

EVINRUDE[®]
E-TEC[®]



Installation and Predelivery



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INSTALLATION & PREDELIVERY

TABLE OF CONTENTS

BOAT RIGGING

REMOTE CONTROLS

CONTROL SYSTEM SELECTION 8
CONTROL INSTALLATION 9
CONTROL CABLE ROUTING 10

INFORMATION DISPLAY SYSTEMS 11

ENGINE MONITOR SYSTEM 11
SYSTEMCHECK GAUGES 11
I-COMMAND DISPLAYS 11
SYSTEMCHECK (MWS) HARNESS CONNECTIONS 12
I-COMMAND HARNESS CONNECTIONS WITH MECHANICAL REMOTE CONTROL 13
EVINRUDE ICON / I-COMMAND HARNESS CONNECTIONS 14

BATTERY INSTALLATION 15

BATTERY RECOMMENDATIONS 15
BATTERY CONNECTIONS 15
BATTERY CABLE REQUIREMENTS 16
BATTERY SWITCHES AND MULTIPLE BATTERIES 16
AUXILIARY BATTERY CHARGING 17
BATTERY AND SWITCH WIRING DIAGRAMS 18

FUEL SYSTEM REQUIREMENTS 20

REGULATIONS AND GUIDELINES 20
PERMANENT FUEL TANKS 20
PORTABLE FUEL TANKS 20
FUEL HOSE 20
FUEL SYSTEM PRIMER 21
FUEL FILTERS 21
FUEL FLOW REQUIREMENTS 22

REMOTE OIL TANK INSTALLATION (V4 – V6) 23

LOCATION 23
MOUNTING 23
REMOTE OIL FILL KIT (OPTIONAL) 25

CABLE AND HOSE INSTALLATION 26

BOAT CABLE AND HARNESS ROUTING 26
PROTECTIVE SLEEVE/CONDUIT 27
BATTERY CABLES 27
FUEL HOSE 27
OIL SUPPLY HOSE 27
OETIKER CLAMP SERVICING 28

OUTBOARD INSTALLATION	
HULL PREPARATION	31
TRANSOM MEASURING AND DRILLING	33
LIFTING THE OUTBOARD	44
STEERING SYSTEMS	46
OUTBOARD MOUNTING	48
OUTBOARD RIGGING	
COMMON PRACTICES – ALL MODELS	51
CONTROL CABLE IDENTIFICATION	51
CABLE RETAINER CLIP INSTALLATION	51
<i>EVINRUDE E-TEC</i> 90° V MODELS 200–300 HP	52
<i>EVINRUDE E-TEC</i> 60° V MODELS 115–200 HP	58
<i>EVINRUDE E-TEC</i> MODELS 40–90 HP	65
<i>EVINRUDE E-TEC</i> MODELS 15–30 HP	71
FUEL AND OIL PRIMING	
FUEL REQUIREMENTS	75
FUEL SYSTEM PRIMING	76
OIL REQUIREMENTS	77
RECOMMENDED LUBRICANTS	77
OIL INJECTION RATE	77
BREAK-IN OILING	78
OIL SUPPLY PRIMING	79
PREDELIVERY	
BEFORE START-UP	83
RUNNING CHECKS	84
PROPELLERS	86
WATER TEST AND FINAL ADJUSTMENTS	88
ENGINE MOUNTING HEIGHT AND JACK PLATE ADJUSTMENT	88
FUEL SYSTEM VACUUM	88
ENGINE WATER PRESSURE	88
WATER PRESSURE CHART	89
TILT LIMIT SWITCH ADJUSTMENT (75 – 300 HP)	90
TRIM SENDING UNIT ADJUSTMENT (75 – 300 HP)	91
TRIM SENDING UNIT ADJUSTMENT (25 – 60 HP)	92
TRIM TAB ADJUSTMENT	93
DUAL-OUTBOARD ALIGNMENT	94
INDEX	95
SAMPLE PREDELIVERY CHECKLIST	97

SAFETY INFORMATION

This publication is written for qualified, factory-trained technicians who are already familiar with the use of *Evinrude/Johnson* Special Tools. The included information is not a substitute for work experience. It is an organized guide for reference, repair, and/or maintenance.

The following symbols and/or signal words may be used in this document:

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates an instruction which, if not followed, could severely damage engine components or other property.

These safety alert signal words mean:

ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

IMPORTANT: Identifies information that controls correct assembly and operation of the product.

DO NOT perform any work until you have read and understood these instructions completely.

Torque wrench tightening specifications must strictly be adhered to.

Should removal of any locking fastener (lock tabs, locknuts, or patch screws) be required, always replace with a new one.

When replacement parts are required, use *Evinrude/Johnson Genuine Parts* or parts with equivalent characteristics, including type, strength and material. Use of substandard parts could result in injury or product malfunction.

Always wear EYE PROTECTION AND APPROPRIATE GLOVES when using power tools.

Unless otherwise specified, engine must be OFF when performing this work.

Always be aware of parts that can move, such as flywheels, propellers, etc.

Some components may be HOT. Always wait for engine to cool down before performing work.

If you use procedures or service tools that are not recommended in this manual, YOU ALONE must decide if your actions might injure people or damage the outboard.

This document may be translated into other languages. In the event of any discrepancy, the English version shall prevail.

⚠ 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. Remove propeller before servicing and when running the outboard on a flushing device.

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.

⚠ WARNING

Wear safety glasses to avoid personal injury, and set compressed air to less than 25 psi (172 kPa).

The motor cover and flywheel cover are machinery guards. Use caution when conducting tests on running outboards. **DO NOT** wear jewelry or loose clothing. Keep hair, hands, and clothing away from rotating parts.

During service, the outboard may drop unexpectedly. Avoid personal injury; always support the outboard's weight with a suitable hoist or the tilt support bracket during service.

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

The electrical system presents a serious shock hazard. **DO NOT** handle primary or secondary ignition components while outboard is running or flywheel is turning.

Gasoline is extremely flammable and highly explosive under certain conditions. Use caution when working on any part of the fuel system.

Protect against hazardous fuel spray. Before starting any fuel system service, carefully relieve fuel system pressure.

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

Keep all electrical connections clean, tight, and insulated to prevent shorting or arcing and causing an explosion.

Always work in a well ventilated area.

Replace any locking fastener (locknut or patch screw) if its locking feature becomes weak. Definite resistance to tightening must be felt when reusing a locking fastener. If replacement is indicated, use only authorized replacement or equivalent.

ABBREVIATIONS USED IN THIS MANUAL

Units of Measurement

A	Amperes
amp-hr	Ampere hour
fl. oz.	fluid ounce
ft. lbs.	foot pounds
HP	horsepower
in.	inch
in. Hg	inches of mercury
in. lbs.	inch pounds
kPa	kilopascals
ml	milliliter
mm	millimeter
N·m	Newton meter
P/N	part number
psi	pounds per square inch
RPM	revolutions per minute
°C	degrees Celsius
°F	degrees Fahrenheit
ms	milliseconds
μs	microseconds
Ω	Ohms
V	Volts
VAC	Volts Alternating Current
VDC	Volts Direct Current

List of Abbreviations

ABYC	American Boat & Yacht Council
ATDC	after top dead center
AT	air temperature sensor
BPS	barometric pressure sensor
BTDC	before top dead center
CCA	cold cranking amps
CFR	Code of Federal Regulations
CPS	crankshaft position sensor
EMM	Engine Management Module
EPA	Environmental Protection Agency
ICOMIA	International Council of Marine Industry Associations
ID	Inside dimension
MCA	marine cranking amps
MWS	modular wiring system
NMEA	National Marine Electronics Assoc.
ROM	read only memory
S.A.F.E.	speed adjusting failsafe electronics
SAC	start assist circuit
SAE	Society of Automotive Engineers
SYNC	synchronization
TDC	top dead center
TPS	throttle position sensor
USCG	United States Coast Guard
WOT	wide open throttle
WTS	water temperature sensor

EMISSION-RELATED INSTALLATION INSTRUCTIONS

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

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine SI (spark ignition) engine repair establishment or individual.

Manufacturer's Responsibility

Beginning with 1999 model year outboards, manufacturers of marine outboards must determine the exhaust emission levels for each outboard horsepower family and certify these outboards with the United States of America Environmental Protection Agency (EPA). An emissions control information label, showing emission levels and outboard specifications, must be placed on each outboard at the time of manufacture.

Dealer's Responsibility

When performing service on all 1999 and more recent *Evinrude/Johnson* outboards that carry an emissions control information label, adjustments must be kept within published factory specifications.

Replacement or repair of any emission related component must be executed in a manner that maintains emission levels within the prescribed certification standards.

Dealers are not to modify the outboard in any manner that would alter the horsepower or allow emission levels to exceed their predetermined factory specifications.

Exceptions include manufacturer's prescribed changes, such as altitude adjustments, for example.

Owner's Responsibility

The owner/operator is required to have outboard maintenance performed to maintain emission levels within prescribed certification standards.

The owner/operator is not to, and should not allow anyone to, modify the outboard in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

Tampering with the fuel system to change horsepower or modify emission levels beyond factory settings or specifications will void the product warranty.

EPA Emission Regulations

All new 1999 and more recent *Evinrude/Johnson* outboards are certified to the EPA as conforming to the requirements of the regulations for the control of air pollution from new watercraft marine spark ignition outboards. This certification is contingent on certain adjustments being set to factory standards. For this reason, the factory procedure for servicing the product must be strictly followed and, whenever practical, returned to the original intent of the design. The responsibilities listed above are general and in no way a complete listing of the rules and regulations pertaining to the EPA requirements on exhaust emissions for marine products. For more detailed information on this subject, you may contact the following locations:

VIA U.S. POSTAL SERVICE:

Office of Mobile Sources
Engine Programs and Compliance Division
Engine Compliance Programs Group (6403J)
401 M St. NW
Washington, DC 20460

VIA EXPRESS or COURIER MAIL:

Office of Mobile Sources
Engine Programs and Compliance Division
Engine Compliance Programs Group (6403J)
501 3rd St. NW
Washington, DC 20001

EPA INTERNET WEB SITE:

www.epa.gov

BOAT RIGGING

REMOTE CONTROLS

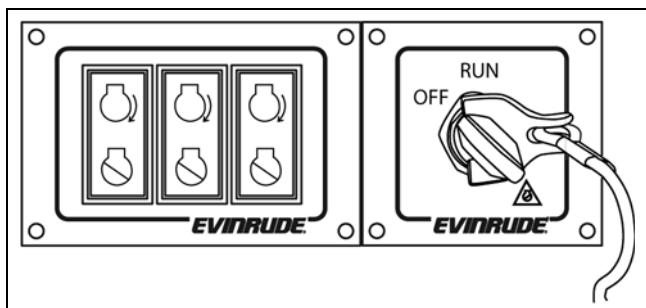
Control System Selection

Outboard remote control systems provide the operator with tools for:

- Starting and stopping the engine
- Shifting into Forward, Neutral, or Reverse
- Changing engine speed
- Changing the tilt/trim angle of the outboard.

The remote control system must include the following features:

- Shift stroke must be 1.125 to 1.330 in. (28.6 to 33.8 mm) between Neutral and Forward
 - Throttle stroke must PUSH for open
 - Start-in-gear prevention
 - Emergency stop switch with lanyard—multiple-outboard installations require separate start switches and a single emergency stop switch
 - Connections for engine monitor warning system
- Refer to **Engine Monitor System** on p. 11.



ICON style multiple start switches with master power/emergency stop switch 007875

⚠ 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.

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.

Several remote control options, including both mechanical and electronic systems, are available in the *Evinrude/Johnson Genuine Parts and Accessories* catalog.

Mechanical control systems use push/pull cables to physically move the shift and throttle components on the outboard.

These systems use a Modular Wiring System (MWS) harness to carry start, stop, and trim signals (analog) to the outboard. Specific harness selection depends on the type of Information Display system being used. Refer to **INFORMATION DISPLAY SYSTEMS** on p. 11.

Electronic control systems, such as *Evinrude ICON*, manage all engine control functions through a low-voltage, digital data network.



Evinrude ICON multi-engine control

007986

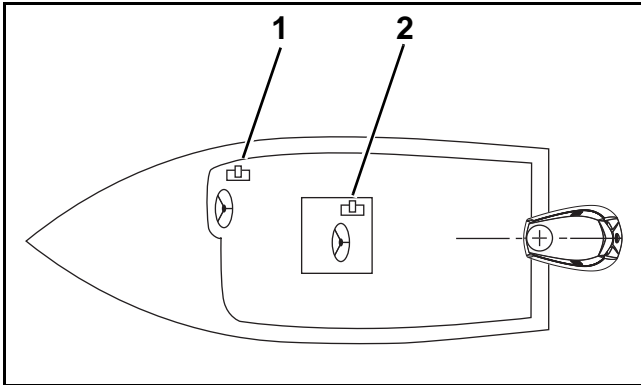
These systems can only be used with outboards equipped for electronic control, including *Evinrude ETEC* models identified with a “DE” prefix in the model number.

Conversion kits are available to add electronic control capabilities to standard *ETEC* models from 150 to 300 HP, 2008 and newer.

Control Installation

Plan the installation of remote controls carefully, following all instructions provided with the control.

Select an appropriate location based on the boat configuration.

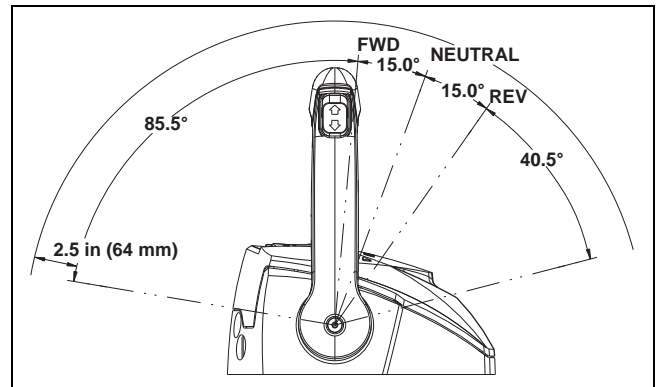


1. Side console
2. Center console

005471

IMPORTANT: The mounting location must be a flat surface and must be strong enough to provide rigid support. Strengthen mounting surface as necessary.

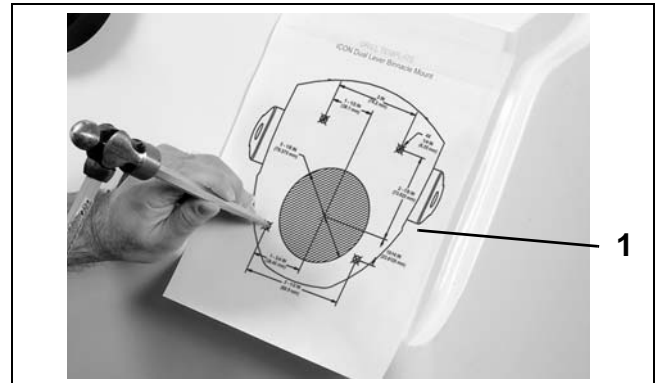
Place remote control at proposed location and check clearance around remote control lever at full throttle in FORWARD and then at full throttle in REVERSE. There must be at least 2.5 in. (64 mm) of clearance between the handle and any part of the boat throughout the control lever travel.



Typical control clearances

007920

Use an appropriate drill template to cut mounting holes. Templates are included with the control instructions.



1. Template

007922

Install control with hardware provided.

IMPORTANT: Make sure remote control assembly is secure and does not move during operation.

BOAT RIGGING

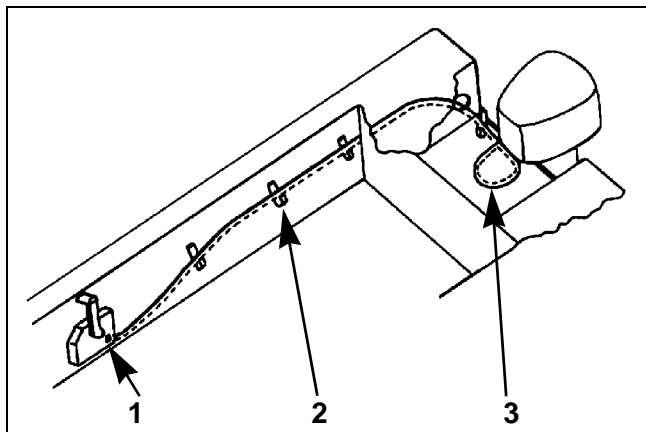
REMOTE CONTROLS

Control Cable Routing

Control cables and harnesses should be routed along a protected path to the rear of the boat and secured to prevent movement or damage.

Harness connections should be mounted in a dry location, away from bilge and motor well areas.

Control cables should be long enough to allow 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

Evinrude ICON Networks

All control information is transferred between the outboard and an *Evinrude ICON* system through a single network cable. For complete installation instructions, refer to the ***Evinrude ICON Remote Control System Installation Guide***, P/N 764952.

When installing an *ICON* network, remember:

- Control network must include two cable hubs
- DO NOT use the key switch to power accessories (switched B+)—use an *ICON* Accessory Power Relay Kit
- The *ICON* Gateway provides a connection for an *I-Command* Information Display network.

Refer to **Evinrude ICON / I-Command Harness Connections** on p. 14 for a typical network installation diagram.

INFORMATION DISPLAY SYSTEMS

Engine Monitor System

All remote controlled outboards must be equipped with an engine monitoring system to warn the operator of conditions that could damage the outboard.

The engine monitor system includes sensors on the outboard and oil tank, a warning horn, a dash-mounted display, and related wiring.

The outboard's *EMM* sends information about monitored functions to:

- *SystemCheck* gauges, or
- An *I-Command* or *ICON* display.

IMPORTANT: Operating the outboard without an engine monitor will void the warranty for failures related to monitored functions.



Typical *I-Command* and *SystemCheck* gauges 007988

SystemCheck Gauges

SystemCheck gauges are used with mechanical remote control systems only.

SystemCheck gauges receive monitored information from the outboard through a Modular Wiring System (MWS) harness.

Refer to **SystemCheck (MWS) Harness Connections** on p. 12.

I-Command Displays

I-Command digital displays are designed specifically for *NMEA 2000* certified *Evinrude E-TEC* outboards. These displays provide enhanced engine and boat performance information. Multiple functions are integrated into the easy-to-use displays. Additional displays and accessories can be added with the plug and play design.

I-Command information displays can be used with either a mechanical remote control system or with an *Evinrude ICON* system. For complete installation instructions, refer to ***I-Command* Installation Guide**.

When installing an *I-Command* network, remember:

- A terminator must be installed at each end of the network
- There should be no open or unused network device connectors
- The network should be grounded at a single location only
- A maximum of 50 devices can be attached to the network *
- The distance between any two points on the network must not exceed 100 meters (328 ft.).

* The *EMM* on *Evinrude E-TEC* outboards has a load equivalency number of 1. Less than 50 mA of the network's power is used by the *EMM*.

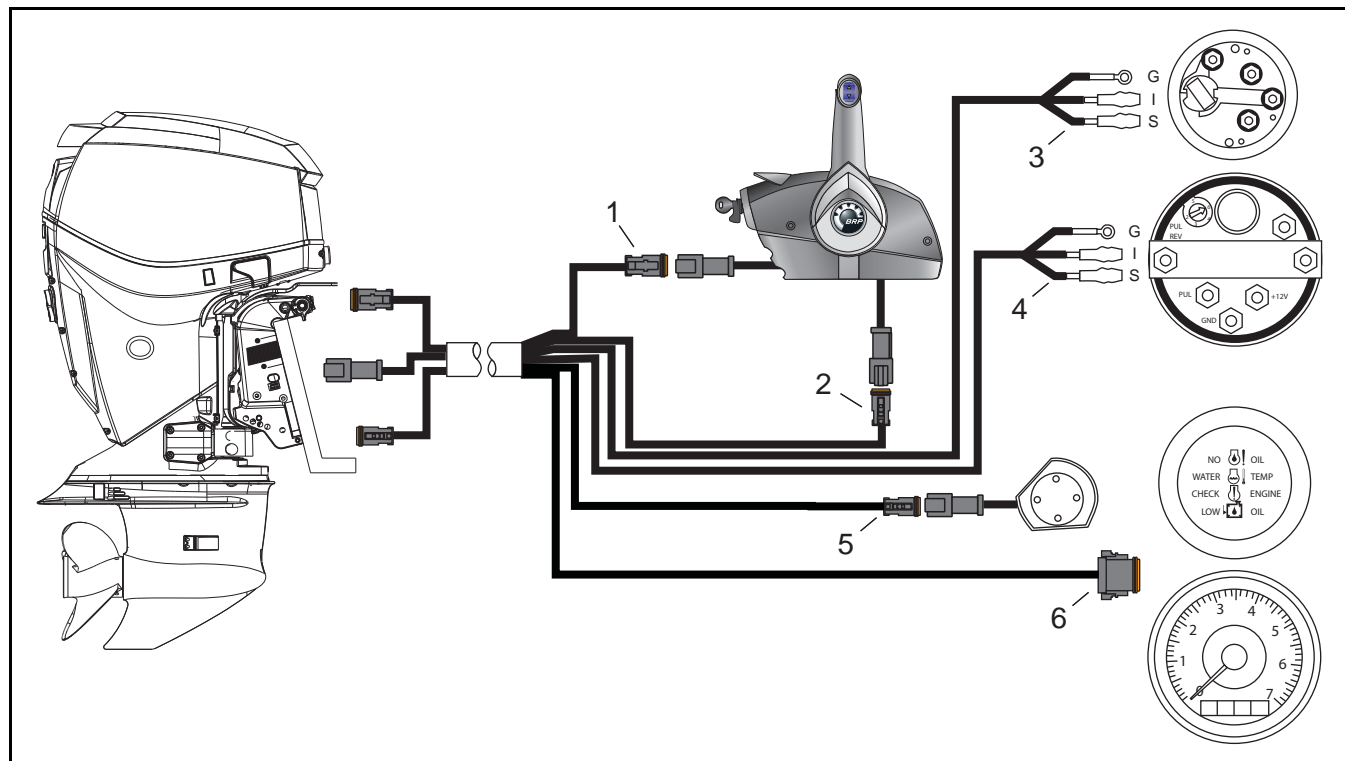
If a mechanical control is used, the *I-Command* network receives monitored information through an *I-Command* network harness connected directly to the outboard's *EMM*. An *I-Command* Ignition and Trim harness is required to carry start, stop, and trim signals to the outboard.

Refer to **I-Command Harness Connections With Mechanical Remote Control** on p. 13.

If an *ICON* control is used, the *I-Command* network receives monitored information through the *ICON* control network gateway.

Refer to **Evinrude ICON / I-Command Harness Connections** on p. 14.

SystemCheck (MWS) Harness Connections

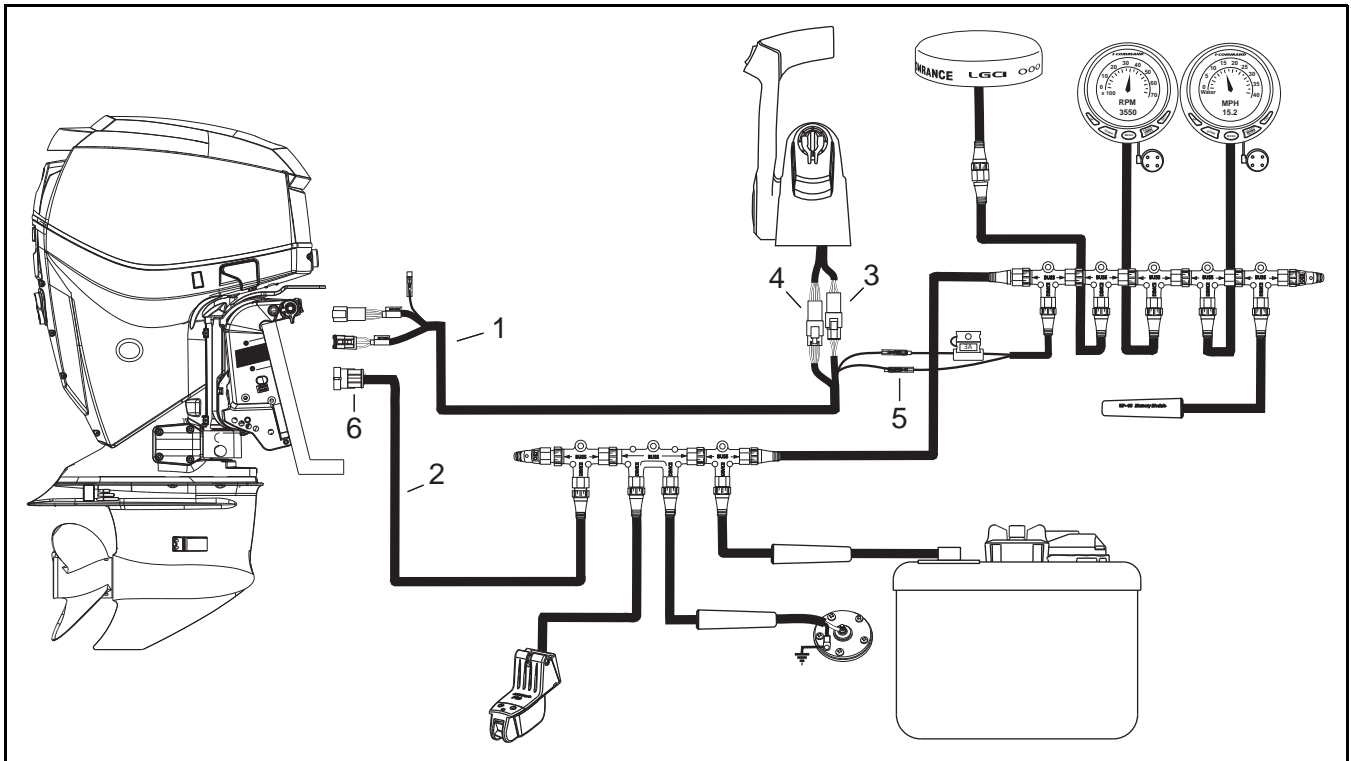


Typical MWS wiring with a side-mount mechanical remote control

007989

1. **6-Pin Connector** – Connect to a pre-wired remote control or to a dash-mounted key switch.
2. **3-Pin Connector** – Connect to remote control trim switch or to a dash-mounted trim switch.
3. **Black, purple, white/tan wires** – Connect to the trim gauge.
4. **Black, purple, gray wires** – Connect to a conventional tachometer when a *SystemCheck* tachometer is not used.
5. **2-Pin Connector** – Must connect to the warning horn in all installations.
6. **8-Pin Connector** – Connect to a *SystemCheck* gauge or tachometer.

I-Command Harness Connections With Mechanical Remote Control

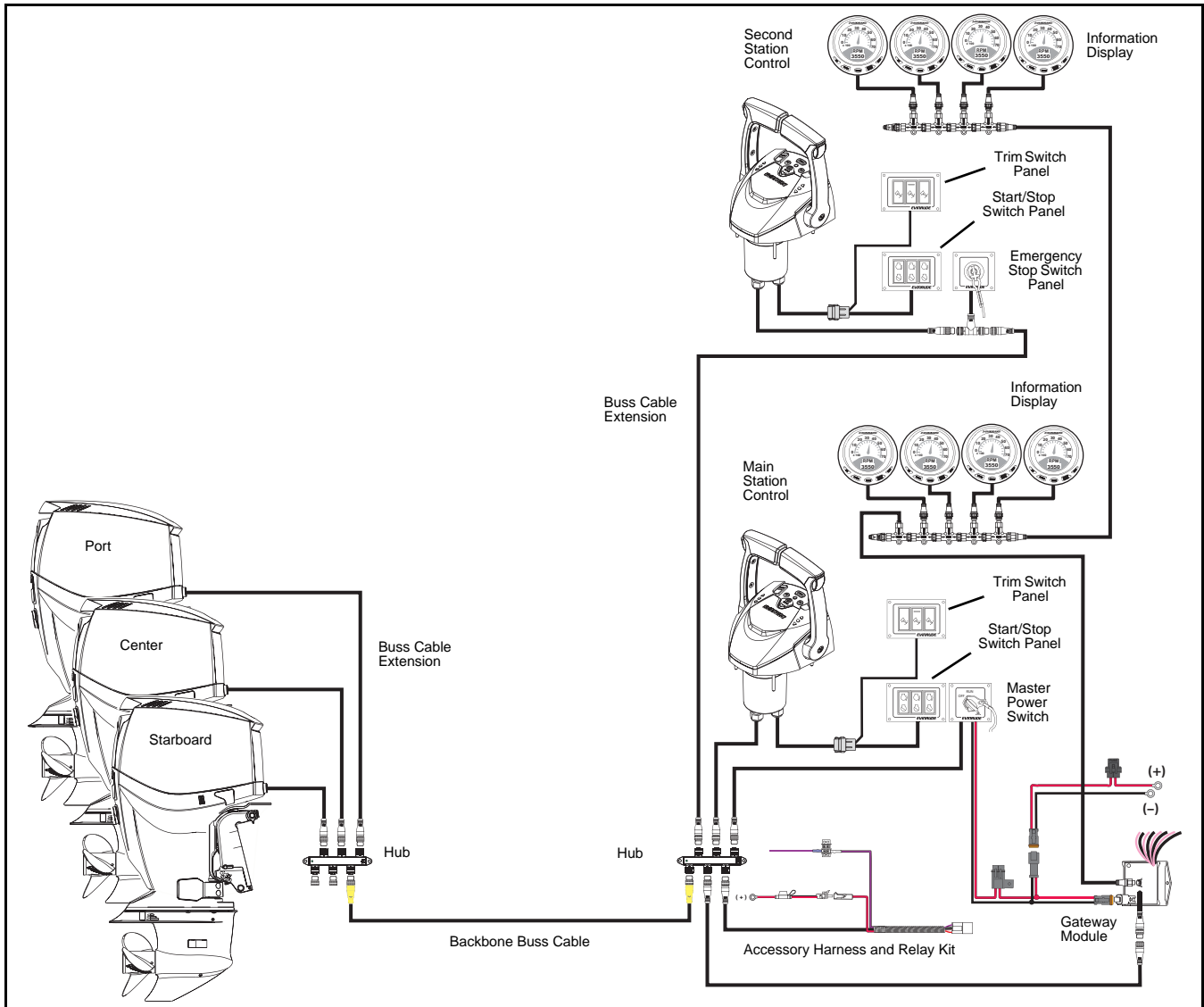


Typical I-Command wiring with a binnacle-mount mechanical remote control

007990

1. **I-Command Ignition and Trim Harness**
2. **I-Command Network Harness**
3. **6-Pin Connector** – Connect to a pre-wired remote control or to a dash-mounted key switch.
4. **3-Pin Connector** – Connect to remote control trim switch or to a dash-mounted trim switch.
5. **Purple, black wires** – Connect to network power supply.
6. **4-Pin Amp Connector** – Connect to outboard EMM.

