YAMAHA

SUPPLEMENTARY SERVICE MANUAL 2011

PHAZER

Venture lite

PZ50GTA
PZ50RTA
PZ50MTA
PZ50VTA

LIT-12618-02-93

8GC-28197-12

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the PZ50GTA, PZ50RTA, PZ50MTA, PZ50VTA. For complete information, on service procedures, it is necessary to use this Supplementary Service Manual together with following manual:

PZ50W, PZ50GTW, PZ50FXW, PZ50MW, PZ50VTW, PZ50MPW SERVICE MANUAL:
8GC-28197-10 (LIT-12618-02-58)
PZ50X, PZ50GTX, PZ50RTX, PZ50MTX, PZ50VTX, PZ50MPX
SUPPLEMENTARY SERVICE MANUAL:
8GC-28197-11 (LIT-12618-02-67)

PZ50GTA, PZ50RTA, PZ50MTA, PZ50VTA
SUPPLEMENTARY SERVICE MANUAL

1st Edition, April 2010

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P/N.LIT-12618-02-93

MAJOR SPECIFICATIONS

Model		PZ50GTA	PZ50RTA	PZ50MTA	PZ50VTA
Model code		8GK7	8GN9	8GP9	8GJ9
Catalogue name		Phazer GT	Phazer RTX	Phazer MTX	Venture Lite
Class		Trail		Mountain	2-Up Touring Utility
Seating capacity		One			Two
Engine type		Liquid cooled 4-stroke, 10valves			
Cylinder arrangement/ Displacement		Backward-inclined parallel 2-cylinder/499cm^3			
Fuel system type		Electronic fuel injection			
Track length		3,072.4 mm (121 in)		3,648.5 mm (144 in)	
Front suspension		Independent, double wishbone			
Front shock absorber		40 mm GYTR® dual-clicker HPG	Fox® FLOAT™ (air shock)	KYB® gas cell	KYB® gas cell
Rear suspension		Dual Shock®	Dual Shock® CK	ProMountain® 144	ProComfort® 144
Rear shock absorber	Front	C36 KYB® HPG	C36 KYB® aluminum HPG	C36 KYB® HPG	KYB® gas cell
	Rear	C36 KYB® HPG	C40 aluminum HPG	C36 KYB® HPG	KYB® gas cell
Ski type		Lightweight plastic, saddleless design		Wide saddleless plastic mountain ski	Lightweight plastic, saddleless design
Electric start		Standard			
Reverse		Standard			

IMPORTANT

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha snowmobiles should have a basic understanding of mechanics and the techniques to repair these types of snowmobiles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the snowmobile unsafe and unfit for use.
This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the snowmobile will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his snowmobile and to conform to federal environmental quality objectives.
Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

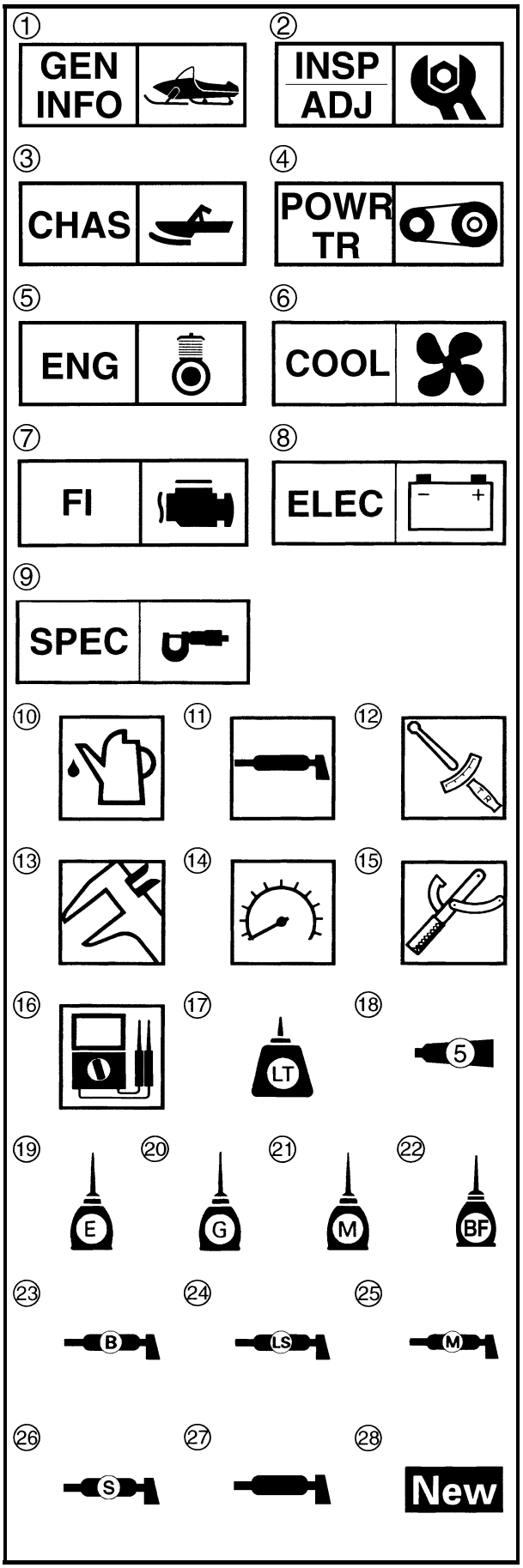
TIP

- This Service Manual contains information regarding periodic maintenance to the emission control system.
  Please read this material carefully.
- Designs and specifications are subject to change without notice.

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 snowmobile or other property.**
TIP	A TIP provides key information to make procedures easier or clearer.



ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Periodic inspection and adjustment
③ Chassis
④ Power train
⑤ Engine
⑥ Cooling system
⑦ Fuel injection system
⑧ Electrical
⑨ Specifications

Illustrated symbols ⑩ to ⑯ are used to identify the specifications which appear.

⑩ Filling fluid
⑪ Lubricant
⑫ Tightening torque
⑬ Wear limit, clearance
⑭ Engine speed
⑮ Special tool
⑯ Electrical data (Ω, V, A)

Illustrated symbols ⑰ to ㉘ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply locking agent (LOCTITE®)
⑱ Apply Yamabond No. 5®
⑲ Apply engine oil
⑳ Apply gear oil
㉑ Apply molybdenum disulfide oil
㉒ Apply brake fluid
㉓ Apply wheel bearing grease
㉔ Apply low-temperature lithium-soap-based grease
㉕ Apply molybdenum disulfide grease
㉖ Apply silicone grease
㉗ ESSO beacon 325 grease or Aeroshell grease #7A
㉘ Use new one

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CHAPTER 1. GENERAL INFORMATION

CHAPTER 2. PERIODIC INSPECTION AND ADJUSTMENT

CHAPTER 5. ENGINE

CHAPTER 7. FUEL INJECTION SYSTEM

CHAPTER 8. ELECTRICAL

CHAPTER 9. SPECIFICATIONS

GENERAL INFORMATION

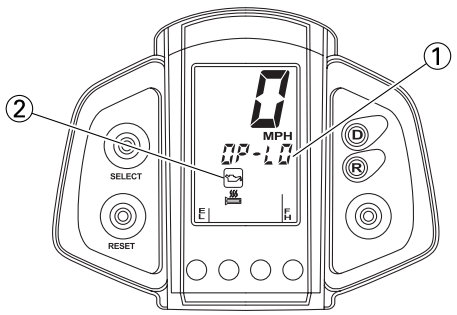
FEATURES

OIL PRESSURE SENSING SYSTEM

This model is equipped with an oil pressure sensing system. When the oil pressure drops, the rpm limiter is activated, and the engine rpm is reduced, or the engine is shut off, if necessary.

If the oil pressure is incorrect upon starting the engine

1. "OP-LO" ① appears and the oil level/pressure warning indicator ② illuminates on the meter display.



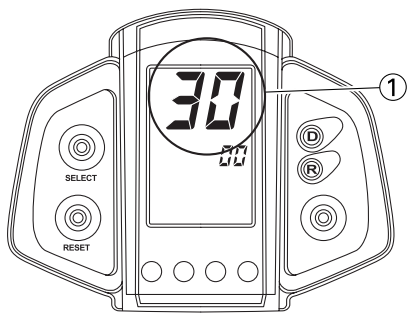
2. When the two items, above, are displayed, they indicate the rpm limiter is in operation; the rpm is reduced to less than or equal to the clutch engagement rpm, even though the throttle is open. If the incorrect oil pressure persists, the engine stops automatically after approximately one minute.
3. When the oil pressure stabilizes to the correct level ("OP-LO" disappears and the oil level/pressure warning indicator goes off), the limiter is automatically canceled as long as the throttle is not operated.
4. Note that it may take a few seconds for the oil pressure to rise to the optimum level after the engine is started, even in normal conditions. If the meter display described in (1) is no longer displayed after a few seconds, this indicates that everything is normal.

TIP

When disassembling the engine, replacing the engine oil or oil filter, etc., if the oil is drained entirely from the piping, there may be delay before the oil pressure rises.

If abnormally low oil pressure is detected when the snowmobile is running

1. Fault code No. 30 ① appears on the meter display.
2. If the snowmobile runs at high speed simultaneously, the engine rpm decreases gradually and the engine is shut off, after approximately seven seconds. If the snowmobile runs at low speed, the engine is shut off immediately.



If air has entered the oil pressure line due to excessive snowmobile movement (falling over, excessive tilting, etc.), the oil pressure may drop and the system may be activated.
Refer to "OIL PRESSURE SENSING SYSTEM TROUBLESHOOTING".

PERIODIC INSPECTION AND ADJUSTMENT

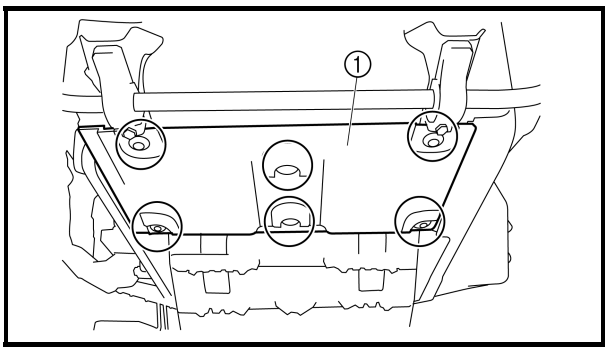
ENGINE

ENGINE OIL REPLACEMENT

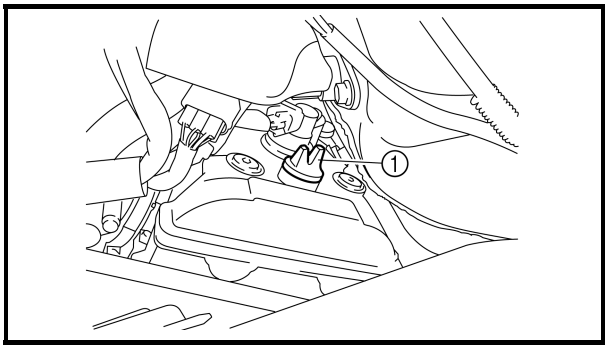
This model is equipped with an oil pressure sensing system. When the oil pressure drops, the rev limiter is activated, and the engine is stopped, if necessary. If the oil pressure is incorrect when the engine is started, "OP-LO" appears and the oil level/pressure warning indicator illuminates. Note that it may take a few seconds for the oil pressure to rise to the optimum level after the engine is started, even in normal conditions.
Refer to "OIL PRESSURE SENSING SYSTEM".

TIP

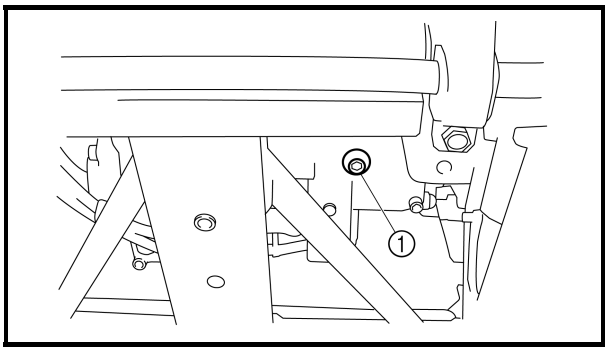
If "OP-LO" remains on and the oil level/pressure warning indicator remains illuminated for more than a few seconds after starting the engine, this indicates that oil pressure is incorrect. In this case, check the oil pressure sensing system.



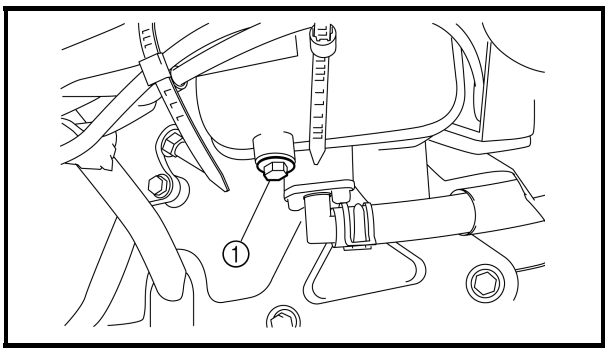
1. Place the snowmobile on a level surface and apply the parking brake.
2. Start the engine, warm up for several minutes, and then turn it off.
3. Place a containers under the engine oil drain bolt and oil tank.
4. Remove:
   - Bottom panel ①
5. Remove:
   - Left side panel
   - Right side cover
   - Right lower cover
   Refer to "COWLINGS" in CHAPTER 3.
6. Disconnect:
   - Oil level gauge coupler
   Refer to "ENGINE OIL LEVEL INSPECTION" in CHAPTER 2.
7. Remove:
   - Oil level gauge/dipstick
   Refer to "ENGINE OIL LEVEL INSPECTION" in CHAPTER 2.



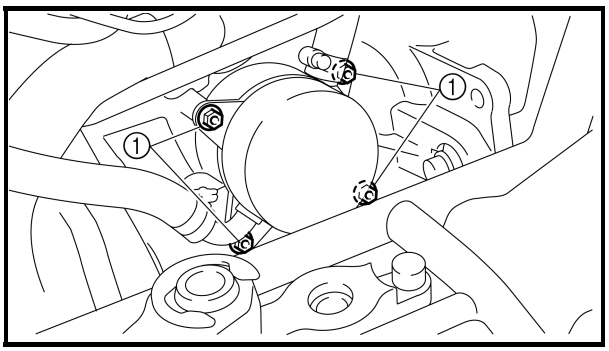
8. Remove:
   • Cylinder head oil filler cap ①



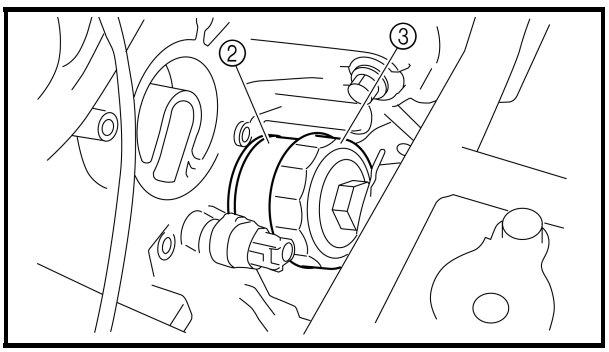
9. Remove:
   • Oil pan engine oil drain bolt ①



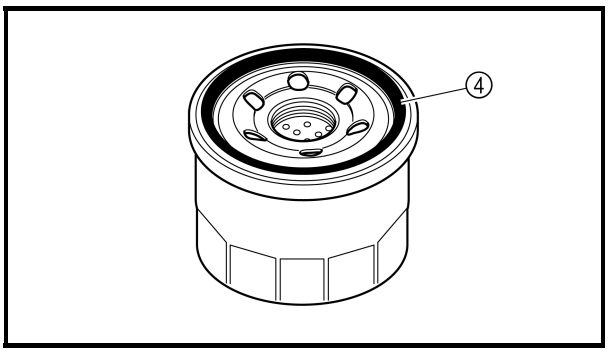
10. Remove:
    • Oil tank engine oil drain bolt ①
11. Drain:
    • Engine oil
      (completely from the oil pan and oil tank)
12. If the oil filter cartridge is also to be replaced, perform the following procedure.



Replacement steps:
- Remove the air filter case.
  Refer to “COWLINGS” in CHAPTER 3.
- Remove the oil cooler bolts ①.
- Remove the oil cooler.
- Remove the oil filter cartridge ② with an oil filter wrench ③.



Oil filter wrench:
90890-01469, YM-01469



• Apply a thin coat of engine oil onto the O-ring ④ of the new oil filter cartridge.

NOTICE

Make sure that the O-ring ④ is positioned correctly in the groove of the oil filter cartridge.

• Tighten the new oil filter cartridge to specification with an oil filter wrench.

Oil filter cartridge:
17 Nm (1.7 m•kgf, 12 ft•lbf)

• Tighten the oil cooler bolts to specification.

Oil cooler bolt:
10 Nm (1.0 m•kgf, 7.2 ft•lbf)
LOCTITE®

13. Install:
• Drain bolts
(along with the new gaskets)

Oil tank engine oil drain bolt:
16 Nm (1.6 m•kgf, 12 ft•lbf)
Oil pan engine oil drain bolt:
30 Nm (3.0 m•kgf, 22 ft•lbf)

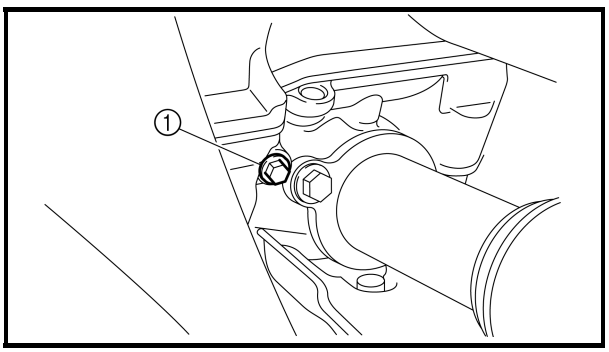
14. Fill:
• Engine oil
(with the specified amount of the recommended engine oil)
Add 1.5 L (1.3 Imp.qt, 1.6 US qt) of the recommended engine oil to the oil tank, and then install and tighten the oil level gauge/ dipstick and the cylinder head cap.

Quantity:
Total amount:
3.00 L (2.64 Imp.qt, 3.17 US qt)
Periodic oil change:
2.45 L (2.16 Imp.qt, 2.59 US qt)
With oil filter replacement:
2.63 L (2.31 Imp.qt, 2.78 US qt)

15. Inspect:
    - Engine and oil tank
      (for engine oil leaks)
16. Inspect:
    - Engine oil level
      Refer to “ENGINE OIL LEVEL INSPECTION” in CHAPTER 2.

TIP

If “OP-LO” remains on and the oil level/pressure warning indicator remains illuminated for more than a few seconds after starting the engine, this indicates that oil pressure is incorrect. In this case, check the oil pressure sensing system.
Refer to “OIL PRESSURE SENSING SYSTEM TROUBLESHOOTING”.



