

SUZUKI OUTBOARD MOTOR

SET-UP MANUAL

DF115BG **DF140BG**

Applicable model and effective serial number:

11505F (DF115BG) -140001 and later

11505Z (DF115BZG)-140001 and later

14004F (DF140BG) -140001 and later

14004Z (DF140BZG)-140001 and later

99505-99L00-01E

FOREWORD

This outboard motor has been designed and produced utilizing Suzuki's most modern technology. The finest product, however, cannot perform properly unless it is correctly assembled and serviced. This set-up manual has been produced to aid you in properly assembling and servicing this outboard motor.

NOTE:

This set-up manual has been prepared exclusively for the following models.

Applicable model and effective serial number:

11505F (DF115BG) -140001 and later

11505Z (DF115BZG)-140001 and later

14004F (DF140BG) -140001 and later

14004Z (DF140BZG)-140001 and later

- * This manual has been prepared on the basis of the latest specifications at the time of publication. If modifications have been made since then, differences may exist between the content of this manual and the actual outboard motor.
- * Illustrations in this manual are used to show the basic principles of operation and work procedures and may not represent the actual outboard motor exactly in detail.
- * This manual is intended for those who have enough knowledge and skills to service SUZUKI outboard motors. Without such knowledge and skills, you should not attempt servicing by relying on this manual only. Instead, please contact your nearby authorized SUZUKI outboard motor dealer.

⚠ WARNING

Apprentice mechanics or do-it-yourself mechanics that don't have the proper tools and equipment may not be able to properly perform the services described in this manual. Improper assembly and/or servicing may result in injury to the mechanic and may render the engine unsafe for the boat operator and passengers.

⚠ WARNING

Improper electronic calibration of the system will make this product and/or the system inoperable or unsafe for use.

Electronic calibration is required before use. After installation of this product, the Suzuki Precision Control system requires electronic calibration, which should be performed only by a person who has been specifically trained in the Suzuki Precision Control system.

SUZUKI MOTOR CORPORATION

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IMPORTANT

▲ WARNING/▲ CAUTION/NOTICE/NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol ▲ and the words WARNING, CAUTION, NOTICE and NOTE have special meanings. Pay special attention to the messages highlighted by these signal words.

▲ WARNING

Indicates a potential hazard that could result in death or serious injury.

▲ CAUTION

Indicates a potential hazard that could result in minor or moderate injury.

NOTICE

Indicates a potential hazard that could result in damage to the motor or boat.





NOTE:

Indicates special information to make maintenance easier or instructions clearer.



Please note, however, that the warnings and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the outboard motor. In addition to the WARNINGS, CAUTIONS and NOTICE stated, you must use good judgement and basic mechanical safety principles.

SYMBOL

Listed in the table below are symbols indicating special instructions and other important information necessary for proper servicing. Please note the definition for each symbol. You will find these symbols used throughout this manual. Refer back to this table if you are not sure of any symbol(s) meanings.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply SUZUKI SILICONE SEAL.
	Apply SUZUKI WATER RESISTANT GREASE.		Use special tool.

MATERIALS REQUIRED

<p>WATER RESISTANT GREASE EP2</p>  <p>99000-25350 (250 g/8.8 oz)</p>	<p>SUZUKI SILICONE SEAL</p>  <p>93691-80030 (100 g/3.5 oz)</p>
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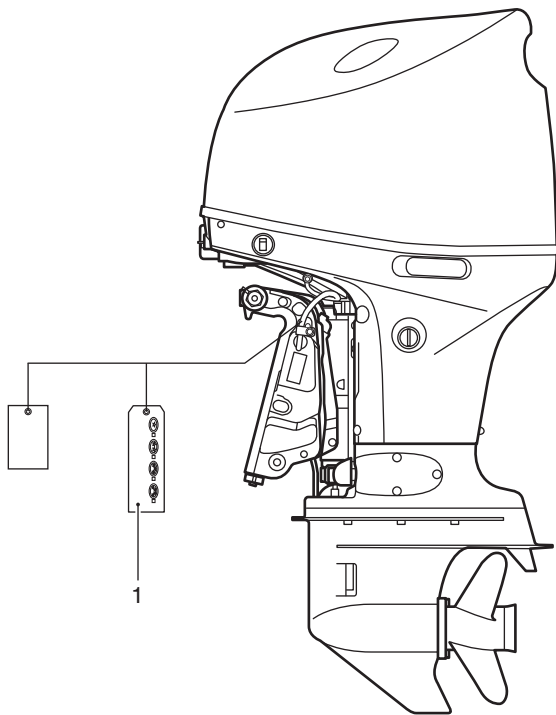
GENERAL INFORMATION

HANG TAGS

It is mandatory that every new Suzuki outboard motor be assembled and serviced in accordance with the instructions in the set-up manual.

A critical step in the set-up and pre-delivery process of every outboard motor is to attach the hang tags to the outboard motor. Hang tags are required to remain on the motor until it is delivered to the customer.

Be sure the hang tags are attached to the outboard motor as shown.



1. Tag, CARB emission

The Star Label means Cleaner Marine Engines
This engine has been certified as a:

 <input type="checkbox"/>	 <input type="checkbox"/>	 <input checked="" type="checkbox"/>	 <input type="checkbox"/>
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The Symbol for Cleaner Marine Engines:
Cleaner Air and Water - for a healthier lifestyle and environment.
Better Fuel Economy - burns up to 30 - 40 percent less gas and oil than conventional carbureted two-stroke engines, saving money and resources.
Longer Emissions Warranty - protects consumer for worry free operation.

EMISSION-RELATED INSTALLATION INSTRUCTIONS

Fuel lines and fuel tanks used for a vessel must meet the requirements of federal law (40 CFR 1045.112 and 40 CFR 1060).

If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the vessel, as described in 40 CFR 1068.105

Failing to follow these instructions when installing a certified engine in a vessel violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.

OUTBOARD MOTOR INSTALLATION

HORSEPOWER SELECTION

⚠ WARNING

Overpowering your boat may cause operating/handling difficulties which could result in a crash.

The boat may also sustain hull damage or other damage due to stress.

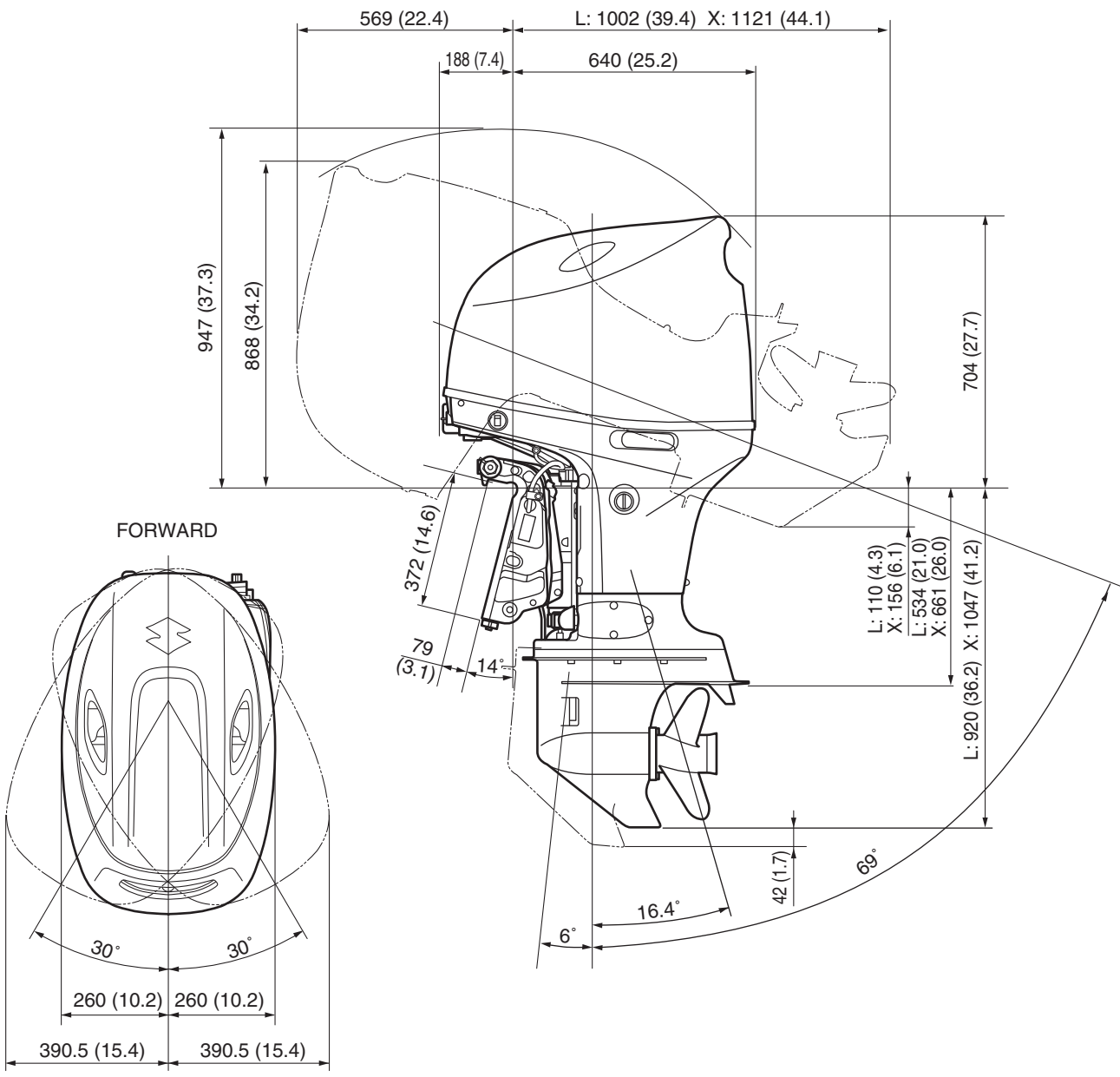
- Do not overpower your boat.
- Never install an outboard motor with horsepower exceeding the boat manufacturer's recommended maximum horsepower.

NOTE:

- *State the maximum horsepower outboard motor that can be safely used on that boat. There is severe product liability potential connected with rigging and selling a boat with an outboard motor exceeding the horsepower capacity limitation.*
- *The rig should not be underpowered, as this will not allow the performance balance you are trying to achieve. Determine the customer's needs, application and use of the perspective rig to make the best overall horsepower recommendation.*

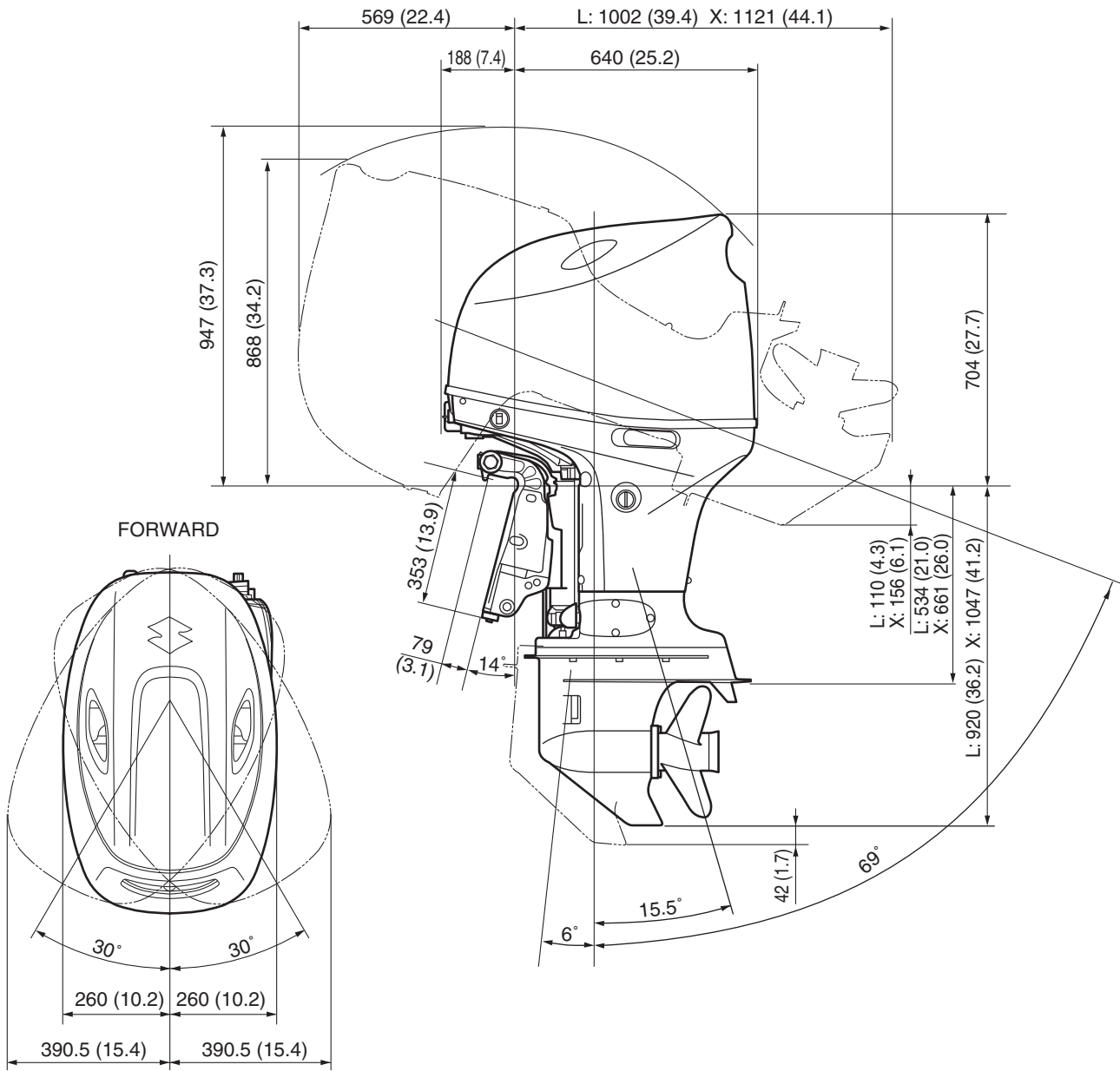
MOTOR DIMENSIONS

DF115BG/115BZG



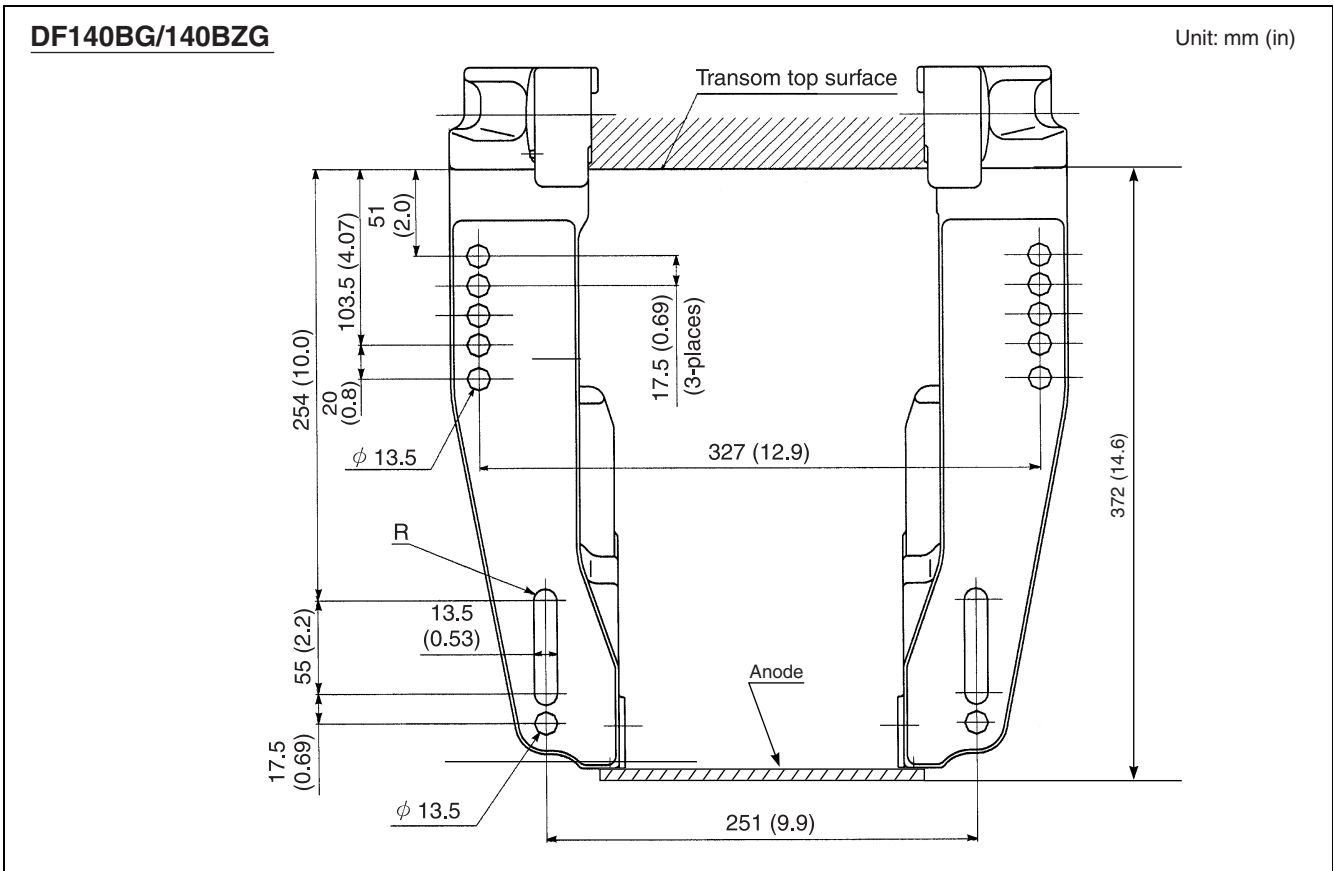
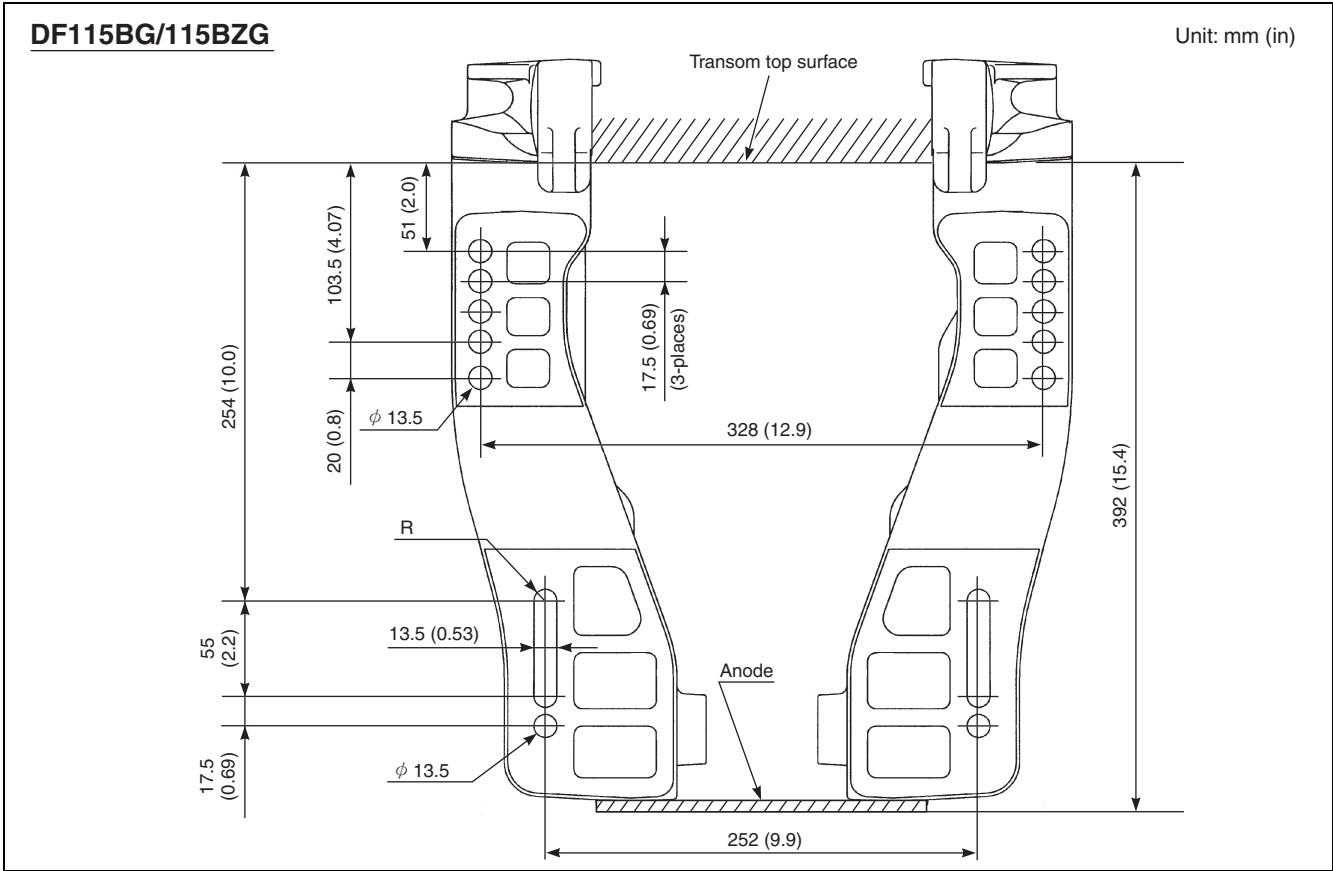
Unit : mm (in)

DF140BG/140BZG



Unit : mm (in)

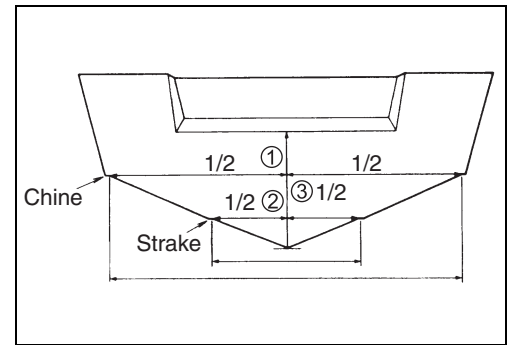
RANSOM DIMENSIONS



ESTABLISHING THE CENTER-LINE

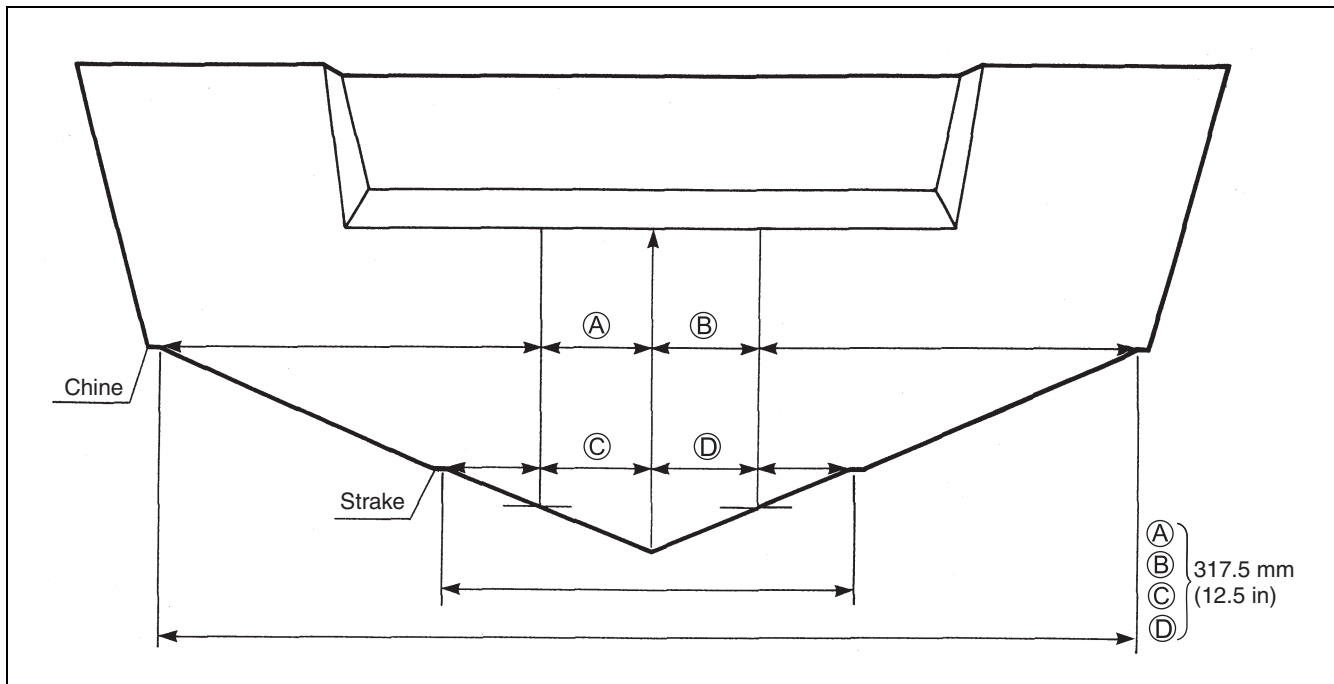
To establish the center of the transom you may use the following procedure:

- (1) Measure across the transom from chine to chine and make a mark on the transom face at $1/2$ of this measurement.
- (2) Measure across the transom from strake to strake and make a second mark on the transom face at $1/2$ of this measurement.
- (3) Align a straightedge with the marks on the transom face and draw a line. This is the vertical center-line of the transom for a single engine installation.
- (4) Drill mounting holes as in a single engine installation.



For dual engine installation you may use the following procedure: (Minimum engine center-line distance is 635 mm/25 in)

- (1) Following the horizontal line from chine to chine, mark the line at 317.5 mm (12.5 in) on both sides of the previously established single engine vertical center-line.
- (2) Following the horizontal line from strake to strake, mark this line also at 317.5 mm (12.5 in) on both sides of the vertical center-line.
- (3) Align a straightedge with these two sets of marks and draw the vertical center-line for a dual engine installation.
- (4) Drill mounting holes as in a dual engine installation.



NOTE:

Do not drill engine top mounting bolt holes higher than 25.4 mm (1 in) below top edge of actual boat transom.

LIFTING THE MOTOR

⚠ WARNING

Lifting the outboard motor using a hoist with insufficient capacity can result in serious injury and/or damage to the outboard motor.

Use a hoist which has a minimum lift capacity of at least 450 kg (1000 lbs.) when lifting the motor.

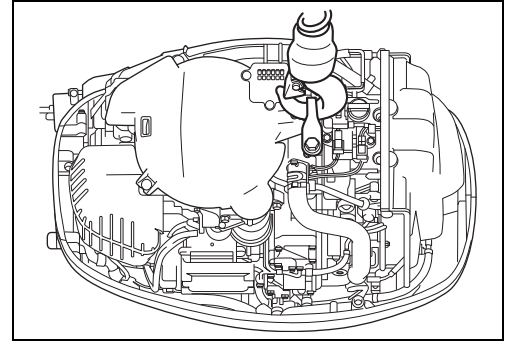
⚠ WARNING

Failure to use the proper attachment point for lifting the outboard motor can result in severe injury and/or damage to the outboard motor.

Use the lifting eye only. Do not lift the motor using a flywheel lifting attachment.

Attach lift to lifting eye on cylinder block.

Lift engine and align with holes drilled in transom.



MOUNTING THE OUTBOARD MOTOR

NOTICE

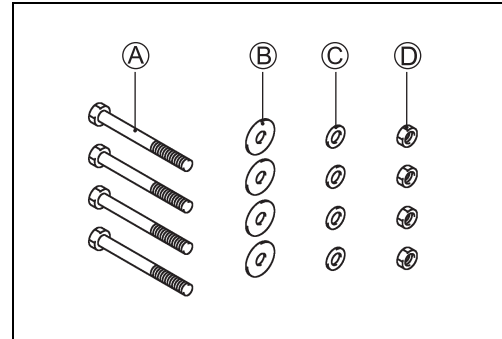
Use of mounting hardware which is not equivalent in quality to genuine SUZUKI parts can lead to performance problems and transom clamp bracket damage.

Use only genuine SUZUKI mounting hardware.

Genuine SUZUKI parts are designed and built specially for SUZUKI outboard motors.

Mounting hardware (Contained parts)

Item	Part name	Part number	Q'ty
(A)	Bolt (M12 × 115)	09100-12091	4
(B)	Washer (OD 35 mm)	09160-12128	4
(C)	Washer (OD 22 mm)	09160-12110	4
(D)	Nut (M12)	09159-12014	4

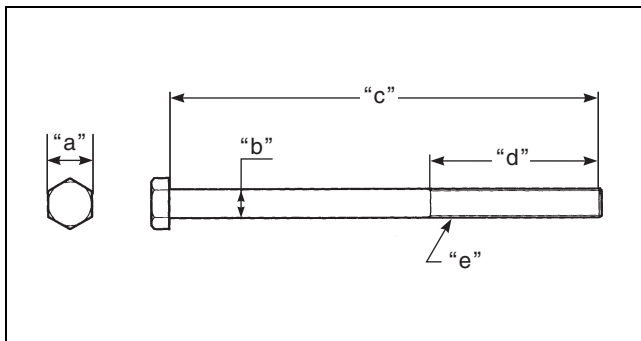


Mounting bolt dimensions (Standard) Factory supplied

Part number	"a"	"b"	"c"	"d"	"e"
09100-12091	19 mm 3/4 inch	12.7 mm 1/2 inch	115 mm 4.5 inch	70 mm 2.8 inch	M12×1.25

(Optional) Available from Suzuki Genuine Parts

Part number	"a"	"b"	"c"	"d"	"e"
09100-12090	19 mm 3/4 inch	12 mm 1/2 inch	150 mm 5.9 inch	75 mm 3.0 inch	M12×1.25



Mounting bolt selection

Boat transom thickness	40 mm – 79 mm (1.6 in – 3.1 in)	79 mm – 114 mm (3.1 in – 4.5 in)
Part number	09100-12091	09100-12090

Transom inspection

Transom surface

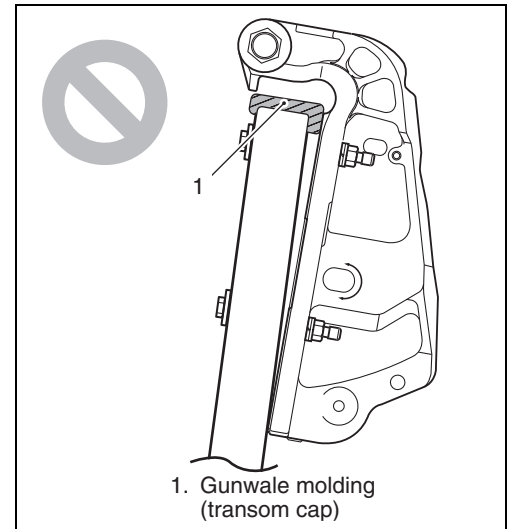
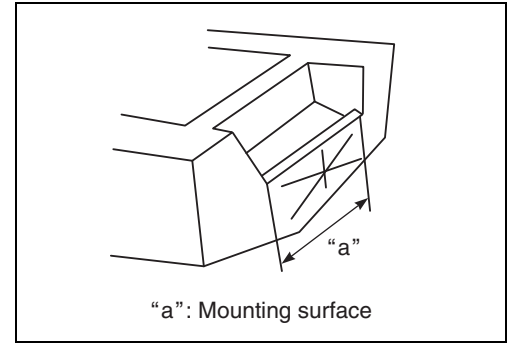
Check the transom surface with a straightedge across the engine mounting area.

The surface of the transom where the outboard motor(s) is to be mounted must be flat to allow full contact of the motor clamp bracket with the transom.

This is important in maintaining the strength of the motor to boat installation.

NOTE:

Clamp brackets must not contact gunwale moldings or transom cap which can create clearance between the transom board and clamp bracket as shown.

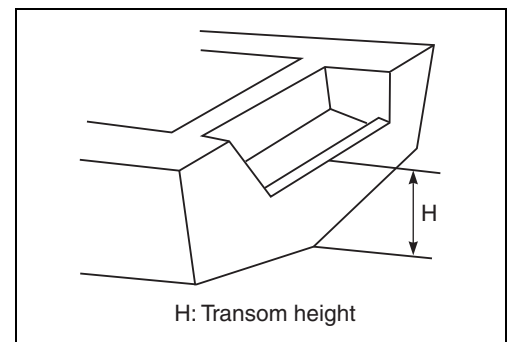


Transom height

The transom height must be measured so that a motor of the correct shaft length can be selected.

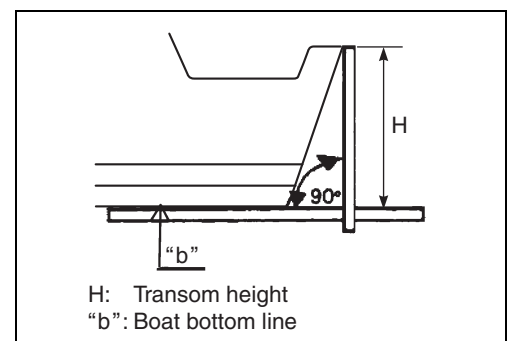
Suzuki outboard motors are available in different shaft lengths on selected models.

L: 20 inch shaft
X: 25 inch shaft



As shown to the right, transom height is measured by placing a straightedge against the bottom and extending out past the transom.

A second straightedge is used to measure from the top of the transom to the bottom line at a 90° angle.



Drilling instruction

Center the motor on the transom.

Make sure the transom height matches the engine shaft length of the outboard to be installed.

Generally, the anti-ventilation plate is aligned with the boat bottom or is slightly above the boat bottom.

Depending on hull design, and intended application:

- In the case of step hull, the anti-ventilation plate may be higher than the boat bottom as shown.
- The optimum mounting height of the outboard motor is affected by the boat and motor combination.

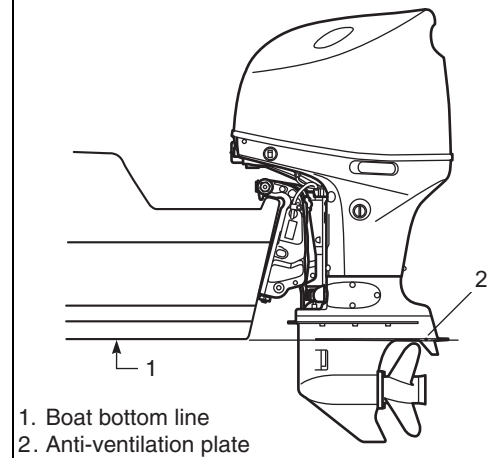
Test runs at different height can help determine the optimum mounting height.

Drill the mounting holes perpendicular to the transom board.

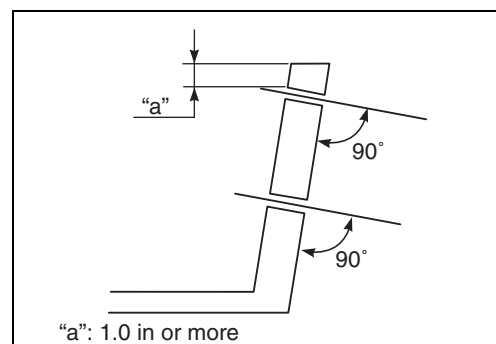
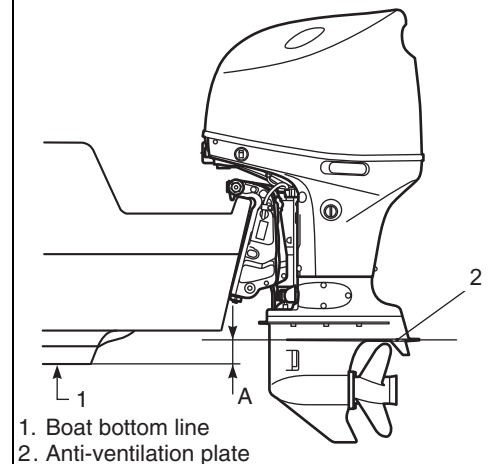
NOTE:

- Be sure to drill all holes perpendicular (90°) to the transom surface.
- Drill the upper holes at least 25.4 mm (1.0 in) lower than the transom top surface.

General mounting



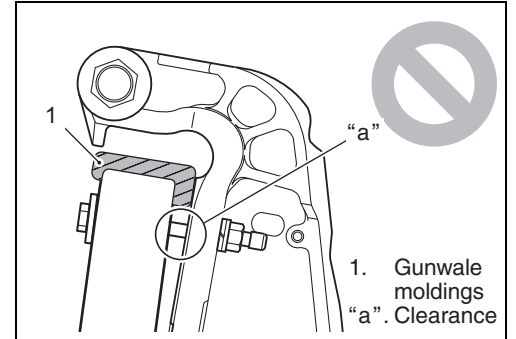
Step-hull



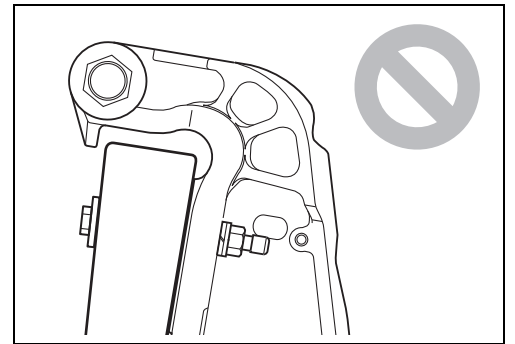
Precaution on outboard motor mounting

When installing the outboard, observe the following precautions.

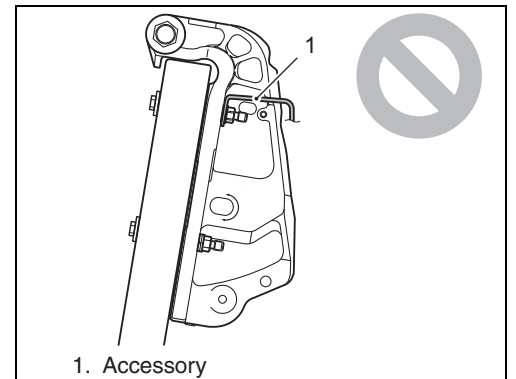
- Transom bolt must not be exposed from transom surface.
- Clamp brackets must not contact gunwale moldings "1" or transom cap which can create clearance "a" between the transom board and clamp brackets as shown.



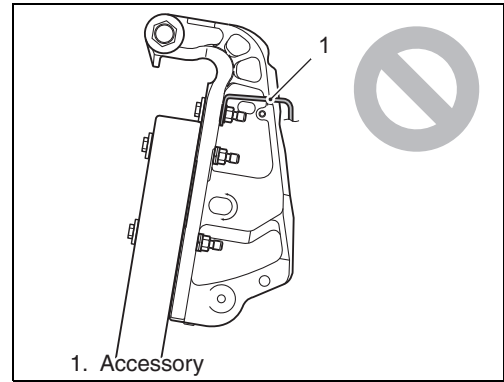
- The washer, bolt head and nut should be parallel to the transom surface to provide uniformly clamping force.



- Do not try to install accessories onto the boat, using the engine mounting bolts included with the outboard motor.

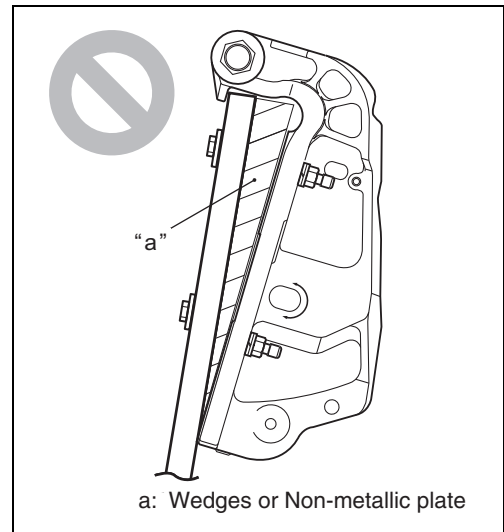


- Do not install an accessory to clamp bracket as shown in figure.



- Do not install wedges or non-metallic plate between clamp bracket and transom as shown.

**If a plate is required, only a metal plate is to be used.
Even if the wedges is made of metal, it must be never used.**



Mount the outboard motor to transom

⚠ WARNING

If the motor is loosely secured, the motor clamp brackets can break, causing a loss of boat control and accident.

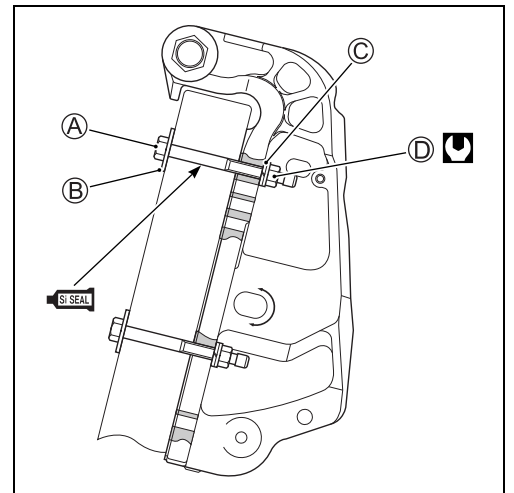
To avoid serious injury resulting from loss of boat control caused by loosened clamp brackets, be sure to properly tighten transom nuts to the specified torque.

The outboard must be secured to the boat transom with four mounting bolts, flat washers and lock nuts.

- (1) Center the motor on the transom.
Make sure that anti-cavitation plate is located 0 – 25 mm (0 – 1 in) below the boat bottom.
- (2) Mark four position of motor mounting bolt on the transom board.
- (3) Drill the mounting holes perpendicular to the transom board using 12 mm drill bit.
- (4) Install motor mounting bolts **A** with large diameter flat washer **B** from inside of transom and through clamp bracket.
- (5) Install small diameter flat washers **C** and nuts **D** on clamp bracket side.
- (6) Tighten all mounting bolts/ nuts securely.

🔩 Mounting bolt/nut: 55 N·m (5.6 kgf·m, 41 lbf·ft)

- (7) Check the transom for dent or cracks or other deformation.



NOTE:

• To ensure water-tightness, sealant (SUZUKI SILICONE SEAL or equivalent) should be applied to all bolt holes. Apply the sealant to the shanks of the bolts, but not the threads.

If water tightness is not secured, water can seep into the transom core material causing early degradation of the transom board.

- To reduce possibility of thread damage to mounting bolts and possible incorrect torque, do not use an impact wrench.
- Do not use an impact tool to tighten or loosen the transom nuts.
- If the specified tightening torque can not be reached due to weak transom material, it may be necessary to install a reinforcement plate to the transom board. If a reinforcement plate is required, contact the boat manufacturer for recommendations. The transom reinforcement plate should be installed between the transom surface and the washer ⑤.

NOTICE

Never reuse the lock nut ④ after it has been threaded into position and torqued.

Once you have tightened the lock nut ④, it will no longer have the necessary fastening performance if you reuse it.

NOTE:

If there is a clearance between the clamp bracket and the transom top surface, place a proper spacer on the transom top surface so that the motor weight can be supported by the transom through the spacer.

NOTE:

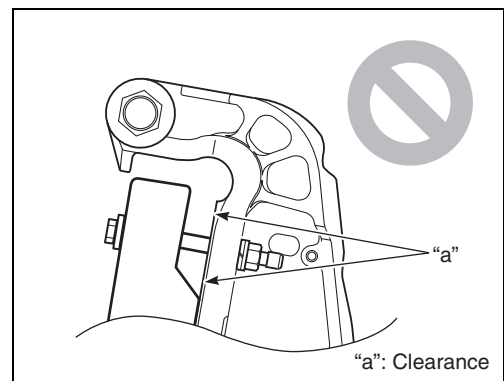
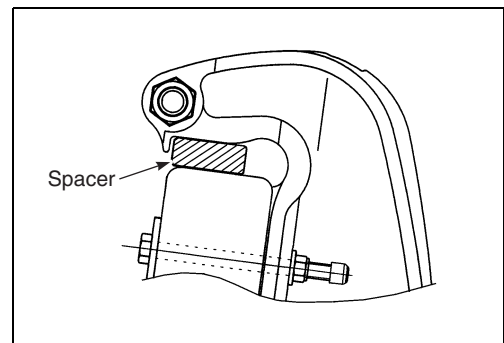
Make sure that there is no clearance at the matting surfaces between the transom board and motor clamp brackets. Clearance can result in damage to the motor clamp bracket.

