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PREFACE

This manual covers set-up, installation, and pre-delivery service procedures for the Honda BF200A and BF225A outboard motors.

Set-up, installation, and pre-delivery service must be performed by an authorized Honda Marine Dealer. These instructions are provided for dealer use only.

Proper set-up, installation, and pre-delivery service are essential for safe, reliable operation. Your customer expects the outboard motor to be correctly set-up, installed, adjusted, and ready for use; test the outboard motor to be sure that it functions properly.

DO NOT OVER POWER THE BOAT

Do not install an outboard motor that exceeds the recommended maximum horsepower for the boat. Refer to the boat certification plate for the boat's maximum recommended horsepower. For most boat applications, the outboard motor should have a horsepower which provides 80 % of the maximum recommended horsepower for the boat. If the certification plate information is not available, contact the boat manufacturer.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice.

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TORQUE VALUES

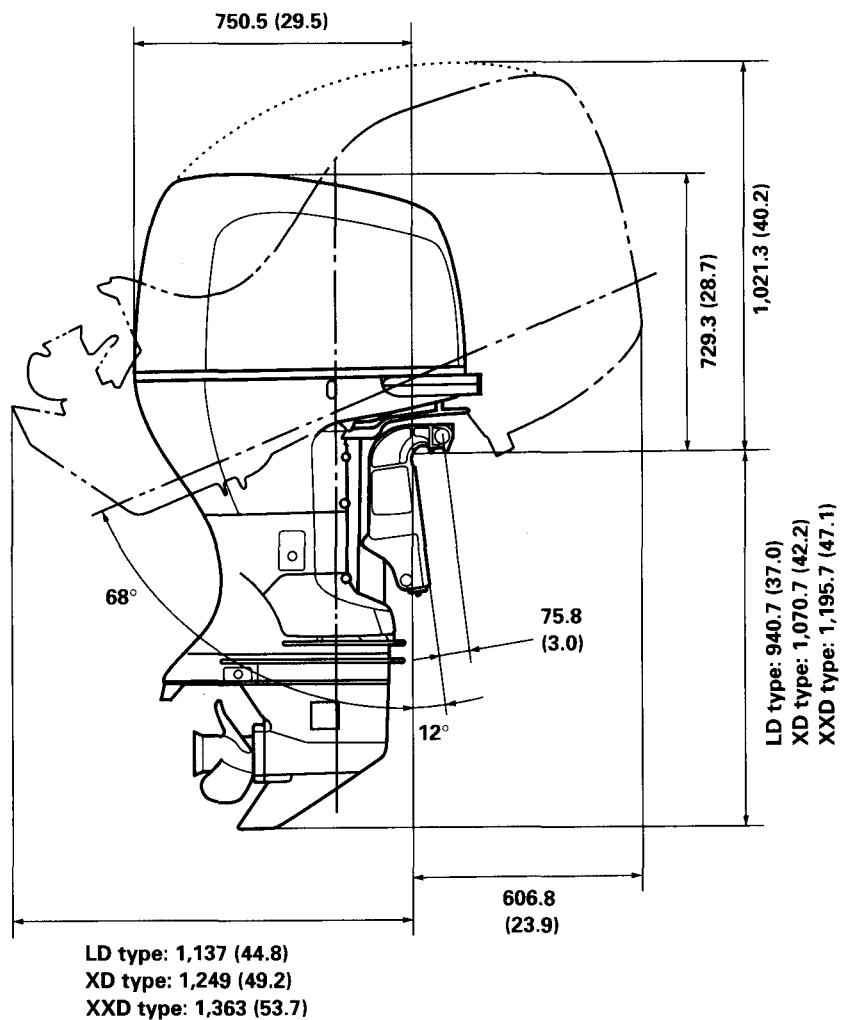
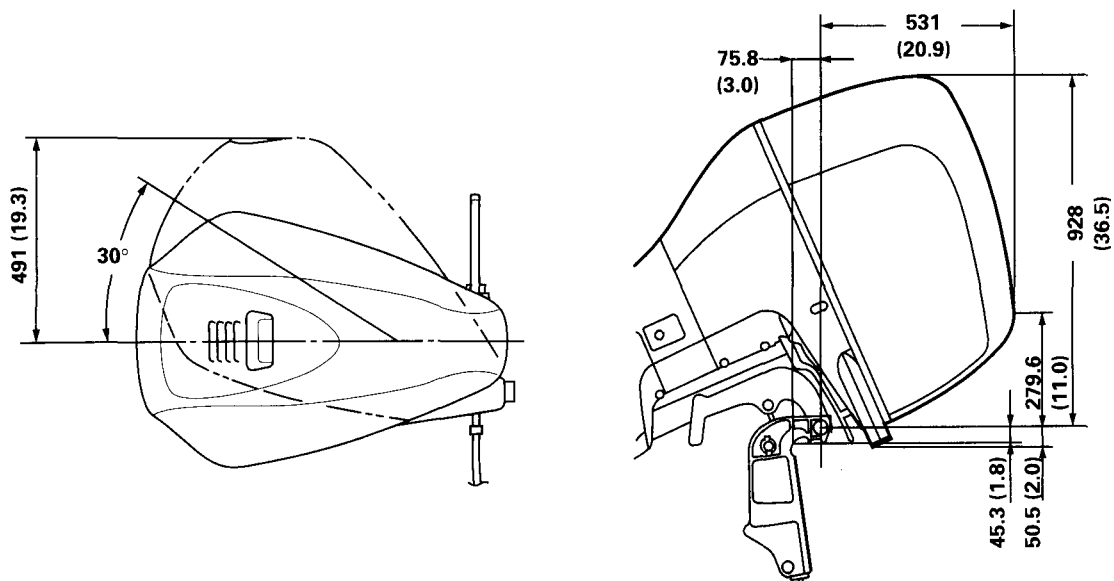
FASTENER APPLICATION	DESCRIPTION	TORQUE VALUES		
		N·m	kgf·m	lbf·ft
Propeller lock nut (18 mm castle nut)	Minimum torque	1	0.1	7
	Maximum torque	44	4.5	33
Front separate cover bolt	6 × 17 mm, 6 × 35 mm special bolt	12	1.2	9
	6 × 25 mm hex bolt	10	1.0	7
Steering link arm bolt	3/8-24 UNF	22	2.2	16
Steering link arm lock nut	3/8-24 UNF	18	1.8	13
Steering plate nut	10 mm	34	3.5	25
Stern bracket mount bolt	12 × 119 mm	54	5.5	40
Standard hardware	5 mm screw	4.2	0.4	3.0
	6 mm screw	9	0.9	6.5
	6 mm bolt, nut	10	1.0	7
	6 mm flange bolt, nut	12	1.2	9
	8 mm bolt, nut	21	2.1	15
	8 mm flange bolt, nut	26	2.7	20
	10 mm bolt, nut	34	3.5	25
	12 mm bolt, nut	54	5.5	40
	10 mm flange bolt, nut	39	4.0	29

Torque values for special hardware will be called out during procedure.

DIMENSIONAL DRAWINGS

Unit: mm (in)

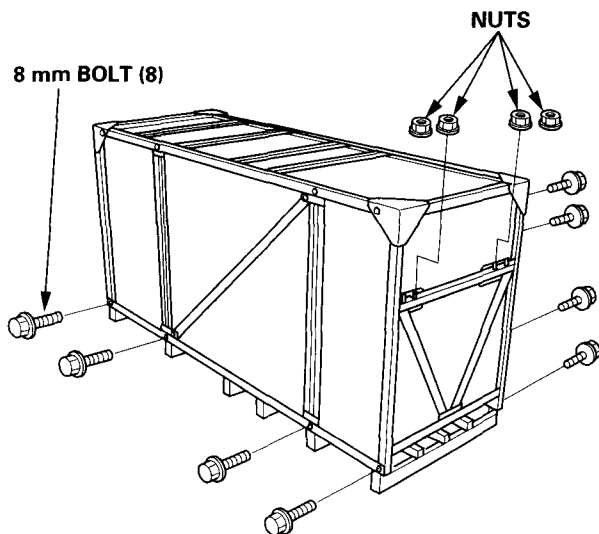
AT 68° TILT UP:



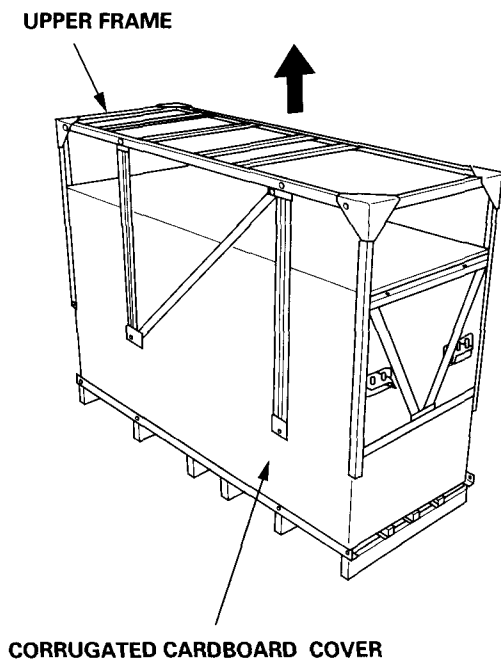
UNPACKING

• Wear the heavy gloves during unpacking to protect your hands from the sharp edges and burrs on the steel crate frame.

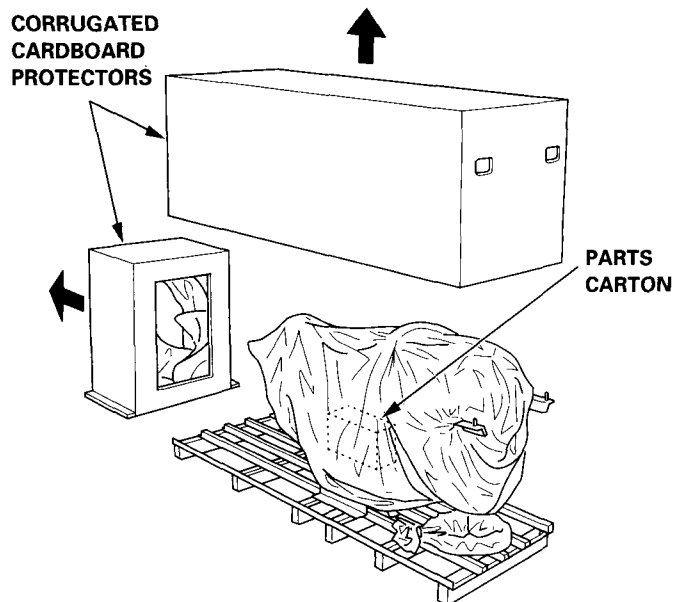
1. Remove the eight bolts attaching the upper frame and the four nuts attaching the engine hanger bracket.



2. Lift up the upper frame slowly with care not to strike on the outboard motor. (Get an assistant to help remove the crate frame.) Then remove the corrugate card board cover.



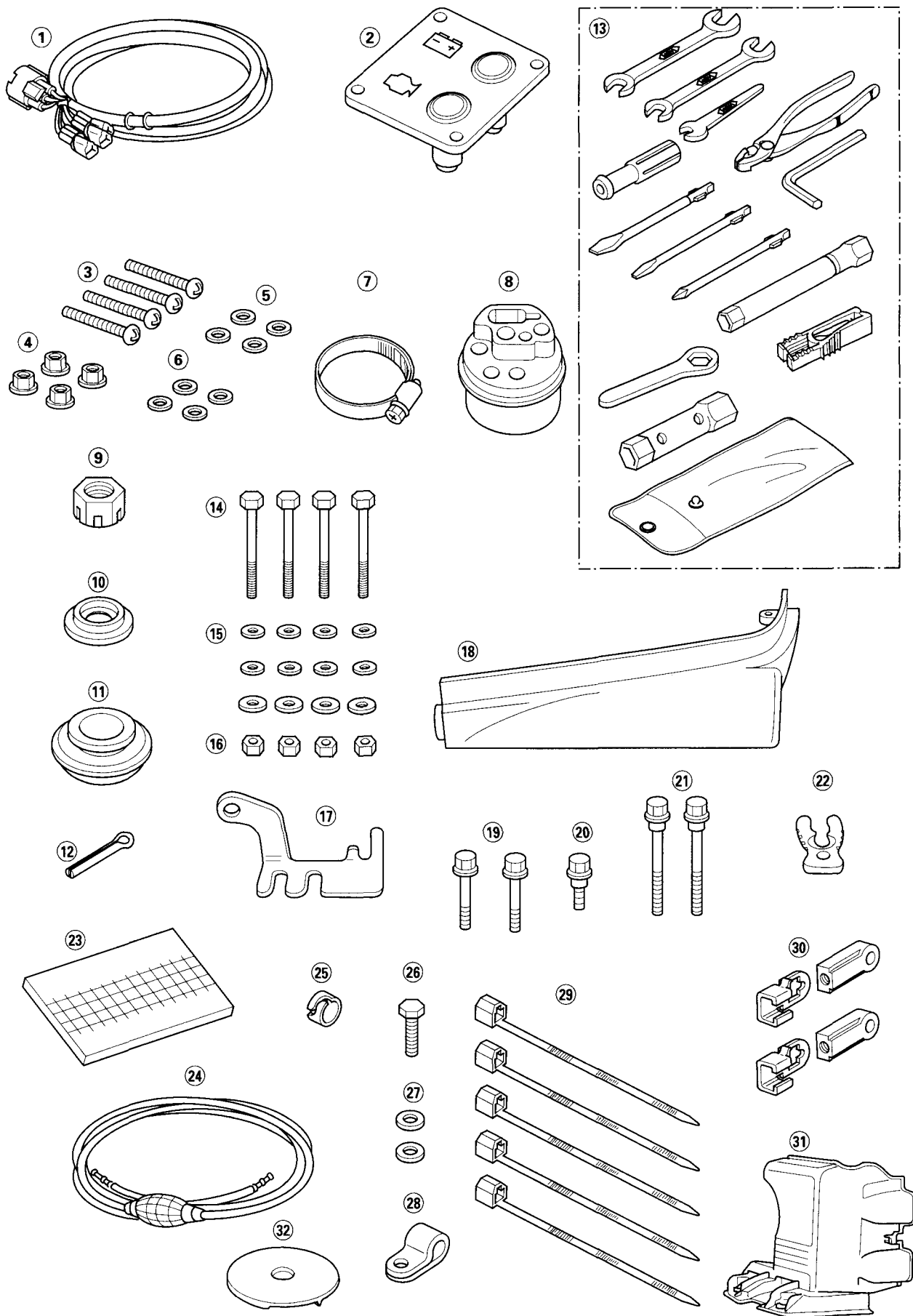
3. Lift up and remove the corrugated cardboard protector that contains the engine, then slide and remove the corrugated cardboard protector that contains the engine cover.



4. Cut the tie and remove the parts carton from the crate. Compare the parts to the parts list on page 5.
5. After comparing the parts, go to step 6 on page 7.

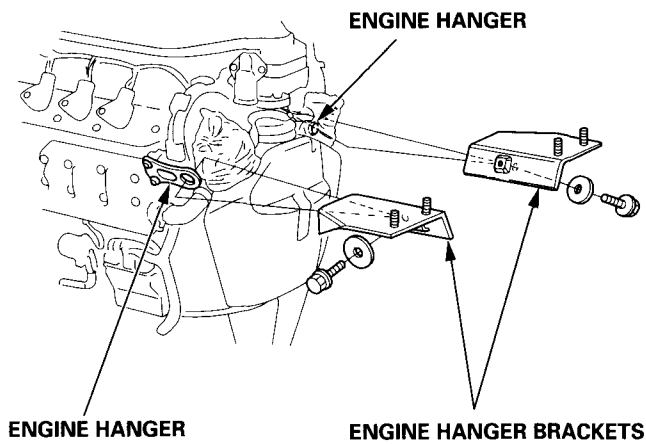
PARTS PACKAGE INSPECTION

No.	Part name	BF200A					BF225A					Remarks
		LD	XD	XCD	XXD	XXCD	LD	XD	XCD	XXD	XXCD	
1	Indicator wire harness	1	1	1	1	1	1	1	1	1	1	Use with Ref. No. 2
2	Indicator panel assembly	1	1	1	1	1	1	1	1	1	1	
3	5 × 40 mm pan-head screw	4	4	4	4	4	4	4	4	4	4	
4	5 mm flange nut	4	4	4	4	4	4	4	4	4	4	
5	5 mm plain washer	4	4	4	4	4	4	4	4	4	4	
6	5 mm spring washer	4	4	4	4	4	4	4	4	4	4	
7	Sub tank band	1	1	1	1	1	1	1	1	1	1	Use for propeller installation
8	Undercase grommet A	1	1	1	1	1	1	1	1	1	1	
9	18 mm castle nut	1	1	1	1	1	1	1	1	1	1	
10	Propeller thrust washer	1	1	1	1	1	1	1	1	1	1	
11	Propeller washer	1	1	1	1	1	1	1	1	1	1	
12	4.0 mm split pin	1	1	1	1	1	1	1	1	1	1	
13	Tool kit	1	1	1	1	1	1	1	1	1	1	Use for outboard motor installation
14	12 × 119 mm hex bolt	4	4	4	4	4	4	4	4	4	4	
15	12 mm plain washer	12	12	12	12	12	12	12	12	12	12	
16	12 mm self-locking nut	4	4	4	4	4	4	4	4	4	4	
17	Remote control cable plate	1	1	1	1	1	1	1	1	1	1	Use with Ref. No. 18
18	Front separate cover	1	1	1	1	1	1	1	1	1	1	
19	6 × 25 mm hex bolt	2	2	2	2	2	2	2	2	2	2	
20	6 × 17 mm special bolt	1	1	1	1	1	1	1	1	1	1	
21	6 × 37 mm special bolt	2	2	2	2	2	2	2	2	2	2	
22	Emergency lock clip	1	1	1	1	1	1	1	1	1	1	
23	Owner's manual	1	1	1	1	1	1	1	1	1	1	
24	Fuel tube assembly	1	1	1	1	1	1	1	1	1	1	
25	Band tube clip 12.5 mm	1	1	1	1	1	1	1	1	1	1	
26	6 × 16 mm hex bolt	1	1	1	1	1	1	1	1	1	1	
27	6 mm washer	2	2	2	2	2	2	2	2	2	2	
28	Cable clamp	1	1	1	1	1	1	1	1	1	1	
29	Tie cable	5	5	5	5	5	5	5	5	5	5	
30	Shift pivot	2	2	2	2	2	2	2	2	2	2	
31	Electric parts cover	1	1	1	1	1	1	1	1	1	1	
32	Gear case cover	—	—	1	—	1	—	—	1	—	1	



(From page 4)

6. Remove the engine hanger brackets that secures the engine hangers.

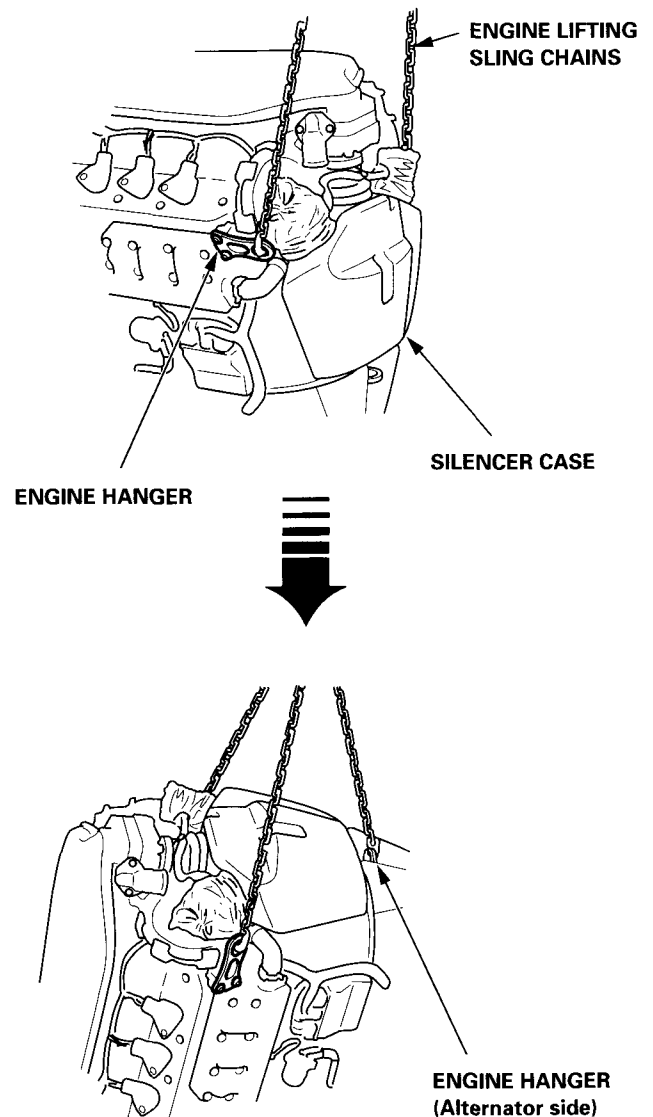


7. Connect engine lifting sling chains to the engine hangers, and lift up the outboard motor with a hoist.

- To prevent damage the silencer case, first connect the chains to the two engine hangers of the cylinder head side, then connect other chain to the other engine hanger located above the alternator.

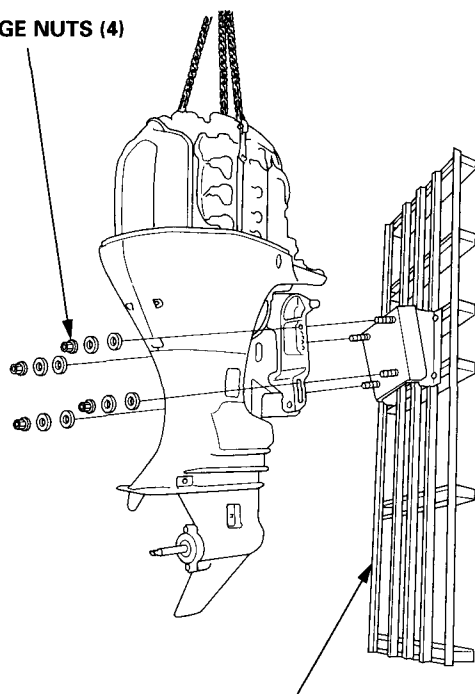
NOTICE

- Use a suitable hoist with a capacity rating of 500 kg (1,100 lbs) or more. This outboard motor total height with the lower crate frame is over 2 m (79 in).
- Get an assistant to help to lift up the outboard motor.



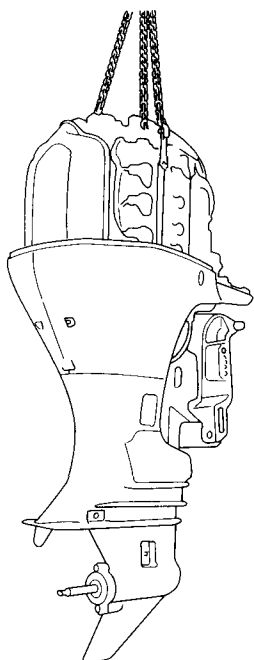
8. With the lower crate frame set on the floor, remove the lower crate frame from the outboard motor by removing the four flange nuts.

FLANGE NUTS (4)



LOWER CRATE FRAME

9. Install the outboard motor on the boat while holding it vertically as shown.



MOTOR INSTALLATION

Motor Selection

Secure and correct installation is essential for safe boating and good performance. Follow the installation instructions provided in this manual.

⚠ WARNING

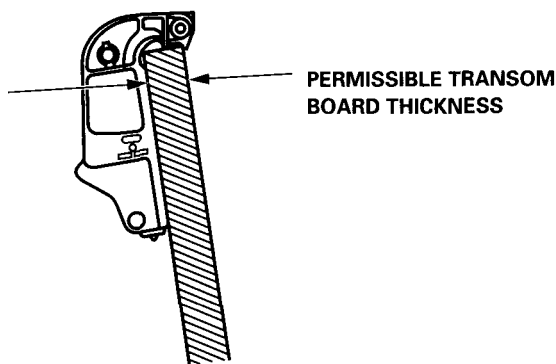
Improper set-up or pre-deliver service can cause an unsafe condition that can cause your customer to be seriously hurt or killed. Follow the procedures and precautions in this manual and shop manual carefully.

Before installation, check to be sure that the outboard motor does not exceed the recommended maximum horsepower for the boat on which it is to be installed. Refer to the boat's certification plate for recommended maximum horsepower. For most applications, the outboard motor should provide 80% of the recommended maximum horsepower for the boat. If the certification plate information is not available, contact the boat dealer or manufacturer.

Refer to the following dimensional drawings to be sure there is nothing on the boat that will interfere with outboard motor tiltup and steering.

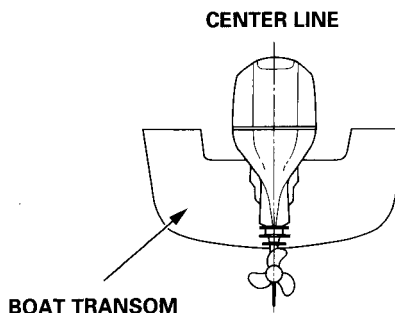
The BF200A and BF225A outboard motors are designed to be installed on boat transom with the following transom board thickness.

Boat transom board thickness: 50 – 70 mm (2-2-3/4 in)

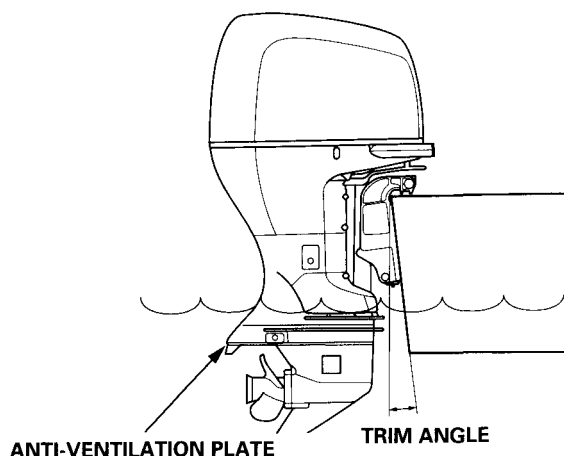


General Guidelines

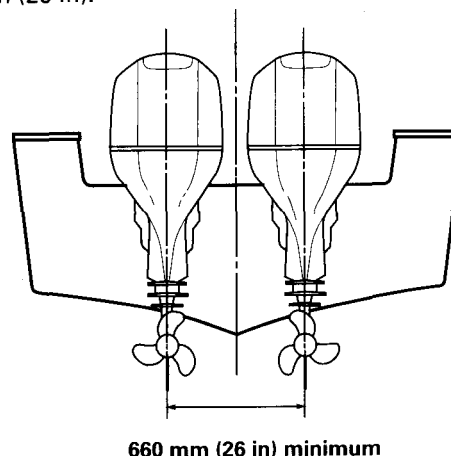
Install the outboard motor on the center of the transom securely and be sure that the boat is will-balanced.



