












**YAMAHA**

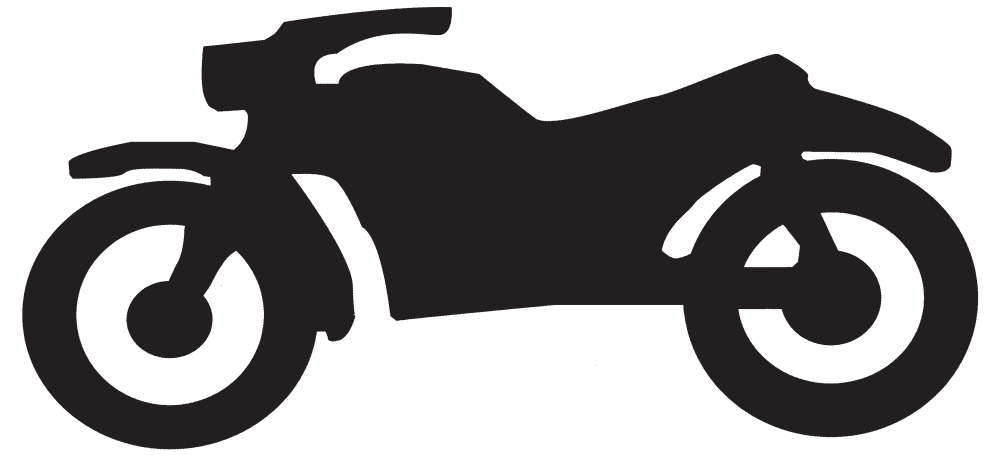
**FZS1000(N) 2001**

**5LV1-AE1**

**SERVICE MANUAL**

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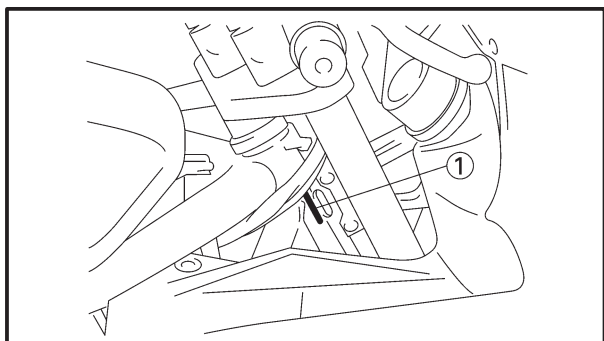
**GEN  
INFO**

**1**

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**CHAPTER 1  
GENERAL INFORMATION**

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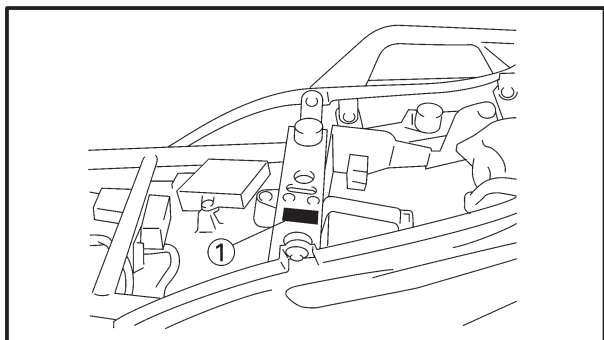
EAS00014

## GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

EAS00017

### VEHICLE IDENTIFICATION NUMBER

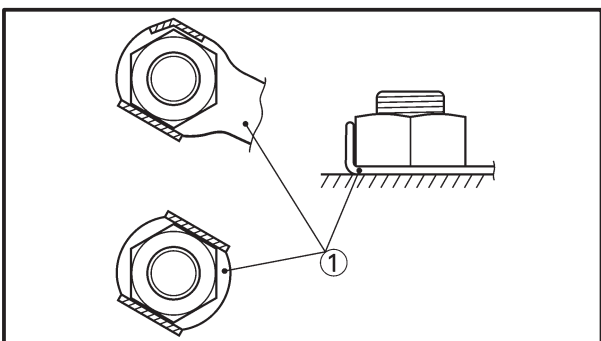
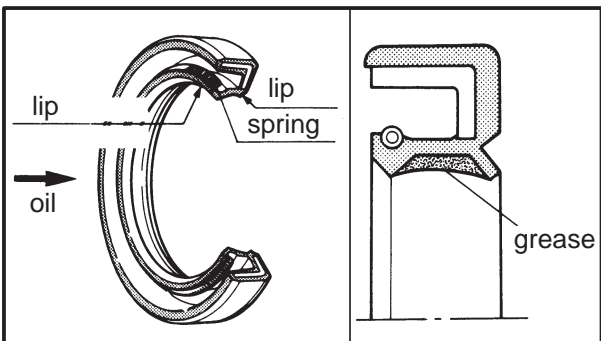
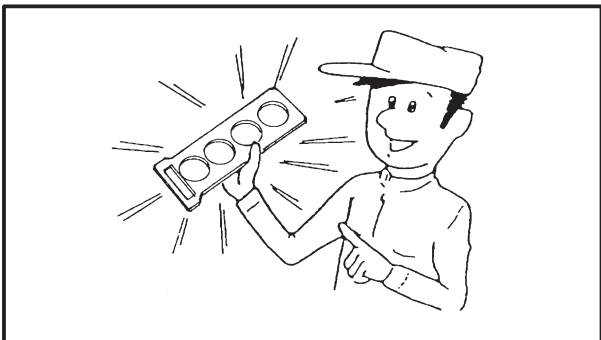
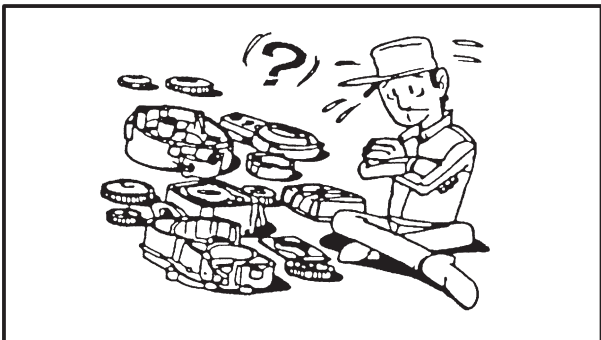
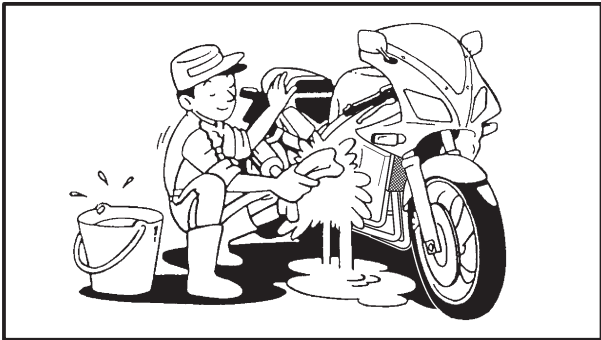
The vehicle identification number ① is stamped into the right side of the steering head.



EAS00018

### MODEL CODE

The model code label ① is affixed to the frame. This information will be needed to order spare parts.



EAS00020

**IMPORTANT INFORMATION  
PREPARATION FOR REMOVAL AND DIS-  
ASSEMBLY**

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.  
Refer to the "SPECIAL TOOLS" section.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS00021

**REPLACEMENT PARTS**

1. Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

EAS00022

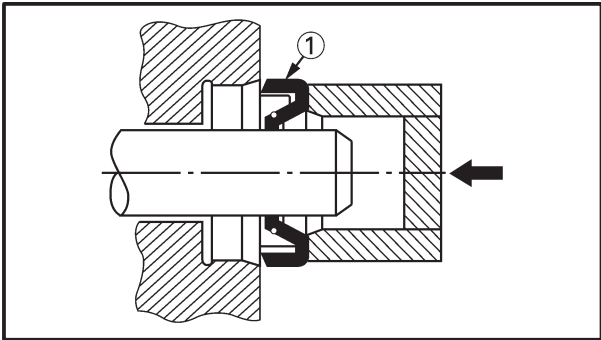
**GASKETS, OIL SEALS AND O-RINGS**

1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and apply grease onto the oil seal lips with grease.

EAS00023

**LOCK WASHERS/PLATES AND COTTER PINS**

1. After removal, replace all lock washers/plates① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



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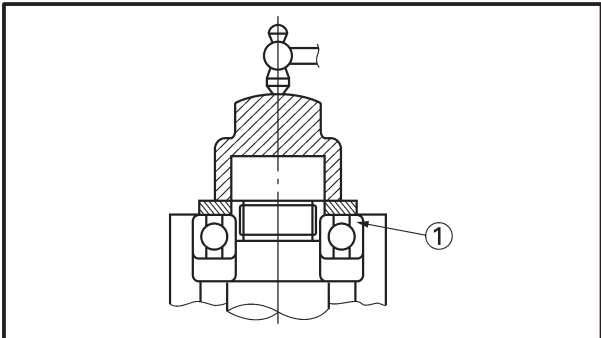
**BEARINGS AND OIL SEALS**

1. Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, apply a light coat of lithium soap base grease onto the oil seal lips. Oil bearings liberally when installing, if appropriate.

