YAMAHA

WaveRunner

VX 700

VX 700 (F2V)

SERVICE MANUAL

F2V-28197-ZN-11

Preface

This manual has been prepared by Yamaha primarily for use by Yamaha dealers and their trained mechanics when performing maintenance procedures and repairs to Yamaha equipment. It has been written to suit the needs of persons who have a basic understanding of the mechanical and electrical concepts and procedures inherent in the work, for without such knowledge attempted repairs or service to the equipment could render it unsafe or unfit for use.

Because Yamaha has a policy of continuously improving its products, models may differ in detail from the descriptions and illustrations given in this publication. Use only the latest edition of this manual. Authorized Yamaha dealers are notified periodically of modifications and significant changes in specifications and procedures, and these are incorporated in successive editions of this manual. Also, up-to-date parts information is available on YPEC-web. Additional information and up-to-date information on Yamaha products and services are available on Yamaha Service Portal.

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

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 damages to the watercraft or other property.

TIP:

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

WaveRunner
VX 700
SERVICE MANUAL

Contents

General information

⚠Safety while working

To prevent an accident or injury and to provide quality service, observe the following safety procedures.

Rotating part

- Hands, feet, hair, jewelry, clothing, personal flotation device straps, and so on, can become entangled with internal rotating parts of the engine or jet pump unit, resulting in serious injury or death.
- Keep hands, feet, hair, jewelry, clothing, personal flotation device straps, and so on, away from any exposed moving parts when operating the engine with the seat removed.
- Keep away from intake grate while engine is on. Items such as hair, clothing, or personal flotation device straps can become entangled in moving parts resulting in severe injury.

Hot part

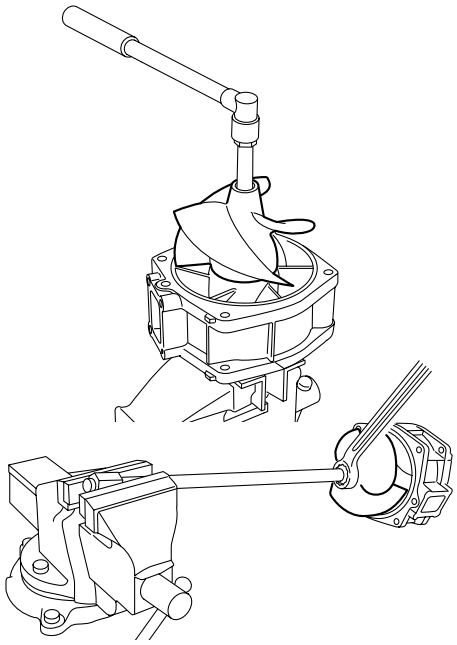
During and after operation, engine parts are hot enough to cause burns. Do not touch any parts in the engine compartment until the engine has cooled.

Electric shock

Do not touch any electrical parts while starting or operating the engine. Otherwise, shock or electrocution could result.

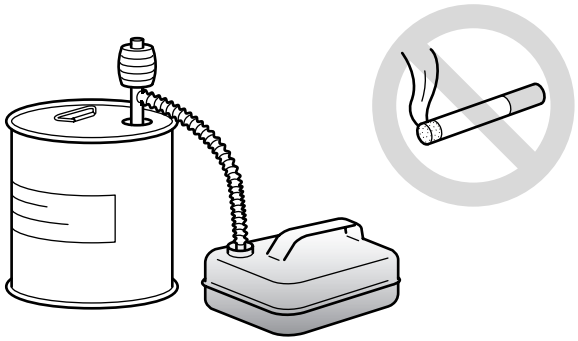
Impeller

Do not hold the impeller with your hands when loosening or tightening the impeller.



Handling of gasoline

- Gasoline is highly flammable. Keep gasoline and all flammable products away from heat, sparks, and open flames.
- Gasoline is poisonous and can cause injury or death. Handle gasoline with care. Never siphon gasoline by mouth. If you swallow some gasoline, inhale a lot of gasoline vapor, or get some gasoline in your eyes, see your doctor immediately. If gasoline spills on your skin, wash with soap and water. If gasoline spills on your clothing, change your clothes.

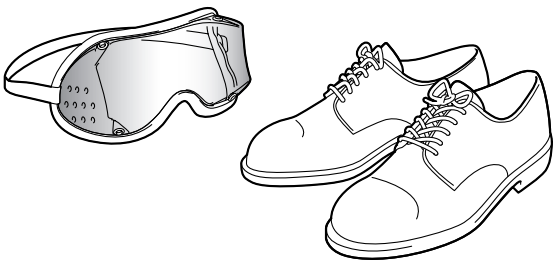


Ventilation

- Gasoline vapor and exhaust gas are heavier than air and extremely poisonous. If gasoline vapor or exhaust gas is inhaled in large quantities, it may cause loss of consciousness and death within a short time.
- When test running an engine indoors (for example, in a water tank) make sure to do so where adequate ventilation can be maintained.

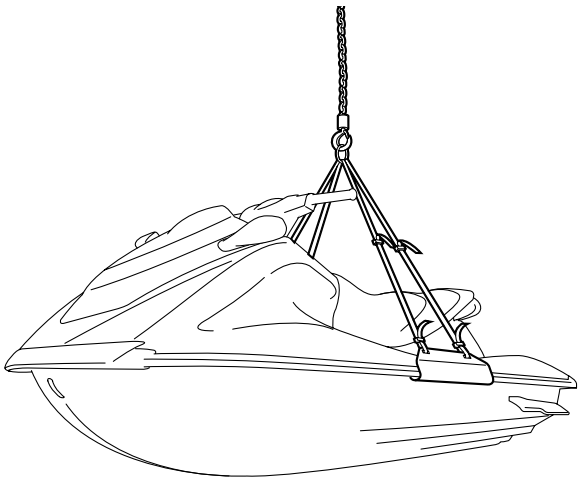
Self-protection

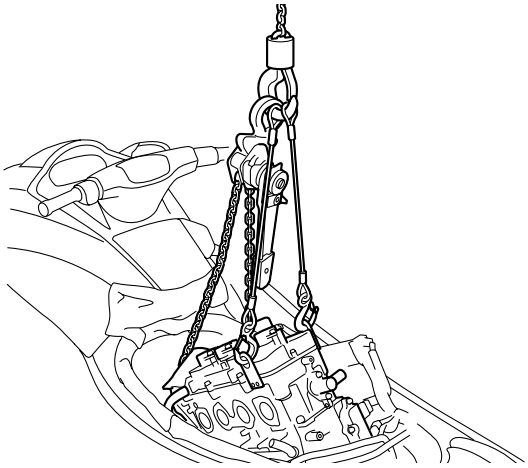
- Protect your eyes by wearing safety glasses or safety goggles during all operations involving drilling and grinding, or when using an air compressor.
- Protect your hands and feet by wearing protective gloves and safety shoes when necessary.



Working with crane

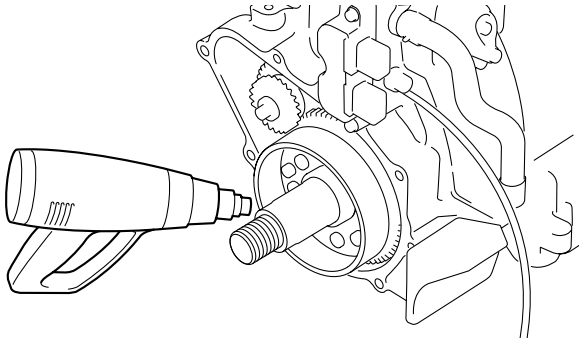
- When moving the watercraft, or when lifting the engine during removal or installation, make sure to use a crane with a lifting capacity that is equal to or more than the weight of the watercraft or engine respectively.
- When lifting the watercraft, use the watercraft lift harness and make sure that the watercraft is in a stable position when moving it.
- Use the wire ropes of adequate strength, and lift up the engine unit using the three point suspension. If the engine unit does not have three or more points to be suspended, support it using additional ropes or the like so that the engine unit can be lifted and carried in a stable manner.





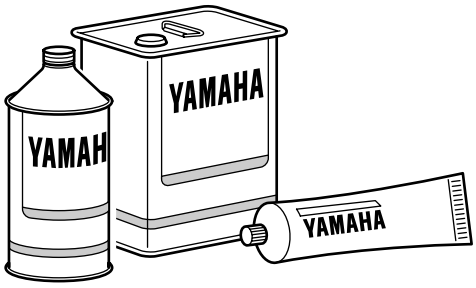
Handling of heat gun

- Improper handling of a heat gun may result in burns. For information on the proper handling of the heat gun, see the operation manual issued by the manufacturer.
- When using a heat gun, keep it away from the gasoline and oil, to prevent a fire.
- Components become hot enough to cause burns. Do not touch any hot components directly.



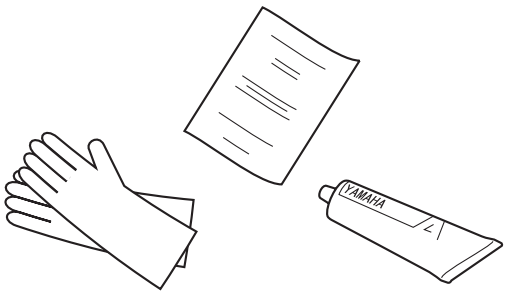
Part, lubricant, and sealant

Use only genuine Yamaha parts, lubricants, and sealants, or those recommended by Yamaha, when servicing or repairing the watercraft.



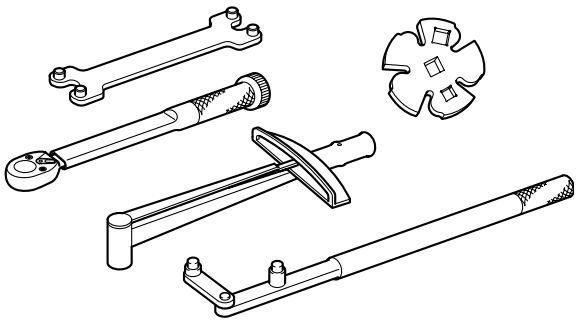
Handling of sealant

- Wear protective gloves to protect your skin, when using the sealants.
- See the material safety data sheet issued by the manufacturer. Some of the sealants may be harmful to human health.



Special service tool

Use the recommended special service tools to work safely, and to protect parts from damage.

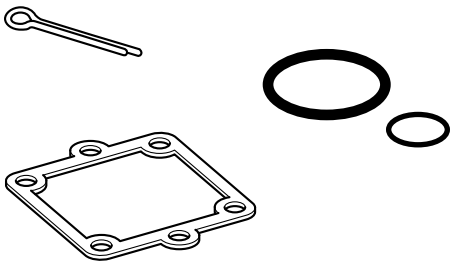


Tightening torque

Follow the tightening torque specifications provided throughout the manual. When tightening nuts, bolts, and screws, tighten the large sizes first, and tighten fasteners starting in the center and moving outward.

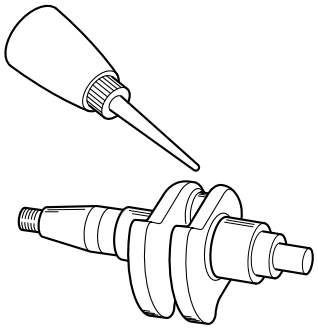
Non-reusable part

Always use new gaskets, seals, O-rings, cotter pins, and so on, when installing or assembling parts.



Disassembly and assembly

- Use compressed air to remove dust and dirt during disassembly.
- Apply engine oil to the contact surfaces of moving parts before assembly.



- Install bearings so that the bearing identification mark is facing in the direction indicated in the installation procedure. In addition, make sure to lubricate the bearings liberally.
- Apply a thin coat of water resistant grease to the lip and periphery of an oil seal before installation.
- Check that moving parts operate normally after assembly.

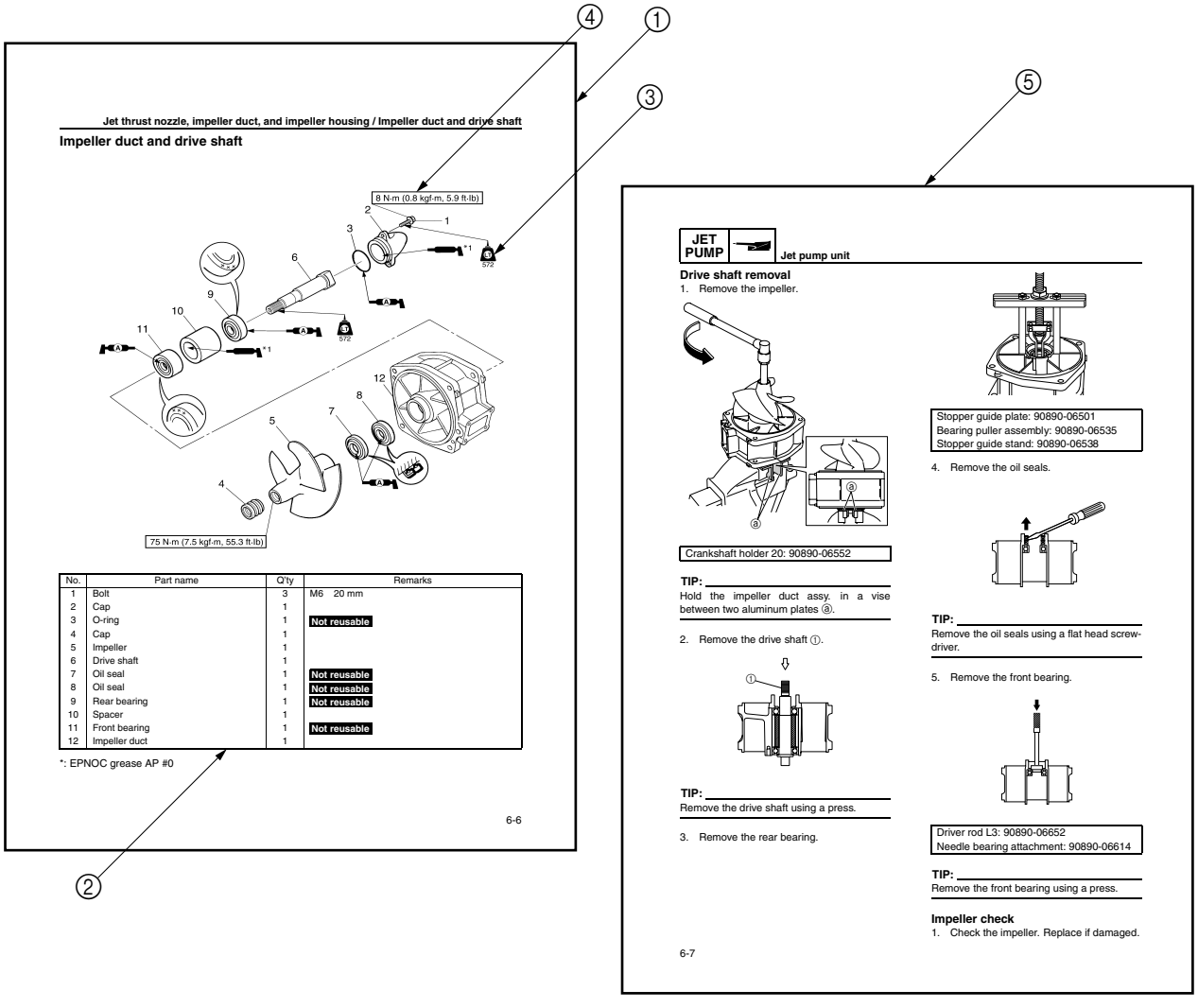
How to use this manual

Manual format

The format of this manual has been designed to make service procedures clear and easy to understand. Use the information below as a guide for effective and quality service.

- Parts are shown and detailed in an exploded diagram and are listed in the component list (see ① in the following figure for an example page).
- The component list consists of part names and quantities, as well as bolt and screw dimensions (see ② in the following figure). To assemble or install the components, reverse the steps indicated in the component list.
- Symbols are used to indicate important aspects of a procedure, such as the grade of lubricant and the lubrication point (see ③ in the following figure).
- Tightening torque specifications are provided in the exploded diagrams (see ④ in the following figure), and in the related detailed instructions. Some torque specifications are listed in stages as torque figures or angles in degrees.
- Separate procedures and illustrations are used to explain the details of removal, checking, and installation where necessary (see ⑤ in the following figure for an example page).

TIP:
For troubleshooting procedures, see Chapter 9, “Troubleshooting.”



No.	Part name	Q'ty	Remarks
1	Bolt	3	M6 20 mm
2	Cap	1	
3	O-ring	1	Not reusable
4	Cap	1	
5	Impeller	1	
6	Drive shaft	1	
7	Oil seal	1	Not reusable
8	Oil seal	1	Not reusable
9	Rear bearing	1	Not reusable
10	Spacer	1	
11	Front bearing	1	Not reusable
12	Impeller duct	1	

Abbreviation

The following abbreviations are used in this service manual.

Abbreviation	Description
BOW	Bow end
CDI	Capacitor discharge ignition
EX	Exhaust
IN	Intake
NMMA	National Marine Manufacturers Association
PON	Pump Octane Number
PORT	Port side
RON	Research Octane Number
STBD	Starboard side
STERN	Stern end
TDC	Top Dead Center

Adhesive, lubricant, sealant, and thread locking agent

Symbol

Symbols in an exploded diagram or illustration indicate the grade of lubricant and the lubrication points.

Symbol	Name	Application
	Yamaha 2-stroke motor oil	Lubricant
	Water resistant grease (Yamaha grease A)	Lubricant
	Molybdenum disulfide grease	Lubricant
	Epnoc grease AP#0	Lubricant

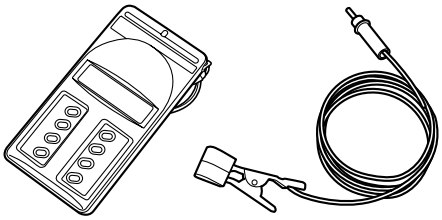
Symbols in an exploded diagram or illustration indicate the type of adhesive, sealant, or thread locking agent and the application points.

Symbol	Name	Application
	Gasket Maker	Sealant
	LOCTITE 271 (red)	Thread locking agent
	LOCTITE 242 (blue)	Thread locking agent
	LOCTITE 572 (white)	Sealant
	Silicone sealant	Sealant
	ThreeBond 1207B	Sealant
	ThreeBond 1207D	Sealant
	ThreeBond 1322	Thread locking agent

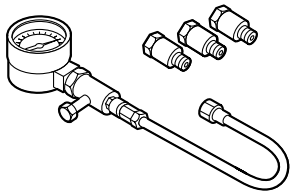
Special service tool

Special service tools with Yamaha part numbers (90890-*****) are distributed by the Parts Division.

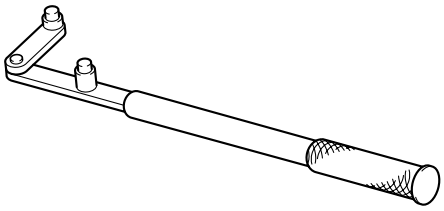
Digital tachometer
90890-06760



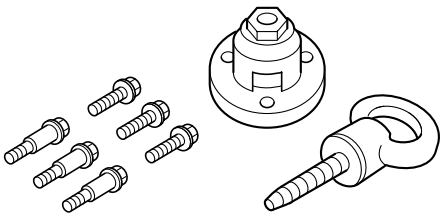
Compression gauge
90890-03160



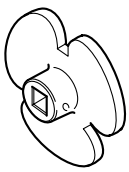
Flywheel holder
90890-06522



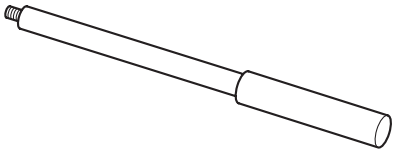
Flywheel puller
90890-06521



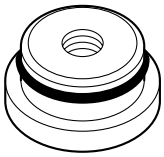
Coupler wrench
90890-06425



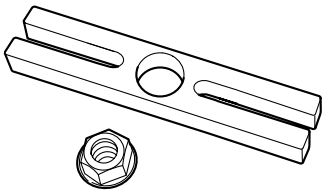
Driver rod L3
90890-06652



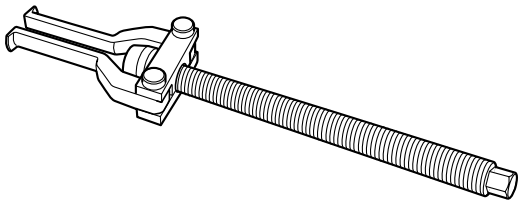
Needle bearing attachment
90890-06614
Ball bearing attachment
90890-06634



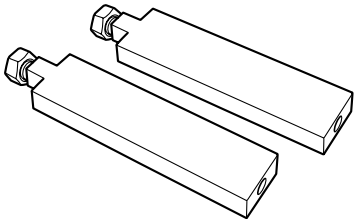
Stopper guide plate
90890-06501



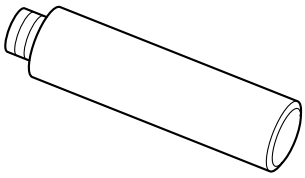
Bearing puller assembly
90890-06535



Stopper guide stand
90890-06538



Driver rod LS
90890-06606



Ball bearing attachment
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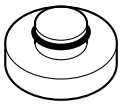
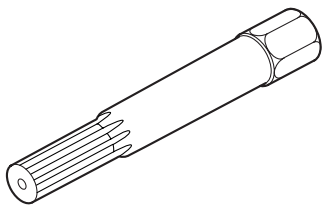
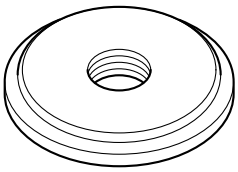


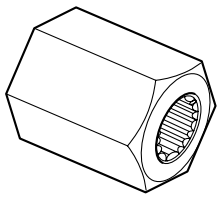
Crankshaft holder 20
90890-06552



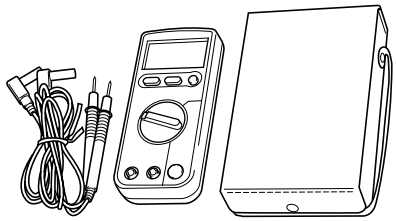
Bearing outer race attachment
90890-06628



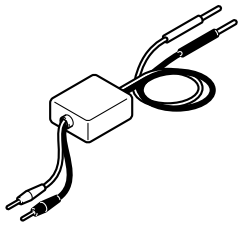
Drive shaft holder 5
90890-06519



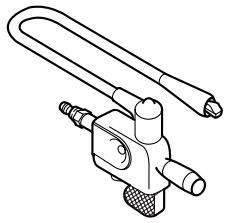
Digital circuit tester
90890-03174



Peak voltage adapter B
90890-03172



Ignition tester (Spark gap tester)
90890-06754

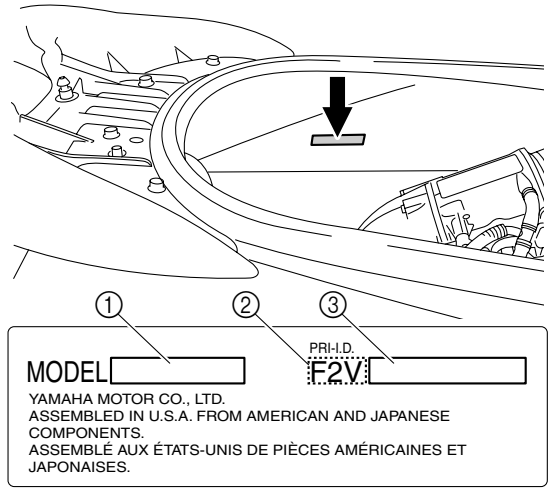


Model feature

Identification number

Primary I.D. number

The primary I.D. number is stamped on a label attached to the inside of the engine compartment.

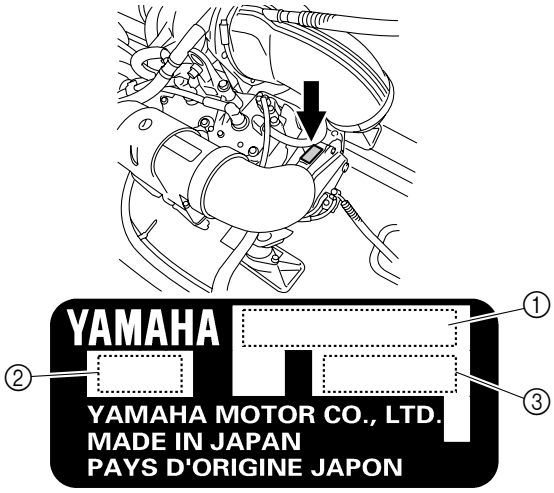


① Model name
② Hull type
③ Primary I.D. number

Starting primary I.D. number:
F2V: 800101

Engine serial number

The engine serial number is stamped on a label attached to the engine unit.

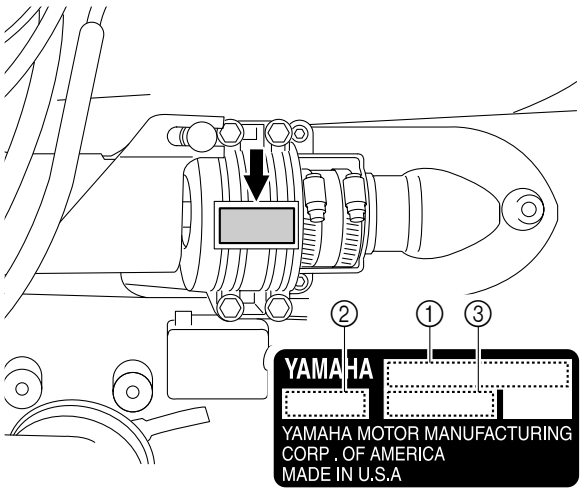


① Engine name
② Engine type
③ Engine serial number

Starting engine serial number:
6CP: 1000001

Jet pump unit serial number

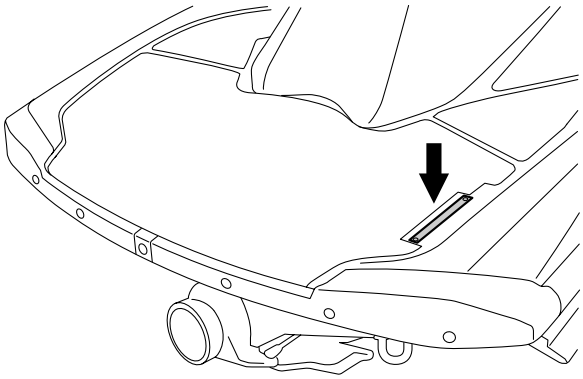
The jet pump unit serial number is stamped on a label attached to the intermediate housing.



① Jet pump unit name
② Jet pump unit type
③ Jet pump unit serial number

Hull identification number (H.I.N.)

The H.I.N. is stamped on a plate attached to the boarding platform.



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— MEMO —

Specification

Model data

Model code

Item	Unit	Model
		VX 700
Hull		F2V
Engine/jet		6CP/6CP

Dimension and weight

Item	Unit	Model
		VX 700
Length	mm (in)	3220 (126.8)
Width	mm (in)	1170 (46.1)
Height	mm (in)	1160 (45.7)
Dry weight	kg (lb)	283 (624)
Maximum capacity	Person/ kg (lb)	3/240 (530)

Performance

Item	Unit	Model
		VX 700
Full throttle operating range	r/min	7200
Trolling speed	r/min	1250–1350
Maximum fuel consumption	L/h (US gal/ h, Imp.gal/h)	34.0 (9.0, 7.5)
Cruising range	h	1.47

Power unit

Item	Unit	Model
		VX 700
Type		2-stroke L2
Cylinder quantity		2
Total displacement	cm^3 (cu. in)	701 (42.8)
Bore × stroke	mm (in)	81.0 × 68.0 (3.19 × 2.68)
Compression ratio		7.2 : 1
Intake system		Reed valve
Starting enrichment		Choke valve
Scavenging system		Loop charge
Exhaust system		Wet exhaust
Lubrication system		Oil injection
Cooling system		Water cooled
Starting system		Electric starter
Ignition system		CDI
Maximum ignition timing advance	Degree	BTDC 21°
Spark plug		BR8HS (NGK)
Spark plug gap	mm (in)	0.6–0.7 (0.024–0.038)
Firing order		1–2

Drive unit

Item	Unit	Model
		VX 700
Jet pump type		Axial flow, single stage
Impeller rotation		Counterclockwise (viewed from rear)
Transmission		Constant mesh 1-speed
Jet thrust nozzle horizontal angle	Degree	24 + 24
Trim system		—
Jet thrust nozzle trim angle	Degree	3

Fuel and oil requirement

Item	Unit	Model
		VX 700
Fuel type		Regular unleaded gasoline
Fuel minimum rating	PON	86
	RON	90
Fuel tank capacity		
Total	L (US gal, Imp.gal)	50 (13.2, 11.0)
Reserve	L (US gal, Imp.gal)	12 (3.2, 2.6)
Engine oil type		YAMALUBE 2-W
Fuel and oil mixing ratio (Wide open throttle)		50:1
Engine oil grade	NMMA-certified	TC-W3
Oil tank capacity	L (US gal, Imp.gal)	3.8 (1.0, 0.8)

Battery requirement

Item	Unit	Model
		VX 700
Type		Fluid
Capacity	V/Ah	12/19
Specific gravity at 20 °C (68 °F)		1.265

Fuel system technical data

Fuel system

Item	Unit	Model
		VX 700
Carburetor		
Manufacturer		Mikuni
Model × quantity		BN38 × 2
Type		Floatless
ID mark		62T03F/03R
Main jet (MJ)		120 (front), 130 (rear)
Main nozzle (MN)	mm (in)	2.5 (0.10)
Pilot jet (PJ)		67.5
Low speed screw	turns out	5/8 ± 1/4
Throttle valve		190
Valve seat size	mm (in)	1.5 (0.06)
Arm height	mm (in)	0–0.2 (0–0.008)
High speed screw	turns out	5/8 ± 1/4 (front), 1 1/8 ± 1/4 (rear)
Throttle lever free play	mm (in)	4.0–7.0 (0.16–0.28)

Power unit technical data

Power unit

Item	Unit	Model
		VX 700
Cylinder Minimum compression pressure (*1)	kPa (kgf/cm^2, psi)	590 (5.9, 84)

(*1) Measuring conditions:
Ambient temperature 20 °C (68 °F), with spark plugs removed from all cylinders.
The figures are for reference only.

Cylinder head assy.

Item	Unit	Model
		VX 700
Cylinder head Warpage limit	mm (in)	0.1 (0.004)

Crank case assy.

Item	Unit	Model
		VX 700
Cylinder		
Bore	mm (in)	81.000–81.020 (3.1890–3.1898)
Bore wear limit	mm (in)	81.100 (3.1929)
Taper limit	mm (in)	0.080 (0.0031)
Out-of-round limit	mm (in)	0.050 (0.0020)
Piston		
Diameter	mm (in)	80.922–80.941 (3.1859–3.1866)
Measuring point	mm (in)	10.0 (0.39)
Ring groove (Top)	mm (in)	1.210–1.240 (0.0476–0.0488)
Ring groove (2nd)	mm (in)	1.210–1.240 (0.0476–0.0488)
Pin boss bore diameter	mm (in)	20.008–20.020 (0.7877–0.7882)
Pin outside diameter	mm (in)	19.995–20.000 (0.7872–0.7874)
Piston-to-cylinder clearance	mm (in)	0.080–0.085 (0.0031–0.0033)
Piston ring		
End gap measuring point	mm (in)	10.0 (0.39)
Top ring		
Type		Keystone
Dimension height (B)	mm (in)	1.170–1.190 (0.0461–0.0469)
Dimension width (T)	mm (in)	2.750–2.950 (0.1083–0.1161)
End gap (*1)	mm (in)	0.20–0.40 (0.008–0.015)
Side clearance	mm (in)	0.03–0.05 (0.001–0.002)
2nd ring		
Type		Keystone
Dimension height (B)	mm (in)	1.170–1.190 (0.0461–0.0469)
Dimension width (T)	mm (in)	2.750–2.950 (0.1083–0.1161)
End gap (*1)	mm (in)	0.20–0.40 (0.008–0.015)
Side clearance	mm (in)	0.03–0.05 (0.001–0.002)
Connecting rod		
Small end inside diameter	mm (in)	24.995–25.008 (0.9841–0.9846)
Maximum small end axial play	mm (in)	2.000 (0.0787)
Crankshaft		
Width	mm (in)	61.950–62.000 (2.4390–2.4409)
Deflection limit	mm (in)	0.050 (0.0020)
Big end side clearance	mm (in)	0.250–0.750 (0.0098–0.0295)
Reed valve		
Thickness	mm (in)	0.2 (0.01)
Stopper height	mm (in)	8.8–9.2 (0.35–0.36)
Warpage limit	mm (in)	0.2 (0.01)

(*1) The figures are for reference only.

Jet pump unit technical data

Jet pump unit

Item	Unit	Model
		VX 700
Impeller housing		
Inside diameter	mm (in)	155.35–155.45 (6.116–6.120)
Impeller-to-housing clearance	mm (in)	0.35–0.45 (0.014–0.018)
Clearance limit	mm (in)	0.60 (0.024)
Impeller		
Material		Stainless steel
Blades number		3
Pitch angle	Degree	13.2
Drive shaft		
Runout limit	mm (in)	0.01 (0.0004)
Intermediate drive shaft		
Runout limit	mm (in)	0.30 (0.012)
Nozzle		
Diameter	mm (in)	86.80–87.40 (3.417–3.441)
maximum difference of jet thrust nozzle distances	mm (in)	5 (0.2)

Electrical technical data

Ignition system

Item	Unit	Model
		VX 700
CDI unit		
Output peak voltage		
at cranking (loaded)	V	10
at 1500 r/min (loaded)	V	200
at 3500 r/min (loaded)	V	130
Pickup coil		
Output peak voltage		
at cranking (unloaded)	V	5.2
at cranking (loaded)	V	5.1
at 1500 r/min (loaded)	V	14.1
at 3500 r/min (loaded)	V	29.3
Resistance (*1)		
at 20 °C (68 °F)	Ω	12.6–15.4

(*1) The figures are for reference only.

Charging system

Item	Unit	Model
		VX 700
Charge coil		
Output peak voltage		
at cranking (unloaded)	V	180
at cranking (loaded)	V	20
at 1500 r/min (loaded)	V	210
at 3500 r/min (loaded)	V	150
Resistance (*1)		
at 20 °C (68 °F)	Ω	497.7–608.3
Lighting coil		
Output peak voltage		
at cranking (unloaded)	V	8.7
at 1500 r/min (unloaded)	V	25.6
at 3500 r/min (unloaded)	V	47.3
Resistance (*1)		
at 20 °C (68 °F)	Ω	1.143–1.397
Minimum charging current	A at r/min	14 at 6000
Rectifier regulator		
Output peak voltage		
at 3500 r/min (loaded)	V	13.0

(*1) The figures are for reference only.

Control system

Item	Unit	Model
		VX 700
Ignition coil		
Primary coil resistance		
at 20 °C (68 °F)	Ω	0.078–0.106
Secondary coil resistance		
at 20 °C (68 °F)	kΩ	14.336–30.464
Thermoswitch (engine)		
Input voltage (*1)	V	11.0–12.0
Continuity temperature	°C (°F)	77–83 (171–181)
No continuity temperature	°C (°F)	63–77 (145–171)

(*1) The figures are for reference only.

Starting system

Item	Unit	Model
		VX 700
Fuse		
Rating		
Main	V/A	12/10
Starter motor		
Type		Constant mesh
Output	kW	0.8
Cranking time limit	Seconds	30
Commutator diameter	mm (in)	27.0–28.0 (1.06–1.10)
Commutator undercut (*1)	mm (in)	0.2–0.7 (0.008–0.028)
Brush length	mm (in)	6.5–12.5 (0.26–0.49)

(*1) The figures are for reference only.

Meter system

Item	Unit	Model
		VX 700
Fuel level sensor		
Resistance		
at 20 °C (68 °F)		
Empty position	Ω	757.0–803.0
Full position	Ω	0–8.0
Oil level sensor		
Float distance (for continuity)	mm	37.0–41.0 (1.46–1.61)

Specified tightening torque

Fuel system

Part to tightened	Screw size	Tightening torque			See page
		N·m	kgf·m	ft·lb	
Fuel cock knob screw	ø4	2	0.2	1.5	4-1
Fuel cock assy./washer nut	—	5	0.5	3.7	4-1
Choke knob screw	ø3	2	0.2	1.5	4-3
Choke knob nut	—	2	0.2	1.5	4-3
Oil filler neck/rubber seal nut	—	6	0.6	4.4	4-4
Oil filler hose clamp	—	3.7	0.37	2.7	4-4
Fuel filler neck/rubber seal nut	—	6	0.6	4.4	4-6
Fuel filler hose clamp	—	3.7	0.37	2.7	4-6
Fuel level sensor assy. clamp		1	0.1	0.7	4-6
Carburetor cover 1 bolt	M5	1	0.1	0.7	4-8
Flame arrester holder bolt	M6	8	0.8	5.9	4-8
Throttle cable locknut	—	8	0.8	5.9	4-8
Choke cable locknut	—	8	0.8	5.9	4-8
Carburetor assy. nut	—	18	1.8	13.3	4-8
Needle valve assy. plate screw	ø3	1	0.1	0.7	4-11
Float arm screw	ø3	1	0.1	0.7	4-11
Cover (carburetor 1) screw	ø5	4.4	0.44	3.2	4-11
Cover (carburetor 2) screw	ø5	3.4	0.34	2.5	4-11
Diaphragm cover screw	ø5	3.4	0.34	2.5	4-11
Body assy. screw	ø4	2	0.2	1.5	4-11
Main jet	—	1.8	0.18	1.3	4-11
Pilot jet	—	0.7	0.07	0.5	4-11
Air bleed screw	ø6	5	0.5	3.7	4-17
Oil pump bolt	M6	8	0.8	5.9	4-17

Power unit

Part to tightened		Screw size	Tightening torque			See page
			N·m	kgf·m	ft·lb	
Coupling cover bolt		M6	8	0.8	5.9	5-1
Engine mounting bolt		M8	17	1.7	12.5	5-1
Engine mount bolt		M8	17	1.7	12.5	5-3
Exhaust joint clamp		—	5	0.5	3.7	5-10
Exhaust ring joint clamp		—	2	0.2	1.5	5-10
Exhaust ring bolt		M8	29	2.9	21.4	5-10
Muffler stay bolt	1st	M10	2	0.2	1.5	5-11
	2nd		2	0.2	1.5	5-11
	3rd		2	0.2	1.5	5-11
	4th		39	3.9	28.8	5-11
	5th		46	4.6	33.9	5-11
	6th		39	3.9	28.8	5-11
Exhaust outer cover 1		M6	8	0.8	5.9	5-12
Exhaust outer cover 2		M6	8	0.8	5.9	5-12
Muffler bolt	1st	M10	21	2.1	15.5	5-13
	2nd		39	3.9	28.8	5-13
Reed valve/valve stopper screw		ø3	1	0.1	0.7	5-14

Specification

Part to tightened		Screw size	Tightening torque N·m	kgf·m	ft·lb	See page
Reed valve assy. bolt		M5	4	0.4	3.0	5-14
Intake manifold bolt		M6	8	0.8	5.9	5-14
Thermoswitch bolt		M6	8	0.8	5.9	5-16
Spark plug		—	25	2.5	18.4	5-16
Cylinder head bolt	1st	M8	15	1.5	11.1	5-16
	2nd		29	2.9	21.4	5-16
Cylinder bolt	1st	M10	22	2.2	16.2	5-18
	2nd		39	3.9	28.8	5-18
Anode screw		ø4	3	0.3	2.2	5-18
Starter motor bolt		M8	18	1.8	13.3	5-25
Starter motor positive lead nut		—	5	0.5	3.7	5-25
Flywheel cover bolt		M6	8	0.8	5.9	5-25
Flywheel magneto bolt		M10	74	7.4	54.6	5-25
Drive coupling		—	36	3.6	26.6	5-25
Base assy. screw		ø6	8	0.8	5.9	5-25
Engine bracket/lower crankcase bolt	1st	M10	23	2.3	17.0	5-30
	2nd		52	5.2	38.4	5-30
Upper crankcase/lower crankcase bolt	1st	M8	15	1.5	11.1	5-30
	2nd		27	2.7	19.9	5-30

Jet pump unit

Part to tightened	Screw size	Tightening torque			See page
		N·m	kgf·m	ft·lb	
Intake grate bolt	M6	8	0.8	5.9	6-1
	M10	40	4.0	29.5	6-1
Ride plate bolt	M8	17	1.7	12.5	6-1
Cover screw	ø5	4	0.4	3.0	6-1
Steering cable joint nut	—	6.8	0.68	4.9	6-2
Jet pump unit assy. bolt	M6	8	0.8	5.9	6-2
	M10	40	4.0	29.5	6-2
Rubber plate bolt	M6	7	0.7	5.2	6-2
Rubber plate nut	—	7	0.7	5.2	6-2
Bracket bolt	M8	17	1.7	12.5	6-2
		14	1.4	10.3	6-2
Spout hose clamp	—	1	0.1	0.7	6-2
		2	0.2	1.5	6-2
Jet thrust nozzle bolt	M8	15	1.5	11.1	6-5
Nozzle/bracket bolt	M10	40	4.0	29.5	6-5
Water inlet cover/water inlet strainer bolt	M6	7	0.7	5.2	6-5
Cap bolt	M6	8	0.8	5.9	6-6
Impeller	M22	75	7.5	55.3	6-6
Transom plate nut	—	26	2.6	19.2	6-10
Flushing hose nut	—	5.5	0.55	4.1	6-10
Intermediate housing cover bolt	M8	17	1.7	12.5	6-12
Rubber hose clamp	—	4	0.4	3.0	6-12
Joint bolt	M6	7	0.7	5.2	6-12
Driven coupling	M24	36	3.6	26.6	6-13
Intermediate drive shaft extension	M24	36	3.6	26.6	6-13

Electrical system

Part to tightened	Screw size	Tightening torque			See page
		N·m	kgf·m	ft·lb	
Electrical box bracket nut	—	15	1.5	11.1	7-2
Ground lead screw	ø6	4	0.4	3.0	7-2
Starter relay bolt	M6	3	0.3	2.2	7-2
CDI unit screw	ø6	4	0.4	3.0	7-2
Rectifier regulator screw	ø6	4	0.4	3.0	7-2
Ignition coil screw	ø6	4	0.4	3.0	7-2
Electrical box case screw	ø6	4	0.4	3.0	7-2
Bracket nut	—	17	1.7	12.5	7-2
Starter motor terminal nut	—	5	0.5	3.7	7-12
Starter motor rear cover bolt	M5	6	0.6	4.4	7-12

Hull and hood

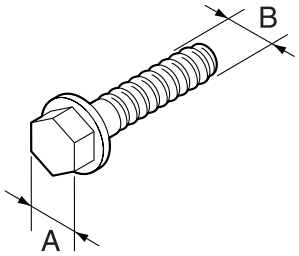
Part to tightened	Screw size	Tightening torque			See page
		N·m	kgf·m	ft·lb	
Upper handlebar cover screw	ø4	1	0.1	0.7	8-1
	ø5	1	0.1	0.7	8-1
Lower handlebar cover screw	ø6	4	0.4	3.0	8-1
Grip end bolt	M5	1	0.1	0.7	8-2
Left handlebar switch assy. screw	ø5	3	0.3	2.2	8-2
Throttle lever assy. bolt	M5	3	0.3	2.2	8-2
Handlebar holder bolt	M8	20	2	14.8	8-2
Mirror nut	—	7	0.7	5.2	8-8
Hood lock bolt	M5	4	0.4	3.0	8-8
Front hood screw	ø5	2	0.2	1.5	8-8
Hinge nut	—	7	0.7	5.2	8-8
Hinge bolt	M6	7	0.7	5.2	8-8
Engine hatch cover nut	—	5	0.5	3.7	8-11
Engine hatch cover bolt	M6	5	0.5	3.7	8-11
Multifunction meter screw	ø5	4	0.4	3.0	8-11
Steering cable stopper bolt	M6	7	0.7	5.2	8-13
Steering master assy. bolt	M8	17	1.7	12.5	8-13
Steering arm assy. bolt	M8	16	1.6	11.8	8-13
Ball joint nut	—	7	0.7	5.2	8-14
Ball joint	—	7	0.7	5.2	8-14
Buzzer bracket bolt	M5	4	0.4	3.0	8-14
Case assy. bolt	M6	7	0.7	5.2	8-14
Steering cable locknut	—	7	0.7	5.2	8-16
Packing nut	—	5.9	0.59	4.4	8-16
Seat lock assy. bolt	M6	6	0.6	4.4	8-18
Projection nut	—	26	2.6	19.2	8-18
Handgrip nut	—	5	0.5	3.7	8-18
Seat holder nut	—	15	1.5	11.1	8-19
Cooling water pilot outlet nut	—	4	0.4	3.0	8-19
Water lock/rubber hose clamp	—	5	0.5	3.7	8-23
Exhaust outlet/rubber hose clamp	—	5	0.5	3.7	8-23
Exhaust outlet/Exhaust outlet bolt		5	0.5	3.7	8-23
Bow eye bolt	M6	13	1.3	9.6	8-25
Front protector nut	—	7	0.7	5.2	8-25
Sponson bolt	M8	15	1.5	11.1	8-25
Ski tow nut	—	15	1.5	11.1	8-27
Spout hose clamp	—	2	0.2	1.5	8-27
Spout nut	—	5	0.5	3.7	8-27
Stern eye nut	—	15	1.5	11.1	8-27
Drain plug nut	—	2	0.2	1.5	8-27

General tightening torque

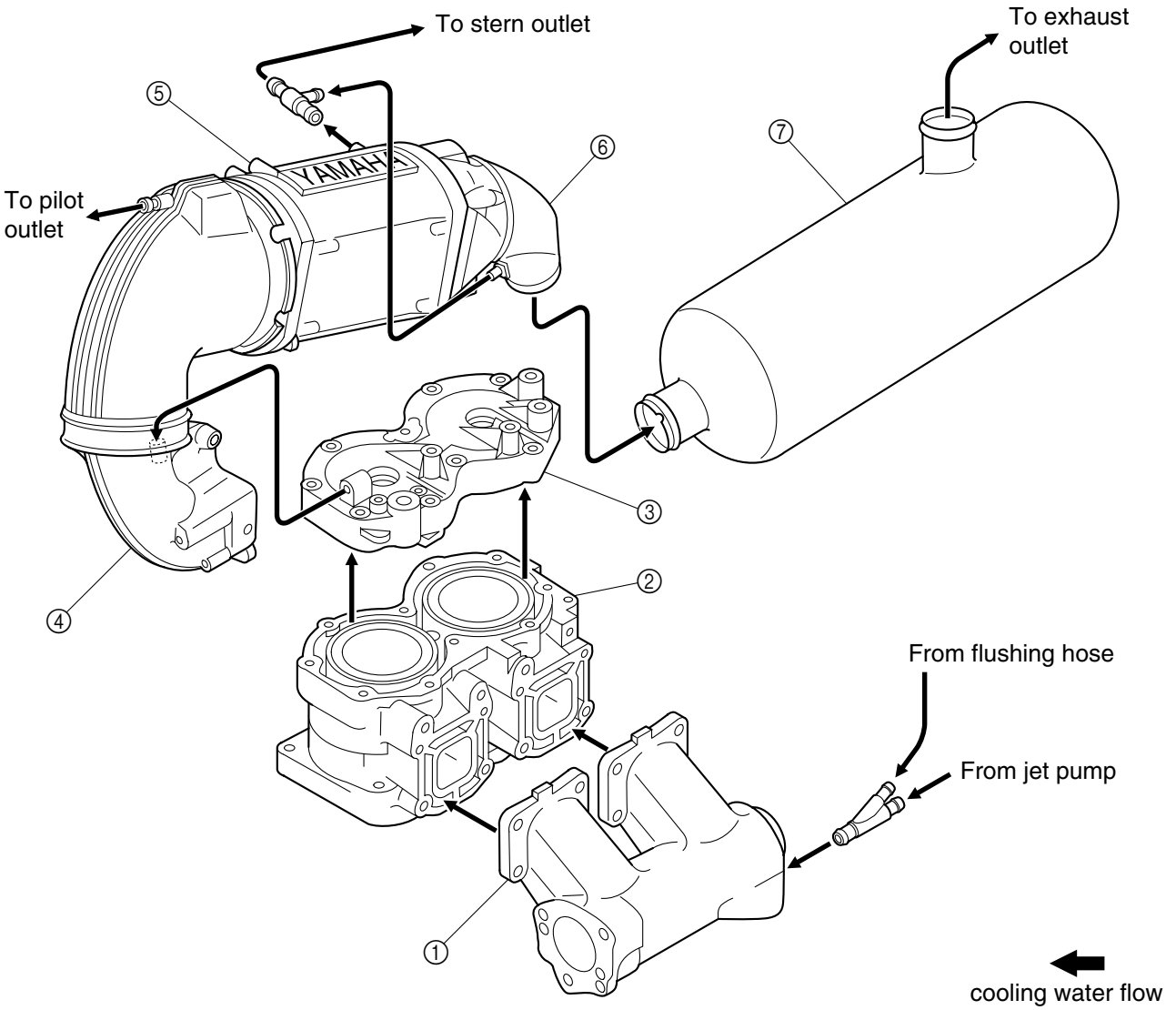
This chart indicates the tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components and assemblies are provided in the applicable sections of this manual. To prevent warpage, tighten multi-fastener assemblies in a crisscross fashion and progressive stages until the specified torque is reached. Unless otherwise indicated, torque specifications require clean, dry threads.

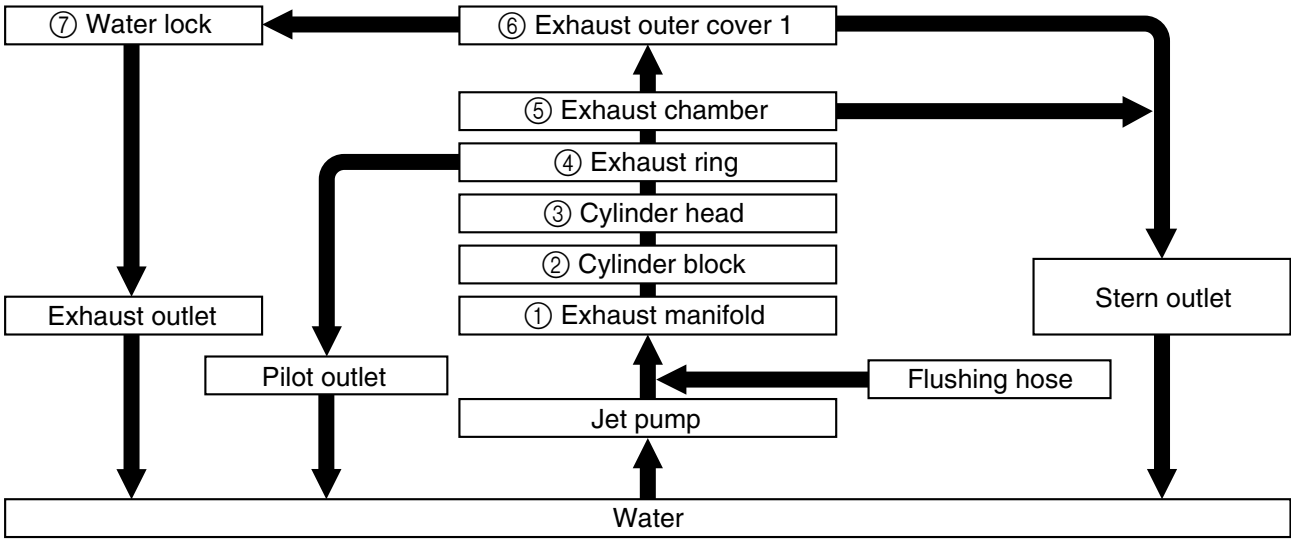
Components should be at room temperature.