Evinrude *ICON* / I-Command Harness Connections



Typical Evinrude *ICON* network for three outboards and two control stations

007978

BATTERY INSTALLATION

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

Battery Recommendations

Outboard Model	Battery Rating
115–300 HP	675 CCA (845 MCA), or 800 CCA (1000 MCA) below 32°F (0°C) 107 amp-hr in extreme applications
15–90 HP	640 CCA (800 MCA), or 800 CCA (1000 MCA) below 32° F (0° C) 107 amp-hr in extreme applications

Battery Location

Proper installation will prevent battery movement while underway.

- Secure all batteries in protected locations
- Place 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.

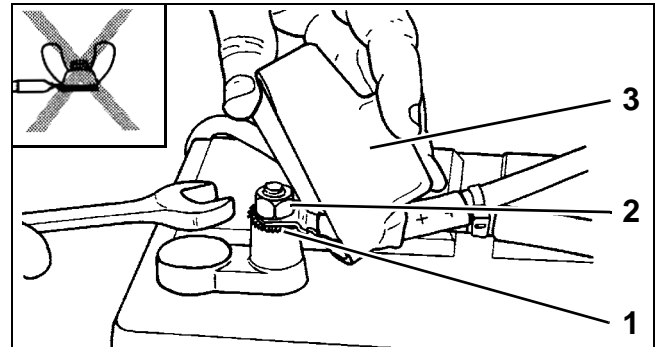
Battery Connections

⚠ 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.

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 DR5103
 1. Starwasher
 2. Hex nut
 3. Terminal Insulator

NOTICE 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.

BOAT RIGGING

BATTERY INSTALLATION

Battery Cable Requirements

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

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

	15–30 HP	40–300 HP
1 to 10 Ft. (.3 to 3 m)	6 Gauge	4 Gauge
11 to 15 Ft. (3.4 to 4.6 m)	4 Gauge	2 Gauge
16 to 20 Ft. (4.9 to 6.1 m)	2 Gauge	1 Gauge

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.

Battery Switches and Multiple Batteries

A multiple battery setup, including marine battery selector switches, can provide flexibility in single and dual outboard installations.

Refer to **Battery and Switch Wiring Diagrams** on p. 18 for battery connection options.

The battery selection function can be used for emergency starting if a primary battery becomes discharged.

The OFF position of the battery selector switch can be used to minimize battery discharge during periods of non-use.

Typical battery functions

Primary

- Used as starting battery under normal operating conditions.
- Red (+) cable connected to battery switch.
- Primary battery is charged by connection to main red (+) outboard battery cable.

Dual outboard installations can utilize the opposing outboard's primary battery as a secondary battery for emergency starting only.

Secondary

- Used as back-up starting battery under abnormal operating conditions.
- Red (+) cable connected to battery switch.
- Secondary battery is charged independently from primary battery.

Accessory

- Not used as starting battery.
- Isolated from outboard start function.
- No red (+) cable connected to battery switch.

Secondary and accessory batteries are often charged by an isolated battery charging circuit. Refer to **Auxiliary Battery Charging** on p. 17.

Battery Switch Requirements

Battery switches must meet the following requirements.

- The switch must be approved for marine use.
- The switch should be a “make before break” design.
- Switch amperage rating should be adequate for the outboard it will be used on.
- Use one battery switch for each outboard installed.
- Use appropriately sized wire and terminals.
- Use AWG stranded copper wire.

Battery Switch Location

- Locate battery switch as close to the batteries as possible.
- Locate switch so that it cannot be accidentally bumped or switched.
- Refer to the battery switch manufacturer's installation instructions.
- Fasten all battery switches to solid surfaces.
- Route wiring as directly as possible.
- Support the battery switch as needed to prevent abrasion.
- Use appropriate wiring and connectors.
- Seal all connections and terminals with liquid neoprene to prevent corrosion.

NOTICE Insulate all battery positive (+) terminals to prevent shorting.

Battery Switch Operation

- Select the primary battery for normal operation.
- Secondary batteries should only be selected for emergency starting.
- ALL or BOTH switch position is for emergency starting only.

Provide operator with the documentation supplied by the battery switch manufacturer. Make sure that the operator is informed of proper battery switch operation.

NOTICE The negative (–) terminals of a multiple 12-volt battery installation must be connected together.

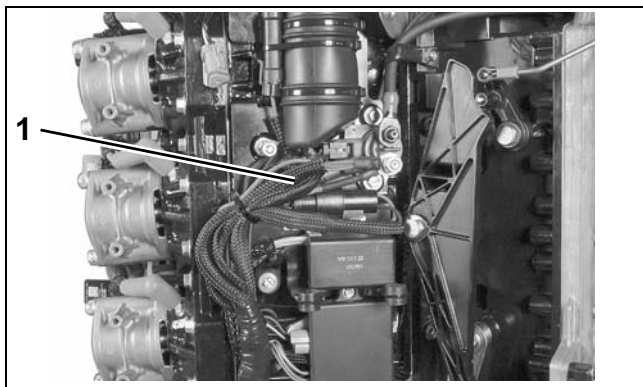
Auxiliary Battery Charging

EVINRUDE E-TEC V4 – V6 MODELS

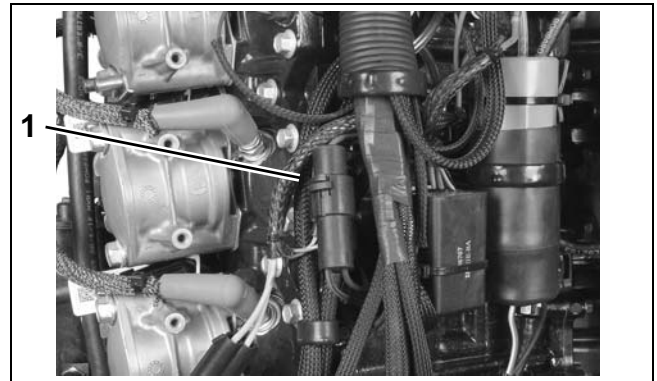
Evinrude E-TEC V4–V6 outboards are equipped with isolated battery charging capability. The isolated charge connection must only be used to charge a single 12-volt battery or two 12-volt batteries wired in parallel.

NOTICE Never connect an external battery isolator to the stator of an *Evinrude E-TEC*.

Accessory Charge Lead Kit, P/N 5006253, is routed from a connector on the outboard’s electrical harness to the accessory battery.



90° V6 Models
 1. Accessory battery charge connector



60° V4–V6 Models
 1. Accessory battery charge connector

004944

NOTICE The accessory charging kit must never be connected to any battery of a 24-volt electrical system.

EVINRUDE E-TEC 40 – 90HP MODELS

Evinrude E-TEC 40 – 90 HP outboards do not have a built in isolator feature. Proper methods must be used to connect a second battery.

Battery charging output on 40 – 90 HP models is 25 Amps. Be sure to follow published standards for wire gauge selection. Refer to **Battery Cable Requirements** on p. 16.

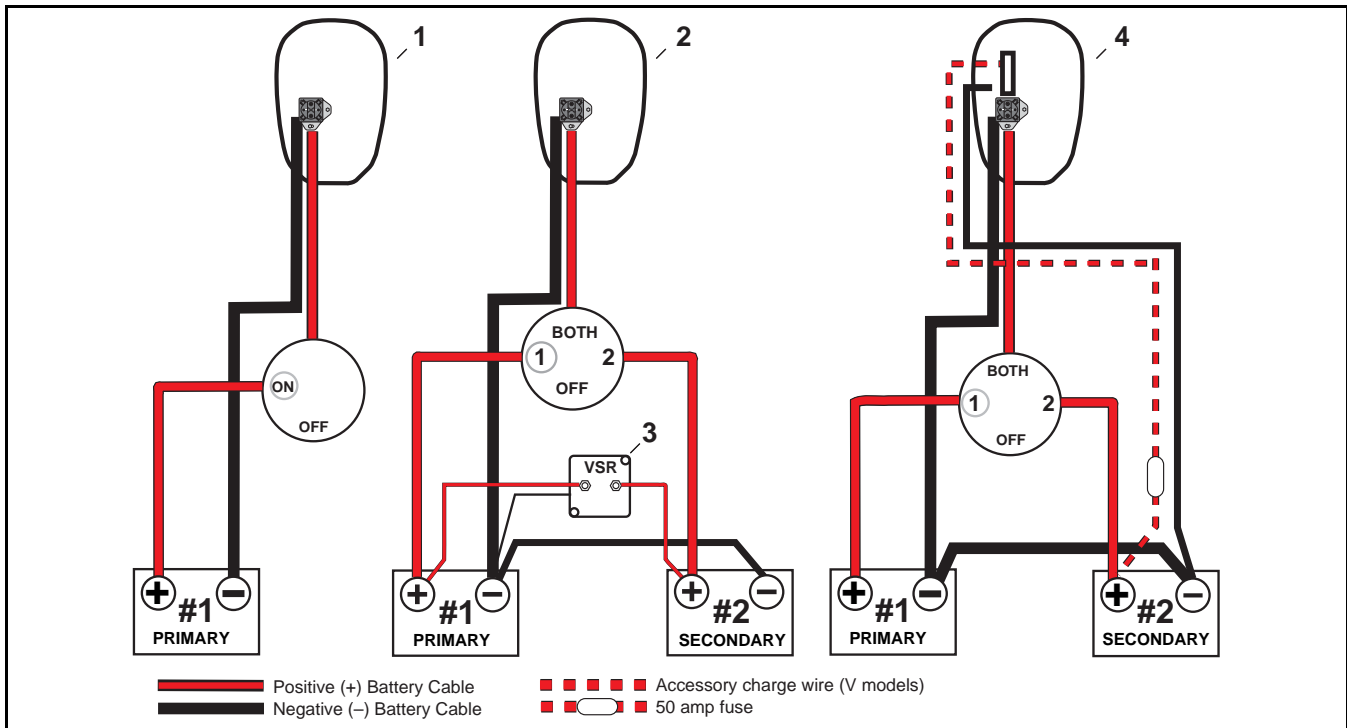
If a battery isolator is desired, a battery switch, such as P/N 506161, and a voltage sensitive relay, such as *BEP* model 710-125A, can be used to create a battery isolator/combiner.

The voltage sensitive relay (VSR) regulates charging of a second battery based on predetermined voltage levels of the primary battery.

NOTICE Never connect an external battery isolator to the stator of an *Evinrude E-TEC*.

Battery and Switch Wiring Diagrams

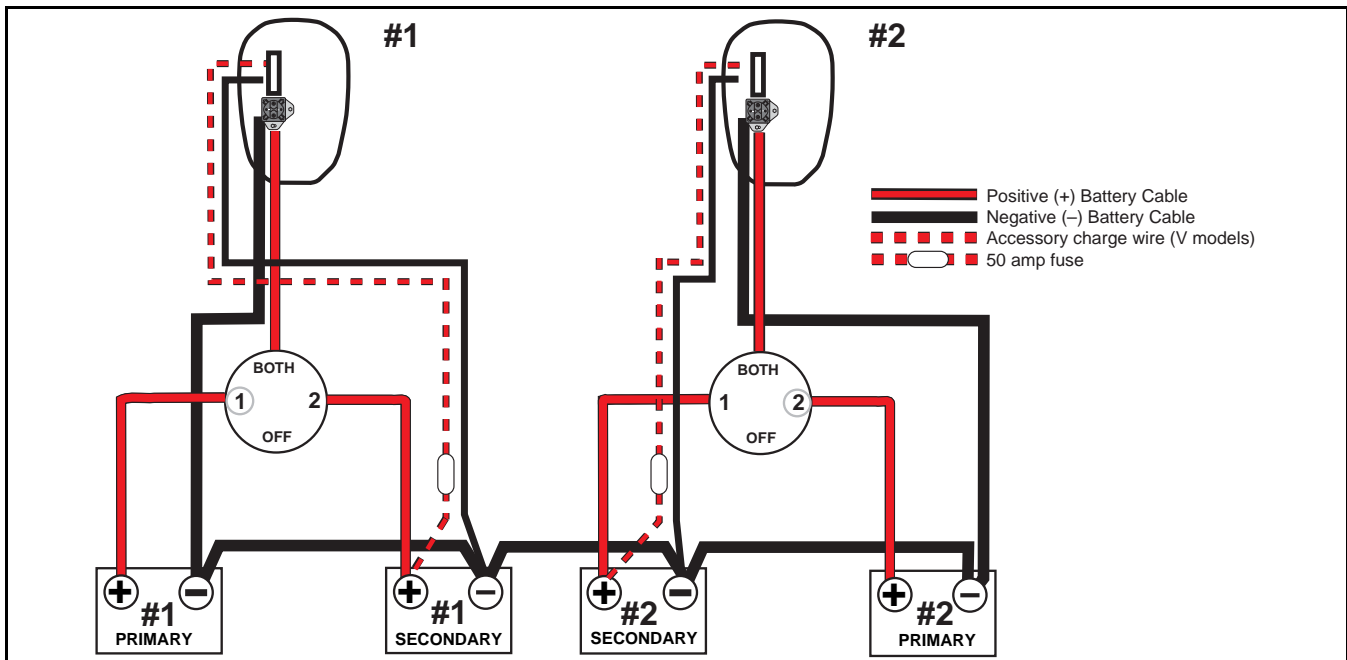
Single outboard



1. Single starting battery with ON/OFF switch
2. Two starting batteries with isolator/combiner (15 – 90 HP models)
3. Voltage sensitive relay
4. Two starting batteries with Auxiliary charging kit (V models)

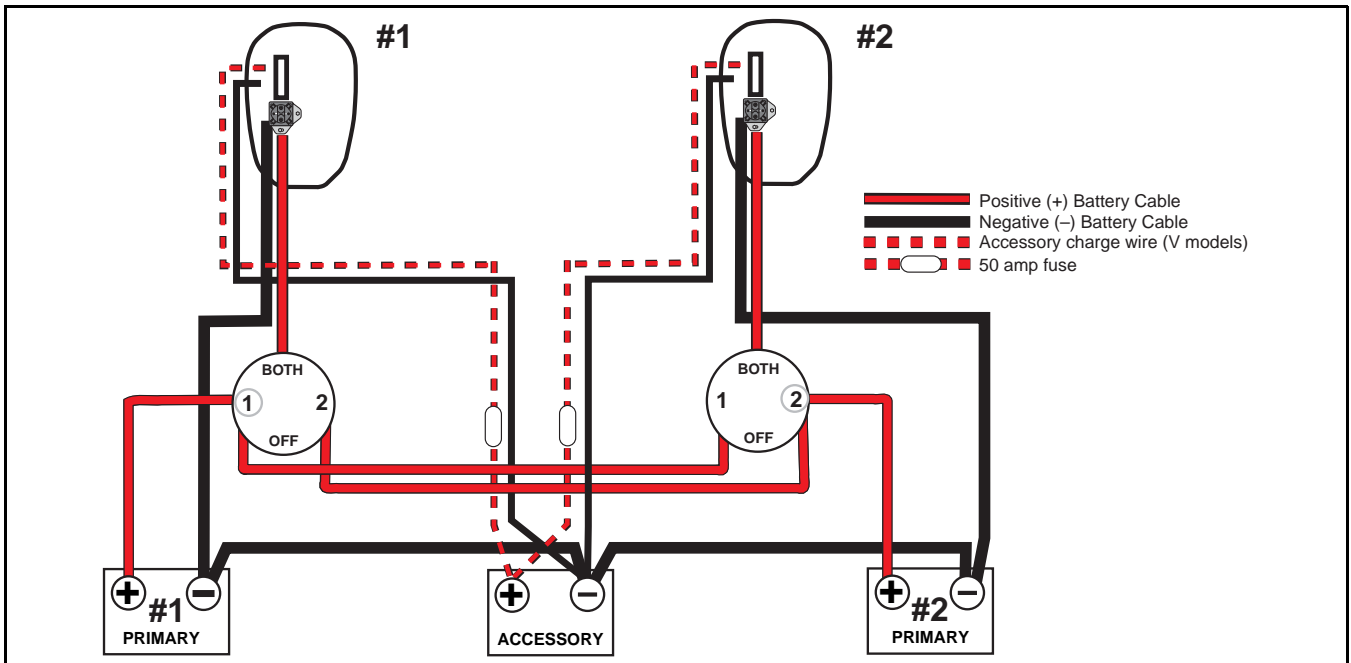
008056

Two outboards: Two starting batteries each



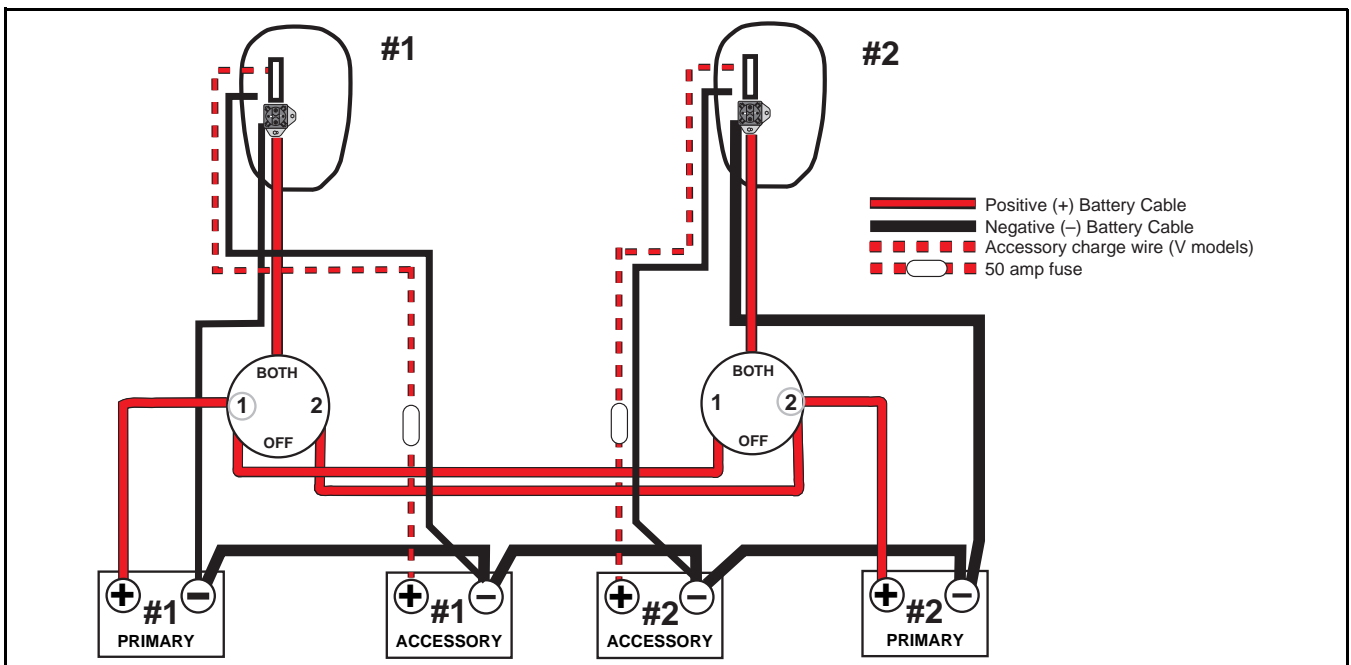
008055

Two outboards: One primary battery each; one isolated accessory battery



008053

Two outboards: One primary battery each; two isolated accessory batteries



008054

FUEL SYSTEM REQUIREMENTS

Regulations and Guidelines

Vessel manufacturer, and/or installer of an EPA certified outboard, must meet minimum specifications for boat fuel systems established by:

- U.S. Environmental Protection Agency (EPA)
 - 40 CFR 1045.112
 - 40 CFR 1060
- U.S. Coast Guard (USCG)
 - 33 CFR 183
- American Boat & Yacht Council (ABYC)
 - Standard H-24
 - Standard H-25.

Permanent Fuel Tanks

Permanent fuel tanks must be properly vented outside of the hull.

Remote fuel tank gas fills must be grounded.

Fuel tank pickups should include an anti-siphon valve to prevent fuel flow if a leak occurs in the fuel distribution system.

Portable Fuel Tanks

⚠ WARNING

If engine is equipped with a quick-disconnect fuel hose, you **MUST disconnect the fuel hose from the engine and the fuel tank to prevent fuel leaks:**

- Whenever the engine is **NOT** being used
- Whenever the engine is being trailered
- Whenever the engine is in storage.

NOTE: A small amount of fuel may be released when the fuel connector is disconnected.

Store portable fuel tanks in well-ventilated areas, away from heat sources and open flames. Close the vent screw of the fuel tank cap, if equipped, to prevent escape of fuel or fuel vapors which could accidentally ignite. Do not allow disconnected fuel hoses to leak fuel.

NOTICE Do not use portable fuel tanks for outboards larger than 115 HP. Inadequate fuel flow to high horsepower outboards can result in serious powerhead damage.

Fuel Hose

All fuel hoses used for rigging outboards manufactured after January 1, 2009 must meet EPA permeation requirements for evaporative emissions.

- Use SAE J30R9, or USCG Type B1-15, fuel hose in motor well areas.
- Use USCG Type A1-15 fuel hose between permanent fuel tanks and motor well fittings in inaccessible routings.
- Compliant hoses are labeled with the applicable specification.



1. Specification
2. Date code

007944

Permanently installed fuel hoses should be as short and horizontal as possible.

Use corrosion-resistant metal clamps on permanently installed fuel hoses.

Multi-outboard applications require separate fuel tank pickups and hoses. (A fuel selector switch may be used for “kicker” motors as long as it has enough flow capacity for the larger outboard.)

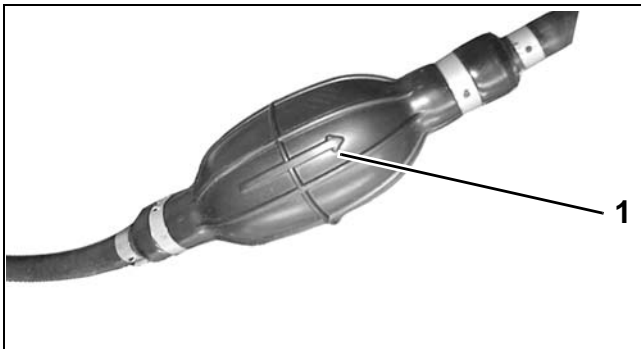
Use only fuel lines (or copper tubing) that meet the **Fuel Flow Requirements** for the outboard.

Fuel System Primer

Outboards require a priming system to refill the fuel system after periods of non-use. The most common priming system is a primer bulb in the fuel supply hose.

Install the primer bulb as follows:

- The primer bulb must meet the same **Fuel Flow Requirements** as the fuel hose.
- The primer bulb should be easily accessible.
- The arrow on the primer bulb must point in the direction of fuel flow.
- The fuel supply hose must allow the primer bulb to be held with the arrow pointing up during priming.



1. Arrow indicates direction of fuel flow

000124

An alternative to a primer bulb is a U.S. Coast Guard approved marine primer pump. Electric primer pumps offer the convenience of outboard priming from a dash-mounted momentary switch.

Fuel Filters

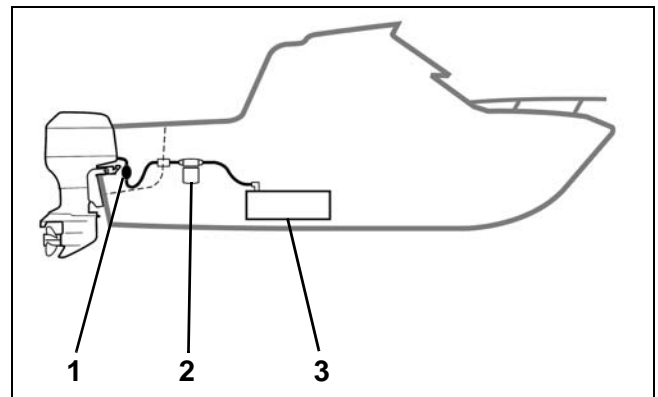
Boat-mounted fuel filters and water-separating fuel filter assemblies must meet the required fuel flow and filter specification. Refer to **Fuel Flow Requirements**.

The filter must be mounted to a rigid surface above the full level of the fuel tank and accessible for servicing.

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



174176



Typical Fuel Supply Configuration

DRC6797

1. Primer bulb
2. Water separating fuel filter
3. Anti-siphon valve, in fuel pick-up of tank

NOTICE Avoid using in-line fuel filters external to the outboard. The filter area and flow characteristics may not be adequate for high horsepower outboards.

BOAT RIGGING
FUEL SYSTEM REQUIREMENTS

Fuel Flow Requirements

	15 – 30 HP	40 – 90 HP	115 – 300 HP
Fuel tank pickup tube	1/4 in. (6.4 mm) min. ID	5/16 in. (7.9 mm) min. ID	3/8 in. (9.5 mm) min. ID
Fuel fittings	5/32 in. (4.1 mm) min. ID	1/4 in. (6.4 mm) min. ID	9/32 in. (7.1 mm) min. ID
Fuel supply hoses	1/4 in. (6.4 mm) min. ID	3/8 in. (9.5 mm) min. ID	3/8 in. (9.5 mm) min. ID
	ALL MODELS		
Fuel tank pickup screen	100 mesh, 304 grade stainless steel wire, 0.0045 in. wire diameter, 1 in. (25 mm) long		
Antisiphon valve	2.5 in. (63.5 mm) Hg maximum pressure drop at 20 gph (76 l/hr) flow		
Remote fuel filter	0.4 in. Hg maximum pressure drop at 20 gph (76 l/hr) flow, 150 in. ² (1290 cm ²) of filter area		
Maximum fuel pump lift height	Fuel pump should not be located more than 30 in. (76.2 cm) above bottom of fuel tank		

REMOTE OIL TANK INSTALLATION (V4 – V6)

Location

NOTICE Consider the installation location of the oil tank carefully. The oil tank is vented to the atmosphere. To avoid serious powerhead damage, be sure the oil tank is installed in a location that does not allow constant exposure to sunlight, rain, bilge water or spray.

Select a mounting location that provides:

- A solid place to mount the tank
- A dry location that prevents exposure to rain or spraying water
- Access for adding oil
- Access to oil-primer bulb
- Interference-free hose and wire routing to outboard.

If necessary, the oil tank can be mounted further from the outboard than the supplied hoses and harness allow. The maximum length of oil supply hose that can be fitted to the oil tank is 25 ft. (7.6 m).

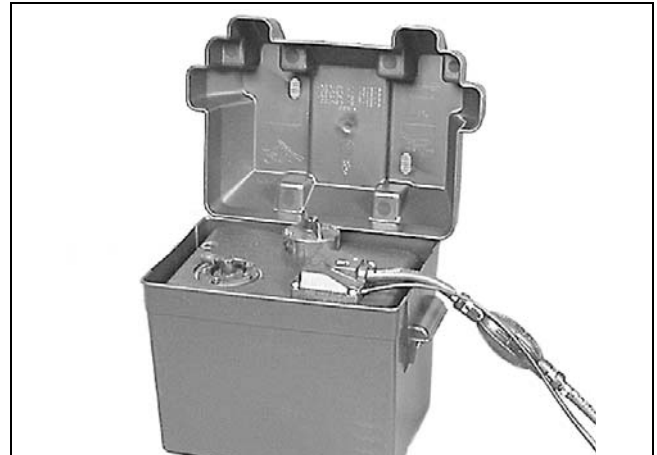
NOTICE Do not add hose to an existing oil supply hose.

If the oil tank requires a longer oil supply hose:

- Oil supply hose between the primer bulb and outboard must be replaced with one continuous length of 1/4 in. (6.4 mm) I.D. hose.
- Maximum length of hose is 25 ft. (7.6 m).
- Replacement hose must be designated for fuel or oil use and approved for marine use.
- Extend wiring harness with 16 gauge AWG wire.
- Protect connections with heat shrink tube.
- Maintain wire color and polarity when extending harness.

An appropriately sized battery box may be used to conceal and protect the oil tank, if desired.

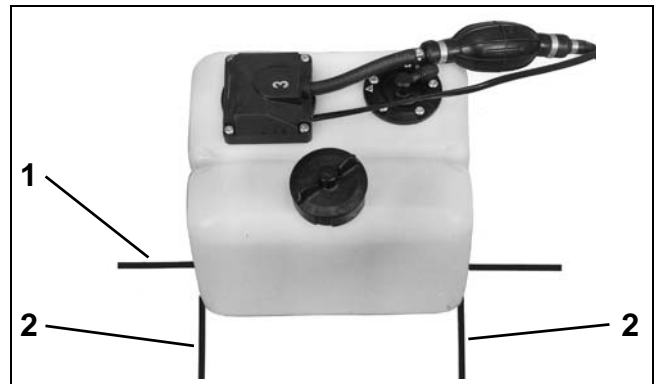
NOTICE Be sure box includes drain holes so it does not fill with water and contaminate oil.



000074

Mounting

Place tank in selected position. Mark one line under groove in tank bottom and lines at each end of tank.



1. Center line of oil tank
2. Ends of tank

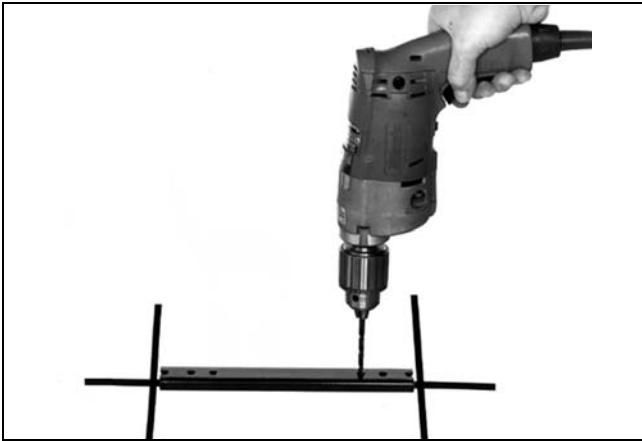
44737

Make sure hole locations provide enough clearance for fastening screws. Screws should not contact or penetrate hull.

