

YAMAHA

SZR 660 '95

4SU-ME1

SERVICE MANUAL

SZR 660 ('95)
SERVICE MANUAL
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R&D TECHNICAL DIVISION
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Although some of the drawings and photographs used in this manual are taken from other manuals and do not refer directly to the model in question, the procedures described and the details illustrated are nonetheless relevant and suitable to the user's purposes.

SYMBOL LEGEND

(Refer to illustrations)

Symbols (1) to (9) are used to indicate chapter number and content.

- (1) General information
- (2) Technical specifications
- (3) Periodic inspection and adjustment
- (4) Engine overhaul
- (5) Cooling system
- (6) Carburetor
- (7) Chassis
- (8) Electricals
- (9) Troubleshooting










Symbols (10) to (16) serve to specify the following elements:













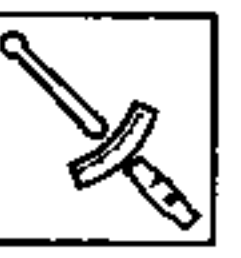

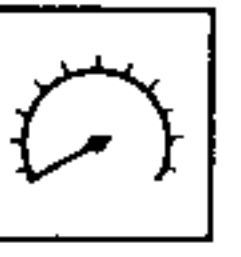




- (10) Fluid
- (11) Lubricant
- (12) Special tool
- (13) Screw tightening
- (14) Wear and tear limit, clearance
- (15) Engine speed
- (16) Resistance (Ω), Voltage (V), Electric Current (A)

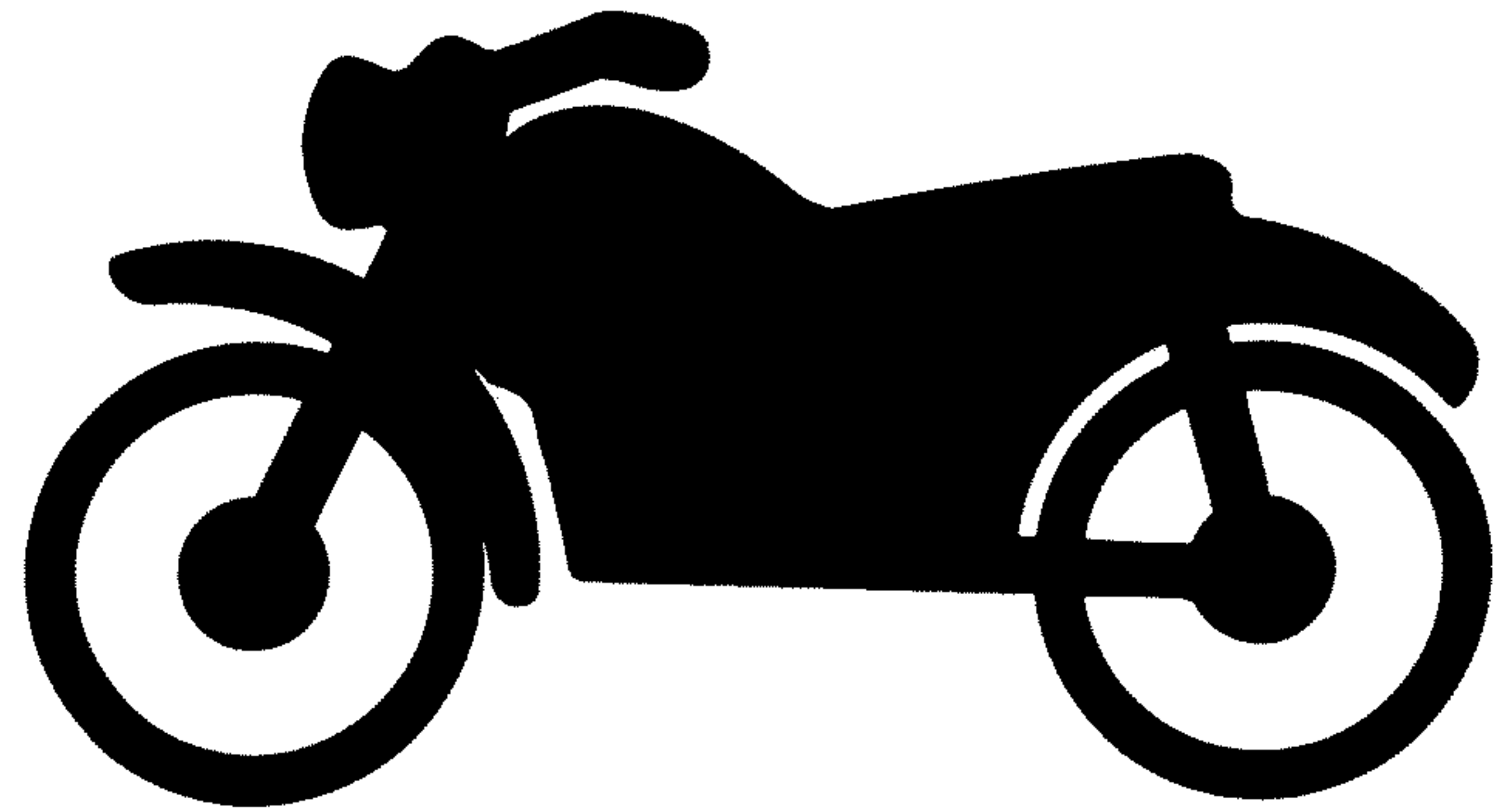
Symbols (17) to (23) in the exploded diagram indicate type of lubricant and location of lubrication point.

- (17) Apply engine oil
- (18) Apply gear oil
- (19) Apply molybdenum disulfide oil
- (20) Apply wheel bearing grease
- (21) Apply lightweight lithium-soap grease
- (22) Apply molybdenum disulfide grease
- (23) Apply locking liquid (LOCTITE®)

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**GEN
INFO**

1

**CHAPTER 1°
GENERAL INFORMATION**

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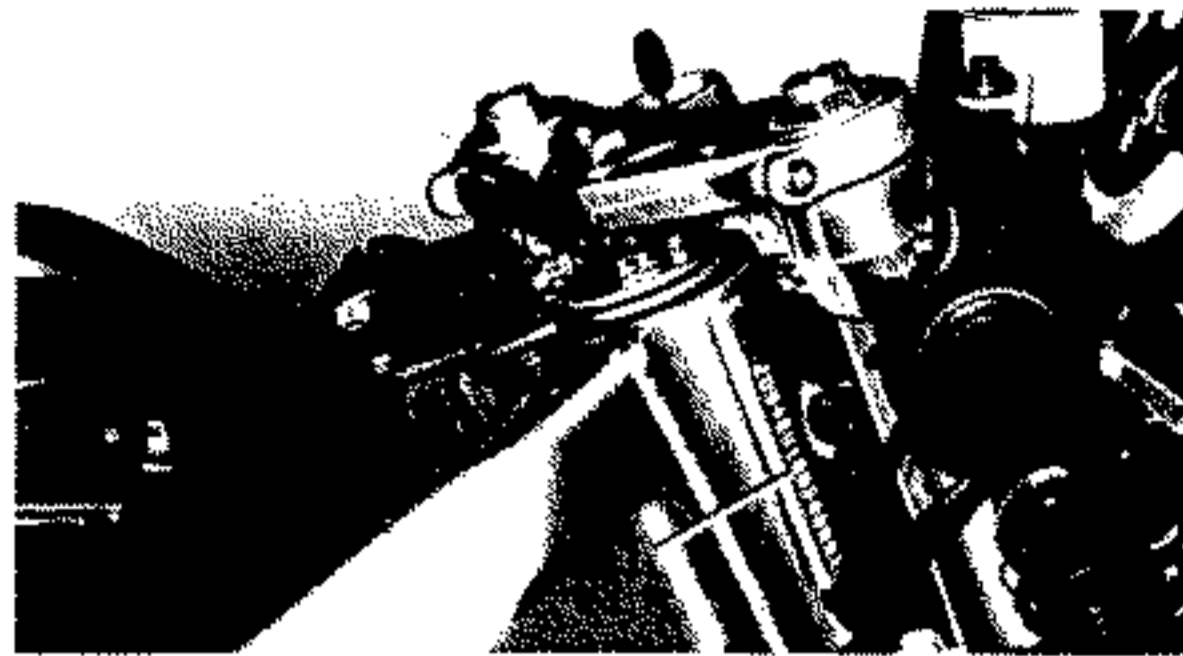


IDENTIFICATION OF MOTORCYCLE

IDENTIFICATION NUMBER

The identification number is stamped on the right of the steering head pipe.

Progressive serial number:
SZR 660
4SU-040101 (D) version
ZD04SU10000000101 (I-GR-P) version
ZD04SU10000020101
[F-B-N-S-DK-NL-(A-CH)] version
ZD04SU10000060101 (E) version

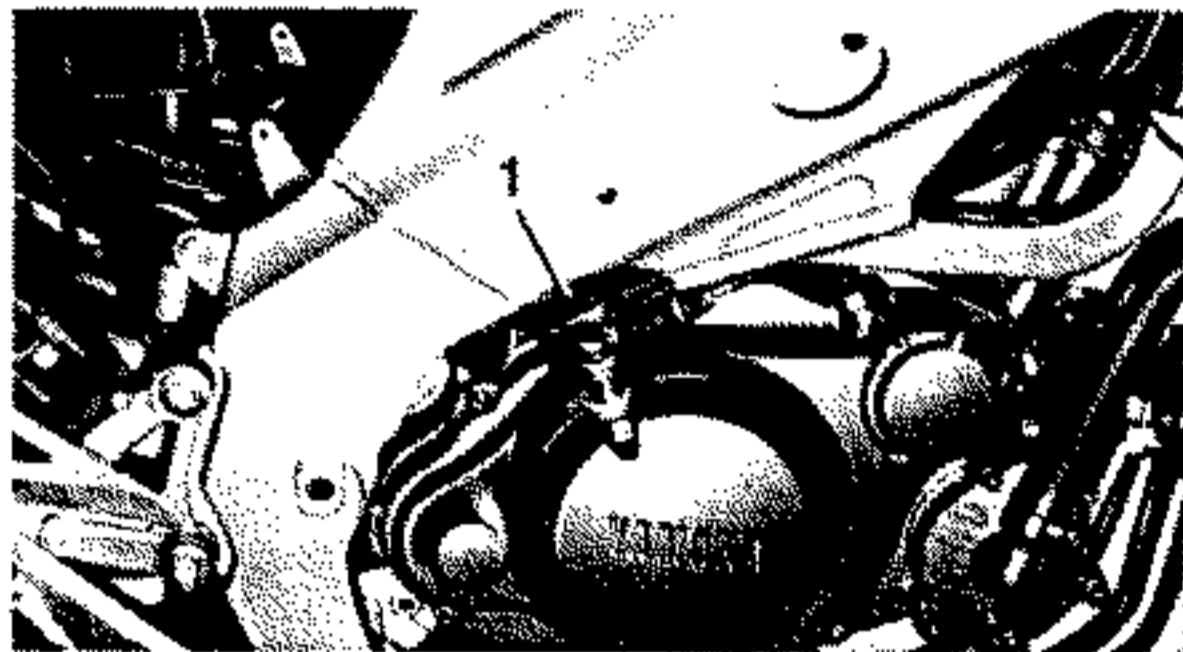


1. Motorcycle identification number

ENGINE SERIAL NUMBER

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

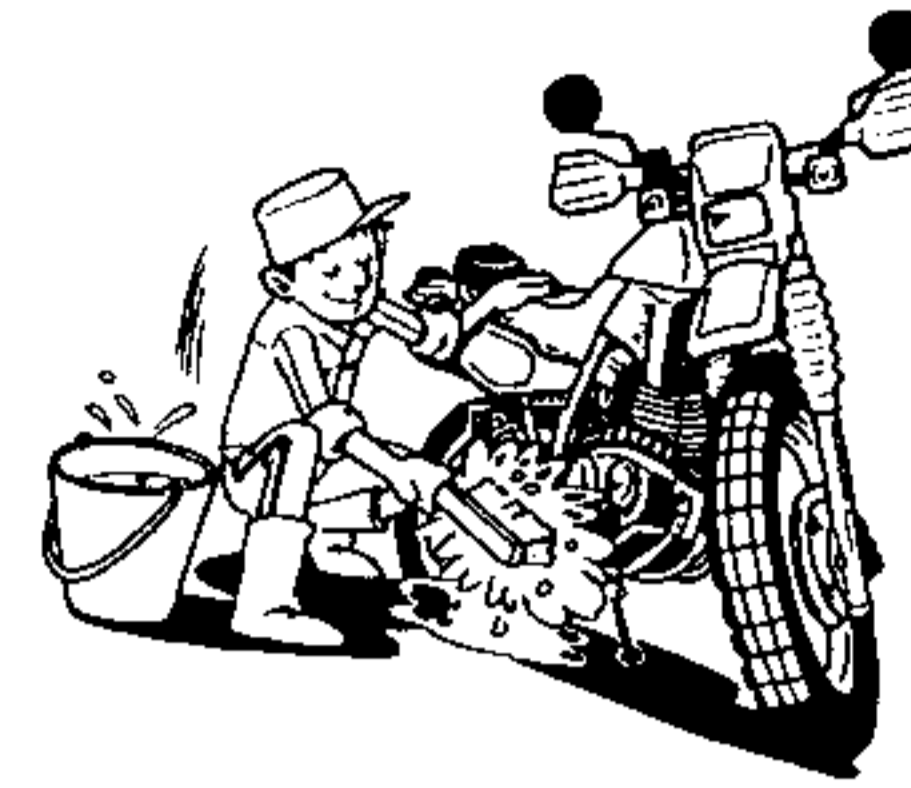
Progressive engine serial number:
SZR 660
4SU-000101



1. Engine serial number

NOTE:

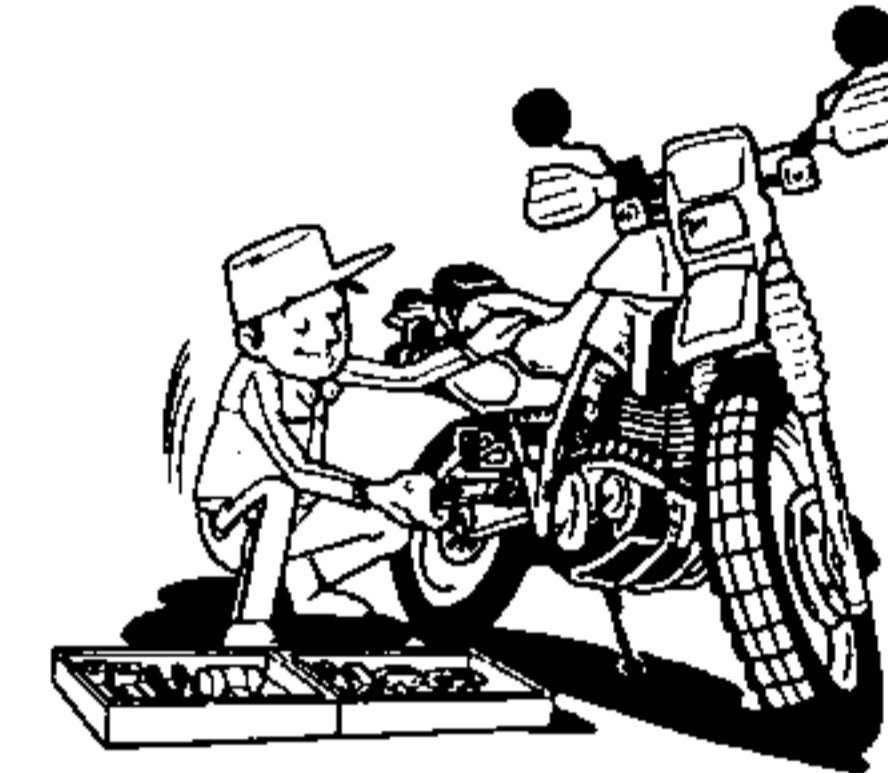
- The first three digits in these numbers identify the model; the other digits form the progressive production number of the unit.
- Diagrams and specifications may be altered without prior warning.



