



YAMAHA

**XV16AL/XV16ALC
XV16ATL/XV16ATLC**

SERVICE MANUAL

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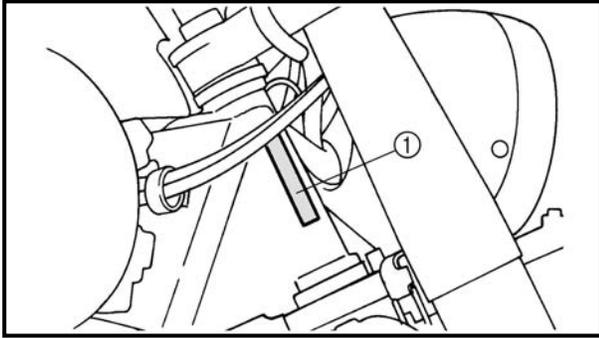
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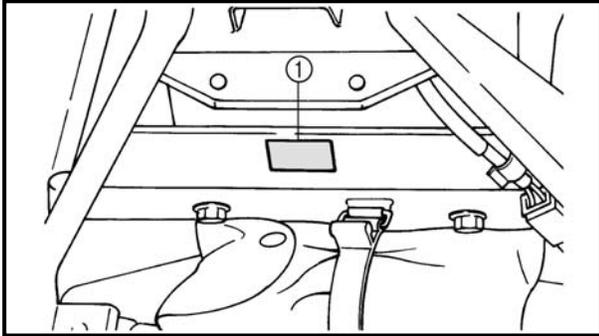
EAS00014

GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

EAS00017

VEHICLE IDENTIFICATION NUMBER

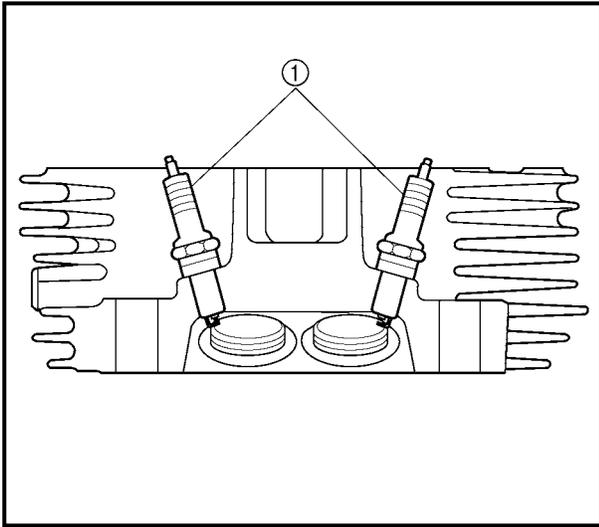
The vehicle identification number ① is stamped into the right side of the steering head pipe.



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MODEL CODE

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



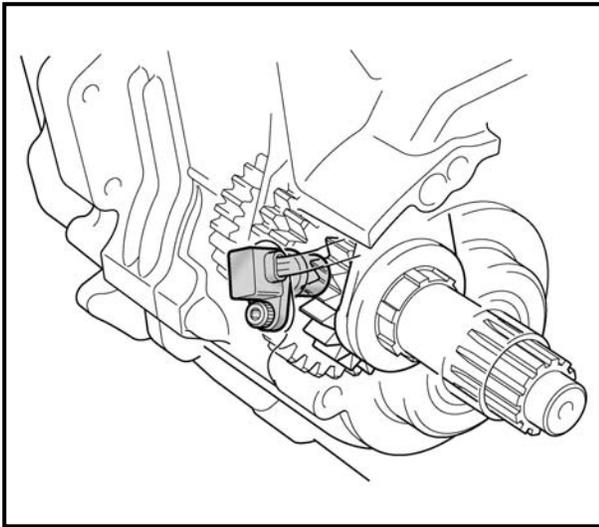
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FEATURES

Twin spark plugs

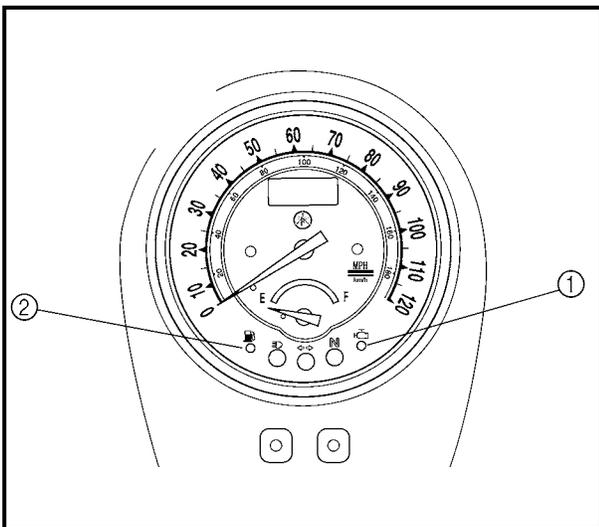
For this model, two spark plugs are incorporated in each cylinder.

By using two spark plugs, the combustion time in the combustion chamber is shortened in an attempt to improve torque.



Speed sensor

The speed sensor is installed to the crankcase and it detects the number of passing gears while the vehicle is running in 5th gear and sends the information out as an electrical signal to the ignitor unit.



Self-diagnosis device

This model is equipped with a self-diagnosis device that has four functions.

The engine trouble indicator light will come on or flash if trouble occurs in an engine monitoring circuit.

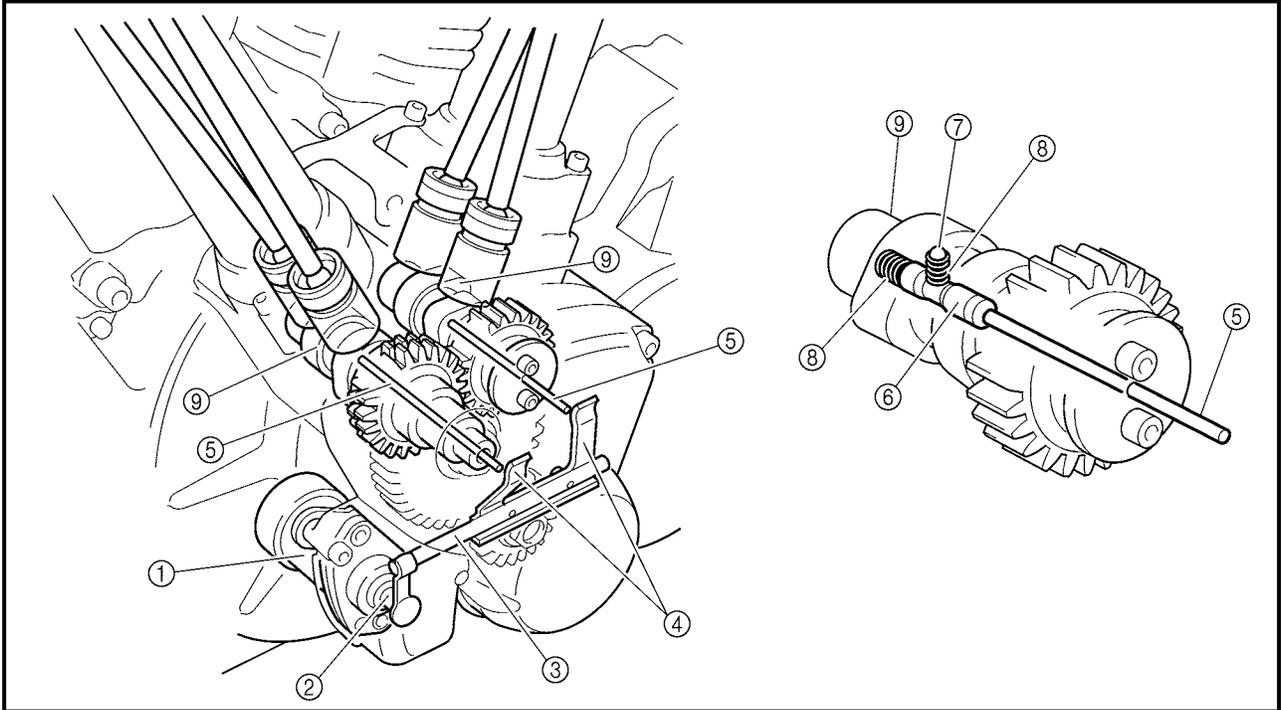
Circuit	Indicator lights	Number of flashes
Throttle position sensor	Engine trouble indicator light ①	3
Speed sensor	Engine trouble indicator light ①	4
Solenoid	Engine trouble indicator light ①	6
Fuel level meter	Fuel level indicator light ②	8

1-2 Refer to "SELF-DIAGNOSIS" in chapter 7.

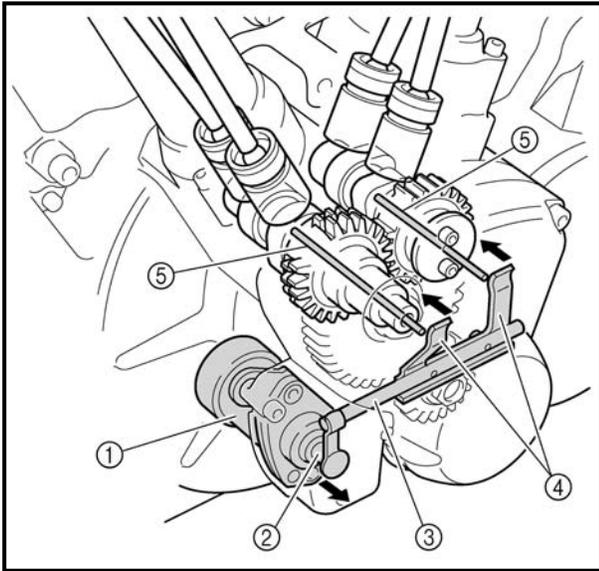
Auto decompression mechanism

The auto decompression mechanism occurs when the engine is started. When the engine is started, the decompression cam and pin raise the exhaust valve lifters, push the push rods, move the rocker arms, and lower the exhaust valves which compress the cylinder. When the cylinder is compressed, pressure is released immediately, resulting in smoother engine starting capabilities and smoother crankshaft revolutions.

1

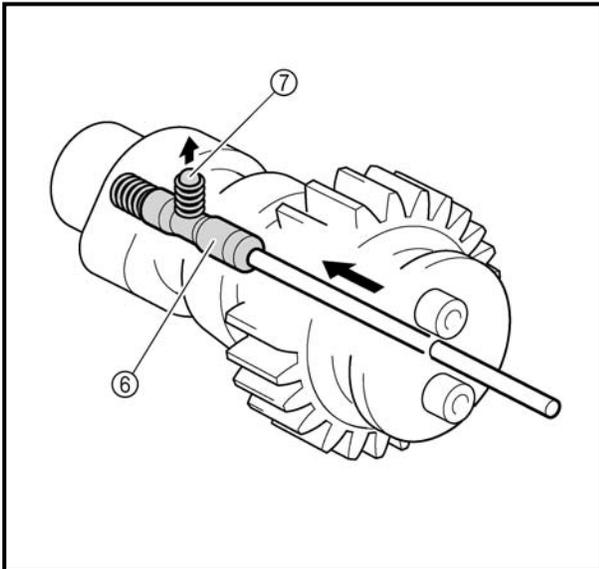


- ① Decompression solenoid
- ② Decompression solenoid rod
- ③ Decompression connector
- ④ Decompression lever
- ⑤ Decompression push rod
- ⑥ Decompression cam
- ⑦ Pin
- ⑧ Spring
- ⑨ Camshaft

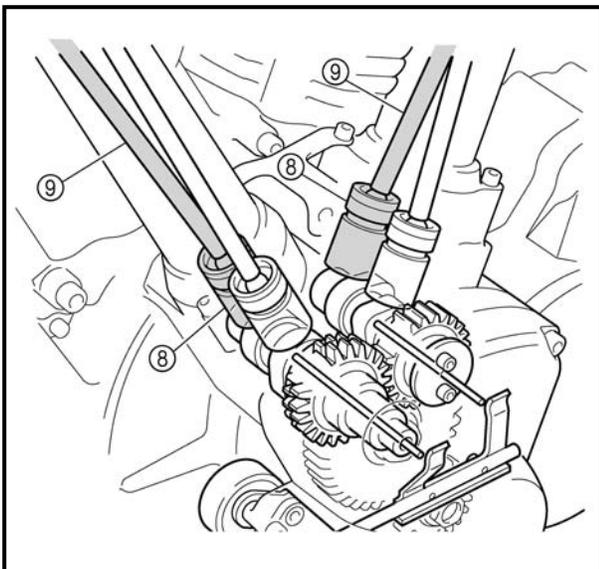


Operation

1. When the starter switch is pushed, electricity is run to the decompression solenoid ① causing it to push out the decompression solenoid rod ②.
2. When the decompression solenoid rod is pushed out, the decompression connector ③ moves the decompression levers ④ in the direction indicated by the arrows, and then the levers push the decompression rods ⑤ toward the camshaft side.



3. The decompression cam ⑥ is pushed in the direction indicated by the arrow, and then the pin ⑦ raises the projection of the decompression cam.



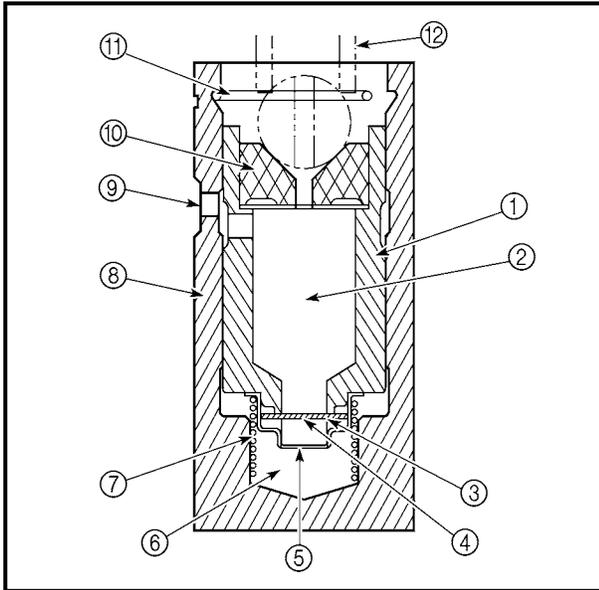
4. When the camshaft is rotated by the self-timing motor, the exhaust valve lifters ⑧ are lifted by the pin just before top dead center (TDC) and the exhaust valve push rod ⑨ and valve rocker arms are operated. Thus, opening the exhaust valve becomes easy.
5. When the engine starts and reaches a specific engine speed the decompression solenoid is turned off and the decompression system stops operating.

1

Hydraulic valve lifters

Since the hydraulic valve-lifting mechanism maintains a valve clearance of zero, periodic valve clearance adjustments are unnecessary.

The advantages of this system as compared to conventional techniques include the following: mechanical noise is reduced, the camshaft action on the valves remains unaffected by engine speed or temperature, and the valve timing is kept stable.



