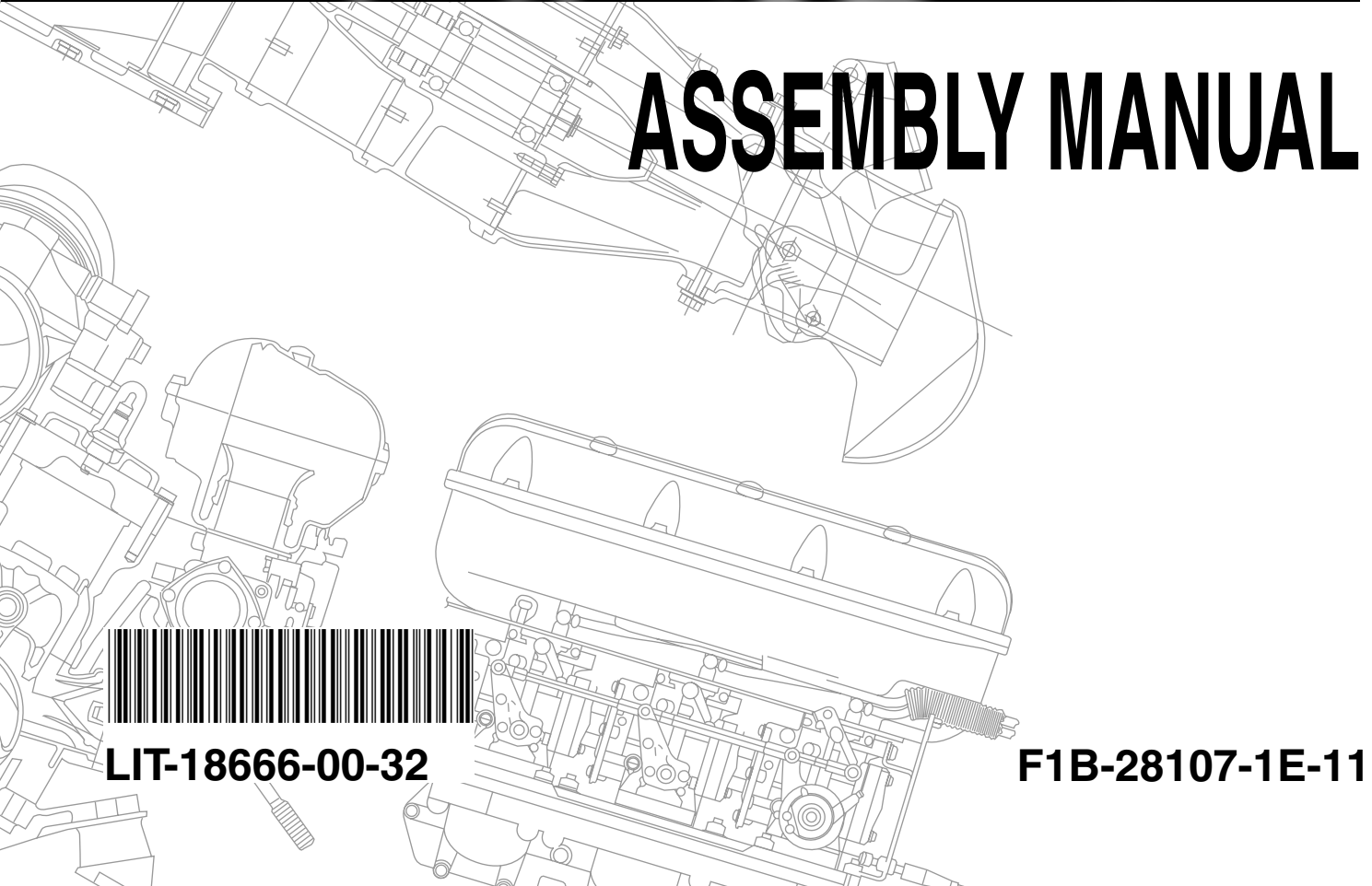




WaveRunner FX140



ASSEMBLY MANUAL



LIT-18666-00-32

F1B-28107-1E-11

CAUTION

- The engine oil tank is empty. Before operating the engine, be sure to fill the tank with oil.
- When adding engine oil to the oil tank or checking the engine oil level, be sure to read the OIL TANK section in the PREDELIVERY CHECKS.

**WaveRunner FX140
ASSEMBLY MANUAL
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1st Edition, January 2002
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P/N LIT-18666-00-32**

PREFACE


This Assembly Manual contains the information needed to assemble the Yamaha watercraft correctly prior to delivery to the customer. Since some external parts of the watercraft have not been assembled at the Yamaha factory for convenience of packing, assembly by the Yamaha dealer is required. It should be noted that the reassembled watercraft should be thoroughly cleaned, inspected, and adjusted prior to delivery to the customer.

NOTICE

Because Yamaha constantly strives for product improvement, the service specifications may be subject to change in the future. If any change is introduced into the specifications or assembly procedures, Yamaha dealers will be notified by a technical bulletin.

IMPORTANT MANUAL INFORMATION:

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

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









WARNING
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, passenger(s), a bystander, or a person inspecting or repairing the watercraft.

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

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

SYMBOLS USED IN THIS ASSEMBLY MANUAL

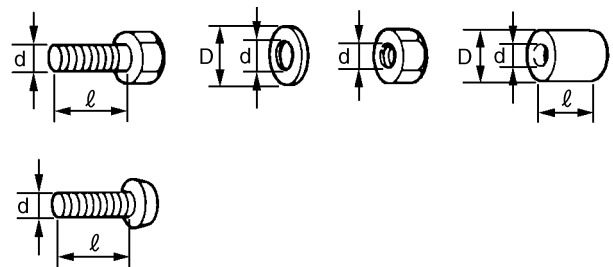
In order to simplify descriptions in assembly manuals, the following symbols are used:

-  : Coat with water resistant grease. (Yamaha grease A, Yamaha marine grease)
-  : Tightening torque.
-  : Provide clearance.
-  : Install so that the arrow mark faces upward.
-  : Frontward of the watercraft.
-  : Made of rubber or plastics.
-  : Tighten temporarily.
-  : Apply locking agent. LOCTITE®, No.242 (BLUE LOCTITE)

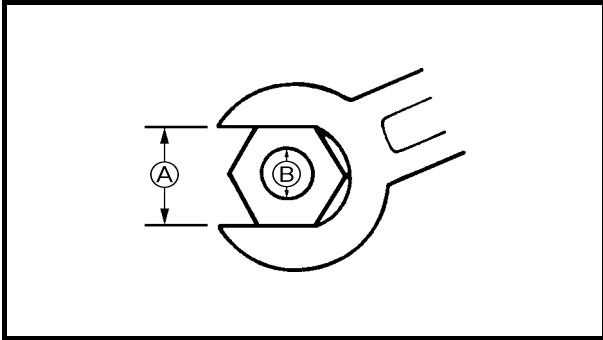
Size:

d/D : Diameter of part.

l : Length of part.



Nut (A)	Bolt (B)	General torque specifications		
		N•m	kgf•m	ft•lb
8 mm	M5	5.0	0.5	3.6
10 mm	M6	8.0	0.8	5.8
12 mm	M8	18	1.8	13
14 mm	M10	36	3.6	25
17 mm	M12	43	4.3	31



GENERAL TORQUE SPECIFICATIONS

This chart specifies the torques for tightening standard fasteners with standard clean dry ISO threads at room temperature. Torque specifications for special components or assemblies are given in applicable sections of this manual. To avoid causing warpage, tighten multi-fastener assemblies in a criss-cross fashion, in progressive stages until the specified torque is reached.

UNPACKING AND CHECKING

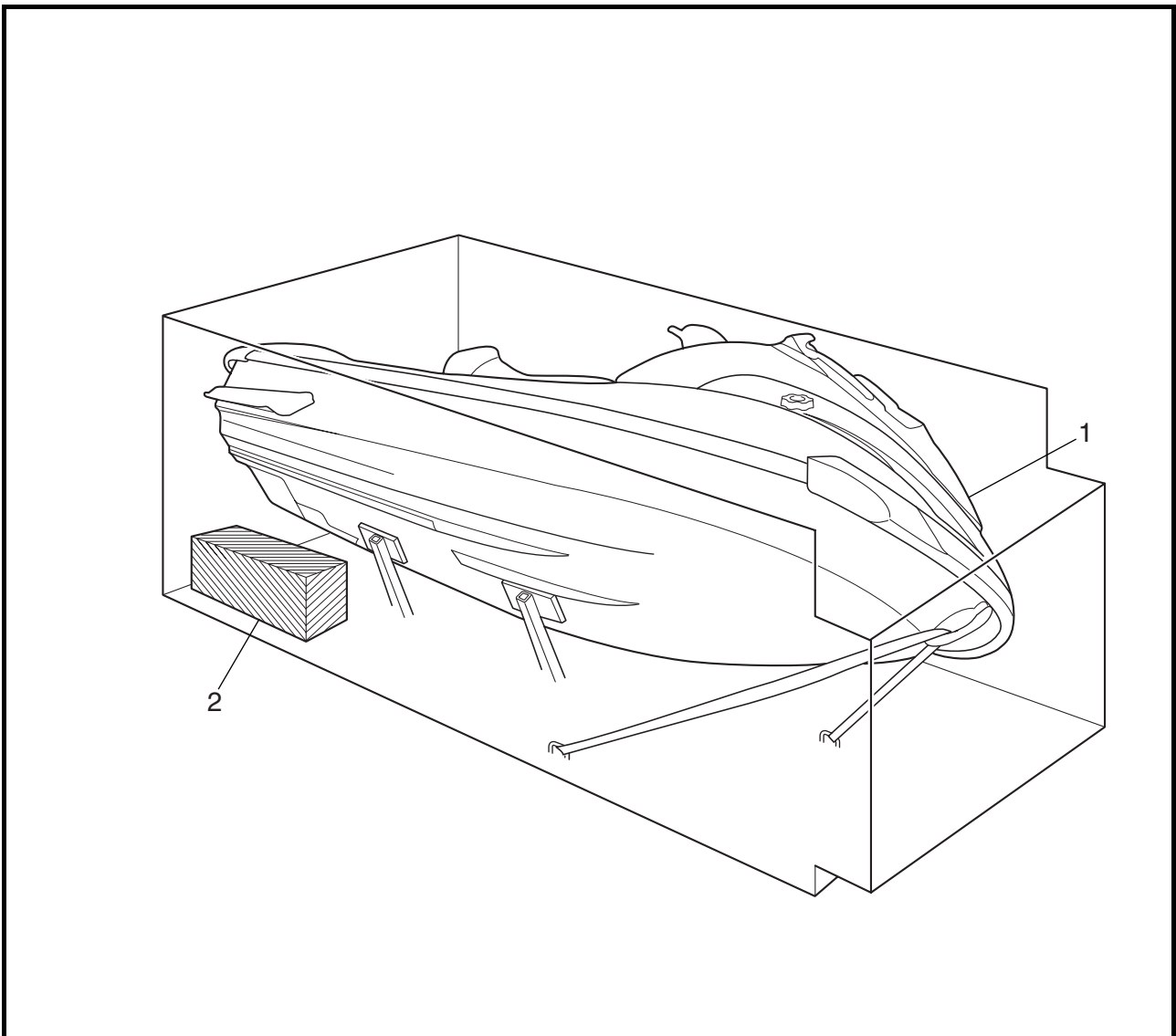
Carefully uncrate unit and inventory any missing or damaged parts.