As a general rule, the outboard should be installed so the anti-ventilation plate is parallel to the boat bottom. If the board transom angle is less than 8°, the BF200A or BF225A anti-ventilation plate will not be parallel to the boat bottom when trimmed to the lowest hole.



Dual outboard motors must be installed so that the outboard motor center-to-center distance is a minimum of 660 mm (26 in).

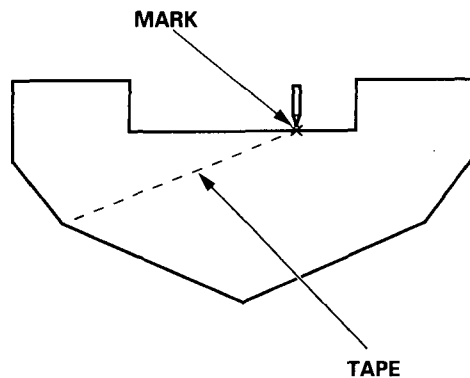


Boat Transom Center Line

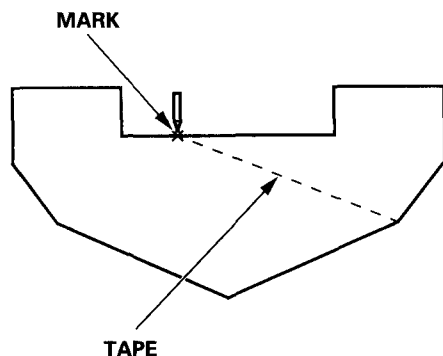
Measure across the transom to determine the transom center line and draw a vertical line. On a "V" bottom boat, the vertical line should pass through the keel.

Use a pencil and tape measure to locate center line.

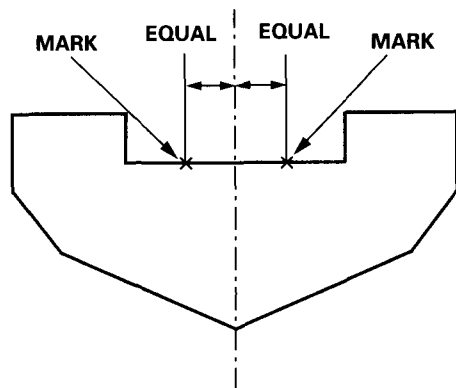
1. Put one end of the tape measure on a chine and place the other end on the upper edge of the transom, somewhere past the "visual" center. Place a mark on the transom and record the distance measured.



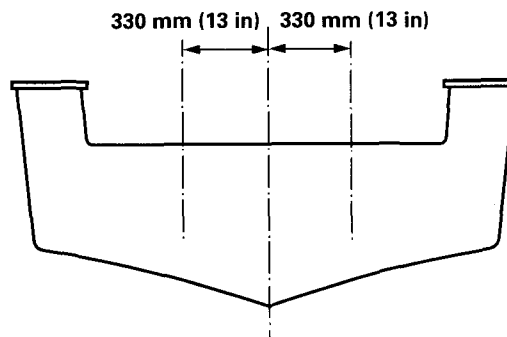
2. Measure the same distance from the opposite chine and make a mark.



3. Measure the distance between the two marks and place a third mark halfway between them. The line connecting the third mark with the keel is the center line.



If dual outboard motors are to be installed, mark transom at a minimum of 330 mm (13 in) from center line.



Before drilling the holes for installation of the outboard motors, set the outboard motors on the respective center lines and check whether the boat is well-balanced. If a boat is out of balance, adjust by sliding the outboard motor to the adequate position.

Installation Height Check

Optimum outboard motor installation height varies with boat type and bottom shape. Contact the boat manufacturer for any special recommendations that are unique to a specific model of boat.

If the outboard motor is installed too low:

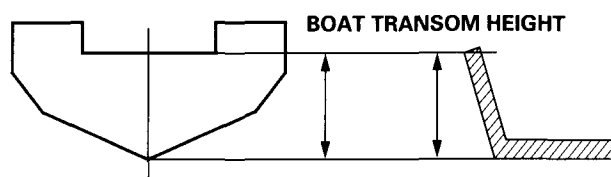
- The boat will squat and be hard to plane.
- The boat high-speed stability will be reduced.
- The boat will tend to porpoise.

If the outboard motor is installed too high:

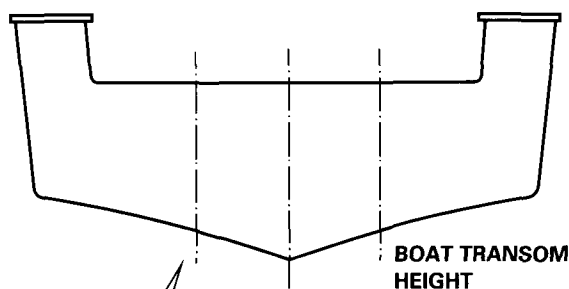
- Cavitation may occur when making a turn, which prevents the boat from smooth cruising.

1. Measure the boat transom height.

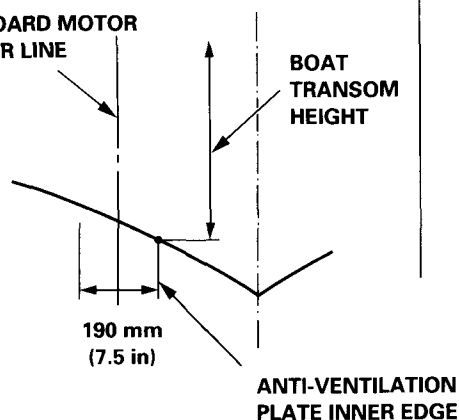
SINGLE OUTBOARD



DUAL OUTBOARDS



OUTBOARD MOTOR CENTER LINE

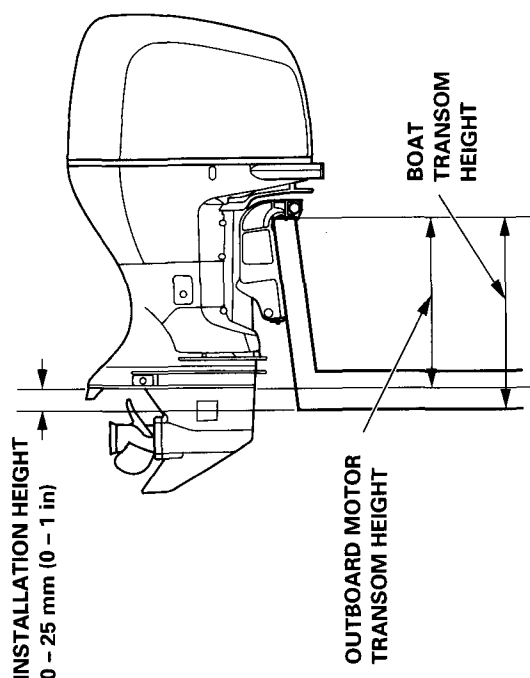


On "V" bottom boats, measure the transom height which is the distance from the top edge of the boat transom to the point at which the vertical line passing the inner edge of the anti-ventilation plate intersects with the boat bottom.

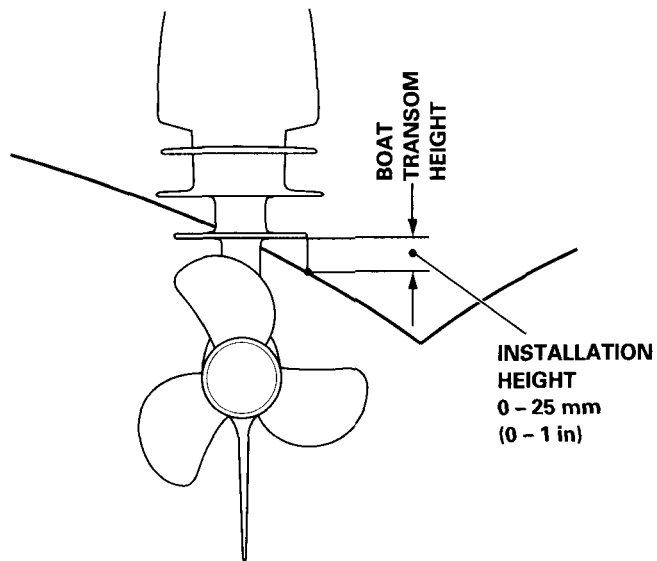
2. Calculate the outboard shaft length requirement. Match the appropriate outboard shaft length to your boat transom height.

Shaft Length	Outboard Motor Transom Height	Workable Boat Transom Height
Long	508 mm (20 in)	483 – 508 mm (19 – 20 in)
Extra long	635 mm (25 in)	610 – 635 mm (24 – 25 in)
Extra-extra long	762 mm (30 in)	737 – 762 mm (29 – 30 in)

To determine outboard shaft length requirement, subtract the motor transom height and the boat transom height/ the difference should be approximately 0 – 25mm (0 – 1 in) which is the installation height range.



When mounting dual outboard motors on "V" bottom boats, the outboard installation height range is 0 – 25 mm (0 – 1 in).



3. If the outboard installation height cannot be achieved, adjust boat transom height.

Boat Transom Height Adjustment

If the installation height is too low, or needs to be modified to accommodate the width of the outboard motor(s), contact the boat's manufacturer and follow their recommendations for corrective action.

If mounting two outboard motors, be sure the installation height is identical for both.

Some boat manufacturer's may require different mounting height. Consult your boat manufacturer for specifics on your boat.

Transom Drilling

Verify no damage will occur when the motor mounting holes are drilled. Look for any structural impediments such as bulkheads, braces, fuel cells, bilge pumps, or floor sections before drilling.

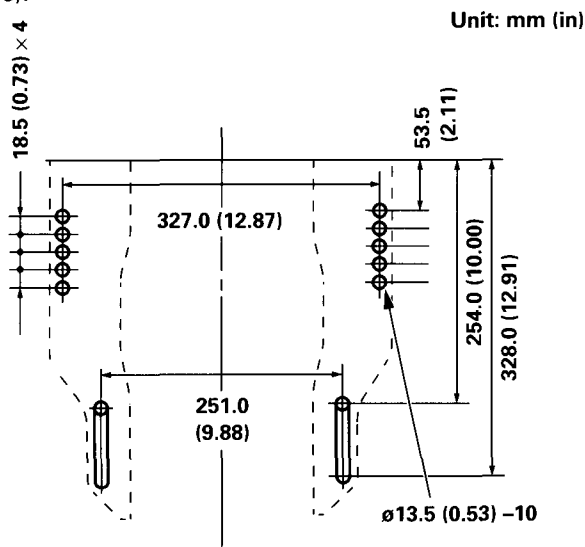
Ensure there is adequate space for the bolt, washer, and transom support plate (if applicable), to bear on a flat surface.

Wear safety glasses and drill four 1/2-inch holes in the transom.

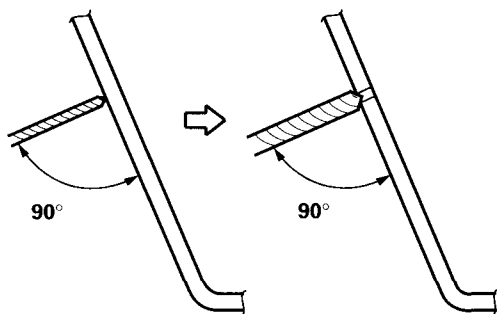
Drill upper holes at least 25 mm (1 in) below transom top edge.

Drill the lower holes in the positions where the top edge of the long hole in the stern bracket comes in contact with the bolt.

1. Mark the center point of the 10 drilling holes (i.e. 5 holes at the right and left sides of the transom respectively that are in the symmetrical position with regard to the center line of the outboard installation line).



2. Using a 3 – 5 mm (0.1 – 0.2 in) diameter drill, drill the pilot holes at the marked points at right angles with the boat transom surface. Then, drill the holes using the 13.5 mm (0.53 in) diameter drill.
3. With the outboard motor resting on the boat transom, verify the correct motor height. The outboard motor can be raised by using a lower set of mounting holes.
4. Use vacuum cleaner to clean up after drilling.

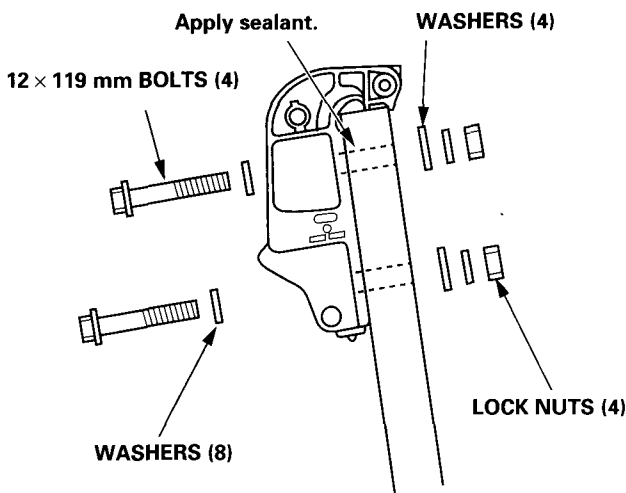


Bolting Motor to Transom

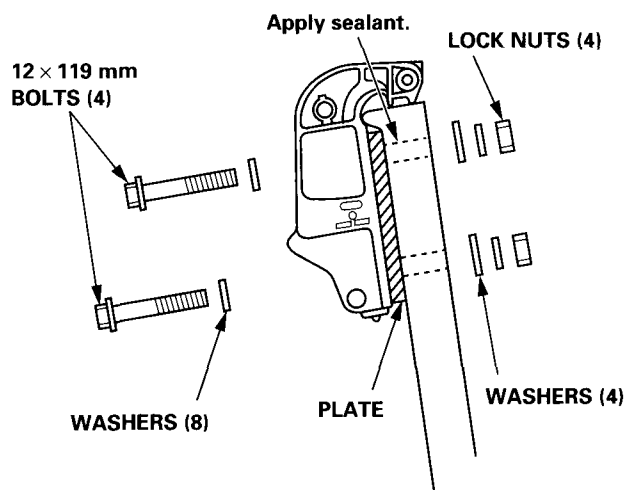
With motor resting on the boat transom, verify correct motor height. Motor can be raised by using a lower set of mounting holes.

Apply silicone sealant or equivalent to the mounting bolt holes. Secure the motor by installing the bolts from the motor side. Tighten the self-lock nuts. The bolts must have the sufficient thread length to tighten down and have at least two or three threads past the end of the self-lock nut.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



If the molding of the transom upper edge interferes with the outboard stern bracket, add the plate or reconditioning the bump and install the outboard stern bracket to the boat transom securely.



NOTICE

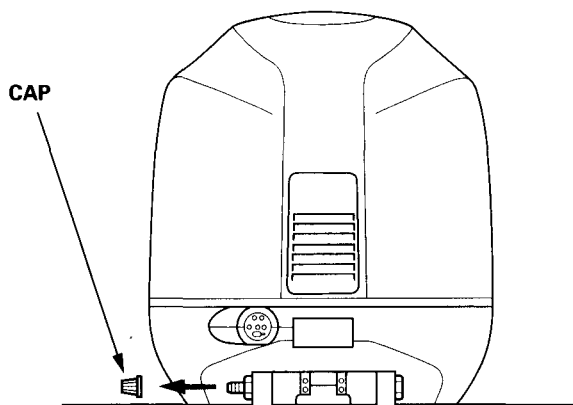
Using an air impact tool to tighten or loosen the transom bolts can generate enough heat to damage the bolt threads. The air impact tool can also produce enough tightening torque to damage the boat transom.

Steering Cable Installation

Do this before final placement of the motor on the transom. Refer to the steering cable manufacturer's manual for cable handling procedures.

Single outboard:

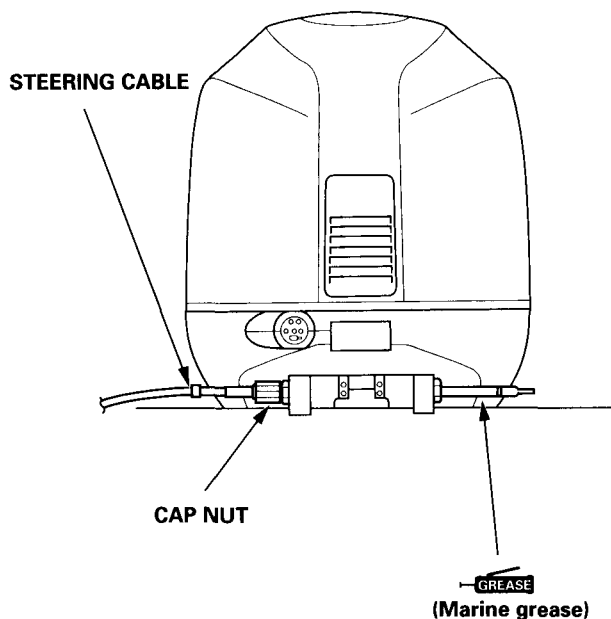
1. Remove the cap from the steering/tilt tube.



2. Apply the marine grease to the inner and outer cable ends. Do not use wheel bearing grease. Install the steering cable through the steering/tilt tube from starboard side.

When the steering cable enters from the port side, the steering/tilt tube must be reversed. Refer to the shop manual for procedures.

3. Hand-tighten the steering cable cap nut at this time.



4. Tighten the steering cable nut until the steering cable end play is removed.

TORQUE:

34 – 49 N·m (3.5 – 4.0 kgf·m, 25 – 36 lbf·ft)

After steering cable nut is torqued, there should be no end play between the outer steering cable and steering/tilt tube.

For further information regarding the steering cable, refer to boat manufacturer's operation manual.

5. Directly after completing the steering link arm and steering cable installation, verify the following:

- Motor turns the proper direction when the steering wheel is turned right and left. If the steering is reversed, correct at the steering box.
- Motor steering angle is equal when the steering wheel is turned full right and left. If the motor steering angle are not equal:
 - Major corrections can be made at the steering box (refer to the steering box or steering cable manufacturer's instructions).
 - Minor corrections can be made by moving the steering tilt tube laterally (refer to the Shop Manual).

Make the steering angles equal as necessary.

- The steering cable and or steering link arm must not come in contact with any part of the boat when the steering wheel is turned full right and left and all tilt angles. Correct as necessary and check again.

Steering Link Arm Installation

The steering link arm must be secured between the steering plate and steering cable, using the bolt, washers, nuts and collar shown below. Both the bolt and self-locking nuts, used at each end of the steering link arm, must be in good condition. Install and tighten hardware as follows:

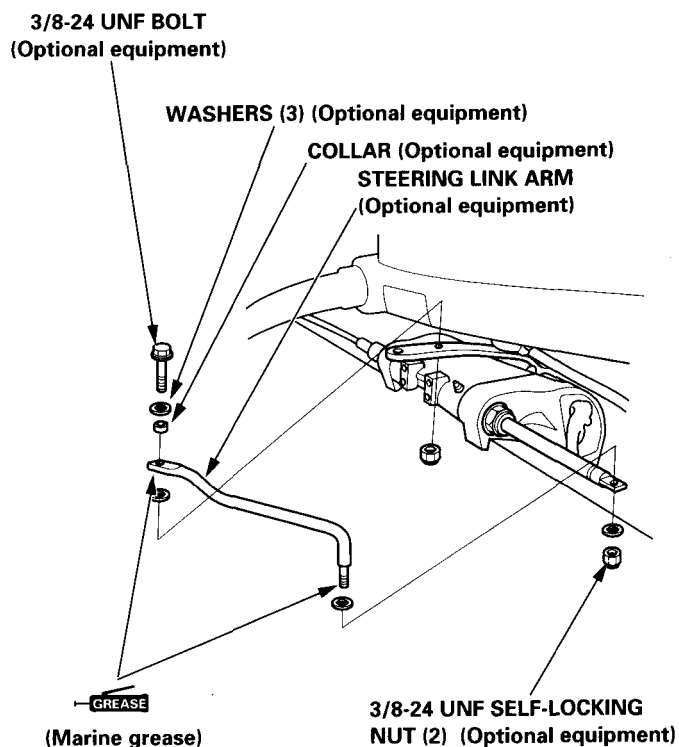
1. Install the bolt, washer and collar into the link arm. Thread the bolt into the steering arm inside hole. Tighten the bolt then tighten the self-lock nut. Do not use forward side hole.

TORQUE:

Bolt: 22 N·m (2.2 kgf·m, 16 lbf·ft)

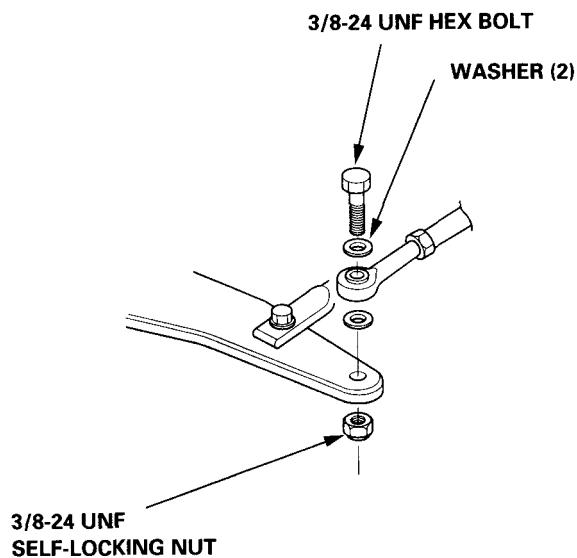
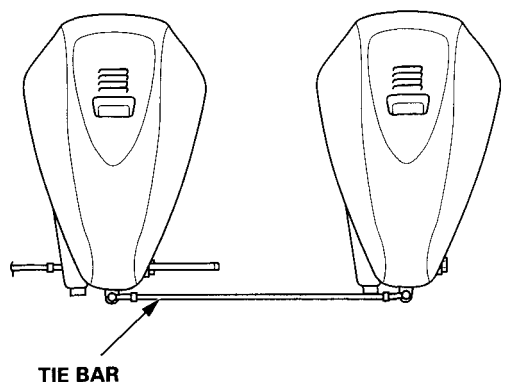
Self-locking nut: 18 N·m (1.8 kgf·m, 13 lbf·ft)

2. Turn the steering wheel to extend the steering cable out of the steering/tilt tube. Connect the steering cable and the steering link arm using the nut and washers.
3. Turn the steering wheel to retract the steering cable into the steering/tilt tube. Tighten the steering link arm to the steering cable with the self-locking nut to a torque of 10 N·m (1.0 kgf·m, 7 lbf·ft), then loosen the self-locking nut 1/8 turn.



Tie Bar Installation (Dual motors)

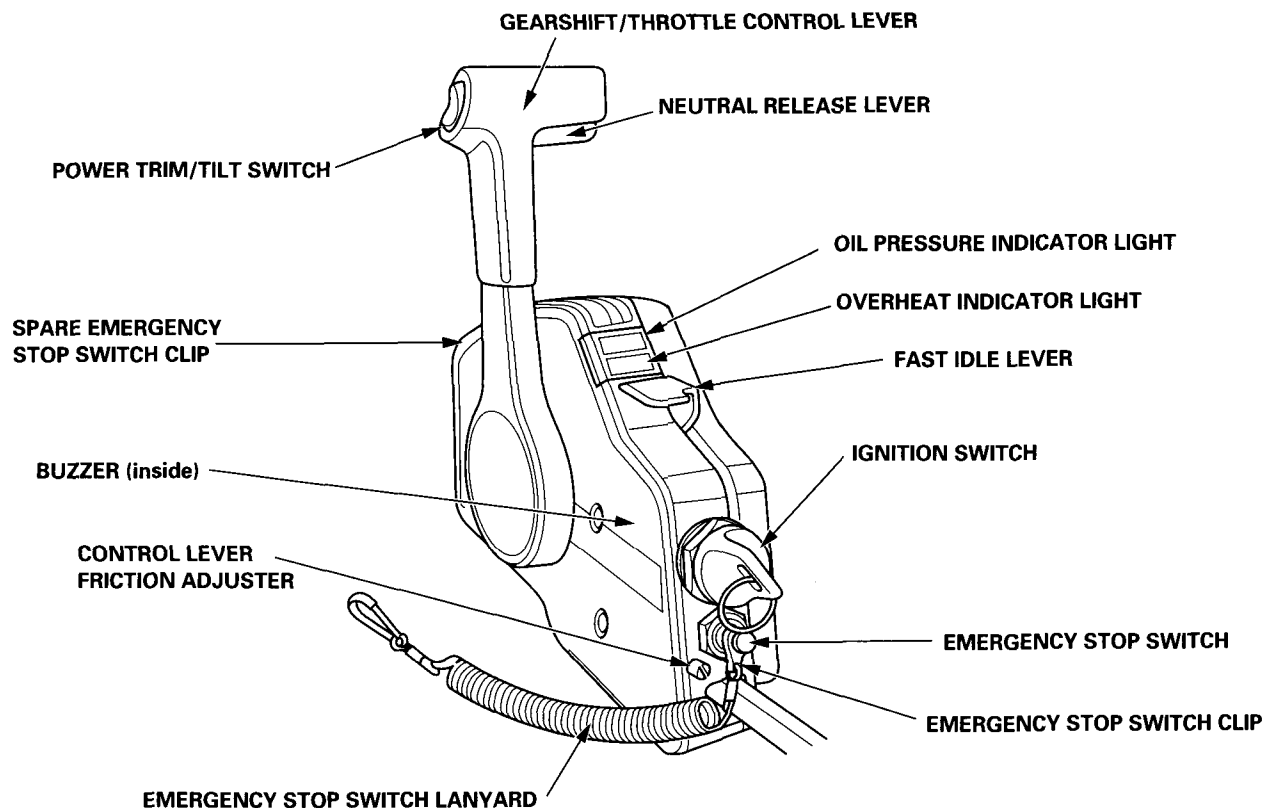
1. As previously described, install the steering cable and the steering link arm.
2. Install a commercially available tie bar in the steering plate hole using the bolt, washers and self-locking nut.