BOAT RIGGING

REMOTE OIL TANK INSTALLATION (V4 – V6)

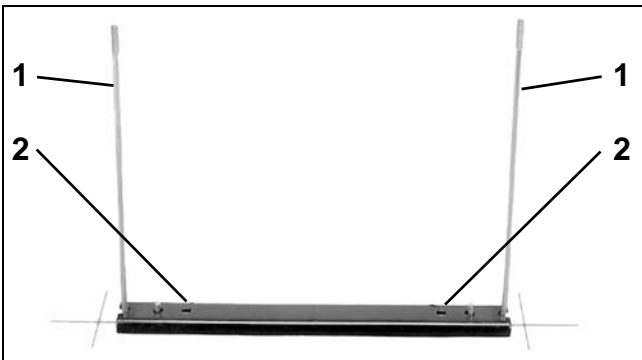
Place floor bracket on center line between end lines. Use the inner bracket holes as guides to drill two 5/32 in. (4 mm) pilot holes.



COB5381

3 GALLON (11.4 L) TANK

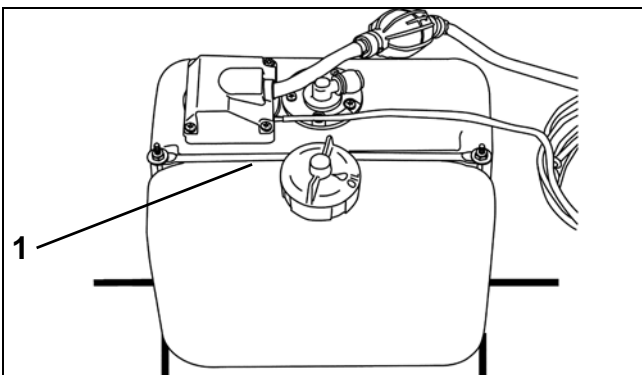
Place rods into floor bracket and secure floor bracket with lag bolts.



1. Rods
2. Lag bolts

22241B

Place oil tank onto floor bracket. Assemble cross-bar onto hook rods, install flat washers and lock-nuts. Tighten locknuts to securely hold tank.



1. Crossbar

DRC7418

1.8 GALLON TANK

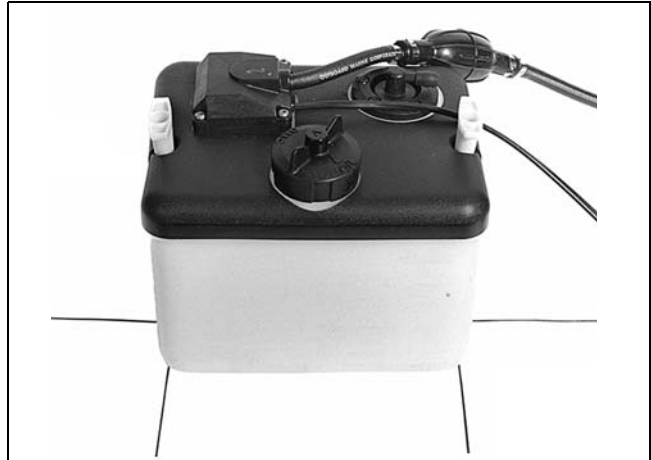
Place rods into floor bracket and secure floor bracket with lag bolts.



1. Rods
2. Lag bolts

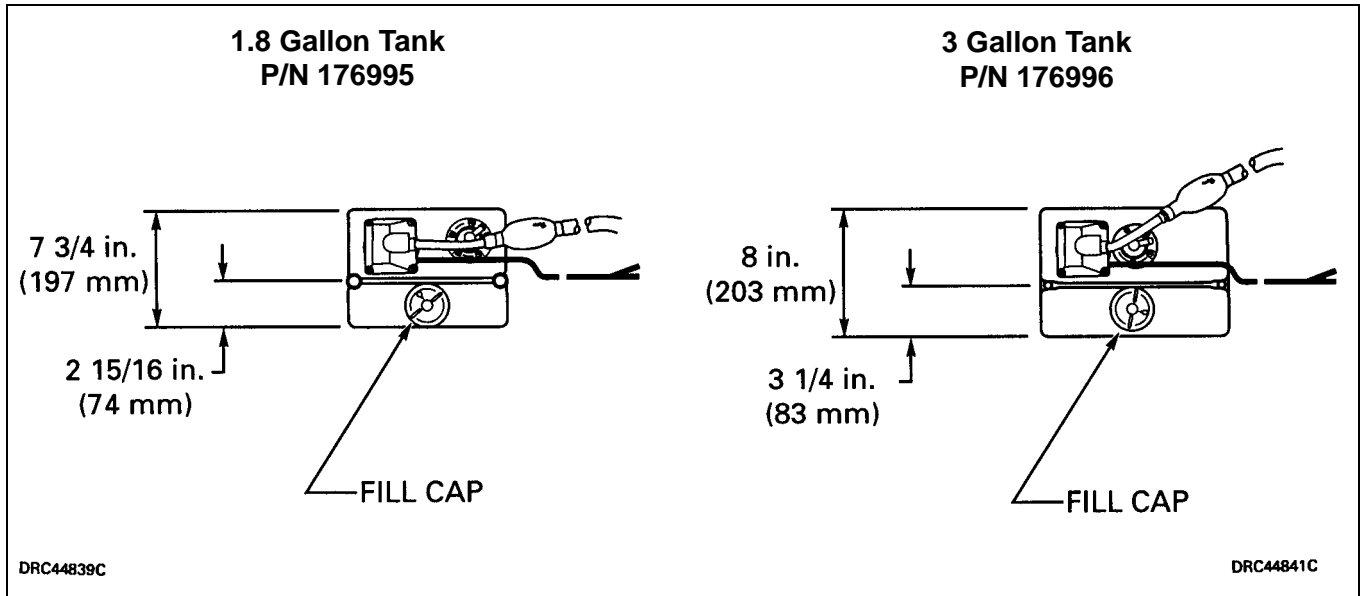
22149A

Place oil tank onto floor bracket. If cover is not pre-assembled, route oil supply hose and harness through the cover and position cover on the oil tank. Attach spring-loaded rods to cover.



48704

Oil Tank Profiles



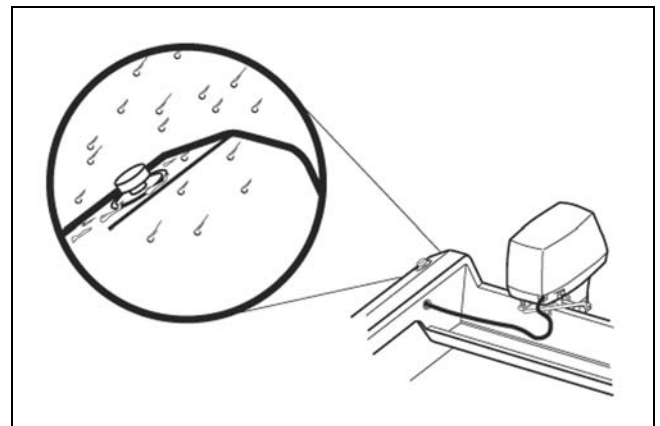
Remote Oil Fill Kit (Optional)

The remote oil fill kit (P/N 176461) provides a deck-mounted fill tube, cap, a tank-mounted tube, and nut that replace the original oil tank cap assembly.

Installation Recommendations

- Select a location on the deck of the boat that is above the oil tank fill cap.
- Select a deck location which allows the required length of 1½ in. I.D. fill hose to route as directly and as vertically as possible.
- Avoid inappropriate hose routings that could distort the fill tube or tank tube.
- Refer to installation instructions provided with remote oil fill kit.

NOTICE A slanted area of the deck will allow water to drain away from the fill and is best suited for the installation.



DRC8123

Additional Items Required

- 1½ in. I.D. fill hose cut to required length. Fill hose (P/N 123956) is available in 25 ft. (7.6 m) lengths.
- Two corrosion resistant 2 in. (50 mm) hose clamps.

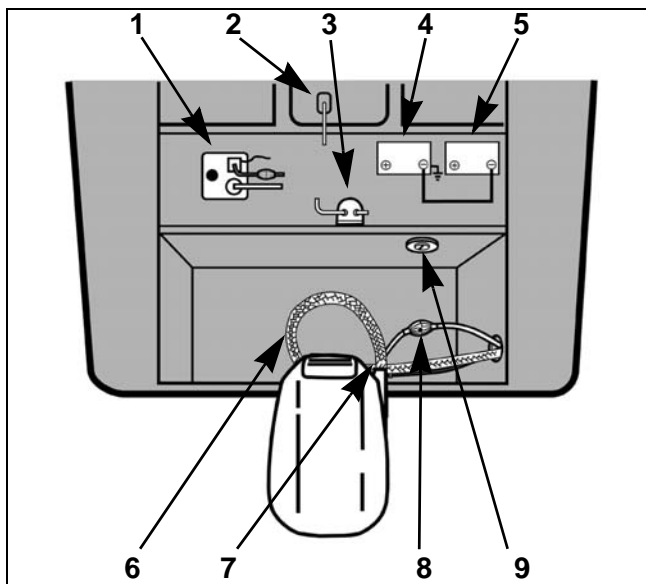
CABLE AND HOSE INSTALLATION

Before installation, identify all required wiring, cables, and hoses:

- Throttle and shift cables
- Instrument harnesses
- Battery cables and switches
- Oil tank sender harness
- Fuel supply hose
- Primer bulb or primer pump
- Oil supply hose.

Determine whether any additional wiring or hoses will be needed for accessory gauges or batteries:

- Speedometer pick-up hose
- Mechanical water pressure gauge hose
- Accessory battery charging kit
- *I-Command* adapter harnesses
- *I-Command* water pressure sensor kit
- *I-Command* oil level sensor kit.



Typical outboard installation

DRC6487

1. Oil tank
2. Anti-siphon valve
3. Water separating fuel filter
4. Starting battery
5. Accessory battery
6. Flexweave protective sleeve
7. Access cover
8. Primer bulb
9. Battery switch

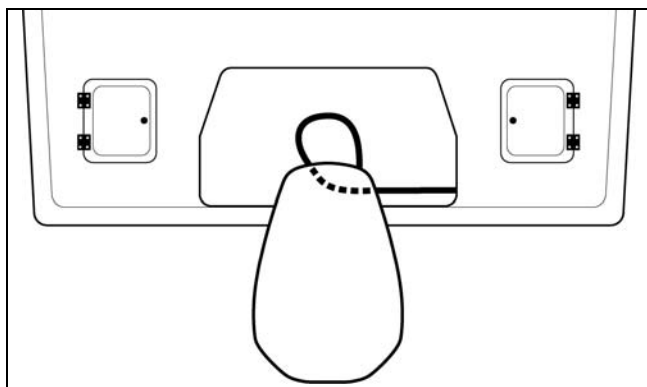
Boat Cable and Harness Routing

⚠ WARNING

Improper installation and routing of outboard controls could wear, bind, and damage components, causing loss of control.

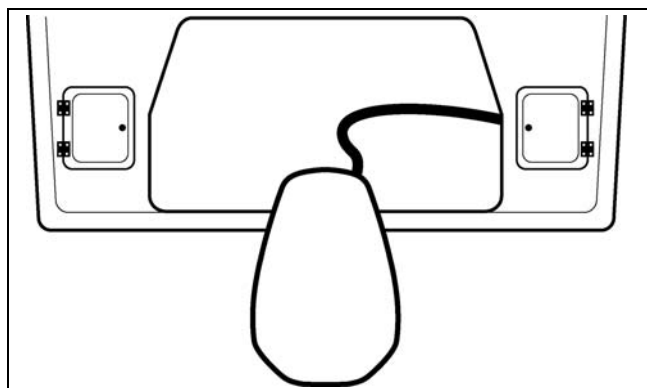
Remote control cables, wiring, and hoses must follow a similar path into the lower motor covers. Select the best routing for the specific application.

All cables, wiring, and hoses must be long enough to provide adequate slack. Check clearances at all possible combinations of trim angles and steering positions.



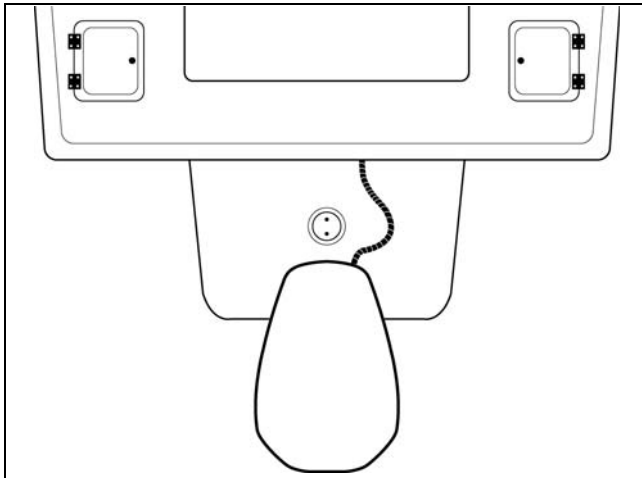
Typical Small Splash Well

DRC7799



Typical Large Splash Well

DRC7797



Typical Engine Bracket

DRC7798A

Protective Sleeve/Conduit

Make sure all cables, wiring, and hoses have been identified and fitted to the appropriate lengths. Refer to **OUTBOARD RIGGING** on p. 51.

Next, bundle the components that route to the outboard with appropriate shielding, such as an expandable “flexweave” sleeve or a flexible conduit.



Flexible conduit installation

005138

Battery Cables

When routing battery cables, be sure to:

- Route cables through the protective sleeve.
- Use the most direct path to route the battery cables to the battery or battery switch.

Fuel Hose

The fuel hose may be routed outside of the protective sleeve or conduit. Electric primers or manual primers may not require this consideration.

Route fuel hoses with enough slack to allow the primer bulb arrow to point “up” during use.

Install the primer bulb with the arrow pointing in the direction of fuel flow to the outboard.

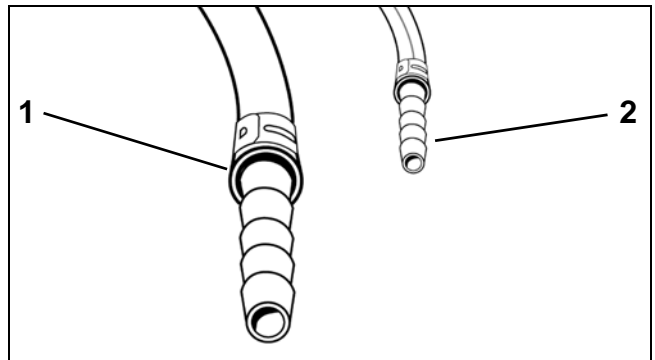
Connect the fuel supply hose from the fuel tank to the fuel supply line at the outboard.

IMPORTANT: Do not permanently fasten this connection until the boat's fuel system has been primed.

Oil Supply Hose

Evinrude E-TEC V4–V6 outboards use a single oil supply hose connected to the outboard and to the boat-mounted oil tank.

- Route the hose from the oil tank to the ¼ in. (6.4 mm) fitting of the oil supply line at the lower motor cover.
- Install the hose on the fitting using the proper size *Oetiker*[†] clamp.



1. Fuel supply hose and fuel fitting - 3/8 in. (9 mm)
2. Oil supply hose and fitting - 1/4 in. (6 mm)

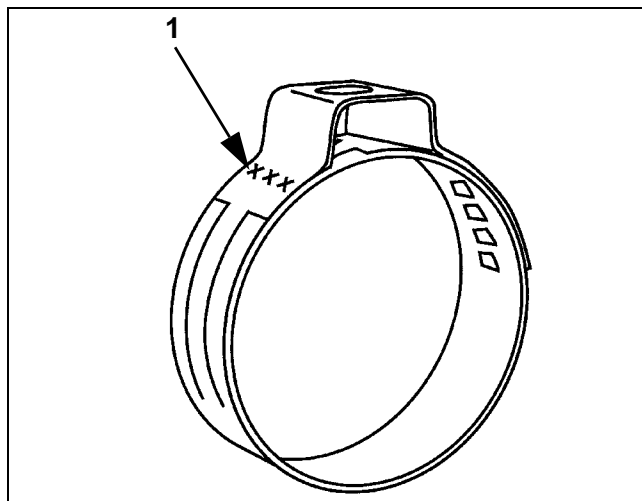
003963

Oetiker Clamp Servicing

Clamp Identification

Use *Oetiker* clamps for making hose connections. These clamps provide corrosion resistance, minimize the potential for abrasion of rigging components, and provide solid, permanent connections.

The selection and installation of an *Oetiker* clamp is essential in the proper sealing of hose connections. The clamp identification numbers appear on the side of the clamp, near the top of the ear. Refer to **Clamp Selection** chart for dimensions.



1. Clamp identification numbers

000093

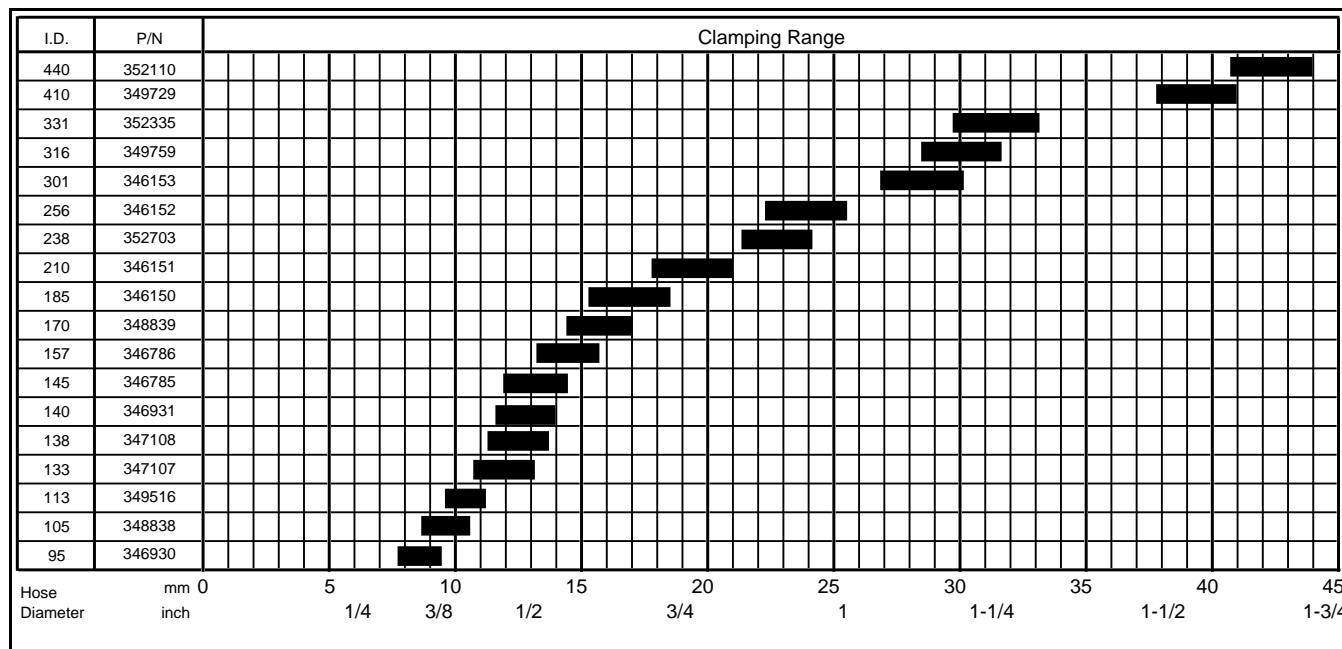
⚠ WARNING

DO NOT re-use *Oetiker* clamps. Fuel leakage could contribute to a fire or explosion.

Clamp Selection

To select the correct size *Oetiker* clamp, measure the outside diameter of the hose when installed on the fitting.

Chose a clamp so that the outside diameter of the hose is approximately in the middle of the clamping range of the clamp.



008458

Clamp Installation

A constant stress should be applied to close the ear clamps. This method ensures a positive stress on the hose and does not result in excessive compression or expansion of the band material.

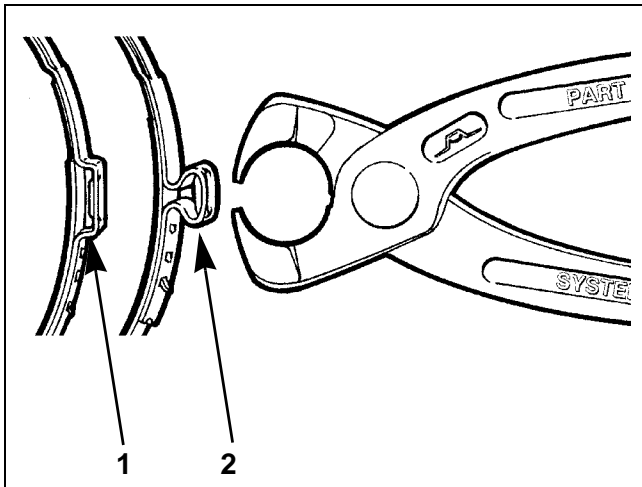
IMPORTANT: Use only *Oetiker* recommended tools to close *Oetiker* stepless clamps.

Oetiker pincers are available in the *Evinrude/Johnson Genuine Parts and Accessories Catalog*.



DP0886

- Position correct size clamp over hose.
- Install hose on fitting.
- Close clamp ear fully with *Oetiker* pincers (pliers).

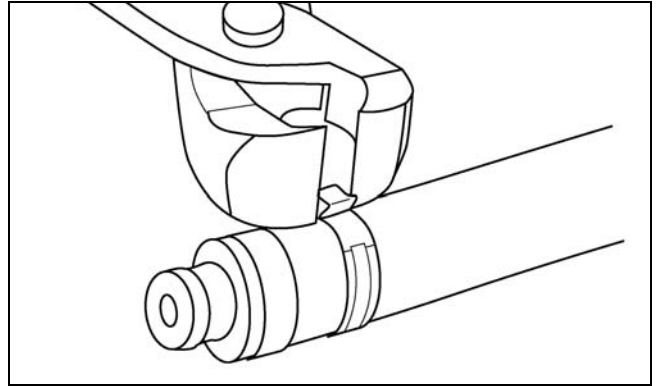


1. Open clamp
2. Closed clamp

000092

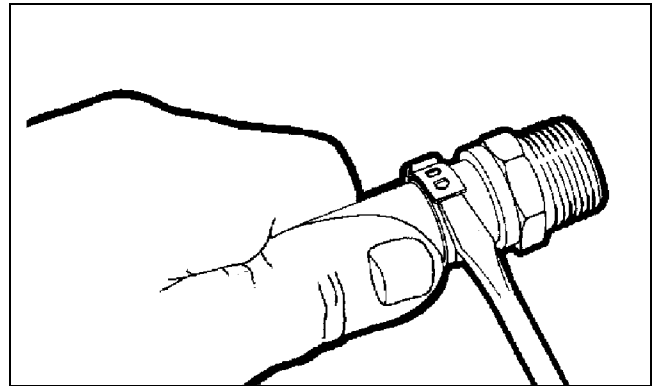
Clamp Removal

Method 1: Position *Oetiker* pincers across clamp ear and cut clamp.



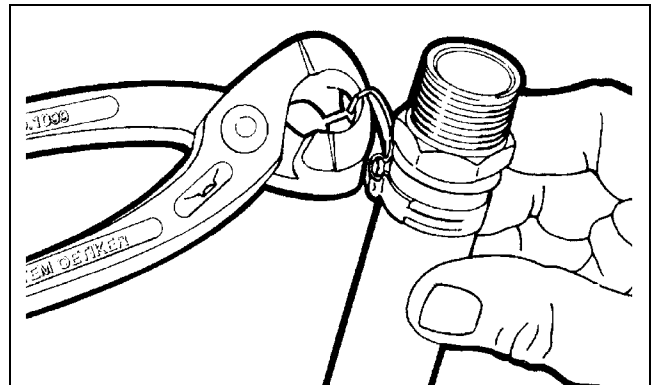
000108

Method 2: Lift end of stepless clamp with screwdriver.



000090

Method 3: Use *Oetiker* pincers (pliers) to grip clamp. Pull clamp off of connection and discard.



000091

NOTES

Technician's Notes

Related Documents

Bulletins	
Instruction Sheets	
Other	

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.
- The transom angle should be approximately 14 degrees.
- Check transom strength and height.

The stern brackets must contact the flat surface of the transom. Modify trim that prevents the stern brackets from resting against the transom surface. Do not modify stern brackets.

⚠ WARNING

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

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 before 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.
- Avoid locating outboard centerlines within 3 in. (76 mm) of bottom strakes on dual-outboard installations.

OUTBOARD INSTALLATION

HULL PREPARATION

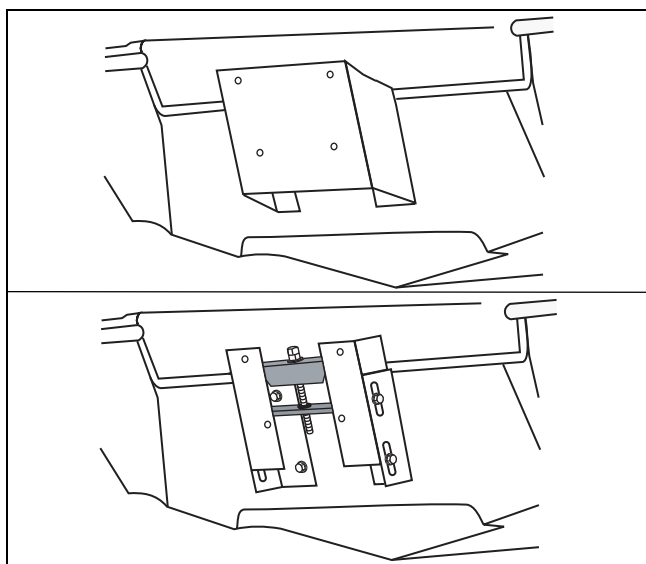
Transom Brackets and Jack Plates

When mounting an outboard on a jack plate:

- Refer to the manufacturer's recommendations for maximum weight and horsepower.
- The jack plate must provide a rigid, one-piece mounting assembly—either a solid surface, or surfaces adequately connected to prevent flexing or twisting.
- DO NOT use a jack plate constructed in two separate pieces—lack of support can twist the stern brackets, wear tilt tube bushings and thrust rollers, and bend or break components.

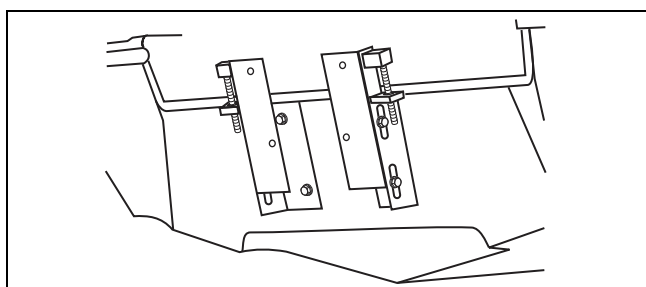
IMPORTANT: Damage caused by use of a two-piece jack plate or unstable mounting surface will not be covered by warranty.

Recommended Designs



007992 007991

Not Recommended



DR5703

Whenever possible, use mounting hardware supplied with the outboard to install jack plate on transom. Tighten to a torque of 40 ft. lbs. (54 N·m).

NOTICE To prevent damage to outboard, check installation frequently for:

- Loose mounting bolts and nuts
- Loose tilt tube or steering cable nuts
- Elongated mounting holes
- Bent or deformed washers

Replace any hardware that fails to maintain torque specifications.

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.

Outboard mounting hardware must meet minimum specifications for material and strength:

- **Material:** Stainless steel; Group 1,2,3 per ASTM F593 OR Grade A2 per ISO 3506-1.
- **Strength:** Minimum proof load.

Part Number	Length (inches)	Thread Size	Proof Load Minimum (lbs.)
327053	3	1/2-13	18,520
318573	3.5	1/2-13	12,771
336676	4.75	1/2-13	12,771
331578	5	1/2-13	18,520
354101	6	1/2-13	18,520
354102	7	1/2-13	18,520
354103	8	1/2-13	18,520
354104	9	1/2-13	18,520

Outboard mounting bolts, backing plates, washers, and nuts are used to attach the outboard to the shipping pallet. If alternate bolt lengths or replacement parts are required, use only *Evinrude/Johnson Genuine Parts*.

IMPORTANT: Standard screws offered by local merchants may not provide the high strength required for outboard installations.

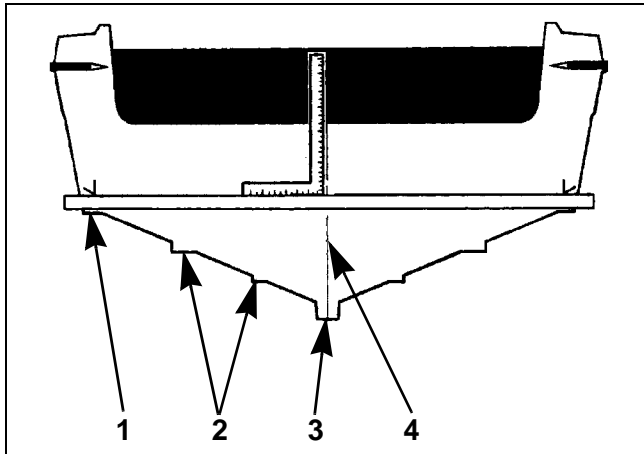
TRANSOM MEASURING AND DRILLING

Hull Centerline

Use the chines of the boat as reference points to locate the centerline of the boat transom.

Use a straightedge to draw a line connecting the port and starboard chines.

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



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

DR5568

Dual-Outboard Centerlines

The following table lists standard ABYC centerline spacing between outboards in dual installations:

2 and 3 cylinder	22 in. (559 mm)
V4 and V6	26 in. (660 mm)

Some applications may require changes in this dimension to avoid strakes, to adjust for transom height, or for performance reasons. Best performance can be determined only through testing. Refer to boat manufacturer for recommendations.

If the standard spacing does not allow full steering travel in a particular installation, it may be necessary to increase the spacing.

