TROUBLESHOOTING

FI SYSTEM MALFUNCTION CODE AND DEFECTIVE CONDITION

(☞4-27 to -29)

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start	**Compression too low**	
	1. Valve clearance out of adjustment	Adjust.
	2. Worn valve guides or poor seating of valves	Repair or replace.
	3. Mistiming valves	Adjust.
	4. Excessively worn piston rings	Replace.
	5. Worn-down cylinder bores	Replace.
	6. Too slowly starter motor cranks	See electrical section.
	7. Poor seating of spark plugs	Retighten.
	Plug not sparking	
	1. Fouled spark plugs	Clean.
	2. Wet spark plugs	Clean and dry.
	3. Defective ignition coils	Replace.
	4. Defective CKP sensor	Replace.
	5. Defective ECM	Replace.
	6. Open-circuited wiring connections	Repair or replace.
	7. Open or short in high-tension cords	Replace.
	No fuel reaching the intake manifold	
	1. Clogged fuel filter or fuel hose	Clean or replace.
	2. Defective fuel pump	Replace.
	3. Defective fuel pressure regulator	Replace.
	4. Defective fuel injector	Replace.
	5. Defective fuel pump relay	Replace.
	6. Defective ECM	Replace.
	7. Open-circuited wiring connections	Check and repair.
	Incorrect fuel/air mixture	
	1. TP sensor out of adjustment	Adjust.
	2. Defective fuel pump	Replace.
	3. Defective fuel pressure regulator	Replace.
	4. Defective TP sensor	Replace.
	5. Defective CKP sensor	Replace.
	6. Defective IAP sensor	Replace.
	7. Defective ECM	Replace.
	8. Defective ECT sensor	Replace.
	9. Defective IAT sensor	Replace.
	10. Clogged ISC valve air passage way	Repair or replace.

Complaint	Symptom and possible causes	Remedy
Engine idles poorly	1. Valve clearance out of adjustment	Adjust.
	2. Poor seating of valves	Replace or repair.
	3. Defective valve guides	Replace.
	4. Worn down camshaft	Replace.
	5. Too wide spark plug gaps	Adjust or replace.
	6. Defective ignition coils	Replace.
	7. Defective CKP sensor	Replace.
	8. Defective ECM	Replace.
	9. Defective TP sensor	Replace.
	10. Defective fuel pump	Replace.
	11. Imbalanced throttle valve	Adjust.
	12. Damaged or cracked vacuum hose	Replace.
	13. Damaged or clogged ISC valve	Replace or repair.
	14. ISC bad learning	Reset learned value.
Engine stalls often	**Incorrect fuel/air mixture**	
	1. Defective IAP sensor or circuit	Repair or replace.
	2. Clogged fuel filter	Clean or replace.
	3. Defective fuel pump	Replace.
	4. Defective fuel pressure regulator	Replace.
	5. Defective ECT sensor	Replace.
	6. Defective thermostat	Replace.
	7. Defective IAT sensor	Replace.
	8. Damaged or cracked vacuum hose	Replace.
	9. Damaged or clogged ISC valve	Replace or repair.
	Fuel injector improperly operating	
	1. Defective fuel injectors	Replace.
	2. No injection signal from ECM	Repair or replace.
	3. Open or short circuited wiring connection	Repair or replace.
	4. Defective battery or low battery voltage	Replace or recharge.
	Control circuit or sensor improperly operating	
	1. Defective ECM	Replace.
	2. Defective fuel pressure regulator	Replace.
	3. Defective TP sensor	Replace.
	4. Defective IAT sensor	Replace.
	5. Defective CKP sensor	Replace.
	6. Defective ECT sensor	Replace.
	7. Defective fuel pump relay	Replace.
	8. Defective ISC valve	Replace.
	9. ISC bad learning	Reset learned value.
	Engine internal parts improperly operating	
	1. Fouled spark plugs	Clean.
	2. Defective CKP sensor or ECM	Replace.
	3. Clogged fuel hose	Clean.
	4. Out of adjustment valve clearance	Adjust.

Complaint	Symptom and possible causes	Remedy
Noisy engine	**Excessive valve chatter**	
	1. Too large valve clearance	Adjust.
	2. Weakened or broken valve springs	Replace.
	3. Worn rocker arm or cam surface	Replace.
	4. Worn and burnt camshaft journal	Replace.
	Noise seems to come from piston	
	1. Worn down pistons or cylinders	Replace.
	2. Carbon combustion chambers fouled with carbon	Clean.
	3. Worn piston pins or piston pin bore	Replace.
	4. Worn piston rings or ring grooves	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain	Replace.
	2. Worn sprockets	Replace.
	3. Tension adjuster not working	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub	Replace.
	2. Worn teeth of clutch plates	Replace.
	3. Distorted clutch plates, driven and drive	Replace.
	4. Worn clutch release bearing	Replace.
	Noise seems to come from crankshaft	
	1. Rattling bearings due to wear	Replace.
	2. Worn and burnt big-end bearings	Replace.
	3. Worn and burnt journal bearings	Replace.
	4. Too large thrust clearance	Replace thrust bearing.
	Noise seems to come from balancer	
	1. Worn and burnt journal bearings	Replace.
	Noise seems to come from transmission	
	1. Worn or rubbing gears	Replace.
	2. Worn splines	Replace.
	3. Worn or rubbing primary gears	Replace.
	4. Worn bearings	Replace.
	Noise seems to come from water pump	
	1. Too much play on pump shaft	Replace.
	2. Worn or damaged impeller shaft	Replace.
	3. Worn or damaged mechanical seal	Replace.
	4. Contact between pump case and impeller	Replace.

Complaint	Symptom and possible causes	Remedy
Engine runs poorly in high speed range	**Defective engine internal/electrical parts**	
	1. Weakened valve springs	Replace.
	2. Worn camshaft	Replace.
	3. Valve timing out of adjustment	Adjust.
	4. Too narrow spark plug gaps	Adjust.
	5. Ignition not advanced sufficiently due to poorly working timing advance circuit	Replace ECM.
	6. Defective ignition coils	Replace.
	7. Defective CKP sensor	Replace.
	8. Defective ECM	Replace.
	9. Clogged air cleaner element	Clean or replace.
	10. Clogged fuel hose, resulting in inadequate fuel supply to injector	Clean and prime.
	11. Defective fuel pump	Replace.
	12. Defective TP sensor	Replace.
	Defective air flow system	
	1. Clogged air cleaner element	Clean or replace.
	2. Defective throttle valve	Adjust or replace.
	3. Sucking air from throttle body joint	Repair or replace.
	4. Defective ECM	Replace.
	5. Imbalanced throttle valve synchronization	Adjust.
	Defective control circuit or sensor	
	1. Low fuel pressure	Repair or replace.
	2. Defective TP sensor	Replace.
	3. Defective IAT sensor	Replace.
	4. Defective CKP sensor	Replace.
	5. Defective GP switch	Replace.
	6. Defective IAP sensor	Replace.
	7. Defective ECM	Replace.
	8. TP sensor out of adjustment	Replace.
	9. Defective ISC valve	Replace.

Complaint	Symptom and possible causes	Remedy
Engine lacks power	**Defective engine internal/electrical parts**	
	1. Loss of valve clearance	Adjust.
	2. Weakened valve springs	Replace.
	3. Valve timing out of adjustment	Adjust.
	4. Worn piston rings or cylinders	Replace.
	5. Poor seating of valves	Repair.
	6. Fouled spark plugs	Clean or replace.
	7. Incorrect spark plugs	Replace.
	8. Clogged fuel injectors	Replace.
	9. TP sensor out of adjustment	Adjust.
	10. Clogged air cleaner element	Clean or replace.
	11. Imbalanced throttle valve synchronization	Adjust.
	12. Sucking air from throttle valve or vacuum hose	Repair or replace.
	13. Too much engine oil	Drain out excess oil.
	14. Defective fuel pump or ECM	Replace.
	15. Defective CKP sensor and ignition coils	Replace.
	Defective control circuit or sensor	
	1. Low fuel pressure	Repair or replace.
	2. Defective TP sensor	Replace.
	3. Defective IAT sensor	Replace.
	4. Defective CKP sensor	Replace.
	5. Defective GP switch	Replace.
	6. Defective IAP sensor	Replace.
	7. Defective ECM	Replace.
	8. TP sensor out of adjustment	Adjust.
	9. Defective ISC valve	Replace.
	10. Imbalanced throttle valve synchronization	Adjust.
Engine overheats	**Defective engine internal parts**	
	1. Heavy carbon deposit on piston crowns	Clean.
	2. Not enough oil in the engine	Add oil.
	3. Defective oil pump or clogged oil circuit	Replace or clean.
	4. Sucking air from intake pipes	Repair or replace.
	5. Use incorrect engine oil	Change.
	6. Defective cooling system	See radiator section.
	Lean fuel/air mixture	
	1. Short-circuited IAP sensor/lead wire	Repair or replace.
	2. Short-circuited IAT sensor/lead wire	Repair or replace.
	3. Sucking air from intake pipe joint	Repair or replace.
	4. Defective fuel injectors	Replace.
	5. Defective ECT sensor	Replace.
	Other factors	
	1. Ignition timing is too advanced due to defective timing advance system (ECT sensor, GP switch, CKP sensor and ECM)	Replace.
	2. Drive chain is too tight	Adjust.
	3. ISC bad learning	Reset learned value.

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke	1. Too much engine oil in the engine	Check with inspection window, drain out excess oil.
	2. Worn piston rings or cylinders	Replace.
	3. Worn valve guides	Replace.
	4. Scored or scuffed cylinder walls	Replace.
	5. Worn valves stems	Replace.
	6. Defective stem oil seal	Replace.
	7. Worn oil ring side rails	Replace.
Slipping clutch	1. Weakened clutch springs	Replace.
	2. Worn or distorted pressure plate	Replace.
	3. Distorted clutch plates	Replace.
	4. Clutch release screw out of adjustment	Adjust.
Dragging clutch	1. Some clutch spring weakened while others are not	Replace.
	2. Distorted pressure plate or clutch plates	Replace.
	3. Clutch release screw out of adjustment	Adjust.
Transmission will not shift	1. Broken gearshift cam	Replace.
	2. Distorted gearshift forks	Replace.
	3. Worn gearshift pawl	Replace.
Transmission will not shift back	1. Broken return spring on shift shaft	Replace.
	2. Rubbing or stickily shift shaft	Repair or replace.
	3. Distorted or worn gearshift forks	Replace.
Transmission jumps out of gear	1. Worn shifting gears on driveshaft or countershaft	Replace.
	2. Distorted or worn gearshift forks	Replace.
	3. Weakened stopper spring on gearshift stopper	Replace.
	4. Worn gearshift cam stopper plate	Replace.

RADIATOR (COOLING SYSTEM)

Complaint	Symptom and possible causes	Remedy
Engine overheats	1. Not enough engine coolant	Add coolant.
	2. Radiator core clogged with dirt or scale	Clean.
	3. Faulty cooling fan	Repair or replace.
	4. Defective cooling fan relay, or open- or short-circuited	Repair or replace.
	5. Defective ECM	Replace.
	6. Defective ECT sensor	Replace.
	7. Clogged water passage	Clean.
	8. Air trapped in the cooling circuit	Bleed air.
	9. Defective water pump	Replace.
	10. Use incorrect coolant	Replace.
	11. Defective thermostat	Replace.
	12. Damaged ISC valve	Replace.
	13. ISC bad learning	Reset learned value.
Engine overcools	1. Defective ECT sensor	Replace.
	2. Extremely cold weather	Put on the radiator cover.
	3. Defective thermostat	Replace.
	4. Defective cooling fan relay, or open- or short-circuited	Repair or replace.
	5. Defective ECM	Replace.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering	1. Overtightened steering stem nut	Adjust.
	2. Broken bearing in steering stem	Replace.
	3. Distorted steering stem	Replace.
	4. Not enough pressure in tires	Adjust.
Wobbly handlebars	1. Loss of balance between right and left front forks	Adjust.
	2. Distorted front fork	Repair or replace.
	3. Distorted front axle or crooked tire	Replace.
	4. Loose steering stem nut	Adjust.
	5. Worn or incorrect tire or wrong tire pressure	Adjust or replace.
	6. Worn bearing/race in steering stem	Replace.
Wobbly front wheel	1. Distorted wheel rim	Replace.
	2. Worn front wheel bearings	Replace.
	3. Defective or incorrect tire	Replace.
	4. Loose axle or axle pinch bolt	Retighten.
	5. Incorrect front fork oil level	Adjust.
	6. Incorrect front wheel weight balance	Adjust.
Front suspension too soft	1. Weakened springs	Replace.
	2. Not enough fork oil	Replenish.
	3. Wrong weight fork oil	Replace.
Front suspension too stiff	1. Too viscous fork oil	Replace.
	2. Too much fork oil	Drain excess oil.
	3. Bent front axle	Replace.
Noisy front suspension	1. Not enough fork oil	Replenish.
	2. Loose bolts on suspension	Retighten.
Wobbly rear wheel	1. Distorted wheel rim	Replace.
	2. Worn rear wheel bearings or swingarm bearings	Replace.
	3. Defective or incorrect tire	Replace.
	4. Worn rear suspension bearings	Replace.
	5. Loose nuts or bolts on rear suspension	Retighten.
	6. Loose rear axle nut	Retighten.
	7. Incorrect rear wheel weight balance	Adjust.
Rear suspension too soft	1. Weakened spring of shock absorber	Replace.
	2. Leakage of oil from shock absorber	Replace.
	3. Improperly rear suspension setting	Adjust.
Rear suspension too stiff	1. Bent shock absorber shaft	Replace.
	2. Bent swingarm pivot shaft	Replace.
	3. Worn swingarm and rear suspension bearings	Replace.
	4. Improperly rear suspension setting	Adjust.
Noisy rear suspension	1. Loose nuts or bolts on rear suspension	Retighten.
	2. Worn swingarm and suspension bearings	Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Insufficient brake power	1. Leakage of brake fluid from hydraulic system	Repair or replace.
	2. Worn pads	Replace.
	3. Friction surfaces of pad are dirty oil or dust	Clean disc/pads or replace.
	4. Worn disc	Replace.
	5. Air in hydraulic system	Bleed air.
	6. Not enough brake fluid in the reservoir	Replenish.
Brake squeaking	1. Carbon adhesion on pad surface	Repair surface with sandpaper.
	2. Tilted pad	Correct pad fitting or replace.
	3. Damaged wheel bearing	Replace.
	4. Loosen front wheel axle or rear wheel axle	Tighten to specified torque.
	5. Worn pads	Replace.
	6. Foreign material in brake fluid	Replace brake fluid.
	7. Clogged return port of master cylinder	Disassemble and clean master cylinder.
Excessive brake lever stroke	1. Air in hydraulic system	Bleed air.
	2. Insufficient brake fluid	Replenish fluid to specified level; bleed air.
	3. Improper quality of brake fluid	Replace with correct fluid.
Leakage of brake fluid	1. Insufficient tightening of connection joints	Tighten to specified torque.
	2. Cracked hose	Replace.
	3. Worn piston and/or cup	Replace piston and/or cup.
Brake drags	1. Rusty part	Clean and lubricate.
	2. Insufficient brake lever or brake pedal pivot lubrication	Lubricate.