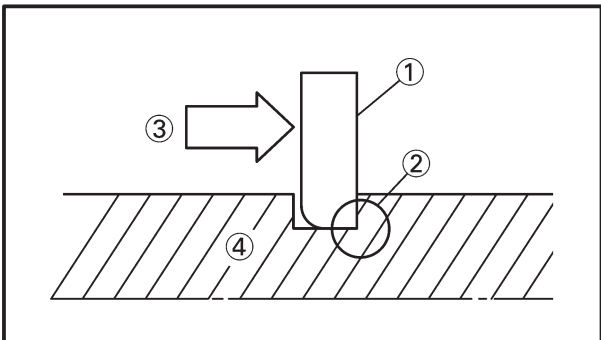
① Oil seal

**CAUTION:**

**Do not spin the bearing with compressed air because this will damage the bearing surfaces.**



① Bearing

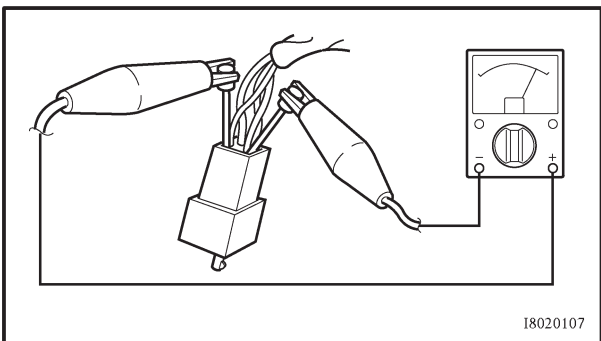
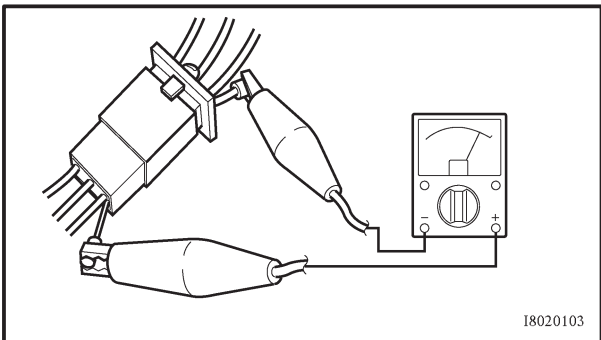
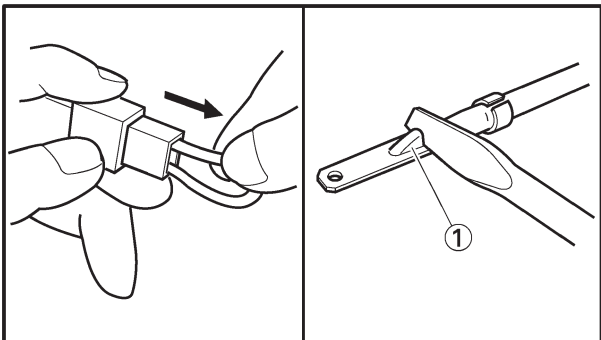
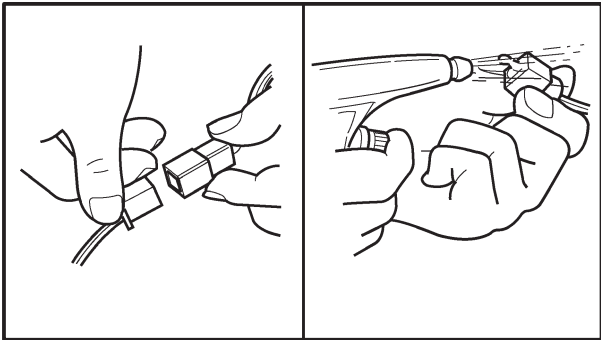


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**CIRCLIPS**

1. Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft



EAS00026

## CHECKING THE CONNECTIONS

Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
  - lead ①
  - coupler ②
  - connector ③

2. Check:
  - lead
  - coupler
  - connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.

3. Check:
  - all connections

Loose connection → Connect properly.

**NOTE:** \_\_\_\_\_


If the pin ① on the terminal is flattened, bend it up.

4. Connect:
  - lead
  - coupler
  - connector

**NOTE:** \_\_\_\_\_

Make sure that all connections are tight.

5. Check:
  - continuity  
(with a pocket tester)

	<b>Pocket tester</b> <b>90890-03112</b>
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**NOTE:** \_\_\_\_\_

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps 1 to 3.
- As a quick remedy, use a contact revitalizer available at most part stores.





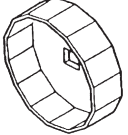
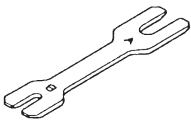
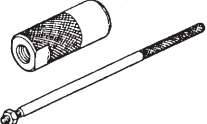
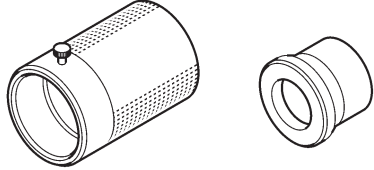

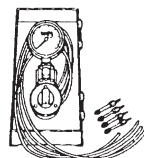
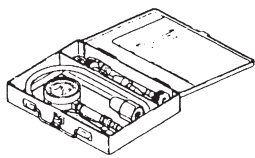
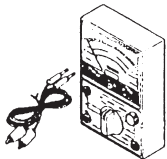
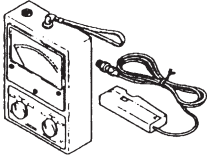
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## SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country. When placing an order, refer to the list provided below to avoid any mistakes.

Tool No.	Tool name/Function	Illustration
90890-01080	Rotor puller  This tool is used to remove the generator rotor.	
90890-01235	Rotor holding tool  This tool is used to hold the generator rotor when removing or installing the generator rotor bolt or pickup coil rotor bolt.	
90890-01304	Piston pin puller set  This tool is used to remove the piston pins.	
90890-01312	Fuel level gauge  This tool is used to measure the fuel level in the float chamber.	
Radiator cap tester 90890-01325 Adapter 90890-01352	Radiator cap tester Adapter  These tools are used to check the cooling system.	
90890-01403	Steering nut wrench  This tool is used to loosen or tighten the steering stem ring nuts.	
90890-01447	Damper rod holder  This tool is used to hold the damper rod assembly when loosening or tightening the damper rod assembly bolt.	



Tool No.	Tool name/Function	Illustration
90890-01426	Oil filter wrench  This tool is needed to loosen or tighten the oil filter cartridge.	
90890-01434	Rod holder  This tool is used to support the damper adjusting rod.	
Rod puller 90890-01437 Rod puller attachment 90890-01436	Rod puller Rod puller attachment  These tools are used to pull up the front fork damper rod.	
Fork seal driver weight 90890-01367 Fork seal driver attachment (ø43) 90890-01374	Fork seal driver weight Fork seal driver attachment (ø43)  This tool is used to install the front fork's oil seal and dust seal.	
90890-03008	Micrometer (50 ~ 75 mm)  This tool is used to measure the piston skirt diameter.	
Vacuum gauge 90890-03094	Vacuum gauge  This guide is used to synchronize the carburetors.	
Compression gauge 90890-03081 Compression gauge adapter 90890-04136	Compression gauge Compression gauge adapter  These tools are used to measure engine compression.	
90890-03112	Pocket tester  This tool is used to check the electrical system.	
90890-03113	Engine tachometer  This tool is used to check engine speed.	

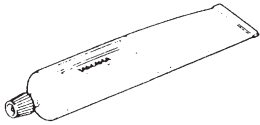


Tool No.	Tool name/Function	Illustration
90890-03141	Timing light  This tool is used to check the ignition timing.	
90890-03173	Carburetor angle driver 2  This tool is used to turn the pilot screw when adjusting the engine idling speed.	
Valve spring compressor 90890-04019 Attachment 90890-04108 90890-04114	Valve spring compressor Valve spring compressor attachment  These tools are used to remove or install the valve assemblies.	
Middle driven shaft bearing driver 90890-04058 Mechanical seal installer 90890-04078	Middle driven shaft bearing driver Mechanical seal installer  These tools are used to install the water pump seal.	
90890-04086	Universal clutch holder  This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
90890-04111 90890-04116	Valve guide remover (ø4) Valve guide remover (ø4.5)  This tool is used to remove or install the valve guides.	
90890-04112 90890-04117	Valve guide installer (ø4) Valve guide installer (ø4.5)  This tool is used to install the valve guides.	
90890-04113 90890-04118	Valve guide reamer (ø4) Valve guide reamer (ø4.5)  This tool is used to rebores the new valve guides.	
90890-06754	Ignition checker  This tool is used to check the ignition system components.	

## SPECIAL TOOLS

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INFO**



Tool No.	Tool name/Function	Illustration
90890-85505	Yamaha bond No. 1215  This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	 A line drawing of a tube of Yamaha bond No. 1215. The tube is rectangular with rounded ends and a small cap on the left side. The Yamaha logo is visible on the side of the tube.