IMPORTANT INFORMATION

PREPARATION FOR DISASSEMBLY AND REASSEMBLY

1. Remove all dirt, mud, dust and foreign objects prior to disassembly.



2. Use proper material and tools. Refer to section 'SPECIAL TOOLS'.



3. When disassembling the cycle, keep together mated parts: gears, cylinders, pistons and other parts 'mated' in the course of normal wear and tear. Such parts must be either re-used together or completely replaced.

4. During disassembly, clean all parts and place them in trays in order of disassembly. This makes reassembly quicker and helps assure that all parts are assembled properly.



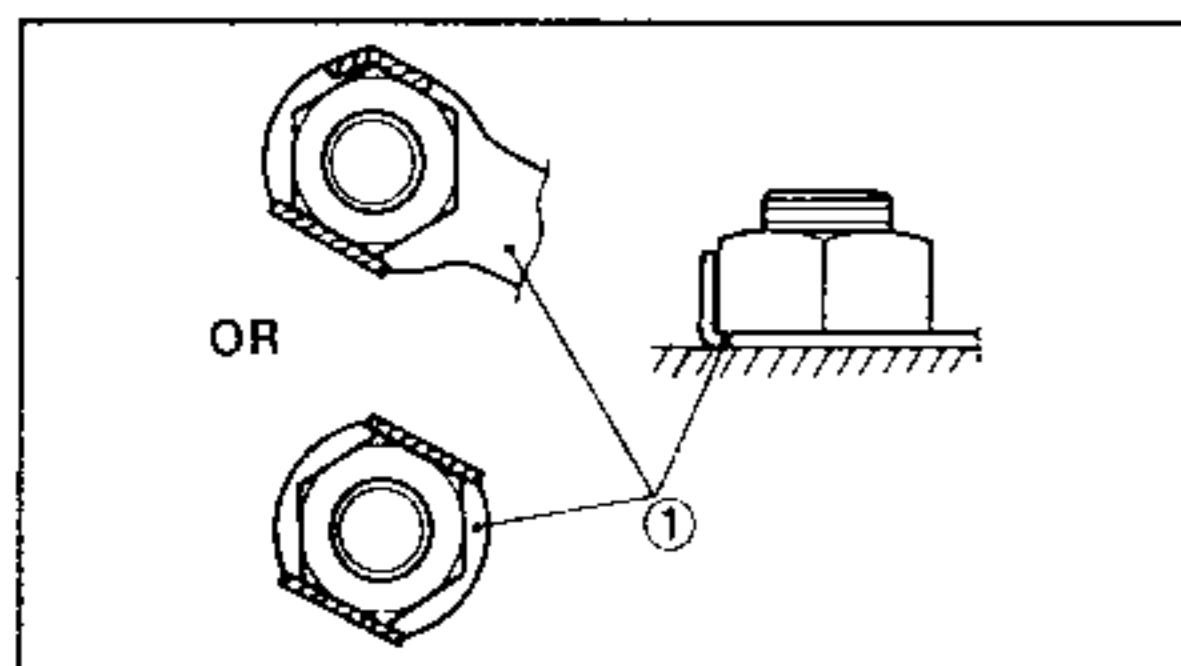
5. Keep away from fire and sources of heat.

SPARE PARTS

1. We recommend original Yamaha parts for all replacements. Use the oil and grease recommended by Yamaha for all assembly and adjustment operations. Products of other makes with the same function and appearance might be inferior in quality.

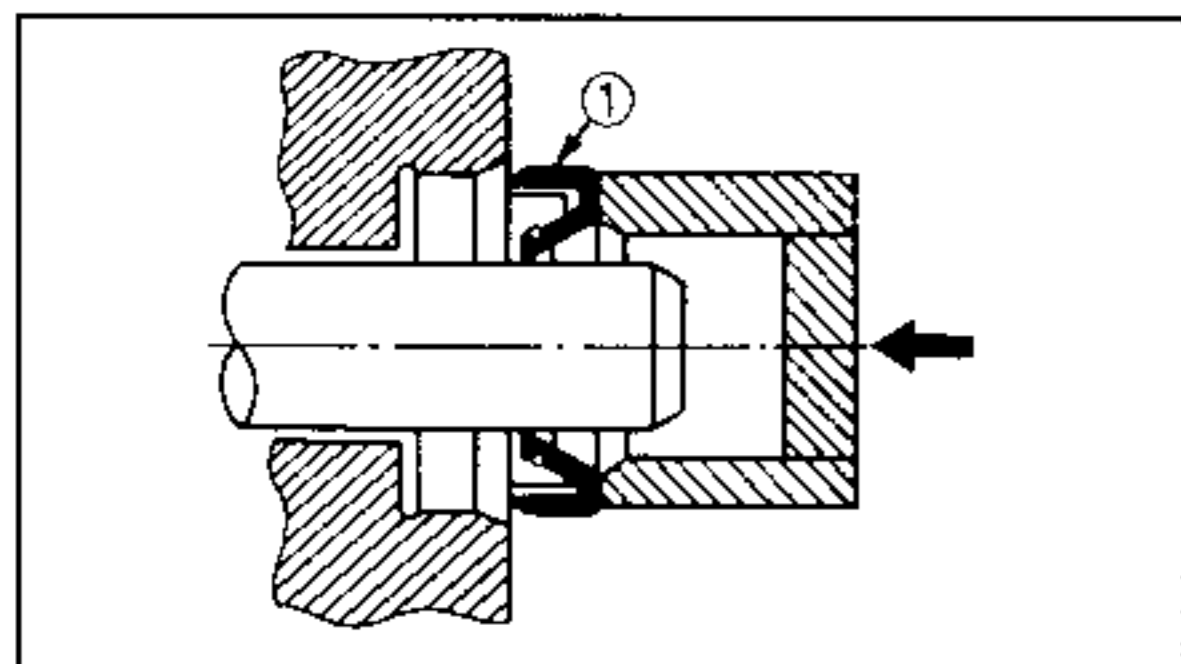
GASKETS, OIL SEALS AND O-RINGS

1. All gaskets, oil seals and O-rings should be replaced during engine overhauls. All gasket surfaces, oil seal lips and O-rings must be cleaned prior to assembly.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to oil seal lips.



LOCK WASHERS, PLATES AND COTTER PINS

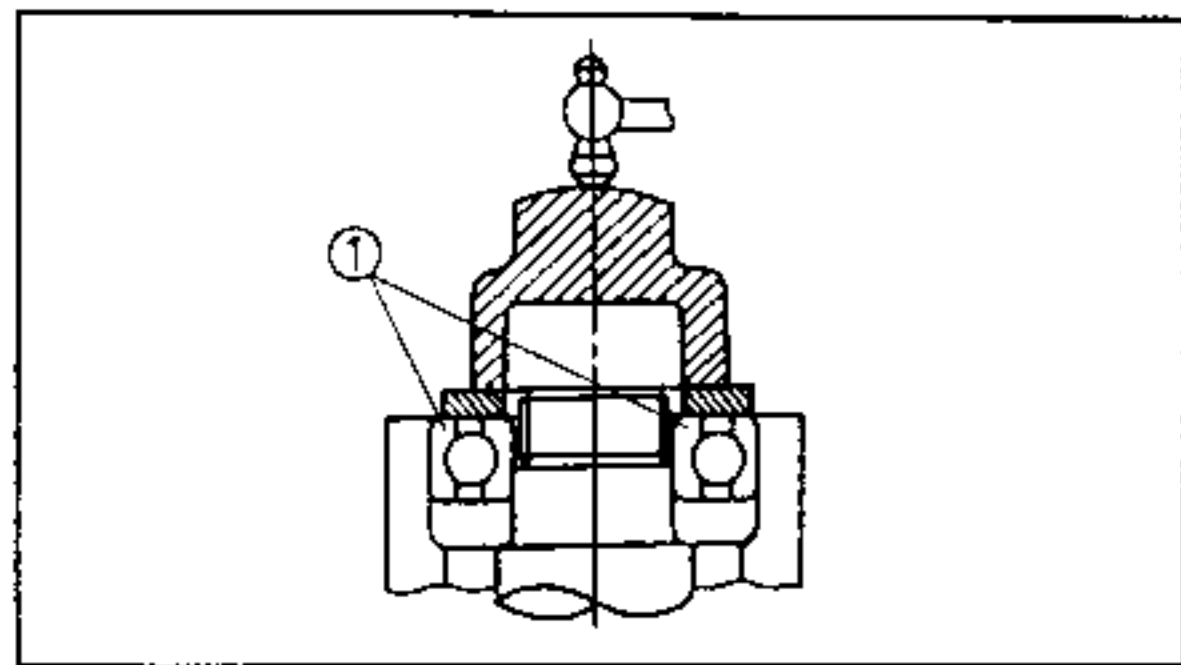
1. All lock washers, plates (1) and cotter pins must be replaced once removed. Lock tabs must be bent along the bolt or nut surfaces after the bolt or nut has been properly tightened.



BEARINGS AND OIL SEALS

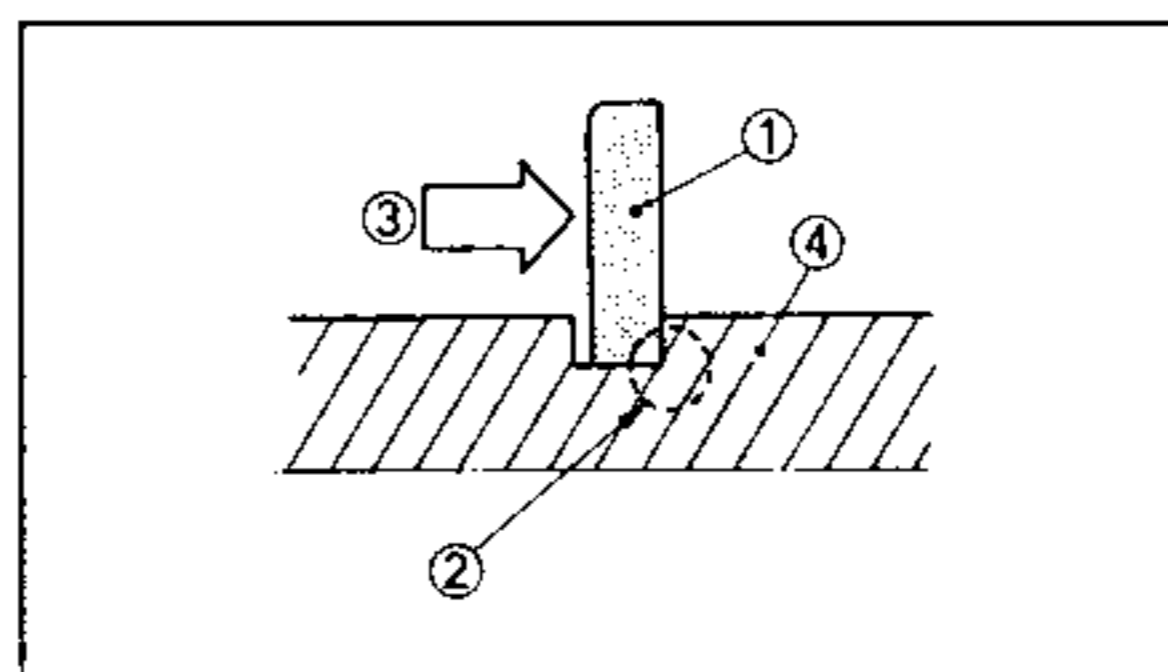
1. Fit bearings and oil seals with the manufacturer's mark or number facing outwards (ie, the stamped letters must be visible). When installing oil seals, apply a light coating of lightweight lithium-based grease to the seal lips. Oil the bearings liberally when installing.

(1) Oil seals



CAUTION: _____
Do not use compressed air to dry the bearings. This damages their outer surface.

(1) Bearing



CIRCLIPS

1. All circlips should be inspected carefully prior to reassembly. Always replace piston ring clips after one use. Replace twisted circlips. When installing a circlip (1), make sure that the sharp-edged corner (2) is positioned opposite the thrust (3) it receives. See the illustration here.

(4) Shaft




SPECIAL TOOLS

Special tools are required to perform proper disassembly and reassembly operations and for proper tuning up. The use of such tools avoids damage due to the use of unsuitable tools and/or makeshift techniques.

The shape and part number used for the special tool differ by country, so two types are provided. Refer to the list provided to avoid errors when placing an order.

