YAMAHA 2016

SUPPLEMENTARY SERVICE MANUAL

MTM660

XSR

B34-F8197-E1

EAS20236

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the MTM660 2016. For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manual.

MTM690/MTM690-U 2016 SERVICE MANUAL: B34-F8197-E0

EAS20002

EAS20003
IMPORTANT

This manual was produced by MBK Industrie. 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. and MBK Industrie are 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.

TIP

Designs and specifications are subject to change without notice.

EAS30001
IMPORTANT MANUAL INFORMATION

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

⚠	**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**

⚠ WARNING	**A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

NOTICE	**A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.**

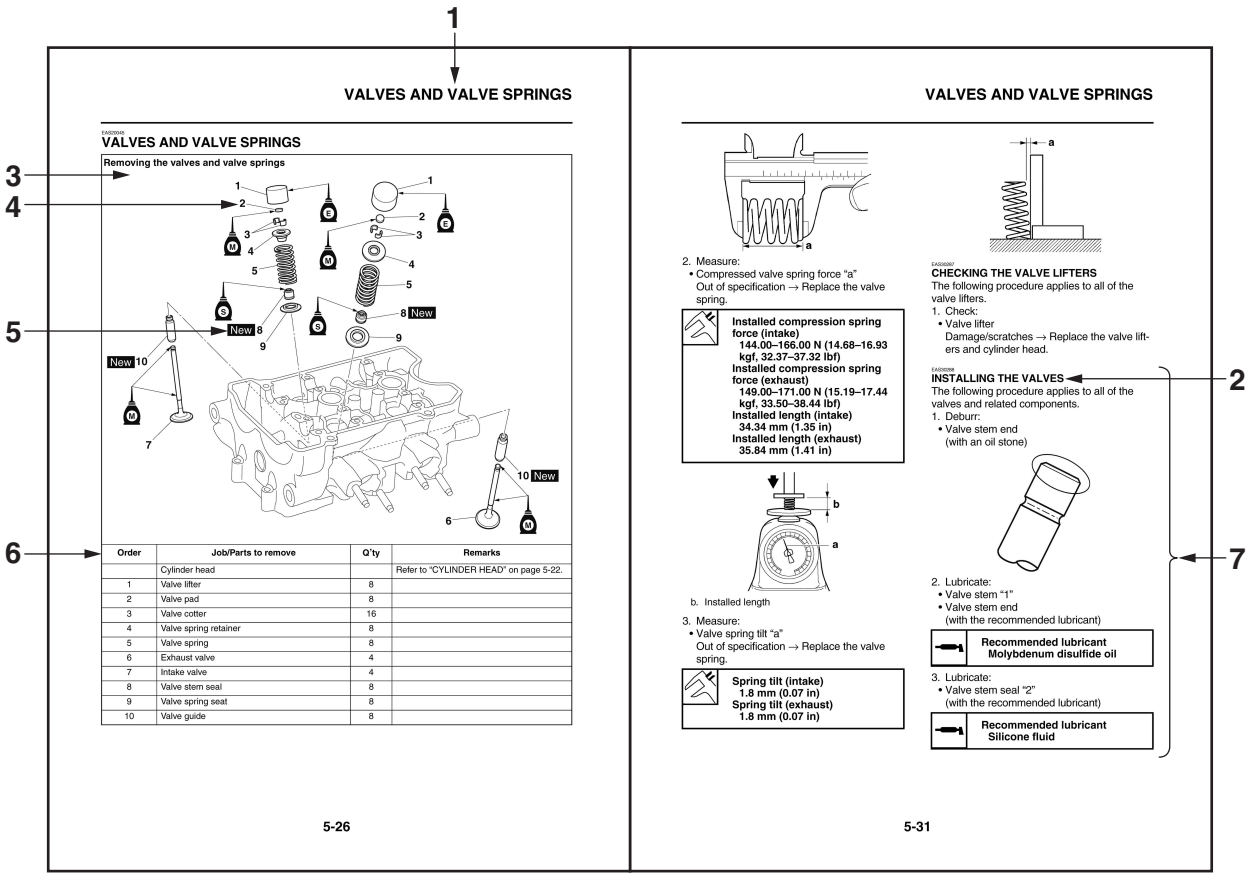
TIP	A TIP provides key information to make procedures easier or clearer.

EAS20004

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.

- The manual is divided into chapters and each chapter is divided into sections. The current section title "1" is shown at the top of each page.
- Sub-section titles "2" appear in smaller print than the section title.
- To help identify parts and clarify procedure steps, there are exploded diagrams "3" at the start of each removal and disassembly section.
- Numbers "4" are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step.
- Symbols "5" indicate parts to be lubricated or replaced.
  Refer to "SYMBOLS".
- A job instruction chart "6" accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc. This step explains removal and disassembly procedure only. For installation and assembly procedure, reverse the steps.
- Jobs "7" requiring more information (such as special tools and technical data) are described sequentially.



EAS20005
SYMBOLS

The following symbols are used in this manual for easier understanding.

TIP

The following symbols are not relevant to every vehicle.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Serviceable with engine mounted		Gear oil
	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
	Special tool		Wheel bearing grease
	Tightening torque		Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone grease
	Electrical data		Apply locking agent (LOCTITE®).
	Engine oil		Replace the part with a new one.
	Silicone fluid		

EAS10003

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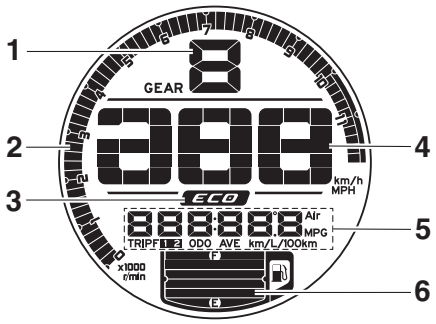
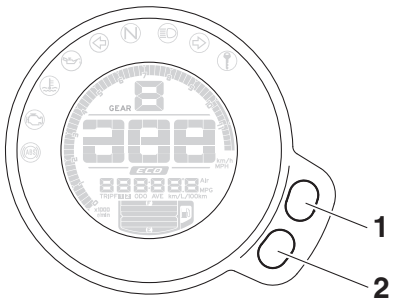
EAS20008
FEATURES

EAS30982
MULTI-FUNCTION METER UNIT



1. Transmission gear display
2. Tachometer
3. Eco indicator “ECO”
4. Speedometer
5. Multi-function display
6. Fuel meter



1. Top set button
2. Bottom set button

EWA17650
⚠ WARNING

Be sure to stop the vehicle before making any setting changes to the multi-function meter unit. Changing settings while riding can distract the operator and increase the risk of an accident.

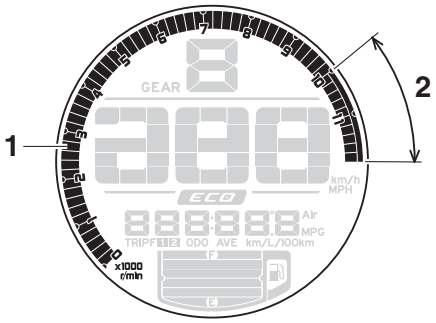
The multi-function meter unit is equipped with the following:
• a speedometer
• a tachometer
• a fuel meter
• an eco indicator
• a transmission gear display
• a multi-function display

TIP

Except when switching to the brightness control mode or to display the clock, turn the key to “ON” before using the bottom and top set buttons.

Speedometer
The speedometer shows the vehicle’s traveling speed.

Tachometer



1. Tachometer
2. Tachometer red zone

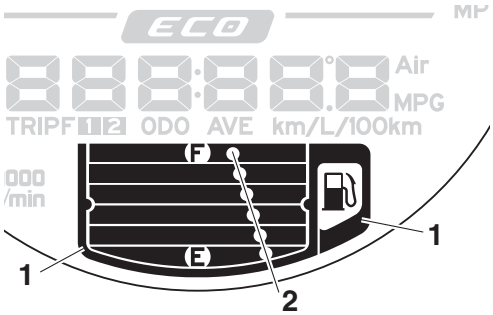
The tachometer allows the rider to monitor the engine speed and keep it within the ideal power range.

ECA19660
NOTICE

Do not operate the engine in the tachometer red zone.

	Red zone **10000 r/min and above**

Fuel meter



1. Frame
2. Fuel meter

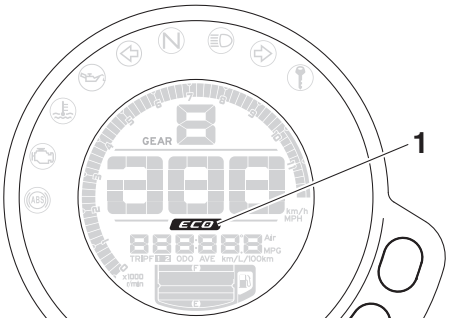
The fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear from “F” (full tank) towards “E” (empty

tank) as the fuel level decreases. When the last segment and frame start flashing, refuel as soon as possible.

TIP

This fuel meter is equipped with a self-diagnosis system. If a problem is detected in the fuel tank electrical circuit, the fuel level segments, frame, and "⛽" flash repeatedly. If this occurs, check the electrical circuit. Refer to "SIGNALING SYSTEM" in chapter 8. (Manual No.: B34-F8197-E0)

Eco indicator



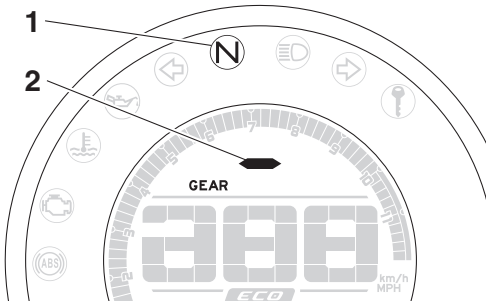
1. Eco indicator "ECO"

This indicator comes on when the vehicle is being operated in an environmentally friendly, fuel-efficient manner. The indicator goes off when the vehicle is stopped.

TIP

Consider the following tips to reduce fuel consumption:
- Avoid high engine speeds during acceleration.
- Travel at a constant speed.
- Select the transmission gear that is appropriate for the vehicle speed.

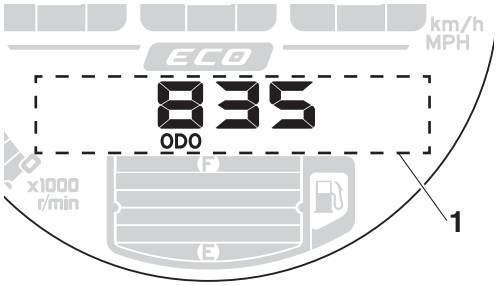
Transmission gear display



1. Neutral indicator light "**N**"
2. Transmission gear display

This display shows the selected gear. The neutral position is indicated by "–" and by the neutral indicator light.

Multi-function display



1. Multi-function display

The multi-function display is equipped with the following:
- an odometer
- two tripmeters
- a fuel reserve tripmeter
- an instantaneous fuel consumption display
- an average fuel consumption display
- a coolant temperature display
- an air temperature display
- a clock
- a brightness control mode

The odometer shows the total distance the vehicle has traveled.
The tripmeters show the distance traveled since they were last reset.

TIP

- The odometer will lock at 999999 and cannot be reset.
- The tripmeter will reset to 0 and continue counting after 9999.9 is reached.

Push the bottom set button to switch the display between odometer "ODO", tripmeters "TRIP 1" and "TRIP 2", instantaneous fuel consumption "km/L" or "L/100 km", average fuel consumption "AVE_ _._ km/L" or "AVE_ _._ L/100 km", coolant temperature "_ _ °C", ambient temperature "Air_ _ °C", and clock "_ _:_ _" in the following order:

ODO → TRIP 1 → TRIP 2 → km/L or L/100 km → AVE_ _._ km/L or AVE_ _._ L/100 km → _ _ °C → Air_ _ °C → Clock _ _:_ _ → ODO

TIP

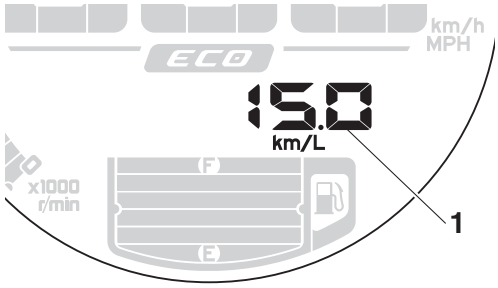
- Push the top set button to switch the display in the reverse order.
- The fuel reserve tripmeter and error code displays come on automatically, while the brightness control mode is accessed separately.

If the lower segment and frame of the fuel meter start flashing, the display automatically changes to fuel reserve tripmeter "TRIP F" and starts counting the distance traveled from that point. In this case, push the bottom set button to switch the display between the various tripmeter, odometer, and fuel consumption modes in the following order:

TRIP F → km/L or L/100 km → AVE_ _._ km/L or AVE_ _._ L/100 km → _ _ °C → Air_ _ °C → Clock _ _:_ _ → ODO → TRIP 1 → TRIP 2 → TRIP F

To reset a tripmeter, select it by pushing the bottom set button, and then push the top set button for one second.
If you do not reset the fuel reserve tripmeter manually, after refueling and traveling 5km (3mi) it resets automatically and disappears from the display.

Instantaneous fuel consumption



1. Instantaneous fuel consumption display

The instantaneous fuel consumption display can be set to either "km/L" or "L/100 km"; or "km/L" or "L/100 km".

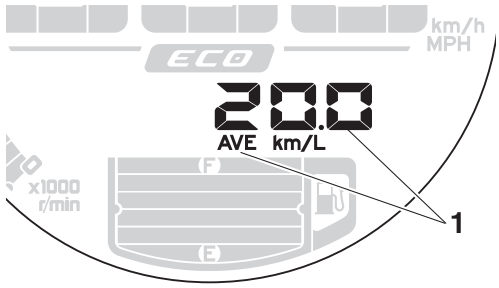
- "km/L": The distance that can be traveled on 1.0 L of fuel under current riding conditions.
- "L/100 km": The amount of fuel necessary to travel 100 km under current riding.
- "MPG": The distance that can be traveled on 1.0 Imp.gal of fuel under current riding conditions.

To switch the instantaneous fuel consumption display settings, push the bottom set button for two second.

TIP

If traveling at speeds under 20 km/h (12 mi/h), "_ _._" is displayed.

Average fuel consumption



1. Average fuel consumption display

This display shows the average fuel consumption since it was last reset.
The average fuel consumption display can be set to either "AVE_ _._ km/L", "AVE_ _._ L/100 km".

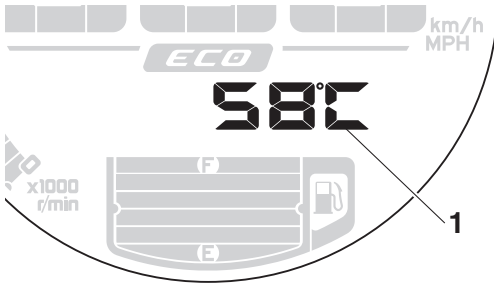
- "AVE_ _._ km/L": The average distance that can be traveled on 1.0 L of fuel.
- "AVE_ _._ L/100 km": The average amount of fuel necessary to travel 100 km.
- "AVE_ _._ MPG": The average distance that can be traveled on 1.0 Imp.gal of fuel.

To switch the average fuel consumption display settings, push the bottom set button for two seconds.
To reset the average fuel consumption, push the top set button for one second.

TIP

After resetting the average fuel consumption, "_ _._" will be shown until the vehicle has traveled 1 km (0.6 mi).

Coolant temperature



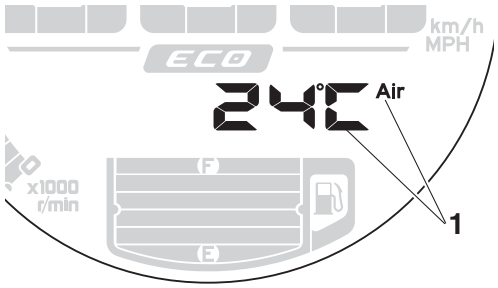
1. Coolant temperature display

This display shows the coolant temperature from 40 °C to 116 °C in 1 °C increments.
If the message “HI” flashes, stop the vehicle, then stop the engine and let the it cool.

TIP

- When the coolant temperature is below 40 °C, “Lo” will be displayed.
- The coolant temperature varies with changes in the weather and engine load.

Air temperature



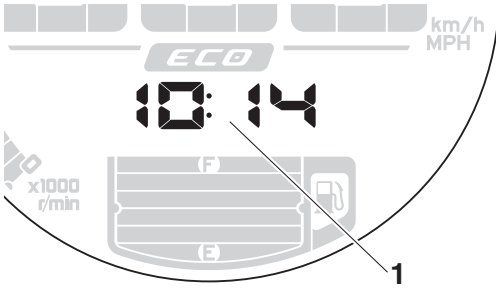
1. Air temperature display

This display shows the air temperature from –9 °C to 99 °C in 1 °C increments. The temperature displayed may vary from the actual ambient temperature.

TIP

- When the air temperature is below –9 °C, “Lo” will be displayed.
- The accuracy of the temperature reading may be affected when riding slowly (under 20 km/h [12.5 mi/h]) or when stopped at traffic signals, railroad crossings, etc.

Clock



1. Clock

The clock displays time in 12-hour format. Even when the key is not in the “ON” position, the clock can be viewed for 10 seconds by pushing the bottom set button.

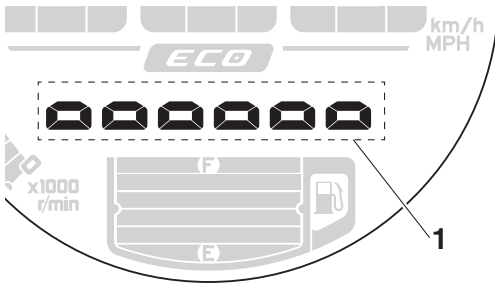
To set the clock

1. Turn the main switch to “ON”.
2. Push the bottom set button and top set button together for two seconds and the hour digits will start flashing.
3. Push the top set button to set the hours.
4. Push the bottom set button and the minute digits will start flashing.
5. Push the top set button to set the minutes.
6. Push the bottom set button to confirm settings and start the clock.

TIP

When setting the hours and minutes, push the top set button briefly to increase the increment value one by one, or push and hold the button to increase the increment value continuously.

Brightness control



1. Brightness level display

The brightness level of the multi-function meter unit panel can be adjusted to suit the rider’s preference.

To adjust the brightness

1. Turn the main switch to “OFF”.
2. Push and hold the bottom set button.
3. Turn the main switch to “ON” and continue pushing the bottom set button until the display switches to the brightness control mode.
4. Push the top set button to set the brightness level.
5. Push the bottom set button to confirm the selected brightness level and exit the brightness control mode.

TIP

There are 6 brightness level settings.

