YAMAHA

TDM850 '99

4TX-AE3

SUPPLEMENTARY SERVICE MANUAL

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the TDM850 ’99. For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manual.

TDM850 ’96 SERVICE MANUAL: 4TX-AE1
TDM850 ’97 SUPPLEMENTARY SERVICE MANUAL: 4TX-AE2

TDM850 ’99
SUPPLEMENTARY
SERVICE MANUAL

First Edition, November 1998

EB001000

NOTICE

This manual was produced by the Yamaha Motor Company 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, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha motorcycles has a basic understanding of the mechanical ideas and the procedures of motorcycles repair. Repairs attempted by anyone without this knowledge are likely to render the motorcycles unsafe and unfit for use.

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

NOTE:

Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

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

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person inspecting or repairing the motorcycle.
CAUTION:	A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

EB002000

HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See “Illustrated symbols”)

1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.

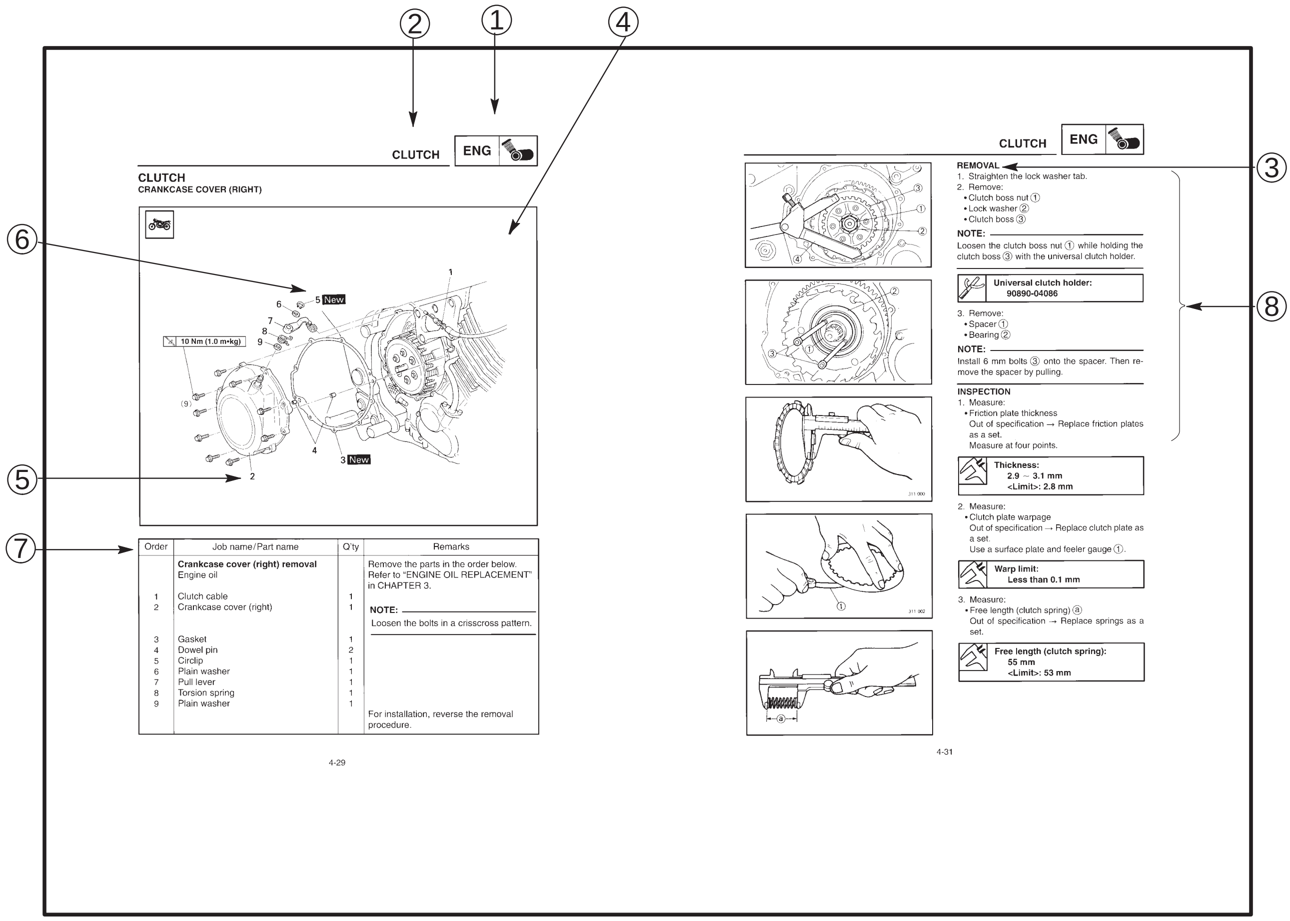
2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

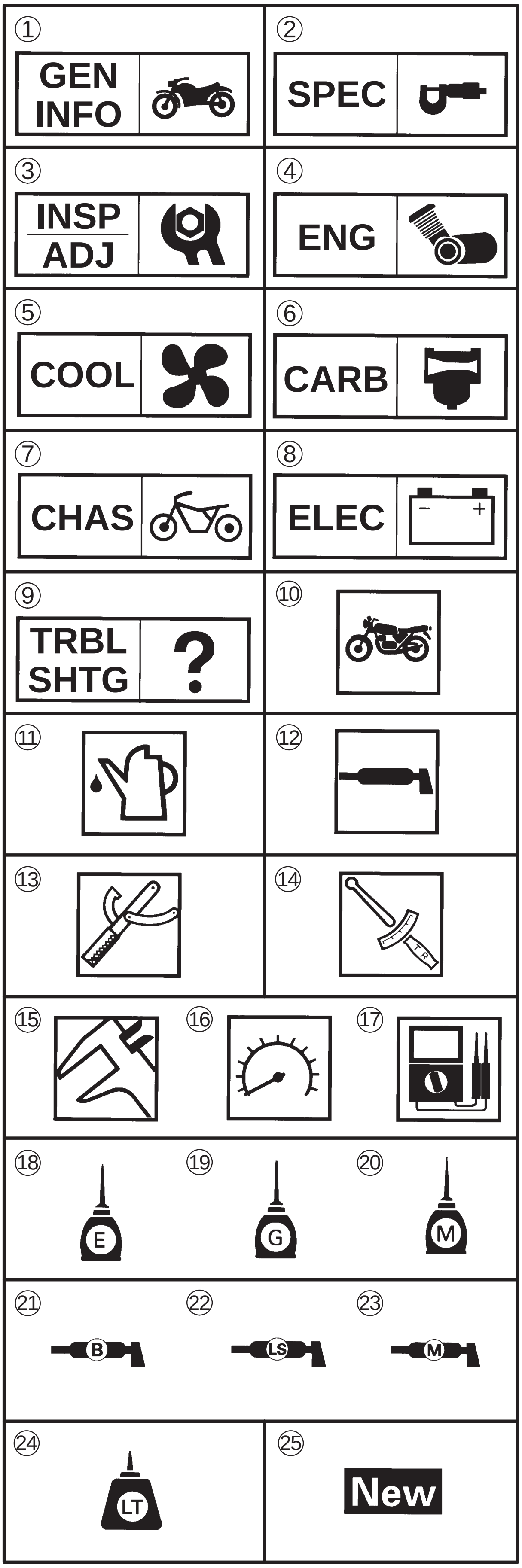
3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS

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

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.
2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.





EB003000

ILLUSTRATED SYMBOLS

Illustrated symbols ① to ⑨ are printed on top right of each page and indicate the subject of each chapter.

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Cooling system
⑥ Carburetion
⑦ Chassis
⑧ Electrical
⑨ Troubleshooting

Illustrated symbols ⑩ to ⑰ are used to identify the specifications appearing in the text.

⑩ Can be serviced with engine mounted
⑪ Filling fluid
⑫ Lubricant
⑬ Special tool
⑭ Torque
⑮ Wear limit, clearance
⑯ Engine speed
⑰ Ω, V, A

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

⑱ Apply engine oil
⑲ Apply gear oil
⑳ Apply molybdenum disulfide oil
㉑ Apply wheel bearing grease
㉒ Apply lightweight lithium-soap base grease
㉓ Apply molybdenum disulfide grease

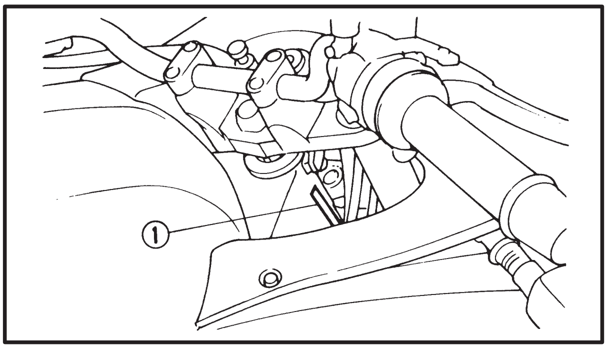
Illustrated symbols ㉔ to ㉕ in the exploded diagrams indicate where to apply a locking agent ㉔ and when to install new parts ㉕.

㉔ Apply locking agent (LOCTITE®)
㉕ replace

CONTENTS

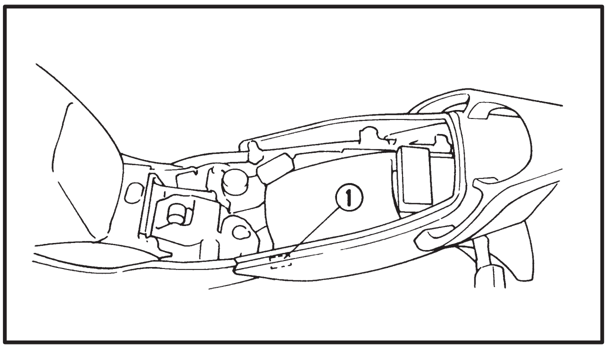
EB100000

GENERAL INFORMATION
MOTORCYCLE IDENTIFICATION
VEHICLE IDENTIFICATION NUMBER



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

MODEL LABEL



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

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item		Standard
Model:		TDM850
Model code:		4TX4
Basic weight (With oil and full fuel tank):		232 kg
Carburetor:		
Type/quantity		BDSR38/2
Manufacturer		MIKUNI
Transmission		
Primary reduction system		Spur gear
Primary reduction ratio		67/39 (1.718)
Secondary reduction system		Chain drive
Secondary reduction ratio		43/16 (2.688)
Transmission type		Constant mesh 5-speed
Operation		Left foot operation
Gear ratio	1st	37/14 (2.643)
	2nd	37/19 (1.947)
	3rd	30/20 (1.500)
	4th	27/23 (1.174)
	5th	27/28 (0.964)
Bulb wattage × quantity		
Meter light		12V 2 W × 3
Indicator lights		
Neutral		14 V 1.4 W × 1
Turn		14 V 1.4 W × 2
High beam		14 V 1.4 W × 1
Fuel		12 V 2 W × 1
Water tempere		14 V 1.4 W × 1

MAINTENANCE SPECIFICATIONS

ENGINE

Item	Standard	Limit
Clutch:		
Clutch spring free length	50 mm	48 mm
Quantity	6	•••
Carburetor:		
I.D. mark	4TX4 40	•••
Main jet	#147.5	•••
Main air jet	#65	•••
Jet needle	#1: 6DJP17 #2: 6CL1	•••
Needle jet	P-O	•••
Pilot air jet 1	#87.5	•••
Pilot air jet 2	#120	•••
Pilot outlet	1.0	•••
Pilot jet	#17.5	•••
Bypass 1	0.8	•••
Bypass 2	0.9	•••
Bypass 3	0.8	•••
Pilot screw	2.0	•••
Valve seat size	1.5	•••
Starter jet 1	#32.5	•••
Starter jet 2	0.9	•••
Throttle valve size	#95	•••
Fuel level	4.4 ~ 5.4 mm	•••
Engine idle speed	1050 ~ 1250 r/min	•••
Intake vacuum	36.0 ~ 38.7 kPa (270 ~ 290 mmHg)	•••
Fuel pump:		
Type	Electrical type	•••
Model/manufacturer	4TX/MITSUBISHI	•••
Output pressure	7 kPa (0.07 kgf/cm^2, 0.07 bar)	•••

CHASSIS

Item	Thread size	Tightening torque		Remarks
		Nm	m•kgf	
Fuel sender and fuel tank	M5	3.8	0.38	
Fuel pump and bracket	M6	6.5	0.65	
Bracket and frame	M6	6.5	0.65	