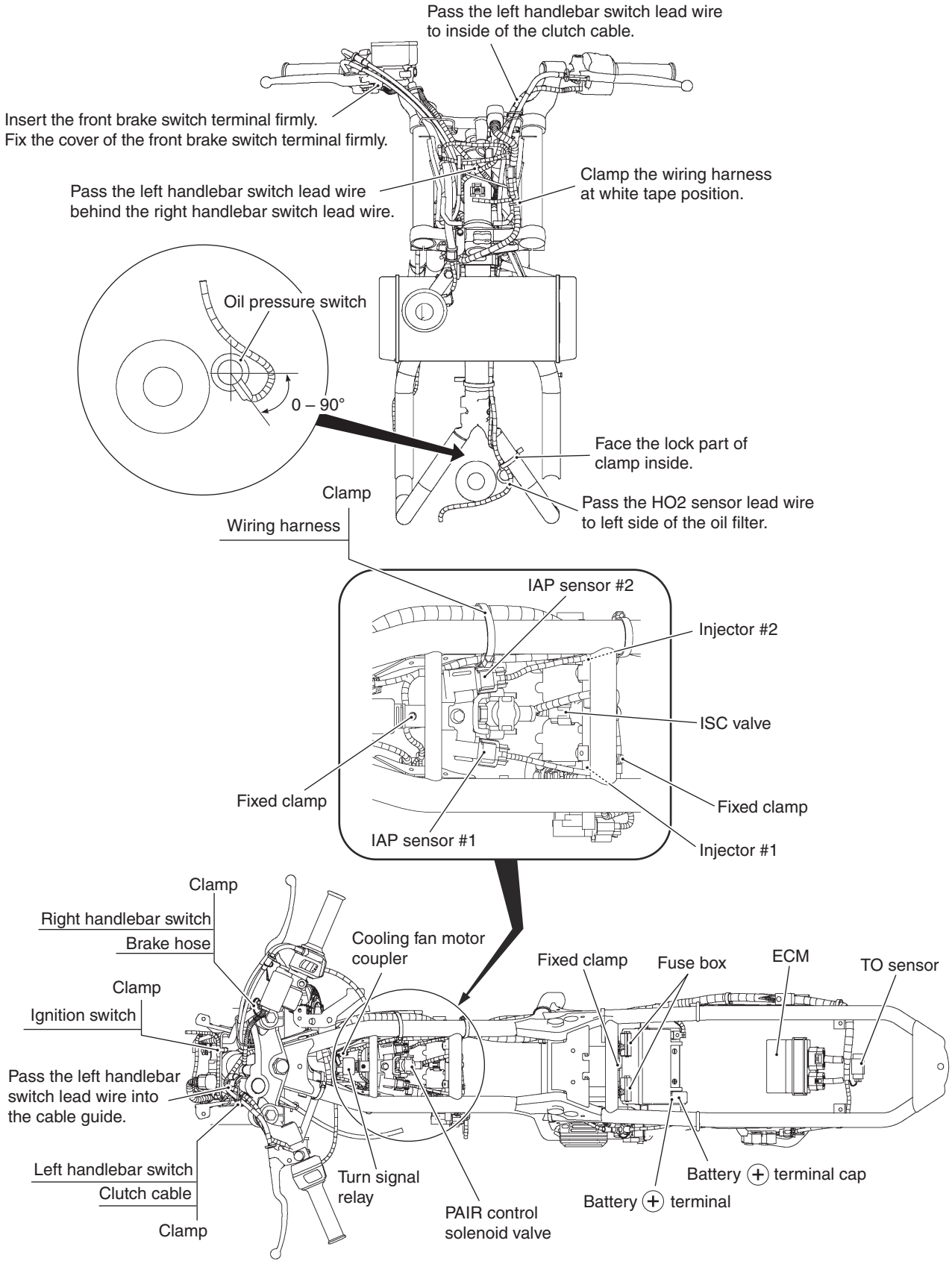
ELECTRICAL

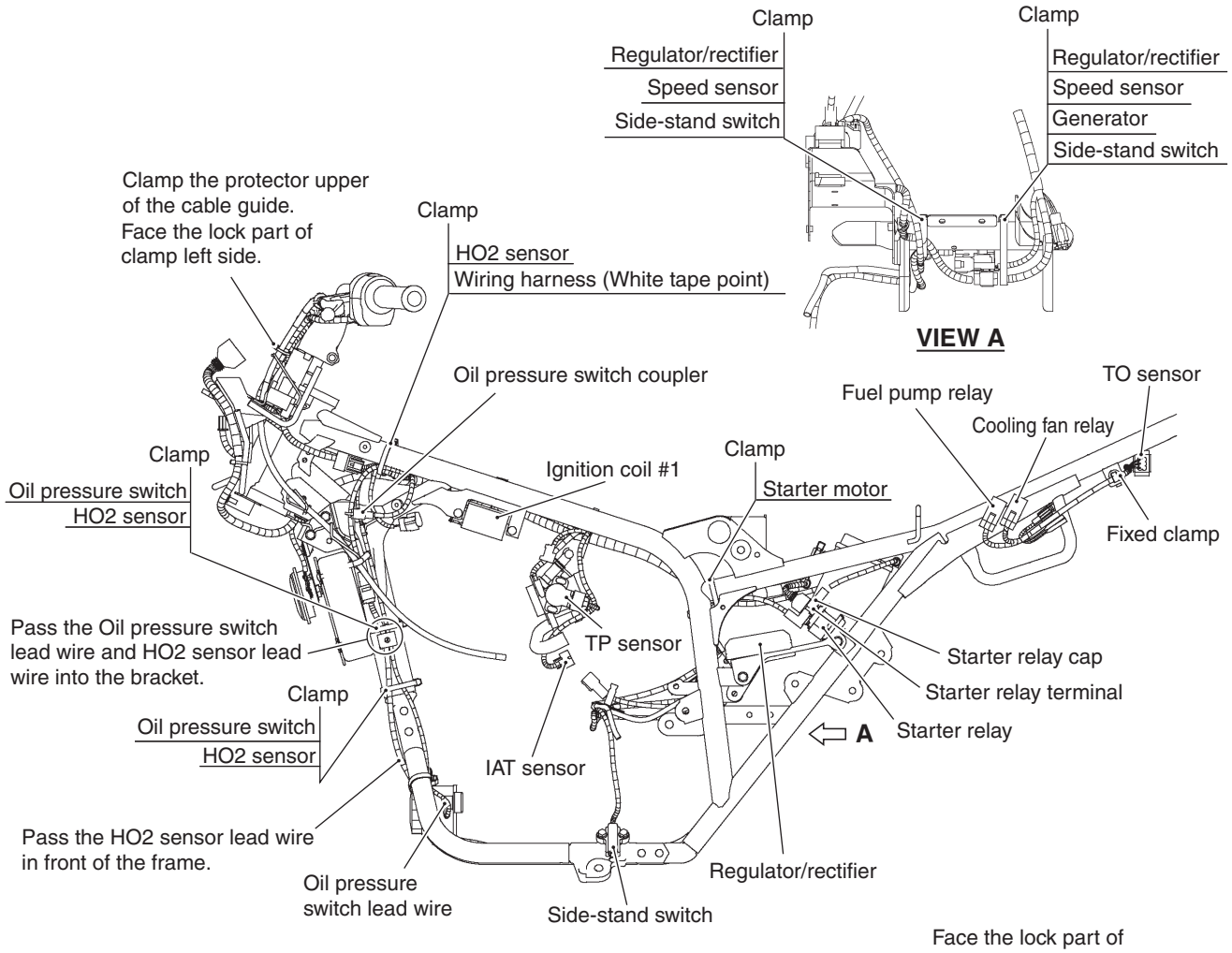
Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking	1. Defective ignition coils	Replace.
	2. Defective spark plugs	Replace.
	3. Defective CKP sensor	Replace.
	4. Defective ECM	Replace.
	5. Defective TO sensor	Replace.
	6. Open-circuited wiring connections	Check and repair.
Spark plug soon become fouled with carbon	1. Mixture too rich	Inspect FI system.
	2. Excessively high idling speed	Inspect FI system.
	3. Incorrect gasoline	Change.
	4. Dirty air cleaner element	Replace.
	5. Too cold spark plugs	Replace with hot type plug.
Spark plug become fouled too soon	1. Worn piston rings	Replace.
	2. Worn piston or cylinders	Replace.
	3. Excessive clearance of valve stems in valve guides	Replace.
	4. Worn stem oil seal	Replace.
Spark plug electrodes overheat or burn	1. Too hot spark plugs	Replace with cold type plugs.
	2. Overheated the engine	Tune up.
	3. Loose spark plugs	Retighten.
	4. Too lean mixture	Inspect FI system.
Generator does not charge	1. Open- or short-circuited lead wires, or loose lead connections	Repair or replace or retighten.
	2. Short-circuited, grounded or open generator coil	Replace.
	3. Short-circuited or punctured regulator/rectifier	Replace.
Generator does charge, but charging rate is below the specification	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals	Repair or retighten.
	2. Grounded or open-circuited generator coil	Replace.
	3. Defective regulator/rectifier	Replace.
	4. Defective cell plates in the battery	Replace the battery.
Generator overcharges	1. Internal short-circuit in the battery	Replace the battery.
	2. Damaged or defective regulator/rectifier	Replace.
	3. Poorly grounded regulator/rectifier	Clean and tighten ground connection.
Unstable charging	1. Lead wire insulation frayed due to vibration, resulting in intermittent short-circuiting	Repair or replace.
	2. Internally shorted generator	Replace.
	3. Defective regulator/rectifier	Replace.
Starter button is not effective	1. Run down battery	Repair or replace.
	2. Defective switch contacts	Replace.
	3. Brushes not seating properly on starter motor commutator	Repair or replace.
	4. Defective starter relay/starter interlock switch	Replace.
	5. Defective main fuse	Replace.

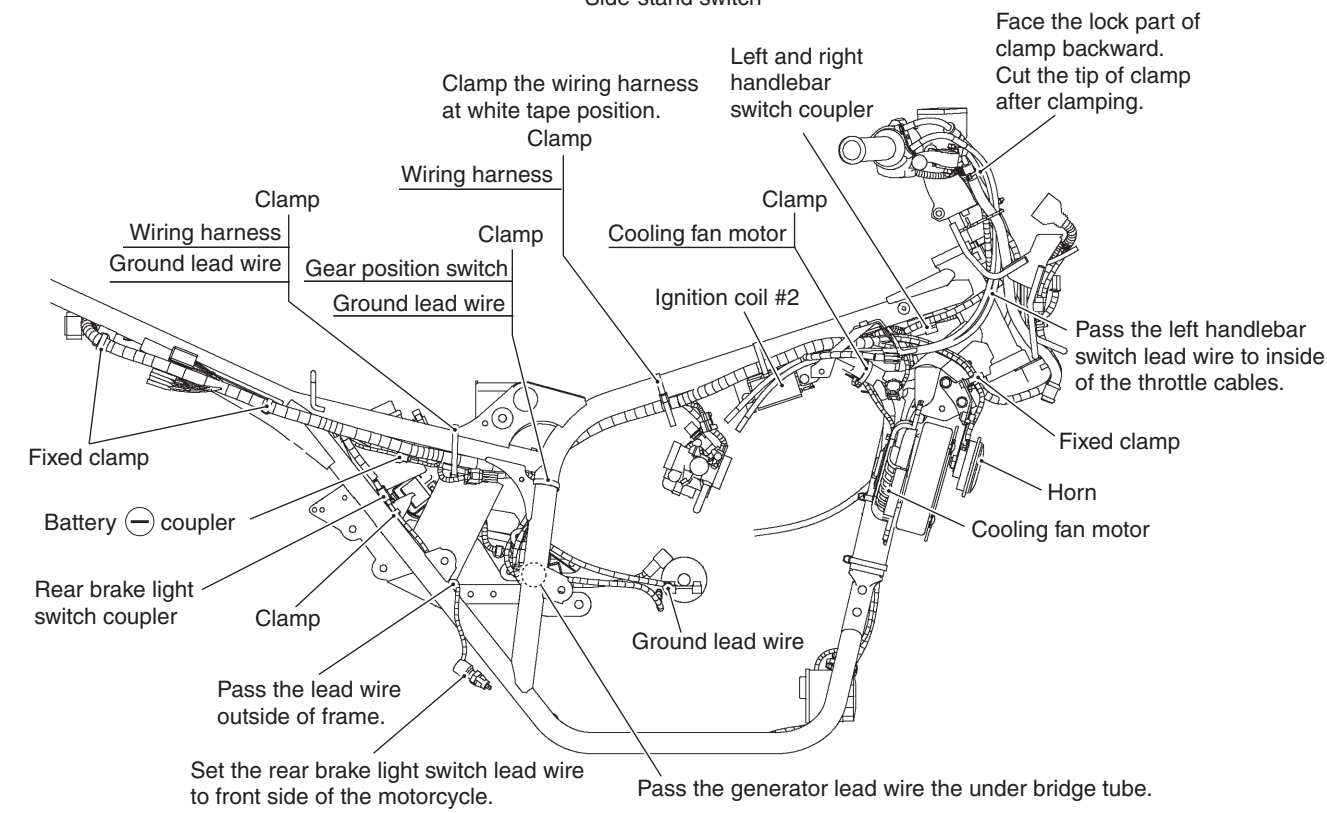
BATTERY

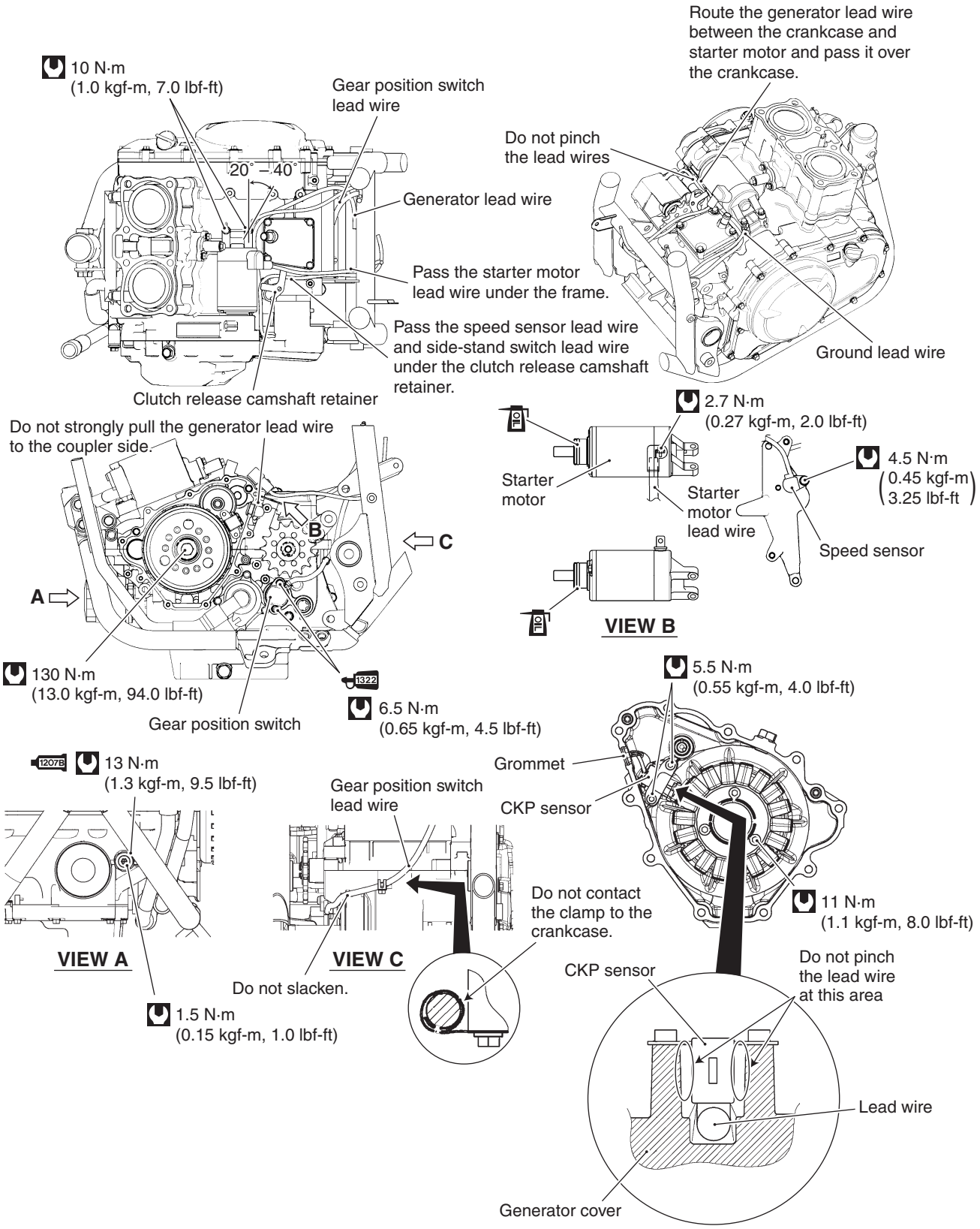
Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surface of cell plates	1. Cracked battery case 2. Battery has been left in a run-down condition for a long time	Replace the battery. Replace the battery.
Battery runs down quickly	1. Trouble in the charging system	Check the generator, regulator/rectifier and circuit connections and make necessary adjustments to obtain specified charging operation.
	2. Cell plates have lost much of their active material as a result of overcharging	Replace the battery and correct the charging system.
	3. Internal short-circuit in the battery	Replace the battery.
	4. Too low battery voltage	Recharge the battery fully.
	5. Too old battery	Replace the battery.
Battery "sulfation"	1. Incorrect charging rate (When not in use batteries should be checked at least once a month to avoid sulfation)	Replace the battery.
	2. The battery was left unused in a cold climate for too long	Replace the battery if badly sulfated.

WIRING HARNESS, CABLE AND HOSE ROUTING
WIRING HARNESS ROUTING

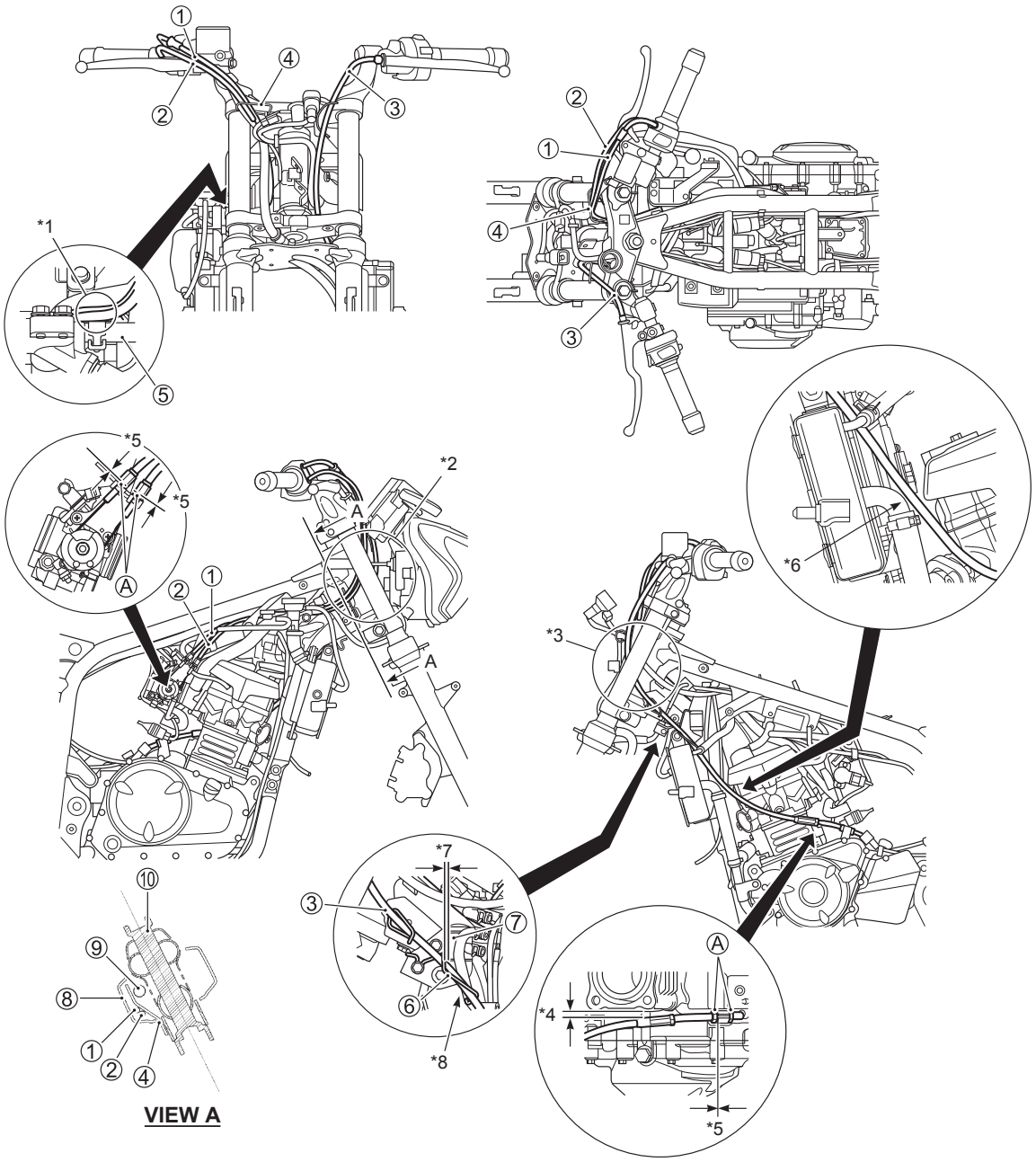



Clamp
Regulator/rectifier
Speed sensor
Side-stand switch
Clamp
Regulator/rectifier
Speed sensor
Generator
Side-stand switch
VIEW A
Clamp the protector upper of the cable guide. Face the lock part of clamp left side.
Clamp
HO2 sensor
Wiring harness (White tape point)
Oil pressure switch coupler
Fuel pump relay
TO sensor
Cooling fan relay
Clamp
Oil pressure switch
HO2 sensor
Ignition coil #1
Clamp
Starter motor
Fixed clamp
Pass the Oil pressure switch lead wire and HO2 sensor lead wire into the bracket.
TP sensor
Starter relay cap
Starter relay terminal
Clamp
Oil pressure switch
HO2 sensor
A
Starter relay
IAT sensor
Pass the HO2 sensor lead wire in front of the frame.
Regulator/rectifier
Oil pressure switch lead wire
Side-stand switch


Face the lock part of clamp backward. Cut the tip of clamp after clamping.
Left and right handlebar switch coupler
Clamp the wiring harness at white tape position.
Clamp
Wiring harness
Clamp
Wiring harness
Ground lead wire
Clamp
Gear position switch
Ground lead wire
Clamp
Cooling fan motor
Ignition coil #2
Pass the left handlebar switch lead wire to inside of the throttle cables.
Fixed clamp
Fixed clamp
Horn
Battery ⊖ coupler
Cooling fan motor
Rear brake light switch coupler
Clamp
Ground lead wire
Pass the lead wire outside of frame.
Set the rear brake light switch lead wire to front side of the motorcycle.
Pass the generator lead wire the under bridge tube.


10 N·m
(1.0 kgf-m, 7.0 lbf-ft)
Gear position switch lead wire
20° – 40°
Generator lead wire
Pass the starter motor lead wire under the frame.
Pass the speed sensor lead wire and side-stand switch lead wire under the clutch release camshaft retainer.
Clutch release camshaft retainer
Route the generator lead wire between the crankcase and starter motor and pass it over the crankcase.
Do not pinch the lead wires
Ground lead wire
Do not strongly pull the generator lead wire to the coupler side.
A
B
C
130 N·m
(13.0 kgf-m, 94.0 lbf-ft)
Gear position switch
1322
6.5 N·m
(0.65 kgf-m, 4.5 lbf-ft)
2.7 N·m
(0.27 kgf-m, 2.0 lbf-ft)
Starter motor
Starter motor lead wire
4.5 N·m
(0.45 kgf-m
3.25 lbf-ft
Speed sensor
VIEW B
5.5 N·m
(0.55 kgf-m, 4.0 lbf-ft)
Grommet
CKP sensor
11 N·m
(1.1 kgf-m, 8.0 lbf-ft)
1207B
13 N·m
(1.3 kgf-m, 9.5 lbf-ft)
VIEW A
1.5 N·m
(0.15 kgf-m, 1.0 lbf-ft)
Gear position switch lead wire
VIEW C
Do not slacken.
Do not contact the clamp to the crankcase.
CKP sensor
Do not pinch the lead wire at this area
Lead wire
Generator cover

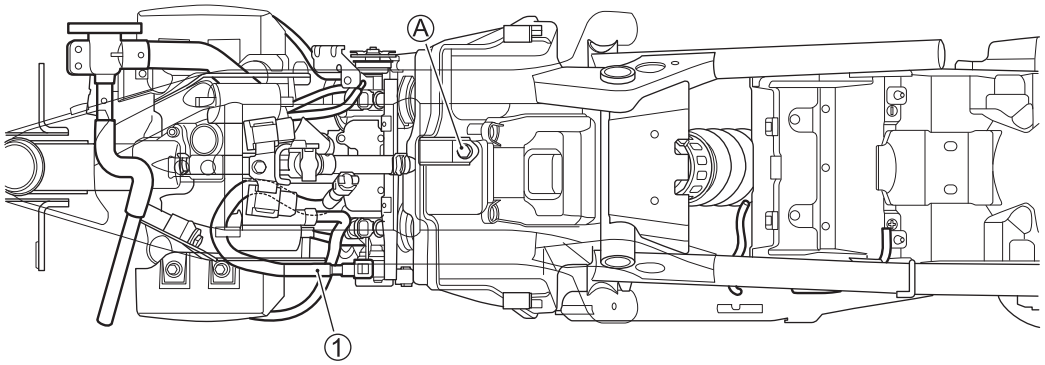
CABLE ROUTING

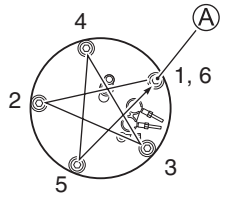


①	Throttle cable No.1	⑨	Left handlebar switch	*7	3 mm (0.12 in)
②	Throttle cable No.2	⑩	Frame	*8	Pass the clutch cable into the clutch cable guide.
③	Clutch cable	*1	Pass the throttle cables over the water bypass hose ⑤.		
④	Cable guide	*2	Pass the throttle cables to the right side of head pipe.		
⑤	Water bypass hose	*3	Pass the clutch cable to the left side of head pipe.		
⑥	Clutch cable guide	*4	7 mm (0.28 in)		
⑦	Bracket	*5	Within 1 turn counterclockwise.		
⑧	Right frame head cover	*6	Make sure the clutch cable is not contacted to the water hose and cylinder head cover cap.		