NOTE: _____

For USA:

If concealed damage is found during uncrating, refer to the Yamaha Warranty Handbook, Chapter 3. Documentation may be required for warranty reimbursement. Do not continue with uncrating or throw the crate away until the requirements in Chapter 3 have been met.

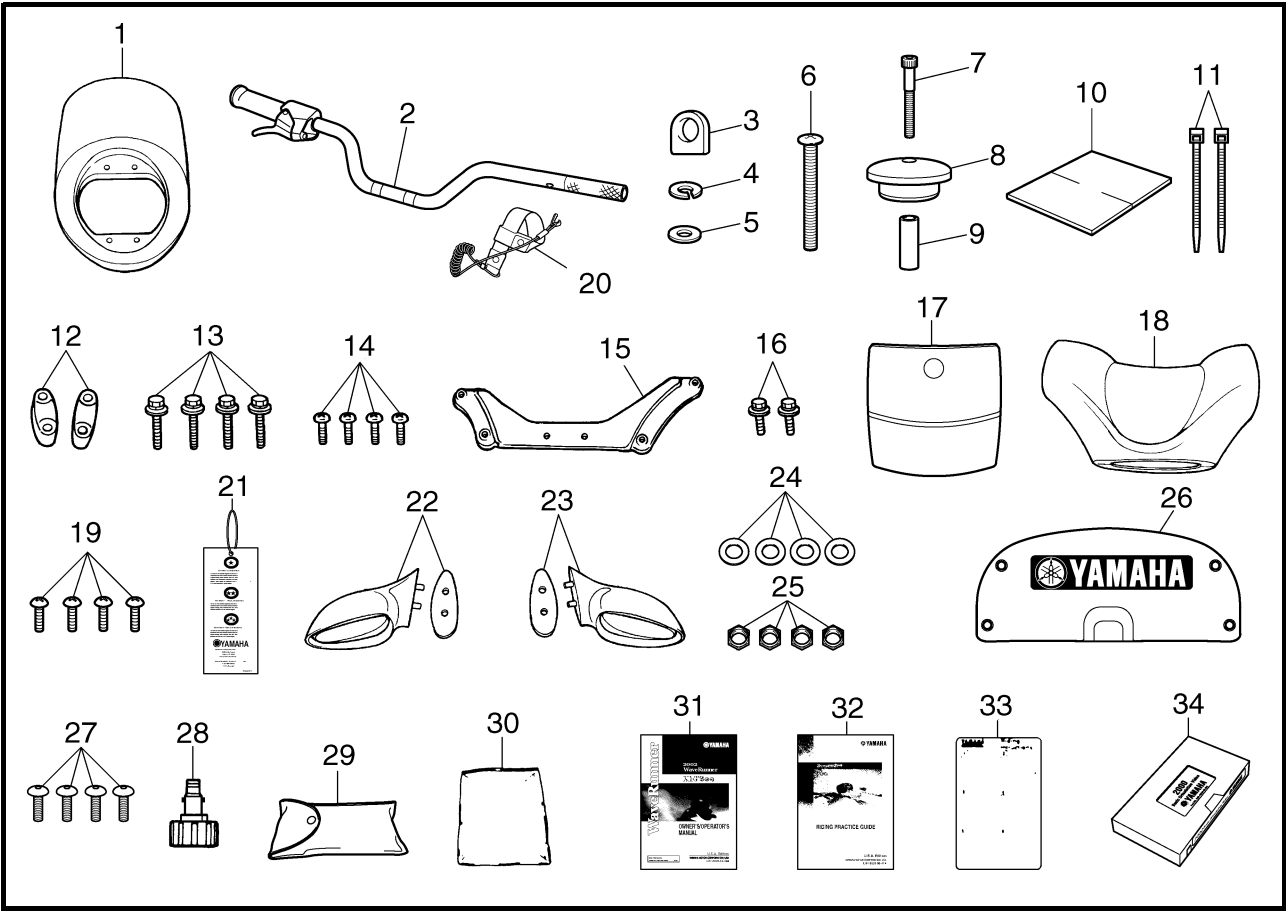
COMPARTMENT DIAGRAM



COMPARTMENT PART CHART

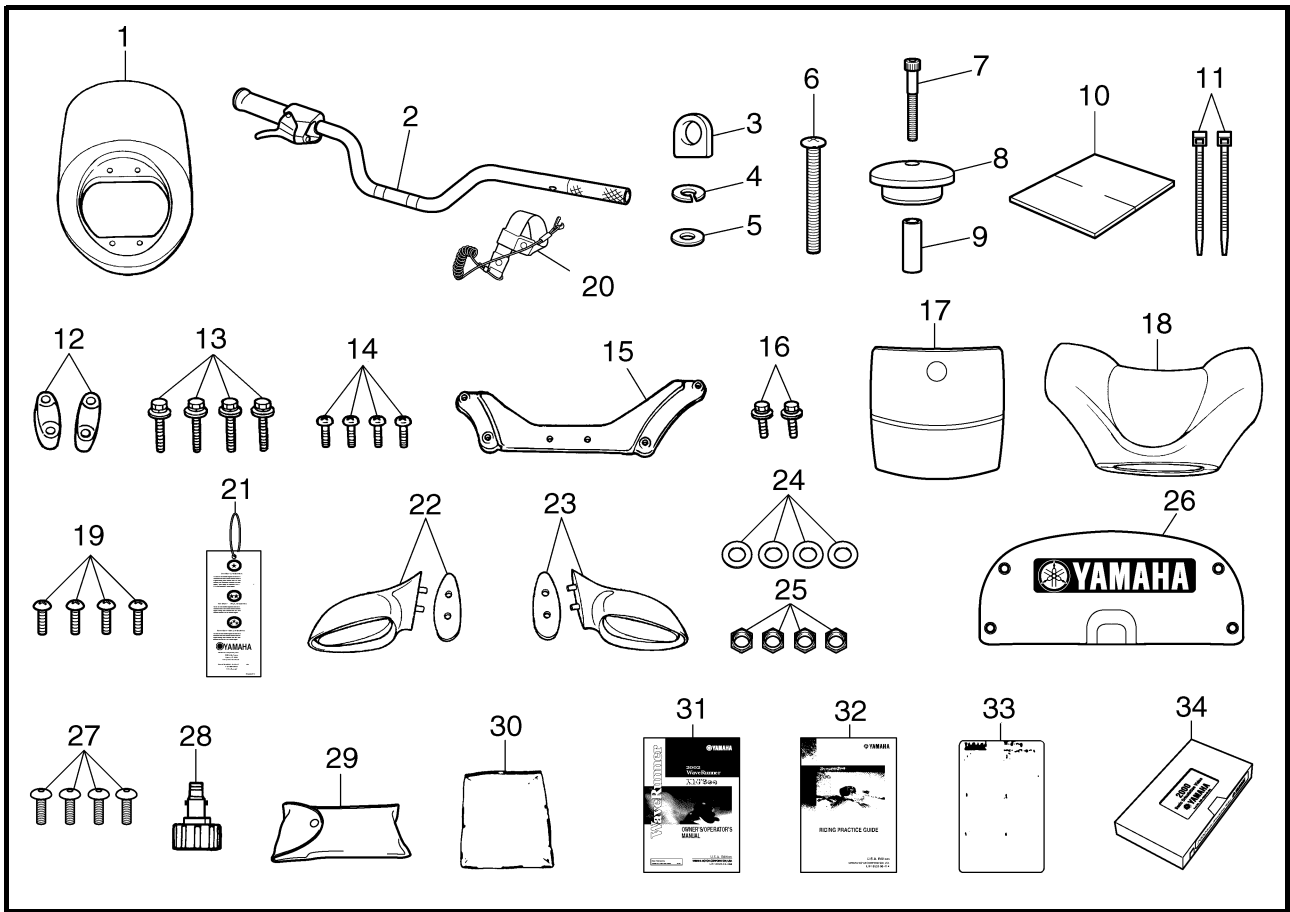
No.	Part name	Q'ty	Remarks
1	Watercraft body	1	
2	Carton box	1	