17. Inspect:
    - Engine oil pressure

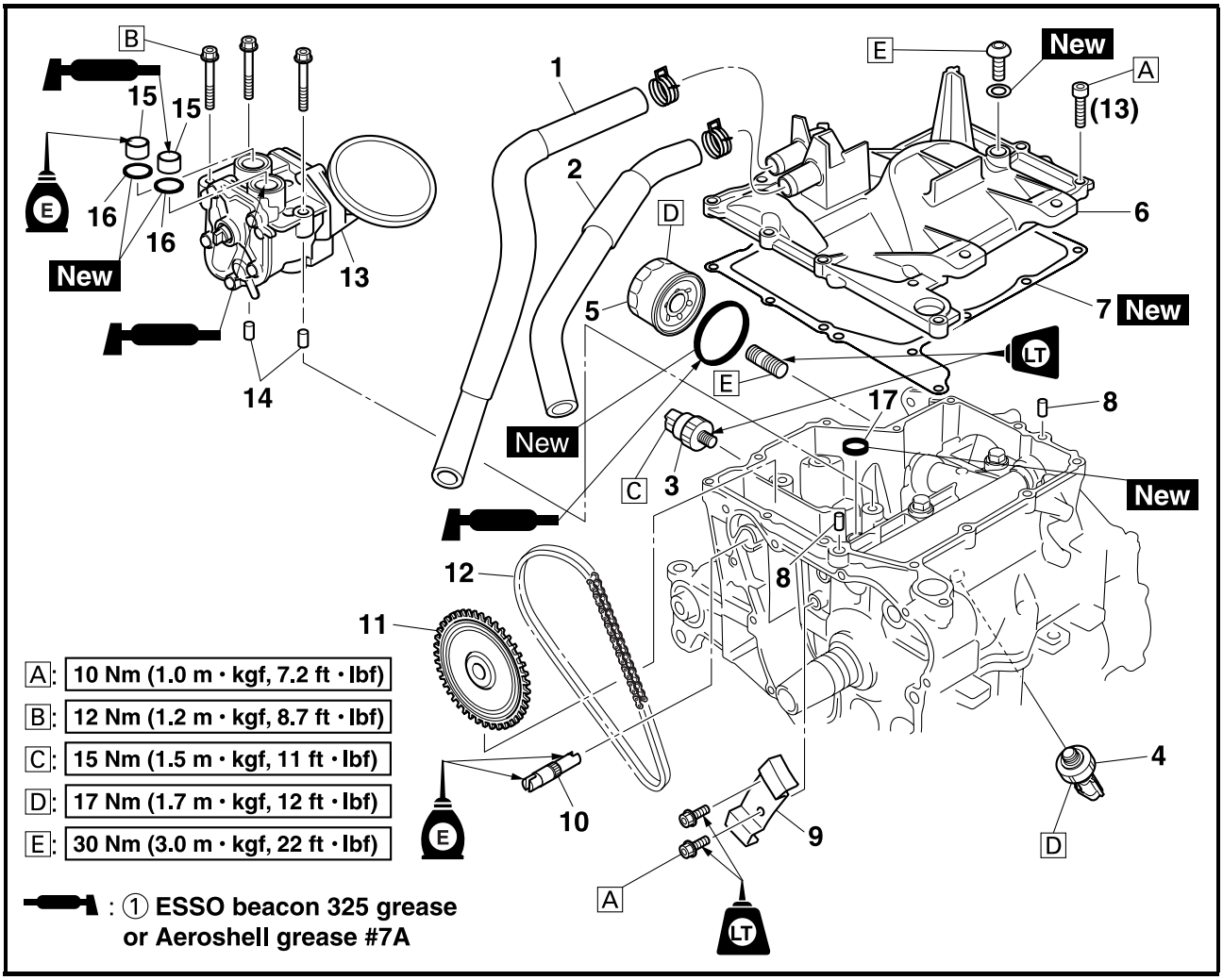
Inspection steps:

- Remove the exhaust pipe joint upper cover.
  Refer to “EXHAUST PIPE AND MUFFLER” in CHAPTER 5.
- Slightly loosen the oil gallery bolt ①.
- Install the fuel tank.
  Refer to “SEAT AND FUEL TANK” in CHAPTER 5.
  Refer to “RIDER SEAT AND FUEL TANK” in CHAPTER 5.
- Start the engine and keep it idling until engine oil starts to seep from the oil check bolt.
  If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- Check the engine oil passages, the oil filter and the oil pump for damage or leakage.
- Start the engine after solving the problem(-s) and check the engine oil pressure again.
- Tighten the oil check bolt to specification.

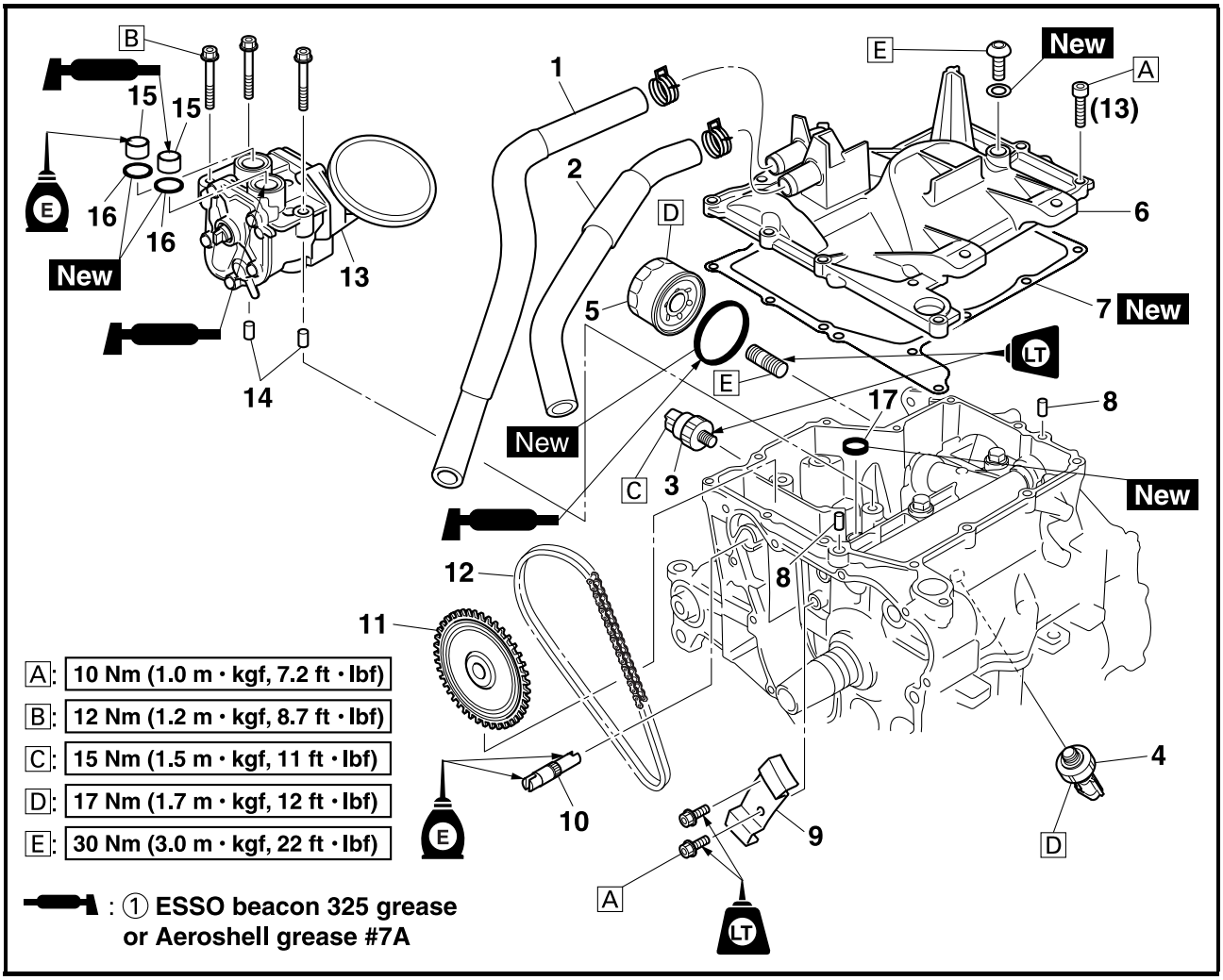
	**Oil check bolt:** **10 Nm (1.0 m•kgf, 7.2 ft•lbf)**

ENGINE

OIL PAN AND OIL PUMP



Order	Job name/Part name	Q'ty	Remarks
	Oil pan and oil pump removal		Remove the parts in the order listed below.
	Engine		Refer to "ENGINE ASSEMBLY".
	Starter clutch gear		Refer to "A.C. MAGNETO ROTOR AND STARTER CLUTCH".
1	Oil tank inlet hose	1	
2	Oil tank outlet hose	1	
3	Oil pressure switch	1	
4	Oil pressure sensor	1	
5	Oil filter cartridge	1	
6	Oil pan	1	
7	Gasket	1	
8	Dowel pin	2	
9	Oil pump drive chain guide	1	
10	Oil pump driven sprocket shaft	1	
11	Oil pump driven sprocket	1	
12	Oil pump drive chain	1	
13	Oil pump	1	

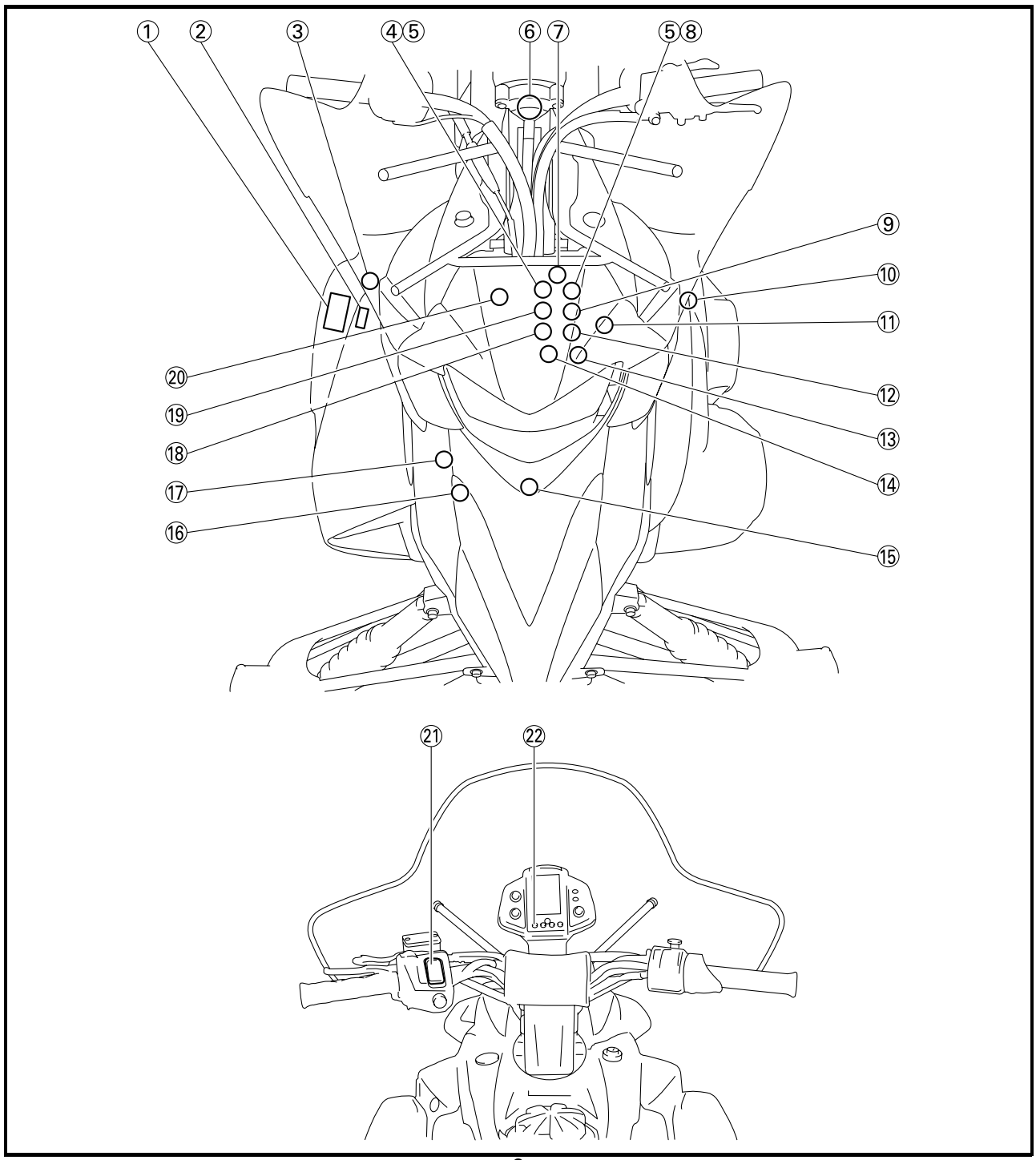


Order	Job name/Part name	Q'ty	Remarks
14	Dowel pin	2	
15	Collar	2	
16	O-ring	2	
17	Gasket	1	

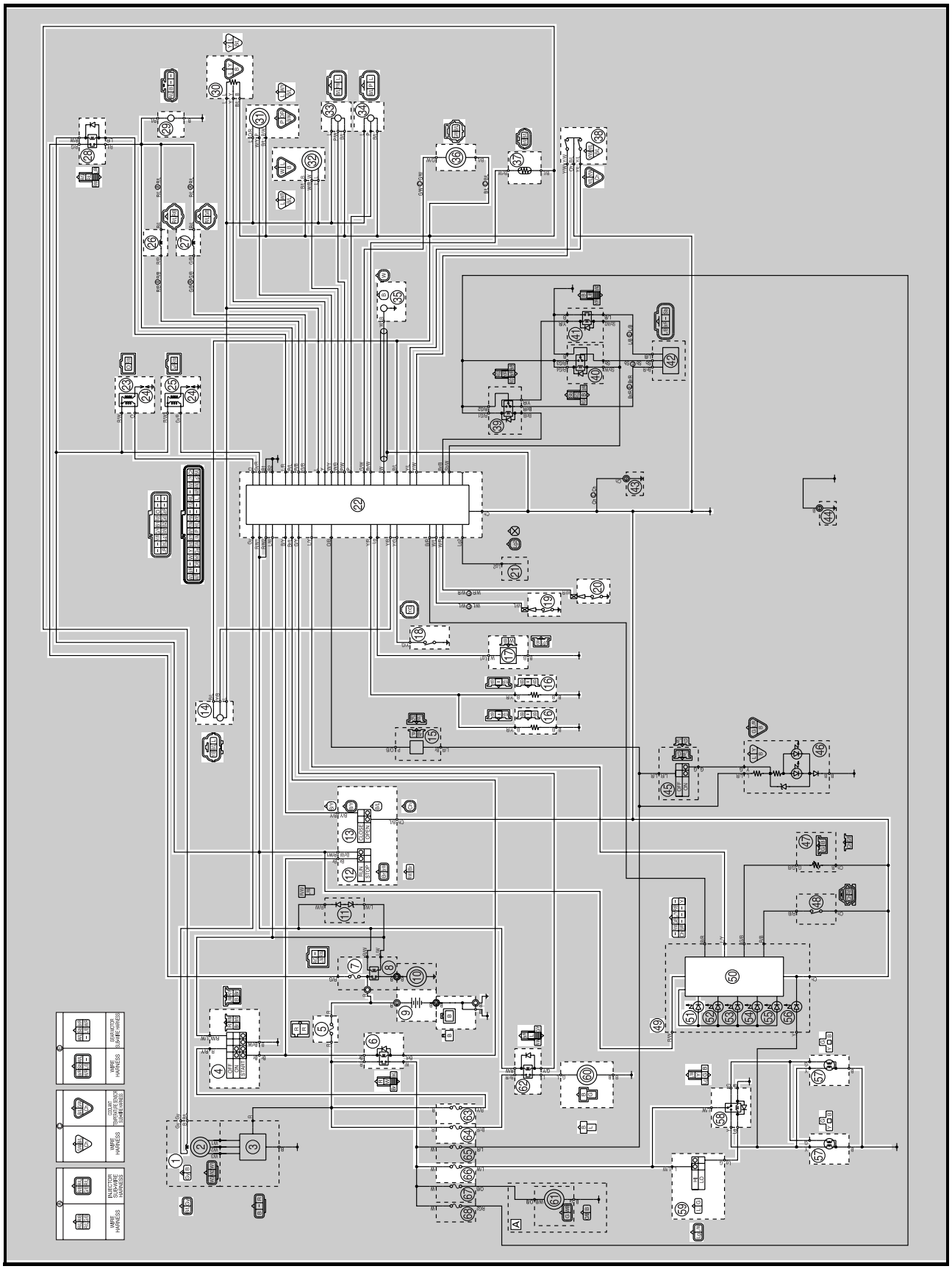
FUEL INJECTION SYSTEM

FUEL INJECTION SYSTEM

① Battery
② ECU (engine control unit)
③ Fuel injection system relay
④ Cylinder-#2 ignition coil
⑤ Spark plug
⑥ Fuel pump
⑦ Cylinder identification sensor
⑧ Cylinder-#1 ignition coil
⑨ Cylinder-#1 intake air pressure sensor
⑩ Speed sensor
⑪ Throttle position sensor
⑫ Injector #1
⑬ Oil pressure sensor
⑭ Knock sensor
⑮ Oil pressure switch
⑯ Coolant temperature sensor
⑰ Crankshaft position sensor
⑱ Injector #2
⑲ Cylinder-#2 intake air pressure sensor
⑳ Intake air temperature sensor
㉑ Grip/thumb warmer adjustment switch
㉒ Warning light

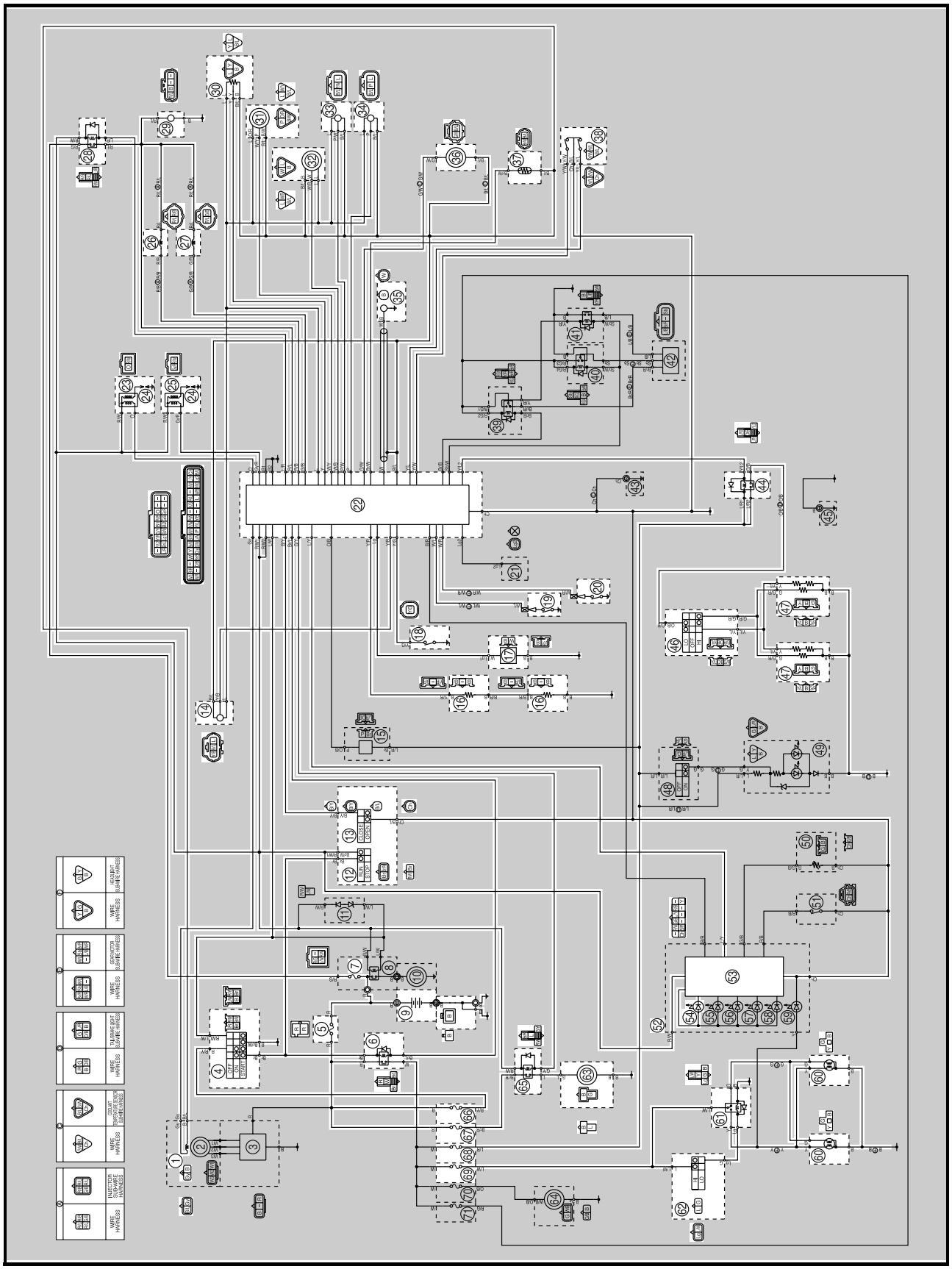


WIRING DIAGRAM (PZ50GTA, PZ50RTA, PZ50MTA)