NOTICE

If the motor is not properly secured to the transom, it can come off.

Be sure to take the following precautions:

- After completing break-in operation (10 hours), retighten the transom nuts to the specified torque.
- Check the nuts periodically for proper tightness.
- Check the transom for dents or cracks or other deformation.



DRAG LINK INSTALLATION

⚠ WARNING

Selection of an improper steering system or improperly installing a steering system on the outboard motor can cause steering/handling difficulties, resulting in loss of control and a crash.

Be sure to follow the steering system manufacturer's instructions for proper selection and installation.

NOTE:

These instructions are for connecting a mechanical push-pull steering system with the following specifications:

- Single cable
- Starboard cable entry into the motor tilt tube.
- Steering cable meeting the current American Boat and Yacht Council's Safety standard (P-17).

Item	Part name	Part number	Q'ty
	Drag link assembly	67701-90J01	
(A)	• Drag link	• Not available separately	1
(B)	• Spacer	• 67721-99E00	1
(C)	• Bolt	• 67725-99E00	1
(D)	• Lock nut	• 67726-99E00	2
(E)	• Washer	• 67728-99E00	4
(F)	Steering cable seal	41161-94400	1

NOTICE

Never reuse the lock nut (D) after it has been threaded into position and torqued.

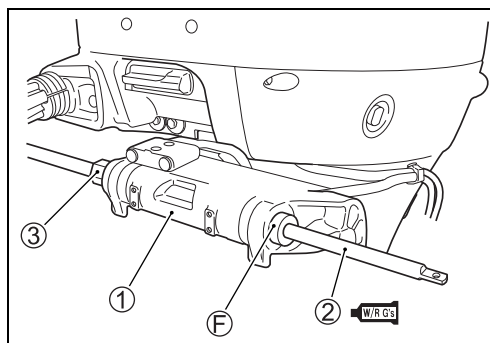
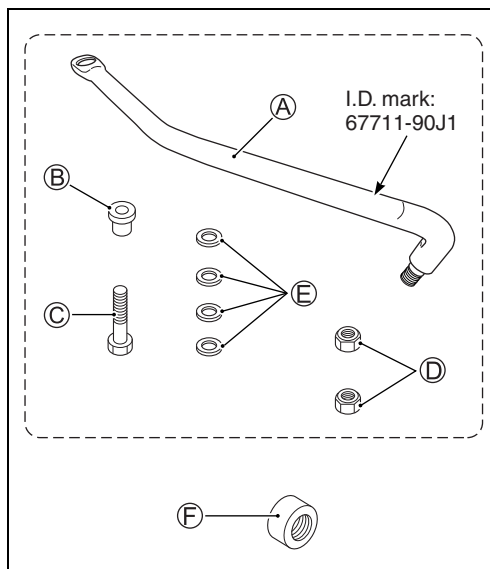
Once you have tightened the lock nut (D), it will no longer have the necessary fastening performance if you reuse it.

Procedure

- (1) Thread the steering cable seal (F) onto the port side end of the motor tilt tube (1).
- (2) Apply SUZUKI WATER RESISTANT GREASE EP2 to the steering cable (2).
- (3) Insert the cable (2) into the tube (1) from the starboard side, then tighten the cable retaining nut (3) to the torque specified by the cable manufacturer.

NOTE:


On most outboard motor installations, it will be necessary to install the steering cable prior to the outboard motor installation.



- (4) Connect the drag link (A) to the steering cable end (2) with washers (E) and lock nut (D) as shown. Tighten the nut (D) to the specified torque, then BACK THE NUT OFF 1/8 TURN.

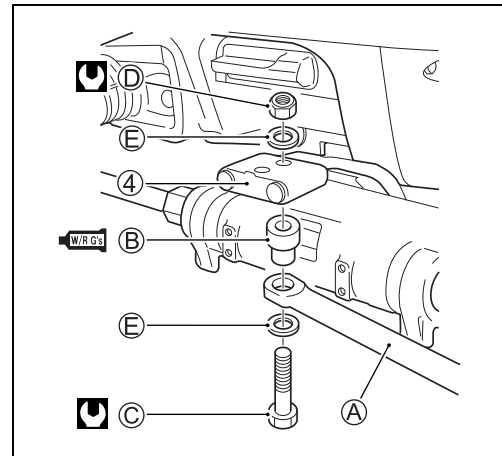
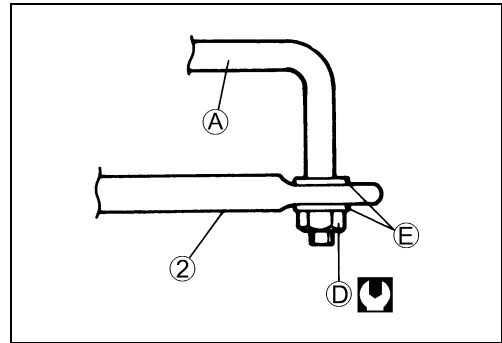
 **Lock nut (D) : 10 N·m (1.0 kgf-m, 7.4 lbf-ft)**

- (5) Move the steering cable until the hole of drag link (A) aligns with the thread hole on the steering bracket (4).
(6) Connect the drag link to the steering bracket (4) by tightening the bolt (C) with the spacer (B) and washers (E) as shown.

 **Bolt (C) : 34 N·m (3.5 kgf-m, 25 lbf-ft)**

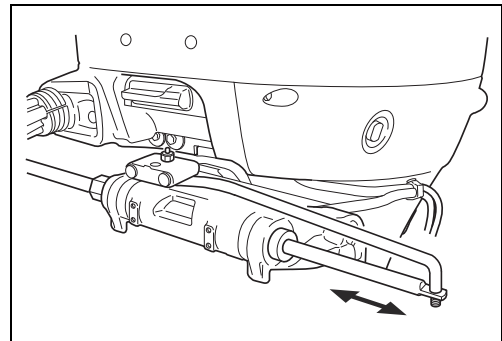
- (7) Tighten the lock nut (D) with the washer (E).

 **Lock nut (D) : 34 N·m (3.5 kgf-m, 25 lbf-ft)**



NOTE:

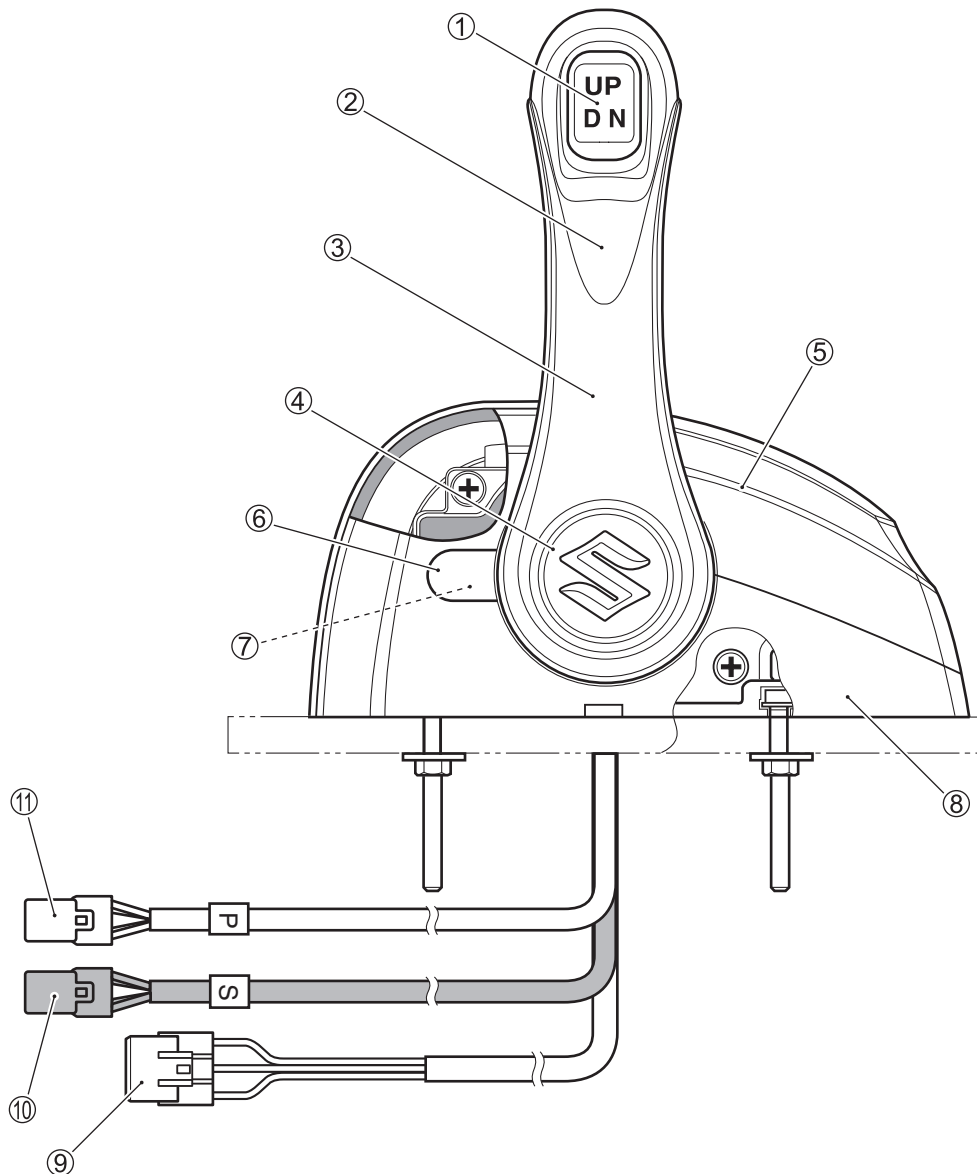
After assembly, check for smooth and free steering operation by turning the steering wheel all the way to the right and left.



TOP MOUNT REMOTE CONTROL BOX

The DBW Model control box is exclusive and does not use the mechanical remote control cable for shift/throttle control. The shift/throttle control is actuated electronically by an SPC system.

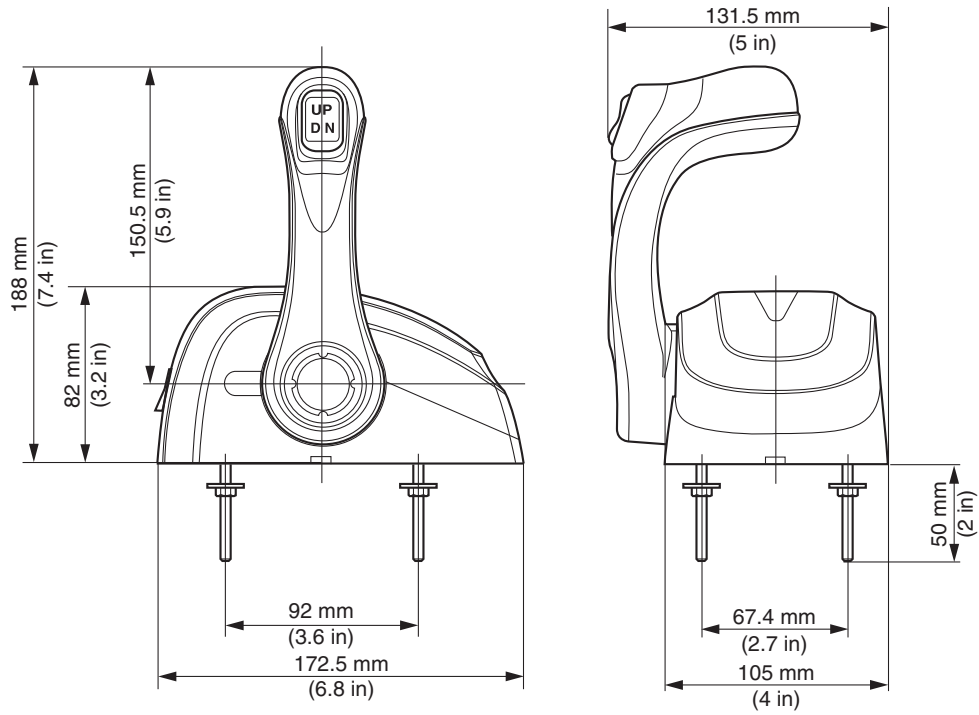
LOCATION OF PARTS



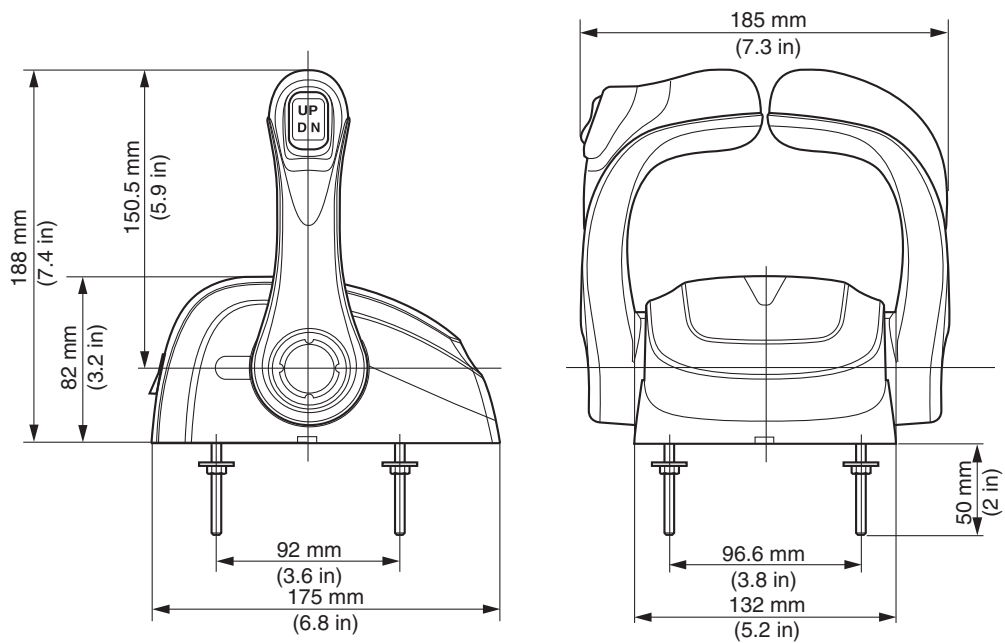
- | | |
|------------------------|---|
| ① PTT switch | ⑥ Grommet |
| ② Grip | ⑦ Friction adjust screw |
| ③ Remote control lever | ⑧ Lower cover |
| ④ Emblem "S" | ⑨ PTT connector |
| ⑤ Upper cover | ⑩ Wire harness connector (Dual type only) |
| | ⑪ Wire harness connector |

DIMENSIONS

(Single Type)



(Dual Type)



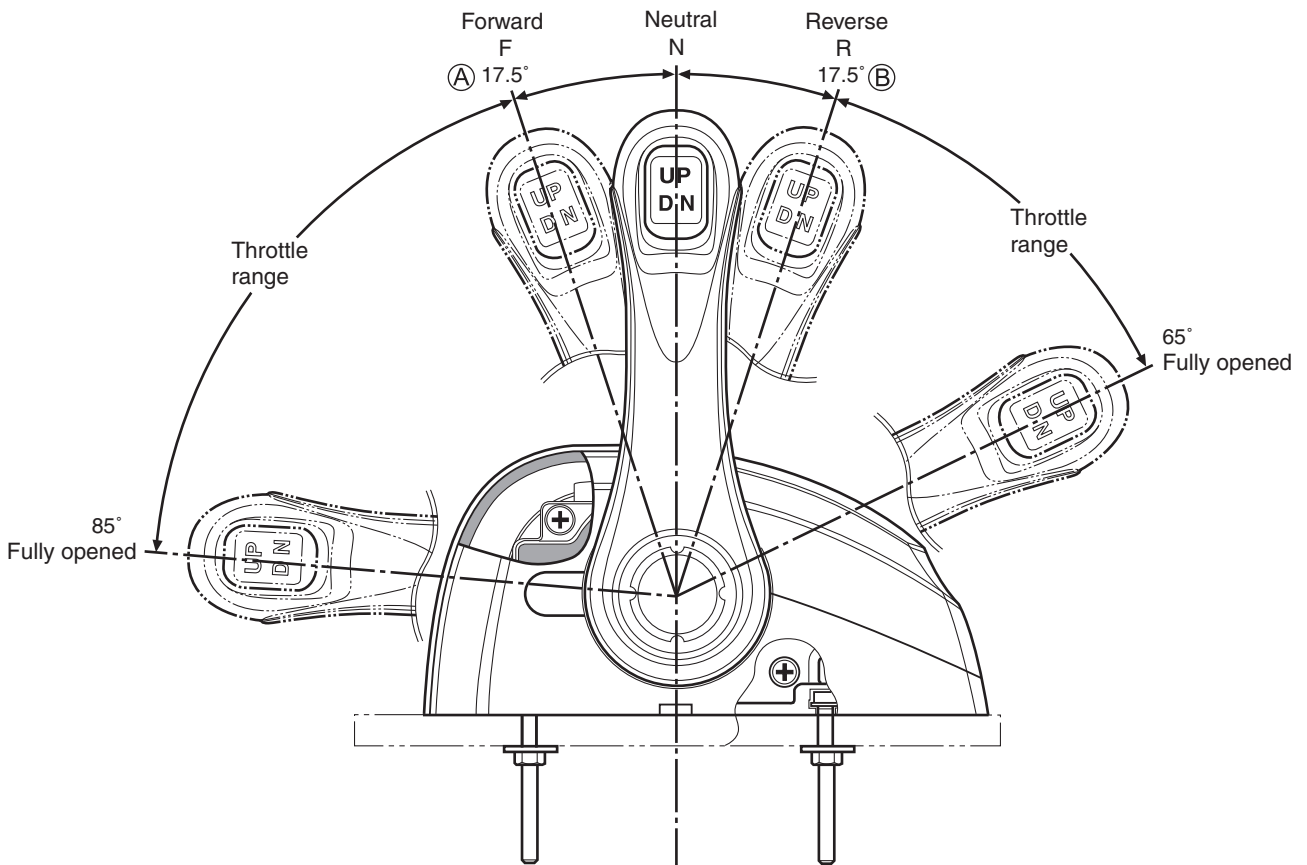
REMOTE CONTROL LEVER OPERATING RANGE

- **Forward**

To shift into forward, push the remote control lever forward and downward thru approx. 17° on (F) side (A). When motor is in gear, push the control lever further downward will open the throttle.

- **Reverse**

To shift into reverse, pull the remote control lever backward and downward thru approx. 17° on (R) side (B). When motor is in gear, push the control lever further downward will open the throttle.



REMOTE CONTROL LEVER FRICTION ADJUSTMENT

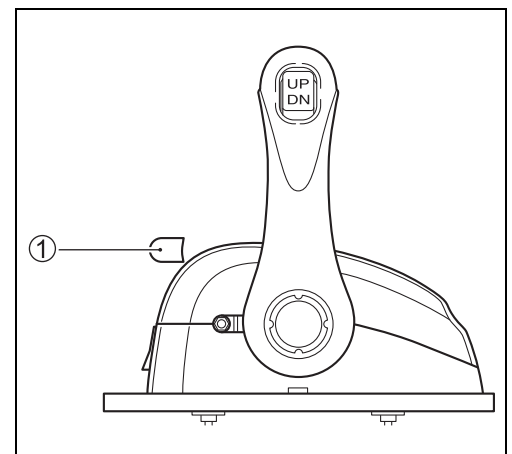
Adjust the lever friction using the following procedure.

1. [Single remote control box]

Remove the rubber grommet ①.

[Dual remote control box]

Remove two rubber grommets ① located on both sides of the remote control box.



- Turn the adjust screw ② with a hexagon wrench.

Turning the adjust screw clockwise:

friction will increase

Turning the adjust screw counterclockwise:

friction will decrease

NOTE:

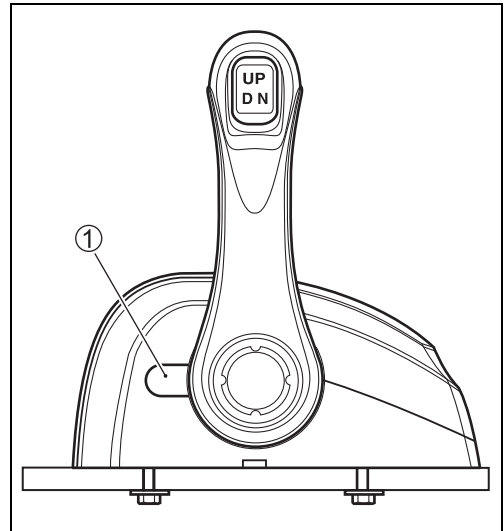
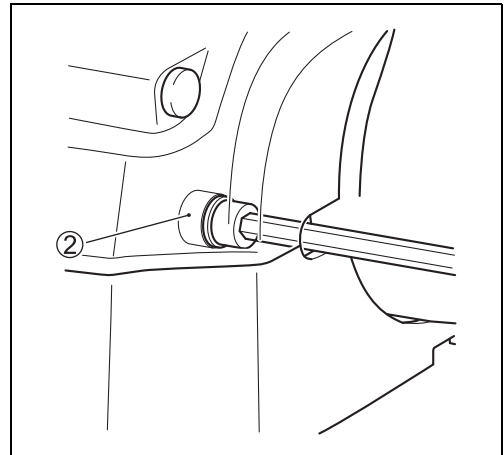
Be careful when tightening the adjust screw so that the tightening torque does not exceed 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft).

NOTICE

Over tightening the friction adjust screw can cause damage to the mechanism.

Do not over tighten the friction adjust screw.

- Reinstall the rubber grommet(s) ①.



DETENT FEELING ADJUSTMENT

Adjust the detent feeling using the following procedure.

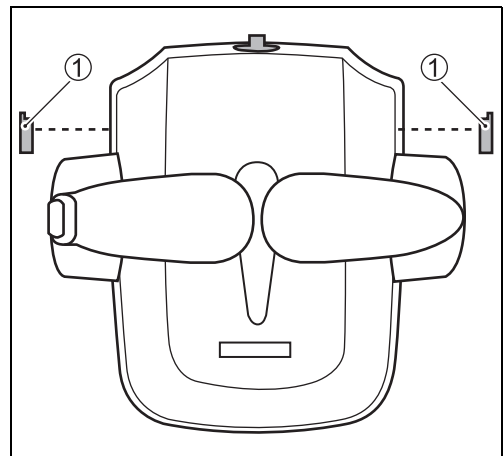
The adjusting procedure explained here and the figures shown in right side are for dual top mount remote control box as an example.

The adjusting procedure for the single top mount remote control box is basically the same as those of dual top mount remote control.

- [Single remote control box]
Remove the rubber grommet ①.

[Dual remote control box]

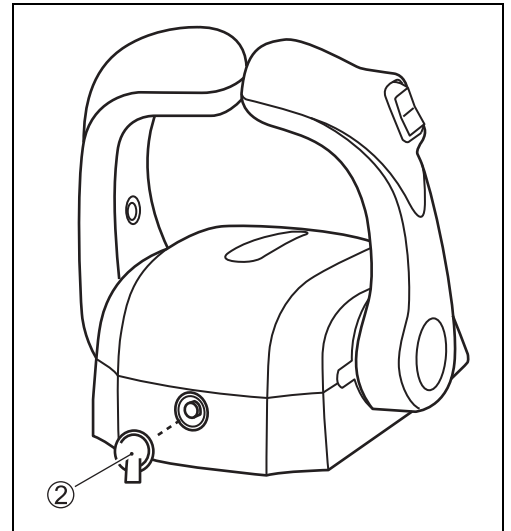
Remove two rubber grommets ① located on both sides of the remote control box.



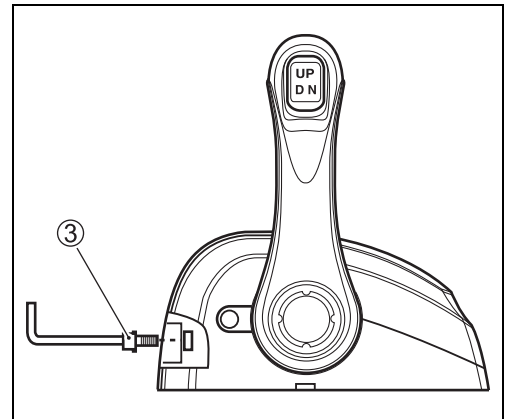
2. Remove the rubber grommet ② from the remote control box main frame.

NOTE:

Direction of the rubber grommet ② the tab should be pointed downward.



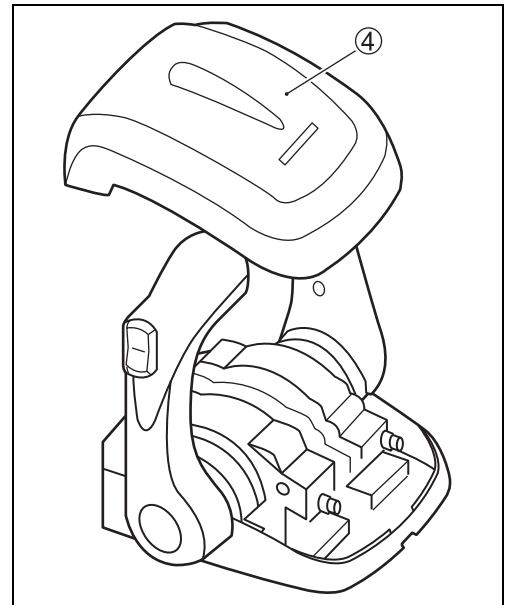
3. Using a hexagon wrench, remove the bolt ③.



4. Remove the remote control box upper cover ④ from the remote control box main frame.

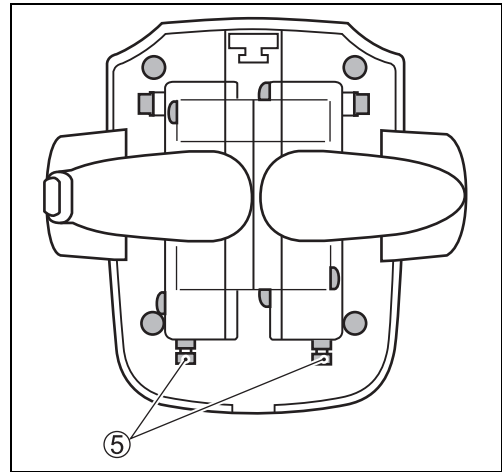
NOTE:

The cover gasket must be removed.



NOTE:

The position of the detent adjust screw ⑤ is as shown in right figure.



5. Loosen the lock nut(s) ⑥ while holding the adjust screw(s) ⑤.

Turn the adjust screw(s) with a hexagon wrench.

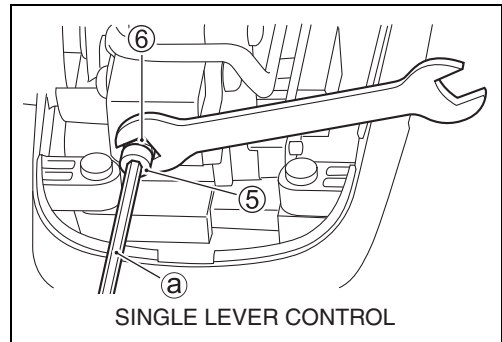
Turning the adjust screw clockwise:

detent force will increase

Turning the adjust screw counterclockwise:

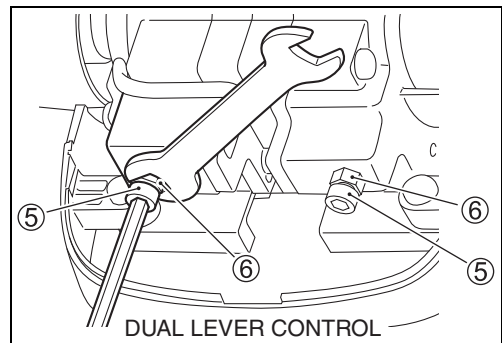
detent force will decrease

Ⓐ: Hex. wrench



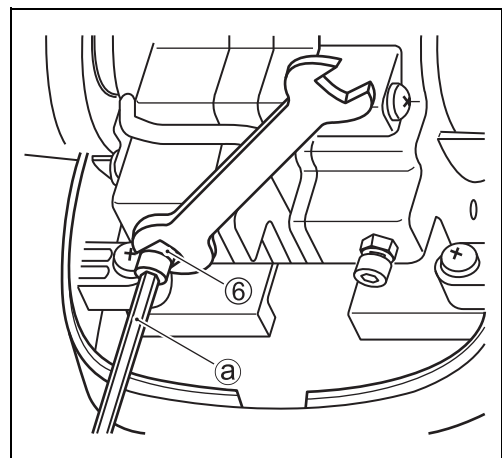
NOTE:

Adjustment of detent force for the dual control lever can be made independently as shown in right figure.



6. To fix the adjustment, tighten the lock nut ⑥ while holding the adjust screw.

Ⓐ: Hex. wrench



7. After the adjustment has been made, reinstall to the original position the parts that have been removed (upper cover, rubber grommet, etc.).

REMOTE CONTROL BOX POSITION

⚠ WARNING

Installing the remote control box in an inappropriate location can result in operating difficulties and an accident.

Be sure to install the remote control box in a location that makes it convenient for the operator to use the control lever.

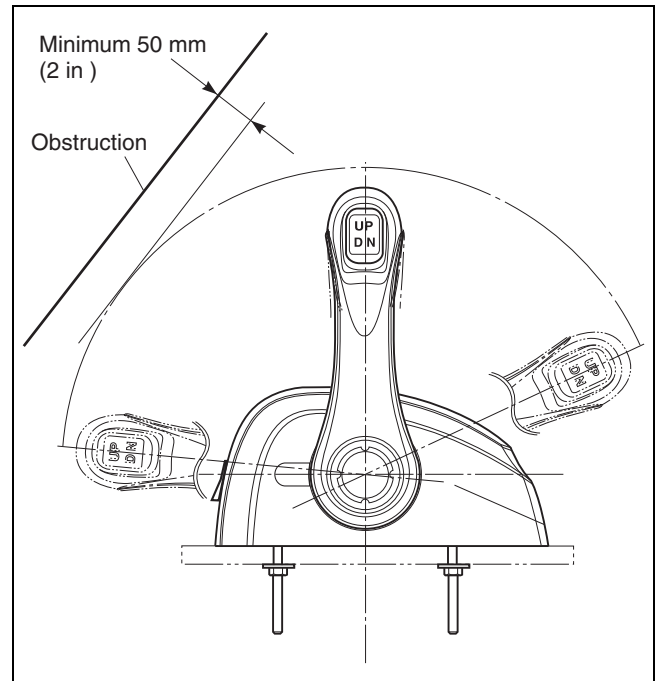
⚠ WARNING

Open, short circuit or poor electrical connections can result in loss of electronic throttle and gear shift control.

Be sure to take the following precautions:

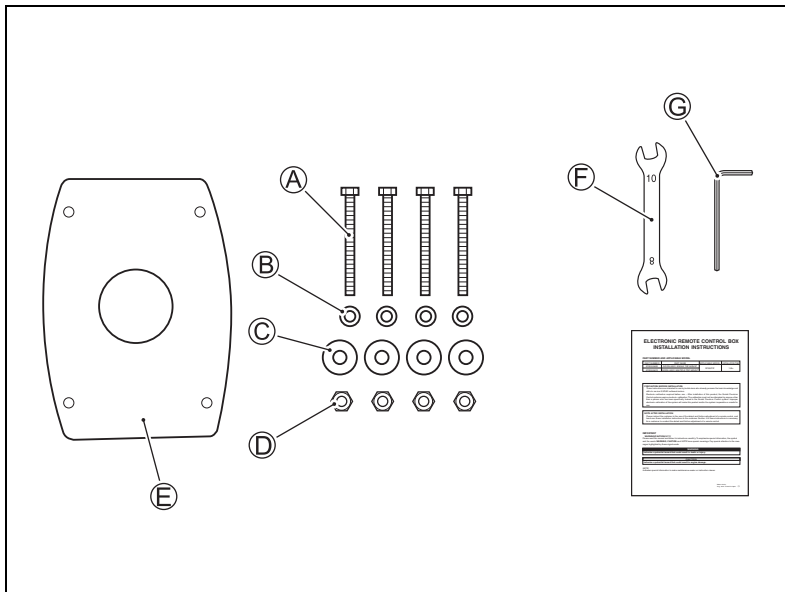
- Do not cut or extend the wiring harness and lead wires of the remote control box. Water may enter from the joint of the wiring harness or lead wire, causing a continuity error at the connections, resulting in shifting and throttle control errors.
- Use a waterproof cap to seal the connectors not in use.

Set the Remote Control Box in a position in which it does not obstruct the operations of the control lever and switches. Make sure there is no obstruction on the path of the remote control wire harness. Allow a space so that the bottom of the Remote Control Box does not contact any other parts. Provide a space so that the remote control wire harness can be routed without bending sharply.



CONTAINED PARTS

Item	Part name	Q'ty
Ⓐ	Bolt (M5-50 mm)	4
Ⓑ	Washer (OD: 10 mm)	4
Ⓒ	Washer (OD: 16 mm)	4
Ⓓ	Nut (M5)	4
Ⓔ	Seal (Single type)	1
Ⓕ	Seal (Dual type)	1
Ⓖ	Spanner	1
Ⓗ	Allen wrench	1

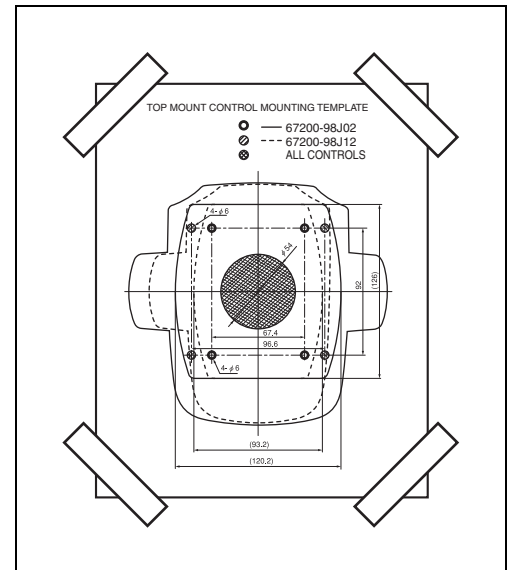


INSTALLATION

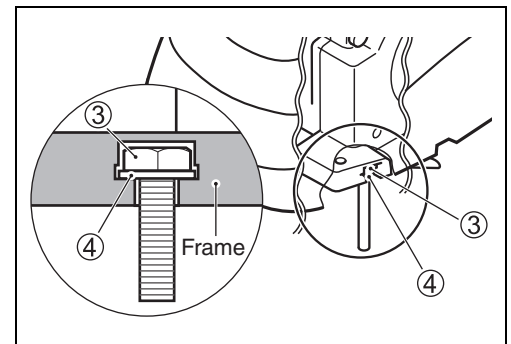
- (1) Select the proper position of the remote control box, and stick the template on the selected position.
- (2) Cut and drill as instructed on the attached template.

NOTE:

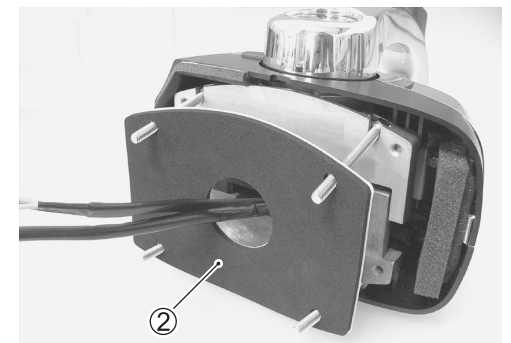
After drilling the holes, make sure opening is free of sharp edges.



- (3) Fit the bolts ③ and the washers ④ into the slots located on the corner of main frame under as shown.

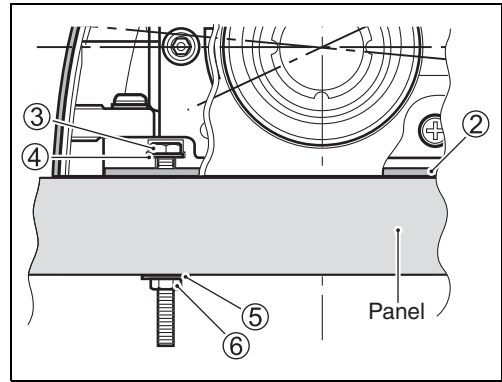


- (4) Peel the release paper of the seal ②. Stick the seal ② on the back side of the Remote Control Box main frame as shown.



- (5) Route the BCM harnesses through the opening and connect with the wire harnesses of the Remote Control Box.

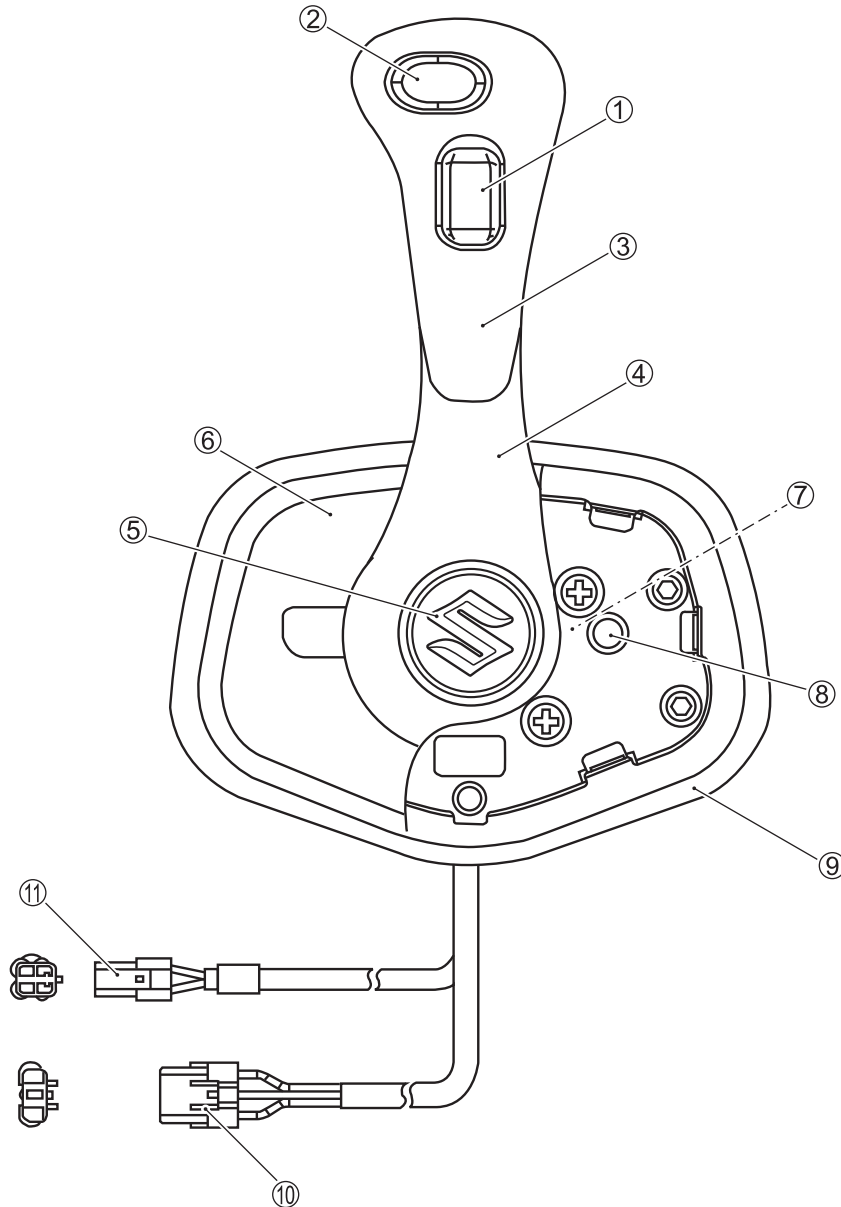
- (6) Place the Remote Control Box into position. Install the washers ④, ⑤ on the bolts ③ and tighten the nuts ⑥.



FLUSH MOUNT REMOTE CONTROL BOX

The DBW Model control box is exclusive and does not use the mechanical remote control cable for shift/throttle control. The shift/throttle control is actuated electronically by an SPC system.

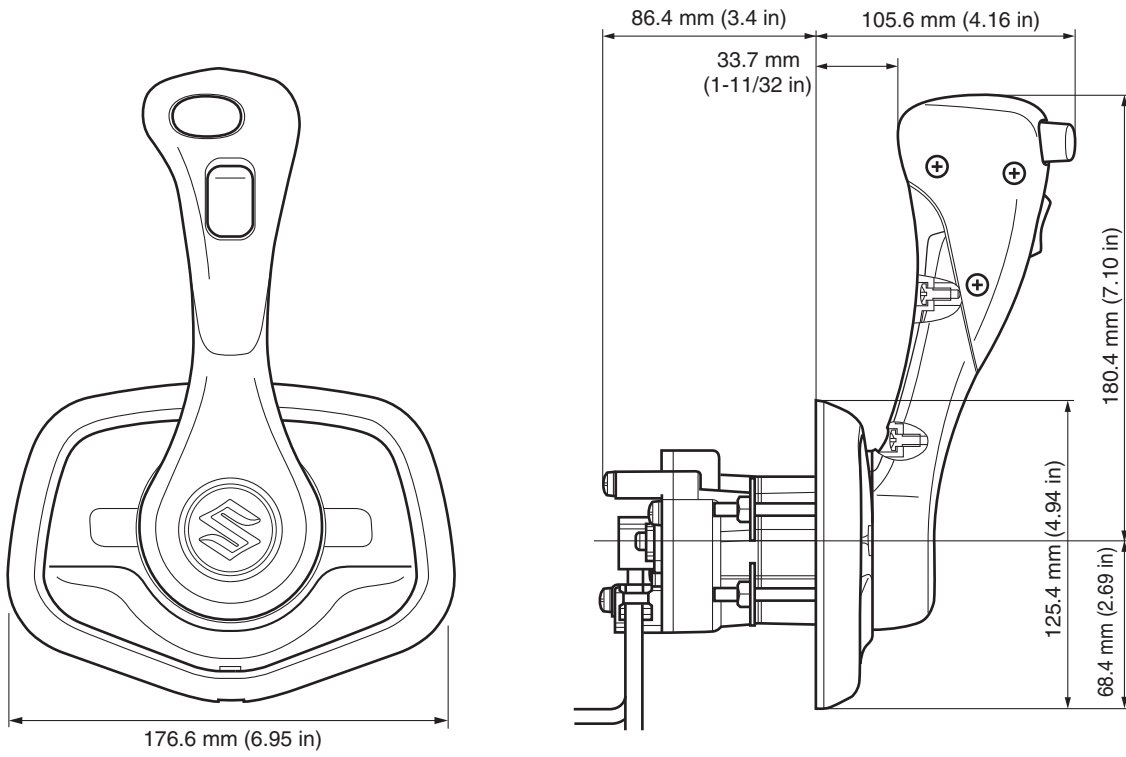
LOCATION OF PARTS



- ① PTT switch
- ② Shift lock button
- ③ Grip
- ④ Remote control lever
- ⑤ Emblem "S"

- ⑥ Upper cover
- ⑦ Grommet
- ⑧ Friction adjust screw
- ⑨ Lower cover
- ⑩ PTT connector
- ⑪ Wire harness connector

DIMENSIONS



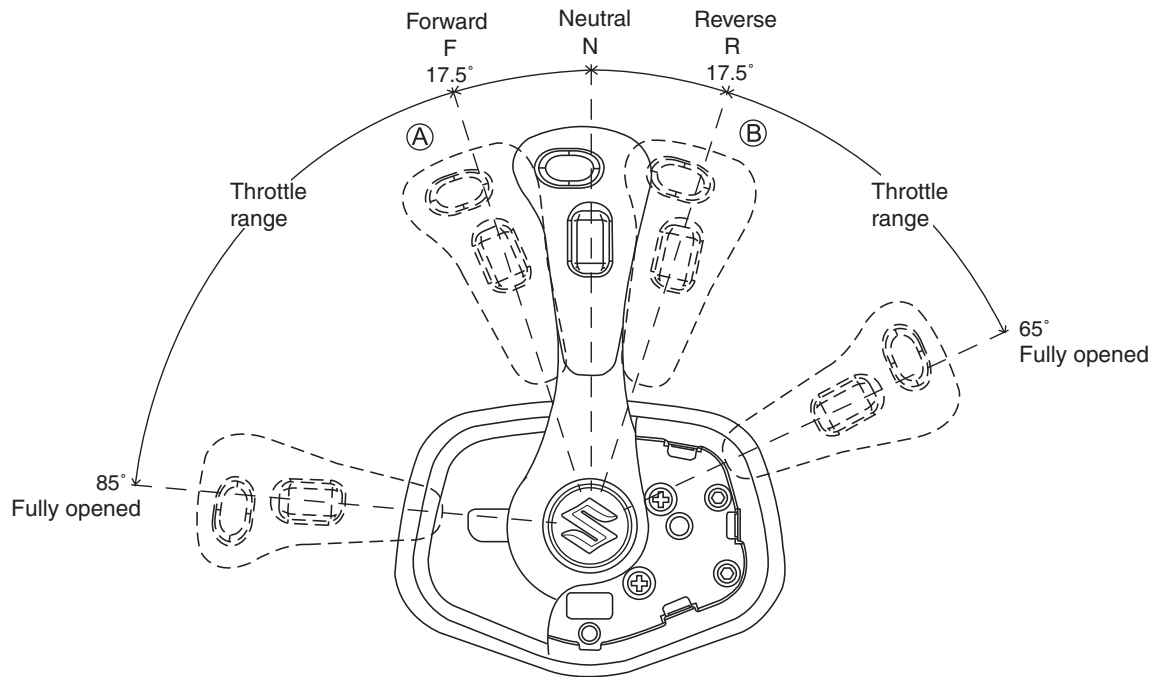
REMOTE CONTROL LEVER OPERATING RANGE

- **Forward**

To shift into forward, push the remote control lever forward and downward thru approx. 17° on (F) side (A). When motor is in gear, push the control lever further downward will open the throttle.

