

INSTALLATION AND PREDELIVERY

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BOAT RIGGING

Remote Controls

Control Selection

WARNING

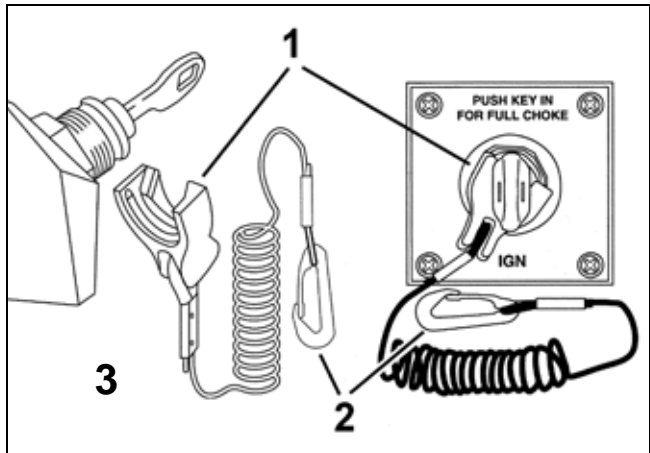
The remote control used must have start-in-gear prevention. This feature can prevent injuries resulting from unexpected boat movement when the outboard starts.

Remote control styles and applications are described in the *Evinrude/Johnson Genuine Parts and Accessories Catalog*. Plan the installation of all remote controls carefully. Read the outboard's Operator's Guide and the remote control's installation instructions prior to installation.

The remote control and wiring harness used must have the following features:

- Start-in-gear prevention
- Emergency stop / key switch
- Shift stroke must measure 1.125 to 1.330 in. (28.6 to 33.8 mm) between NEUTRAL and FORWARD
- Throttle stroke must PUSH for open

- All wiring must be compatible with Modular Wiring System (MWS) components



1. Emergency stop clip
2. Safety lanyard
3. Key switch with emergency stop feature

002817

Additional remote control information:

- Power trim/tilt switch(s) can be integral to the remote control for outboards with power tilt and trim.
- Side-mount controls require a neutral lock feature.
- Single-outboard binnacle remote controls are offered with or without an integrated key switch.

WARNING

Always install and recommend use of an emergency stop/key switch. Doing so will reduce the risk of personal injury or death should the operator fall away from the controls or out of the boat.

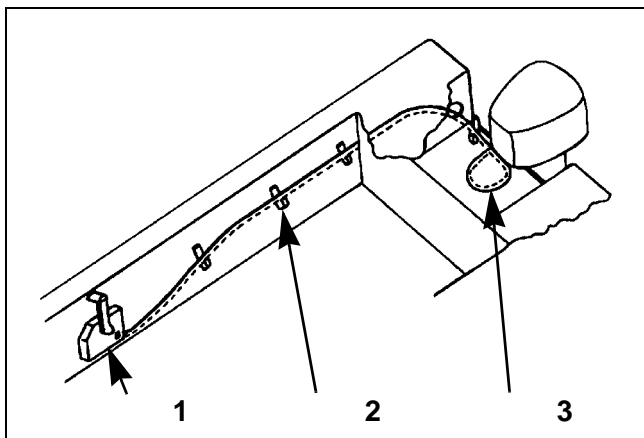
Installation Guidelines

Install the appropriate remote control following all instructions provided with the remote control.

Make sure the following items are checked:

- Correct length control cables and wiring harnesses
- Proper type and quality of cables and wiring harnesses
- Correct routing of cables and harnesses
- Appropriate slack in front of the outboard for remote control cables
- Proper routing of cables to prevent kinking
- Positioning and securing of cables and harnesses along their lengths to prevent movement or damage

Typical transom-mounted outboard installations require a 12 in. (30 cm) cable loop at the front of the outboard when the cables are routed from the side of the splash well.



1. Surface side-mount remote control
2. Cable support
3. 12 in. (30 cm) cable loop at front of outboard

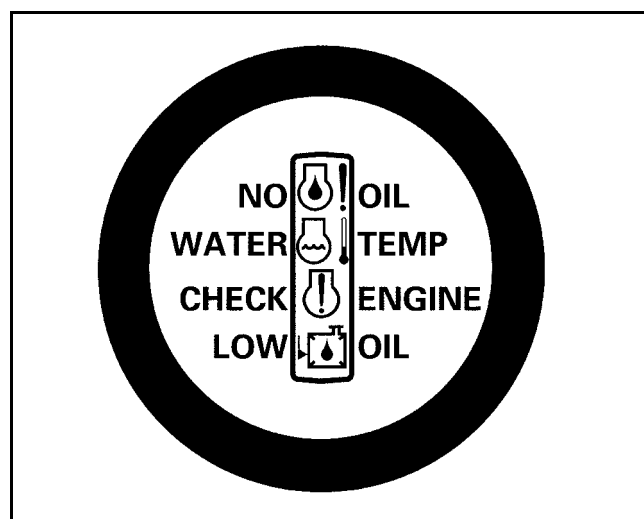
DR4277

SystemCheck™ Monitor

The *SystemCheck* engine monitor alerts the operator of certain engine problems. Refer to the Operator's Guide for detailed information related to the various warning signals.

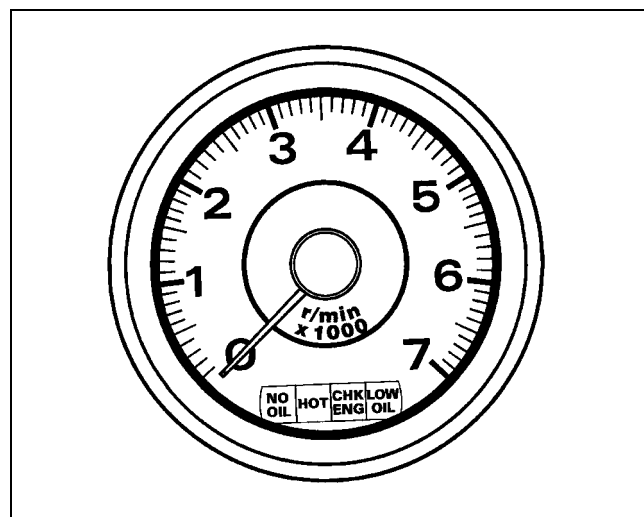
IMPORTANT: Outboards with remote controls must be equipped with a *SystemCheck* (or equivalent) engine monitor. Operating the outboard without an engine monitor will void the warranty for failures related to monitored functions.

SystemCheck gauges are available in two sizes.



Typical *SystemCheck* gauge

DR5206



Typical *SystemCheck* gauge with tachometer

DR5364

INSTALLATION AND PREDELIVERY BOAT RIGGING

Battery Installation

Each outboard requires its own starting battery. Select a battery that meets or exceeds the minimum requirements.

Minimum 12 Volt Battery Recommendations

- 360 CCA (465 MCA), 50 amp-hr minimum

Location and Preparation

Proper installation will prevent battery movement while underway.

- Secure all batteries in protected locations.
- Position battery as close to the outboard as possible.
- Battery location must provide access for periodic maintenance.
- Use battery mounting trays or battery boxes on all battery installations.
- Connections and terminals must be covered with an insulator.
- Battery connections must be clean and free from corrosion.
- Read and understand the safety information supplied with the battery before installation.



WARNING

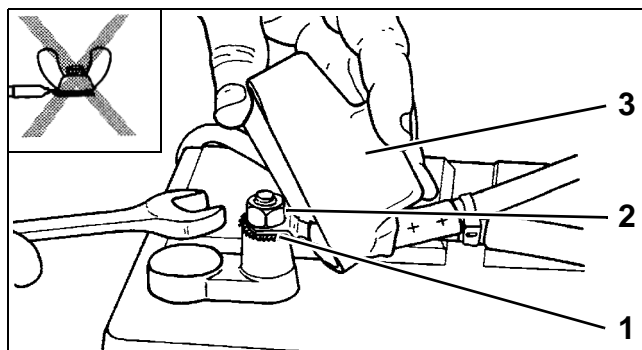


Keep the battery connections clean, tight, and insulated to prevent their shorting or arcing and causing an explosion. If the battery mounting system does not cover the connections, install protective covers. Check often to see that connections stay clean and tight.

