YAMAHA 2003

FJR1300(R)
FJR1300A(R)

5JW1-AE4

SUPPLEMENTARY SERVICE MANUAL

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the FJR1300(R)/FJR1300A(R) 2003. For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manuals.

FJR1300(N) 2001 SERVICE MANUAL: 5JW1-AE1
FJR1300(P) 2002 SUPPLEMENTARY SERVICE MANUAL: 5JW1-AE2

FJR1300(R)/FJR1300A(R) 2003
SUPPLEMENTARY
SERVICE MANUAL

First edition, February 2003

EAS00002

NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:

Designs and specifications are subject to change without notice.

EAS00004

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person checking or repairing the motorcycle.

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.

NOTE: A NOTE provides key information to make procedures easier or clearer.

EAS00007

HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to “SYMBOLS”.

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in chapter 3 (“PERIODIC CHECKS AND ADJUSTMENTS”), where the sub-section title(s) appears.

③ Sub-section titles appear in smaller print than the section title.

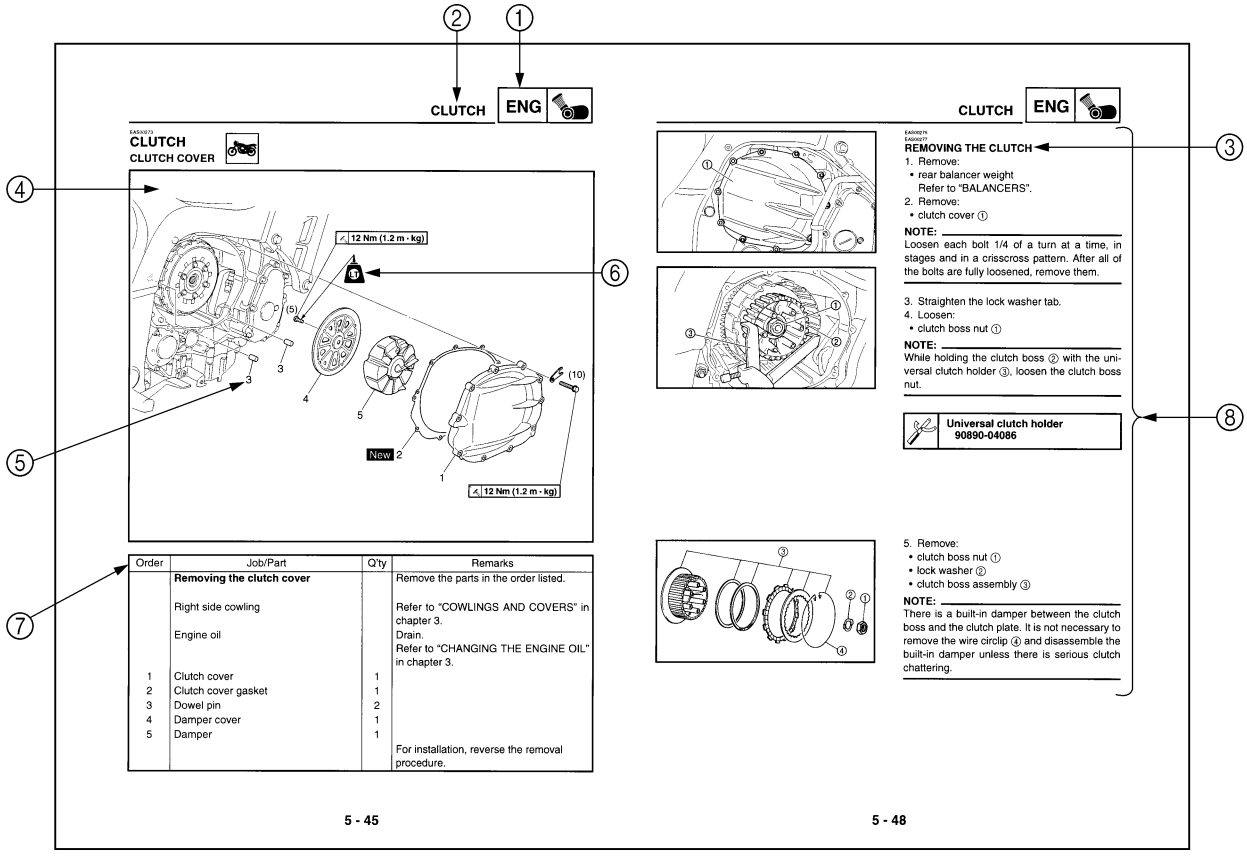
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

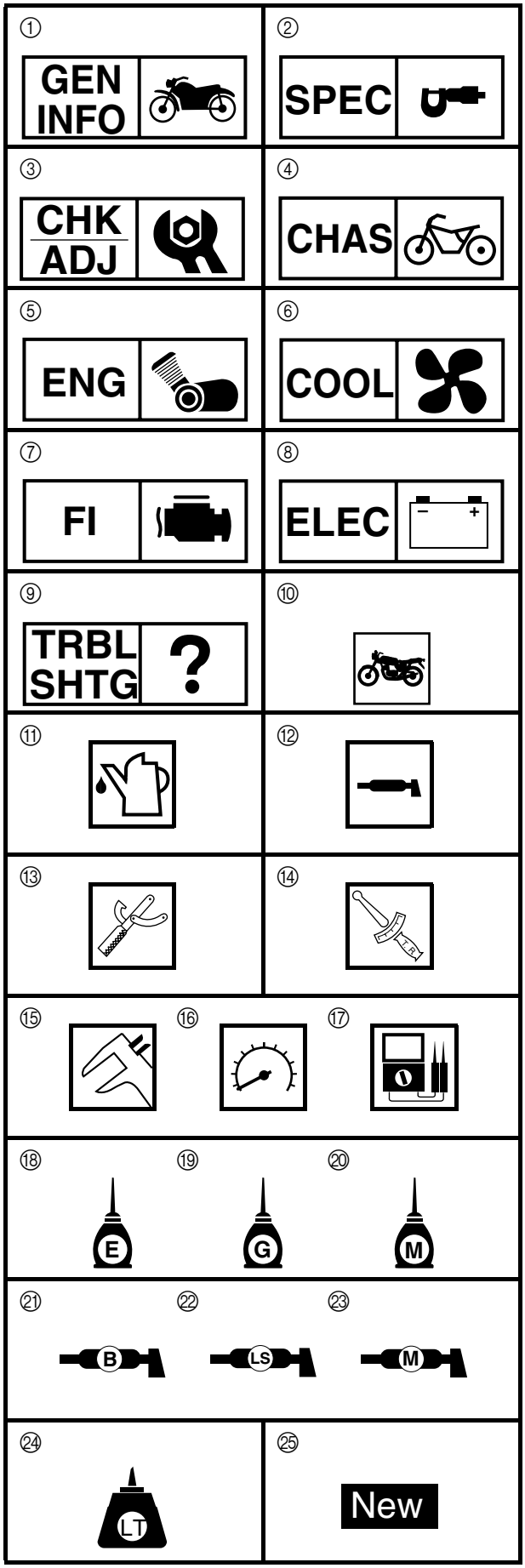
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

⑥ Symbols indicate parts to be lubricated or replaced.
Refer to “SYMBOLS”.

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.





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SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

① General information
② Specifications
③ Periodic checks and adjustments
④ Chassis
⑤ Engine
⑥ Cooling system
⑦ Fuel injection system
⑧ Electrical system
⑨ Troubleshooting

Symbols ⑩ to ⑰ indicate the following.

⑩ Serviceable with engine mounted
⑪ Filling fluid
⑫ Lubricant
⑬ Special tool
⑭ Tightening torque
⑮ Wear limit, clearance
⑯ Engine speed
⑰ Electrical data

Symbols ⑱ to ㉓ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum disulfide oil
㉑ Wheel bearing grease
㉒ Lithium soap base grease
㉓ Molybdenum disulfide grease

Symbols ㉔ to ㉕ in the exploded diagrams indicate the following.

㉔ Apply locking agent (LOCTITE®)
㉕ Replace the part

CONTENTS

GENERAL INFORMATION

EB104000

SPECIAL TOOLS

The following special tool is necessary for complete and accurate tune-up and assembly.
Use only the appropriate special tool as this will help prevent damage caused by the use of inappropriate tools or improvised techniques.
When placing an order, refer to the list provided below to avoid any mistakes.

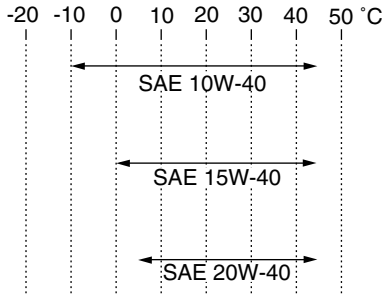
Tool No.	Tool name/Function	Illustration
90890-03149	Test coupler adaptor This tool is used to check the ABS diagnosis.	

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard	Limit
Model code	FJR1300: 5JWA (for Europe)	----
	5JWB (for F)	----
	5JWC (for Oceania)	----
	FJR1300A: 5VS1 (for Europe)	----
	5VS2 (for F)	----
	5VS3 (for Oceania)	----
Dimensions		
Overall length	2,195 mm	----
Overall width	760 mm	----
Overall height	1,435 mm	----
Seat height	805 mm	----
Wheelbase	1,515 mm	----
Minimum ground clearance	135 mm	----
Minimum turning radius	3,100 mm	----
Weight		
Wet (with oil and a full fuel tank)	275 kg (FJR1300)	----
	282 kg (FJR1300A)	----
Dry (without oil and fuel)	244 kg (FJR1300)	----
	251 kg (FJR1300A)	----
Maximum load (total of cargo, rider, passenger, and accessories)	201 kg (FJR1300)	----
	194 kg (FJR1300A)	----

ENGINE SPECIFICATIONS

Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 4-stroke, DOHC	----
Displacement	1,298 cm^3	----
Cylinder arrangement	Forward-inclined parallel 4-cylinder	----
Bore × stroke	79.0 × 66.2 mm	----
Compression ratio	10.8 : 1	----
Engine idling speed	1,000 ~ 1,100 r/min	----
Vacuum pressure at engine idling speed	33.3 kPa (250 mmHg)	----
Water temperature	100 ~ 105 °C	----
Oil temperature	80 ~ 90 °C	----
Standard compression pressure (at sea level)	1,600 kPa (16 kg/cm^2, 16 bar) at 400 r/min	----
Engine oil		
Lubrication system	Wet sump	----
Recommended oil		
	SAE 20W-40 SE SAE 10W-40 SE API service SE, SF, SG type or higher	---- ---- ----
Quantity		
Total amount	4.9 L	----
Without oil filter cartridge replacement	3.8 L	----
With oil filter cartridge replacement	4 L	----
Oil pressure (hot)	30 kPa (0.30 kg/cm^2, 0.30 bar) at 1,000 r/min	----
Relief valve operating pressure	480 ~ 560 kPa (4.80 ~ 5.60 kg/cm^2, 4.80 ~ 5.60 bar)	----

Item	Standard	Limit
Cooling system		
Radiator capacity (including all routes)	3.2 L	----
Radiator capacity	1.03 L	----
Radiator cap opening pressure	93.3 ~ 122.7 kPa (0.93 ~ 1.23 kg/cm^2, 0.93 ~ 1.23 bar)	----
Valve relief pressure	4.9 kPa (0.05 kg/cm^2, 0.05 bar)	----
Radiator core		
Width	360 mm	----
Height	295.8 mm	----
Depth	27 mm	----
Coolant reservoir		
Capacity	0.25 L	----
<From low to full level>	0.15 L	----
Water pump		
Water pump type	Single-suction centrifugal pump	----
Reduction ratio	75/48 × 25/28 (1.395)	----
Maximum impeller shaft tilt	----	0.15 mm
Measurement B	24.997 ~ 25.097 mm	23.997 mm
Fuel pump		
Pump type	Electrical	----
Model (manufacturer)	5JW (DENSO)	----
Maximum consumption amperage	5.5 A	----
Output pressure	294 kPa (2.94 kg/cm^2, 2.94 bar)	----
Throttle bodies		
Model (manufacturer) × quantity	42EHS (MIKUNI) × 4	----
Intake vacuum pressure	33.3 kPa (250 mmHg)	----
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm	----
ID mark	5JW1 40	----

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Front tire		
Tire type	Tubeless	----
Size	120/70 ZR17 M/C (58W)	----
Model (manufacturer)	MEZ4J FRONT (METZELER)/ BT020F N (BRIDGESTONE)	----
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kgf/cm^2, 2.5 bar)	----
90 ~ 201 kg (FJR1300)	250 kPa (2.5 kgf/cm^2, 2.5 bar)	----
90 ~ 194 kg (FJR1300A)	250 kPa (2.5 kgf/cm^2, 2.5 bar)	----
High-speed riding	250 kPa (2.5 kgf/cm^2, 2.5 bar)	----
Minimum tire tread depth	----	1.6 mm
Rear tire		
Tire type	Tubeless	----
Size	180/55 ZR17 M/C (73W)	----
Model (manufacturer)	MEZ4J (METZELER)/ BT020R N (BRIDGESTONE)	----
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kgf/cm^2, 2.5 bar)	----
90 ~ 201 kg (FJR1300)	290 kPa (2.9 kgf/cm^2, 2.9 bar)	----
90 ~ 194 kg (FJR1300A)	290 kPa (2.9 kgf/cm^2, 2.9 bar)	----
High-speed riding	250 kPa (2.5 kgf/cm^2, 2.5 bar)	----
Minimum tire tread depth	----	1.6 mm
Front brakes		
Brake type	Dual-disc brake	----
Operation	Right-hand operation	----
Brake lever free play (at lever end)	7.5 ~ 16.5 mm	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	320.0 × 4.5 mm	----
Minimum thickness	----	4 mm
Maximum deflection	----	0.1 mm
Brake pad lining thickness	5.5 mm	0.5 mm
Master cylinder inside diameter	15 mm (FJR1300)	----
	16 mm (FJR1300A)	----
Caliper cylinder inside diameter	30.2 mm and 27 mm	----

Item	Standard	Limit
Front suspension		
Suspension type	Telescopic fork	----
Front fork type	Coil spring/oil damper	----
Front fork travel	135 mm	----
Spring		
Free length	264 mm	259 mm
Spacer length	149.5 mm	----
Installed length	249 mm	----
Spring rate (K1)	7.84 N/mm (0.8 kgf/mm)	----
Spring rate (K2)	10.78 N/mm (1.1 kgf/mm)	----
Spring stroke (K1)	0 ~ 91 mm	----
Spring stroke (K2)	91 ~ 135 mm	----
Optional spring available	No	----
Fork oil		
Recommended oil	Suspension oil “01” or equivalent	----
Quantity (each front fork leg)	664 cm^3	----
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	104 mm	----
Inner tube outer diameter	48 mm	----
Inner tube bearing	----	0.2 mm
Damper adjusting rod locknut distance	12 mm	----
Spring preload adjusting positions		
Minimum	6	----
Standard	4	----
Maximum	1	----
Rebound damping adjusting positions		
Minimum*	17	----
Standard*	12	----
Maximum*	1	----
Compression damping adjusting positions		
Minimum*	21	----
Standard*	12	----
Maximum*	1	----
*from the fully turned-in position		

Item	Standard	Limit
Rear suspension		
Suspension type	Swingarm (link suspension)	----
Rear shock absorber assembly type	Coil spring/gas-oil damper	----
Rear shock absorber assembly travel	60 mm	----
Upper spring		
Free length	156 mm	152.88 mm
Installed length	138.1 mm	----
Lower spring		
Free length	72.5 mm	71.05 mm
Installed length	65.4 mm	----
Spring rate (K1)	83.3 N/mm (8.49 kgf/mm)	----
Spring stroke (K1)	0 ~ 32 mm	----
Spring rate (K2)	117.6 N/mm (11.99 kgf/mm)	----
Spring stroke (K2)	32 ~ 60 mm	----
Optional spring available	No	----
Standard spring preload gas/air pressure	1,200 kPa (12.0 kg/cm^2, 12.0 bar)	----
Spring preload adjusting positions		
Rider only	SOFT	----
With passenger or cargo	HARD	----
Rebound damping adjusting positions		
Minimum*	20	----
Standard*	10	----
Maximum*	3	----
* from the fully turned-in position		

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	----
Ignition system		
Ignition system type	Transistorized coil ignition (digital)	----
Ignition timing	5° BTDC at 1,050 r/min	----
Advancer type	Electric	----
Pickup coil resistance/color	420.8 ~ 569.3 Ω/Gy–B	----
Transistorized coil ignition unit model	F8T927 (MITSUBISHI)	----
(manufacturer)	F8T928 (MITSUBISHI) (for F)	----
Ignition coils		
Model (manufacturer)	JO383 (DENSO)	----
Minimum ignition spark gap	6 mm	----
Primary coil resistance	1.53 ~ 2.07 Ω	----
Secondary coil resistance	12 ~ 18 kΩ	----
Indicator light (voltage/wattage × quantity)		
Neutral indicator light	14 V 1.12 W × 1	----
Turn signal indicator light	14 V 1.4 W × 2	----
Oil level warning light	14 V 1.12 W × 1	----
High beam indicator light	14 V 1.12 W × 1	----
Engine trouble warning light	14 V 1.12 W × 1	----
ABS warning light	14 V 1.12 W × 1	----
Immobilizer system indicator light	LED × 1	----
Bulbs (voltage/wattage × quantity)		
Headlight	12 V 60 W/55 W × 2	----
Auxiliary light	12 V 5 W × 2	----
Tail/brake light	12 V 5 W/21 W × 2	----
Turn signal light	12 V 21 W × 4	----
Meter light	14 V 1.12 W × 4	----
Starting circuit cut-off relay		
Model (manufacturer)	G8R-30Y-N (OMRON)	----
Coil resistance	180 Ω	----
Intake air temperature sensor		
Model (manufacturer)	25978 (MITSUBISHI)	----
Resistance	5.4 ~ 6.6 kΩ at 0 °C	----
	0.29 ~ 0.39 kΩ at 80 °C	----

Item	Standard	Limit
Coolant temperature sensor		
Model (manufacturer)	8CC (MITSUBISHI)	----
Resistance	5.21 ~ 6.37 kΩ at 0 °C	----
	0.290 ~ 0.354 kΩ at 80 °C	----
Fuses (amperage × quantity)		
Main fuse	50 A × 1	----
Fuel injection system fuse	15 A	----
Headlight fuse	25 A × 1	----
Signaling system fuse	15 A × 1	----
Ignition fuse	10 A × 1	----
Radiator fan motor fuse	15 A × 1	----
Hazard lighting fuse	7.5 A	----
Parking lighting fuse	10 A	----
Backup fuse (odometer and clock)	10 A	----
ABS control unit fuse	7.5 A (FJR1300A)	----
ABS motor fuse	30 A (FJR1300A)	----
Windshield motor fuse	2 A	----
Reserve fuse	25 A, 15 A, 10 A, 7.5 A, 2 A × 1	----
	30 A (FJR1300A)	----

TIGHTENING TORQUES

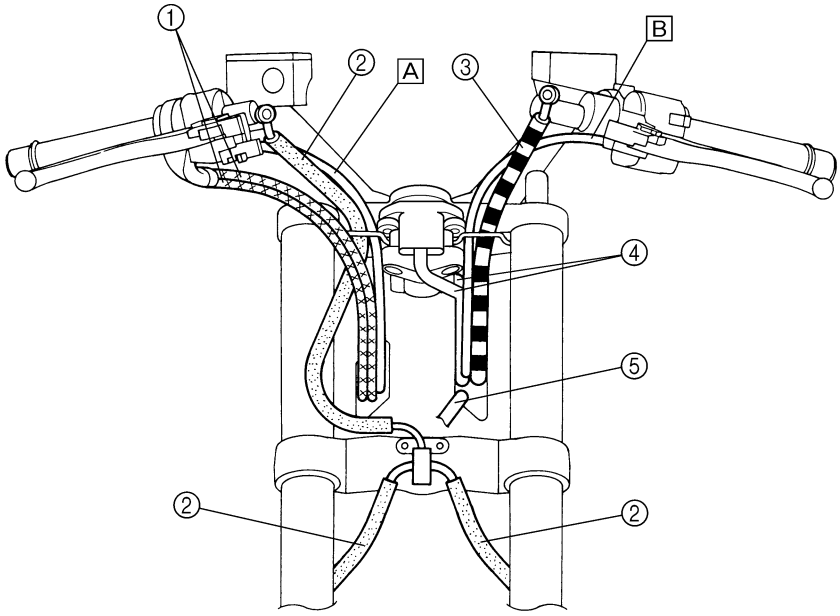
CHASSIS TIGHTENING TORQUES

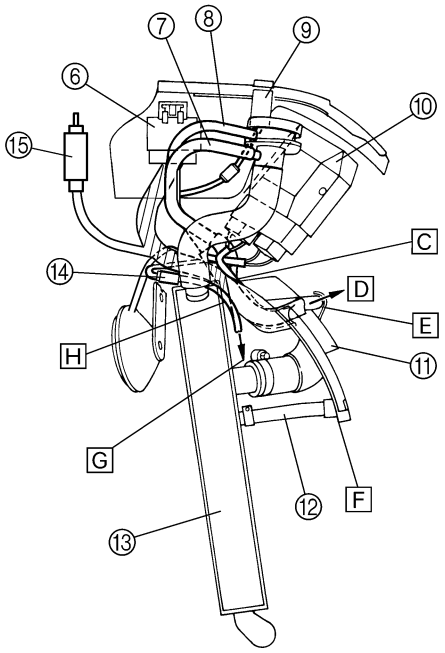
Part to be tightened	Thread size	Tightening torque		Remarks
		Nm	m·kg	
Fuel tank and frame	M6	10	1.0	
Fuel tank and fuel tank bracket	M8	15	1.5	
Front wheel sensor and sensor housing	M8	30	3.0	FJR1300A
Front brake pipe (hydraulic unit to front brake caliper) and lower bracket	M6	7	0.7	FJR1300A
Front brake hose (hydraulic unit to front brake caliper) holder and front wheel sensor lead holder on lower bracket	M6	7	0.7	FJR1300A
Front wheel sensor lead holder and lower bracket	M6	7	0.7	FJR1300A
Front brake pipe union bolt	M8	30	3.0	FJR1300A
Rear wheel sensor and sensor housing	M8	30	3.0	FJR1300A
Rear wheel sensor lead holder and swingarm	M5	4	0.4	FJR1300A
Rear brake hose (hydraulic unit to rear brake caliper) holder and swingarm	M6	7	0.7	FJR1300A
Rear brake hose (rear brake master cylinder to hydraulic unit) holder and frame	M6	7	0.7	FJR1300A
Rear brake hose (rear brake master cylinder to hydraulic unit) holder	M6	7	0.7	FJR1300A
Rear wheel sensor lead holder	M5	4	0.4	FJR1300A
Brake hose union bolt (hydraulic unit)	M10	30	3.0	FJR1300A
Hydraulic unit and hydraulic unit bracket 1	M8	16	1.6	FJR1300A
Hydraulic unit bracket 1 and hydraulic unit bracket 2	M8	16	1.6	FJR1300A
Hydraulic unit bracket 2 and cross member	M8	16	1.6	FJR1300A
Brake fluid reservoir cap	M40	2	0.2	
Reflector (for AUS only)	M6	4	0.4	

CABLE ROUTING

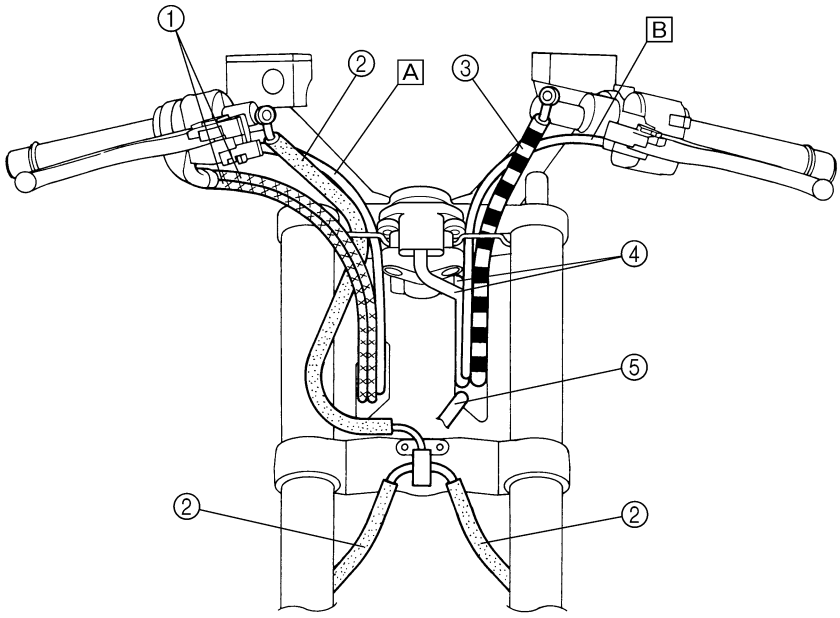
FJR1300

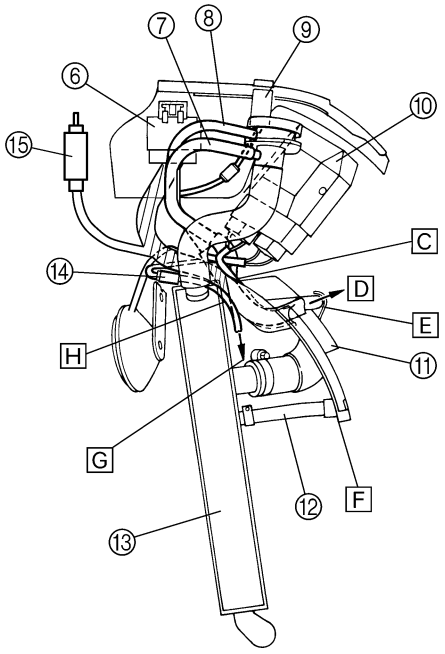
① Throttle cable
② Brake hose
③ Clutch hose
④ Main switch lead/immobilizer lead
⑤ Headlight lead
⑥ Fuse box
⑦ Thermostat assembly breather hose
⑧ Coolant reservoir hose
⑨ Hazard switch
⑩ Rectifier/regulator
⑪ Plate
⑫ Plunger control unit hose 2
⑬ Radiator
⑭ Radiator fan coupler
⑮ Accessory box solenoid



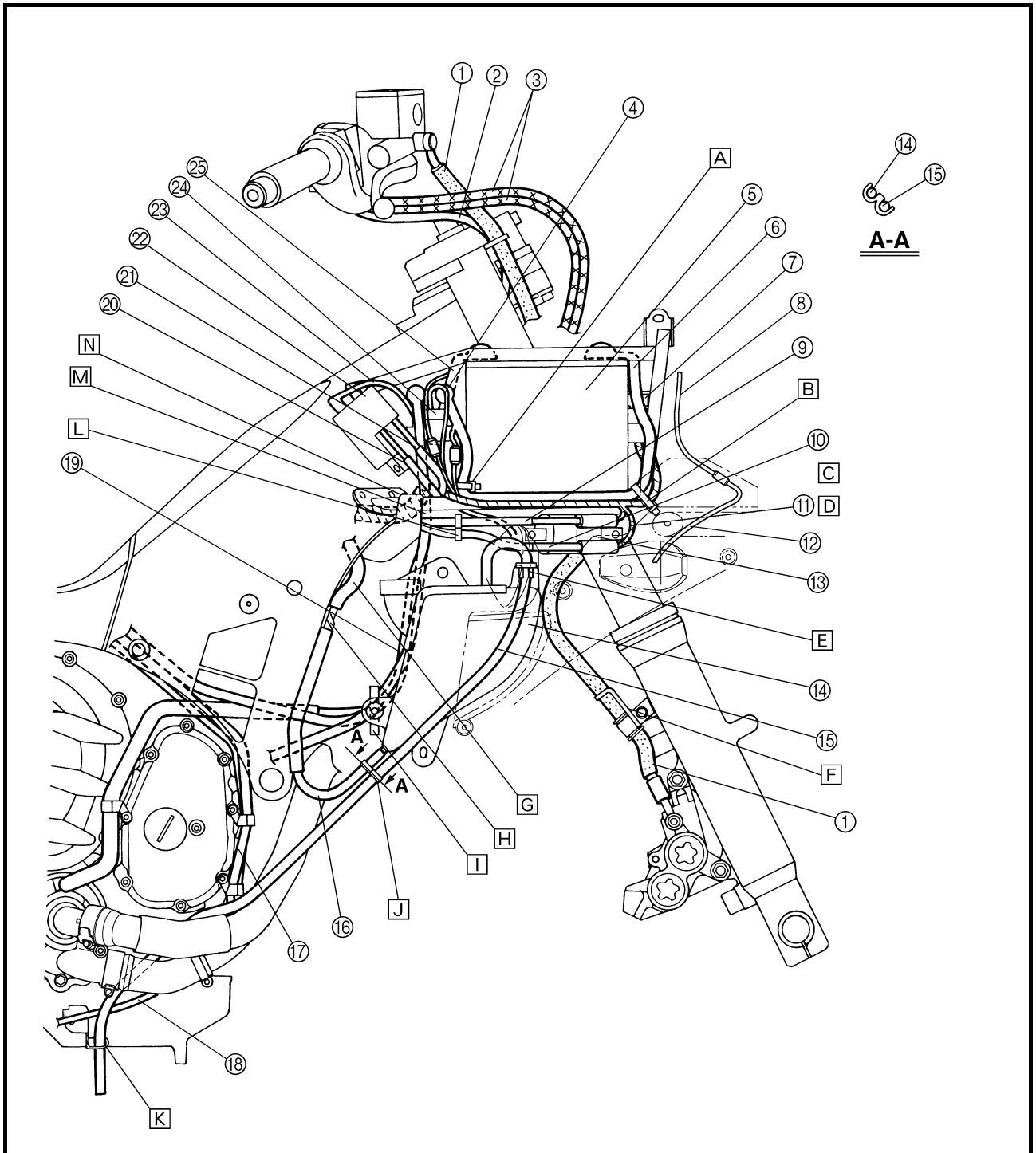


[A] Pass the right handlebar switch lead under the handlebar.
[B] Pass the left handlebar switch lead under the handlebar.
[C] Pass the wire harness, stator coil lead, coolant reservoir hose, and thermostat assembly breather hose through the left slit of the plate.
[D] To the thermostat housing
[E] After passing the coolant reservoir hose through the two hose guides behind the plate, pass the hose through the right hole of the plate.
[F] Pass plunger control unit hose 2 on the inside of the plate.
[G] To the radiator fan
[H] Pass the radiator fan lead on the outside of the plate.

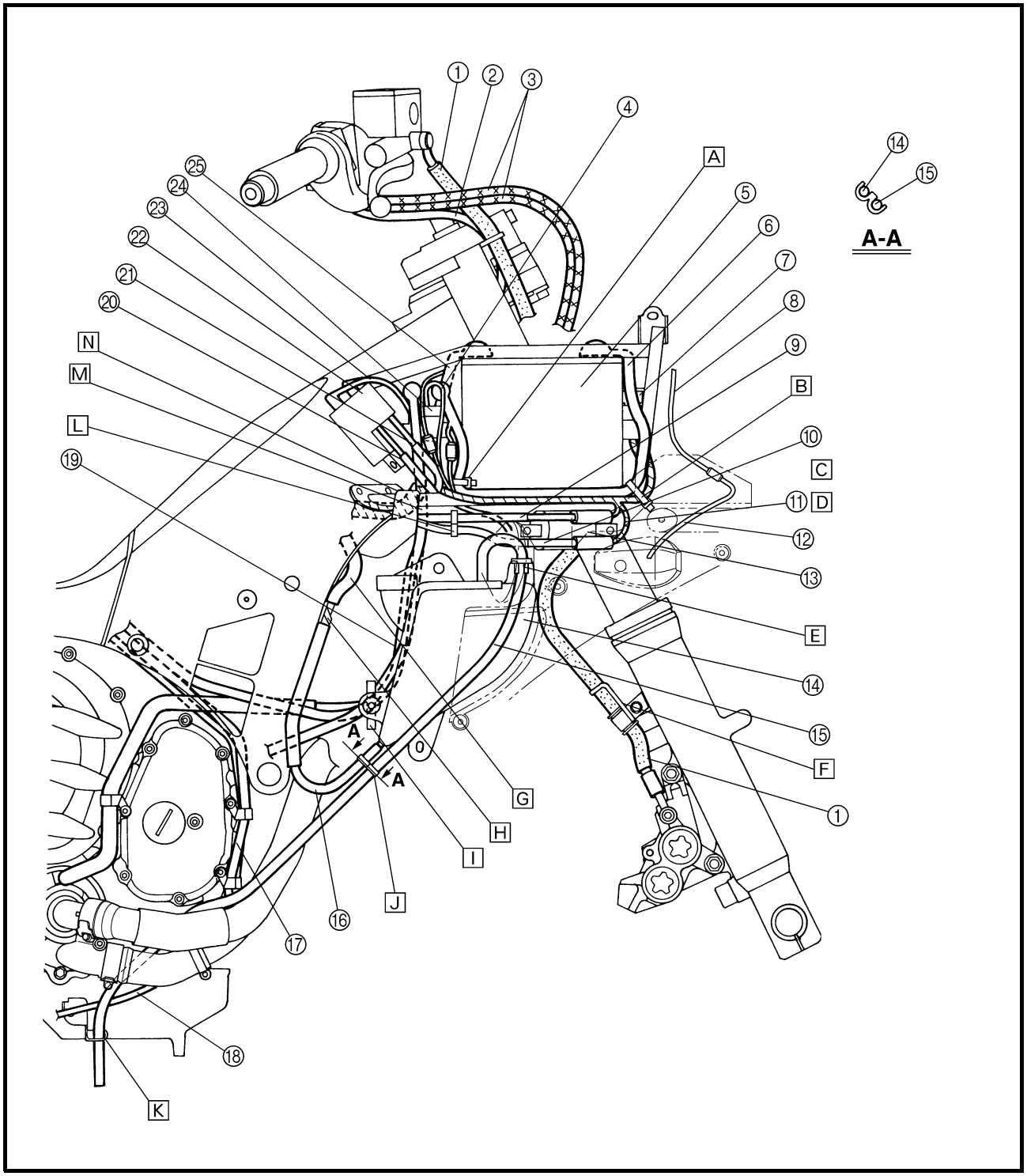




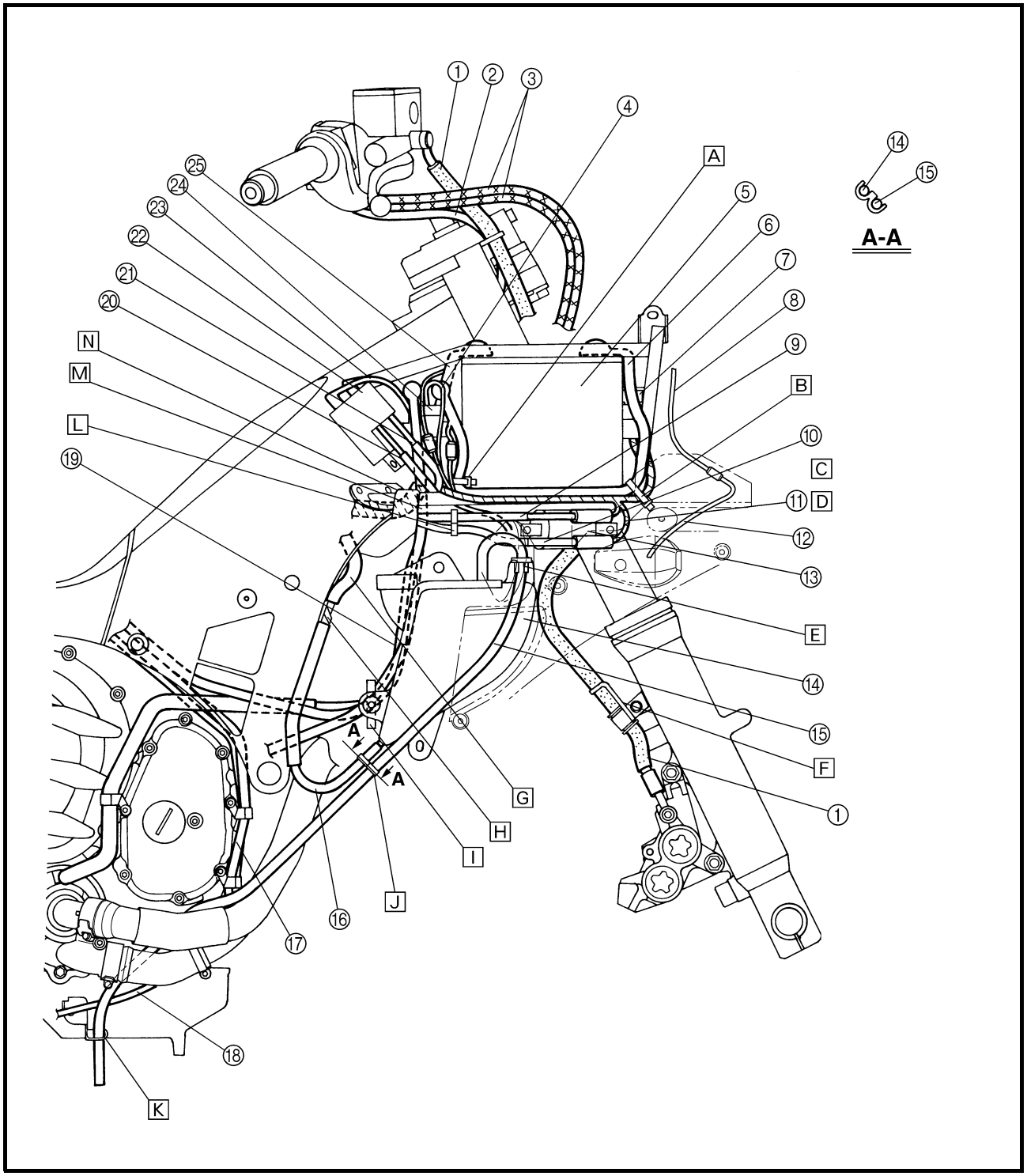
① Brake hose
② Right handlebar switch lead
③ Throttle cable
④ Starter relay lead
⑤ Battery
⑥ Positive battery lead
⑦ Main fuse
⑧ Front turn signal lead
⑨ Spark plug lead #4
⑩ Spark plug lead #1
⑪ Ignition coil leads #1 and #4
⑫ Front turn signal extension-lead
⑬ Ignition coils #1 and #4
⑭ Coolant reservoir
⑮ Coolant reservoir breather hose
⑯ Coolant reservoir hose
⑰ Pickup coil lead
⑱ O_2 sensor lead
⑲ Starter motor lead
⑳ Spark plug lead #2
㉑ Spark plug lead #3
㉒ Ignition coils #2 and #3
㉓ Ignition coil leads #2 and #3
㉔ Starter relay
㉕ Negative battery lead



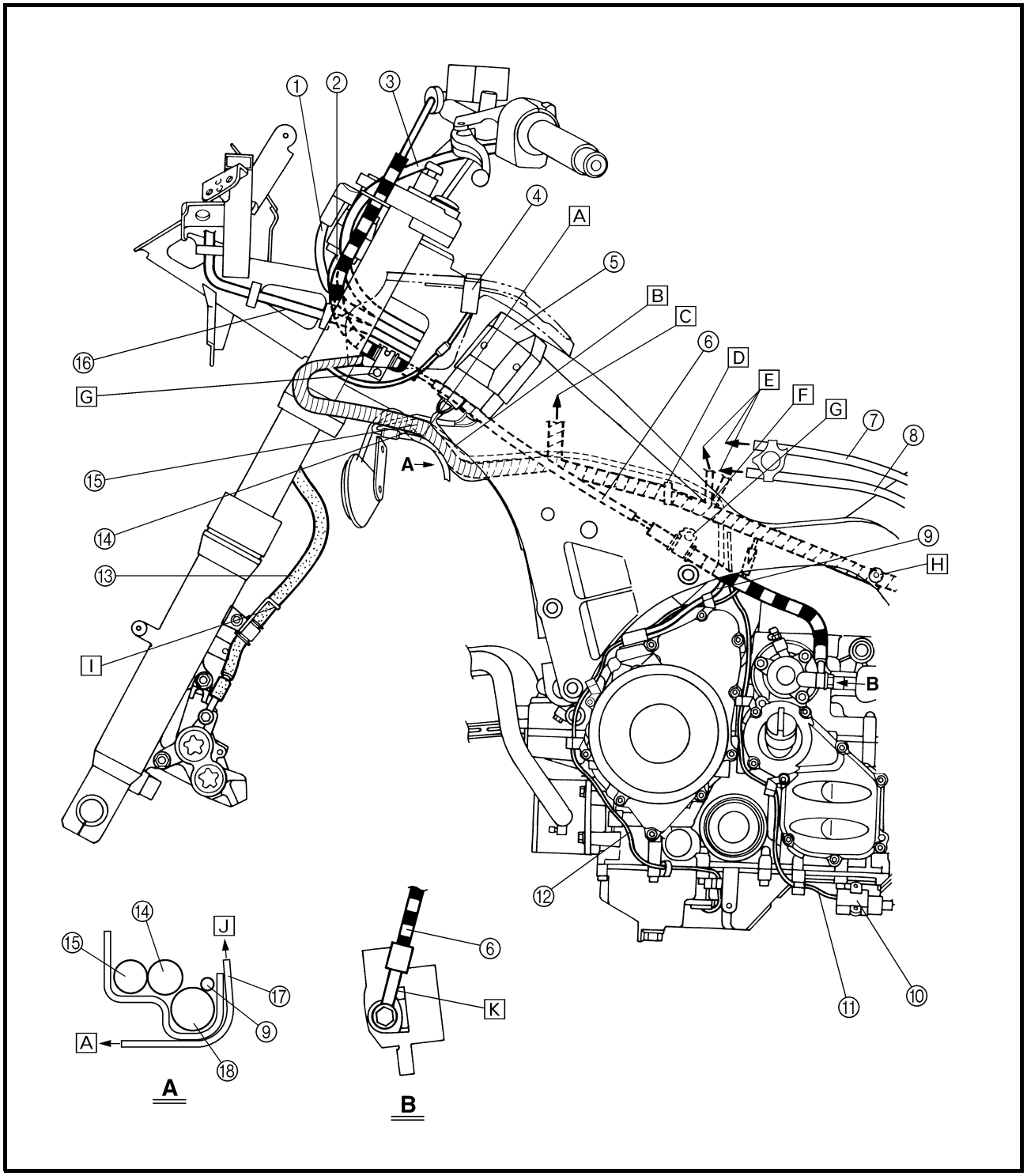
[A] Fasten the positive battery lead to the battery stay with a plastic locking tie.
[B] Fasten the positive battery lead and main fuse lead with a plastic locking tie to the battery stay.
[C] Insert the front turn signal leads into the inner panel.
[D] Install the connector so that the ignition coil leads #1 and #4 can be turned outward.
[E] Support the coolant reservoir breather hose with the hose holder attached to the coolant reservoir.
[F] Pass the brake hose through the brake hose holder.
[G] Pass the coolant reservoir hose through the hole of the plate.
[H] Pass the coolant reservoir hose through the hose guide attached to the coolant reservoir.
[I] Pass the negative battery lead and starter motor lead through the hose guide attached to the coolant reservoir.



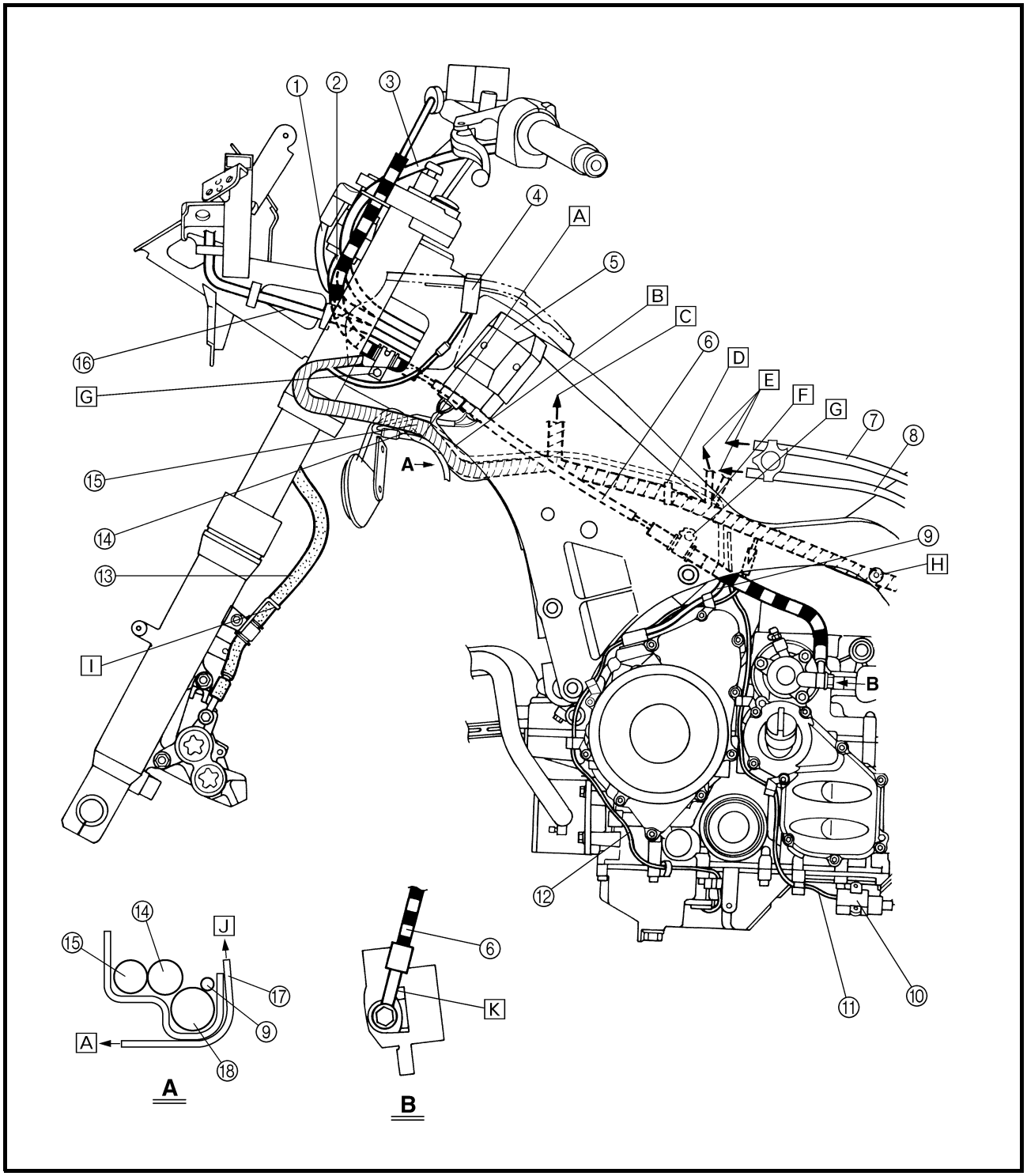
J Support the coolant reservoir hose and coolant reservoir breather hose with the hose holder located under the coolant reservoir.
K Pass the coolant reservoir breather hose through the hole of the coolant reservoir breather hose holder.
L Fasten spark plug leads #1 and #4 at the number mark.
M Pass the wire harness, spark plug leads #1, #2, #3, and #4 through the right slit of the battery bracket.
N Pass the starter motor lead, negative battery lead, wire harness, and spark plug leads #2 and #3 through the battery stay. Be sure to pass the starter motor lead and negative battery lead on the battery stay side.



① Immobilizer lead
② Main switch lead
③ Left handlebar switch lead
④ Hazard switch
⑤ Rectifier/regulator
⑥ Clutch hose
⑦ Fuel tank breather hose
⑧ Fuel tank overflow hose
⑨ Stator coil lead
⑩ Sidestand switch
⑪ Sidestand switch lead
⑫ Oil level switch lead
⑬ Brake hose
⑭ Coolant reservoir hose
⑮ Thermostat assembly breather hose
⑯ Headlight lead
⑰ Radiator fan lead
⑱ Wire harness

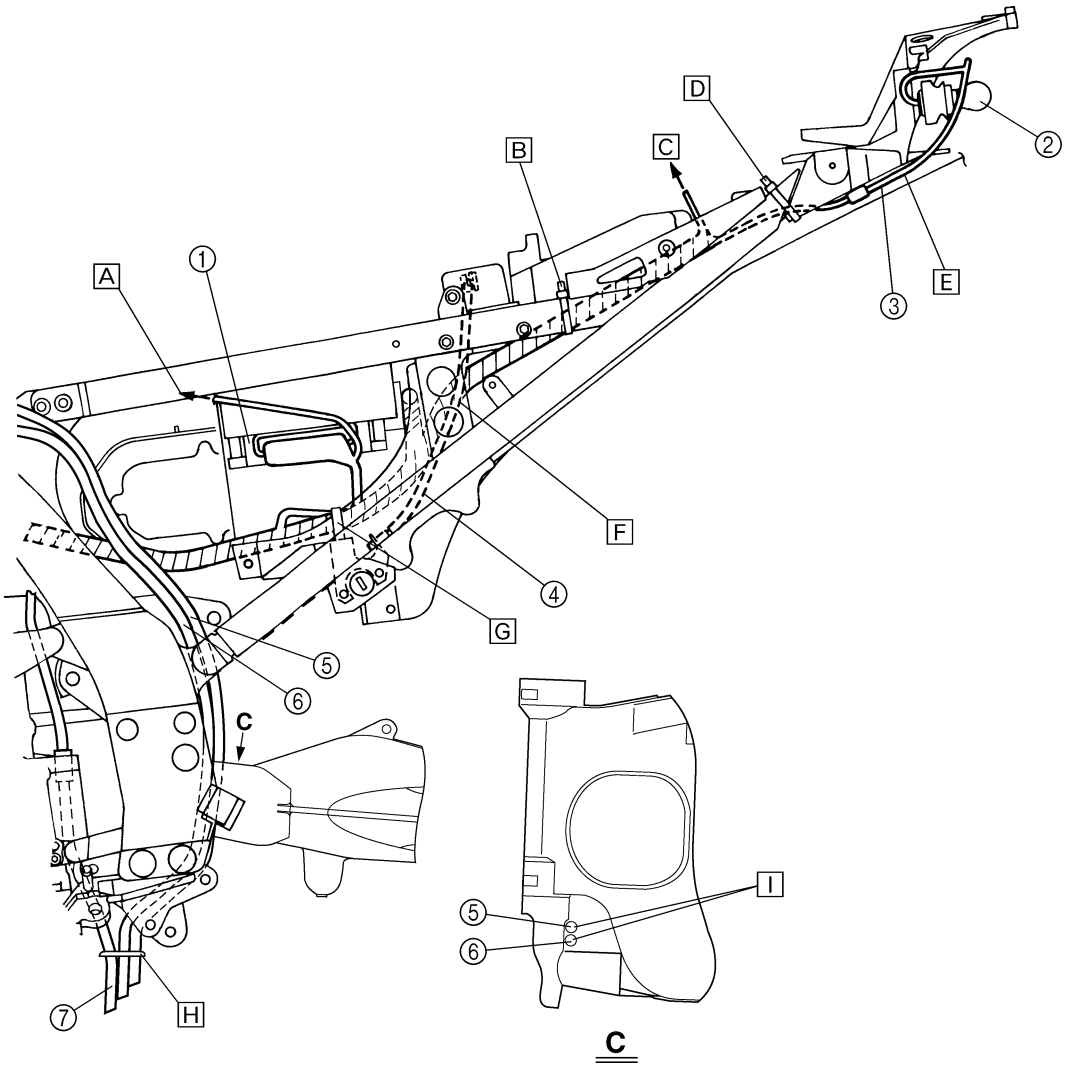


[A] To the radiator fan
[B] Pass the wire harness, stator coil lead, coolant reservoir hose, and thermostat assembly breather hose through the left slit of the plate.
[C] To the right side of the frame
[D] Fasten the wire harness with the plastic band attached to the frame.
[E] To the fuel tank
[F] Pass the stator coil lead through the fork in the wire harness.
[G] Fasten the clutch hose with the hose holder attached to the frame.
[H] Insert the harness holder into the hole at the rear end of the frame.
[I] Pass the brake hose through the brake hose holder.
[J] To the wire harness
[K] Contact the clutch hose to the turn stopper.

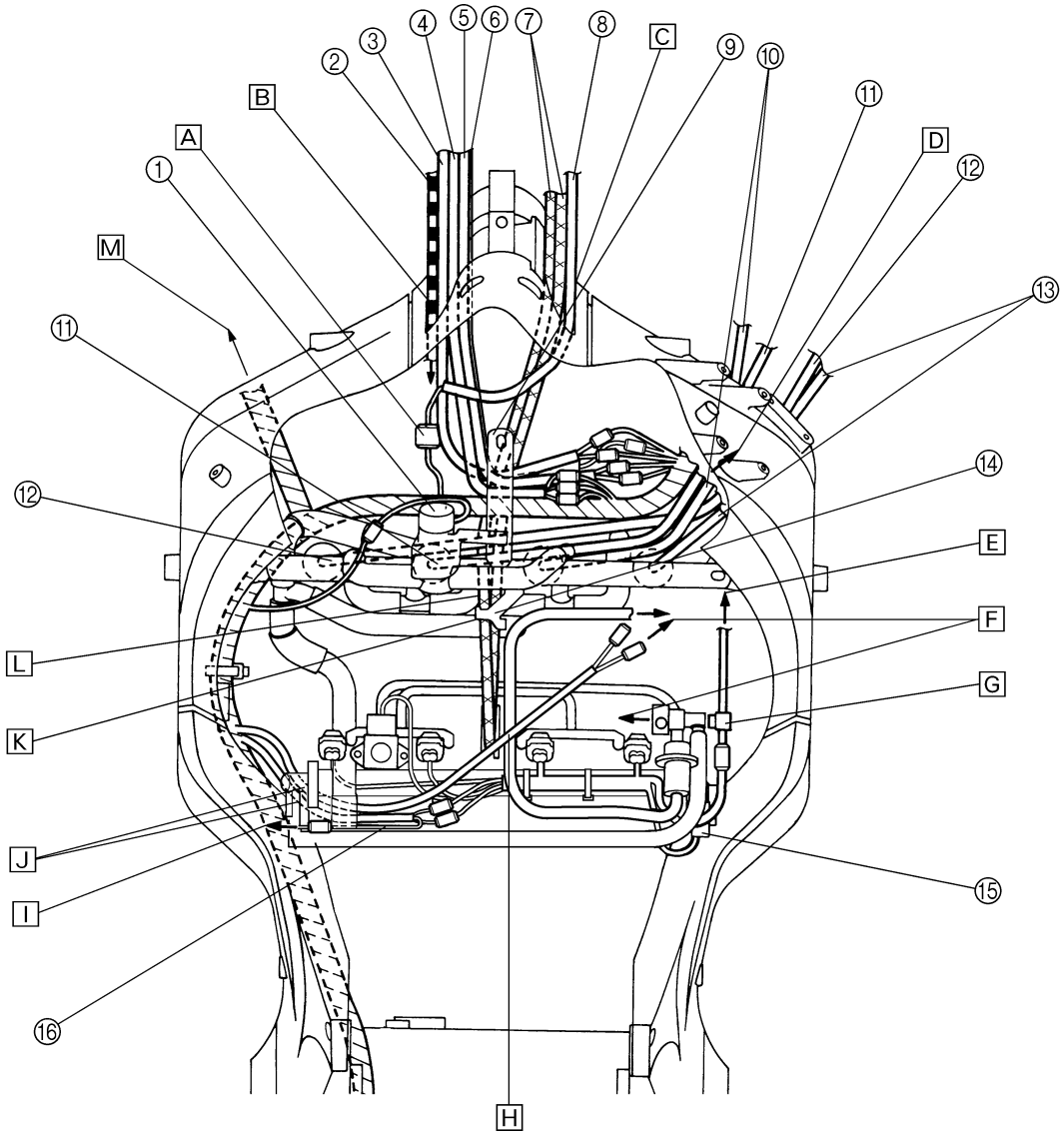


① ECU
② Tail/brake light
③ Tail/brake light lead
④ Seat lock cable
⑤ Fuel tank breather hose
⑥ Fuel tank overflow hose
⑦ Air filter case breather hose

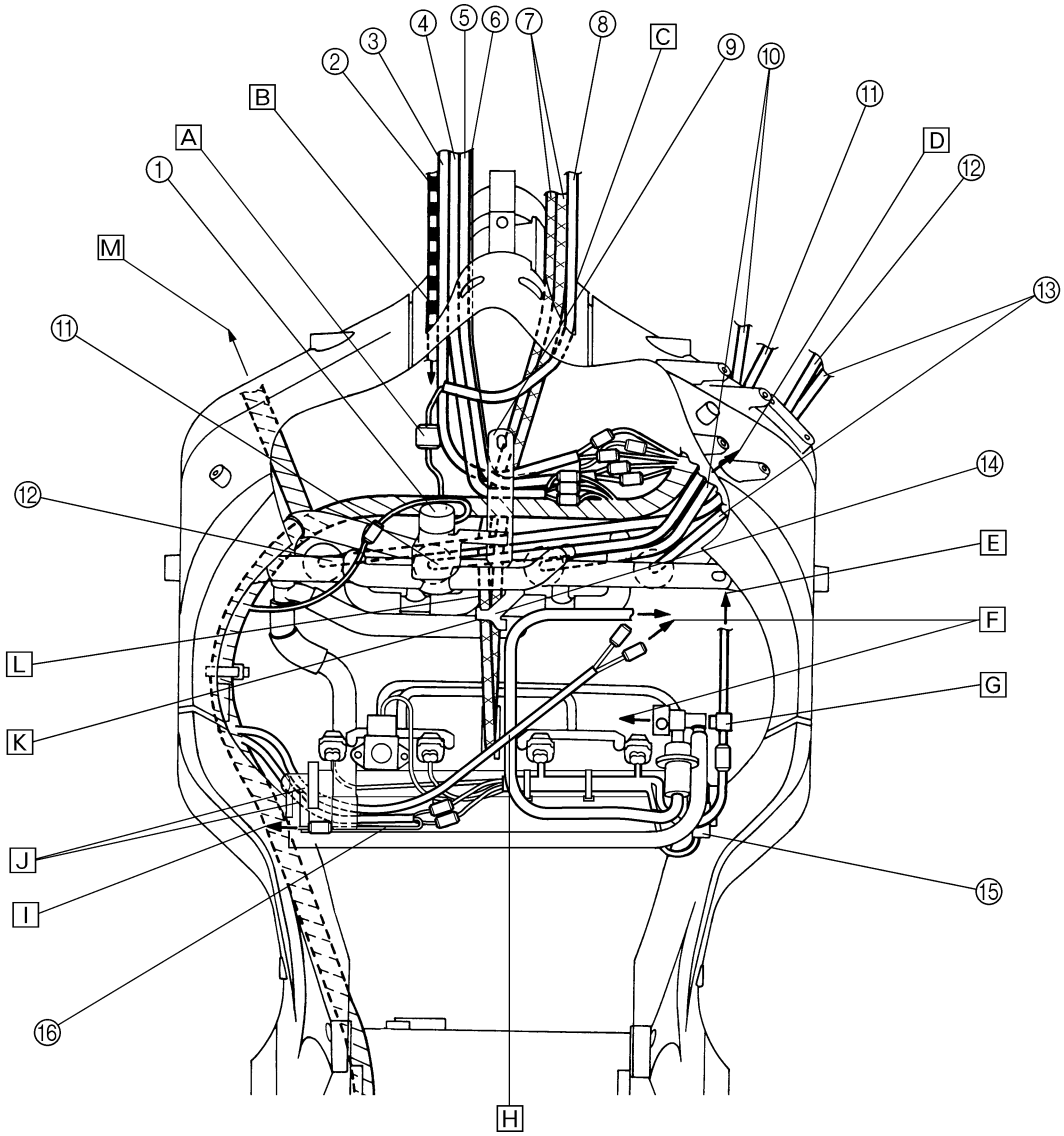
[A] To the intake air temperature sensor
[B] Fasten the wire harness to the frame with a plastic locking tie.
[C] To the inside of the U-lock storage box
[D] Fasten the tail/brake light lead to the frame with a plastic locking tie.
[E] Pass the tail/brake light lead between the rear cover and frame.
[F] Pass the wire harness on the inside of the seat lock cable.
[G] Fasten the wire harness and wire harness (ECU) with the clamp attached to the clamp bracket, which is attached to the seat lock bracket.
[H] Pass the air filter case breather hose, fuel tank breather hose, and fuel tank over flow hose through the hose guide.
[I] Pass the fuel tank breather hose and fuel tank overflow hose between the swingarm and universal joint.