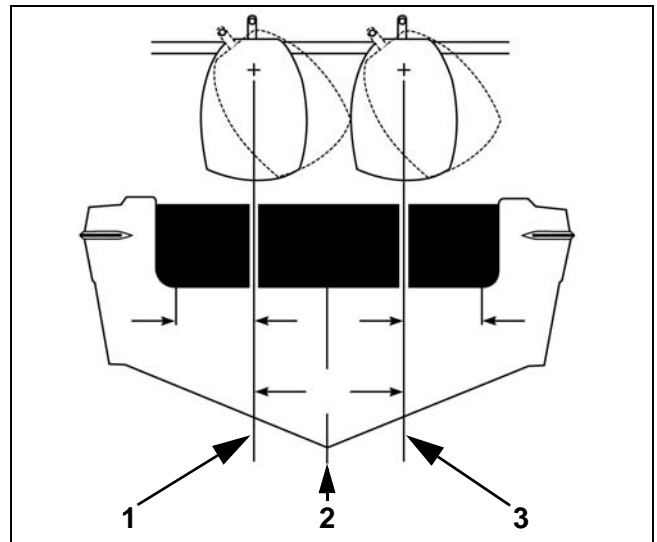
IMPORTANT: Some steering systems may require additional spacing. Refer to steering system manufacturer for recommendations.

The top edge of the transom should be more than twice the width of the dual-outboard centerline spacing dimension. Bracket installations may not require this consideration.

Measure the transom for dual-outboard spacing after the centerline of the hull is established.

Divide the spacing dimension by two. Use the resulting number to space the outboard centerlines from the hull centerline.

EXAMPLE: A 26 in. (660 mm) dual-outboard spacing would result in two outboard centerlines, each 13 in. (330 mm) from the hull centerline.



- 1. Port centerline
- 2. Hull centerline
- 3. Starboard centerline

DRC5527B

OUTBOARD INSTALLATION

TRANSOM MEASURING AND DRILLING

Transom Height

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

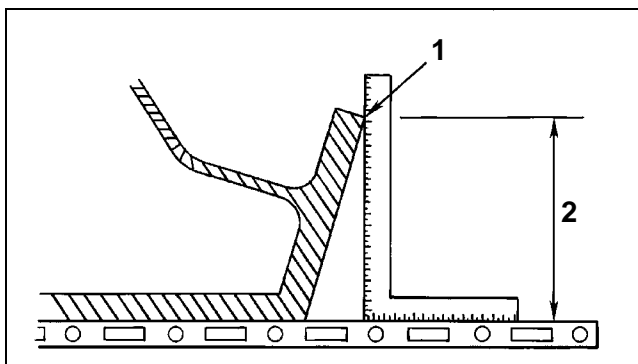
- A 19 to 21 in. (48.3 to 53.3 mm) transom height uses a 20 in. (50.8 mm) shaft outboard.
- The shaft length of the outboard being installed should come close to matching the transom height of the boat.
- Refer to **SPECIFICATIONS** in outboard Operator's Guide for transom height.

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

For dual-outboard installations, transom height should be measured at the outboard centerlines.

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

15–30 HP MODELS

With the outboard installed on the boat:

- Generally the anti-ventilation plate of the gearcase should align with the bottom of the hull.
- The anti-ventilation plate should NOT extend more than 2 in. (5 cm) BELOW the bottom of the hull.

Transom Drilling Locations

75–300 HP, ALL MODELS

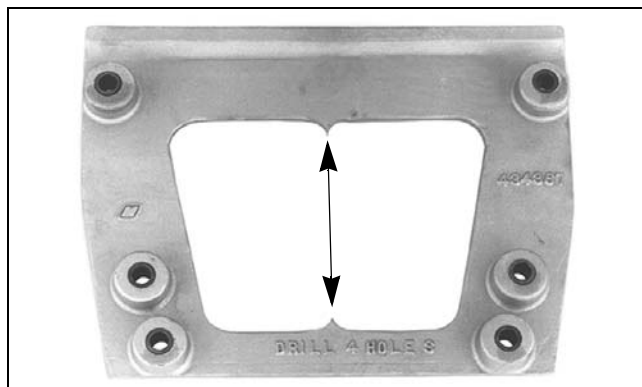
40–60 HP, POWER TRIM MODELS

25–30 HP, POWER TRIM MODELS

All models use the standard ABYC 4-Bolt mounting pattern.

Use Transom drill fixture, P/N 434367 or P/N 385368, as a guide for correct hole placement. If drill fixture is unavailable, refer to **Drilling and Hardware Diagrams** on p. 36 for measurements.

Position drill fixture on top of transom or bracket and align indicator points with centerline.



Transom drill fixture P/N 434367 (heavy duty)

24496

The indicators are affected by the squareness of the top edge of the transom. If either side of the fixture must be raised more than ¼ in. (6 mm) above the transom's top surface to make both indicators align, the transom must be modified.

IMPORTANT: DO NOT assume that the top edge of the transom is straight. Position the drill fixture based on measurements aligning it to the bottom of the hull.

NOTICE Maintain at least 1.75 in. (45 mm) of transom surface above the top mounting bolts.

OUTBOARD INSTALLATION

TRANSOM MEASURING AND DRILLING

2

Before drilling any mounting holes:

- Make sure the hole locations provide enough clearance for mounting bolts and washers.
- Check the inside area of the transom for obstructions.
- Check transom height(s) at centerlines.

Drill four ½ in. (13 mm) mounting holes in the appropriate locations.

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

40–65 HP, MANUAL TILT MODELS

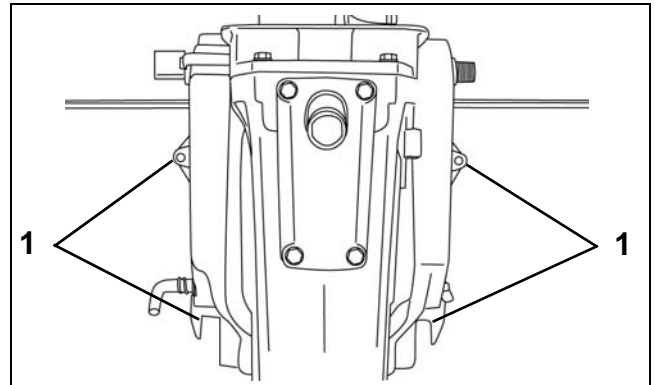
25–30 HP, MANUAL TILT MODELS

15 HP, POWER TILT MODELS

Center the outboard on the transom (or mounting bracket) and tighten clamp screws by hand.

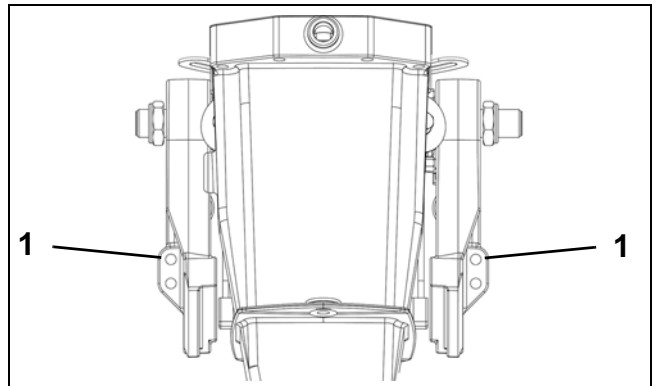
Use each stern bracket's mounting holes as a guide to drill holes through the transom.

- 40–65 HP models require four 5/16 in. (8 mm) holes
- 25–30 HP models require two 5/16 in. (8 mm) holes
- 15 HP models require four 5/16 in. (8 mm) holes.



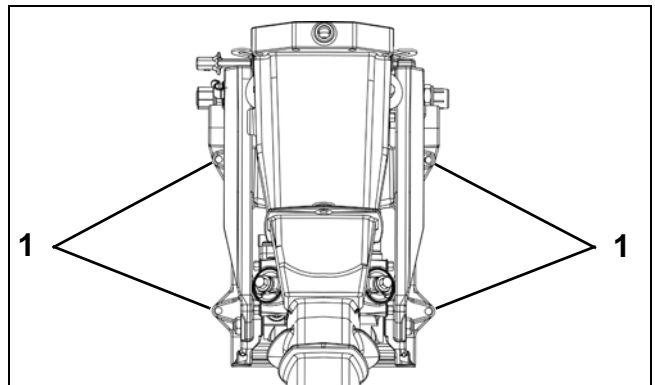
40 – 65 HP Models

002215



25 – 30 HP Models

007998



15 HP Models

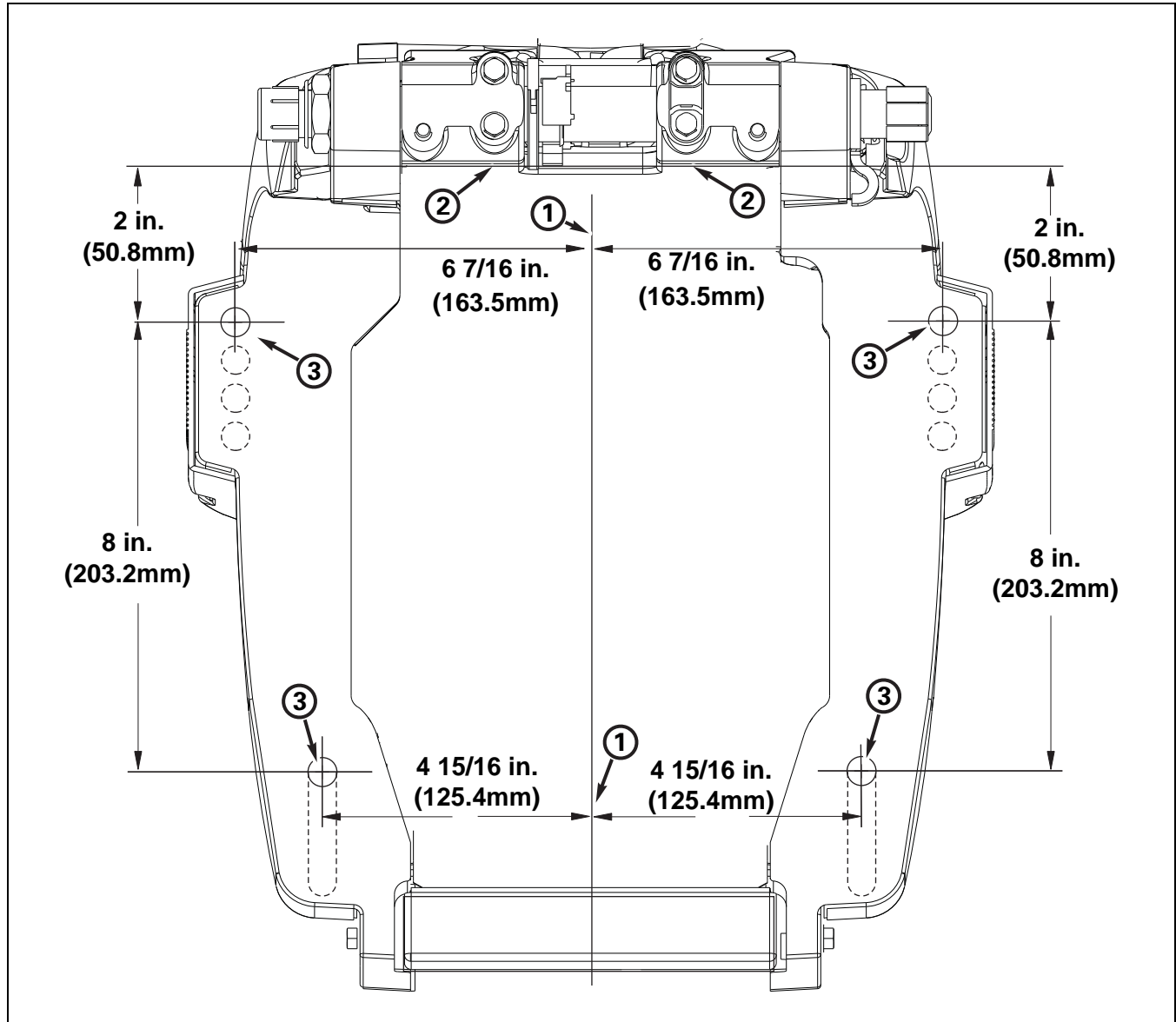
007999

OUTBOARD INSTALLATION
TRANSOM MEASURING AND DRILLING

Drilling and Hardware Diagrams

75–300 HP, ALL MODELS; 40–60 HP, POWER TRIM MODELS; 25–30 HP, POWER TRIM MODELS

IMPORTANT: This is not a template.



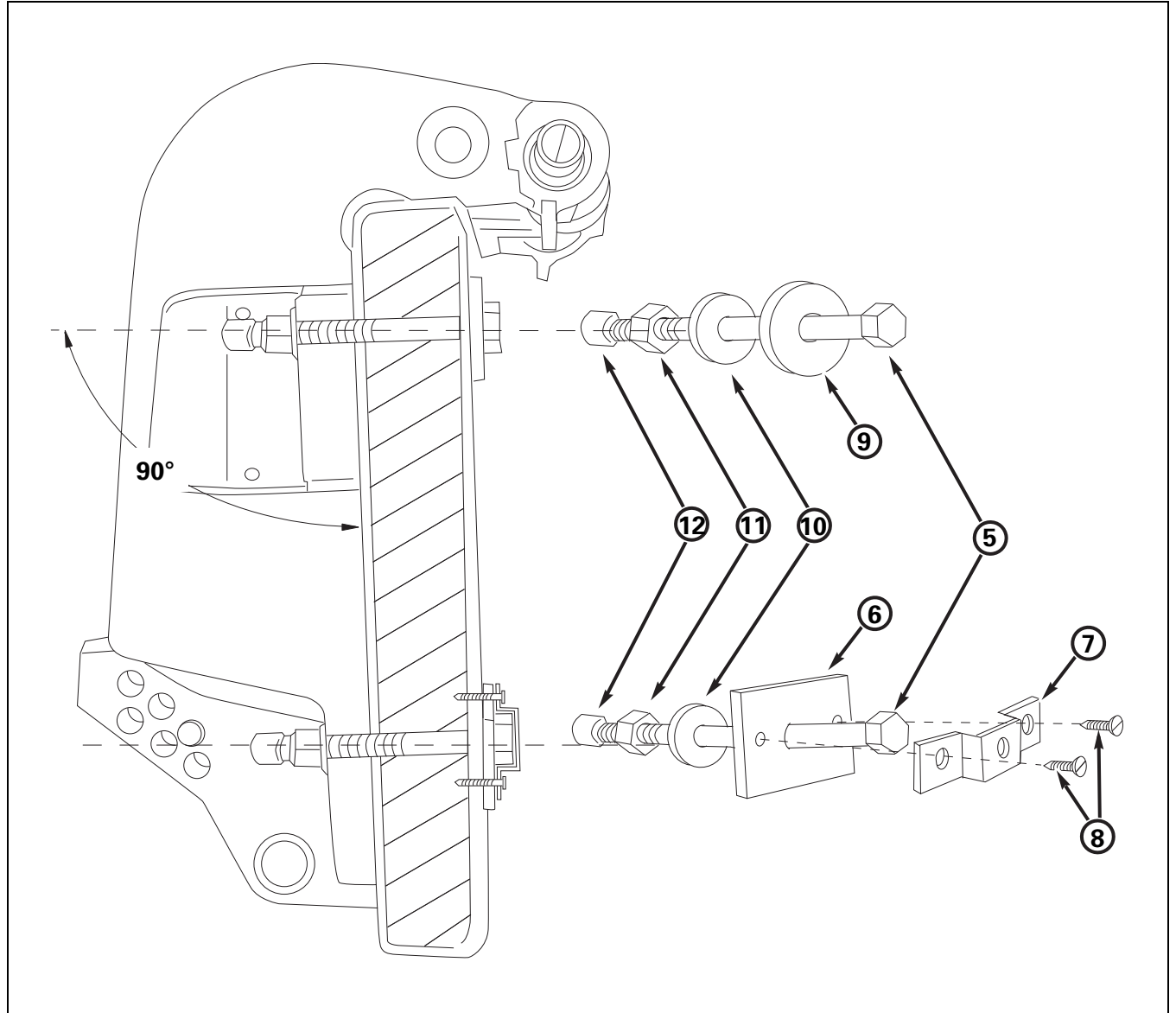
- 1. Center of Transom
- 2. Top of Transom
- 3. 1/2" Bolt Hole Locations
- 4. Outside of Transom

- 5. Bolt *
- 6. 318272 Plate
- 7. 318273 Retainer
- 8. 319886 Screw
- 9. 307238 Washer
- 10. 320248 Washer
- 11. 313623 Nut
- 12. 318572 Cap

Quantity

- 4 * Choose from the following bolt sizes:
- 2 327053 3 in. (76 mm)
- 2 318573 3 1/2 in. (89 mm)
- 4 336676 4 1/2 in. (114 mm)
- 2 331578 5 in. (127 mm)
- 4 354101 6 in. (152 mm)
- 4 354102 7 in. (178 mm)
- 4 354103 8 in. (203 mm)
- 4 354104 9 in. (229 mm)

IMPORTANT: This is not a template.

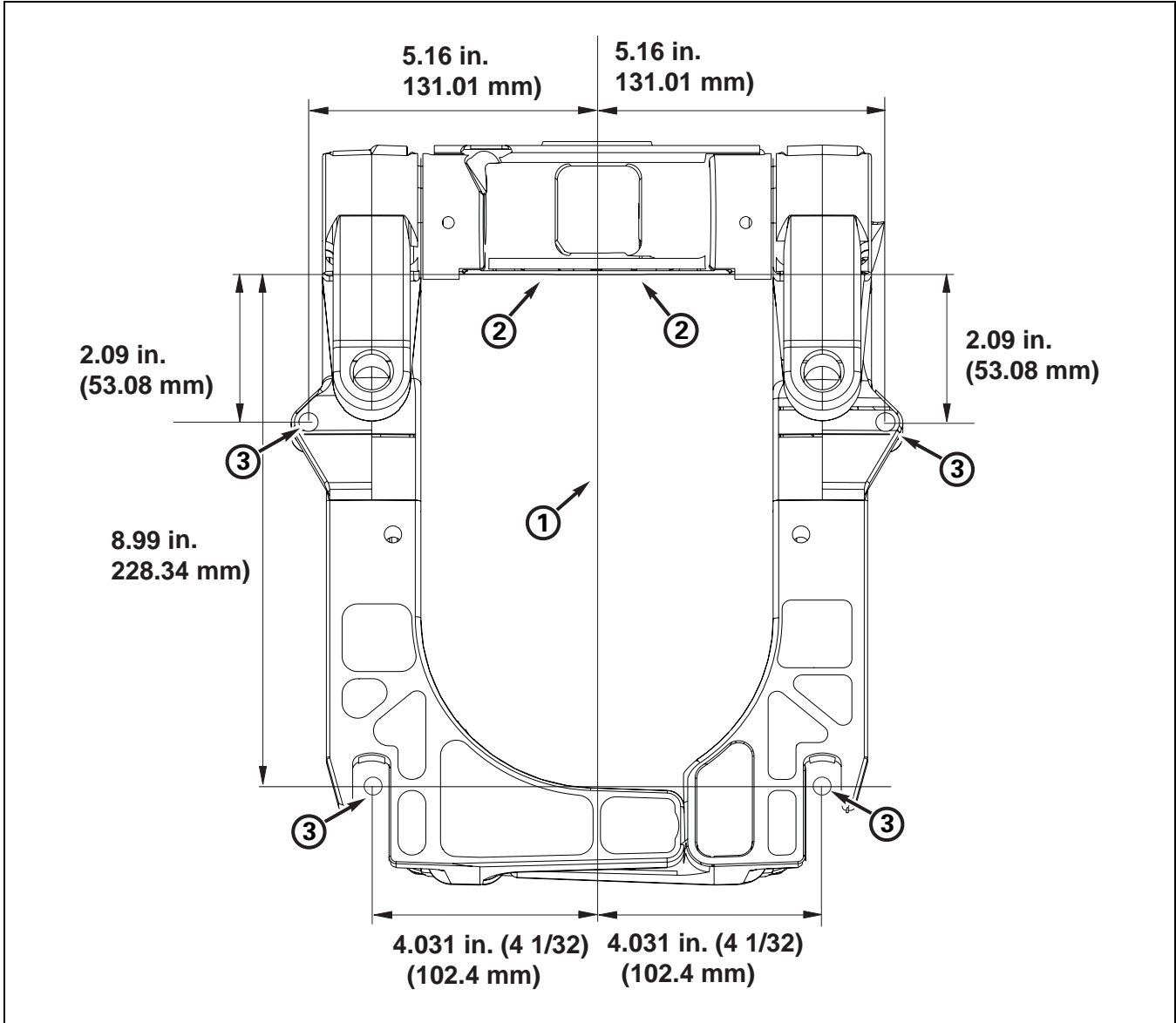


OUTBOARD INSTALLATION

TRANSOM MEASURING AND DRILLING

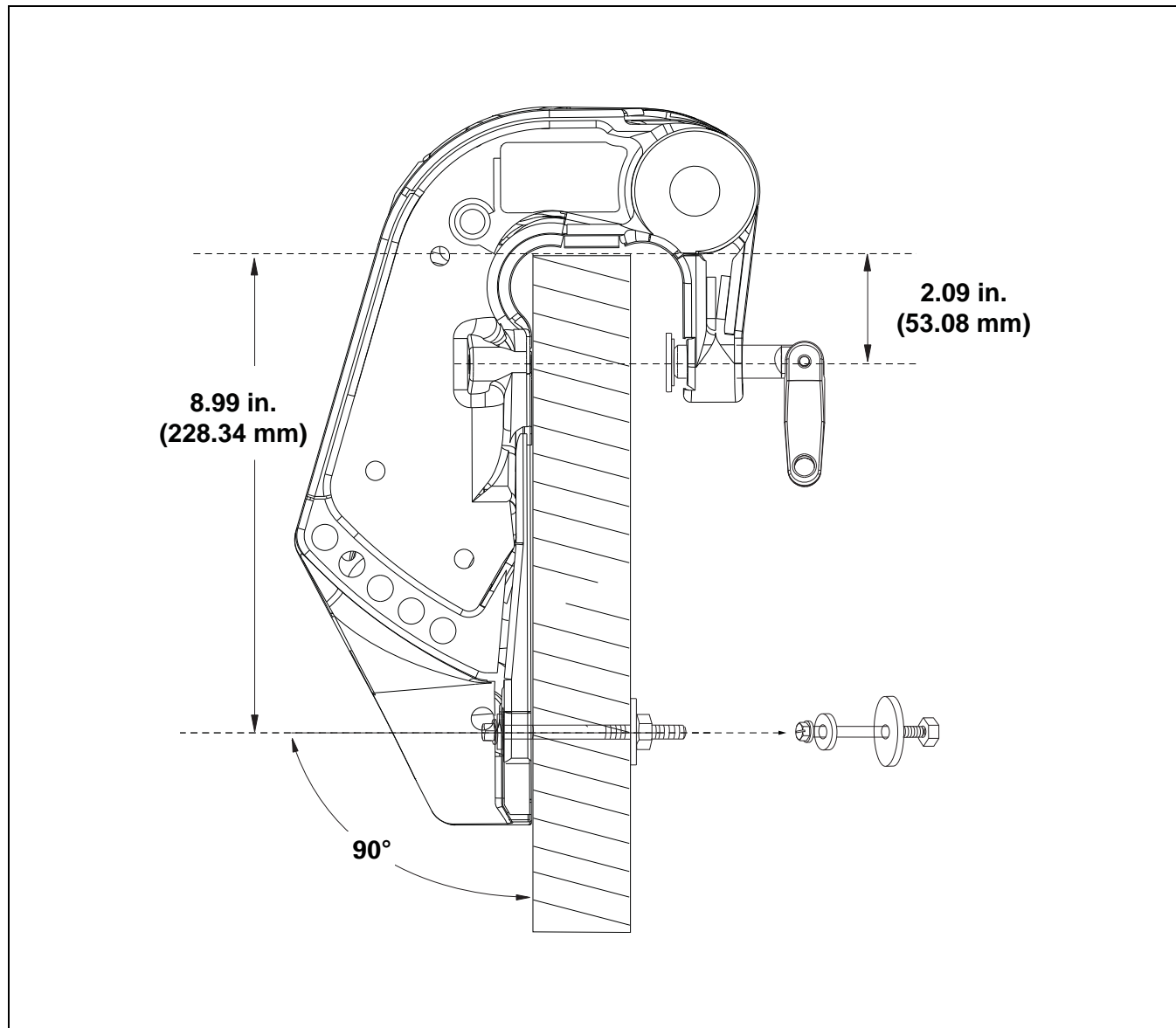
40–65 HP, MANUAL TILT MODELS

IMPORTANT: This is not a template.



1. Center of Transom
2. Top of Transom
3. 5/16" Bolt Hole Locations

IMPORTANT: This is not a template.

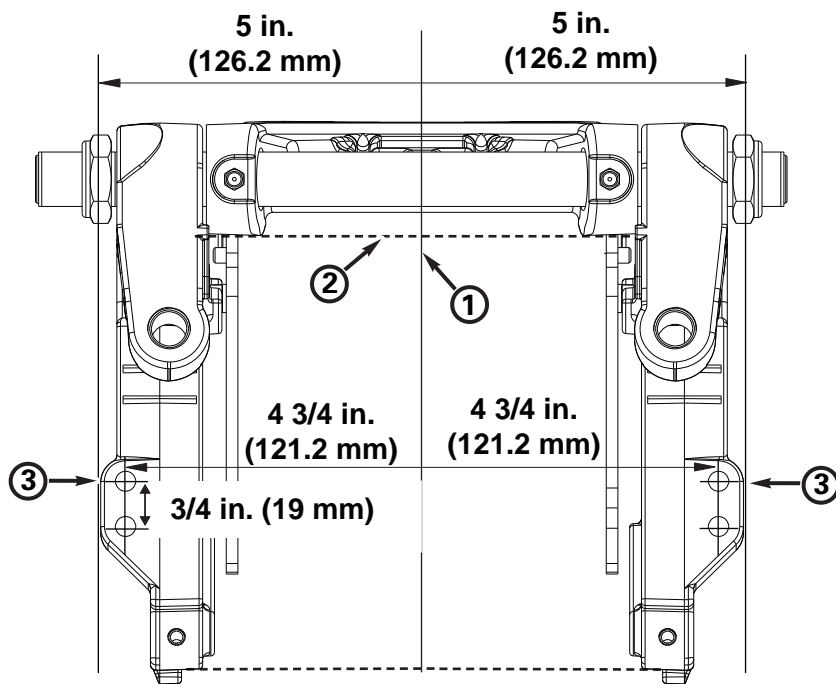


OUTBOARD INSTALLATION

TRANSOM MEASURING AND DRILLING

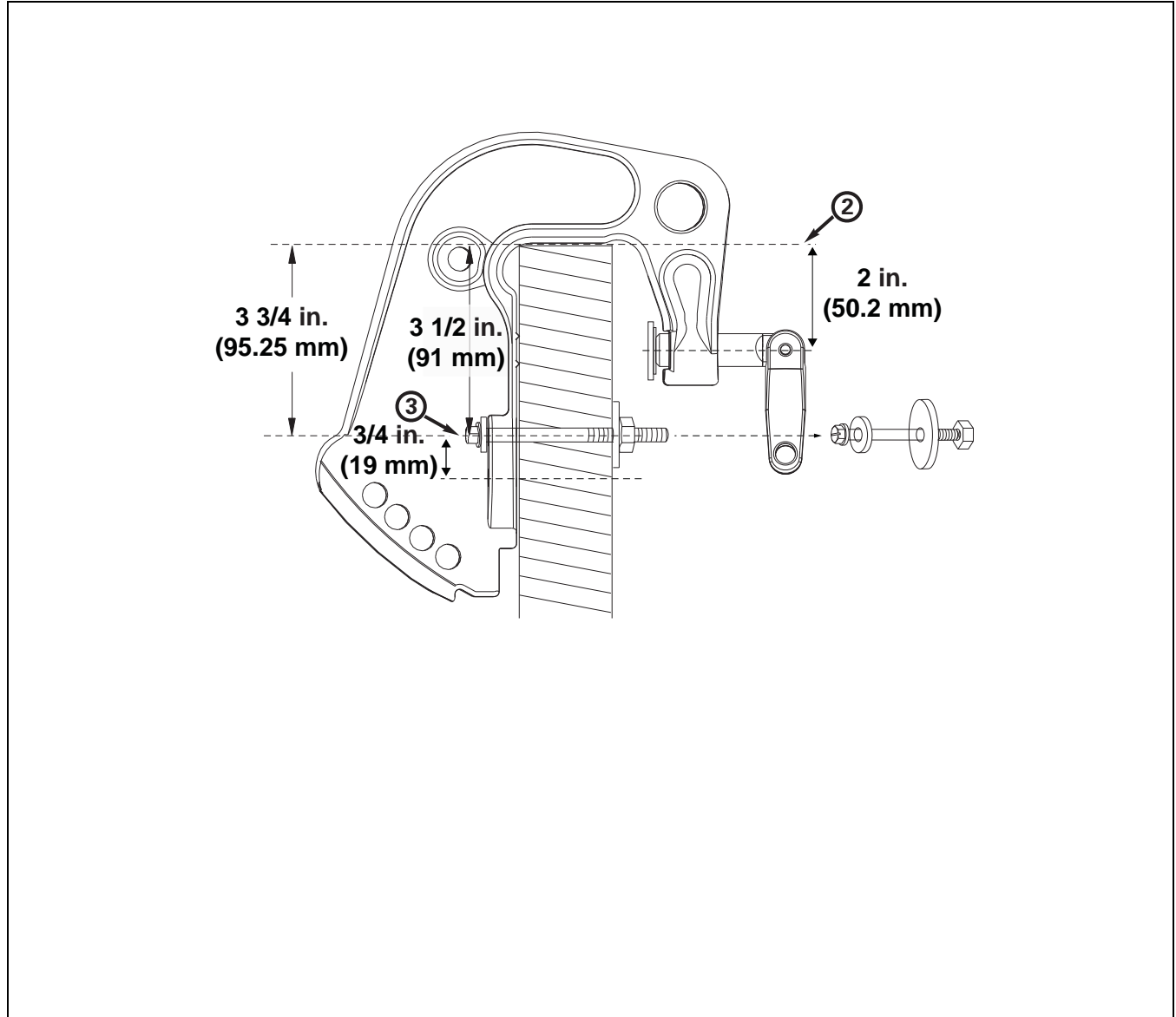
25–30 HP, MANUAL TILT MODELS

IMPORTANT: This is not a template.



1. Center of Transom
2. Top of Transom
3. 5/16" Bolt Hole Locations

IMPORTANT: This is not a template.