Connections

IMPORTANT: Connect the battery positive (+) cable to the battery positive (+) post FIRST. Connect the battery negative (-) cable to the battery negative (-) post LAST.

Install a starwasher on the threaded battery post. Stack cables from the outboard, then cables from accessories. Finish this connection with a hex nut.



Marine Style Battery Post

1. Starwasher
2. Hex nut
3. Terminal Insulator

DR5103

IMPORTANT: Do not use wing nuts to fasten ANY battery cables. Wing nuts can loosen and cause electrical system damage not covered under warranty.

Tighten all connections securely. Apply *Triple-Guard* grease to prevent corrosion.

Battery Cable Requirements

Evinrude/Johnson outboards are shipped with stranded copper battery cables for typical installations in which the starting battery is positioned close to the transom.

Specialized outboard installations with extended length battery cables require an increased wire size. Refer to the table below.

IMPORTANT: Inadequate battery cables can affect the performance of an outboard's high amperage start circuit and the cranking speed of the outboard. DO NOT use aluminum wire cables. Use ONLY AWG stranded copper wire cables.

Model	1 to 10 Ft. (0.3 to 3 m)	11 to 15 Ft. (3.4 to 4.6 m)	16 to 20 Ft. (4.9 to 6.1 m)
30 HP	6 Gauge	4 Gauge	3 Gauge

Fuel System Requirements

Overview

Fuel systems must meet the minimum specifications. These requirements must be met to insure the proper delivery of fuel to the outboard. The guidelines established by the ABYC and U.S. Coast Guard should always be followed.

- Permanent fuel tanks must be properly vented outside of the hull.
- Remote fuel tank gas fills must be grounded.
- Permanent fuel tank pickups should have the correct anti-siphon valve installed to prevent fuel flow if a leak occurs in the fuel distribution system. Refer to ABYC Standard H-24.

Fuel Hose

All fuel hoses must be designated as fuel hose and approved for marine use.

- Use only fuel lines (or copper tubing) that meet the outboard minimum I.D. requirement.
- "USCG Type A1" fuel hose must be used between permanent fuel tanks and motor well fittings on inaccessible routings.
- Use "USCG Type B1" for fuel hose routings in motor well areas.
- Use corrosion-resistant metal clamps on permanently installed fuel hoses routed below decks.
- Multi-outboard applications require separate fuel tank pickups. Install separate fuel hoses from the fuel tank to the outboards in multi-outboard applications.

Fuel System Primer

Outboards require a priming system capable of refilling the fuel system after periods of non-use.

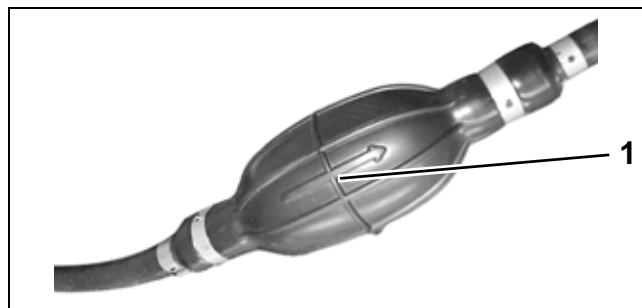
Primer Bulbs

Primer bulbs that meet the outboard's minimum inside diameter fuel line requirements are used on most outboards.

Install the primer bulb in the fuel supply hose as follows:

- The primer bulb should be installed in an accessible location.
- The arrow on the primer bulb must point in the direction of fuel flow.

- The fuel primer bulb must be positioned in the fuel supply hose so the primer bulb can be held with the arrow pointing "up" during priming.



1. Arrow indicates direction of fuel flow

000124

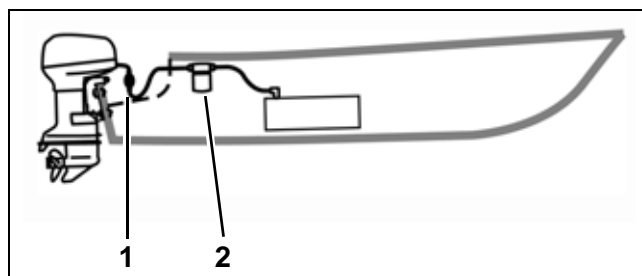
Fuel Filters

Boat-mounted fuel filters and water-separating fuel filter assemblies must meet the required fuel flow and filter specification. The filter must be mounted to a rigid surface above the "full" level of the fuel tank and accessible for servicing.

The *Evinrude/Johnson* Fuel Filter Assembly, P/N 174176, meets all requirements for a water-separating fuel filter.



0070



Typical Fuel Supply Configuration

1. Primer bulb
2. Fuel filter (optional)

001151

OUTBOARD INSTALLATION

Hull Preparation

Maximum Capacity

WARNING

Do not overpower the boat by installing an outboard that exceeds the horsepower indicated on the boat's capacity plate. Overpowering could result in loss of control.

Before installing outboard:

- Refer to the boat manufacturer's certification label for maximum horsepower rating.
- Refer to ABYC Standards to determine the maximum horsepower capacity for boats without certification labeling.



1029A

Mounting Surface

Inspect transom surface prior to drilling mounting holes.

- The transom should meet ABYC Standards.
- The transom must be flat and cannot have any protrusions.
- The transom angle should be approximately 14 degrees.
- Check transom strength and height.

WARNING

DO NOT install an outboard on a curved or irregular surface. Doing so can wear, bind, and damage components, causing loss of control.

Top Edge of Transom or Bracket

Transom thickness or off-sets must also be considered. The top edge of the transom or bracket must provide a proper surface for stern brackets. The stern brackets must contact the flat surface of the transom or bracket. Modify moldings or components that prevent the stern brackets from resting against the transom surface. Do not modify transom brackets.

Transom Clearances

Make sure the transom and splash well area provide adequate clearances.

- The top edge of the transom should be wide enough to allow full steering travel. The ABYC standard for most single outboard installations is 33 in. (84 cm).
- Check cable and hose routing clearances.
- Make sure there is clearance for mounting bolts and washers. Check the inside area of the transom for obstructions prior to drilling holes.

Water Flow

Inspect the hull area directly in front of the mounting location.

- Boat-mounted equipment should not create turbulence in the water flow directly in front of the outboard's gearcase. Turbulence or disruptions in the water flow directly in front of the gearcase will affect engine cooling and propeller performance.

Mounting Hardware

WARNING

Use all mounting hardware supplied with the outboard to help ensure a secure installation. Substituting inferior hardware can result in loss of control.

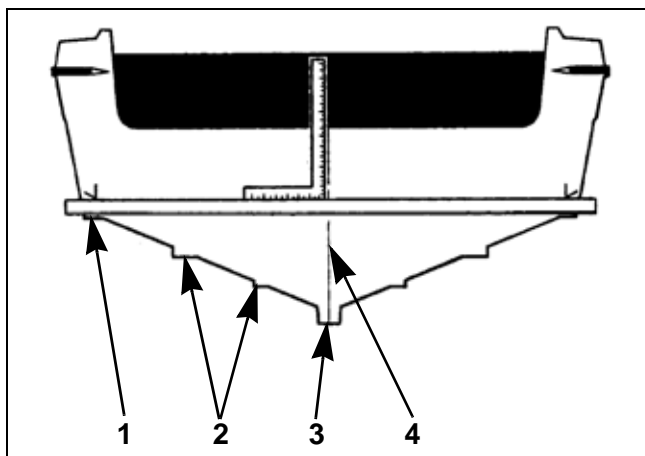
Transom Measuring and Drilling

Hull Centerline

Locate the centerline of the boat transom as it relates to the hull (bottom) of the boat.

Use a straightedge to draw a line connecting the port and starboard chines. The chines should be used as reference points for determining the centerline of the hull.