**S P E E C**

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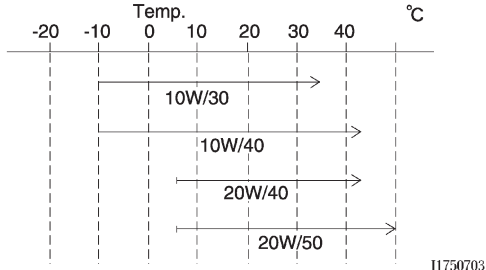
## SPECIFICATIONS

### GENERAL SPECIFICATIONS

Item	Standard	Limit
<b>Model code</b>	5VL1 (A) (B) (D) (DK) (E) (GB) (GR) (I) (N) (NL) (S) (SF) (CH) (P) 5LV2 (F) 5LV3 (D) 5LV4 (AUS)	... ... ... ...
<b>Dimensions</b>		
Overall length	2,125 mm	...
Overall width	765 mm	...
Overall height	1,190 mm	...
Seat height	820 mm	...
Wheelbase	1,450 mm	...
Minimum ground clearance	140 mm	...
Minimum turning radius	2,900 mm	...
<b>Weight</b>		
Wet (with oil and a full fuel tank)	231 kg	...
Dry (without oil and fuel)	208 kg	...
Maximum load (total of cargo, rider, passenger, and accessories)	189 kg	...



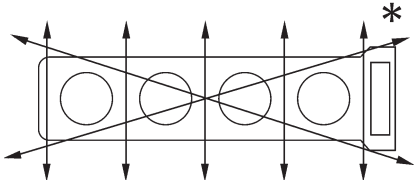
ENGINE SPECIFICATIONS

Item	Standard	Limit
<b>Engine</b> Engine type Displacement Cylinder arrangement Bore × stroke Compression ratio Engine idling speed Vacuum pressure at engine idling speed Standard compression pressure (at sea level)	Liquid-cooled, 4-stroke, DOHC 998 cm <sup>3</sup> Forward-inclined parallel 4-cylinder 74 × 58 mm 11.4 : 1 1,050 ~ 1,150 r/min 30 kPa (225 mm Hg) 1,450 kPa (14.5 kg/cm <sup>2</sup> ) at 400 r/min	... ... ... ... ... ... ...
<b>Fuel</b> Recommended fuel Fuel tank capacity Total (including reserve) Reserve only	Regular unleaded gasoline 21 L 4.0 L	... ... ...
<b>Engine oil</b> Lubrication system Recommended oil  Quantity Total amount Without oil filter cartridge replacement With oil filter cartridge replacement Oil pressure (hot) Relief valve opening pressure	Wet sump SAE20W40SE or SAE10W30SE 3.7 L 2.8 L 3.0 L 45 kPa at 1,100 r/min (0.45 kg/cm <sup>2</sup> at 1,100 r/min) 490 ~ 570 kPa (4.9 ~ 5.7 kg/cm <sup>2</sup> )	... ... ... ... ... ... ...

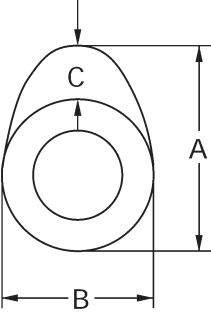
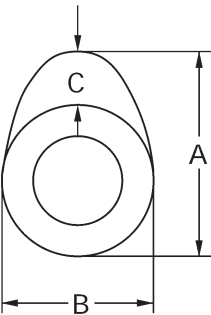
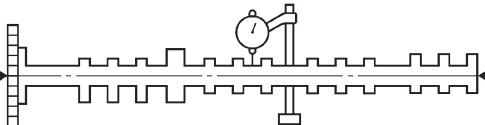


## ENGINE SPECIFICATIONS

**SPEC**


Item	Standard	Limit
<b>Oil filter</b> Oil filter type Bypass valve opening pressure	Cartridge (paper) 180 ~ 220 kPa (1.8 ~ 2.2 kg/cm <sup>2</sup> )	... ...
<b>Oil pump</b> Oil pump type Inner-rotor-to-outer-rotor-tip clearance Outer-rotor-to-oil-pump-housing clearance	Trochoid 0.09 ~ 0.15 mm 0.03 ~ 0.08 mm	... ... ...
<b>Cooling system</b> Radiator capacity Radiator cap opening pressure Radiator core Width Height Depth Coolant reservoir Capacity Water pump Water pump type Reduction ratio Max. impeller shaft tilt	2.4 L 95 ~ 125 kPa (0.95 ~ 1.25 kg/cm <sup>2</sup> ) 340 mm 238 mm 24 mm 0.3 L Single-suction centrifugal pump 68/43 × 28/28 (1.581) ...	... ... ... ... ... ... ... 0.15 mm
<b>Starting system type</b>	Electric starter	
<b>Spark plugs</b> Model (manufacturer) × quantity Spark plug gap	CR9E/U27ESR-N (NGK/DENSO) × 4 0.7 ~ 0.8 mm	... ...
<b>Cylinder head</b> Max. warpage  	...	0.1 mm

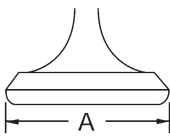
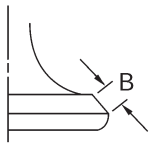
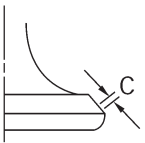
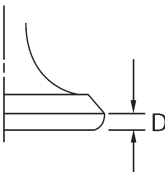
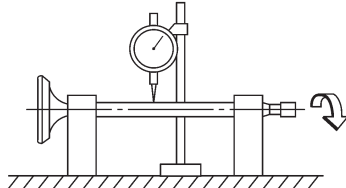


Item	Standard	Limit
<p><b>Camshafts</b>                      Drive system                      Camshaft cap inside diameter                      Camshaft journal diameter                      Camshaft-journal-to-camshaft-cap clearance                      Intake camshaft lobe dimensions</p>	<p>Chain drive (right)                      24.500 ~ 24.521 mm                      24.459 ~ 24.472 mm                      0.028 ~ 0.062 mm</p>	<p>•••                      •••                      •••                      •••</p>
		
<p>Measurement A                      Measurement B                      Measurement C</p>	<p>32.5 ~ 32.6 mm                      24.95 ~ 25.05 mm                      7.45 ~ 7.65 mm</p>	<p>32.4 mm                      24.85 mm                      •••</p>
<p>Exhaust camshaft lobe dimensions</p> 		
<p>Measurement A                      Measurement B                      Measurement C</p>	<p>32.95 ~ 33.05 mm                      24.95 ~ 25.05 mm                      7.75 ~ 7.95 mm</p>	<p>32.85 mm                      24.85 mm                      •••</p>
<p>Max. camshaft runout</p>	<p>•••</p>	<p>0.03 mm</p>
		

# ENGINE SPECIFICATIONS

**SPEC**

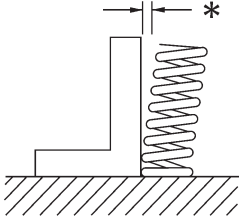



Item	Standard	Limit	
<b>Timing chain</b>			
Model/number of links	RH2015/130	•••	
Tensioning system	Automatic	•••	
<b>Valves, valve seats, valve guides</b>			
Valve clearance (cold)			
Intake	0.11 ~ 0.20 mm	•••	
Exhaust	0.21 ~ 0.25 mm	•••	
Valve dimensions			
			
Head Diameter	Face Width	Seat Width	Margin Thickness
Valve head diameter A			
Intake	22.9 ~ 23.1 mm		•••
Exhaust	24.4 ~ 24.6 mm		•••
Valve face width B			
Intake	1.76 ~ 2.90 mm		•••
Exhaust	1.76 ~ 2.90 mm		•••
Valve seat width C			
Intake	0.9 ~ 1.1 mm		•••
Exhaust	0.9 ~ 1.1 mm		•••
Valve margin thickness D			
Intake	0.5 ~ 0.9 mm		•••
Exhaust	0.5 ~ 0.9 mm		•••
Valve stem diameter			
Intake	3.975 ~ 3.990 mm		3.945 mm
Exhaust	4.465 ~ 4.480 mm		4.43 mm
Valve guide inside diameter			
Intake	4.000 ~ 4.012 mm		4.05 mm
Exhaust	4.500 ~ 4.512 mm		4.55 mm
Valve-stem-to-valve-guide clearance			
Intake	0.010 ~ 0.037 mm		0.08 mm
Exhaust	0.020 ~ 0.047 mm		0.10 mm
Valve stem runout	•••		0.01 mm
			
Valve seat width			
Intake	0.9 ~ 1.1 mm		•••
Exhaust	0.9 ~ 1.1 mm		•••

# ENGINE SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Valve springs</b>		
Free length		
Intake	38.9 mm	•••
Exhaust	40.67 mm	•••
Installed length (valve closed)		
Intake	34.5 mm	•••
Exhaust	35 mm	•••
Compressed spring force (installed)		
Intake	82 ~ 96 N (8.36 ~ 9.79 kg)	•••
Exhaust	110 ~ 126 N (11.22 ~ 12.85 kg)	•••
Spring tilt		
		
Intake	•••	2.5° / 1.7 mm
Exhaust	•••	2.5° / 1.8 mm
Winding direction (top view)		
Intake	Clockwise	•••
Exhaust	Clockwise	•••
		
<b>Cylinders</b>		
Cylinder arrangement	Forward-inclined, parallel 4-cylinder	•••
Bore × stroke	74 × 58 mm	•••
Compression ratio	11.4 : 1	•••
Bore	74.00 ~ 74.01 mm	•••
Max. taper	•••	0.05 mm
Max. out-of-round	•••	0.05 mm

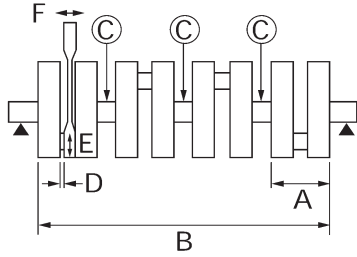
# ENGINE SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Piston</b>		
Piston-to-cylinder clearance	0.030 ~ 0.055 mm	0.12 mm
Diameter D	73.955 ~ 73.970 mm	...
Height H	5 mm	...
Piston pin bore (in the piston)		
Diameter	17.002 ~ 17.013 mm	17.043
Offset		...
Offset direction	Intake side	...
Piston pins		
Outside diameter	16.991 ~ 17.000 mm	16.971
Piston-pin-to-piston-pin-bore clearance	0.002 ~ 0.022 mm	0.072 mm
Piston rings		
Top ring		
Ring type	Barrel	...
Dimensions (B × T)	0.90 × 2.75 mm	...
End gap (installed)	0.32 ~ 0.44 mm	...
Ring side clearance	0.030 ~ 0.065 mm	...
2nd ring		
Ring type	Taper	...
Dimensions (B × T)	0.8 × 2.8	...
End gap (installed)	0.43 ~ 0.58 mm	...
Ring side clearance	0.020 ~ 0.055 mm	...
Oil ring		
Dimensions (B × T)	1.5 × 2.6 mm	...
End gap (installed)	0.10 ~ 0.35	...



