

REMOTE CONTROLS

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Single binnacle remote control box



Dual binnacle remote control box



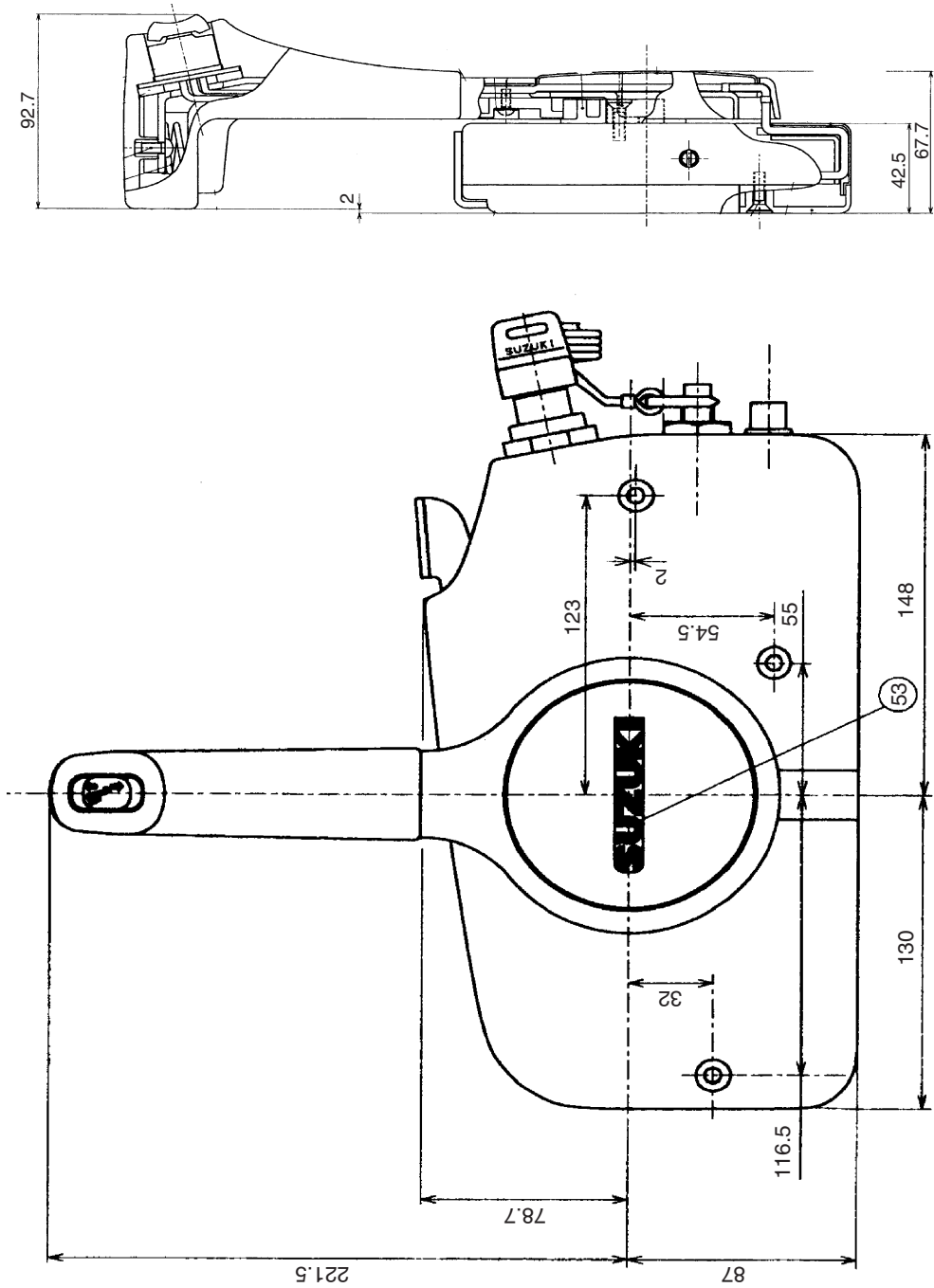
Concealed remote control box



Side mount remote control box

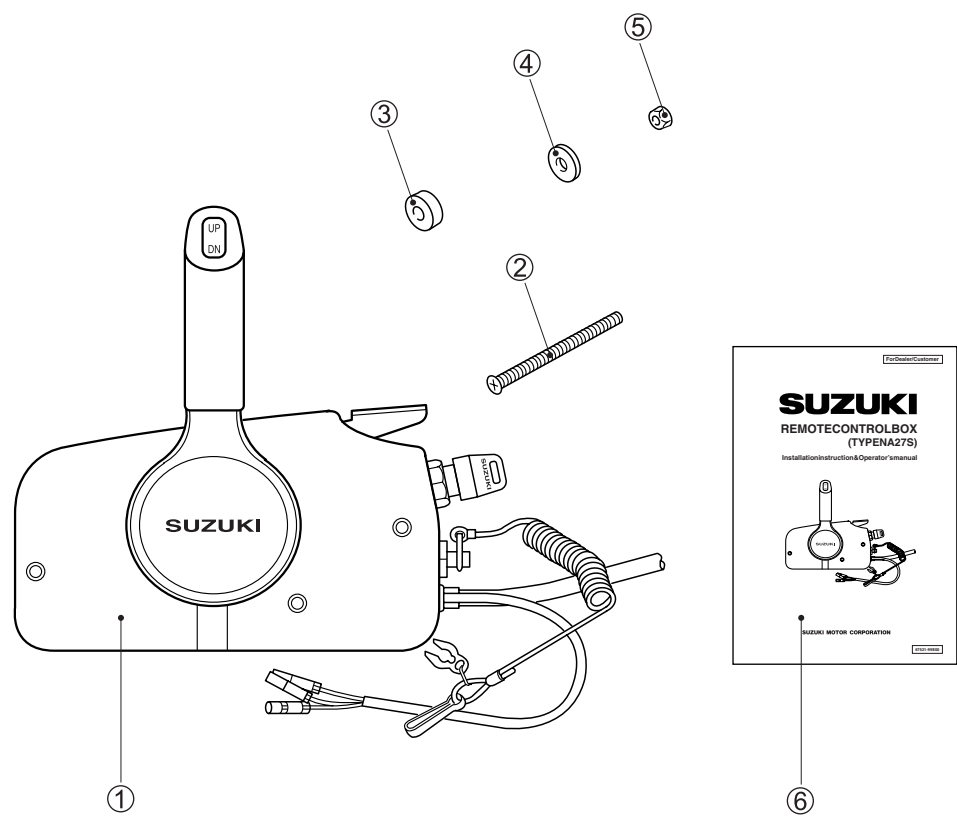
SIDE MOUNT REMOTE CONTROL BOX

Part number	Applicable models	Years	Throttle	Wire harness type	PTT switch	Ignition switch	Emergency switch	Caution buzzer	Neutral switch
67200-91J00	DF4/5/6	From 2005	Push to open	2-Wire	NO	NO	YES	NO	NO
67200-89E30	DF9.9/15	Up to 2004	Push to open	8-Wire	NO	YES	YES	YES	NO
67200-93J00	DF25 – 250	From 2005	Push to open	10-Wire	YES	YES	YES	YES	YES
67200-94J10	DF9.9 – 30	From 2005	Push to open	8-Wire	NO	YES	YES	YES	NO
67200-99E50	DF25 – 140	Up to 2004	Push to open	10-Wire	YES	YES	YES	YES	YES



TYPE NA27S

COMPONENT PARTS



No.	Part name	Q'ty
①	Remote control assy	1
②	Screw (6 mm × 90)	3
③	Spacer	3
④	Washer (6.5 × 24 × 2.0)	3
⑤	Nut (6 mm)	3
⑥	Installation instruction & Operator's manual	1

SIDE MOUNT REMOTE CONTROL BOX INSTALLATION INSTRUCTION

⚠ WARNING

- Improperly installed remote control box can lead to loss of boat control possibly resulting in accident.
- Make sure to install the remote control box properly.
- For installation of the remote control box, ask your authorized SUZUKI MARINE DEALER to perform the necessary work.
- Do not attempt to install the remote control box on a customer's do-it-yourself basis.

CAUTION

- Perform installation or adjustment with the engine stopped and the lock plate removed from the emergency stop switch.
- For electric starter equipped specification, disconnect the battery cable from the battery before carrying out the work.
- Problems resulting from the work operation in a manner not instructed in this manual will become liable to the operator who has performed such a work operation.

REMOTE CONTROL BOX MOUNTING POSITION

To determine this box mounting position, the following points must be checked.

- The remote control lever can be securely operated fore-and-aft without interference.
- There is no interference with the operation of switches and other equipment.
- Other related equipment will not come in contact with the remote control box.
- There is no sharp bend on the shift/throttle remote control cable and wiring harness that are extending from the remote control box when installed.

At least 200 mm of radius must be secured when routing and bending the remote control cable.

CAUTION

When routing the remote control cable, do not bend it to a radius smaller than 200 mm. If the cable is bent to a smaller radius, the remote control lever operation may become heavy possibly shortening the life of the cable.

CAUTION

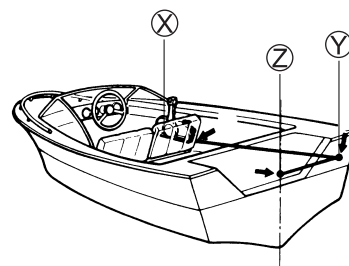
The lock-nut and C-ring must be replaced with new ones, if removed.

REMOTE CONTROL CABLE LENGTH

To determine the length of remote control cable, it is recommended to calculate in the following formula.

Remote control cable length = (Distance ① to ②) + (Distance ② to ③) + Approx. 900 mm (3 ft)

Fig.1



REMOTE CONTROL CABLE INSTALLATION

NOTE:

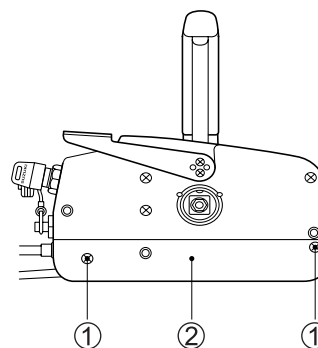
Use Suzuki genuine parts for remote control cable.

1. Loosen two screws ① and remove back plate ②.
2. Screw the cable end to the distance of 13 mm onto the threaded end of remote control cable and fix the cable end with the lock nut securely.

Apply SUZUKI WATER RESISTANT GREASE or equivalent to the hole of the cable end.

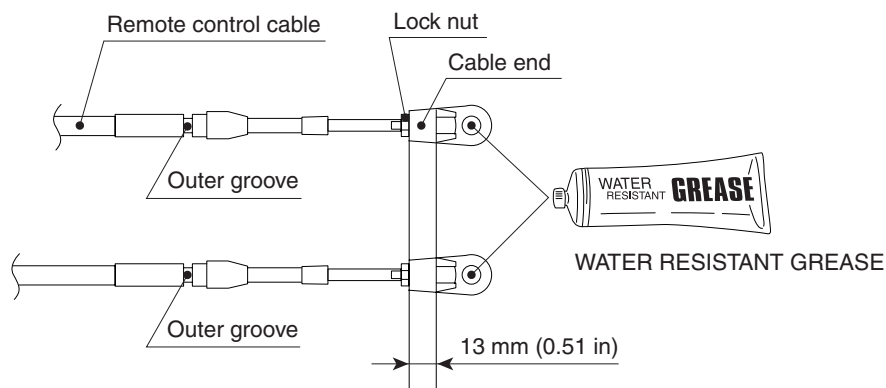
(SUZUKI WATER RESISTANT GREASE is available separately from the kit.)

Fig.2



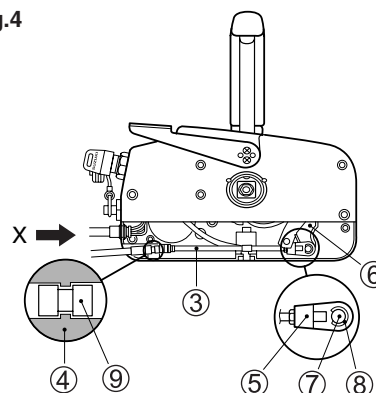
WRG's 99000-25161: SUZUKI WATER RESISTANT GREASE

Fig.3



3. Insert the outer groove (See Fig. 3) of the shift remote control cable ③ into the clamp groove ④ of the housing. Next, fit the cable end ⑤ onto the pin ⑦ of the shift arm ⑥, and fix the end with the circlip ⑧ fitted into the groove of pin ⑦.

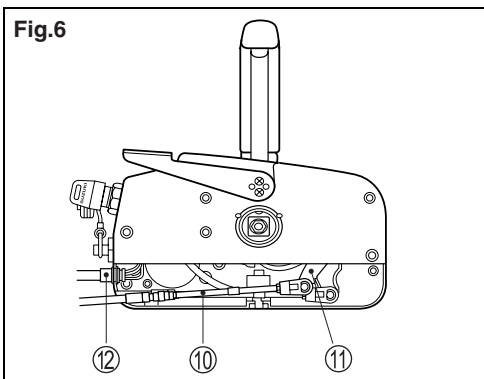
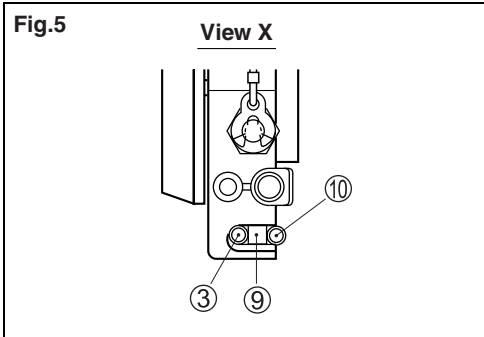
Fig.4



4. Insert the grommet ⑨ into the clamp groove ④ all the way until it contacts the shift side remote control cable ③.
5. Install the throttle remote control cable ⑩ to the throttle arm ⑪ in the same manner as the shift remote control cable ③ as shown in Fig. 4.
6. Install the back plate ② and tighten it with two screws ① (See Fig. 2).

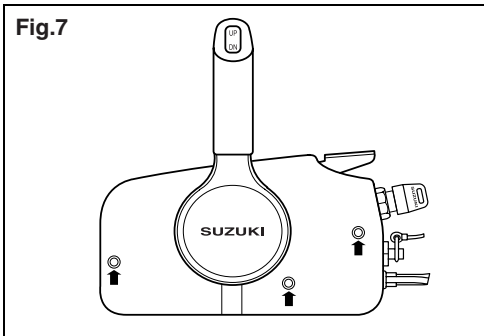
Tightening torque: 4 N·m (0.4 kgf-m, 2.9 lb-ft)

Check that the wiring harness grommet ⑫ is properly inserted into the slot of back plate ②.



REMOTE CONTROL BOX INSTALLATION

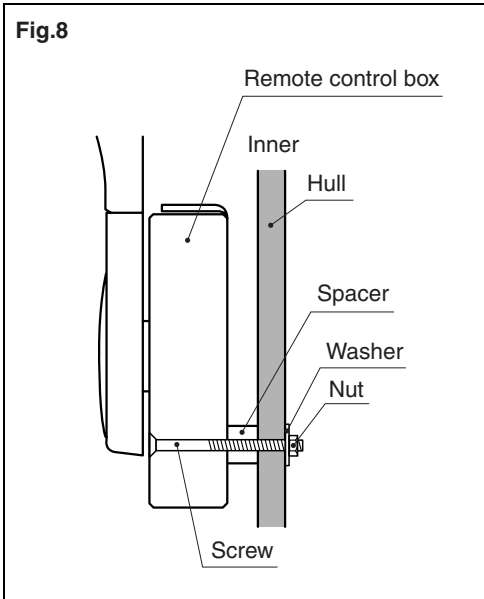
1. Mark three positions of remote control box mounting screw (▲ in Fig. 7) on the hull with a 6 mm drill passed through the screw holes.
2. Drill 6 mm through holes.



3. As shown in Fig. 8, install the remote control box on the hull using three each of screws, spacers, washers and nuts that come supplied with the kit.

Tightening torque: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

With the remote control box installed on the hull, check that at least three threads of the screw come out of the nut.



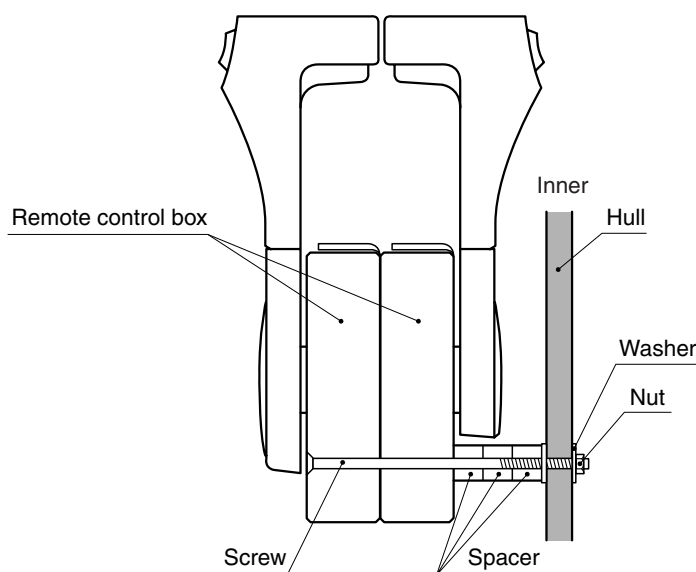
TWIN ATTACHMENT KIT (OPTIONAL)

- In the case of dual engine installation, two remote control boxes can be installed on the boat as shown in Fig. 9 using the twin attachment kit that is available separately.
- With the remote control box installed on the hull, check that at least three threads of the screw come out of the nut.

⚠ WARNING

- To secure sufficient space for remote control operation, use 2-3 spacers side by side on the screw. (See Fig. 9.)
- Mount two remote control boxes together using the screw and nut securely and on completion of installation, check that the remote control lever can be operated smoothly.

Fig.9



Part No.	Part name	Q'ty
67140-95600	Attachment, twin remote control kit opt	1
36632-95501	Clamp	1
37119-94300	Band	2
67294-95600	Spacer	3
67296-95620	Screw 6 mm × 1.0 × 165	3

The number of spacer included in the attachment, twin remote control kit has three. Please order a necessary number separately.

NOTE:

- When installing two remote control boxes together to the hull, use the twin attachment kit of Suzuki genuine parts. (The twin attachment kit is available separately.)
- The twin attachment kit consists of three screws and three spacers.
- In the case of mounting two remote control boxes together:
Prepare the twin attachment kit and necessary number of spacers.
For washers and nuts, use those which come supplied with the remote control box.
- For two remote control boxes to be put together, one side of the remote control levers requires relocation. To relocate the attaching position of remote control lever, refer to "6. Relocating remote control lever attached position" section of this manual.

ADJUSTMENT OF REVERSE THROTTLE OPENING

In reversing, if the engine speed exceeds 4 000 rpm or the boat speed is insufficient when the remote control lever is moved fully to the maximum position, adjust the reverse throttle opening in the following procedures.

CAUTION

- The adjustment of reverse throttle opening must be performed with the engine at stop and the lock plate removed from the emergency stop switch. In the case of electric starter specification outboard motor, this work must be performed with the battery cable disconnected from the battery.
- Problems resulting from the work operation in a manner not instructed in this manual will become liable to the operator who has performed such a work operation.

1. Stop the engine.
Remove the remote control box from the hull.
2. Loosen and remove five screws ①.
Remove the rear housing ⑬ and back plate ②.
3. Loosen the lock nut ④.
Adjust the engine speed when the remote control lever is moved to the maximum in reverse by turning the adjusting bolt ⑤.
The engine speed when the remote control lever is moved to the maximum position decreases with the bolt ⑤ turned clockwise and increases with the bolt ⑤ turned counter-clockwise.
4. Tighten the lock nut ④ to lock the adjusting bolt ⑤.

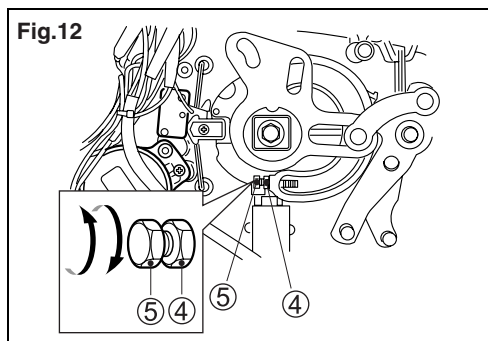
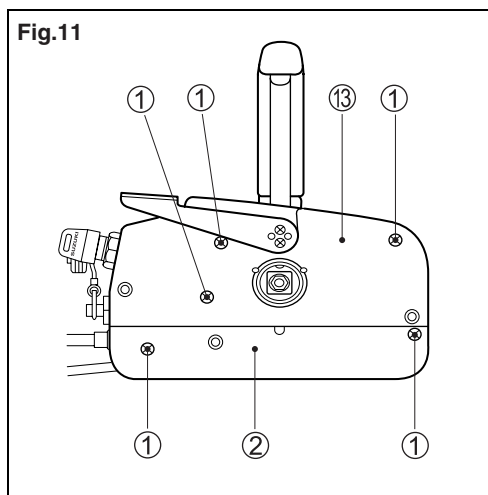
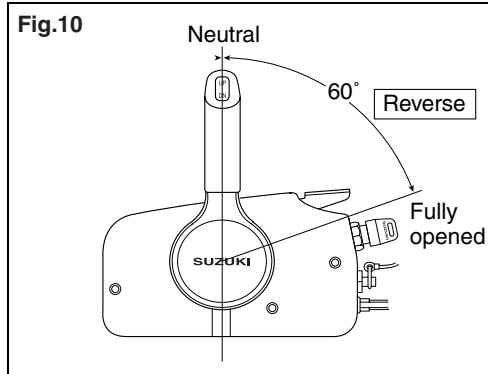
Tightening torque (lock nut ④):

1.8 N·m (0.18 kgf-m, 1.3 lb-ft)

5. Restore the rear housing ⑬ and back plate ② to the original position and tighten the screw ①.

Tightening torque: 4 N·m (0.4 kgf-m, 2.9 lb-ft)

6. Restore the remote control box to the original position on the hull.
7. Set the boat afloat and check for the maximum engine speed in reverse.
Repeat the procedures 1 – 6 as necessary.

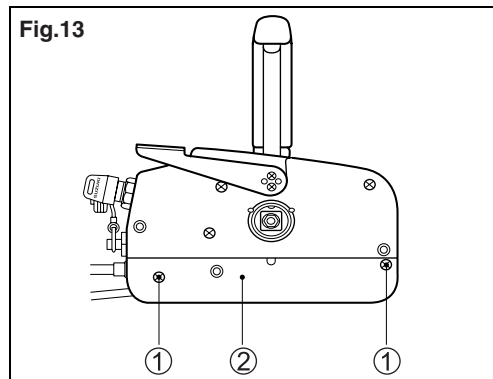


RELOCATING REMOTE CONTROL LEVER ATTACHED POSITION

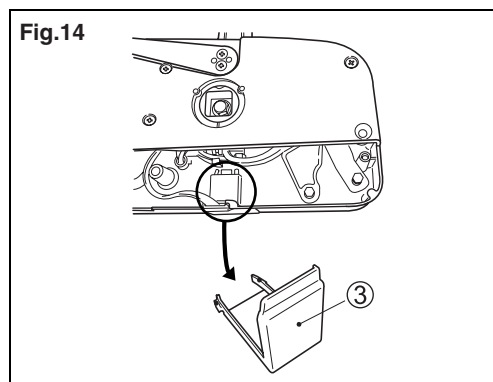
In this remote control box, the remote control lever can be relocated from the port side to the starboard side.

When relocating the lever attached position, follow the procedures below.

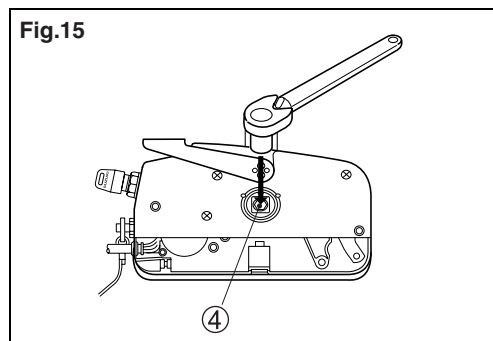
1. Remove two screws ① and back plate ②.



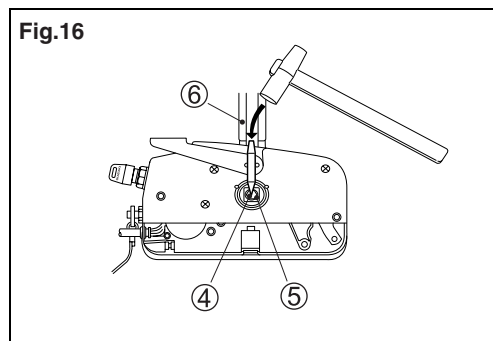
2. Compress the pawl section of wire cover ③ and remove it from the remote control box.



3. Using a 12 mm socket wrench, turn the bolt ④ 3 – 4 rotations counterclockwise to loosen it. Do not remove the bolt at this time.



4. Using a center punch and a plastic hammer, lightly hit the bolt head ④ and slide the remote control lever ⑥. Remove the bolt ④ and washer ⑤ and detach the remote control lever ⑥ from the remote control box.



CAUTION

To prevent the power trim & tilt switch wires (9 in Fig. 17) from breaking or other damage during remote control lever relocating work, avoid causing the wires to be pinched with remote control box body or to be pulled taut excessively.

5. Loosen and remove two screws ⑧.
Remove the neutral lock holder ⑦.

6. Turn the remote control box to the backside. Install the neutral lock holder ⑦ as shown in the illustration and tighten it with two screws ⑧.

Tightening torque: 4 N·m (0.4 kgf·m, 2.9 lb·ft)

7. Install the remote control lever ⑥ with the lever square section ① and shaft square section ② aligned.

Fig.17

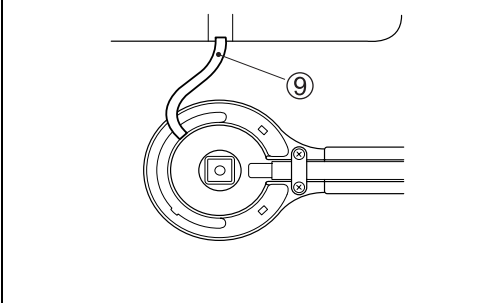


Fig.15

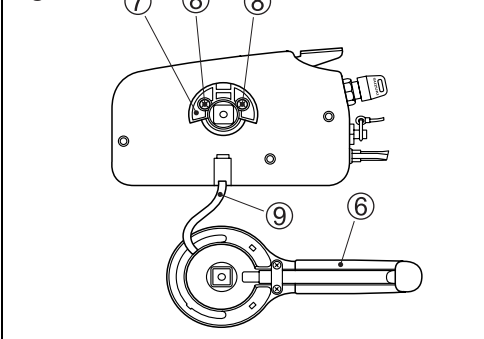


Fig.19

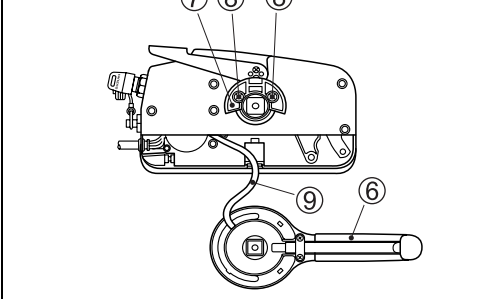
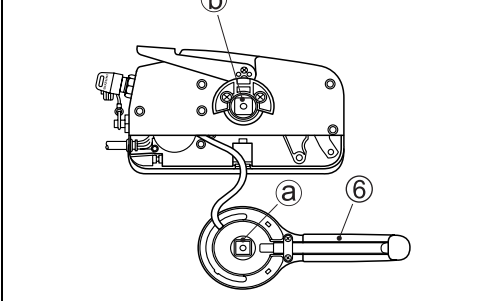
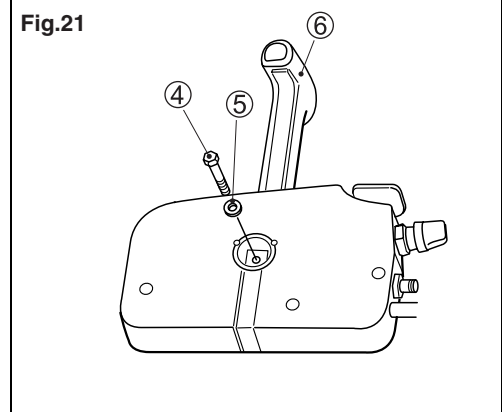


Fig.20



8. Turn the remote control box again to the other side. Tighten the remote control lever with the bolt ④ and washer ⑤.

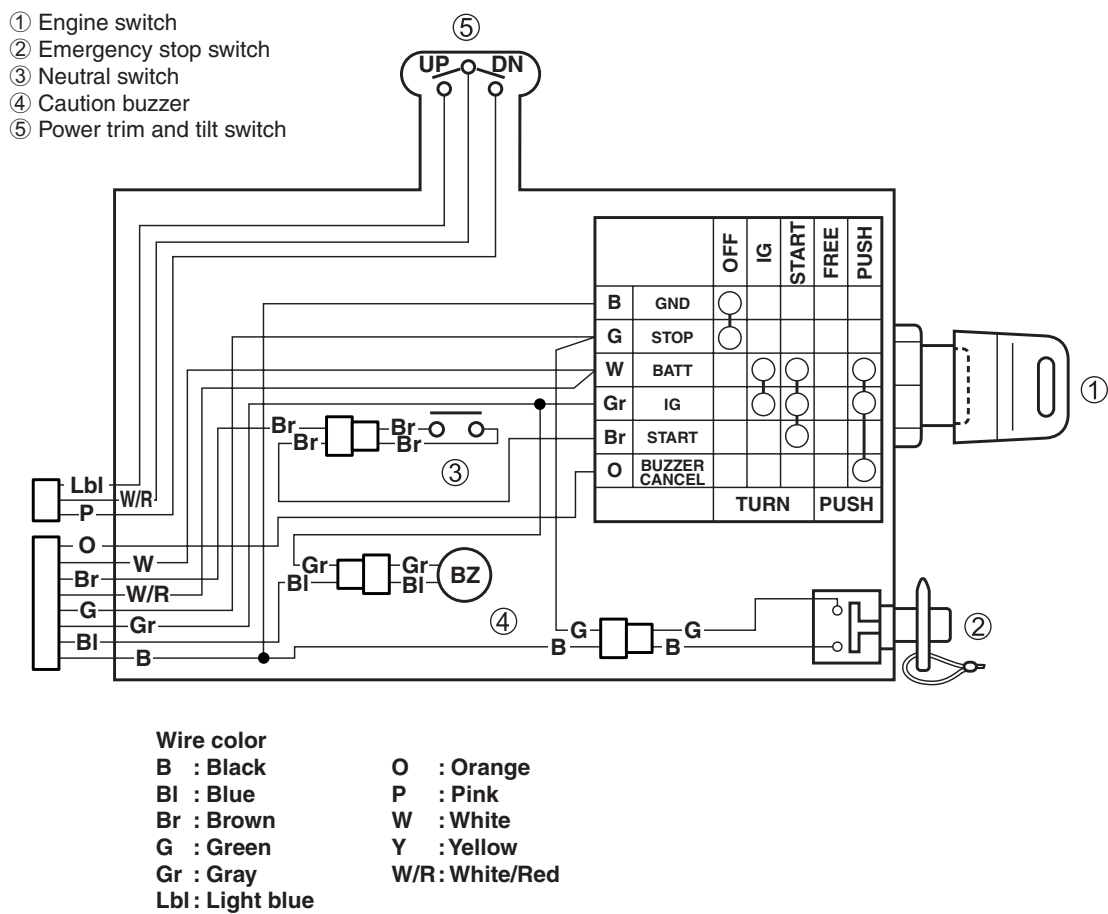
Tightening torque: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

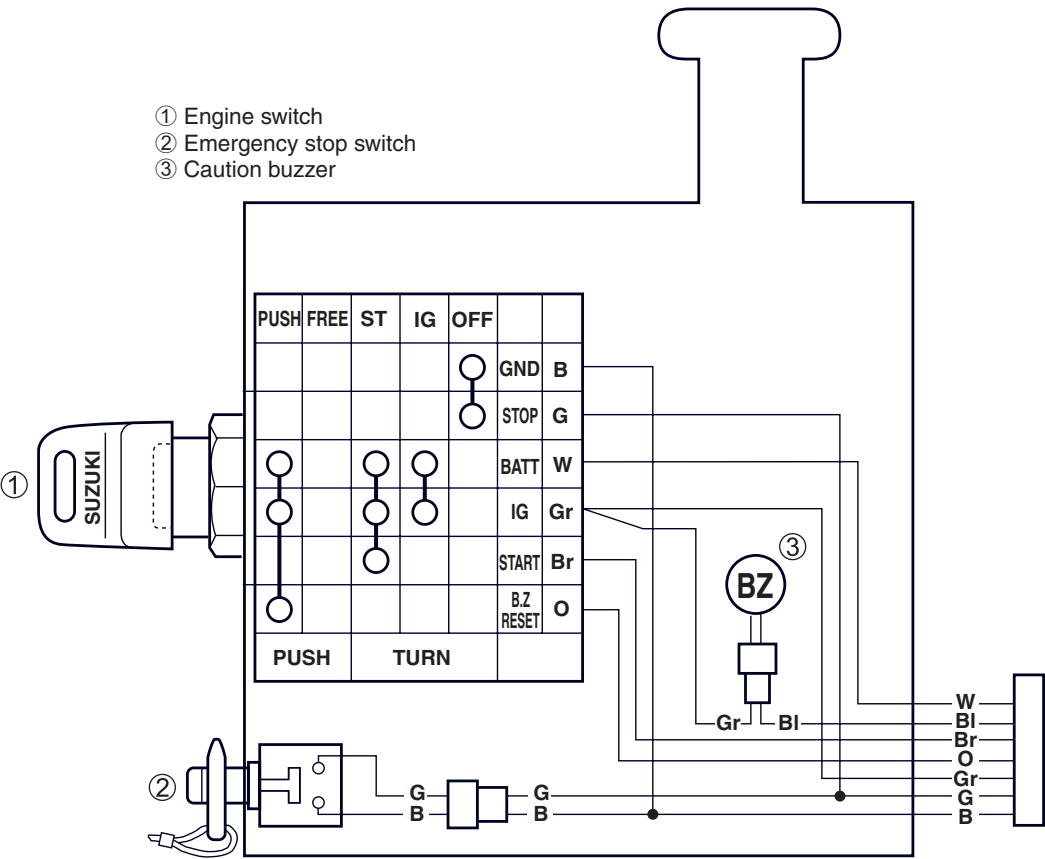


9. Route the power trim & tilt switch wires ⑨ using care not to twist or sag. Install the back plate ② and tighten with two screws ①.

Tightening torque: 4 N·m (0.4 kgf-m, 2.9 lb-ft)

WIRING DIAGRAM

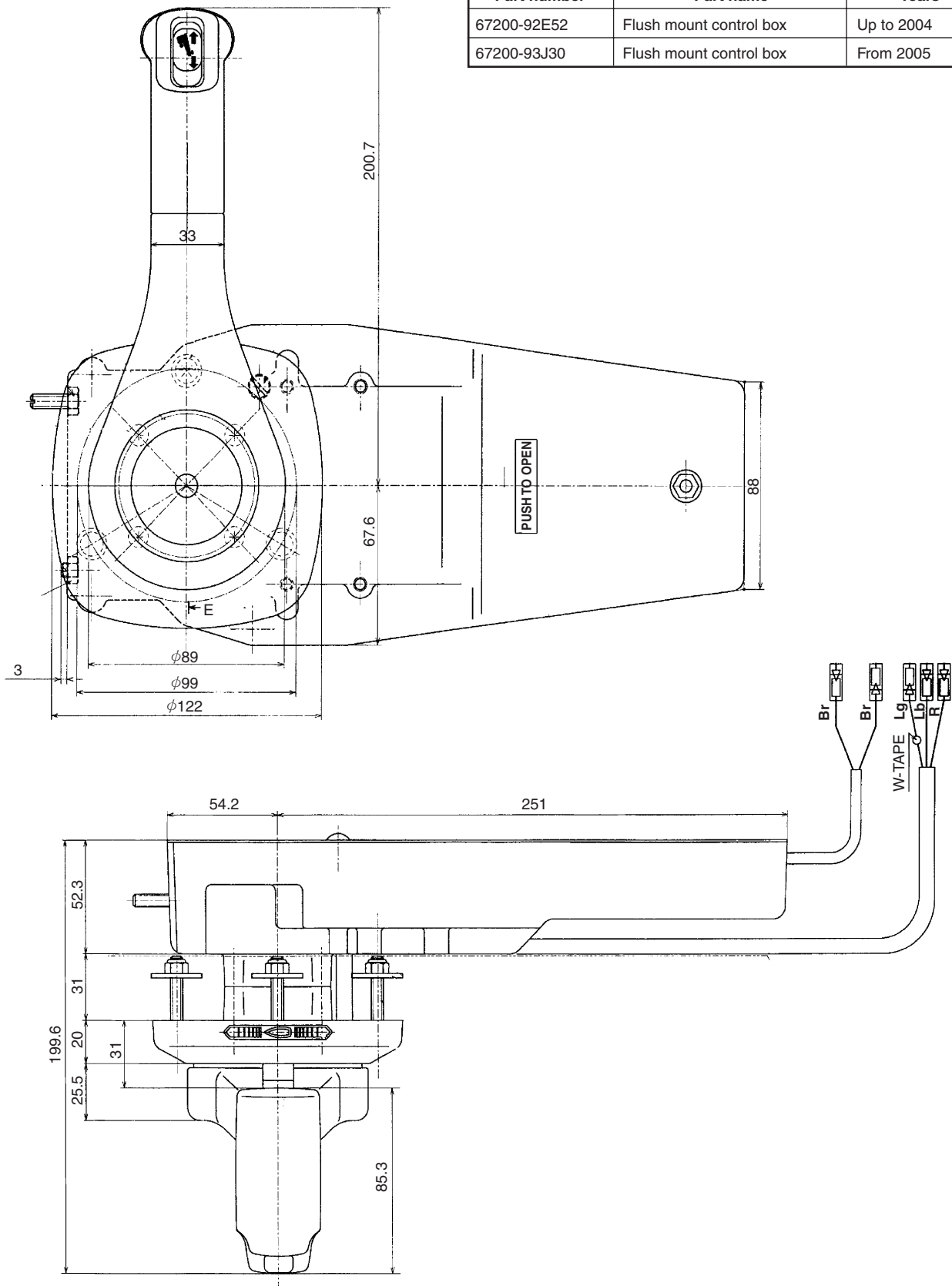




Wire color
B : Black Gr : Gray
BI : Blue O : Orange
Br : Brown W : White
G : Green

CONCEALED REMOTE CONTROL BOX

Part number	Part name	Years
67200-92E52	Flush mount control box	Up to 2004
67200-93J30	Flush mount control box	From 2005



CONCEALED REMOTE CONTROL BOX

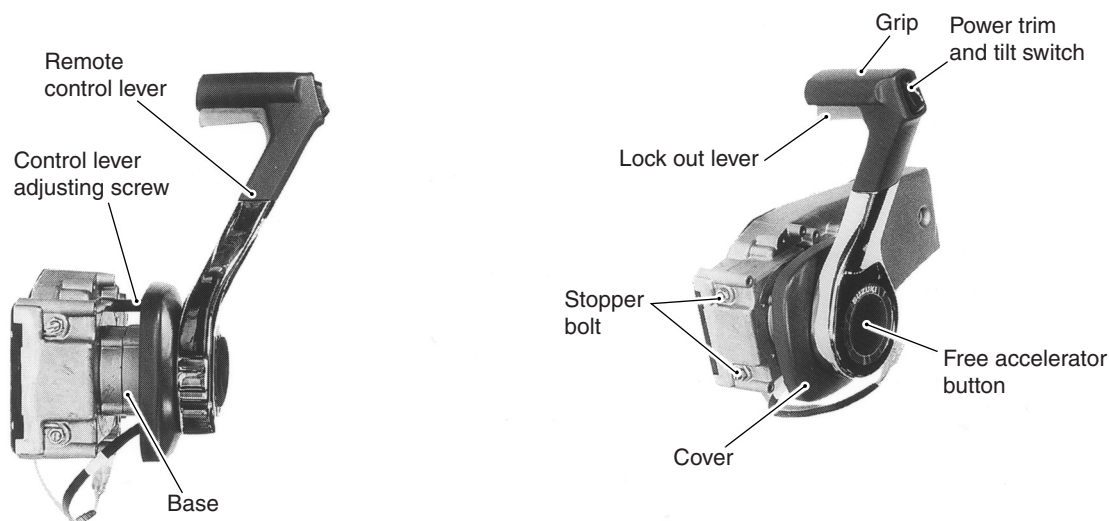
This side mount concealed type control box is a Suzuki genuine part.

