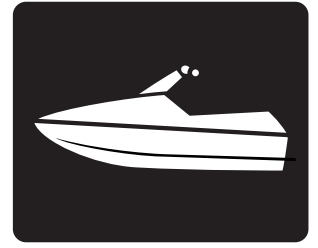




YAMAHA



**WaveRunner
VX110 Sport
VX110 Deluxe**

ASSEMBLY MANUAL



LIT-18666-00-36

F1K-28107-1G-11

**WaveRunner
VX110 Sport/VX110 Deluxe
ASSEMBLY MANUAL
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P/N LIT-18666-00-36**

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

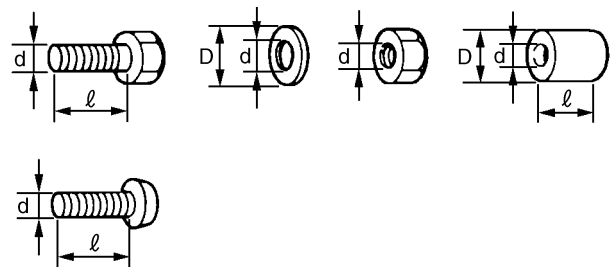
In order to simplify descriptions in assembly manuals, the following symbols are used:

-  : 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 242 (blue)

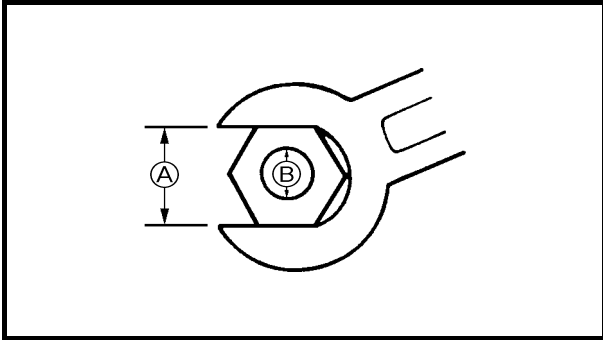
Size:

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

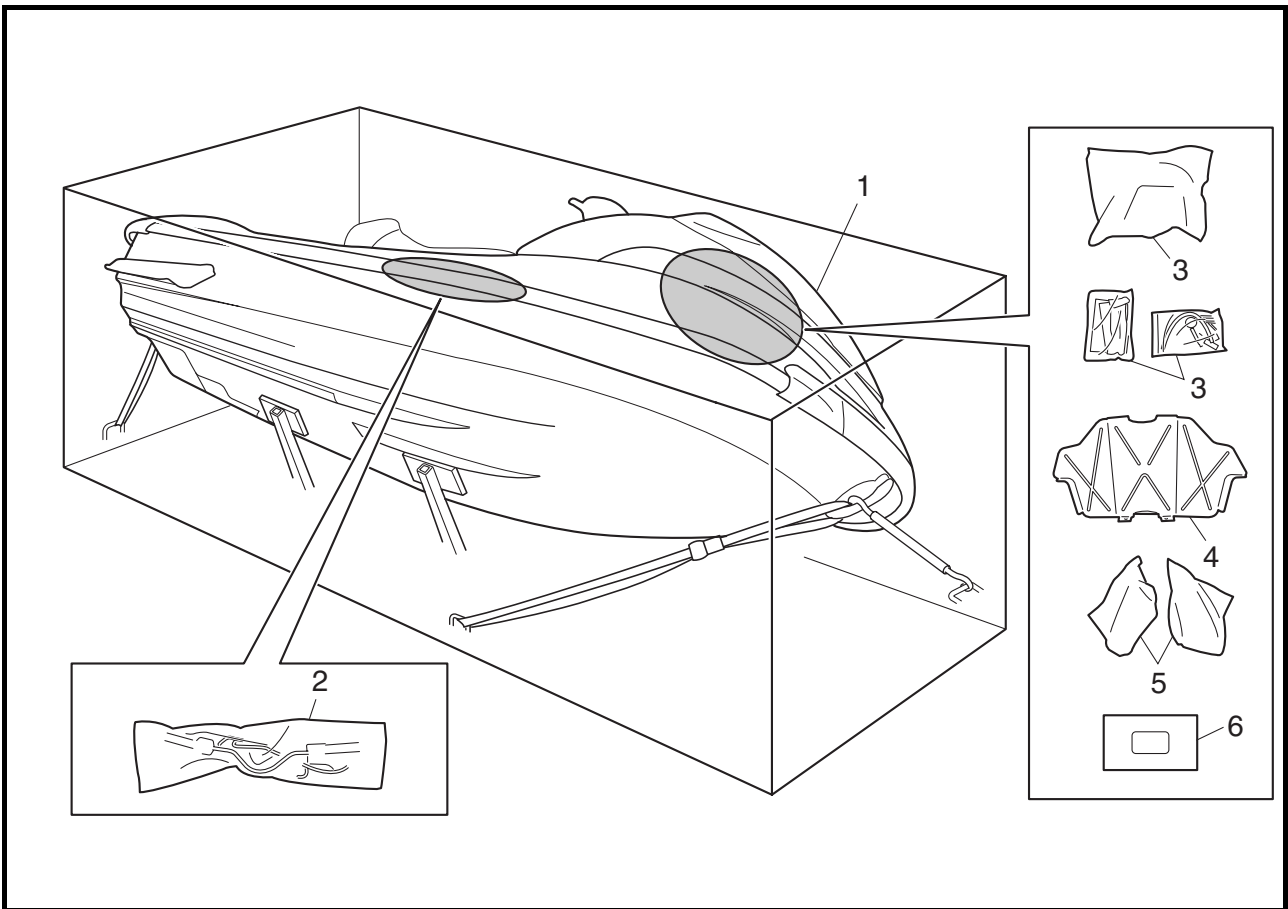
Carefully uncrate unit and inventory any missing or damaged parts.

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.