For USA, CDN
P/N. YM-□□□□□, YU-□□□□□
YS-□□□□□, YK-□□□□□
ACC-□□□□□

Except for USA, CDN
P/N. 90890-□□□□□

Tool number	Tool name	Illustration
YM-08035	VALVE ADJUSTMENT TOOL	
90890-01311	VALVE ADJUSTMENT TOOL	
YU-08036-A	INDUCTIVE ENGINE SPEED INDICATOR	



Tool number	Tool name	Illustration
90890-03113	INDUCTIVE ENGINE SPEED INDICATOR	
YM-33277-A	INDUCTIVE STROBOSCOPIC LAMP	
90890-03141	INDUCTIVE STROBOSCOPIC LAMP	
YU-33223	PRESSURE GAUGE	
90890-03081	PRESSURE GAUGE	
YU-33223-3	ADAPTER FOR PRESSURE GAUGE	
90890-04082	ADAPTER FOR PRESSURE GAUGE	
YM-01312-A	FUEL LEVEL GAUGE	
90890-01312	FUEL LEVEL GAUGE	
YU-01304	PISTON PIN CLIP PULLER	



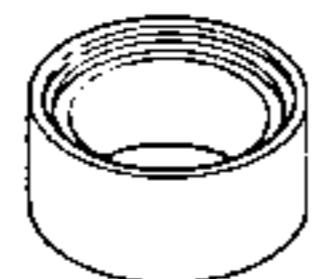


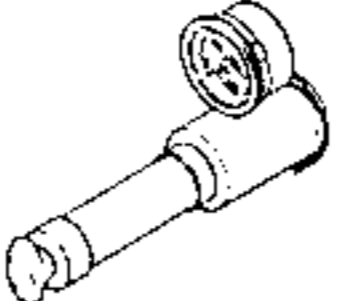
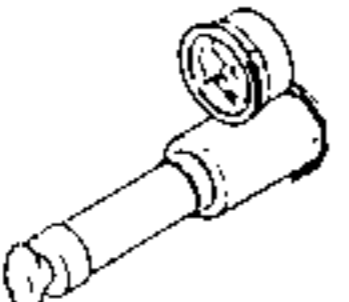
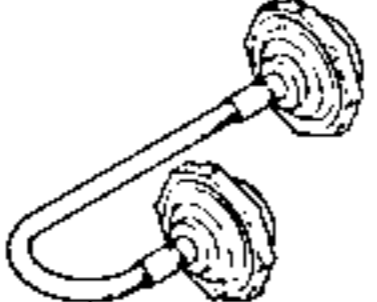
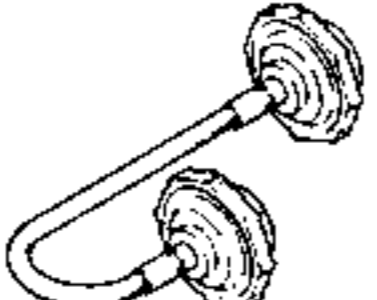
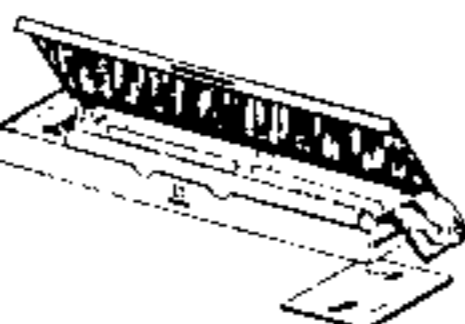
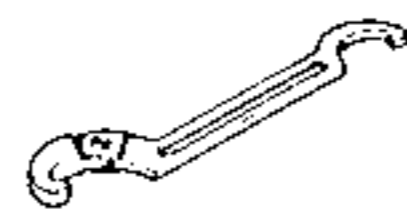
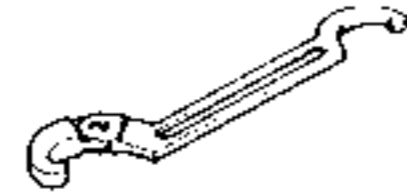
Tool number	Tool name	Illustration
90890-01304	PISTON PIN CLIP PULLER	
YS-01880	ROTOR HOLDER	
90890-01701	ROTOR HOLDER	
YU-33270	ROTOR SCREW PULLER	
90890-01362	ROTOR SCREW PULLER	
YM-04063-A	ADAPTER FOR ROTOR SCREW PULLER	
90890-04063	ADAPTER FOR ROTOR SCREW PULLER	
YM-91042	ALL-PURPOSE CLUTCH HOLDER	
90890-04086	ALL-PURPOSE CLUTCH HOLDER	
YU-01135-A	CRANKCASE SEPARATING TOOL	

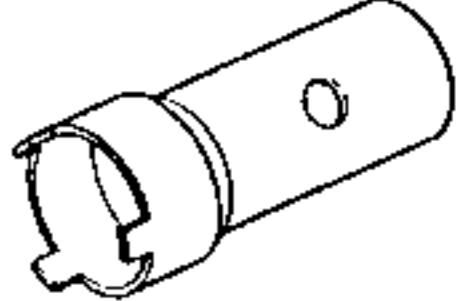
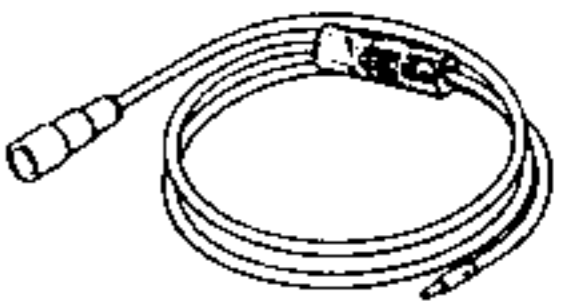
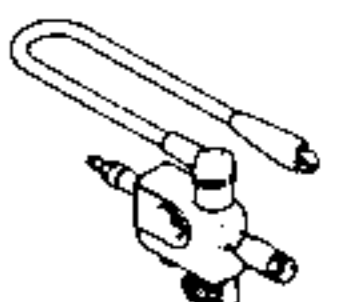
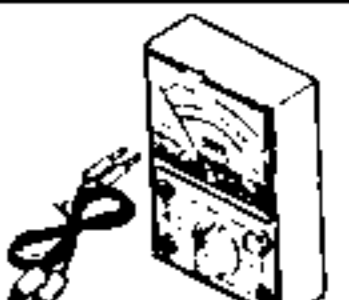



Tool number	Tool name	Illustration
90890-01135	CRANKCASE SEPARATING TOOL	
YU-01083-A	SLIDING HAMMER UNIT	
90890-01083	SLIDING HAMMER BOLT	
90890-01084	SLIDING HAMMER WEIGHT	
YM-04019	VALVE SPRING COMPRESSION CLAMP	
90890-04019	VALVE SPRING COMPRESSION CLAMP	
YM-91043	VALVE HOUSING CUTTER	
YM-04064	6 mm (0.24 in) VALVE GUIDE PULLER	
90890-04064	6 mm (0.24 in) VALVE GUIDE PULLER	
YM-04066	6 mm (0.24 in) VALVE GUIDE REAMER	



Tool number	Tool name	Illustration
90890-04066	6 mm (0.24 in) VALVE GUIDE REAMER	
YM-04065-A	6 mm (0.24 in) VALVE GUIDE INSTALLER	
90890-04065	6 mm (0.24 in) VALVE GUIDE INSTALLER	
YU-90050	DRIVING SHAFT INSTALLATION UNIT	
90890-01274	DRIVING SHAFT INSTALLATION HOSE	
90890-01275	DRIVING SHAFT INSTALLATION BOLT	
YM-90069	#10 (M14) ADAPTER (FOR DRIVING SHAFT INSTALLATION)	
90890-04059	#10 (M14) ADAPTER (FOR DRIVING SHAFT INSTALLATION)	
YM-91044	CRANK SPACER	
90890-04081	CRANK SPACER	

Tool number	Tool name	Illustration
90890-01288	SPACER (FOR CRANK)	
ACC-11001-01	SEALANT (QUICK GASKET) [®] Yamaha Bond No. 1215 [®]	
90890-85505	SEALANT (QUICK GASKET) [®] Yamaha Bond No. 1215 [®]	
YU-24460-01	RADIATOR CAP TESTER	
90890-01325	RADIATOR CAP TESTER	
YU-33984	ADAPTER (FOR RADIATOR CAP TESTER)	
90890-01352	ADAPTER (FOR RADIATOR CAP TESTER)	
4SU-F8120-W0	FRONT FORK SERVICE KIT ASSY	
YU-01268	RING NUT WRENCH	
90890-01268	RING NUT WRENCH	

Tool number	Tool name	Illustration
90890-01385	RING NUT WRENCH	
YM-34487	DINAMIC SPARK TESTER	
90890-03144	IGNITION CHECKER	
YU-03112	POCKET TESTER	
90890-03112	POCKET TESTER	



SPEC

2

**CHAPTER 2°
TECHNICAL SPECIFICATIONS**

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TECHNICAL SPECIFICATIONS - GENERAL SPECIFICATIONS

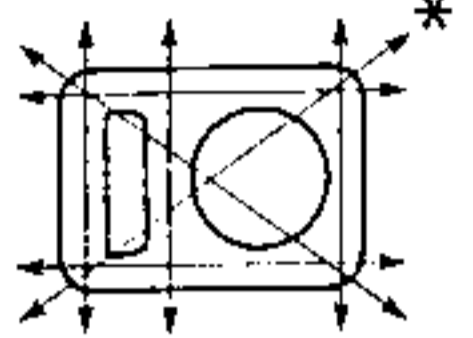
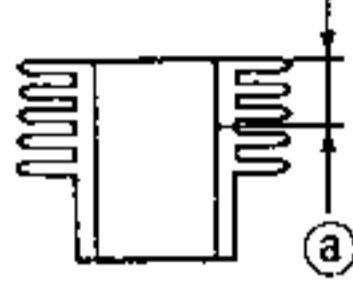
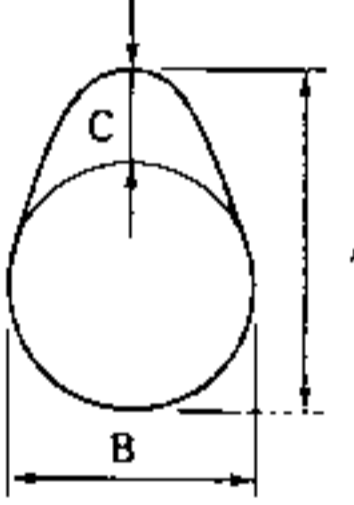
Model code number Initial engine stamp number Initial frame stamp number	4SU1 4SU-000101 4SU-040101 (D) version ZD04SU10000000101 (I-GR-P) version ZD04SU10000020101 [F-B-N-S-DK-NL-(A-CH)] version ZD04SU10000060101 (E) version
Dimensions: Overall length Overall width Overall height Seat height Wheel base Minimum ground clearance	2,040 mm 740 mm 1,140 mm 770 mm 1,410 mm 145 mm
Basic weight	159 kg
Minimum turning radius	3,150 mm (left); 3,200 mm (right)
Engine: Engine type Model Cylinder layout Displacement Bore x stroke Compression ratio Starting system	4-stroke, SOHC, liquid cooled, 5-valve 4SU1 Single cylinder, inclined forward 659 cc 100x84 mm 9.2:1 Electric starter
Lubrication: Type Recommended engine oil	Dry sump with separate oil tank SHELL SUPER 4TX 20W/50
Capacity (engine oil): Periodic oil change With oil filter replacement Total amount	2.6 liters 2.7 liters 3.0 liters
Cooling system: Type Water/cooling liquid ratio Circuit liquid total quantity Expansion tank capacity From "LOW" to "FULL"	Liquid with forced circulation and electric fan 50% - 50% 1.4 liters 0.55 liters 0.210 liters
Air filter: Type	Dry filter element
Fuel (type): Tank capacity: Total Reserve amount	Premium Grade Fuel. If Premium Grade gasoline is not available, then unleaded gasoline with octane grade (R.O.N.) of 91 or higher can be used 14 liters 2.5 liters
Carburetor: Type/Manufacturer	Y26PV-3J/TEIKEI
Spark plug: Type/Manufacturer Electrode gap	DPR8EA-9 or DPR9EA-9/NGK 0.8-0.9 mm
Clutch: Type	Wet, multi-disc

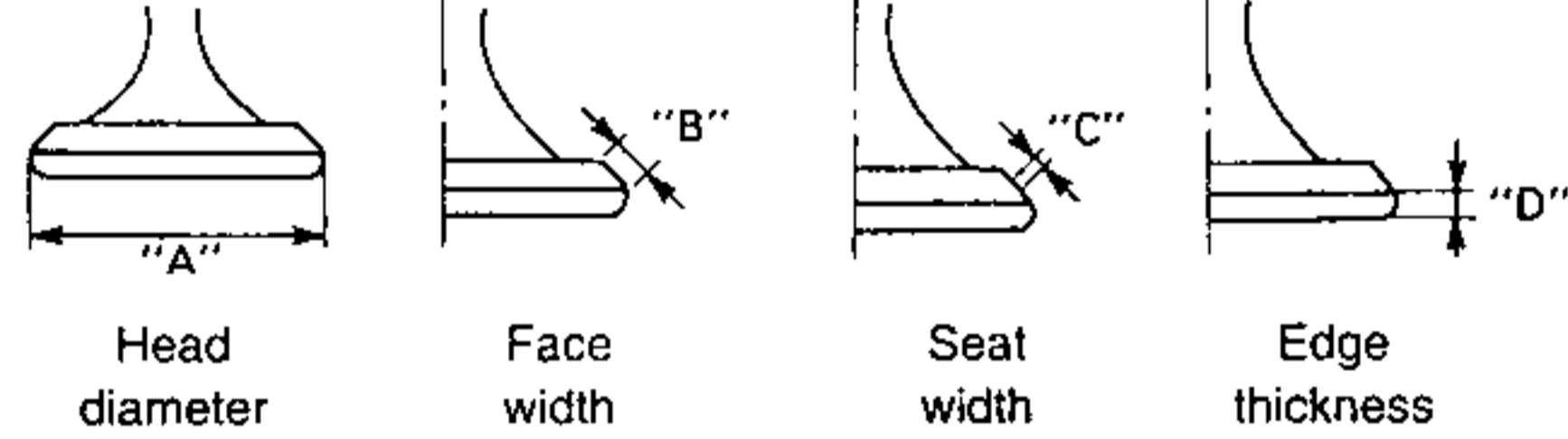
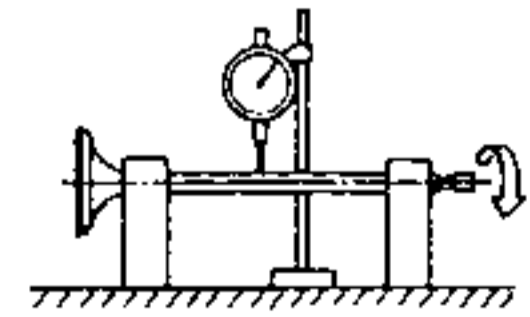