The single control lever provides one-handed operation of throttle, shift and power trim functions.

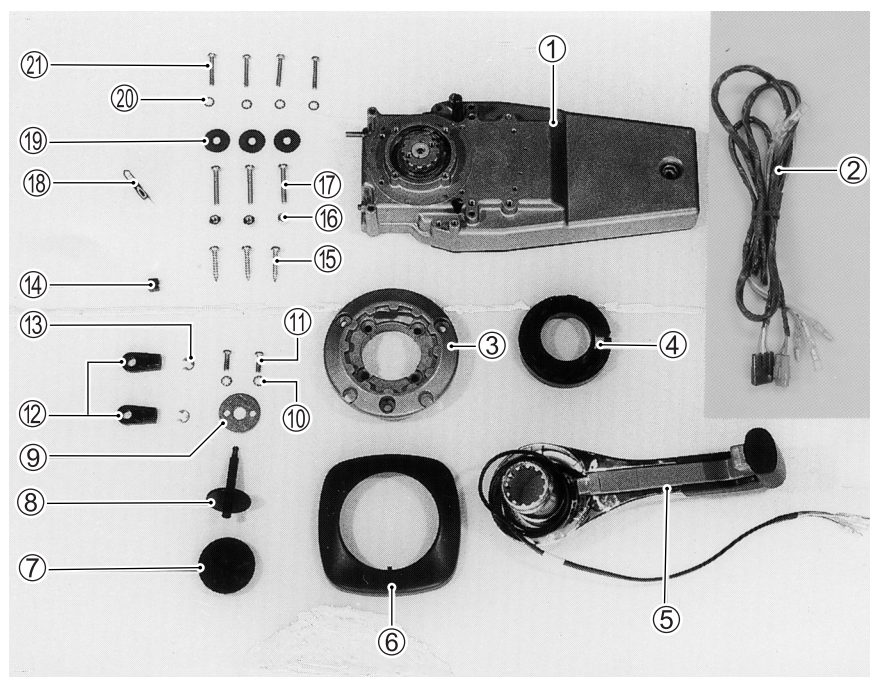
To ensure smooth, dependable operation, it will be necessary to thoroughly follow the installation and set-up instructions detailed herein.

Suzuki reserves the right to make alterations or modifications at any time, without notice.

LOCATION OF PARTS



COMPONENT PARTS



- ① Remote control box
- ② PTT switch & neutral switch wire
- ③ Base
- ④ Neutral lock holder
- ⑤ Control lever
- ⑥ Cover
- ⑦ Rubber grommet
- ⑧ Accelerator shaft
- ⑨ Circular retaining plate
- ⑩ Washer
- ⑪ Screw
- ⑫ Cable joint
- ⑬ Circlip
- ⑭ Grommet
- ⑮ Wood screw
- ⑯ Nylon nut
- ⑰ Screw
- ⑱ Sticker
- ⑲ Plain washer
- ⑳ Washer
- ㉑ Screw

CONCEALED REMOTE CONTROL BOX INSTALL INSTRUCTION

REMOTE CONTROL BOX POSITION

NOTE:

- Set the remote control box in a position where the operation of the control lever and switches are not obstructed. Make sure there is no obstruction in the path of the remote control cables.
- Allow a space so that the remote control box does not contact any other parts.
- Provide a space so that the remote control cables can be routed without bending sharply.
- The radius of a cable bend should be more than 200 mm (8 in).

DRILLING HOLES FOR MOUNTING POSITION

Select the proper position for the remote control box.

Affix template to the selected position, and drill the necessary openings through it. Required will be a hole saw large enough to accommodate the 73 mm center opening and a drill bit, to make a single 12 mm hole for protrusion of the tension adjustment screw.

NOTE:

At the bottom of the center opening, it will be necessary to cut or chamfer a channel wide enough to hold the PTT wire.

* (A)

When using bolt/nut (for hull thickness of less than 20 mm):

7 mm diameter through hole, 3 places.

When using wood screw (for hull thickness of 20 – 30 mm):

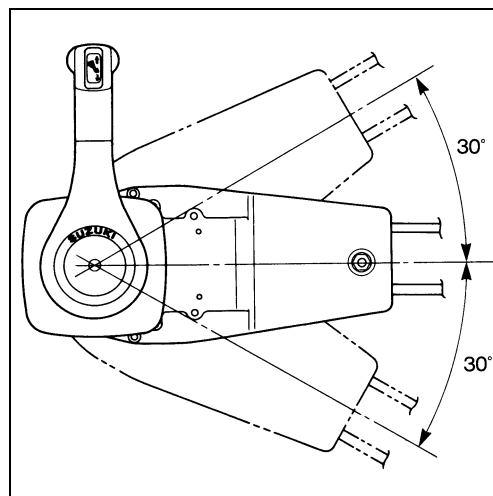
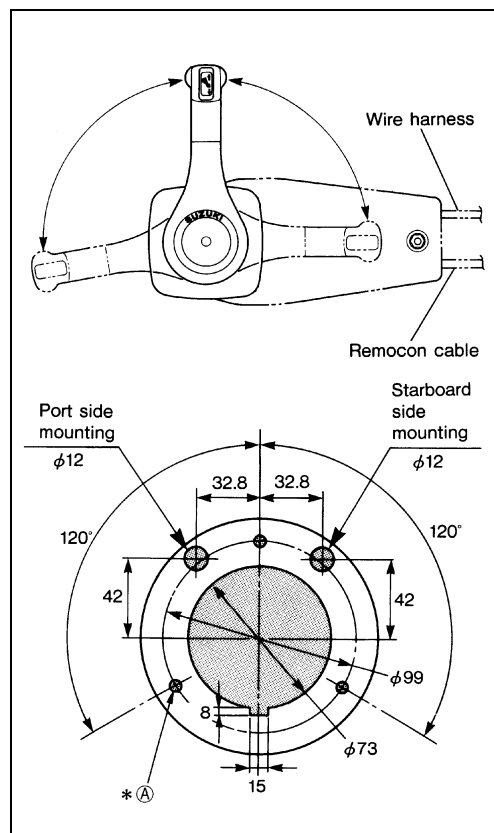
3 mm diameter through hole, 3 places.

The remote control box can be mounted at an angle of 30° above or below the normal mounting plane.

Control lever position can be altered so that neutral (N) remains vertical.

NOTE:

Do not fix the remote control box before installing the remote control cables.

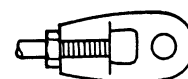
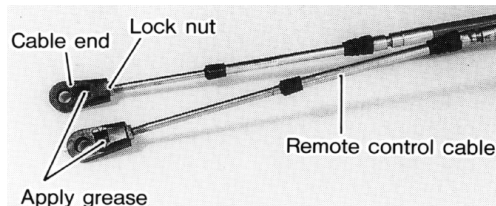
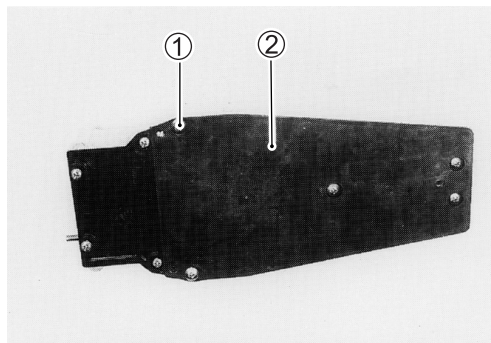


INSTALLING THE REMOTE CONTROL CABLE

CAUTION

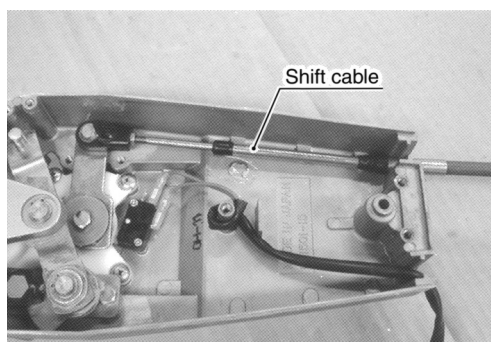
Make sure to install the shift and throttle cables on the remote control box side first. If they are installed on the engine side first, it may make the adjustment operation impossible.

1. Loosen the five screws ① and remove the back plate ②.
2. Screw the cable end onto the threaded portion at the end of each remote control cable and fix it with a lock nut. Apply SUZUKI WATER RESISTANCE GREASE to the hole of each cable end.

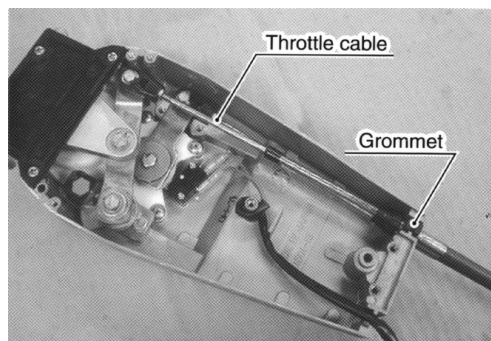


Screw the cable end into the  part.

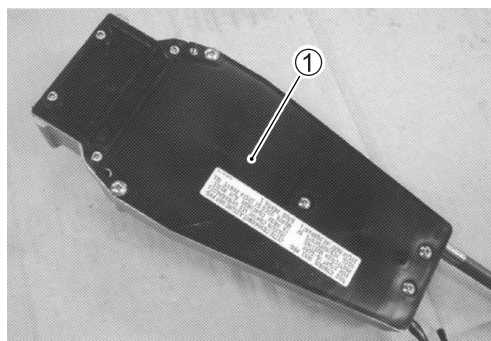
3. Insert the outer casing flange of the shift remote control cable into the clamp groove of the housing. Next, fit the cable end onto the pin at the tip end of the shift arm and fix it with a circlip.



4. Fit the throttle remote control cable to the throttle arm in the same manner.
5. Insert a grommet into the clamp groove.

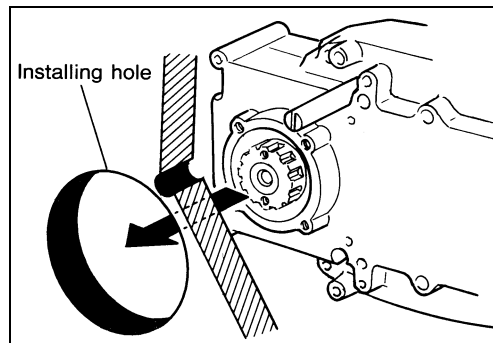


6. Secure the back plate ① with the five screws.



SECURING OF REMOTE CONTROL BOX TO HULL AND ASSEMBLY OF RELATED COMPONENTS.

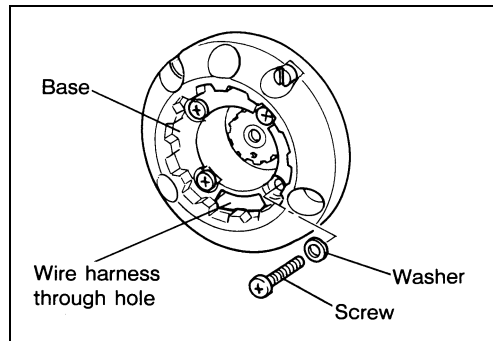
1. Through the installation hole, position the remote control box so that there is alignment of the control box mounting holes and the holes in the hull mounting surface.



2. Insert the four screws and secure the base to the control box.

Tightening torque:

3 – 4.5 N·m (0.3 – 0.45 kgf-m, 2.2 – 3.3 lb-ft)

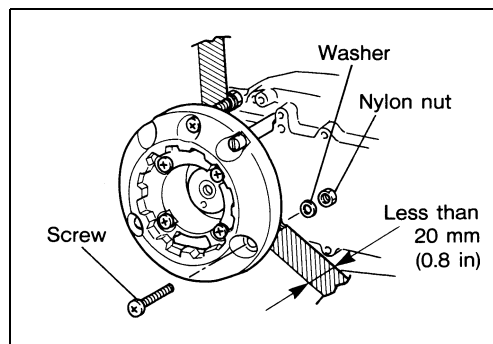


3. Using the template holes, secure the remote control box using the three 8 mm bolts, washer and nylon lock nuts.

NOTE:

The bolts, nuts and washers can only be used where thickness of mounting surface is less than 20 mm (0.8 in).

Where mounting surface thickness is between 20 mm (0.8 in) and 30 mm (1.2 in), it will be necessary to use the wood screws.

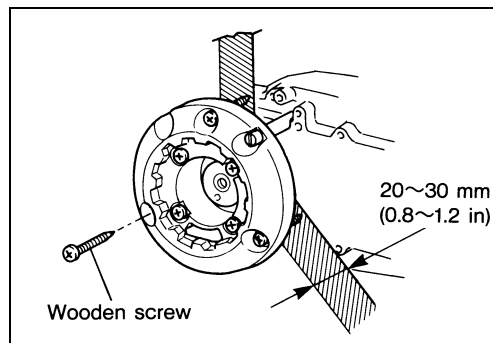


NOTE:

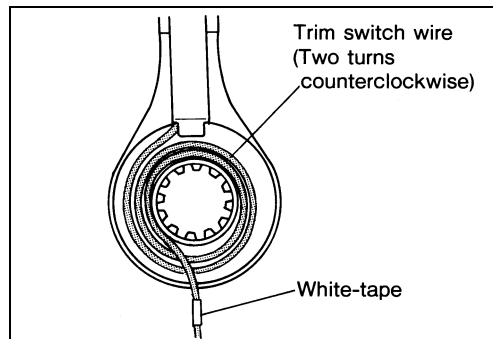
Where thickness of mounting surface exceeds 30 mm (1.2 in), it will not be possible to install this control box.

Tightening torque:

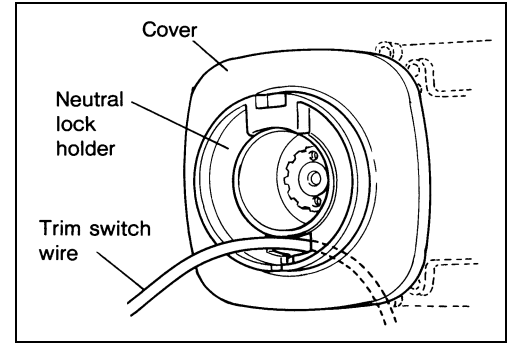
5 – 8 N·m (0.5 – 0.8 kgf-m, 3.6 – 5.8 lb-ft)



4. The trim switch wire must be coiled two turns counterclockwise around the center boss of the control lever. Ensure that the taped white collar is positioned below the control lever.
5. Pass the end of the trim switch wire through the slot in the mounting base and the hole in the hull mounting area. Feed the end of the wire to the stern of the hull.



6. Slide the taped white collar of the trim switch wire in through the slot in the circumference of the neutral lock holder and locate the neutral lock holder in the base.
7. By hand, press the cover onto the base and snap tightly home.



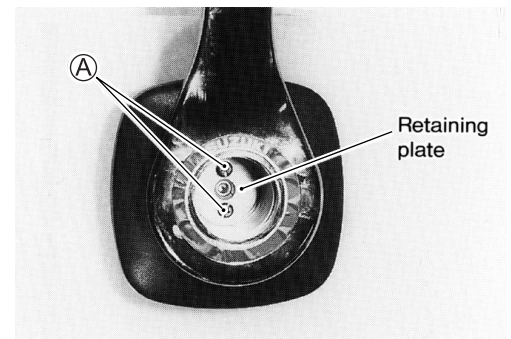
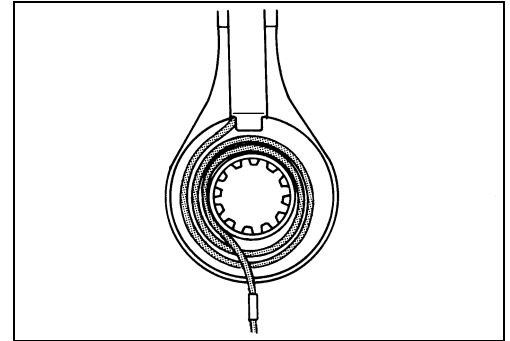
8. Install the remote control lever as follows:
Place the retaining plate in the control lever center boss, insert the washers and screws (A). Tighten the screws thoroughly.

Tightening torque:

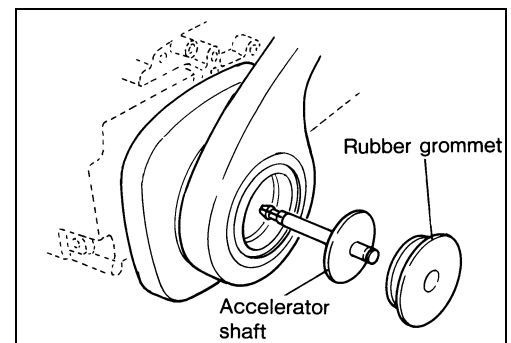
3 – 4.5 N·m (0.3 – 0.45 kgf-m, 2.2 – 3.3 lb-ft)

CAUTION

Ensure that the PTT wire is not twisted or kinked and that the taped white collar is correctly positioned. The wire must be coiled correctly, so that the windings do not cross each other.



9. Snap the accelerator shaft in and install the rubber grommet.

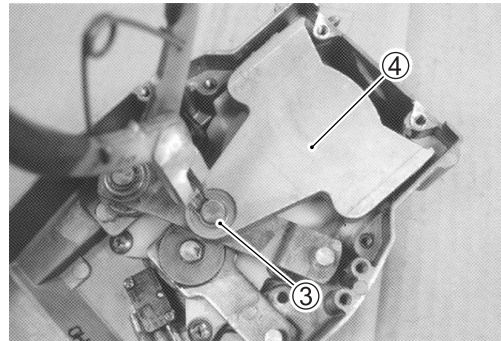
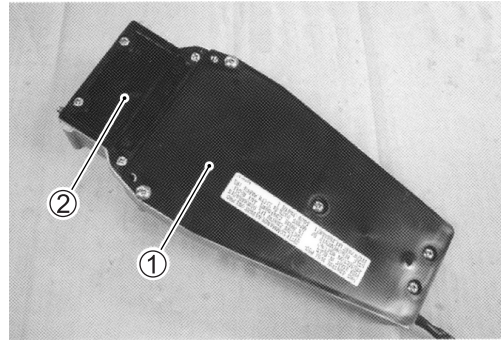


CHANGE FROM THE PUSH-TO-OPEN THROTTLE TYPE TO THE PULL-TO-OPEN THROTTLE TYPE

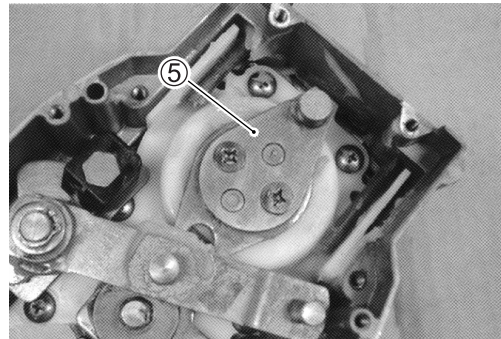
The remote control box permits the change from the push-to-open throttle type to the pull-to-open type by changing the position of some parts.

If necessary, change the throttle type in the following procedure:

1. Loosen the five screws and remove the back plate ①.
2. Loosen the four screws and remove the dwell plate retainer ②.
3. Remove the circlip ③, then remove the dwell plate ④.

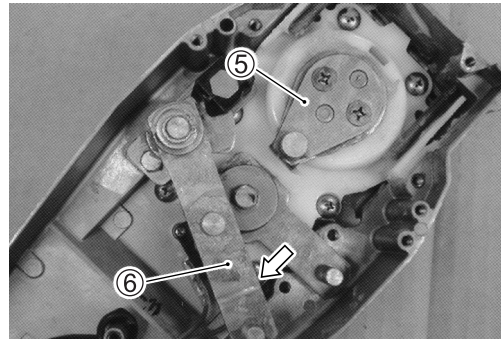


4. Loosen two screws and remove the throttle lever ⑤.

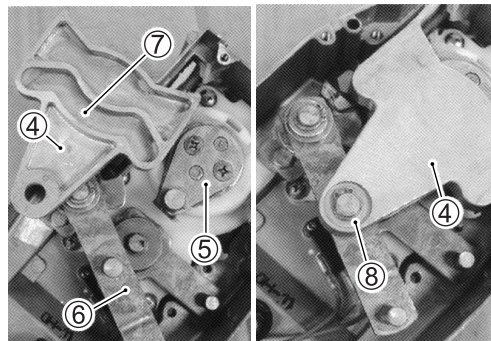


Change the throttle lever ⑤ from left to right side (thru 180°) by 180° and tighten the two screws.

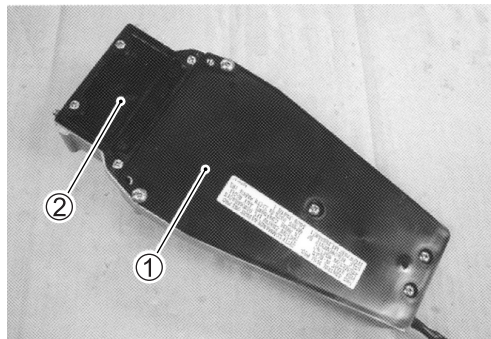
Turn the throttle arm ⑥ to the right side also.



5. Align both the cam groove (for pull-to-open) ⑦ in the dwell plate ④ and the rod in the throttle lever assembly ⑤ in the correct position, then lock the throttle arm ⑥ assembly and dwell plate ④ with the circlip ⑧.



6. Secure the dwell plate retainer ② with the four screws.
7. Secure the back plate ① with the five screws.

**CAUTION**

To ensure correct and smooth operation, the shift and throttle cables must be positioned and routed properly. Bends and curves in cables must not be too sharp or of a small radius.

CAUTION

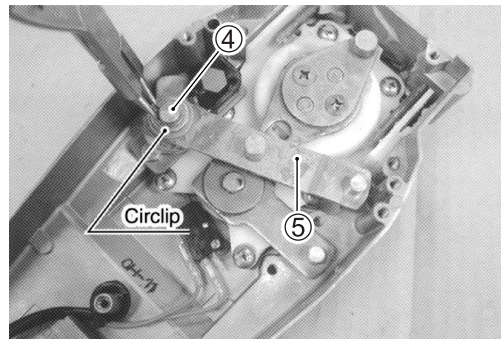
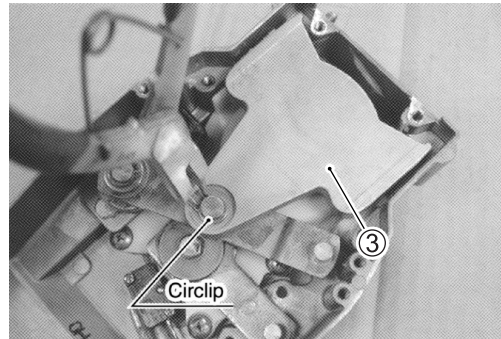
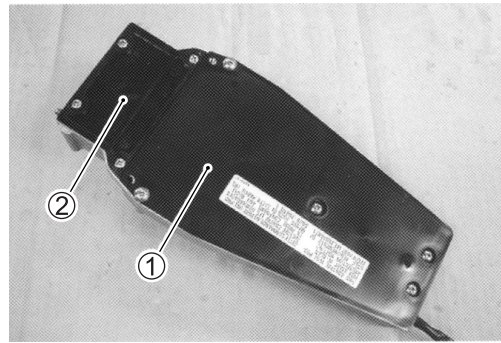
The lock-nut and C-ring must be replaced with new ones, if removed.

PORT SIDE MOUNTING

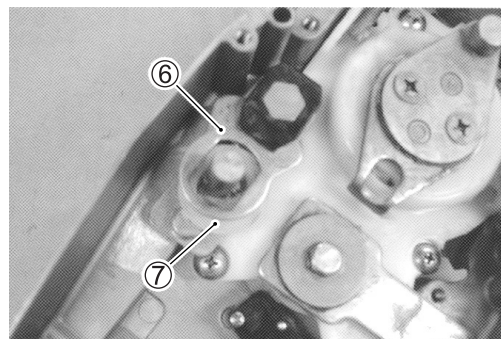
With this remote control box, the control lever can be changed to facilitate port side mounting.

Where necessary, the control lever position can be change by using the following procedure:

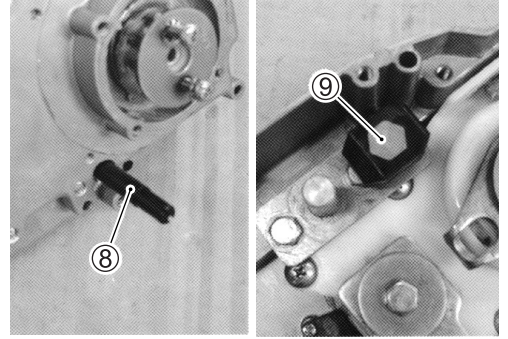
1. Remove the control lever, the cover and the base as described in "CONTROL LEVER TENSION ADJUSTMENT".
2. Loosen the five screws and remove the back plate ①.
3. Loose the four screws and remove the dwell plate retainer ②.
4. Remove the circlip and the dwell plate ③.
5. Remove the circlip from the shaft assy ④ and remove the washer and the throttle arm assy ⑤.



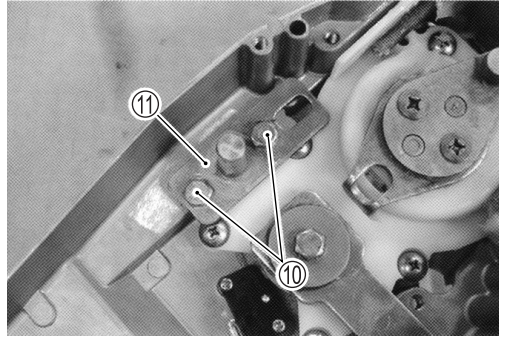
6. Remove the brake disc ⑥ and bushing ⑦ from the throttle shaft.



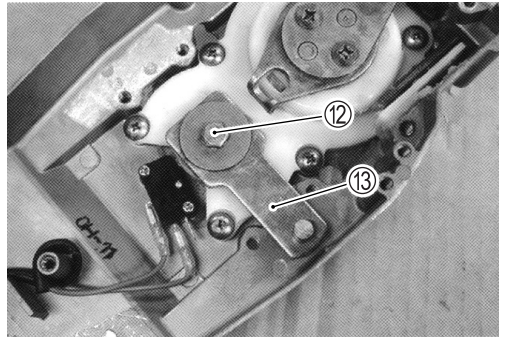
7. Turn the adjusting screw ⑧ counterclockwise to separate it from the brake shoe ⑨.



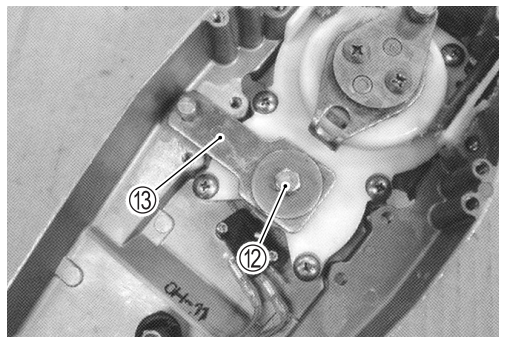
8. Loosen the two bolts ⑩ and remove the shaft assy ⑪.



9. Loosen the bolt ⑫ and remove the shift arm assy ⑬.



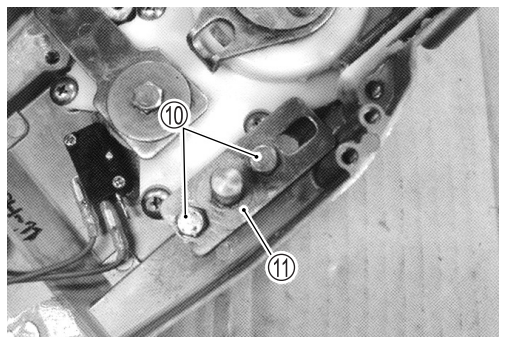
10. Install the shift arm assembly ⑬. While holding it in an inverted position, secure it with the bolt ⑫.



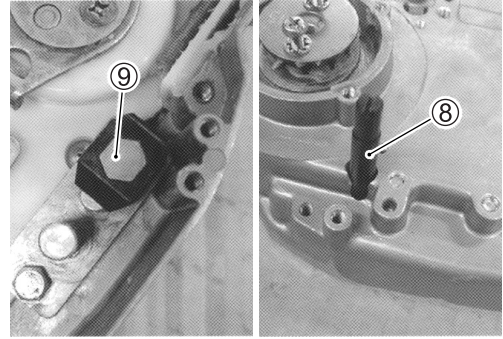
11. Change the installation position of the shaft assy ⑪ from upper to lower and secure it with the bolts ⑩.

Tightening torque:

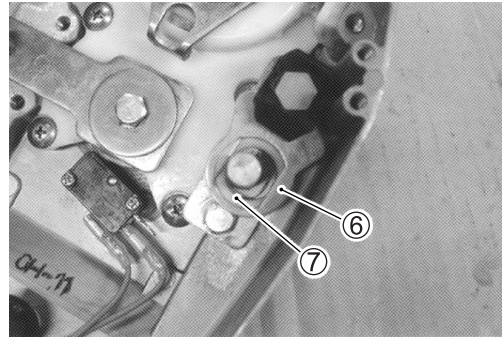
5 – 8 N·m (0.5 – 0.8 kgf-m, 3.6 – 5.8 lb-ft)



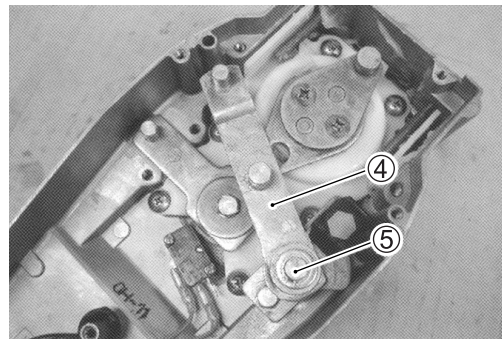
12. Turn the adjusting screw ⑧ clockwise to attach it to the brake shoe ⑨.



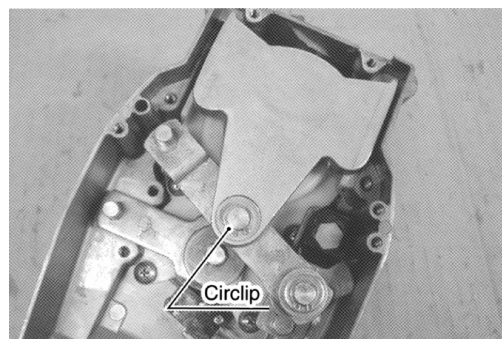
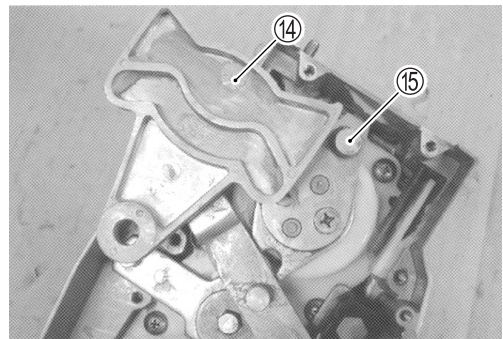
13. Insert the brake disc ⑥ and bushing ⑦ in the throttle shaft.



14. Install the throttle arm assy ④ on the shaft assy ⑤.
Place the washer and fix it with the circlip.



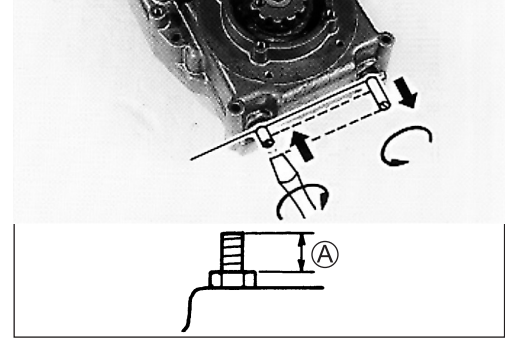
15. Align the cam groove ⑭ (push-to-open) in the dwell plate and the roller ⑮ in the throttle lever assembly in the correct position. Retain the throttle arm assembly and dwell plate with the circlip.



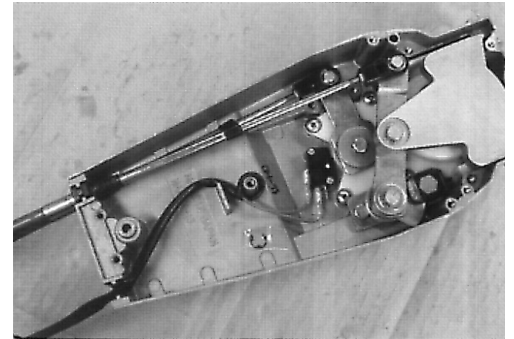
16. Loosen the locknuts, reverse the right and left stopper thread lengths, and secure the bolts with the two locknuts.

CAUTION

Prior to loosening the locknuts measure the original thread length $\textcircled{A}$ protruding from the nut.
After reversing the stopper thread lengths, adjust the thread length so that $\textcircled{A}$ is as before.



17. Reposition the neutral wire from the upper groove to the lower groove.
18. Reposition the shift cable and throttle cable from the lower groove to the upper groove.



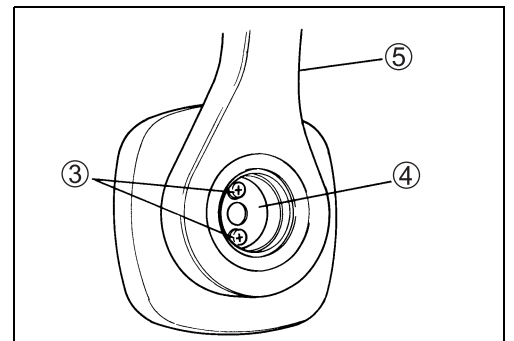
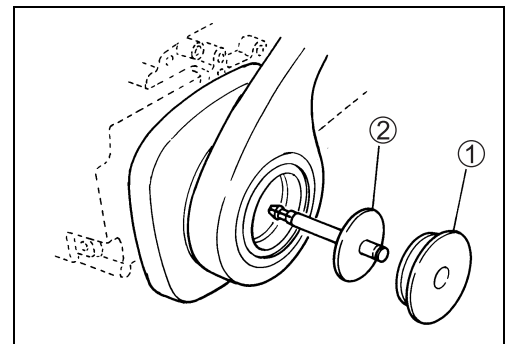
19. Tighten the screws on the dwell plate retainer and back plate (in that order).



CONTROL LEVER TENSION ADJUSTMENT

Control lever tension can be adjusted by turning the tension adjustment knob with a screwdriver. Clockwise will increase tension and counterclockwise will decrease tension.

1. To adjust, remove the rubber grommet $\textcircled{1}$ in the center boss of the control lever. Pull out the free accelerator shaft $\textcircled{2}$ and remove it completely.
2. Loosen the two screws $\textcircled{3}$, remove the circular retaining plate $\textcircled{4}$ and take the control lever $\textcircled{5}$ off.

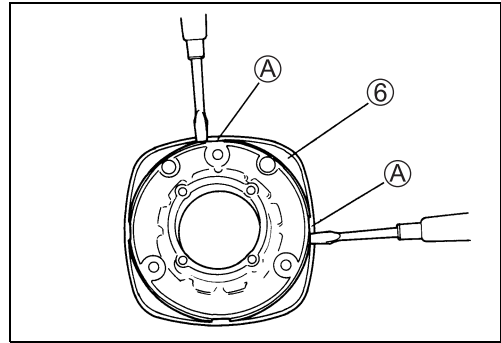


3. Gently pry plastic cover ⑥ from mounting surface and detach it.

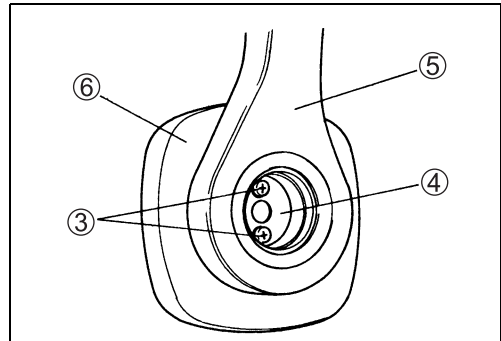
CAUTION

The plastic cover snap fits onto the base with four tongue clips.

Using a screwdriver, gently pry two of the tongues ① outwards. Do not use force, as the tongues may break.



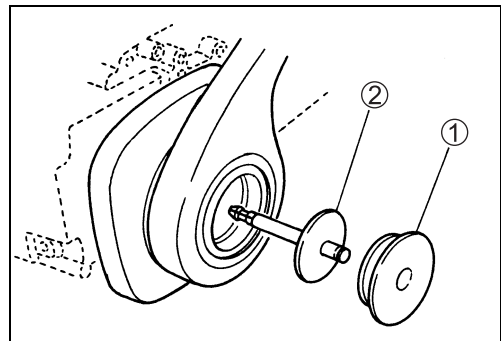
With plastic cover removed, place control lever temporarily on splines and temporarily tighten the two screws ③. Adjust tension, checking it by moving lever. If tension is satisfactory, take control lever off, replace plastic cover ⑥ and reinstall control lever ⑤. Replace the retaining plate ④ and tighten the two screws ③ firmly.



Snap in the free accelerator shaft ② and re-insert the rubber grommet ①.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.