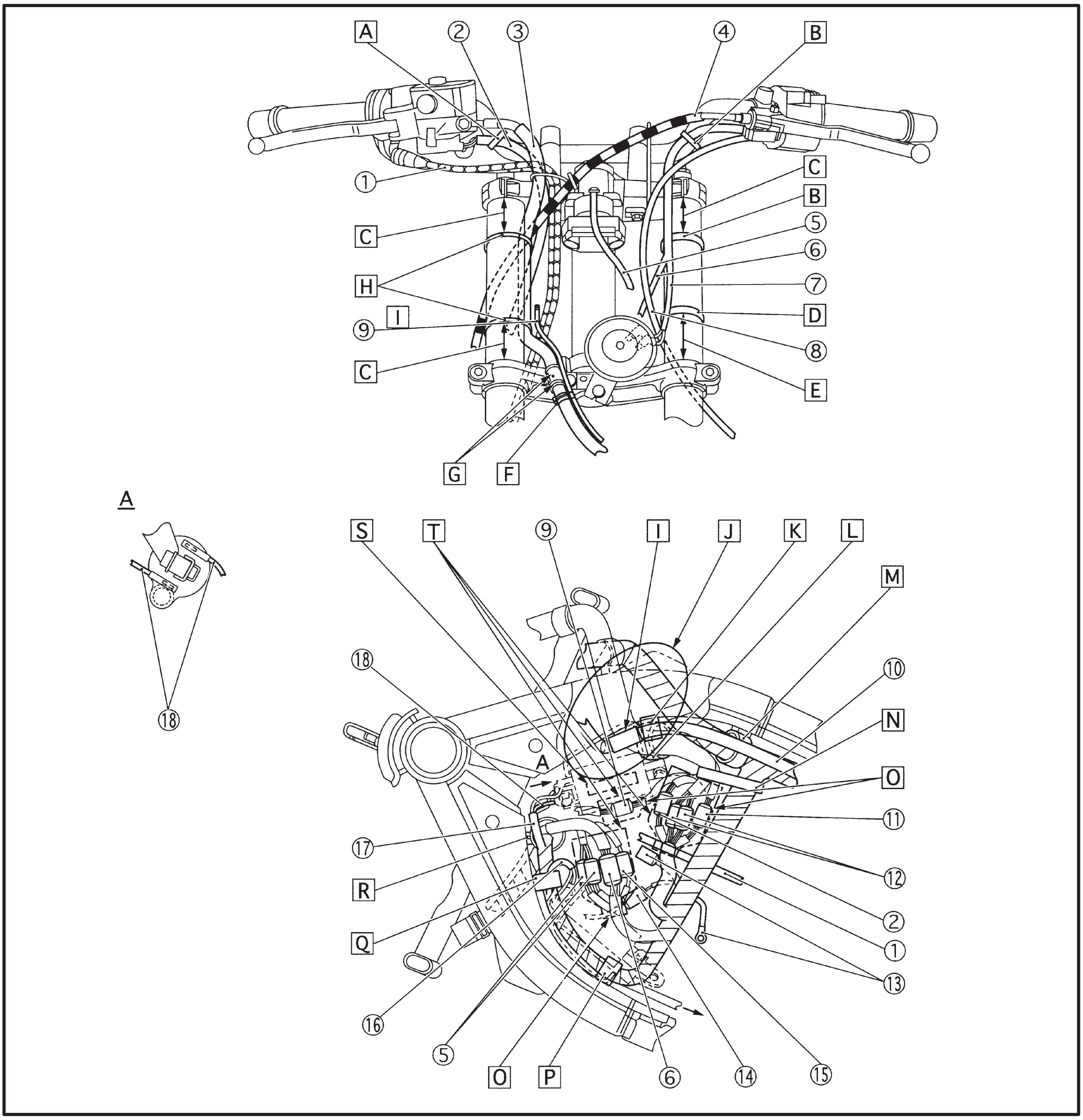
ELECTRICAL

Item		Standard	Limit
Charging system:			
Type		A.C. magneto	•••
Model/manufacturer		TLN252/DENSO	•••
Nominal output		14 V 25 A at 5,000 r/min	•••
Stator coil resistance		0.23 ~ 0.35 Ω at 20°C/W-W	•••
Starter relay:			
Model/manufacturer		MS5F-421/JIDECO	•••
Amperage rating		180 A	•••
Coil winding resistance		4.2 ~ 4.6 Ω at 20°C	•••
Fuel sender:			
Model/manufacturer		4TX/NIPPON/SEIKI	•••
resistance	full	4 ~ 10Ω	•••
	empty	90 ~ 100Ω	•••
Fuel pump relay:			
Model/manufacturer		G8R-30Y-B/OMRON	•••
Coil winding resistance		225 Ω ± 10%	•••
Hazard relay:			
Model/manufacturer		4KM-00/MATSUSHITA	•••
Coil winding resistance		72 ~ 88 Ω at 20°C	•••
Circuit breakers:			
Type		Fuse	•••
Amperage for individual circuits			
Main fuse		30 A × 1	•••
Headlight fuse		15 A × 1	•••
Signal system fuse		15 A × 1	•••
Ignition fuse		10 A × 1	•••
Fuse (position light and hazard)		10 A × 1	•••
Radiator fan fuse		7.5 A × 1	•••
Back up		5 A × 1	•••
Reserve fuse		15 A × 1	•••
Reserve fuse		10 A × 1	•••
Reserve fuse		5 A × 1	•••

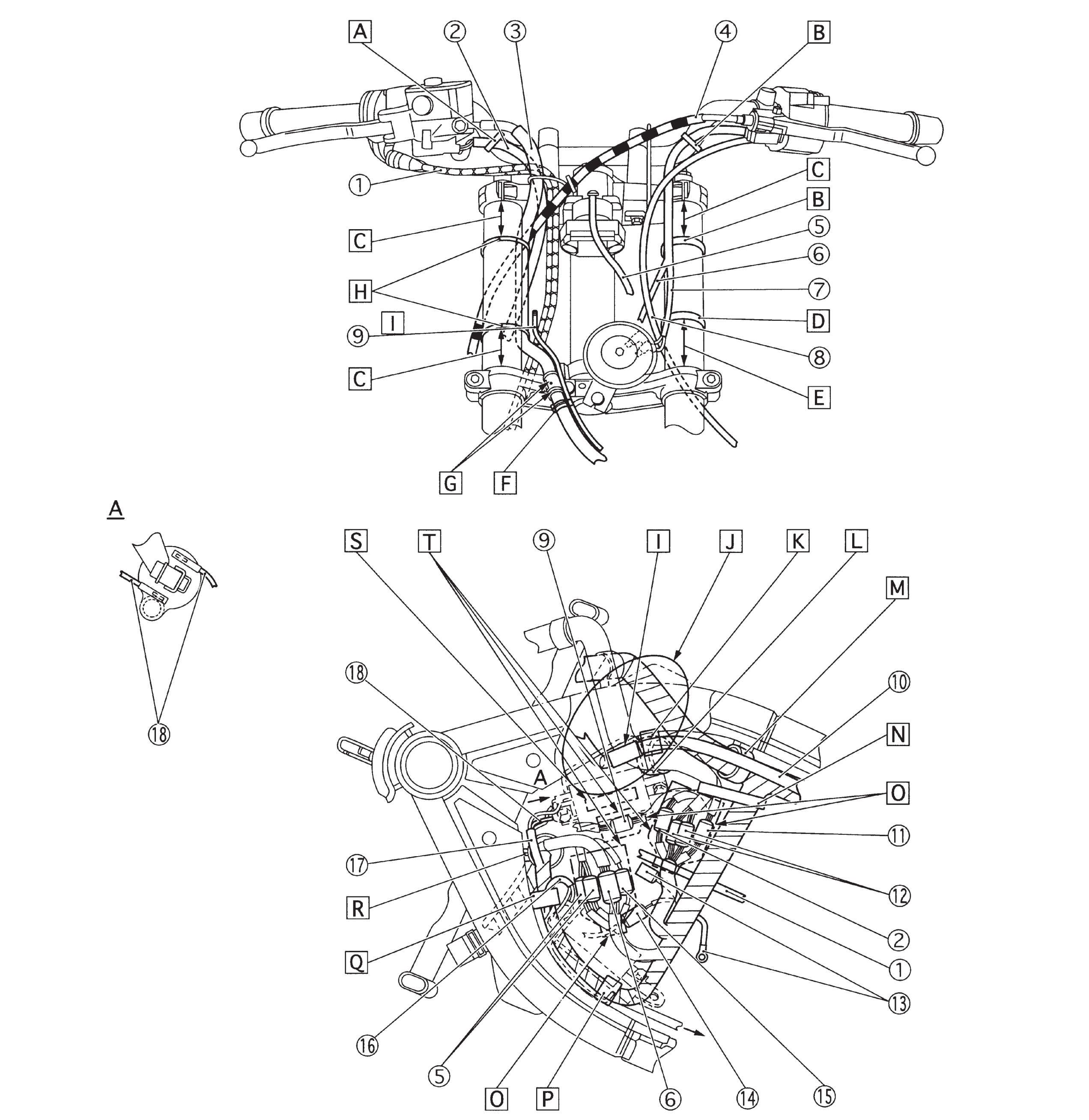
CABLE ROUTING

① Throttle cable 1
② Right handlebar switch lead
③ Brake hose
④ Clutch cable
⑤ Main switch lead
⑥ Left handlebar switch lead
⑦ Horn lead
⑧ Starter cable
⑨ Speed sensor lead
⑩ Coolant reservoir hose
⑪ Headlight lead
⑫ Meter light lead
⑬ Thermo unit lead
⑭ Thermo switch lead
⑮ Fan motor lead
⑯ Ignition coil (left) lead
⑰ Ignition coil (right) lead
⑱ Negative lead

A Fasten the right handlebar switch lead with a plastic band.
B Fasten the handlebar switch lead with a plastic band.
C 50 mm
D Fasten the horn lead with a plastic band.
E 60 mm
F Set the clamp within 10 mm from the upper end of protector.
G Align the brake hose white mark to the mark of bracket.
H Fasten the brake hose with a plastic band and cut the end of band.
I Pass the speed sensor lead between throttle cable and clutch cable and fasten to the frame head pipe.
J Pass the wireharness and hoses under the frame.
K Fasten the coolant reservoir hose with a plastic band.

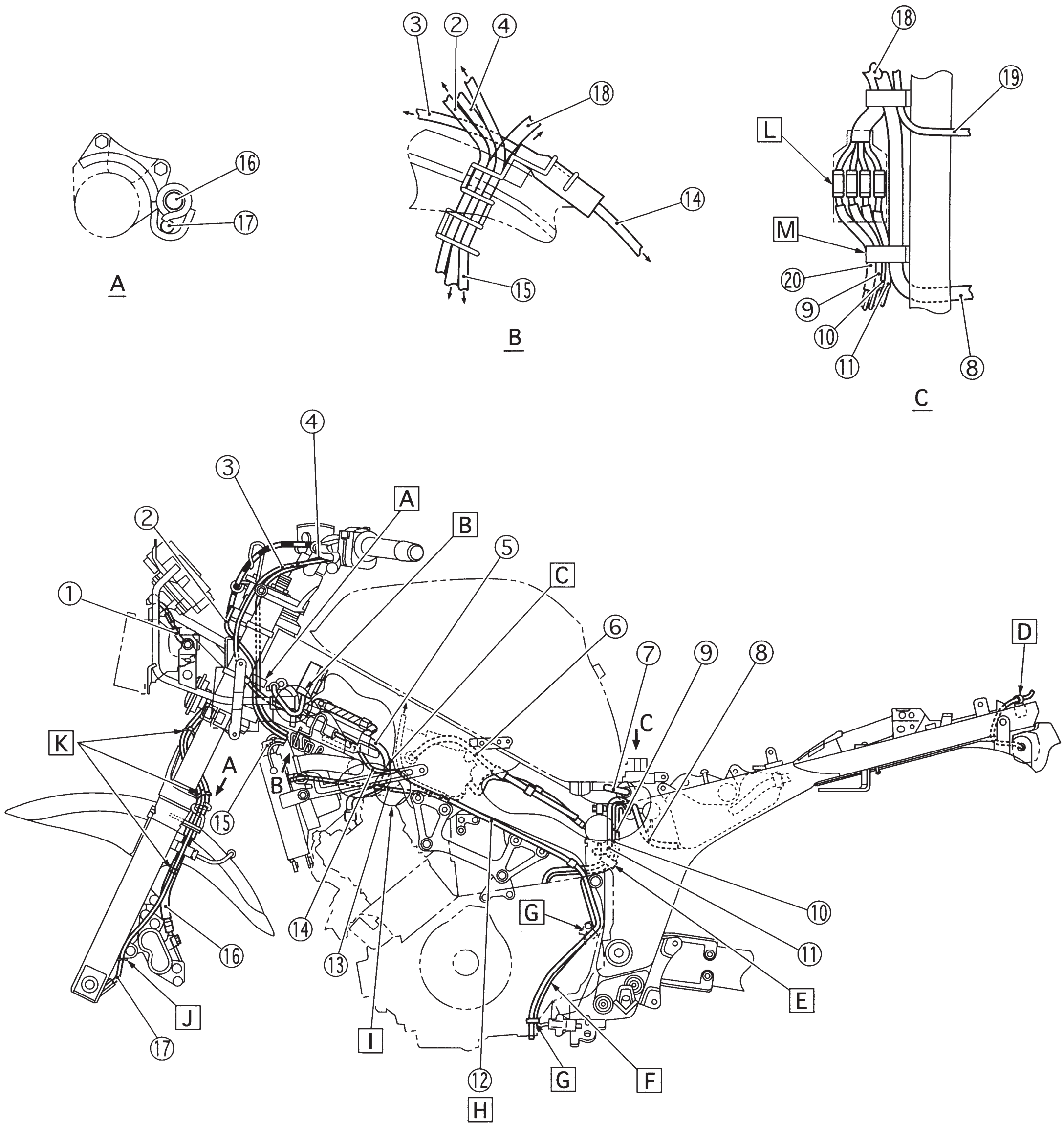


L Fasten the meter lead and headlight lead with a plastic band.
M Fasten the wireharness with a plastic band.
N Fasten the wireharness, right handlebar switch lead meter lead and headlight lead with a plastic band.
O Connect the coupler and insert to the protector.
P Fasten the wireharness with a plastic band.
Q Fasten the wireharness and ignition coil (left) lead with a plastic band.
R Fasten the wireharness right handlebar switch lead, main switch lead fan motor lead with a plastic band.
S Set the ignition coil at the mark upward.
T Protector is under the coupler.

