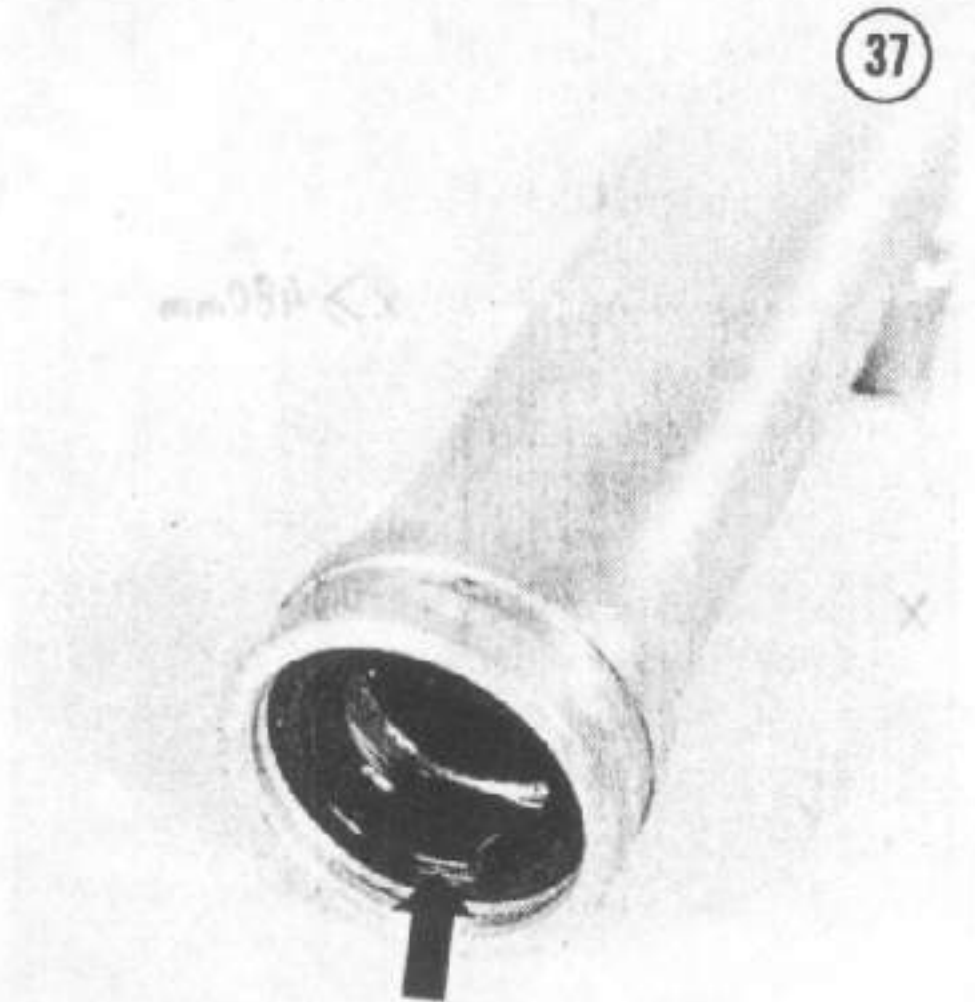


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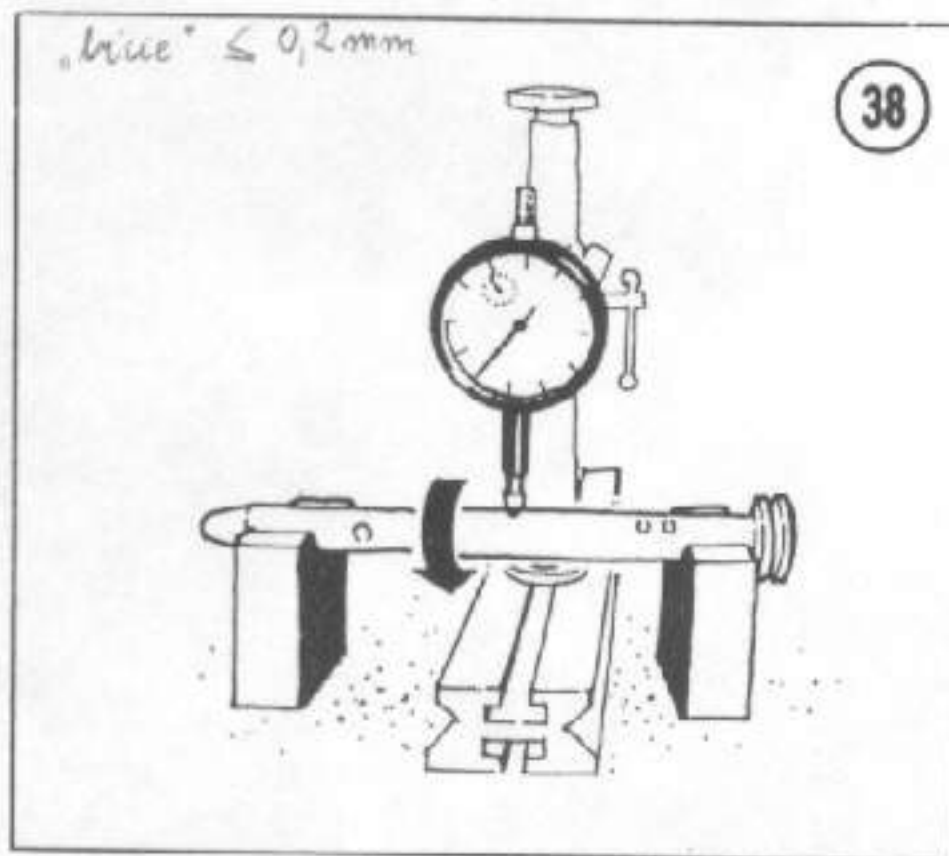
§ 7.3.

Inspection

1. Thoroughly clean all parts in solvent and dry. Check the fork tube for signs of wear or galling.
2. Check the dampener rod for straightness. Figure 38 shows one method. The rod should be replaced if the runout is 0.008 in. (0.2mm) or greater.
3. Carefully check the dampener valve and the piston ring for wear or damage.
4. Inspect the oil seals for scoring and nicks and loss of resiliency. Replace if its condition is questionable.



37



5. Measure uncompressed length of the spring with a square as shown in **Figure 39**. Replace the spring if it is 18.90 in. (480mm) or shorter.
6. Any parts that are worn or damaged should be replaced; simply cleaning and reinstalling unserviceable components will not improve performance of the front suspension.

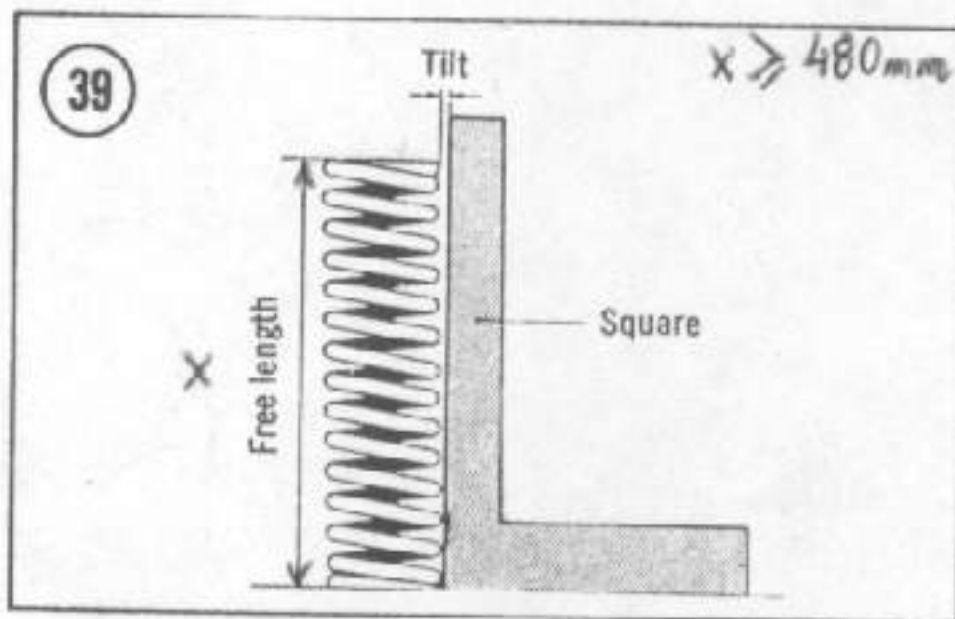
9.7.4.

Assembly

1. Install the oil seal and snap ring (**Figure 37**).

NOTE: Make sure seal seats squarely and fully in the bore of the slider.

2. Insert the dampener rod into fork tube (**Figure 36**) and install oil lock piece (**Figure 35**).
3. Apply a light coat of oil to the outside of the fork tube and install it into the slider. Apply Loctite Lock 'N' Seal to the threads of the Allen bolt and install it (**Figure 34**).

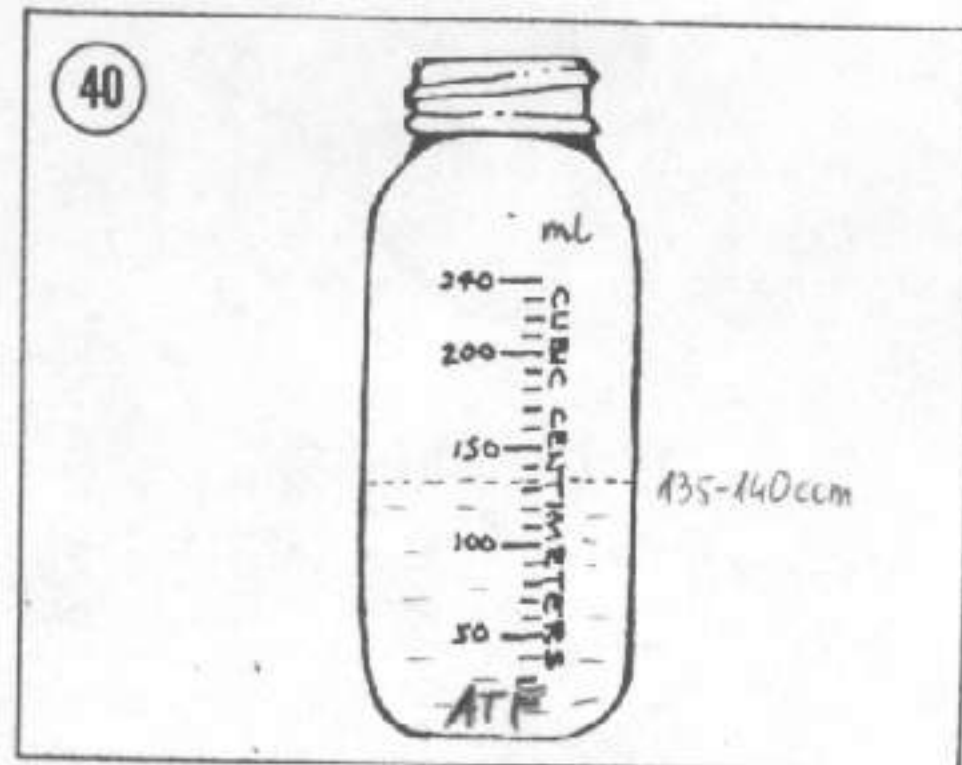


4. Slide the rubber boot into place (**Figure 33**).
5. Fill the fork tube with 4.5-4.7 oz. (135-140cc) of fresh oil.

NOTE: Use only Automatic Transmission Fluid (ATF).

NOTE: In order to measure the correct amount of fluid, use a plastic baby bottle. These have measurements in fluid ounces (oz.) and cubic centimeters (cc) on the side (**Figure 40**).

6. Insert the spring with the tapered end down toward the axle. Install the spring seat, washer, and the top bolt.
7. Install the fork as described under *Front Fork Removal/Installation* in this chapter.



CHAPTER TEN

REAR SUSPENSION AND FINAL DRIVE

This chapter includes repair and replacement procedures for the rear wheel, final drive unit and rear suspension components.

10.1 REAR WHEEL

Refer to **Figure 1** for this procedure.

10.1.1.

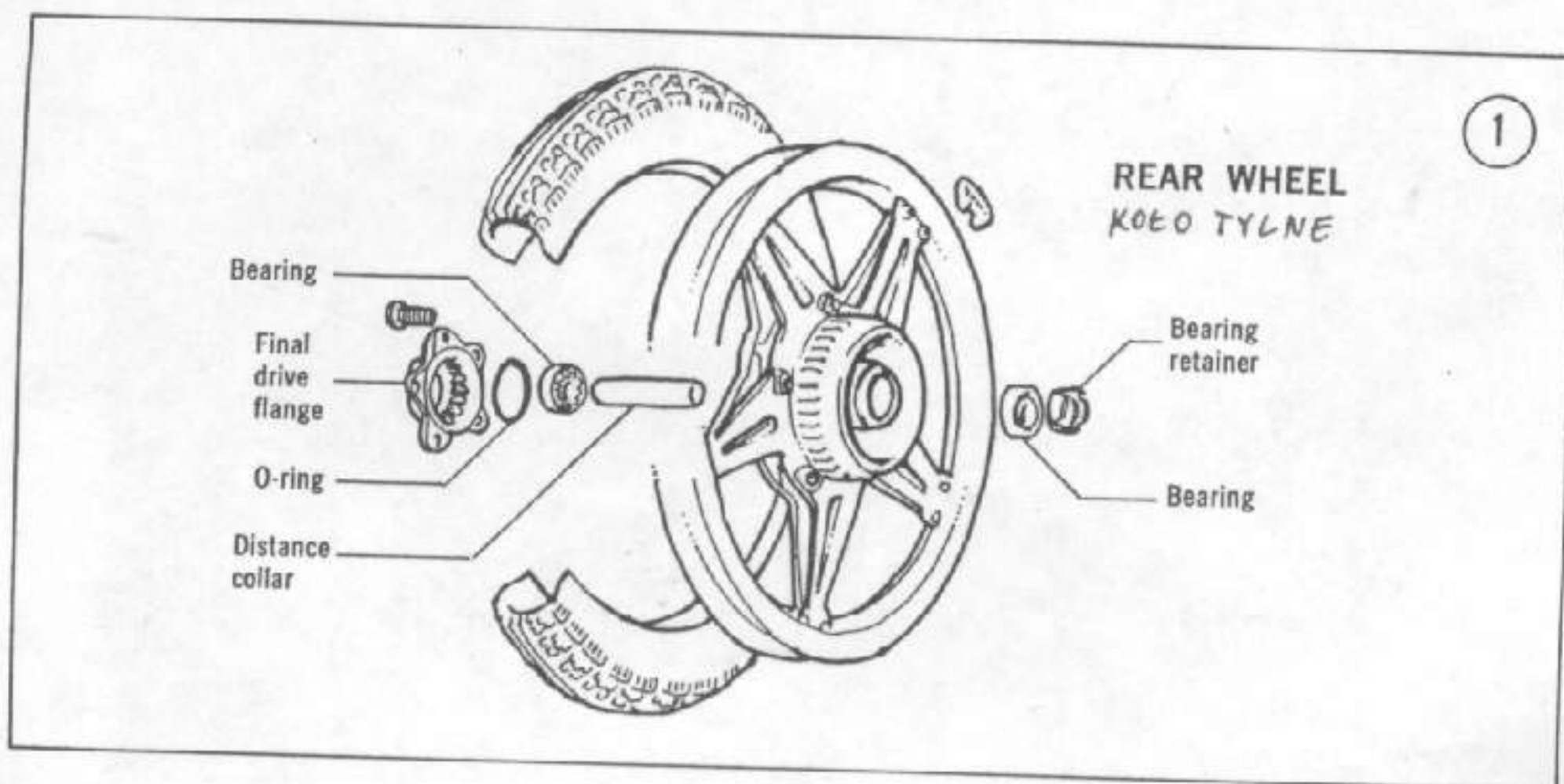
Removal/Installation

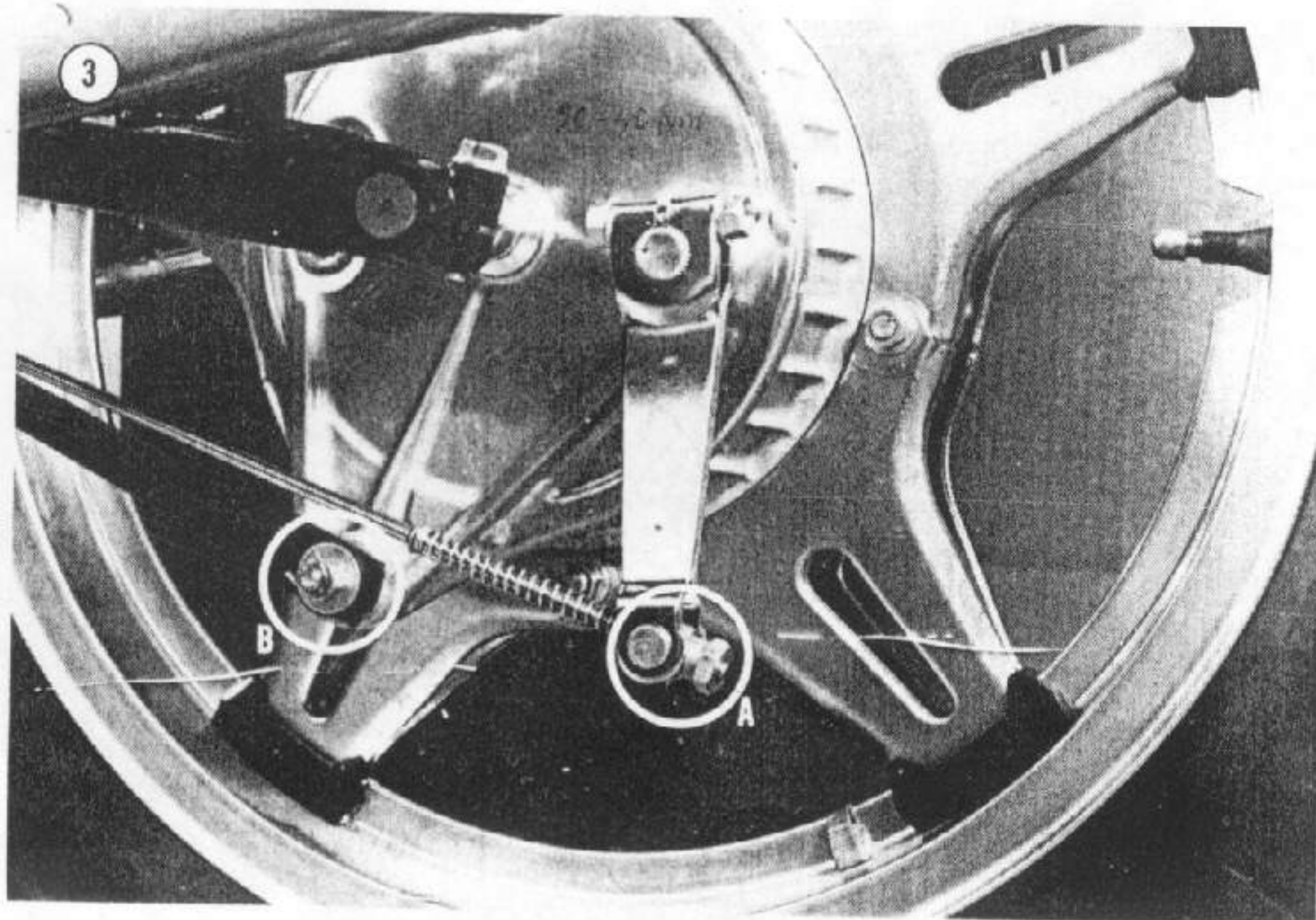
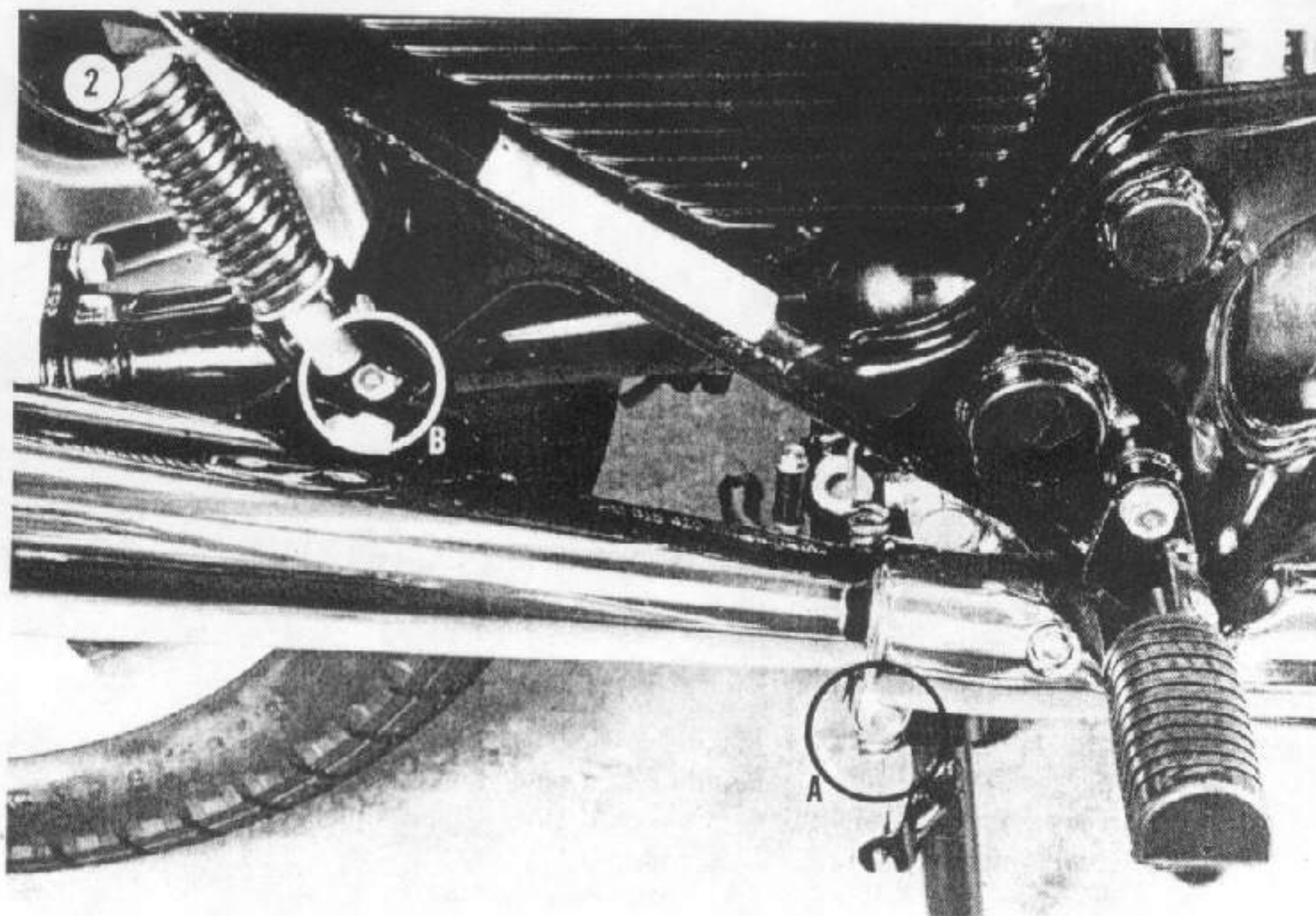
1. Place a support block under the engine crankcase so that the rear wheel clears the ground.