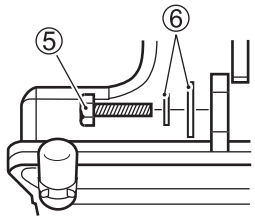
ITEM	N·m	kgf-m	lbf-ft
Ⓐ	4.5	0.45	3.5

INTAKE SYSTEM HOSE ROUTING

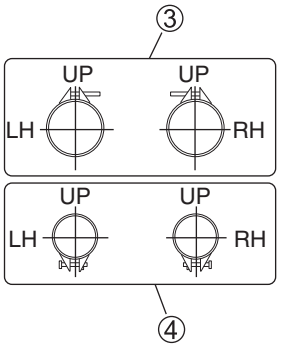


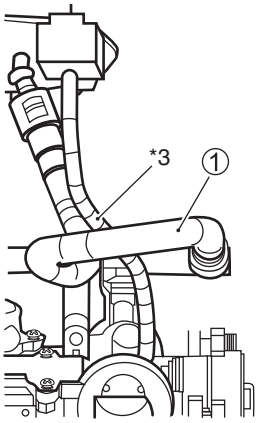


VIEW A

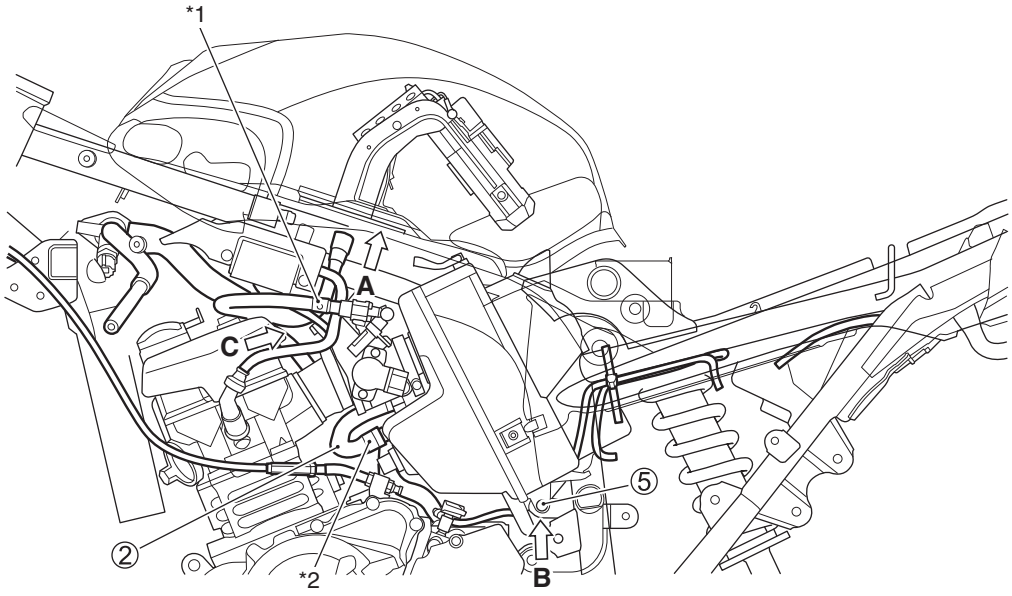


VIEW B





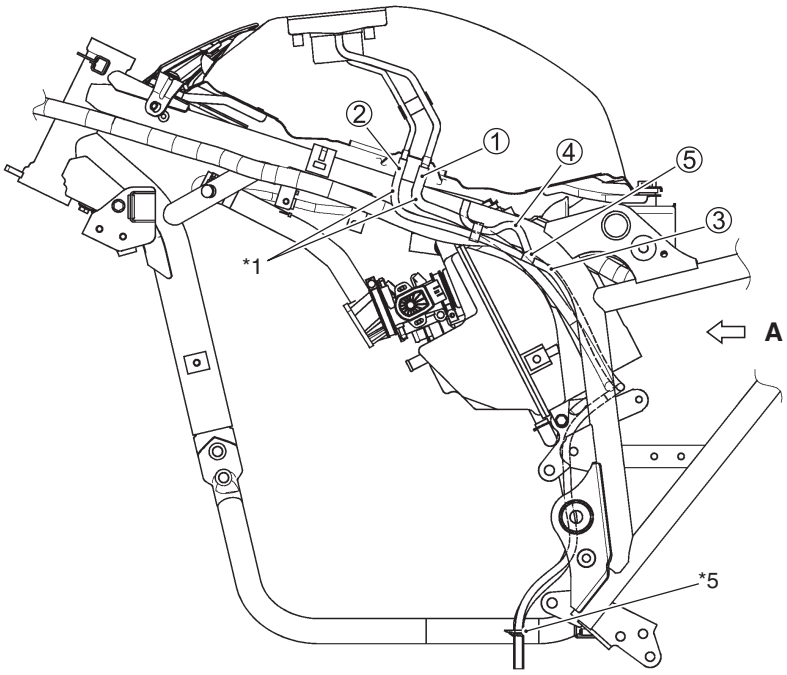
VIEW C

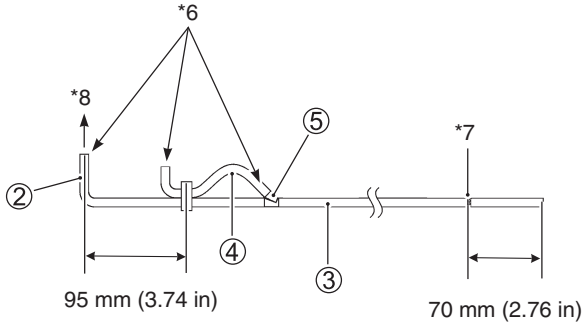


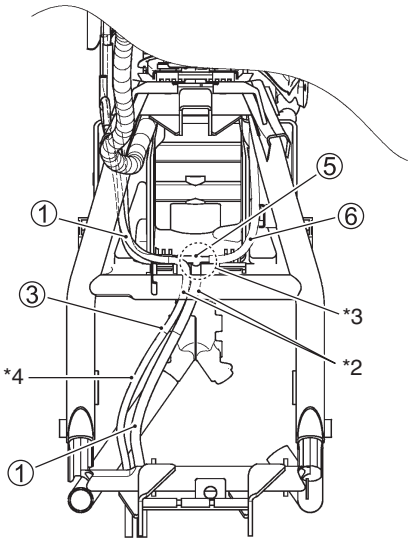
①	Fuel feed hose	⑥	Washer
②	ISC valve hose	*1	White mark
③	Intake pipe clamp	*2	Clamp end should face left side.
④	Outlet tube clamp	*3	Pass the IAP sensor hose #1 between the fuel feed hose.
⑤	Air cleaner lower mounting bolt		

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	10	1.0	7.0
⑤	5.5	0.55	4.0

FUEL TANK DRAIN HOSE ROUTING



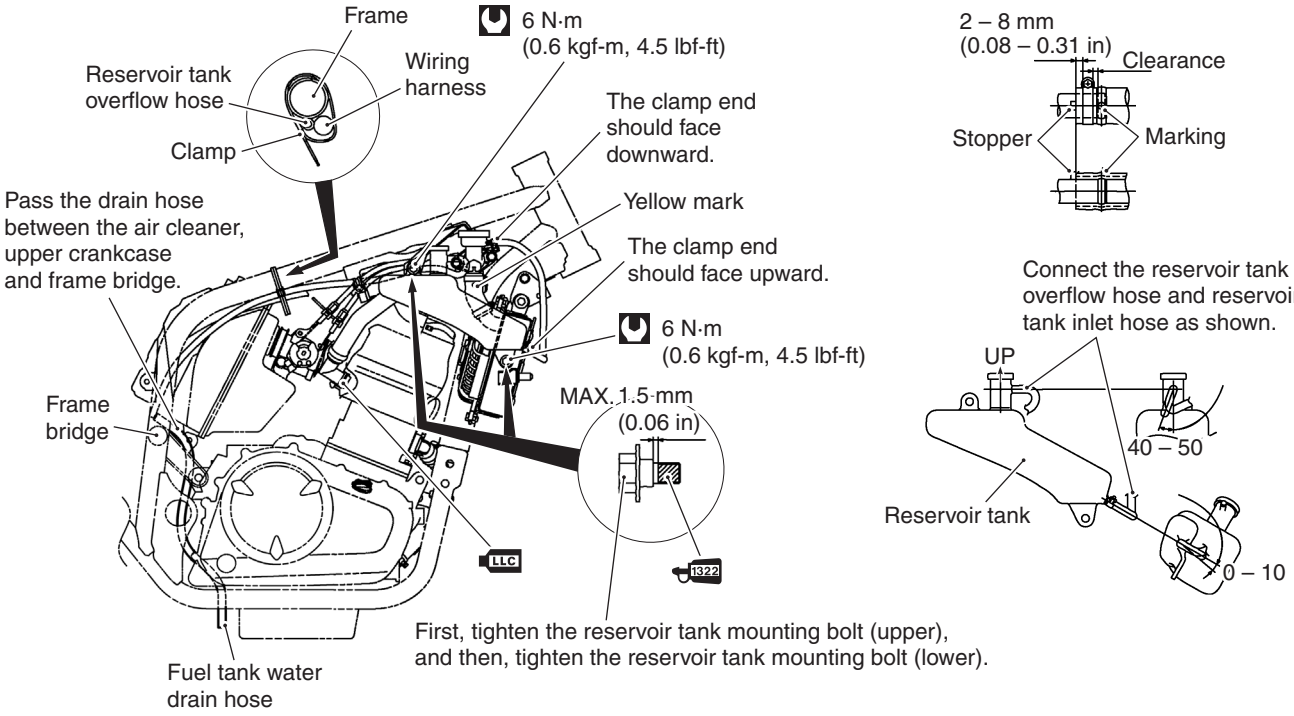


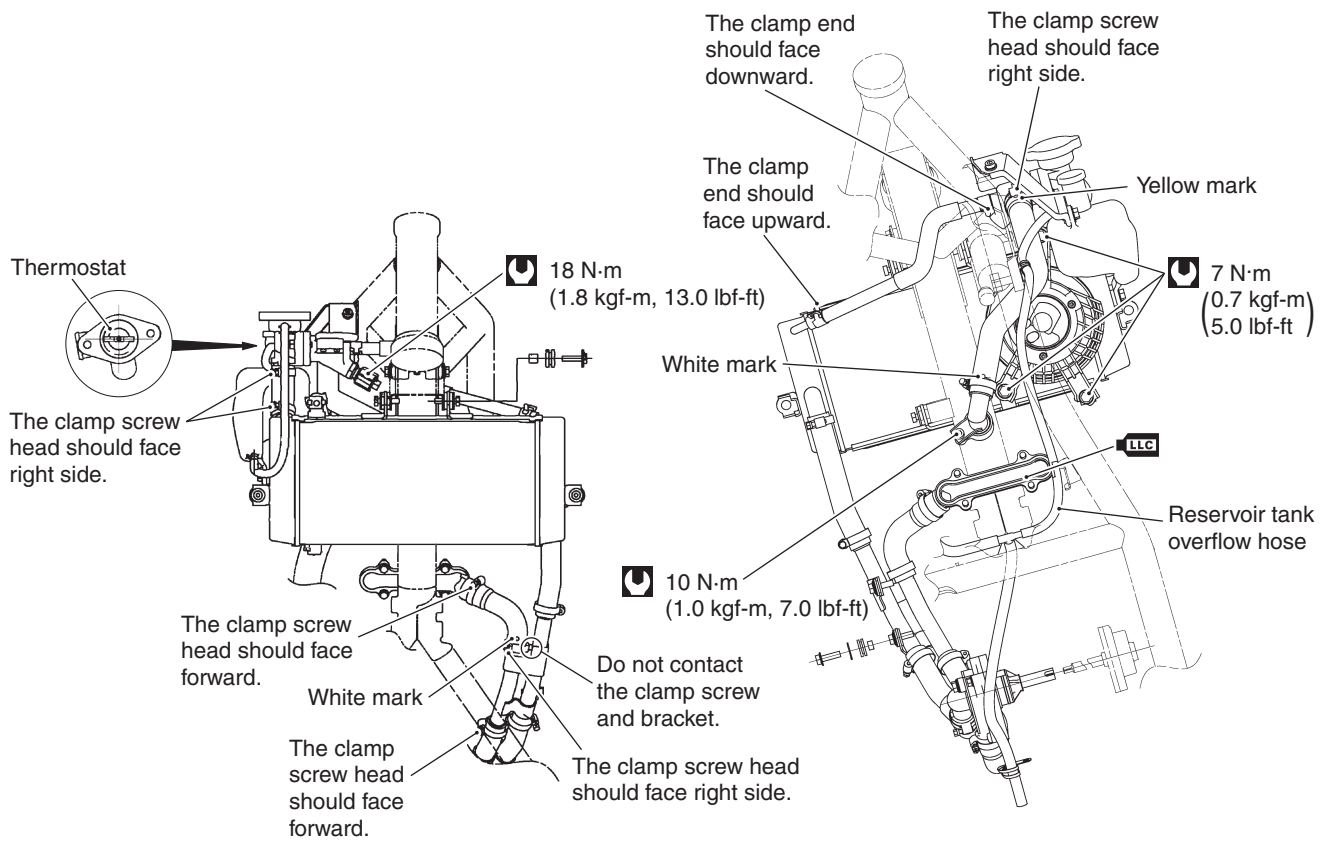


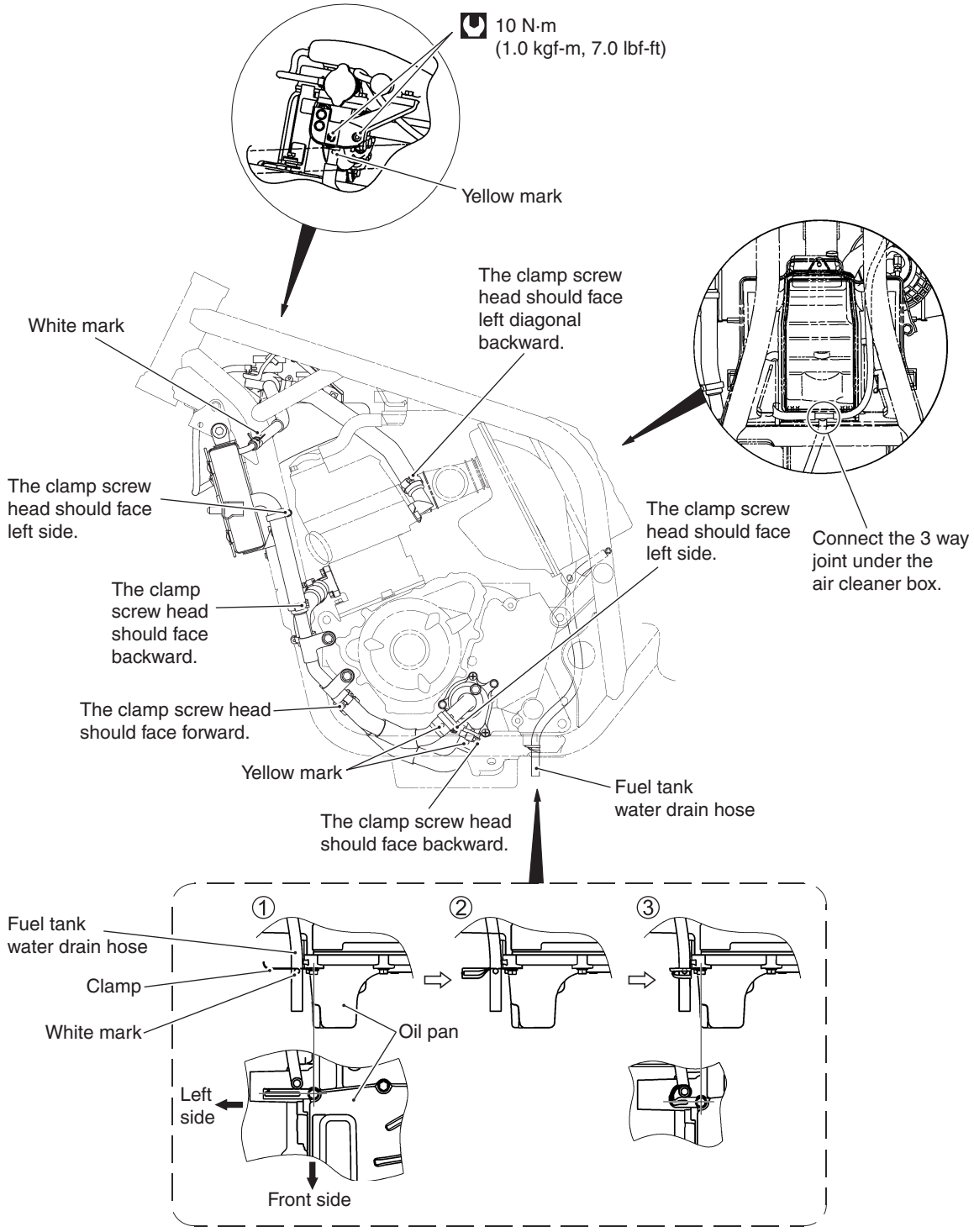
VIEW A

①	Fuel tank water drain hose	*2	Pass the hoses to the forward of frame.
②	Fuel tank breather hose No.1	*3	Connect the reservoir tank overflow hose ⑥ to the narrow side of 3 way joint ⑤.
③	Fuel tank breather hose No.2	*4	Pass the fuel tank breather hose No.2 to left side of the fuel tank water drain hose.
④	Fuel tank breather hose No.3	*5	Align the white making on the hoses with the clamp.
⑤	3-way joint	*6	Match the direction of 3-way joint and hoses.
⑥	Reservoir tank overflow hose	*7	White marking
*1	Set the fuel tank water drain hose and fuel tank breather hose No.1 with lengthwise backward.	*8	To fuel tank.

COOLING SYSTEM HOSE ROUTING

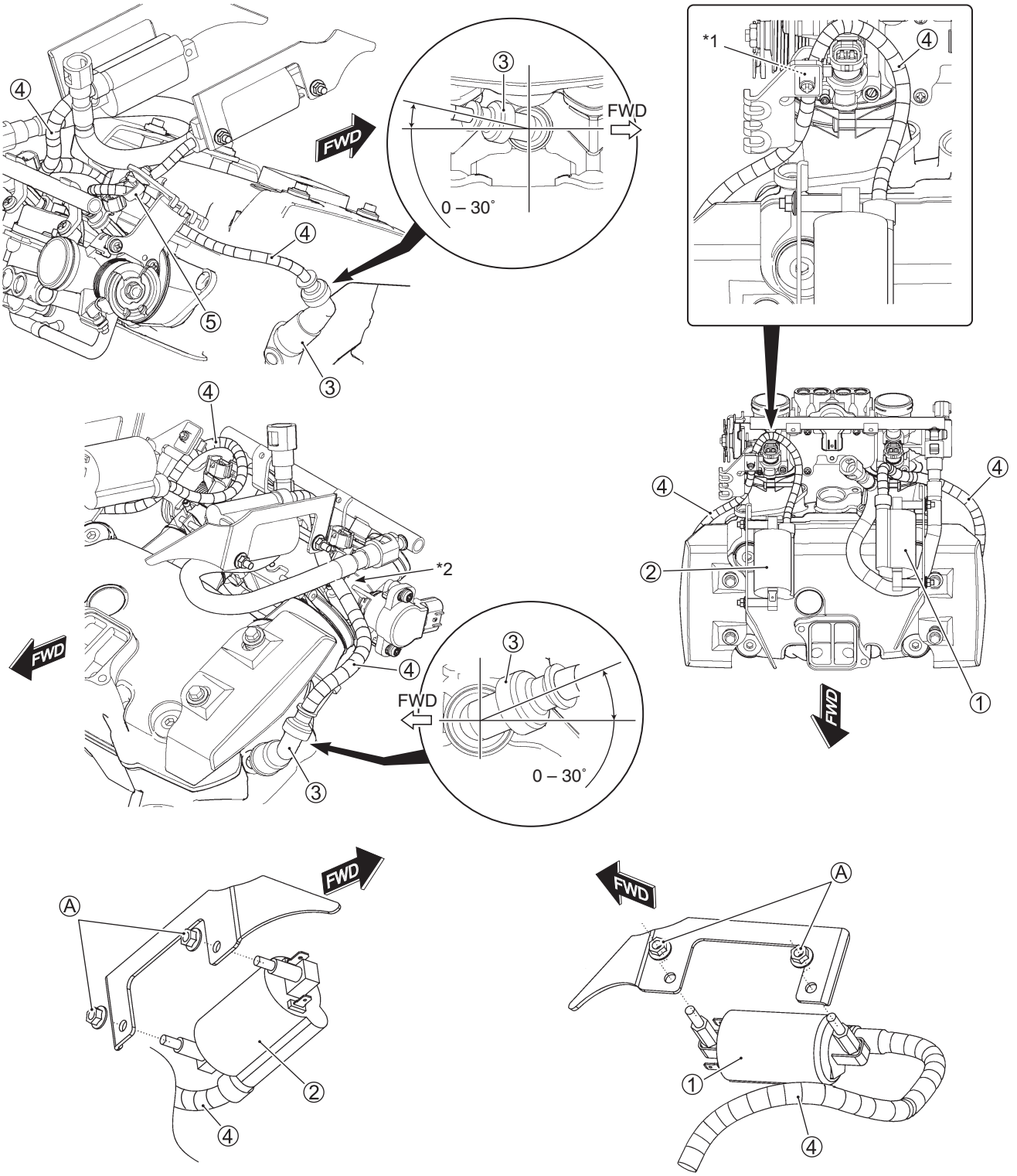






When clamping the fuel tank water drain hose, clamp the fuel tank water drain hose in this order (① → ② → ③).