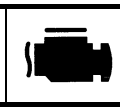


① Crankshaft position sensor
④ Main switch
⑤ Main fuse
⑥ Load control relay
⑦ Fuel injection system fuse
⑨ Battery
⑫ Engine stop switch
⑬ Throttle switch
⑭ Oil pressure sensor
⑯ Grip warmer
⑰ Thumb warmer
⑱ Oil pressure switch
⑲ Drive position switch
⑳ Reverse position switch
㉒ ECU (engine control unit)
㉓ Cylinder-#1 ignition coil
㉔ Spark plug
㉕ Cylinder-#2 ignition coil
㉖ Injector #1
㉗ Injector #2
㉘ Fuel injection system relay
㉙ Fuel pump
㉚ Throttle position sensor
㉛ Speed sensor
㉜ Cylinder identification sensor
㉝ Cylinder-#1 intake air pressure sensor
㉞ Cylinder-#2 intake air pressure sensor
㉟ Knock sensor
㊱ Coolant temperature sensor
㊲ Intake air temperature sensor
㊳ Grip/thumb warmer adjustment switch
㊾ Speedometer unit
㊿ Multi-function meter
(51) Warning light
(57) Headlight
(58) Headlight relay
(59) Headlight beam switch
(60) Radiator fan motor
(62) Radiator fan motor relay
(63) Ignition fuse
(64) Radiator fan motor fuse
(66) Headlight fuse

WIRING DIAGRAM (PZ50VTA)



① Crankshaft position sensor
④ Main switch
⑤ Main fuse
⑥ Load control relay
⑦ Fuel injection system fuse
⑨ Battery
⑫ Engine stop switch
⑬ Throttle switch
⑭ Oil pressure sensor
⑯ Grip warmer
⑰ Thumb warmer
⑱ Oil pressure switch
⑲ Drive position switch
⑳ Reverse position switch
㉒ ECU (engine control unit)
㉓ Cylinder-#1 ignition coil
㉔ Spark plug
㉕ Cylinder-#2 ignition coil
㉖ Injector #1
㉗ Injector #2
㉘ Fuel injection system relay
㉙ Fuel pump
㉚ Throttle position sensor
㉛ Speed sensor
㉜ Cylinder identification sensor
㉝ Cylinder-#1 intake air pressure sensor
㉞ Cylinder-#2 intake air pressure sensor
㉟ Knock sensor
㊱ Coolant temperature sensor
㊲ Intake air temperature sensor
㊳ Grip/thumb warmer adjustment switch
㊹ Passenger grip warmer relay
㊻ Passenger grip warmer switch
㊼ Passenger grip warmer
㊷ Speedometer unit
㊸ Multi-function meter
㊹ Warning light
㊵ Headlight
㊶ Headlight relay
㊷ Headlight beam switch
㊸ Radiator fan motor
㊺ Radiator fan motor relay
㊻ Ignition fuse
㊼ Radiator fan motor fuse
㊽ Signal fuse
㊾ Headlight fuse



ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and the warning light and self-diagnosis warning indicator come on to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the warning light and self-diagnosis warning indicator flash when the main switch is being turned to the start position.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and the warning light and self-diagnosis warning indicator flash to alert the rider of the detected malfunction.
- After the engine has been stopped, the lowest fault code number appears on the odometer/tripmeter LCD. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

SELF-DIAGNOSTIC FUNCTION TABLE

If the ECU detects an abnormal signal from a sensor while the snowmobile is being driven, the warning light and self-diagnosis warning indicator come on to alert the rider that a malfunction has occurred and the ECU provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.

Self-Diagnostic-Function table

Fault code No.	Item	Symptom	Able/unable to start	Able/unable to drive
11	Cylinder identification sensor	No normal signals are received from the cylinder identification sensor.	Unable	Able (under certain conditions)
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	Unable	Unable
13	Cylinder-#1 intake air pressure sensor (open or short circuit)	No normal signals are received from the Cylinder-#1intake air pressure sensor.	Able	Able
14	Cylinder-#1 intake air pressure sensor (hose line)	Cylinder-#1 intake air pressure sensor: hose system malfunction (clogged or detached hose). Intake air system failure (the pressure is not supplied to the intake air pressure sensor in a stable condition)	Able	Able
15	Throttle position sensor (open or short circuit)	No normal signals are received from the throttle position sensor.	Able	Able
16	Throttle position sensor (stuck)	Signal from throttle position sensor will not change.	Able	Able
21	Coolant temperature sensor (open or short circuit)	No normal signals are received from the coolant temperature sensor.	Able	Able
22	Intake air temperature sensor (open or short circuit)	No normal signals are received from the intake air temperature sensor.	Able	Able
25	Cylinder-#2 intake air pressure sensor (open or short circuit)	No normal signals are received from the Cylinder-#2 intake air pressure sensor.	Able	Able

Fault code No.	Item	Symptom	Able/unable to start	Able/unable to drive
26	Cylinder-#2 intake air pressure sensor (hose line)	Cylinder-#2 intake air pressure sensor: hose system malfunction (clogged or detached hose). Intake air system failure (the pressure is not supplied to the intake air pressure sensor in a stable condition)	Able	Able
30	Oil pressure dropped	Detection of the low oil pressure signal	Unable	Unable
33	Cylinder-#1 ignition coil (faulty ignition)	No normal signals are received from the ignition circuit.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
34	Cylinder-#2 ignition coil (faulty ignition)	No normal signals are received from the ignition circuit.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
42	Speed sensor	No normal signals are received from the speed sensor.	Able	Unable
43	Fuel system voltage (monitoring voltage)	ECU is unable to monitor the battery voltage (an open or short circuit in the line to the ECU).	Able	Able
44	Error in writing the amount of CO adjustment on EEPROM	Error is detected while reading or writing on EEPROM (CO adjustment value).	Under certain conditions	Under certain conditions
46	Vehicle system power supply (monitoring voltage)	The rectifier/regulator does not function properly.	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	Unable	Unable
65	Knock sensor (open or shot circuit)	No normal signals are received from the knock sensor.	Able	Able
67	Oil pressure sensor (open or short circuit)	No normal signals are received from the oil pressure sensor.	Able	Able
84	T.O.R.S.	Conditions requiring T.O.R.S. operation are detected.	Able	Unable
85	Oil pressure switch (open circuit)	Oil pressure switch: open circuit detected.	Able	Able

Communication error with the meter

Fault code No.	Item	Symptom	Able/unable to start	Able/unable to drive
Er-1	ECU internal malfunction (output signal error)	No signals are received from the ECU.	Able (unable if ECU failure)	Able (unable if ECU failure)
Er-2	ECU internal malfunction (output signal error)	No signals are received from the ECU within the specified duration.	Able	Able
Er-3	ECU internal malfunction (output signal error)	Data from the ECU cannot be received correctly.	Able	Able
Er-4	ECU internal malfunction (input signal error)	Non-registered data has been received from the meter.	Able	Able

TROUBLESHOOTING CHART

Engine operation is not normal or the warning light and self-diagnosis warning indicator flash.
* Warning light and self-diagnosis warning indicator may not flash even if the engine operation is not normal.

The warning light and self-diagnosis warning indicator flash.

Check the fault code number displayed on the meter.

Identify the system with the malfunction. (Refer to "Self-Diagnostic-Function table".)

Identify the probable cause of the malfunction. (Refer to "Fault code table".)

Check and repair the probable cause of the malfunction.

Fault code No.	No fault code No.
Check and repair. (Refer to "TROUBLESHOOTING DETAILS".) Monitor the operation of the sensors and actuators in the diagnostic mode. (Refer to "Diagnostic mode table".)	Check and repair. (Refer to "Self-Diagnostic-Function table".)

Perform the ECU reinstatement action. (Refer to "Reinstatement method" in "TROUBLESHOOTING DETAILS".)

Turn the main switch off, turn the main switch back on, and then check if the fault code number is still displayed.

Fault code number displayed

Fault code number not displayed

The warning light and self-diagnosis warning indicator do not come on.

Check the operation of the following sensors and actuators in the diagnostic mode. (Refer to "Diagnostic mode table".)

- 01: Throttle position sensor (throttle angle)
- 03, 04: Intake air pressure
- 07: Vehicle speed pulse
- 09: Fuel system voltage (battery voltage)
- 30: Cylinder-#1 ignition coil
- 31: Cylinder-#2 ignition coil
- 36: Injector #1
- 37: Injector #2

OK → Engine malfunction → Check and repair the inner parts of the engine. (Refer to CHAPTER 5.) → OK

NG → Defective sensor or actuator → Check and repair the corresponding sensor or actuator. → OK

Check the engine condition.

OK

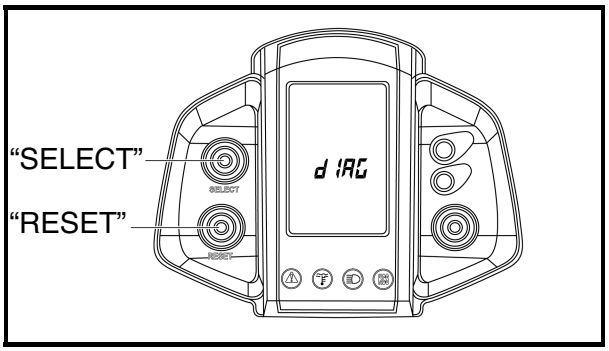
Repairs completed

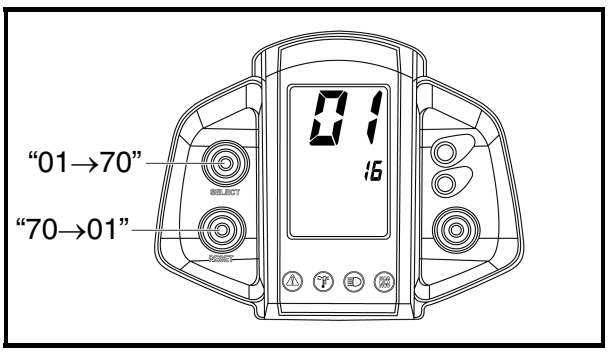
Erasing the malfunction history:*
The malfunction history is stored even if the main switch is turned off.
The malfunction history must be erased in the diagnostic mode. (Refer to the "Diagnostic mode table (Diagnostic code No. 62)".)

* Operated when the warning light and self-diagnosis warning indicator flash.

DIAGNOSTIC MODE

It is possible to monitor the sensor output data or check the activation of actuators without connecting the measurement equipment by simply switching the meter indication from the normal mode to the diagnostic monitoring mode.





Setting the diagnostic mode

1. Turn the main switch off and set the engine stop switch to "RUN".
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the "SELECT" and "RESET" buttons, turn the main switch on, and continue to press the buttons for 8 seconds or more.

TIP

- All displays on the meter disappear except the odometer/tripmeter displays.
- "dIAG" appears on the odometer/tripmeter LCD.

4. Check that "dIAG" appears, and then simultaneously press the "SELECT" and "RESET" buttons for 2 seconds or more to activate the diagnostic mode. The diagnostic code number "01" appears on the speedometer LCD.
5. Select the diagnostic code number corresponding to the fault code number by pressing the "SELECT" and "RESET" buttons.

TIP

- To decrease the selected diagnostic code number, press the "RESET" button. Press the "RESET" button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the "SELECT" button. Press the "SELECT" button for 1 second or longer to automatically increase the diagnostic code numbers.

6. Verify the operation of the sensor or actuator.
   - Sensor operation
     The data representing the operating conditions of the sensor appears on the odometer/tripmeter LCD.
   - Actuator operation
     Push the grip warmer side of the grip/thumb warmer adjustment switch to operate the actuator.
     If the grip warmer side of the switch is pushed again while the actuator is operating, the actuator operation will stop and restart from the beginning.
7. Turn the main switch off to cancel the diagnostic mode.

TIP

To perform a reliable diagnosis, make sure to turn off the power supply before every check and then start right from the beginning.

Fault code table

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
11	No normal signals are received from the cylinder identification sensor.	• Open or short circuit in wire harness. • Defective cylinder identification sensor. • Malfunction in ECU. • Improperly installed cylinder identification sensor.	—
12	No normal signals are received from the crankshaft position sensor.	• Open or short circuit in wire harness. • Defective crankshaft position sensor. • Malfunction in A.C. magneto rotor. • Malfunction in ECU. • Improperly installed crankshaft position sensor.	—
13	Cylinder-#1 intake air pressure sensor: open or short circuit detected.	• Open or short circuit in wire harness. • Defective cylinder-#1 intake air pressure sensor. • Malfunction in ECU.	03
14	Cylinder-#1 intake air pressure sensor: hose system malfunction (clogged or detached hose).	• Cylinder-#1 intake air pressure sensor hose is detached, clogged, kinked, or pinched. • Malfunction in ECU.	03
15	Throttle position sensor: open or short circuit detected.	• Open or short circuit in wire harness. • Defective throttle position sensor. • Malfunction in ECU. • Improperly installed throttle position sensor.	01
16	Stuck throttle position sensor detected.	• Stuck throttle position sensor. • Malfunction in ECU.	01
21	Coolant temperature sensor: open or short circuit detected.	• Open or short circuit in sub-wire harness 2. • Open or short circuit in wire harness. • Defective coolant temperature sensor. • Malfunction in ECU.	06
22	Intake air temperature sensor: open or short circuit detected.	• Open or short circuit in wire harness. • Defective intake air temperature sensor. • Malfunction in ECU.	05
25	Cylinder-#2 intake air pressure sensor: open or short circuit detected.	• Open or short circuit in wire harness. • Defective cylinder-#2 intake air pressure sensor. • Malfunction in ECU.	04
26	Cylinder-#2 intake air pressure sensor: hose system malfunction (clogged or detached hose).	• Cylinder-#2 intake air pressure sensor hose is detached, clogged, kinked, or pinched. • Malfunction in ECU.	04
30	Engine stops when an oil pressure drop is detected.	• Oil pressure dropped.	—
33	Open circuit detected in the primary lead of the cylinder-#1 ignition coil.	• Open or short circuit in sub-wire harness 1. • Open or short circuit in wire harness. • Malfunction in cylinder-#1 ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	30
34	Open circuit detected in the primary lead of the cylinder-#2 ignition coil.	• Open or short circuit in sub-wire harness 1. • Open or short circuit in wire harness. • Malfunction in cylinder-#2 ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	31

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
42	No normal signals are received from the speed sensor.	• Open or short circuit in wire harness. • Defective speed sensor. • Malfunction in ECU.	07
43	ECU is unable to monitor the battery voltage (an open or short circuit in the line to the ECU).	• Open or short circuit in wire harness. • Malfunction in ECU.	09 50
44	Error is detected while reading or writing on EEPROM (CO adjustment value).	• Malfunction in ECU. (The CO adjustment value is not properly written on or read from the internal memory.)	60
46	Power supply to the fuel injection system is not normal.	• Malfunction in the charging system. (Refer to “CHARGING SYSTEM” in CHAPTER 8.)	09
50	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	• Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.)	—
65	Knock sensor: open or short circuit detected.	• Open or short circuit in wire harness. • Defective knock sensor. • Malfunction in ECU. • Improperly installed knock sensor.	—
67	Oil pressure sensor malfunction: open or short circuit detected	• Open or short circuit in wire harness. • Defective oil pressure sensor. • Malfunction in ECU. • Improperly installed oil pressure sensor.	—
84	Conditions requiring T.O.R.S. operation are detected.	• Open or short circuit in wire harness. • Defective throttle position sensor. • Defective throttle switch. • Defective speed sensor. • Malfunction in ECU. • Improperly installed throttle position sensor.	01 07 24
85	Oil pressure switch: open circuit detected.	• Open circuit in wire harness. • Defective oil pressure switch. • Malfunction in ECU.	—
Er-1	No signals are received from the ECU.	• Open or short circuit in wire harness. • Malfunction in speedometer unit. • Malfunction in ECU. • Defective wire connection of the ECU coupler.	—
Er-2	No signals are received from the ECU within the specified duration.	• Improper connection in wire harness. • Malfunction in speedometer unit. • Malfunction in ECU.	—
Er-3	Data from the ECU cannot be received correctly.	• Improper connection in wire harness. • Malfunction in speedometer unit. • Malfunction in ECU.	—
Er-4	Non-registered data has been received from the meter.	• Improper connection in wire harness. • Malfunction in speedometer unit. • Malfunction in ECU.	—

Diagnostic mode table

Switch the meter display from the regular mode to the diagnostic mode. To switch the display, refer to “DIAGNOSTIC MODE”.

TIP

- Check the intake air temperature and coolant temperature as close as possible to the intake air temperature sensor and the coolant temperature sensor respectively.
- If it is not possible to check the intake air temperature, use the ambient temperature as reference.

Diagnostic code No.	Item	Description of action	Data displayed on meter (reference value)
01	Throttle angle	Displays the throttle angle. • Check with throttle fully closed. • Check with throttle fully open.	0 ~ 125 degrees • Fully closed position (12 ~ 22) • Fully open position (95 ~ 100)
03	Pressure difference (atmospheric pressure and cylinder-#1 intake air pressure)	Displays the pressure difference (atmospheric pressure and cylinder-#1 intake air pressure). • Generate the pressure difference by cranking the engine with the starter, without actually starting the engine.	• Not cranking: atmospheric pressure • Cranking: intake air pressure decreases to less than the atmospheric pressure.
04	Pressure difference (atmospheric pressure and cylinder-#2 intake air pressure)	Displays the pressure difference (atmospheric pressure and cylinder-#2 intake air pressure). • Generate the pressure difference by cranking the engine with the starter, without actually starting the engine.	• Not cranking: atmospheric pressure • Cranking: intake air pressure decreases to less than the atmospheric pressure.
05	Intake air temperature	Displays the intake air temperature. • Check the temperature in the air filter case.	Compare it to the value displayed on the meter. (Minimum displayed value: –30 °C [-22.0 °F])
06	Coolant temperature	Displays the coolant temperature. • Check the temperature of the coolant.	Compare it to the value displayed on the meter. (Minimum displayed value: –30 °C [-22.0 °F])
07	Vehicle speed pulse	Displays the cumulative number of vehicle pulses that are generated when the tire is spun.	(0 ~ 999; resets to 0 after 999) OK if the numbers appear on the meter.
09	Fuel system voltage (battery voltage)	Displays the fuel system voltage (battery voltage).	0 ~ 18.7 V Normally, approximately 12.0 V
24	Throttle switch	Displays that the switch is on or off.	Throttle open: on Throttle closed: off

Diagnostic code No.	Item	Description of action	Data displayed on meter (reference value)
26	Grip warmer operation	Operates the grip warmer and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. The grip warmer operates and the self-diagnosis warning indicator remains on for 120 seconds. This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	—
27	Thumb warmer operation	Operates the thumb warmer and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. The thumb warmer operates and the self-diagnosis warning indicator remains on for 120 seconds. This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	—
30	Cylinder-#1 ignition coil	Actuates the cylinder-#1 ignition coil five times at 1-second intervals and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. Connect an ignition checker. This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the spark five times.
31	Cylinder-#2 ignition coil	Actuates the cylinder-#2 ignition coil five times at 1-second intervals and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. Connect an ignition checker. This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the spark five times.

Diagnostic code No.	Item	Description of action	Data displayed on meter (reference value)
36	Injector #1	Actuates injector #1 five times at 1-second intervals and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the operating sound of the injector five times.
37	Injector #2	Actuates injector #2 five times at 1-second intervals and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the operating sound of the injector five times.
50	Fuel injection system relay	Actuates the fuel injection system relay five times at 1-second intervals and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. (The indicator is off when the relay is on and it is on when the relay is off.) This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the operating sound of the fuel injection system relay five times.
51	Radiator fan motor relay	Actuates the radiator fan motor relay for five cycles of 5 seconds and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. (The relay is on for 2 seconds and off for 3 seconds.) This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the operating sound of the radiator fan motor relay five times. (At that time, the fan motor rotates.