EAS20013
GENERAL SPECIFICATIONS

Model

Model	B343

EAS20014
ENGINE SPECIFICATIONS

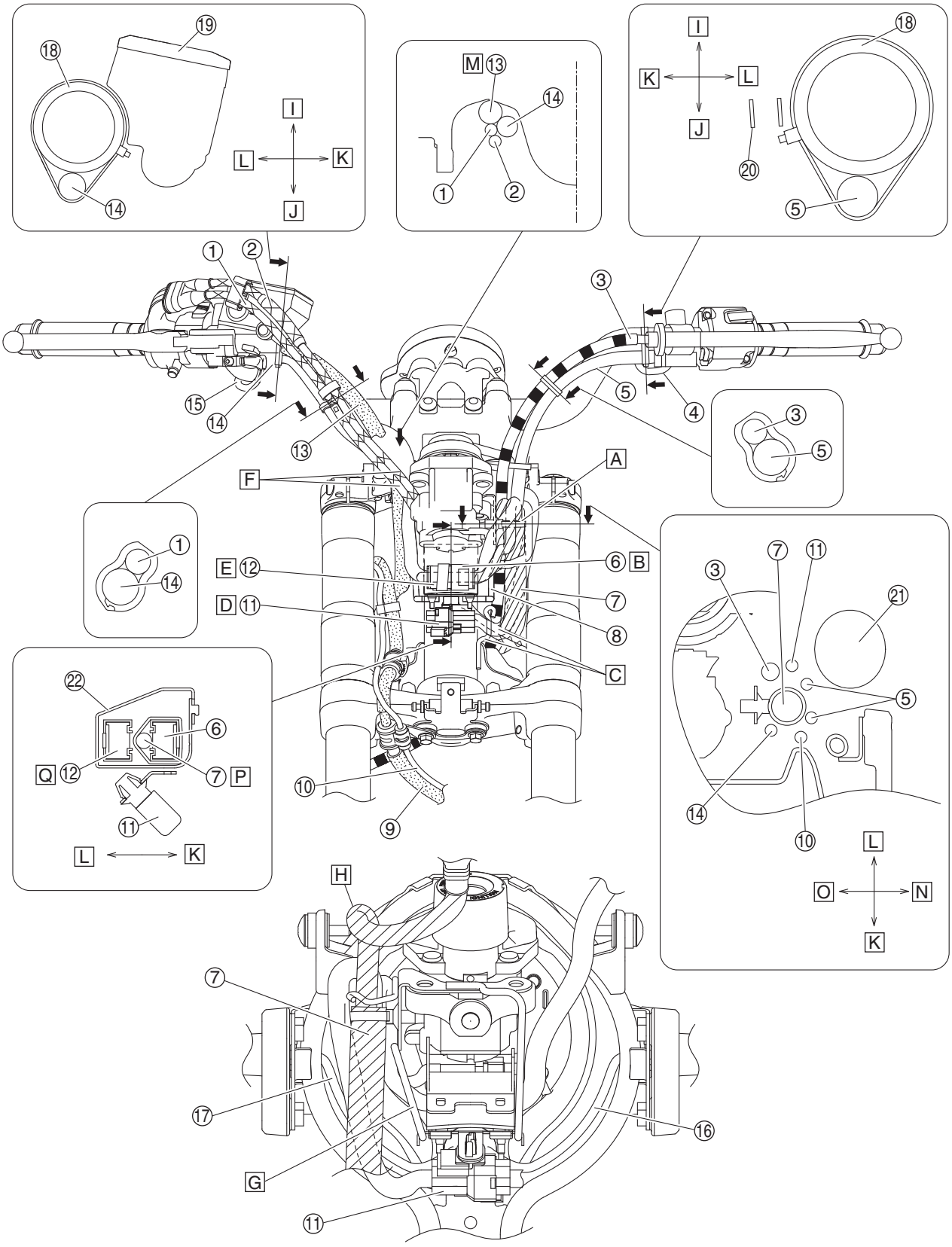
Engine	
Displacement	655 cm³
Bore × stroke	78.0 × 68.6 mm (3.07 × 2.70 in)
Compression ratio	11.0 : 1
Compression pressure (#1 cylinder)	630–850 kPa/495 r/min (6.3–8.5 kgf/cm²/495 r/min, 89.6–120.9 psi/495 r/min)
Compression pressure (#2 cylinder)	610–830 kPa/495 r/min (6.1–8.3 kgf/cm²/495 r/min, 86.8–118.1 psi/495 r/min)
Fuel	
Recommended fuel	Regular unleaded gasoline (Gasohol (E10) acceptable)
Minimum research octane	90
Cylinder	
Bore	78.000–78.010 mm (3.0709–3.0713 in)
Piston	
Diameter	77.970–77.985 mm (3.0697–3.0703 in)
Piston ring	
Oil ring	
End gap (installed)	0.10–0.40 mm (0.0039–0.0157 in)
Throttle body	
ID mark	1WS1 30

EAS20015
CHASSIS SPECIFICATIONS

Front tire	
Wear limit (front)	1.5 mm (0.06 in)
Rear tire	
Wear limit (rear)	1.5 mm (0.06 in)

EAS20021
CABLE ROUTING

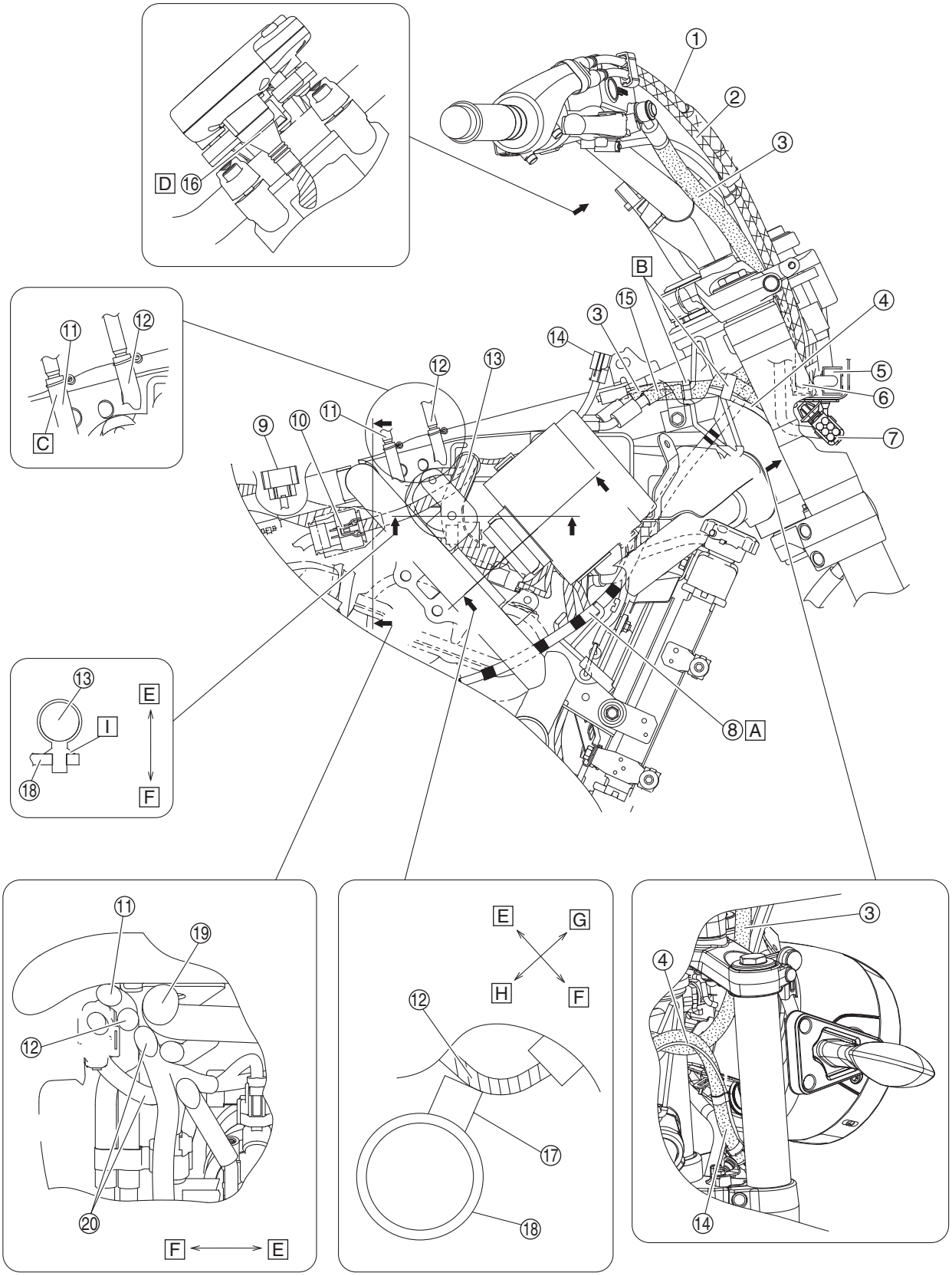
Handlebar (front view)



1. Throttle cable (decelerator cable)
2. Throttle cable (accelerator cable)
3. Clutch cable
4. Clutch switch lead
5. Handlebar switch lead (left handlebar switch)
6. Handlebar switch coupler (left handlebar switch)
7. Wire harness
8. Cable guide
9. Brake hose (hydraulic unit to left front brake caliper)
10. Front wheel sensor lead
11. Sub-wire harness coupler (headlight, turn signal light, and auxiliary light)
12. Handlebar switch coupler (right handlebar switch)
13. Brake hose (front brake master cylinder to hydraulic unit)
14. Handlebar switch lead (right handlebar switch)
15. Front brake light switch lead
16. Front turn signal light lead (right turn signal light)
17. Front turn signal light lead (left turn signal light)
18. Handlebar
19. Front brake master cylinder assembly
20. Clutch lever holder
21. Front fork
22. Coupler cover

A. Insert the projection on the holder into the hole in the cable guide.
B. Fasten the left handlebar switch coupler to the wire harness with tape, and then place the coupler in the coupler cover. Make sure that the wire harness is positioned to the rear of the coupler.
C. Route the throttle cables through the guide. Be sure to route the throttle cable (decelerator cable) over the throttle cable (accelerator cable).
D. Connect the sub-wire harness coupler (headlight, turn signal light, and auxiliary light), and then insert the projection on the coupler into the hole in the cable guide.
E. Position the right handlebar switch coupler to the rear of the left handlebar switch coupler.
F. Route the throttle cables to the rear of the main switch.
G. Connect the auxiliary light coupler, and then place the coupler in the headlight body.
H. To meter assembly
I. Upward
J. Downward
K. Forward
L. Rearward
M. Route the brake hose (front brake master cylinder to hydraulic unit) through the guide as shown in the illustration.
N. Outward
O. Inward
P. Bend the wire harness 180° and secure it with tape.
Q. Connect the right handlebar switch coupler, and then place the coupler in the coupler cover.

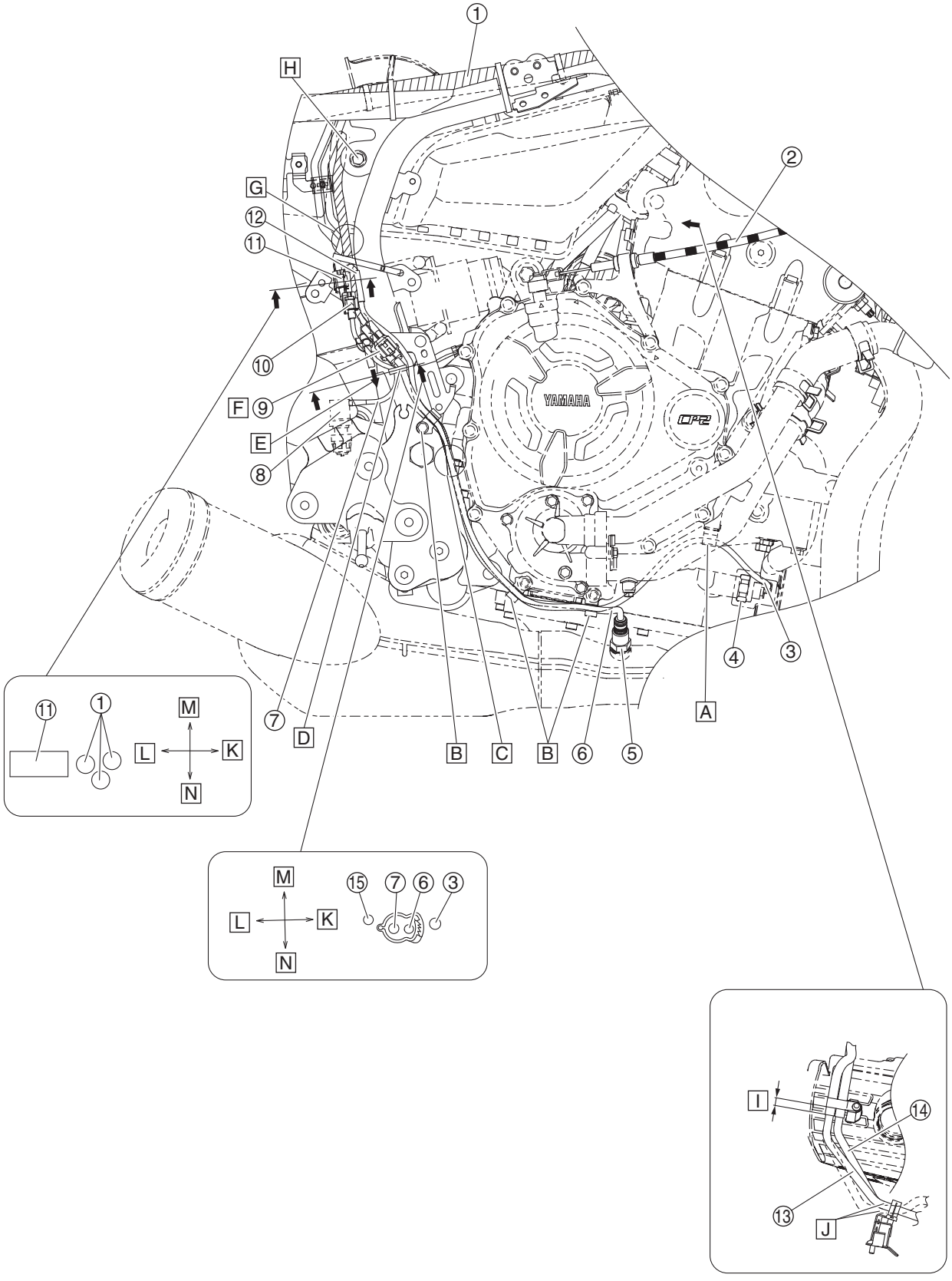
ECU and clutch cable (right side view)



1. Throttle cable (accelerator cable)
2. Throttle cable (decelerator cable)
3. Brake hose (front brake master cylinder to hydraulic unit)
4. Front wheel sensor lead
5. Handlebar switch coupler (left handlebar switch)
6. Handlebar switch coupler (right handlebar switch)
7. Sub-wire harness coupler (headlight, turn signal light, and auxiliary light)
8. Clutch cable
9. Fuel pump coupler
10. Sub-wire harness coupler
11. Fuel tank breather hose
12. Fuel tank overflow hose
13. Wire harness
14. Intake air temperature sensor coupler
15. Brake hose (hydraulic unit to left front brake caliper)
16. Meter assembly cover
17. Damper
18. Frame
19. Cylinder head breather hose
20. Sub-wire harness

A. Route the clutch cable through the guide as shown in the illustration.
B. Fasten the brake hose (hydraulic unit to left front brake caliper) and front wheel sensor lead with the holders. Refer to “CABLE ROUTING (Hydraulic unit assembly (top and right side view))”.
C. Blue paint mark
D. After connecting the meter assembly coupler, install the coupler cover completely until it contacts the meter assembly.
E. Inward
F. Outward
G. Forward
H. Rearward
I. Insert the projection on the wire harness holder into the hole in the frame.

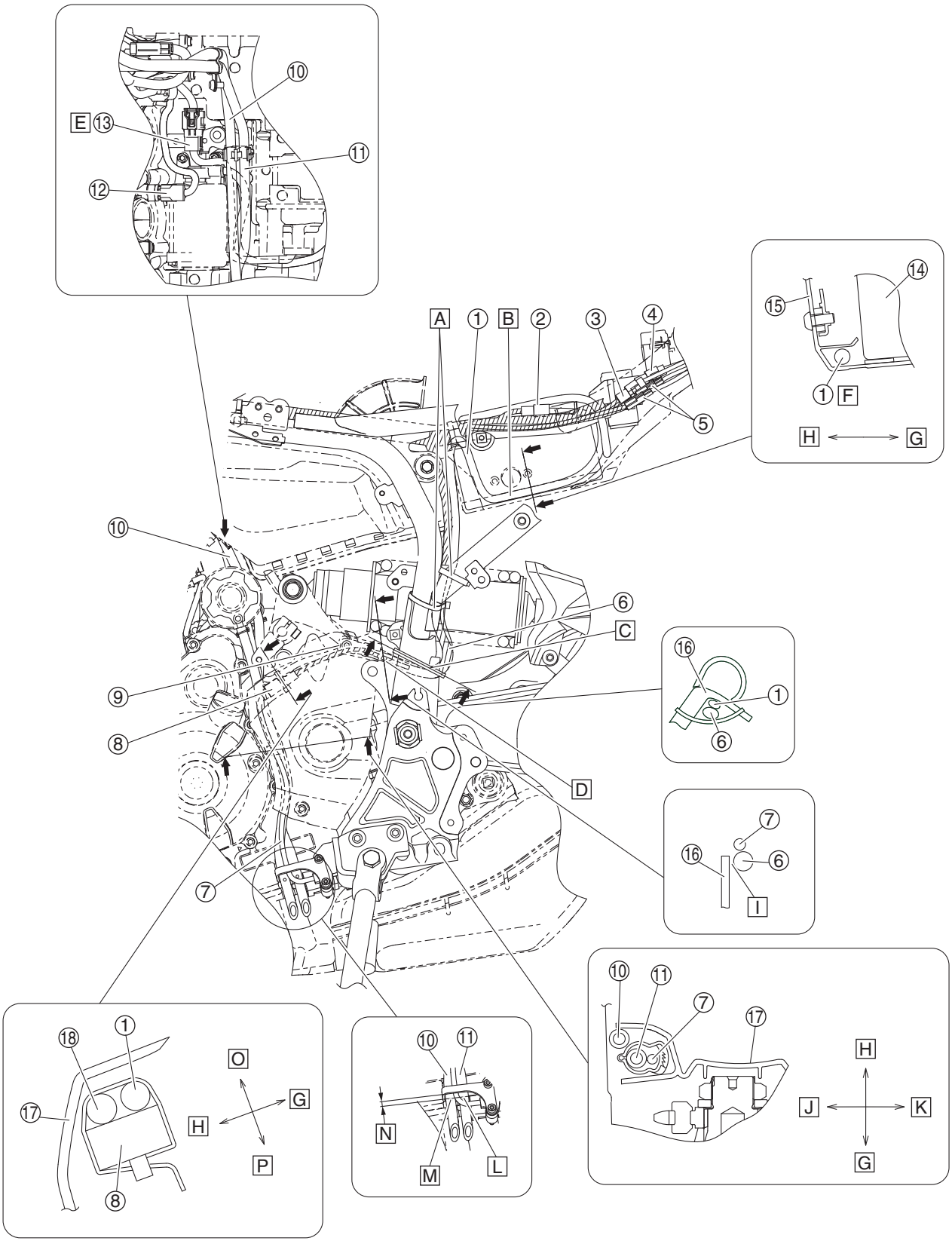
Fuel tank breather hose and fuel tank overflow hose (right side view)