COMPARTMENT DIAGRAM



COMPARTMENT PART CHART

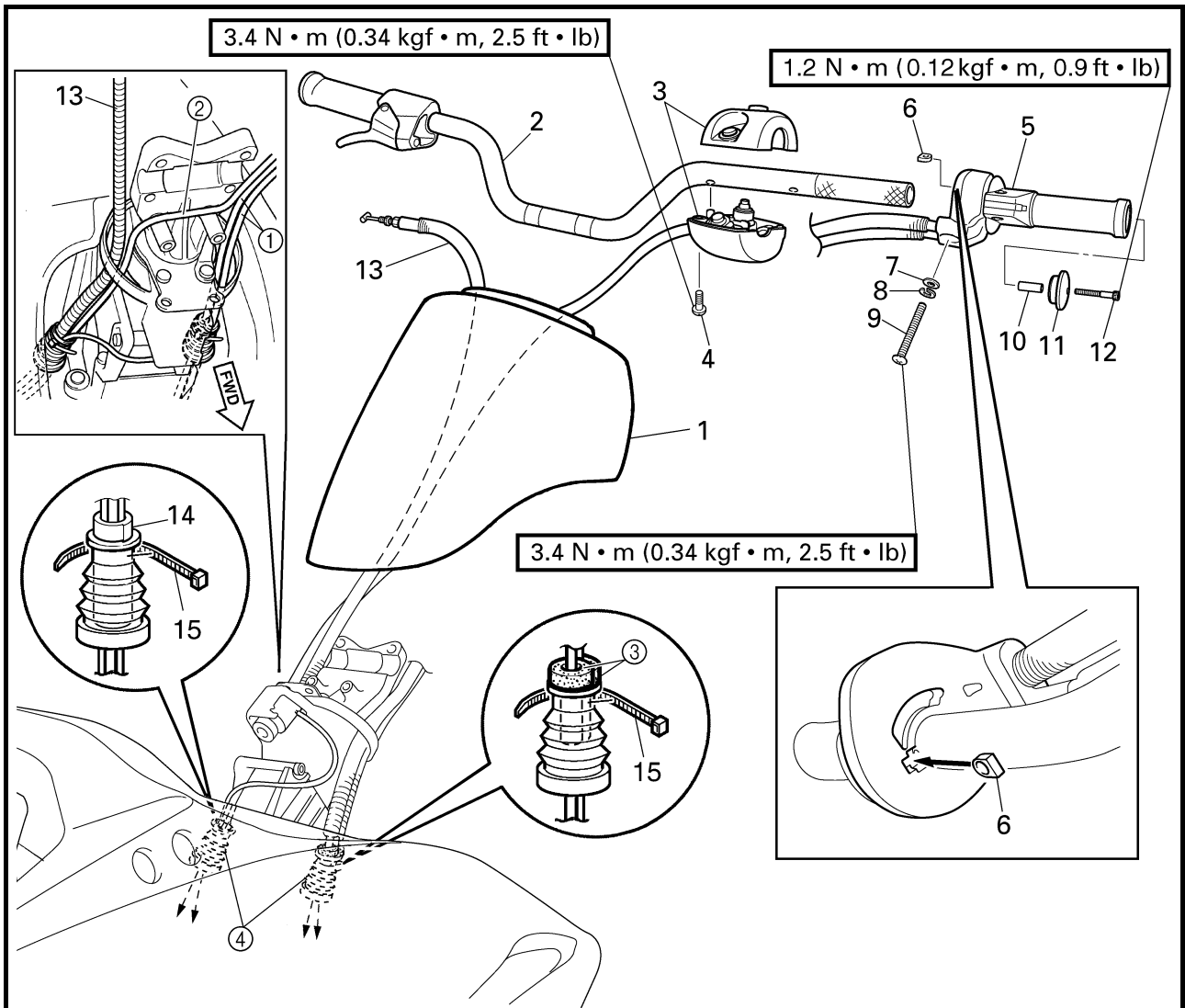
No.	Part name	Q'ty	Part number
1	Steering boss cover	1	F0D-U143E-00
2	Handlebar assembly	1	F1B-61552-00
3	Special nut	1	GH1-U143B-00
4	Washer 13 × 6 mm (0.51 × 0.24 in)	1	92990-06600
5	Spring washer	1	9299R-06100
6	Screw 6 × 65 mm (0.24 × 2.56 in)	1	97880-06065
7	Bolt 5 × 35 mm (0.20 × 1.38 in)	1	90110-05015
8	Grip end	1	GP7-U155F-00
9	Spacer 8 × 6 × 22 mm (0.31 × 0.24 × 0.87 in)	1	90387-05800
10	Hose packing	1	GJ1-U7578-11
11	Band	2	90601-200U1
12	Upper handlebar holder	2	EU0-23814-30
13	Bolt 8 × 48 mm (0.31 × 1.89 in)	4	90119-089UU
14	Screw 6 × 14 mm (0.24 × 0.55 in)	4	90154-06006
15	Handlebar cover stay	1	F1B-U142K-00
16	Bolt 6 × 15 mm (0.24 × 0.59 in)	2	90119-069US
17	Pad	1	F1B-U156E-00



No.	Part name	Q'ty	Part number
18	Handlebar cover	1	F1B-U143D-00
19	Screw 6 × 25 mm (0.24 × 0.98 in)	4	90150-06008
20	Engine shut-off cord	1	EW2-68348-00
21	Star label tag ^{*1}	1	F1B-U410M-00
22	Left mirror (with seal)	1	F1B-U596B-00
23	Right mirror (with seal)	1	F1B-U596C-00
24	Washer 18 × 8 mm (0.71 × 0.31 in)	4	9299R-08200
25	Nut 8 mm (0.31 in)	4	9572R-08300
26	Panel	1	F1B-U555B-00
27	Screw 5 × 20 mm (0.20 × 0.79 in)	4	90111-05004
28	Flushing hose connector	1	67X-12590-00
29	Tool kit	1	F1B-65986-00
30	Vinyl bag	1	EU0-65901-01
31	Owner's/Operator's manual	1	F1B-F8199-10, F1B-F8199-C0 ^{*1}
32	Riding practice guide	1	F1B-F819T-00
33	Riding instruction card	1	FN8-U595B-03
34	Basic orientation video	1	F0D-U595A-00

^{*1}: For California

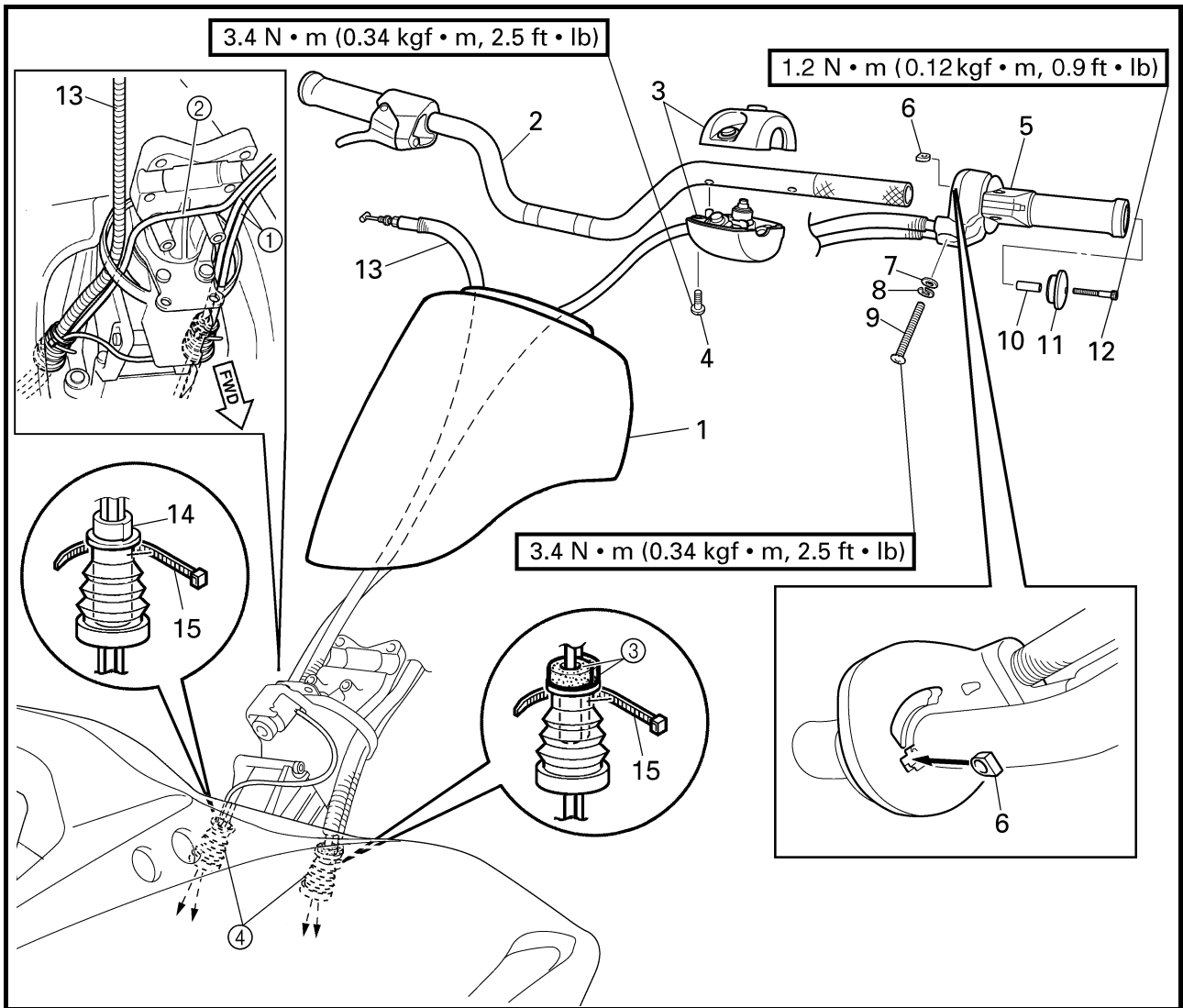
HANDLEBAR SWITCH AND QSTS GRIP INSTALLATION EXPLODED DIAGRAM



INSTALLATION CHART

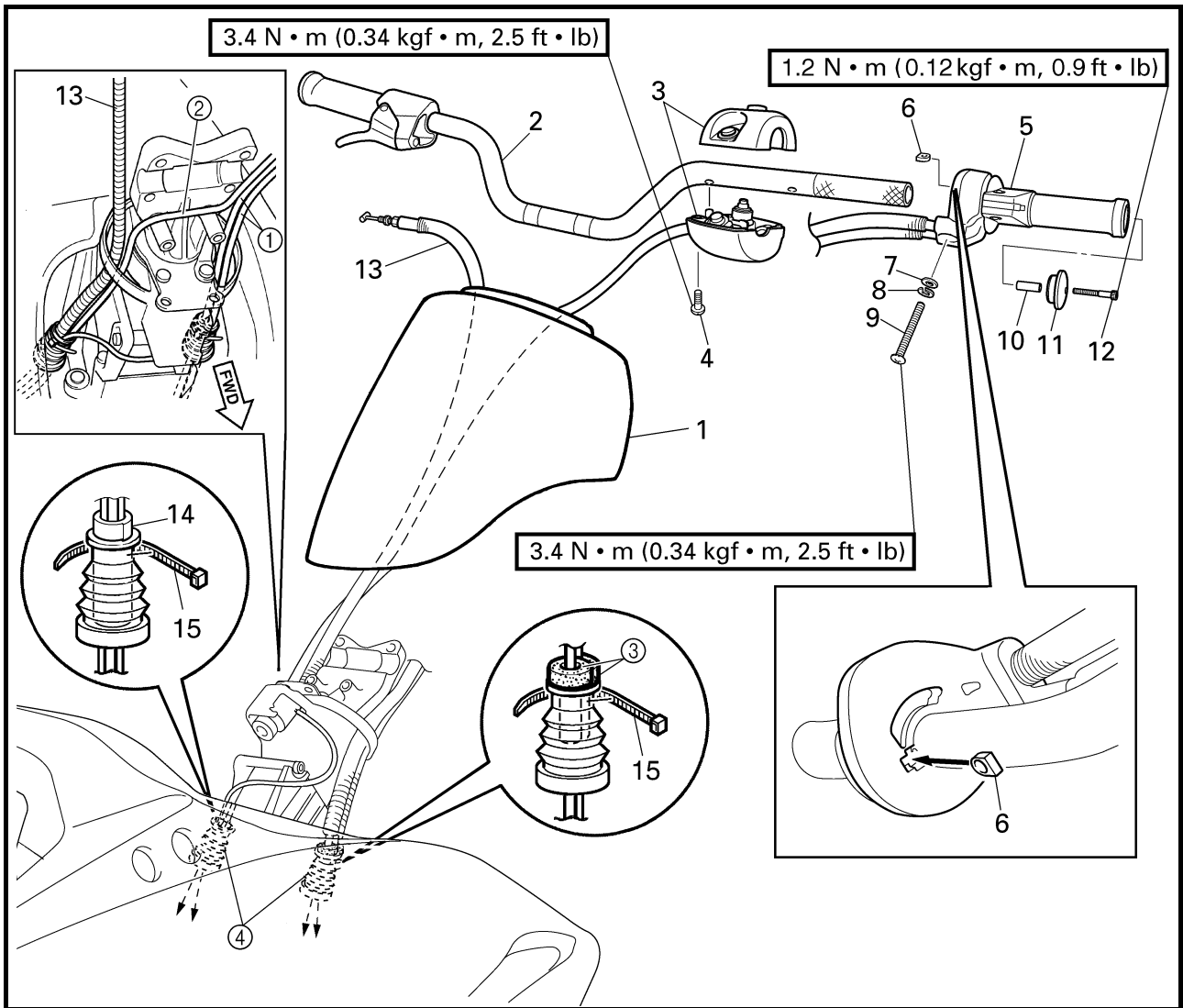
Step	Procedure/Part name	Q'ty	Service points
	HANDLEBAR SWITCH AND QSTS GRIP INSTALLATION		Follow "Step" order for installation.
1	Steering boss cover	1	
2	Handlebar assembly	1	
3	Handlebar switch	1	NOTE: _____ Align the handlebar switch projection with the hole on the handlebar.
4	Screw 5 × 25 mm (0.20 × 0.98 in)	2	NOTE: _____ The screws have been slightly tightened to hold the handlebar switch in position.
5	QSTS grip	1	
6	Special nut	1	