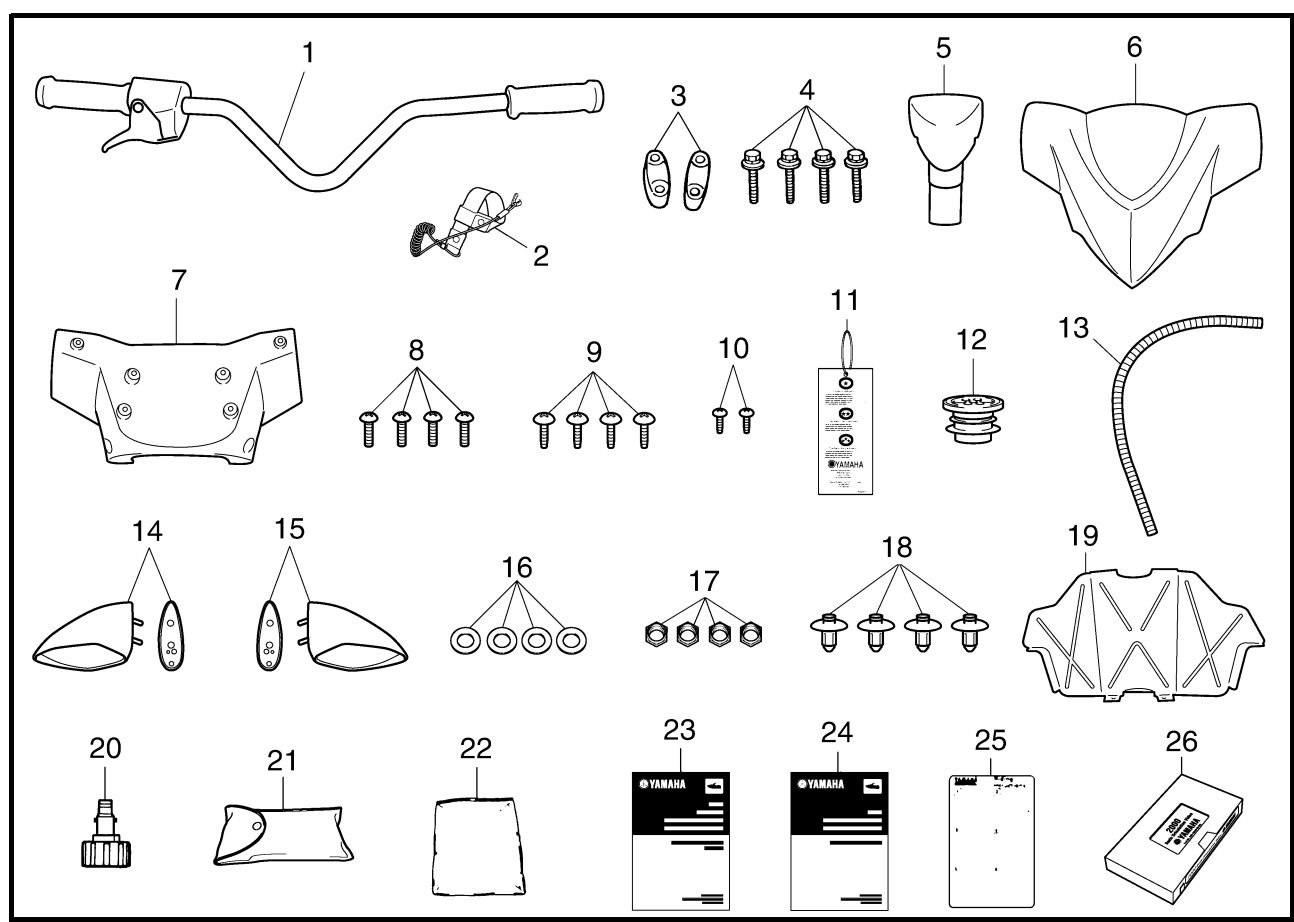
COMPARTMENT DIAGRAM



COMPARTMENT PART CHART

No.	Part name	Q'ty	Remarks
1	Watercraft body	1	
2	Handlebar assembly	1	
3	Vinyl bag	3	
4	Bow locker plate	1	
5	Mirror	2	
6	Basic orientation video	1	