Use a framing square to accurately place a line on the transom. The centerline of the hull should be in line with the keel of the hull and perpendicular to the midpoint of the line connecting the port and starboard chines.



1. Chine
2. Strake
3. Keel
4. Hull centerline

DR5568

Transom Heights

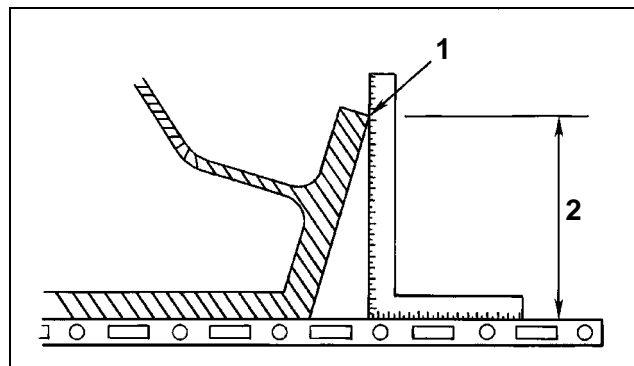
Make sure the transom height is consistent with the height of the outboard to be installed.

- A 19 to 21 in. (48.3 to 53.3 cm) transom height uses a 20 in. (50.8 cm) shaft outboard.
- The shaft length of the outboard being installed should come close to matching the transom height of the boat.

Determine transom height by measuring from the top edge of the transom, along the centerline.

Use a straightedge as a reference to extend the bottom of the boat.

Position the straightedge along centerline. The distance from the top edge of the straightedge to the top edge of the transom is the actual transom height.



1. Top edge of transom
2. Actual transom height

DR5541

Transom Drilling Locations

Refer to **Drilling and Hardware Diagram** on p. 36 for measurements. Or, use the outboard stern brackets as a template for location and size of holes to drill in the transom.

Center the outboard on the transom (or mounting bracket) and tighten clamp screws by hand. An accessory transom plate is recommended to protect the transom.

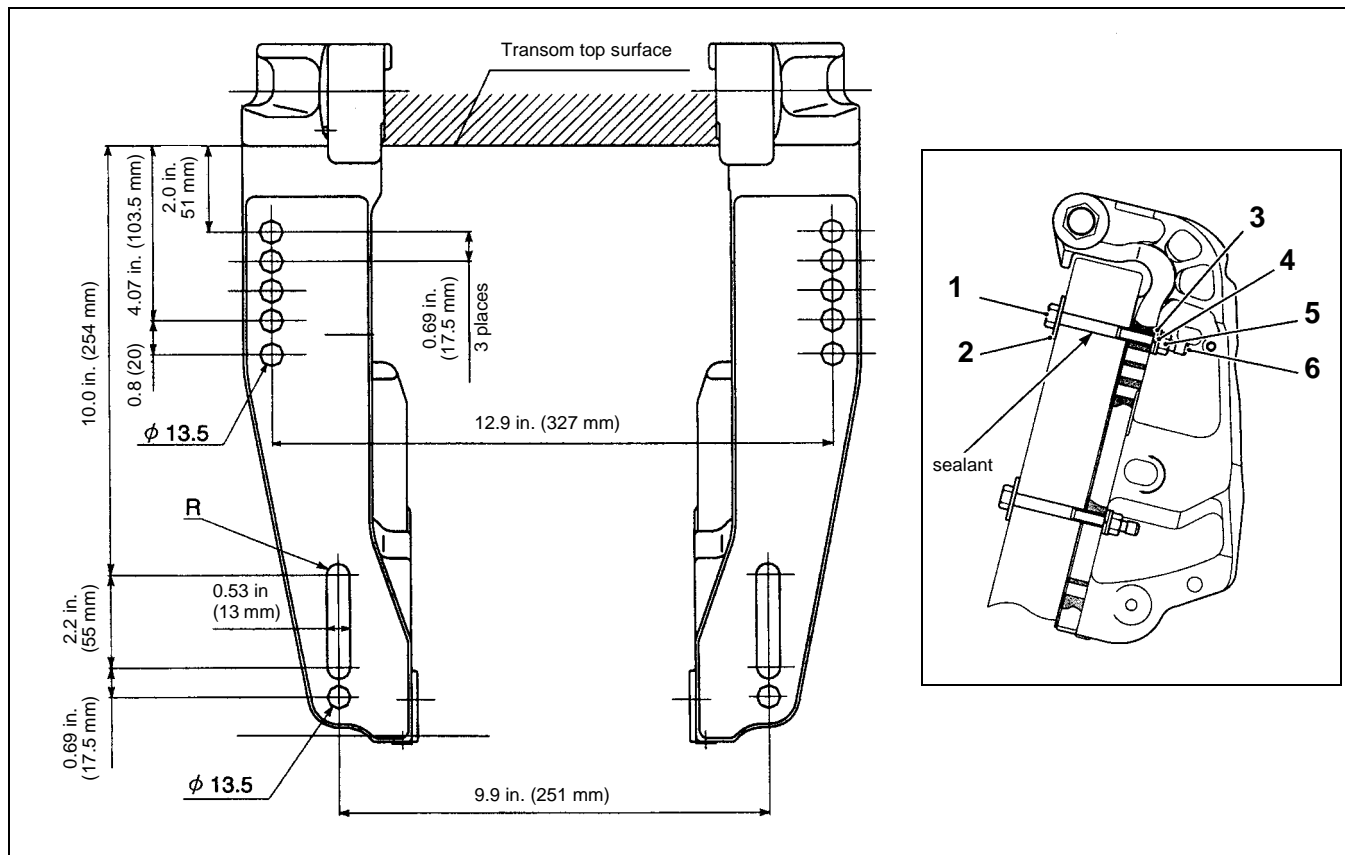
Using each stern bracket's mounting holes as a guide, drill holes through the transom.

IMPORTANT: Be sure to drill the required holes perpendicular to transom surface.

INSTALLATION AND PREDELIVERY

OUTBOARD INSTALLATION

Drilling and Hardware Diagram



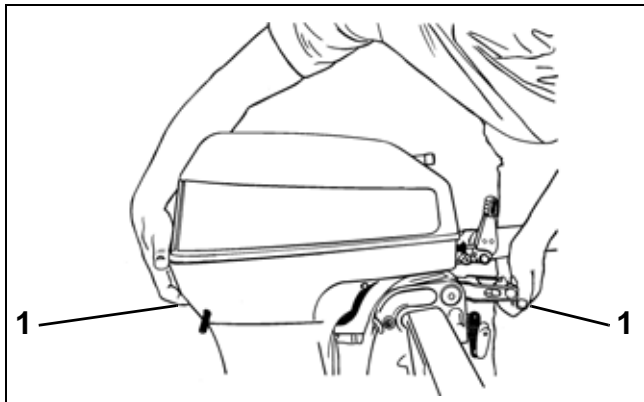
TYPICAL - Stern bracket for your engine may appear different, but dimensions apply to all 30 to 140 Models.

Item	Part name	Part Number	Quantity
1	Bolt 4 in. (100 mm)	5030385	4
	4.5 in. (115 mm)	5030386	4
	6 in. (150 mm)	5033511	4
2	Washer (large)	5030436	4
3	Washer (small)	5030438	4
4	Lock washer	5030462	4
5	Nut	5030418	4
6	Cap	5030839	4

- Drill the upper holes at least 1.75 in. (45 mm) away from the transom top surface.
- Install the large diameter washer (P/N 5030436) on the transom board side.
- To ensure a water-tight outboard installation, polysulfide sealant should be applied to all bolt holes.
- If tightening torque cannot be reached to the specified torque due to weak transom material, it is necessary to reinforce the transom board with an attachment plate.

Lifting the Outboard

Lift the outboard using the lift grips (NOT the tilt grip or steering handle) and place it in the center of the boat's transom.