- **Reverse**

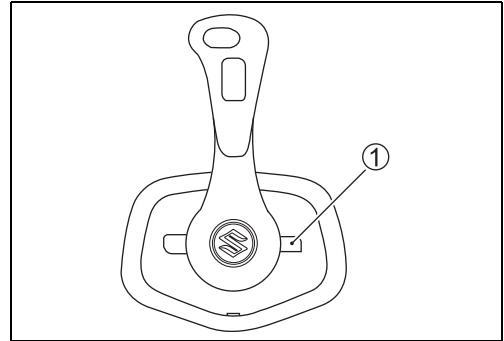
To shift into reverse, pull the remote control lever backward and downward thru approx. 17° on (R) side (B). When motor is in gear, push the control lever further downward will open the throttle.



REMOTE CONTROL LEVER FRICTION ADJUSTMENT

Adjust the lever friction using the following procedure.

1. Remove the rubber grommet ①.



2. Turn the adjust screw ② with a hexagon wrench.

Turning the adjust screw clockwise:

friction will increase

Turning the adjust screw counterclockwise:

friction will decrease

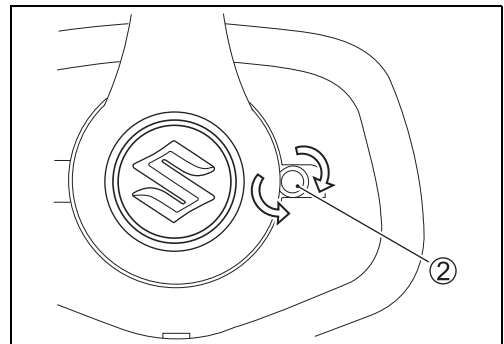
NOTE:

Be careful when tightening the adjust screw so that the tightening torque does not exceed 2.5 N·m (0.25 kgf-m, 1.8 lbf-ft).

NOTICE

Over tightening the friction adjust screw can cause damage to the mechanism.

Do not over tighten the friction adjust screw.



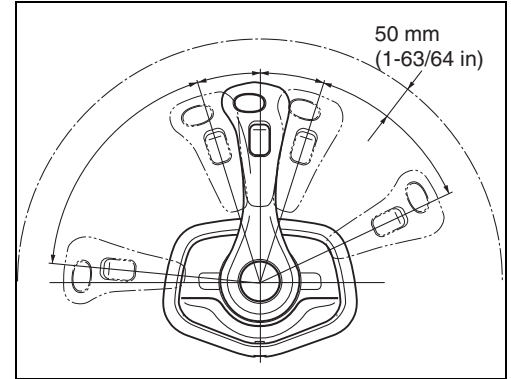
3. Reinstall the rubber grommet ①.

REMOTE CONTROL POSITION

Set the Remote Control Box in a position in which it does not obstruct the operations of the control lever and switches. Make sure there is no obstruction on the path of the remote control wire harness.

Allow a space so that the back of the Remote Control Box does not contact any other parts.

Provide a space so that the remote control wire harness can be routed without bending sharply.



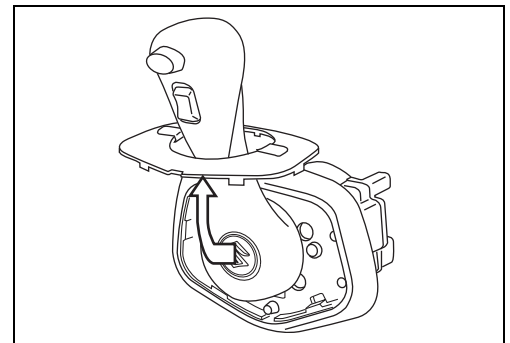
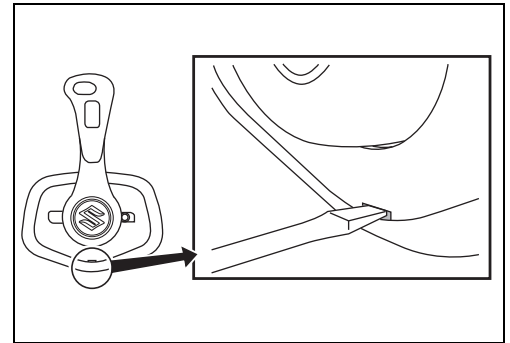
INSTALLATION

- (1) Select the proper position for the remote control, and attach the template on the selected position. Cut out the shaded portion and drill 4 installation holes of 6.5 mm (17/64 in) diameter.

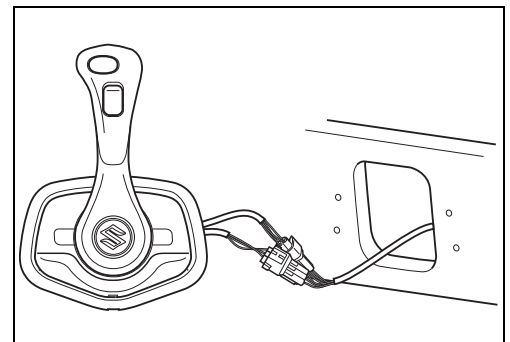
NOTE:

After drilling the holes, make sure the opening is free of sharp edges.

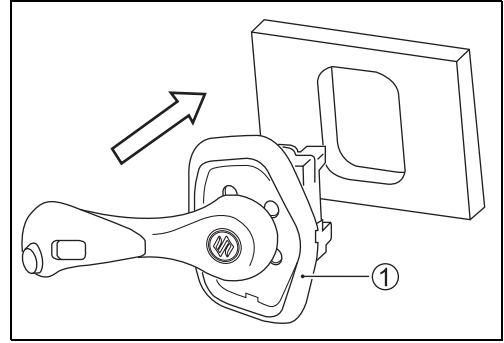
- (2) Remove the top cover of the remote control by using a flat head screwdriver as leverage.



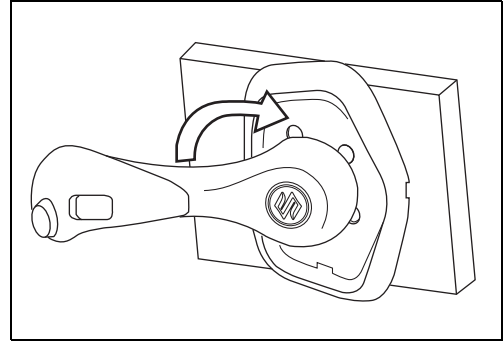
- (3) Route the BCM harnesses through the installation hole and connect with the wire harness of the remote control box.




- (4) Rotate the remote control box ① turning in 90 degrees as shown in the figure and place it into the installation hole.

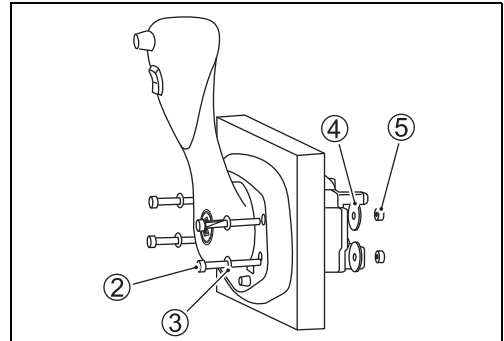


- (5) After the base of the remote control ① touches the mounting panel, turn the remote control clockwise to its normal position.

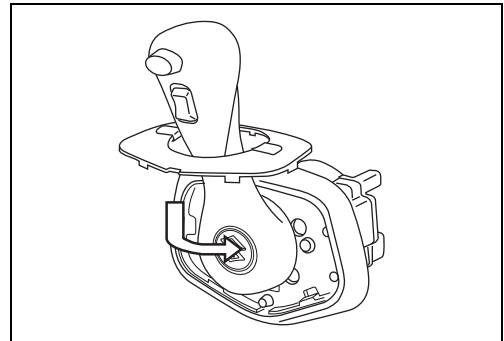


- (6) Fasten the sets of Bolt ②, Washer ③, ④, Nut ⑤ as shown in the figure.

 **Tightening Torque: 4.5 – 5.5 N·m (0.46 – 0.56 kgf·m, 3.3 – 4.1 lbf·ft)**



- (7) Reinstall the top cover to the Remote Control box.



PRECAUTION WHEN INSTALLING ELECTRONIC SYSTEM COMPONENTS

▲ WARNING

Open, short circuit or poor electrical connections can result in loss of electronic throttle and gear shift control.

Be sure to take the following precautions:

- Do not cut or extend the wiring harness and lead wires.
Water may enter from the joint of the wiring harness or lead wire, causing a continuity error at the connections, resulting in shifting and throttle control errors.
- Ensure all connections are correct and tight, and plug all connectors not in use with a waterproof cap.

CAUTION

If you do not disconnect the battery before connecting the wiring harness to electrical equipment, you could get an electrical shock.

Always disconnect the battery before installing or removing electrical equipment.

First turn the main switch OFF, and disconnect the battery's negative terminal, and then disconnect the positive terminal.

When reconnecting the battery, turn the main switch OFF, connect the battery's positive terminal first, and then connect the negative terminal.

NOTICE

Installing and routing the harness of SPC (Suzuki Precision Control) system components in an inappropriate location can result in system failure.

Be sure to take the following precautions:

- To avoid malfunction of the electronic control system caused by radio waves, antennas, or coaxial cables of the radio, install navigation and other equipment more than 50 cm (20 in) away from the BCM and the outboard motor.
- Install the BCM in a dry location, as far as possible from where it might get splashed with water.
- Install the BCM so that the connector faces downward.
- Install the BCM on a flat surface so it will not fall off during boating.
- Lay out the wires of the wiring harness in dry locations, as far as possible from where they might be exposed to water.
- Fix the wiring harness using clamps positioned at a proper distance.

CONNECTION OF CONTROL HARNESS

CONNECTING COMPONENTS

⚠ WARNING

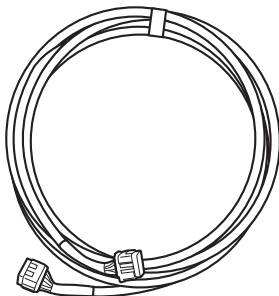
Open, short circuit or poor electrical connections can result in loss of electronic throttle and gear shift control.

Be sure to take the following precautions:

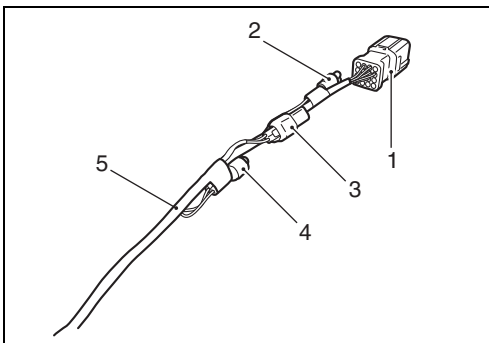
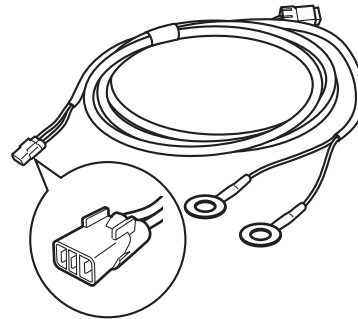
- Do not cut or extend the wiring harness and lead wires.

Water may enter from the joint of the wiring harness or lead wire, causing a continuity error at the connections, resulting in shifting and throttle control errors.

Remote control harness

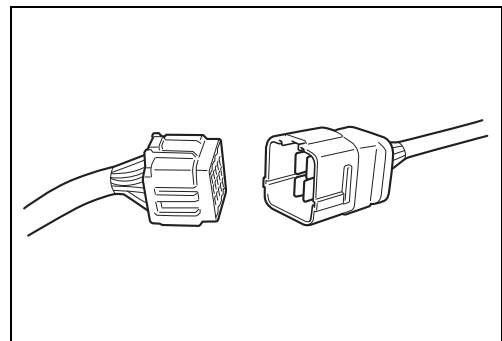


Sub-battery cable

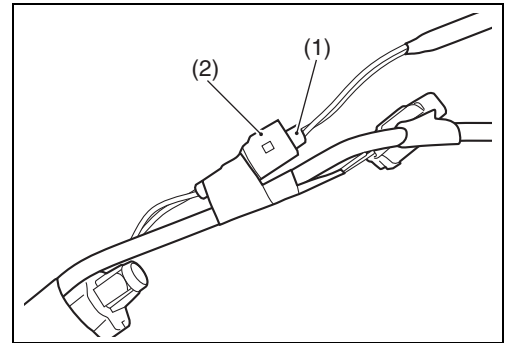


1. Connect the Remote control harness
2. Connect the key less control harness
3. Connect the terminal resistor
4. Connect the sub-battery cable
5. Remote control harness (engine side)

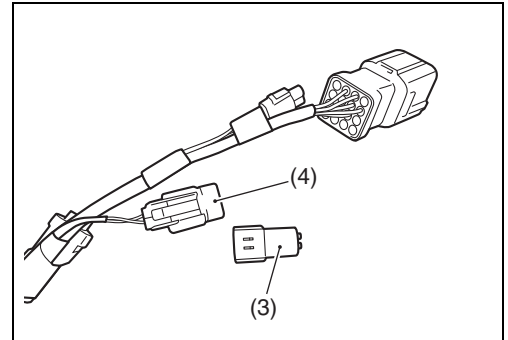
- (1) Connect the 16-pin connector of the remote control harness to the connector on the engine side.



- (2) Connect the 2-pin connector of the sub-battery cable (1) to the connector (2) on the engine side.



- (3) Remove the terminal resistor dummy plugs (3), connect the terminal resistors (4) into position.



- (4) Connect SPC system components and accessories.
Refer to "WIRING" section.

QUADRUPLE ENGINE INSTALLATION

SYSTEM STRUCTURE AND OUTLINE

1. Remote Control box

On the Quadruple Engine Installation of DBW (Drive by Wire) models, all engines can be controlled by a twin lever remote control box.

- The port remote control lever controls both port engine and port center engine.
- The starboard remote control lever controls both starboard engine and starboard center engine.

2. BCM (Boat Control Module)

Necessary BCMs:

- One BCM for the port and port center engines
- Another BCM for the starboard and starboard center engines

So that two BCMs are required for the quadruple engine installation with single station on a boat.

Also four BCMs are required for the quadruple engine installation with dual station on a boat.

While communicating the BCM each other, the BCM controls to prevent mismatches between two engine groups that are the port and port center engines and the starboard and starboard center engines.

- On the dual station:

Neither main BCM for the PORT engine group nor sub-BCM for the STBD engine group communicate each other.

Similarly, neither main BCM for the STBD engine group nor sub BCM for the PORT engine group communicate each other.

About BCM

The BCM for quadruple engine installation (p/no.: 36770-98J22) which has communication function with other BCM is strictly designed for that system.

The BCM (p/no.: 36770-98J13) is for single, dual and triple engine installations.

Use the BCM and its quantity appropriate to the system.

The system doesn't work correctly when the incorrect BCM is used.

- When the BCM for quadruple engine installation (P/No.: 36770-98J22) is used on single, dual and triple engine installations, system error is indicated due to no communication can be made with other BCM. The system error indication is turning on the LED diagnostic lamp in the switch panel and beeping the buzzer. In this condition, there are no functions of changing station and throttle only.
- In reverse, when the BCM (P/No.: 36770-98J13) for single, dual and triple engine installations is used on quadruple engine installation, there is a possibility of mismatch to the functions of "changing station" and "throttle only" due to no communication between two port side engine group and two starboard side engine one.

Example of mismatches;

- (1) When changing station to the 2nd one from the 1st one at the starboard and starboard center engine group, they can be controlled by the 2nd station but can't do to the port and port center engine group.
- (2) When selecting the throttle only function at the starboard and starboard center engine group, they can be controlled throttle only but can't do to the port and port center engine group.

3. Sub-Battery Cable

A sub-battery cable is required for each engine groups that are two port-side engines and two starboard-side ones.

- One sub-battery cable for the group of port and port center engines.
- Another sub-battery cable for the group of starboard and starboard center engines.

4. Battery

- One battery is required for each of the engines in the case of quadruple engine installation as the same manner for the other multiple engine installation.
- Connect the negative battery terminals of all batteries together to maintain the BCM power source in the case of multiple engine installation.
- Use a negative cable mentioned above with AWG 2 or larger thickness (lower gauge number) to connect the negative terminals of each engine batteries.

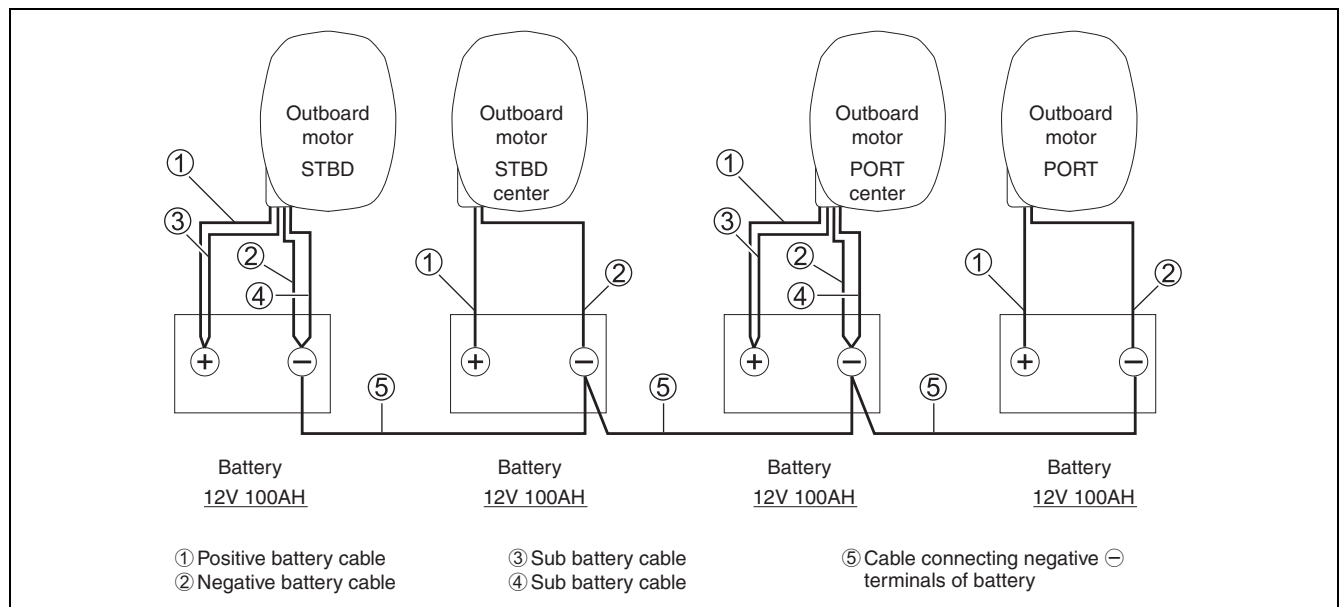
NOTE:

In multiple-motor installation, to maintain the BCM power source, all of the negative battery terminals should be connected together.

⚠ WARNING

Failure to follow these instructions may cause the wire to overheat and a fire may result.

Use a cable with AWG (American Wire Gauge) number 2 or larger thickness (lower gauge number) to connect the negative battery terminal.



5. System Wiring

Refer to page 65, 67 for the wiring of the system.

6. Electronic Calibration for the System

The electronic calibration is the same way as for the dual engine installation with single station and the dual engine installation with dual station. In other words, the electronic calibration for quadruple engine installation is equal in two times of that for dual engine installation.

- Calibrate the group of port and port center engines first then the group of starboard and starboard center engines.
- Or calibrate the group of starboard and starboard center engines first then the group of port and port center engines.

INSTALLATION OF SWITCH PANEL

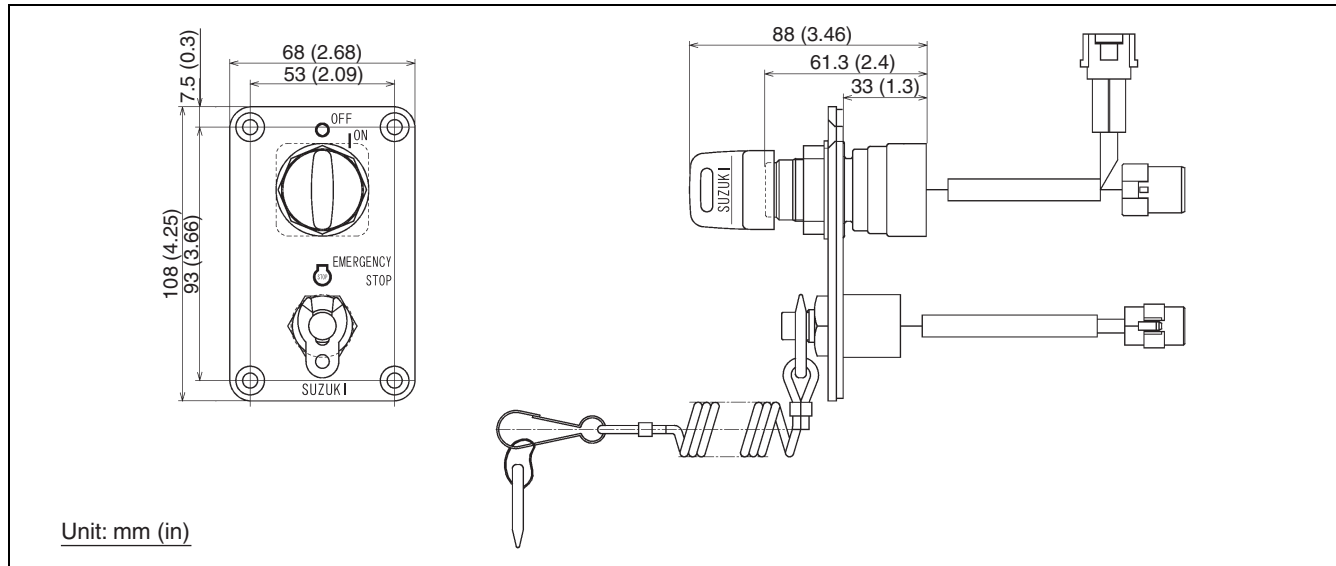
NOTICE

Installing the switch panel in an inappropriate location can result in switch failure or operating difficulties.

- Do not install the switch in a location where it is likely to be sprayed with water. Exposure to water can cause failure of the switch.
- Be sure to install the switch on the dashboard in a location that makes it convenient for the operator to use the switch. Avoid locating the switch where the operator's view of the switch is obstructed.

Install the emergency stop switch panel and main switch panel at an appropriate position on the dashboard. Installing dimensions are as shown in the figure below.

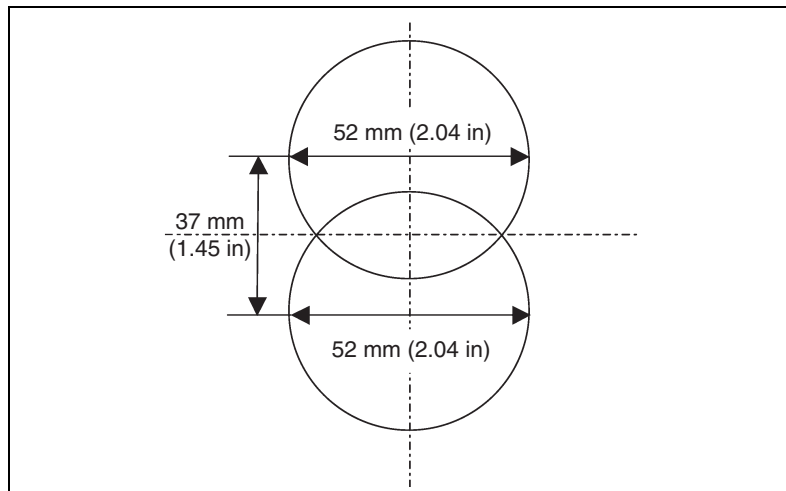
MAIN SWITCH PANEL ASSEMBLY



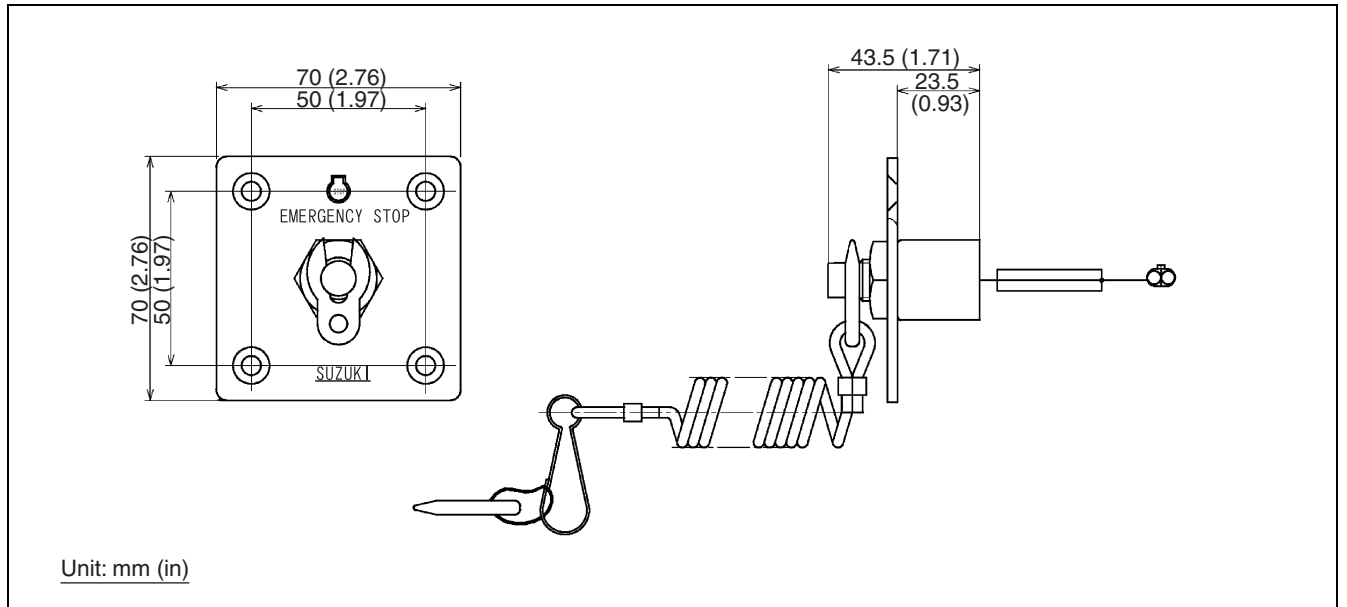
INSTALLING HOLE DIMENSIONS:

Make two (2) holes of 52 mm in diameter on the main switch panel assembly as shown in the figure below. Distance between centers of two (2) holes is 37 mm.

Fix the panel with four (4) screws.



EMERGENCY SWITCH PANEL ASSEMBLY

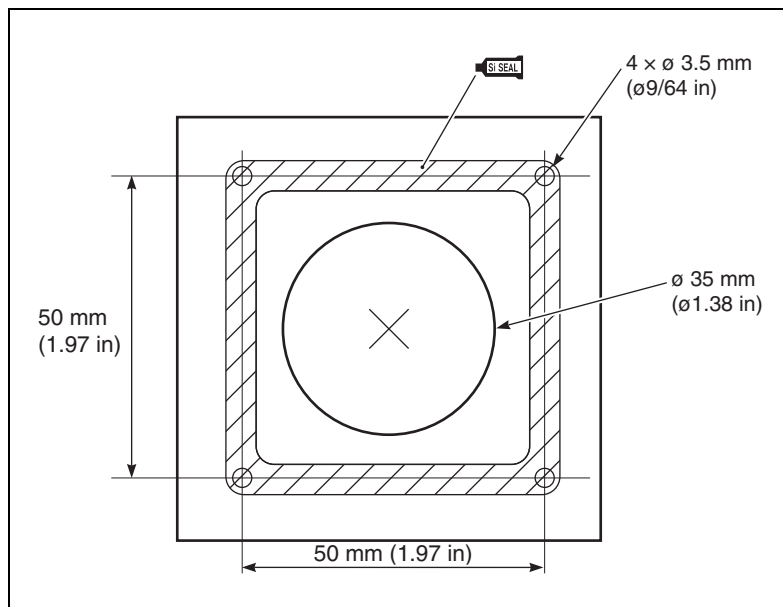


INSTALLING HOLE DIMENSIONS:

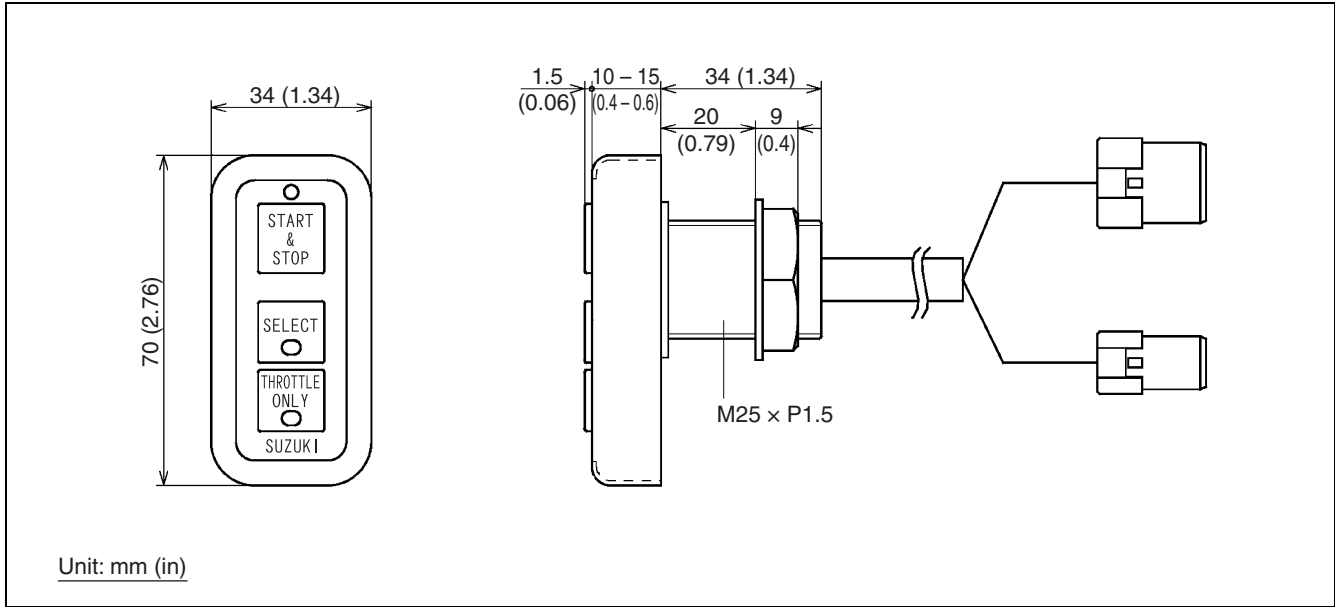
Make a hole of 35 mm in diameter on the emergency switch panel assembly and apply silicone seal as shown in the figure below.

Fix the panel with four (4) screws.

 **93691-80030: SUZUKI Silicone Seal (100 g)**

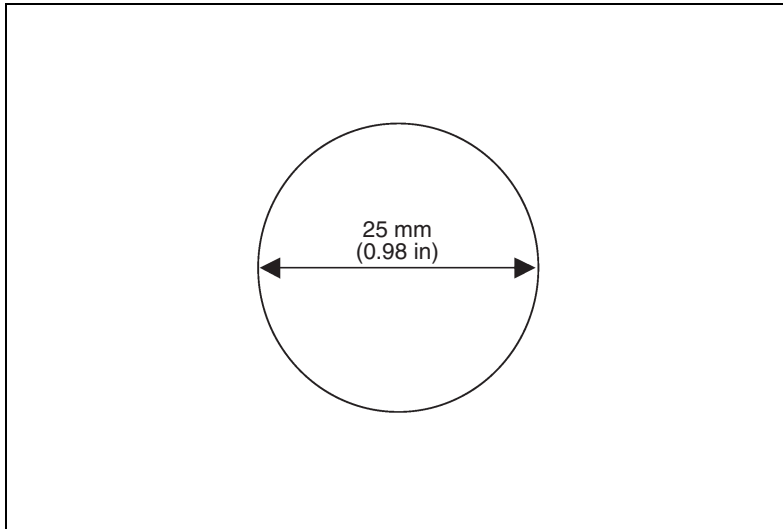


SINGLE SWITCH PANEL ASSEMBLY

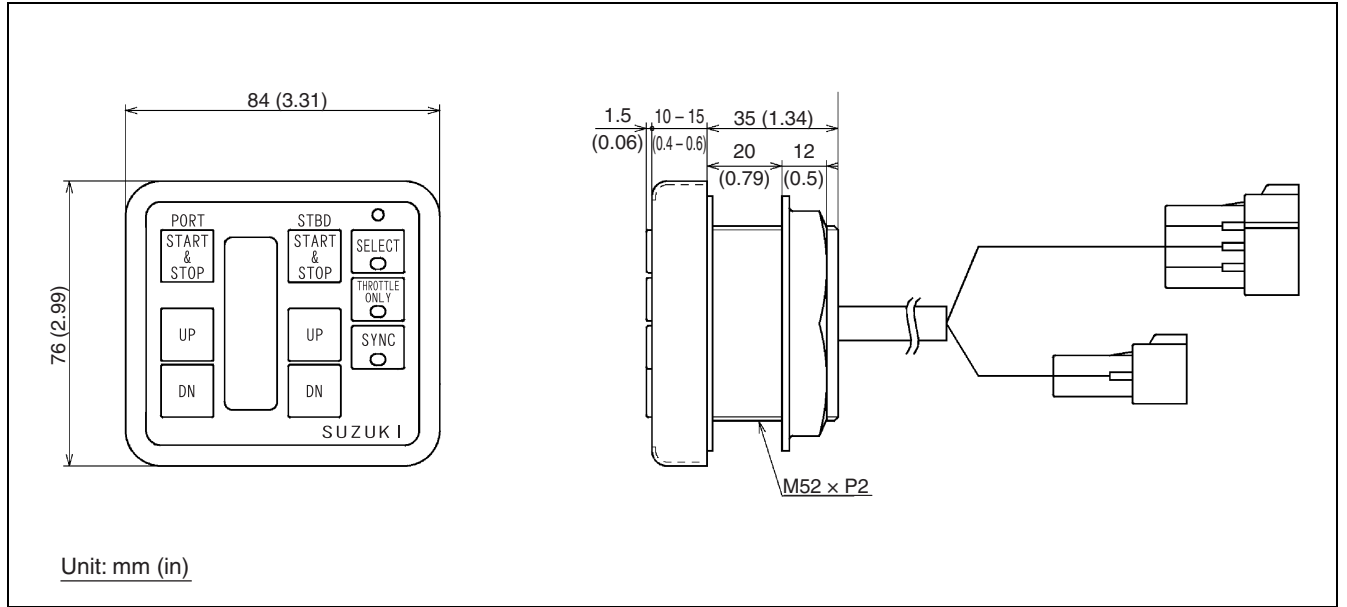


INSTALLING HOLE DIMENSIONS:

Make a hole of 25 mm in diameter on the single switch panel assembly as shown in the figure below. Fix the panel with a spin nut.

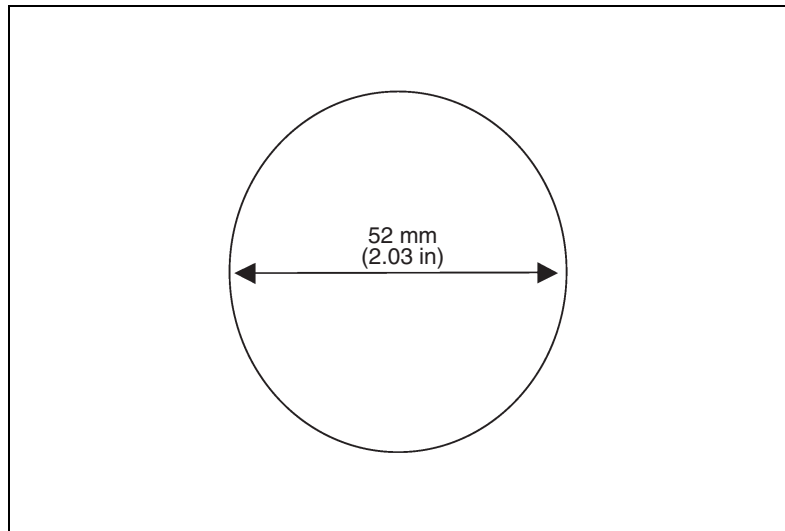


DUAL SWITCH PANEL ASSEMBLY

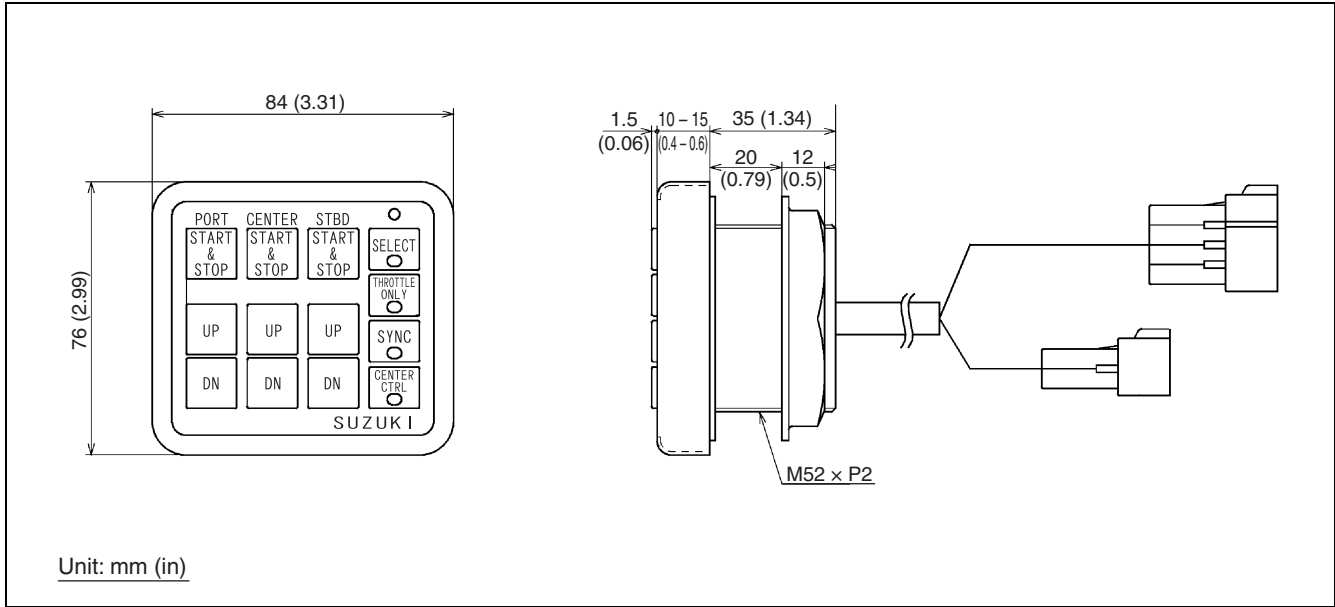


INSTALLING HOLE DIMENSIONS:

Make a hole of 52 mm in diameter on the dual switch panel assembly as shown in the figure below. Fix the panel with a spin nut.

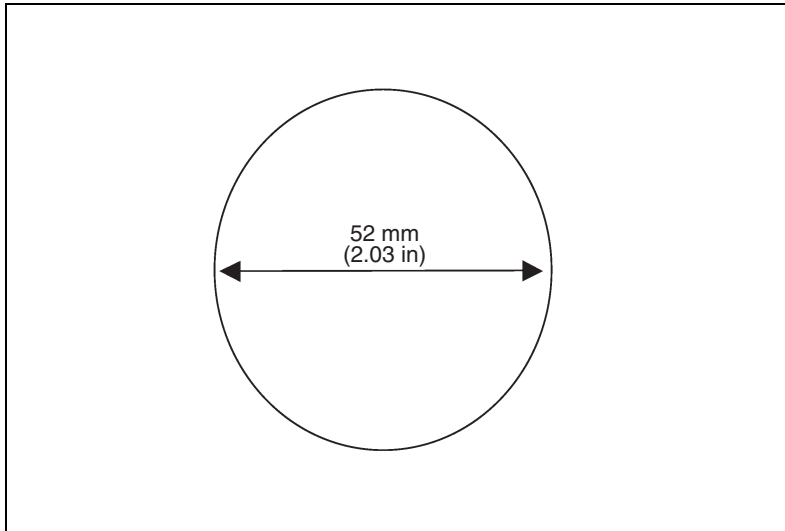


TRIPLE SWITCH PANEL ASSEMBLY

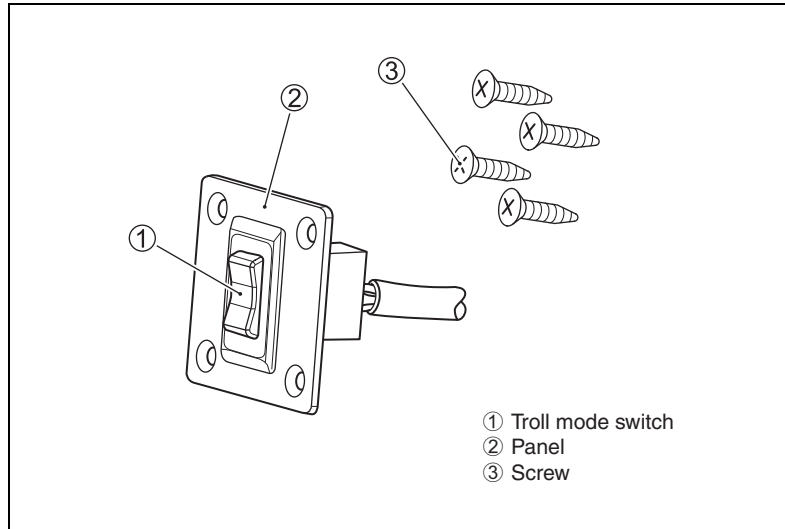


INSTALLING HOLE DIMENSIONS:

Make a hole of 52 mm in diameter on the triple switch panel assembly as shown in the figure below. Fix the panel with a spin nut.