Diagnostic code No.	Item	Description of action	Data displayed on meter (reference value)
52	Headlight relay	Actuates the headlight relay for five cycles of 5 seconds and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. (The relay is on for 2 seconds and off for 3 seconds.) This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the operating sound of the headlight relay five times. (At that time, the headlight and taillight come on.)
59	Passenger grip warmer relay	Actuates the passenger grip warmer relay for five cycles of 5 seconds and displays the self-diagnosis warning indicator 1 second after the grip warmer side of the grip/thumb warmer adjustment switch is pushed. (The relay is on for 2 seconds and off for 3 seconds.) This operation is performed each time the grip warmer side of the switch is pushed. However, if the grip warmer side of the switch is pushed again while the operation is being performed, the operation will stop immediately and restart from the beginning.	After pushing the switch, check the operating sound of the passenger grip warmer relay five times.
60	EEPROM fault code display	• Displays the cylinder number if an error is detected in the EEPROM CO adjustment value for the cylinder as fault code No. 44. • If both cylinders are defective, the display alternates every 2 seconds.	(01 ~ 02) Displays the cylinder number. (00) Displays when there is no malfunction.
61	Malfunction history code display	• Displays the code numbers of past malfunctions (i.e., a code number of a malfunction that occurred once and which has been corrected). • If more than one code number is detected, the display alternates every 2 seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.	11 ~ 85 (00) Displays when there is no malfunction.
62	Malfunction history code erasure	• Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history. • Erases only the history codes when the grip warmer side of the grip/thumb warmer adjustment switch is pushed.	00 ~ 24 (00) Displays when there is no malfunction.
70	Control number	• Displays the program control number.	00 ~ 254

Fault code No.	30	Symptom	Engine stops when an oil pressure drop is detected.

Diagnostic code No. – –

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Oil pressure dropped.	Place the snowmobile on a level surface, and then check the oil pressure after warming up the engine. Refer to “ENGINE OIL REPLACEMENT”. Check the engine oil level Refer to “ENGINE OIL LEVEL INSPECTION” in CHAPTER 2.	Set the main switch to “ON → OFF → ON” and then check the blinking of the fault code.
2	Oil pressure switch or sensor installation status	Check for looseness or pinching. Check that the switch and sensor are installed in the specified position.	
3	Defective oil pressure switch.	Remove the coupler of the oil pressure switch and then check the continuity using a tester while idling. Normal oil pressure → switch OFF Low oil pressure → switch ON The resistance value of the oil pressure switch is not within the specified range. → Replace the oil pressure switch.	
4	ECU malfunction	Replace the ECU.	

Fault code No.	67	Symptom	Oil pressure sensor: open or short circuit detected.

Diagnostic code No. – –

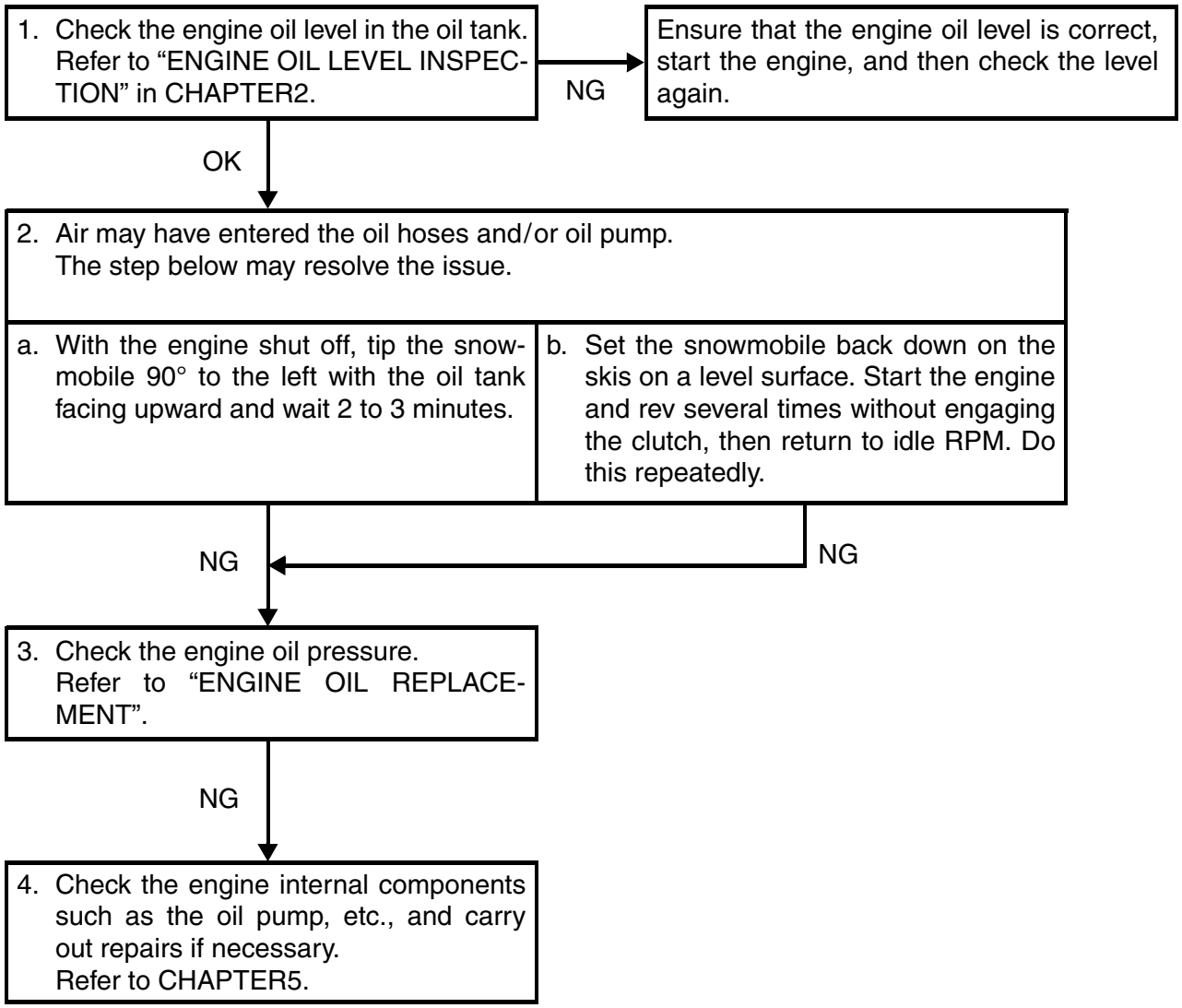
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connections Oil pressure sensor coupler	Check the couplers for any pins that may have pulled out. Check the locking condition of the couplers. If there is a malfunction, repair/replace it and connect the coupler securely.	Set the main switch to “ON” and then check the blinking of the fault code.
2	Connections Wire harness ECU coupler	Check the couplers for any pins that may have pulled out. Check the locking condition of the couplers. If there is a malfunction, repair/replace it and connect the coupler securely.	
3	Continuity of wire harness.	Open or short circuit → Replace the wire harness. Between oil pressure sensor and ECU coupler. Black/Blue – Black/Blue Yellow/Black – Yellow/Black Blue – Blue	
4	Defective oil pressure sensor.	Replace if defective.	
5	ECU malfunction	Replace the ECU.	

Fault code No.	85	Symptom	Oil pressure switch: open circuit detected.
Diagnostic code No. – –			

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connections Oil pressure switch coupler	Check the couplers for any pins that may have pulled out. Check the locking condition of the couplers. If there is a malfunction, repair/replace it and connect the coupler securely.	Set the main switch to “ON” and then check the blinking of the fault code.
2	Oil pressure switch installation status	Check for looseness or pinching. Check that the switch is installed in the specified position.	
3	Defective oil pressure switch	Switch checking procedure With the engine stopped, carry out the steps below. 1. Connect the temperature probe tester ($\Omega \times 100$) to the oil pressure switch coupler. Positive tester probe → connector terminal Negative tester probe → identification sensor body (Metal part) 2. Check that the oil pressure switch has continuity. If it has continuity, it is normal. 3. If it does not have continuity, the switch is defective. → Replace the oil pressure switch.	
4	Connections Wire harness ECU coupler	Check the couplers for any pins that may have pulled out. Check the locking condition of the couplers. If there is a malfunction, repair/replace it and connect the coupler securely.	
5	Continuity of wire harness.	Open or short circuit → Replace the wire harness. Between oil pressure switch and ECU coupler. Yellow/Green – Yellow/Green	
6	ECU malfunction	Replace the ECU.	

OIL PRESSURE SENSING SYSTEM TROUBLESHOOTING

If "OP – LO" display/limiter control is not canceled or the meter displays fault code No.30.

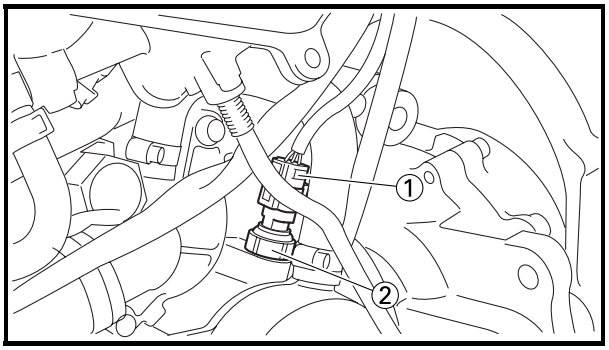


If abnormally low oil pressure is detected when the snowmobile is running (fault code No. 30), resulting in the engine stop.

1. Air may have entered the oil hoses due to the snowmobile falling over during running, etc. Carry out steps (1) to (3) above.
2. If fault code No.30 continues in the meter display, carry out the check and repair work. Refer to "TROUBLESHOOTING DETAILS".
3. Carry out step (4) above.

If the oil pressure sensor error (fault code No. 67) or oil pressure switch error (fault code No. 85) is detected.

According to fault code No. 67 or No. 85 in the meter display, carry out the check and repair work. Refer to "TROUBLESHOOTING DETAILS".



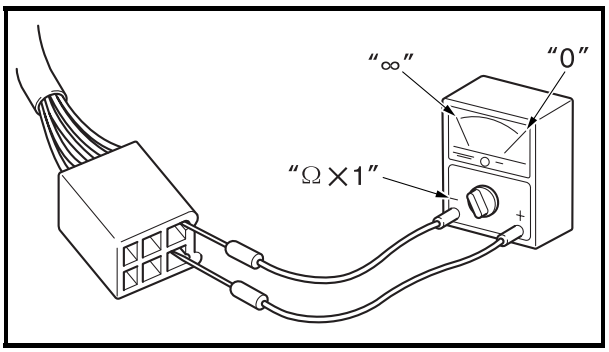
OIL PRESSURE SENSOR

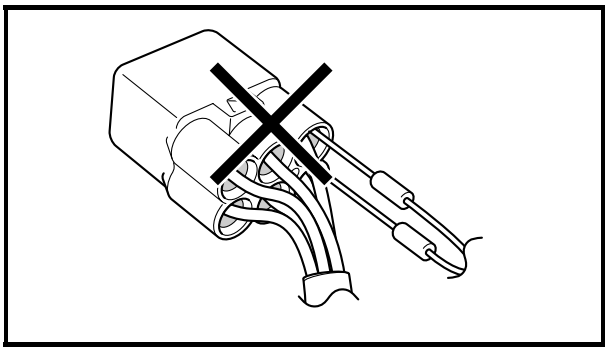
NOTICE

• Precautions when removing/installing the sensor coupler.
When removing/installing the coupler, carefully wipe peripheral components with a soft cloth. Be careful to prevent liquid such as water or oil from dropping into the coupler.
If water or oil comes into contact with the coupler, this may result in a sensor malfunction.
The same also applies to other FI-related sensors.
• Never subject the oil pressure sensor to strong shocks. If the oil pressure sensor is dropped, replace it.

1. Disconnect:
   • Oil pressure sensor coupler ①
2. Remove:
   • Oil pressure sensor ②
3. Install:
   • Oil pressure sensor

	**Oil pressure sensor bolt** **15 Nm (1.5 m•kgf, 11 ft•lbf)**





ELECTRICAL

SWITCH INSPECTION

SWITCH INSPECTION

Use a pocket tester to check the terminals for continuity. If the continuity is faulty at any point, replace the switch.

Analog pocket tester:
YU-03112-C
Pocket tester:
90890-03112

TIP

- Set the pocket tester to "0" before starting a test.
- When testing the switch for continuity the pocket tester should be set to the "× 1 Ω" range.
- When checking the switch turn it on and off a few times.

NOTICE

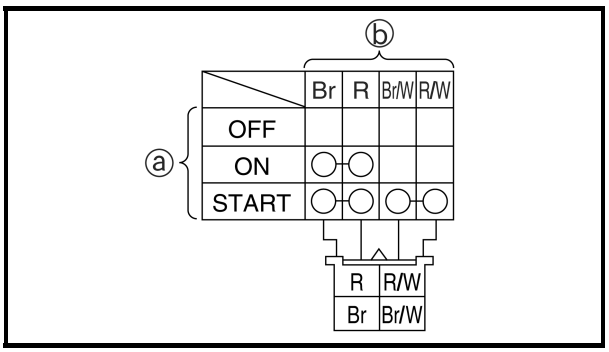
- **For waterproof couplers, never insert the tester probes directly into the coupler.**

  When performing any checks using a waterproof coupler, use the specified test harness or a suitable commercially available test harness.
- **Precautions when removing/installing the sensor coupler.**

  When removing/installing the coupler, carefully wipe peripheral components with a soft cloth. Be careful to prevent liquid such as water or oil from dropping into the coupler.

  If water or oil comes into contact with the coupler, this may result in a sensor malfunction.

  The same also applies to other FI-related sensors.



INSPECTING A SWITCH SHOWN IN THE MANUAL

The terminal connections for switches (main switch, handlebar switch, engine stop switch, light switch, etc.) are shown in a chart similar to the one on the left. This chart shows the switch positions ⓐ in the column and the switch lead colors ⓑ in the top row.

For each switch position, "○——○" indicates the terminals with continuity.

The example chart shows that:

There is continuity between the "Brown and Red" leads when the switch is set to "ON".

There is continuity between the "Brown and Red" and between "Brown/White and Red/White" leads when the switch is set to "START".

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Description
Model:	PZ50GTA, PZ50RTA, PZ50MTA, PZ50VTA
Model code number:	8GK7 (PZ50GTA) 8GN9 (PZ50RTA) 8GP9 (PZ50MTA) 8GJ9 (PZ50VTA)
Transmission: Overall reduction ratio	 9.00 ~ 2.25 : 1 (PZ50VTA)

MAINTENANCE SPECIFICATIONS

FRONT SUSPENSION

Item	Description
Ski suspension (front suspension): Spring rate Wire diameter	 30 N/mm (3.06 kgf/mm, 171.3 lbf/in) (PZ50MTA) 8.5 mm (0.33 in) (PZ50MTA)
Shock absorber: Damping force Extension Compression	 1200 N/0.3 m/s (122.4 kgf/0.3 m/s, 269.8 lbf/0.3 m/s) (PZ50MTA) 860 N/0.3 m/s (88.7 kgf/0.3 m/s, 193.4 lbf/0.3 m/s) (PZ50MTA)

POWER TRAIN

Item	Description
V-belt: Part number Circumference Width “A”	 8GK-17641-10 1135.0 mm (44.68 in) 34.5 mm (1.36 in)
Primary sheave spring: Number of coils	 4.73 (PZ50GTA, PZ50RTA)
Slide rail suspension (rear suspension): Suspension spring type Front Rear Suspension spring rate Front	 Coil spring Torsion spring 23.00 N/mm (2.35 kgf/mm, 131.35 lbf/in) (PZ50MTA)

Item	Description
Shock absorber: damping force	
Front	
Extension	1,610 N/0.3 m/s (164.2 kgf/0.3 m/s, 362.0 lbf/0.3 m/s) (PZ50MTA)
Compression	1,570 N/0.3 m/s (160.1 kgf/0.3 m/s, 353.0 lbf/0.3 m/s) (PZ50MTA)
Rear	
Extension	2,665 N/0.3 m/s (271.8 kgf/0.3 m/s, 599.2 lbf/0.3 m/s) (PZ50RTA) 1,690 N/0.3 m/s (172.3 kgf/0.3 m/s, 380.0 lbf/0.3 m/s) (PZ50MTA)
Compression	920 N/0.3 m/s (93.8 kgf/0.3 m/s, 206.9 lbf/0.3 m/s) (PZ50RTA) 1,000 N/0.3 m/s (102.0 kgf/0.3 m/s, 224.9 lbf/0.3 m/s) (PZ50MTA)

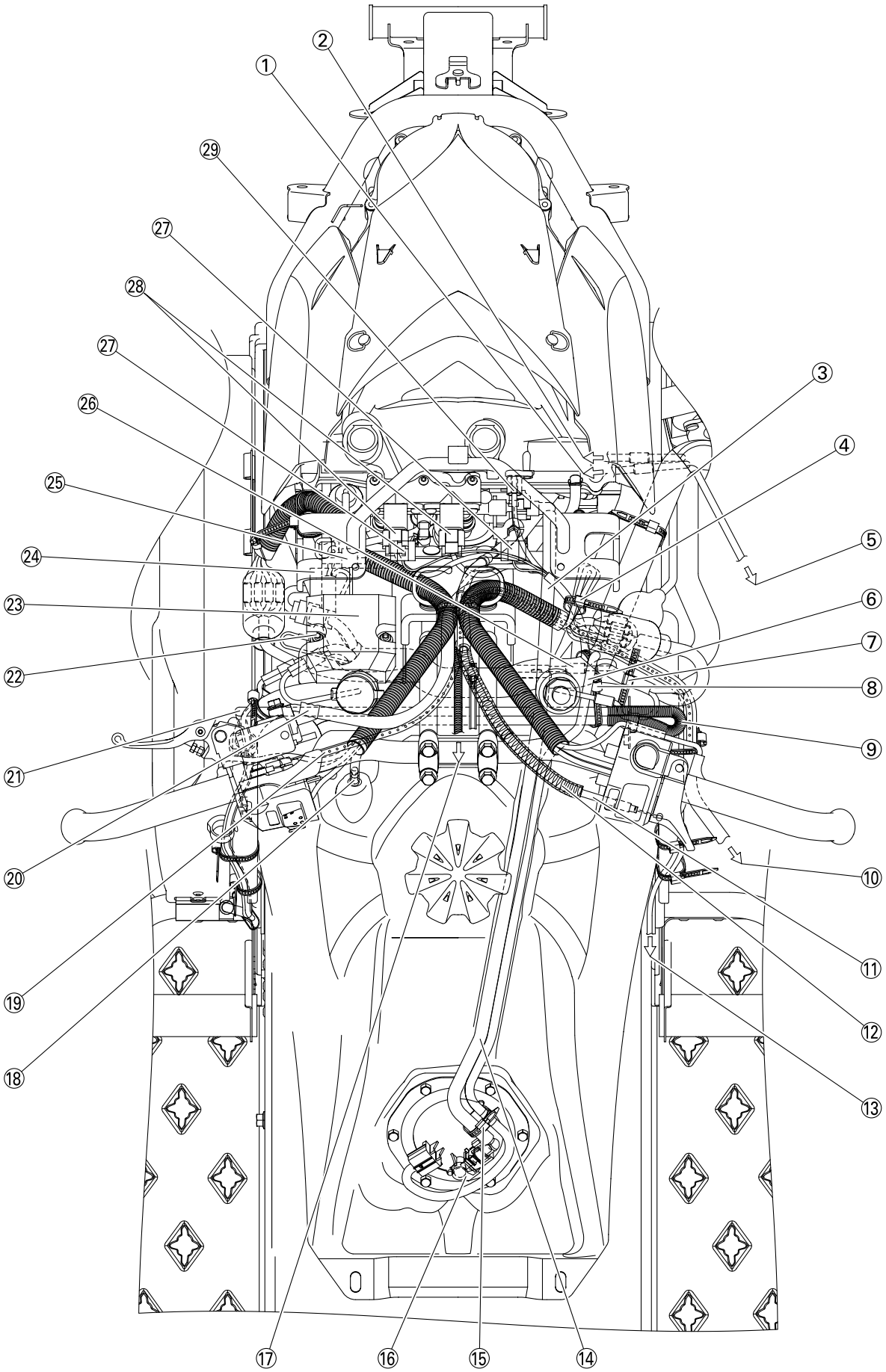
ELECTRICAL

Item	Description
Grip warmer:	
Grip warmer-heater resistance	
(left)	6.75 ~ 8.25 Ω at 20 °C (68 °F) (Black – Black) (PZ50GTA, PZ50RTA, PZ50MTA)
(right)	6.75 ~ 8.25 Ω at 20 °C (68 °F) (Black – Black) (PZ50GTA, PZ50RTA, PZ50MTA)