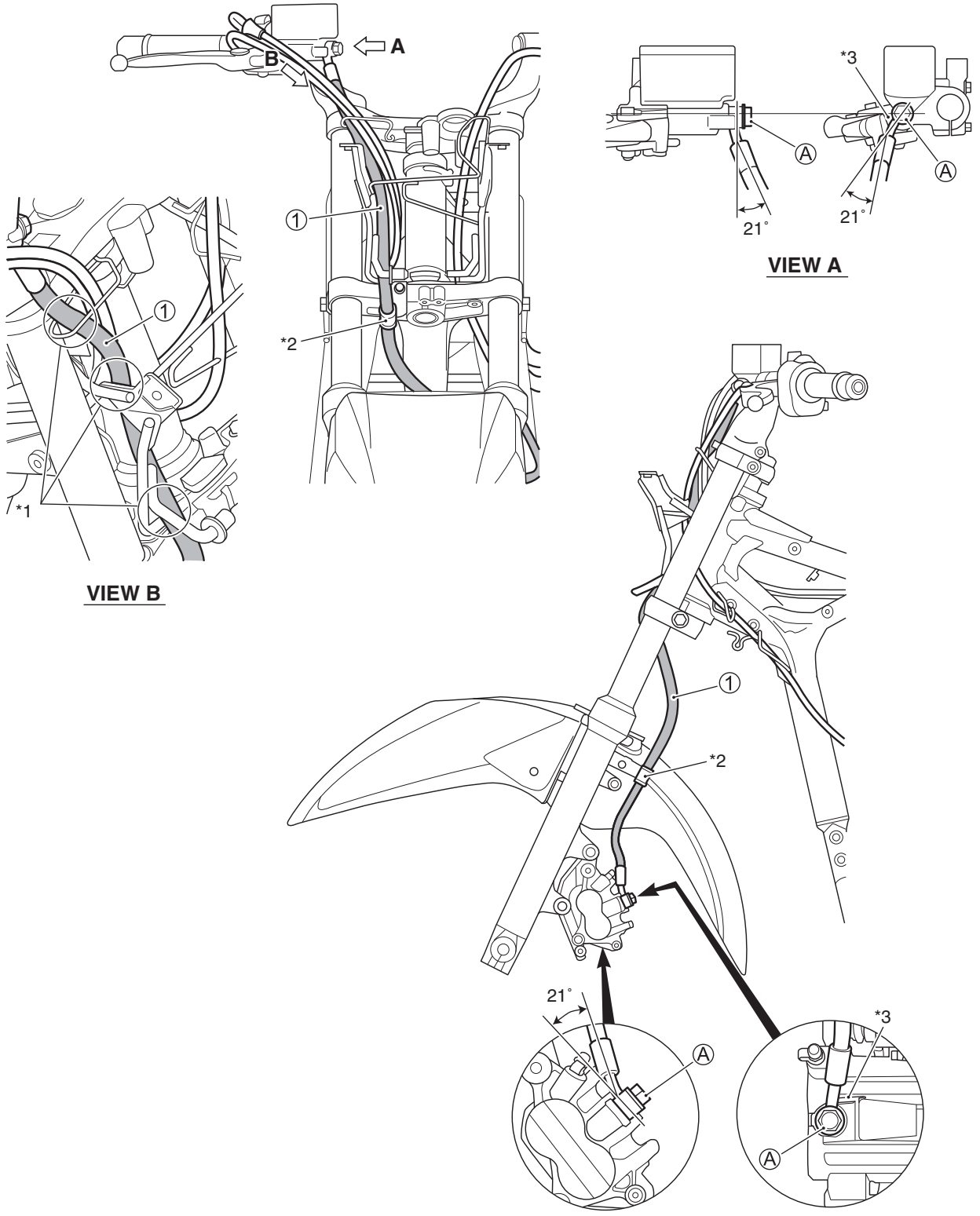
IGNITION COIL INSTALLATION



①	Ignition coil #1	*1	Pass the high tension cord behind the throttle cable guide.
②	Ignition coil #2		
③	Spark plug cap	*2	Pass the high tension cord under the fuel hose.
④	High tension cord		
⑤	Clamp		

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	6.5	0.65	4.5

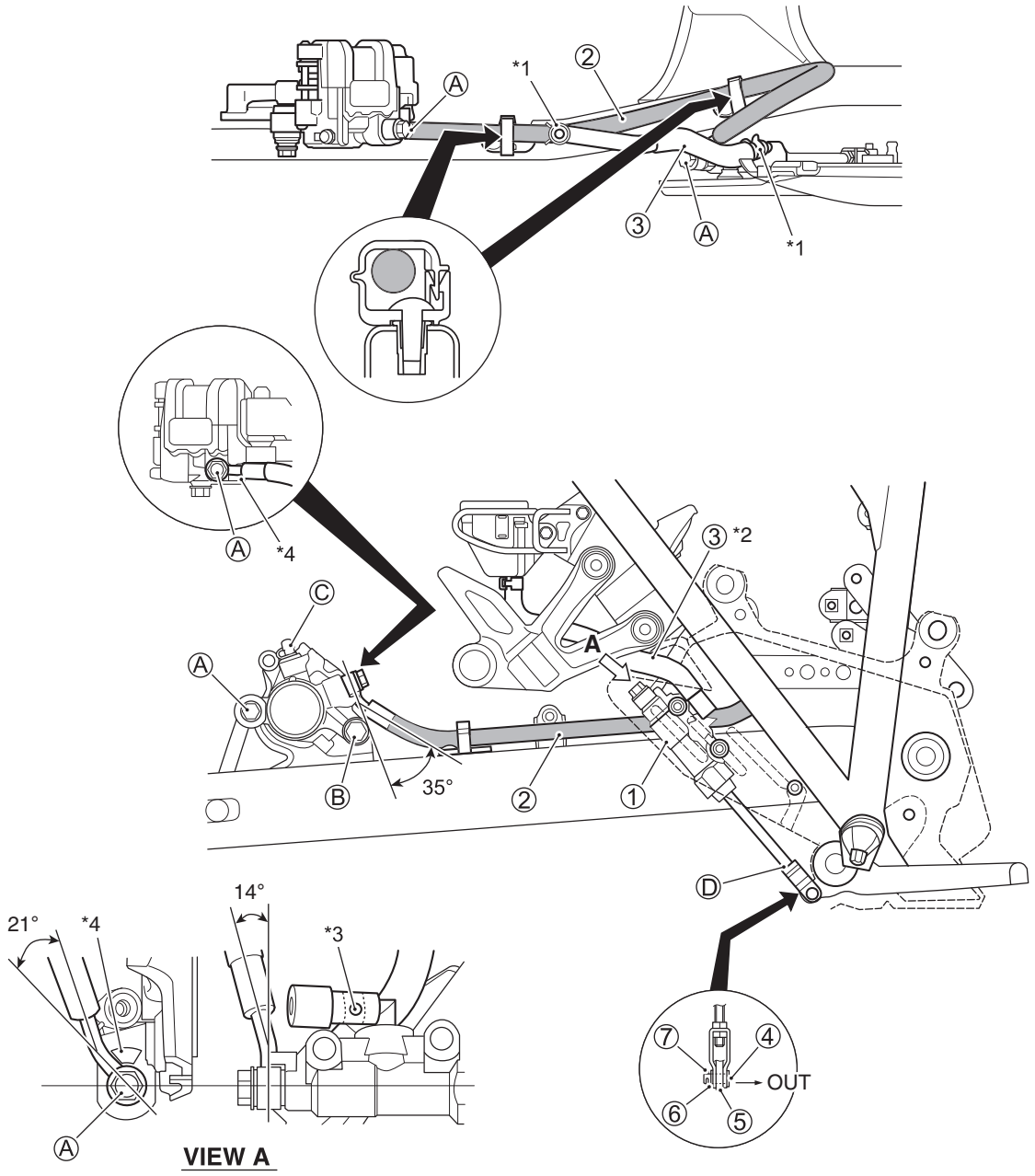
FRONT BRAKE HOSE ROUTING



①	Brake hose	*3	After the brake hose union has contacted the stopper, tighten the union bolt.
*1	Pass the brake hose as shown.		
*2	Clamp the brake hose firmly.		

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	23	2.3	16.5

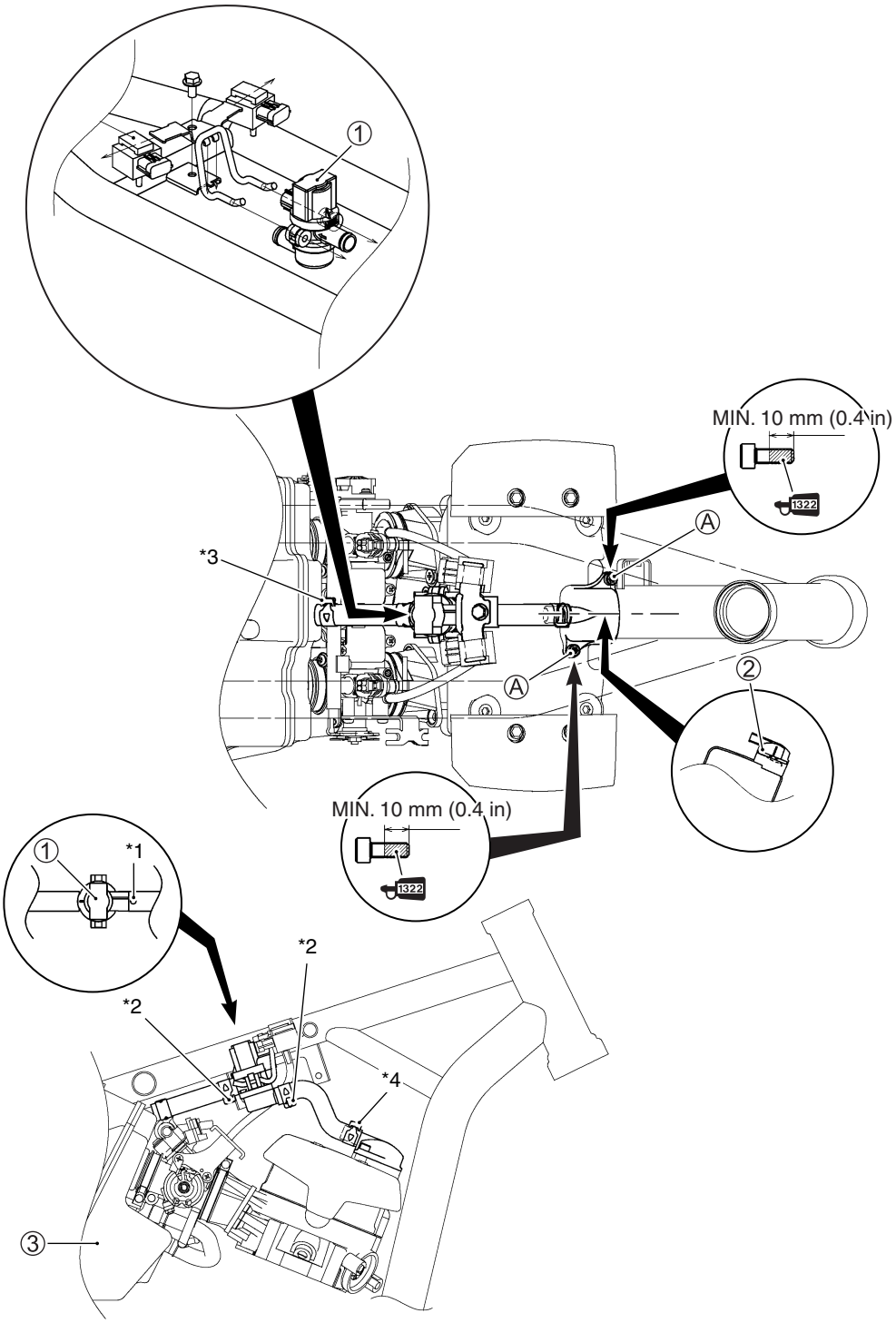
REAR BRAKE HOSE ROUTING



①	Rear brake master cylinder	*1	Clamp ends should face as shown.
②	Rear brake hose	*2	Insert the reservoir tank hose to the union firmly.
③	Rear brake reservoir tank hose		
④	Pin	*3	White paint faces outside before binding the clamp.
⑤	Rear brake pedal	*4	After the brake hose union has contacted the stopper, tighten the union bolt.
⑥	Washer		
⑦	Cotter pin		

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	23	2.3	16.5
Ⓑ	27	2.7	19.5
Ⓒ	6	0.6	4.5
Ⓓ	18	1.8	13.0

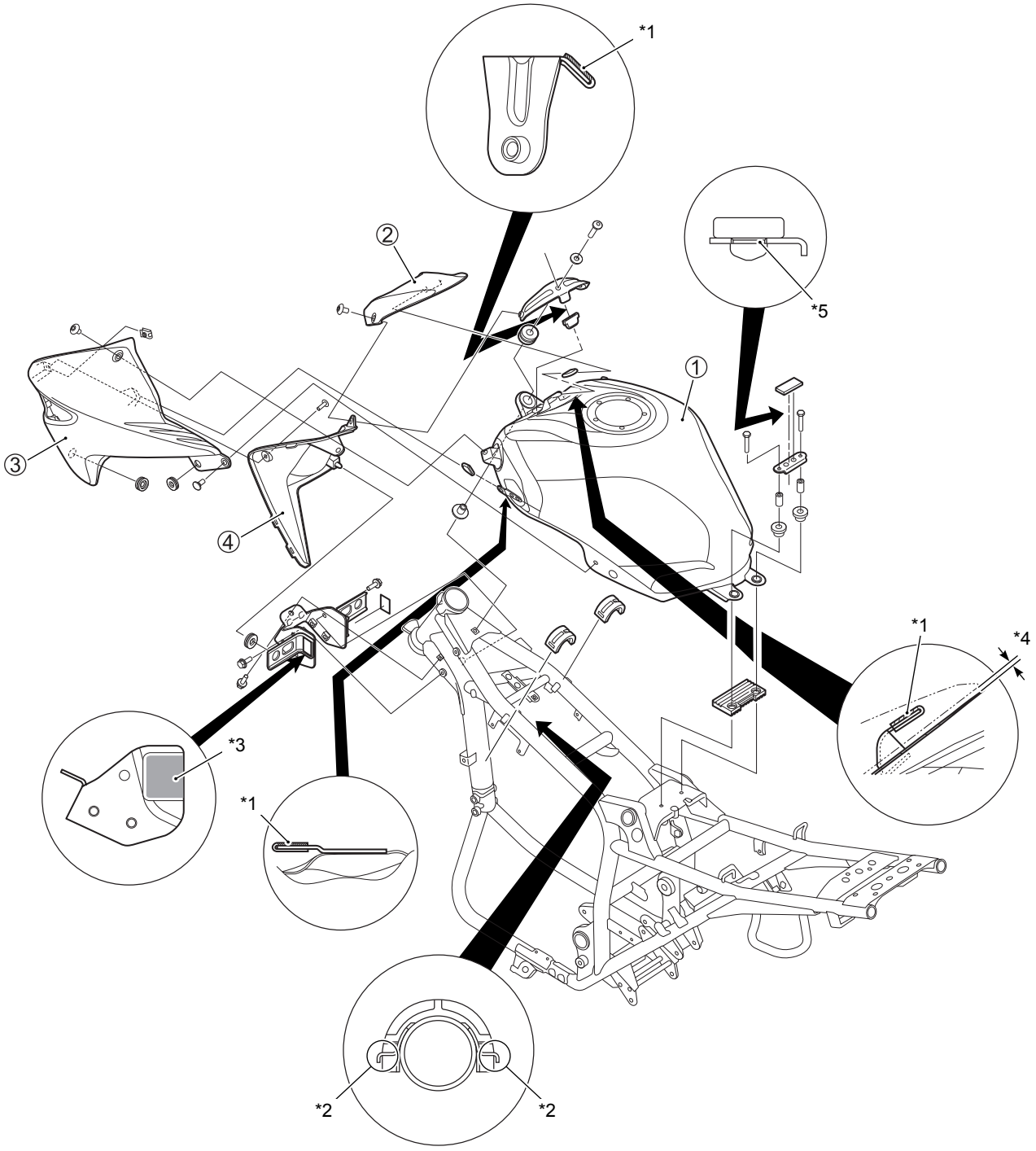
PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING



①	PAIR control solenoid valve	*2	The clamp end should face downward.
②	PAIR reed valve	*3	The clamp end should face left side.
③	Air cleaner box	*4	The clamp end should face upward.
*1	White mark		

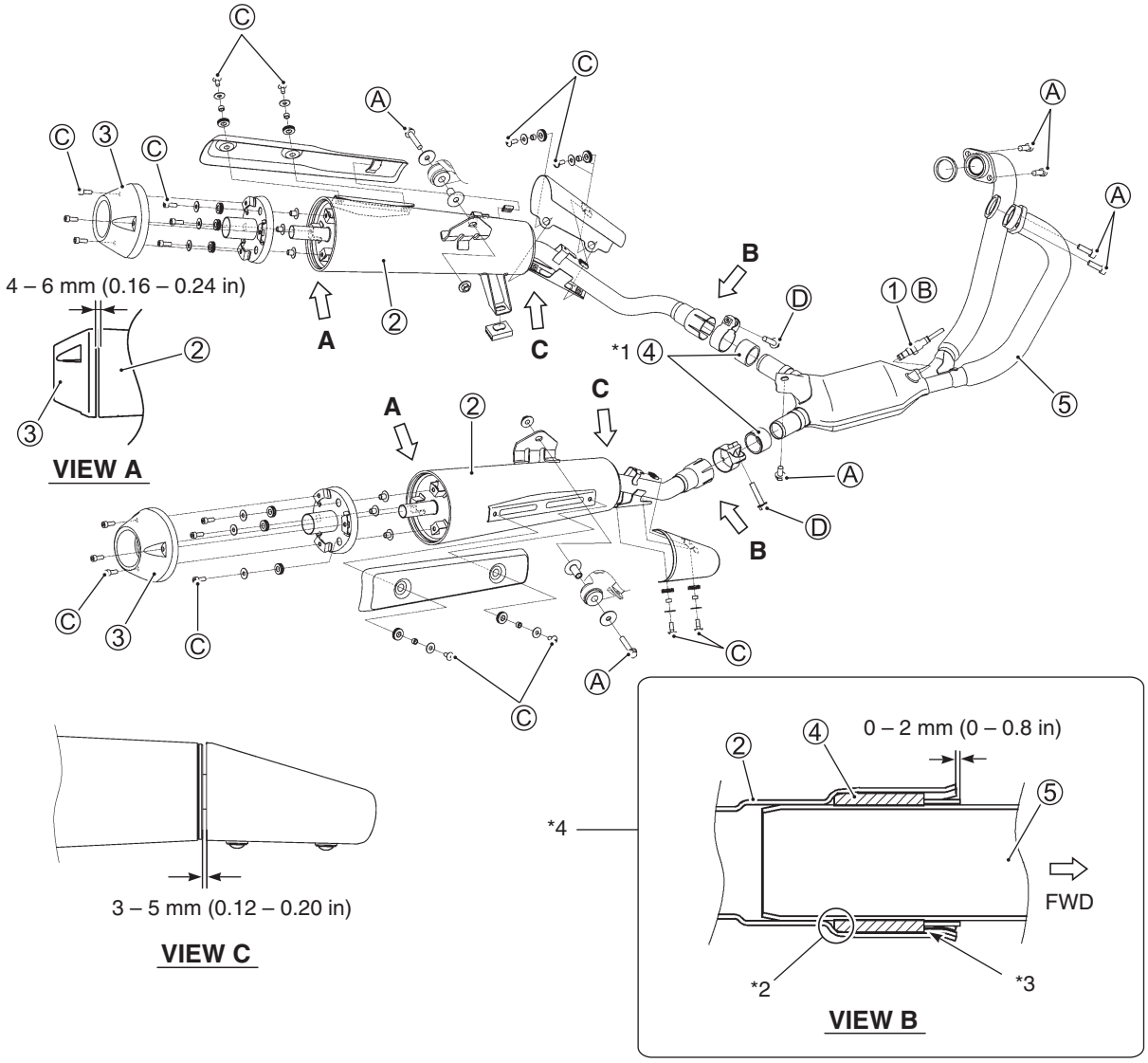
ITEM	N·m	kgf-m	lbf-ft
Ⓐ	10	1.0	7.0

FUEL TANK INSTALLATION



①	Fuel tank	*2	Hung on projection part firmly.
②	Fuel tank center cover	*3	Clean the surface before attaching the cushion.
③	Fuel tank cover	*4	Keep clearance 2 – 4 mm (0.08 – 0.16 in) between the fuel tank and fuel tank covers ②, ③, ④.
④	Fuel tank front cover		
*1	Apply adhesive agent.	*5	Insert the cushion to the bracket firmly.