SINGLE BINNACLE REMOTE CONTROL BOX



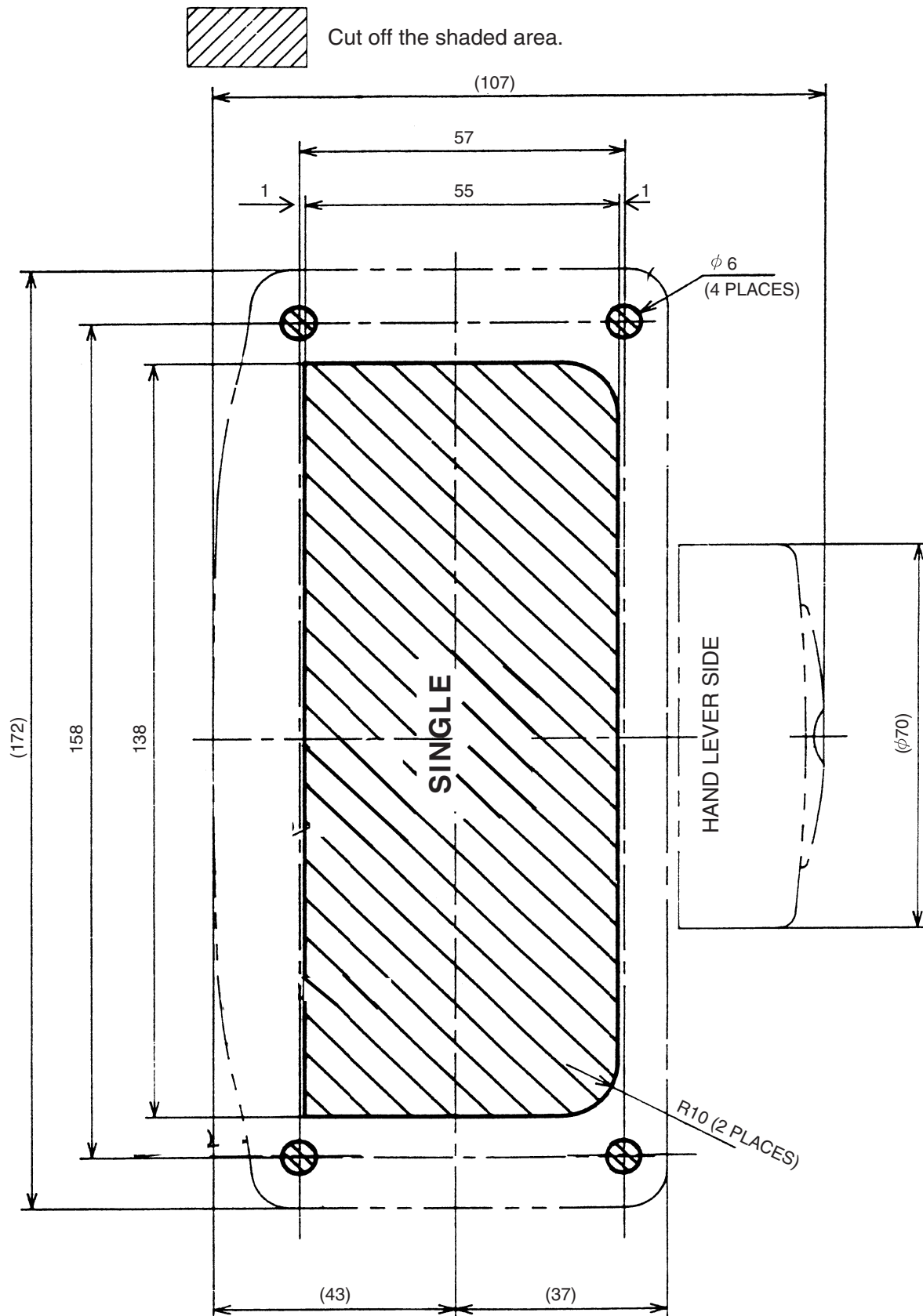
Part number	Part name	Years
67200-92E05	Single binnacle control box	Up to 2004
67200-93J12	Single binnacle control box	From 2005

DUAL BINNACLE REMOTE CONTROL BOX

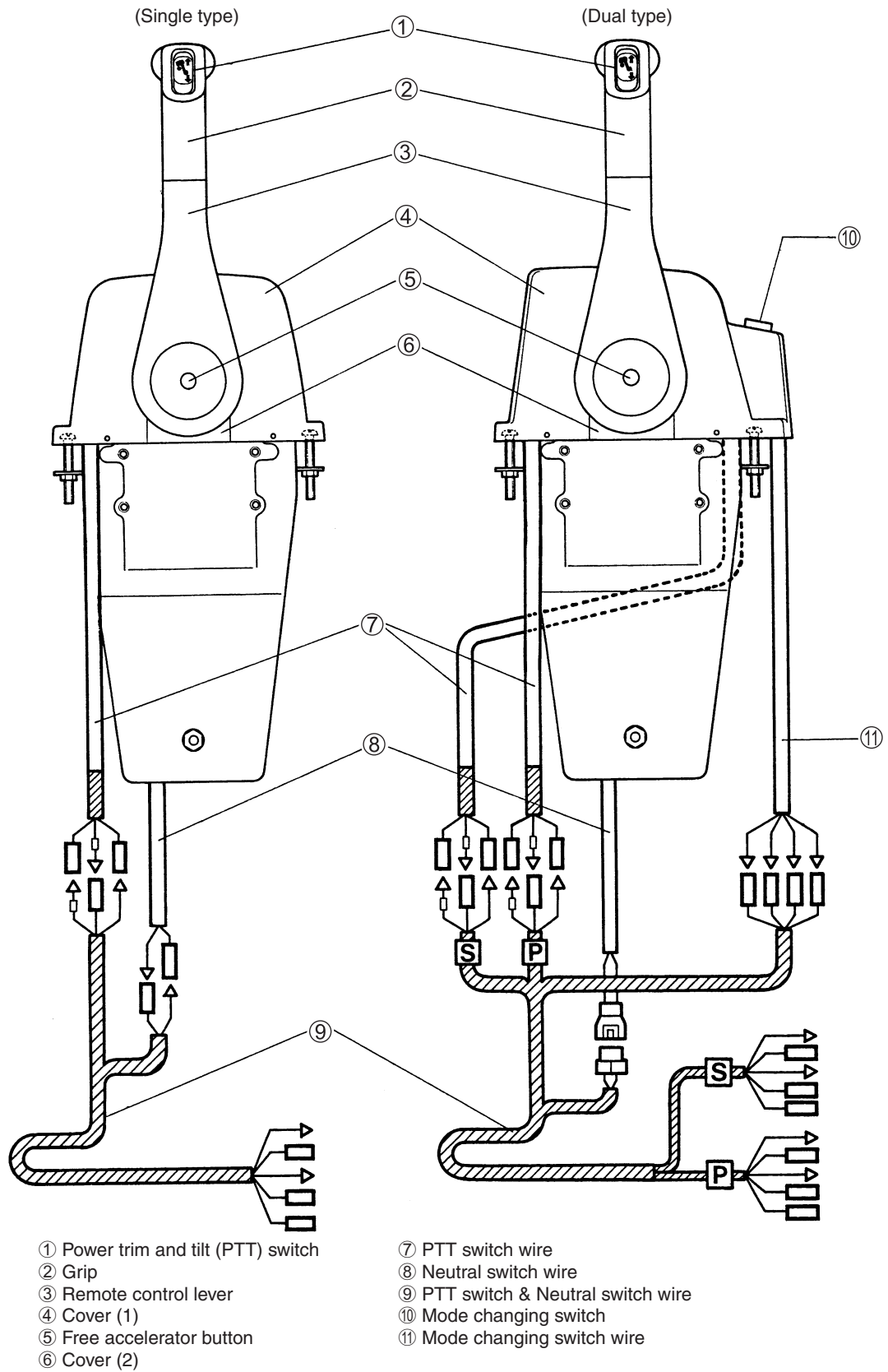


Part number	Part name	Years
67200-92E15	Dual binnacle control box	Up to 2004
67200-93J22	Dual binnacle control box	From 2005

DRILLING TEMPLATE (ACTUAL SIZE)

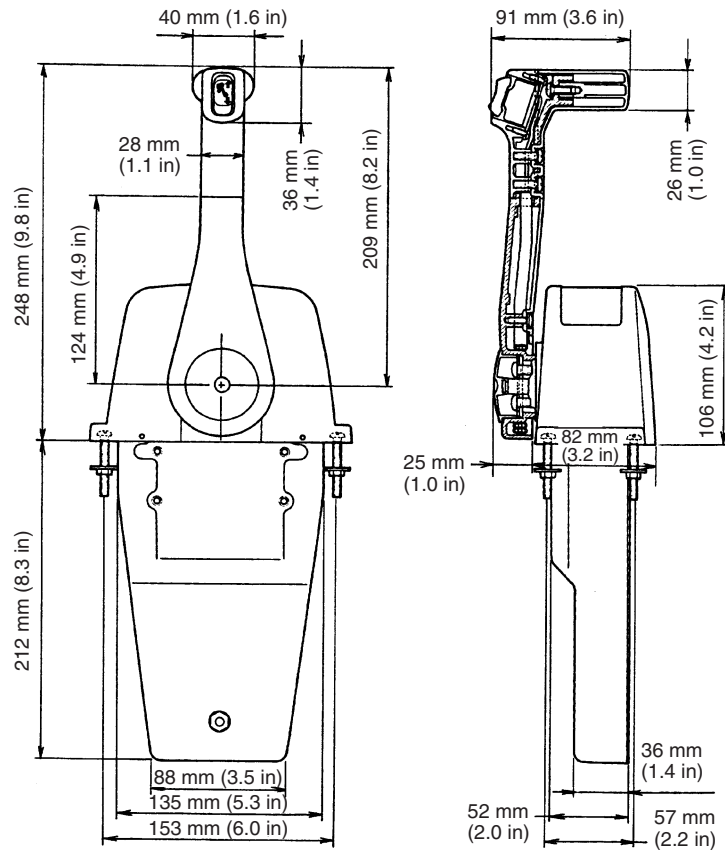


LOCATION OF PARTS

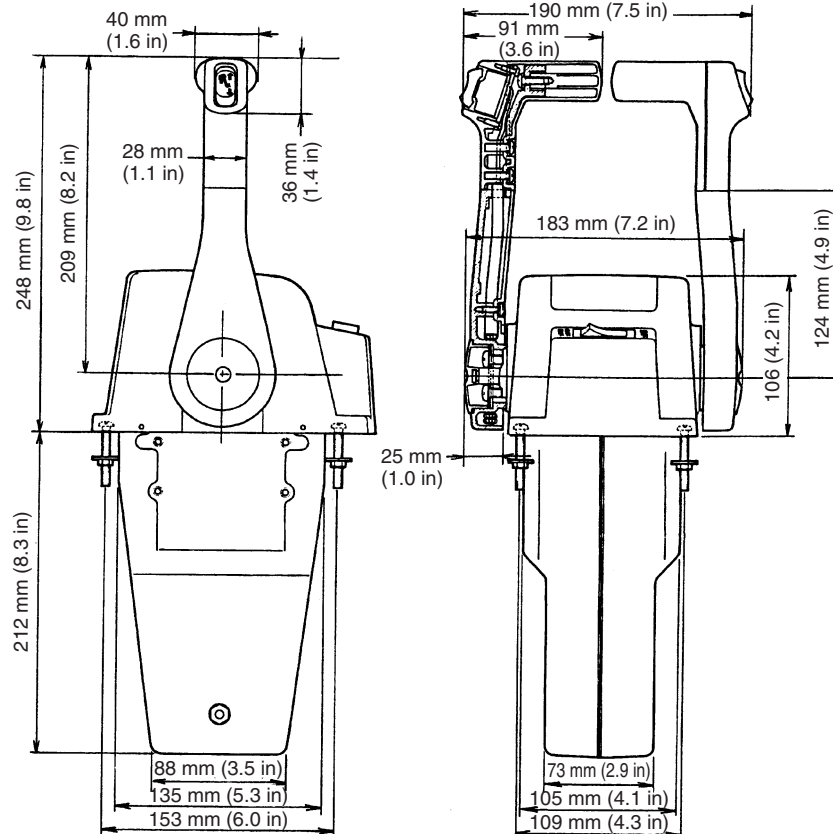


DIMENSION

(Single type)



(Dual type)



SINGLE & DUAL BINNACLE REMOTE CONTROL BOX INSTALL INSTRUCTION

REMOTE CONTROL BOX POSITION

NOTE:

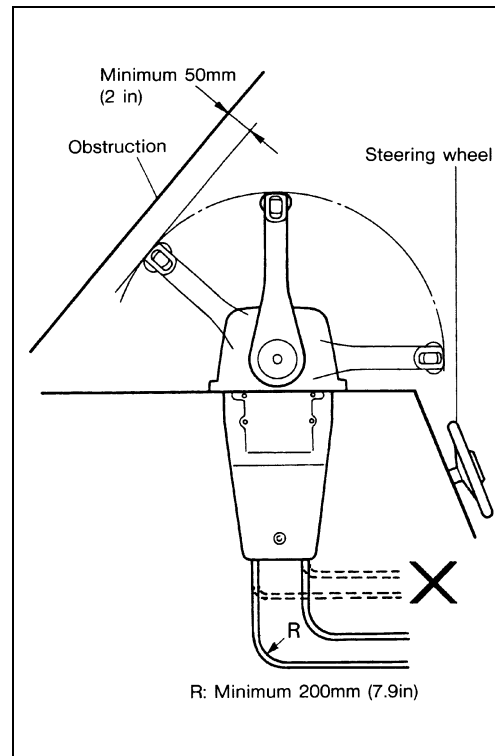
- Set the remote control box in a position in which it does not obstruct the operations of the control lever and switches. Make sure there is no obstruction on the path of the remote control cables.
- Allow a space so that the bottom of the remote control box does not contact any other parts.
- Provide a space so that the remote control cables can be routed without bending sharply.
- The radius of a cable bend should be more than 200 mm (7.87 in).

DRILLING HOLES OF MOUNTING POSITION

Select the proper position for the remote control box, and stick the template on the selected position, then drill holes through it.

NOTE:

Do not fix the remote control box before installing the remote control cables.

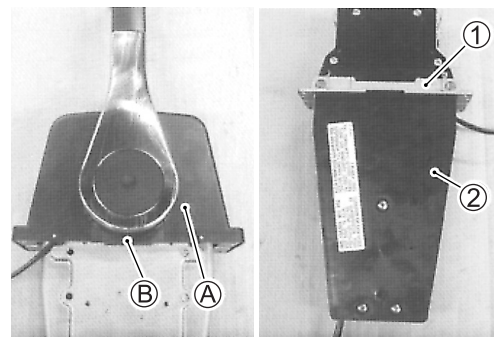


INSTALLING THE REMOTE CONTROL CABLE FOR SINGLE ENGINE

CAUTION

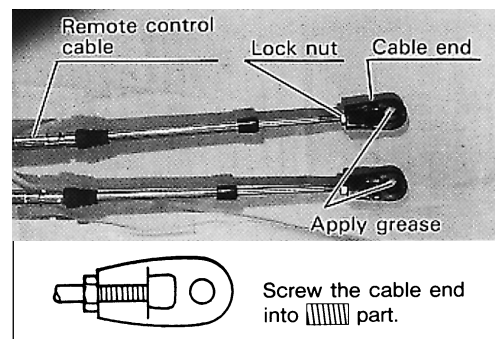
Make sure to install the shift cable and throttle cable on the remote control box side first. If they are installed on the engine side first, it may cause the adjustment operation to become impossible.

1. Remove the remote control cover (A) by and after loosening the two screws.
Remove (B) from the body by hand.
2. Loosen the two screws and remove the mounting flange (1) on the back plate side.
3. Loosen the three screws and remove the back plate (2).
4. Screw the cable end onto the threaded portion at the tip end of each remote control cable, and fix it with a lock nut. Apply SUZUKI WATER RESISTANCE GREASE to the hole of each cable end.

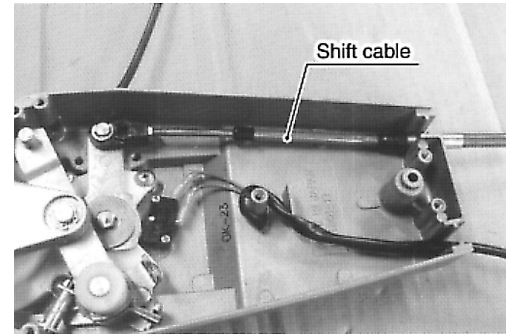


CAUTION

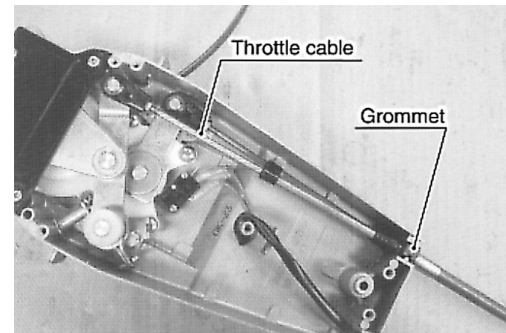
The lock-nut and C-ring must be replaced with new ones, if removed.



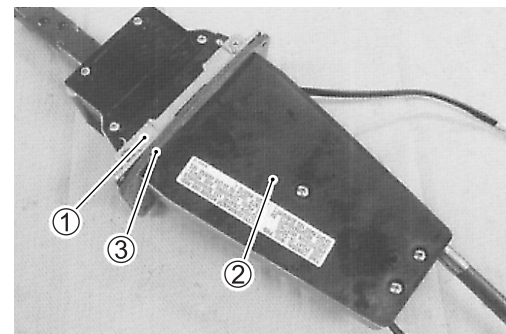
5. Insert the outer casing flange of the shifting remote control cable into the clamp groove of the housing.
Next, fit the cable end onto the pin at the tip end of the shift arm and fix it with a circlip.



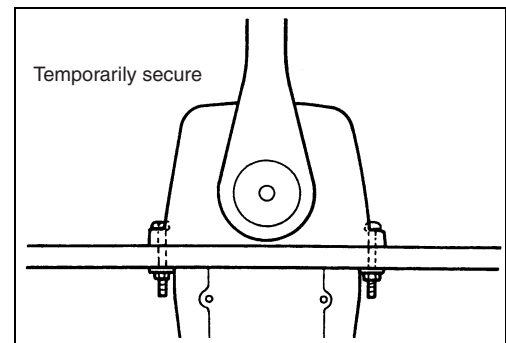
6. Install the throttle remote control cable to the throttle arm also in the same manner.
7. Insert a grommet into the clamp groove.



8. Secure the back plate ② with the three screws.
9. Install the mounting flange ① with the two screws.
10. Install the packing ③.

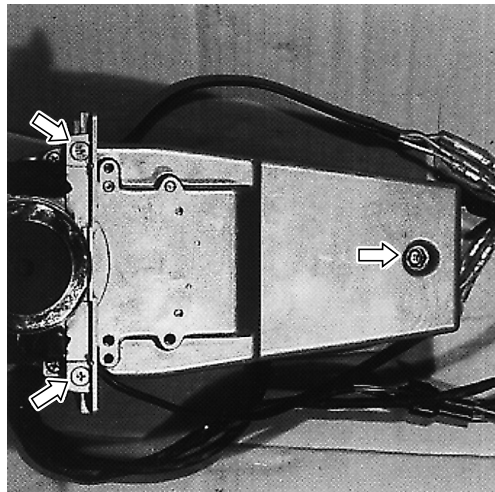


11. After installing the remote control cables, temporarily secure the remote control box to the predetermined position with the screws and nuts.



INSTALLING THE REMOTE CONTROL BOX FOR DUAL ENGINES

1. After loosening the three screws, separate the two remote control boxes.
2. Connect the cables in the same procedure as in the case of the single engine model.
3. After connecting the cables, secure the two remote control boxes with the three screws.
4. Peel the paper off the back of packing, and adhere the packing to the boat hull so that the holes in the packing align with the remote control box mounting screw holes in the hull.
5. Next, temporarily secure the remote control boxes to the predetermined position with the screws and nuts.

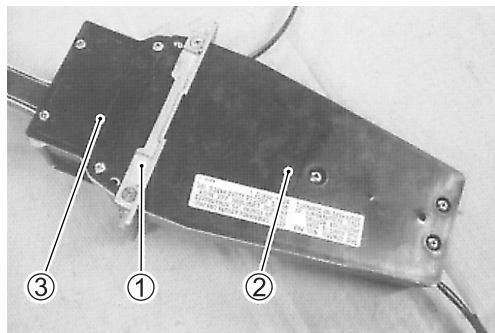
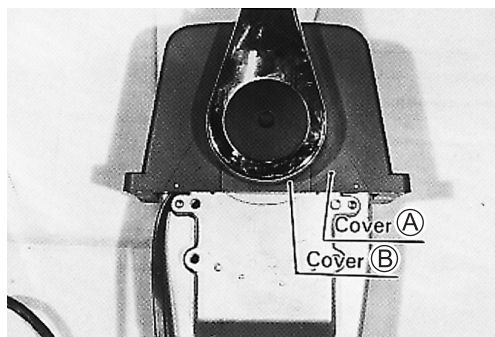


CHANGE FROM THE PUSH-TO-OPEN THROTTLE TYPE TO THE PULL-TO-OPEN THROTTLE TYPE

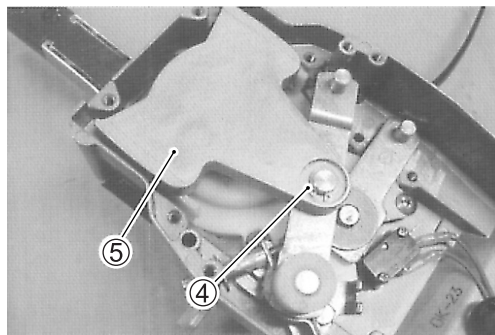
The remote control box permits the change from the push-to-open throttle type to the pull-to-open type by changing some of the parts positions.

If necessary, change the throttle type in the following procedure:

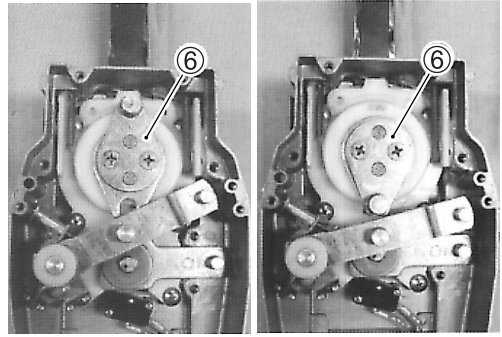
1. Remove the remote control cover (A) by hand after loosening the two screws.
Remove (B) from the body by hand.
2. Loosen the two screws and remove the mounting flange (1).
3. Loosen the three screws and remove the back plate (2).
4. Loosen the four screws and remove the dwell plate retainer (3).



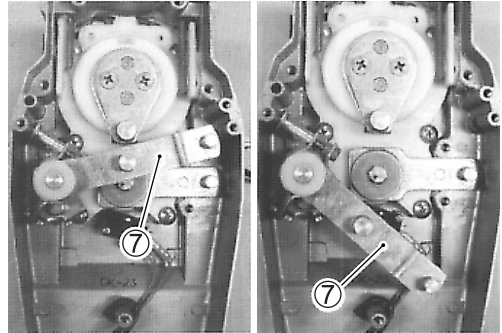
5. Remove the circlip (4) and remove the dwell plate (5).



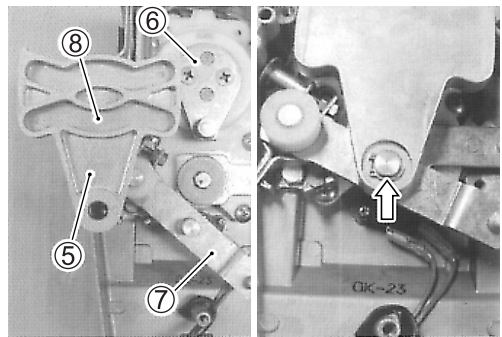
6. Loosen two screws and remove the throttle lever ⑥. Turn the rod downward by 180° and tighten with two screws.



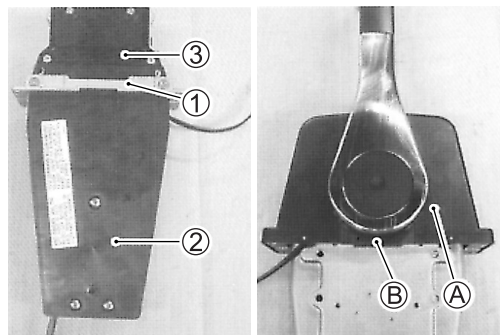
7. Turn the throttle arm ⑦ downward.



8. Align both the cam groove (for pull-to-open) ⑧ in the dwell plate ⑤ and the rod in the throttle lever assembly ⑥ with the specific position, and lock the throttle arm ⑦ assembly and dwell plate ⑤ with the circlip.



9. Secure the dwell plate retainer ③ with the four screws.
 10. Secure the back plate ② with the three screws.
 11. Install the mounting flange ① with the two screws.
 12. Tighten cover ④ with the two screws. Install ⑤ on the body.



CAUTION

If the shift cable or throttle cable is found to be curve in too small a radius or to be fixed in a wring position on the boat, correct such a problem and make the operation smooth.

CAUTION

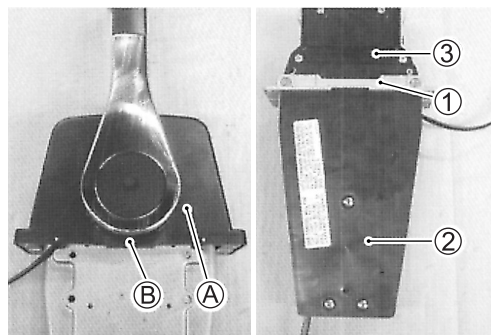
The lock-nut and C-ring must be replaced with new ones, if removed.

CHANGE IN THE CONTROL LEVER POSITION

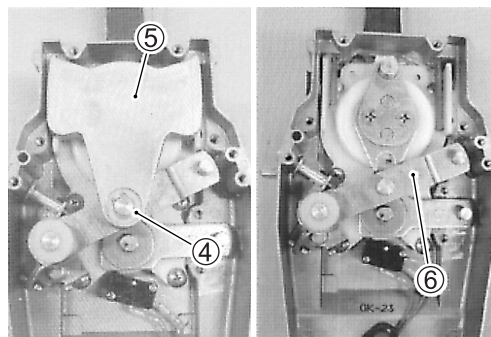
The remote control box permits to change the control lever position from the right side to the left side.

If necessary, change the control lever position in the following procedure:

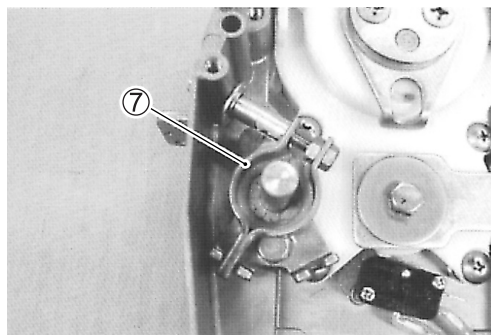
1. Remove the remote control cover by hand (A) after loosening the two screws. Remove (B) from the body by hand.
2. Loosen the two screws and remove the mounting flange (1).
3. Loosen the three screws and remove the back plate (2).
4. Loosen the four screws and remove the dwell plate retainer (3).



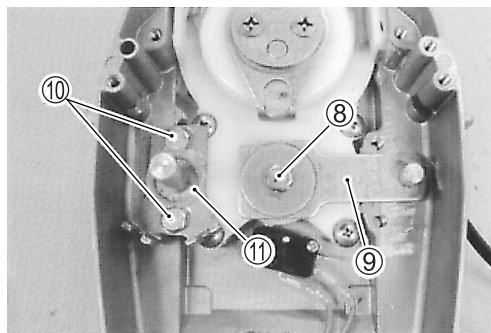
5. Remove the circlip (4) and the dwell plate (5).
6. Remove the throttle arm assembly (6).



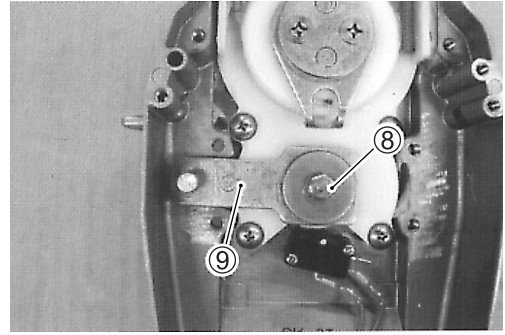
7. Remove the brake adjust (7).



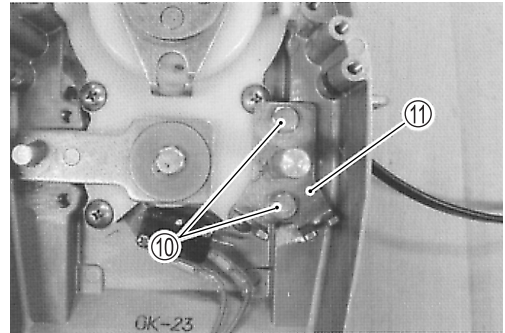
8. Loosen the bolt (8) and remove the shift arm assembly (9).
9. Loosen the two bolts (10) and remove the shaft assembly (11).



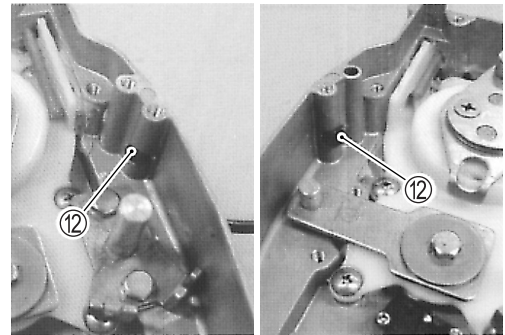
10. Install the shift arm assembly ⑨, while holding it in an inverted position and secure it with the bolt ⑧.



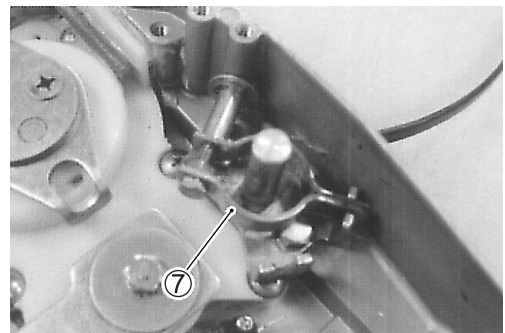
11. Change the shaft assy ⑪ installed position from the left to the right and secure it with the bolts ⑩.



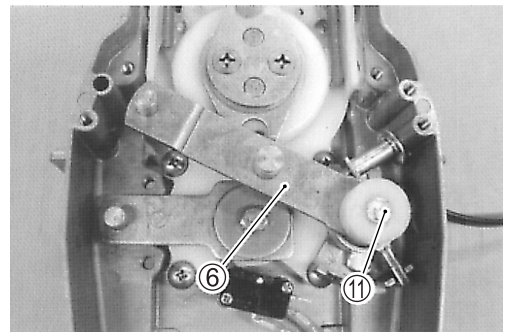
12. Remove the grommet ⑫ fitted on the right side and insert it into the left side hole.



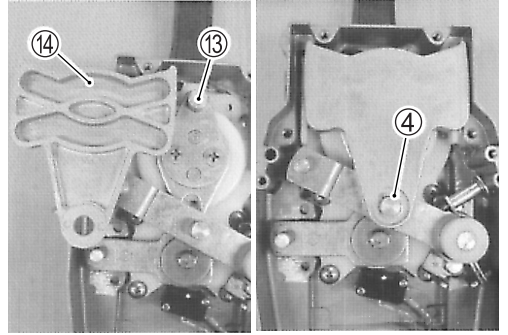
13. Relocate the brake adjust ⑦ from the left to the right position.



14. Install the throttle arm assy ⑥ on the shaft assy ⑪.



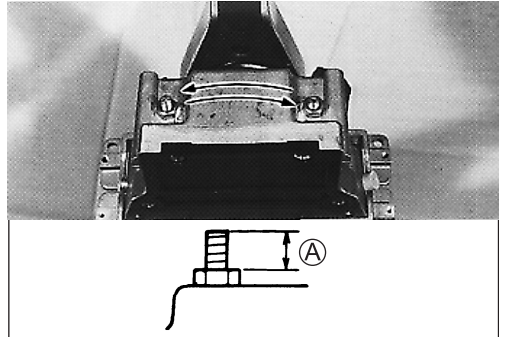
15. Align the cam groove ⑭ (for push-to-open) in the dwell plate and the roller in the throttle lever assembly ⑬ with the specific position, and hold the throttle arm assembly and dwell plate with the circlip ④.



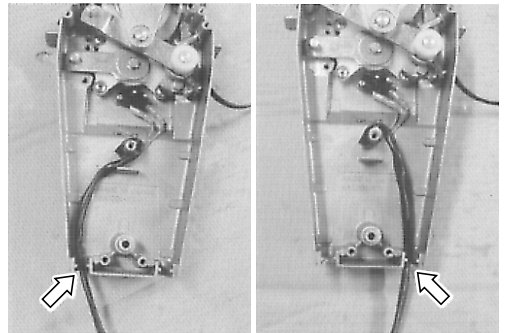
16. Loosen the locknuts, and reverse the right and left stopper bolt positions, and secure the bolts with the two locknuts.

CAUTION

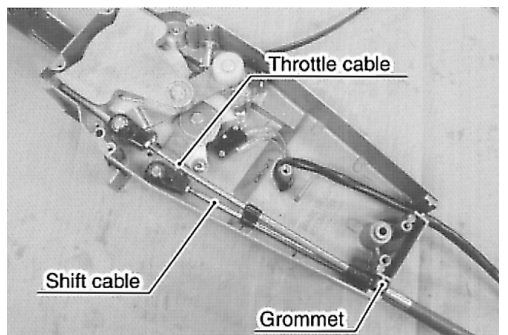
Measure the original thread length ① protruded from the nut. After the stopper bolts are repositioned, adjust the thread protruded length to the same length ① as measured before the stopper bolts are repositioned.



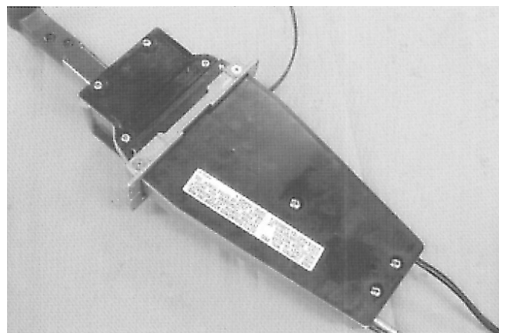
17. Reposition the neutral wire from the left groove to the right groove.



18. Reposition the shift cable and throttle cable from the right groove to the left groove.

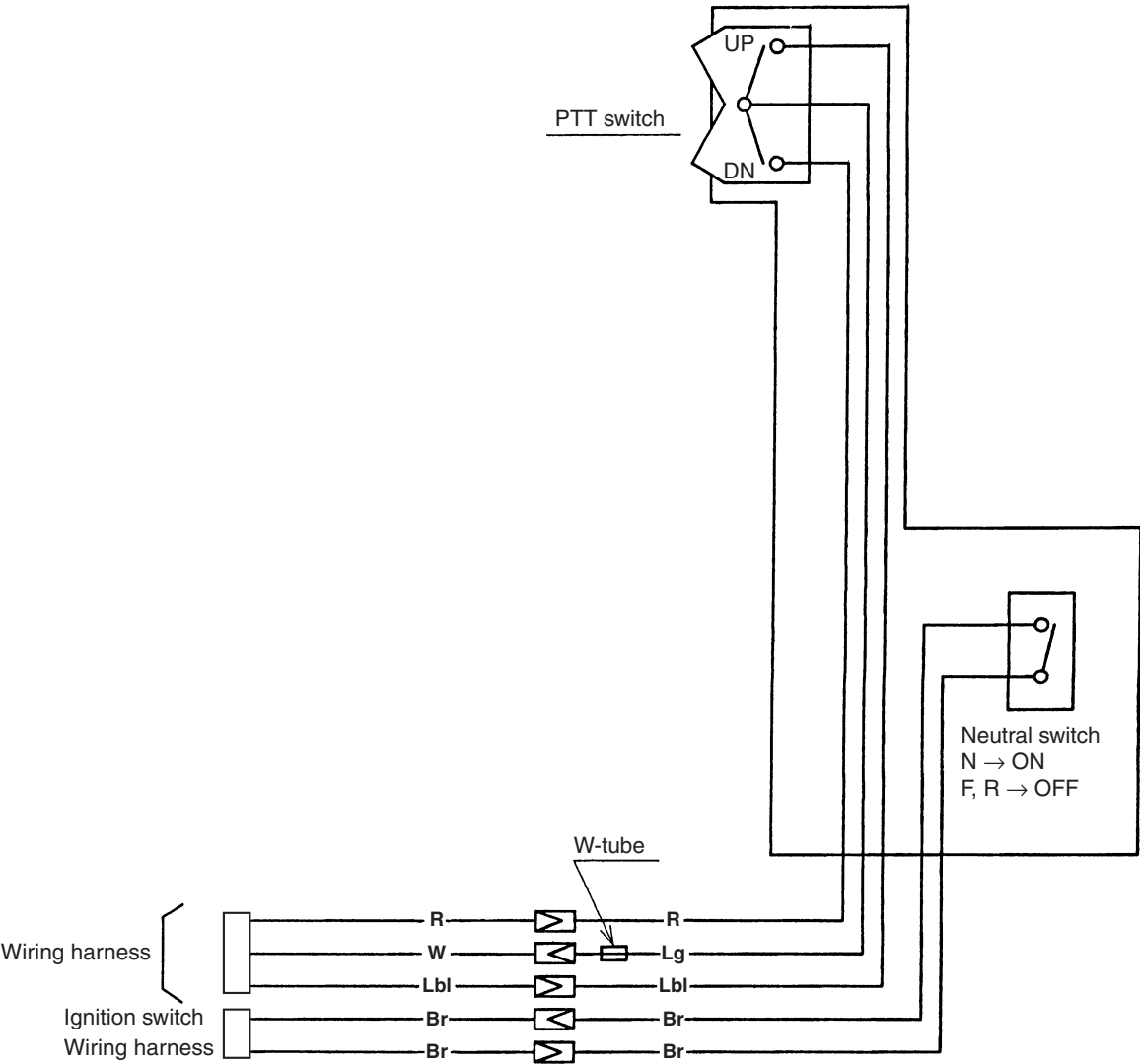


19. Tighten the screws on the dwell plate retainer, back plate and flange in that order.



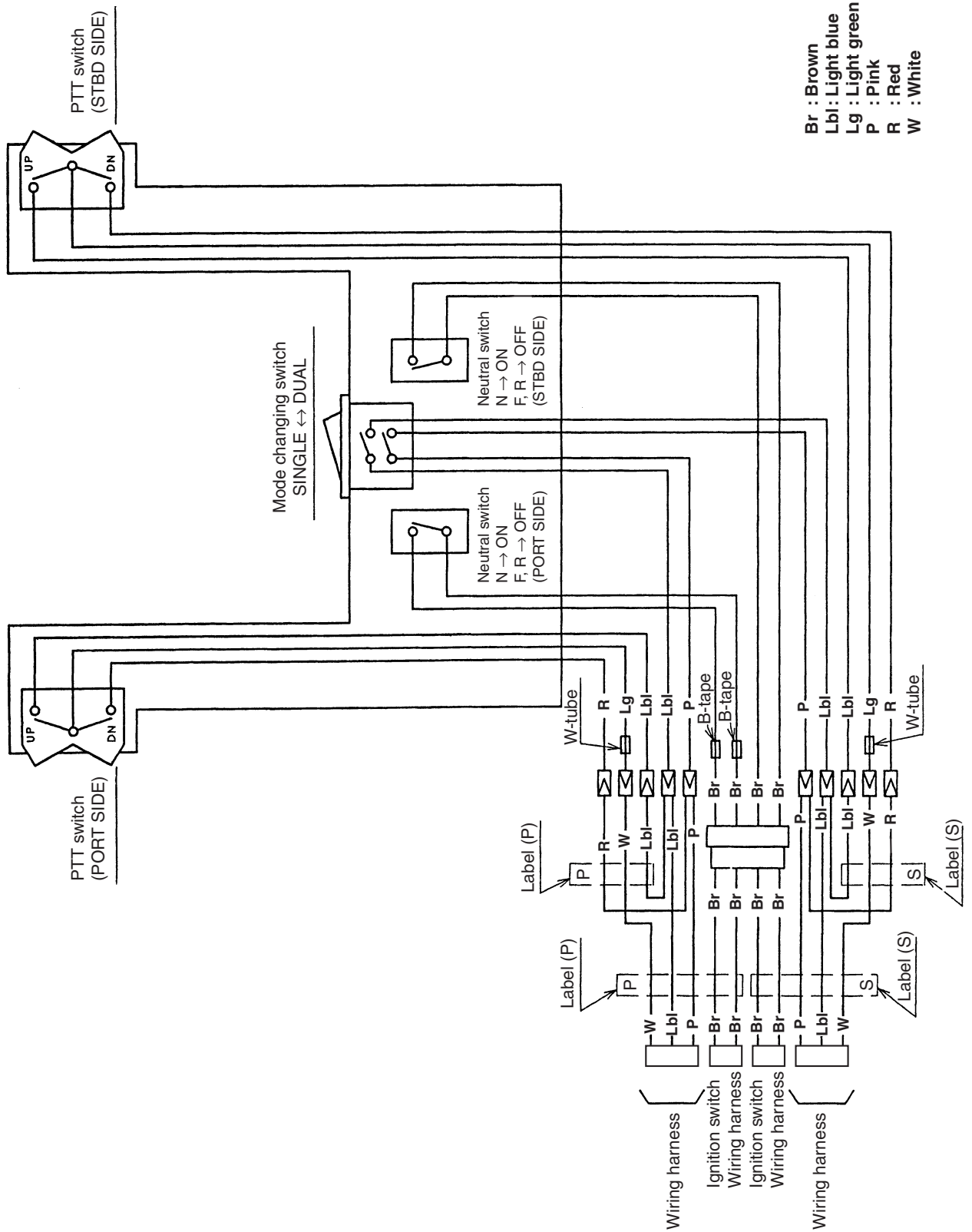
WIRING

Single type



Br : Brown
Lbl : Light blue
Lg : Light green
R : Red
W : White

Dual type



GENUINE REMOTE CONTROL CABLES

These genuine cables employ the latest in cable technology, The inner core is encased in nylon and travels back and forth in a high-density polyethylene liner.