TIGHTENING TORQUE

ENGINE

Parts to be tightened	Tightening torque			Remarks
	Nm	m•kgf	ft•lbf	
Oil pressure sensor	15	1.5	11	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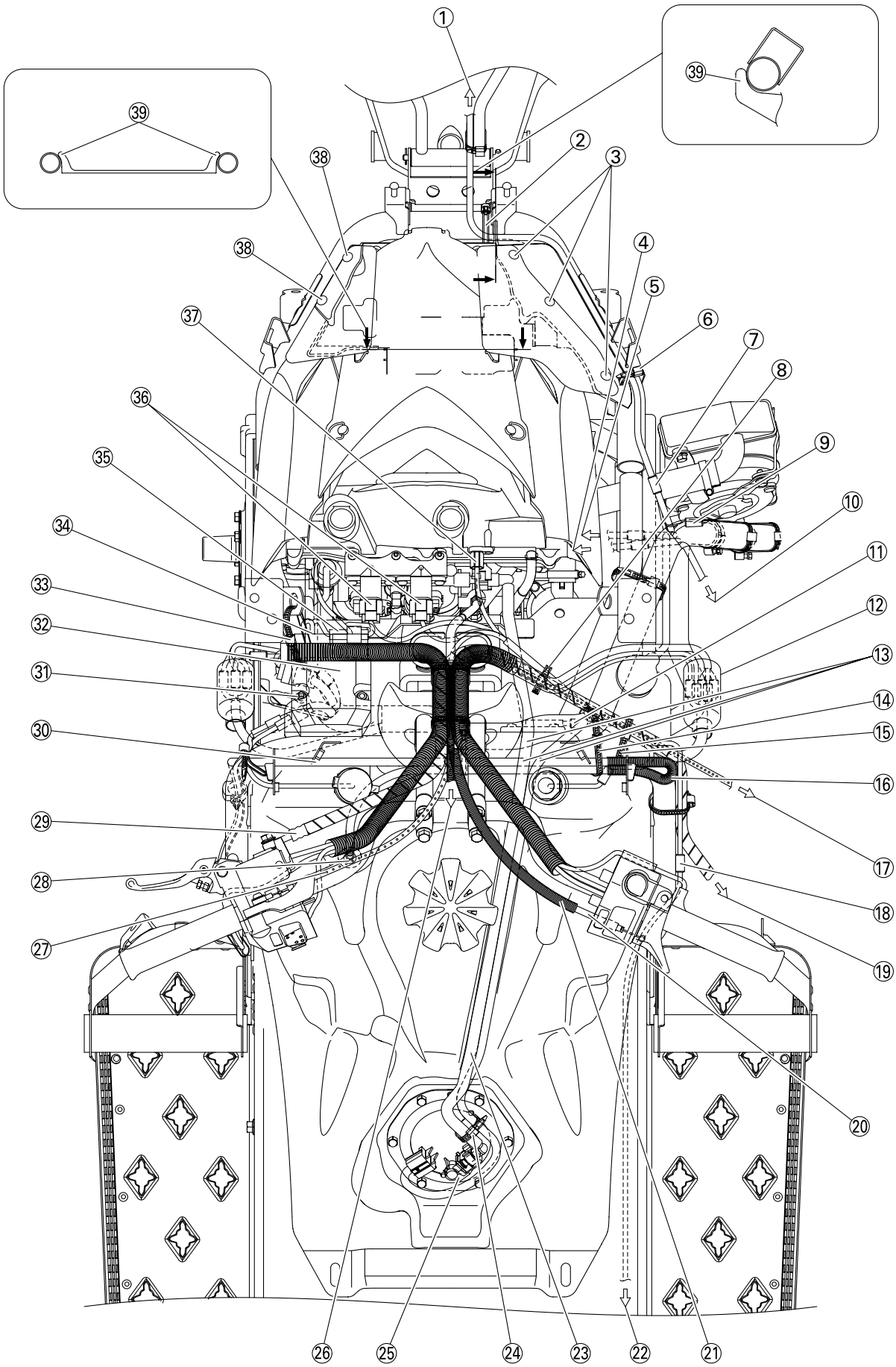
CABLE ROUTING

PZ50GTA, PZ50RTA, PZ50MTA

① To the coolant temperature sensor
② To the knock sensor
③ Pass the fuel hose over the wire harness and fuel tank breather hose.
④ Bundle the slack in the right handlebar switch leads and fasten it with the clamp.
⑤ To the oil level switch
⑥ Pass the fuel pump lead over the wire harness and fuel tank breather hose.
⑦ Clamp the wire harness, parking brake cable, and brake hose to the frame rear cross member with the clamp.
⑧ Clamp the wire harness and fuel tank breather hose to the frame rear cross member with the clamp.
⑨ Spring
⑩ To the brake
⑪ Throttle cable
⑫ Throttle cable protector
⑬ To the tail/brake light
⑭ Fuel hose
⑮ Clamp the fuel pump lead at the positioning tape to the fuel hose with the clamp.
⑯ Clamp
⑰ To the meter
⑱ Install the fuel tank breather hose to the fuel tank with the hose clamp. Be sure to connect the hose end that does not have a paint mark to the fuel tank.
⑲ Parking brake cable
⑳ Brake hose
㉑ Route the fuel tank breather hose along the frame rear cross member.
㉒ Tighten the rectifier/regulator securing flange nut together with the ground lead.
㉓ Rectifier/regulator
㉔ Connect the wire harness side coupler (black) to the rectifier/regulator.
㉕ AC magneto lead coupler
㉖ Fuel sender coupler
㉗ Headlight coupler
㉘ Route the intake air pressure sensor coupler behind the throttle cable on the rear of the snowmobile (so that the coupler with white tape is positioned on the left side.)
㉙ Route the intake air temperature sensor coupler further to the right of the snowmobile than the throttle cable.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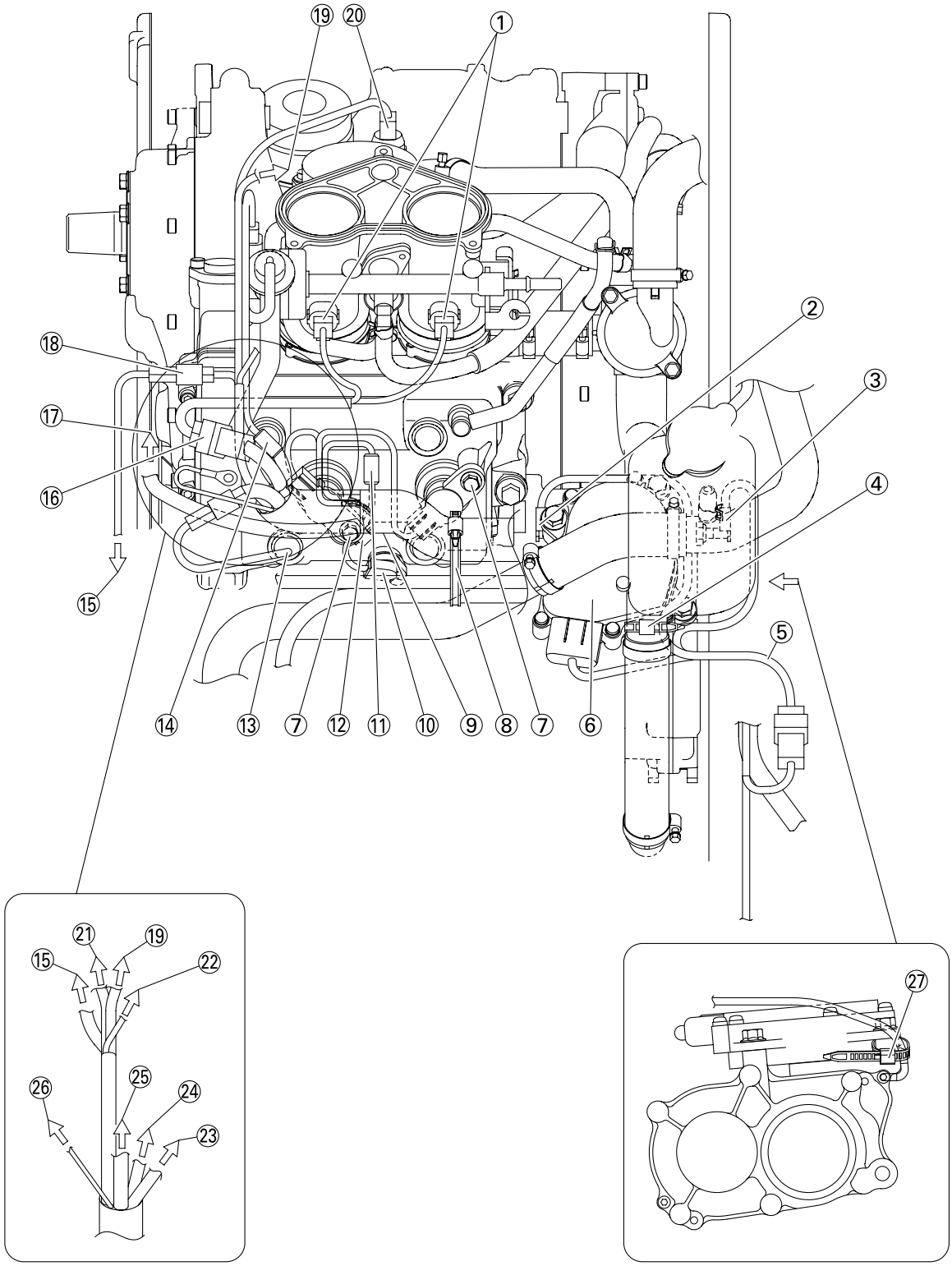
PZ50VTA

① To the headlight
② Clamp the headlight lead to the frame front cross member with the clamp.
③ Rivet the frame front cross member protector and right cover.
④ To the coolant temperature sensor
⑤ To the knock sensor
⑥ Pass the clamp through the hole in the frame front cross member, and then clamp the wire harness with the clamp. Position the buckle of the clamp on top of the leads, with the end facing to the left.
⑦ Headlight lead coupler
⑧ Clamp the right handlebar switch leads to the parking brake cable, brake hose, and wire harness. The leads can be clamped in any direction.
⑨ Radiator fan motor coupler
⑩ To the oil level switch
⑪ Fuel sender coupler
⑫ Position the coupler cover on the right of the coolant reservoir.
⑬ Pass the fuel hose and fuel pump lead over the wire harness and fuel tank breather hose.
⑭ Clamp the wire harness and fuel tank breather hose to the frame rear cross member with the clamp.
⑮ Clamp the wire harness, parking brake cable, and brake hose to the frame rear cross member with the clamp.
⑯ Spring
⑰ To the parking brake
⑱ Tail/brake light lead coupler
⑲ To the brake
⑳ Throttle cable
㉑ Install the throttle cable protector, aligning it with the rivet nut of the throttle cable.
㉒ To the tail/brake light
㉓ Fuel hose
㉔ Clamp the fuel pump lead at the white tape to the fuel hose with the clamp.
㉕ Clamp
㉖ To the meter
㉗ Parking brake cable
㉘ Install the fuel tank breather hose to the fuel tank with the hose clamp. Be sure to connect the hose end that does not have a paint mark to the fuel tank.
㉙ Brake hose
㉚ Route the fuel tank breather hose along the frame rear cross member.
㉛ Tighten the rectifier/regulator securing together with the ground lead.
㉜ Rectifier/regulator
㉝ Pass the clamp through the hole for the shroud stopper and then clamp the left handlebar switch lead.
㉞ Connect the wire harness side coupler (black) to the rectifier/regulator.
㉟ AC magneto lead coupler
㊱ Route the intake air pressure sensor coupler behind the throttle cable on the rear of the snowmobile (so that the coupler with white tape is positioned on the left side).
㊲ Route the intake air temperature sensor coupler to the right of the snowmobile than the throttle cable.
㊳ Rivet the frame front cross member protector and left cover.
㊴ Fit the claw of the frame front cross member protector firmly under the frame front cross member.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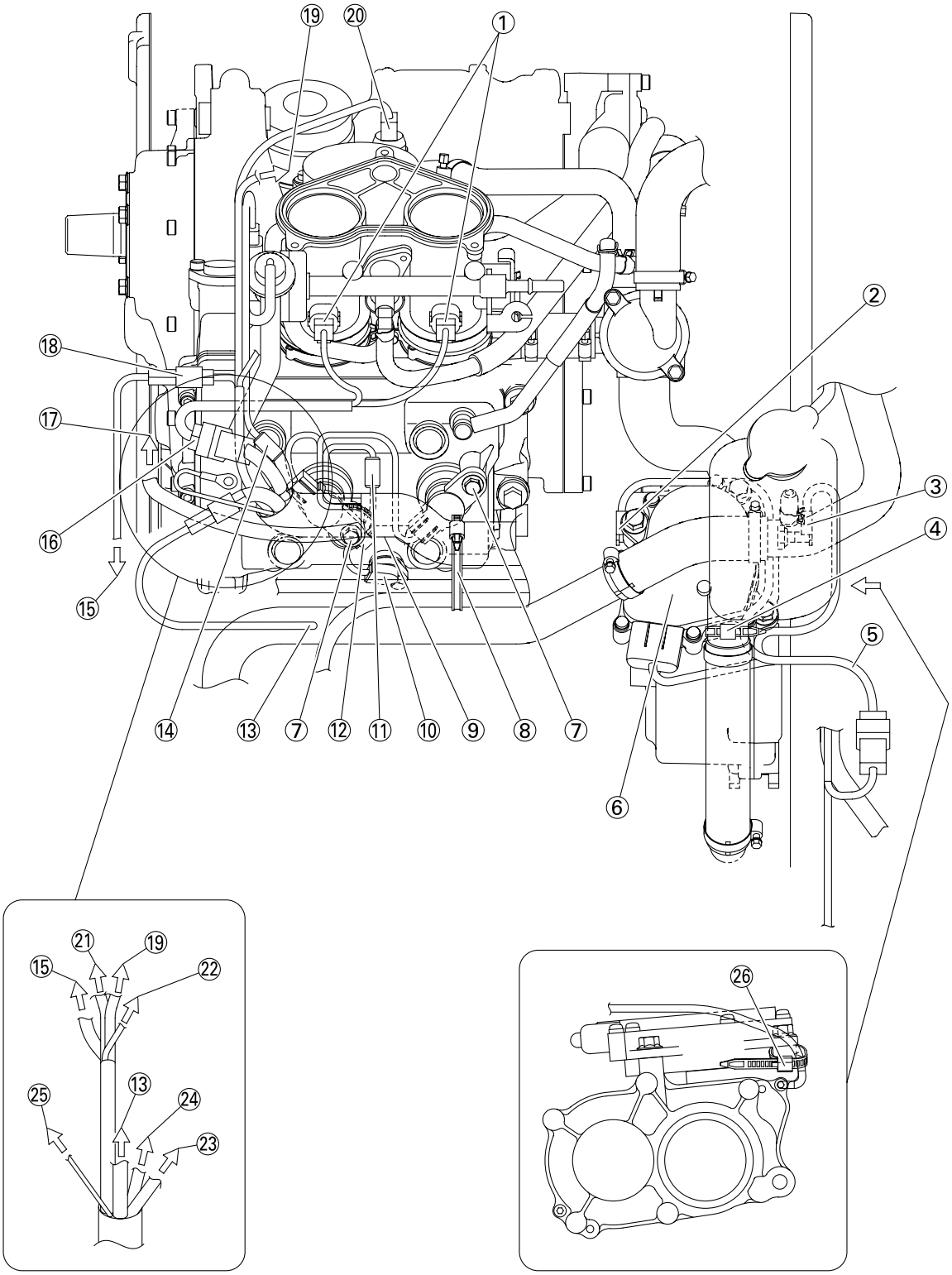
PZ50GTA, PZ50RTA, PZ50MTA

① Injector
② Reverse position switch coupler
③ Drive position switch coupler
④ Clamp the reverse position switch lead to the coolant reservoir tank with the clamp. Install the plastic band with its buckle positioned on top of the coolant reservoir tank and its end facing to the right (Make sure not to clamp the drive position switch coupler and sub-wire harness.)
⑤ Sub-wire harness
⑥ Gear motor
⑦ Ignition coil
⑧ Clamp the wire harness and fuel tank breather hose to the frame rear cross member with the clamp.
⑨ Route the wire harness under the frame rear cross member.
⑩ Cylinder identification sensor
⑪ Cylinder identification sensor coupler
⑫ Clamp the cylinder identification sensor lead to the cylinder head cover boss with the clamp.
⑬ To the auxiliary DC jack
⑭ Throttle position sensor lead coupler
⑮ To the speed sensor
⑯ Injector sub-wire harness coupler
⑰ To the handlebar switch
⑱ Speed sensor coupler
⑲ To the oil pressure sensor
⑳ Oil pressure switch coupler
㉑ To the oil pressure switch
㉒ To the rectifier/regulator
㉓ To the injector sub-wire harness
㉔ To the throttle position sensor coupler
㉕ To the auxiliary DC outlet
㉖ To the body ground (Tighten the ground lead together with the rectifier/regulator securing flange nut.)
㉗ Clamp the sub-wire harness at the white tape with the clamp.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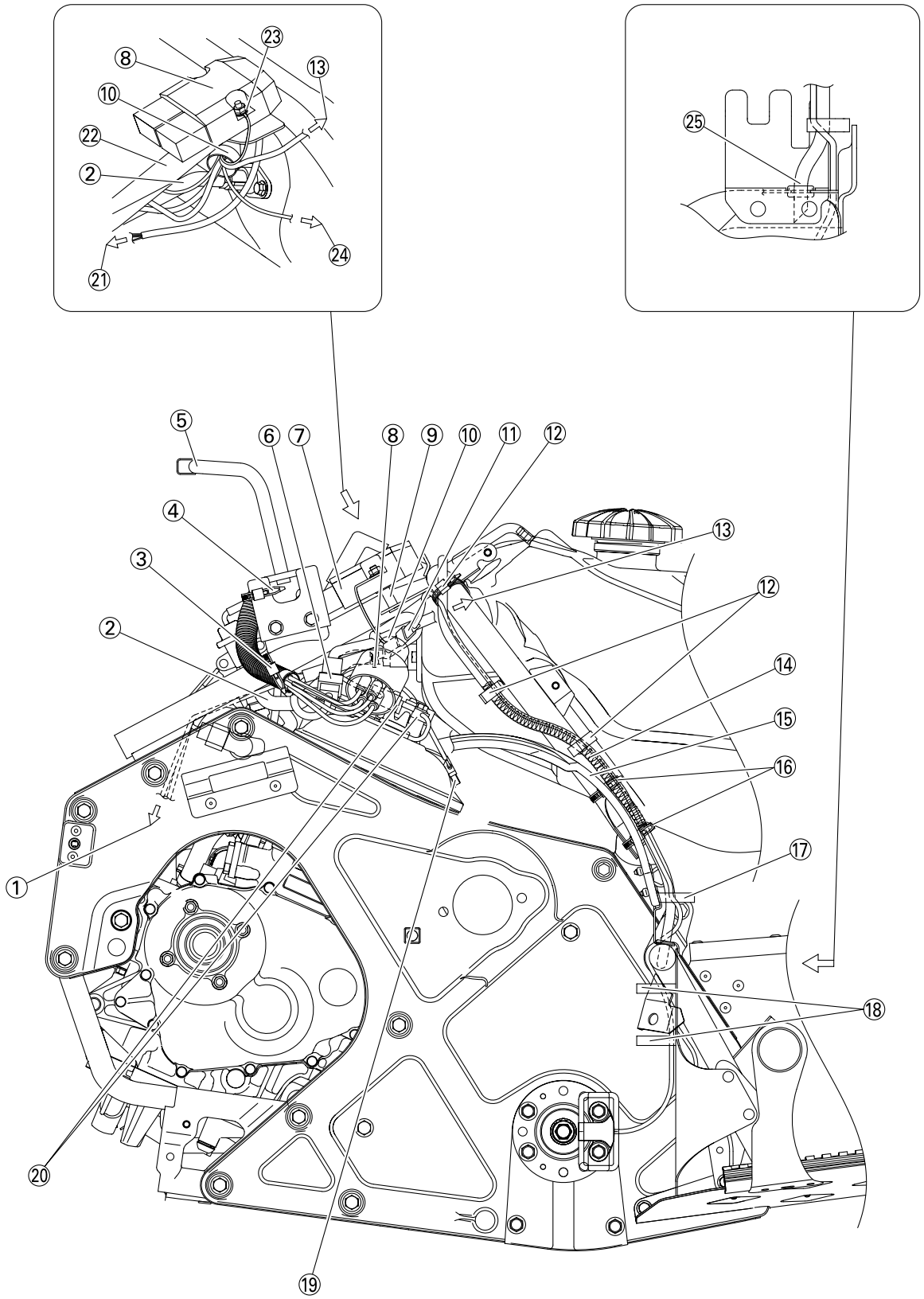
PZ50VTA