TYPICAL
1. Lift grips

DR4661

Before Mounting Outboard to Transom

Some rigging components that attach directly to the outboard should be assembled before the outboard is mounted to the boat's transom. Steering system components and gearcase speedometer pickup hoses are the most common. Determine what equipment will be installed prior to mounting the outboard to the transom or bracket.

Steering Systems

Mechanical Cables

All *Evinrude/Johnson* outboards equipped with tilt tubes are designed to be compatible with mechanical steering systems that meet ABYC Standard P-17. Single-cable mechanical steering systems can be used on single or dual-outboard installations if an ABYC-approved steering link is used.

Dual-cable mechanical steering helps provide firm steering control at high speeds.

Extend the output end of the steering cable and lubricate the inner core of cable prior to installation.

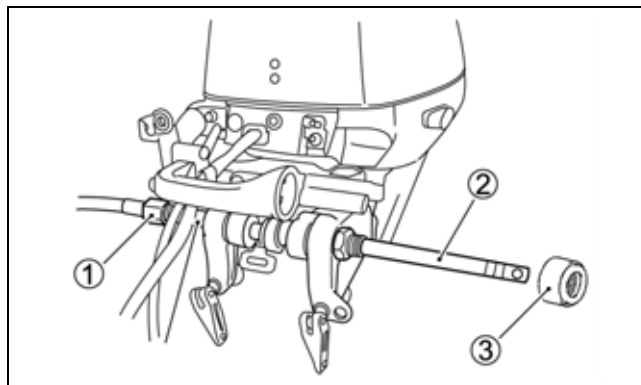


ABYC-approved mechanical steering cable.

5873

IMPORTANT: Install steering cable through tilt tube **before** mounting outboard on transom. Tighten nut securely.

Apply *Triple-Guard* grease to cable and install cable wiper nut on tilt tube.



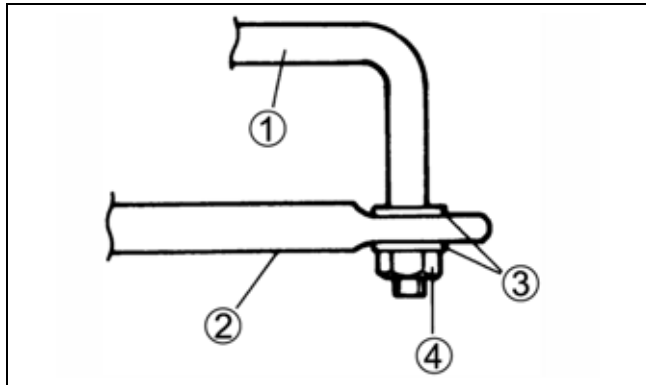
1. Cable nut
2. Grease
3. Wiper nut

004823

INSTALLATION AND PREDELIVERY OUTBOARD INSTALLATION

Drag Link

Connect drag link to the steering cable with washers and safety nut. Tighten the nut to 84 in. lbs. (10 N·m), then back the nut off 1/8 turn.



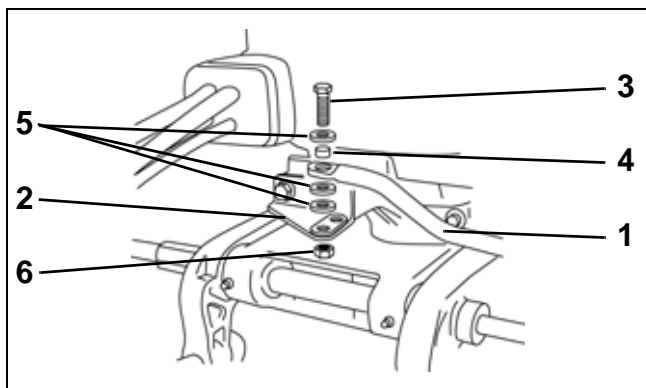
1. Drag link
2. Steering cable
3. Washers
4. Safety nut

004824

Move the steering cable until hole of drag link aligns with the front threaded hole on the steering arm attachment.

Connect the drag link to the attachment by tightening the screw with spacer and washers. Tighten screw to 24.5 ft. lbs. (34 N·m).

Install safety nut and tighten to 24.5 ft. lbs. (34 N·m).



1. Drag link
2. Attachment
3. Screw
4. Spacer
5. Washers
6. Safety nut

005079

IMPORTANT: After assembly, check for smooth and free steering operation.

Outboard Mounting

Fastening the Outboard to the Transom



WARNING



The outboard must be correctly installed. Failure to correctly install the outboard could result in serious injury, death, or property damage.

IMPORTANT: Follow all directions carefully. The outboard's warranty will not cover product damage or failure resulting from incorrect outboard installation.



WARNING



Even if equipped with clamp screws, the outboard must be bolted to the boat to prevent it from "working off the transom" during operation.

Center the outboard on the boat's transom (or mounting bracket) and tighten the clamp screws by hand, NOT with tools. An accessory transom plate is recommended to protect the boat's transom (or mounting bracket).



WARNING

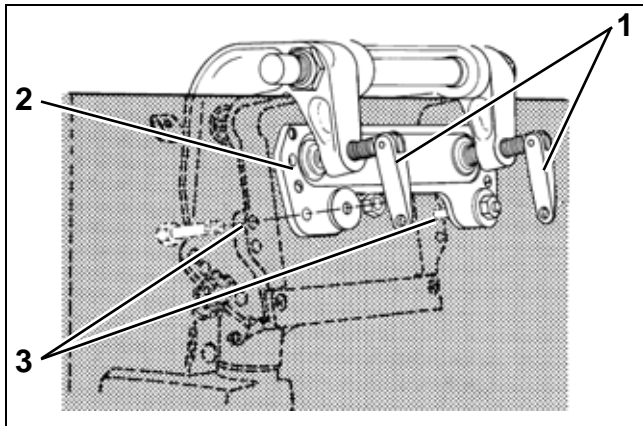


If either side of the transom deforms or cracks when the bolts are tightened to their recommended torque, the transom construction may not be adequate or may be deteriorated. Structural failure of the transom could result in loss of boat control and injury to the occupants.

IMPORTANT: Use a marine sealant rated for above or below waterline use. RTV silicone is not approved for below waterline use. Polyurethane sealants are not easily removed and may damage outboard or boat mounting surfaces when removed.

Apply marine sealer (rated for above and below waterline use) under hex heads of bolts, on the mounting plates, and to the bolt shanks.

Tighten bolts to 14.5 ft. lbs. (20 N·m).



- TYPICAL**
1. Clamp screws
 2. Transom plate
 3. Stern bracket holes

DR5815

IMPORTANT: After 30 minutes of operation, retighten clamp screws by hand. DO NOT use tools to tighten clamp screws. Check clamp screws regularly.

OUTBOARD RIGGING



WARNING

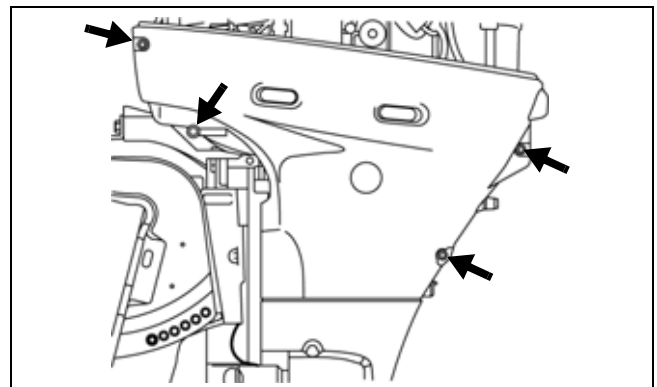


To prevent accidental starting of engine, confirm the battery cables are disconnected at battery and spark plug leads are disconnected from spark plugs.