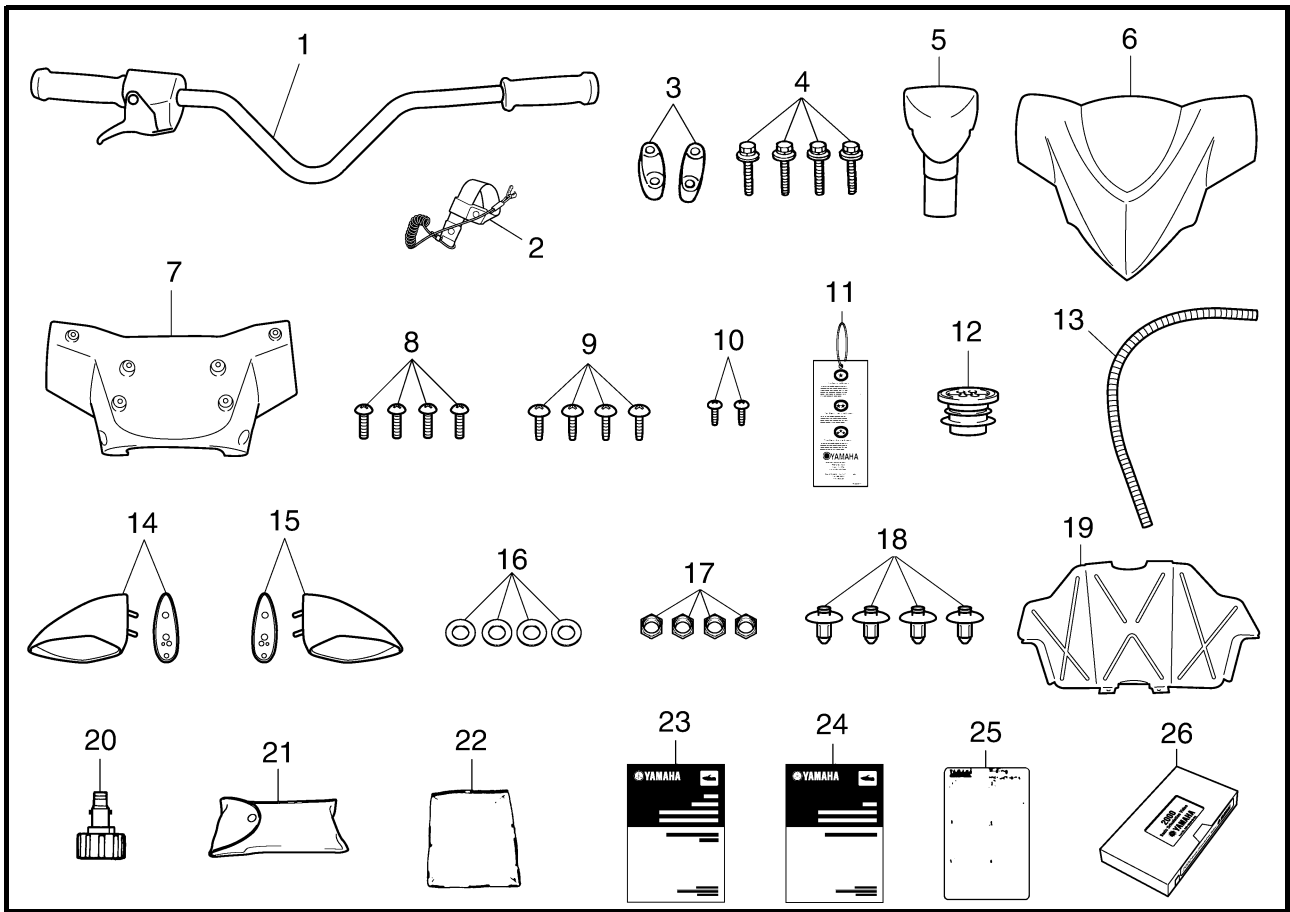
COMPARTMENT DIAGRAM



COMPARTMENT PART CHART

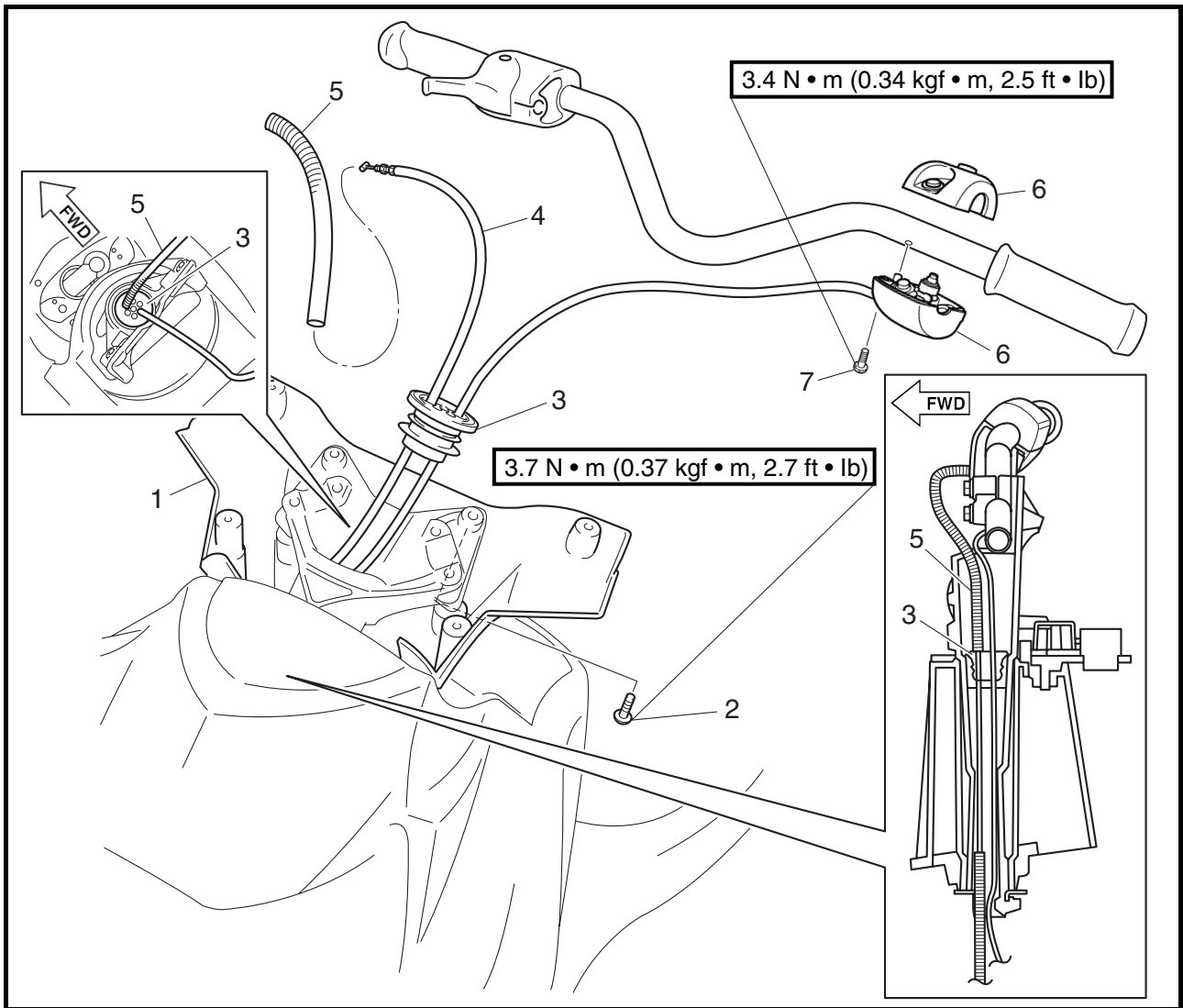
No.	Part name	Q'ty	Part number
1	Handlebar assembly	1	F1K-U155A-00
2	Engine shut-off cord	1	EW2-68348-00
3	Upper handlebar holder	2	EU0-23814-30
4	Bolt 8 × 48 mm (0.31 × 1.89 in)	4	90119-089UU
5	Pad	1	F1K-U142D-00
6	Upper handlebar cover	1	F1K-U143D-01
7	Lower handlebar cover	1	F1K-U143E-00
8	Screw 6 × 13 mm (0.24 × 0.51 in)	4	90154-06017
9	Screw 5 × 15 mm (0.20 × 0.59 in)	4	90149-05903
10	Screw 4 × 9 mm (0.16 × 0.35 in)	2	90157-04003
11	Star label tag ^{*1}	1	F1B-U410M-00
12	Grommet	1	F0M-61469-00
13	Corrugated tube	1	F0D-6773E-00
14	Left mirror (with seal)	1	F1S-U596B-10
15	Right mirror (with seal)	1	F1S-U596C-10

*1: For California



No.	Part name	Q'ty	Part number
16	Washer 18 × 8 mm (0.71 × 0.31 in)	4	9299R-08200
17	Nut 8 mm (0.31 in)	4	9572R-08300
18	Rivet	4	90269-08801
19	Storage compartment panel	1	F1K-U475F-01
20	Flushing hose connector	1	67X-E2590-00
21	Tool kit	1	F1B-65986-00
22	Vinyl bag	1	EU0-65901-01
23	Owner's/Operator's manual	1	F1K-F8199-10
24	Riding practice guide	1	F1K-F819T-10
25	Riding instruction card	1	FN8-U595B-04
26	Basic orientation video	1	F0D-U595A-01