1. Wire harness
2. Clutch cable
3. Oil pressure switch lead
4. Oil pressure switch
5. O_2 sensor
6. O_2 sensor lead
7. Rear brake light switch lead
8. Rear brake light switch
9. O_2 sensor coupler
10. Rear brake light switch coupler
11. Rear wheel sensor coupler
12. Oil pressure switch connector
13. Fuel tank overflow hose
14. Fuel tank breather hose
15. Rear wheel sensor lead

A. Route the oil pressure switch lead through the guide, and then secure the lead by bending the guide around the lead.
B. Route the oil pressure switch lead to the inside of the O_2 sensor lead, and then secure the leads by bending the guides around the leads.
C. Do not pinch the O_2 sensor lead between the pivot shaft protector and the engine.
D. Fasten the rear brake light switch lead and O_2 sensor lead with the holder.
E. To rear brake caliper bracket
F. Connect the O_2 sensor coupler, and then insert the projection on the coupler into the hole in the bracket.
G. Make sure that the wire harness is not pinched between the pivot shaft protector (right) and the frame.
H. Route the wire harness to the inside of the bracket as shown in the illustration so that the harness does not contact the air filter case bolt flange.
I. Less than 10 mm (0.39 in). Fasten the hose protector of each hose with the holder.
J. Make sure that there is no slack in the fuel tank breather hose and fuel tank overflow hose.
K. Forward
L. Rearward
M. Inward
N. Outward

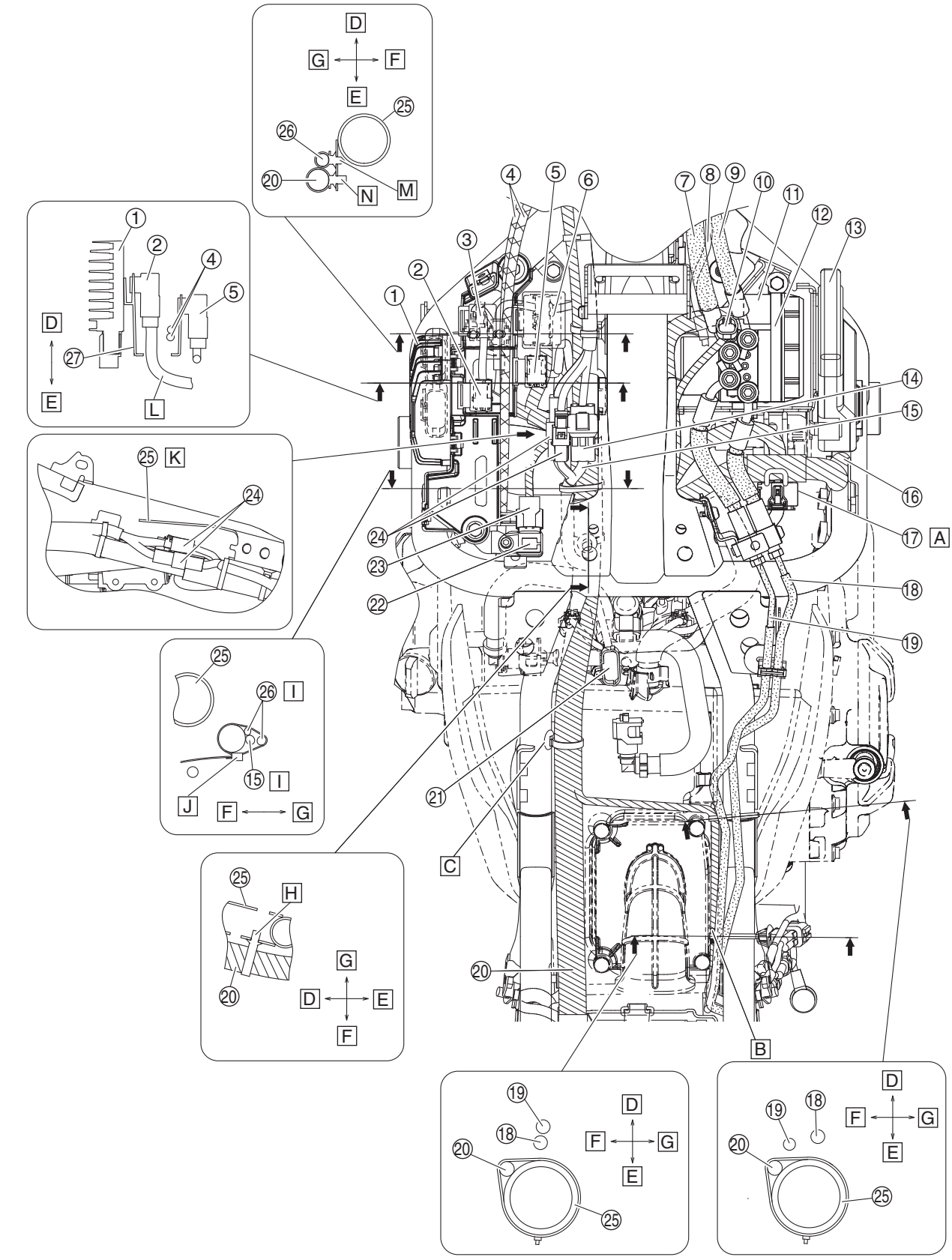
Engine (left side view)



1. Starter motor lead
2. Positive battery sub-wire harness
3. Tail/brake light coupler
4. License plate light coupler
5. Rear turn signal light coupler
6. Engine ground lead
7. Sidestand switch lead
8. Sidestand switch coupler
9. Terminal cover
10. Fuel tank overflow hose
11. Fuel tank breather hose
12. Coolant temperature sensor coupler
13. Gear position switch coupler
14. Battery
15. Battery box
16. Frame
17. Drive sprocket cover
18. Gear position switch lead

A. Fasten the engine ground lead and starter motor lead to the frame with plastic locking ties. Point the end of each plastic locking tie rearward, and then cut off the excess end of the tie to 2 mm (0.08 in) or less.
B. Make sure that the starter motor lead is not twisted.
C. Fasten the starter motor lead and engine ground lead with the holder. Align the white tape on the starter motor lead with the holder.
D. Make sure that there is no twist in the starter motor lead and sidestand switch lead.
E. Insert the projection on the coupler into the hole in the bracket.
F. Fit the starter motor lead between the bottom of the battery box and the rib on the battery box.
G. Inward
H. Outward
I. Do not pinch the sidestand switch lead between the engine ground lead and the frame.
J. Forward
K. Rearward
L. Blue paint mark
M. White paint mark
N. 2–3 mm (0.08–0.12 in)
O. Upward
P. Downward

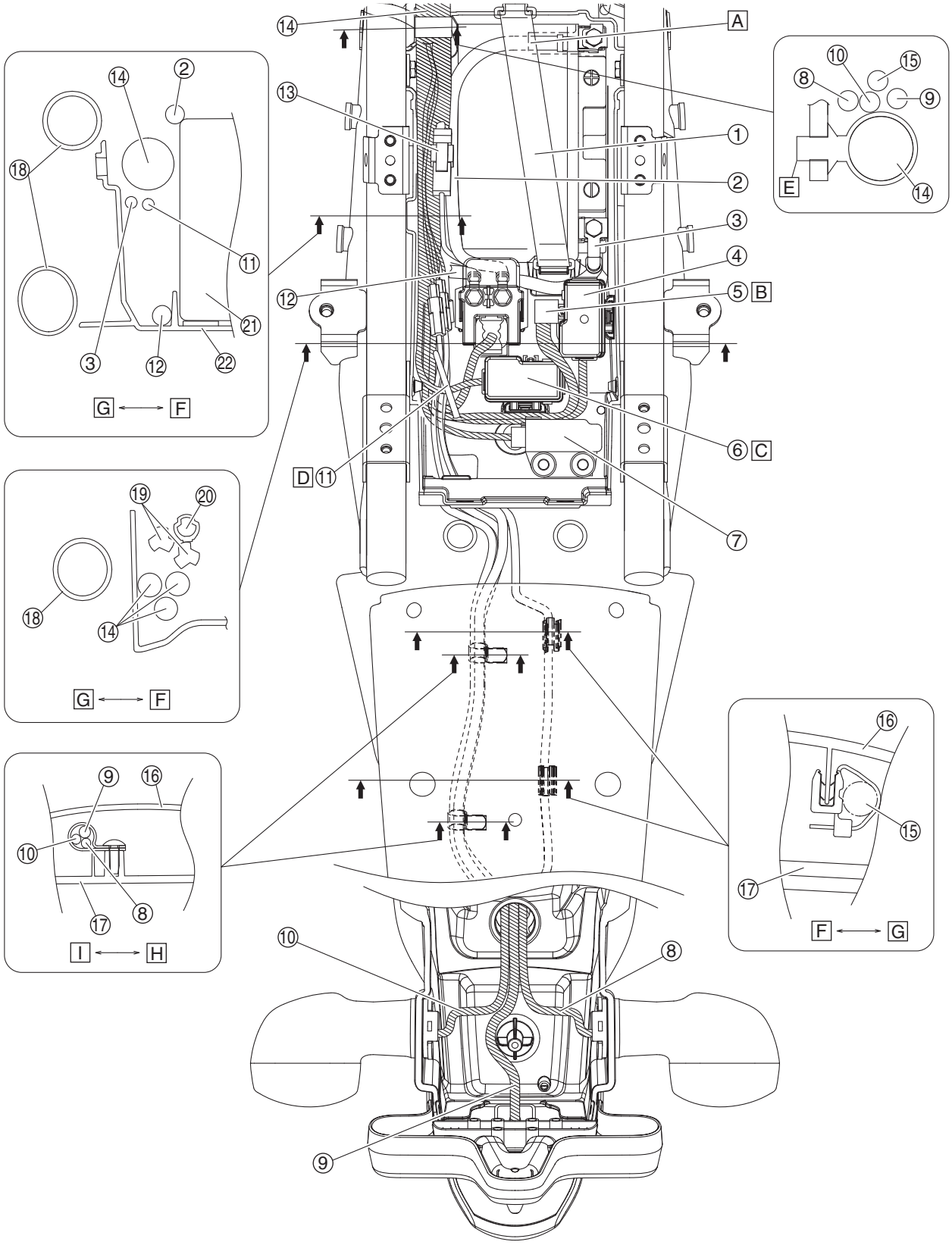
Electrical components tray (top view)



1. Rectifier/regulator
2. Headlight relay
3. Turn signal/hazard relay
4. Throttle cable
5. Radiator fan motor relay
6. Relay unit
7. Brake hose (front brake master cylinder to hydraulic unit)
8. Front wheel sensor lead
9. Brake hose (hydraulic unit to left front brake caliper)
10. Intake air temperature sensor coupler
11. ABS ECU coupler
12. Hydraulic unit assembly
13. ECU (Engine Control Unit)
14. Immobilizer unit coupler
15. Immobilizer unit lead
16. ECU lead
17. Sub-wire harness coupler
18. Brake hose (hydraulic unit to rear brake caliper)
19. Brake hose (rear brake master cylinder to hydraulic unit)
20. Wire harness
21. Fuel pump coupler
22. Intake air pressure sensor
23. Intake air pressure sensor coupler
24. Main switch coupler
25. Frame
26. Main switch lead
27. Electrical components tray 1

A. Insert the projection on the bracket into the hole in the sub-wire harness coupler.
B. White paint mark
C. Insert the projection on the wire harness holder into the hole in the frame.
D. Forward
E. Rearward
F. Inward
G. Outward
H. Insert the projection on the wire harness holder into the hole in the frame from the bottom of the frame.
I. Route the immobilizer unit lead and main switch lead to the outside of the wire harness.
J. Face the buckle of the plastic band downward with the end pointing inward.
K. Position the immobilizer unit coupler and main switch couplers under the frame.
L. Route the headlight relay lead and turn signal/hazard relay lead through the rear hole in the electrical component tray 1.
M. Insert the projection on the main switch lead holder into the upper hole in the frame.
N. Insert the projection on the wire harness holder into the lower hole in the frame.

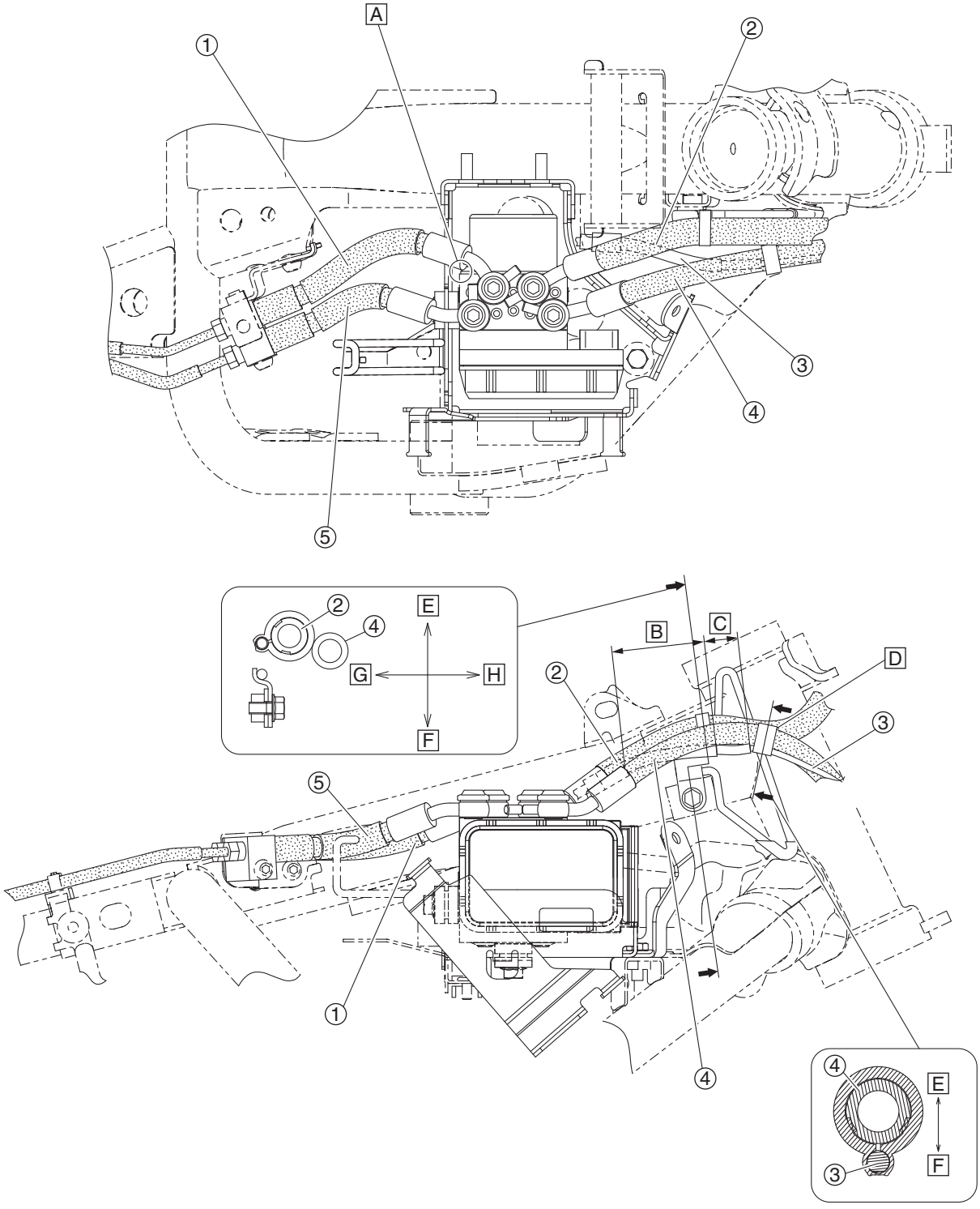
Battery and rear fender (top view)



1. Battery band
2. Positive battery lead
3. Negative battery lead
4. Fuse box 1
5. Yamaha diagnostic tool coupler
6. Fuse box 2
7. Lean angle sensor
8. Rear turn signal light lead (right turn signal light)
9. License plate light lead
10. Rear turn signal light lead (left turn signal light)
11. Seat lock cable
12. Starter motor lead
13. Positive battery sub-wire harness coupler
14. Wire harness
15. Tail/brake light lead
16. Rear fender
17. Lower fender cover
18. Frame
19. Rear turn signal light coupler
20. License plate light coupler
21. Battery
22. Battery box

A. Route the positive battery lead through the hole in the battery band.
B. Position the Yamaha diagnostic tool lead and coupler above fuse boxes 1 and 2 as shown in the illustration.
C. Connect all of the couplers near fuse box 2, and then install fuse box 2 to the battery box.
D. Route the seat lock cable over the each lead.
E. Insert the projection on the wire harness holder into the hole in the battery box.
F. Inward
G. Outward
H. Right
I. Left

Hydraulic unit assembly (top and right side view)



1. Brake hose (rear brake master cylinder to hydraulic unit)
2. Brake hose (front brake master cylinder to hydraulic unit)
3. Front wheel sensor lead
4. Brake hose (hydraulic unit to left front brake caliper)
5. Brake hose (hydraulic unit to rear brake caliper)

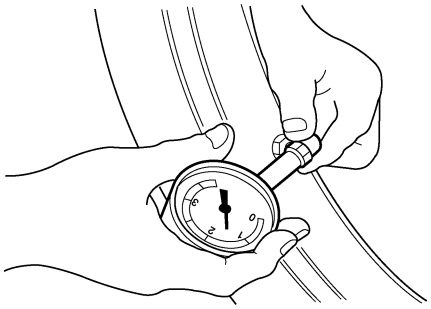
A. Make sure that the pipe section of the brake hose (rear brake master cylinder to hydraulic unit) does not contact the hydraulic unit.
B. Protective sleeve and tape
C. Tape
D. Fasten the front wheel sensor lead to the brake hose (hydraulic unit to left front brake caliper) with the holder. Align the edge of the holder with the edge of the tape on the front wheel sensor lead as shown in the illustration.
E. Upward
F. Downward
G. Inward
H. Outward

EAS20022
PERIODIC MAINTENANCE

EAS30640
CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   - Tire pressure
     Out of specification → Regulate.



EWA13181
⚠ WARNING

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded vehicle could cause tire damage, an accident or an injury.

NEVER OVERLOAD THE VEHICLE.