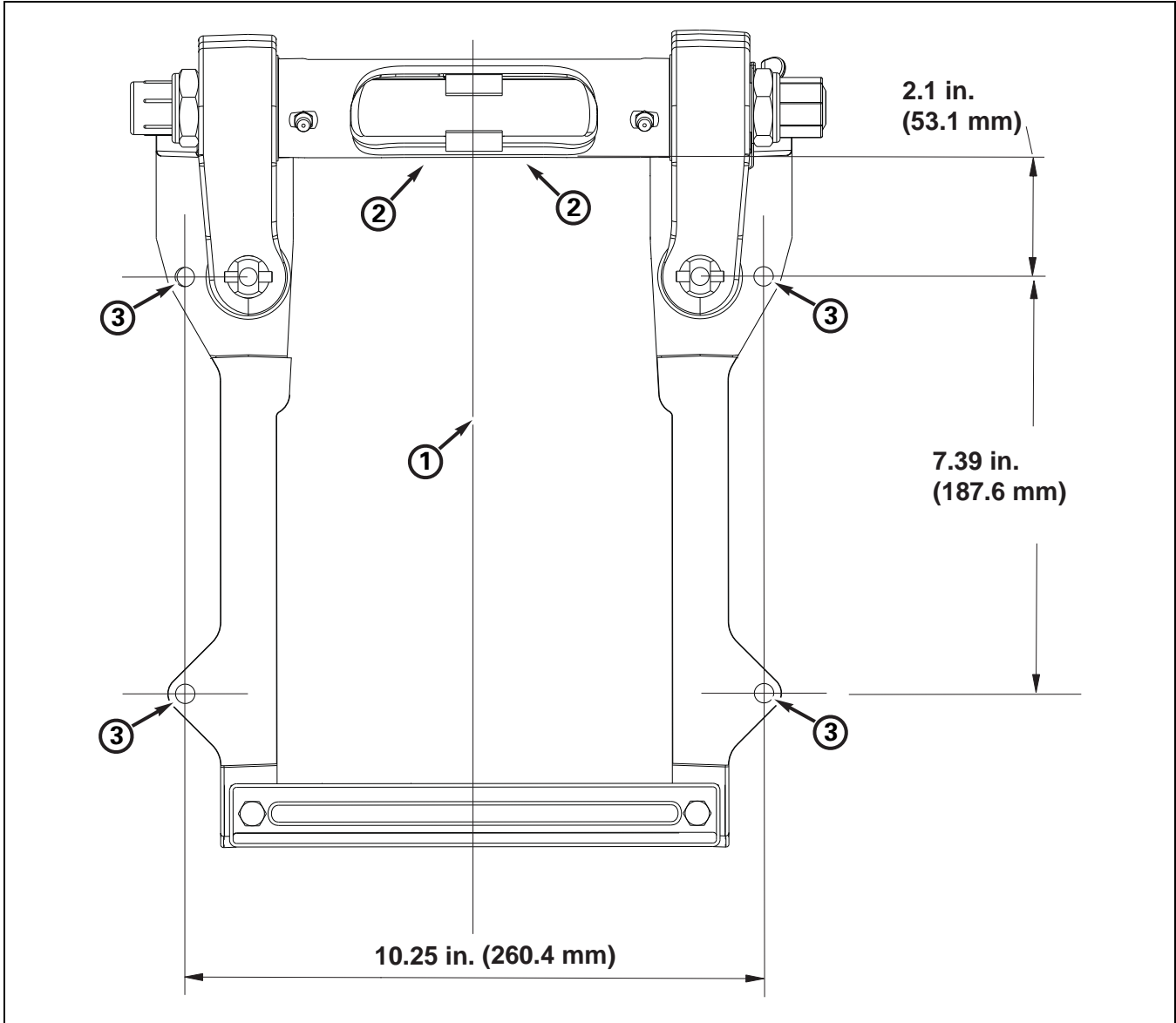


OUTBOARD INSTALLATION

TRANSOM MEASURING AND DRILLING

15 HP, POWER TILT MODELS

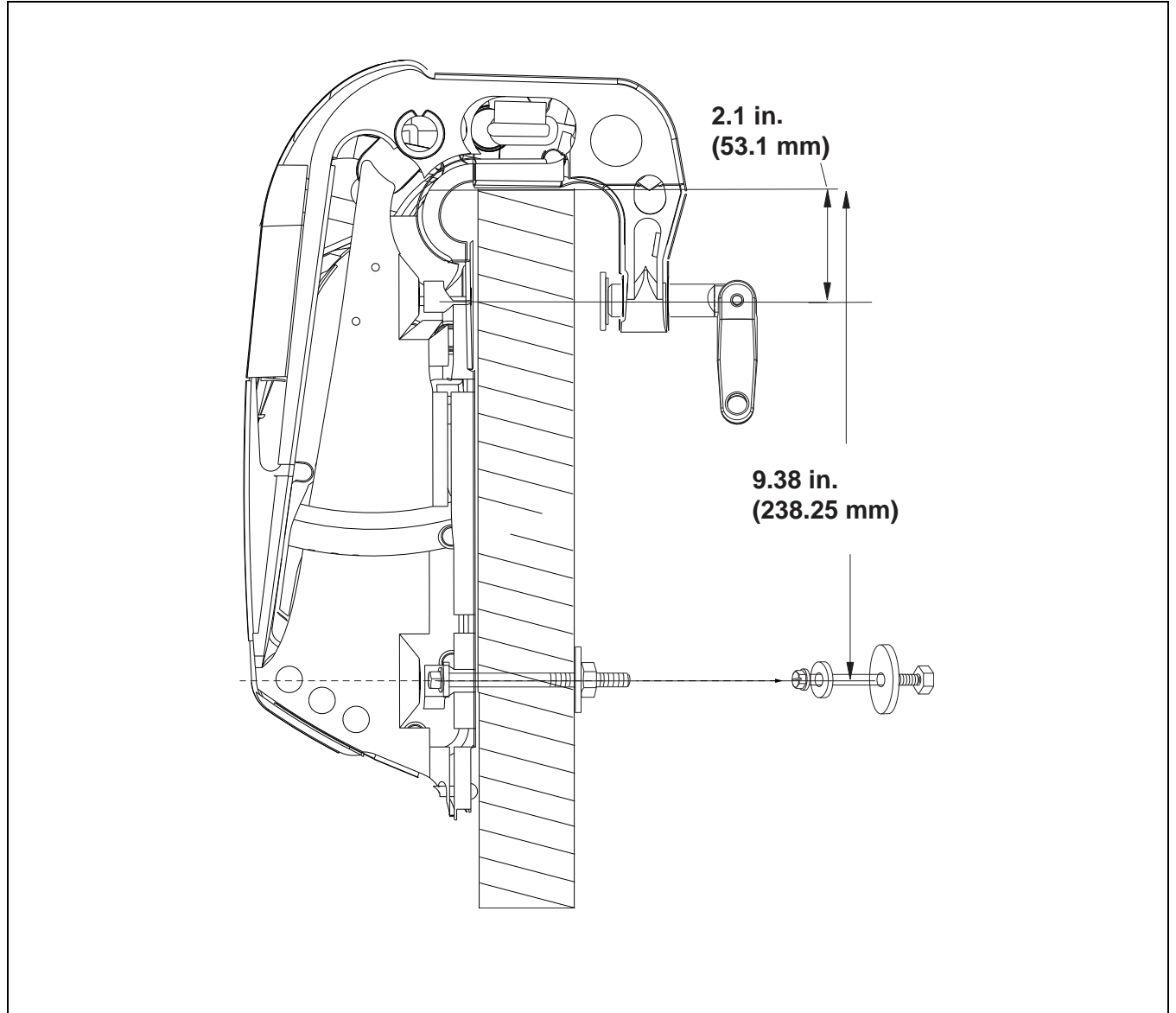
IMPORTANT: This is not a template.



1. Center of Transom
2. Top of Transom
3. 5/16" Bolt Hole Locations

OUTBOARD INSTALLATION TRANSOM MEASURING AND DRILLING

IMPORTANT: This is not a template.



2

OUTBOARD INSTALLATION
LIFTING THE OUTBOARD

LIFTING THE OUTBOARD

Lifting Fixtures

⚠ WARNING

To avoid personal injury, make sure the lifting capacity of the hoist is at least twice the weight of the outboard.

DO NOT allow the lift hook or chain from the hoist to come in contact with any part of the engine during lifting.

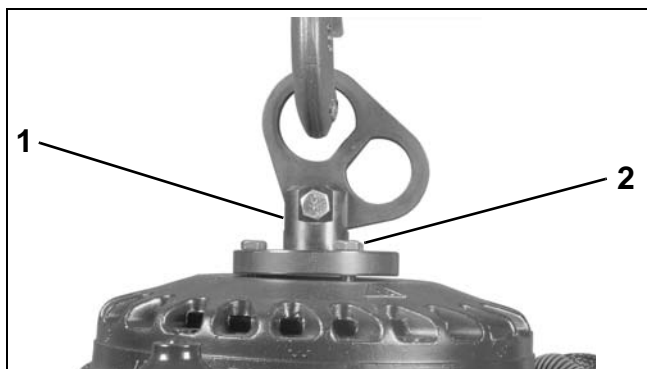
Remove shipping carton.

Use correct Lifting Fixture to lift outboard:

Model	Lifting Fixture
90° V6	P/N 396748 with 1 3/4 in. screws
60° V4-V6	P/N 342672
40-90 HP	P/N 396748 with 1 1/8 in. screws
15-30 HP	P/N 354717

90° V6 MODELS

Position lifting tool on flywheel and seat the three screws completely.

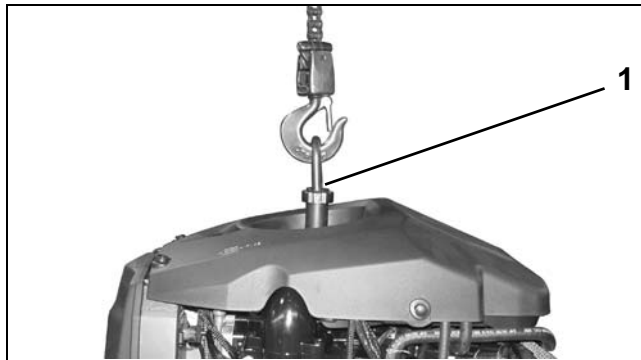


1. Lifting fixture
 2. 1 3/4 in. screws

Fasten appropriate chain hook to eye of tool. Carefully hoist outboard with chain and unbolt outboard mounting brackets from frame.

60° V4 AND V6 MODELS

Position lifting tool on crankshaft and tighten the center retaining screw securely using a 1/4 in. Allen wrench.

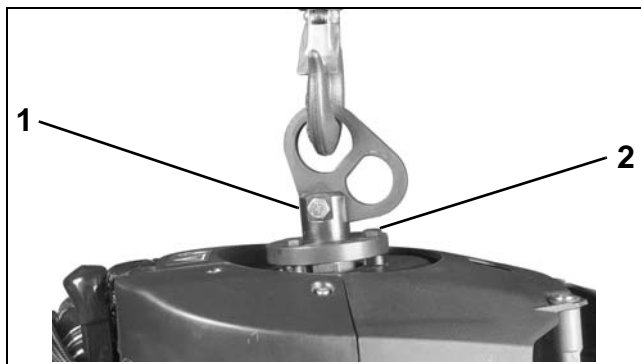


1. Center retaining screw
 004945

Fasten appropriate chain hook to eye of tool. Carefully hoist outboard with chain and unbolt outboard mounting brackets from frame.

40-90 HP MODELS

With recoil starter removed, place lifting tool on flywheel and seat the three screws completely. Refer to **RECOIL STARTER REMOVAL** in the correct Service Manual.



1. Lifting fixture
 2. 1 1/8 in. screws
 002098

NOTICE Use only the 1 1/8 in. (short) screws, P/N 398067, included with the tool to avoid damage to electronic components under the flywheel.

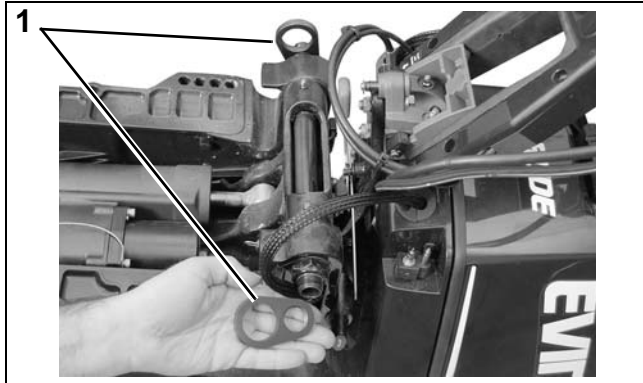
Fasten appropriate chain hook to eye of tool. Carefully hoist outboard with chain and unbolt outboard mounting brackets from frame.

OUTBOARD INSTALLATION LIFTING THE OUTBOARD

2

15–30 HP MODELS

Install Lifting Tool, P/N 354717, on both sides of the tilt tube.



1. Lifting tool, P/N 354717

007122

⚠ WARNING

To avoid personal injury or outboard damage, be sure the lifting tool is fully threaded on both sides of the tilt tube.

Use an appropriate chain, at least 36 inches (91 cm) long with two snap hooks, each capable of lifting 500 lbs. (227 kg).

Attach hooks to lifting device and attach chain to hoist.

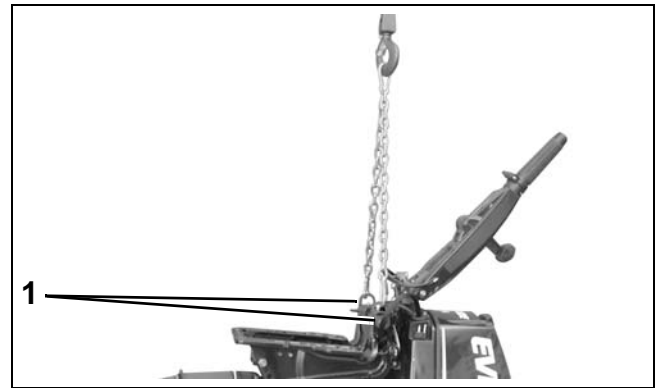
⚠ WARNING

Use this tool for horizontal lifting of 30 HP and smaller Evinrude E-TEC models ONLY.

DO NOT use this tool to lift outboards larger than 30 HP Evinrude E-TEC models.

To avoid personal injury and boat or outboard damage, DO NOT use this tool to install or remove outboard from transom as outboard can unexpectedly tip.

Lift the engine out of the carton.



1. Lifting tool, P/N 354717

007123

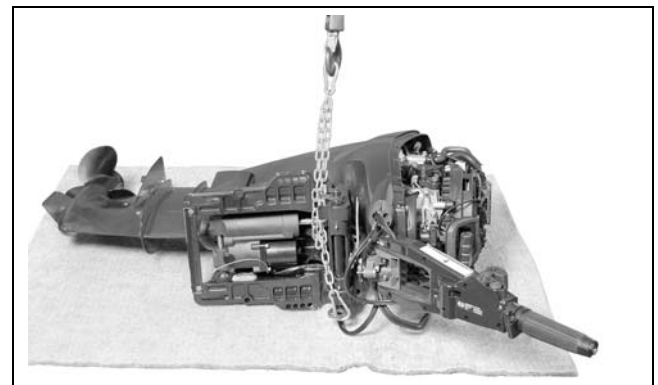
Remove upper motor cover.

Place clean pad or cardboard on the floor.

Lower outboard onto the pad. Use hoist to carefully roll the outboard onto its port side.

⚠ CAUTION

To avoid damage to the outboard, DO NOT allow the outboard to fall unrestrained.



007211

Remove chain from lifting tool.

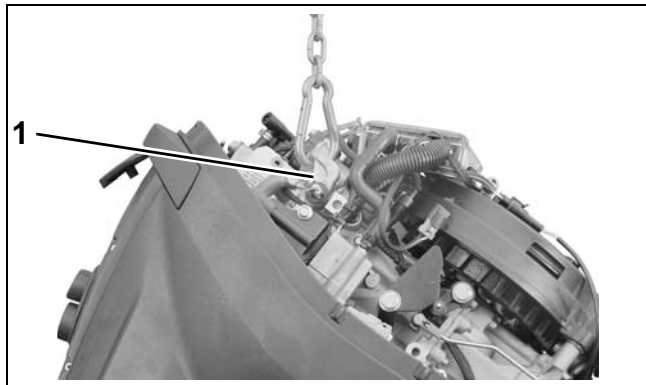
Remove lifting tool from outboard.

OUTBOARD INSTALLATION STEERING SYSTEMS

Attach chain to lift eye on back of engine block.

⚠ WARNING

If the chain snap hooks are too large, the cast in lift eye could break causing the outboard to drop suddenly causing personal injury and damaging the outboard.

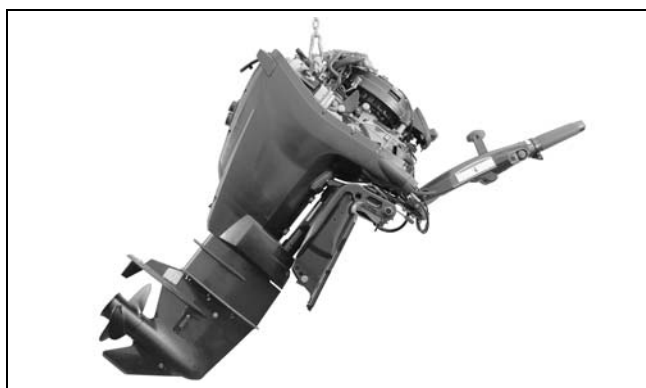


1. Lift eye

007212

Carefully lift engine with hoist.

NOTICE To avoid damage to the outboard, lift the outboard in one smooth motion. DO NOT allow the outboard to bounce.



007213

STEERING SYSTEMS

Mechanical Cables

All *Evinrude* outboards equipped with tilt tubes are 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 steering cable and lubricate the inner core before installation.



ABYC-approved mechanical steering cable.

5873

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

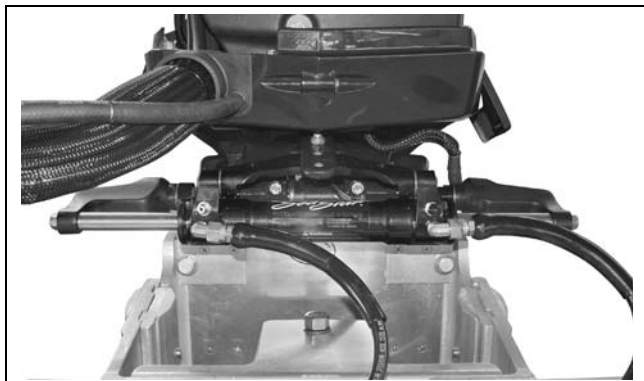
⚠ WARNING

DO NOT use cable over pulley steering on 40 HP and larger outboards.

Manual Hydraulic Steering

Manual hydraulic steering systems use hydraulic fluid to transfer motion and load from the helm to the outboard.

Use only a hydraulic steering system designed for the specific application. Refer to the steering system manufacturer's specifications for recommended applications.



Typical manual hydraulic steering

004948

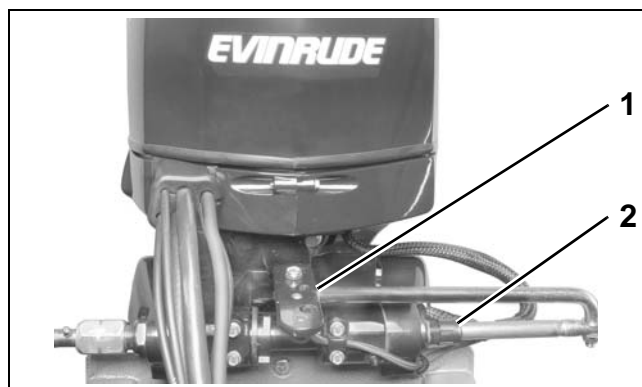
IMPORTANT: Some hydraulic steering systems require additional centerline spacing in dual-outboard installations. Refer to steering system manufacturer's recommendations and to **Dual-Outboard Centerlines** on p. 33.

Drag Links

Use the correct drag link to allow full steering travel:

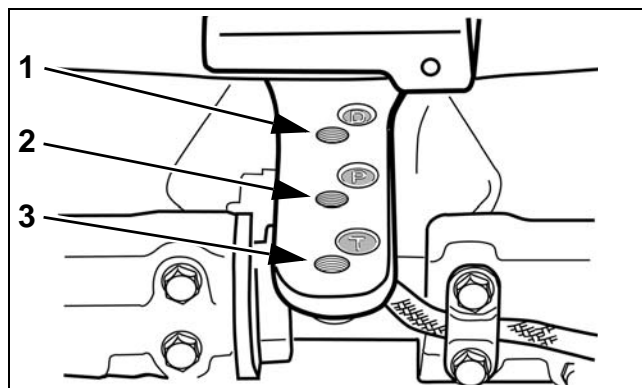
Model	Drag Link
90° V6	P/N 175125
60° V4-V6	P/N 175125
75-90 HP	P/N 175125
40-60 HP	P/N 173699
15-30 HP	P/N 173699

Install cable wiper nut on tilt tube and connect drag link to the correct location on the steering arm. For single motor, single cable applications, the drag link should be installed in the rear hole.



1. Drag link connection
2. Wiper nut

002097



1. Rear Location (D)—Steering drag link connection
2. Middle Location (P)—Power steering connection (Refer to manufacturer's instructions for hydraulic steering systems.)
3. Front Location (T)—Bar connection (multiple outboard installations)

DRC7162

OUTBOARD INSTALLATION

OUTBOARD MOUNTING

OUTBOARD MOUNTING

IMPORTANT: Some rigging components, such as steering cables, must be fitted to the outboard before the outboard is mounted to the transom. Determine what equipment will be installed before mounting.

Mounting Height

Boat performance depends on outboard mounting height.

Generally, the anti-ventilation plate of the gearcase should align with the bottom of the hull. Conventional V-hulls often perform well with the anti-ventilation plate approximately 1 in. (25 cm) above the bottom of the hull.

Boats that exceed 50 MPH may benefit from higher outboard heights. Consult the boat manufacturer for specific outboard mounting height information for a particular hull.

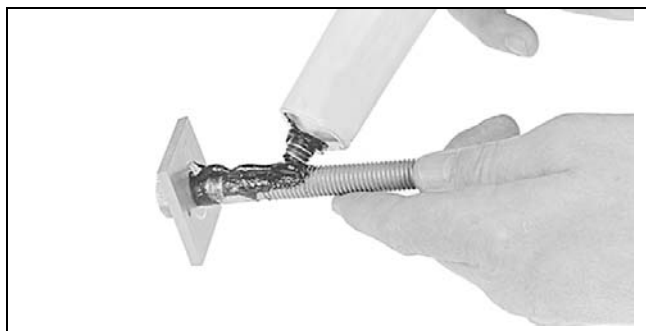
Test outboard and boat performance at different heights until the best performance is achieved.

NOTICE Be sure that outboard water pressure is not adversely affected by the mounting height of the outboard.

Mounting Bolt Installation

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.

Apply marine sealer under hex heads of bolts, on the mounting plates, and to the bolt shanks.

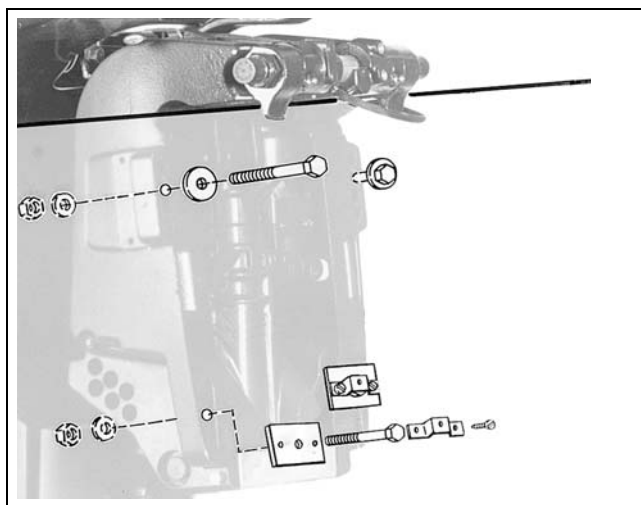


0078A

75–300 HP, ALL MODELS
40–60 HP, POWER TRIM MODELS
25–30 HP, POWER TRIM MODELS

Assemble transom mounting plates on mounting bolts.

Install the mounting bolts through the transom from the inside of the boat.



DR5536

Position the square aluminum transom mounting plates (when applicable) so the retainer holes are horizontal.

Position hex head of bolt with flats toward holes in the mounting plates. Install retainer over hex head of the bolt and secure it with screws provided.

Install all washers and nuts. Tighten nuts and bolts to a torque of 40 ft. lbs. (54 N·m).

⚠ WARNING

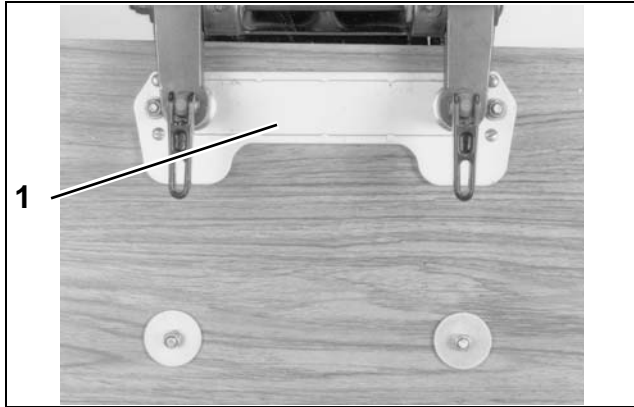
If either side of the transom deforms or cracks when the bolts are tightened to their recommended torque, the transom construction may not be adequate or may be deteriorated. Structural failure of the transom could result in loss of boat control and injury to the occupants.

OUTBOARD INSTALLATION OUTBOARD MOUNTING

2

40–65 HP, MANUAL TILT MODELS

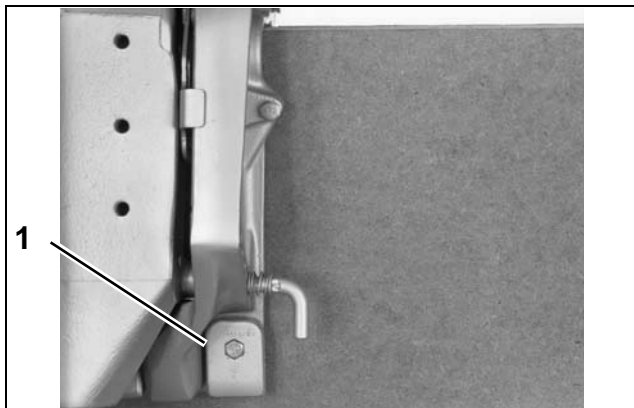
Manual tilt models require Transom Mounting Kit, P/N 394219. The kit includes a transom mounting plate and hardware for fastening outboard to transom.



1. Transom mounting plate

18961

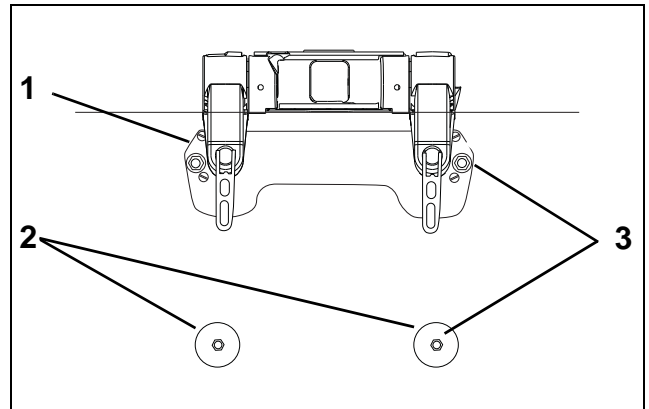
The kit also includes clamp pads, P/N 315774, which must be used to secure mounting bolts in slots at the bottom of the outboard stern brackets.



1. Clamp pad

COB2505

Install the mounting bolts through the stern brackets and transom. Install round backing plates and locknuts onto bolts and tighten securely.

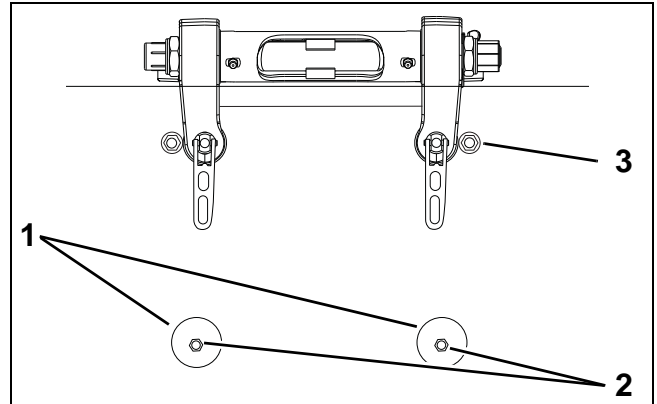


- 1. Transom mounting plate
- 2. Round backing plates
- 3. Locknuts

008015

25–30 HP, MANUAL TILT MODELS 15 HP, POWER TILT MODELS

Install the mounting bolts through the stern brackets and transom. Install round backing plates and locknuts onto bolts and tighten securely.



- 1. Round backing plates
- 2. Locknuts
- 3. Nut and washer (15 HP)

008014

OUTBOARD RIGGING

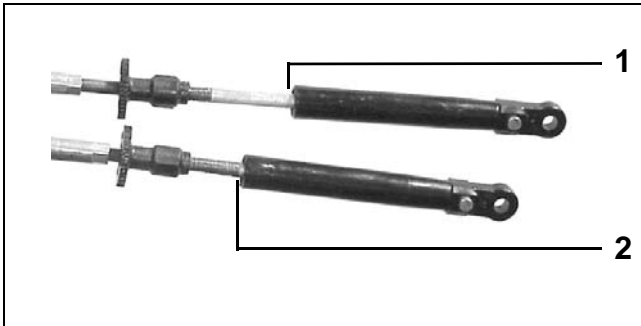
COMMON PRACTICES – ALL MODELS

Control Cable Identification

IMPORTANT: Identify control cable function 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.