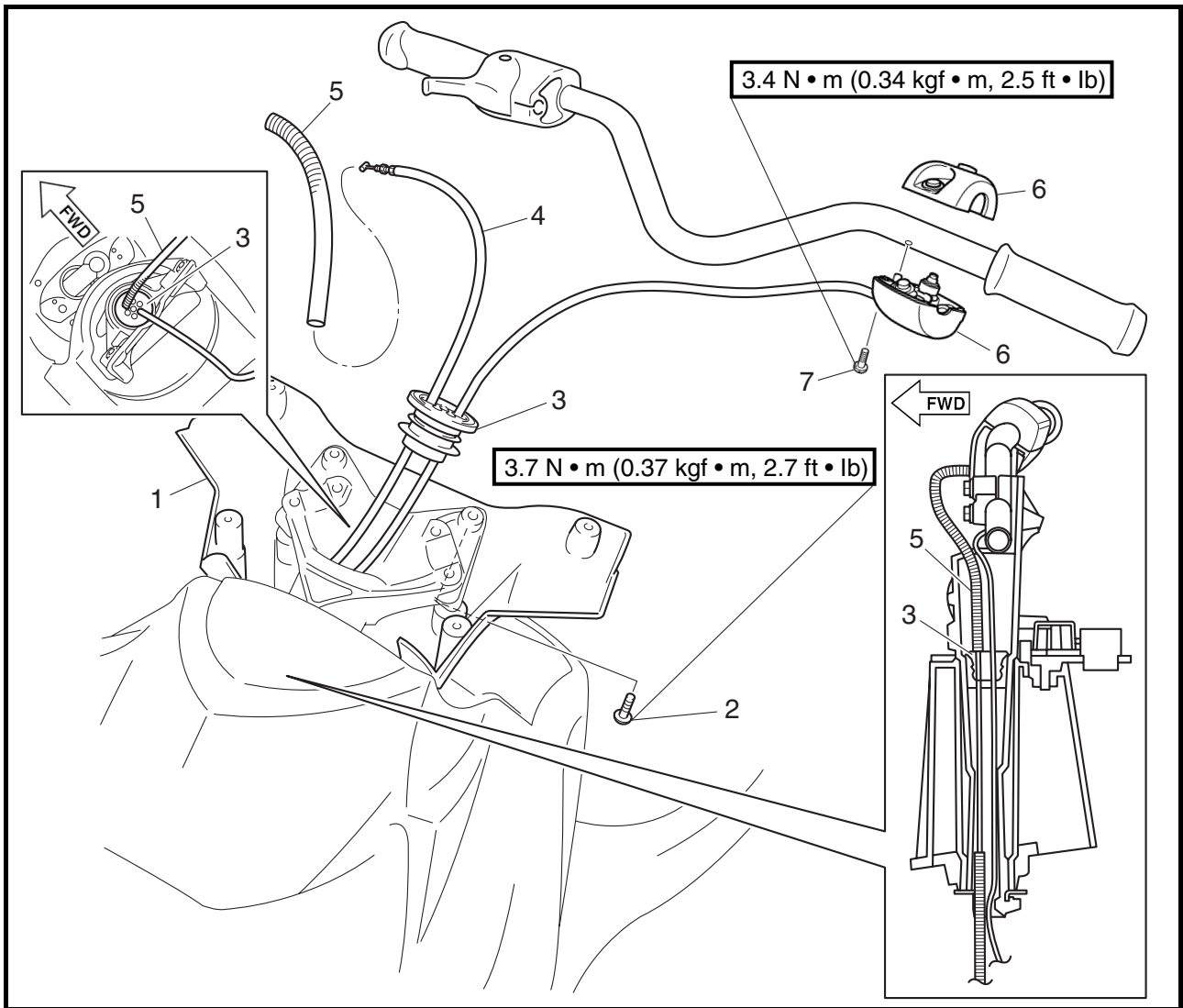
THROTTLE CABLE INSTALLATION EXPLODED DIAGRAM



INSTALLATION CHART

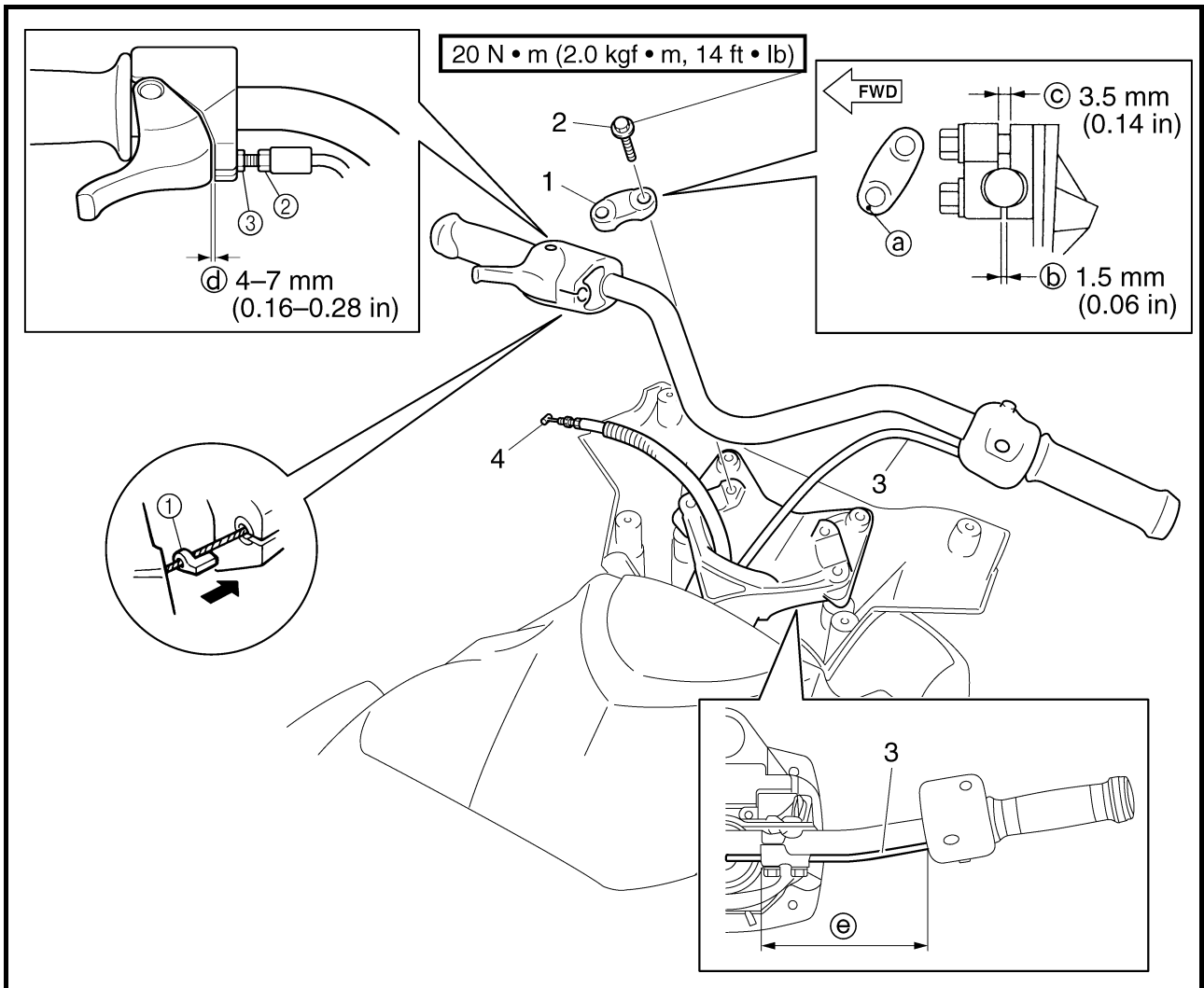
Step	Procedure/Part name	Q'ty	Service points
THROTTLE CABLE INSTALLATION			
1	Lower handlebar cover	1	Follow "Step" order for installation.
2	Screw 6 × 13 mm (0.24 × 0.51 in)	4	
3	Grommet	1	
			NOTE: Pass the throttle cable and handlebar switch lead through the grommet, and then fit the grommet into the steering column.

EXPLODED DIAGRAM



Step	Procedure/Part name	Q'ty	Service points
4	Throttle cable	1	NOTE: _____ Align the handlebar switch projection with the hole on the handlebar. _____
5	Corrugated tube	1	
6	Handlebar switch	1	
7	Screw 5 × 25 mm (0.20 × 0.98 in)	2	