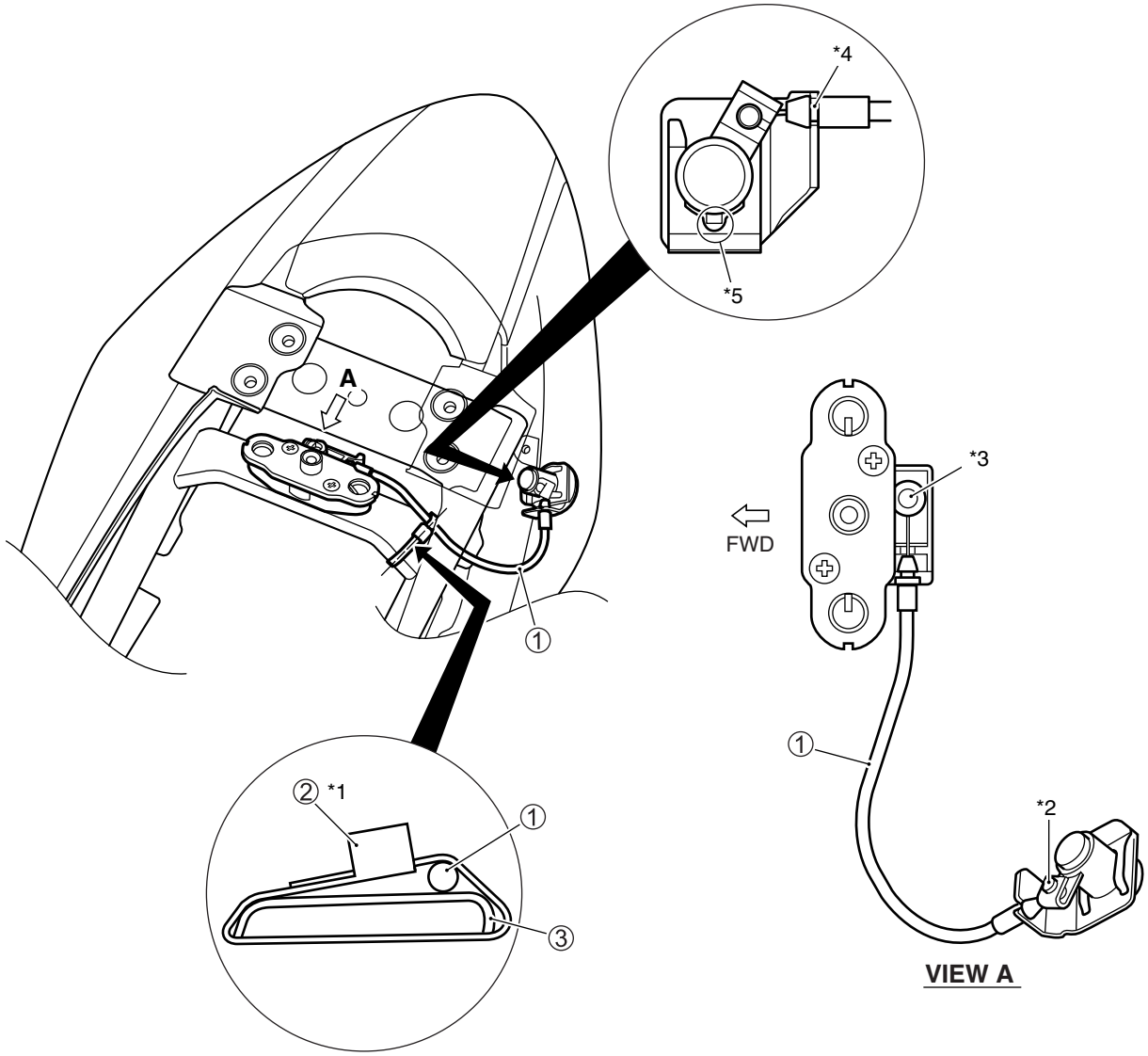
MUFFLER & EXHAUST PIPE INSTALLATION



①	HO2 sensor	*2	The chamfer side of connector face the muffler side.
②	Muffler		
③	Rear muffler cover	*3	Contact the connector ④ to the stopper.
④	Connector	*4	Install the connector ④ to the exhaust pipe ⑤ and then install the muffler ②.
⑤	Exhaust pipe		
*1	Apply muffler seal.		

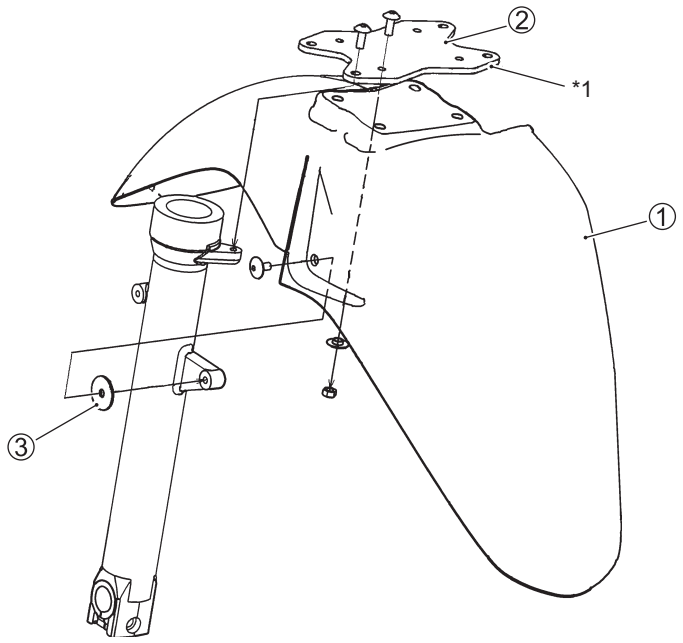
ITEM	N·m	kgf-m	lbf-ft
Ⓐ	23	2.3	16.5
Ⓑ	25	2.5	18.0
Ⓒ	10	1.0	7.0
Ⓓ	17	1.7	12.5

SEAT LOCK CABLE ROUTING



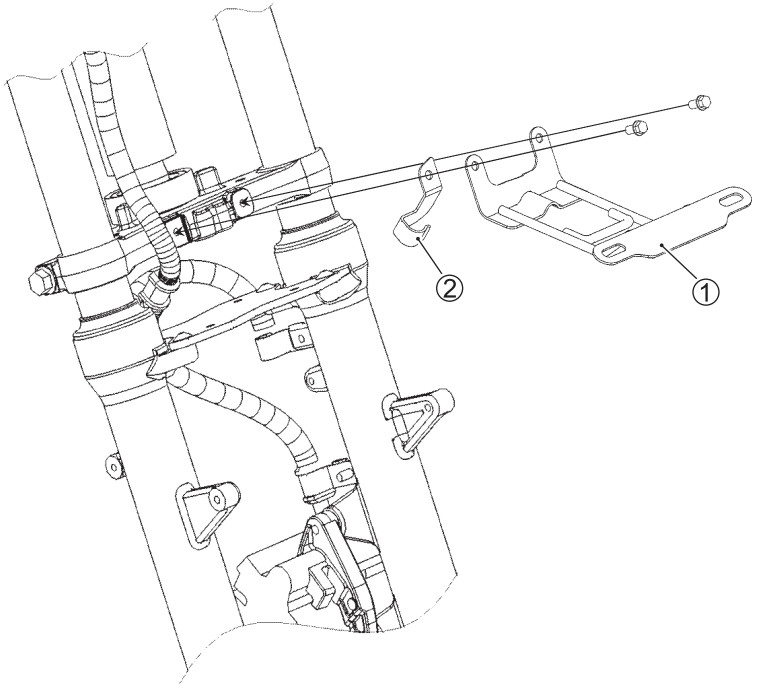
①	Seat lock cable	*2	The tip of the cable is cylindrical shaped.
②	Clamp	*3	The tip of the cable is spherical shaped.
③	Flame	*4	Set the cable firmly.
*1	The lock part of clamp over the frame.	*5	Align the lib of seat lock assembly and groove of each parts.

FRONT FENDER INSTALLATION



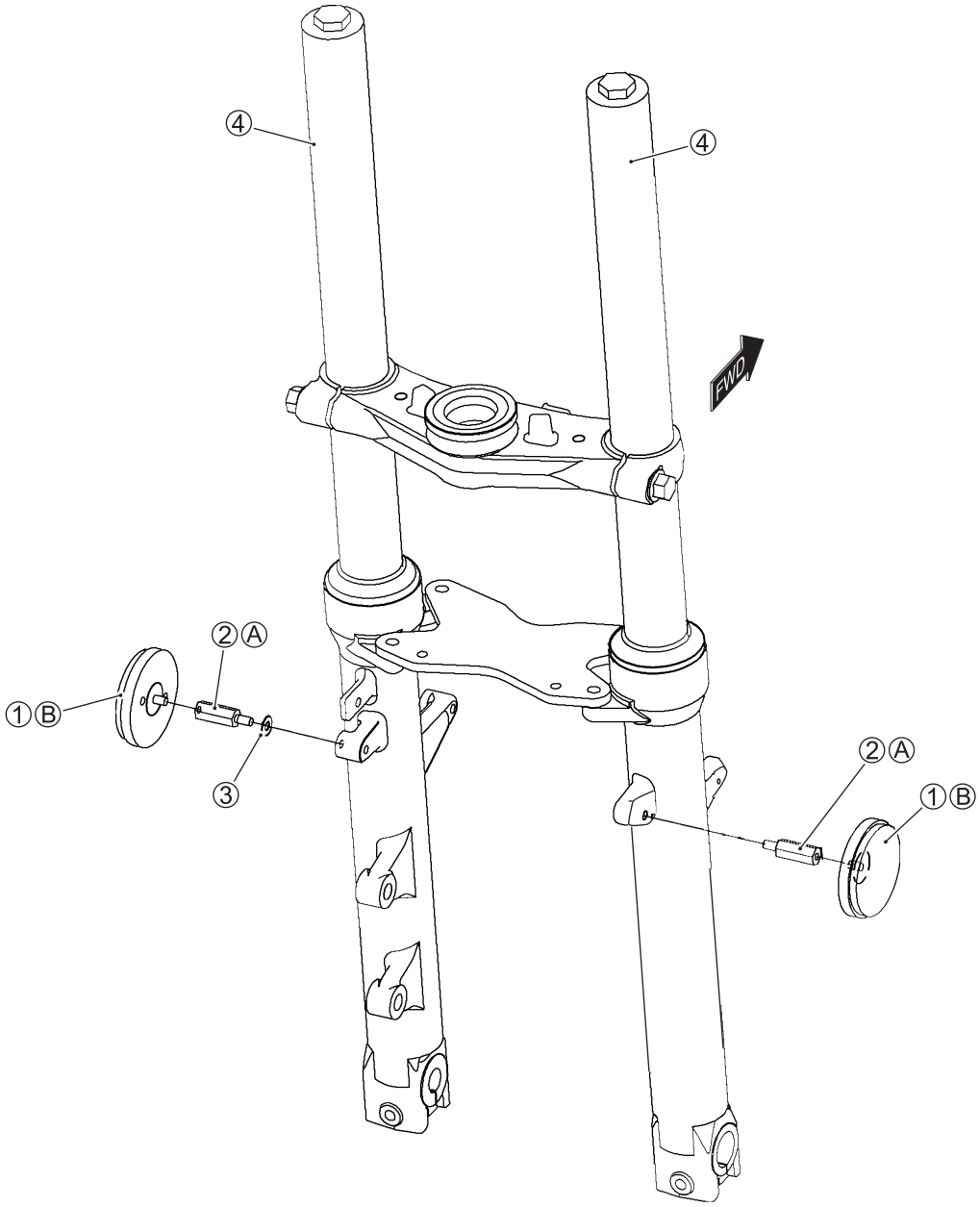
①	Front fender	③	Washer (RH only)
②	Front stabilizer	*1	The embossed lettering of the front stabilizer must face lower side

FRONT LICENSE PLATE INSTALLATION (Only for P-12)



①	Front license plate	②	Clamp

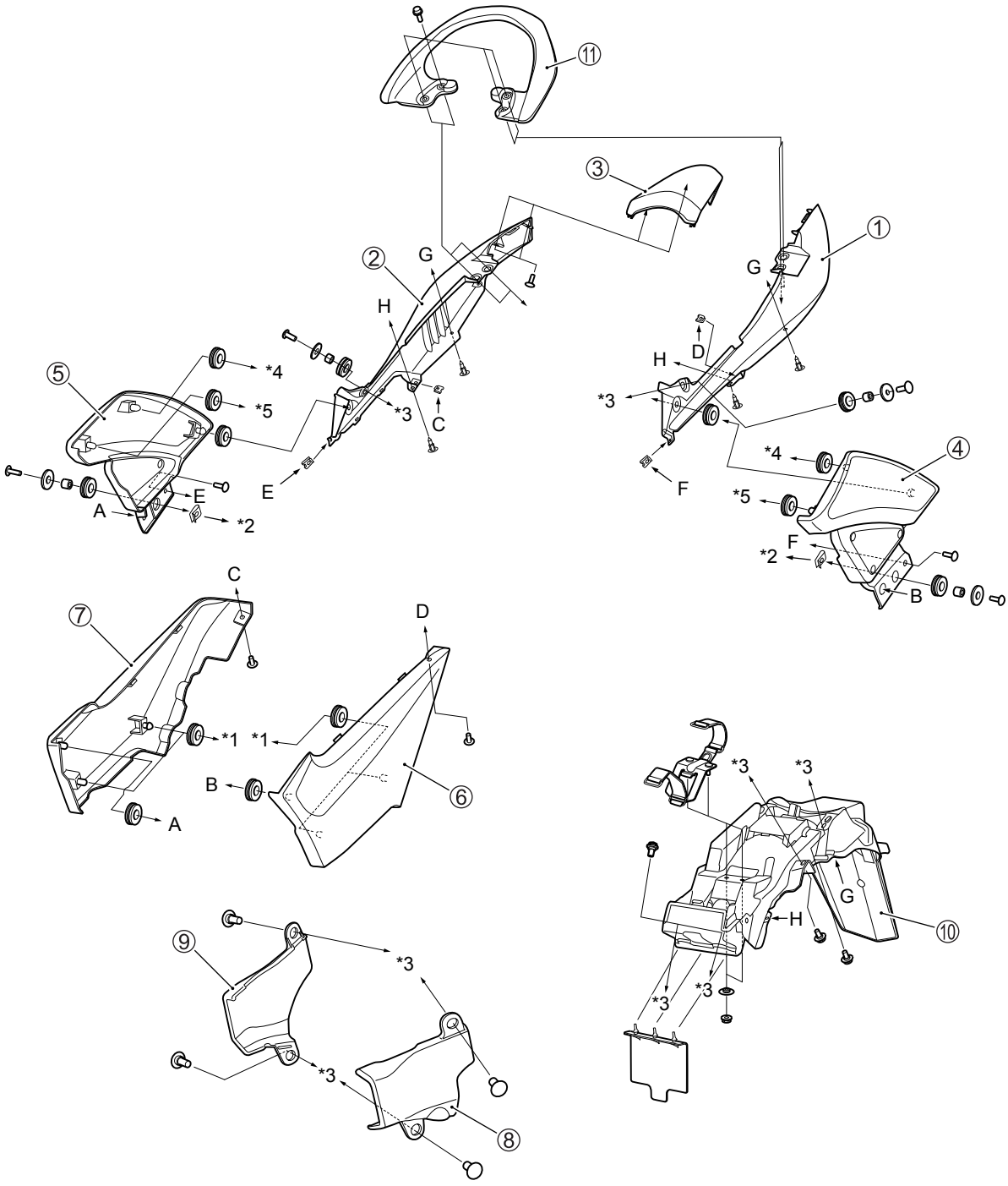
FRONT SIDE REFLEX REFLECTOR INSTALLATION (Only for P-24)



①	Reflex reflector	③	Washer
②	Reflector bolt	④	Front fork

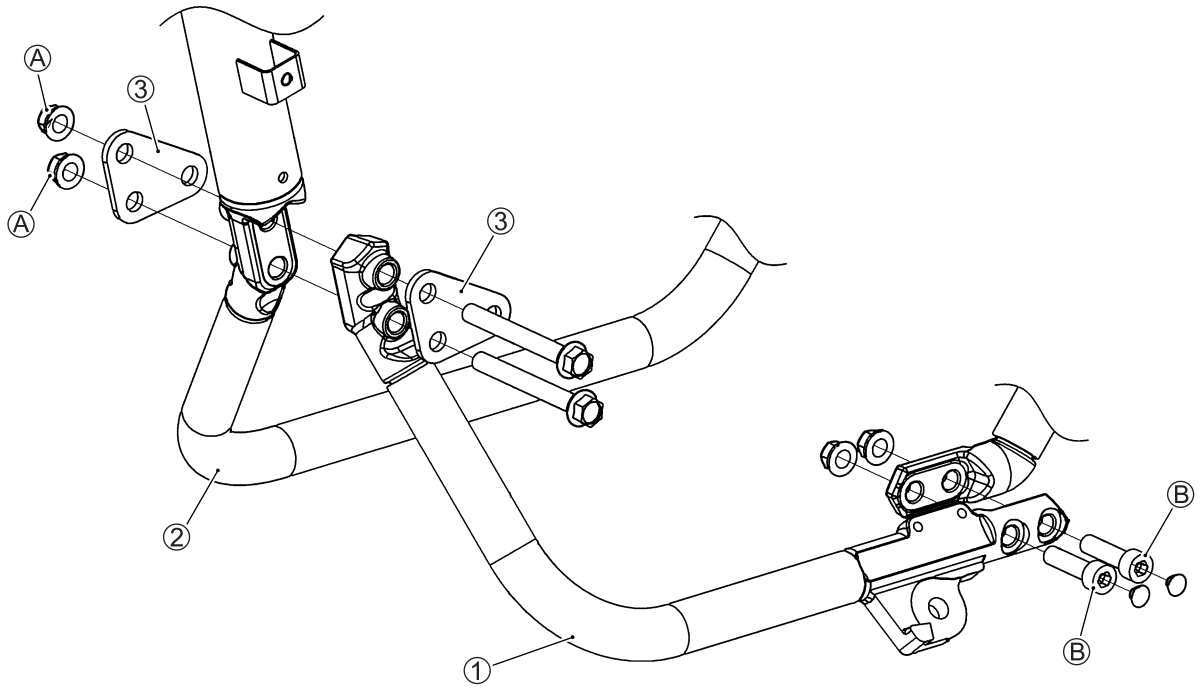
ITEM	N·m	kgf-m	lbf-ft
Ⓐ	4.5	0.45	3.5
Ⓑ	1.8	0.18	1.5

FRAME COVER INSTALLATION



①	Frame upper cover (LH)	⑨	Frame head cover (RH)
②	Frame upper cover (RH)	⑩	Rear fender
③	Frame upper cover (CENTER)	⑪	Pillion rider handle
④	Frame front cover (LH)	*1	To footrest bracket.
⑤	Frame front cover (RH)	*2	To air cleaner box.
⑥	Frame cover (LH)	*3	To frame.
⑦	Frame cover (RH)	*4	To fuel tank.
⑧	Frame head cover (LH)	*5	To fuel tank cover.

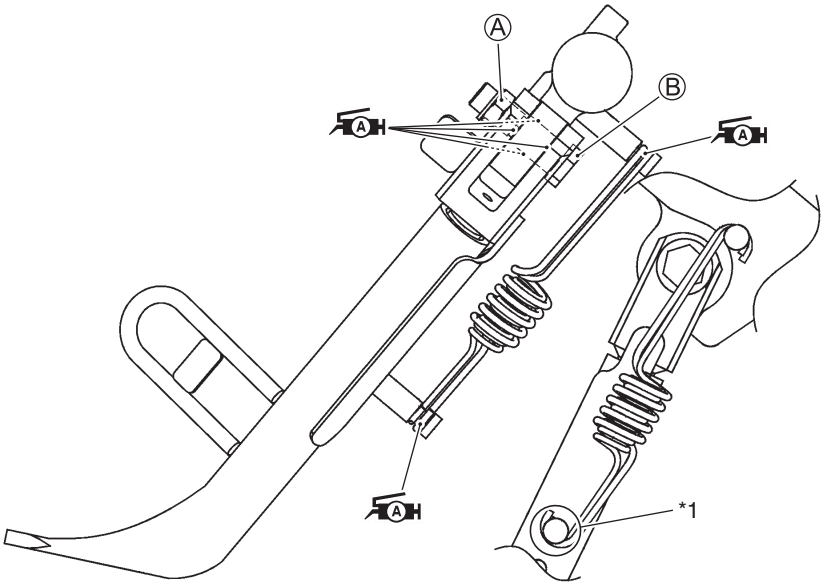
FRAME INSTALLATION



①	Frame down tube
②	Frame
③	Engine mounting bracket

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	60	6.0	43.5
Ⓑ	50	5.0	36.0

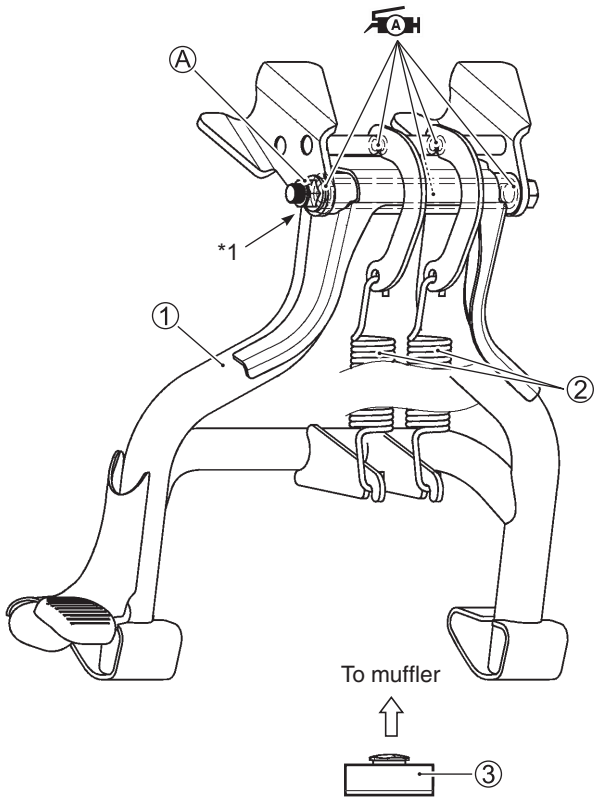
SIDE-STAND INSTALLATION



*1	Install the spring as shown.