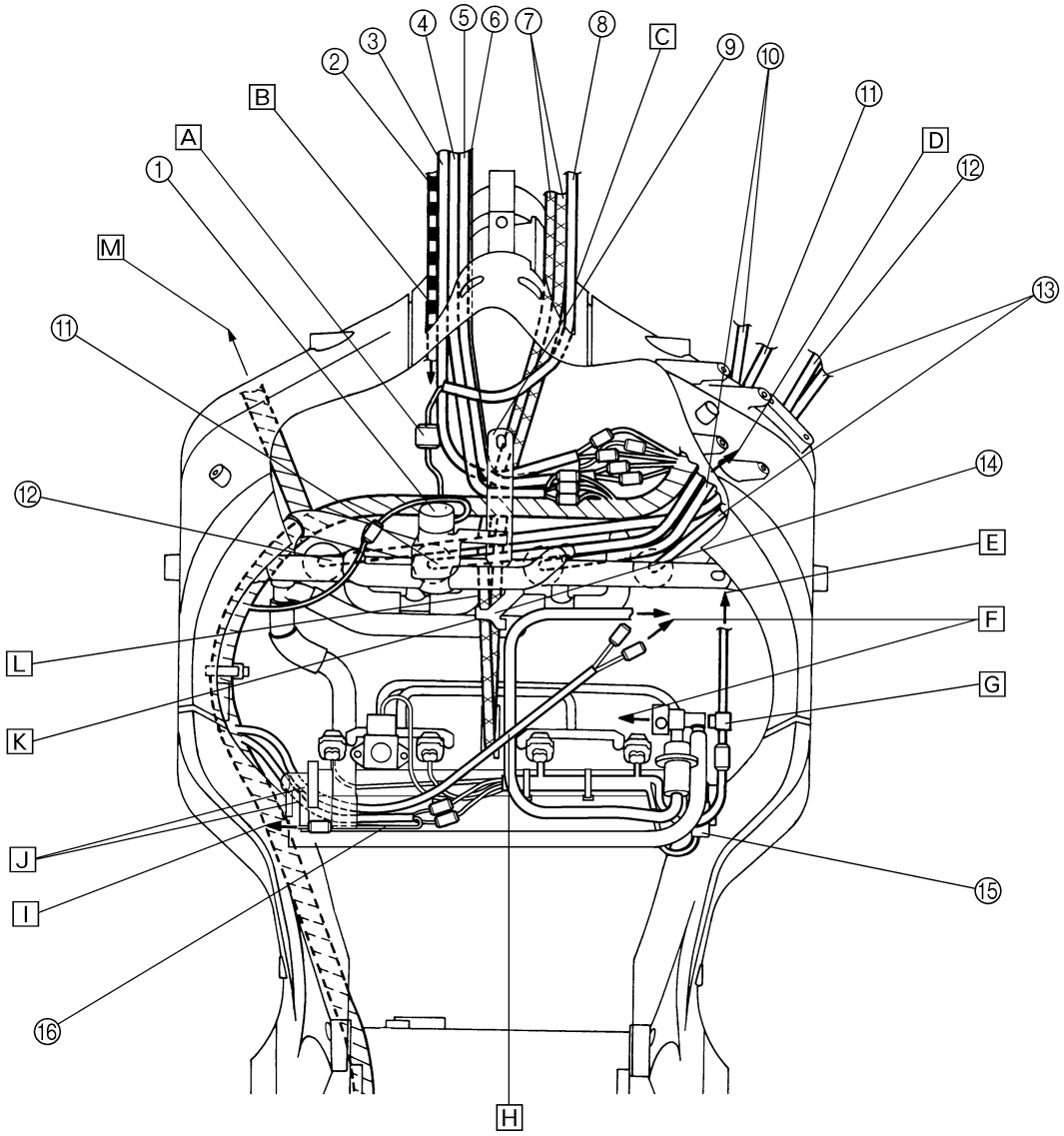
① Air cut-off valve
② Clutch hose
③ Left handlebar switch lead
④ Headlight lead
⑤ Main switch lead
⑥ Immobilizer lead
⑦ Throttle cable
⑧ Right handlebar switch lead
⑨ T-bar
⑩ Spark plug lead #3
⑪ Spark plug lead #2
⑫ Spark plug lead #1
⑬ Spark plug lead #4
⑭ Cable guide
⑮ Throttle position sensor
⑯ Sidestand switch lead



[A] Connect the wire harness and right handlebar switch lead.
[B] Pass the left handlebar switch lead, immobilizer lead, main switch lead, headlight lead, and clutch hose through the hole on the left side of the frame.
[C] Pass the right handlebar switch lead and throttle cables through the hole on the right side of the frame.
[D] To the lower left slit of the plate
[E] To the cylinder identification sensor
[F] To the fuel tank
[G] Pass the cylinder identification sensor lead through the lead guide of throttle body.
[H] Pass the lead wire above the fuel return hose.
[I] To the sidestand switch lead
[J] Pass the cylinder identification sensor lead under the fuel hose, then to the wire harness.

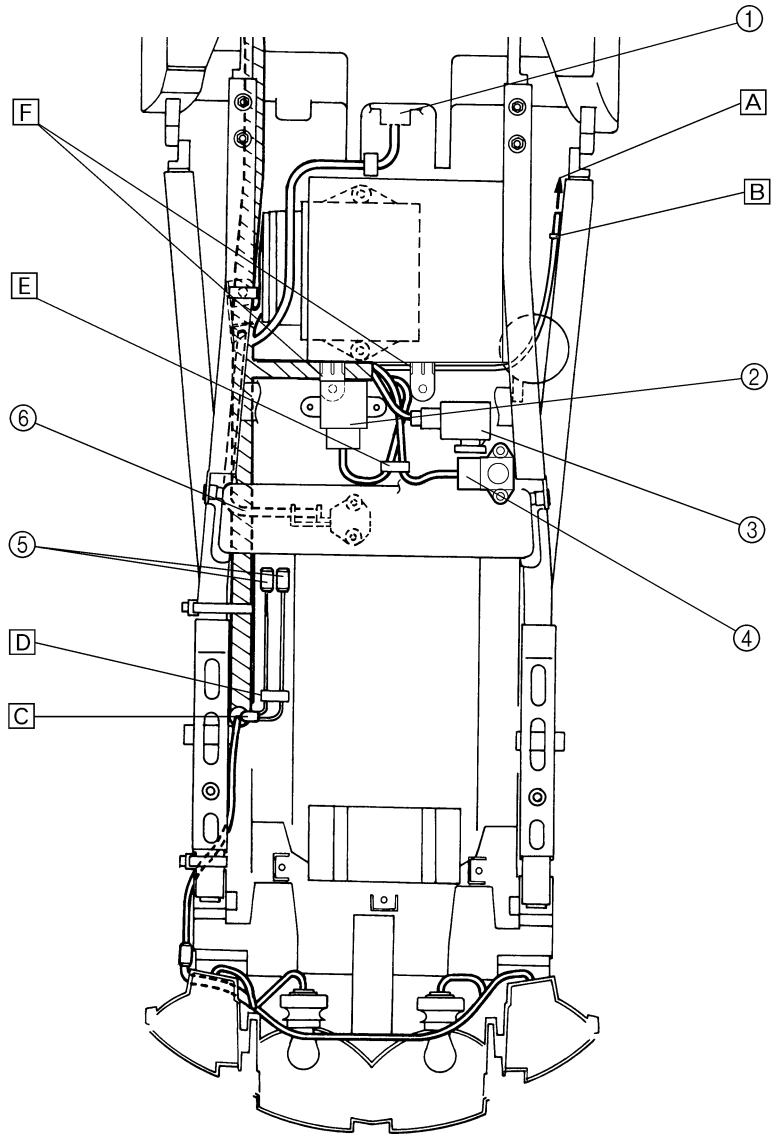


[K] Support the throttle cables with the T-bar located behind the cable guide.
[L] Pass the throttle cables under spark plug leads #1, #2, #3, and #4, and the wire harness, headlight lead, main switch lead, immobilizer lead, right handlebar switch lead, and left handlebar switch lead. Install the thermostat, heat protector, throttle cables, spark plug leads, wire harnesses, and air cut valve under the cable guide in the respective order.
[M] To the left slit of the plate



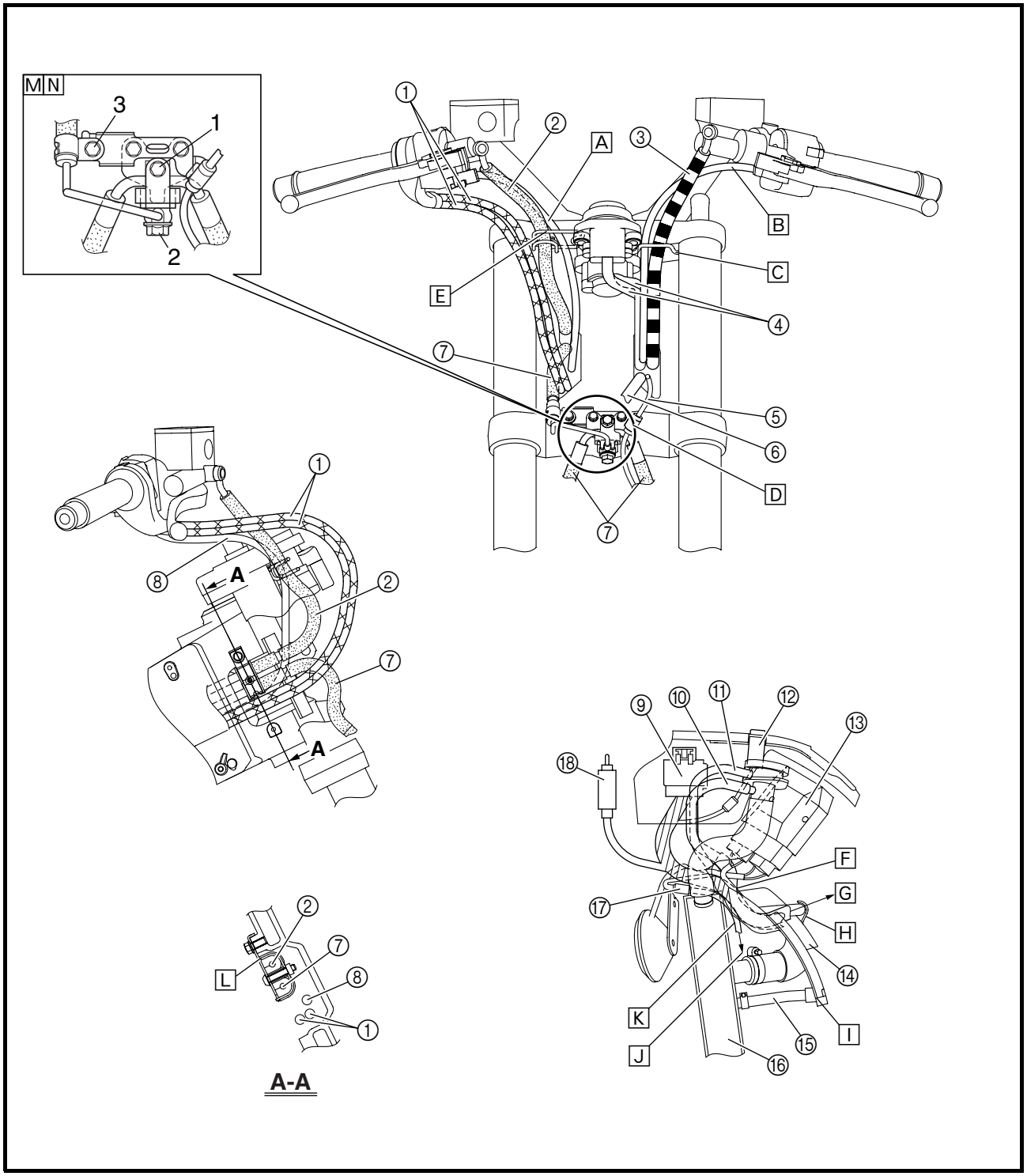
① Intake air temperature sensor
② Lean angle circuit cut-off relay
③ Starting circuit cut-off relay
④ Atmospheric pressure sensor
⑤ CYCLELOCK coupler
⑥ Seat lock cable

A To the rear brake light switch
B Pass the rear brake light switch through the lead guide attached to the frame.
C Pass the CYCLELOCK coupler through the inside of the storage box of the U-lock.
D Pass the CYCLELOCK coupler through the lead guide.
E Pass the pressure sensor lead and lean angle circuit cut-off relay lead through the lead guide.
F Pass the wire harnesses under the tray bracket.

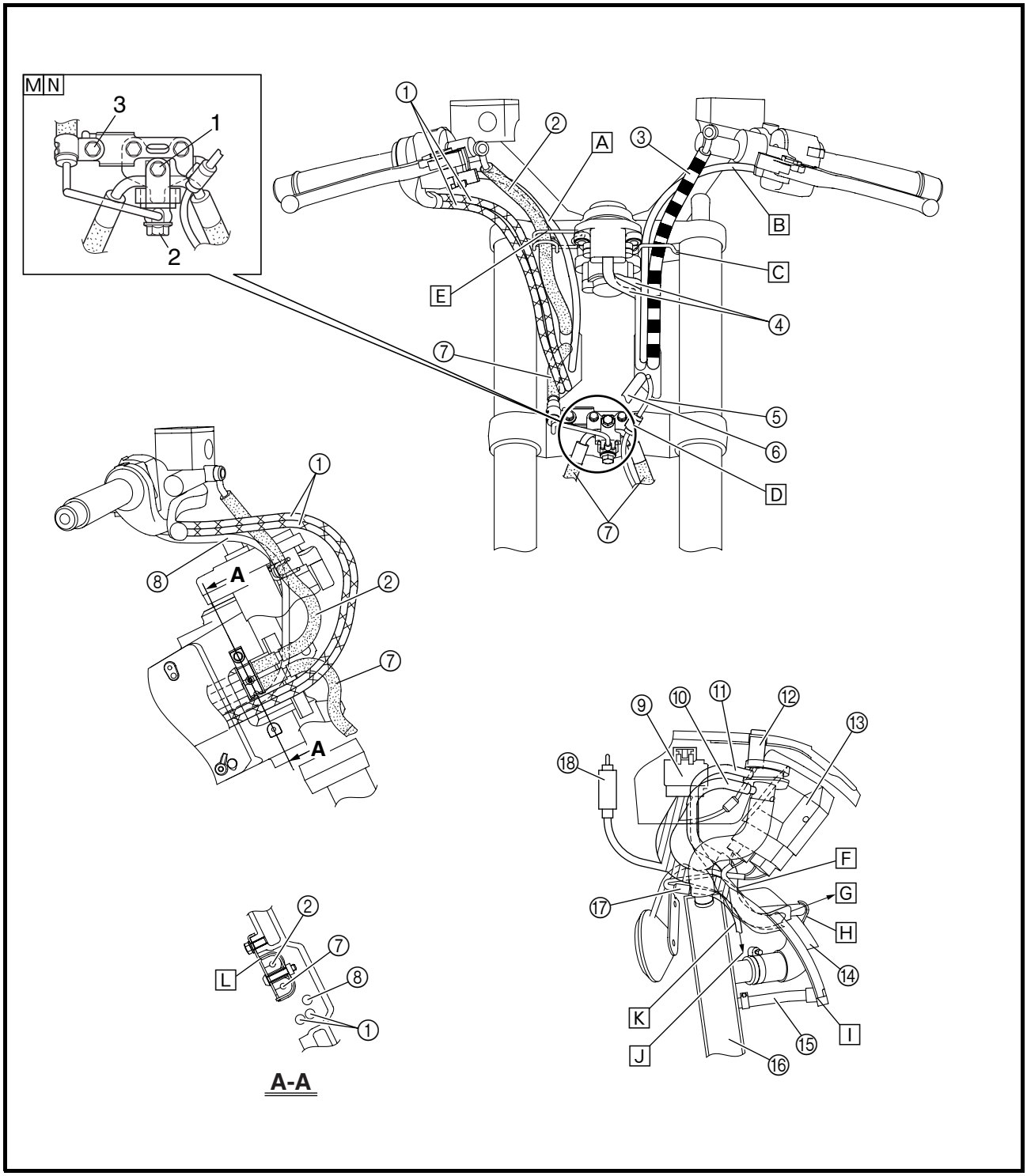


FJR1300A

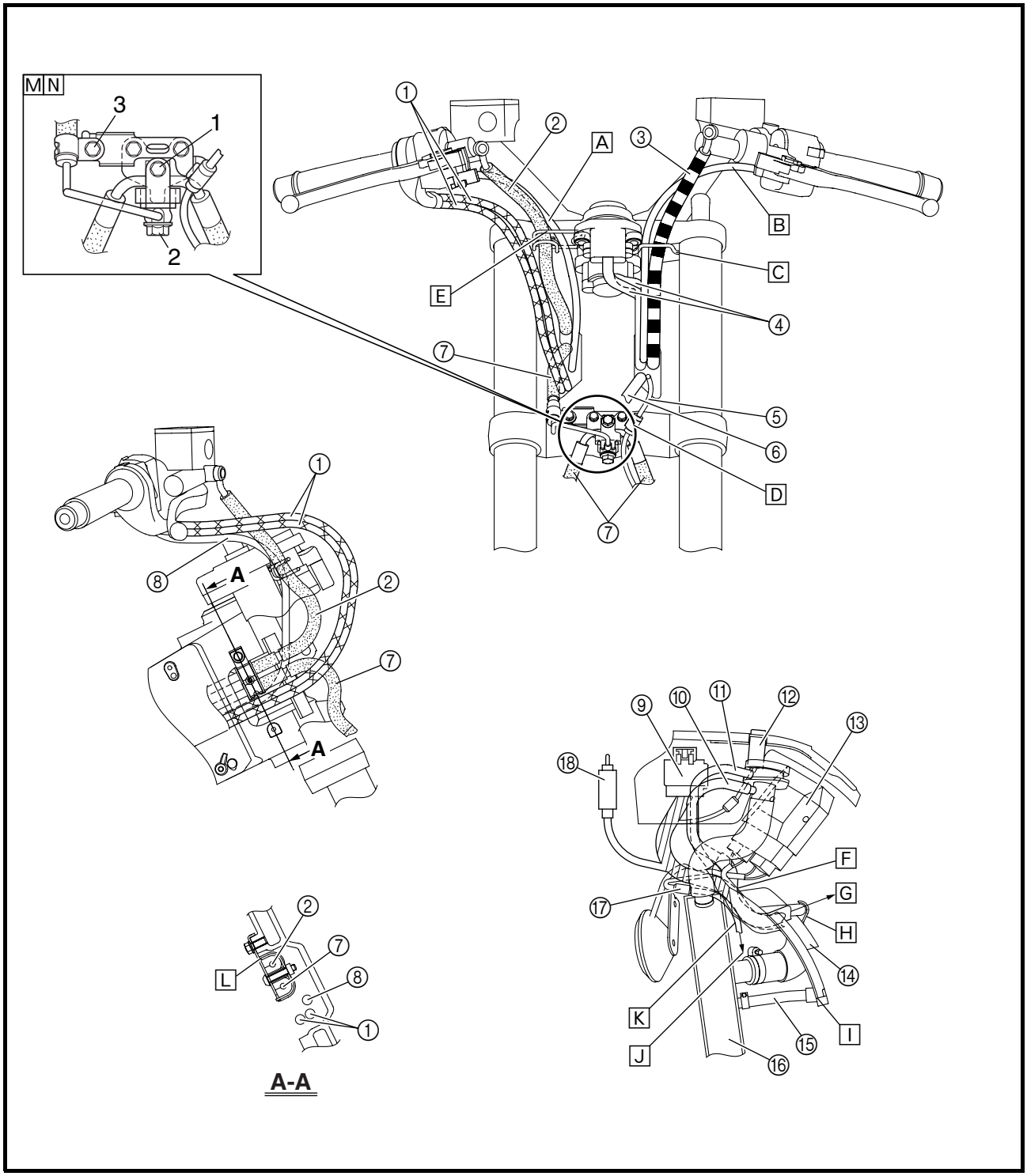
① Throttle cable
② Brake hose (front brake master cylinder to hydraulic unit)
③ Clutch hose
④ Main switch/immobilizer lead
⑤ Front wheel sensor lead
⑥ Headlight lead
⑦ Brake hose (hydraulic unit to front brake caliper)
⑧ Right handlebar switch lead
⑨ Fuse box
⑩ Thermostat assembly breather hose
⑪ Coolant reservoir hose
⑫ Hazard switch
⑬ Rectifier/regulator
⑭ Plate
⑮ Plunger control unit hose 2
⑯ Radiator
⑰ Radiator fan coupler
⑱ Accessory box solenoid



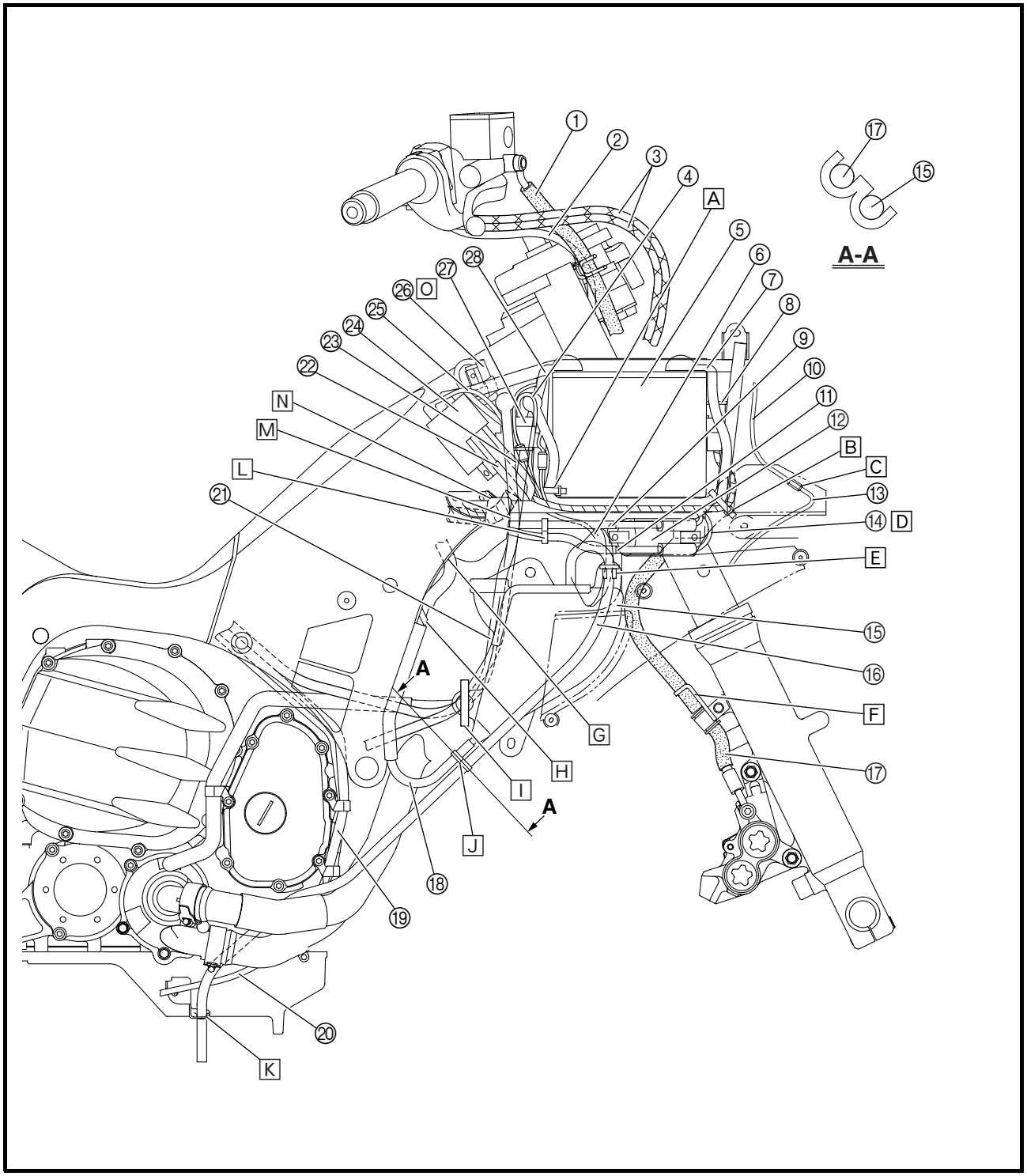
A Pass the right handlebar switch lead under the handlebar.
B Pass the left handlebar switch lead under the handlebar.
C Pass the clutch hose and left handlebar switch lead through the guide.
D Install the front wheel sensor lead grommet into the holder.
E Pass the brake hose (front brake master cylinder to hydraulic unit) and right handlebar switch lead through the guide.
F Pass the wire harness, stator coil lead, coolant reservoir hose, and thermostat assembly breather hose through the left slit of the plate.
G To the thermostat housing
H After passing the coolant reservoir hose through the two hose guides behind the plate, pass the hose through the right hole of the plate.
I Pass plunger control unit hose 2 on the inside of the plate.
J To the radiator fan



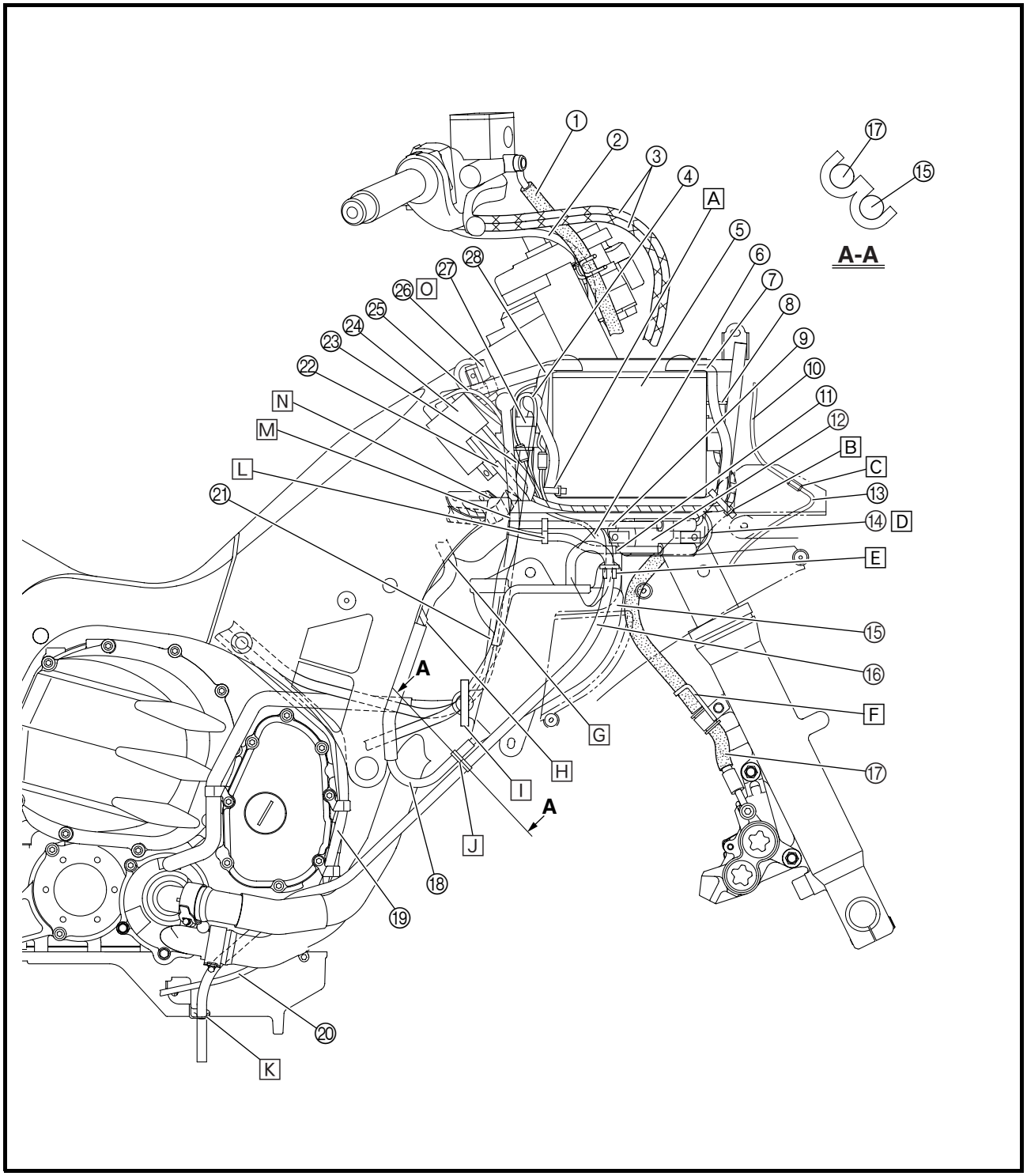
K Pass the radiator fan lead on the outside of the plate.
L Fasten the brake hoses to the frame.
M Tighten the brake hose joint bolt, union bolt, and brake hose holder bolt in the proper tightening sequence as shown.
N When replacing the brake hoses, remove the engine from the frame.



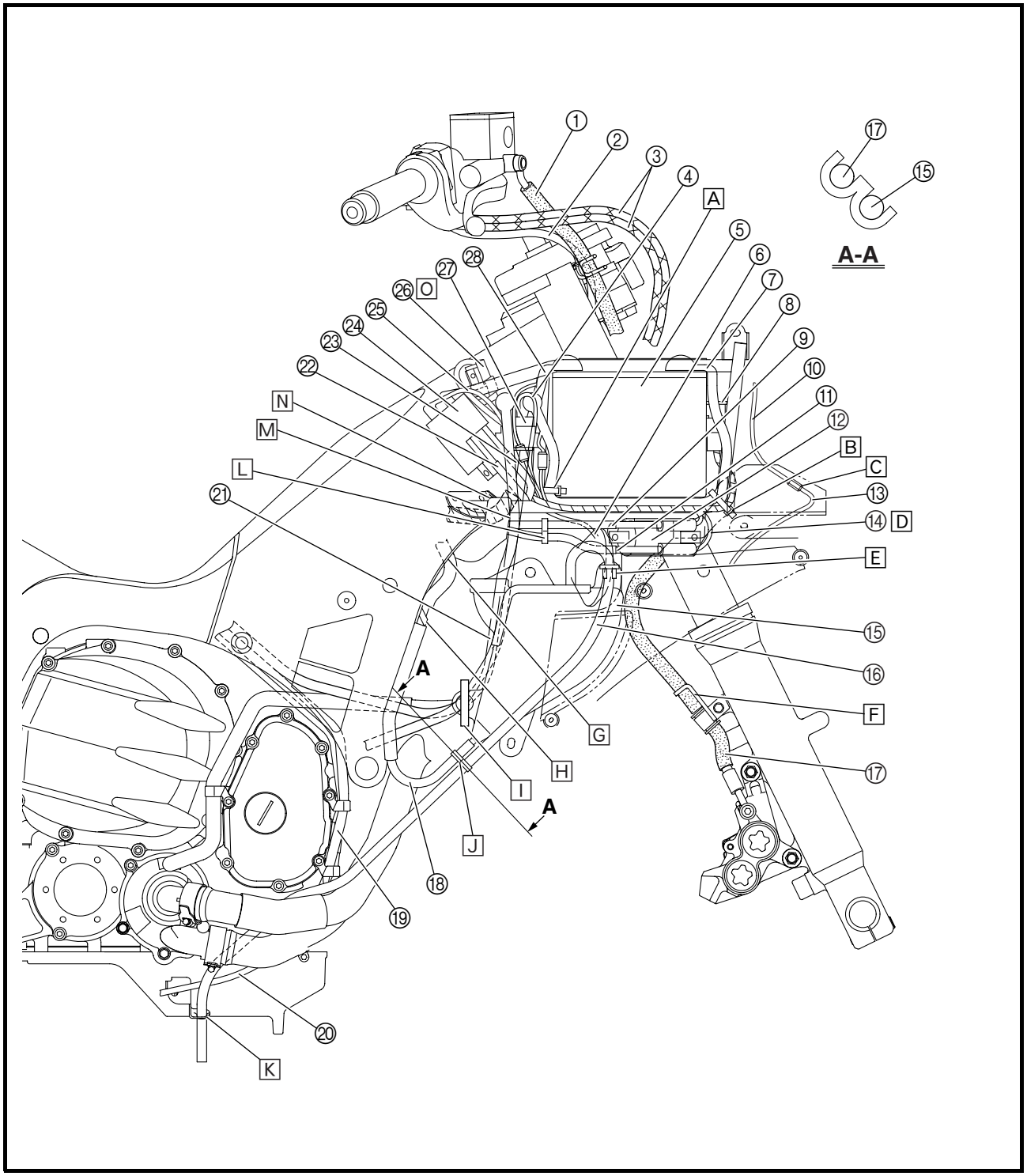
① Brake hose (front brake master cylinder to hydraulic unit)
② Right handlebar switch lead
③ Throttle cable
④ Starter relay lead
⑤ Battery
⑥ Horn lead
⑦ Positive battery lead
⑧ Main fuse
⑨ Spark plug lead #4
⑩ Front turn signal lead
⑪ Spark plug lead #1
⑫ Ignition coils #1 and #4
⑬ Front turn signal extension lead
⑭ Ignition coil leads #1 and #4
⑮ Coolant reservoir
⑯ Coolant reservoir breather hose
⑰ Brake hose (hydraulic unit to front brake caliper)
⑱ Coolant reservoir hose
⑲ Pickup coil lead
⑳ O_2 sensor lead
㉑ Starter motor lead
㉒ Spark plug lead #2
㉓ Spark plug lead #3
㉔ Ignition coils #2 and #3
㉕ Ignition coil leads #2 and #3
㉖ ABS test coupler
㉗ Starter relay
㉘ Negative battery lead



[A] Fasten the positive battery lead to the battery stay with a plastic locking tie.
[B] Fasten the positive battery lead and main fuse lead to the battery stay with a plastic locking tie.
[C] Insert the front turn signal leads into the inner panel.
[D] Install the connector so that ignition coil leads #1 and #4 can be turned outward.
[E] Support the coolant reservoir breather hose with the hose holder attached to the coolant reservoir.
[F] Pass the brake hose through the brake hose holder.
[G] Pass the coolant reservoir hose through the hole of the plate.
[H] Pass the coolant reservoir hose through the hose guide attached to the coolant reservoir.
[I] Pass the negative battery lead and starter motor lead through the hose guide attached to the coolant reservoir.

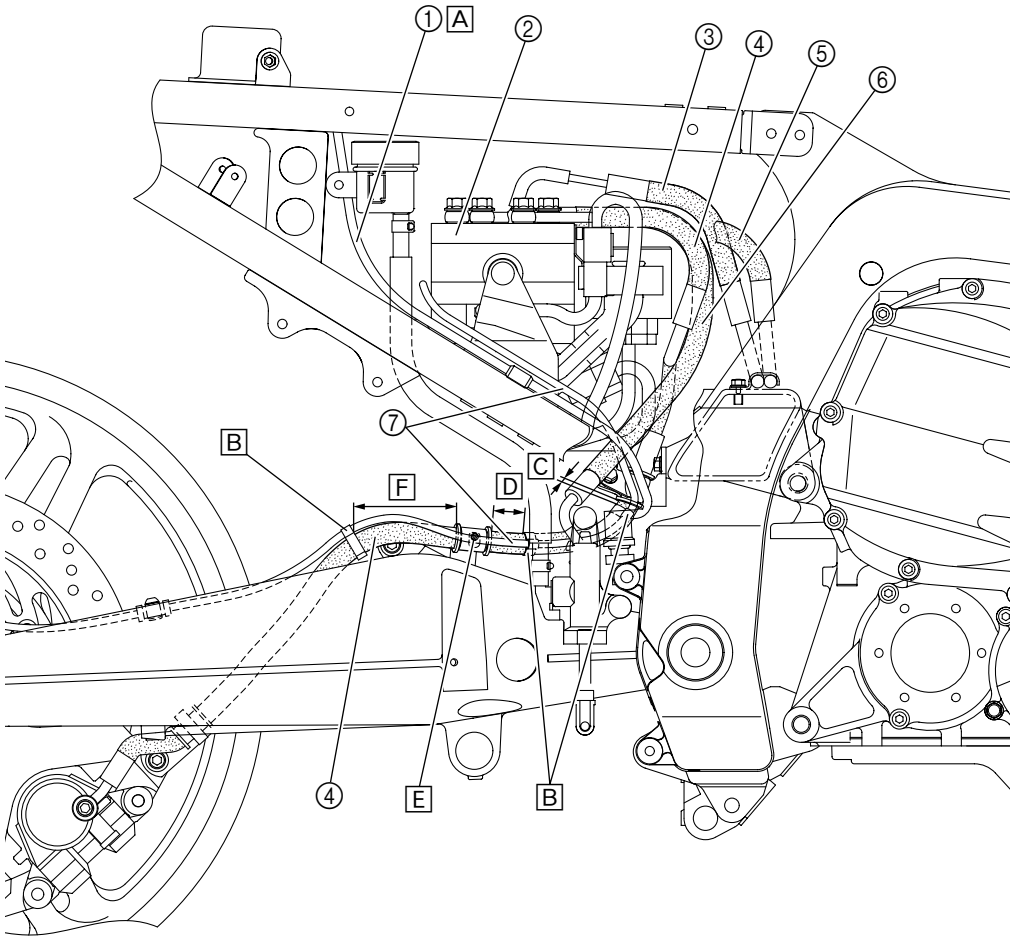


[J] Support the coolant reservoir hose and coolant reservoir breather hose with the hose holder located under the coolant reservoir.
[K] Pass the coolant reservoir breather hose through the hole of the coolant reservoir breather hose holder. The coolant reservoir hose end must extend at least 50 mm from the coolant reservoir hose holder.
[L] Fasten spark plug leads #1 and #4 at the number mark.
[M] Pass the wire harness and spark plug leads #1, #2, #3, and #4 through the right slit of the plate.
[N] Pass the starter motor lead, negative battery lead, wire harness, and spark plug leads #2 and #3 through the battery stay. Be sure to pass the starter motor lead and negative battery lead on the battery stay side.
[O] After checking the ABS, install the test coupler into the battery stay.

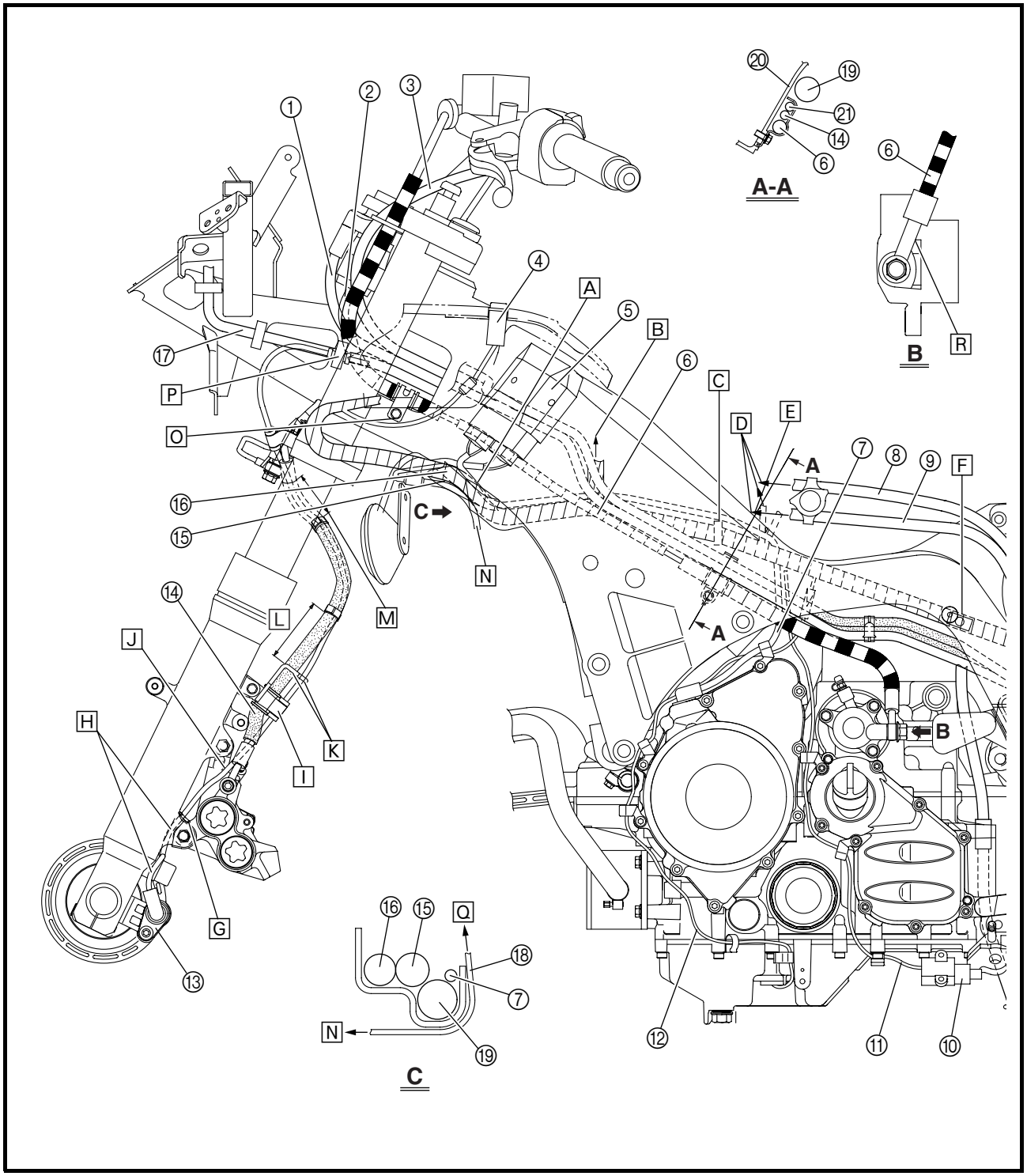


① Tail/brake light lead
② Hydraulic unit
③ Brake hose (front brake master cylinder to hydraulic unit)
④ Brake hose (hydraulic unit to rear brake caliper)
⑤ Brake hose (hydraulic unit to front brake caliper)
⑥ Brake hose (rear brake master cylinder to hydraulic unit)
⑦ Rear wheel sensor lead

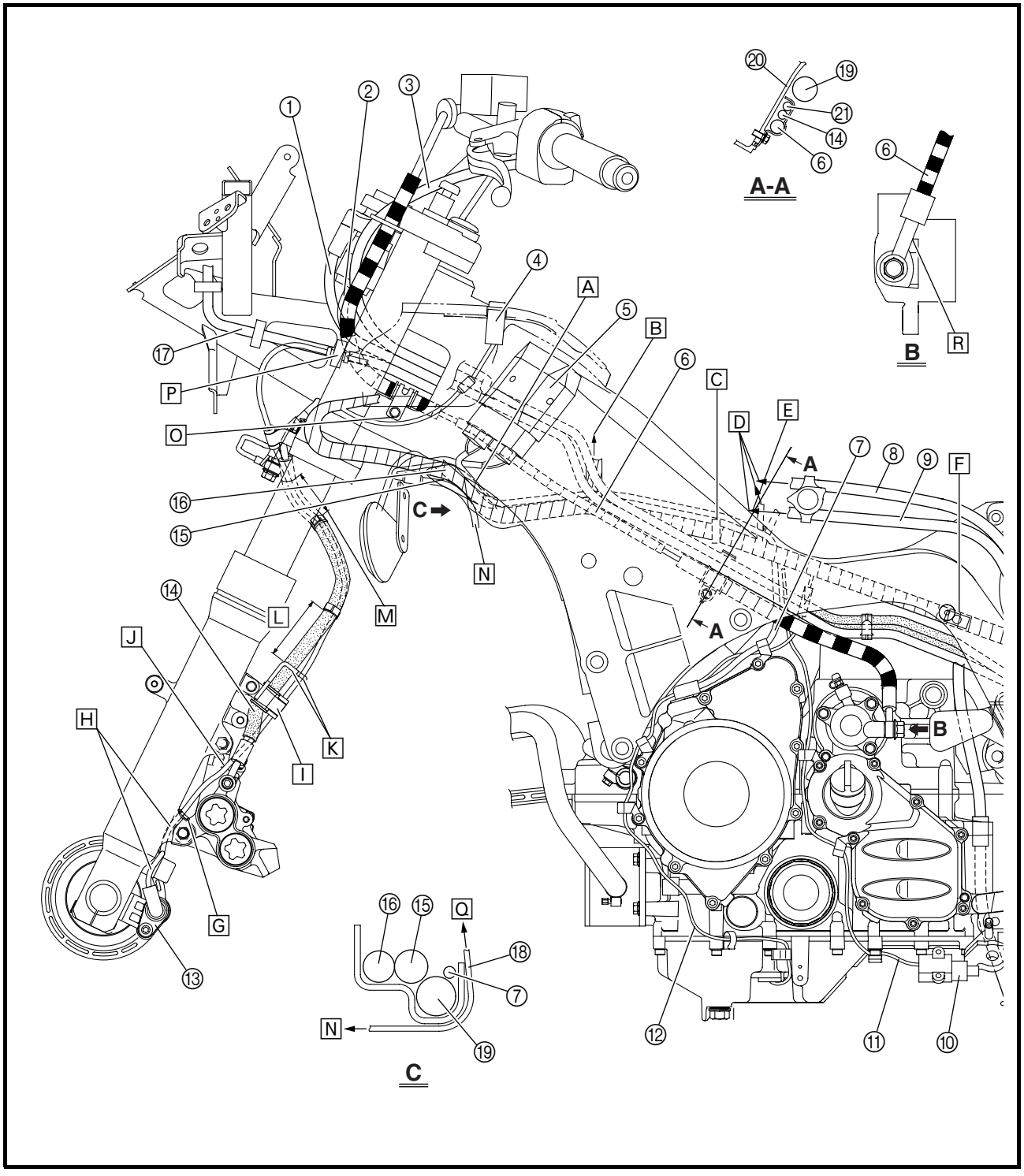
[A] Pass the tail/brake light lead under the rear wheel sensor lead.
[B] Fasten the rear wheel sensor lead to the rear brake hose (hydraulic unit to rear brake caliper) with a plastic locking tie.
[C] 0 ~ 10 mm
[D] 17 ~ 27 mm
[E] Fasten the brake hose (hydraulic unit to the rear brake caliper) with the paint of the grommet over the hole in the brake hose holder.
[F] 70 ~ 80 mm



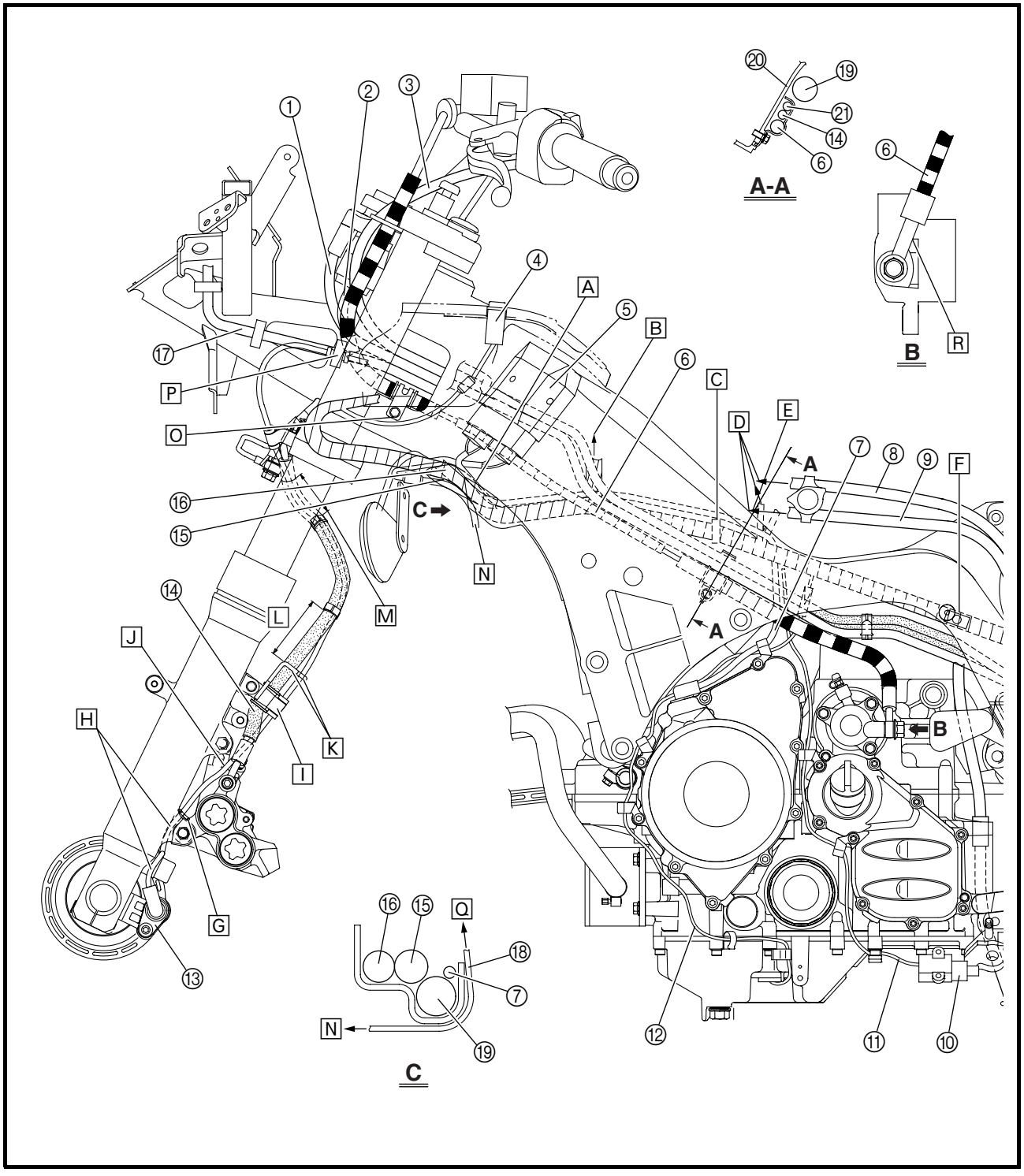
① Immobilizer lead
② Main switch lead
③ Left handlebar switch lead
④ Hazard switch
⑤ Rectifier/regulator
⑥ Clutch hose
⑦ Stator coil lead
⑧ Fuel tank breather hose
⑨ Fuel tank overflow hose
⑩ Sidestand switch
⑪ Sidestand switch lead
⑫ Oil level switch lead
⑬ Front wheel sensor
⑭ Brake hose (hydraulic unit to front brake caliper)
⑮ Coolant reservoir hose
⑯ Thermostat assembly breather hose
⑰ Headlight lead
⑱ Radiator fan lead
⑲ Wire harness
⑳ Frame
㉑ Brake hose (front brake master cylinder to hydraulic unit)



[A] Pass the wire harness, stator coil lead, coolant reservoir hose, and thermostat assembly breather hose through the left slit of the plate.
[B] To the right side of the frame
[C] Fasten the wire harness with the plastic band attached to the frame.
[D] To the fuel tank
[E] Pass the stator coil lead through the fork in the wire harness.
[F] Insert the harness holder into the hole at the rear end of the frame.
[G] Pass the front wheel sensor lead through the holder.
[H] Pass the front wheel sensor lead outside of the adjusting screw boss and inside of the caliper mounting boss.
[I] Fasten the front wheel sensor lead grommet to the brake hose holder.
[J] Pass the front wheel sensor lead between the front brake caliper and brake hose (hydraulic unit to front brake caliper).

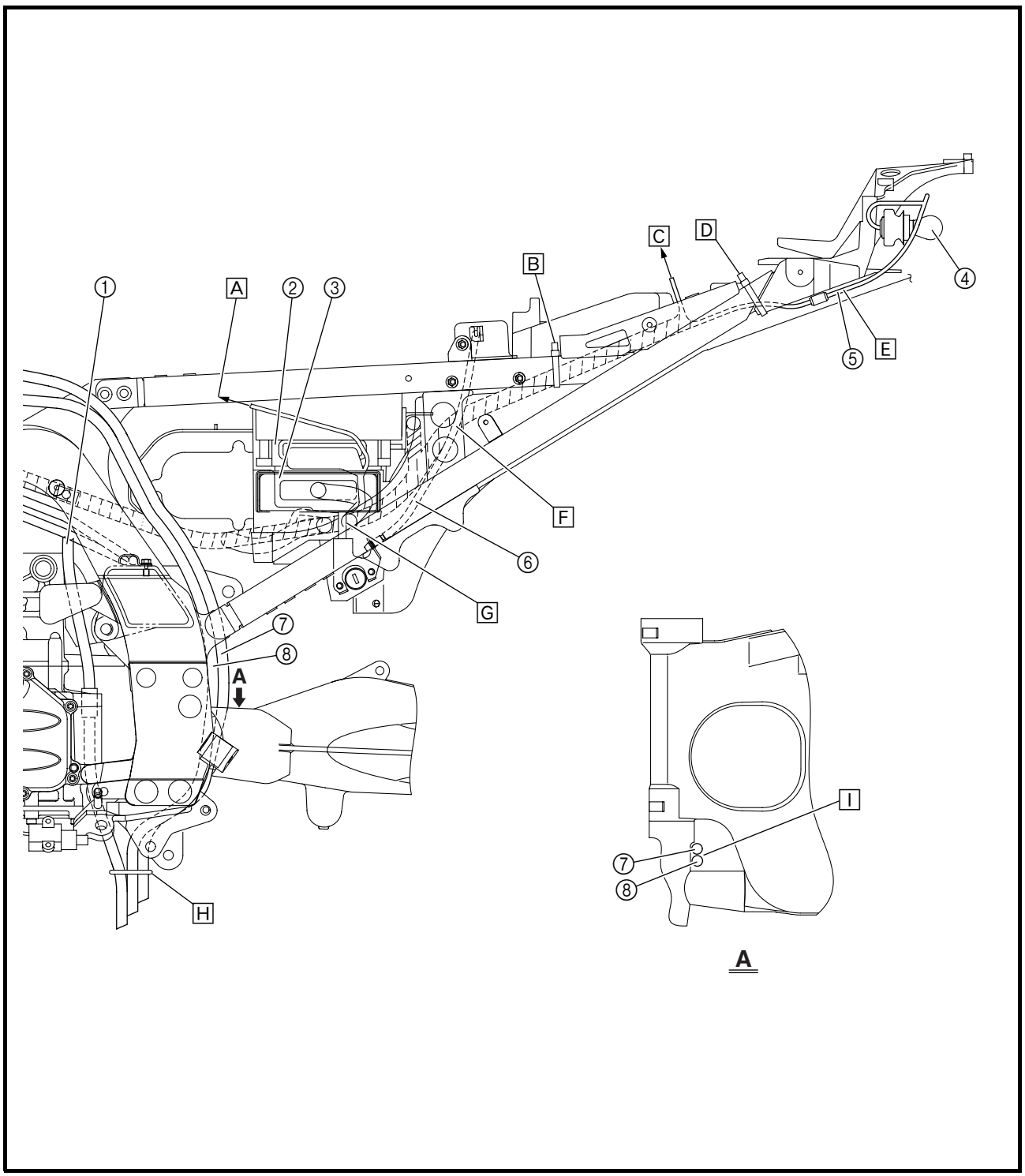


[K] Pass the brake hose (hydraulic unit to front brake caliper) and front wheel sensor through the brake hose holder.
[L] 60 ~ 70 mm
[M] 43 ~ 53 mm
[N] To the radiator fan
[O] Fasten the clutch hose with the hose holder attached to the frame.
[P] Fasten the headlight lead and the front wheel sensor lead with the lead holder attached to the headlight stay.
[Q] To the wire harness
[R] Contact the clutch hose to the turn stopper.