EXPLODED DIAGRAM



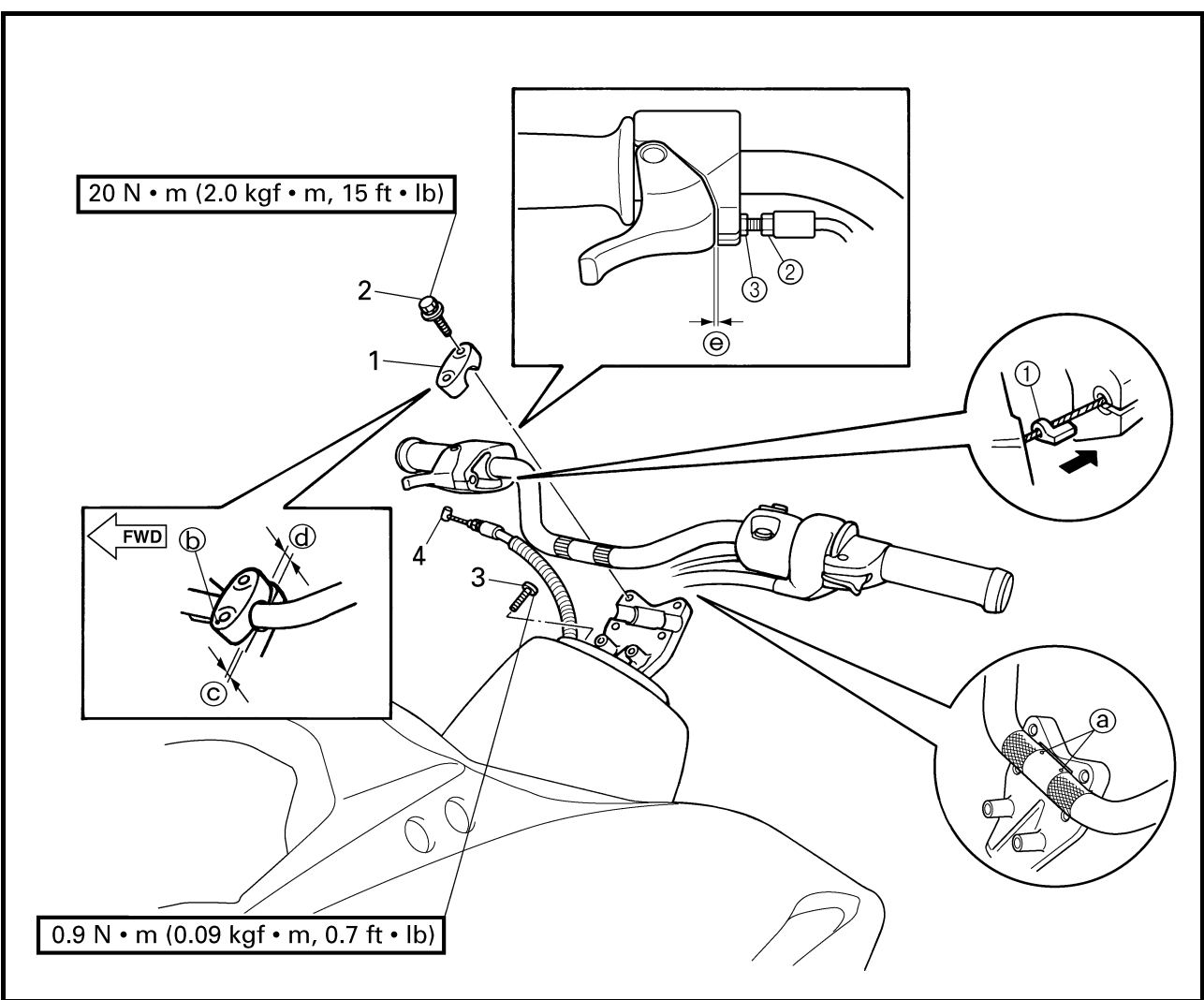
Step	Procedure/Part name	Q'ty	Service points
7	Washer 13 × 6 mm (0.51 × 0.24 in)	1	<p>NOTE:</p> <ul style="list-style-type: none"> Route the QSTS ① cables through the port side in the steering console. Route the handlebar switch lead ②, buzzer lead and throttle cable through the starboard side in the steering console. Position the corrugated tube for the throttle cable as shown in the illustration so that the tube attaches to the end of the outer throttle cable.
8	Spring washer	1	
9	Screw 6 × 65 mm (0.24 × 2.56 in)	1	
10	Spacer 8 × 6 × 22 mm (0.31 × 0.24 × 0.87 in)	1	
11	Grip end	1	
12	Bolt 5 × 35 mm (0.20 × 1.38 in)	1	
13	Throttle cable (with corrugated tube)	1	

EXPLODED DIAGRAM



Step	Procedure/Part name	Q'ty	Service points
14	Hose packing	1	NOTE: _____ • Install the hose packing as shown. • Install the sponges ③ of QSTS cables as shown. • Make sure that the grommet ④ is installed to the deck securely.
15	Band	2	