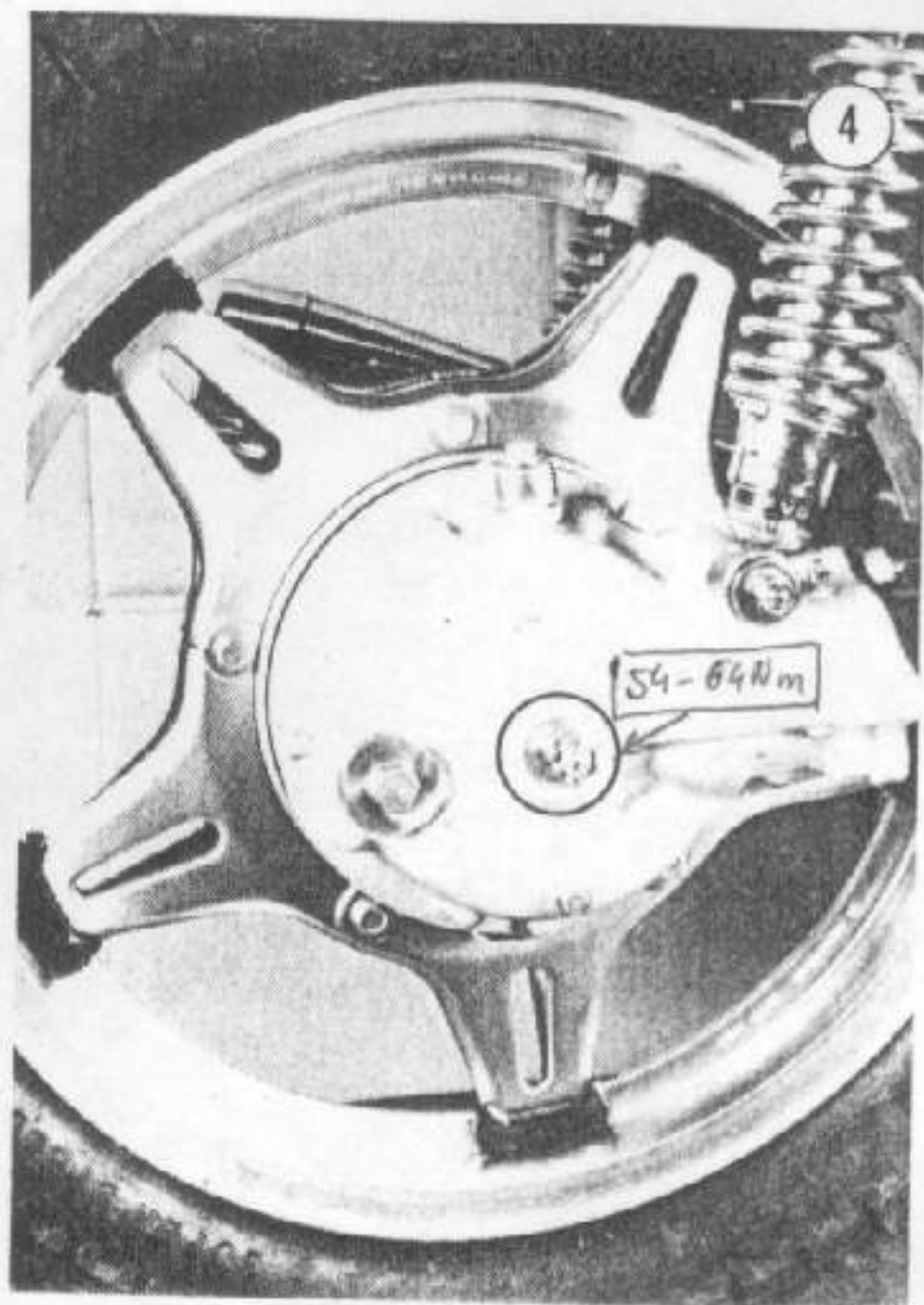
2. Loosen the clamps (A, **Figure 2**) securing the mufflers to the common collector. Remove the bolt securing the rear foot pegs and mufflers (B, **Figure 2**). Slide the mufflers out of the collector and remove them.

3. Remove the brake rod adjusting nut (A, **Figure 3**). Separate the rod from the brake arm.

4. Remove the cotter pin, backing plate stop nut, washer, rubber grommet (B, **Figure 3**) and disconnect the torque arm from the backing plate.







5. Remove cotter pin and axle nut (Figure 4). Discard the cotter pin. Loosen the axle holder bolt (A, Figure 5).

6. Withdraw the axle bolt from the left side. Catch the axle spacer (B, Figure 5) as the axle bolt is withdrawn.

7. Slide the wheel to the left to disengage it from the hub drive spline and remove the wheel.

8. Install by reversing the removal steps. Apply molybdenum disulfide grease to the final drive flange splines on the wheel (Figure 6) and the ring gear (Figure 7).

9. Make sure that the wheel hub splines engage with the final drive.

10. Torque the axle nut to 40-47 ft.-lb. (54-64 N•m), the brake torque arm bolt and nut to 11-17 ft.-lb. (15-23 N•m) and the axle holder bolt to 15-22 ft.-lb. (20-30 N•m). Install a new cotter pin on the axle nut.

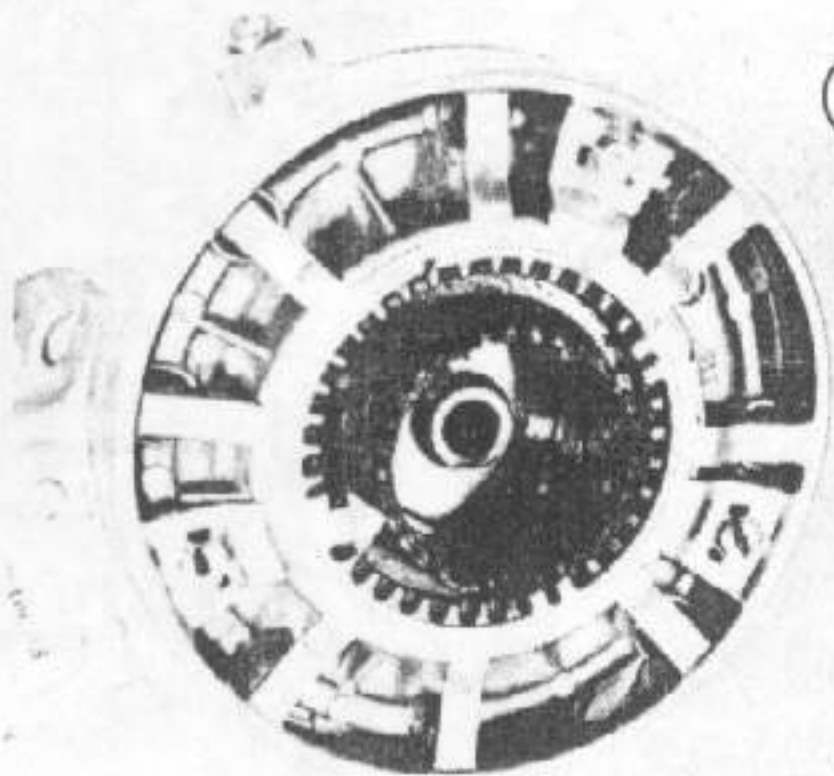
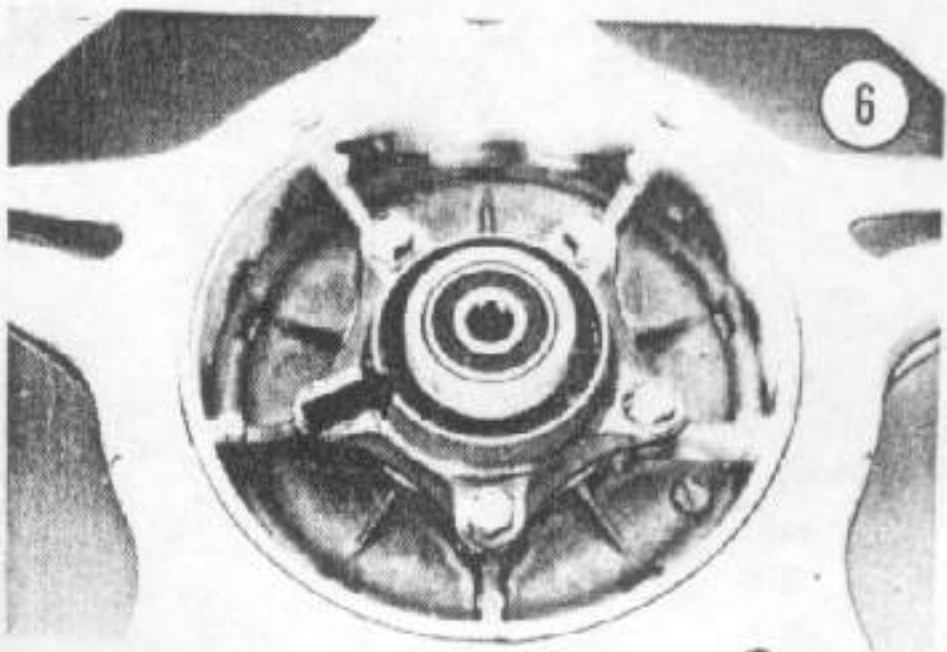
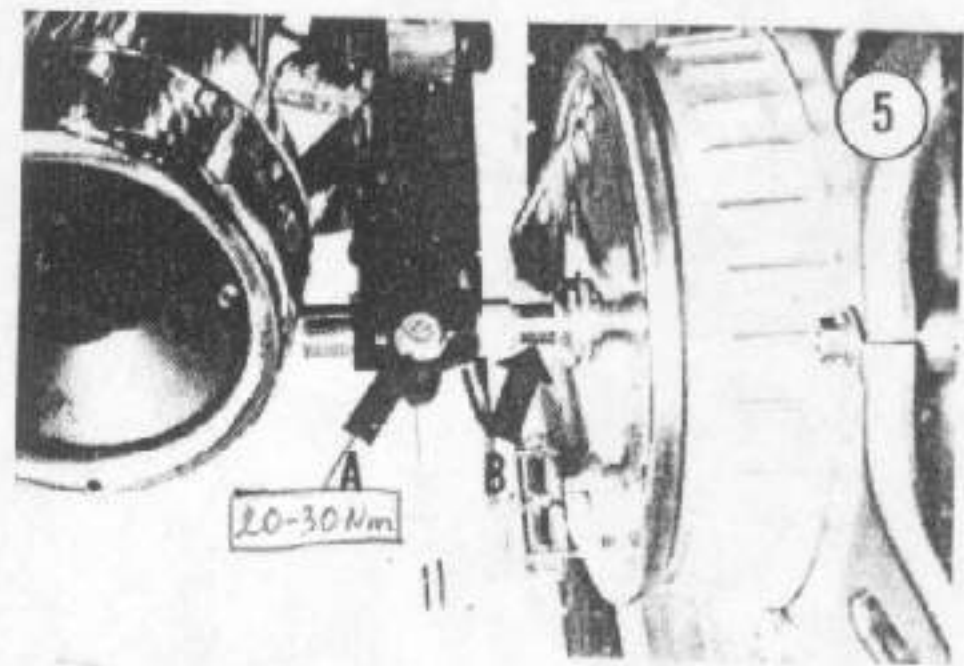
CAUTION

Never reuse a cotter pin. Always install a new one.

10.1.2.

Inspection

Measure the wobble and runout of the wheel rim with a dial indicator as shown in Figure 8. The standard value for both wobble and runout is 0.02 in. (0.5mm). The maximum permissible limit is 0.08 in. (2mm). If the runout exceeds the limit it will have to be replaced as the Com-Star wheel cannot be serviced.



10.2

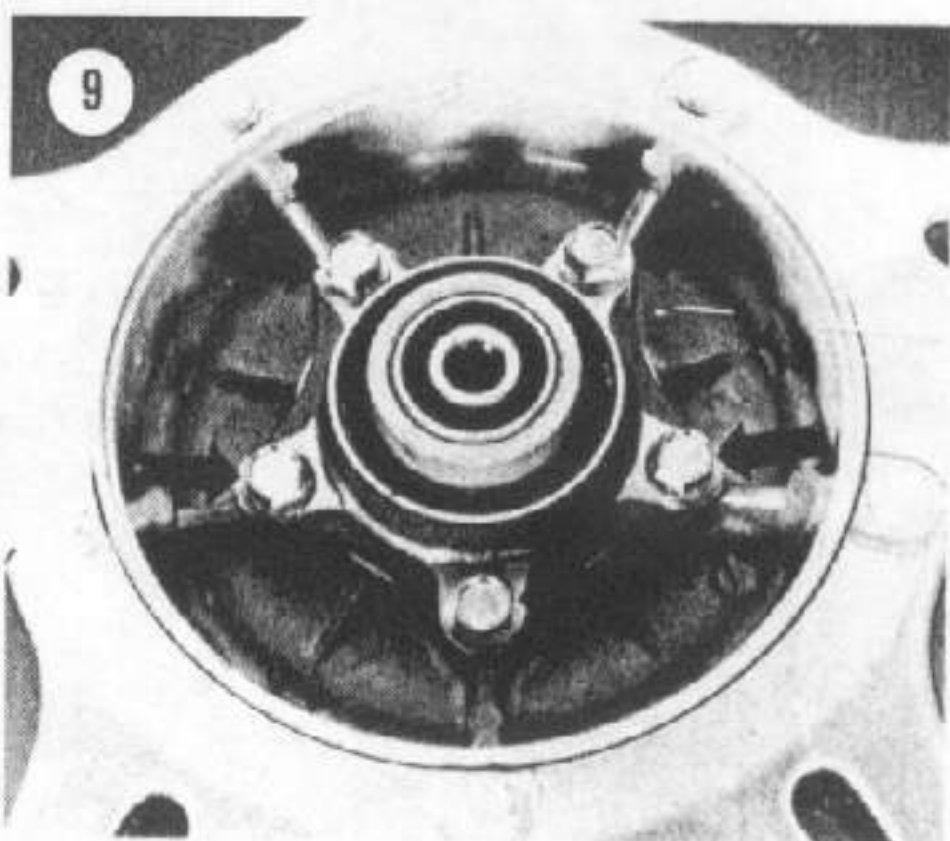
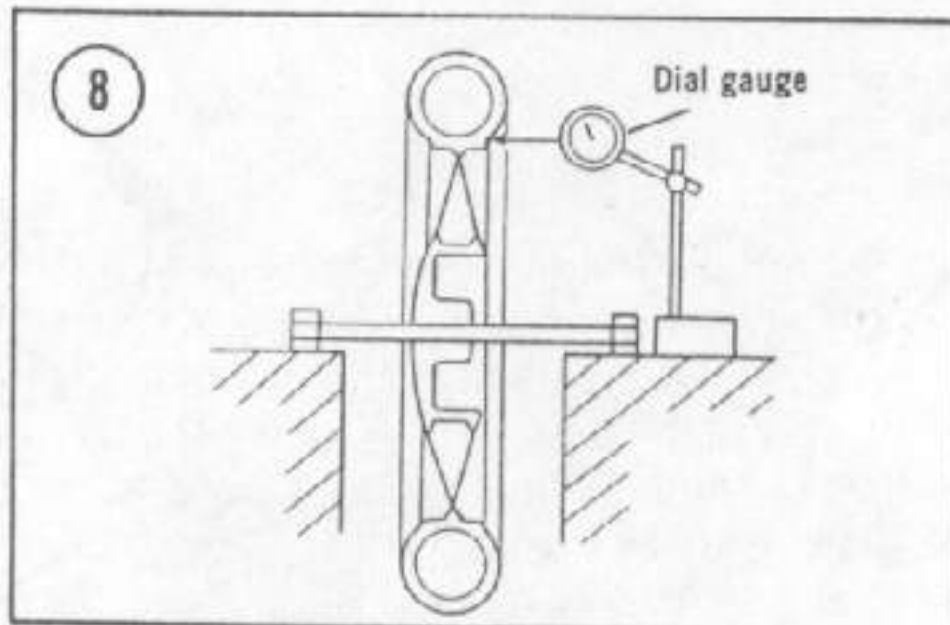
REAR HUB

10.2.1.
Disassembly

1. Remove rear wheel as described under *Rear Wheel Removal/Installation* in this chapter.
2. Pull the brake assembly straight up and out of the brake drum.
3. Remove the 5 bolts (Figure 9) and pull out the final drive flange and O-ring.
4. Remove the right-hand bearing and distance collar.
5. Remove the bearing retainer from the hub (Figure 10).
6. Remove the left-hand bearing.

10.2.2.
Inspection

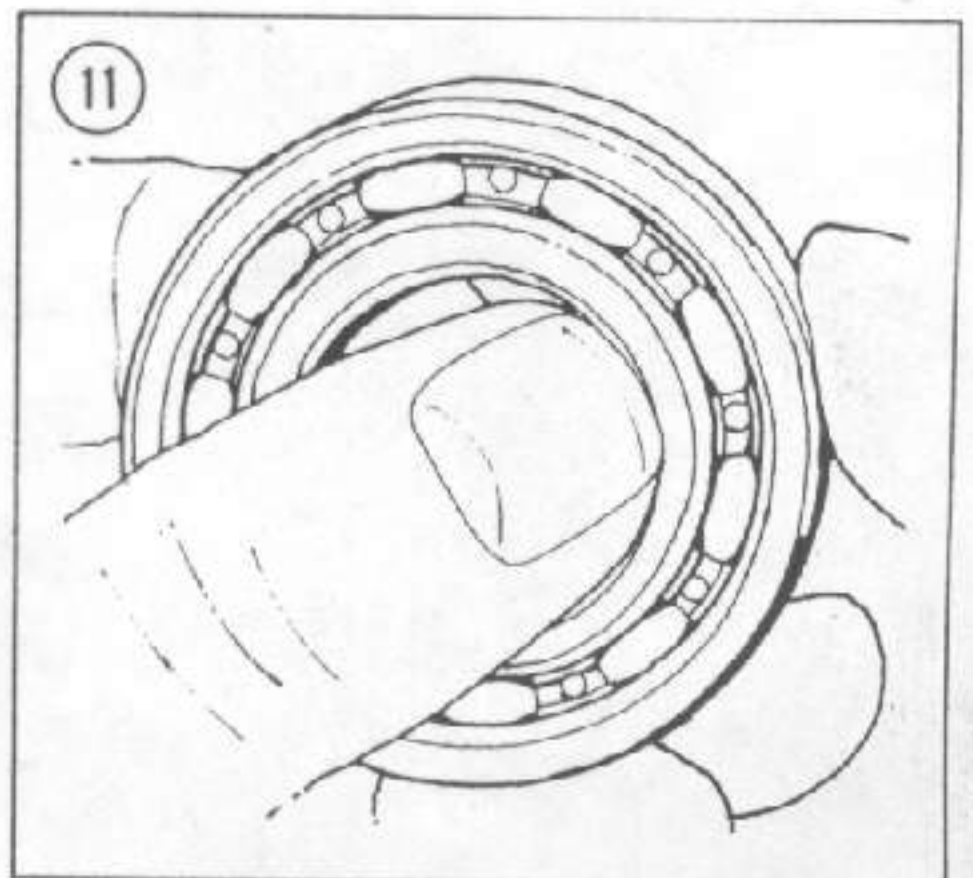
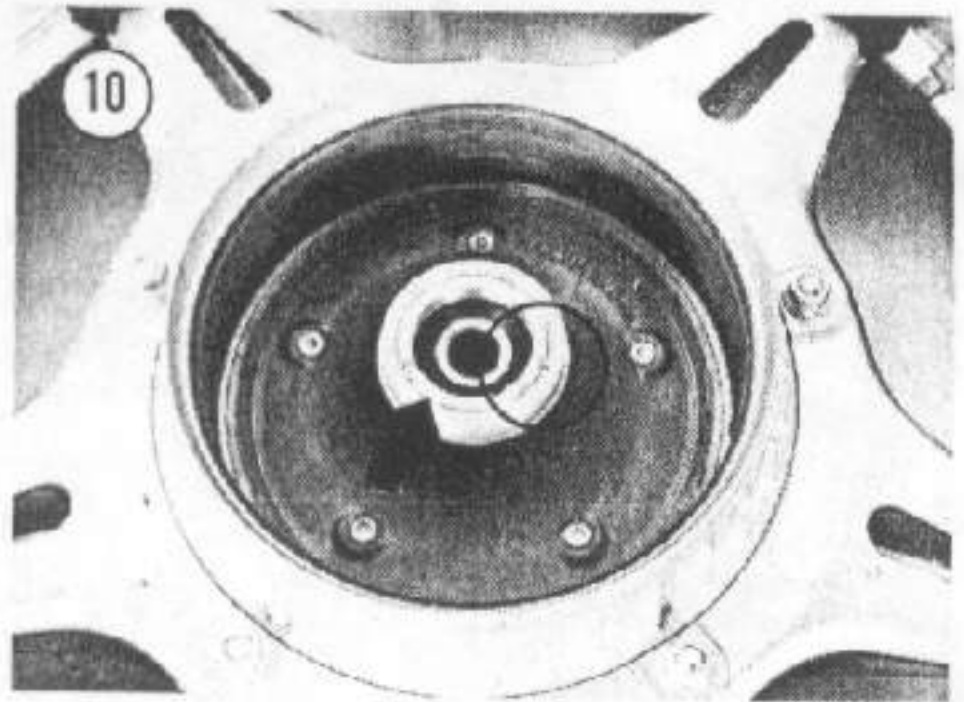
1. Clean bearings thoroughly in solvent and dry with compressed air. Do not let the bearing spin while drying.
2. Clean the inside and outside of the hub with solvent. Dry with compressed air.



3. Turn each bearing by hand (Figure 11). Make sure bearings turn smoothly. Check the balls for evidence of wear, pitting, or excessive heat (bluish tint). Replace if necessary; always replace as a complete set.
4. Check the axle for wear and straightness. Use V-blocks and a dial indicator as shown in Figure 12. If the runout is 0.008 in. (0.2mm) or greater, the axle must be replaced.
5. Check the brake drum surface (Figure 10) for out-of-round, scoring, and excessive wear.

10.2.3.
Assembly

1. Pack the bearing thoroughly with multipurpose grease. Work grease in between the balls completely.
2. Install the left-hand bearing.
3. Install the bearing retainer (Figure 10) and stake it with a centerpunch.



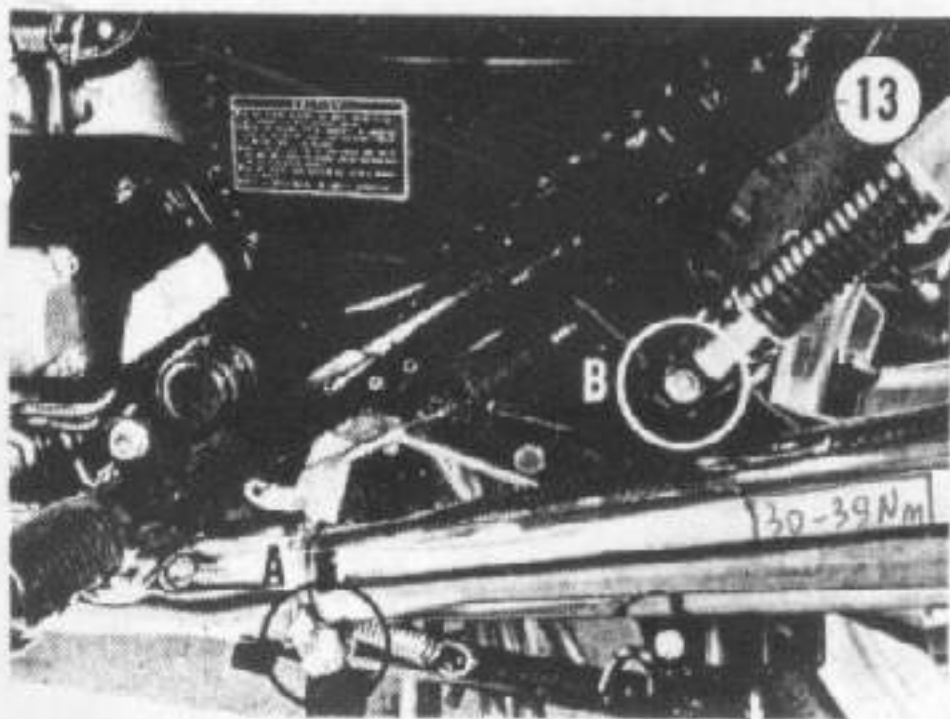
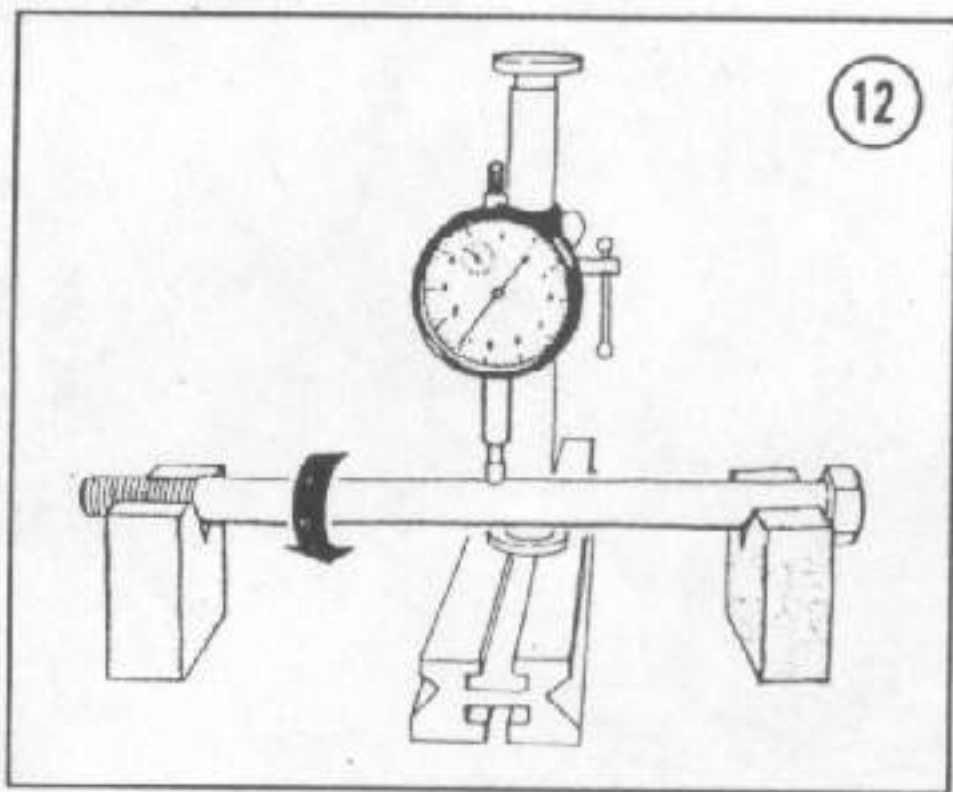
4. Press in the axle spacer.
5. Install the distance collar and drive in the right-hand wheel bearing.

NOTE: Install bearings with the sealed side facing outward.