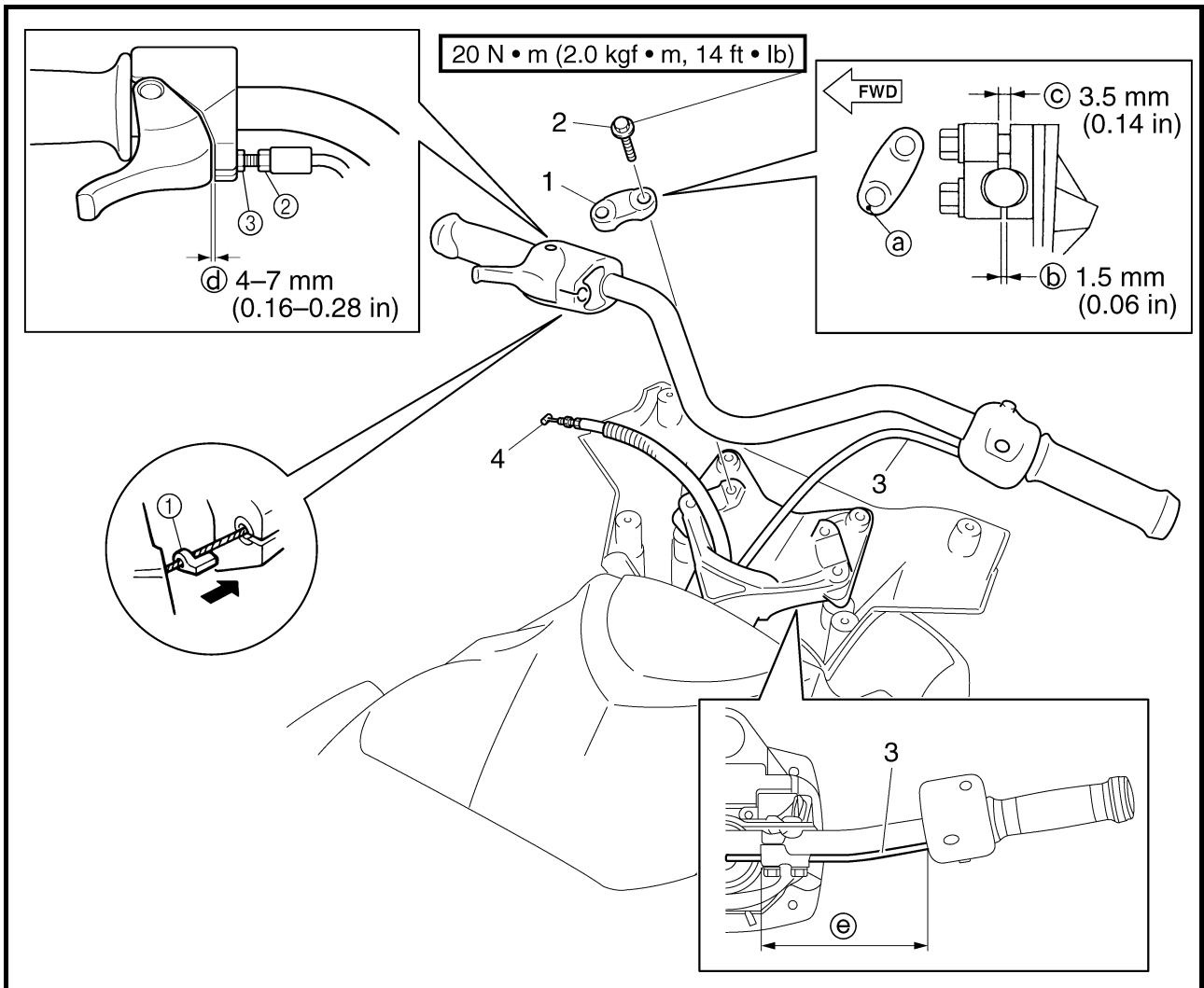
HANDLEBAR INSTALLATION EXPLODED DIAGRAM



INSTALLATION CHART

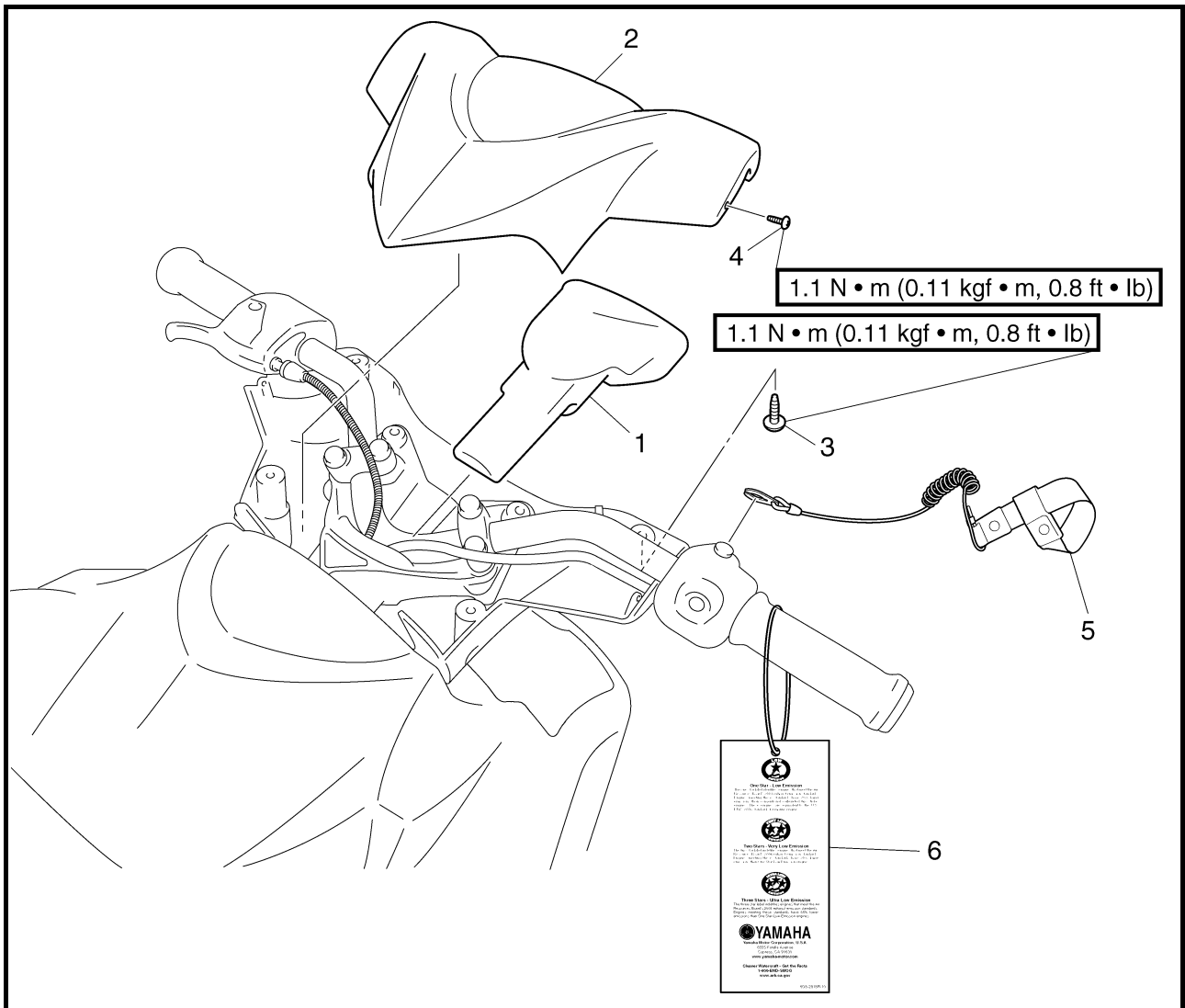
Step	Procedure/Part name	Q'ty	Service points
1	HANDLEBAR INSTALLATION Upper handlebar holder	2	Follow "Step" order for installation. NOTE: _____ The upper handlebar holder should be installed with the punched mark ① forward.
2	Bolt 8 × 48 mm (0.31 × 1.89 in)	4	NOTE: _____ Tighten the bolts so that the front clearance ② of the upper handlebar holder is smaller than the rear clearance ③. Reference clearance: ②: 1.5 mm (0.06 in) ③: 3.5 mm (0.14 in)
3	Handlebar switch lead	1	NOTE: _____ Be sure to leave some slack in the handlebar switch lead in the area ④ shown in the illustration.

EXPLODED DIAGRAM



Step	Procedure/Part name	Q'ty	Service points				
4	Throttle cable	1	<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. <p>Throttle lever free play ④: 4–7 mm (0.16–0.28 in)</p> <table border="1"> <tr> <td>Turn in</td> <td>Free play is increased.</td> </tr> <tr> <td>Turn out</td> <td>Free play is decreased.</td> </tr> </table> <ul 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

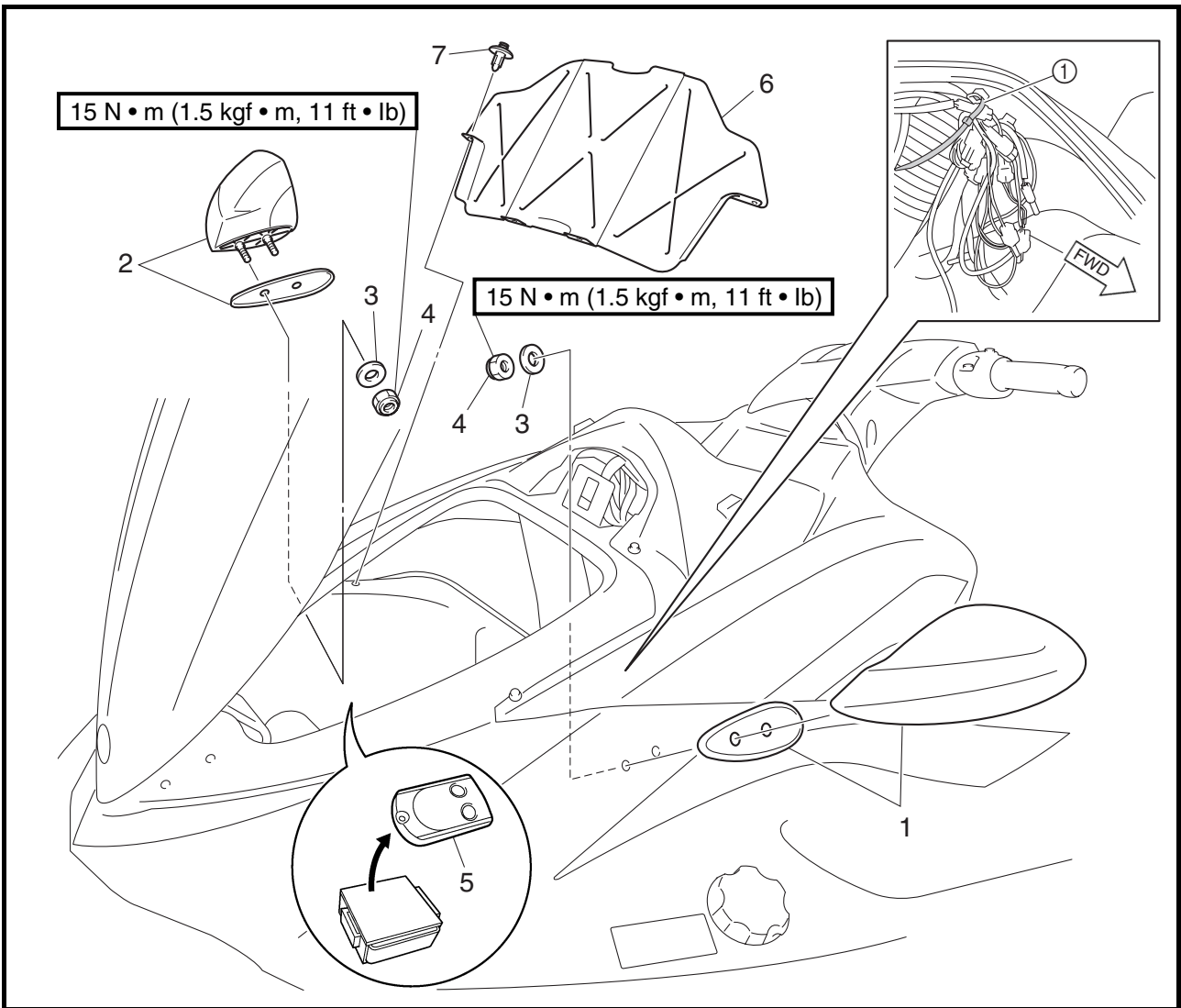


INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	STEERING PAD INSTALLATION		Follow "Step" order for installation.
1	Pad	1	
2	Upper handlebar cover	1	
3	Screw 5 × 15 mm (0.20 × 0.59 in)	4	
4	Screw 4 × 9 mm (0.16 × 0.35 in)	2	
5	Engine shut-off cord	1	
6	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