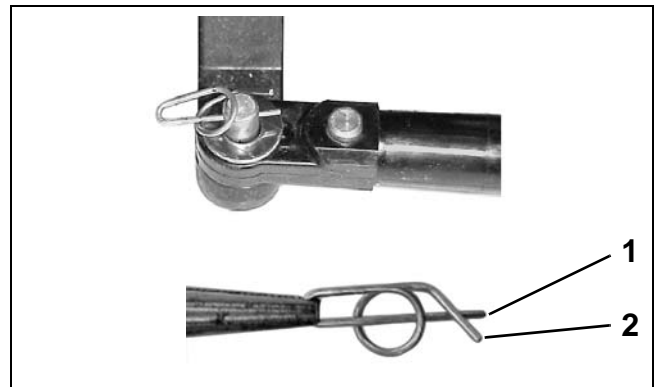
30501

Cable Retainer Clip Installation

When installing retainer clips on control arm linkage pins, clips should be locked and **must not** be bent or deformed.

For proper installation, review the following steps:

- Place washer on pin.
- Position retainer clip with straight section on the bottom and angled section on the top.
- Use long nose pliers to insert straight section of clip into linkage pin hole.



1. Straight section
2. Angled section
DP0818N
DP0817

- Push the clip towards the hole while lifting on the curved end with the pliers.
- Be sure retainer clip fully engages the pin.
- Lock the retainer by moving the angled section **behind** the straight section.



Locked Retainer Clip
1. Angled section behind straight section
DP0817A

OUTBOARD RIGGING

EVINRUDE E-TEC 90° V MODELS 200–300 HP

EVINRUDE E-TEC 90° V MODELS 200–300 HP

Cable, Hose, and Wire Routing

⚠ CAUTION

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

Refer to **Control Cable Identification** on p. 51.

Remove two screws and bracket that fasten the grommet to lower motor cover.



1. Grommet retaining bracket

003964

Route all hoses, control cables, and wiring through a protective sleeve or conduit into the boat and through the grommet.

The fuel hose may be routed through the protective sleeve or through an alternate hole in the lower motor cover grommet.

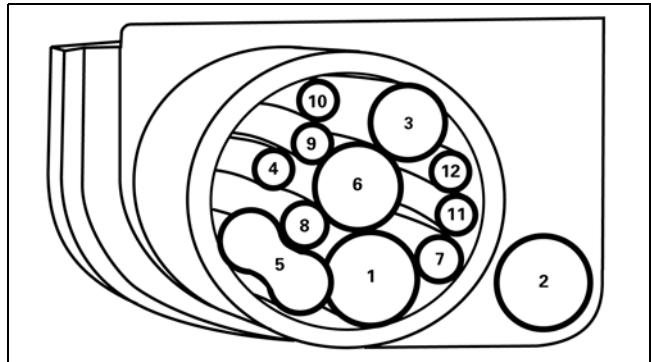
To route the fuel hose outside the sleeve, trim the material covering the alternate fuel hose slot in the grommet.



1. Alternate fuel hose location

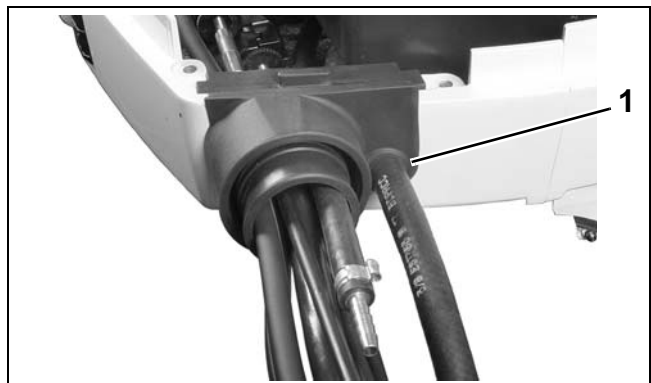
003970

Refer to the following diagram to ensure proper positioning of rigging components in grommet.



1. Fuel supply hose
2. Fuel supply hose--alternate location
3. Oil supply hose
4. Oil tank sending unit harness
5. Battery cables
6. Main wire harness (MWS)
7. Shift cable
8. Throttle cable
9. Accessory charge wires
10. I-Command harness
11. Water pressure hose
12. Speedometer hose

000095B



1. Alternate fuel hose location

003971

The main wiring harness, battery cables, oil tank sending unit harness, and any *ICON* or *I-Command* network cables should be routed along the

same path to the starboard side of the powerhead. Secure all cables with clamps.



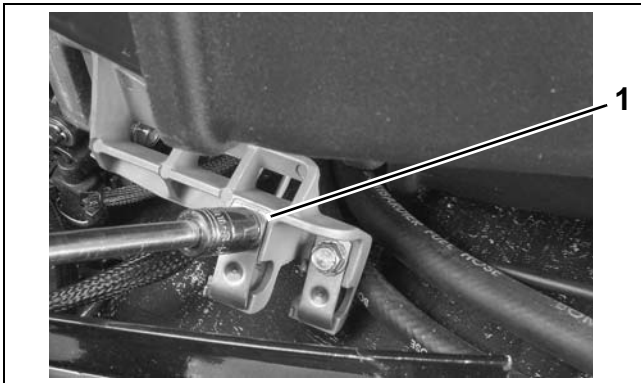
003974

NOTICE After installation, make sure there is enough clearance for all cables to avoid binding or chafing through all engine steering and tilting angles.

Control Cable Installation

Refer to **Control Cable Identification** on p. 51.

Remove control cable trunnion covers and cable attachment hardware.



1. Trunnion covers 005037

Shift Cable Installation and Adjustment

Place the shift cable on the shift lever pin and install the washer and retainer clip. Refer to **Cable Retainer Clip Installation** on p. 51.

IMPORTANT: Do not bend or deform clip.

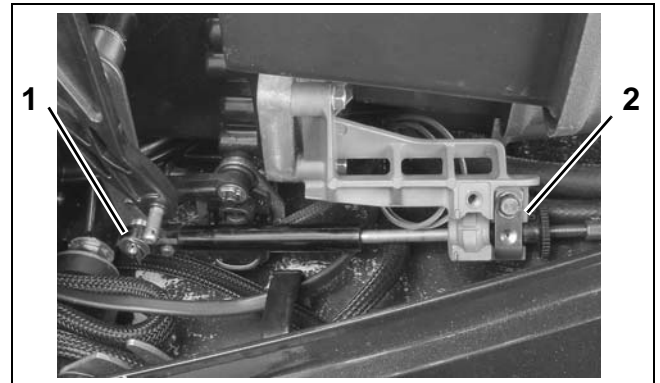
Make sure the remote control, gearcase, shift linkage, and shift cable are in NEUTRAL.

Hold the shift linkage in NEUTRAL.

Push and pull on the shift cable and observe the cable slack. Hold the casing guide in the center of the slack.

Adjust shift cable trunnion to align with center of the trunnion block. Place cable trunnion in trunnion block.

Install trunnion cover and screw. Tighten screw to a torque of 60 to 80 in. lbs. (7 to 9 N·m).

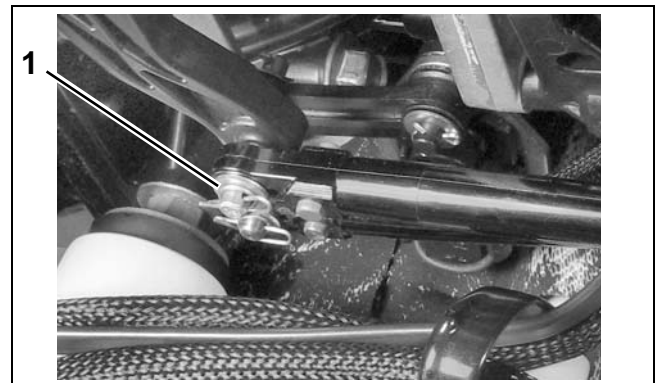


1. Shift cable retainer clip and washer 005038
 2. Shift cable trunnion

Throttle Cable Installation and Adjustment

With remote control lever in NEUTRAL, pull firmly on throttle cable casing to remove slack.

Place throttle cable on throttle lever pin and install washer and retainer clip. Refer to **Cable Retainer Clip Installation** on p. 51.

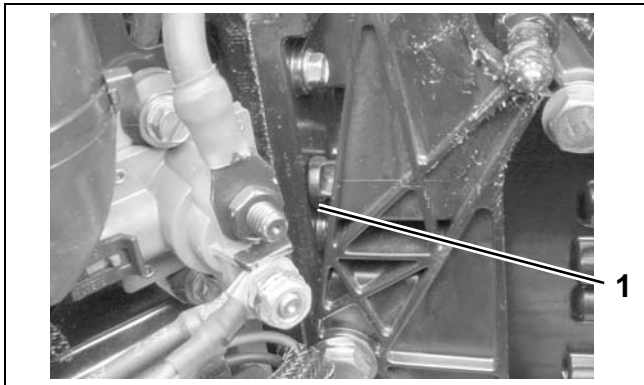


1. Throttle cable retainer clip and washer 003967

OUTBOARD RIGGING

EVINRUDE E-TEC 90° V MODELS 200–300 HP

Make sure that idle stop of the throttle lever is against the crankcase.



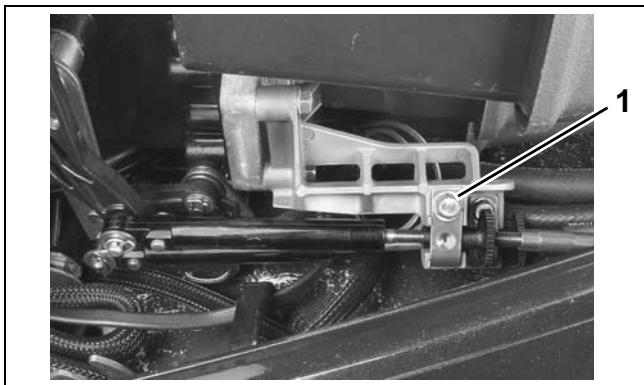
1. Throttle lever stop

003968

Adjust the throttle cable trunnion to align with the trunnion block. Place the cable trunnion in the trunnion block.

IMPORTANT: Move control handle to FORWARD and pull back slowly to NEUTRAL. Make sure the engine throttle lever is against the stop. If not, remove slack by adjusting cable trunnion.

Install trunnion cover and screw. Tighten screw to a torque of 60 to 80 in. lbs. (7 to 9 N·m).

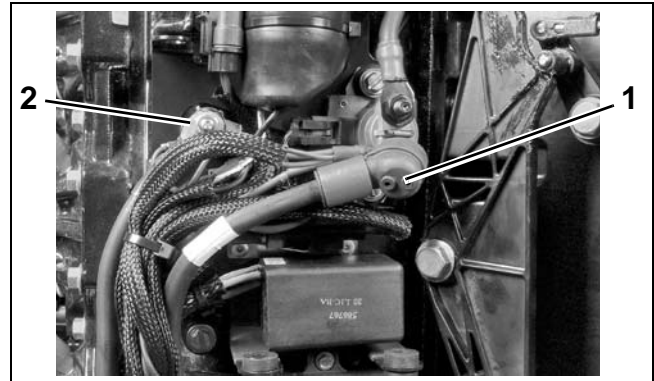


1. Trunnion cover and screw, throttle cable

005039

Battery Cable Connections

Install battery cables on starter solenoid and main ground stud.



1. Positive (+) battery connection
2. Ground (-) connection

003975

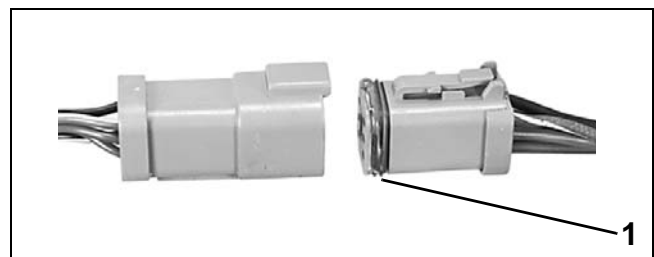
SystemCheck Harness Connections

Remove harness connector cover.



003972

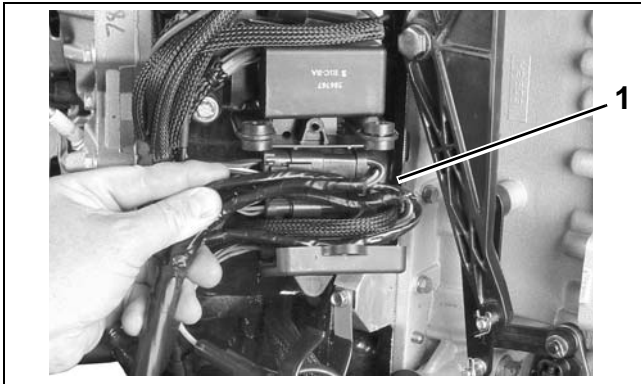
Before installing electrical connectors, check that the seal is in place. Clean off any dirt from connectors. Apply a light coat of *Electrical Grease* to the seal only. DO NOT fill connectors with *Electrical Grease*.



1. Seal

42079A

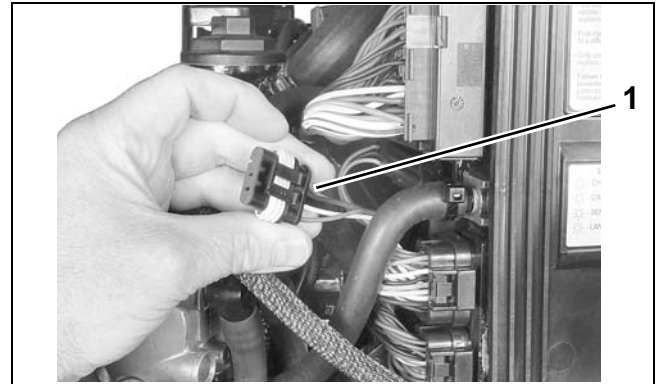
Connect outboard main wire harness to boat wire harness. Secure connectors in bracket. Refer to the diagram inside of the electrical cover.



1. Harness connections

003973

If using a mechanical control system, connect the *I-Command* Engine Interface Cable to the *EMM* CANbus connector.



1. EMM CANbus connector

004265

NOTICE BE SURE all harnesses and wires are not pinched, cannot contact flywheel, and do not interfere with moving throttle or shift linkages.

Replace harness connector cover.

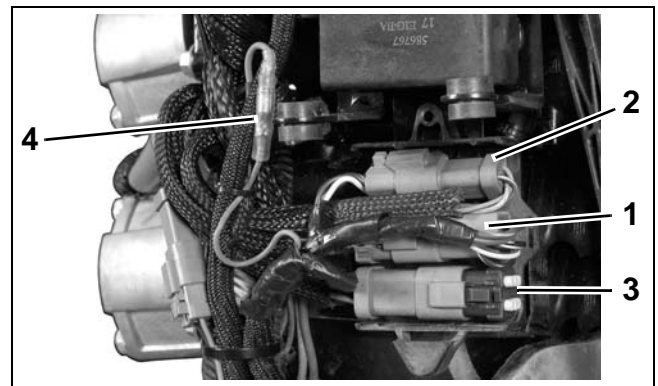
***I-Command* Network Connections**

If the outboard will be used with *I-Command*, or other *NMEA 2000* compliant CANbus instruments, use the following connections to supply information to the network:

If using an *Evinrude ICON* control system, the *I-Command* Engine Interface Cable, Power Supply Kit, and Ignition and Trim Harness are not required. Connect the *I-Command* network directly to the *ICON* gateway module. Refer to **Evinrude ICON / I-Command Harness Connections** on p. 14.

Use an *I-Command* Ignition and Trim Harness to connect the outboard to the key switch and trim/tilt control. Seal unused *SystemCheck* connector with 6-Pin Connector Seal, P/N 586076.

If connecting to an existing *Deutsch*-style *I-Command* network, connect the purple wires between the *I-Command* Ignition and Trim Harness and the *I-Command* Engine Interface Cable. This connection supplies power to the network when the key switch is on. Newer, quick connect-style networks do not use this connection.



1. *I-Command* Ignition connector

2. Trim/Tilt connector

3. *SystemCheck* connector (with seal)

4. Network power supply connector (*Deutsch* style networks)

006862

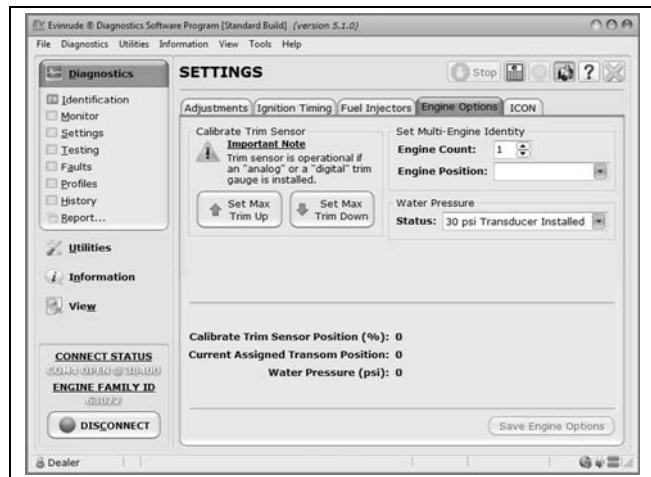
Route the harnesses around the starboard side of the powerhead along the same path as the battery cables.

OUTBOARD RIGGING

EVINRUDE E-TEC 90° V MODELS 200–300 HP

For an *I-Command* oil level display, an accessory CANbus oil level sender must be installed in the oil tank. Connect the sender to the *I-Command* network. Refer to the ***I-Command Digital Network Guide***, P/N 355008.

Use *Evinrude Diagnostics* software to adjust network settings in the *EMM*. From the *Settings* screen, select *Engine Options*.



Engine Options Screen

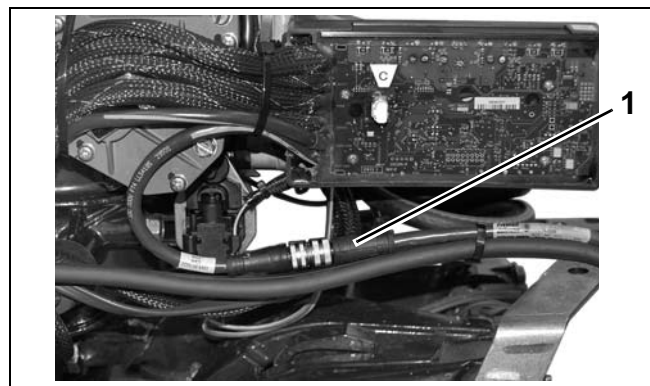
008563

ICON Network Connections

If the outboard is equipped for an *Evinrude ICON* control system, connect the outboard to the network as follows.

Refer to **Evinrude ICON / I-Command Harness Connections** on p. 14.

Connect the buss cable from the rear network hub to the outboard's network harness.



1. ICON network connector

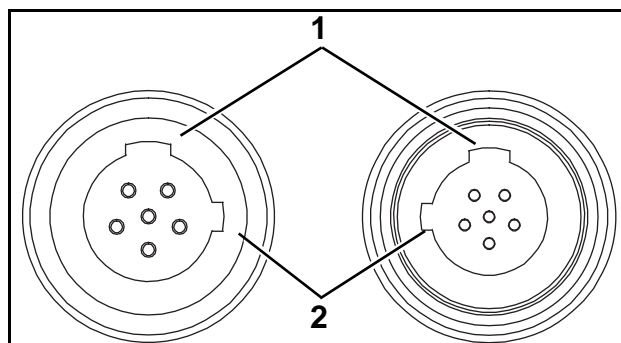
008001

IMPORTANT: Do not force connectors or locking rings. Properly aligned connectors assemble easily.

DO NOT use *Electrical Grease* on *ICON* buss cable connectors.

To assemble the connectors:

- Use the large tabs and small tabs to carefully align buss cable connectors.
- Carefully align pins and sockets of connectors. Do NOT force connectors together.
- Tighten locking rings of buss connectors finger tight. Do NOT use locking rings to force connectors together.



1. Large tabs
2. Small tabs

007883

Do not rotate connectors until they align. This could result in a mismatched connection. It is possible for each pin to enter a socket even if the tabs are misaligned. Look at the tabs to ensure connector alignment prior to making the connection.

Engine Monitor information is distributed to an *ICON* or *I-Command* network through the *ICON* gateway module. Refer to the ***I-Command Digital Network Guide***, P/N 355008.

The *ICON* Harness and Relay Kit, P/N 765296, must be used to provide power to boat accessories that require switched B+. This kit is used in place of connecting accessories to the “A” terminal of the key switch. Accessories connected to the accessory power relay should not exceed 7 amps.

NOTICE Do not connect boat accessories to the key switch of an *ICON* system. Connecting accessories to the key switch can cause low

current, resulting in erratic operation of the remote control system.

For more information, refer to the *Evinrude ICON Remote Control System Installation Guide*, P/N 764952.

Water Pressure Gauge

To display engine water pressure, install a water pressure hose fitting in the cylinder block as shown.

Use *Pipe Sealant with Teflon* on the threads of the hose fitting. Refer to installation instructions supplied with gauge.

Route the water pressure hose around the starboard side of the powerhead along the same path as the battery cables.



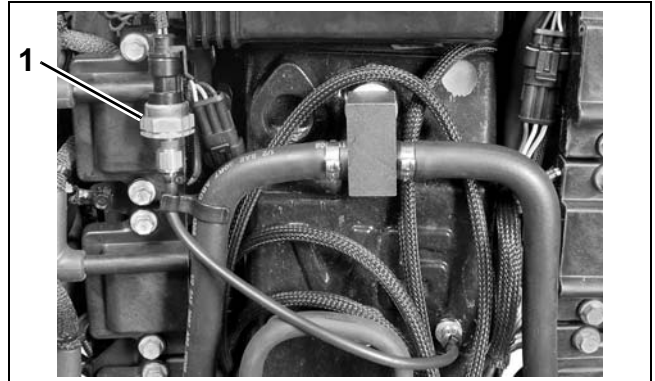
1. Water pressure hose fitting 005035

For an *I-Command* water pressure display, several water pressure sensor kits are available. Refer to the *Evinrude/Johnson Genuine Parts and Accessories* catalog.

To send water pressure data to the *EMM*, along with an *I-Command* display, install a water pressure transducer kit.

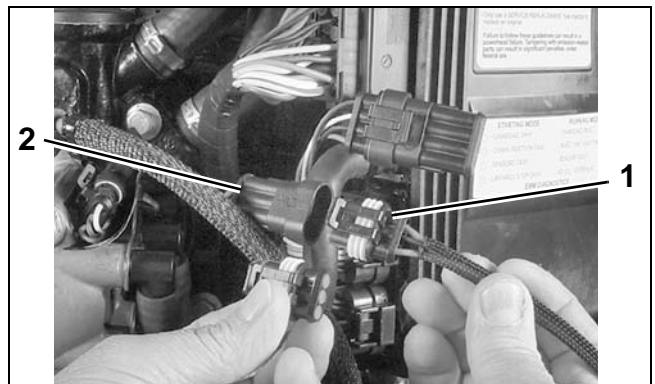
Water pressure readings in excess of 40 psi (275 kpa) are possible for 90° V6 models at boat speeds in excess of 50 mph (80 kph/43 kts).

Use 50 psi Water Pressure Transducer Kit, P/N 5008640.



1. Water pressure transducer 008131

Connect the transducer lead to the engine wiring harness connector.



1. Water pressure transducer lead
2. Engine harness connector 004120

OUTBOARD RIGGING

EVINRUDE E-TEC 60° V MODELS 115–200 HP

EVINRUDE E-TEC 60° V MODELS 115–200 HP

Cable, Hose, and Wire Routing

⚠ CAUTION

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

Refer to **Control Cable Identification** on p. 51.

Remove two screws and bracket that fasten the grommet to lower motor cover.



1. Grommet retaining bracket

003964

Route all hoses, control cables, and wiring through a protective sleeve or conduit into the boat and through the grommet.

The fuel hose may be routed through the protective sleeve or through an alternate hole in the lower motor cover grommet.

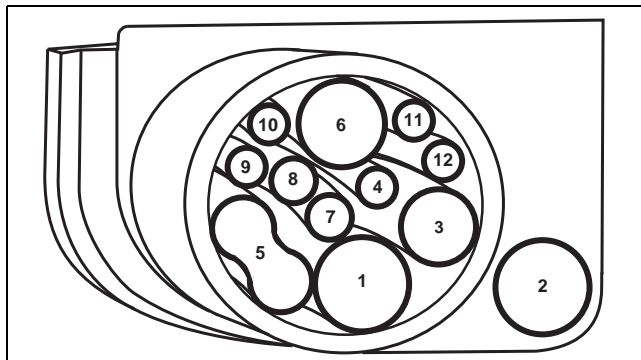
To route the fuel hose outside the sleeve, trim the material covering the alternate fuel hose slot in the grommet.



1. Alternate fuel hose location

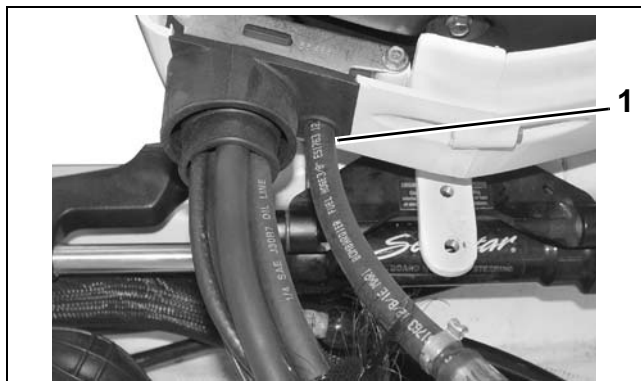
003970

Refer to the following diagram to ensure proper positioning of rigging components in grommet.



000095c

1. Fuel supply hose
2. Fuel supply hose--alternate location
3. Oil supply hose
4. Oil tank sending unit harness
5. Battery cables
6. Main wire harness (MWS)
7. Shift cable
8. Throttle cable
9. Accessory charge wires
10. I-Command harness
11. Water pressure hose
12. Speedometer hose

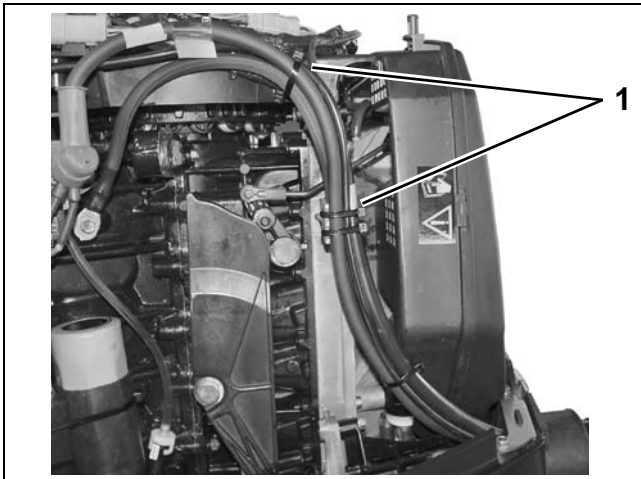


1. Alternate fuel hose location

004946

The main wiring harness, battery cables, oil tank sending unit harness, and any *ICON* or *I-Command* network cables should be routed along the

same path to the starboard side of the powerhead. Secure all cables with clamps.



1. Anchor points

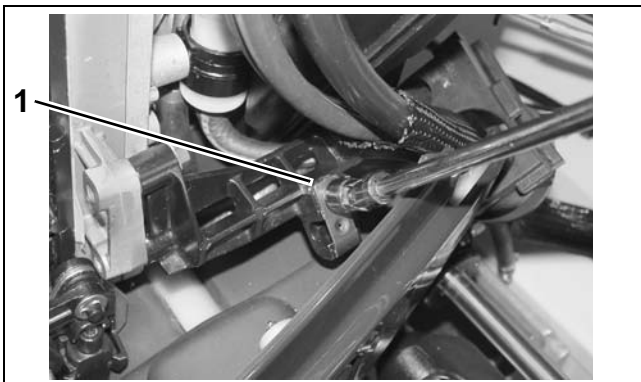
004949

NOTICE After installation, make sure there is enough clearance for all cables to avoid binding or chafing through all engine steering and tilting angles.

Control Cable Installation

Refer to **Control Cable Identification** on p. 51.

Remove control cable trunnion covers and cable attachment hardware.



1. Trunnion covers

004955

Shift Cable Installation and Adjustment

Place the shift cable on the shift lever pin and install the washer and retainer clip. Refer to **Cable Retainer Clip Installation** on p. 51.

IMPORTANT: Do not bend or deform clip.

Make sure the remote control, gearcase, shift linkage, and shift cable are in NEUTRAL.

Hold the shift linkage in NEUTRAL.

Push and pull on the shift cable and observe the cable slack. Hold the casing guide in the center of the slack.

Adjust shift cable trunnion to align with center of the trunnion block. Place cable trunnion in trunnion block.

Install trunnion cover and screw. Tighten screw to a torque of 60 to 80 in. lbs. (7 to 9 N·m).



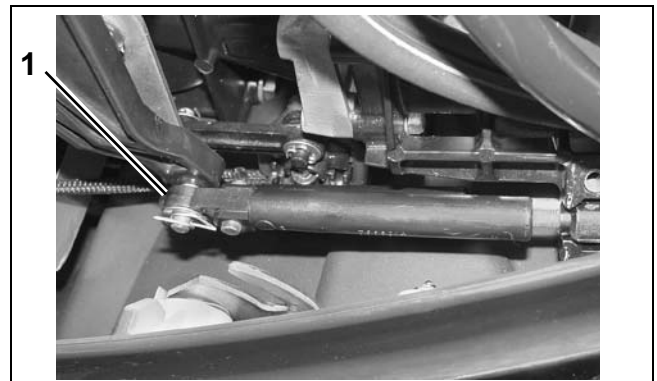
1. Shift cable retainer clip and washer
2. Shift cable trunnion

004956

Throttle Cable Installation and Adjustment

With remote control lever in NEUTRAL, pull firmly on throttle cable casing to remove slack.

Place throttle cable on throttle lever pin and install washer and retainer clip. Refer to **Cable Retainer Clip Installation** on p. 51.



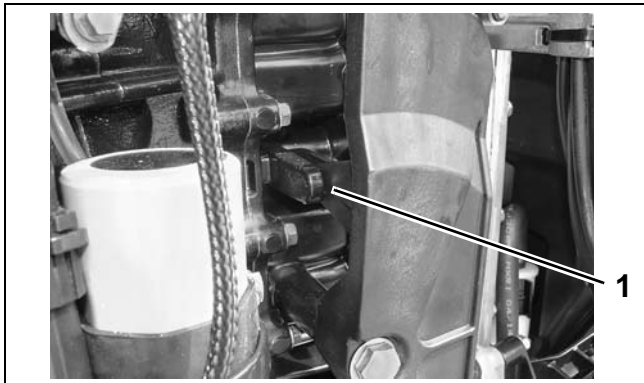
1. Throttle cable retainer clip and washer

004957

OUTBOARD RIGGING

EVINRUDE E-TEC 60° V MODELS 115–200 HP

Make sure that idle stop of the throttle lever is against the crankcase.