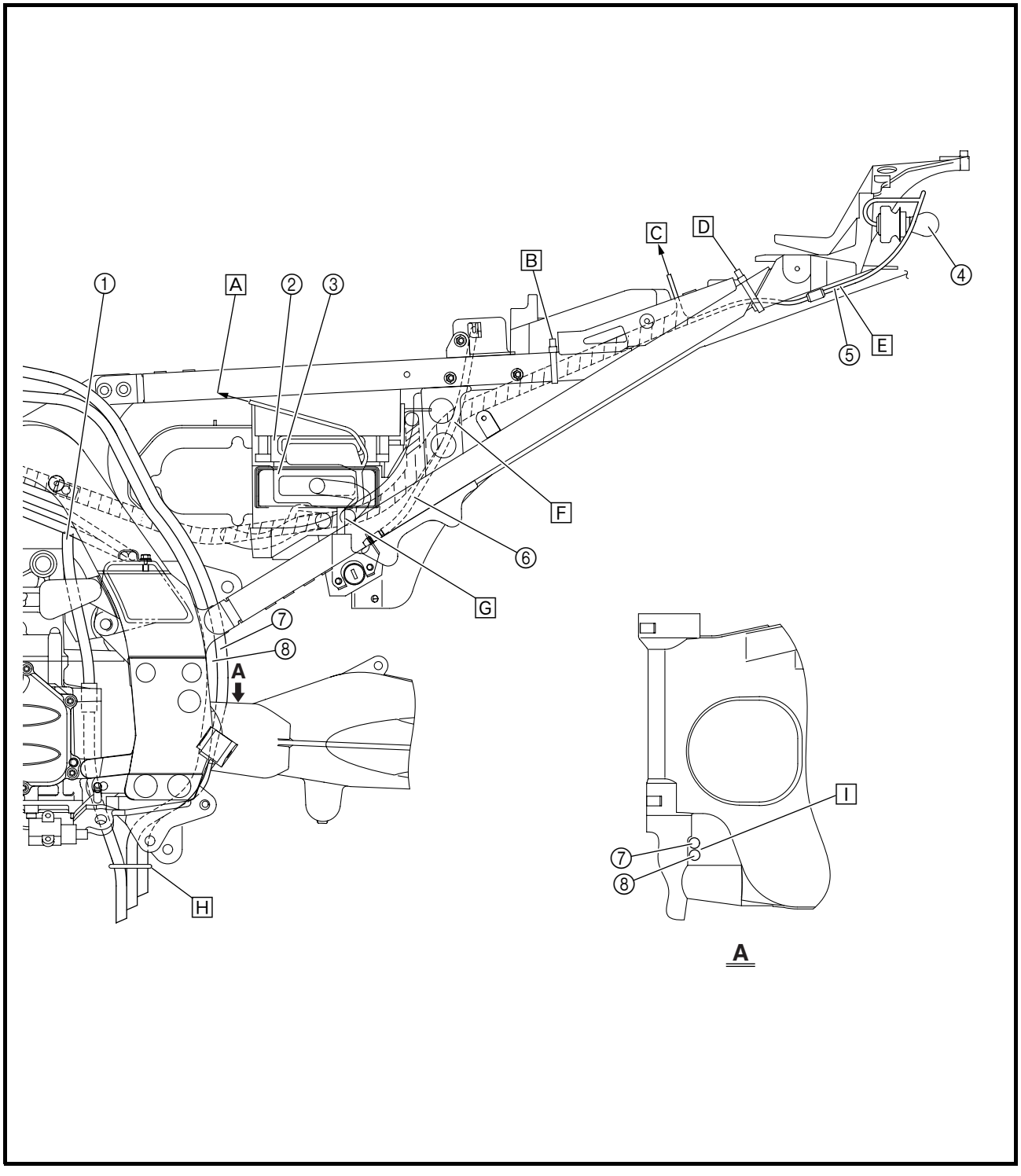


① Air filter case breather hose
② ECU (engine)
③ ECU (ABS)
④ Tail/brake light
⑤ Tail/brake light lead
⑥ Seat lock cable
⑦ Fuel tank breather hose
⑧ Fuel tank overflow hose

A To the intake air temperature sensor
B Fasten the wire harness to the frame with a plastic locking tie.
C To the inside of the U-lock storage box
D Fasten the tail/brake light lead to the frame with a plastic locking tie.
E Pass the tail/brake light lead between the rear cover and frame.
F Pass the wire harness on the inside of the seat lock cable.

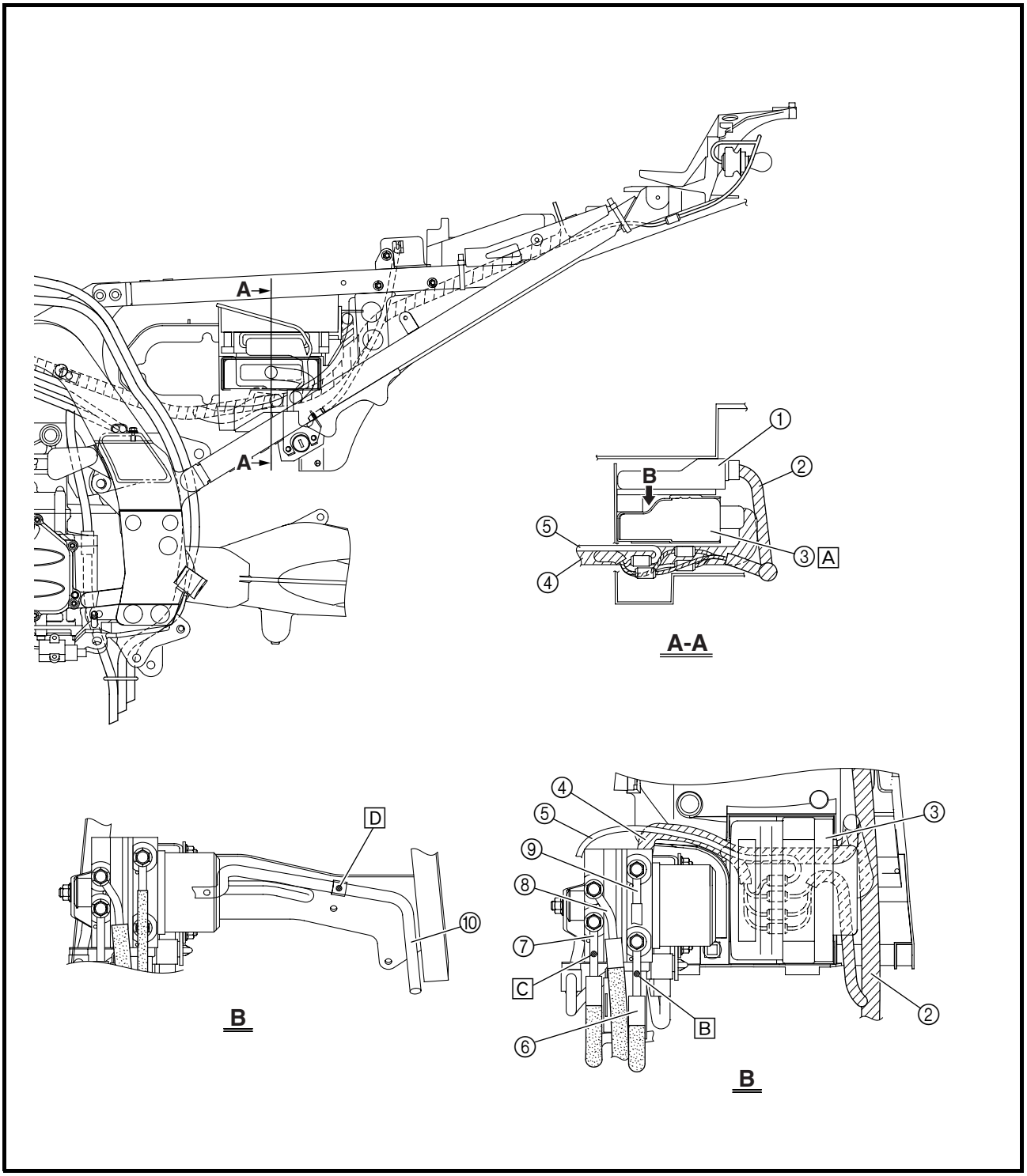


G Fasten the wire harness and wire harness (ECU) with the clamp attached to the clamp bracket, which is attached to the seat lock bracket.
H Pass the air filter case breather hose, fuel tank breather hose, and fuel tank over flow hose through the hose guide.
I Pass the fuel tank breather hose and fuel tank overflow hose between the swingarm and universal joint.

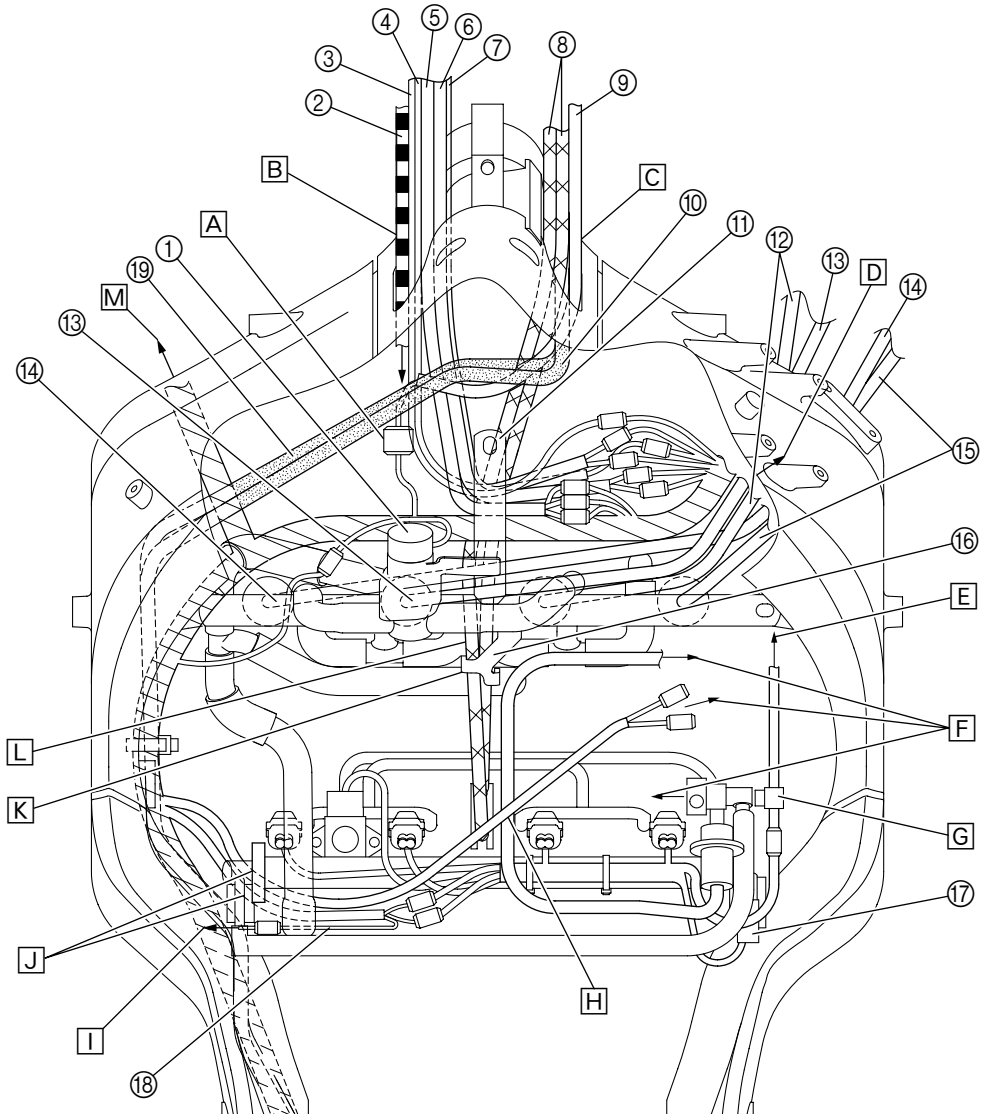


① ECU (engine)
② Wire harness
③ ECU (ABS)
④ Sub-wire harness (ABS)
⑤ Rear wheel sensor lead
⑥ Brake hose (rear brake master cylinder to hydraulic unit)
⑦ Brake hose (hydraulic unit to rear brake caliper)
⑧ Brake hose (hydraulic unit to front brake caliper)
⑨ Brake hose (front brake master cylinder to hydraulic unit)
⑩ Hydraulic unit breather hose

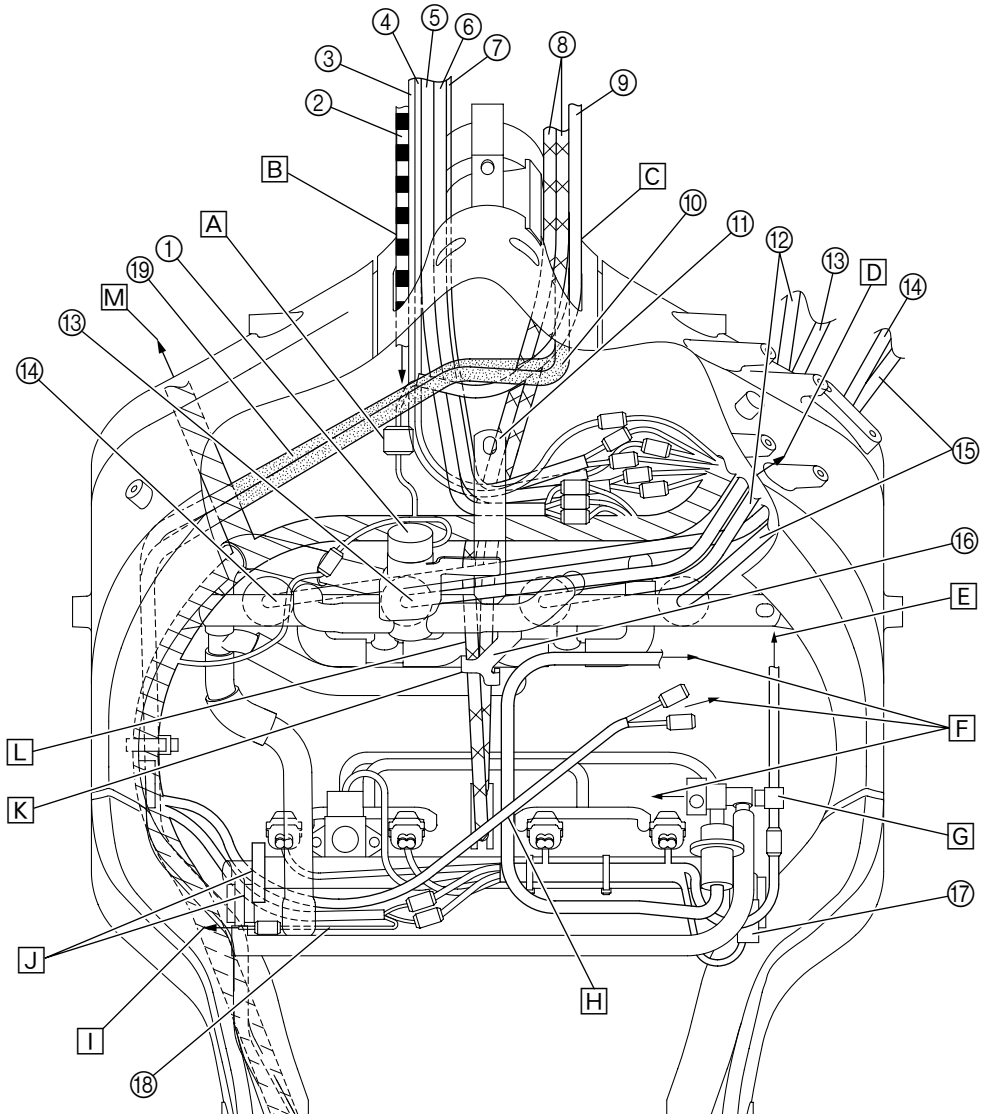
[A] Be sure to install the ECU (ABS) so that the sub-wire harness (ABS) and leads do not get pinched between the ECU (ABS) and rear fender.
[B] Yellow paint mark
[C] Blue paint mark
[D] Fasten the hydraulic unit breather hose with the hose holder attached to the cross member.



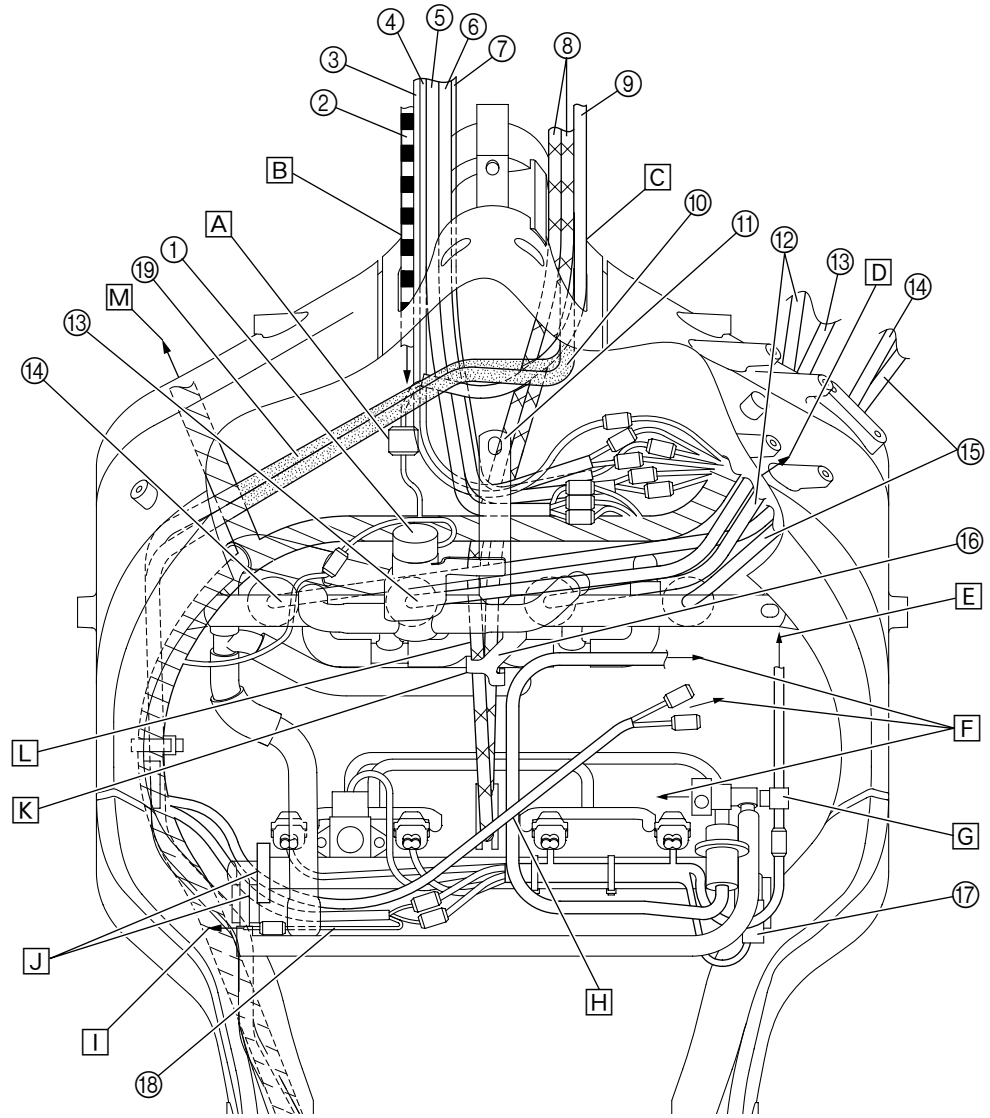
① Air cut-off valve
② Clutch hose
③ Front wheel sensor lead
④ Left handlebar switch lead
⑤ Headlight lead
⑥ Main switch lead
⑦ Immobilizer lead
⑧ Throttle cable
⑨ Right handlebar switch lead
⑩ Brake hose (front brake master cylinder to hydraulic unit)
⑪ T-bar
⑫ Spark plug lead #3
⑬ Spark plug lead #2
⑭ Spark plug lead #1
⑮ Spark plug lead #4
⑯ Cable guide
⑰ Throttle position sensor
⑱ Sidestand switch lead
⑲ Brake hose (hydraulic unit to front brake caliper)



[A] Connect the wire harness and right handlebar switch lead.
[B] Pass the left handlebar switch lead, front wheel sensor lead, immobilizer lead, main switch lead, headlight lead, and clutch hose through the hole on the left side of the frame.
[C] Pass the brake hoses, right handlebar switch lead, and throttle cables through the hole on the right side of the frame.
[D] To the lower left slit of the plate
[E] To the cylinder identification sensor
[F] To the fuel tank
[G] Pass the cylinder identification sensor lead through the lead guide of the throttle body.
[H] Pass the lead wire above the fuel return hose.
[I] To the sidestand switch lead
[J] Pass the cylinder identification sensor lead under the fuel hose, then to the wire harness.

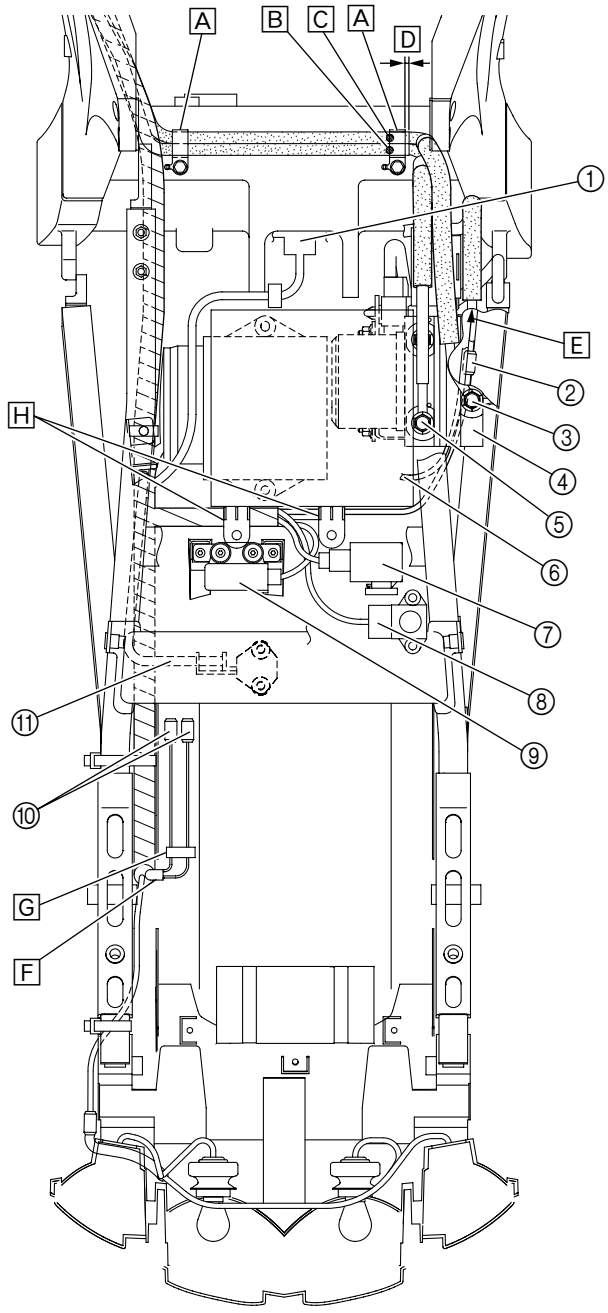


K Support the throttle cables with the T-bar located behind the cable guide.
L Pass the throttle cables under spark plug leads #1, #2, #3, and #4, and the wire harness, headlight lead, main switch lead, immobilizer lead, right handlebar switch lead, and left handlebar switch lead. Install the thermostat, heat protector, throttle cables, spark plug leads, wire harnesses, and air cut valve under the cable guide in the respective order.
M To the left slit of the plate

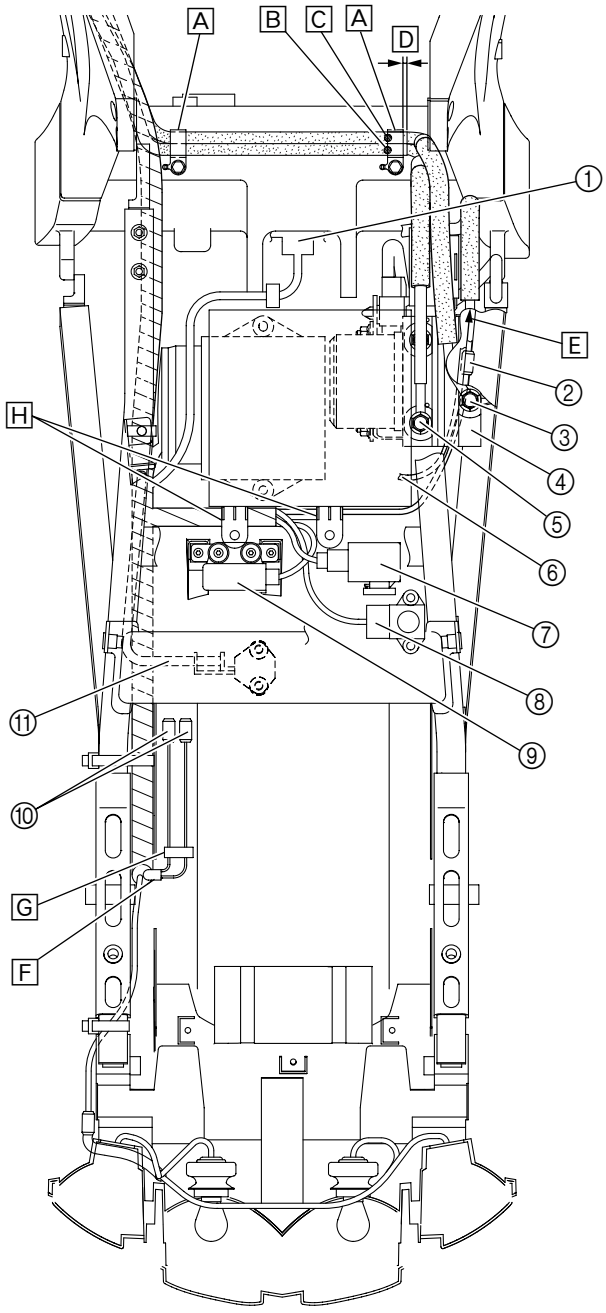


① Intake air temperature sensor
② Rear brake light switch coupler
③ Brake hose (hydraulic unit to front brake caliper)
④ Hydraulic unit
⑤ Brake hose (front brake master cylinder to hydraulic unit)
⑥ Rear wheel sensor lead
⑦ Starting circuit cut-off relay
⑧ Atmospheric pressure sensor
⑨ Lean angle cut-off switch
⑩ CYCLELOCK coupler
⑪ Seat lock cable

A Fasten the brake hoses with the hose holder attached to the frame.
B White paint mark
C Yellow paint mark
D When install the brake hose holder, sure to leave 0 ~ 6 mm between the hose protector end and the hose holder end.
E To the rear brake light switch and rear wheel sensor

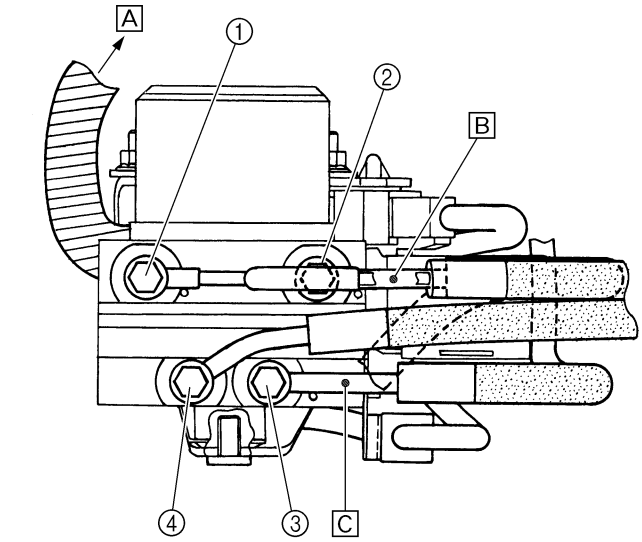


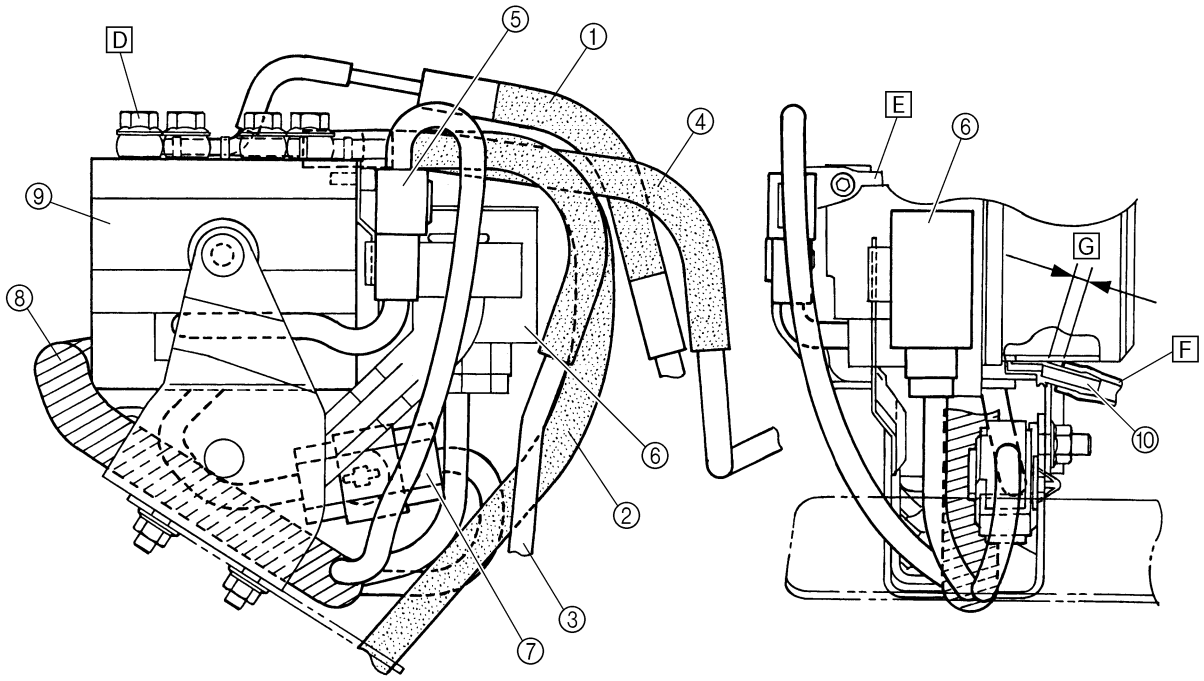
F Pass the CYCLELOCK coupler through the inside of the storage box of the U-lock.
G Pass the CYCLELOCK coupler through the lead guide.
H Pass the wire harnesses under the tray bracket.



① Brake hose (front brake master cylinder to hydraulic unit)
② Brake hose (rear brake master cylinder to hydraulic unit)
③ Brake hose (hydraulic unit to rear brake caliper)
④ Brake hose (hydraulic unit to front brake caliper)
⑤ Hydraulic unit solenoid coupler
⑥ Fail-safe relay
⑦ ABS motor coupler
⑧ Sub-wire harness (ABS)
⑨ Hydraulic unit
⑩ Hydraulic unit drain plug

[A] To the ECU (ABS)
[B] Install the brake hose with the yellow paint mark facing up.
[C] Install the brake hose with the blue paint mark facing up.
[D] Contact the brake hoses to the hose stoppers.
[E] Contact the bracket claw to the hydraulic unit.
[F] Insert the hydraulic unit drain plug with the white paint mark facing down.
[G] 5 ~ 7 mm





EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE AND LUBRICATION CHART

NOTE:

- **The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.**
- From 50,000 km, repeat the maintenance intervals starting from 10,000 km.
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

No.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (× 1,000 km)					ANNUAL CHECK
				1	10	20	30	40	
1	*	**Fuel line**	• Check fuel hoses for cracks or damage.		√	√	√	√	√
2	*	**Spark plugs**	• Check condition. • Clean and regap.		√		√		
			• Replace.			√		√	
3	*	**Valves**	• Check valve clearance. • Adjust.	**Every 40,000 km**					
4		**Air filter element**	• Clean.		√		√		
			• Replace.			√		√	
5	*	**Clutch**	• Check operation, fluid level and vehicle for fluid leakage. (See NOTE on page 43.)	√	√	√	√	√	
6	*	**Front brake**	• Check operation, fluid level and vehicle for fluid leakage. (See NOTE on page 43.)	√	√	√	√	√	√
			• Replace brake pads.	**Whenever worn to the limit**					
7	*	**Rear brake**	• Check operation, fluid level and vehicle for fluid leakage. (See NOTE on page 43.)	√	√	√	√	√	√
			• Replace brake pads.	**Whenever worn to the limit**					
8	*	**Brake hoses**	• Check for cracks or damage.		√	√	√	√	√
			• Replace. (See NOTE on page 43.)	**Every 4 years**					
9	*	**Wheels**	• Check runout and for damage.		√	√	√	√	
10	*	**Tires**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
11	*	**Wheel bearings**	• Check bearing for looseness or damage.		√	√	√	√	
12	*	**Swingarm**	• Check operation and for excessive play.		√	√	√	√	
			• Lubricate with lithium-soap-based grease.	**Every 50,000 km**					
13	*	**Steering bearings**	• Check bearing play and steering for roughness.	√	√	√	√	√	
			• Lubricate with lithium-soap-based grease.	**Every 20,000 km**					

No.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (× 1,000 km)					ANNUAL CHECK
				1	10	20	30	40	
14	*	**Chassis fasteners**	• Make sure that all nuts, bolts and screws are properly tightened.		√	√	√	√	√
15		**Sidestand/center-stand**	• Check operation. • Lubricate.		√	√	√	√	√
16	*	**Sidestand switch**	• Check operation.	√	√	√	√	√	√
17	*	**Front fork**	• Check operation and for oil leakage.		√	√	√	√	
18	*	**Shock absorber assembly**	• Check operation and shock absorber for oil leakage.		√	√	√	√	
19	*	**Rear suspension relay arm and connecting arm pivoting points**	• Check operation.		√	√	√	√	
20	*	**Electronic fuel injection**	• Adjust engine idling speed and synchronization.	√	√	√	√	√	√
21		**Engine oil**	• Change. • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
22		**Engine oil filter cartridge**	• Replace.	√		√		√	
23	*	**Cooling system**	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
			• Change.	**Every 3 years**					
24		**Final gear oil**	• Check oil level and vehicle for oil leakage. • Change.	√	√	√	√	√	
25	*	**Front and rear brake switches**	• Check operation.	√	√	√	√	√	√
26		**Moving parts and cables**	• Lubricate.		√	√	√	√	√
27	*	**Throttle grip housing and cable**	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√
28	*	**Muffler and exhaust pipe**	• Check the screw clamp for looseness.	√	√	√	√	√	
29	*	**Lights, signals and switches**	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

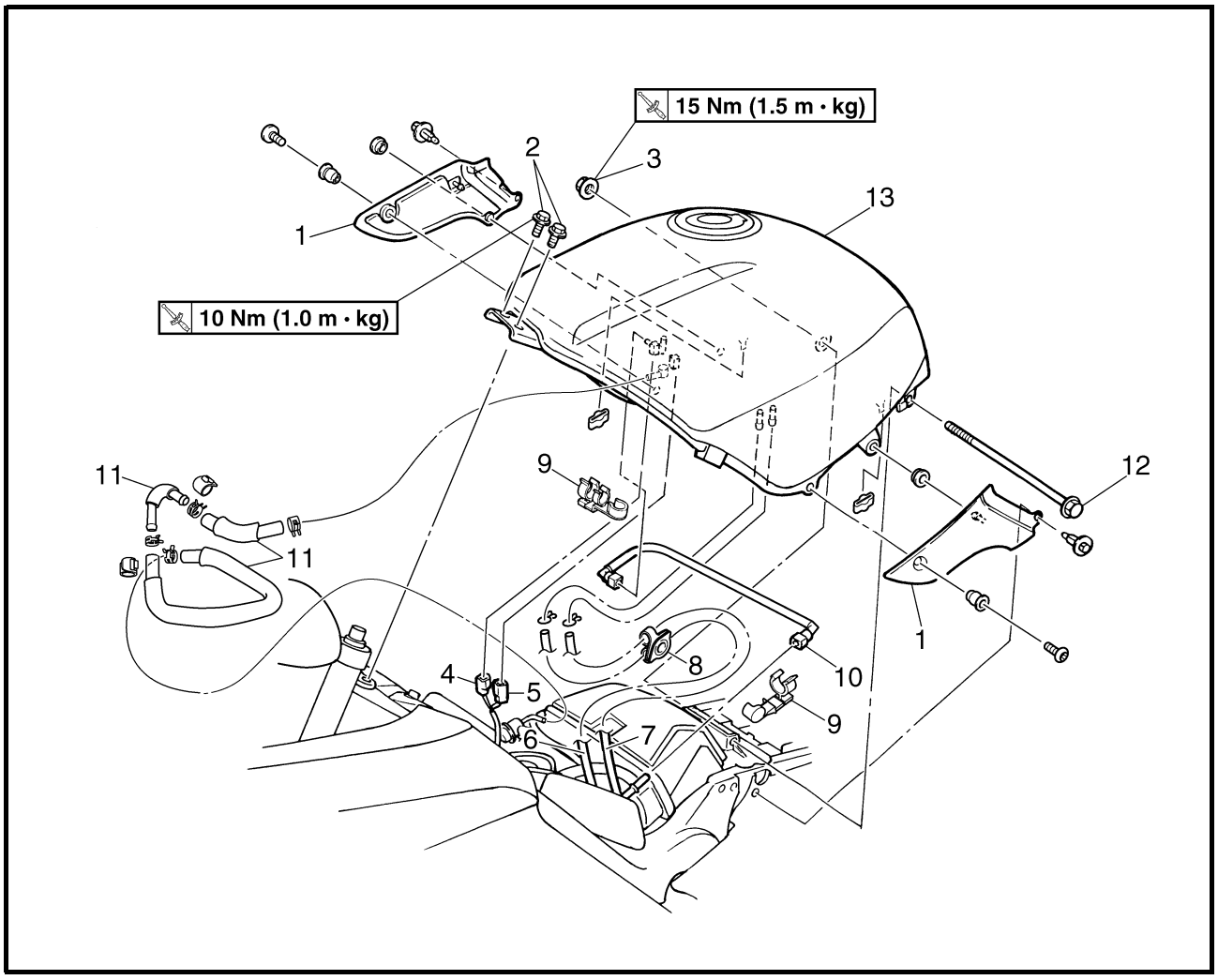
NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake and clutch service
  - Regularly check and, if necessary, correct the brake and clutch fluid levels.
  - Every two years replace the internal components of the brake master cylinders and calipers as well as the clutch master and release cylinders, and change the brake and clutch fluids.
  - Replace the brake and clutch hoses every four years and if cracked or damaged.

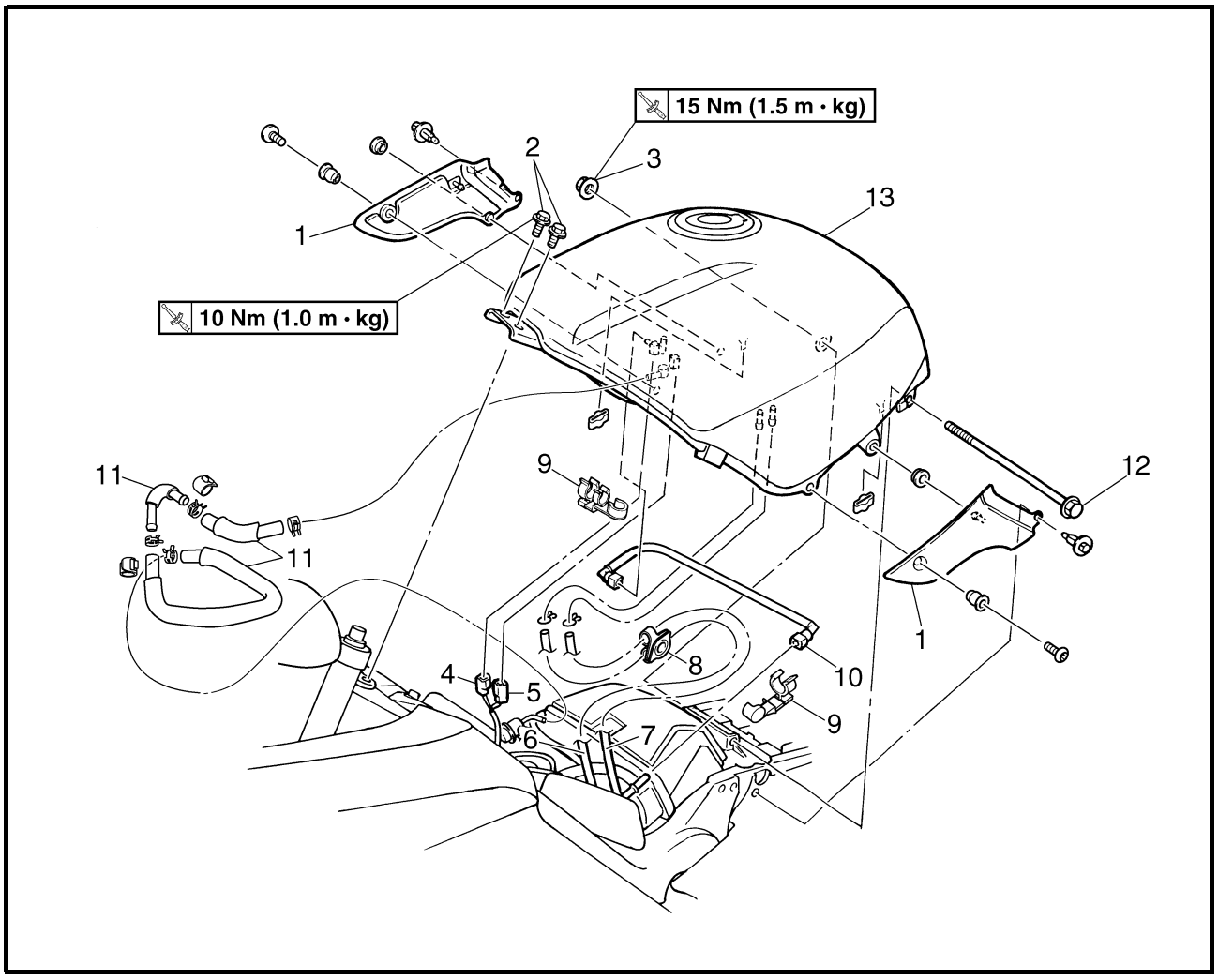
SEATS AND FUEL TANK

EAS00040

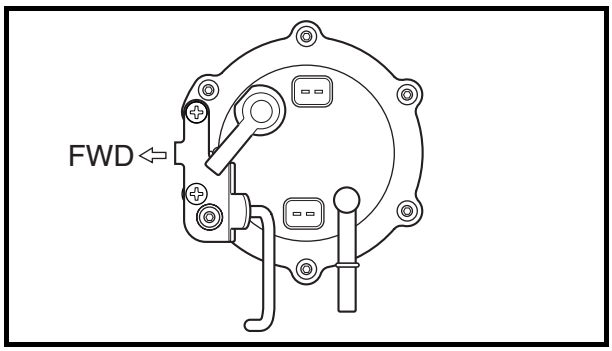
FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS AND FUEL TANK" in chapter 3. (Manual No.: 5JW1-AE1)
	Fuel		Drain.
1	Fuel tank side panel (left and right)	1/1	
2	Bolt	2	
3	Nut	1	
4	Fuel sender coupler	1	
5	Fuel pump coupler	1	
6	Fuel tank overflow hose	1	
7	Fuel tank breather hose	1	
8	Hose holder	1	
9	Fuel hose holder	2	
10	Fuel hose	1	Refer to "REMOVING THE FUEL TANK" and "INSTALLING THE FUEL HOSE" in chapter 3. (Manual No.: 5JW1-AE1)
11	Fuel return hose	1	



Order	Job/Part	Q'ty	Remarks
12	Bolt	1	
13	Fuel tank	1	Refer to "REMOVING THE FUEL TANK" in chapter 3. (Manual No.: 5JW1-AE1) For installation, reverse the removal procedure.



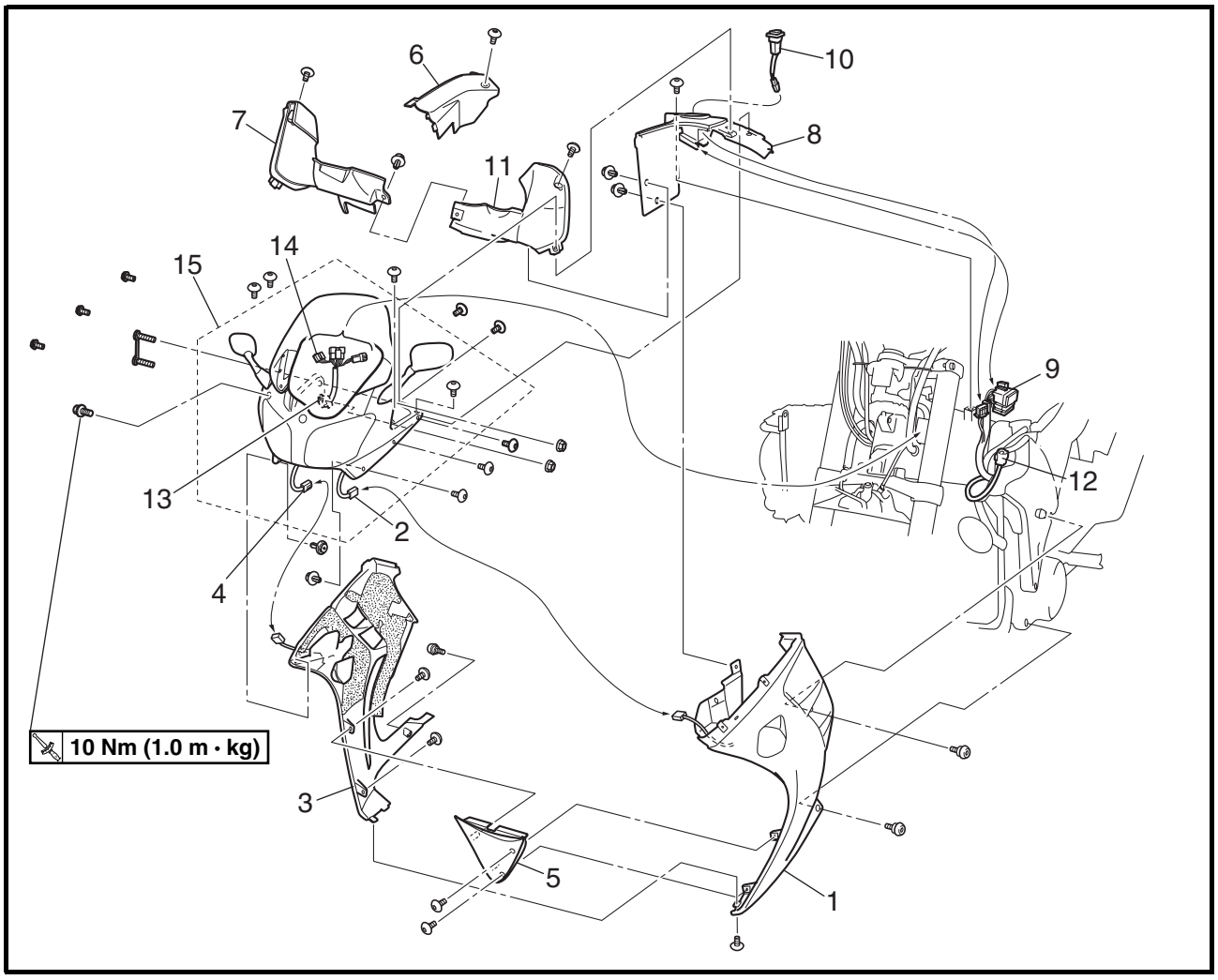
INSTALLING THE FUEL PUMP

1. Install:
   - fuel pump — **4 Nm (0.4 m · kg)**

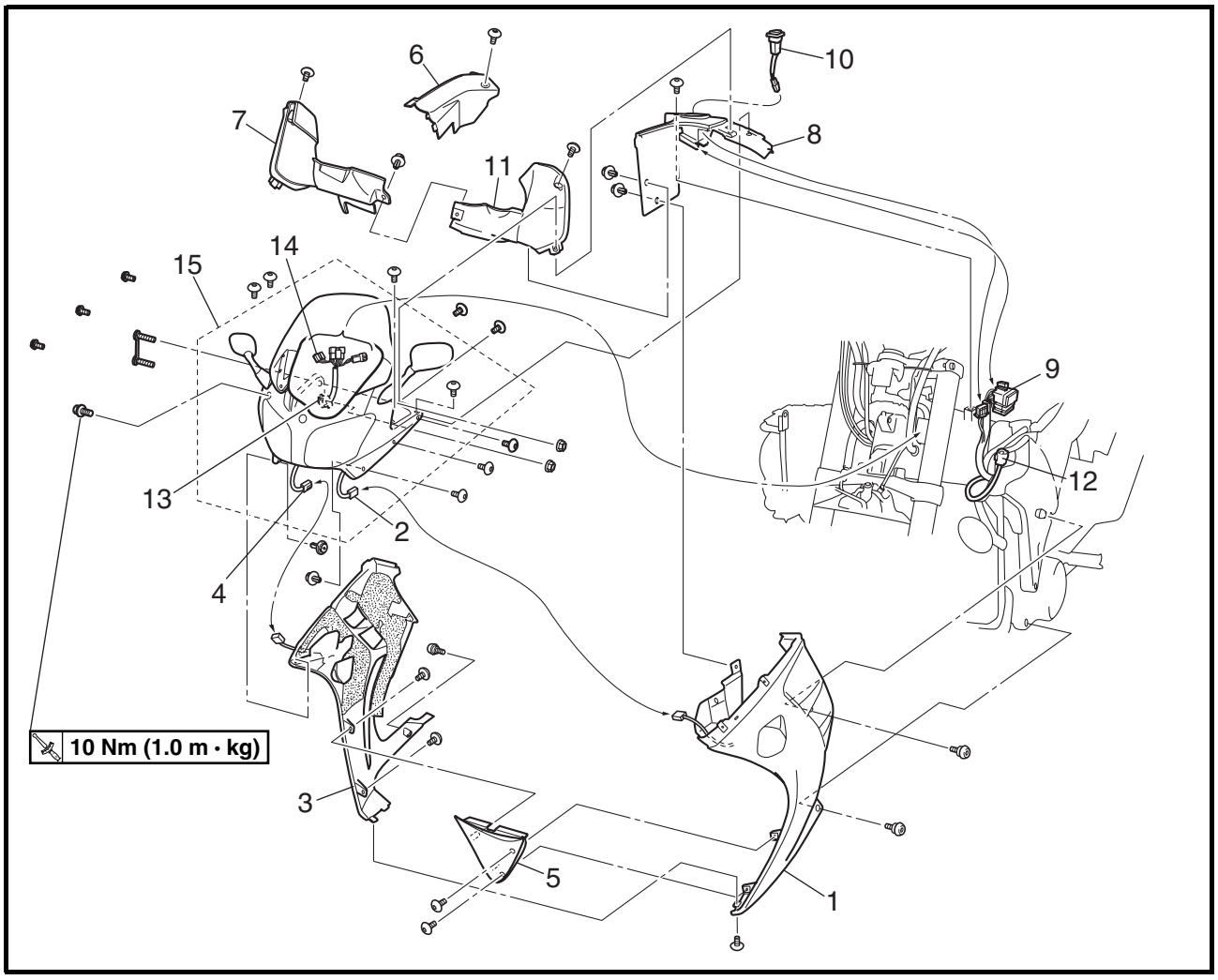
NOTE:

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump as shown in the illustration.
- Tighten the fuel pump bolts in stages in a crisscross pattern and to the specified torque.

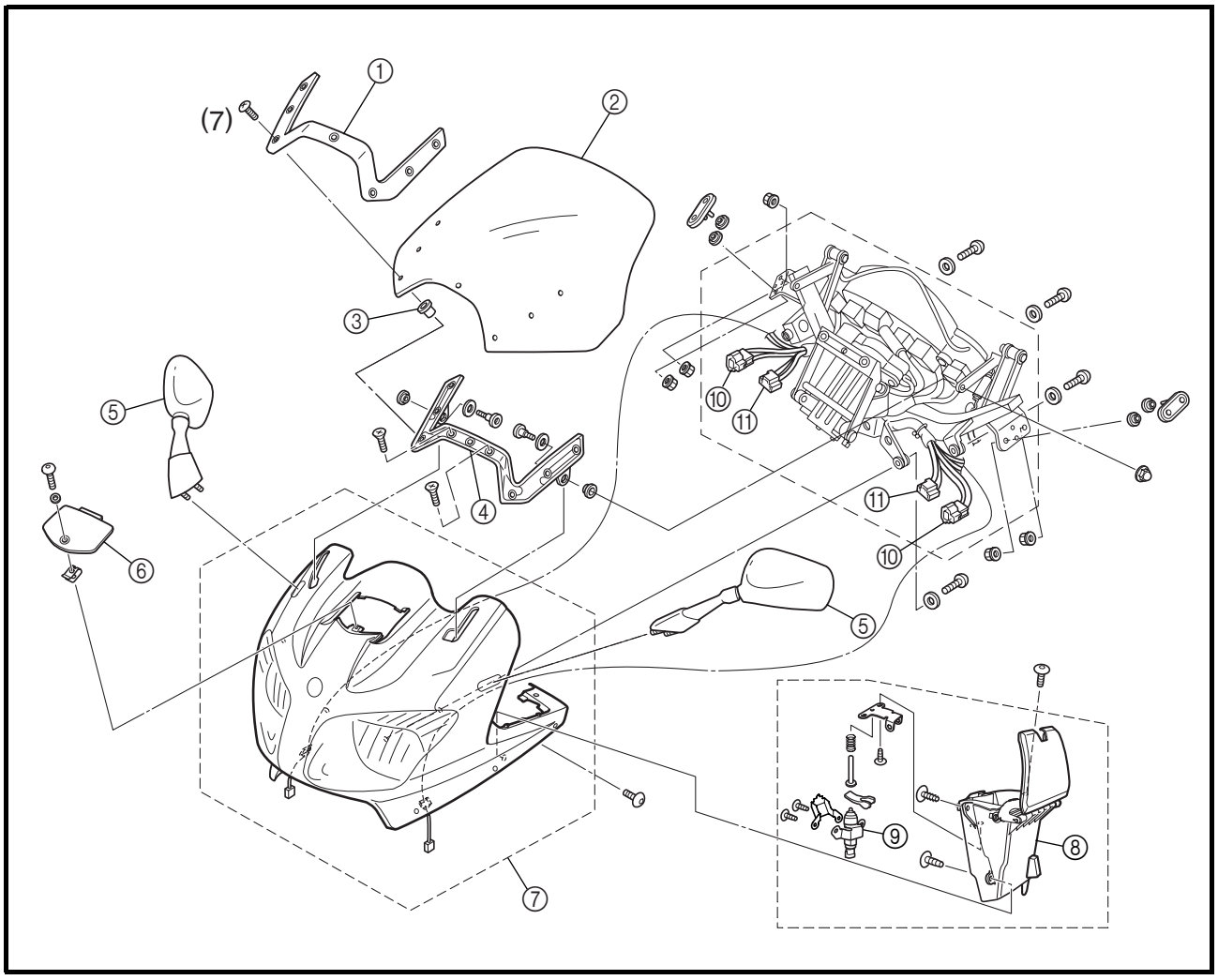
EAS00041
COWLINGS AND COVERS
COWLINGS



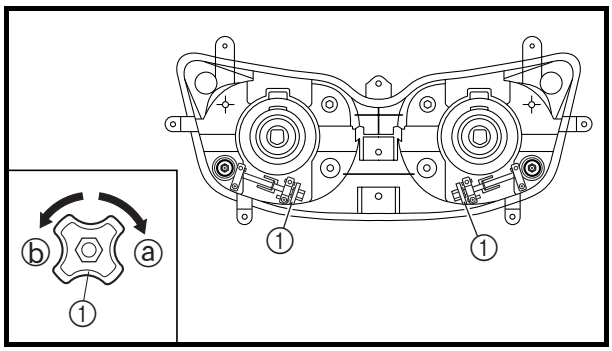
Order	Job/Part	Q'ty	Remarks
	Removing the cowlings		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS AND FUEL TANK" in chapter 3. (Manual No.: 5JW1-AE1)
	Fuel tank		Refer to "SEATS AND FUEL TANK".
1	Left side cowling	1	
2	Front turn signal coupler (left)	1	
3	Right side cowling	1	
4	Front turn signal coupler (right)	1	
5	Front bottom cowling	1	
6	Right inner panel (front cowling)	1	
7	Front right inner panel (front cowling)	1	
8	Left inner panel (front cowling)	1	
9	Fuse box	1	
10	Hazard switch	1	



Order	Job/Part	Q'ty	Remarks
11	Front left inner panel (front cowling)	1	
12	Accessory box solenoid coupler	1	
13	Clamp	1	
14	Sub-wire harness coupler	3	
15	Front cowling assembly	1	For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the front cowling assembly		Remove the parts in the order listed.
①	Windshield outer bracket	1	
②	Windshield	1	
③	Grommet	7	
④	Windshield inner bracket	1	
⑤	Rear view mirror (left and right)	2	
⑥	Panel	1	
⑦	Front cowling	1	
⑧	Accessory box	1	
⑨	Accessory box lock assembly	1	
⑩	Auxiliary light coupler	2	
⑪	Headlight coupler	2	
			For assembly, reverse the disassembly procedure.



ELECTRICAL SYSTEM

EAS00185
ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

1. Adjust:
   • headlight beam (vertically)

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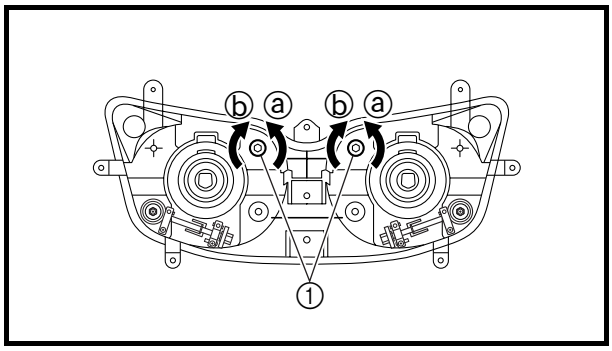
a. Turn the adjusting knob ① in direction ⓐ or ⓑ.

Direction ⓐ	**Headlight beam is raised.**
Direction ⓑ	**Headlight beam is lowered.**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



2. Adjust:
   • headlight beam (horizontally)

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a. Turn the adjusting screw ① in direction ⓐ or ⓑ.