2

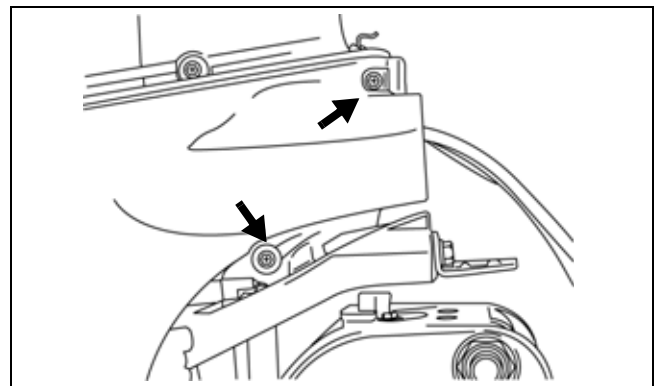
MWS Harness Installation

Remove six (6) screws and starboard side lower engine cover.



Port side

001722

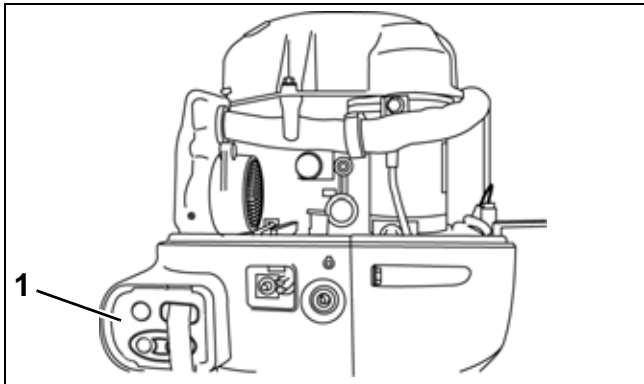


Starboard side

001723

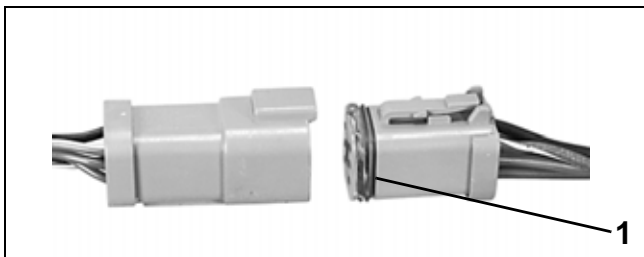
INSTALLATION AND PREDELIVERY OUTBOARD RIGGING

Remove grommet from front panel.



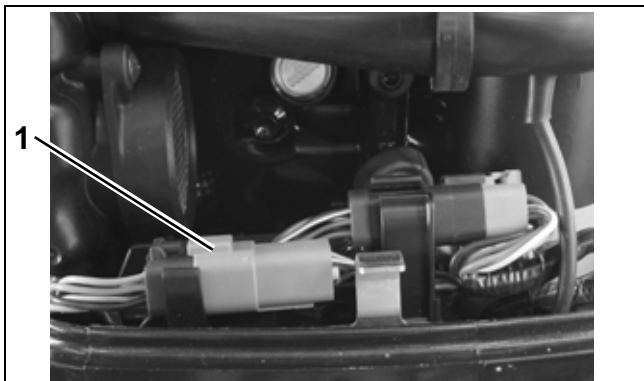
1. Grommet 001668

Before installing electrical connectors, check that the seal is in place. Clean off any dirt from connectors. Apply a light coat of *Electrical Grease* to the seal. Push connectors together until latched.



1. Seal 42079A

Insert MWS cable through front panel. Join MWS harness connectors to engine connectors. Secure 6-pin connectors in clips and push excess trim and tilt cable underneath air silencer.



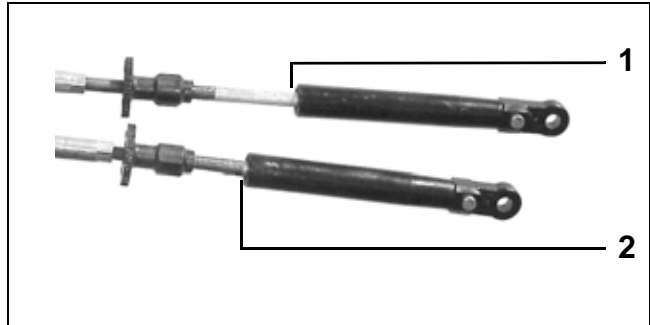
1. 6-pin connector 002856

Control Cable Identification

IMPORTANT: Control cable function must be identified before rigging outboard.

Identify each control cable:

- Put the control handle into NEUTRAL position. The throttle cable casing guide will retract completely and the shift cable casing guide will go to the midpoint of its travel.



1. Shift cable casing guide extended to midpoint
2. Throttle cable casing guide retracted DP0811

Extend the control cables and lubricate them with *Triple-Guard* grease.



30501

WARNING

To prevent accidental starting, disconnect the battery cables at the battery. Twist and remove all spark plug leads.

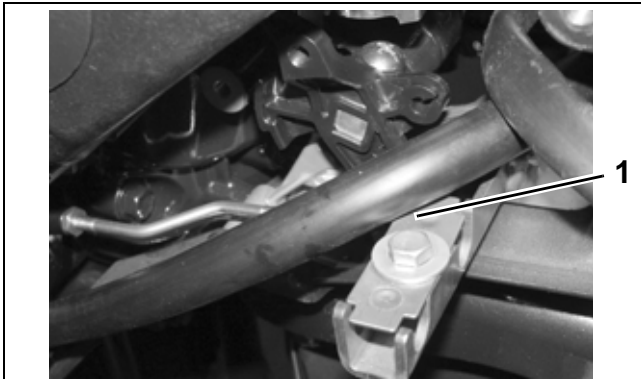
Control Cable Installation

Shift Cable

Move the remote control handle to NEUTRAL.

Make sure gearcase is in NEUTRAL gear detent.

Remove cable retainer screw and plate.



1. Cable retainer screw

002857

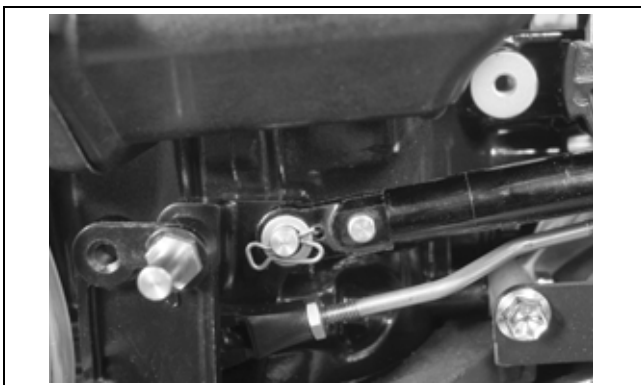


WARNING



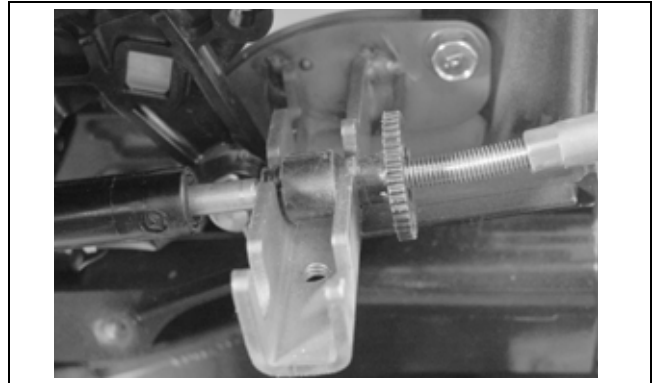
Failure to properly install shift cable retainer clip could result in loss of shift function.

Install the shift cable on the shift lever pin using the flat washer and retainer clip supplied with the outboard.



002858

Pull end of cable to remove slack and adjust shift cable trunnion nut to fit in anchor pocket.



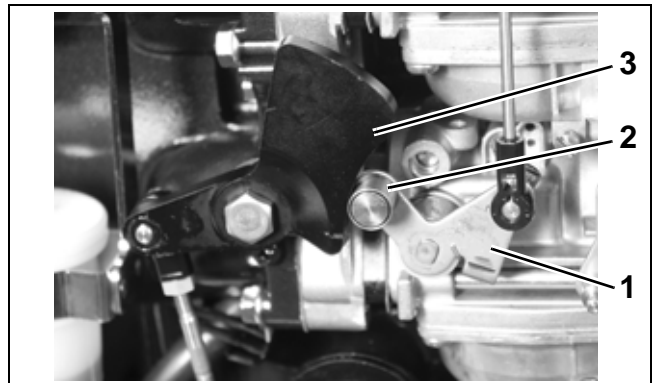
002859

Move remote control lever to FORWARD and make sure propeller shaft is in gear. Do the same in REVERSE.