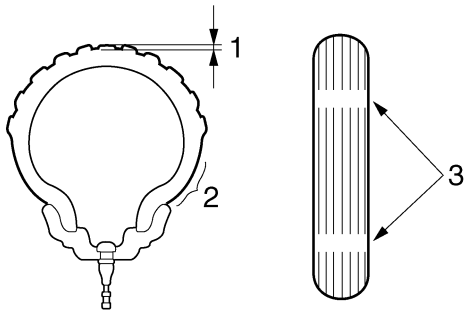
Tire air pressure (measured on cold tires)
Loading condition
0–173 kg (0–381 lb)
Front
225 kPa (2.25 kgf/cm², 33 psi)
Rear
250 kPa (2.50 kgf/cm², 36 psi)
High-speed riding
Front
225 kPa (2.25 kgf/cm², 33 psi)
Rear
250 kPa (2.50 kgf/cm², 36 psi)
Maximum load
172 kg (379 lb)

*** Total weight of rider, passenger, cargo and accessories**

2. Check:
   - Tire surfaces
     Damage/wear → Replace the tire.

EWA13190
⚠ WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.



1. Tire tread depth
2. Side wall
3. Wear indicator

Wear limit (front)
1.5 mm (0.06 in)
Wear limit (rear)
1.5 mm (0.06 in)

EWA14090
⚠ WARNING

After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this vehicle.

Front tire
Size
120/70 R17M/C (58V)
Manufacturer/model
PIRELLI/PHANTOM SPORTSCOMP

Rear tire
Size
180/55 R17M/C (73V)
Manufacturer/model
PIRELLI/PHANTOM SPORTSCOMP

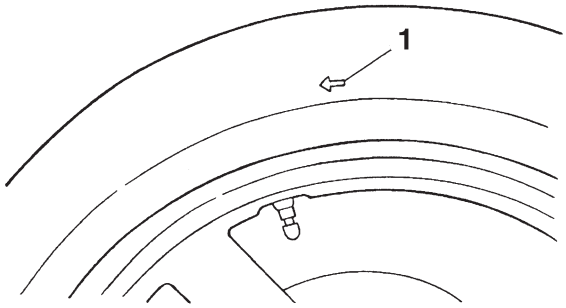
EWA13210

⚠ WARNING

New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

TIP

For tires with a direction of rotation mark “1”: Install the tire with the mark pointing in the direction of wheel rotation.



EAS20041
ENGINE INSPECTION

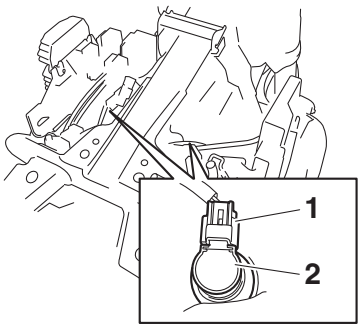
EAS30249
MEASURE THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

TIP

Insufficient compression pressure will result in a loss of performance.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3. (Manual No.: B34-F8197-E0)
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
   - Seat
     Refer to "GENERAL CHASSIS (1)" in chapter 4. (Manual No.: B34-F8197-E0)
   - Fuel tank center cover
   - Air scoops
     Refer to "GENERAL CHASSIS (3)" in chapter 4. (Manual No.: B34-F8197-E0)
   - Fuel tank
     Refer to "FUEL TANK" on page 38.
4. Disconnect:
   - Ignition coil couplers "1"
5. Remove:
   - Ignition coils "2"



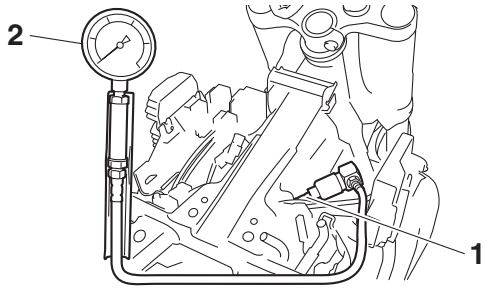
6. Remove:
   - Spark plugs

ECA13340
NOTICE

Before removing the spark plugs, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinders.

7. Install:
   - Extension "1"
   - Compression gauge "2"

Extension
90890-04136
Compression gauge
90890-03081
Engine compression tester
YU-33223



8. Measure:
   - Compression pressure
     Out of specification → Refer to steps (c) and (d).

TIP

Due to the engine characteristics, the compression pressure is different for cylinder #1 and cylinder #2.

Compression pressure (#1 cylinder)
630–850 kPa/495 r/min (6.3–8.5 kgf/cm²/495 r/min, 89.6–120.9 psi/495 r/min)
Compression pressure (#2 cylinder)
610–830 kPa/495 r/min (6.1–8.3 kgf/cm²/495 r/min, 86.8–118.1 psi/495 r/min)

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a. Turn the main switch to "ON".
b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

EWA12940
⚠ WARNING

To prevent sparking, ground all spark plug leads before cranking the engine.

TIP

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm², 14 psi).

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces and piston crown for carbon deposits.
   Carbon deposits → Eliminate.
d. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.
   Refer to the following table.

Compression pressure (with oil applied into the cylinder)	
Reading	Diagnosis
Higher than without oil	Piston ring(s) wear or damage → Repair.
Same as without oil	Pistons, valves, cylinder head gasket or piston ring(s) possibly defective → Repair.

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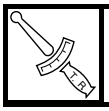
9. Install:
   • Spark plugs
   • Ignition coils

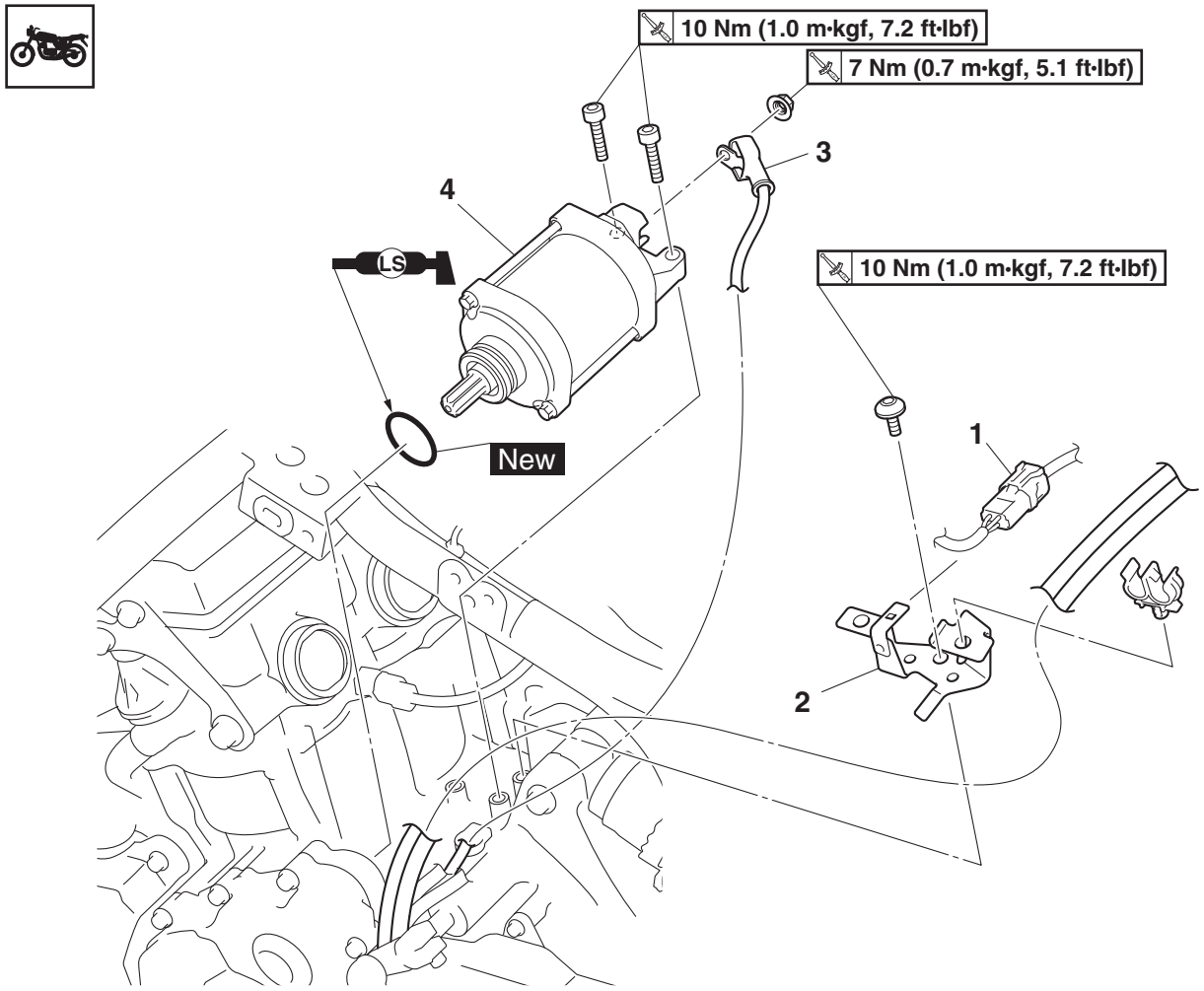


Spark plug
13 Nm (1.3 m·kgf, 9.4 ft·lbf)

10. Connect:
    • Ignition coil couplers
11. Install:
    • Fuel tank
      Refer to “FUEL TANK” on page 38.
    • Air scoops
    • Fuel tank center cover
    • Fuel tank cover (left)
    • Fuel tank cover (right)
    • Fuel tank top cover
      Refer to “GENERAL CHASSIS (3)” in chapter 4. (Manual No.: B34-F8197-E0)
    • Seat
      Refer to “GENERAL CHASSIS (1)” in chapter 4. (Manual No.: B34-F8197-E0)

EAS20052
ELECTRIC STARTER

Removing the starter motor



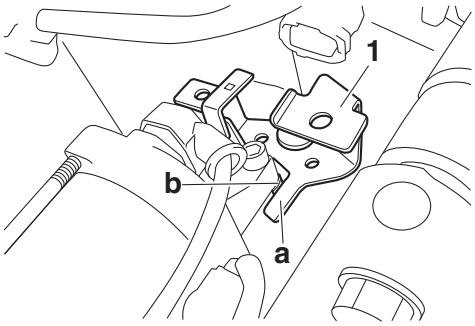
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS (1)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank center cover/Outer side covers/Inner side covers		Refer to "GENERAL CHASSIS (3)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank		Refer to "FUEL TANK" on page 38.
	Pivot shaft protectors		Refer to "SWINGARM" in chapter 4. (Manual No.: B34-F8197-E0)
	Air duct bracket		Refer to "GENERAL CHASSIS (4)" in chapter 4. (Manual No.: B34-F8197-E0)
	Throttle bodies/Air filter case		Refer to "THROTTLE BODIES" on page 43.
1	Gear position switch coupler	1	
2	Coupler and hose bracket	1	
3	Starter motor lead	1	Disconnect.
4	Starter motor	1	

EAS30327
INSTALLING THE STARTER MOTOR

1. Install:
   • Coupler and hose holder bracket “1”

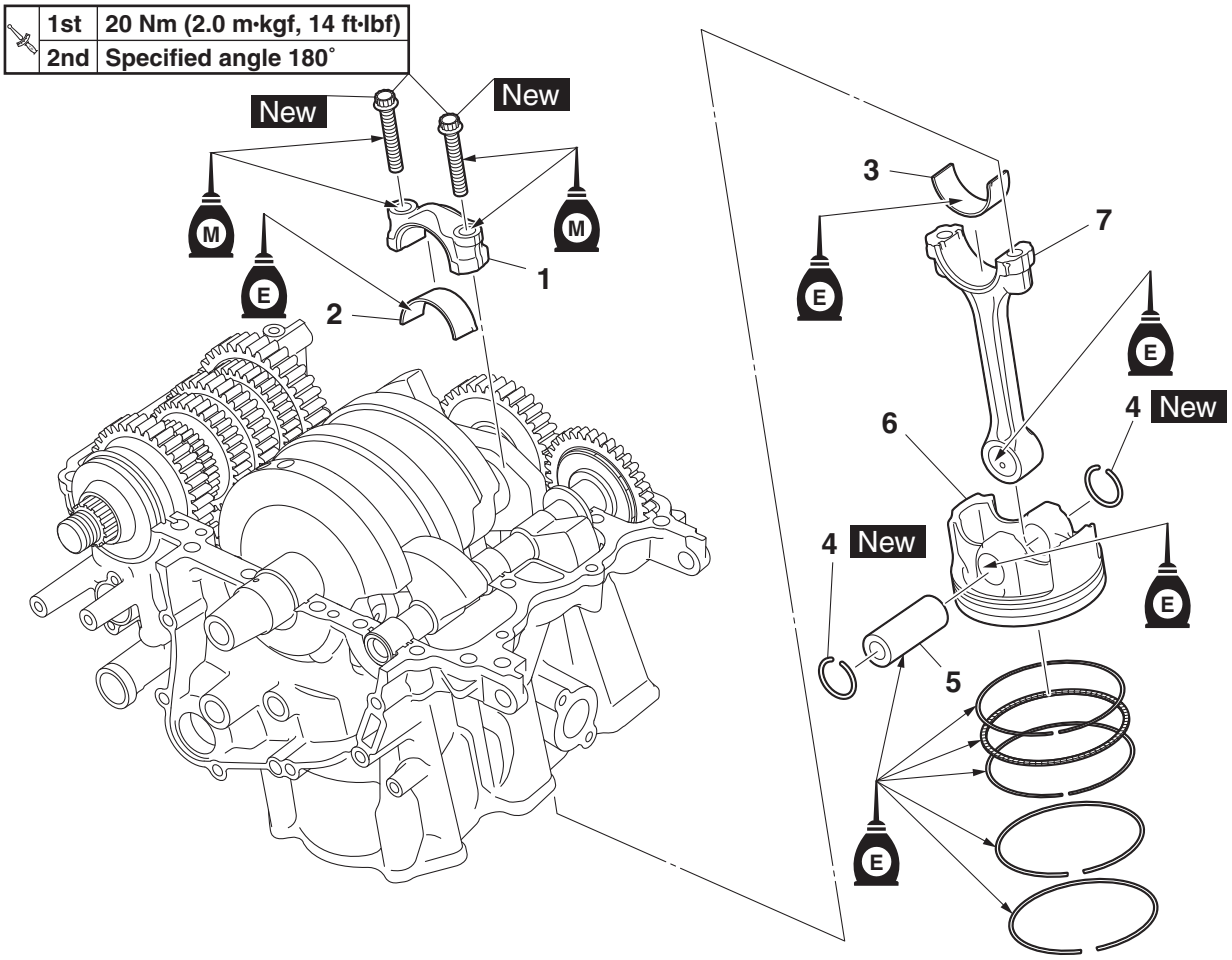
TIP

Make sure that the tab “a” on the coupler and hose holder bracket contacts the projection “b” on the cylinder block.



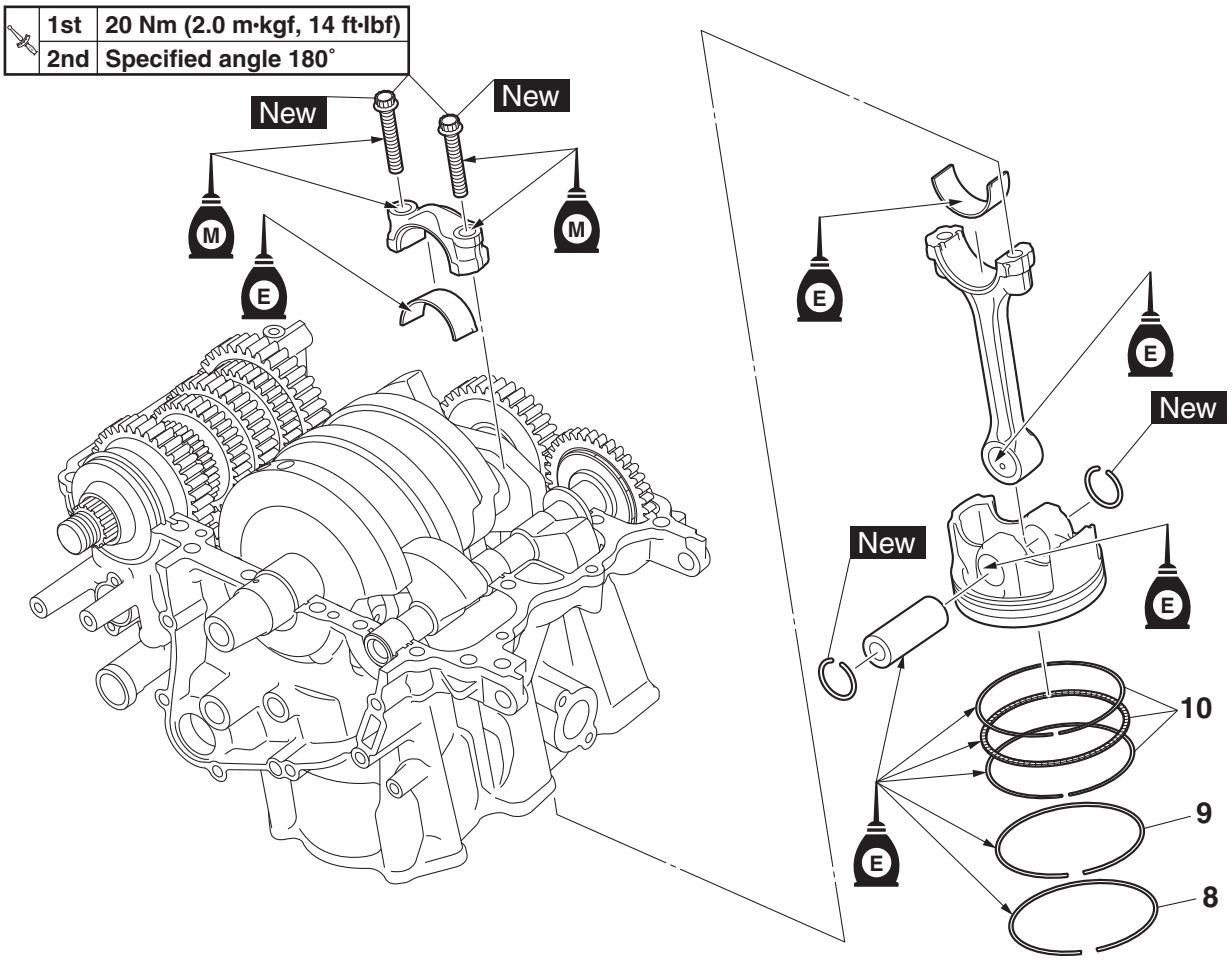
EAS20132
CONNECTING RODS AND PISTONS

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to all of the connecting rods and pistons.
			Refer to "CRANKCASE" in chapter 5. (Manual No.: B34-F8197-E0)
1	Connecting rod cap	1	
2	Big end lower bearing	1	
3	Big end upper bearing	1	
4	Piston pin clip	2	
5	Piston pin	1	
6	Piston	1	
7	Connecting rod	1	

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
8	Top ring	1	
9	2nd ring	1	
10	Oil ring	1	

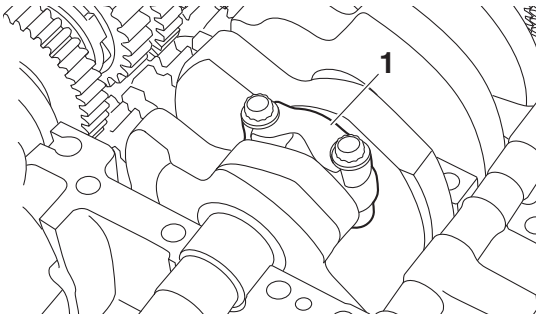
EAS30745
REMOVING THE CONNECTING RODS AND PISTONS

The following procedure applies to all of the connecting rods and pistons.