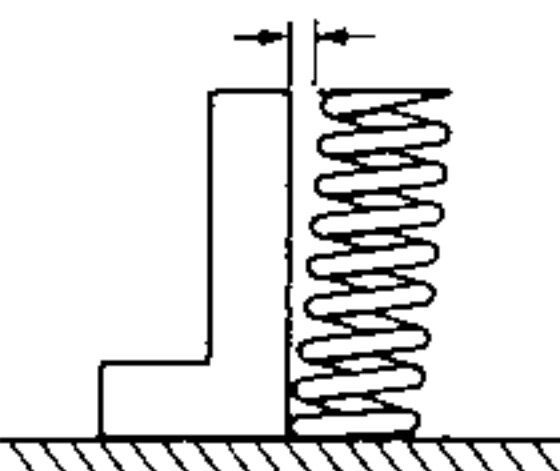

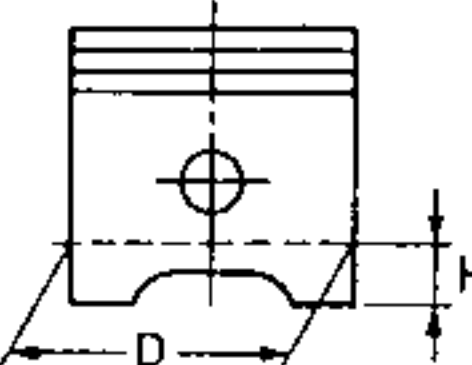
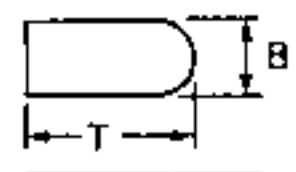
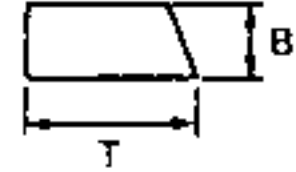
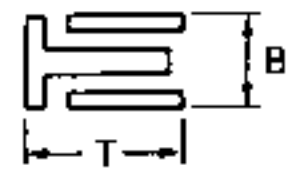
Transmission: Type Primary reduction system Primary reduction ratio Secondary reduction system Secondary reduction ratio Operation Gear ratio:	Constant mesh 5-speed Straight-tooth gears 71/34 (2.088) Chain drive 39/15 (2.600) Left foot operation 30/13 (2.308) 27/17 (1.588) 24/20 (1.200) 21/22 (0.954) 19/24 (0.792)									
Frame: Frame type Caster angle/Trail	Deltabox aluminium frame 24°/102 mm									
Tires: Type Size: Front Rear	Tubeless 110/70 ZR17 TX15 (MICHELIN) - 110/70 ZR17 TL (DUNLOP) 150/60 ZR17 TX25 (MICHELIN) - 150/60 ZR17 TL (DUNLOP)									
Tire inflation pressure (cold tires) bar-kg/cm ² (psi) Rider only With passenger	<table border="1"> <thead> <tr> <th></th> <th>Front</th> <th>Rear</th> </tr> </thead> <tbody> <tr> <td>Rider only</td> <td>2 (28)</td> <td>2.2 (32)</td> </tr> <tr> <td>With passenger</td> <td>2.2 (32)</td> <td>2.5 (37)</td> </tr> </tbody> </table>		Front	Rear	Rider only	2 (28)	2.2 (32)	With passenger	2.2 (32)	2.5 (37)
	Front	Rear								
Rider only	2 (28)	2.2 (32)								
With passenger	2.2 (32)	2.5 (37)								
Brakes: Front brake type Operation Rear brake type Operation	Single 320 mm disk brake Right hand operation Single 210 mm disk brake Right foot operation									
Front suspension: Rear suspension:	Adjustable upside-down telescopic fork, dia. 41 mm, Upside Down Aluminium swinging fork with adjustable shock absorber									
Wheel travel: Front Rear	120 mm 121.5 mm									
Electric system: Ignition system Battery type/Voltage Fuses Generator Headlight type	T.C.I. (Digital) CTX9 BS YACHT MF/12V 8Ah 20A (Main) - 7.5A (Electric fan) A.C. 12V Provided with quartz lamp (halogen)									
Bulb specifications: Headlights (halogen) Tail/Brake light Turn lights Front parking light Numberplate light Warning lamps: "N" (neutral) - "High beam" "Low fuel" - "Turn lights"	12V-2x55W 12V-21/5W 12V-10W 12V-5W 12V-5W 12V-4x1.2W									

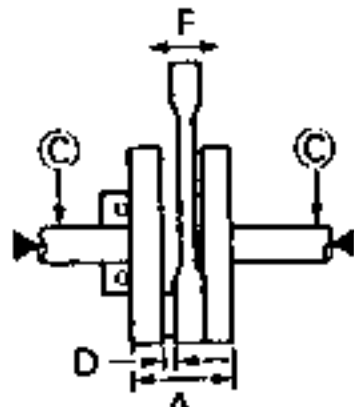
MAINTENANCE SPECIFICATIONS

ENGINE

Part	Standard	Limit
Cylinder head: 	—	0.03 mm *The lines show where you have to site the measuring slide rule
Cylinder: Bore Measurement point (a) 	100.005 ~ 100.07 mm 50 mm	100.1 mm —
Cam shaft: Advance method Cam shaft outer diameter Backlash between cam shaft and cap Cam size: 	Chain advance (left) 22.967 ~ 22.980 mm 0.020 ~ 0.054 mm Suction: *A" 35.69 ~ 35.79 mm "B" 30.06 ~ 30.16 mm "C" 5.74 mm Exhaust: "A" 36.50 ~ 36.60 mm "B" 30.11 ~ 30.21 mm "C" 6.55 mm	— — — 35.54 mm 29.91 mm — 36.35 mm 29.96 mm —
Cam shaft eccentricity limit	—	0.03 mm
Timing chain: Timing chain type Link number Timing chain adjustment method	75 RN 2015 126 links Automatic	
Rocker/rocker shaft: Rocker outer diameter Rocker shaft inner diameter Rocker-shaft backlash	12.000 ~ 12.018 mm 11.976 ~ 11.991 mm 0.009 ~ 0.042 mm	— — —

Part	Standard	Limit
Valves, valve seats, valve guide: Valve clearance (cold): Suction Exhaust	0.10 ~ 0.15 mm 0.15 ~ 0.20 mm	— —
Valve sizes: Suction: *A" head diameter *B" face width *C" seat width *D" edge thickness Exhaust: *A" head diameter *B" face width *C" seat width *D" edge thickness 	29.9 ~ 30.1 mm 2.25 mm 0.9 ~ 1.1 mm 0.85 ~ 1.15 mm 31.9 ~ 32.1 mm 2.26 mm 0.9 ~ 1.1 mm 0.85 ~ 1.15 mm	— — — — — — — —
Rod outer diameter: Suction Exhaust Guide inner diameter: Suction Exhaust Backlash between rod and guide: Suction Exhaust Rod eccentricity limit 	5.975 ~ 5.990 mm 5.960 ~ 5.975 mm 6.000 mm ~ 6.012 mm 6.000 ~ 6.012 mm 0.010 mm ~ 0.037 mm 0.025 ~ 0.052 mm —	5.95 mm 5.93 mm 6.05 mm 6.55 mm 0.08 mm 0.1 mm 0.01 mm
Valve seat standard width: Suction and Exhaust	0.9 ~ 1.1 mm	—

Part	Standard	Limit
Valve springs: Free length: Suction Exhaust Position size (with closed valve): Suction Exhaust Winding sense (top view): Suction and exhaust Slope limit: 	32.63 mm 36.46 mm 27.50 mm 31.00 mm Clockwise 	- - - - - - 2.5°/1.4 mm 2.5°/1.6 mm
Suction Exhaust Compression force (with closed valve): Suction Exhaust	- - 10.2 ~ 11.8 kg 12.3 ~ 14.1 kg	- - - -
Piston: "D" piston size "H" measurement point 	99.945 ~ 99.985 mm 2.5 mm	- -
Piston allowance Piston pin off-centring Piston-cylinder backlash	1.0 mm Suction side 0.050 ~ 0.070 mm	- 0.15 mm
Rings: Type: Upper ring Lower ring Sizes (B x T): Upper ring  Lower ring  Scraper ring 	Trapezoidal Conic B = 1.2 mm T = 3.8 mm B = 1.2 mm T = 4.0 mm B = 2.5 mm T = 3.4 mm	- - - - -

Part	Standard	Limit
End clearance (with mounted ring): Upper ring Lower ring Scraper ring Side backlash (with installed ring): Upper ring Lower ring Scraper ring	0.30 ~ 0.45 mm 0.30 ~ 0.45 mm 0.20 ~ 0.70 mm 0.04 ~ 0.08 mm 0.03 ~ 0.07 mm 0.015 ~ 0.042 mm	- - - - - -
Main shaft: "A" shaft width "C" off-centring limit "D" backlash "F" small end backlash 	74.95 ~ 75.00 mm - 0.35 ~ 0.65 mm 0.8 ~ 1.0 mm	- 0.03 mm - -
Balancing weight: Advance method	Cylinder gear	
Clutch: Friction plate: Thickness Quantity Friction plate: Thickness Quantity Clutch plate: Thickness Quantity Distortion limit Clutch spring: Free length Quantity Clutch release method	2.74 ~ 2.86 mm 6 parts 2.94 ~ 3.06 mm 2 parts 1.2 mm 7 parts - 42.8 mm 5 parts Rack and pinion external traction	2.6 mm 2.8 mm - 0.2 mm 40.8 mm
Gear box: Principal axis off-centring limit Intermediate shaft off-centring limit	- -	0.08 mm 0.08 mm
Selector: Type	Drum with cam and guide bar	



Part	Standard	Limit
Lubrication system:		
Oil filter:		
Type	Paper	
Oil pump:		
Type	Trochoidal	
Extremity clearance	0.12 mm	-
Lateral clearance	0.03 ~ 0.08 mm	-
Derivation valve adjustment pressure	80 ~ 120 kPa (0.8 ~ 1.2 kg/cm ²)	-
Cooling system:		
Radiator		
Width	431 mm	-
Height	133 mm	-
Thickness	32 mm	-
Valve adjustment pressure	95 ~ 125 kPa (0.95 ~ 1.25 kg/cm ²)	-
Expansion tank capacity	0.55 litri	-
From "LOW" to "FULL"	0.210 litri	-
Liquid pump:		
Type	Single suction centrifugal pump	-
Reduction ratio	33/34 (0.971)	-
Thermostat:		
Opening temperature	80 ~ 84°C (176 ~ 183°F)	-
Carburetor:		
Identification initials	4SU-00	-
Main jet (M.J.)		
Primary carburetor	#140	-
Secondary carburetor	#165	-
Main air jet (M.A.J.)		
Primary carburetor	Ø 1.0	-
Secondary carburetor	Ø 1.0	-
Jet needle (J.N.)		
Primary carburetor	5D96-3/5	-
Secondary carburetor	5X7C-4/5	-
Nozzle jet (N.J.)		
Primary carburetor	V-00	-
Secondary carburetor	Ø 2.7	-
Pilot air jet (P.A.J.)	Ø 0.6	-
Pilot jet (P.J.)	#50	-
Pilot output (P.O.)	0.8	-
By pass (B.P.)	Ø 1.0	-
Pilot screw (P.S.)	ca. 3 turns open	-
Valve seat (V.S.)	Ø 2.5	-
Starter jet (G.S.)	# 76	-
Fuel level (F.L.)	6.0~8.0 mm under float chamber matching surface	-
Float height (F.H.)	25.0~27.0 mm	-
Engine idle speed	1,300 ± 50 rpm	-
Suction pressure at engine idle speed	26.6~34.6 kPa (200~260 mmHg)	-



ELECTRIC SYSTEM

Part	Standard	Limit
Voltage:	12V	-
Ignition system:		
Minimum spark advance (B.T.D.C.)	12° at 1,300 rpm	-
Maximum spark advance (B.T.D.C.)	38° at 6,500 rpm	-
Spark advance device	Electric type	
Spark unit:		
Model/Manufacturer	TNDF19/NIPPONDENSO	
Pick-up coil resistance (colour)	184~276 Ω at 20°C (68°F) (Blue/Yellow - Green/White)	-
Ignition coil:		
Model/Manufacturer	JO268/NIPPONDENSO	
Primary coil resistance	3.4~4.6 Ω at 20°C (68°F)	-
Secondary coil resistance	10.4~15.6 kΩ at 20°C (68°F)	-
Spark plug cap:		
Type	Resin	
Spark plug cap resistance	10 kΩ at 20°C (68°F)	-
Charge system:		
Type	CA magnet generator	



Part	Standard	Limit
AC Alternator: Model/Manufacturer Recharge output Armature resistance (winding) (colour)	TLMZ55/NIPPONDENSO 14V, 24.5A at 5,000 rpm 0.20~0.30 Ω at 20°C (68°F) (White - White)	- -
Voltage regulator/Rectifier: Model/Manufacturer Voltage regulator: Type Not charged adjusted voltage Rectifier: Capacity Resistance voltage	SH650A/SHINDENGEN Short circuit semiconductor 14.2~15.2V 25A 240V	-
Battery: Electrolyte density	1.320	-
Electric starter system: Type Starter motor: Model/Manufacturer Capacity Brush length Commutator diameter Mica cut (depth) Ignition relay: Model/Manufacturer Nominal amperage	Constant mesh gear SM-13/MITSUBA 0.8 kW 12.5 mm 28 mm 0.7 mm MS5D-191/HITACHI 100A	5 mm 27 mm -
Horn: Type Model/Manufacturer Max. intensity	Flat 220/CEV-PAGANI 2.5A	



Part	Standard	Limit
Turn light relay: Type Model/Manufacturer Automatic stop device Flashing frequency Power	Warm-wire type 301877102/CEV-PAGANI None 60~120 cycles/min 10Wx2+2W	-
Electric fan: Model/Manufacturer	VA27-A37/C-46A 12V/SPAL	
Thermostatic switch: Model/Manufacturer Operating temperature	VF105A/N. THERMOSTAT 102~108°C (215.6~226.4°C): ON 98°C (208.4°F): OFF	- -
Thermo unit: Model/Manufacturer Coil resistance	KIAL 41/NIPPONDENSO 226 Ω at 50°C (122°F) 26.4 Ω at 115°C	- -
Electric circuit switch device: Type Individual amperage	Fuse 20A (main) 7.5A (electric fan)	




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Part	Standard	Limit
Steering: Bearing type	Taper roller bearing	
Front suspension: Fork travel Fork spring: free length Spring constant (K) Optional spring Oil amount Oil level	120 mm 402 mm 7.95 N/mm (0.795 kg/mm) None 300 cu.cm 130 mm from upper edge of inner tube (fully compressed, without spring)	-
Oil type: Inner tube external diameter	BEL RAY MC 10 SAE5 41 mm	
Rear suspension: Shock absorber travel Free spring length Spring-loaded length: Standard Minimum Maximum Spring constant (K) Travel Optional spring Gas pressure	48 mm 175 mm 166 mm 161 mm 170 mm 125 N/mm (12.5 kg/mm) Zero-65 mm None 12 kg/sq.cm (170 psi)	-
Rear arm: Clearance limit	-	1.0 mm at the rear arm end (move rear arm from side to side)
Side clearance	0.4-0.7 mm at the rear arm axle	-
Front wheel: Type Rim size Wheel material Wheel eccentricity limit: Vertical Lateral	Light alloy 3.00x17" Aluminium - -	0.5 mm 0.5 mm



Part	Standard	Limit
Rear wheel: Type Rim size Wheel material Wheel eccentricity limit Vertical Lateral	Light alloy 4.00x17" Aluminium - -	0.5 mm 0.5 mm
Drive chain: Type/Manufacturer Number of links Chain slack	135 ORS-A REGINA CHAIN 110 25-40 mm	-
Front disk brake: Type External disk diameter Disk thickness Pad thickness Internal master cylinder diameter Internal caliper cylinder diameter Quantity Brake fluid type	Single 320 mm 4 mm 5.0 mm 13 mm 30/34 mm 2 parts DOT #4	3.5 mm 0.8 mm
Rear disk brake: Type External disk diameter Disk thickness Pad thickness Internal master cylinder diameter Internal caliper cylinder diameter Brake fluid type	Single 210 mm 5 mm 4.0 mm 11 mm 32 mm DOT #4	4 mm 0.8 mm
Brake pedal lever: Brake lever free play (travel) Brake pedal position	2-5 mm at the lever end 50 mm below the footrest plane	- - -
Clutch lever and throttle grip: Clutch lever free play Throttle cable free play	10-15 mm at the lever end 3.0-5.0 mm at the grip flange	- -