Width across flats (A)	Screw size (B)	General torque specifications		
		N·m	kgf·m	ft·lb
8 mm	M5	5	0.5	3.7
10 mm	M6	8	0.8	5.9
12 mm	M8	18	1.8	13.3
14 mm	M10	36	3.6	26.6
17 mm	M12	43	4.3	31.7



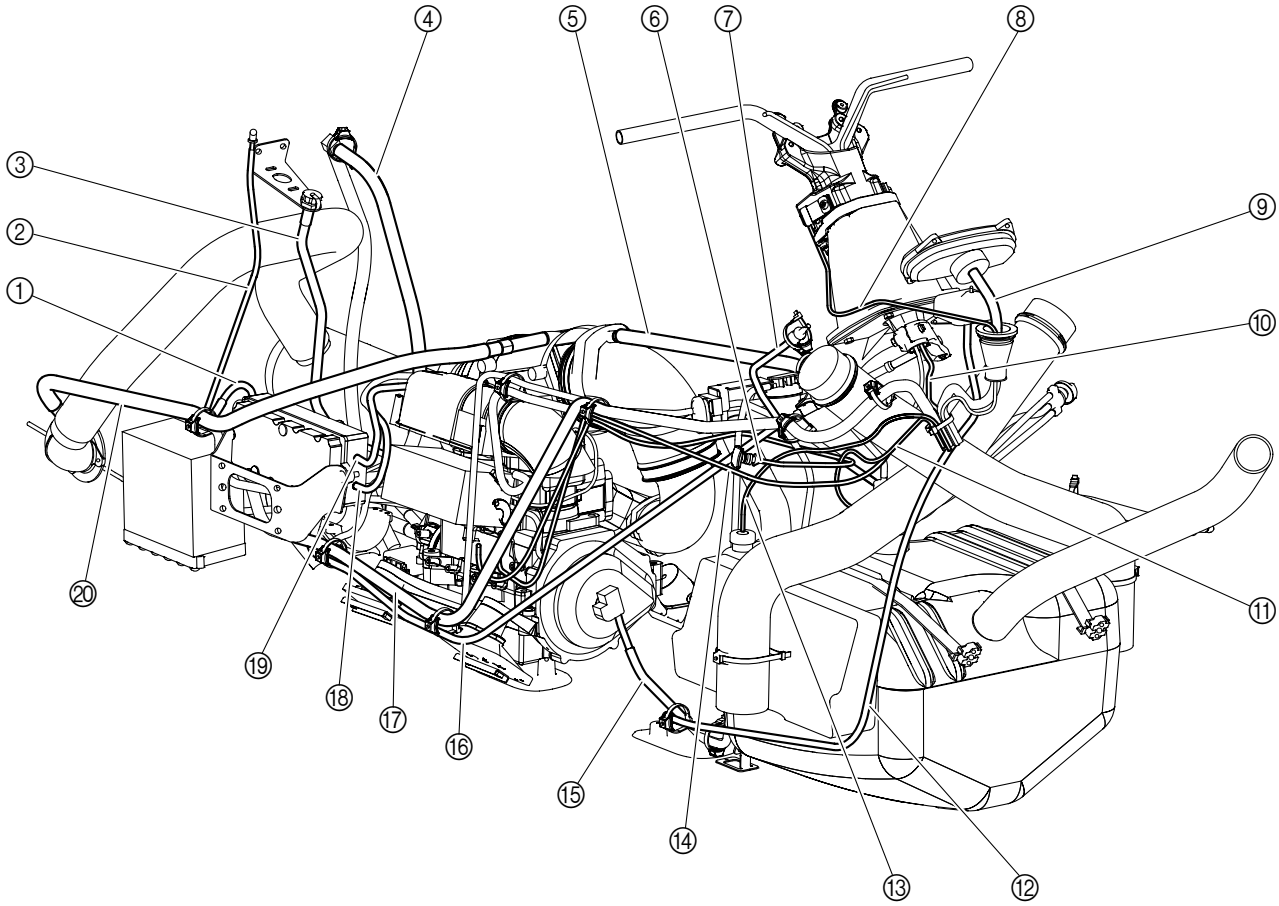
Cooling system





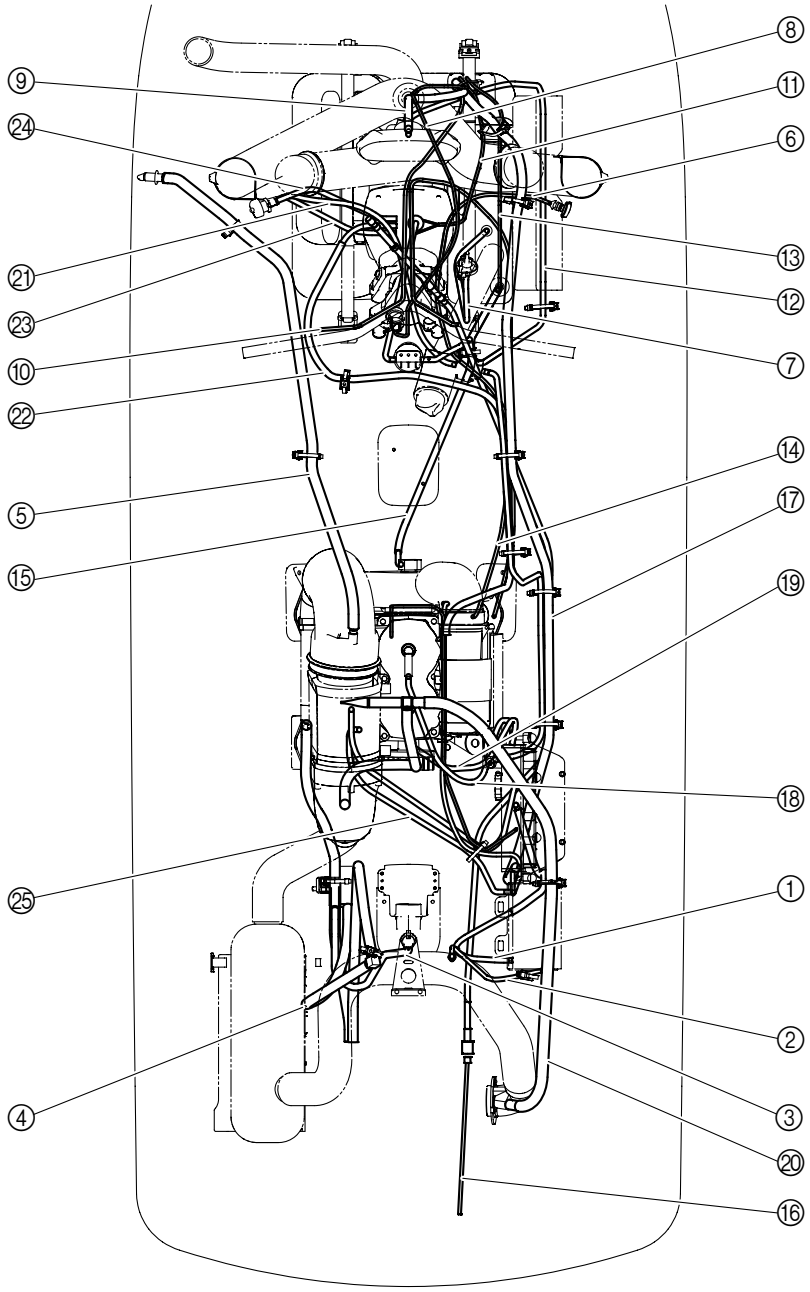
Cable and hose routing

Starboard bow view



① Positive battery cable
② Battery breather hose
③ Flushing hose
④ Bilge hose
⑤ Cooling water pilot outlet hose
⑥ Choke cable
⑦ Oil tank breather hose
⑧ Buzzer lead
⑨ Multifunction meter lead
⑩ Left handlebar switch lead
⑪ Fuel level sensor lead
⑫ Fuel tank breather hose
⑬ Oil level sensor lead
⑭ Throttle cable
⑮ Oil hose
⑯ Steering cable
⑰ Wiring harness
⑱ Spark plug lead (#1)
⑲ Spark plug lead (#2)
⑳ Cooling water outlet hose

Top view



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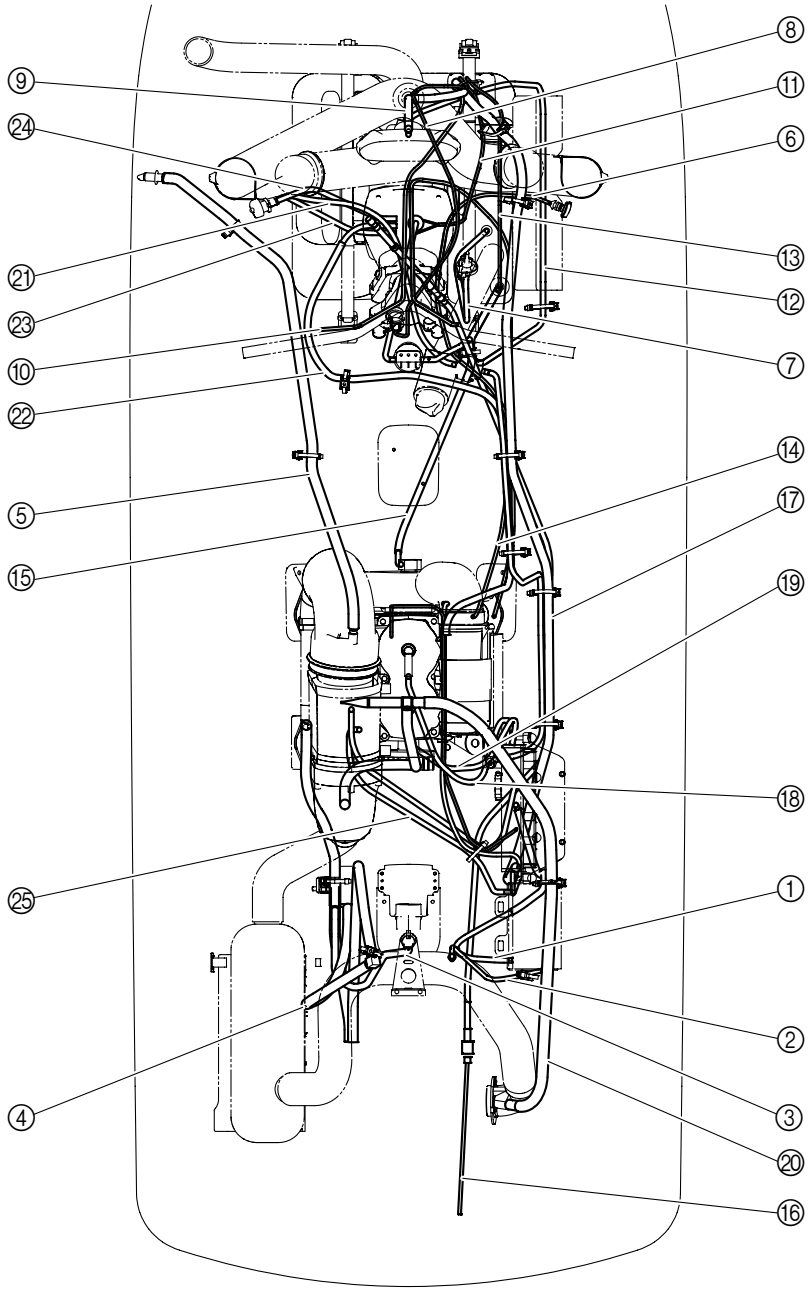
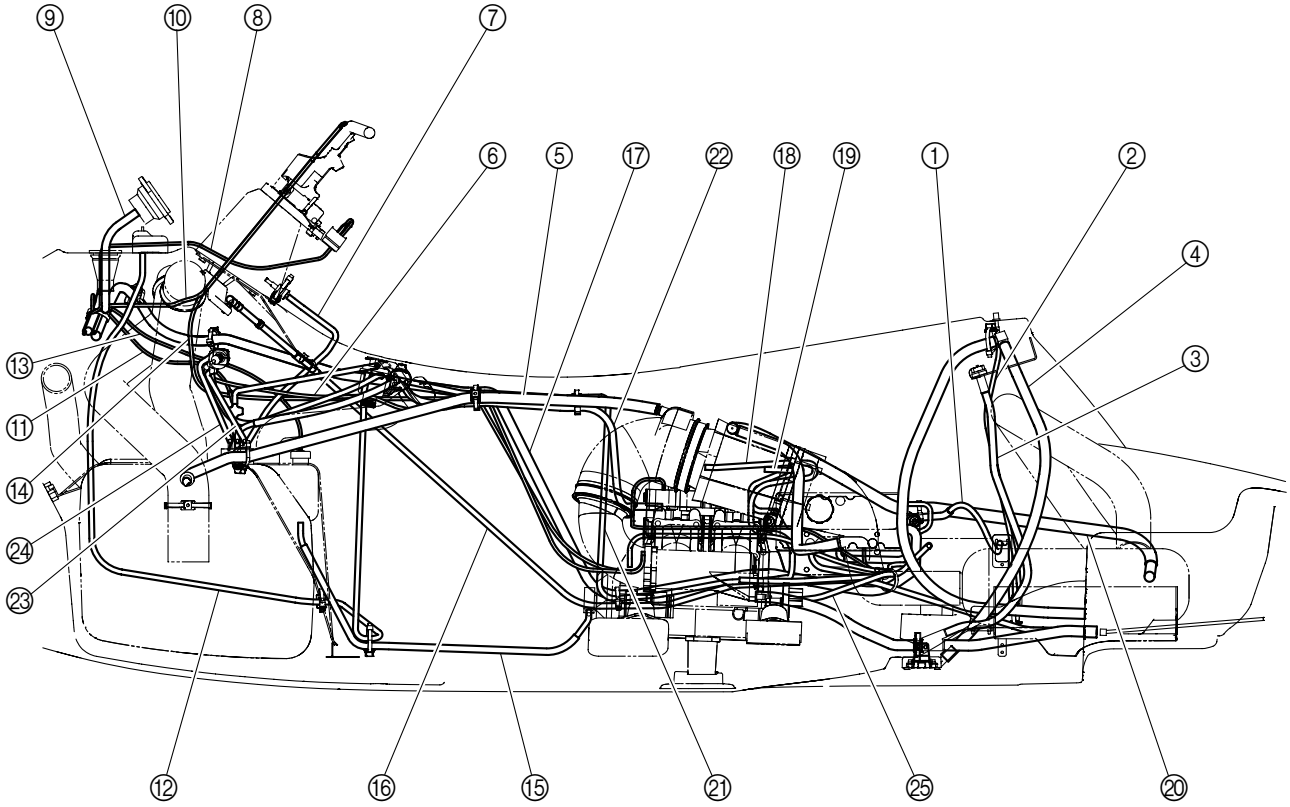
⑫ Fuel tank breather hose
⑬ Oil level sensor lead
⑭ Throttle cable
⑮ Oil hose
⑯ Steering cable
⑰ Wiring harness
⑱ Spark plug lead (#1)
⑲ Spark plug lead (#2)
⑳ Cooling water outlet hose
㉑ Fuel inlet hose
㉒ Fuel return hose



㉓ Fuel hose
㉔ Fuel reservoir hose
㉕ Negative battery cable

Port view



① Positive battery cable
② Battery breather hose
③ Flushing hose
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⑤ Cooling water pilot outlet hose
⑥ Choke cable
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⑧ Buzzer lead
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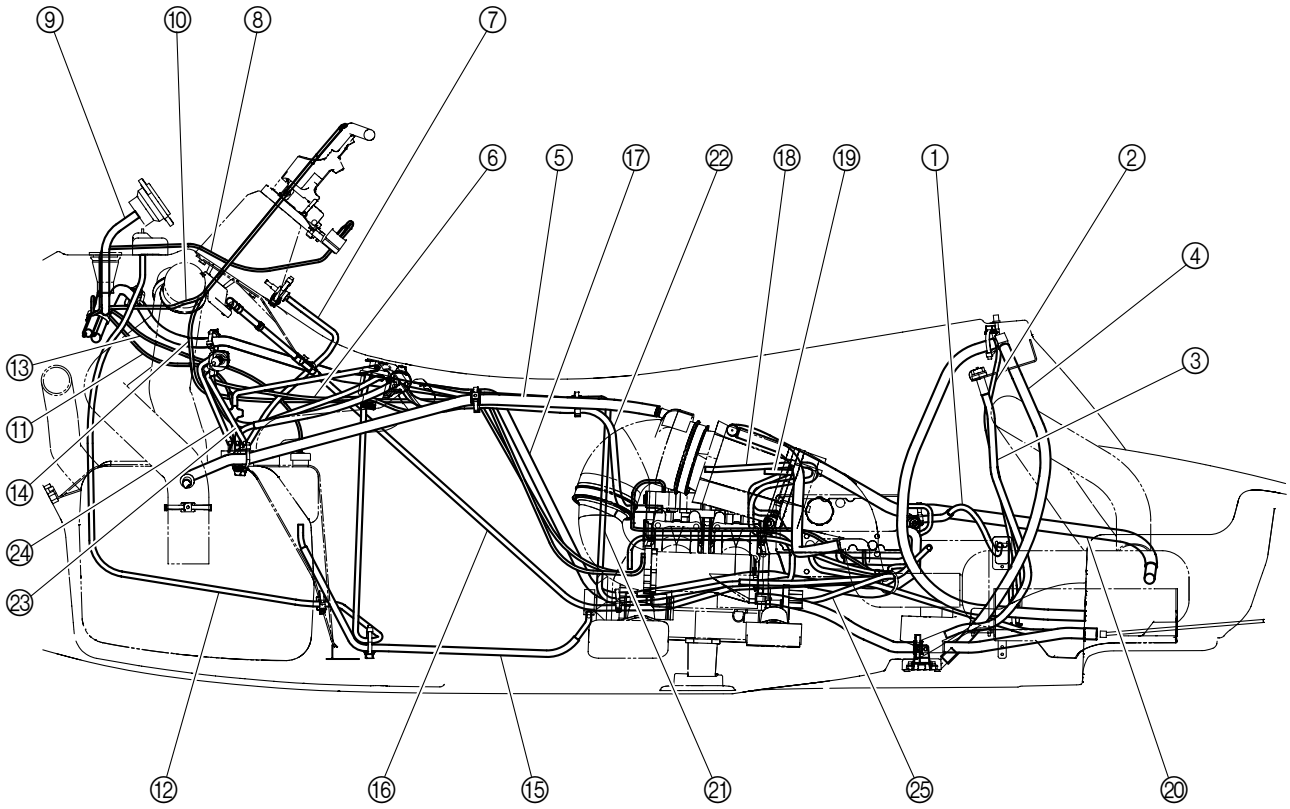
⑩ Left handlebar switch lead
⑪ Fuel level sensor lead
⑫ Fuel tank breather hose
⑬ Oil level sensor lead
⑭ Throttle cable
⑮ Oil hose
⑯ Steering cable
⑰ Wiring harness
⑱ Spark plug lead(#1)
⑲ Spark plug lead(#2)
⑳ Cooling water outlet hose
㉑ Fuel inlet hose
㉒ Fuel return hose



㉓ Fuel hose
㉔ Fuel reservoir hose
㉕ Negative battery cable

— MEMO —

Maintenance

Maintenance interval chart

The following chart should be considered strictly as a guide to general maintenance intervals. Depending on operating conditions, the maintenance intervals should be changed.

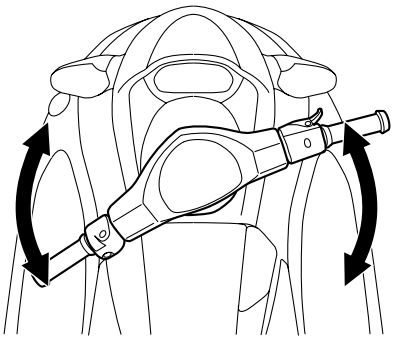
MAINTENANCE INTERVAL / ITEM		INITIAL	THEREAFTER EVERY				PAGE
		10 hours	50 hours		100 hours	200 hours	
			6 months	12 months	12 months	24 months	
Spark plugs	Check, clean, replace	○	○		○		3-4
Lubrication points	Lubricate				○		3-10
Fuel system	Check				○		3-3
Fuel filter	Check	○				○	3-3
	Check, replace	○				○	3-3
Fuel tank	Check, clean					○	3-3
Oil injection system	Check, adjust	○				○	3-4
Carburetor	Check, adjust	○			○		4-15
Engine idling speed	Check, adjust				○		3-6
Carburetor throttle shaft	Check				○		4-14
Water inlet strainer	Check, clean				○		3-7
Bilge strainer	Clean				○		3-9
Impeller	Check				○		3-7
Jet thrust nozzle angle	Check, adjust				○		3-7
Throttle cable	Check, adjust	○			○		3-2
Choke cable	Check, adjust				○		3-4
Stern drain plugs	Check, replace				○		3-10
Battery	Check, charge				○		3-8
Rubber coupling	Check					○	6-12
Engine mounts	Check					○	3-6
Nuts and bolts	Check	○			○		3-7

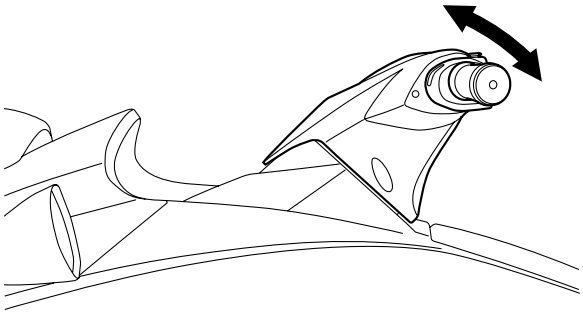
Periodic service

Steering system

Steering master check

1. Turn the handlebar lock to lock and push it back and forth.

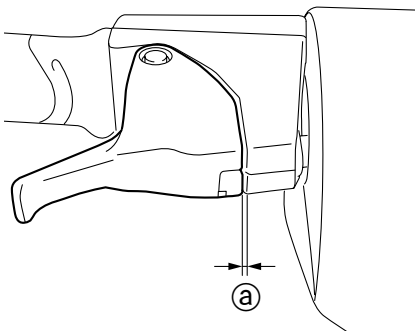




2. Check for excessive play of the handlebar. Check the bushings, bolts, and nuts if there is excessive play. See “Handlebar and handlebar switch assy.” (8-2).

Throttle lever free play check

1. Measure the throttle lever free play ⓐ. Adjust if out of specification.



Throttle lever free play ⓐ:
4.0–7.0 mm (0.16–0.28 in)

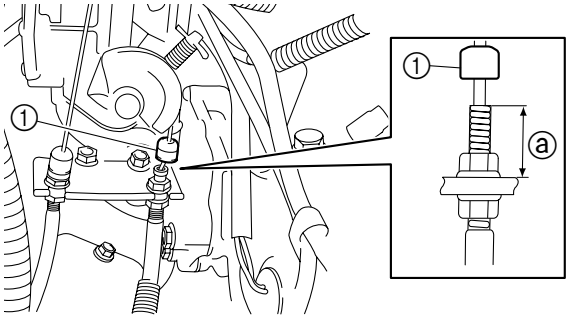
Throttle lever free play adjustment

Follow all the steps if the throttle cable has been replaced.

NOTICE

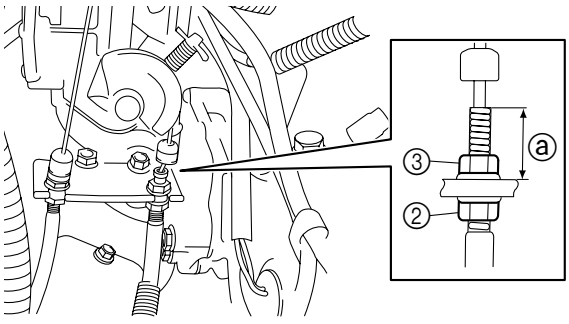
After adjusting the throttle lever free play, make sure that the throttle cable is not pulled when the handlebar is turned to the right and left.

1. Face the handlebar straight ahead.
2. Slide the throttle cable end boot ① to the carburetor pulley end.
3. Check that the throttle cable installation length ⓐ is within specification.



Throttle cable installation length ⓐ:
14.0 ± 1.0 mm (0.55 ± 0.04 in)

4. If the throttle cable installation length ⓐ is out of specification, loosen the locknut ②, and then turn the adjusting nut ③ to adjust the length.
5. Tighten the locknut ② to the specified torque.



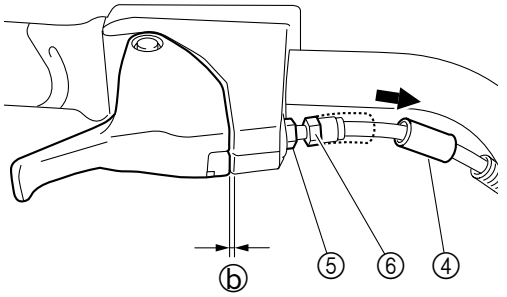
Locknut ②: 8 N·m (0.8 kgf·m, 5.9 ft·lb)

6. Slide the boot ① to its original position.

7. Remove the upper handlebar cover. See “Steering pad and handlebar cover” (8-1).

8. Slide the rubber cover ④ away from the throttle lever, and then loosen the locknut ⑤.

9. Turn the adjuster ⑥ in or out until the specified free play ⓑ is obtained.



Turn in	Free play ⓑ is increased.
Turn out	Free play ⓑ is decreased.

Throttle lever free play ⓑ: 4.0–7.0 mm (0.16–0.28 in)

10. Tighten the locknut ⑤.

11. Slide the rubber cover ④ to its original position.

12. Install the upper handlebar cover. See “Steering pad and handlebar cover installation” (8-6).

Fuel system

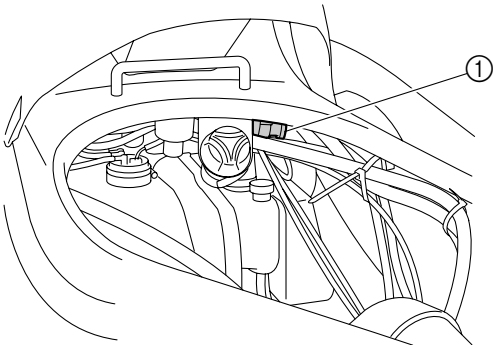
⚠ WARNING

- **Before checking the fuel system, remove the battery and then remove the fuel filler cap to reduce any pressure inside the fuel tank.**
- **Always reduce the fuel pressure in the fuel line before checking the line. If the fuel pressure is not released, pressurized fuel could spray out.**
- **When removing fuel system parts, wrap them in a cloth and take care that no fuel spills into the engine compartment.**

Fuel filter check

1. Check the fuel filter ①. Replace the fuel filter if cracked or damaged.

2. Replace the fuel filter if there are water contaminants, and check for water in the fuel tank. See “Fuel tank check” (3-3).



Fuel hose check

1. Check the fuel hose. Replace if cracked or damaged.

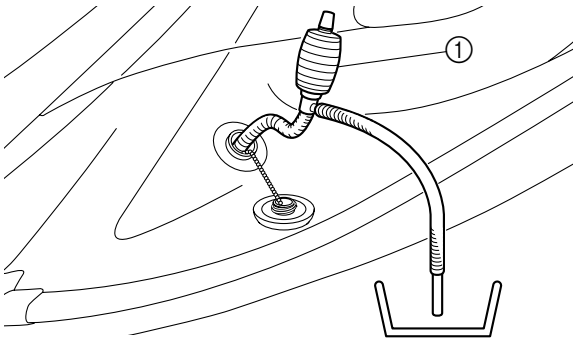
Fuel filler cap, fuel filler neck, and hose check

1. Check the fuel filler cap, fuel filler neck, nut, and fuel filler hose. Replace if cracked or damaged. See “Fuel filler cap check” (4-7).

Fuel tank check

1. Check the fuel tank. Replace if cracked or damaged.

2. Check for water in the fuel tank. Extract the water and fuel if there is water in the fuel tank.



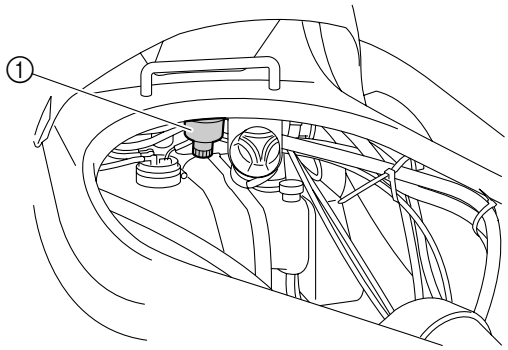
TIP:

Use a commercially available siphon pump ①.

Water separator check

1. Check the water separator ①. Drain the water if water has accumulated.

2. Check the O-ring of the drain plug. Replace the O-ring if cracked or damaged. See "Water separator check" (8-21).



TIP:

To drain water from the water separator, loosen the drain plug.

Choke cable check

1. Pull the choke knob out until it stops, and then release the knob. The knob should not move.

Choke cable adjustment

1. If the choke knob moves back on its own, tighten the choke knob adjusting nut slightly. If the knob is difficult to move, loosen the adjusting nut slightly.

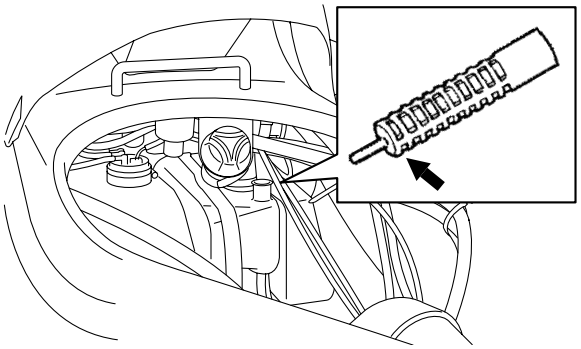
Oil injection system

⚠ WARNING

Do not allow the oil tank to become completely empty. If the oil tank becomes empty the oil injection pump must be bled to ensure proper oil flow, otherwise engine damage may occur. See "Oil pump air bleeding" (4-18).

Oil filter check

1. Check the oil filter. Clean if there are contaminants. Replace if frayed or torn.



Oil hose, oil filler cap and rubber seal check

1. Check the oil hose, or oil filler cap. Replace if cracked or damaged.

2. Check the rubber seal. Replace if cracked or worn.

Oil tank check

1. Check the oil tank. Replace if cracked or damaged.

Check valve check

1. Check the check valve. See "Check valve check" (4-18).

Power unit

Spark plug check

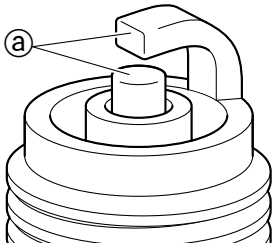
1. Remove the spark plug caps, and then remove the spark plugs.

TIP:

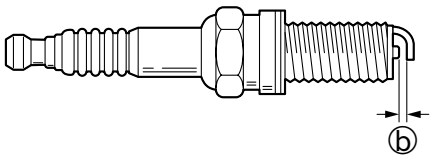
Be careful not to get water or any other foreign substances in the spark plug holes.

2. Clean the electrodes ⓐ.

3. Check the electrodes ⓐ. Replace the spark plug if damaged or worn.



4. Measure the spark plug gap ⓑ. Replace if out of specification.



Specified spark plug (manufacturer): BR8HS (NGK) Spark plug gap ⓑ: 0.6–0.7 mm (0.024–0.028 in)

5. Tighten the spark plugs to the specified torque.

Spark plug: 25 N·m (2.5 kgf·m, 18.4 ft·lb)

TIP:
Before installing a spark plug, clean the gasket surface and spark plug surface.

6. Install the spark plug caps.

Compression pressure measurement

NOTICE

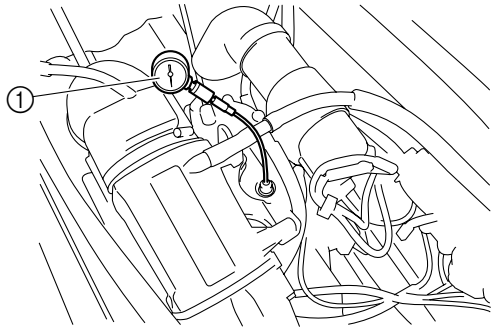
When starting the engine to measure the compression pressure on land, make sure to connect a garden hose to the watercraft for proper water supply.

TIP:
Make sure that the battery voltage is more than 12 V.

1. Place the watercraft in a horizontal position.
2. Start the engine and warm it up for 6 minutes or more at engine idle speed.

TIP:
Warm up the engine an additional 5 minutes if the ambient temperature is 20 °C (68 °F) or less.

3. Stop the engine.
4. Remove the spark plug caps, and then remove the plugs.
5. Install the special service tool ①.



Compression gauge ①: 90890-03160

6. Fully open the throttle lever.
7. Crank the engine until the reading on the compression gauge stabilizes.
8. Measure the compression pressure for all cylinders according to steps 5–7.

Compression pressure (reference data): 590 kPa (5.9 kgf/cm^2, 84 psi)

9. If the compression pressure is below specification, squirt a few drops of engine oil into the cylinder and measure again.

Compression pressure (with engine oil added into the cylinder)	
Reading	Check
Higher than without engine oil	Piston ring and piston
Same as without engine oil	Cylinder head gasket or piston

10. Install the spark plugs, and then install the spark plug caps. See “Spark plug check” (3-4).

Engine oil level check

⚠ WARNING

Do not allow the oil tank to become completely empty. If the oil tank becomes empty the oil injection pump must be bled to ensure proper oil flow, otherwise engine damage may occur. See "Oil pump air bleeding" (4-18).

NOTICE

Make sure that debris or water does not enter the oil filler hole.

1. Remove the oil tank filler cap.
2. Slowly add engine oil to the oil tank.
3. Stop filling when the oil level just reaches the top of the oil tank.

Recommended engine oil: YAMALUBE 2-W, or an equivalent NMMA-certified TC-W3 marine oil

4. Install the oil tank filler cap.

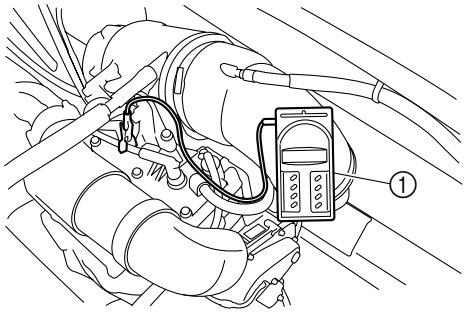
Trolling speed check

1. Place the watercraft in the water.
2. Start the engine and warm it up for 6 minutes or more at engine idle speed.

TIP:

Warm up the engine an additional 5 minutes if the ambient temperature is 20 °C (68 °F) or less.

3. Connect the special service tool ① to the spark plug wire.
4. Check the trolling speed.

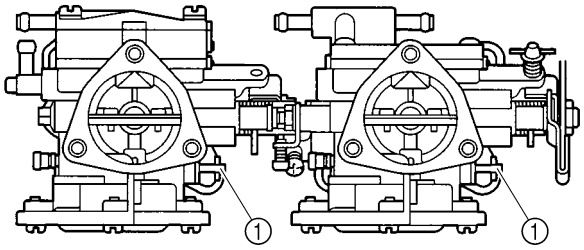


Digital tachometer ①: 90890-06760

Trolling speed: 1250–1350 r/min

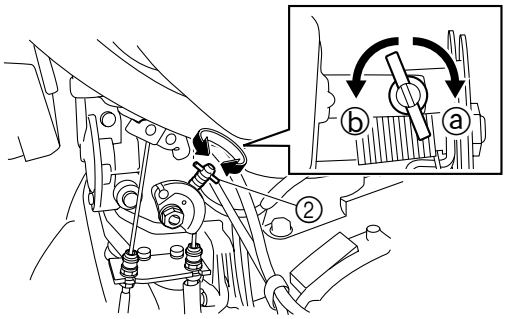
Trolling speed adjustment

1. Turn the low speed screws ① until they are lightly seated, and then turn out the low speed screws ① to the specified number of turns.



Low speed screw ①: 5/8 ± 1/4 turns out

2. Start the engine.
3. Turn the throttle stop screw ② in or out until the specified speed is obtained.



Turn in ⓐ	Trolling speed is increased.
Turn out ⓑ	Trolling speed is decreased.

Engine mount check

1. Check the engine mounts. Replace if cracked or damaged.

TIP:

- Make a note of the position of each engine mount so that it can be installed in its original place.
- When replacing the engine mounts, make sure to check the coupling clearance.

Nut and bolt check

1. Check the engine, deck, and hull for loose bolts and nuts. Tighten if loose. See “Specified tightening torque” (2-8).

Jet pump unit

Impeller check

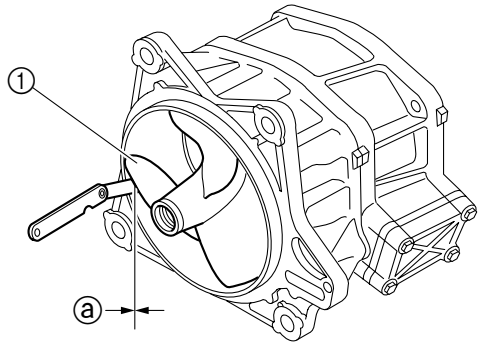
⚠ WARNING

Make sure to remove the battery before checking the jet pump unit.

1. Remove the jet pump unit. See “Jet pump unit removal” (6-4).

2. Check the impeller ①. Replace if damaged.

3. Measure the impeller-to-housing clearance ⓐ. Measure the impeller housing inside diameter if the impeller-to-housing clearance ⓐ is out of specification. See “Impeller housing check” (6-8).



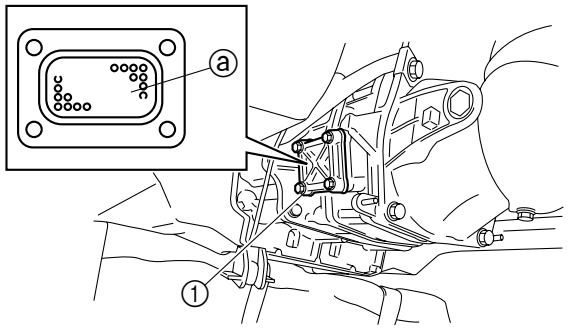
Impeller-to-housing clearance ⓐ:
0.35–0.45 mm (0.014–0.018 in)

4. Install the jet pump unit. See “Jet pump unit installation” (6-4).

Water inlet strainer check

1. Remove the water inlet strainer cover ① and water inlet strainer. See “Jet thrust nozzle, impeller duct, and impeller housing” (6-5).

2. Check the water inlet strainer mesh ⓐ. Clean if contaminated. Replace if cracked or damaged.

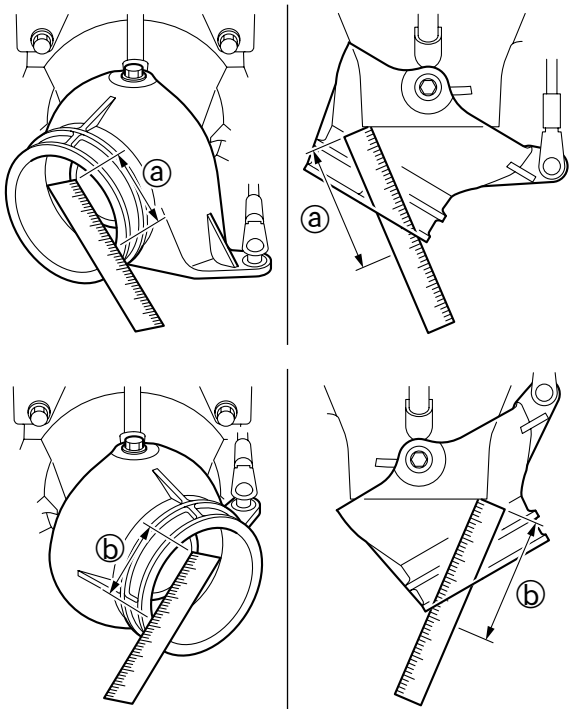


3. Install the water inlet strainer mesh ⓐ and water inlet strainer cover ①. See “Jet thrust nozzle, impeller duct, and impeller housing” (6-5).

Jet thrust nozzle steering angle check

1. Turn the handlebar lock to lock.

2. Measure distances ⓐ and ⓑ. Adjust if out of specification.



Difference of distances ⓐ and ⓑ:
Maximum 5 mm (0.2 in)

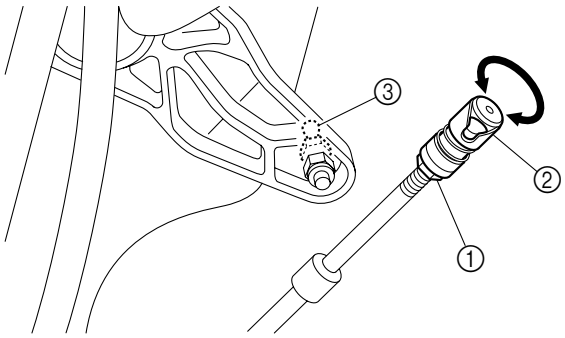
Jet thrust nozzle steering angle adjustment

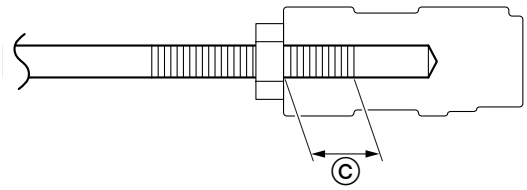
1. Remove the service lid. See “Front hood” (8-8).

2. Loosen the locknut ①.

3. Disconnect the steering cable joint ② from the ball joint ③.

4. Turn the steering cable joint ② in or out to adjust distances ⓐ and ⓑ. **WARNING! The steering cable joint must be screwed in more than 8 mm (0.31 in) ⓒ.**



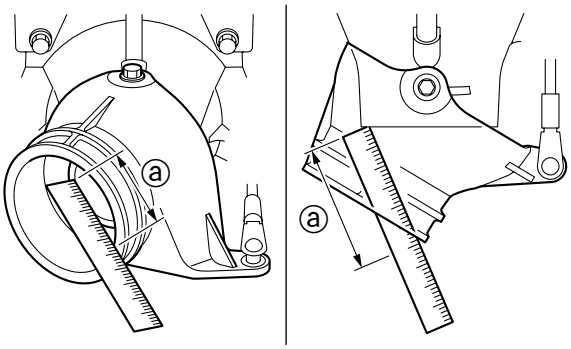


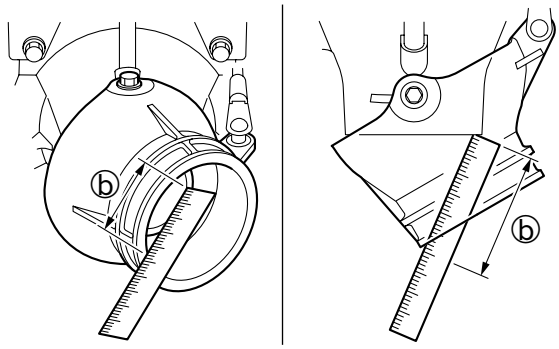
Turn in	Distance ⓐ is increased.
Turn out	Distance ⓑ is increased.

5. Connect the steering cable joint ② to the ball joint ③, and then tighten the locknut ① to the specified torque.

Locknut ①: 7 N·m (0.7 kgf·m, 5.2 ft·lb)

6. Check the difference of distances ⓐ and ⓑ again.





7. If the jet thrust nozzle steering angle cannot be properly adjusted using the cable joint at the steering master end, adjust the cable joint at the jet pump end so that the difference of distances ⓐ and ⓑ is within specification. See “Steering cable installation (jet pump end)” (8-17).

8. Install the service lid. See “Front hood” (8-8).

Electrical

Battery check

⚠ WARNING

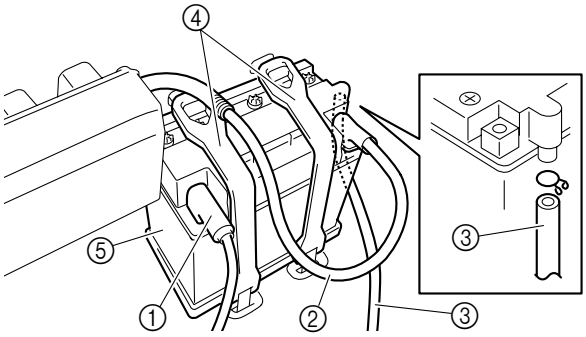
Battery electrolyte is poisonous and dangerous, causing severe burns, etc. Electrolyte contains sulfuric acid. Avoid contact with skin, eyes or clothing.
Antidotes
External: Flush with water.
Internal: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention.
Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc., well away. If using or charging the battery in an enclosed space, make sure that it is well ventilated. Always shield your eyes when working near batteries.
KEEP OUT OF THE REACH OF CHILDREN.

NOTICE

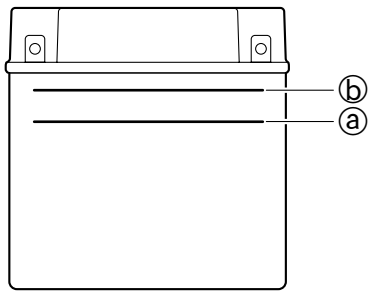
Be careful not to place the battery on its side.
Make sure to remove the battery from the battery compartment when adding battery electrolyte or charging the battery.
When checking the battery, make sure the breather hose is connected to the battery and not obstructed.

1. Disconnect the negative battery cable ①, positive battery cable ②, and battery breather hose ③. ***NOTICE:*** **When removing the battery, disconnect the negative battery cable first.**

2. Remove the bands ④, and then remove the battery ⑤.



3. Check the battery electrolyte level. If the level is at or below the minimum level mark ⓐ, add distilled water until the level is between the maximum level mark ⓑ and minimum level mark ⓐ.



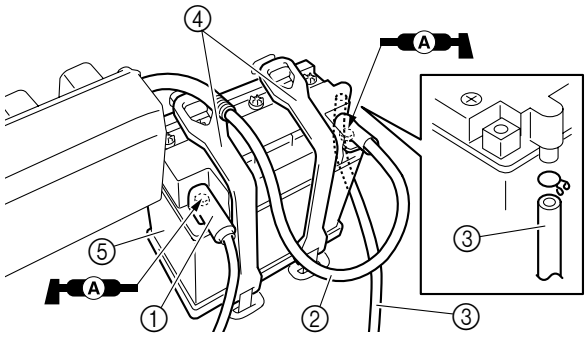
4. Check the specific gravity of the electrolyte. Charge the battery if below specification.

Specific gravity at 20 °C (68 °F): 1.265

5. Install the battery ⑤, and then install the bands ④.

6. Connect the battery breather hose ③. ***NOTICE:*** **Make sure that the battery breather hose ③ is properly connected and is not obstructed.**

7. Connect the positive battery cable ②, and then connect the negative battery cable ①. ***NOTICE:*** **Connect the positive battery cable ② to the battery terminal first.**



TIP:

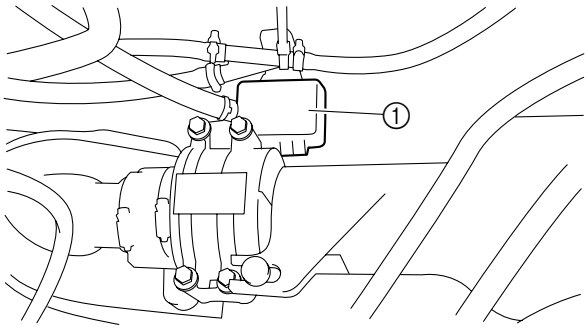
Apply water resistant grease to the terminals to minimize corrosion.

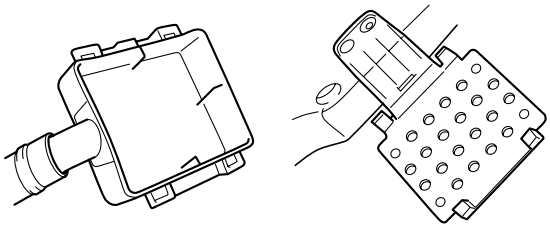
Hull and hood

Bilge strainer check

1. Remove the bilge strainer case ①.

2. Check the bilge strainer. Clean if contaminated. Replace if cracked or damaged.



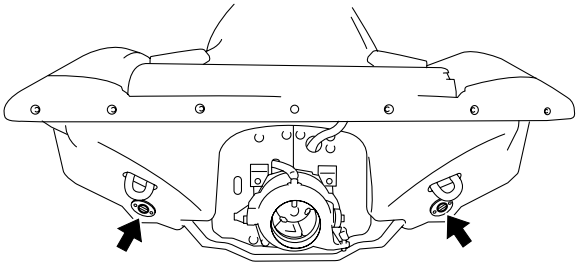


TIP:
Remove the bilge strainer case ① by pushing the hooks on the bilge strainer inward.

3. Install the bilge strainer case ①.

Drain plug check

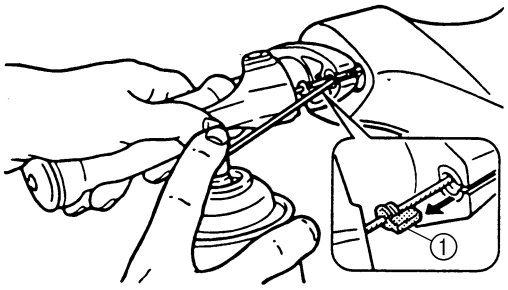
1. Check the O-ring of each drain plug. Replace if cracked or damaged. See "Drain plug check" (8-29).



Lubrication points

Throttle cable and choke cable lubrication

1. Lubricate the throttle cable (handlebar end).

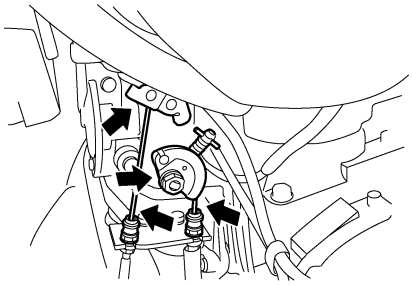


Recommended lubricant: Rust inhibitor

TIP:
Before lubricating the throttle cable, squeeze the throttle lever, and then remove the rubber seal ①.

2. Lubricate the throttle cable (carburetor end).

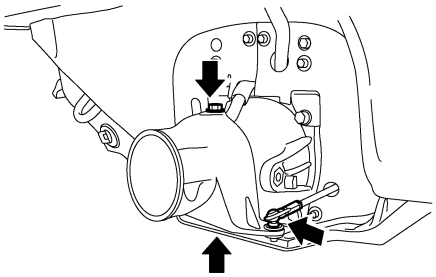
3. Lubricate the choke cable (carburetor end).



Recommended lubricant:
Yamaha grease A

Nozzle pivot shaft and steering cable lubrication

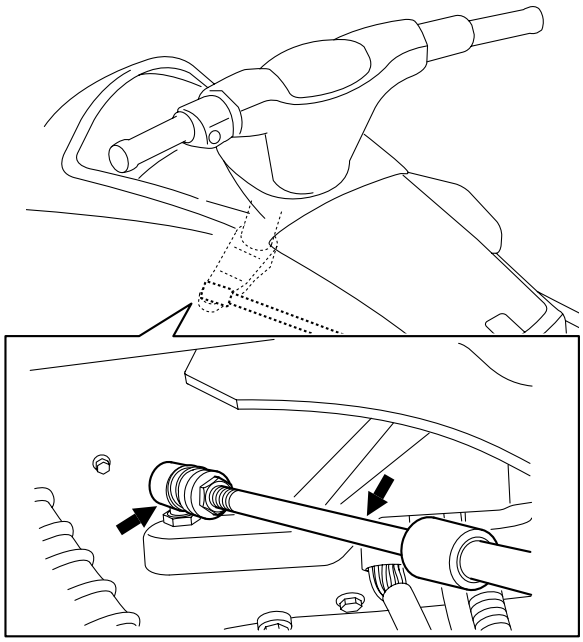
1. Lubricate the nozzle pivot shaft and steering cable.



Recommended lubricant:
Yamaha grease A

Steering cable and steering cable joint lubrication

1. Lubricate the steering cable and steering cable joint.

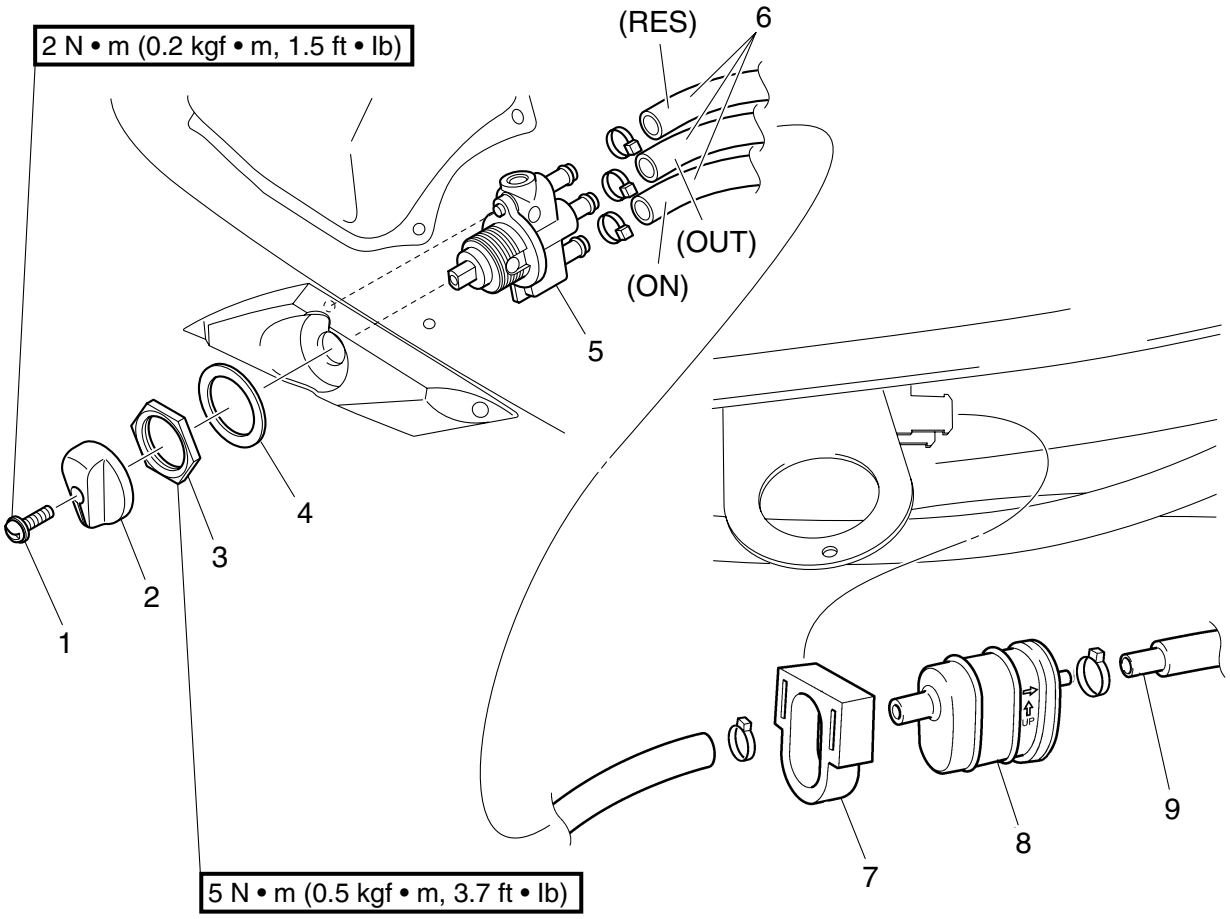


Recommended lubricant:
Yamaha grease A

TIP:
Disconnect the joint and apply a small amount of grease.

Fuel system

Fuel cock and fuel filter



No.	Part name	Q'ty	Remarks
1	Screw	1	M4 × 7 mm
2	Fuel cock knob	1	
3	Nut	1	
4	Washer	1	
5	Fuel cock assy.	1	
6	Fuel hose	3	
7	Holder	1	
8	Fuel filter	1	
9	Fuel hose	1	

Fuel filter check

See “Fuel system” (3-3).

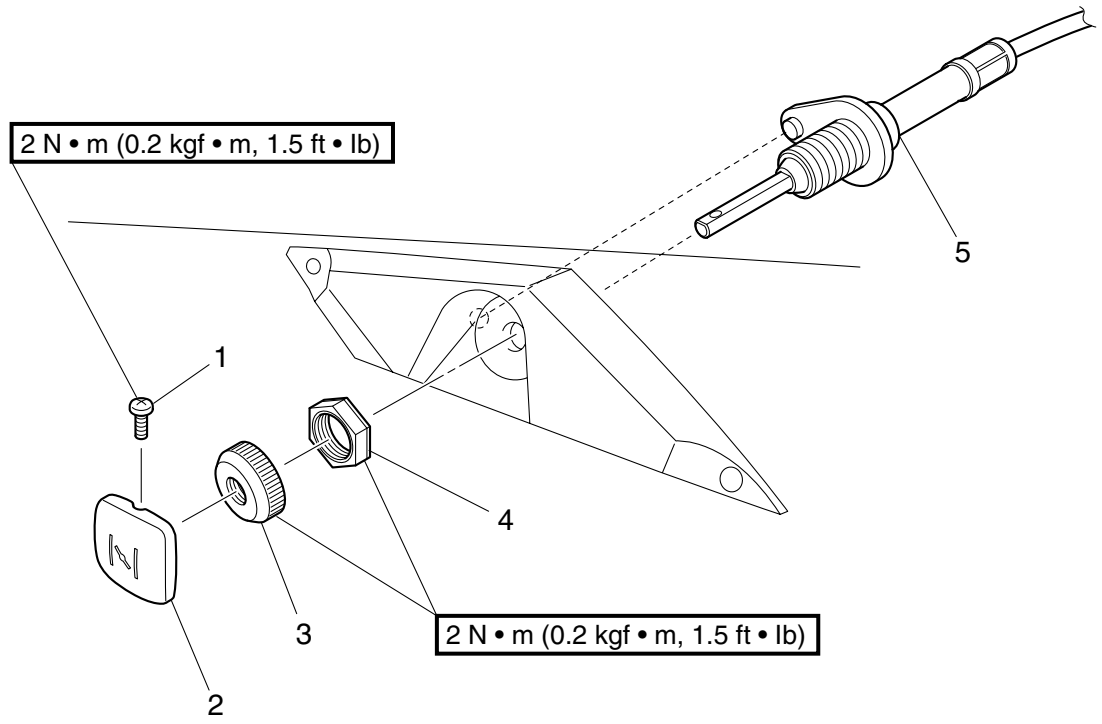
Fuel cock check

⚠ WARNING

Before checking the fuel system, remove the battery, and then remove the fuel filler cap to reduce any pressure inside the fuel tank.

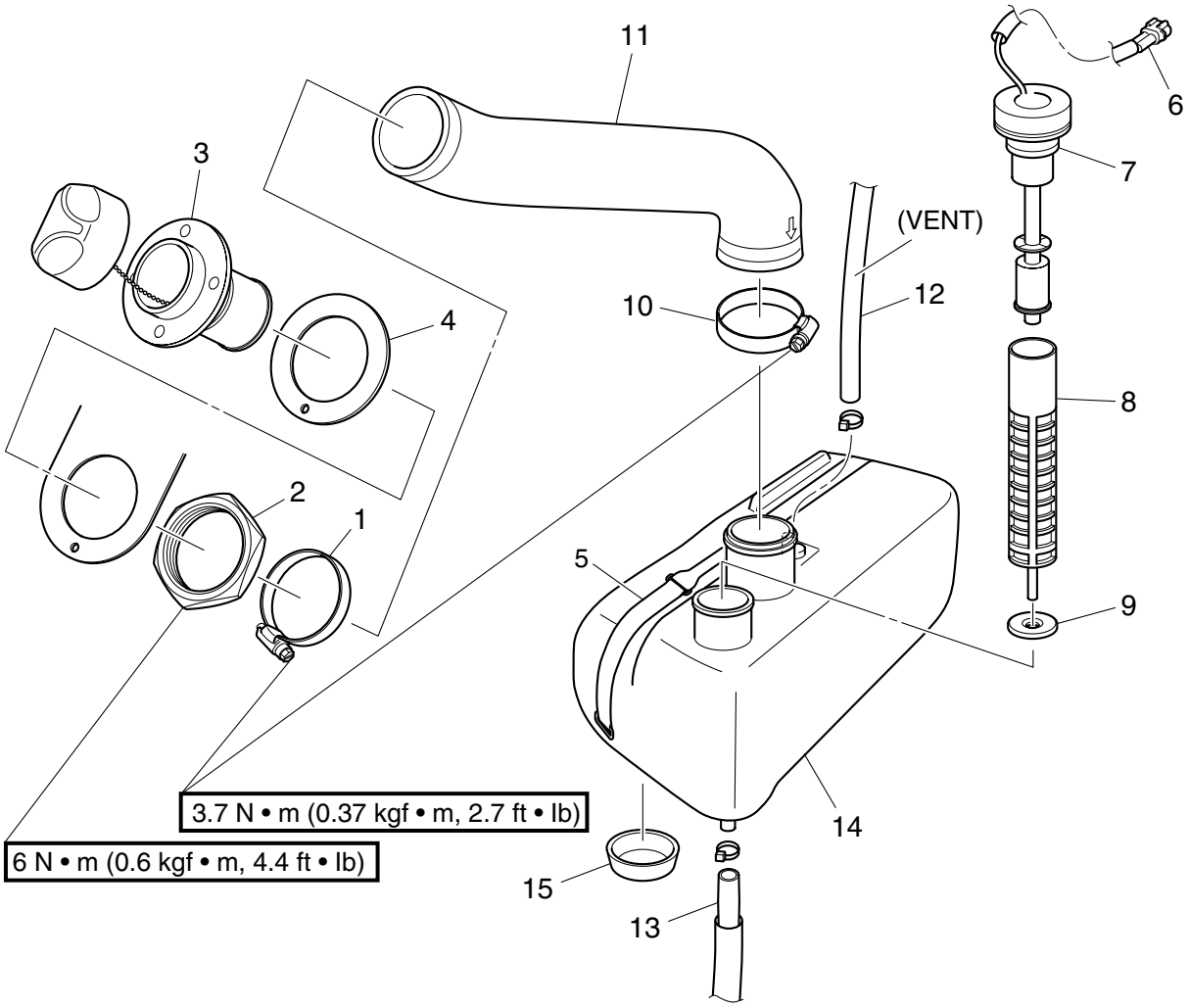
1. Check the fuel cock. Replace if there is rough movement.

Choke cable



No.	Part name	Q'ty	Remarks
1	Screw	1	M3 × 6 mm
2	Knob	1	
3	Friction adjusting nut	1	
4	Nut	1	
5	Choke cable	1	

Oil tank



No.	Part name	Q'ty	Remarks
1	Clamp	1	
2	Nut	1	
3	Oil filler neck	1	
4	Rubber seal	1	
5	Tank belt	1	
6	Oil level sensor coupler	1	
7	Oil level sensor	1	
8	Oil filter	1	
9	Damper	1	
10	Clamp	1	
11	Oil filler hose	1	
12	Breather hose	1	
13	Oil hose	1	
14	Oil tank	1	
15	Damper	1	

Oil line check

1. Clean the oil filter, and then check the oil filter. Replace if frayed or teared.

2. Check the rubber seal. Replace if cracked or worn.

3. Check the hoses. Replace if cracked or damaged.

4. Check the oil tank filler cap. Replace if cracked or damaged.

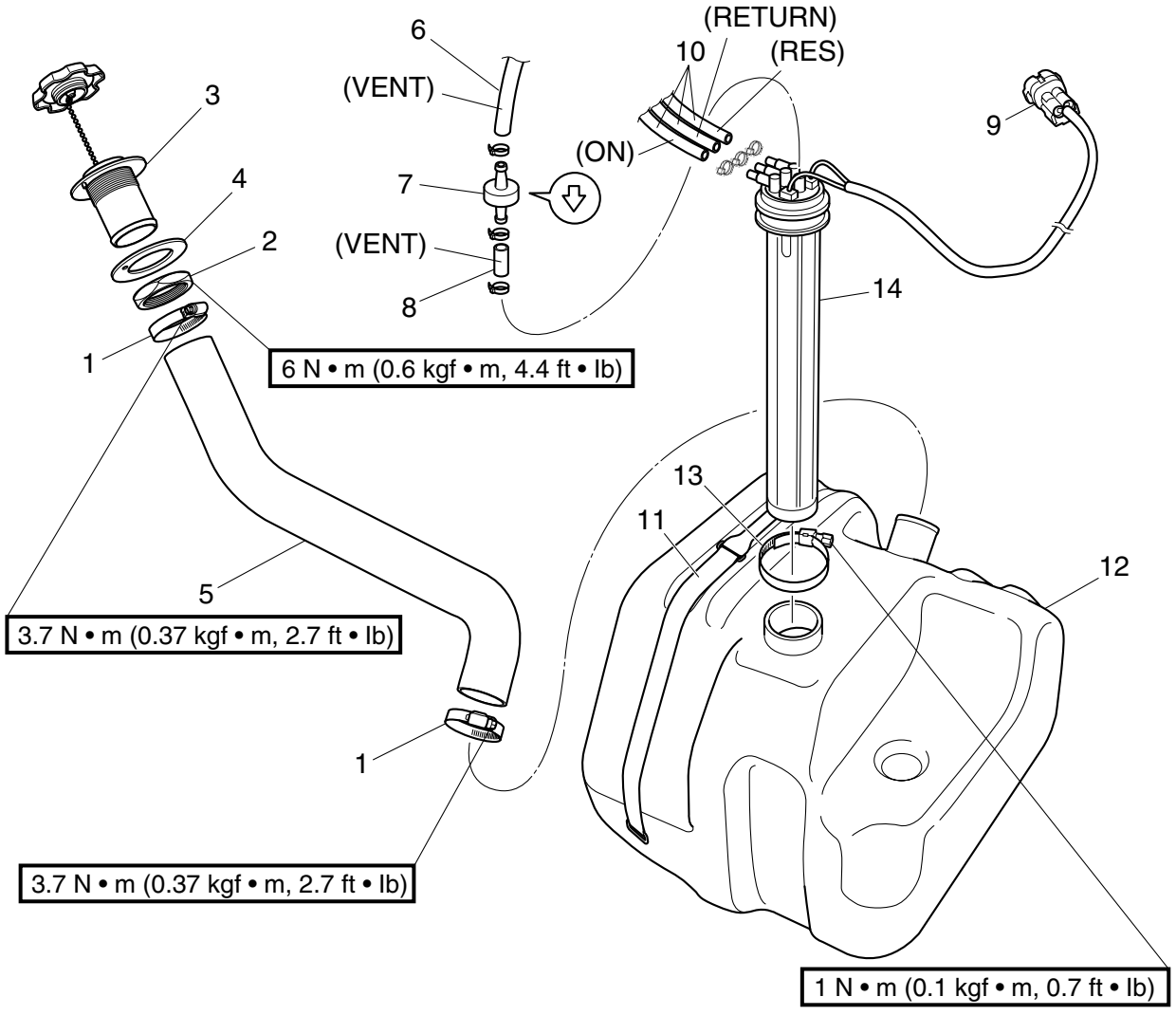
Oil level sensor check

See “Indication system” (7-15).

Oil tank check

1. Check the oil tank. Replace if cracked or damaged.

Fuel tank

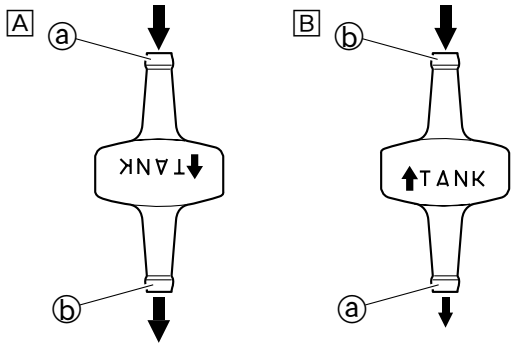


No.	Part name	Q'ty	Remarks
	Oil tank		See "Oil tank" (4-4).
	Engine unit		See "Engine unit" (5-1).
1	Clamp	2	
2	Nut	1	
3	Fuel filler neck	1	
4	Rubber seal	1	
5	Fuel filler hose	1	
6	Fuel tank breather hose	1	
7	Check valve	1	
8	Fuel tank breather hose	1	
9	Fuel level sensor coupler	1	
10	Fuel hose	3	
11	Tank belt	1	
12	Fuel tank	1	
13	Clamp	1	
14	Fuel level sensor assy.	1	

Check valve check

1. Blow into the end ⓐ of the check valve, and make sure that airflow from the end ⓑ is unrestricted. Replace if the air flow is restricted.

2. Blow into the end ⓑ of the check valve, and make sure that airflow from the end ⓐ is restricted. Replace if the air flow is unrestricted.



A Upright
B Inverted

Fuel level sensor check

See “Indication system” (7-15).