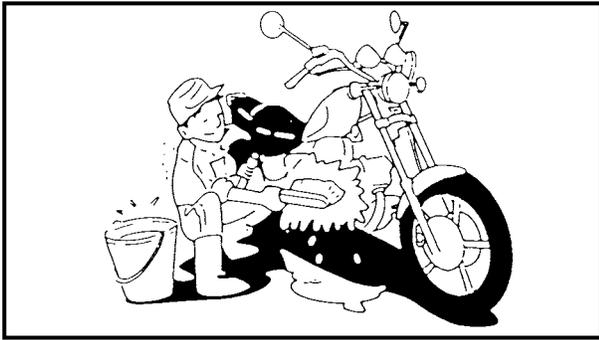
- ① Plunger
- ② Oil reservoir
- ③ Check valve spring
- ④ Check valve
- ⑤ Spring retainer
- ⑥ High-pressure chamber
- ⑦ Plunger spring
- ⑧ Valve lifter body
- ⑨ Oil supply inlet
- ⑩ Push rod cup
- ⑪ Plunger retaining clip
- ⑫ Valve push rod

The hydraulic valve-lifting system functions as follows:

1. As the camshaft rotates, the valve lifter is pushed up by the passing cam lobe.
2. Since the check valve ④ prevents the engine oil contained inside the high-pressure chamber from escaping, the plunger ① moves up along with the valve lifter body ⑧ and pushes up the push rod, causing the valve to be lifted.
3. As the camshaft continues to rotate, the valve lifter moves back down to its original position, where it remains while the cam heel passes.

When a positive valve clearance is caused by either heat expansion of the cylinder head or engine oil leaking from the valve lifter during stage 2, the plunger, which no longer receives pressure from the push rod, is pushed up by the plunger spring ⑦. As a result, the valve clearance is zeroed and engine oil is allowed to return to the high-pressure chamber from the reservoir ② through the check valve ④.

When, on the contrary, a negative valve clearance occurs (this is the case when the cam heel is passing the valve lifter, but the rocker arm, pushed by the push rod, is lifting the valve), the plunger ① continues to receive pressure from the valve push rod. As engine oil contained inside the high-pressure chamber leaks from the gaps between the valve lifter body ⑧ and the plunger ① as well as between the valve lifter body ⑧ and the check valve ④, the plunger ① moves down and the valve clearance is zeroed.



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IMPORTANT INFORMATION

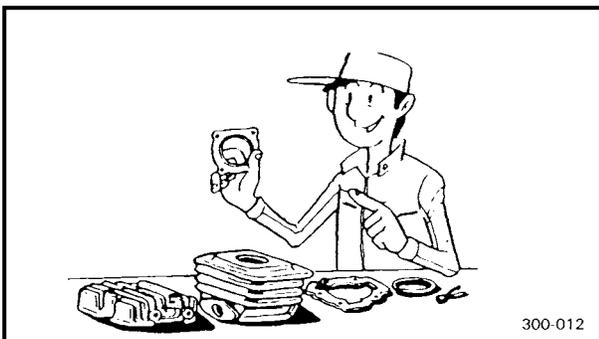
PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust, and foreign material.
2. Use only the proper tools and cleaning equipment. Refer to "SPECIAL TOOLS".
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.



300 008

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.



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REPLACEMENT PARTS

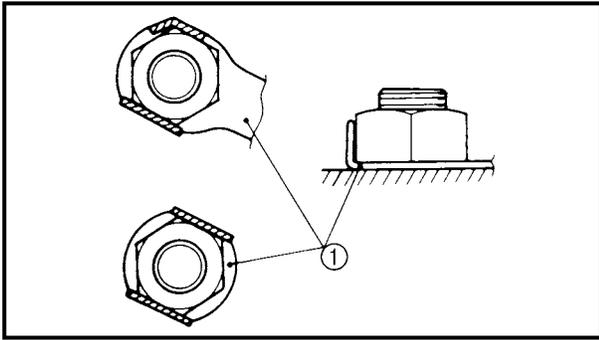
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

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 lubricate the oil seal lips with grease.

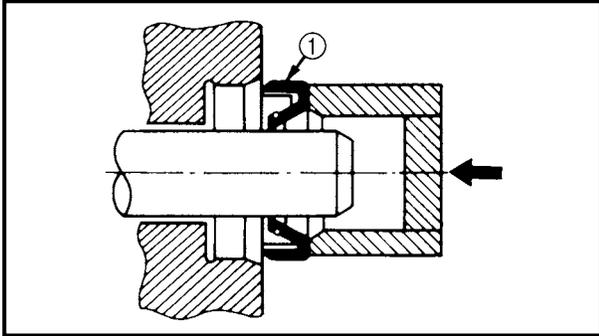
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EAS00023

LOCK WASHERS/PLATES AND COTTER PINS

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

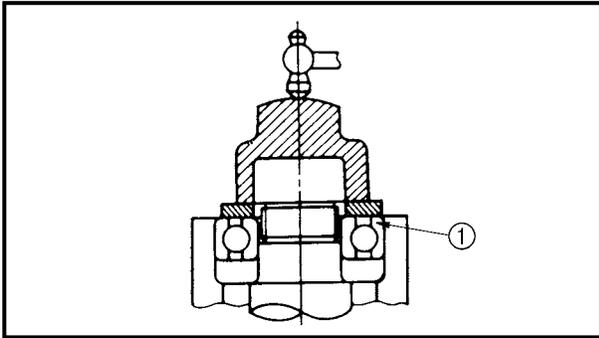


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BEARINGS AND OIL SEALS

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

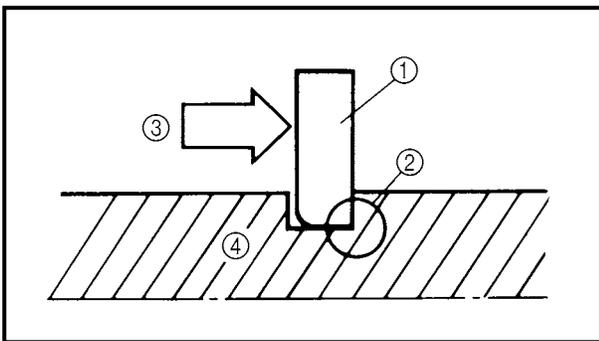
① Oil seal



CAUTION:

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

① Bearing



EAS00025

CIRCLIPS

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 the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

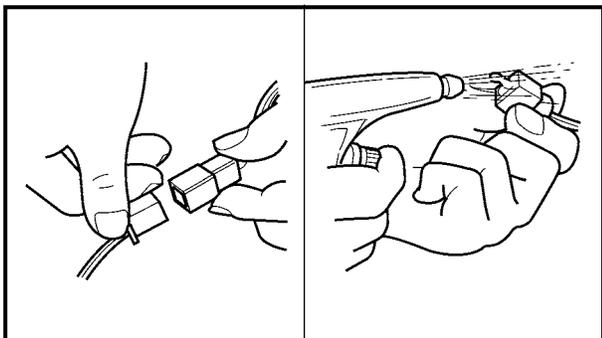
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CHECKING THE CONNECTIONS

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

1. Disconnect:

- lead
- coupler
- connector

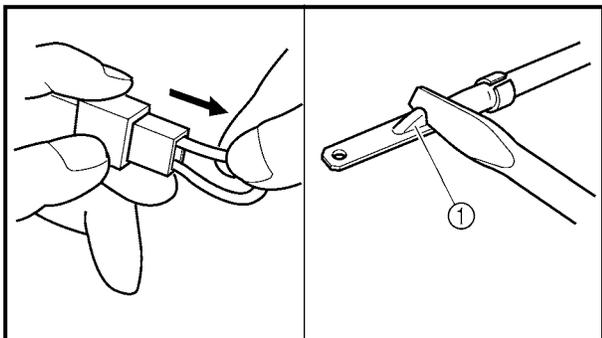


2. Check:

- lead
- coupler
- connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



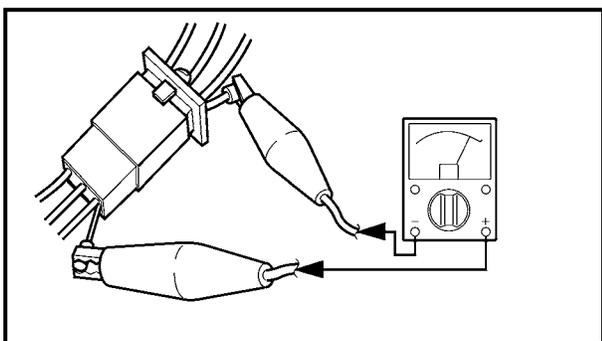
3. Check:

- all connections

Loose connection → Connect properly.

NOTE: _____

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



4. Connect:

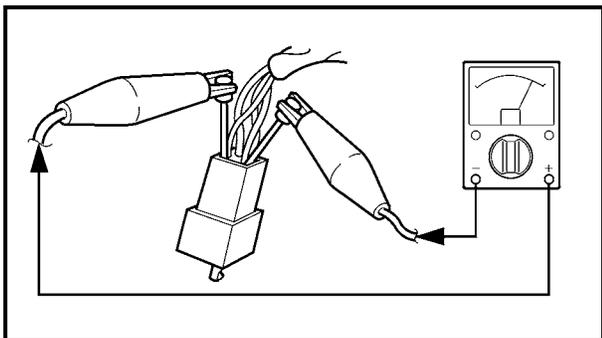
- lead
- coupler
- connector

NOTE: _____

Make sure all connections are tight.

5. Check:

- continuity
(with the pocket tester)



	Pocket tester YU-03112
---	-----------------------------------

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.

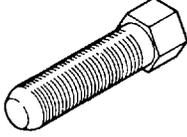
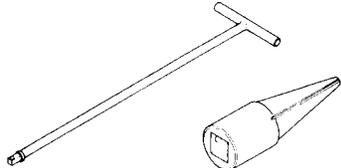
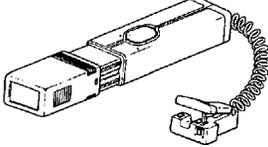
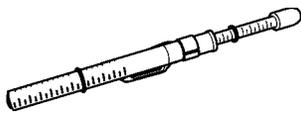
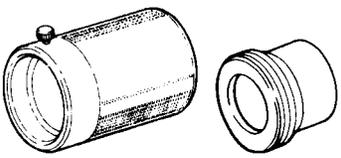
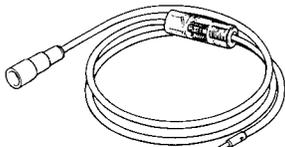
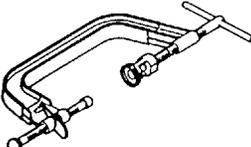


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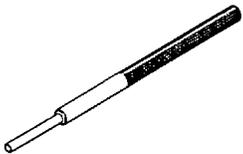
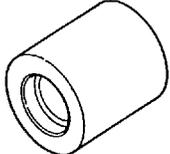
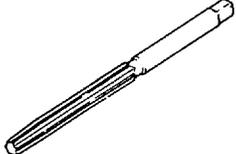
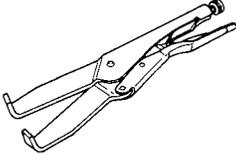
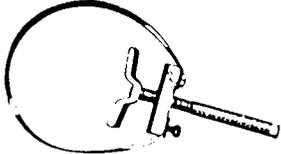
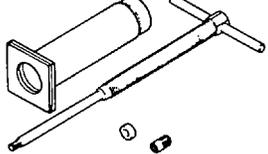
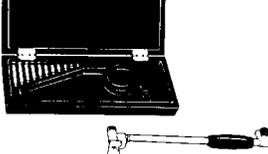
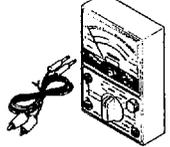
SPECIAL TOOLS

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.

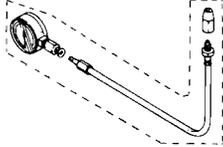
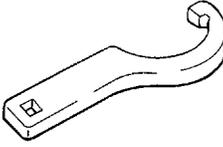
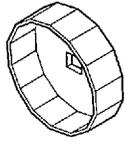
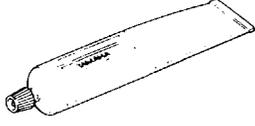
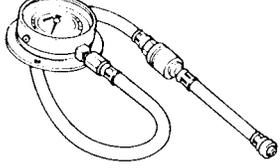
When placing an order, refer to the list provided below to avoid any mistakes.

Tool No.	Tool name/Function	Illustration
YM-01080-A	Flywheel puller This tool is used to remove the generator rotor.	
T-handle YM-01326 Damper rod holder YM-1300-1	T-handle Damper rod holder These tools are used to hold the cartridge cylinder when loosening or tightening the cartridge cylinder bolt.	
YM-01312-A	Fuel level gauge This tool is used to measure the fuel level in the float chamber.	
YM-33277-A	Timing light This tool is used to check the ignition timing.	
YM-03170	Belt tension gauge This tool is used to measure the drive belt slack.	
Fork seal driver weight YM-33963 Adapter YM-8020	Fork seal driver weight Adapter These tools are used to install the front fork's oil seal and dust seal.	
YM-34487	Dynamic spark tester This tool is used to check the ignition system components.	
YM-04019	Valve spring compressor This tool is used to remove or install the valve assemblies.	



Tool No.	Tool name/Function	Illustration
YM-4064-A	Valve guide remover (6 mm) This tool is used to remove or install the valve guides.	
YM-4065-A	Valve guide installer This tool is used to install the valve guides.	
YM-4066	Valve guide reamer This tool is used to rebores the new valve guides.	
YM-91042	Universal clutch holder This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
YS-01880	Sheave holder This tool is used to hold the generator rotor when removing or installing the generator rotor bolt, generator shaft bolt or pickup coil rotor bolt.	
YU-01304	Piston pin puller This tool is used to remove the piston pins.	
YU-03009	Micrometer (75 ~ 100 mm) This tool is used to measure the piston skirt diameter.	
YU-03017	Cylinder bore gauge (50 ~ 100 mm) This tool is used to measure the cylinder bore.	
YU-03112	Pocket tester This tool is used to check the electrical system.	



Tool No.	Tool name/Function	Illustration
Compression gauge YU-33223 Compression gauge adapter YU-33223-3	Compression gauge These tools are used to measure engine compression.	
YU-33975	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
YU-38411	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
YU-8036-A	Inductive tachometer This tool is used to check engine speed.	
ACC-11001-05-01	Quick Gasket® This sealant is used to seal two mating surfaces (e. g., crankcase mating surfaces).	
90890-03153	Oil pressure gauge This tool is used to measure the engine oil pressure.	