Left headlight

Direction ⓐ	**Headlight beam moves to the left.**
Direction ⓑ	**Headlight beam moves to the right.**

Right headlight

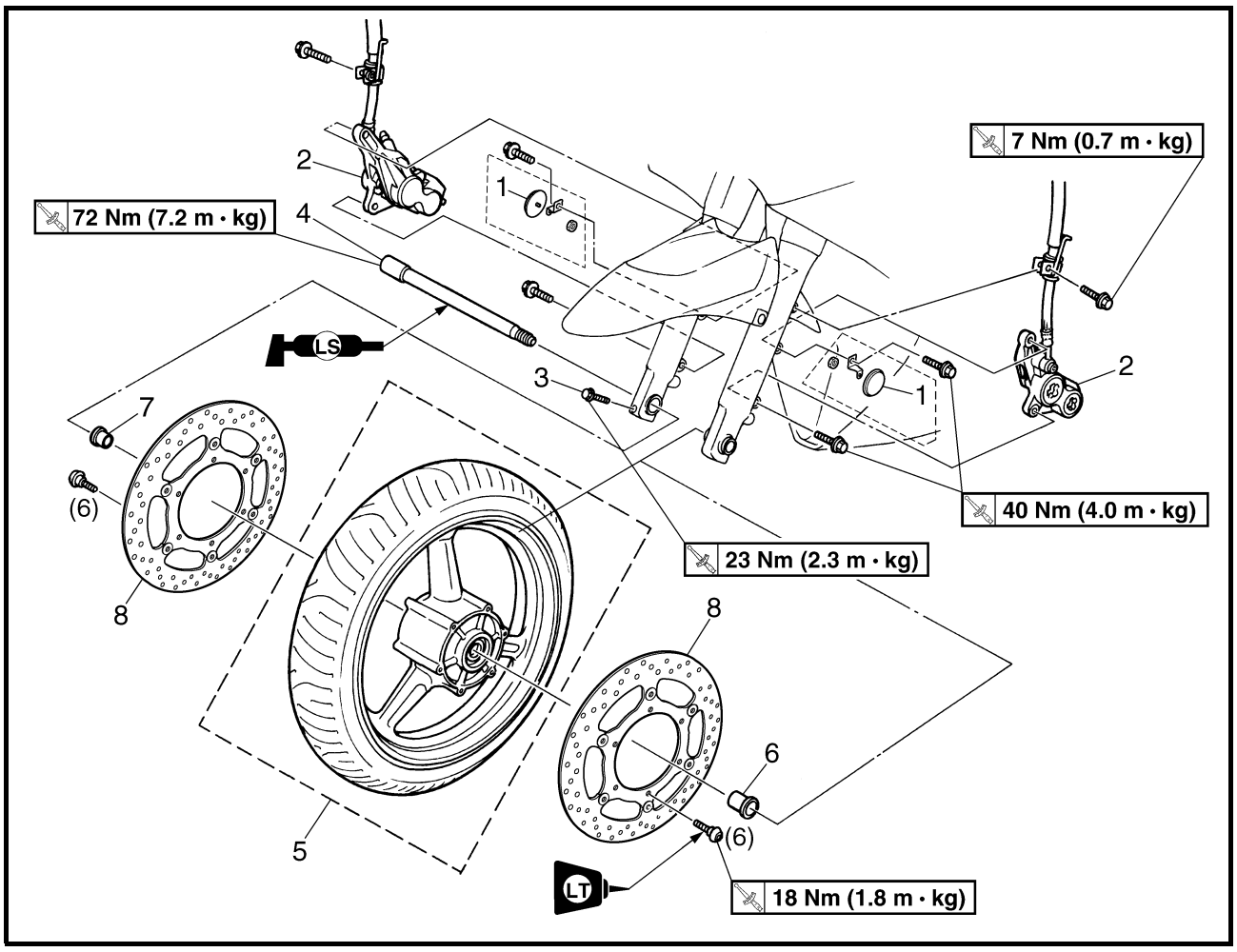
Direction ⓐ	**Headlight beam moves to the right.**
Direction ⓑ	**Headlight beam moves to the left.**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00514

CHASSIS

FRONT WHEEL AND BRAKE DISCS

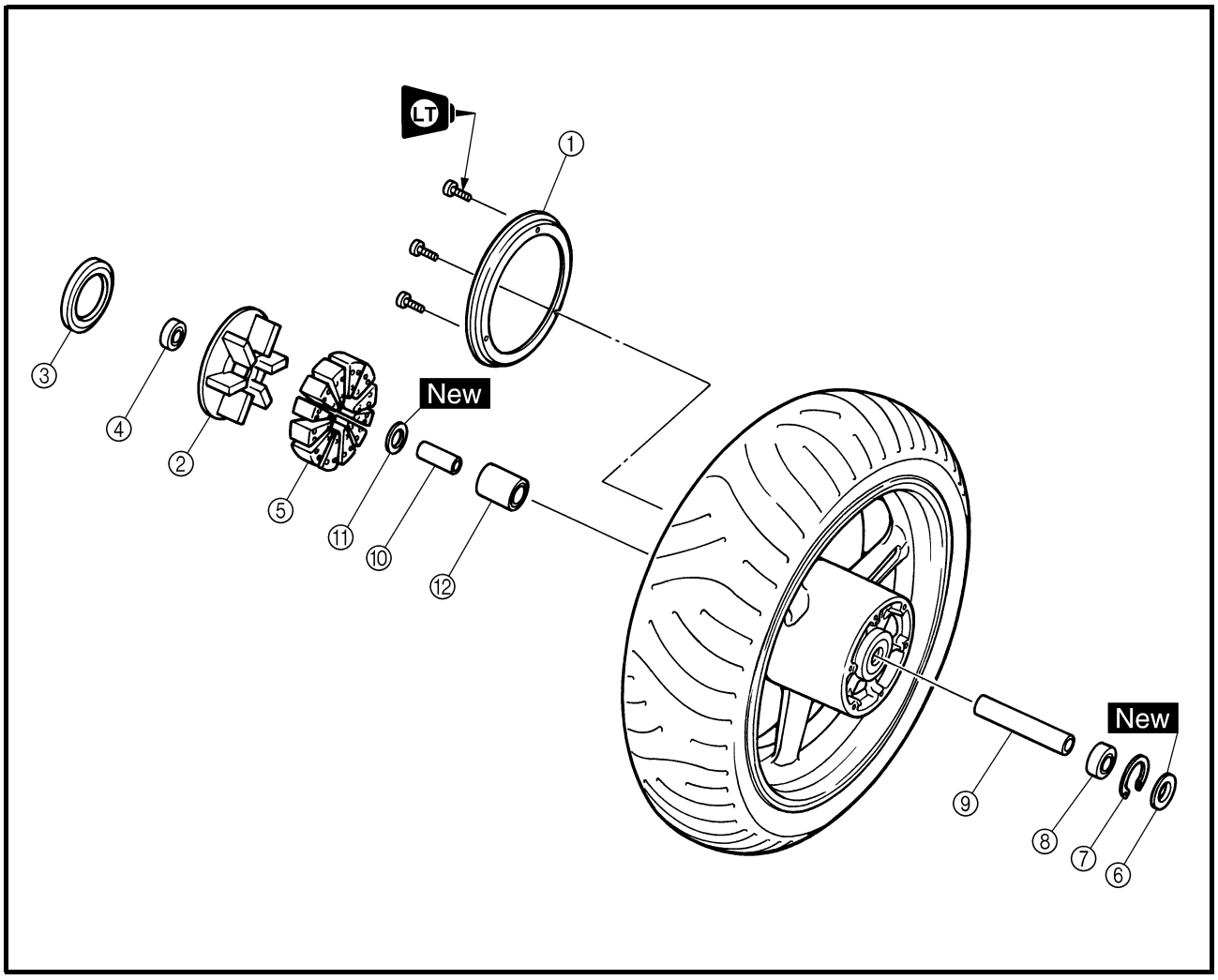


Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake discs		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the front wheel is elevated.
1	Reflector	2	For AUS only
2	Brake caliper (left and right)	2	
3	Wheel axle pinch bolt	1	Loosen.
4	Front wheel axle	1	
5	Front wheel	1	
6	Collar (left)	1	
7	Collar (right)	1	
8	Brake disc (left and right)	2	
			For installation, reverse the removal procedure.

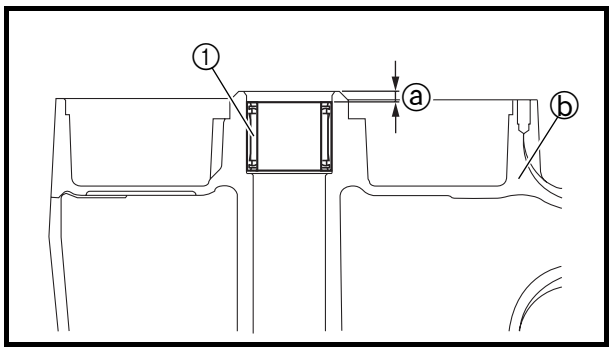
Refer to "REMOVING/INSTALLING THE FRONT WHEEL" in chapter 4. (Manual No.: 5JW1-AE1)

REAR WHEEL AND BRAKE DISC

EAS00560



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear wheel		Remove the parts in the order listed.
①	Dust cover	1	
②	Rear wheel drive hub	1	
③	Dust seal	1	
④	Wheel bearing	1	
⑤	Rear wheel drive hub damper	6	
⑥	Oil seal	1	
⑦	Circlip	1	
⑧	Wheel bearing	1	
⑨	Spacer	1	
⑩	Collar	1	
⑪	Oil seal	1	
⑫	Bearing	1	
			For assembly, reverse the disassembly procedure.



INSTALLING THE BEARING

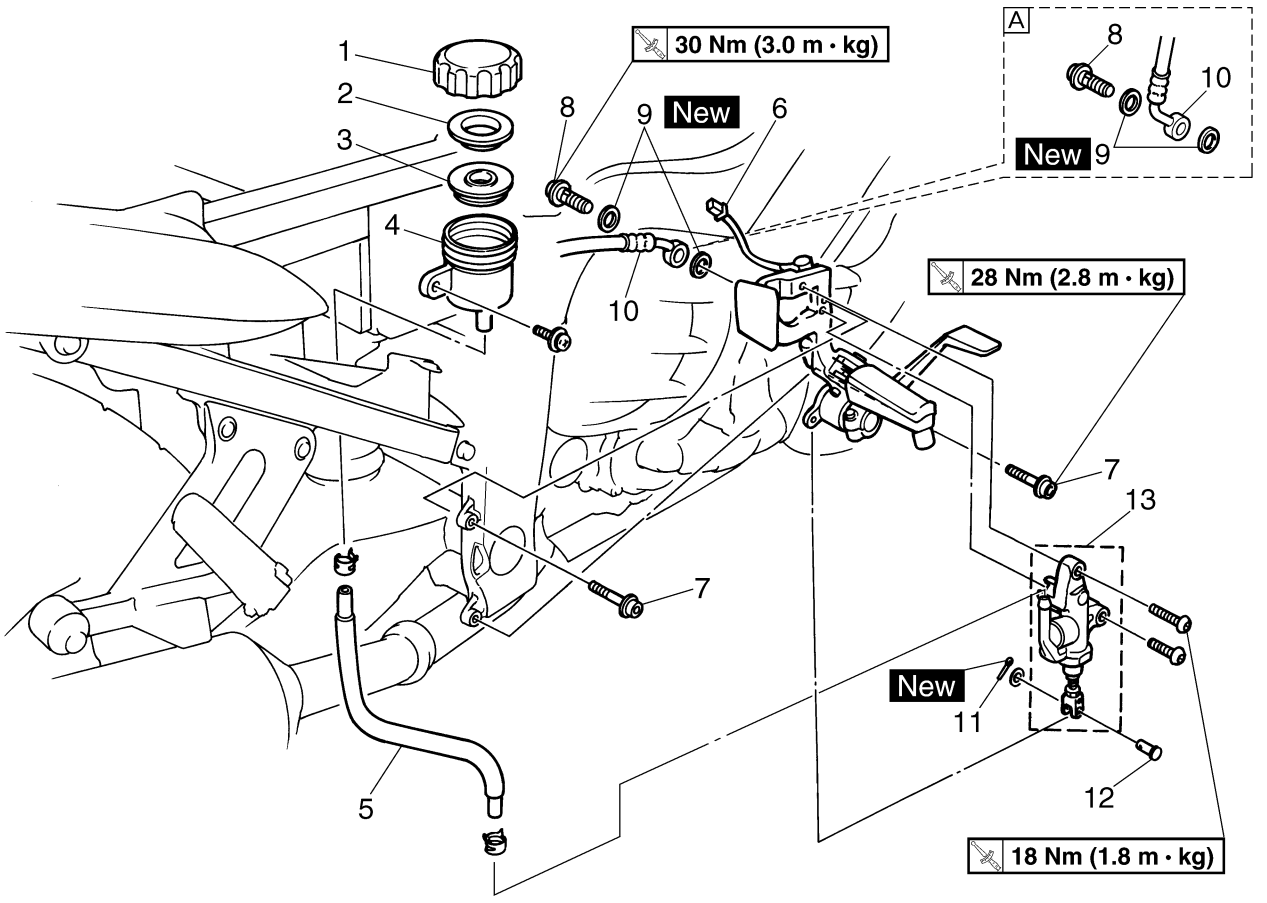
1. Install:
   • bearing ①

ⓐ 3.5 ~ 4.5 mm
ⓑ rear wheel

FRONT AND REAR BRAKES

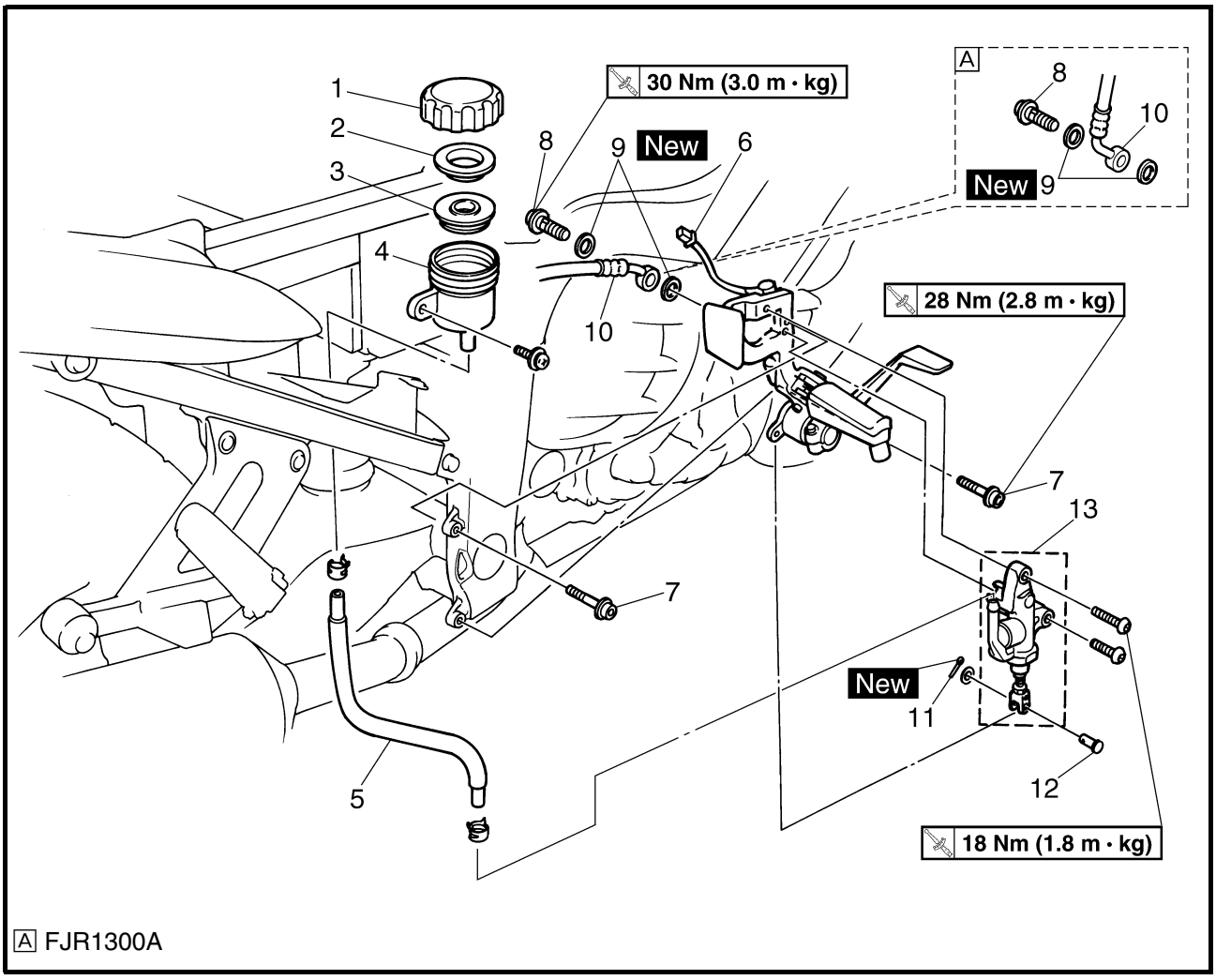
EAS00586

REAR BRAKE MASTER CYLINDER



A FJR1300A

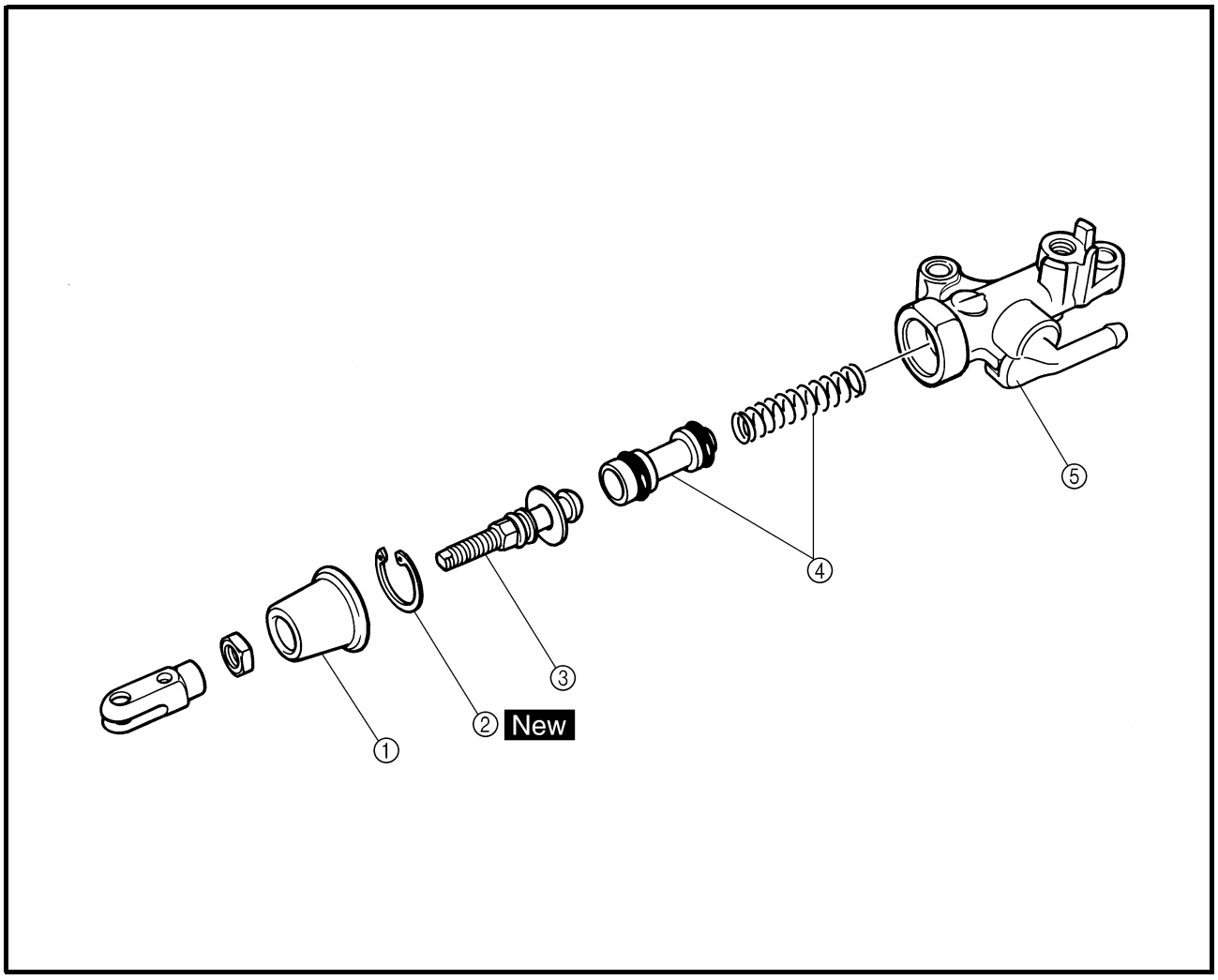
Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Side cover (right)		Refer to "COWLINGS AND COVERS" in chapter 3. (Manual No.: 5JW1-AE1)
	Brake fluid		Drain.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm holder	1	
3	Brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir	1	
5	Brake fluid reservoir hose	1	
6	Rear brake light switch coupler	1	Disconnect.
7	Right footrest bracket bolt	2	



A FJR1300A

Order	Job/Part	Q'ty	Remarks
8	Union bolt	1	Refer to "DISASSEMBLING/ ASSEMBLING THE REAR BRAKE MASTER CYLINDER" in chapter 4. (Manual No.: 5JW1-AE1)
9	Copper washer	2	
10	Brake hose	1	Disconnect.
11	Cotter pin	1	
12	Pin	1	
13	Brake master cylinder	1	For installation, reverse the removal procedure.

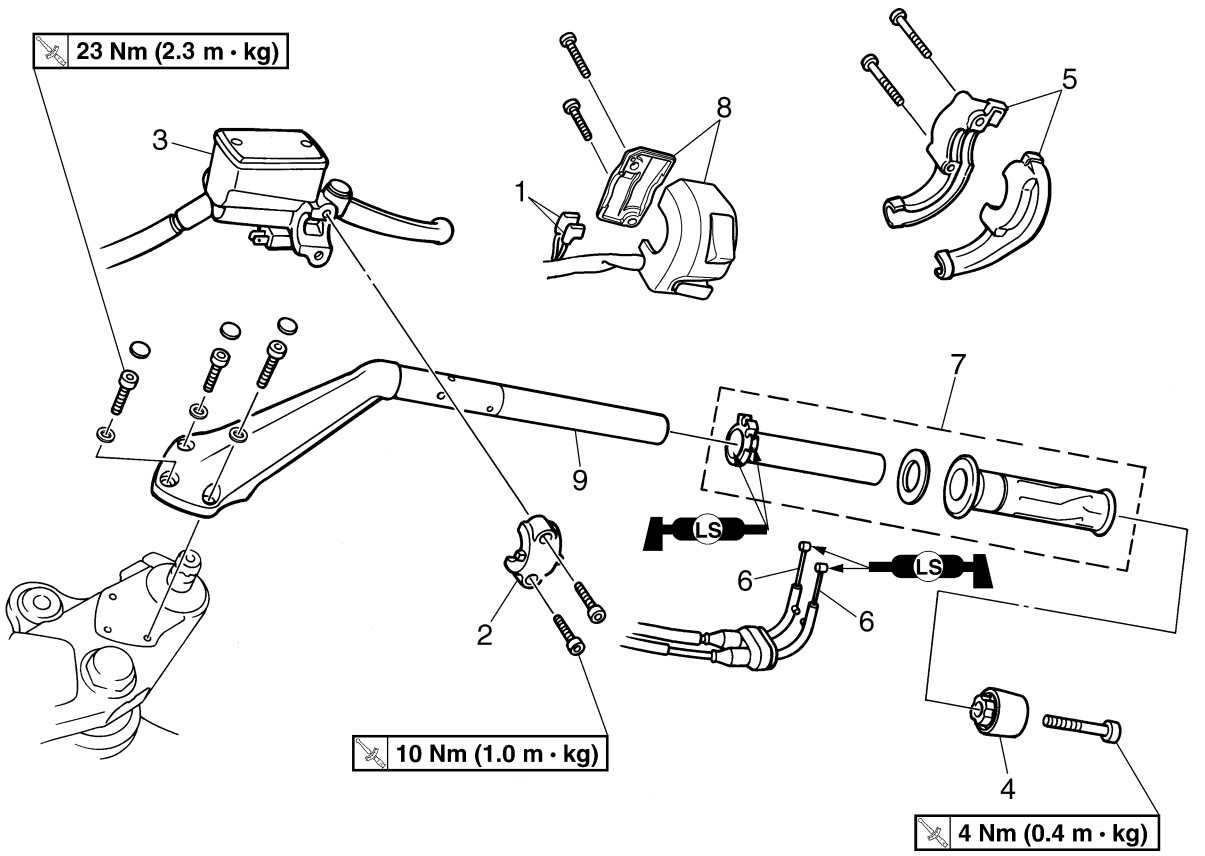
EAS00587



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Push rod	1	
④	Brake master cylinder kit	1	
⑤	Brake master cylinder	1	
			For assembly, reverse the disassembly procedure.

HANDLEBARS

RIGHT HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the right handlebar		Remove the parts in the order listed.
1	Front brake light switch connector	2	Disconnect.
2	Brake master cylinder holder	1	Refer to "REMOVING/ INSTALLING THE HANDLEBARS" in chapter 4. (Manual No.: 5JW1-AE1)
3	Brake master cylinder	1	
4	Grip end	1	
5	Throttle cable housing	1	
6	Throttle cable	2	Disconnect.
7	Throttle grip	1	
8	Right handlebar switch	1	
9	Right handlebar	1	
			For installation, reverse the removal procedure.

ANTI-LOCK BRAKE SYSTEM (FJR1300A)

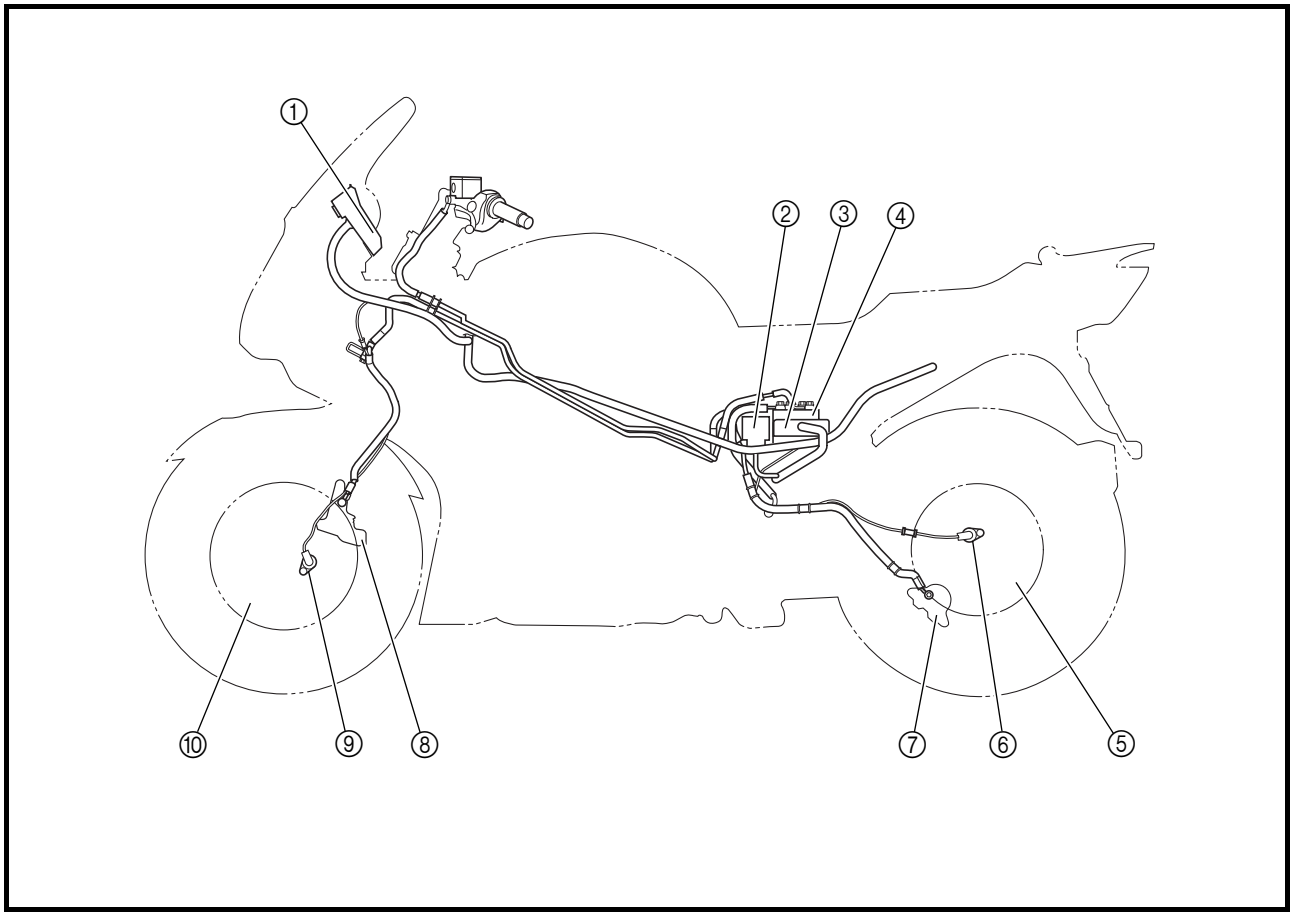
ABS OUTLINE

Yamaha ABS features

1. The Yamaha ABS (Anti-Lock Brake System) features a dual electronic control system, which acts on the front and rear brakes independently.
2. The ABS features a compact and lightweight design to help maintain the basic maneuverability of the motorcycle.
3. The hydraulic unit, which is the main component of the ABS, is centrally located on the motorcycle to increase mass centralization.

ABS layout

① ABS warning light
② Fail-safe relay
③ Electronic control unit (ECU)
④ Hydraulic unit
⑤ Rear disc rotor
⑥ Rear wheel sensor
⑦ Rear brake caliper
⑧ Front brake caliper
⑨ Front wheel sensor
⑩ Front disc rotor



EAS00872
ABS

The operation of the Yamaha ABS brakes is the same as conventional motorcycles, with a brake lever for operating the front wheel brake and a brake pedal for operating the rear wheel brake.
When wheel lockup is detected during emergency braking, hydraulic control is performed by the hydraulic system independently.

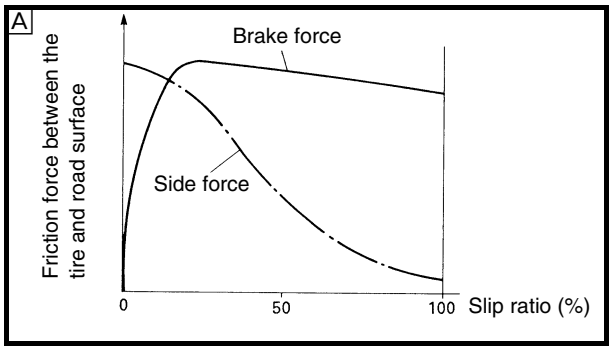
EAS00873
Useful terms

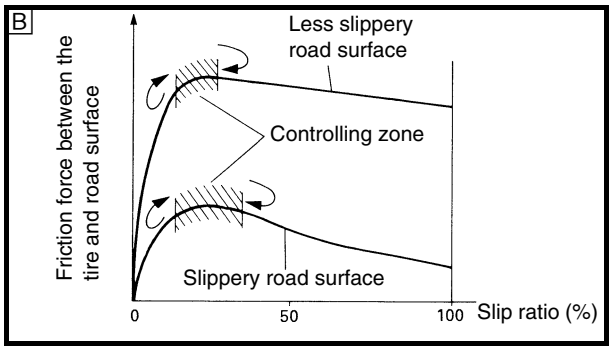
- Wheel speed:
  The rotation speed of the front and rear wheels.
- Chassis speed:
  The speed of the chassis.
  When the brakes are applied, wheel speed and chassis speed are reduced. However, the chassis travels forward by its inertia even though the wheel speed is reduced.
- Brake force:
  The force applied by braking to reduce the wheel speed.
- Wheel lock:
  A condition that occurs when the rotation of one or both of the wheels has stopped but the motorcycle continues to travel.
- Side force:
  The force on the tires which supports the motorcycle when cornering.

- Slip ratio:
  When the brakes are applied, slipping occurs between the tires and the road surface. This causes a difference between the wheel speed and the chassis speed.
  Slip ratio is the value that shows the rate of wheel slippage and is defined by the following formula.

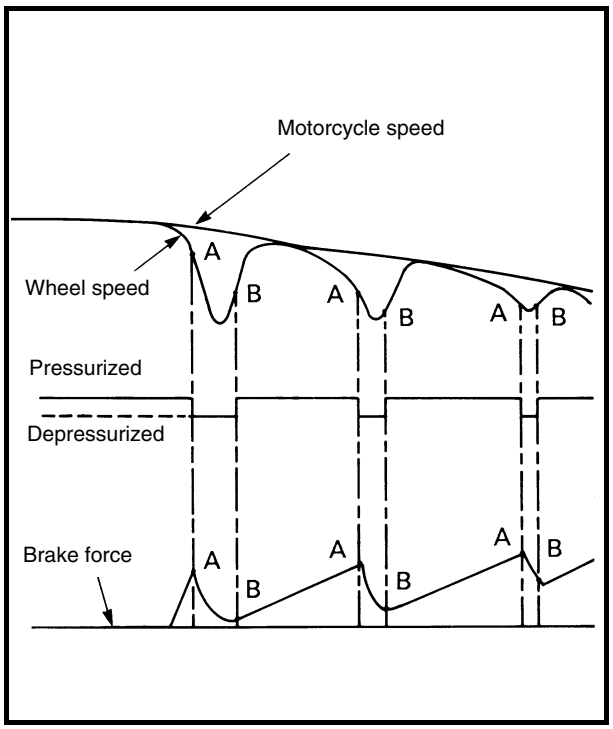
$$\text{Slip ratio} = \frac{\text{Chassis speed} - \text{Wheel speed}}{\text{Chassis speed}} \times 100\ (\%)$$

  0%: There is no slip between the wheel and the road surface. The chassis speed is equal to the wheel speed.
  100%: The wheel speed is "0", but the chassis is moving (i.e., wheel lock).





EAS00874
Brake force and motorcycle stability
When the brake pressure is increased, wheel speed is reduced. Slip occurs between the tire and the road surface and brake force is generated. The limit of this brake force is determined by the friction force between the tire and the road surface and is closely related to wheel slippage. Wheel slippage is represented by the slip ratio.
Therefore, side force is also closely related to wheel slippage. See figure A. If the brakes are applied while keeping the proper slip ratio, it is possible to obtain the maximum brake force without losing much side force.
ABS allows full use of the tire capabilities even on slippery road surfaces or less slippery road surfaces. See figure B.



EAS00875
Wheel slip and hydraulic control

The ECU (ABS) calculates the wheel speed of each wheel according to the rotation signal received from the front and rear wheel sensors. In addition, the ECU (ABS) calculates the motorcycle chassis speed and the rate of speed reduction based on the wheel speed values.

The difference between the chassis speed and the wheel speed calculated in the slip ratio formula is equal to the wheel slip. When the wheel has a tendency to lock, the wheel speed is suddenly reduced. When the wheel slip and the wheel speed reduction rate exceed the preset values, the ECU (ABS) determines that the wheel has a tendency to lock.

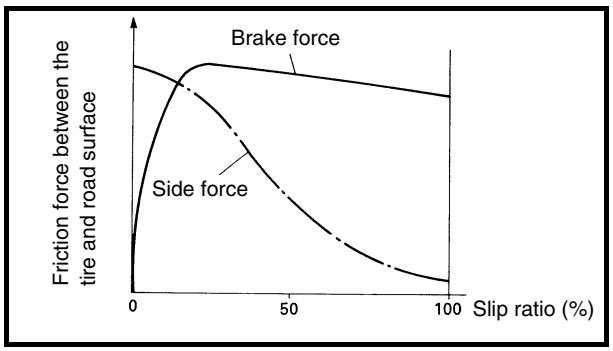
If the slip is large and the wheel has a tendency to lock (point A in the figure), the ECU (ABS) reduces the brake fluid pressure in the brake caliper and increases the pressure of the brake fluid in the brake caliper when the tendency to lock has diminished (point B in the figure).

EAS00876
ABS operation and motorcycle control

If the ABS starts operating, there is a tendency of the wheel to lock, and the motorcycle is approaching the limit of control. To make the rider aware of this condition, the ABS has been designed to generate a reaction-force pulsating action in the brake lever or brake pedal.

NOTE:

When the ABS is activated, a pulsating action may be felt at the brake lever or brake pedal, but this does not indicate a malfunction.



The higher the cornering force on a tire, the less traction there is available for braking. This is true whether the motorcycle is equipped with an ABS or not. Therefore, sudden braking while cornering is not recommended. Excessive cornering force, which an ABS cannot prevent, could cause the tire to slip sideways.

⚠ WARNING

The braking of the motorcycle, even in the worst case, is principally executed when the motorcycle is advancing straight ahead. During a turn, sudden braking is liable to cause a loss of traction of the tires. Even in motorcycles equipped with an ABS, overturning of the motorcycle cannot be prevented if it is braked suddenly.

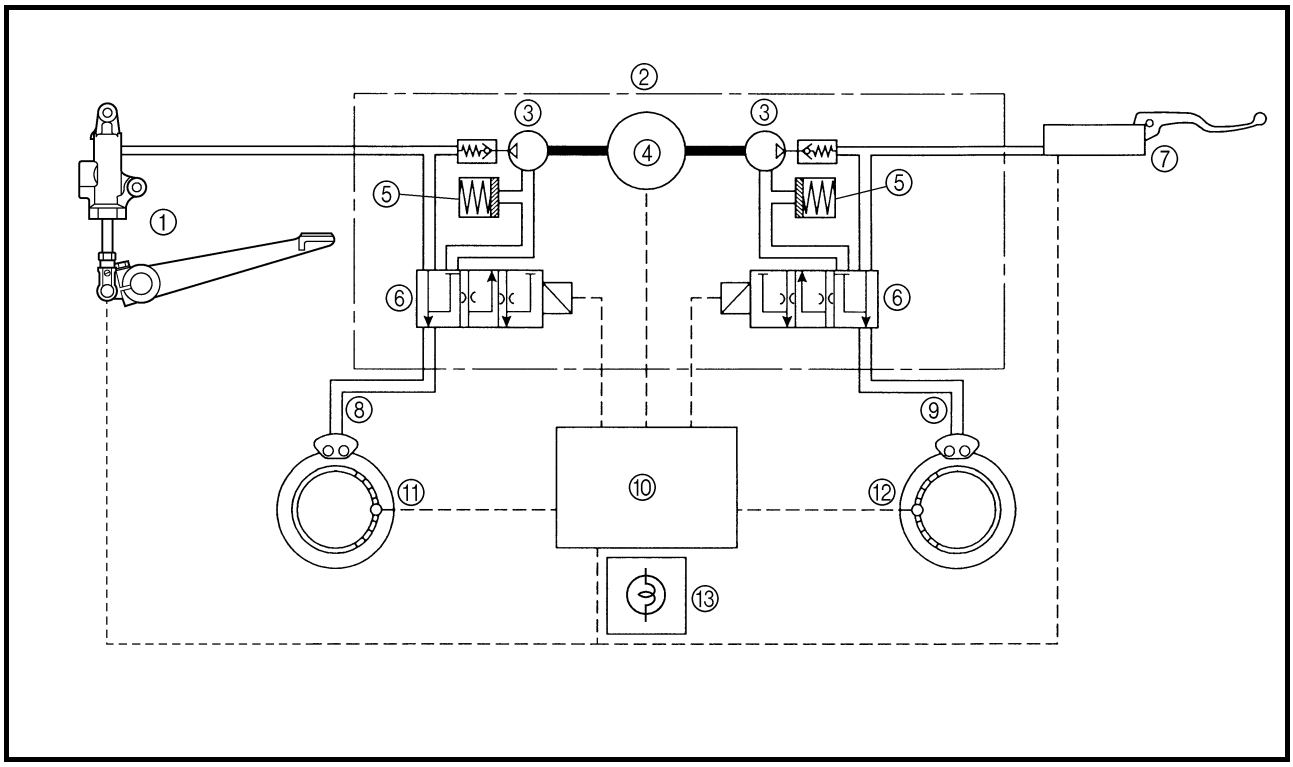
The ABS functions to prevent the tendency of the wheel to lock by controlling the brake hydraulic pressure. But, if there is a tendency of the wheel to lock on a slippery road surface, due to engine braking, the ABS may not be able to prevent the wheel from locking.

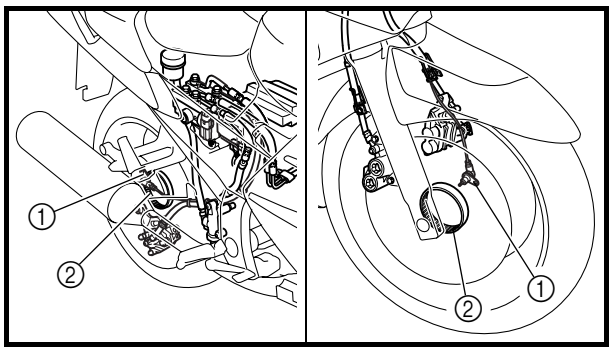
⚠ WARNING

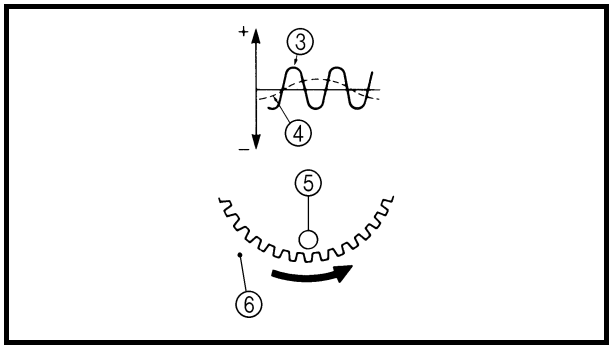
The ABS controls only the tendency of the wheel to lock caused by applying the brakes. The ABS cannot prevent wheel lock on slippery surfaces, such as ice, when it is caused by engine braking, even if the ABS is operating.

EAS00877
Electronic ABS features
The Yamaha ABS (Anti-lock Brake System) has been developed with the most advanced electronic technology.
The ABS control is processed with good response providing various travel conditions for motorcycles.
The ABS also includes a highly developed self-diagnostic function. The ABS detects any problem conditions and allows normal braking even if the ABS is not operating properly.
When this occurs, the ABS warning light on the meter assembly comes on.
The ABS stores the malfunction codes in the memory of the ECU (ABS) for easy problem identification and troubleshooting.

ABS block diagram
① Rear brake master cylinder
② Hydraulic unit
③ Hydraulic pump
④ ABS motor
⑤ Buffer chamber
⑥ Hydraulic control valve
⑦ Front brake master cylinder
⑧ Rear brake caliper
⑨ Front brake caliper
⑩ ECU (ABS)
⑪ Rear wheel sensor
⑫ Front wheel sensor
⑬ ABS warning light







EAS00878
ABS component functions

• Wheel sensors and sensor rotors

Wheel sensors ① detect the wheel rotation speed and transmit the wheel rotation signal to the ECU (ABS).

Each wheel sensor is composed of a permanent magnet and a coil. The wheel sensors are installed in the sensor housing for each wheel.

Sensor rotors ② are pressed in the inner side of the front and rear wheel hubs and rotate with the wheels. The sensor rotors have 42 serrations inside and are installed close to the wheel sensors. As the distance changes between the top and bottom of the serrations with the rotation of the wheels, inductive electromotive force is generated in the wheel sensors. Wheel rotation speed is detected based on the frequency of this alternating voltage.

③ At high speed
④ At low speed
⑤ Wheel sensor
⑥ Sensor rotor

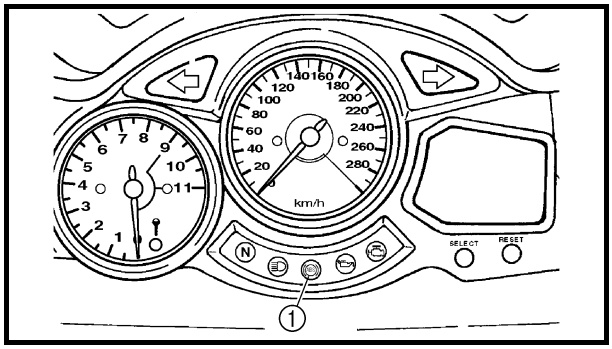
• ABS warning light

The ABS warning light comes on to warn the rider if a malfunction in the ABS occurs.

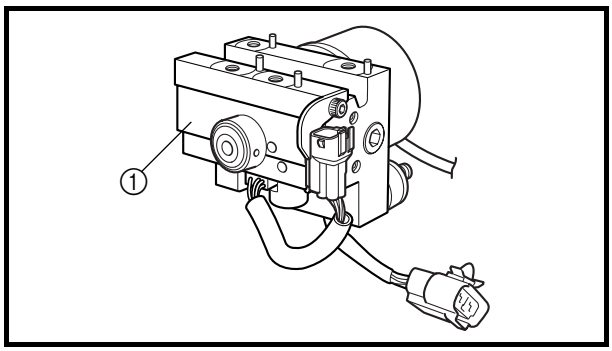
When the main switch is set to “ON”, the ABS warning light comes on for 2 seconds to check if the ABS warning light is disconnected and to check if the ABS is operating properly, then goes off.

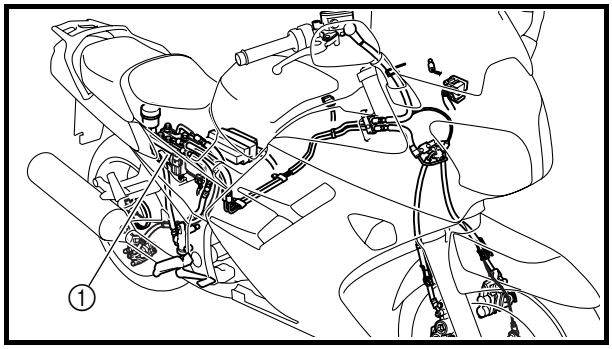
CAUTION:

If the rear wheel is raced with the motorcycle on the centerstand, the ABS warning light may flash or come on. If this occurs, set the main switch to “OFF,” then back to “ON”. The ABS operation is normal if the ABS warning light comes on for 2 seconds, then goes off.

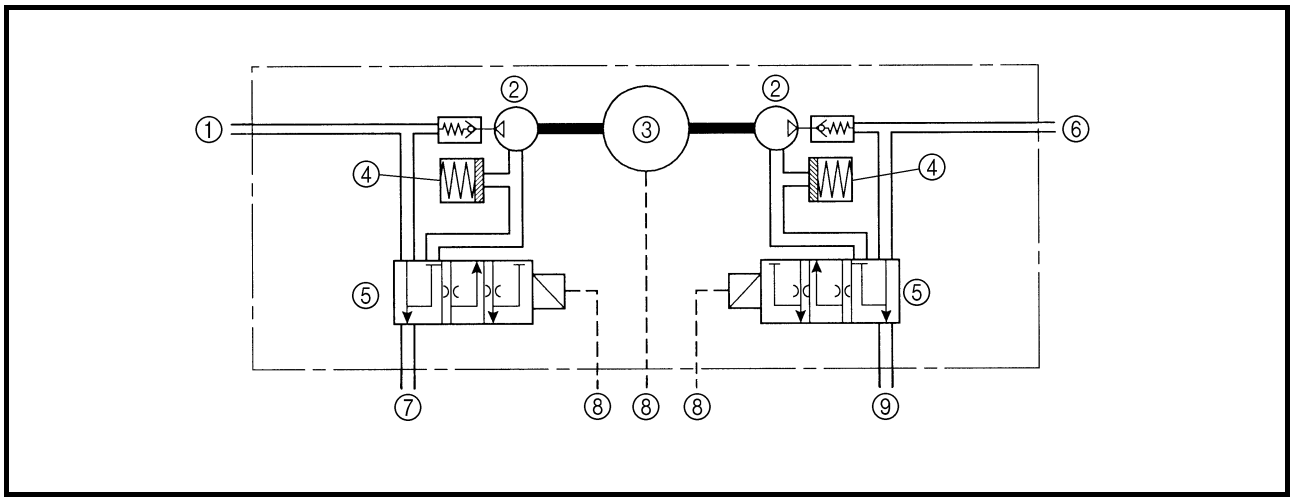


① ABS warning light



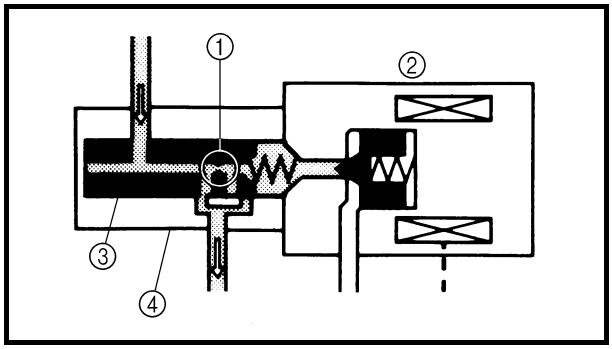


EAS00879
• Hydraulic unit
The hydraulic unit ① is composed of a hydraulic control valve (solenoid valve, flow control valve), a buffer chamber, and a hydraulic pump for each brake and an ABS motor. The hydraulic unit adjusts the front and rear wheel brake fluid pressure to control the wheel rotation speed according to signals transmitted from the ECU (ABS).

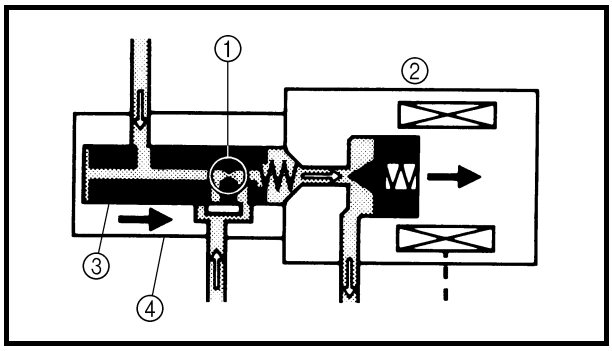


① To rear brake master cylinder
② Hydraulic pump
③ ABS motor
④ Buffer chamber
⑤ Hydraulic control valve
⑥ To front brake master cylinder
⑦ To the rear brake caliper
⑧ To the ECU (ABS)
⑨ To the front brake caliper

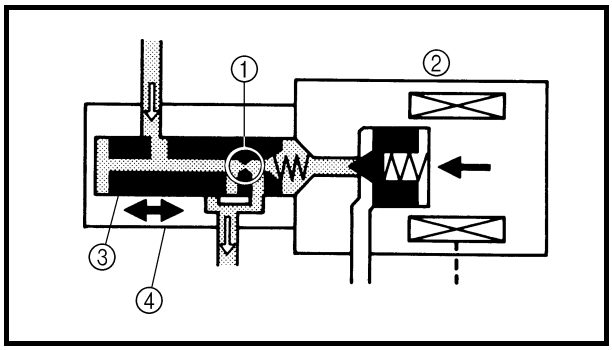
• Hydraulic control valve
The hydraulic control valve is composed of a flow control valve and solenoid valve.
When the ABS is activated, the flow control valve regulates the flow of brake fluid to each brake and the solenoid valve decreases and increases the brake fluid pressure.



1) When the brakes are operated normally, the solenoid valve ② is closed, the spool ③ of the flow control valve does not move, and the hydraulic line between the brake master cylinder and brake caliper is open.

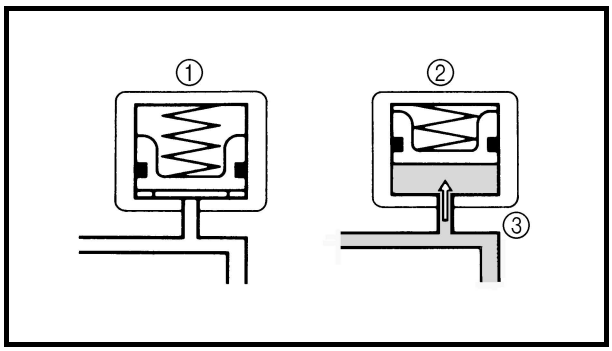


2) When the ABS is activated, the solenoid valve ② is opened by the power supplied from the ECU (ABS) signals to decrease the brake fluid pressure and the spool ③ of the flow control valve is moved toward the solenoid valve.

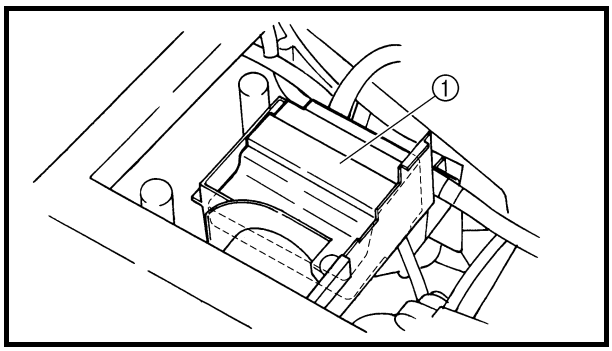


3) When the ECU (ABS) stops transmitting signals to decrease the brake fluid pressure, the solenoid valve ② closes and the brake fluid is pressurized again. Pressurizing the brake fluid again, while the ABS is activated, limits the flow of the brake fluid with the movement of the flow control valve spool ③ and provides a gradual pressure increase.

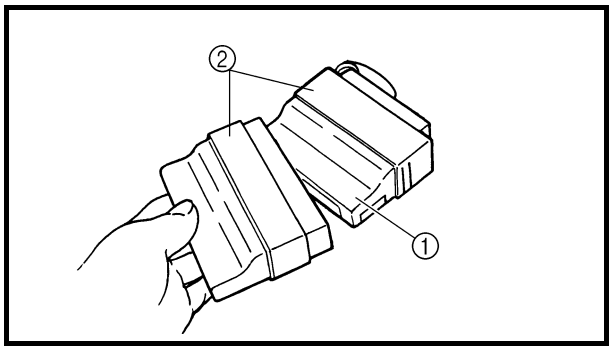
① Orifice
② Solenoid valve
③ Spool
④ Flow control valve



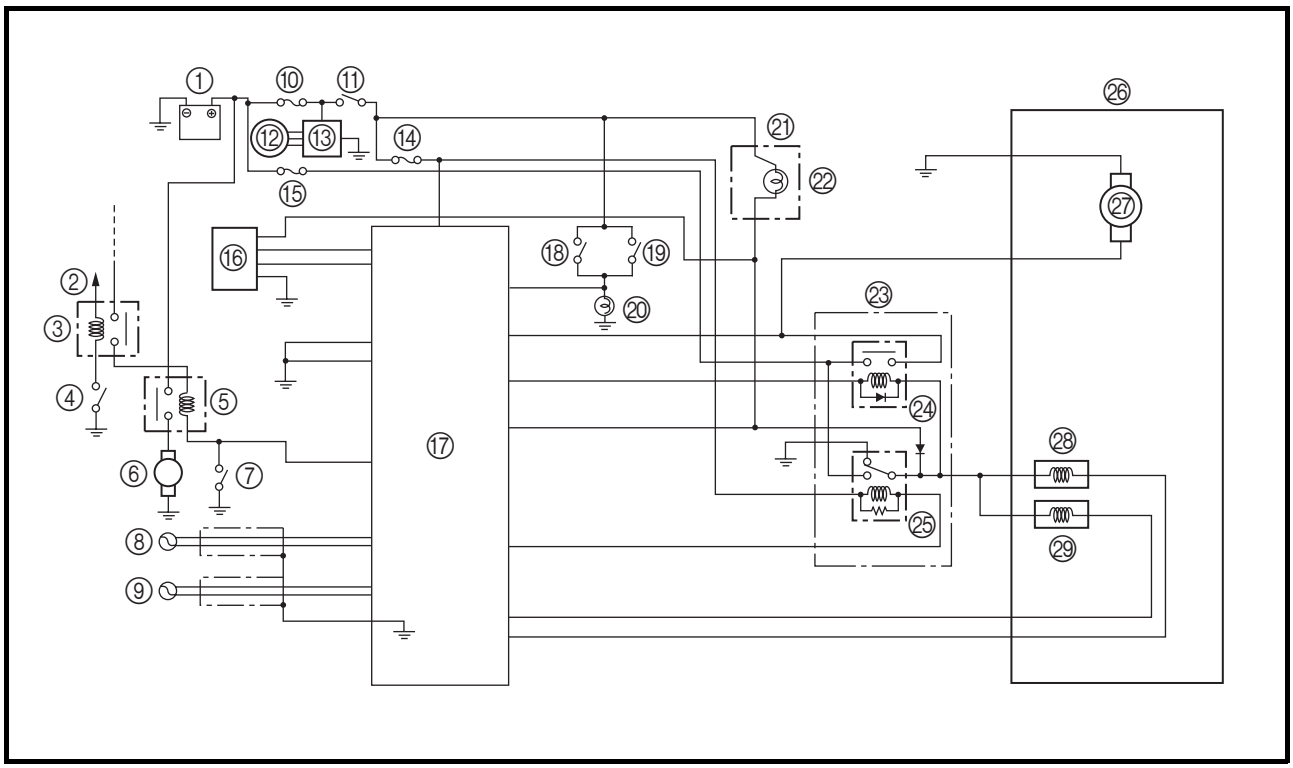
• Buffer chamber
The buffer chamber accumulates the brake fluid that is depressurized while the ABS is operating.
① Buffer chamber (pressurized)
② Buffer chamber (depressurized)
③ Raised piston



• Electronic control unit (ECU)
The ECU (ABS) ① controls the ABS and is installed under the tray bracket. To protect the ECU (ABS) from water damage, it is protected by a cover ②.

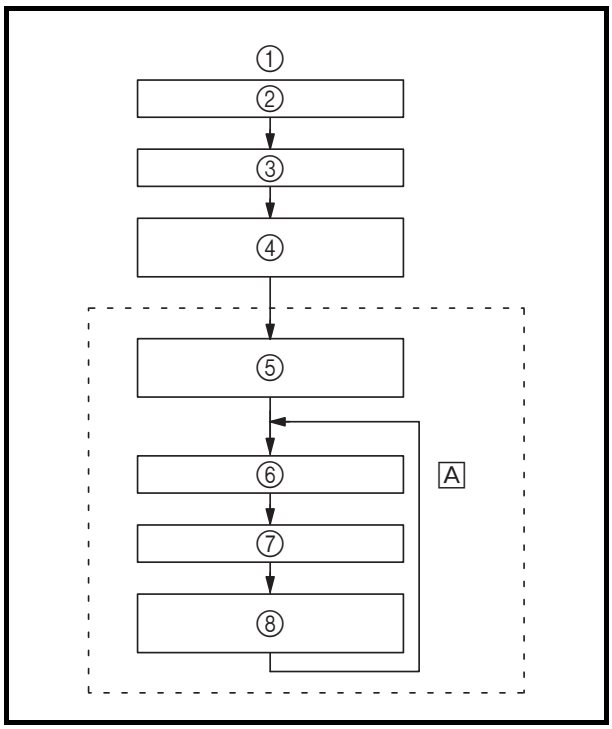


As shown in the block diagram below, the ECU (ABS) receives wheel sensor signals from the front and rear wheels and also receives signals from other monitor circuits. Both a main microcomputer and a sub microcomputer are installed in the ECU (ABS) to provide mutual monitoring.