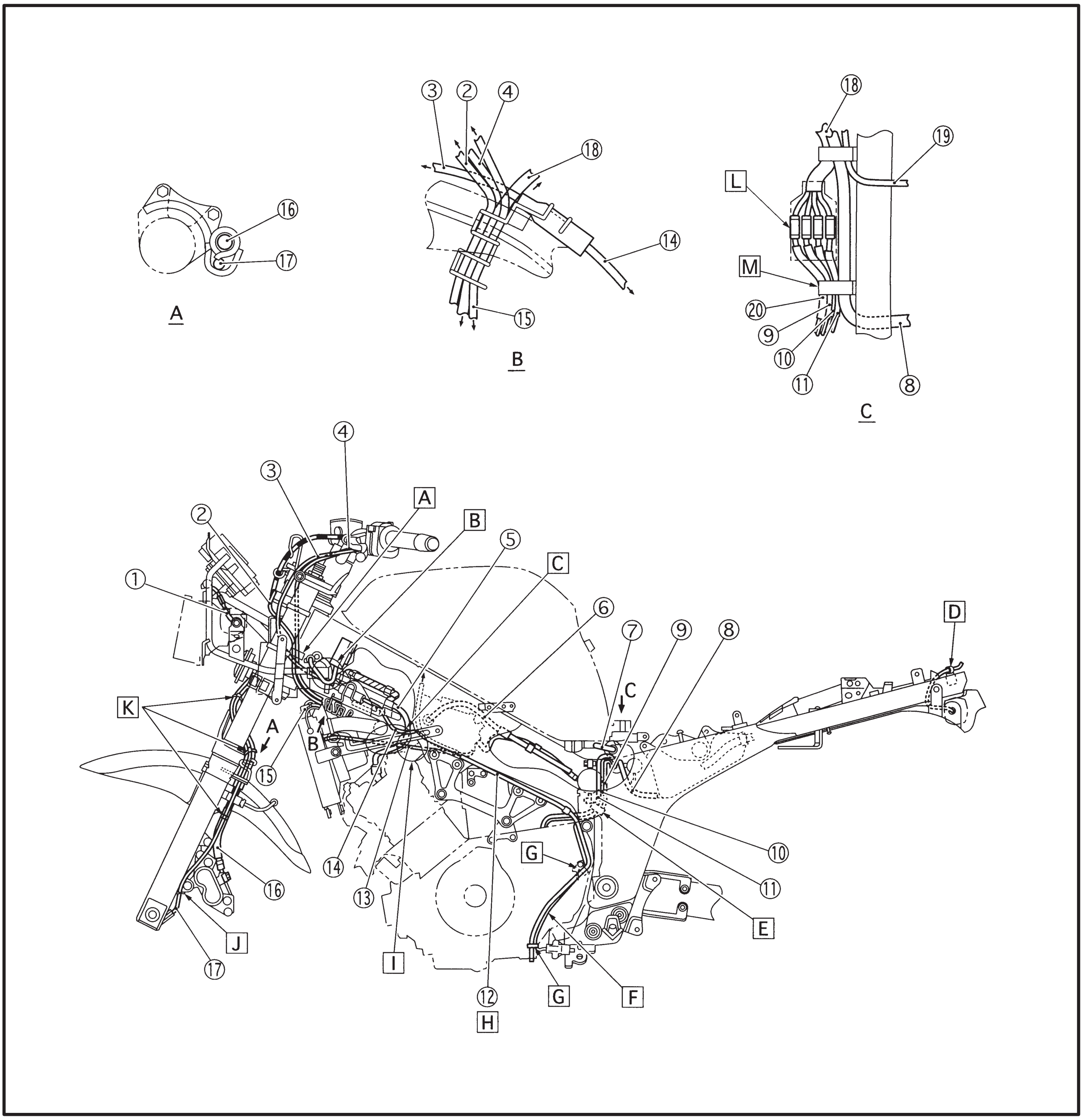


① Front flasher light (left) lead
② Main switch lead
③ Starter cable 1
④ Left handlebar switch lead
⑤ Spark plug lead
⑥ Carburetor breather hose
⑦ Fuel hose
⑧ Coolant reservoir hose
⑨ Sidestand switch lead
⑩ Neutral switch lead
⑪ A.C. magneto lead
⑫ Air filter case breather hose
⑬ Carburetor heater hose
⑭ Starter cable 2
⑮ Thermo switch lead
⑯ Brake hose
⑰ Speed sensor lead
⑱ Wire harness
⑲ Flasher relay lead
⑳ Fuel pump lead

A Fasten the left handlebar switch lead and main switch lead with a plastic band.
B Route the wireharness to the rear-side of the frame pipe.
C Route the starter cable through radiator hose upward and spark plug lead rear side and in front of air filter case breather hose. Route the spark plug lead to the outside of the carburetor starter bracket and carburetor heater hose.

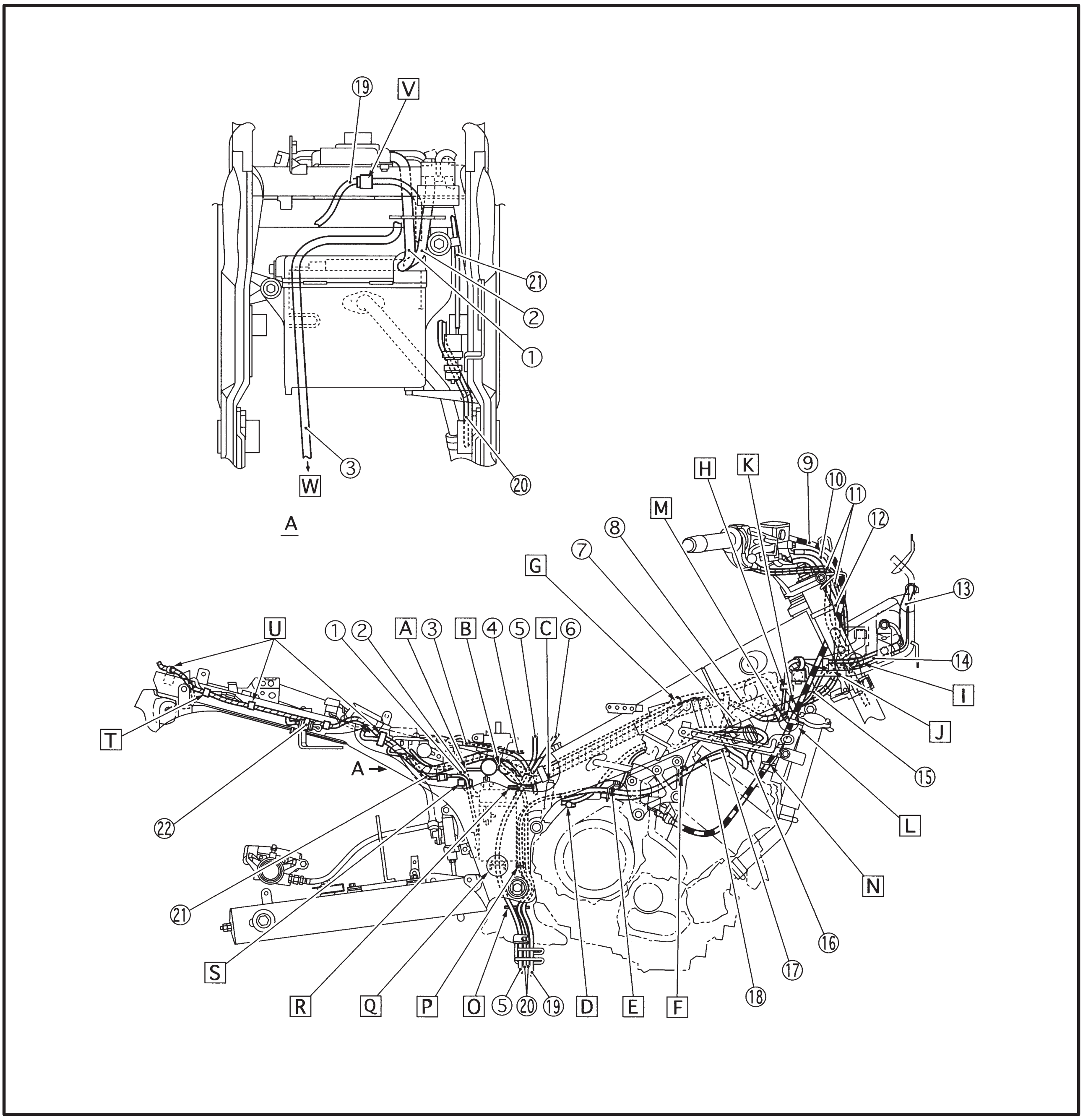


D Fasten the rear flasher light (left) lead.
E Fasten the sidestand switch lead neutral switch lead and A.C. magneto lead.
F Route the sidestand switch lead and air filter case breather hose to the inside of the engine cover.
G Fasten the sidestand switch lead to the air filter case breather hose.
H Route the air filter case breather hose over the idle adjust bracket.
I Route the air filter case breather hose to the outside of the carburetor heater hose and route the carburetor heater hose to the inside of the air filter case breather hose.
J Clamp the speed sensor lead to the outer tube with a holder.
K Clamp the speed sensor lead along the brake hose (three position).
L Connect the coupler and insert the protector. Set the protector between crosstube and fuel pump.
M Fasten the coolant reservoir hose, A.C. magneto lead, neutral switch lead and sidestand switch lead.

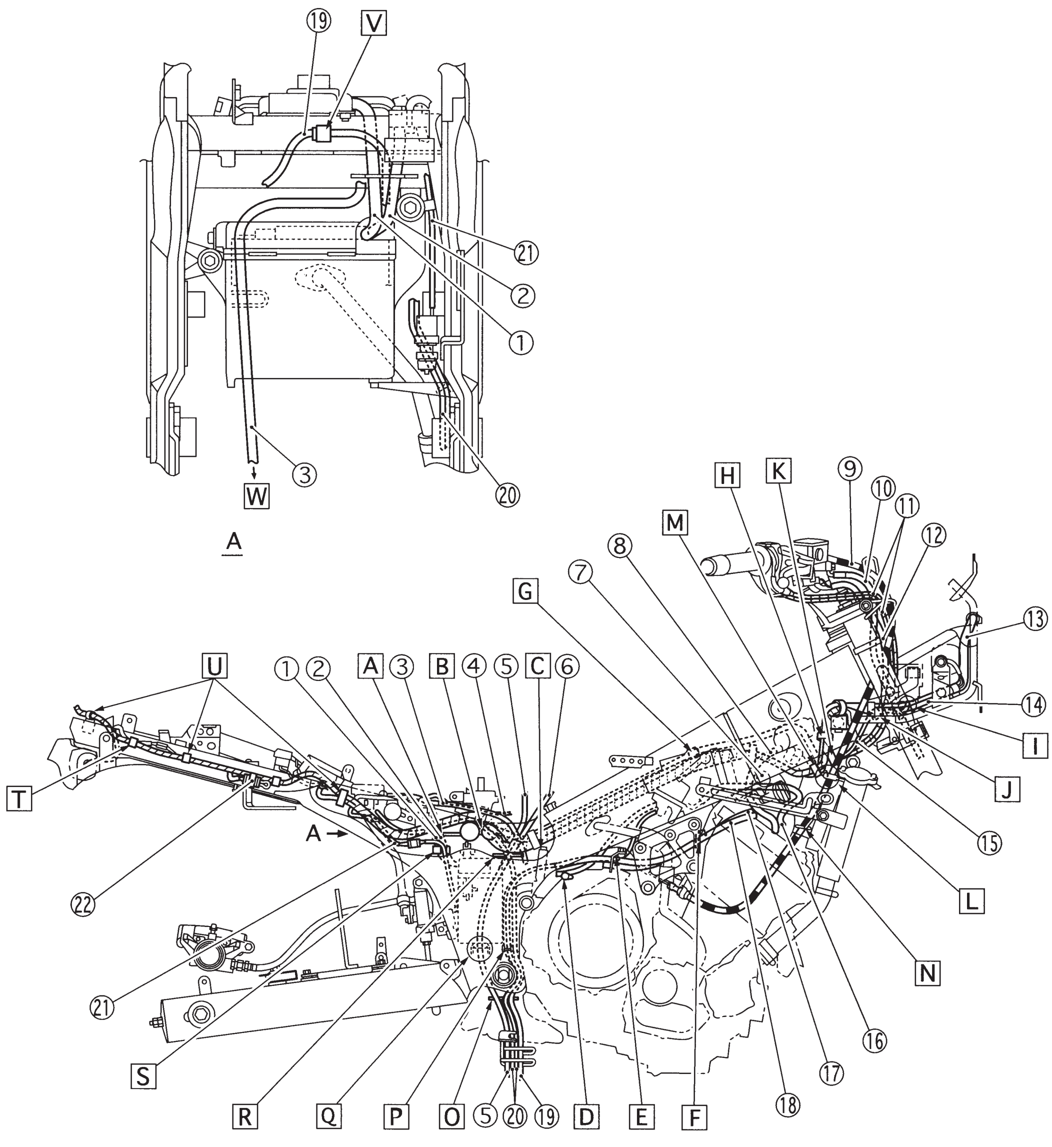


1. Battery negative lead
2. Battery positive lead
3. Starter motor lead
4. Fuel sender lead
5. Fuel tank drain hose
6. Fuel tank breather hose (for DEU)
7. Water hose
8. Spark plug lead
9. Clutch cable
10. Brake hose
11. Throttle cable
12. Right handlebar switch lead
13. Headlight lead
14. Meter light lead
15. Speed sensor lead
16. Carburetor heater hose
17. Vacuum hose (#1)
18. Vacuum hose (#2)
19. Coolant reservoir breather hose
20. Carburetor breather hose
21. Rear brake switch lead
22. CYCLELOCK lead

A Route the battery positive lead and battery negative lead through the clamp.
B Fasten the wireharness Coolant breather hose and flasher relay lead.
C Route the carburetor breather hoses through the engine clamp.
D Fasten the carburetor air vent hose.
E Route the carburetor breather hoses, vacuum hose (#1) down ward and vacuum hose (#2) upward through the guide.
F Route the vacuum hose (#1) inside, vacuum hose (#2) outside through the guide.
G Fasten the coolant reservoir hose.
H Fasten the wireharness right handlebar switch lead meter lead and headlight lead with a clamp.
I Route the relay lead through the outside of wireharness.