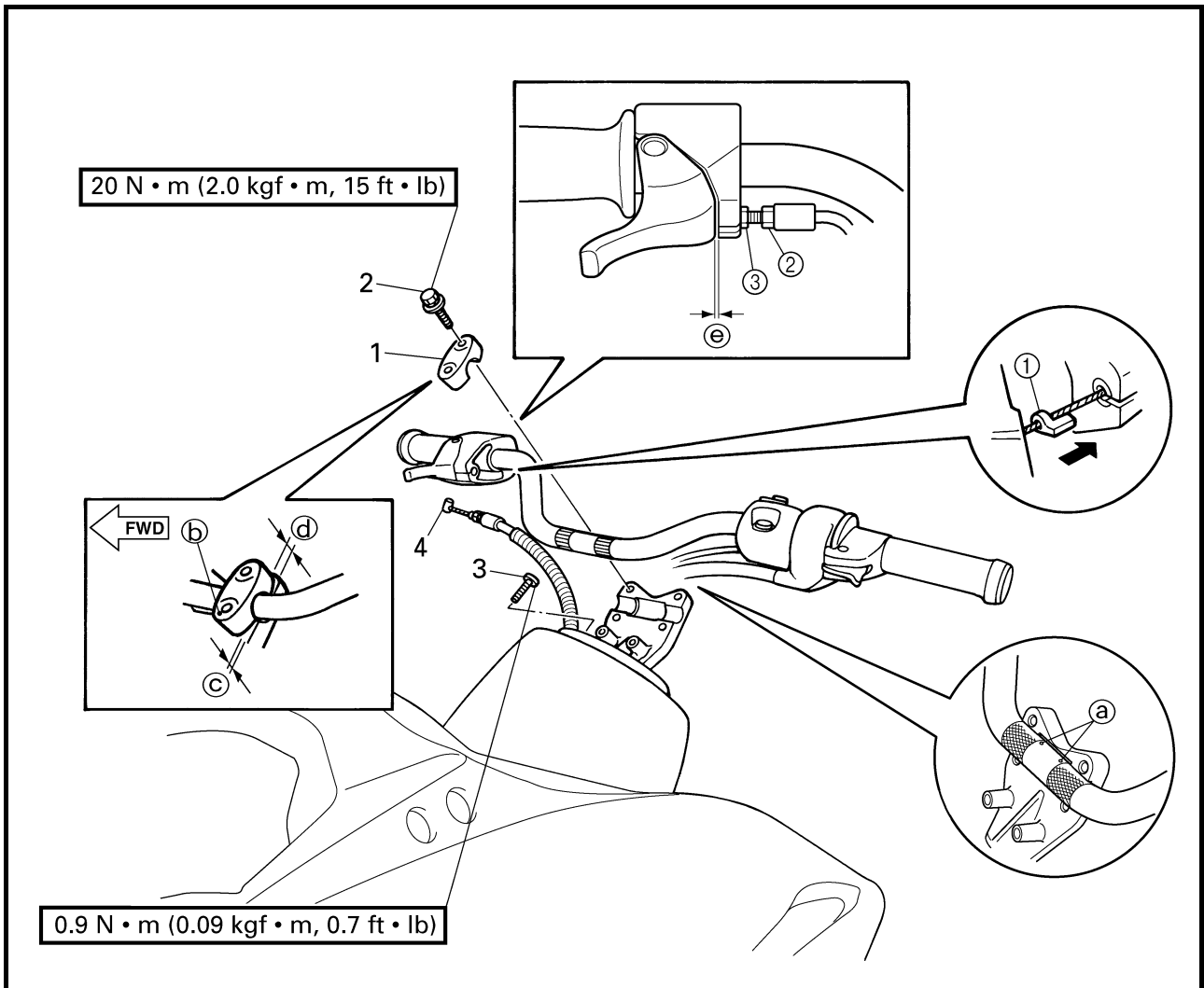
HANDLEBAR INSTALLATION EXPLODED DIAGRAM



INSTALLATION CHART

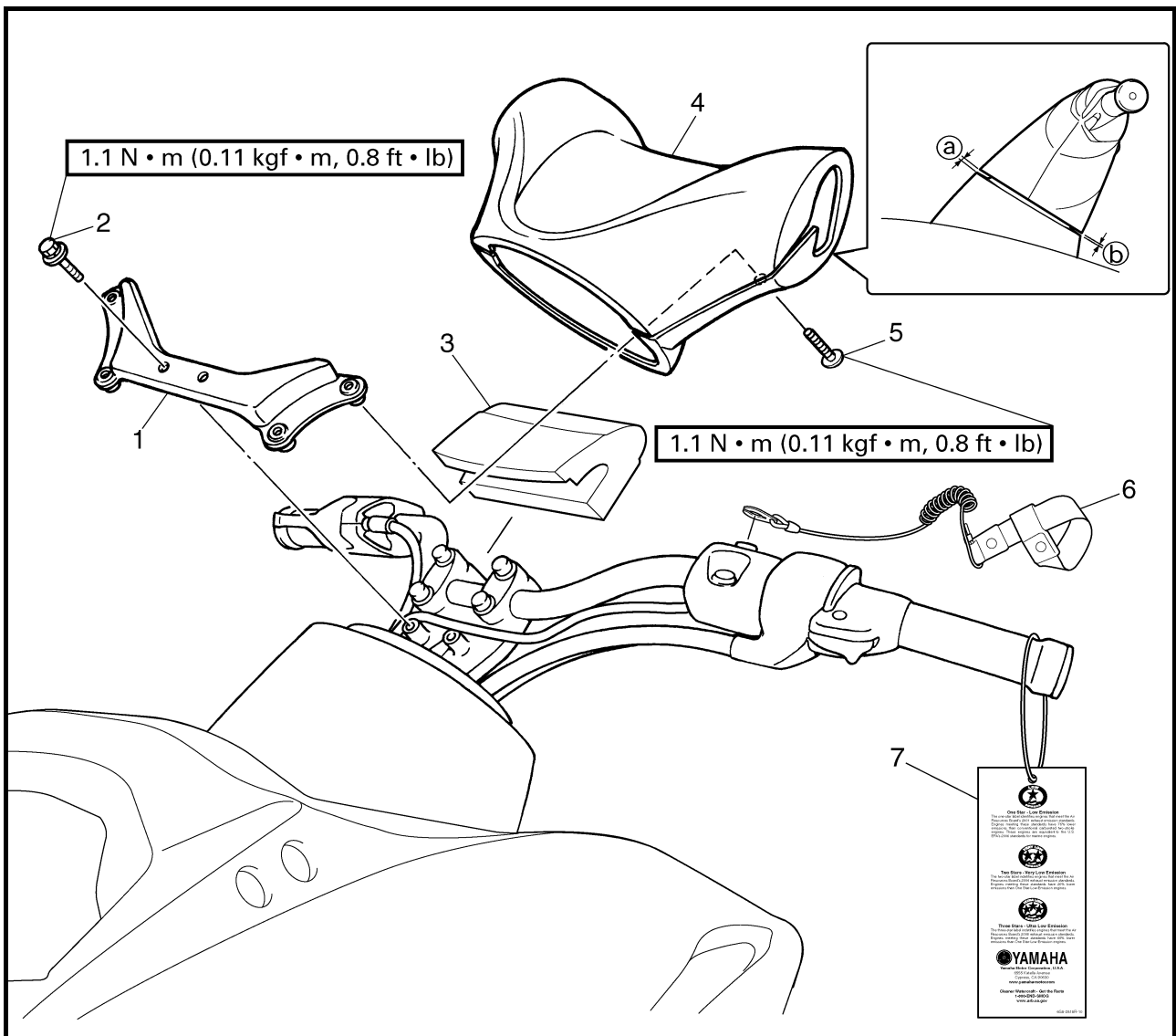
Step	Procedure/Part name	Q'ty	Service points
1	HANDLEBAR INSTALLATION Upper handlebar holder	2	Follow "Step" order for installation. NOTE: _____ • Align the punched marks (a) on the handlebar with the top surface of the lower handlebar holder. • The upper handlebar holder should be installed with the punched mark (b) forward.
2	Bolt 8 × 48 mm (0.31 × 1.89 in)	4	NOTE: _____ Tighten the bolts so that the front clearance (c) of the upper handlebar holder is smaller than the rear clearance (d). Reference clearance: (c): 1.5 mm (0.06 in) (d): 3.5 mm (0.14 in)
3	Screw 6 × 14 mm (0.24 × 0.55 in)	4	

EXPLODED DIAGRAM



Step	Procedure/Part name	Q'ty	Service points				
4	Throttle cable	1	<div data-bbox="815 1532 1428 1803"> <p>Installation steps:</p> <ul style="list-style-type: none"> • Install the throttle cable end into the throttle lever. • Fit the seal ① into the groove in the bracket. • Turn the adjuster ② in/out until the specified free play is obtained. </div> <div data-bbox="815 1803 1428 1899"> <p>Throttle lever free play ②: 4–7 mm (0.16–0.28 in)</p> </div> <table border="1" data-bbox="815 1899 1428 1989"> <tr> <td data-bbox="815 1899 1010 1944">Turn in</td> <td data-bbox="1010 1899 1428 1944">Free play is increased.</td> </tr> <tr> <td data-bbox="815 1944 1010 1989">Turn out</td> <td data-bbox="1010 1944 1428 1989">Free play is decreased.</td> </tr> </table> <ul data-bbox="815 1989 1428 2051" style="list-style-type: none"> • Tighten the locknut ③. 	Turn in	Free play is increased.	Turn out	Free play is decreased.
Turn in	Free play is increased.						
Turn out	Free play is decreased.						

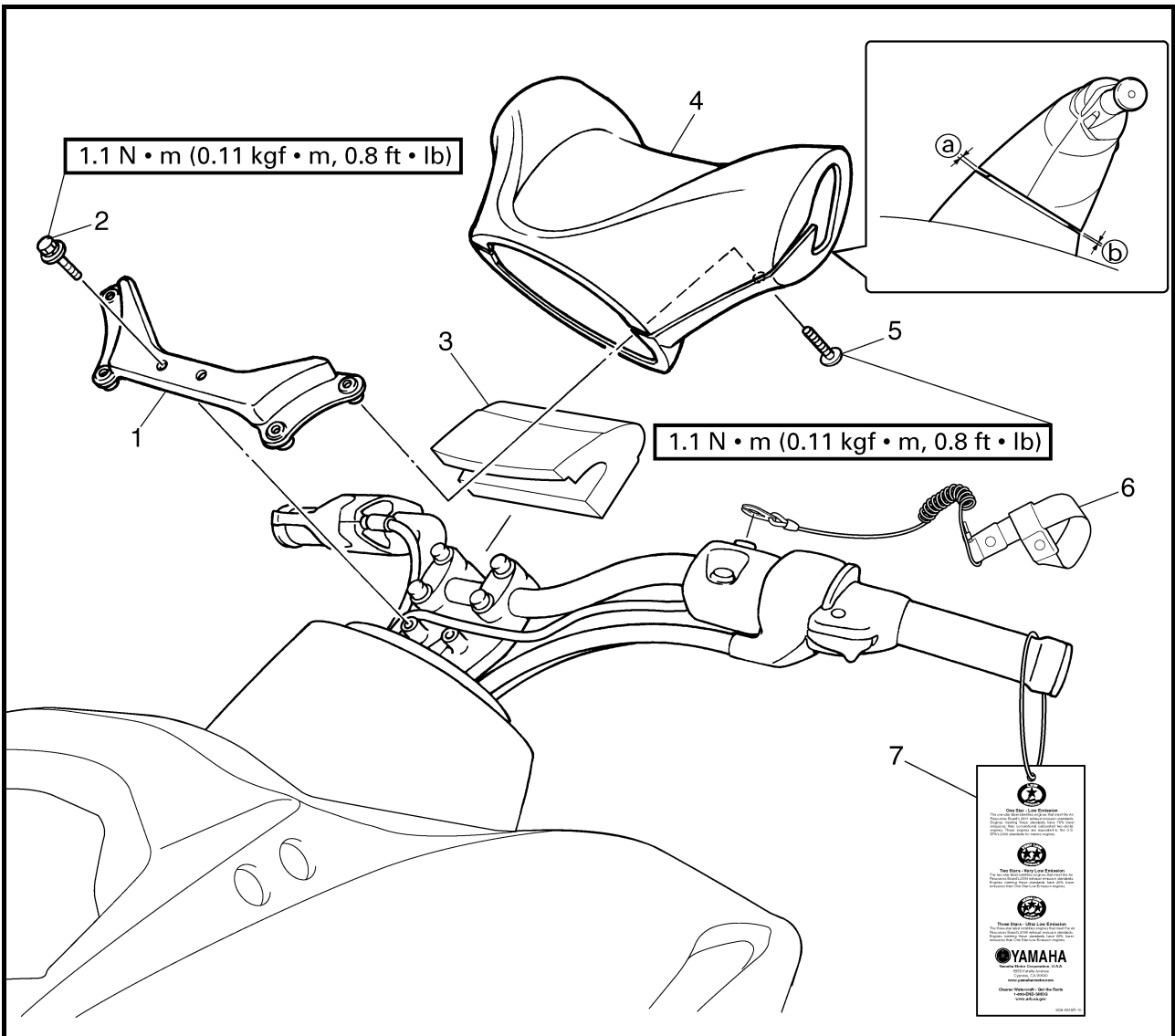
STEERING PAD INSTALLATION EXPLODED DIAGRAM



INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	STEERING PAD INSTALLATION		Follow "Step" order for installation.
1	Handlebar cover stay	1	Cover the handlebar holders with the pad.
2	Bolt 6 × 15 mm (0.24 × 0.59 in)	2	
3	Pad	1	
4	Handlebar cover	1	
5	Screw 6 × 25 mm (0.24 × 0.98 in)	4	
6	Engine shut-off cord	1	
			NOTE: _____ If the handlebar cover is in contact with the steering boss cover, adjust the handlebar mount angle so that the clearance (a) and (b) are equal. _____