① Battery
② Engine stop switch
③ Starting circuit cut-off relay
④ Sidestand switch
⑤ Starter relay
⑥ Starter motor
⑦ Start switch
⑧ Front wheel sensor
⑨ Rear wheel sensor
⑩ Main fuse
⑪ Main switch
⑫ Generator
⑬ Rectifier/regulator
⑭ ABS fuse
⑮ ABS motor fuse
⑯ ABS test coupler
⑰ ECU (ABS)
⑱ Rear brake light switch
⑲ Front brake light switch
⑳ Tail/brake light
㉑ Meter assembly
㉒ ABS warning light
㉓ Fail-safe relay
㉔ ABS motor relay
㉕ Solenoid relay
㉖ Hydraulic unit
㉗ ABS motor
㉘ Front solenoid
㉙ Rear solenoid

The necessary actions are confirmed by the motor monitor circuit and control signals are transmitted to the hydraulic unit and fail-safe relay.



• ABS control operation

The ABS control operation performed in the ECU (ABS) is divided into the following two parts.

- Hydraulic control
- Self-diagnosis

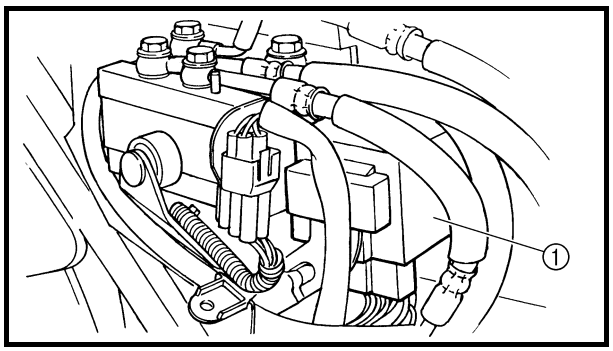
These operations are performed once every 8/1,000 of a second. When a failure is detected in the ABS, a malfunction code is stored in the memory of the ECU (ABS) for easy problem identification and troubleshooting.

NOTE:

Some types of failures are not recorded in the memory of the ECU (ABS) (e.g., a drop in battery voltage).

① Software operation flow
② Set the main switch to “ON”.
③ Initialize
④ Self-diagnosis (when static)
⑤ Self-diagnosis (when riding)
⑥ Receive signals
⑦ Control operation
⑧ Depressurize/pressurize

A 8/1,000 of a second



• **Fail-safe relay**

The fail-safe relay controls the power supply of the hydraulic unit and is located beside the hydraulic unit.

① Fail-safe relay

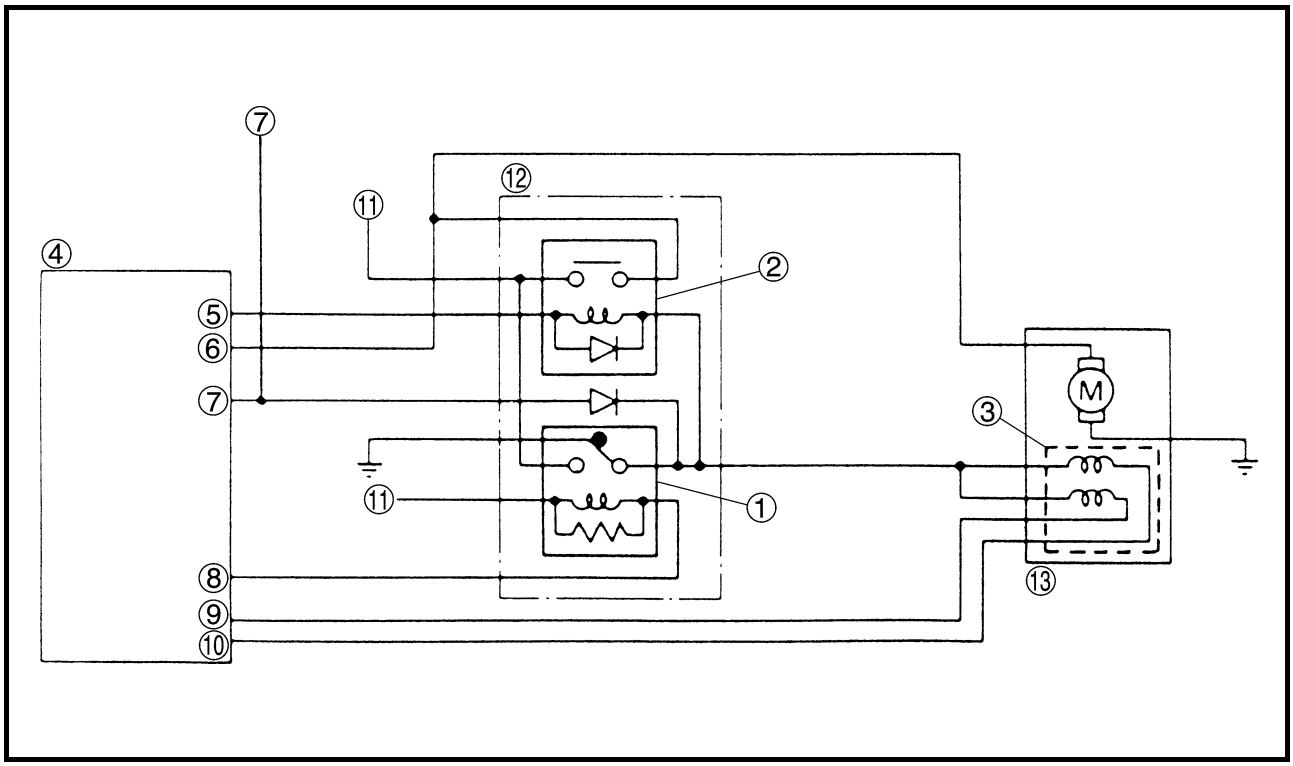
Composition and operation

The fail-safe relay is composed of the solenoid relay ① and ABS motor relay ②. The solenoid relay is activated (continuous) by signals transmitted from the ECU (ABS). As a result, the solenoid valve ③ can be operated.

If a malfunction occurs in the circuit, the solenoid relay is deactivated and it becomes impossible for the solenoid valve to reduce the hydraulic pressure of the brake fluid and normal braking is resumed.

The ABS motor relay is also activated by signals transmitted from the ECU (ABS) and operates simultaneously when the ABS starts to reduce the hydraulic pressure of the brake fluid.

If the solenoid relay is turned off, the motor relay is also deactivated and the motor stops operating if there is a malfunction.



① Solenoid relay
② ABS motor relay
③ Solenoid valve
④ Electric control unit (ECU)
⑤ Pump motor relay coil
⑥ Pump motor monitor
⑦ ABS warning light
⑧ Fail-safe relay coil
⑨ Rear solenoid
⑩ Front solenoid
⑪ Power
⑫ Fail-safe relay
⑬ Hydraulic unit

ABS operation

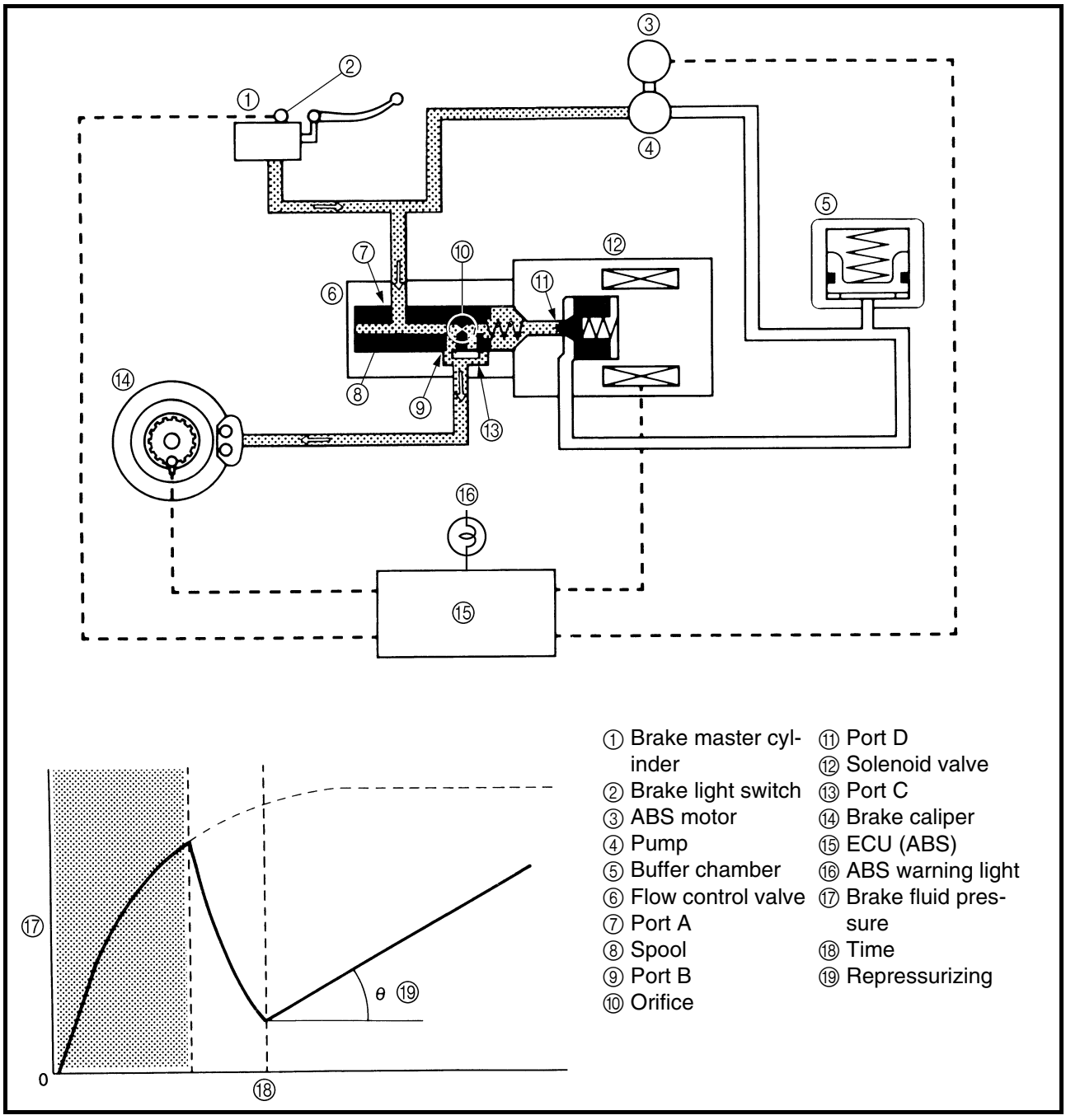
The ABS hydraulic circuit consists of two systems: the front wheel and rear wheel. The following describes the front system only.

• Normal braking (ABS not activated)

When the ABS is not activated port D ⑪ of the solenoid valve is closed because a control signal has not been transmitted from the ECU (ABS) and port A ⑦ and port B ⑨ of the flow control valve are open. Therefore, when the brake lever is squeezed, the hydraulic pressure in the brake master cylinder increases and the brake fluid is sent to the brake caliper via port A and port B.

At this time, the inlet and outlet check valves of the pump close the lines and brake fluid is not sent. As a result, the brake master cylinder directly pressurizes the brake caliper during normal braking.

When the brake lever is released, the brake fluid in the brake caliper returns to the brake master cylinder via port A and port B.



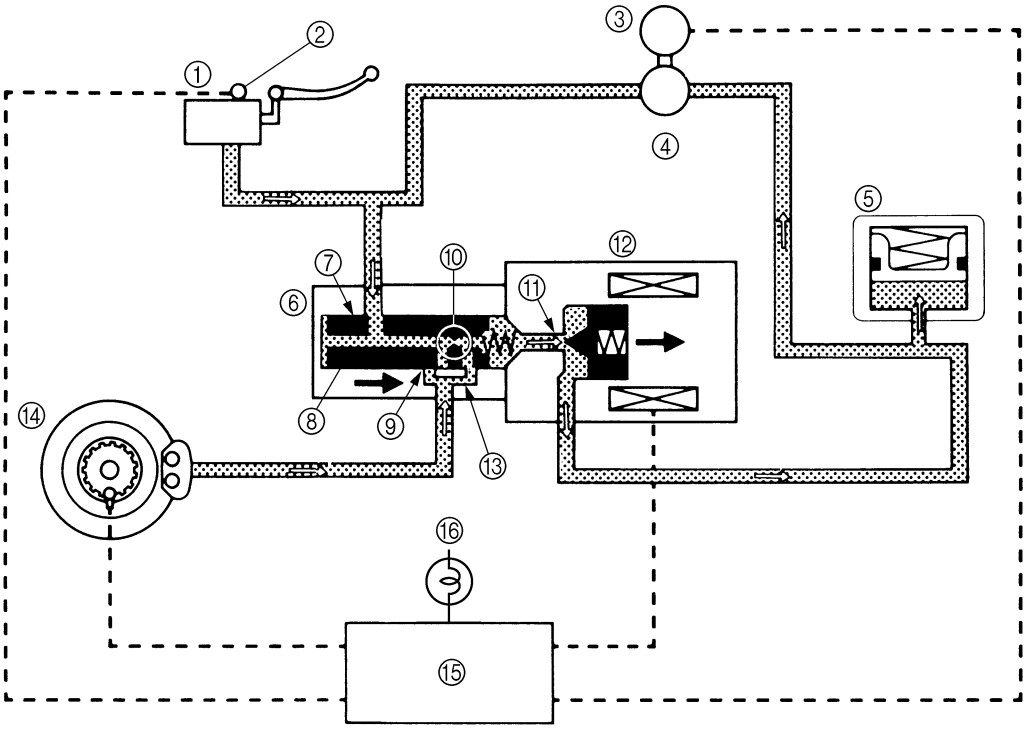
① Brake master cylinder
② Brake light switch
③ ABS motor
④ Pump
⑤ Buffer chamber
⑥ Flow control valve
⑦ Port A
⑧ Spool
⑨ Port B
⑩ Orifice
⑪ Port D
⑫ Solenoid valve
⑬ Port C
⑭ Brake caliper
⑮ ECU (ABS)
⑯ ABS warning light
⑰ Brake fluid pressure
⑱ Time
⑲ Repressurizing

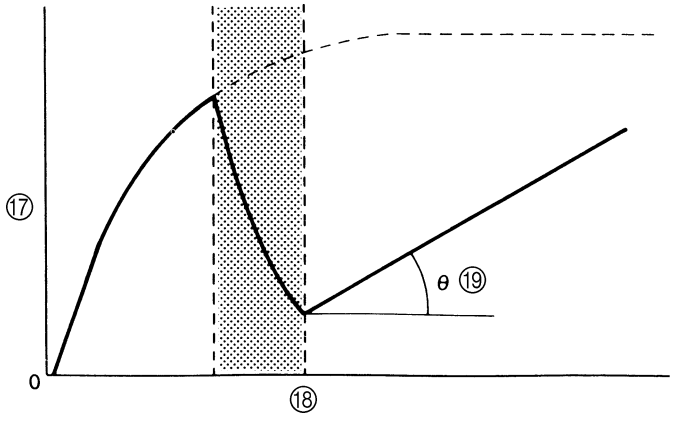
• **Emergency braking (ABS activated)**

1) Depressurized state

When the front wheel is about to lockup, port D ⑪ of the solenoid valve is opened by the "depressurization" signal transmitted from the ECU (ABS). When this occurs, the spool of the flow control valve compresses the return spring to close port B ⑨. Brake fluid that has entered through port A ⑦ is restricted by the orifice ⑩ and the brake fluid is sent to the brake caliper via port C ⑬ and port D ⑪, and the buffer chamber. As a result, the hydraulic pressure in the brake caliper is reduced.

The brake fluid stored in the buffer chamber is pumped back to the brake master cylinder by the fluid pressure pump linked to the pump motor.

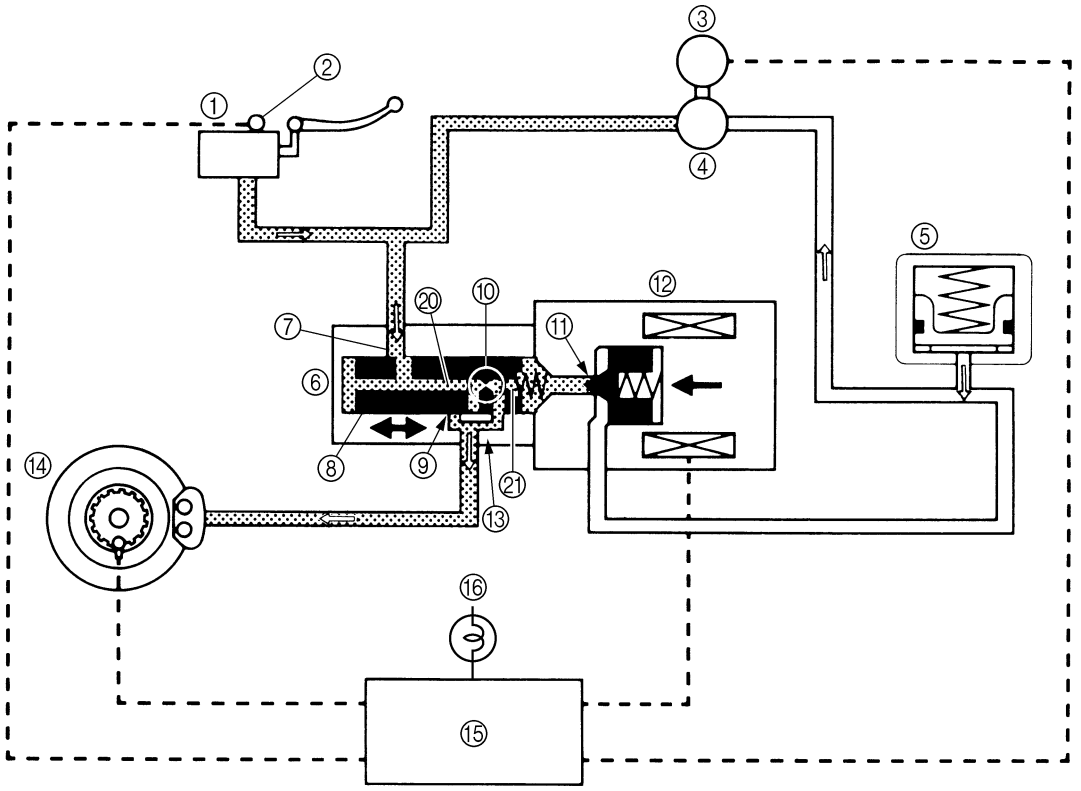


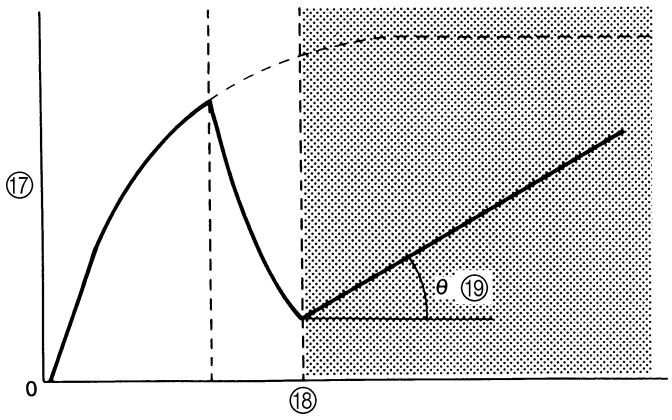


① Brake master cylinder
② Brake light switch
③ ABS motor
④ Pump
⑤ Buffer chamber
⑥ Flow control valve
⑦ Port A
⑧ Spool
⑨ Port B
⑩ Orifice
⑪ Port D
⑫ Solenoid valve
⑬ Port C
⑭ Brake caliper
⑮ ECU (ABS)
⑯ ABS warning light
⑰ Brake fluid pressure
⑱ Time
⑲ Repressurizing

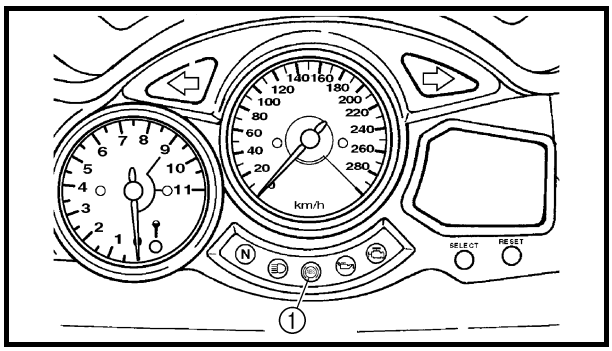
2) Pressurized state

Port D ⑪ is closed by the "pressurization" signal transmitted from the ECU (ABS). Before this occurs, the spool of the flow control valve has compressed the return spring to close port B ⑨. Brake fluid that has entered through port A ⑦ is further restricted by the orifice ⑩ and the brake fluid is sent to the brake calipers via port A ⑦ and port C ⑬. At this time, the brake is pressurized at a constant speed regardless of the brake fluid pressure level since restriction of port A ⑦ changes so that a constant pressure difference is maintained between chamber A ⑳ and chamber B ㉑ of the flow control valve.





① Brake master cylinder
② Brake light switch
③ ABS motor
④ Pump
⑤ Buffer chamber
⑥ Flow control valve
⑦ Port A
⑧ Spool
⑨ Port B
⑩ Orifice
⑪ Port D
⑫ Solenoid valve
⑬ Port C
⑭ Brake caliper
⑮ ECU (ABS)
⑯ ABS warning light
⑰ Brake fluid pressure
⑱ Time
⑲ Repressurizing
⑳ Chamber A
㉑ Chamber B

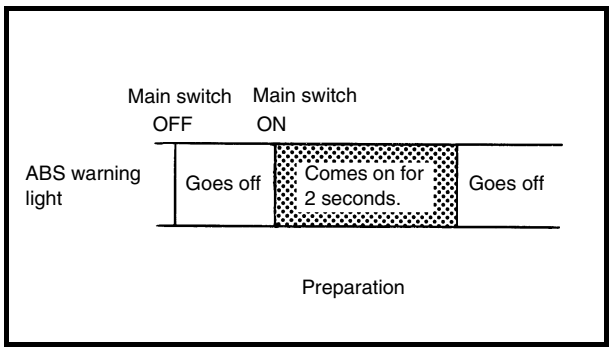


EAS00880

Self-diagnosis function

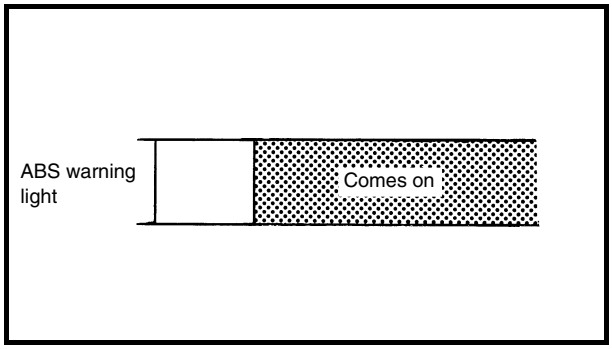
• ABS warning light

The ABS warning light ① comes on when a malfunction is detected by the ABS self-diagnosis. It is located in the meter assembly.



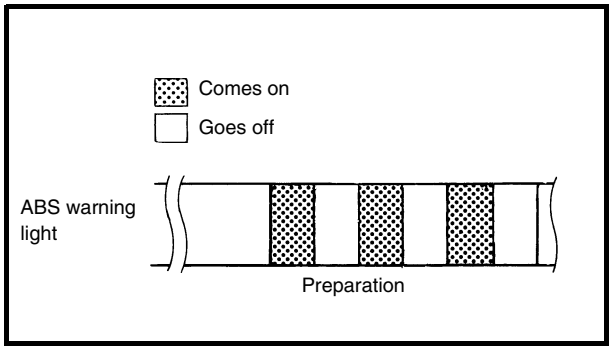
• Instances when the ABS warning light comes on

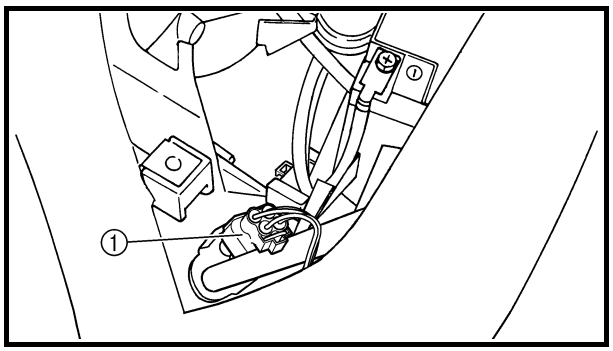
1) The ABS warning light comes on when the main switch is set to "ON".
   The ABS warning light comes on for 2 seconds while the ABS is performing a self-diagnosis, then goes off if there are no problems.
2) The ABS warning light comes on while riding.
   If the ABS warning light comes on while riding, a malfunction has been detected in the ABS. The ABS hydraulic control will not be performed. The ABS will have recourse to manual braking if this occurs.
3) The ABS warning light flashes while riding.
   If the ABS warning light flashes while riding, there is no problem with the function of the ABS. However, the ECU (ABS) input has unstable factors. (For details, refer to "TROUBLESHOOTING".)

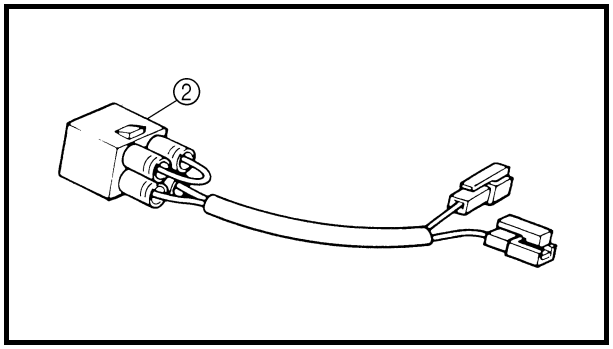


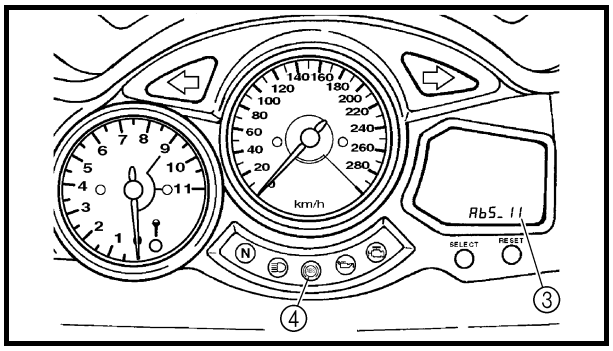
NOTE:

The ABS warning light comes on or flashes if the motorcycle is ridden with the test coupler adaptor connected to the test coupler.









4) The ABS warning light ④ flashes and malfunction code ③ is indicated on the multifunction display when a test coupler adaptor ② is connected to the 4-pin test coupler ① for troubleshooting the ABS.
The 4-pin test coupler can be accessed by removing the right inner panel (front cowling).

When the test coupler adaptor is connected to the 4-pin test coupler, the ABS warning light starts flashing and the multifunction display indicates all the malfunction codes recorded in the ECU (ABS).

	Test coupler adaptor **90890-03149**

NOTE:
The ABS warning light comes on or flashes if the motorcycle is ridden with the test coupler adaptor connected to the test coupler.

Cautions for operation

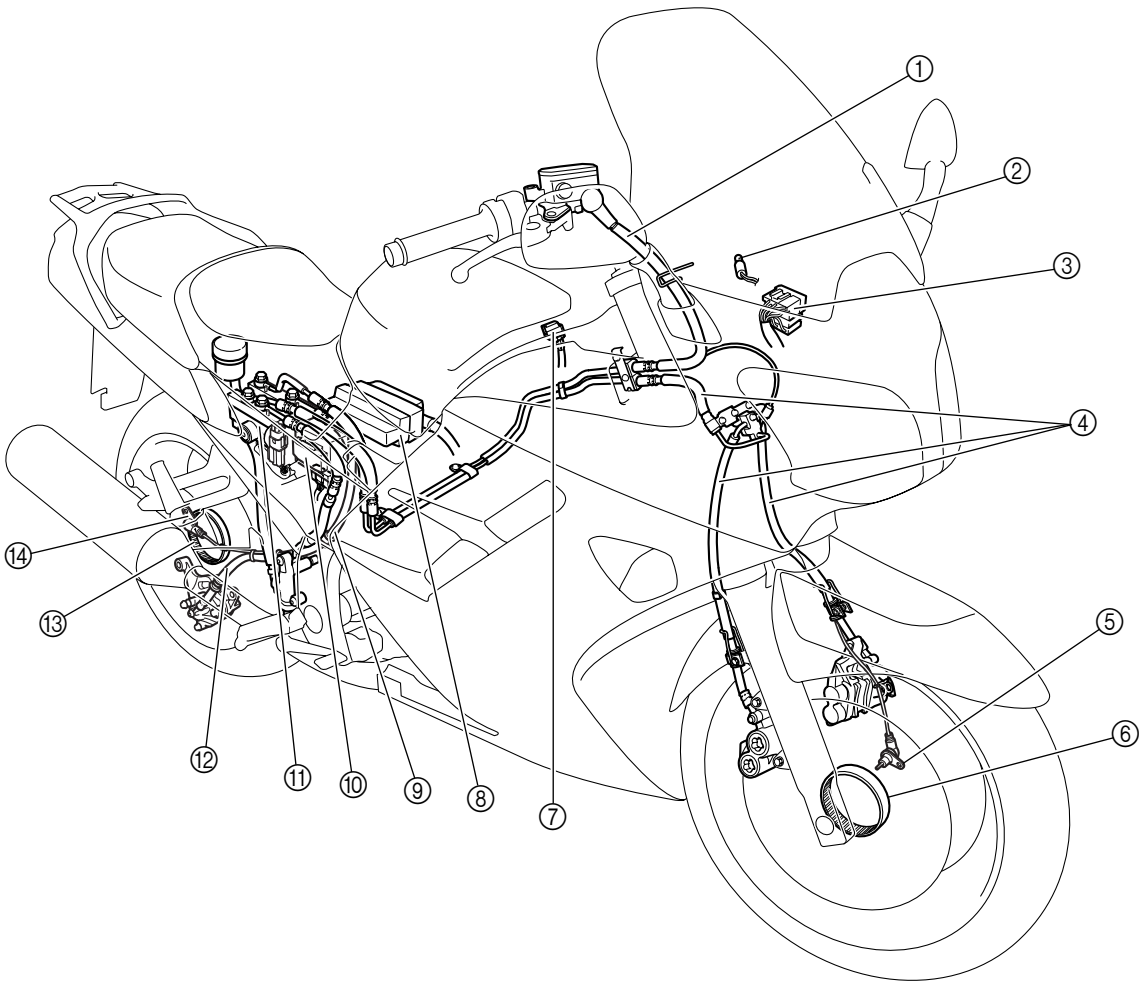
ABS warning light:
- When the main switch is set to “ON”, the ABS warning light comes on for 2 seconds, then goes off.
- If the ABS warning light comes on while riding, stop the motorcycle, and then set the main switch to “OFF”, then set the main switch to “ON”. The ABS operation is normal if the ABS warning light comes on for 2 seconds, then off.
- If the rear wheel is raced with the motorcycle on the centerstand, the ABS warning light may flash or come on. If this occurs, set the main switch to “OFF,” then back to “ON”. The ABS operation is normal if the ABS warning light comes on for 2 seconds, then goes off.
- The ABS operation is normal if the ABS warning light flashes.
- Even if the ABS warning light remains on and does not go off or if it comes on after riding, conventional braking performance of the motorcycle is maintained.

ABS function:
- A brake system in which the hydraulic control has been performed by the ABS alerts a rider that the wheels had a tendency to lock by generating a reaction-force pulsating action in the brake lever or brake pedal. When the ABS is activated, the grip between the road surface and tires is close to the limit. The ABS cannot prevent wheel lock* on slippery surfaces such as ice, when it is caused by engine braking, even if the ABS is activated.
- The ABS is not designed to shorten the braking distance or improve the cornering performance.
- Depending on the road conditions, the braking distance may be longer compared to that of vehicles not equipped with an ABS. Therefore, ride at a safe speed and keep a safe distance between yourself and other vehicles.
- The braking of the motorcycle, even in the worst case, is principally executed when the motorcycle is advancing straight ahead. During a turn, sudden braking is liable to cause a loss of traction of the tires. Even motorcycles equipped with an ABS cannot be prevented from falling over if braked suddenly.
- The ABS does not work when the main switch is set to “OFF”. The conventional braking function can be used.

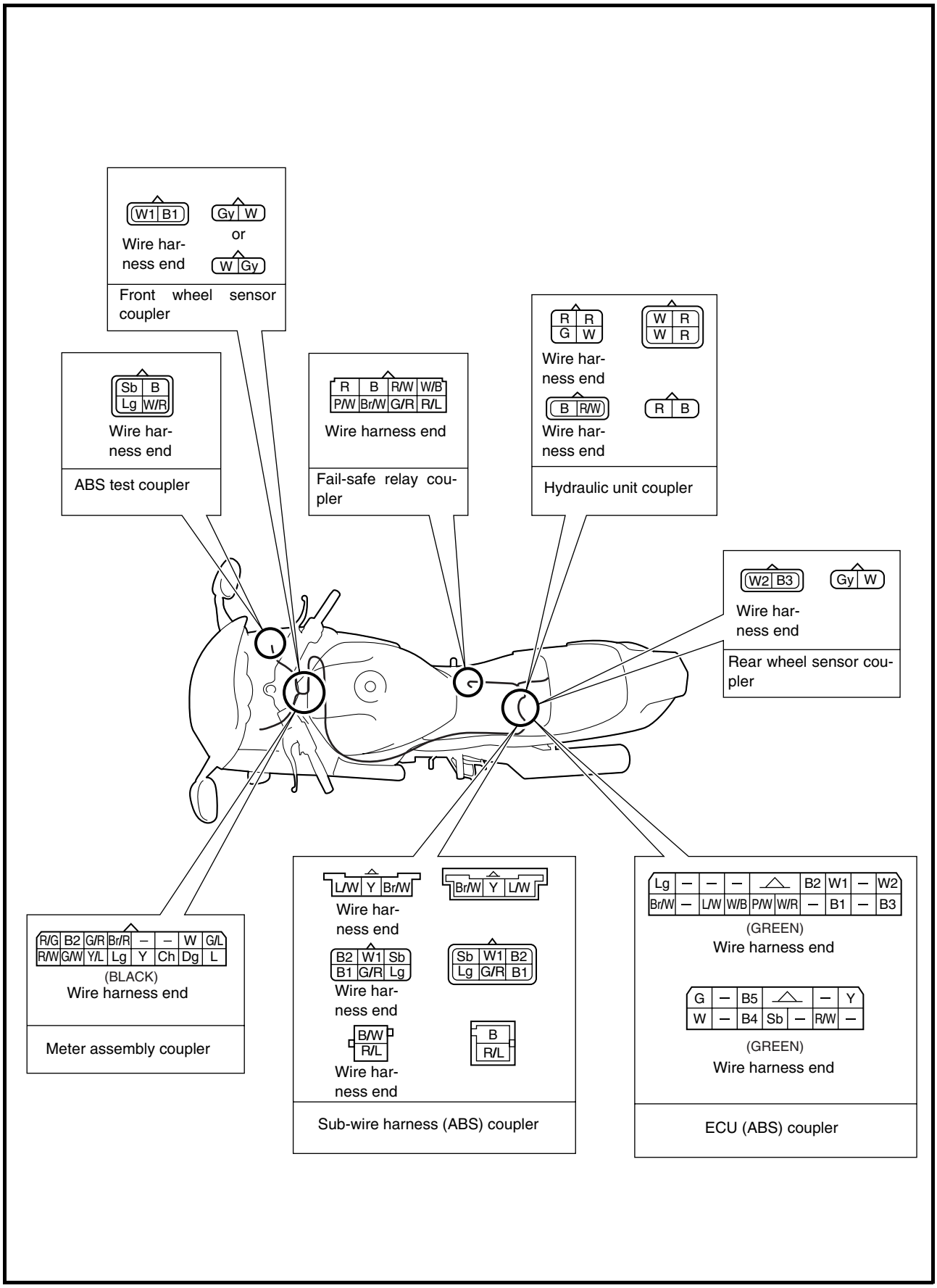
* Wheel lock: A condition that occurs when the rotation of one or both of the wheels has stopped but the motorcycle continues to travel.

EAS00882
ABS COMPONENTS

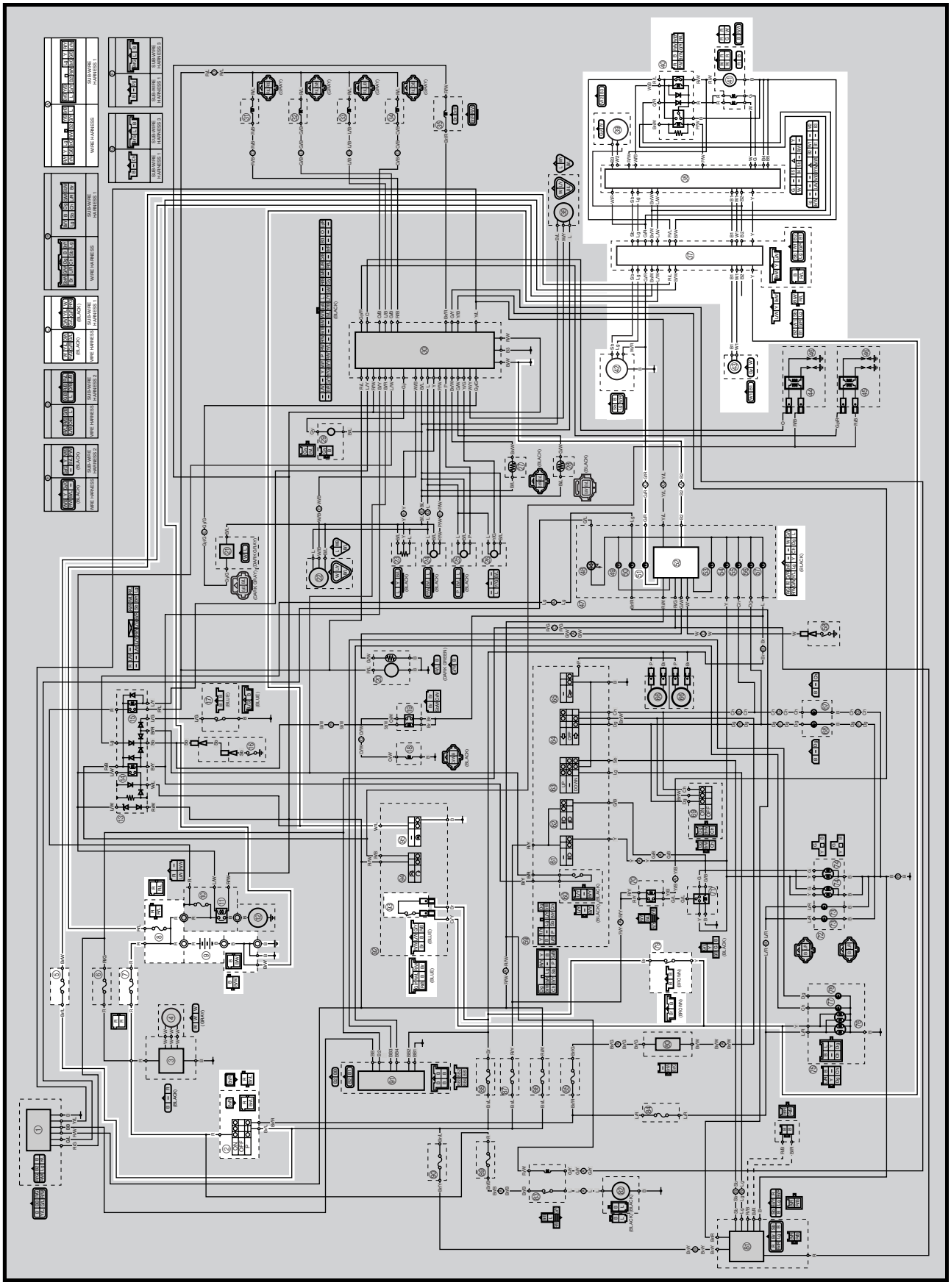
① Front brake hose (front brake master cylinder to hydraulic unit)
② ABS warning light
③ Fuse box
④ Front brake hose (hydraulic unit to front brake caliper)
⑤ Front wheel sensor
⑥ Front wheel sensor rotor
⑦ ABS test coupler
⑧ Electronic control unit (ECU)
⑨ Rear brake hose (rear brake master cylinder to hydraulic unit)
⑩ Fail-safe relay
⑪ Hydraulic unit
⑫ Rear brake hose (hydraulic unit to rear brake caliper)
⑬ Rear wheel sensor rotor
⑭ Rear wheel sensor



EAS00883
ABS COUPLERS



EAS00884
CIRCUIT DIAGRAM



② Main switch
⑤ ABS fuse
⑦ Main fuse
⑧ ABS motor fuse
⑨ Battery
㊲ Sub-wire harness (ABS)
㊳ ECU (ABS)
㊴ Rear wheel sensor
㊵ Fail-safe relay
㊶ Hydraulic unit
㊷ ABS test coupler
㊸ Front wheel sensor
㊶ ABS warning light
㊷ Multifunction meter
㊾ Rear brake light switch
㊸ Front brake light switch
㊺ Start switch

TROUBLESHOOTING

EAS00881

ABS troubleshooting outline

Use this section to troubleshoot the ABS. Read this service manual carefully and make sure you understand the information provided before repairing any malfunctions or performing service.
The electronic control unit (ECU) has an ABS self-diagnostic function. When failures occur in the ABS, the ABS warning light on the meter assembly indicates a malfunction.
The troubleshooting below describes the problem identification and service method according to the indications by the multifunction display. For troubleshooting other than the following items, follow the normal service method.

⚠ WARNING

When maintenance or checks have been performed on components related to the ABS, be sure to perform a final check before delivering the motorcycle to the customer. (Refer to "[D-6] Final check".)

1. ABS condition when the ABS warning light comes on
1) ABS warning light remains on. → The ABS is not operating, manual braking is used.
   • Diagnose the malfunction using the ABS self-diagnostic function.
2) Light comes on, and then goes off when starting → ABS operation is normal.
   • The ABS warning light comes on for 2 seconds, and then goes off every time the main switch is set to "ON".
3) ABS warning light flashes. → ABS operation is normal.
   • The brake switch is defective or improperly adjusted.
   • The rear wheel is racing.
   • The motorcycle is continuously ridden on extremely uneven roads.
2. Self-diagnosis and service
   The ECU (ABS) has an ABS self-diagnostic function. By utilizing this function, quick problem identification and service are possible. The malfunction codes are stored in the memory of the ECU (ABS).

Malfunctions are detected

The ABS warning light cannot be used to recall the malfunction codes from the memory of the ECU (ABS) if the ABS warning light is already on. Connect the test coupler adaptor to the test coupler, connect a pocket tester to the terminal of the light green lead of the test coupler adaptor, and determine the malfunction codes by the movement of the pocket tester needle. (Refer to "[B-5] ABS malfunction check using the ABS self-diagnosis (present malfunction)".)

Malfunctions are not detected

The multifunction display indicates all the malfunction codes recorded in the ECU.
You can also recall the malfunction codes by using a pocket tester. Note all malfunction codes if more than two malfunction codes are stored in the memory.

Deleting the malfunction codes

When the service has been completed, check the normal operation of motorcycle and then delete the malfunction codes. (Refer to "[D-6] Final check".) By deleting the malfunction code memory, it is possible to pursue the cause correctly if the next malfunction occurs.

ABS self-diagnosis by the ECU (ABS)
The ECU (ABS) performs a static check on the ABS when the main switch is set to “ON”. The ECU (ABS) also monitors the ABS while riding the motorcycle and checks for malfunctions. If malfunctions occur, the malfunction codes are stored in the memory of the ECU (ABS). The malfunction codes can be recalled from the memory using the ABS self-diagnostic function of the ECU (ABS) and a pocket tester or the multifunction display.

3. Handling and service

CAUTION:

Handling the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.

- The ECU (ABS), hydraulic unit, wheel sensors, and fail-safe relay cannot be disassembled.
- Always delete the malfunction codes stored in the memory of the ECU (ABS) after service has been completed.

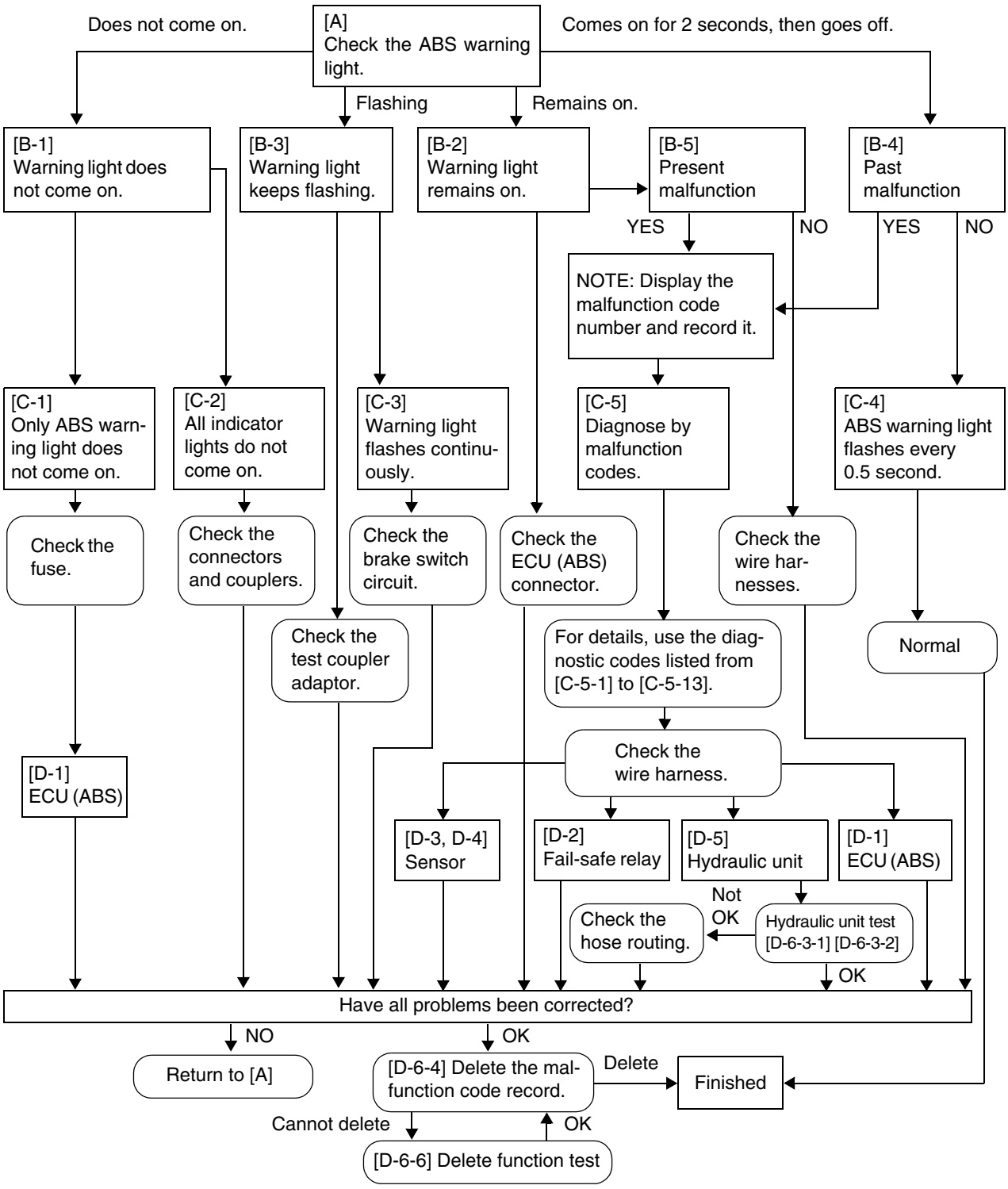
EAS00885
Basic troubleshooting instructions

⚠ WARNING

- **Perform the troubleshooting [A] → [B] → [C] → [D] in order. The malfunction will not be diagnosed correctly if the troubleshooting is performed in the wrong order or if the steps are omitted.**
- **Make sure that the battery has been sufficiently charged before troubleshooting.**

[A] ABS malfunction check using the ABS warning light
[B] Detailed ABS malfunction check
The results of the self-diagnosis by the ECU (ABS) are displayed using the multifunction display or a pocket tester.
[C] Determining the cause and location of the malfunction
Determine the cause of the malfunction from the condition and place where the malfunction occurred.
[D] ABS maintenance
Execute the final check after disassembly and reassembly.

EAS00886
Basic troubleshooting process



NOTE:

Do not delete the malfunction codes during troubleshooting. Delete the malfunction codes only after service has been completed.

⚠ WARNING

When maintenance or checks have been performed on components related to the ABS, be sure to perform a final check before delivering the motorcycle to the customer. (Refer to "[D-6] Final check".)

EAS00887
ABS troubleshooting

• [A] ABS malfunction check using the ABS warning light

Set the main switch to "ON". (Do not start the engine.)

1) Warning light does not come on. → [B-1]
2) Warning light remains on. → [B-2]
3) Warning light flashes. → [B-3]
4) Warning light comes on for 2 seconds, then goes off. → [B-4]

• [B] Detailed ABS malfunction check

• [B-1] Warning light does not come on

Do other indicators operate normally?

1) Yes. → [C-1]
2) No. → [C-2]

• [B-2] ABS warning light remains on

Check the ECU (ABS) under the tray. Is the coupler connected securely?

1) Yes. → [B-5]
2) No. → Connect the coupler securely until a "click" sound is heard.

• [B-3] Warning light flashes

NOTE:

Check the battery voltage before proceeding.

Check the test coupler located in the right inner panel (front cowling). Is the T/C terminal grounded?

1) Yes. → Disconnect the grounding lead from the T/C terminal and install the protective cap onto the test coupler.

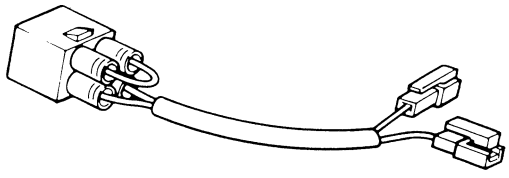
NOTE:

When the test coupler adaptor is connected to test coupler, the T/C terminal is grounded.

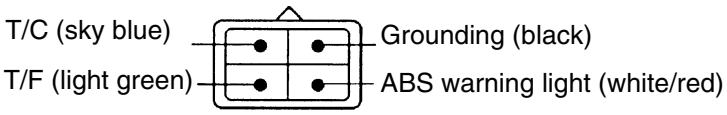
2) No. → [C-3]

Function of the test coupler terminals

- The ABS self-diagnostic function of the ECU (ABS) is operated when the T/C terminal is grounded.
- The malfunction codes stored in the memory of the ECU (ABS) are recalled and output (rise and fall of voltage) at the T/F terminal.
- The ABS warning light terminal is used to check the ABS warning light circuit.
- To ground the T/C terminal, connect the test coupler adaptor to the test coupler.



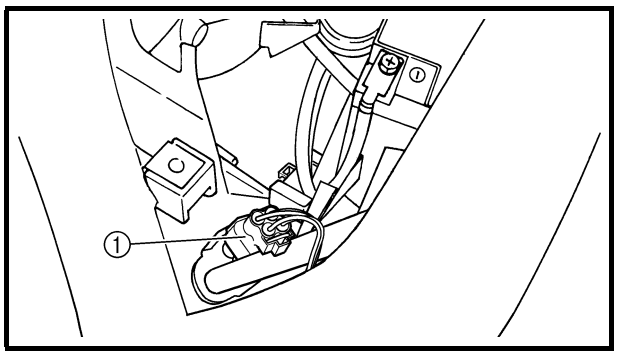
Test coupler adaptor

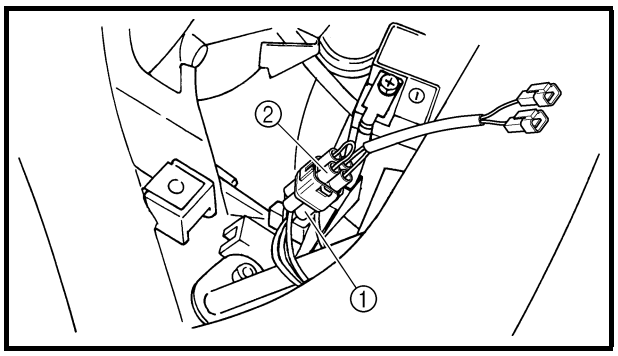


Test coupler

• [B-4] ABS malfunction check using the ABS self-diagnosis (past malfunction)

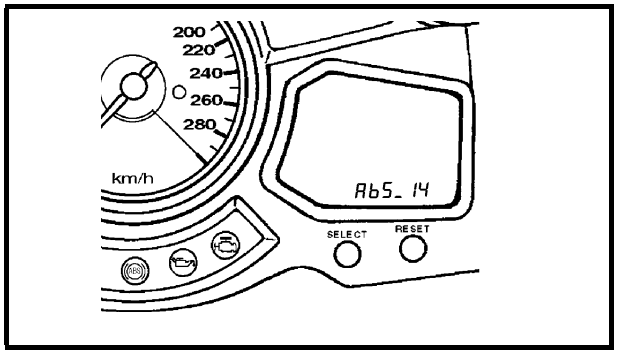
Remove the right inner panel (front cowling) and the front right inner panel (front cowling) to access the test coupler ①. Remove the protective cap and connect the test coupler adaptor ② to the test coupler. The T/C terminal (sky blue) is now grounded.





1) Indicate the malfunction code (Example: malfunction code 14)

Multifunction display



2) ABS warning light flashes every 0.5 second for more than 6 seconds. → [C-4, C-5]

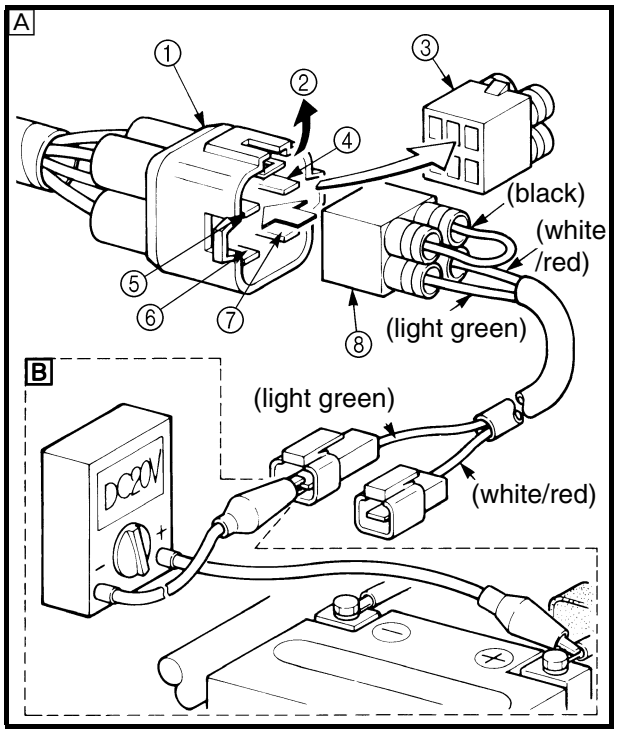
If the ABS warning light flashes every 0.5 second, the malfunction code of a past malfunction has not been stored in the memory of the ECU (ABS). If a malfunction code is displayed on the multi-function display, the ABS warning light flashes. Make sure that the customer understands the possible conditions when the ABS warning light comes on.

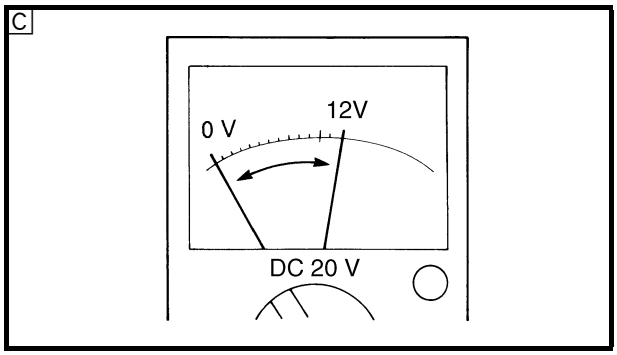
• [B-5] ABS malfunction check using the ABS self-diagnosis (present malfunction)

NOTE:

Before proceeding, read [B-3], “Function of the test coupler terminals”.

Remove the right inner panel (front cowling) and the front right inner panel to access the test coupler. Remove the protective cap and connect the test coupler adaptor to the test coupler. The T/C terminal (sky blue) is now grounded. (Figure A)



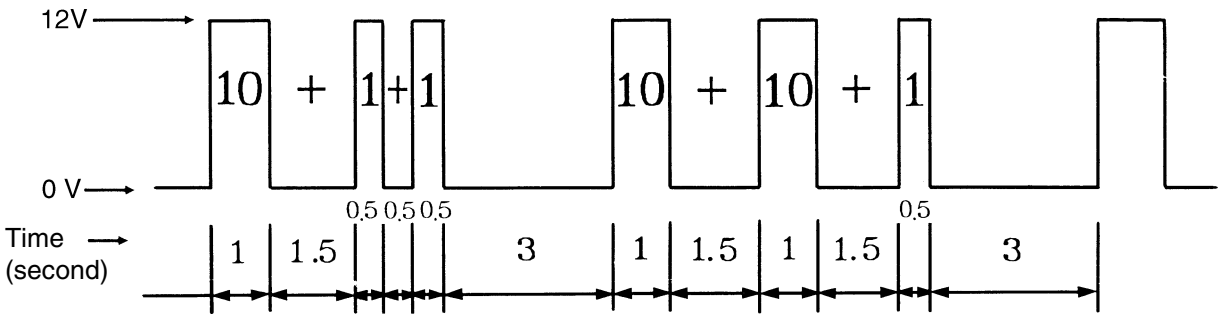


① Test coupler
② Lock plate
③ Protective cap
④ Grounding
⑤ T/C terminal
⑥ T/F terminal
⑦ Light terminal
⑧ Test coupler adaptor

Because malfunction codes for present malfunctions are not displayed on the meter assembly, check the malfunction code as follows.