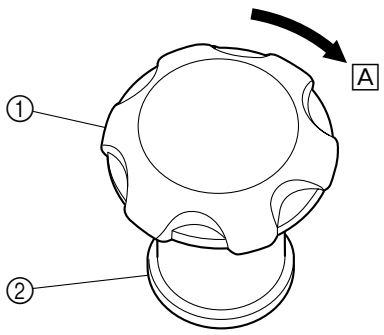
Fuel tank check

1. Check the fuel tank. Replace if cracked or damaged.

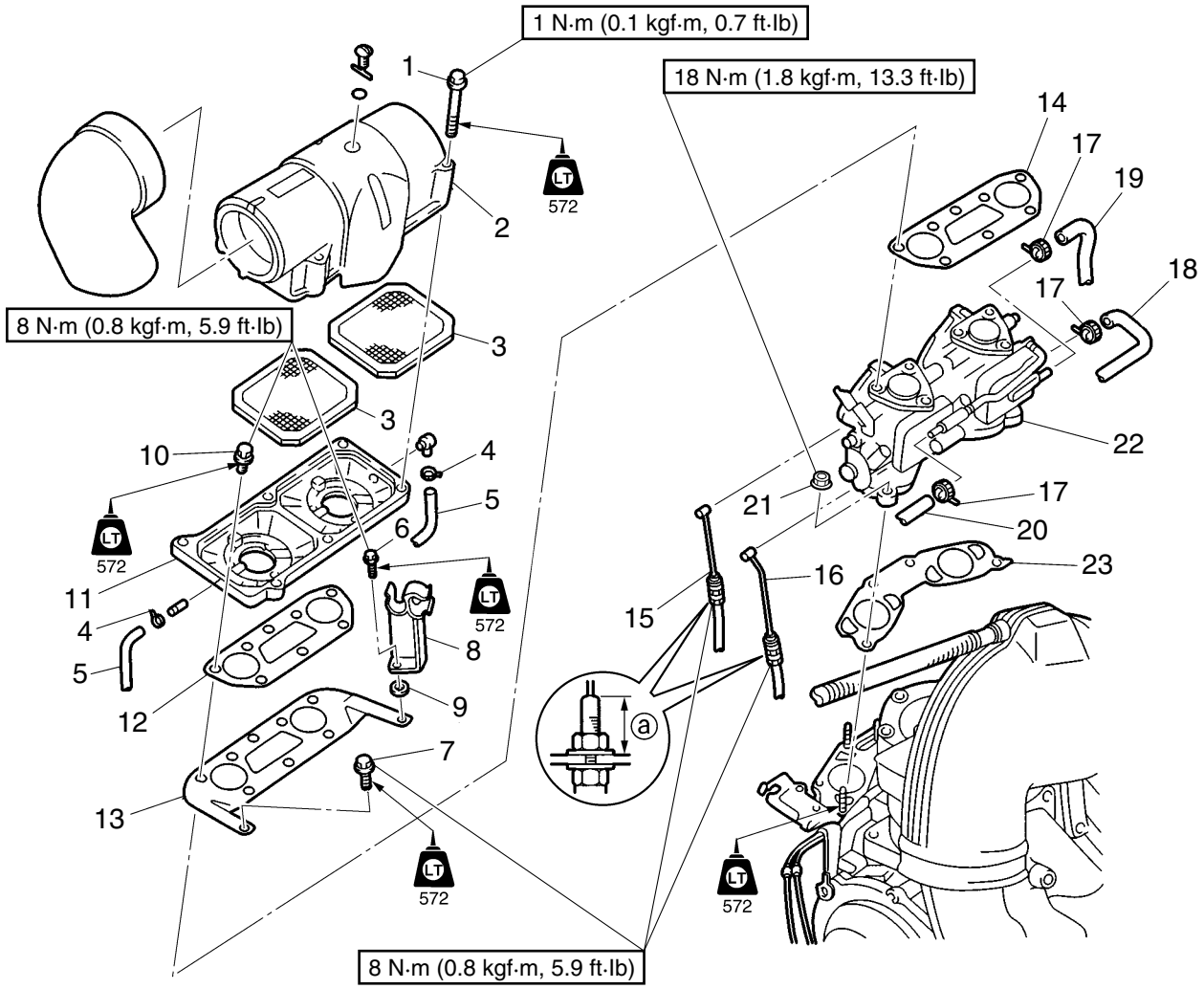
Fuel filler cap check

1. Install the fuel filler cap ① onto the fuel filler neck ②, and then hold the fuel filler neck ②.

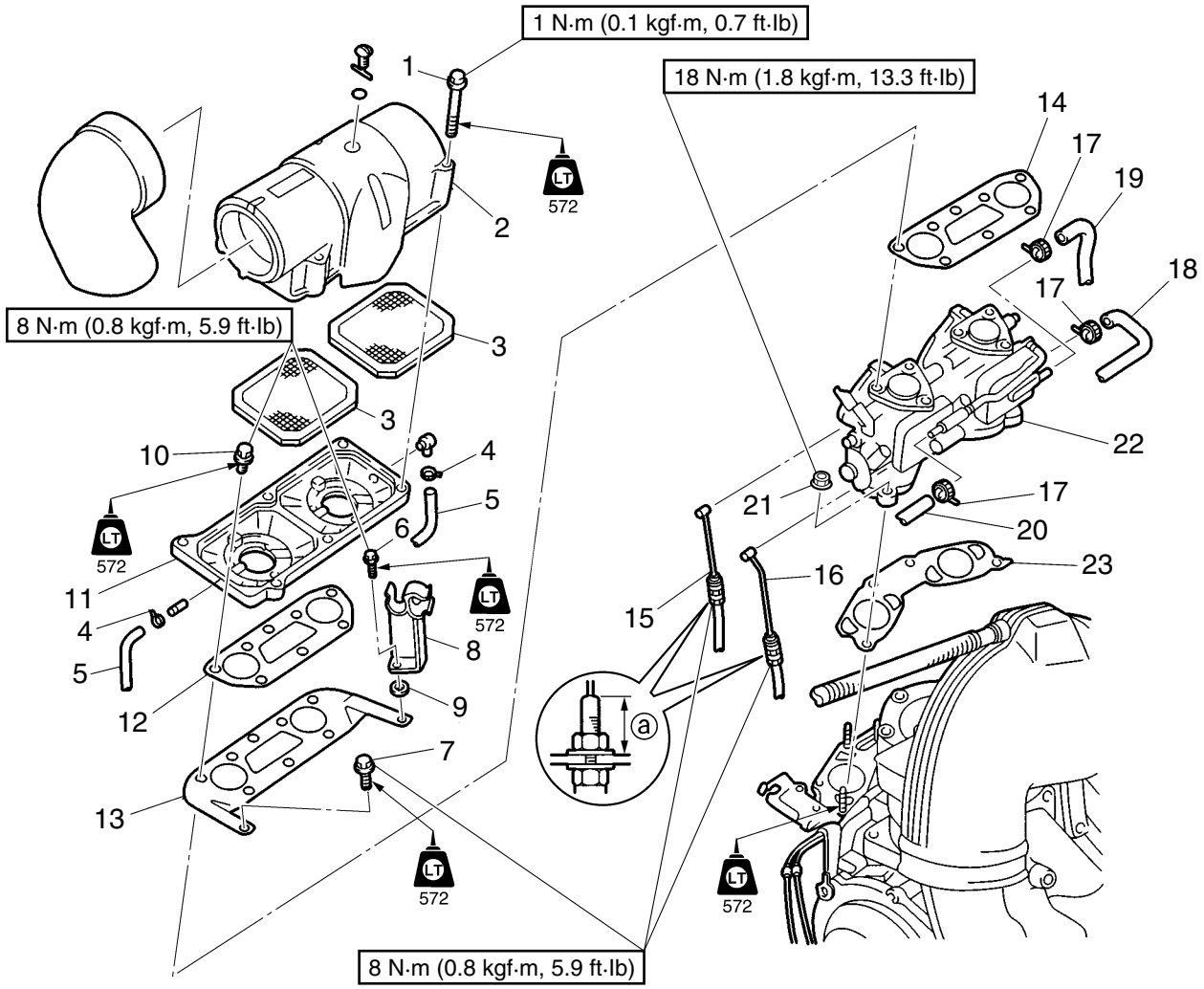
2. Turn the fuel filler cap ① clockwise A and check that it clicks when tightened completely. Replace if it does not click.



Carburetor unit



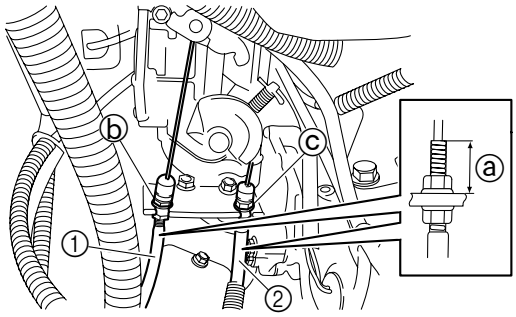
No.	Part name	Q'ty	Remarks
	Fuel cock knob		Turn the fuel cock knob to "OFF".
1	Bolt	6	M5 × 56 mm
2	Cover	1	
3	Flame arrester	2	
4	Band	2	**Not reusable**
5	Oil delivery hose 2	2	
6	Bolt	1	M6 × 14 mm
7	Bolt	1	M6 × 12 mm
8	Holder	1	
9	Washer	1	
10	Bolt	6	M6 × 20 mm
11	Flame arrester holder	1	
12	Gasket	1	**Not reusable**
13	Plate	1	
14	Gasket	1	**Not reusable**
15	Choke cable	1	ⓐ: 13–15 mm (0.51–0.59 in)



No.	Part name	Q'ty	Remarks
16	Throttle cable	1	ⓐ: 13–15 mm (0.51–0.59 in)
17	Band	3	**Not reusable**
18	Fuel hose	1	
19	Pulse hose	1	
20	Fuel reservoir hose	1	
21	Nut	4	
22	Carburetor assy.	1	
23	Gasket	1	**Not reusable**

Choke cable and throttle cable installation

1. Install the choke cable ① and throttle cable ②, and then tighten the nuts to the specified torque.



Choke cable and throttle cable guide installation position ⓐ: 14.0 ± 1.0 mm (0.55 ± 0.04 in)

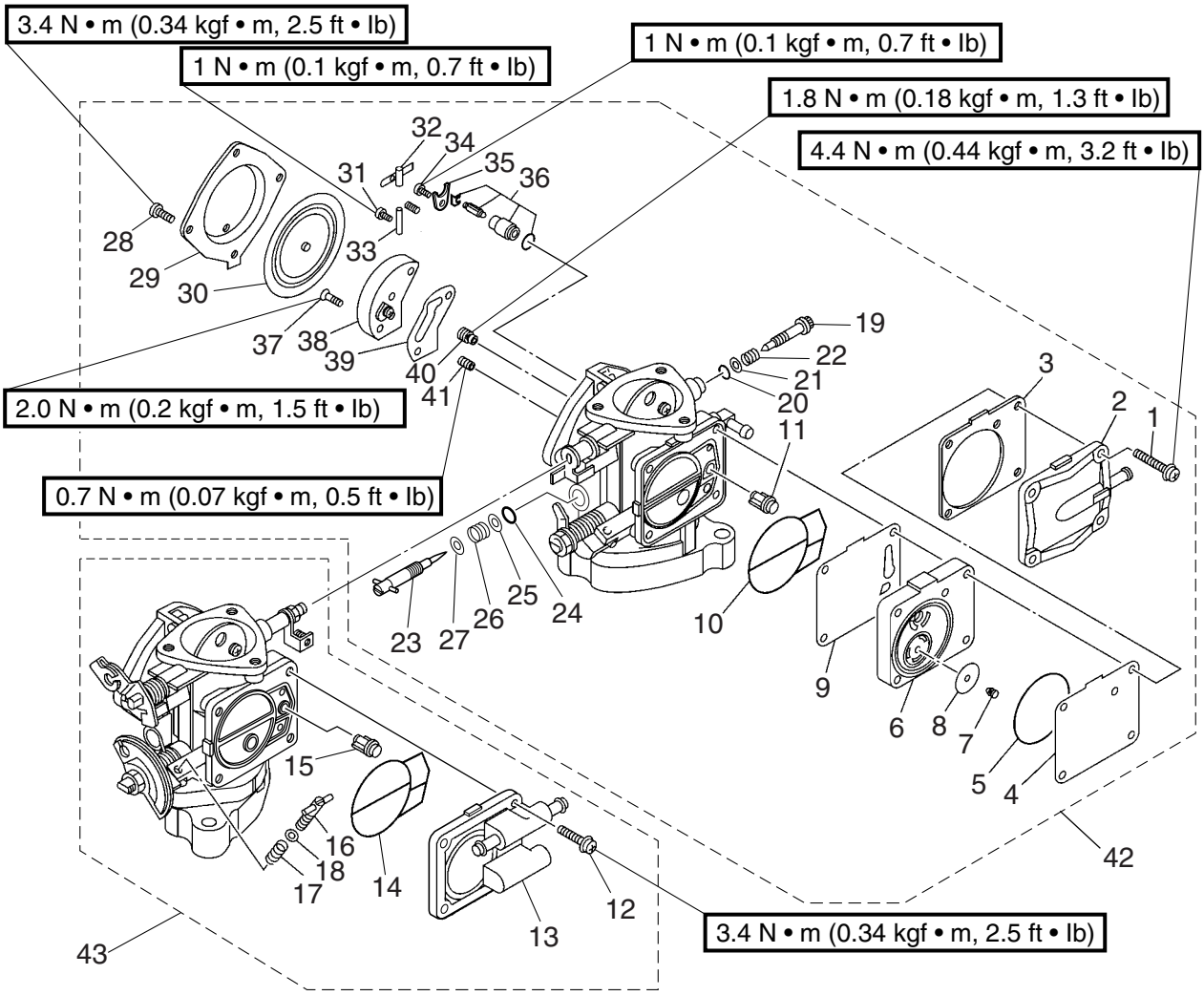
Choke cable nut ⓑ: 8 N·m (0.8 kgf·m, 5.9 ft·lb) Throttle cable nut ⓒ: 8 N·m (0.8 kgf·m, 5.9 ft·lb)

2. Adjust the throttle lever free play. See “Steering system” (3-2).

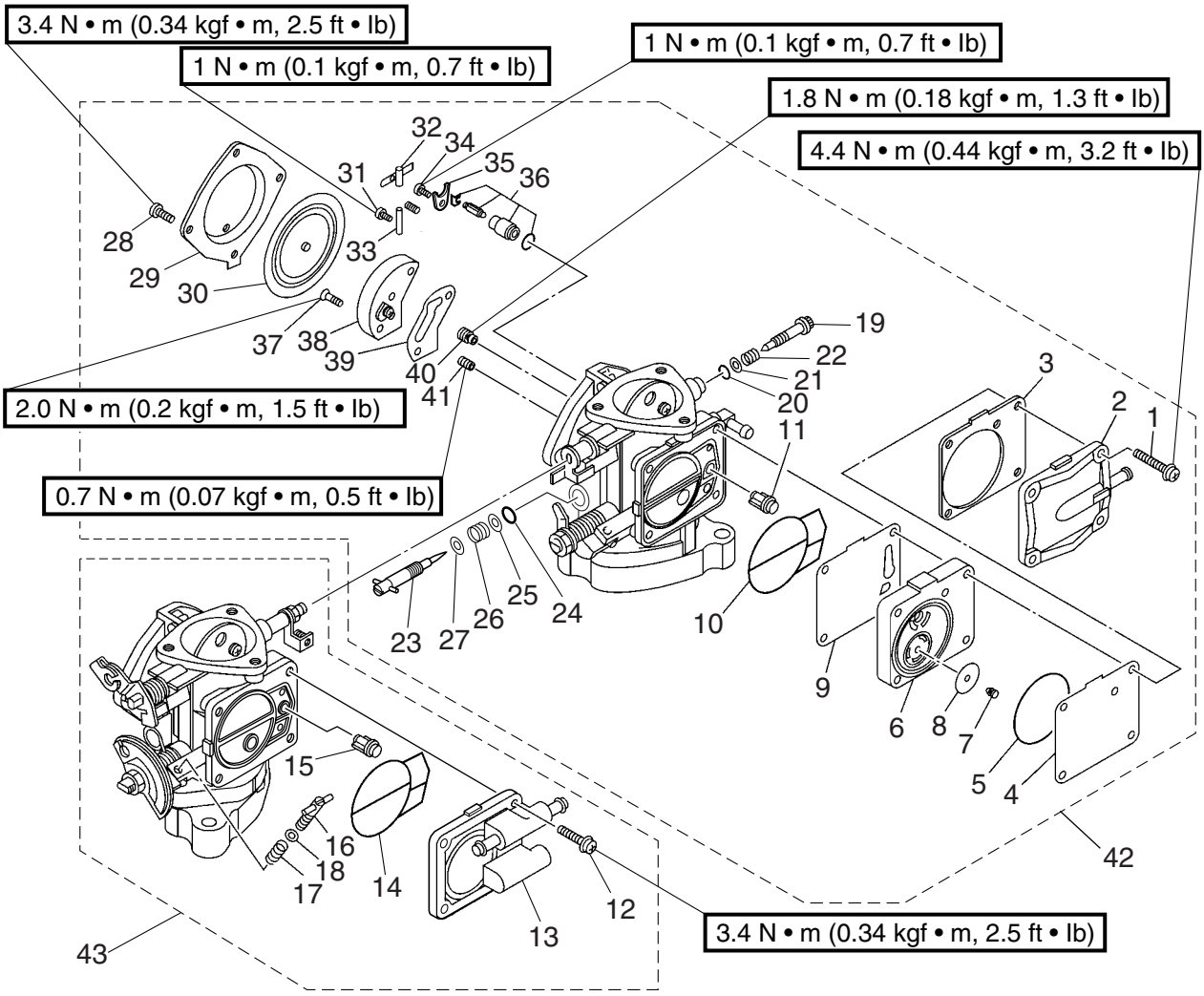
Carburetor assy. check

1. Adjust the trolling speed. See “Power unit” (3-4).

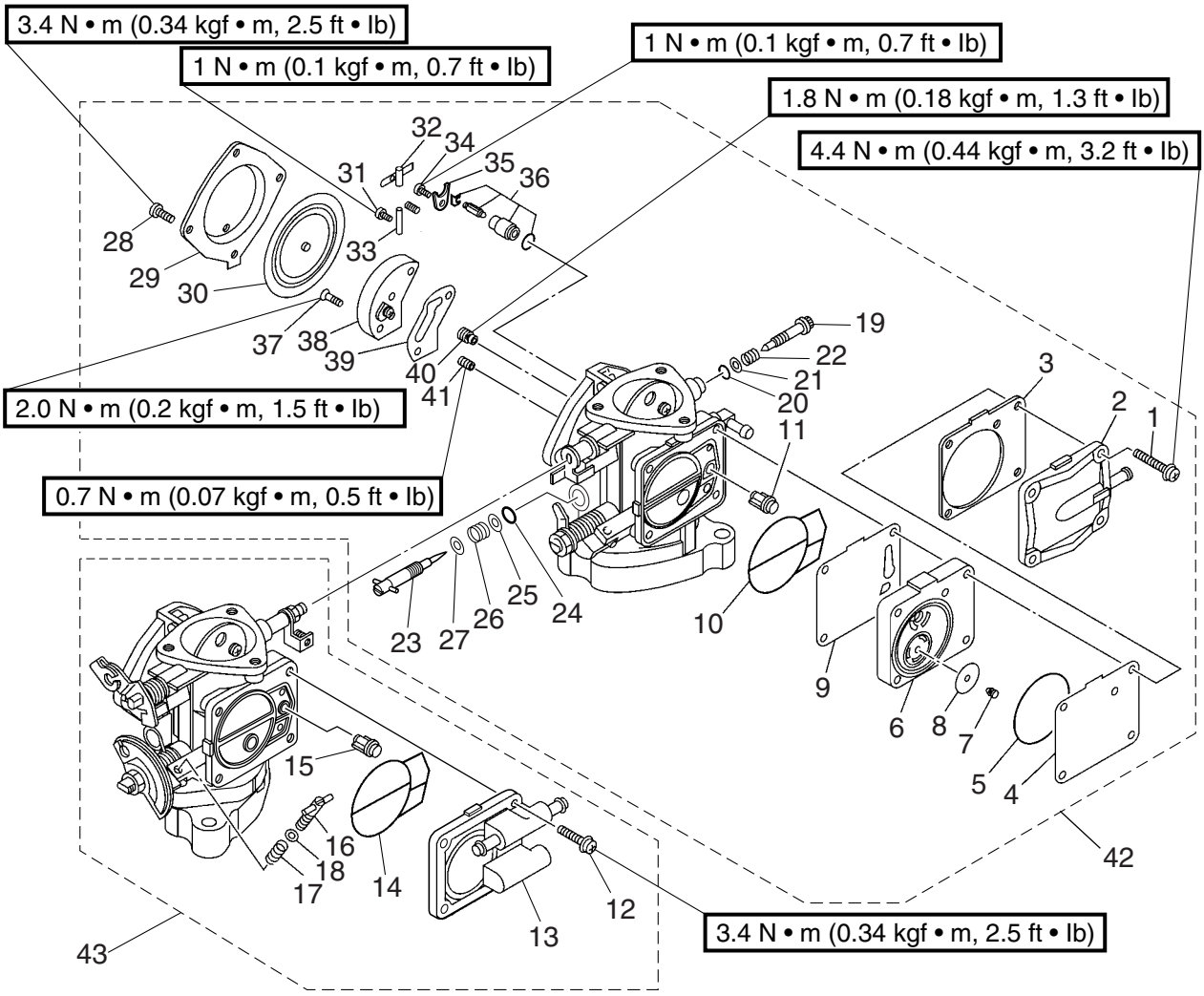
Carburetor and fuel pump



No.	Part name	Q'ty	Remarks
	Carburetor assy.		See "Carburetor unit" (4-8).
1	Screw	4	M5 × 30 mm
2	Cover	1	
3	Fuel pump gasket	1	**Not reusable**
4	Fuel pump diaphragm	1	
5	O-ring	1	
6	Fuel pump diaphragm body	1	
7	Bushing	2	
8	Valve seat	2	
9	Diaphragm	1	
10	Packing	1	
11	Fuel filter	1	
12	Screw	4	M5 × 18 mm
13	Cover	1	
14	Packing	1	
15	Fuel filter	1	



No.	Part name	Q'ty	Remarks
16	Idle adjusting screw	1	
17	Spring	1	
18	Washer	1	
19	High speed screw	2	
20	O-ring	2	**Not reusable**
21	Washer	2	
22	Spring	2	
23	Low speed screw	2	
24	O-ring	2	**Not reusable**
25	Washer	2	
26	Spring	2	
27	Washer	2	
28	Screw	8	M5 × 12 mm
29	Cover	2	
30	Diaphragm	2	
31	Screw	2	M3 × 6 mm



No.	Part name	Q'ty	Remarks
32	Arm	2	
33	Pin	2	
34	Screw	2	M3 × 6 mm
35	Plate	2	
36	Needle valve assy.	2	
37	Screw	4	M4 × 11 mm
38	Body assy.	2	
39	Gasket	2	**Not reusable**
40	Main jet	2	Carburetor 1 (R): #130 Carburetor 2 (F): #120
41	Pilot jet	2	#67.5
42	Carburetor assy. 1	1	
43	Carburetor assy. 2	1	

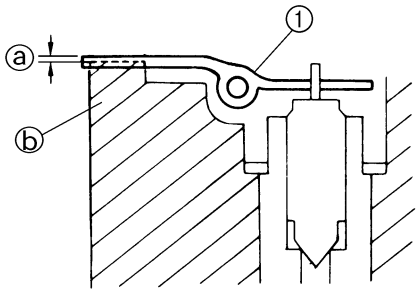
Diaphragm check

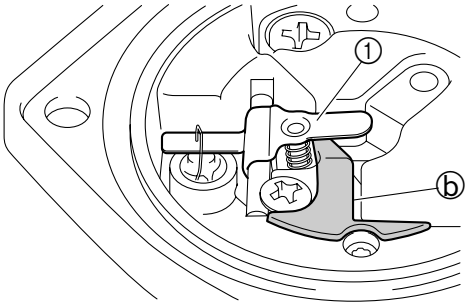
1. Check the diaphragm. Replace if damaged.

Arm check

1. Check the arm ①. Repair if bent. Replace if damaged.

2. Measure the arm height ⓐ.





Arm height ⓐ: 0–0.2 mm (0–0.008 in)

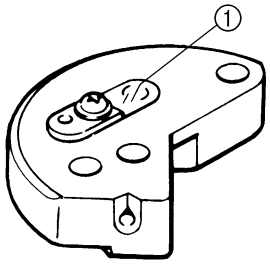
TIP:

- Measure the distance between the surface of the carburetor body ⓑ and the top surface of the arm.
- The arm should be resting on the needle valve, but not compressing it.

Body assy. check

1. Clean the body assy., and then check the body assy. Replace if damaged.

2. Check the valve (clear film) ①. Replace if damaged.

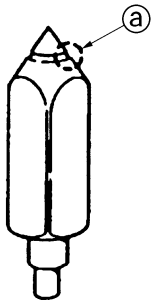


TIP:

Always replace the body assy. and valve (clear film) as a set.

Needle valve check

1. Clean the needle valve assy., and then check the needle valve assy. Replace if worn ⓐ.



TIP:

Always replace the needle valve and needle valve seat as a set.

Jet and carburetor body check

NOTICE

Do not use a steel wire to clean the jets. This may enlarge the jet diameters and seriously affect performance.

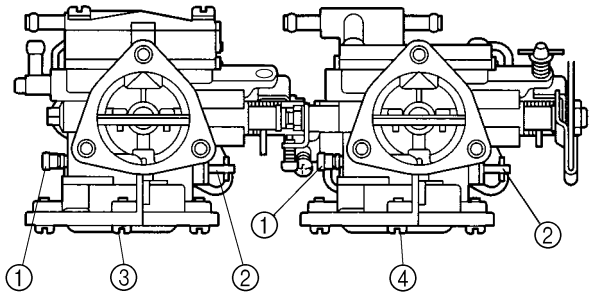
1. Clean the main jet, pilot jet and carburetor body, and then check the main jet, pilot jet and carburetor body. Replace if damaged or worn.

TIP:
Before disassembling the carburetor, make sure to note the number of times the speed screw is turned in from its set position to the seated position.

Fuel pump check
1. Check the fuel pump gasket, diaphragm, fuel pump diaphragm, fuel pump diaphragm body, and valve seat. Replace if damaged.

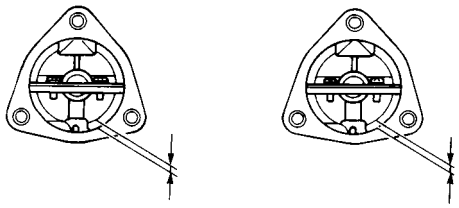
Fuel filter check
1. Clean the fuel filter, and then check the fuel filter. Replace if damaged.

High and low speed screw adjustment
1. Tighten the high speed screw ① and low speed screw ② until they are lightly seated, then out the specified number of turns.



High speed screw:
1 1/8 ± 1/4 turn out [carburetor 1 (rear) ③]
5/8 ± 1/4 turn out [carburetor 2 (front) ④]
Low speed screw:
5/8 ± 1/4 turn out

Throttle valve synchronization check and adjustment
1. While turning the throttle cable pulley, check that the opening angle of both throttle valves is the same.



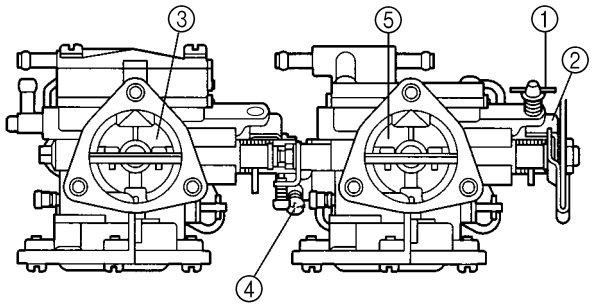
2. Turn out the idle adjusting screw ① until its tips are no longer touching the throttle cable pulley ②.

TIP:
Record the set position of the idle adjusting screw.

3. Check that the throttle valve of the Carburetor 1 (rear) ③ is fully closed.

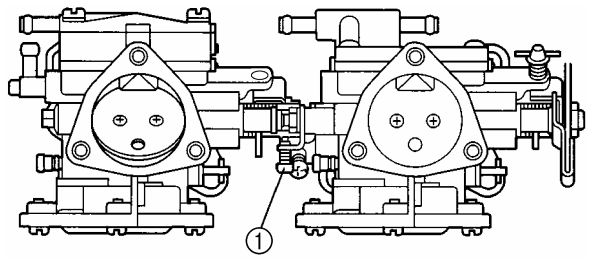
4. Turn the synchronization screw ④ in or out until the throttle valve of the Carburetor 2 (front) ⑤ is fully closed.

5. Turn in the idle adjusting screws to the set position.



Choke valve synchronization check and adjustment
1. While turning the choke lever, check that the opening angle of both choke valves is the same.

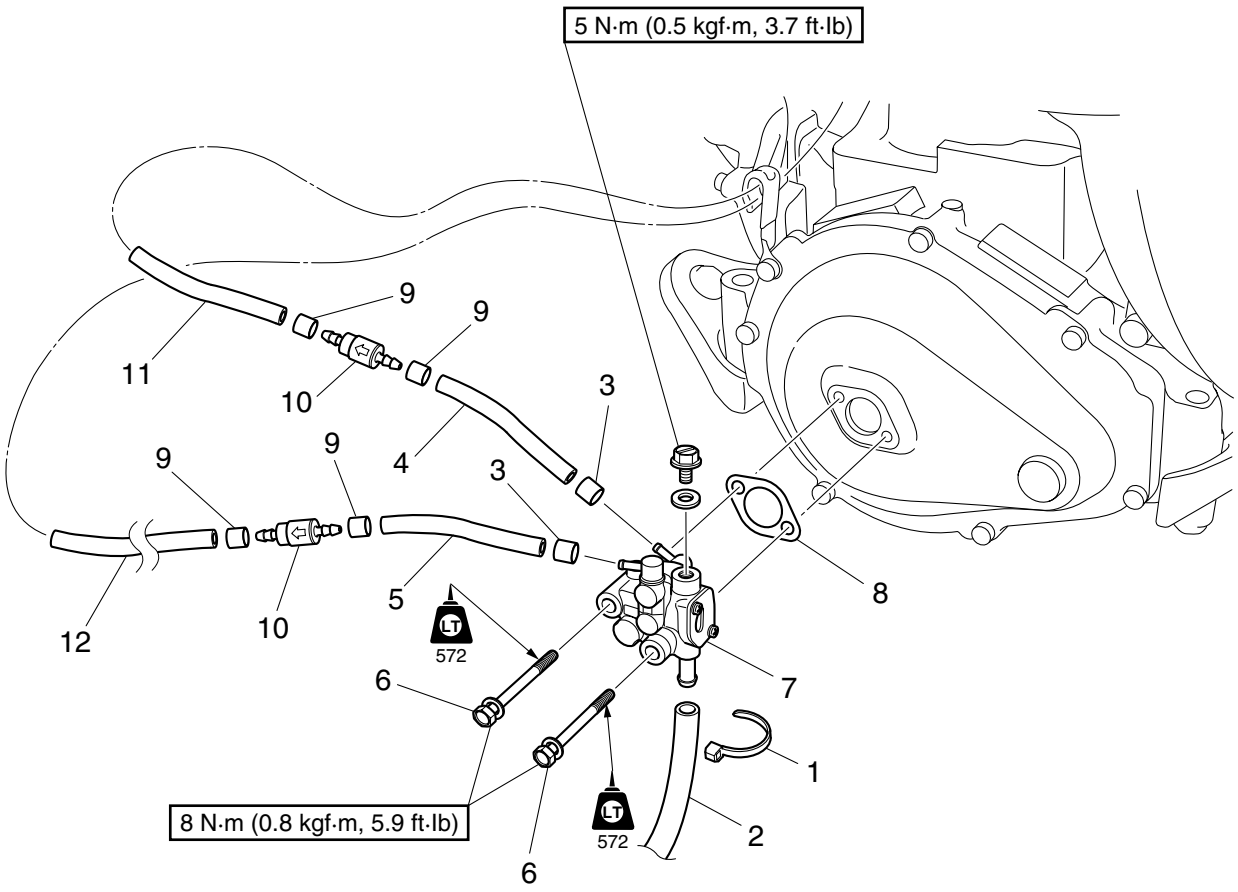
2. Turn the synchronization screw ① in or out until both choke valves are fully closed when the choke lever is turned to the closed position.



Carburetor assy. check

1. Adjust the trolling speed. See “Power unit” (3-4).

Oil pump



No.	Part name	Q'ty	Remarks
1	Band	1	
2	Oil hose	1	
3	Hose clamp	2	
4	Oil delivery hose 1	1	85 mm (3.35 in)
5	Oil delivery hose 1	1	70 mm (2.76 in)
6	Bolt	2	M6 × 35 mm
7	Oil pump	1	
8	Gasket	1	**Not reusable**
9	Hose clamp	4	
10	Check valve	2	
11	Oil delivery hose 2	1	210 mm (8.27 in)
12	Oil delivery hose 2	1	450 mm (17.72 in)

Oil pump check

NOTICE

- **If the oil delivery hoses are not full of oil, fill them up.**
- **After installing the oil injection system, bleed the system of any air.**

1. Clean the oil pump, and then check the oil pump. Replace if damaged or worn.

Oil hose check

NOTICE

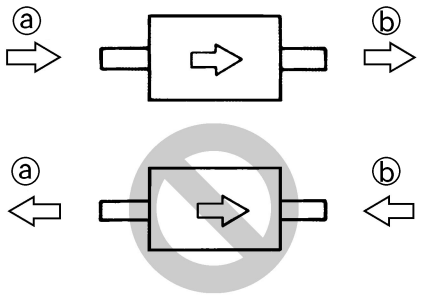
- **If the oil delivery hoses are not full of oil, fill them up.**
- **After installing the oil injection system, bleed the system of any air.**

1. Check the oil hose and oil delivery hose. Replace if cracked or damaged.

Check valve check

1. Blow into the end ⓐ of the check valve, and make sure that airflow from the end ⓑ is unrestricted. Replace if the airflow is restricted.

2. Blow into the end ⓑ of the check valve, and make sure that airflow from the end ⓐ is restricted. Replace if the airflow is unrestricted.



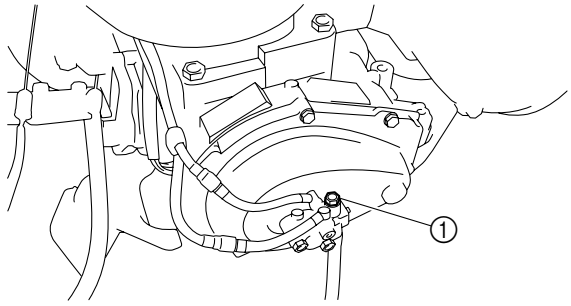
Oil pump air bleeding

NOTICE

Do not run the engine if oil does not flow out of the air bleed screw. Inspect the oil hose for proper routing and make sure there are no restrictions in the line.

1. Place rags around the air bleed screw ① to catch any oil that might spill.

2. Fill the oil tank with the recommended oil.



Recommended engine oil:
YAMALUBE 2-W, or an equivalent
NMMA-certified TC-W3 marine oil

TIP:
If the oil pump is replaced or the oil delivery hose is reinstalled, bleed air from the hose by disconnecting its from the oil pump.
After bleeding the air, reconnect the hose.

3. Loosen the air bleed screw ① two full turns and make sure that both oil and air bubbles flow out.

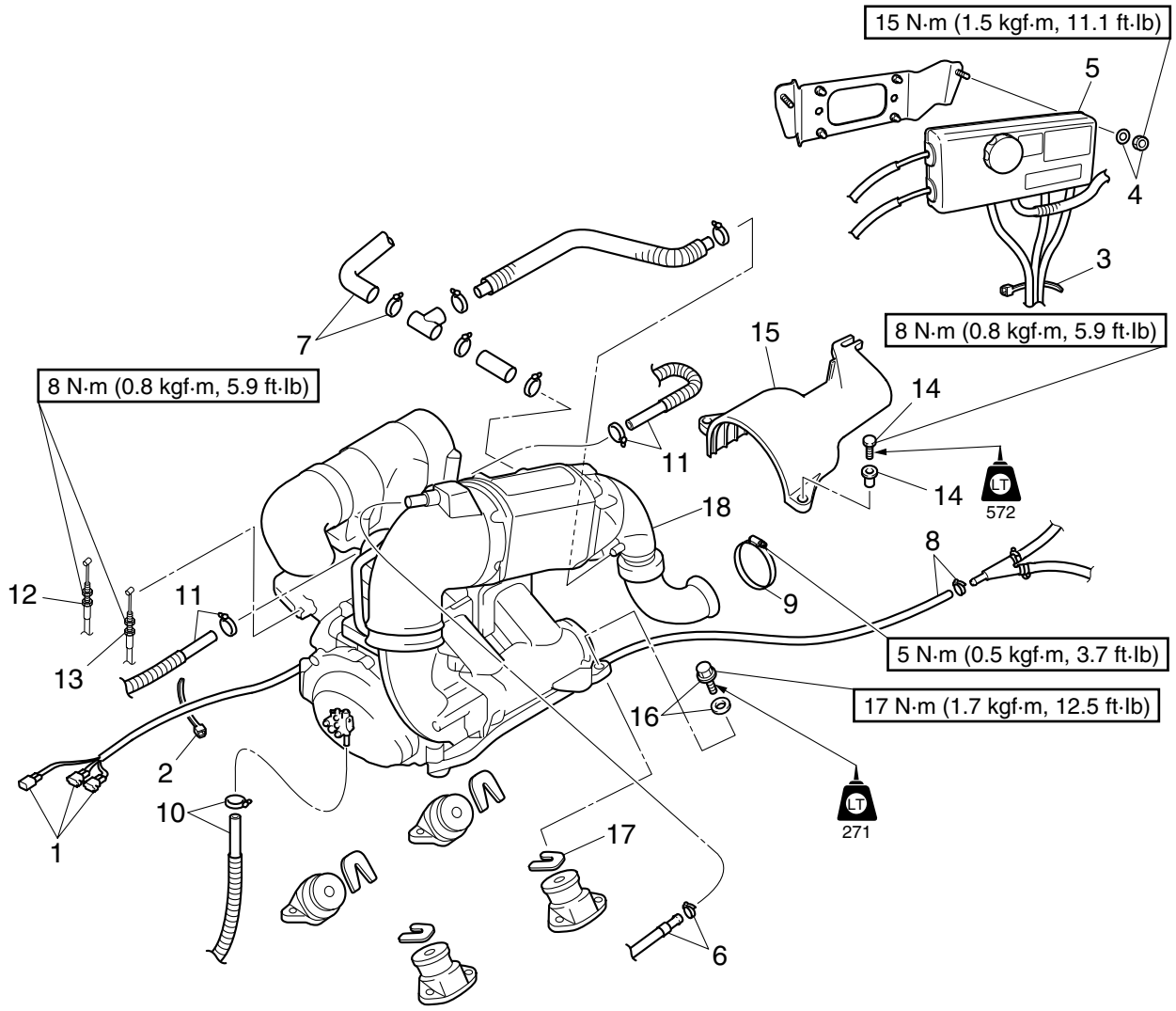
4. When there are no air bubbles left, tighten the air bleed screw.

Air bleed screw:
5 N·m (0.5 kgf·m, 3.7 ft·lb)

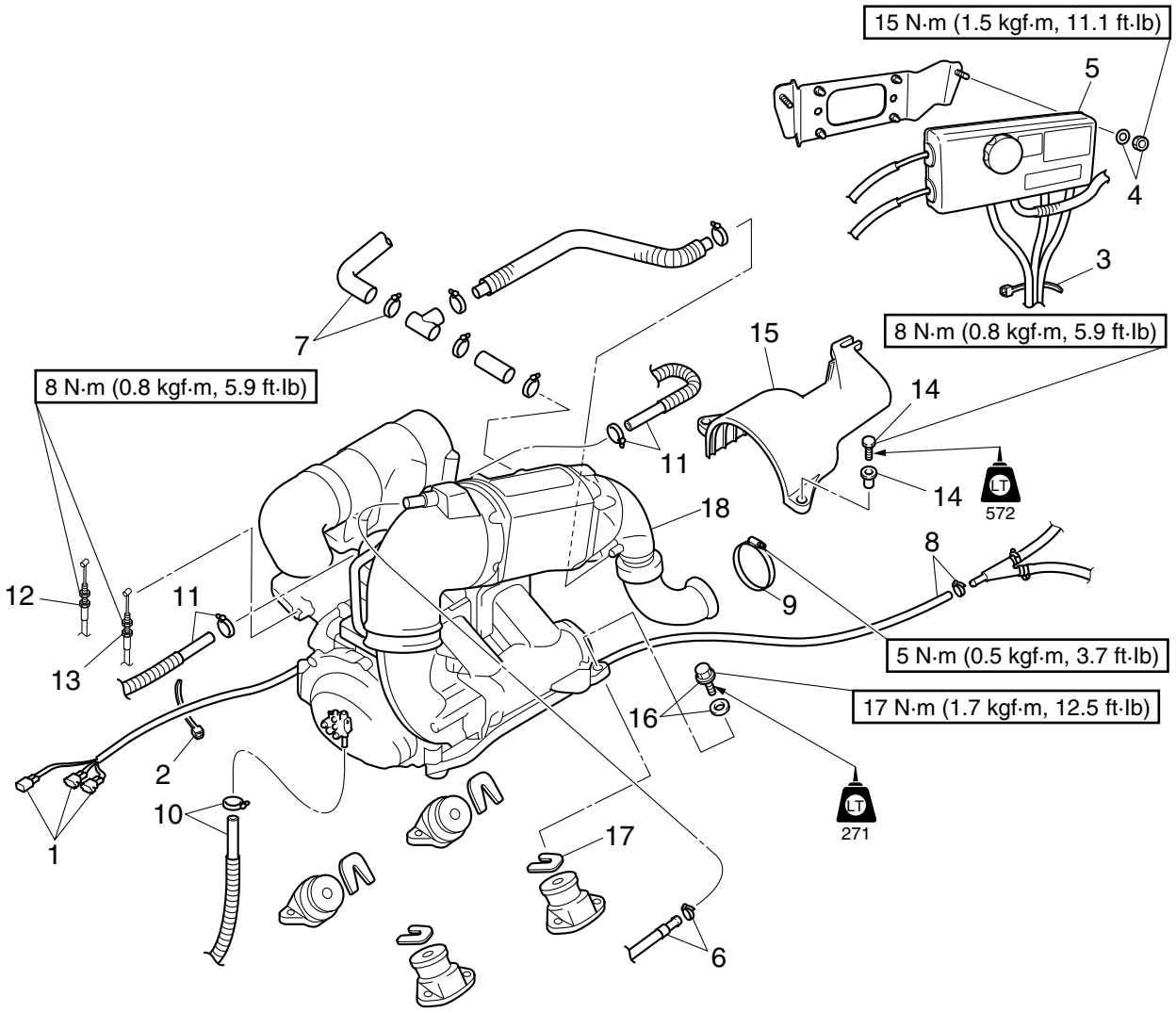
5. Wipe up any spilt oil.

Power unit

Engine unit



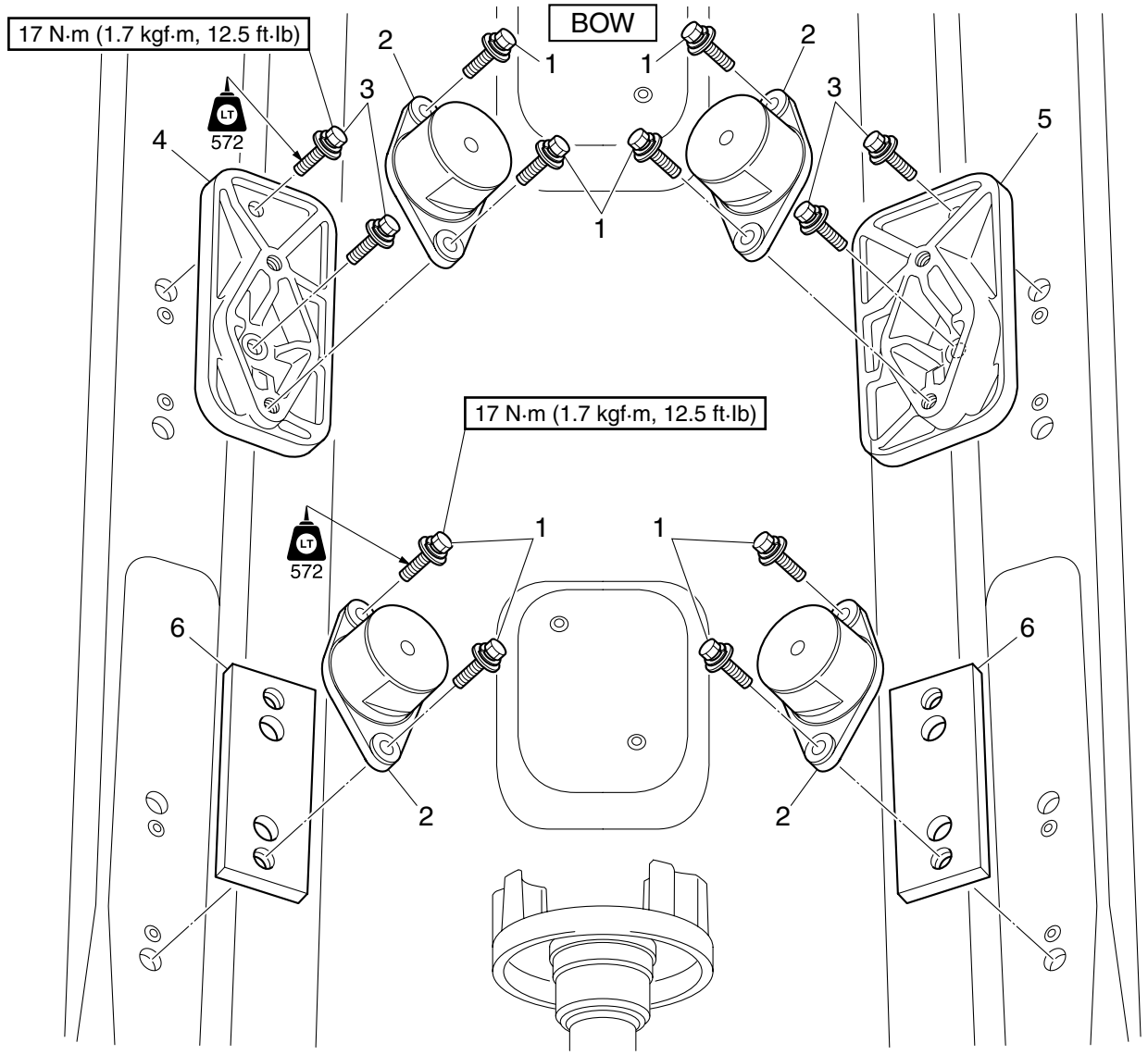
No.	Part name	Q'ty	Remarks
	Storage compartment panel		See "Front hood" (8-8).
	Positive and negative battery lead		See "Electrical box" (7-2).
1	Coupler	3	
2	Plastic tie	7	
3	Plastic tie	1	
4	Nut/washer	2/2	
5	Electrical box	1	
6	Band/cooling water hose	1/1	[A] Cooling water pilot outlet
7	Band/cooling water hose	1/1	
8	Clamp/cooling water hose	1/1	[B] Cooling water outlet
9	Clamp	1	
10	Band/oil hose	1/1	
11	Band/fuel hose	2/2	
12	Choke cable	1	
13	Throttle cable	1	



No.	Part name	Q'ty	Remarks
14	Bolt/collar	2/2	M6 × 25 mm
15	Coupling cover	1	
16	Bolt/washer	4/4	M8 × 35 mm
17	Shim	*	
18	Engine unit	1	

*: As required.

Engine mount



No.	Part name	Q'ty	Remarks
1	Bolt	8	M8 × 35 mm
2	Engine mount	4	
3	Bolt	4	
4	Bracket	1	
5	Bracket	1	
6	Bracket	2	

Engine unit removal

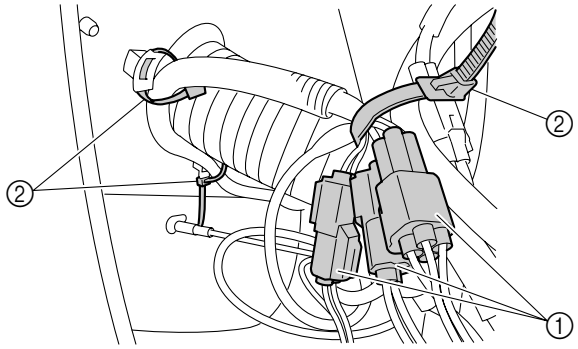
NOTICE

Before removing the engine, make sure to take adequate measures to protect the deck opening from damage.

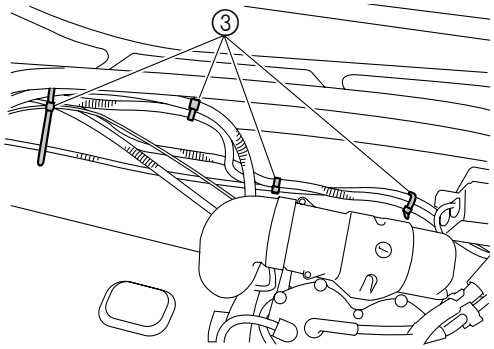
1. Disconnect the negative battery cable, and then disconnect the positive battery cable.

2. Remove the service lid.

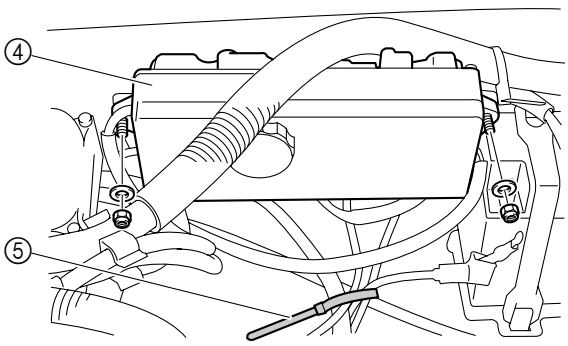
3. Disconnect the multifunction meter couplers ①, and then remove the plastic ties ②.



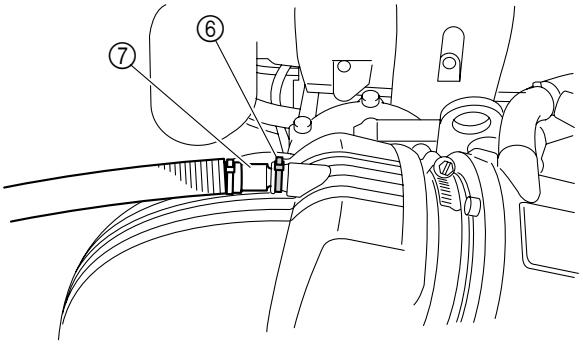
4. Remove the wiring harness from the plastic ties ③.



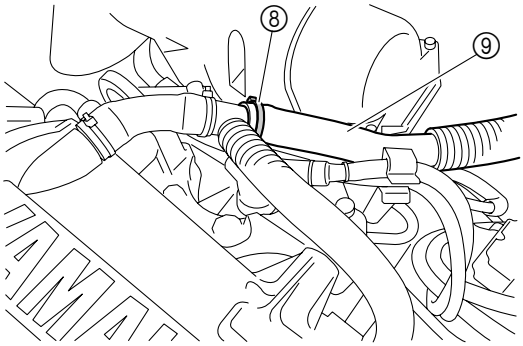
5. Remove the electrical box ④ and plastic ties ⑤.



6. Remove the band ⑥, and then disconnect the cooling water hose ⑦.

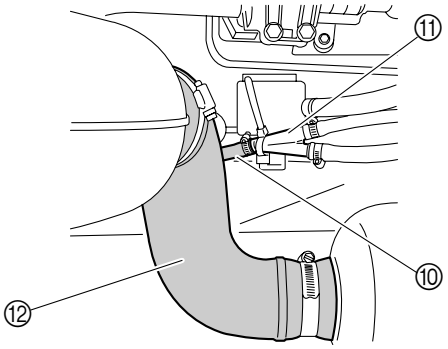


7. Remove the band ⑧, and then disconnect the cooling water hose ⑨.

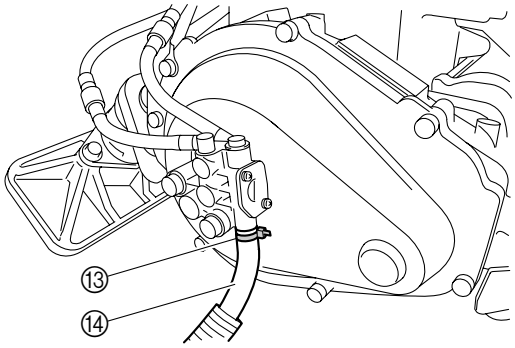


8. Disconnect the cooling water hose ⑩ from hose joint ⑪.

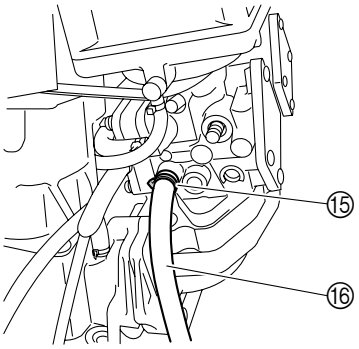
9. Disconnect the exhaust hose ⑫ from the water lock.



10. Remove the band ⑬, and then disconnect the oil hose ⑭ from oil pump.



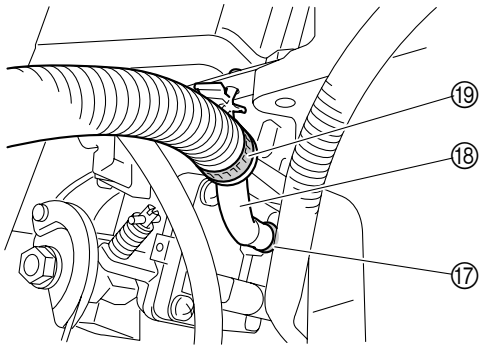
11. Remove the band ⑮, and then disconnect the fuel hose ⑯.



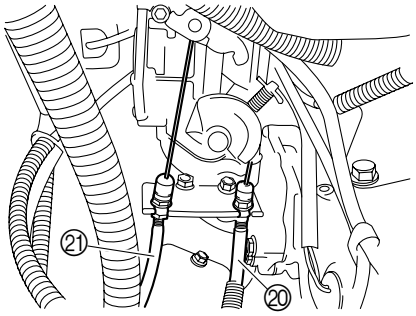
TIP:
When removing the fuel hose, remove the fuel filler cap to reduce any pressure inside the fuel tank.

12. Remove the band ⑰, and then disconnect the fuel hose ⑱.

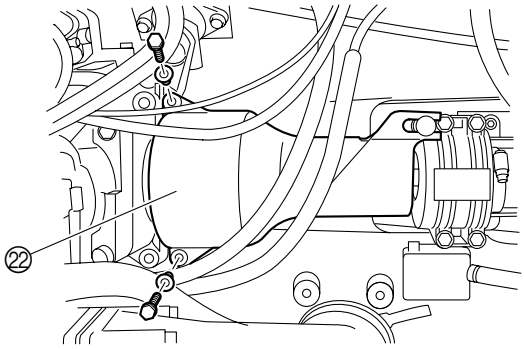
13. Remove the fuel hose ⑱ from the plastic ties ⑲.



14. Disconnect the throttle cable ⑳ and choke cable ㉑.



15. Remove the coupling cover ㉒.

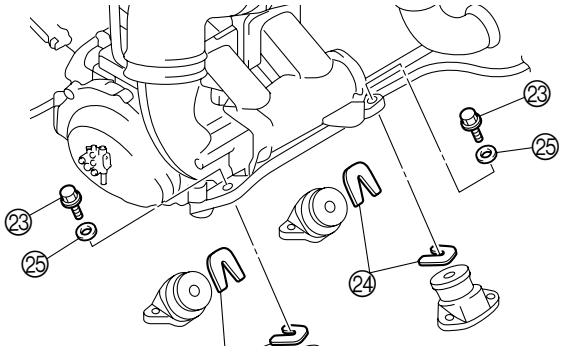


16. Loosen the engine mounting bolts ㉓.

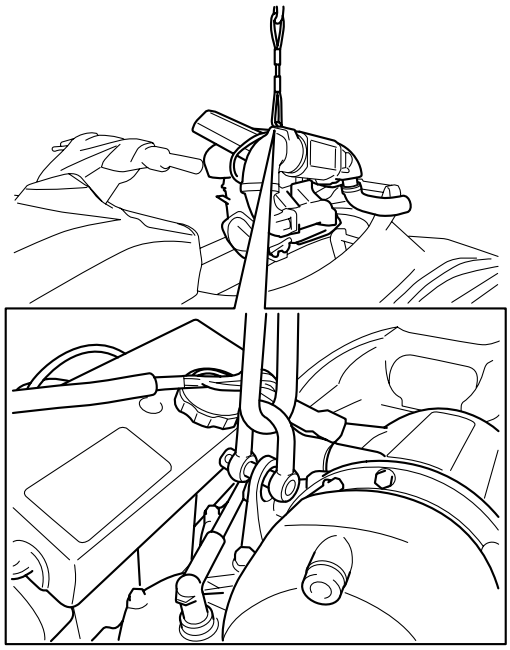
17. Lift the engine unit slightly, remove the shims ㉔, and then lower the unit.

TIP:
Make a note of the position of each removed shim so that it can be installed in its original position.

18. Remove the engine mounting bolts ㉓ and washer ㉕.



19. Suspend the engine unit using an engine hangers, and then separate the unit from the engine mounts and move it forward to disconnect the coupling. ***NOTICE:*** **When removing the engine unit, take care to avoid causing damage to the hull liner and deck opening.**



Engine mount check

1. Check the engine mounts. Replace if cracked or damaged.

TIP:

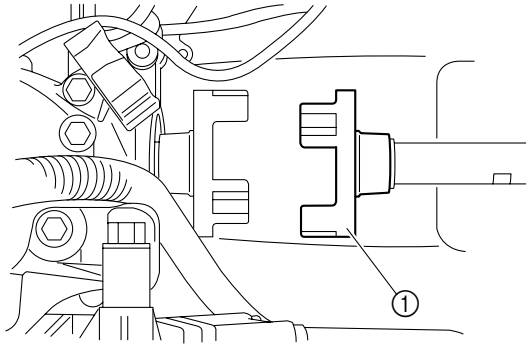
- Make a note of the position of each engine mount so that it can be installed in its original position.
- When replacing the engine mounts, make sure to check the coupling clearance.

Engine unit installation

NOTICE

When installing the engine unit, take care to avoid causing damage to the hull liner and deck opening.

1. Move the engine unit rearward to connect the coupling ①, and then lower the unit onto the engine mounts.

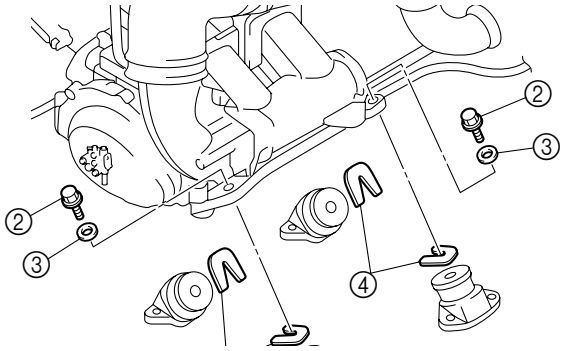


TIP:

Do not install the rubber damper until the coupling clearance adjustment has been made.

2. Temporarily install the engine mounting bolts ② and washer ③.

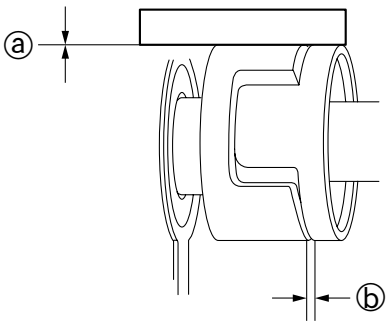
3. Lift the engine unit slightly, install the shims ④, and then lower the unit.



TIP:

Install the shims in their original positions.

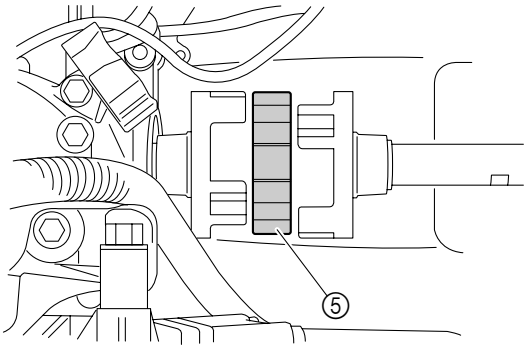
4. Measure the coupling clearance ⓐ, and if necessary, add or remove shims ④ so that the clearance ⓑ is within specification.