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SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard	Limit
Dimensions		
Overall length	2,500 mm (98.4 in)	----
Overall width	980 mm (38.6 in)	----
Overall height	1,140 mm (44.9 in): XV16A	----
	1,500 mm (59.1 in): XV16AT	----
Seat height	710 mm (28.0 in)	----
Wheelbase	1,685 mm (66.3 in)	----
Minimum ground clearance	145 mm (5.71 in)	----
Minimum turning radius	3,200 mm (126 in)	----
Weight		
Wet (with oil and a full fuel tank)	332 kg (732 lb): XV16A	----
	347 kg (765 lb): XV16AT	----
Dry (without oil and fuel)	307 kg (678 lb): XV16A	----
	322 kg (710 lb): XV16AT	----
Maximum load (total of cargo, rider, passenger, and accessories)	196 kg (432 lb): XV16A	----
	181 kg (399 lb): XV16AT	----



ENGINE SPECIFICATIONS

Item	Standard	Limit
Engine		
Engine type	Air-cooled, 4-stroke, OHV	----
Displacement	1,602 cm ³	----
Cylinder arrangement	V-type 2-cylinder	----
Bore × stroke	95 × 113 mm (3.74 × 4.45 in)	----
Compression ratio	8.3:1	----
Engine idling speed	850 ~ 950 r/min	----
Vacuum pressure at engine idling speed	52 kPa (390 mm Hg, 15.4 in Hg)	----
Standard compression pressure (at sea level)	1,200 kPa (12.0 kgf/cm ² , 171 psi) at 200 r/min	----
Fuel		
Recommended fuel	Unleaded fuel (for USA) Regular unleaded gasoline (for CDN)	----
Fuel tank capacity		
Total (including reserve)	20 L (17.6 Imp qt, 21.1 US qt)	----
Reserve only	3.5 L (3.08 Imp qt, 3.70 US qt)	----
Engine oil		
Lubrication system	Dry sump	----
Recommended oil		----
	Yamalube 4 (20W40) or SAE 20W40 type SE motor oil (40°F/5°C or above) (Non-Friction modified)	
Quantity		
Total amount	5.0 L (4.4 Imp qt, 5.3 US qt)	----
Without oil filter cartridge replacement	3.7 L (3.3 Imp qt, 3.9 US qt)	----
With oil filter cartridge replacement	4.1 L (3.6 Imp qt, 4.3 US qt)	----
Oil pressure (hot)	60 kPa (0.6 kgf/cm ² , 8.5 psi) at 900 r/min	----
Relief valve opening pressure	0.60 MPa (6.0 kgf/cm ² , 85 psi)	----
Transfer gear oil		
Recommended oil	SAE80API "GL-4" hypoid gear oil	----
Quantity	0.4 L (0.35 Imp qt, 0.42 US qt)	----
Oil filter		
Oil filter type	Cartridge (paper)	----
Bypass valve opening pressure	80 ~ 120 kPa (0.8 ~ 1.2 kgf/cm ² , 11.3 ~ 17.1 psi)	----

ENGINE SPECIFICATIONS

SPEC



2

Item	Standard	Limit
Engine oil pump		
Oil pump type	Trochoidal	----
Inner rotor to outer rotor tip clearance	0.00 ~ 0.12 mm (0.000 ~ 0.005 in)	0.17 mm (0.007 in)
Inner rotor outer rotor 2 to oil pump housing clearance (feed pump)	0.03 ~ 0.08 mm (0.001 ~ 0.003 in)	0.13 mm (0.005 in)
Inner rotor outer rotor 1 to oil pump housing clearance (scavenging pump)	0.06 ~ 0.11 mm (0.002 ~ 0.004 in)	0.16 mm (0.006 in)
Transfer oil pump		
Oil pump type	Trochoidal	----
Inner rotor to outer rotor tip clearance	0.07 ~ 0.12 mm (0.003 ~ 0.005 in)	0.17 mm (0.007 in)
Inner rotor outer rotor to oil pump housing clearance	0.03 ~ 0.08 mm (0.001 ~ 0.003 in)	0.16 mm (0.006 in)
Starting system type		
	Electric starter	
Spark plugs		
Model	DPR7EA-9/X22EPR-U9	----
Manufacturer	NGK/DENSO	----
Quantity	4	----
Spark plug gap	0.8 ~ 0.9 mm (0.031 ~ 0.035 in)	----
Cylinder heads		
Max. warpage	----	0.10 mm (0.004 in)
Camshafts		
Drive system	Gear drive	----
Crankcase hole inside diameter	25.000 ~ 25.021 mm (0.9843 ~ 0.9851 in)	----
Camshaft cover hole inside diameter	28.000 ~ 28.021 mm (1.1024 ~ 1.1032 in)	----
Camshaft journal diameter (crankcase side)	24.937 ~ 24.950 mm (0.9818 ~ 0.9823 in)	----
Camshaft journal diameter (camshaft cover side)	27.967 ~ 27.980 mm (1.1011 ~ 1.1016 in)	----
Camshaft to crankcase clearance	0.050 ~ 0.084 mm (0.0020 ~ 0.0033 in)	----
Camshaft to camshaft cover clearance	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)	----
Camshaft intake cam dimensions		



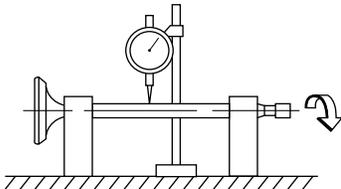
Item	Standard	Limit
Measurement A	36.594 ~ 36.649 mm (1.4407 ~ 1.4429 in)	36.494 mm (1.4368 in)
Measurement B	31.950 ~ 32.050 mm (1.2579 ~ 1.2618 in)	31.850 mm (1.2539 in)
Camshaft exhaust cam dimensions		
Measurement A	36.554 ~ 36.654 mm (1.4391 ~ 1.4431 in)	36.454 mm (1.4352 in)
Measurement B	31.950 ~ 32.050 mm (1.2579 ~ 1.2618 in)	31.850 mm (1.2539 in)
Rocker arms, Rocker arm shafts		
Rocker arm inside diameter	15.000 ~ 15.018 mm (0.5906 ~ 0.5913 in)	15.036 mm (0.5920 in)
Rocker arm shaft outside diameter	14.981 ~ 14.991 mm (0.5898 ~ 0.5902 in)	14.97 mm (0.5894 in)
Rocker arm to rocker arm shaft clearance	0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.003 in)
Valves, valve seats, valve guides		
Valve clearance (cold)		
Intake	0 ~ 0.04 mm (0 ~ 0.0016 in)	----
Exhaust	0 ~ 0.04 mm (0 ~ 0.0016 in)	----
Valve dimensions		
Head Diameter		
Face Width		
Seat Width		
Margin Thickness		
Valve head diameter A		
Intake	33.9 ~ 34.1 mm (1.3346 ~ 1.3425 in)	----
Exhaust	27.9 ~ 28.1 mm (1.0984 ~ 1.1063 in)	----
Valve face width B		
Intake	1.3 ~ 2.3 mm (0.0512 ~ 0.0906 in)	----
Exhaust	1.2 ~ 2.4 mm (0.0472 ~ 0.0945 in)	----
Valve seat width C		
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	2.0 mm (0.079 in)
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	2.0 mm (0.079 in)

ENGINE SPECIFICATIONS

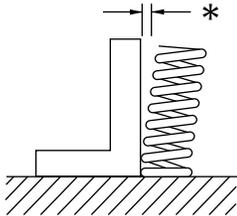
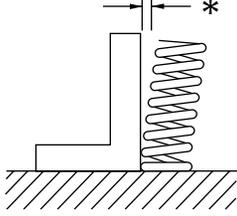
SPEC



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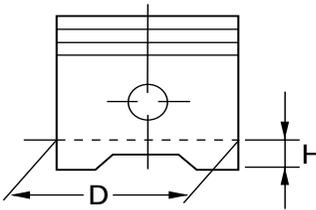
Item	Standard	Limit
Valve margin thickness D		
Intake	0.7 ~ 1.3 mm (0.028 ~ 0.051 in)	0.4 mm (0.016 in)
Exhaust	0.7 ~ 1.3 mm (0.028 ~ 0.051 in)	0.4 mm (0.016 in)
Valve stem diameter		
Intake	5.975 ~ 5.990 mm (0.2352 ~ 0.2358 in)	5.945 mm (0.2341 in)
Exhaust	5.960 ~ 5.975 mm (0.2346 ~ 0.2352 in)	5.920 mm (0.2331 in)
Valve guide inside diameter		
Intake	6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	6.05 mm (0.2382 in)
Exhaust	6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	6.05 mm (0.2382 in)
Valve stem-to-valve guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.1 mm (0.004 in)
Valve stem runout	----	0.01 mm (0.0004 in)
		
Valve seat width		
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	----
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	----
Valve springs		
Inner springs		
Free length		
Intake	38.26 mm (1.51 in)	36.26 mm (1.43 in)
Exhaust	38.26 mm (1.51 in)	36.26 mm (1.43 in)
Installed length (valve closed)		
Intake	29.0 mm (1.14 in)	----
Exhaust	29.0 mm (1.14 in)	----
Compressed spring force (installed)		
Intake	63 ~ 73 N (6.3 ~ 7.3 kgf, 13.9~ 16.1 lb)	----
Exhaust	63 ~ 73 N (6.3 ~ 7.3 kgf, 13.9~ 16.1 lb)	----



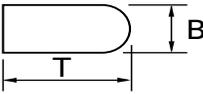
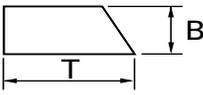
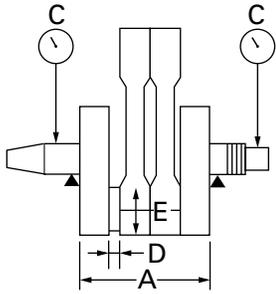
Item	Standard	Limit
<p>Spring tilt</p> 		
Intake	----	2.5° /2.4 mm (2.5°/0.094 in)
Exhaust	----	2.5° /2.4 mm (2.5°/0.094 in)
Winding direction (top view)		
Intake	Counterclockwise	----
Exhaust	Counterclockwise	----
		
Outer springs		
Free length		
Intake	43.25 mm (1.70 in)	41.26 mm (1.62 in)
Exhaust	43.25 mm (1.70 in)	41.26 mm (1.62 in)
Installed length (valve closed)		
Intake	31.0 mm (1.22 in)	----
Exhaust	31.0 mm (1.22 in)	----
Compressed spring force (installed)		
Intake	139 ~ 161 N (13.9 ~ 16.1 kgf, 30.6 ~ 35.5 lb)	----
Exhaust	139 ~ 161 N (13.9 ~ 16.1 kgf, 30.6 ~ 35.5 lb)	----
Spring tilt		
		
Intake	----	2.5° /2.4 mm (2.5°/0.094 in)
Exhaust	----	2.5° /2.4 mm (2.5°/0.094 in)



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Item	Standard	Limit
Winding direction (top view) Intake Exhaust	Clockwise Clockwise 	---- ----
Valve lifters		
Valve lifter outside diameter	22.9680 ~ 22.9744 mm (0.9043 ~ 0.9045 in)	----
Valve lifter case inside diameter	22.990 ~ 23.010 mm (0.9051 ~ 0.9059 in)	----
Valve lifter-to-valve lifter case clearance	0.0156 ~ 0.0420 mm (0.0006 ~ 0.0017 in)	----
Valve push rods		
Valve push rod length	293.45 ~ 293.95 mm (11.553 ~ 11.573 in)	----
Valve push rod runout	0.3 mm (0.012 in)	----
Cylinders		
Bore	95.000 ~ 95.010 mm (3.7402 ~ 3.7406 in)	----
Max. taper	----	0.05 mm (0.0016 in)
Max. out of round	----	0.05 mm (0.0016 in)
Pistons		
Piston-to-cylinder clearance	0.025 ~ 0.050 mm (0.001 ~ 0.002 in)	0.15 mm (0.006 in)
Diameter D 	94.960 ~ 94.975 mm (3.7386 ~ 3.7392 in)	----
Height H	5 mm (0.20 in)	----
Piston pin bore (in the piston)		
Diameter	22.004 ~ 22.015 mm (0.8663 ~ 0.8667 in)	22.045 mm (0.8679 in)
Offset	1.0 mm (0.04 in)	----
Piston pins		
Outside diameter	21.991 ~ 22.000 mm (0.8658 ~ 0.8661 in)	21.971 mm (0.8650 in)
Piston pin-to-piston pin bore clearance	0.004 ~ 0.024 mm (0.00016 ~ 0.00094 in)	0.074 mm (0.0029 in)



Item	Standard	Limit
<p>Piston rings</p> <p>Top ring</p>  <p>Ring type Dimensions (B × T) End gap (installed) Ring side clearance</p> <p>2nd ring</p>  <p>Ring type Dimensions (B × T) End gap (installed) Ring side clearance</p> <p>Oil ring</p>  <p>Dimensions (B × T) End gap (installed)</p>	<p>Barrel</p> <p>1.2 × 3.8 mm (0.047 × 0.150 in)</p> <p>0.30 ~ 0.45 mm (0.012 ~ 0.018 in)</p> <p>0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)</p> <p>Taper</p> <p>1.2 × 3.8 mm (0.047 × 0.150 in)</p> <p>0.30 ~ 0.45 mm (0.012 ~ 0.018 in)</p> <p>0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)</p> <p>2.5 × 3.4 mm (0.098 × 0.134 in)</p> <p>0.2 ~ 0.7 mm (0.008 ~ 0.028 in)</p>	<p>---</p> <p>---</p> <p>0.65 mm (0.026 in)</p> <p>0.12 mm (0.0047 in)</p> <p>---</p> <p>---</p> <p>0.8 mm (0.031 in)</p> <p>0.12 mm (0.0047 in)</p> <p>---</p> <p>---</p>
<p>Connecting rods</p> <p>Crankshaft pin-to-big end bearing clearance</p> <p>Bearing color code</p> <p>Connecting rod length</p>	<p>0.037 ~ 0.074 mm (0.0015 ~ 0.0029 in)</p> <p>1 = Blue, 2 = Black, 3 = Brown, 4 = Green, 5 = Yellow.</p> <p>191.95 ~ 192.05 mm (7.557 ~ 7.561 in)</p>	<p>---</p> <p>---</p>
<p>Crankshaft</p>  <p>Width A Max. runout C Big end side clearance D</p>	<p>132.8 ~ 133.2 mm (5.228 ~ 5.244 in)</p> <p>0.320 ~ 0.474 mm (0.013 ~ 0.019 in)</p>	<p>---</p> <p>0.04 mm (0.0016 in)</p> <p>---</p>

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Item	Standard	Limit
Big end radial clearance E	0.037 ~ 0.074 mm (0.0015 ~ 0.0029 in)	0.09 mm (0.0035 in)
Crankshaft journal-to-crankshaft-journal bearing clearance	0.030 ~ 0.062 mm (0.0012 ~ 0.0024 in)	0.1 mm (0.0040 in)
Clutch		
Clutch type	Wet, multiple disc	----
Clutch release method	Rack and pinion (pull rod type)	----
Clutch release method operation	Cable operation	----
Operation	Left-hand operation	----
Clutch cable free play (at the end of the clutch lever)	10 ~ 15 mm (0.39 ~ 0.59 in)	----
Friction plates		
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Plate quantity	9	----
Clutch plates		
Thickness	2.2 ~ 2.4 mm (0.087 ~ 0.094 in)	----
Plate quantity	8	----
Max. warpage	----	0.2 mm (0.008 in)
Clutch springs		
Free length	7 mm (0.276 in)	----
Spring quantity	1	----
Min. length		6.5 mm (0.256 in)
Transmission		
Transmission type	Constant mesh, 5-speed	----
Primary reduction system	Spur gear	----
Primary reduction ratio	72/47 (1.532)	----
Secondary reduction system	Belt drive	----
Secondary reduction ratio	35/32 × 70/33 (2.320)	----
Operation	Left-foot operation	----
Gear ratios		
1st gear	39/16 (2.437)	----
2nd gear	30/19 (1.578)	----
3rd gear	29/25 (1.160)	----
4th gear	29/32 (0.906)	----
5th gear	21/28 (0.750)	----
Max. main axle runout	----	0.08 mm (0.003 in)
Max. drive axle runout	----	0.08 mm (0.003 in)