Set the pocket tester range to DC 20 V. Connect the pocket tester negative probe to the T/F terminal (light green) of the test coupler adaptor and the pocket tester positive probe to the positive battery terminal. (Figure B)
Determine the malfunction code according to the movement of the pocket tester needle. (Figure C)
A tester reading with the digits of 10 and digits of 1 pattern is shown below.

Example: malfunction code 12 Example: malfunction code 21



• [C] Determining the cause and location of the malfunction

• [C-1] Only the ABS warning light does not come on when the main switch is set to "ON"

NOTE:

Check following the steps in sequence.

1. Visual check

1) Check the ABS fuse.
   Determine the cause of the blown fuse and repair. Replace with a new fuse. (Refer to "CHECKING THE FUSES" in chapter 3. [Manual No.: 5JW1-AE1])
2) Check the sub-wire harness (ABS) and wire harness couplers.
   Check that the sub-wire harness (ABS) couplers are securely connected to the wire harness couplers. Both harnesses are connected by three couplers. (Refer to "ABS COUPLERS".)
3) Check the connection of the sub-wire harness (ABS) to the ECU (ABS).
   Check that the sub-wire harness (ABS) is securely connected to the ECU (ABS). (Refer to "ABS COUPLERS".)

2. Confirmation using the test coupler adaptor

1) Connect the test coupler adaptor to the test coupler. (Refer to "[B-5] ABS malfunction check using the ABS self-diagnosis (present malfunction)".)
2) Ground the warning light terminal (white/red) of the test coupler adaptor or connect the warning light terminal to the negative battery terminal.
   • If the ABS warning light comes on, the sub-wire harness (ABS) may be disconnected.
   • If the ABS warning light does not come on, the ABS warning light lead may be disconnected or the contact of the ABS warning light may be defective.
3) Remove the ECU (ABS) coupler and check the ECU (ABS) coupler and test coupler adaptor ends of the white/red lead for continuity. (Refer to "ABS COUPLERS".)
   • If there is continuity, the ECU (ABS) is defective. → Replace the ECU (ABS). (Refer to "[D-1] Maintenance of the ECU (ABS)".)
   • If there is no continuity, the warning light circuit in the sub-wire harness (ABS) is defective. Disconnection or short → Correct. (Refer to "CIRCUIT DIAGRAM".)

• [C-2] ABS warning light and all other indicators do not come on

NOTE:

Check following the steps in sequence.

1. Check the power supply system.

1) Check that the battery is connected correctly.
2) Check the battery voltage. (Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. [Manual No.: 5JW1-AE1])
3) Check if the main fuse is blown. If the main fuse is blown, determine the cause and repair. Replace with a new fuse. (Refer to "CHECKING THE FUSES" in chapter 3. [Manual No.: 5JW1-AE1])

2. Check the connections.

1) Check that the main fuse coupler is securely connected.
2) Check that the wire harness is securely connected to the sub-wire harness (ABS).
3) Check that the main switch coupler is securely connected.
4) Check that the meter assembly coupler is securely connected. (Refer to "ABS COUPLERS".)

When these checks are finished, return to [A] and check the ABS again.

• [C-3] ABS warning light flashes

With the engine off, check the front and rear brake switches.
Check if the brake light comes on when the front or rear brake is applied.

1) The light does not come on for only one brake.

→ The corresponding brake switch connector is disconnected. (Refer to “CIRCUIT DIAGRAM”.)

→ The corresponding brake switch is defective.

2) The light does not come on for either brake.

→ The wire harness may be disconnected or the fuse may be blown. Check the fuse and make sure the wire harness (brown lead) is connected to the power source end of the brake switch. (Refer to “CIRCUIT DIAGRAM”.)

3) The brake light comes on.

→ The sub-wire harness (ABS) and the wire harness couplers may be disconnected. (Refer to “ABS COUPLERS”.)

4) Adjust the rear brake switch to the specified setting.

• [C-4] ABS warning light flashes every 0.5 second

If the ABS warning light flashes every 0.5 second, the malfunction code of a past malfunction has not been stored in the memory of the ECU (ABS). If a malfunction code is displayed on the multi-function display, the ABS warning light flashes. Make sure that the customer understands the possible conditions when the ABS warning light comes on.

1. Warning light flashes
   The following are probable causes to explain why the ABS warning light flashed while riding and then stopped flashing or stopped flashing when the main switch was set to “OFF”, then to “ON”.

1) The rear wheel was rotated with the motorcycle on the centerstand. → The system is normal.
2) The rear wheel raced. → The system is normal.
3) The motorcycle was ridden on the rear wheel with the front wheel elevated. → The system is normal.
4) The motorcycle was ridden on extremely uneven roads continuously. → The system is normal.
5) The brake switch is defective or improperly adjusted. → Replace or adjust.

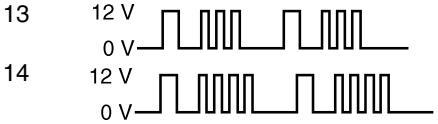
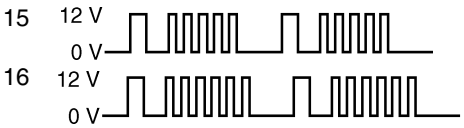
2. Voltage drop
   For the ABS to operate correctly, the voltage should be always higher than the specified voltage. If the voltage drops to lower than 10 V, the ABS warning light comes on and the ABS does not operate. When the voltage recovers to higher than 10 V, the ABS operates. However, the magneto, battery and rectifier/regulator must be checked. Follow the regular procedures for service of the power supply system.
3. ABS is stopped by the ECU (ABS)
   The ECU (ABS) may stop the ABS operation if it is exposed to extremely strong electromagnetic waves or static electricity.
   When the ECU (ABS) is no longer exposed to the electromagnetic waves, static electricity, and the ABS warning light is not flashing, there is no effect on the operation of the ABS. Explain to the customer that the ABS will operate normally.

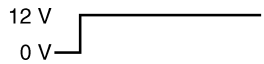
• [C-5] Diagnosis by the malfunction code

Malfunction codes are used to determine the malfunctions that have occurred. (Refer to "[B-4] ABS malfunction check using the ABS self-diagnosis (past malfunction)" and "[B-5] ABS malfunction check using the ABS self-diagnosis (present malfunction)".) The malfunction codes are explained in the following table.

NOTE:

Record all of the malfunction codes displayed and check the check points.

Malfunction code	Problem	Check point	Reference
11 *1	Front wheel sensor signal is not received properly. 	• Installation of the front wheel sensor • Front wheel sensor lead and coupler • ABS wire harness circuit • Front wheel sensor rotor	[C-5-1] Malfunction code 11 (page 91)
12	Rear wheel sensor signal is not received properly. 	• Installation of the rear wheel sensor • Rear wheel sensor lead and coupler • ABS wire harness circuit • Rear wheel sensor rotor	[C-5-2] Malfunction code 12 (page 91)
13 (front) 14 (rear)	Incorrect signal is detected by the front (13) or rear (14) wheel sensor. 	• Wheel sensor installation • Wheel sensor housings • Wheel sensor rotors	[C-5-3] Malfunction codes 13 (front wheel) and 14 (rear wheel) (page 92)
15 (front) 16 (rear)	No continuity in the front or rear wheel sensor circuits 	• Continuity of sensor circuits • ABS wire harness circuit • Connection of sensor coupler	[C-5-4] Malfunction codes 15 (front wheel sensor) and 16 (rear wheel sensor) (page 92)
21	Hydraulic unit solenoid circuit is broken or short-circuited. 	• ABS wire harness circuit • Hydraulic unit solenoid coupler • Hydraulic unit solenoid	[C-5-5] Malfunction code 21 (page 92)
31	Disconnection is detected on the system of fail-safe relay and hydraulic unit solenoid coupler. 	• ABS wire harness circuit • Fail-safe relay circuit • Hydraulic unit solenoid coupler	[C-5-6] Malfunction code 31 (page 93)
32	Defective operation of the fail-safe relay is detected. 	• Fail-safe relay • ABS wire harness circuit	[C-5-7] Malfunction code 32 (page 93)
33	Defective operation of the ABS motor is detected. (ABS motor stops and will not rotate.) 	• ABS wire harness circuit • ABS motor coupler • Fail-safe relay • ABS motor circuit	[C-5-8] Malfunction code 33 (page 94)

Malfunction code	Problem	Check point	Reference
34	Defective operation of the ABS motor is detected. (ABS motor keeps running and will not stop.) 	• Fail-safe relay • ABS wire harness circuit • ABS motor circuit	[C-5-9] Malfunction code 34 (page 94)
41	Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic state (when the battery voltage is normal). 	• Brake dragging • Hydraulic unit operation test 2 (Refer to [D-6-3-2].) • Front wheel brake line	[C-5-10] Malfunction code 41 (page 95)
42	Rear wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic state (when the battery voltage is normal). 	• Brake dragging • Hydraulic unit operation test 2 (Refer to [D-6-3-2].) • Rear wheel brake line	[C-5-11] Malfunction code 42 (page 96)
51	Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic state (when the battery voltage is low). 	• Brake dragging • Hydraulic unit operation test 2 (Refer to [D-6-3-2].) • Front wheel brake line • Battery voltage	[C-5-12] Malfunction code 51 (page 98)
52	Rear wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic state (when the battery voltage is low). 	• Brake dragging • Hydraulic unit operation test 2 (Refer to [D-6-3-2].) • Rear wheel brake line • Battery voltage	[C-5-13] Malfunction code 52 (page 99)
Present malfunction (test always indicates 12 V)	ECU (ABS) may be malfunctioning 	• ABS wire harness circuit (test coupler circuits) • ECU (ABS) (Replace)	[D-1] Maintenance of the ECU (ABS) (page 101)

*1 Malfunction code 11 is indicated if the rear wheel rotates for more than 20 seconds with the front wheel stopped.

NOTE:

Malfunction code 15 (front wheel sensor) or 16 (rear wheel sensor) is displayed if a defective connection to either the front or rear sensor is detected whether or not the motorcycle is ridden.

• [C-5-1] Malfunction code 11 (Front wheel sensor signal is not received correctly.)

Set the main switch to "OFF", then back to "ON" after removing the test coupler adaptor.

1) ABS warning light remains on.

→ Defective connection in the front wheel sensor circuit.

- Front wheel sensor coupler is disconnected. → [D-3]
- Front wheel sensor lead or coil is broken. → [D-3]
- Sub-wire harness (ABS) sensor circuit is broken. → (Refer to "CIRCUIT DIAGRAM".)
- ECU (ABS) coupler terminal is disconnected. → [D-1]

2) ABS warning light comes on for 2 seconds, then goes off.

① With the front wheel stopped, the rear wheel was rotated for more than 20 seconds. This is not a malfunction.

② A signal is not generated at the front wheel sensor.

- Front wheel sensor is not installed properly. → [D-3]
- Front wheel sensor rotor is defective. → [D-3]

③ Front wheel sensor circuit is short-circuited.

- Front wheel sensor or lead is short-circuited. → [D-3]
- Sub-wire harness (ABS) sensor circuit is short-circuited. → (Refer to "CIRCUIT DIAGRAM".)

④ Front wheel sensor output drops.

- Sensor signal output may drop due to failure of the bearings, wheel axle, wheel or sensor housing of the front wheel. Check these components when installed for looseness, distortion, and bends.

• [C-5-2] Malfunction code 12 (Rear wheel sensor signal is not received correctly.)

Set the main switch to "OFF", then back to "ON".

1) ABS warning light remains on.

→ Defective connection in the rear wheel sensor circuit.

- Rear wheel sensor coupler is disconnected. → [D-4]
- Rear wheel sensor lead or coil is broken. → [D-4]
- Sub-wire harness (ABS) sensor circuit is disconnected. → (Refer to "CIRCUIT DIAGRAM".)
- ECU (ABS) coupler terminal is disconnected. → [D-1]

2) ABS warning light comes on for 2 seconds, then goes off.

① With the rear wheel stopped, the front wheel was rotated at a speed faster than 11 km/h. This is not a malfunction.

② A signal is not generated at the rear wheel sensor.

- Rear wheel sensor is not installed properly. → [D-4]
- Rear wheel sensor rotor is defective. → [D-4]

③ Rear wheel sensor circuit is short-circuited.

- Rear sensor or lead is short-circuited. → [D-3]
- Sub-wire harness (ABS) sensor circuit is short-circuited. → (Refer to "CIRCUIT DIAGRAM".)

④ Rear wheel sensor output drops

- Sensor signal output may drop due to failure of the bearings, wheel, or sensor housing of the rear wheel. Check these components when installed for looseness, distortion, and bends.

NOTE:

If the motorcycle is ridden on extremely uneven roads continuously, the ABS warning light may flash and malfunction code 11 or 12 may be recorded depending on the condition.

- **[C-5-3] Malfunction codes 13 (front wheel) and 14 (rear wheel) (Incorrect signal is detected from either the front or rear wheel.)**

1) The wheel sensors or sensor rotors are not properly installed.
① Installation of the front or rear wheel sensor
- Check that the wheel sensor is properly installed in the housing. → [D-3, 4]
- Check if there is looseness between the housing and the wheel. → [D-3, 4]

② Installation of the front or rear wheel sensor rotor
- Check that the sensor rotor is correctly pressed in the wheel. → [D-3, 4]
- Check the rotor and inside the rotor housing for foreign materials. → [D-3, 4]

2) Teeth surfaces of the sensor rotors are defective.
- Check for flaws on the teeth surfaces of the front or rear wheel sensor rotors. Also, check for any foreign materials. → [D-3, 4]

3) Sensor output has dropped.
- Sensor signal output may drop due to failure of the bearings, wheel axle, wheel or sensor housing of the front or rear wheel. Check these components when installed for looseness, distortion, and bends.

- **[C-5-4] Malfunction codes 15 (front wheel sensor) and 16 (rear wheel sensor) (No continuity in the sensor circuits.)**

Broken front or rear wheel sensor circuit is detected.
- Front or rear wheel sensor coupler is broken. → [D-3, 4]
- Front or rear wheel sensor or lead is broken. → [D-3, 4]
- Sub-wire harness (ABS) sensor circuit is broken. → (Refer to "CIRCUIT DIAGRAM".)
- Sub-wire harness (ABS) is disconnected from the ECU (ABS) coupler terminal. → [D-1]

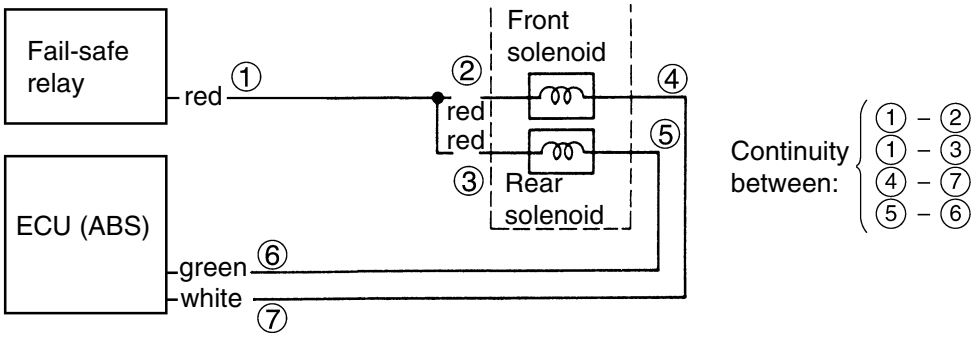
NOTE:
- Check that both the front and rear wheel sensor couplers are connected securely.
- If the motorcycle is ridden after malfunction code 15 (front wheel sensor) or 16 (rear wheel sensor) is displayed, the malfunction code will be overwritten from 15 to 11 (front wheel sensor signal) or from 16 to 12 (rear wheel sensor signal).

- **[C-5-5] Malfunction code 21 (Hydraulic unit solenoid circuit is broken or short-circuited.)**

Check the following:
1) Hydraulic unit solenoid coupler
- Check if the hydraulic unit solenoid coupler terminal is disconnected. (Refer to "ABS COUPLERS".)

2) Hydraulic unit solenoid
- Check the front and rear wheel solenoids for continuity → [D-5]
- Check the insulation of all solenoid terminals and the negative battery terminal. → [D-5]

3) Sub-wire harness (ABS)
- Check the hydraulic unit solenoid circuits for continuity. (See the illustration below.)

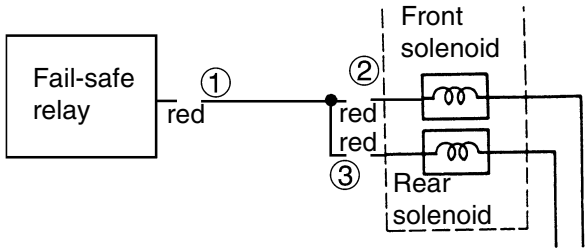


- Check the insulation of the hydraulic unit solenoid circuits and the negative battery terminal.

• [C-5-6] Malfunction code 31 (Disconnection is detected between the fail-safe relay and the hydraulic unit solenoid.)

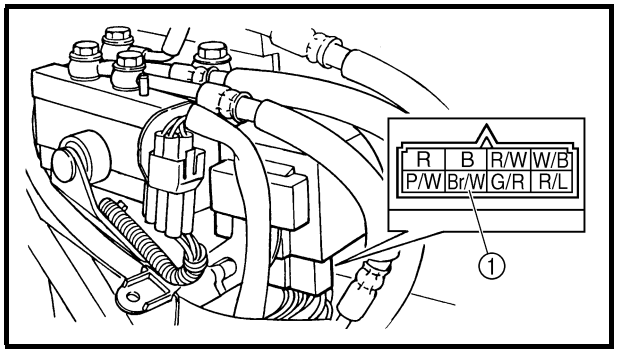
Check the following:

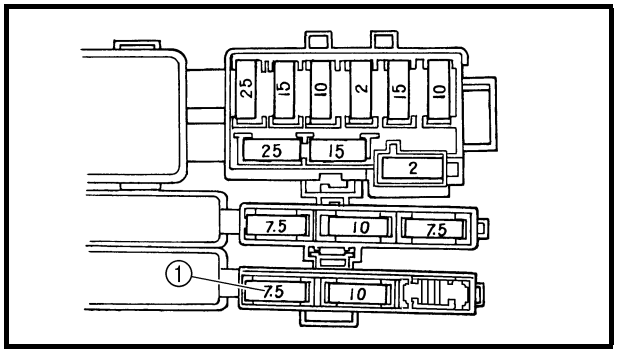
1) ABS motor fuse
   • Check if the ABS motor fuse beside the battery is blown.
2) Hydraulic unit solenoid coupler
   • Check if the hydraulic unit solenoid coupler located in the right side cover is connected properly. (Refer to "ABS COUPLERS".)
3) Sub-wire harness (ABS)
   • Check the pink/white leads between the ECU (ABS) and the fail-safe relay for continuity. (Refer to "CIRCUIT DIAGRAM".)
   • ECU (ABS) coupler terminal (pink/white) is disconnected. → [D-1]
   • Check the red leads between ① and ②, and between ① and ③ of the hydraulic unit solenoid circuits for continuity.



4) Fail-safe relay
   • Check if the fail-safe relay operates correctly. → [D-2]
5) Wire harness
   • Check for continuity between the red/blue terminal of the fail-safe relay coupler and the positive battery terminal.
   • Remove the ABS fuse and check for continuity between the brown/white lead of the fail-safe relay coupler and the ABS fuse. (See the illustration below.)

Check for continuity between these two points ①.





• [C-5-7] Malfunction code 32 (Fail-safe relay malfunction is detected.)

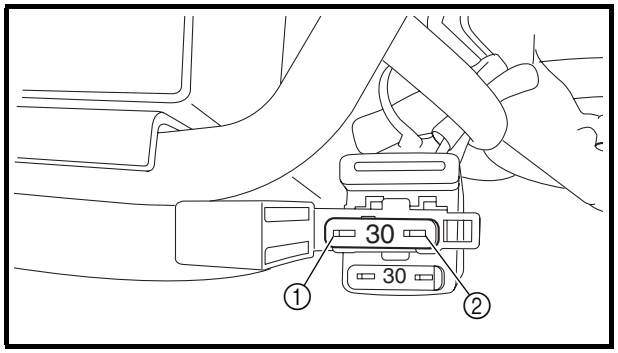
Check the following:

1) Fail-safe relay
   • Check if the fail-safe relay operates correctly. → [D-2]
2) Sub-wire harness (ABS)
   • Disconnect the sub-wire harness (ABS) from the fail-safe relay and the ECU (ABS), and then check the insulation of the fail-safe relay coupler between the red/blue and red terminals.

- **[C-5-8] Malfunction code 33 (ABS motor operation malfunction is detected. [ABS motor stops and does not rotate.])**

Check the following:

1) ABS motor fuse
   - Check if the ABS motor fuse beside the battery is blown.
2) Fail-safe relay
   - Check if the fail-safe relay operates correctly. → [D-2]
3) Wire harness and sub-wire harness (ABS)
   - Remove the fail-safe relay and the ABS motor fuse, and then check for continuity between the red/blue terminal of the sub-wire harness (ABS) and the sub-wire harness (ABS) end (terminal A shown in the illustration) of the ABS motor fuse terminal beside the battery. (Refer to "CIRCUIT DIAGRAM".)



① Terminal A
② Terminal B

   - Check for continuity between the positive battery terminal and the battery end of the ABS motor fuse terminal (terminal B shown in the above illustration).
   - Remove the ECU (ABS) and the fail-safe relay from the sub-wire harness (ABS), and then check for continuity between the white/black lead terminals and the red/white lead terminals.

- **[C-5-9] Malfunction code 34 (ABS motor operation malfunction is detected. [ABS motor keeps rotating and does not stop.])**

Check the following:

1) ABS motor
   - Check if the ABS motor coupler located in the right side cover is connected properly.
   - Check the ABS motor for continuity. → [D-5]
2) Sub-wire harness (ABS)
   - Remove the ABS motor coupler and check for continuity between the black terminal of the ABS motor coupler of the sub-wire harness (ABS) and the negative battery terminal.
   - Remove the ECU (ABS) coupler and check for continuity between the red/white terminal of the ECU (ABS) coupler and the red/white terminal of the ABS motor coupler. → [D-1]
   - Remove the fail-safe relay and check for continuity between the red/white terminal of the ABS motor coupler of the sub-wire harness (ABS) and the positive battery terminal.
3) Fail-safe relay
   - Check if the fail-safe relay operates correctly. → [D-2]

- **[C-5-10] Malfunction code 41 (Front wheel does not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic pressure [when the battery voltage is normal].)**

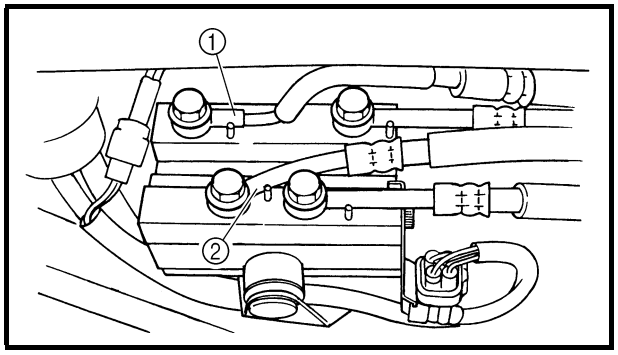
Check the following:

1) Rotation of the front wheel
   - Check that there is no brake disc drag on the front wheel and make sure it rotates smoothly.
   - Check the front wheel axle for loose bearings and bends, and the brake disc for distortion.
2) Brake master cylinder and brake caliper
   - Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake lever is operated and that the pressure decreases when the lever is released.
3) Brake fluid
   - Visually check the brake fluid in the brake master cylinder reservoir and the fluid for water, foreign materials, solidification and contamination.
   - Check for air in the brake hose lines.
4) Brake hose lines
   - Check the brake hose lines for kinks and deterioration.

⚠ WARNING

Only use genuine Yamaha parts. Using other brake pipes, hoses and union bolts may close the brake hose lines.

- Check that the connections of the brake hose lines from the brake master cylinder to the hydraulic unit and to the front brake caliper from the hydraulic unit are correct.



⚠ WARNING

The front brake will not function properly if the connections are reversed.
- **Front brake hose ① inlet: from the front brake master cylinder**
- **Front brake hose ② outlet: to the front brake caliper**

NOTE:
- If the front brake hose inlet and outlet connections are reversed on the hydraulic unit, the brake lever is pulled to full stroke without responding and will be pushed back slowly without pulsating when the final check in [D-6] is performed.
- If the front and rear brake hose connections are reversed on the hydraulic unit, the pulsating action in the brake lever and brake pedal will be performed in the reverse order when the final check in [D-6] is performed.

5) Hydraulic unit solenoid coupler terminal
- Check if the front and rear hydraulic unit solenoid coupler terminals (hydraulic unit and sub-wire harness [ABS]) are reversed.

	Terminal color	
	Solenoid	Sub-wire harness (ABS)
Front	white, white	red, green
Rear	red, red	red, white

6) Hydraulic unit

If the malfunction is not corrected after performing steps 1) to 5), replace the hydraulic unit. Be sure to connect the brake hoses and couplers correctly and securely. Check the hydraulic unit operation. (Refer to "[D-6] Final check".)

- **[C-5-11] Malfunction code 42 (Rear wheel does not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic pressure [when the battery voltage is normal].)**

Check the following:

1) Rotation of the rear wheel
- Check that there is no brake drag on the rear wheel and make sure it rotates smoothly.
- Check for brake disc distortion.

2) Brake master cylinder and brake caliper
- Check that the brake fluid pressure is correctly transmitted to the brake disc when the brake pedal is operated and that the pressure decreases when the pedal is released.

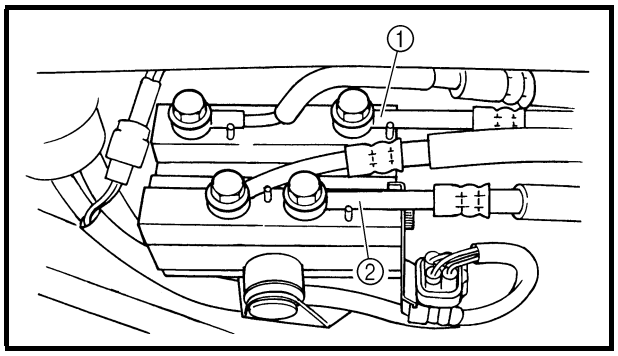
3) Brake fluid
- Visually check the brake fluid in the brake master cylinder reservoir and check the fluid for water, foreign materials, solidification and contamination.
- Check for air in the brake hose lines.

4) Brake hose lines
- Check the brake hose lines for kinks and deterioration (particularly between the hydraulic unit and the rear brake caliper).

⚠ WARNING

Only use genuine Yamaha parts. Using other brake pipes, hoses and union bolts may close the brake hose lines.

• Check that the connections of the brake hose lines from the brake master cylinder to the hydraulic unit and to the rear brake caliper from the hydraulic unit are correct.



⚠ WARNING

The rear brake will not function properly if the connections are reversed.
- **Rear brake hose ① inlet: from the rear brake master cylinder**
- **Rear brake hose ② outlet: to the rear brake caliper**

NOTE:
- If the rear brake hose inlet and outlet connections are reversed on the hydraulic unit, the brake pedal is pressed down to full stroke without responding and will be pushed back slowly without pulsating when the final check in [D-6] is performed.
- If the front and rear brake hose connections are reversed on the hydraulic unit, the pulsating action in the brake lever and brake pedal will be performed in the reverse order when the final check in [D-6] is performed.

5) Hydraulic unit solenoid coupler terminal
• Check if the front and rear hydraulic unit solenoid coupler terminals (hydraulic unit and sub-wire harness [ABS]) are reversed.

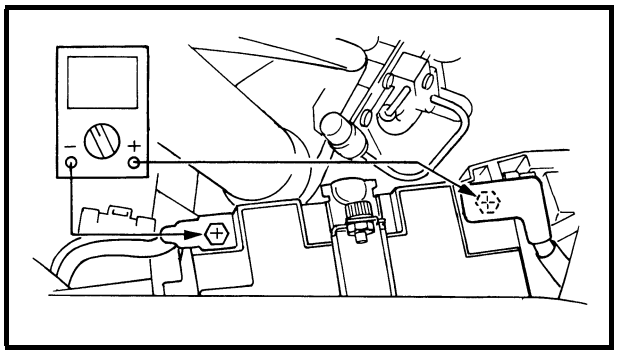
	Terminal color	
	Solenoid	Sub-wire harness (ABS)
Front	white, white	red, green
Rear	red, red	red, white

6) Hydraulic unit
If the malfunction is not corrected after performing steps 1) to 5), replace the hydraulic unit. Be sure to connect the brake hose lines and couplers correctly and securely. Check the hydraulic unit operation. (Refer to “[D-6] Final check”.)

- **[C-5-12] Malfunction code 51 (Front wheel does not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic pressure [when the battery voltage is low].)**

Check the following:

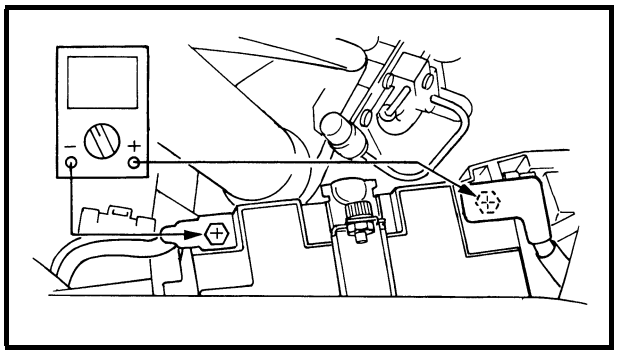
1) Rotation of the front wheel
   Refer to "[C-5-10] Malfunction code 41".
2) Brake master cylinder and brake caliper
   Refer to "[C-5-10] Malfunction code 41".
3) Brake fluid
   Refer to "[C-5-10] Malfunction code 41".
4) Brake hose lines
   Refer to "[C-5-10] Malfunction code 41".
5) Hydraulic unit solenoid coupler terminals
   Refer to "[C-5-10] Malfunction code 41".
6) Hydraulic unit
   Refer to "[C-5-10] Malfunction code 41".
7) Battery voltage
   Measure the battery voltage.



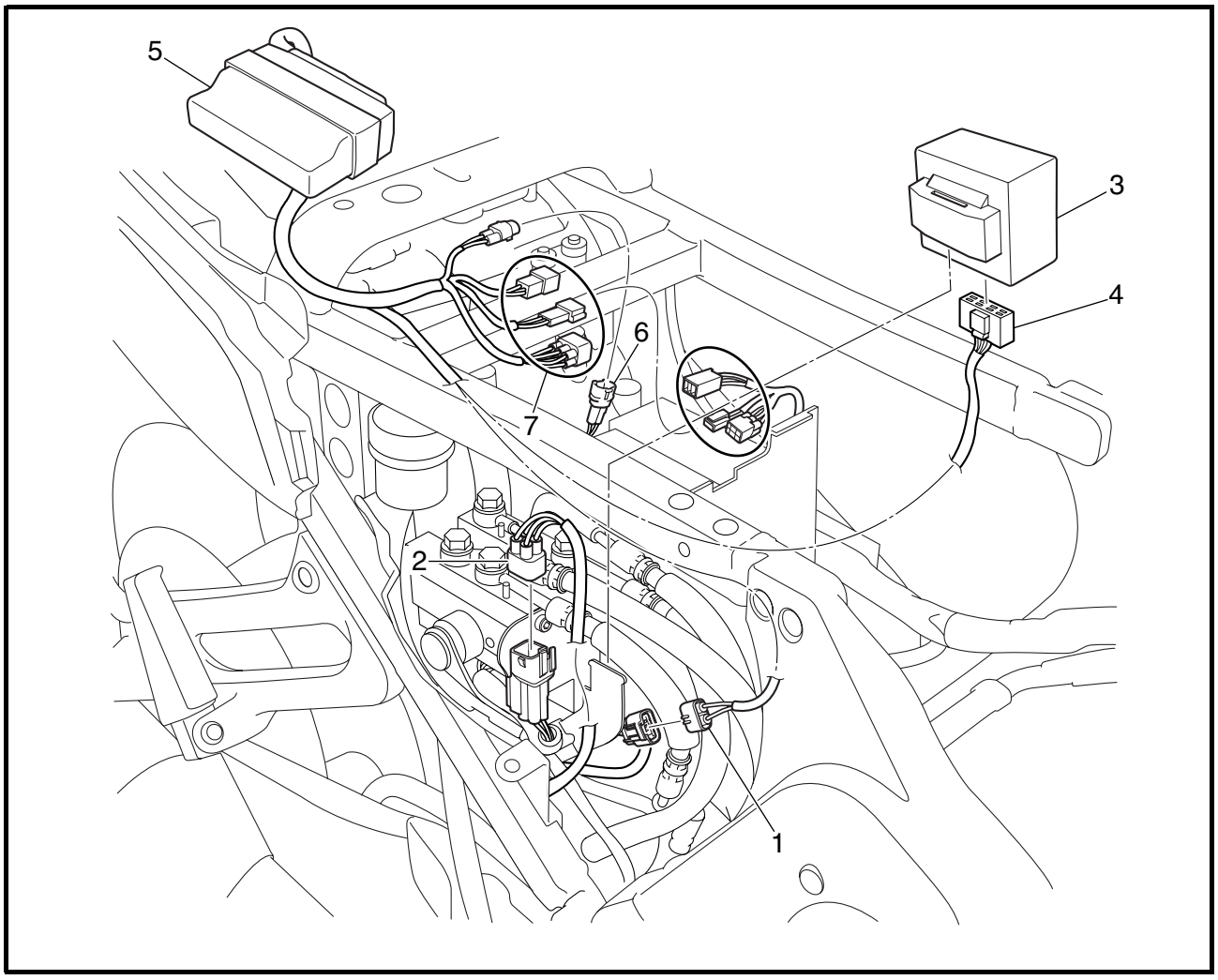
- **[C-5-13] Malfunction code 52 (Rear wheel does not recover from the locking tendency even though the signal is continuously transmitted from the ECU (ABS) to release the hydraulic pressure [when the battery voltage is low].)**

Check the following:

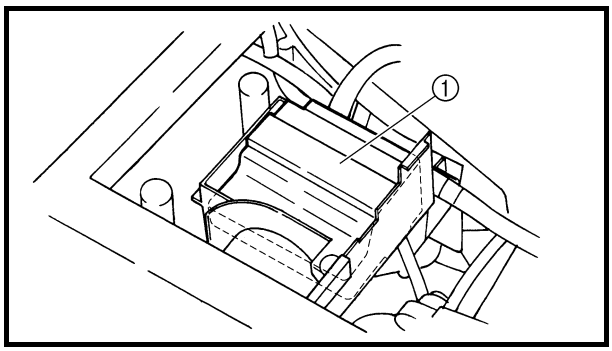
1) Rotation of the rear wheel
   Refer to "[C-5-11] Malfunction code 42".
2) Brake master cylinder and brake caliper
   Refer to "[C-5-11] Malfunction code 42".
3) Brake fluid
   Refer to "[C-5-11] Malfunction code 42".
4) Brake hose lines
   Refer to "[C-5-11] Malfunction code 42".
5) Hydraulic unit solenoid coupler terminals
   Refer to "[C-5-11] Malfunction code 42".
6) Hydraulic unit
   Refer to "[C-5-11] Malfunction code 42".
7) Battery voltage
   Measure the battery voltage.



EAS00888
ECU (ABS) AND FAIL-SAFE RELAY



Order	Job/Part	Q'ty	Remarks
	Removing the ECU (ABS) and fail-safe relay		Remove the parts in the order listed.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3. (Manual No.: 5JW1-AE1)
1	ABS motor coupler	1	Disconnect.
2	Hydraulic unit solenoid coupler	1	Disconnect.
3	Fail-safe relay	1	
4	Fail-safe relay coupler	1	Disconnect.
5	ECU (ABS)	1	
6	Front wheel sensor coupler	1	Disconnect.
7	ECU (ABS) coupler	3	Disconnect.
			For installation, reverse the removal procedure.



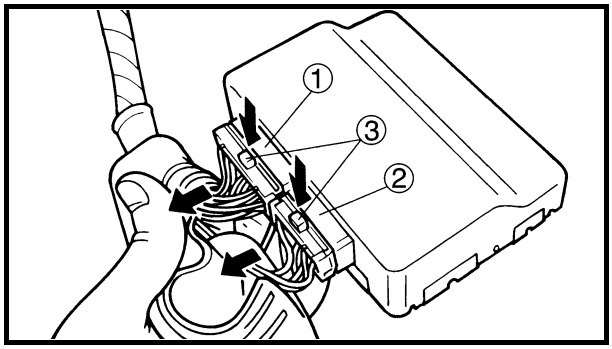
[D-1] Maintenance of the ECU (ABS)

• Removing the ECU (ABS)

1. Remove:
   • ECU (ABS) ①

NOTE:

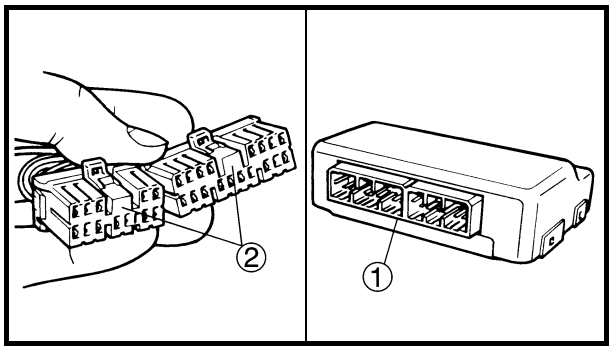
When removing the ECU (ABS), take care not to damage the ECU (ABS) or ECU (ABS) couplers.



2. Remove:
   • ECU (ABS) coupler ①
   • ECU (ABS) coupler ②

NOTE:

Do not pull the ECU (ABS) leads to remove the ECU (ABS) couplers.
Always press on the locks ③ to disconnect the ECU (ABS) couplers from the ECU (ABS).

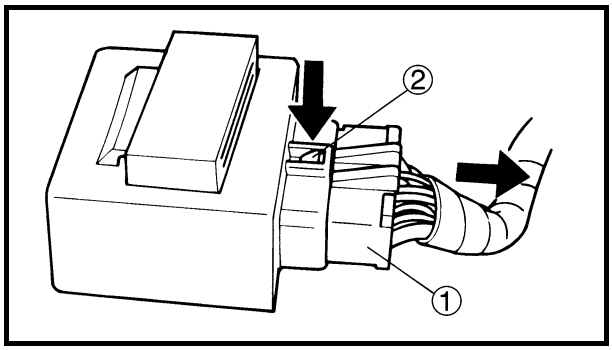


• Checking the ECU (ABS)

1. Check:
   • ECU (ABS) terminals ①
     Cracks/damage → Replace the ECU (ABS).
   • ECU (ABS) coupler terminals ②
     Defective connections/contamination/disconnections → Repair or clean.

NOTE:

If the ECU (ABS) coupler terminals are clogged with mud or dirt, clean with compressed air.



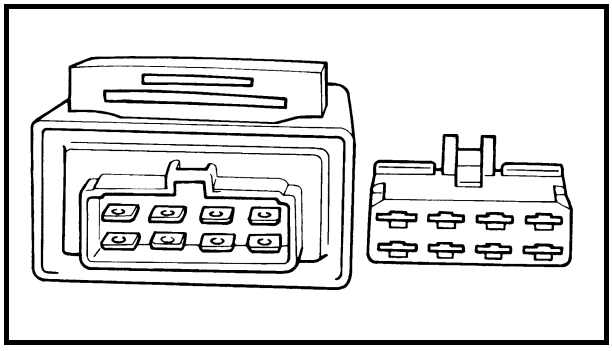
[D-2] Maintenance of the ABS fail-safe relay

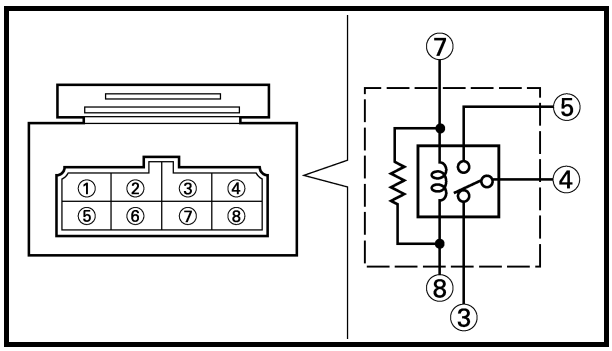
• Removing the fail-safe relay

1. Remove:
   • ABS fail-safe relay coupler ①

NOTE:

Do not pull the ABS fail-safe relay leads to remove the ABS fail-safe relay coupler.
Always press on the lock ② to disconnect the ABS fail-safe relay coupler from the ABS fail-safe relay.

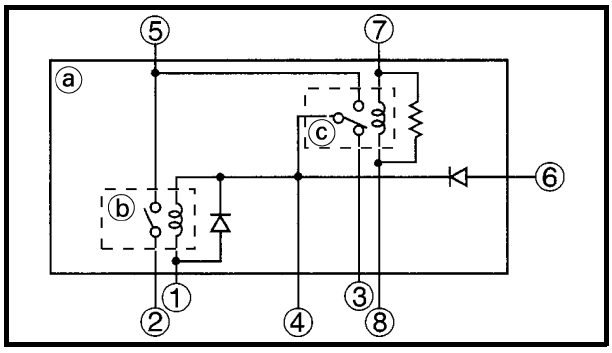




Operation of solenoid relay

○—○ : Continuity

Terminal number	③	④	⑤	⑦	⑧
Normal condition	○	○		○	○
Connect the battery to terminals ⑦ and ⑧		○	○		



- **Checking the fail-safe relay**

1. Check:
   - solenoid relay for continuity
     Connect the pocket tester (Ω × 1) to the terminals.
     Check for continuity between terminals ③ and ④ of the solenoid relay.
     Tester positive probe → Terminal ③
     Tester negative probe → Terminal ④
     Tester reading is "∞". → Replace the fail-safe relay.
   - Check for continuity between terminals ⑦ and ⑧ of the solenoid relay.
     Tester positive probe → Terminal ⑦
     Tester negative probe → Terminal ⑧

Solenoid relay resistance
150 ~ 450 Ω

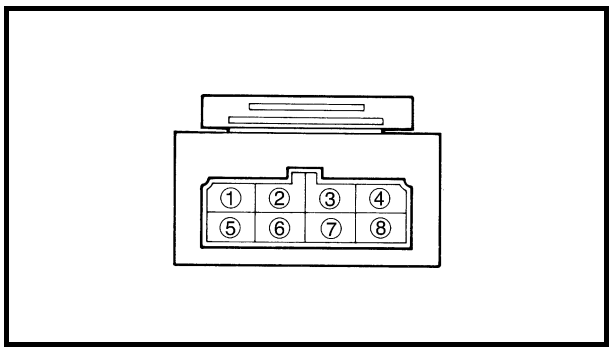
Tester reading is "∞". → Replace the fail-safe relay.

- Connect the positive battery terminal to terminal ⑦ and the negative battery terminal to terminal ⑧, and then check for continuity between terminals ④ and ⑤ of the solenoid relay.
  Tester positive probe → Terminal ④
  Tester negative probe → Terminal ⑤
  Tester reading is "∞". → Replace the fail-safe relay.

CAUTION:

When connecting the solenoid relay and battery terminals, be careful not to short-circuit the positive and negative battery terminals.

ⓐ Fail-safe relay
ⓑ ABS motor relay
ⓒ Solenoid relay



Operation of ABS motor relay

○—○ : Continuity

Terminal number	①	②	⑤	⑥	
Normal condition	○			○	
Connect the battery to terminals ⑥ and ①		○	○		

2. Check:
   - ABS motor relay for continuity
     Connect the pocket tester (Ω × 1) to the terminals of the ABS motor relay.
     Check for continuity between terminals ① and ⑥ of the ABS motor relay.
     Tester positive probe → Terminal ①
     Tester negative probe → Terminal ⑥

ABS motor relay resistance
50 ~ 150 Ω

Tester reading is "∞". → Replace the fail-safe relay.

CAUTION:

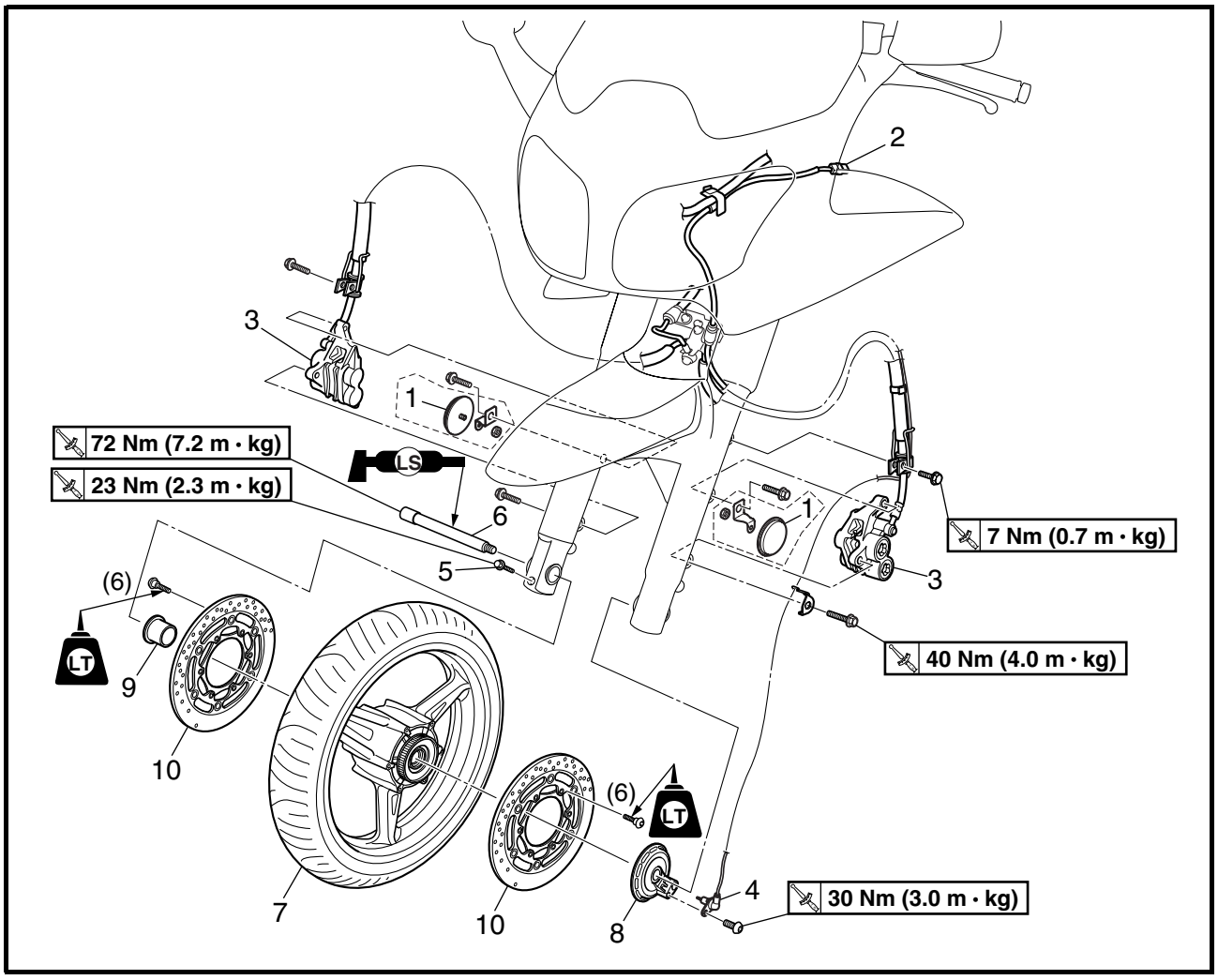
Do not reverse the connections. If the pocket tester leads are connected in reverse to terminals ① and ⑥, a correct pocket tester reading cannot be obtained.

- Connect the positive battery terminal to terminal ⑥ and the negative battery terminal to terminal ①, and then check for continuity between terminals ② and ⑤ of the ABS motor relay.
  Tester positive probe → Terminal ②
  Tester negative probe → Terminal ⑤
  Tester reading is "∞". → Replace the fail-safe relay.

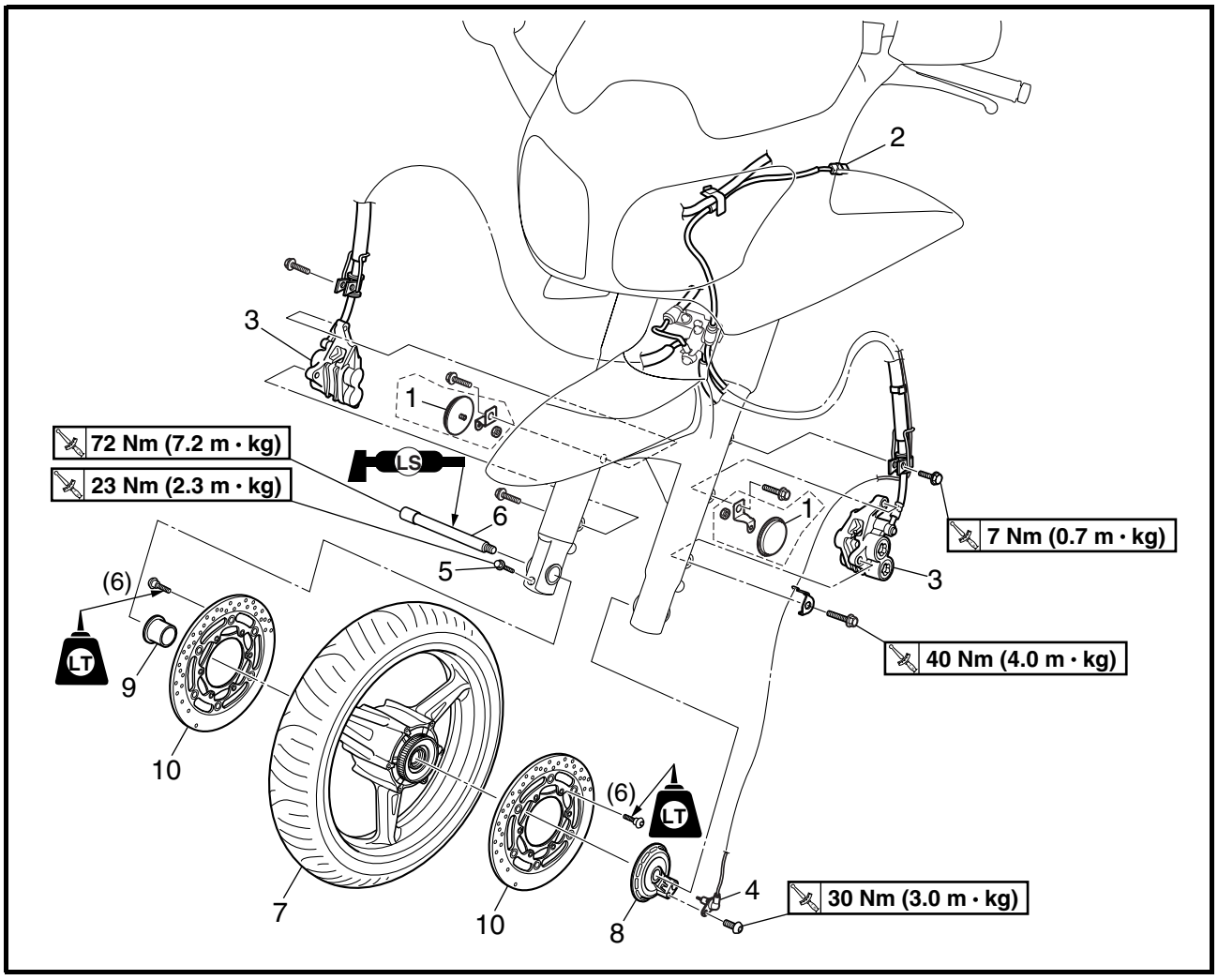
CAUTION:

- **Be sure to connect the pocket tester positive and negative probes correctly. If the pocket tester probes are connected in reverse, the diode of the fail-safe relay will be broken.**
- **When connecting the battery and the ABS motor relay terminals, be careful not to short-circuit the positive and negative battery terminals.**

EAS00889
FRONT WHEEL SENSOR AND SENSOR ROTOR



Order	Job/Part	Q'ty	Remarks
	Removing the front wheel sensor and sensor rotor		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the front wheel is elevated.
	Rider seat		Refer to "SEATS AND FUEL TANK" in chapter 3. (Manual No.: 5JW1-AE1)
	Fuel tank		Refer to "SEATS AND FUEL TANK".
1	Reflector	2	For AUS only.
2	Front wheel sensor coupler	1	Disconnect.
3	Brake caliper (left and right)	2	
4	Front wheel sensor	1	Refer to "Maintenance of the front wheel sensor and sensor rotor".
5	Wheel axle pinch bolt	1	Loosen.
6	Front wheel axle	1	
7	Front wheel	1	
8	Sensor housing	1	



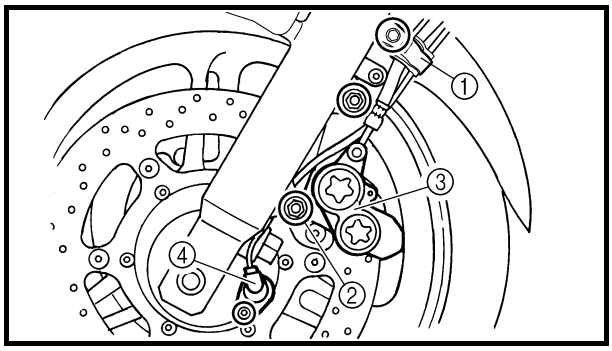
Order	Job/Part	Q'ty	Remarks
9	Collar (right)	1	
10	Brake disc (left and right)	2	
			For installation, reverse the removal procedure.

[D-3] Maintenance of the front wheel sensor and sensor rotor

- **ABS wheel sensor and sensor rotor**

CAUTION:

- **Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.**
- **The ABS wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.**

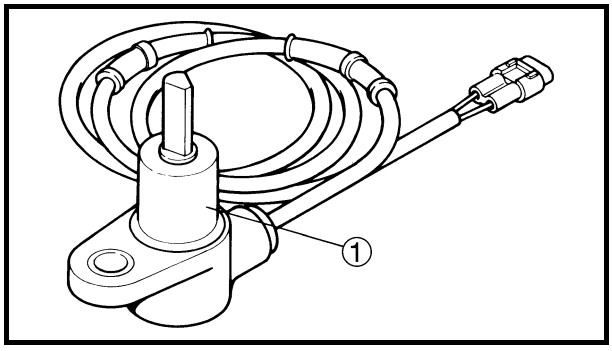


- **Removing the front wheel sensor**

1. Remove:
   - brake hose holder ①
   - front wheel sensor lead holder ②
   - brake caliper ③
   - front wheel sensor ④

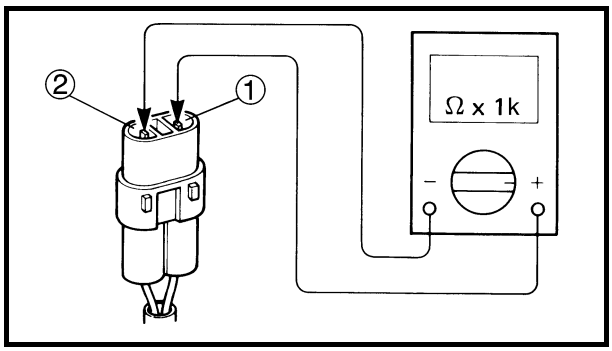
CAUTION:

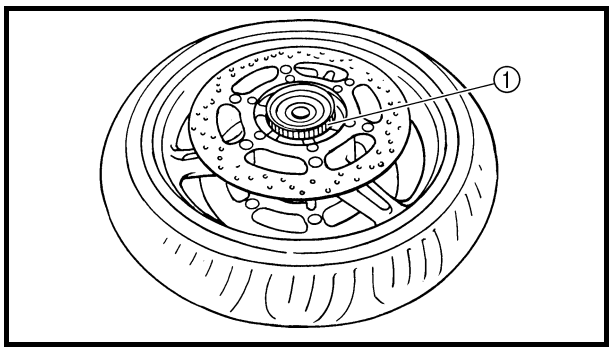
- **Be sure not to contact the sensor electrode to any metal part when removing the front wheel sensor from the sensor housing.**
- **Do not operate the brake lever when removing the brake caliper.**



- **Checking the front wheel sensor and sensor rotor**

1. Check:
   - front wheel sensor ①
     Cracks/bends/distortion → Replace.
     Iron powder/dust → Clean.





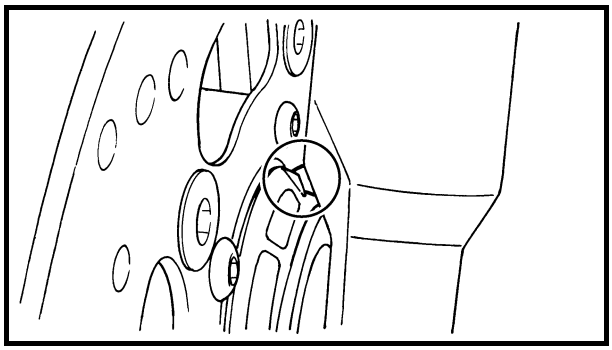
2. Measure:
   • front wheel sensor resistance
   Connect the pocket tester (Ω × 1k) to the terminals of the front wheel sensor coupler.
   Tester positive probe → Terminal ①
   Tester negative probe → Terminal ②

	Regulated resistance **1.12 ~ 1.68 kΩ at 20 °C**

   Out of specification → Replace.
3. Check:
   • front wheel sensor rotor ①
   Cracks/damage → Replace the front wheel assembly.

NOTE:

The wheel sensor rotor of the motorcycle is inserted under pressure by a special process and cannot be replaced as a single unit. To replace the sensor rotor, replace the wheel assembly.