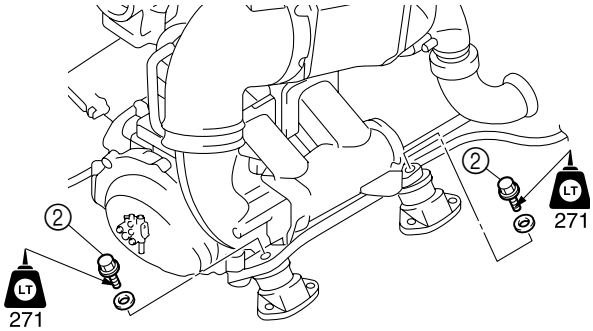
Clearance ⓐ:
Less than 1.0 mm (0.039 in) (without rubber damper)
Clearance ⓑ:
2.0–4.0 mm (0.079–0.157 in)

Available shim thicknesses:
0.10, 0.30, 0.50, 1.00, and 2.00 mm

5. Lift the engine unit slightly, remove the shims ④, and then lower the engine unit.
6. Remove the engine mounting bolts ② and washer ③.
7. Separate the engine unit from the engine mounts and move it forward to disconnect the coupling.
8. Install the rubber damper ⑤.

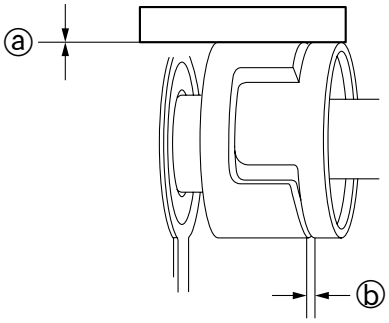


9. Install the shims ④, and then adjust the position of the engine unit so that the coupling clearances ⓐ and ⓑ are within specification.
10. Tighten the engine mounting bolts ② to the specified torque.



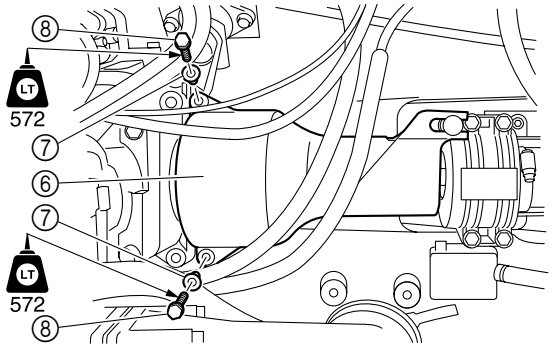
Engine mounting bolt ②:
17 N·m (1.7 kgf·m, 12.5 ft·lb)

11. Check that the coupling clearances ⓐ and ⓑ are within specification. Readjust if out of specification.



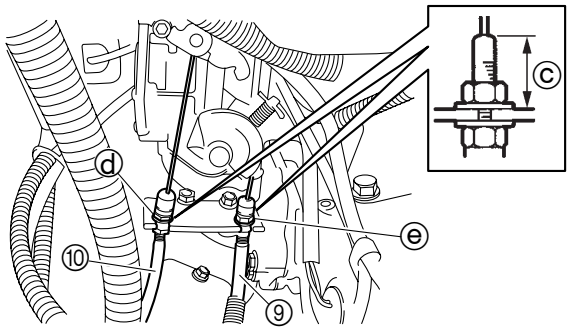
Clearance ⓐ:
Less than 0.5 mm (0.039 in) (with rubber damper)
Clearance ⓑ:
2.0–4.0 mm (0.079–0.157 in)

12. Install the coupling cover ⑥ and collar ⑦, and then tighten the bolt ⑧ to the specified torque.



Coupling cover bolt ⑧:
8 N·m (0.8 kgf·m, 5.9 ft·lb)

13. Connect the throttle cable ⑨ and choke cable ⑩.
14. Check the throttle cable installation length ⓒ and choke cable installation length ⓒ is within specification, and then tighten the nuts to the specified torque.

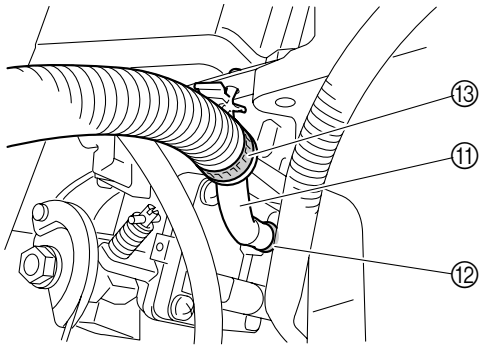


Choke cable and throttle cable guide installation position ⓒ:
14.0 ± 1.0 mm (0.55 ± 0.04 in)

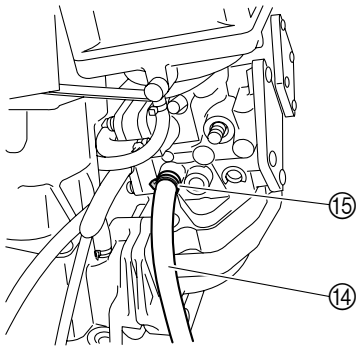
Choke cable nut ⓓ:
8 N·m (0.8 kgf·m, 5.9 ft·lb)
Throttle cable nut ⓔ:
8 N·m (0.8 kgf·m, 5.9 ft·lb)

15. Connect the fuel hose ⑪, and then install the band ⑫.

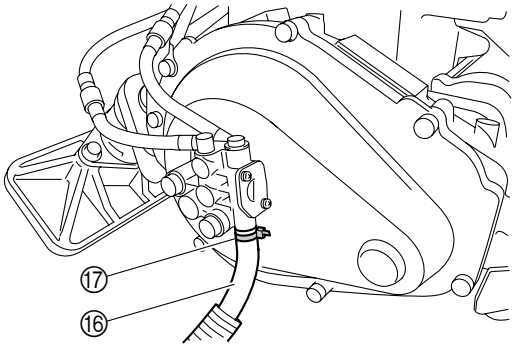
16. Install the plastic ties ⑬.



17. Connect the fuel hose ⑭, and then install the band ⑮.

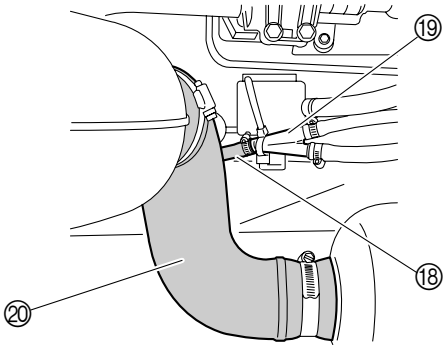


18. Connect the oil hose ⑯, and then install the band ⑰.

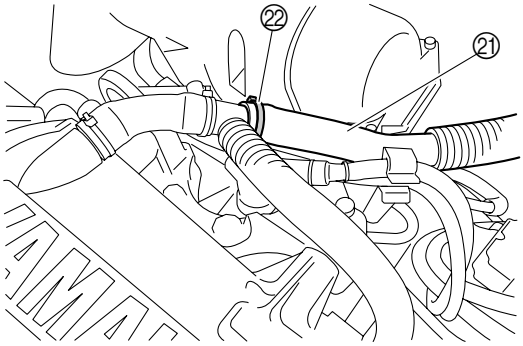


19. Connect the cooling water hose ⑱ to hose joint ⑲.

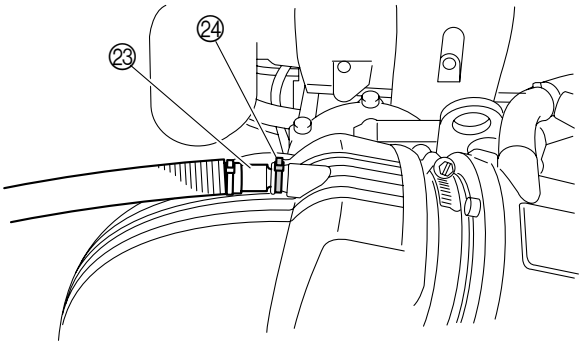
20. Connect the exhaust hose ⑳.



21. Connect the cooling water hose ㉑, and then install the band ㉒.



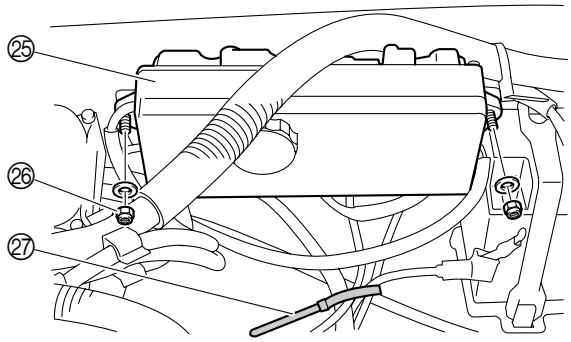
22. Connect the cooling water hose ㉓, and then install the band ㉔.



5

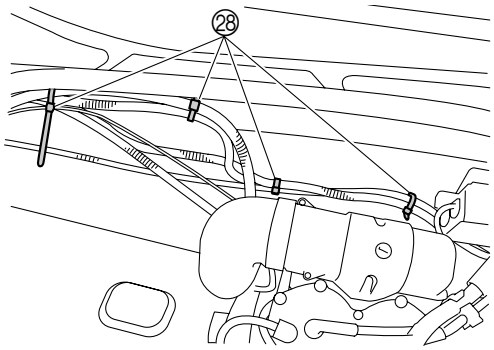
23. Install the fuse box assy. ㉕, and then tighten the nuts ㉖ to the specified torque.

24. Install the band ㉗.

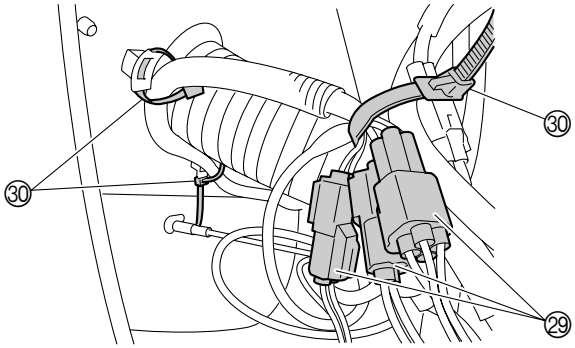


Electrical box nut ㉖:
15 N·m (1.5 kgf·m, 11.1 ft·lb)

25. Install the plastic ties ㉘.



26. Connect the multifunction meter couplers ㉙, and then install the plastic ties ㉚.

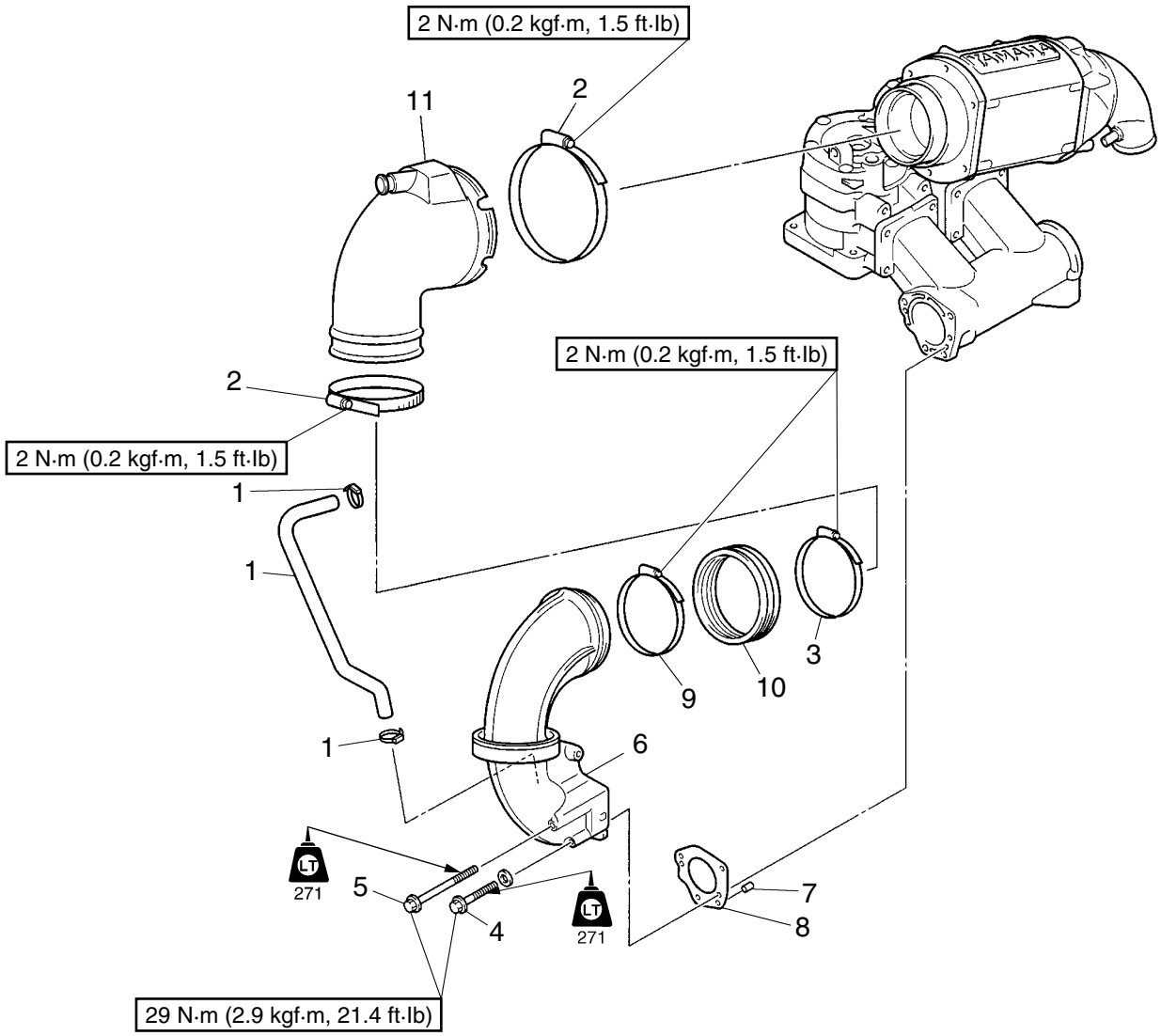


27. Install the service lid.

28. Connect the positive battery cable, and then connect the negative battery cable.

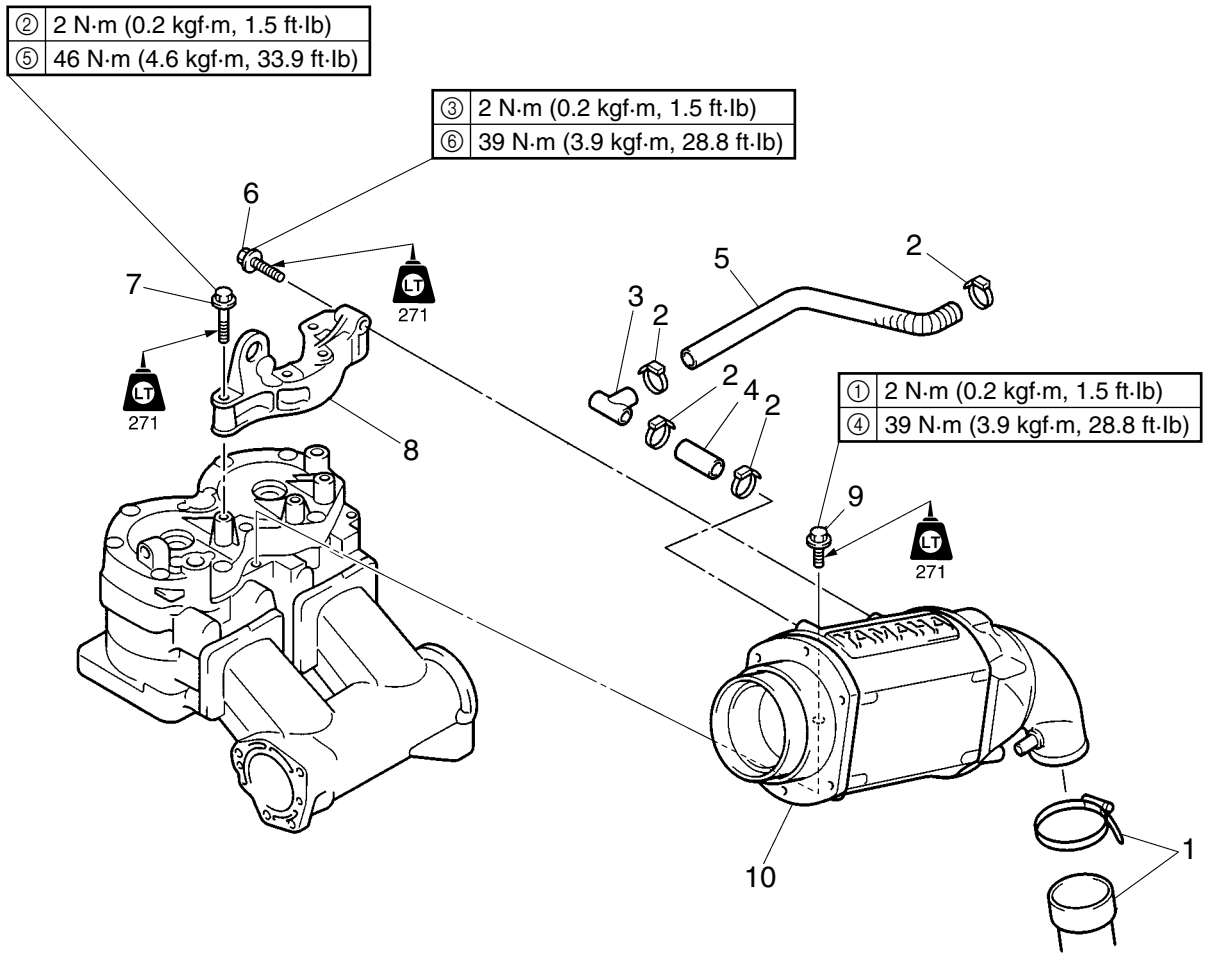
29. Coat the battery cable terminals and battery terminals with water resistance grease.

Exhaust ring



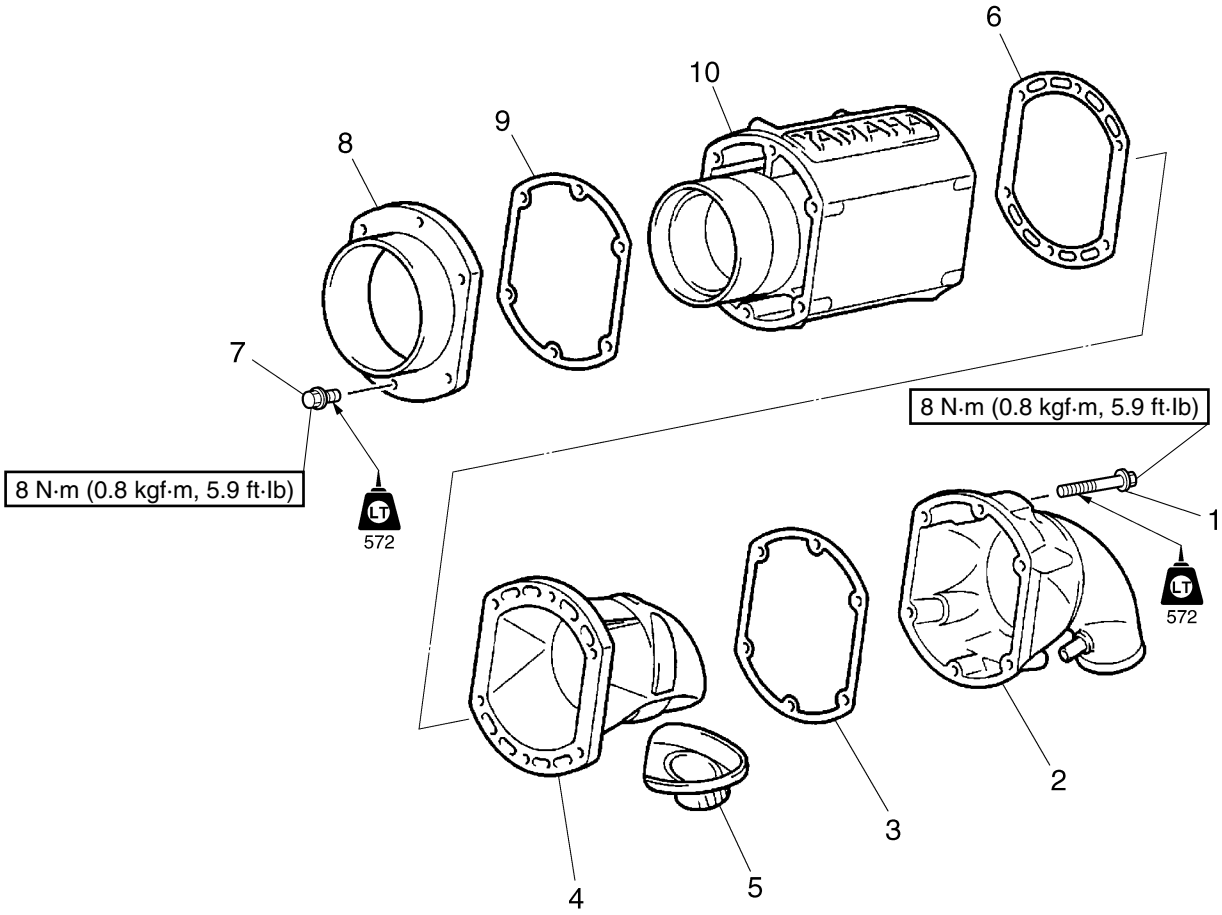
No.	Part name	Q'ty	Remarks
1	Band/pilot water hose	2/1	
2	Clamp	2	
3	Clamp	1	
4	Bolt	2	M8 × 75 mm
5	Bolt	2	M8 × 115 mm
6	Exhaust ring	1	
7	Dowel pin	2	
8	Gasket	1	**Not reusable**
9	Clamp	1	
10	Joint	1	
11	Exhaust joint	1	

Exhaust chamber assy.



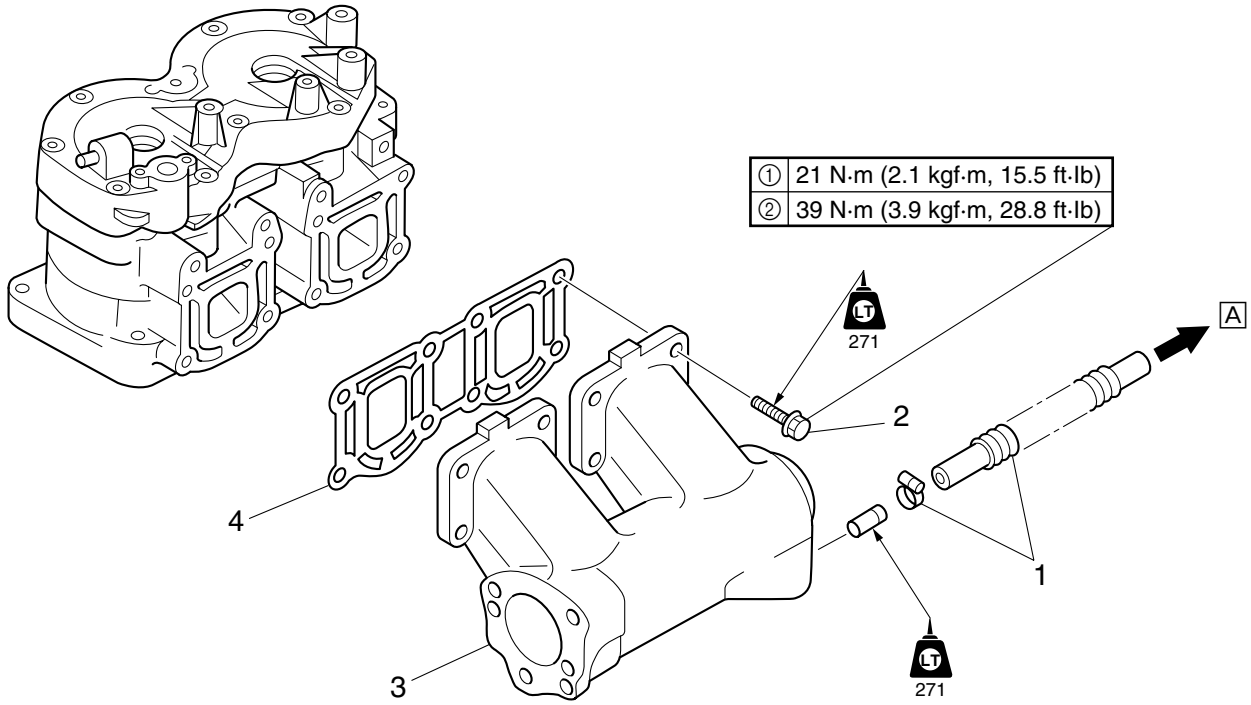
No.	Part name	Q'ty	Remarks
	Exhaust ring		See "Exhaust ring" (5-10).
1	Clamp/exhaust hose	1/1	
2	Band	4	**Not reusable**
3	Joint	1	
4	Hose	1	
5	Hose	1	
6	Bolt	2	M10 × 35 mm
7	Bolt	4	M10 × 45 mm
8	Muffler stay	1	
9	Bolt	2	M10 × 35 mm
10	Exhaust chamber assy.	1	

Exhaust chamber



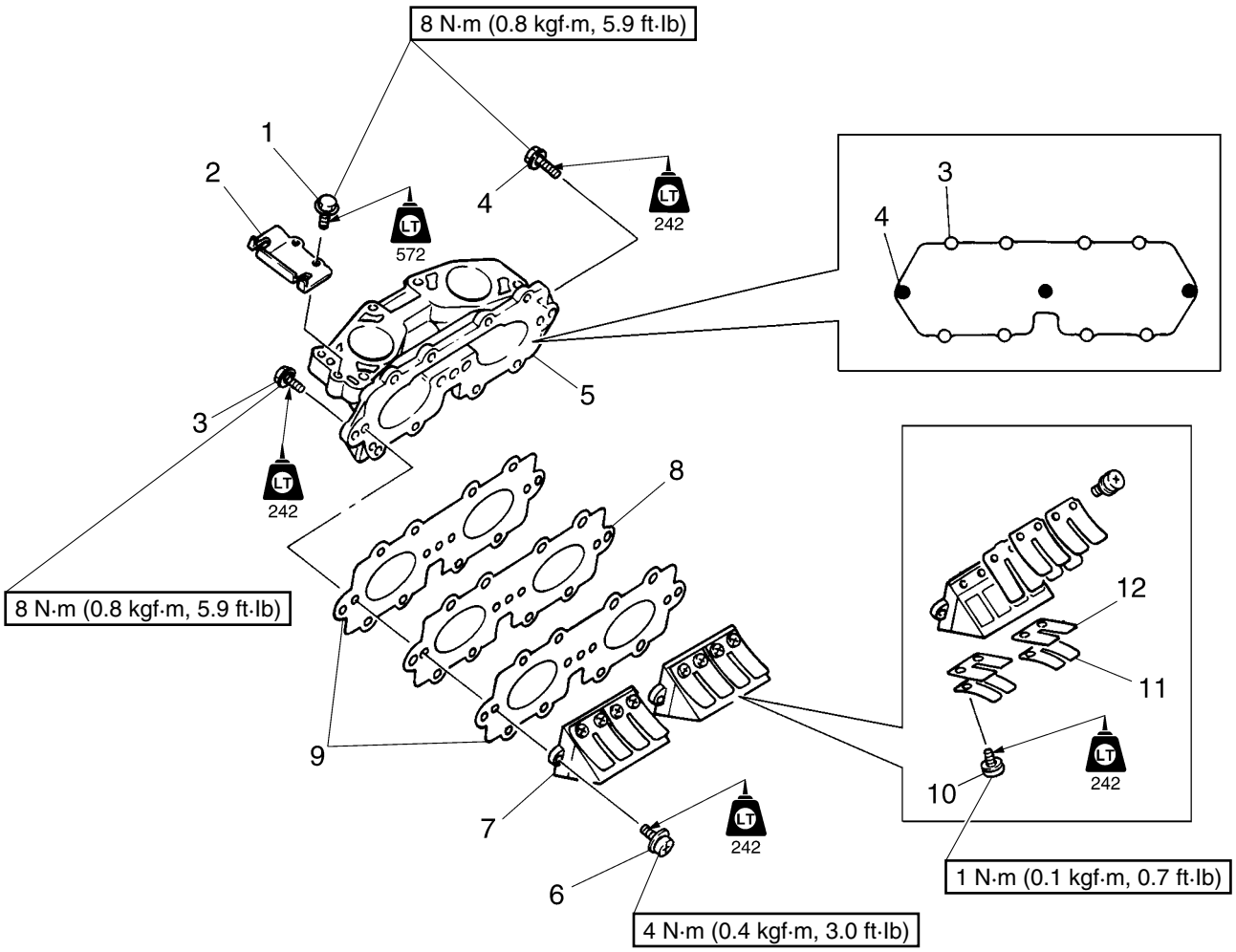
No.	Part name	Q'ty	Remarks
1	Bolt	6	M6 × 70 mm
2	Exhaust outer cover 1	1	
3	Gasket	1	**Not reusable**
4	Exhaust inner cover	1	
5	Rubber seal	1	
6	Gasket	1	**Not reusable**
7	Bolt	6	M6 × 25 mm
8	Exhaust outer cover 2	1	
9	Gasket	1	**Not reusable**
10	Exhaust chamber	1	

Muffler



No.	Part name	Q'ty	Remarks
	Exhaust chamber		See "Exhaust chamber assy." (5-11).
1	Clamp/cooling water hose	1/1	A Cooling water inlet
2	Bolt	8	M10 × 35 mm
3	Muffler	1	
4	Gasket	1	**Not reusable**

Reed valves

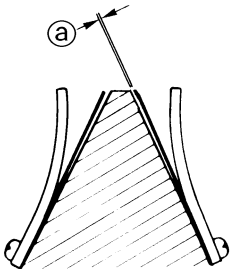


No.	Part name	Q'ty	Remarks
	Carburetor assy.		See "Carburetor unit" (4-8).
1	Bolt	2	M6 × 16 mm
2	Plate	1	
3	Bolt	8	M6 × 25 mm
4	Bolt	3	M6 × 35 mm
5	Intake manifold	1	
6	Screw	4	M5 × 15 mm
7	Reed valve assy.	2	
8	Plate	1	
9	Gasket	2	**Not reusable**
10	Screw	16	M3 × 8 mm
11	Valve stopper	8	
12	Reed valve	8	

Reed valve check

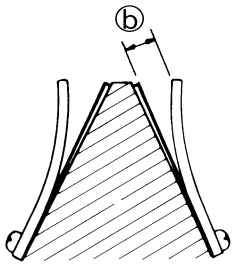
1. Check the reed valves. Replace if cracked or damaged.

2. Measure the valve warpage ⓐ. Replace if out of specification.



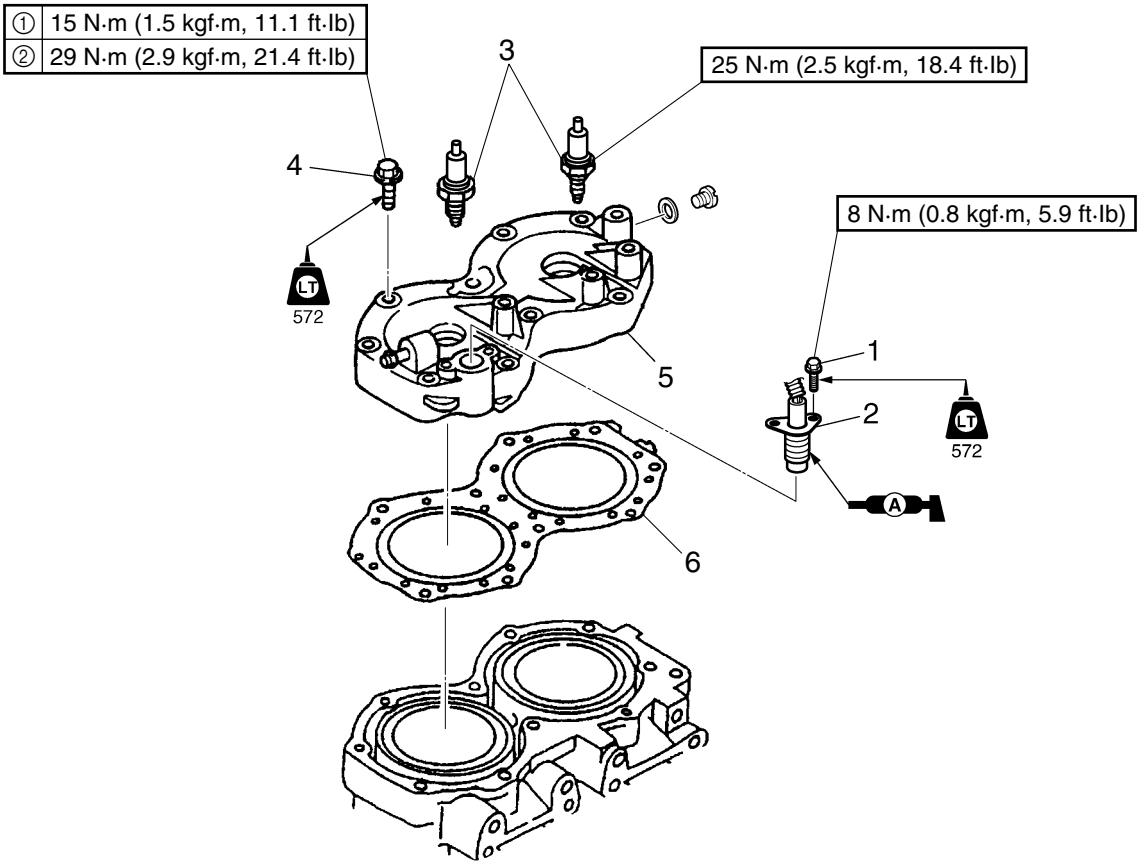
Valve warpage limit: 0.2 mm (0.01 in)

3. Measure the valve stopper height ⓑ. Replace if out of specification.



Valve stopper height: 8.8–9.2 mm (0.35–0.36 in)

Cylinder head



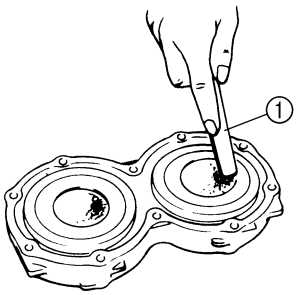
No.	Part name	Q'ty	Remarks
	Exhaust chamber assy.		See "Exhaust chamber assy." (5-11).
1	Bolt	2	M6 × 16 mm
2	Thermoswitch	1	
3	Spark plug	2	
4	Bolt	10	M8 × 50 mm
5	Cylinder head	1	
6	Gasket	1	

Cylinder head check

NOTICE

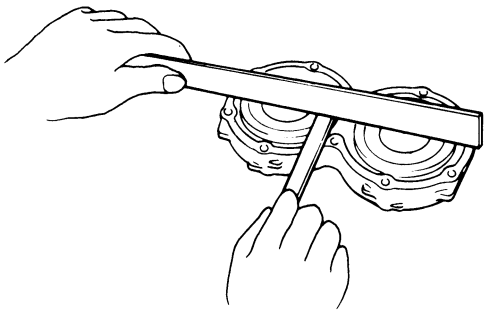
Do not use a sharp instrument to avoid damaging or scratching the cylinder head or spark plug bore threads.

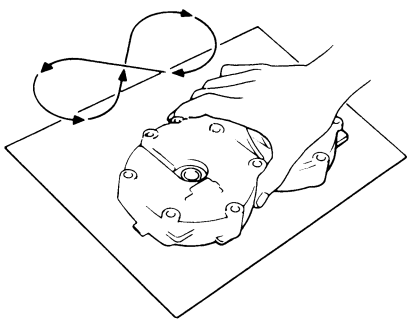
1. Eliminate the carbon deposits (using a rounded scraper ①).



2. Check the cylinder head water jacket. Clean or replace the cylinder head if there is corrosion or mineral deposits.

3. Measure the cylinder head warpage. Resurface if out of specification or if there are score marks.





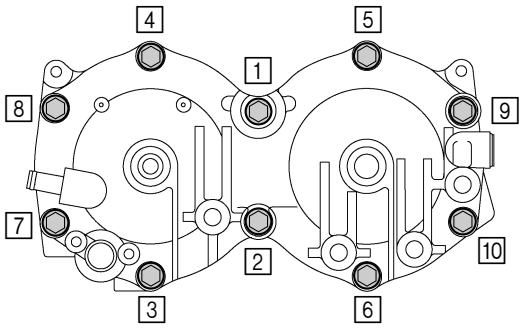
Warpage limit: 0.1 mm (0.004 in)

TIP:

Place 400–600 grit wet sandpaper on a surface plate and resurface the cylinder head using a figure-eight sanding pattern.

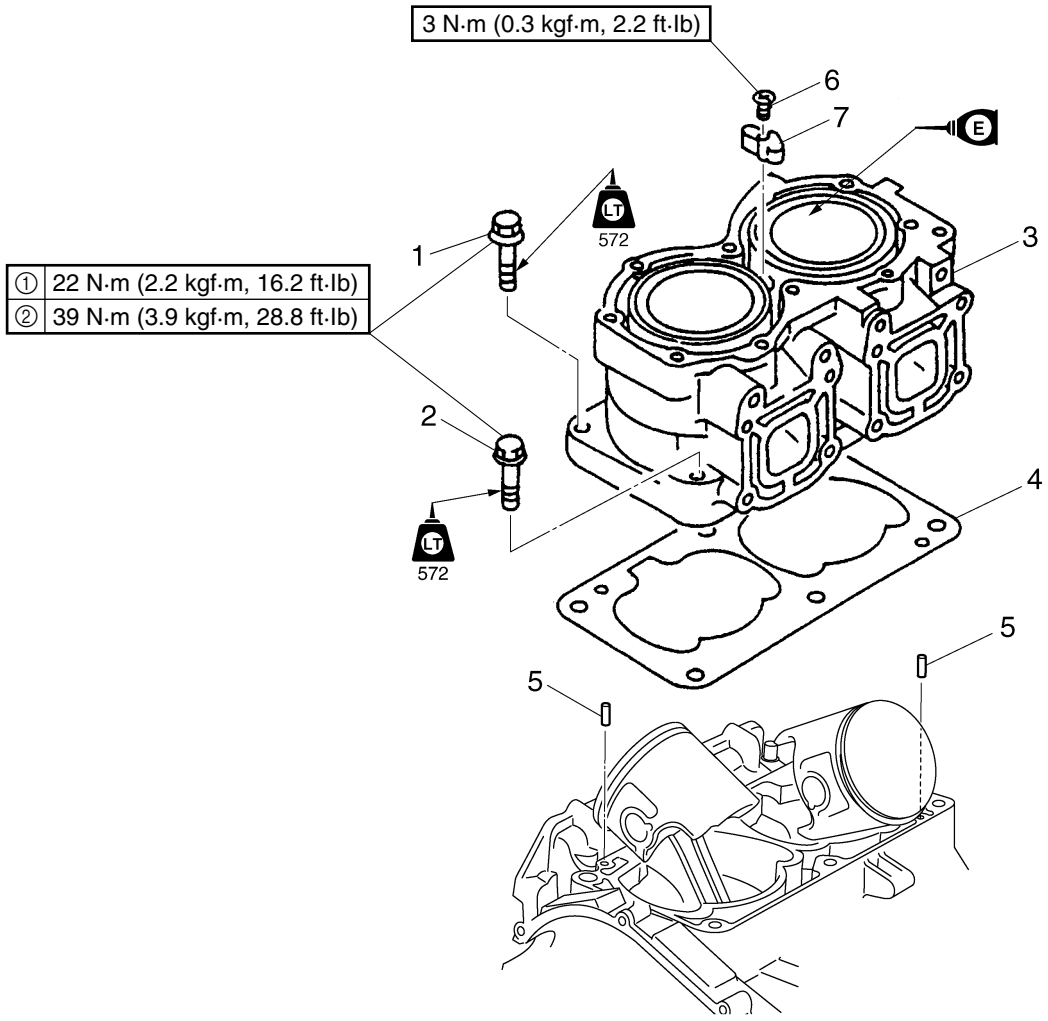
Cylinder head installation

1. Install the cylinder head, and then tighten the bolts to the specified torque in the order 1, 2, and so on.



Cylinder head bolt: 1st: 15 N·m (1.5 kgf·m, 11.1 ft·lb) 2nd: 29 N·m (2.9 kgf·m, 21.4 ft·lb)

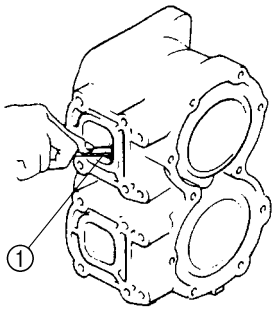
Cylinder



No.	Part name	Q'ty	Remarks
	Cylinder head		See "Cylinder head" (5-16).
1	Bolt	4	M10 × 40 mm
2	Bolt	2	M10 × 55 mm
3	Cylinder	1	
4	Gasket	1	**Not reusable**
5	Dowel pin	2	
6	Screw	1	M4 × 12 mm
7	Anode	1	

Cylinder check

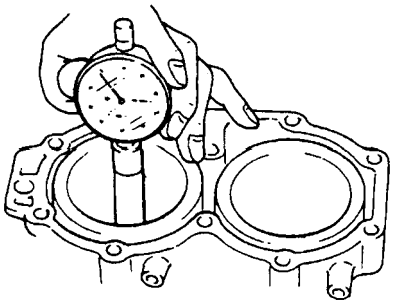
1. Eliminate the carbon deposits (using a rounded scraper ①).

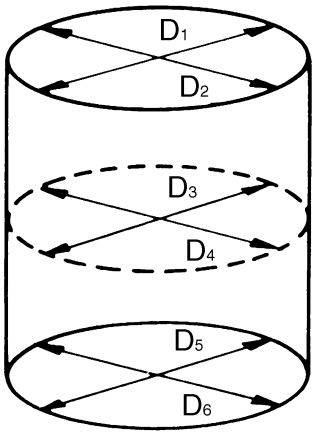


2. Check the cylinder water jacket. Clean or replace the cylinder if there is corrosion or mineral deposits.

3. Check the cylinder inner surface. Replace if there are score marks.

4. Measure the cylinder bore "D" (using a cylinder gauge). Replace the cylinder and piston as a set if out of specification.





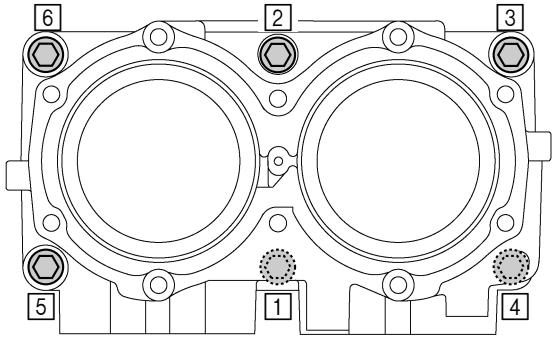
	Standard	Limit
Cylinder bore "D"	**81.000–81.020 mm (3.1890–3.1898 in)**	**81.100 mm (3.1929 in)**
Taper "T"	**—**	**0.080 mm (0.0031 in)**
Out of round "R"	**—**	**0.050 mm (0.0020 in)**
D = Maximum (D_1–D_6) **T = (Maximum D_1 or D_2) – (Maximum D_5 or D_6)** **R = (Maximum D_1, D_3 or D_5) – (Minimum D_2, D_4 or D_6)**		

TIP:

Measure the cylinder bore parallel to and at a right angle to the crankshaft. Then, average the measurements.

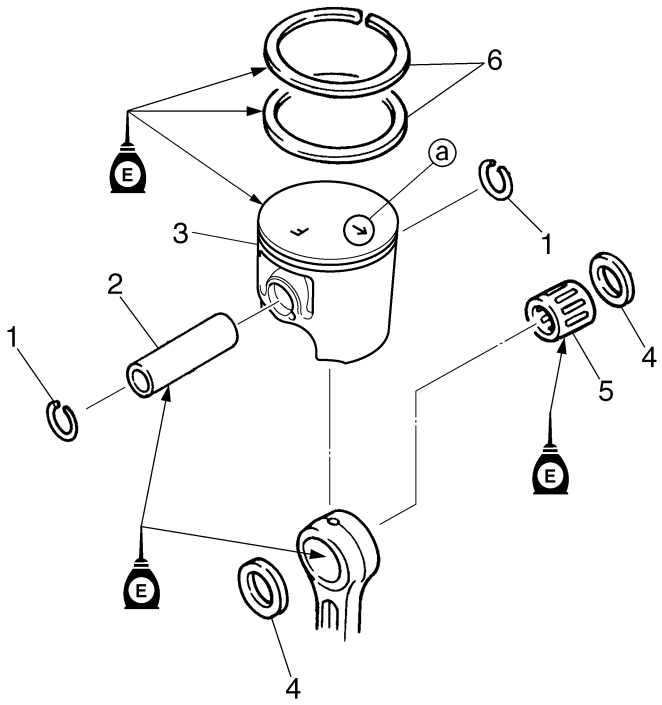
Cylinder installation

1. Install the cylinder, and then tighten the bolts to the specified torque in the order 1, 2, and so on.



Cylinder bolt:
1st: 22 N·m (2.2 kgf·m, 16.2 ft·lb)
2nd: 39 N·m (3.9 kgf·m, 28.8 ft·lb)

Pistons



No.	Part name	Q'ty	Remarks
	Cylinder		See "Cylinder" (5-18).
1	Piston pin clip	4	**Not reusable**
2	Piston pin	2	
3	Piston	2	ⓐ Arrow mark
4	Washer	4	
5	Bearing	2	
6	Piston ring	4	

Piston pin clip removal and installation

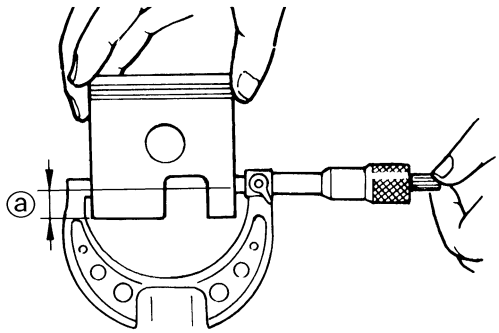
TIP:
Before removing or installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.

Piston check

1. Eliminate the carbon deposits (from the piston crown and piston ring grooves).
2. Check the piston wall. Repair using 600–800 grit wet sandpaper or replace if there are score marks.

TIP:
Lightly sand the piston wall in a crisscross pattern.

3. Measure the piston skirt diameter. Replace if out of specification.

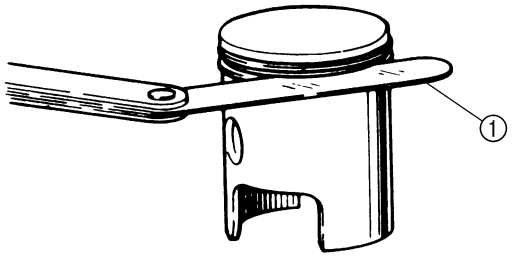


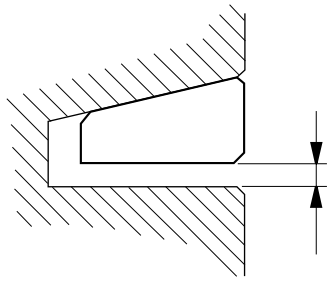
Piston diameter	Distance ⓐ
80.922–80.941 mm (3.1859–3.1866 in)	10 mm (0.39 in)

Piston-to-cylinder clearance:
0.080–0.085 mm (0.0031–0.0033 in)

Piston ring check

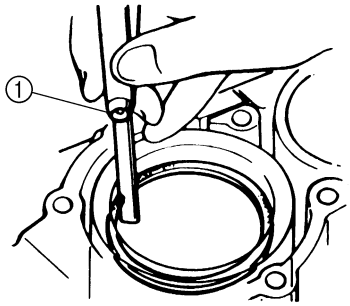
1. Measure the side clearance (using a thickness gauge ①). Replace the piston and piston rings as a set if out of specification.





Side clearance:
0.03–0.05 mm (0.001–0.002 in)

2. Measure the end gap (using a thickness gauge ①). Replace the piston rings as a set if out of specification.



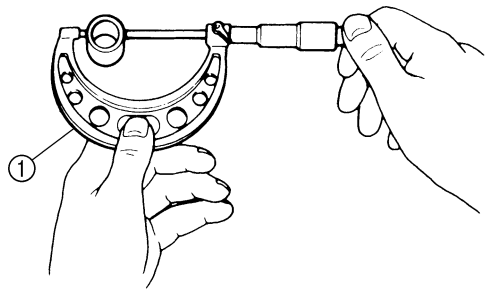
End gap: 0.20–0.40 mm (0.008–0.015 in)

TIP:
Push the piston ring into the cylinder with the piston crown.

Piston pin and bearing check

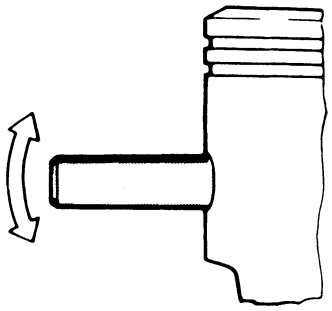
1. Check the piston pins and bearings. Replace if there are signs of heat discoloration.

2. Measure the piston pin outside diameter (using a micrometer ①). Replace if out of specification.

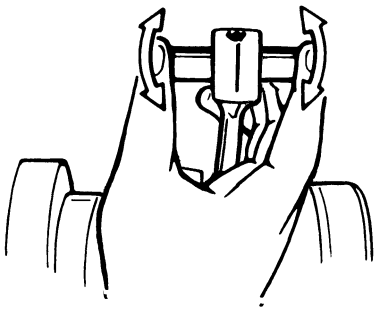


Piston pin outside diameter:
Standard:
19.995–20.000 mm
(0.7872–0.7874 in)
Limit:
19.990 mm (0.7870 in)

3. Insert the piston pin into the piston, and then check the piston-pin-to-piston free play as shown. Replace the piston pin, piston, or both if there is free play.



4. Check the piston-pin-to-small-end-bearing-to-connecting-rod free play at the small end of the connecting rod as shown. Replace the piston pin, crankshaft assy., small end bearing, or all parts if there is free play or wear at the small end.

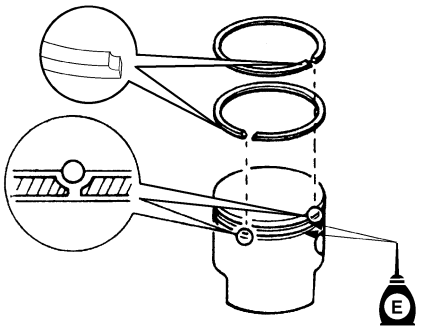


Piston installation

NOTICE

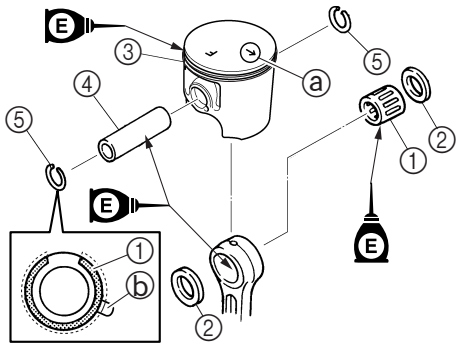
Align each end gap with its respective locating pin.

1. Install the top ring and 2nd ring.



TIP:
Install the piston rings with the recess for the locating pin facing up toward the piston crown.

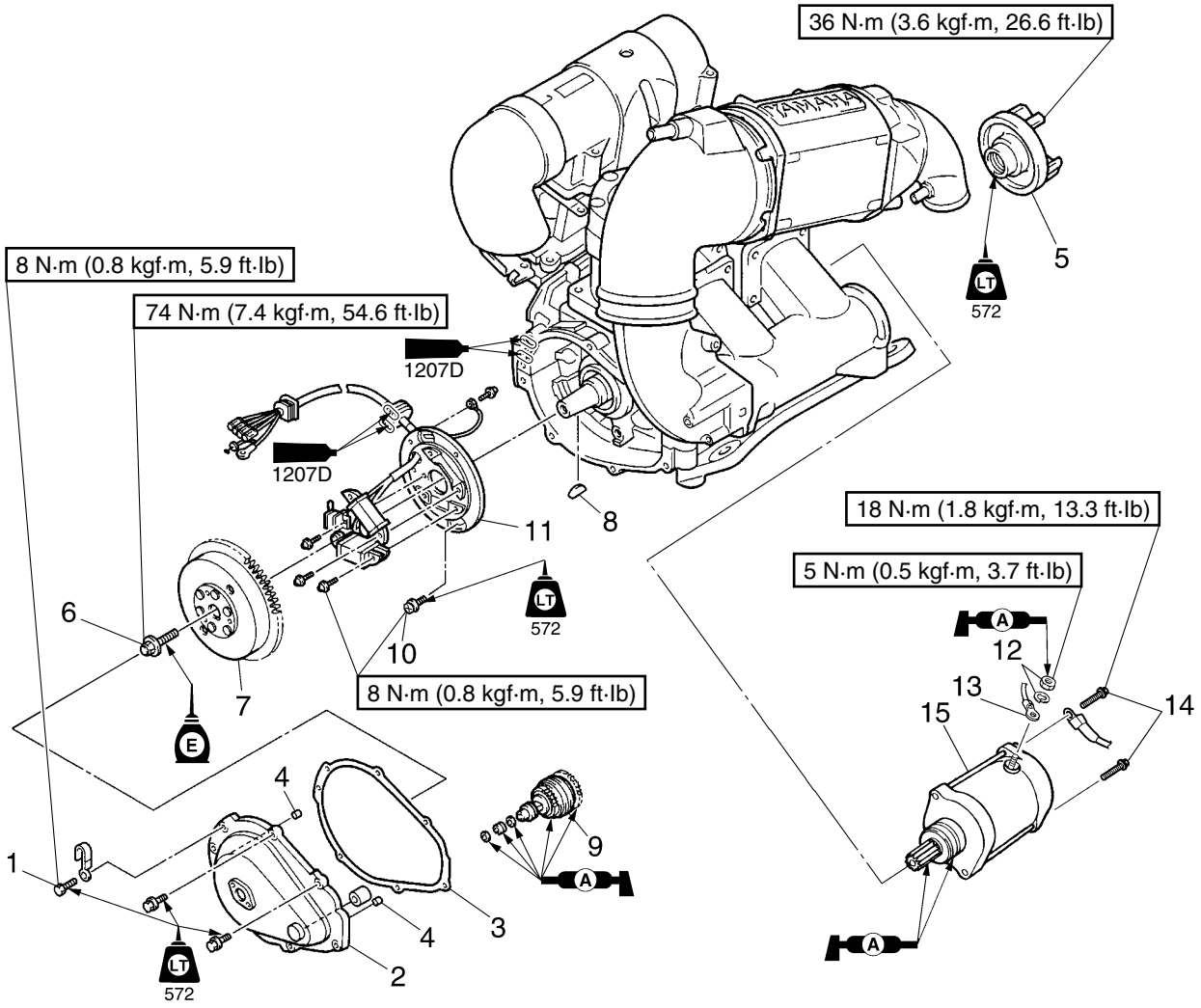
2. Assemble the bearing ①, washer ②, piston ③, piston pin ④, and new piston pin clips ⑤. ***NOTICE:*** **Do not reuse a piston pin clip, always replace it with a new one.**



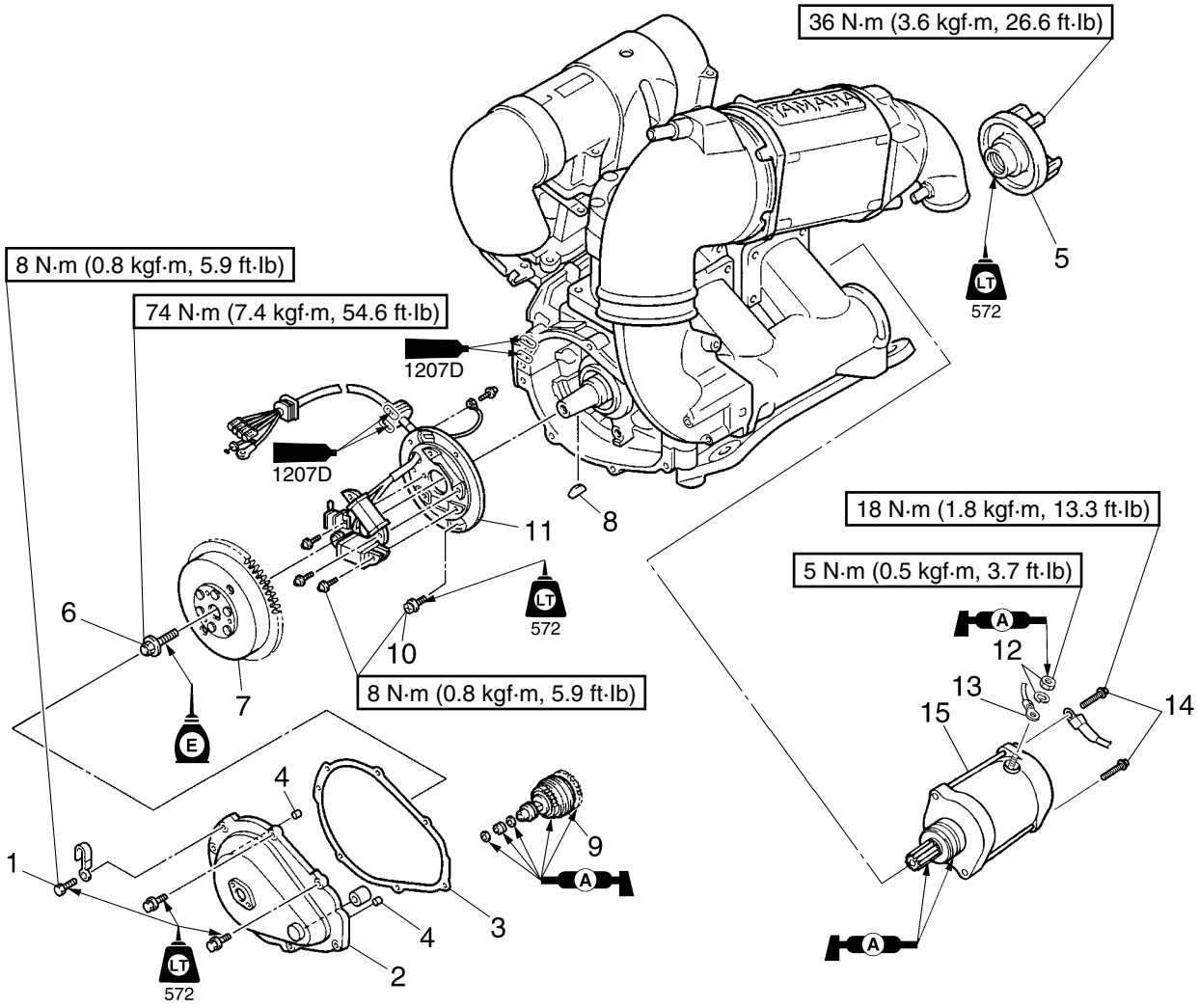
TIP:

- Install the piston with the arrow ⓐ facing towards the exhaust port.
- Do not align the open end of the clip with the piston pin slot ⓑ.

Flywheel magneto and base assy.