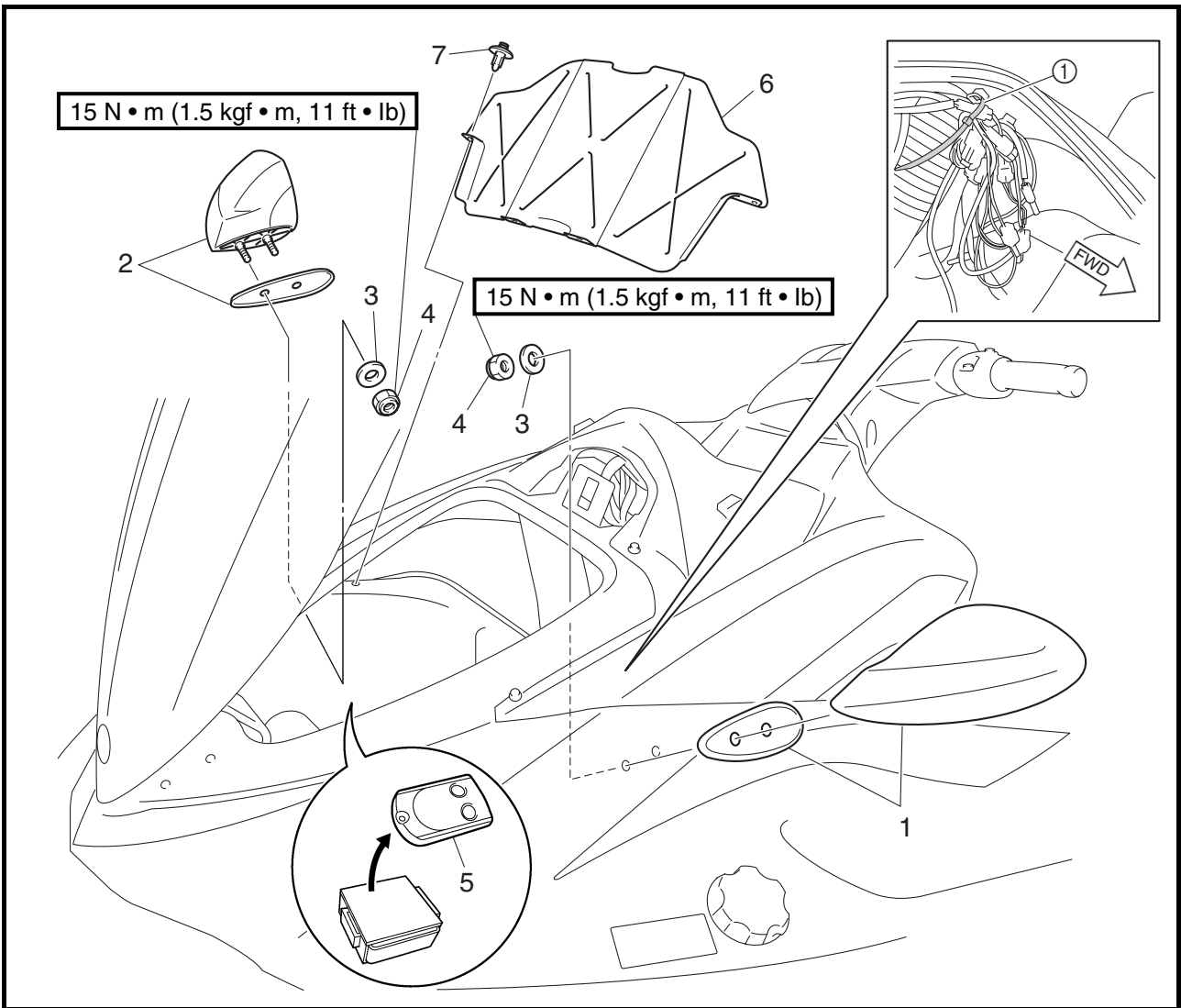
REAR VIEW MIRROR INSTALLATION EXPLODED DIAGRAM



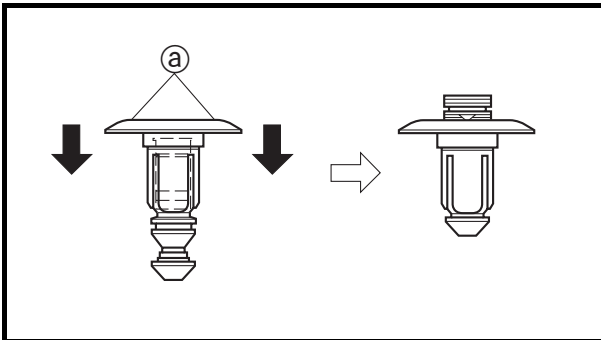
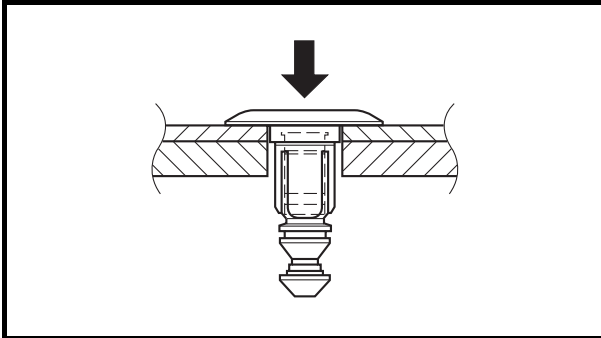
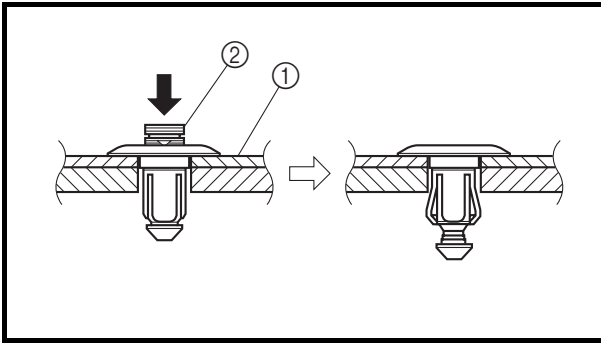
INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	REAR VIEW MIRROR INSTALLATION		Follow "Step" order for installation.
1	Left mirror (with seal)	1	NOTE: <ul style="list-style-type: none"> Remove the remote control transmitters (in the vinyl bag). Place the remote control transmitters in the glove compartment. Give the remote control transmitters to the customer at time of delivery.
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	Remote control transmitter (Deluxe model only)	2	

EXPLODED DIAGRAM



Step	Procedure/Part name	Q'ty	Service points
6	Storage compartment panel	1	NOTE: _____ Before installing the storage compartment panel, fasten the buzzer lead, steering sensor lead, start switch lead, engine shut-off switch lead, and multifunction meter lead with a plastic tie ①. _____
7	Rivet	4	