① Injector
② Reverse position switch coupler
③ Drive position switch coupler
④ Clamp the reverse position switch lead to the coolant reservoir tank with the clamp. Install the plastic band with its buckle positioned on top of the coolant reservoir tank and its end facing to the right (Make sure not to clamp the drive position switch coupler and sub-wire harness.)
⑤ Sub-wire harness
⑥ Gear motor
⑦ Ignition coil
⑧ Clamp the wire harness and fuel tank breather hose to the frame rear cross member with the clamp.
⑨ Route the wire harness under the frame rear cross member.
⑩ Cylinder identification sensor
⑪ Cylinder identification sensor coupler
⑫ Clamp the cylinder identification sensor lead to the cylinder head cover boss with the clamp.
⑬ To the auxiliary DC outlet
⑭ Throttle position sensor lead coupler
⑮ To the speed sensor
⑯ Injector sub-wire harness coupler
⑰ To the handlebar switch
⑱ Speed sensor coupler
⑲ To the oil pressure sensor
⑳ Oil pressure switch coupler
㉑ To the oil pressure switch
㉒ To the rectifier/regulator
㉓ To the injector sub-wire harness
㉔ To the throttle position sensor coupler
㉕ To the body ground (Tighten the ground lead together with the rectifier/regulator securing flange nut.)
㉖ Clamp the sub-wire harness at the white tape with the clamp.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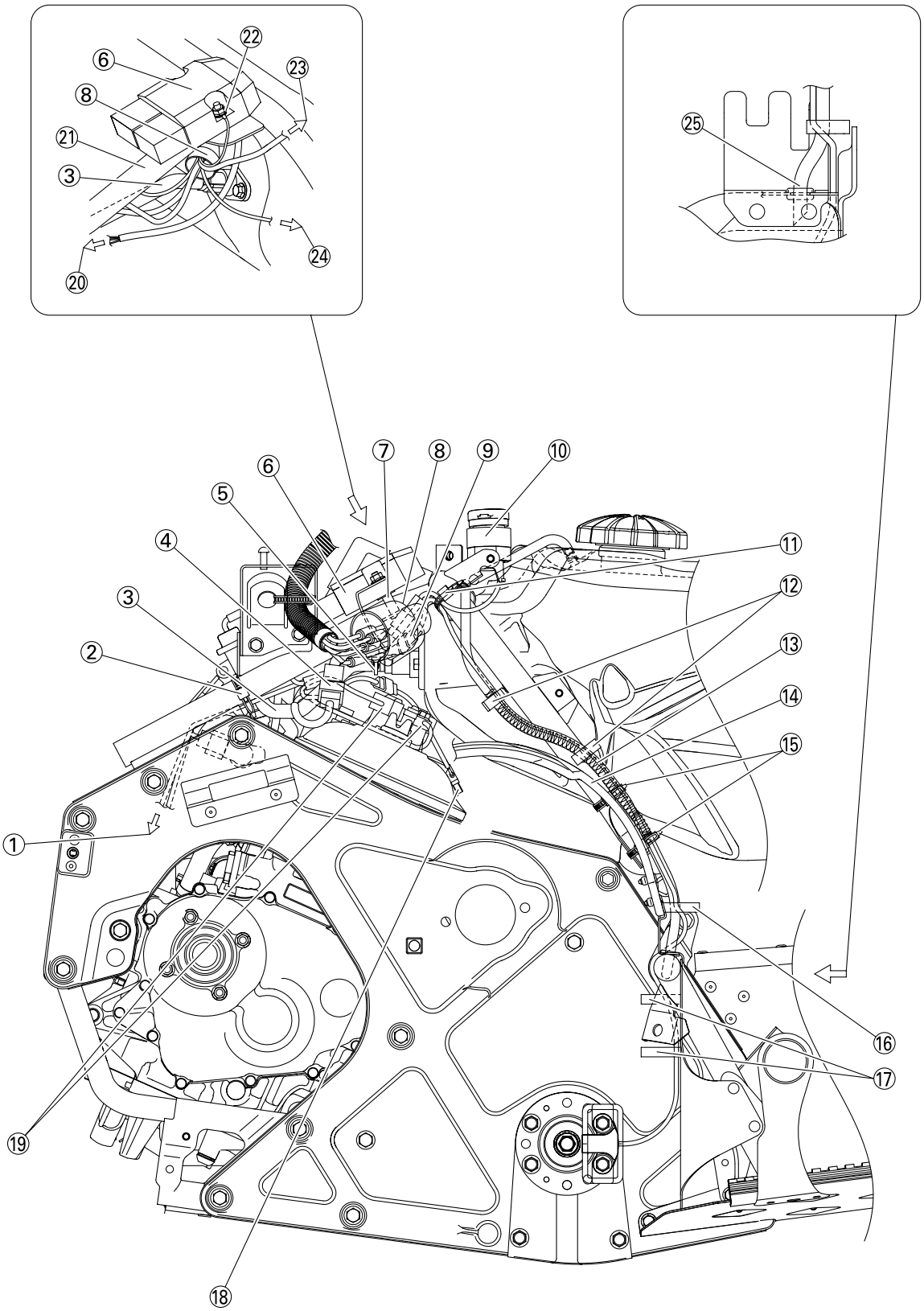
PZ50GTA, PZ50RTA, PZ50MTA

① Connect the branch line of the oil pressure sensor and oil pressure switch to the oil pressure sensor and oil pressure switch in the engine section.
② Fuel hose
③ Clamp the corrugated tube, oil pressure sensor lead, oil pressure switch lead, and throttle position sensor lead the frame front cross member with the clamp.
④ Clamp the corrugated tube to the headlight stay with the clamp.
⑤ Headlight stay
⑥ Injector sub-wire harness coupler
⑦ Rectifier/regulator
⑧ Fasten the fuel hose with the hose clip. Face the ends of the hose clip outward, angled 45° downward.
⑨ Collar
⑩ Wire harness
⑪ Speed sensor coupler
⑫ Clamp the speed sensor lead and fuel tank breather hose to the frame rear cross member with the clamp. For routing, order insignificant.
⑬ To the auxiliary DC jack
⑭ Hose protector
⑮ Drive guard
⑯ Clamp the speed sensor lead and fuel tank breather hose with a clamp. For routing, order insignificant.
⑰ Clamp the speed sensor lead and fuel tank breather hose with the lead holder (be sure to bend the holder so that the lead and hose will not come loose). For routing, order insignificant.
⑱ Clamp the speed sensor lead with the lead holder (be sure to bend the holder so that the lead and hose will not come loose). For routing, order insignificant.
⑲ Cylinder identification sensor
⑳ Ignition coil
㉑ To the handlebar switch
㉒ Frame rear cross member
㉓ Ground lead
㉔ To the speed sensor
㉕ Align the paint mark on the fuel tank breather hose with the top of the grommet. During installation, soapy water may be applied to the grommet hole.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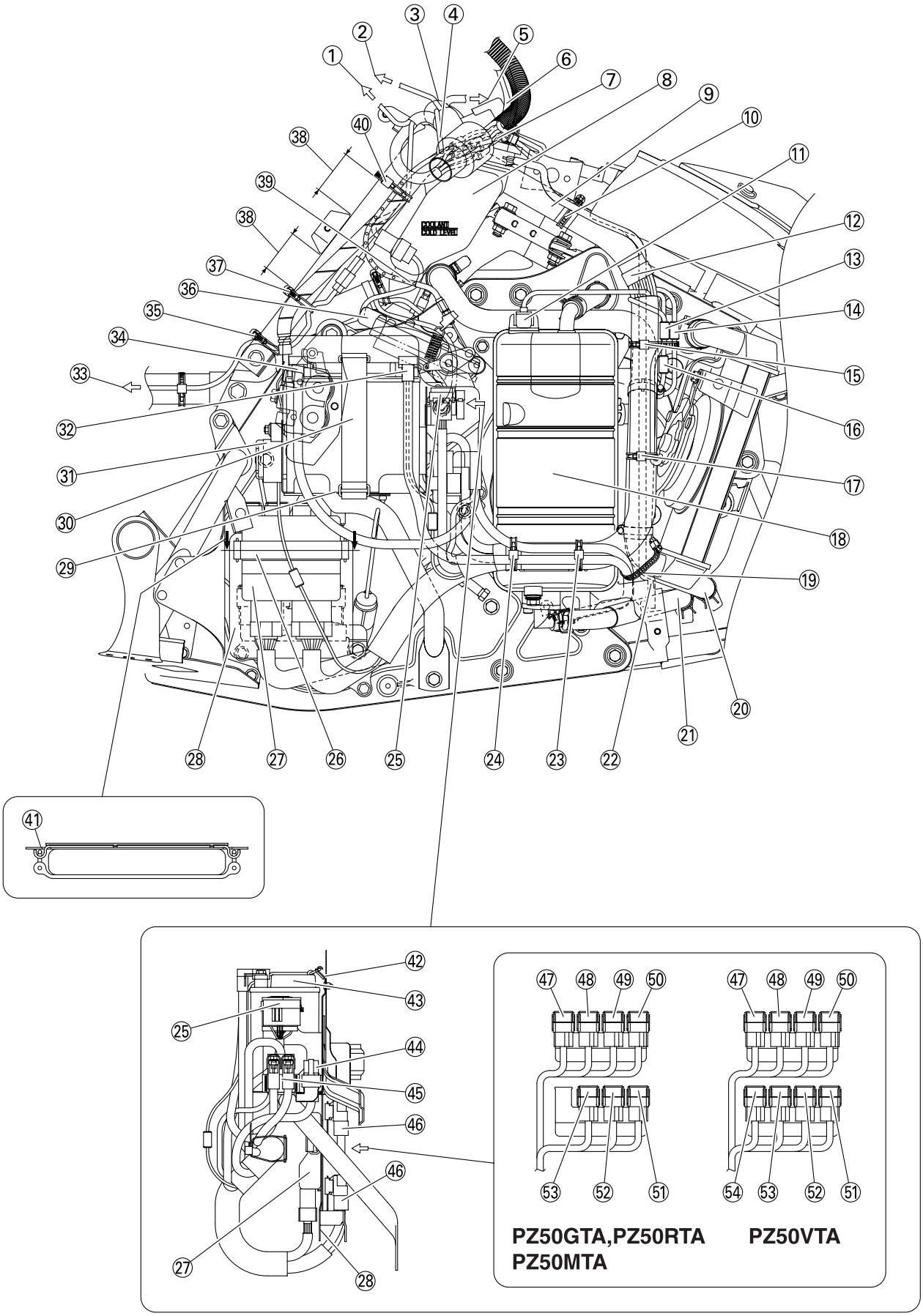
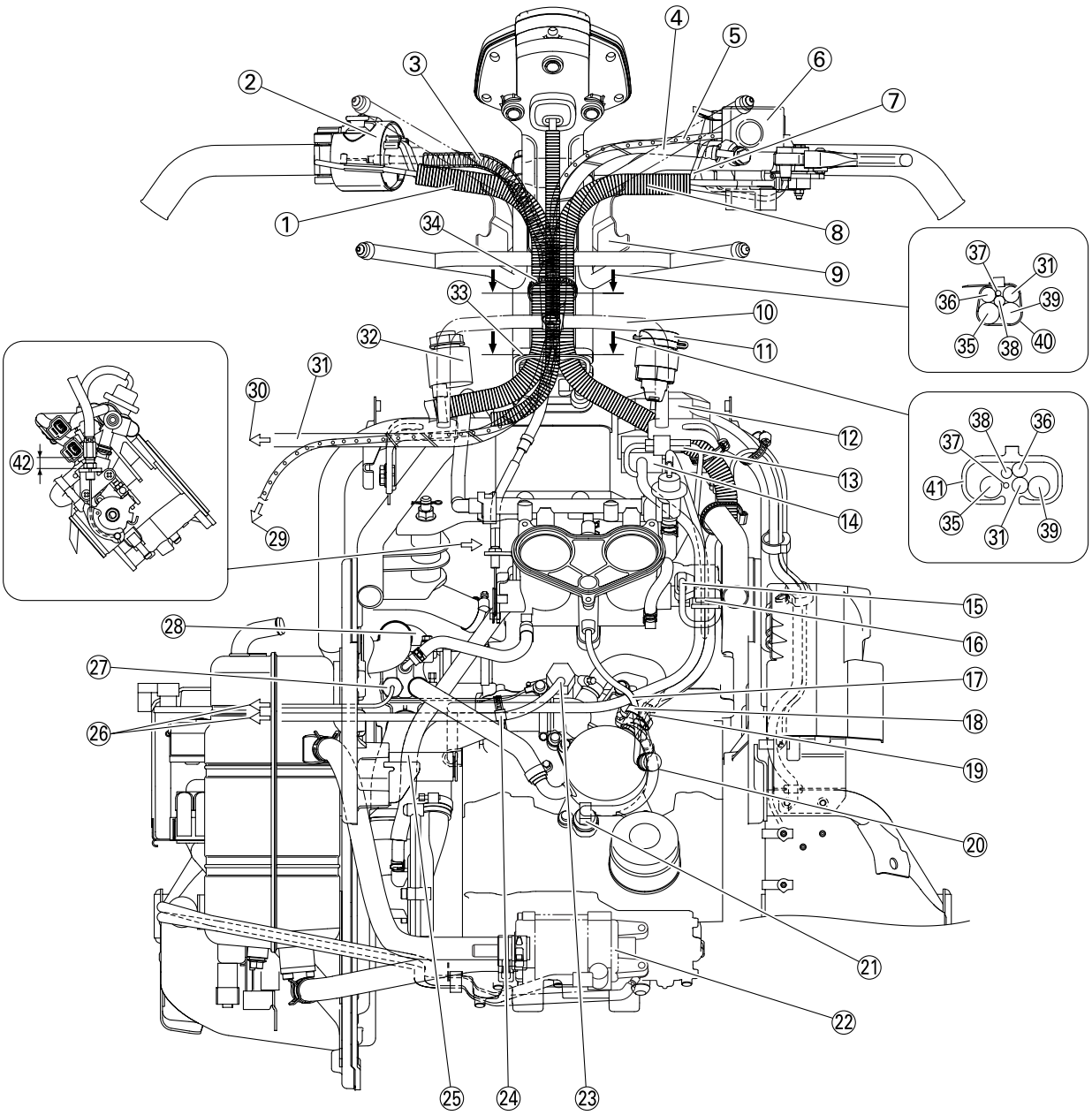
PZ50VTA

① Connect the branch line of the oil pressure sensor and oil pressure switch to the oil pressure sensor and oil pressure switch in the engine section.
② Clamp the oil pressure sensor lead, oil pressure switch lead, and throttle position sensor lead the frame front cross member with the clamp.
③ Fuel hose
④ Injector sub-wire harness coupler
⑤ Fasten the fuel hose with the hose clip. Face the ends of the hose clip outward, angled 45° downward.
⑥ Rectifier/regulator
⑦ Collar
⑧ Wire harness
⑨ Speed sensor coupler
⑩ Auxiliary DC outlet
⑪ Clamp the auxiliary DC outlet lead, fuel tank breather hose, and speed sensor lead to the frame rear cross member with the clamp. For routing, order insignificant.
⑫ Clamp the speed sensor lead and fuel tank breather hose to the frame rear cross member with the clamp. For routing, order insignificant.
⑬ Hose protector
⑭ Drive guard
⑮ Clamp the speed sensor lead and fuel tank breather hose with a clamp. For routing, order insignificant.
⑯ Clamp the speed sensor lead and fuel tank breather hose with the lead holder (be sure to bend the holder so that the lead and hose will not come loose). For routing, order insignificant.
⑰ Clamp the speed sensor lead with the lead holder (be sure to bend the holder so that the lead and hose will not come loose). For routing, order insignificant.
⑱ Cylinder identification sensor
⑲ Ignition coil
⑳ To the handlebar switch
㉑ Frame rear cross member
㉒ Ground lead
㉓ To the auxiliary DC jack
㉔ To the speed sensor
㉕ Align the paint mark on the fuel tank breather hose with the top of the grommet. During installation, soapy water may be applied to the grommet hole.