CAUTION

Tap the bearings squarely into place and tap on the outer race only. Do not tap on the inner race or the bearings might be damaged. Be sure that the bearings are completely seated.

6. Install the O-ring. Apply molybdenum disulfide grease to the O-ring and final drive splines.
7. Install the final drive flange and torque the bolts to 29-36 ft.-lb. (39-48 N•m).
8. Install the brake assembly into the drum.
9. Install the wheel as described under *Rear Wheel Removal/Installation* in this chapter.



10.3

WHEEL BALANCING

For complete information refer to *Wheel Balancing* in Chapter Nine.

10.4

TIRE CHANGE

Refer to *Tire Changing* in Chapter Nine.

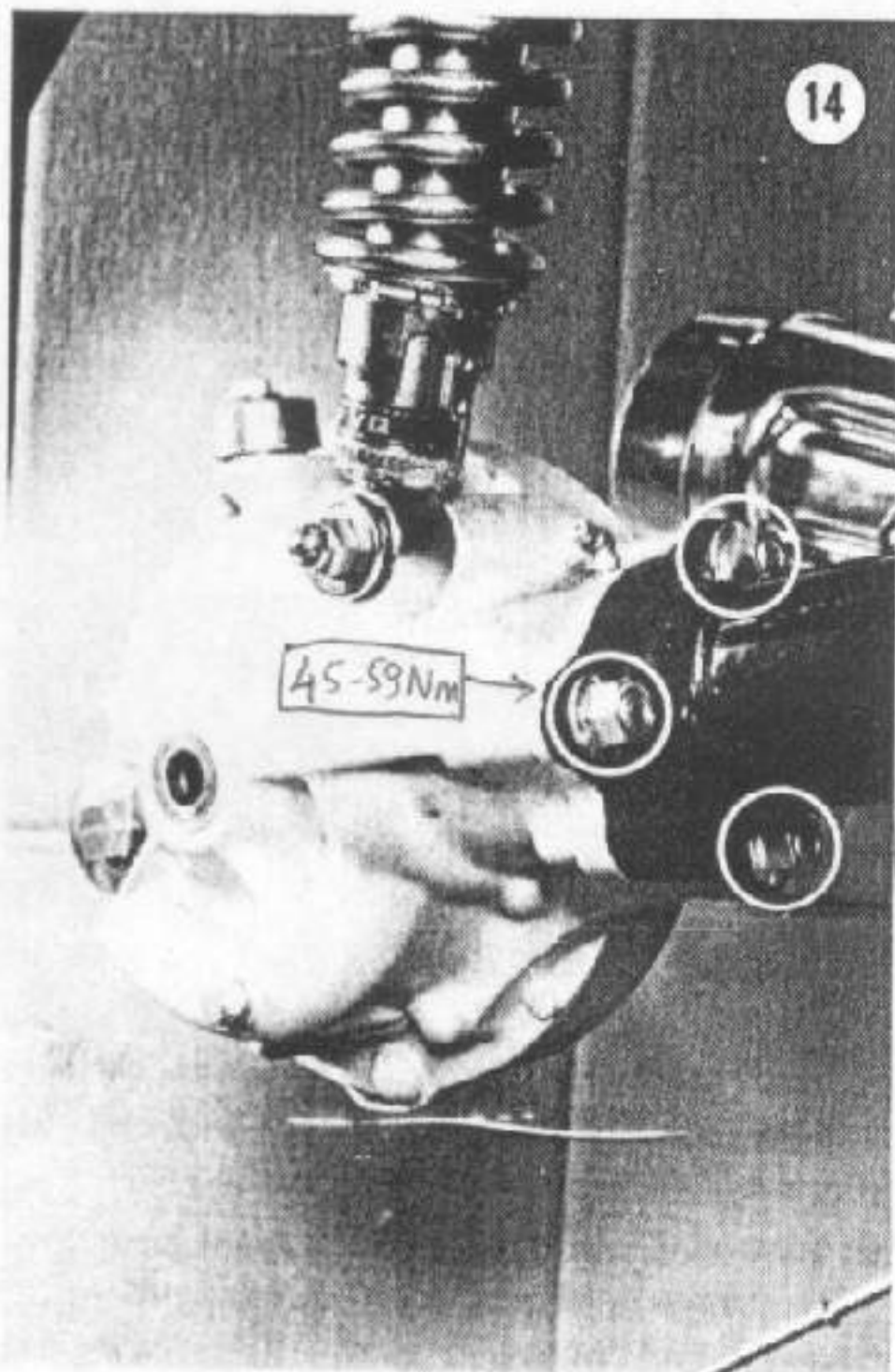
10.5

FINAL DRIVE

10.5.1.

Removal/Installation

1. Remove rear wheel as described under *Rear Wheel Removal/Installation* in this chapter.
2. Loosen the clamps securing the mufflers (A, **Figure 13**) to the collector and remove the bolts securing the rear foot pegs and mufflers (B, **Figure 13**). Remove the mufflers.
3. Remove the 3 nuts (**Figure 14**) securing the final drive unit to the swing arm.
4. Remove the right-hand lower shock absorber acorn nut (**Figure 15**).
5. Pull the final drive unit straight back until it is free.



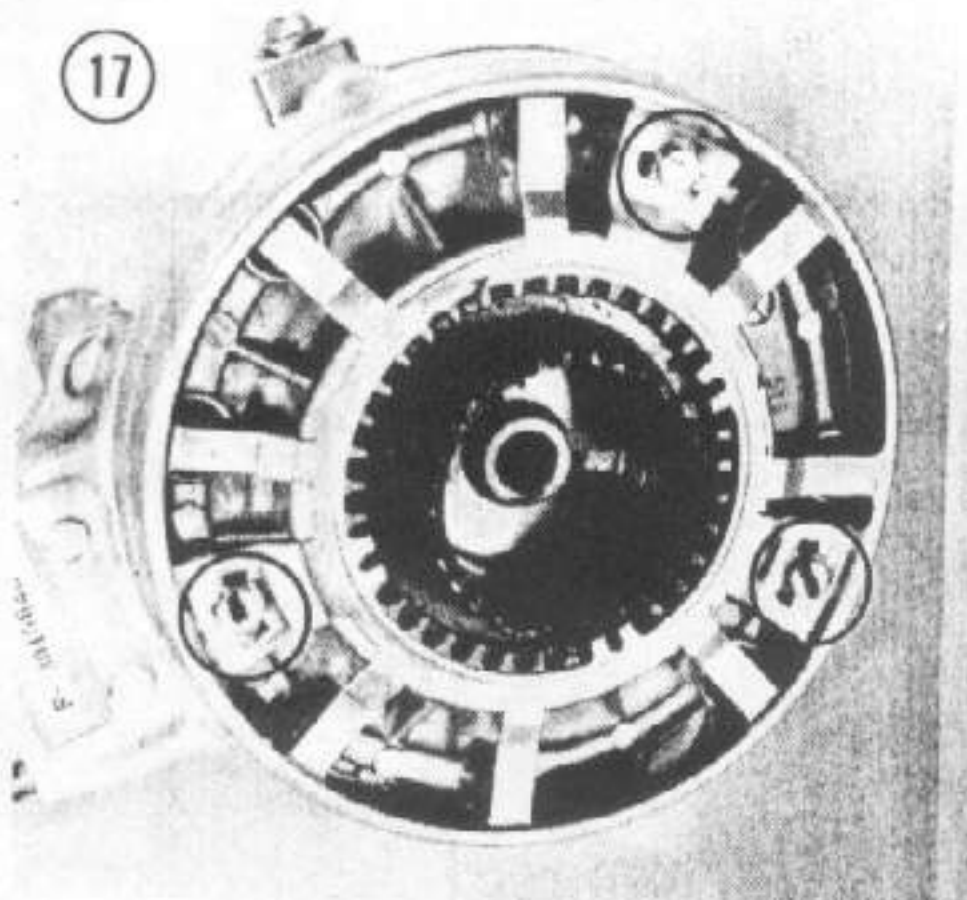
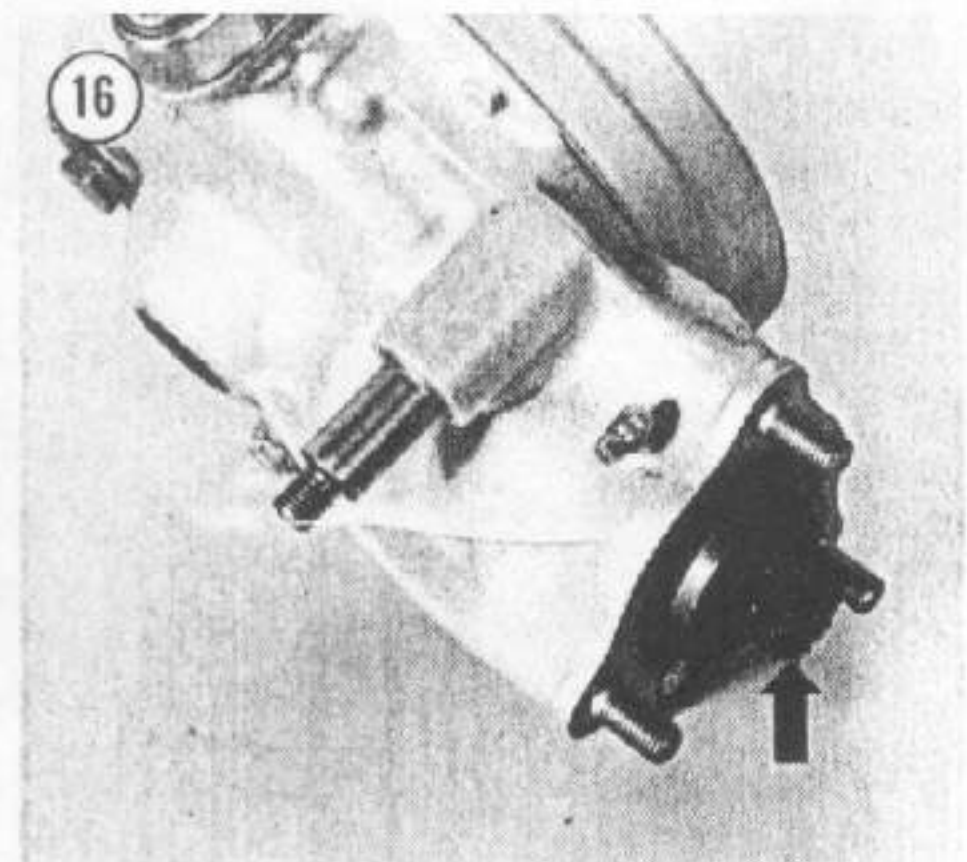
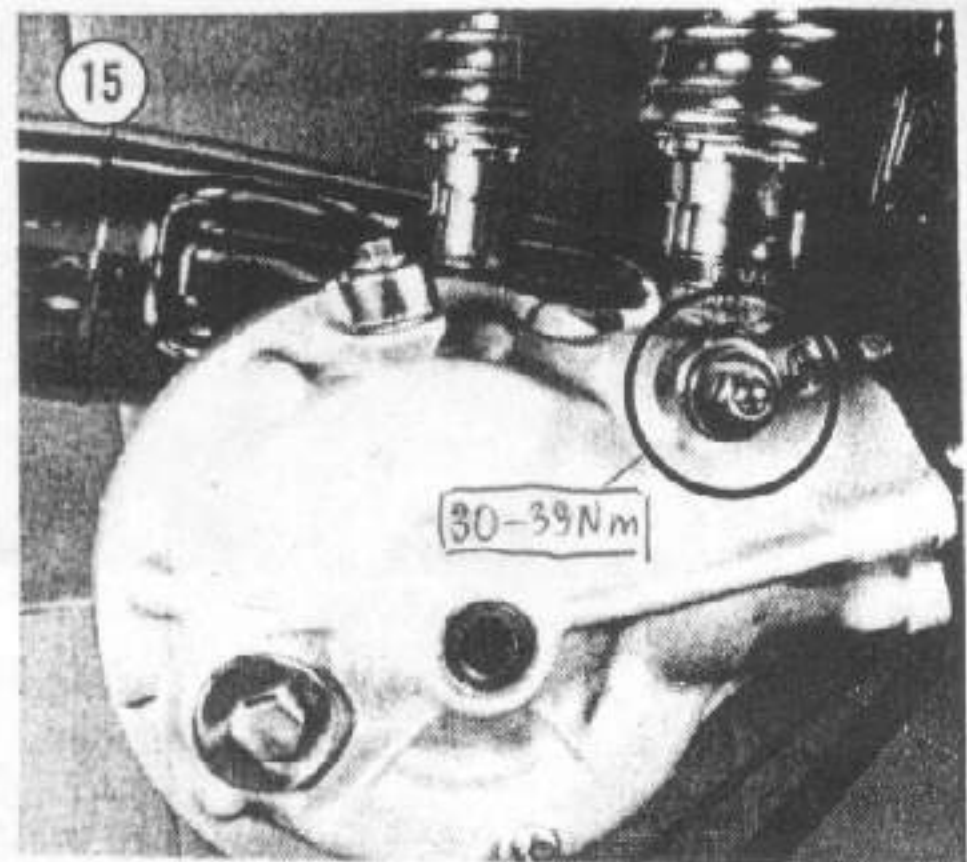
6. Wipe the grease from the pinion joint (on the end of the final drive) and drive shaft joint splines.
7. Check the splines (**Figure 16**) on both joints carefully for signs of wear. Replace the joints if necessary.
8. Pack the drive joint with multipurpose molybdenum disulfide grease. Also grease the pinion joint splines.
9. Install the final drive unit onto the swing arm. Install the 3 nuts but *do not* tighten them at this time.
10. Insert the rear axle through the swing arm and final drive to align the final drive unit. Tighten the 3 nuts to 33-44 ft.-lb. (45-59 N•m). Remove the rear axle.
11. Install the lower shock absorber acorn nut and tighten to 22-29 ft.-lb. (30-39 N•m).
12. Install the axle spacer with the small end toward the right-hand side.
13. Check the locking tabs on the 3 bolts (**Figure 17**) securing the dust cover in place. Make sure all are snug up against the bolts to prevent them from working loose during travel.
14. Install the rear wheel and mufflers.

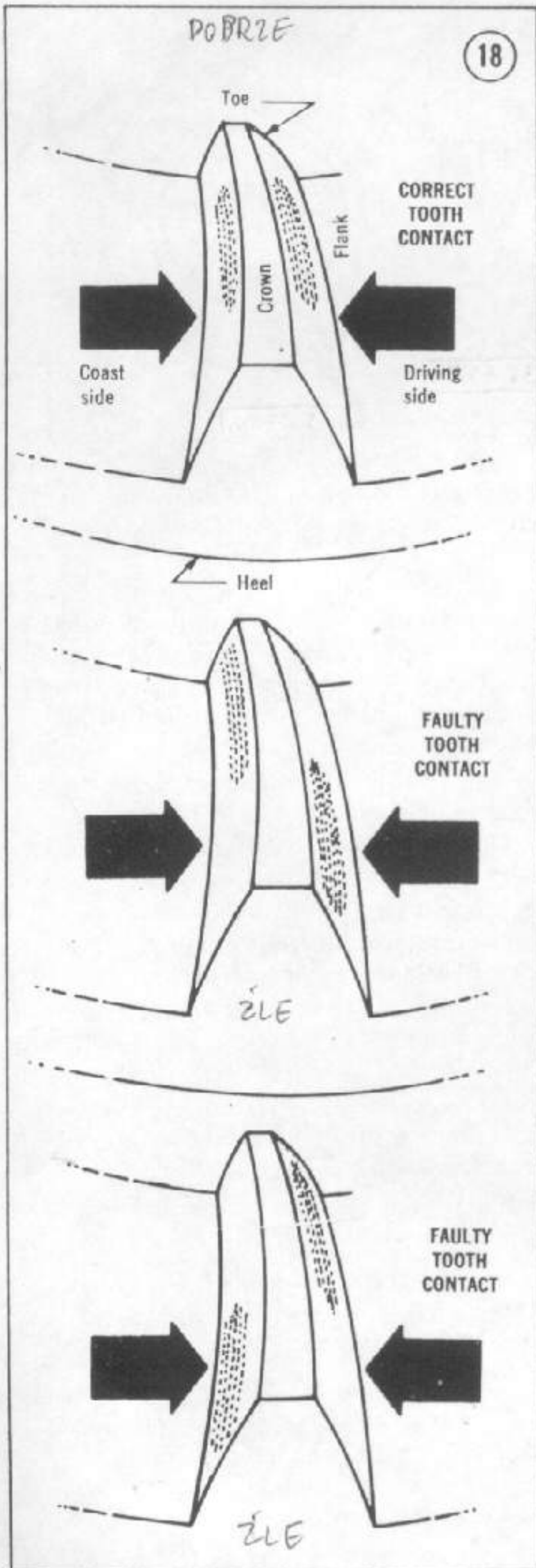
10.5.2.

Disassembly and Inspection

Although it may be practical for you to disassemble the final drive for inspection, you cannot replace the bearings or seals (which require bearing removal) without special tools. If there is trouble in the final drive unit, it may be best to remove the unit, take it to your Honda dealer, and let them overhaul it.

1. Remove the final drive unit as described under *Final Drive Removal/Installation* in this chapter.
2. Remove the drain plug, drain the oil from the unit, and reinstall the plug.
3. Straighten the locking tabs (**Figure 17**) against the 3 bolts. Remove the bolts and the dust cover.
4. Remove the 8 bolts securing the case cover.
5. Remove the case cover along with the ring gear and bearing.
6. Remove the ring gear spacer from the case.
7. Separate the left-hand case cover from the ring gear and bearing.





NOTE: Tap lightly with a plastic or rubber mallet to separate the case cover from the ring gear and bearing.

8. Inspect the ring gear oil seal for leakage. Replace it if the lip is damaged or if the spring band is distorted.

NOTE: In order to replace the seal, it is necessary to remove the bearing. This must be done by a Honda dealer or qualified machine shop.

CAUTION

The bearings are easily damaged if removed. The following inspection procedures do not require bearing removal. Remove the bearings only if they are defective.

9. Make sure that all bearings are clean.

10. Turn each bearing by hand. Make sure that bearings turn smoothly. Check rollers for evidence of wear, pitting, or excessive heat (bluish tint).

11. If any bearing is questionable, take it to your dealer. He will verify if the bearing is defective and replace it for a small bench fee. Special pullers are required to remove the bearings, and a press must be used to install them.

CAUTION

The final drive case is very easily damaged by trying to use improvised bearing replacement tools. Take the job to your dealer to avoid costly and unnecessary damage.

12. Check the wear pattern on the ring and pinion teeth (Figure 18). Check for the following characteristics:

- a. Some clearance between top of teeth and top of pattern
- b. No distinct lines indicating high pressure areas
- c. Marks on adjoining teeth should be directly opposite each other
- d. Both drive and coast patterns should be fairly well centered on teeth.

14. Check teeth on ring and pinion gears. Look for visible wear or damage. Check for chipped or missing teeth.

10.5.3. Assembly

This procedure assumes that all seals and bearings are in good condition and properly installed.

1. Clean off all old liquid gasket material from the mating surfaces of the gear case and cover.

NOTE: Make sure the entire assembly is clean and free of foreign matter prior to assembly.

2. Clean the cover mating surface of the gear case; remove any burrs with an oilstone.
3. Apply a liquid gasket sealant like Loctite Fit-All, or equivalent, to the mating surfaces of the gear case and the cover.

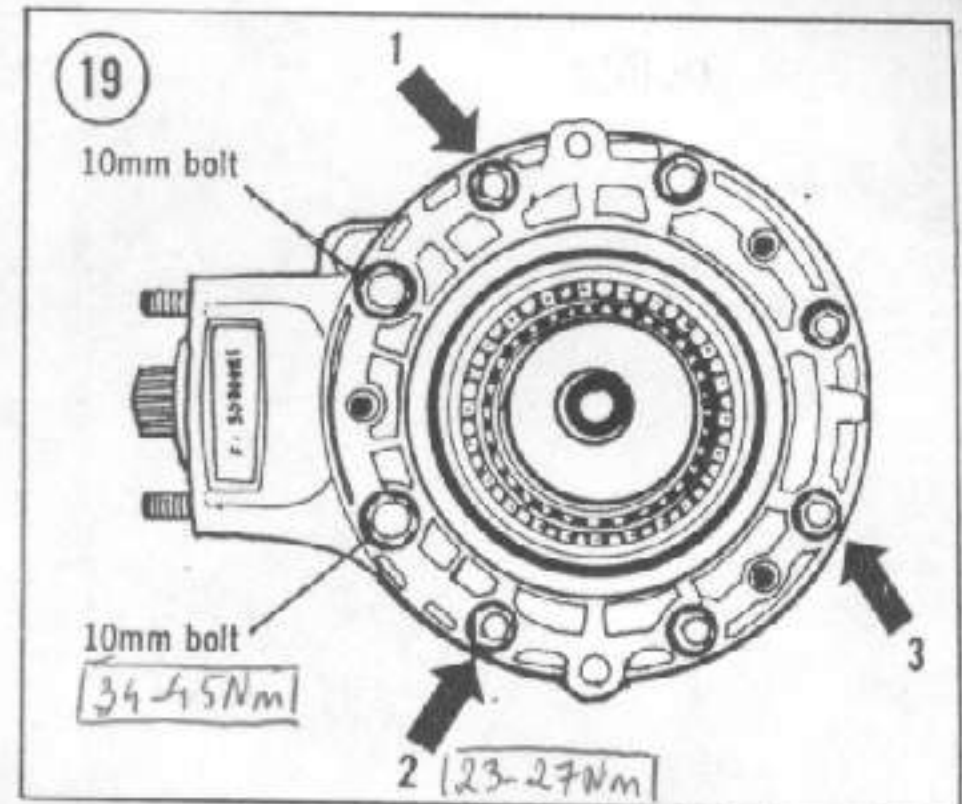
NOTE: The following steps adjust the gear preload. These steps must be followed exactly or the gears will wear prematurely. If the inspection in Step 12 of Final Drive, Disassembly and Inspection showed satisfactory gear wear patterns, and nothing has been replaced, use the original ring gear control spacer (shim) and skip Steps 4-13; continue on with Steps 15-18 only.

4. Apply a thin even coat of Prussian Blue or lead oxide to the teeth of the ring gear and check the tooth contact pattern.
5. Install the original ring gear control spacer (shim) onto the ring gear. A small coating of grease will hold it in place.
6. Install the ring gear into the case and install the gear case cover.

CAUTION

Do not allow the gear case cover to become tilted while installing it.

7. Partially install the 8 case cover bolts. Tighten the 3 indicated 8mm bolts in the sequence shown in **Figure 19** in two or more steps until the gear case cover comes in contact with the gear case. Torque the six 8mm bolts to 17-20 ft.-lb. (23-27 N•m) and the two 10mm bolts to 25-33 ft.-lb. (34-45 N•m) in a crisscross pattern in two or more steps.
8. Turn the pinion shaft several turns in both directions so that the contact pattern on the teeth is pressed into the coating of Prussian Blue or lead oxide.



9. Remove the 8 case bolts, remove the case cover, and carefully lift out the ring gear assembly.

10. Examine the contact pattern on the teeth and check for the characteristics listed under Step 12 of the *Disassembly/Inspection* procedure. **Figure 18** shows typical patterns. Your pattern need not be exactly like the illustration to be acceptable.

11. If pattern is not acceptable, purchase different size shims and repeat Steps 4-10 to determine which size shim should be used. Do not use more than one at a time.

12. When you have found a shim which produces an acceptable pattern, clean all traces of Prussian Blue or lead oxide from the gears.