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Item	Standard	Limit
Shifting mechanism		
Shift mechanism type	Guide bar	----
Max. shift fork guide bar bending	----	0.025 mm (0.001 in)
Shift fork thickness	6.26 ~ 6.39 mm (0.246 ~ 0.252 in)	----
Air filter type		
	Dry element	----
Fuel pump		
Pump type	Electrical	----
Model (manufacturer)	4WM (MITSUBISHI)	----
Output pressure	15 ~ 20 kPa (0.15 ~ 0.20 kgf/cm ² , 2.1 ~ 2.8 psi)	----
Carburetor		
Model (manufacturer) × quantity	BSR40 (MIKUNI) × 1	----
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm (0.12 ~ 0.20 in)	----
ID mark	4WM1 00 4WM2 10 (for California)	----
Main jet	#165	----
Main air jet	#60	----
Jet needle	6HDC26	----
Needle jet	X-2	----
Pilot air jet	#100	----
Pilot outlet	1.0 (XV16A), 1.1 (XV16AT)	----
Pilot jet	#35	----
Bypass 1	0.9	----
Bypass 2	1.0	----
Bypass 3	0.9	----
Pilot screw turns out	2-1/2	----
Valve seat size	2.0	----
Starter jet 1	#57.5	----
Starter jet 2	1.0	----
Butterfly valve size	#110	----
Fuel level (below the float chamber mating surface)	2.0 ~ 3.0 mm (0.079 ~ 0.12 in)	----



CHASSIS SPECIFICATIONS

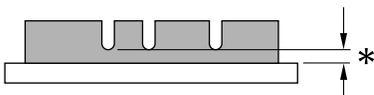
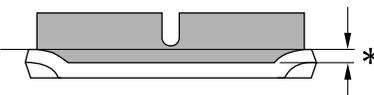
Item	Standard	Limit
Frame		
Frame type	Double cradle	----
Caster angle	32°	----
Trail	142 mm (5.59 in)	----
Front wheel		
Wheel type	Spoke wheel	----
Rim		
Size	16 × MT3.00	----
Material	Steel	----
Wheel travel	140 mm (5.51 in)	----
Wheel runout		
Max. radial wheel runout	----	1 mm (0.04 in)
Max. lateral wheel runout	----	0.5 mm (0.02 in)
Rear wheel		
Wheel type	Spoke wheel	----
Rim		
Size	16 × MT3.50	----
Material	Steel	----
Wheel travel	110 mm (4.33 in)	----
Wheel runout		
Max. radial wheel runout	----	1 mm (0.04 in)
Max. lateral wheel runout	----	0.5 mm (0.02 in)
Front tire		
Tire type	With tube	----
Size	130/90 - 16 67H	----
Model (manufacturer)	D404FL (DUNLOP)/ G703F (BRIDGESTONE)	----
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	250 kPa (2.5 kg/cm ² , 36 psi)	----
90 kg (198 lb) ~ Maximum load*	250 kPa (2.5 kg/cm ² , 36 psi)	----
High-speed riding	250 kPa (2.5 kg/cm ² , 36 psi)	----
	* Load is the total weight of the cargo, rider, passenger and accessories.	
Min. tire tread depth	----	1.6 mm (0.06 in)

CHASSIS SPECIFICATIONS

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Item	Standard	Limit
Rear tire		
Tire type	With tube	----
Size	150/80 B16 71H	----
Model (manufacturer)	D404 (DUNLOP)/ G702 (BRIDGESTONE)	----
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	250 kPa (2.5 kg/cm ² , 36 psi)	----
90 kg (198 lb) ~ Maximum load*	280 kPa (2.8 kg/cm ² , 40 psi)	----
High-speed riding	280 kPa (2.8 kg/cm ² , 40 psi)	----
	* Load is the total weight of the cargo, rider, passenger and accessories.	
Min. tire tread depth	----	1.6 mm (0.06 in)
Front brakes		
Brake type	Dual-disc brake	----
Operation	Right-hand operation	----
Brake lever free play (lever end)	2 ~ 5 mm (0.08 ~ 0.20 in)	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	298 × 5 mm (11.7 × 0.20 in)	----
Min. thickness	----	4.5 mm (0.18 in)
Max. deflection	----	0.1 mm (0.004 in)
Brake pad lining thickness	6.0 mm (0.24 in)	0.5 mm (0.02 in)
		
Master cylinder inside diameter	15.8 mm (0.62 in)	----
Caliper cylinder inside diameter	30.1 mm (1.19 in) and 33.3 mm (1.31 in)	----
Rear brake		
Brake type	Single-disc brake	----
Operation	Right-foot operation	----
Brake pedal position (from the top of the brake pedal to the bottom of the rider footrest board)	100 mm (3.9 in)	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	320 × 7 mm (12.6 × 0.28 in)	----
Min. thickness	----	6.5 mm (0.26 in)
Max. deflection	----	0.1 mm (0.004 in)
Brake pad lining thickness	7.5 mm (0.30 in)	0.5 mm (0.02 in)
		

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Item	Standard	Limit
Master cylinder inside diameter	12.7 mm (0.5 in)	----
Caliper cylinder inside diameter	33.9 mm (1.33 in) and 30.2 mm (1.19 in)	----
Steering		
Steering bearing type	Taper roller bearings	----
Front suspension		
Suspension type	Telescopic fork	----
Front fork type	Coil spring/oil damper	----
Front fork travel	140 mm (5.51 in)	----
Spring		
Free length	571 mm (22.5 in)	566 mm (22.3 in)
Spring rate (K1)	6.8 N/mm (0.7 kgf/mm, 39.2 lb/in)	
Spring stroke (K1)	0 ~ 140 mm (0 ~ 5.51 in)	----
Optional spring available	No	----
Fork oil		
Recommended oil	Yamaha fork oil 5WT	----
Quantity (each front fork leg)	554 cm ³ (19.5 Imp oz, 18.7 US oz)	----
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	110 mm (4.33 in)	----
Inner tube outer diameter	43 mm (1.69 in)	----
Rear suspension		
Suspension type	Swingarm (link suspension)	----
Rear shock absorber assembly type	Coil spring/gas-oil damper	----
Rear shock absorber assembly travel	50 mm (1.97 in)	----
Spring		
Free length	187 mm (7.36 in)	182 mm (7.17 in)
Installed length	172 mm (6.77 in): XV16A 169 mm (6.65 in): XV16AT	----
Spring rate (K1)	127 N/mm (13 kgf/mm, 728 lb/in)	----
Spring stroke (K1)	0 ~ 50 mm (0 ~ 1.97 in)	----
Optional spring available	No	----
Standard spring preload gas/air pressure	1,000 kPa (10 kgf/cm ² , 142 psi)	----
Swingarm		
Free play (at the end of the swingarm)		
Radial	----	1 mm (0.04 in)
Axial	----	1 mm (0.04 in)

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Item	Standard	Limit
Drive belt		
Model (manufacturer)	UBD-0568	----
Drive belt slack (on a sidestand)	7.5 ~ 13 mm (0.30 ~ 0.51 in)	----
Drive belt slack (on a suitable stand)	14 ~ 21 mm (0.55 ~ 0.83 in)	----

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ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	----
Ignition system		
Ignition system type	Transistorized coil ignition (TCI)	----
Ignition timing	10° BTDC at 1,000 r/min	----
Advanced timing	40° BTDC at 4,000 r/min	----
Advancer type	Throttle position sensor and electrical	----
Pickup coil resistance/color	248 ~ 372 Ω / Gy-B	----
Transistorized coil ignition unit model (manufacturer)	J4T098 (MITSUBISHI)	----
Ignition coils		
Model (manufacturer)	J0383 (DENSO)	----
Minimum ignition spark gap	6 mm (0.24 in)	----
Primary coil resistance	1.53 ~ 2.07 Ω	----
Secondary coil resistance	12 ~ 18 kΩ	----
Spark plug caps		
Material	Resin	----
Resistance	10 kΩ	----
Throttle position sensor standard resistance	4.0 ~ 6.0 kΩ	----
Charging system		
System type	AC magneto	----
Model (manufacturer)	F4T363 (MITSUBISHI)	----
Nominal output	14 V / 21 A at 5,000 r/min	----
Stator coil resistance	0.45 ~ 0.55 Ω at 20°C (68°F)	----
Voltage regulator		
Regulator type	Semiconductor, short circuit	----
Model	SH650D-11	----
No-load regulated voltage	14.1 ~ 14.9 V	----
Rectifier		
Model	SH650D-11	----
Rectifier capacity	18 A	----
Withstand voltage	200 V	----
Battery		
Battery type	YTX20L-BS	----
Battery voltage/capacity	12V / 18AH	----
Headlight type	Halogen bulb	
Indicator light type × quantity	Bulb × 3 and LED × 2	
Bulbs (voltage/wattage × quantity)		
Headlight	12 V 60 W / 55 W × 1	----
Tail/brake light	12 V 8 W / 27 W × 1	----
Front turn signal/position light	12 V 27 W / 8 W × 2	----
Rear turn signal light	12 V 27 W × 2	----
Meter light	14 V 1.7 W × 3	----

ELECTRICAL SPECIFICATIONS

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Item	Standard	Limit
Neutral indicator light	12 V 1.7 W × 1	
Turn signal indicator light	12 V 1.7 W × 1	
High beam indicator light	12 V 1.7 W × 1	
Fuel level indicator light	LED	
Engine trouble indicator light	LED	
Electric starting system		
System type	Constant mesh	----
Starter motor		
Model (manufacturer)	SM-13 (MITSUBA)	----
Power output	0.8 kW	----
Brushes		
Overall length	10 mm (0.40 in)	5 mm (0.20 in)
Spring force	7.65 ~ 10.01 N (765 ~ 1,001 gf, 27.0 ~ 35.3 oz)	----
Commutator resistance	25 ~ 35 mΩ	----
Commutator diameter	28 mm (1.10 in)	27 mm (1.06 in)
Mica undercut	0.7 mm (0.03 in)	----
Starter relay		
Model (manufacturer)	MS5F-411 (JIDECO)	----
Amperage	100 A	----
Coil resistance	4.18 ~ 4.62 Ω	----
Horn		
Horn type	Eddy	----
Model (manufacturer) × quantity	YP-12 (NIKKO) × 2	----
Max. amperage	2 A	----
Turn signal relay		
Relay type	Semi-transistor	----
Model (manufacturer)	FB257H (DENSO)	----
Self-cancelling device built-in	Yes	----
Turn signal blinking frequency	75 ~ 95 cycles/min.	----
Wattage	27 W × 2 + 3.4 W, 21 (23) W × 2 + 3.4 W	----
Fuel sender		
Model (manufacturer)	4WM (NIPPON SEIKI)	----
Resistance	13 ~ 140 Ω at 20 °C (68 °F)	----
Sidestand relay		
Model (manufacturer)	G8R-30Y-B (OMRON)	----
Coil resistance	202 ~ 248 Ω	----
Diode		
	Yes	----
Fuel pump maximum amperage		
	1 A	----
Fuel pump relay model (manufacturer)		
	G8R-30Y-B (OMRON)	----
Thermo switch model (manufacturer)		
	4TR (NIPPON TEXISAS INSTALLMENTS)	----

ELECTRICAL SPECIFICATIONS

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Item	Standard	Limit
Fuses (amperage × quantity)		
Main fuse	30 A × 1	----
Headlight fuse	15 A × 1	----
Signaling system fuse	10 A × 1	----
Ignition fuse	15 A × 1	----
Carburetor heater fuse	10 A × 1	----
Backup fuse (odometer)	5 A × 1	----
Reserve fuse	30 A, 15 A, 10 A, 5 A × 1	----

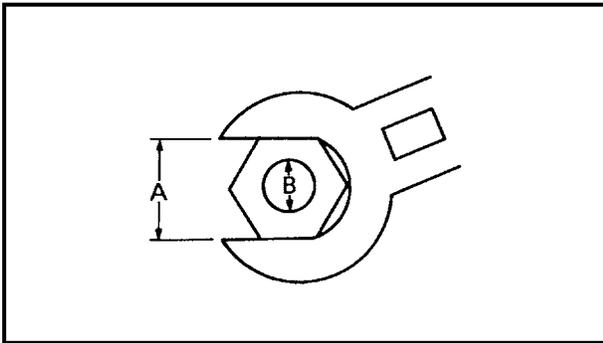
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TIGHTENING TORQUES

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 crisscross 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: Width across flats

B: Thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



ENGINE TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kgf	ft·lb	
Spark plug	–	M12	4	18	1.8	13	
Cylinder head	Nut	M12	8	50	5.0	36	
Cylinder head	Nut	M10	4	39	3.9	28	
Cylinder head (exhaust pipe)	Stud bolt	M8	4	15	1.5	11	
Camshaft driven gear	Nut	M14	1	52	5.2	37	
Camshaft drive gear	Bolt	M10	1	30	3.0	22	
Connecting rod	Bolt	M8	4	38.5	3.85	28	
Rocker arm adjusting screw	Nut	M7	4	20	2.0	14	
Front cylinder camshaft end cover	Bolt	M5	2	10	1.0	7.2	
Engine oil drain bolt (crankcase)	–	M14	1	43	4.3	31	
Engine oil drain bolt (oil tank)	–	M14	1	43	4.3	31	
Oil filter cartridge	–	M20	1	17	1.7	12	
Oil filter bolt	–	M20	1	70	7.0	50	
Oil filter bracket	Bolt	M6	4	10	1.0	7.2	
Oil delivery pipe (generator cover-to-crankcase)	Nut	M20	1	40	4.0	29	
Joint bolt	–	M16	1	40	4.0	29	
Oil delivery pipe (cylinder head-to-crankcase)	Union bolt	M10	2	21	2.1	15	
Oil delivery pipe (cylinder head-to-crankcase)	Union bolt	M8	1	18	1.8	13	
Carburetor joint	Bolt	M6	4	12	1.2	8.7	
Carburetor joint clamp	Screw	M4	1	3	0.3	2.2	
Air filter case	Bolt	M6	3	7	0.7	5.1	
Air filter case clamp	Screw	M4	1	3	0.3	2.2	
Exhaust pipe	Nut	M6	4	20	2.0	14	
Muffler	Bolt	M10	2	25	2.5	18	
Muffler clamp	Bolt	M10	2	30	3.0	22	
Crankcase (cylinder head)	Stud bolt	M12	8	–	–	–	*1
Crankcase (cylinder head)	Stud bolt	M10	4	–	–	–	*1
Crankcase (transfer gear case)	Stud bolt	M8	1	13	1.3	9.4	*2
Pickup coil	Screw	M6	2	7	0.7	5.1	
Pickup coil lead holder	Screw	M6	7	7	0.7	5.1	
Stator coil assembly	Screw	M6	3	7	0.7	5.1	
Stator coil assembly lead holder	Bolt	M6	1	7	0.7	5.1	
Starter clutch	Bolt	M8	6	24	2.4	17	

TIGHTENING TORQUES

SPEC



Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kgf	ft·lb	
Generator rotor	Bolt	M12	1	160	16.0	115	
Generator shaft	Bolt	M8	1	28	2.8	20	
Pickup coil rotor	Bolt	M12	1	115	11.5	85	
Baffle plate	Bolt	M6	4	10	1.0	7.2	
Clutch boss	Nut	M20	1	70	7.0	50	Use a lock washer.
Clutch spring plate	Bolt	M6	6	8	0.8	5.8	
Pull lever	Bolt	M6	1	10	1.0	7.2	
Transfer gear oil drain bolt	–	M8	1	18	1.8	13	
Middle drive gear	Nut	M22	1	85	8.5	61	Use a lock washer.
Transfer gear case	Bolt	M8	4	30	3.0	22	
Transfer gear case	Nut	M8	1	30	3.0	22	
Transfer gear oil checking bolt	–	M6	1	8	0.8	5.8	
Transfer gear oil pump cover	Screw	M6	2	7	0.7	5.1	
Transfer gear oil pump	Bolt	M6	5	10	1.0	7.2	
Drive pulley case	Bolt	M8	7	30	3.0	22	
Drive pulley	Nut	M22	1	85	8.5	61	Use a lock washer.
Drive pulley cover bracket	Bolt	M8	2	30	3.0	22	
Shift arm	Bolt	M6	1	10	1.0	7.2	
Shift rod locknut	–	M8	2	12	1.2	8.7	
Shift shaft spring stopper	Bolt	M8	1	22	2.2	16	
Stopper lever	Bolt	M6	1	10	1.0	7.2	
Neutral switch	Screw	M6	2	7	0.7	5.1	

2

NOTE:

- *1: When installing the crankcase stud bolts (cylinder head), make sure that their installed length is 140.5 ~ 142.5 mm (5.53 ~ 5.61 in).
- *2: When installing the crankcase stud bolts (transfer gear case), make sure that their installed length is 68.3 ~ 70.3 mm (2.69 ~ 2.77 in).



CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening torque			Remarks
		Nm	m·kgf	ft·lb	
Upper bracket and inner tube	M6	10	1.0	7.2	See NOTE.
Upper bracket and steering shaft	M22	130	13.0	94	
Handlebar holder (lower) and handlebar holder (upper)	M8	23	2.3	17	
Ring nut (steering shaft)	M25	3	0.3	2.2	
Brake hose joint and lower bracket	M6	7	0.7	5.1	
Front brake master cylinder cap	M4	2	0.2	1.4	
Handlebar holder (lower)	M12	40	4.0	29	
Front brake master cylinder	M6	10	1.0	7.2	
Union bolt (brake hose)	M10	30	3.0	22	
Engine mounting:					
Mounting bolt (cylinder head and engine stay)	M10	48	4.8	35	
Mounting bolt (crankcase and engine stay)	M12	88	8.8	64	
Mounting bolt (crankcase and frame)	M12	88	8.8	64	
Engine stay and frame	M10	48	4.8	35	
Transfer gear case stay and frame	M8	30	3.0	22	
Muffler stay and frame	M8	26	2.6	19	
Muffler stay and muffler	M10	30	3.0	22	
Ignition coil	M6	7	0.7	5.1	
Swingarm pivot shaft	M18	125	12.5	90	
Relay arm and swingarm	M12	59	5.9	43	
Relay arm and connecting rod	M12	59	5.9	43	
Relay arm and rear shock absorber	M10	40	4.0	29	
Rear shock absorber, connecting rod and frame	M12	59	5.9	43	
Drive belt case (upper) and swingarm	M6	10	1.0	7.2	
Drive belt case (lower) and swingarm	M6	7	0.7	5.1	
Mud guard and swingarm	M6	7	0.7	5.1	
Fuel petcock and fuel tank	M6	7	0.7	5.1	
Fuel sender and fuel tank	M6	7	0.7	5.1	
Fuel tank (rear) and frame	M6	7	0.7	5.1	
Meter cover and fuel tank	M6	7	0.7	5.1	
Side cover and frame	M6	7	0.7	5.1	
Starter relay and battery positive lead	M6	7	0.7	5.1	
Starter relay and starter motor lead	M6	7	0.7	5.1	
Rear fender side mold and rear fender stay	M8	30	3.0	22	
Sidestand bolt and nut	M10	48	4.8	35	
Footrest bracket and frame	M10	48	4.8	35	
Rear footrest and frame	M8	23	2.3	17	

TIGHTENING TORQUES

SPEC



Item	Thread size	Tightening torque			Remarks
		Nm	m·kgf	ft·lb	
Rear master cylinder and rear brake bracket	M8	23	2.3	17	
Rear brake reservoir tank	M6	4	0.4	2.9	
Union bolt (rear brake hose)	M10	30	3.0	22	
Footrest bracket and rear brake bracket	M8	16	1.6	11	
Footrest bracket and shift rod bracket	M8	16	1.6	11	
Front wheel axle	M18	78	7.8	56	
Front wheel axle pinch bolt	M8	19	1.9	13	
Rear wheel axle nut	M18	150	15.0	110	
Front brake caliper	M10	40	4.0	29	
Rear brake caliper	M10	40	4.0	29	
Brake disc and wheel	M8	23	2.3	17	
Caliper bleed screw	M8	6	0.6	4.3	
Driven pulley and rear wheel clutch hub	M12	95	9.5	68	
Rear brake caliper bracket and swingarm	M10	48	4.8	35	

NOTE:

1. First, tighten the ring nut to approximately 52 Nm (5.2 m · kg, 37 ft · lb) with a torque wrench, then loosen the ring nut completely.
2. Retighten the ring nut to specification.

2



LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Connecting rod bolts and nuts	
Connecting rod small end and big end	
Crankshaft pins	
Crankshaft journals	
Piston surfaces	
Piston pins	
Camshaft cam lobes and camshaft journals	
Valve push rods	
Valve push rod end balls	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Valve lifters	
Oil pump rotors (inner and outer) and oil pump housing	
Oil strainer	
Starter clutch idle gear inner surface	
Starter clutch idle gear shaft	
Starter clutch roller and starter clutch gear outer surface	
Clutch pull rod	
Pressure plate bearing	
Transmission gears (wheel and pinion)	
Shift drum	
Shift forks and shift fork guide bars	
Shift shaft	
Shift pedal	
Shift lever joint	
Crankcase mating surface	Sealant (Quick Gasket®)
Stator coil lead grommet	Sealant (Quick Gasket®)
Pickup coil lead grommet	Sealant (Quick Gasket®)

2



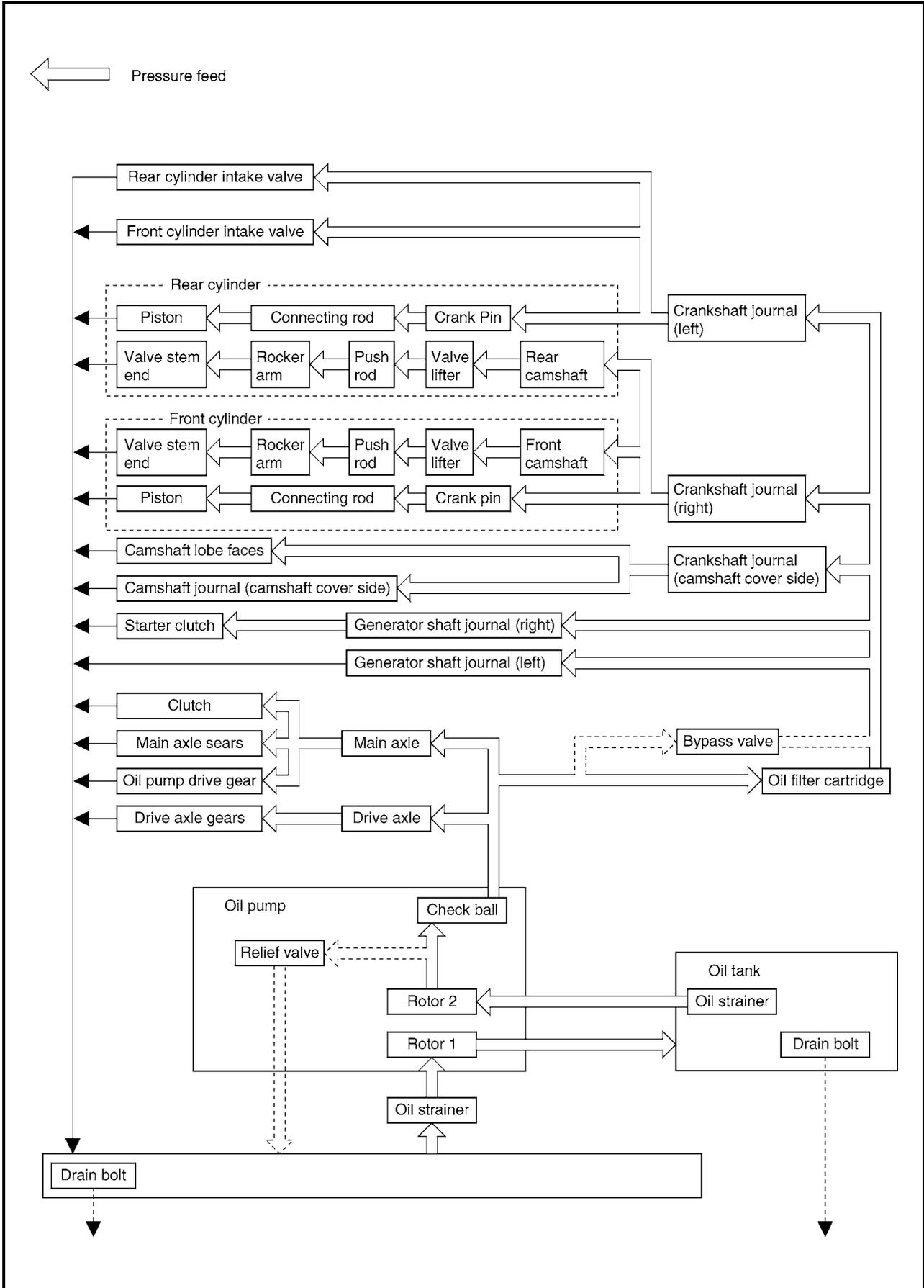
CHASSIS LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	
Steering bearing cover	
Steering head pipe lower oil seal	
Front wheel oil seal (right and left)	
Rear wheel oil seal	
Rear wheel drive hub mating surface	
Rear brake pedal shaft	
Shift pedal	
Front footrest pivot	
Sidestand sliding surface	
Tube guide (throttle grip) inner surface	
Brake lever pivot bolt, contact surface	
Clutch lever pivot bolt, contact surface	
Swingarm pivot shaft	
Swingarm pivot bearing	
Swingarm pivot oil seal	
Relay arm bearing (inner)	
Rear shock absorber bearing (inner)	
Connecting rod bearing (inner)	



ENGINE OIL LUBRICATION CHART

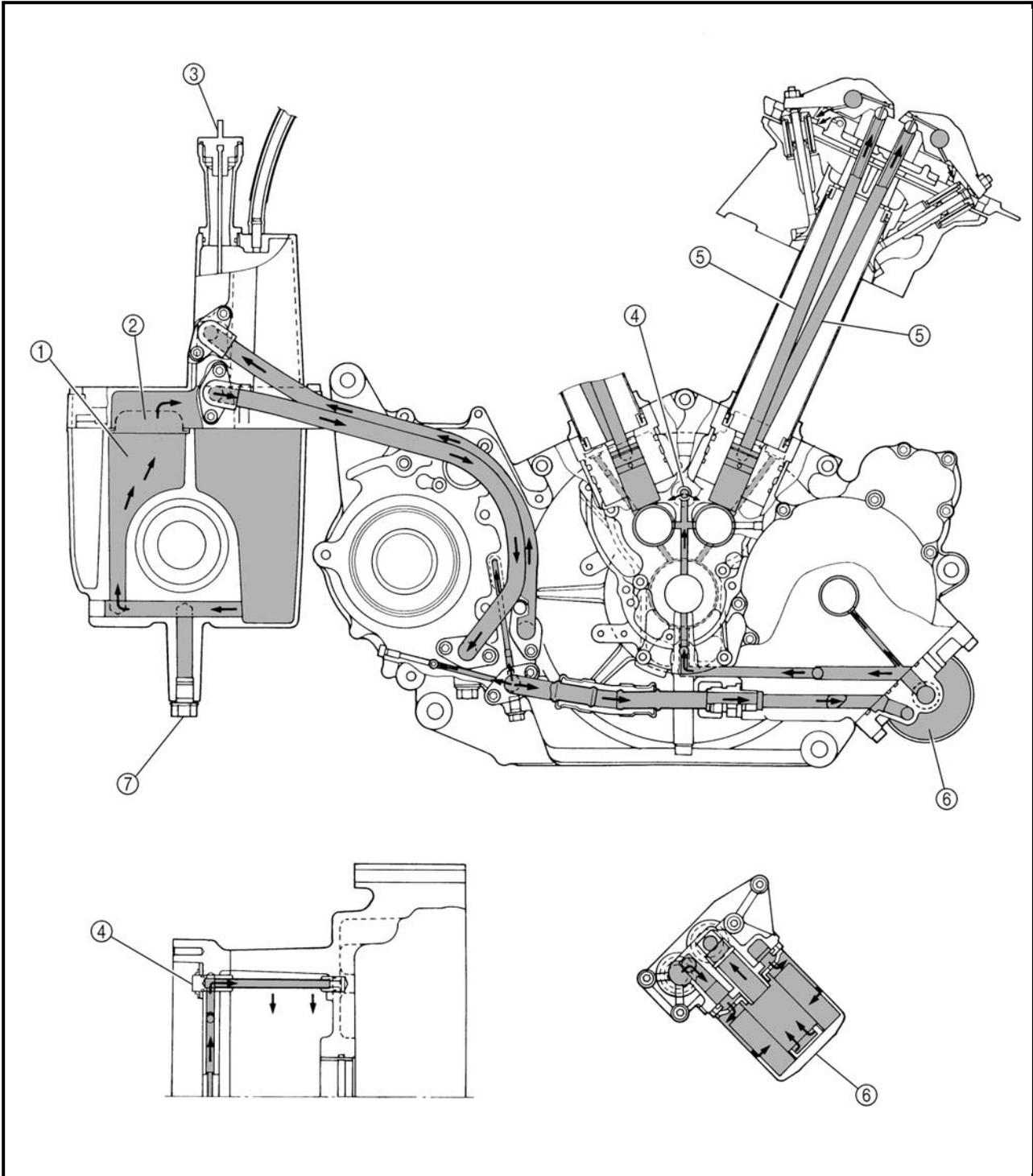
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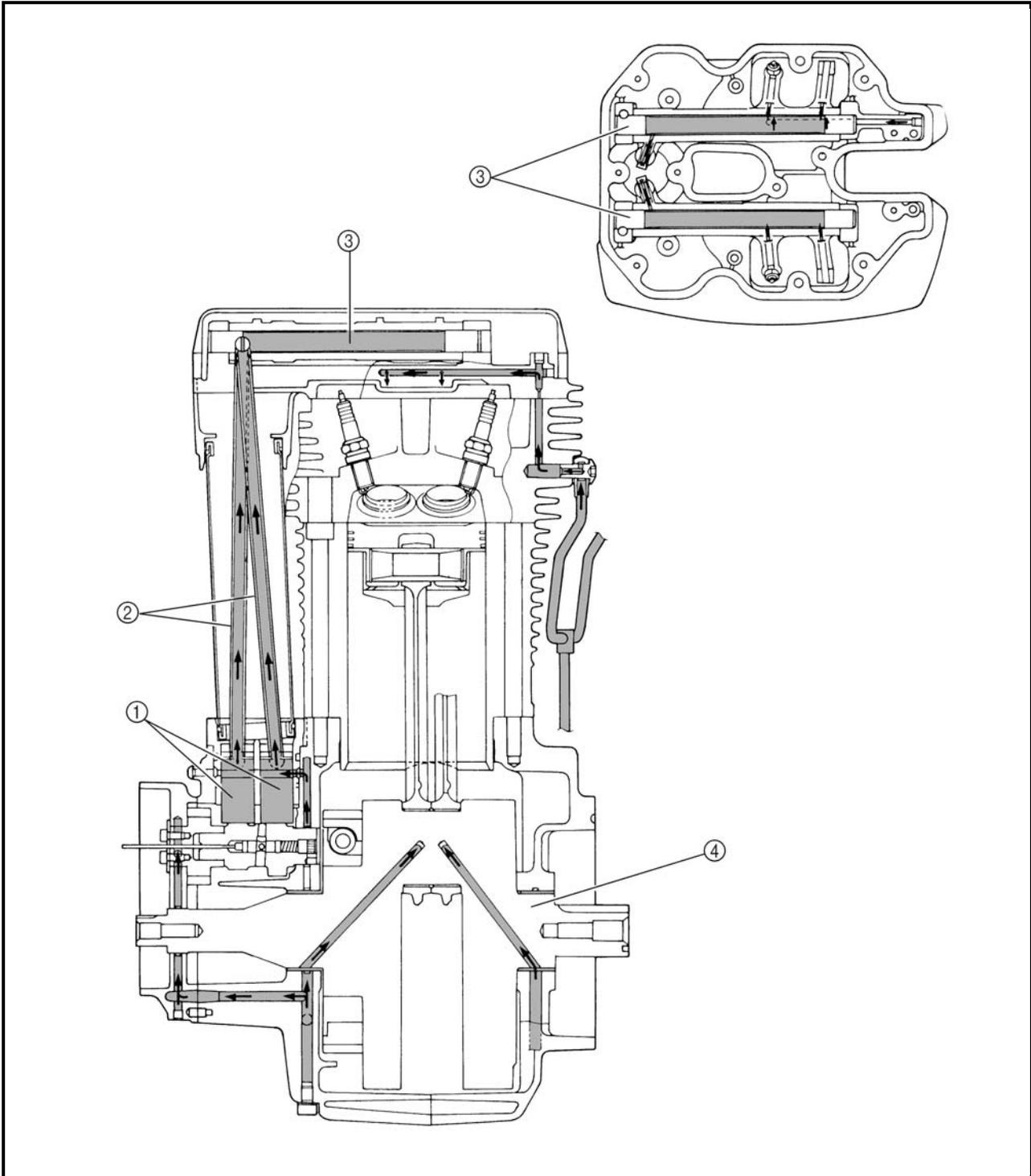
ENGINE OIL FLOW DIAGRAMS