3. After installation, test run the outboard motors and adjust the tie bar (see page 47).

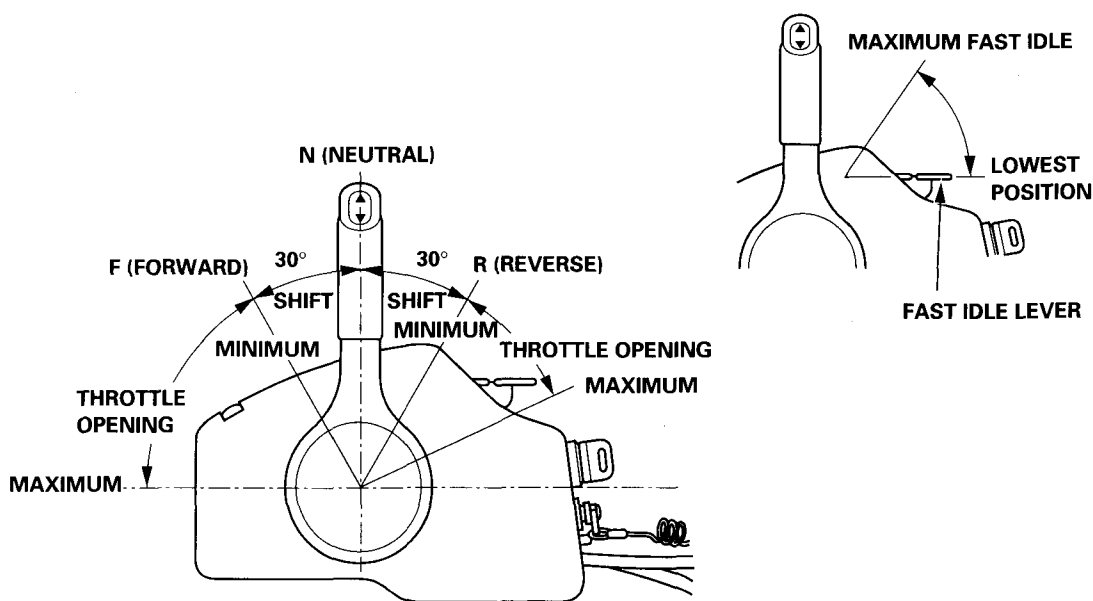
REMOTE CONTROL BOX (Optional equipment)

• SIDE-MOUNT REMOTE CONTROL



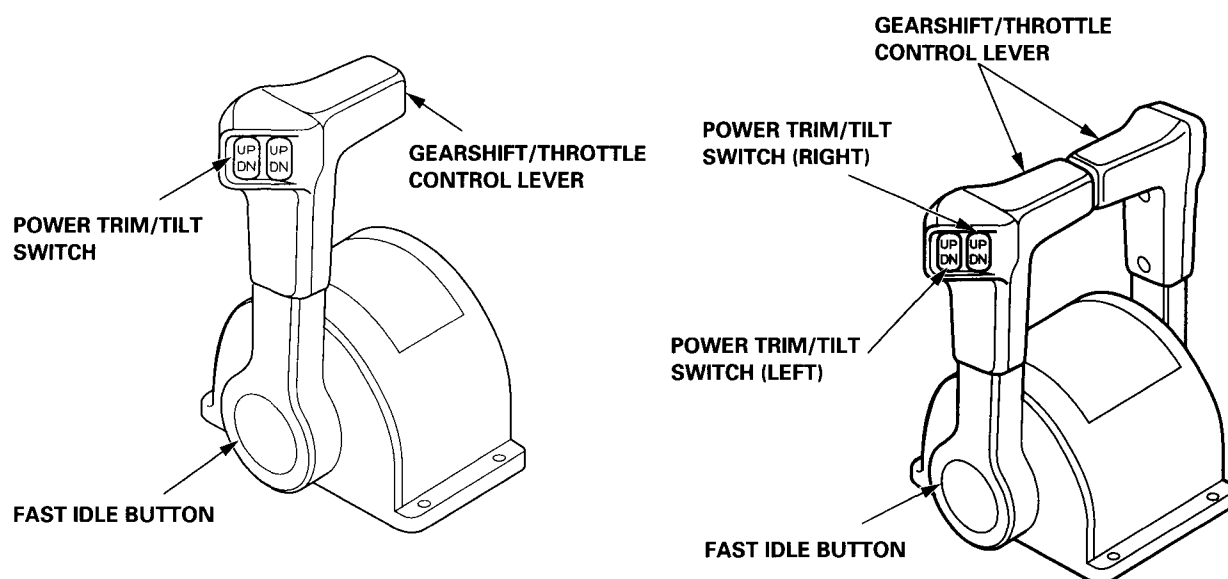
The fast idle lever is only needed for starting carbureted outboard models. The BF200A and BF225A models use programmed fuel injection so, this lever will not be needed for starting.

After the engine starts and if the outside temperature is below 41°F (5°C), the fast idle lever can be used to accelerate engine warm up.



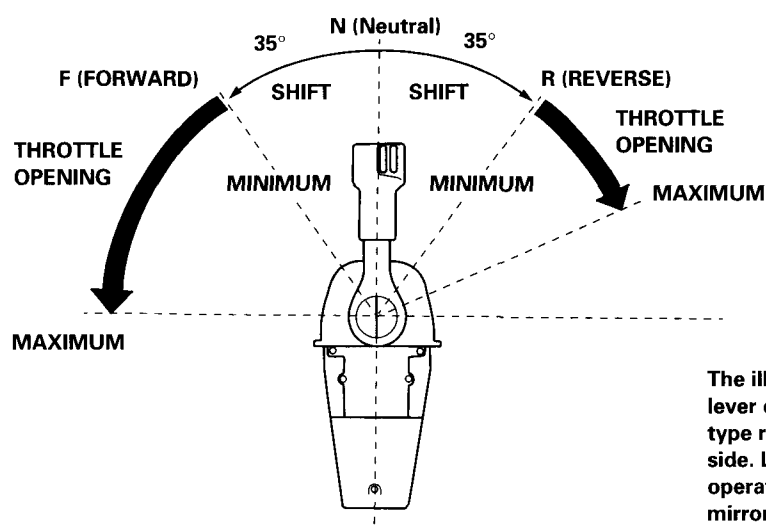
• TOP MOUNT REMOTE CONTROL

This section shows you the right-hand handle type only. The right-hand remote control is designed so that you can perform the throttle operation and the tilt angle adjustment with your right hand. Note that the name and operation of each part of the left-hand handle type are identical with those of the right-hand handle type.



The first idle button is only needed for starting carbureted outboard models. The BF200A and BF225A models use programmed fuel injection so, this lever will not be needed for starting.

After the engine starts and if the outside temperature is below 41°F (5°C), the fast idle lever can be used to accelerate engine warm up.

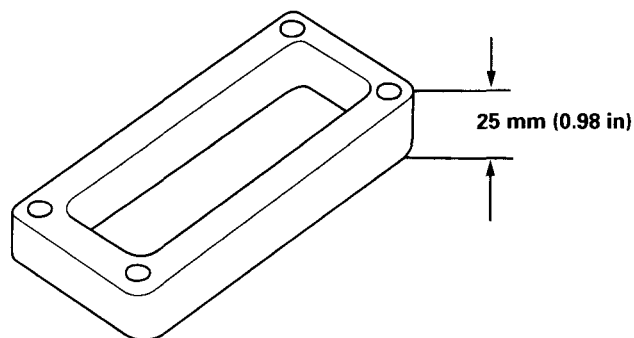


The illustration shows the remote control lever operation when the right-hand handle type remote control is mounted on the right side. Left-hand handle type remote control operation mounted on the left side is the mirror image of the above illustration.

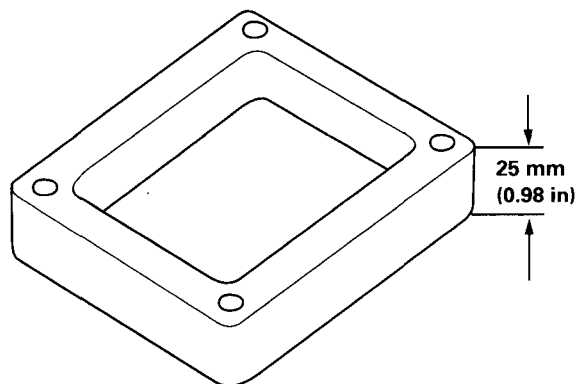
- **SPACER (Optional equipment)**

- The spacer is not included in remote control kit. It is available as an optional part. Purchase a genuine Honda spacer for the outboard motor remote control kit as needed.
- Note that the installation height of the remote control increase 25 mm (0.98 in) by mounting the spacer.
- Check the spacer installation and the surrounding area for freedom from interference and restriction.

For single lever type:



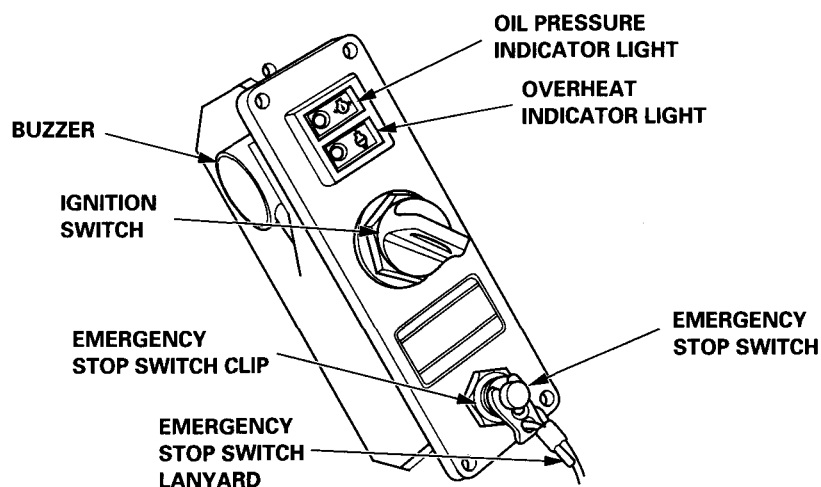
For dual lever type:



- **CONTROL PANEL**

(for PANEL/TOP MOUNT type)

The switch panel is not included in the remote control kit. It is available as an optional part. Purchase this genuine Honda part as needed.

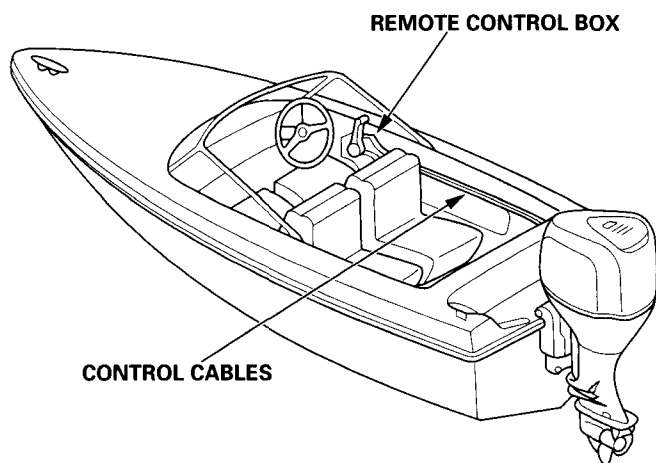


Cable Selection

1. Select the control box installation position for boat and suitable type of the control box.

Recommended control cable:

- Morse 33C cable (commercially available)



Side mount control box:

The remote control box is normally mounted on the starboard side. The control lever can be reversed to accommodate port side (see page 20).

Position the spacer plate between the control box and the installation surface.

Panel mount control box:

It is necessary to make a clearance to route the control cable behind the control box.

If the thickness of the mounting location is 25 mm (0.98 in) or more, this location is not suitable to mounting, select other location.

Top mount control box:

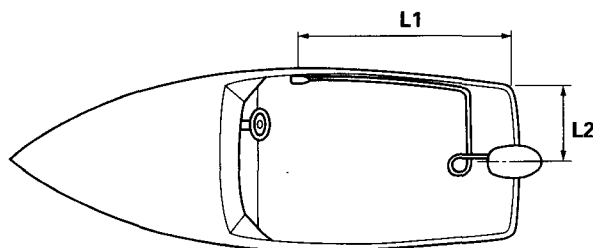
It is necessary to make a clearance to route the control cable under the control box.

2. Calculate the control cable length.
Measure the distance of L1 and L2 and calculate the required control cable length as follows.

Side mount control box, Panel mount control box:

Required control cable length =

$$L1 + L2 + 12" \text{ to } 18" (300 \text{ to } 450 \text{ mm})$$



Top mount control box:

- Measure the length of the control cable route on the boat and add 12" to 18" (300 to 400 mm) to this length.
- When the boat is mounted with dual outboard motors, measure the length to the respective outboard motors.

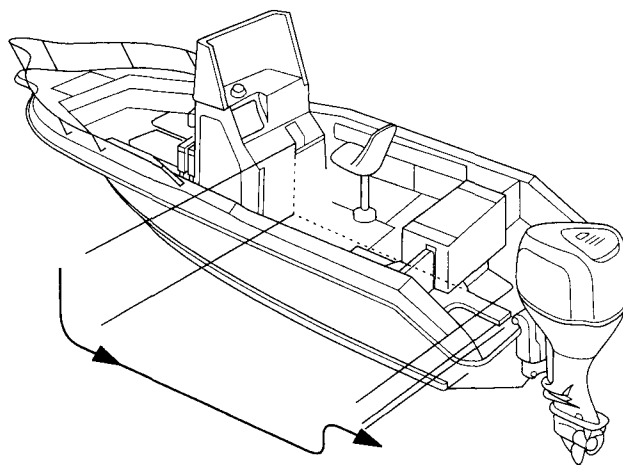
Do not bend the control cable sharp with the radius of the cable bend being 300 mm (12 in) or below.

Bending the cable sharp will increase the operation load of the control lever which deteriorates the operationability of the lever.

The control cable must be long enough not to change the cable routing when tilting up/down the outboard motor or when turning the steering handle right or left.

If must be long enough that allows proper tilt-up or down of the outboard motor and secure steering operation.

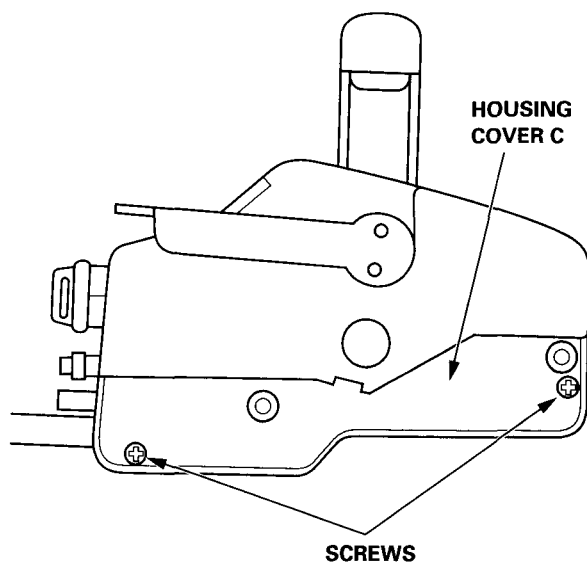
Add the extra length to the cable if it is obliged to route the cable with slackness or if it is not possible to route the cable in an ordinal route.



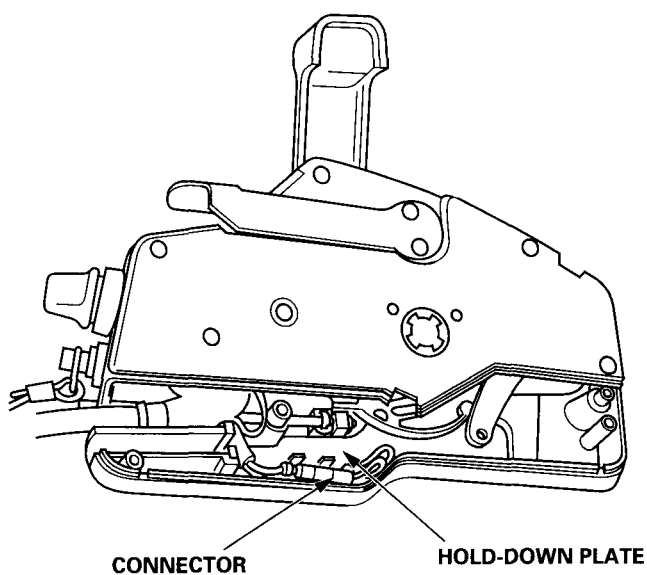
Reversing Control Lever

This side mount control box is available designed to be mounted on the starboard side. It can be mounted on the port side by reversing the control lever installation in the following procedure.

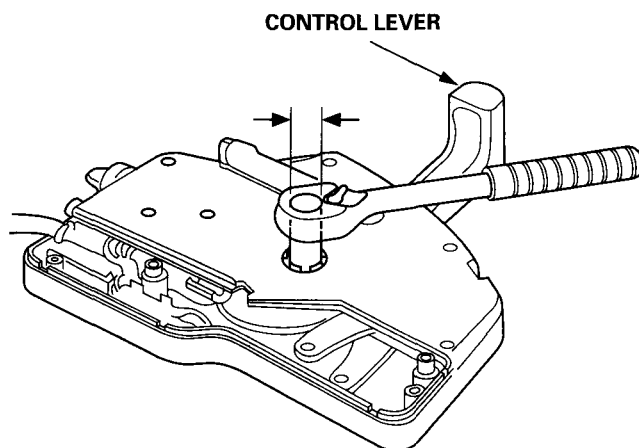
1. Remove the two screws and remove the housing cover C.



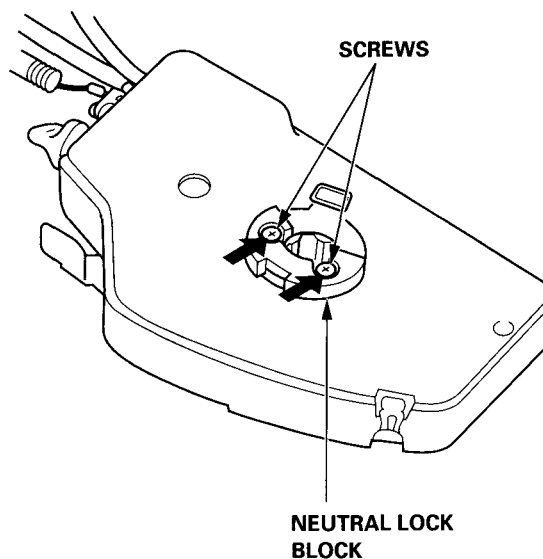
2. Remove the two screws and remove the hold-down plate.
3. Disconnect the power trim/tilt switch harness connector.



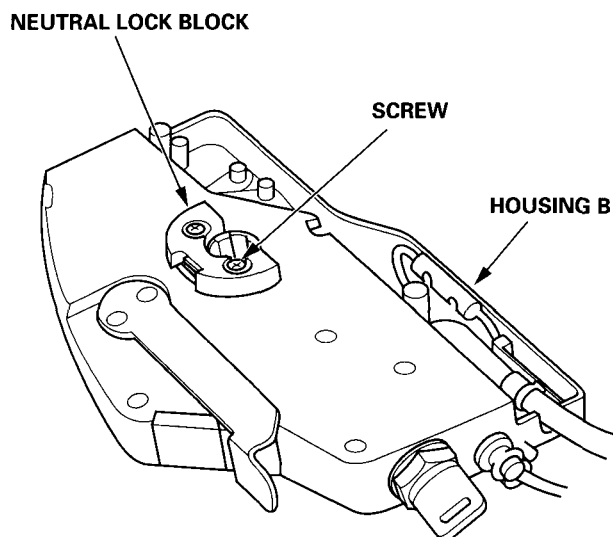
4. Set the control lever in the neutral position. Remove the 8 mm lever lock bolt and remove the control lever with care not to damage the power trim/tilt switch harness.



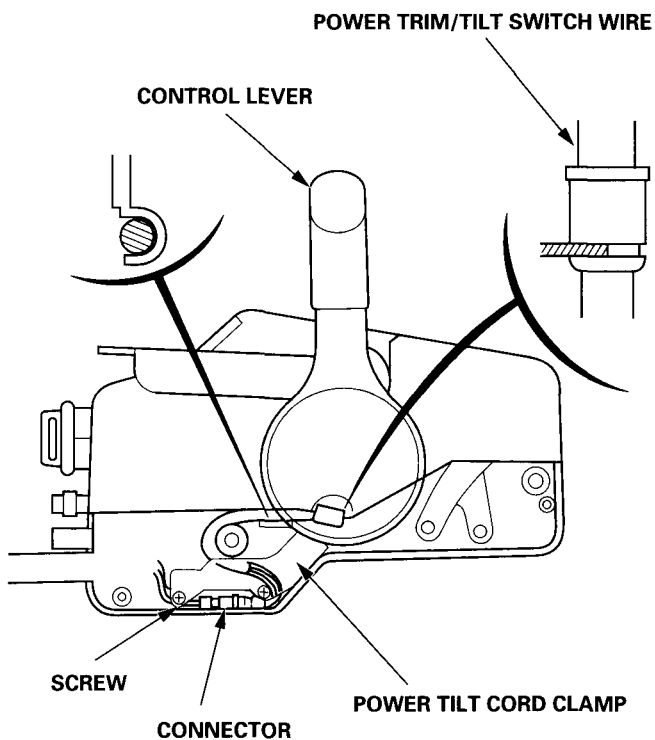
5. Remove the two screws and remove the neutral lock block.



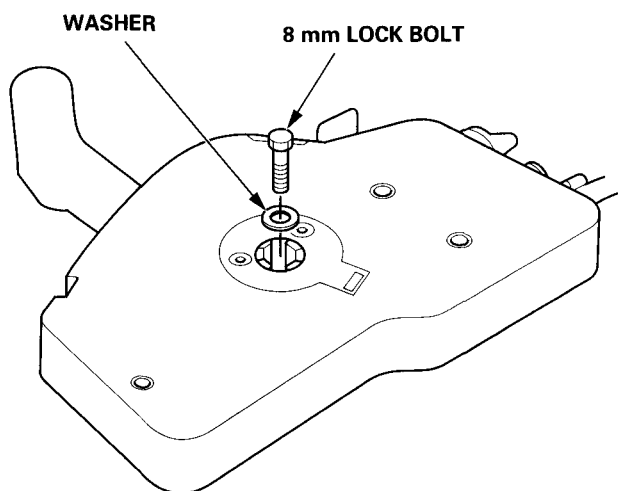
6. Install the neutral lock block on the reverse side of the control box with the two screws.



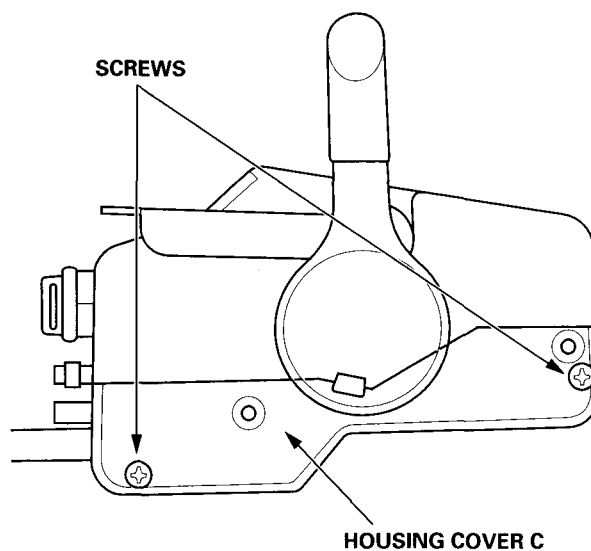
7. Install the control lever from the housing B side in the neutral position. Align the groove in the switch wire grommet with the cutout in the housing B.
8. Pass the power trim/tilt switch harness as shown and connect the connector.
9. Install the power tilt cord clamp with the two screws.



10. Tighten the 8 mm lock bolt with washer. **TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)**



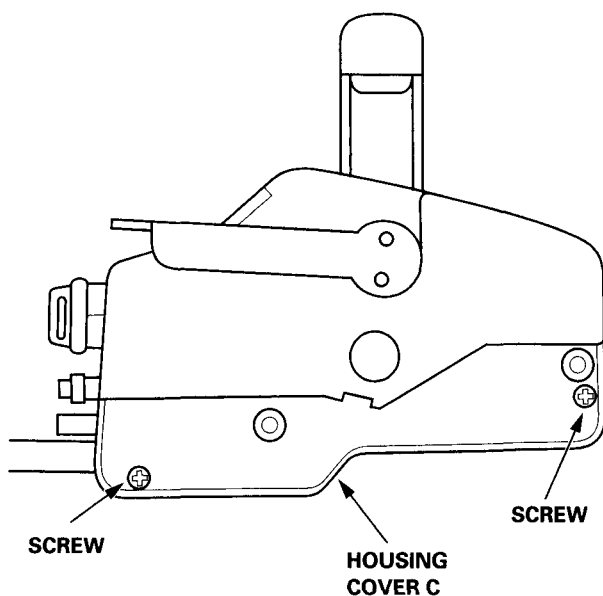
11. Install the housing cover C and tighten the two screws. Do not overtighten the screws. **TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)**



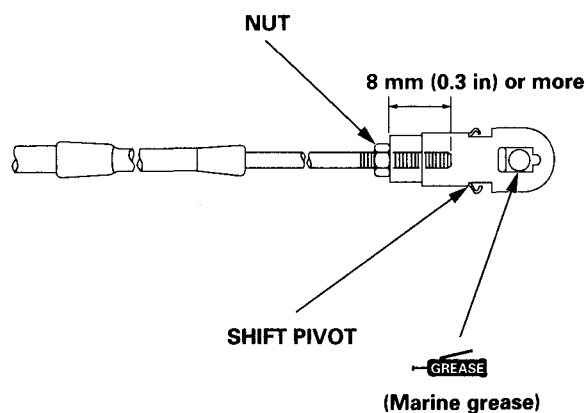
Cable Connection

Route and connect the control cables to the remote control box before connecting them to the motor.