Item	Standard	Limit
<b>Connecting rods</b> Crankshaft-pin-to-big-end-bearing clearance Bearing color code	0.031 ~ 0.055 mm -1 = Violet 0 = White 1 = Blue 2 = Black	... ...
<b>Crankshaft</b>  Width A Width B Max. runout C Big end side clearance D Crankshaft-journal-to-crankshaft-journal-bearing clearance Bearing color code	52.40 ~ 57.25 mm 300.75 ~ 302.65 mm ... 0.160 ~ 0.262 mm 0.029 ~ 0.053 mm -1 = Pink/violet 0 = Pink/white 1 = Pink/blue 2 = Pink/black 3 = Pink/brown	.. ... 0.03 mm ... ... ...
<b>Clutch</b> Clutch type Clutch release method Clutch release method operation Operation Clutch cable free play (at the end of the clutch lever) Friction plates Thickness Plate quantity Thickness Plate quantity Clutch plates Thickness Plate quantity Max. warpage Clutch springs Free length Spring quantity	Wet, multiple disc Cam (pull rod type) Cable operation Left-hand operation 10 ~ 15 mm 2.92 ~ 3.08 mm 8 3.42 ~ 3.58 mm 1 1.9 ~ 2.1 mm 8 ... 50 mm 6	... ... ... ... ... 2.82 mm ... 3.32 mm ... ... ... 0.1 mm ... ...

## ENGINE SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Transmission</b>		
Transmission type	Constant mesh, 6-speed	•••
Primary reduction system	Spur gear	•••
Primary reduction ratio	68/43 (1.581)	•••
Secondary reduction system	Chain drive	•••
Secondary reduction ratio	44/16 (2.750)	•••
Operation	Left-foot operation	•••
<b>Gear ratios</b>		
1st gear	35/14 (2.500)	•••
2nd gear	35/19 (1.842)	•••
3rd gear	30/20 (1.500)	•••
4nd gear	28/21 (1.333)	•••
5th gear	30/25 (1.200)	•••
6th gear	29/26 (1.115)	•••
Max. main axle runout	•••	0.08 mm
Max. drive axle runout	•••	0.08 mm
<b>Shifting mechanism</b>		
Shift mechanism type	Guide bar	•••
Max. shift fork guide bar bending	•••	0.1 mm
Installed shift rod length	260 mm	•••
<b>Air filter type</b>		
	Dry element	•••
<b>Fuel pump</b>		
Pump type	Electrical	•••
Model (manufacturer)	4SV (MITSUBISHI)	•••
Output pressure	20 kPa (0.2 kg/cm <sup>2</sup> )	•••

## ENGINE SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Carburetors</b>		
Model (manufacturer) × quantity	BSR37 (MIKUNI) × 4	...
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm	...
ID mark	5LV1 00	...
Main jet	Carburetors 1 and 4: #132.5 Carburetors 2 and 3: #130	...
Main air jet	#80	...
Jet needle	Carburetor 1 and 4: 5D129-3/5 Carburetor 2 and 3: 5D130-3/5	...
Needle jet	P-OM	...
Pilot air jet	#85	...
Pilot outlet	1.0	...
Pilot jet	#15	...
Bypass 1	0.9	...
Bypass 2	0.9	...
Bypass 3	0.9	...
Pilot screw turns out	2.0	...
Valve seat size	1.5	...
Starter jet 1	#42.5	...
Starter jet 2	0.8	...
Throttle valve size	#115	...
Fuel level (above the line on the float chamber)	3.0 ~ 4.0 mm	...
<b>Max. EXUP cable free play (at the EXUP valve pulley)</b>	1.5 mm	...





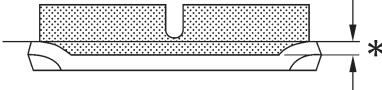
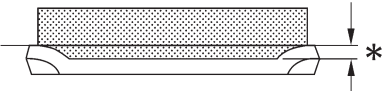
## CHASSIS SPECIFICATIONS

Item	Standard	Limit
<b>Frame</b>		
Frame type	Double cradle	•••
Caster angle	26°	•••
Trail	104 mm	•••
<b>Front wheel</b>		
Wheel type	Cast wheel	•••
Rim		
Size	17 × MT3.50	•••
Material	Aluminum	•••
Wheel travel	140 mm	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm
Max. lateral wheel runout	•••	0.5 mm
<b>Rear wheel</b>		
Wheel type	Cast wheel	•••
Rim		
Size	17 × MT5.50	•••
Material	Aluminum	•••
Wheel travel	135 mm	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm
Max. lateral wheel runout	•••	0.5 mm
<b>Front tire</b>		
Tire type	Tubeless	•••
Size	120/70 ZR17 (58W)	•••
Model (manufacturer)	MEZ4Y FRONT (METZELER) BT020F U (BRIDGESTONE)	•••
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar)	•••
90 ~ 201 kg	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar)	•••
High-speed riding	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar)	•••
Min. tire tread depth	•••	1.6 mm

## CHASSIS SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Rear tire</b>		
Tire type	Tubeless	•••
Size	180/55 ZR17 (73W)	•••
Model (manufacturer)	MEZ4Y (METZELER) BT020R U (BRIDGESTONE)	•••
Tire pressure (cold)		
0 ~ 90 kg	270 kPa (2.7 kgf/cm <sup>2</sup> , 2.7 bar)	•••
90 ~ 201 kg	290 kPa (2.9 kgf/cm <sup>2</sup> , 2.9 bar)	•••
High-speed riding	290 kPa (2.9 kgf/cm <sup>2</sup> , 2.9 bar)	•••
Min. tire tread depth	•••	1.6 mm
<b>Front brakes</b>		
Brake type	Dual-disc brake	•••
Operation	Right-hand-operation	•••
Recommended fluid	DOT 4	•••
Brake discs		
Diameter × thickness	298 × 5 mm	•••
Min. thickness	•••	4.5 mm
Max. deflection	•••	0.1 mm
Brake pad lining thickness	5.5 mm	0.5 mm
		
Master cylinder inside diameter	14 mm	•••
Caliper cylinder inside diameter	30.2 mm and 27 mm	•••
<b>Rear brake</b>		
Brake type	Single-disc brake	•••
Operation	Right-foot operation	•••
Brake pedal position (from the top of the brake pedal to the top of the rider footrest)	35 ~ 40 mm	•••
Recommended fluid	DOT 4	•••
Brake discs		
Diameter × thickness	267 × 5 mm	•••
Min. thickness	•••	4.5 mm
Max. deflection	•••	0.1 mm
Brake pad lining thickness	5.5 mm	0.5 mm
		
Master cylinder inside diameter	12.7 mm	•••
Caliper cylinder inside diameter	42.9 mm	•••

## CHASSIS SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Front suspension</b>		
Suspension type	Telescopic fork	...
Front fork type	Coil spring/oil damper	...
Front fork travel	140 mm	...
Spring		
Free length	344.0 mm	...
Spacer length	78.5 mm	...
Installed length	320.0 mm	...
Spring rate (K1)	8.1 N/mm (0.83 kg/mm)	...
Spring rate (K2)	11.8 N/mm (1.2 kg/mm)	...
Spring stroke (K1)	0 ~ 55 mm	...
Spring stroke (K2)	55 ~ 140 mm	...
Optional spring available	No	...
Fork oil		
Recommended oil	Suspension oil "01" or equivalent	...
Quantity (each front fork leg)	440 cm <sup>3</sup>	...
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	140 mm	...
Spring preload adjusting positions		
Minimum	5 (fully turned out position)	...
Standard	2	...
Maximum	1	...
Rebound damping adjusting positions		
Minimum*	17	...
Standard*	7	...
Maximum*	1	...
Compression damping adjusting positions		
Minimum*	21	...
Standard*	6	...
Maximum*	1	...
*from the fully turned-in position		