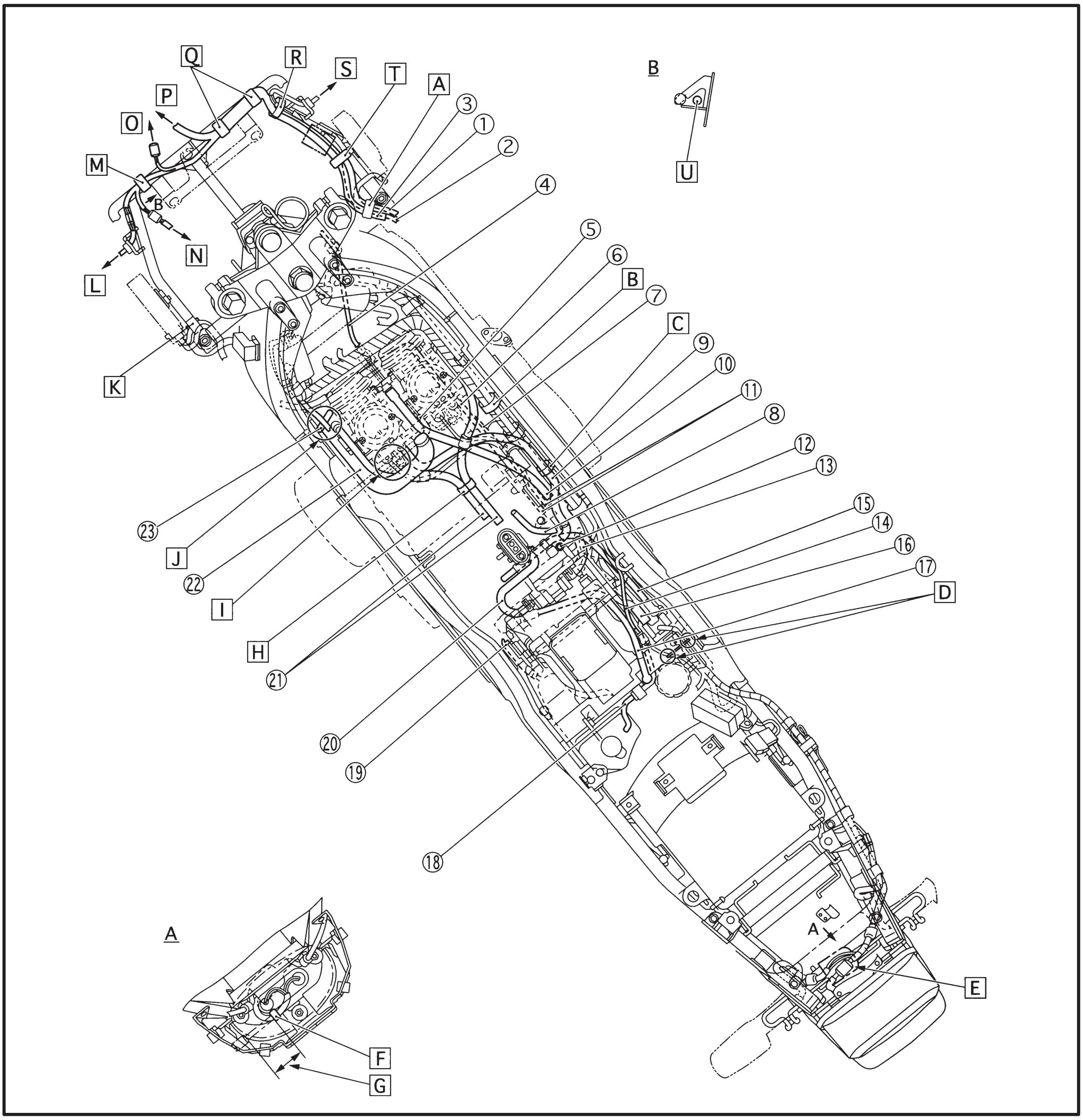


J Fasten the right handlebar switch lead and speed sensor lead with a clamp.
K Fasten the throttle cable and speed sensor lead with a clamp.
L Route the coolant reservoir hose through the outside of clutch cable.
M Fasten the wireharness, right handlebar switch lead, meter lead and headlight lead with a clamp.
N Route the clutch cable through the guide of stay.
O Route the coolant reservoir breather hose, fuel tank drain hose, carburetor breather hose through the guide.
P Route the carburetor breather hoses through the clamp.
Q Route the fuel tank drain hose, fuel tank breather hose through the hole of the frame bracket.
R Route the coolant reservoir breather hose, fuel tank breather hoseand fuel tank drain hose through the guide.
S Route the brake switch lead through the guide.
T Fasten the wireharness, rear flasher lead with a clamp.
U Fasten the wireharness with a clamp.
V Fasten the coolant reservoir breather hose with a clamp.
W To the engine.

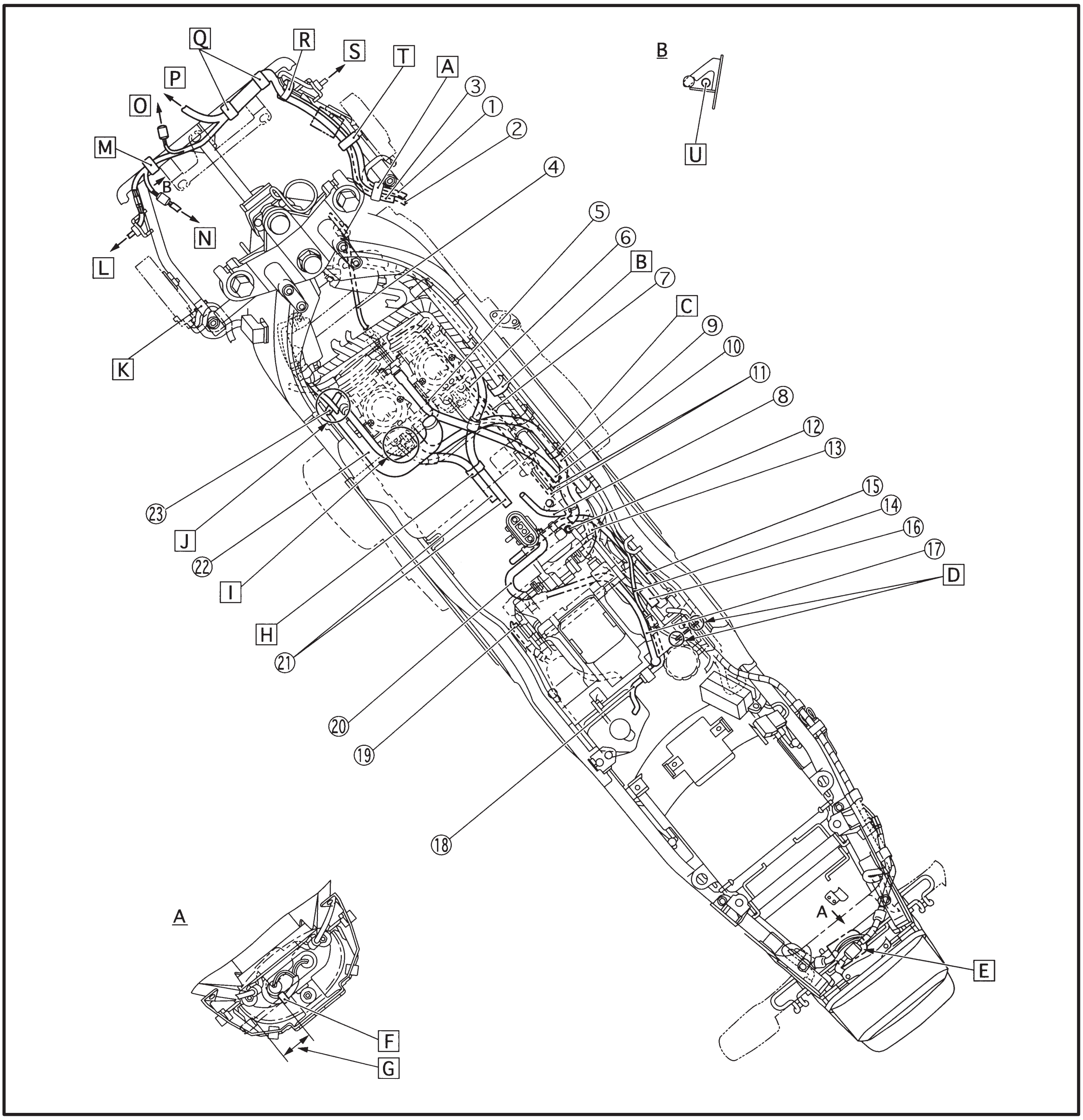


① Head light lead
② Wireharness
③ Meter light lead
④ Throttle cable
⑤ Throttle stop screw cable
⑥ Vacuum hose (#2)
⑦ Vacuum hose (#1)
⑧ Fuel tank breather hose
⑨ Fuel hose
⑩ Carburetor air vent hose
⑪ Carburetor breather hose
⑫ Fuel tank drain hose
⑬ Fuel hose
⑭ Fuel sender lead
⑮ Starter motor lead
⑯ Battery positive lead
⑰ Battery negative lead
⑱ Coolant reservoir breather hose
⑲ Coolant reservoir hose
⑳ Fuel hose
㉑ Carburetor breather hose
㉒ Cylinder head breather hose
㉓ Air filter case breather hose

A Fasten the meter lead, headlight lead wireharness with a clamp.
B Fasten the wireharness, coolant reservoir hose with a clamp.
C Fasten the fuel hose with a clamp.
D Route the starter relay lead and fuel sender lead through the guide of bracket.
E Connect the coupler and insert the protector.
F Fasten the taillight lead to the taillight bracket above left taillight with a clamp and end of clamp is downward.
G 50 mm



H Fasten the carburetor breather hose and see the hose mark.
I In order to carburetor breather hose, idle adjust cable coolant breather hose from downward.
J Route the air filter drain hose to outside of throttle position sensor lead.
K Fasten the wireharness with a clamp.
L To left flasher.
M Fasten the headlight lead with a clamp.
N To head light.
O To auxiliary light.
P To meter.
Q Fasten the meter lead, headlight lead with a clamp.
R Fasten the meter lead, headlight lead and right flasher lead connecter with a clamp.
S To right flasher.
T Fasten the meter lead, headlight lead, relay assembly lead and right flasher lead with a clamp.



PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION

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

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

NO.		ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL (1,000 km)	EVERY 6,000 km or 6 months (whichever comes first)	EVERY 12,000 km or 12 months (whichever comes first)
1	*	**Fuel line**	• Check fuel hoses for cracks or damage. • Replace if necessary.		√	√
2	*	**Fuel filter**	• Check condition. • Replace if necessary.			√
3		**Spark plugs**	• Check condition. • Clean, regap or replace if necessary.	√	√	√
4	*	**Valves**	• Check valve clearance. • Adjust if necessary.	Every 42,000 km or 42 months (whichever comes first)		
5		**Air filter**	• Clean or replace if necessary.		√	√
6		**Clutch**	• Check operation. • Adjust or replace cable.	√	√	√
7	*	**Front brake**	• Check operation, fluid level and vehicle for fluid leakage. • Correct accordingly. • Replace brake pads if necessary.	√	√	√
8	*	**Rear brake**	• Check operation, fluid level and vehicle for fluid leakage. • Correct accordingly. • Replace brake pads if necessary.	√	√	√
9	*	**Wheels**	• Check balance, runout and for damage. • Rebalance or replace if necessary.		√	√
10	*	**Tires**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√
11	*	**Wheel bearings**	• Check bearing for looseness or damage. • Replace if necessary.		√	√
12	*	**Swingarm**	• Check swingram pivoting point for play. • Correct if necessary. • Lubricate with molybdenum disulfide grease every 24,000 km or 24 months (whichever comes first).		√	√
13		**Drive chain**	• Check chain slack. • Adjust if necessary. Make sure that the rear wheel is properly aligned. • Clean and lubricate.	Every 500 km and after washing the motorcycle or riding in the rain		
14	*	**Steering bearings**	• Check bearing play and steering for roughness. • Correct accordingly. • Lubricate with lithium soap base grease every 24,000 km or 24 months (whichever comes first).		√	√
15	*	**Chassis fasteners**	• Make sure that all nuts, bolts and screws are properly tight ened. • Tighten if necessary.		√	√
16		**Sidestand**	• Check operation. • Lubricate and repair if necessary.		√	√
17	*	**Sidestand switch**	• Check operation. • Replace if necessary.	√	√	√
18	*	**Front fork**	• Check operation and for oil leakage. • Correct accordingly.		√	√
19	*	**Rear shock absorber assembly**	• Check operation and shock absorber for oil leakage. • Replace shock absorber assembly if necessary.		√	√
20	*	**Rear shock absorber assembly pivoting points**	• Check operation. • Lubricate with molybdenum disulfide grease every 24,000 km or 24 months (whichever comes first).		√	√