Throttle Cable

Move the remote control handle from NEUTRAL to the FORWARD detent, and then **halfway** back to NEUTRAL.

Make sure the throttle lever is fully closed, as shown. There should be some clearance between the roller and throttle cam.



1. Throttle lever
2. Roller
3. Throttle cam

002863



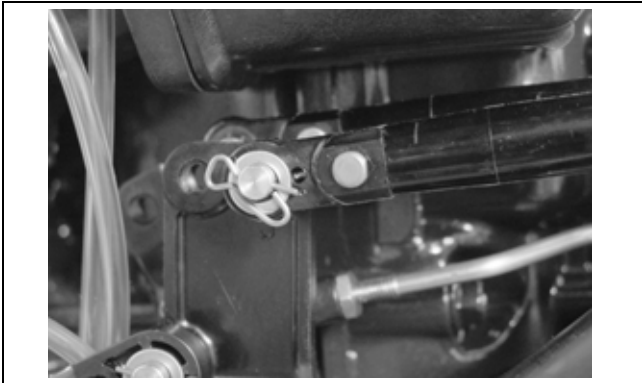
WARNING



Failure to properly install throttle cable retainer clip could result in loss of throttle function.

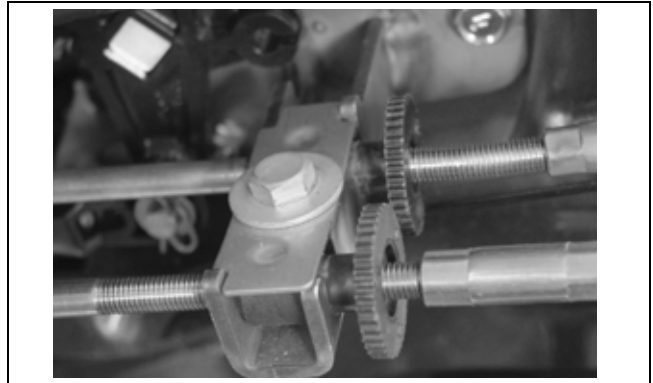
INSTALLATION AND PREDELIVERY OUTBOARD RIGGING

Attach throttle cable to throttle lever pin using flat washer and retainer clip supplied with outboard.



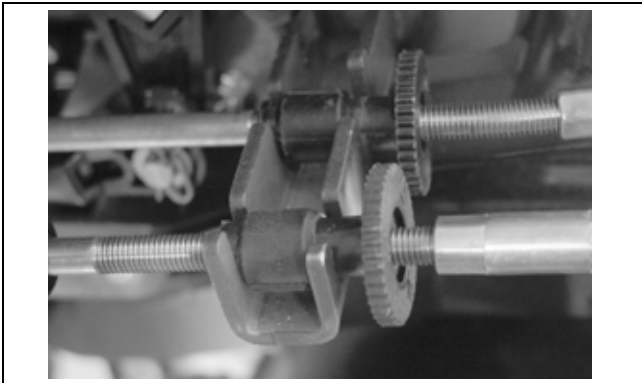
002860

Install cable retainer and screw and torque screw to 60 to 84 in.lbs. (7 to 9 N-m).



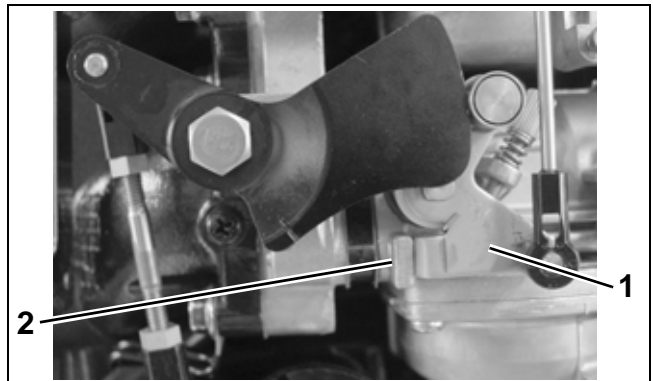
002862

Pull on throttle cable to remove backlash. Adjust trunnion nut to fit in anchor pocket with throttle held closed by throttle spring. Do not pull on throttle cable while adjusting length.



002861

Make sure the throttle lever contacts the stopper when the throttle control is fully open.



1. Throttle lever
2. Stopper

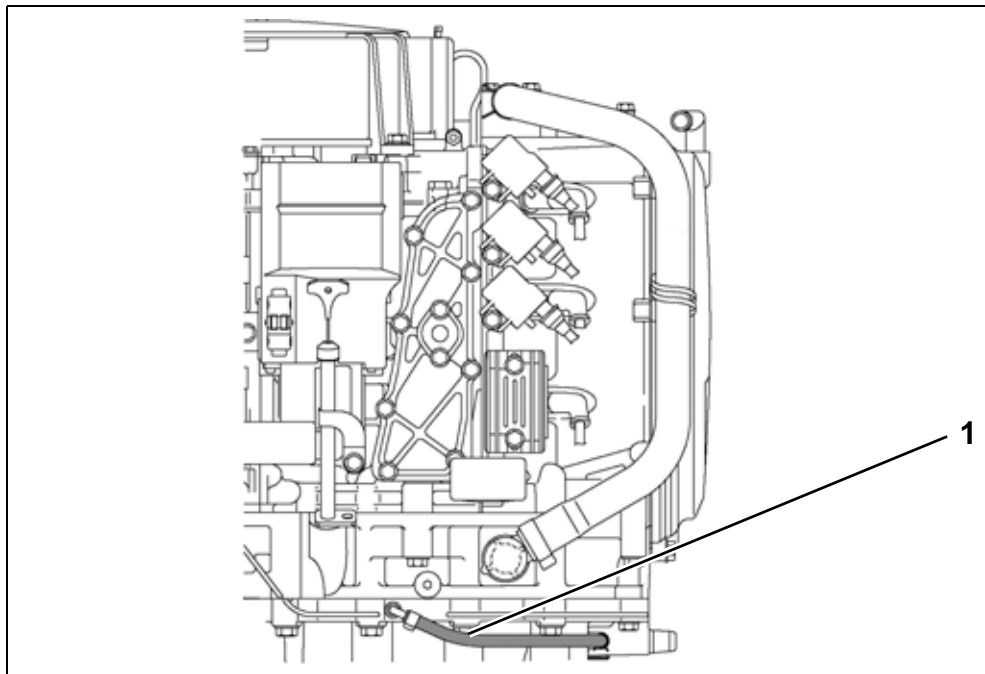
002864

Slip rubber grommet onto control cables, MWS harness, and battery cables. Press grommet onto lower engine cover front panel.

Water Pressure Gauge Connection

Locate water hose on starboard side of powerhead.