## CHASSIS SPECIFICATIONS

**SPEC**


Item	Standard	Limit
<b>Steering</b>		
Steering bearing type	Angular ball bearings	•••
<b>Rear suspension</b>		
Suspension type	Swingarm (link suspension)	•••
Rear shock absorber assembly type	Coil spring/gas-oil damper	•••
Rear shock absorber assembly travel	65 mm	•••
Spring		
Free length	182.5 mm	•••
Installed length	163 mm	•••
Spring rate (K1)	73.6 N/mm (7.5 kgf/mm)	•••
Spring stroke (K1)	0 ~ 65 mm	•••
Optional spring available	No	•••
Standard spring preload gas/air pressure	1,200 kPa (12 kgf/cm <sup>2</sup> )	•••
Spring preload adjusting positions		
Minimum	1	•••
Standard	6	•••
Maximum	11	•••
Rebound damping adjusting positions		
Minimum*	20	•••
Standard*	10	•••
Maximum*	3	•••
Compression damping adjusting positions		
Minimum*	1	•••
Standard*	7	•••
Maximum*	12	•••
*from the fully turned-in position		
<b>Swingarm</b>		
Free play (at the end of the swingarm)		
Radial	•••	1 mm
Axial	•••	1 mm
<b>Drive chain</b>		
Model (manufacturer)	50ZVM (DAIDO)	•••
Link quantity	116	•••
Drive chain slack	40 ~ 50 mm	•••
Maximum ten-link section	150.1 mm	152.5 mm



## ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
<b>System voltage</b>	12 V	...
<b>Ignition system</b>		
Ignition system type	Transistorized coil ignition	...
Ignition timing	5° BTDC at 1,100 r/min	...
Advanced timing	55° BTDC at 5,000 r/min	...
Advancer type	Throttle position sensor and electrical	...
Pickup coil resistance/color	248 ~ 372 Ω/Gy-B	...
Transistorized coil ignition unit model (manufacturer)	TNDF66 (DENSO)	...
<b>Ignition coils</b>		
Model (manufacturer)	J0313 (DENSO)	...
Minimum ignition spark gap	6 mm	...
Primary coil resistance	1.87 ~ 2.53 Ω	...
Secondary coil resistance	12 ~ 18 kΩ	...
<b>Spark plug caps</b>		
Material	Rubber	...
Resistance	10 kΩ	...
<b>Throttle position sensor standard resistance</b>	4 ~ 6 kΩ	...
<b>Charging system</b>		
System type	AC magneto	...
Model (manufacturer)	F4T361 (MITSUBISHI)	...
Normal output	14 V/365 W at 5,000 r/min	...
Stator coil resistance/color	0.27 ~ 0.33 Ω at 20°C/W-W	...
<b>Rectifier/regulator</b>		
Regulator type	Semiconductor short circuit	...
Model (manufacture)	SH650C-11 (SHINDENGEN)	...
No-load regulated voltage	14.1 ~ 14.9 V	...
Rectifier capacity	18 A	...
Withstand voltage	200 V	...
<b>Battery</b>		
Battery type	GT14B-4	...
Battery voltage/capacity	12 V/12AH	...
<b>Headlight type</b>	Halogen bulb	
<b>Bulbs (voltage/wattage × quantity)</b>		
Headlight	12 V 60 W/55 W × 2	...
Auxiliary light	12 V 5 W × 2	...
Tail/brake light	12 V 5 W/21 W × 2	...
Turn signal light	12 V 21 W × 4	...
Meter light	12 V 2 W × 3	...

## ELECTRICAL SPECIFICATIONS

SPEC



Item	Standard	Limit
<b>Indicator light</b> (voltage/wattage × quantity)		
Neutral indicator light	14 V 1.4 W × 1	...
High beam indicator light	14 V 1.4 W × 1	...
Oil level indicator light	14 V 1.4 W × 1	...
Turn signal indicator light	14 V 1.4 W × 2	...
Fuel indicator light	12 V 2 W × 1	...
Water temperature indicator light	LED	...
<b>Electric starting system</b>		
System type	Constant mesh	...
Starter motor		
Model (manufacturer)	SM-13 (MITSUBA)	...
Power output	0.8 kW	...
Brushes		
Overall length	12.5 mm	4 mm
Spring force	7.65 ~ 10.01 N (780 ~ 1,021 gf)	...
Commutator resistance	0.025 ~ 0.035 Ω	...
Commutator diameter	28 mm	27 mm
Mica undercut	0.7 mm	...
<b>Starter relay</b>		
Model (manufacturer)	MS5F-631 (JIDECO)	...
Amperage	180 A	...
Coil resistance	4.18 ~ 4.62 Ω	...
<b>Horn</b>		
Horn type	Plain	...
Model (manufacturer) × quantity	YF-12 (NIKKO) × 1	...
Max. amperage	3 A	...
<b>Turn signal relay</b>		
Relay type	Full-transistor	...
Model (manufacturer)	FE246BH (DENSO)	...
Self-cancelling device built-in	No	...
Turn signal blinking frequency	75 ~ 95 cycles/min.	...
Wattage	21 W × 2 + 3.4 W	...
<b>Oil level switch</b>		
Model (manufacturer)	5LV (DENSO)	...
<b>Fuel sender</b>		
Model (manufacturer)	5LV (NIPPON SEIKI)	...
Resistance	4 ~ 100 Ω at 25°C	...
<b>Sidestand/fuel pump relay</b>		
Model (manufacturer)	5EB-20 (OMRON)	...
Coil resistance	180 Ω	...
<b>Fuel pump maximum amperage</b>	1.2 A	...
<b>Radiator fan</b>		
Model (manufacturer)	4XV (TOYO RADIATOR)	...
<b>Thermo switch</b>		
Model (manufacturer)	5JJ (NIPPON THERMOSTAT)	...

## ELECTRICAL SPECIFICATIONS

**SPEC**

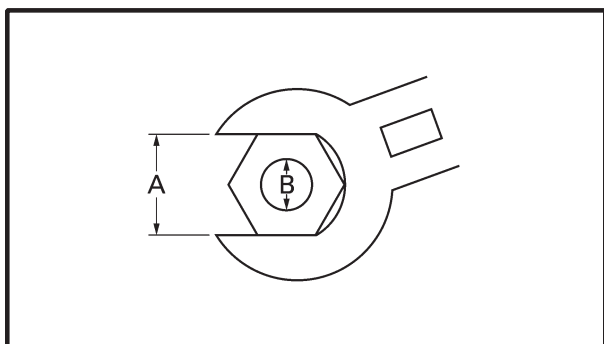


Item	Standard	Limit
<b>Fuses (amperage × quantity)</b>		
Main fuse	30 A × 1	...
Headlight fuse	20 A × 1	...
Signaling system fuse	20 A × 1	...
Ignition fuse	20 A × 1	...
Radiator fan fuse	10 A × 1	...
Turn signal relay fuse	10 A × 1	...
Backup fuse (odometer)	10 A × 1	...
Reserve fuse	30 A × 1	...
	20 A × 1	...
	10 A × 1	...

EAS00029

**TIGHTENING TORQUE**  
**GENERAL TIGHTENING TORQUES**

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a criss-cross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A: Distance between flats  
 B: Outside thread diameter

A (Nut)	B (Bolt)	General tightening torques	
		Nm	m•kg
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



## TIGHTENING TORQUES

**SPEC**



### ENGINE TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m•kgf	
Spark plugs	–	M10	4	13	1.3	
Cylinder head	Nut	M10	8	50	5.0	
Cylinder head	Cap nut	M10	2	50	5.0	
Cylinder head	Bolt	M6	2	12	1.2	
Camshaft caps	Bolt	M6	28	10	1.0	
Cylinder head cover	Bolt	M6	6	12	1.2	
Cylinder head (exhaust pipe)	Stud bolt	M8	8	15	1.5	
Connecting rod caps	Nut	M8	8	36	3.6	
Generator rotor	Bolt	M10	1	65 + 60°	6.5 + 60°	
Crankshaft sprocket	Bolt	M10	1	60	6.0	
Cap bolt (timing chain tensioner)	Bolt	M6	1	6.4	0.64	
Camshaft sprocket	Bolt	M7	4	24	2.4	
Water pump inlet pipe	Bolt	M6	1	10	1.0	
Water pump outlet pipe	Bolt	M6	1	10	1.0	
Oil/water pump assembly driven sprocket	Bolt	M6	1	15	1.5	
Oil pump	Bolt	M6	1	12	1.2	
Oil cooler	Bolt	M20	1	35	3.5	
Engine oil drain bolt	–	M14	1	43	4.3	
Oil strainer housing	Bolt	M6	2	10	1.0	
Oil/water pump assembly driven sprocket cover	Bolt	M6	1	12	1.2	
Oil delivery pipe	Bolt	M6	1	10	1.0	
Oil filter bolt	Bolt	M20	1	70	7.0	
Oil filter cartridge	–	M20	1	17	1.7	
Oil pipe	Bolt	M6	2	10	1.0	
Air cleaner cap and air cleaner	Screw	M6	4	6	0.6	
Frame and air cleaner	Bolt	M6	3	7	0.7	
Air cleaner cover and air cleaner	Screw	M6	6	2	0.2	
Ring nut and cylinder head	Nut	M8	8	20	2.0	
Exhaust pipe and muffler	Bolt	M8	3	20	2.0	
Emission check bolt	Bolt	M8	4	10	1.0	
EXUP pulley cover	Bolt	M6	3	10	1.0	
EXUP cable bracket	Bolt	M6	3	10	1.0	
EXUP pulley and shaft arm	Bolt	M5	1	10	1.0	
Exhaust joint	Bolt	M4	2	3	0.3	
Exhaust pipe assembly	Bolt	M8	1	20	2.0	
Air induction system pipe	Band	–	4	3.5	0.35	
Crankcase (cylinder head)	Stud bolt	M10	10	10	1.0	
Crankcase	Bolt	M9	10	See note		
Crankcase	Bolt	M6	2	14	1.4	
Crankcase	Bolt	M6	14	12	1.2	
Crankcase	Bolt	M8	2	24	2.4	