13. Install the proper shim on the ring gear. Hold it in place with a small amount of heavy grease.

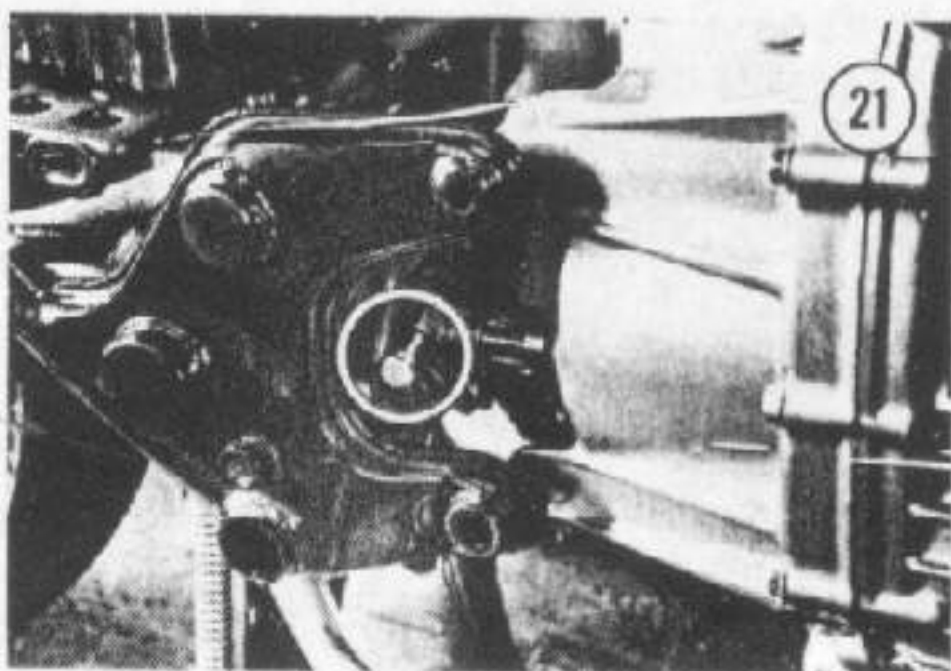
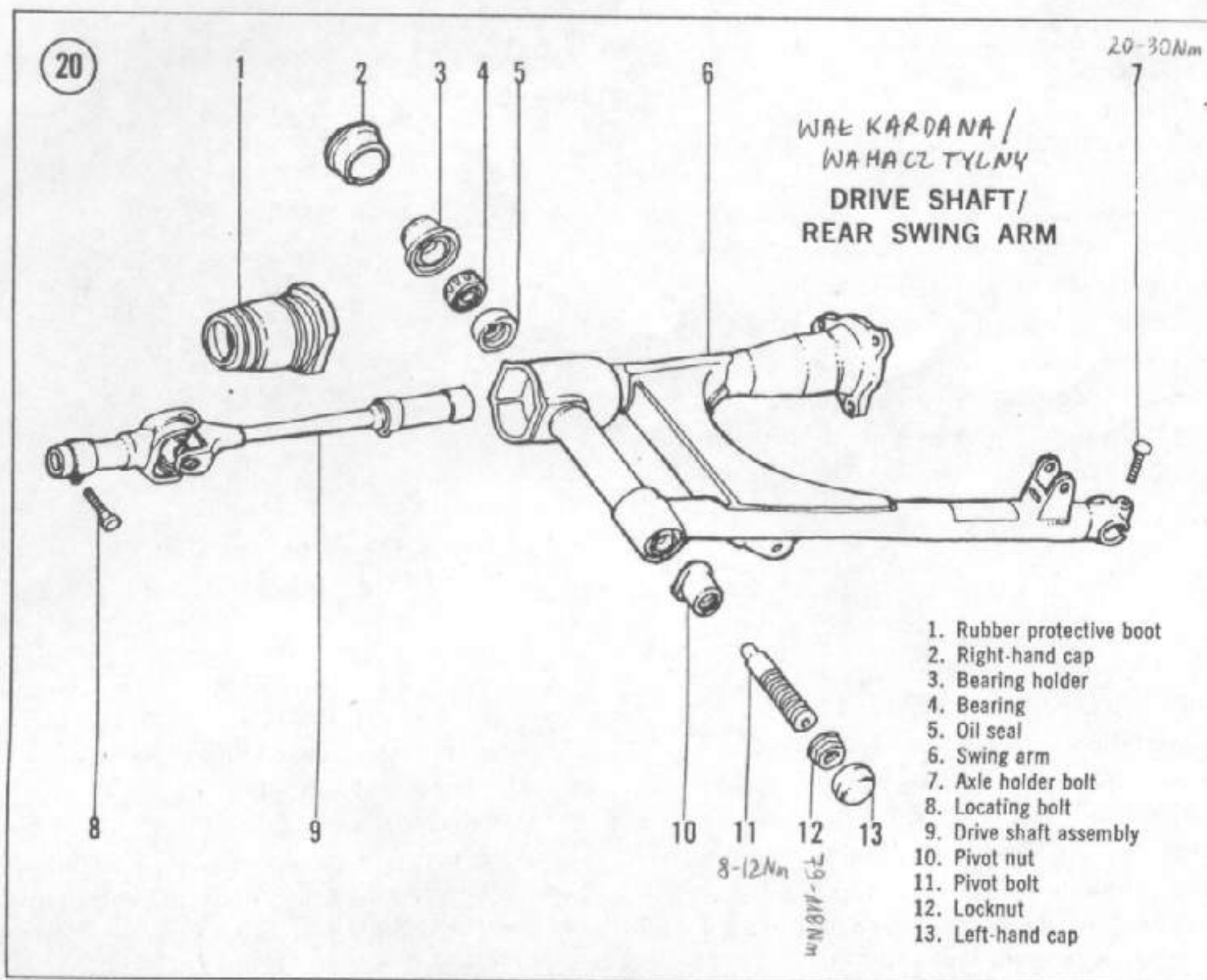
14. Apply a liquid gasket sealant like Loctite Fit-All or equivalent, to the mating surfaces of the gear case and the cover.

15. Install the ring gear into the case and install the gear case cover.

CAUTION

Do not allow the gear case cover to become tilted while installing it.

16. Install the 8 cover bolts and tighten in sequence shown in **Figure 19** in 2 or more steps until the gear case comes in contact with the gear case. Tighten two 10mm bolts to 25-33 ft.-lb. (34-45 N•m) and six 8mm bolts to 17-20 ft.-lb. (23-27 N•m).



17. Install the dust cover and 3 bolts. Tighten the bolts and bend up the locking tabs to secure the bolts in place.

WARNING

If any of the locking tabs are broken or cracked, the dust cover must be replaced. If the bolts work loose during

travel, they will cause severe damage to the final drive unit and brake shoe assembly. They may even lock up the rear wheel causing an accident.

18. Install the final drive unit as described under *Final Drive Removal/Installation* in this chapter.

10-6

DRIVE SHAFT/REAR SWING ARM

Refer to **Figure 20** for this procedure.

10.6.4.

Removal/Installation

1. Remove rear wheel as described under *Rear Wheel Removal/Installation* in this chapter.
2. Remove the final drive unit as described under *Final Drive Removal/Installation* in this chapter.
3. Slide back the rubber protective boot and remove the locating bolt (**Figure 21**).

4. Disengage the drive shaft from the engine final shaft.
5. Remove the left-hand shock absorber lower acorn nut.
6. Remove the drain tubes from the clamp (Figure 22).
7. Remove the protective cap and remove the locknut (A, Figure 23) from the pivot bolt on the left-hand side.
8. Remove the pivot bolt (B, Figure 23) from the left-hand side.
9. Remove the right-hand pivot and bearing.
10. Remove the swing arm and the drive shaft assembly.

10.6.2.

Inspection

1. Remove rubber boot from swing arm.
2. Withdraw the drive shaft from the swing arm and thoroughly wash the splines in cleaning solvent. Dry them with compressed air.
3. Inspect the splines for wear and damage.
4. Inspect the universal joint for play. Rotate the shaft in both directions. If there is noticeable side play the shaft must be replaced.
5. If the splines in the drive shaft joint (A, Figure 24) are damaged, this joint may be replaced. Drive out the spring pin (B, Figure 24) with a small drift punch and separate it from the drive shaft.
6. Apply molybdenum disulfide grease to the splines prior to assembly. Assemble new joint onto drive shaft and drive in spring pin.

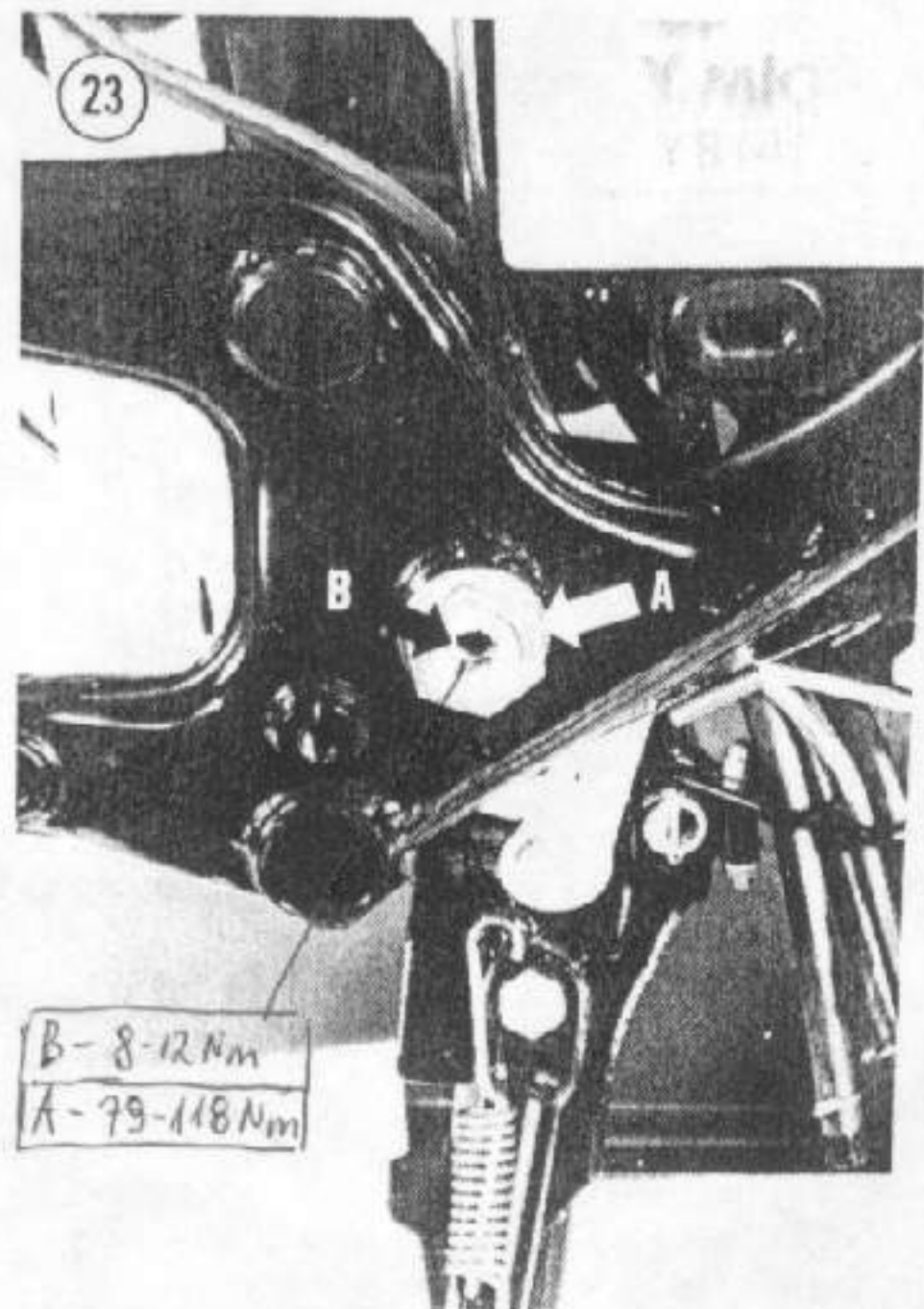
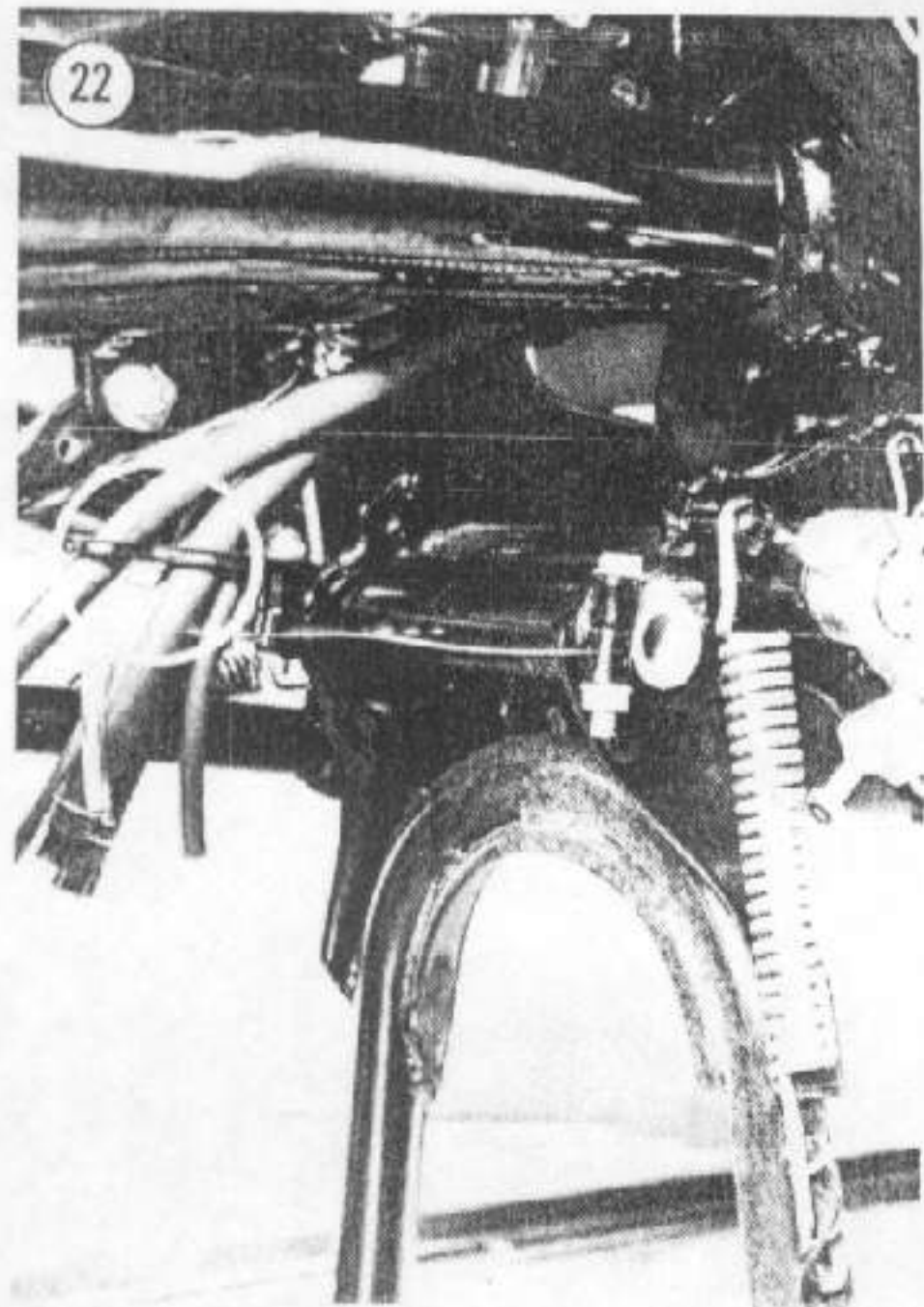
CAUTION

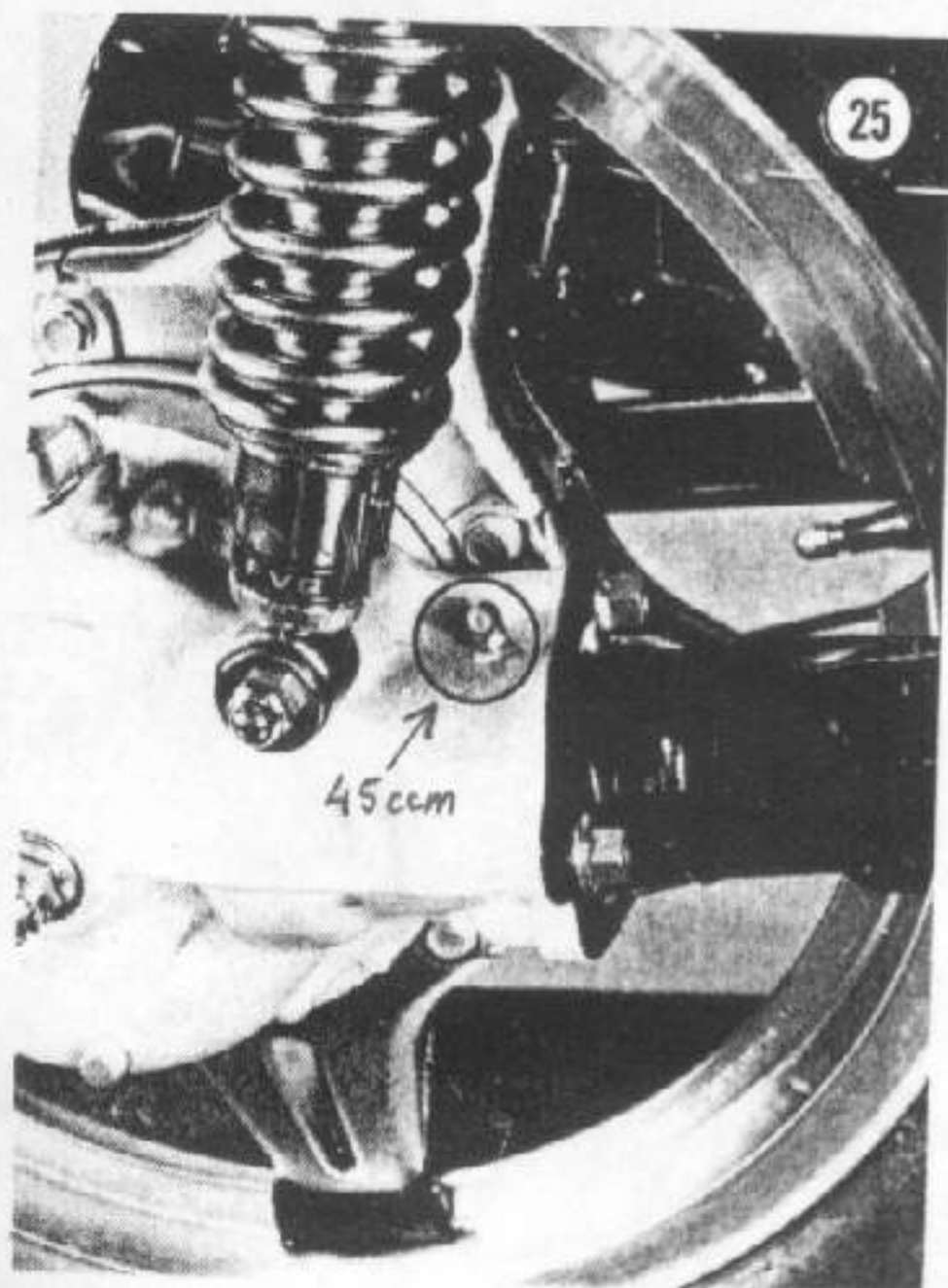
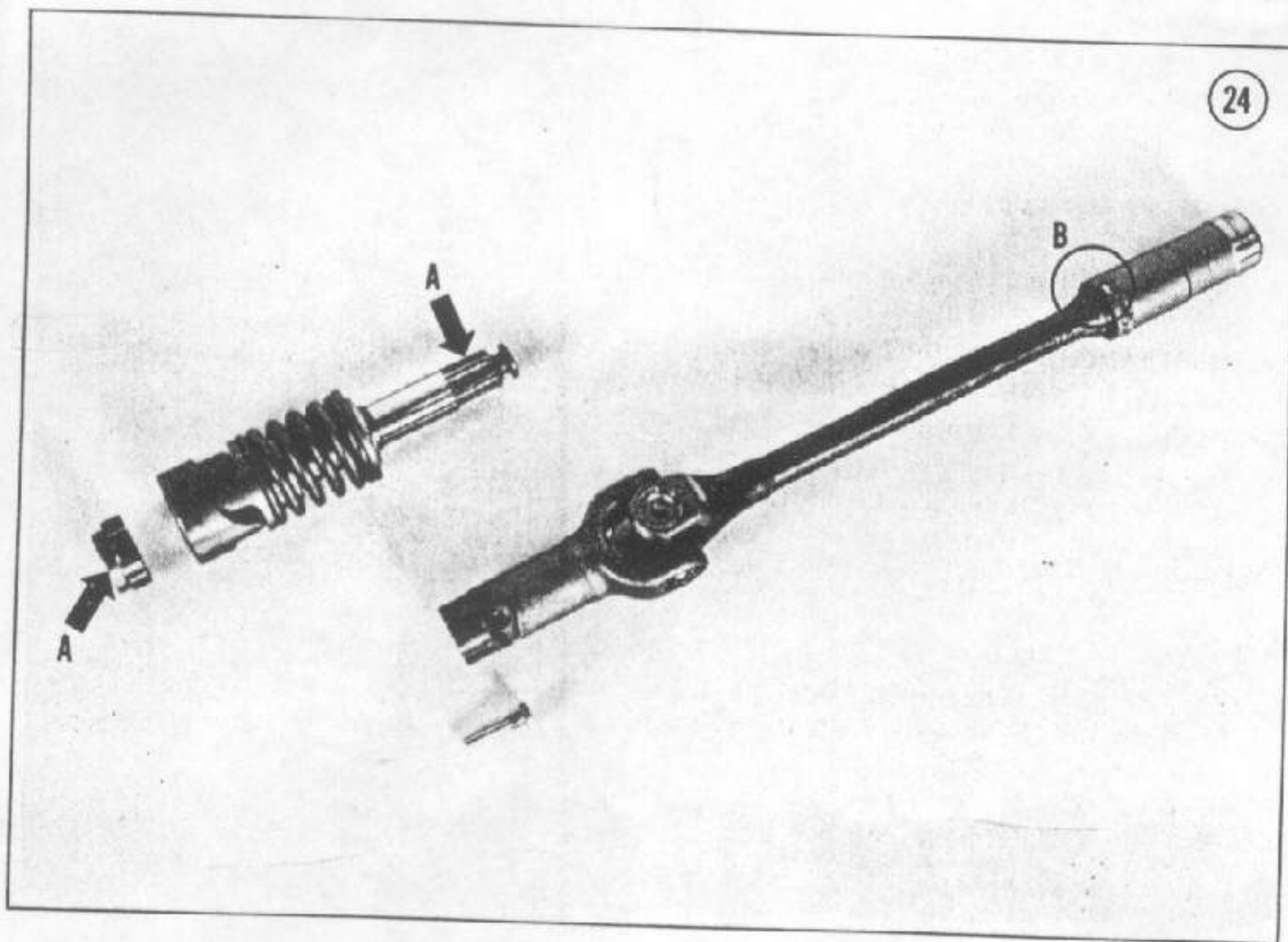
The spring pin must be driven in so it is below the surface of the joint. It must not stick up or it will interfere with the swing arm housing.

10.6.3.

Installation

1. Installation is the reverse of the removal steps noting the following information. Coat the surfaces of the splines with molybdenum disulfide grease.
2. Make sure the right-hand oil seal bearing and pivot are properly installed.
3. Install the swing arm onto the right-hand side and insert the pivot bolt.





4. Tighten pivot bolt slowly to a torque of 6-9 ft.-lb. (8-12 N•m).
5. Install the locknut and tighten to 58-87 ft.-lb. (79-118 N•m).
6. After installation is completed, fill the final drive Zerk fitting (Figure 25) with molybdenum disulfide grease, approximately 1.5 oz. (45cc). Check the fluid level in the final drive unit as described under *Final Drive* in Chapter Three.

10.7

REAR SHOCKS

The rear shocks are spring controlled and hydraulically dampened. Spring preload can be adjusted by rotating the cam ring at the base of the spring (Figure 26) — *clockwise to increase preload and counterclockwise to decrease it.*

NOTE: Use spanner wrench furnished in CX500 tool kit for this adjustment.