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	40	4.0	29.0
Ⓑ	10	1.0	7.0

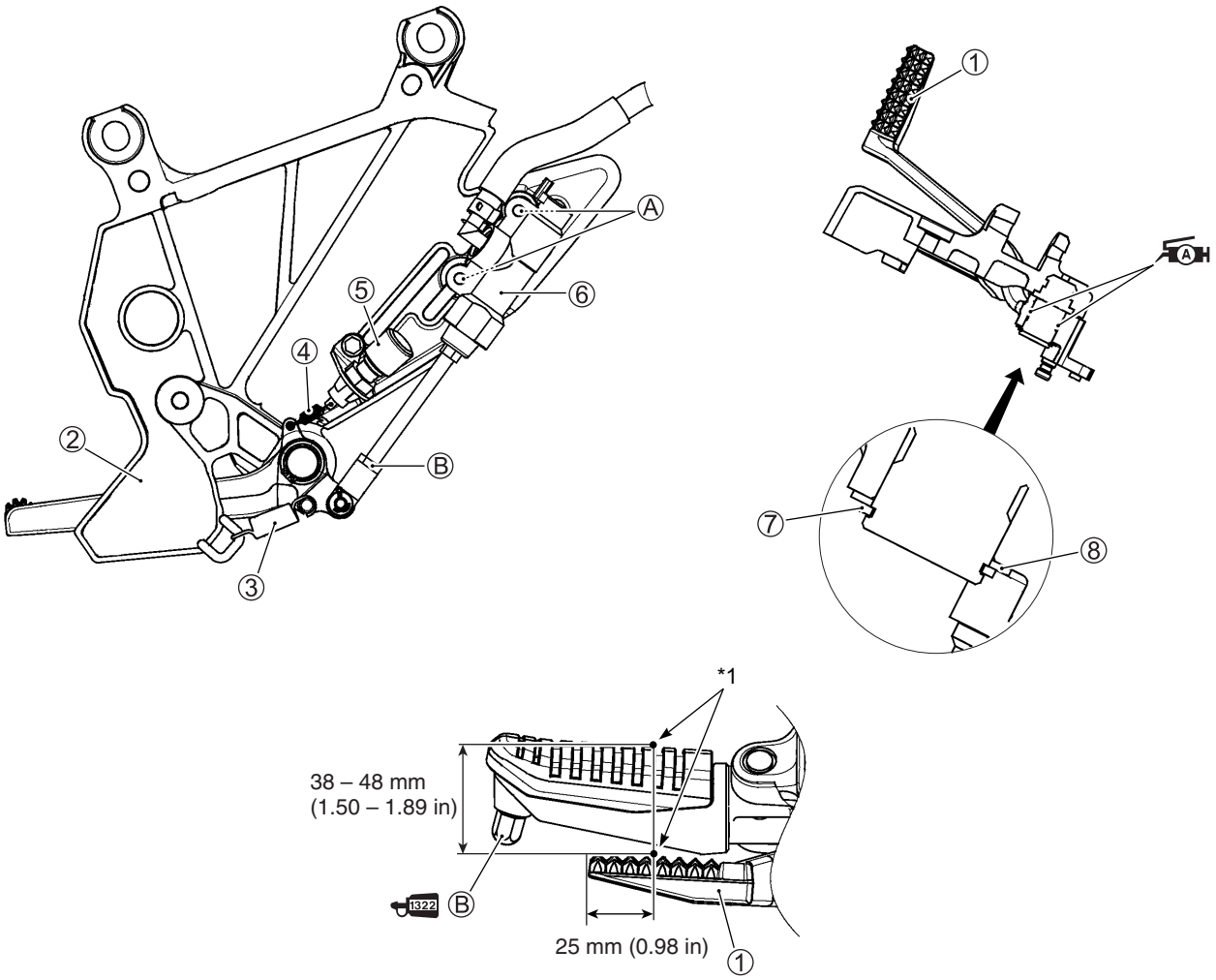
CENTER STAND INSTALLATION (For P-12)



①	Center stand	③	Center stand cushion
②	Center stand spring	*1	Do not apply grease to the flange and thread part.

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	60	6.0	43.5

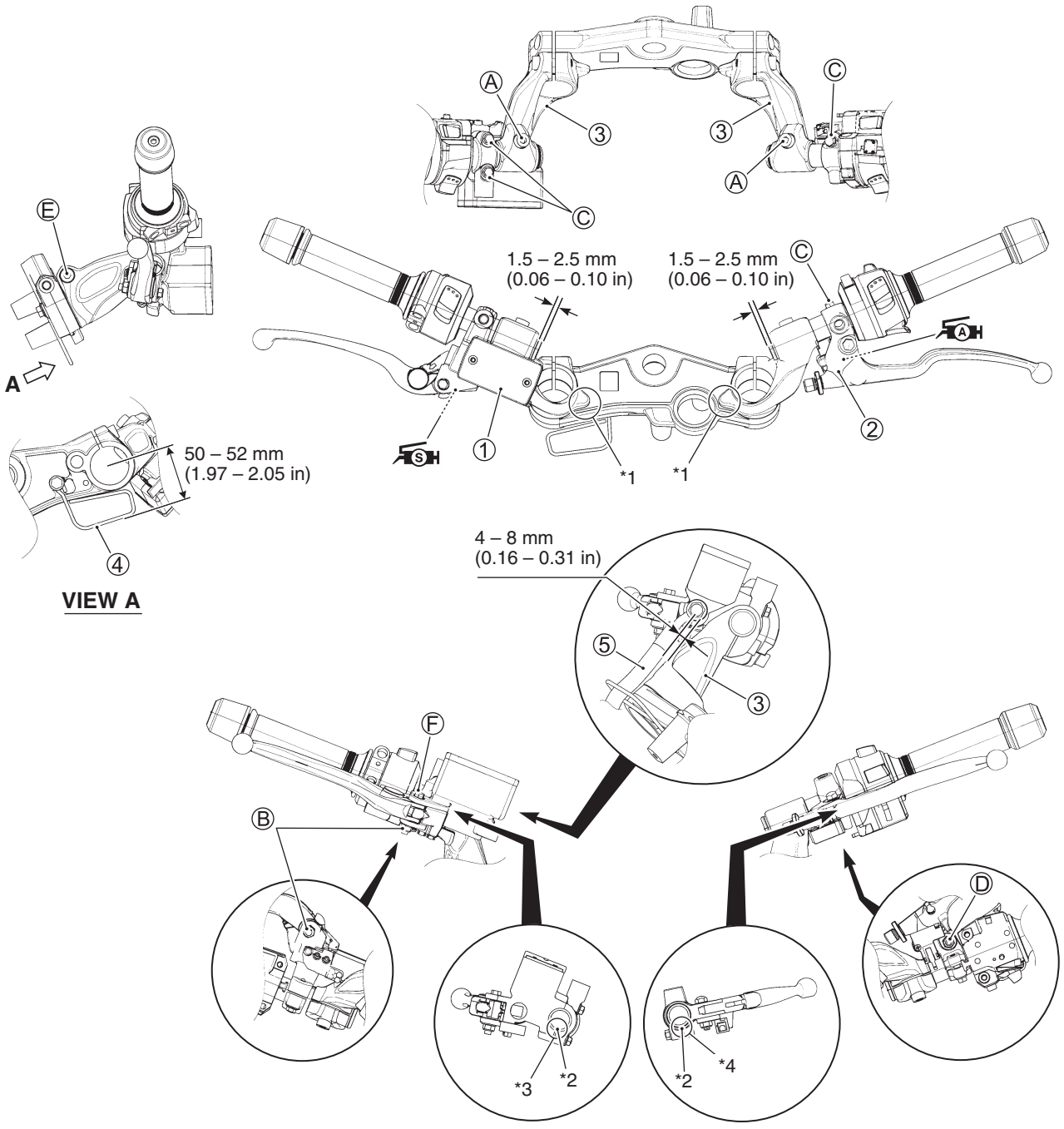
REAR BRAKE PEDAL INSTALLATION



①	Brake pedal	⑥	Rear brake master cylinder
②	Footrest bracket	⑦	Circlip
③	Brake pedal spring	⑧	Washer
④	Brake switch spring	*1	Measuring position.
⑤	Brake switch		

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	10	1.0	7.0
Ⓑ	18	1.8	13.0

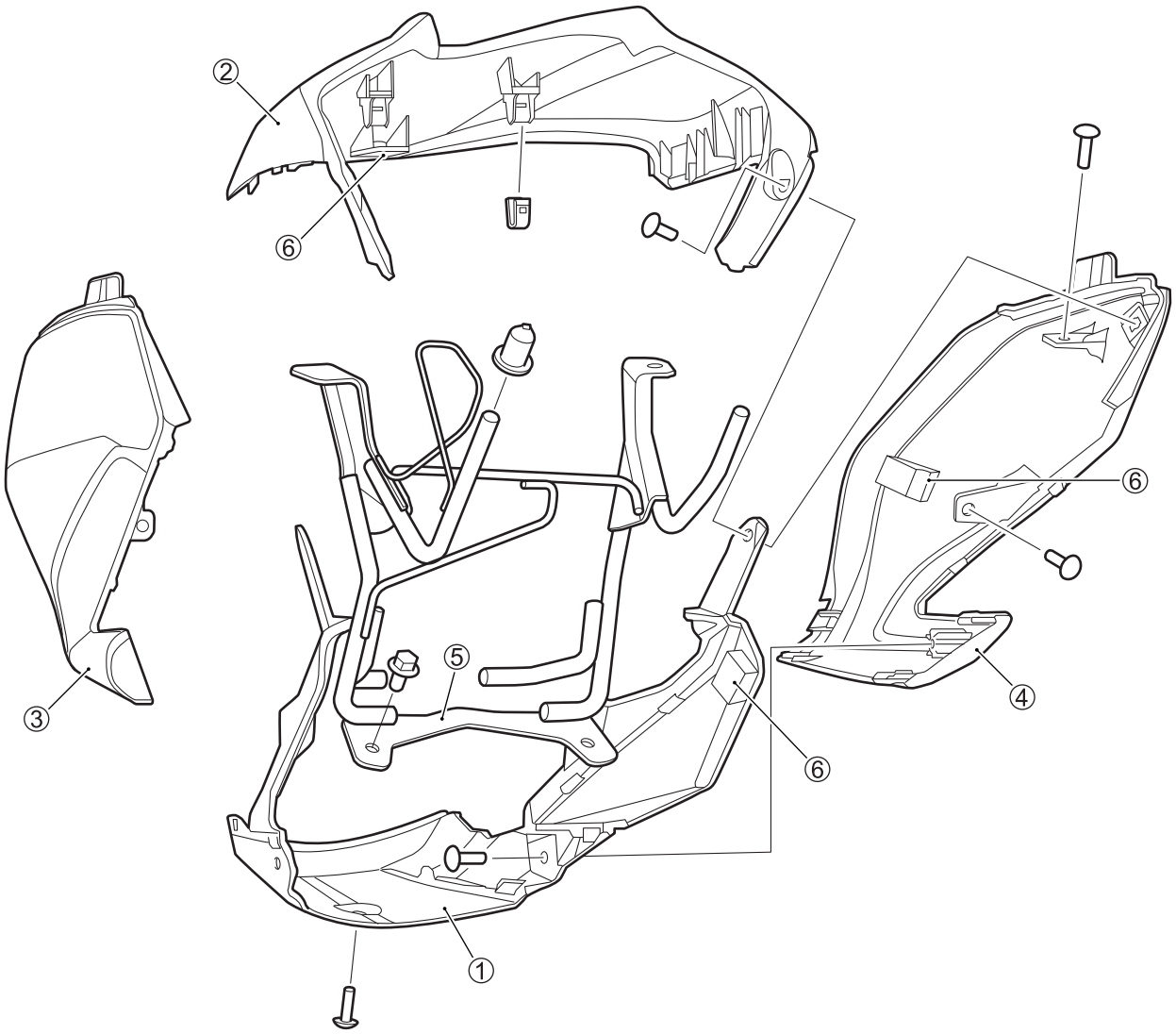
HANDLEBARS INSTALLATION



①	Front brake master cylinder	*1	Set the boss of handlebar holder into the hole of upper bracket.
②	Clutch lever holder	*2	punch mark.
③	Handlebar holder	*3	Align the matching surface of front brake master cylinder with punch mark.
④	Guide	*4	Align the matching surface of clutch lever holder with punch mark.
⑤	Front brake hose		

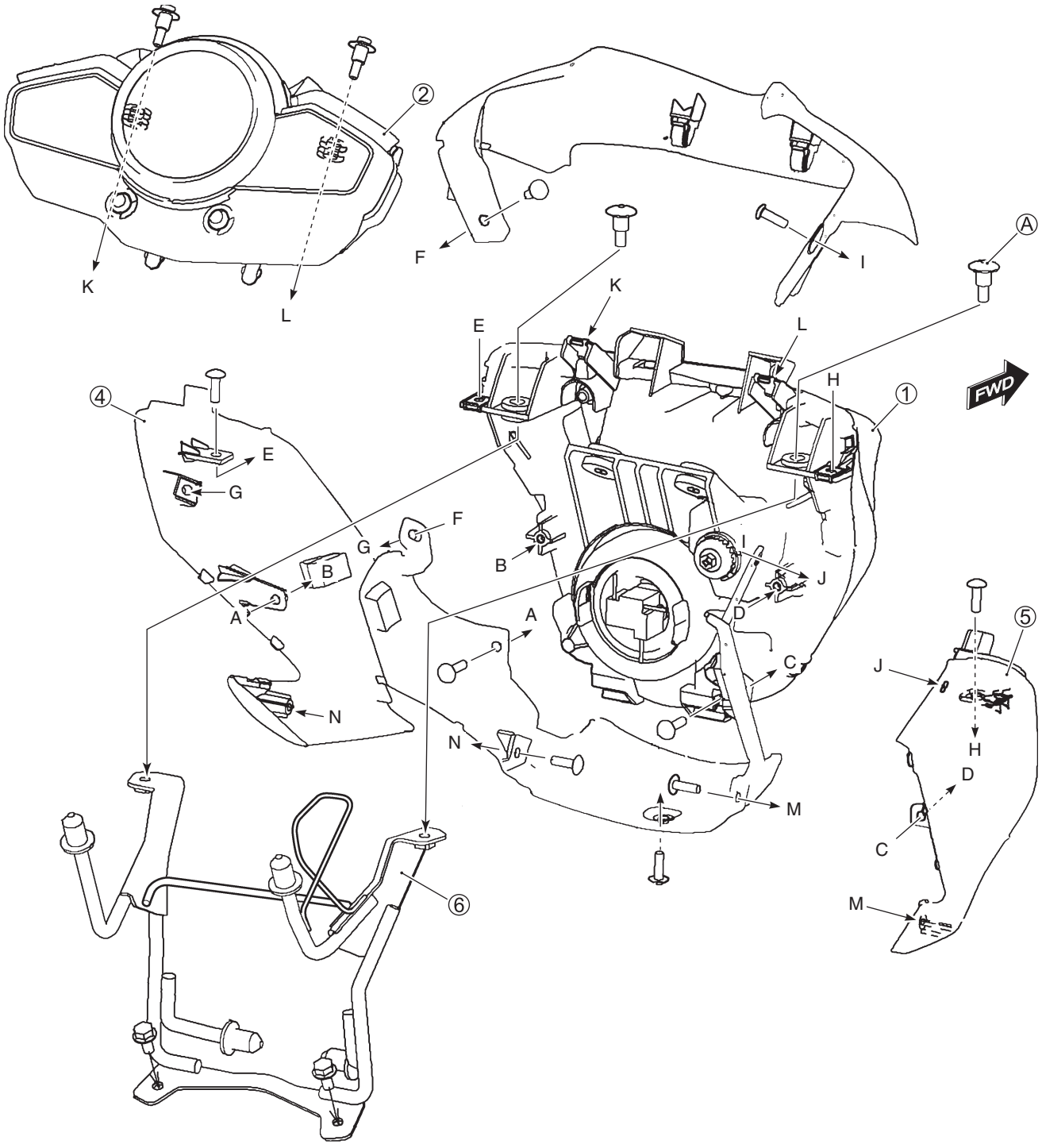
ITEM	N·m	kgf-m	lbf-ft
Ⓐ	16	1.6	11.5
Ⓑ	6	0.6	4.5
Ⓒ	10	1.0	7.0
Ⓓ	6.5	0.65	4.5
Ⓔ	23	2.3	16.5
Ⓕ	1	0.1	0.5

HEADLIGHT COVER INSTALLATION



①	Headlight lower cover	④	Headlight side cover (RH)
②	Headlight upper cover	⑤	Headlight housing brace
③	Headlight side cover (LH)	⑥	Cushion

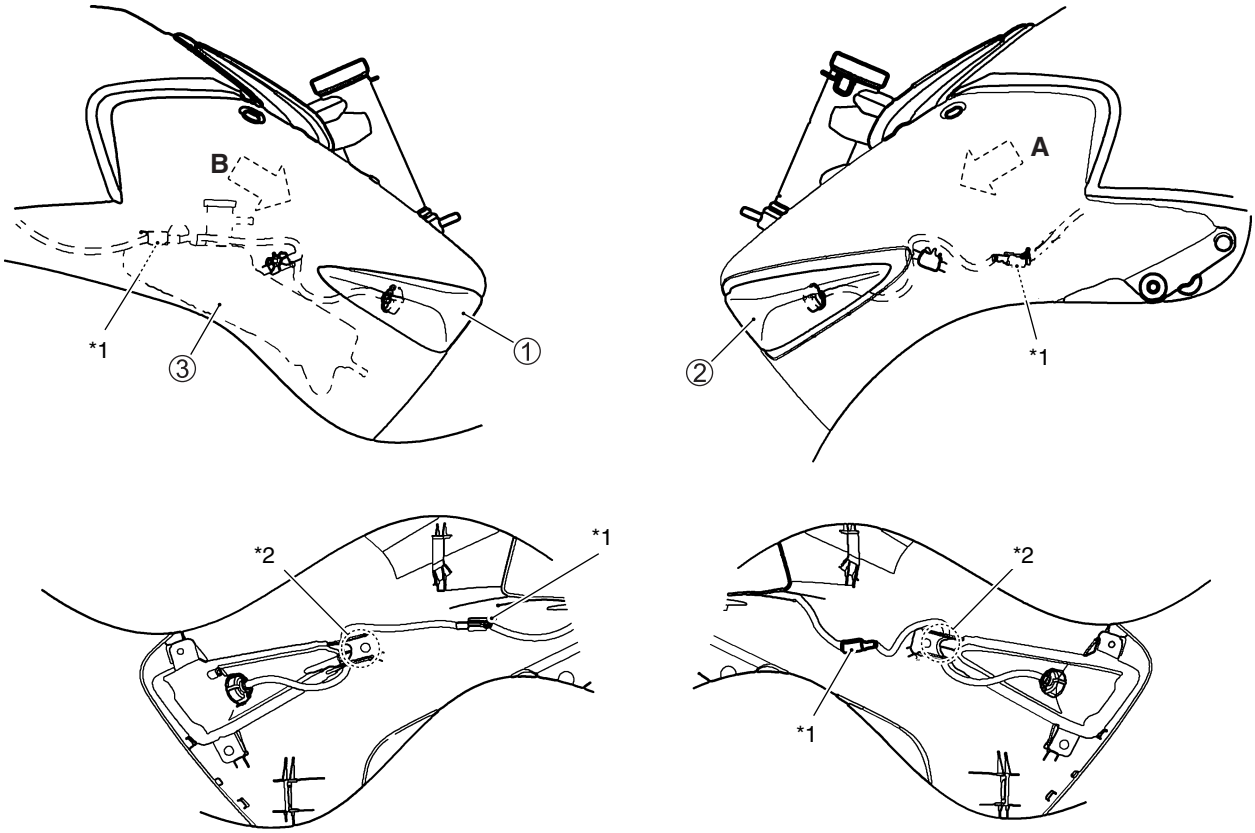
HEADLIGHT INSTALLATION



①	Headlight unit	④	Headlight side cover (LH)
②	Combination meter assembly	⑤	Headlight side cover (RH)
③	Headlight upper cover	⑥	Headlight housing brace

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	6	0.6	4.5

FRONT TURN SIGNAL LIGHT INSTALLATION



VIEW B

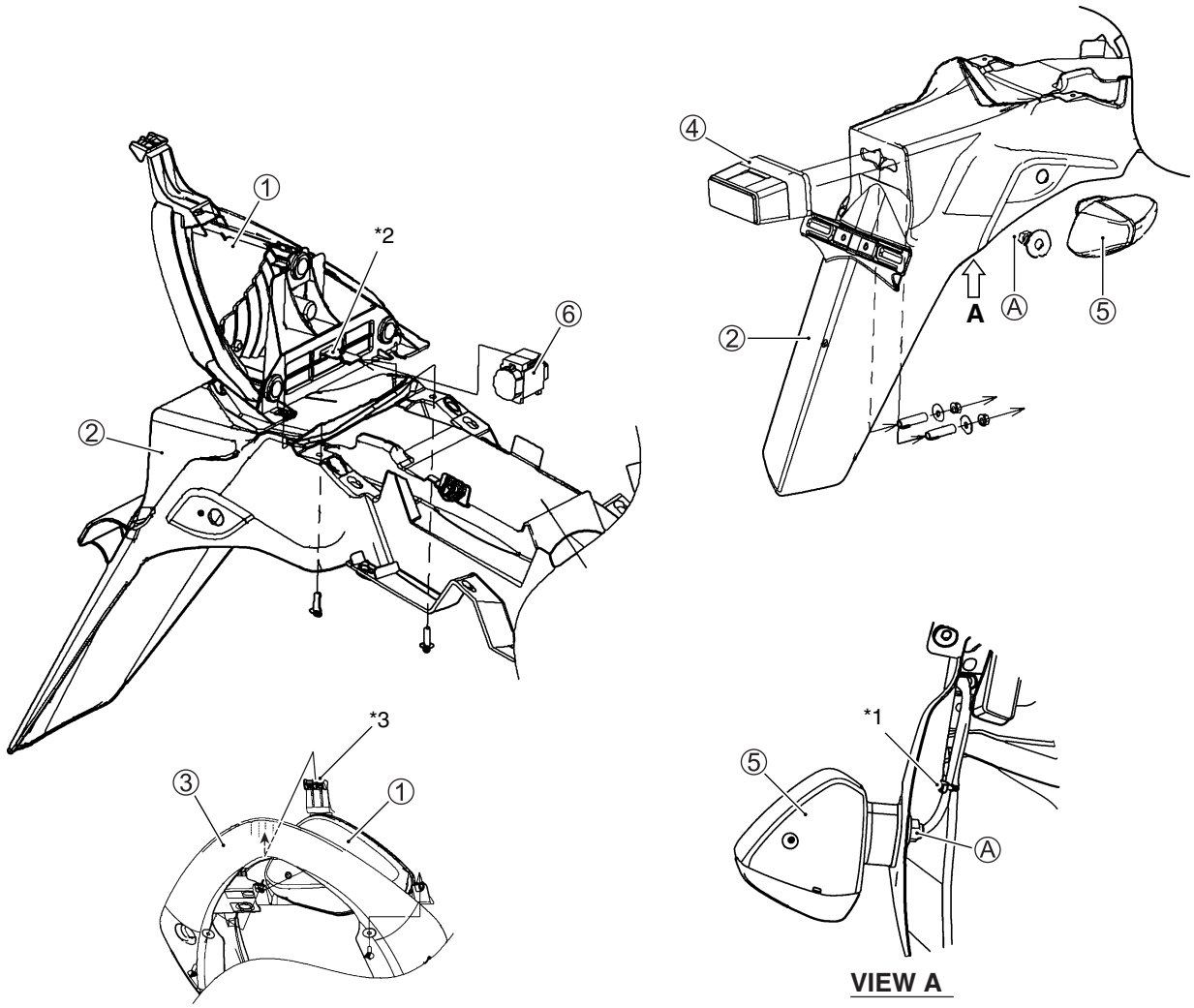
RH

VIEW A

LH

①	Front turn signal light (RH)	③	Radiator reservoir tank	*2	Pass the front turn signal lead wire behind the front turn signal light.
②	Front turn signal light (LH)	*1	Coupler position.		