1. Remove:
   - Connecting rod cap “1”
   - Connecting rod
   - Big end bearings

TIP

- Identify the position of each connecting rod cap so that it can be reinstalled in its original place.
- After removing the connecting rods and connecting rod caps, care should be taken not to damage the mating surfaces of the connecting rods and connecting rod caps.



2. Remove:
   - Piston pin clips “1”
   - Piston pin “2”
   - Piston “3”
   - Connecting rod “4”

ECA13810

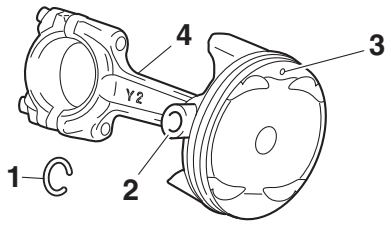
NOTICE

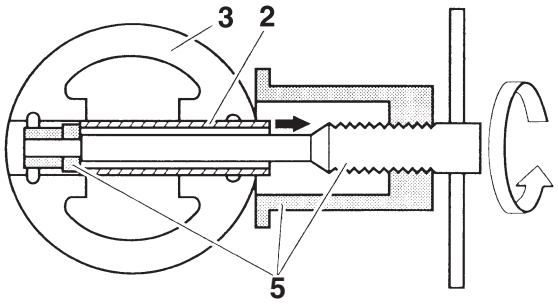
Do not use a hammer to drive the piston pin out.

TIP

- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are debarred and the piston pin is still difficult to remove, remove it with the piston pin puller set “5”.

Piston pin puller set
90890-01304
Piston pin puller
YU-01304

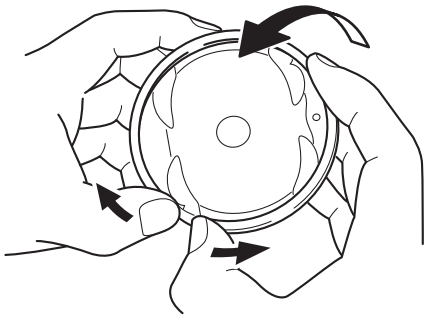




3. Remove:
   - Top ring
   - 2nd ring
   - Oil ring

TIP

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



EAS30747
CHECKING THE CYLINDER AND PISTON

The following procedure applies to all of the cylinders and pistons.

1. Check:
   - Piston wall
   - Cylinder wall
     Vertical scratches → Replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   - Piston-to-cylinder clearance

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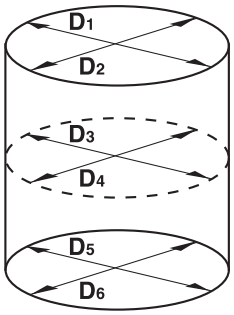
a. Measure cylinder bore with the cylinder bore gauge.

TIP

Measure cylinder bore by taking side-to-side and front-to-back measurements of the cylinder.

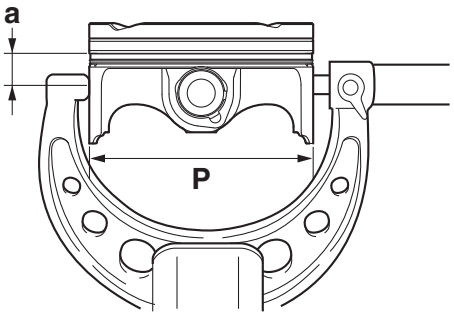
Bore
78.000–78.010 mm (3.0709–3.0713 in)
Taper limit
0.050 mm (0.0020 in)
Out of round limit
0.050 mm (0.0020 in)

"C" = maximum of D_1, D_2, D_3, D_4, D_5, D_6
Taper (front-to-back) = maximum difference between D_1, D_3, D_5 Taper (side-to-side) = maximum difference between D_2, D_4, D_6
Out of round (top) = difference between D_1, D_2 Out of round (middle) = difference between D_3, D_4 Out of round (bottom) = difference between D_5, D_6



b. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter "P" with the micrometer.

Diameter
77.970–77.985 mm (3.0697–3.0703 in)



a. 8.0 mm (0.31 in) from the bottom edge of the piston

d. If out of specification, replace the piston and piston rings as a set.
e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance =
Cylinder bore "C" – Piston skirt diameter "P"

f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.

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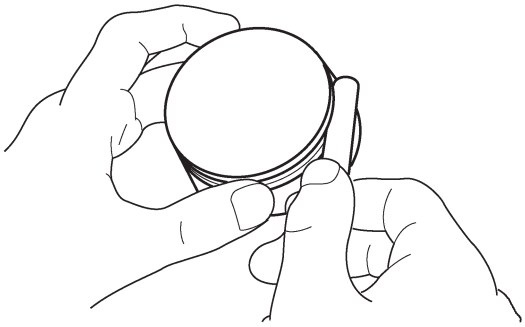
EAS30748
CHECKING THE PISTON RINGS

1. Measure:
   • Piston ring side clearance
   Out of specification → Replace the piston and piston rings as a set.

TIP

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Top ring
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)
Side clearance limit
0.115 mm (0.0045 in)
Ring side clearance
0.020–0.055 mm (0.0008–0.0022 in)
Side clearance limit
0.115 mm (0.0045 in)



2. Install:
   • Piston ring
   (into the cylinder)

TIP

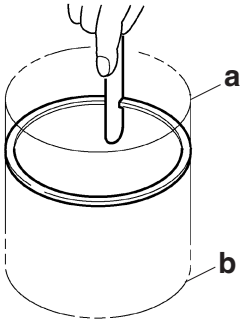
Use the piston crown to level the piston ring near the bottom of the cylinder where the cylinder wear is lowest.

3. Measure:
   • Piston ring end gap
   Out of specification → Replace the piston ring.

TIP

The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring
Top ring
End gap (installed)
0.15–0.25 mm (0.0059–0.0098 in)
End gap limit
0.50 mm (0.0197 in)
2nd ring
End gap (installed)
0.30–0.45 mm (0.0118–0.0177 in)
End gap limit
0.80 mm (0.0315 in)
Oil ring
End gap (installed)
0.10–0.40 mm (0.0039–0.0157 in)



a. Bottom of cylinder
b. Top of cylinder

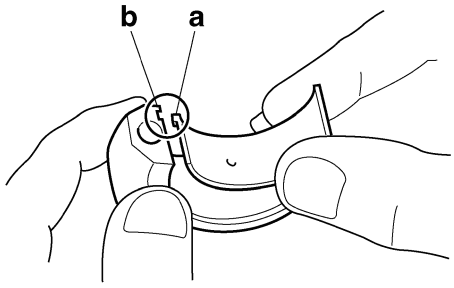
EAS30751
INSTALLING THE CONNECTING ROD AND PISTON

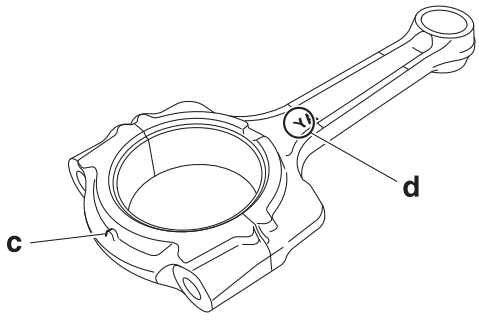
The following procedure applies to all of the connecting rods and pistons.

1. Install:
   • Big end bearings
   • Connecting rod cap
   (onto the connecting rod)

TIP

- Be sure to reinstall each big end bearing in its original place.
- Align the projections "a" on the big end bearings with the notches "b" in the connecting rods and connecting rod caps.
- Make sure that the projection "c" on the connecting rod cap faces the same direction as the "Y" mark "d" on the connecting rod.





2. Tighten:
   • Connecting rod bolts New

ECA18390

NOTICE

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts.

TIP

Install by carrying out the following procedures in order to assemble in the most suitable condition.

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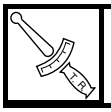
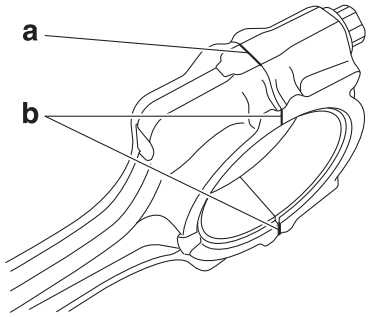
a. Replace the connecting rod bolts with new ones.
b. Clean the connecting rod bolts and lubricate the bolt threads and seats with molybdenum disulfide oil.
c. After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.
d. Tighten the connecting rod bolt while checking that the sections shown "a" and "b" are flush with each other by touching the surface.

	**Connecting rod bolt** **30 Nm (3.0 m·kgf, 22 ft·lbf)**

TIP

To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.



a. Side machined face
b. Thrusting faces

e. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

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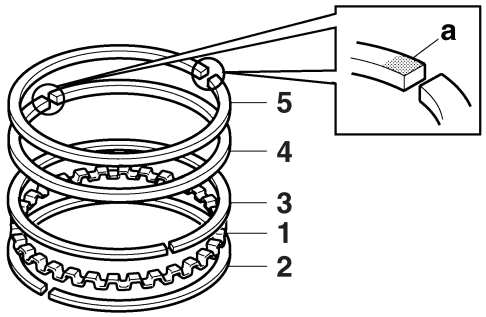
3. Install:
   • Oil ring expander "1"
   • Lower oil ring rail "2"
   • Upper oil ring rail "3"
   • 2nd ring "4"
   • Top ring "5"

TIP

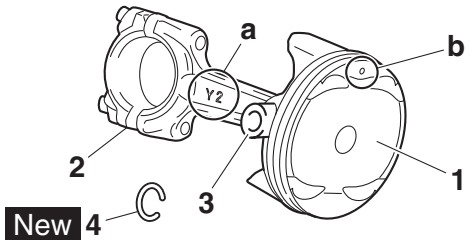
Be sure to install the piston rings so that the manufacturer's marks "a" face up.

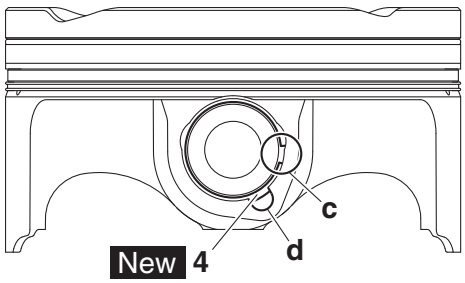


4. Install:
   • Piston "1"
   (onto the respective connecting rod "2")
   • Piston pin "3"
   • Piston pin clips "4" New

TIP

• Apply engine oil onto the piston pin.
• Make sure that the "Y" mark "a" on the connecting rod faces left when the punch mark "b" on the piston is pointing up as shown.
• When installing a piston pin clip, make sure that the clip ends "c" are positioned away from the cutout "d" in the piston as shown in the illustration.
• Reinstall each piston into its original cylinder.

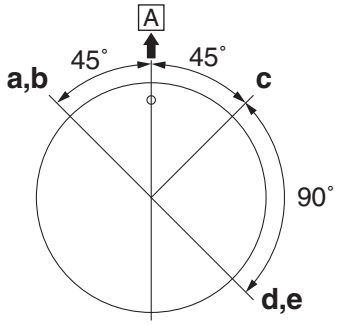




5. Lubricate:
   • Piston
   • Piston rings
   • Cylinder
   (with the recommended lubricant)

Recommended lubricant
Engine oil

6. Offset:
   • Piston ring end gaps



a. 2nd ring
b. Lower oil ring rail
c. Upper oil ring rail
d. Top ring
e. Oil ring expander
A. Exhaust side

7. Lubricate:
   • Crankshaft pin
   • Connecting rod big end bearing inner surface
   (with the recommended lubricant)

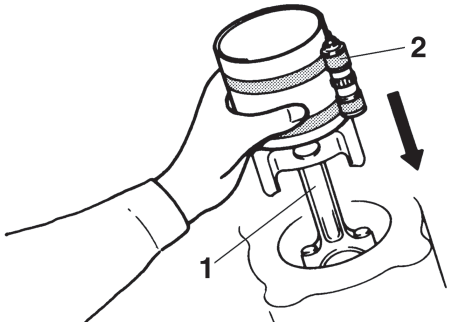
Recommended lubricant
Engine oil

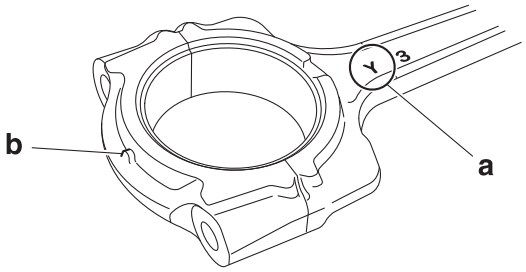
8. Install:
   • Connecting rod assemblies “1”
   (into the cylinder and onto the crankshaft pin)
   • Connecting rod caps
   (onto the connecting rod)

TIP

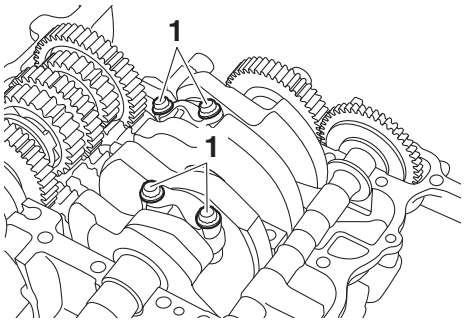
- While compressing the piston ring with piston ring compressor “2”, install the connecting rod assembly into the cylinder with the other hand.
- Make sure the “Y” marks “a” on the connecting rods face towards the left side of the crankshaft.
- Make sure that the projection “b” on the connecting rod cap faces the same direction as the “Y” mark “a” on the connecting rod.
- Apply Molybdenum disulfide oil to the threads and seats of the connecting rod bolt.

Piston ring compressor
90890-05158
Piston ring compressor
YM-08037





9. Tighten:
   • Connecting rod bolts “1”



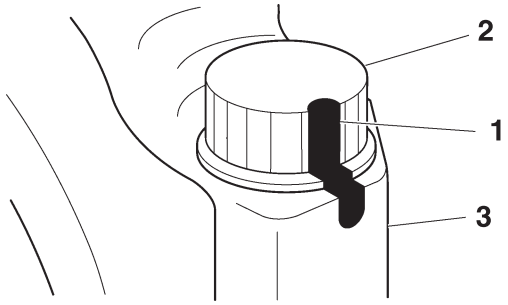
TIP

Tighten the connecting rod bolts using the following procedure.

a. Tighten the connecting rod bolts with a torque wrench.

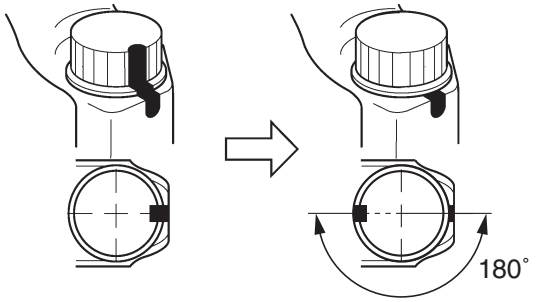
Connecting rod bolt (1st)
20 Nm (2.0 m·kgf, 14 ft·lbf)

b. Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”.



c. Tighten the connecting rod bolts further to reach the specified angle 175–185°.

	Connecting rod bolt (final) **Specified angle 180°**



EWA16610

WARNING

If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890

NOTICE

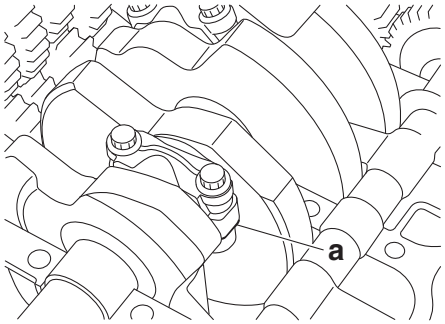
Do not use a torque wrench to tighten the bolt to the specified angle.

d. After the installation, check that the section shown “a” is flush with each other by touching the surface.

EWA17120

WARNING

If the connecting rod and cap are not flush with each other, remove the connecting rod bolts and big end bearing and restart from step (1). In this case, make sure to replace the connecting rod bolts.