PZ50GTA,PZ50RTA
PZ50MTA
PZ50VTA

① To the main switch
② To the fuel pump
③ Pass the wire harness over the frame rear cross member.
④ To the fuel sender
⑤ To the sensor and meter
⑥ Brake hose
⑦ Parking brake cable
⑧ Coolant reservoir
⑨ Wire harness
⑩ Clamp the wire harness, at the positioning tape marks, to the frame rear cross member. Face the head of the clamp to top of the snowmobile and the end of the clamp to inside of the snowmobile.
⑪ Oil level switch coupler
⑫ Avoid contacting the joint coupler with the radiator outlet pipe.
⑬ Radiator fan motor coupler
⑭ Knock sensor coupler
⑮ Clamp the wire harness, radiator fan motor lead and knock sensor lead to the radiator outlet pipe with the clamp. Install the clamp with its buckle positioned to the outside of the pipe and its end facing rearward.
⑯ Coolant temperature sensor coupler
⑰ Clamp the wire harness and radiator fan motor lead to the radiator outlet hose with the clamp. Install the clamp with its buckle positioned to the outside of the hose and its end facing rearward.
⑱ Oil tank
⑲ Clamp the starter motor lead and negative battery lead to the radiator joint pipe with the clamp to top of the snowmobile and the end of the clamp to inside of the snowmobile.
⑳ Oil tank inlet hose
㉑ Oil tank outlet hose
㉒ Place the end of the coolant reservoir breather hose to the inside of the frame front cross member.
㉓ Clamp the wire harness, starter motor lead, and negative battery lead to the oil tank with the clamp. Face the end of the clamp upward.
㉔ Clamp the starter motor lead, negative battery lead, and wire harness at the positioning tape to the oil tank with the clamp. Face the end of the clamp upward.
㉕ Fuse box
㉖ ECU (engine control unit) band
㉗ ECU (engine control unit)
㉘ ECU (engine control unit) rubber pad
㉙ Battery seat
㉚ Battery band
㉛ Back buzzer
㉜ Battery negative lead
㉝ To the tail/brake light
㉞ Battery positive lead
㉟ Clamp the tail/brake light lead to the frame rear cross member with the clamp, making sure to route the lead to the inside of the cross member. Install the clamp with its buckle positioned towards the rear of the machine and its end facing to the right.
㊱ Gear motor
㊲ Clamp the tail/brake light lead and brake hose to the frame rear cross member with the clamp. Install the clamp with its buckle positioned towards the rear of the snowmobile and its end facing to the right.
㊳ 40 ~ 50 mm (1.6 ~ 2.0 in)
㊴ The parking brake cable must not be folded or bent.
㊵ Clamp the wire harness, brake hose, and parking brake cable with the clamp.
㊶ Pass the hook of the battery bracket through the hole of the ECU (engine control unit) rubber pad.
㊷ Affix the battery rubber pad, aligning it with the end of the bending part of the battery bracket.
㊸ Battery
㊹ Main fuse
㊺ Starter relay
㊻ Relay assembly
㊼ Radiator fan motor relay
㊽ Fuel injection system relay
㊾ Load control relay
㊿ Headlight relay
(51) Gear motor relay 1
(52) Gear motor relay 2
(53) Gear motor relay 3
(54) Passenger grip warmer relay (PZ50VTA)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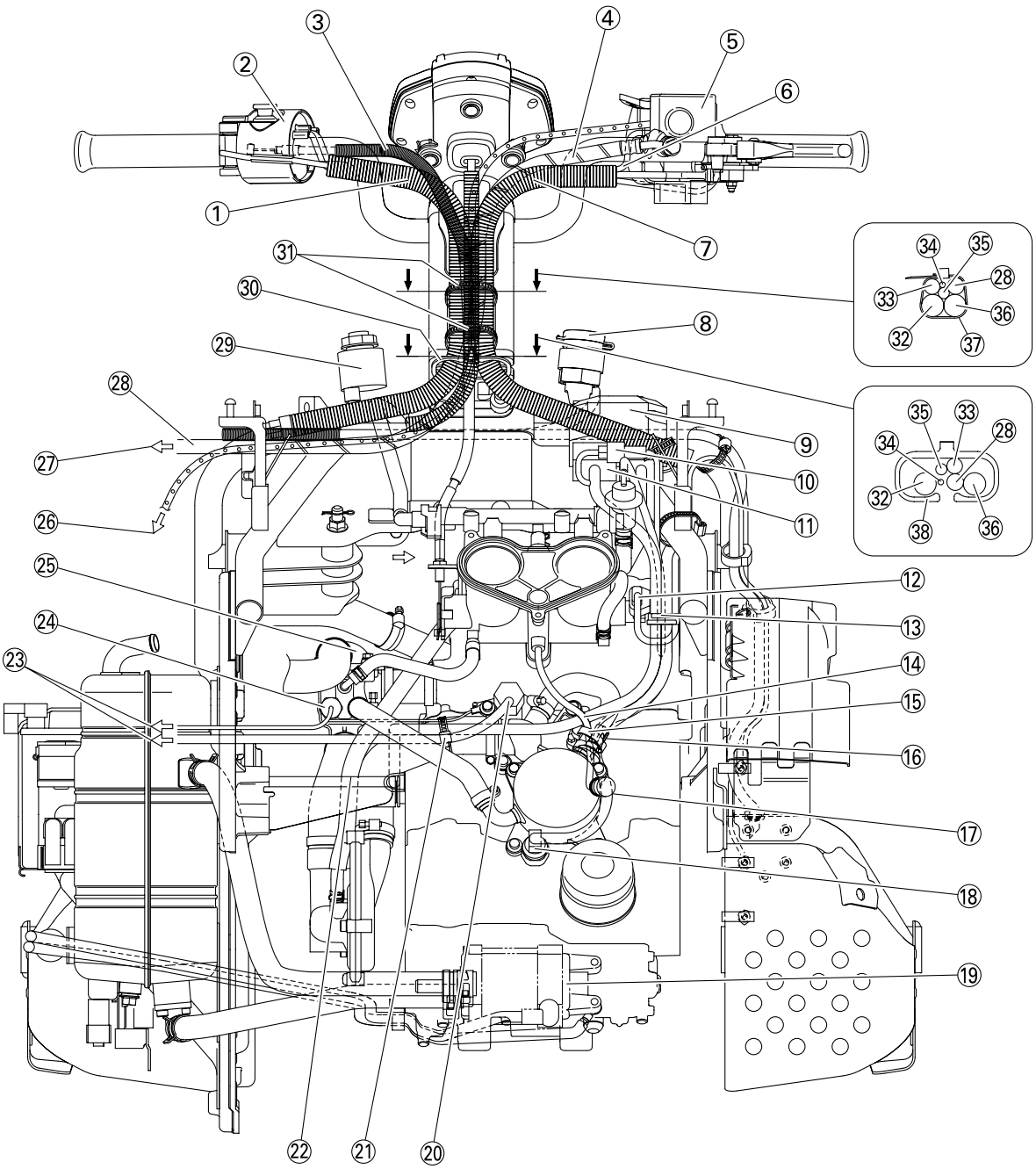
PZ50GTA, PZ50RTA, PZ50MTA

① Route the corrugated tube further to the rear of the snowmobile than the windshield bracket and then install it.
② Right handlebar switch
③ Pass the throttle cable over the handlebar.
④ Pass the brake hose in behind of the windshield bracket.
⑤ Pass the parking brake cable behind the windshield bracket.
⑥ Left handlebar switch
⑦ Pass the left handlebar switch leads behind the handlebar.
⑧ Route the corrugated tube to the rear of the snowmobile than the windshield bracket and then install it.
⑨ Windshield bracket
⑩ Headlight stay
⑪ Auxiliary DC jack
⑫ Rectifier/regulator
⑬ AC magneto lead coupler
⑭ Connect the AC magneto lead side coupler (gray) to the rectifier/regulator.
⑮ Throttle position sensor coupler (black)
⑯ Clamp the AC magneto lead, throttle position sensor lead, wire harness (oil pressure sensor lead and oil pressure switch lead), and pressure regulator hose with the clamp.
⑰ Pass the AC magneto lead behind the idle adjusting screw wire.
⑱ Clamp the oil cooler inlet hose, idle adjusting screw wire, and oil pressure switch lead with the clamp. Install the clamp with its buckle positioned towards the rear of the snowmobile and its end facing to the right. Do not clamp the oil pressure sensor coupler.
⑲ Oil pressure sensor coupler
⑳ Pass the oil pressure switch lead under the idle adjusting screw, making sure that the lead is not too taut.
㉑ Oil pressure switch coupler (gray)
㉒ Starter motor
㉓ Knock sensor
㉔ Clamp
㉕ Pass the throttle body heater outlet hose behind the engine mounting bracket.
㉖ To the wire harness
㉗ Coolant temperature sensor
㉘ Thermostat housing cover
㉙ To the parking brake
㉚ To the brake
㉛ Brake hose
㉜ Main switch
㉝ Pass the corrugated tube, parking brake cable, throttle cable, meter lead, and brake hose with the holder.
㉞ Clamp the corrugated tube, parking brake cable, throttle cable, meter lead, and brake hose with the clamp.
㉟ Corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead)
㊱ Meter lead
㊲ Parking brake cable
㊳ Throttle cable
㊴ Corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead)
㊵ Install the clamp with its buckle positioned behind the leads, cables, and hose and its end facing to the right. Be sure to position the corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead) and corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead) towards the front and clamp the throttle cable at the throttle cable adjusting nut. For other leads, order insignificant.
㊶ Position the corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead) and corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead) towards the front of the guide. For other leads, order insignificant.
㊷ 10 mm (0.39 in)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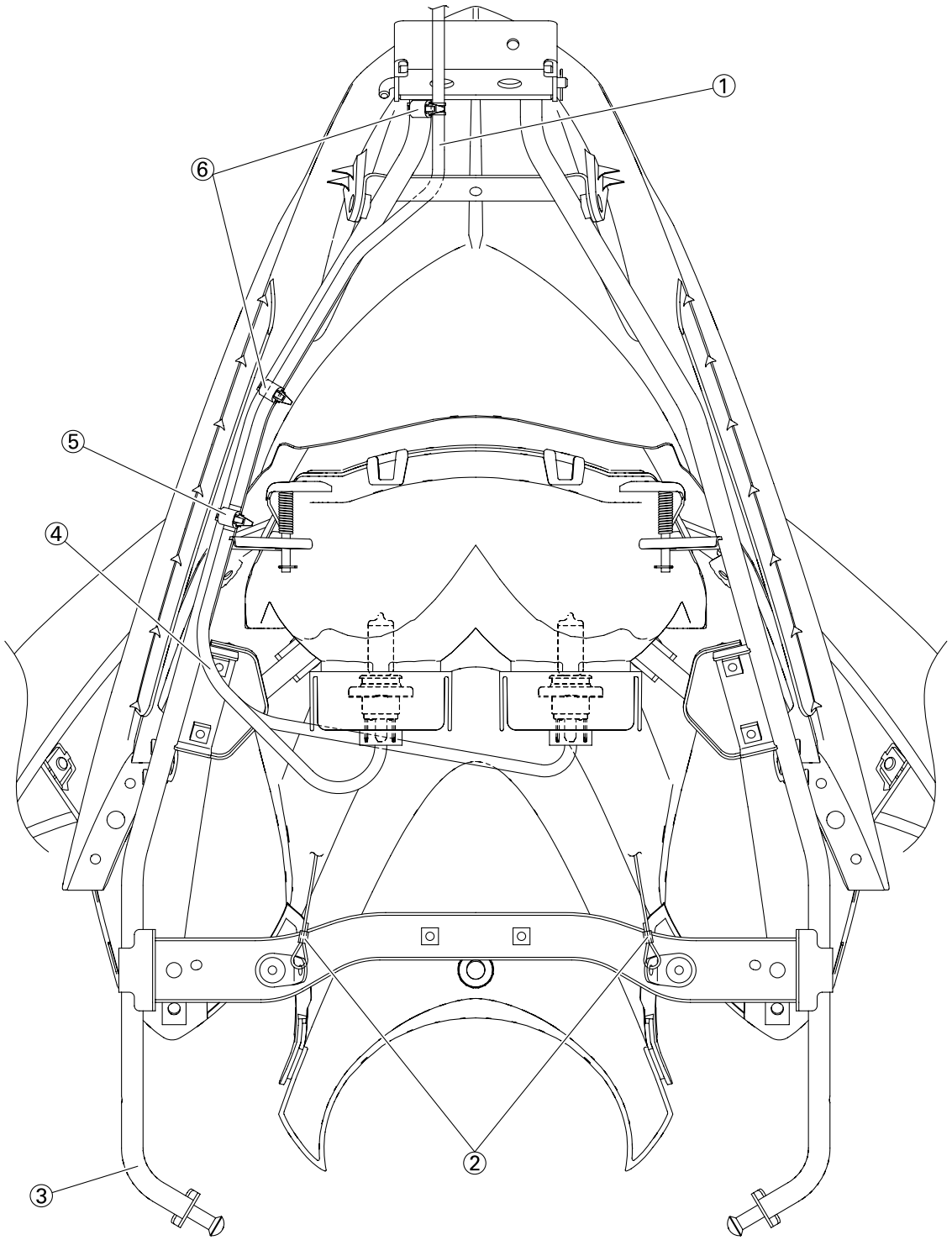
PZ50VTA

① Corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead)
② Right handlebar switch
③ Pass the throttle cable over the handlebar.
④ Pass the brake hose in front of the handlebar.
⑤ Left handlebar switch
⑥ Pass the left handlebar switch leads behind the handlebar.
⑦ Corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead)
⑧ Auxiliary DC jack
⑨ Rectifier/regulator
⑩ AC magneto lead coupler
⑪ Connect the AC magneto lead side coupler (gray) to the rectifier/regulator.
⑫ Throttle position sensor coupler (black)
⑬ Clamp the AC magneto lead, throttle position sensor lead, wire harness (oil pressure sensor lead and oil pressure switch lead), and pressure regulator hose with the clamp.
⑭ Pass the AC magneto lead behind the idle adjusting screw wire.
⑮ Clamp the oil cooler inlet hose, idle adjusting screw wire, and oil pressure switch lead with the clamp. Install the clamp with its buckle positioned towards the rear of the snowmobile and its end facing to the right. Do not clamp the oil pressure sensor coupler.
⑯ Oil pressure sensor coupler
⑰ Pass the oil pressure switch lead under the idle adjusting screw, making sure that the lead is not too taut.
⑱ Oil pressure switch coupler (gray)
⑲ Starter motor
⑳ Knock sensor
㉑ Clamp
㉒ Pass the throttle body heater outlet hose behind the engine mounting bracket.
㉓ To the wire harness
㉔ Coolant temperature sensor
㉕ Thermostat housing cover
㉖ To the parking brake
㉗ To the brake
㉘ Brake hose
㉙ Main switch
㉚ Pass the corrugated tube, parking brake cable, throttle cable, meter lead, and brake hose with the holder.
㉛ Clamp the corrugated tube, parking brake cable, throttle cable, meter lead, and brake hose with the clamp.
㉜ Corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead)
㉝ Meter lead
㉞ Parking brake cable
㉟ Throttle cable
㊱ Corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead)
㊲ Install the clamp with its buckle positioned behind the leads, cables, and hose and its end facing to the right. Be sure to position the corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead) and corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead) towards the front and clamp the throttle cable at the throttle cable adjusting nut. For other leads, order insignificant.
㊳ Position the corrugated tube (engine stop switch lead, throttle switch lead, right grip warmer lead, and thumb warmer lead) and corrugated tube (left grip warmer lead, grip/thumb warmer adjustment switch lead, brake light switch lead, and headlight beam switch lead) towards the front of the guide. For other leads, order insignificant.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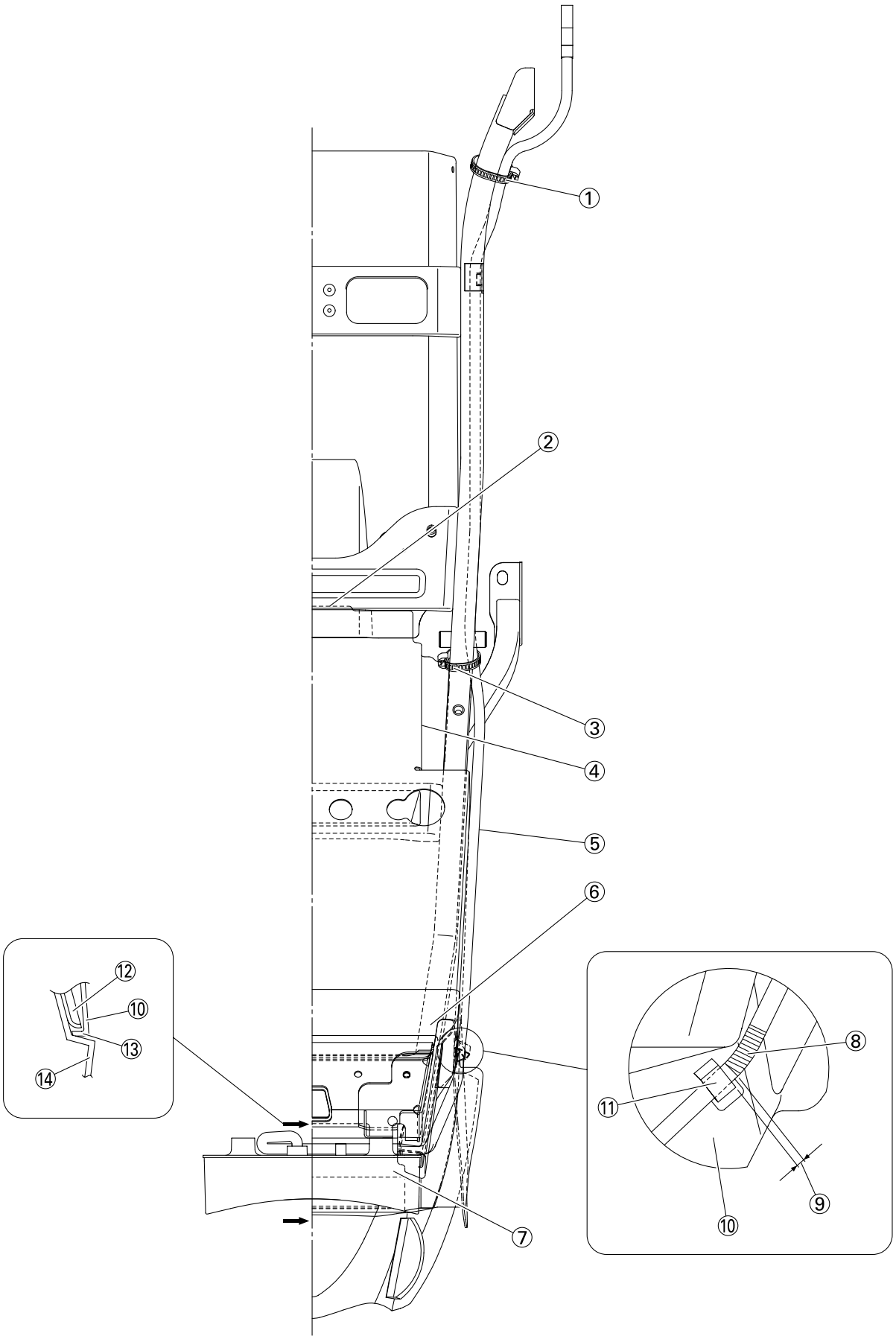
PZ50VTA

① Clamp the headlight lead to the inside of the shroud frame.
② Shroud stopper
③ Shroud frame
④ Headlight lead
⑤ Clamp the headlight lead at the white tape to the shroud frame with the clamp, making sure to position the clamp near the bracket.
⑥ Clamp the headlight lead to the shroud frame with the clamp, making sure to route the lead along the bend in the frame.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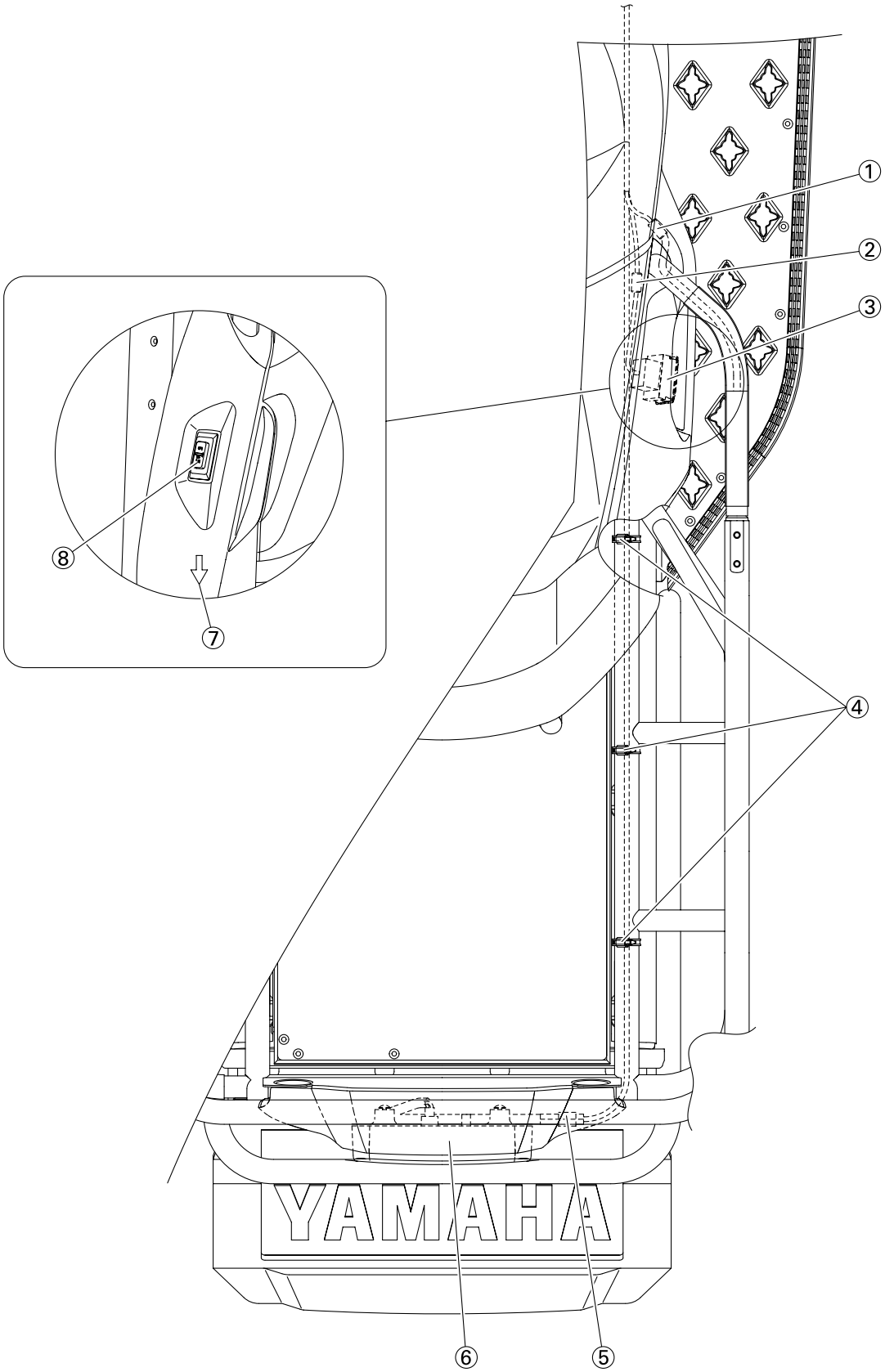
PZ50GTA, PZ50RTA, PZ50MTA