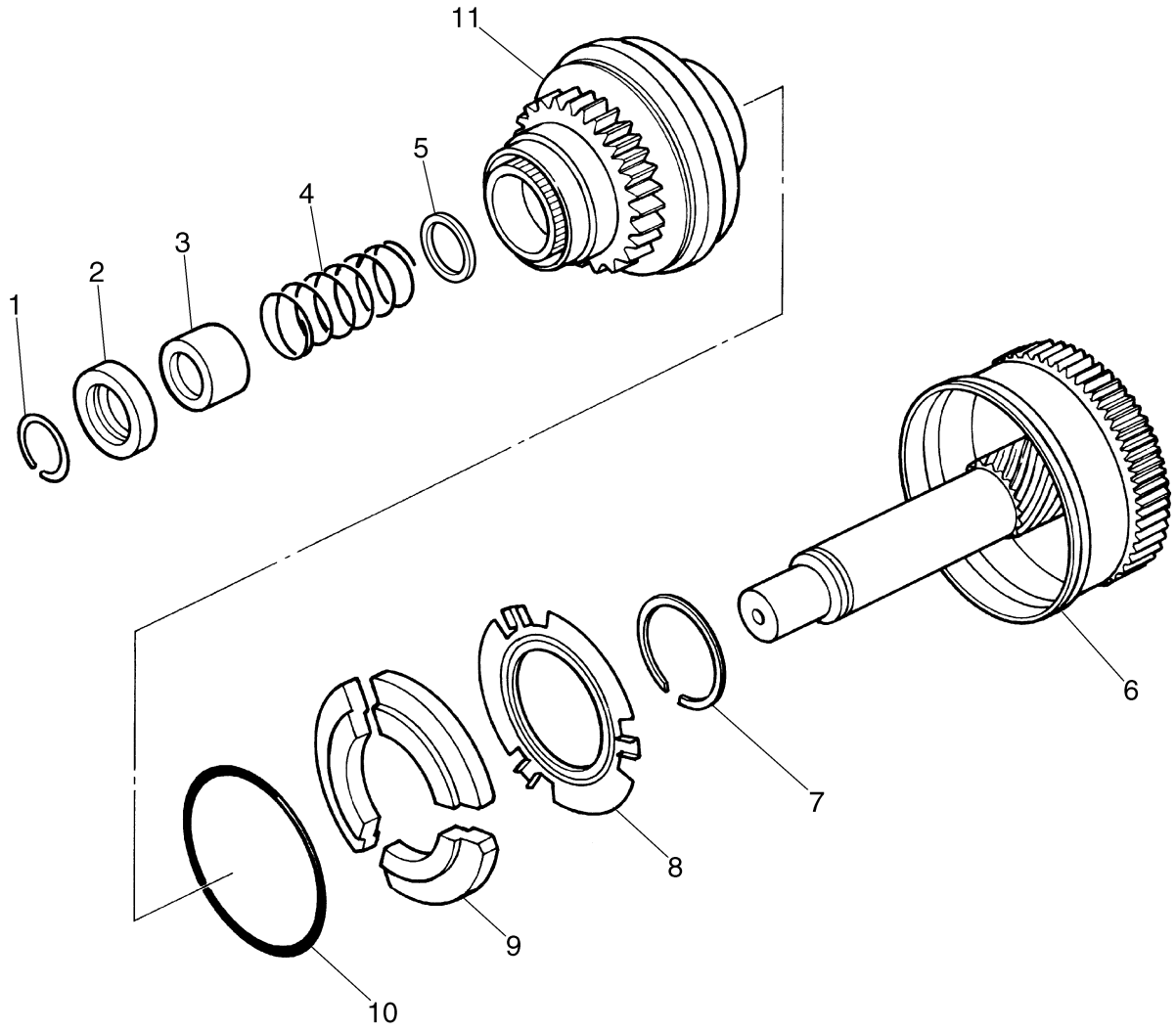


No.	Part name	Q'ty	Remarks
	Engine unit		See "Engine unit" (5-1).
	Oil pump		See "Oil pump" (4-17).
1	Bolt	7	M6 × 25 mm
2	Flywheel cover	1	
3	Gasket	1	**Not reusable**
4	Dowel pin	2	
5	Drive coupling	1	
6	Bolt	1	M10 × 32 mm
7	Flywheel magneto	1	
8	Woodruff key	1	
9	Starter clutch assy.	1	
10	Screw	2	M6 × 16 mm
11	Base assy.	1	
12	Nut/washer	1/1	
13	Starter motor lead	1	



No.	Part name	Q'ty	Remarks
14	Bolt	2	M6 × 16 mm
15	Starter motor	1	

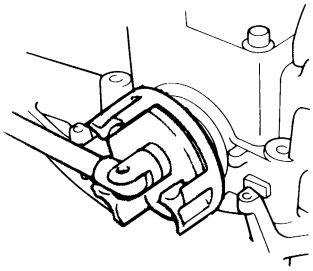
Starter clutch assy.

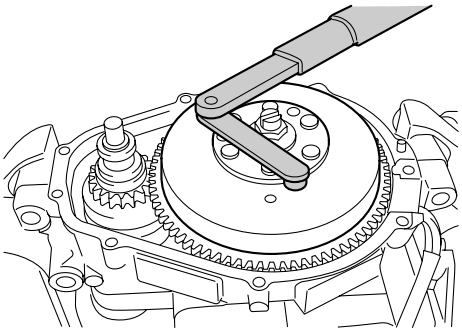


No.	Part name	Q'ty	Remarks
1	Clip	1	**Not reusable**
2	Clip stopper	1	
3	Spring seat	1	
4	Spring	1	
5	Washer	1	
6	Idle gear	1	
7	Circlip	1	
8	Plate	1	
9	Weight	3	
10	Spring ring	1	
11	Pinion gear	1	

Drive coupling removal and installation

1. Remove the drive coupling.





Coupler wrench: 90890-06425 Flywheel holder: 90890-06522

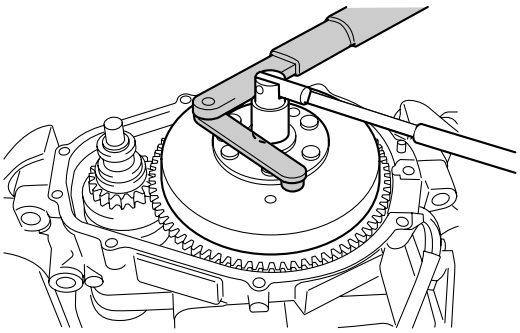
Drive coupling: 36 N·m (3.6 kgf·m, 26.6 ft·lb)

TIP:

Install the drive coupling with the same special service tools that were used for removal.

Flywheel magneto removal and installation

1. Remove the flywheel magneto bolt.



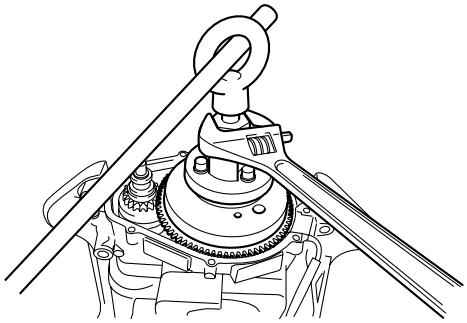
Flywheel holder: 90890-06522

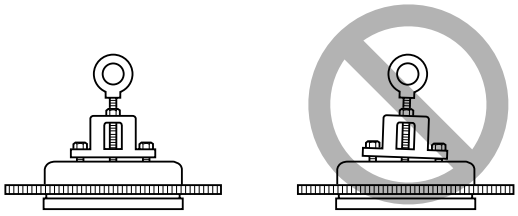
Flywheel magneto bolt: 74 N·m (7.4 kgf·m, 54.6 ft·lb)

TIP:

Install the bolt with the same special service tool that was used for removal.

2. Remove the flywheel magneto. ***NOTICE:*** **To prevent damage to the engine or special service tools, screw in the flywheel puller set bolts evenly and completely so that the puller plate is parallel to the flywheel magneto.**





Flywheel puller: 90890-06521

TIP:

When installing the flywheel magneto, degrease the flywheel magneto where it is coupled to the crankshaft.

Drive coupling check

1. Check the drive coupling. Replace if damaged or worn.

Flywheel magneto check

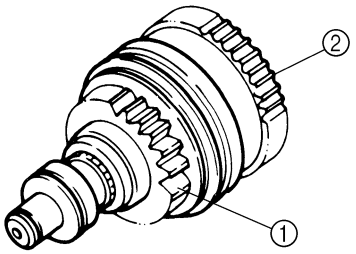
1. Check the ring gear. Replace if damaged or worn.

Starter clutch assy. check

1. Check the pinion gear ①. Replace if damaged or worn.

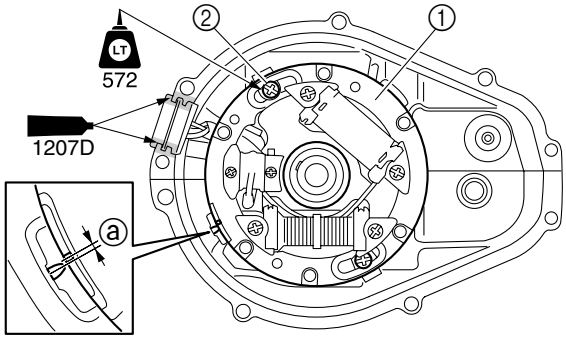
2. Check the idle gear ②. Replace if damaged or worn.

3. Check the gear movement. Replace the defective part(s) if there is rough movement.



Base assy. installation

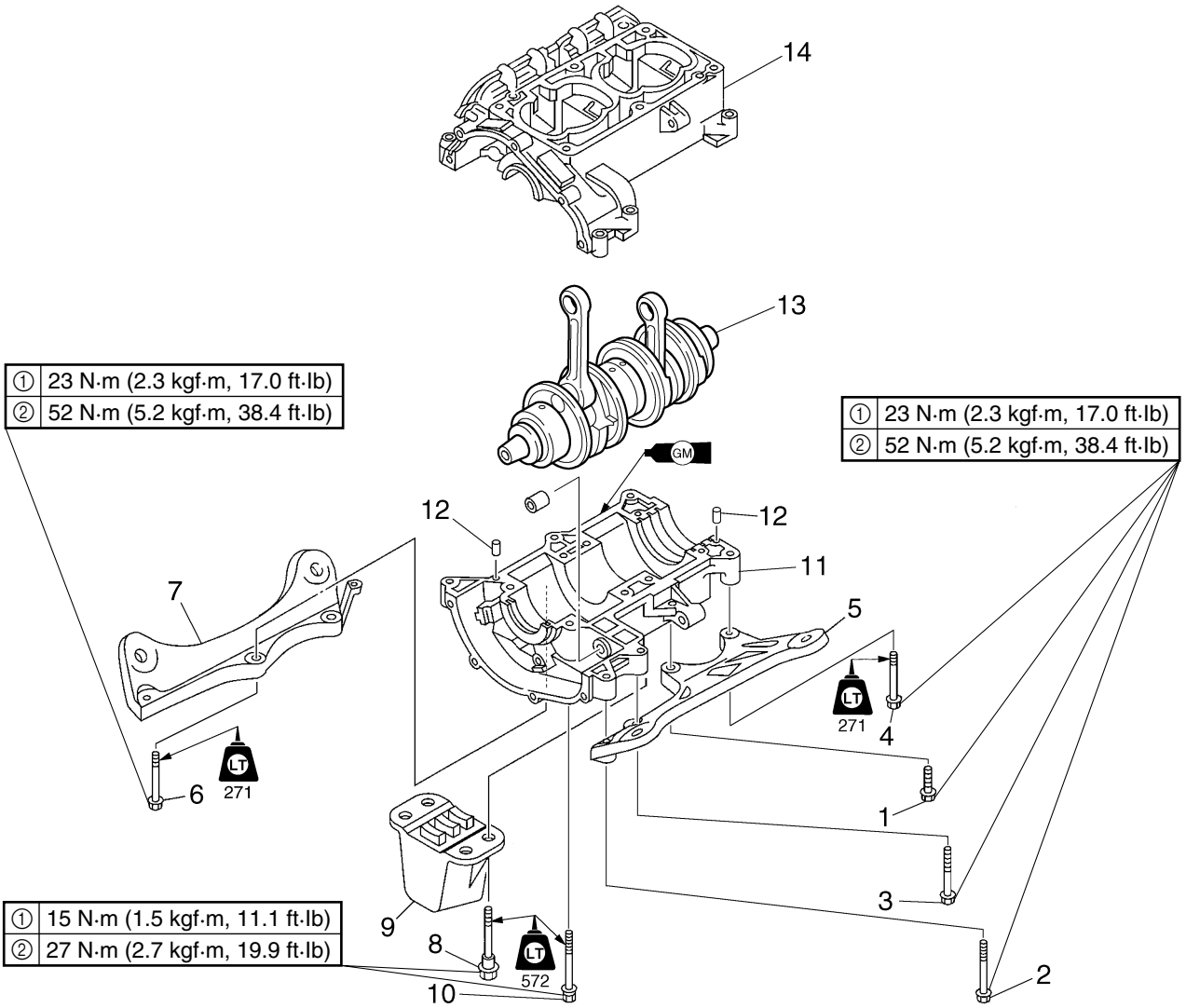
1. Install the base assy ①.



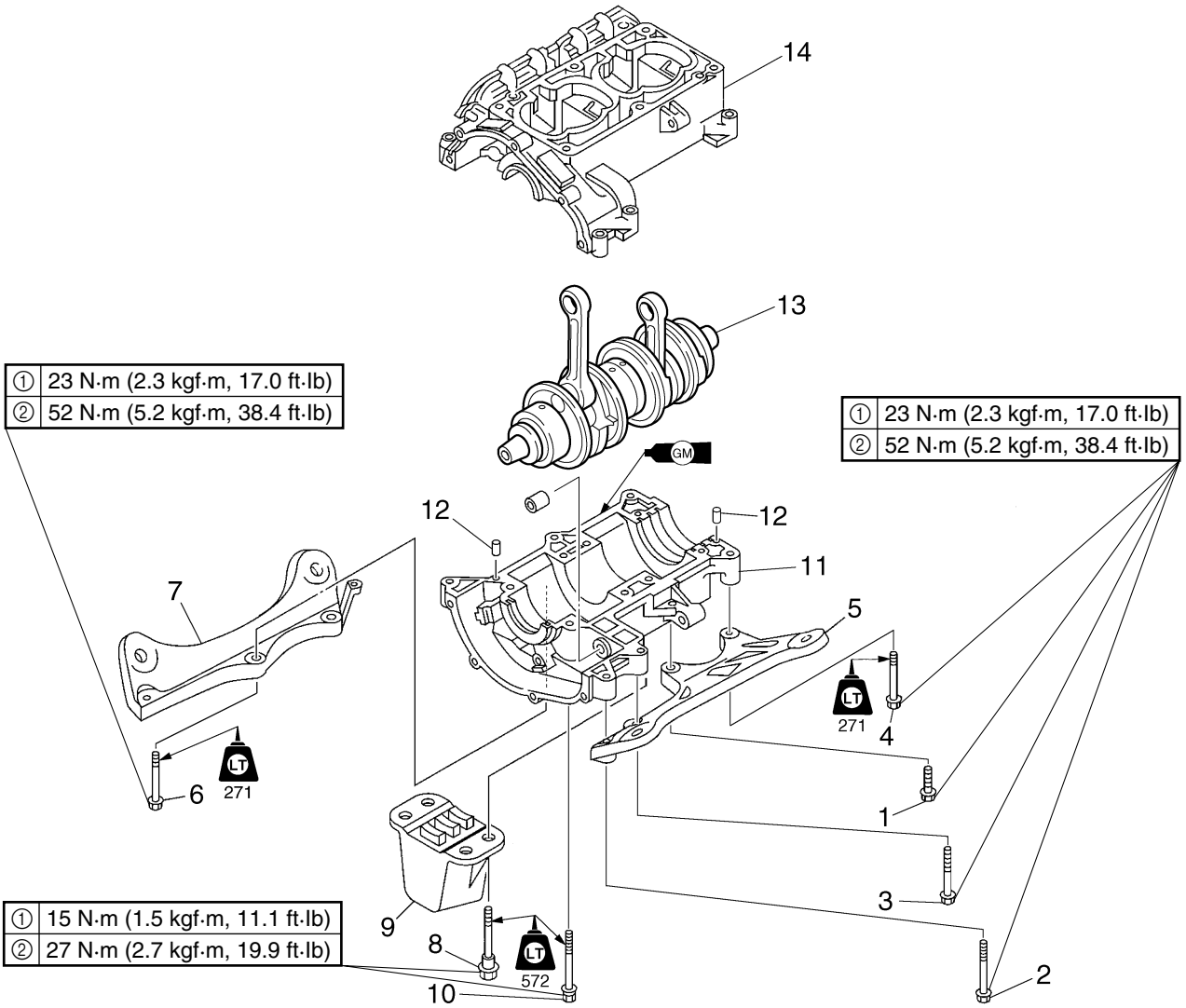
Distance ⓐ:0 ± 1 mm (0 ± 0.04 in)

Base assy. screw ②: 8 N·m (0.8 kgf·m, 5.9 ft·lb)

Crankcase



No.	Part name	Q'ty	Remarks
	Base assy. and starter motor		See "Flywheel magneto and base assy." (5-25).
	Pistons		See "Pistons" (5-21).
1	Bolt	1	M10 × 35 mm
2	Bolt	1	M10 × 65 mm
3	Bolt	1	M10 × 70 mm
4	Bolt	1	M10 × 80 mm
5	Engine bracket	1	
6	Bolt	3	M10 × 70 mm
7	Engine bracket	1	
8	Bolt	4	M8 × 83 mm
9	Rubber mount	1	
10	Bolt	4	M8 × 85 mm
11	Lower crankcase	1	
12	Dowel pin	2	



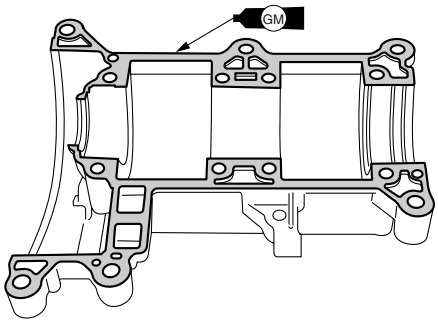
No.	Part name	Q'ty	Remarks
13	Crankshaft assy.	1	
14	Upper crankcase	1	

Crankcase check

1. Check the mating surfaces. Replace the crankcase if scratched.

Crankcase installation

1. Apply the Gasket Maker (to the crankcase mating surfaces).

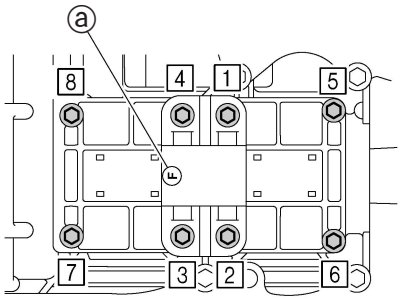


TIP:
Before applying Gasket Maker, clean the crankcase mating surfaces.

2. Install the crankshaft.

TIP:
- Install the bearing location pins into the grooves in the crankcase body.
- Make sure that the crankshaft rotates smoothly after installing it.

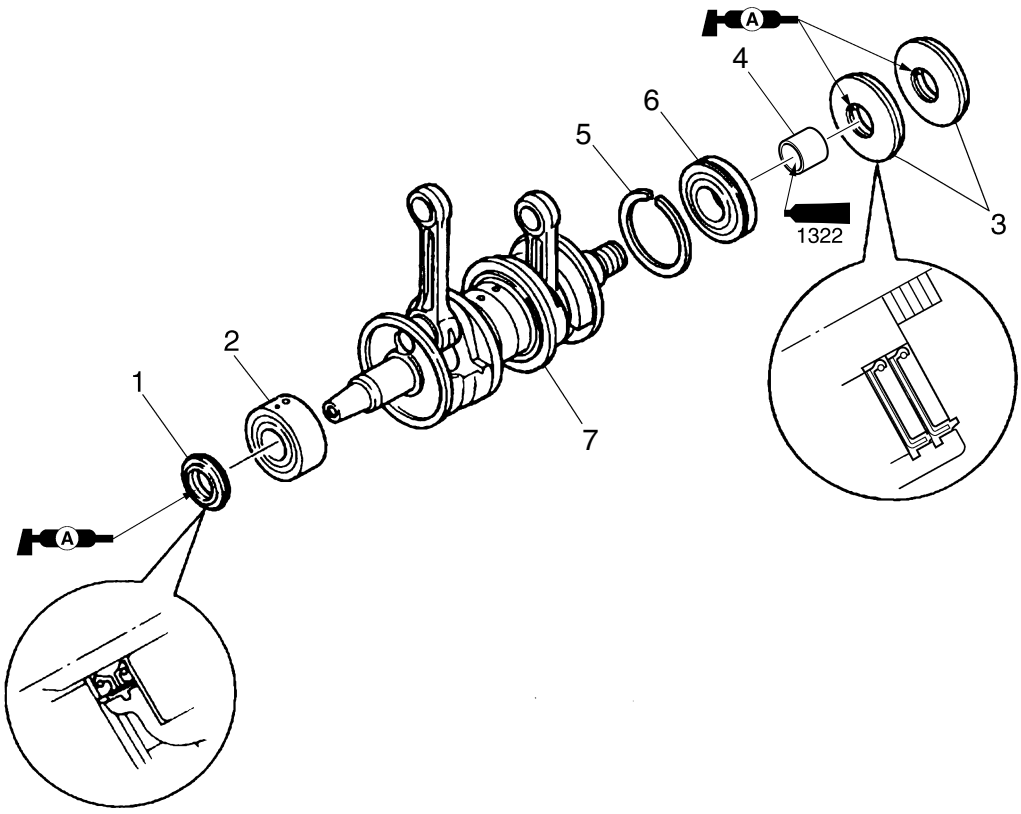
3. Install the crankcase and rubber mount, and then tighten the bolts to the specified torque in the order 1, 2, and so on.



Crankcase bolt:
1st: 15 N·m (1.5 kgf·m, 11.1 ft·lb)
2nd: 27 N·m (2.7 kgf·m, 19.9 ft·lb)

TIP:
Be sure that the “F” mark ⓐ is on the flywheel magneto side.

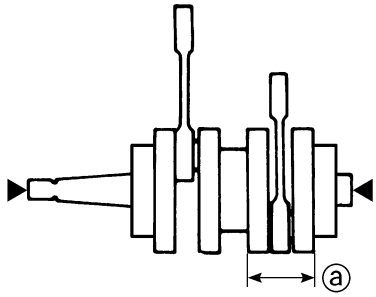
Crankshaft



No.	Part name	Q'ty	Remarks
	Crankcase		See "Crankcase" (5-30).
1	Oil seal	1	**Not reusable**
2	Bearing	1	
3	Oil seal 1	2	**Not reusable**
4	Drive shaft collar	1	
5	Bearing clip	1	
6	Bearing 2	1	
7	Crankshaft assy.	1	

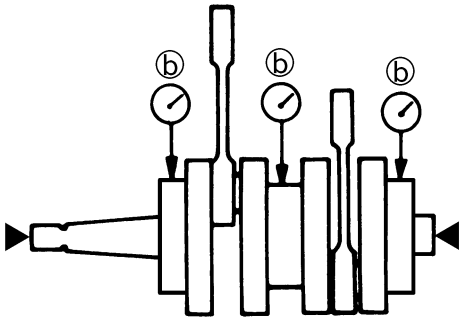
Crankshaft check

1. Measure the crank width ⓐ. Replace if out of specification.



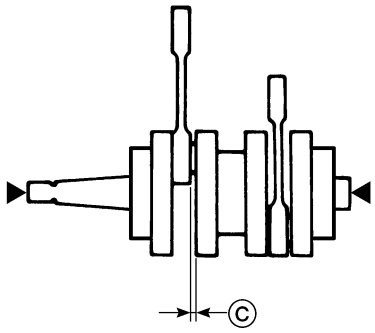
Crank width ⓐ: 61.950–62.000 mm (2.4390–2.4409 in)

2. Measure deflection ⓑ (using a dial gauge). Replace if out of specification.



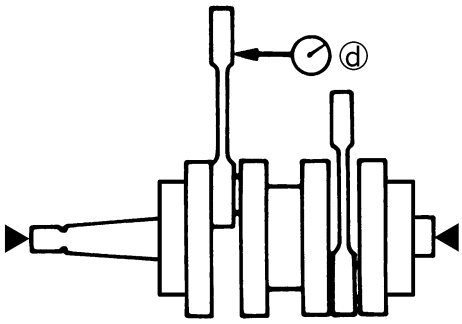
Deflection limit ⓑ: 0.050 mm (0.0020 in)

3. Measure big end side clearance ⓒ (using a thickness gauge). Replace if out of specification.



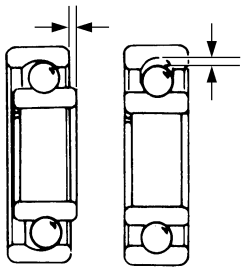
Big end side clearance ⓒ: 0.250–0.750 mm (0.0098–0.0295 in)

4. Measure small end free play ⓓ (using a dial gauge). Replace if out of specification.



Maximum small end axial play ⓓ: 2.000 mm (0.0787 in)

5. Check the bearings. Replace if damaged or pitted.



TIP:

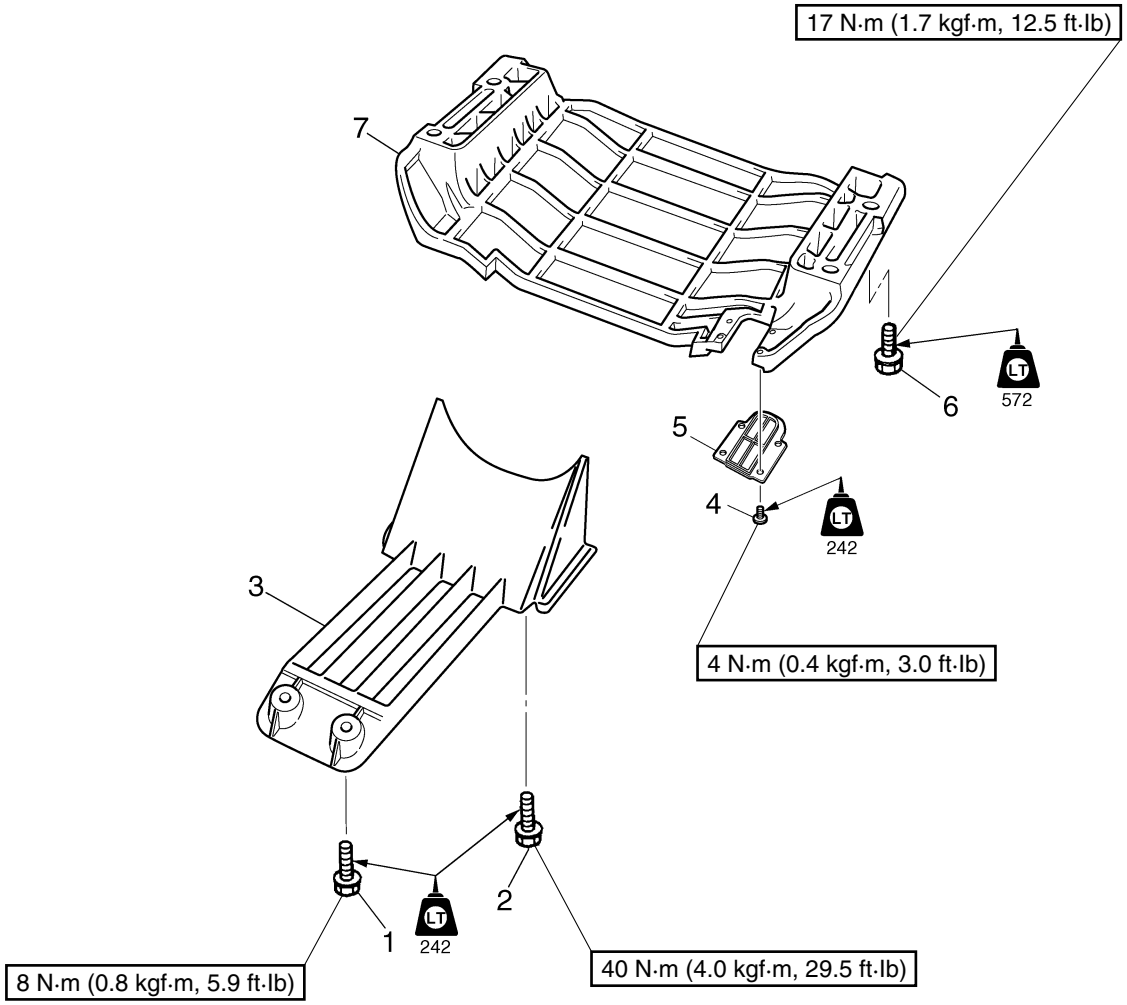
- Before checking the bearings, thoroughly clean them.
- Immediately after checking the bearings, lubricate them to prevent rust.

6. Check the oil seals. Replace if damaged or worn.

— MEMO —

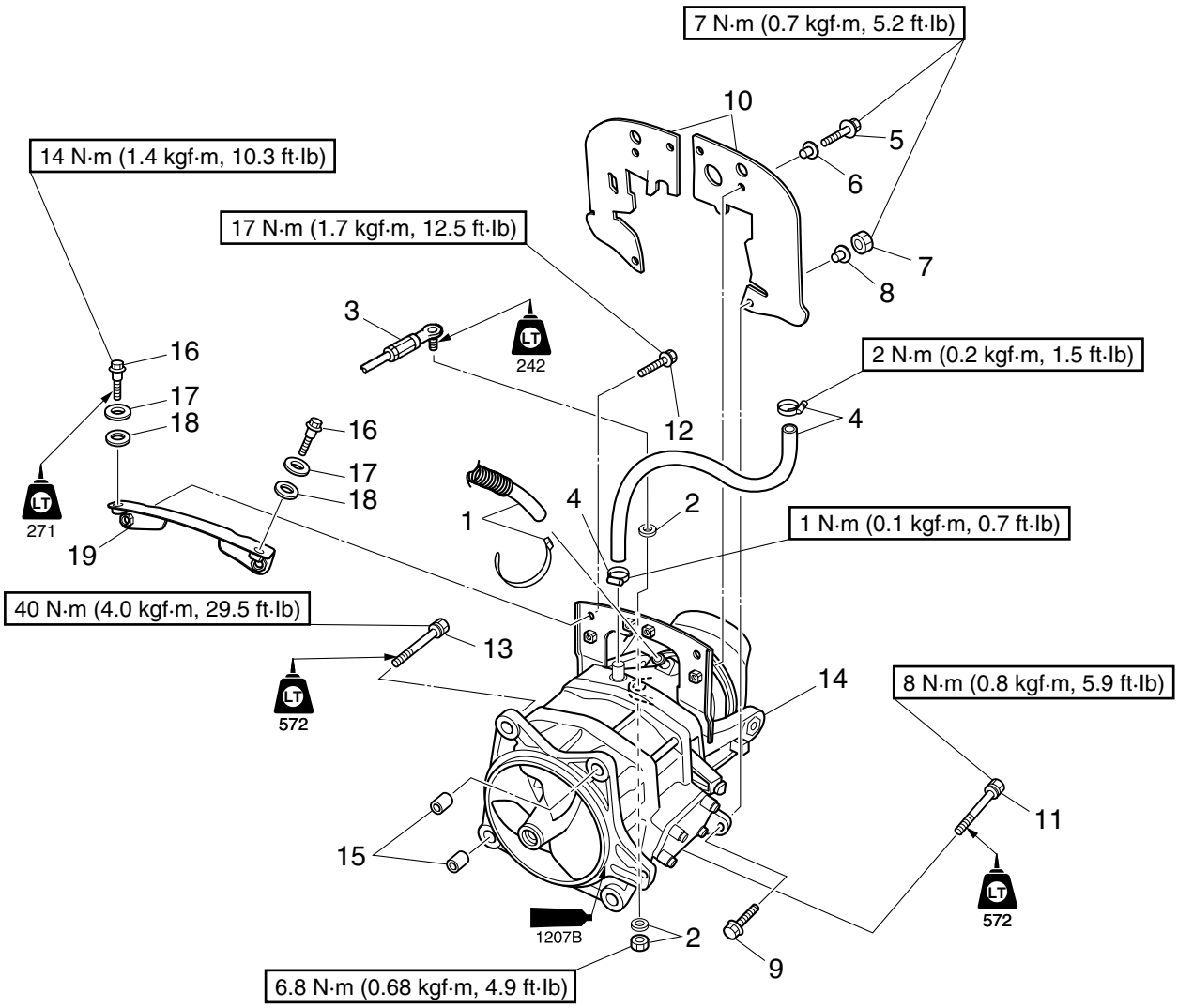
Jet pump unit

Intake grate and ride plate

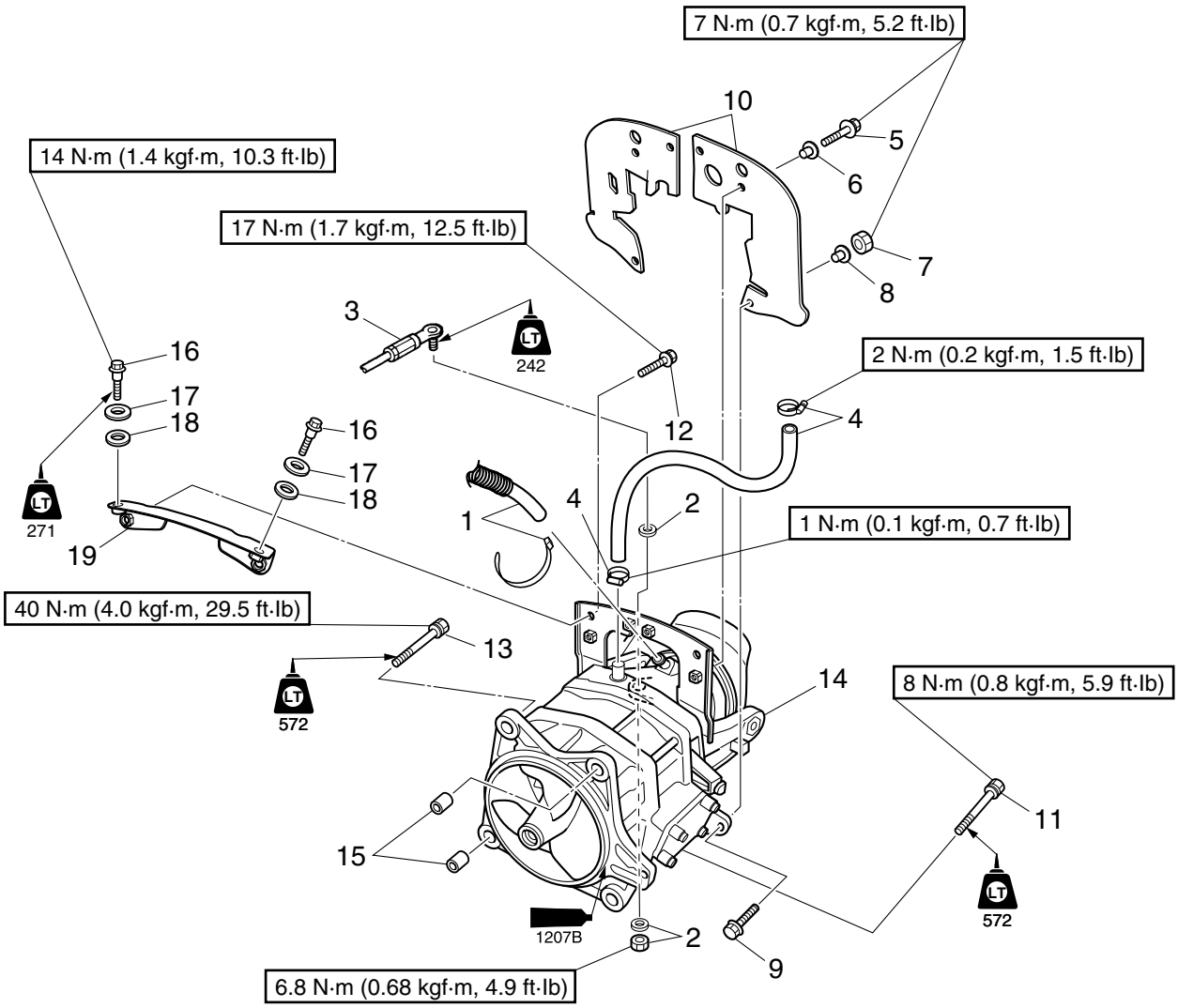


No.	Part name	Q'ty	Remarks
1	Bolt	2	M6 × 30 mm
2	Bolt	2	M10 × 25 mm
3	Intake grate	1	
4	Screw	4	M5 × 12 mm
5	Cover	1	
6	Bolt	4	M8 × 35 mm
7	Ride plate	1	

Jet pump unit



No.	Part name	Q'ty	Remarks
1	Band/Bilge hose	1	
2	Nut/washer	1/2	
3	Steering cable joint	1	
4	Clamp/spout hose	2/1	
5	Bolt	4	M6 × 22 mm
6	Collar	4	
7	Nut	2	
8	Collar	2	
9	Bolt	2	M6 × 25 mm
10	Rubber plate	2	
11	Bolt	1	M6 × 30 mm
12	Bolt	2	M8 × 18 mm
13	Bolt	4	M10 × 45 mm
14	Jet pump unit	1	
15	Dowel pin	2	
16	Bolt	2	M8 × 24 mm



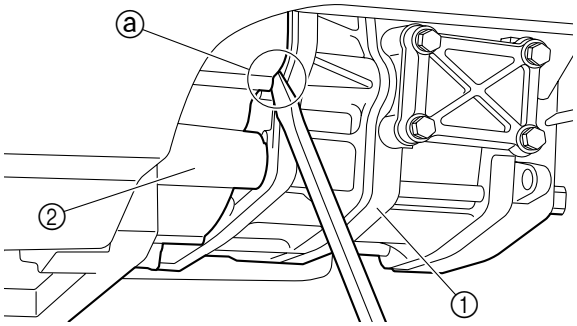
No.	Part name	Q'ty	Remarks
17	Washer	2	
18	Gasket	2	
19	Bracket	1	

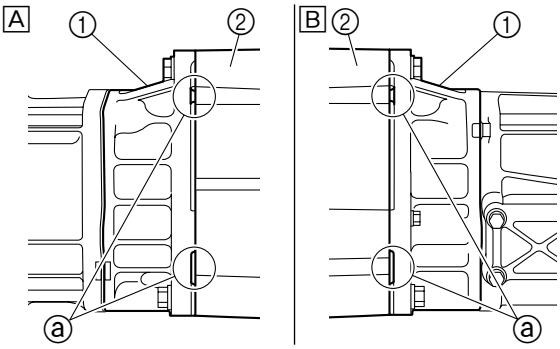
Jet pump unit removal

⚠ WARNING

Make sure to remove the battery before removing the jet pump unit.

1. Remove the jet pump unit ①.





A STBD
B PORT

TIP:

Insert a flat-head screwdriver into the gaps ⓐ between the jet pump unit ① and the transom plate ② to separate them.

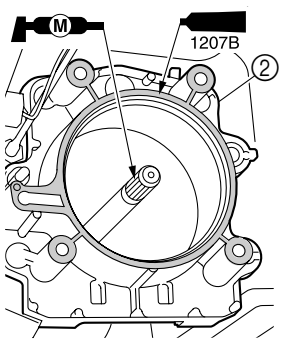
Jet pump unit installation

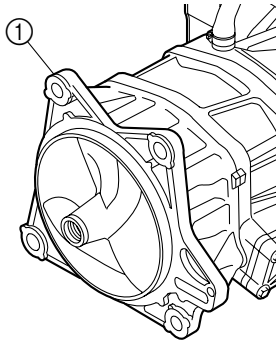
⚠ WARNING

Make sure to remove the battery before installing the jet pump unit.

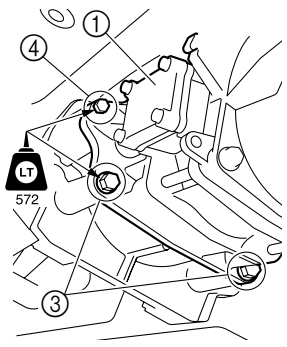
1. Clean the mating surfaces of the jet pump unit ① and transom plate ②.

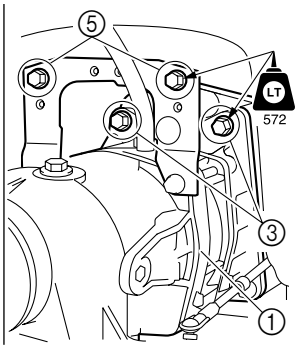
2. Apply sealant to the mating surfaces of the jet pump unit ① and transom plate ②.





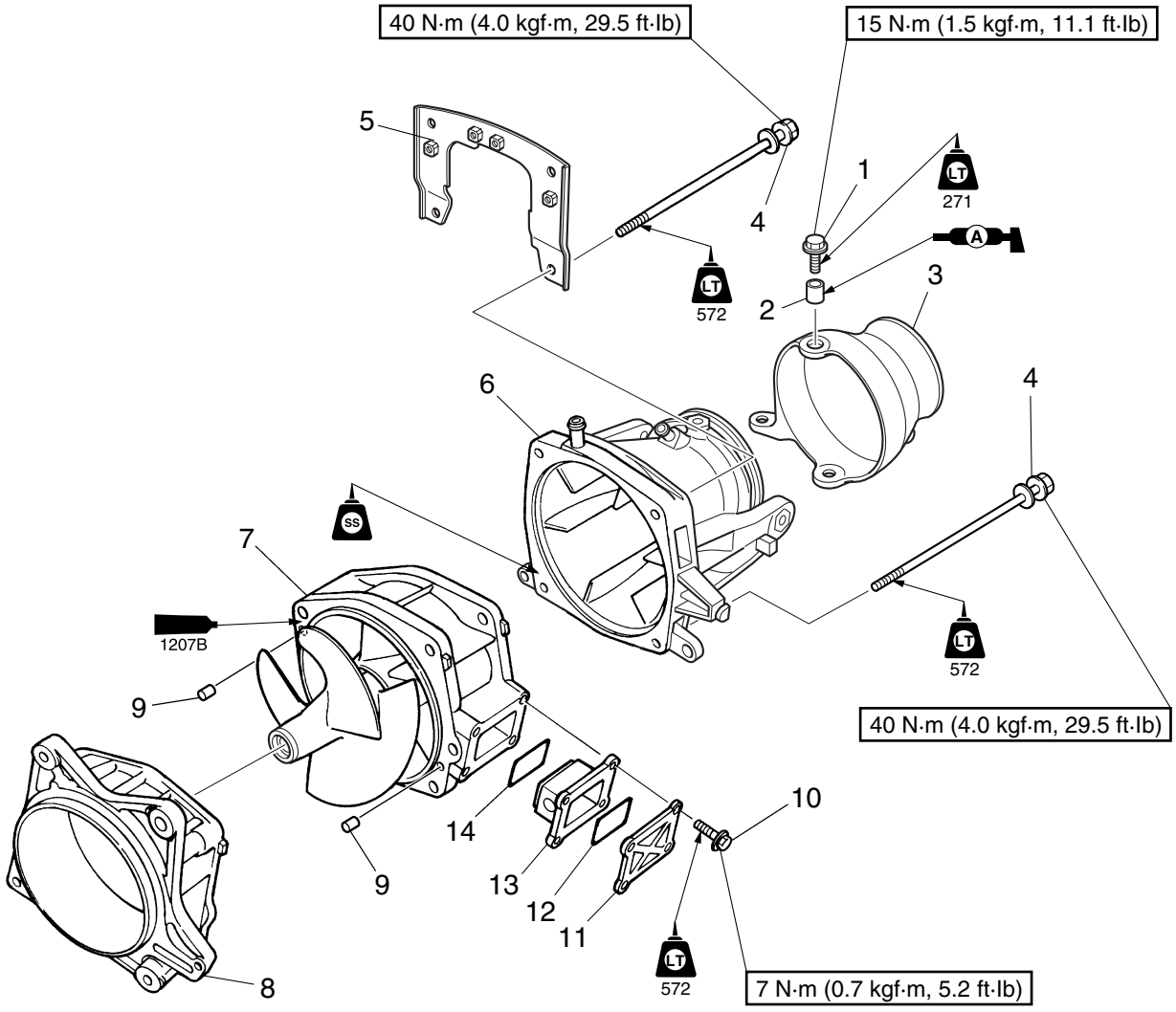
3. Install the jet pump unit ①, and then tighten the bolts ③, ④, and ⑤ to the specified torques.





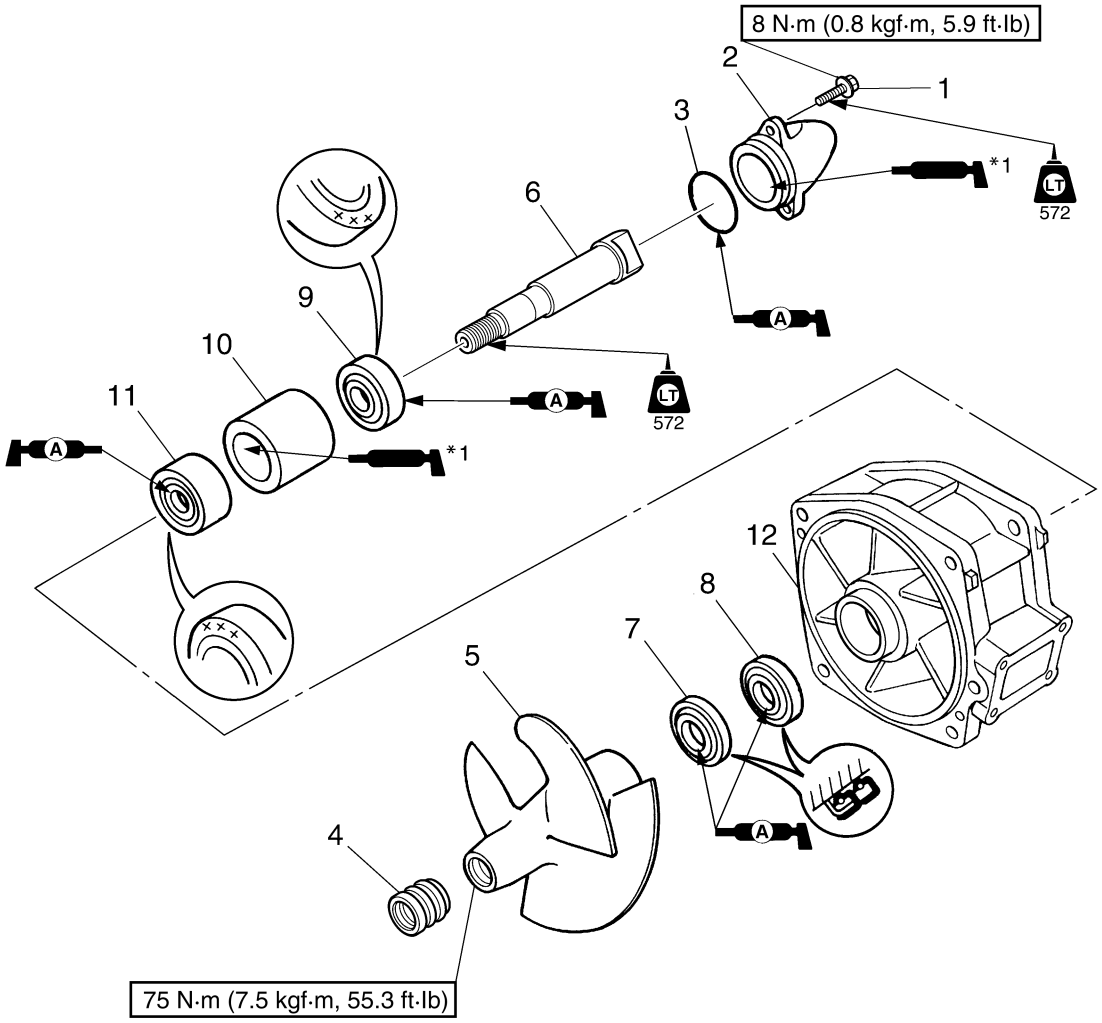
Jet pump unit assy. bolt (M10 × 45 mm) ③: 40 N·m (4.0 kgf·m, 29.5 ft·lb)
Jet pump unit assy. bolt (M6 × 30 mm) ④: 8 N·m (0.8 kgf·m, 5.9 ft·lb)
Bracket bolt (M8 × 18 mm) ⑤: 17 N·m (1.7 kgf·m, 12.5 ft·lb)

Jet thrust nozzle, impeller duct, and impeller housing



No.	Part name	Q'ty	Remarks
1	Bolt	2	M8 × 25 mm
2	Collar	2	
3	Jet thrust nozzle	1	
4	Bolt	4	M10 × 125 mm
5	Bracket	1	
6	Nozzle	1	
7	Impeller duct assy.	1	
8	Impeller housing 1	1	
9	Pin	2	
10	Bolt	4	M6 × 35 mm
11	Water inlet cover	1	
12	Packing	1	
13	Water inlet strainer	1	
14	Packing	1	

Impeller duct and drive shaft

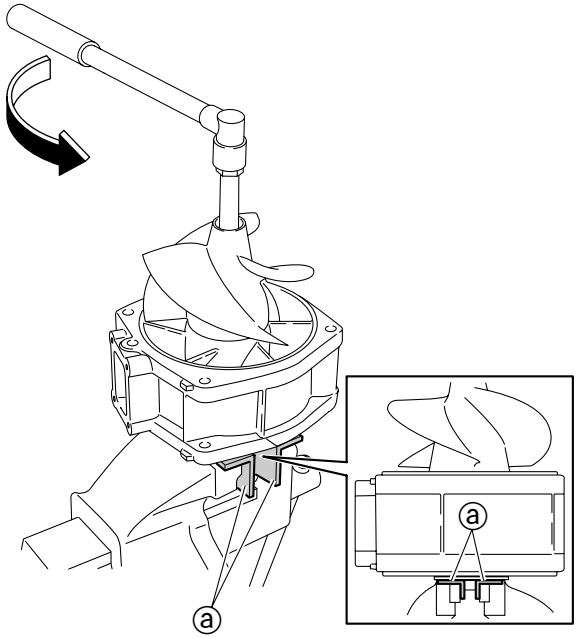


No.	Part name	Q'ty	Remarks
1	Bolt	3	M6 × 20 mm
2	Cap	1	
3	O-ring	1	**Not reusable**
4	Cap	1	
5	Impeller	1	
6	Drive shaft	1	
7	Oil seal	1	**Not reusable**
8	Oil seal	1	**Not reusable**
9	Rear bearing	1	**Not reusable**
10	Spacer	1	
11	Front bearing	1	**Not reusable**
12	Impeller duct	1	

*: EPNOC grease AP #0

Drive shaft removal

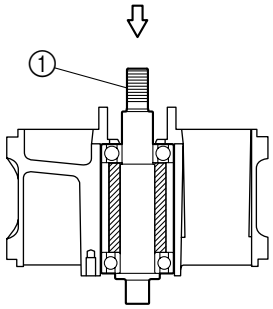
1. Remove the impeller.



Crankshaft holder 20: 90890-06552

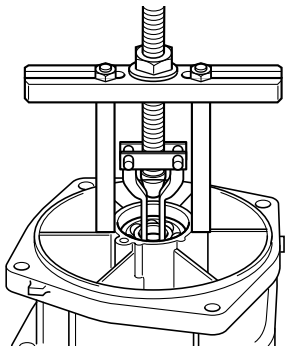
TIP:
Hold the impeller duct assy. in a vise between two aluminum plates ⓐ.

2. Remove the drive shaft ①.



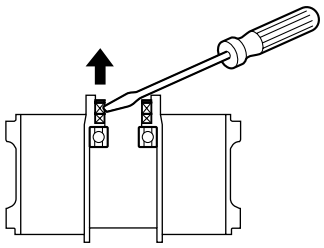
TIP:
Remove the drive shaft using a press.

3. Remove the rear bearing.



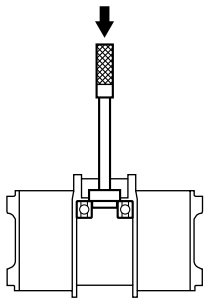
Stopper guide plate: 90890-06501 Bearing puller assembly: 90890-06535 Stopper guide stand: 90890-06538

4. Remove the oil seals.



TIP:
Remove the oil seals using a flat head screwdriver.

5. Remove the front bearing.

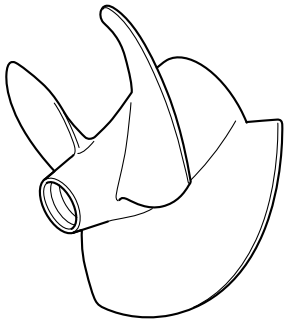


Driver rod L3: 90890-06652 Needle bearing attachment: 90890-06614

TIP:
Remove the front bearing using a press.

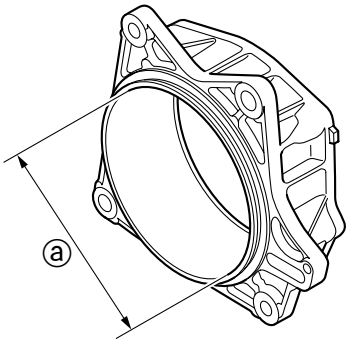
Impeller check

1. Check the impeller. Replace if damaged.



Impeller housing check

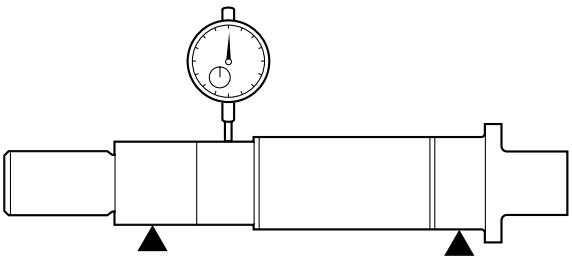
1. Measure the impeller housing inside diameter ⓐ. Replace if out of specification.



Impeller housing inside diameter ⓐ:
155.35–155.45 mm (6.116–6.120 in)

Drive shaft check

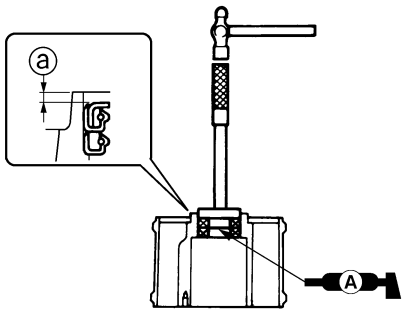
1. Check the drive shaft. Replace if cracked or damaged.
2. Measure the drive shaft runout. Replace if out of specification.



Drive shaft runout limit:
0.01 mm (0.0004 in)

Drive shaft installation

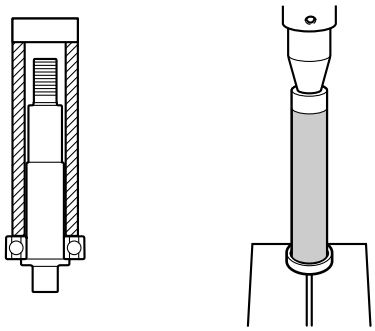
1. Install the oil seals.



Driver rod LS: 90890-06606 Ball bearing attachment: 90890-06634

Distance ⓐ: 4.6 ± 0.2 mm (0.18 ± 0.01 in)

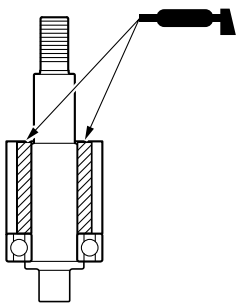
2. Install the rear bearing.



TIP:

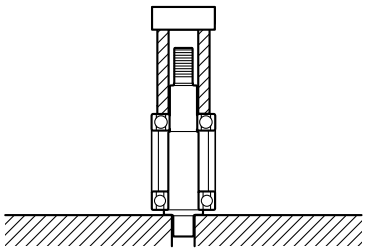
- Install the rear bearing onto the drive shaft using a press.
- Press the rear bearing using a pipe of the proper size [more than 140 mm (5.51 in) long and that has an inner diameter of 26 mm (1.02 in)].

3. Install the spacer.
4. Add a EPNOC grease AP #0 (between the drive shaft and spacer).



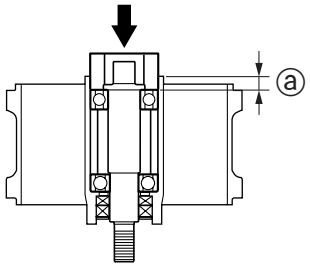
Quantity: 20 g (0.7 oz)

5. Install the front bearing.



TIP:
Press the spacer and the front bearing using a pipe of the proper size [more than 60 mm (2.36 in) long and that has an inner diameter more than 24 mm (0.94 in)].

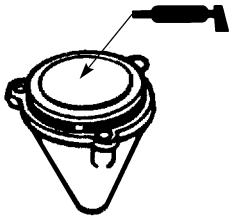
6. Install the drive shaft. (with front bearing spacer and rear bearing)



Distance ⓐ:
11.7 ± 0.2 mm (0.46 ± 0.01 in)

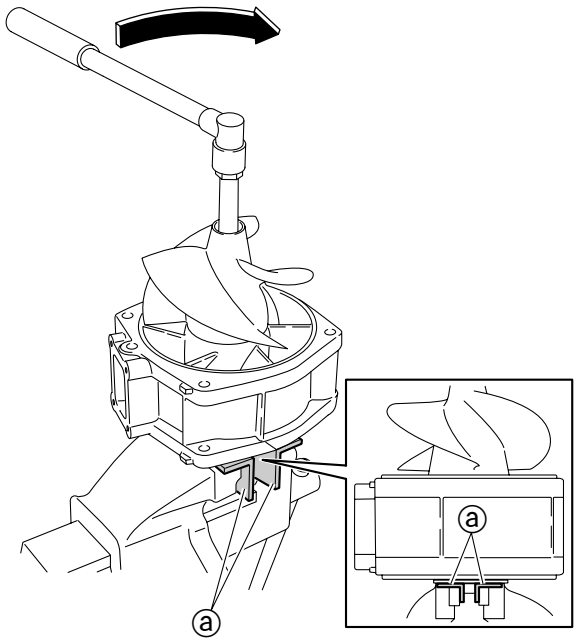
TIP:
Press the rear bearing using a washer or pipe of the proper size [outer diameter of 50 mm (1.97 in) and an inner diameter of 33 mm (1.30 in)].

7. Add a EPNOC grease AP #0 (into the cap).



Quantity: 20 g (0.7 oz)

8. Install the impeller.

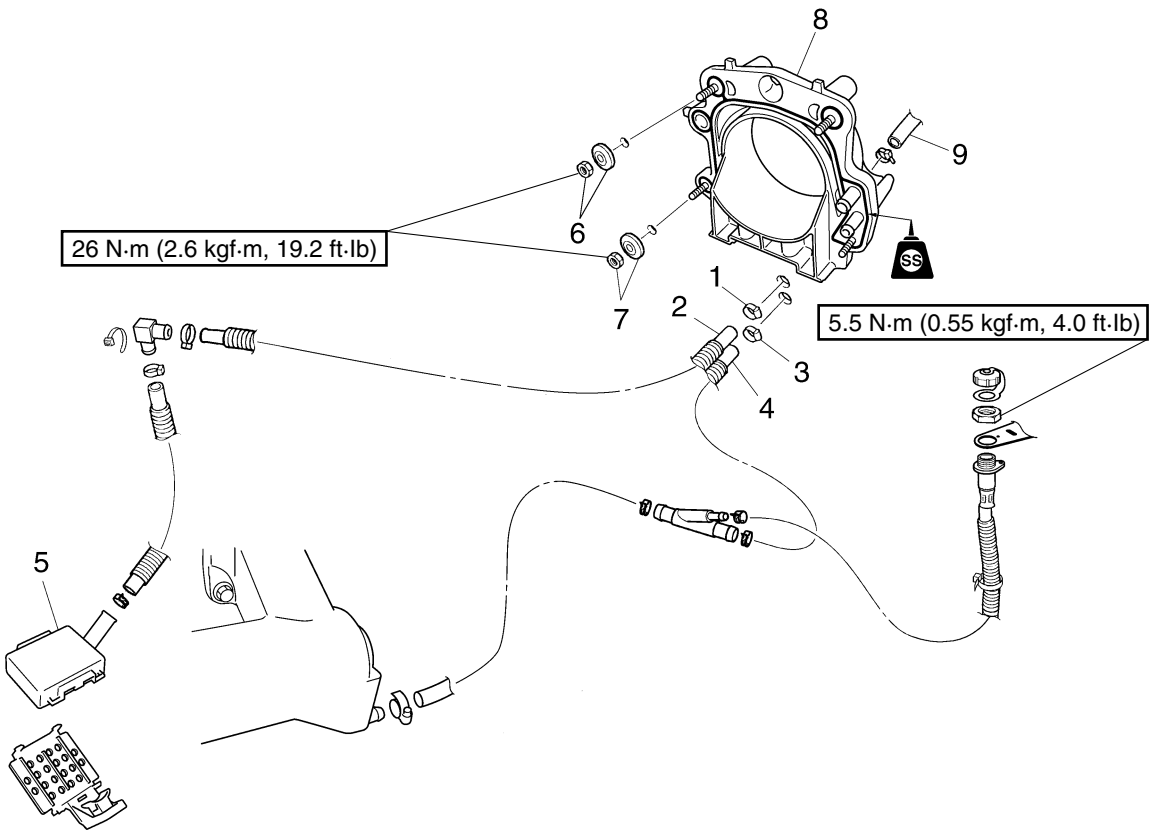


Impeller: 75 N·m (7.5 kgf·m, 55.3 ft·lb)

Crankshaft holder 20: 90890-06552

TIP:
Hold the impeller duct assembly in a vise between two aluminum plates ⓐ.