TROLL MODE SWITCH



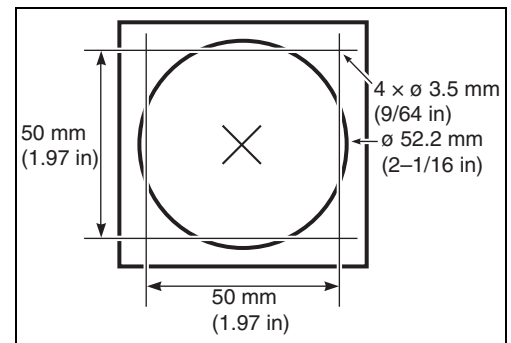
INSTALLATION

- (1) Using hole saw and drill bit, drill hole through the dash panel at the location (X) shown.

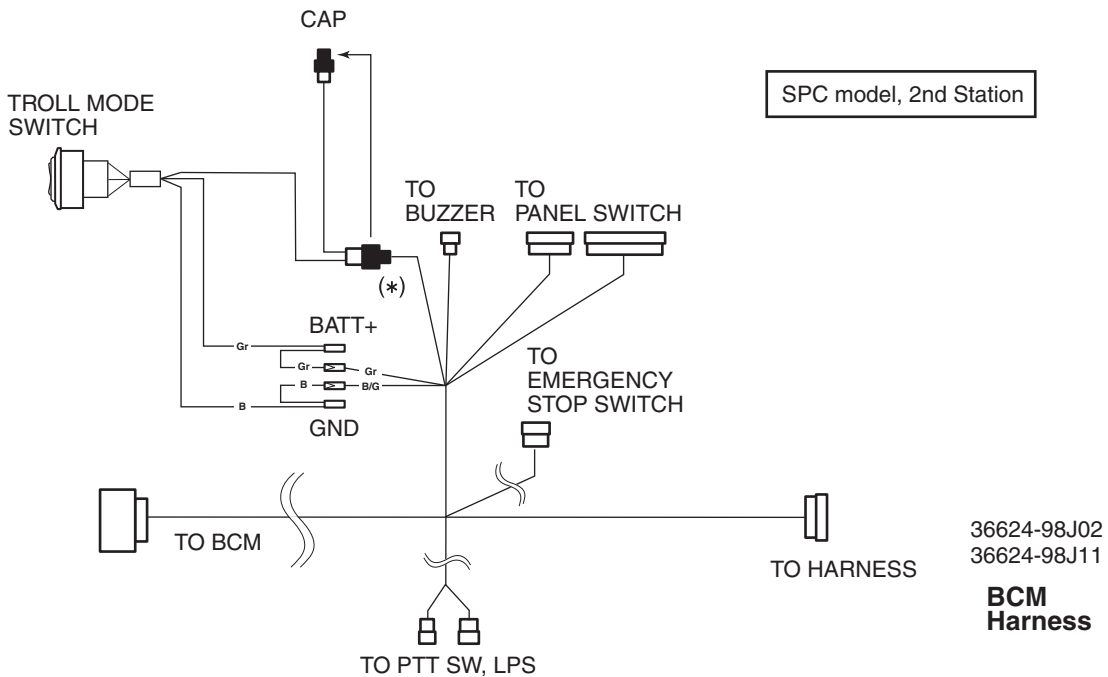
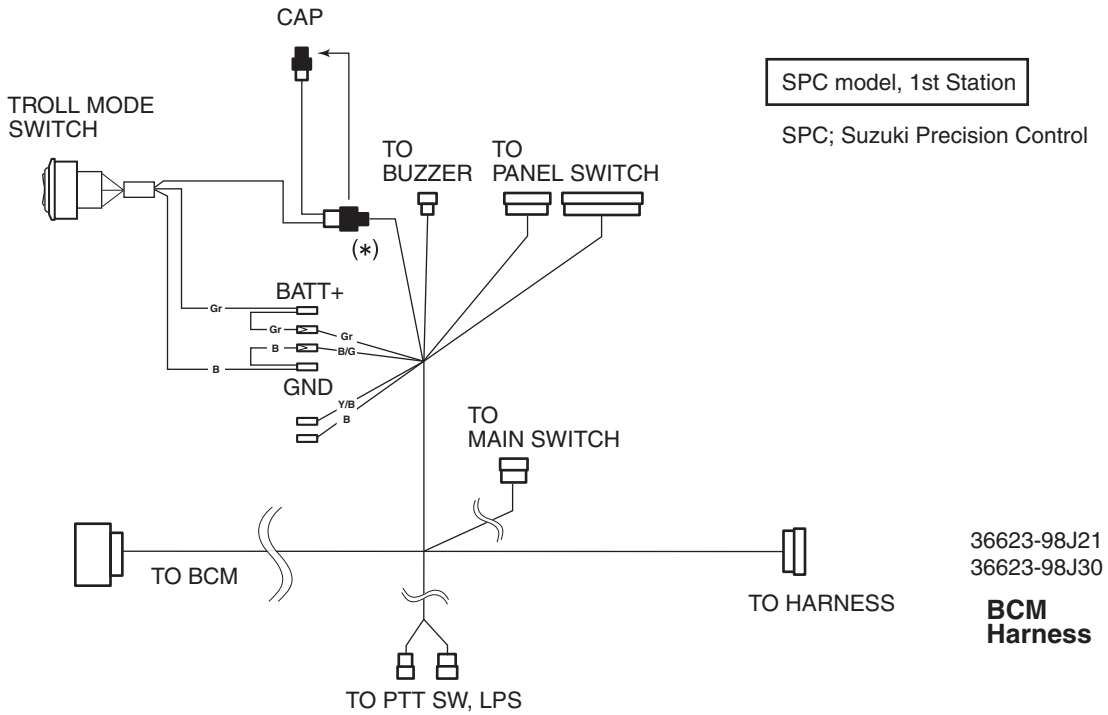
Required tool

- 52.2 mm (2-1/16 in) Hole saw
- 3.5 mm (9/64 in) Drill bit
- Electric drill

- (2) Connect the leads, matching their color, as shown in the illustration. (Refer to next page.)
- (3) Attach the panel to the dashboard with the screws.



WIRE CONNECTION



SPC model;
A "Cap" is connected to the (*) marked connector in the "BCM Harness".
When the "Troll Mode Switch" is installed, it is necessary to remove the "Cap"
from the (*) marked connector.
The removed "Cap" should be used as the plug for the unused connector.

NOTE:
The unused connector is for the "Analog Trim Meter".
Therefore, it is not used for the SPC model.

INSTALLATION OF BCM (Boat control module)

NOTICE

Installing and routing the harness of SPC system components in an inappropriate location can result in system failure.

Be sure to take the following precautions:

- Avoid installing the BCM where it will be exposed to direct sun.
- Install the BCM in a dry location, as far as possible from where it might get splashed with water.
- Install the BCM so that the connector faces downward.
- Install the BCM on a flat surface so it will not fall off during boating.

The following conditions must be observed when installing BCM.

- Install in a dry protected area.
- Area selected for installation must not exceed 75 °C (167 °F)
- Anchor BCM to a flat solid surface.

NOTE:

Engine will not start with improper combination of BCM and ECM.

In this case:

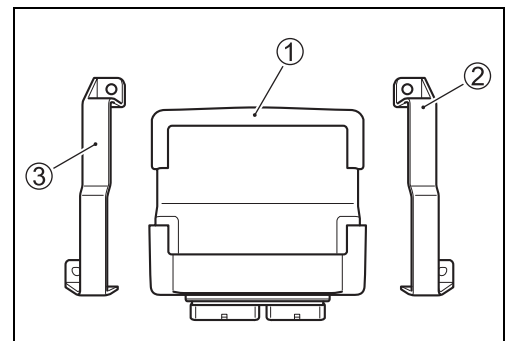
- Caution buzzer sounds
- Gauge screen indicates "Check Control Unit C"
- Engine cranking does not take place

For this model, BCM must be used with the following part number.

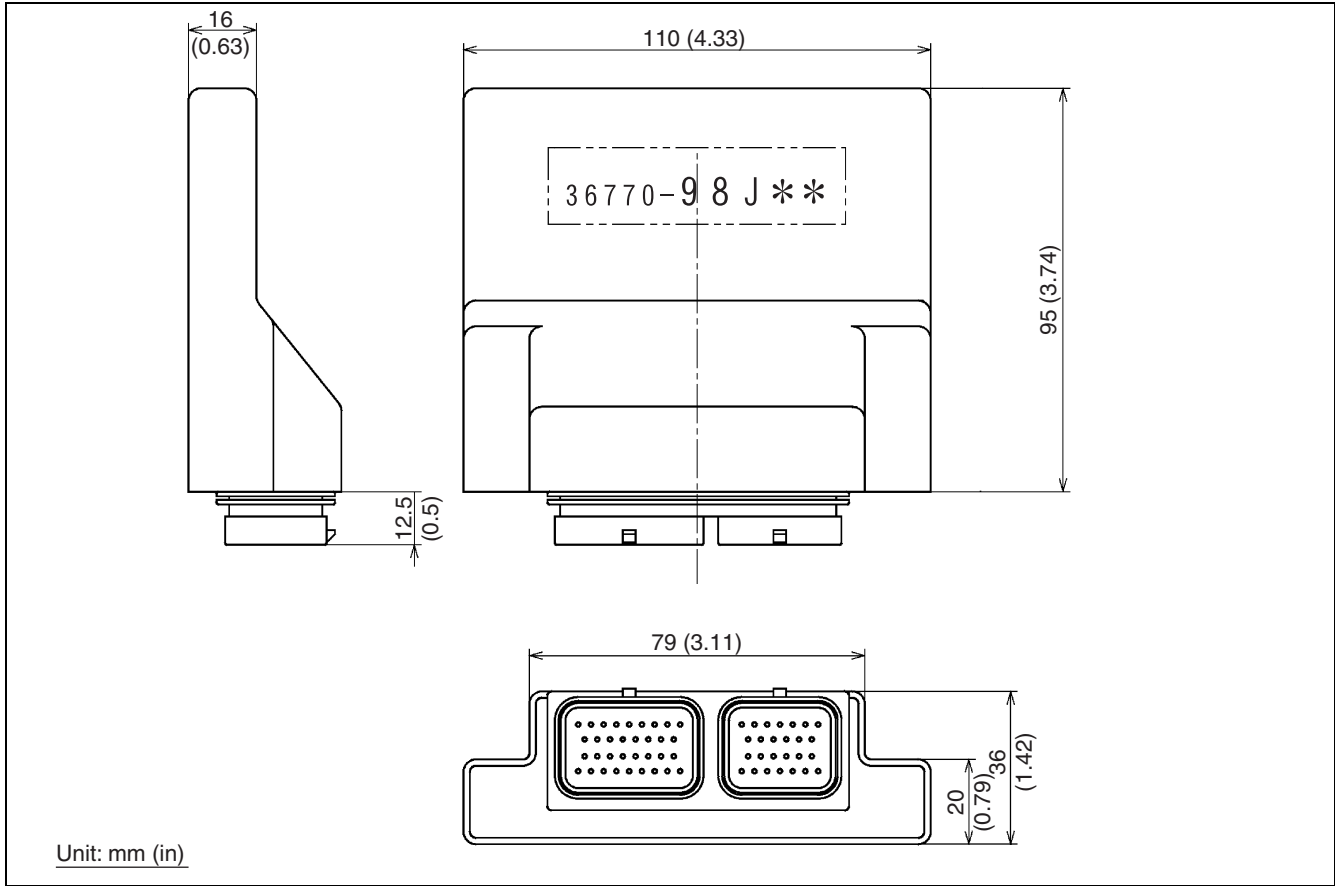
For single, dual and triple engine installation: P/N: 36770-98J13 and later

For quadruple engine installation: P/N: 36770-98J22 and later

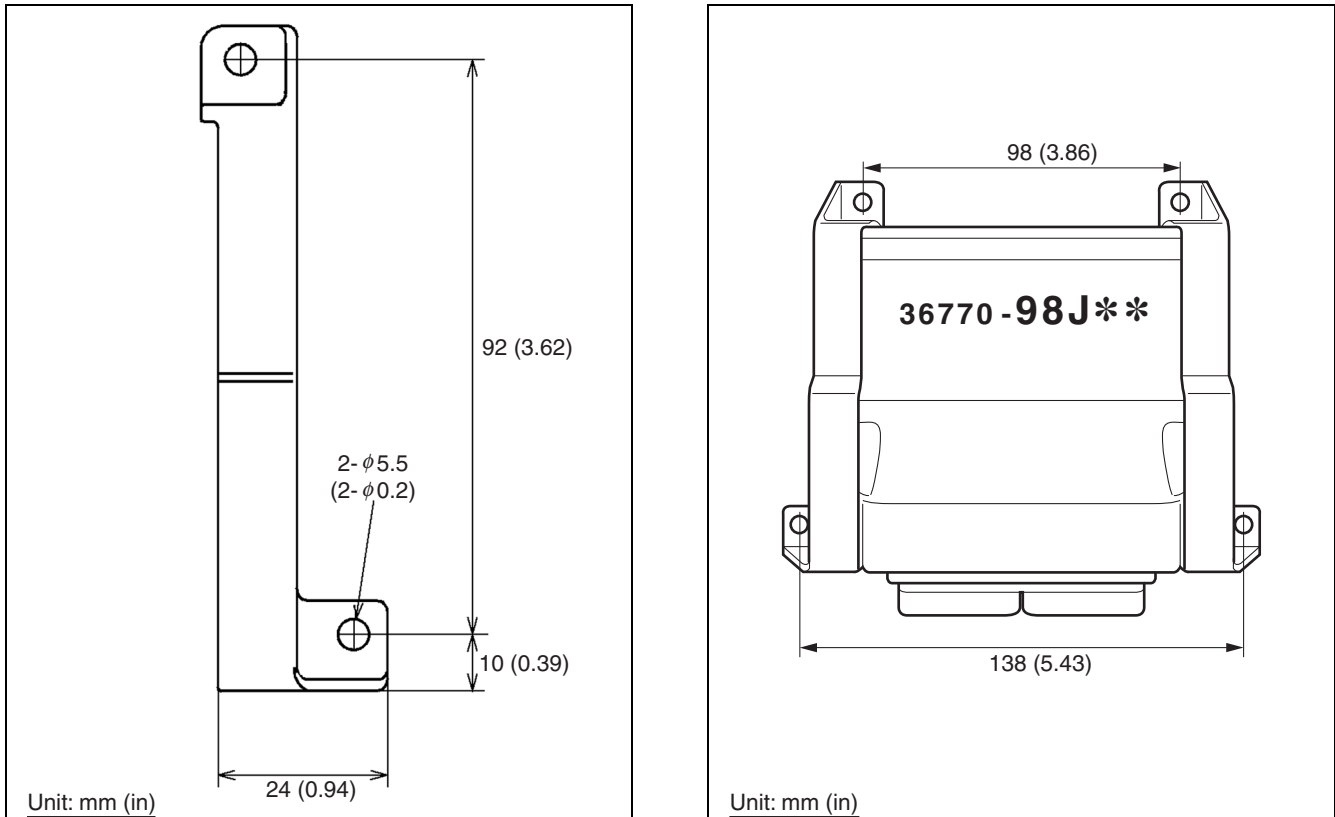
- (1) Install the cushion ① to the BCM (boat control module).
- (2) Install the holder R ② and holder L ③ to the BCM and install the BCM with four (4) screws.



BCM (Boat Control Module)

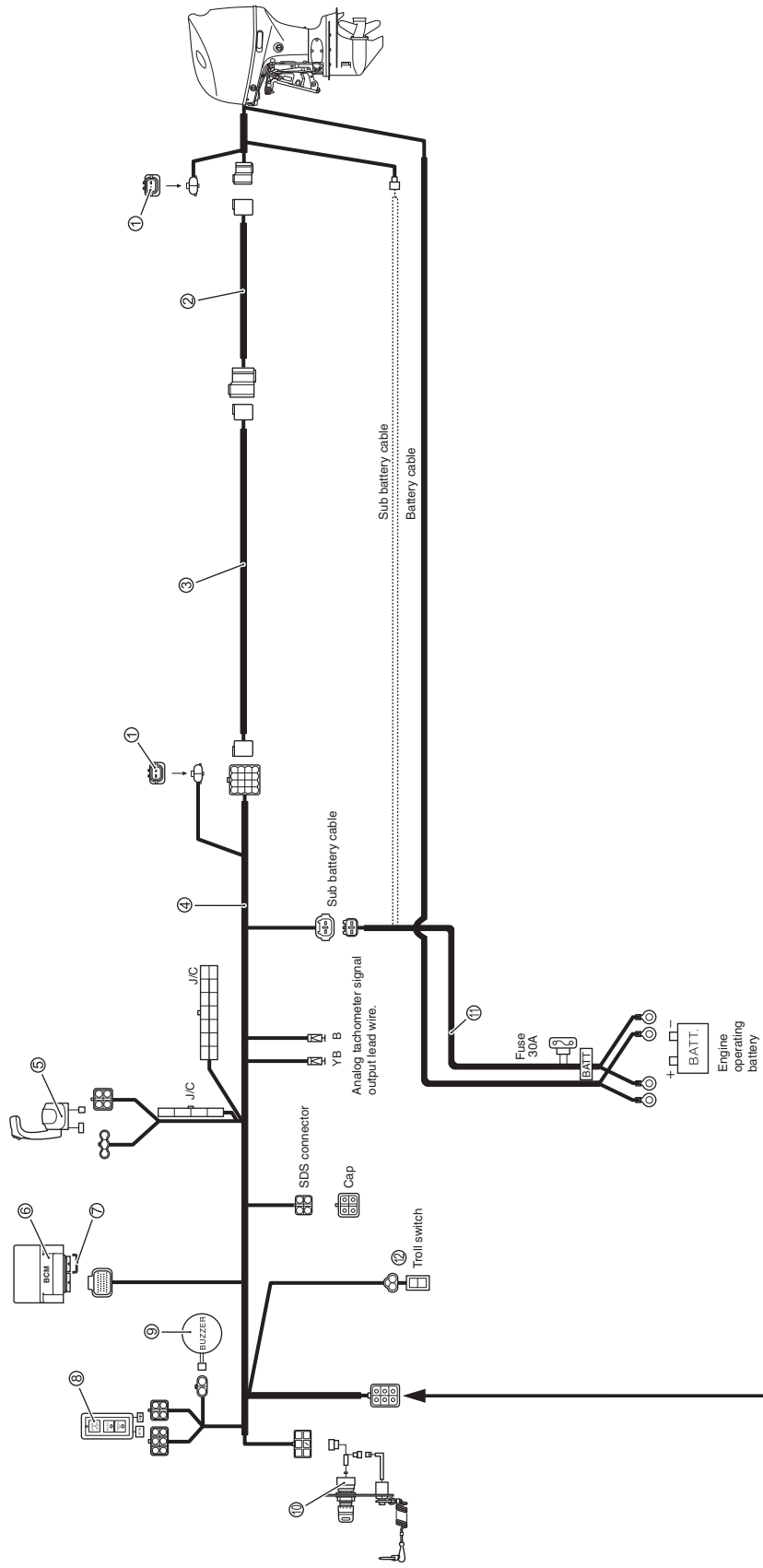


BCM (Boat Control Module) holder L/R



WIRING

SINGLE ENGINE – SINGLE STATION

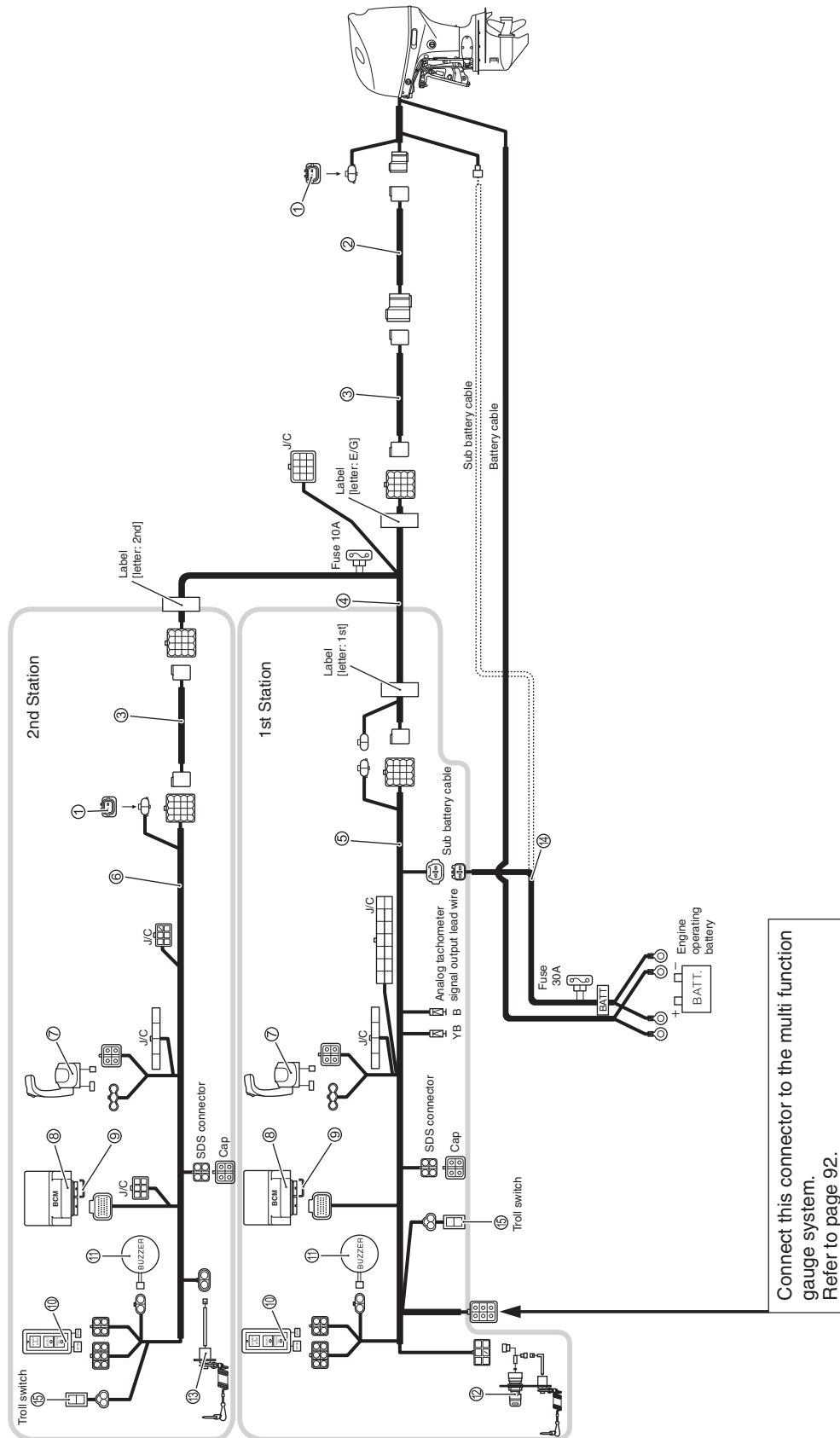


Connect this connector to the multi function gauge system.
Refer to page 91.

[Single engine – Single station]

No.	Part Name	Part No.	Qty
①	Terminal resistor	33926-98J00	2
②	Remote control EXT wire assembly (2 m)	36620-98J51	(1)
③	Remote control wire assembly (6.5 m)	36620-98J31	1
	Remote control wire assembly (9.5 m)	36620-98J41	
④	BCM No.1 harness assembly, single	36623-98J21	1
⑤	Top mount remote control box	67200-98J06	1
⑥	BCM	36770-98J13	1
⑦	Rubber cap	33911-88BL0	1
⑧	Single switch panel assembly	37100-98J11	1
⑨	Caution buzzer	38500-93J90	1
⑩	Main switch panel	37100-98J07	1
⑪	Sub-Battery cable (2 m)	36625-98J10	1
⑫	Troll control switch	37860-87L00	1

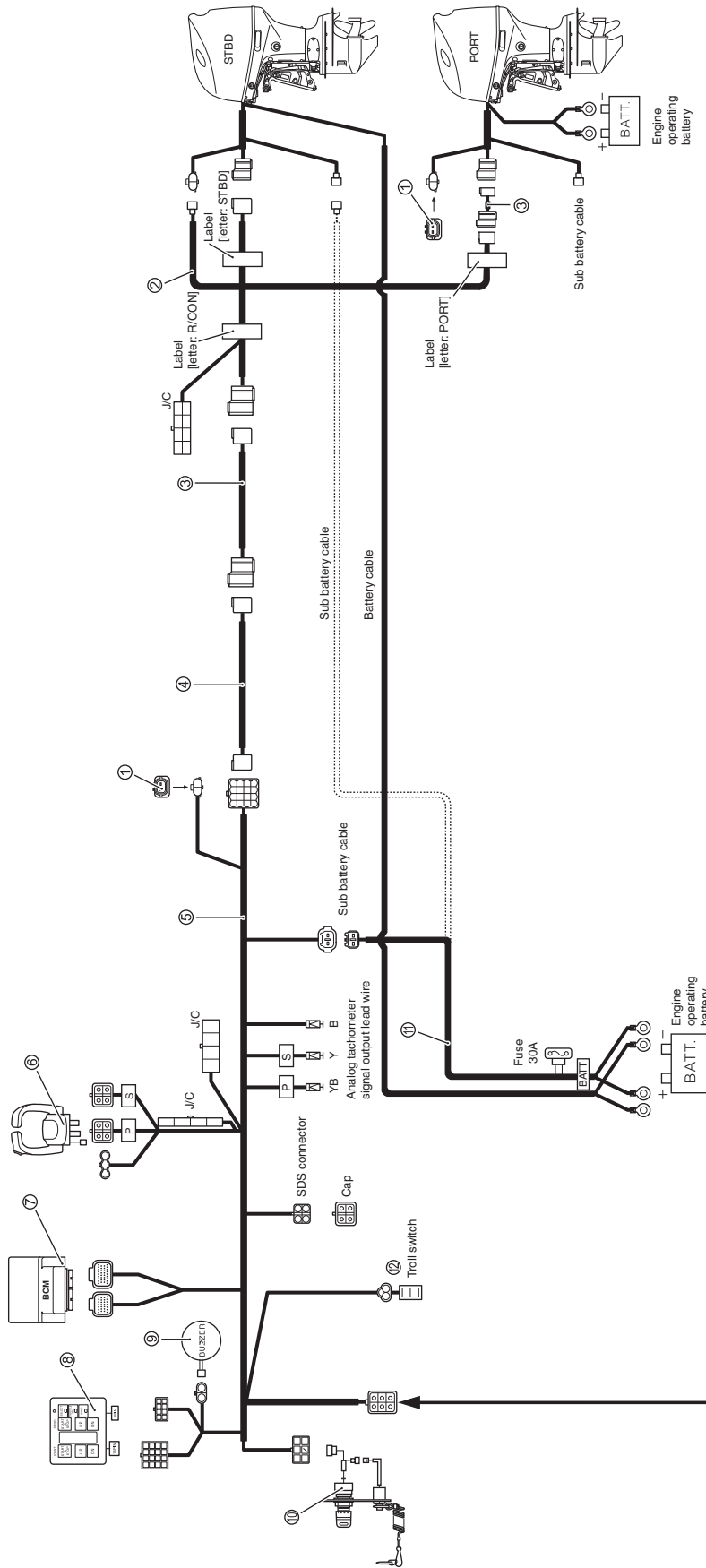
SINGLE ENGINE – DUAL STATIONS



[Single engine – Dual stations]

No.	Part Name	Part No.	Qty
①	Terminal resistor	33926-98J00	2
②	Remote control EXT wire assembly (2 m)	36620-98J51	(1)
③	Remote control wire assembly (6.5 m)	36620-98J31	2
	Remote control wire assembly (9.5 m)	36620-98J41	
④	Dual station main harness assembly	36622-98J00	1
⑤	BCM No.1 harness assembly, single	36623-98J21	1
⑥	BCM No.2 harness assembly, single	36624-98J02	1
⑦	Top mount remote control box	67200-98J06	2
⑧	BCM	36770-98J13	2
⑨	Rubber cap	33911-88BL0	2
⑩	Single switch panel assembly	37100-98J11	2
⑪	Caution buzzer	38500-93J90	2
⑫	Main switch panel	37100-98J07	1
⑬	Emergency stop switch panel	37803-93J06	1
⑭	Sub-Battery cable (2 m)	36625-98J10	1
⑮	Troll control switch	37860-87L00	2

DUAL ENGINES – SINGLE STATION

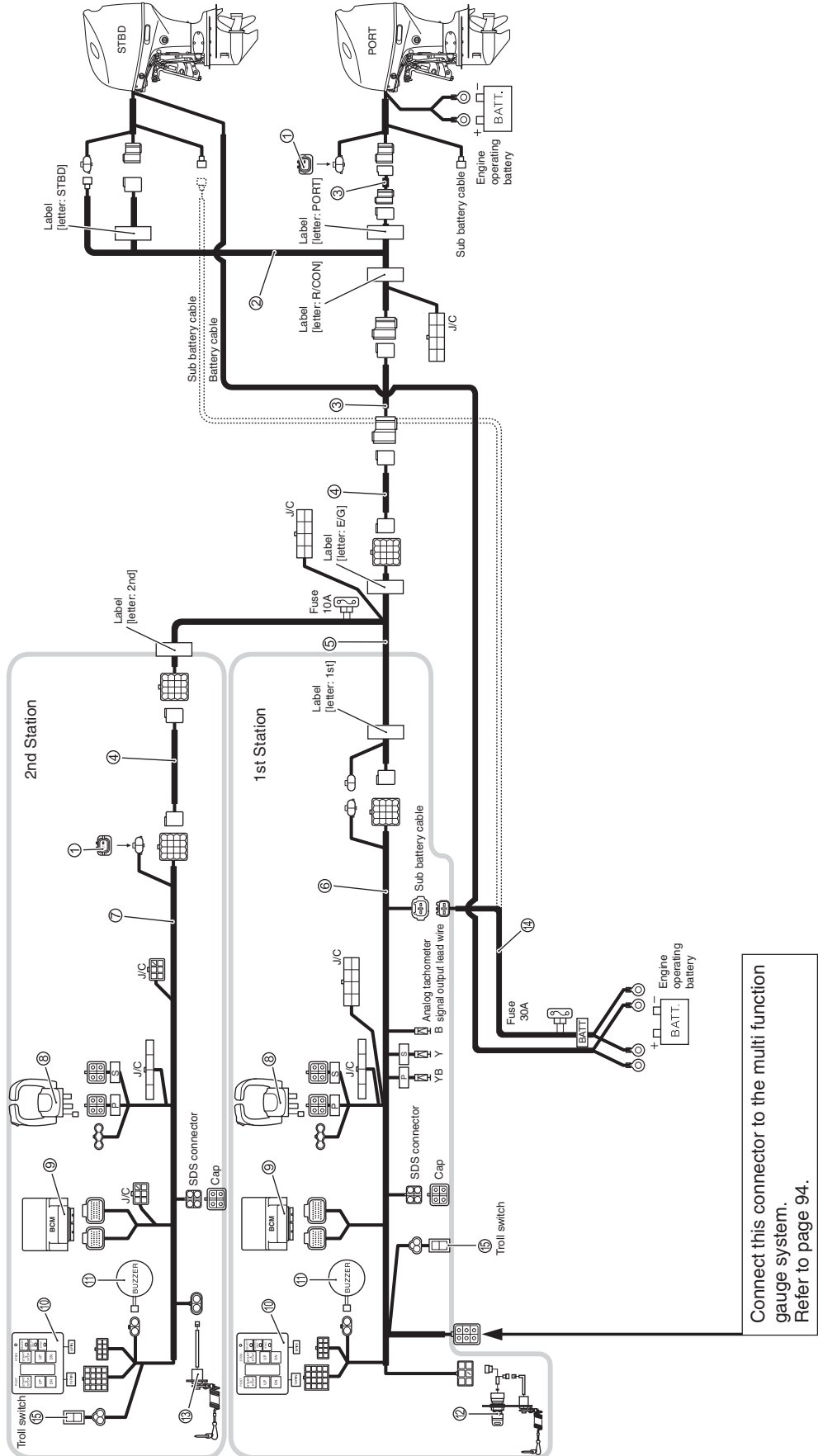


Connect this connector to the multi function gauge system.
Refer to page 93.

[Dual engines – Single station]

No.	Part Name	Part No.	Qty
①	Terminal resistor	33926-98J00	2
②	Dual engine harness assembly	36621-98J00	1
③	Remote control EXT wire assembly (2 m)	36620-98J51	(2)
④	Remote control wire assembly (6.5 m)	36620-98J31	1
	Remote control wire assembly (9.5 m)	36620-98J41	
⑤	BCM No.1 harness assembly, multi	36623-98J30	1
⑥	Top mount remote control box, Twin	67200-98J16	1
⑦	BCM	36770-98J13	1
⑧	Dual switch panel assembly	37100-98J21	1
⑨	Caution buzzer	38500-93J90	1
⑩	Main switch panel	37100-98J07	1
⑪	Sub-Battery cable (2 m)	36625-98J10	1
⑫	Troll control switch	37860-87L00	1

DUAL ENGINES – DUAL STATIONS

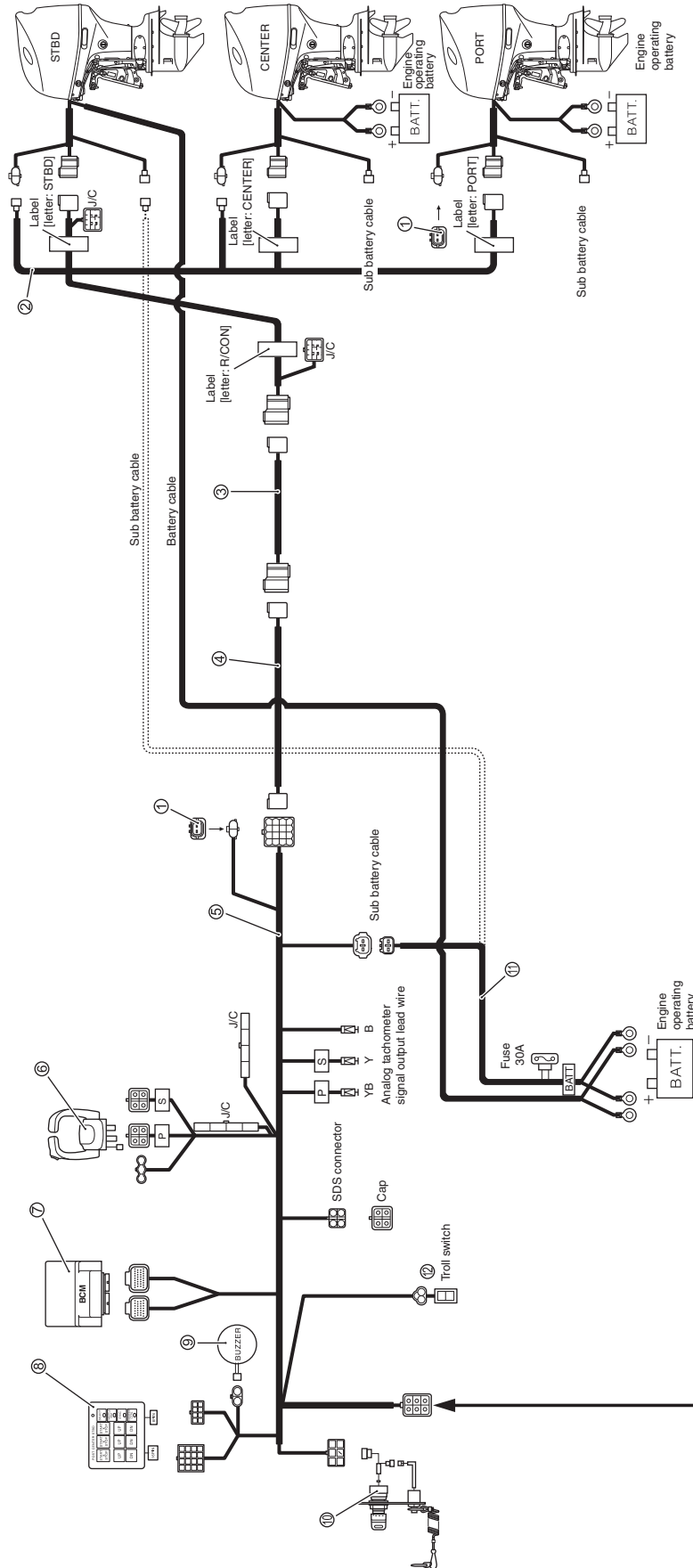


Connect this connector to the multi function gauge system. Refer to page 94.

[Dual engines – Dual stations]

No.	Part Name	Part No.	Qty
①	Terminal resistor	33926-98J00	2
②	Dual engine harness assembly	36621-98J00	1
③	Remote control EXT wire assembly (2 m)	36620-98J51	(2)
④	Remote control wire assembly (6.5 m)	36620-98J31	2
	Remote control wire assembly (9.5 m)	36620-98J41	
⑤	Dual station main harness assembly	36622-98J00	1
⑥	BCM No.1 harness assembly, multi	36623-98J30	1
⑦	BCM No.2 harness assembly, multi	36624-98J11	1
⑧	Top mount remote control box, Twin	67200-98J16	2
⑨	BCM	36770-98J13	2
⑩	Dual switch panel assembly	37100-98J21	2
⑪	Caution buzzer	38500-93J90	2
⑫	Main switch panel	37100-98J07	1
⑬	Emergency stop switch panel assembly	37803-93J06	1
⑭	Sub-Battery cable (2 m)	36625-98J10	1
⑮	Troll control switch	37860-87L00	2

TRIPLE ENGINES – SINGLE STATION

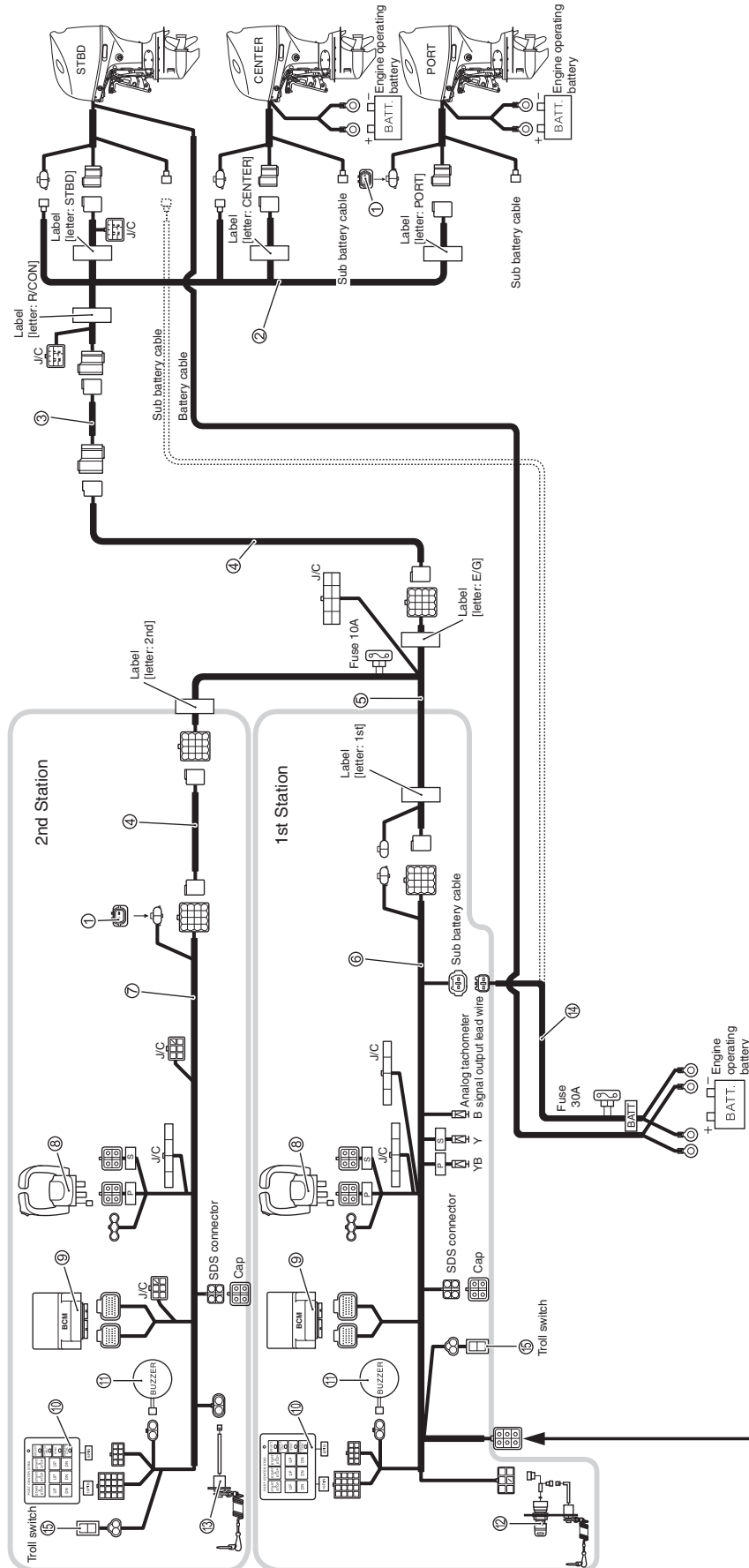


Connect this connector to the multi function gauge system. Refer to page 95.