① Clamp the tail/brake light lead with the clamp. Face the end of the clamp downward.
② Insert the end of the seat lower plate under the seat rail bracket.
③ Clamp the tail/brake light lead with the clamp. Install the clamp with its buckle positioned to the inside of the tail/brake light lead and its end facing downward.
④ Seat lower plate
⑤ Route the tail/brake light lead outside of the seat lower plate.
⑥ After installing the seat lower plate, put the rubber cover on the seat rail. Put out the clamp of the seat rail from the hole of the rubber cover.
⑦ Tail/brake light
⑧ Tail/brake light lead positioning tape
⑨ 0 ~ 20 mm (0 ~ 0.79 in) from the end of the positioning tape
⑩ Rubber cover
⑪ Using the tail/brake light lead positioning tape as a guide, clamp the tail/brake light lead as shown in the illustration. Fold the end of the clamp so that the lead does fall off.
⑫ Seat rail
⑬ Insert the rib of the rubber cover between the tail/brake light bracket and seat rail.
⑭ Tail/brake light bracket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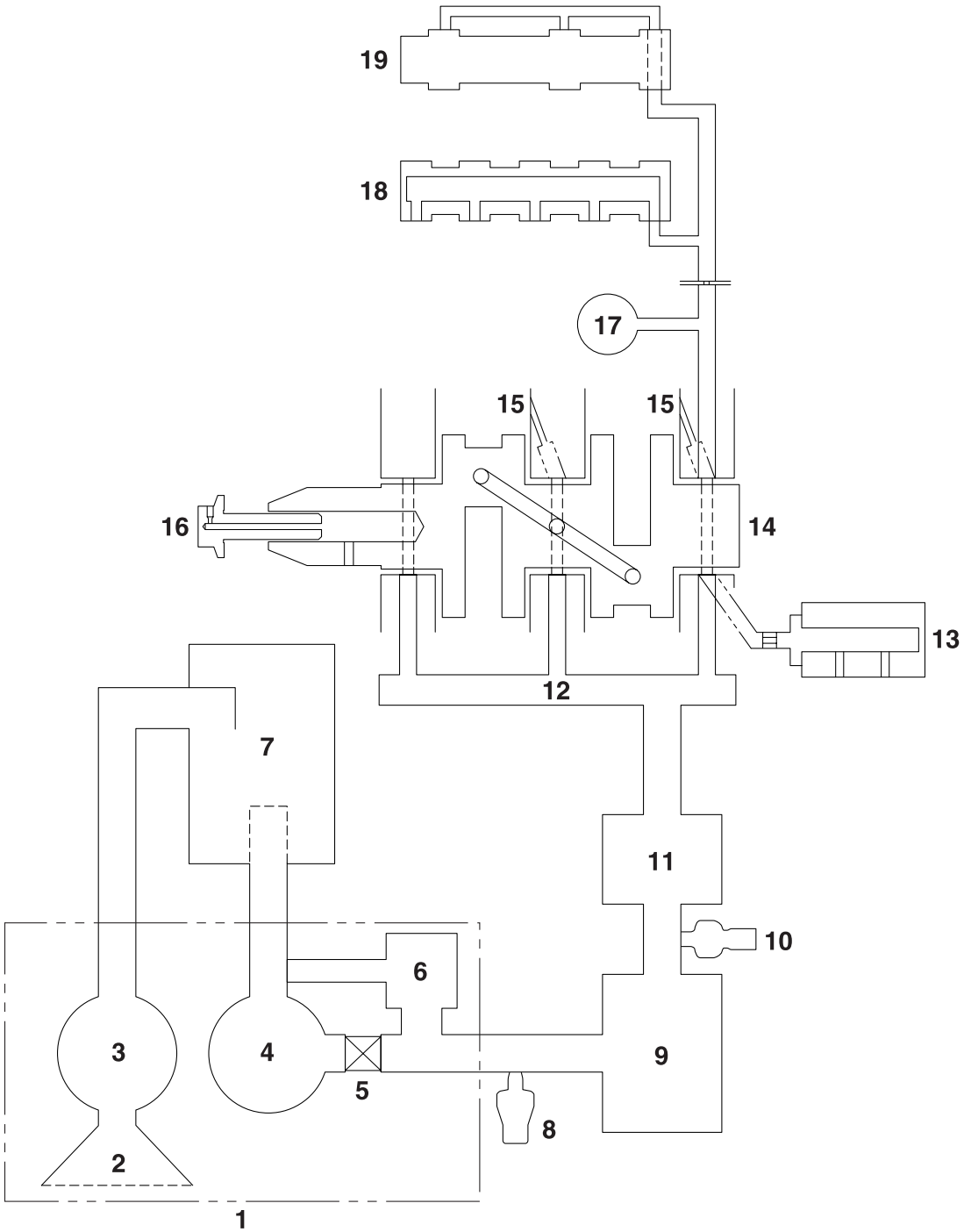
②
③
④
⑤
⑥
⑦
⑧
YAMAHA

PZ50VTA

① Connect the passenger grip warmer coupler, and then place it in the rear lower cover.
② Passenger grip warmer switch coupler
③ Passenger grip warmer switch
④ Clamp the tail/brake light lead to the rear carrier with the clamp.
⑤ Connect the tail/brake light coupler, and then place it in the tail/brake light cover.
⑥ Tail/brake light
⑦ Front of the snowmobile
⑧ Install the passenger grip warmer switch with letter 'Hi' on the switch faced toward the front of the snowmobile.

ENGINE OIL LUBRICATION CHART



1. Oil pump assembly
2. Oil strainer
3. Scavenge pump
4. Feed pump
5. Check valve
6. Relief valve
7. Oil tank
8. Oil pressure switch
9. Oil cooler
10. Oil pressure sensor
11. Oil filter
12. Main gallery
13. Primary sheave drive shaft
14. Crankshaft
15. Oil nozzle
16. AC magneto rotor bolt
17. Timing chain tensioner
18. Intake camshaft
19. Exhaust camshaft

WIRING DIAGRAM
2011 PZ50GTA, PZ50RTA, PZ50MTA

① Crankshaft position sensor
② AC magneto
③ Rectifier/regulator
④ Main switch
⑤ Main fuse
⑥ Load control relay
⑦ Fuel injection system fuse
⑧ Starter relay
⑨ Battery
⑩ Starter motor
⑪ Diode
⑫ Engine stop switch
⑬ Throttle switch
⑭ Oil pressure sensor
⑮ Back buzzer
⑯ Grip warmer
⑰ Thumb warmer
⑱ Oil pressure switch
⑲ Drive position switch
⑳ Reverse position switch
㉑ CO adjustment coupler
㉒ ECU (engine control unit)
㉓ Cylinder-#1 ignition coil
㉔ Spark plug
㉕ Cylinder-#2 ignition coil
㉖ Injector #1
㉗ Injector #2
㉘ Fuel injection system relay
㉙ Fuel pump
㉚ Throttle position sensor
㉛ Speed sensor
㉜ Cylinder identification sensor
㉝ Cylinder-#1 intake air pressure sensor
㉞ Cylinder-#2 intake air pressure sensor
㉟ Knock sensor
㊱ Coolant temperature sensor
㊲ Intake air temperature sensor
㊳ Grip/thumb warmer adjustment switch
㊴ Gear motor relay 1
㊵ Gear motor relay 2
㊶ Gear motor relay 3
㊷ Gear motor
㊸ Engine ground
㊹ Frame ground
㊺ Brake light switch
㊻ Tail/brake light
㊼ Fuel sender
㊽ Oil level switch
㊾ Speedometer unit
㊿ Multi-function meter
(51) Warning light
(52) Low coolant temperature indicator light
(53) Knock control system indicator light
(54) Drive position indicator light
(55) Reverse position indicator light
(56) High beam indicator light
(57) Headlight
(58) Headlight relay
(59) Headlight beam switch
(60) Radiator fan motor
(61) Auxiliary DC jack
(62) Radiator fan motor relay
(63) Ignition fuse
(64) Radiator fan motor fuse
(65) Signal fuse
(66) Headlight fuse
(67) Auxiliary DC jack fuse
(68) Gear motor fuse

[A] OPTION

COLOR CODE

B..... Black
Br ..... Brown
Ch ..... Chocolate
G ..... Green
Gy ..... Gray
L ..... Blue
Lg ..... Light green
O ..... Orange
P..... Pink
R ..... Red
Sb..... Sky blue
W..... White
Y..... Yellow
B/L ..... Black/Blue
B/R ..... Black/Red
B/W..... Black/White
B/Y..... Black/Yellow
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YAMAHA MOTOR CO., LTD.

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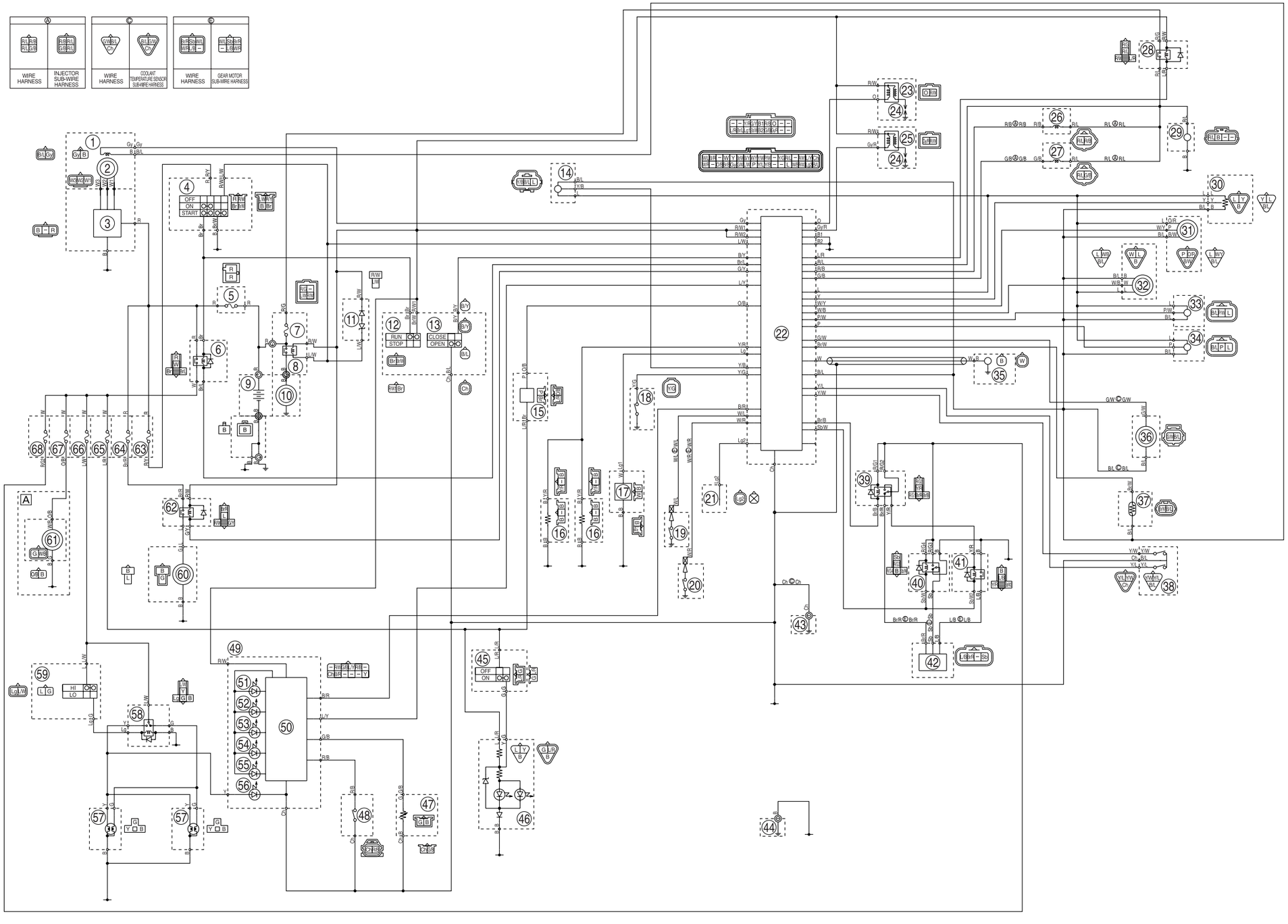
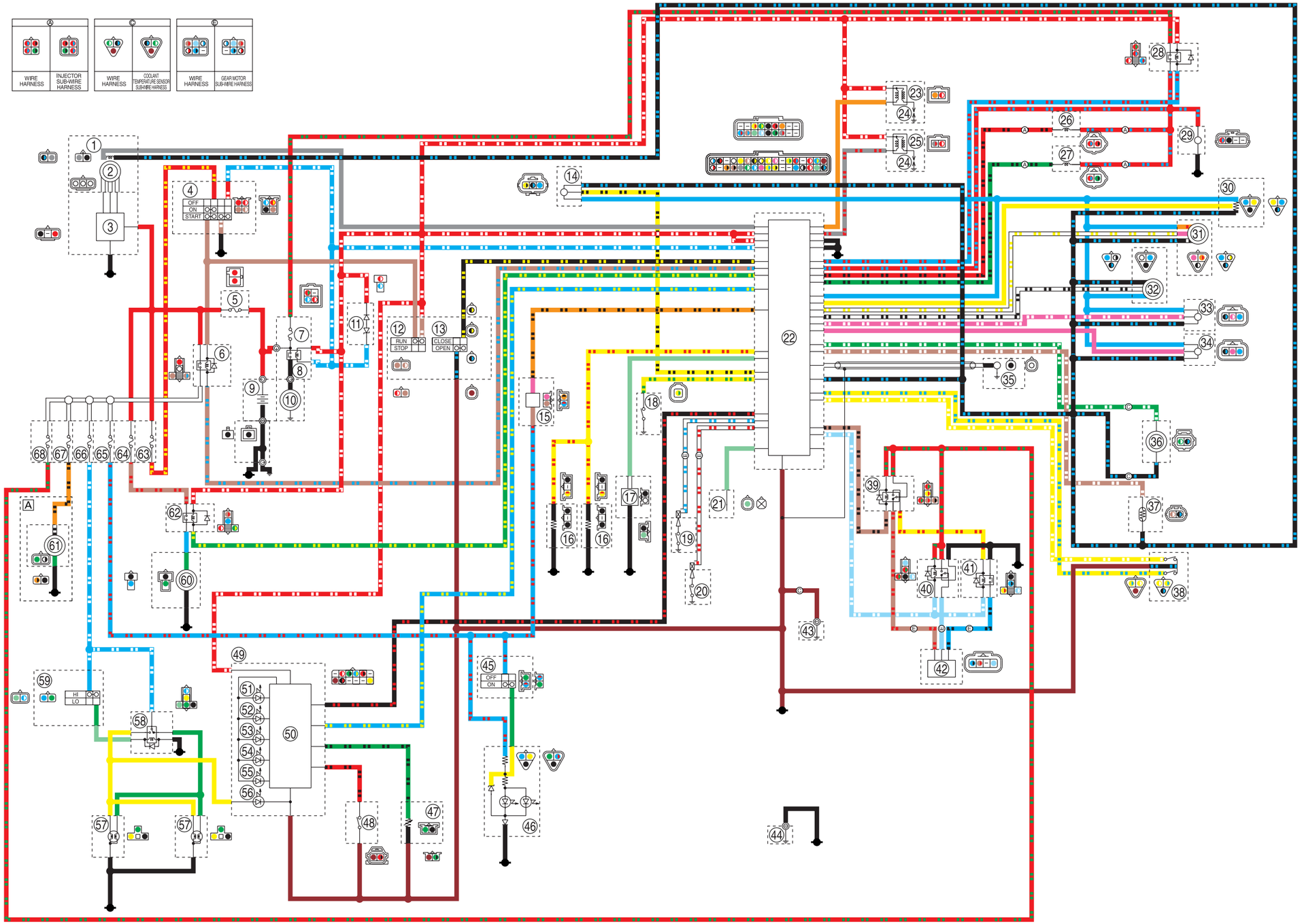
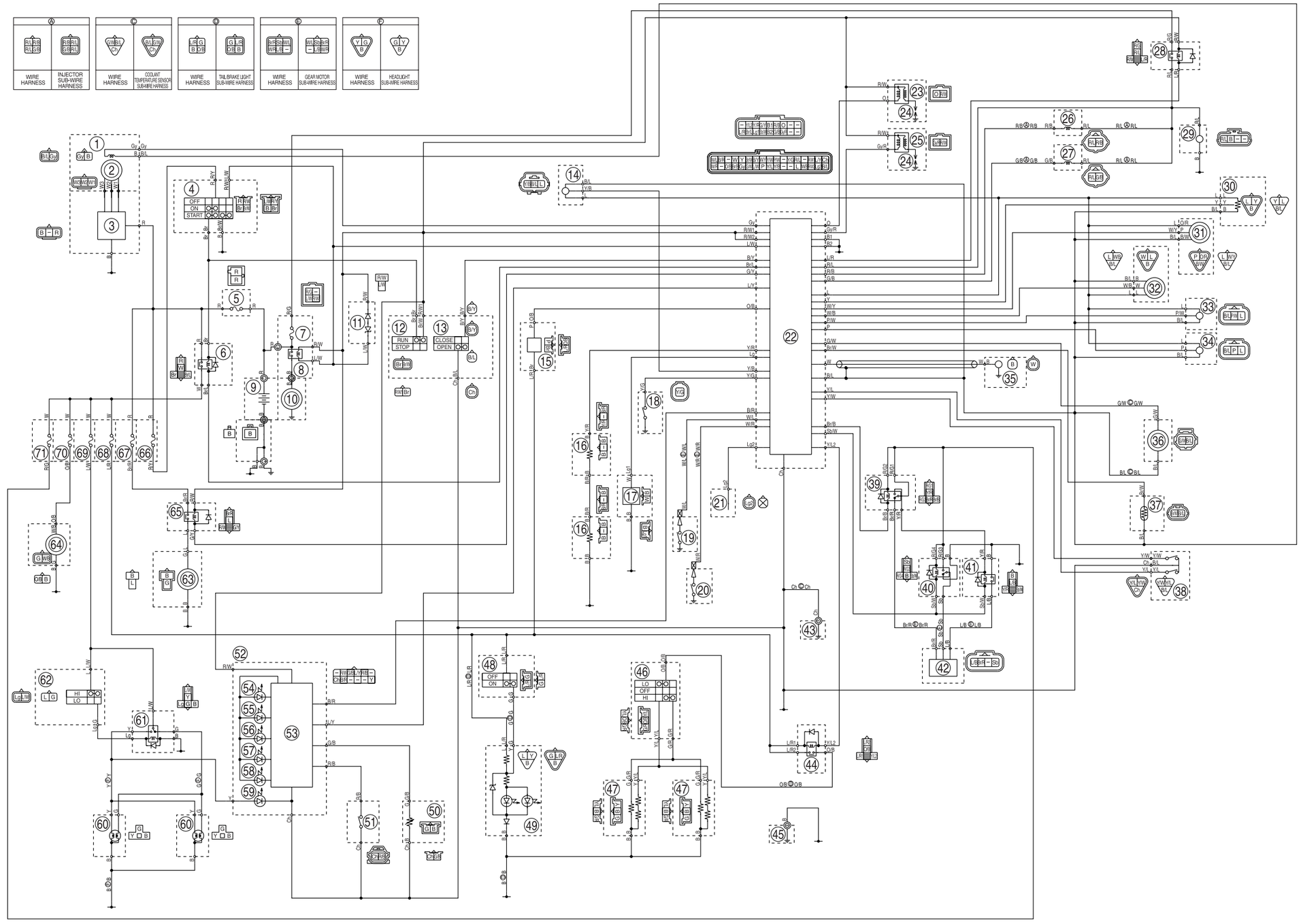
WIRING DIAGRAM
2011 PZ50GTA, PZ50RTA, PZ50MTA



WIRING DIAGRAM
2011 PZ50GTA, PZ50RTA, PZ50MTA



WIRING DIAGRAM
2011 PZ50VTA



WIRING DIAGRAM
2011 PZ50VTA