## TIGHTENING TORQUES

**SPEC**

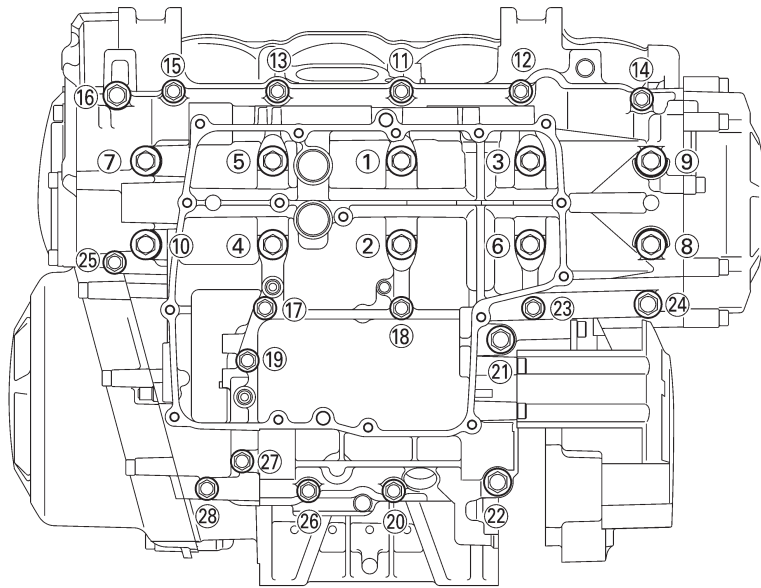

Item	Fastener	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m•kgf	
AC magneto cover	Bolt	M6	9	12	1.2	
Drive sprocket cover	Bolt	M6	4	10	1.0	
Plate	Bolt	M6	2	10	1.0	
Clutch cover	Bolt	M6	8	12	1.2	
Timing chain cap bolt	Bolt	M6	8	12	1.2	
Shift shaft cover	Bolt	M6	5	12	1.2	
Breather plate	Bolt	M6	5	10	1.0	
Timing mark accessing screw	Bolt	M8	1	15	1.5	
Starter clutch idle gear shaft	Bolt	M6	1	10	1.0	
Starter one-way clutch	Bolt	M6	3	12	1.2	
Clutch boss	Nut	M20	1	90	9.0	Use a lock washer.
Clutch spring	Bolt	M6	6	8	0.8	
Drive sprocket	Nut	M22	1	85	8.5	Use a lock washer.
Main axle bearing housing	Screw	M6	3	12	1.2	
Shift lever stopper	Bolt	M6	2	10	1.0	
Stopper screw	Screw	M8	1	22	2.2	
Shift rod	Nut	M6	1	6.5	0.65	Left thread
Shift rod	Nut	M6	2	6.5	0.65	
Shift rod joint	Bolt	M6	1	10	1.0	
Shift arm	Bolt	M6	1	10	1.0	
AC magneto stator coil	Screw	M6	3	14	1.4	
Ignitor unit	Screw	M5	2	7	0.7	
Neutral switch	–	M10	1	20	2.0	
Pick up coil	Bolt	M6	2	10	1.0	
Thermo unit	–	–	1	15	1.5	

**NOTE:**

1. First, tighten the bolt to approximately 14.7 Nm (1.5 m•kg) with a torque wrench.
2. Retighten the bolt to 14.7 Nm (1.5 m•kg), and tighten another 45 ~ 50°.



Crankcase tightening sequence:



## TIGHTENING TORQUES

**SPEC**


### CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening		Remarks
		Nm	m•kgf	
Upper bracket pinch bolt	M8	30	3.0	See note
Upper bracket cap nut	M22	110	11	
Upper bracket and handlebar holder	M10	32	3.2	
Handlebar holder	M8	23	2.3	
Lower bracket pinch bolt	—	23	2.3	
Lower bracket ring nut	M25	18	1.8	
Front brake master cylinder	M6	10	10	
Front brake hose union bolt	M10	30	3.0	
Engine mounting				
Engine mounting bolt/nut	M10	55	5.5	
Engine mounting bolt/nut	M8	33	3.3	
Frame and down tube	M10	89	8.9	
Clutch cable lock nut	M8	7	0.7	
Ignition coil and stay	M6	7	0.7	
Pivot shaft	M18	125	12.5	
Rear shock absorber (upper)	M10	40	4.0	
Rear shock absorber and relay arm	M10	40	4.0	
Relay arm and frame	M10	40	4.0	
Relay arm and connecting arm	M12	48	4.8	
Connecting arm and swing arm	M12	48	4.8	
Drive chain guard	M6	7	0.7	
Drive chain case	M6	7	0.7	
Fuel cock	M6	7	0.7	
Fuel sender	M5	4	0.4	
Side cover	M6	4	0.4	
Coolant reservoir tank	M6	4	0.4	
Front wheel axle	M16	72	7.2	
Front wheel axle pinch bolt	M8	23	2.3	
Front brake caliper	M10	40	4.0	
Front brake disk	M6	18	1.8	
Front brake bleed screw	M8	6	0.6	
Rear brake torque rod	M8	23	2.3	
Rear wheel sprocket	M10	69	6.9	
Drive chain adjusting nut	M8	16	1.6	
Rear brake caliper	M10	40	4.0	
Rear wheel axle	M24	150	15	
Rear brake hose union bolt	M10	30	3.0	
Rear brake bleed screw	M8	6	0.6	
Rear brake disk	M8	23	2.3	
Rider footrest bracket and frame	M8	30	3.0	
Rear brake reservoir tank	M6	4	0.4	
Rear brake master cylinder	M8	23	2.3	
Rider footrest and bracket	M10	55	5.5	
Passenger footrest bracket and frame	M8	28	2.8	
Passenger footrest bracket and muffler	M10	48	4.8	

**NOTE:**

1. First, tighten the ring nut to approximately 52 Nm (5.2 m•kg) with a torque wrench, then loosen the ring nut completely.
2. Retighten the ring nut to specification.

## LUBRICATION POINTS AND LUBRICANT TYPES

**SPEC**



EAS00031

### LUBRICATION POINTS AND LUBRICANT TYPES ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Crankshaft pins	
Piston surfaces	
Piston pins	
Connecting rod bolts and nuts	
Crankshaft journals	
Camshaft lobes	
Camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Water pump impeller shaft	
Oil pump rotors (inner and outer)	
Oil strainer	
Starter clutch idle gear inner surface	
Starter clutch assembly	
Primary driven gear	
Transmission gears (wheel and pinion)	
Main axle and drive axle	
Shift drum	
Shift forks and shift fork guide bars	
Shift shaft	
Shift shaft boss	
Cylinder head cover mating surface	Yamaha bond No.1215
Crankcase mating surface	Yamaha bond No.1215
Clutch cover (crankcase mating surface)	Yamaha bond No.1215
Generator rotor cover (crankcase mating surface)	Yamaha bond No.1215