TIGHTENING TORQUES

Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Head					
Flange bolt	M9	4	38	3.8	
Flange bolt	M9	2	38	3.8	
Socket head bolt	M6	1	10	1.0	
Stud bolt (exhaust pipe)	M6	4	7	0.7	
Screw plug	M18	—	55	5.5	
Spark plug	M12	1	18	1.8	
Cylinder head cover					
Socket head bolt	M6	16	10	1.0	
Cylinder head cover					
Socket head bolt	M6	1	10	1.0	
Cylinder head lateral cover	M32	2	12	1.2	
Socket head bolt	M6	4	10	1.0	
Gear unit assembling					
Socket head bolt	M6	1	10	1.0	
Engine speed indicator stop cap					
Flat head screw	M6	1	7	0.7	
Cylinder					
Flange bolt	M10	2	42	4.2	
Flange bolt	M10	2	42	4.2	
Socket head bolt	M6	2	10	1.0	
1 support					
Socket head bolt	M6	1	10	1.0	
Balancer shaft gear					
Hexagonal nut	M16	1	60	6.0	
Rotor (AC magnet)					
Hexagonal nut	M14	1	150	15.0	
Lock nut (valve clearance adjustment)					
Hexagonal nut	M6	4	14	1.4	
2 retainer guide					
Hexagonal bolt	M6	2	8	0.8	
Timing sprocket					
Flange bolt	M7	2	20	2.0	
Timing chain tensioner					
Hexagonal head bolt	M6	2	10	1.0	
Rocker shaft stop					
Socket head bolt	M6	2	10	1.0	
Cooling liquid pump					
Socket head bolt	M6	3	10	1.0	
1 tube					
Socket head bolt	M6	1	10	1.0	
2 tube					
Flange bolt	M6	1	10	1.0	
Thermostat assembly					
Flange bolt	M6	2	10	1.0	

Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Filter (coolant)					
Cylindrical socked head bolt	M6	1	10	1.0	
Oil pump					
Socket head bolt	M6	2	10	1.0	
Oil delivery/return hose					
Truncated cone head screw	M6	2	7	0.7	
Draining plug (oil sump)	M14	1	30	3.0	
Oil filter cover					
Socket head bolt	M6	3	10	1.0	
Drainage screw	M5	1	5	0.5	
Radiator					
Flange bolt	M6	4	10	1.0	
Oil pump assembly					
Flange bolt	M6	3	10	1.0	
2 cover					
Truncated cone head screw	M6	1	7	0.7	
Oil suction net filter					
Truncated cone head screw	M6	2	7	0.7	
Drainage hole					
Plug screw	M14	1	30	3.0	
Filter cover					
Socket head bolt	M6	1	10	1.0	
Socket head bolt	M6	2	10	1.0	
Filter cover drainage					
Screw	M5	1	5	0.5	
1 oil tube					
Socket head bolt	M6	4	10	1.0	
Drilled joint	M12	1	35	3.5	
2 oil tube					
Socket head bolt	M6	2	10	1.0	
Drilled joint	M12	1	35	3.5	
Connecting oil hose					
Bolt	M10	2	20	2.0	
Socket head bolt	M6	1	10	1.0	
Carburetor joint					
Socket head bolt	M6	4	10	1.0	
Left carburetor joint					
Clamp	M4	1	2	0.2	
Right carburetor joint					
Clamp	M5	1	5	0.5	
Carburetor joint (left, air filter)					
Clamp	M4	1	2	0.2	
Carburetor joint (right, air filter)					
Clamp	M5	1	5	0.5	



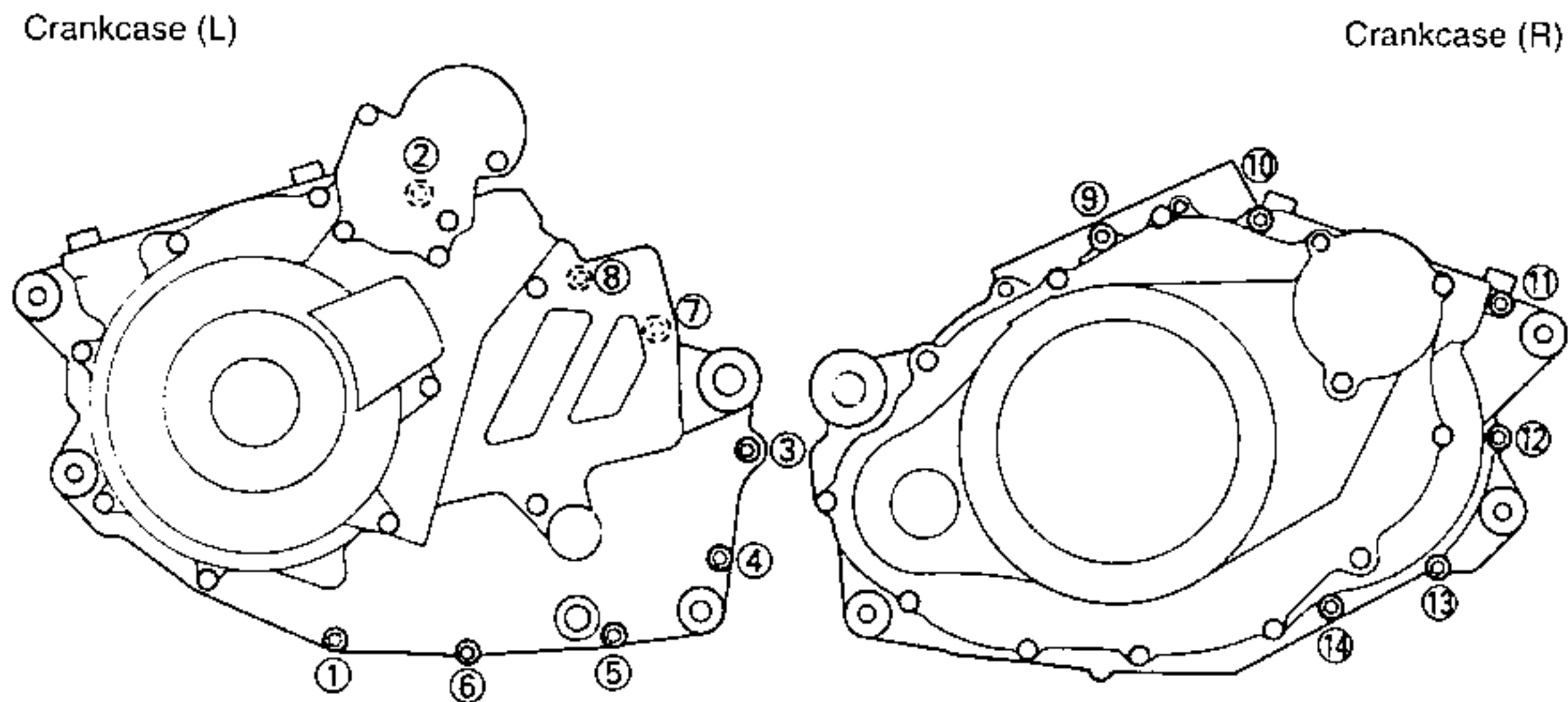
Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Air cleaner case					
Self-tapping screw	M9	7	5	0.5	
Air cleaner cover					
Crosshead screw	M5	3	5	0.5	
Exhaust pipe					
Nut	M6	4	10	1.0	
1-2 exhaust pipes					
Socket head bolt	M6	1	10	1.0	
Silent-Block to frame					
Flange nut	M8	1	23	2.3	
Silent-Block to bracket					
Flange nut	M8	1	23	2.3	
1 exhaust pipe to bracket					
Flange screw	M8	1	23	2.3	
Muffler and exhaust pipe					
Socket head bolt	M6	1	10	1.0	
Muffler assembling					
Flange bolt	M10	1	40	4.0	
1 - 2 oil sump					
Socket head bolt	M6	9	10	1.0	
Socket head bolt	M6	4	10	1.0	
Socket head bolt	M6	1	10	1.0	
Holdfast (cable)					
Truncated cone head screw	M6	1	7	0.7	
1 crankcase cover					
Socket head bolt	M6	6	10	1.0	
Socket head bolt	M6	1	10	1.0	
Socket head bolt	M6	1	10	1.0	
Socket head bolt	M6	1	10	1.0	
Plug screw	M8	1	10	1.0	
2 crankcase cover					
Socket head bolt	M6	2	10	1.0	
3 crankcase cover					
Socket head bolt	M6	5	10	1.0	
Socket head bolt	M6	3	10	1.0	
Socket head bolt	M6	2	10	1.0	
Bearing cover plate					
Flat head screw	M6	3	7	0.7	
Locking plate					
Socket head bolt	M6	2	10	1.0	
Clutch spring					
Screw with washer	M6	5	8	0.8	
Clutch hub					
Nut	M20	1	90	9.0	Use a lock washer
Primary transmission gear					
Nut	M20	1	120	12.0	Use a lock washer
Thrust lever assembly (stop)					
Bolt	M6	1	6.5	0.65	Use a lock washer
Thrust lever assembly					
Screw	M8	1	12	1.2	



Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Guide sprocket					
Nut	M18	1	110	11.0	Use a lock washer
Oil seal cover					
Socket head bolt	M6	2	10	1.0	
Stop lever					
Screw with washer	M6	1	10	1.0	
Gearbox arm					
Bolt	M6	1	10	1.0	
Stator coil					
Truncated cone head screw	M6	3	7	0.7	
Neutral switch	M10	1	20	2.0	
1 lateral cylinder head cover	M32	2	12	1.2	
Spring tensioner					
Hole	M16	1	20	2.0	
Starter					
Flange bolt	M6	2	10	1.0	
1 cover					
Socket head bolt	M6	1	10	1.0	
Socket head bolt	M6	3	10	1.0	
Starter unidirectional clutch					
Socket head bolt	M8	3	30	3.0	Stop
Pick-up coil					
Truncated cone head screw	M5	2	5	0.5	
Ignition coil					
Socket head bolt	M5	2	5	0.5	
Voltage regulator					
Hexagonal head bolt	M6	2	5	0.5	
Ignition unit					
Hexagonal head screw	M6	2	5	0.5	
Thermo switch					
Truncated cone head screw	M16	1	28	2.8	
Thermo unit					
Truncated cone head screw	PT1/8	1	15	1.5	

Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Engine assembling:					
Front engine bracket and frame	M10 x 1.25	1	65	6.5	Axle
Front engine bracket and engine	M10 x 1.25	2	65	6.5	Flange bolt and locknut
Upper cylinder head bracket and frame	M10 x 1.25	2	65	6.5	Socket head bolt and locknut
Upper engine bracket and cylinder head	M10 x 1.25	1	65	6.5	Socket head bolt and locknut
Rear/upper engine and frame	M10 x 1.25	1	65	6.5	Socket head bolt and locknut
Rear/lower engine and frame	M10 x 1.25	1	65	6.5	Bolt
Lower/rear engine axle tightening	M6 x 1.0	1	10	1.0	Socket head screw
Driver footrest and frame	M8 x 1.25	4	23	2.3	Special screw

Tightening sequence:



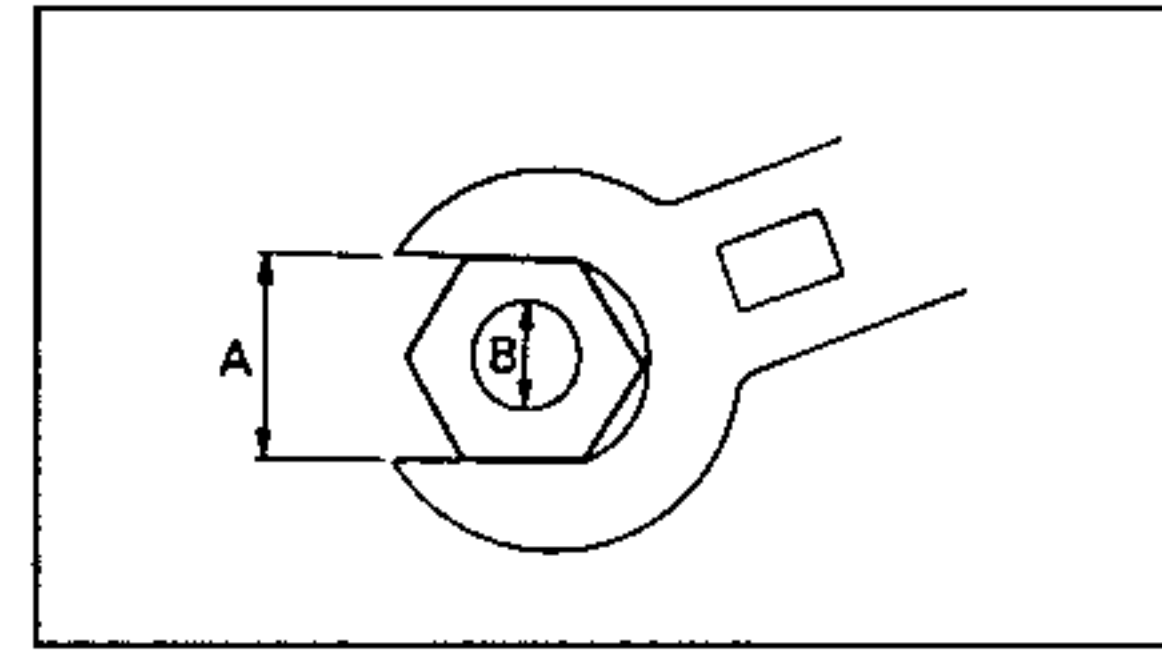
Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Passenger footrest and frame	M8 x 1.25	4	25	2.5	Hexagonal head screw with flange
Footrest to bracket	M10 x 1.5	2	50	5.0	Socket thin head screw
Side stand:					
Side stand bracket to frame	M10 x 1.25	2	55	5.5	Screw
Stand pivot	M10 x 1.25	1	40	4.0	Pivot
Stand nut	M10 x 1.25	1	35	3.5	Special nut
Rear small frame:					
Upper rear small frame to main frame fastening	M10 x 1.25	2	40	4.0	Hexagonal head screw with flange
Lower rear small frame to main frame fastening	M8 x 1.25	2	23	2.3	Hexagonal head screw with flange
Front small frame:					
Rear small frame to steering head fastening	M8 x 1.25	2	25	2.5	Hexagonal head screw with flange
Rear small frame to main frame fastening	M8 x 1.25	1	23	2.3	Hexagonal head screw with flange
Side panel/fender/rear cowling/fuel tank:					
Rear wheel fender to rear arm	M6 x 1	3	10	1.0	Hexagonal head screw
Front wheel fender to front fork	M6 x 1	4	10	1.0	Socket thin head screw
Front wheel fender to front fork	M6 x 1	2	10	1.0	Socket thin head screw and locknut
Battery case to rear small frame	M6 x 1	5	10	1.0	Hexagonal head screw
Rear cowling to rear small frame	M6 x 1	2	10	1.0	Socket thin head screw
Fuel tank to frame	M6 x 1	1	10	1.0	Large socket thin head screw
Fuel tank to rear small frame	M6 x 1	1	10	1.0	Socket thin head screw
Fuel pump to bracket	M5 x 0.75	2	5	0.5	Flange nut
Bracket to fuel tank	M6 x 1	2	7	0.7	Cylindrical head screw
Front small frame and headlight	M6 x 1	4	7	0.7	Locknut
Front small frame and instrumentation	M5 x 0.75	3	5	0.5	Flange nut
Front small frame and mirrors	M6 x 1	4	10	1.0	Flange cap nut
Side panel to frame bracket	M6 x 1	2	10	1.0	Hexagonal head screw
Bracket to frame	M6 x 1	2	10	1.0	Socket thin head screw
Air connection to front small frame	M6 x 1	2	10	1.0	Socket head screw
Side panel, air connection to bracket	M5 x 0.75	3	5	0.5	Socket thin head screw
Front fork/handle bar:					
Handle crown and fork	M8 x 1.25	2	23	2.3	Socket head screw
Handle crown and handle bar fastening	M6 x 1	2	10	1.0	Socket head screw