- ① Oil tank
- ② Oil strainer
- ③ Dipstick
- ④ Oil delivery pipe
- ⑤ Push rod
- ⑥ Oil filter cartridge
- ⑦ Engine oil drain bolt (oil tank)



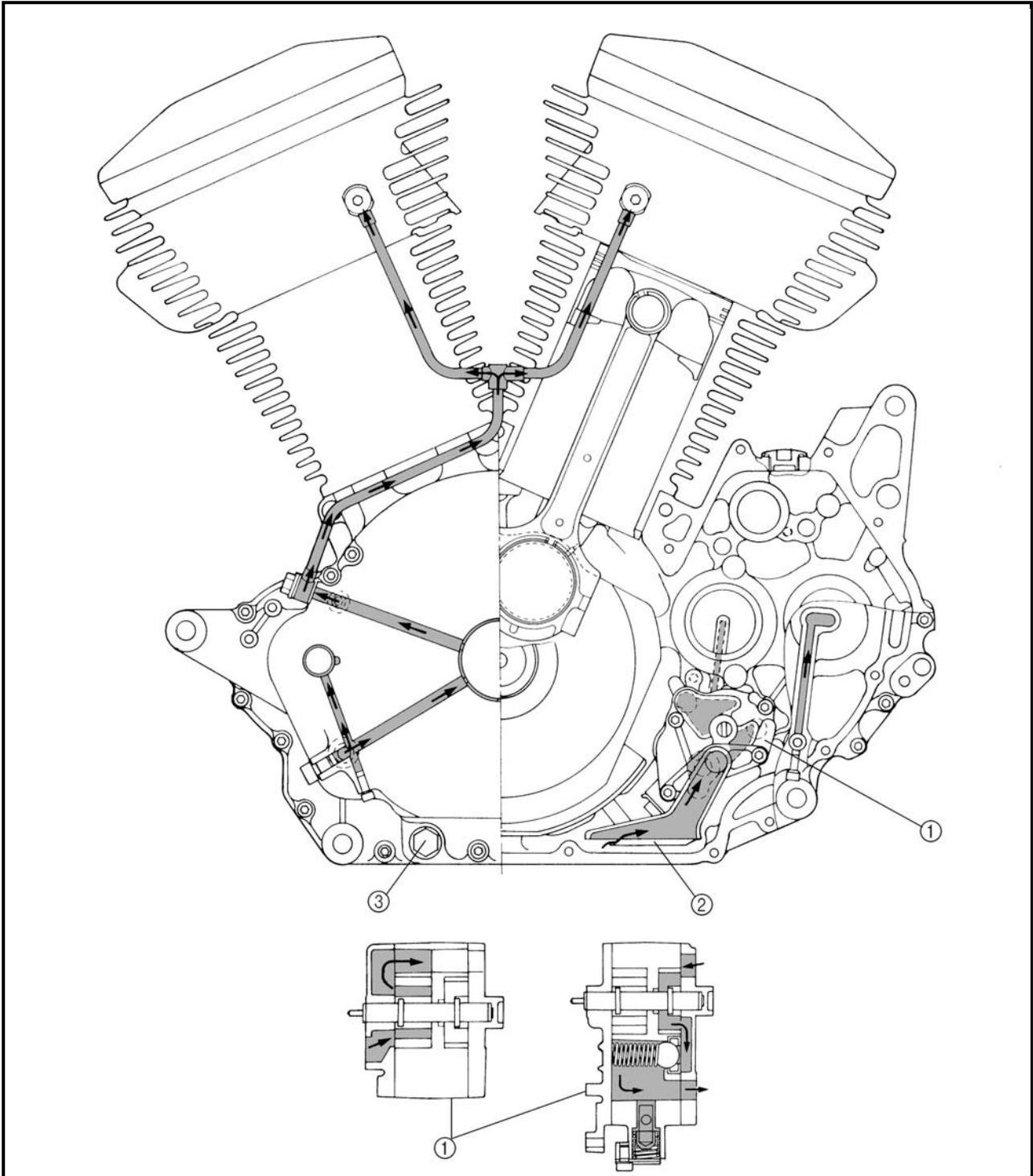


- ① Valve lifter
- ② Push rod
- ③ Rocker arm shaft
- ④ Crankshaft





- ① Engine oil pump
- ② Oil strainer
- ③ Engine oil drain bolt (engine)

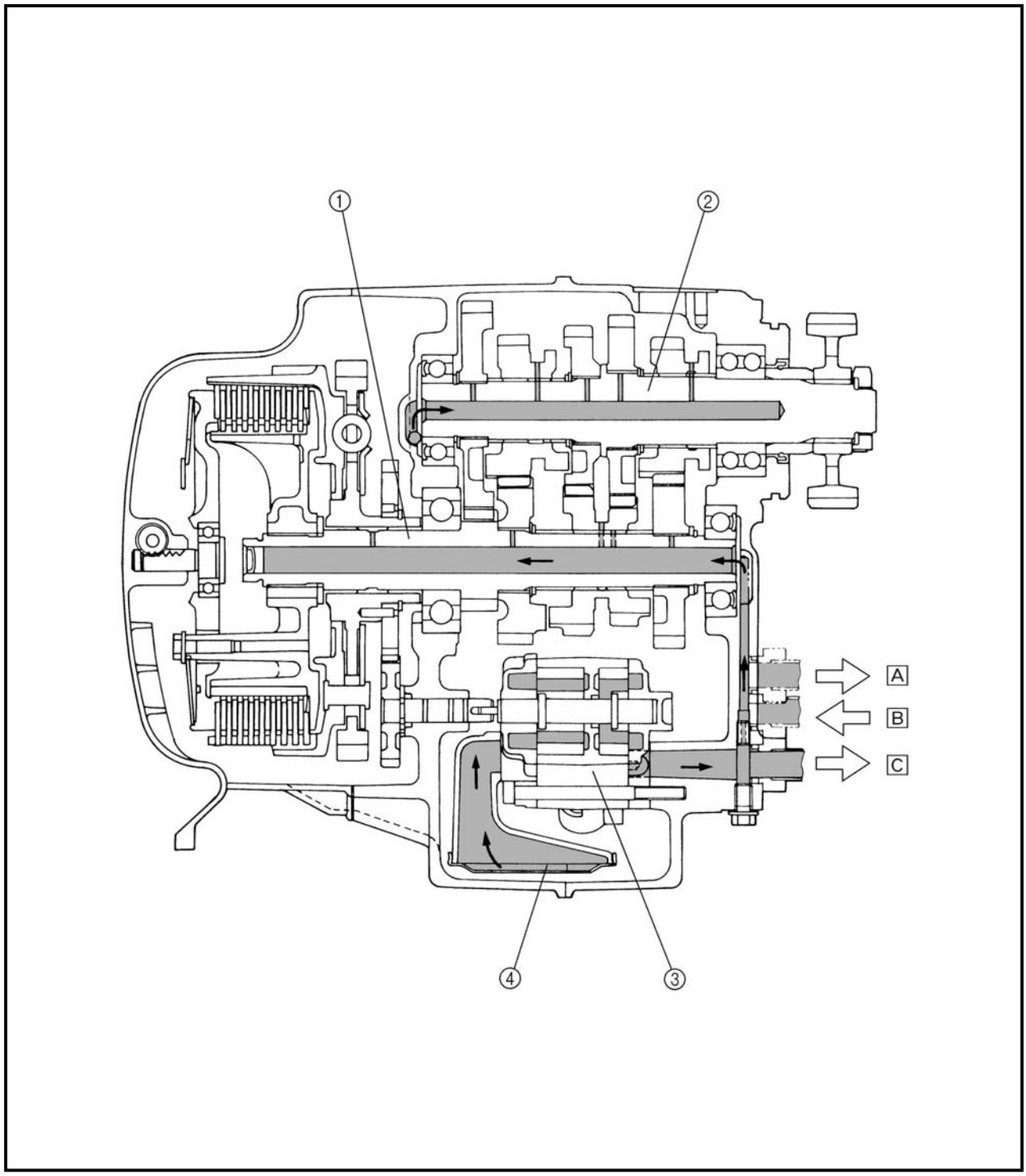




- ① Main axle
- ② Drive axle
- ③ Engine oil pump
- ④ Oil strainer

- A To oil tank
- B From oil tank
- C To oil filter cartridge

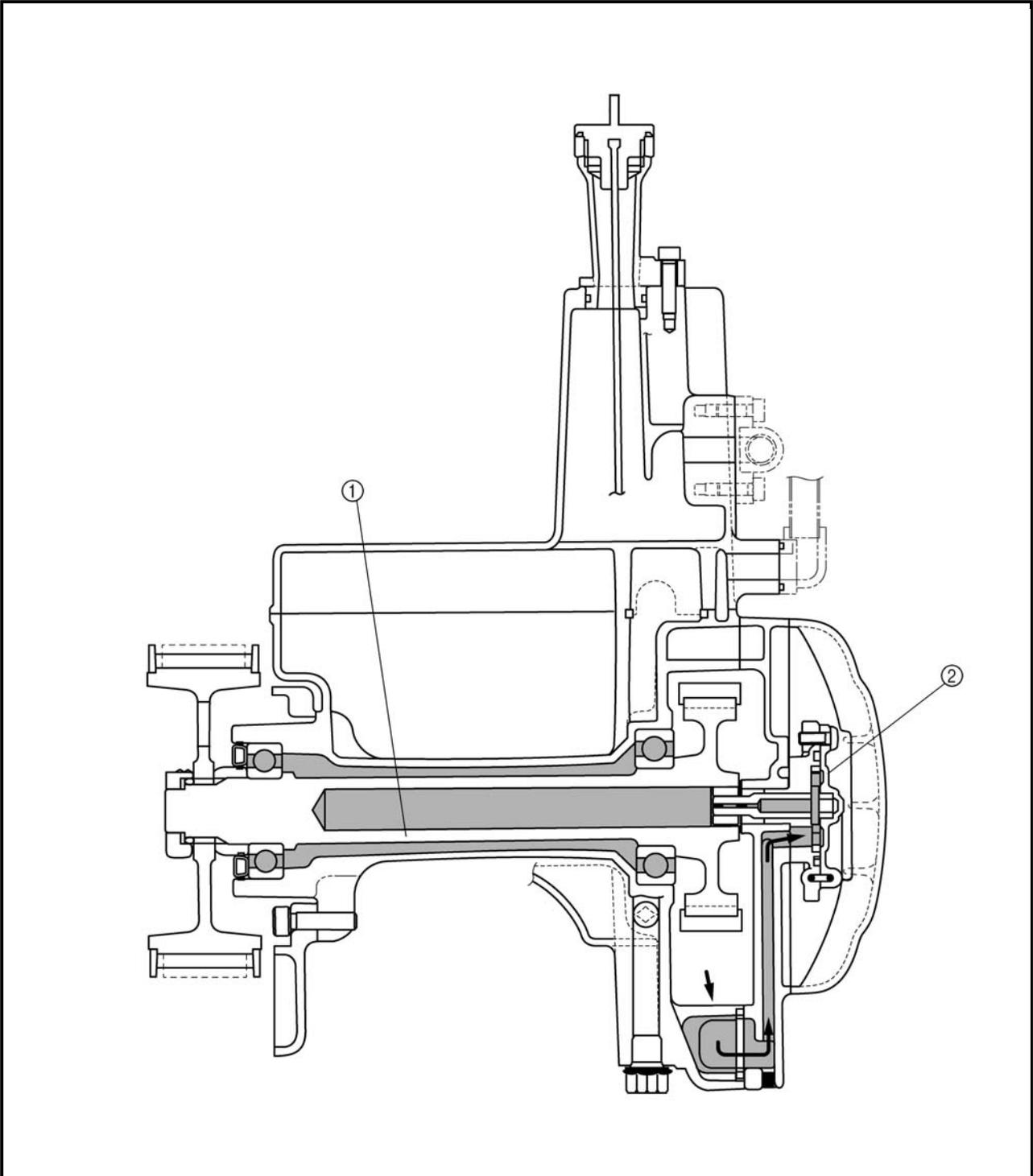
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TRANSFER GEAR OIL FLOW DIAGRAMS