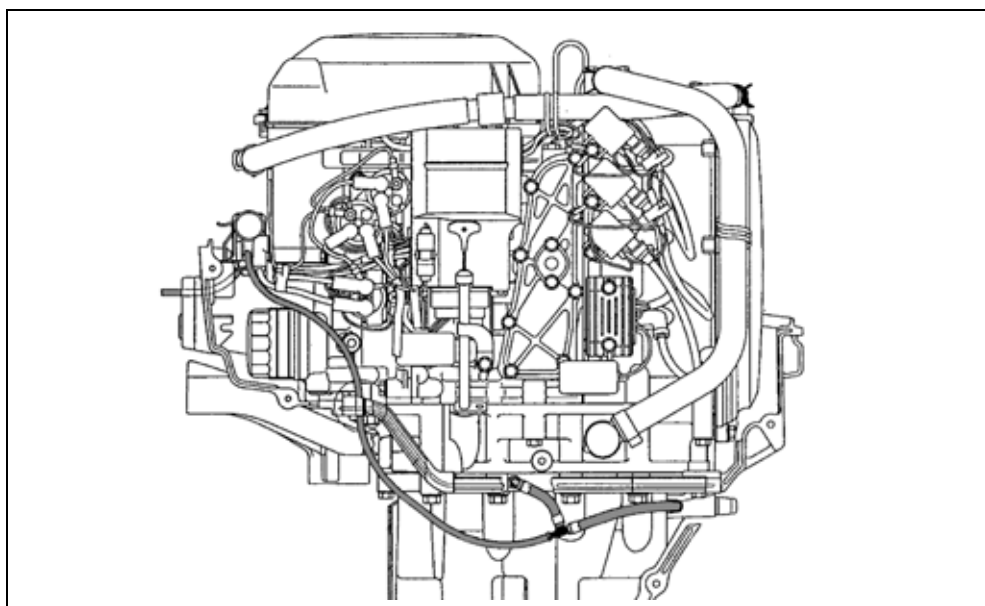
Cut hose approximately 2.75 in. (70 mm) from block fitting.



1. Cut hose here

003002

Install T-fitting supplied in kit, with restricted part of fitting toward water pressure gauge. Route hose through rigging grommet in lower engine cover.



003001

FUEL AND OIL

Fuel Requirements



WARNING



Gasoline is extremely flammable and highly explosive under certain conditions. Improper handling of fuel could result in property damage, serious injury or death.

Always turn off the outboard before fueling.

Never permit anyone other than an adult to refill the fuel tank.

Do not fill the fuel tank all the way to the top or fuel may overflow when it expands due to heating by the sun.

Remove portable fuel tanks from the boat before fueling.

Always wipe off any fuel spillage.

Do not smoke, allow open flames or sparks, or use electrical devices such as cellular phones in the vicinity of a fuel leak or while fueling.

Minimum Octane

Evinrude/Johnson outboards are certified to operate on unleaded automotive gasoline with an octane rating equal to or higher than:

- 87 (R+M)/2 AKI, or
- 90 RON

Use unleaded gasoline that contains methyl tertiary butyl ether (MTBE) **ONLY** if the MTBE content does not exceed 15% by volume.

Use alcohol-extended fuels **ONLY** if the alcohol content does not exceed:

- 10% ethanol by volume
- 5% methanol with 5% cosolvents by volume

When using alcohol-extended fuels, be aware of the following:

- The boat's fuel system may have different requirements regarding the use of alcohol fuels. Refer to the boat's owner guide.
- Alcohol attracts and holds moisture that can cause corrosion of metallic parts in the fuel system.
- Alcohol blended fuel can cause engine performance problems.
- All parts of the fuel system should be inspected frequently and replaced if signs of deterioration or fuel leakage are found. Inspect at least annually.

IMPORTANT: Always use fresh gasoline. Gasoline will oxidize, resulting in loss of octane and volatile compounds, as well as the production of gum and varnish deposits which can damage the outboard.

Additives

IMPORTANT: The only fuel additives approved for use in *Evinrude* outboards are 2+4[®] fuel conditioner and *Evinrude/Johnson* Fuel System Cleaner. **Use of other fuel additives can result in poor performance or engine damage.**

Evinrude/Johnson 2+4 Fuel Conditioner will help prevent gum and varnish deposits from forming in fuel system components and will remove moisture from the fuel system. It can be used continuously and should be used during any period when the outboard is not being operated on a regular basis. Its use will reduce spark plug fouling, fuel system icing, and fuel system component deterioration.

Evinrude/Johnson Fuel System Cleaner will help keep fuel injectors in optimal operating condition.

Evinrude/Johnson Carbon Guard will minimize carbon deposit build-up when used as directed.

Oil Requirements

IMPORTANT: 4-Stroke outboards are shipped without oil in the crankcase. Oil must be added before starting the engine for the first time.

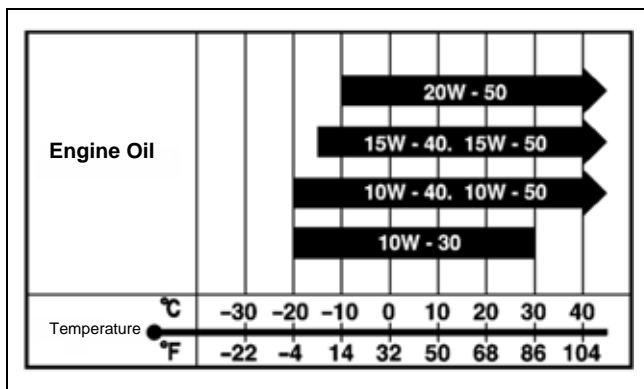
IMPORTANT: During the initial 10-hour break-in period, use *Evinrude/Johnson 4-Stroke Outboard Oil* or SAE 10W-40, API SE, SF, SG, SH, or SJ rated. DO NOT use synthetic or synthetic blend oils during break-in period.

Evinrude/Johnson Ultra™ 4-Stroke synthetic outboard oil is recommended for normal use in these outboards after break-in.

If *Ultra 4-Stroke* oil is not available, you must use SAE 10W-40, API SE, SF, SG, SH, or SJ rated.

IMPORTANT: Failure to follow this recommendation could void the outboard warranty if a lubrication-related failure occurs.

If SAE 10W-40 motor oil is not available, select an alternative according to the following chart:



004813

RUNNING CHECKS



WARNING



DO NOT run outboard without a water supply to the outboard's cooling system. Cooling system and/or powerhead damage could occur.



DANGER



DO NOT run the engine indoors or without adequate ventilation or permit exhaust fumes to accumulate in confined areas. Engine exhaust contains carbon monoxide which, if inhaled, can cause serious brain damage or death.



DANGER



Contact with a rotating propeller is likely to result in serious injury or death. Assure the engine and prop area is clear of people and objects before starting engine or operating boat. Do not allow anyone near a propeller, even when the engine is off. Blades can be sharp and the propeller can continue to turn even after the engine is off.

Break-In (10 Hours)

Follow this procedure to protect the outboard during its initial hours of operation. Careful break-in allows internal engine components to seat properly, resulting in maximum engine life and performance.

Failure to carefully follow the break-in procedures can result in engine damage.

Perform the 10-Hour break-in procedure with the boat and engine in the water, using an appropriate propeller.

INSTALLATION AND PREDELIVERY RUNNING CHECKS

IMPORTANT: DO NOT perform break-in using a flushing device. DO NOT start-up or run the engine out of water. DO NOT leave a running engine unattended.

During the break-in, check water pump operation often. Look for a steady stream of water from the water pump indicator. If the stream of water stops, shut off the engine to prevent damage. Find and correct the cause before continuing.

Change the RPM often. Avoid holding a throttle setting longer than 15 minutes.

Check the crankcase oil level often. Add oil if needed.

First 10 minutes of operation — Operate engine in gear at idle only.

Balance of First 2 hours of operation — Operate in gear below 3500 RPM or 1/2 throttle only.

With easy planing boats, use full throttle to quickly accelerate boat onto plane. Immediately reduce throttle to one-half as soon as the boat is on plane. BE SURE boat remains on plane at this throttle setting.

Third hour of operation — Run the engine in gear at various speeds up to 4000 RPM or 3/4 throttle only.

Balance of first 10 hours of operation — Run the engine in gear at various engine speeds including full throttle, but remain at full throttle no longer than 5 minutes.

Change the engine speed every 15 minutes.

DO NOT exceed recommended maximum engine RPM. Refer to **TECHNICAL DATA** on p. 16.

Fuel System

Perform running checks of the fuel system by following these steps:

- Squeeze fuel primer bulb until hard or activate electric primer. Observe all fuel hoses and connections. Repair any leaks.
- Start outboard. Visually inspect all oil hoses and connections and fuel hoses and connections. Repair any leaks or misrouted hoses.