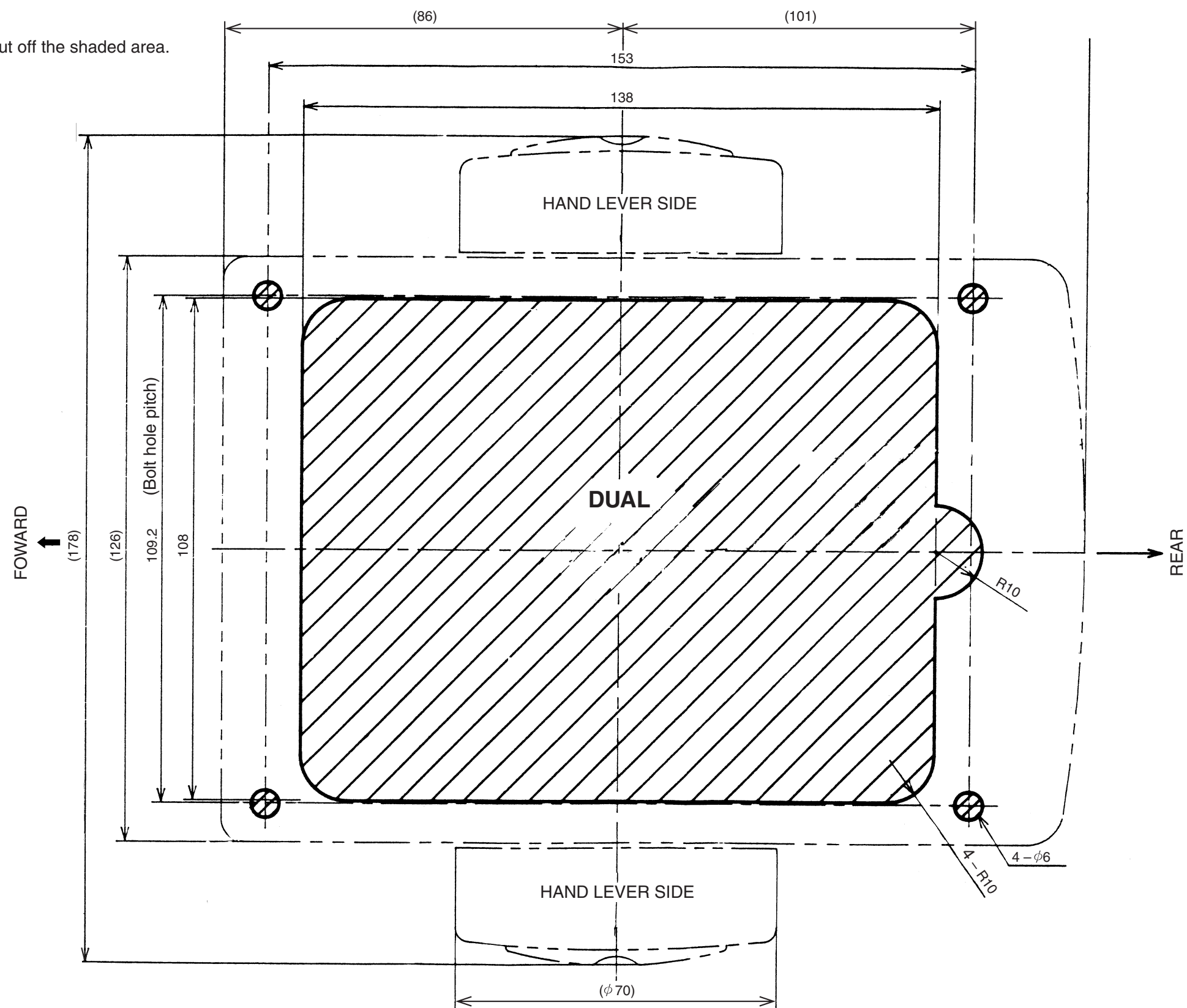
Part name	Part number	Q'ty
Control Cable 8 ft (2.4 m)	67320-93J00	2
Control Cable 10 ft (3.1 m)	67320-93J10	2
Control Cable 12 ft (3.7 m)	67320-93J20	2
Control Cable 14 ft (4.3 m)	67320-93J30	2
Control Cable 16 ft (4.9 m)	67320-93J40	2
Control Cable 18 ft (5.5 m)	67320-93J50	2
Control Cable 20 ft (6.1 m)	67320-93J60	2
Control Cable 22 ft (6.7 m)	67320-93J70	2
Control Cable 24 ft (7.3 m)	67320-93J80	2

Choose one item which is matched to the boat in length.





Cut off the shaded area.



CONTROL CABLE/WIRING HARNESS INSTALLATION ON ENGINE SIDE

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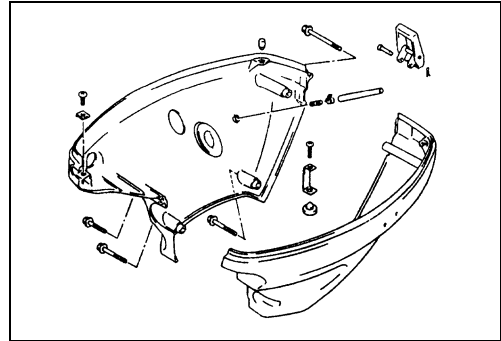
DF9.9/15 CONTROL CABLES AND WIRING HARNESS INSTALLATION

CONNECTING CABLES AND WIRING HARNESSES

[R-specification]

REMOTE CONTROL CABLE INSTALLATION

1. Remove the engine side lower cover.



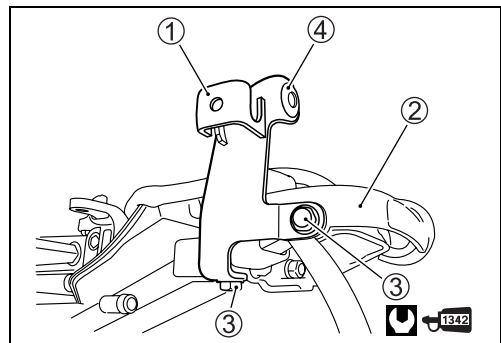
2. Fit the remote control cable holder ① to the steering bracket ② and tighten two bolts ③.

Apply thread lock to the bolt threads.

 **99000-32050: THREAD LOCK "1342"**

 **Bolt ③: 10 N·m (1.0 kgf·m)**

Fit the grommet ④ to the cable holder ①.

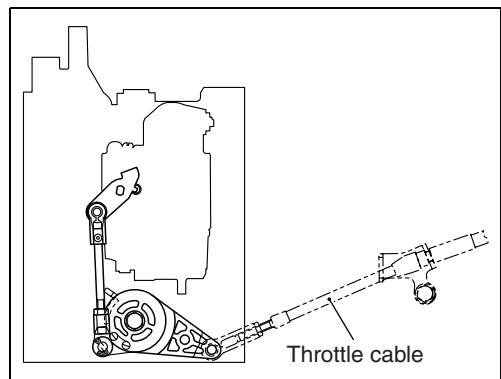


3. Perform the cable connection and adjustment.

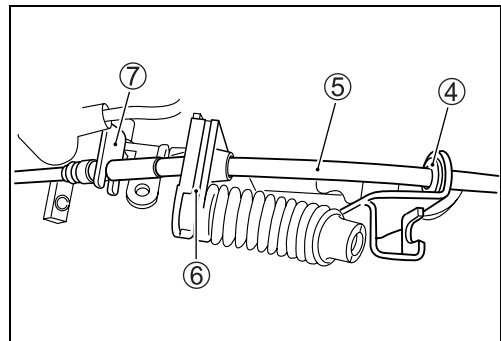
[Throttle cable]

NOTE:

Connect the throttle cable to the outside ball pivot.



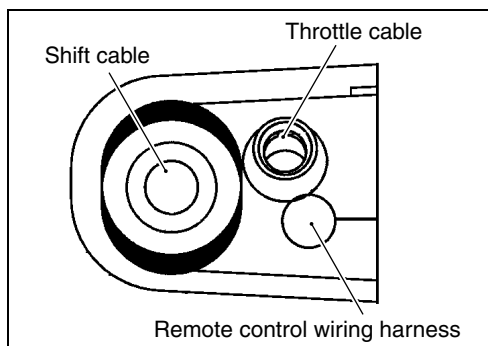
- (1) Shift the remote control lever to neutral position.
- (2) Pass the throttle cable ⑤ through the grommet ④ on the cable holder and the grommet ⑥ on the front panel.
- (3) Engage the stepped section of the outer throttle cable with U-slot of the throttle cable holder ⑦.



NOTE:

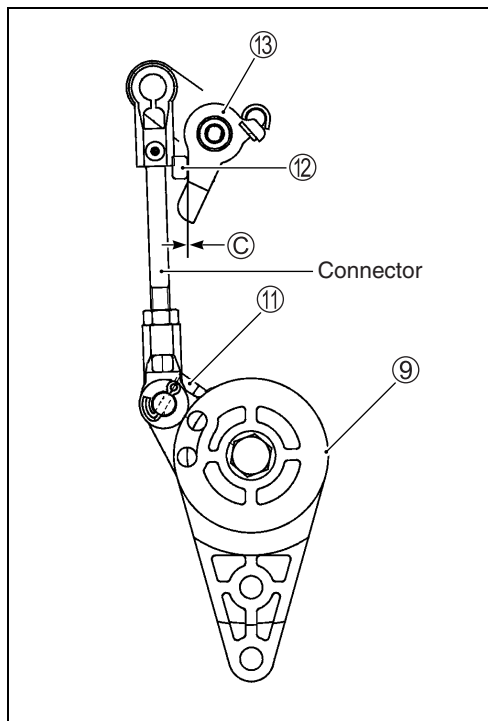
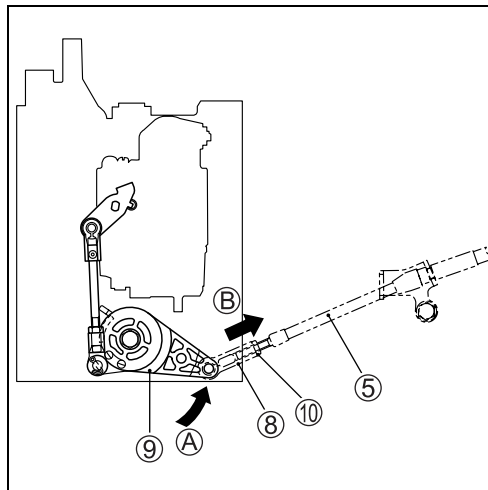
Pass the following cables through the positions of front panel grommet ⑥ as shown.

- Remote control wiring harness
- Shift cable
- Throttle cable



- (4) Screw the throttle cable connector ⑧ onto the cable.
- (5) Check that the carburetor throttle valve is fully opened.
- (6) Fully turn the throttle drum ⑨ counterclockwise (Direction ① in the illustration) to the completely closed position.
- (7) Push the cable end toward arrow ② in the illustration to remove cable play. With the cable held in this position, turn the cable connector ⑧ so that the connector hole center aligns with the ball pivot center on the throttle drum ⑨.
- (8) Press fit the cable connector onto the ball pivot. Tighten the cable lock nut ⑩ against the connector.
- (9) Set that the throttle drum stopper ⑨ contacts the cylinder block stopper ⑪ when the throttle is fully opened.

In this condition, check that there is 0 – 2 mm of clearance shown as ③ between the lever ⑬ and the carburetor full open stopper ⑫. If the clearance is not in the specification, readjust the length of connector threads engaged.



[Shift cable]

- (a) Shift the remote control lever to neutral position.
- (b) Pass the shift cable ⑭ through the front panel grommet ⑥ as shown.
Engage the stepped section of outer shift cable with the slot of cable holder ①.
- (c) Screw the cable connector ⑮ onto the shift cable ⑭.
- (d) Move the clutch control lever ⑯ from reverse to neutral positions. Repeat this operation several times and then position the clutch control lever ⑯ to neutral.

NOTE:

Turn the propeller and check that the clutch is correctly in neutral.

- (e) Push the shift cable end toward arrow ⑤ to remove cable play. With the cable held in this position, turn the cable connector ⑮ so that the center of screw hole on the clutch control lever ⑯ aligns with the center of connector hole.
- (f) Tighten the cable connector ⑮ to the clutch control lever ⑯ using the bolt ⑰.

 Bolt ⑰: 2.5 N·m (0.25 kgf·m)

- (g) Tighten the cable lock nut ⑱ against the connector.

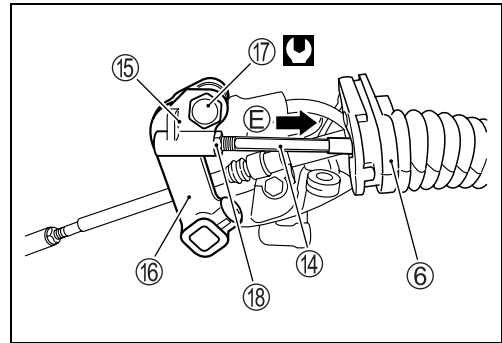
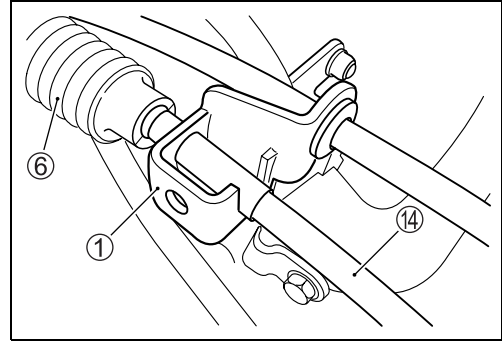
[Inspection]

- (A) Move the remote control lever to forward and reverse and check that the shifting operates properly and the throttle can open fully.
- (B) Check that the throttle closes completely and the clutch shifts into neutral when the remote control lever is returned to neutral position.
- (C) Operate the remote control lever to forward and reverse. Check that the throttle is completely closed at the time of clutch engagement and the throttle begins to open when the lever is further leaned.

CAUTION

- Screw the cable connector onto the cable by at least 13 mm.
- The throttle/shift cables must be adjusted and routed so that they do not interfere with the equipment when the steering is turned all the way to the right and left.

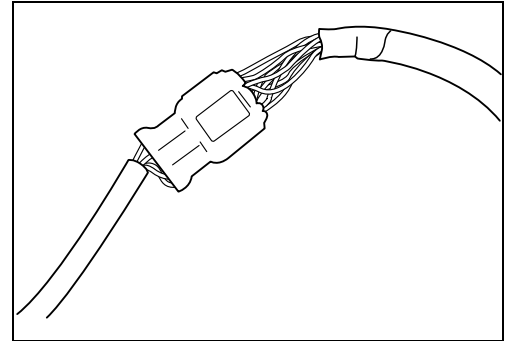
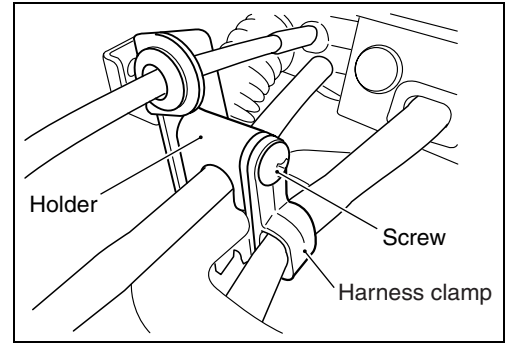
4. Install the engine lower cover.



CONNECTING CONTROL WIRING HARNESS

Install the wiring harness clamp on the holder as shown in the illustration.

Tighten the screw to secure the control wiring harness.

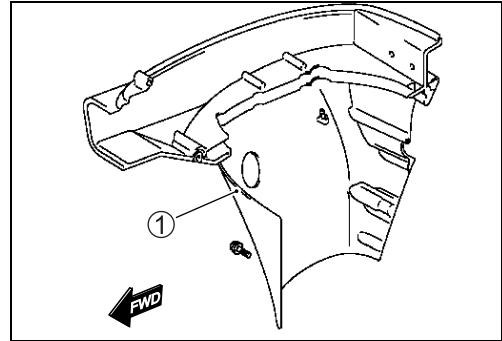


DF25-V2 CONTROL CABLES AND WIRING HARNESS INSTALLATION

CONNECTING CABLES AND WIRING HARNESSES [R-SPECIFICATION]

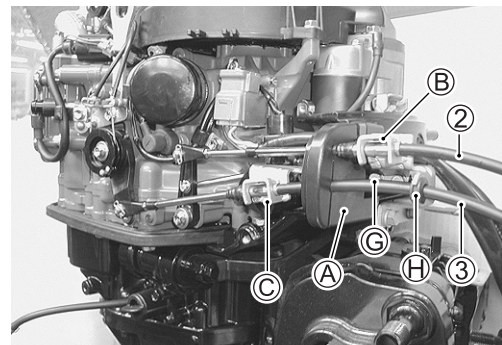
Procedure

- (1) Remove five bolts and take the starboard side cover ① off.



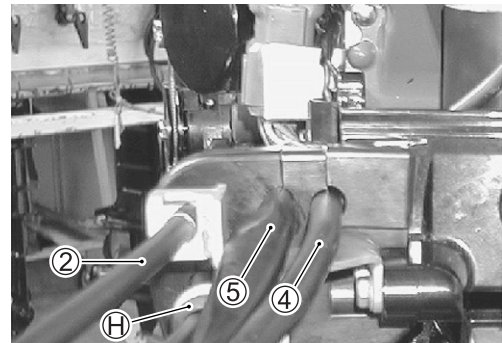
— Clutch control cable —

- (2) Remove two bolts ⑥ and the clutch cable holder ③ on the engine side.
- (3) Insert the clutch cable ② in to cable grommet ①.

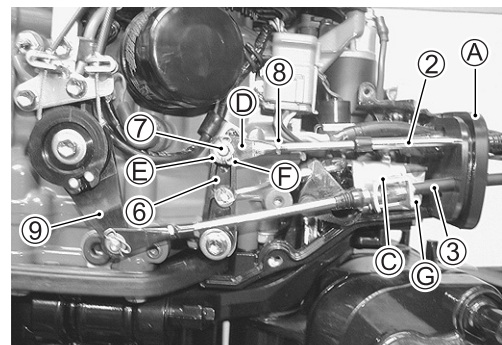


- (4) Set the clutch control cable ② in the slot on cable holder ③ and fit the groove of cable on the holder.
- (5) Route the following items through the grommet ① referring to the illustration.

- Clutch control cable ②.
- Throttle control cable ③.
- Remote control wire harness ④.
- Battery cable ⑤.

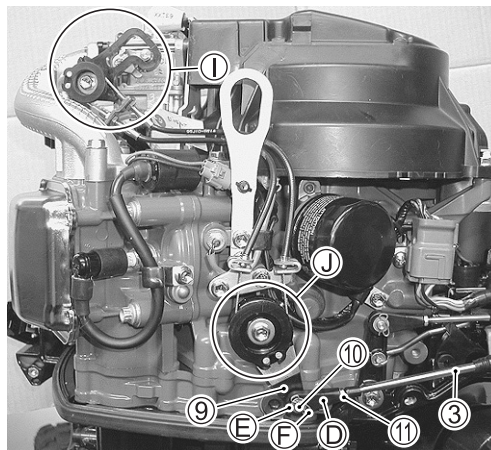


- (6) Set the lever of remote control handle into “NEUTRAL” position.
- (7) Make sure that the clutch arm ⑥ is in the “NEUTRAL” position.
- (8) Thread the connector ⑦ onto the clutch control cable ② until the connector hole aligns with the pivot pin ⑧ on the clutch control arm ⑥.
- (9) Install the washer ⑨ and clip ⑩, then tighten the lock nut ⑧.



— Throttle control cable —

- (10) Remove two bolts ⑥ and the throttle cable holder ③ on the engine side.
- (11) Under the condition of throttle control lever ⑨ is fully closed.
(refer to the enlarged view ①.)
Match mark of the interlink throttle lever and cylinder block rib must be aligned.
- (12) When throttle cam is fully closed,
(refer to the enlarged view ①.)
roller center and match mark must be straight line up.
- (13) Insert the throttle control cable ③ in to the cable grommet ④ and the grommet ⑤.
- (14) Set the throttle control cable ③ in the slot on cable holder ③ and fit the groove of cable on the holder.
- (15) While pulling the throttle control inner cable ③ out side, set the connector ⑦ onto the pivot pin ⑩ with the flat side of connector towards the arm.
- (16) Install the washer ⑧ and clip ⑧, then tighten the lock nut ⑪.



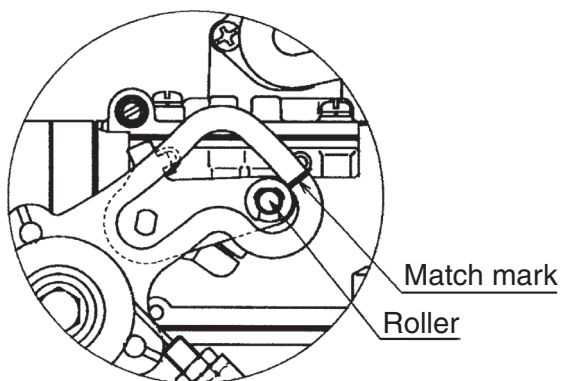
CAUTION

Cable connectors and turnbuckles must be threaded at least 13 mm (0.51) onto cable.

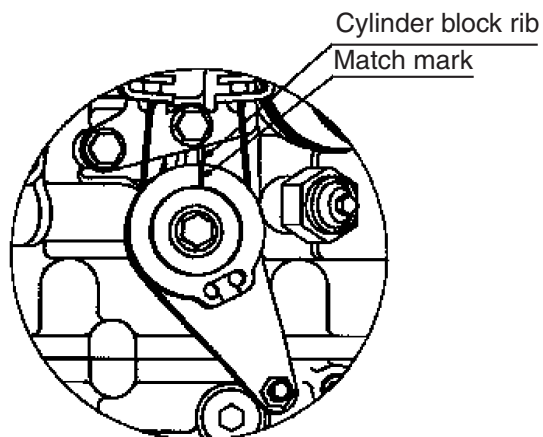
NOTE:

After assembly, make sure that the cables are not stretched or otherwise stressed when the outboard motor is turned all the way to the right and left.

① Enlarged view

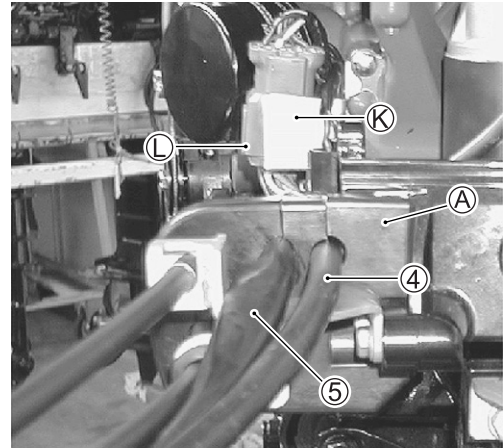


② Enlarged view



WIRE HARNESS INSTALLATION

- (1) Remove the starboard side cover from the outboard motor. (refer to the page 7.)
- (2) Route the remote control wire harness ④ and the battery cable ⑤ through the grommet ①.
- (3) Connect the remote control wire harness to the engine side.
- (4) Press fit the remote control wire harness connector ② into the connector holder ③.
- (5) Pass every cable and harness through the grommet ① and back the grommet to the holder on the front panel.
- (6) Assemble the starboard side cover.



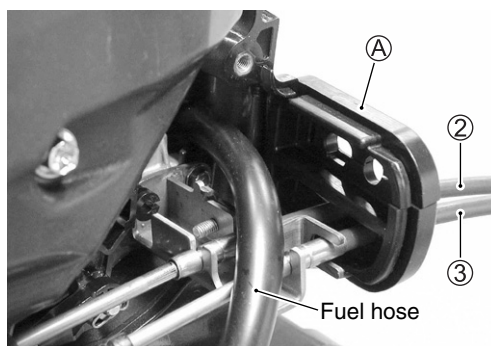
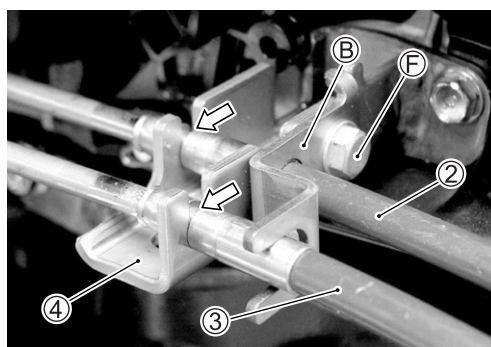
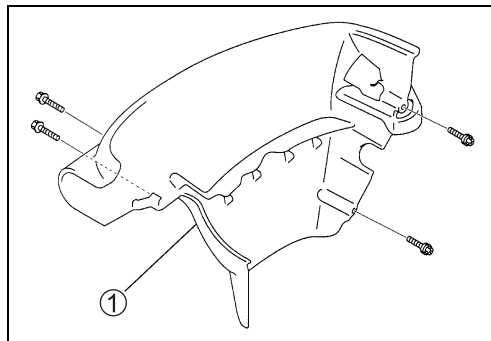
DF25/30 CONTROL CABLES AND WIRING HARNESS INSTALLATION

CONNECTING CABLES AND WIRING HARNESSES

[DF25/30.QR.T]

REMOTE CONTROL CABLE INSTALLATION

1. Remove four bolts that tighten the STBD lower cover ①.
Remove the STBD lower cover.
2. Pass the shift cable ② through the cable holder ④ and engage the stepped section of outer shift cable with U-slot of the holder.
3. Pass the throttle cable ③ through the cable holder ④ and engage the stepped section of outer cable with U-slot of the holder.
4. Install the cable stopper ⑤ using the bolt ⑥ and secure the shift cable and throttle cable. (See right illustration.)
5. Fit the cable grommet ⑦ to the shift cable ② and throttle cable ③.
6. Perform the cable connection and adjustment.



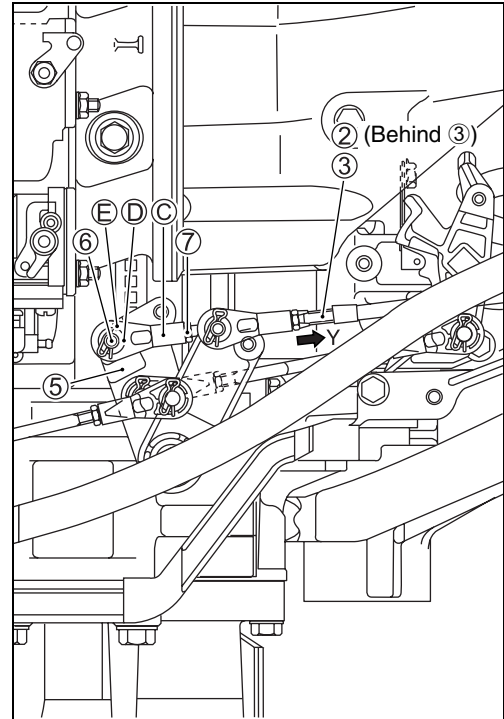
[Shift cable]

- (a) Shift the remote control lever to neutral position.
- (b) Move the clutch control arm ⑤ from reverse to neutral. Repeat this operation several times and then hold the clutch control arm ⑤ position in neutral.

NOTE:

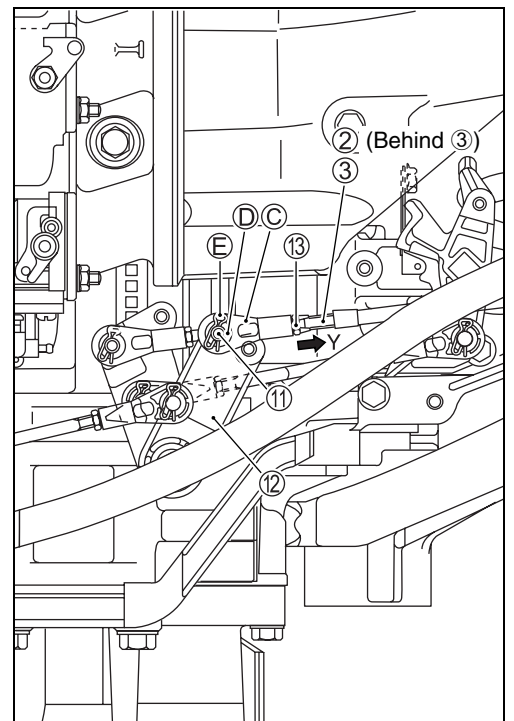
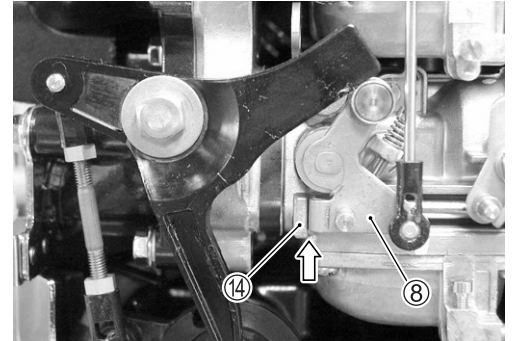
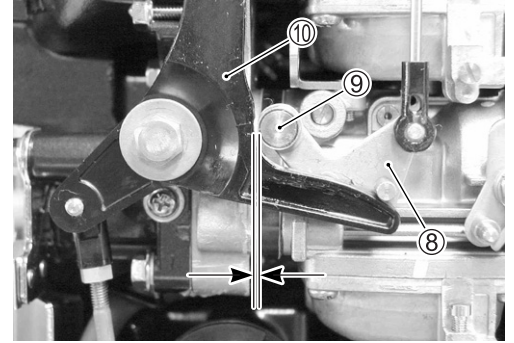
Turn the propeller and check that the clutch is correctly in neutral.

- (c) Screw the cable connector ③ onto the shift cable ②.
Push the inner cable of shift cable toward arrow Y in the illustration (cable holder side) to remove cable play. With the cable held in this position, turn the cable connector ③ so that the center of the connector hole aligns with the center of ball pivot ⑥ on the clutch control arm ⑤.
- (d) Push the cable connector onto the pivot pin ⑥ with the connector's flat side facing the clutch control arm.
- (e) Fit the washer ① and clip ④ on the pivot pin. Secure the connector by tightening the cable lock nut ⑦ against the cable connector ③.



[Throttle cable]

- (1) Shift the remote control lever to neutral position.
- (2) Screw the cable connector ③ onto the throttle cable ②.
- (3) Check that the throttle lever is in completely closed position.
- (4) Give a slight clearance between the roller ⑨ and the throttle cam ⑩ and hold this condition.
- (5) With the inner cable of throttle cable ③ pushed in toward arrow Y in the illustration (cable holder side), turn the cable connector ③ and align the center of the connector hole with the pivot pin ⑪ located on the throttle control lever ⑫.
- (6) Push the cable connector ③ onto the pivot pin ⑪ with the connector's flat side facing the throttle lever.
- (7) Fit the washer ⑬ and clip ⑭ to the pivot pin. Secure the connector by tightening the cable lock nut ⑬ against the cable connector ③.
- (8) Check that the throttle lever ⑧ contacts the stopper ⑭ when the throttle is opened fully.



[Inspection]

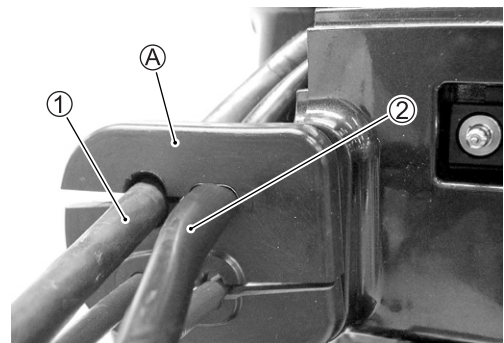
- (A) Move the remote control lever to forward and reverse and check that the shifting operates properly and the throttle can open fully.
- (B) Check that the throttle closes completely and the clutch shifts into neutral when the remote control lever is returned to neutral position.
- (C) Operate the remote control lever to forward and reverse. Check that the throttle is completely closed at the time of clutch engagement and the throttle begins to open when the lever is further leaned.

CAUTION

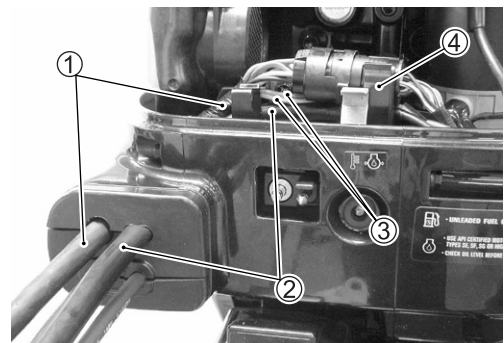
- Screw the cable connector onto the cable by at least 13 mm.
- The throttle/shift cables must be adjusted and routed so that they do not interfere with the equipment when the steering is turned all the way to the right and left.

CONNECTING CONTROL WIRING HARNESS

1. Remove the STBD side lower cover.
2. Pass the remote control wiring harness ① and battery cable ② through the grommet ③. (See the right illustration.)
3. Press the grommet ③ to fit into the front panel.



4. Route the battery cable ② as shown in the illustration. (Pass the battery cable ② under the holder ④.)
5. Connect the remote control wiring harness ① and the PTT wiring harness (T-specification) to the engine side wiring harness connector. Route the PTT wiring harness connector under the connector.
6. Push the connector into the holder ④.
7. Reinstall the STBD side lower cover in the original position.

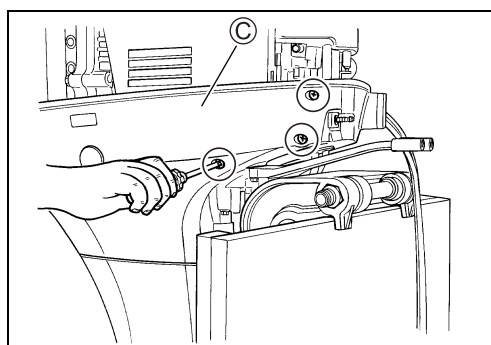
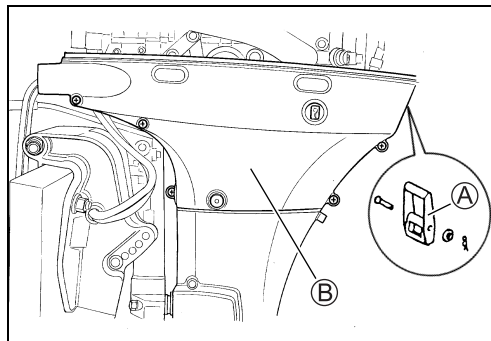


DF40/50 CONTROL CABLES AND WIRING HARNESS INSTALLATION

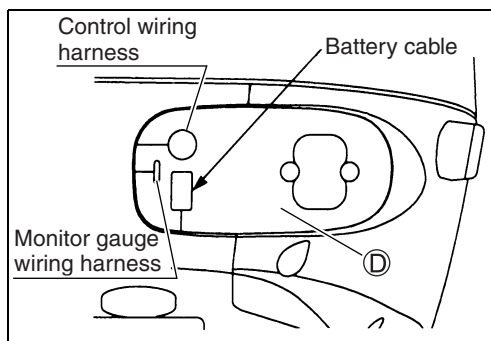
CONNECTING CABLES AND WIRING HARNESSES

[Connecting control wiring harness]

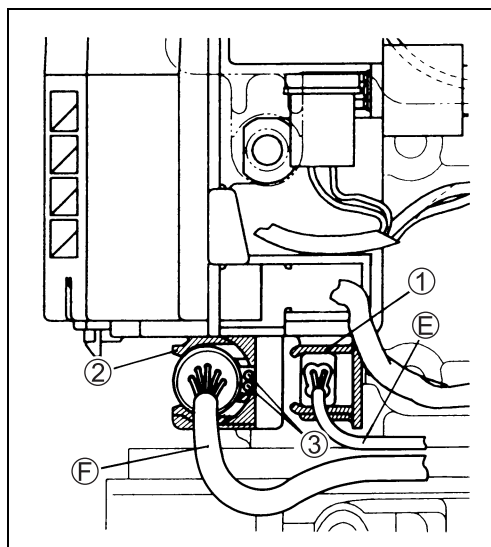
1. Remove the fastener (A).
Remove the PORT lower cover (B) and STBD lower cover (C).