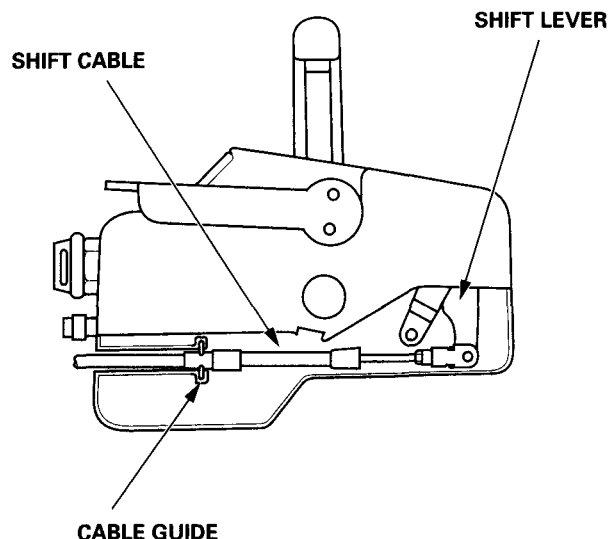
1. Remove the two screws and remove the housing cover C.



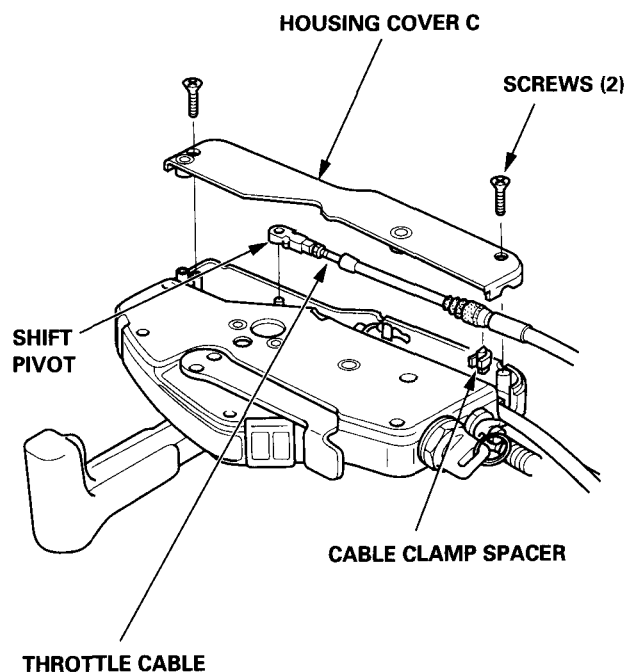
2. Screw in the nut and the shift pivot on the control box side of the control cable to the position shown. Screw in the shift pivot 8 mm (0.3 in) or more from the end of the control cable and tighten the lock nut securely. Apply marine grease to the joint of the shift pivot.



3. Aligning the groove in the shift cable with the cable guide, connect the shift cable to the control box.
4. Connect the shift pivot to the shift lever.



5. Install the cable clamp spacer.
6. Install the throttle cable by aligning the groove in the cable with the cable guide.
7. Connect the shift pivot to the shift lever.
8. Install the housing cover C with the two screws.

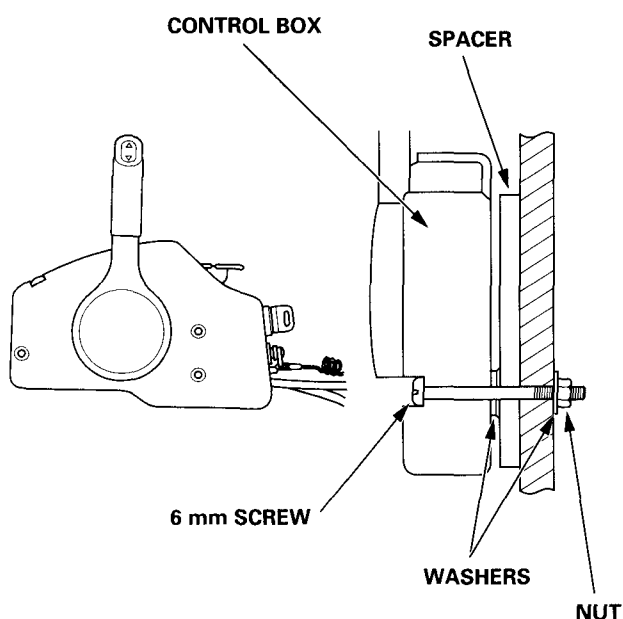


Control Box Installation

Side Mount Control Box

This control box is designed to be mounted on the starboard side. When it is mounted on the port side, reverse the control lever installation for the port mount type (see page 18). Set a spacer between the control box and the boat to obtain the clearance for operation of the lever. Connect the control cable to the control box before installing the control box.

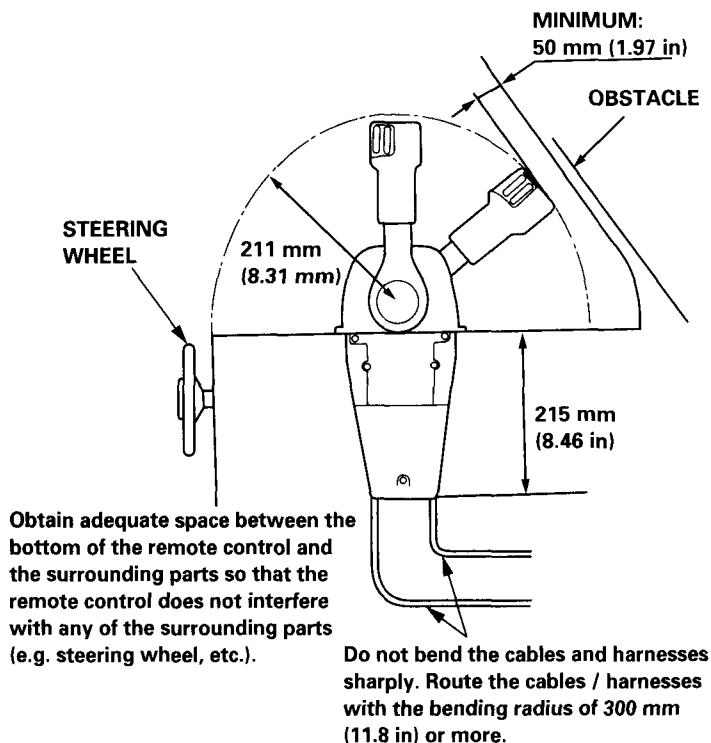
1. Select the control box installation position for boat and suitable type of the control box.
Recommended installation position:
 - Convenient for the control lever operation
 - Free from interference or restriction in routing the cables and harnesses between the control box and the outboard motor.
 - Near a corner of the driver's seat.
 - Underside of the control box is level with the upper surface of the seat.
2. Set the remote control box at the installation position and mark the drilling points for the control box mounting screws.
3. Drill at the marked points using the 7 mm-diameter drill.
4. Connect the control cables to the remote control box (see page 22).
5. Install the remote control box using the washers, nuts and the screws.
6. Set the spacer and washers between the remote control box and the mounting surface on the boat as shown to obtain the clearance for smooth operation of the control lever.
7. Install the control box with the control lever set in the neutral position.



Top Mount Control Box

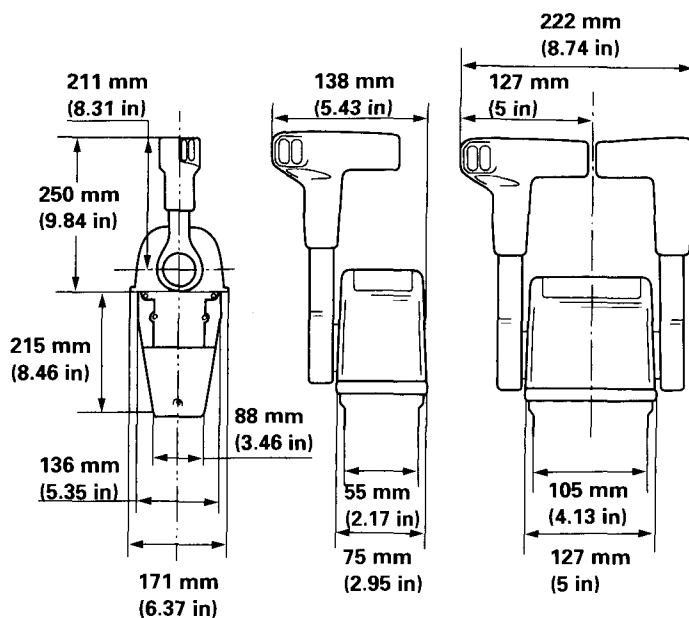
Select the remote control installation position on the boat.

- Install the remote control in the position that allows proper remote control lever operation, and where the cables and harnesses can be routed properly without strain between the remote control and the outboard motor.



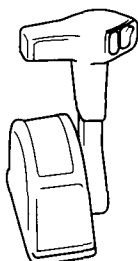
Recommended Installation Position

See the following drawings for the space necessary to install the remote control.



- Both the single and the dual lever type remote controls are available in the right-hand handle type and the left-hand handle type respectively. Select the correct type for the boat.

**LEFT-HAND HANDLE
SINGLE LEVER TYPE**

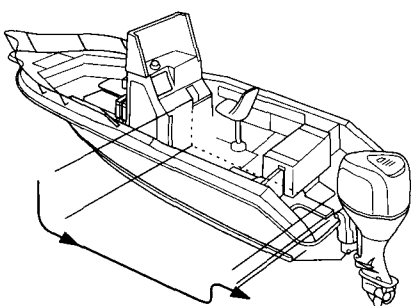


**RIGHT-HAND HANDLE
SINGLE LEVER TYPE**



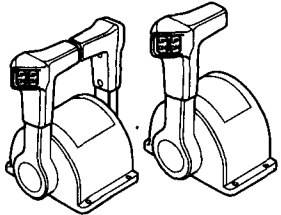
Control Cable Routing

- Top mount control:**
Measure the control cable routing length along the actual cable route, and add 300 – 450 mm (11.8 – 17.72 in) to the measurement.
- Dual mount remote control:**
Measure the control cable routing length to the respective outboard motors.



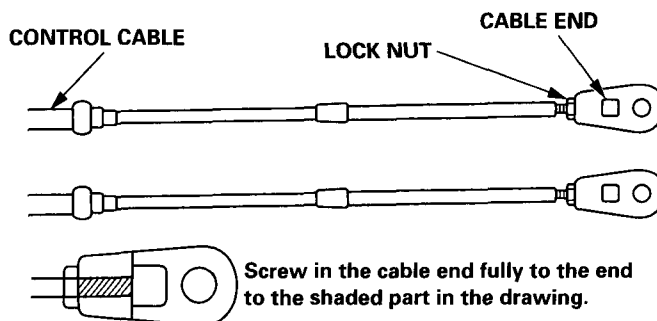
NOTICE

- Bending the control cable sharply (i.e. with small bending diameter) will increase the remote control lever resistance, which will cause the remote control to fail. Cable bend diameter must never be less than 600 mm (24 in).
- If the cable loop is too small at the motor end, there will be an increase load on the control lever operation resulting in a shorter service life of the cable and controls. The control cable loop at the motor end should be long enough to provide unrestricted outboard motor movement when it is tilted up / down and steered.

Remote Control and Control Cable matching table	
Remote Control	Control Cable
TOP MOUNT TYPE 	TELEFLEX UNIVERSAL OR MORSE 33C CABLE 

33C Cable and Cable End Installation

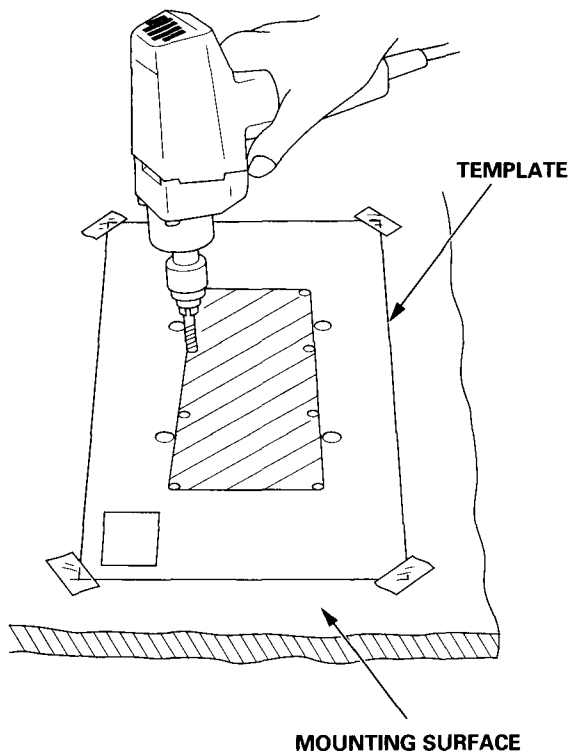
- Screw on the cable end over the threaded part at the end of the control cable and secure with the lock nut not to allow the cable end to turn.



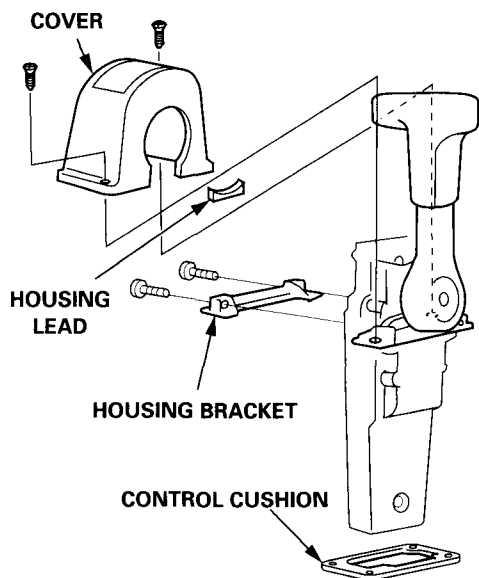
Top Mount Remote Control Installation (Right-hand handle, Single lever type)

This section explains the installation procedure of the right-hand handle single lever type remote control. The left-hand handle single lever type remote control and the left-hand / right-hand handle dual lever type remote controls can be installed in the same manner.

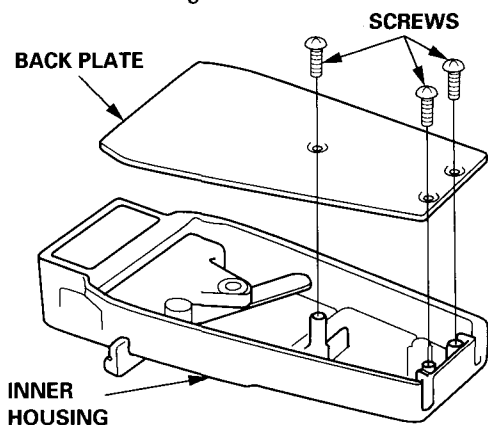
- Attach the drilling template (include in kit of the remote control box) to the remote control mounting surface using pieces of adhesive tape.
- Drill the installation holes and cut out the center.
- Install the control cushion around the opening and spacer (if used).
- Pass the remote control wire harness and the control cables along the route properly.



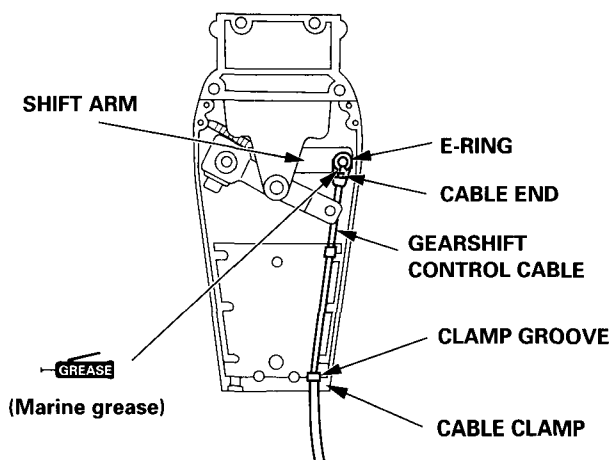
5. Remove the cover and the other parts as shown.



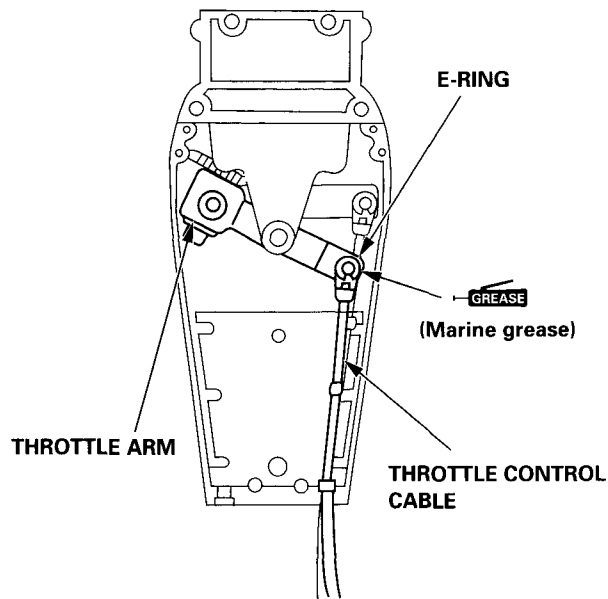
6. Remove the screw and remove the back plate from the inner housing.



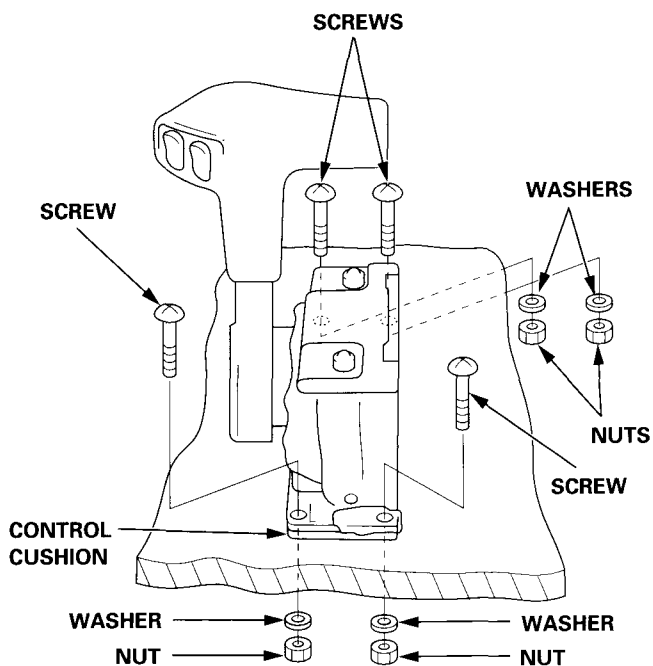
7. Apply marine grease to both the shift and throttle pins at the end of each arm.
 8. Install the gearshift control cable groove in the housing clamp groove. Insert the cable end into the pin at the end of the shift arm, and secure with an E-ring.
 9. Insert the cable clamp spacer in the clamp groove.



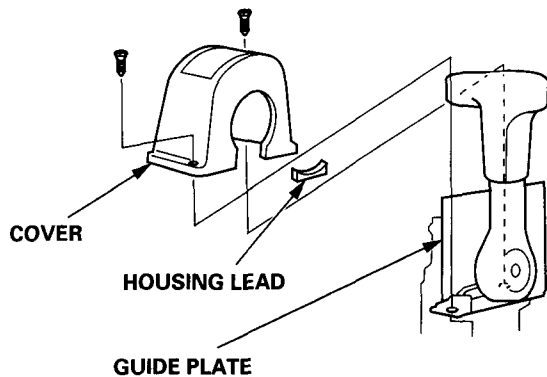
10. Apply marine grease to the throttle cable pin where it connects to the throttle arm.
 11. Connect the throttle control cable to the throttle arm, in the same manner as the gearshift control cable, with an E-ring.



12. Install the back plate and the housing bracket in the reverse order of removal.
 13. Install the remote control as shown. Be sure to connect the switch wire to the remote control wire harness before installation.

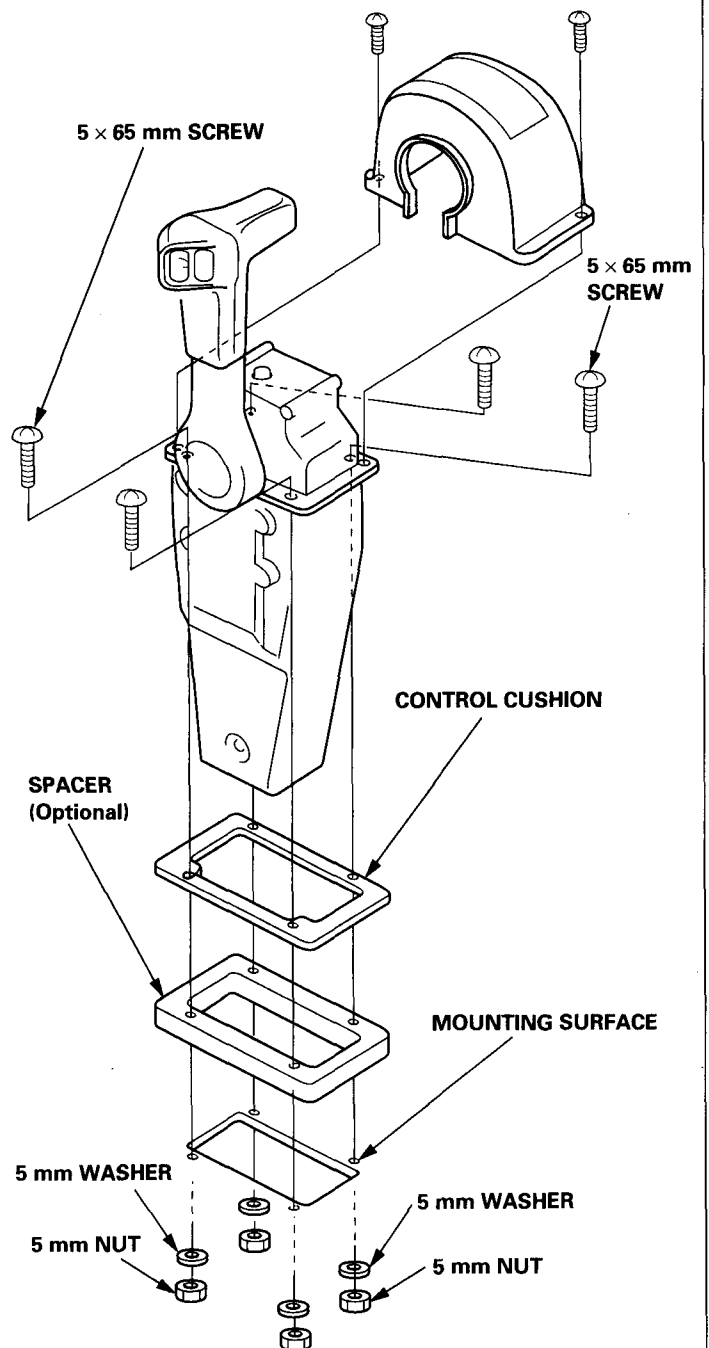


14. Use the guide plate (provided with the kit) and install the cover and the housing lead. Follow the instructions on the guide plate carefully.



Spacer Installation (Optional equipment)

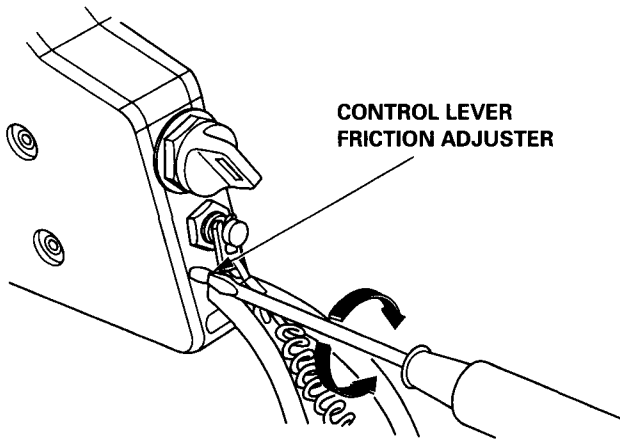
Install the spacer, if necessary, between the control cushion and the mounting surface as shown, and secure with the 5 × 65 mm screws, 5 mm washers and 5 mm nuts (provided with the spacer).



Control Lever Friction Adjustment

Side Mount Control Box

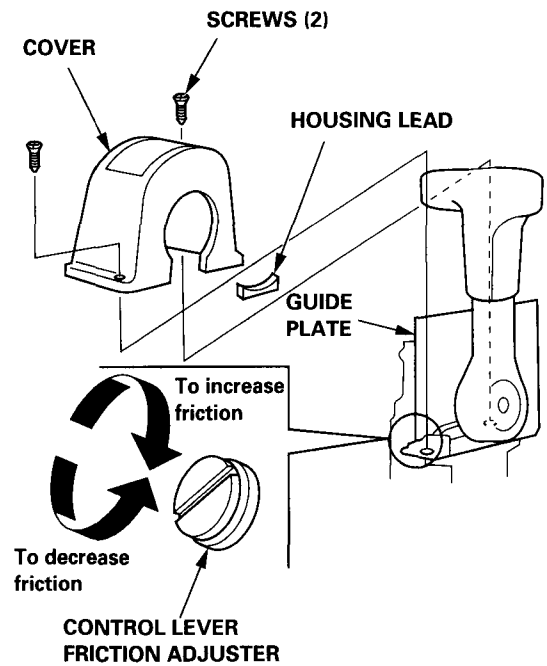
Adjust the friction by turning the control lever friction adjuster.



Top Mount Control Box

Adjust the friction by turning the control lever friction adjuster.

1. Remove the two screws, cover and the housing lead.

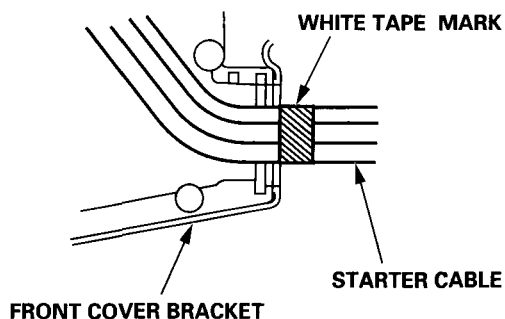


2. Adjust the friction by turning the control lever friction adjuster
3. After adjusting, install the housing lead, cover and the two screws securely.