Part to be tightened	Thread size	Q.ty	Tightening torque		Note
			Nm	mkg	
Under bracket and fork	M8 x 1.25	4	23	2.3	Socket head screw
Handle bar fastening to fork	M8 x 1.25	4	23	2.3	Socket head screw
Handle crown nut	M22 x 1.0	1	110	11.0	Nut
Counterweight to handle bar fastening	M8 x 1.25	2	25	2.5	Socket head screw
Upper steering ring nut and steering column	M25 x 1.0	2	3	0.3	Ring nut
Rear/front braking circuit:					
Front brake master cylinder and fastening bracket to handle bar	M6 x 1.0	2	10	1.0	Socket head screw
Brake fluid tank (front bracket)	M6 x 1.0	2	10	1.0	Socket head screw
Front brake master cylinder and brake hose	M10 x 1.0	1	15	1.5	Joint
Front brake caliper and brake hose	M10 x 1.0	1	15	1.5	Joint
Front and rear brake fluid bleeder screw	M10 x 1.0	1	6	0.6	Air bleeder
Front brake caliper to front fork	M10 x 1.5	2	50	5.0	Hexagonal head screw with flange
Front wheel axle	M16 x 1.5	1	70	7.0	Axle
Front wheel axle fastening bolt	M8 x 1.25	1	15	1.5	Socket head screw
Front/rear brake disk and hub	M8 x 1.25	6+3	23	2.3	Socket thin head screw
Footrest and rear brake master cylinder	M6 x 1.0	2	13	1.3	Hexagonal head screw
Bracket and rear brake fluid tank	M6 x 1.0	1	4	0.4	Socket head screw
Rear brake caliper and bracket	M8 x 1.25	2	23	2.3	Socket thin head screw
Rear brake caliper and brake hose	M10 x 1.0	1	15	1.5	Joint
Rear brake master cylinder and brake hose	M10 x 1.0	1	15	1.5	Joint
Driven sprocket and hub clutch	M8 x 1.25	6	23	2.3	Hexagonal head screw
Rear wheel axle nut	M14 x 1.5	1	80	8.0	Axle + locknut
Shock absorber/rear arm:					
Rear arm/rear arm axle and main frame	M18 x 1.5	1	110	11	Axle + locknut
Rear arm and connecting rods	M10 x 1.25	1	40	4.0	Bolt + locknut
Relay arm and connecting rods	M10 x 1.25	1	40	4.0	Bolt + locknut
Relay arm and frame	M10 x 1.25	1	40	4.0	Bolt + locknut
Relay arm and shock absorber	M10 x 1.25	1	40	4.0	Bolt + locknut
Shock absorber and frame	M10 x 1.25	1	40	4.0	Bolt + locknut
Chain guard seal and rear arm	M6 x 1.0	1	5	0.5	Hexagonal head screw
Chain case and rear arm	M6 x 1.0	2	9	0.9	Hexagonal head screw

GENERAL SPECIFICATIONS ABOUT TIGHTENING TORQUES

This table indicates the tightening torques for standard attachments with ISO-pitch thread. Torque specifications for special components or units are indicated in the related sections of this manual. In order to avoid any damage, tighten those units with many fastenings by following a progressive cross sequence, until the final tightening torque is obtained. Unless otherwise specified, the tightening torques given are meant for clean and dry threads. All components must be at ambient temperature.

A (Nut)	B (Bolt)	General specification about tightening torques	
		Nm	mkg
10 mm	6 mm	6	0.6
12 mm	8 mm	15	1.5
14 mm	10 mm	30	3.0
17 mm	12 mm	55	5.5
19 mm	14 mm	85	8.5
22 mm	16 mm	130	13.0



A: Distance between flat parts
B: External thread diameter

DEFINITION OF UNITS OF MEASUREMENT

Unit	Meaning	Definition	Measure
mm	millimetre	10 ⁻³ metres	Length
cm	centimetre	10 ⁻² metres	Length
kg	kilogram	10 ³ grams	Weight
N	Newton	1 kg x m/sec ²	Force
Nm	Newton-metre	N x m	Torque
mkg	metre per kilo	m x kg	Torque
Pa	Paskal	N/m ²	Pressure
N/mm	Newton per mm	N/mm	Spring constant
L	Litre	—	Volume or capacity
cm ³	Cubic centimetres	—	Volume or capacity
rpm	Revolutions per minute	—	Engine speed


**LUBRICATION POINTS AND LUBRICANT TYPE
ENGINE**

Lubrication points (part name)	Lubricant type
Oil seal edges (completely)	
Bearing retainer	
Rod pins	
Rod (big end)	
Pistons and piston rings	
Hub (balancer drive sprocket)	
Piston pins	
Valve stem and guide	
Oil seal (valve stem end)	
Rocker shaft and rocker arm	
Cam and bearing (camshaft)	
Rotor and rotor housing (oil pump)	
Disengagement control rod	
Primary driven gear and primary shaft	
Sliding gear (transmission)	
Free gear (transmission)	
Shift forks and fork guide bar	
Gearshift cam and bearing (gearshift cam)	
Gearshift shaft	
Rod housing coupled surfaces	Bonding agent (rapid seal adhesive) [®] Yamaha bond No. 1215 [®]
Coupled surfaces (cylinder head and cylinder head cover)	Bonding agent (rapid seal adhesive) [®] Yamaha bond No. 1215 [®]

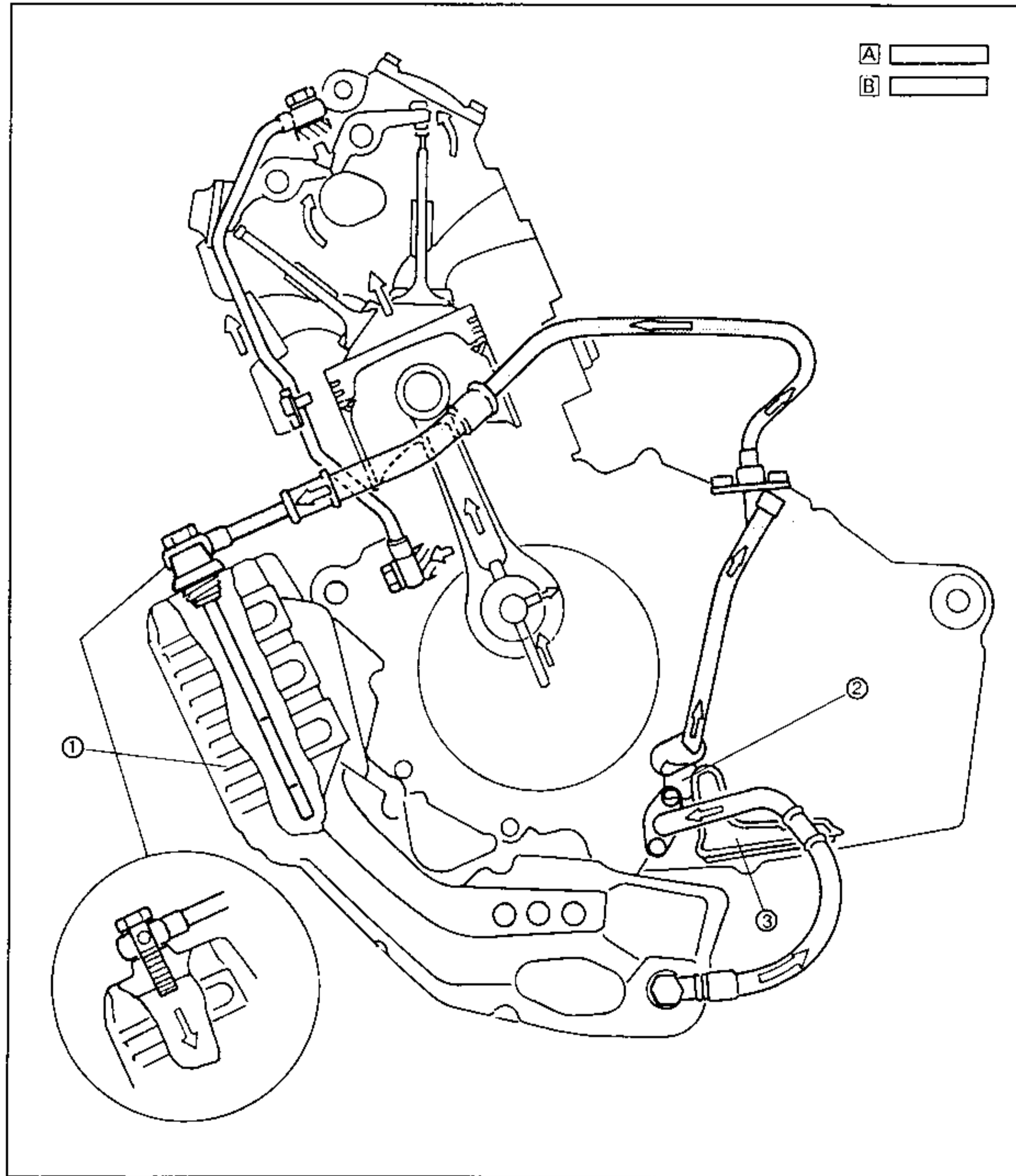

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Lubrication points (part name)	Lubricant type
Gear unit (tachometer)	
Oil seal edges (completely)	
Wheel axle (front and rear wheels)	
Rear wheel hub and clutch	
Bearing brasses (rear arm) and relay arm	
Pivot rod (rear arm)	
Bearing brasses (rear shock absorber)	
Bearing brasses (shock arm and link)	
Bearing (shock arm and link)	
Pivot points (brake pedal and gearshift selector)	
Bearings (steering column)	
Throttle grip end	
Pivot points (brake lever and clutch lever)	
Clutch cable end	
Pivot points (side stand)	
Bearing brasses (chain tensioner)	
Grease nipple (rear arm)	
Grease nipple (shock arm)	
Grease nipple (shock link)	

LUBRICATION LAYOUT

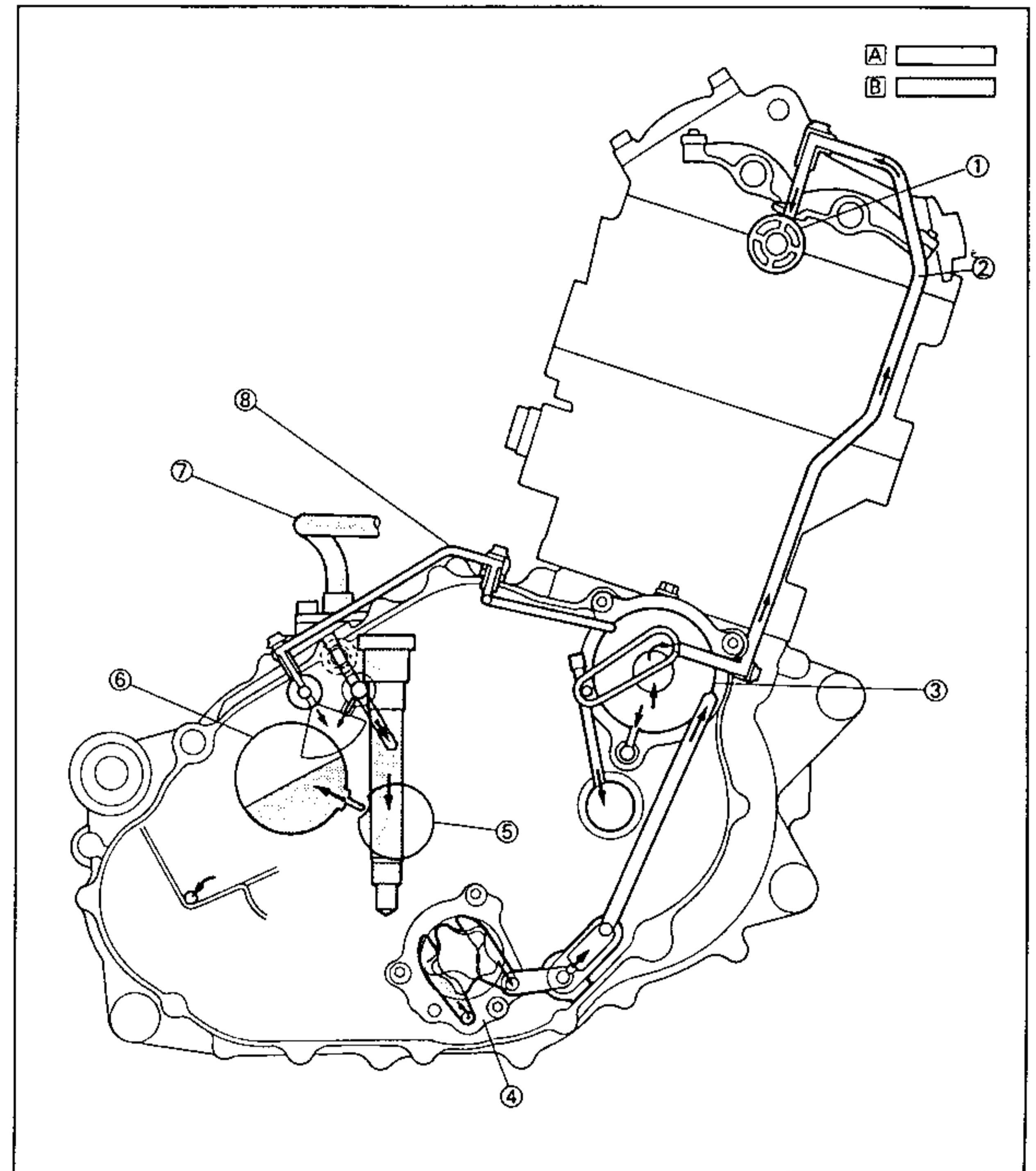
- (1) Oil tank
- (2) Oil pump
- (3) Oil pump strainer (engine)