2. Route the monitor gauge wiring harness and control wiring harness through the grommet (D) referring to the right illustration.



3. Connect the monitor gauge wiring harness (E) to the engine side wiring harness connector.
Push the connector into the holder (1).
4. Connect the control wiring harness (F) to the engine side wiring harness connector.
Route the control wiring harness under the fuel hose.
Push the connector into the holder (2).
Route the PTT lead (3) behind the connector of control wiring harness (F).



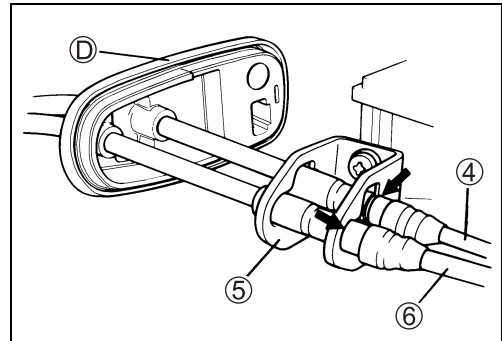
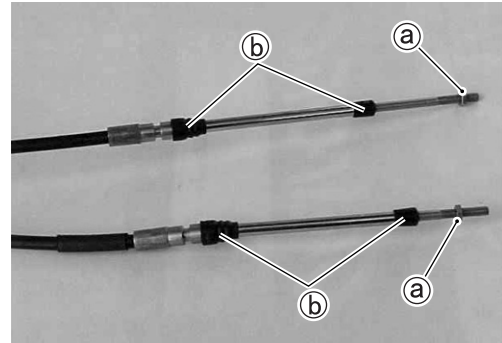
[Connecting shift/throttle cables]

5. Remove the lock nut ① and dust seal ② from the shift cable ④ and throttle cable ⑥.

Pass the shift cable ④ and throttle cable ⑥ through the cable grommet ③.

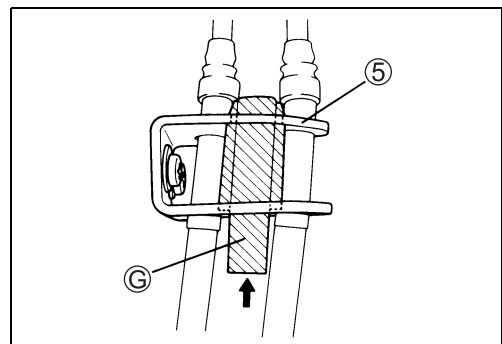
Refit the removed lock nut and dust seal to their original positions.

6. Pass the shift cable ④ through the cable holder ⑤ and engage the stepped section of the outer cable with U-slot of the holder.
7. Pass the throttle cable ⑥ through the cable holder ⑤ and engage the stepped section of the outer cable with U-slot of the holder.



8. In the center of the cable holder ⑤ (between the throttle cable and shift cable), insert the remote control cable stopper ⑧.

The stopper must be inserted in the direction indicated by the arrow (➡).

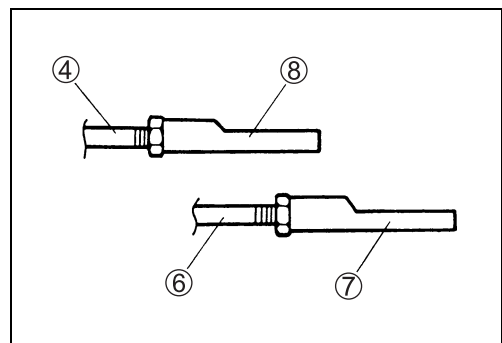


9. Screw the throttle cable connector ⑦ and the shift cable connector ⑧ onto the respective cables.

NOTE:

The cable connector must be screwed onto the cable by at least 13 mm.

10. Perform the cable connection and adjustment.



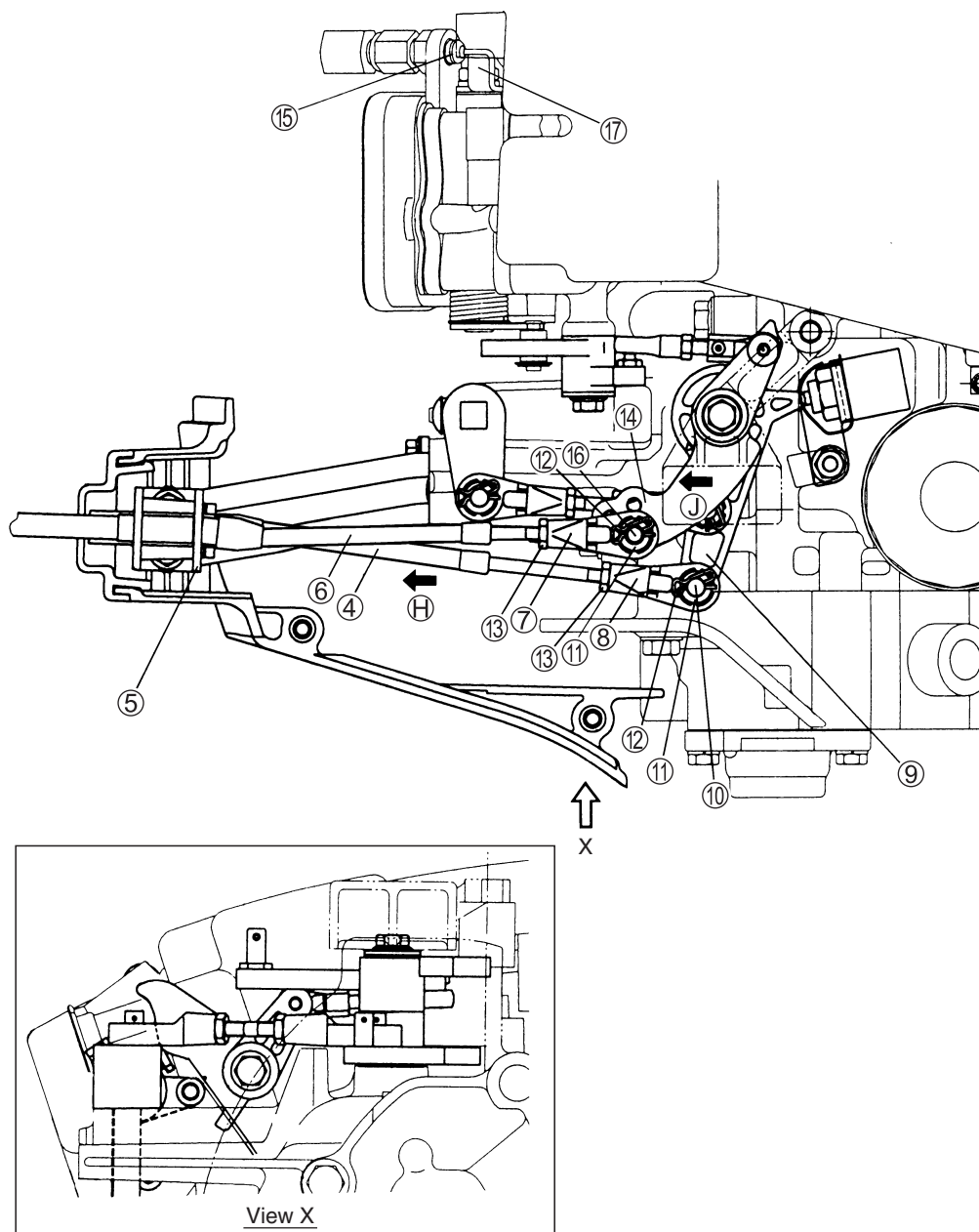
[Shift cable]

- (a) Shift the remote control lever to neutral position.
- (b) Move the clutch control lever ⑨ from reverse to neutral. Repeat this operation several times and then hold the clutch control lever in neutral position.

NOTE:

Turn the propeller and check that the clutch is correctly in neutral.

- (c) Push the inner cable of shift cable toward arrow H in the illustration (cable holder side) to remove cable play. With the cable held in this position, turn the cable connector ⑧ so that the center of the connector hole aligns with the center of clutch lever pin ⑩.
- (d) Push the cable connector ⑧ onto the clutch lever pin ⑩ so as to engage.
Fit the washer ⑪ and clip ⑫ to the clutch lever pin ⑩.
Secure the connector by tightening the cable lock nut ⑬ against the cable connector ⑧.



[Throttle cable]

- (1) Shift the remote control lever to neutral position.
- (2) Push the throttle lever lightly toward arrow ㉑ as indicated to open the throttle fully and hold this position.
Check that the idle switch ⑮ is in ON position.
- (3) With the inner cable of throttle cable ⑥ pushed in toward the direction of arrow ㉒ as illustrated, turn the cable connector ⑦ so as to align the center of cable connector hole with the center of throttle connector pin ⑯.
- (4) Push the cable connector ⑦ onto the connector pin ⑯.
Fit the washer ⑪ and clip ⑫ to the connector pin.
Secure the connector by tightening the cable lock nut ⑬ against the connector.

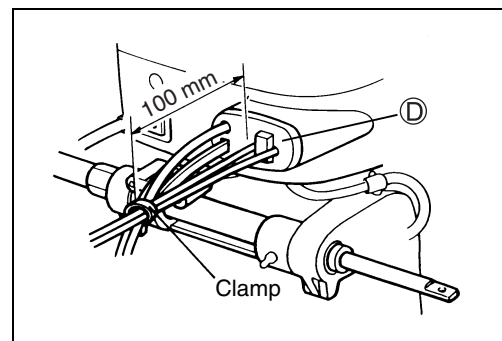
[Inspection]

- (A) Move the remote control lever to forward and reverse and check that the shifting operates properly and the throttle can open fully.
- (B) Check that the throttle closes completely and the clutch shifts into neutral when the remote control lever is returned to neutral position.
- (C) Operate the remote control lever several times so that the throttle can open fully and close completely.
With the remote control lever in neutral position, check that the tip of the idle switch ⑮ is pushed in by the throttle lever ⑰ and the switch is turned ON.

CAUTION

- Screw the cable connector onto the cable by at least 13 mm.
- Adjust the throttle cable so that the throttle valve in the throttle body opens fully when the remote control lever is shifted forward and moved to the full throttle position and that the throttle valve closes completely when the lever is returned to neutral.
- Check that the throttle valve is closed completely at the time of shifted-in on the engine side when the remote control lever is moved either forward or reverse, and also check that the throttle starts to operate when the lever is moved further.
- The throttle/shift cables must be adjusted and routed so that they do not interfere with the equipment when the steering is turned all the way to the right and left.

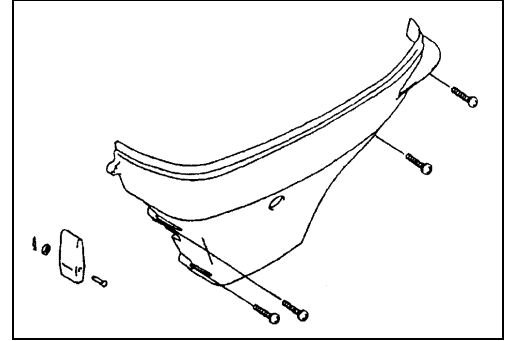
11. Reinstall the engine lower cover in the original position.
12. Install the remote control cable grommet ㉓ on the front panel.
13. After the control cable and control wiring harness have been installed tie the shift/throttle cable, control wiring harness, monitor gauge wiring harness and battery cable using the clamp.



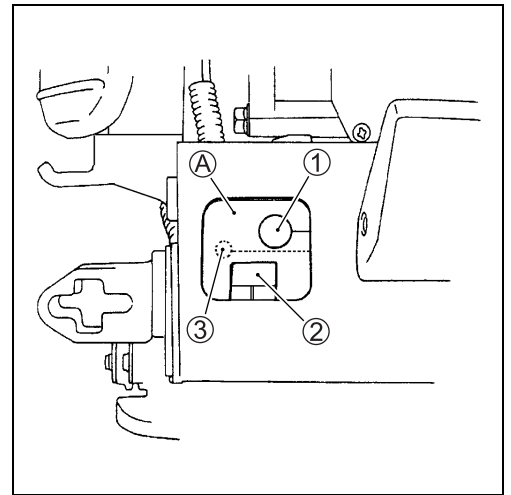
DF60/70 CONTROL CABLES AND WIRING HARNESS INSTALLATION

CONNECTING CABLES AND WIRING HARNESSES

1. Remove the STBD engine lower cover.



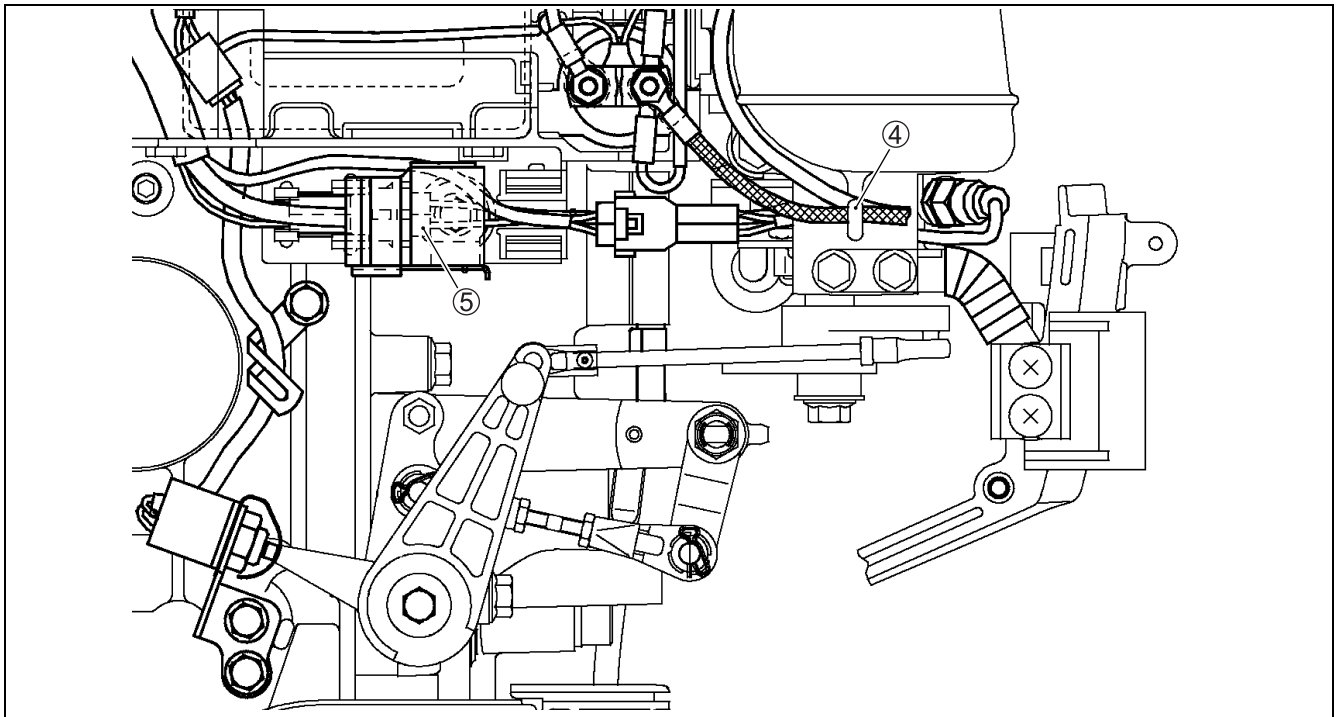
2. Route the following items the cable grommet (A).
Remote control harness (1).
Battery cable (2).
Water pressure / Speedometer pickup tube (3).



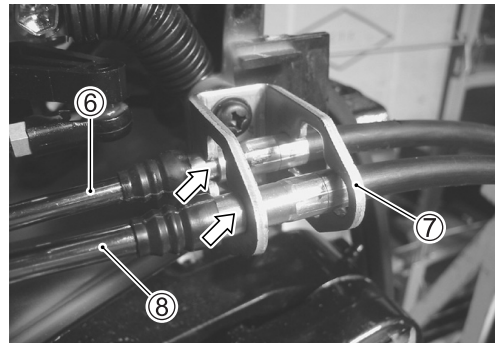
NOTE:

Fit the remote control wiring harness on the cableholder (4) of the silencer case.

3. Connect the remote control wiring harness (5) to the engine side.

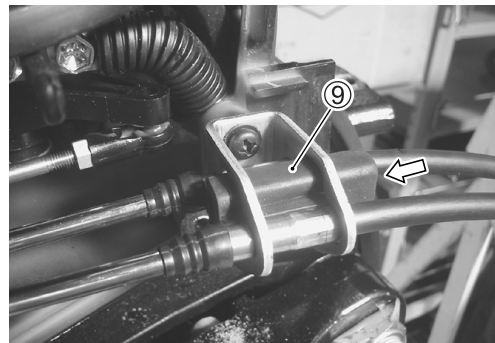


4. Pass the shift cable ⑥ through the cable holder ⑦ and engage the stepped section of the outer cable with U-slot of the holder.
5. Pass the throttle cable ⑧ through the cable holder and engage the stepped section of the outer cable with U-slot of the holder.



6. In the center of the cable holder (between the throttle cable and shift cable), insert the remote control cable stopper ⑨.

The stopper must be inserted in the direction indicated by the arrow (⇐).

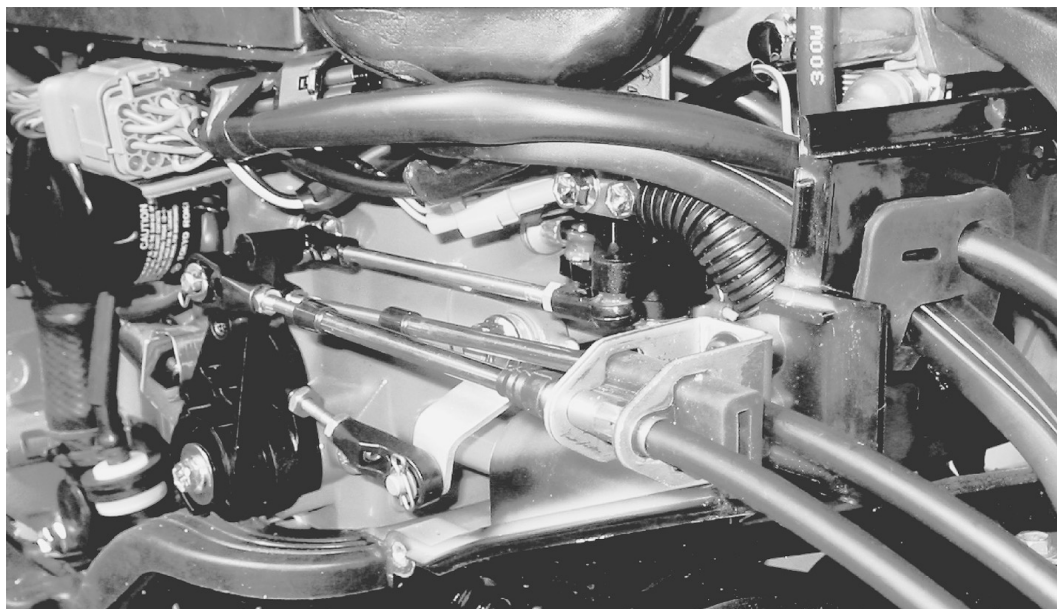
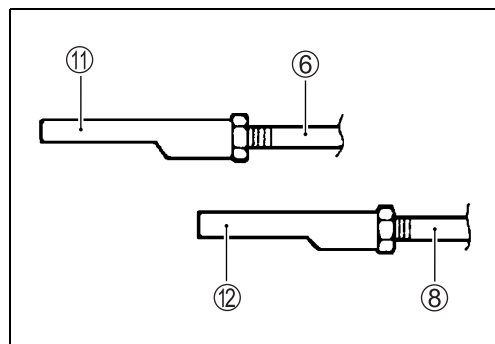


7. Screw the throttle cable connector ⑪ and the shift cable connector ⑫ onto the respective cables.

NOTE:

Each cable connector must be screwed onto the cable by at least.

8. Perform the cable connection and adjustment.



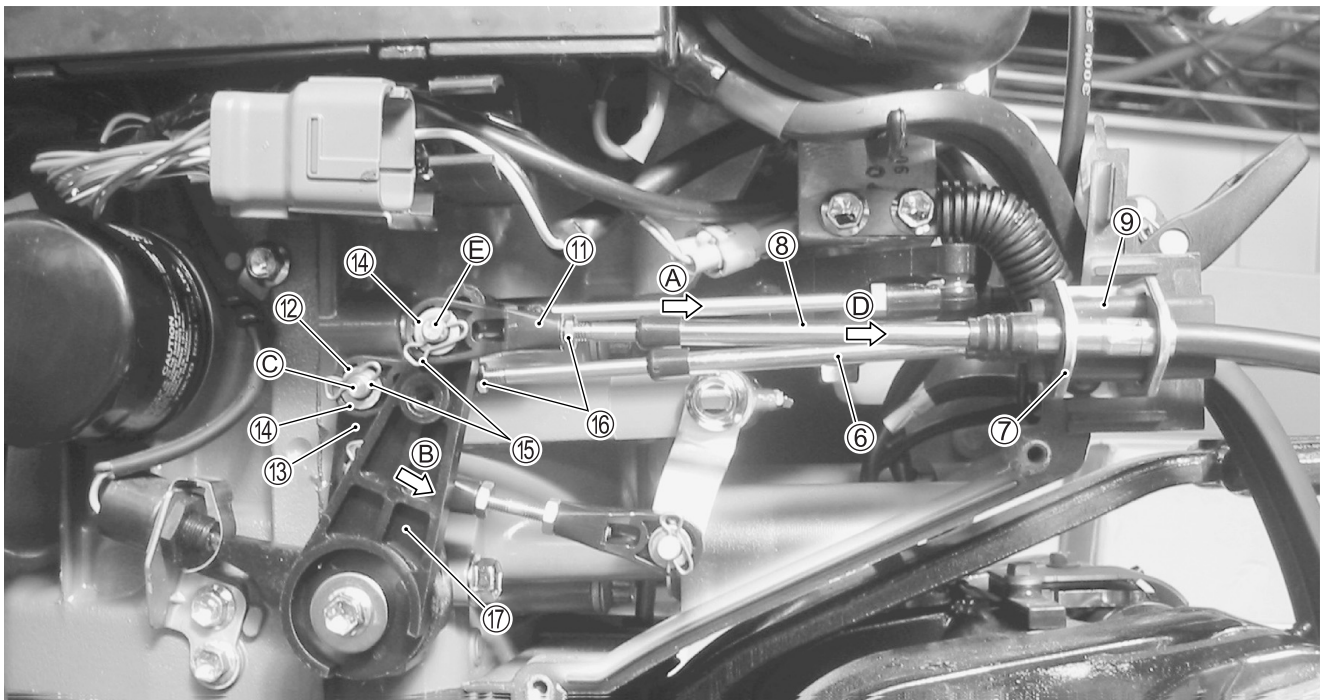
[Shift cable]

- (a) Shift the remote control lever to neutral position.
- (b) Move the clutch control lever ⑬ from reverse to neutral. Repeat this operation several times and then hold the clutch control lever in neutral position.

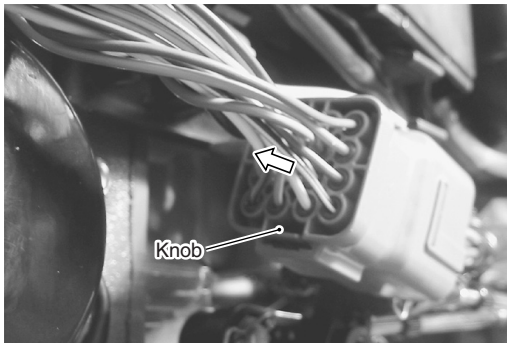
NOTE:

Turn the propeller and check that the clutch is correctly in neutral.

- (c) Push the inner cable of shift cable ⑦ toward arrow A in the illustration (cable holder side) to remove cable play. With the cable held in this position, turn the cable connector ⑫ so that the center of the connector hole aligns with the center of clutch lever pin C.
 - (d) Push the cable connector ⑫ onto the clutch lever pin C so as to engage.
- Fit the washer ⑭ and clip ⑮ to the clutch lever pin.
- Secure the connector by tightening the cable lock nut ⑯ against the cable connector ⑫.

**NOTE:**

Disconnect the connector by pressing the knob and sliding it toward



[Throttle cable]

- (1) Shift the remote control lever to neutral position.
- (2) Push the throttle control arm ⑰ lightly toward arrow ② as indicated to open the throttle fully and hold this position.
- (3) With the inner cable of throttle cable ⑧ pushed in toward the direction of arrow ④ (cable holder side) as illustrated, turn the cable connector ⑪ so as to align the center of cable connector hole with the center of throttle connector pin ⑤.
- (4) Push the cable connector ⑪ onto the connector pin ⑤.
Fit the washer ⑭ and clip ⑮ to the connector pin ⑤.
Secure the connector by tightening the cable lock nut ⑯ against the connector ⑪.

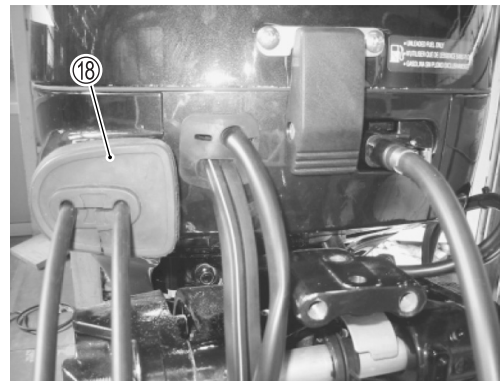
[Inspection]

- (A) Move the remote control lever to forward and reverse and check that the shifting operates properly and the throttle can open fully.
- (B) Check that the throttle closes completely and the clutch shifts into neutral when the remote control lever is returned to neutral position.

CAUTION

- **Screw the cable connector onto the cable by at least 13 mm.**
- **Adjust the throttle cable so that the throttle valve in the throttle body opens fully when the remote control lever is shifted forward and moved to the full throttle position and that the throttle valve closes completely when the lever is returned to neutral.**
- **Check that the throttle valve is closed completely at the time of shifted-in on the engine side when the remote control lever is moved forward and reverse, and also check that the throttle starts to operate when the lever is moved further.**
- **The throttle/shift cables must be adjusted and routed so that they do not interfere with the equipment when the steering is turned all the way to the right and left.**

9. Reinstall the engine lower cover in the original position.
10. Install the remote control cable grommet ⑱ on the front panel.

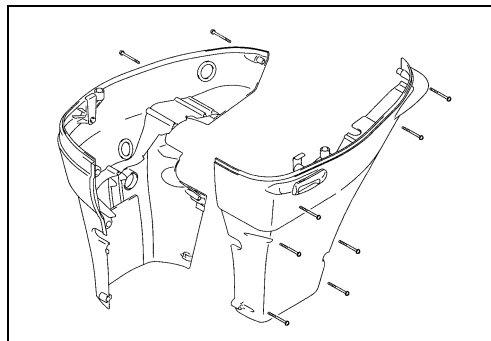


DF90/115/140 CONTROL CABLES AND WIRING HARNESS INSTALLATION

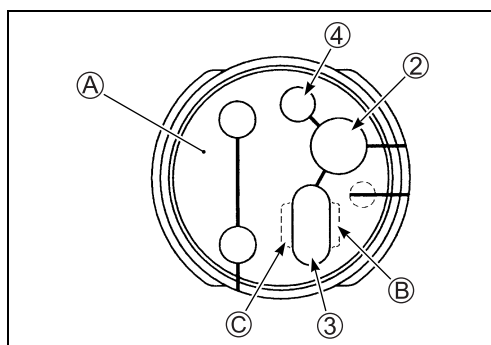
CONNECTING CABLES AND WIRING HARNESSES

[Connecting control wiring harness]

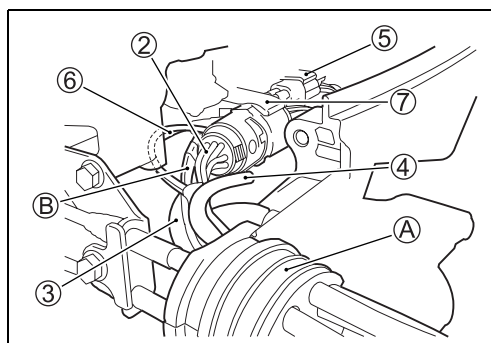
1. Loosen 9 screws and remove the PORT and STBD side lower covers.



2. Pass the control wiring harness ②, monitor gauge wiring harness ③, trim meter wiring harness ④, battery cable ③ and speedometer pick up tube ④ through the cable grommet ① referring to the right illustration.



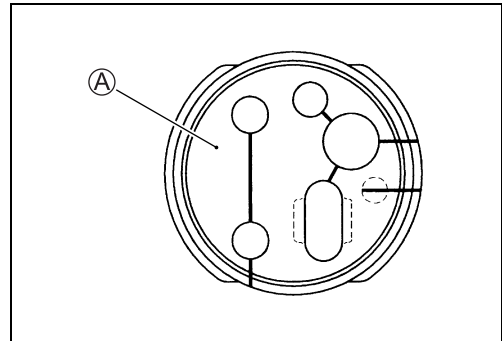
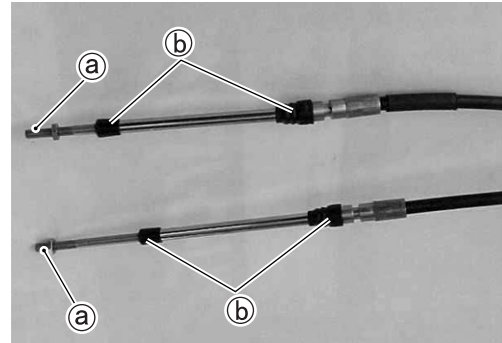
3. Connect the monitor gauge wiring harness ⑤ to the wiring harness connector on the engine side. Push the connector into the holder ⑥.
4. Connect the control wiring harness ② and PTT lead ⑥ to the wiring harness connector on the engine side. Push the connector into the holder ⑦. Route the monitor wiring harness ⑤ and PTT lead ⑥ behind the connector ②.
5. Press the cable grommet ① into the front panel.



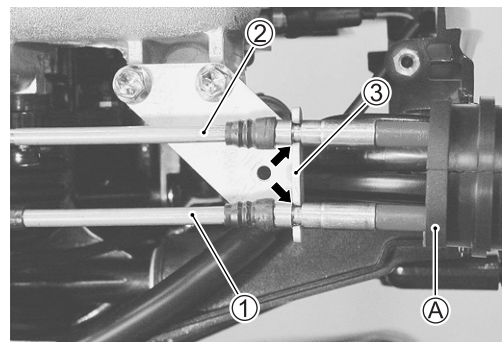
[Connecting shift/throttle cables]

6. Remove the lock nut ① and cable seal ② from the shift cable ③ and throttle cable ④.

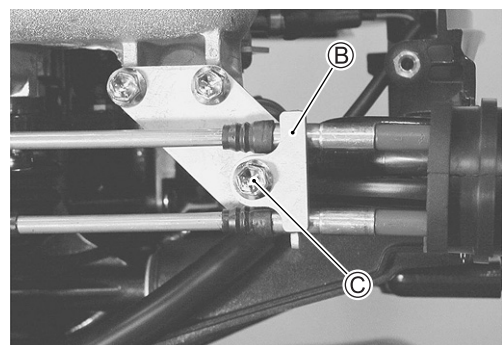
Pass the shift cable ③ and throttle cable ④ through the cable grommet ⑤. Refit the lock nut and cable seal to their original position.



7. Engage the stepped section of the outer cables of shift cable ① and throttle cable ② with U-slot of the throttle cable holder ③.

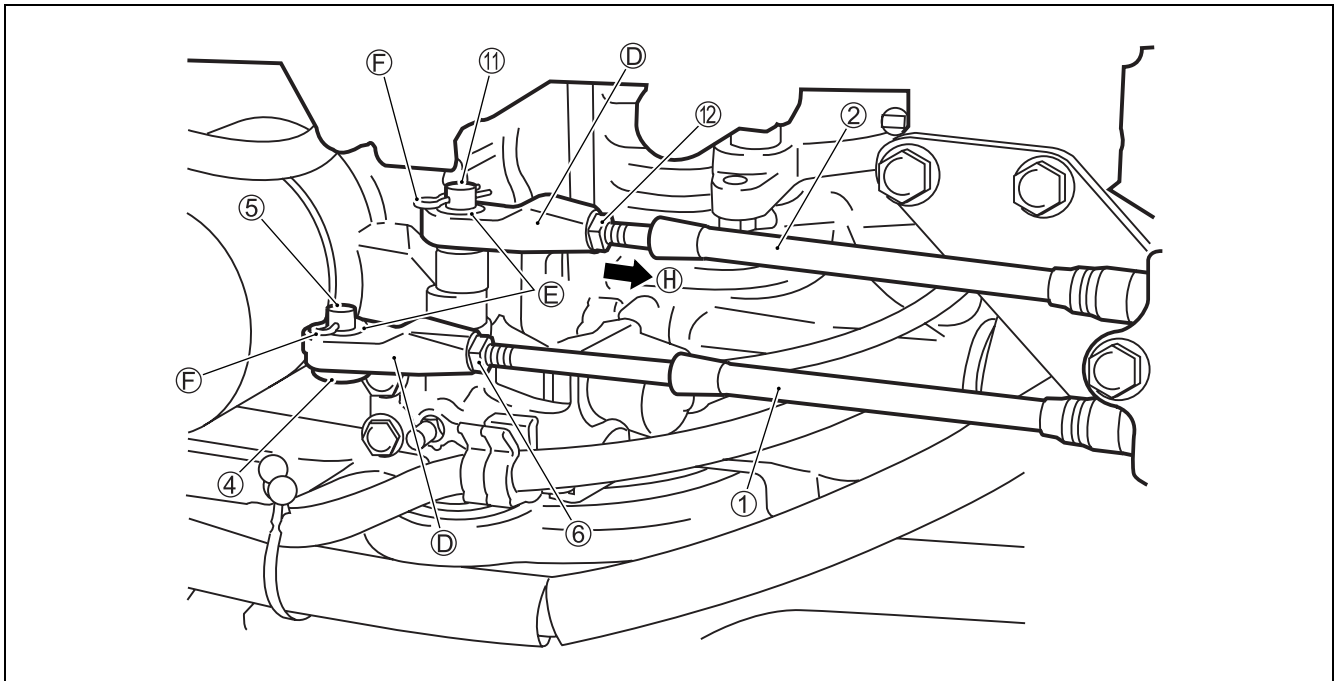


8. Install the cable stopper ④ and tighten the bolt ⑤.
9. Perform the cable connection and adjustment.

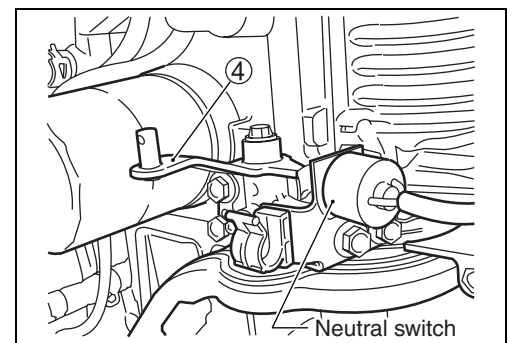


[Shift cable]

- (a) Shift the remote control lever to neutral position.
- (b) Shift the clutch control arm ④ to neutral position.
- (c) Screw the connector ⑩ onto the shift cable ①. Push in the inner cable of shift cable toward arrow ⑨ in the illustration to remove cable play. With the cable held in this position, turn the cable connector so that the center of the connector ⑩ hole aligns with the center of pivot pin ⑤ on the clutch control arm.
- (d) Fit the connector ⑩ to the pivot pin ⑤ with the connector's flat section facing the arm side.
- (e) Fit the washer ⑪ and lock pin ⑫ to the pivot pin.
- (f) Secure the connector by tightening the cable lock nut ⑥ against the cable connector.
- (g) Operate the remote control lever from neutral to forward and reverse and check for angle of the remote control lever inclination at the beginning of clutch engagement, which should be equal for both the forward and reverse.

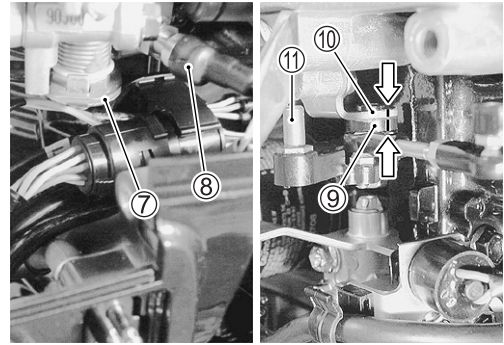
**NOTE:**

Check that the neutral switch is in ON position when the remote control lever is in neutral.



[Throttle cable]

- (1) Shift the remote control lever to neutral.
- (2) Set the throttle lever ⑦ in the completely closed position. Check that the tip of the idle switch ⑧ is pushed in so that the switch is turned ON. At this time, also check that the slit mark on the throttle control arm ⑨ aligns with that on the bracket ⑩.
- (3) Screw the connector ① onto the throttle cable ②. Push in the inner cable of throttle cable toward arrow ④ in the illustration to remove cable play. With the cable held in this position, turn the cable connector so that the center of the connector ① hole aligns with the center of pivot pin ⑪ on the throttle control arm.
- (4) Fit the connector ① to the pivot pin ⑪ with the connector's flat section facing the arm side.
- (5) Fit the washer ③ and lock pin ⑤ to the pivot pin.
- (6) Secure the connector by tightening the cable lock nut ⑫ against the cable connector.

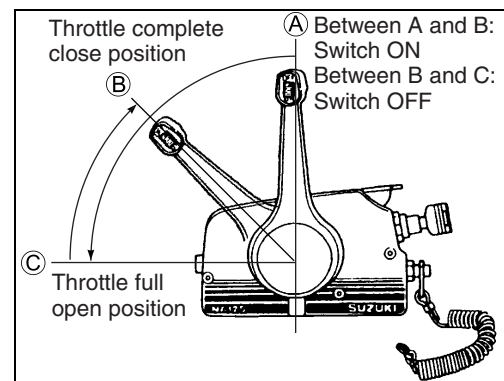
**[Inspection]**

Perform the following inspection to check that both the throttle and shift cables are installed properly.