## LUBRICATION POINTS AND LUBRICANT TYPES

**SPEC**



EAS00032

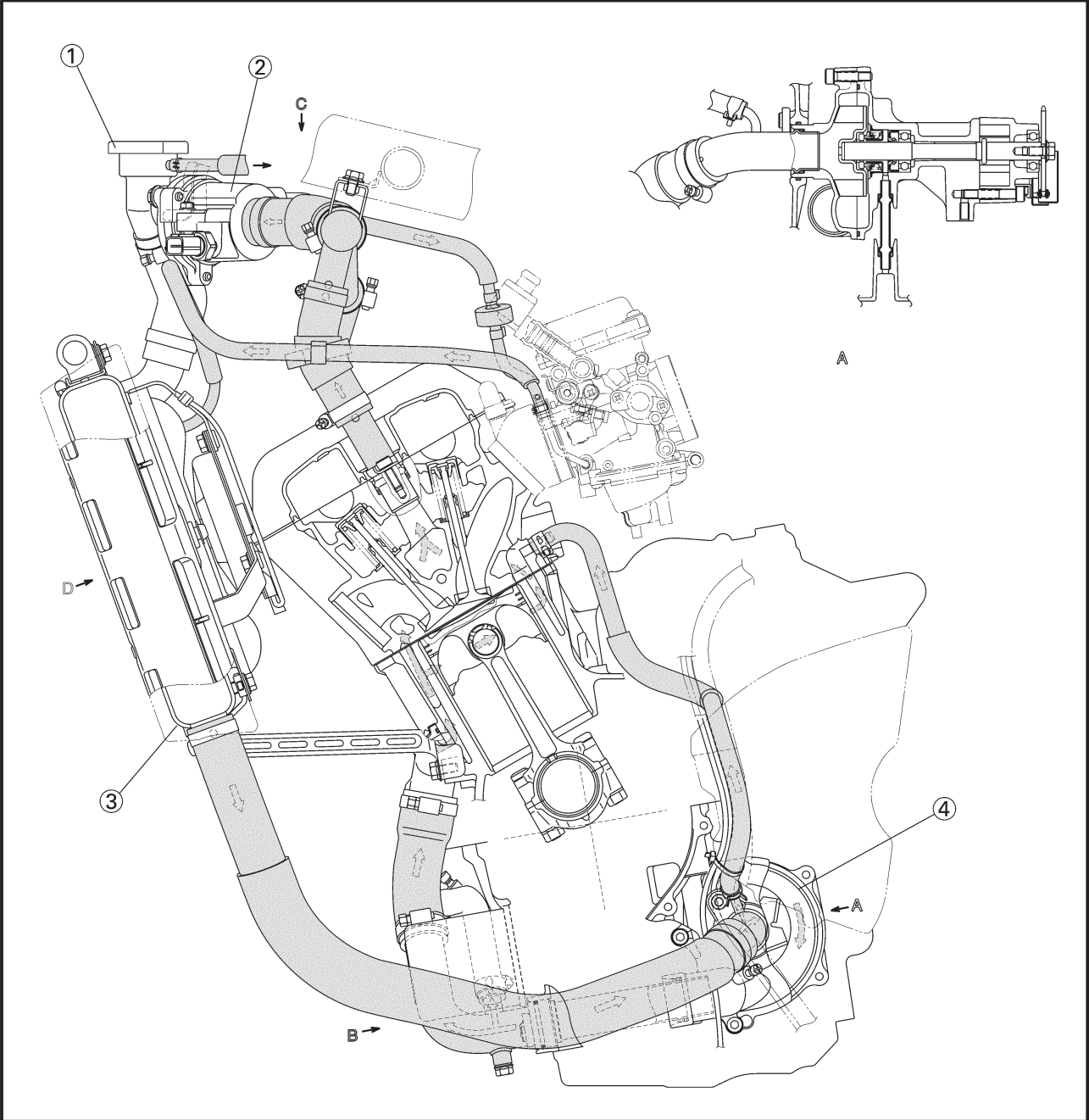
### CHASSIS

Lubrication point	Lubricant
Steering bearings, steering seal lips and ball race cover lips	
Pivot shaft	
Swing arm pivoting points and connecting arm bearings	
Connecting arm oil seal lips	
Swing arm oil seal lips	
Relay arm bearings	
Relay arm oil seal lips	
Rear shock absorber upper bolt	
Front wheel oil seal lips	
Rear wheel oil seal lips	
Clutch hub oil seal lips	
Throttle cable end	
Starter cable end and starter lever	
Rear brake pedal moving point	
Shift pedal moving point	
Side stand moving point	
Passenger footrest ball joint and moving point	
Engine mounting bracket collar and oil seal lips	
Mainstand moving point	

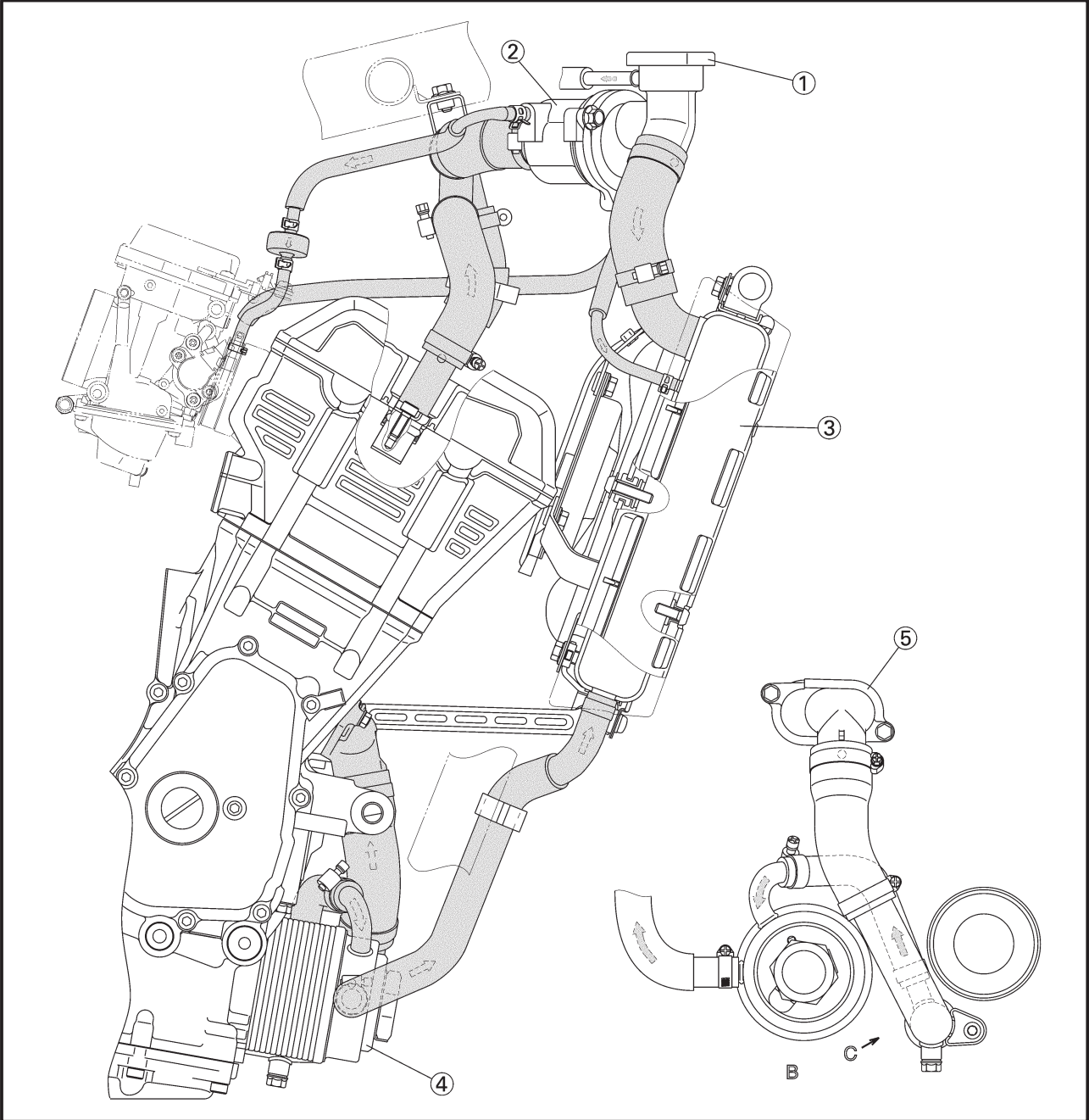
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COOLING SYSTEM DIAGRAMS