• Installing the front wheel sensor

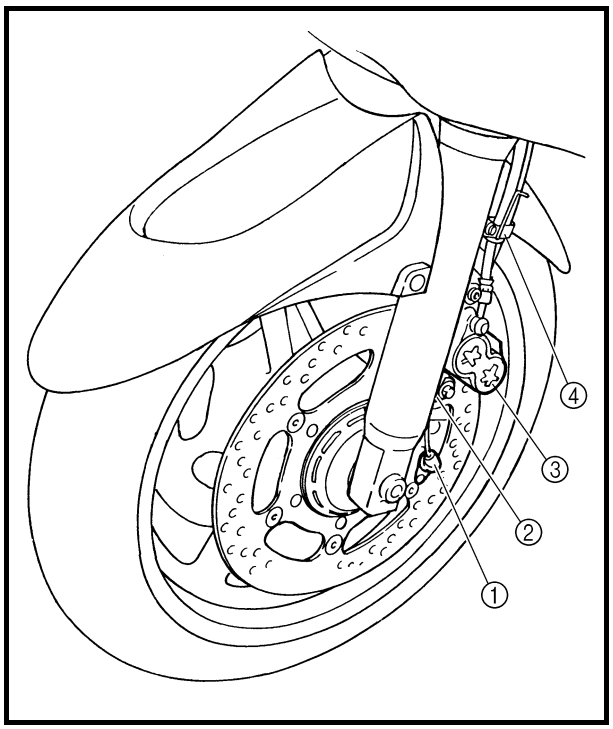
1. Install:
   • front wheel

NOTE:

Align the slot in the sensor housing with the projection of the front fork before assembly.

CAUTION:

Make sure there are no foreign materials in the wheel hub. Foreign materials cause damage to the inner sensor rotor and front wheel sensor.



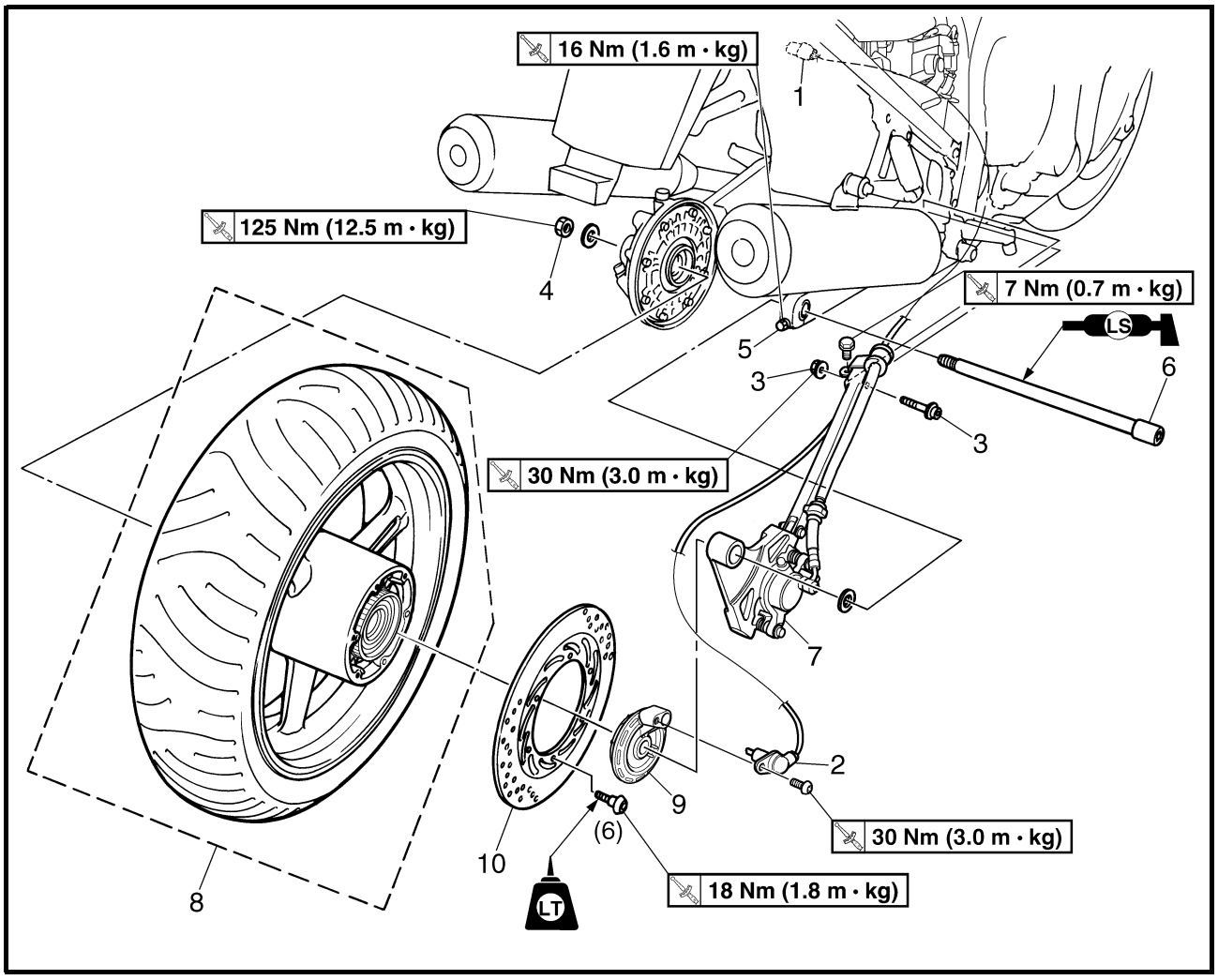
2. Install:
   - front wheel sensor ①
     30 Nm (3.0 m · kg)
   - front wheel sensor lead holder ②
   - brake caliper ③ **40 Nm (4.0 m · kg)**
   - brake hose holder ④

NOTE:
When installing the front wheel sensor, check the wheel sensor lead for twists and the sensor electrode for foreign materials.

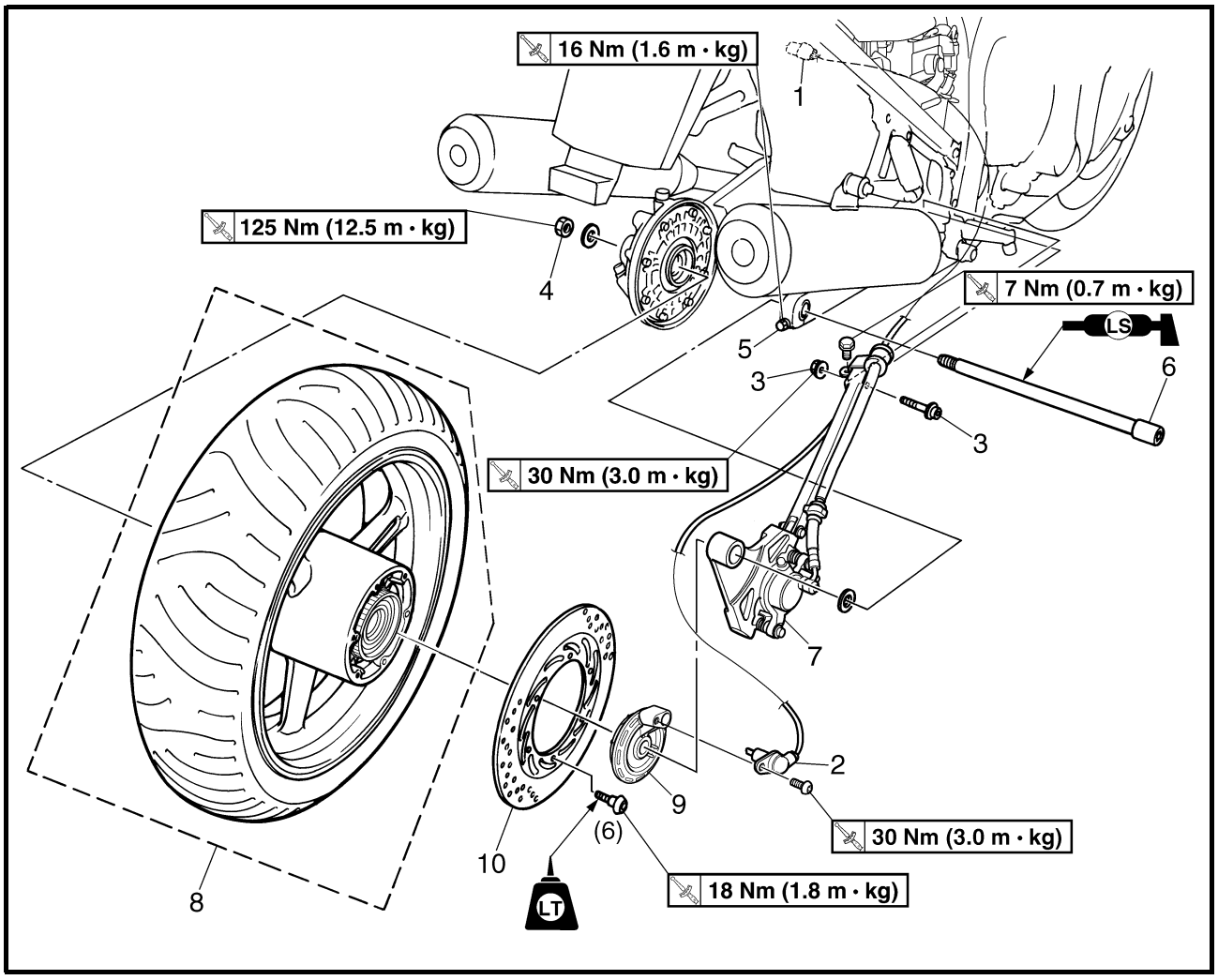
CAUTION:
To route the front wheel sensor lead, refer to "CABLE ROUTING".

3. Check:
   - front wheel sensor installation
     Check if the wheel sensor housing is installed properly. Refer to "[D-3] Maintenance of the front wheel sensor and sensor rotor".

EAS00890
REAR WHEEL SENSOR AND SENSOR ROTOR



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel sensor and sensor rotor		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the rear wheel is elevated.
	ECU (ABS)		Refer to "ECU (ABS) AND FAIL-SAFE RELAY".
1	Rear wheel sensor coupler	1	Disconnect.
2	Rear wheel sensor	1	
3	Brake torque rod nut/bolt	1/1	Refer to "INSTALLING THE REAR WHEEL" in chapter 4. (Manual No.: 5JW1-AE1)
4	Wheel axle nut	1	
5	Wheel axle pinch bolt	1	Loosen.
6	Wheel axle	1	
7	Brake caliper	1	
8	Rear wheel	1	

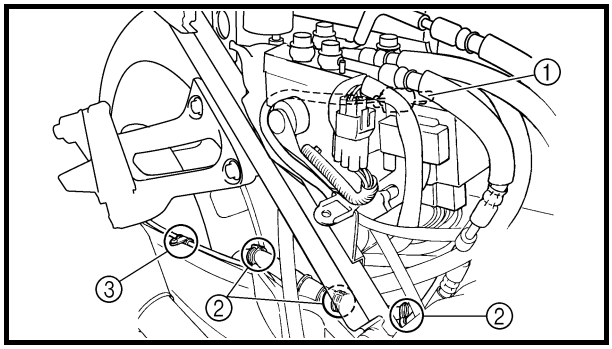


Order	Job/Part	Q'ty	Remarks
9	Sensor housing	1	
10	Brake disc	1	
			For installation, reverse the removal procedure.

[D-4] Maintenance of the rear wheel sensor and sensor rotor

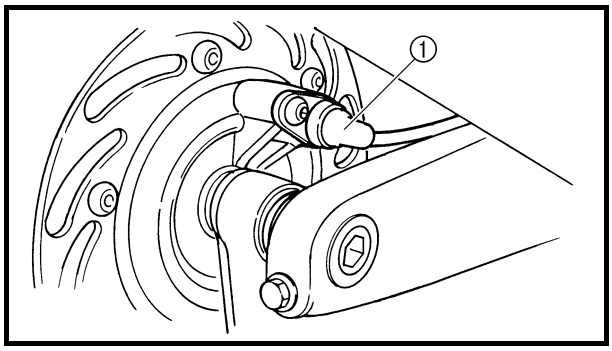
CAUTION:

- **Be sure not to contact the sensor electrode to any metal part when removing the front wheel sensor from the sensor housing.**
- **Do not operate the brake lever when removing the brake caliper.**



- **Removing the rear wheel sensor**

1. Disconnect:
   - rear wheel sensor ①
2. Remove:
   - clamp ②
   - rear wheel sensor lead holder ③



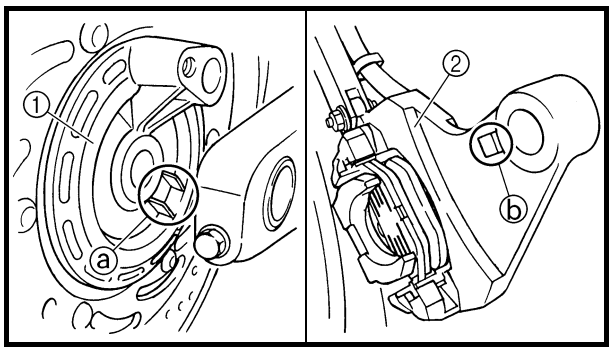
3. Remove:
   - rear wheel sensor ①

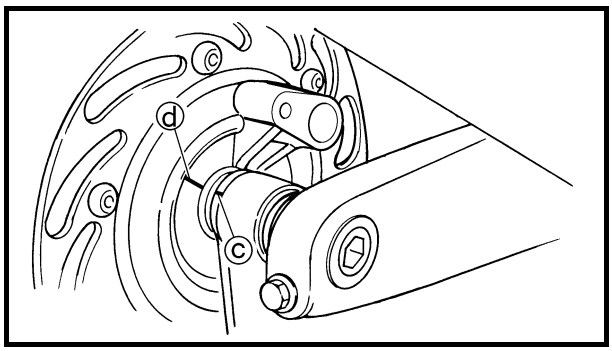
CAUTION:

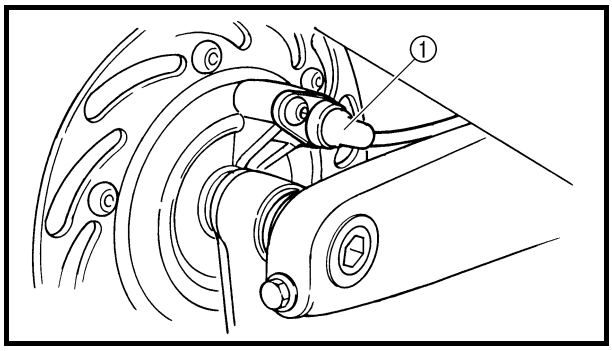
Be sure not to contact the sensor electrode to any metal part when removing the rear wheel sensor from the sensor housing.

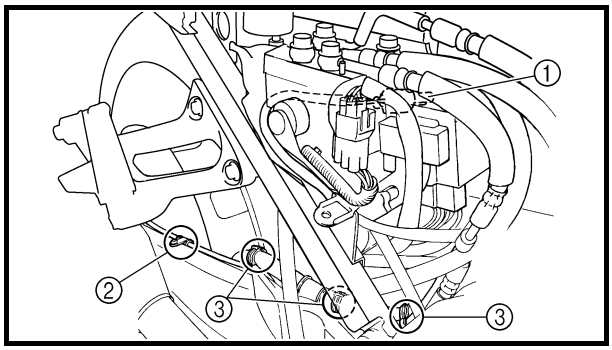
- **Checking the rear wheel sensor and sensor rotor**

Refer to “Checking the front wheel sensor and sensor rotor”.









• Installing the rear wheel sensor

1. Install:
   • rear wheel

NOTE:

- Align the slot ⓐ of the sensor housing ① with the projection ⓑ of the rear brake caliper assembly ②, and then assemble them.
- After installation, check that the projection ⓒ of the rear brake caliper assembly is inserted into the slot ⓓ of the sensor housing.

CAUTION:

Make sure there are no foreign materials in the wheel hub. Foreign materials cause damage to the inner sensor rotor and rear wheel sensor.

2. Install:
   • rear wheel sensor ①

30 Nm (3.0 m · kg)

NOTE:

When installing the rear wheel sensor, check the rear wheel sensor lead for twists and the sensor electrode for foreign materials.

CAUTION:

To route the rear wheel sensor lead, refer to "CABLE ROUTING".

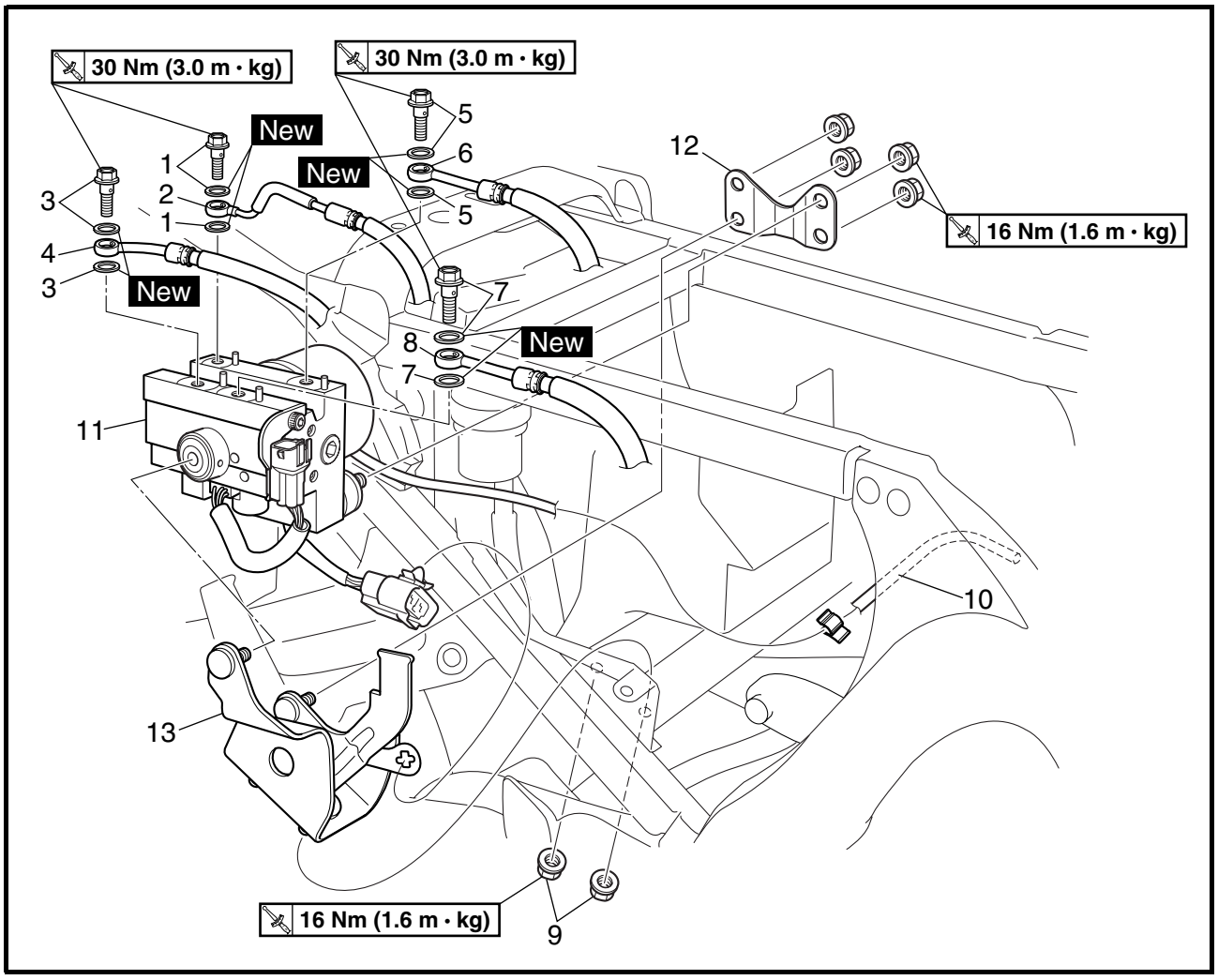
3. Connect:
   • rear wheel sensor coupler ①
   • rear wheel sensor lead holder ②
   • clamp ③

CAUTION:

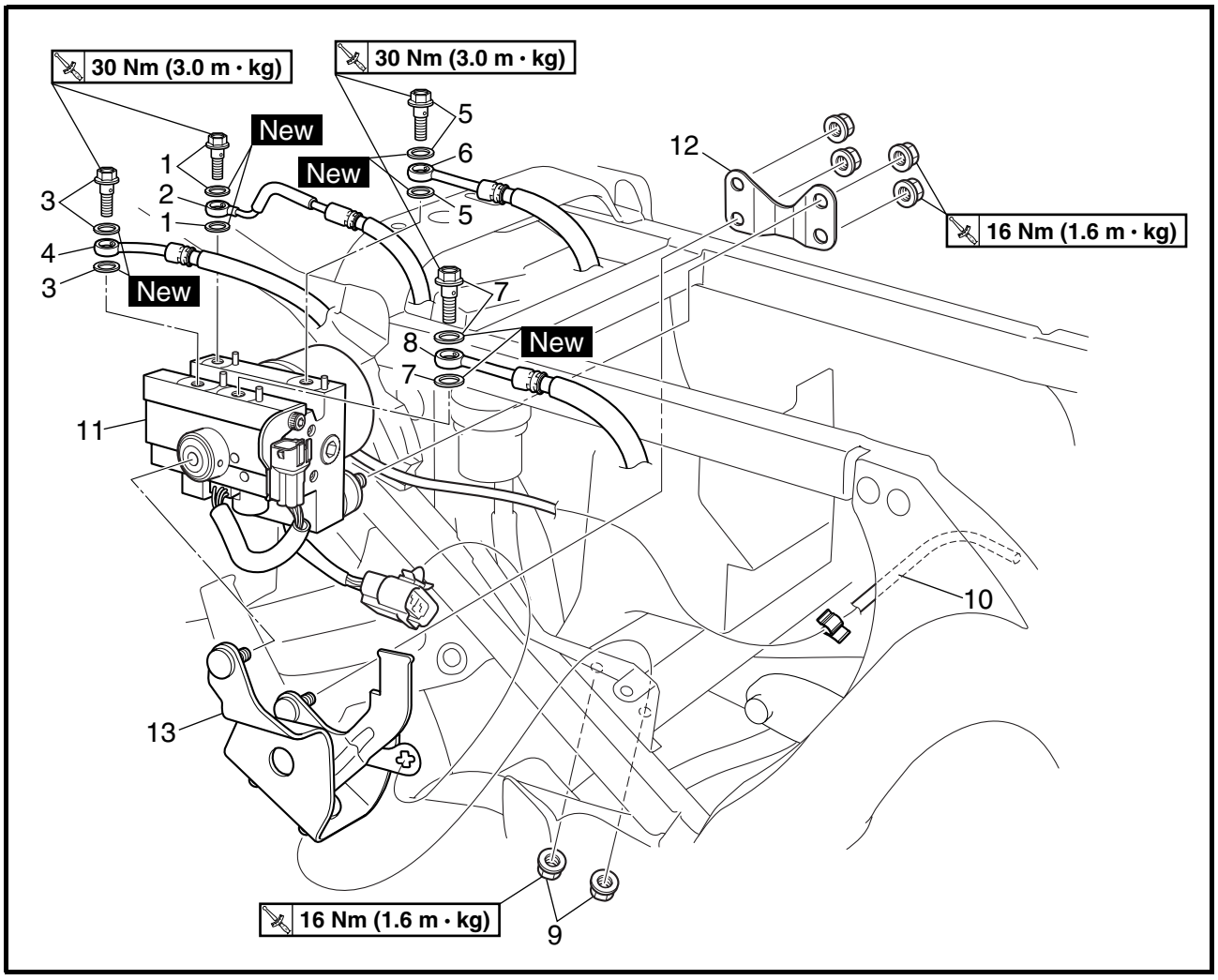
To route the rear wheel sensor lead, refer to "CABLE ROUTING".

4. Check:
   • rear wheel sensor installation
   Check if the wheel sensor housing is installed properly. Refer to "[D-4] Maintenance of the rear wheel sensor and sensor rotor".

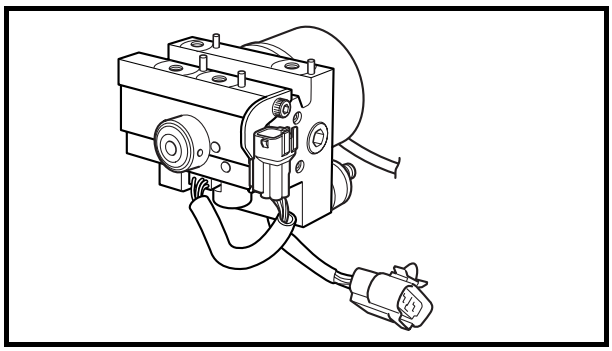
EAS00891
HYDRAULIC UNIT



Order	Job/Part	Q'ty	Remarks
	Removing the hydraulic unit		Remove the parts in the order listed.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3. (Manual No.: 5JW1-AE1)
	ABS motor coupler/Hydraulic unit solenoid coupler	1/1	Refer to "ECU (ABS) AND FAIL-SAFE RELAY".
	Fail-safe relay/Fail-safe relay coupler	1/1	
	Brake fluid		Drain.
1	Union bolt/copper washers	1/2	
2	Front brake hose	1	(front brake master cylinder to hydraulic unit)
3	Union bolt/copper washers	1/2	
4	Front brake hose	1	(hydraulic unit to front brake caliper)
5	Union bolt/copper washers	1/2	



Order	Job/Part	Q'ty	Remarks
6	Rear brake hose	1	(rear brake master cylinder to hydraulic unit)
7	Union bolt/copper washers	1/2	
8	Rear brake hose	1	(hydraulic unit to rear brake caliper)
9	Nut	2	
10	Breather hose	1	
11	Hydraulic unit	1	
12	Hydraulic unit bracket 1	1	
13	Hydraulic unit bracket 2	1	
			For assembly, reverse the disassembly procedure.



[D-5] Maintenance of the hydraulic unit

CAUTION:

Do not remove the hydraulic unit to check the resistance of the solenoid valves and the ABS motor for continuity.

⚠ WARNING

Refill with the same type of brake fluid that is already in the system. Mixing fluids may result in a harmful chemical reaction, leading to poor braking performance.

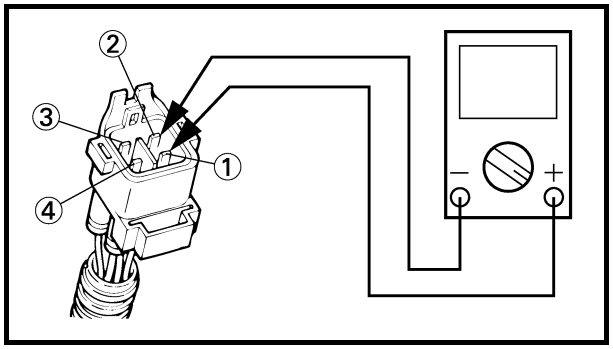
CAUTION:

- **Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.**
- **The ABS wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.**
- **Do not set the main switch to "ON" when removing the hydraulic unit.**
- **Do not clean with compressed air.**
- **Do not reuse the brake fluid.**
- **Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.**
- **Do not allow any brake fluid to contact the couplers. Brake fluid may damage the couplers and cause bad contacts.**
- **If the union bolts for the hydraulic unit have been removed, be sure to tighten them to the specified torque and bleed the brake system.**

• Checking the resistance of the solenoid valves and ABS motor for continuity

CAUTION:

When check the hydraulic unit solenoid relay and ABS motor, do not remove the brake hoses.



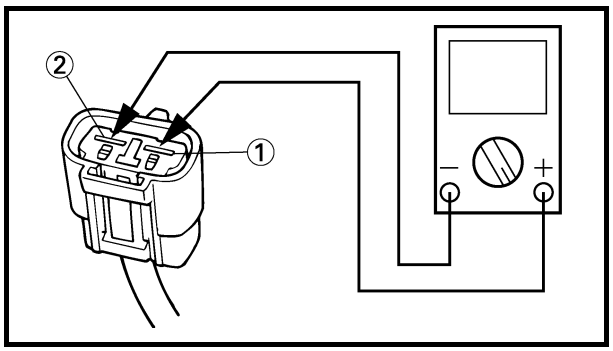
1. Measure:
   • resistance of the solenoid valve (front)
   Connect a pocket tester (Ω × 1) to the terminals of the solenoid valve (front).
   Tester positive probe → Terminal ①
   Tester negative probe → Terminal ②

	Solenoid valve resistance 2.96 ~ 3.2 Ω at 20 °C

   Out of specification → Replace the hydraulic unit.
2. Measure:
   • resistance of the solenoid valve (rear)
   Connect the pocket tester (Ω × 1) to the terminals of solenoid valve (rear).
   Tester positive probe → Terminal ④
   Tester negative probe → Terminal ③

	Solenoid valve resistance 2.96 ~ 3.2 Ω at 20 °C

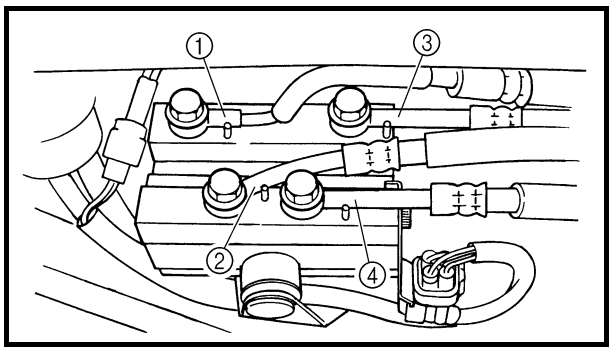
   Out of specification → Replace the hydraulic unit.



3. Check:
   • ABS motor for continuity
   Connect the pocket tester (Ω × 1) to the terminals of the ABS motor coupler.
   Tester positive probe → Terminal ①
   Tester negative probe → Terminal ②

	There is continuity.

   No continuity → Replace the hydraulic unit.



• Removing the hydraulic unit

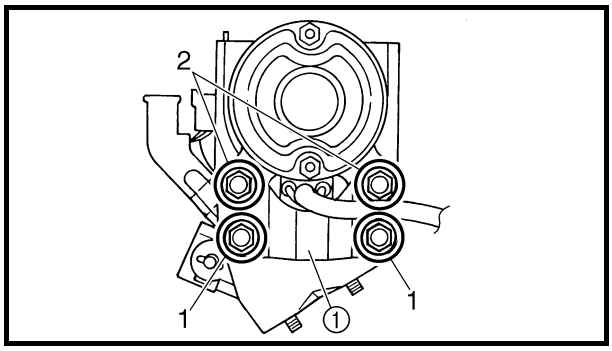
1. Remove:
   - brake hose ① (from the front brake master cylinder)
   - brake hose ② (to the front brake caliper)
   - brake hose ③ (from the rear brake master cylinder)
   - brake hose ④ (to the rear brake caliper)

NOTE:

Do not operate the brake lever and brake pedal while removing the brake hoses.

CAUTION:

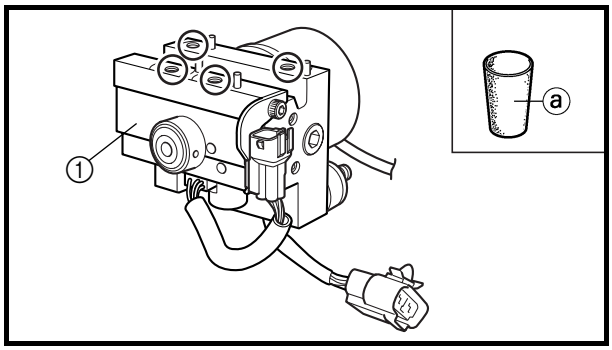
When removing the brake hoses, cover the area around the hydraulic unit to catch any spilt brake fluid. Do not allow the brake fluid to contact other parts.



2. Remove:
   - hydraulic unit bracket 1 ①

NOTE:

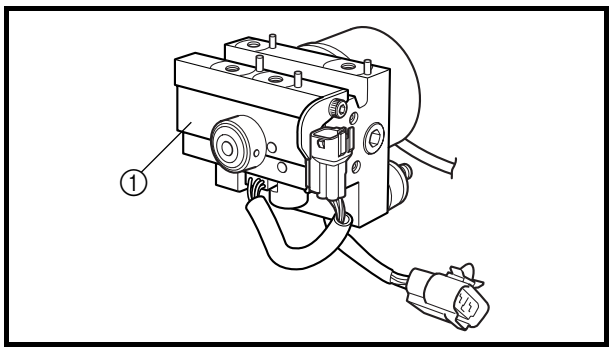
Loosen the nuts in the proper sequence.



3. Remove:
   - hydraulic unit ①

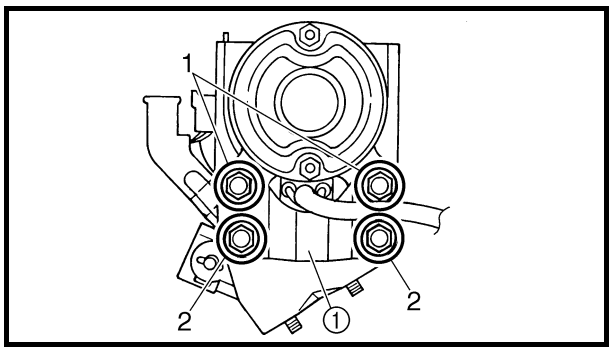
NOTE:

To avoid brake fluid leakage and to prevent foreign materials from entering the hydraulic unit, insert a rubber plug ⓐ or a bolt (M10 × 1.25) into each union bolt hole.



• Checking the hydraulic unit

1. Check:
   - hydraulic unit ①
     Cracks/damage → Replace the hydraulic unit.



• Installing the hydraulic unit

Proceed in the reverse order of disassembly. Pay attention to the following items.

1. Install:
   • hydraulic unit bracket 1 ①

16 Nm (1.6 m · kg)

NOTE:

Tighten the nuts in the proper sequence.

2. Install:
   • hydraulic unit

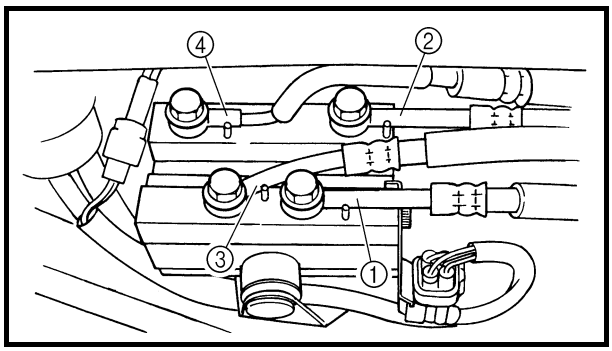
NOTE:

Do not allow any foreign materials to enter the hydraulic unit or the brake hoses when installing the hydraulic unit.

CAUTION:

Do not remove the rubber plugs or bolts (M10 × 1.25) installed in the union bolt holes before installing the hydraulic unit.

3. Remove:
   • rubber plugs or bolts (M10 × 1.25)
4. Install:
   • copper washer New
   • brake hose ① (to the rear brake caliper)
   • brake hose ② (from the rear brake master cylinder)
   • brake hose ③ (to the front brake caliper)
   • brake hose ④ (from the front brake master cylinder)
   • union bolt **30 Nm (3.0 m · kg)**



⚠ WARNING

The brake hoses to the front and rear brake calipers can be distinguished by the rubber at the end of each hose. Be sure to connect each brake hose to the correct union bolt hole.

CAUTION:

To route the front and rear brake hoses, refer to "CABLE ROUTING".

5. Fill:
   • brake master cylinder reservoirs

Recommended brake fluid
DOT 4

6. Bleed the brake system.
7. Check the operation of the hydraulic unit according to the brake lever and the brake pedal response. (Refer to "[D-6-3-1] Hydraulic unit operation test 1".)

CAUTION:

Always check the operation of the hydraulic unit according to the brake lever and the brake pedal response.

8. Delete the malfunction codes. (Refer to "[D-6-4] Deleting the malfunction codes".)
9. Perform a trial run. (Refer to "[D-6-5] Trial run".)

HYDRAULIC ABS

EAS00892

Bleeding the brake system (ABS)

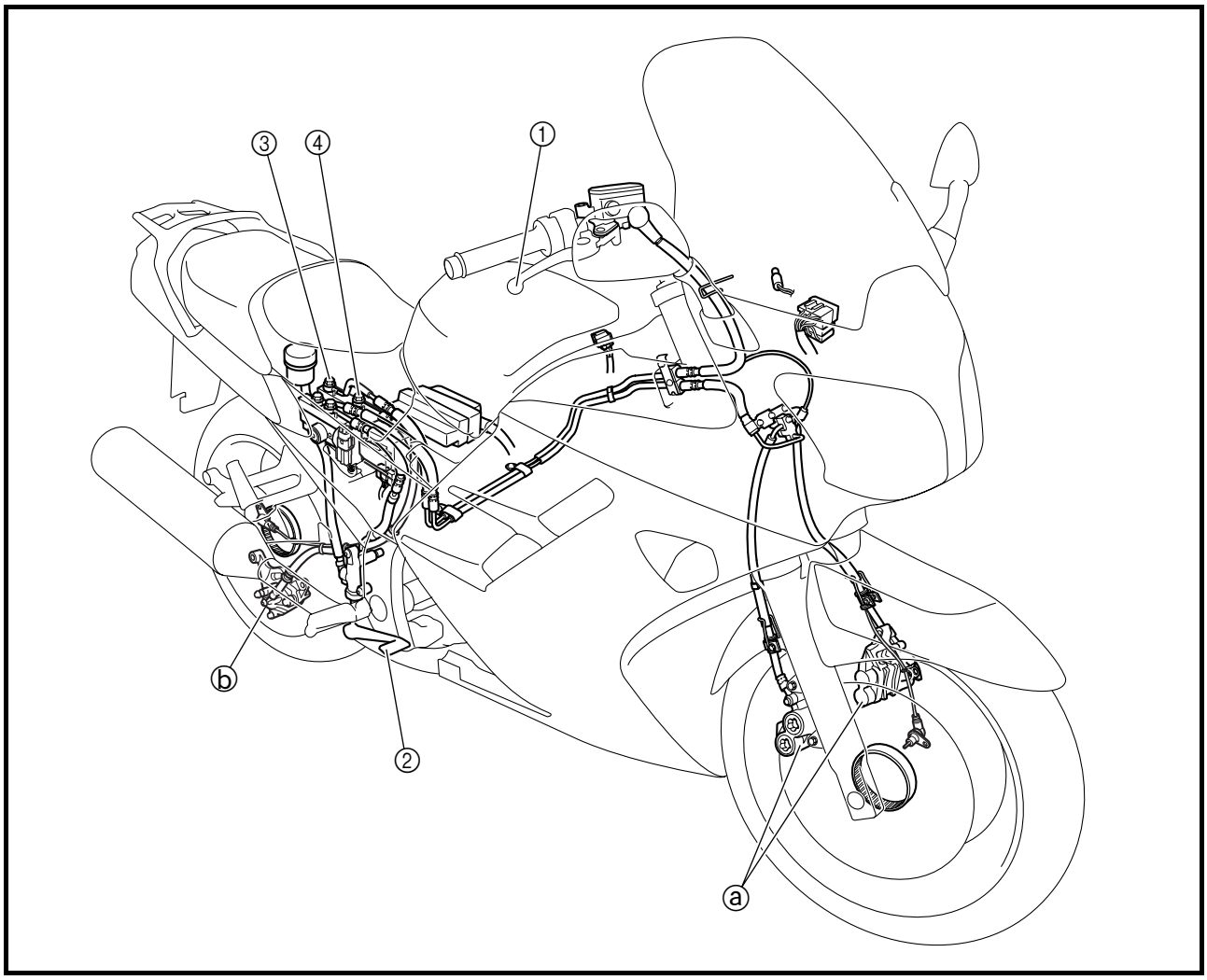
⚠ WARNING

Always bleed the brake system when the brake related parts are removed.

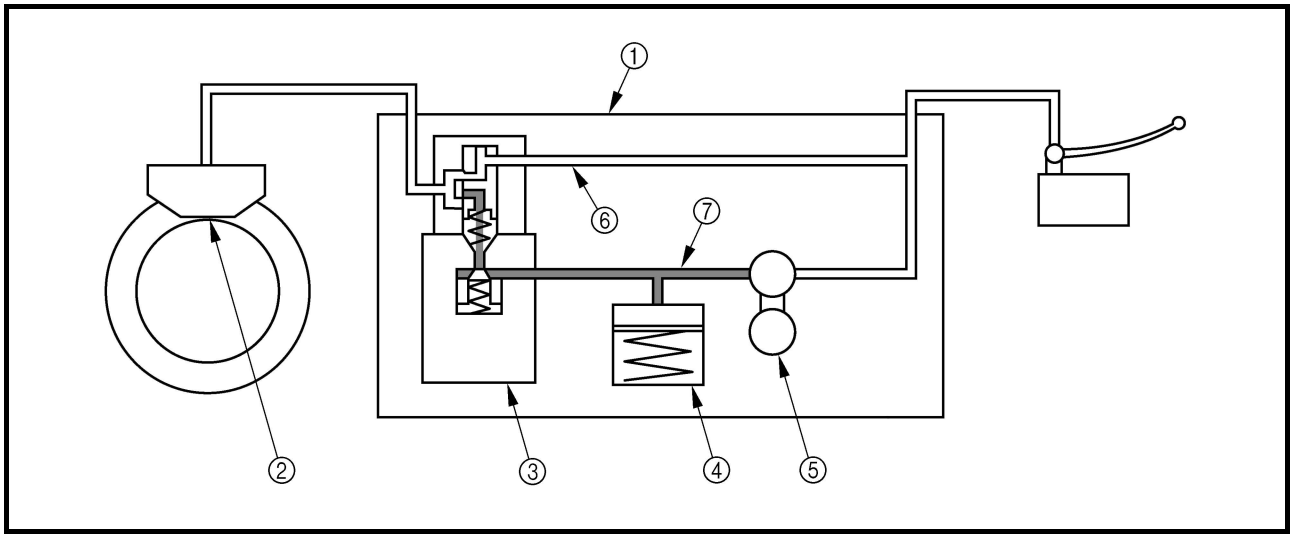
CAUTION:

Bleed the brake system in the following order.
1st: Front brake caliper ⓐ
2nd: Rear brake caliper ⓑ

- Brake lever ①
- Brake pedal ②
- Front brake hose ③ (from the front brake master cylinder)
- Rear brake hose ④ (from the rear brake master cylinder)



Bleeding the ABS for FJR1300A



① Hydraulic unit
② Brake caliper
③ Solenoid valve
④ Buffer chamber
⑤ Hydraulic pump
⑥ Brake master cylinder pressure
⑦ Hydraulic pump pressure

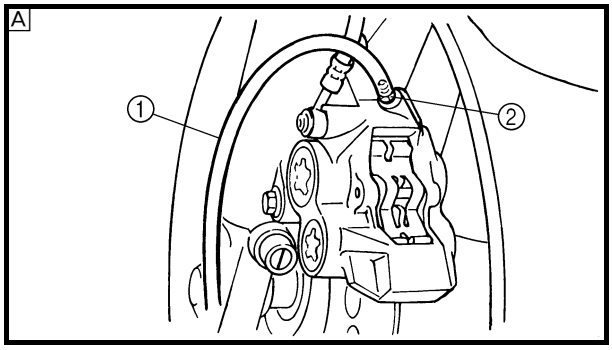
EAS00134

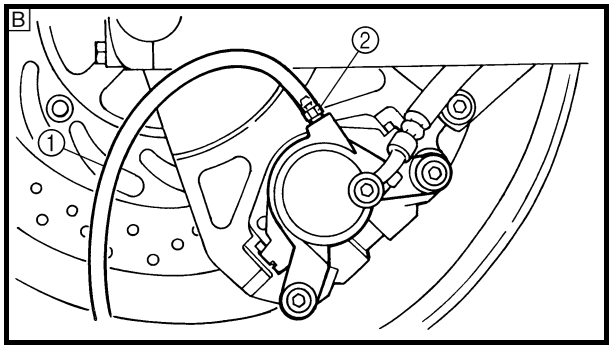
Bleeding the ABS brake

⚠ WARNING

Bleed the ABS whenever:
- **the system is disassembled.**
- **a brake hose is loosened, disconnected or replaced.**
- **the brake fluid level is very low.**
- **brake operation is faulty.**

NOTE:
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the ABS, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the ABS, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours.
- Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.





1. Remove:
   • right side cover
   Refer to "COWLINGS AND COVERS" in chapter 3. (Manual No.: 5JW1-AE1)
2. Bleed:
   • ABS

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Connect a clear plastic hose ① tightly to the bleed screw ②.

A Front
B Rear

d. Place the other end of the hose into a container.
e. Slowly apply the brake several times.
f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
g. Loosen the bleed screw.

NOTE:

Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip or the brake pedal to fully extend.

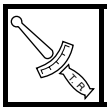
h. Tighten the bleed screw, and then release the brake lever or brake pedal.
i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
j. Check the operation of the hydraulic unit. Refer to "[D-6-3-1] Hydraulic unit operation test 1".

CAUTION:

Make sure that the main switch is set to "OFF" before checking the operation of the hydraulic unit.

k. After operating the ABS, repeat steps (e) to (i), and then fill the primary circuit with 60 cm^3 of the recommended brake fluid.

l. Tighten the bleed screw to the specified torque.



Bleed screw
6 Nm (0.6 m · kg)

m. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
(Manual No.: 5JW1-AE1)

⚠ WARNING

After bleeding the ABS, check the brake operation.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

• [D-6] Final check

Checking procedures

1. Check the brake fluid level in the brake master cylinder reservoirs.
2. Check the wheel sensors for proper installation.
3. Perform hydraulic unit operation test 1 or 2.
4. Delete the malfunction codes.
5. Perform a trial run.

• [D-6-1] Checking the brake fluid level of the brake master cylinder reservoirs

1. Check:
   • brake fluid level
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
   (Manual No.: 5JW1-AE1)

• [D-6-2] Checking the wheel sensors for proper installation

1. Check if the front wheel sensor housing and the rear wheel sensor housing are installed correctly. (Refer to "[D-3] Maintenance of the front wheel sensor and sensor rotor" and "[D-4] Maintenance of the rear wheel sensor and sensor rotor".)

2. Check:
   • installation of the wheel sensors to the sensor housings (Refer to "[D-3] Maintenance of the front wheel sensor and sensor rotor" and "[D-4] Maintenance of the rear wheel sensor and sensor rotor".)

	**Wheel sensor** **30 Nm (3.0 m·kg)**

Hydraulic unit operation test

The reaction-force pulsating action generated in the brake lever and brake pedal when the ABS is activated can be tested when the motorcycle is stopped.

The hydraulic unit operation can be tested by the following two methods.

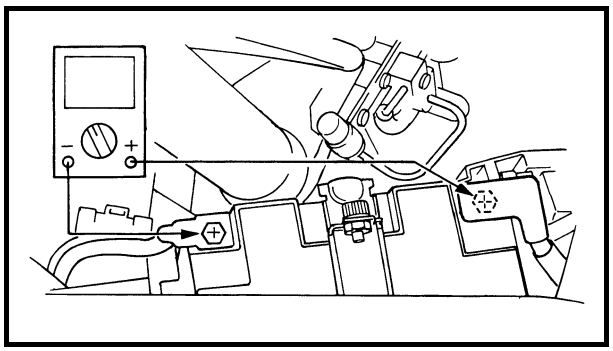
- Hydraulic unit operation test 1: this test generates the same reaction-force pulsating action that is generated in the brake lever and brake pedal when the ABS is activated.
- Hydraulic unit operation test 2: this test checks the function of the ABS after the system was disassembled, adjusted, or serviced.

• [D-6-3-1] Hydraulic unit operation test 1

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

1. Place the motorcycle on the centerstand.
2. Set the main switch to "OFF".
3. Remove:
   • right inner panel (front cowling)
   • front right inner panel (front cowling)
   Refer to "COWLINGS AND COVERS".

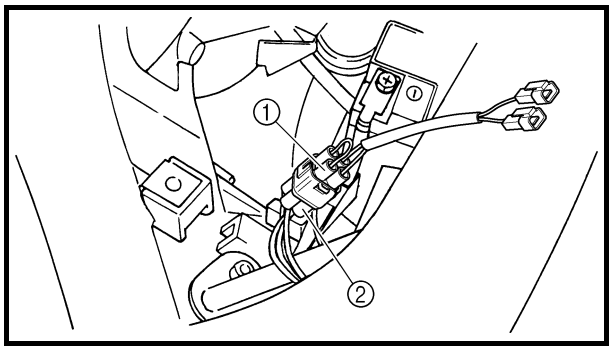


4. Check:
   • battery voltage

Battery voltage
Higher than 12.8 V

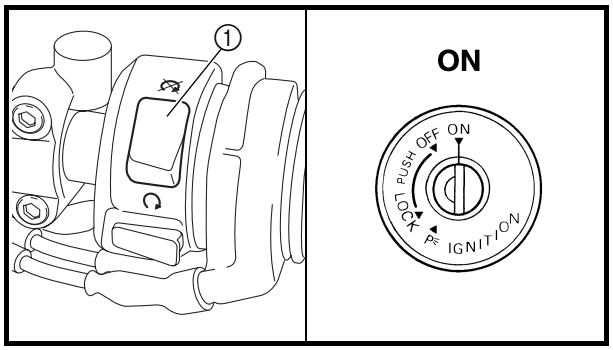
Lower than 12.8 V → Charge or replace the battery.

NOTE:
- If the battery voltage is lower than 12.8 V, charge the battery and perform hydraulic unit operation test 1.
- If the battery voltage is lower than 10 V, the ABS warning light comes on and the ABS does not operate.



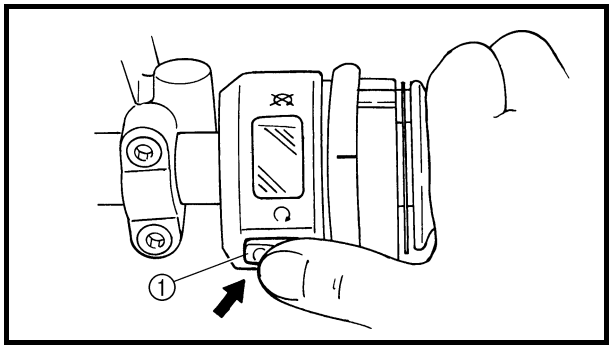
5. Connect the test coupler adaptor ① to the test coupler ②.

Test coupler adaptor
90890-03149



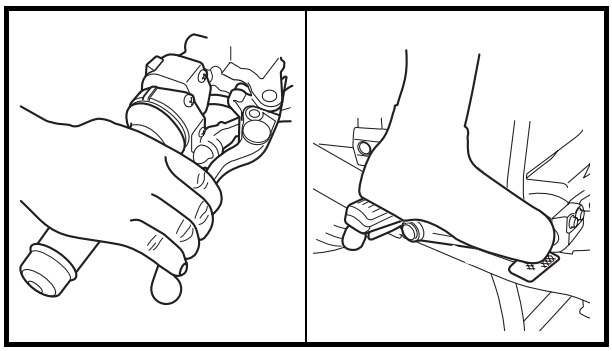
6. Set the engine stop switch ① to " ⊠ ".
7. Set the main switch to "ON".

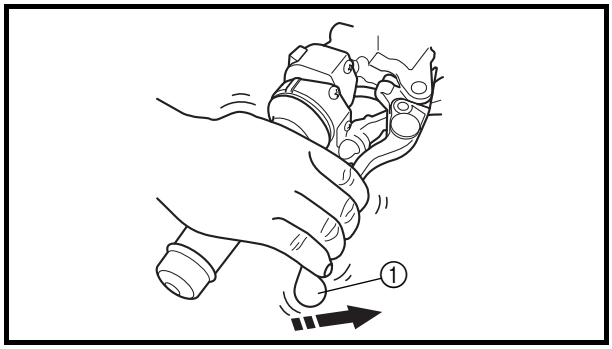
NOTE:
After setting the main switch to "ON", wait (approximately 2 seconds) until the ABS warning light goes off.

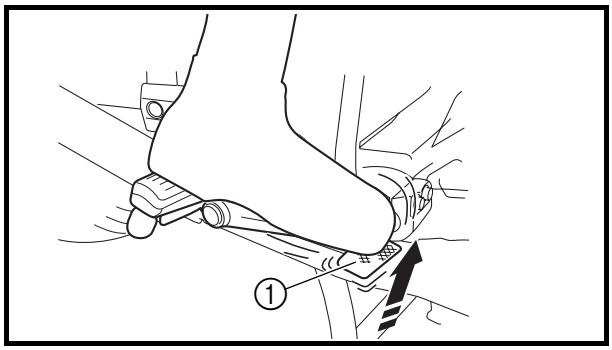


8. Push the start switch ① for at least 4 seconds.

CAUTION:
Do not operate the brake lever or the brake pedal.







9. After releasing the start switch, operate the brake lever and the brake pedal simultaneously.

NOTE:

- A reaction-force pulsating action is generated in the brake lever ① 0.5 second after the brake lever and the brake pedal are operated simultaneously and continues for approximately 1 second.
- Be sure to continue to operate the brake lever and brake pedal even after the pulsating action has stopped.

10. After the pulsating action has stopped in the brake lever, it is generated in the brake pedal ① 0.5 second after and continues for approximately 1 second.

NOTE:

Be sure to continue to operate the brake lever and brake pedal even after the pulsating action has stopped.

11. After the pulsating action has stopped in the brake pedal, it is generated in the brake lever 0.5 second after and continues for approximately 1 second.

CAUTION:

- **Check that the pulsating action is felt in the brake lever, brake pedal, and again in the brake lever, in this order.**
- **If the pulsating action is felt in the brake pedal before it is felt in the brake lever, check that the brake hoses are connected correctly to the hydraulic unit.**
- **If the pulsating action is hardly felt in either the brake lever or brake pedal, check that the brake hoses are connected correctly to the hydraulic unit.**

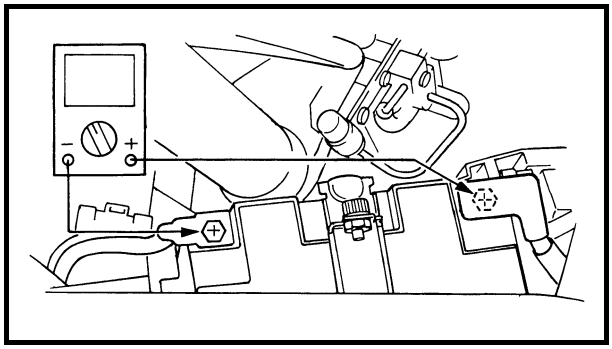
12.Set the main switch to “OFF”.
13.Remove the test coupler adaptor from the test coupler.
14.Set the main switch to “ON”.
15.Set the engine stop switch to “ ”.

• **[D-6-3-2] Hydraulic unit operation test 2**

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

1. Place the motorcycle on the centerstand.
2. Set the main switch to “OFF”.
3. Remove:
   • right inner panel (front cowling)
   • front right inner panel (front cowling)
   Refer to “COWLINGS AND COVERS”.
4. Check:
   • battery voltage

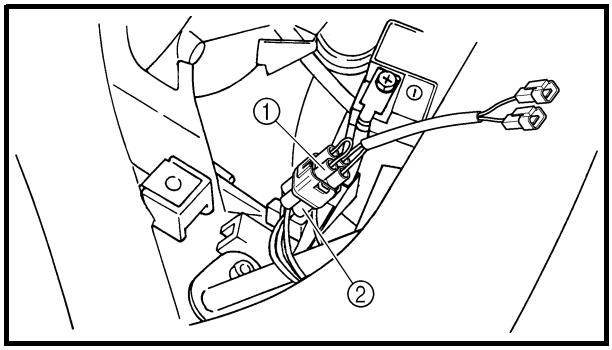


Battery voltage
Higher than 12.8 V

Lower than 12.8 V → Charge or replace the battery.

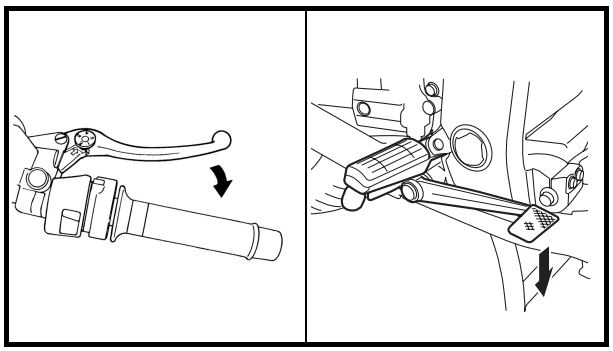
NOTE:

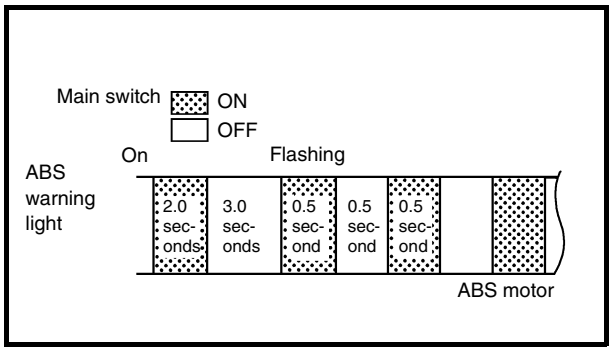
- If the battery voltage is lower than 12.8 V, charge the battery and perform hydraulic unit operation test 2.
- If the battery voltage is lower than 10 V, the ABS warning light comes on and the ABS does not operate.

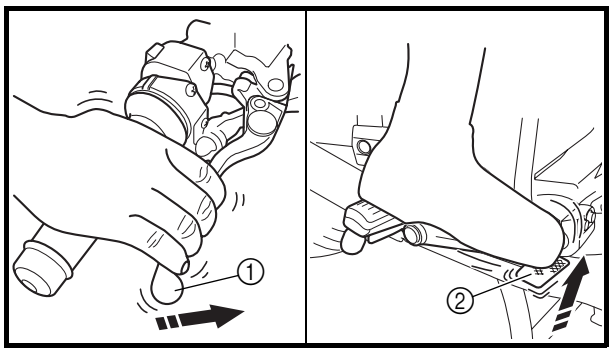


5. Connect the test coupler adaptor ① to the test coupler ②.

Test coupler adaptor
90890-03149







6. Set the main switch to "ON" while operating the brake lever and the brake pedal simultaneously.

CAUTION:

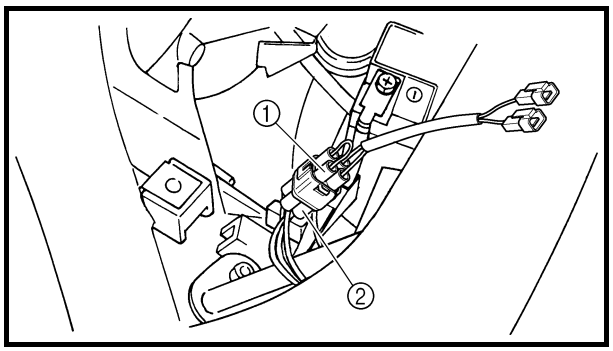
When the main switch is set to "ON", be sure to operate both the brake levers and the brake pedal simultaneously. If only the brake levers or brake pedal are operated, set the main switch to "OFF" and start the procedure again.