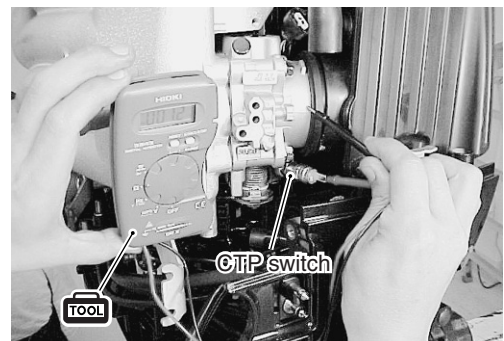
- (A) Move the remote control lever to forward and reverse and check that the shifting operates properly and the throttle can open fully.
- (B) Check that the throttle closes completely and the clutch shifts into neutral when the remote control lever is returned to neutral position.
- (C) Perform the operation check of the idle switch in the following procedure:
 - I. Operate the remote control lever several times so that the throttle opens fully and closes completely.
 - II. Shift the lever to forward and then open the throttle fully. Slowly return the throttle until the throttle valve closes completely.

NOTE:

At this time, the idle switch should be turned ON.



- III. Disconnect the lead wire from the idle switch located on the throttle body.
- IV. Touch the tester probes each to the idle switch terminal and the throttle body.
- V. The tester should show continuity (switch ON) with the remote control lever positioned in step II above.
- VI. If the tester does not show continuity (switch OFF), adjust the length of the connector threaded onto the remote control cable until the switch turns ON. Tighten the cable lock nut against the connector.



CAUTION

The connector must be screwed onto the cable by at least 13 mm.

VII. Return the remote control lever to neutral.

Perform the final check for proper installation of the throttle control cable by carrying out the steps II through V.

VIII. Connect the lead wire to the idle switch.

CAUTION

- **Screw the cable connector onto the cable by at least 13 mm.**
- **Adjust the throttle cable so that the throttle valve in the throttle body opens fully when the remote control lever is shifted forward and moved to the full throttle position and that the throttle valve closes completely when the lever is returned to neutral.**
- **Check that the throttle valve is closed completely at the time of shifted-in on the engine side when the remote control lever is moved forward and reverse, and also check that the throttle starts to operate when the lever is moved further.**
- **The throttle/shift cables must be adjusted and routed so that they do not interfere with the equipment when the steering is turned all the way to the right and left.**

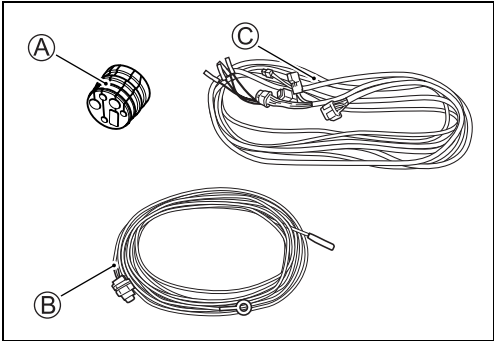
10. Reinstall the engine lower cover in the original position.

DF150/175 CONTROL CABLES AND WIRING HARNESS INSTALLATION

CONNECTING CABLES AND WIRING HARNESSES

[Connecting control wiring harness]
Component parts packed together

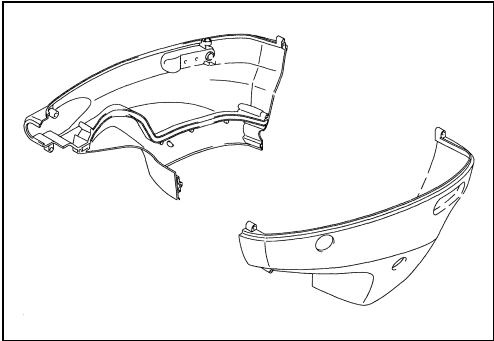
Item		Description	Q'ty
Ⓐ	Grommet	61124-96J00	1
Ⓑ	Battery sub wire (3.7 m)	36625-93J00	1
	Battery sub wire (6.5 m) OPT	36625-93J10	(1)
Ⓒ	Remote control harness (5.0 m) OPT	36620-93J00	(1)
	Remote control harness (3.5 m) OPT	36620-93J50	(1)
	Remote control harness (6.5 m) OPT	36620-93J60	(1)



•Depending on the boat equipment, optional battery sub wire and/or remote control harness are need to be used.

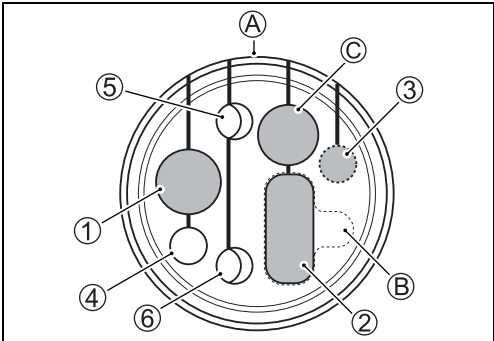
Procedure

1. Loosen the eight (8) bolts, then remove the starboard and port side covers from the outboard motor.



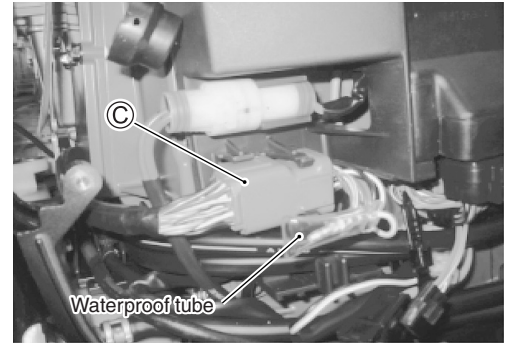
2. Route the following items through the grommet Ⓐ.

- ①Fuel hose
- ②Battery cable
- ③Speed meter pickup tube
- ④Water pressure gauge tube
- ⑤Remote control cable throttle
- ⑥Remote control cable clutch
- ⒷBattery sub wire and Isolator lead wire

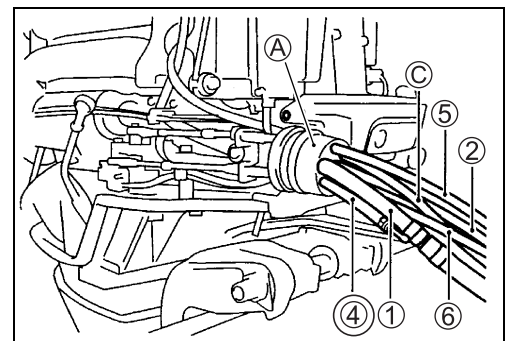


ⒸRemote control harness

3. Connect the remote control harness ③ to the engine side.
4. Cut the waterproof tube .



5. Connect the battery sub wire ② to the engine side.
6. Push the grommet ① into the front panel.

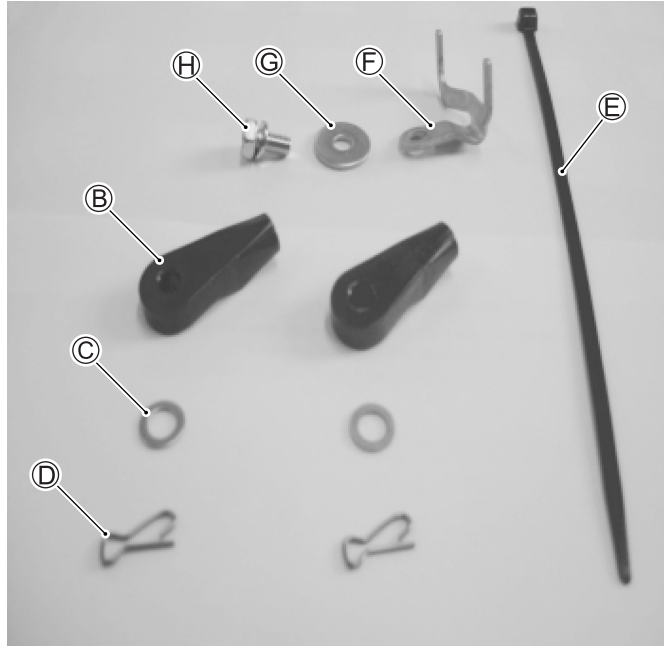


CONTROL CABLES INSTALLATION

Contained parts

Item	Part name	Description	Q'ty
(A)	Remote control box (Side-mount type)	67200-93J00	1
(B)	Cable connector	67467-89J01	2
(C)	Washer	09160-06055	2
(D)	Clip	09385-06012	2
(E)	Band	09407-20405	1
(F)	Stopper, remocon cable	67343-96J00	1
(G)	Washer	09160-06047	1
(H)	Bolt	01570-06127	1

Depending on the model specification, the remote control box is optional.



Required parts

Part name	Part number	Q'ty
Control cable 8ft (2.4 m)	67200-93J00	1
Control cable 10ft (3.1 m)	67467-89J01	2
Control cable 12ft (3.7 m)	09160-06055	2
Control cable 14ft (4.2 m)	09385-06012	2
Control cable 16ft (4.8 m)	09407-20405	1

Part name	Part number	Q'ty
Control cable 18ft (5.4 m)	67320-93J50	2
Control cable 20ft (6.0 m)	67320-93J60	2
Control cable 22ft (6.7 m)	67320-93J70	2
Control cable 24ft (7.3 m)	67320-93J80	2

Choose one item which is matched to the boat in length.

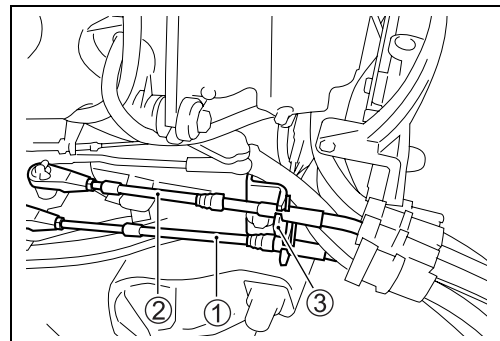
REMOTE CONTROL BOX SIDE

For the procedure to connect the throttle control cable and clutch control cable to the remote control box, refer to the "REMOTE CONTROL BOX SET-UP INSTRUCTION" that supplied with each unit of remote control box.2

ENGINE SIDE

Procedure

- (1) Remove the starboard and port side covers. (See page 5.)
- (2) Install the clutch control cable ① and throttle control cable ② to the grommet.
- (3) Secure the cable ① and ② in the cable holder ③ by fitting groove on the cable into a slot on the holder.

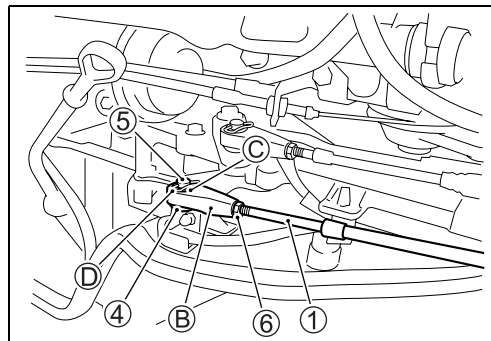
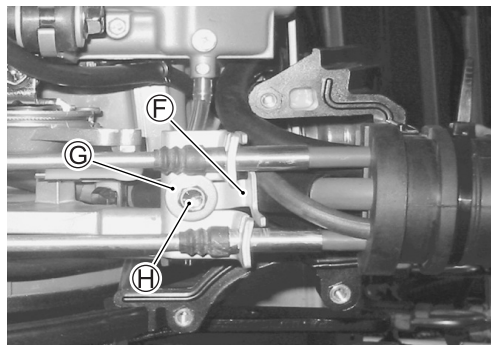


Install the stopper remote cable (F) using the washer (G) and bolt (H) to secure the shift cable and throttle cable.

- (4) Position the remote control handle into "NEUTRAL".

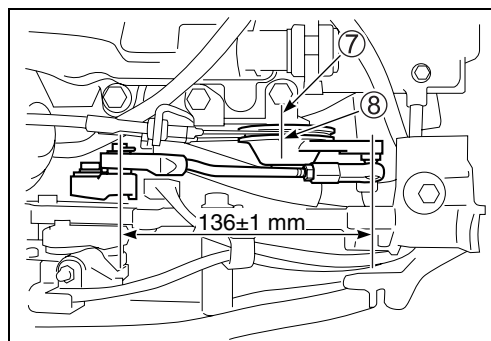
— Clutch control cable —

- (5) Make sure that the clutch control arm (4) is in the neutral position.
- (6) Thread the connector (B) onto the clutch control cable (1) until the connector hole aligns with the pivot pin (5) on the clutch control arm (4).
- (7) Set the connector (B) onto the pivot pin (5) with the flat side of connector towards the arm.
- (8) Install the washer (C) and clip (D), then tighten the lock nut (6).
- (9) Make sure that both forward and reverse gear can be engaged with the same angle of remote control handle travel from "NEUTRAL" position.

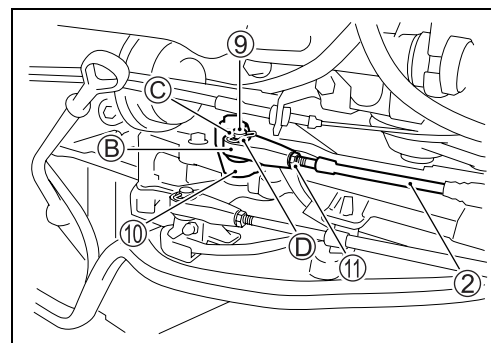


— Throttle control cable —

- (10) Check the throttle rod length, in-between both end pivot pin centers, is 136 ± 1 mm, when the throttle lever (10) (see page 7) is fully closed.
And, the allow mark (7) on throttle cable bracket and the allow mark (8) on throttle drum should be aligned.



- (11) While pulling the throttle control inner cable outside, thread the connector (B) onto the throttle control cable (2) until the connector hole aligns with the pivot pin (9) on the throttle control arm (10).
- (12) Set the connector (B) onto the pivot pin (9) with the flat side of connector towards the arm.
- (13) Install the washer (C) and clip (D), then tighten the lock nut (11).



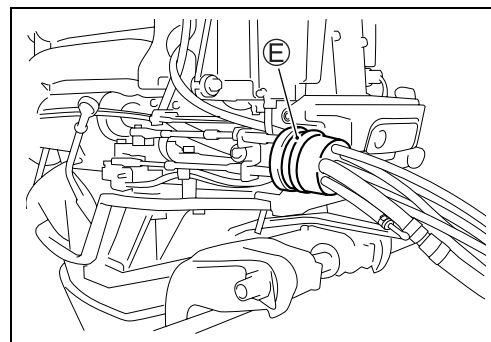
- (14) Tighten the grommet by the band (E) and cut off the excess.

CAUTION

Cable must be threaded at least 13 mm (0.51 in) onto cable.

NOTE:

After assembly, make sure that the cables are not stretched or otherwise stressed when the outboard motor is turned all the way to the right and left.



DF200/225/250 CONTROL CABLES AND WIRING HARNESS INSTALLATION

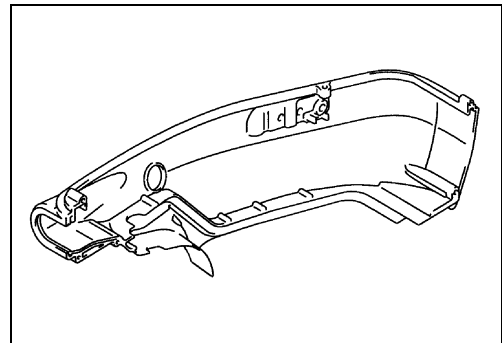
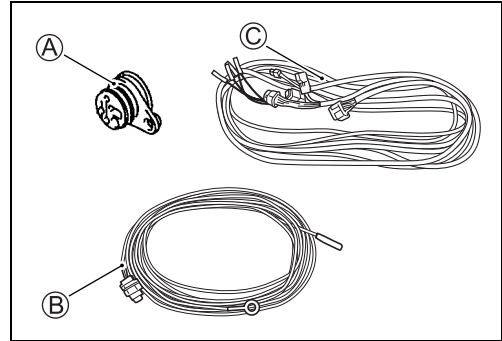
CONNECTING CABLES AND WIRING HARNESSES

[Connecting control wiring harness]

Component parts packed together

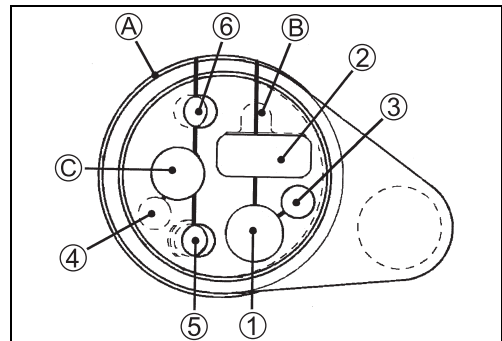
Item	Description	Q'ty
(A)	Grommet	1
(B)	Sub-battery cable	1
(C)	Remote control wiring harness	1

1. Remove five bolts and detach the STBD side cover.

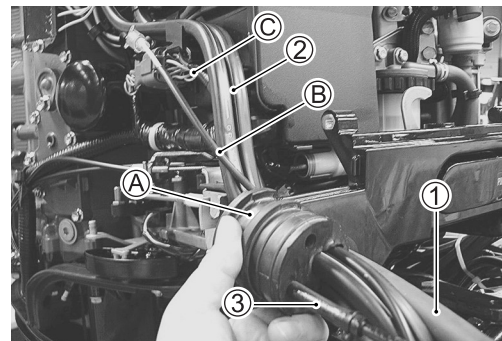


2. Pass the following parts through the grommet (A).

- Fuel hose ①
- Sub-battery cable (B)
- Battery cable ②
- Remote control wiring harness (C)
- Speedometer pickup tube ③
- Water pressure gauge ④
- Shift cable ⑤
- Throttle cable ⑥



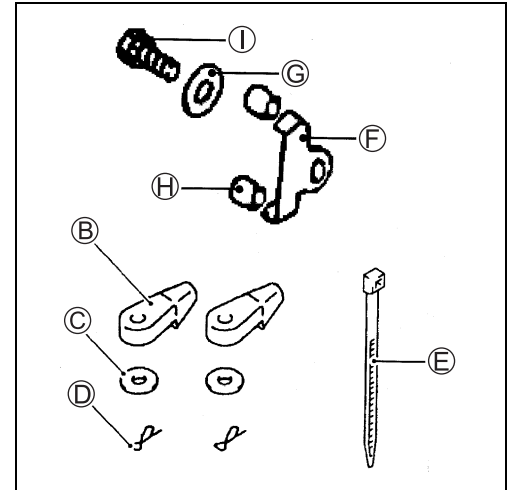
3. Connect the remote control wiring harness (C) to the engine side wiring harness connector and push the connector into the holder ①.
4. Connect the sub-battery cable to the engine side wiring harness.
5. Fit the grommet (A) to the front panel.



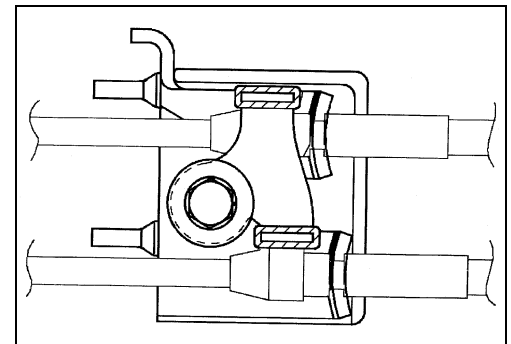
[Connecting shift/throttle cables]

Component parts packed together

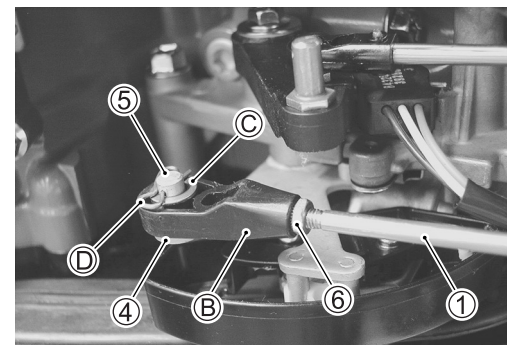
Item	Description	Q'ty
(A)	Remote control box (side mount type)	1
(B)	Cable connector	2
(C)	Washer	2
(D)	Lock pin	2
(E)	Tie strap	1
(F)	Stopper, remocon cable	1
(G)	Washer	1
(H)	Cushion, R/con cable stopper	2
(I)	Bolt	1



1. Remove the STBD side cover.
2. Pass the shift cable ① and throttle cable ② through the grommet.
3. As shown in the photo, engage the stepped section of outer cable of the shift cable ① and throttle cable ② with U-slot of the throttle cable holder ③.
Install the stopper remocon cable F using the washer G and bolt I of secure the shift cable and throttle cable.
4. Shift the remote control lever to neutral.
5. Connect and adjust the cables.

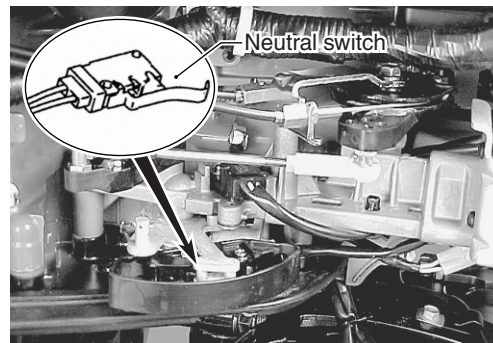
**[Shift cable]**

- (a) Shift the clutch control arm to neutral position.
- (b) Screw the connector (B) onto the shift cable (1). Push the inner cable of shift cable all the way in and then pull out a half of the length of cable play. With the cable held in this position, turn the cable connector (B) so that the center of the connector (B) hole aligns with the center of pivot pin (5) on the clutch control arm.
- (c) Fit the connector (B) to the pivot pin (5) with the connector's flat section facing the arm side.
- (d) Fit the washer (C) and lock pin (D). Secure the connector by tightening the cable lock nut (6) against the connector.
- (e) While turning the propeller, operate the remote control lever from neutral to forward and reverse and check for angle of the remote control lever inclination at the beginning of clutch engagement, which should be equal for both the forward and reverse.

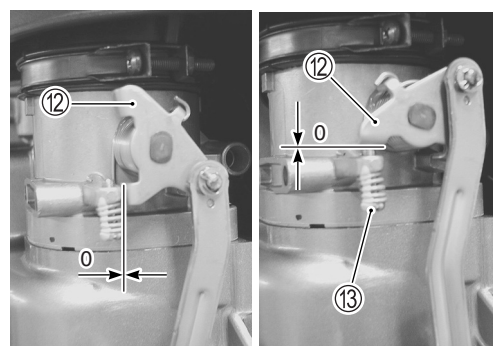
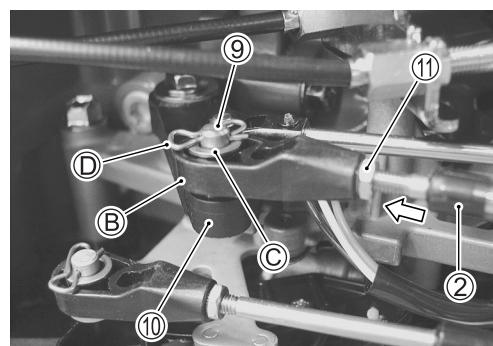
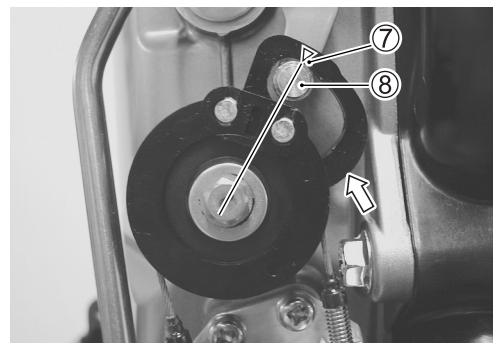


NOTE:

Check that the neutral switch is in ON position when the remote control lever is in neutral.

**[Throttle cable]**

- (1) Shift the remote control lever to neutral.
- (2) Operate the throttle control arm to have the arrow mark (▼) align with the center of roller ⑧ and hold this position.
- (3) Screw the connector ⑥ onto the throttle cable ②. With the inner cable of the throttle cable pulled all the way out, turn the connector ⑥ so that the center of the connector hole aligns with the center of pivot pin ⑨ on the throttle control arm ⑩.
- (4) Fit the connector ⑥ to the pivot pin ⑨ with the connector's flat section facing the arm side.
- (5) Fit the washer ③ and lock pin ④ to the pivot pin.
- (6) Secure the connector by tightening the cable lock nut ⑪ against the connector.
- (7) Check that the throttle lever ⑫ comes to the full open position when the remote control lever is moved to the full open position.
- (8) When the remote control lever is in completely closed position, check that the throttle lever ⑫ contacts the tip of the throttle stop screw ⑬.

**NOTE:**

Do not attempt to adjust the throttle valve opening such as by turning the throttle stop screw ⑬.

[Inspection]

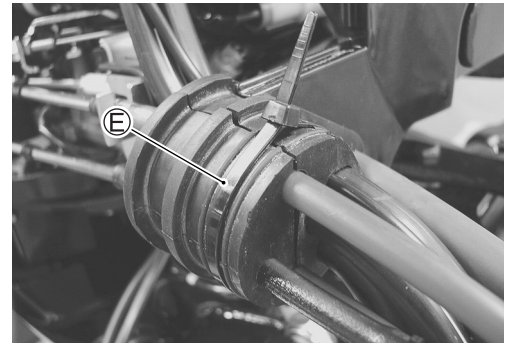
Perform the following inspection to check that both the throttle and shift cables are installed properly.

- Check that the clutch on the engine can shift into forward and reverse and the throttle can open fully when the remote control lever is operated respectively forward and reverse.
- Check that the clutch on the engine shifts into neutral and the throttle closes completely when the remote control lever is returned to neutral.

CAUTION

- **Screw the cable connector onto the cable by at least 13 mm.**
- **Adjust the throttle cable so that the throttle valve in the throttle body opens fully when the remote control lever is shifted forward and then moved to the full throttle position. Also check that the throttle valve closes completely when the lever is returned to neutral.**
- **Check that the throttle valve is closed completely at the time of shifted-in on the engine side when the remote control lever is moved either forward or reverse, and also check that the throttle starts to operate when the lever is moved further.**
- **The throttle/shift cables must be adjusted and routed so that they do not interfere with the equipment when the steering is turned all the way to the right and left.**

6. Tie the grommet ⑤ with the tie strap.



DRAG LINK

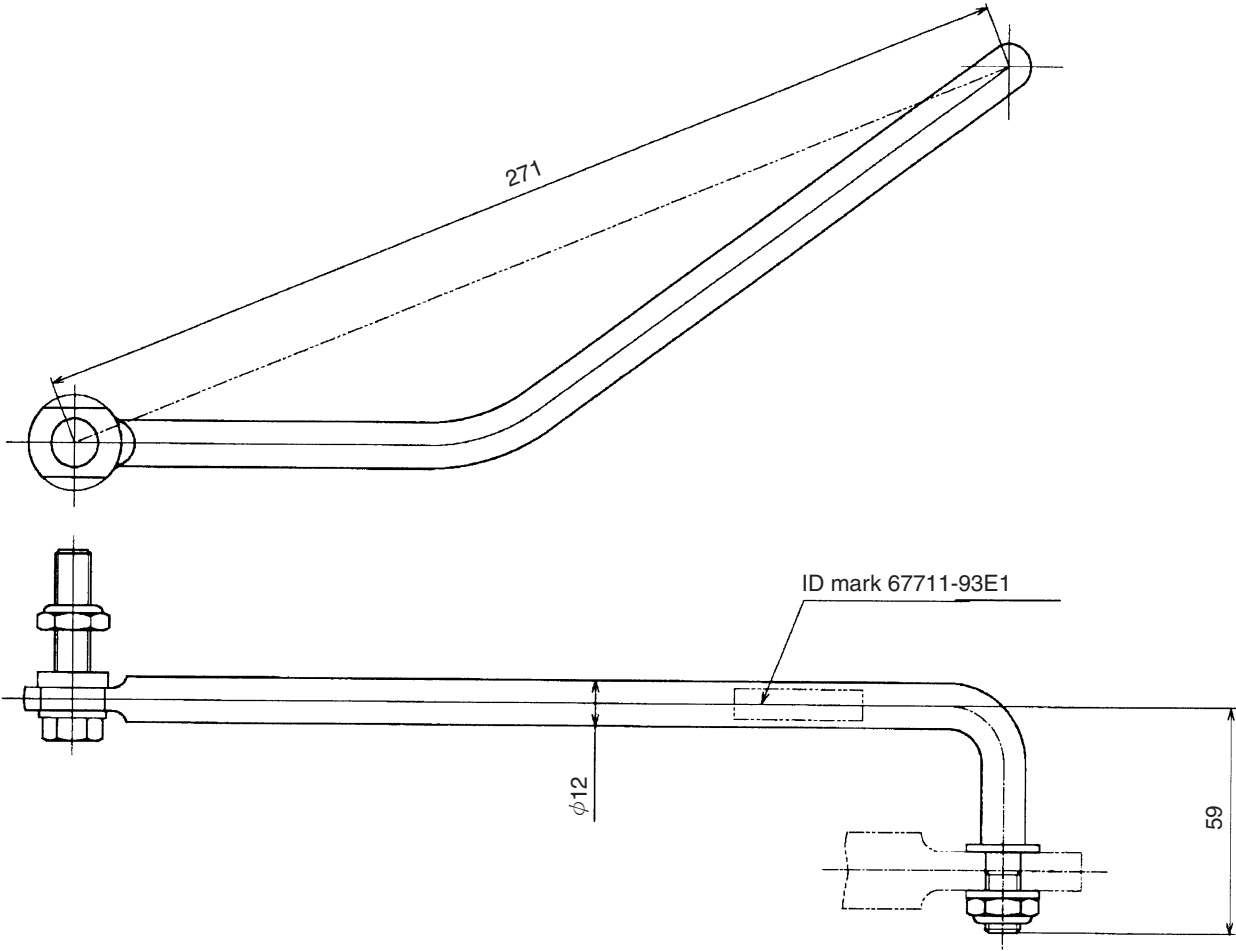
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DRAG LINK KIT

Applicable model	Part number	Part name
DF9.9/15	67701-93E12	Drag link kit
DF25-V2	67701-95J00	Drag link kit
DF25/30	67701-89J20	Drag link kit
DF40/50 DF60/70 DF200/225/250	67701-87J11	Drag link kit
DF90/115/140	67701-90J00	Drag link kit
DF150/175	67701-96J00	Drag link kit

DF9.9/15 67701-93E12



DF9.9/15 DRAG LINK INSTALLATION

⚠ WARNING

If the drag link and related parts are not installed correctly the steering system may bind, causing the operator to lose steering control of the boat.

NOTE:

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

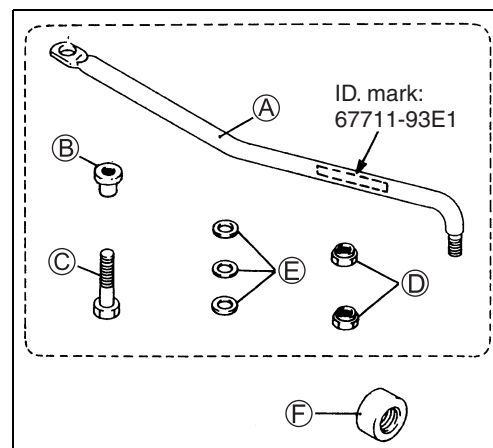
- Single cable
- Starboard cable entry into the motor tilt tube.
- Steering cable meeting the current American Boat and Yacht Council's Safety standard (P-17).

Contained parts (Remote control model)

Item	Part number	Part name	Q'ty
	67701-93E12	Drag link kit	
(A)	• Not available separately	• Drag link	1
(B)	• 67721-93E10	• Spacer	1
(C)	• 67725-99E10	• Bolt	1
(D)	• 67726-99E00	• Safety nut	2
(E)	• 67728-99E00	• Washer	3
(F)	41161-94400	Steering cable seal	1

CAUTION

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

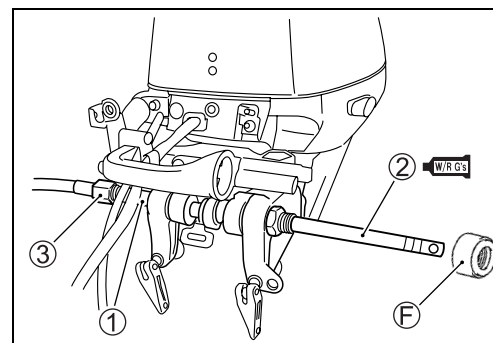


Procedure

1. Thread the steering cable seal (F) onto the port side end of the motor tilt tube (1).
2. Apply SUZUKI WATER RESISTANT GREASE 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.

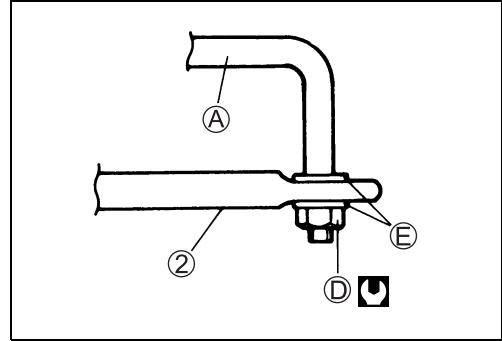
NOTE:

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 safety nut (D) as shown. Tighten the nut (D) to the specified torque, then BACK THE NUT OFF 1/8 TURN.

 **Safety nut (D): 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

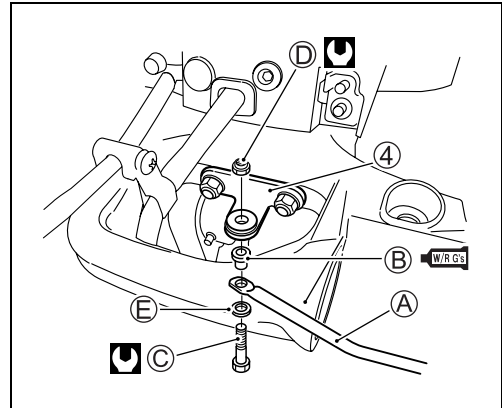


5. Move the steering cable until the hole of drag link (A) aligns with the thread hole on the attachment (4).
6. Connect the drag link to the attachment (4) by tightening the bolt (C) with the spacer (B) and washer (E) as shown.

 **Bolt (C): 34 N·m (3.4 kgf-m, 24.5 lb-ft)**

7. Tighten the safety nut (D).

 **Safety nut (D): 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

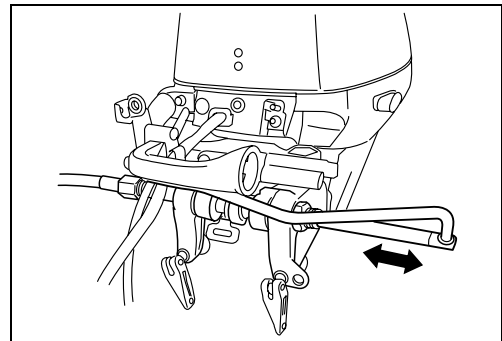


NOTE:

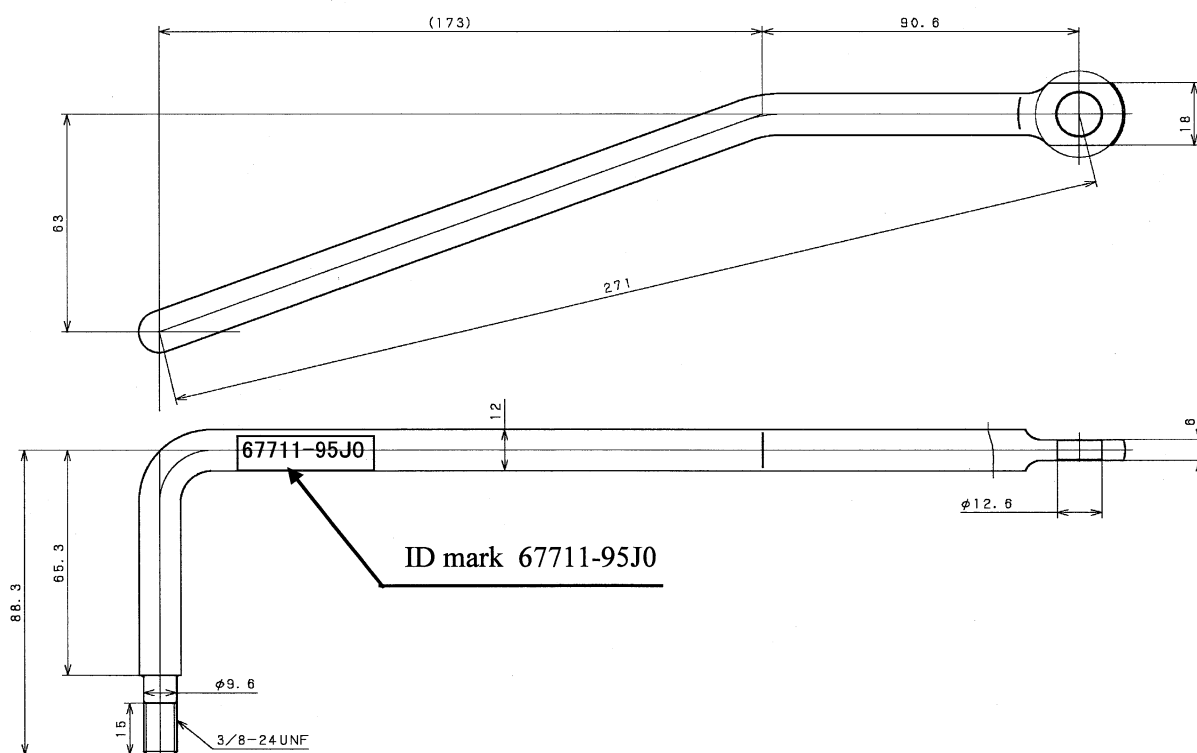
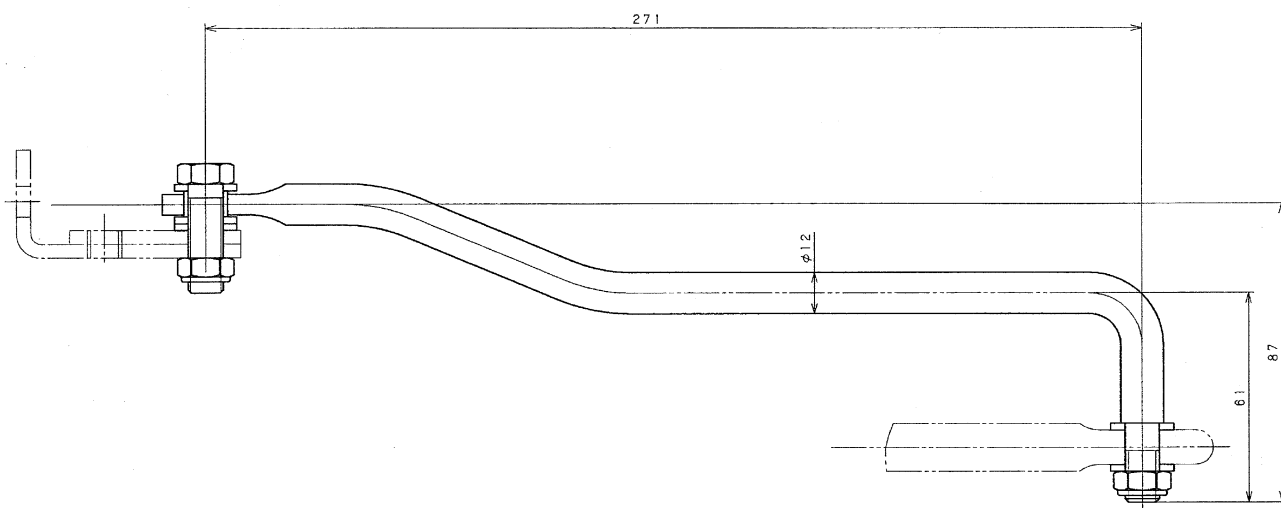
After assembly, check for smooth and free steering operation by turning the steering all the way to the right and left.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.