SERVICE POINTS

RIVET INSTALLATION

1. Install:

- Rivets

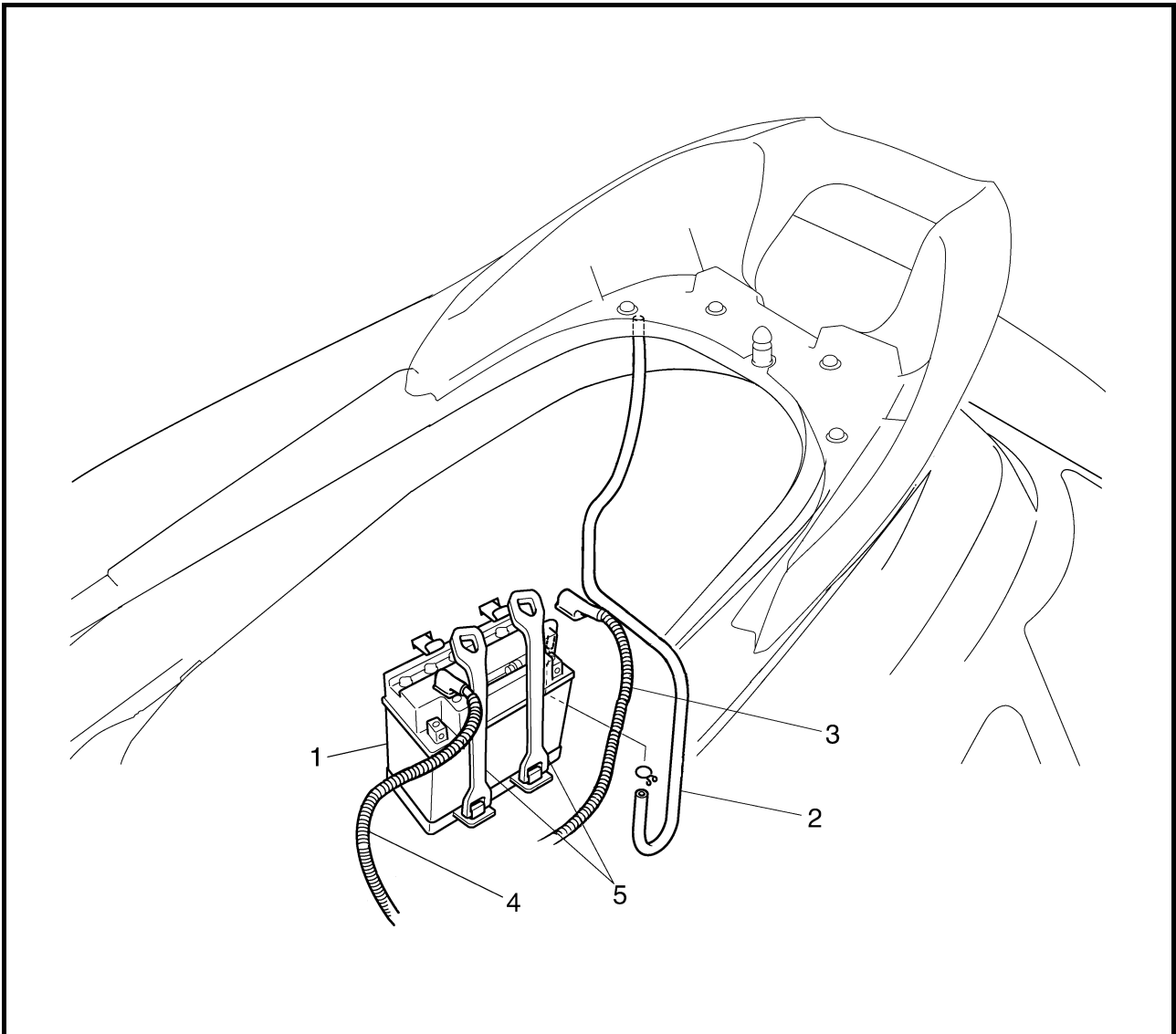
Installing steps:

- Insert a rivet completely in the holes in both the storage compartment panel ① and inner hull.
- Push in the rivet pin ② until it clicks and is flush with the top of the rivet.

NOTE:

- To remove a rivet, push the rivet pin in until it clicks and is below the top of the rivet.
- Before reinstalling a rivet, hold the rivet flange ③ with both hands and push the rivet pin perpendicularly against a hard flat surface until the pin protrudes from the top of the rivet.

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	1	
		2	

PREDELIVERY CHECK CHECKING CHART

Check elements	Checking points	Reference page
Throttle lever	Free play	7
Oil tank	Engine oil	13
Battery	Battery condition	16
Steering system	Handlebar and jet thrust nozzle horizontal positions	18
Shift system (Deluxe model only)	Reverse gate position	19

OIL TANK

1. Check:

- Engine oil level



Recommended oil:

**SAE 10W-30, 20W-40, 20W-50
API SE, SF, SG, SH, SJ, SL**

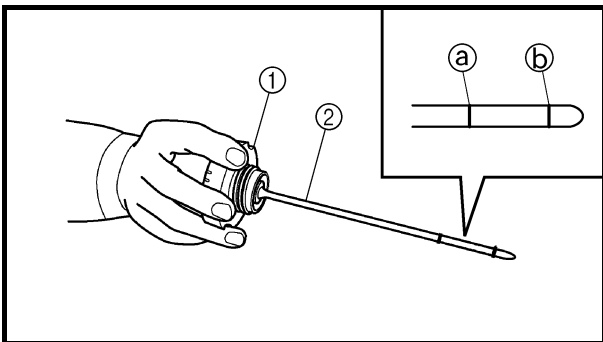
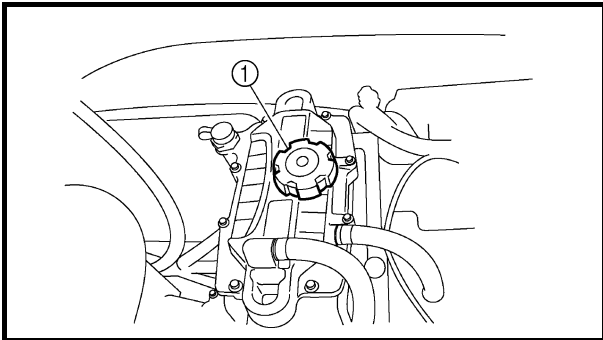
NOTE:

The engine was filled with the correct amount of oil at the factory.

Checking steps:

CAUTION:

- When checking the engine oil level on water, be careful of other watercraft, boats, swimmers, or obstacles. The water current or wind can cause the watercraft to move and lead to a collision.
- When checking the engine oil level on land, supply water to the cooling water passages.



- Make sure that engine has enough oil but do not overfill. If there is too little oil, the engine can be damaged. If there is too much oil, the air filter can become saturated with oil, permanently damaging the filter and reducing engine performance. Follow the checking procedure carefully.
- Make sure that debris or water does not enter the oil tank filler hole. Debris or water in the engine oil can cause serious engine damage.

- Place the watercraft in a horizontal position or launch the watercraft.
- Remove the 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.
- Start the engine.

CAUTION: _____

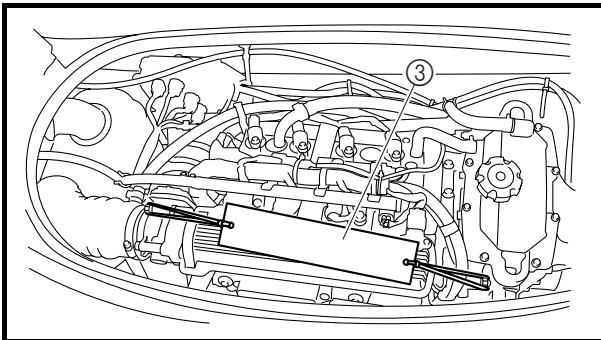
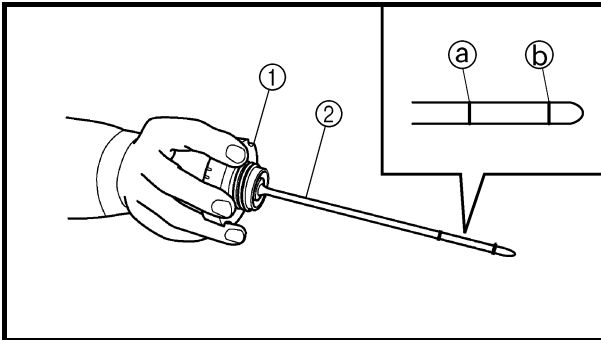
When starting the engine make sure the dipstick is securely fitted into the oil tank.

NOTE: _____

- The engine cannot be started if the Yamaha Security System is in the lock mode.
- For information on the Yamaha Security System, see the owner's manual.
- Run the engine at trolling speed for 6 minutes or more, 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 20 °C (68 °F) or less, warm up the engine for an additional 5 minutes.

- Remove the oil filler cap ①, wipe the dipstick ② clean, and then screw the filler cap into the filler hole completely.
- Remove the filler cap again to check the oil level is between the minimum level mark ① and maximum level mark ② on the dipstick.
- 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 intake manifold after checking the engine oil level.