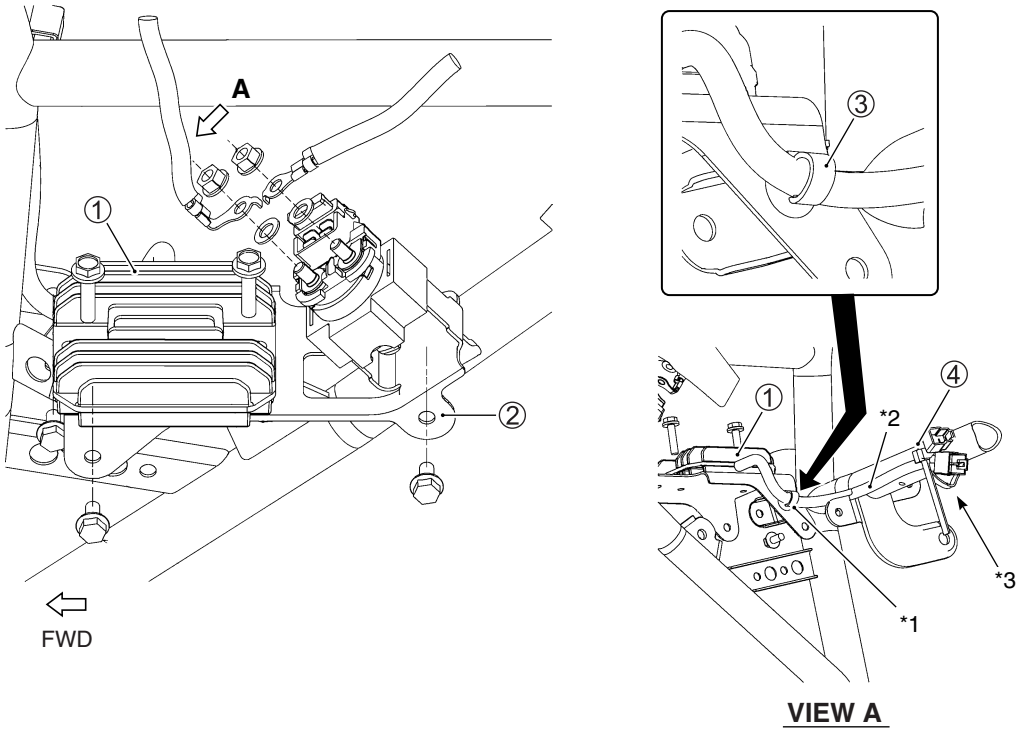
REAR COMBINATION LIGHT INSTALLATION

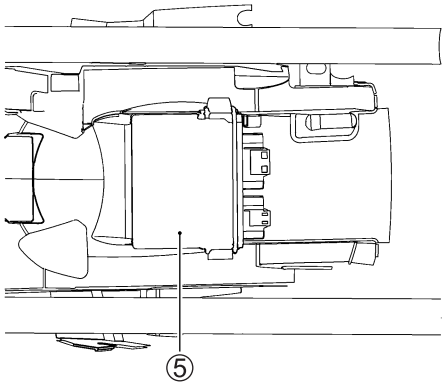


①	Brake/Tail light	*1	Cut the tip of clamp after clamping the lead wires. After clamping the rear turn signal light lead wire and license plate light lead wire, pass the lead wires inside the hole of the rear fender. Do not slacken.
②	Rear fender		
③	Rear frame center cover		
④	License plate light	*2	When installing the TO sensor, do not damage the brake/tail light bracket.
⑤	Rear turn signal light		
⑥	TO sensor	*3	Set the cushion of brake/tail light to the rib of the rear frame center cover.

ITEM	N·m	kgf-m	lbf-ft
Ⓐ	7	0.7	5.0

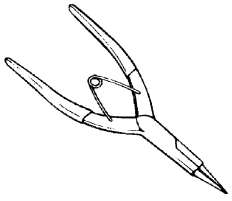
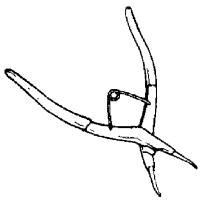
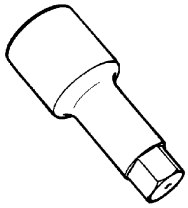
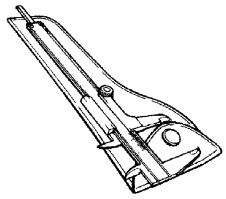
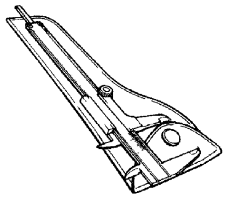
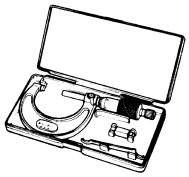
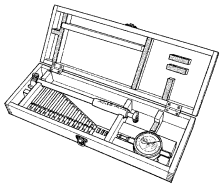
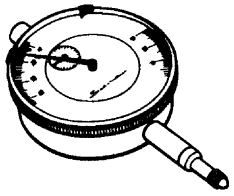
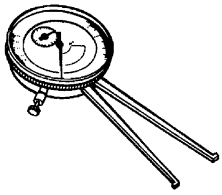
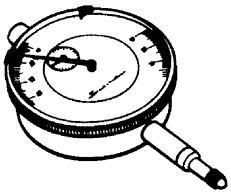
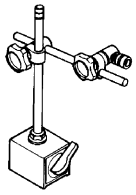
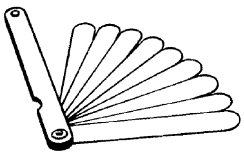
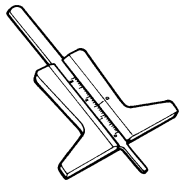
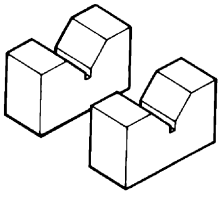
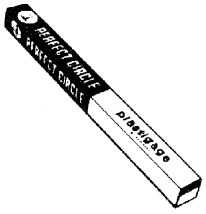
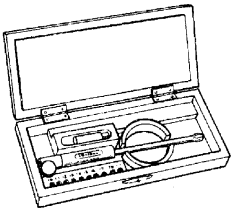
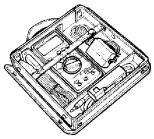
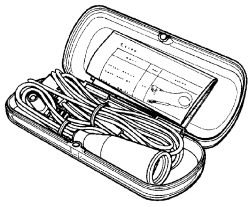
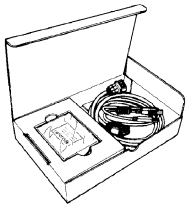
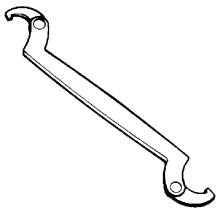
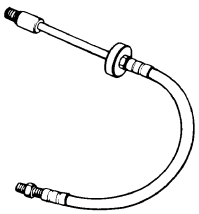
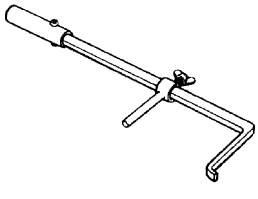
REGULATOR/RECTIFIER INSTALLATION

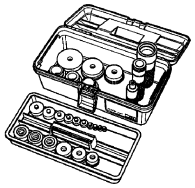
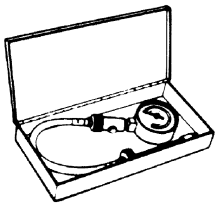
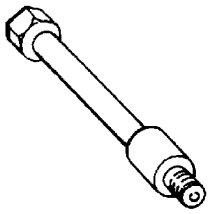
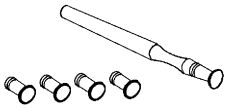
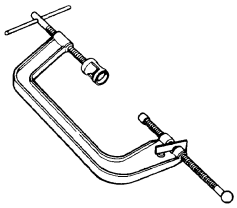
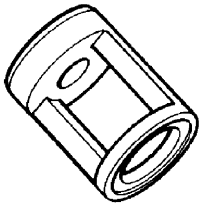
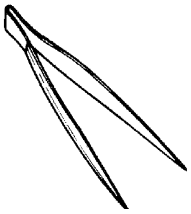
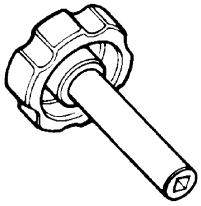
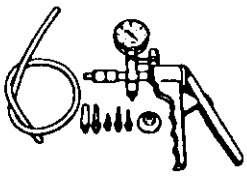
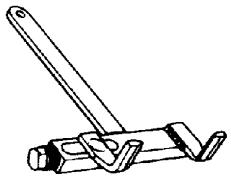
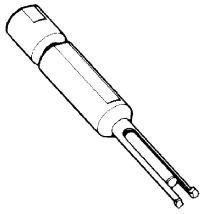
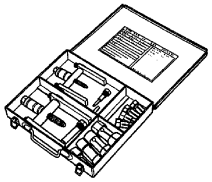
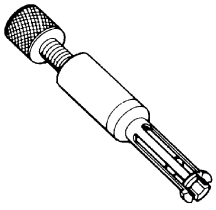
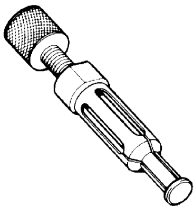
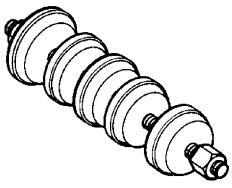
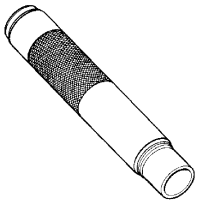
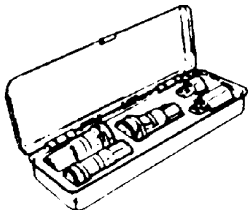
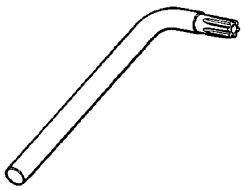
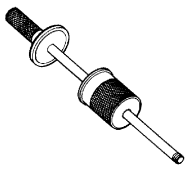
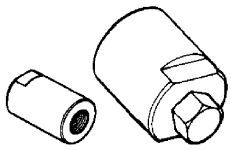
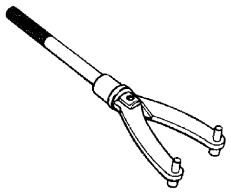
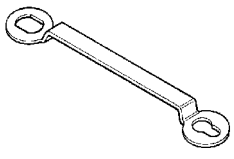


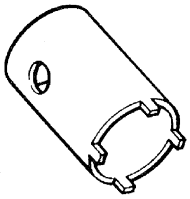
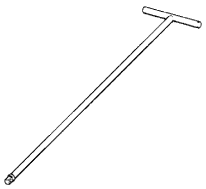
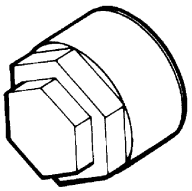
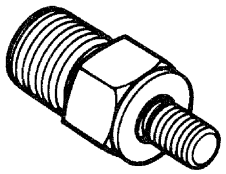
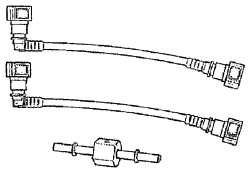
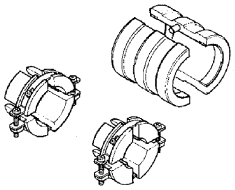
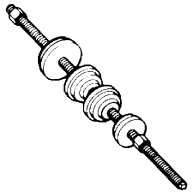
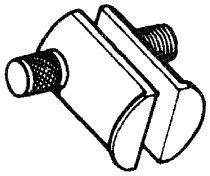
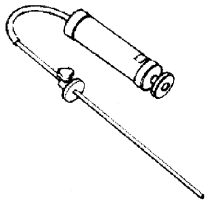
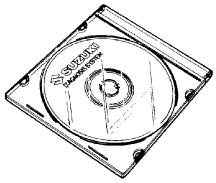


①	Regulator/Rectifier	④	Clamp	*2	Pass the regulator/rectifier lead wire along the frame. Do not slacken.
②	Bracket	⑤	ECM	*3	Clamp the regulator/rectifier lead wire at root of the connector.
③	Clamp	*1	Install the clamp to the bracket.		

SPECIAL TOOLS

 **09900-06107 Snap ring pliers (Open type)**	 **09900-06108 Snap ring pliers (Close type)**	 **09900-18710 Hexagon socket (12 mm)**	 **09900-20101 Vernier calipers (150 mm)**	 **09900-20102 Vernier calipers (200 mm)**
 **09900-20202 Micrometer (25 – 50 mm)**	 **09900-20203 Micrometer (50 – 75 mm)**	 **09900-20205 Micrometer (0 – 25 mm)**	 **09900-20530 Cylinder gauge set**	 **09900-20602 Dial gauge**
 **09900-20605 Dial calipers (10 – 34 mm)**	 **09900-20607 Dial gauge**	 **09900-20701 Dial gauge chuck**	 **09900-20803 Thickness gauge**	 **09900-20805 Tire depth gauge**
 **09900-21304 V blocks**	 **09900-22301 Plastigage (0.025 – 0.076 mm)**	 **09900-22302 Plastigage (0.051 – 0.152 mm)**	 **09900-22403 Small bore gauge (18 – 35 mm)**	 **09900-25008 Multi circuit tester set**
 **09900-25009 Needle-point probe set**	 **09904-41010 SUZUKI Diagnostic system set**	 **09910-60611 Universal clamp wrench**	 **09913-10750 Compression gauge adapter**	 **09913-50121 Oil seal remover**

 **09913-70210** **Bearing installing set (10 – 75 ϕ)**	 **09915-40620** **Oil filter wrench**	 **09915-64512** **Compression gauge**	 **09915-72410** **Oil pressure gauge attachment**	 **09915-74521** **Adapter hose**
 **09915-77331** **Oil pressure gauge (1 000 kPa)**	 **09916-10911** **Valve lapper set**	 **09916-14510** **Valve lifter**	 **09916-14910** **Valve lifter attachment**	 **09916-84511** **Tweezer**
 **09917-14910** **Tappet adjust driver**	 **09917-47011** **Vacuum pump gauge set**	 **09920-53740** **Clutch sleeve hub holder**	 **09921-20210** **Bearing remover (12 mm)**	 **09921-20240** **Bearing remover set**
 **09923-73210** **Bearing remover**	 **09923-74511** **Bearing remover**	 **09924-84510** **Bearing installer set**	 **09925-18011** **Bearing installer**	 **09930-10121** **Spark plug wrench set**
 **09930-11950** **Torx® wrench (T25H)**	 **09930-30104** **Rotor remover sliding shaft**	 **09930-31921** **Rotor remover set**	 **09930-40113** **Flywheel rotor holder**	 **09930-44521** **Rotor holder**

 **09930-82720 Mode selection switch**	 **09940-14911 Steering stem nut socket wrench**	 **09940-34520 T type handle**	 **09940-34581 Front fork assembling attachment (F)**	 **09940-40211 Fuel pressure gauge adapter**
 **09940-40220 Fuel pressure gauge attachment**	 **09940-52861 Front fork oil seal installer set**	 **09940-92720 Spring scale**	 **09941-34513 Bearing installer**	 **09941-54911 Bearing outer race remover**
 **09941-74911 Steering race installer**	 **09943-74111 Front fork oil level gauge**	 **99565-01010-028 CD-ROM Ver.28**		

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NOTE:
When order the special tool, please confirm whether it is available or not.