DF25-V2 67701-95J00



DF25-V2 DRAG LINK INSTALLATION

⚠ WARNING

If the drag link and related parts are not installed correctly the steering system may bind, causing the operator to lose steering control of the boat.

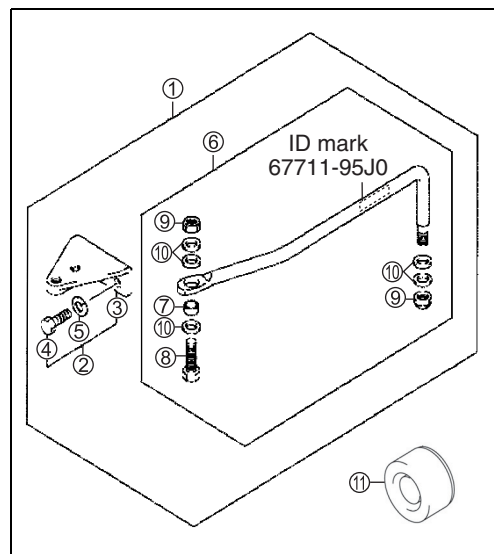
NOTE:

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).

Contained parts (Remote control model)

Item	Part name	Part number	Q'ty
①	67700-95J00	Drag link set	1
②	67100-95J00	• Steering bracket attachment set	1
③	43755-95J00	• Steering bracket attachment	1
④	09100-10270	• Bolt (10 x 25)	2
⑤	09162-10005	• Lock washer (10.2 x 18.4 x 2.5)	2
⑥	67701-95J00	• Drag link assy	1
	• Not available separately	• Drag link	(1)
⑦	67721-89J00	• Drag link Spacer	1
⑧	67725-959J00	• Bolt	1
⑨	67726-99E00	• Self-lock nut	2
⑩	67728-99EJ00	• Washer	5
⑪	41161-94400	Steering cable seal	1



CAUTION

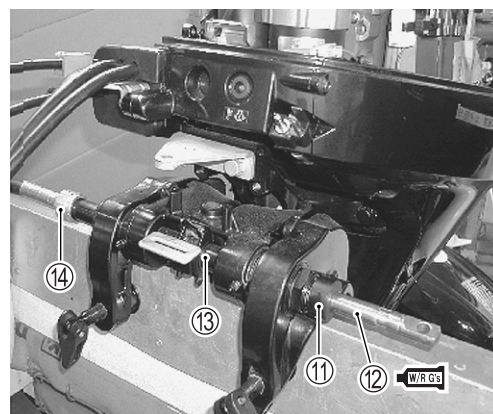
Never reuse the safety nut ⑨ after it have been threaded into position and torqued.

Procedure

1. Thread the steering cable seal ⑪ onto the port side end of the motor tilt tube ⑬.
2. Apply SUZUKI WATER RESISTANT GREASE to the steering cable ⑫.
3. Insert the steering cable ⑫ into the clamp bracket shaft ⑬ from the starboard side, then tighten the cable retaining nut ⑭ to the torque specified the steering cable manufacturer.

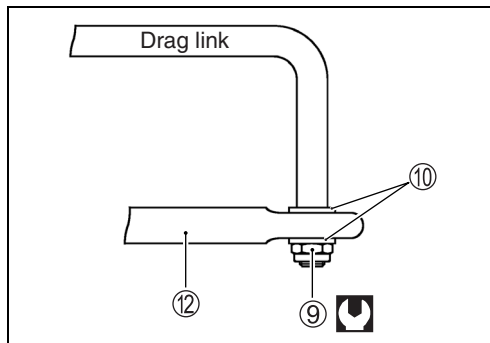
NOTE:

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 to the steering cable end ⑫ with washers ⑩ and self-lock nut ⑨ as shown. Tighten the self-lock nut ⑨ to the specified torque, then BACK THE SELF LOCK NUT OFF 1/8 TURN.

 **Self-lock nut ⑨ : 10 N·m (1.0 kg-m, 7.0 lb-ft)**

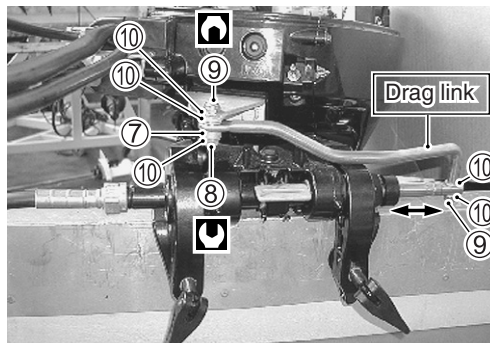


- 5) Move the steering cable until the hole of drag link aligns with the front tapped hole on the steering bracket ③.
- (6) Connect the drag link to the steering bracket ③ by tightening bolt ⑧ with the spacer ⑦ and washers ⑩ as shown.

 **Bolt ⑧ : 34 N·m (3.4 kg-m, 24.5 lb-ft)**

- (7) Tighten the self-lock nut ⑨.

 **Self-lock nut ⑨ : 34 N·m (3.4 kg-m, 24.5 lb-ft)**

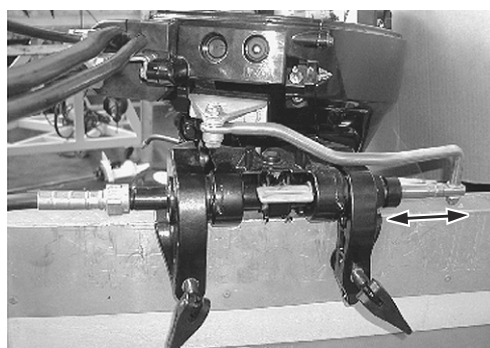


NOTE:

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

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.

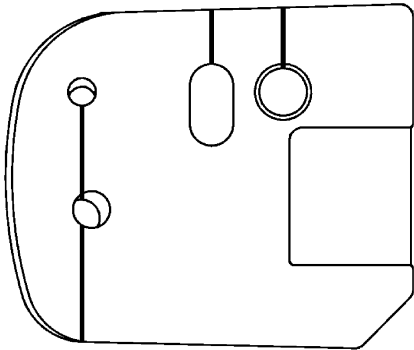


Reference

Three types of cable grommet are available for models of remote control and tiller handle with/without elec-
tric start.

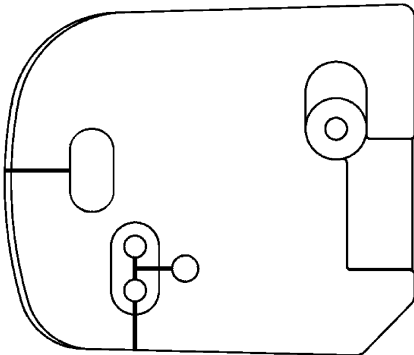
Item	Part number	Part name	Q'ty
Ⓐ	61124-95J20	Remote control	
Ⓑ	61124-95J20	Tiller handle with electric starter	1
Ⓒ	67721-94520	Tiller handle with recoil starter	1

Ⓐ



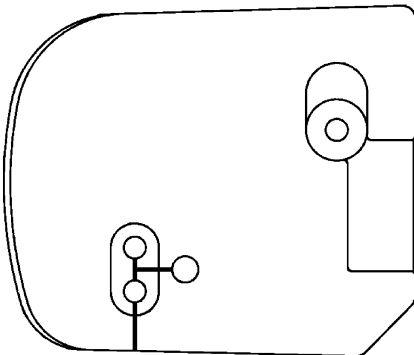
Remote control model

Ⓑ

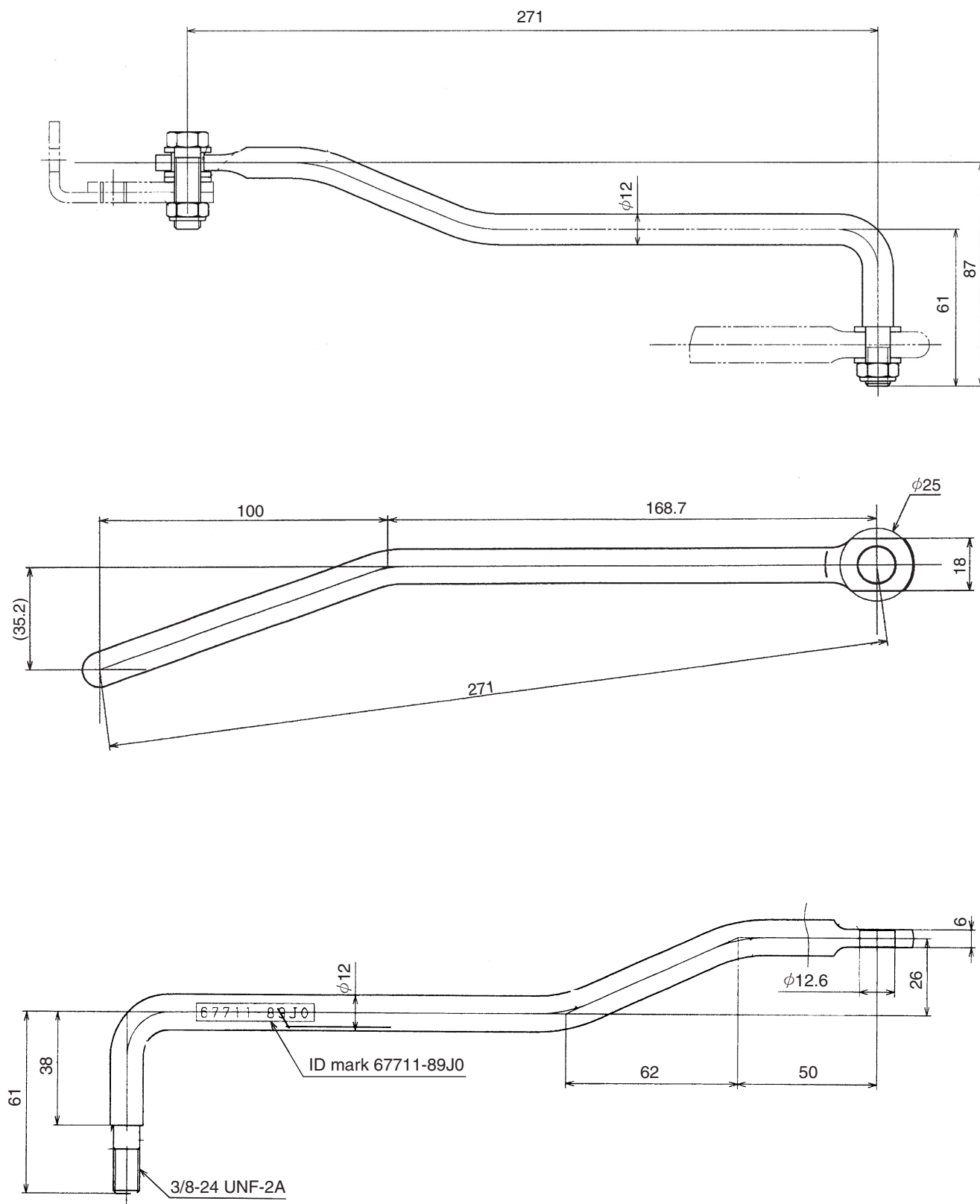


Tiller handle with electric starter model

Ⓒ



Tiller handle with recoil starter model



DF25/30 DRAG LINK INSTALLATION

⚠ WARNING

If the drag link and related parts are not installed correctly the steering system may bind, causing the operator to lose steering control of the boat.

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.
- ESteering cable meeting the current American Boat and Yacht Council's Safety standard (P-17).

Contained parts (Remote control model)

Item	Part number	Part name	Q'ty
	67701-89J00	Drag link kit	
Ⓐ	• Not available separately	• Drag link	1
Ⓑ	• 67721-94520	• Spacer	1
Ⓒ	• 67725-93E00	• Bolt	1
Ⓓ	• 67726-94500	• Safety nut	2
Ⓔ	• 67728-94501	• Washer	5
Ⓕ	41161-94400	Steering cable seal	1

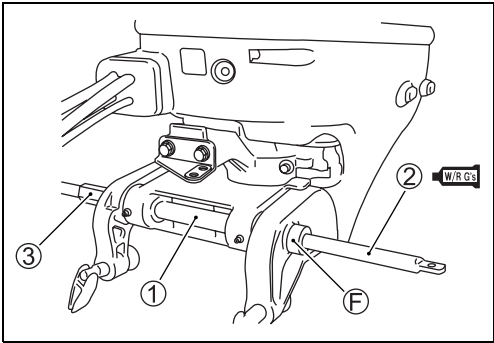
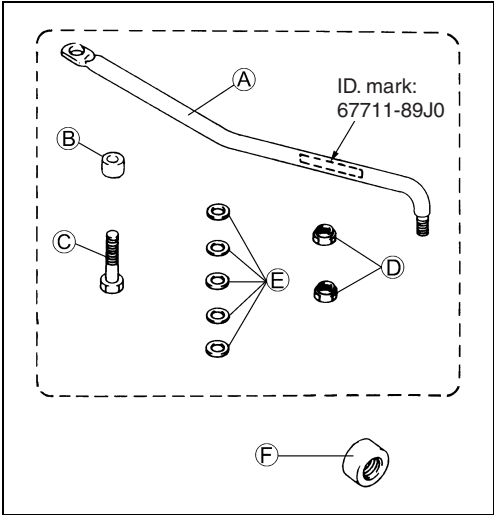
CAUTION

Never reuse the safety nut Ⓓ after it have been threaded into position and torqued.

Procedure

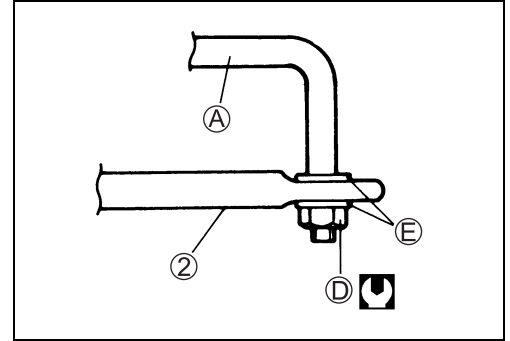
1. Thread the steering cable seal Ⓕ onto the port side end of the motor tilt tube ①.
2. Apply SUZUKI WATER RESISTANT GREASE to the steering cable ②.
3. Insert the cable ② into the tube ① from the starboard side, then tighten the cable retaining nut ③ to the torque specified by the cable manufacturer.

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 safety nut (D) as shown. Tighten the nut (D) to the specified torque, then BACK THE NUT OFF 1/8 TURN.

 **Safety nut (D): 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

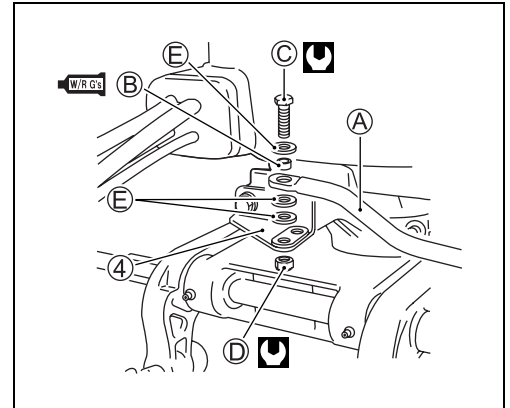


5. Move the steering cable until the hole of drag link (A) aligns with the front thread hole on the steering bracket (4).
6. Connect the drag link to the steering bracket (4) by tightening the bolt (C) with the spacer (B) and washers (E) as shown.

 **Bolt (C): 34 N·m (3.4 kgf-m, 24.5 lb-ft)**

7. Tighten the safety nut (D).

 **Safety nut (D): 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

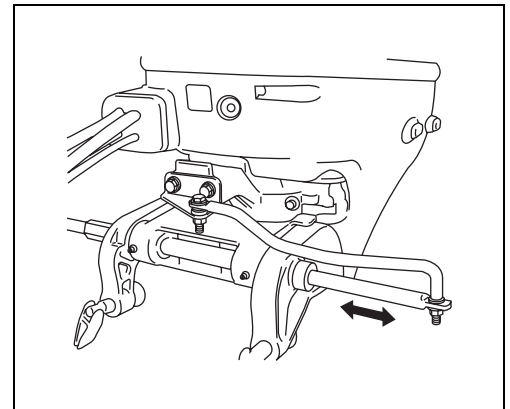


NOTE:

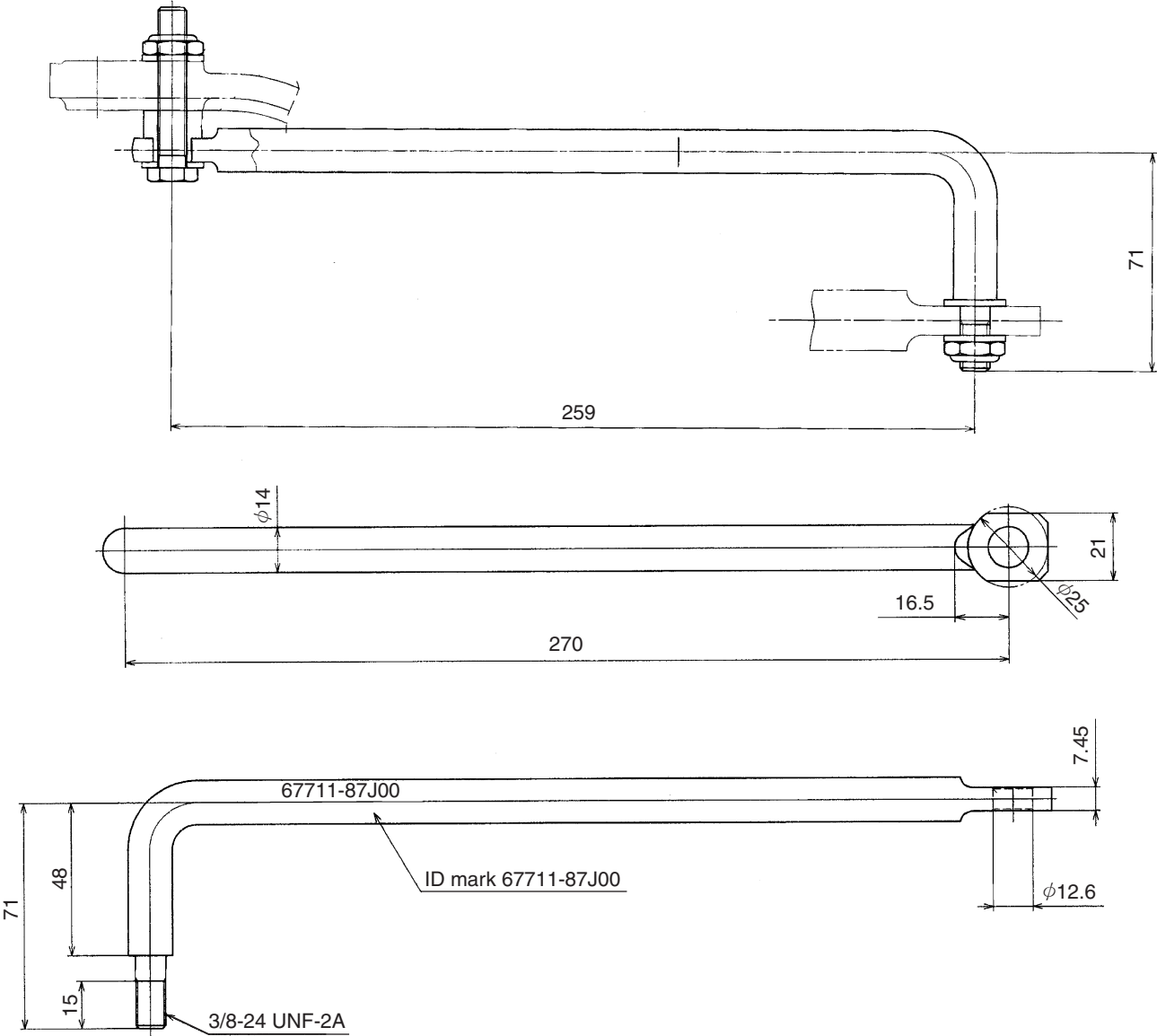
After assembly, check for smooth and free steering operation by turning the steering all the way to the right and left.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.



DF40/50, DF60/70, DF200/225/250 67701-87J11



DF40/50, DF60/70, DF200/225/250 DRAG LINK INSTALLATION

⚠ WARNING

If the drag link and related parts are not installed correctly the steering system may bind, causing the operator to lose steering control of the boat.

NOTE:

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

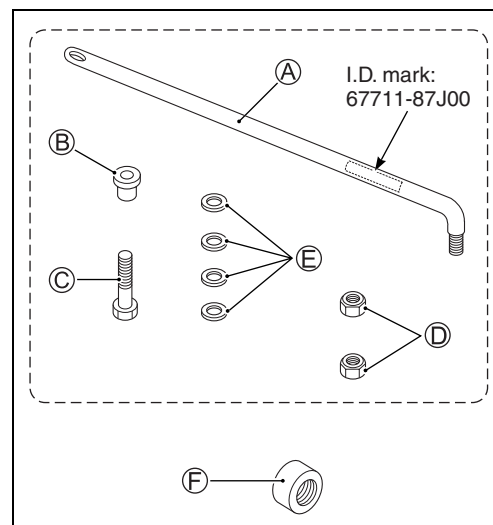
- Single cable
- Starboard cable entry into the motor tilt tube.
- Steering cable meeting the current American Boat and Yacht Council's Safety standard (P-17).

Contained parts

Item	Part number	Part name	Q'ty
(A)	67701-87J11	Drag link kit	
(A)	• Not available separately	• Drag link	1
(B)	• 67721-99E00	• Spacer	1
(C)	• 67725-99E00	• Bolt	1
(D)	• 67726-99E00	• Safety nut	2
(E)	• 67728-99E00	• Washer	4
(F)	41161-94400	Steering cable seal	1

CAUTION

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

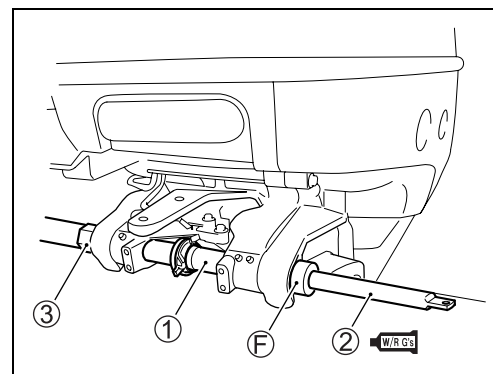


Procedure

1. Thread the steering cable seal (F) onto the port side end of the motor tilt tube (1).
2. Apply SUZUKI WATER RESISTANT GREASE 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.

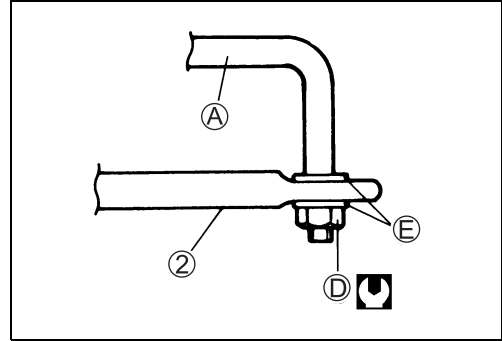
NOTE:

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 safety nut (D) as shown. Tighten the nut (D) to the specified torque, then BACK THE NUT OFF 1/8 TURN.

 **Safety nut (D) : 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

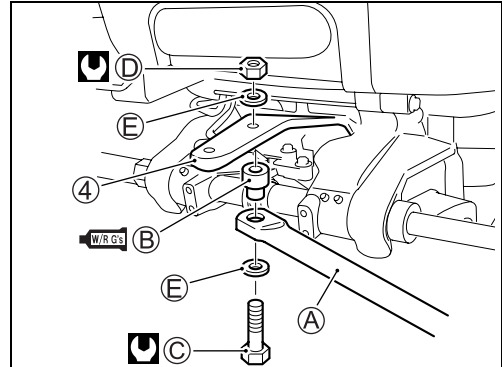


5. Move the steering cable until the hole of drag link (A) aligns with the rear thread hole on the steering bracket (4).
 6. Connect the drag link to the steering bracket (4) by tightening the bolt (C) with the spacer (B) and washers (E) as shown.

 **Bolt (C) : 34 N·m (3.4 kgf-m, 24.5 lb-ft)**

7. Tighten the safety nut (D) with the washer (E).

 **Safety nut (D) : 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

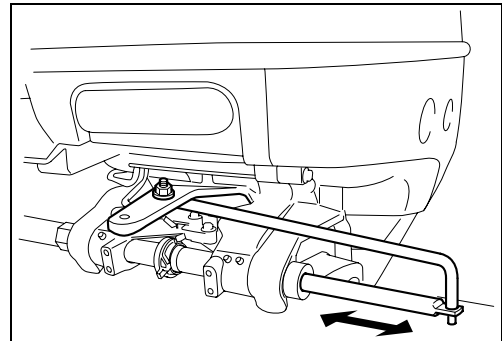


NOTE:

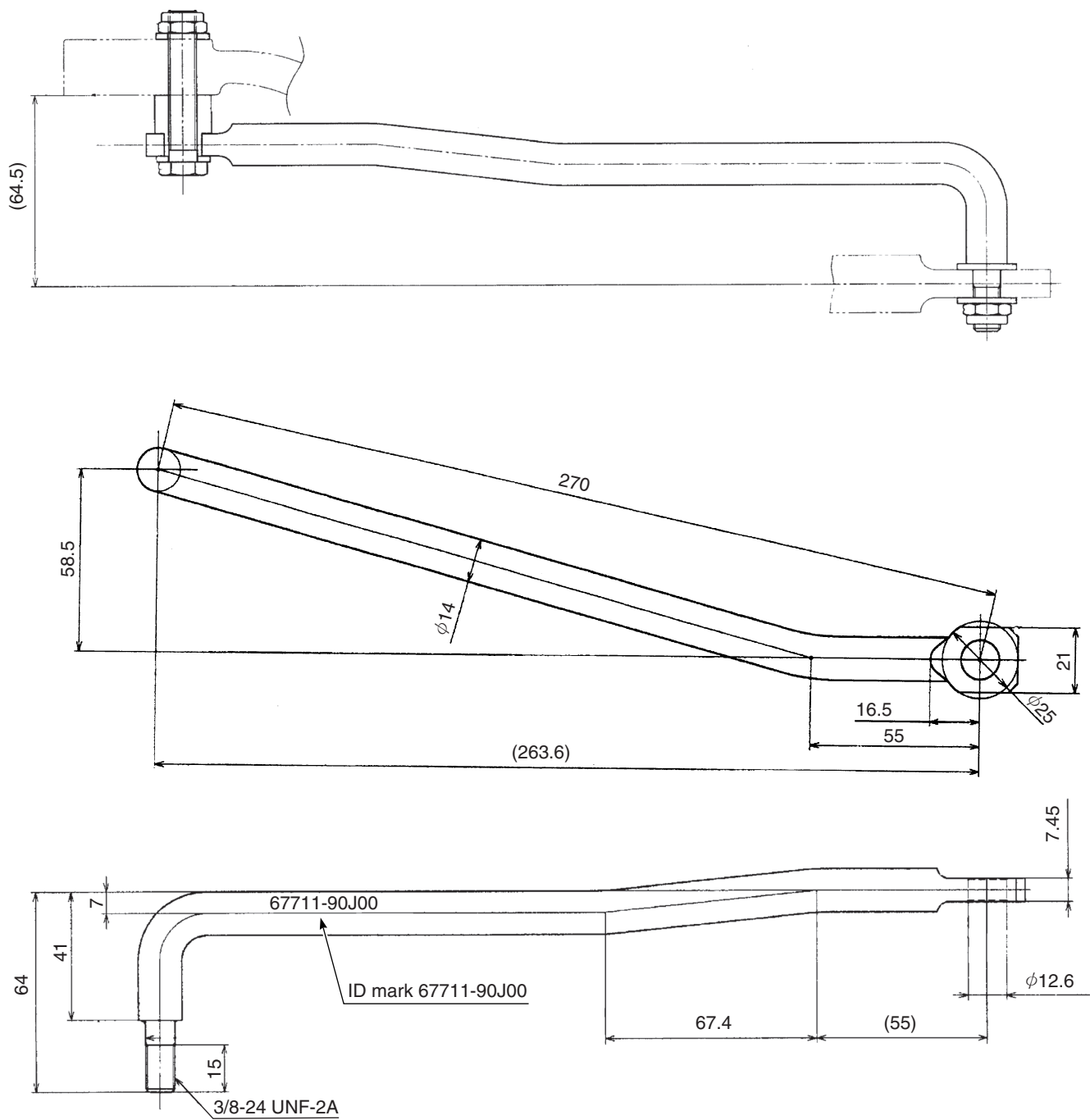
After assembly, check for smooth and free steering operation by turning the steering all the way to the right and left.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.



DF90/115/140 67701-90J00



DF90/115/140 DRAG LINK INSTALLATION

⚠ WARNING

If the drag link and related parts are not installed correctly the steering system may bind, causing the operator to lose steering control of the boat.

NOTE:

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

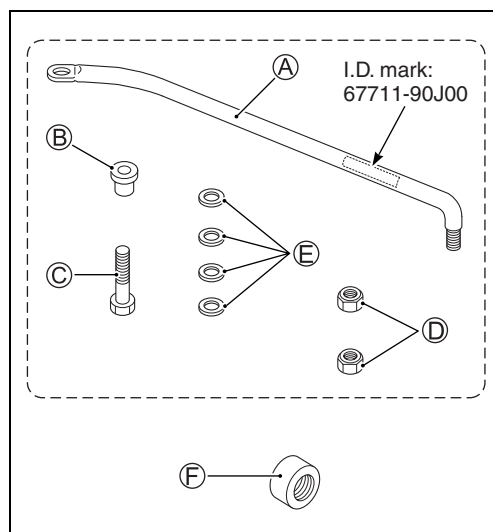
- Single cable
- Starboard cable entry into the motor tilt tube.
- Steering cable meeting the current American Boat and Yacht Council's Safety standard (P-17).

Contained parts

Item	Part number	Part name	Q'ty
	67701-90J00	Drag link kit	
Ⓐ	• Not available separately	• Drag link	1
Ⓑ	• 67721-99E00	• Spacer	1
Ⓒ	• 67725-99E00	• Bolt	1
Ⓓ	• 67726-99E00	• Safety nut	2
Ⓔ	• 67728-99E00	• Washer	4
Ⓕ	41161-94400	Steering cable seal	1

CAUTION

Never reuse the safety nut Ⓓ after it have been threaded into position and torqued.

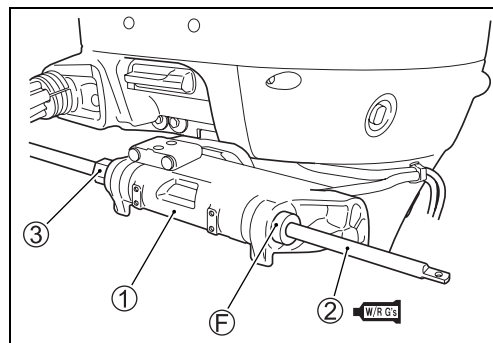


Procedure

1. Thread the steering cable seal Ⓕ onto the port side end of the motor tilt tube ①.
2. Apply SUZUKI WATER RESISTANT GREASE 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.

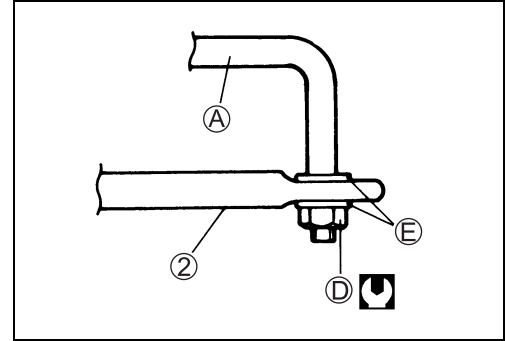
NOTE:

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 safety nut (D) as shown. Tighten the nut (D) to the specified torque, then BACK THE NUT OFF 1/8 TURN.

 **Safety nut (D) : 10 N·m (1.0 kg-m, 7.0 lb-ft)**

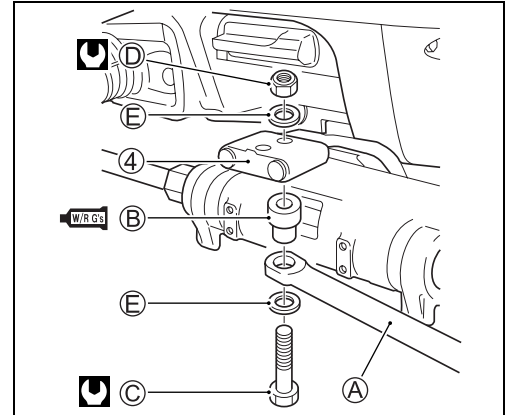


5. Move the steering cable until the hole of drag link (A) aligns with the rear thread hole on the steering bracket (4).
6. Connect the drag link to the steering bracket (4) by tightening the bolt (C) with the spacer (B) and washers (E) as shown.

 **Bolt (C) : 34 N·m (3.4 kg-m, 24.5 lb-ft)**

7. Tighten the safety nut (D) with the washer (E).

 **Safety nut (D) : 10 N·m (1.0 kg-m, 7.0 lb-ft)**

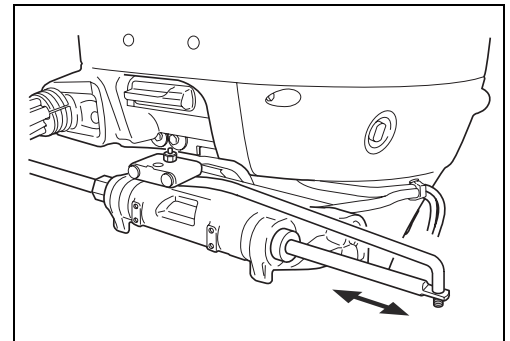


NOTE:

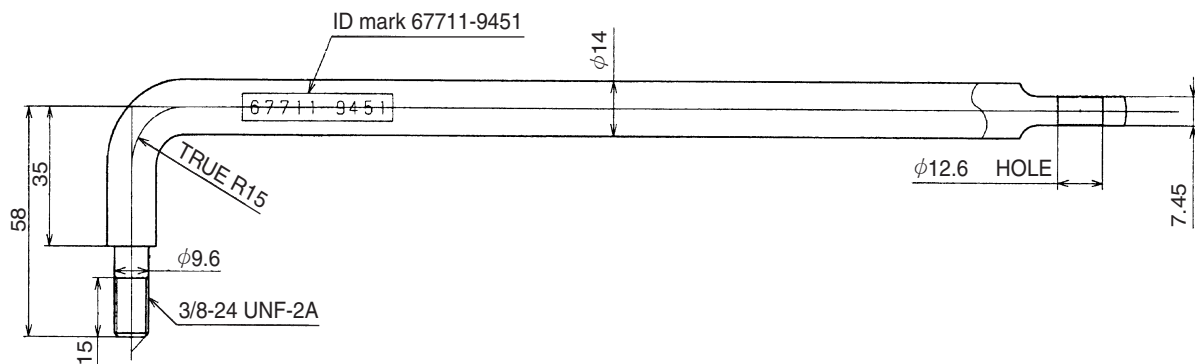
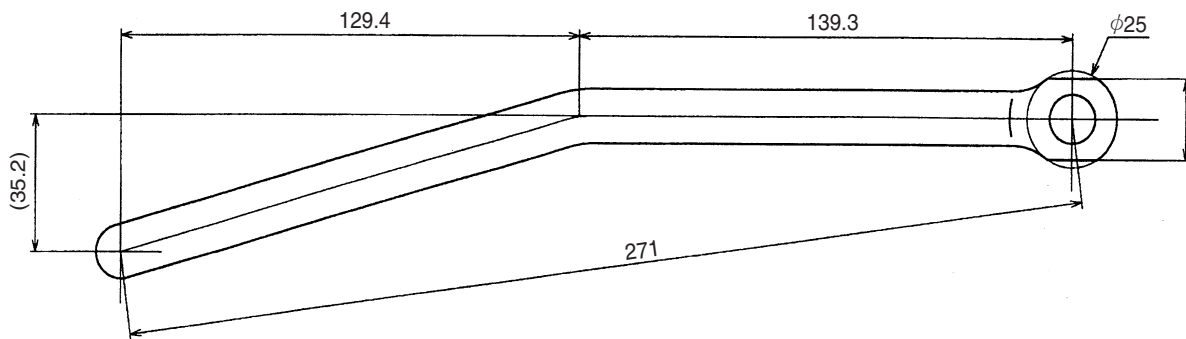
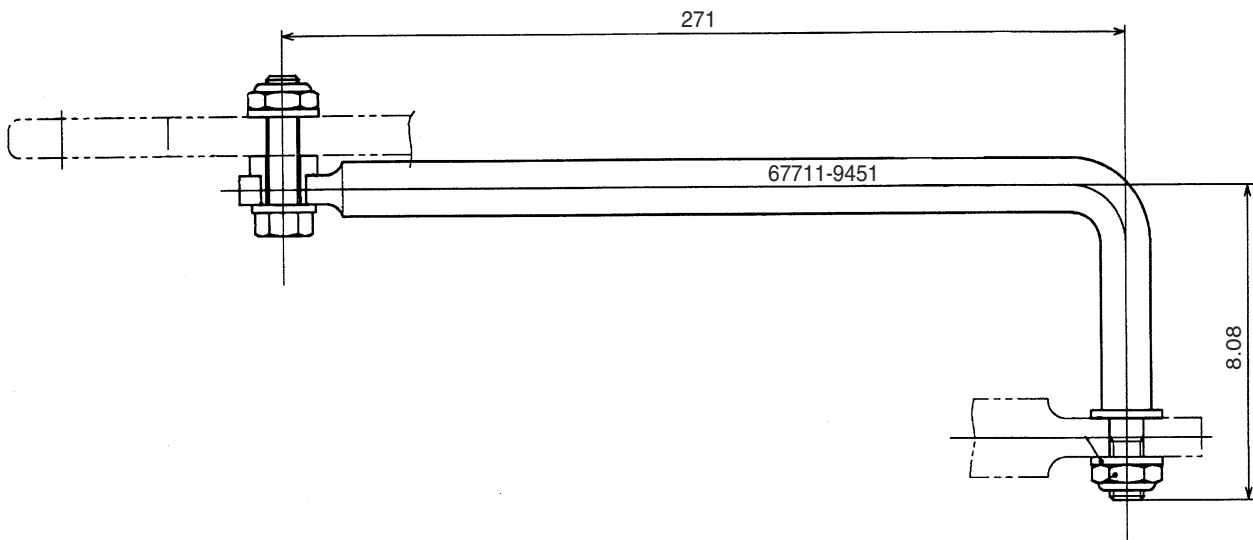
After assembly, check for smooth and free steering operation by turning the steering all the way to the right and left.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.