Transom plate and hoses



No.	Part name	Q'ty	Remarks
	Exhaust system		See "Exhaust system" (8-23).
	Jet pump unit assy.		See "Jet pump unit" (6-2).
1	Clamp	1	
2	Bilge hose 1	1	
3	Clamp	1	
4	Cooling water hose	1	Cooling water inlet
5	Bilge strainer	1	
6	Nut/washer	2/2	
7	Nut/washer	2/2	
8	Transom plate	1	
9	Bilge hose 2	1	

Bilge strainer check

See “Hull and hood” (3-9).

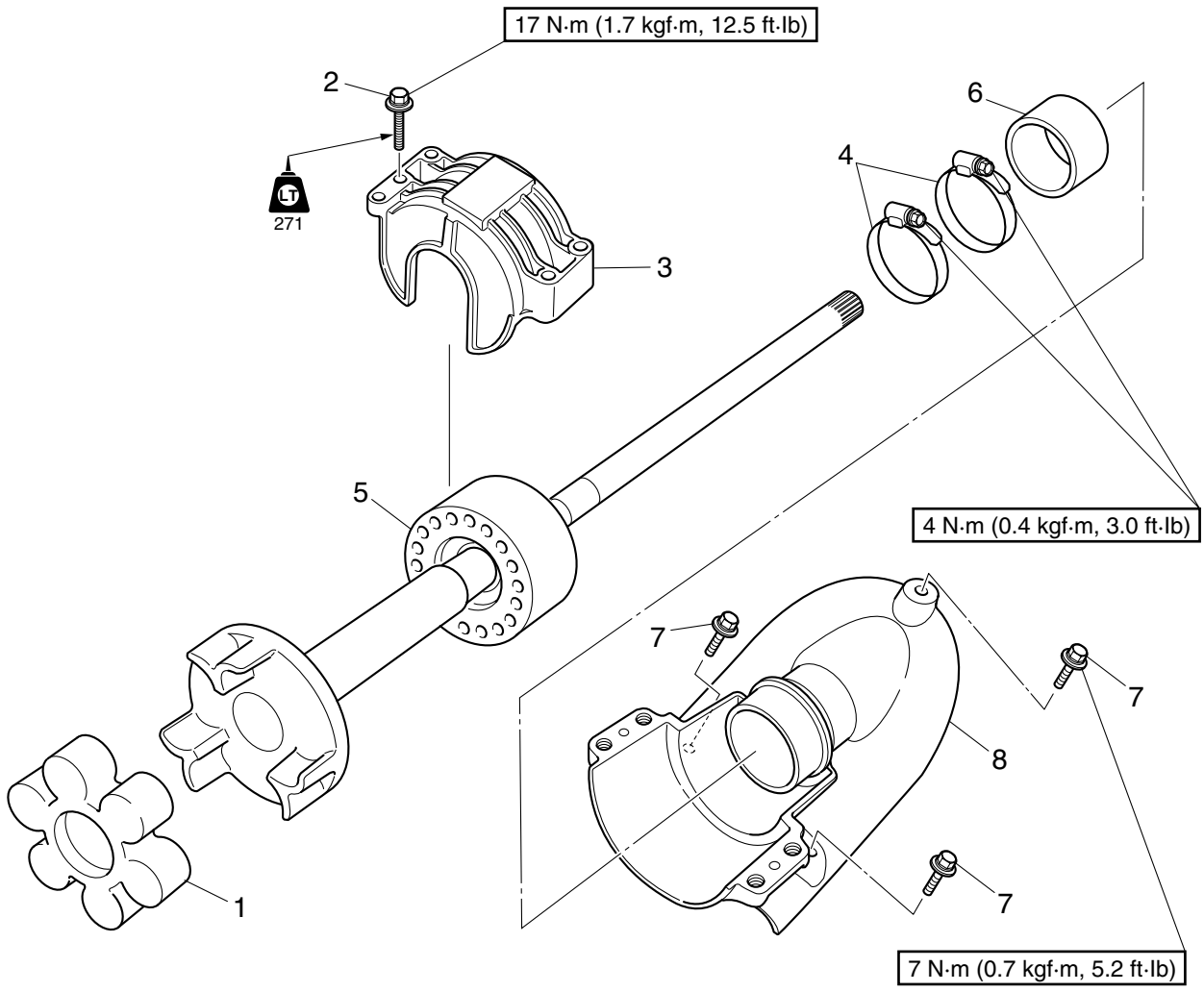
Bilge hose check

1. Check the bilge hoses. Replace if cracked or damaged.

Cooling water hose check

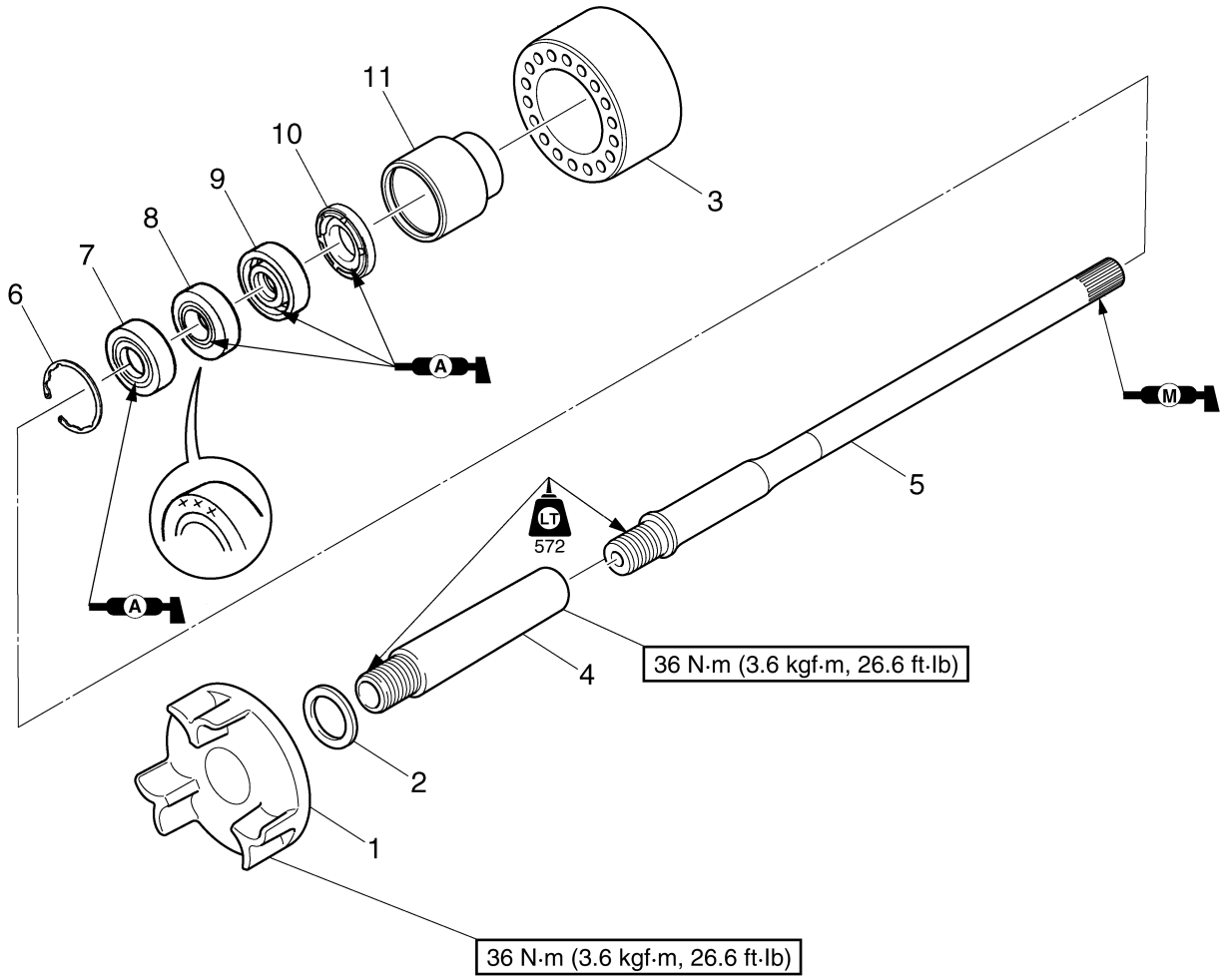
1. Check the cooling water hoses. Replace if cracked or damage.

Bearing housing



No.	Part name	Q'ty	Remarks
	Engine unit		See "Engine unit" (5-1).
1	Rubber coupling	1	
2	Bolt	4	M8 × 48 mm
3	Intermediate housing cover	1	
4	Clamp	2	
5	Intermediate drive shaft assy.	1	
6	Rubber hose	1	
7	Bolt	3	M6 × 14 mm
8	Joint	1	

Intermediate drive shaft assy.



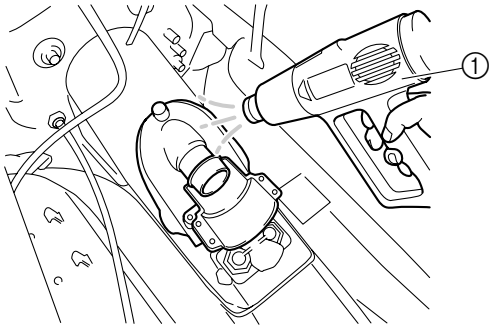
No.	Part name	Q'ty	Remarks
1	Driven coupling	1	
2	Washer	1	
3	Damper	1	
4	Intermediate drive shaft extension	1	
5	Intermediate drive shaft	1	
6	Circlip	1	**Not reusable**
7	Oil seal	1	**Not reusable**
8	Bearing	1	**Not reusable**
9	Oil seal	1	**Not reusable**
10	Oil seal	1	**Not reusable**
11	Bearing housing	1	

Joint removal

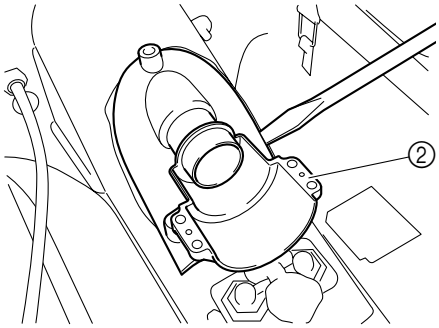
⚠ WARNING

Do not touch the joint or adhesive that was heated by the heat gun with your bare hands; they will be very hot and could cause burns.

1. Set a heat gun ① to 350 °C (662 °F) and use it for about 20 minutes to heat the joint and adhesive.



2. Once the adhesive has softened, use a flat head screwdriver to remove the joint ② from the hull.

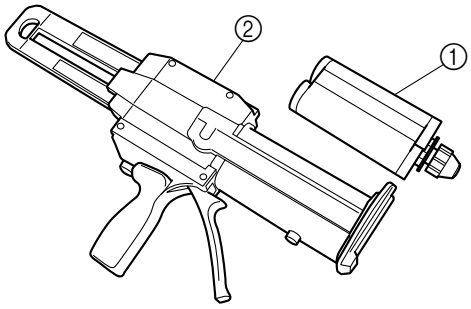


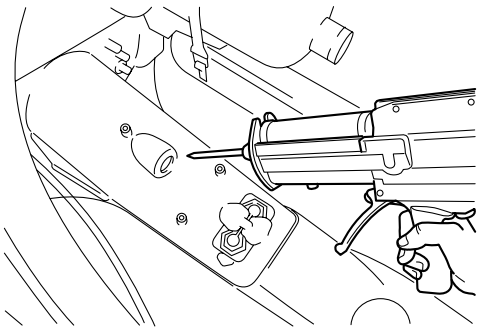
TIP:

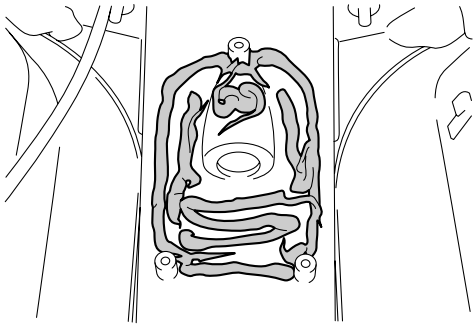
- When using the heat gun, be careful not to direct the heat towards any hoses or rubber parts.
- After removing the joint, clean off any adhesive remaining on the hull.

Joint installation

1. Apply urethane adhesive ① (MWV-GLUET-UB) to the hull in the area shown in the illustration using the glue gun ② (MWV-GLUEG-UN), and then install the joint.



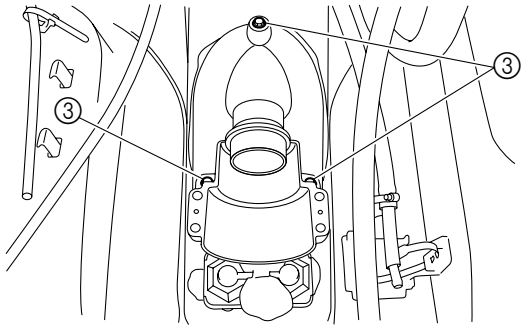




TIP:

Before installing the joint, clean the contact surfaces of the joint and hull to remove any dirt.

2. Tighten the bolts ③ to the specified torque.



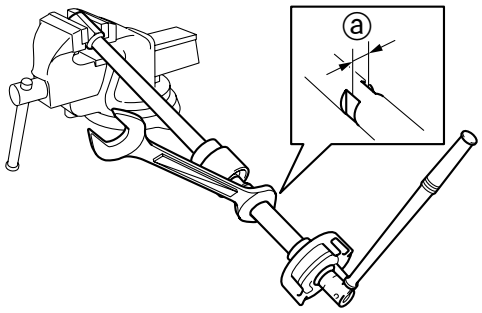
Joint bolt ③: 7 N·m (0.7 kgf·m, 5.2 ft·lb)

6

TIP:
- Remove any adhesive that is protruding in or around the hole for the intermediate drive shaft.
- After installing the joint, allow the adhesive to harden for at least 24 hours before placing the watercraft in the water.

Driven coupling removal and installation

1. Remove the driven coupling.



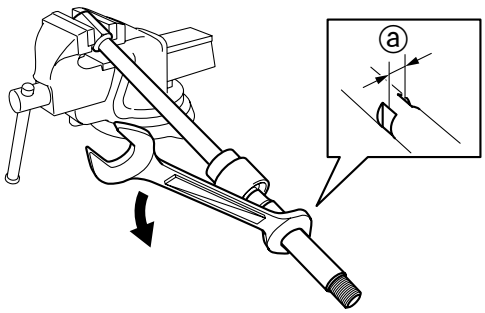
Coupler wrench: 90890-06425
Drive shaft holder 5: 90890-06519

Width ⓐ: 27 mm (1.06 in)

TIP:
- Install the driven coupling using the same special service tools that were used for removal.
- Check that the drive shaft holder and intermediate drive shaft are properly engaged.

Intermediate drive shaft extension removal

1. Remove the intermediate drive shaft extension.



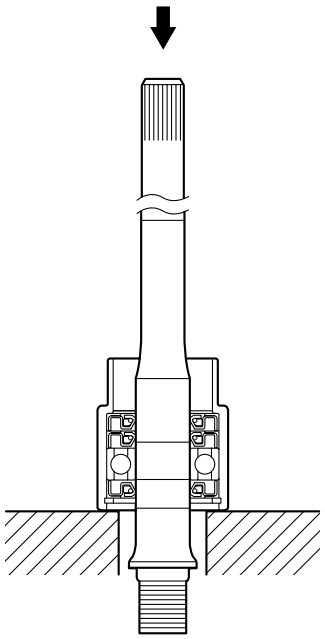
Drive shaft holder 5: 90890-06519

Width ⓐ: 27 mm (1.06 in)

TIP:
- Fit a wrench into the notches in the intermediate drive shaft extension.
- Check that the drive shaft holder and intermediate drive shaft are properly engaged.

Intermediate drive shaft removal

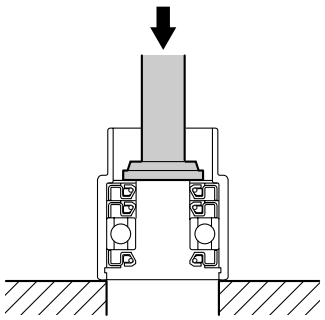
1. Remove the intermediate drive shaft.



TIP:
Remove the intermediate drive shaft using a press.

Bearing removal

1. Remove the circlip, bearing and oil seals.



Driver rod LS: 90890-06606
Bearing outer race attachment:
90890-06628

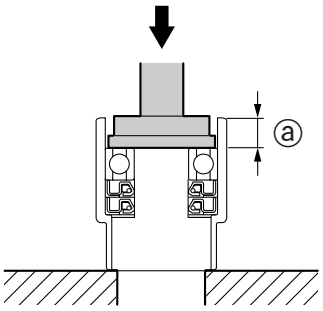
TIP:
Remove the bearing and oil seals using a press.

Driven coupling check

1. Check the driven coupling and driven coupling damper. Replace if damaged or worn.

Bearing and oil seals installation

1. Install the oil seals and bearing.

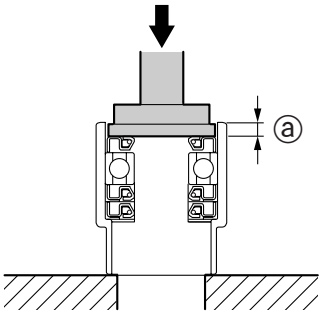


Driver rod LS: 90890-06606
Ball bearing attachment: 90890-06631

Distance ⓐ:
14.2 ± 0.2 mm (0.56 ± 0.01 in)

TIP:
Install the bearing using a press.

2. Install the oil seal.

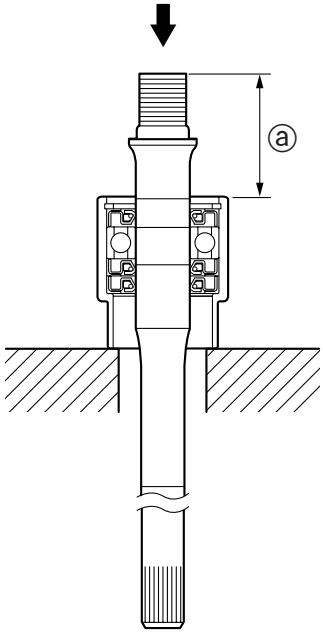


Driver rod LS: 90890-06606
Ball bearing attachment: 90890-06631

Distance ⓐ:
6.2 ± 0.2 mm (0.24 ± 0.01 in)

Intermediate drive shaft installation

1. Install the intermediate drive shaft.

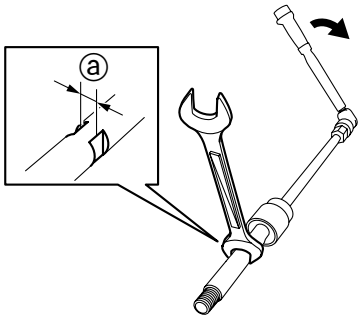


Distance ⓐ:
56.8 ± 0.2 mm (2.24 ± 0.01 in)

TIP:
Install the intermediate drive shaft using a press.

Intermediate drive shaft extension installation

1. Install the intermediate drive shaft extension.



Drive shaft holder 5: 90890-06519

Width ⓐ: 27 mm (1.06 in)

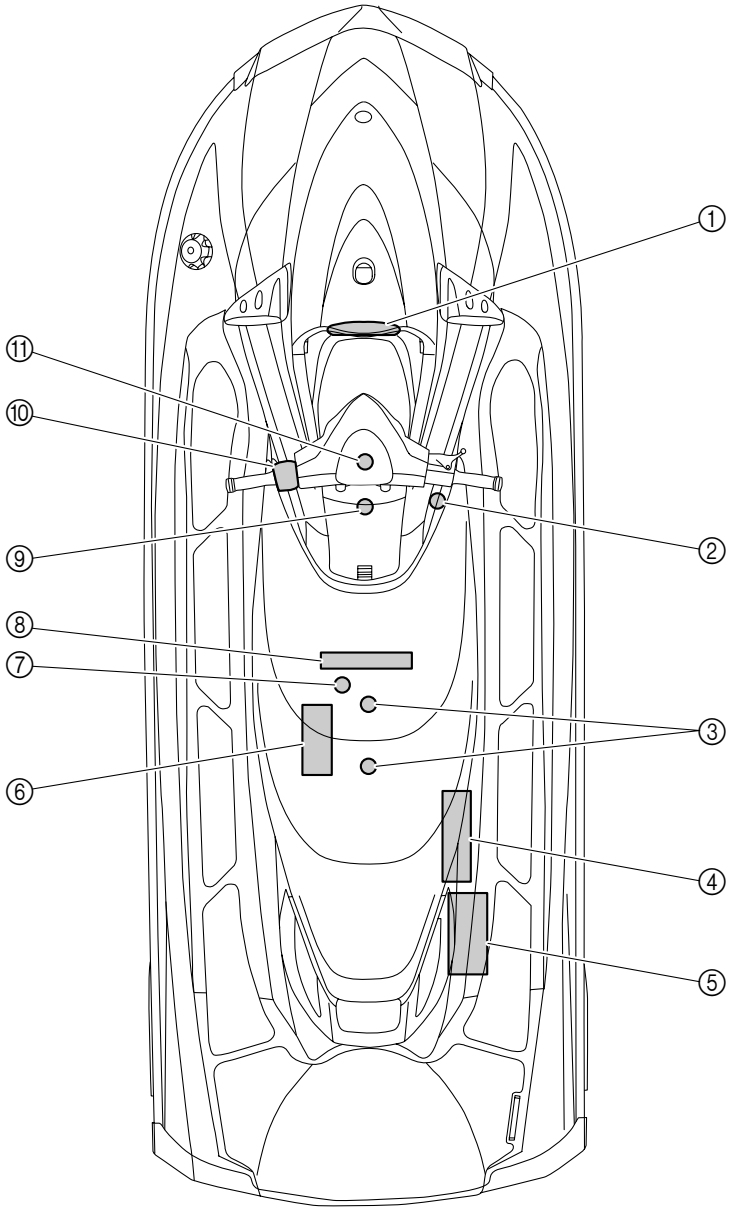
Intermediate drive shaft extension: 36 N·m (3.6 kgf·m, 26.6 ft·lb)

TIP:

Fit a wrench into the notches in the intermediate drive shaft extension.

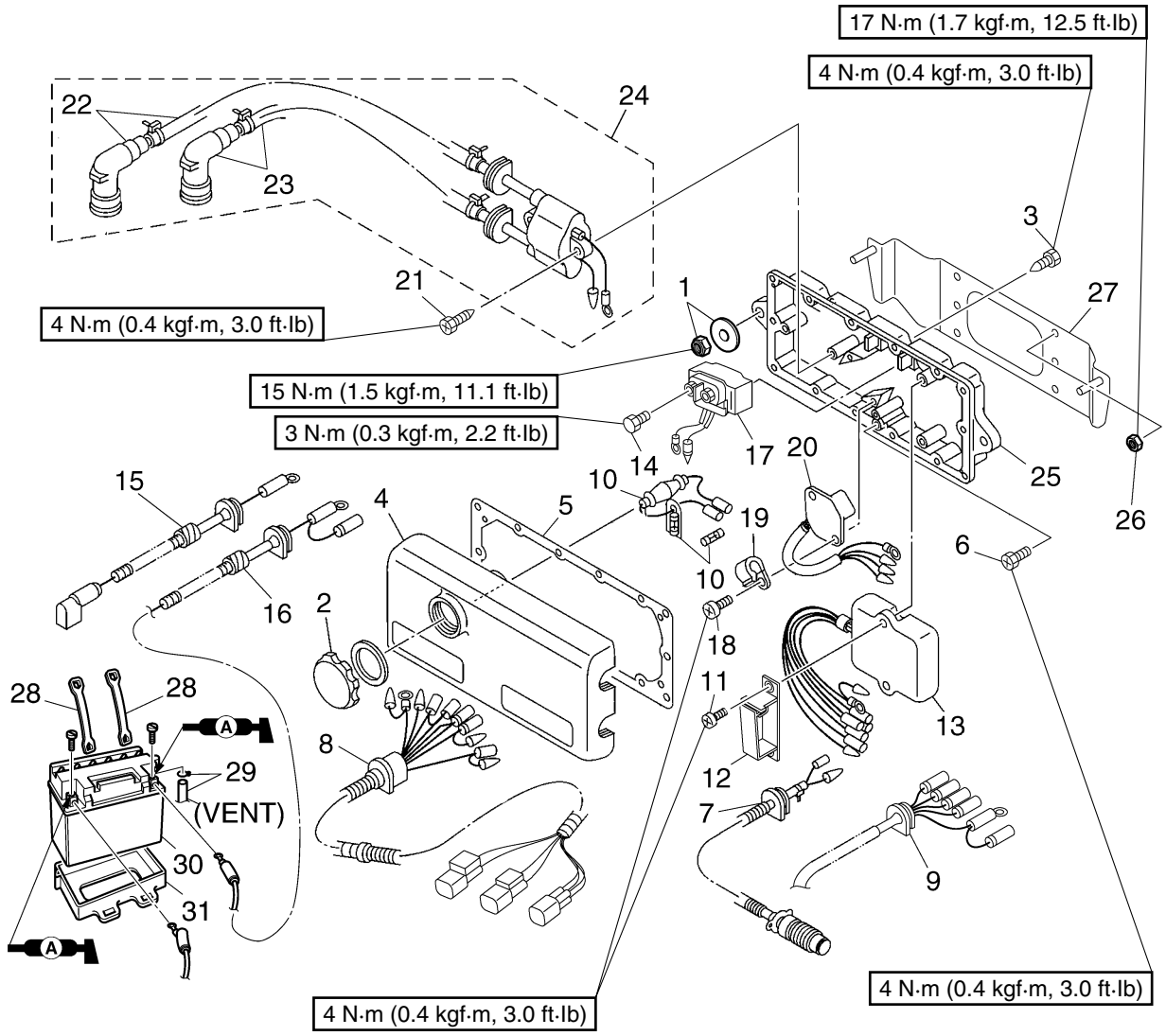
Electrical system

Electrical components

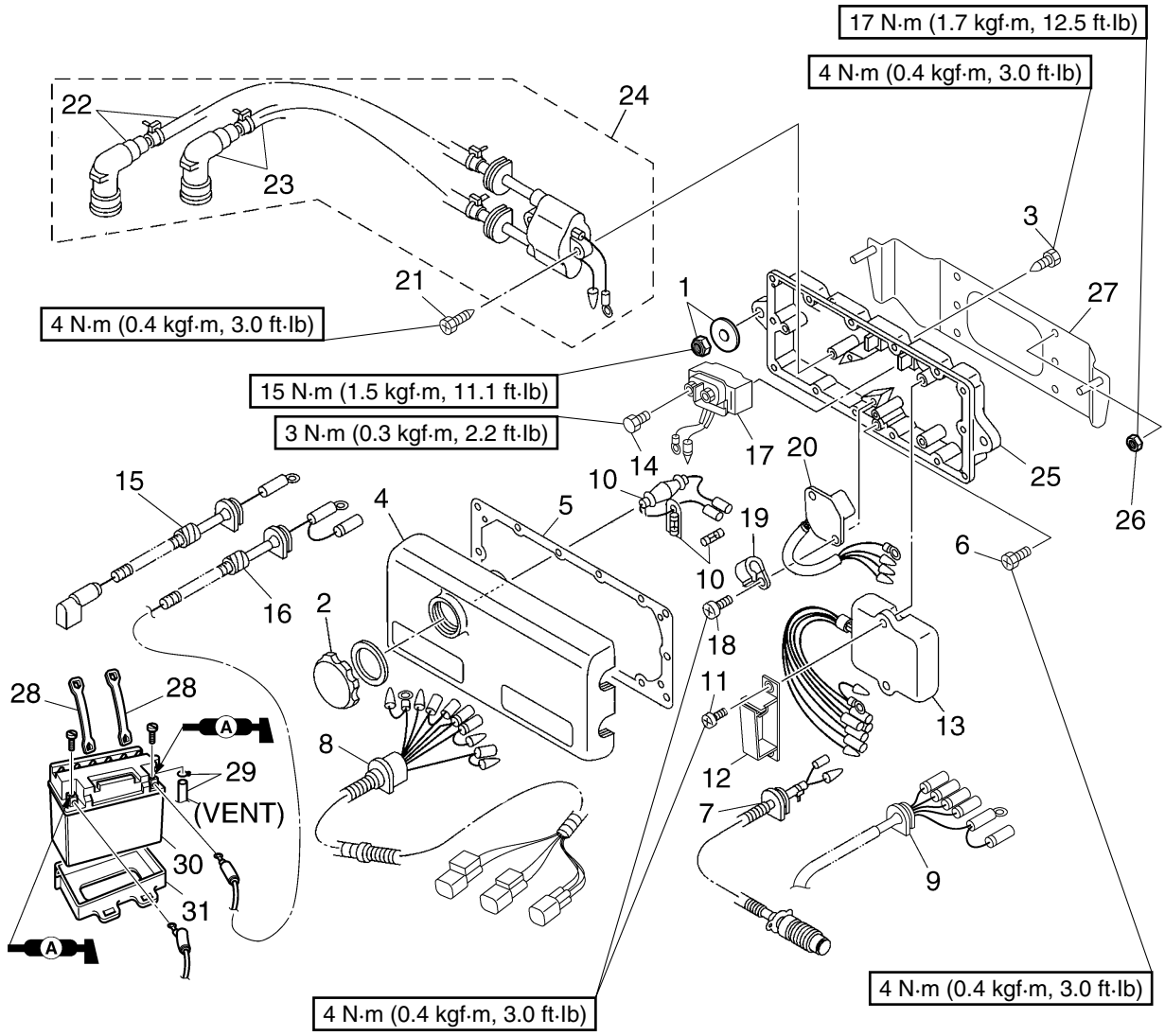


① Multifunction meter
② Oil level sensor
③ Spark plugs
④ Electrical box (rectifier regulator, CDI unit, starter relay, and ignition coil)
⑤ Battery
⑥ Starter motor
⑦ Thermoswitch
⑧ Lighting coil, pickup coil, and charge coil
⑨ Fuel level sensor
⑩ Left handlebar switch assy. (Engine stop switch, engine shut-off switch, and start switch)
⑪ Buzzer

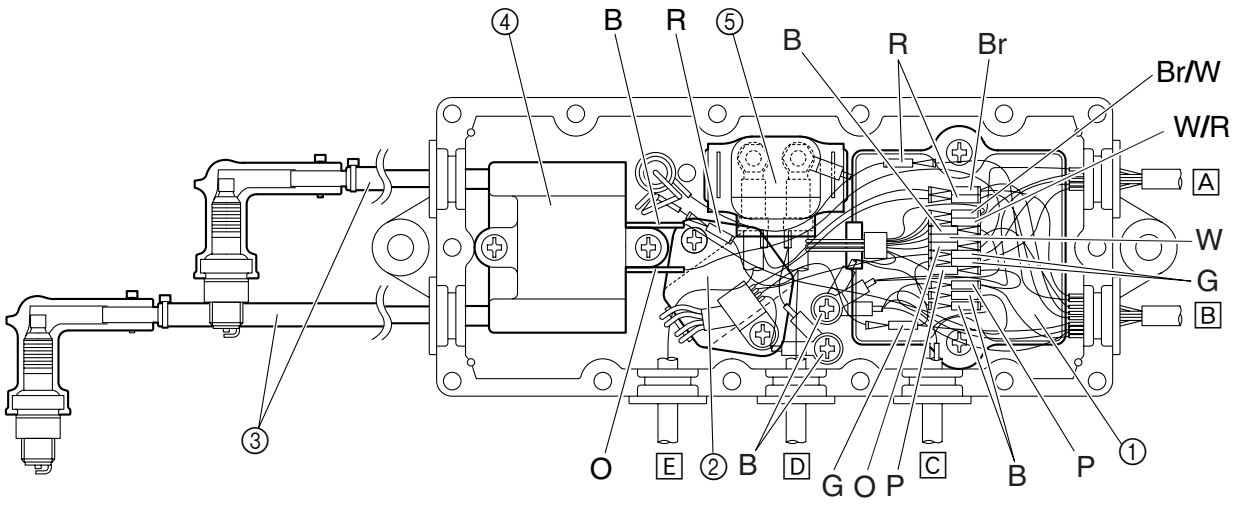
Electrical box

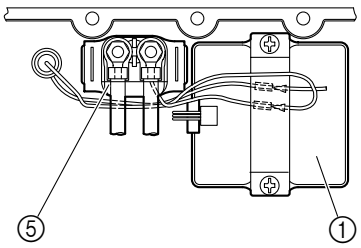


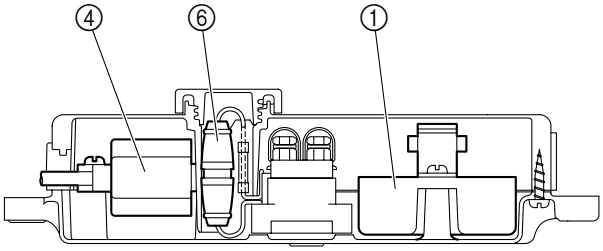
No.	Part name	Q'ty	Remarks
1	Nut/washer	2/2	
2	Electrical box cap	1	
3	Screw	14	ø6 × 24 mm
4	Electrical box cover	1	
5	Gasket	1	
6	Screw	2	ø6 × 16 mm
7	Wiring harness	1	Electrical box to thermoswitch
8	Wiring harness	1	Electrical box to multifunction meter and handlebar switch
9	Wiring harness	1	Electrical box to base assy.
10	Fuse holder/fuse/spare fuse	1/1/1	
11	Screw	2	ø6 × 16 mm
12	Holder	1	
13	CDI unit	1	
14	Bolt	2	M6 × 10 mm
15	Starter motor cable	1	Starter relay to starter motor



No.	Part name	Q'ty	Remarks
16	Positive battery cable	1	Starter relay to positive battery terminal
17	Starter relay	1	
18	Screw	2	ø6 × 16 mm
19	Holder	1	
20	Rectifier regulator	1	
21	Screw	2	ø6 × 30 mm
22	Spark plug wire 1/spark plug cap	1/1	
23	Spark plug wire 2/spark plug cap	1/1	
24	Ignition coil assy.	1	
25	Electrical box case	1	
26	Nut	4	
27	Bracket	1	
28	Band	2	
29	Battery breather hose	1	
30	Battery	1	
31	Battery box	1	







① CDI unit
② Rectifier regulator
③ Spark plug wires
④ Ignition coil
⑤ Starter relay
⑥ Fuse holder

A To base assy.
B To multifunction meter, engine start switch, and engine stop switch
C To thermoswitch
D To positive battery terminal
E To starter motor

B : Black
Br : Brown
G : Green
O : Orange
P : Pink
R : Red
W : White
Br/W : Brown/White
W/R : White/Red

7

Electrical analysis

To measure the peak voltage

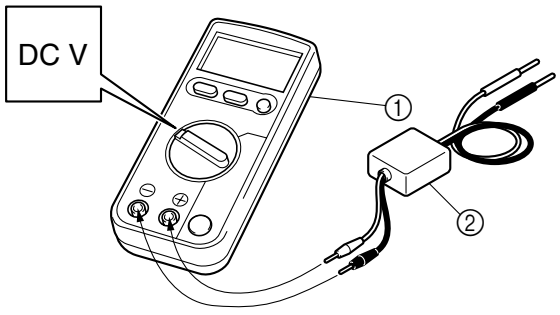
⚠ WARNING

When measuring the peak voltage, do not touch any of the connections of the digital tester probes.

NOTICE

- **When testing the voltage between the terminals of an electrical component with the digital tester, do not allow any of the leads to touch any metal parts.**
- **When starting the engine on land, make sure to connect a garden hose to the watercraft for proper water supply.**

To check the electrical components or measure the peak voltage, use the special service tools. A faulty electrical component can be easily checked by measuring the peak voltage. The specified engine speed when measuring the peak voltage is affected by many factors, such as fouled spark plugs or a weak battery. If one of these factors is present, the peak voltage cannot be measured properly.



Digital circuit tester ①: 90890-03174
Peak voltage adapter B ②: 90890-03172

TIP:

- Before measuring the peak voltage, check all wiring for proper connection and corrosion, and check that the battery is fully charged.
- Use the peak voltage adapter with the recommended digital circuit tester.
- Connect the positive pin of the peak voltage adapter to the positive terminal of the digital circuit tester, and the negative pin to the negative terminal.
- When measuring the peak voltage, set the selector on the digital circuit tester to the **DC voltage mode**.

Ignition system

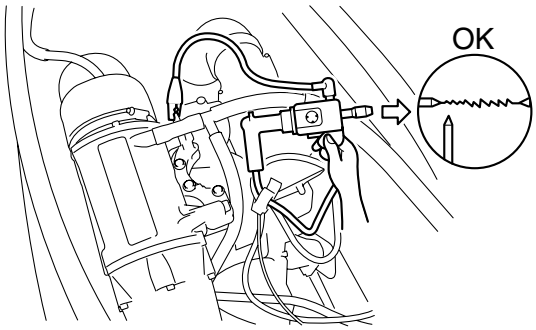
Ignition coil

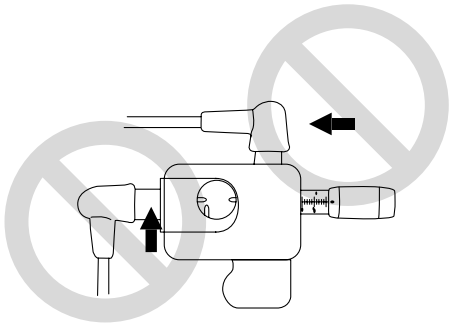
Ignition spark

⚠ WARNING

- **When performing the spark gap test, take special care not to let sparks leak out of the removed spark plug cap.**
- **When performing the spark gap check, keep flammable gas or liquids away, since this test can produce sparks.**

1. Connect the spark plug cap to the special service tool.
2. Crank the engine and observe the ignition spark through the discharge window.
3. Check the ignition spark. **WARNING! Do not touch any of the connections of the special service tool leads.**
4. Measure the CDI unit output peak voltage and ignition coil resistance, if there is no spark, or the spark is weak.

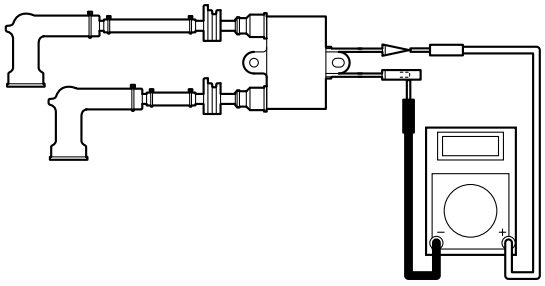




Ignition tester (Spark gap tester):
90890-06754

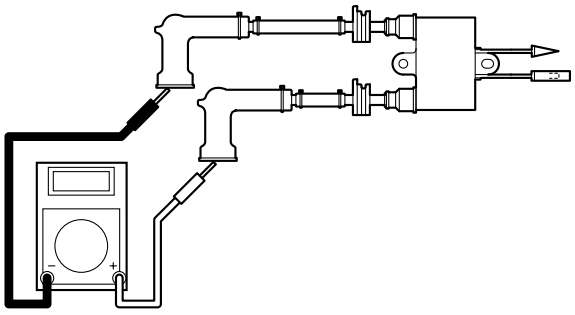
Ignition coil resistance

1. Measure the primary coil resistance.
2. Replace the ignition coil if out of specification.



Primary coil resistance at 20 °C (68 °F) (reference data):
Connector – Connector
0.078–0.106 Ω

3. Measure the secondary coil resistance.
4. Replace the ignition coil if out of specification.

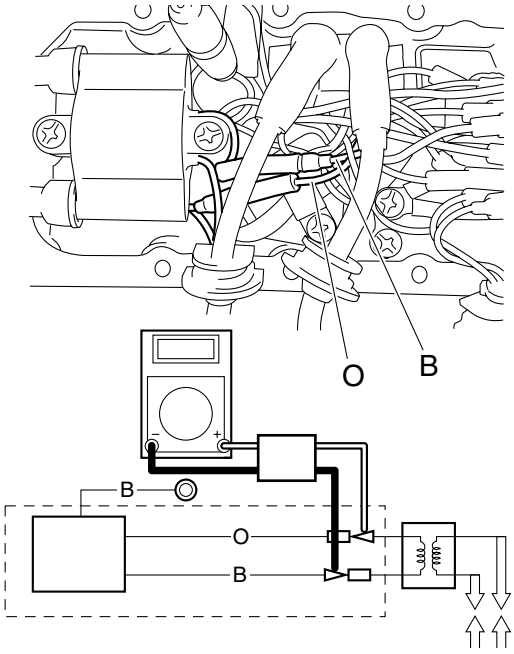


Secondary coil resistance at 20 °C (68 °F) (reference data):
Spark plug cap – Spark plug cap
14.336–30.464 kΩ

CDI unit

CDI unit output peak voltage

1. Measure the CDI unit output peak voltage.
2. Measure the CDI unit resistance and charge coil output peak voltage if below specification.

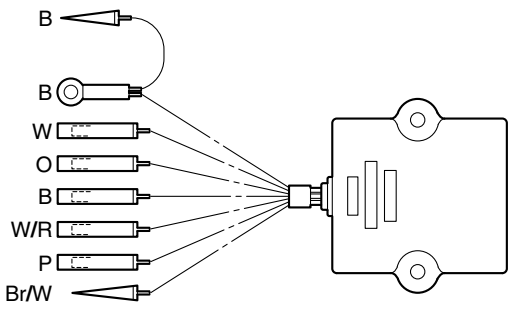


CDI unit output peak voltage: Orange (O) – Black (B)			
r/min	Loaded		
	Cranking	1500	3500
V	10	200	130

TIP:
To crank the engine, connect the engine shut-off cord to the engine shut-off switch, and then push the engine start switch and engine stop switch simultaneously.

CDI unit resistance

1. Measure the CDI unit resistance.
2. Replace the CDI unit if out of specification.



[kΩ]

		A						
		B	W	O	B	W/R	P	Br/W
B	B		10–40	●	0	150–600	3–11	2–6
	W	∞		∞	∞	∞	∞	∞
	O	●	●		●	●	●	●
	B	0	10–40	●		150–600	3–11	2–6
	W/R	9–36	50–200	●	9–36		10–40	17–70
	P	∞	∞	∞	∞	∞		∞
	Br/W	20–80	15–60	●	20–80	250–1000	50–200	

A Tester lead ⊕
B Tester lead ⊖
"●" mark: The needle swings toward zero once, and then returns to the home position.

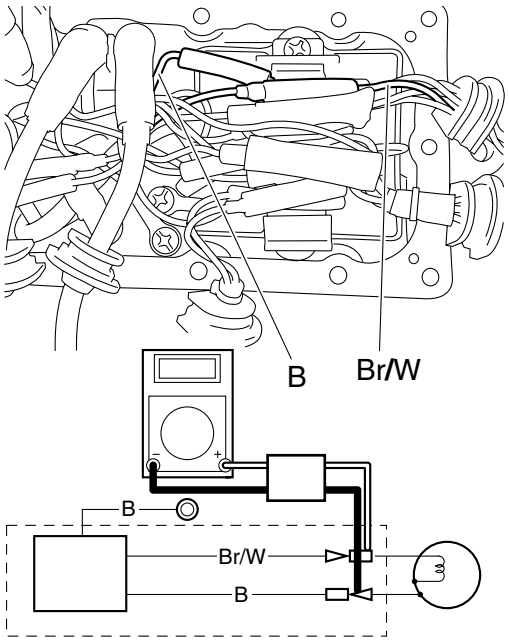
TIP:
- The resistance values will vary from tester to tester, especially with electronic digital testers. For some testers, the polarity of the leads is reversed.
- The "∞" mark indicates no continuity.

Charge coil

Charge coil output peak voltage

1. Measure the charge coil output peak voltage.

2. Measure the charge coil resistance if below specification.



Charge coil output peak voltage: Brown/White (Br/W) – Black (B)				
r/min	Unloaded	Loaded		
	Cranking		1500	3500
V	180	20	210	150

TIP:
- To crank the engine, connect the engine shut-off cord to the engine shut-off switch, and then push the engine start switch and engine stop switch simultaneously.
- If measuring the charge coil output peak voltage under the "Cranking" and "Unloaded" conditions, disconnect the charge coil terminals.

Charge coil resistance

1. Measure the charge coil resistance.

2. Replace the charge coil if out of specification.

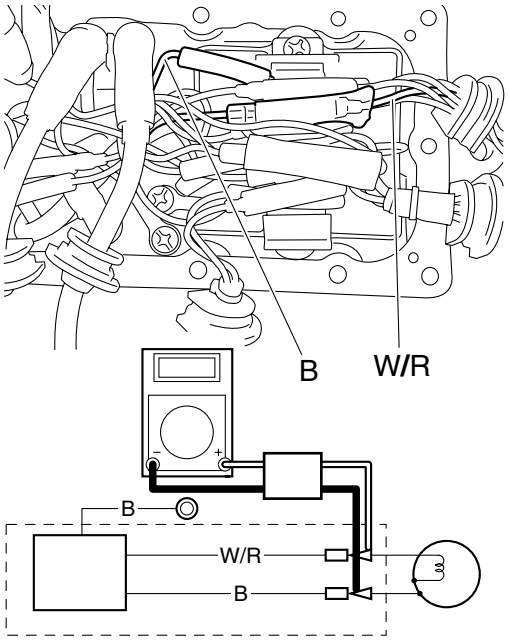
Charge coil resistance at 20 °C (68 °F) (reference data):
Brown/White (Br/W) – Black (B)
497.7–608.3 Ω

Pickup coil

Pickup coil output peak voltage

1. Measure the pickup coil output peak voltage.

2. Measure the pickup coil resistance if below specification.



Pickup coil output peak voltage: White/Red (W/R) – Black (B)				
r/min	Unloaded	Loaded		
	Cranking		1500	3500
V	5.2	5.1	14.1	29.3

TIP:

- To crank the engine, connect the engine shut-off cord to the engine shut-off switch, and then push the engine start switch and engine stop switch simultaneously.
- If measuring the pickup coil output peak voltage under the "Cranking" and "Unloaded" conditions, disconnect the pickup coil terminals.

Pickup coil resistance

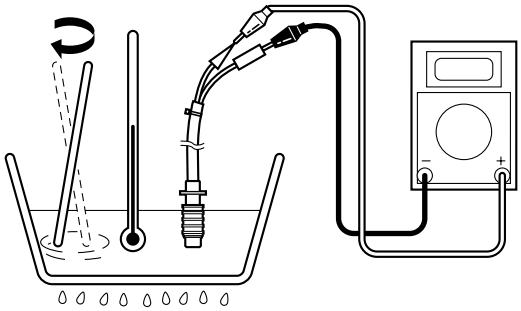
1. Measure the pickup coil resistance.

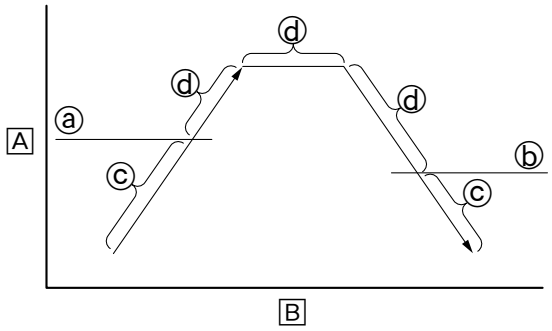
2. Replace the pickup coil if out of specification.

Pickup coil resistance at 20 °C (68 °F) (reference data):
White/Red (W/R) – Black (B)
12.6–15.4 Ω

Thermoswitch

1. Suspend the thermoswitch in a container filled with water, and then slowly heat the water.





2. Check the thermoswitch for continuity when the specified temperatures are reached.

3. Replace if out of specification.

Thermoswitch (engine) continuity temperature:
ⓐ: 77–83 °C (171–181 °F)
ⓑ: 63–77 °C (145–171 °F)

ⓒ No continuity
ⓓ Continuity
A Temperature
B Time

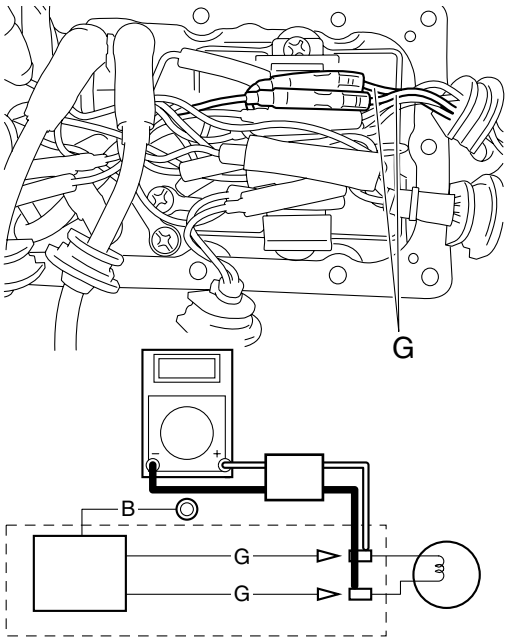
7

Charging system

Lighting coil

Lighting coil output peak voltage

1. Disconnect the lighting coil connectors.
2. Measure the lighting coil output peak voltage.
3. Measure the lighting coil resistance if below specification.



Lighting coil output peak voltage: Green (G) – Green (G)			
r/min	Unloaded		
	Cranking	1500	3500
V	8.7	25.6	47.3

TIP:

To crank the engine, connect the engine shut-off cord to the engine shut-off switch, and then push the engine start switch and engine stop switch simultaneously.

Lighting coil resistance

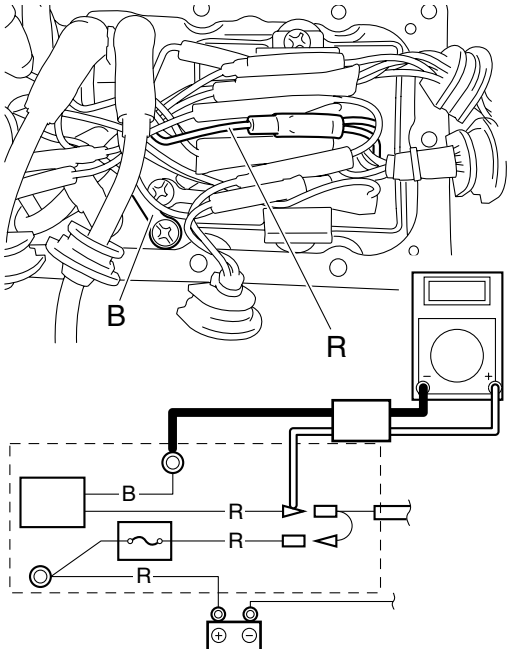
1. Measure the lighting coil resistance.
2. Replace the lighting coil if out of specification.

Lighting coil resistance at 20 °C (68 °F) (reference data):
Green (G) – Green (G)
1.143–1.397 Ω

Rectifier regulator

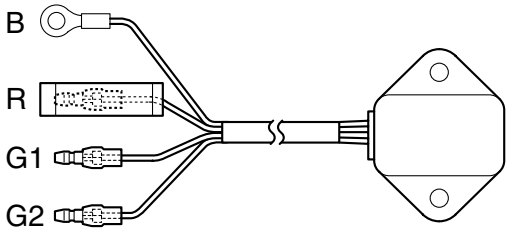
Rectifier regulator output peak voltage

1. Disconnect the rectifier regulator connectors.
2. Measure the rectifier regulator output peak voltage.



Rectifier regulator output peak voltage: Red (R) – Black (B)		
r/min	Unloaded	
	1500	3500
V	13.0	

3. Measure the rectifier regulator resistance if below specification.



[kΩ]

		A			
		R	B	G1	G2
B	R		∞	∞	∞
	B	2–20		1–10	1–10
	G1	1–10	2–15		3–30
	G2	1–10	2–15	3–30	

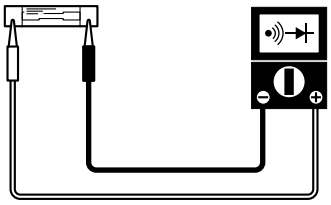
A Tester lead ⊕
B Tester lead ⊖

TIP:
- The resistance values will vary from tester to tester, especially with electronic digital testers. For some testers, the polarity of the leads is reversed.
- The "∞" mark indicates no continuity.

Starting system

Fuse

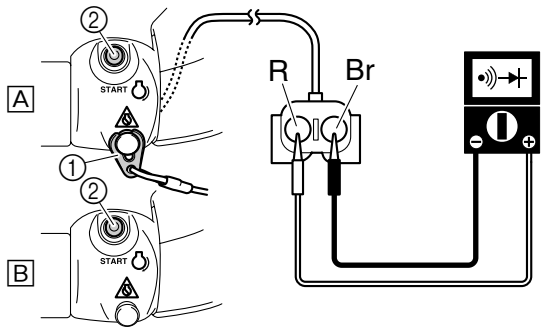
1. Check the fuse for continuity. Replace if there is no continuity.



Left handlebar switch assy.

Engine start switch continuity

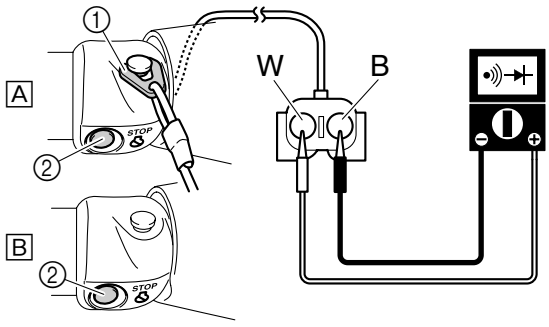
1. Disconnect the left handlebar switch coupler (white coupler). See "Handlebar and handlebar switch assy." (8-2).
2. Check the engine start switch for continuity.
3. Replace the left handlebar switch assy. if out of specification.



Engine start switch continuity:		
Clip ①	Engine start switch ②	Red (R) – Brown (Br)
Installed A	Free	No continuity
	Pushed	Continuity
Removed B	Free	No continuity
	Pushed	No continuity

Engine stop switch continuity

1. Disconnect the left handlebar switch coupler (black coupler). See "Handlebar and handlebar switch assy." (8-2).
2. Check the engine stop switch for continuity.
3. Replace the left handlebar switch assy. if out of specification.



Engine stop switch continuity:		
Clip ①	Engine stop switch ②	White (W) – Black (B)
Installed A	Free	No continuity
	Pushed	Continuity
Removed B	Free	Continuity
	Pushed	Continuity

7

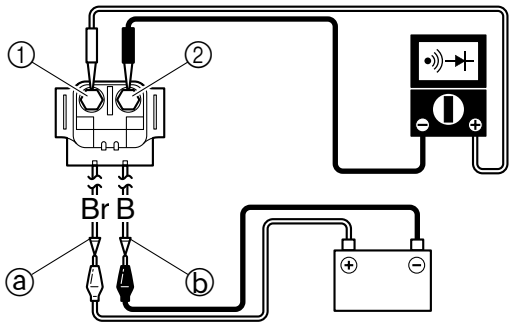
Starter relay

1. Connect the tester leads between the starter relay terminals ① and ②.

2. Connect the positive battery lead to the terminal ⓐ, and the negative battery lead to the terminal ⓑ.

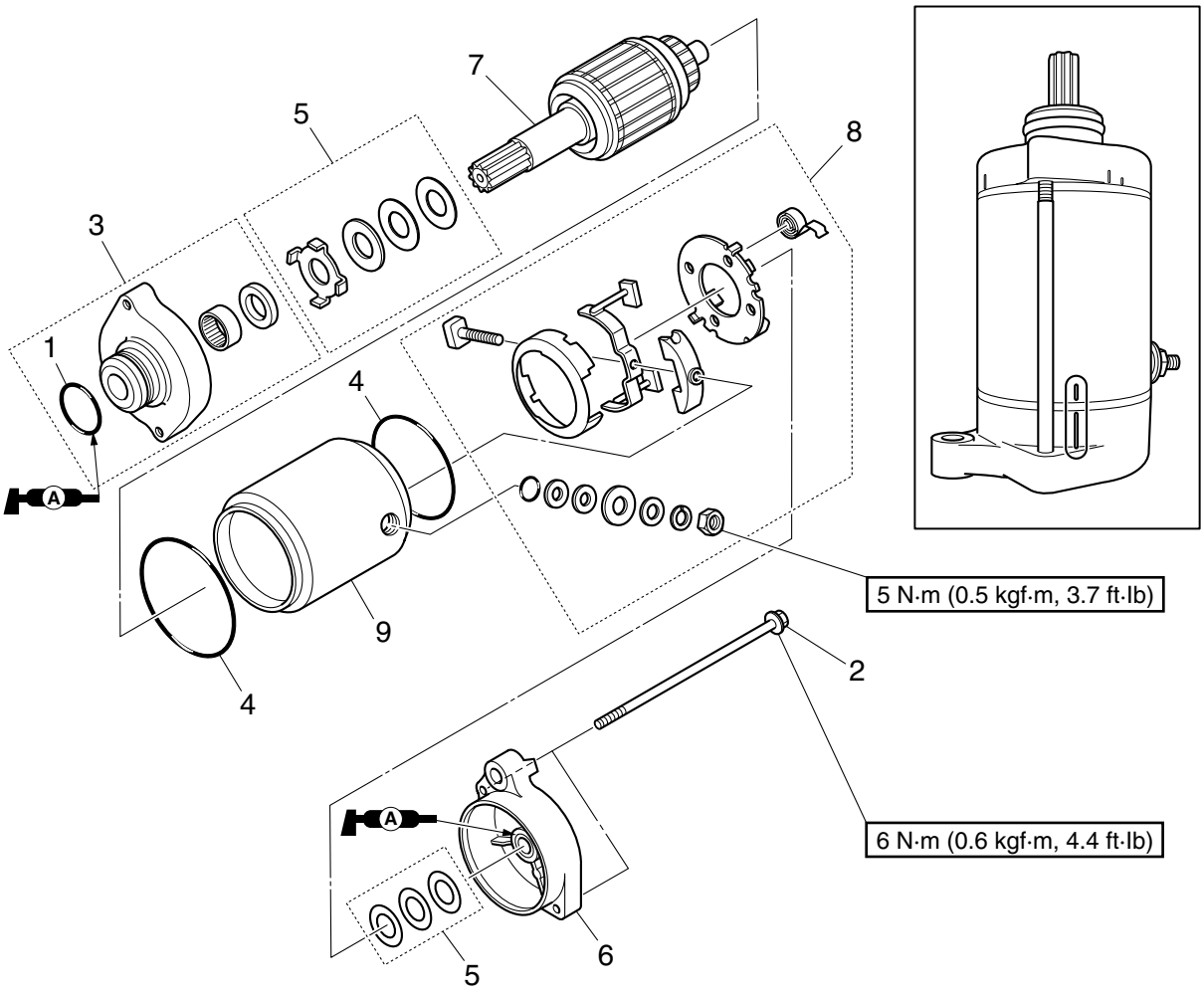
3. Check the continuity between the starter relay terminals ① and ②.

4. Replace the starter relay if out of specification.



Starter relay continuity:	
Battery lead ⓐ – ⓑ	Terminal ① – ②
Disconnected	No continuity
Connected	Continuity

Starter motor



No.	Part name	Q'ty	Remarks
1	O-ring	1	**Not reusable**
2	Bolt	2	M5 × 114 mm
3	Front cover assy.	1	
4	O-ring	2	**Not reusable**
5	Washer set	1	
6	Rear cover assy.	1	
7	Armature	1	
8	Brush holder assy.	1	
9	Starter motor yoke	1	

Starter motor operation

1. Hold the starter motor in a vise using aluminum plates on both sides.

2. Connect the positive battery cable to the starter motor terminal bolt.

3. Connect the negative battery cable to the starter motor body, and then check the starter motor operation. **WARNING! Do not touch the armature shaft.**

TIP:

- Check the starter motor operation for a few seconds.
- If the starter motor is disassembled, make sure to check the operation again after assembling it.

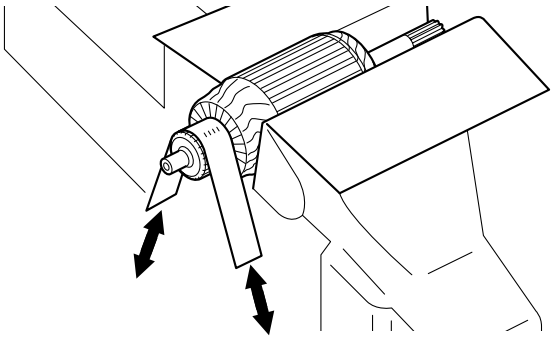
4. Disconnect the negative battery cable, and then the positive battery cable from the battery terminals.