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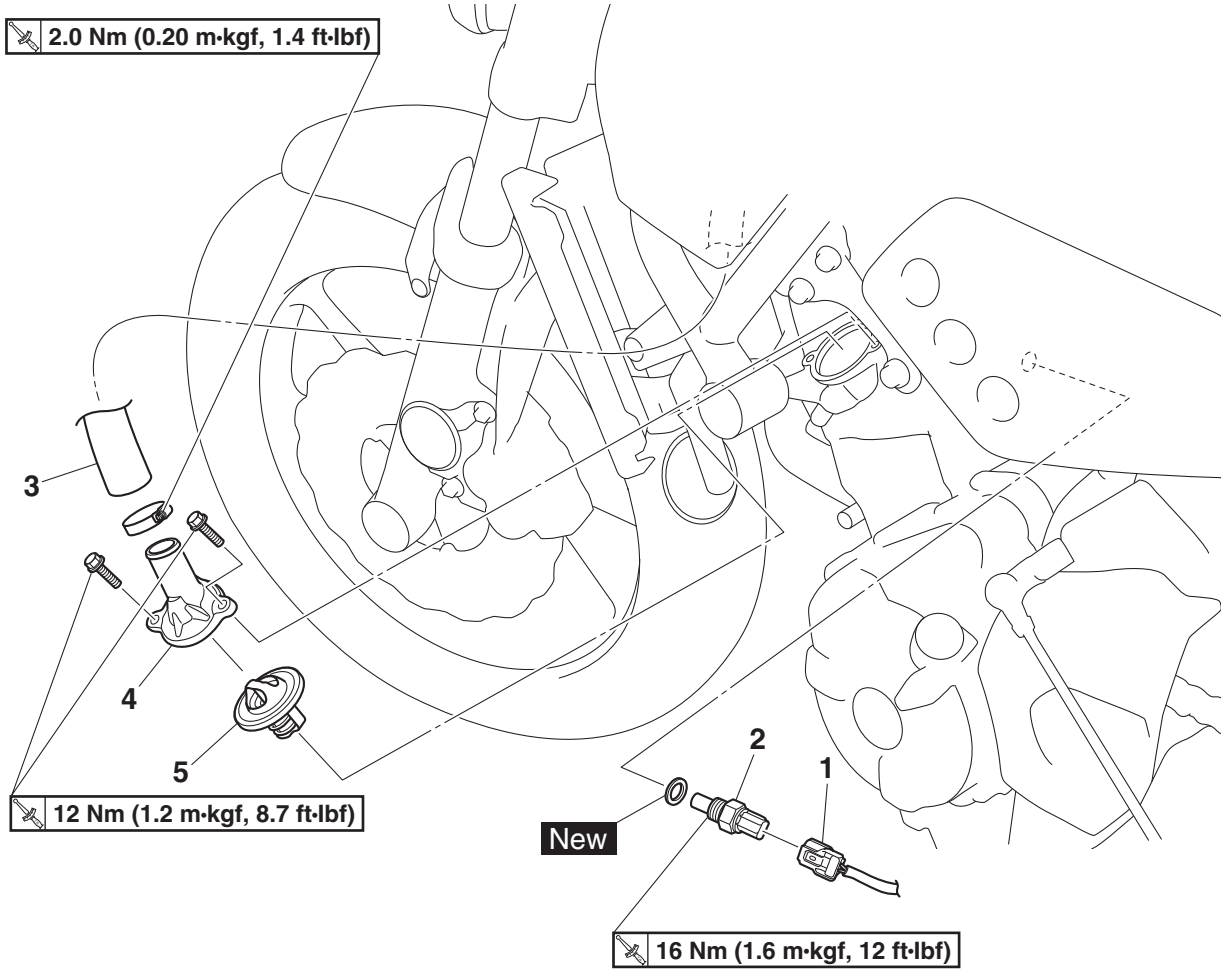
EAS20065
THERMOSTAT

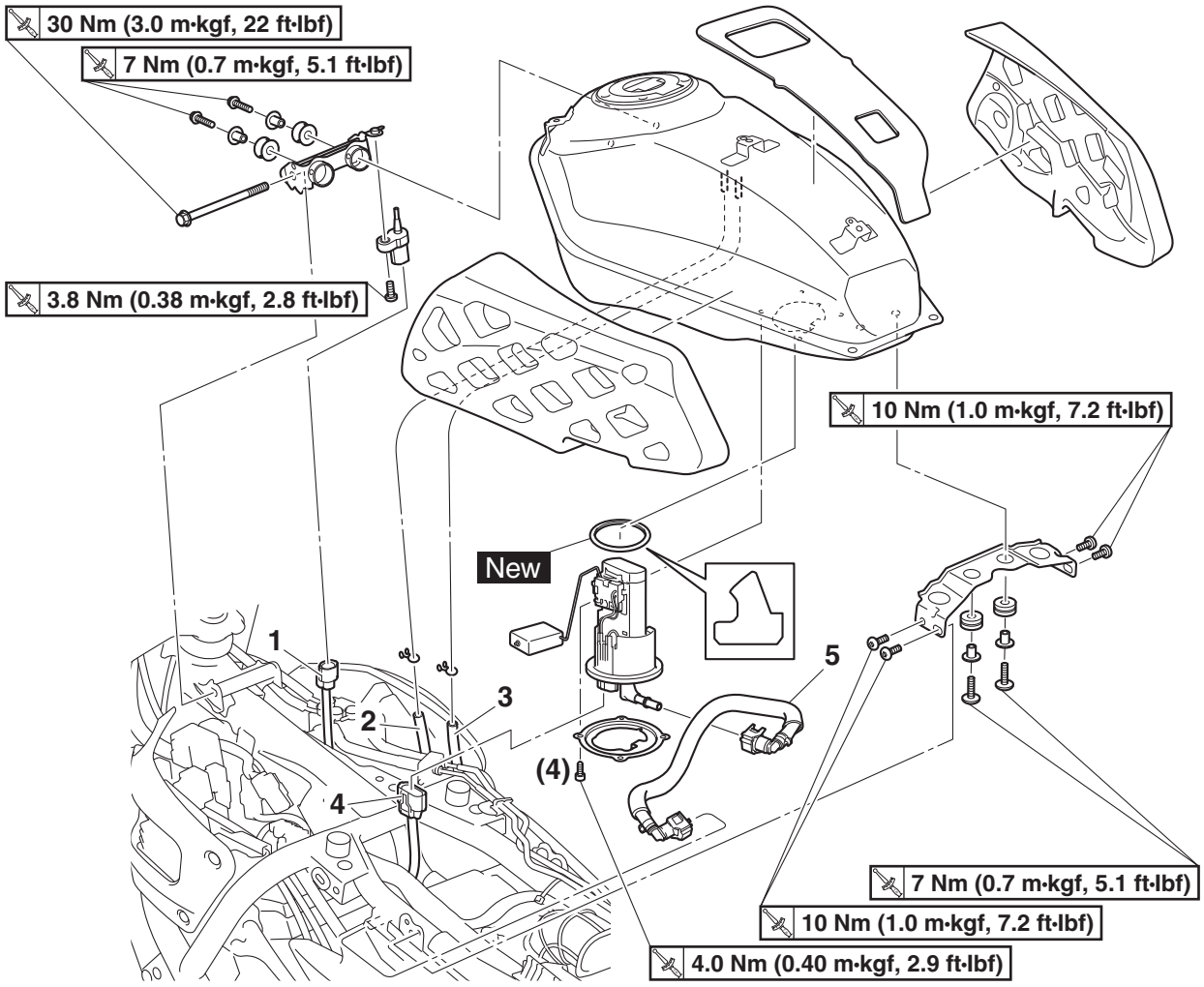
Removing the thermostat



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3. (Manual No.: B34-F8197-E0)
	Seat		Refer to "GENERAL CHASSIS (1)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank center cover		Refer to "GENERAL CHASSIS (3)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank		Refer to "FUEL TANK" on page 38.
1	Coolant temperature sensor coupler	1	Disconnect.
2	Coolant temperature sensor	1	
3	Radiator inlet hose	1	Disconnect.
4	Thermostat cover	1	
5	Thermostat	1	

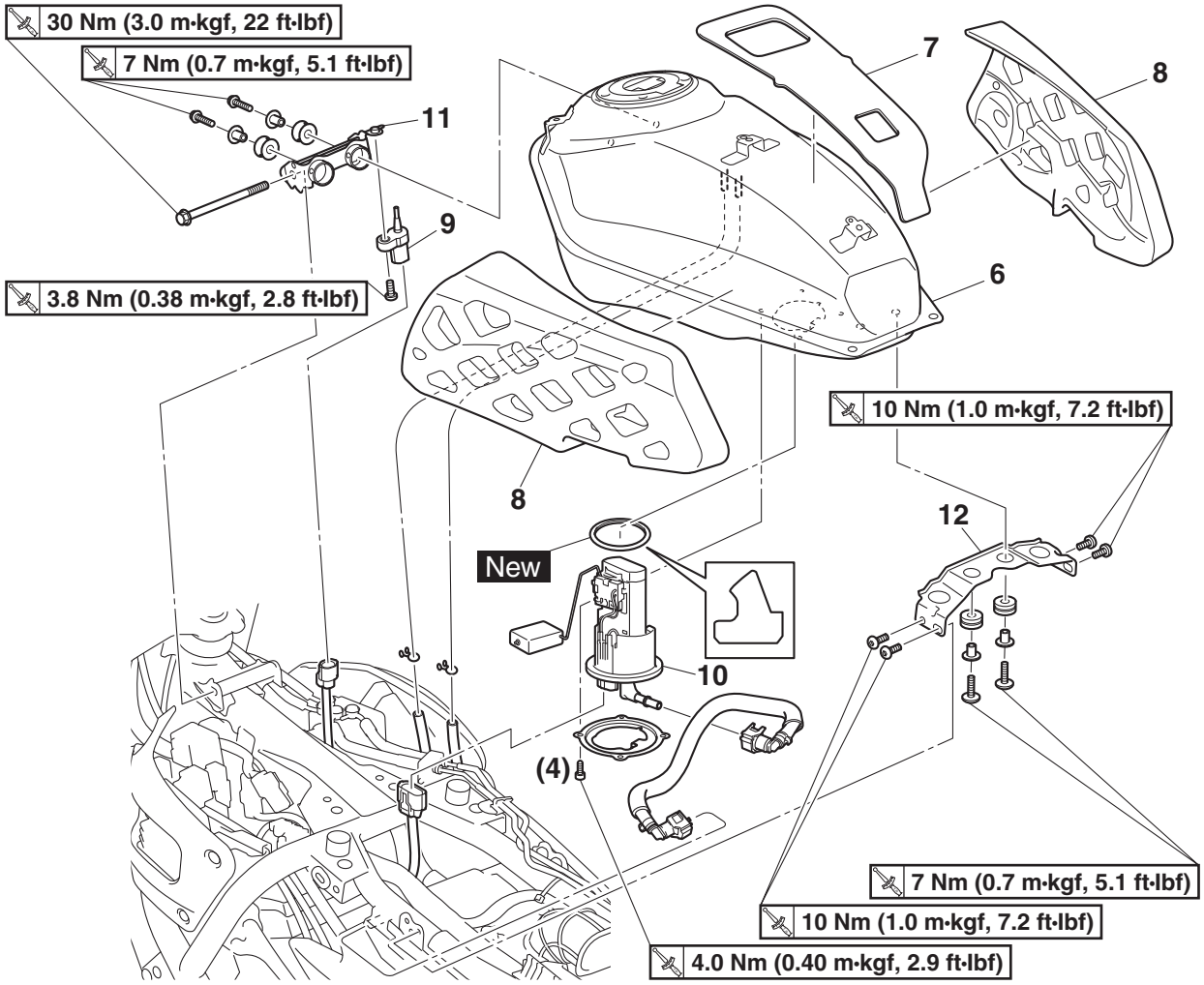
EAS20067
FUEL TANK

Removing the fuel tank and fuel pump



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS (1)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank center cover/Inner side cover (left)		Refer to "GENERAL CHASSIS (3)" in chapter 4. (Manual No.: B34-F8197-E0)
1	Intake air temperature sensor coupler	1	Disconnect.
2	Fuel tank overflow hose	1	Disconnect.
3	Fuel tank breather hose	1	Disconnect.
4	Fuel pump coupler	1	Disconnect.
5	Fuel hose	1	

Removing the fuel tank and fuel pump



Order	Job/Parts to remove	Q'ty	Remarks
6	Fuel tank	1	
7	Damper 1	1	
8	Damper 2	2	
9	Intake air temperature sensor	1	
10	Fuel pump	1	
11	Front fuel tank bracket	1	
12	Rear fuel tank bracket	1	

EAS30450
REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
   • Fuel hose

EWA17320
⚠ WARNING

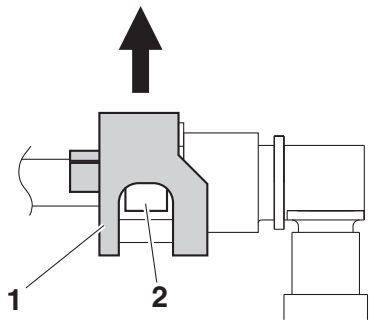
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA20020
NOTICE

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

TIP

- To remove the fuel hose from the fuel rail and fuel pump, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown, press the two buttons "2" on the sides of the connector, and then remove the hose.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.



3. Remove:
   • Fuel tank

TIP

Do not set the fuel tank down on the installation surface of the fuel pump. Be sure to lean the fuel tank against a wall or the like.

EAS30451
REMOVING THE FUEL PUMP

1. Remove:
   • Fuel pump

ECA14721
NOTICE

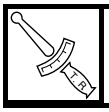
- **Do not drop the fuel pump or give it a strong shock.**
- **Do not touch the base section of the fuel sender.**

EAS30454
CHECKING THE FUEL PUMP BODY

1. Check:
   • Fuel pump body
   Obstruction → Clean.
   Cracks/damage → Replace fuel pump assembly.

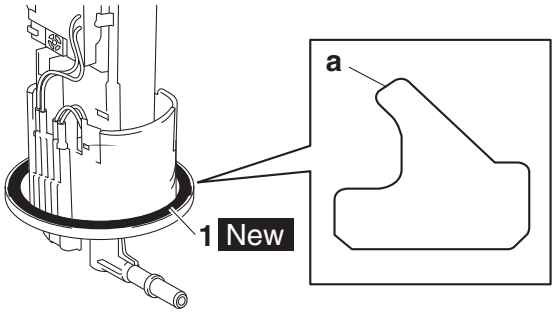
EAS30456
INSTALLING THE FUEL PUMP

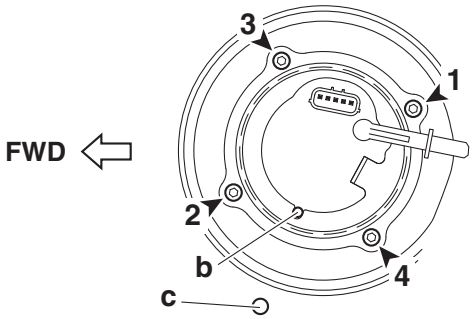
1. Install:
   • Fuel pump gasket "1" New
   • Fuel pump
   • Fuel pump bracket

	**Fuel pump bolt** **4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)**

TIP

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- The gasket lip "a" shall face toward the fuel tank.
- Align the projection "b" on the fuel pump with the punch mark "c" on the fuel tank.
- Align the slot in the fuel pump bracket with the projection "b" on the fuel pump.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



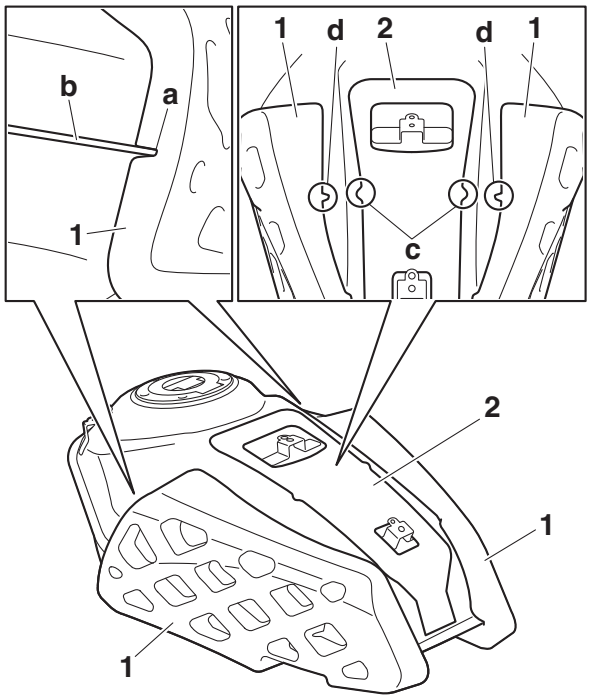


EAS31801
INSTALLING THE DAMPERS

1. Install:
   - Damper 2 “1”
   - Damper 1 “2”

TIP

- Fit the slot “a” in each damper 2 over the rib “b” on the fuel tank.
- Align the projections “c” on damper 1 with the projection “d” on each damper 2.



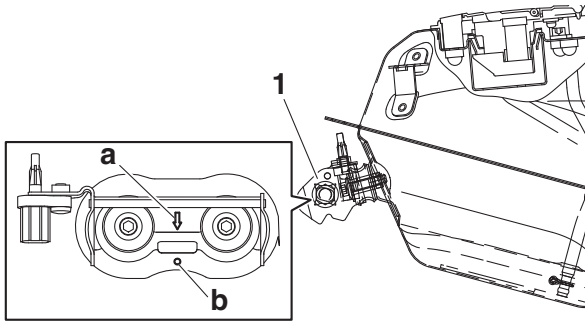
EAS31081
INSTALLING THE FUEL TANK BRACKET

1. Install:
   - Grommets
   - Collars
   - Front fuel tank bracket “1”

Fuel tank bolt (front side)
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

TIP

Make sure that the arrow mark “a” on the front fuel tank bracket points toward the hole “b” in the fuel tank.

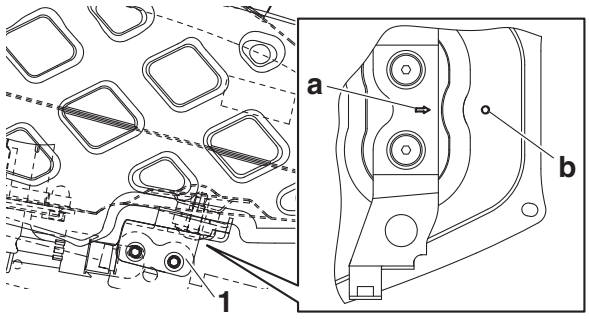


2. Install:
   - Grommets
   - Collars
   - Rear fuel tank bracket “1”

Fuel tank bolt (rear side)
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

TIP

Make sure that the arrow mark “a” on the rear fuel tank bracket points toward the punch mark “b” on the fuel tank.



EAS30457
INSTALLING THE FUEL TANK

1. Tighten:
   - Front fuel tank bracket bolt (temporarily)

TIP

Temporarily tighten the front fuel tank bracket bolt.

2. Install:
   • Fuel hose

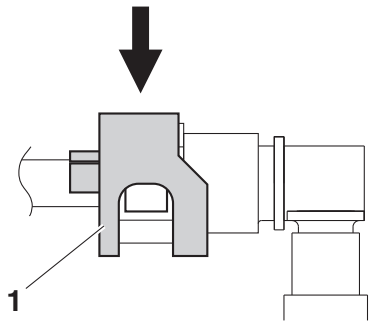
ECA18420

NOTICE

When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover on the fuel hose is in the correct position; otherwise, the fuel hose will not be properly installed.

TIP

- Install the fuel hose securely onto the fuel rail and fuel pump until a distinct “click” is heard.
- To install the fuel hose, slide the fuel hose connector cover “1” on each end of the hose in the direction of the arrow shown.