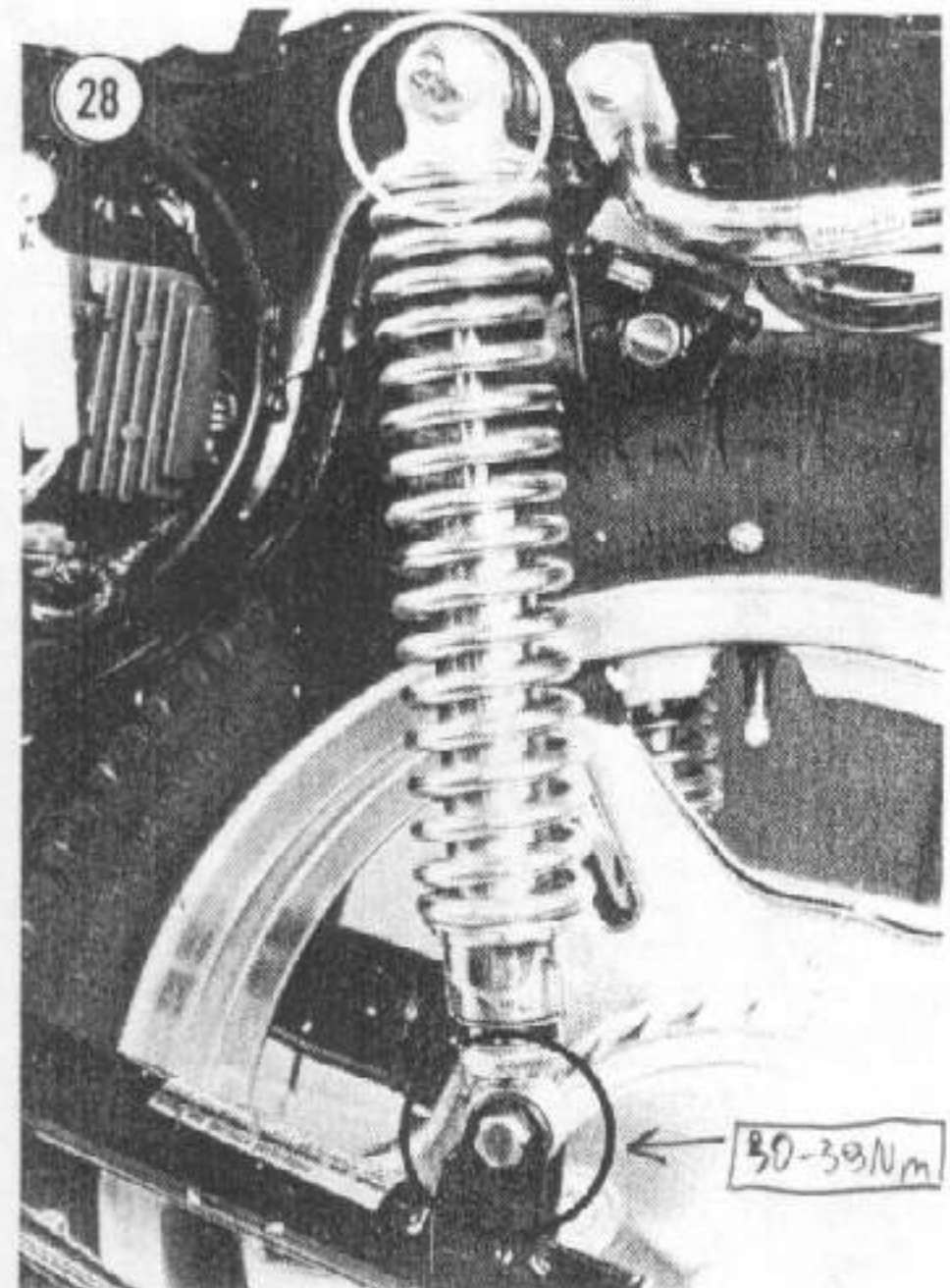
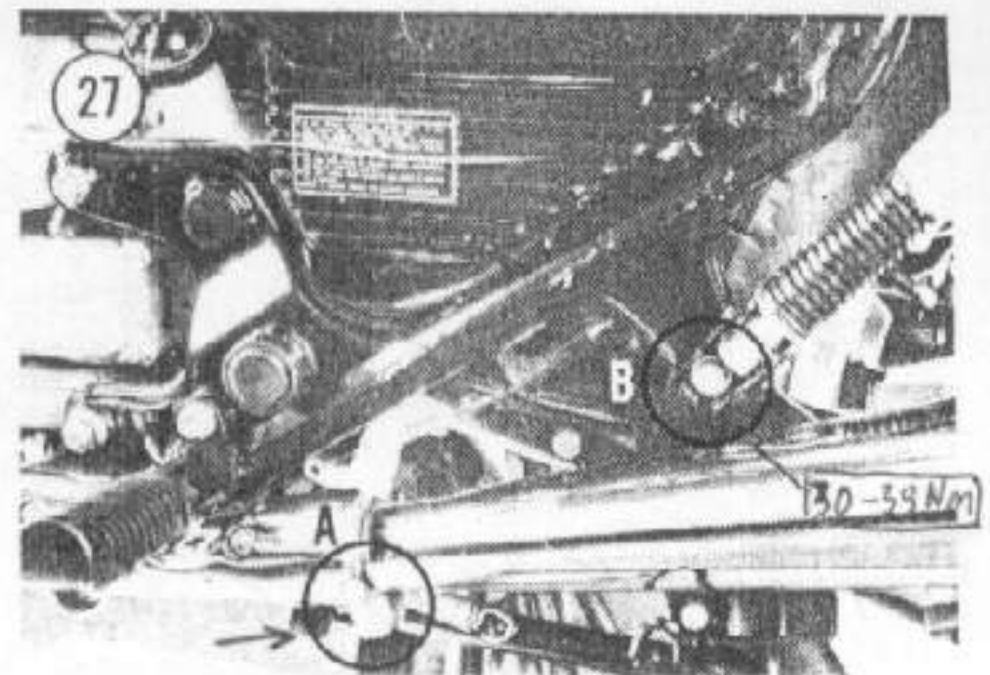
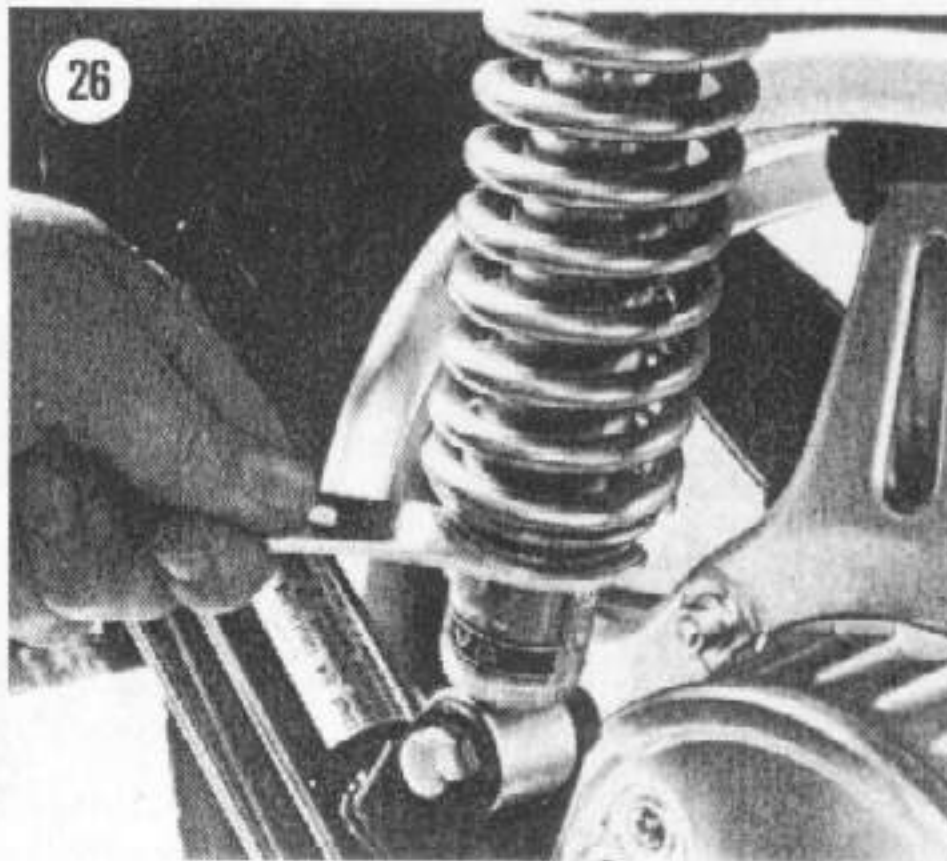
Both cams must be indexed on the same detent. The shocks are sealed and cannot be rebuilt. Service is limited to removal and replacement of the hydraulic unit.

10.7.A.

Removal/Installation

Removal and installation of the rear shocks is easier if they are done separately. The remaining unit will support the rear of the bike and maintain the correct relationship between the top and bottom mounts.

1. Block up the engine or support it on the centerstand.
2. Adjust both shocks to their softest setting, *completely counterclockwise*. Remove the seat.
3. Loosen the clamps securing the mufflers (A, **Figure 27**) to the collector and remove the bolts securing the rear footpegs and mufflers (B, **Figure 27**). Slide the mufflers out of the collector and remove them.
4. Remove upper and lower bolt (**Figure 28**).
5. Pull the shock off.
6. Install by reversing removal steps. Torque the footpeg bolts and shock bolts to 22-29 ft.-lb. (30-39 N•m).



CHAPTER ELEVEN

BRAKES

The CX500 has a single-disc front brake operated by a hand lever and drum-type rear brake operated by a foot lever. This chapter describes repair and replacement procedures for all brake components.

M.1

FRONT DISC BRAKE

The front disc brake is actuated by hydraulic fluid and is controlled by a hand lever like the drum-type brake. As the brake pads wear, the brake fluid level drops in the reservoir and automatically adjusts for wear.

When working on hydraulic brake systems, it is necessary that the work area and all tools be absolutely clean. Any tiny particles of foreign matter and grit in the caliper assembly or the master cylinder can damage the components. Also, sharp tools must not be used inside the caliper or on the piston. If there is any doubt about your ability to correctly and safely carry out major service on the brake components, take the job to a Honda dealer or brake specialist.

M.1.1

Master Cylinder Removal/Installation

1. Remove the rear view mirror.

CAUTION

Cover the fuel tank and headlight nacelle with a heavy cloth or plastic tarp to protect it from accidental spilling of brake fluid. Wash any brake fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

2. Remove bolt (A, **Figure 1**) securing brake hose to master cylinder and remove it.
3. Remove the electrical leads from the brake light switch (A, **Figure 2**).
4. Remove the bolt and nut (B, **Figure 2**) securing the brake lever and remove it.
5. Remove the 2 clamping bolts (B, **Figure 1**) securing the master cylinder to the handlebar, and remove it.
6. Install by reversing the removal steps.
7. Bleed the brake as described under *Bleeding the System* in this chapter.

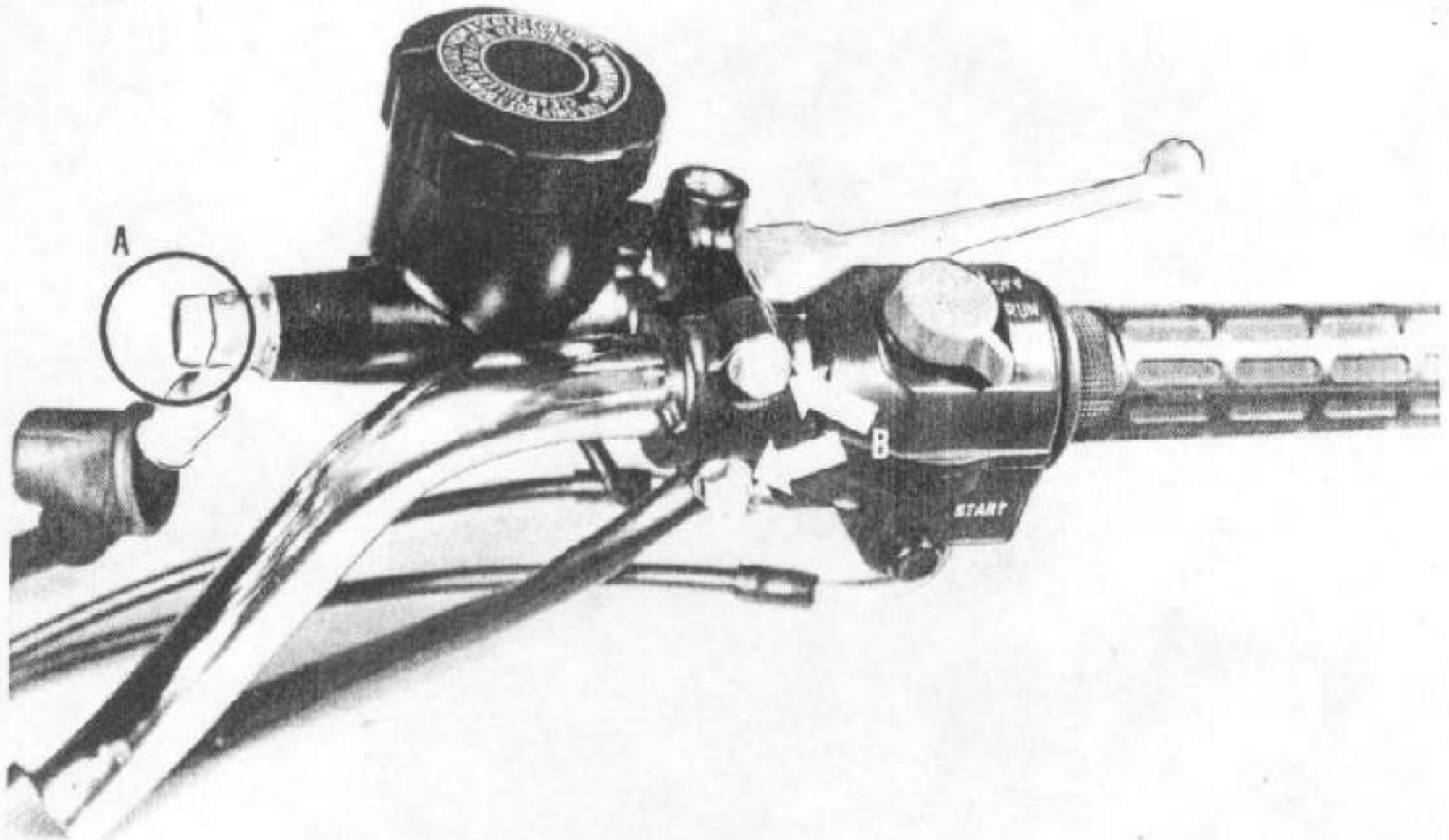
M.1.2

Master Cylinder Disassembly

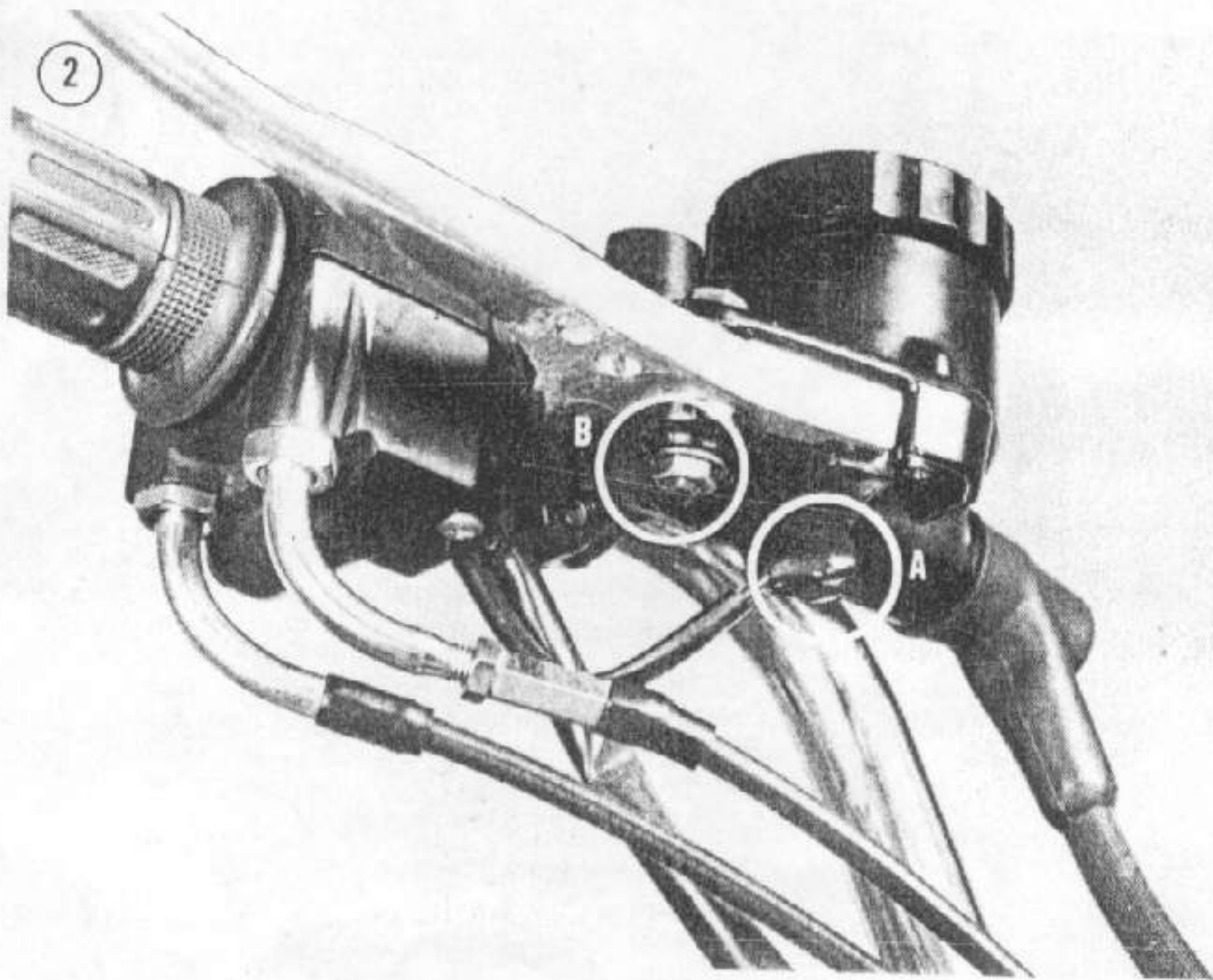
Refer to **Figure 3** for this procedure.

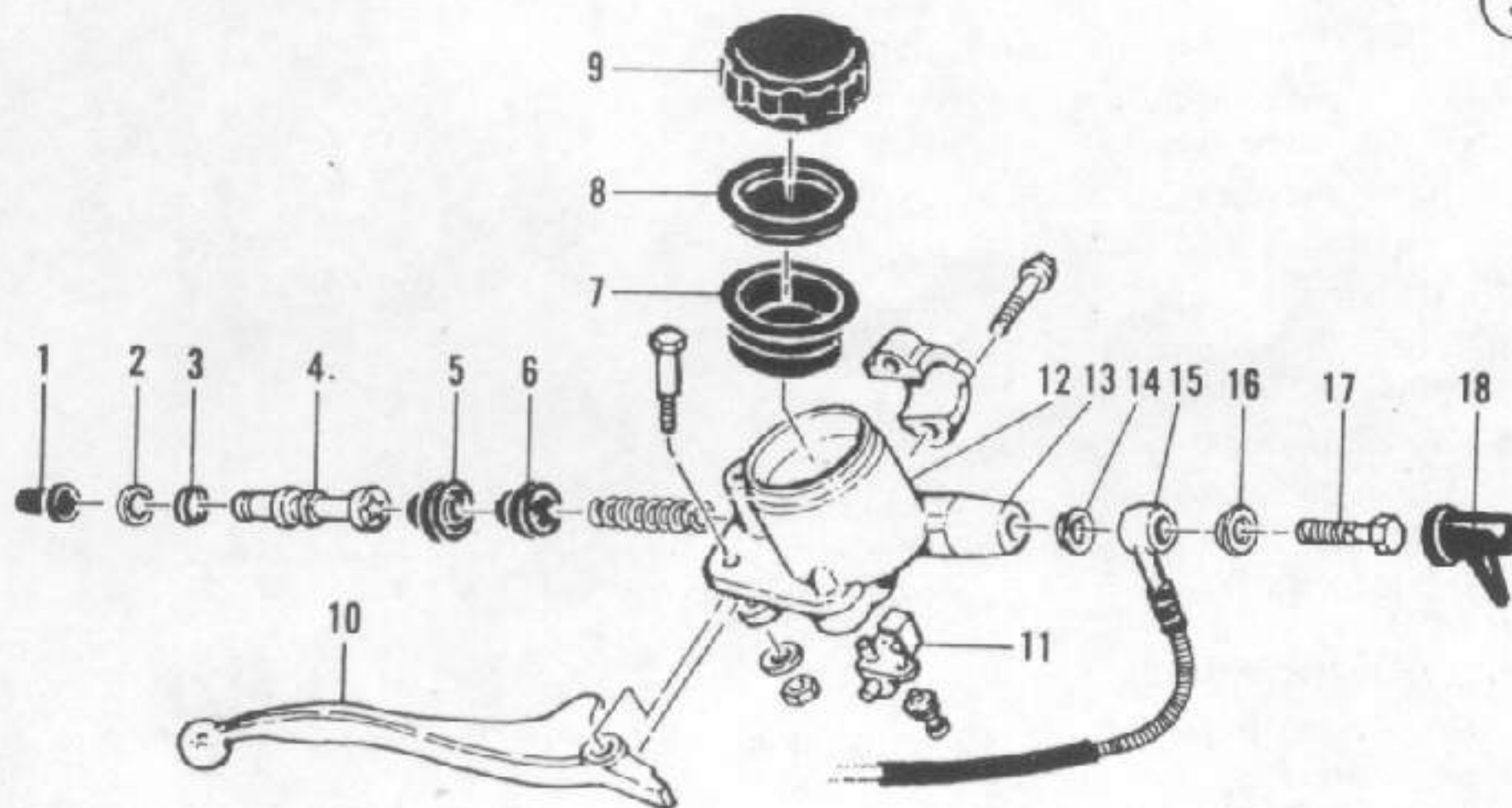
1. Remove the master cylinder as described under *Master Cylinder Removal/Installation* in this chapter.

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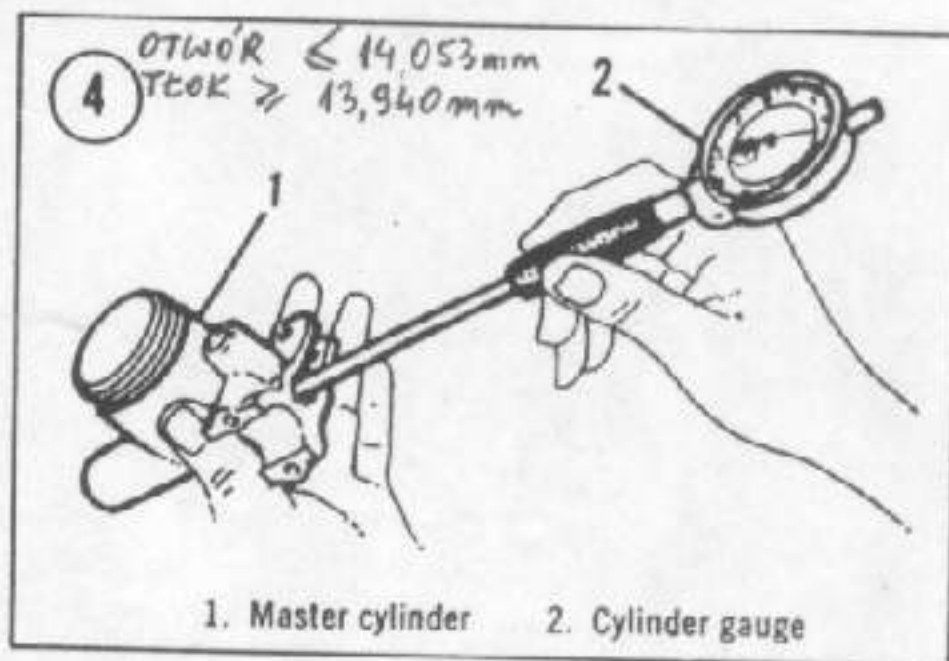
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MASTER CYLINDER POMPA HAMULCOWA

- | | | |
|------------------|-------------------------------|--------------------------|
| 1. Rubber boot | 7. Diaphragm | 13. Master cylinder body |
| 2. Circlip | 8. Seal | 14. Washer |
| 3. Washer | 9. Top cap | 15. Brake hose/fitting |
| 4. Piston | 10. Brake lever | 16. Washer |
| 5. Secondary cap | 11. Brake light switch | 17. Bolt |
| 6. Primary cap | 12. Master cylinder reservoir | 18. Rubber boot |



- Remove the top cap and diaphragm; pour out the brake fluid and discard it. *Never* reuse brake fluid.
- Remove the boot and snap ring.
- Remove the washer, piston, secondary and primary caps and the spring.

11.1.3.

Master Cylinder Inspection

- Clean all parts in denatured alcohol or fresh brake fluid. Inspect the cylinder bore and piston contact surfaces for signs of wear and damage. If either part is less than perfect, replace it.
- Check the end of the piston for wear caused by the lever and check the pivot bore in the lever. Discard the caps.
- Make sure the passages in the bottom of the brake fluid reservoir are clear. Check the reservoir cap and diaphragm for damage and deterioration and replace as necessary.
- Inspect the condition of the threads in the bores for the brake line and the switch.
- Check the lever pivot lug for cracks.
- Measure the cylinder bore (Figure 4) and the piston. Cylinder bore must not exceed 0.553 in.

(14.053mm) and the piston must not be smaller than 0.549 in. (13.940mm). Replace both parts if they exceed these measurements.

M.4.4.

Master Cylinder Assembly

1. Soak the new caps in fresh brake fluid for at least 15 minutes to make them pliable.
2. Install the spring.
3. Install the primary and secondary caps into the cylinder.
4. Install the piston and washer and install the snap ring and boot.
5. Install the diaphragm and top cap.
6. Install the master cylinder on the handlebar and connect the brake hose and brake light switch electrical leads.