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.

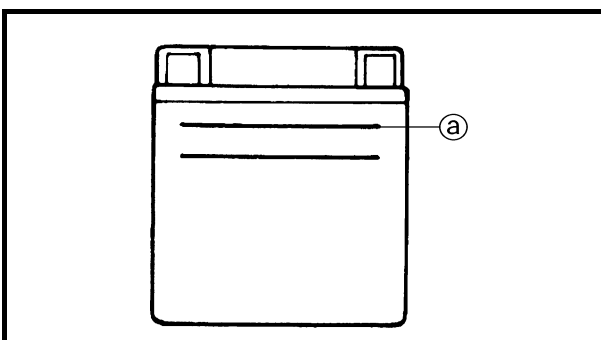
When checking the battery, make sure the breather hose is connected to the battery and not obstructed.

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:

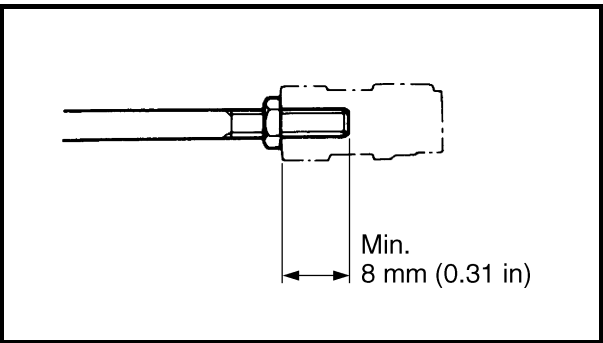
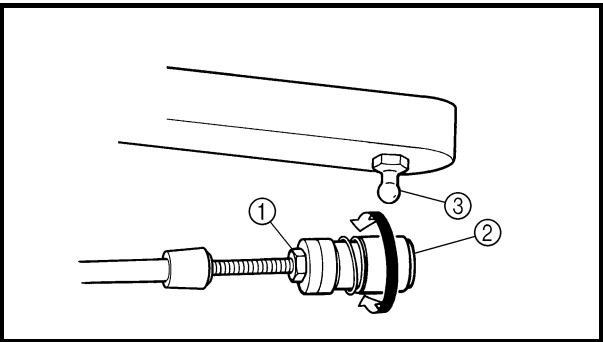
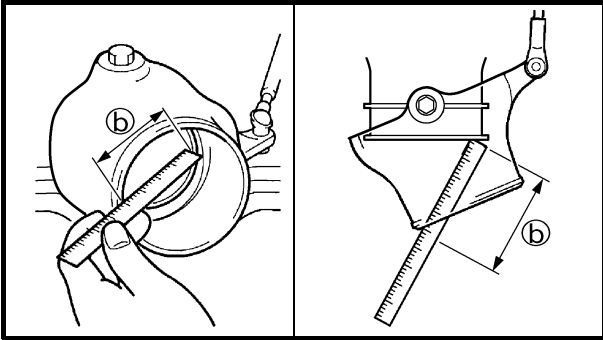
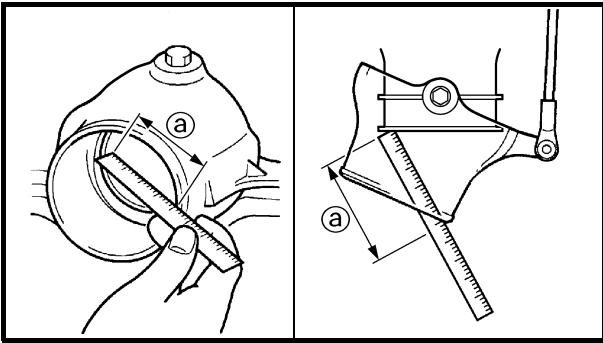
Replace the battery if there are differences of 0.025 or more on the specific gravity of each cell's electrolyte after recharging.

4. Install:

- Filler caps

CAUTION:

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



STEERING CABLE

1. Check:

- Distance ①, ②
- Out of specification → Adjust.

**Difference of distances ① and ②:
Maximum 5 mm (0.2 in)**

Checking steps:

- Set the control grip in the neutral position.
- Turn the handlebar lock to lock.
- Measure the distances ① and ②.
- If the difference of distances ① and ② is not within specification, adjust the cable joint.

2. Adjust:

- Steering cable joint (steering column 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 in or out for adjusting the distances ① and ②.

Turn in	Distance ① is increased.
Turn out	Distance ② is increased.

⚠ WARNING

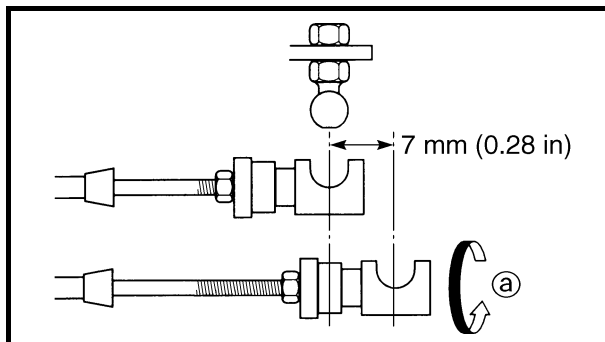
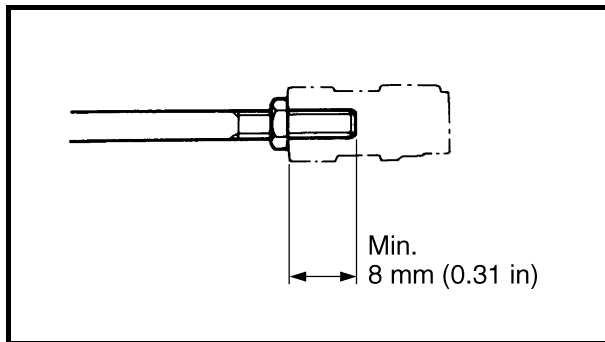
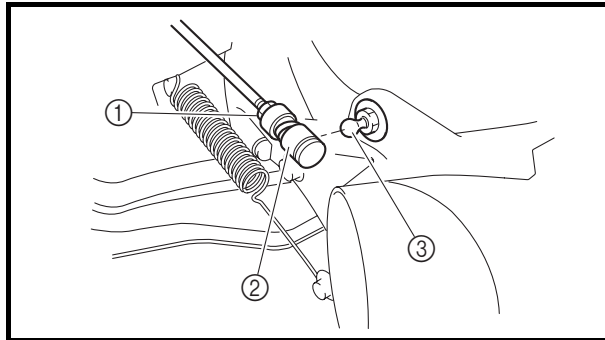
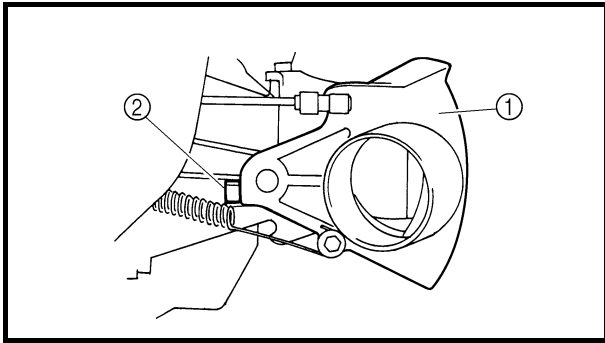
The cable joint must be screwed in more than 8 mm (0.31 in).

- Connect the cable joint and tighten the locknut.

Locknut:
6.5 N • m (0.65 kgf • m, 4.7 ft • lb)

NOTE:

If the steering cable cannot be properly adjusted by the cable joint at the handle end, adjust the cable joint at the jet pump end so that the specified distance is obtained.



SHIFT CABLE (Deluxe model only)

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.

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 ① 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:
3.8 N • m (0.38 kgf • m, 2.7 ft • lb)

**APPENDICES
SERVICE DATA**

Item	Unit	VX110 Sport/VX110 Deluxe
Trolling speed:	r/min	1,550–1,750
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, 20W-40, 20W-50 API SE, SF, SG, SH, SJ, SL
Fuel tank capacity	L (US gal, Imp gal)	60 (15.9, 13.2)
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



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