Armature

Armature appearance

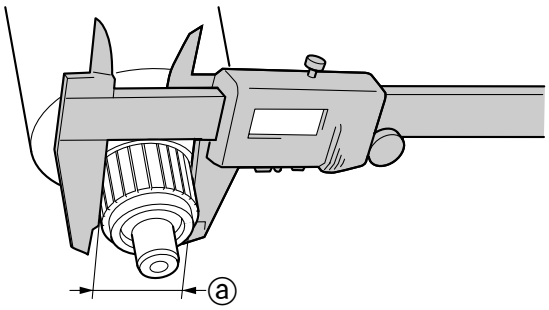
1. Check the armature. Replace if damaged or worn.

2. Check the commutator. Clean with 600-grit sandpaper and compressed air if dirty.



Commutator diameter

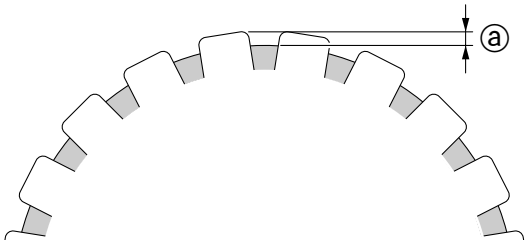
1. Measure the commutator diameter ⓐ. Replace the armature if below specification.



Commutator diameter ⓐ:
27.0–28.0 mm (1.06–1.10 in)

Commutator undercut

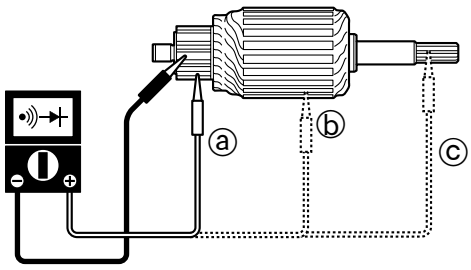
1. Measure the commutator undercut ⓐ. Replace the armature if below specification.



Commutator undercut ⓐ (reference data):
0.2–0.7 mm (0.008–0.028 in)

Armature continuity

1. Check the armature for continuity. Replace if out of specification.



Armature continuity:	
Commutator segments ⓐ	Continuity
Segment ⓐ – Armature core ⓑ	No continuity
Segment ⓐ – Armature shaft ⓒ	No continuity

Front and rear cover

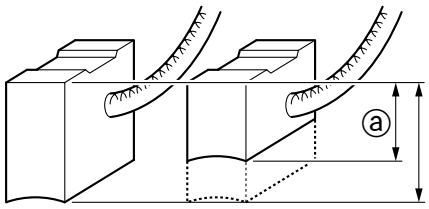
1. Check the front cover oil seal. Replace the front cover if damaged or worn.

2. Check the rear cover metal. Replace the rear cover if cracked or damaged.

Brush holder

Brush length

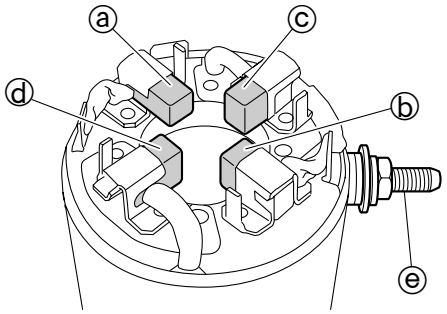
1. Measure the brush length ⓐ. Replace the brush holder assy. if below specification.

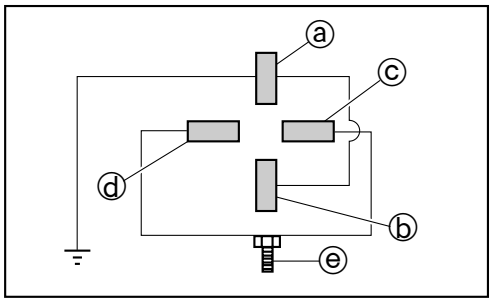


Brush length ⓐ:
6.5–12.5 mm (0.26–0.49 in)

Brush holder assy. continuity

1. Check the brush holder assy. for continuity. Replace if out specification.





Brush holder assy. continuity:	
Brush ⓐ – Brush ⓑ Brush ⓒ – Brush ⓓ Brush ⓒ – Terminal ⓔ Brush ⓓ – Terminal ⓔ	Continuity
For all brush and terminal combinations not listed above.	No continuity

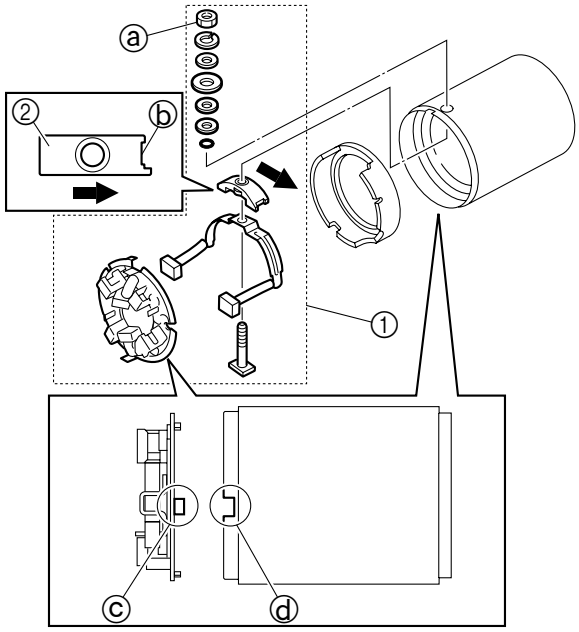
Starter motor assembly

NOTICE

Do not reuse an O-ring, always replace it with a new one.

1. Install the brush holder assy. ①, and then tighten the nut ⓐ to the specified torque.

7



Starter motor terminal nut ⓐ: 5 N·m (0.5 kgf·m, 3.7 ft·lb)

TIP:
- Install the spacer ② so that the notch ⓑ in the spacer is facing in the direction of the arrow.
- Align the protrusion ⓒ on the brush holder with the notch ⓓ on the starter motor yoke.

Indication system

Multifunction meter

Multifunction meter appearance

1. Check the multifunction meter external appearance. Replace the multifunction meter if there is cracked meter hosing, fogged meter, or water intrusion.

Tachometer operation

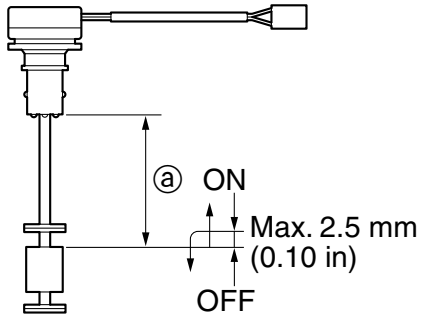
1. Check the tachometer display.
2. Measure the lighting coil output peak voltage if it does not operate correctly. See “Lighting coil” (7-9).
3. Measure the CDI unit resistance. See “CDI unit” (7-6).
4. Check the wiring harness for continuity.
5. Replace or repair the wiring harness if there is no continuity.
6. Replace the multifunction meter if there is continuity.

Hour meter operation

1. Check the hour meter display.
2. Replace the multifunction meter if it does not operate correctly.

Oil level sensor and oil level warning indicator

1. Check the oil level sensor if oil level warning indicator does not come on.
2. Replace the oil level sensor if out of specification.



Oil level sensor continuity:	
Float position	Blue (L)- Black (B)
OFF	No continuity
ON	Continuity

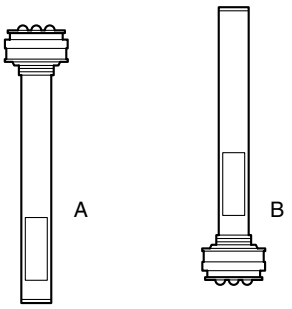
Float length ⓐ: 37.0–41.0 mm (1.46–1.61 in)

3. Replace the multifunction meter if the oil level sensor continuity is within specification.

Fuel level meter display and fuel level warning indicator

1. Measure the fuel level sensor resistance if fuel level meter does not display.
2. Measure the fuel level sensor resistance if fuel level warning indicator does not come on.

3. Replace the fuel level sensor if out of specification.



Float position	Resistance (Ω)
A	757.0–803.0
B	0–8

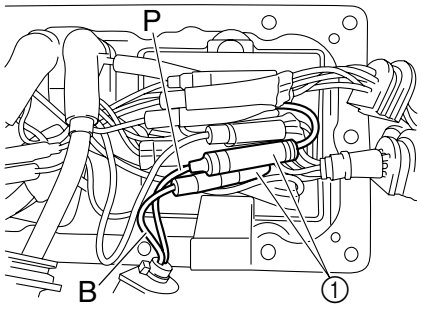
4. Replace the multifunction meter if the fuel level sensor resistance is within specification.

Engine overheat warning indicator

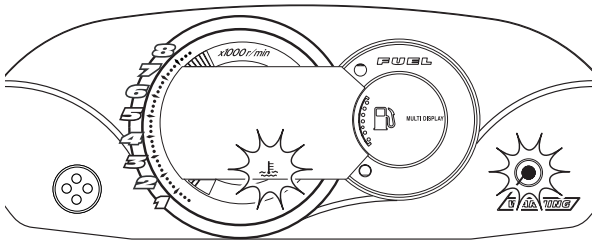
1. Check the thermoswitch if engine overheat warning indicator does not come on. See “Thermoswitch” (7-8).

2. Start the engine.

3. Disconnect the thermoswitch connectors ①, and then connect the jumper lead to the disconnected connector.



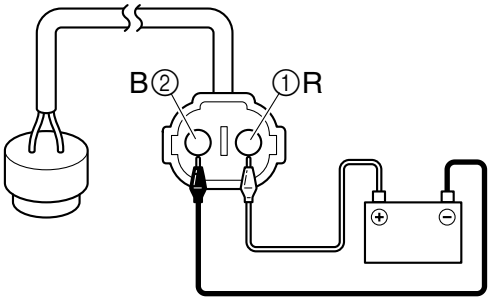
4. Check that the “WARNING” indicator light and the engine overheat warning indicator blink, and the buzzer begins to sound intermittently.



Buzzer

1. Connect the positive battery lead to the terminal ① and the negative battery lead to the terminal ②.

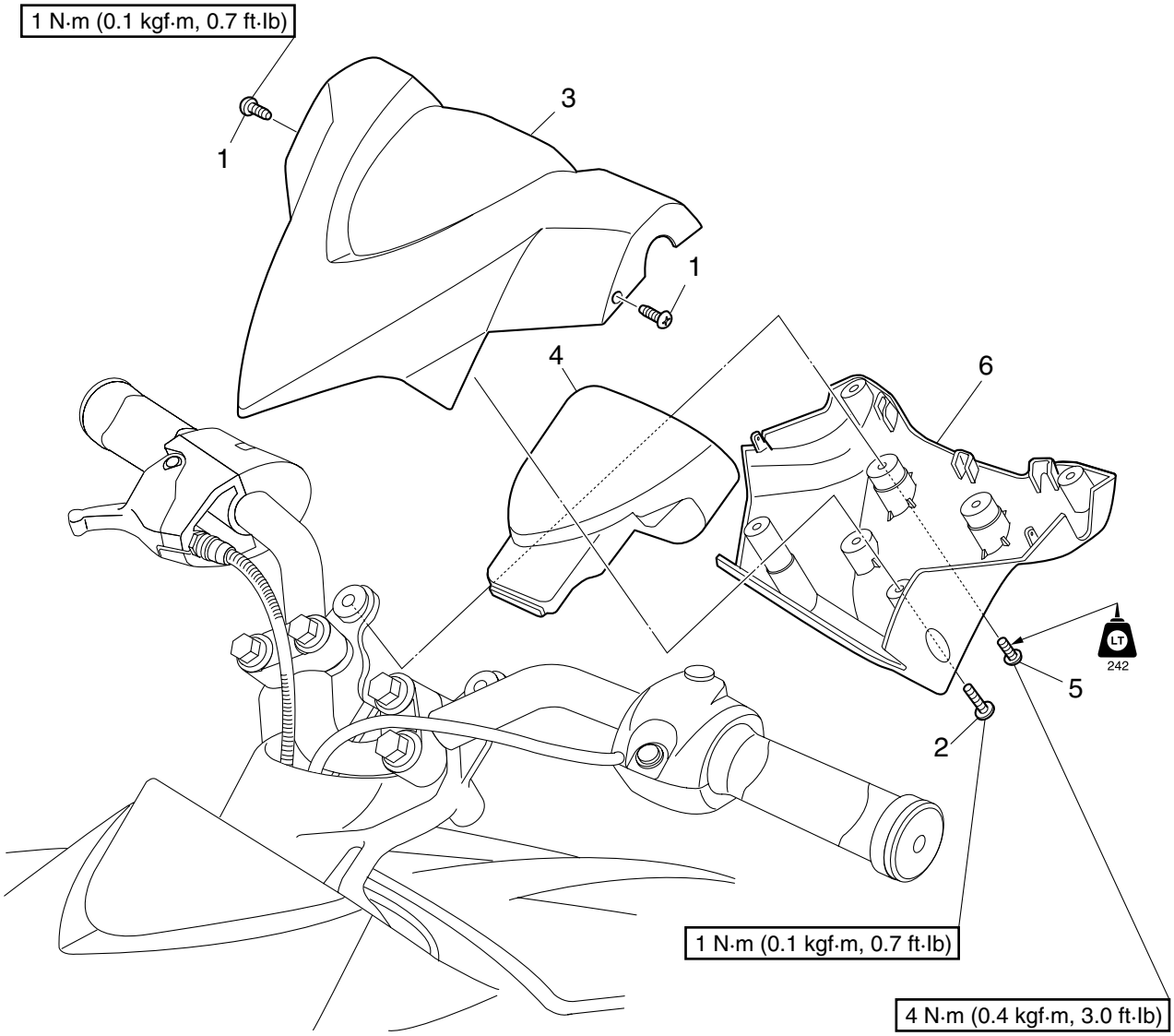
2. Check that the buzzer sounds. Replace the buzzer if does not sound.



7

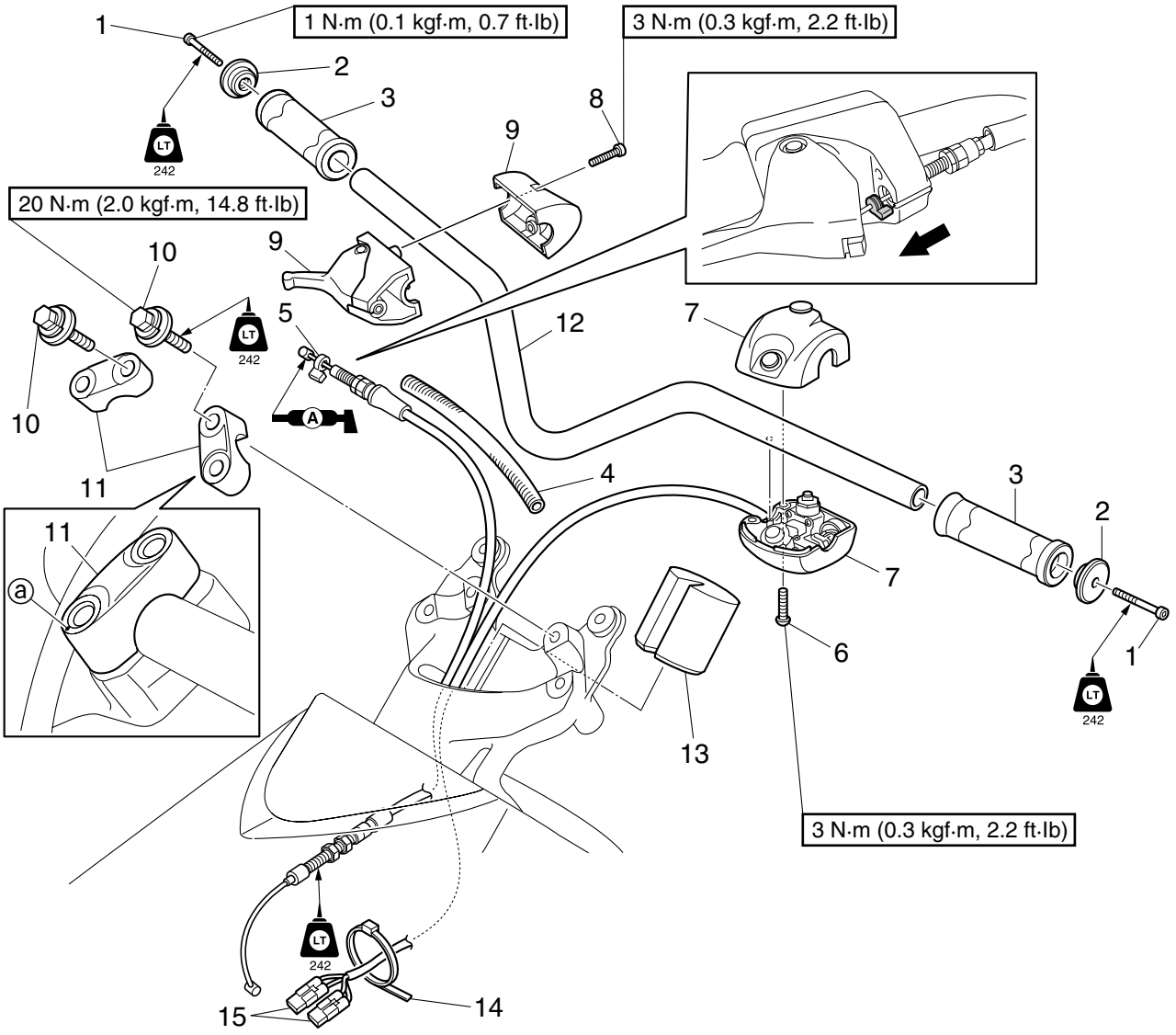
Hull and hood

Steering pad and handlebar cover



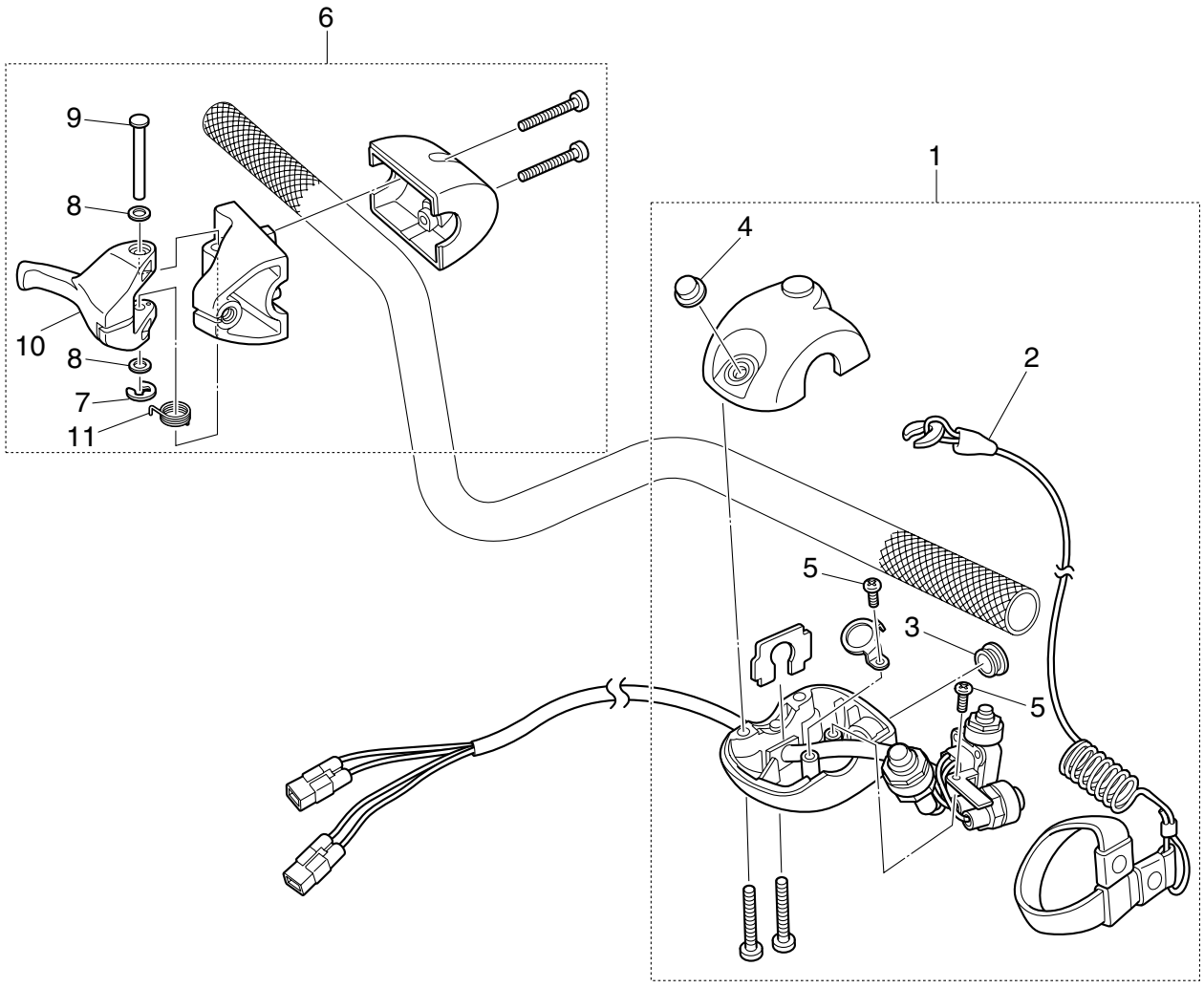
No.	Part name	Q'ty	Remarks
1	Screw	2	ø4 × 10 mm
2	Screw	4	ø5 × 16 mm
3	Upper handlebar cover	1	
4	Steering pad	1	
5	Screw	4	ø6 × 14 mm
6	Lower handlebar cover	1	

Handlebar and handlebar switch assy.



No.	Part name	Q'ty	Remarks
1	Bolt	2	M5 × 35 mm
2	Grip end	2	
3	Handlebar grip	2	
4	Corrugated tube	1	
5	Throttle cable	1	
6	Screw	2	ø5 × 25 mm
7	Left handlebar switch assy.	1	
8	Bolt	2	M5 × 25 mm
9	Throttle lever assy.	1	
10	Bolt	4	M8 × 45 mm
11	Handlebar holder	2	ⓐ Punch mark
12	Handlebar	1	
13	Grommet	1	
14	Plastic tie	1	
15	Left handlebar switch coupler	2	

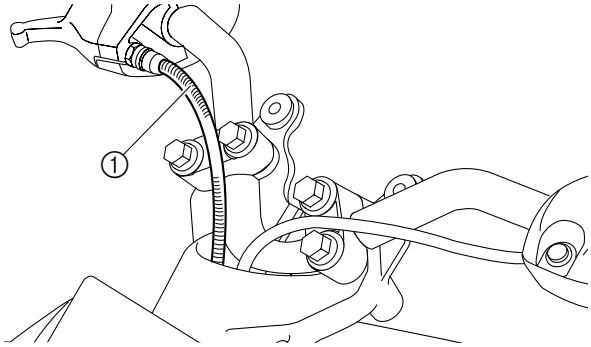
Left handlebar switch assy. and throttle lever assy.



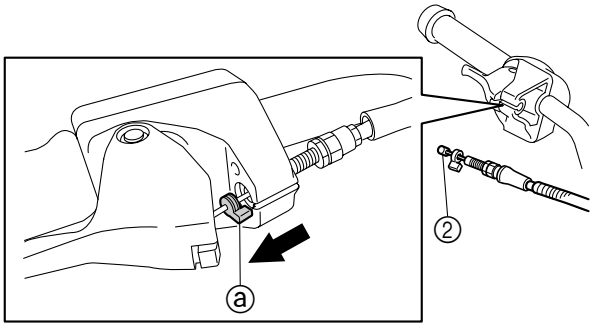
No.	Part name	Q'ty	Remarks
1	Left handlebar switch assy.	1	
2	Engine shut-off cord	1	
3	Stop button assy.	1	
4	Start button assy.	1	
5	Screw	2	
6	Throttle lever assy.	1	
7	E-ring	1	
8	Washer	2	
9	Shaft	1	
10	Lever	1	
11	Spring	1	

Throttle cable removal

1. Remove the corrugated tube ①.



2. Remove the throttle cable ②. ***NOTICE:*** **Make sure to remove the throttle cable seal ⓐ.**



Handlebar check

1. Check the handlebar. Replace if bent, cracked, or damaged.

Left handlebar switch assy. check

1. Check the left handlebar switch assy. Replace if cracked or damaged.

TIP:

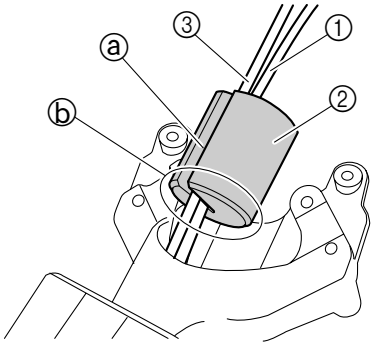
To check the continuity of the left handlebar switch assy. See "Left handlebar switch assy." (7-10).

Handlebar assy. installation

NOTICE

After installing the handlebar assy., make sure that the throttle cable and left handlebar switch lead are not pulled when the handlebar is turned to the right and left.

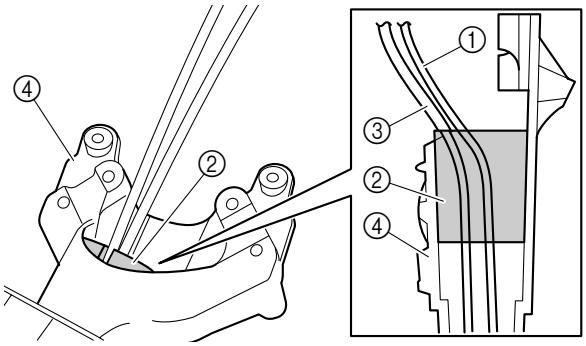
1. Install the left handlebar switch lead ① into the opening ⓐ in the grommet ②, and then install the throttle cable ③ into the opening ⓐ.



TIP:

Face the chamfered end ⓑ of the grommet ② down, with the opening ⓐ facing forward.

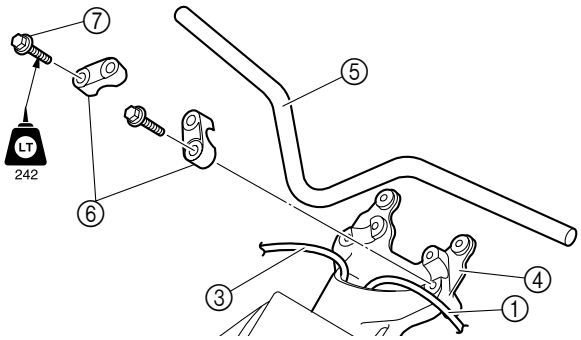
2. Install the grommet ② into the steering master ④.



TIP:

Push the grommet ② into the steering master ④ until it is installed securely.

3. Install the handlebar ⑤ and upper handlebar holders ⑥, and then tighten the bolts ⑦ to the specified torque.



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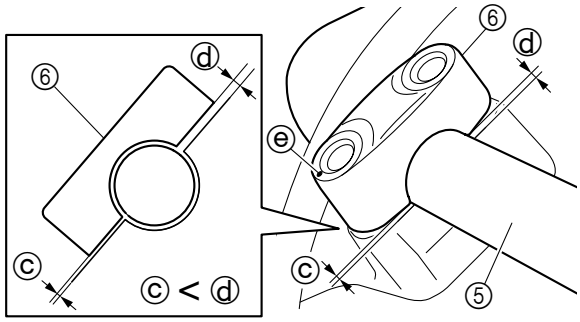
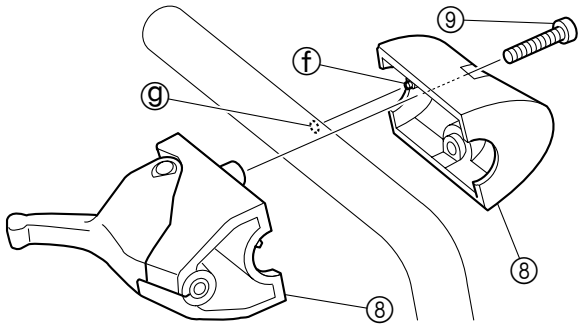


Handlebar holder bolt ⑦: 20 N·m (2.0 kgf·m, 14.8 ft·lb)

TIP:

- Do not route the left handlebar switch lead ① and throttle cable ③ between the handlebar ⑤ and the steering master ④.
- The upper handlebar holder ⑥ should be installed with the punch mark ⓔ facing down.
- Tighten the bolts ⑦ so that there is clearance between the steering master ④ and the upper handlebar holders ⑥ at both ends of the upper handlebar holders.
- Make sure that clearance ⓒ is narrower than clearance ⓓ.

4. Install the throttle lever assy. ⑧, and then tighten the bolts ⑨ to the specified torque.

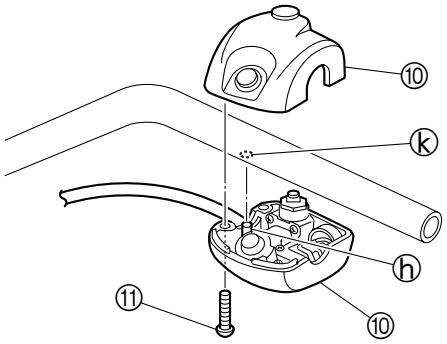


Throttle lever assy. bolt ⑨: 3 N·m (0.3 kgf·m, 2.2 ft·lb)

TIP:

Align the projection ⓕ on the throttle lever assy. with the handlebar hole ⓖ.

5. Install the left handlebar switch assy. ⑩, and then tighten the screws ⑪ to the specified torque.



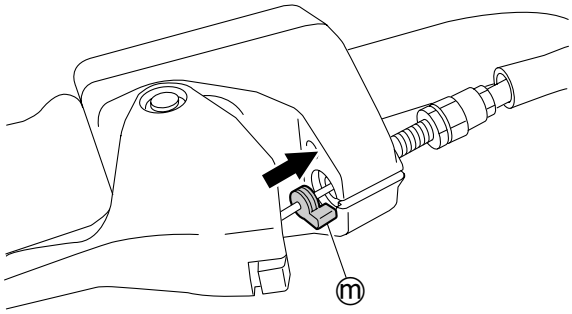
Left handlebar switch screw ⑪: 3 N·m (0.3 kgf·m, 2.2 ft·lb)

TIP:

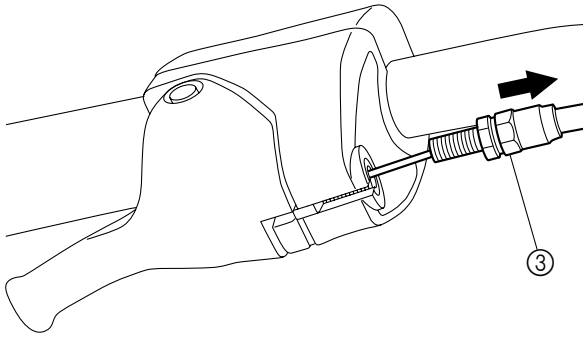
Align the projection ⓗ on the handlebar switch assy. with the handlebar hole ⓚ.

6. Install the throttle cable end into the throttle lever.

7. Fit the seal ⓜ into the groove in the bracket.

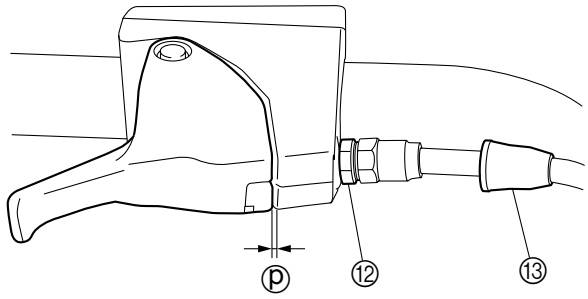


8. Pull the throttle cable ③ in the direction of the arrow shown.



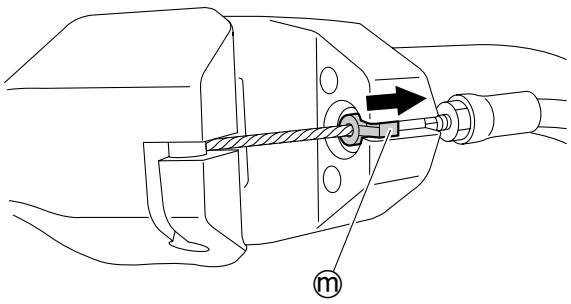
9. Adjust the throttle lever free play ⓟ. See “Throttle lever free play check” (3-2).

10. Tighten the locknut ⑫, and then slide the rubber cover ⑬ to its original position.

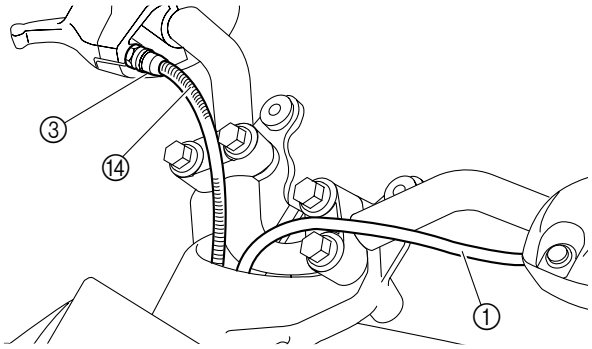


Throttle lever free play ⓟ:
4.0–7.0 mm (0.16–0.28 in)

11. Insert the seal ⓜ completely into the slot in the bracket.



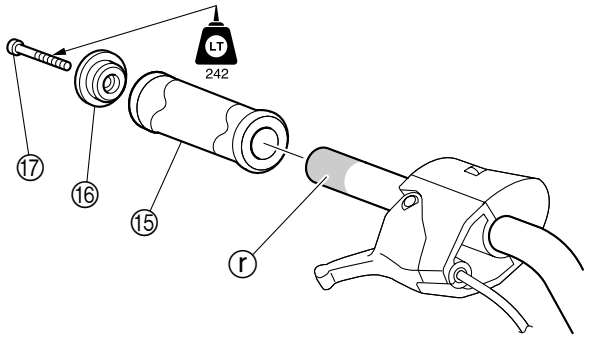
12. Install the corrugated tube ⑭ onto the throttle cable ③, and then route the throttle cable ③ and left handlebar switch lead ①.



13. Apply adhesive to the handlebars ⓡ and the inner surface of the handlebar grips ⑮.

14. Install the handlebar grips ⑮.

15. Install the grip ends ⑯, and then tighten the bolts ⑰ to the specified torque.



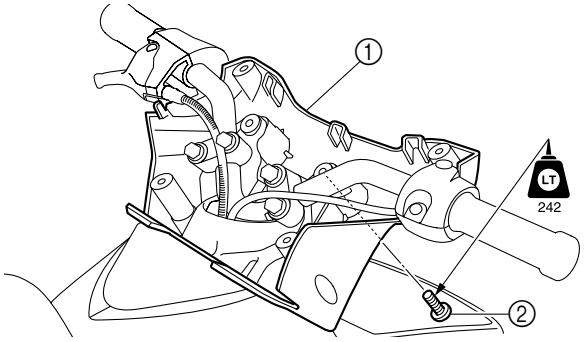
Grip end bolt ⑰:
1 N·m (0.1 kgf·m, 0.7 ft·lb)

Steering pad and handlebar cover installation

NOTICE

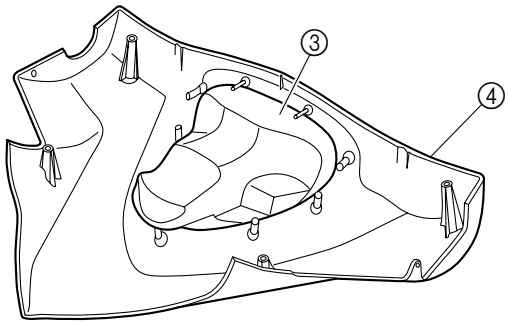
After installing the handlebar upper cover, make sure that the throttle cable is not pulled when the handlebar is turned to right and left.

1. Install the lower handlebar cover ①, and then tighten the screws ② to the specified torque.



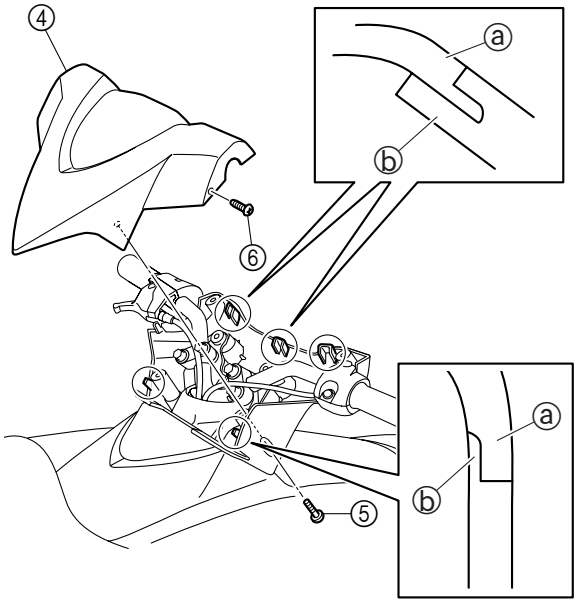
Lower handlebar cover screw ②:
4 N·m (0.4 kgf·m, 3.0 ft·lb)

2. Push the steering pad ③ into the upper handlebar cover ④ until it is installed securely.



TIP:
If the steering pad ③ is not installed securely, the upper handlebar cover ④ cannot be installed properly onto the lower handlebar cover.

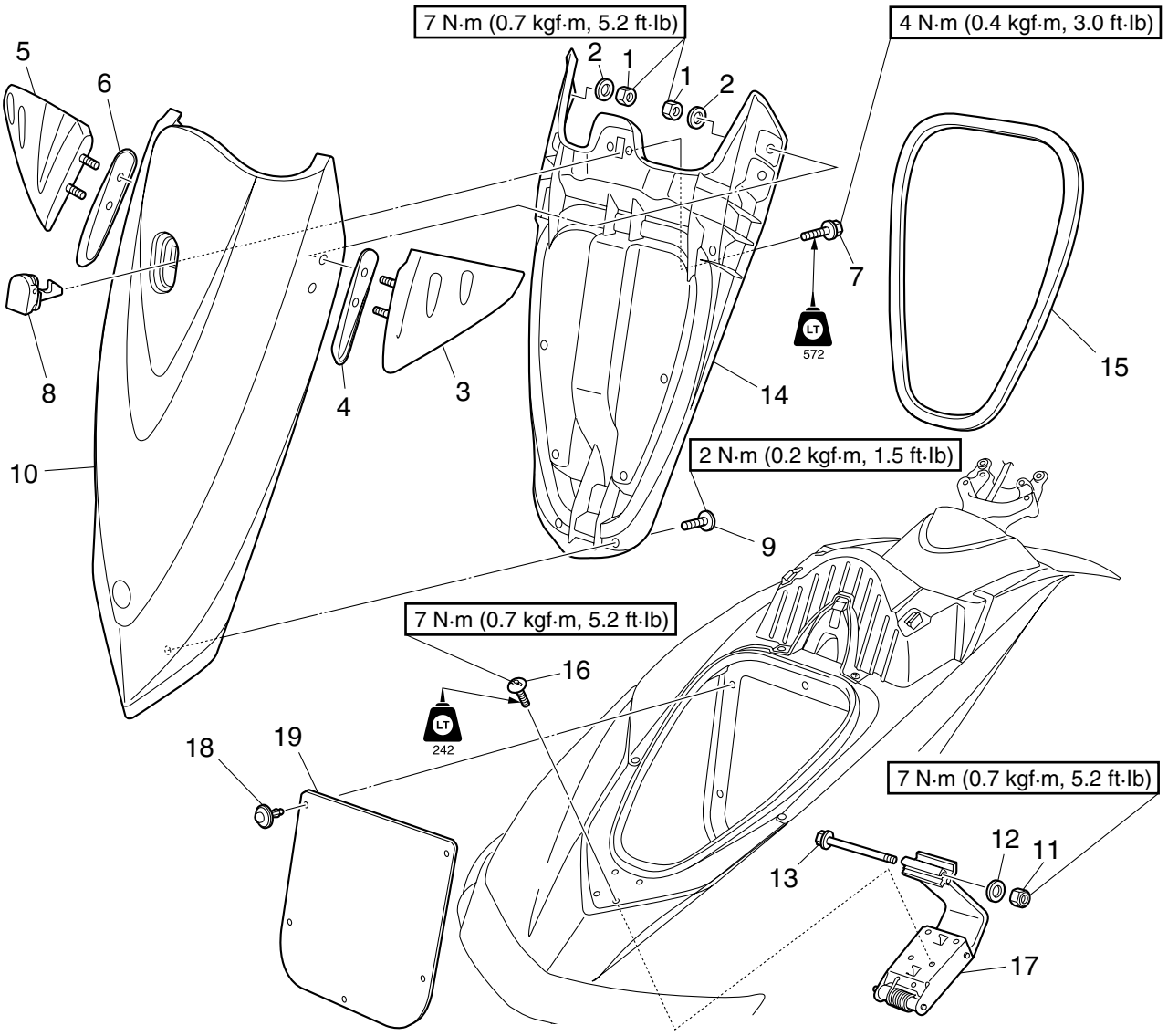
3. Install the upper handlebar cover ④, and then tighten the screws ⑤ and ⑥ to the specified torque.



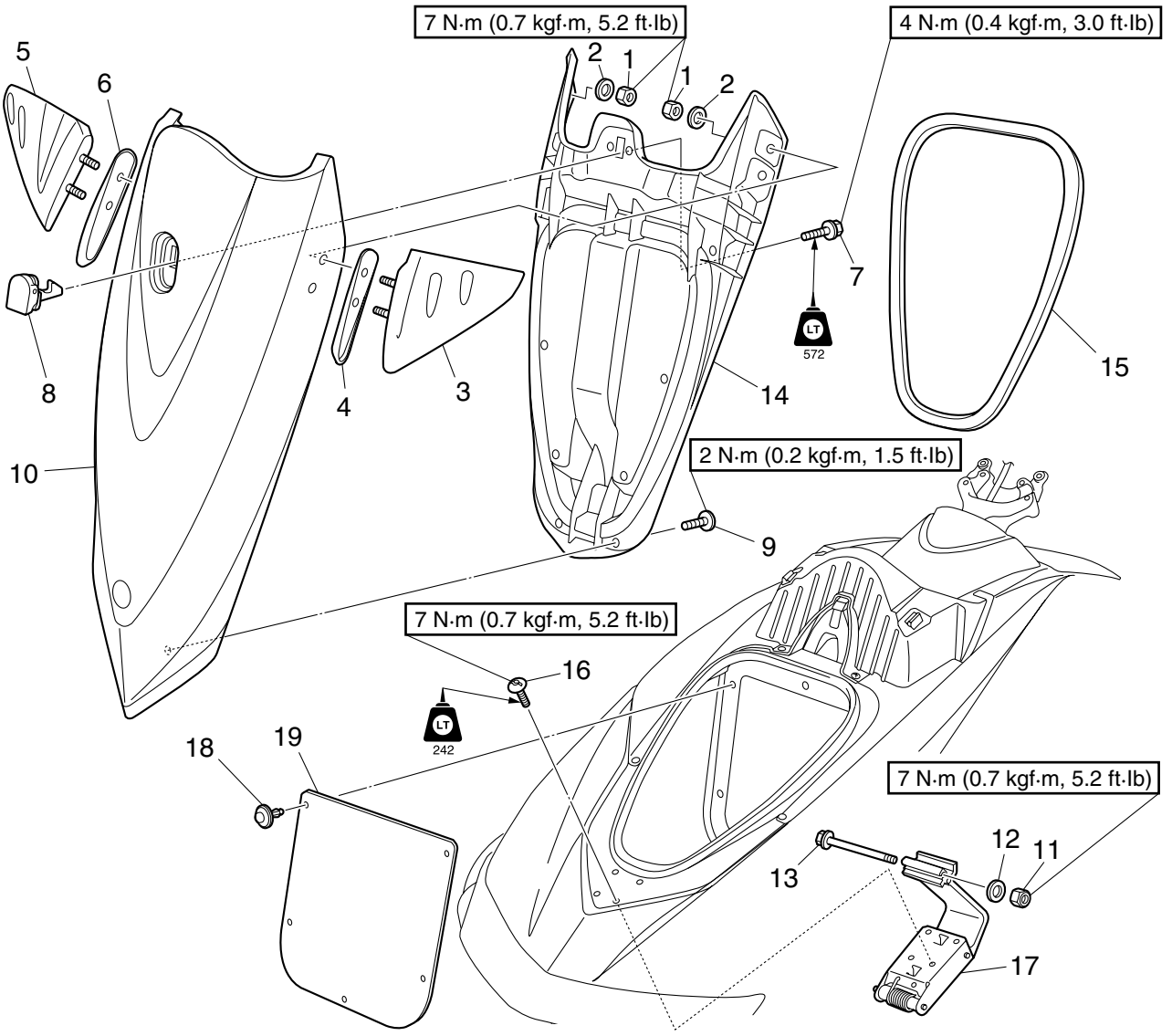
Upper handlebar cover screw (ø5 × 16 mm) ⑤:
Upper handlebar cover screw (ø4 × 10 mm) ⑥:
1 N·m (0.1 kgf·m, 0.7 ft·lb)

TIP:
Align the portions ⓐ on the upper handlebar cover with the portions ⓑ on the lower handlebar cover.

Front hood



No.	Part name	Q'ty	Remarks
1	Nut	4	
2	Washer	4	
3	Left mirror	1	
4	Left mirror spacer	1	
5	Right mirror	1	
6	Right mirror spacer	1	
7	Bolt	2	M5 × 20 mm
8	Hood lock assy.	1	
9	Screw	8	ø5 × 15 mm
10	Front hood	1	
11	Nut	2	
12	Washer	2	
13	Bolt	2	M6 × 95 mm
14	Ventilator cover	1	
15	Packing	1	**Not reusable**
16	Bolt	4	M6 × 18 mm

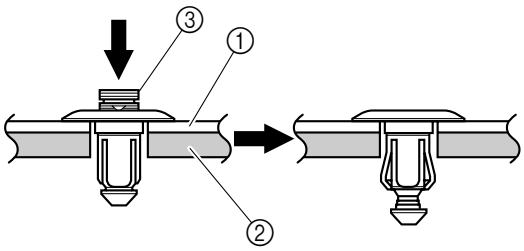


No.	Part name	Q'ty	Remarks
17	Hinge assy.	1	
18	Rivet	5	
19	Service lid	1	

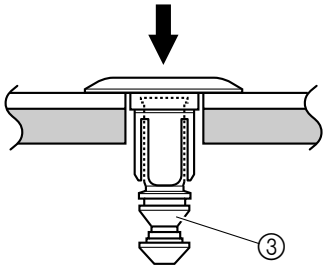
Service lid installation

1. Install the service lid ①, and then insert a rivet completely in the holes in both the service lid ① and inner hull ②.

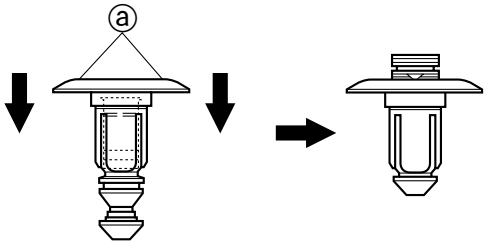
2. Push in the rivet pin ③ until it clicks and is flush with the top of the rivet.



3. When removing a rivet, push the rivet pin ③ in until it clicks and is below the top of the rivet.



4. When reinstalling a rivet, hold the rivet flange ⓐ with both hands and push the rivet pin perpendicularly against a hard flat surface until the pin protrudes from the top of the rivet.



Hinge assy. check

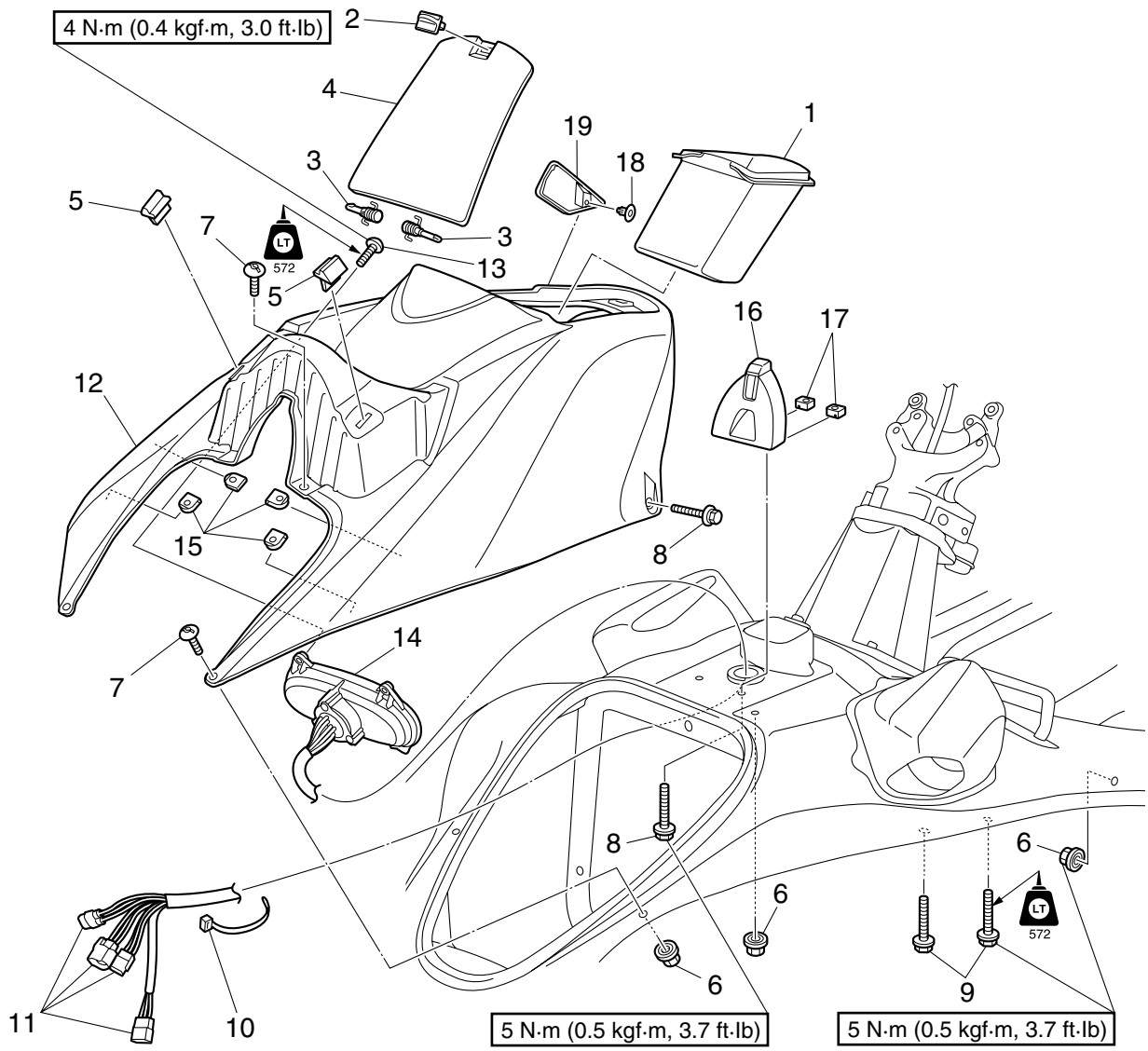
1. Fully open the front hood and check that it remains in the open position. If the front hood cannot remain in the open position, replace the hinge assy.

Hood lock check

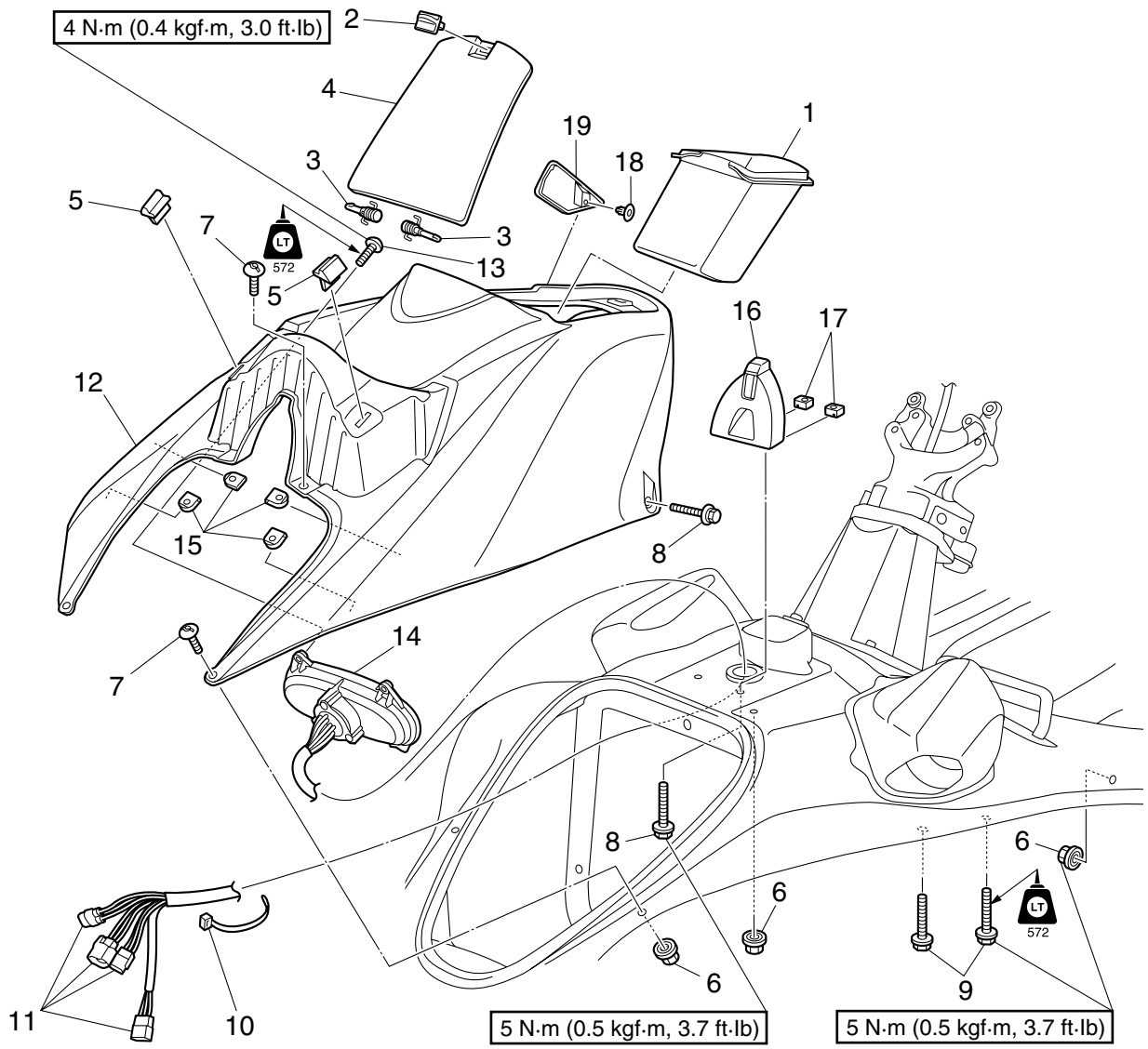
1. Fully close the front hood and check that it latches securely. If the front hood cannot latch securely, check that the hood lock is installed properly.

2. Check the hood lock. Replace if cracked or damaged.

Multifunction meter and engine hatch cover

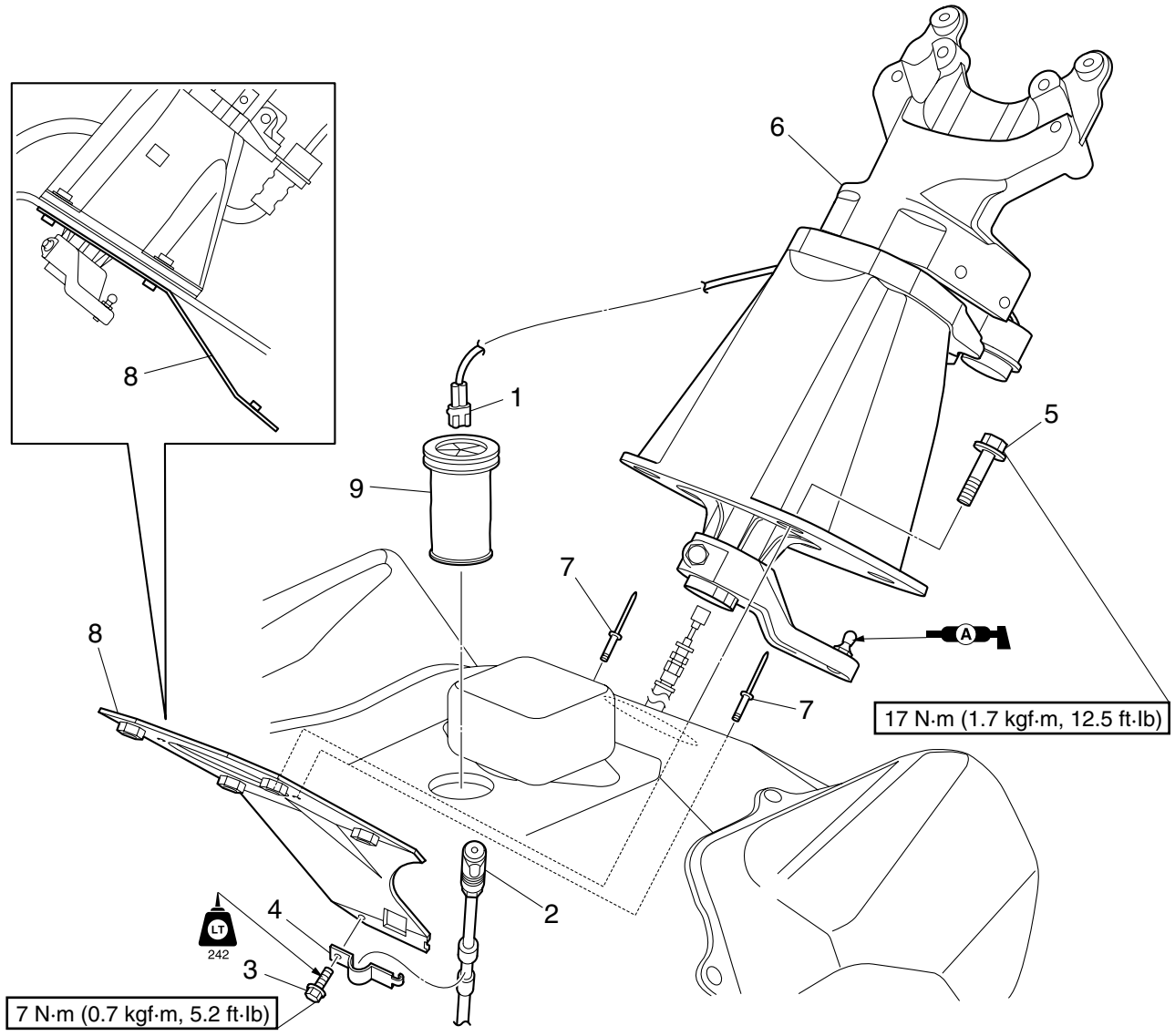


No.	Part name	Q'ty	Remarks
	Seat assy.		See "Seat and handgrip" (8-18).
1	Glove box	1	
2	Lock	1	
3	Hinge pin	2	
4	Center console box lid	1	
5	Damper	2	
6	Nut	6	
7	Bolt	4	M6 × 18 mm
8	Bolt	4	M6 × 29 mm
9	Bolt	4	M6 × 29 mm
10	Plastic tie	1	
11	Multifunction meter coupler	4	
12	Engine hatch cover	1	
13	Screw	4	ø5 × 15 mm
14	Multifunction meter	1	
15	Spring nut	4	



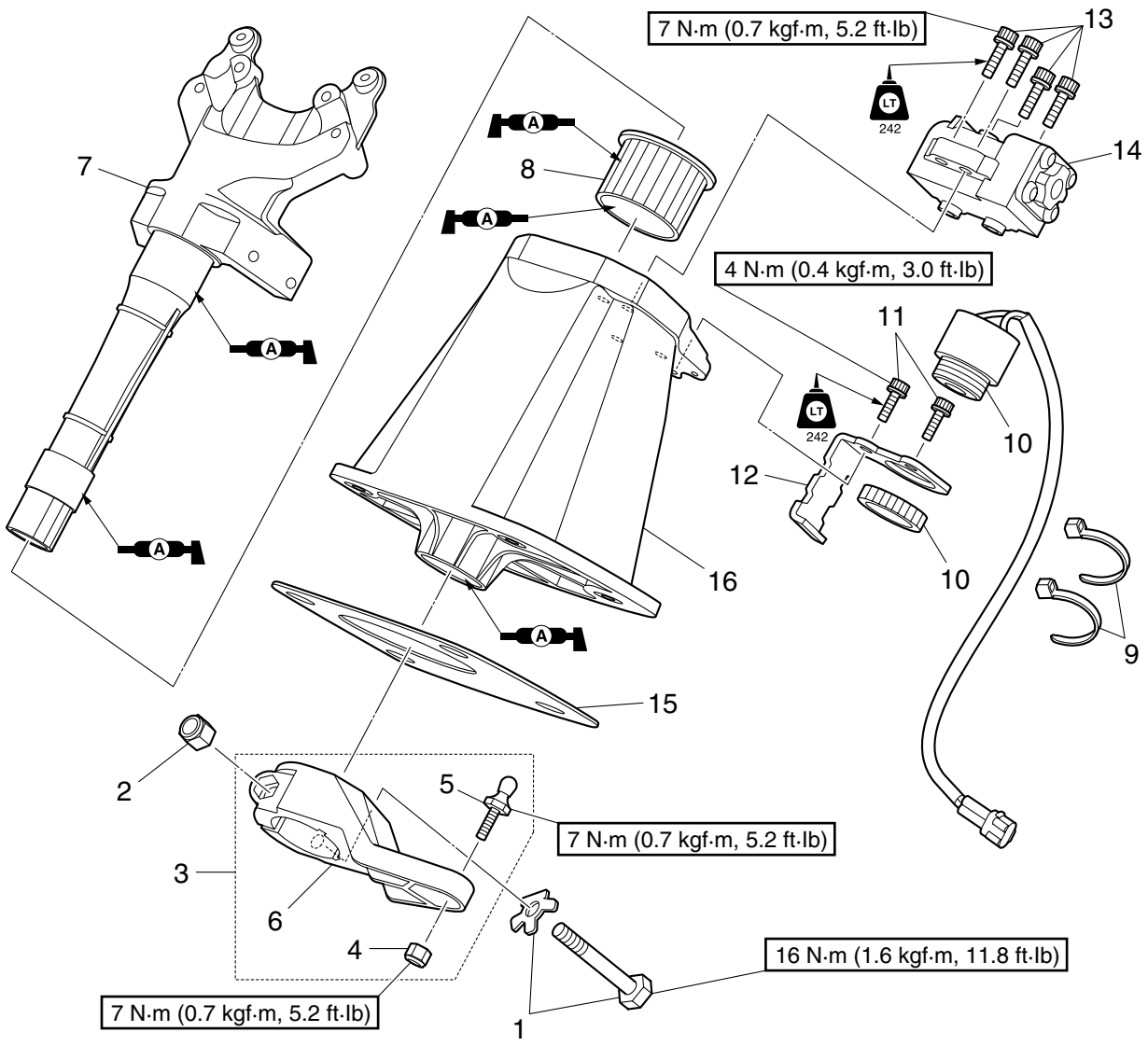
No.	Part name	Q'ty	Remarks
16	Lid lock hook	1	
17	Nut	2	
18	Revet	1	
19	Plug	1	

Steering master assy.