M.4.5

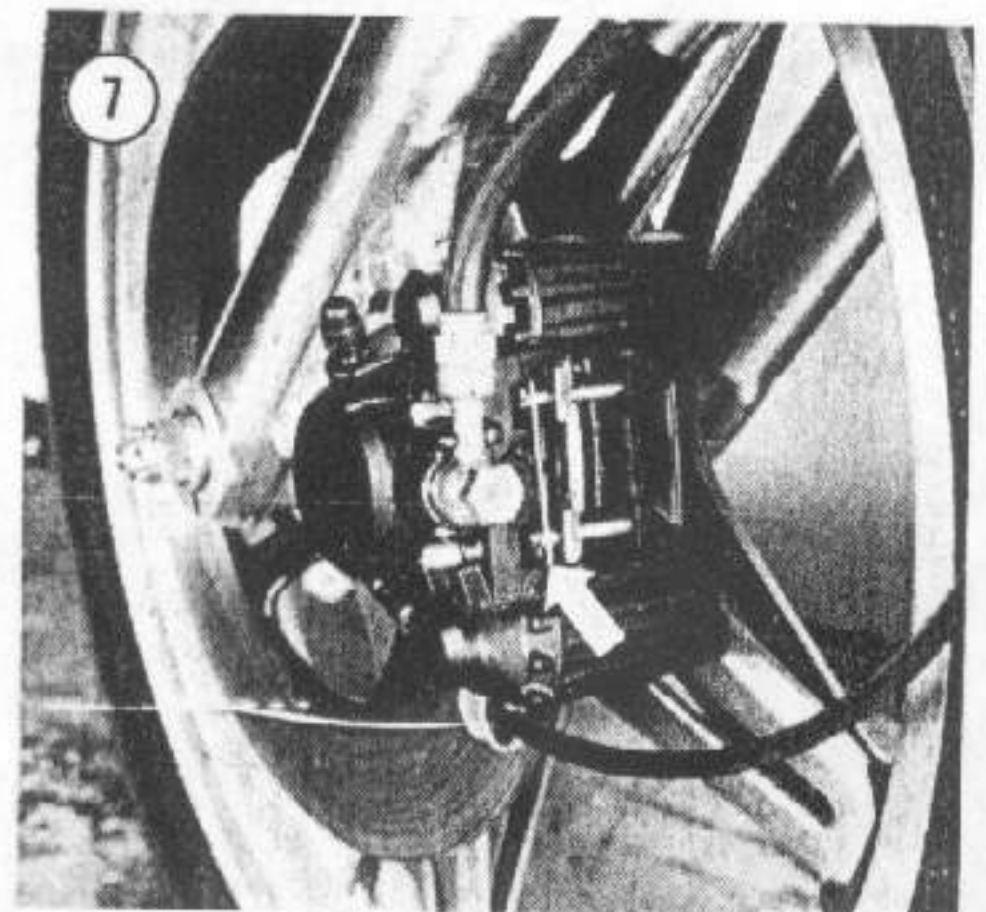
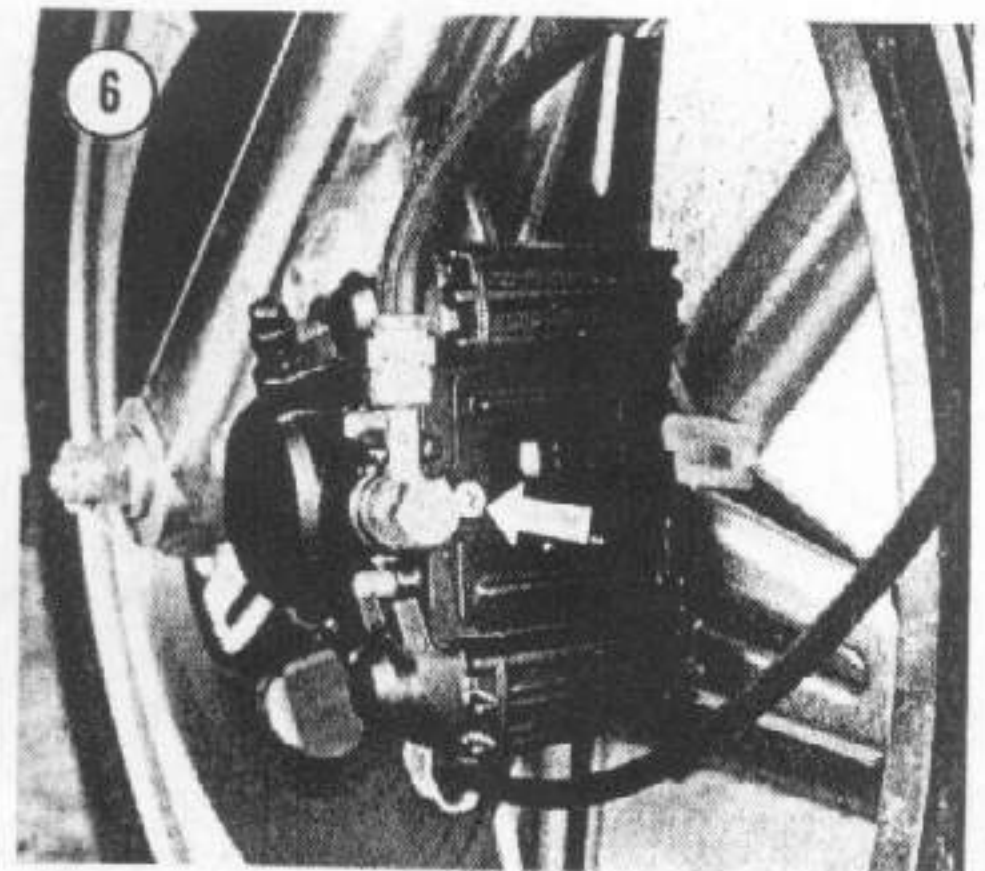
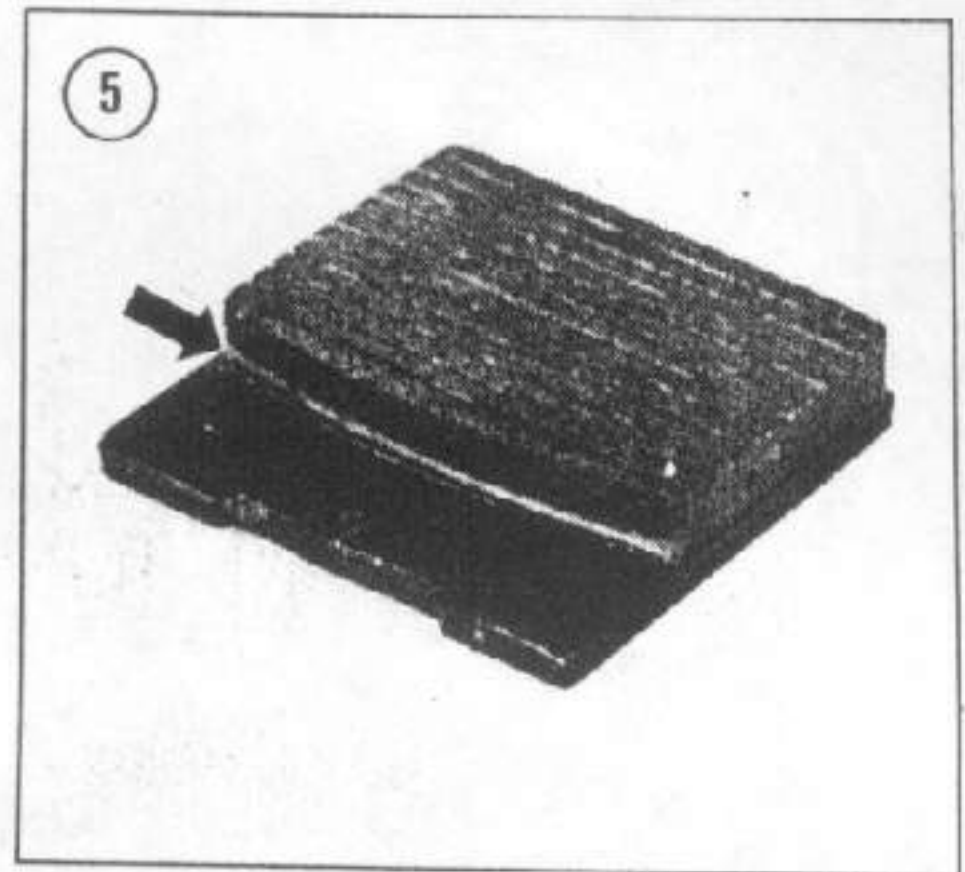
Brake Pad Replacement

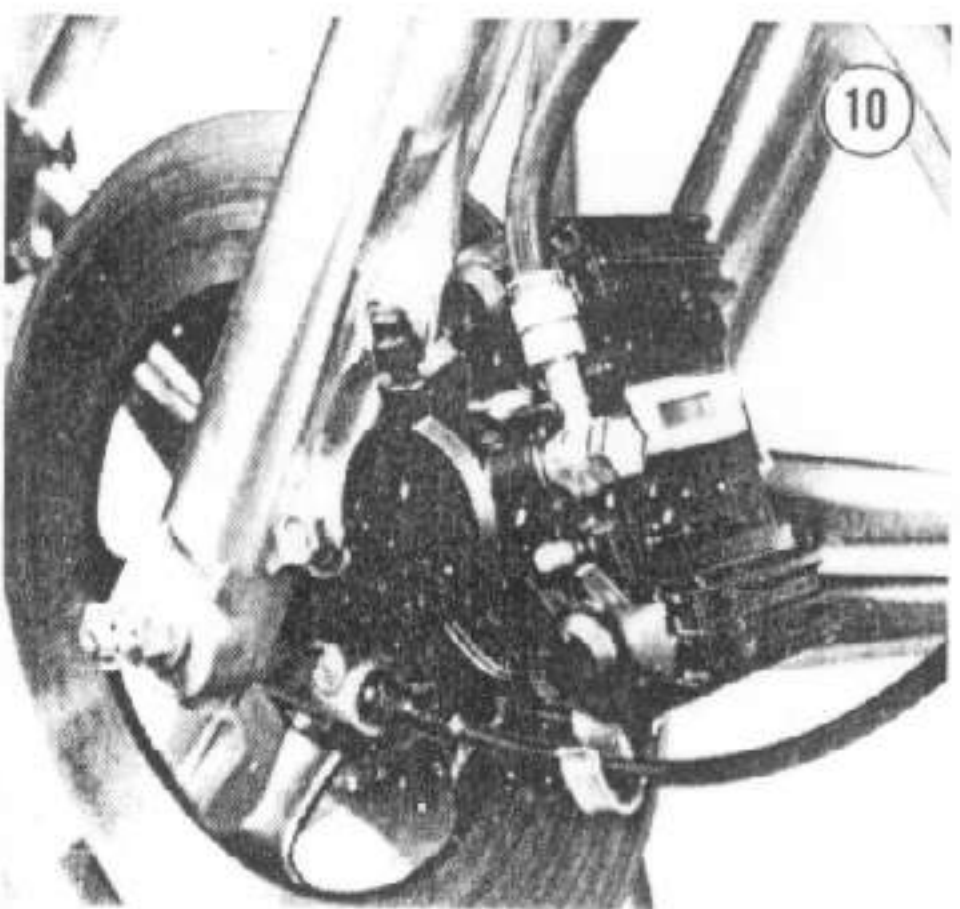
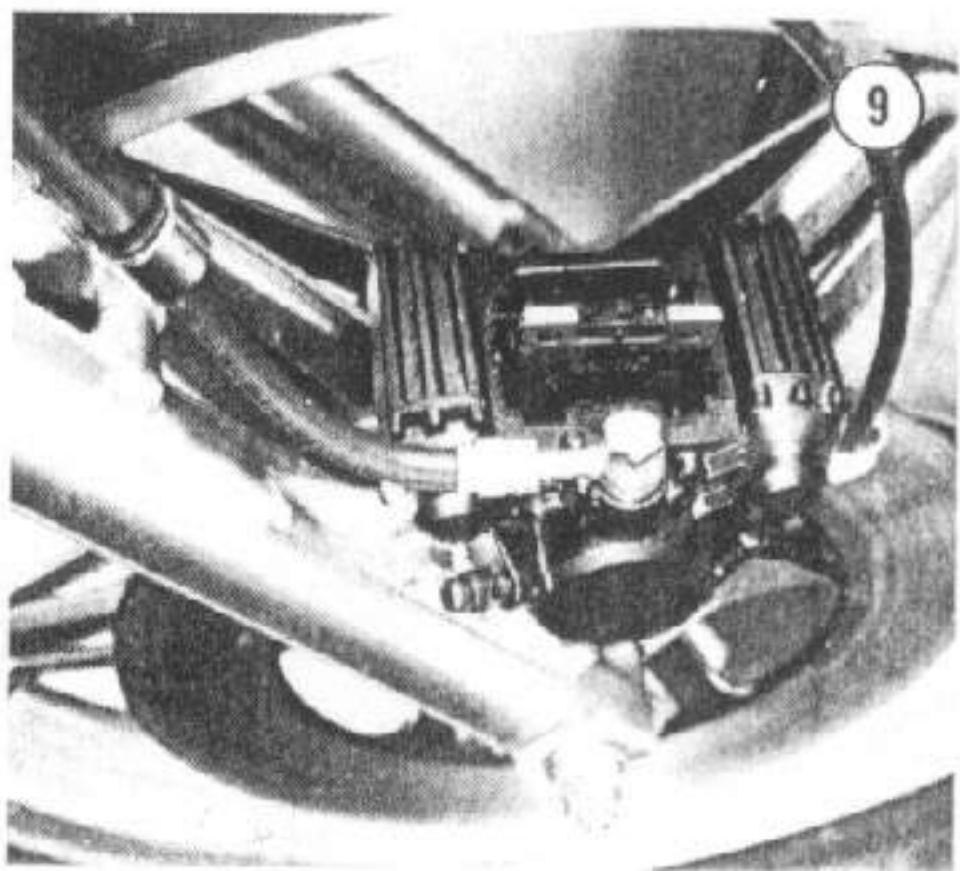
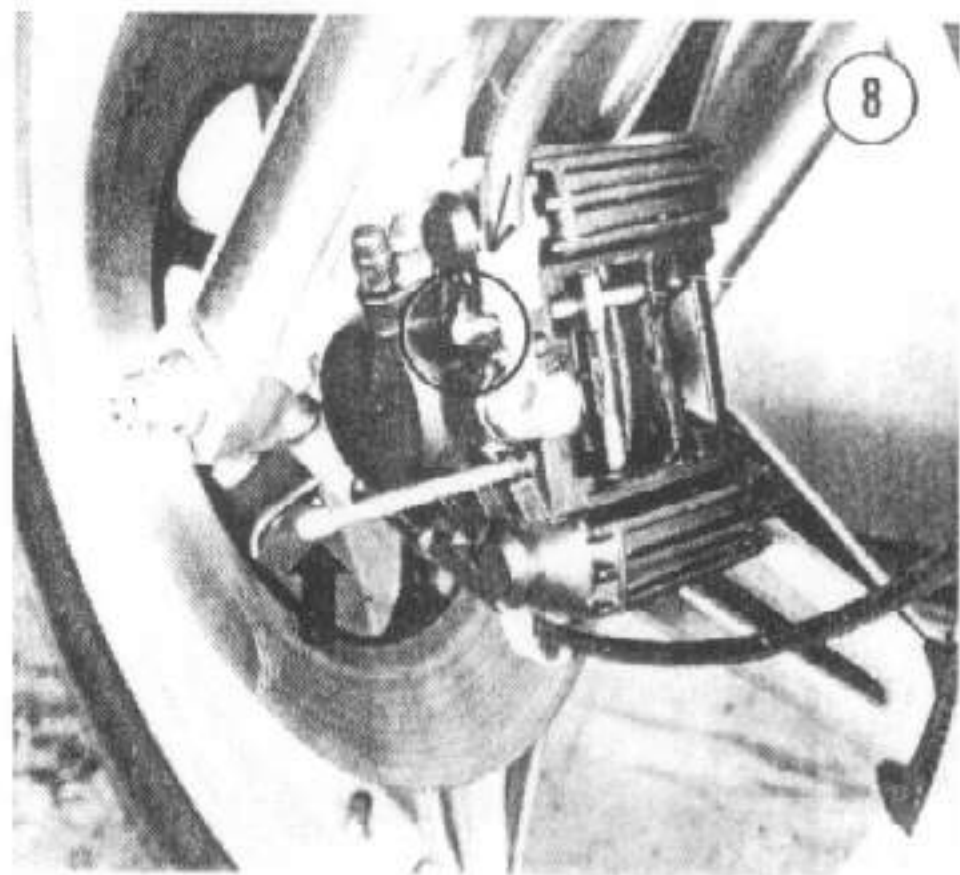
There is no recommended mileage interval for changing the friction pads in the disc brake. Pad wear depends greatly on riding habits and conditions. The disc pads should be checked for wear every 1,000 miles and replaced when the red line on the pad (Figure 5) reaches the edges of the brake disc. Always replace both pads at the same time.

1. Unscrew the caliper cover (Figure 6) and remove it.
2. Pull up and remove the clip (Figure 7).
3. Remove the 2 pins securing the pads in place (Figure 8), remove the pads (Figure 9) and discard them.
4. Clean the pad recess and end of the piston with a soft brush. Do not use solvent, wire brush, or any hard tool which would damage the cylinder or the piston.
5. Lightly coat the end of the piston and the backs of the new pads (*not the friction material*) with disc brake lubricant.

NOTE: Check with your dealer to make sure the friction compound of the new pads is compatible with the disc material. Remove any roughness from backs of new pads with a fine cut file; blow them clean with compressed air.

6. Remove the cap from the master cylinder and slowly push the piston into the caliper while checking the reservoir to make sure the brake





fluid does not overflow. Remove fluid, if necessary, prior to it overflowing. The piston should move freely. If it does not and there is any evidence of it sticking in the cylinder, the caliper should be removed and serviced as described under *Caliper Rebuilding* in this chapter.

7. Push the caliper to the right and push the piston in to allow the new pads to be installed.

8. Install the new pads with the anti-rattle shim on outboard pad next to the piston (Figure 9).

9. Insert the 2 pins with the holes (Figure 8) facing upward to enable the insertion of the clip. Install the clip (Figure 7).

10. Screw the caliper cover into place (Figure 6) and snap inspection cover (Figure 10) closed.

11. Carefully remove any rust or corrosion from the disc.

12. Block the motorcycle up so that the front wheel is off the ground. Spin the front wheel and activate the brake lever for as many times as it takes to refill the cylinder in the caliper and correctly locate the pads.

13. Refill the fluid in the reservoir if necessary and replace the top cap.

WARNING

Use brake fluid clearly marked DOT 3. Others may vaporize and cause brake failure. Always use the same brand name; do not intermix as many are not compatible.

WARNING

*Do not ride the motorcycle until you are sure the brake is operating correctly with full hydraulic advantage. If necessary, bleed the brakes as described under *Bleeding the System* in this chapter.*

14. Bed the pads in gradually for the first 50 miles by using only light pressure as much as possible. Immediate hard application will glaze the new friction pads and greatly reduce the effectiveness of the brake.

M.A.6

Caliper Removal/Installation

It is not necessary to remove the front wheel to perform this procedure.

1. Disconnect the speedometer cable clip (A, **Figure 11**).
2. Remove the bolt (**Figure 12**) securing the brake hose to the caliper and remove it. Drain the fluid from the line and discard it.
3. Remove the 2 caliper mounting bolts (B, **Figure 11**) and slide the caliper off the disc.
4. Install the caliper by reversing the removal steps; carefully insert the caliper onto the disc avoiding damage to the pads. Torque the caliper mounting bolts to 22-29 ft.-lb. (29-39 N•m).
5. Bleed the brakes as described under *Bleeding the System* in this chapter.

WARNING

Do not ride the motorcycle until you are sure the brake is operating correctly.

11.1.7.

Caliper Rebuilding

If the caliper leaks, the caliper should be rebuilt. If the piston sticks in the cylinder, indicating severe wear or galling the entire unit should be replaced. Rebuilding a leaky caliper requires special tools and experience.

Caliper service should be entrusted to your Honda dealer or brake specialist. Considerable money can be saved by removing the caliper yourself and taking it in for repair.

11.1.8

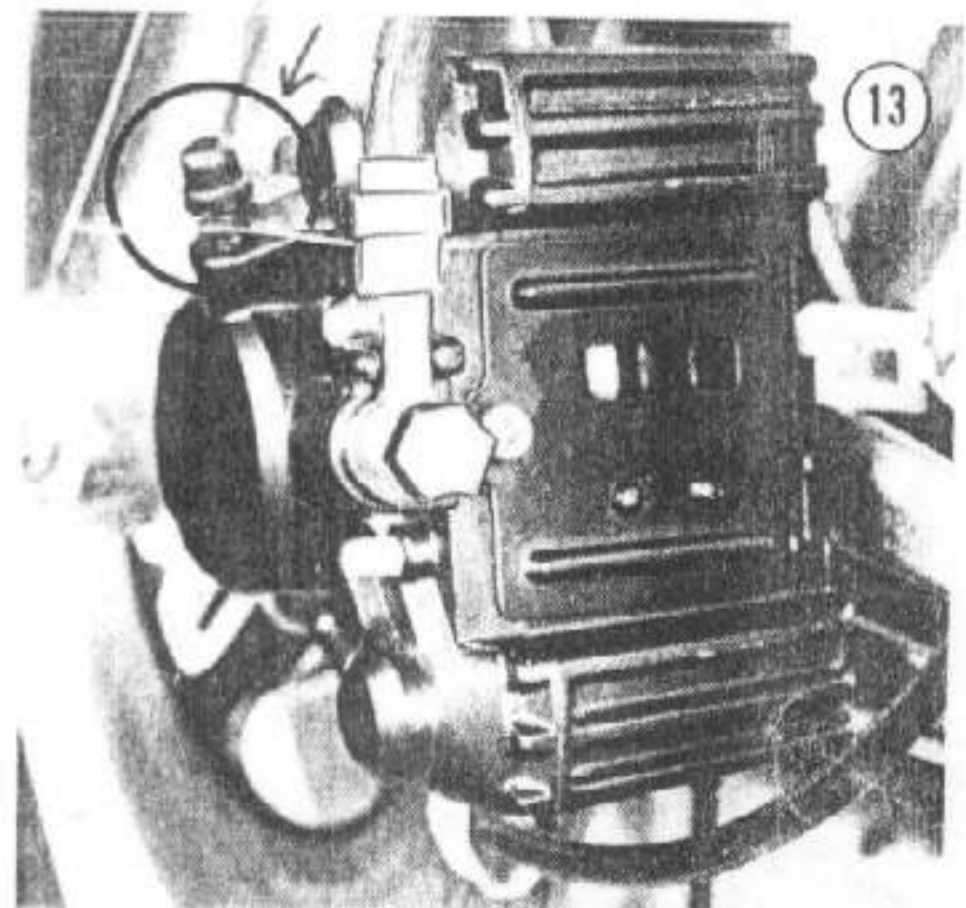
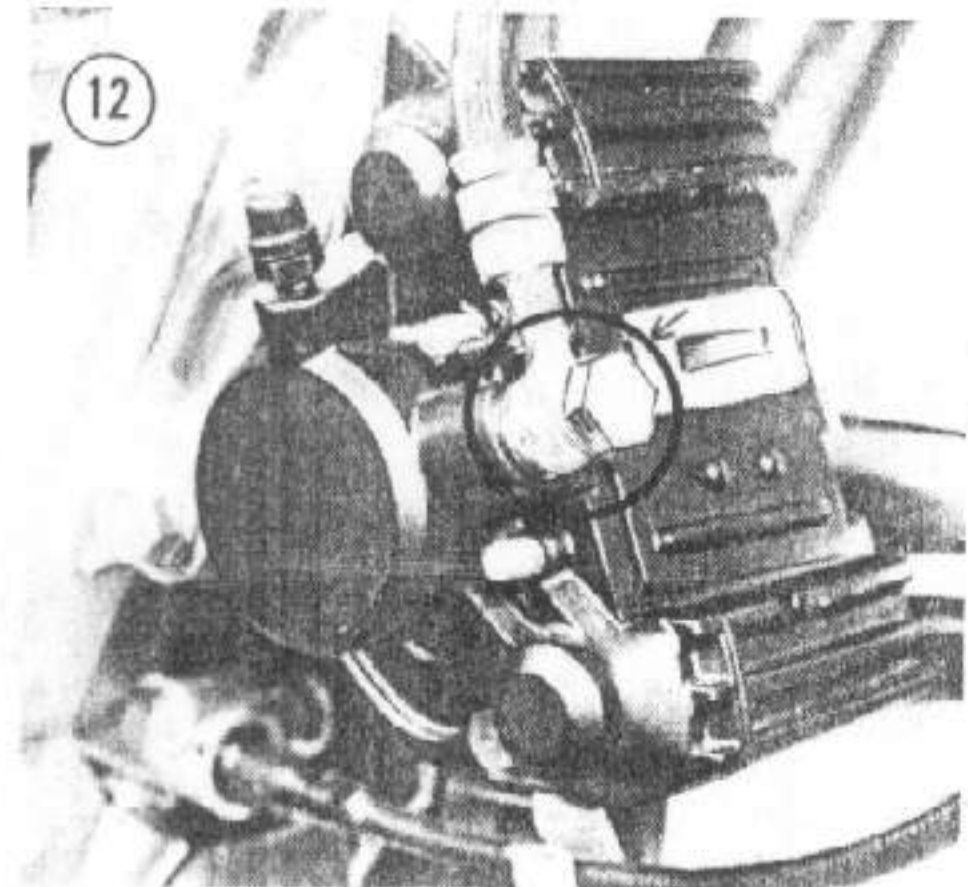
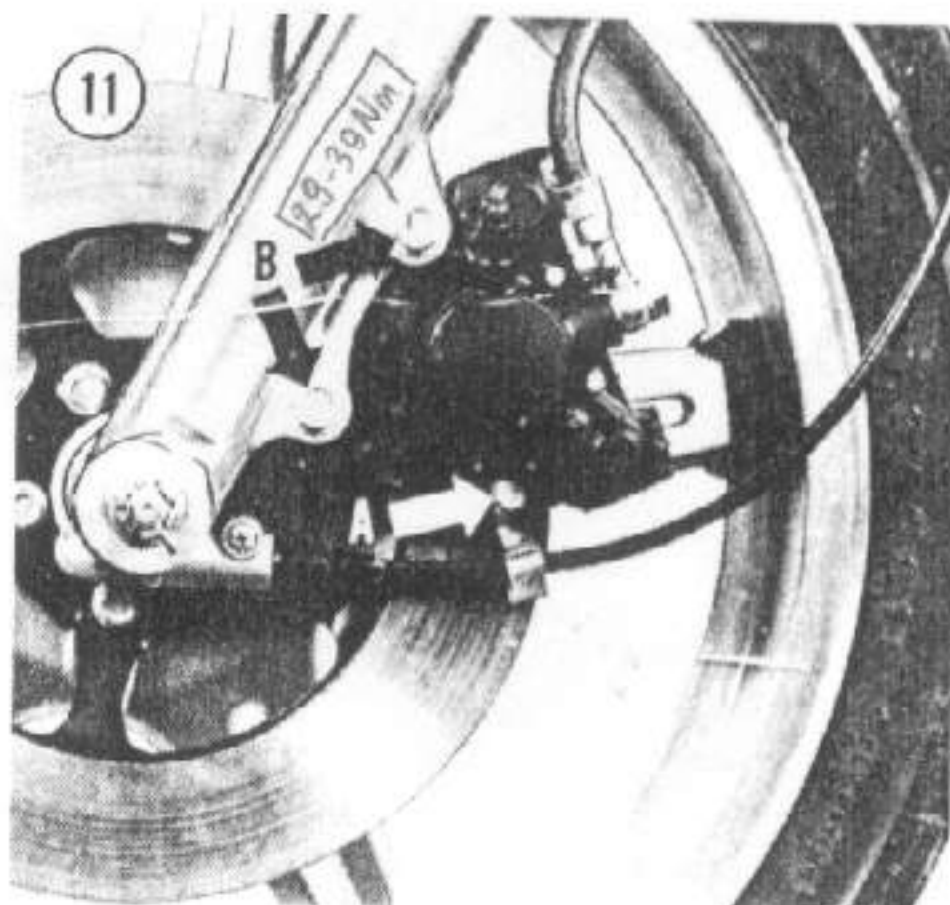
Bleeding the System

1. Remove the dust cap (**Figure 13**) from the brake caliper bleed valve.

2. Connect a length of clear tubing to the bleed valve on the brake caliper (**Figure 14**) and place the other end of the tube into a clean container. Fill the container with enough fresh brake fluid to keep the end submerged. The tube should be long enough so that a loop can be made higher than the bleed valve to prevent air from being drawn into the caliper during bleeding.