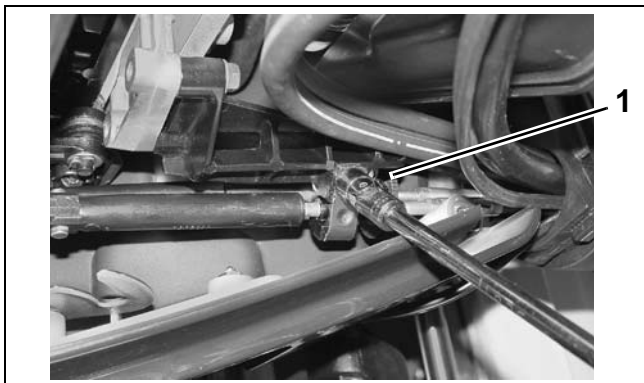
1. Throttle lever stop

004947

Adjust the throttle cable trunnion to align with the trunnion block. Place the cable trunnion in the trunnion block.

IMPORTANT: Move control handle to FORWARD and pull back slowly to NEUTRAL. Make sure the engine throttle lever is against the stop. If not, remove slack by adjusting cable trunnion.

Install trunnion cover and screw. Tighten screw to a torque of 60 to 80 in. lbs. (7 to 9 N·m).

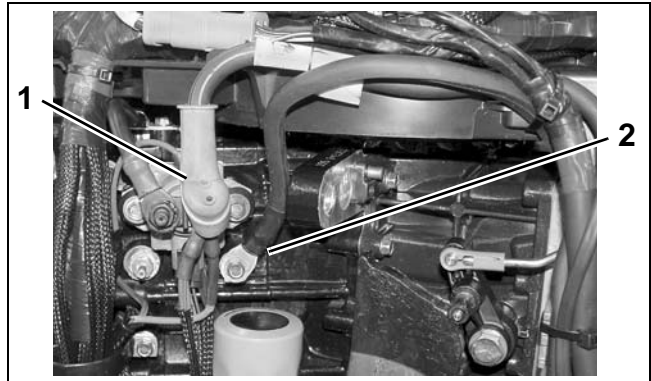


1. Trunnion cover and screw, throttle cable

004958

Battery Cable Connections

Install battery cables on starter solenoid and main ground stud.

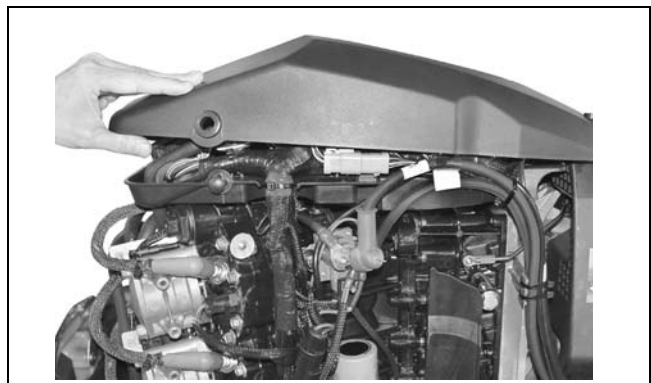


1. Positive (+) battery connection
2. Ground (-) connection

004953

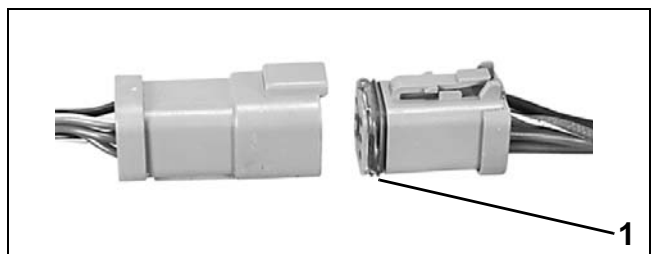
SystemCheck Harness Connections

Remove flywheel/harness connector cover.



004954

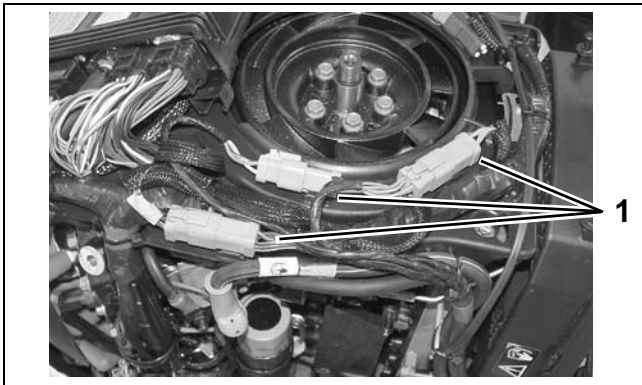
Before installing electrical connectors, check that the seal is in place. Clean off any dirt from connectors. Apply a light coat of *Electrical Grease* to the seal only. DO NOT fill connectors with *Electrical Grease*.



1. Seal

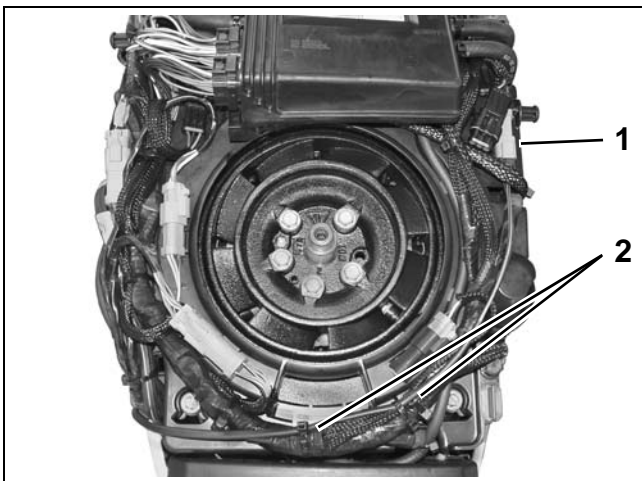
42079A

Connect outboard main wire harness to boat wire harness. Secure connectors in brackets.



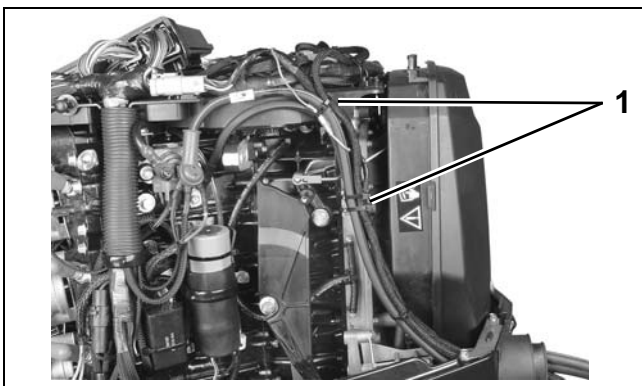
1. Harness connections 004951

Route oil tank sending unit harness around the front to the port side. Secure all cables with tie straps.



1. Low oil sender connection 004952
2. Tie straps

Secure all cables with tie-straps.



1. Anchor points 005270

NOTICE BE SURE all harnesses and wires are not pinched, cannot contact flywheel, and do not interfere with moving throttle or shift linkages.

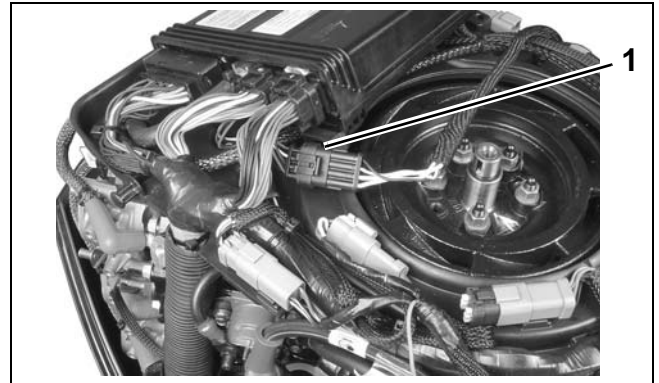
Replace flywheel/harness connector cover.

***I-Command* Network Connections**

If the outboard will be used with *I-Command*, or other *NMEA 2000* compliant CANbus instruments, use the following connections to supply information to the network:

If using an *Evinrude ICON* control system, the *I-Command* Engine Interface Cable, Power Supply Kit, and Ignition and Trim Harness are not required. Connect the *I-Command* network directly to the *ICON* gateway module. Refer to **Evinrude ICON / I-Command Harness Connections** on p. 14.

If using a mechanical control system, connect the *I-Command* Engine Interface Cable to the *EMM* CANbus connector.

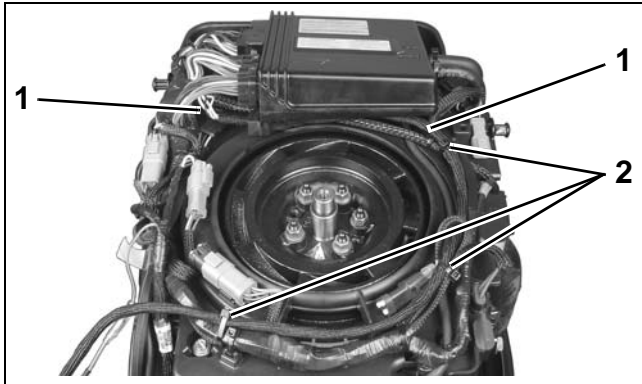


1. EMM CANbus connector 005267

OUTBOARD RIGGING

EVINRUDE E-TEC 60° V MODELS 115–200 HP

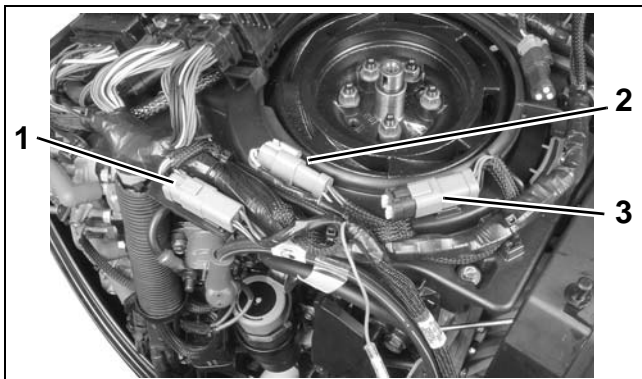
Route the harness under the front of the *EMM* and around the port side of the powerhead. Secure with tie straps.



1. Harness routing
2. Tie straps

005268

Use an *I-Command* Ignition and Trim Harness to connect the outboard to the key switch and trim/tilt control. Seal unused *SystemCheck* connector with 6-Pin Connector Seal, P/N 586076.

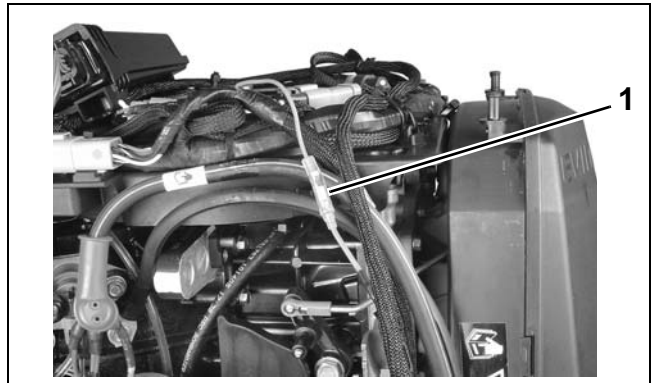


1. I-Command Ignition connector
2. Trim/Tilt connector
3. SystemCheck connector (with seal)

005266

If connecting to an existing *Deutsch*-style *I-Command* network, connect the purple wires between the *I-Command* Ignition and Trim Harness and the *I-Command* Engine Interface Cable. This connection supplies power to the network when the key

switch is on. Newer, quick connect-style networks do not use this connection.

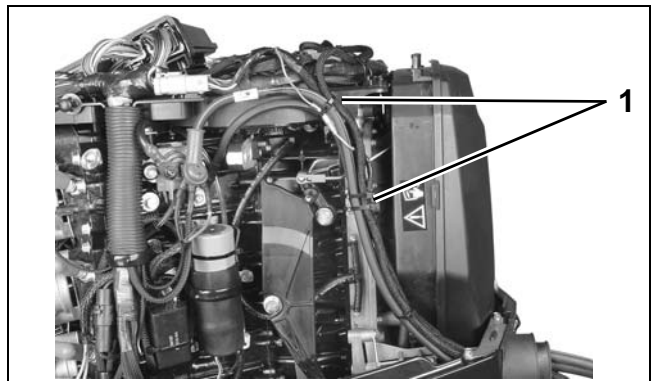


1. Network power supply connector

005269

Route the harnesses around the starboard side of the powerhead along the same path as the battery cables.

Secure all cables with tie-straps.



1. Anchor points

005270

For an *I-Command* oil level display, an accessory CANbus oil level sender must be installed in the oil tank. Connect the sender to the *I-Command* network. Refer to the ***I-Command* Digital Network Guide**, P/N 355008.

Use *Evinrude Diagnostics* software to adjust network settings in the *EMM*. From the *Settings* screen, select *Engine Options*.



Engine Options Screen

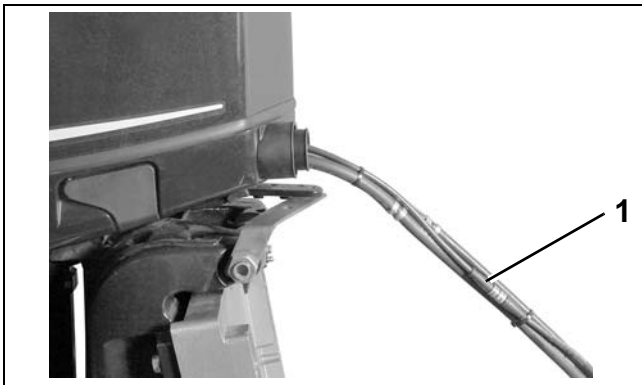
008563

ICON Network Connections

If the outboard is equipped for an *Evinrude ICON* control system, connect the outboard to the network as follows.

Refer to **Evinrude ICON / I-Command Harness Connections** on p. 14.

Connect the buss cable from the rear network hub to the outboard's network harness.



1. ICON network connector

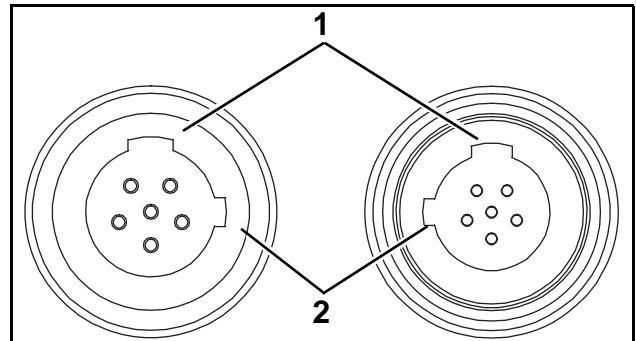
008157

IMPORTANT: Do not force connectors or locking rings. Properly aligned connectors should assemble easily.

Do not use *Electrical Grease* on *ICON* buss cable connectors.

To assemble the connectors:

- Use the large tabs and small tabs to carefully align buss cable connectors.
- Carefully align pins and sockets of connectors. Do NOT force connectors together.
- Tighten locking rings of buss connectors finger tight. Do NOT use locking rings to force connectors together.



1. Large tabs
2. Small tabs

007883

Do not rotate connectors until they align. This could result in a mismatched connection. It is possible for each pin to enter a socket even if the tabs are misaligned. Look at the tabs to ensure connector alignment prior to making the connection.

Engine Monitor information is distributed to an *ICON* or *I-Command* network through the *ICON* gateway module. Refer to the ***I-Command Digital Network Guide***, P/N 355008.

The *ICON* Harness and Relay Kit, P/N 765296, must be used to provide power to boat accessories that require switched B+. This kit is used in place of connecting accessories to the “A” terminal of the key switch. Accessories connected to the accessory power relay should not exceed 7 amps.

NOTICE Do not connect boat accessories to the key switch of an *ICON* system. Connecting accessories to the key switch can cause low current, resulting in erratic operation of the remote control system.

For more information, refer to the ***Evinrude ICON Remote Control System Installation Guide***, P/N 764952.

OUTBOARD RIGGING

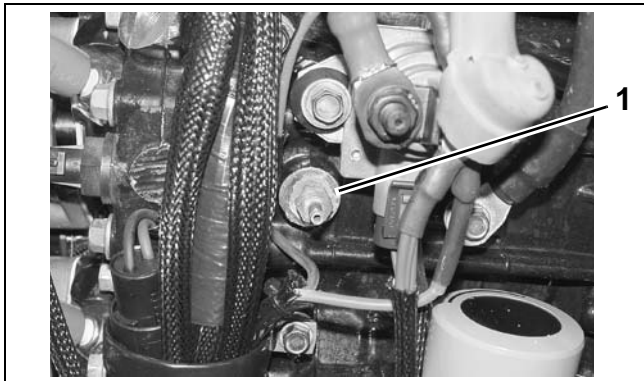
EVINRUDE E-TEC 60° V MODELS 115–200 HP

Water Pressure Gauge

To display engine water pressure, install a water pressure hose fitting in the cylinder block as shown.

Use *Pipe Sealant with Teflon* on the threads of the hose fitting. Refer to installation instructions supplied with gauge.

Route the water pressure hose around the starboard side of the powerhead along the same path as the battery cables.



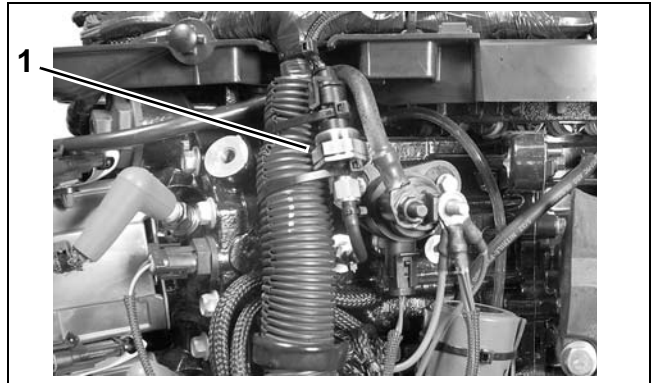
1. Water pressure hose fitting

004959

For an *I-Command* water pressure display, several water pressure sensor kits are available. Refer to the ***Evinrude/Johnson Genuine Parts and Accessories*** catalog.

To send water pressure data to the *EMM*, along with an *I-Command* display, install a water pressure transducer kit.

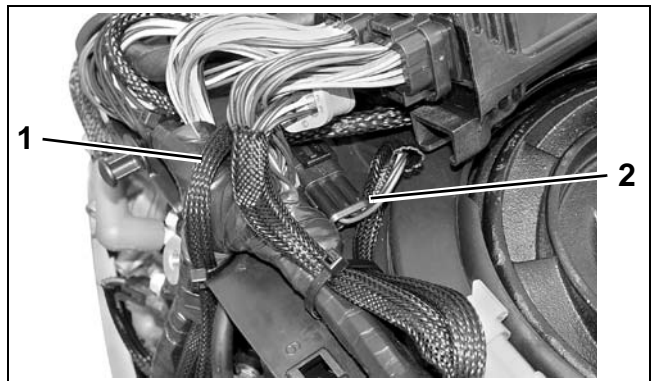
- Use 50 psi Water Pressure Transducer Kit, P/N 5008640 on 2012 and **newer** 60° V4/V6 models.
- Use 30 psi Water Pressure Transducer Kit, P/N 5008300 on 2011 and **older** 60° V4/V6 models.



1. Water pressure transducer

008129

Connect the transducer lead to the engine wiring harness connector.



1. Water pressure transducer lead

2. Engine harness connector

004962

EVINRUDE E-TEC MODELS 40–90 HP

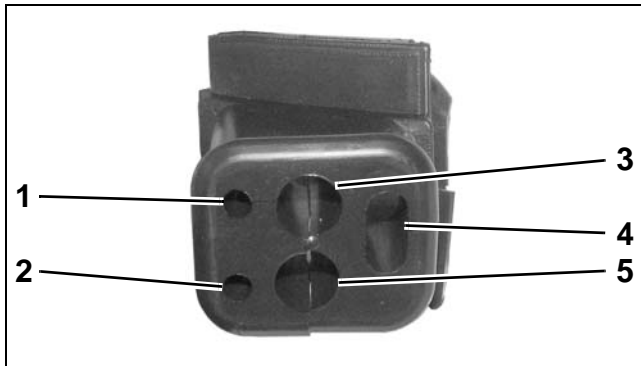
Cable, Hose, and Wire Routing

⚠ CAUTION

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

Refer to **Control Cable Identification** on p. 51.

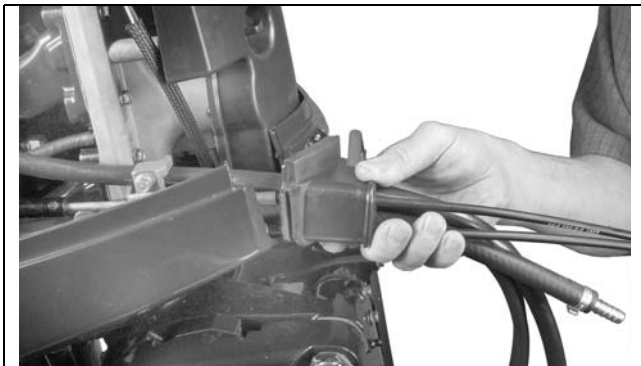
Apply soapy water to the inside surfaces of grommet and install cables and fuel line as shown:



1. Throttle cable
2. Shift cable
3. Main wiring harness
4. Battery cable
5. Fuel line

001998

Place the grommet into position in the lower engine cover.



002104

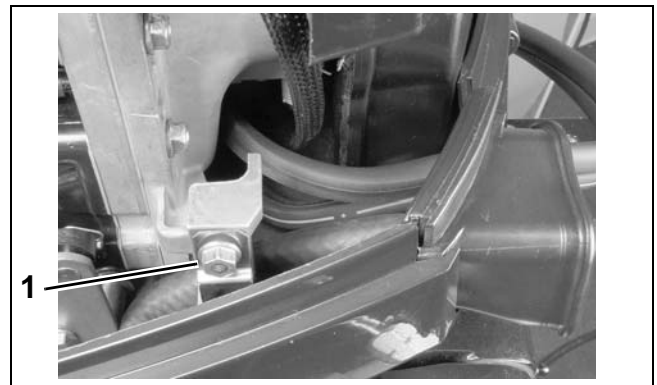
When grommet is in place and all cables have been installed, tighten a tie strap around the outside of the grommet to form a watertight seal around the cables.

NOTICE After installation, make sure there is enough clearance for all cables to avoid binding or chafing through all engine steering and tilting angles.

Control Cable Installation

Refer to **Control Cable Identification** on p. 51.

Remove cable retainer from anchor block. Apply *Triple-Guard* grease to both anchor block pockets.



1. Cable retainer

002099

IMPORTANT: DO NOT secure cables to throttle and shift lever pins until all cables, wires, and hoses have been routed and grommet has been installed in the lower engine cover.

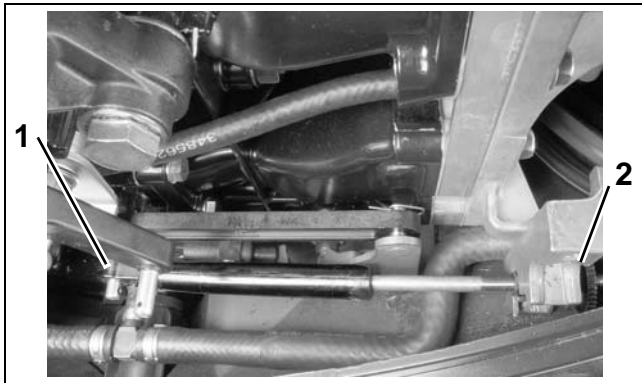
Make sure the remote control is in NEUTRAL, and throttle is in the IDLE position.

Pull firmly on shift cable casing to remove slack. With outboard in NEUTRAL, place the cable trun-

OUTBOARD RIGGING

EVINRUDE E-TEC MODELS 40–90 HP

nion into the lower anchor pocket. Adjust the trunnion nut so the casing fits onto the shift lever pin.



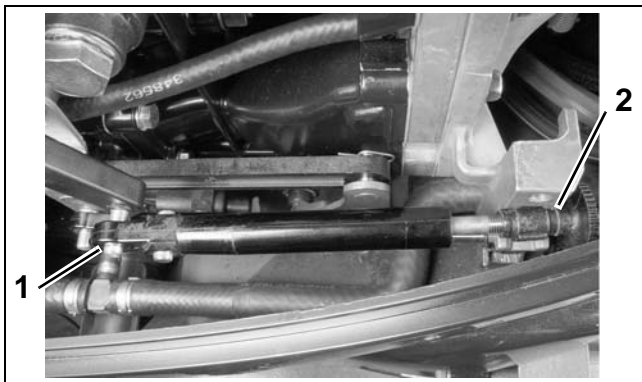
1. Shift lever pin
2. Trunnion nut

002100

If there are not enough threads on the shift cable for the adjustment, or if the gearcase does not shift fully into FORWARD or REVERSE, refer to the **Service Manual** for shift rod height adjustment.

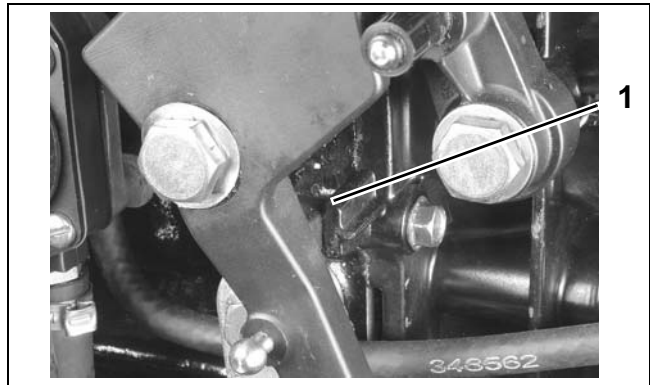
With remote control lever in NEUTRAL, pull firmly on throttle cable casing to remove slack.

With engine throttle lever against stop, place the cable trunnion into the upper anchor pocket and adjust the trunnion nut so the casing fits onto the throttle lever pin.



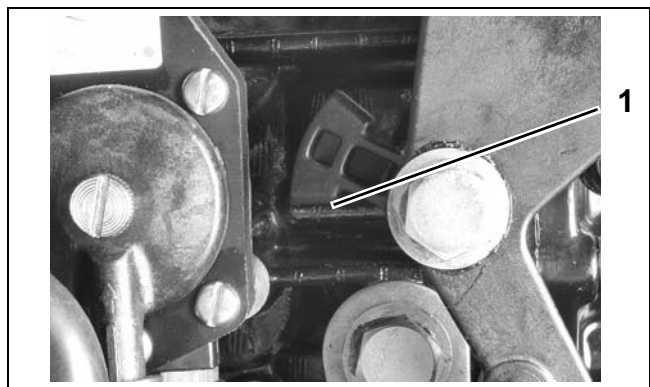
1. Throttle lever pin
2. Trunnion nut

002101



1. Throttle lever stop – 3 Cylinder models

005111



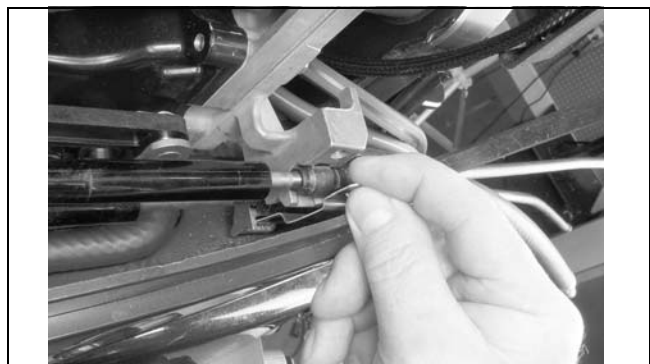
1. Throttle lever stop – 2 Cylinder models

005114

IMPORTANT: Move control handle to FORWARD and pull back slowly to NEUTRAL. Make sure the engine throttle lever is against the stop. If not, remove slack by adjusting cable trunnion.

After grommet has been installed in lower engine cover, install the washers and retainer clips on the throttle and shift lever pins. Refer to **Cable Retainer Clip Installation** on p. 51.

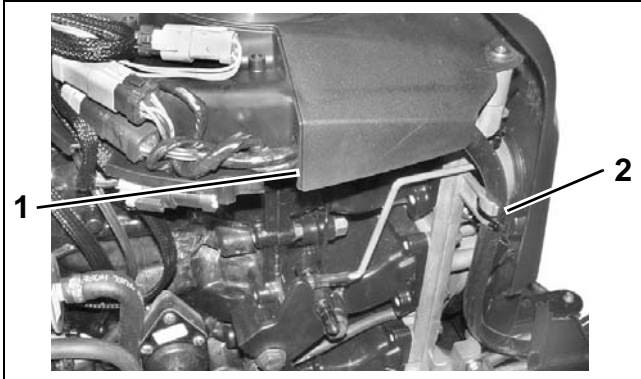
Install cable retainer and screw. Tighten screw to a torque of 60 to 84 in. lbs. (7 to 9.5 N·m).



002103

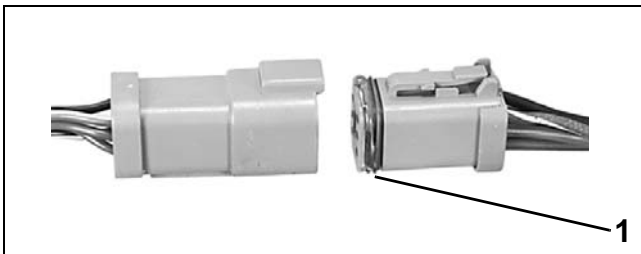
SystemCheck Harness Connections

Place the wiring harness through notch in lower motor cover and route to the recess in the flywheel cover. Secure the cable with a tie strap as shown:



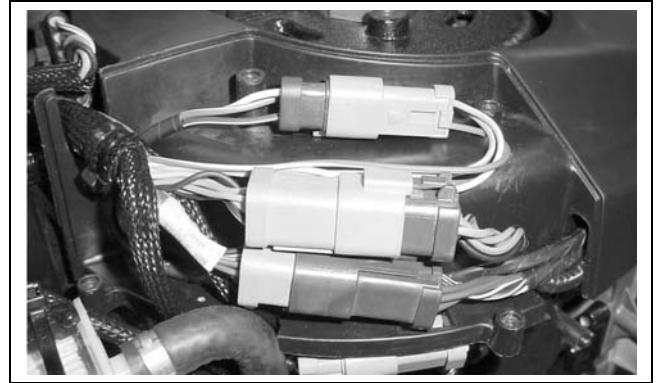
1. Recess
2. Tie strap
002011

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 only. DO NOT fill connectors with *Electrical Grease*.