- [A] INTAKE
- [B] RETRIEVAL



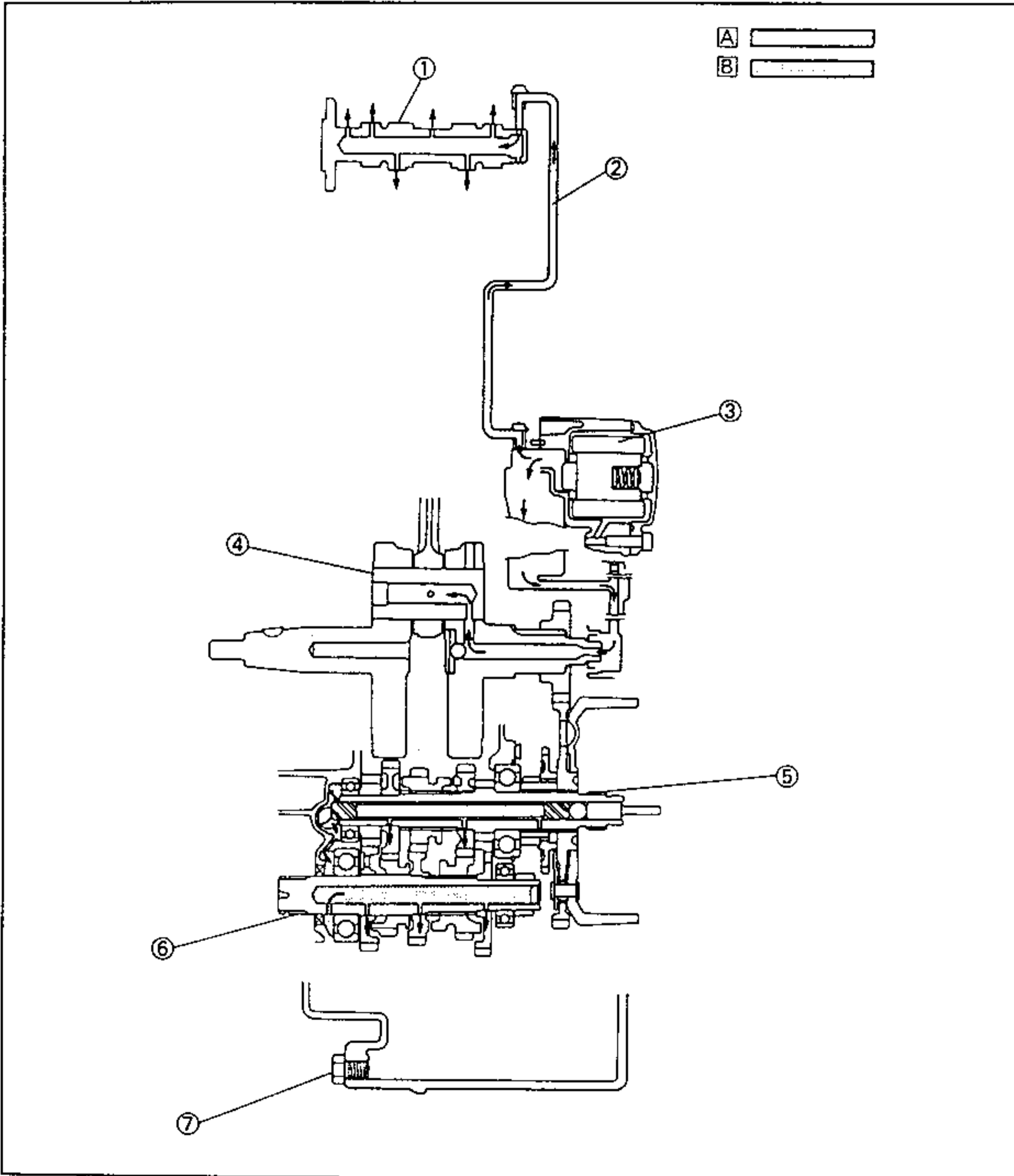
- (1) Camshaft
- (2) Oil delivery hose
- (3) Oil filter
- (4) Oil pump
- (5) Main driving shaft
- (6) Drive shaft
- (7) Oil hose
- (8) Oil delivery hose

- [A] INTAKE
- [B] RETRIEVAL



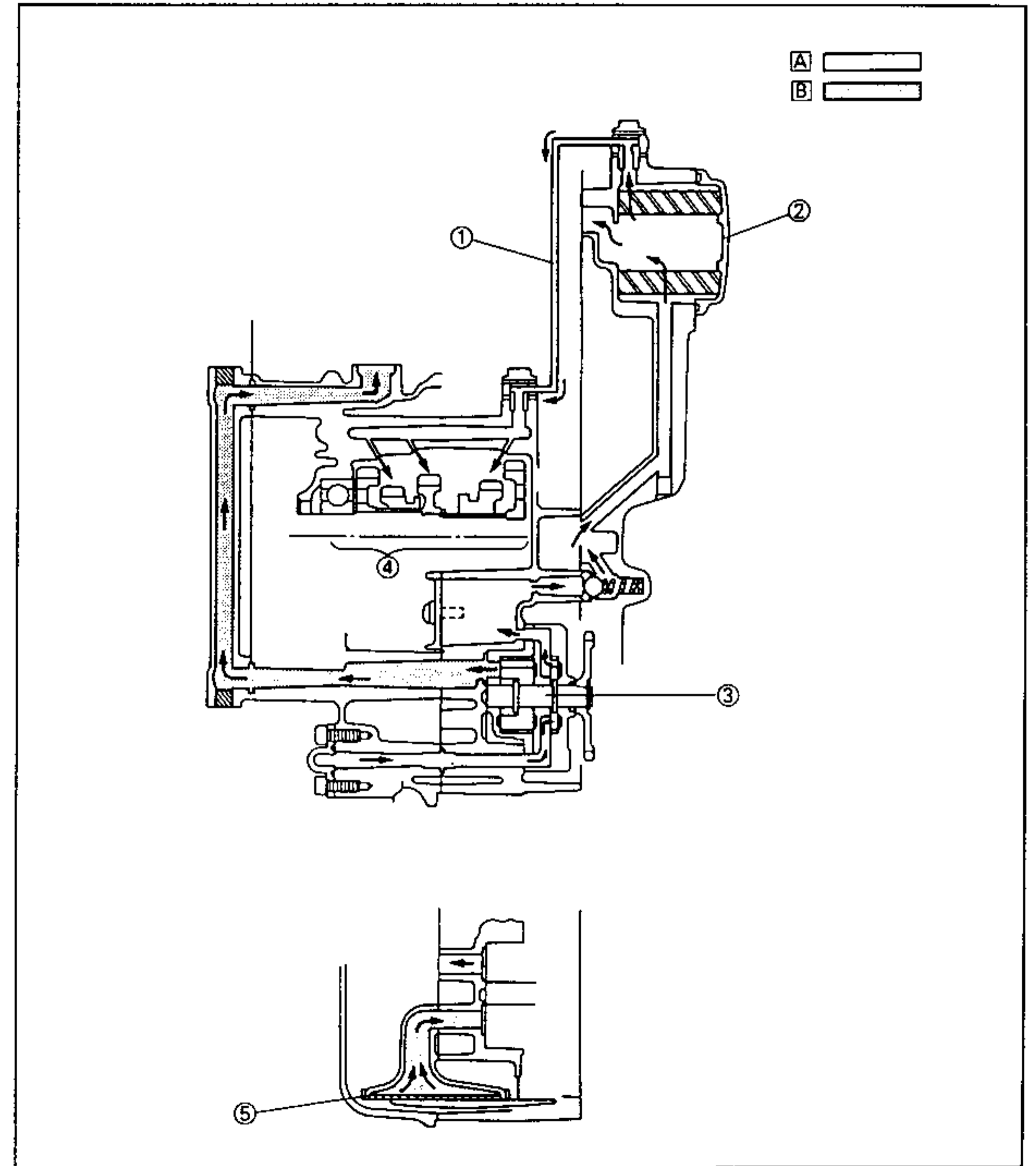
- (1) Camshaft
- (2) Oil delivery hose
- (3) Oil filter
- (4) Connecting rod pin
- (5) Main driving shaft
- (6) Secondary drive shaft
- (7) Drain plug

- [A] INTAKE
- [B] RETRIEVAL



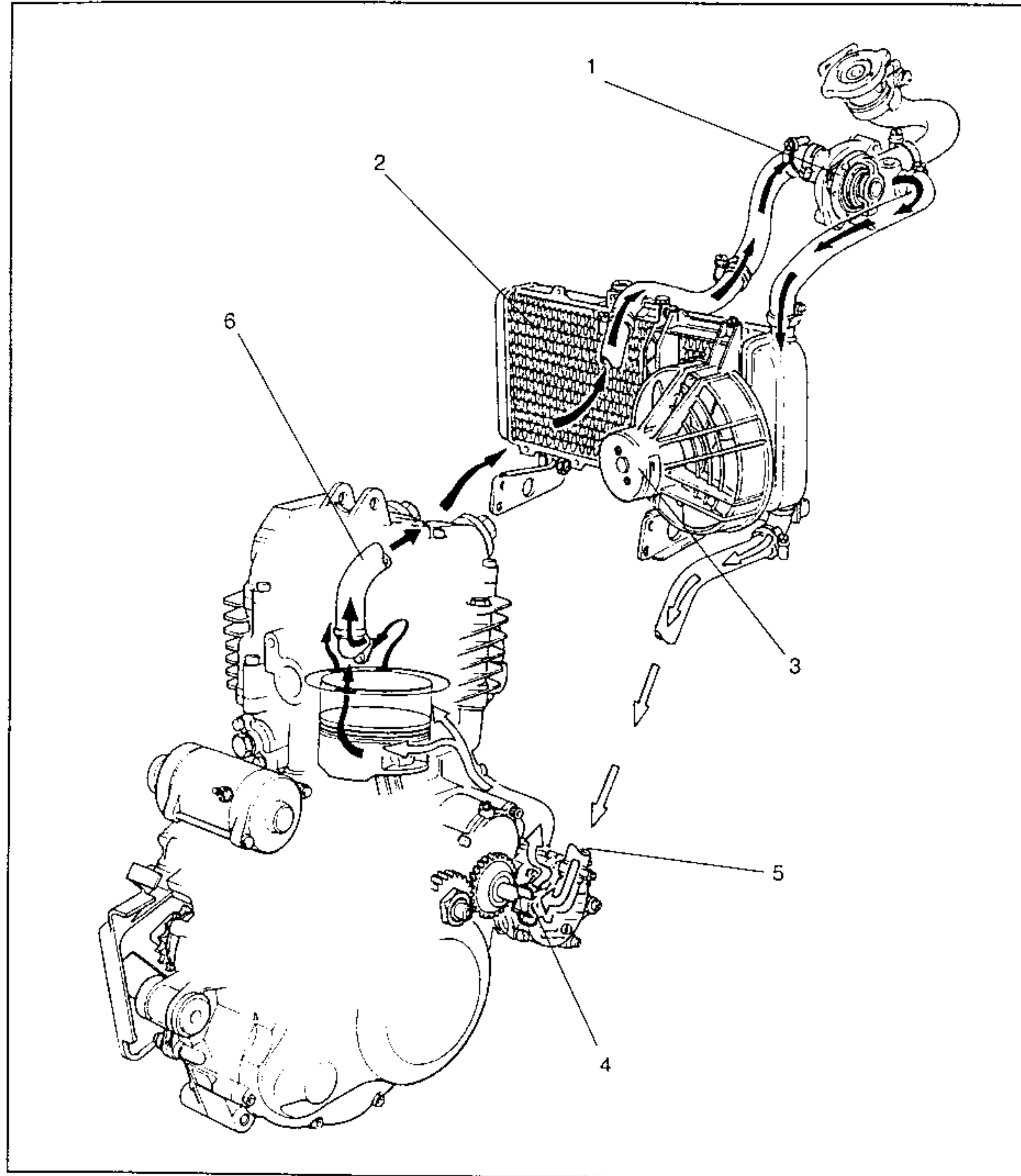
- (1) Oil delivery hose
- (2) Oil filter
- (3) Oil pump
- (4) Transmission
- (5) Oil pump strainer

- [A] INTAKE
- [B] RETRIEVAL



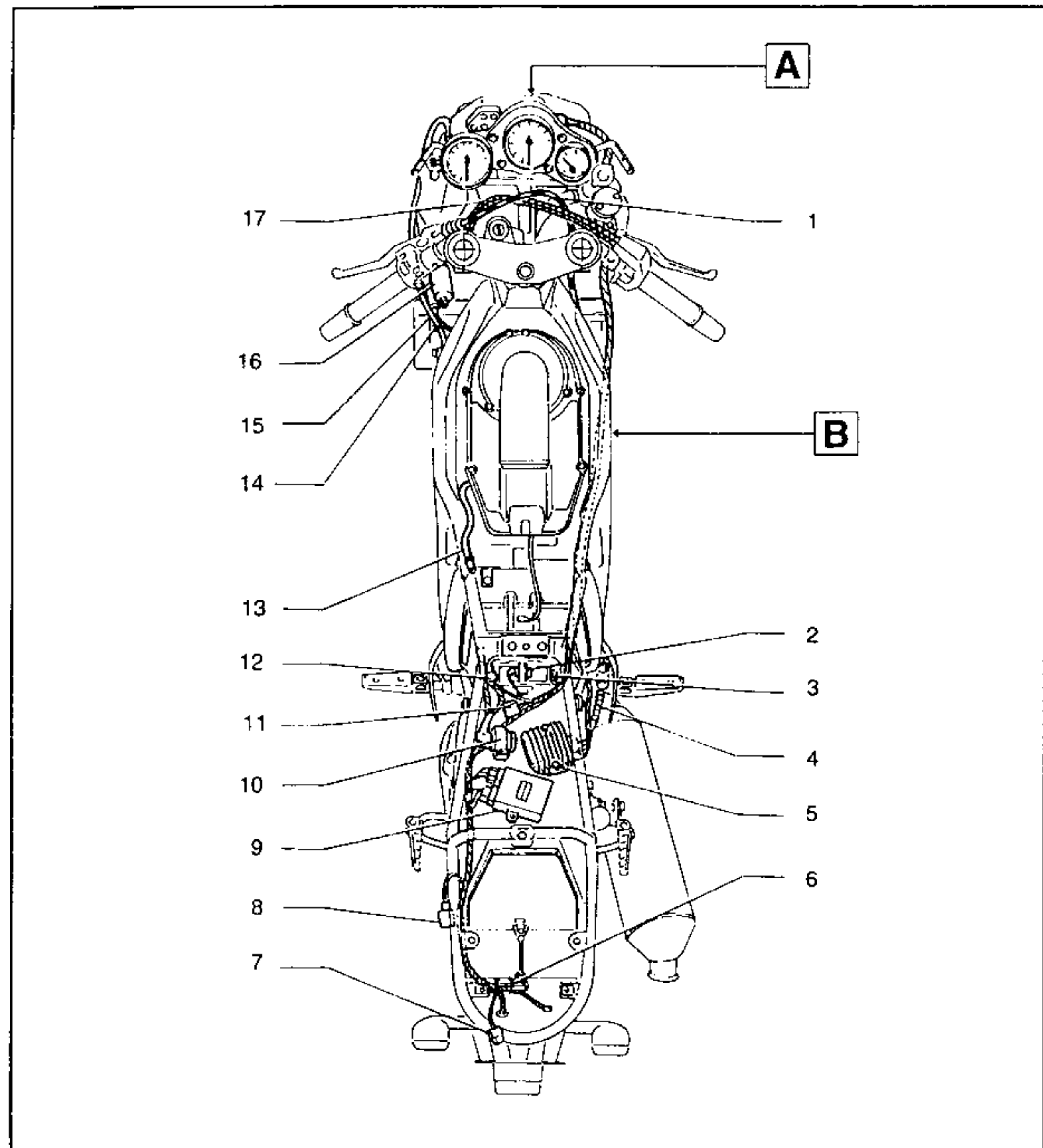
COOLING LAYOUT

- (1) Thermostat
- (2) Radiator
- (3) Electric fan
- (4) Pump
- (5) Inlet hose
- (6) Outlet hose