CAUTION

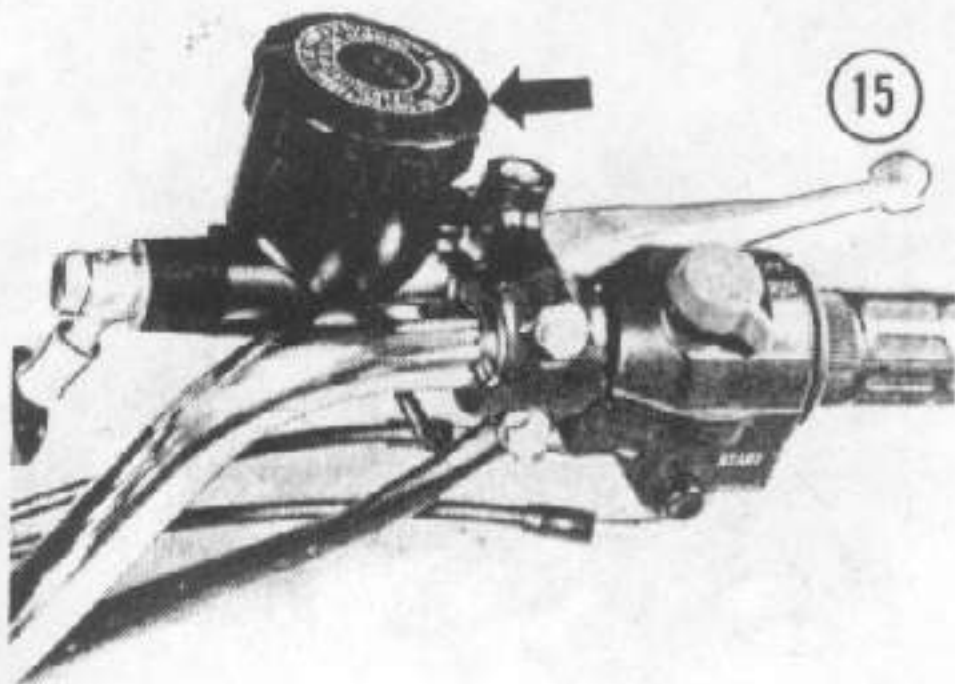
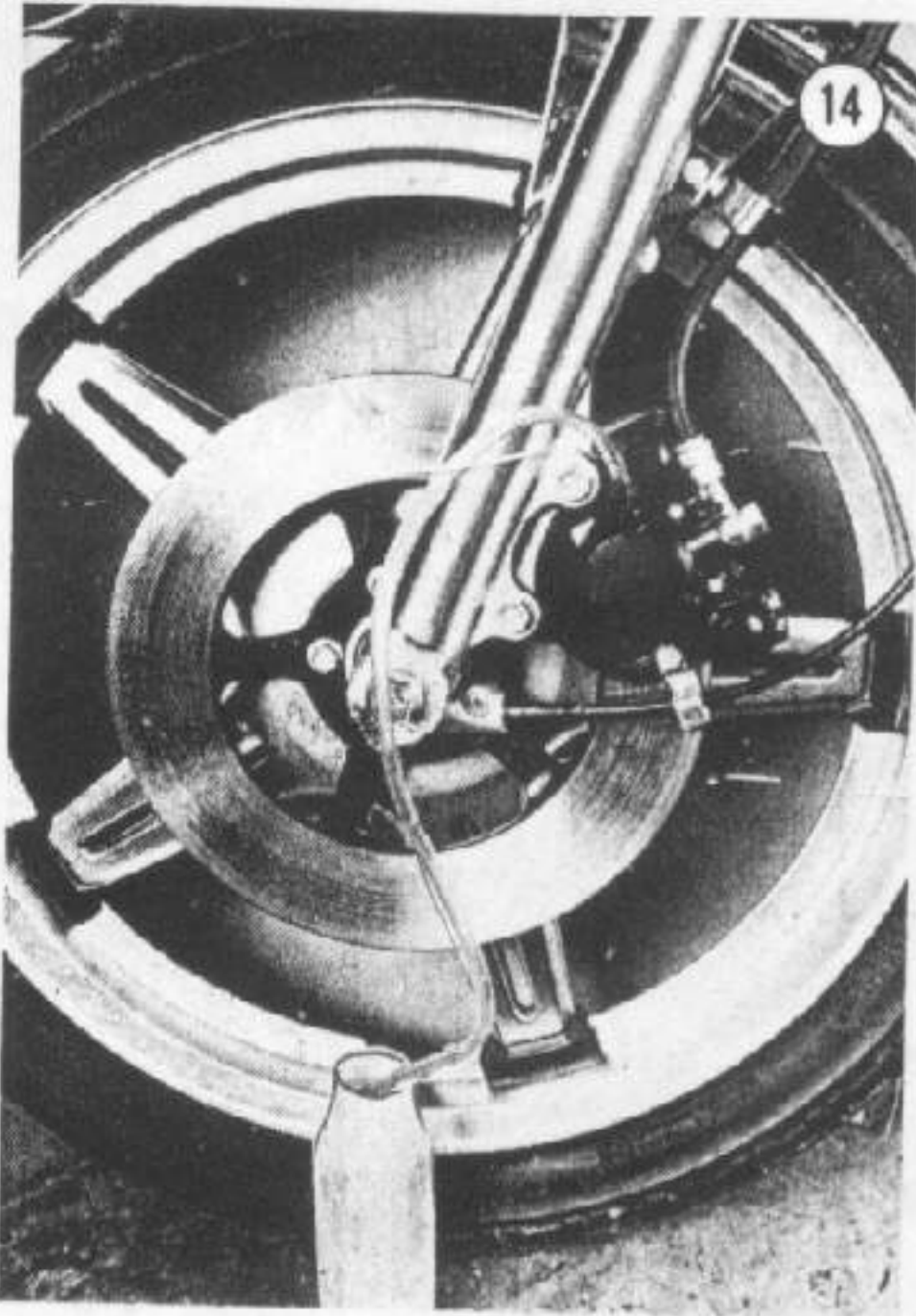
Cover the fuel tank and headlight nacelle with a heavy cloth or plastic tarp to protect it from the accidental spilling of brake fluid. Wash any brake fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.



3. Remove the cap of the master cylinder (Figure 15). Fill the fluid reservoir almost to the top lip, insert the diaphragm and *leave in place* during this procedure. Screw the cap on loosely to prevent the entry of dirt.

WARNING

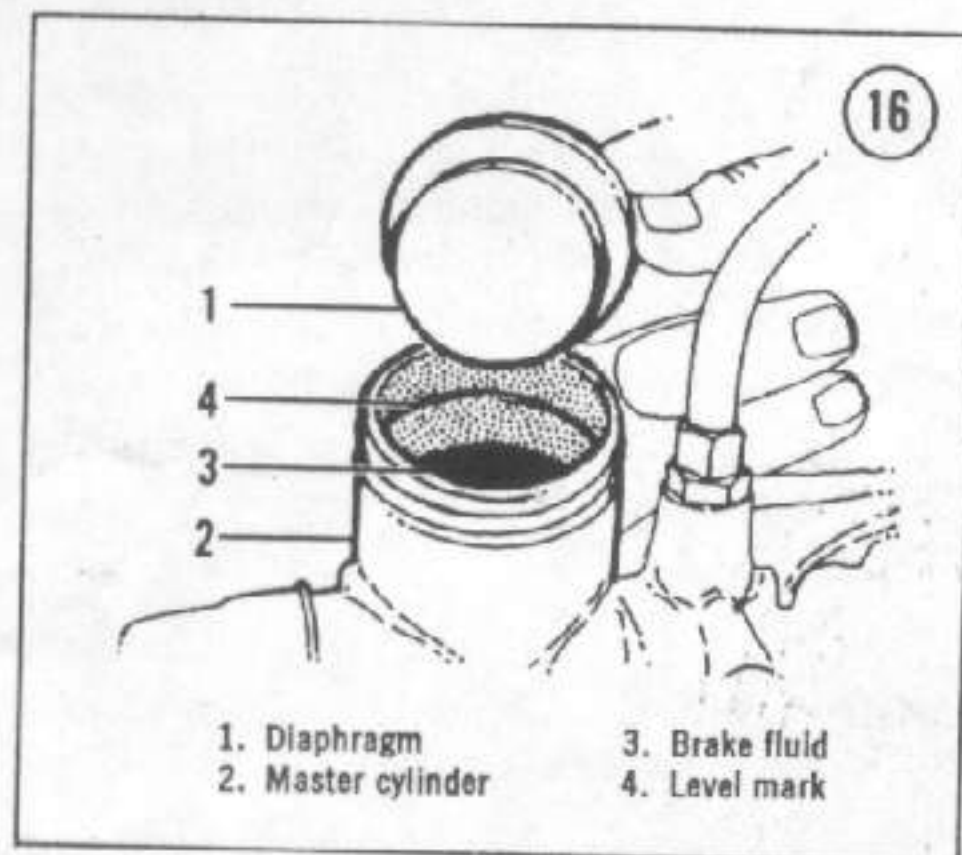
Use brake fluid clearly marked DOT 3. Others may vaporize and cause brake failure. Always use the same brand name, do not intermix, as many are not compatible.



4. Pump the lever several times with the bleed valve closed until you feel pressure building up.
5. Hold the lever down tight and open the bleed valve about one-half turn. Squeeze the lever all the way in. As the fluid enters the system, the level will drop in the reservoir. Maintain the level at about 1/2 inch from the top of the reservoir to prevent air from being drawn into the system.
6. Continue to pump the lever and fill the reservoir until the fluid emerging from the hose is completely free of bubbles.

NOTE: *Do not allow the reservoir to empty during the bleeding operation or more air will enter the system. If this occurs, the entire procedure must be repeated.*

7. Hold the lever down, tighten the bleed valve, remove the bleed tube and install the bleed valve dust cap.
8. If necessary, add fluid to correct the level in the reservoir. It should be to the UPPER level line (Figure 16).
9. Install the reservoir cap tightly.
10. Test the feel of the brake lever. It should be firm and should offer the same resistance each time it's pulled. If it feels spongy, it's likely that there is still air in the system and it must be bled again. When all air has been bled from the system, and the fluid level is correct in the reservoir, double check for leaks and tighten all the fittings and connections.



WARNING

Before riding the motorcycle, make certain that the front brake is operative by compressing the lever several times.

M.1.9**Brake Disc Removal/Installation**

1. Remove the front wheel as described under *Front Wheel Removal/Installation* in Chapter Nine.

NOTE: Insert a piece of wood in the caliper in place of the disc. That way, if the brake lever is inadvertently squeezed the piston will not be forced out of the cylinder. If this does happen, the caliper might have to be disassembled to reseal the piston, and the system will have to be bled. By using the wood, bleeding the brake is not necessary when installing the wheel.

2. Remove the 5 bolts securing the disc to the wheel and remove the disc.

3. Install by reversing these removal steps. Torque the 5 bolts to 20-24 ft.-lb. (27-32.5 N•m).

M.1.10**Brake Disc Inspection**

It is not necessary to remove the disc from the wheel to inspect it. Small marks on the disc are not important, but deep radial scratches reduce braking effectiveness and increase pad wear. The disc should be replaced.

1. Measure the thickness at several points around the disc with a vernier caliper or micrometer (**Figure 17**). The disc must be replaced if thickness at any point is less than 0.16 in. (4mm).

2. Measure runout with a dial indicator. Use a procedure similar to that used on wheel wobble (**Figure 18**) in this chapter. If the runout exceeds 0.012 in. (0.3mm) disc must be replaced.

3. Clean the disc of any rust or corrosion with a non-petroleum solvent such as trichloroethylene.

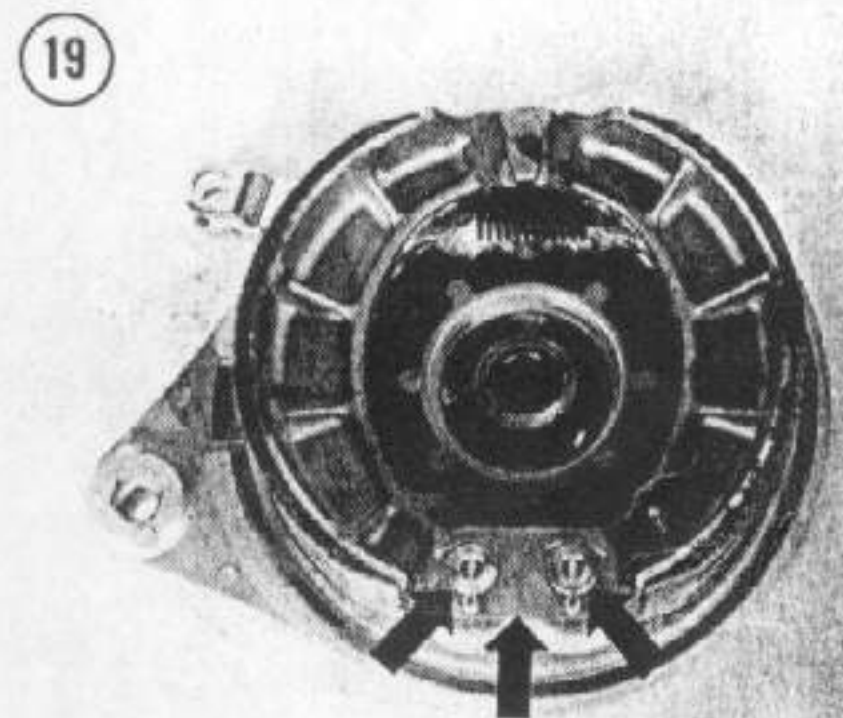
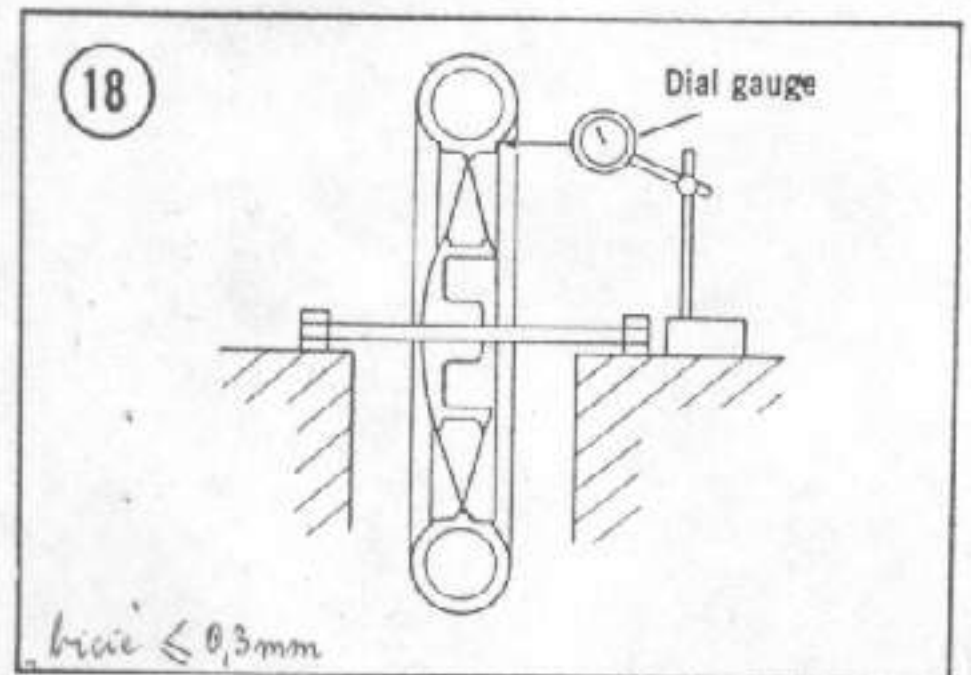
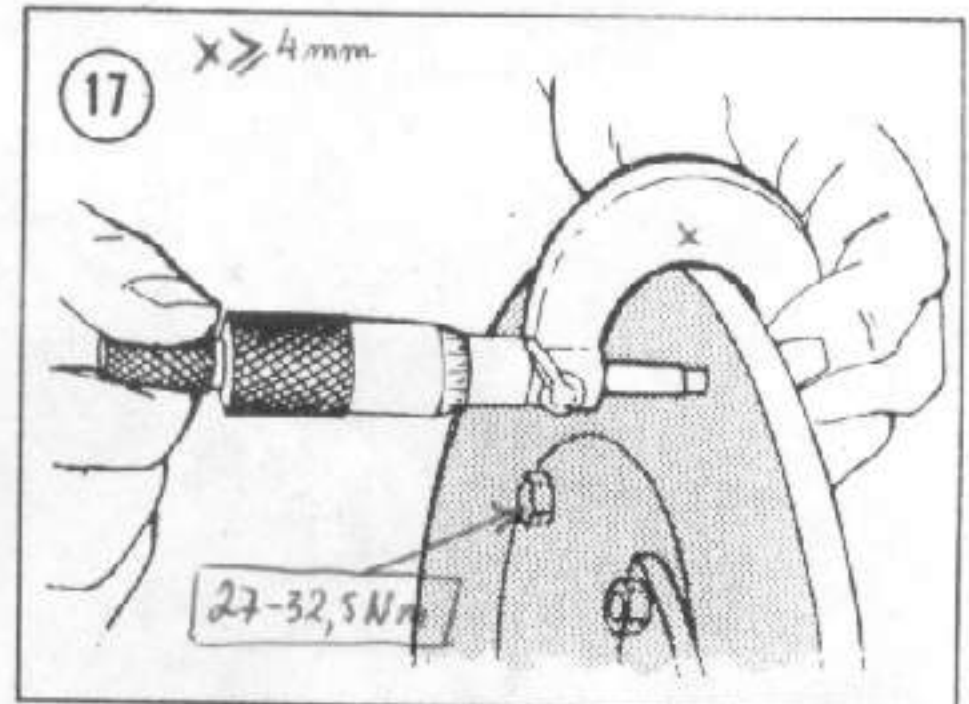
M.2**REAR DRUM BRAKE****M.2.1.****Disassembly**

1. Remove the rear wheel as described under *Rear Wheel Removal* in Chapter Ten.

2. Pull the brake assembly straight up and out of the brake drum.

3. Remove the cotter pins and dual washer from the brake shoe pivot pins (**Figure 19**).

4. Remove the return springs by lightly gripping the coil section with a pair of pipe pliers and extend one of the spring ends with needle nose pliers. Remove the brake shoes.

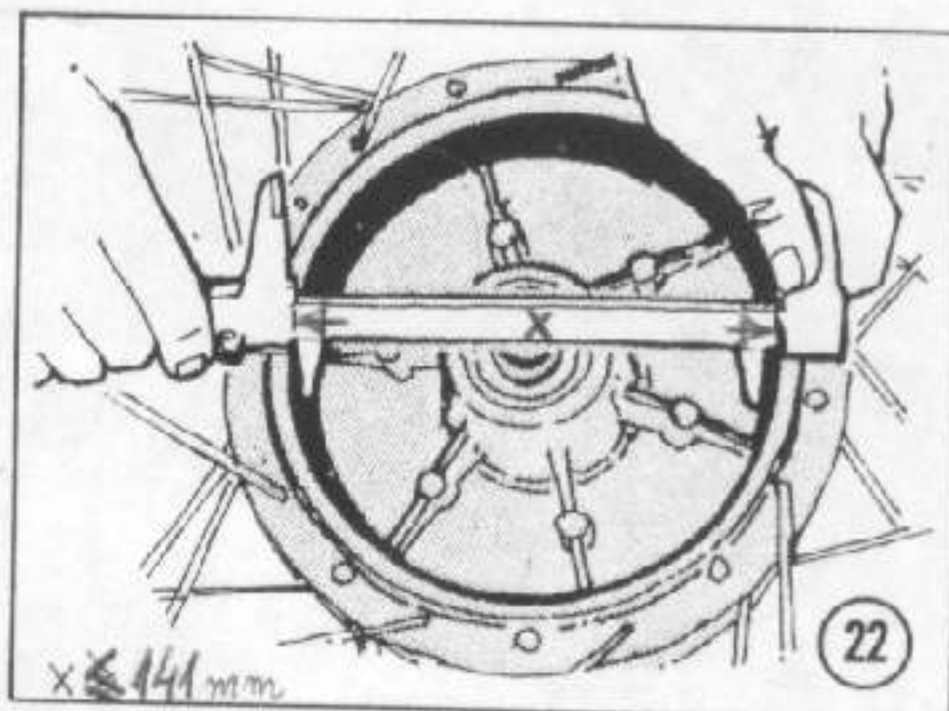
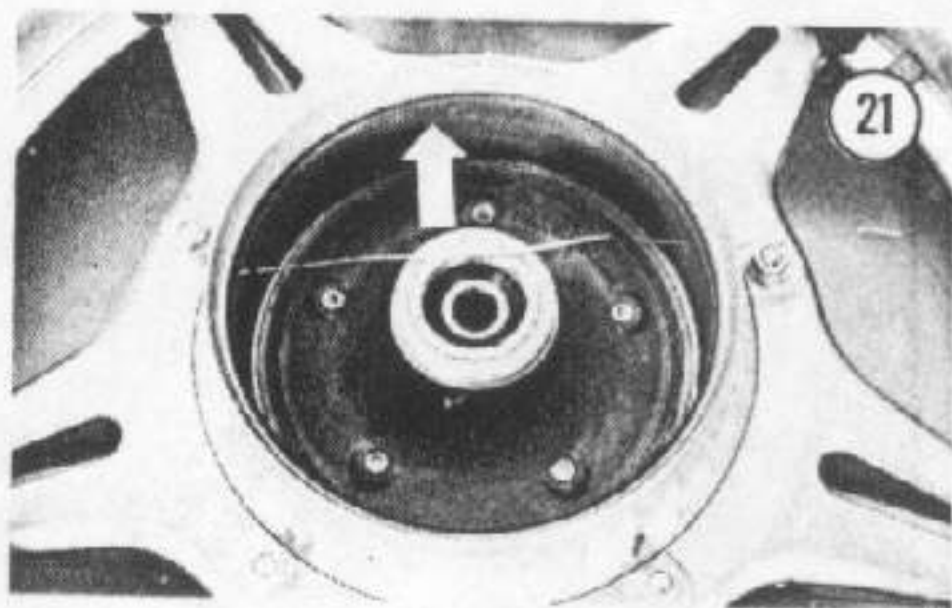
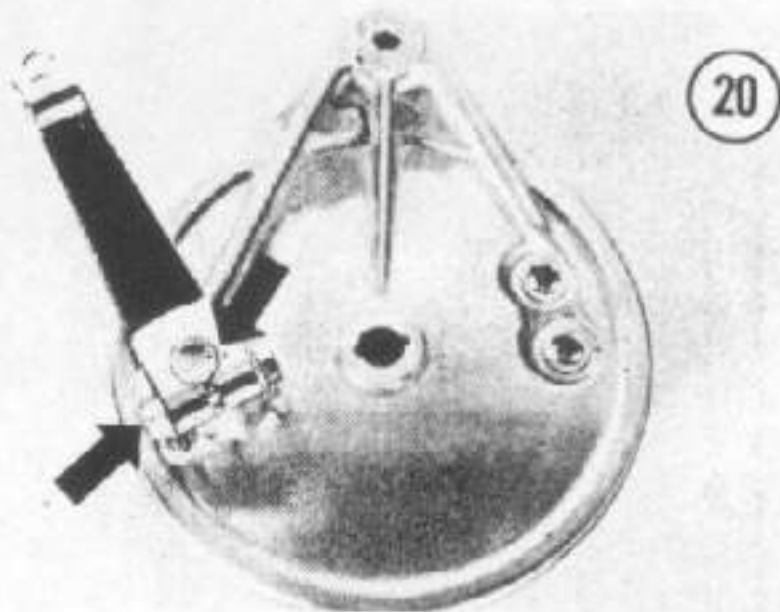


5. Remove the bolt and nut (Figure 20) on the brake arm.
6. Remove the arm from the camshaft and pull the cam out of the backing plate.