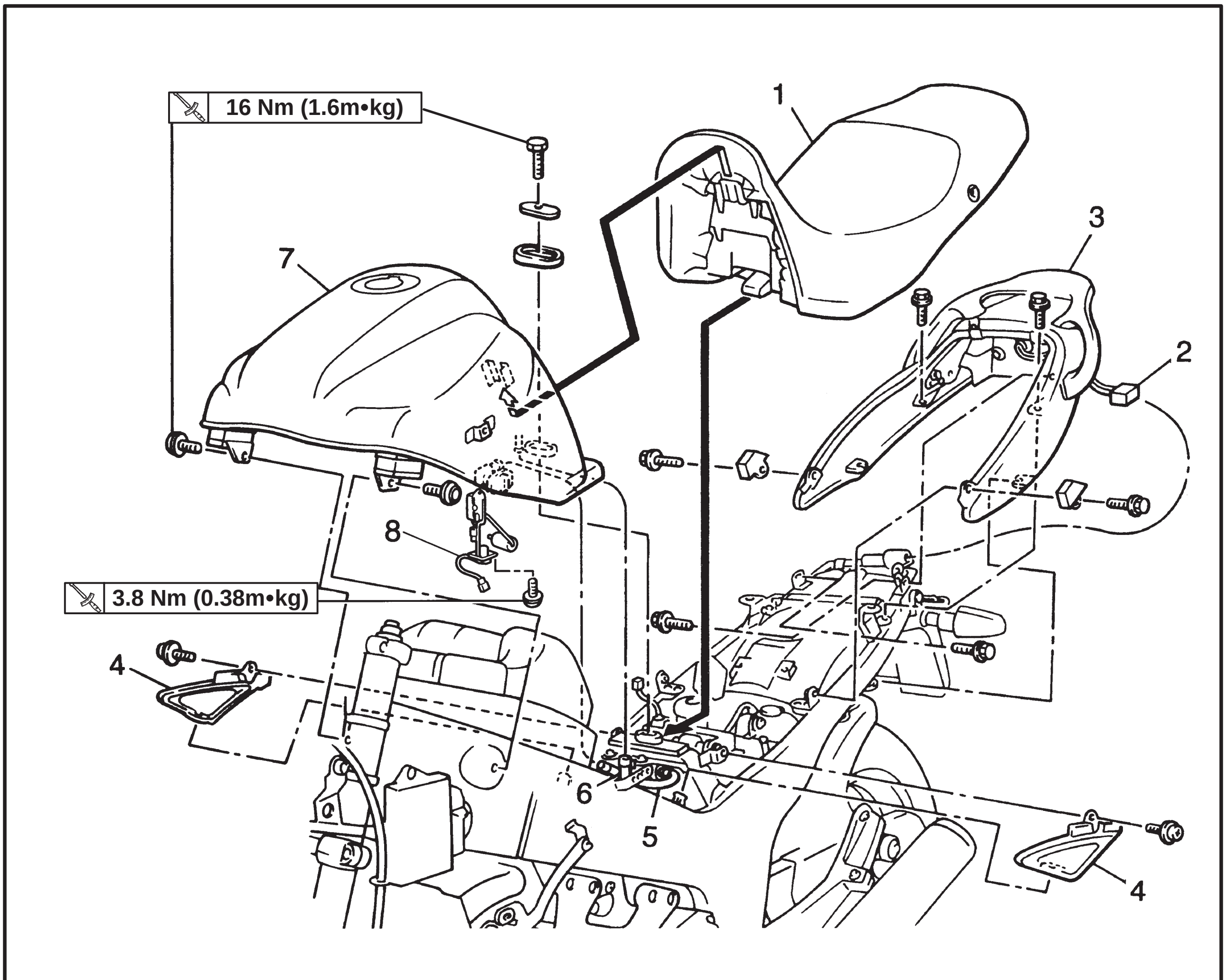
NO.		ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL (1,000 km)	EVERY 6,000 km 6 months (whichever comes first)	EVERY 12,000 km 12 months (whichever comes first)
21	*	**Carburetors**	• Check engine idling speed, synchronization and starter oper ation. • Adjust if necessary.	√	√	√
22		**Engine oil**	• Check oil level and vehicle for oil leakage. • Correct if necessary. • Change. (Warm engine before draining.)	√	√	√
23		**Engine oil filter element**	• Replace.	√		√
24	*	**Cooling system**	• Check coolant level and vehicle for coolant leakage. • Correct if necessary. • Change coolant every 24,000 km or 24 months (whichever comes first).		√	√

* Since these items require special tools, data and technical skills, they should be serviced by a Yamaha dealer.

NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake system
  - When disassembling the master cylinder or caliper cylinder, always replace the brake fluid. Check the brake fluid level regularly and fill as required.
  - Replace the oil seals on the inner parts of the master cylinder and caliper cylinder every two years.
  - Replace the brake hoses every four years or if cracked or damaged.

SEAT, TAIL COVER AND FUEL TANK



Order	Job name/Part name	Q'ty	Remarks
	Seat, tail cover and fuel tank removal		Remove the parts in the order below.
	Side cowling		Refer to "COWLINGS".
1	Seat	1	
2	Taillight lead coupler	1	Disconnect
3	Tail cover	1	
4	Side cover	2	
5	Fuel hose	1	**NOTE:** Set the fuel cock (fuel tank side) to "OFF" before disconnecting the fuel hoses.
6	Fuel tank breather hose	1	
7	Fuel tank	1	
8	Fuel sender coupler	1	Disconnect For installation, reverse the removal procedure.

ENGINE

CARBURETOR SYNCHRONIZATION

NOTE:

Valve clearance and idling speed should be adjusted properly before synchronizing the carburetors.

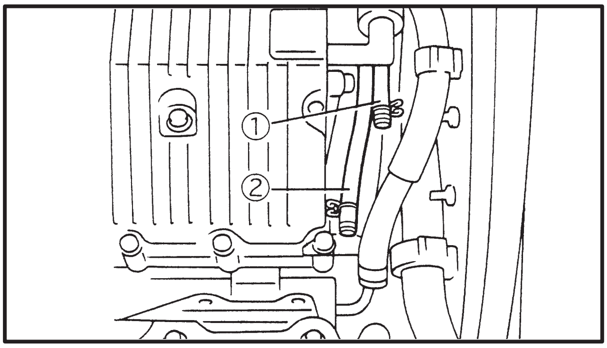
1. Place the motorcycle on a level surface.

NOTE:

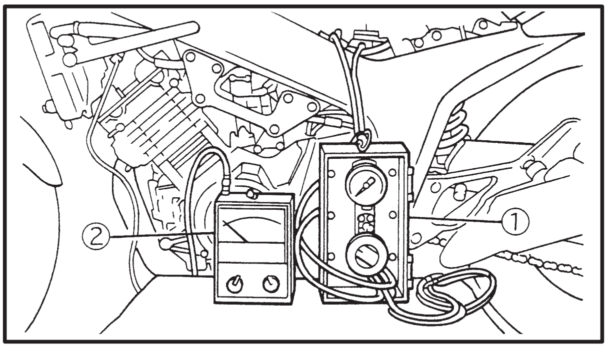
Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.

2. Remove:
   - Side cowling
   - Seat
   - Side cover
   - Fuel tank

   Refer to “COWLINGS, SEAT, TAIL COVER AND FUEL TANK”.



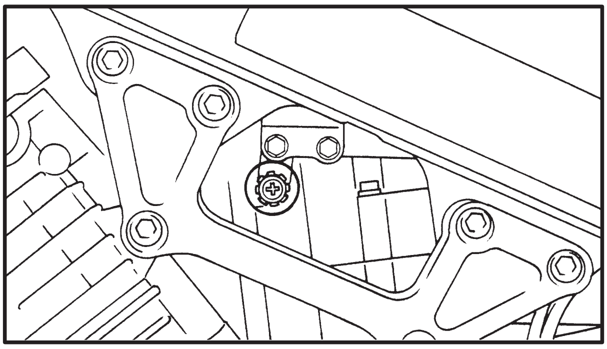
3. Remove:
   - Vacuum hose 1 (#1 carburetor) ①
   - Vacuum hose 2 (#2 carburetor) ②



4. Attach:
   - Adapters
   - Vacuum gauge ①
   - Engine tachometer ②

   (to #1 spark plug lead)

	Vacuum gauge: 90890-03094 **Engine tachometer:** 90890-03113

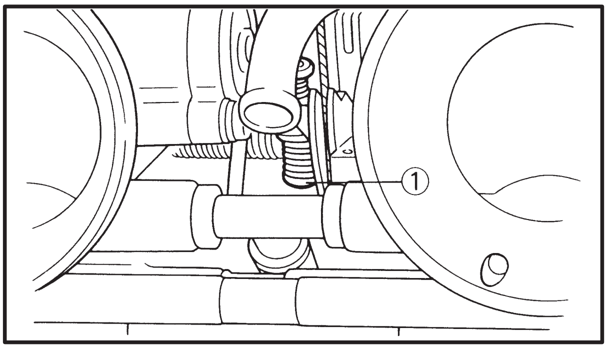


5. Start the engine and let it warm up for several minutes.
6. Check:
   - Engine idling speed

   Out of specification → Adjust.

   Refer to “ENGINE IDLING SPEED ADJUSTMENT”.

	Engine idling speed: 1,050 ～ 1,250 r/min



7. Adjust:
   - Carburetor synchronization

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

Adjustment steps:
- Synchronize carburetor #1 to carburetor #2 by turning synchronizing screw ① until both gauges read the same.
- Race the engine for less than a second, two or three times and check the synchronization again.

Intake vacuum at idle speed: 36.0 – 38.7 kPa (270 – 290 mm Hg)

NOTE:

The difference between both carburetors should be 0.67 kPa (5 mm Hg) or less.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

8. Check:
   - Engine idling speed
     Out of specification → Adjust.
9. Stop the engine and detach the measuring equipment.

10. Adjust:
    - Throttle cable free play
      Refer to “THROTTLE CABLE FREE PLAY ADJUSTMENT”.

Free play: **3 – 5 mm** **At throttle grip flange**

11. Install:
    - Fuel tank
    - Side cover
    - Seat
    - Side cowling
      Refer to “COWLINGS, SEAT, TAIL COVER AND FUEL TANK”.

ENGINE OIL LEVEL INSPECTION

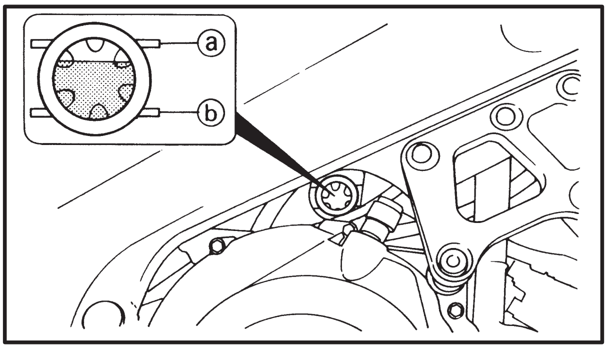
NOTE:

Position the motorcycle straight up when inspecting the oil level.

1. Place the motorcycle on a level surface.

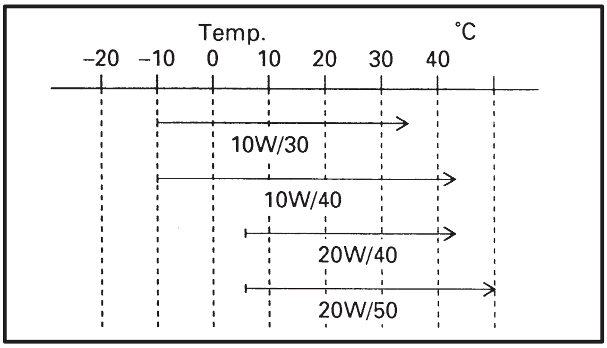
NOTE:

- After idling the engine a few minutes.
  The summer season is about 5 minutes and the winter season is about 15 minutes.
- Turn off the engine and wait a few minutes until the oil settle.
  The motor cycle is vertical.
  Then check that the oil level is between the maximum and minimum marks.
- Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.



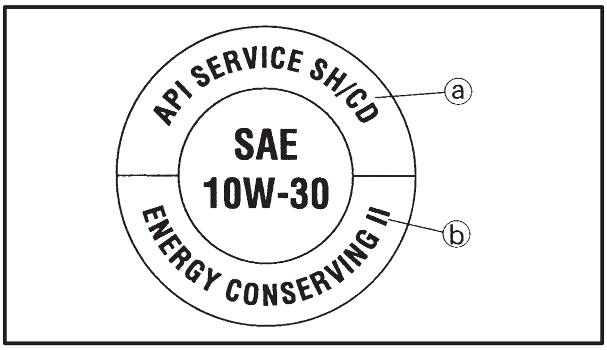
2. Inspect:
   - Oil level
     Oil level should be between the maximum ⓐ and minimum ⓑ marks.
     Oil level is below the minimum mark → Add oil up to the proper level.

Recommended oil:
Refer to the following chart for selection of oils which are suited to the atmospheric temperatures.
Recommended engine oil classification:
API STANDARD:
API "SE" or higher grade

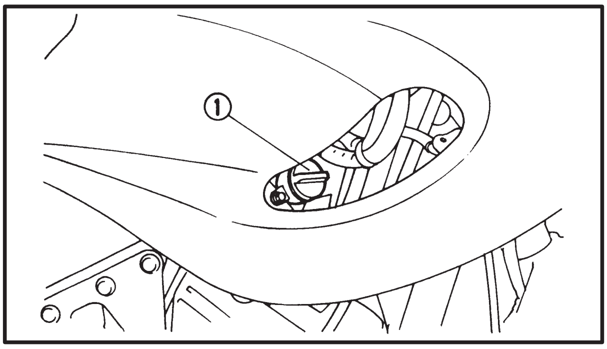


CAUTION:

- **Do not put in any chemical additives or use oils with a grade of CD ⓐ higher.**
- **Be sure not to use oils labeled "ENERGY CONSERVING II" ⓑ or higher. Engine oil also lubricates the clutch and additives could cause clutch slippage.**
- **Be sure no foreign material enters the crankcase.**

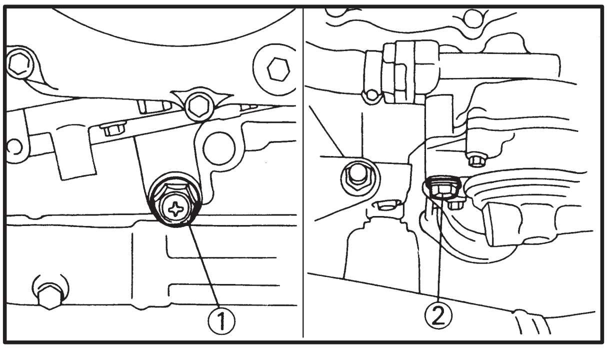


3. Start the engine and let it warm up for several minutes.
4. Turn off the engine and check the oil level again.



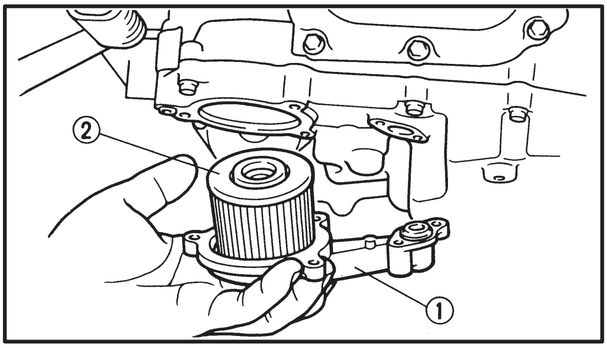
ENGINE OIL REPLACEMENT

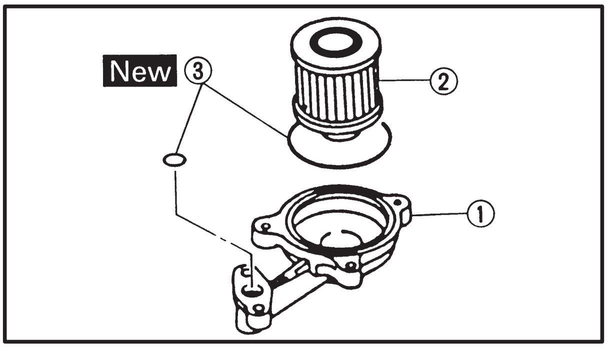
1. Start the engine and let it warm up for several minutes.
2. Stop the engine and place an oil pan under the drain bolt.
3. Remove:
   - Oil filler plug 1



4. Remove:
   - Drain bolt (with gasket) 1
   - Oil filter drain bolt (with gasket) 2

   Drain the crankcase and oil tank of its oil.