- ① Middle driven shaft
- ② Transfer gear oil pump

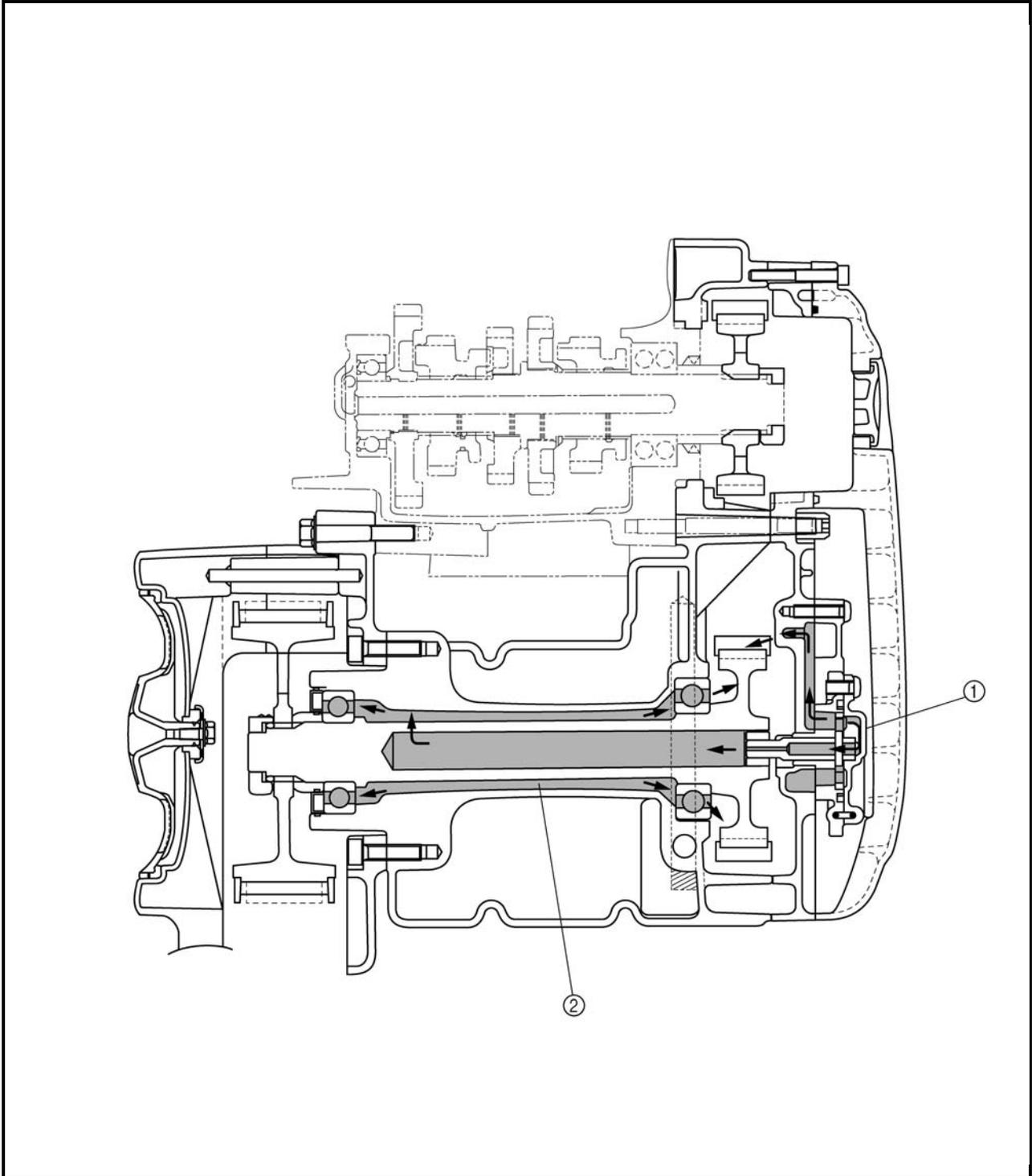


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- ① Transfer gear oil pump
- ② Middle driven shaft

2



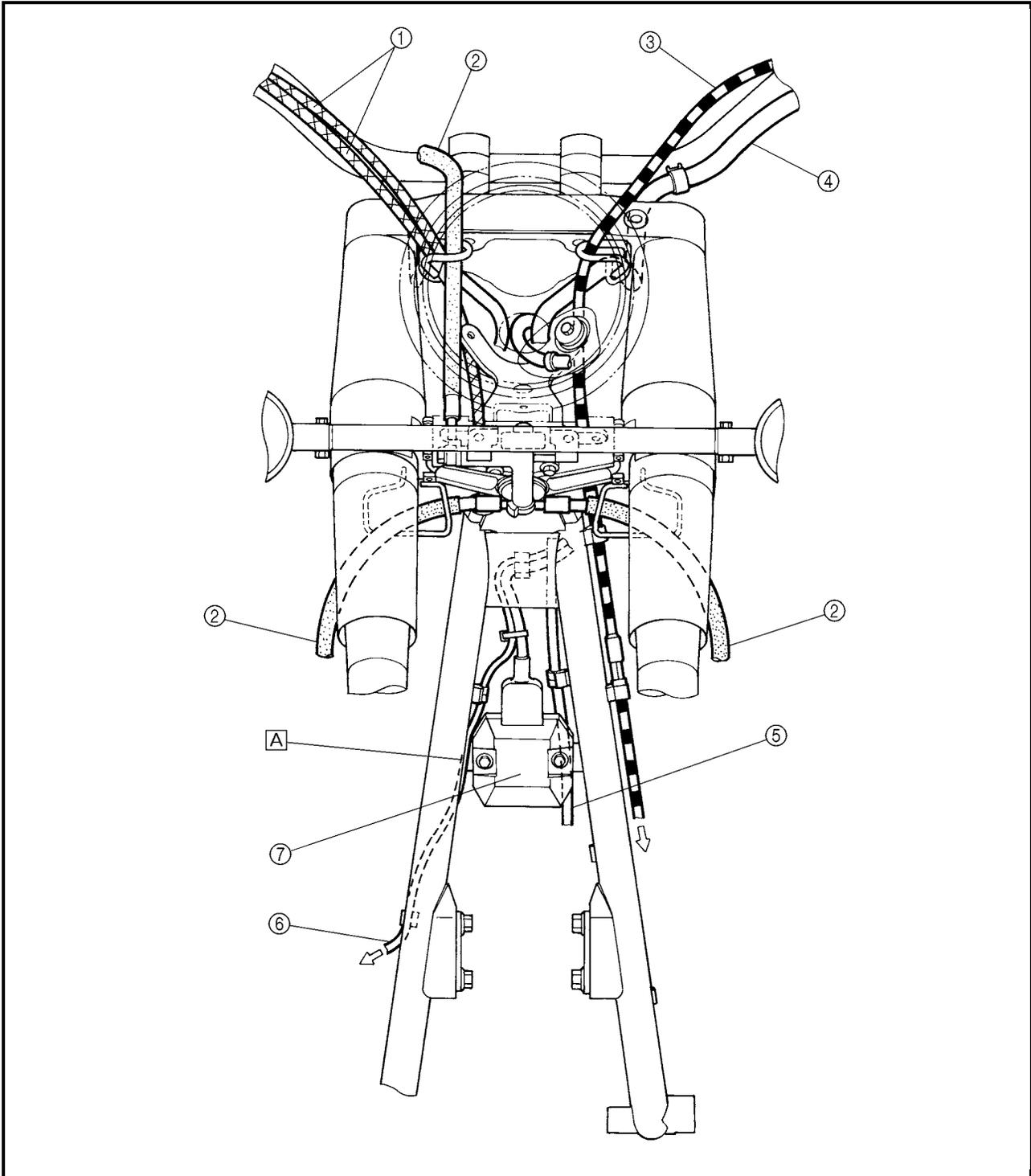


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CABLE ROUTING

- ① Throttle cables
- ② Brake hose
- ③ Clutch cable
- ④ Left handlebar switch lead
- ⑤ Vacuum hose (air induction system)
- ⑥ Rear brake light switch lead
- ⑦ Rectifier/regulator

A Route the rear brake light switch lead in front of the rectifier/regulator bracket on the frame.

**2**

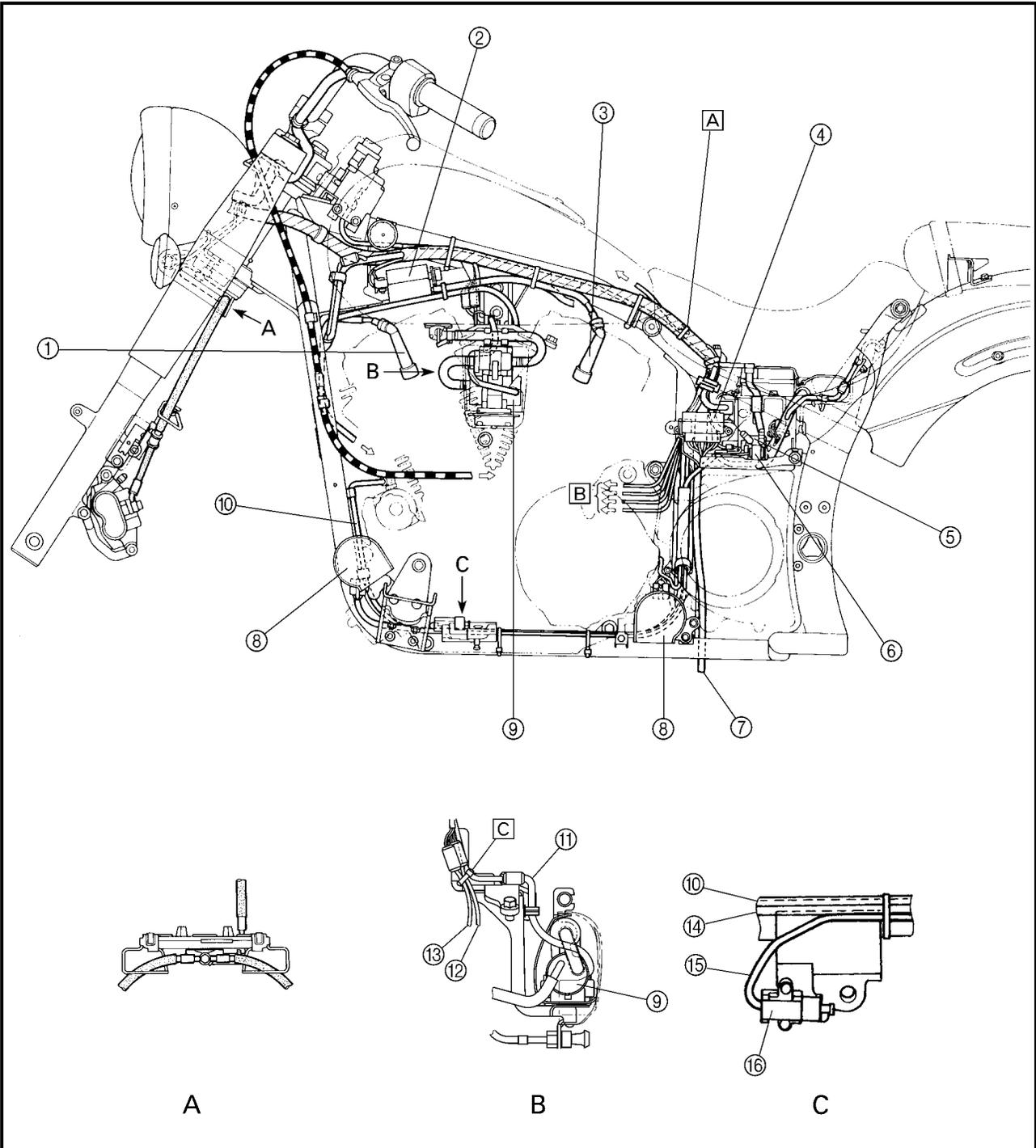


- ① Spark plug cap #3
- ② Ignition coil (rear cylinder)
- ③ Spark plug cap #1
- ④ Fuse box
- ⑤ Starter relay
- ⑥ Thermo switch
- ⑦ Fuel tank breather hose
- ⑧ Horns
- ⑨ Fuel pump
- ⑩ Starter motor lead
- ⑪ Fuel pump lead

- ⑫ Carburetor heater lead
- ⑬ Throttle position sensor lead
- ⑭ Horn lead
- ⑮ Sidestand switch lead
- ⑯ Sidestand switch

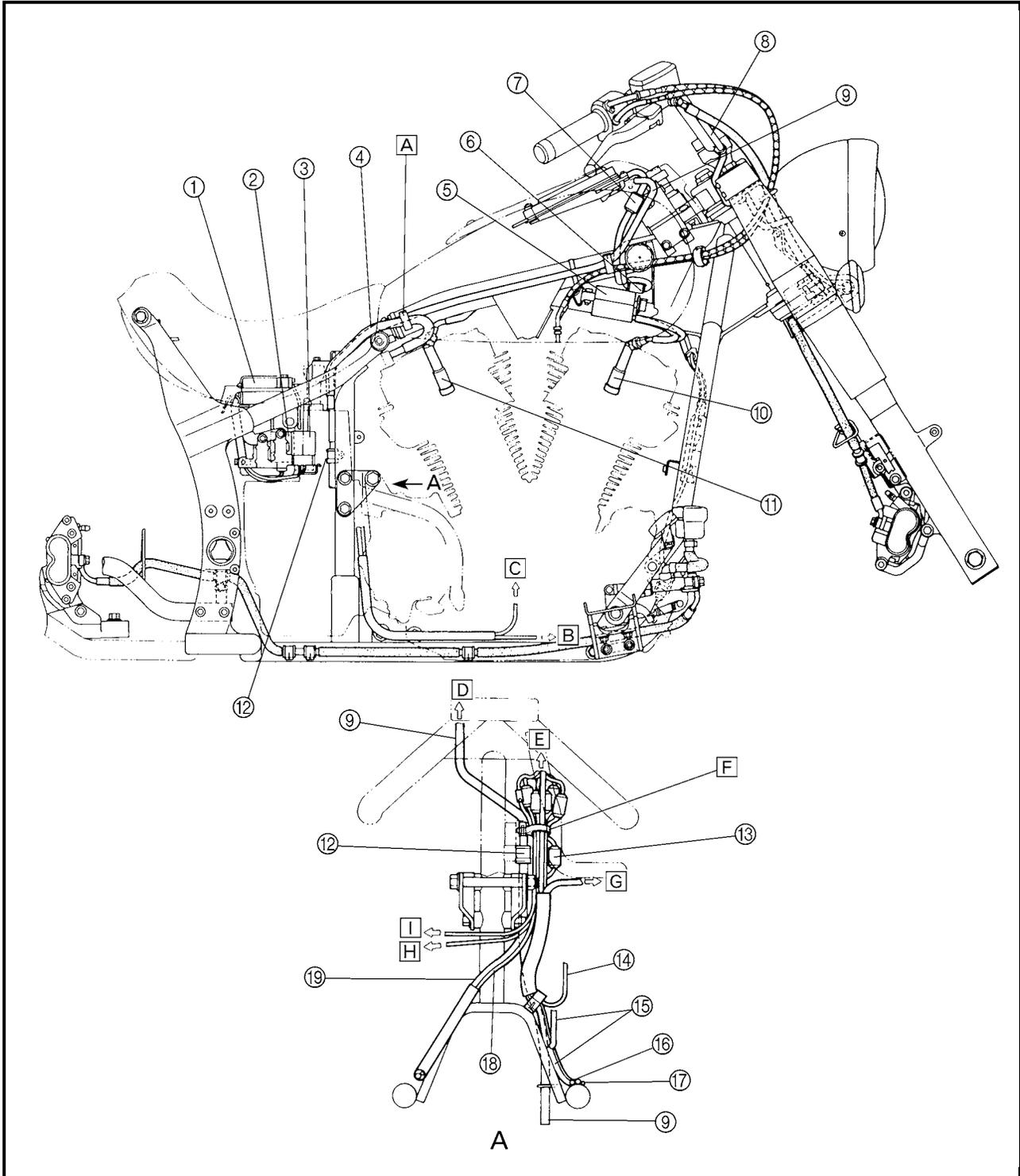
- [A] Fasten the wire harness, fuel sender lead (wire harness side) and seat lock cable with a plastic locking tie.
- [B] To the speed sensor, neutral switch, stator coil and decompression solenoid.
- [C] Fasten the throttle position sensor lead, carburetor heater lead and fuel pump lead with a plastic locking tie to the engine bracket.