3. Connect:
   • Fuel pump coupler
   • Fuel tank breather hose
   • Fuel tank overflow hose
   • Intake air temperature sensor
4. Tighten:
   • Rear fuel tank bracket bolts

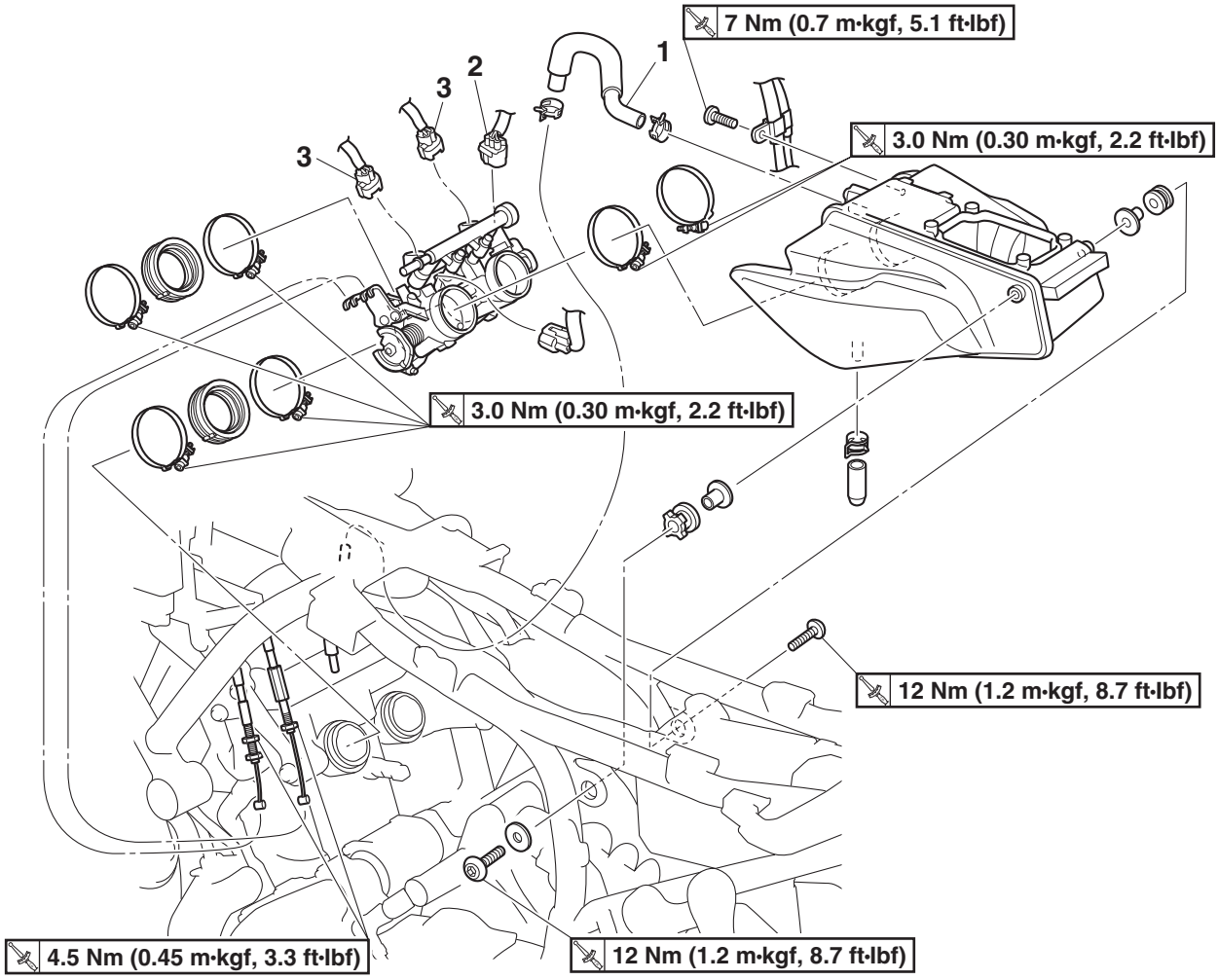
	Rear fuel tank bracket bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

5. Tighten:
   • Front fuel tank bracket bolt

	Front fuel tank bracket bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)

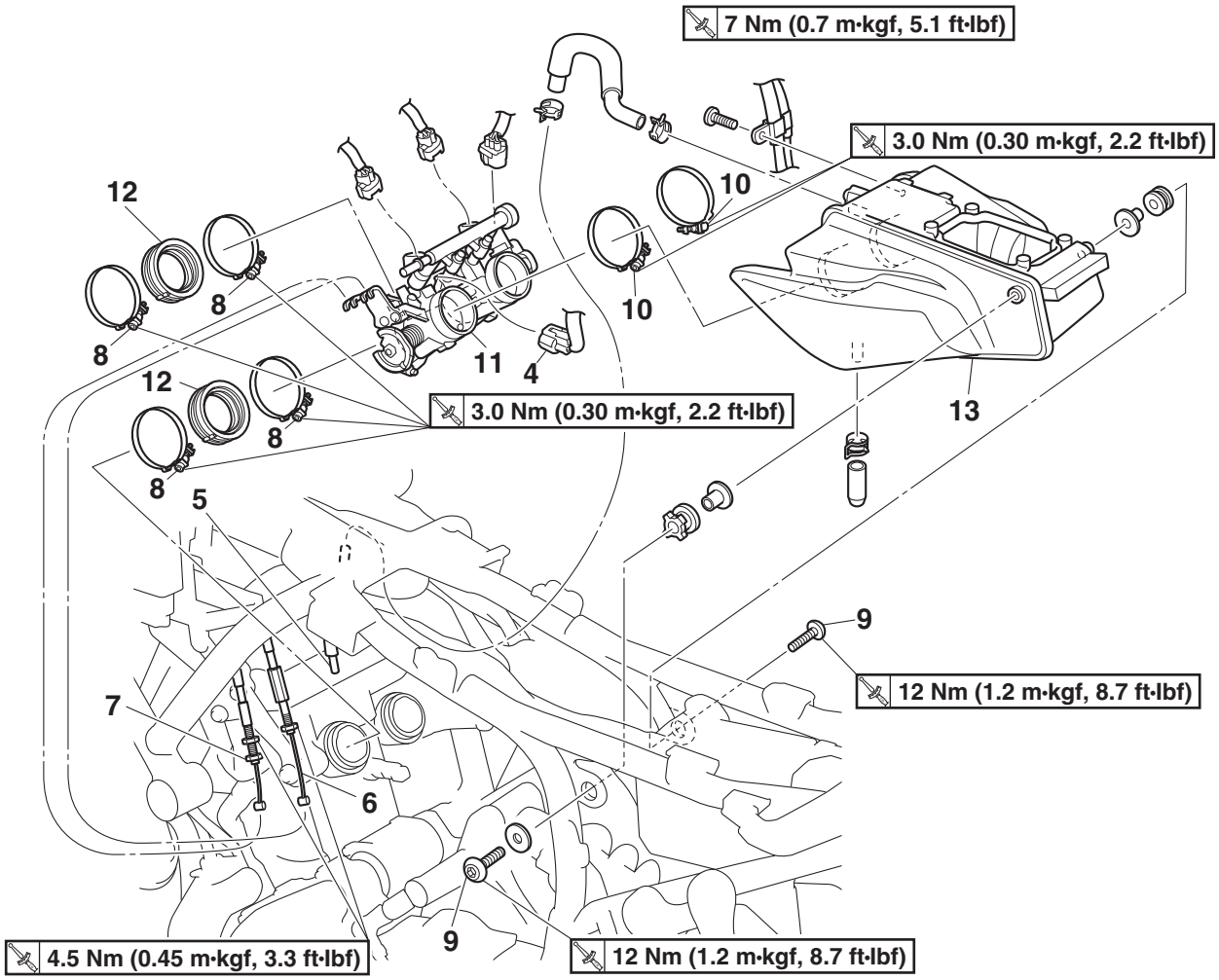
EAS20070
THROTTLE BODIES

Removing the air filter case and throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS (1)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank center cover/Inner side covers		Refer to "GENERAL CHASSIS (3)" in chapter 4. (Manual No.: B34-F8197-E0)
	Fuel tank		Refer to "FUEL TANK" on page 38.
	Air duct bracket		Refer to "GENERAL CHASSIS (4)" in chapter 4. (Manual No.: B34-F8197-E0)
	Pivot shaft protector (left/right)		Refer to "SWINGARM" in chapter 4. (Manual No.: B34-F8197-E0)
1	Cylinder head breather hose	1	
2	Throttle position sensor coupler	1	Disconnect.
3	Injector coupler	2	Disconnect.

Removing the air filter case and throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
4	ISC (Idle Speed Control) unit coupler	1	Disconnect.
5	Intake air pressure sensor hose	1	Disconnect.
6	Throttle cable (decelerator cable)	1	Disconnect.
7	Throttle cable (accelerator cable)	1	Disconnect.
8	Throttle body joint clamp screw	4	Loosen.
9	Air filter case bolt	2	
10	Air filter case joint clamp screw	2	Loosen.
11	Throttle bodies	1	
12	Throttle body joint	2	
13	Air filter case	1	

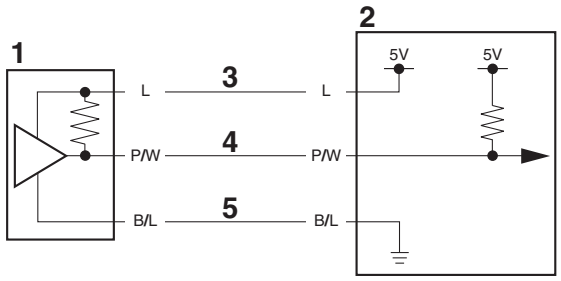
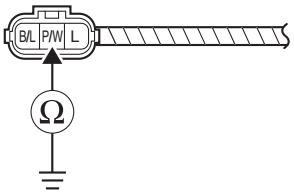
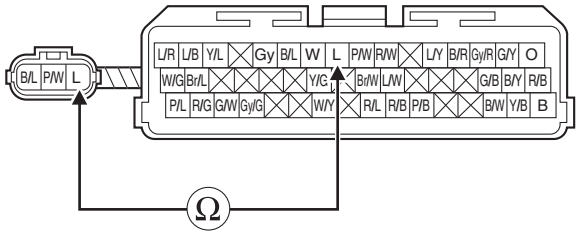
EAS20078
FUEL INJECTION SYSTEM

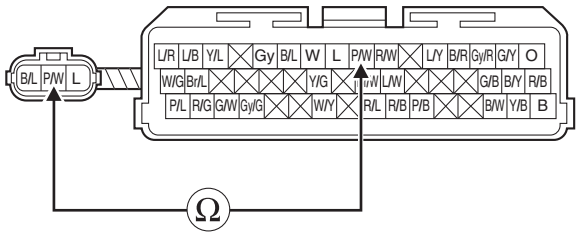
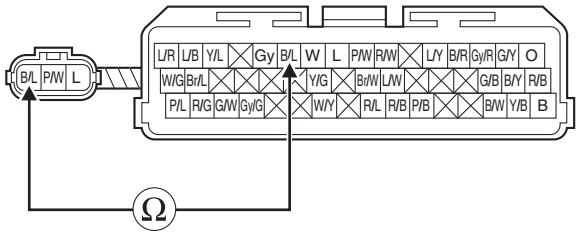
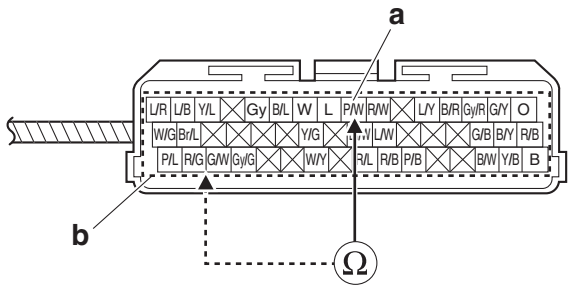
EAS31791
TROUBLESHOOTING DETAILS (FAULT CODE)

Fault code No. P0107, P0108

Fault code No.	**P0107, P0108**
Item	**[P0107] Intake air pressure sensor: ground short circuit detected.** **[P0108] Intake air pressure sensor: open or power short circuit detected.**
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	03
Tool display	Displays the intake air pressure.
Procedure	Operate the throttle while pushing the "(≋)" side of the start/engine stop switch. (If the display value changes, the performance is OK.)

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of intake air pressure sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" →Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.

3-1	 1. Intake air pressure sensor 2. ECU 3. Sensor input lead 4. Sensor output lead 5. Sensor ground lead
3-2	Disconnect the ECU coupler from the ECU. Disconnect the intake air pressure sensor coupler from the intake air pressure sensor.
3-3	[For P0107] Ground short circuit Between intake air pressure sensor coupler and ground: pink/white–ground If there is continuity, replace the wire harness. 
3-4	[For P0108] Open circuit Between intake air pressure sensor coupler and ECU coupler: blue–blue If there is no continuity, replace the wire harness. 

3-5	[For P0108] Open circuit Between intake air pressure sensor coupler and ECU coupler: pink/white–pink/white If there is no continuity, replace the wire harness. 		
3-6	[For P0108] Open circuit Between intake air pressure sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness. 		
3-7	Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” in chapter 8. (Manual No.: B34-F8197-E0)		
3-8	[For P0107/P0108] Short circuit Between intake air pressure sensor output terminal (pink/white) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness. 		
4	Installed condition of intake air pressure sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 5.

5	Defective intake air pressure sensor.	Execute the diagnostic mode. (Code No. 03) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg) 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. → Check the intake air pressure sensor. Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” in chapter 8. (Manual No.: B34-F8197-E0)	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (engine control unit)” in chapter 8. (Manual No.: B34-F8197-E0)	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recovered” using the Yamaha diagnostic tool, and then delete the fault code.	

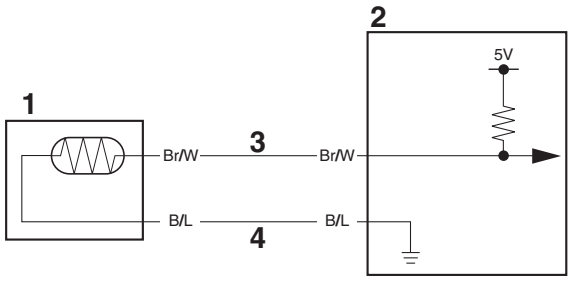
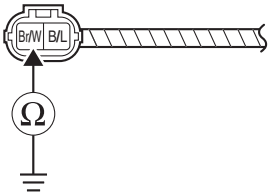
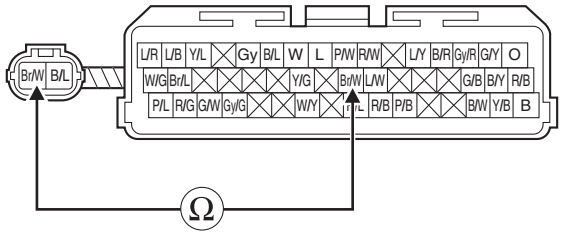
Fault code No. P0112, P0113

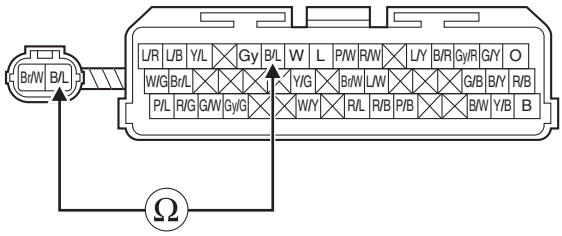
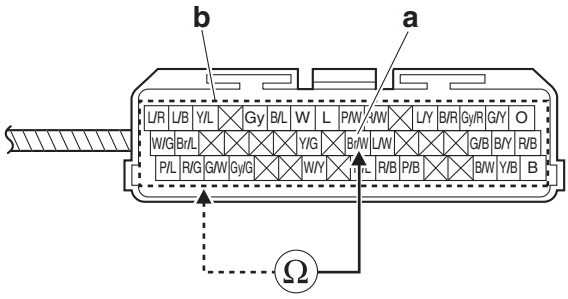
TIP

Perform this procedure when the engine is cold.

Fault code No.	**P0112, P0113**
Item	**[P0112] Intake air temperature sensor: ground short circuit detected.** **[P0113] Intake air temperature sensor: open or power short circuit detected.**
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	05
Tool display	Displays the air temperature.
Procedure	Compare the actually measured air temperature with the tool display value.

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of intake air temperature sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 4.

3-1	 1. Intake air temperature sensor 2. ECU 3. Sensor output lead 4. Sensor ground lead
3-2	Disconnect the ECU coupler from the ECU. Disconnect the intake air temperature sensor coupler from the intake air temperature sensor.
3-3	[For P0112] Ground short circuit Between intake air temperature sensor coupler and ground: brown/white–ground If there is continuity, replace the wire harness. 
3-4	[For P0113] Open circuit Between intake air temperature sensor coupler and ECU coupler: brown/white–brown/white If there is no continuity, replace the wire harness. 

3-5	[For P0113] Open circuit Between intake air temperature sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness. 		
3-6	Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” in chapter 8. (Manual No.: B34-F8197-E0)		
3-7	[For P0112/P0113] Short circuit Between intake air temperature sensor output terminal (brown/white) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness. 		
4	Installed condition of intake air temperature sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 5.
5	Defective intake air temperature sensor.	Execute the diagnostic mode. (Code No. 05) When engine is cold: Displayed temperature is close to the ambient temperature. The displayed temperature is not close to the ambient temperature. → Check the intake air temperature sensor. Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” in chapter 8. (Manual No.: B34-F8197-E0)	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 6.

6	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (engine control unit)” in chapter 8. (Manual No.: B34-F8197-E0)	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recovered” using the Yamaha diagnostic tool, and then delete the fault code.	

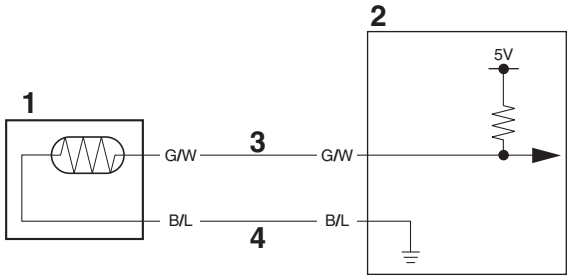
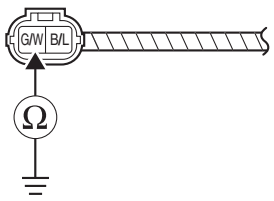
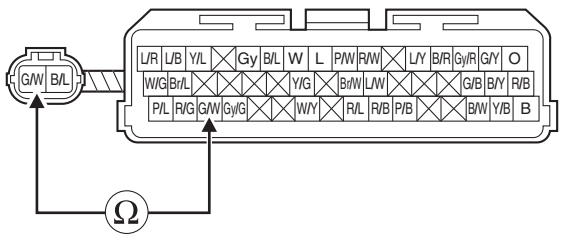
Fault code No. P0117, P0118

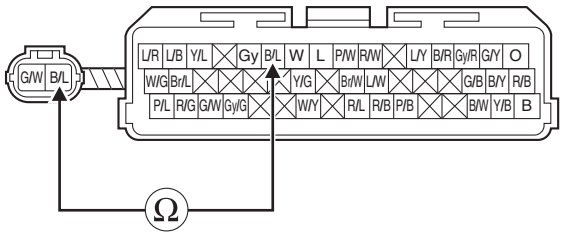
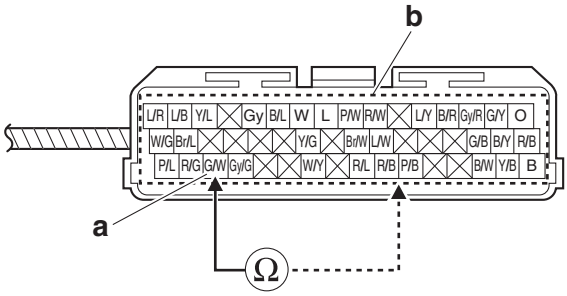
TIP

Perform this procedure when the engine is cold.