Emergency Stop Switch

Check emergency stop function. With outboard running at IDLE, pull safety lanyard from emergency stop switch. Outboard must stop immediately.

Outboard Controls

Confirm that controls can be easily moved into all gear and throttle settings. Do not shift outboard when propeller shaft is not turning.

Start-In-Gear Prevention

	WARNING	
<p>Make certain that the starter will not operate when the outboard is in gear. The start-in-gear prevention feature is required by the United States Coast Guard to help prevent personal injuries.</p>		

Start outboard and shift outboard into FORWARD.

Turn outboard OFF while lever is in FORWARD.

Attempt to restart the outboard. Outboard should not start.

Pull shift lever back to NEUTRAL and restart outboard.

Shift remote control lever to REVERSE.

Turn outboard OFF while lever control is in REVERSE.

Attempt to restart the outboard. Outboard should not start.

Tachometer Pulse Setting

Confirm accuracy of tachometer reading.

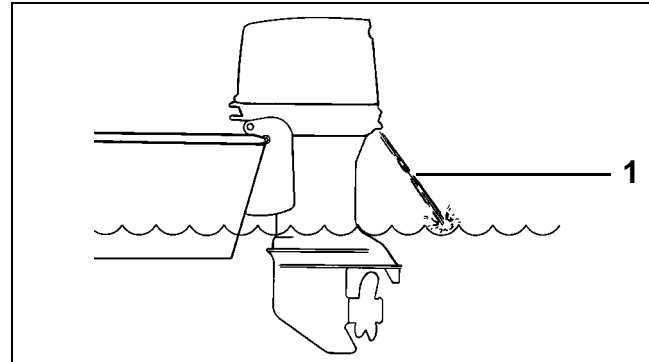
- Adjust dial on back of tachometer to 6 pulse/12 pole setting.

Water Pump Overboard Indicator

A steady stream of water should flow from the overboard indicator.

Operating Temperature

An outboard running at idle speed should achieve a temperature based on the engine's thermostatic control. In general, the powerhead temperature should reach at least 100°F (38°C) after five minutes of idling. Confirm that the powerhead reaches idle temperature.



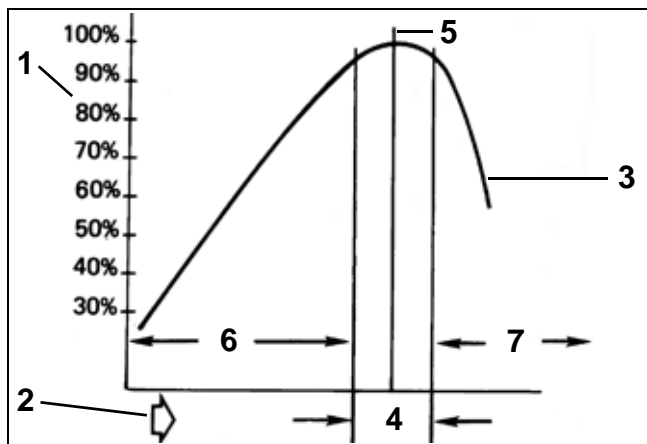
1. Water pump overboard indicator

DRC4952

PROPELLER SELECTION

Refer to **Propeller Hardware Installation** on p. 49 before installing propeller.

The correct propeller, under normal load conditions, will allow the engine to run near the midpoint of the RPM operating range at full throttle. Refer to **TECHNICAL DATA** on p. 16.



1. Percentage of horsepower (kw)
2. Engine RPM
3. Horsepower curve
4. Full throttle operating range
5. Midpoint of full throttle operating range, horsepower rating in kilowatts (kw)
6. Engine is overloaded at full throttle
7. Engine is overspeeding at full throttle
- DR1261



CAUTION



Selection of the wrong propeller could reduce engine service life, affect boat performance, or cause serious damage to the powerhead.

Procedure

The propeller selection process is very important to the engine's service life and to boat performance. Proceed carefully and thoroughly while considering the following points:

- During the engine break-in period, run the outboard at wide-open throttle for only brief periods of time to check full-throttle RPM.
- Use an accurate tachometer to determine the engine's full-throttle RPM while testing various propellers.
- Select a propeller that suits the customer's application and allows the engine to run near the midpoint of the full-throttle operating range when the boat has a normal load in it. Refer to **TECHNICAL DATA** on p. 16.
- To compensate for changes in boat loading, the engine's full-throttle RPM must be verified periodically.

IMPORTANT: If the propeller blades have too much pitch, the engine is operating below its normal range at full throttle, power is being lost, and powerhead damage could occur. If the propeller blades have too little pitch, the engine is operating above its normal range at full throttle and damage from overspeeding could occur.



WARNING



When servicing the propeller, always shift the outboard to **NEUTRAL**, turn the key switch **OFF**, and twist and remove all spark plug leads so the engine cannot be started accidentally.

Propeller Hardware Installation



WARNING



When servicing the propeller, always shift the outboard to NEUTRAL, turn the key switch OFF, and twist and remove all spark plug leads so the engine cannot be started accidentally.

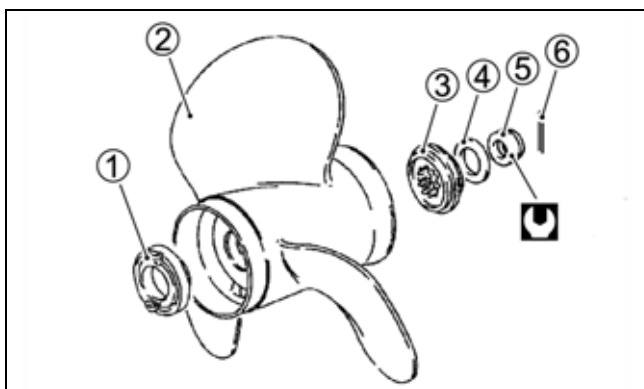
Apply *Triple-Guard* grease to the entire propeller shaft before installing the propeller.

Install thrust bushing onto propeller shaft with shoulder of thrust bushing facing aft. Taper of bushing must match taper of propshaft.

Install propeller on propeller shaft by aligning splines and pushing until seated on the thrust bushing.

IMPORTANT: Depending on propeller style, different thrust bushings, spacers, and cotter pin keepers are used. See the *Evinrude/Johnson Genuine Parts* book for a complete listing and descriptions.

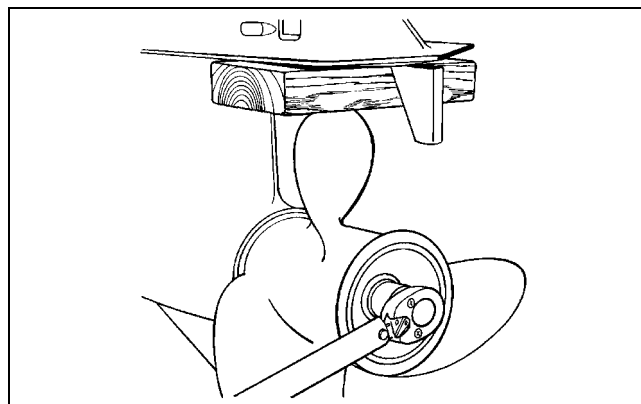
Install the spacer, engaging the propeller shaft splines.



1. Thrust bushing
2. Propeller
3. Spacer
4. Washer
5. Propeller Nut
6. Cotter pin

004361

Wedge a block of wood between propeller blade and the anti-ventilation plate.



DRC3984

Install the propeller nut and torque to:

- 156 in. lbs. (18 N·m)

If cotter pin holes in the propeller nut and propeller shaft are not aligned, tighten the nut until they are in line. Do not loosen.

Insert a new cotter pin through the propeller nut and shaft. Bend its ends over the nut to secure the assembly.

IMPORTANT: After fastening propeller nut, make sure outboard is in NEUTRAL and carefully spin propeller. Propeller must turn freely and should not spin off center. If propeller appears to wobble, check for possible bent propeller shaft.

NOTES

Technician's Notes

Related Documents

Bulletins	
Instruction Sheets	
Other	