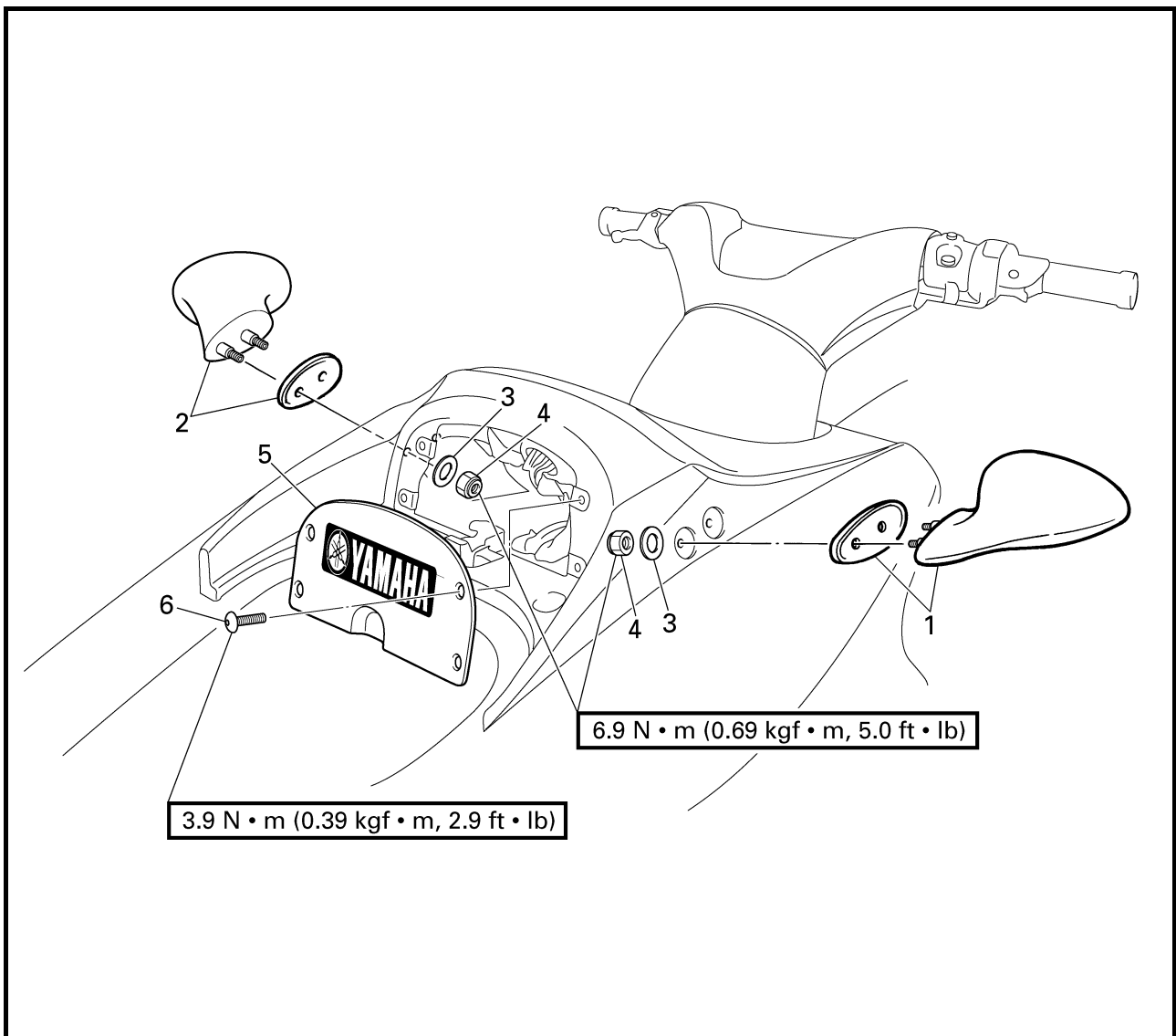
EXPLODED DIAGRAM



Step	Procedure/Part name	Q'ty	Service points
7	Star label tag ^{*1}	1	NOTE: _____ Be sure to attach the star label tag to the handlebar grip after installing all parts.

^{*1}: For California

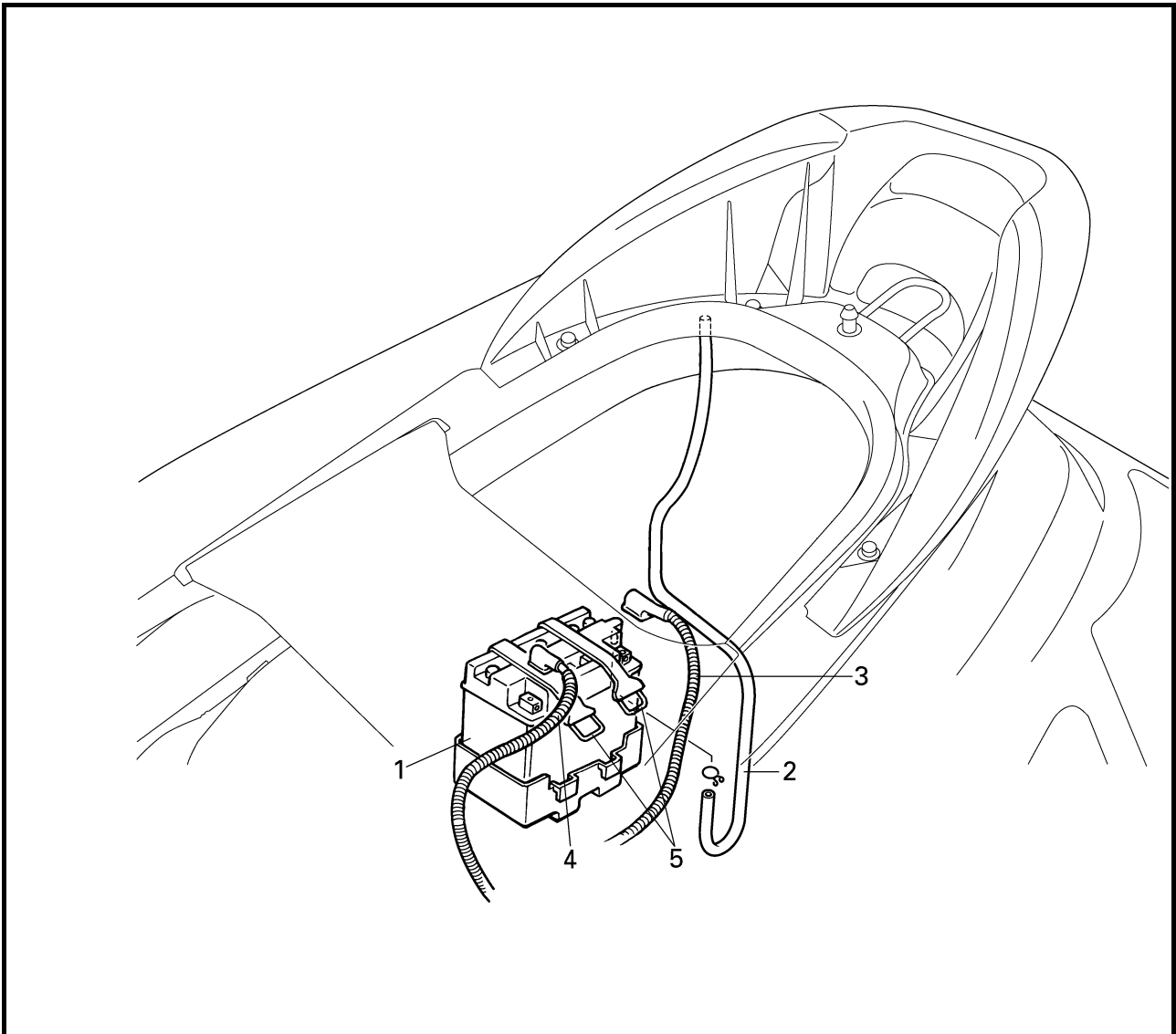
REAR VIEW MIRROR INSTALLATION EXPLODED DIAGRAM



INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	REAR VIEW MIRROR INSTALLATION		Follow "Step" order for installation.
1	Left mirror (with seal)	1	
2	Right mirror (with seal)	1	
3	Washer 18 × 8 mm (0.71 × 0.31 in)	4	
4	Nut 8 mm (0.31 in)	4	
5	Panel	1	
6	Screw 5 × 20 mm (0.20 × 0.79 in)	4	

BATTERY INSTALLATION EXPLODED DIAGRAM

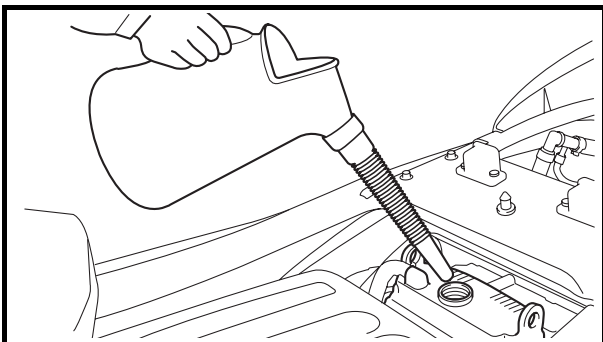
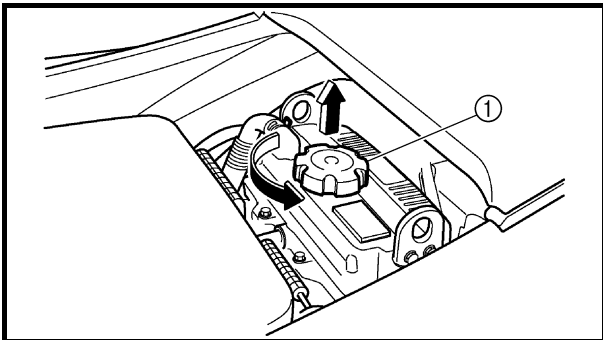


INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	BATTERY INSTALLATION		
1	Battery	1	Follow "Step" order for installation. NOTE: _____ Charge the battery before installing it. Refer to "PREDELIVERY CHECK". _____
2	Battery breather hose	1	CAUTION: _____ Make sure that the battery breather hose is not pinched. _____
3	Battery positive lead (red)	1	
4	Battery negative lead (black)	1	
5	Band	2	

PREDELIVERY CHECK CHECKING CHART

Check elements	Checking points	Reference page
Throttle lever	Free play	8
Oil tank	Engine oil	13
Battery	Battery condition	16
Trolling speed	Trolling speed	18
Steering system	Handlebar and jet thrust nozzle horizontal positions	19
QSTS	Jet thrust nozzle trim position	20
Shift system	Reverse gate position	21



OIL TANK

1. Remove:
 - Oil filler cap ①
2. Fill:
 - Oil tank
(with the specified amount of the recommended engine oil)

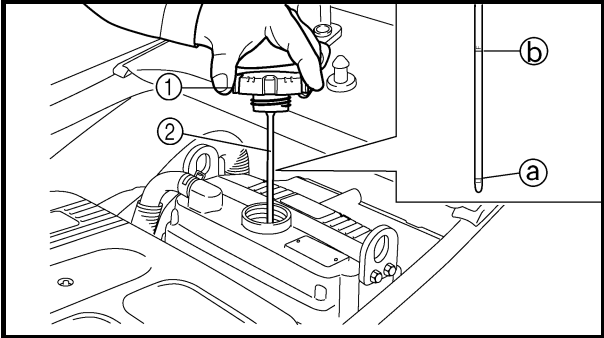


Recommended oil:
SAE 10W-30
API SE, SF, SG, SH, SJ
Oil quantity:
1.8 L (1.9 US qt, 1.6 Imp qt)

CAUTION:

When starting the engine make sure the dipstick is securely fitted into the oil tank.

3. Install:
 - Oil filler cap



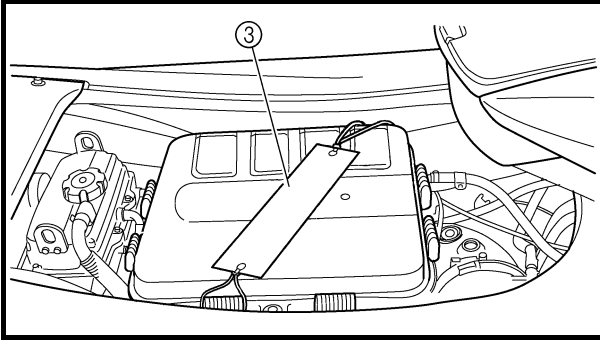
4. Check:
- Engine oil level

Checking steps:

CAUTION:

- **When checking the oil level in water, stay clear of other boats. The watercraft could be drifted away by the current or wind.**
- **Do not run the engine for more than 15 seconds without supplying water, when checking the oil level on land. The engine could overheat.**
- **Do not run the engine with too much or not enough oil in the oil tank. Oil could spray out or the engine could be damaged.**

- Place the watercraft in a horizontal position.
- Remove the front seat.
- Remove the oil filler cap ① and check for oil on the dipstick ②.
- If there is no oil on the dipstick, pour enough oil so that the tip of the dipstick comes into contact with the oil, and then install the filler cap.
- To warm up the engine perform one of the following two ways.
- **In water**
 - a. Place the watercraft in water, and then start the engine.
 - b. Run the engine at 7,000 r/min or more for more than 5 minutes.
 - c. Run the engine at trolling speed for 2–3 minutes.
 - d. Stop the engine.
- **On land**
 - a. Connect the flushing hose connector to the watercraft.
 - b. Start the engine, and then turn on the water supply.
 - c. Run the engine at trolling speed for 6–8 minutes.
 - d. Turn the water supply off, and then stop the engine.