[Triple engines – Single station]

No.	Part Name	Part No.	Qty
①	Terminal resistor	33926-98J00	2
②	Triple engine harness assembly	36621-98J10	1
③	Remote control EXT wire assembly (2 m)	36620-98J51	(1)
④	Remote control wire assembly (6.5 m)	36620-98J31	1
	Remote control wire assembly (9.5 m)	36620-98J41	
⑤	BCM No.1 harness assembly, multi	36623-98J30	1
⑥	Top mount remote control box, Twin	67200-98J16	1
⑦	BCM	36770-98J13	1
⑧	Triple switch panel assembly	37100-98J31	1
⑨	Caution buzzer	38500-93J90	1
⑩	Main switch panel assembly	37100-98J07	1
⑪	Sub-Battery cable (2 m)	36625-98J10	1
⑫	Troll control switch	37860-87L00	1

TRIPLE ENGINES – DUAL STATIONS

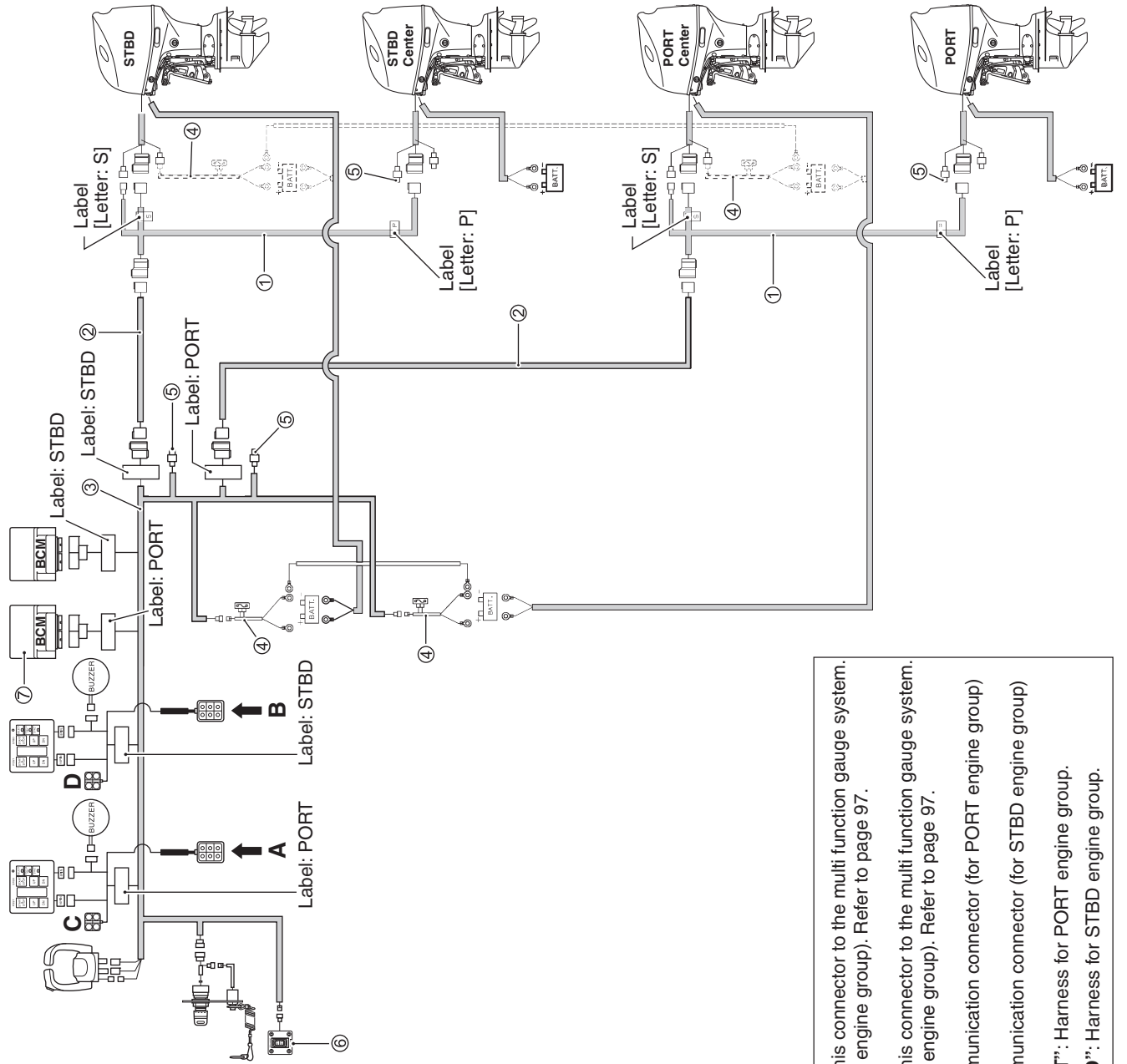


Connect this connector to the multi function gauge system. Refer to page 96.

[Triple engines – Dual stations]

No.	Part Name	Part No.	Qty
①	Terminal resistor	33926-98J00	2
②	Triple engine harness assembly	36621-98J10	1
③	Remote control EXT wire assembly (2 m)	36620-98J51	(1)
④	Remote control wire assembly (6.5 m)	36620-98J31	2
	Remote control wire assembly (9.5 m)	36620-98J41	
⑤	Dual station main harness assembly	36622-98J00	1
⑥	BCM No.1 harness assembly, multi	36623-98J30	1
⑦	BCM No.2 harness assembly, multi	36624-98J11	1
⑧	Top mount remote control box, Twin	67200-98J16	2
⑨	BCM	36770-98J13	2
⑩	Triple switch panel assembly	37100-98J31	2
⑪	Caution buzzer	38500-93J90	2
⑫	Main switch panel	37100-98J07	1
⑬	Emergency stop switch panel assembly	37803-93J06	1
⑭	Sub-Battery cable (2 m)	36625-98J10	1
⑮	Troll control switch	37860-87L00	2

QUADRUPLE ENGINES – SINGLE STATION



- A:** Connect this connector to the multi function gauge system. (for PORT engine group). Refer to page 97.
- B:** Connect this connector to the multi function gauge system. (for STBD engine group). Refer to page 97.
- C:** SDS communication connector (for PORT engine group)
- D:** SDS communication connector (for STBD engine group)
- “Label PORT”: Harness for PORT engine group.
- “Label STBD”: Harness for STBD engine group.

Quadruple engines – Single station

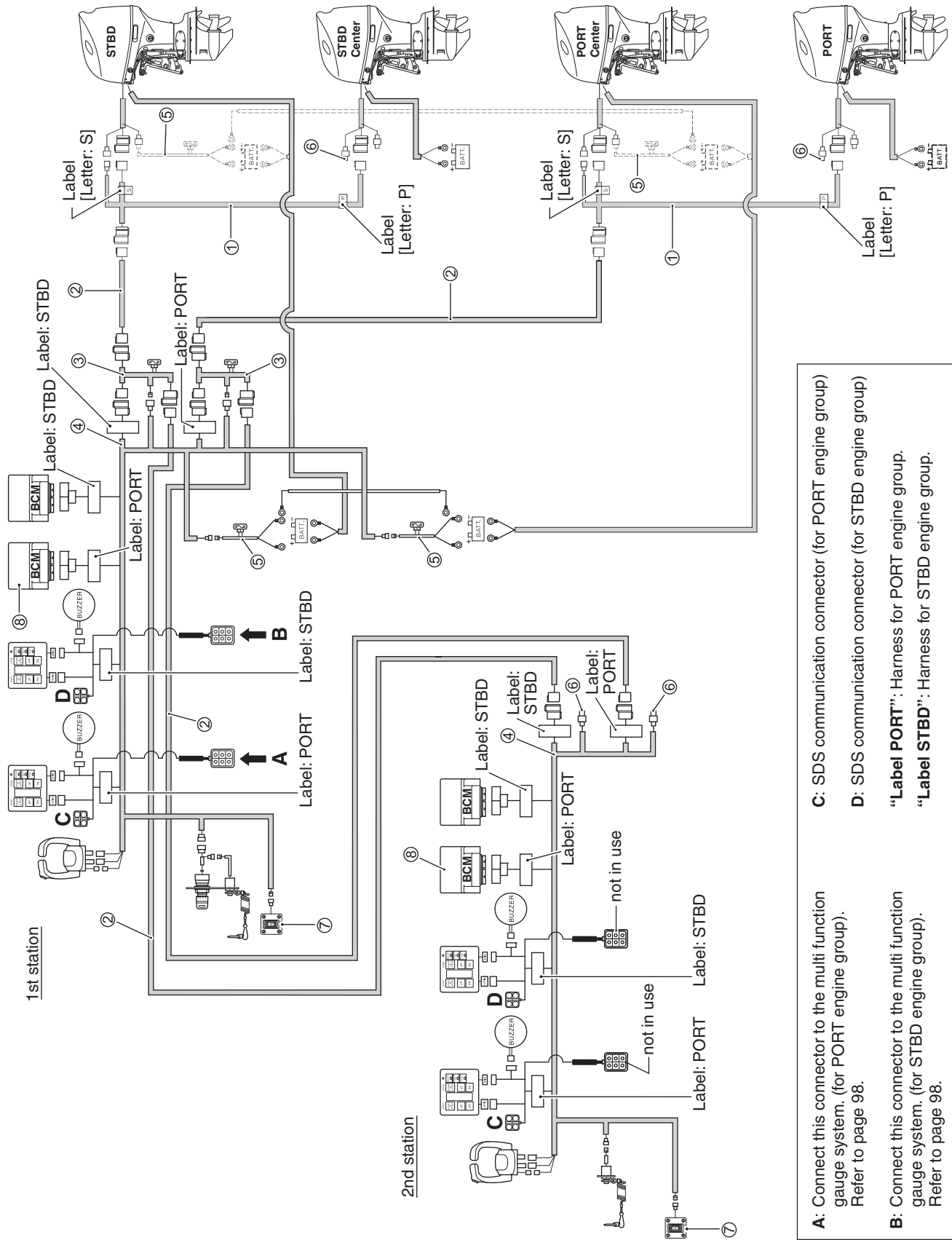
No.	Part Name	Part No.
①	Dual engine harness	36621-98J00
②	Remote control wire (6.5 m)	36620-98J31
	Remote control wire (9.5 m)	36620-98J41
③	BCM Quadruple harness	36623-98J40
④	Sub-Battery cable (2 m)	36625-98J10
⑤	Terminal resistor	33926-98J00
⑥	Troll control switch	37860-87L00
⑦	BCM	36770-98J22

Quadruple engine & Single station Kit

Part Number: 67000-98J76

Part Name	Part No.	Qty
Quadruple engine & Single station Kit	67000-98J77	1
• BCM cushion	• 33925-93J00	2
• Terminal resistor	• 33926-98J00	4
• Dual engine harness	• 36621-98J00	2
• BCM Quadruple harness	• 36623-98J40	1
• Sub-Battery cable (2 m)	• 36625-98J10	2
• BCM	• 36770-98J22	2
• BCM holder (L)	• 36775-98J00	2
• BCM holder (R)	• 36776-98J00	2
• Main switch panel assembly	• 37100-98J07	1
• Dual switch panel	• 37100-98J21	2
• Caution buzzer	• 38500-93J90	2
• Dual remote control box	• 67200-98J16	1
• Harness clamp	• 09403-13402	20
• Buzzer clamp	• 09407-08401	2

QUADRUPLE ENGINES – DUAL STATIONS



- A:** Connect this connector to the multi function gauge system. (for PORT engine group). Refer to page 98.
- B:** Connect this connector to the multi function gauge system. (for STBD engine group). Refer to page 98.
- C:** SDS communication connector (for PORT engine group)
- D:** SDS communication connector (for STBD engine group)
- “Label **PORT**”: Harness for PORT engine group.
- “Label **STBD**”: Harness for STBD engine group.

Quadruple engines – Dual stations

No.	Part Name	Part No.
①	Dual engine harness	36621-98J00
②	Remote control wire (6.5 m)	36620-98J31
	Remote control wire (9.5 m)	36620-98J41
③	Dual station harness	36622-98J00
④	BCM Quadruple harness	36623-98J40
⑤	Sub-Battery cable (2 m)	36625-98J10
⑥	Terminal resistor	33926-98J00
⑦	Troll control switch	37860-87L00
⑧	BCM	36770-98J22

Quadruple engine & Dual station Kit

Part Number: 67000-98J86

Part Name	Part No.	Qty
Quadruple engine & Dual station Kit	67000-98J87	1
• BCM cushion	• 33925-93J00	2
• Dual station harness	• 36622-98J00	2
• BCM Quadruple harness	• 36623-98J40	1
• BCM	• 36770-98J22	2
• BCM holder (L)	• 36775-98J00	2
• BCM holder (R)	• 36776-98J00	2
• Dual switch panel	• 37100-98J21	2
• Emergency stop switch panel	• 37803-93J06	1
• Caution buzzer	• 38500-93J90	2
• Dual remote control box	• 67200-98J16	1
• Harness clamp	• 09403-13402	15
• Buzzer clamp	• 09407-08401	2

NOTE:

To set the quadruple engine – dual station system, single station kit for quadruple engine and dual station kit for quadruple engine are needed.

BATTERY

BATTERY REQUIREMENT

Suzuki recommends a 12-volt cranking-type lead acid battery for the DF115BG/140BG.

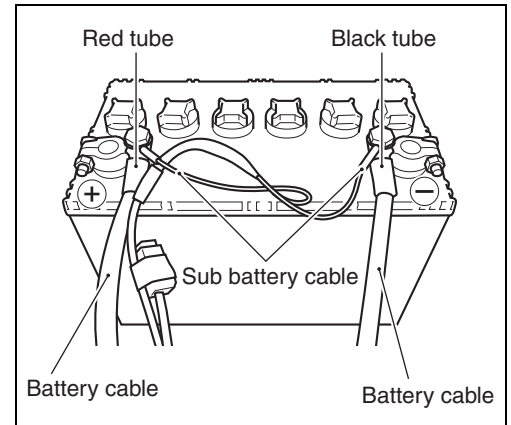
Minimum battery requirement for starting the engine is provided below.

The battery must satisfy one of the specifications described below.

**650 Marine Cranking Amps (MCA)/ABYC,
or 512 Cold Cranking Amps (CCA)/SAE
or 160 Reserve Capacity (RC) Minutes/SAE
or 12 V 100 AH**

NOTE:

- *The specifications listed above are the minimum battery rating requirements for starting the engine.*
- *If your boat application requires additional battery loads, it is recommended that an auxiliary battery or batteries be installed.*
- *Dual-purpose (Cranking/Deep Cycle) batteries can be used if they meet the minimum specifications listed above (MCA, CCA, or RC).*
- *Do not use a Deep Cycle battery for the main cranking battery.*
- *The use of Maintenance-Free, sealed, or Gel-Cell batteries is not recommended because they may not be compatible with Suzuki's charging system.*
- *When connecting batteries in parallel, they must be of the same type, capacity, manufacturer, and of similar age. When replacement is necessary, they should be replaced as a set.*



INSTALLATION OF BATTERY

⚠ WARNING

Failure to take proper precautions when handling the battery may cause severe injury.

Be sure to take the following precautions when handling the battery:

- Never expose the battery to open flames or electric sparks as batteries generate gas which is flammable and explosive.
- Do not place the battery near the fuel tank.
- Battery acid is poisonous and corrosive. Avoid contact with eyes, skin, clothing and painted surfaces. If you come in contact with battery acid, flush immediately with large amounts of water and seek immediate medical attention.
- Batteries should always be kept out of reach of children.
- When checking or servicing battery, disconnect the negative (black) cable. Be careful not to cause a short circuit by allowing metal objects to contact the battery posts and motor at the same time.
- Wear approved eye protection.

Store the battery free from splash of water, etc. and fix it securely to the hull with a battery band or the like to prevent it from falling down during boating.

NOTE:

It is recommended that the battery be installed in an enclosed battery case.

NOTE:

In the case of multiple engine installation, be sure to use a battery for an engine respectively.

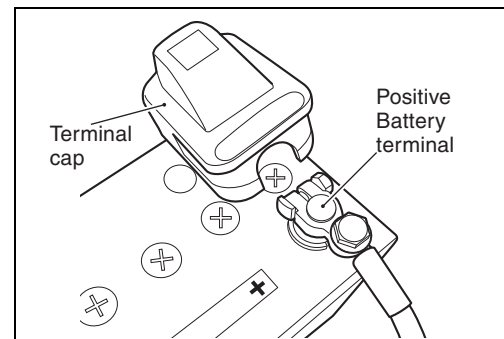
NOTE:

When extending the battery cable, use a cable of diameter larger than equivalence of AV20 (AWG4).

NOTE:

Suzuki recommends that the customer, dealer, or boat builder should install the terminal cap on the positive battery terminal to prevent an accidental short circuit of battery terminals.

If a terminal cap is required, contact your authorized Suzuki Marine Dealer.



CONNECTION OF BATTERY CABLE

- Connect the battery cable securely to the battery.
- Connect the battery cable and sub battery cable to the positive \oplus and negative \ominus terminals of the battery.

NOTE:

Connect the sub battery cable securely to the positive \oplus and negative \ominus terminals of the battery.

If the sub battery cable is not correctly connected to the battery, the engine cannot start (operate).

NOTE:

Locate the sub-battery cable fuse at visible place for easy maintenance to boat operator.

NOTICE

Failure at the battery connection will cause incorrect operation of the engine control system.

Be sure to take the following precautions:

- Ensure battery cable connections are clean and secure.
- Be sure to use hexagon nuts to secure battery cables to the battery terminals to avoid loss of electrical power.
- Do not use wing nuts to secure the battery cables.
- Check the nuts periodically for proper tightness.

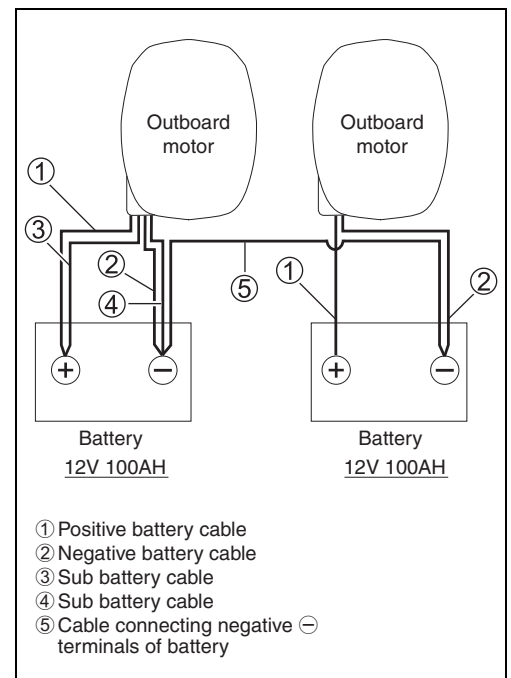
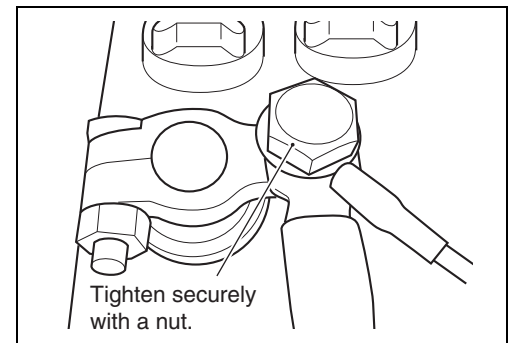
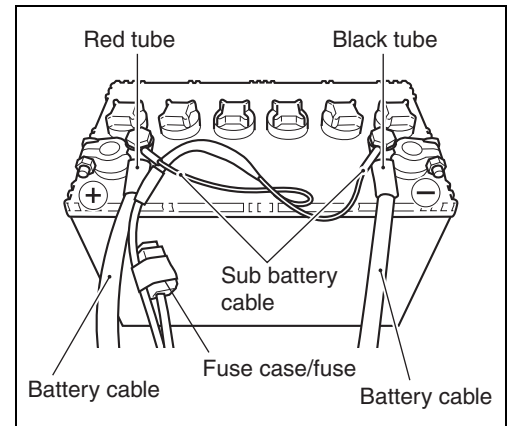
NOTE:

In multiple-motor installation, to maintain the BCM power source, all of the negative battery terminals should be connected together.

⚠ WARNING

Failure to follow these instructions may cause the wire to overheat and a fire may result.

Use a cable with AWG (American Wire Gauge) number 2 or larger thickness (lower gauge number) to connect the negative battery terminals.



SPC SYSTEM ELECTRONIC CALIBRATION

⚠ WARNING

Improper electronic calibration of the system will make this product and/or the system inoperable or unsafe for use.

Electronic calibration is required before use. After installation of this product, the Suzuki Precision Control System requires electronic calibration, which should be performed only by a person who has been specifically trained in the Suzuki Precision Control system.

To perform electronic calibration, a battery powered personal computer and the Suzuki Diagnostic System software Version 8.50/hardware must be used.

For the Suzuki Diagnostic System Version 8.50 operation, refer to “Suzuki Diagnostic System Version 8 Operation Manual.”

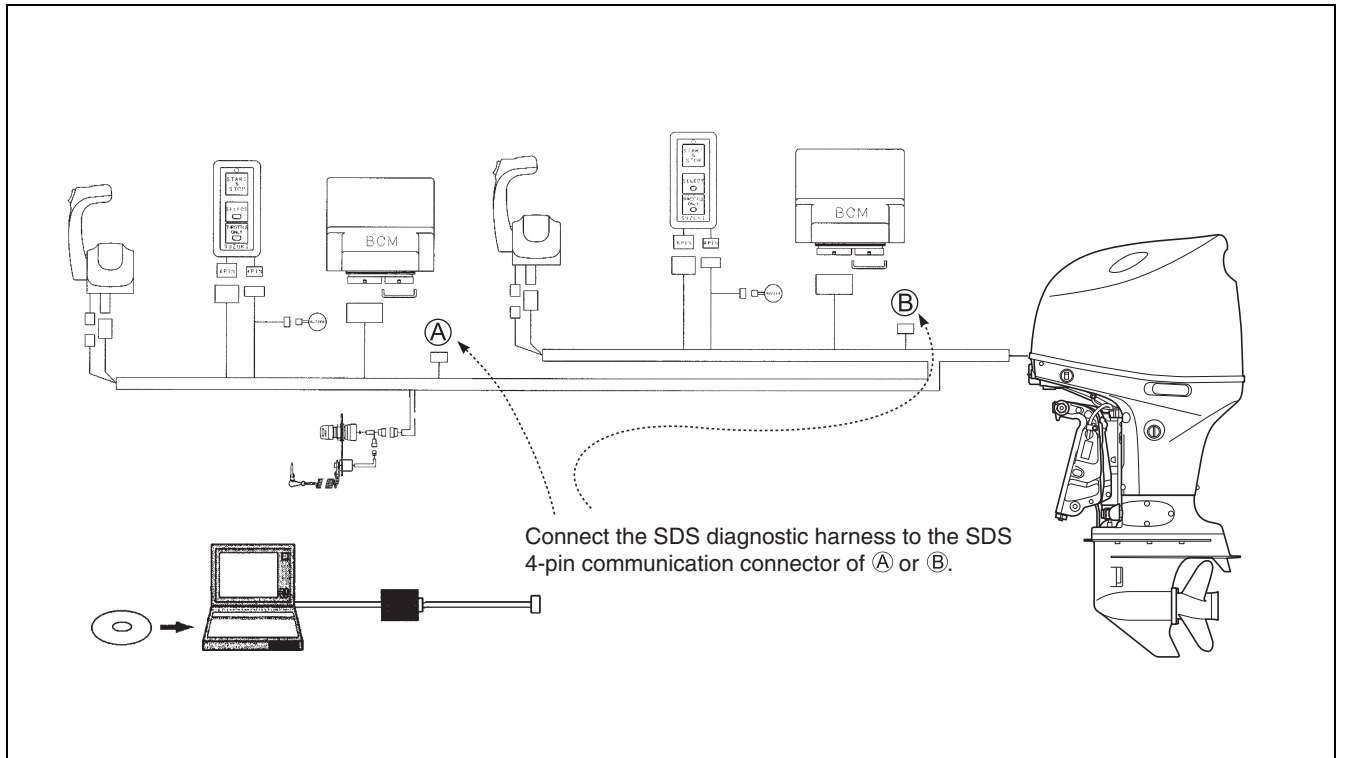
Required tool

The necessary tools are as follows.

Tool name	Part number	Q'ty
Suzuki Diagnostic System software Version 8.50 set	09933-19324	1
• Diagnostic harness		1
• USB adapter		1
• USB cable		1

CONNECTING PC AND BCM

- (1) Connect your PC to the BCM of the outboard motor by using the special tools.

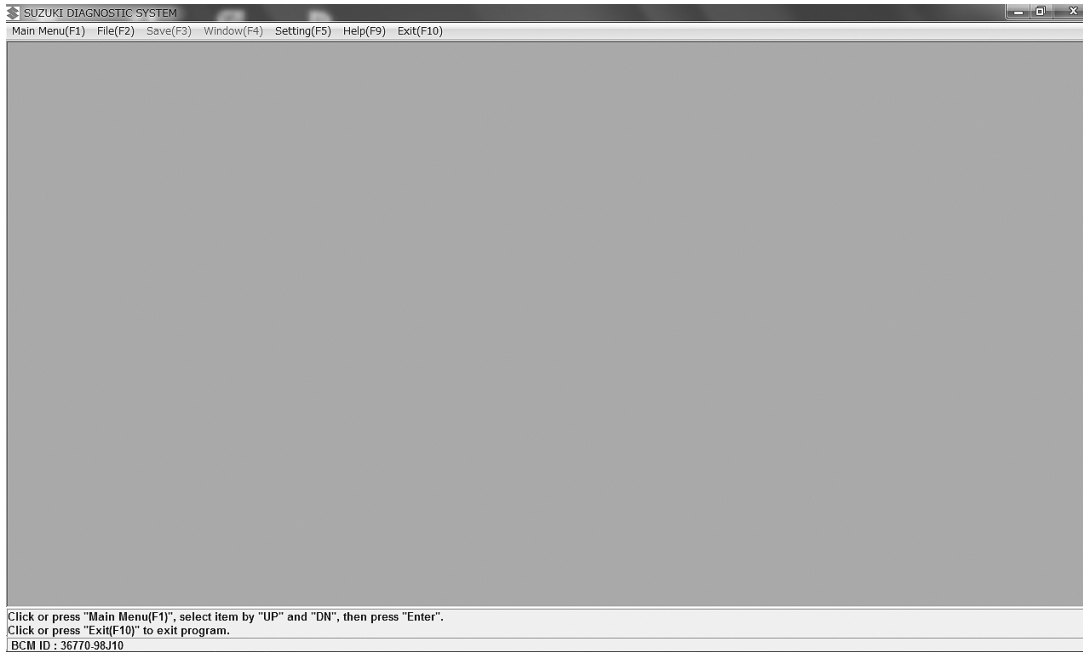


NOTE:

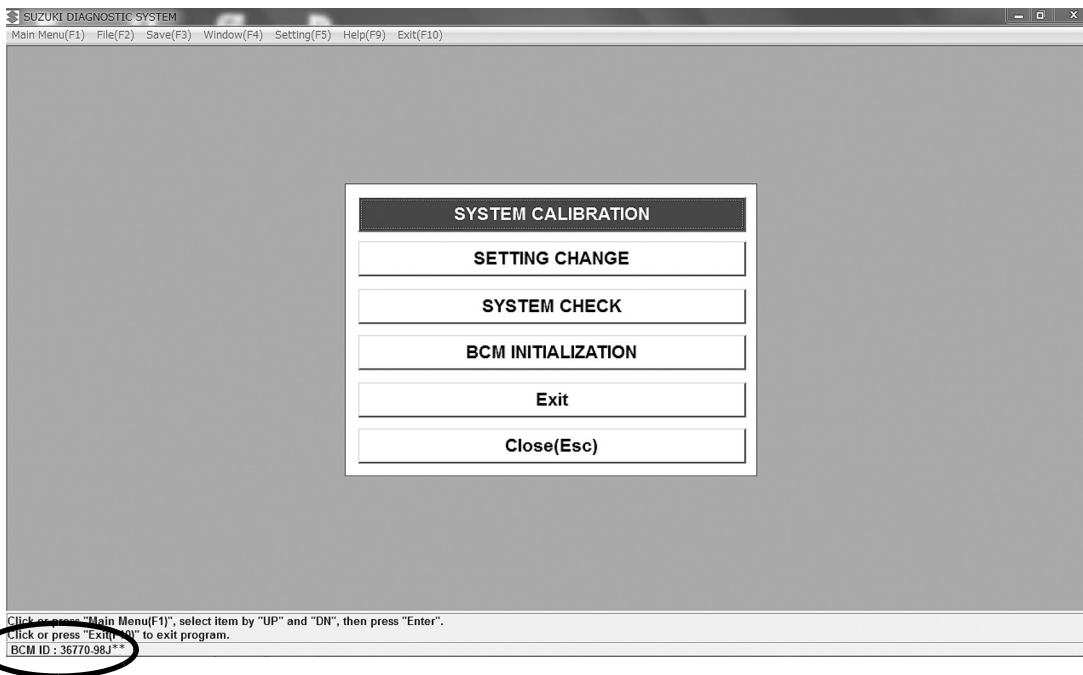
- Check that your PC and the main switch of the outboard motor are off before connecting the diagnostic harness.
- If two stations are available, a master BCM and sub BCM are installed. To calibrate the system, connect the diagnostic harness to the master BCM (main switch side BCM).
(If only one station is available, only the master BCM is installed.)

BCM MAIN MENU

- (1) Start the SDS program.
- (2) The SDS program window appears.



- (3) Click the "Main Menu (F1)" button ("F1" key on the keyboard). The following Menu dialog box appears. The BCM part number is displayed in the lower left of this dialog box.



SYSTEM CALIBRATION

Calibrate the SPC system and registers information of outboard motor and remote control box in the BCM.

Perform this item when an outboard motor, remote control box, and meters, are first installed on the boat. Also perform this item when the BCM is replaced or the ECM or remote control box of the outboard motor is replaced.

SETTING CHANGE

Sets, changes, or resets the remote control lever and tilt down.

Perform this item when the remote control box is disassembled or when the tilt position is changed.

SYSTEM CHECK

Enables you to check the system configuration registered in the master BCM.

BCM INITIALIZATION

Deletes the (master or sub) BCM information registered in the BCM after system calibration and system configuration information (*Number of engine, Number of station).

Exit

Exits the SDS program.

Close (Esc)

Closes the menu box.

NOTE:

- *The ECM or BCM calibrated in one boat cannot be reused in another boat.
To reuse the ECM or BCM, be sure to calibrate the system after deleting the BCM information by using the BCM INITIAL-IZATION menu.*
- *The BCM INITIALIZATION menu cannot be used to delete the diagnostic information registered in the BCM.*
- *Use the BCM INITIALIZATION menu to delete information for the connected BCM.
(To delete information for the master BCM, connect the diagnostic harness to the master BCM. To delete information for the sub BCM, connect the diagnostic harness to the sub BCM.)*

SYSTEM CALIBRATION

Calibrate the system and register information in the BCM.

- **SYSTEM FORMATION REGISTRATION**

Sets the number of stations and the number of engines and registers information in the BCM. If two stations are available, also registers information in both the master BCM and sub BCM.

- **ENGINE LOCATION REGISTRATION**

Registers the positions (PORT, CENTER, STBD) of engines in the BCM.

- **LEVER POSITION CALIBRATION**

Registers the position (Forward: full opening, full closing, neutral, Reverse: full opening, full closing) of the remote control lever in the BCM.

NOTE:

To change the system configuration after system calibration, be sure to initialize the system by using the BCM INITIALIZATION menu.

- *Example: The system is calibrated as a single engine and then the single engine is changed to the dual engine.*

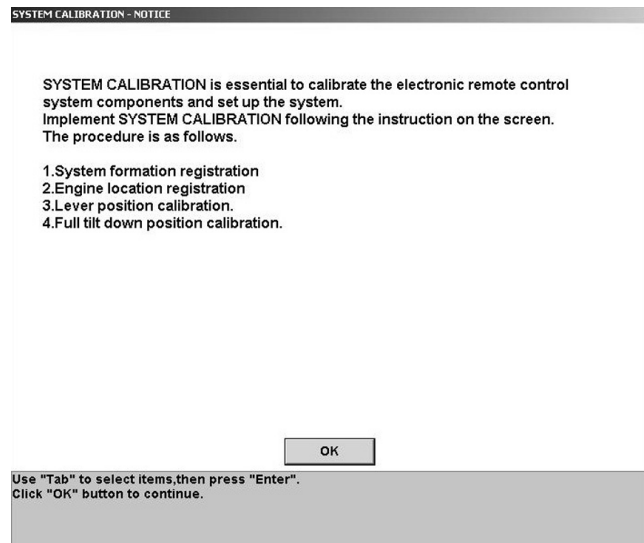
NOTE:

On Quadruple engine:

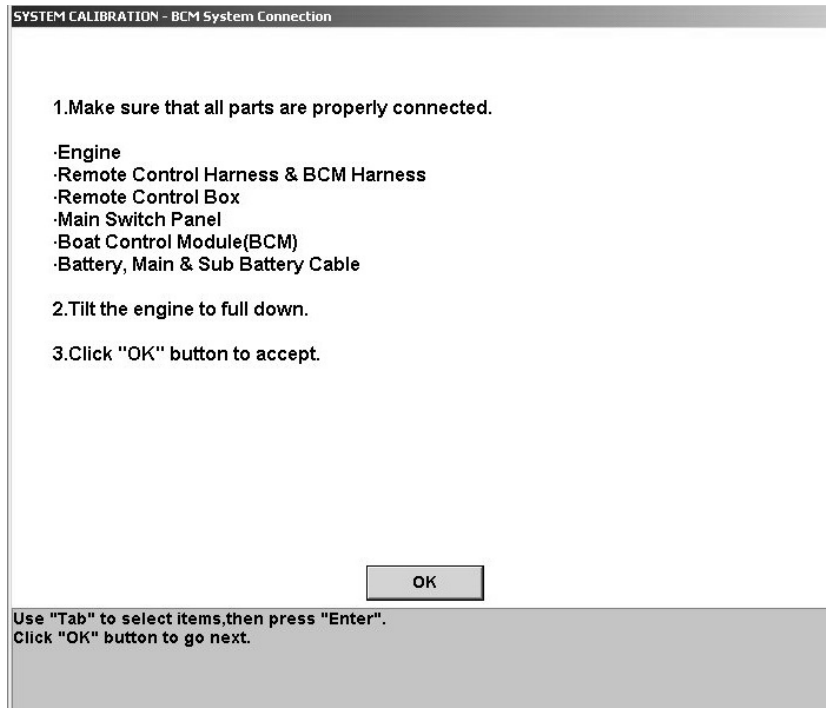
The electronic calibration for quadruple engine installation is equal in two times of that for dual engine installation.

- *Calibrate the group of port and port center engines first then the group of starboard and starboard center engines.*
- *Or calibrate the group of starboard and starboard center engines first then the group of port and port center engines.*

- (1) Clicking the “SYSTEM CALIBRATION” button from the Main Menu dialog box displays the following NOTICE window.
(Keyboard) Select a desired item by using the “Up” or “Down” arrow key and press the “Enter” key to have the selected item accepted.
Click the “OK” button and proceed to the next step.

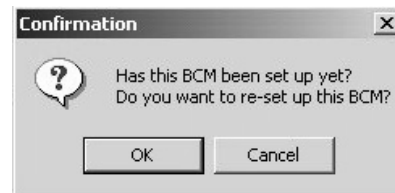


- (2) The following window appears. Click the "OK" button and proceed to the next step ("Enter" key on the keyboard).

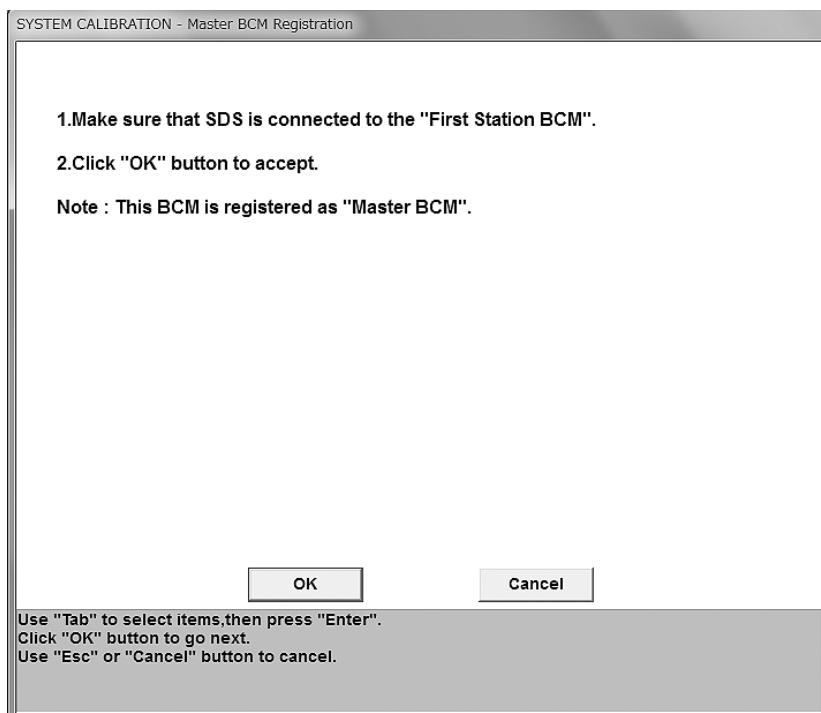


NOTE:

If the BCM has already been calibrated, the Confirmation window appears.

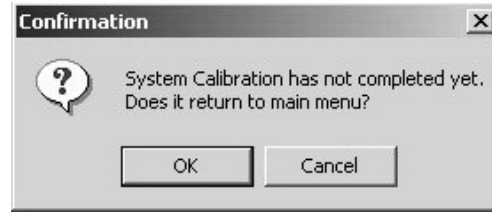


- (3) The following window appears. Click the "OK" button and proceed to the next step ("Enter" key on the keyboard).

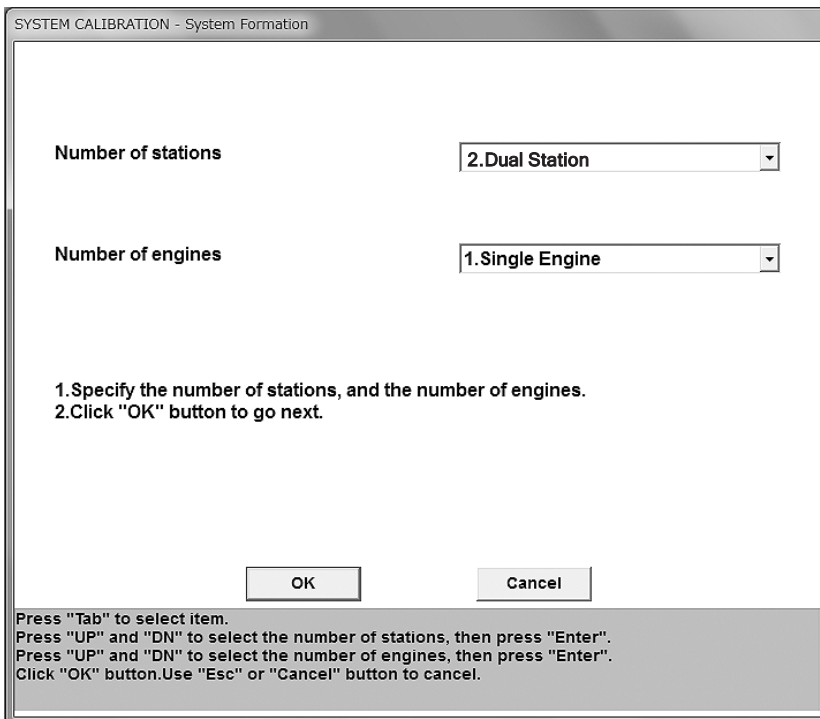


NOTE:

- The station to which SDS was connected is registered as the master BCM. If SDS is connected to the BCM of the second station and the system is calibrated, the BCM of the second station serves as the master BCM.
- If the "Cancel" button is clicked or the "Esc" key is pressed during system calibration, the window shown at right appears. Click the "OK" button to calibrate the system. To continue system calibration, click the "Cancel" button.



- (4) The following window appears. This window is used to register the system configuration. In this window, select the number of stations and the number of engines by clicking the ▼ button, click the "OK" button, and proceed to the next step.
- (Keyboard) Move to a desired item by using the "Tab" key. Select a desired item by using the "Up" or "Down" arrow key and press the "Enter" key to have the selected item accepted.
- Clicking the "Cancel" button cancels system calibration.

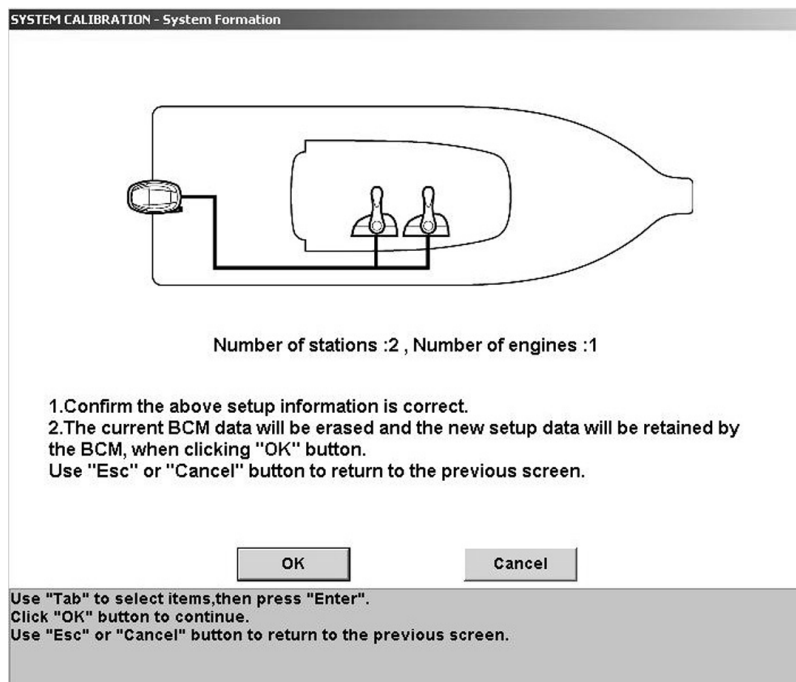


NOTE:

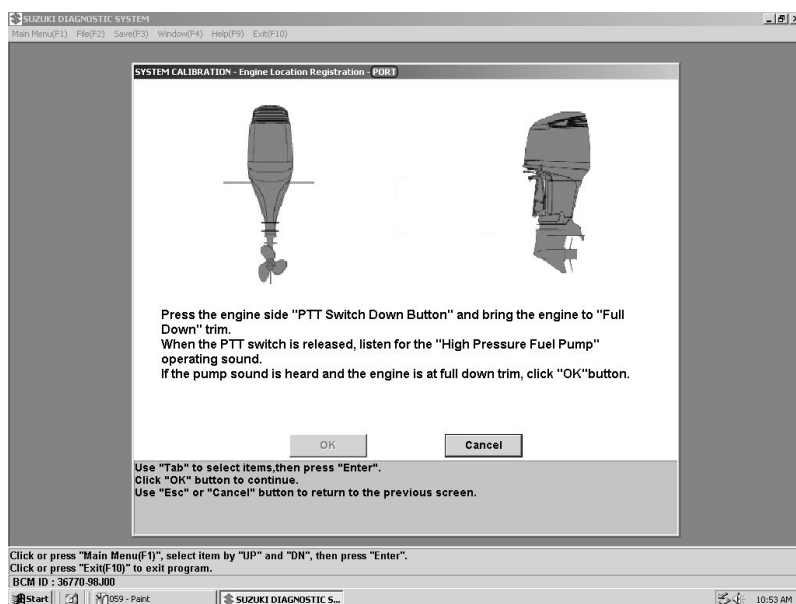
If you make a selection different from the actual configuration, the error screen is displayed.



- (5) The following window appears. Check that the calibration are correct, click the “OK” button, and proceed to the next step (“Enter” key on the keyboard).
Clicking the “Cancel” button brings you back to the previous window.



- (6) The following window appears. This window is used to register the outboard motor position in the BCM. Operate the PTT switch of the outboard motor to perform full tilt down. Click the “OK” button to have the outboard motor position accepted and proceed to the next step. (Figure is an example of registering the PORT outboard motor.)
Clicking the “Cancel” button cancels system calibration.



NOTE:

- For the dual engines, register the PORT and STBD positions. For triple engines, register the PORT, CENTER, and STBD positions.
- After full tilt down, the high-pressure fuel pump of the outboard motor is actuated for 3 seconds. Listen for the actuation sound.

(7) The following window appears. This window is used to register the position of the remote control lever in the BCM.

Set the lever to each position (Forward, Neutral, Reverse) and click the “Set” button.

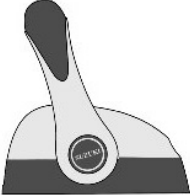
If the set lever positions are correctly registered, “✓” mark is displayed in the “Status” column in the right side of the window.

Repeat the same operation to register all the lever positions.

Clicking the “Cancel” button cancels system calibration.