5. If the oil filter is to be replaced during this oil change, remove the following parts and reinstall them.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

Replacement steps:

- Remove the oil filter cover 1 and oil filter element 2.
- Check the O-rings 3, if cracked or damaged, replace them with a new one.
- Install the oil filter element and oil filter cover.

	Oil filter cover (M10): **10 Nm (1.0 m•kg)**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

6. Install:
   - Gaskets New
   - Drain bolt **35 Nm (3.5 m•kg)**
   - Oil filter drain bolt **30 Nm (3.0 m•kg)**

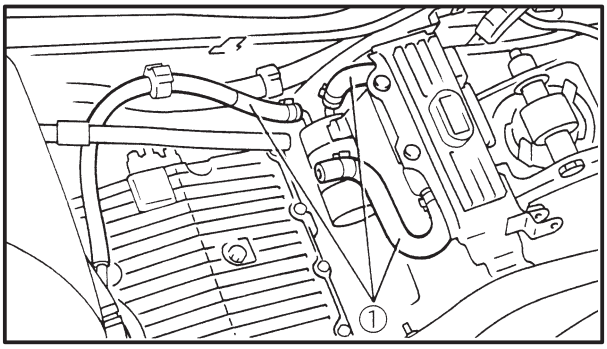
7. Fill:
   • Crankcase

CAUTION:

The engine should be filled with oil in two steps. First fill the engine with 3.2 liters of oil. Then start the engine and race it five or six times. Continue idling the engine a few minutes. Stop the engine and fill it with oil to the specified level.

Oil quantity:
Total amount:
4.2 L
Periodic oil change:
3.5 L
With oil filter replacement:
3.6 L

8. Install:
   • Oil filler plug
9. Inspect:
   • Engine (for oil leaks)
   • Oil level
   Refer to “ENGINE OIL LEVEL INSPECTION”.



FUEL LINE INSPECTION

1. Remove:
   - Side cowling
   - Seat
   - Side cover
   - Fuel tank

   Refer to "COWLINGS, SEAT, TAIL COVER AND FUEL TANK".
2. Inspect:
   - Fuel hoses ①

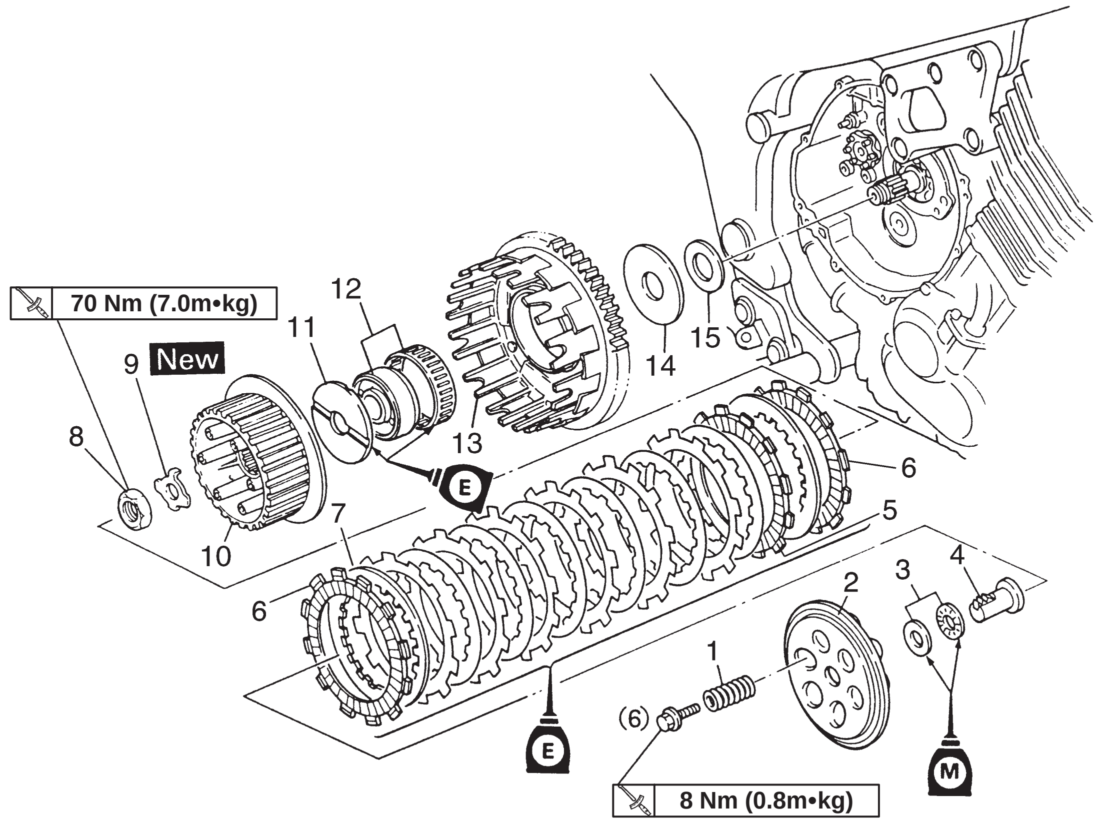
   Cracks/Damage → Replace.
   Loose connection → Connect properly.

NOTE:
Drain and flush the fuel tank if abrasive damage to any components is evident.

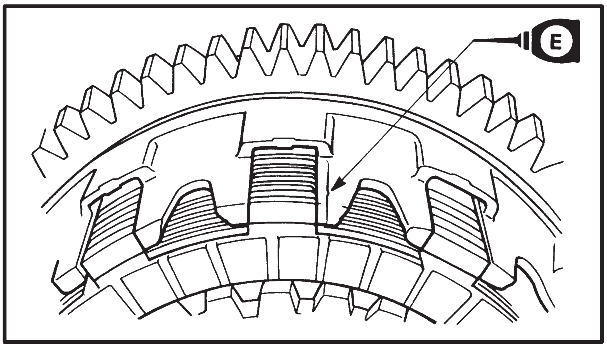
3. Install:
   - All removed parts

NOTE:
Install all removed parts in reversed order of their removal.

CLUTCH
CLUTCH



Order	Job name/Part name	Q'ty	Remarks
	Clutch removal		Remove the parts in the order below.
1	Clutch spring	6	
2	Pressure plate	1	
3	Plain washer/Bearing	1/1	
4	Pull rod	1	
5	Friction plate	7	
6	Friction plate	2	
7	Clutch plate	8	Refer to "REMOVAL", and "INSTALLATION".
8	Clutch boss nut	1	
9	Lock washer	1	
10	Clutch boss	1	
11	Thrust plate	1	
12	Spacer/Bearing	1/1	
13	Clutch housing	1	
14	Thrust plate 2	1	
15	Thrust plate 1	1	
			For installation, reverse the removal procedure.



INSTALLATION

1. Install:
   • friction plates
   • clutch plates

CAUTION:

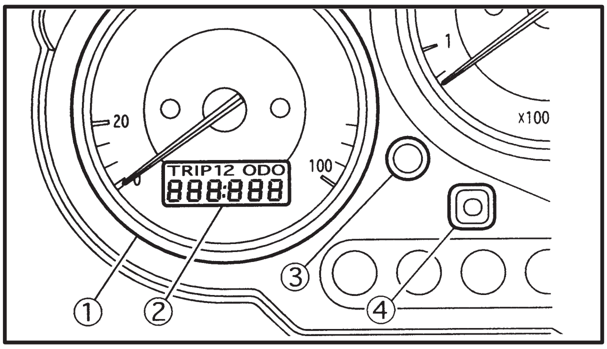
The friction plates are made in two types. The first and last friction plates are different in material from the other ones and black on the surface. Assembly should be done in the correct order.

NOTE:

• Mount friction and clutch plate alternately.
• Lubricate the friction plates with engine oil.

INSTRUMENT FUNCTIONS

COMBINATION METER



① Speedometer
② Clock, odometer
③ Select button
④ Reset button

This combination meter is equipped with the following.

- An odometer
- Two trip odometers
- A clock

Odometer and trip meters

Use the trip meters to estimate how far you can ride on a tank of fuel.

Push the Select button to change between the odometer mode "ODO" and the trip odometer modes "TRIP 1" and "TRIP 2" in the following order:
"ODO" → "TRIP 1" → "TRIP 2" → "ODO"
To reset a trip odometer to 0.0, select it by pushing the select button and push the reset button for at least one second.

Clock

To change the display to the clock mode, push both the select and reset buttons.
To set the clock:

1. Push both the select and reset buttons for at least two seconds.
2. When the hour digits start flashing, push the reset button to set the hours.
3. Push the select button to change the minutes.
4. When the minute digits start flashing, push the reset button to set the minutes.
5. Push the select button to start the clock.

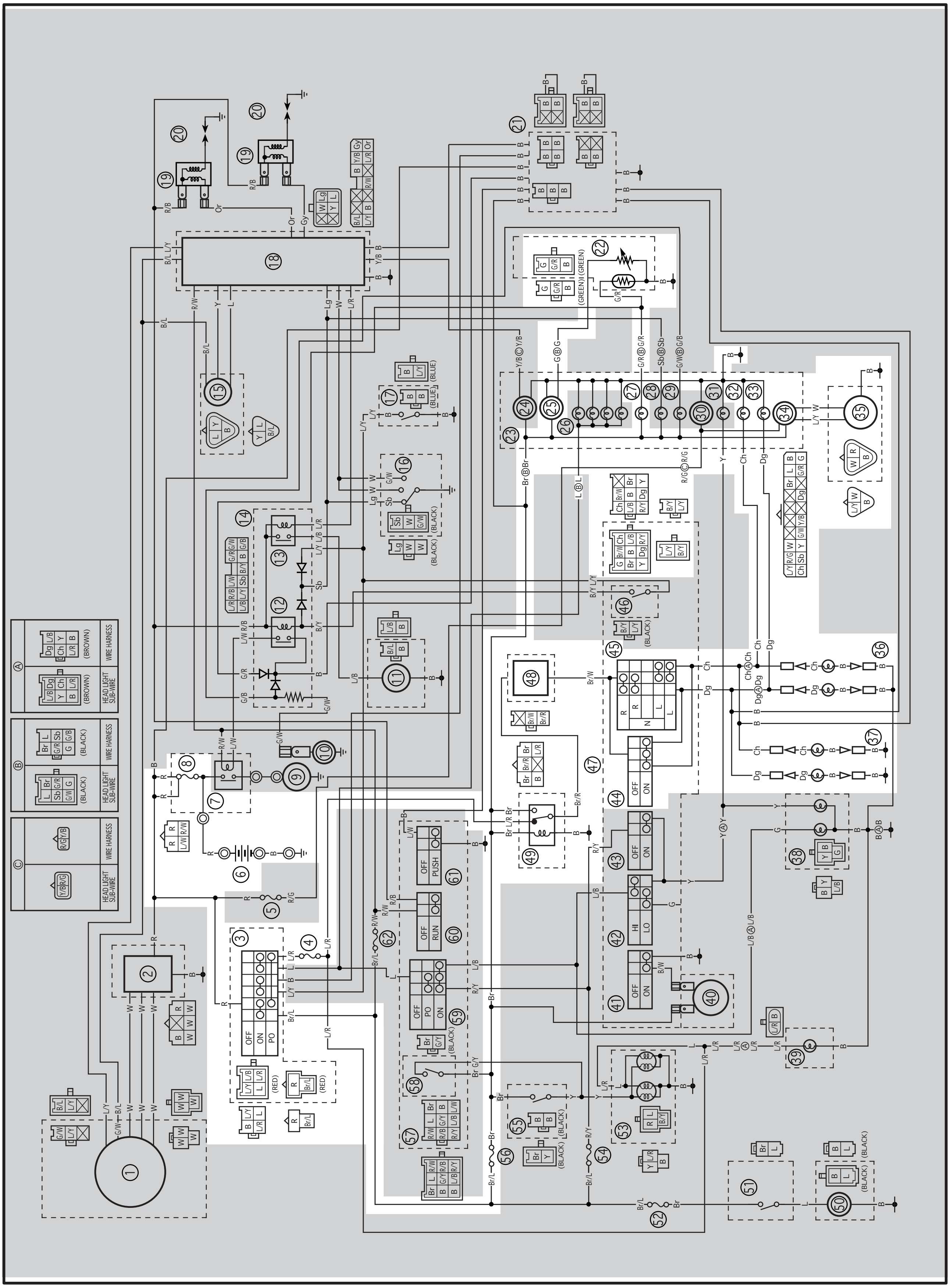
NOTE:

After setting the clock, be sure to push the select button before turning the main switch to "OFF", otherwise the clock will not be set.