**CAUTION:**

When checking the oil level on land, be sure to connect a garden hose to the watercraft for proper water supply.

NOTE:

If the ambient temperature is less than 15 °C (59 °F), run the engine for an additional 5 minutes.

- Remove the oil filler cap ①, wipe the dipstick ② clean, insert it back into the filler hole, and then remove it again to check the oil level.

NOTE:

The engine oil should be between the minimum level mark ① and maximum level mark ②.

- If the engine oil is below the minimum level mark ①, add sufficient oil of the recommended type to raise it to the correct level.
- If the engine oil is above the maximum level mark ②, extract sufficient oil using an oil changer to lower it to the correct level.

NOTE:

If the oil temperature is low, the reading on the dipstick will be low, and if the temperature is high, the reading on the dipstick will be high.

- Be sure to remove the oil notification tag ③ from the air cleaner case cover after filling the oil tank with oil.

BATTERY

⚠ 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.

CAUTION:

Be careful not to place the battery on its side.

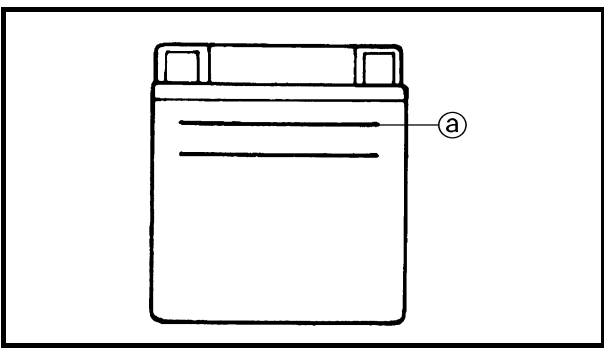
Make sure to remove the battery from the battery compartment when adding battery electrolyte or charging the battery.

When checking the battery, make sure the breather hose is connected to the battery and not obstructed.

- 1. Fill:
 - Battery electrolyte

Filling steps:

- Remove all the filler caps using pliers.
- Fill with the specified electrolyte from a jug.
- After the electrolyte is filled up as far as the UPPER LEVEL (a), allow the cell to stand for 20 minutes. If after 20 minutes, the electrolyte level has dropped, add more electrolyte up to the UPPER LEVEL mark once again.



2. Initial battery charging:

- Battery

Charging steps:

- Connect the charging cable (+) and (-) of the battery charger to the battery terminals correctly.
- Charge the battery for 3 to 5 hours with the rate of 1.9 ampere.

⚠ WARNING


Turn the battery charger on after the battery is connected to the charger. The sparking by connecting the charging cable to the battery terminal can cause an explosion to the explosive gases coming out from the battery cells.

CAUTION:

Always charge the battery when the electrolyte is poured into the battery for the first time. Otherwise, the battery can cause the lowering of performance earlier.

3. Inspect:

- Specific gravity of the electrolyte
Out of specification → Recharge.

	Specific gravity at 20°C (68°F): 1.28
---	--

NOTE:

Replace the battery if there are differences of 0.025 or more on the specific gravity of each cell's electrolyte after recharging.

4. Install:

- Filler caps

CAUTION:

Rinse off any electrolyte from the battery case and wipe the battery dry prior to installation.

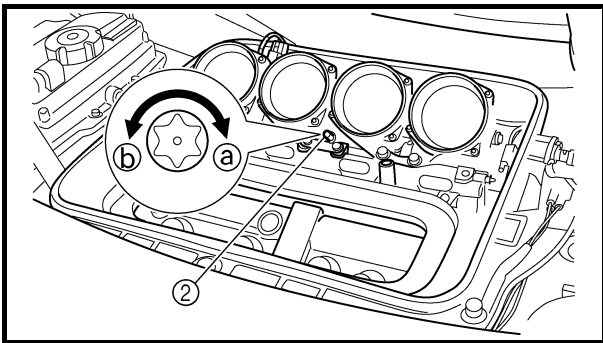
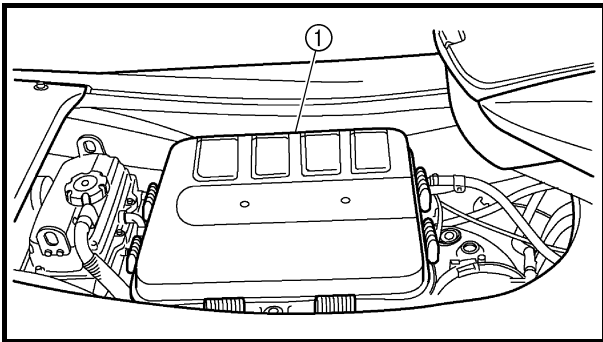
TROLLING SPEED

1. Measure:

- Trolling speed
Out of specification → Adjust.


	Trolling speed: 1,700 ± 100 r/min
---	--

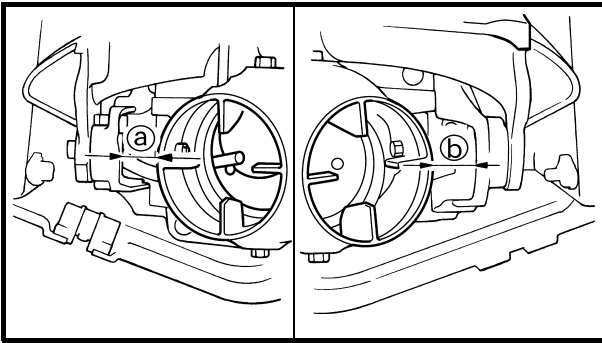
Checking steps: (Watercraft on water)
<ul style="list-style-type: none"> • Start the engine and allow it to warm up for a 15 minutes. • Check the engine trolling speed using the tachometer of the multifunction meter or using the Yamaha Diagnostic System.



2. Adjust:

- Trolling speed

Adjustment steps:	
<ul style="list-style-type: none"> • Remove the air filter case cover ①. • Start the engine. • Turn the throttle stop screw ② in or out until the specified speed is obtained. 	
Turn in (a)	Increase trolling speed.
Turn out (b)	Decrease trolling speed.
<ul style="list-style-type: none"> • Install the air filter case cover. 	
	Air filter case cover screw: 2.5 N • m (0.25 kgf • m, 1.8 ft • lb) LOCTITE® 572



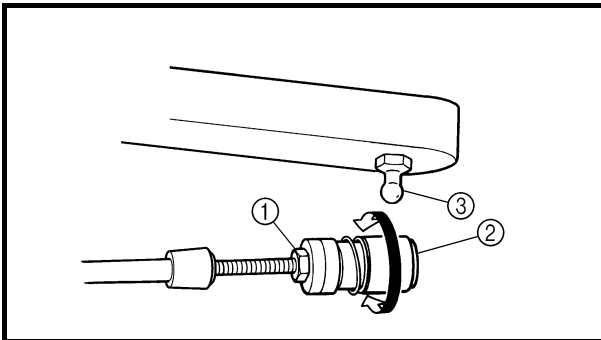
STEERING CABLE

1. Check:

- Jet thrust nozzle clearance ①, ②
Difference → Adjust.

Checking steps:

- Set the control grip in the neutral position.
- Turn the handlebar lock to lock.
- Measure the clearances ① and ②.
- If ① and ② clearances are not even, adjust the cable joint.

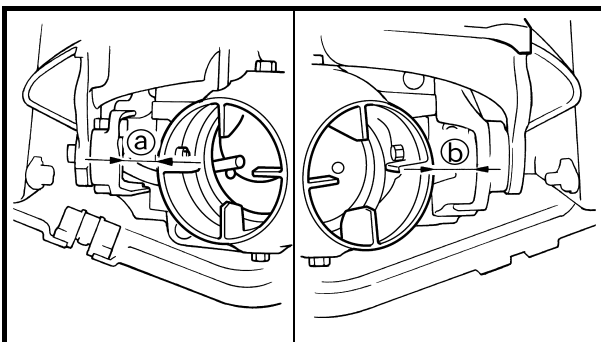


2. Adjust:

- Steering cable joint (handle end)

Adjustment steps:

- Set the control grip in the neutral position.
- Loosen the locknut ①.
- Disconnect the cable joint ② from the ball joint ③.
- Turn the cable joint ② in or out for adjusting clearances ① and ②.



Turn in	Clearance ① is increased.
---------	---------------------------

Turn out	Clearance ② is increased.
----------	---------------------------

⚠ WARNING

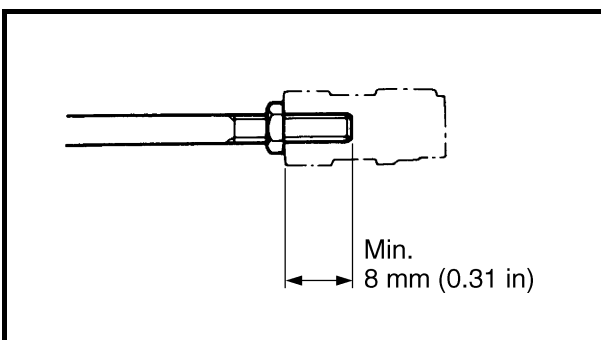
The cable joint must be screwed in more than 8 mm (0.31 in).

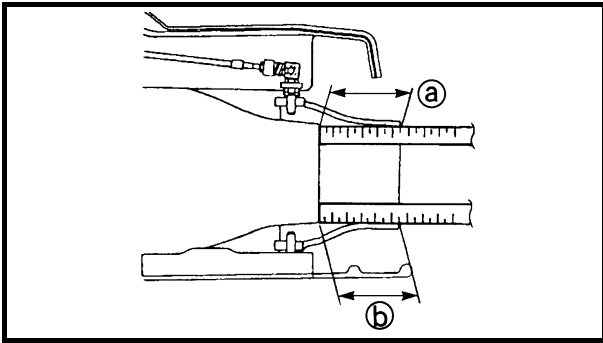
- Connect the cable joint and tighten the locknut.



Locknut:

6.4 N • m (0.64 kgf • m, 4.6 ft • lb)





QSTS CABLE

1. Measure:

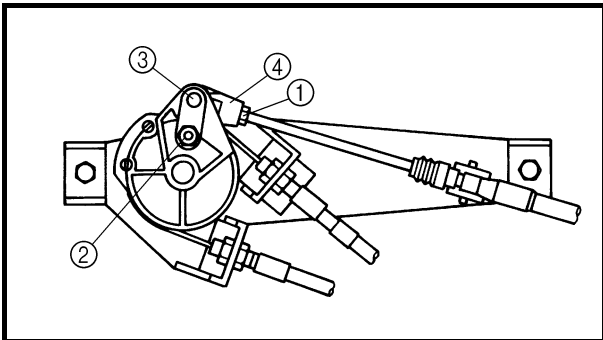
- Jet thrust nozzle set length (a), (b)
Difference → Adjust.