2





- ① Battery
- ② Turn signal relay
- ③ Relay unit
- ④ Oil tank breather hose
- ⑤ Ignition coil (front cylinder)
- ⑥ Main switch coupler
- ⑦ Meter assembly couplers
- ⑧ Right handlebar switch lead
- ⑨ Fuel tank breather hose
- ⑩ Spark plug cap #4
- ⑪ Spark plug cap #2
- ⑫ Sidestand switch coupler
- ⑬ Pickup coil lead
- ⑭ Horn leads
- ⑮ Starter motor lead
- ⑯ Sidestand switch lead
- ⑰ Decompression solenoid lead
- ⑱ Stator coil lead
- ⑲ Rollover valve

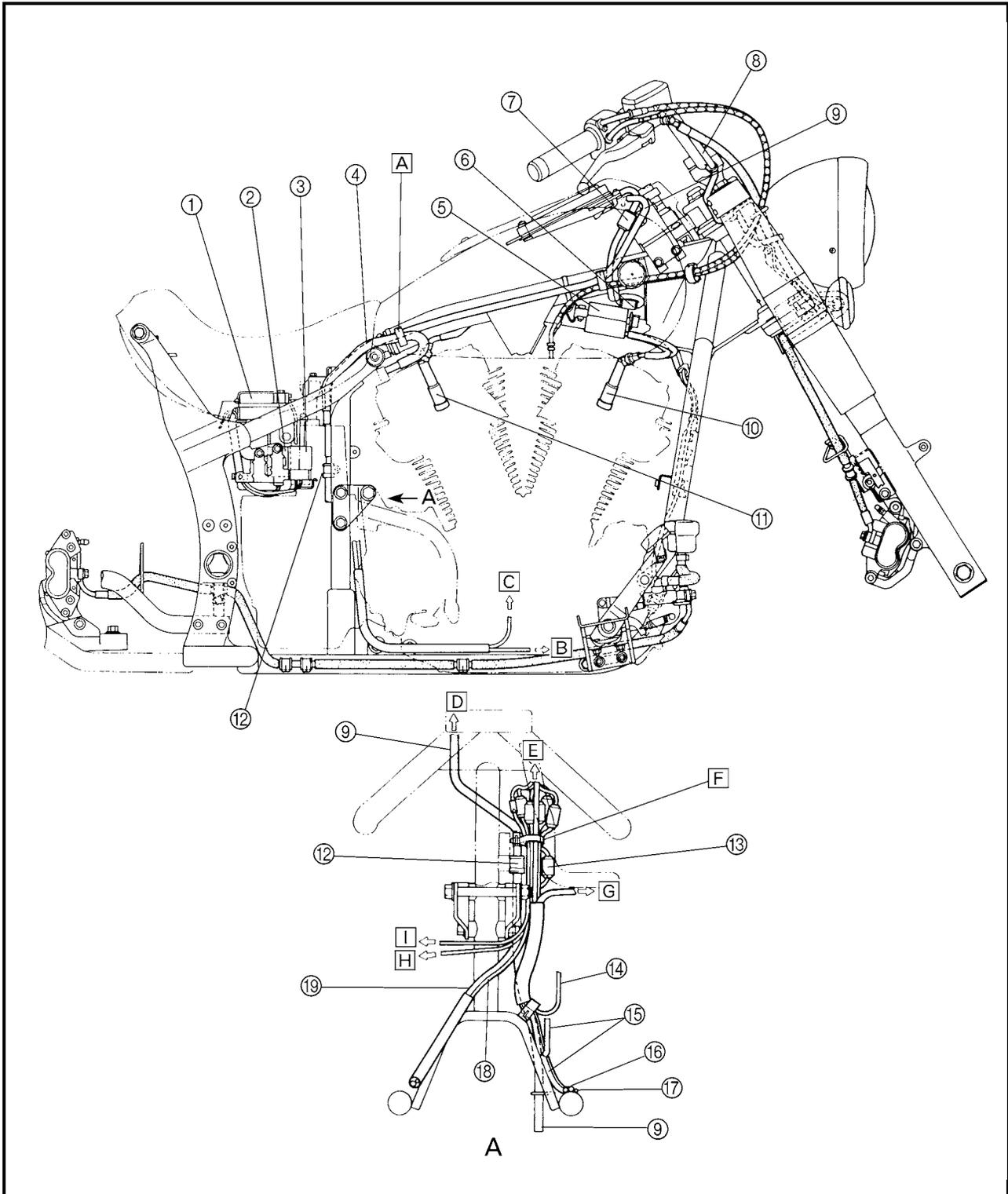




- A Fasten the fuel tank breather and oil tank breather hose with a plastic clamp and then insert the clamp into the frame.
- B To the stator coil.
- C To the decompression solenoid.
- D To the fuel tank.
- E To the wire harness.

- F Fasten the starter motor lead, stator coil lead, decompression solenoid lead, pickup coil lead speed sensor lead and neutral switch lead with a plastic clamp and then insert the clamp into the frame.
- G To the starter relay.
- H To the decompression solenoid.
- I To the speed sensor.

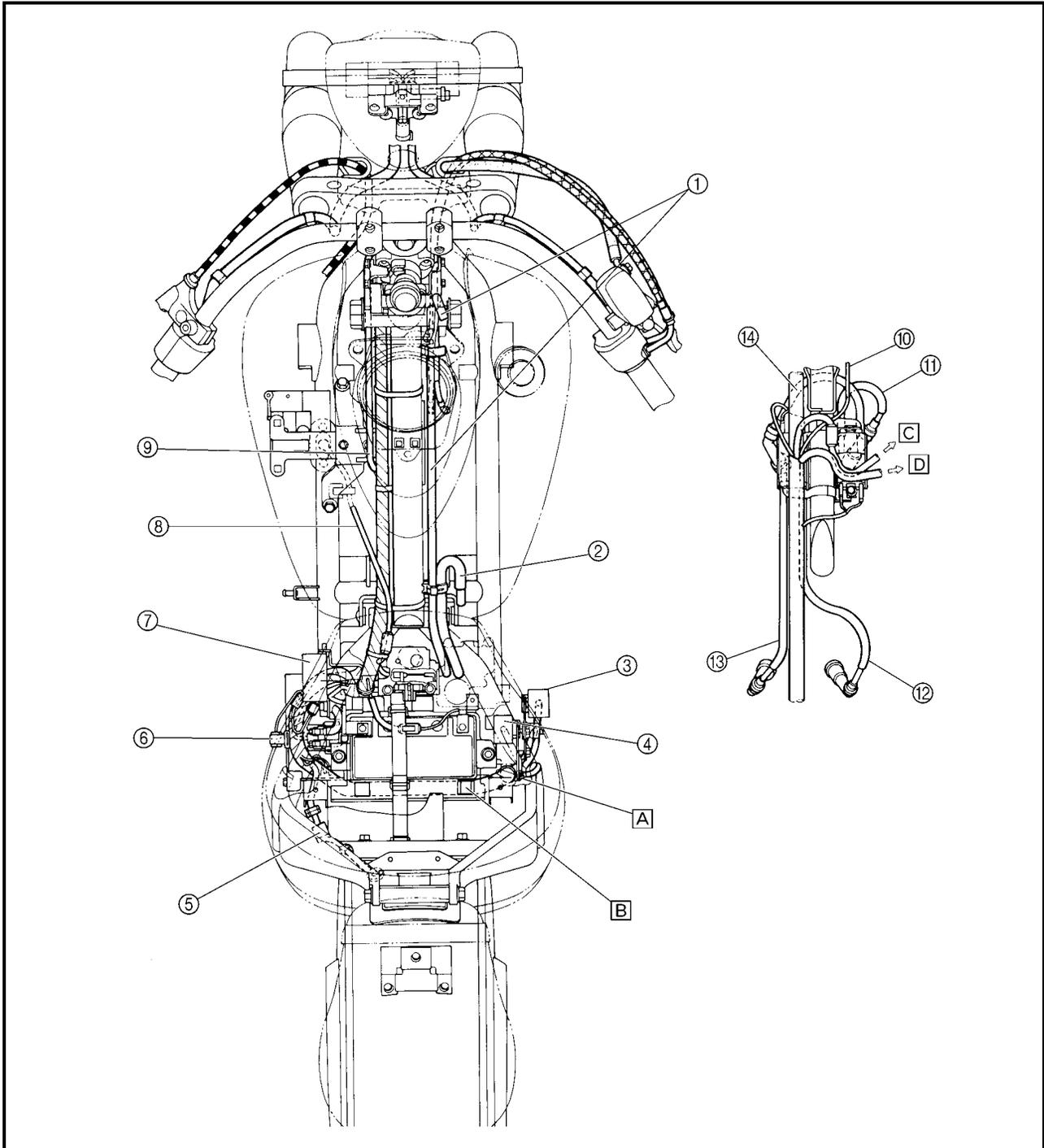
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- ① Fuel tank breather hose
- ② Oil tank breather hose
- ③ Relay unit
- ④ Turn signal relay
- ⑤ Tail/brake light and rear turn signal light sub-wire harness coupler
- ⑥ Thermo switch
- ⑦ Fuse box
- ⑧ Fuel sender lead
- ⑨ Vacuum hose (air induction system)
- ⑩ Solenoid valve lead (California only)
- ⑪ Spark plug lead #4

- ⑫ Spark plug lead #2
- ⑬ Spark plug lead #1
- ⑭ Spark plug lead #3
- A Fasten the wire harness with a plastic clamp and then insert the clamp into the relay bracket.
- B Position the white tape on the wire harness with the hole on battery box, as shown.
- C To the main switch.
- D To the meter assembly.

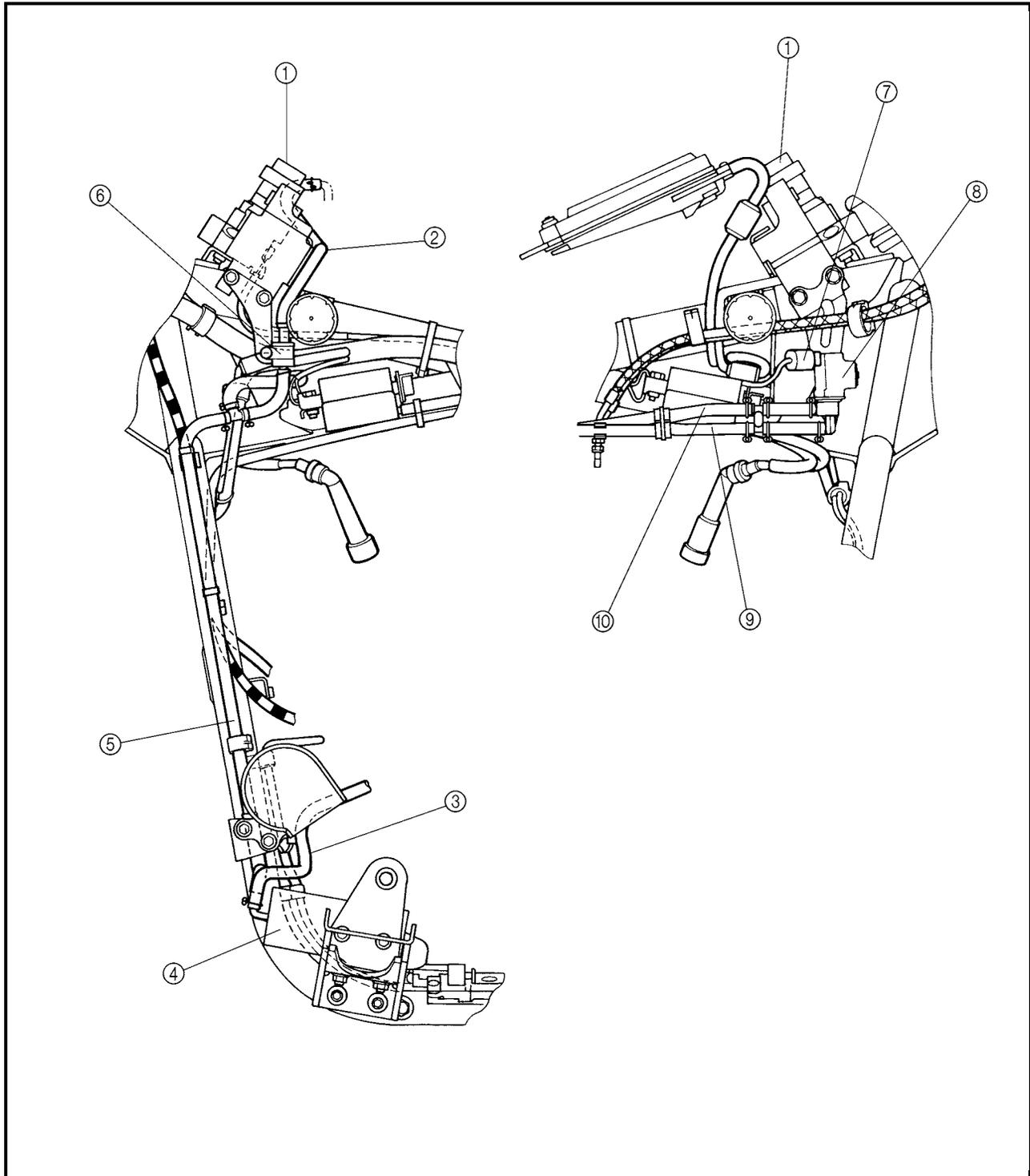




Evaporative emission control system (California only)

- ① Main switch
- ② Fuel tank breather hose
- ③ Charcoal canister to carburetor hose
- ④ Charcoal canister
- ⑤ Charcoal canister to rollover valve hose
- ⑥ Rollover valve
- ⑦ Solenoid valve coupler
- ⑧ Solenoid valve
- ⑨ Solenoid valve to air filter case hose
- ⑩ Solenoid valve to carburetor hose

2



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