EB806000

SIGNAL SYSTEM

CIRCUIT DIAGRAM



③ Main switch
④ Fuse (position light and hazard)
⑥ Battery
⑧ Main fuse
㉒ Fuel sender
㉕ Fuel meter
㉗ Fuel level indicator light
㉜ Turn indicator light (left)
㉝ Turn indicator light (right)
㉞ Speed meter
㉟ Speed sensor
㊱ Front flasher light
㊲ Rear flasher light
㊹ Hazard switch
㊺ Turn switch
㊽ Flasher relay
㊾ Hazard relay

EB806010

TROUBLESHOOTING

- **Any of the following fail to light: flasher light, trun and fuel level indicator light.**
- **The fuel meter fails to operate.**

Check:
1. main and signal system fuses
2. battery
3. main switch
4. wiring
   (of the entire signal system)

NOTE:
- Before troubleshooting, remove the following part(-s):
1) seats
2) fuel tank
3) air filter case
4) side cowlings
5) side covers
- Troubleshoot with the following special tool(-s).

	Pocket tester **90890-03112**

EB802400

1. Main and signal system fuses

- Check the main and signaling system fuses for continuity.
  Refer to “FUSE INSPECTION”.
- Are the main and signaling system fuses OK?

YES ↓ — NO ↓

NO: Replace the fuse(-s).

EB802401

2. Battery

- Check the condition of the battery.
  Refer to “BATTERY INSPECTION”.

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

- Is the battery OK?

YES ↓ — NO ↓

NO:
- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3. Main switch

- Check the main switch for continuity.
  Refer to “SWITCH INSPECTION”.
- Is the main switch OK?

YES ↓ — NO ↓

NO: Repalce the main switch.

EB806400

4. Wiring

- Check the entire signal system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the signal system’s wiring properly connected and withour defects?

YES ↓ — NO ↓

YES: Check the condition of each of the signaling system’s circuits. Refer to “SIGNAL SISTEM CHECK.”

Properly connect or repair the signal system’s wiring

SIGNAL SYSTEM CHECK

1. Flasher light and/or turn indicator light does not blink.

1. Flasher/turn indicator light bulb and socket

- Check the flasher/turn indicator light bulb and socket for continuity.
- Are the flasher/turn indicator light bulb and socket OK?

YES ↓ NO ↓

NO: Replace the flasher/turn indicator light balb, socket or both.

2. Turn switch

- Refer to “SWITCH INSPECTION”.
- Is the turn switch OK?

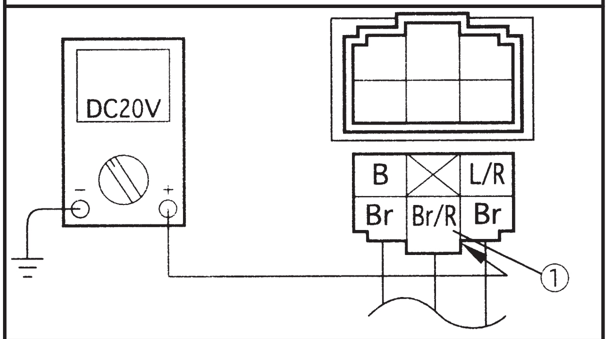
YES ↓ NO ↓

NO: Replace the left handlebar switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the hazard relay coupler.

Tester (+) lead → Brown/Red terminal ①
Tester (–) lead → Frame ground



- Turn the main switch to “ON” or “P”.
- Check for voltage (12 V) on the “Brouwn/Red” lead at the flasher relay terminal.
- Is the voltage within specification.

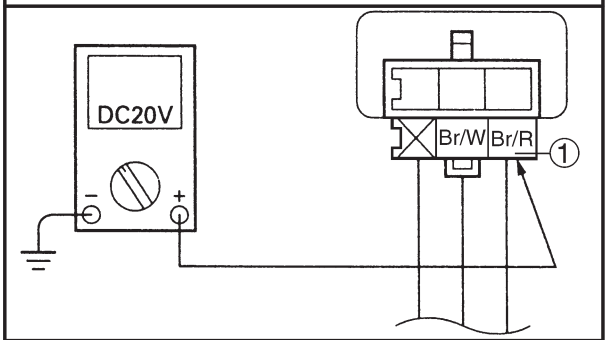
YES ↓ NO ↓

NO: Wiring circuit from main switch to hazard relay connector is faulty, repair.

4. Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay coupler.

Tester (+) lead → Brown/Red terminal ①
Tester (–) lead → Frame ground



- Turn the main switch to “ON” or “P”.
- Check for voltage (12 V) on the “Brown/Red” lead at the flasher relay terminal.
- Is the voltage within specification.

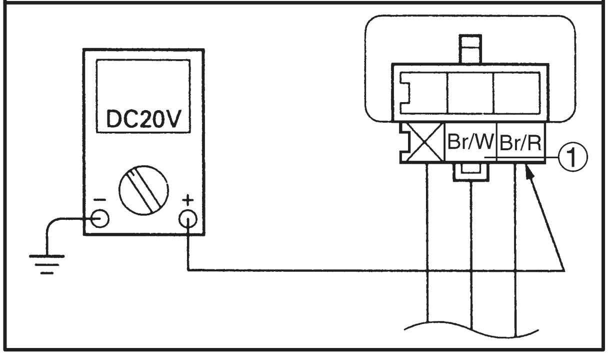
YES ↓ NO ↓

NO: Wiring circuit from main switch to flasher relay connector is faulty, repair.

5. Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay lead.

Tester (+) lead → Brown/White terminal ①
Tester (–) lead → Frame ground



- Turn the main switch to “ON” or “P”.
- Check for voltage (12 V) on the “Brouwn/White” lead at the flasher relay terminal.
- Is the voltage within specification.

YES ↓ NO ↓

Replace the flasher relay.

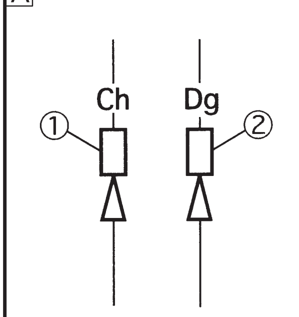
5. Voltage

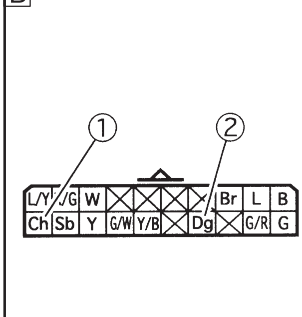
- Connect the pocket tester (DC 20 V) to the bulb socket connector.

A Flasher lights
B Turn indicator light

At flasher light (left):
Tester (+) lead → Chocolate lead ①
Tester (–) lead → Frame ground

At flasher light (right):
Tester (+) lead → Dark green lead ②
Tester (–) lead → Frame ground

A


B


- Turn the main switch to “ON” or “P”.
- Turn the turn switch to “L” or “R”.
- Check for voltage (12 V) on the “Chocolate” lead or “Dark green” lead at the bulb socket connector.
- Is the voltage with in specification.

YES ↓ NO ↓

This circuit is good.

Wiring circuit from turn switch to bulb socket connector is faulty, repair.

2. The fuel level indicator light fails to come on or the fuel meter fails to operator.

1. Fuel level indicator light bulb and socket

- Check the fuel level indicator bulb and socket continuity.
- Are the fuel level indicator light bulb and socket OK?

YES ↓ NO ↓

Replace the bulb and/or socket.

2. Fuel sender

- Drain the fuel and remove the fuel sender from the fuel tank.
- Disconnect the fuel sender coupler from the wire harness.
- Connect the posket tester (Ω × 1) to the fuel sender.

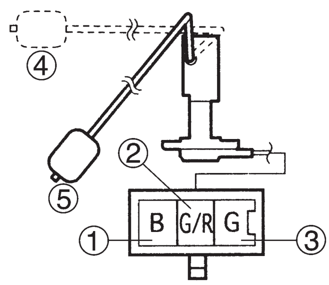
Tester (+) lead → Green/Red terminal ②
Tester (–) lead → Black terminal ①

- Check the fuel sender for continuity.
- Connect the pocket tester (Ω × 1) to the fuel sender

Tester (+) lead → Green/Red terminal ③
Tester (–) lead → Black terminal ①

- Measure the fuel sender resistance.

Fuel sender resistance
④ : 4 ~ 10 Ω at 20°C
⑤ : 90 ~ 100 Ω at 20°C



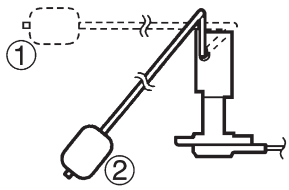
- Is the fuel sender OK?

YES | NO

Replace the fuel sender.

3. Fuel meter

- Drain the fuel and remove the fuel sender from the fuel tank.
- Connect the fuel sender to wireharness.
- Move the float to "UP" ① or "DOWN" ② .



- Turn the main switch to "ON".
- Check the fuel gauge needle moves "F" or "E".

Float position	Needle moves
Float "UP" ①	"F"
Float "DOWN" ②	"E"

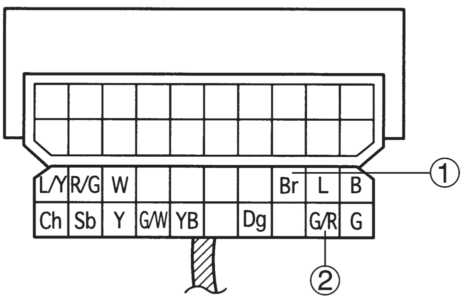
YES | NO

Replace the fuel meter

4. Voltage

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

Tester positive probe → Brown ①
Tester negative probe → Green/Red ②



- Set the main switch to "ON".
- Measure the voltage (12 V).
- Is the voltage within specification?

YES | NO

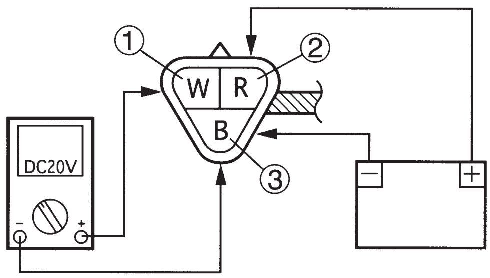
This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

2. The speed meter fails to operate.

1. Speed sensor

- Connect the pocket tester (DC 20 V) and battery (12 V)to the speed sensor coupler as shown.
- Speed sensor coupler (speed sensor side)



Battery positive terminal → red ②
Battery negative terminal → black ③

Tester positive probe → white ①
Tester negative probe → black ③

- Set the main switch to “ON”.
- Elevate the front wheel and slowly rotate it.
- Does the voltage (5V) read cycle 4 times with each, full rotation of the front wheel?

YES

NO

Replace the speed sensor.

2. Wiring

- Check the entire wiring signal system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the signal system’s wiring properly connected and with out defects?

YES

Replace the speed meter.

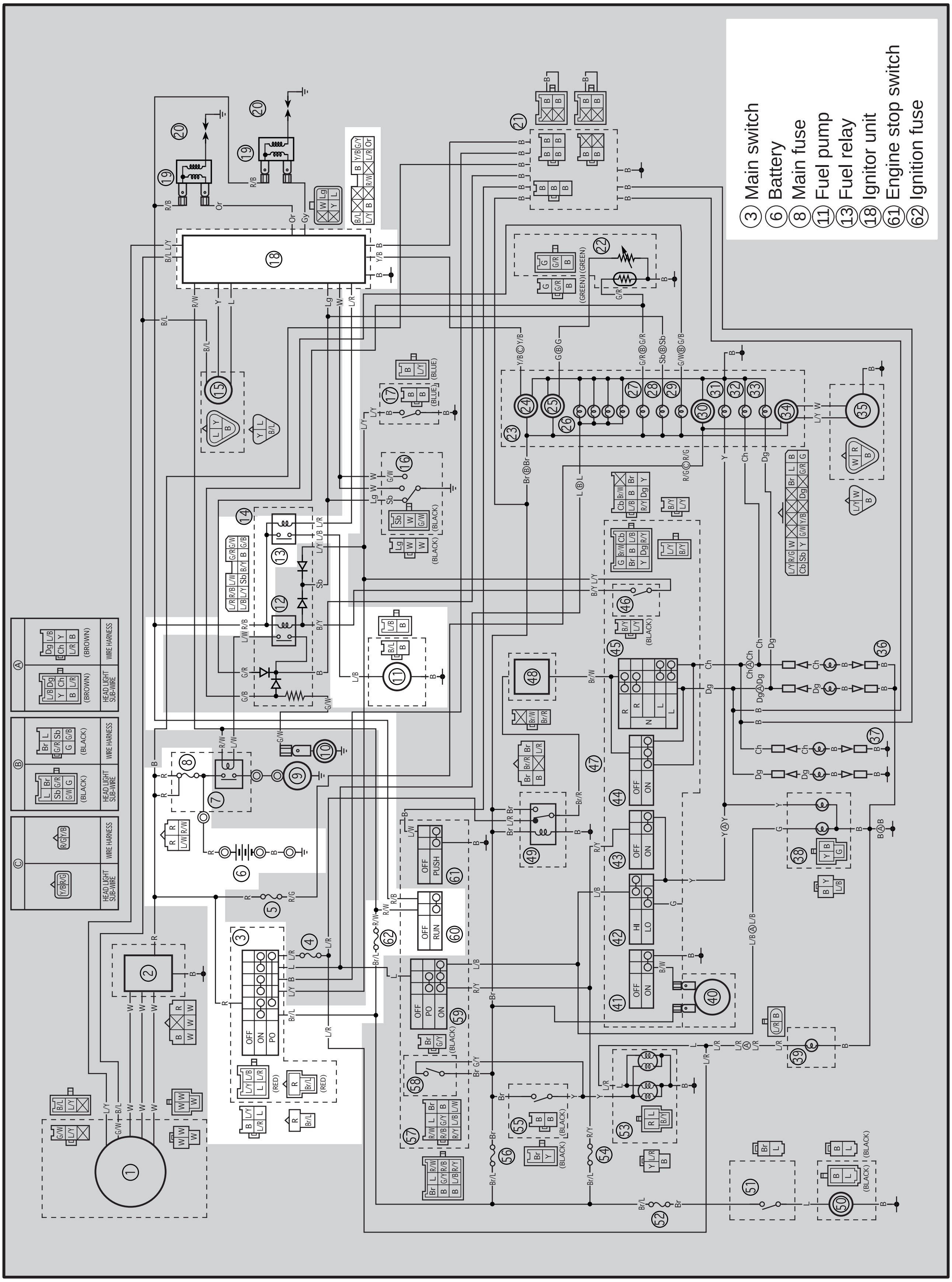
NO

Properly connect or repair the signal system’s wiring.