TIGHTENING TORQUE
ENGINE

ITEM		N·m	kgf-m	lbf-ft
Cylinder head cover bolt	(Initial)	10	1.0	7.0
	(Final)	14	1.4	10.0
Cylinder head bolt		25	2.5	18.0
Cylinder head cover cap bolt		10	1.0	7.0
Cylinder side bolt		10	1.0	7.0
Primary drive gear nut		70	7.0	50.5
Exhaust pipe bolt		23	2.3	16.5
Exhaust connecting bolt		17	1.7	12.5
Muffler support bolt		23	2.3	16.5
Muffler chamber support bolt		23	2.3	16.5
Muffler front cover screw		10	1.0	7.0
Muffler rear cover stay bolt		10	1.0	7.0
Muffler rear cover bolt		10	1.0	7.0
Muffler body cover screw		10	1.0	7.0
Speed sensor rotor bolt		23	2.3	16.5
Speed sensor bolt		4.5	0.45	3.5
Speed sensor bracket bolt		10	1.0	7.0
Engine sprocket nut		120	12.0	87.0
Engine mounting nut		55	5.5	40.0
Engine mounting bracket nut		60	6.0	43.5
Crank balancer bolt		50	5.0	36.0
Valve clearance adjuster lock-nut		10	1.0	7.0
Camshaft sprocket bolt		15	1.5	11.0
Spark plug		11	1.1	8.0
Throttle cable nut		4.5	0.45	3.0
Camshaft journal holder bolt		10	1.0	7.0
Cam chain tension adjuster cap bolt		8	0.8	6.0
Cam chain tension adjuster mounting bolt		10	1.0	7.0
Cam chain tensioner bolt		10	1.0	7.0
PAIR reed valve cover bolt		10	1.0	7.0
Generator cover plug		11	1.1	8.0
Clutch cover bolt		10	1.0	7.0
Clutch sleeve hub nut		50	5.0	36.0
Clutch release adjuster lock-nut		5.5	0.55	4.0
Clutch cable adjuster lock-nut		4.5	0.45	3.0
Valve timing inspection plug		21	2.1	15.0
Starter clutch bolt		26	2.6	19.0
Generator cover bolt		10	1.0	7.0
Generator rotor bolt		130	13.0	94.0
Generator stator set bolt		11	1.1	8.0
Gearshift cam stopper bolt		10	1.0	7.0
Gearshift cam stopper plate bolt		11	1.1	8.0

ITEM			N·m	kgf-m	lbf-ft
Shift cam bearing retainer screw			10	1.0	7.0
Oil pressure switch			13	1.3	9.5
Oil filter			20	2.0	14.5
Oil pressure switch lead wire bolt			1.5	0.15	1.0
Gearshift arm stopper			19	1.9	13.5
Gearshift fork shaft plug			25	2.5	18.0
Oil pressure regulator			28	2.8	20.0
Oil filter union bolt			15	1.5	11.0
Oil separator plate bolt			10	1.0	7.0
Engine sprocket cover bolt			10	1.0	7.0
Ignition coil nut			6.5	0.65	4.5
Gearshift lever shaft			40	4.0	29.0
Gearshift link arm bolt			10	1.0	7.0
Crankshaft journal bolt	(M: 8)	(Initial)	15	1.5	11.0
		(Final)	26	2.6	19.0
Crankcase bolt	(M: 6)		11	1.1	8.0
	(M: 8)		26	2.6	19.0
Oil gallery plug	Cylinder head		10	1.0	7.0
	Lower crankcase		25	2.5	18.0
Oil drain plug			23	2.3	16.5
Oil pump mounting bolt			10	1.0	7.0
Conrod cap bolt	(Initial)		15	1.5	11.0
	(Final)		90° (1/4 turn)		
Breather cover bolt			10	1.0	7.0
Oil strainer bolt			10	1.0	7.0
Oil pan bolt			10	1.0	7.0
Starter motor mounting bolt			10	1.0	7.0
Starter motor lead wire bolt			2.7	0.27	2.0
Headlight mounting screw			6	0.6	4.5

FI SYSTEM AND INTAKE AIR SYSTEM

ITEM	N·m	kgf-m	lbf-ft
GP switch mounting bolt	6.5	0.65	4.5
CKP sensor mounting bolt	5.5	0.55	4.0
Fuel delivery pipe mounting screw	5	0.5	3.5
Fuel pump mounting bolt	10	1.0	7.0
HO2 sensor	25	2.5	18.0
EVAP canister bracket mounting bolt	10	1.0	7.0
EVAP canister holder screw	5.5	0.55	4.0
EVAP system purge control solenoid valve mounting nut	7	0.7	5.0
Air cleaner upper mounting bolt	10	1.0	7.0
Air cleaner lower mounting bolt	5.5	0.55	4.0

COOLING SYSTEM

ITEM	N·m	kgf-m	lbf-ft
Impeller securing bolt	8	0.8	6.0
Water pump cover screw	5.5	0.55	4.0
Water pump mounting bolt	10	1.0	7.0
Water pump air bleeder bolt	6	0.6	4.5
Water jacket plug	25	2.5	18.0
Cooling fan motor assembly mounting bolt	7	0.7	5.0
Cooling fan mounting nut	1.1	0.11	1.0
ECT sensor	18	1.8	13.0
Cooling fan motor mounting screw	2.7	0.27	2.0
Radiator assembly mounting bolt	10	1.0	7.0
Reservoir tank mounting bolt	6	0.6	4.5
Reservoir tank bracket mounting bolt	10	1.0	7.0
Cylinder head water outlet pipe bolt	10	1.0	7.0
Water hose clamp screw	1.5	0.15	1.0
Thermostat connector cap bolt	10	1.0	7.0

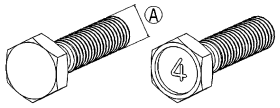
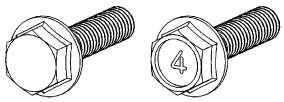
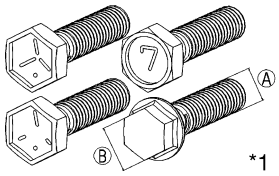
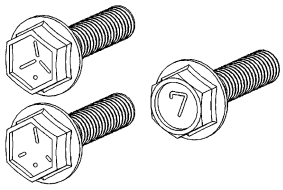
CHASSIS

ITEM	N·m	kgf-m	lbf-ft
Steering stem head nut	65	6.5	47.0
Steering stem nut	23 N·m (2.3 kgf-m, 16.5 lbf-ft) then turn counterclockwise 0 – 1/4		
Front fork upper clamp bolt	23	2.3	16.5
Front fork lower clamp bolt	33	3.3	24.0
Front fork cap bolt	23	2.3	16.5
Front fork damper rod bolt	30	3.0	21.5
Front axle	65	6.5	47.0
Front axle pinch bolt	23	2.3	16.5
Handlebar clamp bolt	16	1.6	11.5
Handlebar holder bolt	23	2.3	16.5

Front brake master cylinder holder bolt	10	1.0	7.0
Front brake caliper mounting bolt	26	2.6	19.0
Front brake caliper sliding pin A	23	2.3	16.5
Front brake caliper sliding pin B	13	1.3	9.5
Front brake pad mounting pin	18	1.8	13.0
Front brake pad pin plug	2.5	0.25	2.0
Brake hose union bolt	23	2.3	16.5
Front brake lever pivot bolt	1	0.1	0.5
Front brake lever pivot bolt lock-nut	6	0.6	4.5
Air bleeder valve (Front and Rear brake caliper)	6	0.6	4.5
Brake disc bolt (Front)	18	1.8	13.0
Brake disc bolt (Rear)	23	2.3	16.5
Rear brake caliper mounting bolt	23	2.3	16.5
Rear brake caliper sliding pin	27	2.7	19.5
Rear brake pad mounting pin	18	1.8	13.0
Rear brake pad pin plug	2.5	0.25	2.0
Rear brake master cylinder mounting bolt	10	1.0	7.0
Rear brake master cylinder rod lock-nut	18	1.8	13.0
Front footrest bracket mounting bolt	23	2.3	16.5
Swingarm pivot nut	65	6.5	47.0
Rear shock absorber mounting nut (Upper)	50	5.0	36.0
Rear shock absorber mounting nut (Lower)	84	8.4	61.0
Rear axle nut	65	6.5	47.0
Rear sprocket nut	49	4.9	35.5
Side-stand nut	40	4.0	29.0
Side-stand bolt	10	1.0	7.0
Frame down tube bolt/nut	50	5.0	36.0
Rear turn signal light mounting nut	7	0.7	5.0
Front reflector bolt (For P-24)	4.5	0.45	3.5
Front reflex reflector (For P-24)	1.8	0.18	1.5
Clutch lever holder bolt	10	1.0	7.0
Clutch lever pivot nut	6.5	0.65	4.5
Bank sensor bolt	18	1.8	13.0
Center stand nut (For P-12)	60	6.0	43.5

TIGHTENING TORQUE CHART

Each fastener should be tightened to the torque specified in “TIGHTENING LIST”. If no description or specification is provided, refer to the following tightening torque chart for the applicable torque for each fastener.

Strength	Unit	Thread diameter (Nominal diameter) Ⓐ [mm]								
		4	5	6	8	10	12	14	16	18
A equivalent of 4T strength fastener without flange 	N·m	1.5	3.0	5.5	13	29	45	65	105	160
	kgf-m	0.15	0.3	0.55	1.3	2.9	4.5	6.5	10.5	16.0
	lbf-ft	1.0	2.0	4.0	9.5	21.0	32.5	47.0	76.0	115.5
A equivalent of 4T strength fastener with flange 	N·m	1.7	3.3	6	14	32	50	72	116	176
	kgf-m	0.17	0.33	0.6	1.4	3.2	5.0	7.2	11.6	17.6
	lbf-ft	1.0	2.5	4.5	10.0	23.0	36.0	52.0	84.0	127.5
A equivalent of 7T strength fastener without flange and small crown shape bolt *1 	N·m	2.3	4.5	10	23	50	85	135	210	240
	kgf-m	0.23	0.45	1.0	2.3	5.0	8.5	13.5	21.0	24.0
	lbf-ft	1.5	3.5	7.0	16.5	36.0	61.5	97.5	152.0	173.5
A equivalent of 7T strength fastener with flange except small crown shape bolt 	N·m	2.5	5	11	25	55	94	149	231	264
	kgf-m	0.25	0.5	1.1	2.5	5.5	9.4	14.9	23.1	26.4
	lbf-ft	2.0	3.5	8.0	18.0	40.0	68.0	107.5	167.0	191.0

*1: Small crown shape bolt (crown shape bolt with flange either “Ⓐ = 5 & Ⓑ = 7” or “Ⓐ = 6 & Ⓑ = 8”)

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	27.0 (1.06)	—
	EX.	22.5 (0.89)	—
Valve clearance (when cold)	IN.	0.05 – 0.10 (0.002 – 0.004)	—
	EX.	0.17 – 0.22 (0.007 – 0.009)	—
Valve guide to valve stem clearance	IN.	0.010 – 0.037 (0.0004 – 0.0015)	—
	EX.	0.030 – 0.057 (0.0012 – 0.0022)	—
Valve guide I.D.	IN. & EX.	5.000 – 5.012 (0.1969 – 0.1973)	—
Valve stem O.D.	IN.	4.975 – 4.990 (0.1959 – 0.1965)	—
	EX.	4.955 – 4.970 (0.1951 – 0.1957)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	2.2 (0.09)
Valve seat width	IN. & EX.	0.9 – 1.1 (0.035 – 0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	32.1 (1.26)
	OUTER	—	31.8 (1.25)
Valve spring tension (IN. & EX.)	INNER	58.2 – 71.2 N (6.0 – 7.3 kgf, 13.2 –16.1 lbs) at length 28.0 mm (1.10 in)	—
	OUTER	158.7 – 182.5 N (16.2 – 18.6 kgf, 35.7 – 41.0 lbs) at length 31.5 mm (1.24 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.34 – 33.38 (1.313 – 1.314)	33.04 (1.301)
	EX.	33.05 – 33.09 (1.301 – 1.303)	32.75 (1.289)
Camshaft journal oil clearance	0.032 – 0.066 (0.0013 – 0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	22.012 – 22.025 (0.8666 – 0.8671)		—
Camshaft journal O.D.	21.959 – 21.980 (0.8645 – 0.8654)		—
Camshaft runout	—		0.10 (0.004)
Rocker arm I.D.	IN. & EX.	12.003 – 12.018 (0.4726 – 0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.986 – 11.994 (0.4719 – 0.4722)	—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 300 – 1 700 kPa (13 – 17 kgf/cm², 185 – 242 psi)			1 000 kPa (10 kgf/cm², 142 psi)
Compression pressure difference	—			200 kPa (2 kgf/cm², 28 psi)
Piston-to-cylinder clearance	0.04 – 0.05 (0.001 – 0.002)			0.120 (0.0047)
Cylinder bore	53.500 – 53.515 (2.1063 – 2.1069)			53.590 (2.1098)
Piston diam.	53.455 – 53.470 (2.1045 – 2.1051) Measure at 10 mm (0.4 in) from the skirt end.			53.380 (2.1016)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	1R	Approx. 5.3 (0.21)	4.2 (0.17)
	2nd	2R	Approx. 4.6 (0.18)	3.6 (0.14)
Piston ring end gap	1st		0.20 – 0.32 (0.008 – 0.013)	0.50 (0.020)
	2nd		0.20 – 0.32 (0.008 – 0.013)	0.50 (0.020)
Piston ring-to-groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.01 – 1.03 (0.0398 – 0.0406)	—
	2nd		1.01 – 1.03 (0.0398 – 0.0406)	—
	Oil		2.01 – 2.03 (0.0791 – 0.0799)	—
Piston ring thickness	1st		0.97 – 0.99 (0.0382– 0.0390)	—
	2nd		0.97 – 0.99 (0.0382 – 0.0390)	—
Piston pin bore	15.002 – 15.008 (0.5906 – 0.5909)			15.030 (0.5917)
Piston pin O.D.	14.996 – 15.000 (0.5904 – 0.5906)			14.980 (0.5898)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	15.006 – 15.014 (0.5908 – 0.5911)		15.040 (0.5921)
Conrod big end side clearance	0.10 – 0.20 (0.004 – 0.008)		0.30 (0.012)
Conrod big end width	19.95 – 20.00 (0.7854 – 0.7874)		—
Crank pin width	20.10 – 20.15 (0.7913 – 0.7933)		—
Conrod big end oil clearance	0.032 – 0.056 (0.0013 – 0.0022)		0.080 (0.0031)
Crank pin O.D.	30.976 – 31.000 (1.2195 – 1.2205)		—
Crankshaft journal oil clearance	0.016 – 0.040 (0.0006 – 0.0016)		0.080 (0.0031)
Crankshaft journal O.D.	29.976 – 30.000 (1.1802 – 1.1811)		—
Crankshaft thrust bearing thickness	Right side	2.450 – 2.625 (0.0965 – 0.1033)	—
	Left side	2.450 – 2.475 (0.0965 – 0.0974)	
Crankshaft thrust clearance	0.050 – 0.105 (0.0020 – 0.0041)		—
Crankshaft runout	—		0.05 (0.002)

CRANK BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Crank balancer journal oil clearance	0.020 – 0.044 (0.0008 – 0.0017)	0.080 (0.0031)
Crank balancer journal O.D.	27.976 – 28.000 (1.0660 – 1.1024)	—
Balancer spring free length	—	10.3 (0.41)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	200 – 500 kPa (2 – 5 kgf/cm², 28 – 71 psi) at 3 000 r/min	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD / SPECIFICATION		LIMIT
Clutch cable play	10 – 15 (0.39 – 0.59)		—
Clutch release screw	1 turn counterclockwise		—
Drive plate thickness	No. 1 and 2	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
	No. 3	3.42 – 3.58 (0.135 – 0.141)	3.12 (0.123)
Drive plate claw width	No. 1 and 2	15.9 – 16.0 (0.626 – 0.630)	15.2 (0.598)
	No. 3	15.98 – 16.05 (0.629 – 0.632)	15.2 (0.598)
Driven plate distortion	No. 1, 2 and 3	—	0.10 (0.004)
Clutch spring free length	38.5 (1.528)		36.6 (1.441)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		3.238 (68/21)		—
Final reduction ratio		3.286 (46/14)		—
Gear ratios	Low	2.417 (29/12)		—
	2nd	1.529 (26/17)		—
	3rd	1.182 (26/22)		—
	4th	1.043 (24/23)		—
	5th	0.909 (20/22)		—
	Top	0.808 (21/26)		—
Shift fork to groove clearance		0.10 – 0.30 (0.004 – 0.012)		0.50 (0.020)
Shift fork groove width		5.0 – 5.1 (0.197 – 0.201)		—
Shift fork thickness		4.8 – 4.9 (0.189 – 0.193)		—
Drive chain		Type	DID520VF	
		Links	116 links	—
		20-pitch length	—	320.5 (12.62)
Drive chain slack		20 – 30 (0.8 – 1.2)		—
Gearshift lever height		28 – 38 (1.1 – 1.5)		—

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STANDARD/SPECIFICATION		NOTE
Thermostat valve opening temperature	Approx. 88 °C (190 °F)		—
Thermostat valve lift	4.5 mm (0.18 in) and over at 100 °C (212 °F)		—
ECT sensor resistance	20 °C (68 °F)	Approx. 2.45 kΩ	—
	50 °C (122 °F)	Approx. 0.811 kΩ	—
	80 °C (176 °F)	Approx. 0.318 kΩ	—
	110 °C (230 °F)	Approx. 0.142 kΩ	—
Radiator cap valve opening pressure	93 – 123 kPa (0.93 – 1.23 kgf/cm², 13.2 – 17.5 psi)		—
Cooling fan operating temperature	OFF→ON	Approx. 105 °C (221°F)	—
	ON→OFF	Approx. 100 °C (212 °F)	—
Engine coolant type	Use an antifreeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		—
Engine coolant	Reserve tank side	Approx. 250 ml (0.3/0.2 US/Imp qt)	—
	Engine side	Approx. 1 100 ml (1.2/1.0 US/Imp qt)	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	STANDARD	NOTE
Injector resistance	11.5 – 12.5 Ω at 20 °C (68 °F)	
Fuel pump discharge amount	97.2 ml (3.3/3.4 US/Imp oz) or more/10 sec.	
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	

FI SENSORS

ITEM	STANDARD		NOTE
CKP sensor resistance	150 – 230 Ω		
CKP sensor peak voltage	1.5 V or more		When cranking
IAP sensor input voltage	4.5 – 5.5 V		
IAP sensor output voltage	Approx. 2.6 V at idle speed		
TP sensor input voltage	4.5 – 5.5 V		
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.4 V	
ECT sensor input voltage	4.5 – 5.5 V		
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage	4.5 – 5.5 V		
IAT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
TO sensor resistance	25.0 – 26.0 kΩ		
TO sensor voltage	Normal	0.4 – 1.4 V	
	Leaning	3.7 – 4.4 V	When leaning 65°
GP switch voltage	0.6 V or more		From 1st to Top
GP switch resistance	Approx. 500 Ω or more		
Injector voltage	Battery voltage		
Ignition coil primary peak voltage	80 V or more		When cranking
HO2 sensor output voltage	0.4 V or less at idle speed		
	0.6 V or more at 5 000 r/min		
HO2 sensor heater resistance	6.7 – 9.5 Ω at 23 °C (73 °F)		
PAIR control solenoid valve resistance	18 – 22 Ω at 20 °C (68 °F)		
EVAP purge control solenoid valve resistance	Approx. 32 Ω at 20 – 30 °C (68 – 86 °F)		
ISC valve resistance	Approx. 20 Ω at 20 °C (68 °F)		

THROTTLE BODY

ITEM	STANDARD / SPECIFICATION
Bore size	26 mm (1.02 in)
I.D. No.	48H1
Idle r/min	1 400 ± 100 r/min
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

ELECTRICAL

Unit: mm (in)

ITEM		STANDARD / SPECIFICATION		NOTE
Firing order		1.2		
Spark plug		Type	NGK: CR7E DENSO: U22ESR-N	
		Gap	0.7 – 0.8 (0.028 – 0.031)	
Spark performance		Over 8 (0.3) at 1 atm.		
CKP sensor resistance		150 – 230 Ω		
CKP sensor peak voltage		1.5 V or more		
Ignition coil resistance		Primary	3.4 – 4.6 Ω	Terminal – Terminal
		Secondary	11.05 – 14.95 kΩ	Plug cap – Terminal
Ignition coil primary peak voltage		80 V or more		
Generator coil resistance		0.2 – 0.9 Ω		
Generator no-load voltage (When engine is cold)		60 V (AC) or more at 5 000 r/min		
Starter motor brush length		Standard	10 (0.39)	
		Limit	6.5 (0.26)	
Regulated voltage		14.0 – 15.5 V at 5 000 r/min		
Starter relay resistance		3 – 6 Ω		
GP switch voltage		0.6 V or more (From 1st to Top)		
Battery	Type designation	YTX9-BS		
	Capacity	12 V 28.8 kC (8 Ah)/10 HR		
Fuse size	Headlight	15 A		
	Signal	10 A		
	Ignition	10 A		
	Fuel	10 A		
	Main	30 A		

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Position		5 × 2
Brake/Tail light		21/5
Turn signal light		10 × 4
License plate light		5
Combination meter light		LED
Turn signal indicator light		LED
High beam indicator light		LED
Neutral indicator light		LED
FI indicator light		LED
Oil pressure indicator light		LED
Engine coolant temp. indicator light		LED
Engine rpm indicator light		LED

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD / SPECIFICATION			LIMIT
Rear brake pedal height	38 – 48 (1.5 – 1.9)			—
Brake disc thickness	Front	4.8 – 5.2 (0.189 – 0.205)		4.5 (0.18)
	Rear	4.3 – 4.7 (0.169 – 0.185)		4.0 (0.16)
Brake disc runout	—			0.30 (0.012)
Brake master cylinder bore & piston diam	Front	Approx 11.0 (0.43)		—
	Rear	Approx 14.0 (0.55)		—
Brake caliper cylinder bore & piston diam	Front	Leading	Approx 27.0 (1.06)	—
		Trailing		
	Rear	Approx 38.2 (1.50)		—
Brake fluid type	DOT 4			—
Wheel rim runout	Axial	—		2.0 (0.08)
	Radial	—		2.0 (0.08)
Wheel rim size	Front	17 M/C × MT 3.00		—
	Rear	17 M/C × MT 4.00		—
Wheel axle runout	Front	—		0.25 (0.010)
	Rear	—		0.25 (0.010)

TIRE

ITEM	STANDARD / SPECIFICATION		LIMIT
Cold inflation tire pressure (Solo riding)	Front	250 kPa (2.50 kgf/cm², 36 psi)	—
	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—
Cold inflation tire pressure (Dual riding)	Front	250 kPa (2.50 kgf/cm², 36 psi)	—
	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—
Tire size	Front	110/80-17 M/C 57H	—
	Rear	140/70-17 M/C 66H	—
Tire type	Front	IRC RX-01F D	—
	Rear	IRC RX-01R	—
Tire tread depth (Recommended depth)	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD / SPECIFICATION	LIMIT
Front fork stroke	120 (4.72)	—
Front fork spring free length	275.9 (10.86)	270 (10.6)
Front fork oil level (without spring, outer tube fully compressed)	136 (5.4)	—
Front fork oil type	SUZUKI FORK OIL G10 or equivalent	—
Front fork oil capacity (each leg)	338 ml (11.4/11.9 US/Imp oz)	—
Front fork inner tube O.D.	37 (1.46)	—
Rear shock absorber spring adjuster	3rd position	—
Rear wheel travel	120 (4.7)	—
Swingarm pivot shaft runout	—	0.3 (0.01)

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		
Fuel tank capacity	Including reserve	13.3 L (3.5/2.9 US/Imp gal)	
	Fuel mark indicator blinking	9.3 L (2.4/2.0 US/Imp gal)	
Engine oil type	SAE 10W-40, API SG or higher with JASO MA		
Engine oil capacity	Change	2.1 L (2.2/1.8 US/Imp qt)	
	Filter change	2.4 L (2.5/2.1 US/Imp qt)	
	Overhaul	2.4 L (2.5/2.1 US/Imp qt)	