No.	Part name	Q'ty	Remarks
1	Buzzer coupler	1	
2	Steering cable joint	1	
3	Bolt	1	M6 × 18 mm
4	Cable stopper	1	
5	Bolt	4	M8 × 30 mm
6	Steering master assy.	1	
7	Rivet	2	**Not reusable**
8	Cable stopper bracket	1	
9	Grommet	1	

Steering master



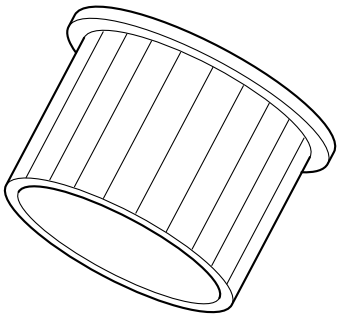
No.	Part name	Q'ty	Remarks
1	Bolt/plate	1/1	M8 × 50 mm
2	Nut	1	
3	Steering arm assy.	1	
4	Nut	1	
5	Ball joint	1	
6	Arm	1	
7	Steering shaft assy.	1	
8	Bushing	1	
9	Band	2	**Not reusable**
10	Buzzer	1	
11	Bolt	2	M5 × 16 mm
12	Bracket	1	
13	Bolt	4	M6 × 25 mm
14	Case assy.	1	
15	Packing	1	**Not reusable**
16	Housing assy.	1	

Shift lever assy. check

1. Check the shift lever assy. Replace if cracked or damaged. ***NOTICE:*** **Do not disassemble the shift lever assy.**

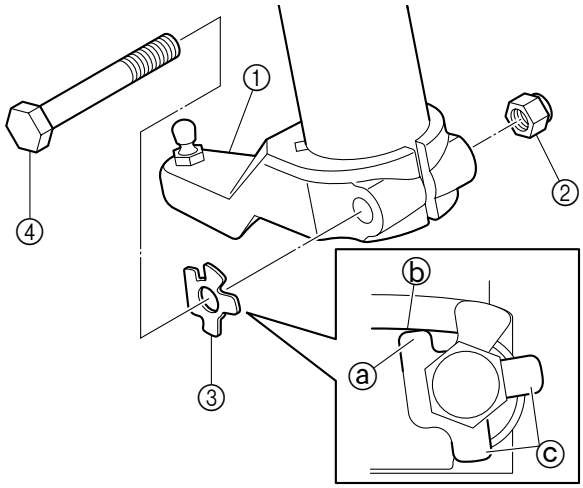
Bushing check

1. Check the bushing. Replace if cracked, damaged, or worn.



Steering arm assy. installation

1. Install the steering arm assy. ①, nut ② and plate ③, and then tighten the bolt ④ to the specified torque.

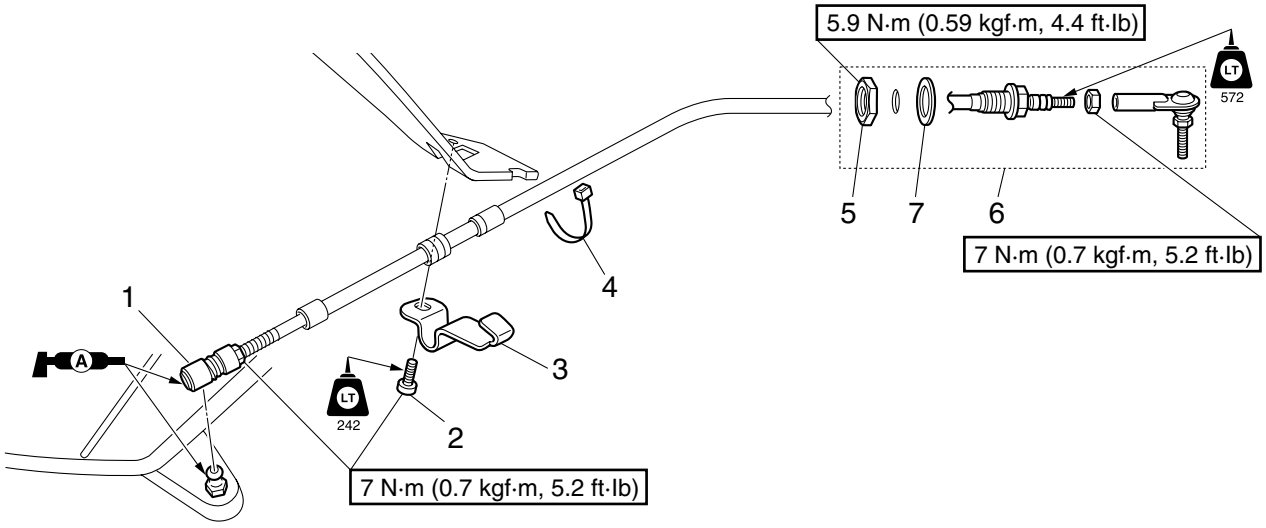


Steering arm assy. bolt ④:
16 N·m (1.6 kgf·m, 11.8 ft·lb)

TIP:

- Align the projection on the steering shaft assy. with the slot on the arm.
- Align the tab ⓐ on the plate ③ with the portion ⓑ on the steering arm assy. ①.
- Bend a tab ⓒ along a flat side of the bolt.

Steering cable



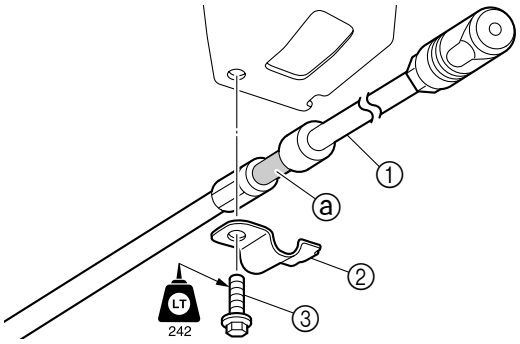
No.	Part name	Q'ty	Remarks
	Service lid		See "Front hood" (8-8).
	Seat assy.		See "Seat and handgrip" (8-18).
	Ride plate/rubber plate		See "Intake grate and ride plate" (6-1).
1	Steering cable joint	1	
2	Bolt	1	M6 × 18 mm
3	Steering cable stopper	1	
4	Plastic tie	3	
5	Nut	1	
6	Steering cable	1	
7	Packing	1	**Not reusable**

Steering cable installation (steering master end)

⚠ WARNING

If a cable becomes damaged, replace it. Never attempt to repair damaged cable.

1. Install the steering cable ① and steering cable stopper ②, and then tighten the bolt ③ to the specified torque.

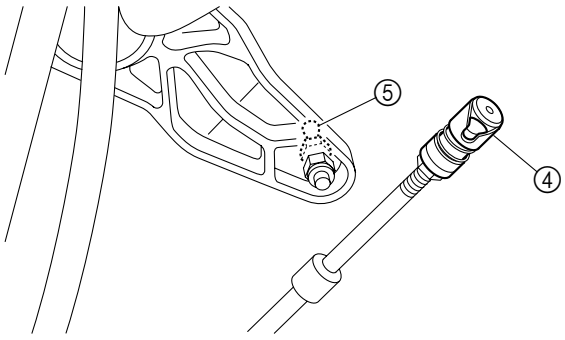


Steering cable stopper bolt ③: 7 N·m (0.7 kgf·m, 5.2 ft·lb)

TIP:

Install the steering cable stopper ② into the groove ⓐ in the outer cable.

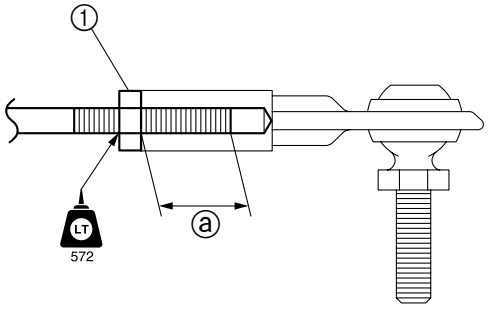
2. Connect the steering cable joint ④ to the ball joint ⑤.



3. Adjust the steering cable. See “Jet thrust nozzle steering angle check” (3-7).

Steering cable installation (jet pump end)

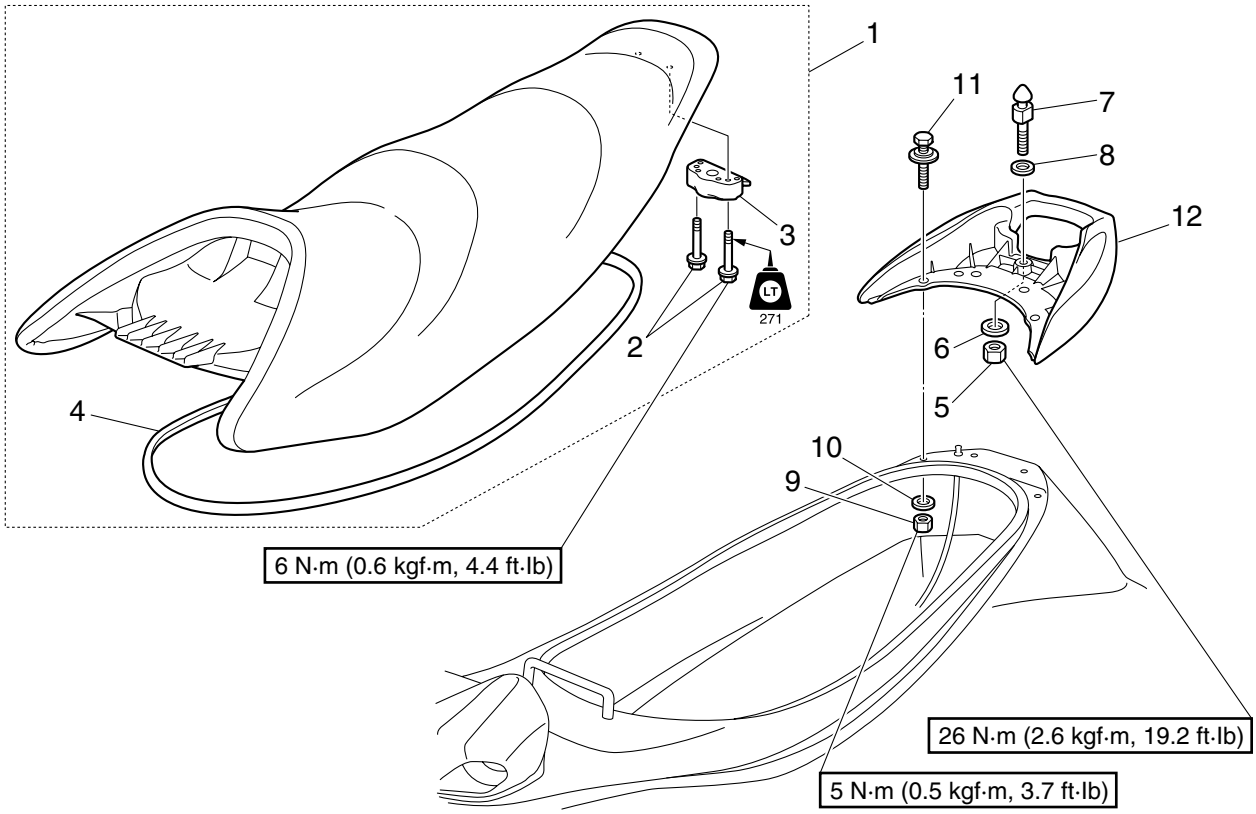
1. Adjust the steering cable set length ⓐ, and then tighten the locknut ① to the specified torque. (jet pump end)



Steering cable set length ⓐ (jet pump end): 14.5 ± 1 mm (0.57 ± 0.04 in)

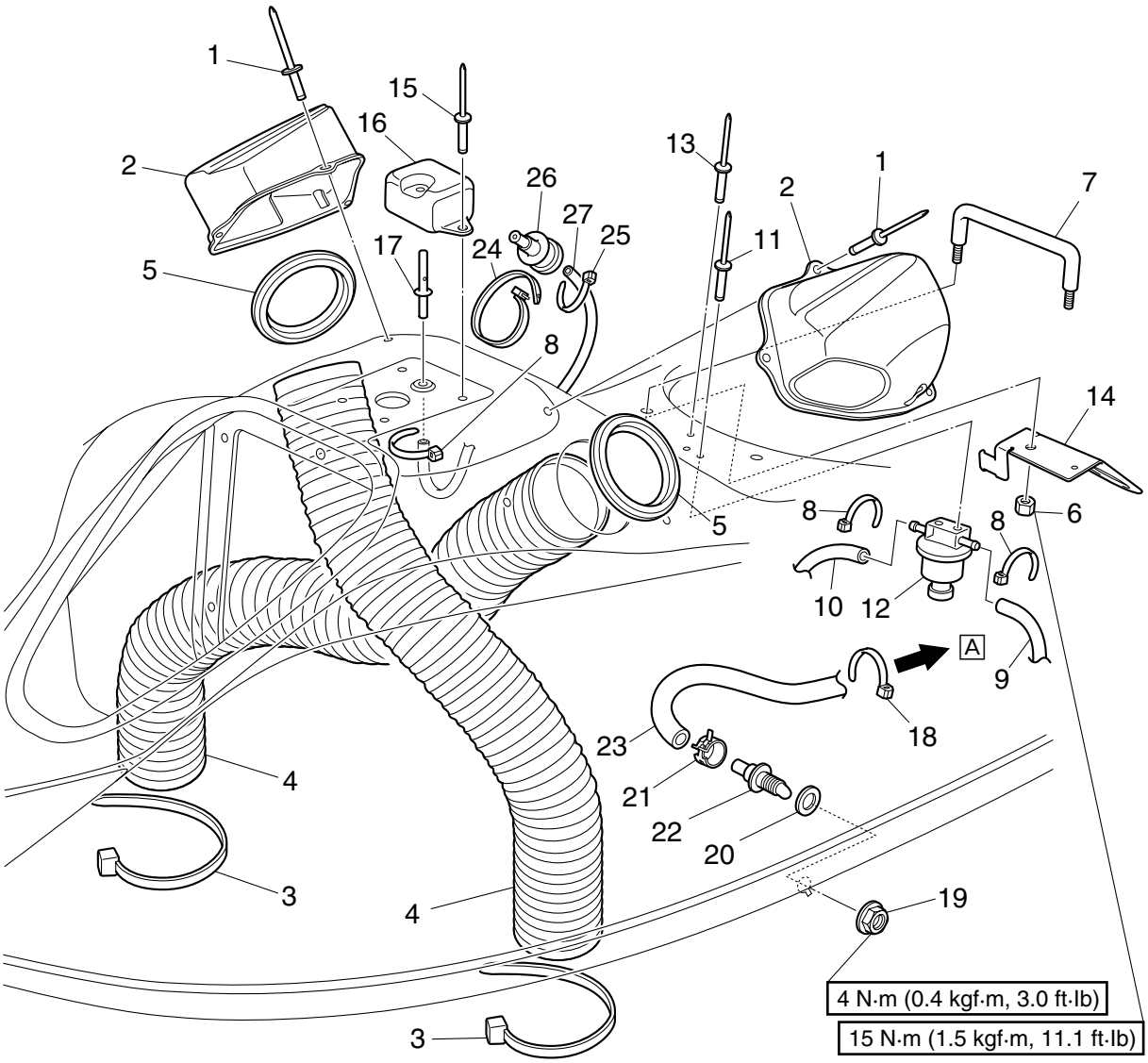
Steering cable locknut (jet pump end) ①: 7 N·m (0.7 kgf·m, 5.2 ft·lb)

Seat and handgrip

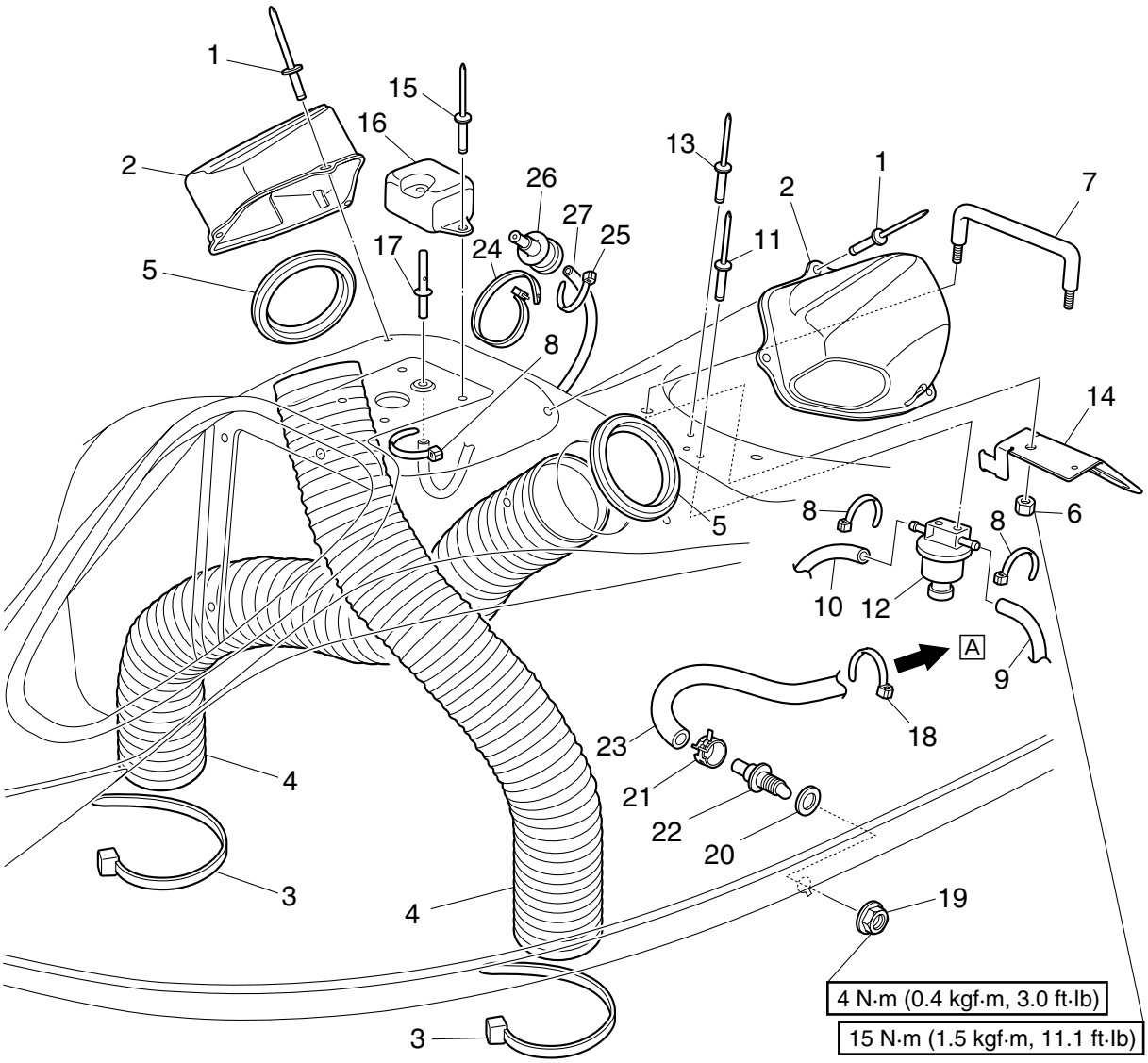


No.	Part name	Q'ty	Remarks
1	Seat assy.	1	
2	Bolt	2	M6 × 40 mm
3	Seat lock assy.	1	
4	Packing	1	**Not reusable**
5	Nut	1	
6	Washer	1	
7	Projection	1	
8	Washer	1	
9	Nut	4	
10	Washer	4	
11	Bolt	4	M8 × 30 mm
12	Handgrip	1	

Ventilation hose and water separator



No.	Part name	Q'ty	Remarks
	Oil filler neck		See "Oil tank" (4-4).
	Fuel filter		See "Fuel cock and fuel filter" (4-1).
1	Rivet	6	**Not reusable**
2	Induction box	2	
3	Band	2	**Not reusable**
4	Ventilation hose	2	
5	Grommet	2	
6	Nut	2	
7	Seat holder	1	
8	Band	3	**Not reusable**
9	Fuel tank breather hose 1	1	
10	Fuel tank breather hose 2	1	
11	Rivet	2	**Not reusable**
12	Water separator	1	
13	Rivet	1	**Not reusable**
14	Filter bracket	1	



No.	Part name	Q'ty	Remarks
15	Rivet	2	**Not reusable**
16	Ventilation socket	1	
17	Ventilation pipe	1	
18	Plastic tie	1	
19	Nut	1	
20	Seal	1	**Not reusable**
21	Clamp	1	
22	Cooling water pilot outlet	1	
23	Cooling water hose	1	A To exhaust joint
24	Plastic tie	1	
25	Band	1	**Not reusable**
26	Check valve	1	
27	Oil tank breather hose	1	

Seat lock check

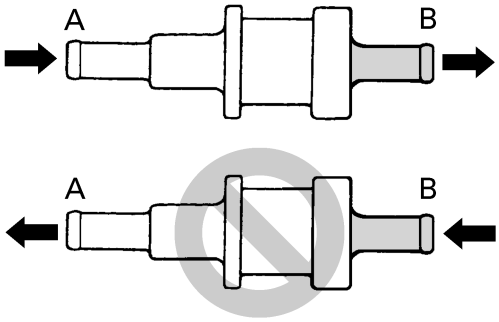
1. Check the seat lock assy. Replace if cracked, damaged, or worn.

2. Check the projection. Replace if damaged.

Check valve check

1. Blow into the end “A” of the check valve, and make sure that airflow from the end “B” is unrestricted. Replace if the air flow is restricted.

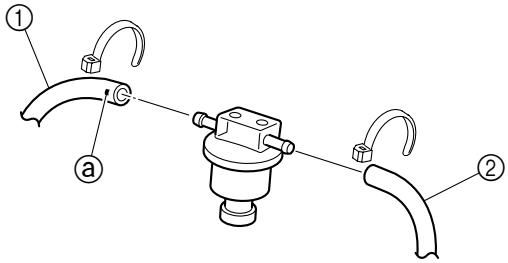
2. Blow into the end “B” of the check valve, and make sure that airflow from the end “A” is restricted. Replace if the air flow is unrestricted.



Water separator assy. removal

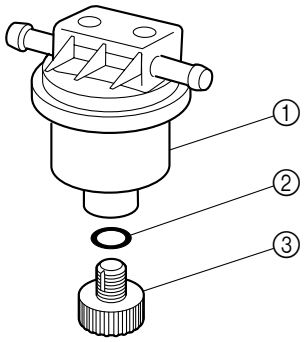
1. Make a mark ⓐ on the fuel tank breather hose 1 ①.

2. Disconnect fuel tank breather hose 1 ① and fuel tank breather hose 2 ②.



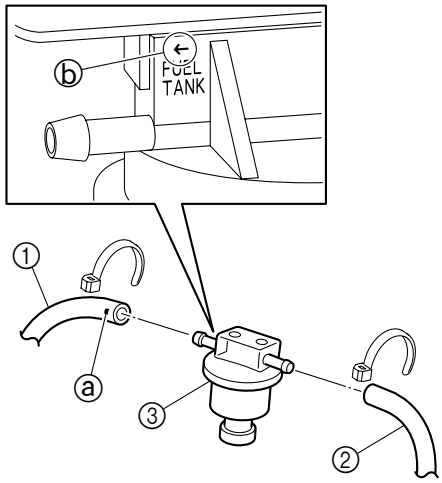
Water separator check

1. Check the water separator ①, O-ring ②, and drain plug ③. Replace if cracked or damaged.



Water separator assy. installation

1. Connect fuel tank breather hose 1 ① and fuel tank breather hose 2 ② onto the water separator ③.



TIP:

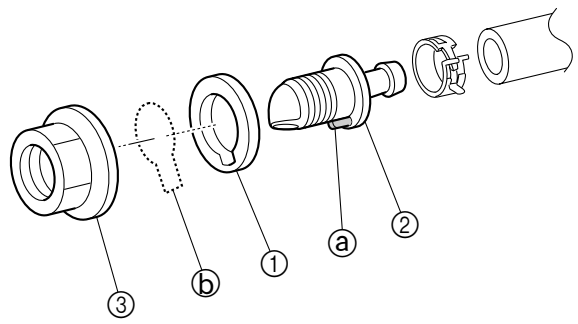
Connect fuel tank breather hose 1 ①, which is identified by the mark ⓐ, to the water separator outlet with the arrow mark ⓑ.

Cooling water pilot outlet installation

NOTICE

Do not reuse a seal, always replace it with a new one.

1. Install a new seal ① and the cooling water pilot outlet ②, and then tighten the nut ③ to the specified torque.

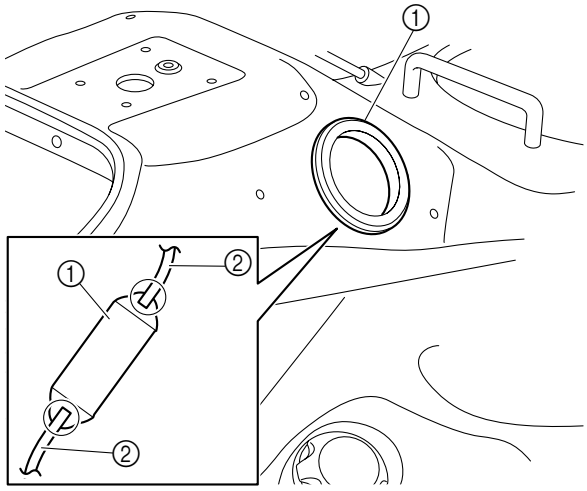


Cooling water pilot outlet nut ③: 4 N·m (0.4 kgf·m, 3.0 ft·lb)

TIP:
Align the projection ⓐ with the slit ⓑ.

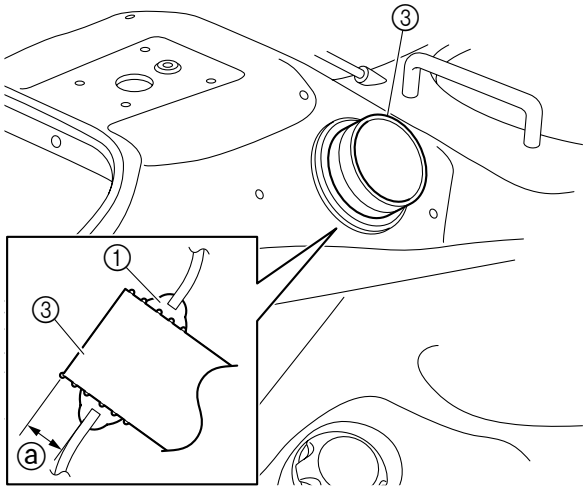
Ventilation hose installation

1. Install the grommets ①.



TIP:
Make sure that the grommet ① is properly seated in the hole in the inner hull ②.

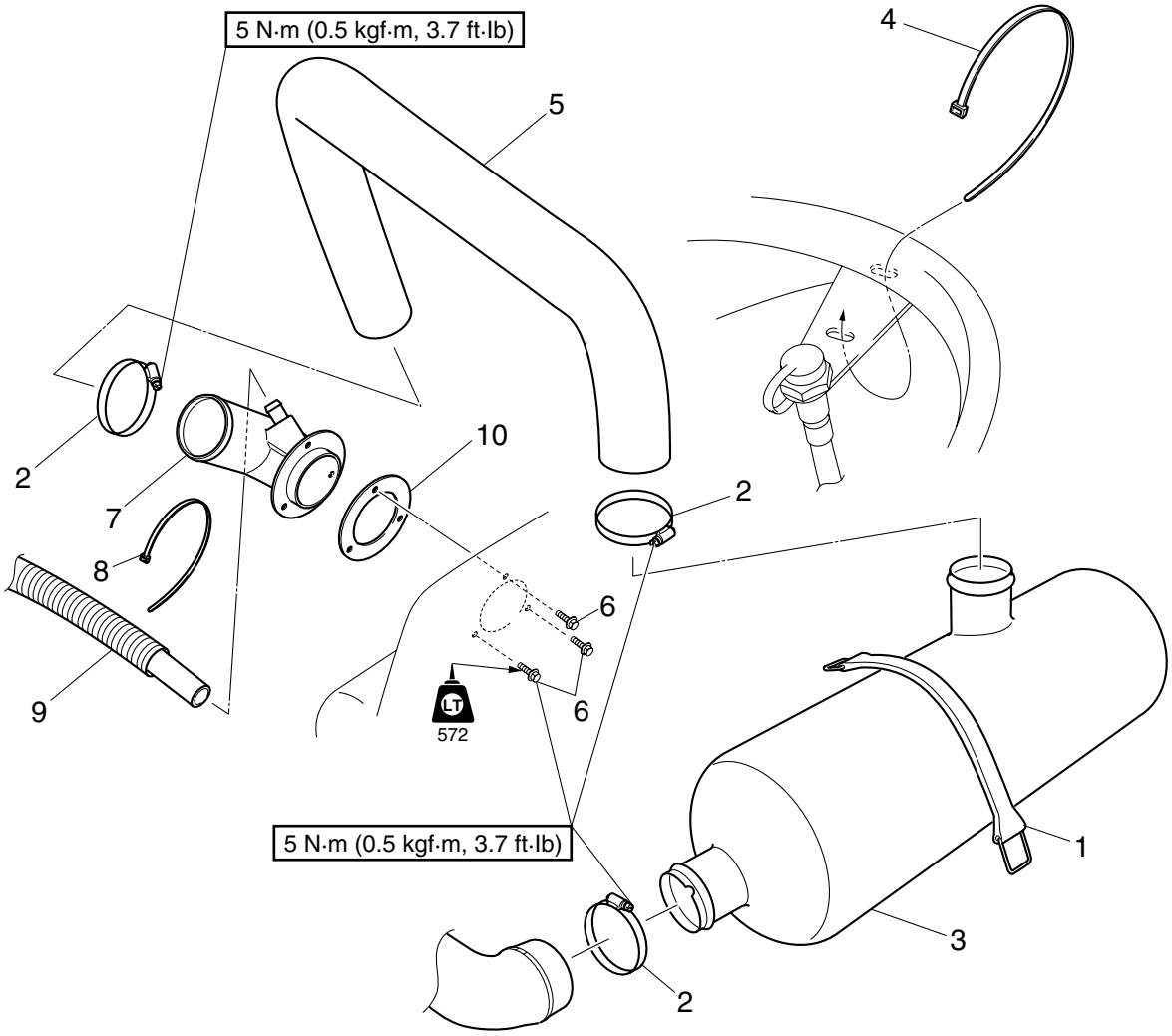
2. Install the ventilation hoses ③.



Installation distance ⓐ: 30–40 mm (1.18–1.57 in)

TIP:
- Make sure to route the ventilation hose (PORT) in front of the ventilation hose (STBD).
- Make sure that the end of the ventilation hose ③ is the specified distance ⓐ from the groove around the outside of the grommet ①.

Exhaust system



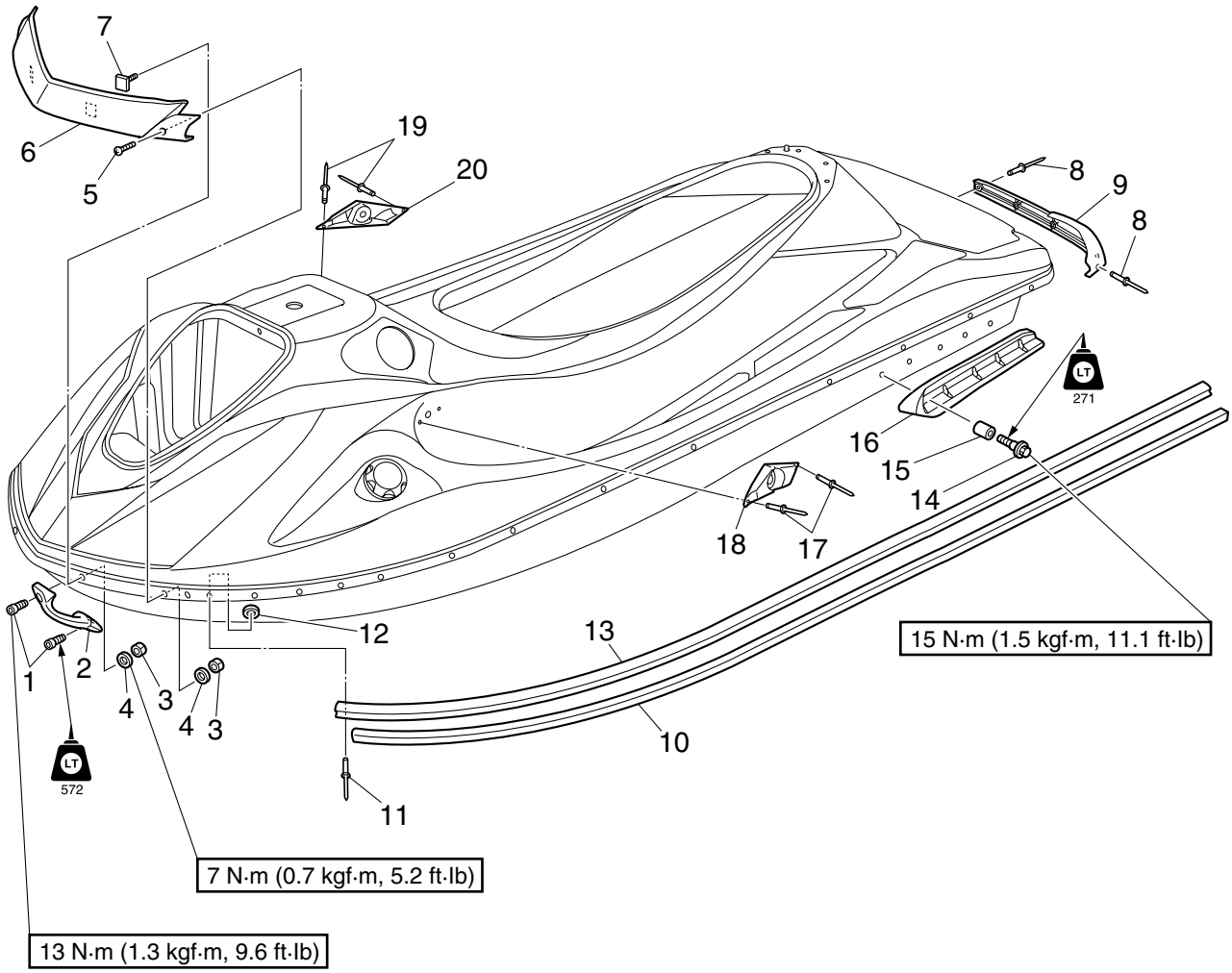
No.	Part name	Q'ty	Remarks
	Ride plate		See "Intake grate and ride plate" (6-1).
1	Band	1	
2	Clamp	3	
3	Water lock	1	
4	Band	1	**Not reusable**
5	Rubber hose	1	
6	Bolt	3	M5 × 20 mm
7	Exhaust outlet	1	
8	Band	1	**Not reusable**
9	Hose	1	
10	Seal	1	**Not reusable**

Exhaust system check

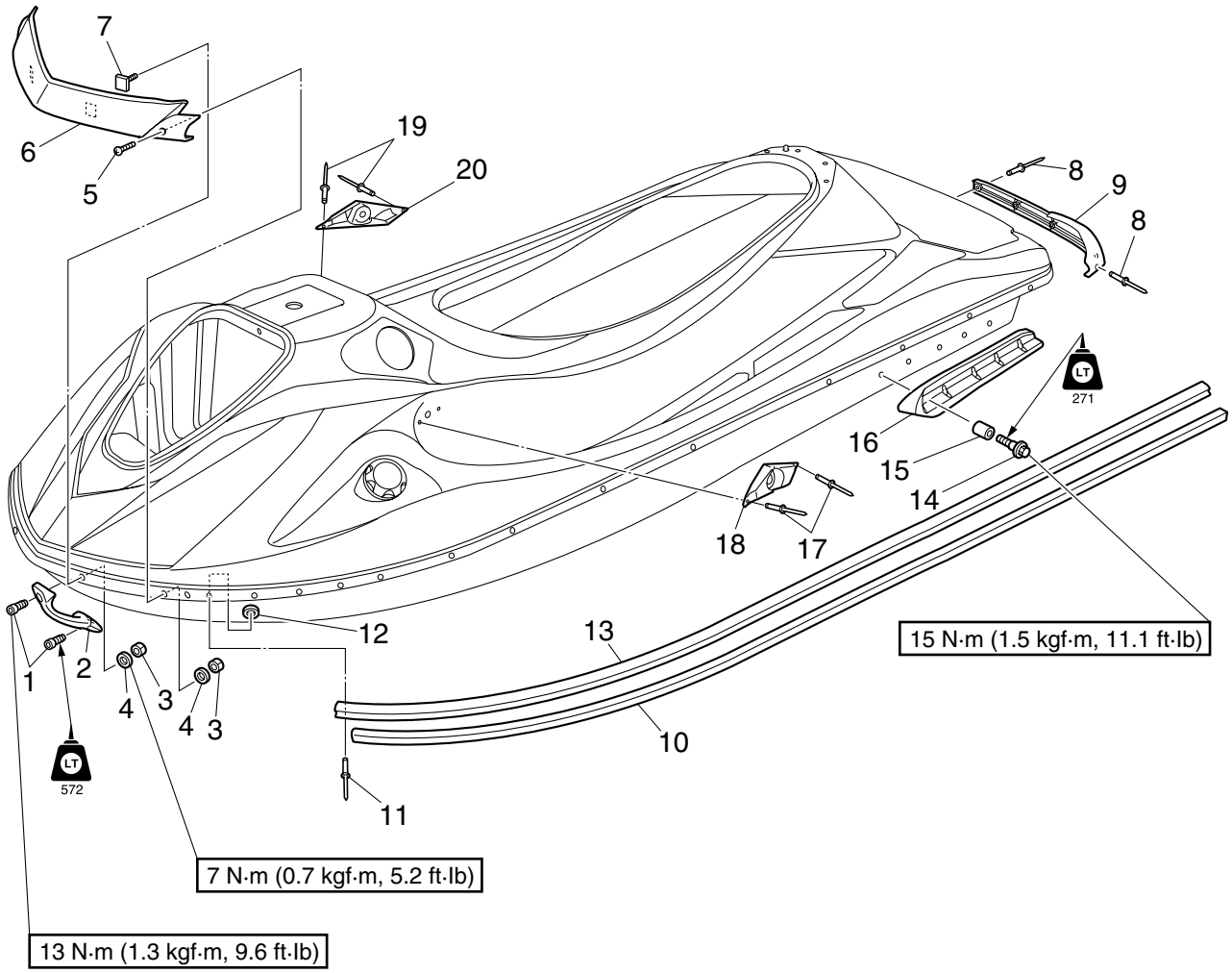
1. Check the rubber hoses. Replace if burned, cracked, or damaged.

2. Check the water lock. Replace if cracked, damaged, or leaked.

Deck and hull

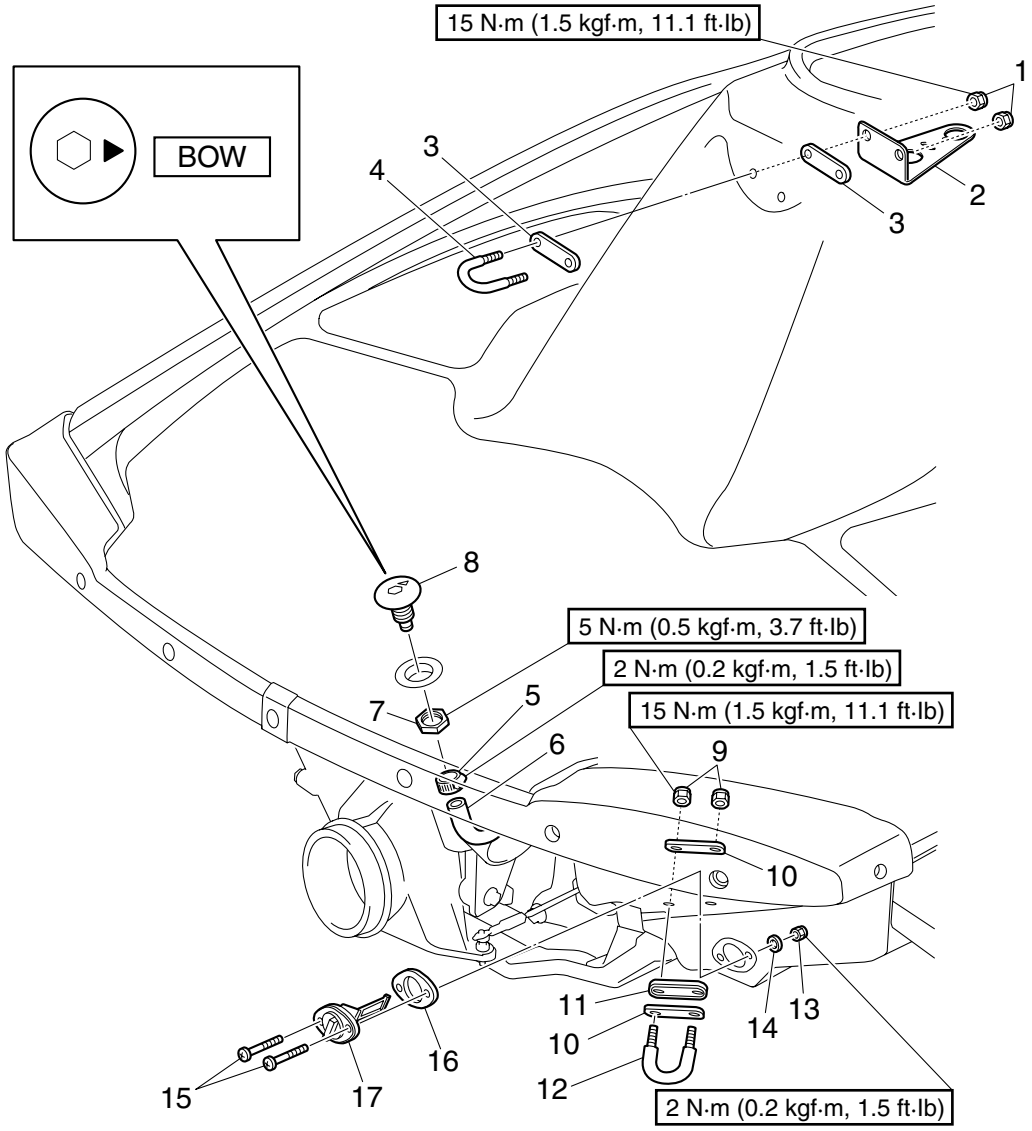


No.	Part name	Q'ty	Remarks
	Fuel cock assy.		See "Fuel cock and fuel filter" (4-1).
	Choke cable		See "Choke cable" (4-3).
1	Bolt	2	M6 × 20 mm
2	Bow eye	1	
3	Nut	4	
4	Washer	4	
5	Bolt	2	M6 × 25 mm
6	Front protector	1	
7	Bolt	2	M6 × 25 mm
8	Rivet	9	**Not reusable**
9	Rear protector	2	
10	Inner gunwale	2	
11	Rivet	30	**Not reusable**
12	Washer	30	
13	Side gunwale	2	
14	Bolt	10	M8 × 40 mm

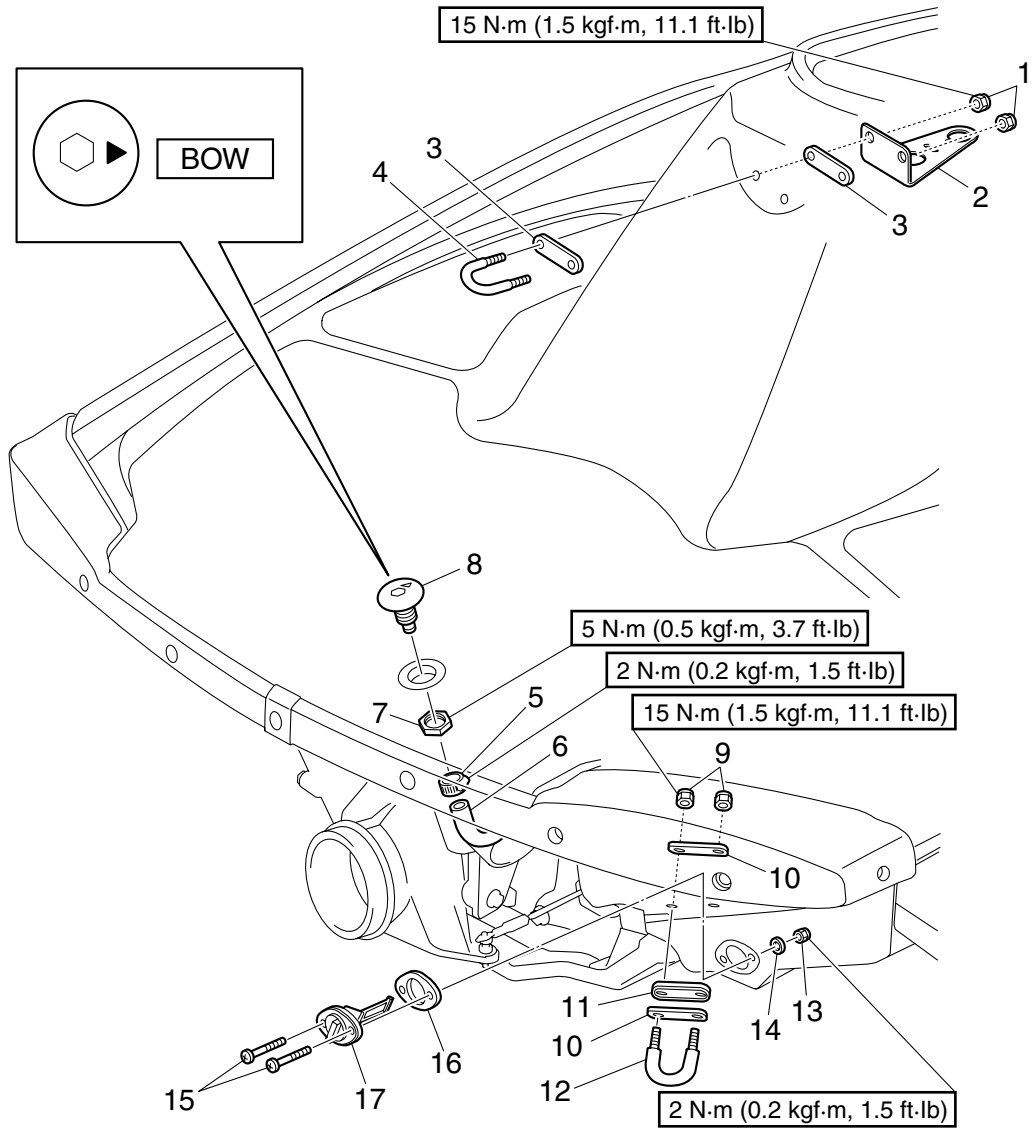


No.	Part name	Q'ty	Remarks
15	Collar	10	
16	Sponson	2	
17	Rivet	2	**Not reusable**
18	Fuel cock cover	1	
19	Rivet	2	**Not reusable**
20	Choke cover	1	

Rear section



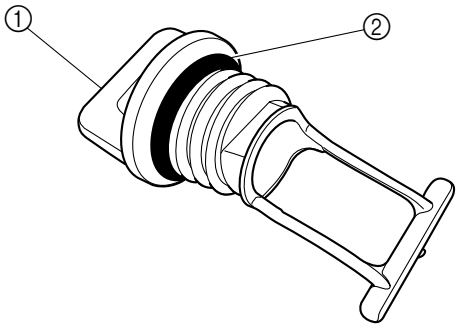
No.	Part name	Q'ty	Remarks
	Water lock		See "Exhaust system" (8-23).
	Flushing hose		See "Transom plate and hoses" (6-10).
1	Nut	2	
2	Bracket	1	
3	Plate	2	
4	Ski tow	1	
5	Clamp	1	
6	Spout hose	1	
7	Nut	1	
8	Spout	1	
9	Nut	4	
10	Plate	4	
11	Packing	2	**Not reusable**
12	Stern eye	2	
13	Nut	4	
14	Washer	4	



No.	Part name	Q'ty	Remarks
15	Screw	4	ø5 × 25 mm
16	Packing	2	**Not reusable**
17	Drain plug	2	

Drain plug check

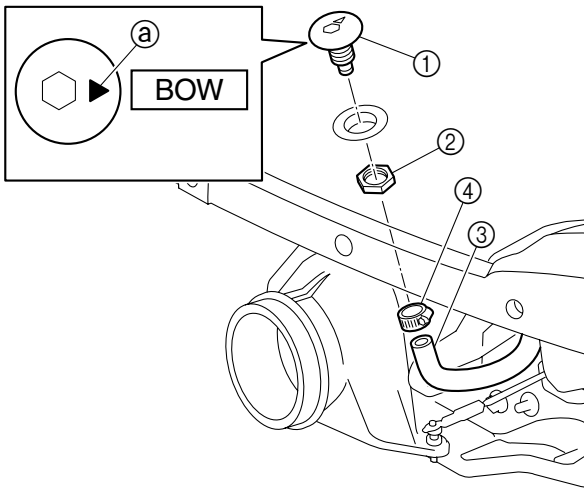
1. Check the drain plug ① and O-ring ②. Replace if cracked or damaged.



Spout installation

1. Install the spout ①, and then tighten the nut ② to the specified torque.

2. Install the hose ③, and then tighten the clamp ④ to the specified torque.



Spout nut ②: 5 N·m (0.5 kgf·m, 3.7 ft·lb) Spout hose clamp ④: 2 N·m (0.2 kgf·m, 1.5 ft·lb)

TIP:

Face the mark ⓐ toward the bow.

Troubleshooting

Engine unit troubleshooting

TIP:

- Before troubleshooting the engine unit, make sure that fresh fuel of the specified type has been used.
- Check that all wiring connections are properly secured and that they are not rusty or corroded.
- Check that the engine shut-off cord is connected to the engine shut-off switch.
- Check that the battery is charged and that its specific gravity is within specification.

Troubleshooting (engine unit, jet pump unit, charging system)

Symptom 1: Specific trouble conditions
Symptom 2: Trouble conditions of an area or individual part
Cause: The content considered as the trouble factors for symptom 2
—: Not applicable

Symptom 1: Engine does not crank.

Symptom 2	Cause	Checking step	See page
Starter motor does not operate	Discharged battery	Check the battery voltage and specific gravity.	3-8
	Loose connection of battery terminal	Check the battery cable and terminal for proper connection.	7-2
	Blown fuse	Check the fuse for continuity	7-10
	Starter relay malfunction	Check the starter relay.	7-11
	Engine start switch malfunction	Check the engine start switch. (left handlebar switch)	7-10
	Short, open, or loose connection in starter motor circuit	Check the wiring harness.	WD
	Starter motor malfunction	Disassemble and check the starter motor.	7-12
	Stuck piston or crankshaft	Disassemble and check the engine unit.	5-21 5-33
	Stuck impeller	Disassemble and check the jet pump unit.	6-6
Starter motor operates, but the engine does not crank	Starter clutch assy. or flywheel magneto malfunction	Check the starter clutch assy., flywheel magneto, or Woodruff key.	5-25 5-27

WD: See the wiring diagram.

Symptom 1: Engine will not start (engine cranks).

Symptom 2	Cause	Checking step	See page
Throttle valve does not move properly	Throttle cable installed incorrectly	Adjust the throttle lever free play.	3-2
	Throttle valve malfunction	Check the carburetor.	4-14
Discharged battery	Battery performance decrease	Check the battery voltage and specific gravity.	3-8
	Lighting coil malfunction	Measure the lighting coil output peak voltage.	7-9
		Measure the lighting coil resistance.	7-9
		Check the lighting coil wiring harness leads for continuity.	WD
	Rectifier regulator malfunction	Measure the rectifier regulator output peak voltage.	7-9
		Check the rectifier regulator wiring harness leads for continuity.	WD
	Short, open, or loose connection in charging circuit	Check the battery cable and terminal for proper connection.	7-2
		Check the wiring harness.	WD
Spark plug does not spark (all cylinders)	Engine shut-off cord clip not installed	Check that the engine shut-off cord clip is installed properly.	7-10
	Engine stop switch malfunction	Check the engine stop switch. (left handlebar switch)	7-10
	Pickup coil malfunction	Measure the pickup coil output peak voltage.	7-8
		Measure the pickup coil resistance.	7-8
	Short, open, or loose connection in pickup coil circuit	Check the pickup coil wiring harness leads for continuity.	WD
	CDI unit malfunction	Measure the CDI unit output peak voltage.	7-6
		Measure the CDI unit resistance.	7-6
		Check the CDI unit wiring harness leads for continuity.	WD
	Charge coil malfunction	Measure the charge coil output peak voltage.	7-7
		Measure the charge coil resistance.	7-7
		Check the charge coil wiring harness leads for continuity.	WD
	Short, open, or loose connection in ignition coil circuit	Measure the ignition coil resistance.	7-6
		Check the ignition coil wiring harness leads for continuity.	WD

WD: See the wiring diagram.

Symptom 2	Cause	Checking step	See page
Fuel not supplied (all cylinders)	Fuel leakage	Check the fuel hose.	3-3
	Clogged fuel filter	Replace the fuel filter.	3-3
	Fuel pump malfunction	Check the fuel pump onto the carburetor.	4-14
	Improper low speed screw setting	Adjust the low speed screw.	4-15
	Air-fuel mixture not supplied	Check the reed valve.	5-15
Compression pressure is low	Compression leakage	Measure the compression pressure.	3-5
		Check the cylinder head gasket and cylinder head warpage.	5-17
		Check the piston and piston ring for damage.	5-22
		Check the cylinder for damage.	5-19

Symptom 1: Unstable engine idle speed, poor acceleration, poor performance, or limited engine speed

Symptom 2	Cause	Checking step	See page
Throttle valve does not move properly	Throttle cable installed incorrectly	Adjust the throttle lever free play.	3-2
	Throttle valve malfunction	Check the throttle valve synchronization.	4-15
	Improper throttle stop screw setting	Adjust the throttle stop screw.	3-6
Spark plug does not spark (some cylinders)	Spark plug malfunction	Check the spark plug.	3-4
	Ignition coil malfunction	Check the ignition spark.	7-5
	Short, open, or loose connection in ignition coil circuit	Measure the ignition coil resistance.	7-6
		Check the ignition coil wiring harness leads for continuity.	WD
Fuel not supplied (some cylinders)	Improper low speed screw setting	Adjust the low speed screw.	4-15
	Improper high speed screw setting	Adjust the high speed screw.	4-15
	Air-fuel mixture not supplied	Check the reed valve.	5-15

Symptom 2	Cause	Checking step	See page
Compression pressure is low	Compression leakage	Measure the compression pressure.	3-5
		Check the cylinder head gasket and cylinder head warpage.	5-17
		Check the piston and piston ring for damage.	5-22
		Check the cylinder for damage.	5-19

WD: See the wiring diagram.

Symptom 1: High engine idle speed

Symptom 2	Cause	Checking step	See page
—	Throttle cable installed incorrectly	Adjust the throttle lever free play and check the cable routing.	3-2
	Improper throttle stop screw setting	Adjust the throttle stop screw.	3-6

Symptom 1: Limited engine speed

Symptom 2	Cause	Checking step	See page
• Buzzer sounds intermittently • Overheat warning indicator blinks • "WARNING" indicator blinks	Clogged cooling water passage	Check the cooling water pilot outlet for water discharge.	—
		Check the cooling water passage.	2-13
	Thermoswitch malfunction	Check the thermoswitch.	7-8

Symptom 1: Discharged battery

Symptom 2	Cause	Checking step	See page
—	Battery performance decrease	Check the battery voltage and specific gravity.	3-8
	Loose connection of battery terminal	Check the battery cable and terminal for proper connection.	7-2
	Short, open, or loose connection in charging circuit	Check the charging circuit for wiring connection and damage.	WD
	Lighting coil malfunction	Measure the lighting coil output peak voltage.	7-9
		Measure the lighting coil resistance.	7-9
		Check the lighting coil wiring harness leads for continuity.	WD
	Rectifier regulator malfunction	Measure the rectifier regulator output peak voltage.	7-9
		Check the rectifier regulator wiring harness leads for continuity.	WD

WD: See the wiring diagram.

Symptom 1: Poor performance

Symptom 2	Cause	Checking step	See page
Watercraft cannot reach high speeds	Jet pump unit malfunction	Check the impeller, impeller duct, and intake grate.	6-6
	Water entered hull	Check the drain plugs and O-rings for damage.	8-29
		Check the cooling water hoses for damage.	2-13
		Check the water lock and rubber hoses for damage.	8-24
		Check the exterior of the hull for damage.	—
		Check the bilge hose, bilge strainer, and joint.	3-9

Appendix

A

Wiring diagram

VX 700

① Thermoswitch
② Base assy. (Lighting coil, pickup coil, charge coil)
③ Starter motor
④ Oil level sensor
⑤ Fuel level sensor
⑥ Multifunction meter
⑦ Buzzer
⑧ Engine start switch
⑨ Engine shut-off switch
⑩ Engine stop switch
⑪ Battery
⑫ Starter relay
⑬ Fuse (10 A)
⑭ CDI unit
⑮ Rectifier regulator
⑯ Ignition coil
⑰ Spark plug

Color code

B : Black
Br : Brown
G : Green
L : Blue
O : Orange
P : Pink
R : Red
W : White
Br/W : Brown/White
L/B : Blue/Black
L/R : Blue/Red
W/L : White/Blue
W/R : White/Red

YAMAHA MOTOR CO., LTD.

Sep. 2010 – ** × 1 CR
(E)

VX700