7. Check:
   - Hydraulic unit operation
     When the main switch is set to "ON", the ABS warning light comes on for 2 seconds, goes off for 3 seconds, then starts flashing.
     When the ABS warning light starts flashing, the brake lever ① will return to its home position. The brake pedal ② will then return to its home position, then the brake lever will return to its home position again.

CAUTION:

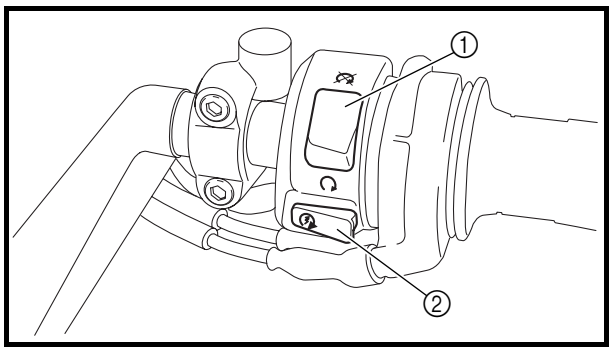
- **Check that the brake lever returns to its home position before the brake pedal returns to its home position.**
- **If the brake pedal returns to its home position before the brake lever does, check that the brake hoses are connected correctly to the hydraulic unit.**
- **If either the brake lever or brake pedal returns to its home position slowly, check that the brake hoses are connected correctly to the hydraulic unit.**

   - If the operation of the hydraulic unit is normal, delete all of the malfunction codes.



- **[D-6-4] Deleting the malfunction codes**

1. Connect the test coupler adaptor ① to the test coupler ②. (Refer to "[B-5] ABS malfunction check using the ABS self-diagnosis (present malfunction)".)
2. Set the main switch to "ON".
   The multifunction display indicates previously recorded malfunction codes.

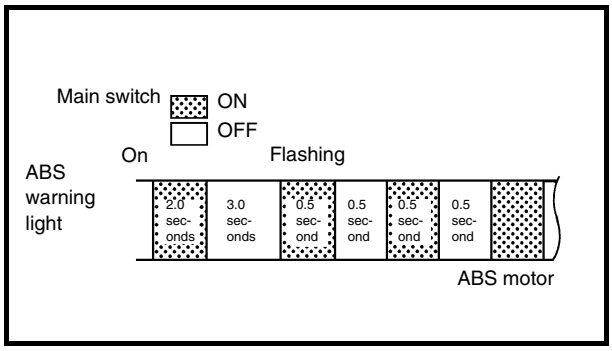


3. Set the engine stop switch ① to "⊠".

CAUTION:

Be sure to set the engine stop switch to "⊠". If the start switch is pushed without setting the engine stop switch to "⊠", the starter motor gears or other parts may be damaged.

4. Push the start switch ② at least 10 times in 4 seconds to delete the malfunction codes.
5. The multifunction meter display switches to the ODO/TRIP display and the ABS warning light flashes in 0.5-second intervals when the malfunction codes are deleted.



6. Set the main switch to "OFF".
7. Set the main switch to "ON".
   Check that the ABS warning light comes on for 2 seconds, goes off for 3 seconds, then starts flashing to confirm that all malfunction codes are deleted.
8. Set the main switch to "OFF".
9. Disconnect the test coupler adaptor from the test coupler and install the protective cap onto the test coupler.

NOTE:

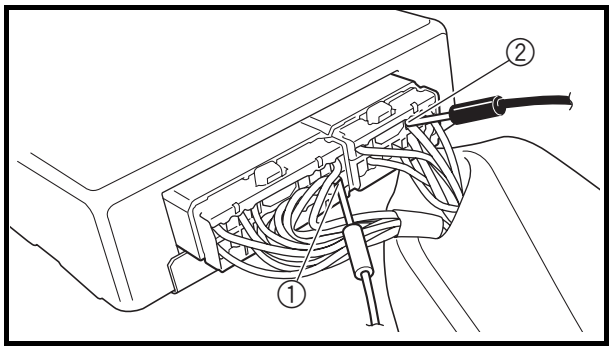
Do not forget to install the protective cap onto the test coupler.

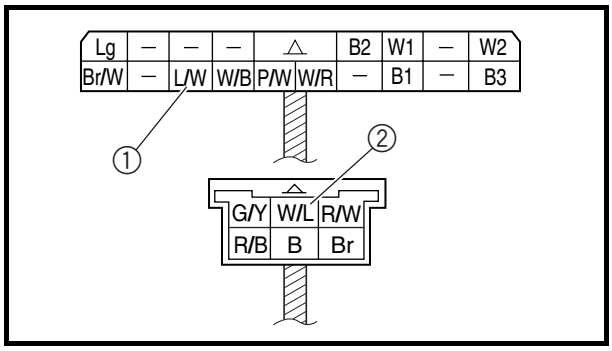
CAUTION:

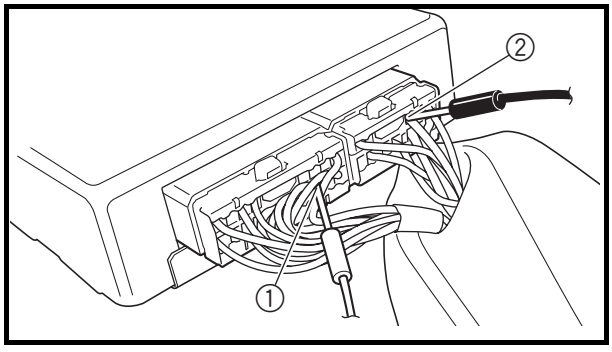
Since the malfunction codes remain in the memory of the ECU (ABS) until they are deleted, always delete the malfunction codes after the service has been completed.

• [D-6-5] Trial run

After all checks and service have been completed, make sure that the motorcycle has no problems by performing a trial run at a speed faster than 10 km/h.







- **[D-6-6] Delete function test**

1. Place the motorcycle on the centerstand.
2. Set the main switch to “OFF”.
3. Connect the test coupler adapter to the test coupler.
4. Set the main switch to “ON”.
5. Check:
   - ECU voltage
     Connect the pocket tester (DC 20 V) to the ECU coupler.
     Tester positive probe → brown/white ①
     Tester negative probe → B5 ②

	Battery voltage **Higher than 12.8 V**

   Lower than 12.8 V → Charge or replace the battery.
6. Check:
   - ECU-to-start-switch-lead continuity
     Connect the pocket tester (Ω × 1) to the ECU coupler and start switch coupler.
     Tester positive probe →
     blue/white ① (ECU)
     Tester negative probe →
     white/blue ② (start switch)
     No continuity → Replace or repair the wire harness.
7. Check:
   - ECU voltage
     Connect the pocket tester (DC 12 V) to the ECU coupler.
     Tester positive probe → blue/white ①
     Tester negative probe → B5 ②
     Push the start switch.

	Start switch ON: less than 1 V **Start switch OFF: more than 12 V**

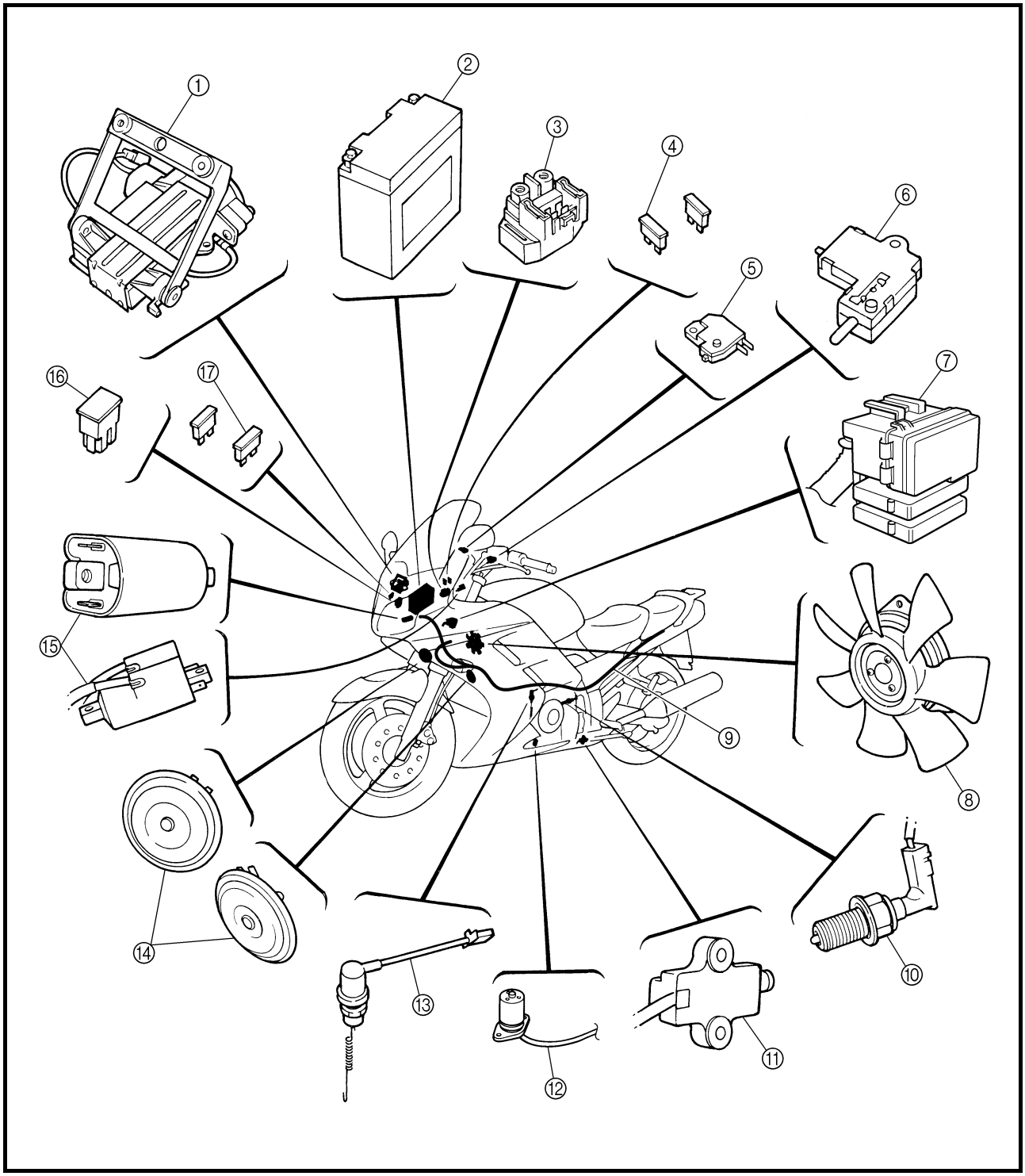
   Out of specification → Replace the handlebar switch.
8. If the above-mentioned checks are within specification, replace the ECU.

EAS00729

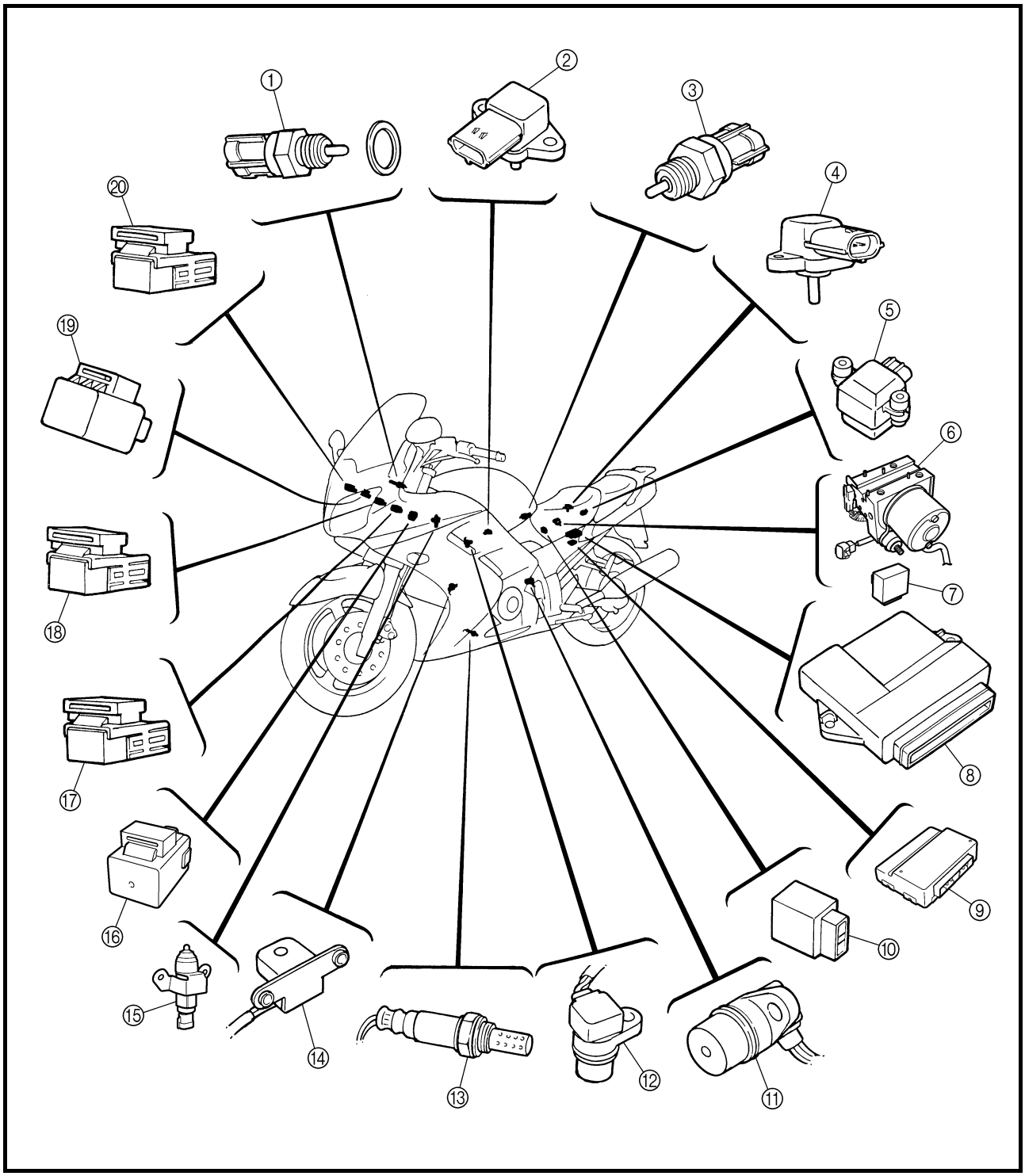
ELECTRICAL

ELECTRICAL COMPONENTS

① Windshield drive unit
② Battery
③ Starter relay
④ Fuel injection system fuse
⑤ Front brake switch
⑥ Clutch switch
⑦ Fuse box
⑧ Radiator fan motor
⑨ Wire harness
⑩ Neutral switch
⑪ Sidestand switch
⑫ Oil level switch
⑬ Rear brake switch
⑭ Horn
⑮ Ignition coil
⑯ Main fuse
⑰ ABS motor fuse (FJR1300A)



① Coolant temperature sensor
② Intake air pressure sensor
③ Intake air temperature sensor
④ Atmospheric pressure sensor
⑤ Lean angle cut-off switch
⑥ Hydraulic unit (FJR1300A)
⑦ Fail-safe relay (FJR1300A)
⑧ ECU (engine)
⑨ ECU (ABS) (FJR1300A)
⑩ Starting circuit cut-off relay
⑪ Speed sensor
⑫ Cylinder identification sensor
⑬ O_2 sensor
⑭ Crankshaft position sensor
⑮ Accessory box solenoid
⑯ Headlight relay 1
⑰ Headlight relay 2
⑱ Fuel injection system relay
⑲ Turn signal relay
⑳ Radiator fan motor relay



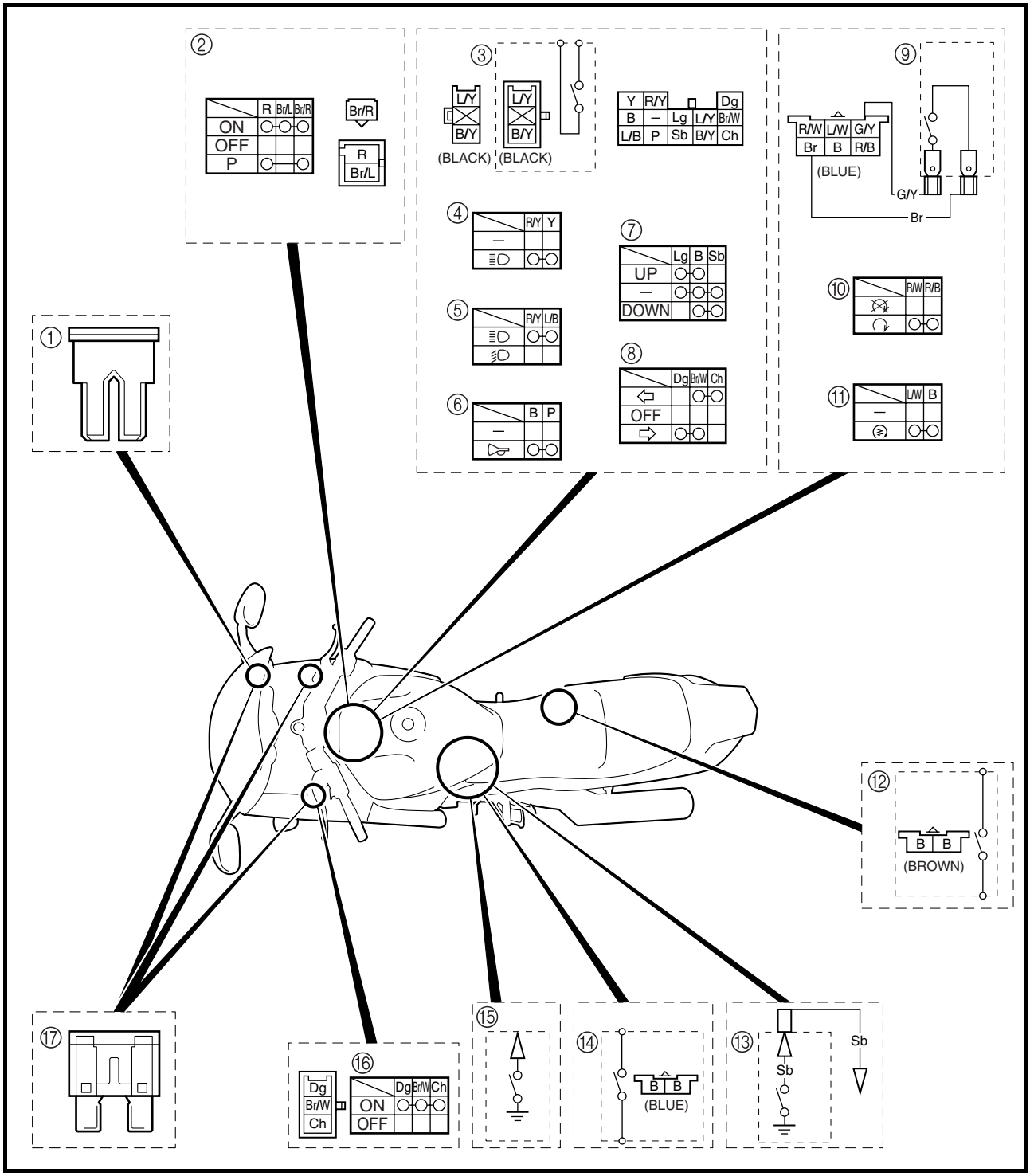
EAS00731
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY” in chapter 8. (Manual No.: 5JW1-AE1)

Damage/wear → Repair or replace.

Improperly connected → Properly connect.

Incorrect continuity reading → Replace the switch.

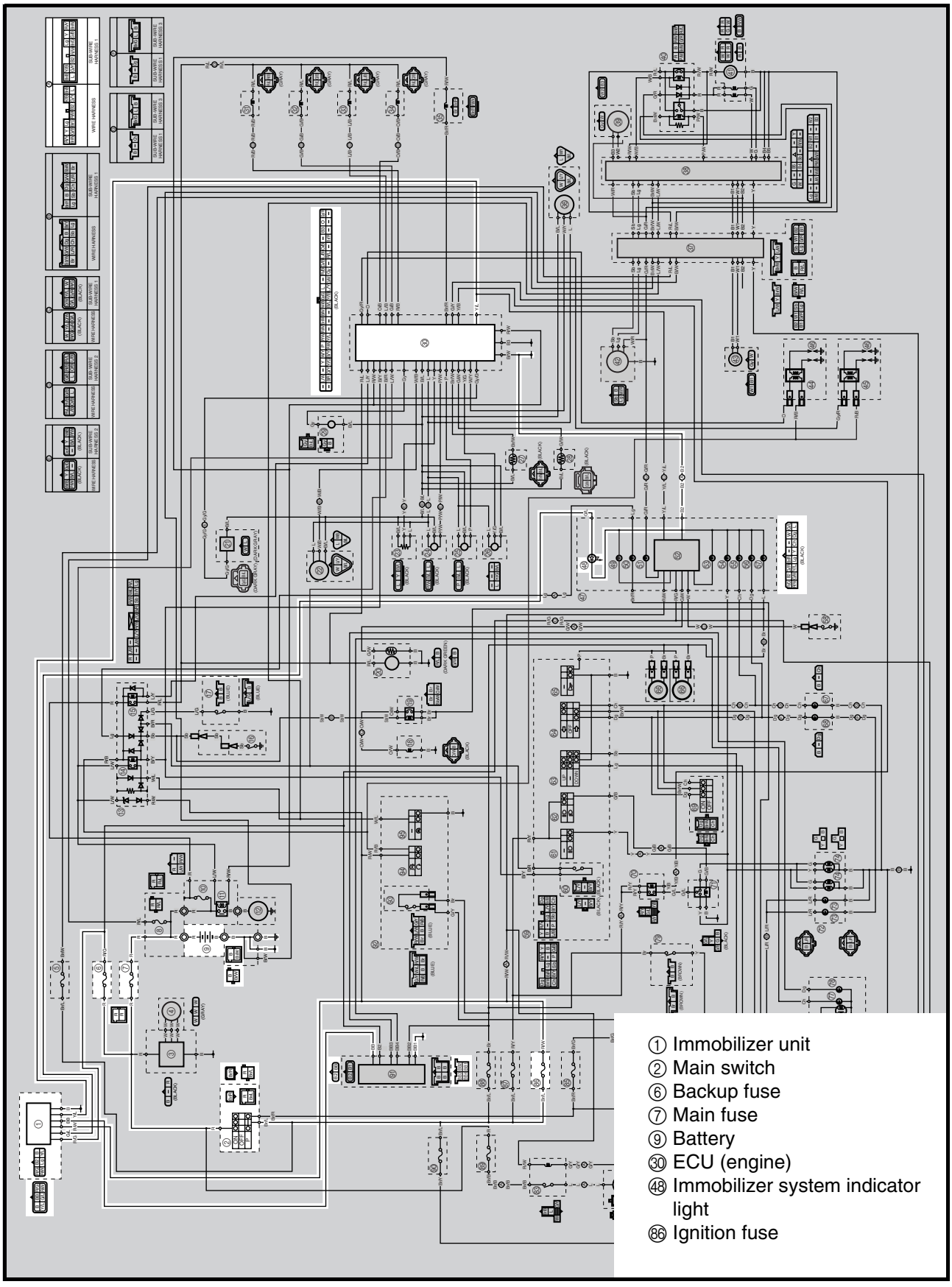


① Main fuse
② Main switch
③ Clutch switch
④ Pass switch
⑤ Dimmer switch
⑥ Horn switch
⑦ Windshield position switch
⑧ Turn signal switch
⑨ Front brake light switch
⑩ Engine stop switch
⑪ Start switch
⑫ Rear brake light switch
⑬ Neutral switch
⑭ Sidestand switch
⑮ Oil level switch
⑯ Hazard switch
⑰ Fuse

EB805000

IMMOBILIZER SYSTEM

CIRCUIT DIAGRAM



GENERAL INFORMATION

This vehicle is equipped with an immobilizer system to help prevent theft by re-registering codes in the standard keys. This system consists of the following.

- a code re-registering key (with a red bow)
- two standard keys (with a black bow) that can be re-registered with new codes
- a transponder (which is installed in each key bow)
- an immobilizer unit
- an ECU
- an immobilizer system indicator light

The key with the red bow is used to register codes in each standard key. Do not use the key with the red bow for driving. It should only be used for re-registering new codes in the standard keys. The immobilizer system cannot be operated with a new key until the key registered with a code. If you lose the code re-registering key, the ECU and main switch (included with an immobilizer unit) needs to be replaced.
Therefore, always use a standard key for driving. (See caution below.)

NOTE:

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

CAUTION:

- **DO NOT LOSE THE CODE RE-REGISTERING KEY! If the code re-registering key is lost, registering new codes in the standard keys is impossible. The standard keys can still be used to start the vehicle, however if code re-registering is required (i.e., if a new standard key is made or all keys are lost) the entire immobilizer system must be replaced. Therefore, it is highly recommended to use either standard key after any code re-registering and keep the code re-registering key in a safe place.**
- **Do not submerse either of the keys in water.**
- **Do not expose the keys to excessively high temperatures.**
- **Do not place either of the keys close to magnets (this includes, but not limited to, products such as speakers, etc.).**
- **Do not place heavy items on either key.**
- **Do not grind either key or alter their shape.**
- **Do not disassemble the plastic part of either key.**
- **Keep other immobilizer keys away for this unit's code re-registering key and main switch.**

KEY CODES REGISTRATION METHOD

In the course of use, you may encounter the following case where replace these parts and registration of code re-registering/standard key is required.

NOTE:

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

Replacement parts on troubles

	Replacement parts					Required key registration
	Main switch *1	Immobilizer unit	Standard key	ECU	Accessory lock*2 and key	
Standard key is missing and replace it is required			○			Standard key
All keys have been lost (Including code re-registering key)	○			○	○	Code re-registering key and standard keys
ECU is defective				○		Code re-registering key
Immobilizer unit is defective		○				Code re-registering key and standard keys
Main switch is defective	○			○	○	Code re-registering key and standard keys
Accessory lock*2 is defective					○	No required

*1 Replaced as a set with the immobilizer unit.
(Because attended to replace the code re-registering key)

*2 Accessory locks mean the seat lock, fuel tank cap or the helmet holder.

Code re-registering key registration:

When the immobilizer unit or ECU is replaced, the unit cannot be used until the key code is registered because it is not registered to the unit.

After replacement of the immobilizer unit or ECU:

1. Turn “ON” the main switch with the code re-registering key.
   Make sure the immobilizer system indicator light goes on for about one second and then off.
   This shows that the code re-registering key registration is finished.
2. Check that the engine can be started.
3. Consequently, carry out the standard key registration, according the section below.

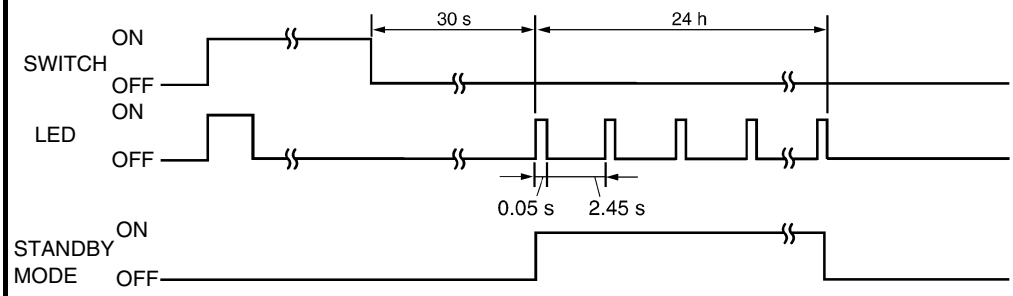
Standard key registration:

When you lose a standard key and need a new one. Or when the code re-registering key is re-registered after the immobilizer unit or ECU, are replaced.

NOTE:

It is prohibited to start the engine with the standard key that is not registered.
If the main switch is turned “ON” with the standard key that is not registered, the immobilizer system indicator light blinks and indicates the error code “52”.
(Refer to “SELF-DIAGNOSIS ERROR CODE INDICATION”).

1. Check that the immobilizer system indicator light is flashing. It indicates the “standby mode”. To initiate the standby mode, turn “OFF” the main switch and then it will be the standby mode when it passes 30 seconds. After 24 hours have passed, the indicator light stop flashing and the standby mode ends.

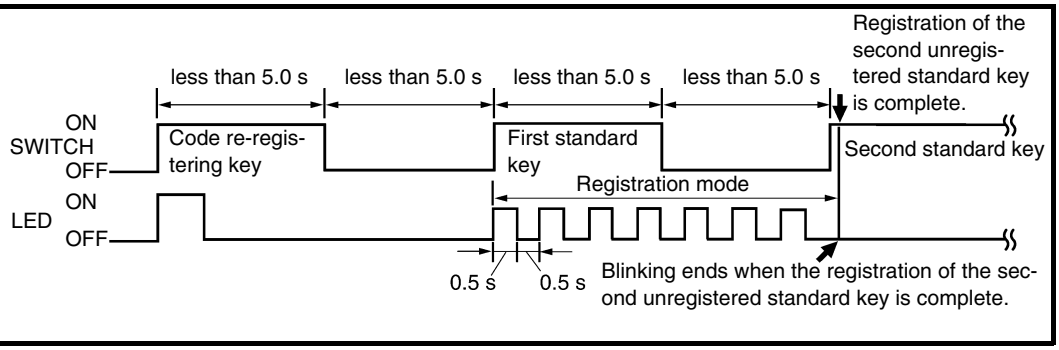
Standby mode	

2. After the main switch is turned “ON” with the code re-registering key, before 5 seconds elapses, turn “OFF” the main switch and then turn “ON” the main switch with the standard key (the first new key) that you want to register.
3. It enters the key registration mode and the two standard key codes that have been stored in the memory are erased and the first new standard key code will be registered. At this time, the indicator light rapidly blinks (“OFF” for 0.5 sec. and “ON” for 0.5 sec.).
4. In the condition as mentioned above (while the indicator light continues rapid flashing), after the main switch is turned “ON” with the first new standard key, turn “OFF” the main switch before 5 seconds elapses, and then turn “ON” the main switch with the standard key that you want to register (which is the second new key or the standard key remained in hand).
5. When the registration is finished, the indicator light goes off.

6. Check that the engine can be started with the two registered standard keys.

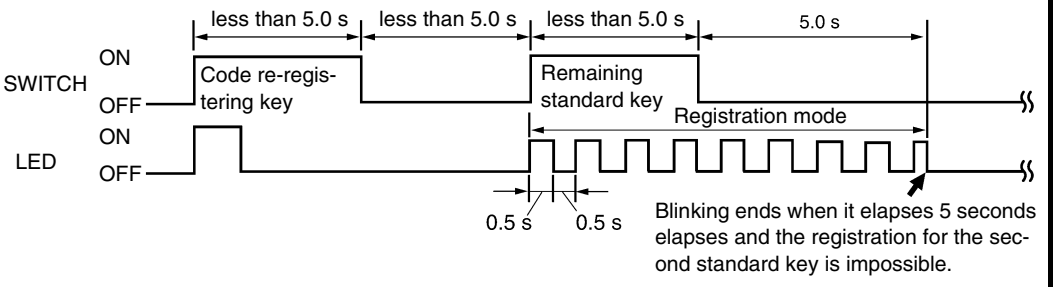
NOTE:

The flashing stops when 5 seconds elapse and the registration mode is finished. In this case, the second standard key cannot be registered and only the first standard key is registered.

Standard key registration method	

Voiding a standard key code:

If you lose one standard key that you used and you want to make the lost standard key unable to be used anymore, re-register another standard key. To re-register, refer to “Standard key registration”. This re-registration disables the lost standard key because its key code has been changed.

Standard key code (lost one) voiding method	

SELF-DIAGNOSIS ERROR CODE INDICATION

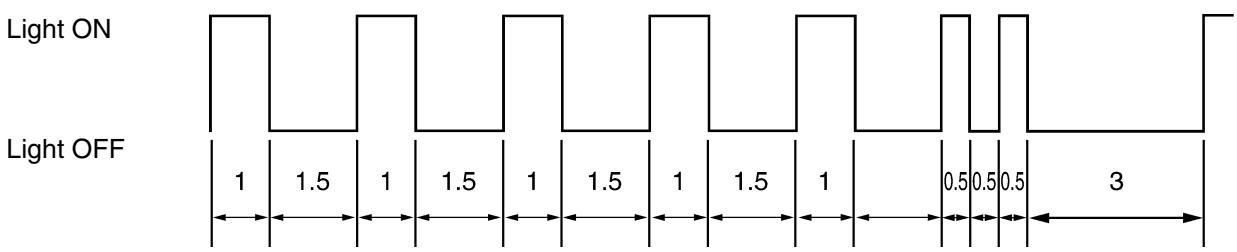
When the system failure occurred, the error code number is indicated in the immobilizer system indicator light blinks at the same time. The pattern of blinking also shows the error code.

Error code	Detection	Symptoms	Trouble	Measures
51	IMMOBILIZER UNIT	Cannot transmit code between the key and immobilizer unit.	1) Objects that may keep off radio waves exist around the keys and antennas. 2) Immobilizer unit failure. 3) Key failure.	1) Keep clear of magnets, metals and other keys from the surroundings of keys and antennas. 2) Replace the immobilizer unit. 3) Replace the key.
52	IMMOBILIZER UNIT	Codes do not match between the key and immobilizer unit.	1) Disturbed by other transponder. Failed to verify continually for ten times. 2) Unregistered sub key was used.	1) Place the immobilizer unit away more than 50 mm from the transponder of other vehicle. 2) Register the standard key.
53	IMMOBILIZER UNIT	Cannot transmit code between the ECU and immobilizer unit.	Noise interference or disconnected lead/cable. 1) Obstruction due to radio wave noise. 2) Error by disconnection of the communication harness. 3) Immobilizer unit failure. 4) ECU failure.	1) Check the wire harness and connector. 2) Replace the immobilizer unit. 3) Replace the ECU.
54	IMMOBILIZER UNIT	Codes do not match between ECU and immobilizer unit.	Noise interference or disconnected lead/cable. 1) Obstruction due to radio wave noise. 2) Immobilizer unit failure. 3) ECU failure (When the used parts from other vehicles are used, the code re-registering key ID is not registered to the ECU.)	1) Register the code re-registering key ID. 2) Replace the immobilizer unit. 3) Replace the ECU.
55	IMMOBILIZER UNIT	Key code registration error.	Same standard key was attempted to continuously two times register.	Prepare the new standard key and register it.
56	ECU	Unidentified code is received.	Noise interference or disconnected lead/cable.	1) Check the wire harness and connector. 2) Replace the immobilizer unit. 3) Replace the ECU.

Immobilizer system indicator light error code indication

Digit of 10: Cycles of 1 sec. ON and 1.5 sec. OFF.
Digit of 1: Cycles of 0.5 sec. ON and 0.5 sec. OFF.

<Example> 52



EAS00781
TROUBLESHOOTING

The immobilizer system fails to operate. (The immobilizer system indicator light starts to blink in the self-diagnosis code sequence.)

Check:
1. main, ignition and backup fuses
2. battery
3. main switch
4. wiring
   (of the entire immobilizer system)

NOTE:
- Before troubleshooting, remove the following part(s).

1) rider seat
2) fuel tank
3) right inner panel (front cowling)
4) left inner panel (front cowling)

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112

EAS00738
1. Main, ignition and backup fuses

- Check the main, ignition and backup fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3. (Manual No.: 5JW1-AE1)
- Are the main, ignition and backup fuses OK?

YES → NO → Replace the fuse(s).

EAS00739
2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. (Manual No.: 5JW1-AE1)

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES → NO
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749
3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO → Replace the main switch.

EAS00787
4. Wiring

- Check the entire immobilizer system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the immobilizer system's wiring properly connected and without defects?

YES → Check the condition of each of the immobilizer system's circuits.
Refer to "CHECKING THE IMMOBILIZER SYSTEM".

NO → Properly connect or repair the immobilizer system's wiring.

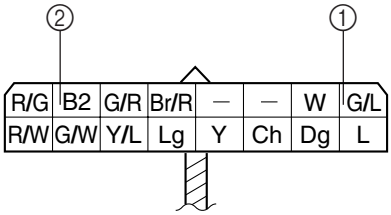
CHECKING THE IMMOBILIZER SYSTEM

1. Immobilizer system indicator light does not go on when the main switch is set to "ON".

1. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler as shown.

Tester positive probe → green/blue ①
Tester negative probe → black 2 ②



- Set the main switch to "ON".
- Measure the voltage (12 V) between green/blue and black 2 on the meter assembly coupler.
- Is the voltage within specification?

YES

Replace the meter assembly.

NO

- Set the main switch to "ON".
- Measure the voltage (12 V) between red/green and black on the immobilizer unit coupler.
- Is the voltage within specification?

YES

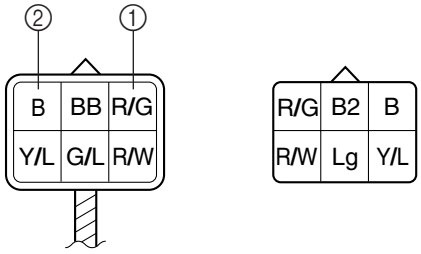
NO

The wiring circuit from the battery to the immobilizer unit is faulty and must be repaired.

2. Voltage

- Connect the pocket tester (DC 20 V) to the immobilizer unit coupler as shown.

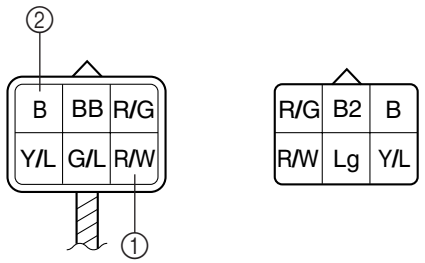
Tester positive probe → red/green ①
Tester negative probe → black ②



3. Voltage

- Connect the pocket tester (DC 20 V) to the immobilizer unit coupler as shown.

Tester positive probe → red/white ①
Tester negative probe → black ②



- Set the main switch to "ON".
- Measure the voltage (12 V) between red/white and black on the immobilizer unit coupler.
- Is the voltage within specification?

YES

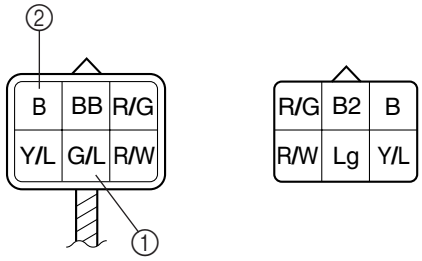
NO

The wiring circuit from the main switch to the immobilizer unit is faulty and must be repaired.

4. Voltage

- Connect the pocket tester (DC 20 V) to the immobilizer unit coupler as shown.

Tester positive probe → **green/blue** ①
Tester negative probe → **black** ②



- Set the main switch to “ON”.
- Measure the voltage (12 V) between green/blue and black on the immobilizer unit coupler.
- Is the voltage within specification?

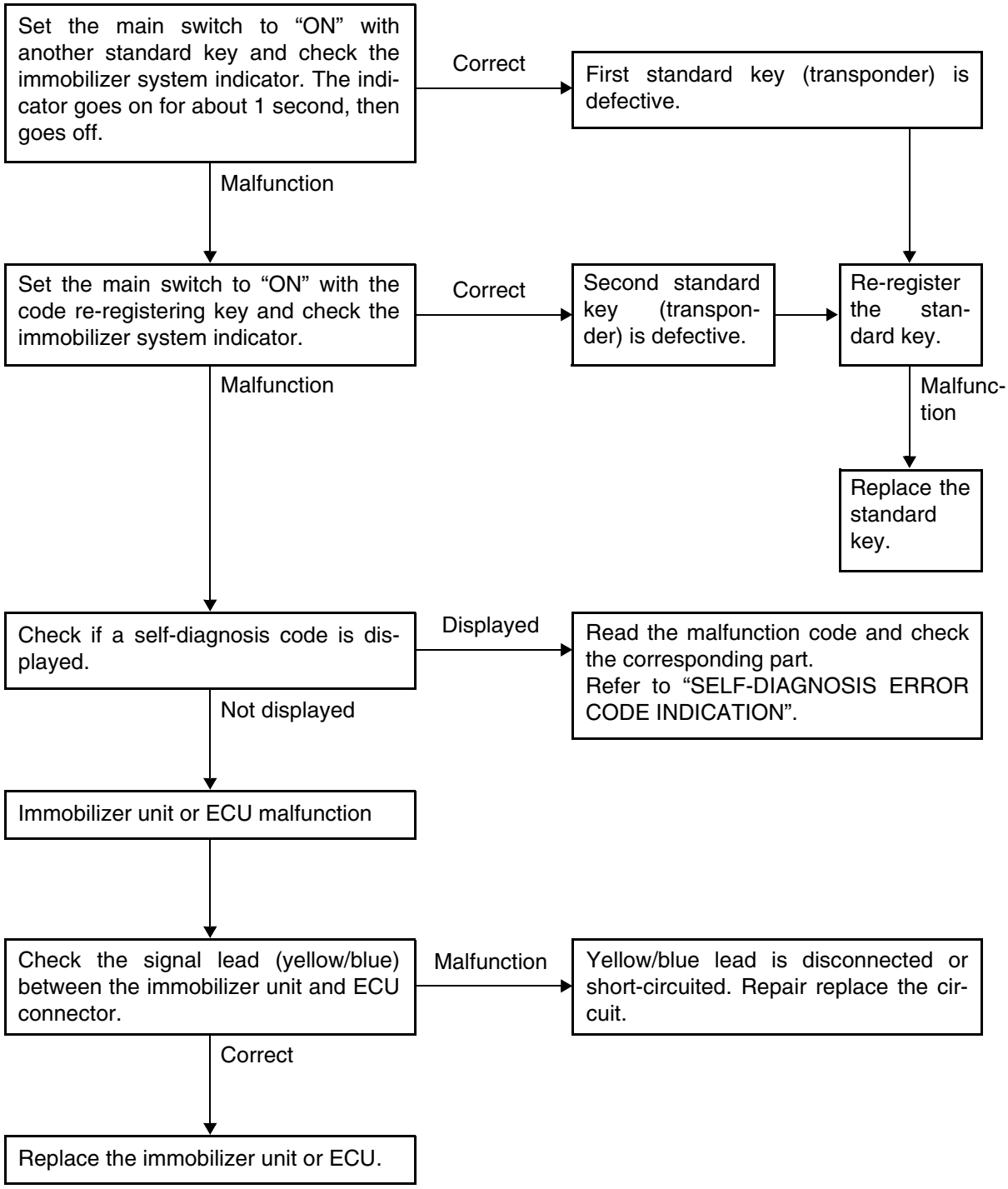
YES

The wiring circuit from the immobilizer unit to the meter assembly is faulty and must be repaired.

NO

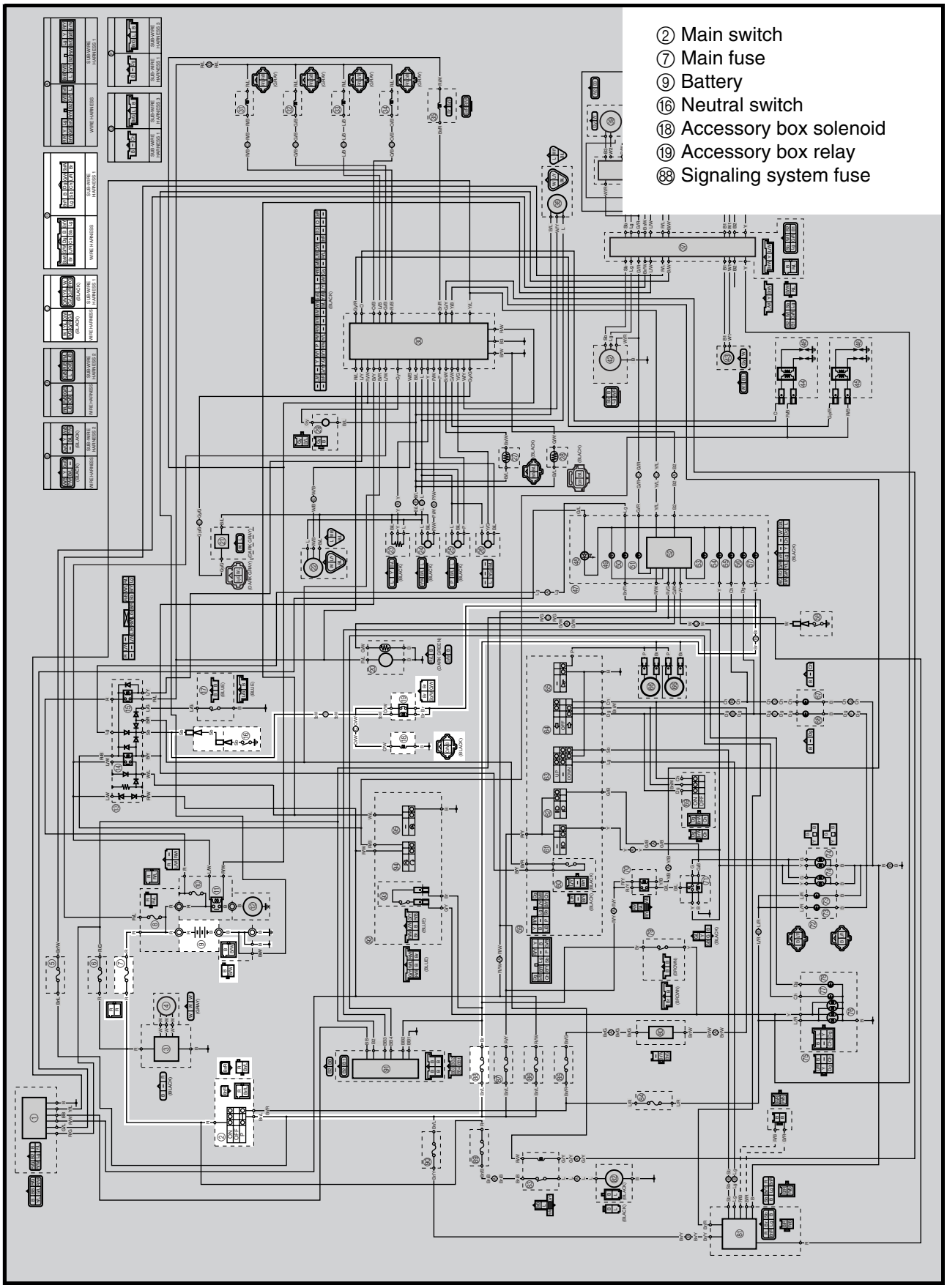
Replace the immobilizer unit.

2. When the main switch is set to “ON”, the immobilizer system indicator light flashes after 1 second.
   • Check if metal or other immobilizer system keys exists near the immobilizer unit. If found, remove the metal or keys, and then check the condition again.



ACCESSORY BOX SYSTEM

CIRCUIT DIAGRAM



EAS00781
TROUBLESHOOTING

The accessory box system fails to operate.

CAUTION:
Before troubleshooting, make sure that the transmission is in neutral.

Check:
1. main and signaling system fuses
2. battery
3. main switch
4. neutral switch
5. accessory box relay
6. accessory box solenoid
7. wiring
   (of the entire accessory box system)

NOTE:
- Before troubleshooting, remove the following part(s):

1) fuel tank
2) front cowling assembly
3) air filter case

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112

EAS00738
1. Main and signaling system fuses

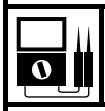
- Check the main and signaling system fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3. (Manual No.: 5JW1-AE1)
- Are the main and signaling system fuses OK?

YES → NO

Replace the fuse(s).

EAS00739
2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. (Manual No.: 5JW1-AE1)



Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES → NO

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749
3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO

Replace the main switch.

EAS00783
4. Neutral switch

- Check the neutral switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

YES → NO

Replace the neutral switch.

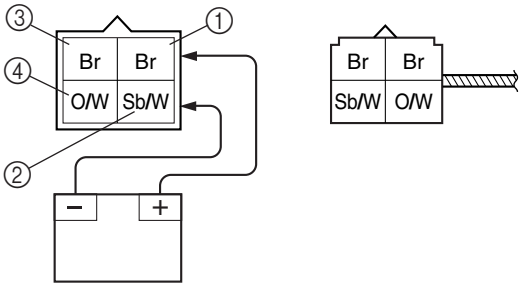
EAS00759

5. Accessory box relay

- Disconnect the accessory box relay from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the accessory box relay terminals as shown.

Battery positive terminal → brown ①
Battery negative terminal → sky blue/white ②

Tester positive probe → brown ③
Tester negative probe → orange/white ④



- Does the accessory box relay have continuity between orange/white and brown?

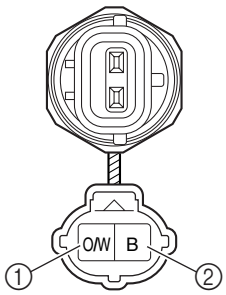
YES → NO

Replace accessory box relay.

6. Accessory box solenoid

- Remove the accessory box solenoid coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the accessory box system solenoid terminal as shown.

Tester positive probe → orange/white ①
Tester negative probe → black ②



- Measure the accessory box solenoid resistance.

Accessory box solenoid resistance
19 ~ 21 Ω at 20 °C

- Is the accessory box solenoid OK?

YES → NO

Replace the accessory box solenoid.

EAS00818

7. Wiring

- Check the entire accessory box system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the accessory box system's wiring properly connected and without defects?

YES → NO

This accessory box system circuit is OK.

Properly connect or repair the accessory box system's wiring.

TROUBLESHOOTING

TROUBLESHOOTING WITH THE ABS WARNING LIGHT

When the main switch is set to “ON”. (Engine does not start.)

ONLY THE ABS WARNING LIGHT DOES NOT COME ON

- Blown, damaged, or incorrect fuse (ABS fuse)
- Defective connection of the sub-wire harness (ABS) and the wire harness
- Defective connection of the sub-wire harness (ABS) and the ECU (ABS)
- Disconnected sub-wire harness (ABS)
- Burnt out ABS warning light bulb or defective bulb contact
- Defective ECU (ABS)

ALL INDICATORS DO NOT COME ON

- Defective battery
- Blown, damaged, or incorrect fuse (main fuse)
- Defective connection of the main fuse coupler
- Defective connection of the wire harness and the sub-wire harness (ABS)
- Defective connection of the main switch coupler
- Defective connection of the meter coupler

ABS WARNING LIGHT CONTINUES TO FLASH

- Defective brake light switch (front or rear)
- Disconnected brake light switch (front or rear) coupler
- Disconnected wire harness
- Blown, damaged, or incorrect fuse (main fuse)
- Defective connection of the sub-wire harness (ABS) and the wire harness couplers

ABS WARNING LIGHT FLASHES EVERY 0.5 SECOND

- Voltage drop (less than 10 V)
  - Battery
  - Rectifier/regulator
  - AC magneto
- Strong radio waves or static electricity
- Test coupler adapter is connected to test coupler

ABS WARNING LIGHT CONTINUES TO COME ON

- Defective connection of the wheel sensor (front or rear) circuit
- Disconnected wheel sensor lead (front or rear) coupler
- Disconnected wheel sensor lead (front or rear) or coil
- Disconnected sensor circuit of the sub-wire harness (ABS)
- Disconnected ECU (ABS) coupler terminal

FJR1300A WIRING DIAGRAM

① Immobilizer unit
② Main switch
③ Rectifier/regulator
④ Generator
⑤ ABS fuse
⑥ Backup fuse (odometer, clock and windshield)
⑦ Main fuse
⑧ ABS motor fuse
⑨ Battery
⑩ Fuel injection system fuse
⑪ Starter relay
⑫ Starter motor
⑬ Relay unit
⑭ Starting circuit cut-off relay
⑮ Fuel injection system relay
⑯ Neutral switch
⑰ Sidestand switch
⑱ Accessory box solenoid
⑲ Accessory box relay
⑳ Fuel pump
㉑ O_2 sensor
㉒ Cylinder identification sensor
㉓ Throttle position sensor
㉔ Intake air pressure sensor
㉕ Atmospheric pressure sensor
㉖ Lean angle cut-off switch
㉗ Intake air temperature sensor
㉘ Coolant temperature sensor
㉙ Crankshaft position sensor
㉚ ECU (engine)
㉛ Cylinder #1 - injector
㉜ Cylinder #2 - injector
㉝ Cylinder #3 - injector
㉞ Cylinder #4 - injector
㉟ Air induction system solenoid
㊱ Speed sensor
㊲ Sub-wire harness (ABS)
㊳ ECU (ABS)
㊴ Rear wheel sensor
㊵ Fail-safe relay
㊶ Hydraulic unit
㊷ ABS test coupler
㊸ Front wheel sensor
㊹ Cylinders #1, #4 - ignition coil
㊺ Cylinders #2, #3 - ignition coil
㊻ Spark plug
㊼ Meter assembly
㊽ Immobilizer system indicator light
㊾ Oil level warning light
㊿ Neutral indicator light
(51) ABS warning light
(52) Multifunction meter
(53) Engine trouble warning light
(54) High beam indicator light
(55) Left turn signal indicator light
(56) Right turn signal indicator light
(57) Meter light
(58) Oil level switch
(59) Left handlebar switch
(60) Clutch switch
(61) Pass switch
(62) Dimmer switch
(63) Windshield position switch
(64) Turn signal switch
(65) Horn switch
(66) Horn
(67) Front turn signal light (left)
(68) Front turn signal light (right)
(69) Hazard switch
(70) Headlight relay 1
(71) Headlight relay 2
(72) Headlight assembly
(73) Auxiliary light
(74) Headlight
(75) Taillight assembly
(76) Tail/brake light
(77) Rear turn signal light (left)
(78) Rear turn signal light (right)
(79) Rear brake light switch
(80) Turn signal relay
(81) Windshield drive unit
(82) Radiator fan motor
(83) Radiator fan motor relay
(84) Parking lighting fuse
(85) Hazard lighting fuse
(86) Ignition fuse
(87) Headlight fuse
(88) Signaling system fuse
(89) Radiator fan motor fuse
(90) Windshield motor fuse
(91) CYCLELOCK
(92) Right handlebar switch
(93) Front brake light switch
(94) Engine stop switch
(95) Start switch

COLOR CODE

B ..... Black
Br ..... Brown
Ch ..... Chocolate
Dg ..... Dark green
G ..... Green
Gy ..... Gray
L ..... Blue
Lg ..... Light green
O ..... Orange
P ..... Pink
R ..... Red
Sb ..... Sky blue
W ..... White
Y ..... Yellow
B/L ..... Black/Blue
B/R ..... Black/Red
B/W ..... Black/White
B/Y ..... Black/Yellow
Br/B ..... Brown/Black
Br/G ..... Brown/Green
Br/L ..... Brown/Blue
Br/R ..... Brown/Red
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L/Y ..... Blue/Yellow
O/B ..... Orange/Black
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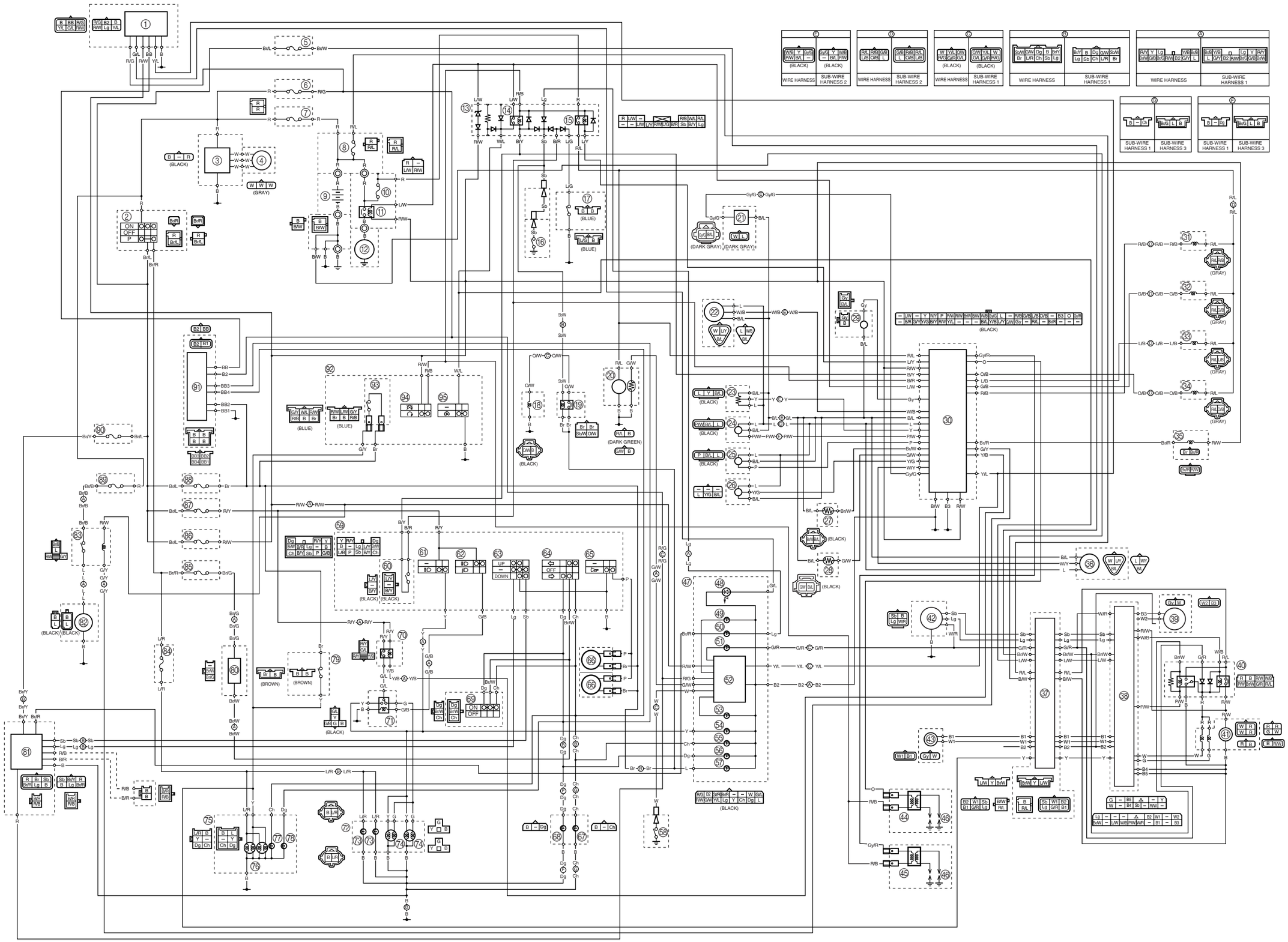
FJR1300A WIRING DIAGRAM



FJR1300 WIRING DIAGRAM