SYSTEM CALIBRATION - Lever Position Calibration - First Station

Forward Neutral Reverse



	Lever Position	Status
1	Reverse Max	✓
2	Reverse Min	✓
3	Neutral	✓
4	Forward Min	
5	Forward Max	


Move the remote control lever to the positions listed in their numerical order.
 Click "Set" button to fix the position and confirm checkmark "✓" appears.
 After fixing all lever positions in order, click "OK" button to accept.
 Note : When using a "Dual Remote Control Box", both levers should be moved simultaneously to the same position.

Set Cancel

Use "Tab" to select items, then press "Enter".
 Click "OK" button to continue.
 Use "Esc" or "Cancel" button to return to the previous screen.

(8) When all the lever positions have been registered, return the lever to the neutral position.

Confirmation

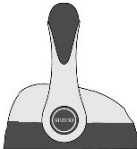


Please set the lever to "Neutral" position.

OK

SYSTEM CALIBRATION - Lever Position Calibration - First Station

Forward Neutral Reverse



	Lever Position	Status
1	Reverse Max	✓
2	Reverse Min	✓
3	Neutral	✓
4	Forward Min	✓
5	Forward Max	✓

Move the remote control lever to the positions listed in their numerical order.
 Click "Set" button to fix the position and confirm checkmark "✓" appears.
 After fixing all lever positions in order, click "OK" button to accept.
 Note : When using a "Dual Remote Control Box", both levers should be moved simultaneously to the same position.

OK Cancel

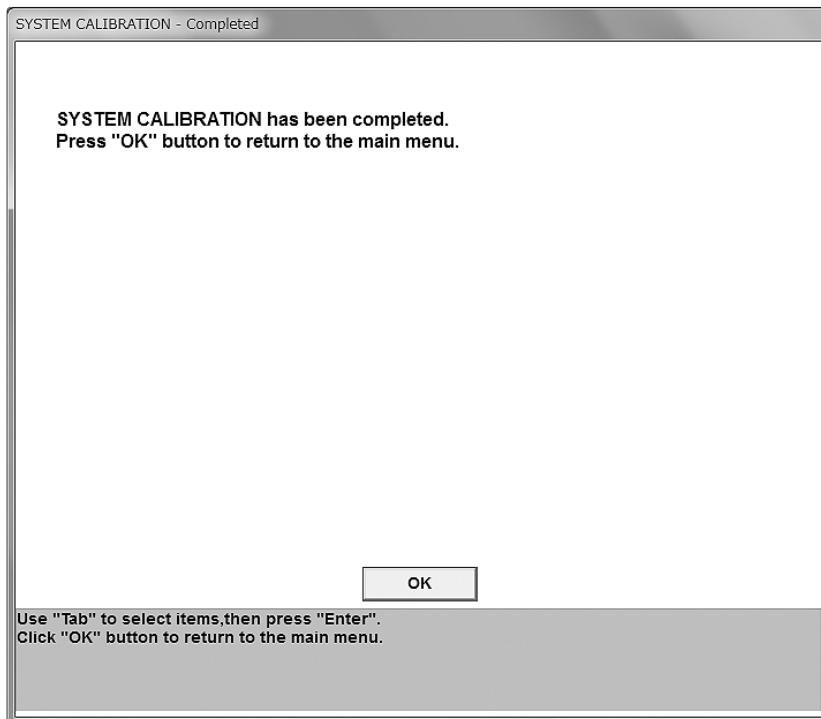
Use "Tab" to select items, then press "Enter".
 Click "OK" button to continue.
 Use "Esc" or "Cancel" button to return to the previous screen.

NOTE:

- If the lever is not set to a correct position, the error message is displayed.
- Click the "OK" button, set the lever to the correct position, and click the "Set" button.
- For a dual control box, you must simultaneously operate both the levers.
- After all the lever positions have been registered, the following confirmation message is displayed.



- (9) Clicking the "OK" button displays the following window:
Click the "OK" button to terminate system calibration.



SETTING CHANGE

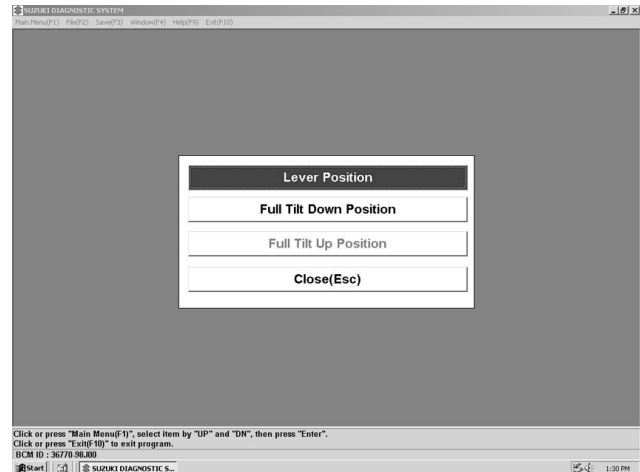
Change or reset the remote control lever characteristics and full tilt down position.

NOTE:

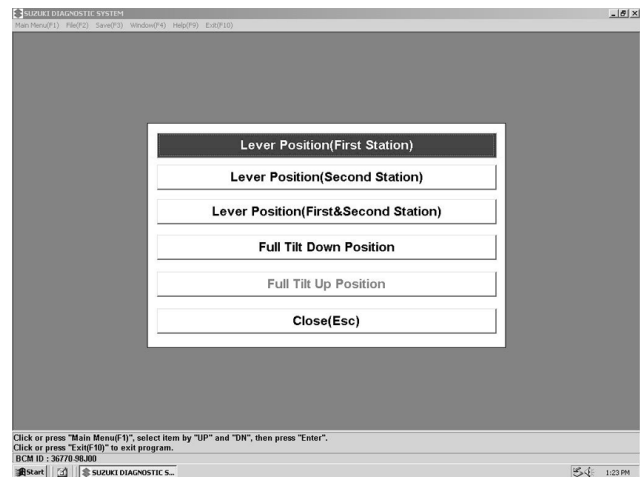
Change system settings when disassembling or replacing the remote control lever, its related parts, or tilt-related parts.

Lever Characteristics

- (1) Clicking the “SETTING CHANGE” button from the Main Menu dialog box displays the following window of boat station configuration registered in the BCM during system calibration.
 - * Figure is the “SETTING CHANGE” initial window registered as the single station.



- * Figure is the “SETTING CHANGE” initial window registered as the dual station.



- (2) Clicking “LEVER POSITION (XXXXXX)” button from the Setup Change dialog box displays the following window:

Set the lever to each position (Forward, Neutral, Reverse) and click the “Set” button.

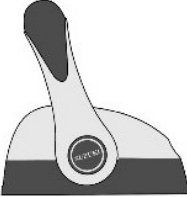
If the set lever positions are correctly registered, “✓” mark is displayed in the “Status” column in the right side of the window.

Repeat the same operation to register all the lever positions.

Clicking the “Cancel” button cancels system setting change.

SYSTEM CALIBRATION - Lever Position Calibration - First Station

Forward Neutral Reverse



	Lever Position	Status
1	Reverse Max	✓
2	Reverse Min	✓
3	Neutral	✓
4	Forward Min	
5	Forward Max	

Move the remote control lever to the positions listed in their numerical order.
Click "Set" button to fix the position and confirm checkmark "✓" appears.
After fixing all lever positions in order, click "OK" button to accept.
Note : When using a "Dual Remote Control Box", both levers should be moved simultaneously to the same position.

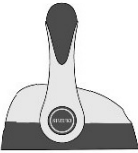
Set Cancel

Use "Tab" to select items, then press "Enter".
Click "OK" button to continue.
Use "Esc" or "Cancel" button to return to the previous screen.

- (3) When all the lever positions have been registered, return the lever to the neutral position.

SYSTEM CALIBRATION - Lever Position Calibration - First Station

Forward Neutral Reverse



	Lever Position	Status
1	Reverse Max	✓
2	Reverse Min	✓
3	Neutral	✓
4	Forward Min	✓
5	Forward Max	✓

Move the remote control lever to the positions listed in their numerical order.
Click "Set" button to fix the position and confirm checkmark "✓" appears.
After fixing all lever positions in order, click "OK" button to accept.
Note : When using a "Dual Remote Control Box", both levers should be moved simultaneously to the same position.

OK Cancel

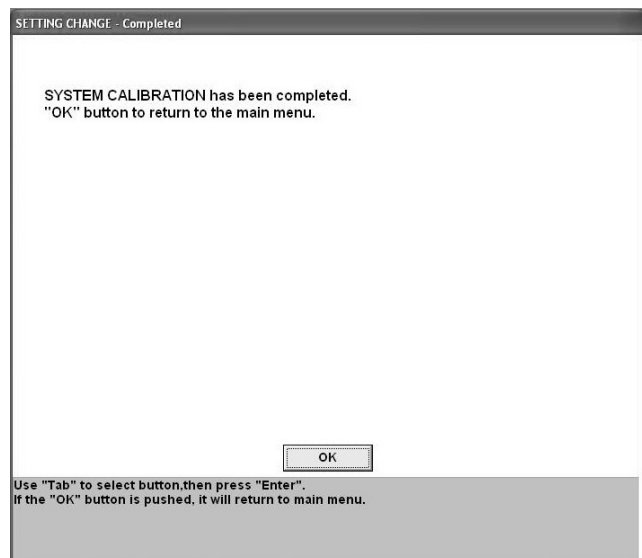
Use "Tab" to select items, then press "Enter".
Click "OK" button to continue.
Use "Esc" or "Cancel" button to return to the previous screen.

NOTE:

- If the lever is not set to a correct position, the error message is displayed.
Click the "OK" button, set the lever to the correct position, and click the "Set" button.
- For the dual control box, you must simultaneously operate both the levers.
- To change the dual station settings, select "First Station", "Second Station", and "Both First and Second Stations."
- After all the lever positions have been registered, the following confirmation message is displayed:

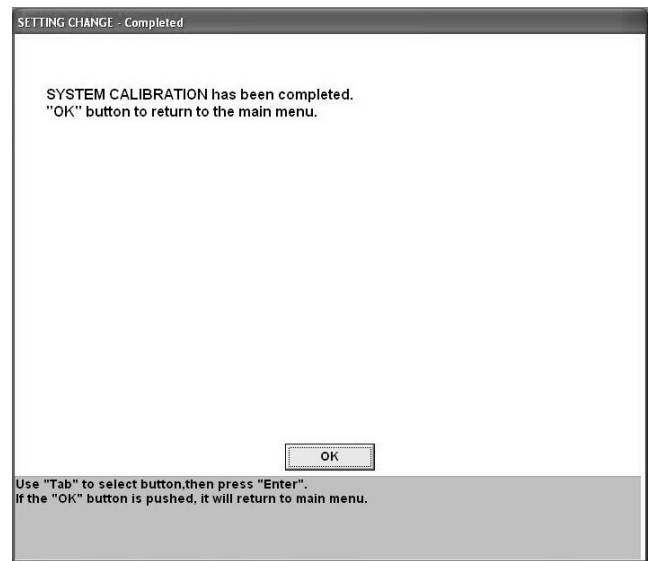
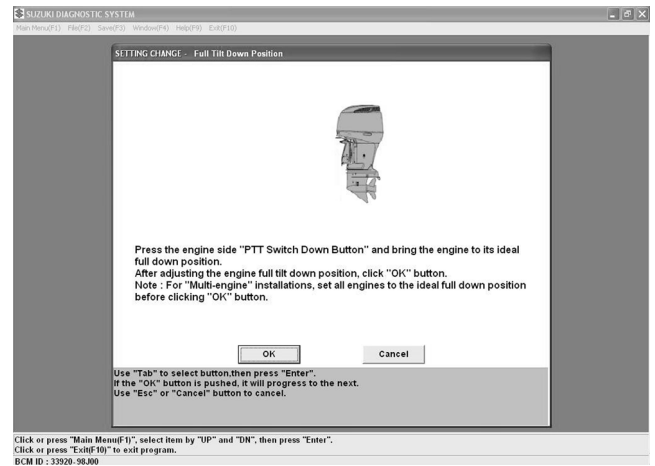


- (4) Clicking the "OK" button after all the lever positions have been registered displays the following window:
Click the "OK" button to terminate setting change.



Full Tilt Down Position

- (1) Clicking the “Full Tilt Down Position” button from the SETTING CHANGE dialog box displays the window.
- (2) Operate the PTT switch of the outboard motor to perform full tilt down.
Clicking the “OK” button registers the full tilt down position and redisplay the SETTING CHANGE completed window.
Click the “OK” button to complete setup change.

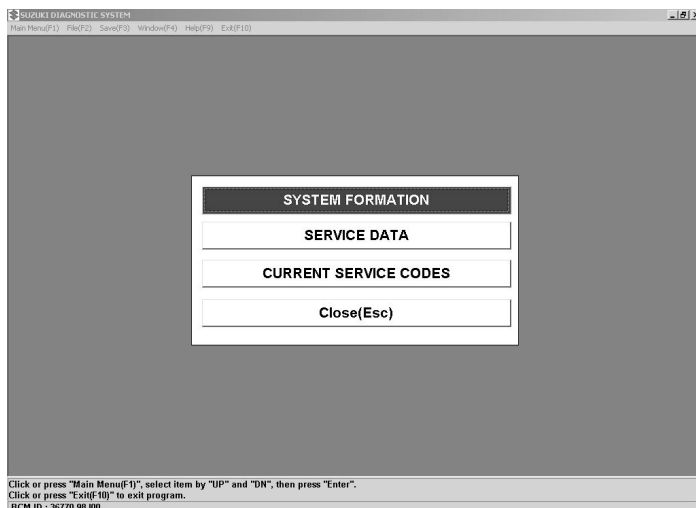


SYSTEM CHECK

Check system settings.

System configuration

- (1) Clicking the “SYSTEM CHECK” button from the Main Menu dialog box displays the following menu window.



(2) Clicking the “SYSTEM FORMATION” button from the menu window displays the window.

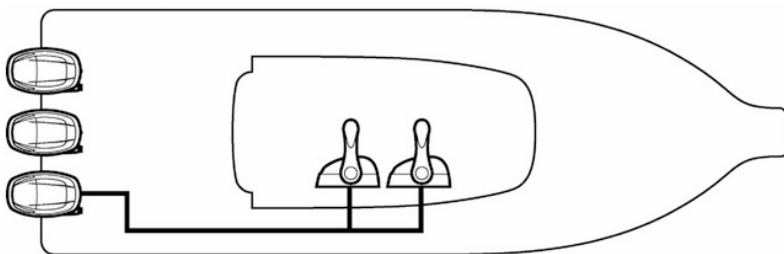
The upper part of this window illustrates the system configuration registered in the BCM.

The following figure shows a dual station of triple outboard motor type.

The lower part of this window shows the master BCM ID, sub BCM ID, PORT ECM ID, CENTER ECM ID, and STBD ECM ID.

Click the “OK” button to terminate system check.

SYSTEM FORMATION



Station	Dual Station
Master Boat Control Module ID	36770-*****
Sub Boat Control Module ID	36770-*****
Engine Control Module ID PORT	33920-*****
Engine Control Module ID CENTER	33920-*****
ENGINE Control Module ID STBD	33920-*****

OK

Use "Tab" to select button, then press "Enter".
If the "OK" button is pushed, it will progress to the next.

NOTE:

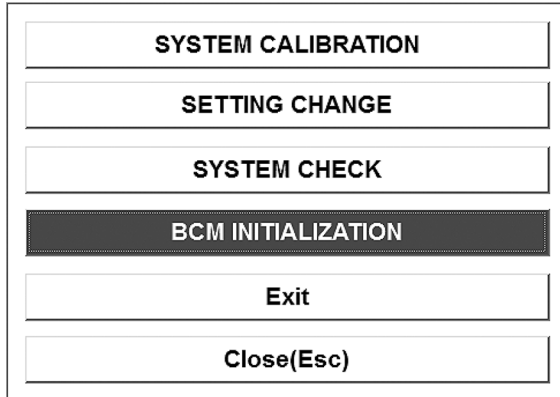
If the illustration and description of the displayed system configuration differ from the registered configuration and the configuration of actual boat, it means that the system is not correctly calibrated.

In this case, be sure to calibrate the system.

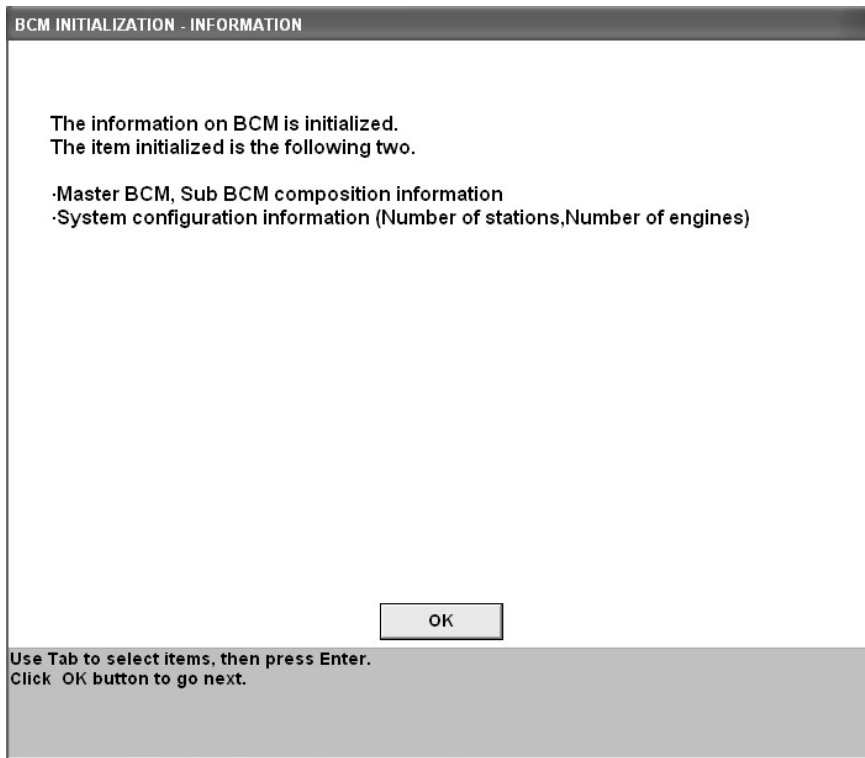
BCM INITIALIZATION

Initialize the information registered in the BCM.

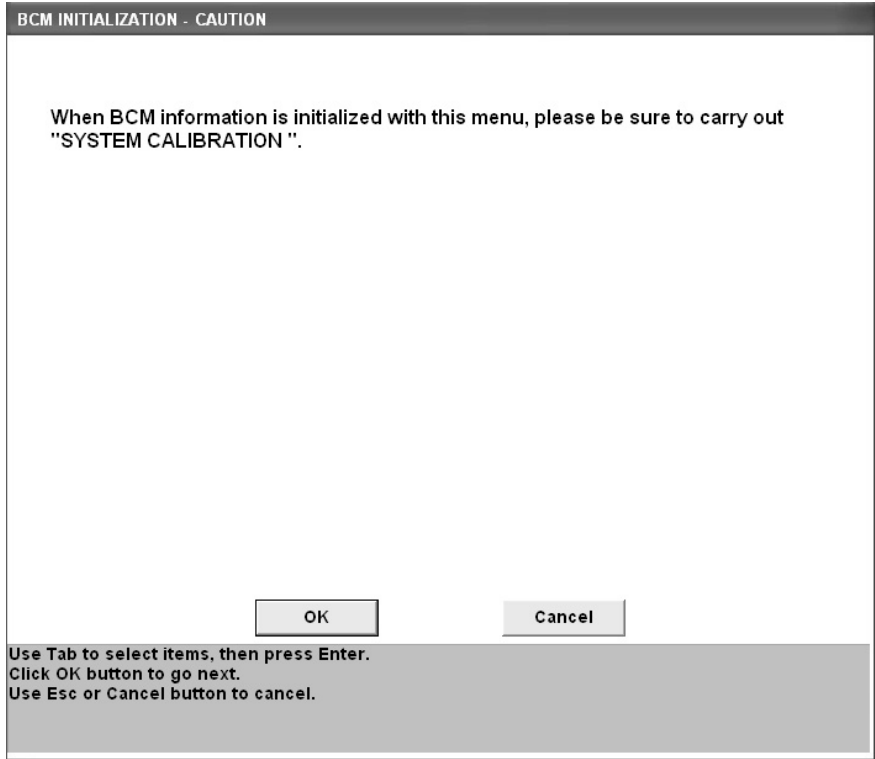
- (1) Clicking the “BCM INITIALIZATION” button from the Main Menu dialog box displays the menu window.



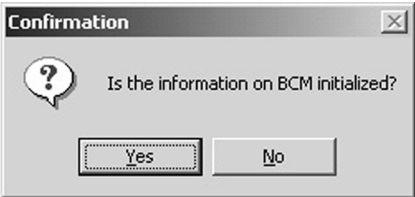
- (2) Delete the (master or sub) BCM information registered in the BCM after system calibration and system configuration information (*Number of engine, Number of station).
Click the “OK” button and proceed to the next step.
(Keyboard) Move to the “OK” button using the “Tab” key and press the “Enter” key.



- (3) The following BCM INITIALIZATION-CAUTION window appears.
 Read the messages and follow the instruction. Then click the “OK” button and proceed to the next step.
 To cancel BCM information deletion, click the “Cancel” button or press the “Esc” key on the keyboard.
 (Keyboard) To delete BCM information, move to the “OK” button by using the “Tab” key and press the “Enter” key to have the deletion accepted. To cancel BCM information deletion, move to the “Cancel” button by using the “Tab” key and press the “Enter” key to have the cancellation accepted.

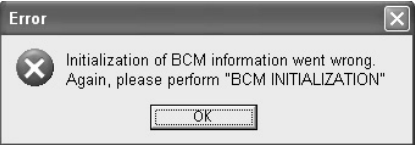


- (4) The following window appears:
 Clicking the “Yes” button deletes BCM information.
 Clicking the “No” button cancels BCM information deletion.



NOTE:

- By clicking the “OK” button, the initialization of BCM information is completed. Click the “OK” button, turn “OFF” the engine switch (main switch) and turn it “ON” again.
- If the initialization of BCM information fails, an error message is indicated.
- Click the “OK” button and start from the step 1 again.



MULTI FUNCTION GAUGE DIMENSIONS & MOUNTINGS

NOTICE

Installing the gauges in an inappropriate location can result in gauge failure or operating difficulties.

- Do not install the gauge in a location where it is likely to be sprayed with water. Exposure to water can cause failure of the gauge.
- Install the gauges on the dashboard so that they can be easily operated and viewed by the operator.

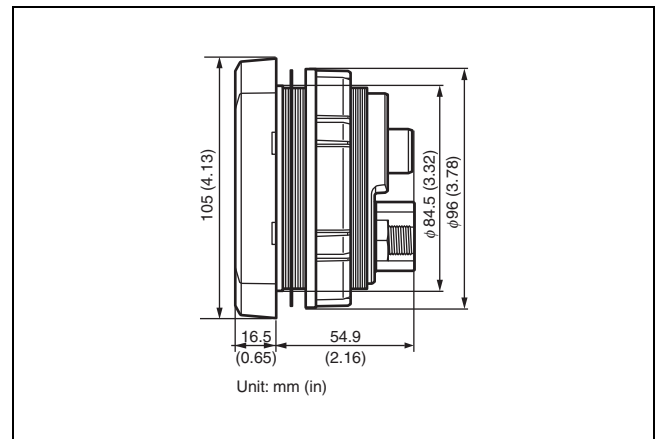
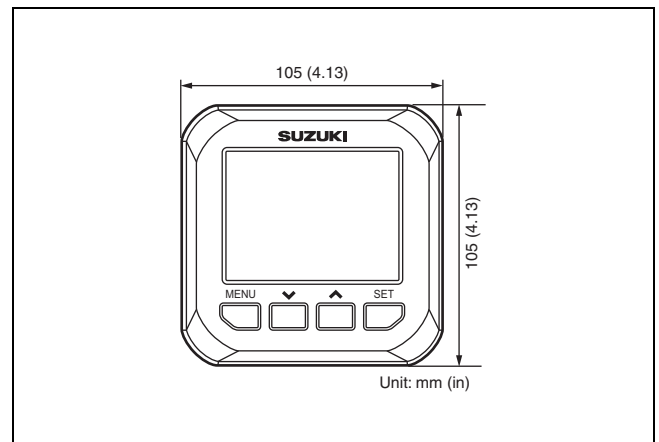
HOLE SIZES

NOTE:

Check area behind panel to be sure there is adequate clearance for installing instruments and wires and to make sure that other components will not be contacted when cutting holes.

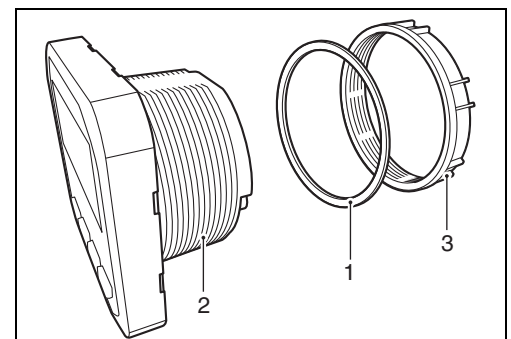
Installation, Multi Function Gauge:

- Panel cut-out, 85 mm (3.35 in) hole saw



FASTENING TO PANEL

- (1) Install the gasket (1) to gauge.
- (2) Insert the gauge (2) into panel hole.
- (3) Thread the nut (3) onto threaded housing of gauge and tighten to back of panel.



MULTI FUNCTION GAUGE SYSTEM CONNECTION

Select the connection method from the examples in the following pages and arrange the required wiring.

NOTE:

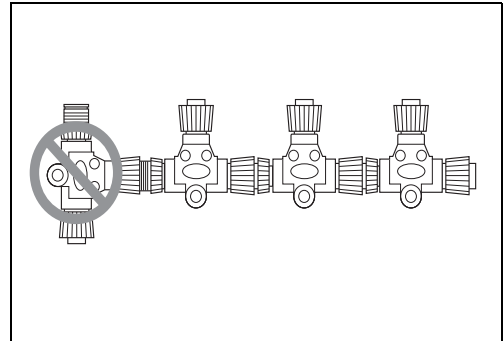
For setting up the multi-function gauge, refer to "INSTALLATION INSTRUCTION MANUAL" packed in the gauge.

T- Connector

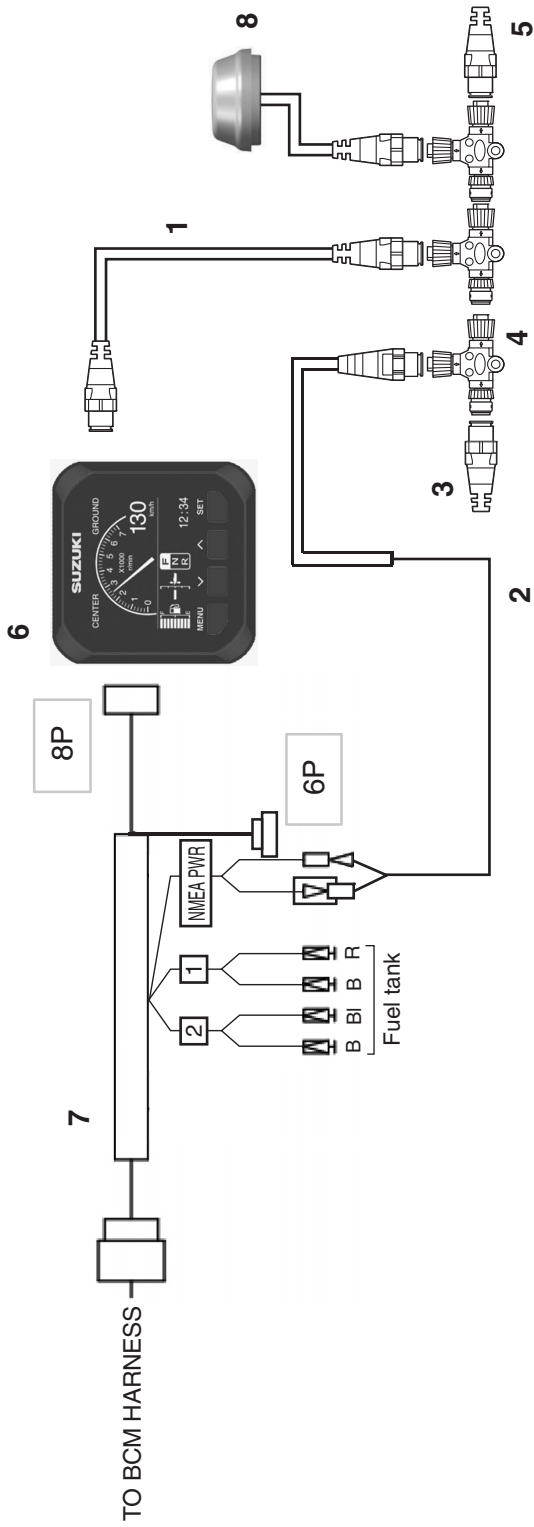
T-Connectors must be connected to be in a straight line as shown in the illustration.

NOTE:

- *Secure the T-connectors to a solid surface or to an existing wire harness, do not leave them free-floating.*
- *Do not overstress cables or connectors by using excessive force when tightening or pulling.*

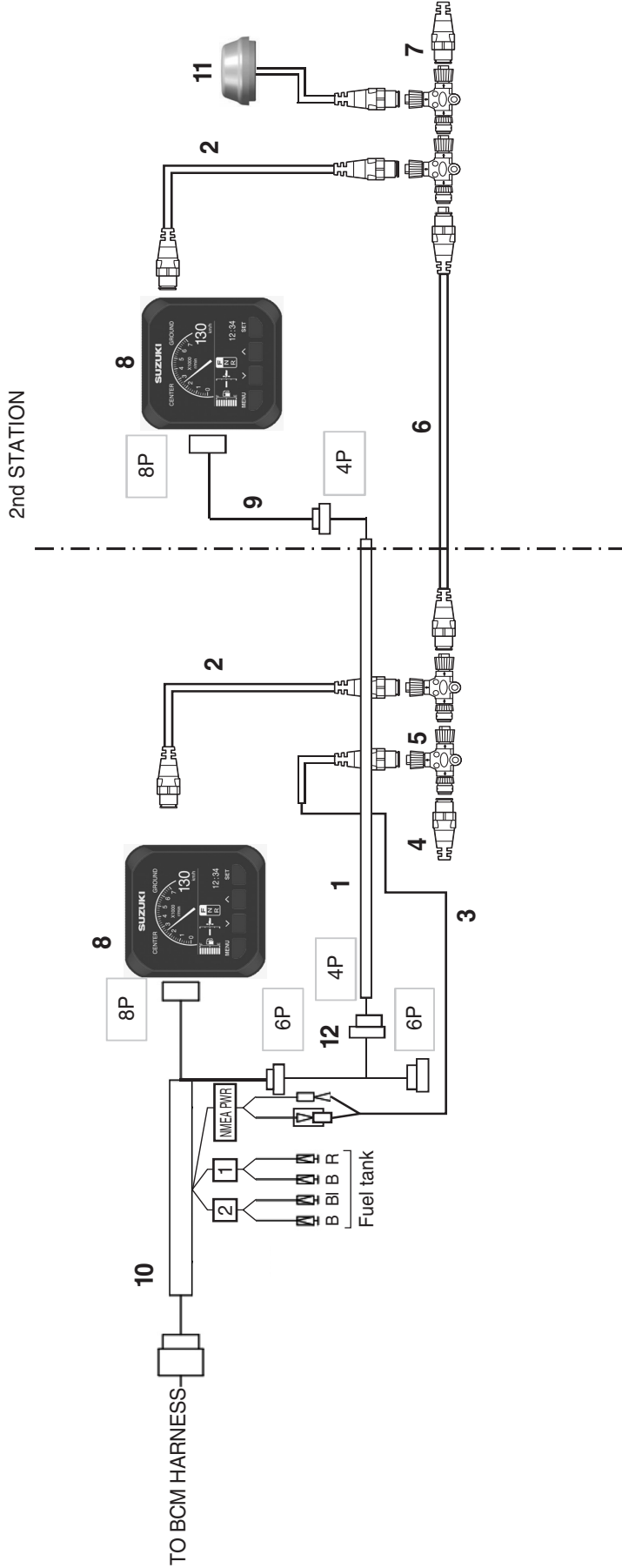


SINGLE ENGINE – SINGLE STATION



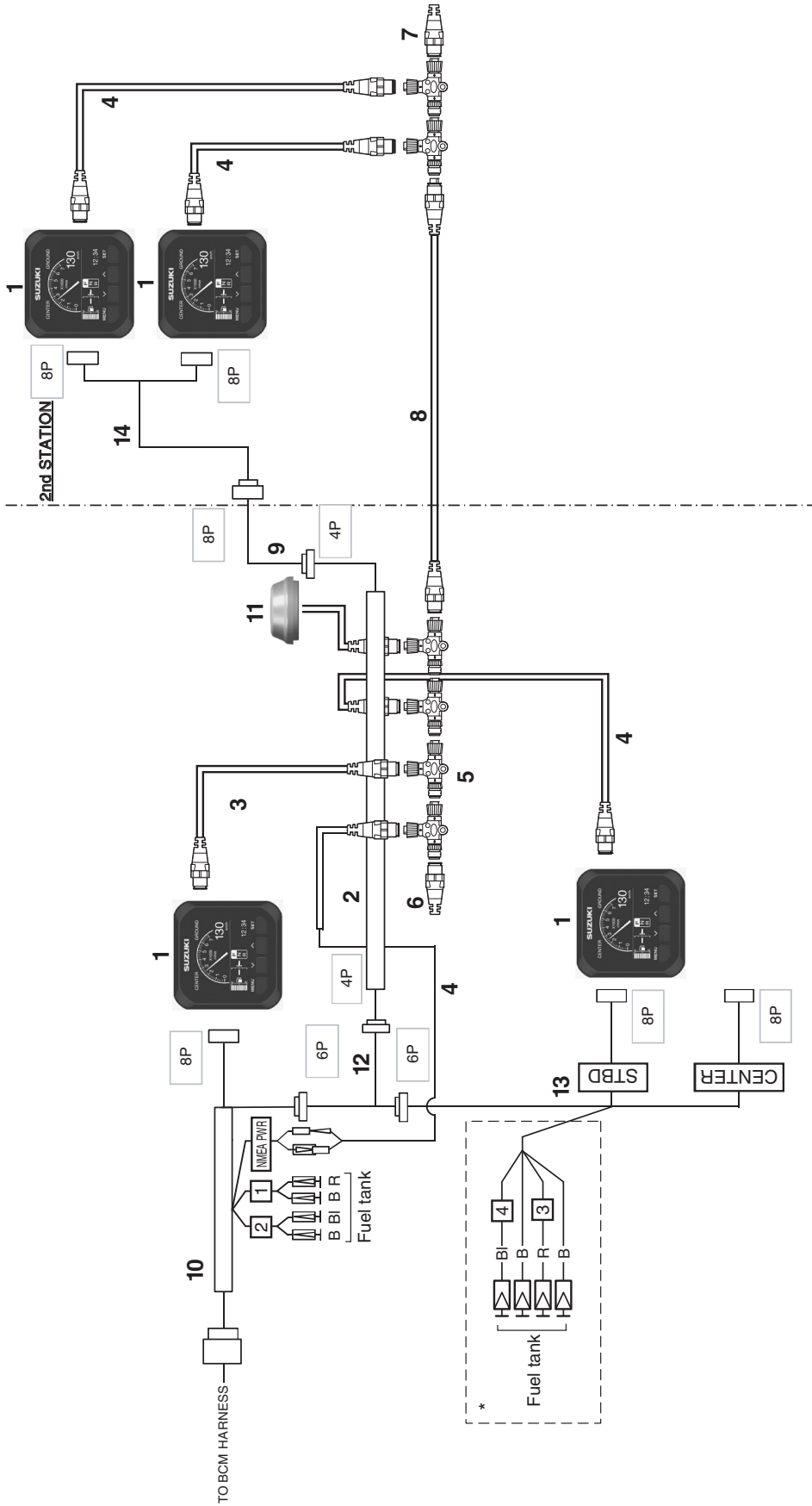
No.	Part name	Part No.	Qty
1	Wire comp, extension (2 feet)	36662-88L10	1
2	Harness assy, network power	36663-88L00	1
3	Terminator (female)	36665-88L00	1
4	T-connector	36664-88L00	3
5	Terminator (male)	36665-88L10	1
6	Multi function gauge set	34011-96L16	1
7	Adapter comp, gauge	36661-96L20	1
8	GPS receiver module	39950-88L02	1

SINGLE ENGINE – DUAL STATIONS



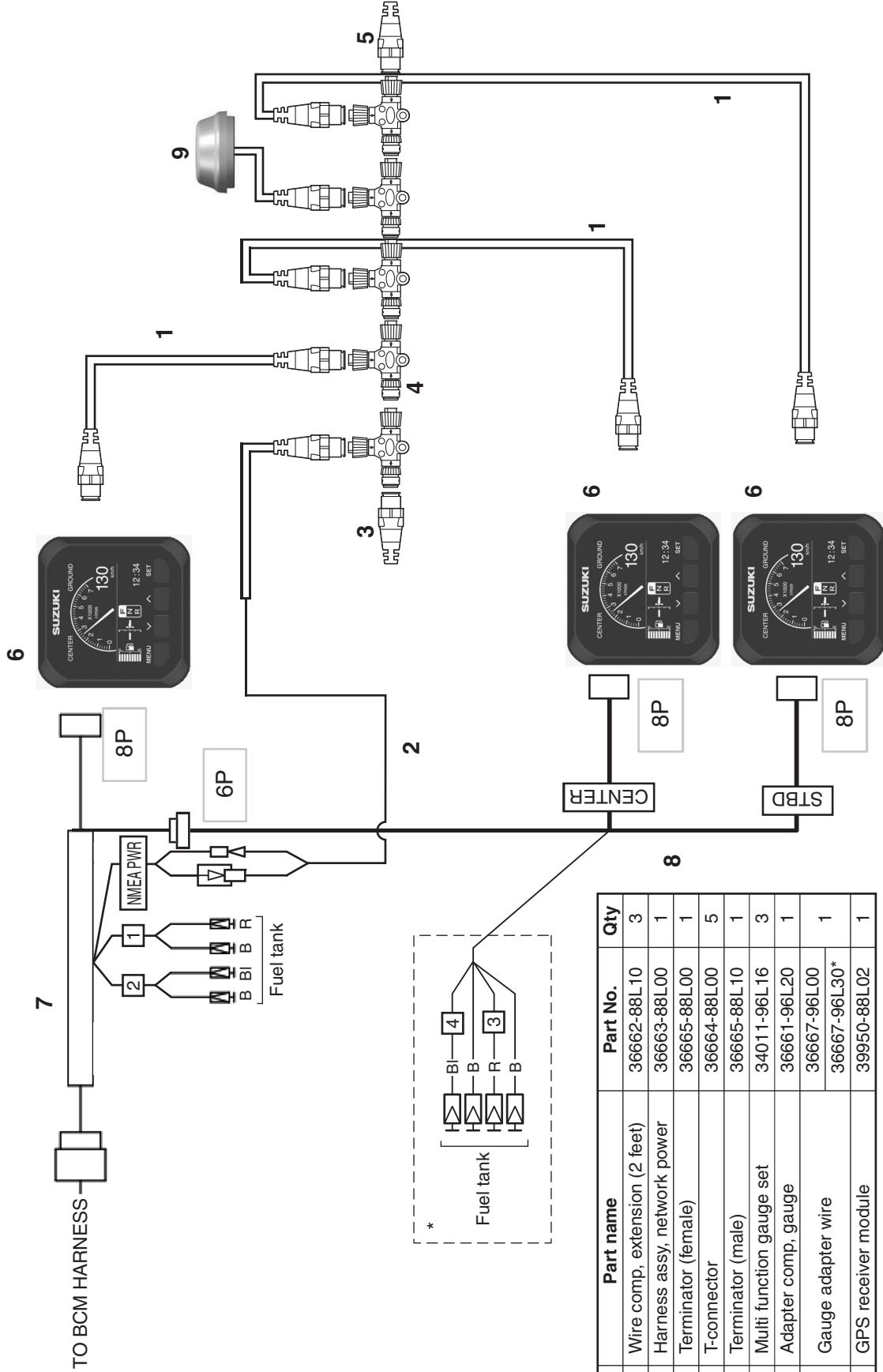
No.	Part name	Part No.	Qty	No.	Part name	Part No.	Qty
1	Wire comp, extension	36682-92E00	1	7	Terminator (male)	36665-88L10	1
2	Wire comp, extension (2 feet)	36662-88L10	2	8	Multi function gauge set	34011-96L16	2
3	Harness assy, network power	36663-88L00	1	9	Adapter, gauge power	36666-96L00	1
4	Terminator (female)	36665-88L00	1	10	Adapter comp, gauge	36661-96L20	1
5	T-connector	36664-88L00	4	11	GPS receiver module	39950-88L02	1
6	Wire comp, extension (25 feet)	36662-88L00	1	12	Adapter, gauge for dual station	36665-96L00	1
	Wire comp, extension (2 feet)	36662-88L10					
	Wire comp, extension (6 feet)	36662-88L20					
	Wire comp, extension (15 feet)	36662-88L30					

DUAL ENGINES – DUAL STATIONS



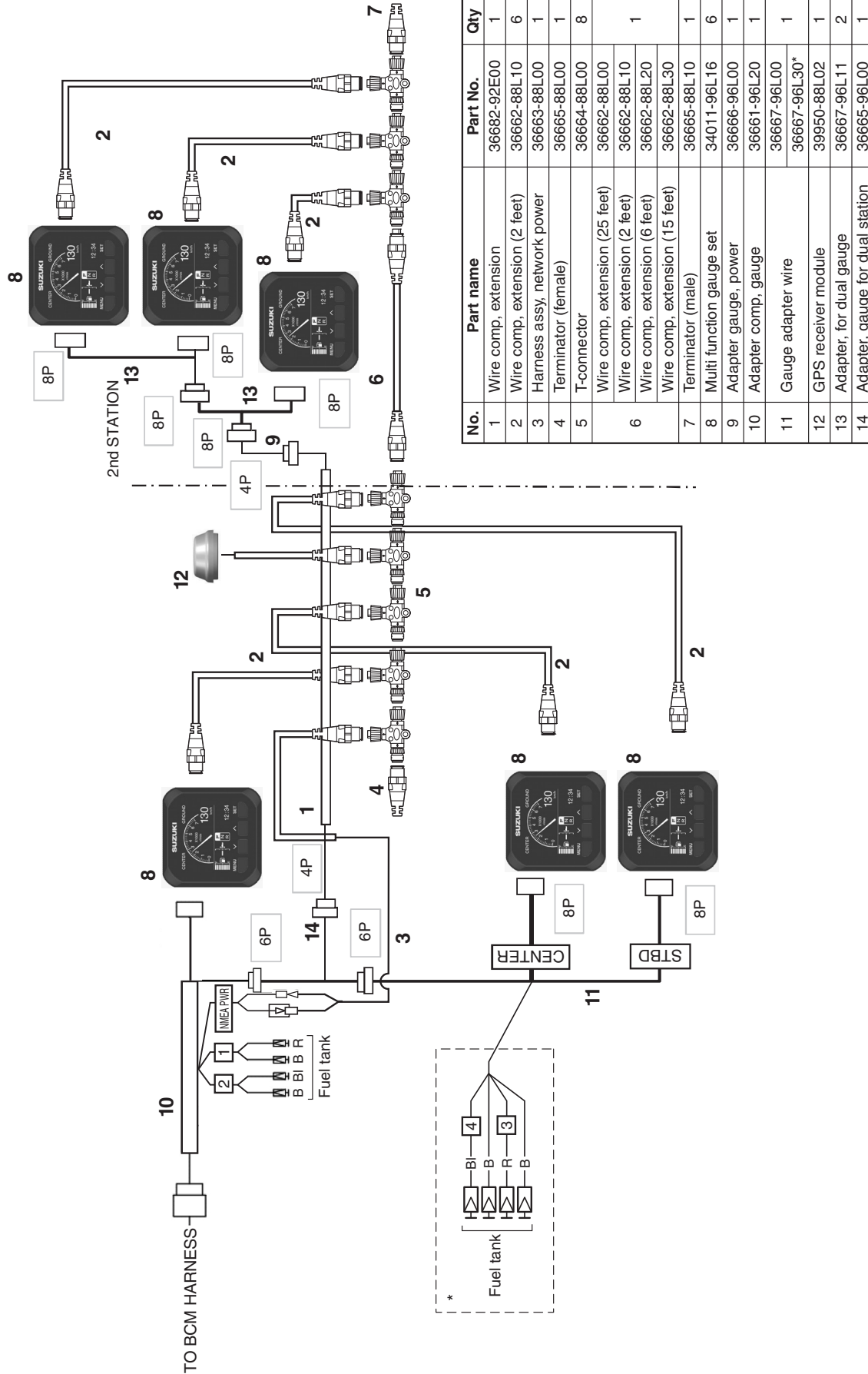
No.	Part name	Part No.	Qty	No.	Part name	Part No.	Qty
1	Multi function gauge set	34011-96L16	4		Wire comp. extension (25 feet)	36662-88L00	
2	Wire comp. extension (6.5m)	36682-92E00	1	8	Wire comp. extension (2 feet)	36662-88L10	1
3	Wire comp. extension (2 feet)	36662-88L10	4		Wire comp. extension (6 feet)	36662-88L20	
4	Harness assy, network power	36663-88L00	1		Wire comp. extension (15 feet)	36662-88L30	
5	T-connector	36664-88L00	6	9	Adapter, gauge power	36666-96L00	1
6	Terminator (female)	36665-88L00	1	10	Adapter comp, gauge	36661-96L20	1
7	Terminator (male)	36665-88L10	1	11	GPS receiver module	39950-88L02	1
				12	Adapter, gauge for dual station	36665-96L00	1
				13	Gauge adapter wire	36667-96L00	1
				14	Adapter, for dual gauge	36667-96L30*	1
						36667-96L11	1