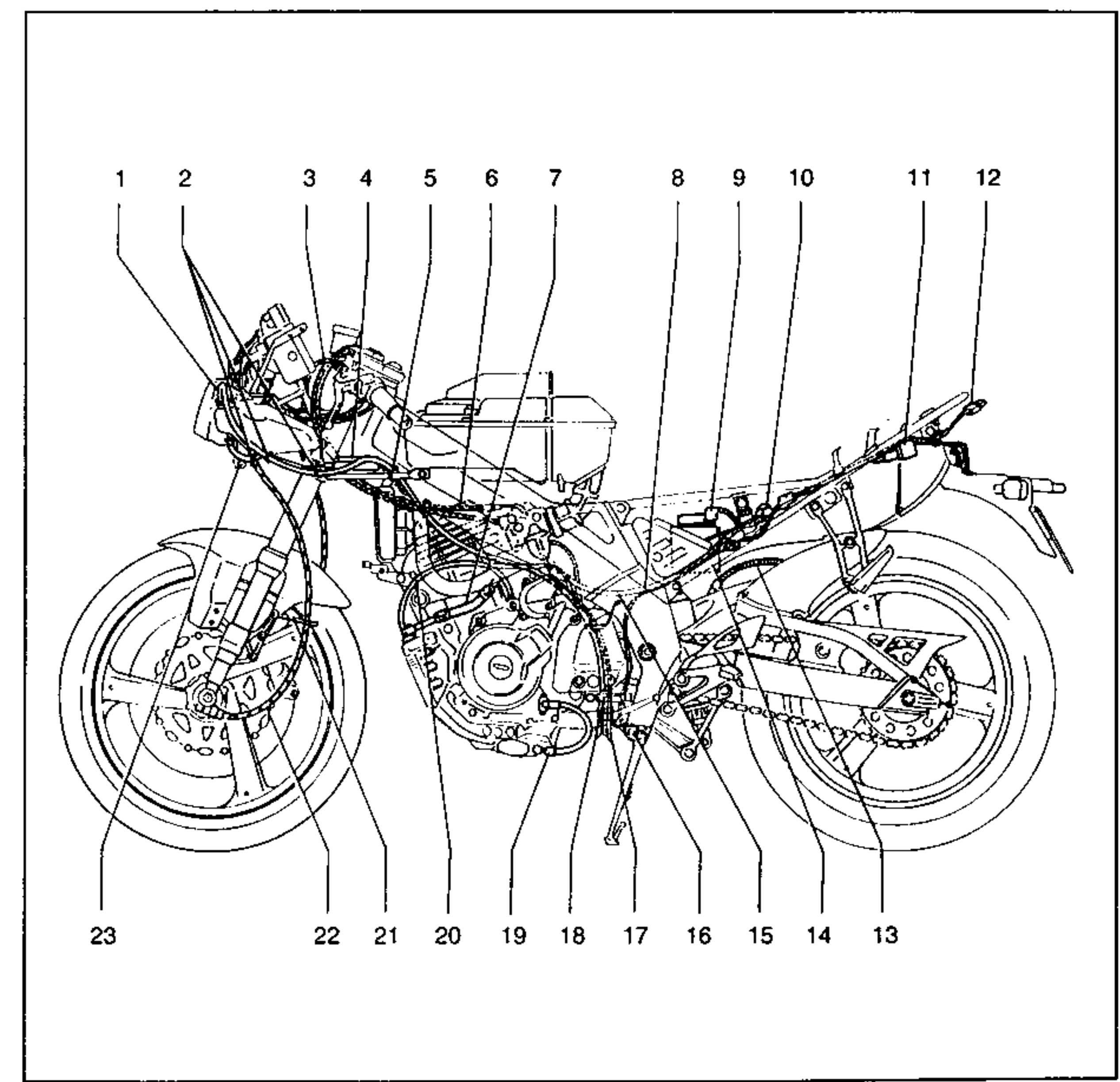


CABLES ROUTING

- | | | | |
|--------------------|-----------------------------|---------------------------------|----------------------------------|
| 1. Clutch cable | 6. Clamp | 11. Connector | 17. Throttle cables |
| 2. Fuse holder | 7. Rear taillight connector | 12. (+) cable | |
| 3. (-) cable | 8. Flasher relay | 13. Fuel impulse pipe | A B Cfr. page 2-32 |
| 4. Rear brake hose | 9. C.D.I. unit | 14. Clamp | |
| 5. Regulator/ | 10. Starter relay | 15. Recovery tank breather pipe | |
| | | 16. Coil | |

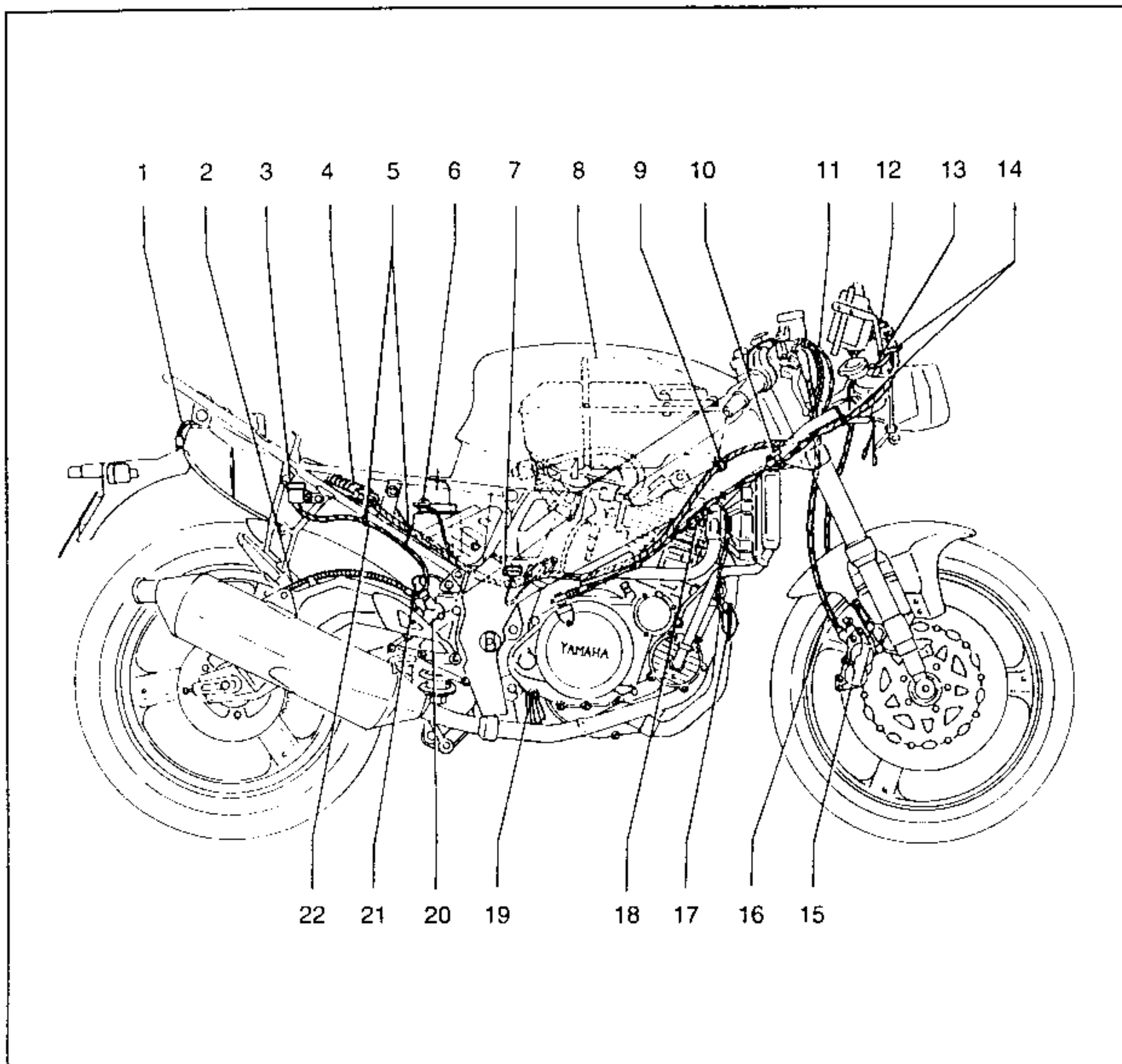


- | | | | |
|--------------------------------|-------------------------------------|---|-------------------------------|
| 1. Recovery tank breather pipe | 8. Starter motor cable | 15. Cables holder | 21. Odometer cable sleeve |
| 2. Clamp | 9. Battery (+) cable/ Starter relay | 16. Side stand switch | 22. Odometer cable |
| 3. Clutch cable | 10. Starter relay | 17. Breather pipes | 23. Recovery tank supply hose |
| 4. Coil | 11. Flasher relay | 18. Cables holder | |
| 5. Clamp | 12. Taillight connector | 19. Oil delivery hose | |
| 6. Throttle cables | 13. Rear brake hose | 20. Engine oil breather pipe (to engine oil tank) | |
| 7. Oil retrieval hose | 14. Battery | | |

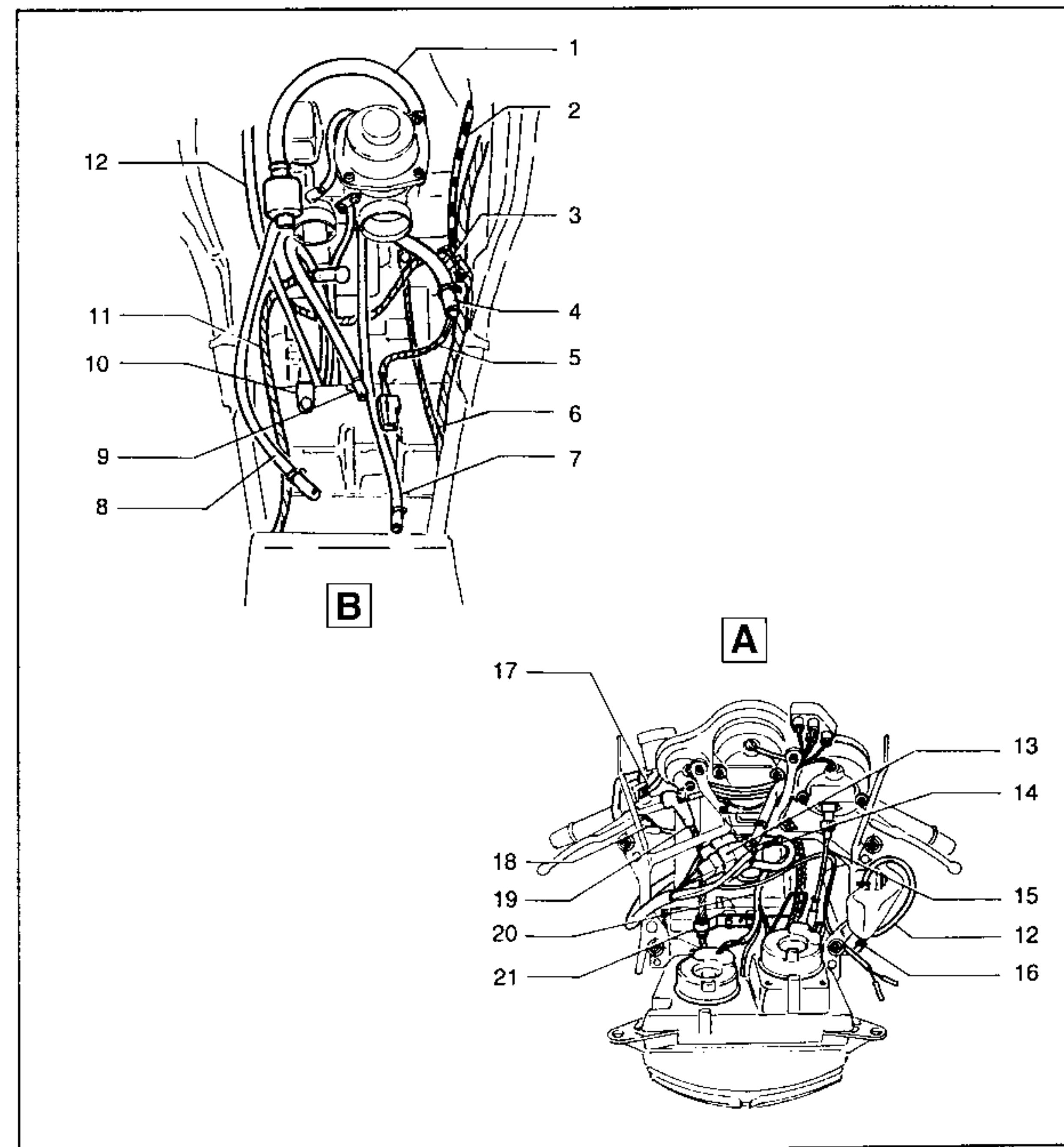


B-12

- | | | | |
|--|------------------------------------|------------------------------------|----------------------------|
| 1. Number plate and direction indicator cables | 7. Low fuel signal connector cable | 14. Clamp | 21. Rear stop switch |
| 2. Rear brake hose | 8. Air cleaner case | 15. Front brake caliper | 22. Rear brake supply hose |
| 3. Rear brake fluid reserve tank | 9. Cable holder | 16. Front brake hose | |
| 4. Regulator/Rectifier | 10. Cable holder | 17. Horn | |
| 5. Clamp | 11. Clutch cable | 18. Cooling radiator fan connector | |
| 6. (-) cable | 12. Throttle cables | 19. Breather pipes | |
| | 13. Recovery tank supply hose | 20. Rear brake master cylinder | |



- | | | | |
|---------------------------------------|--|-----------------------------------|---|
| 1. Carburetor suction connection hose | 8. Fuel impulse pipe | 14. Clamp | 21. Front brake hose and throttle cables holder |
| 2. Clutch cable | 9. Fuel tank water discharge pipe | 15. Odometer cable | |
| 3. Clamp | 10. Cables holder | 16. Recovery tank supply pipe | |
| 4. Fuel tap suction connection hose | 11. Starter motor cable | 17. Front brake fluid supply hose | |
| 5. Low fuel signal connector cable | 12. Recovery tank breather pipe | 18. Front stop switch cable | |
| 6. Earth cable | 13. Instrumentation lighting connector cable | 19. Front brake hose | |
| 7. Battery bleeder pipe | | 20. Front lamps assembly cable | |





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**CHAPTER 3°
PERIODIC INSPECTION AND ADJUSTMENT**

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