- ① Radiator cap
- ② Thermostat housing
- ③ Radiator
- ④ Water pump

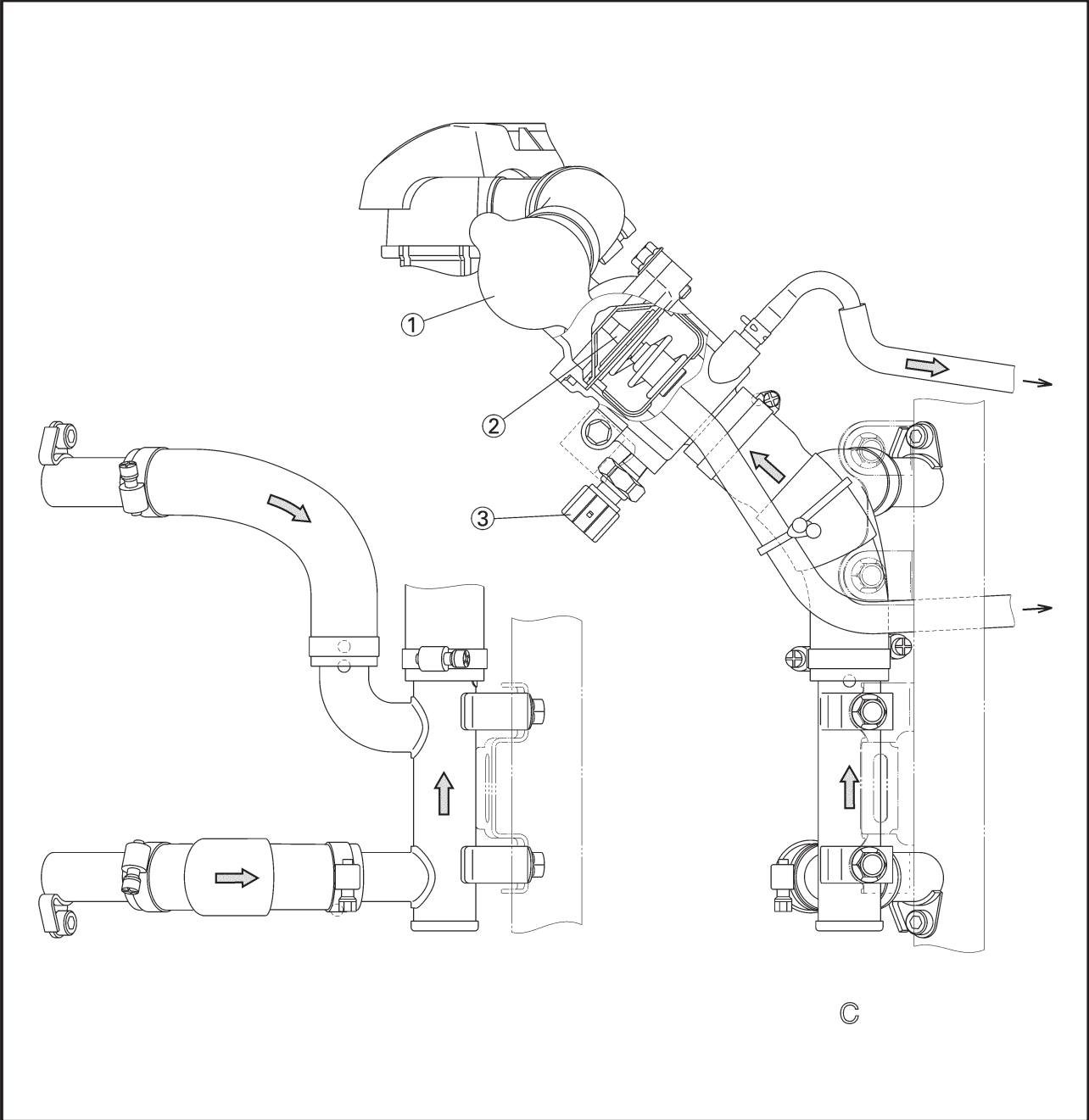


- ① Radiator cap
- ② Thermostat housing
- ③ Radiator
- ④ Oil cooler
- ⑤ Water jacket joint

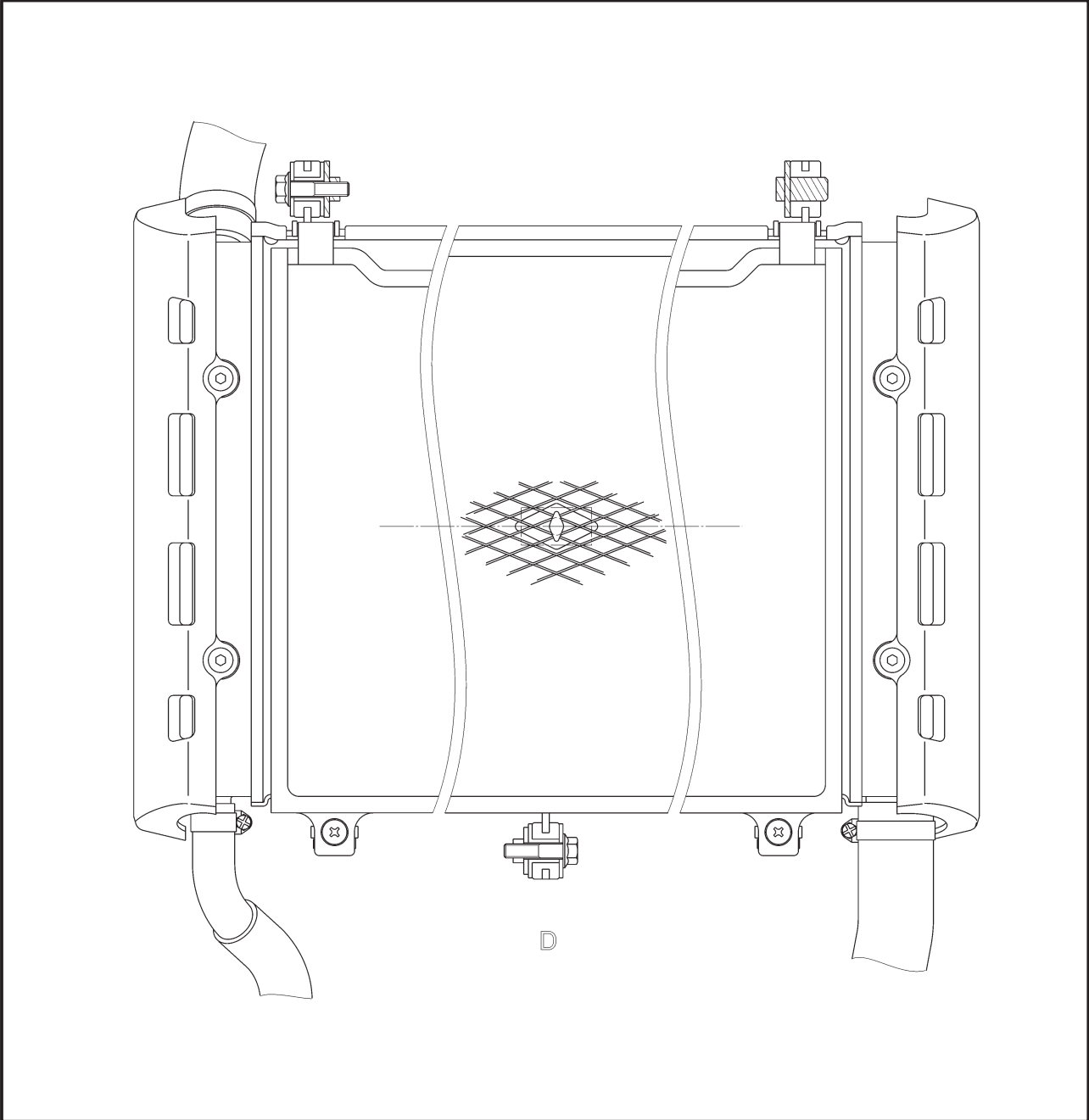




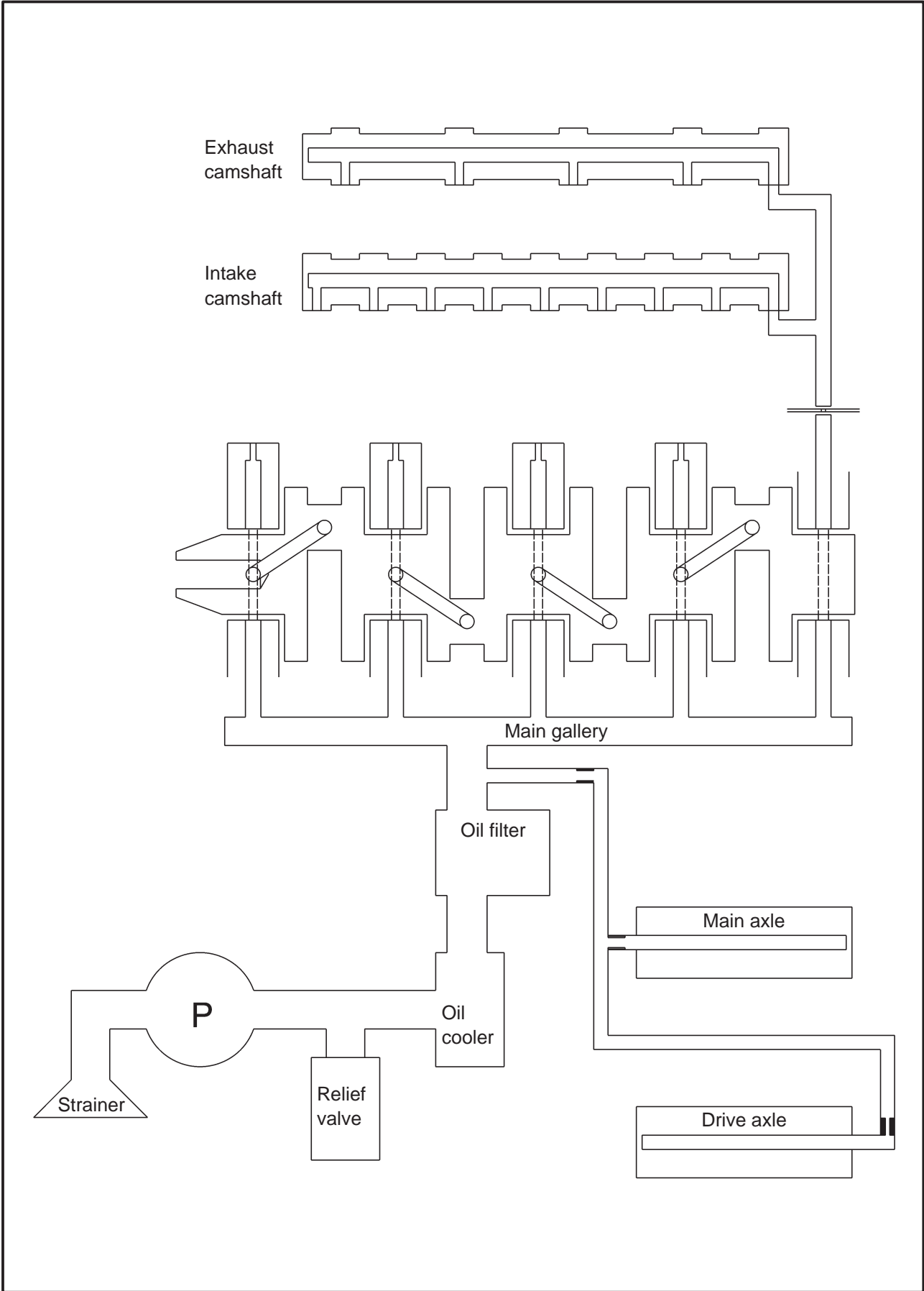
- ① Radiator cap
- ② Thermostat
- ③ Thermo unit



① Radiator



ENGINE OIL LUBRICATION CHART





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