Fault code No.	**P0117, P0118**
Item	**[P0117] Coolant temperature sensor: ground short circuit detected.** **[P0118] Coolant temperature sensor: open or power short circuit detected.**
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	06
Tool display	When engine is cold: Displays temperature closer to air temperature. When engine is hot: Displays current coolant temperature.
Procedure	Compare the actually measured coolant temperature with the tool display value.

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of coolant temperature sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 3.

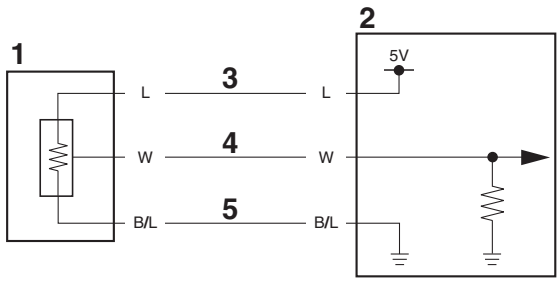
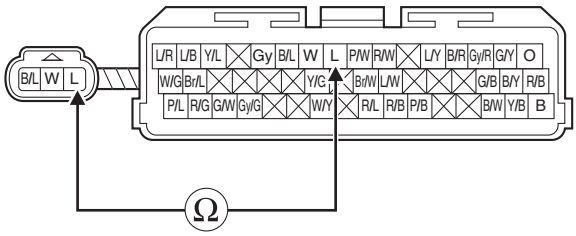
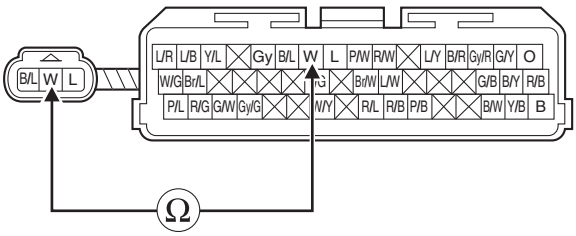
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 4.
3-1	 1. Coolant temperature sensor 2. ECU 3. Sensor output lead 4. Sensor ground lead		
3-2	Disconnect the ECU coupler from the ECU. Disconnect the coolant temperature sensor coupler from the coolant temperature sensor.		
3-3	[For P0117] Ground short circuit Between coolant temperature sensor coupler and ground: green/white–ground If there is continuity, replace the wire harness. 		
3-4	[For P0118] Open circuit Between coolant temperature sensor coupler and ECU coupler: green/white–green/white If there is no continuity, replace the wire harness. 		

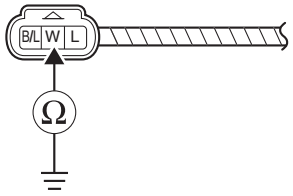
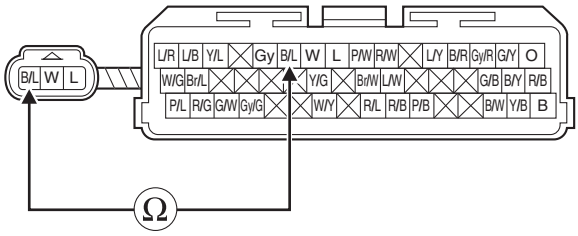
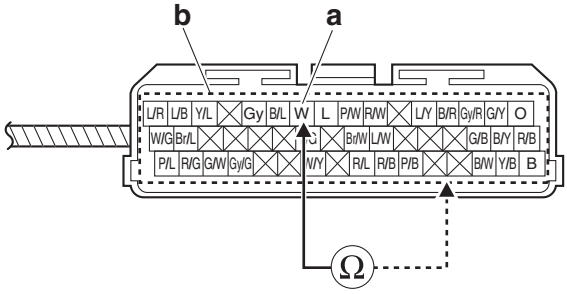
3-5	[For P0118] Open circuit Between coolant temperature sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness. 		
3-6	Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” in chapter 8. (Manual No.: B34-F8197-E0)		
3-7	[For P0117/P0118] Short circuit Between coolant temperature sensor output terminal (green/white) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness. 		
4	Installed condition of coolant temperature sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 5.
5	Defective coolant temperature sensor.	Execute the diagnostic mode. (Code No. 06) When engine is cold: Displayed temperature is close to the ambient temperature. The displayed temperature is not close to the ambient temperature → Check the coolant temperature sensor. Replace if defective. Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” in chapter 8. (Manual No.: B34-F8197-E0)	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 7 and finish the service. Condition is “Detected” → Go to item 6.

6	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (engine control unit)” in chapter 8. (Manual No.: B34-F8197-E0)	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recovered” using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0122, P0123

Fault code No.		**P0122, P0123**	
Item		**[P0122] Throttle position sensor: open or ground short circuit detected.** **[P0123] Throttle position sensor: power short circuit detected.**	
Fail-safe system		Able/Unable to start engine	
		Able/Unable to drive vehicle	
Diagnostic code No.		01	
01	**Tool display**	Throttle position sensor signal • 11–21 (fully closed position) • 96–106 (fully open position)	
	Procedure	• Check with throttle valves fully closed. • Check with throttle valves fully open.	
Item	**Probable cause of malfunction and check**	**Maintenance job**	**Confirmation of service completion**
1	Connection of throttle position sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 8 and finish the service. Condition is “Detected” → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 8 and finish the service. Condition is “Detected” → Go to item 3.

3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” →Go to item 8 and finish the service. Condition is “Detected” → Go to item 4.
3-1	 1. Throttle position sensor 2. ECU 3. Sensor input lead 4. Sensor output lead 5. Sensor ground lead		
3-2	Disconnect the ECU coupler from the ECU. Disconnect the throttle position sensor coupler from the throttle position sensor.		
3-3	[For P0122] Open circuit Between throttle position sensor coupler and ECU coupler: blue–blue If there is no continuity, replace the wire harness. 		
3-4	[For P0122] Open circuit Between throttle position sensor coupler and ECU coupler: white–white If there is no continuity, replace the wire harness. 		

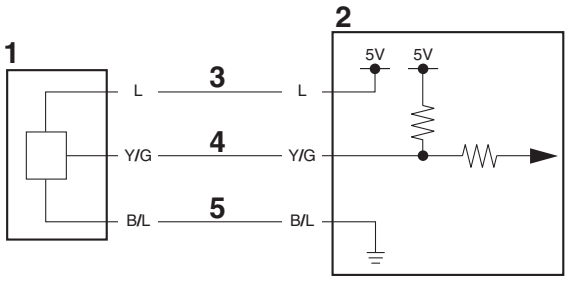
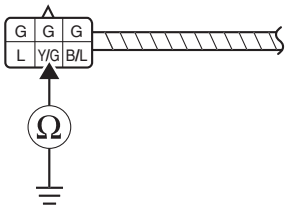
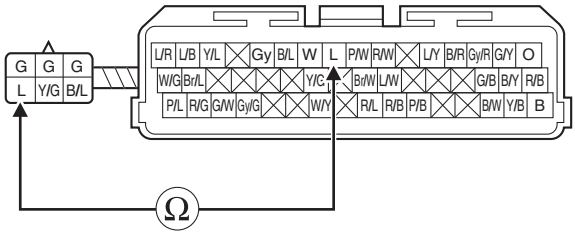
3-5	[For P0122] Ground short circuit Between throttle position sensor coupler and ground: white–ground If there is continuity, replace the wire harness. 		
3-6	[For P0123] Open circuit Between throttle position sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness. 		
3-7	Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” in chapter 8. (Manual No.: B34-F8197-E0)		
3-8	[For P0122/P0123] Short circuit Between throttle position sensor output terminal (white) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness. 		
4	Installed condition of throttle position sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or adjust the sensor. Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” in chapter 7. (Manual No.: B34-F8197-E0)	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 8 and finish the service. Condition is “Detected” → Go to item 5.

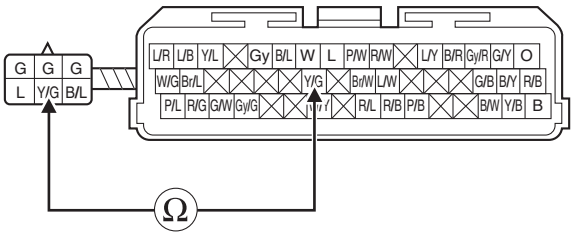
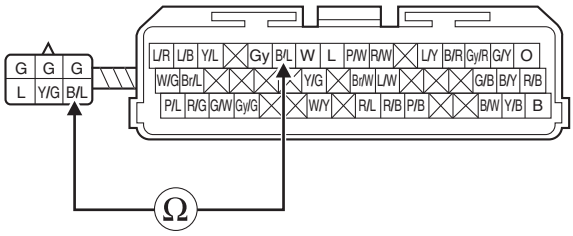
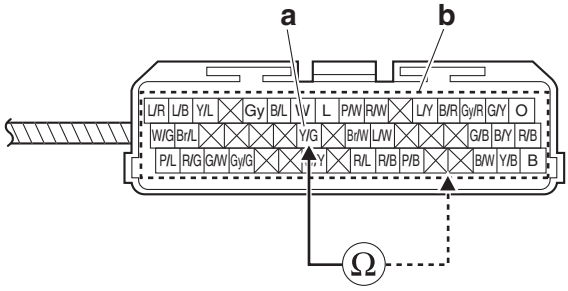
5	Throttle position sensor resistance.	Measure the throttle position sensor resistance. black/blue–blue Refer to “CHECKING THE THROTTLE POSITION SENSOR” in chapter 8. (Manual No.: B34-F8197-E0)	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 8 and finish the service. Condition is “Detected” → Go to item 6.
6	Defective throttle position sensor.	Check throttle position sensor signal. Execute the diagnostic mode. (Code No. 01) When the throttle valves are fully closed: A value of 11–21 is indicated. When throttle valves are fully open: A value of 96–106 is indicated.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 8 and finish the service. Condition is “Detected” → Go to item 7.
7	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (engine control unit)” in chapter 8. (Manual No.: B34-F8197-E0)	Service is finished.
8	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recovered” using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P1604, P1605

Fault code No.	**P1604, P1605**
Item	**[P1604] Lean angle sensor: ground short circuit detected.** **[P1605] Lean angle sensor: open or power short circuit.**
Fail-safe system	Unable to start engine
	Unable to drive vehicle
Diagnostic code No.	08
Tool display	Lean angle sensor output voltage • 0.4–1.4 (upright) • 3.7–4.4 (overturned)
Procedure	Remove the lean angle sensor and incline it more than 65 degrees.

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of lean angle sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, then to “OFF”, and then back to “ON”. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 6 and finish the service. Condition is “Detected” → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, then to “OFF”, and then back to “ON”. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 6 and finish the service. Condition is “Detected” → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to “ON”, then to “OFF”, and then back to “ON”. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 6 and finish the service. Condition is “Detected” → Go to item 4.

3-1	 1. Lean angle sensor 2. ECU 3. Sensor input lead 4. Sensor output lead 5. Sensor ground lead
3-2	Disconnect the ECU coupler from the ECU. Disconnect the lean angle sensor coupler from the lean angle sensor.
3-3	[For P1604] Ground short circuit Between lean angle sensor coupler and ground: yellow/green–ground If there is continuity, replace the wire harness. 
3-4	[For P1605] Open circuit Between lean angle sensor coupler and ECU coupler: blue–blue If there is no continuity, replace the wire harness. 

3-5	[For P1605] Open circuit Between lean angle sensor coupler and ECU coupler: yellow/green–yellow/green If there is no continuity, replace the wire harness. 		
3-6	[For P1605] Open circuit Between lean angle sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness. 		
3-7	Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” in chapter 8. (Manual No.: B34-F8197-E0)		
3-8	[For P1604/P1605] Short circuit Between lean angle sensor output terminal (yellow/green) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness. 		
4	Defective lean angle sensor.	Refer to “CHECKING THE LEAN ANGLE SENSOR” in chapter 8. (Manual No.: B34-F8197-E0)	Turn the main switch to “ON”, then to “OFF”, and then back to “ON”. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recovered” → Go to item 6 and finish the service. Condition is “Detected” → Go to item 5.

5	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (engine control unit)” in chapter 8. (Manual No.: B34-F8197-E0)	Service is finished.
6	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recovered” using the Yamaha diagnostic tool, and then delete the fault code.	

EAS20091

WIRING DIAGRAM

MTM660 2016

1. Main switch
2. ABS solenoid fuse
3. ABS motor fuse
4. Parking lighting fuse
5. ABS control unit fuse
6. Auxiliary fuse
7. Ignition fuse
8. Signaling system fuse
9. Headlight fuse
10. Fuel injection system fuse
11. Backup fuse
12. Radiator fan motor fuse
13. AC magneto
14. Rectifier/regulator
15. Battery
16. Engine ground
17. Immobilizer unit
18. Main fuse
19. Starter relay
20. Starter motor
21. Rear brake light switch
22. Relay unit
23. Starting circuit cut-off relay
24. Fuel pump relay
25. Joint coupler
26. Sidestand switch
27. Crankshaft position sensor
28. O_2 sensor
29. Throttle position sensor
30. Ignition coil #1
31. Ignition coil #2
32. Spark plug
33. Fuel injector #1
34. Fuel injector #2
35. ISC (Idle Speed Control) unit
36. ECU (Engine Control Unit)
37. Intake air temperature sensor
38. Coolant temperature sensor
39. Intake air pressure sensor
40. Lean angle sensor
41. Front wheel sensor
42. Rear wheel sensor
43. ABS ECU (electronic control unit)
44. Yamaha diagnostic tool coupler
45. Fuel sender
46. Fuel pump
47. Oil pressure switch
48. Meter assembly
49. Immobilizer system indicator light
50. Neutral indicator light
51. Meter light
52. Tachometer
53. Multi-function meter
54. Oil pressure warning light
55. Engine trouble warning light
56. Coolant temperature warning light
57. High beam indicator light
58. Turn signal indicator light
59. ABS warning light
60. Horn
61. Gear position switch
62. Handlebar switch (right)
63. Front brake light switch
64. Hazard switch
65. Start/engine stop switch
66. Turn signal/hazard relay
67. Handlebar switch (left)
68. Clutch switch
69. Dimmer switch
70. Pass switch
71. Turn signal switch
72. Horn switch
73. Rear turn signal light (right)
74. Rear turn signal light (left)
75. Front turn signal light (right)
76. Headlight assembly
77. Auxiliary light
78. Headlight
79. Front turn signal light (left)
80. License plate light
81. Tail/brake light
82. Radiator fan motor
83. Radiator fan motor relay
84. Headlight relay
85. Auxiliary DC outlet

A. Wire harness
B. Positive battery sub-wire harness
C. Sub-wire harness (gear position switch, coolant temperature sensor, fuel injector)
D. Sub-wire harness (throttle position sensor, ISC)
E. Sub-wire harness (headlight, turn signal light, auxiliary light)

EAS30613

COLOR CODE

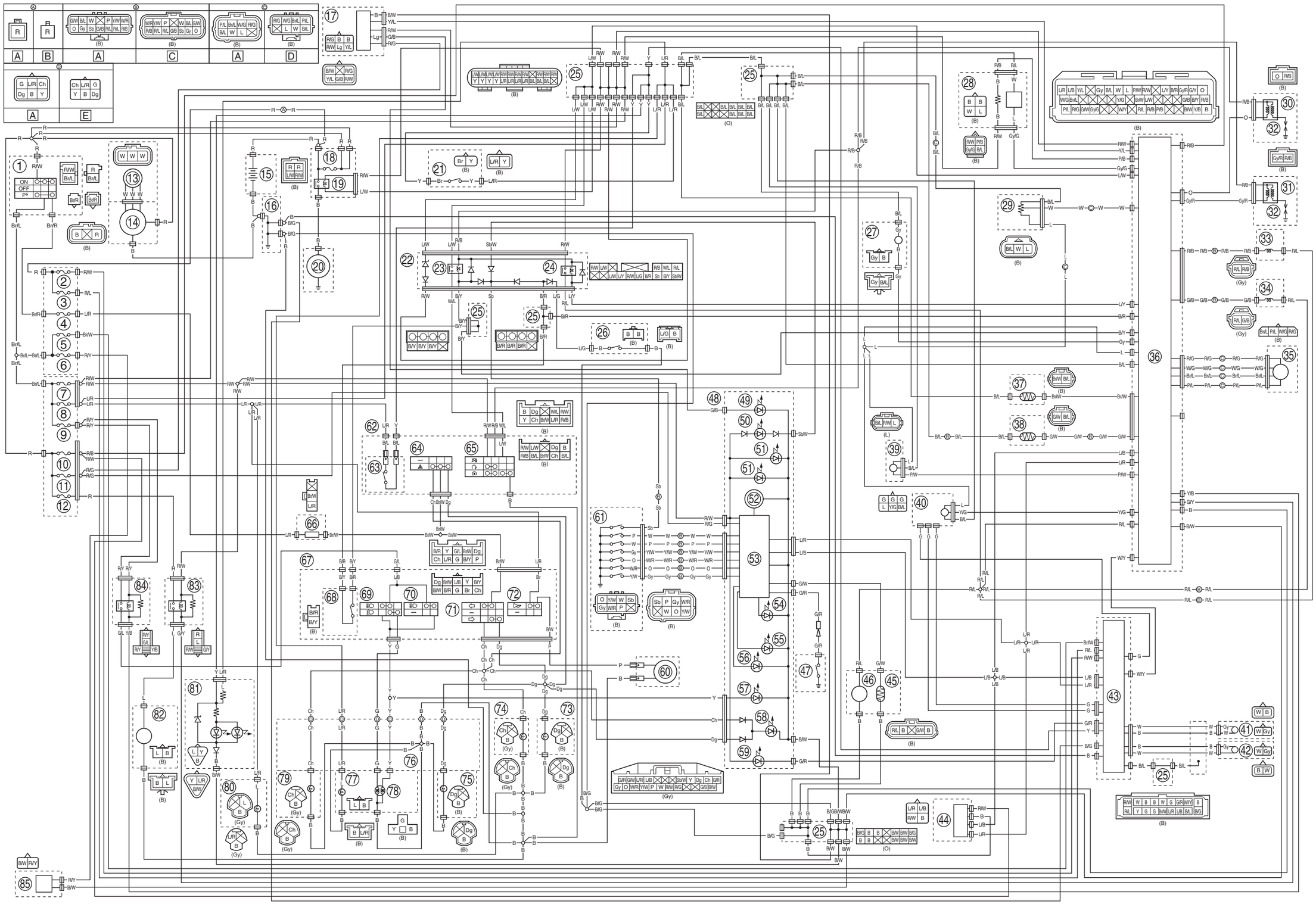
B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/L	Green/Blue
G/R	Green/Red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

MBK Industrie
Z.I. de Rouvroy 02100 Saint Quentin
SAS au capital de 14 000 000 €
R.C St-Quentin B 329 035 422

MBK

YAMAHA

MTM660 2016
WIRING DIAGRAM



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WIRING DIAGRAM