TRIPLE ENGINES – SINGLE STATION

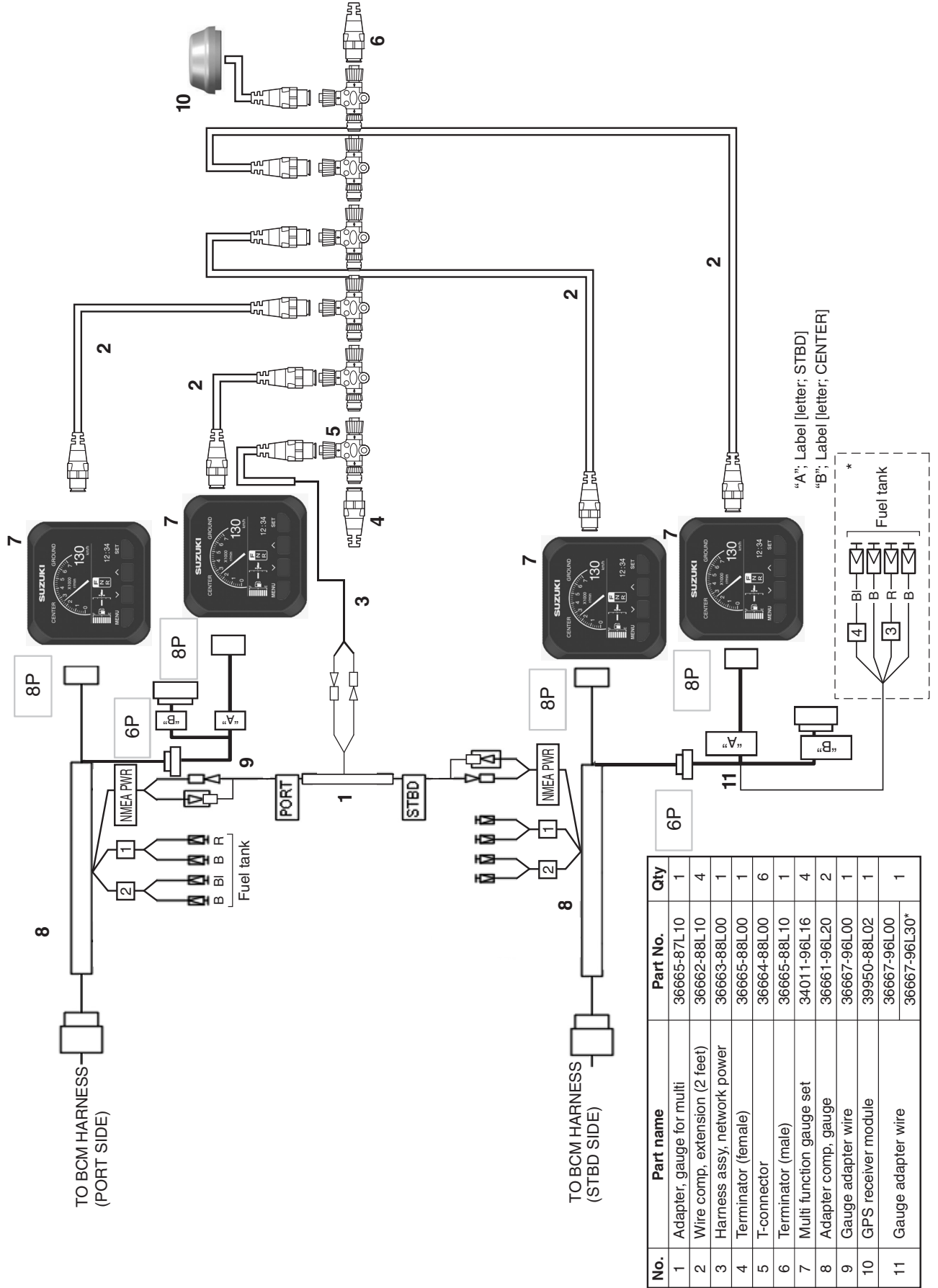


No.	Part name	Part No.	Qty
1	Wire comp, extension (2 feet)	36662-88L10	3
2	Harness assy, network power	36663-88L00	1
3	Terminator (female)	36665-88L00	1
4	T-connector	36664-88L00	5
5	Terminator (male)	36665-88L10	1
6	Multi function gauge set	34011-96L16	3
7	Adapter comp, gauge	36661-96L20	1
8	Gauge adapter wire	36667-96L00	1
		36667-96L30*	1
9	GPS receiver module	39950-88L02	1

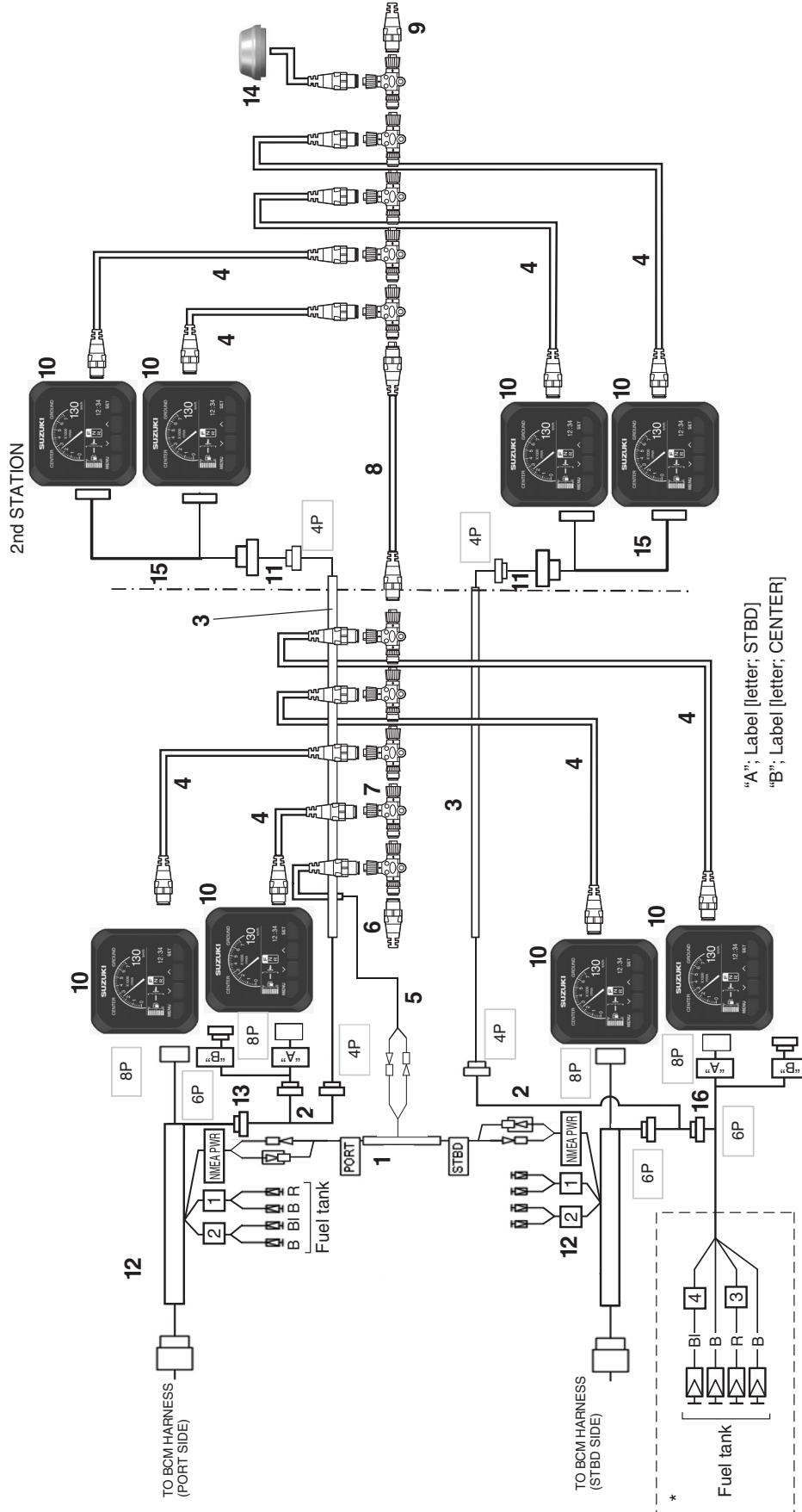
TRIPLE ENGINES – DUAL STATIONS



QUADRUPLE ENGINES – SINGLE STATION



QUADRUPLE ENGINES – DUAL STATIONS



No.	Part name	Part No.	Qty	No.	Part name	Part No.	Qty
1	Adapter, gauge for multi	36665-87L10	1	9	Terminator (male)	36665-88L10	1
2	Adapter, gauge for dual station	36665-96L00	2	10	Multi function gauge set	34011-96L16	8
3	Wire comp. extension	36682-92E00	2	11	Adapter, gauge power	36666-96L00	2
4	Wire comp. extension (2 feet)	36662-88L10	8	12	Adapter comp. gauge	36661-96L20	2
5	Harness assy. network power	36663-88L00	1	13	Gauge adapter wire	36667-96L00	1
6	Terminator (female)	36665-88L00	1	14	GPS receiver module	39950-88L02	1
7	T-connector	36664-88L00	10	15	Adapter, for dual gauge	36667-96L11	2
8	Wire comp. extension (25 feet)	36662-88L00	1	16	Gauge adapter wire	36667-96L00	1
	Wire comp. extension (2 feet)	36662-88L10					
	Wire comp. extension (6 feet)	36662-88L20					
	Wire comp. extension (15 feet)	36662-88L30					

KEYLESS START SYSTEM

⚠ WARNING

The keyless start system emits a low-power radio wave from the system control unit.

- If you have a pacemaker or cardioverter defibrillator (ICD) implant, do not let the pacemaker or ICD come within 22 cm (9 in) of the keyless system transmitter. The radio wave may affect the function of the pacemaker or cardioverter defibrillator (ICD).
- If you use any electro-medical apparatus other than a pacemaker or cardioverter defibrillator (ICD), please contact the electro-medical apparatus manufacturer regarding the influence of the keyless start system radio wave on your electro-medical apparatus.

NOTICE

Installing and routing the harness of the keyless start system components in an inappropriate location can result in system failure.

Be sure to take the following precautions:

- Avoid installing the keyless control unit where it will be exposed to direct sun.
- Install the keyless control unit in a dry location, as far as possible from where it might get splashed with water.
- Install the keyless control unit so that the connector faces downward.
- To avoid malfunction of the Keyless start system caused by radio waves, antennas, or coaxial cables of the radio, install navigation and other equipment more than 50 cm (20 in) away from the keyless control unit.

NOTE:

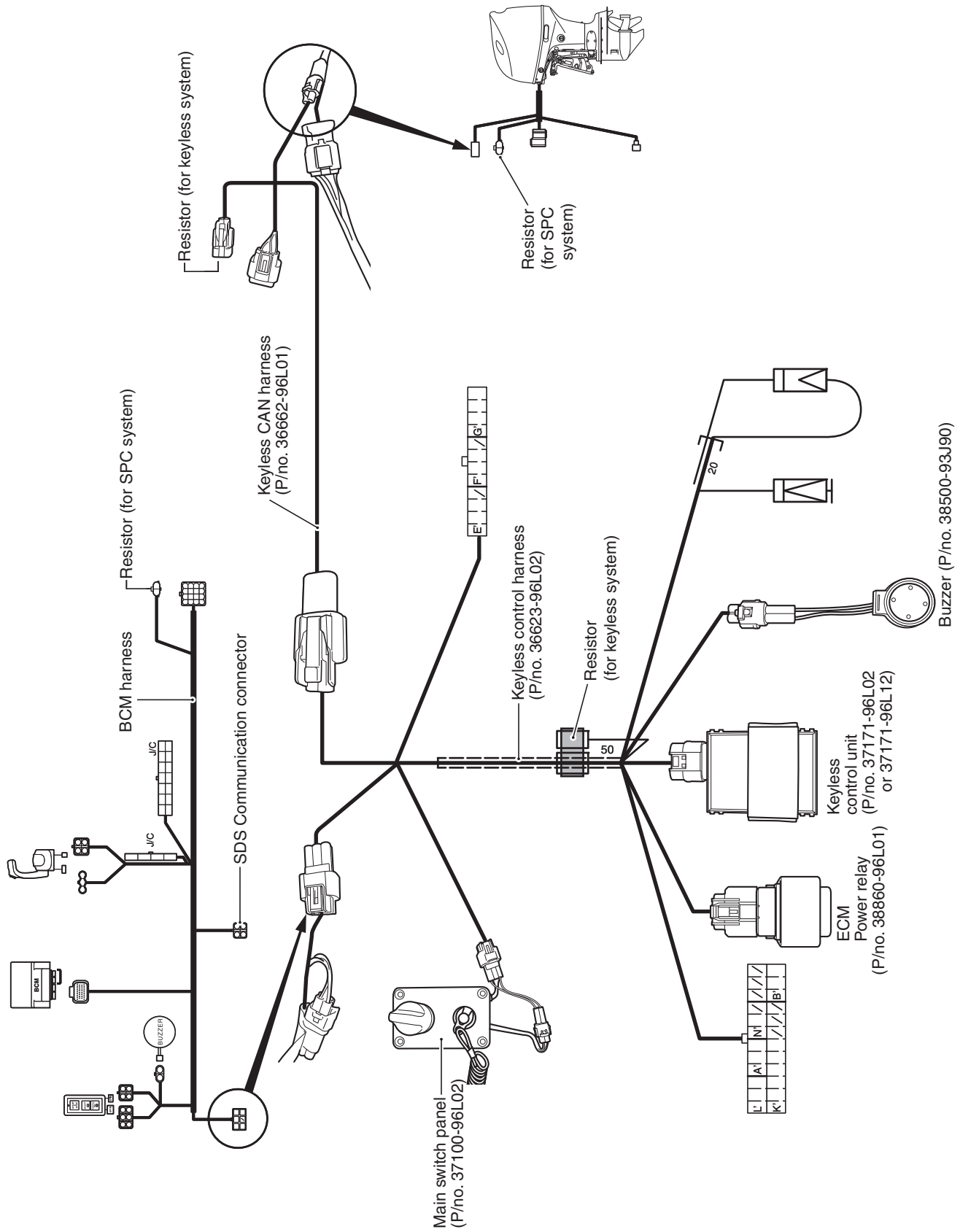
The keyless start system communicates between the key-fob and the keyless control unit by means of a radio wave to control the system.

The keyless control unit must not be installed in a location that hinders communication with the system.

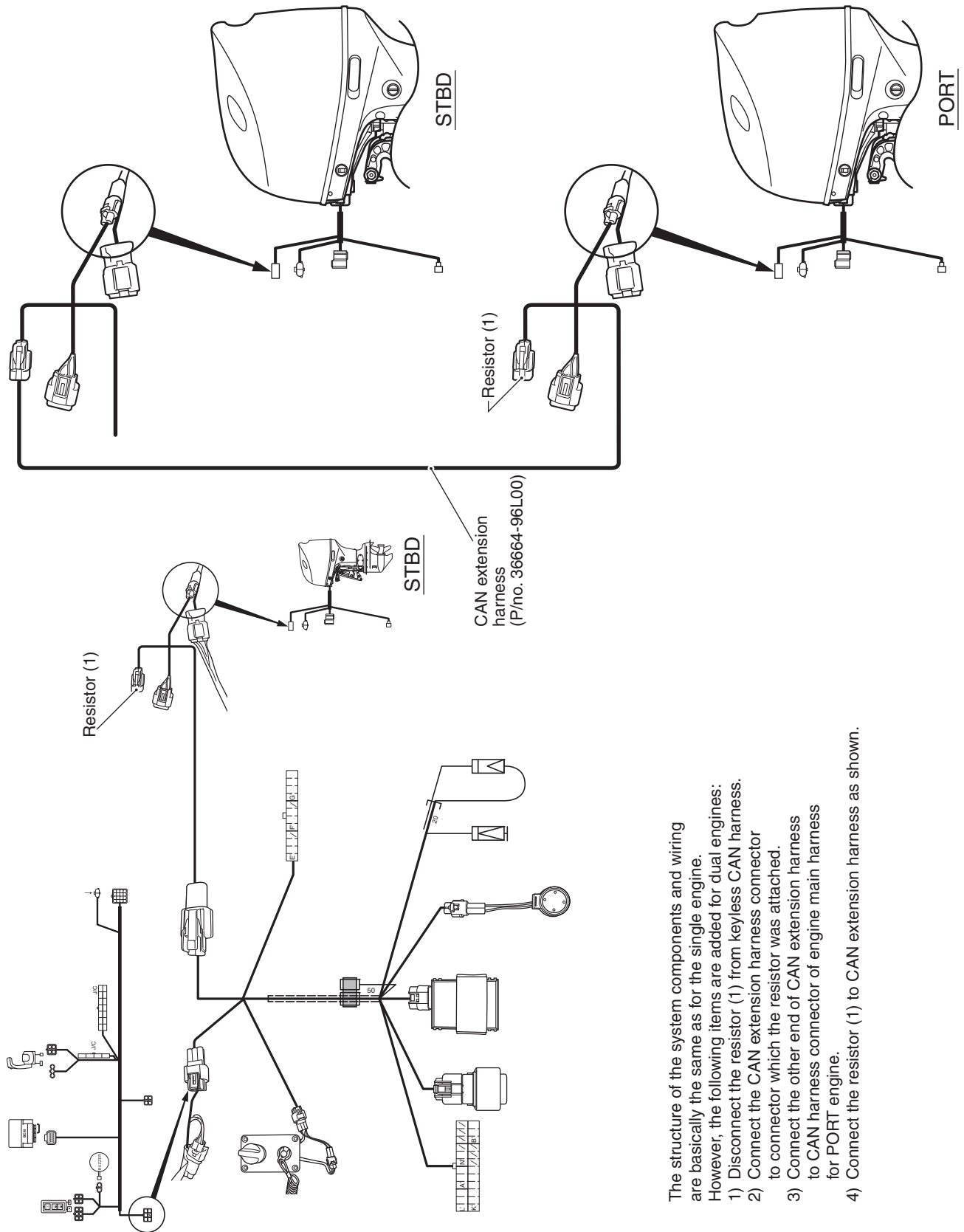
For example, being placed behind a metal cover or enclosure.

KEYLESS START SYSTEM COMPONENT/WIRE CONNECTION DIAGRAM

Keyless Wiring – single engine



Keyless Wiring – dual engines

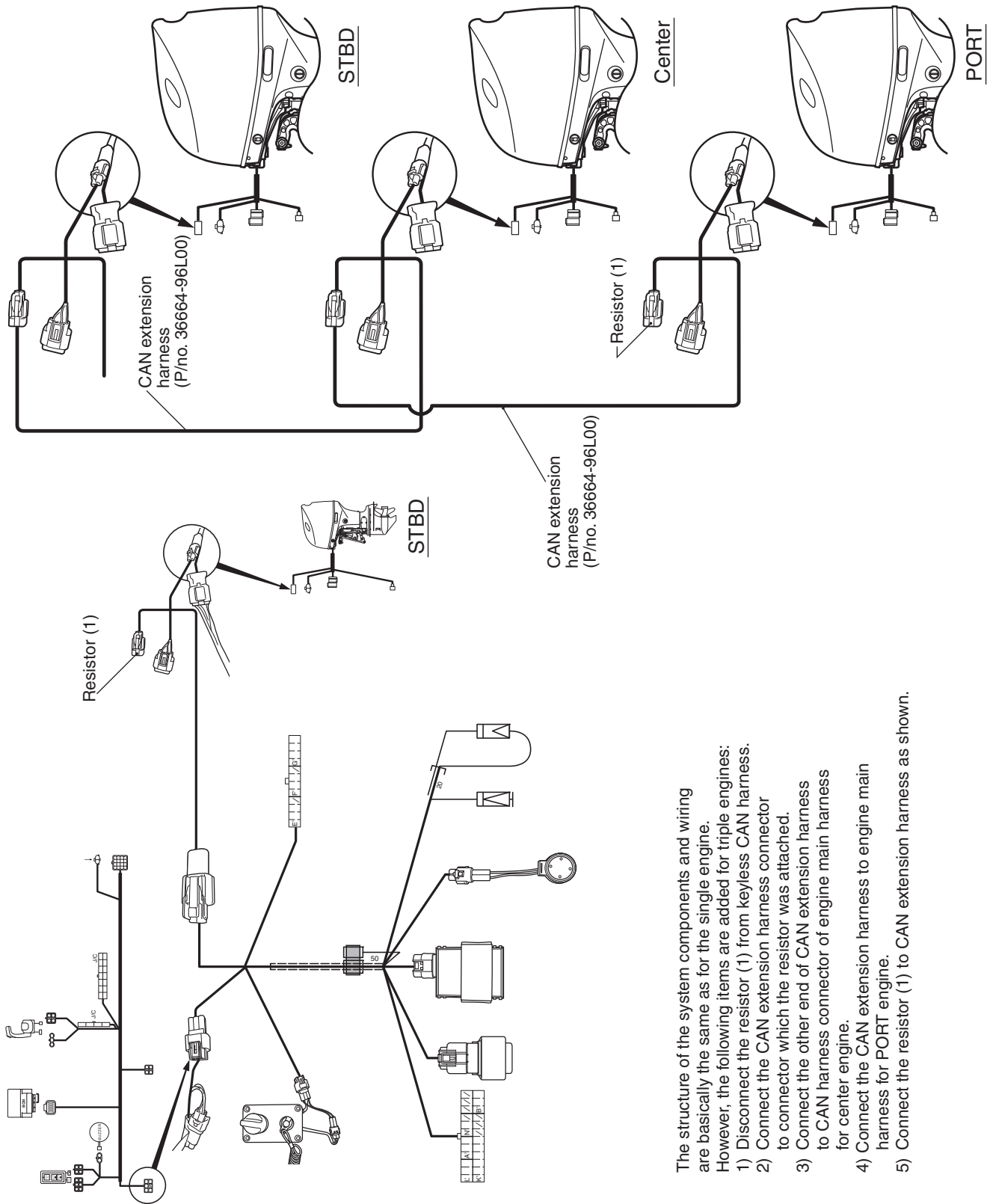


The structure of the system components and wiring are basically the same as for the single engine.

However, the following items are added for dual engines:

- 1) Disconnect the resistor (1) from keyless CAN harness.
- 2) Connect the CAN extension harness connector to connect the resistor which the resistor was attached.
- 3) Connect the other end of CAN extension harness to CAN harness connector of engine main harness for PORT engine.
- 4) Connect the resistor (1) to CAN extension harness as shown.

Keyless Wiring – triple engines

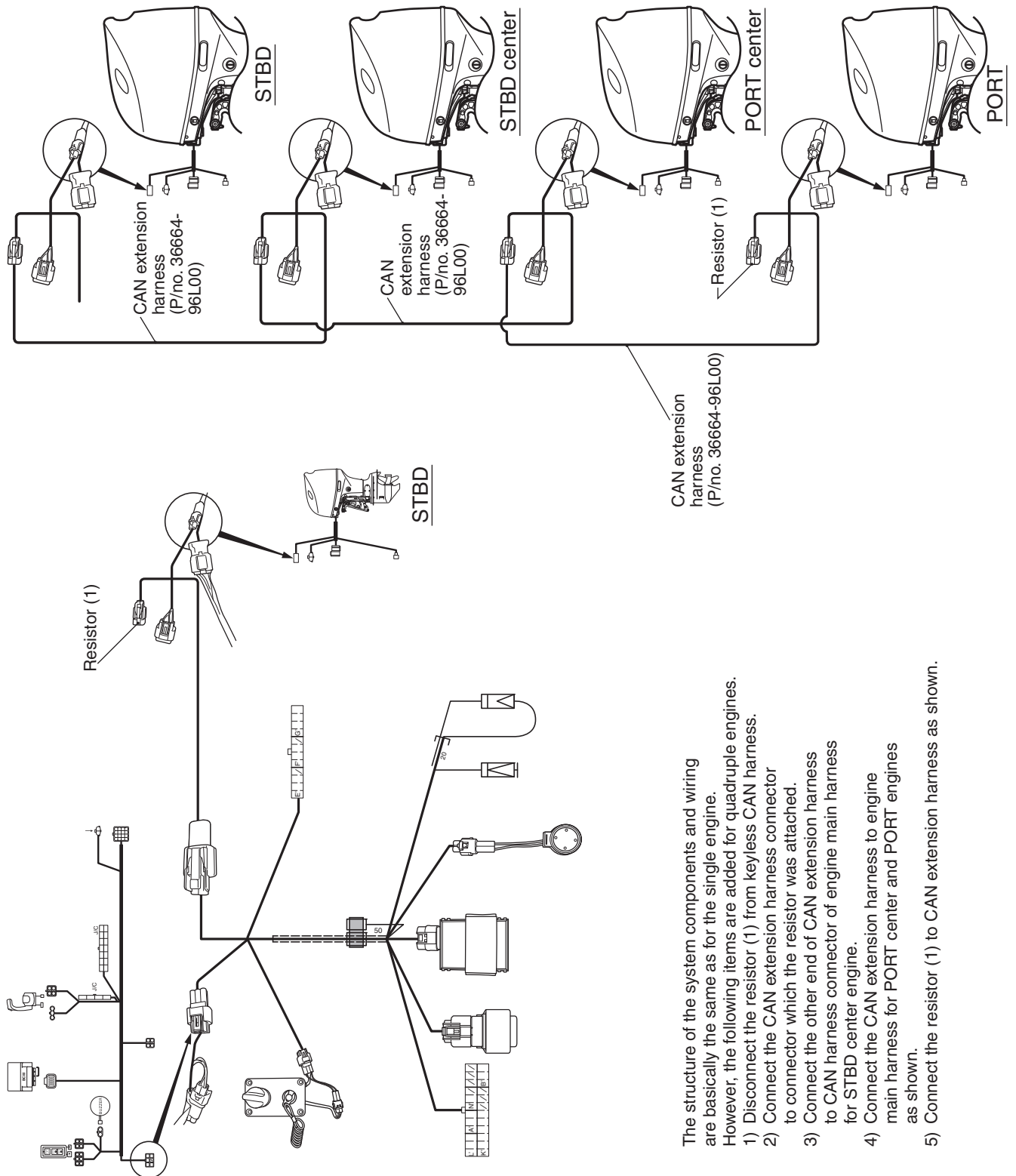


The structure of the system components and wiring are basically the same as for the single engine.

However, the following items are added for triple engines:

- 1) Disconnect the resistor (1) from keyless CAN harness.
- 2) Connect the CAN extension harness connector to connector which the resistor was attached.
- 3) Connect the other end of CAN extension harness to CAN harness connector of engine main harness for center engine.
- 4) Connect the CAN extension harness to engine main harness for PORT engine.
- 5) Connect the resistor (1) to CAN extension harness as shown.

Keyless Wiring – quadruple engines



- The structure of the system components and wiring are basically the same as for the single engine. However, the following items are added for quadruple engines.
- 1) Disconnect the resistor (1) from keyless CAN harness.
 - 2) Connect the CAN extension harness connector to connect the resistor (1) to the other end of CAN extension harness.
 - 3) Connect the other end of CAN extension harness to CAN harness connector of engine main harness for STBD center engine.
 - 4) Connect the CAN extension harness to engine main harness for PORT center and PORT engines as shown.
 - 5) Connect the resistor (1) to CAN extension harness as shown.

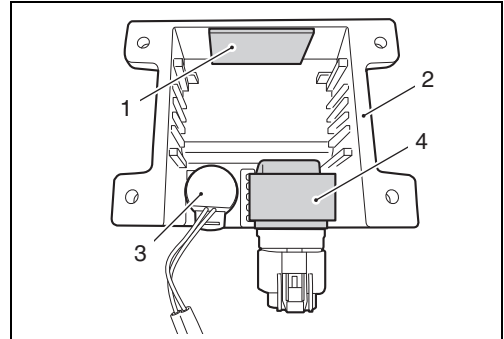
COMPONENT PARTS INSTALLATION OF KEYLESS START SYSTEM

After connecting the keyless start system component parts and wiring harness, each component parts should be installed as follows.

Refer to “KEYLESS START SYSTEM COMPONENT/WIRE CONNECTION DIAGRAM”.

- (1) Peel the back sheet of the cushion (1).
Stick the cushion (1) on the keyless parts holder (2) as shown.

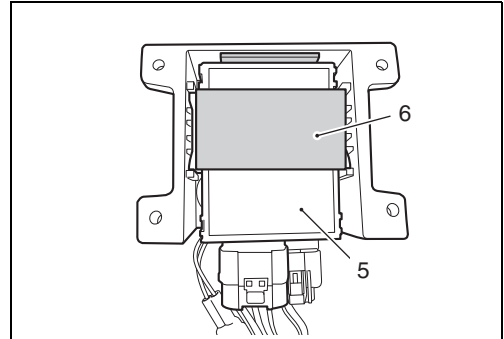
1; Cushion (P/no. 32851-93J00)



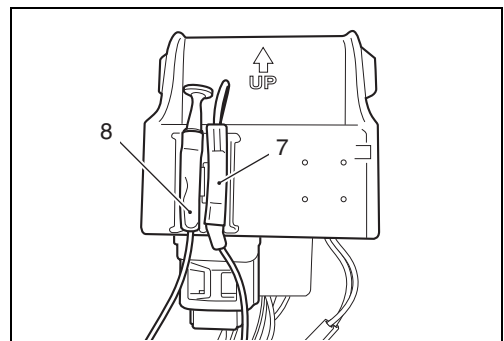
- (2) Install the buzzer (3) onto its mounting post in the keyless parts holder as shown.
- (3) Place the ECM power relay and cushion (4) at the place in keyless parts holder as shown.

- (4) Assemble the keyless control unit (5) and cushion (6), then install them into the keyless parts holder.

6; Cushion (P/no. 32980-38F00)



- (5) Press the Black lead wire (7) and Yellow lead wire (8) connectors at the front until lock as shown.
- (6) Install the keyless parts holder at the appropriate place in the cockpit with four screws.



FUNCTION OF COMPONENT PARTS

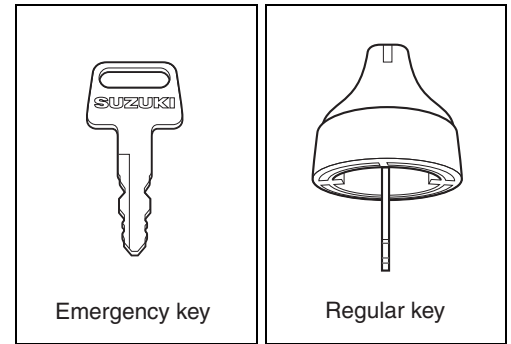
MAIN KNOB KEY AND EMERGENCY KEY

NOTE:

The main switch panel is shipped from the factory with a regular key and an emergency key.

The regular key must be in the switch to complete the installation process.

The emergency key is used to start the engine(s) when the key FOBs have been lost or misplaced.

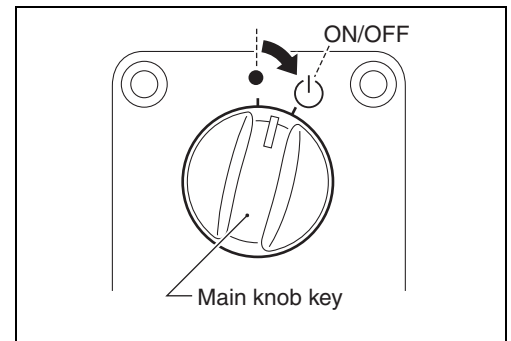


Main Knob Key

The main knob key is used for pairing the key-fobs and powering the system.

Removal: To remove the main knob key, turn the key clockwise about 15 degrees (between the “Neutral” and ON/OFF positions), then lift the key out of the cylinder.

Installation: To install the main key knob, insert the key into the cylinder with light pressure and turn the key about 15 degrees (between the “Neutral” and ON/OFF positions).



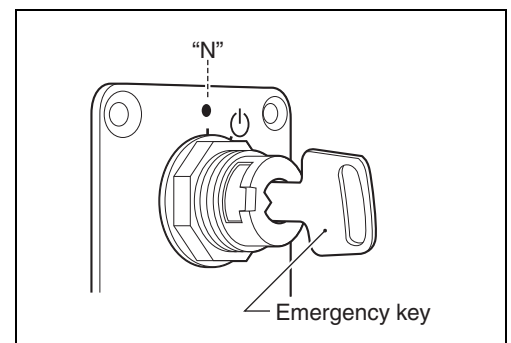
The main key knob is properly installed when it cannot be removed when lifted in the “Neutral” or ON/OFF positions.

Emergency Key

The emergency key is used to create a pass code and to enter the pass code to start the engine(s) when all key-fobs have been lost or misplaced. If the keyless system is installed on a vessel with multiple engines, the emergency key is used to set the engine instances.

Removal and installation:

The emergency key must be in the “Neutral” position to be removed or installed.



“N”: Neutral

KEY FOB

When receiving signals from the keyless control unit, key fob transmits ID codes to keyless control unit.

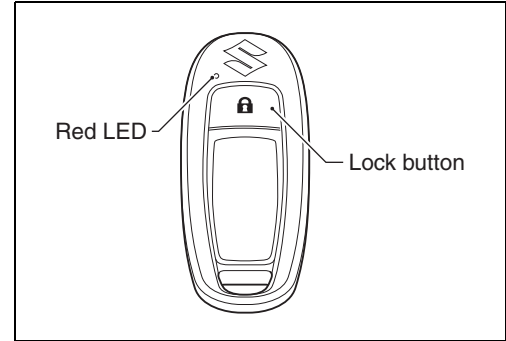
By pressing the key fob button for a longer time, the communication mode can be switched between transmittable (Unlock) and non-transmittable (Lock) modes.

Switching the key fob function

NOTE:

To confirm whether the key fob function is locked or unlocked, press the lock button on the key fob briefly and check the blinking time of the red LED on the key fob.

The LED blinks short when it is unlocked, and it blinks longer when it is locked.



How to lock the key fob function:

If the key fob function is unlocked, press the lock button on the key fob for about one second until the red LED on the key fob blinks once.

How to unlock the key fob function:

If the key fob function is locked, press the lock button on the key fob for about one second until the red LED on the key fob blinks once.

INSTANCE SETTING

When the keyless start system is used in multiple motor installations, the position of each engine, such as PORT, CENTER, STBD, must be registered in each ECM.

To perform the registration, a laptop computer with the Suzuki Diagnostic System version 8.50 or later and hardware version 5 or later must be used.

For operation of the Suzuki Diagnostic System Version 8.50, refer to “Suzuki Diagnostic System Version 8 Operation Manual.”

Necessary tool

The necessary tools are as follows.

Tool name	Part number	Q'ty
Suzuki Diagnostic System software Version 8.50 set	09933-19324	1
• Diagnostic harness		1
• USB adapter		1
• USB cable		1

NOTE:

“INSTANCE SETTING” must be performed before the initial registration ID code to the keyless unit and ECM.

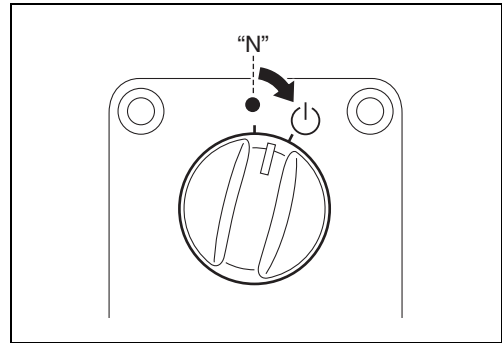
NOTE:

The “Instance Setting” is required for the multiple motor installation only.

It is not necessary to register for the single motor installation.

- (1) Connect the diagnostic harness and the USB cable (with a USB adapter) between the USB port of your PC and the ECM communication connector (4-pin connector).

- (2) Remove the main knob key by turning the key clockwise about 15 degrees (between the “Neutral” and ON/OFF positions), then lift the key out of the cylinder.

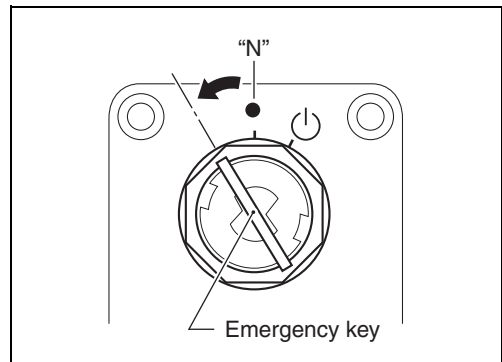


“N”: Neutral

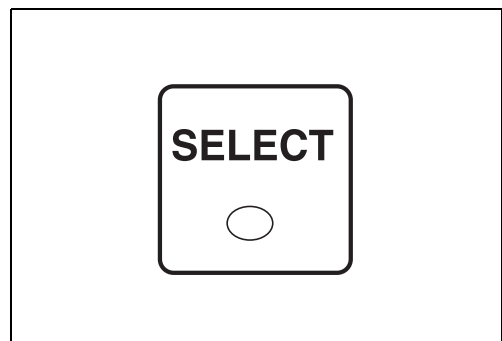


Emergency key

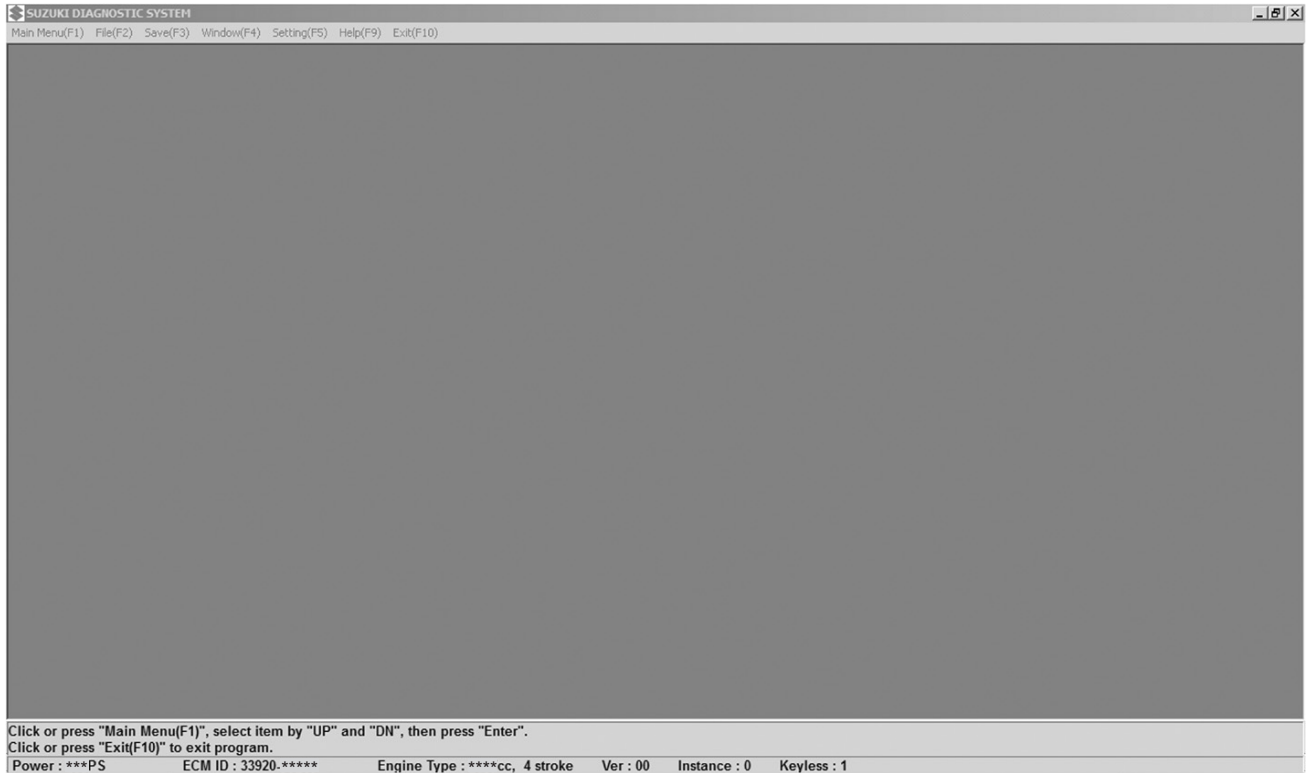
- (3) Insert the emergency key into the switch.
Turn the key counter clockwise from “Neutral”.
The caution buzzer emits one long sound to notify that the system is turned ON.
Confirm that the green LED on “SELECT” switch is ON.



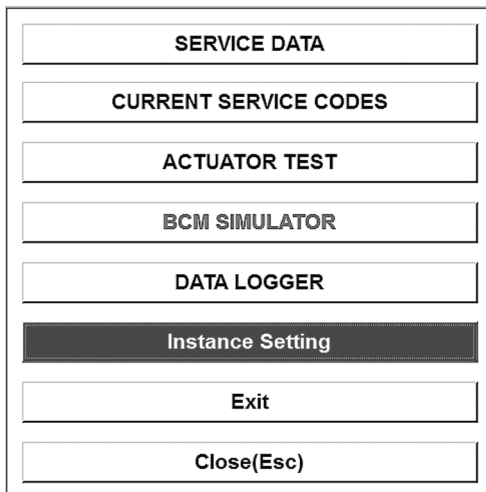
“N”: Neutral



- (4) Start the SDS program.
- (5) The first menu window appears.



- (6) Click "Main Menu(F1)" or press the "F1" key from the keyboard. The following main menu dialog box appears.
- (7) Click the "Instance Setting" button from the Main Menu dialog box.