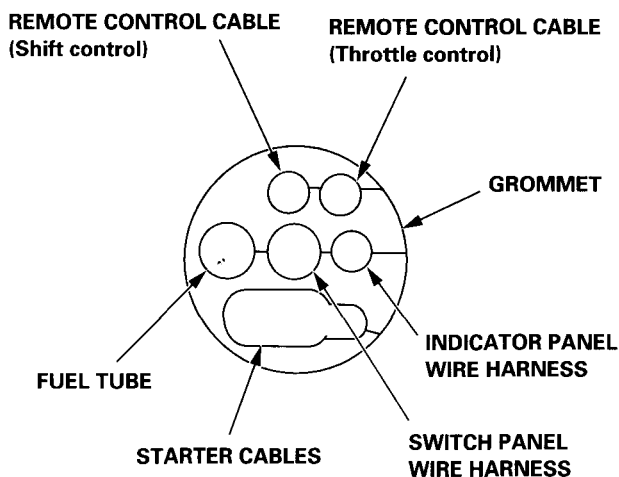
CABLE/ELECTRICAL CONNECTIONS (motor side)

Route and connect the control cables to the remote control box before connecting them to the motor.

1. Route the starter cable to the front cover bracket.
 - Position the white tape mark on the starter cable aligns with the edge of the front cover bracket.

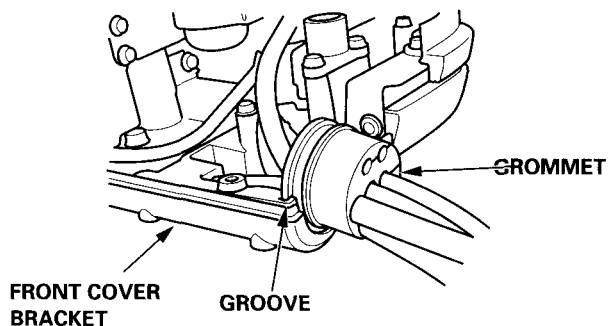


2. Pass the fuel tube, indicator panel wire harness, starter cables, switch panel wire harness through the grommet.

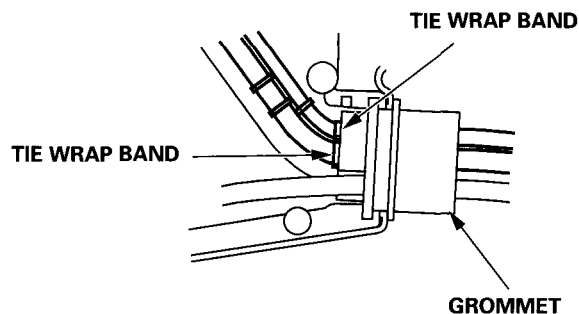


View from outside

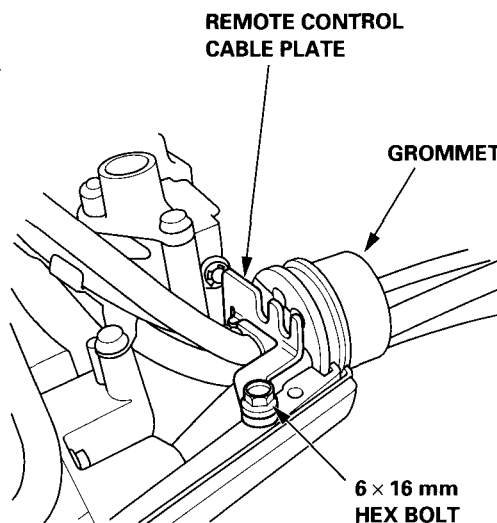
3. Install the grommet by aligning it with the groove in the front cover bracket.



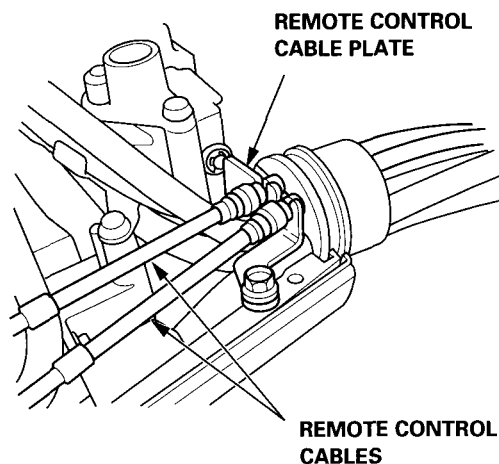
4. Position the tie-wrap band on the switch panel wire harness and indicator panel wire harness at the inside of the grommet.



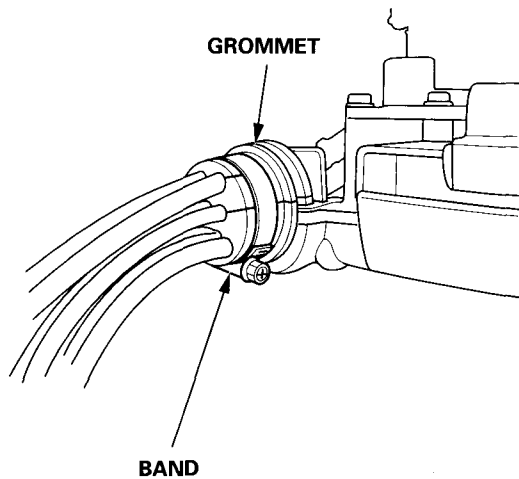
5. Install the remote control cable plate with the 6 x 16 mm hex bolt.



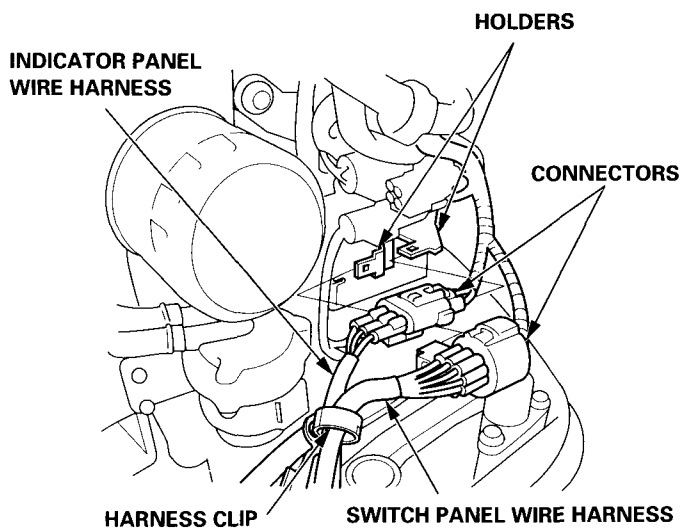
6. Install the remote control cables by aligning it with the groove in the remote control cable plate.



7. Tighten the grommet with the band securely. Make sure the fuel tube is not pinched by the grommet.

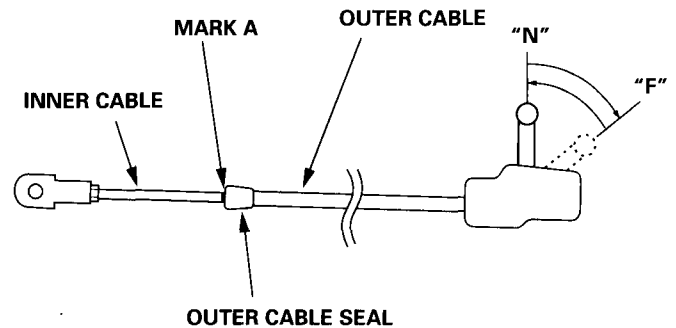


8. Connect the main wire harness 14P connector to the switch panel wire harness connector and the 3P connector to the indicator panel wire harness connector, then attach them to the connector holders.
9. Clamp the switch panel wire harness and the indicator panel wire harness with the harness clip.

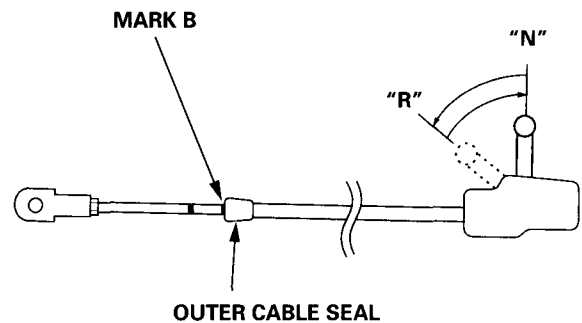


Shift Cable Connection

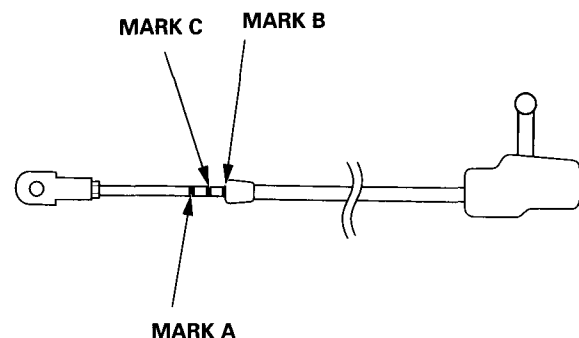
1. Install the shift pivot to the remote control cable.
2. Move the control lever to the full forward "F" position.
3. Then slowly return the control lever to the neutral "N" position, and make a mark (A) on the inner cable at the end of the outer cable seal as shown.



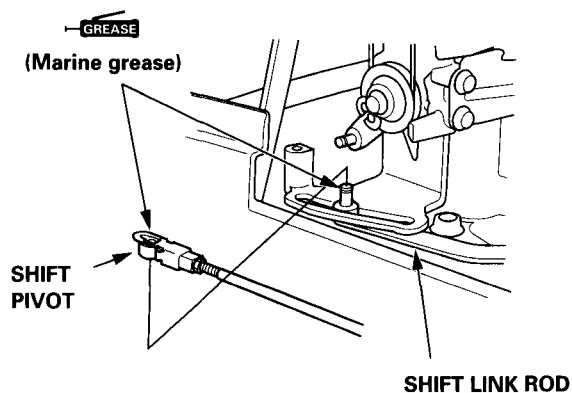
4. Move the control lever to the full reverse "R" position.
5. Then slowly return the control lever to the neutral "N" position, and make a mark (B) on the inner cable at the end of the outer cable seal as shown.



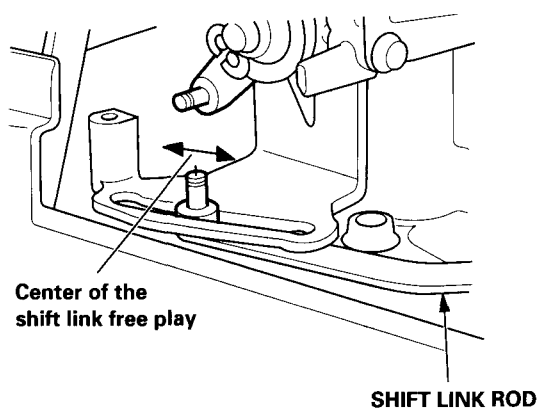
6. Make a mark (C) at the center between the A and B marks.



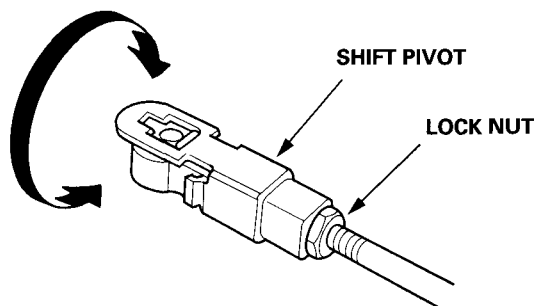
7. Apply marine grease to the joint hole of the shift pivot and shift link.
8. Adjust the shift pivot until it will attach to the shift link.
9. Attach the shift pivot to the shift link, then tighten the lock nut securely.



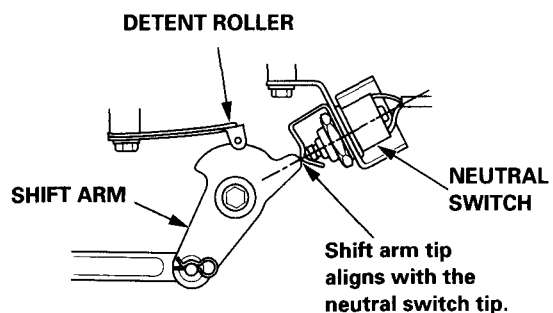
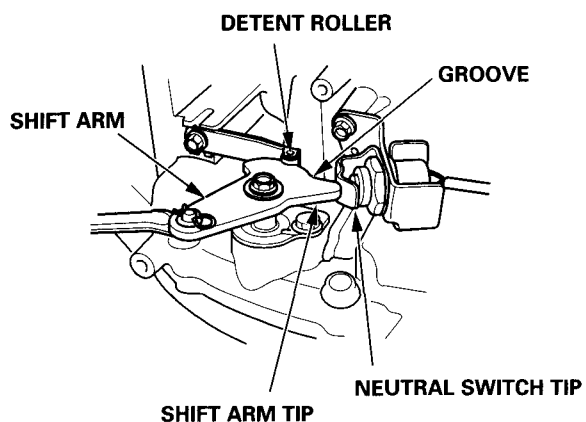
10. Make sure that the shift pivot is in the center of the shift link joint hole, adjust by turning the shift pivot if necessary.



11. If necessary, loosen the lock nut and turn the shift pivot for adjusting. After adjusting, tighten the lock nut securely.



12. Make sure that outboard motor in the neutral position; shift arm tip aligns with the neutral switch tip and the detent roller is set in the groove in the shift arm.



13. After attaching the shift cable to the shift link, check for smooth operation by moving the remote control lever to forward and reverse positions.

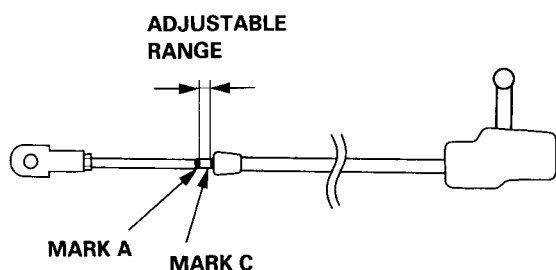
14. Make sure that the shift link moves smoothly and returns to the neutral detent position when the remote control lever is returned to the neutral.

CAUTION:

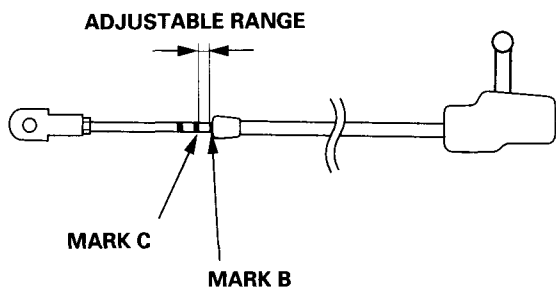
If it is hard to shift, turn propeller shaft. Shifting with force will damage the shift mechanism.

If shift arm moves smoothly and neutral detent aligns, tighten the cable lock nut securely.

- If the shift position is not in neutral position when the shift lever moves from forward position to neutral position, loosen the lock nut of the shift pivot and turn the shift pivot close to mark (A). After adjusting, tighten the lock nut.

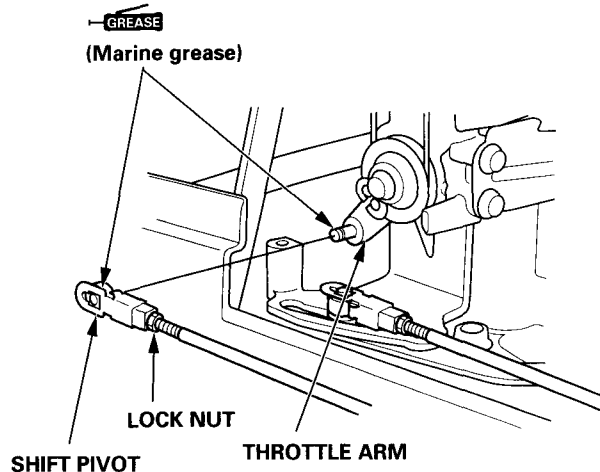


- If the shift position is not in neutral position when the shift lever moves from reverse position to neutral position, loosen the lock nut of the shift pivot and turn the shift pivot close to mark (B). After adjusting, tighten the lock nut.

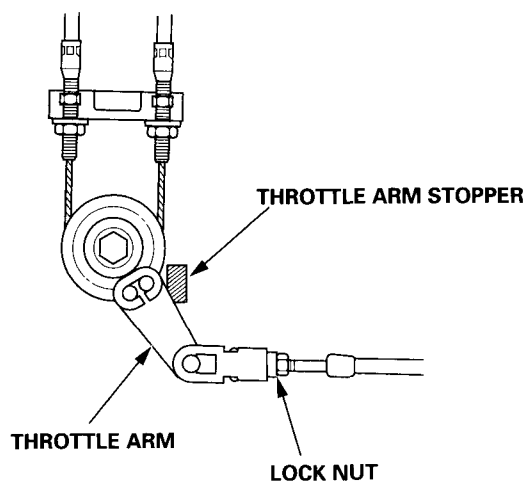


Throttle Cable Connection

1. Apply marine grease to the joint hole of the shift pivot and throttle arm link.
2. Adjust the shift pivot until it will attach to the throttle arm link.
3. Install the shift pivot to the throttle arm link, then tighten the lock nut securely.

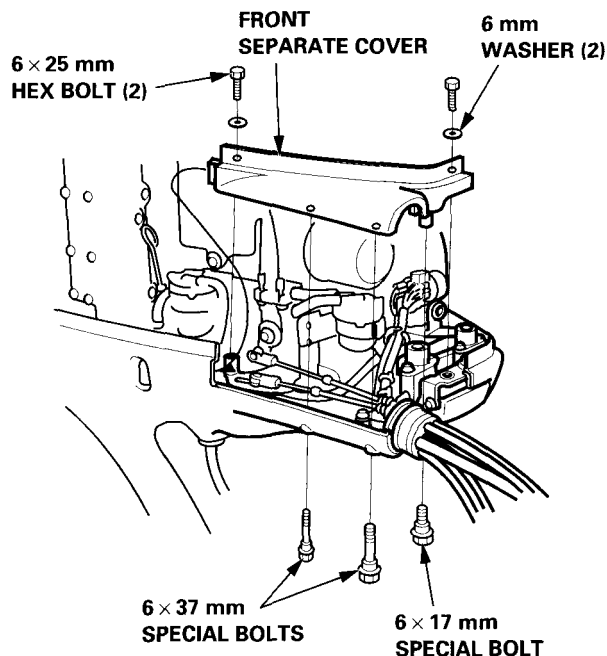


4. Move the remote control lever to the full throttle position.
5. Make sure that the throttle arm contacts the throttle arm stopper. Adjust by turning the shift pivot if necessary.
6. After adjustment, recheck and tighten the lock nut.

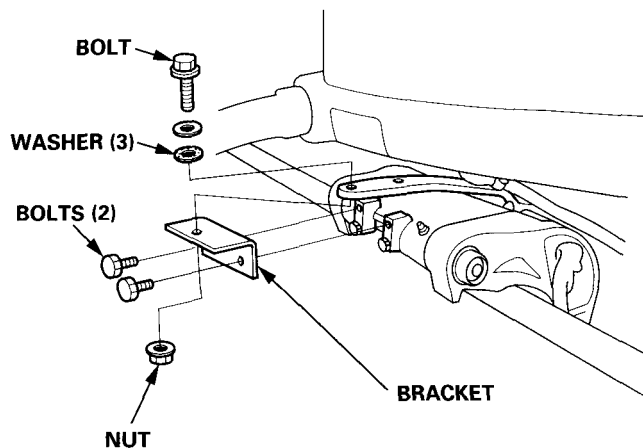


Front Separate Cover Installation

1. Install the front separate cover and tighten the bolts securely.

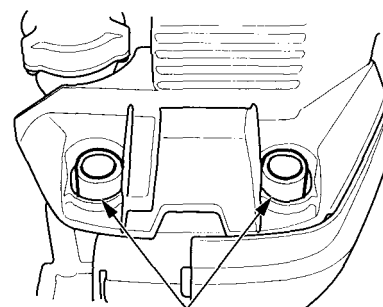
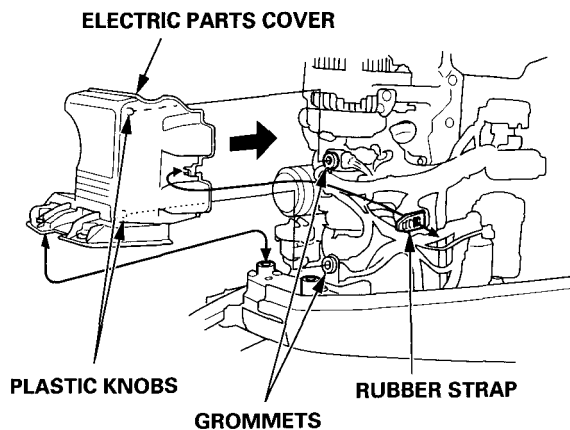


2. After installing the cables and wire harnesses to the motor, remove the bolts, nut and the bracket from the steering arm.



Electric Parts Cover Installation

1. Install the cover lightly so that the plastic knobs align with the holes of the grommets.



ENGINE COVER MOUNTING BOSSSES
(check for proper alignment with electrical parts cover)

2. Install the electrical parts cover and secure with the rubber strap. Make sure the electrical parts cover is properly aligned with the engine cover mounting bosses.

NOTICE

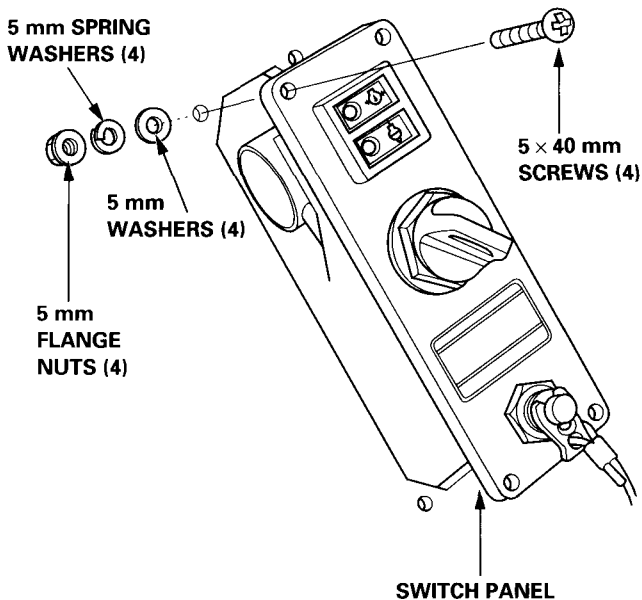
- To install the cover securely, make sure the remote control cable, switch panel wire harness and the indicator wire harness are installed securely.
- If the electrical parts cover is pushed hard and the plastic knobs are not aligned with the grommets, the plastic knobs may break.
- The electrical parts cover must be installed correctly to allow the engine cover to insert into the engine cover mounting bosses.

SWITCH PANEL/INDICATOR PANEL

Switch Panel Installation

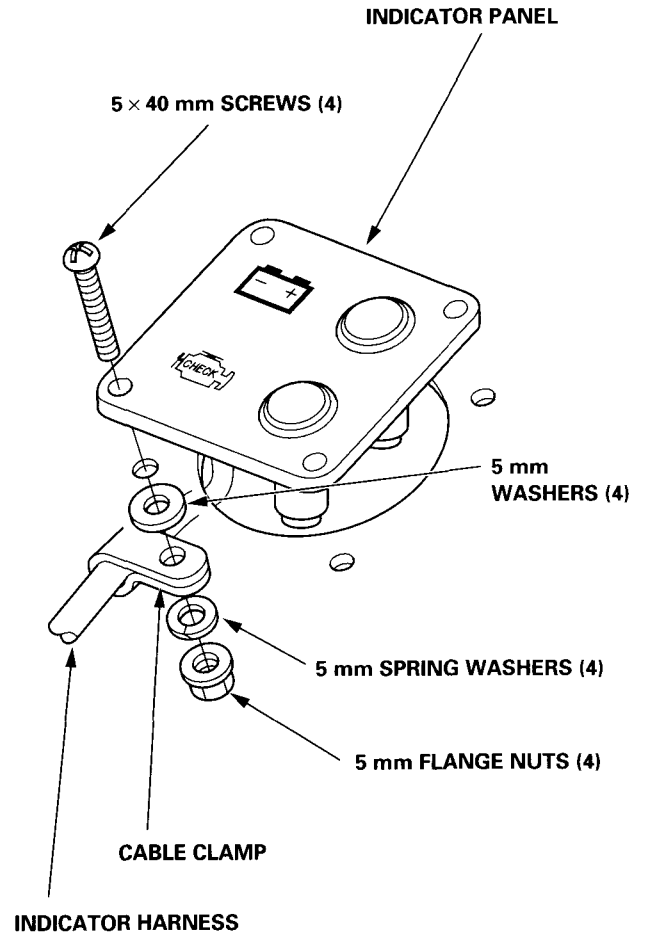
When the panel mount control box or the top mount control box is used, install the switch panel on the boat at the position near the driver's seat.

1. Determine the switch panel installation position. It should be near the driver's seat where the switch panel does not interfere with the driving operation.
2. Attach the template shown at the end of this manual at the switch panel installation position.
3. Drill the holes according to the indication on the template.
4. Install the switch panel by tightening the four 5 × 40 mm screws, four 5 mm washers, four 5 mm spring washers, and the four 5 mm flange nuts.



Indicator Panel Installation

1. Determine the indicator panel installation position.
2. Attach the template shown at the end of this manual at the indicator panel installation position.
3. Drill the holes according to the indication on the template.
4. Install the indicator panel by tightening the four 5 × 40 mm screws, four 5 mm washers, four 5 mm spring washers, and the four 5 mm flange nuts.
5. Clamp the indicator panel wire harness with the cable clamp to prevent damage to the harness caused by vibration.