4.2.2.

Inspection

1. Thoroughly clean and dry all the parts except the linings.
2. Check the contact surface of the drum (Figure 21) for scoring. If there are deep grooves, deep enough to snag a fingernail, the drum should be reground.



3. Measure the inside diameter of the brake drum with vernier calipers (Figure 22). Standard size is 5.51-5.52 in. (140.0-140.3mm). If this measurement is 5.55 in. (141.0mm) or greater, the drum must be replaced.

4. If the brake drum is turned, the linings will have to be replaced and the new ones arced to the new drum contour.

5. Check the brake linings. They should be replaced if worn within 0.08 in. (2.0mm) of the metal shoe table (Figure 23).

6. Inspect the linings for imbedded foreign material. Dirt can be removed with a stiff wire brush. Check for any traces of oil or grease; if they are contaminated they must be replaced.

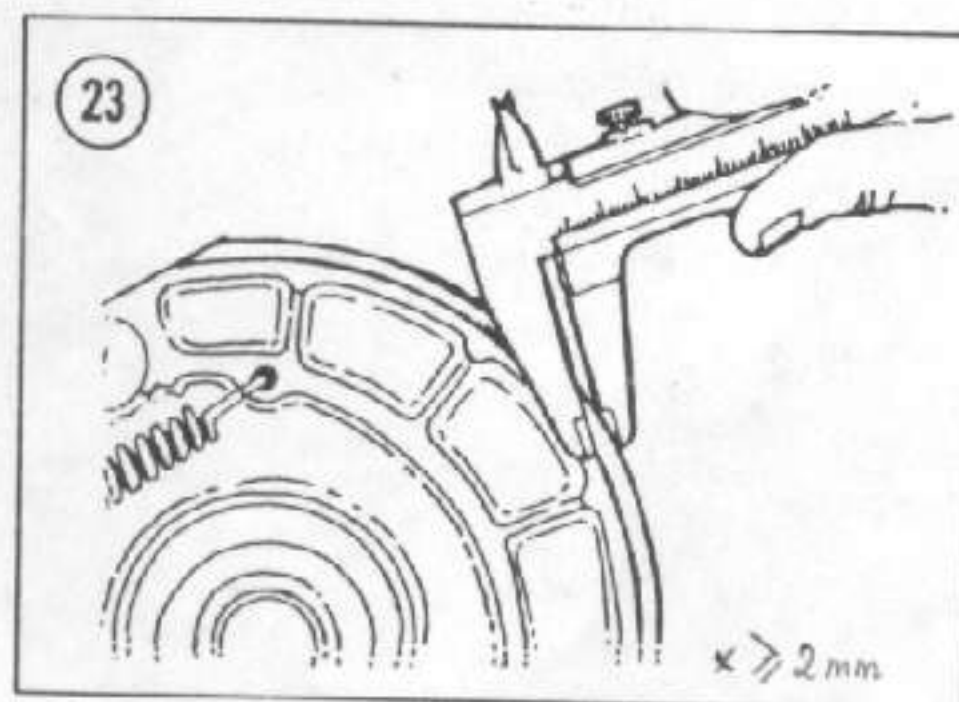
7. Inspect the cam lobe and the pivot pin area of the shaft for wear and corrosion. Minor roughness can be removed with fine emery cloth.

8. Inspect the brake shoe return springs for wear. If they are stretched, they will not fully retract the brake shoes and they will drag and wear out prematurely. Replace if necessary.

4.2.3.

Assembly

1. Assemble the brake by reversing the disassembly steps.
2. Grease the shaft, cam, and pivot post with a light coat of a molybdenum disulfide grease; avoid getting any grease on the brake plate where the linings may come in contact with it.
3. When installing the brake arm onto the camshaft, be sure to align the dimples on the two parts (Figure 20).
4. Install the wheel as described under *Rear Wheel Installation* in Chapter Ten.



CHAPTER TWELVE

FRAME AND REPAINTING

The frame does not require periodic maintenance. However, all welds should be inspected immediately after any accident, even a slight one.

This chapter describes procedures for completely stripping the frame. In addition, recommendations are provided for repainting the stripped frame.

This chapter also includes procedures for the kickstand, centerstand, and footpegs.

12.1

KICKSTAND (SIDE STAND)

12.1.1. Removal/Installation

1. Block up the engine or support the bike on the centerstand.
2. Raise the kickstand and disconnect the return spring (A, Figure 1) from the frame with Vise Grips.
3. Unbolt the kickstand from the frame (B, Figure 1).
4. Install by reversing these removal steps. Apply a light coat of multipurpose grease to the pivot surfaces of the frame tab and the kickstand yoke prior to installation.

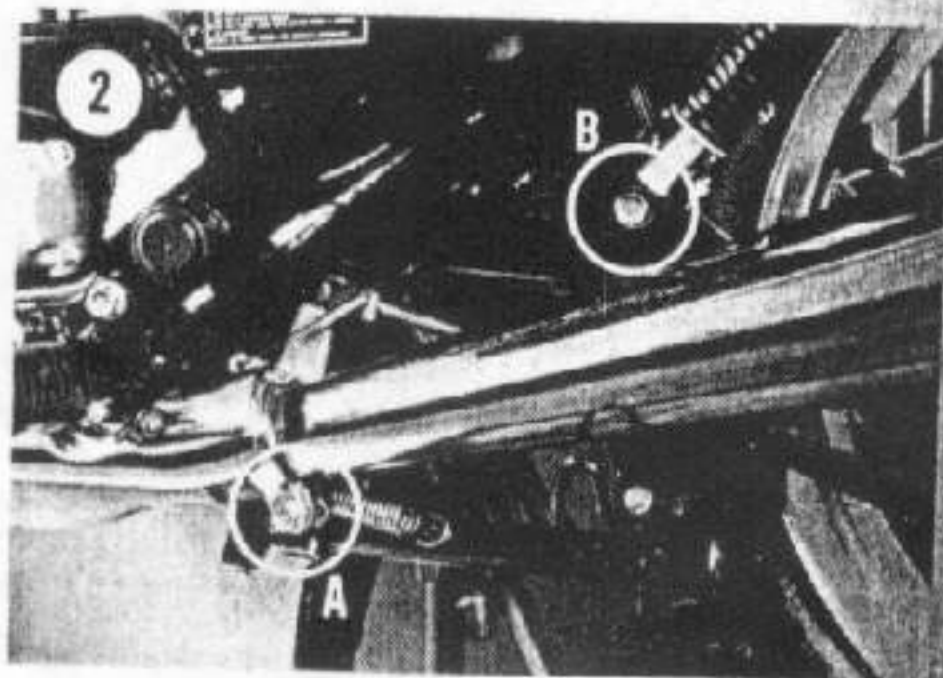
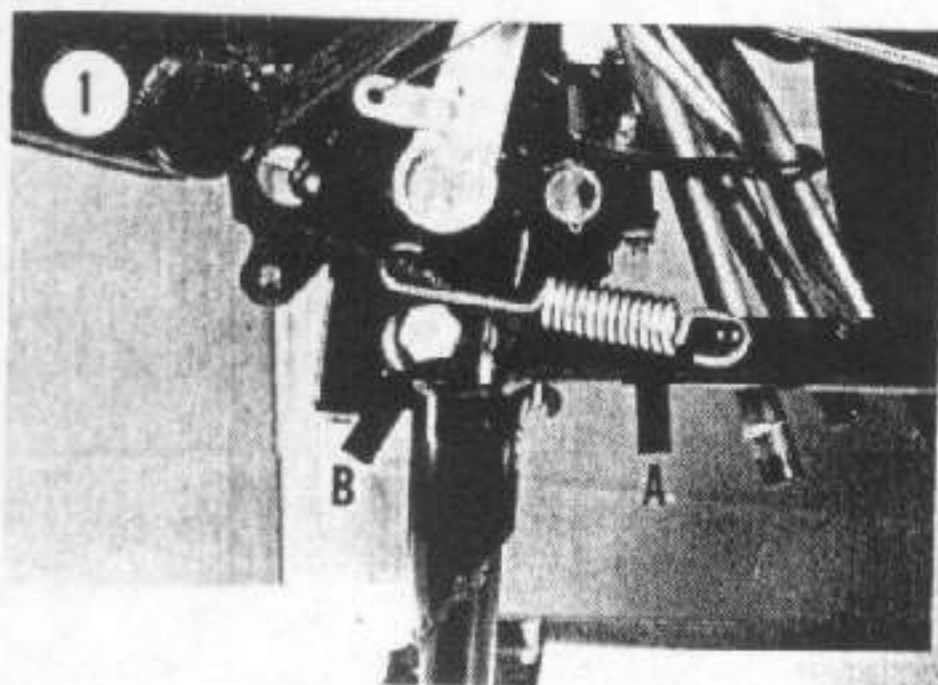
12.2

CENTERSTAND

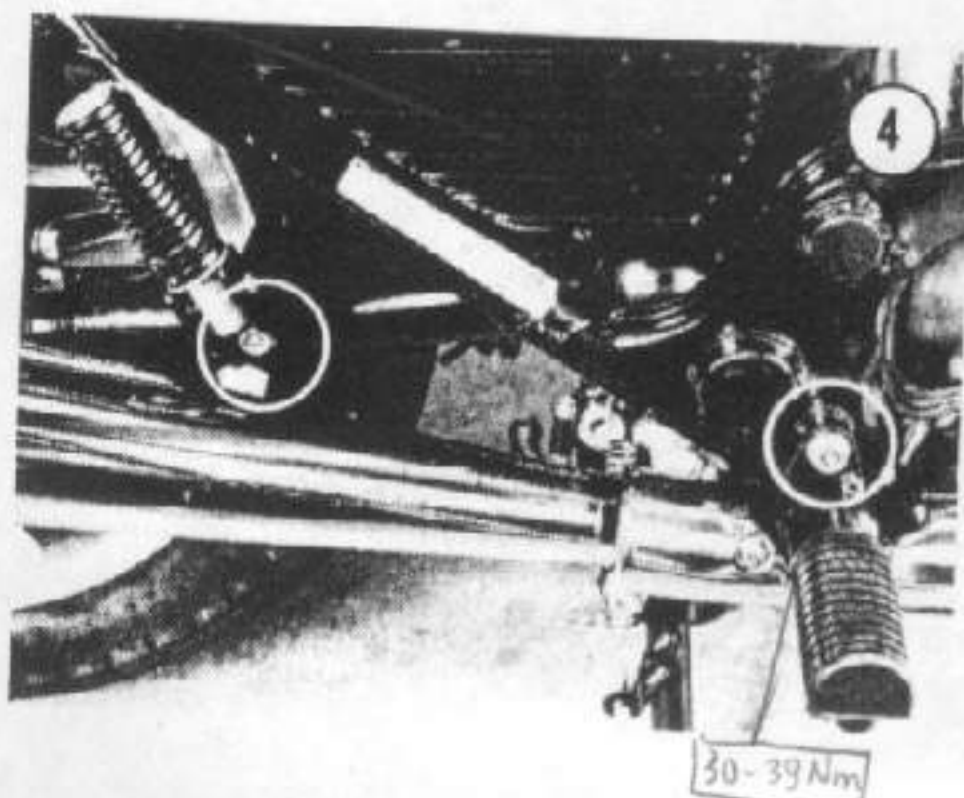
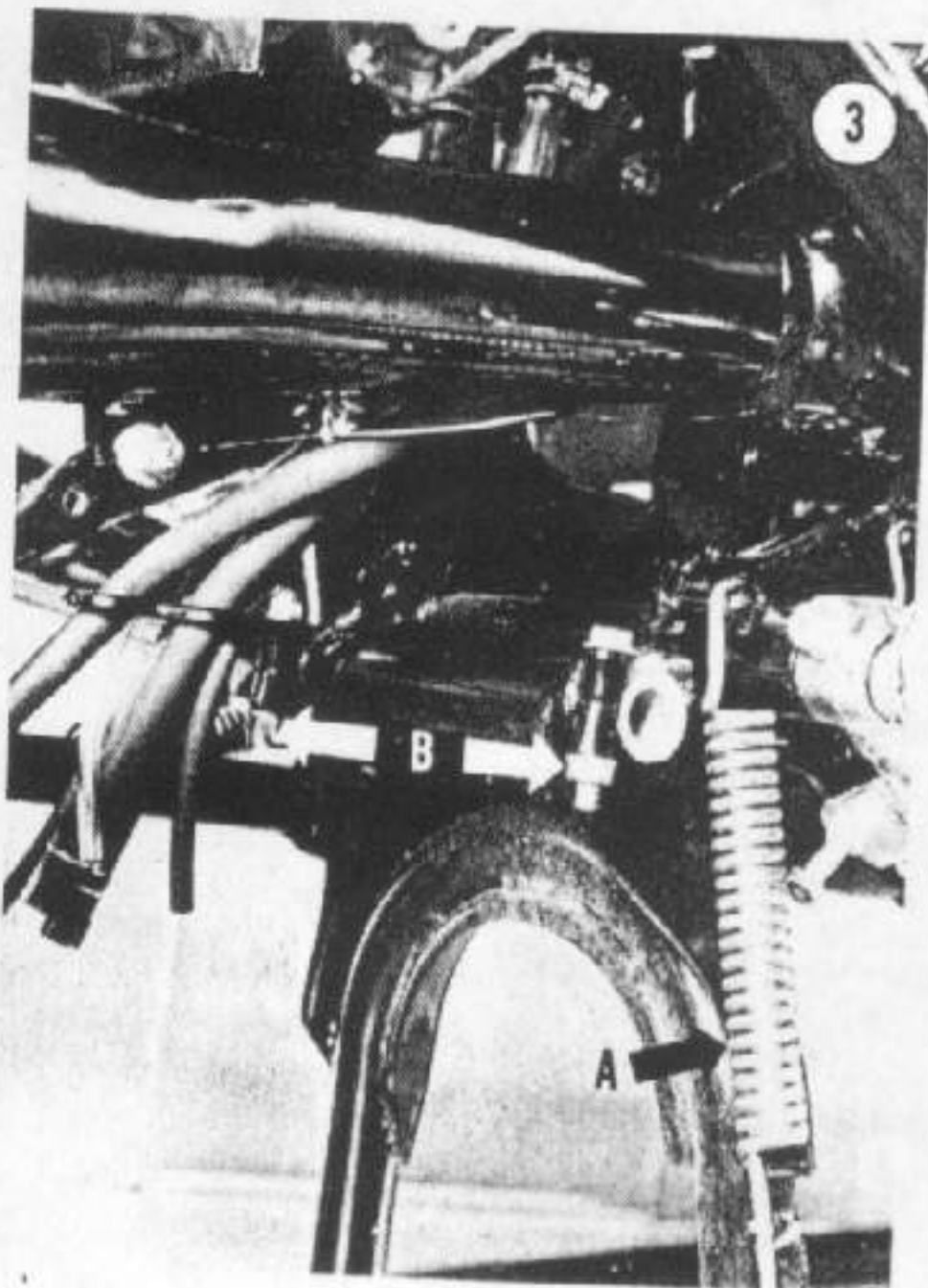
12.2.1. Removal/Installation

1. Block up the engine or support it on the centerstand.

2. Loosen the clamps securing the mufflers (A, Figure 2) to the collector and remove the bolts securing the rear footpegs and mufflers (B, Figure 2). Slide the mufflers out of the collector and remove them.



3. Remove the rear wheel as described under *Rear Wheel Removal* in Chapter Ten.
4. Place the centerstand in the raised position and disconnect the return spring (A, Figure 3) from the frame peg with Vise Grips.
5. Loosen the bolts and nuts on the clamps (B, Figure 3) securing the pivot tube.
6. Withdraw the tube from the right-hand side and lower the centerstand.
7. Install by reversing these removal steps. Apply a light coat of multipurpose grease to all



pivoting points of the centerstand prior to installation.

12.3

FOOTPEGS

12.3.1. Replacement

Remove the bolts (Figure 4) securing the front and rear footpegs to the frame. The rear bolt also holds the muffler in place.

Replace the footpegs and torque the bolts to 22-29 ft.-lb. (30-39 N•m).

When installing the front footpegs, make sure the alignment tab is correctly positioned.

12.4

FRAME

The frame does not require periodic maintenance. However, all welds should be examined immediately after any accident, even a slight one.

12.4.1.

Component Removal/Installation

1. Disconnect the negative battery cable. Remove the fuel tank, seat, and battery.
2. Remove the engine as described in Chapter Four.
3. Remove the front wheel, steering, and suspension components as described in Chapter Nine.
4. Remove the rear wheel and suspension components. See Chapter Ten.
5. Remove the lighting and other electrical equipment. Remove the wiring harness; see Chapter Seven.
6. Remove the kickstand and centerstand as described in this chapter.
7. Remove the bearing races from the steering head tube as described in Chapter Nine.
8. Check the frame for bends, cracks, or other damage, especially around welded joints and areas which are rusted.
9. Assemble by reversing the removal steps.

12.4.2.

Stripping and Painting

Remove all components from the frame. Thoroughly strip off all old paint. The best way is to have it sandblasted down to bare metal. If this is not possible, you can use a liquid paint remover like Strypeeze, or equivalent, and steel wool and a fine hard wire brush.

NOTE: *The headlight nacelle, radiator shroud, side panels, rear fender and taillight housing (Figure 5) are plastic. If you wish to change the color of these parts, consult an automotive paint supplier for the proper procedure.*

CAUTION

Do not use any liquid paint remover on these components as it will damage the surface. The color is an integral part of the component and cannot be removed.

When the frame is down to bare metal, have it inspected for hairline and internal cracks. Magnafluxing is the most common process.

Make sure that the primer is compatible with the type of paint you are going to use for the final coat. Spray one or two coats of primer on as smoothly as possible. Let it dry thoroughly and use a fine grade of wet sandpaper (400-600 grit) to remove any flaws. Carefully wipe clean the surface and then spray the final coat. Use either lacquer or enamel and follow the manufacturer's instructions.

A shop specializing in painting will probably do the best job. However, you can do a surprisingly good job with a good grade of spray paint. Spend a few extra bucks and get a good grade of paint as it will make a difference in

how well it looks and how long it will stand up. One trick in using spray paints is to first shake the can thoroughly — make sure the ball inside the can is loose; if not, return it and get a good one. Shake the can as long as is stated on the can. Then immerse the can *upright* in a pot or bucket of warm water (not hot — not over 120°F).

WARNING

Higher temperatures could cause the can to burst. Do not place the can in direct contact with any flame or heat source.

Leave the can in for several minutes. When thoroughly warmed, shake the can again and spray the frame. Several light mist coats are better than one heavy coat. Spray painting is best done in temperatures of 70°-80°F, any temperature above and below this will give you problems.

After the final coat has dried completely, at least 48 hours, any overspray or orange peel may be removed with a *light application* of rubbing compound and finished with polishing compound. Be careful not to rub too hard and go through the finish.

Finish off with a couple of good coats of wax prior to reassembling all the components.



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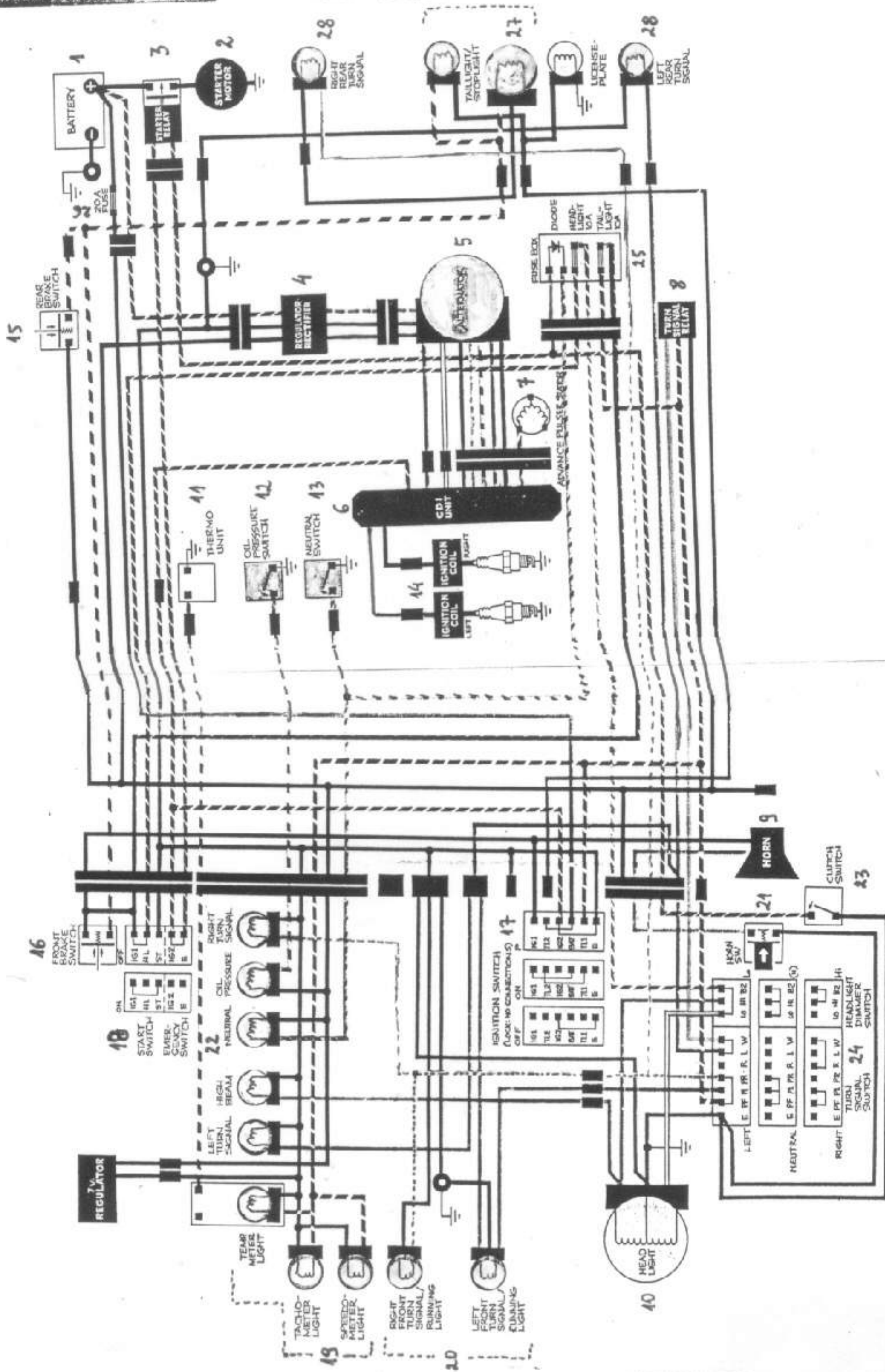
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5. ALTERNATOR
6. MODUŁ ZAPŁONOWY CDI
7. CZUJNIKI IMPULSÓW
8. PRZERYWACZ KIERUNKOWSKAŁÓW
9. SYGNAŁ DŹWIĘKOWY
10. REFLEKTOR GŁÓWNY
11. CZUJNIK TEMPERATURY - TERMOSTAT
12. CZUJNIK CIŚNIENIA OLEJU
13. CZUJNIK POZYCJI LUZZU
14. CEWKI ZAPŁONOWE
15. WŁĄCZNIK STOP-U HAMULCACYLNEGO
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17. STACYJKA -
18. WŁĄCZNIK ZAPŁONU
19. OŚWIETLENIE PRĘDKOŚCIOMIERZA I OBROTOMIERZA, CZUJNIKA TEMPERATURY
20. KIERUNKOWSKAŁY PRZEDNIE / ŚWIATEŁA POZYCYJNE (USA)
21. WŁĄCZNIK SYGNAŁU DŹWIĘKOWEGO
22. KONTROLKI
23. CZUJNIK WŁĄCZENIA SPRZĘGŁA
24. PRZEBŁAZNIK ZESTOŁONY ŚWIATEŁ, KIERUNKOWSKAŁÓW
25. BEZPIECZNIKI
26. BEZPIECZNIK GŁÓWNY
27. ŚWIATEŁO TYLNE (STOP)
28. KIERUNKOWSKAŁY TYLNE

HONDA CX500



SCHEMAT INSTALACJI ELEKTRYCZNEJ HONDA CX500 (USA)