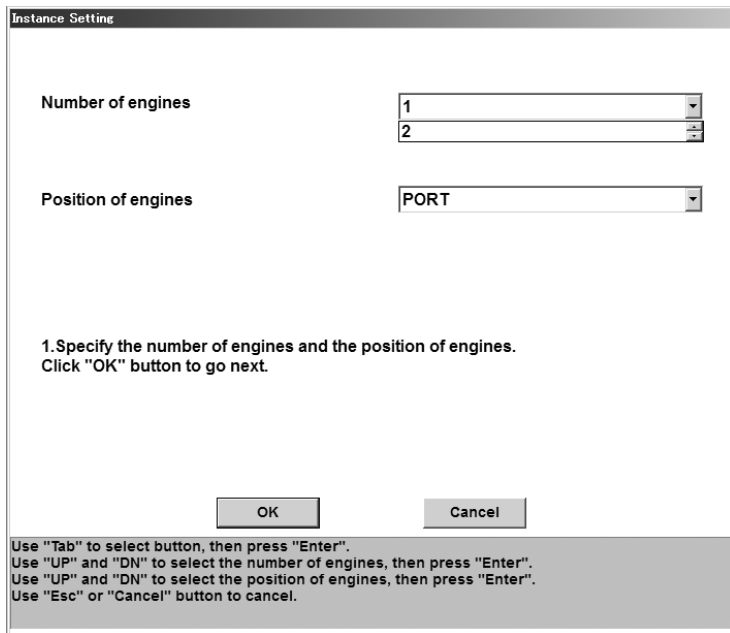
(8) Then following window appears.

This window is used to register the engine configuration.

Select the number of engines and the position of engines by clicking the “▼” button, then click the “OK” button and proceed to the next step.

(Keyboard operation) Move to a desired item by using the “Tab” key. Select a desired item by using the “Up” or “Down” arrow key and pressing the “Enter” key.

Click the “Cancel” button to cancel the engine configuration.



Instance Setting

Number of engines 1
 2

Position of engines PORT

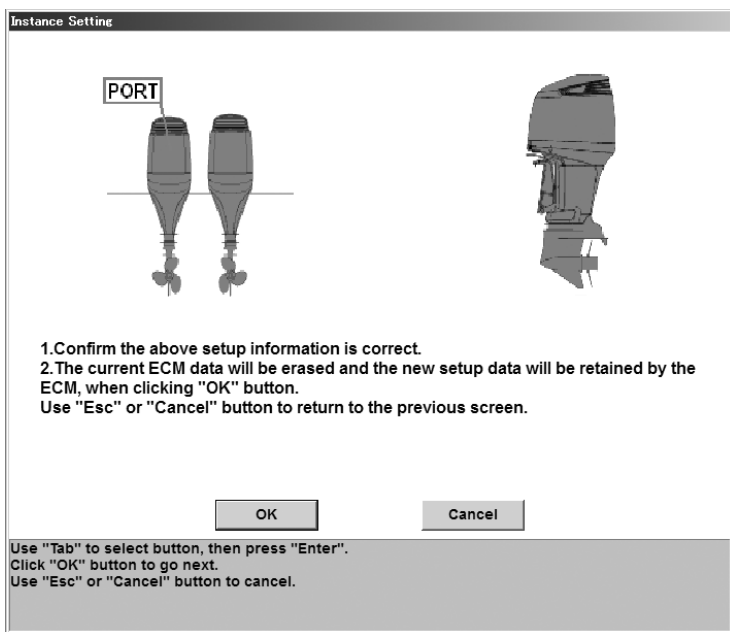
1. Specify the number of engines and the position of engines.
Click "OK" button to go next.

OK Cancel

Use "Tab" to select button, then press "Enter".
Use "UP" and "DN" to select the number of engines, then press "Enter".
Use "UP" and "DN" to select the position of engines, then press "Enter".
Use "Esc" or "Cancel" button to cancel.

(9) Click the “OK” button (or “Enter” key on the keyboard) if the registration is correct.

Clicking the “Cancel” button returns to the previous screen.



Instance Setting

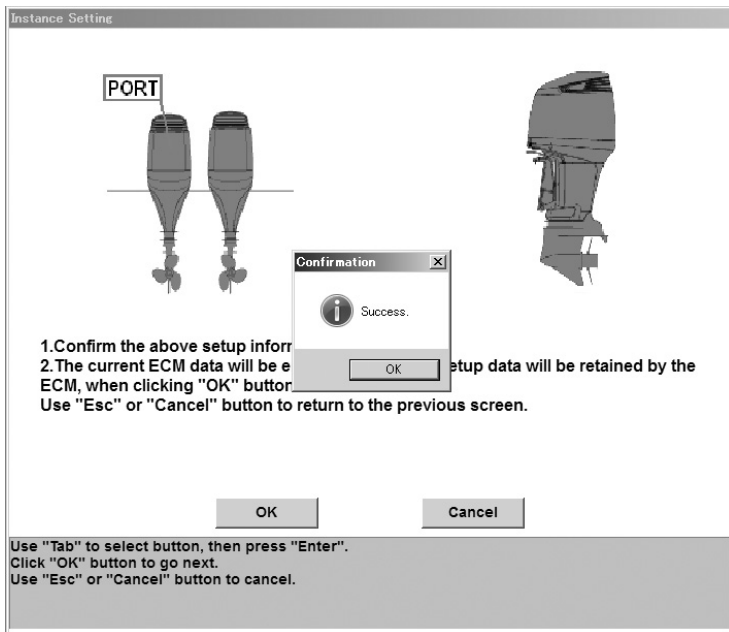
PORT

1. Confirm the above setup information is correct.
2. The current ECM data will be erased and the new setup data will be retained by the ECM, when clicking "OK" button.
Use "Esc" or "Cancel" button to return to the previous screen.

OK Cancel

Use "Tab" to select button, then press "Enter".
Click "OK" button to go next.
Use "Esc" or "Cancel" button to cancel.

- (10) Click the “OK” button to complete the registration of the engine location.
The system then returns to the main menu.



- (11) Turn the emergency key to the “Neutral” position.
Before going to the next step, wait for about one minute until the ECM internal circuit is turned OFF.
- (12) Change the connection of the diagnostic harness to the next engine (ECM).
The position of each engine must be registered to the ECM using the same procedure.

NOTE:

Once an ECM has been connected and paired to a keyless start control unit, the ECM/outboard cannot be started with a normal key switch.

To unpair an ECM from an keyless control unit, see page “UNPAIRING AN ECM FROM THE KEYLESS START SYSTEM”.

REGISTERING THE FIRST AND SECOND KEY-FOB ID CODES

ID codes of individual key-fobs must be registered to enable the keyless start system.

To register the ID code of the first and second key-fob, do the following:

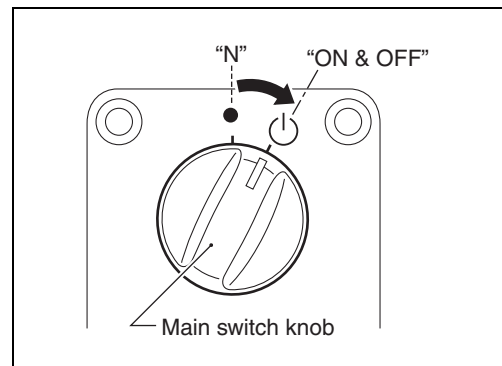
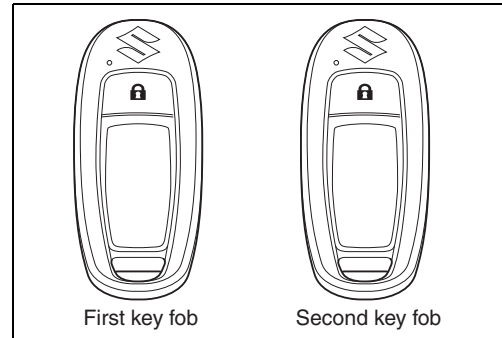
- (1) Complete the system wiring.
- (2) Connect the battery cable and sub battery cable to the battery.

NOTE:

**Two key-fob ID codes must be registered.
The system cannot be operated until two ID codes are registered.**

How to register the first key-fob ID code

- (3) Make sure the first key-fob is placed less than 0.3 m (12 in) from the keyless control unit.
The second key-fob must be separated more than 1 m (3.2 feet) from the keyless control unit, or lock the second key-fob function by operating its lock button.
- (4) Turn the main switch knob from “Neutral” to “ON & OFF”, then release the knob.
The red LED on the key fob lights up; within 10 seconds, briefly press the key fob button.



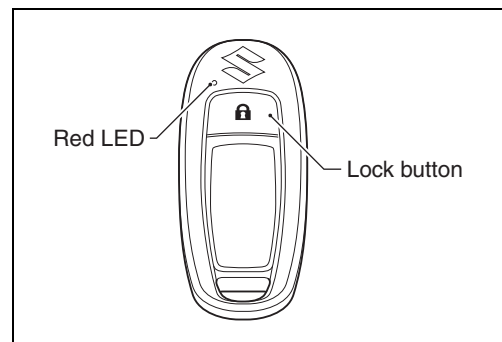
“N”: Neutral

NOTE:

If the buzzer emits five (5) short sounds when the main switch knob is turned from “Neutral” to “ON & OFF” position, the key fob function may be locked.

Press the lock button on the key-fob for more than one second to unlock the key fob function. Then perform step 4 again.

- (5) When the initial registration is successful, the buzzer emits one (1) short sound, followed by one (1) long sound, and the key fob’s red LED turns off.

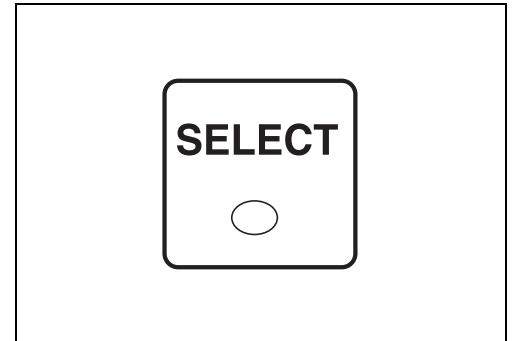


NOTE:

- *If the ID code registration is not successfully completed, the buzzer emits five (5) short sounds.*
- *If the registration is not successful, wait for about one minute, then perform step 4 again.*

How to register the second key-fob ID code

- (6) Make sure the second key-fob is placed less than 0.3 m (12 in) from the keyless control unit.
The first key-fob must be separated more than 1 m (3.2 feet) from the keyless control unit, or lock the first key-fob function by operating its lock button.
- (7) Using the same procedure that was used for registering the first key-fob, register the second key-fob ID code by operating the main switch knob and the second key-fob.
- (8) To confirm the key-fob registration was successful:
 - (a) Turn the main switch knob from “Neutral” to “ON & OFF” and release it.
The buzzer emits two (2) short beeps and the green LED in the “SELECT” switch of the control panel turns on.
At this time, the keyless control unit and the ECM become a pair.



NOTE:

For multiple engine applications, the instance setting must be completed before this first key-on action.

ADDING KEY FOBS

Every key fob has a unique identification code.

The keyless start system can only be controlled by a key fob that has been registered in the keyless control unit.

NOTE:

The first and second key fob ID codes are registered in the keyless control unit at the time of the initial registration for the unit ID code.

Refer to “REGISTERING THE FIRST AND SECOND KEY-FOB ID CODES” in this manual.

NOTE:

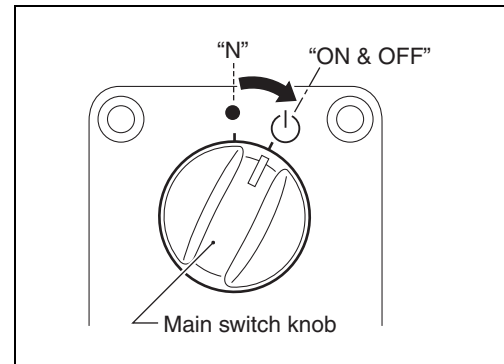
A maximum of six (6) key-fobs can be registered in a keyless start control unit.

Each additional key-fob must be registered.

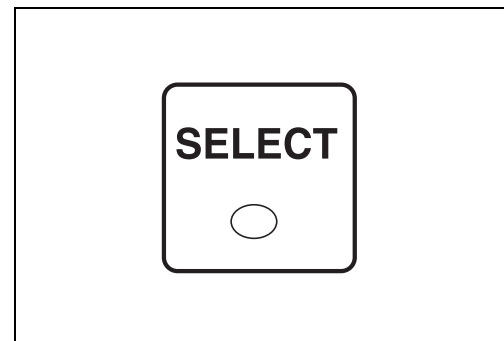
Register one key-fob at a time.

To register additional key fob ID codes, do the following:

- (1) Make sure the engine is stopped, the control lever is in neutral, and the key fob and the keyless start control unit are within proper range.
- (2) Turn the main switch knob from “Neutral” to “ON & OFF” position and release it.
Confirm that the “SELECT” switch green LED turns on.



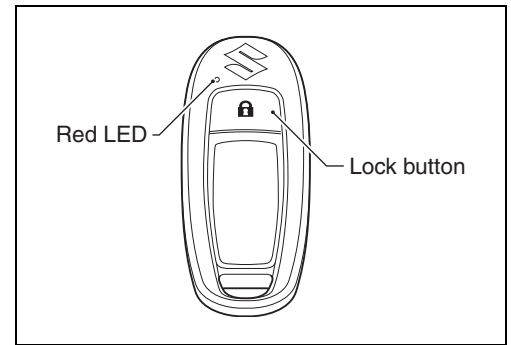
“N”: Neutral



- (3) Make sure only the key fob for registration should be unlocked. All other key fobs must be locked.

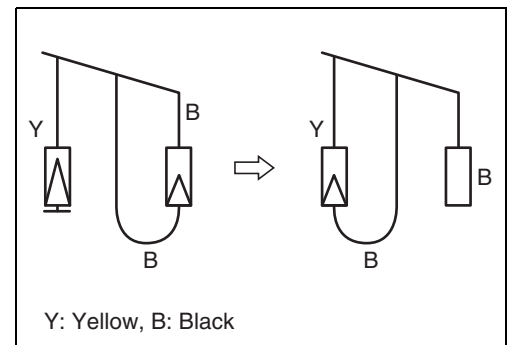
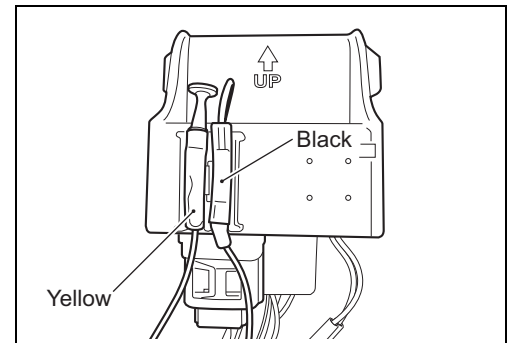
NOTE:

If the other key fobs are not locked during this step, they may transmit radio waves, which will cause the registration procedure to fail.



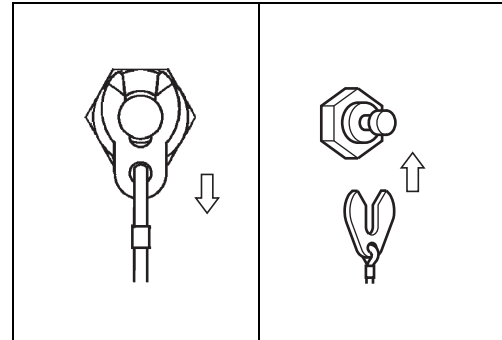
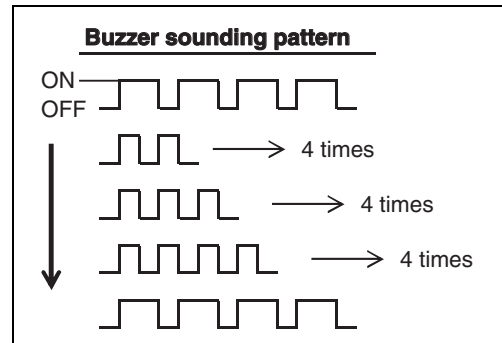
- (4) Make sure the key fob for registration is placed less than 0.3 m (12 in) from the keyless control unit.
Make sure that the keyless start system is ON and green LED of the "SELECT" switch of the control panel is ON.

- (5) Connect the yellow lead wire and black lead wire located in the keyless control harness.



- (6) The buzzer will emit four (4) long beeps, followed by two (2) short beeps emitted four times.

When you hear the two (2) short beeps, immediately remove the lock plate from the stop switch, then reinstall it.

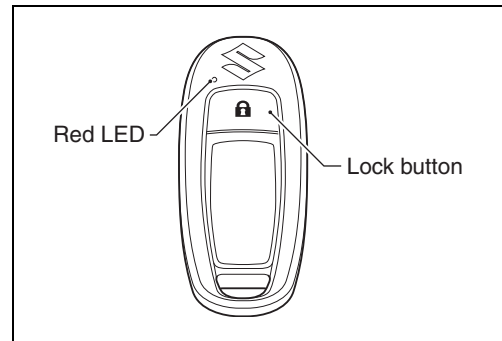


NOTE:

The buzzer emits short beeps, which indicate which key fob ID code has been registered in the keyless control unit.

This pattern is repeated every five seconds until the yellow lead wire and black lead wire are disconnected.

- (7) Briefly press the lock button of the key-fob being added to the keyless start system within ten (10) seconds of attaching the lock plate to the emergency stop switch.



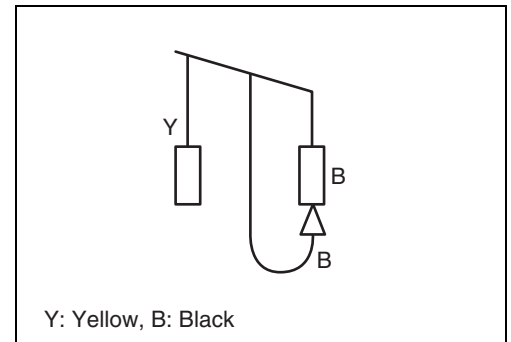
- (8) When the ID code registration has been successfully performed:
- The buzzer sounds a short beep to indicate registration is complete.
Five (5) seconds after the successful registration beep, the keyless start system buzzer emits a series of beeps to indicate the number of the key fob just registered to the system.
- For example, four (4) beeps indicates the key fob just registered is the fourth key fob registered to the keyless control unit.
- Remember, a maximum of six (6) key fobs can be registered on a single keyless control unit.

If the registration is not successful, the red LED on the key-fob will turn OFF and the system continuously emits short beeps until the black lead wires are reconnected.

NOTE:

*Adding another key fob to the keyless system must be done within ten (10) seconds of reinstalling the lock plate.
If this is not done, the buzzer continues to sound.*

- (9) Disconnect the black lead wire from the yellow lead wire and reconnect the black lead wires on the back of the keyless start system parts holder.



- (10) Make sure the keyless start system can be controlled with the key fob registered in its ID code.

UNPAIRING AN ECM FROM THE KEYLESS START SYSTEM

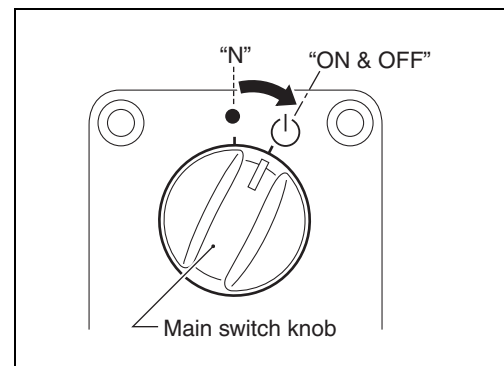
When the outboard motor is resold, removed and started in a test tank, or if it is necessary to use the ECM on another engine, the ECM must be unpaired with the keyless control unit by erasing the ID code in the ECM.

Do the following to erase the ID code:

NOTE:

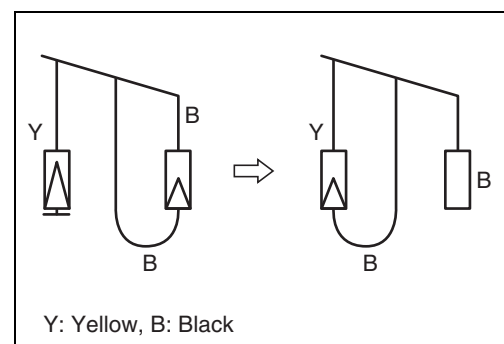
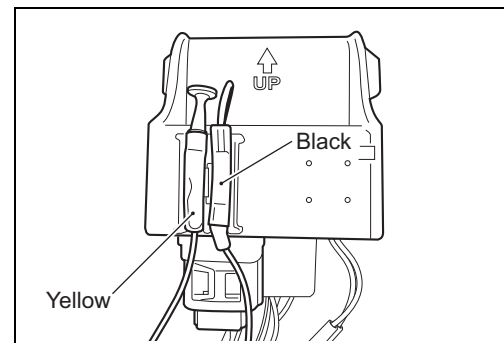
The key-fob ID code registered in the keyless control unit cannot be erased from the keyless control unit.

- (1) Make sure the key-fob and the keyless control unit are within communication range.
- (2) Turn the main switch knob from “Neutral” to “ON & OFF” position, then release the knob.
Confirm that the keyless start system has been turned ON.

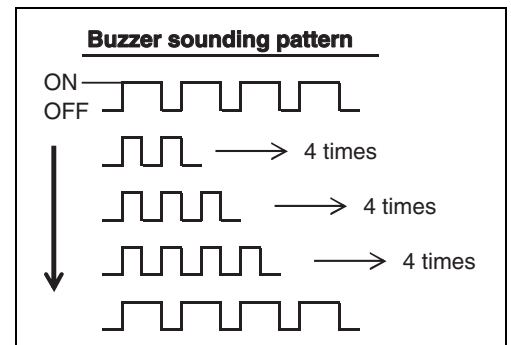


“N”: Neutral

- (3) Connect the black lead wire and the yellow lead wire in the keyless control harness.

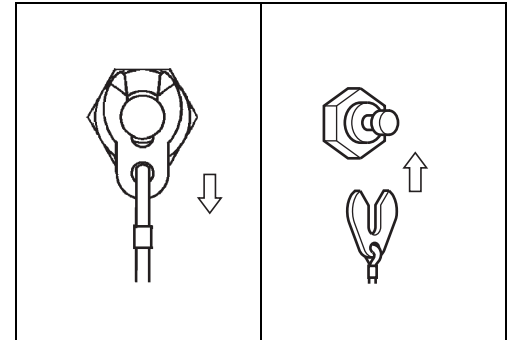


- (4) The buzzer starts sounding in the following patterns:
 Four (4) long sounds, followed by:
- Two (2) short sounds emitted four (4) times
 - Three (3) short sounds emitted four (4) times
 - Four (4) short sounds emitted four (4) times

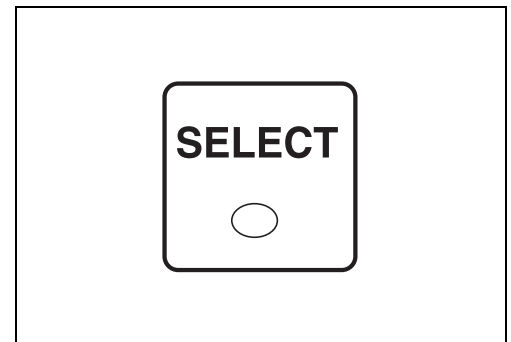


Immediately remove the lock plate from the emergency stop switch, then reinstall it.

If the unpairing is unsuccessful, the buzzer will continuously emit short beeps until the black lead wires are reconnected.



- (5) Disconnect the black wire lead from the yellow wire lead, and then reconnect the two (2) black wire leads.
- (6) The buzzer sounds when unpairing is completed successfully.
 The LED on the “SELECT” switch goes OFF.
- (7) Remove the battery cable from the battery.



NOTE:

*After unpairing an ECM from the keyless start system, do not turn the main switch knob to the “ON & OFF” position.
 If the switch is turned, the ID code cross-check will be performed again between the keyless control unit and ECM.*

STEERING SYSTEM

⚠ WARNING

Selection of an improper steering system or improperly installing a steering system on the outboard motor can cause steering/handling difficulties, resulting in loss of control and a crash.

Be sure to follow the steering system manufacturer's instructions for proper selection and installation.

Suzuki highly recommends installing a hydraulic steering system with power assist rated for the installed horsepower.

To choose an appropriate power assist steering system for the installed horsepower, consult with the steering system manufacturer.

TIE-ROD LENGTH ADJUSTMENT

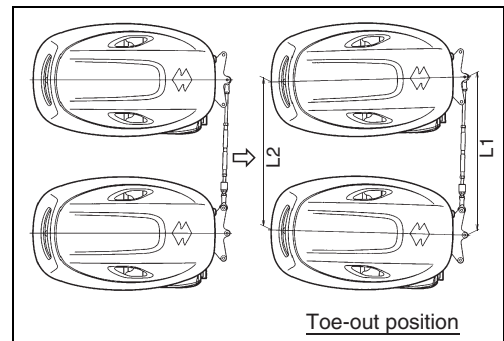
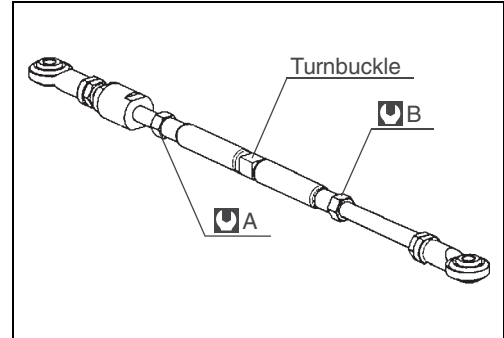
1. Loosen the nuts A and B.
2. Adjust the tie-rod length by turning the turnbuckle.
3. When the tie-rod length has been adjusted, tighten the nuts A and B.

🔩 Nut A and B; 85 N·m (8.7 kgf-m, 63 lb-ft)

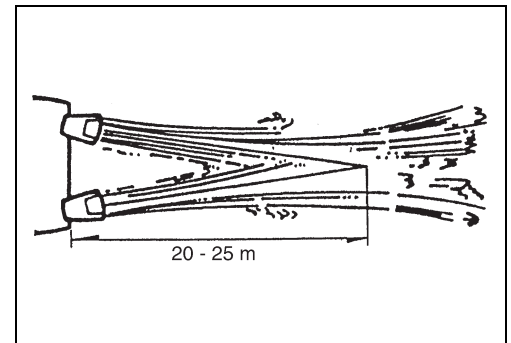
The required length of tie-rod depends on the condition. Adjust the length so that the best result can be obtained. The following is an example of adjustment to obtain the optimum result.

Example: Toe-out position

1. Adjust the tie-rod length so that the two engine center lines in forward direction are away from each other with the differential $L1 - L2$ within 25 mm (0.98 in).



2. The two engine wakes should meet together at approximately 20 m – 25 m behind them.



CORRECT RIGGING

For the best result, it is recommended that the following be checked.

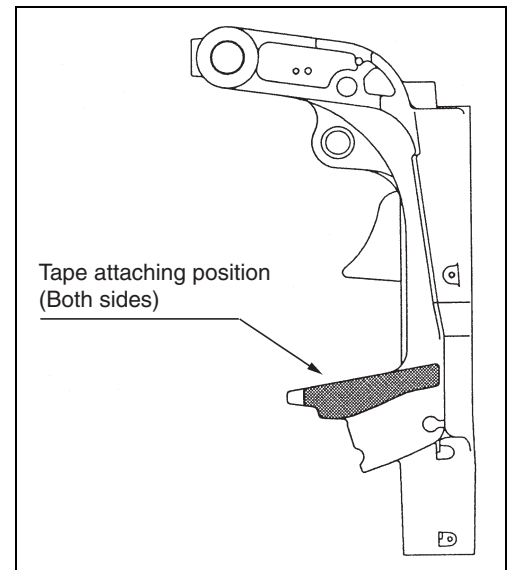
1. Raise the engine to the full tilt up position and lower the manual tilt lock lever.

⚠ WARNING

Failure to take proper precaution when sticking the tape to the swivel can cause severe personal injury.

Make sure that the tilt lock lever is set securely.

2. As shown in right figure, cut four pieces of tape which comes provided in this kit and stick them at the swivel stopper area of both the STBD and PORT side engines.



NOTE:

Prior to sticking the tape, make sure to degrease the attaching surface thoroughly.

NOTE:

For increased adhesion, press and scrape the tape surface. At this time, however, use caution not to cause wrinkle, scratch, etc. on the tape.

3. Perform double-check to make sure that all the bolts and nuts are tightened properly to the specified torque.
4. After one hour of operation, perform another check to make sure that all the bolts and nuts are tightened properly to the specified torque.
5. After another one hour of operation further to the above, check again visually for the surface condition of aluminum tape. If all the four aluminum tapes show the sign of equal contact, it shows the rigging has been accomplished successfully. If any difference in contact condition is found, adjust the tie-rod length observing the following instructions:
 - ① Requiring shorter tie-rod length:

There is a damage on the starboard side aluminum tape of the starboard side engine as well as on the port side tape of the port side engine.
 - ② Requiring longer tie-rod length:

There is a damage on the port side aluminum tape of the starboard side engine as well as on the starboard side tape of the port side engine.

6. If any of the above conditions is present, adjust the tie-rod length to either shorter or longer as appropriate by approximately 5 mm at a time. Repeat the procedures in the steps 1 to 5 until all the four aluminum tapes show the equal contact condition.

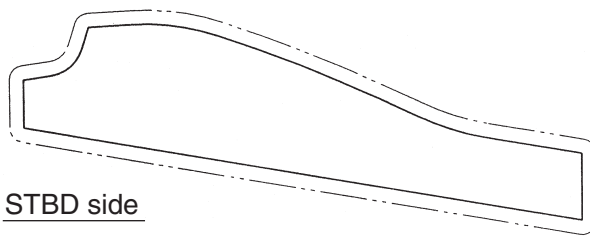
NOTE:

Damaged aluminum tapes can no longer be used for the subsequent adjustment and therefore should be replaced.

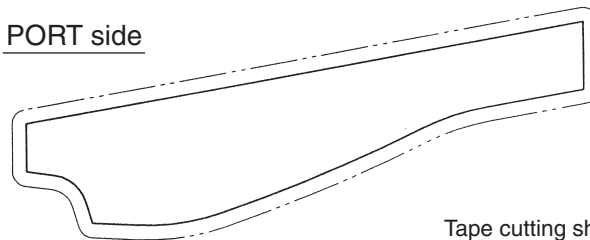
With the procedures above performed, the rigging completes.

NOTE:

- *Depending on the boat and adjustment condition, the initial setting of toe-in can turn to toe-out later. Especially when the boat is equipped with outrigger, such a variation may become more evident.*
- *Double-check all the bolts and nuts for proper installation and tightness.*
- *After two hours of operation, perform another check to make sure that all the bolts and nuts are tightened properly to the specified torque.*
- *At the end of every 50 hours of operation, lubricate and check all the parts for wear, installation condition and tightening torque.*



STBD side



PORT side

Tape cutting shape (Cut along lines of inside.)

FUEL HOSE

⚠ WARNING

Gasoline is extremely flammable and toxic. Service operation of any type performed on the fuel system involves a risk of fire and injury if proper precautions are not taken.

Be sure to take the following precautions when working around gasoline or servicing the fuel system:

- Keep the working area well ventilated and keep away from open flames (such as a gas heater) or sparks.
- Do not smoke or allow anyone else to smoke near the working area.
- Wipe up fuel spills immediately.
- After connecting a hose, check that there is no twist or kink in the hose.

CONNECTION

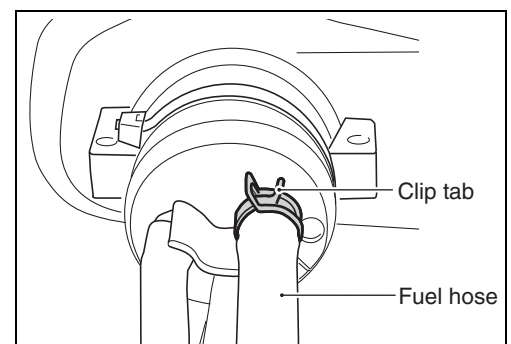
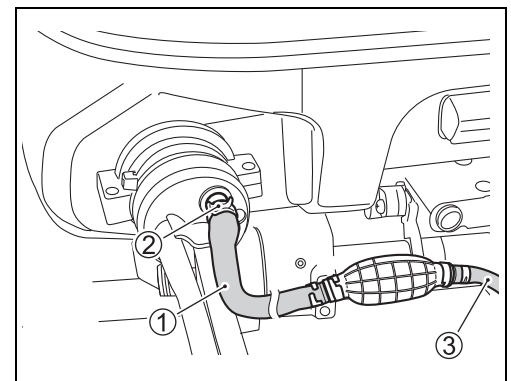
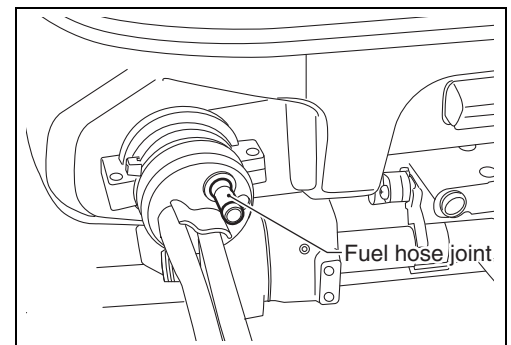
Connect the fuel hose.

- (1) Connect the fuel hose ① to the fuel hose joint and tighten the connecting point with a clip ②.
- (2) Connect the fuel hose ③ to the fuel pipe from the boat fuel tank and tighten the connecting point with a clip.

NOTICE

Installing the fuel hose clip with the tabs facing the battery cables and remote control cable can damage the cables.

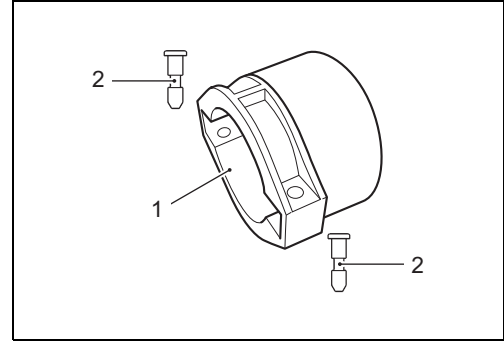
When installing the fuel hose clip, be sure the tabs point away from the battery cables and remote control cable.



RIGGING HOSE ADAPTER KIT

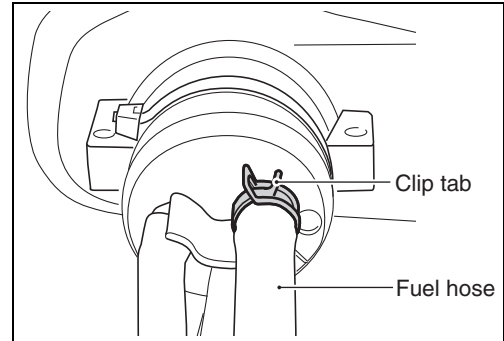
Contained parts

Item	Part name	Part number	Q'ty
1	• Rigging hose adapter	• 67361-90J10	1
2	• Pin	• 09208-06011	2



INSTALLATION

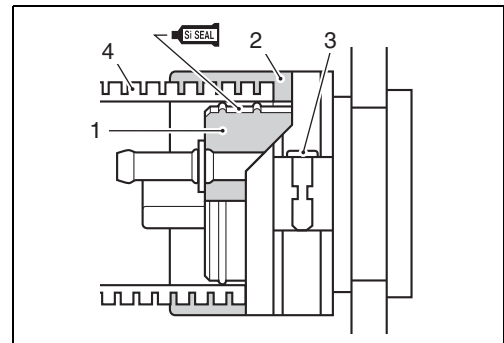
1. Insert the remote control wire, battery cable into the rigging hose adapter.
2. Connect the fuel hose to fuel hose joint.
For the procedure to connect the fuel hose to fuel hose joint, refer to "FUEL HOSE" section.



3. Put on the rigging hose adapter to rigging port grommet, then secure the adapter with pins as shown in the illustration.

The pin must be installed to tab of both side.

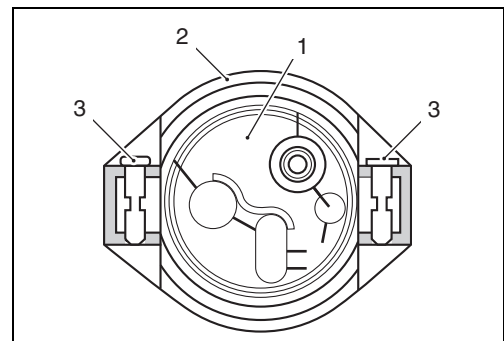
1. Rigging port grommet
2. Rigging hose adapter
3. Pin
4. Rigging hose



NOTE:

Before connecting the rigging hose (4) to the rigging hose adapter (2), apply silicone seal to clearance of a rigging hose (4) and the rigging port grommet (1), to prevent water entry.

 93691-80030: SUZUKI Silicone Seal (100 g)



ENGINE OIL

NOTICE

Use of a poor quality engine oil can adversely affect engine performance and life.

Suzuki recommends that you use Suzuki Marine 4-cycle Engine oil or its equivalent.

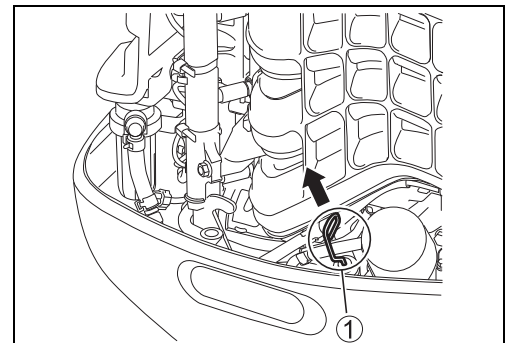
Use the following engine oil.

Recommended oil:

- 4 stroke motor oil
- API classification: SG, SH, SJ, SL, SM, SN or NMMA certified FC-W oil
- Viscosity rating: SAE 10W-40 or 10W-30, NMMA FC-W 10W-40 or 10W-30

NOTE:

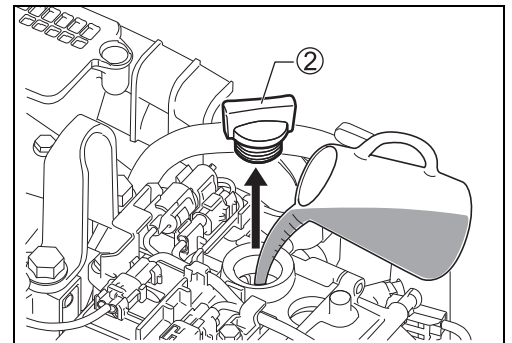
The outboard motor is shipped from the factory without the engine oil.



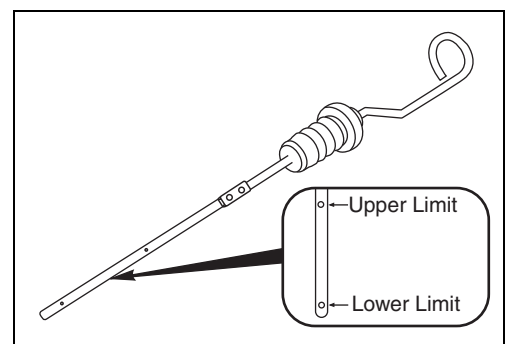
Fill the engine oil in the following procedure.

- (1) Place outboard motor upright on a level surface.
- (2) Remove the oil filler cap ② and oil level dipstick ①.
- (3) Pour recommended engine oil into oil filler opening.

Engine oil amount: 5.5 L (5.8/4.8 US/Imp. qt)



- (4) Check the engine oil level.
- (5) Reinstall the oil filler cap and oil level dipstick.



PROPELLER INSTALLATION

NOTICE

Installing a propeller with either too much or too little pitch will cause incorrect maximum engine speed, which may result in severe damage to the motor.

Select a propeller that will allow the engine to reach the recommended operating range at full throttle with the maximum boat load.

Selection

Select propellers as shown below so that the specified engine rpm is obtained with the throttle fully opened.

Recommended full throttle speed range	DF115BG	5000 – 6000 r/min
	DF140BG	5700 – 6300 r/min

Propeller size chart

Blade × Dia. (in) × Pitch (in)				
Right hand rotation propeller				
3	×	13 and 1/2	×	15
3	×	14	×	17
3	×	14	×	19
3	×	14	×	21
3	×	14	×	23
3	×	13 and 7/8	×	15
3	×	13 and 7/8	×	17
3	×	13 and 7/8	×	19
3	×	13 and 7/8	×	21
3	×	13 and 7/8	×	23
3	×	13 and 7/8	×	25
Left hand rotation propeller				
3	×	13 and 7/8	×	17
3	×	13 and 7/8	×	19
3	×	13 and 7/8	×	21
3	×	13 and 7/8	×	23

Propeller installation

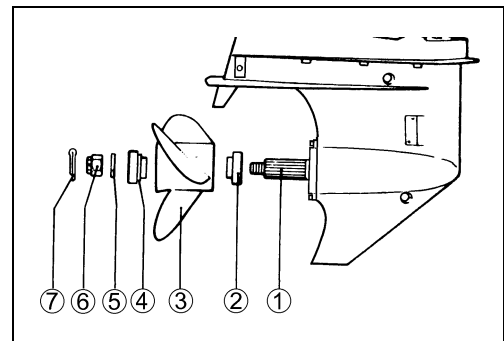
- (1) Coat the propeller shaft ① with the SUZUKI water-resistant grease.

 **99000-25350: SUZUKI Water Resistant Grease EP2**

- (2) Place the stopper ② on the propeller shaft.
- (3) Slide the propeller ③ onto the propeller shaft.
- (4) Place the spacer ④ and washer ⑤ on the propeller shaft.
- (5) Tighten the propeller nut ⑥ to the specified torque.

 **Propeller nut: 55 N·m (5.6 kgf-m, 41 lbf-ft)**

- (6) Push the cotter pin ⑦ through the nut and shaft, then bend to secure.



TRIM TAB ADJUSTMENT

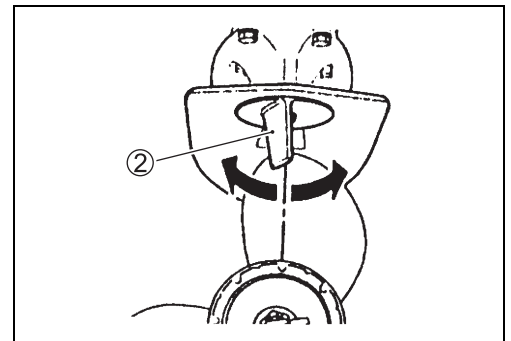
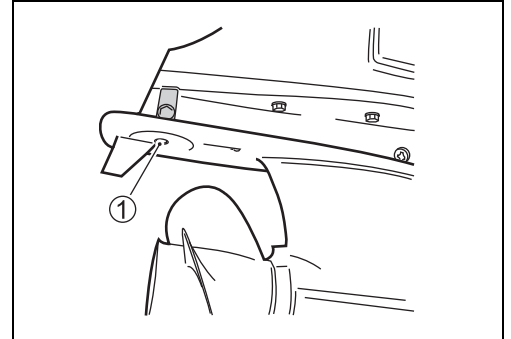
The trim tab counteracts or minimizes propeller torque pull felt through the steering system.

If the steering is pulled to the starboard or port side, adjust the trim tab with the following procedure.

- (1) Loosen the trim tab bolt ①.
- (2) Changing the trim tab setting.
 - To compensate for a veer to starboard, set the trailing edge of tab ② to the right (as viewed from behind).
 - To compensate for a veer to port, set the trailing edge of tab to the left.
- (3) Tighten the trim tab bolt ① to the specified torque.

 **Trim tab bolt: 23 N-m (2.3 kgf-m, 17 lbf-ft)**

- (4) Test drive the boat and repeat the procedure (1) – (3) to set the trim tab in the best position.
With a properly adjusted trim tab, steering should be neutral and there should be no tendency for the steering to be pulled to either port or starboard.



Prepared by

SUZUKI MOTOR CORPORATION

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