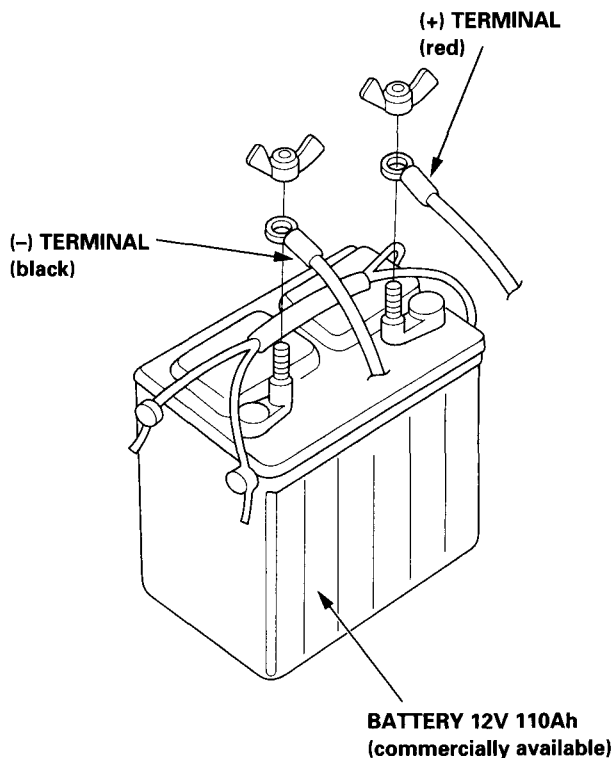
BATTERY (not included)

Minimum requirements:

12V – 110 Ah marine cranking battery

If boat is equipped with dual outboard motors, two batteries must be installed, one for each motor.

In the event that a battery failure makes it necessary to temporarily use one battery for two motors, disconnect the engine ground wire from between the two switch panel.



- Install the battery in the correct size corrosion-resistant battery box, in a dry, well-ventilated location protected from water and direct sunlight.
- Connect the positive (+) battery cable first, then connect the negative (-) battery cable. Tighten cable nuts securely.
- Coat the battery terminal ends with the non-conductive grease. Cover the battery positive (+) terminal.
- Secure the corrosion-resistant battery box properly to the boat. To keep potential sparks away from the fuel tank, do not secure or place battery near the fuel tank.

Wire Connection

Route and connect the wire harness properly, as shown in the wiring diagram.

Use switch panel wire harness and indicator panel wire harness.

Connect the connectors securely. If a terminal is oxidized or corroded, remove the oxidation or corrosion with a nonconductive plastic scrub pad or contact cleaner before reconnecting it.

The switch panel wire harness is 5 m (16.4 ft) in length.

If this is too short to route, we recommended that you use the extension harness (2 m/6.6 ft in length). Note that the extension harnesses can be used up two harnesses with the total length 9 m (29.7 ft) or below.

If the indicator panel wire harness is too short to route, use the extension harness (5 m/16.4 ft in length) for indicator panel wire harness.

Make sure insulators surround their connectors completely and that the ends are not folded up.

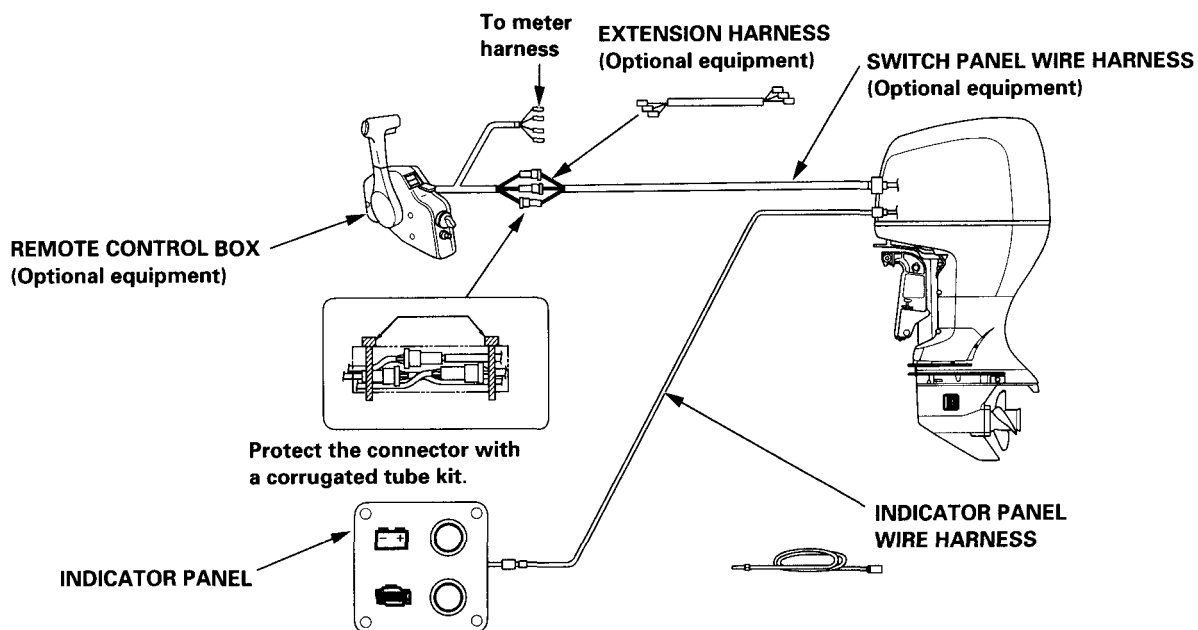
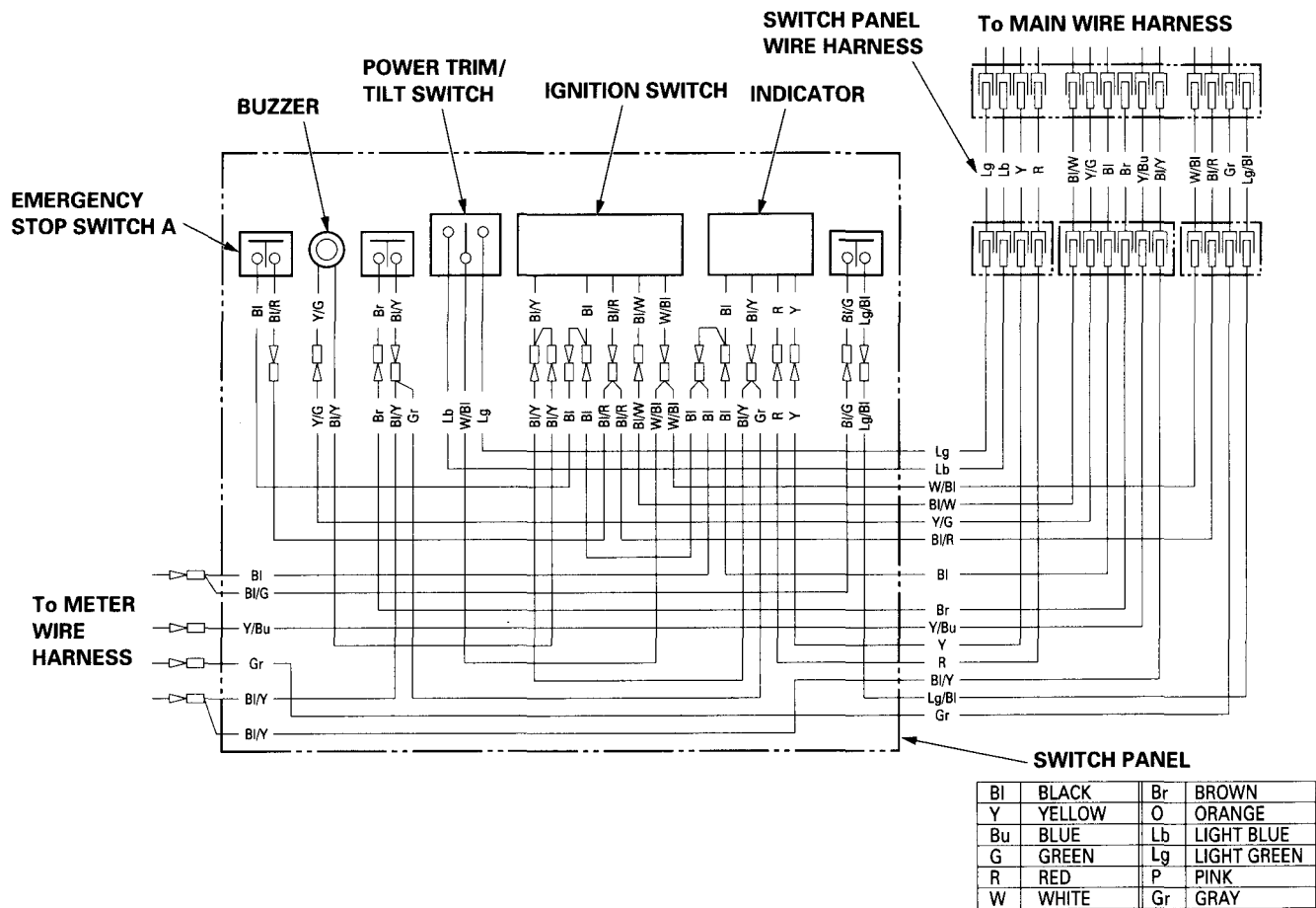
Do not break the wire harness coverings. If the covering of a wire is broken, either repair it with electrician's tape, or replace it.

Attach unused terminals to the adjacent main harness with a piece of vinyl tape so that the terminals don't interfere with the surrounding parts.

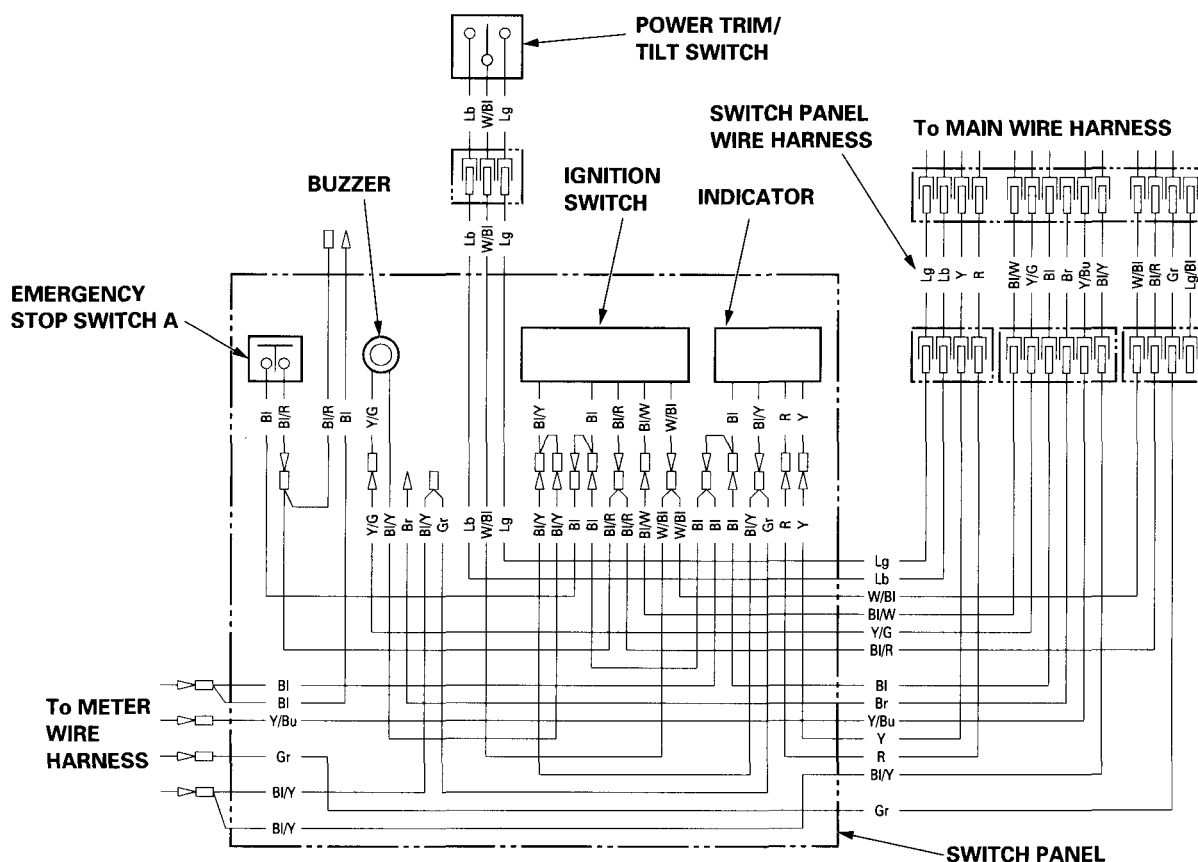
Connect each wire properly, as shown in the wiring diagram.

After each wire and harness is connected, check for proper connections by referring to the wiring diagram.

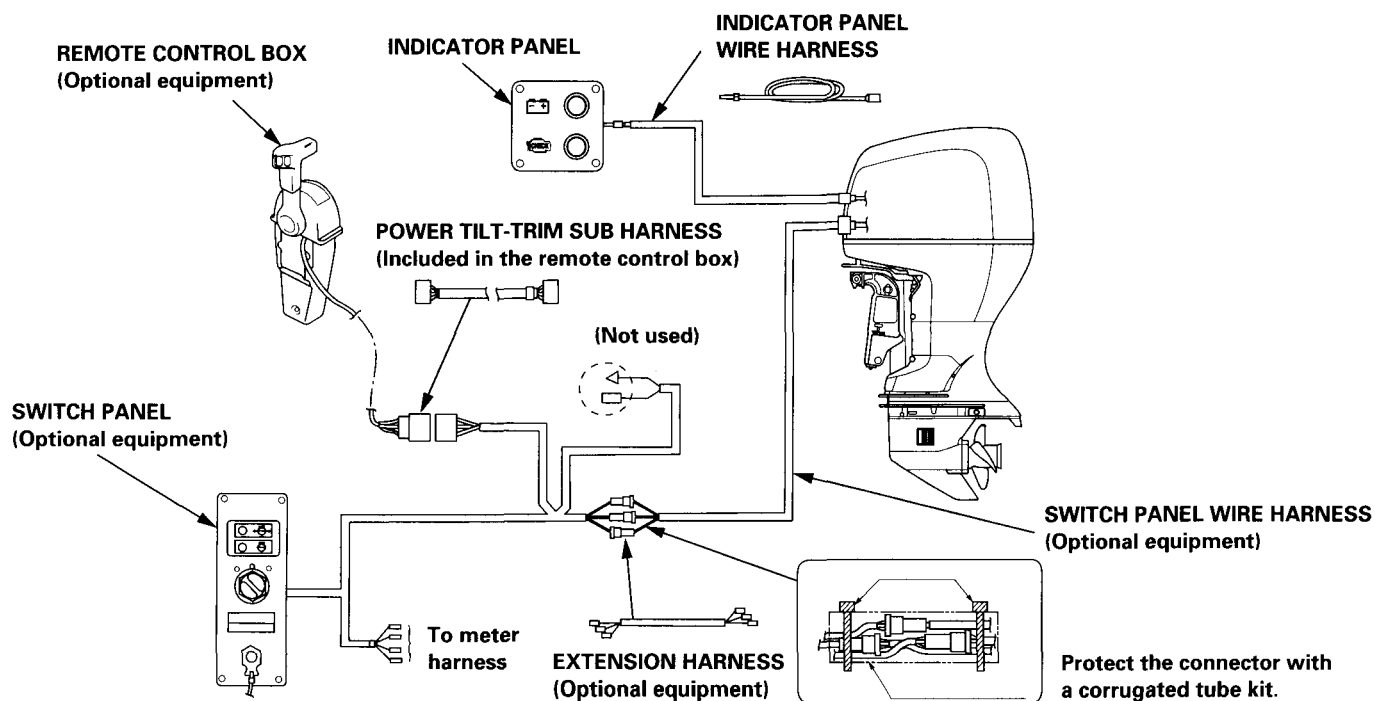
Side Mount Control Box (Optional equipment)



Top Mount Control Box (Optional equipment)



Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY



METERS

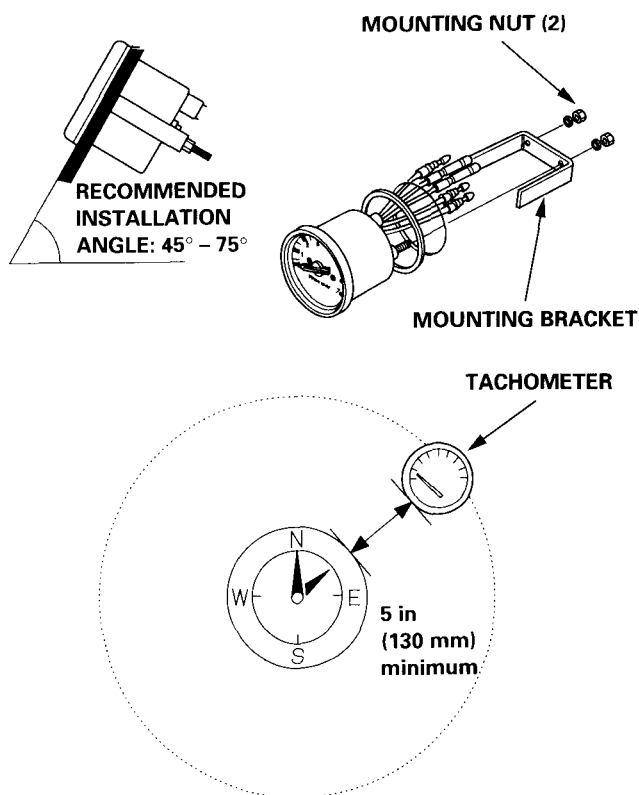
Meter Installation

Meters and other instruments should be installed on the instrument/mounting panel. If any other location is selected, it will be necessary to use a mounting plate with a thickness of 2 – 11 mm (1/16 – 7/16 in).

If mounting plate thickness exceeds 11 mm (0.4 in), the mounting bracket must be modified accordingly. Tighten the mounting nuts evenly on both sides. Meter installation angle should be within 45° – 75°. If the boat has a magnetic compass, install the tachometer a minimum of 130 mm (5 in) away from the compass.

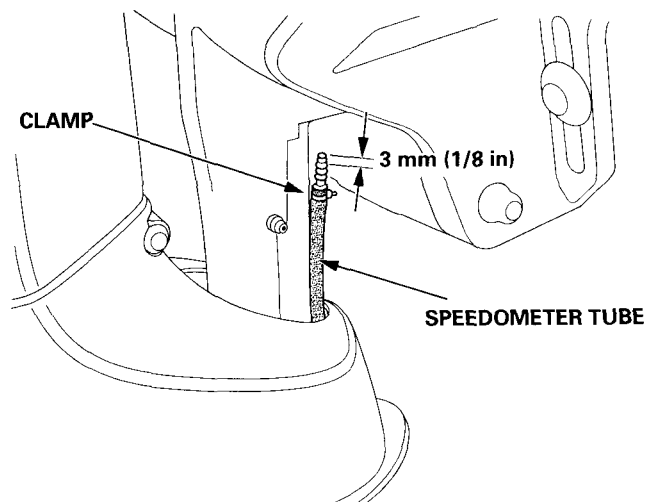
Installation hole diameter:

Tachometer:	Ø 80.5 mm (3.2 in)
Trim meter:	Ø 52.5 mm (2.1 in)
Speedometer:	Ø 86.5 mm (3.4 in)
Hour meter:	Ø 54.0 mm (2.1 in)
Voltmeter:	Ø 54.0 mm (2.1 in)

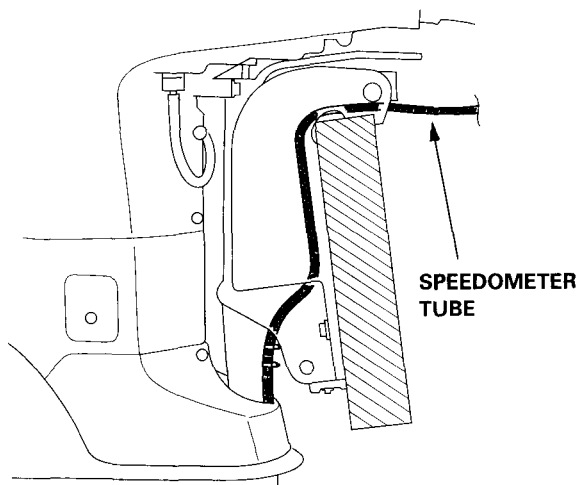


Speedometer Tube Installation

- Cut off about 3 mm (1/8 in) of the nipple end of the outboard motor sensor, then insert it into the speedometer tube. Attach securely with a clamp.



Route the tube through the clamp bracket as shown. Secure the tube to the boat hull in such a way that the tube cannot be cut, bent or crushed. Then, route the tube to the speedometer. If the sensor opening is plugged with salt or a foreign object, remove it with a piece of wire, etc. When the boat is stored, remove the water in the sensor tube. Before the final tube attachment, make sure the tube is not pulled too tight or crushed when the motor is tilted UP or DOWN or turned fully to the right or left.



Meter Wire Connection

Route and connect the wire harness properly, as shown in the wiring diagram.

Use Meter Wire Harness A and B for meter.

Connect leads and terminals securely. Make sure terminals are waterproof.

Use 19-gauge (1.25 mm diameter) wire.

Connect the connectors securely. If a terminal is oxidized or corroded, remove the oxidation or corrosion with a nonconductive plastic scrub pad or contact cleaner before reconnecting it.

Make sure insulators surround their connectors completely and that the ends are not folded up.

Do not break the wire harness coverings. If the covering of a wire broken, either repair it with electrician's tape, or replace it.

Attach unused terminals to the adjacent main harness with a piece of vinyl tape so that the terminals don't interfere with the surrounding parts.

Connect each wire properly, as shown in the wiring diagram.

After each wire and harness is connected, check for proper connections by referring to the wiring diagram.

Connect the battery and turn the main power on to check for proper operation.

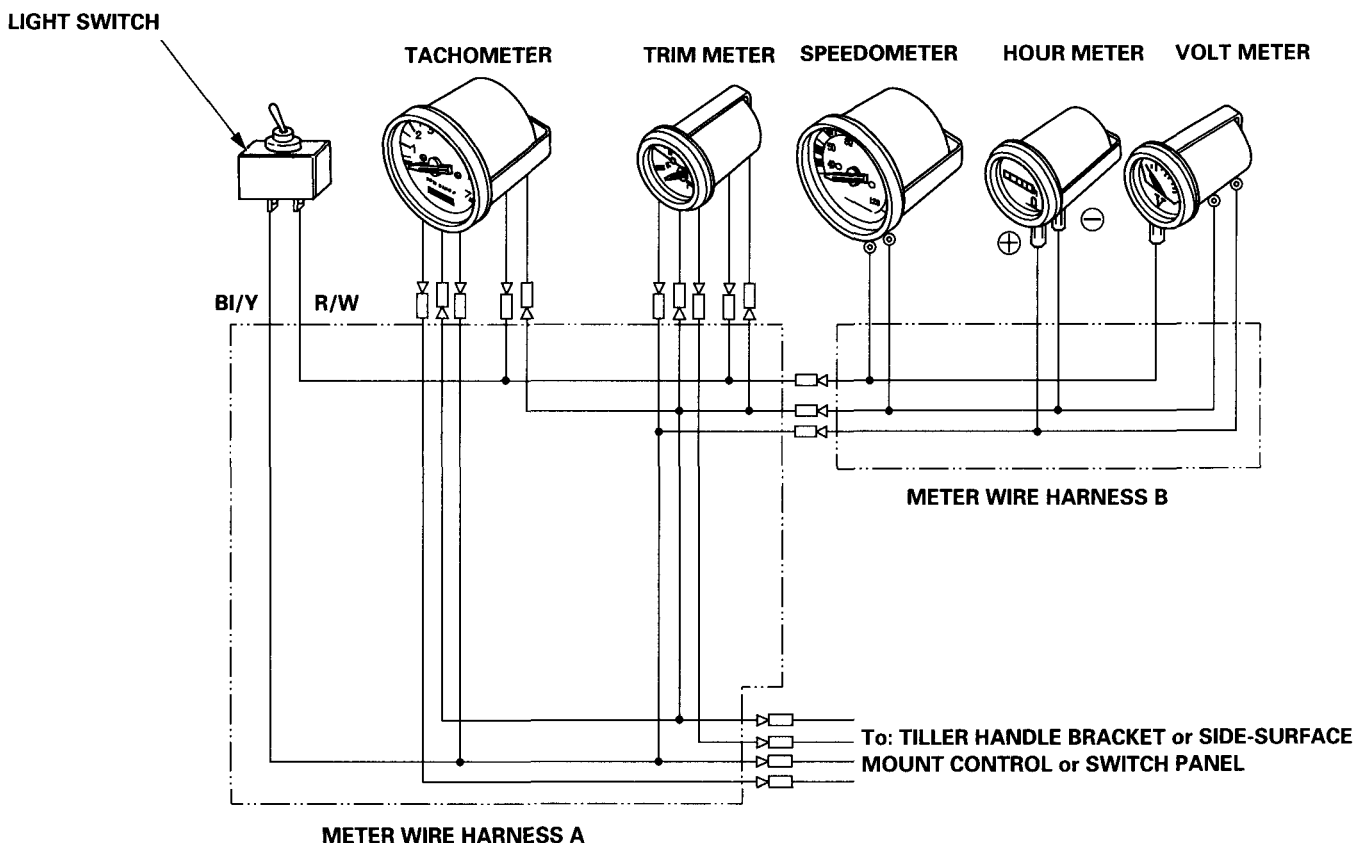
This is an independent engine-control system. Do not attempt to integrate it with the boat's system or other accessories, except for the instrument light switch.

There are three ways to illuminate the instrument lights:

- Connect a commercially available switch (Teleflex 1A 16970 or equivalent) between the BI/Y and R/W terminals.
- Connect 12 V (+) from the boat's instrument lights to the R/W terminal.
- Connect the BI/Y and R/W terminals together for "lights on" with the engine switch.

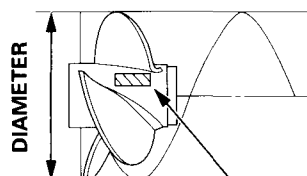
Meter Wiring Diagram

See wiring diagram at the end of this manual for wire color.

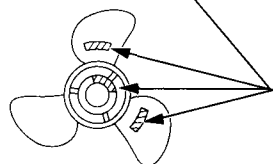


PROPELLER

Propeller Selection



PITCH



PROPELLER DIMENSIONS
(Diameter x Pitch)

Pitch-Advanced Distance During One Turn (Apparent Advanced Distance)

$$\text{Pitch Ratio} = \frac{P}{D} \quad \begin{array}{l} P: \text{Pitch (mm)} \\ D: \text{Outer Diameter of Propeller} \end{array}$$

$$\text{Slip Ratio} = \frac{(\text{Visual Advanced Distance} - \text{Measured Distance})}{\text{Visual Advanced Distance}} \times 100$$

During running; the actually advanced distance is reduced by about 10 – 15 % due to propeller display pitch.