EB808000

FUEL PUMP SYSTEM

CIRCUIT DIAGRAM

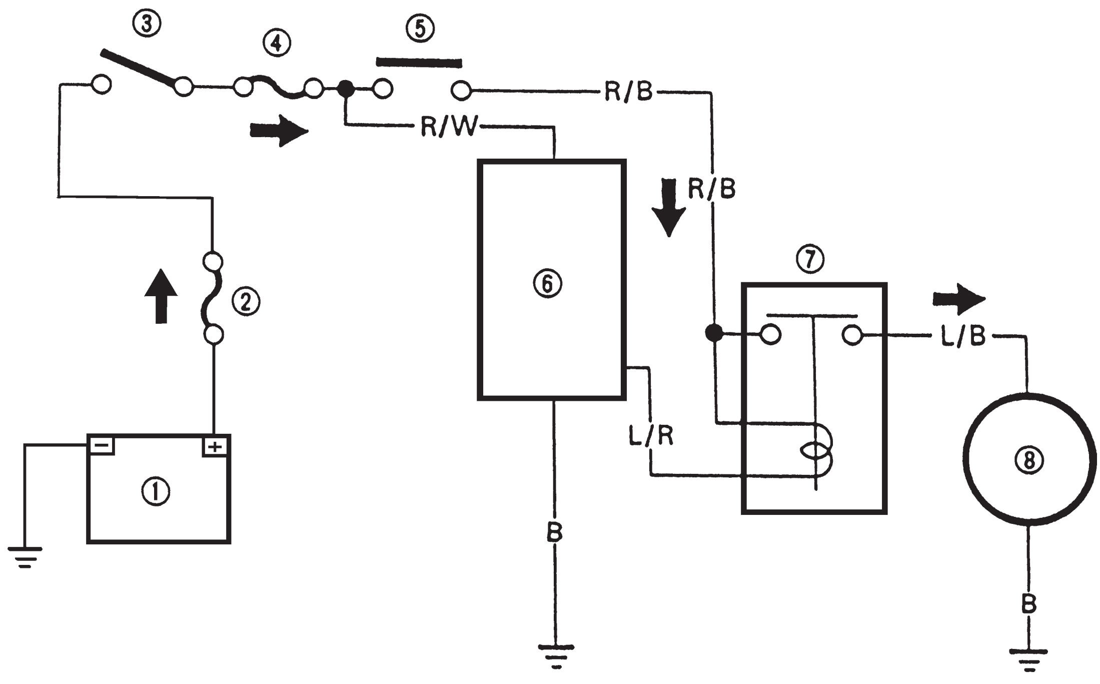


EB808010

FUEL PUMP CIRCUIT OPERATION

The ignitor unit includes the control unit for the fuel pump.

1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Engine stop switch
6. Ignitor unit
7. Fuel pump relay
8. Fuel pump



EB808020
TROUBLESHOOTING

The fuel pump fails to operate.

Check:
1. main and ignition fuses
2. battery
3. main switch
4. engine stop switch
5. fuel pump relay
6. fuel pump
7. wiring
   (the entire fuel pump system)

NOTE:
- Before troubleshooting, remove the following part(-s):
1) seat
2) fuel tank
3) side cowlings
4) side covers
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB802400

1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to “SWITCH INSPECTION”.
- Are the main and ignition fuses OK?

YES NO

Replace the fuse (-s)

EB802401

2. Battery

- Check the condition of the battery.
  Refer to “BATTERY INSPECTION”.

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

- Is the battery OK?

YES NO

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

EB802411

3. Main switch

- Check the main switch for continuity.
  Refer to “SWITCH INSPECTION”.
- Is the main switch OK?

YES NO

Repalce the main switch.

EB802412

4. Engine stop switch

- Check the engine stop switch for continuity.
  Refer to “SWITCH INSPECTION”.
- Is the engine stop switch OK?

YES NO

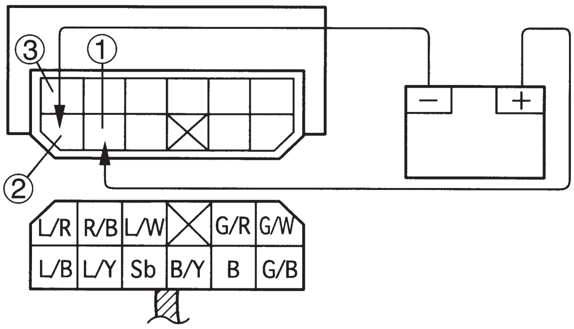
Replace the right handlebar switch

5. Fuel pump relay

- Disconnect the relay unit from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the relay unit ferminals as shown.

Battery positive terminal → red/black ①
Battery negative terminal → blue/red ②

Tester positive probe → red/black ①
Tester negative probe → blue/black ③



- Does the fuel pump relay have continuity between red/black and blue/black?

YES ↓ NO ↓

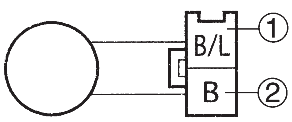
Replace the relay unit

EB808400

6. Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the fuel pump coupler (fuel pump side) as shown.

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



- Measure the fuel pump resistance.

Fuel pump resistance
4 ~ 10 Ω at 20°C

- Is the fuel pump OK?

YES ↓ NO ↓

Relpace the fuel pump.

EB808401

7. Wiring

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

YES ↓ NO ↓

Replace the ignitor unit.

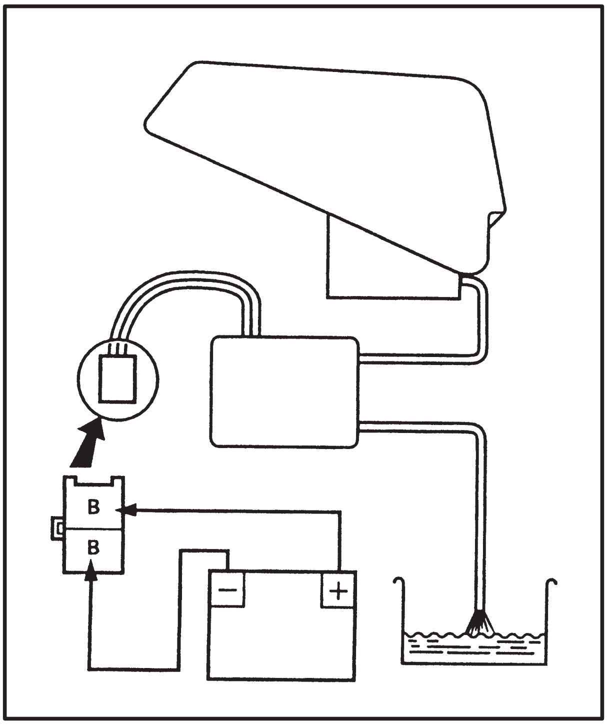
Prperly connect or repair the fuel pump system's wiring.

EB808410

CHECKING THE FUEL PUMP

WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or fire. Be extremely careful and note the following points:
- **Stop the engine before refuelling.**
- **Do not smoke and keep away from open flames, sparks or any other source of fire.**
- **If you do accidentally spill gasoline, wipe it up immediately with dry rags.**
- **If gasoline touches the engine when it is hot, a fire may occur. Therefore, make sure that the engine is completely cool before performing the following test.**



1. Check:
   - fuel pump operation

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

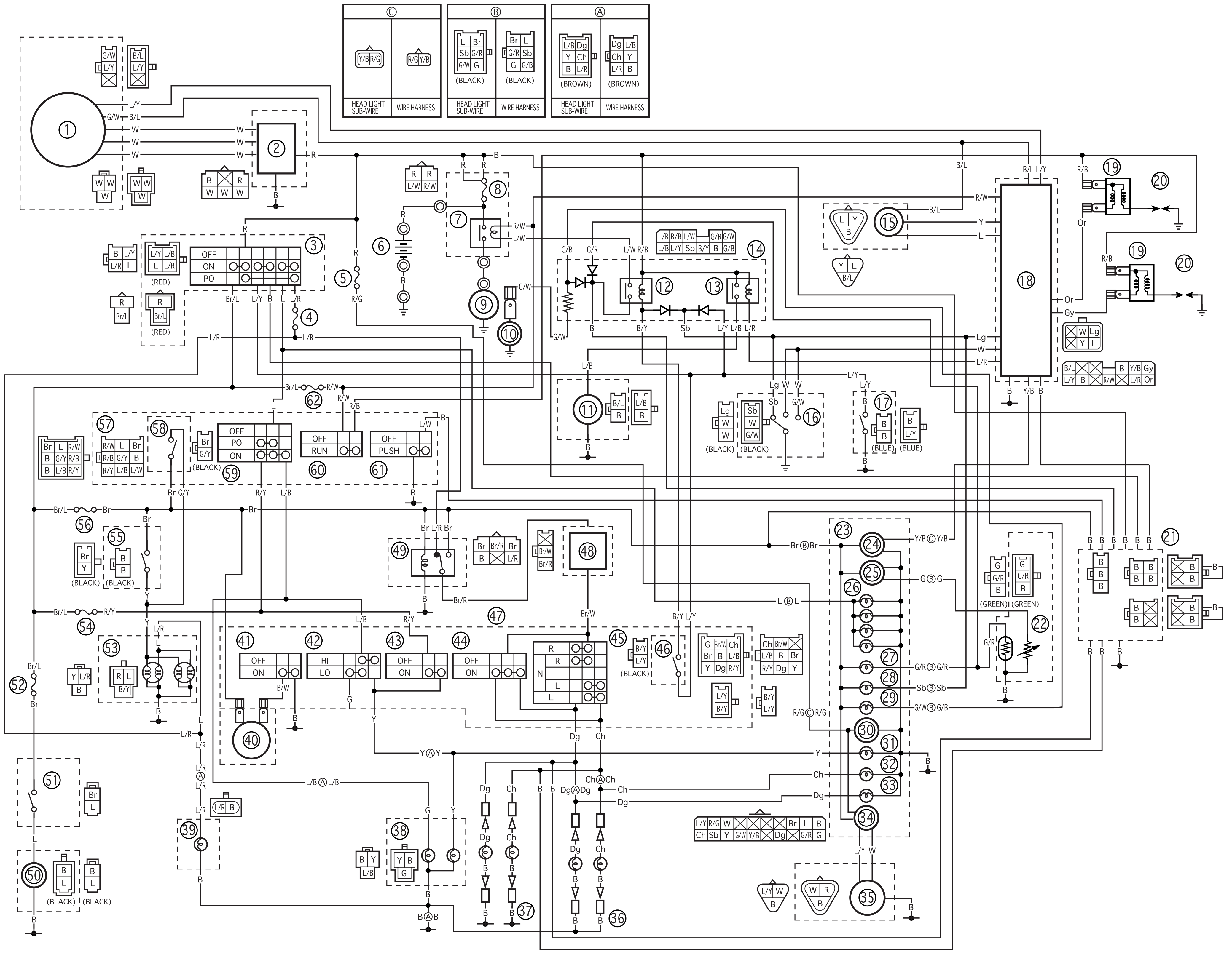
a. Fill the fuel tank.
b. Put the end of the fuel hose into an open container.
c. Connect the battery (12 V) to the fuel pump coupler as shown.

Battery positive lead → blue/black ① **Battery negative lead → black ②**

d. If fuel flows out of the fuel hose, the fuel pump is OK. If fuel does not flow, replace the fuel pump.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

TDM850 ’99 WIRING DIAGRAM



1. A.C. maguneto/pickup coil
2. Rectifier/regulator
3. Main switch
4. Fuse (position light and hazard)
5. Backup fuse (odometer)
6. Battery
7. Starter relay
8. Main fuse
9. Starter motor
10. Thermo unit
11. Fuel pump
12. Starting circuit cutoff relay
13. Fuel pump relay
14. Relay unit
15. T.P.S (throttle position sensor)
16. Gear position switch
17. Sidestand switch
18. Ignitor unit
19. Ignition coil
20. Spark plug
21. CYCLELOCK (option)
22. Fuel sender
23. Meter assembly
24. Tachometer
25. Fuel meter
26. Meter light
27. Fuel level indicator light
28. Neutral indicator light
29. Water temperature meter
30. Combination meter
31. High beam indicator light
32. Turn indicator light (left)
33. Turn indicator light (right)
34. Speed meter
35. Speed sensor
36. Front flasher light
37. Rear flasher light
38. Head light
39. Auxiliary light
40. Horn
41. Horn switch
42. Dimmer switch
43. “PASS” switch
44. Hazard switch
45. Turn switch
46. Clutch switch
47. Left handlebar switch
48. Flasher relay
49. Hazard relay
50. Fan motor
51. Thermo switch
52. Radiator fan fuse
53. Tail/brake light
54. Headlight fuse
55. Rear brake switch
56. Signal system fuse
57. Right handlebar switch
58. Front brake switch
59. Light switch
60. Engine stop switch
61. Start switch
62. Ignition fuse

COLOR CODE

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