DF150/175 67701-96J00



DF150/175 DRAG LINK INSTALLATION

⚠ WARNING

If the drag link and related parts are not installed correctly the steering system may bind, causing the operator to lose steering control of the boat.

NOTE:

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

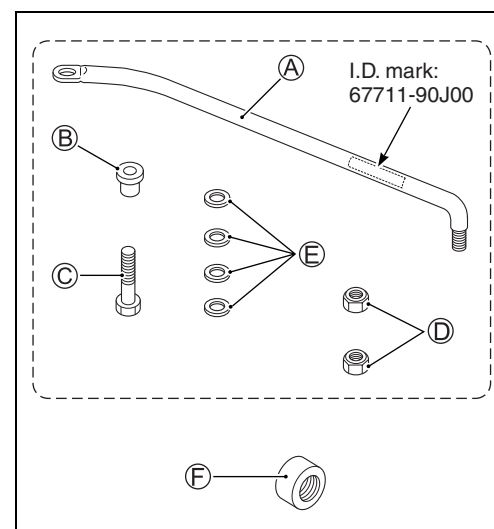
- Single cable
- Starboard cable entry into the clamp bracket shaft.
- Steering cable meeting the current American Boat and Yacht Council's Safety standard (P-17).

Contained parts

Item	Part number	Part name	Q'ty
(A)	67701-90J00	Drag link assy	1
(B)	• Not available separately	• Drag link	1
(B)	• 67721-96J00	• Spacer	1
(C)	• 67725-96J00	• Bolt	1
(D)	• 67726-99E00	• Safety nut	2
(E)	• 67728-99E00	• Washer	4
(F)	41161-94400	Steering cable seal	1

CAUTION

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

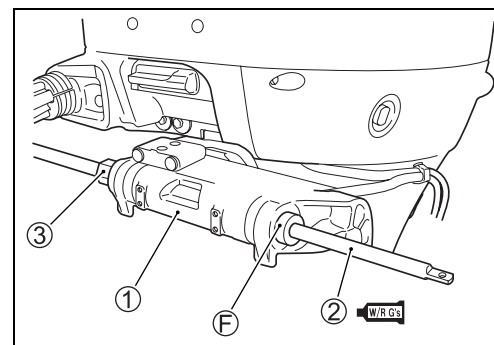


Procedure

1. Thread the steering cable seal (F) onto the port side end of the clamp bracket shaft (1).
2. Apply SUZUKI WATER RESISTANT GREASE 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.

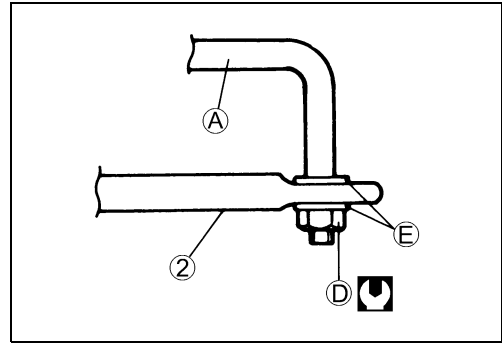
NOTE:

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 safety nut **D** as shown. Tighten the nut **D** to the specified torque, then BACK THE NUT OFF 1/8 TURN.

 **Safety nut **D** : 10 N·m (1.0 kg-m, 7.0 lb-ft)**

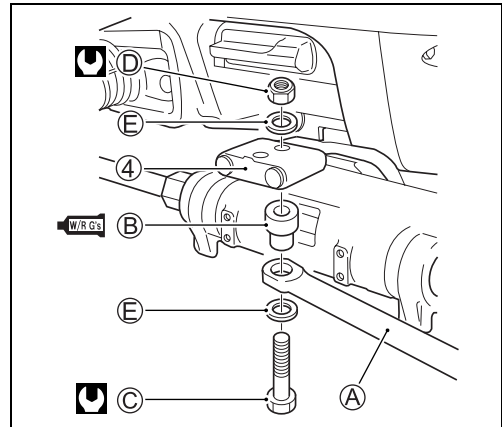


5. Move the steering cable until the hole of drag link **A** aligns with the rear thread hole on the steering bracket **4**.
 6. Connect the drag link to the steering bracket **4** by tightening the bolt **C** with the spacer **B** and washers **E** as shown.

 **Bolt **C** : 34 N·m (3.4 kg-m, 24.5 lb-ft)**

7. Tighten the safety nut **D** with the washer **E**.

 **Safety nut **D** : 34 N·m (3.4 kg-m, 24.5 lb-ft)**

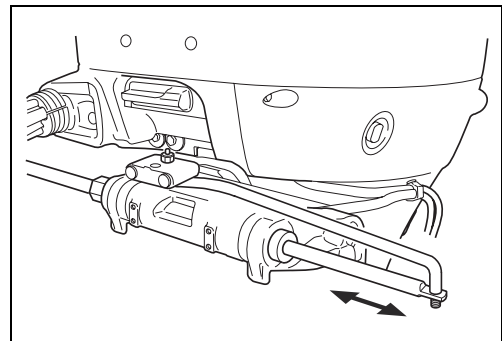


NOTE:

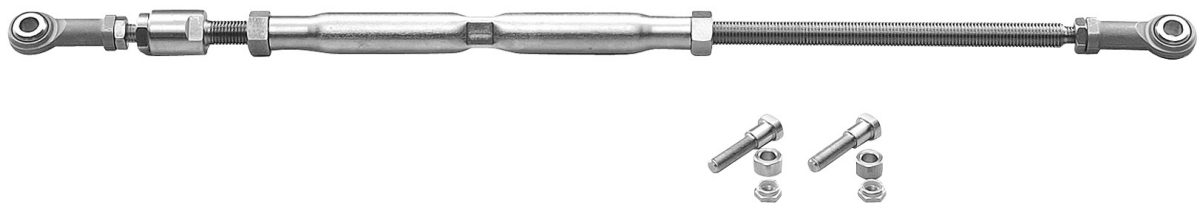
After assembly, check for smooth and free steering operation by turning the steering all the way to the right and left.

CAUTION

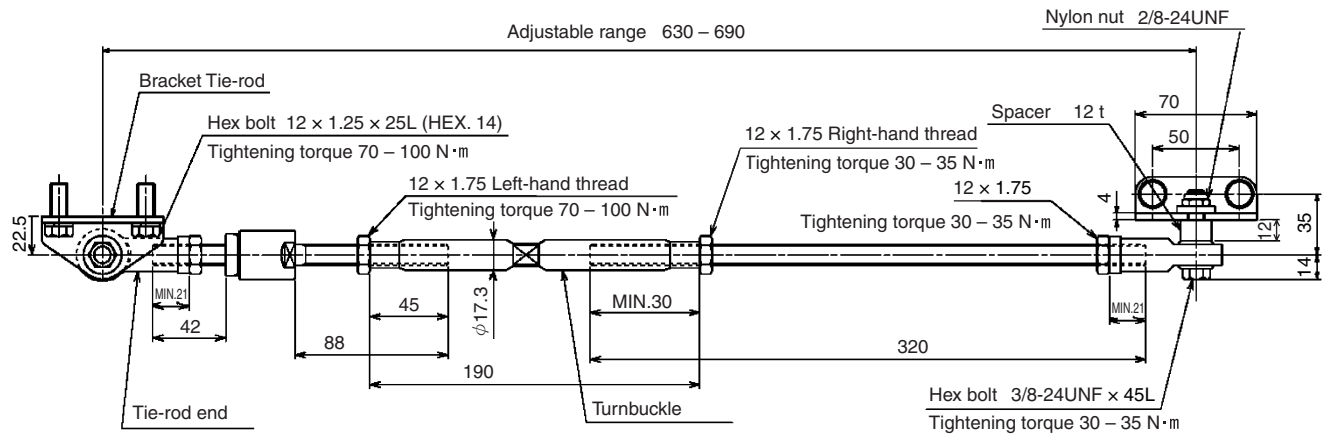
The lock-nut and C-ring must be replaced with new ones, if removed.



TIE-ROD KIT
DF25/30, DF40/50, DF60/70, DF90/115/140

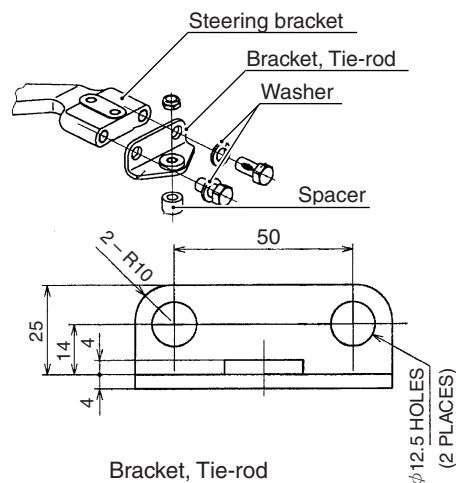


Applicable model	Part number	Part name	Q'ty
DF25/30, DF40/50, DF60/70, DF90/115/140	67600-90J00	Tie-rod kit	1
	67631-90J00	• Bracket, Tie-rod	2
	67725-99E10	• Bolt, Tie-rod (UNF)	2
	67726-99E00	• Nut, Tie-rod	2
	09100-12081	• Bolt, Tie-rod bracket(12 mm)	4
	09160-12066	• Washer, Tie-rod bracket	4
	09180-09022	• Spacer, Tie-rod	2
	67729-90J00	• Instruction, Tie-rod	1
	67628-90J00	• Tape	1

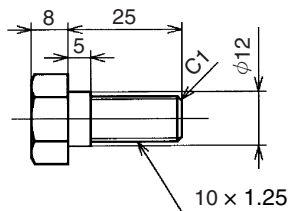
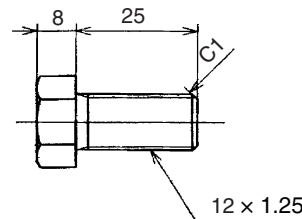


BRACKET, TIE-ROD

DF40/50/60/70/90/115/140



Bolt, Tie-rod bracket

09111-10064
DF40/50, DF60/7009100-12081
DF90/115/140

NOTE:

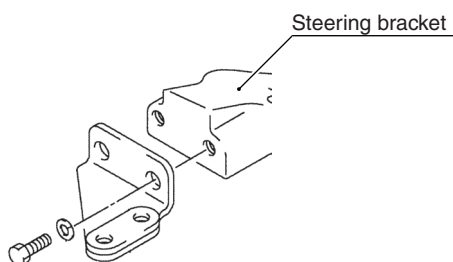
The same tie-rod bracket is used on the models DF40/50, DF60/70 and DF90/115/140. However, the steering bracket differs in diameter of attaching bolt hole on the tie-rod bracket, Therefore two types of tie-rod bracket bolt have been provided.

Tie-rod bracket attaching bolt hole diameter on steering bracket	
DF90/115/140	12 mm
DF40/50, 60/70	10 mm

BRACKET, TIE-ROD KIT

The kit is not available for DF25/30

Part number	Part name	Q'ty
43755-89J00	Bracket, Tie-rod	1
09100-10270	Bolt (10 × 25)	2
09162-10005	Lock washer	2



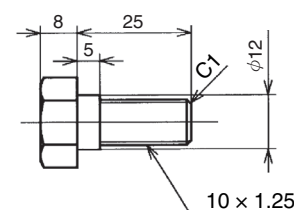
CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.

TIE-ROD ADAPTER KIT

DF40/50/60/70

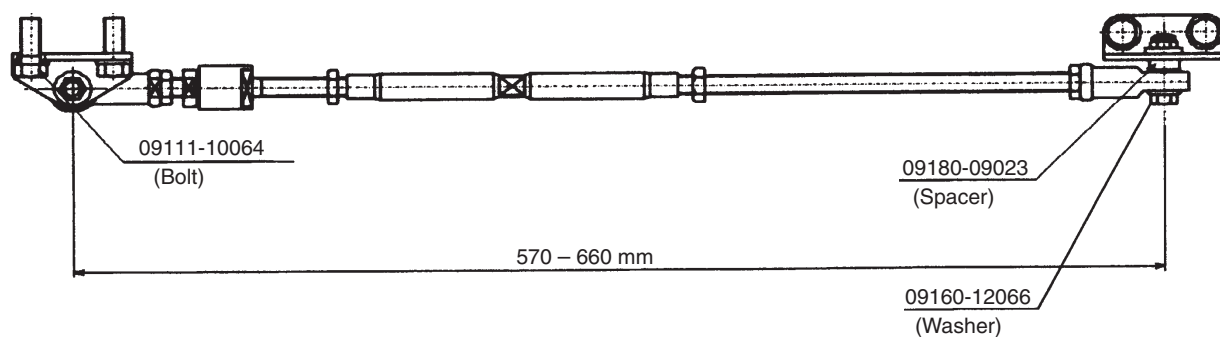
Part number	Part name	Q'ty	Remarks
67620-90E00	Tie-rod adapter kit	1	
09111-10064	• Bolt, Tie-rod bracket	4	10 × 1.25
09180-09023	• Spacer, Tie-rod	2	
09160-12066	• Washer, Tie-rod bracket	4	



09111-10064

NOTE:

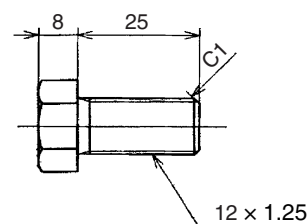
In the case of using 67600-90J00 tie-rod kit on DF40/50, DF60/70, the tie-rod adapter must be obtained separately.



DF90/115/140

The following parts that come supplied with tie-rod kit could be used as they are.

Part number	Part name	Q'ty	Remarks
09100-12081	Bolt, Tie-rod bracket	4	12 × 1.25
09180-09022	Spacer, Tie-rod	2	
09160-12066	Washer, Tie-rod bracket	4	



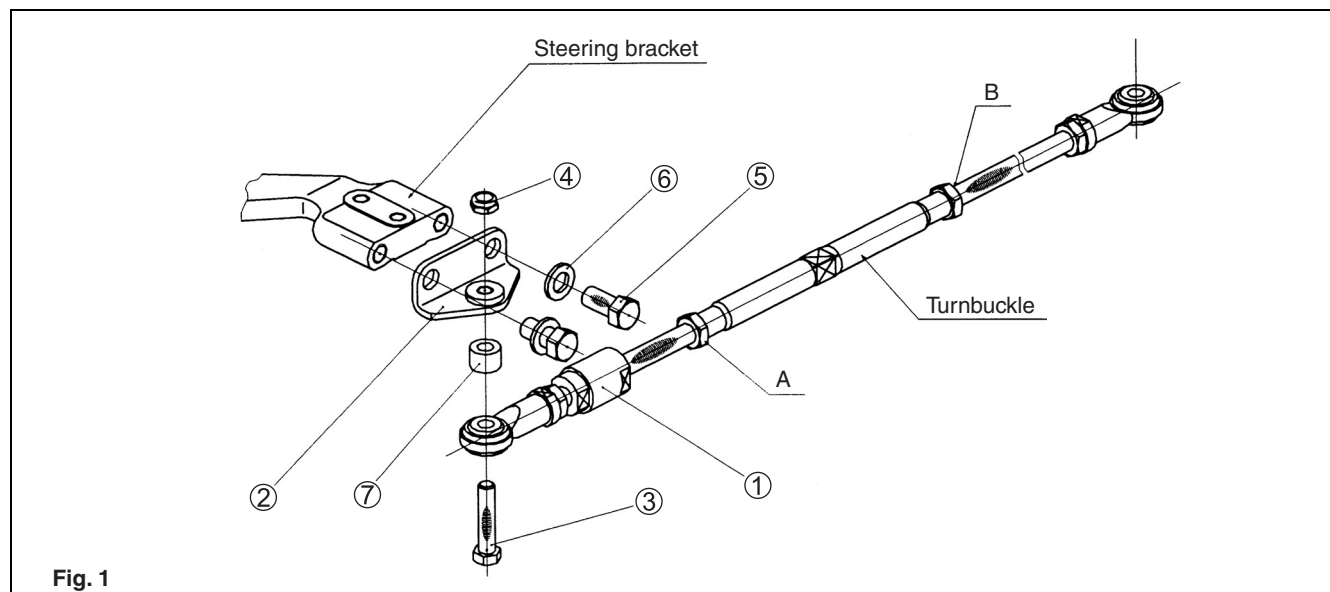
09100-12081
DF90/115/140

TIE-ROD KIT INSTALL INSTRUCTIONS

DF90/115/140 67600-90J00

Ref.	Part number	Part name	Q'ty
1	67610-90J00	Tie-rod kit	1
2	67631-90J00	• Bracket, Tie-rod	2
3	67725-99E10	• Bolt, Tie-rod (UNF)	2
4	67726-99E00	• Nut, Tie-rod	2
5	09100-12081	• Bolt, Tie-rod bracket (12 mm)	4
6	09160-12066	• Washer, Tie-rod bracket	4
7	09180-09022	• Spacer, Tie-rod	2
8	67629-90J00	• Instruction, Tie-rod	1
9	67628-90J00	• Tape	1

PARTS INSTALLATION (BOTH ENGINES)



REF. TOOLS DESCRIPTION

1. 14 mm × 17 mm Spanner
2. 19 mm Spanner
3. Scissors

4. Install the tie-rod bracket (2) on the end of steering bracket with the bolts (5) and washers (6).

Tightening torque: 85 ± 15 N·m

5. Install the tie-rod assy (1) on the bottom side of tie-rod bracket (2) with the spacer (7) positioned in between using the bolt (3).

Tightening torque: 50 ± 10 N·m

6. Tighten the nut (4) to the end of bolt (3) that has been installed in the step 2) above. (When tightening the nut (4), hold the bolt (3) securely so as not to come loose.)

Tightening torque: 30 ± 5 N·m

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.

ADJUSTMENT OF TIE-ROD LENGTH

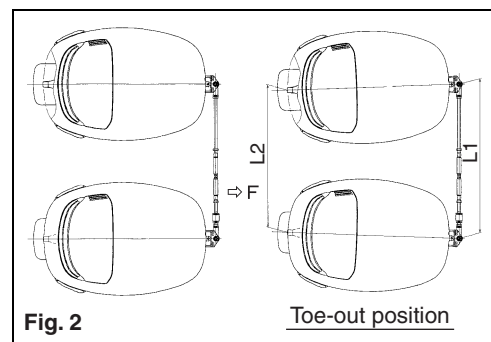
1. Loosen the nuts A and B.
2. Adjust the tie-rod length by turning the turnbuckle. (Fig. 1)
3. When the tie-rod length has been adjusted, tighten the nuts A and B.

Tightening torque: 85 ± 15 N·m

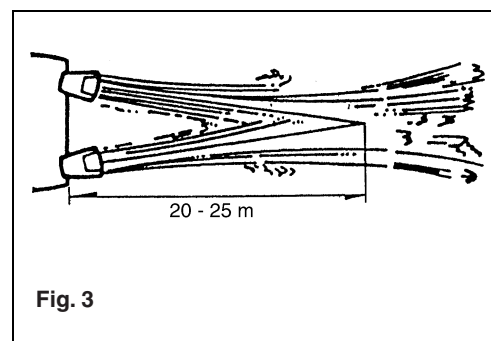
The required length of tie-rod depends on the condition. Adjust the length so that the best result can be obtained. The following is an example of adjustment to obtain the optimum result.

Example: Toe-out position

1. Adjust the tie-rod length so that the two engine centerlines in forward direction are away from each other with the differential $L1 - L2$ within 25 mm (1 inch). (Fig. 2)



2. The two engine wakes should meet together at approximately 20m – 25m behind them. (Fig. 3)



CORRECT RIGGING

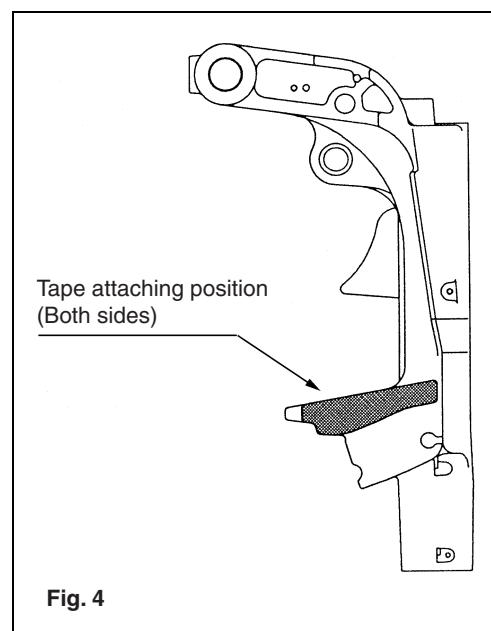
1. As shown in Fig. 4, cut four pieces of tape ⑨ which comes provided in this kit and stick them at the swivel stopper area of both the STBD and PORT side engines.

CAUTION

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

CAUTION

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



2. Perform double-check to make sure that all the bolts and nuts are tightened properly to the specified torque.
3. After one hour of operation, perform another check to make sure that all the bolts and nuts are tightened properly to the specified torque.
4. 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.
5. 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 4 until all the four aluminum tapes show the equal contact condition.

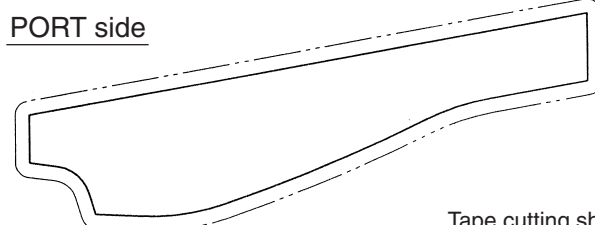
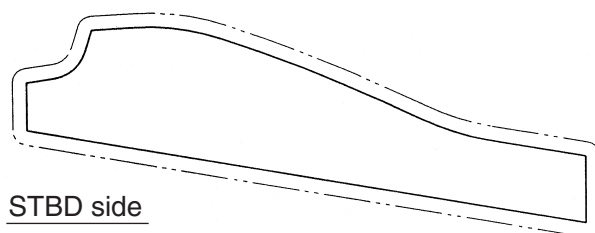
CAUTION

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.

⚠ WARNING

- 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.



Tape cutting shape (Cut along lines of inside.)

TIE-ROD ADAPTER KIT INSTALL INSTRUCTIONS

DF40/50/60/70 67620-99E00

For using this kit for DF40/50/60/70, an adapter kit of exclusive use (sold separately) will be necessary.

Ref.	Part number	Part name	Q'ty
1	09111-10064	• Bolt, Tie-rod bracket	4
2	09180-09023	• Spacer, Tie-rod	2
3	09160-12066	• Washer, Tie-rod bracket	4

Refer to Fig. 1 location of the parts.

09111-10064 Tightening torque: 50.0 N·m

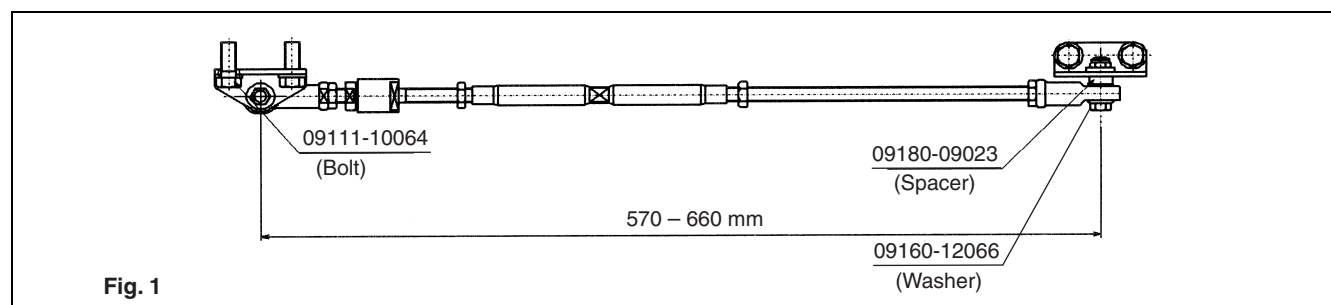
Discard the three parts listed below, that are packed in the kit 67600-90J00 as they will not be necessary at the time of mounting.

Parts to be discarded : 09100-12081 (Bolt) × 4
 : 09180-09022 (Spacer) × 2
 : 09160-12066 (Washer) × 4

CAUTION

Make sure to replace the spacers with new ones. Otherwise, the tie-rod may interfere with the outboard motor possibly causing an extreme danger.

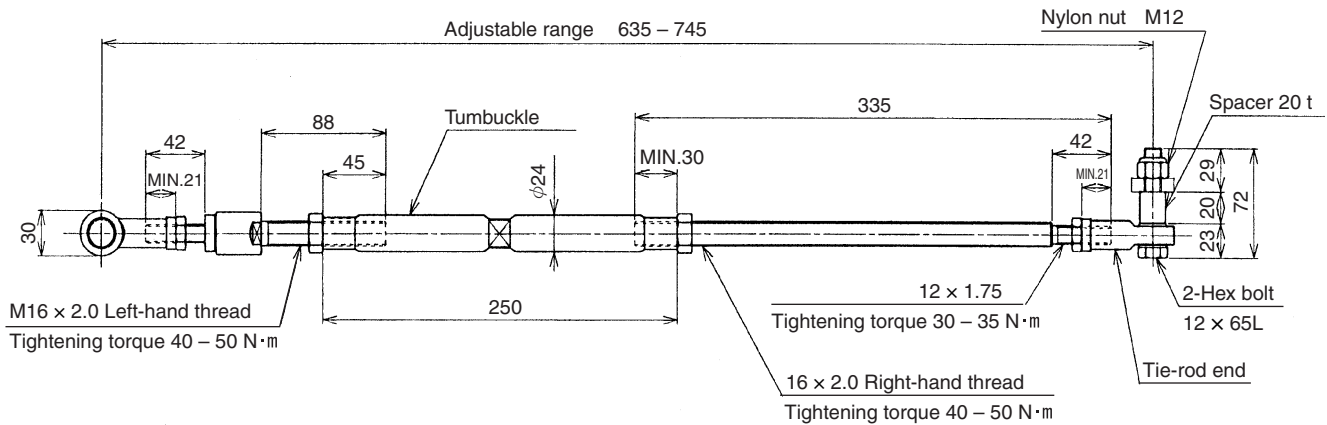
Adjust the length of the tie-rod (space between two engine centerlines) to 570 and 660 mm. (See Fig. 1.)



DF200/225/250 TIE-ROD



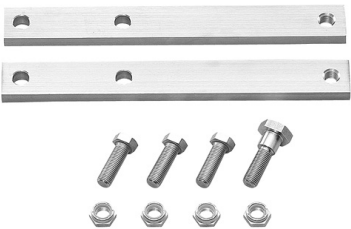
Applicable model	Part number	Part name
DF200/225/250	67600-93J00	Tie-rod kit
	67725-93J00	• Bolt, Tie-rod (12 mm)
	67726-93J00	• Nut, Tie-rod (12 mm)
	67721-93J00	• Spacer, Tie-rod
	67629-93J00	• Instruction



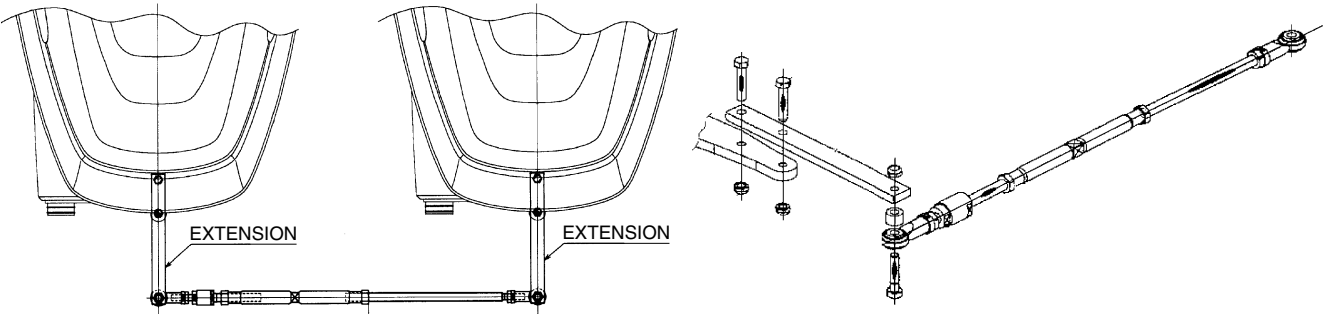
EXTENSION KIT

DF200/225/250

Applicable model	Part number	Part name	Q'ty
DF200/225/250	67630-93J00	Extension kit	1
	67631-93J00	• Extension	2
	67225-93E00	• Bolt	4
	67226-99E00	• Nut	4
	67639-93J00	• Instruction	1



Reference



TIE-ROD KIT INSTALL INSTRUCTIONS

DF200/225/250 67600-93J00

Ref.	Part number	Part name	Q'ty
1	67610-93J00	Tie-rod kit	1
2	67725-93J00	• Bolt, Tie-rod (12 mm)	2
3	67726-93J00	• Nut, Tie-rod (12 mm)	2
4	67721-93J00	• Spacer, Tie-rod	2
5	67629-93J00	• Instruction	1

PARTS INSTALLATION

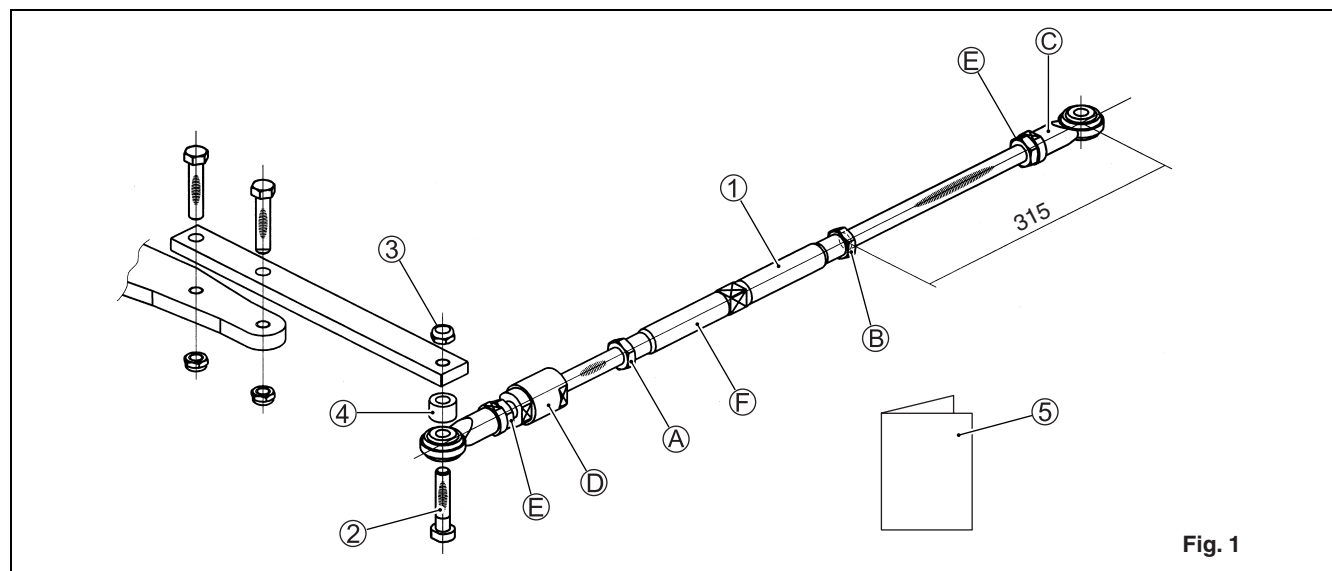


Fig. 1

REF. TOOLS DESCRIPTION

1. 14 mm × 17 mm Spanner
2. 19 mm Spanner
3. 24 mm Spanner
4. Torque wrench

MOUNTING OF PARTS (FOR BOTH ENGINES)

1. Mount the tie-rod kit ① to the lower side of the extension putting the spacer ④ in by using the bolt ②.

Tightening torque: 40 ± 5 N·m

2. Fix the nut ③ to the tip of the bolt mounted in step 1.

Tightening torque: 32.5 ± 2.5 N·m

(Hold down the bolt ② when the nut ③ is tightened so that the bolt ② should not be loosened.)

ADJUSTMENT OF TIE-ROD LENGTH (FIG. 1)

1. Loosen nuts (A) and (B).
2. Adjust the nut (B) by turnbuckle (F) so that it should come to the position of 315 mm from the center of the pole-end (C), then tighten the nut (B).

Tightening torque: 45 ± 5 N·m

3. Turn Universal Comp. (D) to adjust the tie-rod length (L1: See Fig. 2).
4. After adjusting the tie-rod length (L1), tighten the nut (A).

Tightening torque: 45 ± 5 N·m

5. Check for tightening torque of the nut (E).

Tightening torque: 32.5 ± 2.5 N·m

6. Check to see if the tie-bar is not interfered with the outboard motor when steering or tilting up is made.

CAUTION

Cables coming out from the rigging board may sometimes interfere with the tie bar when steering or tilting up. Pass the cables above the tie bar and either protect them with vinyl pipes or put them together by the insulating lock or others in order to avoid the interference with the tie bar.

Before steering the boat with an outboard motor on one side tilted up, check that there is no interference since, in that condition, the tie bar and the outboard motor will be located close each other.

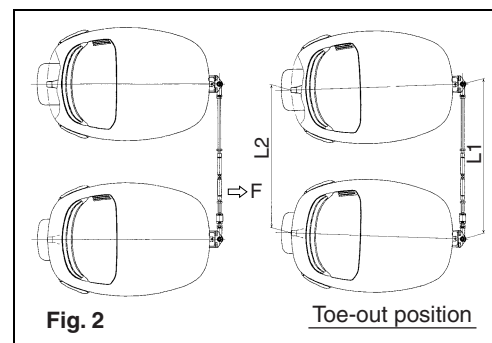
⚠ WARNING

Check to be sure that there is no interference between the fuel hose and the tie bar. Be sure to check this when steering, trimming up or tilting up is performed.

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 centerlines in forward direction are away from each other with the differential $L1 - L2$ within 25 mm (1 inch). (Fig. 2)



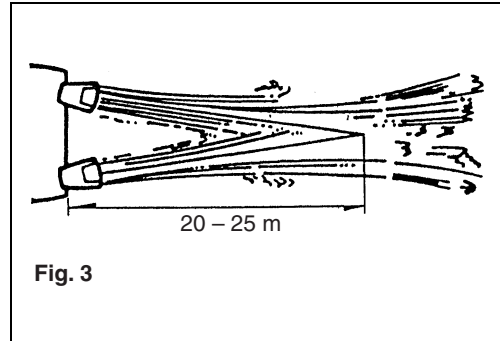
2. The two engine wakes should meet together at approximately 20 m – 25 m behind them. (Fig. 3)

⚠ WARNING

- 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.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.



EXTENSION KIT INSTALL INSTRUCTIONS

DF200/225/250 67630-93J**

Ref.	Part number	Part name	Q'ty
1	67631-93J00	• Extension	2
2	67725-93E00	• Bolt	4
3	67726-99E00	• Nut	4
4	67639-93J00	• Instruction	1

PARTS INSTALLATION

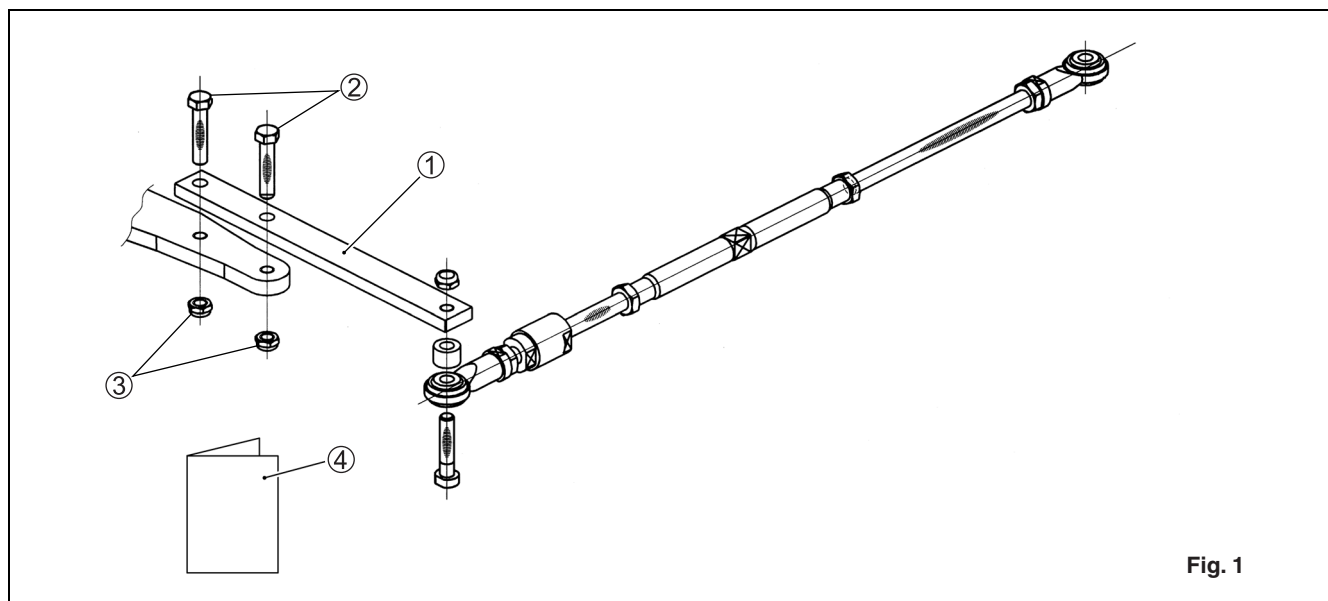


Fig. 1

REF. TOOLS DESCRIPTION

1. 14 mm × 17 mm Spanner
2. Torque wrench
3. Mount the extension ① to upper surface of steering bracket using a bolt ②.

Tightening torque: 30 ± 5 N·m

4. Fix the nut ③ to tip of the bolt mounted in 1) above.

Tightening torque: 17.5 ± 2.5 N·m

(When the nut ③ is tightened, hole down the bolt ② so that the bolt ② could not be loosened.)

CAUTION

- When tilt-up operation is made on the outboard motor with extension set mounted, it may interfere with the motor, possibly damaging the hull.
- To prevent such an interference with the hull, perform adjustment on the tilt limit switch.

⚠ WARNING

- Inspect the assembly again to make sure that all nuts and bolts are tightened properly with the specified torque.
- After two hours of operation, inspect the motor to make sure that all nuts and bolts are tightened properly with the specified torque.
- After every 50 hours of operation, apply antirust oil and check for wear, mounting and torque for all parts.

CAUTION

The lock-nut and C-ring must be replaced with new ones, if removed.