Measurement steps:

- Set the control grip in the neutral position.
- Set the jet thrust nozzle in the center position.
- Measure the jet thrust nozzle set length (a) and (b).
- If (a) and (b) lengths are not even, adjust the cable joint.

2. Adjust:

- QSTS cable



Adjustment steps:

- Set the control grip in the neutral position.
- Loosen the locknut (1).
- Remove the nut (2) and pivot pin (3).
- Set the jet thrust nozzle in the center position.
- Turn the cable joint (4) in or out for adjusting lengths (a) and (b).

Turn in	Length (b) is increased.
---------	--------------------------

Turn out	Length (a) is increased.
----------	--------------------------

⚠ WARNING

The cable joint must be screwed in more than 8 mm (0.31 in).

- Connect the cable joint (4) and pivot pin (3) and tighten the nut (2).

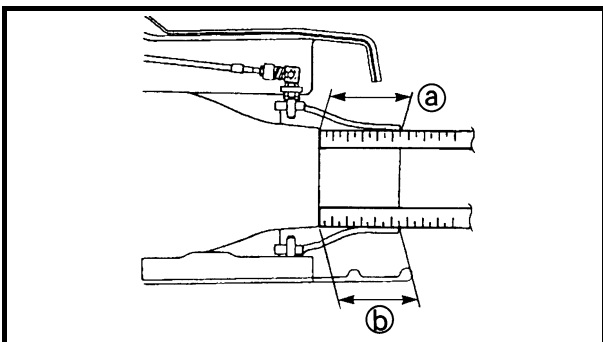


Nut:
3.8 N • m (0.38 kgf • m, 2.7 ft • lb)

- Tighten the locknut (1).

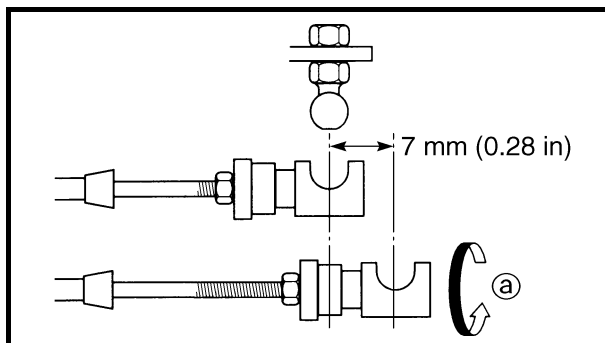
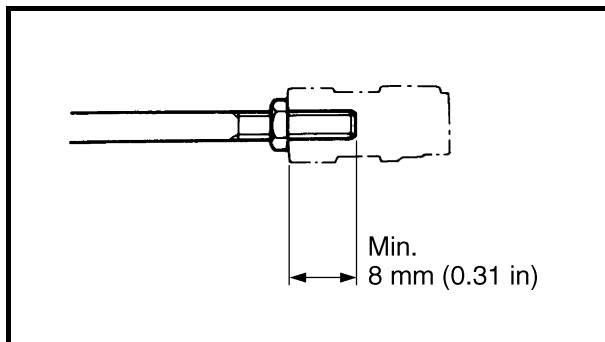
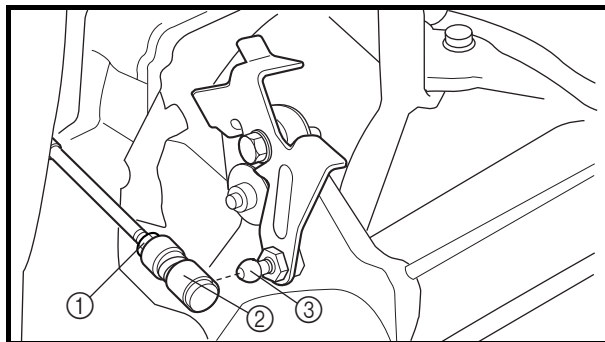
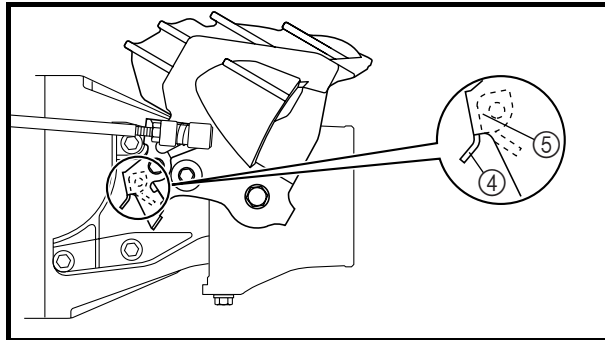
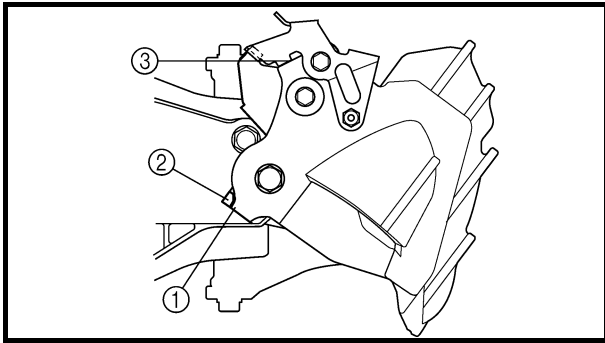


Locknut:
3 N • m (0.3 kgf • m, 2.2 ft • lb)



NOTE:

If the QSTS cable cannot be properly adjusted by the cable joint at the QSTS converter end, adjust the cable joint at the jet pump end so that the same lengths are obtained.



SHIFT CABLE

1. Check:

- Reverse gate stopper lever position
Incorrect → Adjust.

Checking steps:

- Set the shift lever to the reverse position.
- Check that the reverse gate ① contacts the stopper ② on the bracket and the lever ③ contacts the reverse gate.
- Set the shift lever to the forward position.
- Check that the lever ④ has been shifted over the bracket ⑤.

2. Adjust:

- Shift cable joint

Adjustment steps:

- Loosen the locknut ①.
- Disconnect the cable joint ② from the ball joint ③.
- Situate the reverse gate to the stopper on the bracket and the lever to the reverse gate.
- Turn the cable joint to align it with the ball joint.

Turn in	Shortens.
Turn out	Lengthens.

- Turn out the cable joint nine times (a) to extend cable 7 mm (0.28 in) from the aligned position.

⚠ WARNING

The cable joint must be screwed in more than 8 mm (0.31 in).

- Connect the cable joint and tighten the locknut.



Locknut:

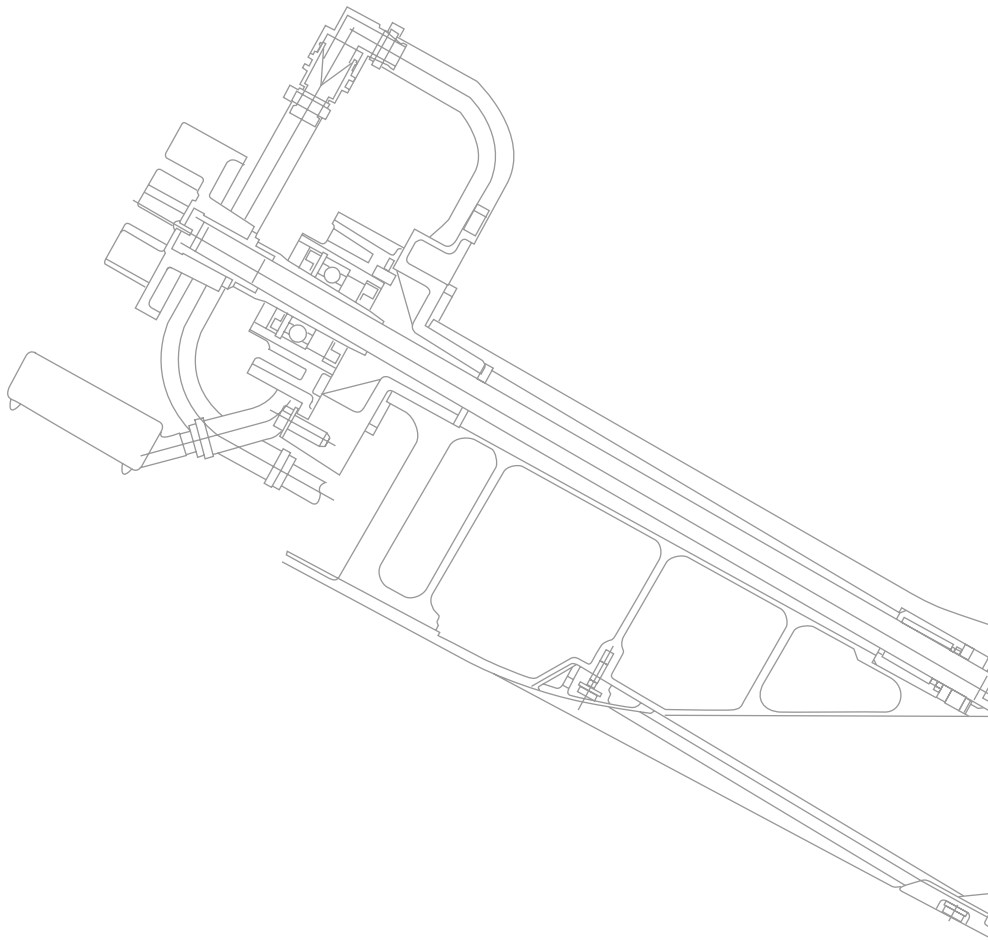
2.9 N • m (0.29 kgf • m, 2.1 ft • lb)

**APPENDICES
SERVICE DATA**

Item	Unit	FX140
Trolling speed:	r/min	1,700 ± 100
Spark plug: Type Gap	mm (in)	CR9EB 0.7–0.8 (0.028–0.031)
Fuel and oil: Fuel		Regular unleaded gasoline with a minimum octane rating of 86 (PON ^{*1}) or 90 (RON ^{*2})
Engine oil		SAE 10W-30 API SE, SF, SG, SH, SJ
Fuel tank capacity	L (US gal, Imp gal)	70 (18.5, 15.4)
Engine oil quantity Total amount	L (US qt, Imp qt)	4.3 (4.5, 3.8)
(without oil filter replacement)	L (US qt, Imp qt)	2.0 (2.1, 1.8)
(with oil filter replacement)	L (US qt, Imp qt)	2.2 (2.3, 1.9)

*1: Pump Octane Number = (Motor Octane Number + Research Octane Number)/2

*2: Research Octane Number



Printed in USA
Feb. 2002 – × 1 CR
F1B-28107-1E-11
(FX1000-A)
(E)

Printed on recycled paper