Recommended full throttle engine speed range:

BF200A: 5,000 – 6,000 rpm

BF225A: 5,000 – 6,000 rpm

Engine speed varies with propeller size and boat condition. A propeller must be selected to adjust maximum engine speed to the recommended engine speed range. Using the wrong propeller can cause motor damage. The proper propeller will assure powerful acceleration, top speed, good fuel economy, cruising comfort, and engine service life.

Propeller Selection Precaution

- Outboard motor must be installed vertically in relation to boat bottom. Set moderate trim angle, and adjust power trim angle to lowest setting.
- Set trim tab, so boat will run in a straight line.
- Protect propeller from foreign objects, check regularly for damage, and/or deformation, and aquatic plants wrapped around propeller hub.
- Keep bottom clean of shells, algae froth and dirt. These will cause a significant drop in top speed.
- When doing propeller checks, select a calm day with little waves action.
- Avoid strong winds. Wind speed should be less than 15 km/h (10 miles/h).
- The boat should carry its average load (crew, load arrangement, ballast).

Select the correct propeller so that full throttle engine speed is within the recommended range.

- If the engine rpm is under the recommended rpm range, lower the propeller pitch by one size (1 to 2 inches) or more as needed.
- If the engine rpm is over the recommended rpm range, select a propeller with a pitch one size larger or as needed.
- If the following conditions exist, acceleration will improve and outboard motor service life will increase by lowering the propeller pitch.
 - Heavy loads such as crew, load, equipment, water skiing, etc;
 - High temperatures and high humidity conditions;
 - When operating at high altitude;
 - When boat bottom needs cleaning;
 - When area around gear case is obstructed;

To increase motor service life and ensure safe navigation, do not use full throttle for extended periods, but run the motor at 70 to 80 % of full throttle.

CAUTION:

If full throttle engine rpm exceeds the recommended range, it can cause increased vibration, noise, reduced boat performance, and possible engine wear damage.

If full throttle engine rpm is below the recommended range, it indicates that the engine is being overloaded.

Propeller Selection Chart

• BF200A

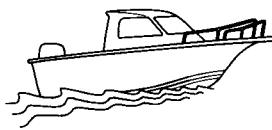
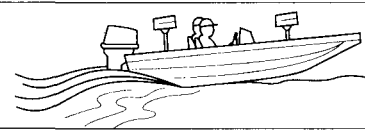
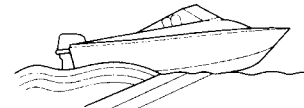
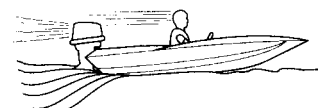
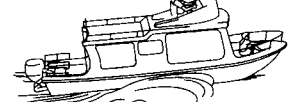
Propeller Type	Propeller Size Dia. × pitch (in)	Speed [km/h]		Speed within recommended engine speed (km/h)									
		5000 rpm	6000 rpm	30	40	50	60	70	80	90	100	110	120
AL	15 – 1/2 × 13	37	62										
	15 – 1/4 × 15	43	69										
	15 × 17	46	75										
	14 – 3/4 × 19	47	80										
	14 – 1/2 × 21	59	94										
	14 – 1/4 × 23	66	98										
SUS	14 – 1/2 × 15	38	66										
	14 – 1/4 × 17	46	76										
	14 × 19	53	85										
	14 × 21	65	96										
	14 – 1/2 × 23	71	102										
	14 × 25	81	114										

• BF225A

Propeller Type	Propeller Size Dia. × pitch (in)	Speed [km/h]		Speed within recommended engine speed (km/h)									
		5000 rpm	6000 rpm	30	40	50	60	70	80	90	100	110	120
AL	15 – 1/2 × 13	37	59										
	15 – 1/4 × 15	42	66										
	15 × 17	45	71										
	14 – 3/4 × 19	46	76										
	14 – 1/2 × 21	59	89										
	14 – 1/4 × 23	65	95										
SUS	14 – 1/2 × 15	38	62										
	14 – 1/4 × 17	45	72										
	14 × 19	52	81										
	14 × 21	64	93										
	14 – 1/2 × 23	70	99										
	14 × 25	80	110										

AL: Aluminum SUS: Stainless Steel

Boat Type and Applicable Size (Length and Weight)

Boat Type	Hull Shape (Example)	Overall length (ft)	Weight (kg) [lbs]	Example				
				Outboard motor	Overall length [ft]	Weight [kg]	Recommended full throttle speed [km/h]	
							BF200A	BF225A
Fishing boat (off shore)		17 – 35	545 – 4,765 [1,202 – 10,505]	Single	23	1,170	60	64
					23	1,405	65	68
					26	1,200	72	76
					26	2,540	57	60
				Dual	28	1,950	87	92
					31	2,450	85	90
Bass boat		17 – 21	365 – 955 [805 – 2,105]	Single	20	800	96	101
					20	450	103	108
					20	545	100	105
Center console		22 – 26	545 – 3,720 [1,202 – 8,201]	Single	23	1,125	69	73
					22	785	73	78
					24	1,200	69	73
				Dual	25	2,050	81	86
					27	1,680	89	95
Runabout		20 – 24	410 – 1,860 [904 – 4,101]	Single	22	910	71	75
					23	1,860	59	63
Water Ski		18 – 20	500 – 1,360 [1,102 – 2,998]	Single	20	545	75	80
					20	815	69	73
Deck boat		21 – 25	635 – 1,765 [1,400 – 3,891]	Single	21	1,110	59	62
					22	815	65	69
Pontoon boat		18 – 30	815 – 1,180 [1,797 – 2,601]	Single	30	1,180	49	52
					26	1,180	45	48
House boat		23 – 65	1,680 – 14,500 [3,704 – 31,967]	Single	23	1,680	39	41
					50	8,300	31	32

Propeller type

[Aluminum propeller]

Propeller size Dia. × pitch (in)	Material	Rotation
15 – 1/2 × 13	AL	STD
15 – 1/4 × 15	AL	STD
15 × 17	AL	STD
14 – 3/4 × 19	AL	STD
14 – 1/2 × 21	AL	STD
14 – 1/4 × 23	AL	STD

STD: STANDARD

[Stainless steel propeller]

Propeller size Dia. × pitch (in)	Material	Rotation
14 – 1/2 × 15	SUS	STD&CR
14 – 1/4 × 17	SUS	STD&CR
14 × 19	SUS	STD&CR
14 × 21	SUS	STD&CR
14 – 1/2 × 23	SUS	STD&CR
14 × 25	SUS	STD only

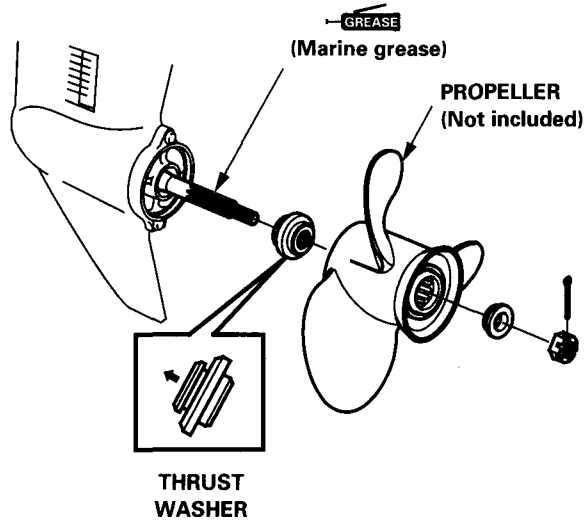
CR: COUNTER ROTATION

Propeller Installation

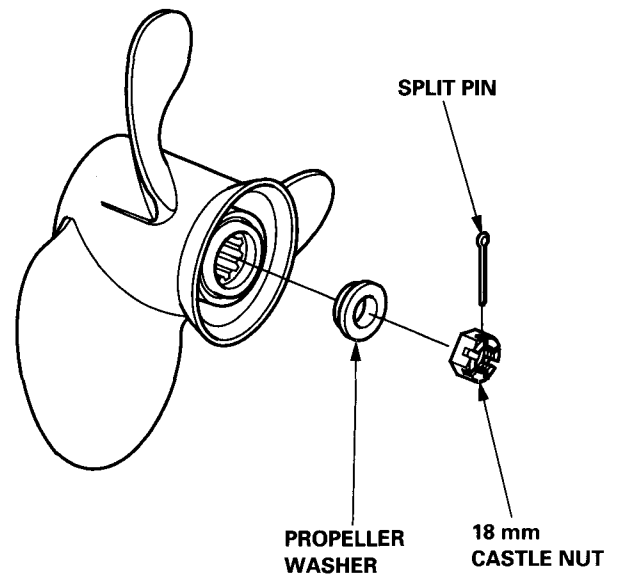
Disconnect the battery cable terminal to prevent the engine from starting accidentally.

Wear heavy gloves to protect your hands from sharp or nicked propeller blades.

1. Apply marine grease to the propeller shaft.
2. Install the thrust washer and the propeller on the propeller shaft.



3. Install the propeller washer and 18 mm castle nut.
TORQUE : 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

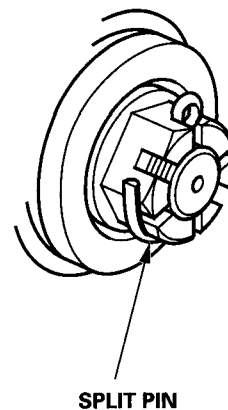


4. Tighten the 18 mm castle nut and secure with the split pin.
If the split pin does not align with the hole in the propeller shaft, adjust by turning the nut in the tightening direction. Do not exceed the maximum torque.

Maximum tightening torque:
44 N·m (4.5 kgf·m, 32 lbf·ft)

After installation, bend the split pin ends as shown to secure.

If the commercially available parts are used, select the stainless steel parts.



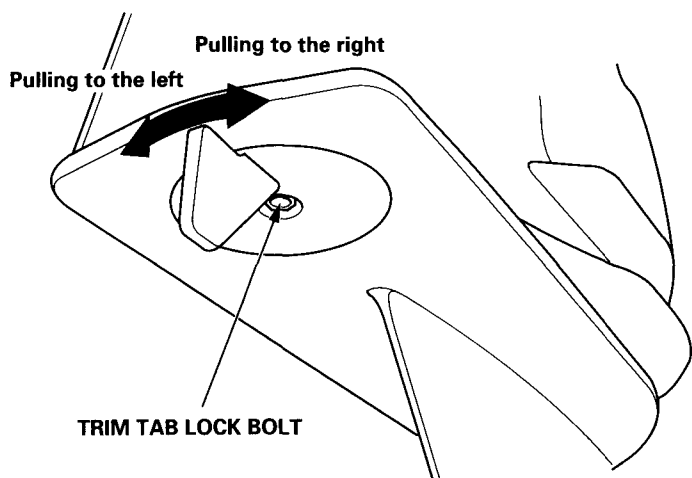
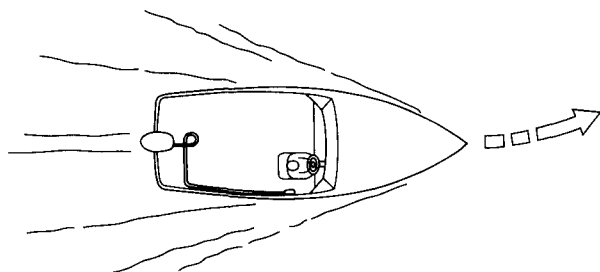
ADJUSTMENT AFTER INSTALLATION

Trim Tab Adjustment Single Motor

After the engine break-in, run the boat at full speed and check to see if the boat pulls to the left or right. Adjust the trim tab as required to ensure good and straight running characteristics.

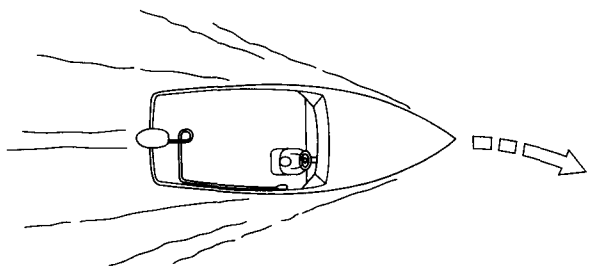
If the boat pulls to the left:

Loosen the trim tab lock bolt, and move the trim tab trailing edge to the left.



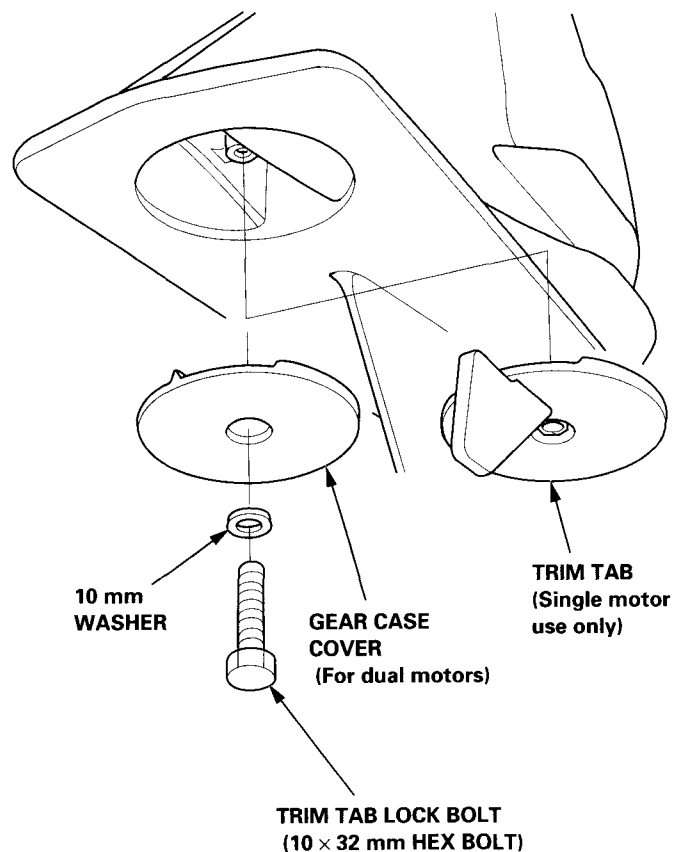
If the boat pulls to the right:

Loosen the trim tab lock bolt, and move the trim tab trailing edge to the right.



Dual Motors

1. Remove the trim tab lock bolt and trim tab from the standard rotation outboard motor.



2. Replace the trim tab to the gear case cover and tighten it with a trim tab lock bolt (10 x 32 mm hex bolt) as specified torque.
TORQUE : 34 N·m (3.5 kgf·m, 25 lbf·ft)

BREAK-IN PROCEDURE

Break-in period: 10 hours

Break-in operation allows the moving parts to wear-in evenly and thus ensures proper performance and longer outboard motor service life.

First 15 minutes:

Run the outboard motor at trolling speed. Use the minimum amount of throttle opening necessary to operate the boat at a safe trolling speed.

Next 45 minutes:

Run the outboard motor up to a maximum of 2,000 to 3,000 rpm or 10 % to 30 % throttle opening.

Next 60 minutes:

Run the outboard motor up to a maximum of 4,000 to 5,000 rpm or 50 % to 80 % throttle opening. Short bursts of full throttle are acceptable but do not operate the motor continuously at full throttle.

Next 8 hours:

Avoid continuous full throttle operation (100 % throttle opening). Do not run the outboard motor at full throttle for more than 5 minutes at a time.

For boats that plane easily, bring the boat up on plane then reduce the throttle opening to the specified break-in settings called out above.

WHEN RADIO STATION/GPS MOUNTED ON THE BOAT

The ECM and its wires are designed so that they are not affected by the external jamming, but the ECM can function erroneously when it receives the extremely strong electric wave. Check the ECM for erroneous operation whenever a radio station or a navigation system is mounted on the boat. Observe the following instructions to prevent erroneous operation.

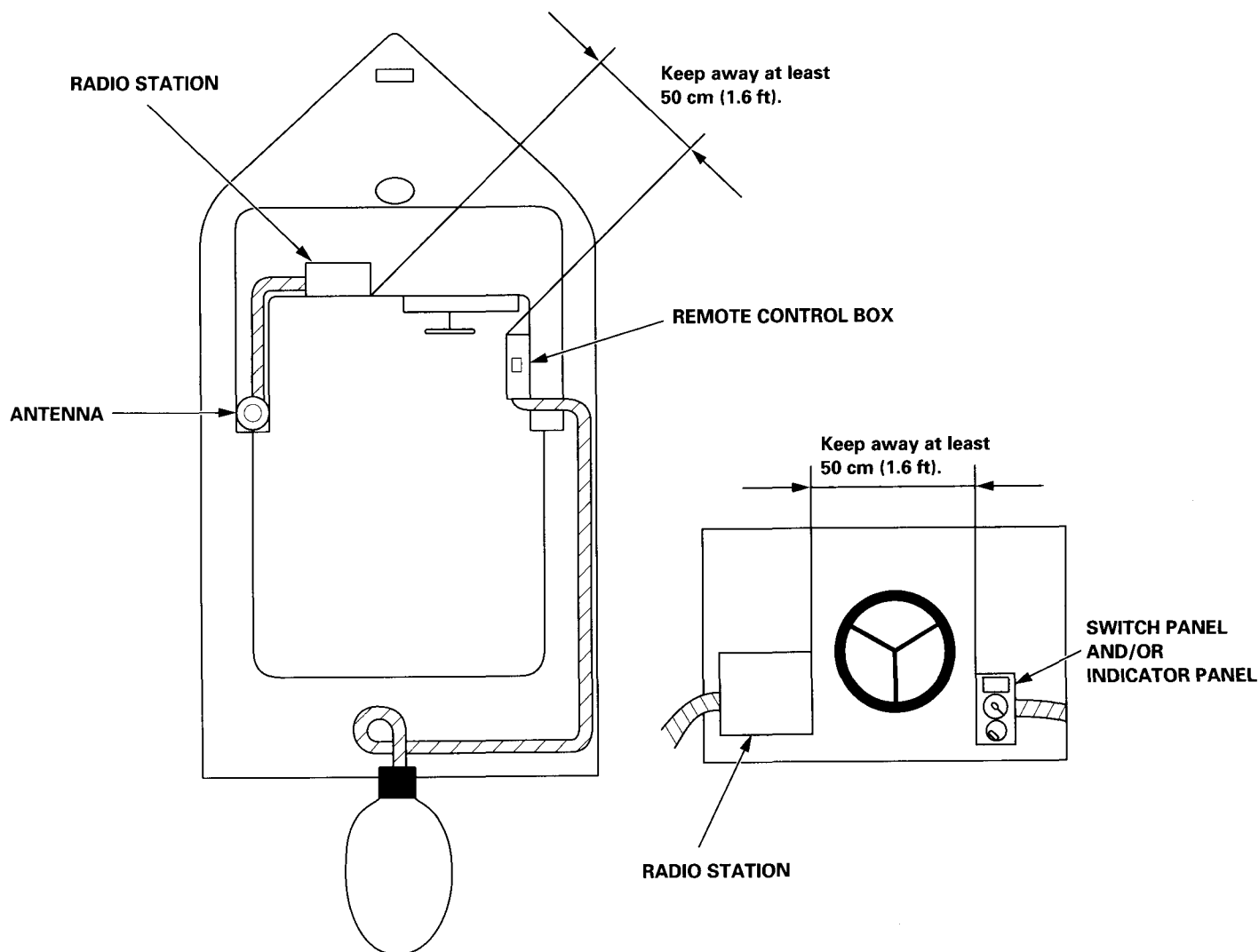
- Set the antenna and the radio station at least 50 cm (1.6 ft) or more away from the ECM, switch panel wire harness, indicator wire harness, switch panel or remote control box and the indicator panel.
- Avoid routing the antenna wire lead too long compared to the remote control wire leads.
- Do not install the radio station that does not conform with the laws and regulations concerned (10W or below).

- Set the GPS antenna and navigation unit at least 3 m (4.8 ft) or more away from the ECM.
- Ground the GPS antenna ground securely.

CAUTION:

After installing a radio station or GPS, the ECM must be inspected for erroneous operation.

(Installation example)



PRE-DELIVERY SERVICE CHECK LIST

Check all items on the following list. Refer to the Owner's Manual or Shop Manual for the specifications and the detailed procedures. Test every unit to be sure it is functioning properly.

On land

• EXTERNAL APPEARANCE

- ☐ Check for paint scratches; touch up if necessary.

• INSTALLATION LOCATION

- ☐ Check for correct installation location.
- ☐ Check outboard motor for correct installation height.
- ☐ Make sure the motor mounting bolts are tight.
- ☐ Check to be sure sealant has been supplied to the transom mounting bolt holes.

• GEAR OIL

- ☐ Check for proper gear oil level. Make sure the oil level and drain plugs are tight.
OIL CAPACITY: 1.17 ℓ (1.24 US qt, 1.03 Imp qt)
Recommended oil: SAE # 90 gear oil
Use gear oil that meets or exceeds the requirement for API Service Classification GL4.

• FUEL SYSTEM

- ☐ Be sure fuel lines are connected securely.
- ☐ Make sure the fuel tank is full of fresh gasoline.
- ☐ Check for fuel leaks. If necessary, repair immediately.

• STEERING SYSTEM

- ☐ Check the steering system for smooth operation.
- ☐ Make sure the outboard motor does not interfere with the steering cable and/or link arm, control cables, wire harness etc. when the steering wheel is turned full left and full right and with the motor in all tilt positions.

• REMOTE CONTROL SYSTEM

- ☐ Check the remote control for proper operation.
- ☐ Make sure the control lever selects the forward, neutral, and the reverse gears.
- ☐ Check for full throttle capability.
- ☐ Check to be sure the throttle operates smoothly with the remote control lever at full throttle position. On side-surface mount controls, the choke fast idle lever must be in the idle position.

• ELECTRICAL SYSTEM

- ☐ Check the wire harnesses for proper connections.
- ☐ Check the battery connections for correct polarity and tightness.
- ☐ Make sure the battery is fully charged and installed securely.
- ☐ Make sure the meters, indicators and switches are connected correctly.

• TILT MECHANISM

- ☐ Push the power trim/tilt switch and make sure the outboard motor tilts up and down smoothly.
- ☐ Check for the tilt motor noise while tilting up or down.
- ☐ Tilt down the outboard motor and check to see that the trim meter functions and indicates "DOWN".
- ☐ Operate the steering with the outboard motor in the tilt-down position, and check to be sure that the cables, harnesses, etc. do not interfere with the outboard motor.
- ☐ Tilt up the outboard motor to the full tilt-up position and check the power trim/tilt oil level.
- ☐ Check the manual tilt valve for proper function.
- ☐ Make sure the tilt stopper sets in the lock position at full tilt-up position.

• ENGINE OIL

- ☐ Check the engine oil level.
Engine oil capacity: 7.6 ℓ (8.0 US qt, 6.69 Imp qt)
Recommended oil: SAE 10W-30
Use 4-stroke motor oil that meets or exceeds the requirement for API Service Classification SG or SH.
Always check the API SERVICE label on the oil container to be sure it includes the letters SG or SH.

• ALL NUTS, BOLTS & OTHER FASTENERS

- ☐ Check security and tighten if necessary.

OPERATION CHECK LIST

In the Water

• OUTBOARD MOTOR INSTALLATION

- ☐ Check that there are no water leaks from the motor mounting bolt holes.
- ☐ Check for the balanced weight distribution in the boat.

• OUTBOARD MOTOR OPERATION

- ☐ Check the neutral switch for proper operation.
- ☐ Turn the ignition switch ON and check whether the buzzer sounds twice.
- ☐ Turn the ignition switch ON and check whether the PGM light, charging light and the OP light come ON.
- ☐ Turn the ignition switch to the START position and check whether the engine starts.
- ☐ Check the outboard motor for any abnormal noise.
- ☐ Check to be sure cooling water flows out of the cooling system indicator.

After the engine warms up:

- ☐ Make sure the motor returns smoothly to idle.
- ☐ Check idle speed.
IDLE SPEED: 650 ± 50 rpm
- ☐ Snap the throttle and check the engine response.
- ☐ Check to see that the emergency stop switch functions securely.

• LEAKS

- ☐ Make sure that there are no leaks from the fuel lines and/or connections. If necessary, repair immediately.
- ☐ Check the outboard motor for cooling water/oil leaks. Repair if necessary.
- ☐ Check the exhaust system for gas leaks.

During Sea Trials

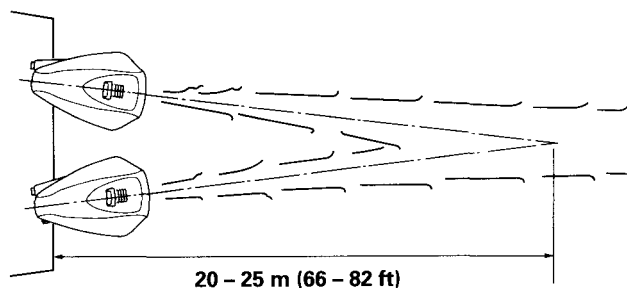
- ☐ Check the gearshift operation with the remote control lever.
- ☐ Check the motor operation at trolling speed. Use the minimum amount of the throttle opening necessary to operate the boat at a safe trolling speed for 15 minutes.

☐ Dual Motors:

Adjust the tie bar length so that the motors toe-out.

Toe-out is when the motors' forward measurement is wider than the motors' after measurement.

Motors will toe-out (viewed from the stern) will ensure better boat stability. It is best if the wakes of two motors joint 20 – 25 m (66 – 82 ft) stern.



Not all boats will follow this specification. Consult your boat manufacturer for toe-in or toe-out recommendation.

• PROPELLER SELECTION

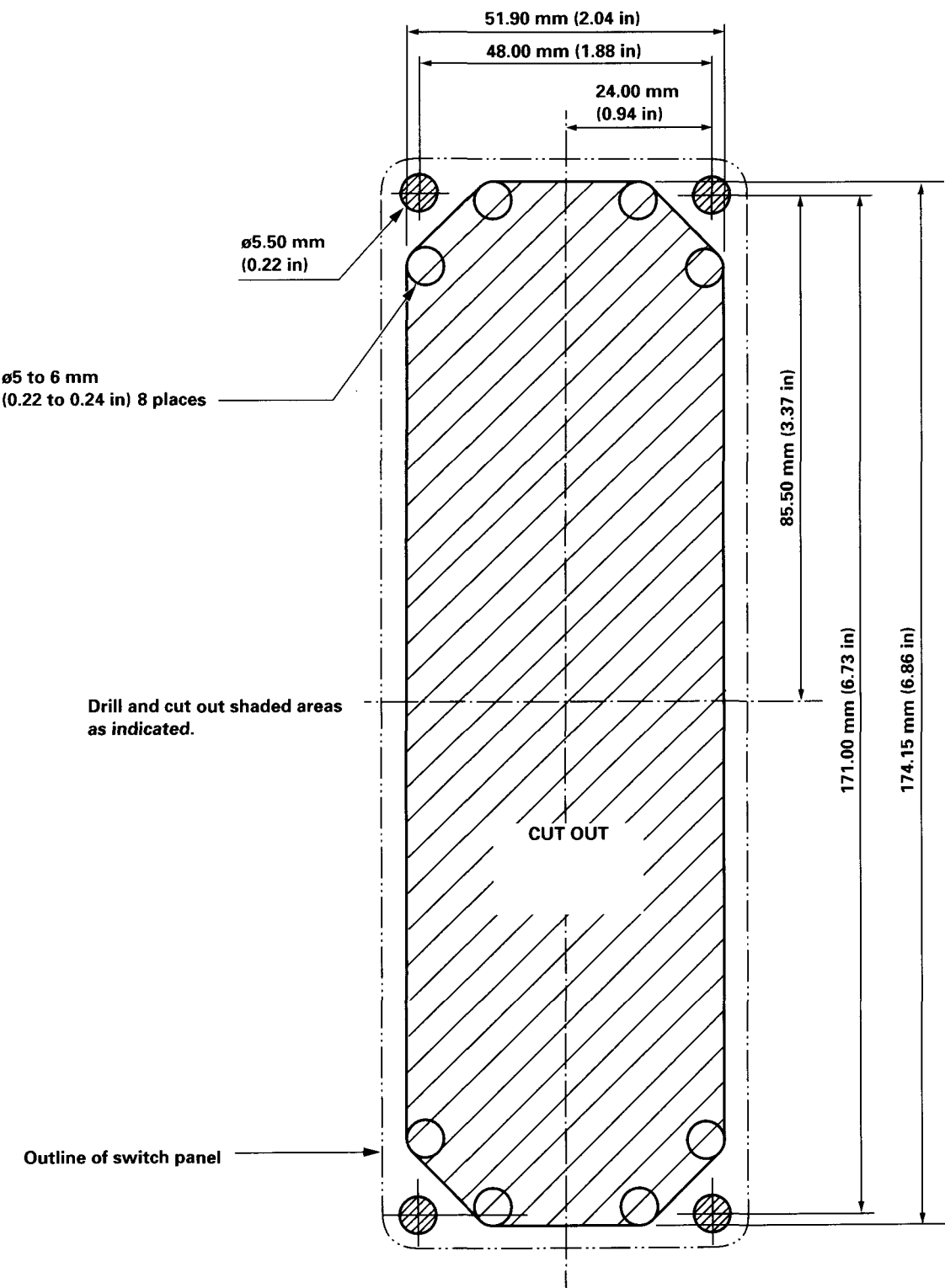
- ☐ Check the engine rpm with the boat under way. Before engine break-in, avoid continuous full throttle operation (100 % throttle opening). Do not run the outboard motor at full throttle for more than 2 minutes at a time.
MAXIMUM RECOMMENDED ENGINE SPEED:
5,000 – 6,000 rpm
- ☐ Make sure that there is no propeller ventilation in a straight line. There is the possibility of some propeller ventilation when turning at full throttle with the motor trimmed out.

After Sea Trials

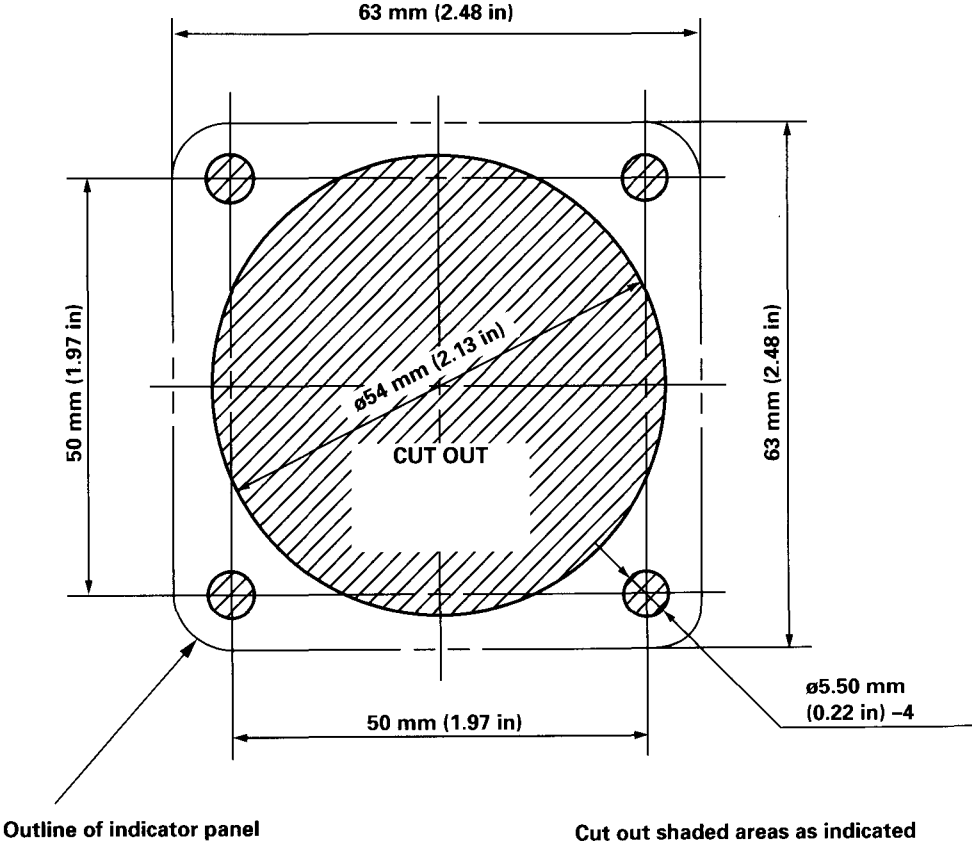
• CHECK & CLEAN THE OUTBOARD MOTOR

- ☐ Check that there is no water in the gear oil.
- ☐ Check that there are no signs of fuel, oil or water leaks. Repair if necessary.
- ☐ After running in salty or dirty water, use a flushing kit to flush the cooling system with clean water. Run the outboard motor at idle during flushing for approximately 10 minutes.
- ☐ Clean the entire outboard motor thoroughly with a cloth.
- ☐ Check the outboard motor for external damage, defects, or cracks.

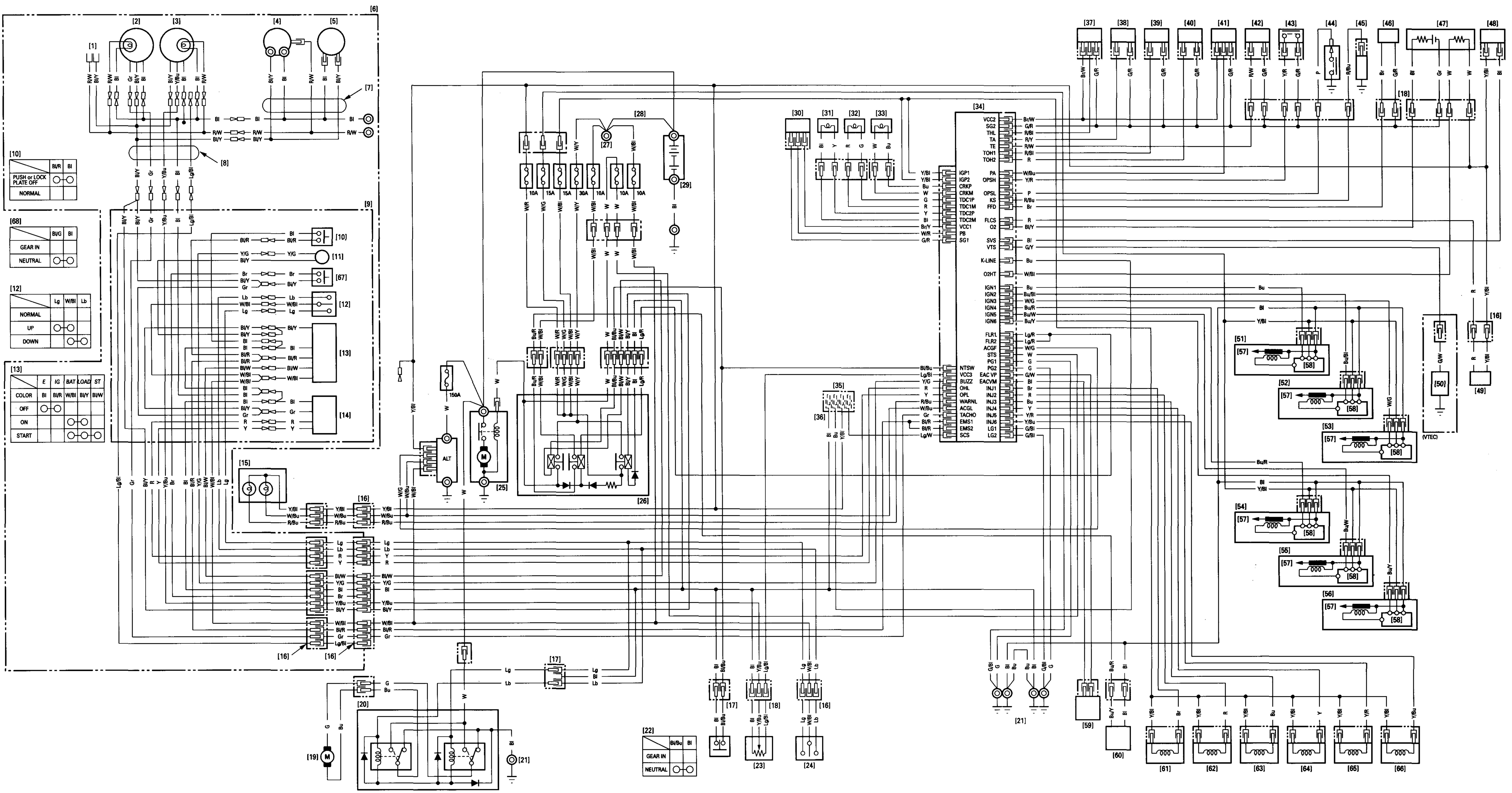
SWITCH PANEL TEMPLATE



INDICATOR PANEL TEMPLATE



Side Mount Control Box



WIRING DIAGRAMS

Side Mount Control Box

- [1] To LIGHTING SWITCH
- [2] TACHOMETER
- [3] TRIM METER
- [4] VOLT METER
- [5] HOUR METER
- [6] OPTIONAL
- [7] METER HARNESS B
- [8] METER HARNESS A
- [9] CONTROL PANEL ASSEMBLY
- [10] EMERGENCY STOP SWITCH

	BI/R	BI
PUSH or LOCK PLATE OFF		
NORMAL		

- [11] POWER TRIM/TILT SWITCH

	Lg	W/BI	Lb
NORMAL			
UP			
DOWN			

- [12] BUZZER
- [13] IGNITION SWITCH

	E	IG	BAT	LOAD	ST
COLOR	BI	BI/R	W/BI	BI/Y	BI/W
OFF					
ON					
START					

- [14] INDICATOR LIGHT (overheat, oil pressure)
- [15] INDICATOR LIGHT (MIL, alternator)
- [16] BLACK CONNECTOR
- [17] GREEN CONNECTOR
- [18] BLUE CONNECTOR
- [19] POWER TILT MOTOR
- [20] POWER TILT RELAY
- [21] GROUND
- [22] NEUTRAL SWITCH

	BI/Bu	BI
GEAR IN		
NEUTRAL		

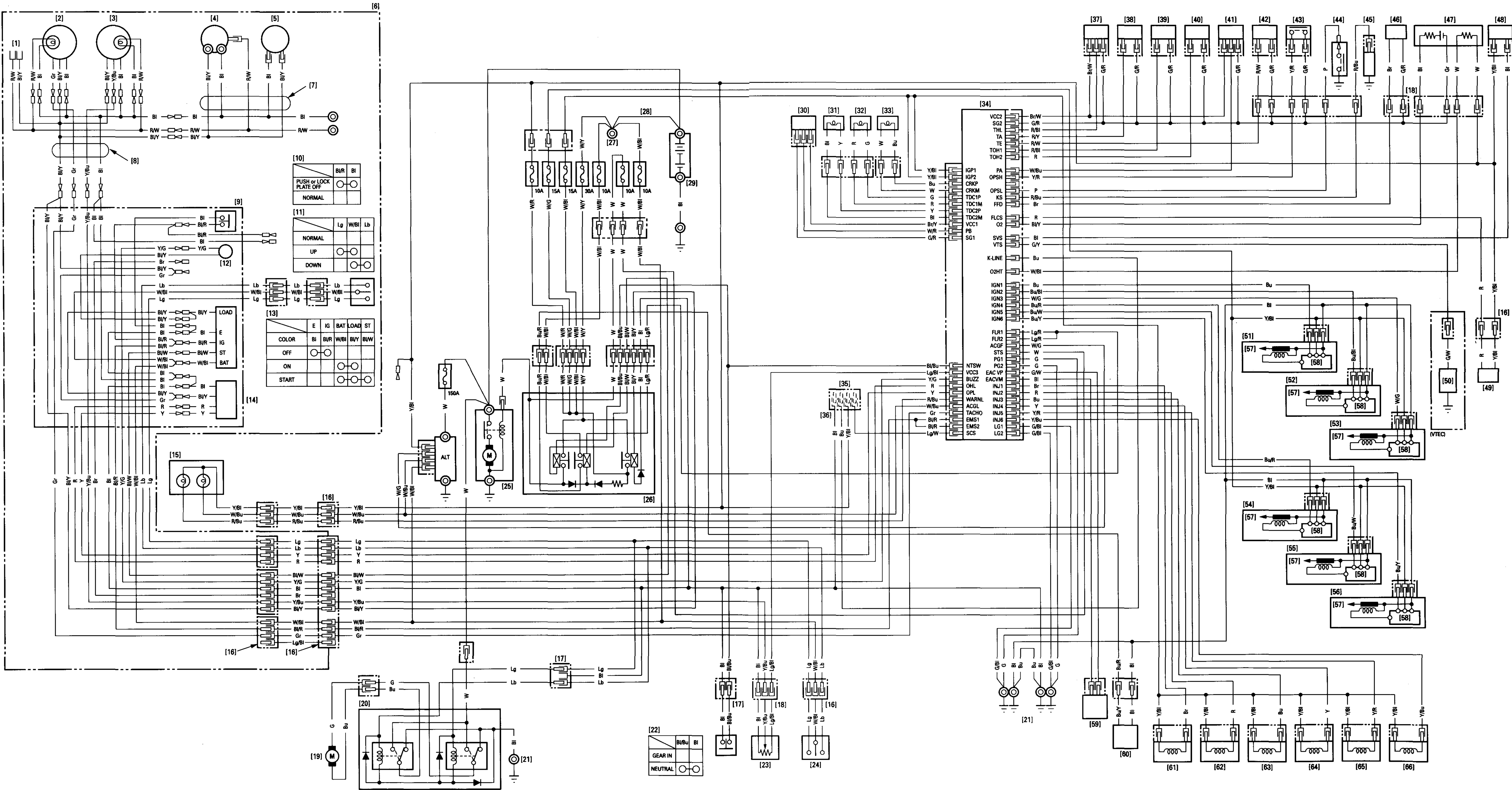
- [23] TRIM ANGLE SENSOR
- [24] POWER TILT SWITCH
- [25] STARTER MOTOR
- [26] PGM-FI MAIN RELAY
- [27] TERM, ON FUSE
- [28] BI (W-LINE)
- [29] BATTERY (12V)
- [30] MAP SENSOR
- [31] TDC SENSOR 2
- [32] TDC SENSOR 1
- [33] CKP SENSOR
- [34] ECM
- [35] SERVICE CHECK CONNECTOR
- [36] RED CONNECTOR
- [37] THROTTLE POSITION SENSOR
- [38] INTAKE AIR TEMPERATURE (IAT) SENSOR
- [39] OVERHEAT SENSOR 1
- [40] OVERHEAT SENSOR 2
- [41] PA SENSOR
- [42] ECT SENSOR
- [43] ENGINE OIL PRESSURE SWITCH (HIGH)
- [44] ENGINE OIL PRESSURE SWITCH (LOW)
- [45] KNOCK SENSOR
- [46] WATER LEVEL SWITCH
- [47] HEATED OXYGEN SENSOR (HO2S)
- [48] INTAKE AIR BYPASS (IAB) CONTROL VALVE
- [49] FUEL LINE CUT SOLENOID VALVE
- [50] VTEC SOLENOID VALVE
- [51] No.1 IGNITION COIL
- [52] No.2 IGNITION COIL
- [53] No.3 IGNITION COIL
- [54] No.4 IGNITION COIL
- [55] No.5 IGNITION COIL
- [56] No.6 IGNITION COIL

- [57] To PLUG
- [58] IGNITOR
- [59] IDLE AIR CONTROL (IAC) VALVE
- [60] FUEL PUMP
- [61] No.1 INJECTOR
- [62] No.2 INJECTOR
- [63] No.3 INJECTOR
- [64] No.4 INJECTOR
- [65] No.5 INJECTOR
- [66] No.6 INJECTOR
- [67] SOLENOID SWITCH
- [68] NEUTRAL SWITCH

	BI/G	BI
GEAR IN		
NEUTRAL		

BI	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

Top Mount/Panel Mount Control Box



WIRING DIAGRAMS

Top Mount/Panel Mount Control Box

- [1] To LIGHTING SWITCH
- [2] TACHOMETER
- [3] TRIM METER
- [4] VOLT METER
- [5] HOUR METER
- [6] OPTIONAL
- [7] METER HARNESS B
- [8] METER HARNESS A
- [9] CONTROL PANEL ASSEMBLY
- [10] EMERGENCY STOP SWITCH

	BI/R	BI
PUSH or LOCK PLATE OFF		
NORMAL		

[11] POWER TRIM/TILT SWITCH

	Lg	W/BI	Lb
NORMAL			
UP			
DOWN			

[12] BUZZER

[13] IGNITION SWITCH

	E	IG	BAT	LOAD	ST
COLOR	BI	BI/R	W/BI	BI/Y	BI/W
OFF					
ON					
START					

- [14] INDICATOR LIGHT (overheat, oil pressure)
- [15] INDICATOR LIGHT (MIL, alternator)
- [16] BLACK CONNECTOR
- [17] GREEN CONNECTOR
- [18] BLUE CONNECTOR
- [19] POWER TILT MOTOR
- [20] POWER TILT RELAY
- [21] GROUND
- [22] NEUTRAL SWITCH

	BI/Bu	BI
GEAR IN		
NEUTRAL		

- [23] TRIM ANGLE SENSOR
- [24] POWER TILT SWITCH
- [25] STARTER MOTOR
- [26] PGM-FI MAIN RELAY
- [27] TERM, ON FUSE
- [28] BI (W-LINE)
- [29] BATTERY (12V)
- [30] MAP SENSOR
- [31] TDC SENSOR 2
- [32] TDC SENSOR 1
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- [35] SERVICE CHECK CONNECTOR
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- [37] THROTTLE POSITION SENSOR
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- [43] ENGINE OIL PRESSURE SWITCH (HIGH)
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- [45] KNOCK SENSOR
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- [54] No.4 IGNITION COIL
- [55] No.5 IGNITION COIL
- [56] No.6 IGNITION COIL

- [57] To PLUG
- [58] IGNITOR
- [59] IDLE AIR CONTROL (IAC) VALVE
- [60] FUEL PUMP
- [61] No.1 INJECTOR
- [62] No.2 INJECTOR
- [63] No.3 INJECTOR
- [64] No.4 INJECTOR
- [65] No.5 INJECTOR
- [66] No.6 INJECTOR

BI	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

OUTBOARD MOTOR**Power Equipment**

News No.	Issue Date
P/P-163	Jul. 2003

SOME PARTS OF CHANGES

Applicable Information	Publication No.	Applicable Page
BF200A-BF225A	96ZY200	P. 5, 13

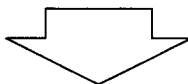
CHANGE LOCATIONS

The following refers to the outboard motors produced on and after November 2002.

The number of the 12 x 119 mm hex bolts that connect the outboard to the boat transom has been changed from four to six. Also, the number of the 12 mm plain washers has been changed from 12 to 18, and the number of the 12 mm self-locking nuts has been changed from four to six.

PARTS PACKAGE INSPECTION (P. 5)**Before Modification**

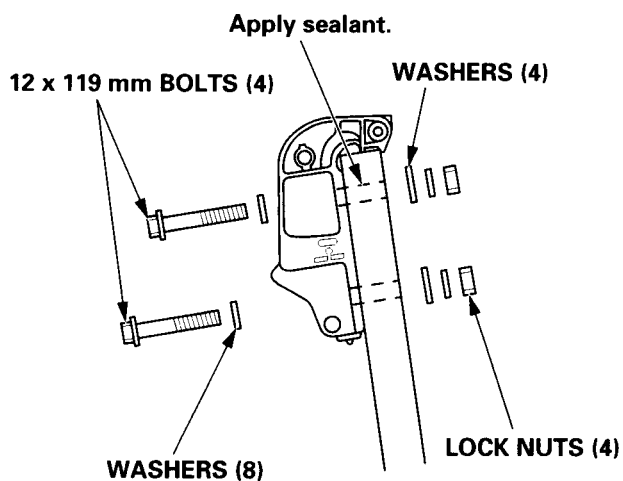
No.	Part name	BF200A					BF225A					Remarks
		LN	XN	XCN	XXN	XXCN	LN	XN	XCN	XXN	XXCN	
14	12 x 119 mm hex bolt	4	4	4	4	4	4	4	4	4	4	Use for outboard motor installation
15	12 mm plain washer	12	12	12	12	12	12	12	12	12	12	
16	12 mm self-locking nut	4	4	4	4	4	4	4	4	4	4	

**After Modification**

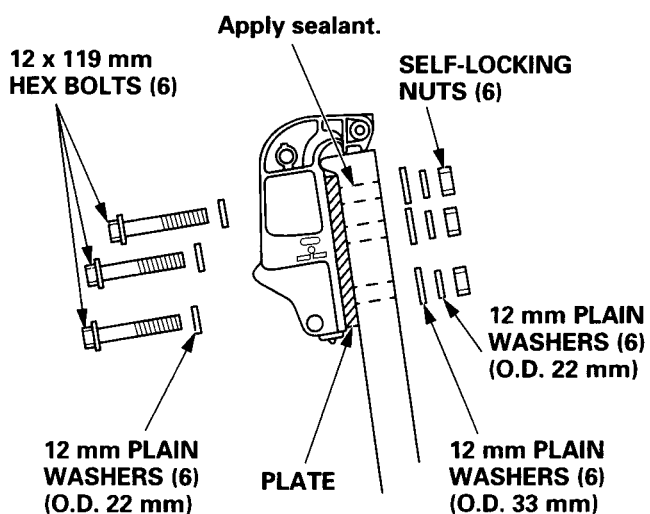
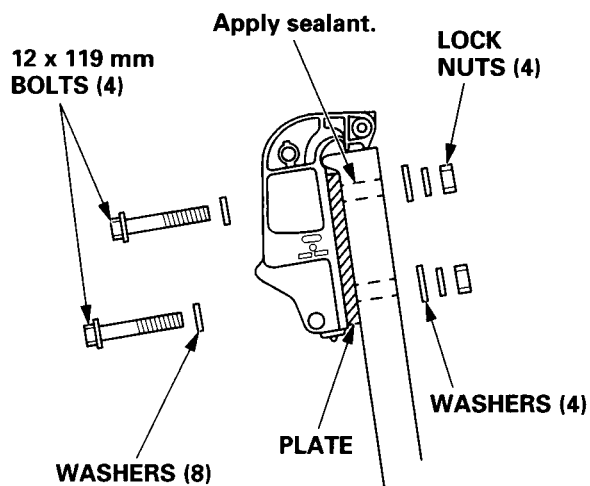
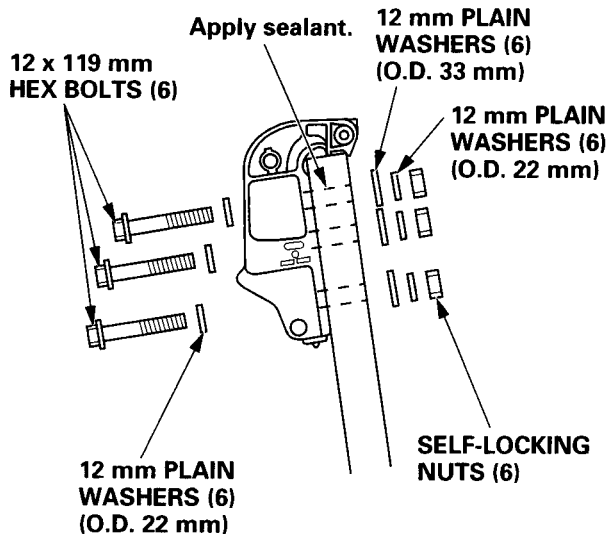
No.	Part name	BF200A	BF225A	Ramarks
		All type		
14	12 x 119 mm hex bolt	6	6	Use for outboard motor installation
15	12 mm plain washer	18	18	
16	12 mm self-locking nut	6	6	

Bolting Motor to Transom (P. 13)

Before Modification



After Modification



NOTICE

The number of the bolts has been changed into six. Decide on the bolt positions more carefully. It is recommended to install the outboard motor temporarily using four bolts, adjust the motor height and tighten the six bolts securely.