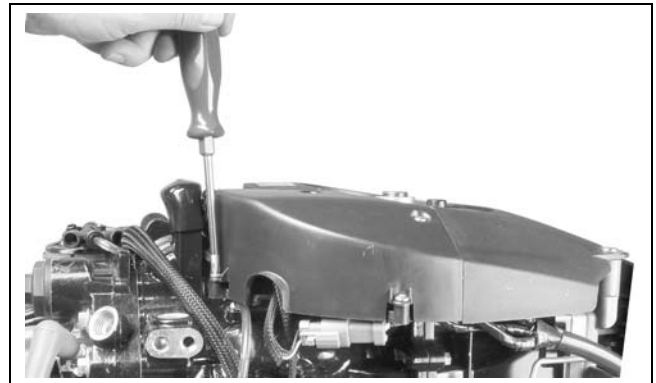
1. Seal
42079A

Arrange connectors in flywheel cover.



001999

Install electrical cover and secure with screws.



002102

NOTICE BE SURE all harnesses and wires are not pinched, cannot contact flywheel, and do not interfere with moving throttle or shift linkages.

OUTBOARD RIGGING

EVINRUDE E-TEC MODELS 40–90 HP

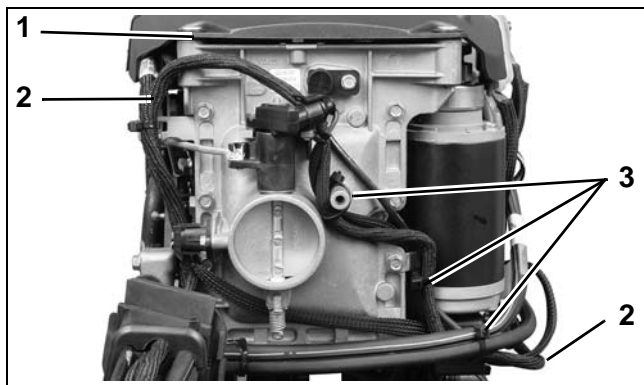
***I-Command* Network Connections**

If the outboard will be used with *I-Command*, or other *NMEA 2000* compliant CANbus instruments, use the following connections to supply information to the network:

Remove lower motor covers. Remove air silencer.

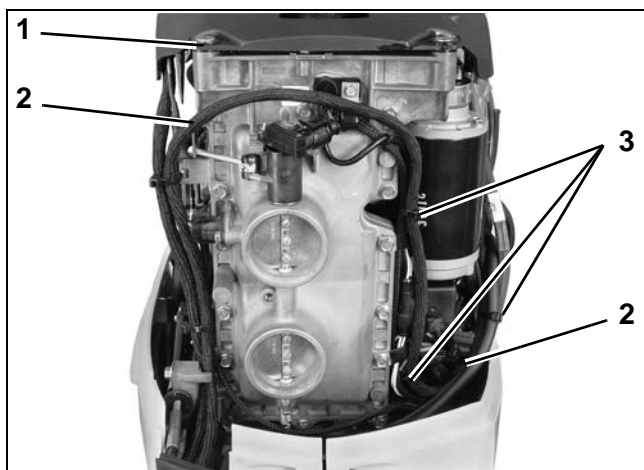
Route *I-Command* Engine Interface Cable around the front of the throttle body, following the path of the TPS wiring, and behind the battery cable. Loosely install tie straps as shown.

NOTICE To prevent wire chafing, harness must be routed below the flywheel cover.



2 Cylinder Models
1. Flywheel cover
2. Harness routing
3. Tie straps

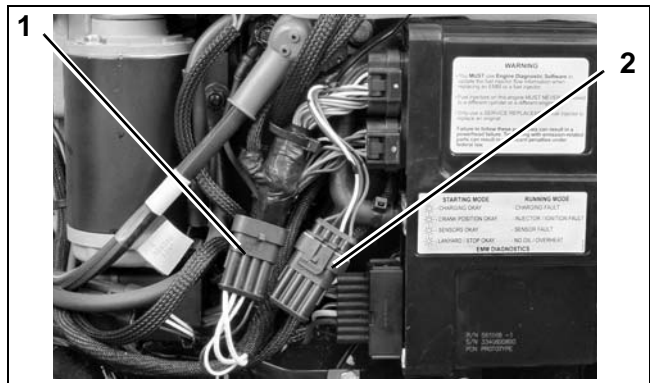
006736



3 Cylinder Models
1. Flywheel cover
2. Harness routing
3. Tie straps

006742

Connect the *I-Command* Engine Interface Cable to the *EMM* CANbus connector.

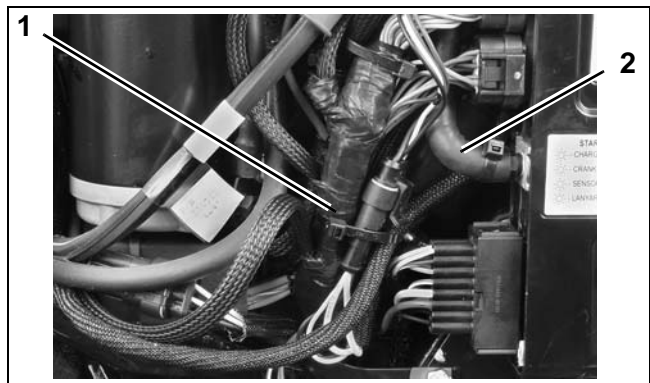


1. *I-Command* network connector
2. *EMM* CANbus connector

006735

2 CYLINDER MODELS

To prevent interference with engine cover latch, bundle excess wiring behind *EMM* cooling water hose. Secure *I-Command* connectors to back side of engine harness with tie strap.

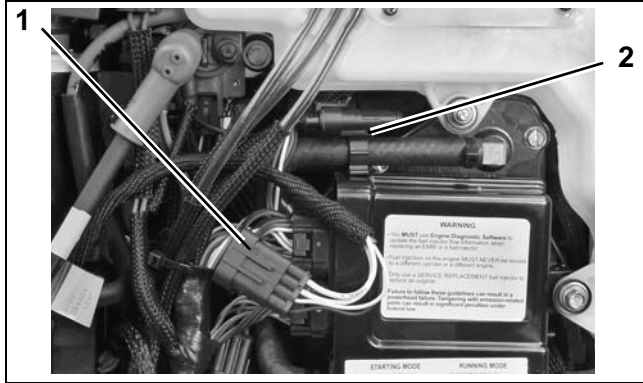


1. Engine harness
2. *EMM* cooling water hose

006738

3 CYLINDER MODELS

EMM CANbus connector cap is clipped to EMM cooling water hose. Remove clip from cap and install on I-Command harness connector.



1. Canbus harness connector
 2. EMM CANbus connector cap and clip
 006743

Install clip and connector to hose.



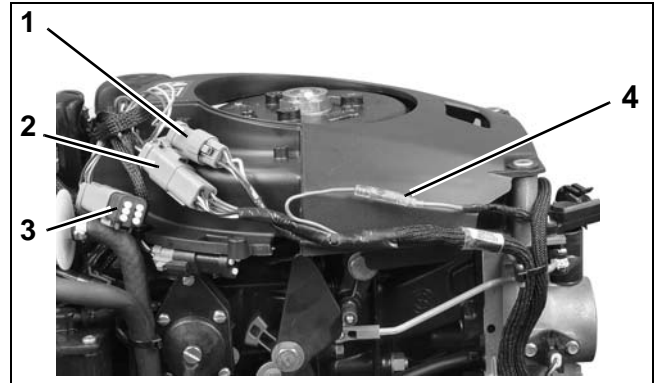
1. CANbus connectors
 2. EMM cooling water hose
 006744

ALL MODELS

Adjust harness routing as needed and secure with tie straps.

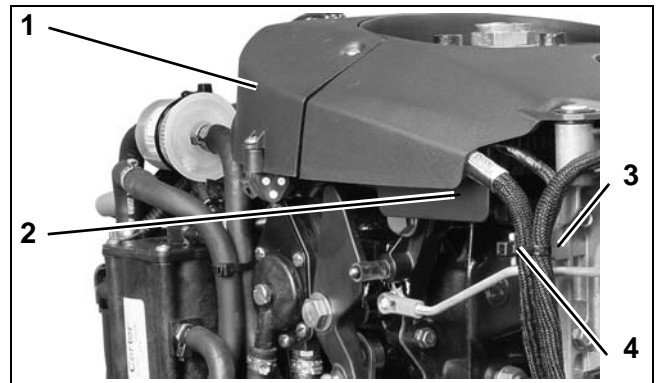
Use an I-Command Ignition and Trim Harness to connect the outboard to the key switch and trim/tilt control. Seal unused SystemCheck connector with 6-Pin Connector Seal, P/N 586076.

If connecting to an existing *Deutsch*-style I-Command network, connect the purple wires between the I-Command Ignition and Trim Harness and the I-Command Engine Interface Cable. This connection supplies power to the network when the key switch is on. Newer, quick connect-style networks do not use this connection.



1. Trim/Tilt connector
 2. I-Command Ignition connector
 3. SystemCheck connector (with seal)
 4. Network power supply connector
 006734

Route I-Command Ignition Harness through wire channel in flywheel cover. Install electrical cover. Make sure both harnesses are in front of the tab and tighten with tie strap.



1. Electrical cover
 2. Wire channel
 3. Tab
 4. Tie strap
 006737

OUTBOARD RIGGING

EVINRUDE E-TEC MODELS 40–90 HP

Use *Evinrude Diagnostics* software to adjust network settings in the *EMM*. From the *Settings* screen, select *Engine Options*.



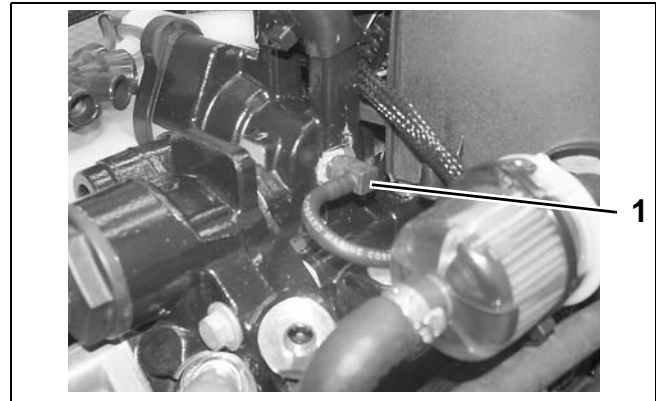
Engine Options Screen

008563A

Water Pressure Gauge

To display engine water pressure, install a water pressure hose fitting in the cylinder block as shown.

Use *Pipe Sealant with Teflon* on the threads of the hose fitting. Refer to installation instructions supplied with gauge.



1. Fitting

002461

For an *I-Command* water pressure display, several water pressure sensor kits are available. Refer to the ***Evinrude/Johnson Genuine Parts and Accessories*** catalog.

EVINRUDE E-TEC MODELS 15–30 HP

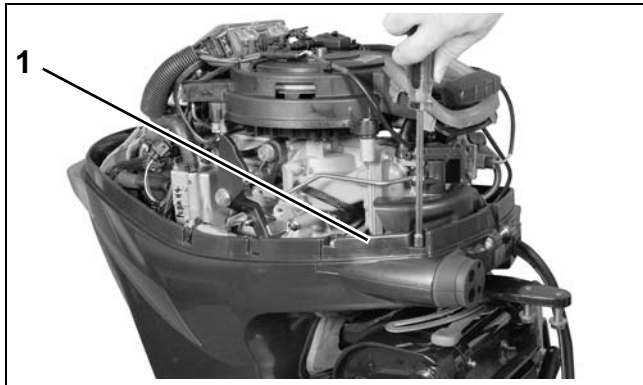
Cable, Hose, and Wire Routing

⚠ CAUTION

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

Refer to **Control Cable Identification** on p. 51.

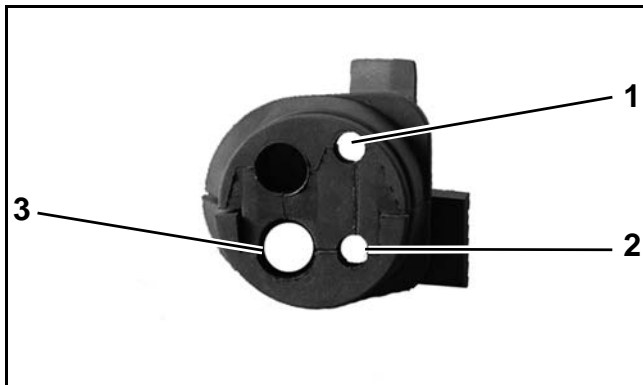
Remove cable entry grommet cover and grommet.



1. Cable entry grommet cover 007120

Remove rubber membrane from grommet holes as needed.

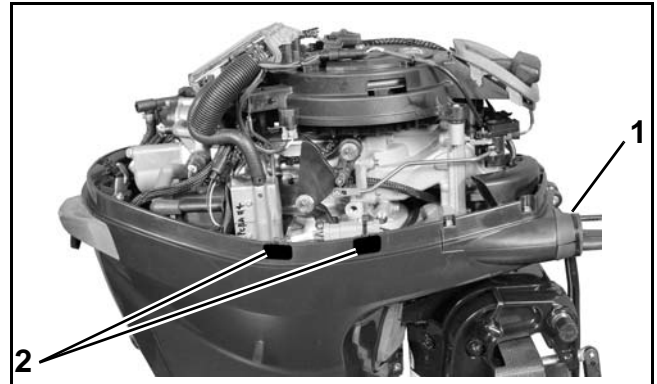
Install cables and wiring harness(es) through grommet as shown:



1. Throttle cable
 2. Shift cable
 3. Electrical harness 007129

When grommet is in place and all cables have been installed, tighten a tie strap around the outside of the grommet to form a watertight seal around the cables.

Place blank sealing decal on lip of lower motor cover at each harness connector tie strap to prevent water intrusion.



1. Tie strap
 2. Blank sealing decal 007127

NOTICE After installation, make sure there is enough clearance for all cables to avoid binding or chafing through all engine steering and tilting angles.

Control Cable Installation

Refer to **Control Cable Identification** on p. 51.

Make sure the remote control is in NEUTRAL, and throttle is in the IDLE position.

Removal of lower motor covers is NOT required. Some images show lower covers removed for clear illustration.

Place the shift cable on the shift lever pin.

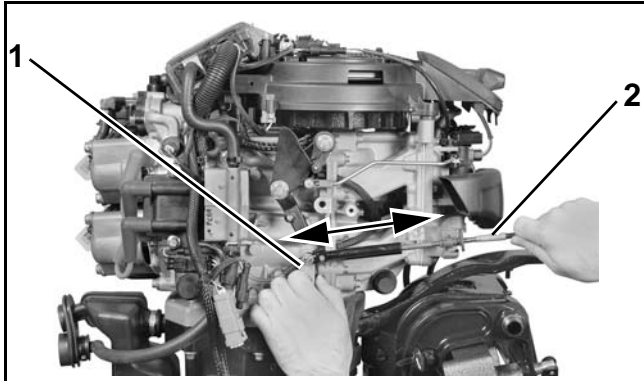
Hold the shift linkage in NEUTRAL.

Push and pull on the shift cable and observe the cable slack. Hold the casing guide in the center of the slack.

OUTBOARD RIGGING

EVINRUDE E-TEC MODELS 15–30 HP

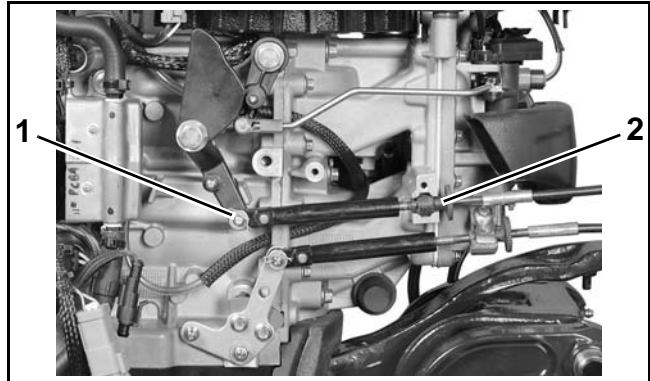
Adjust the shift cable trunnion to align with the center of the trunnion block.



1. Shift linkage
2. Shift cable

007215

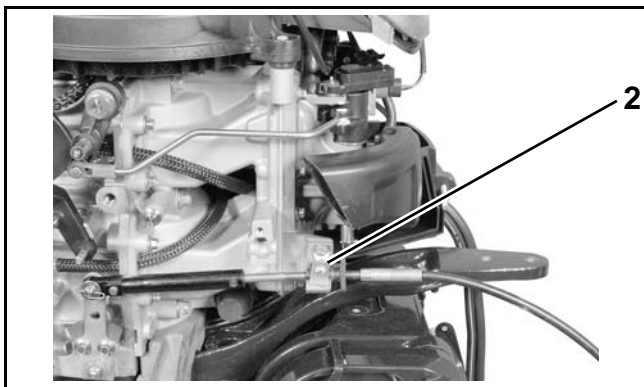
adjust the trunnion nut so the casing fits onto the throttle lever pin.



1. Throttle lever pin
2. Trunnion nut

007217

Install cable retainer and screw. Tighten screw to a torque of 60 to 84 in. lbs. (7 to 9.5 N·m).

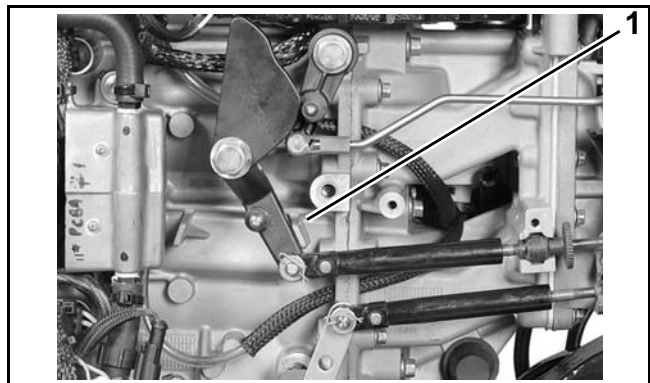


1. Cable retainer

007121

With remote control lever in NEUTRAL, pull firmly on throttle cable casing to remove slack.

With engine throttle lever against stop, place the cable trunnion into the upper anchor pocket and



1. Throttle lever stop

007216

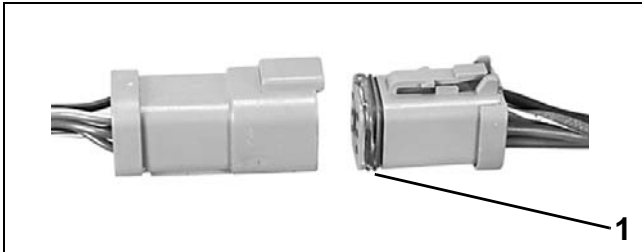
IMPORTANT: Move control handle to FORWARD and pull back slowly to NEUTRAL. Make sure the engine throttle lever is against the stop. If not, remove slack by adjusting cable trunnion.

Install cable retainer and screw. Tighten screw to a torque of 60 to 84 in. lbs. (7 to 9.5 N·m).

Install washers and retainer clips on shift lever and throttle pins. Refer to **Cable Retainer Clip Installation** on p. 51.

SystemCheck Harness Connections

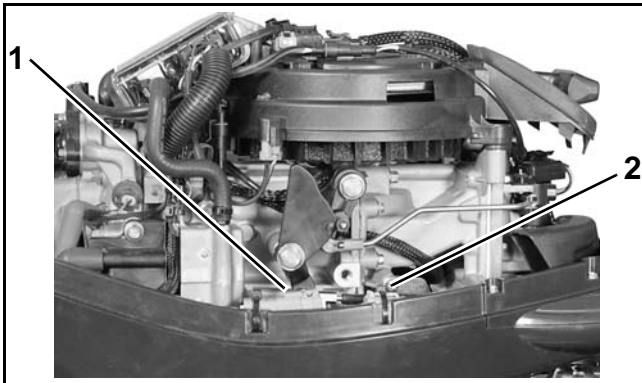
Before installing electrical connectors, check that the seal is in place. Clean off any dirt from connectors. Apply a light coat of *Electrical Grease* to the seal only. **DO NOT** fill connectors with *Electrical Grease*.



1. Seal

42079A

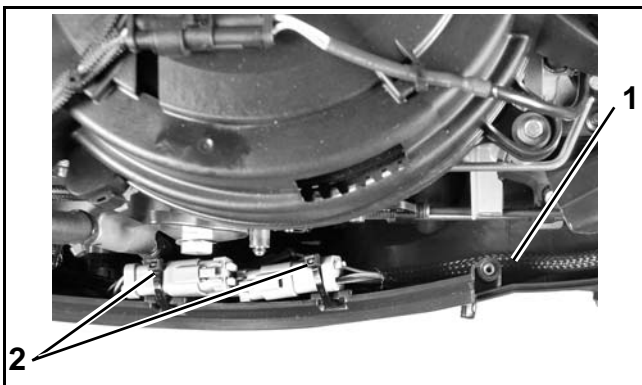
Route electrical harness along the edge of the lower engine cover.



1. Key switch connector
 2. Tachometer connector

007263

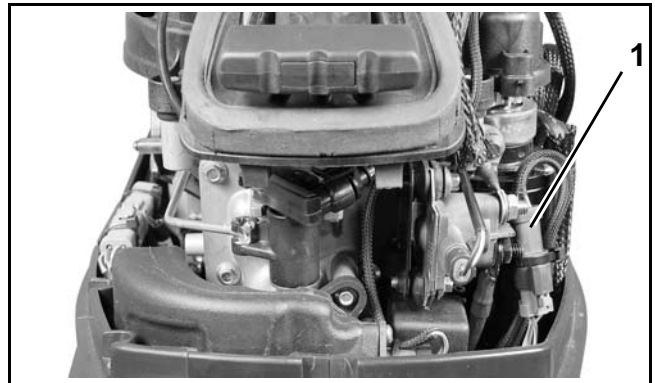
Secure connectors to lower motor cover with two tie straps as shown.



1. Wire routing
 2. Secure with two tie straps

007125

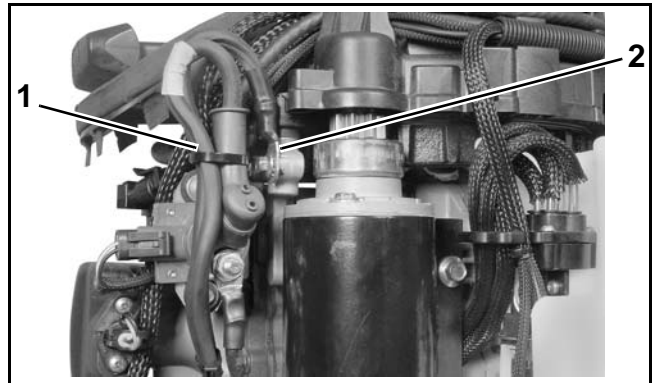
Route trim and tilt connector under air silencer. Use tie strap to secure connector as shown.



1. Trim and tilt connector

007264

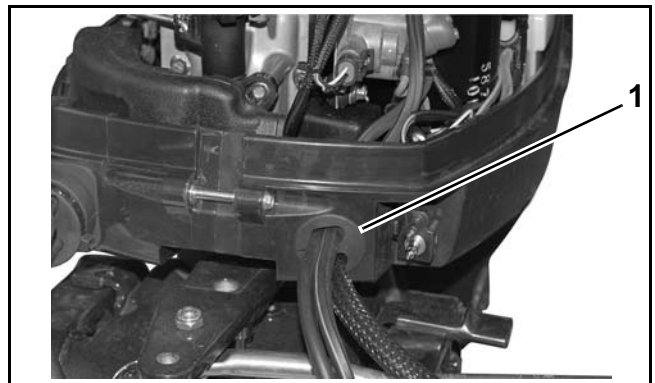
Install battery cables and secure with tie strap.



1. Tie strap

007240

Route battery cable through grommet of port lower motor cover.



1. Battery cable grommet

008009

NOTICE BE SURE all harnesses and wires are not pinched, cannot contact flywheel, and do not interfere with moving throttle or shift linkages.

**OUTBOARD RIGGING
NOTES**

NOTES**Technician's Notes**

Related Documents

Bulletins	
Instruction Sheets	
Other	

FUEL AND OIL PRIMING

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.**

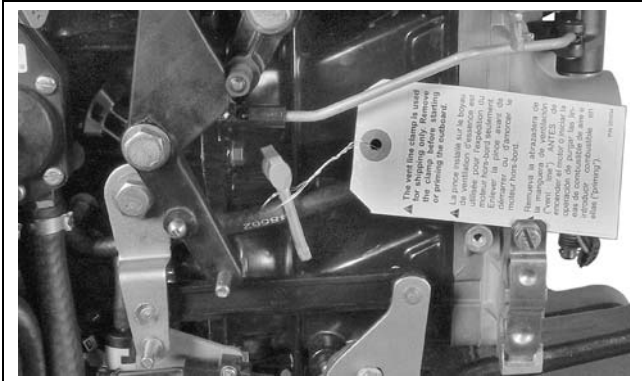
Evinrude/Johnson 2+4 Fuel Conditioner will help prevent gum and varnish deposits from forming in fuel system components and will remove moisture from the fuel system. It can be used continuously and should be used during any period when the outboard is not being operated on a regular basis. Its use will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

FUEL SYSTEM PRIMING

Vent Line Clamp

Federal Regulations require that all outboards with a fuel vapor separator must be shipped with a vent line clamp installed. This clamp must be removed before priming the fuel system or starting the outboard for the first time.



002552

IMPORTANT: Failure to remove the clamp may cause fuel starvation and poor running qualities.

Priming the Fuel System

⚠ WARNING

Fuel vapors are highly flammable. Perform the following procedure in a well ventilated area. Extinguish all smoking materials and make certain no ignition sources are present.

40 – 300 HP MODELS

Insert the fuel supply hose from the fuel tank into a suitable container. Squeeze the fuel primer bulb or activate the boat-mounted electric fuel primer until fuel flows from the fuel hose.

Once fuel flow is observed, connect fuel supply hose from fuel tank to hose fitting on outboard. Secure hose with *Oetiker* clamp.

15 – 65 HP MODELS

Connect the fuel hose connector to the quick connect fitting on the outboard.

ALL MODELS

Use the primer to fill the vapor separator.

The high-pressure fuel circuits and injectors will prime as the outboard is cranked with the starter.

Observe all fuel lines, both in the boat and on the outboard. Repair any fuel leaks.

⚠ WARNING

Failure to check for fuel leaks could allow a leak to go undetected, resulting in fire or explosion and may cause personal injury or property damage.

OIL REQUIREMENTS

Recommended Lubricants

Evinrude/Johnson XD100, XD50, or XD30 outboard oils are recommended for use in *Evinrude E-TEC* outboards. If these oils are not available, you must use a TC-W3 certified oil.

Evinrude/Johnson XD100 outboard oil is highly recommended for all conditions and applications.

Engine Lubricant Below 32°F (0°C)

If the outboard will be operated in temperatures below freezing (32°F, 0°C), use *Evinrude/Johnson XD100*.

LOW OIL Warning Test

IMPORTANT: For new outboards, test low oil warning before filling oil tank.

Turn key switch to ON. The engine monitor warning display should show “LOW OIL.”

Add enough oil to raise level to at least one-quarter capacity.

The “LOW OIL” warning should not display.

IMPORTANT: Prime the oil system on *Evinrude E-TEC 15 – 90 HP* models to turn OFF the “LOW OIL” warning. Refer to **15 – 90 HP Models** on p. 82.

NOTICE Failure to follow these recommendations could void the outboard warranty if a lubrication-related failure occurs.

Oil Injection Rate

The Engine Management Module (*EMM*) controls the oil injection rate based on engine RPM. This rate can be adjusted for the type of oil being used, and also for powerhead break-in. Use *Evinrude Diagnostics* software to access these features.

The Set Oil Type option controls the injection rate for the oil being used and typical operating conditions.

The TC-W3 oil type setting is the standard setting for all outboards. Set TC-W3 for:

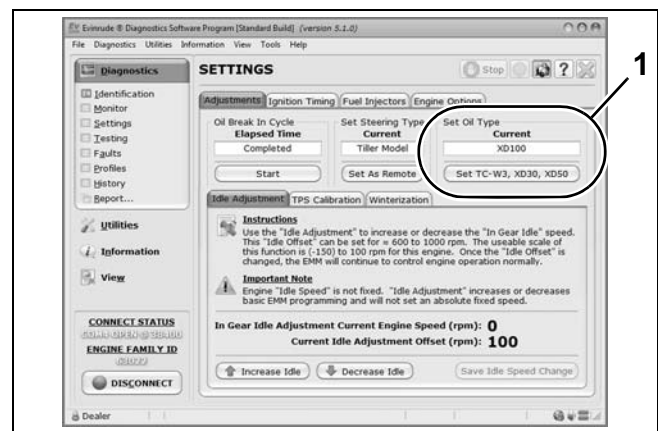
- Operation with all TC-W3 outboard oils including *XD30, XD50, or XD100*.
- Applications requiring maximum lubrication.
- Extreme applications (commercial or harsh conditions, racing or other high performance operation).
- Use this setting with *XD100* outboard oil in extreme applications

The *XD100* setting provides an option to run the outboard at a reduced oil injection rate. This setting **REQUIRES** the use of *Evinrude XD100* outboard lubricant and is not recommended for all applications.

IMPORTANT: The *XD100* setting is not available on all models.

Use the *XD100* setting for:

- Conventional use (runabouts, cruisers)
- Moderate applications



1. Oil control setting

008580

NOTICE Running an *Evinrude E-TEC* outboard on other grades of oil while set to the *XD100* oil ratio will result in increased engine wear and shortened outboard life.

FUEL AND OIL PRIMING

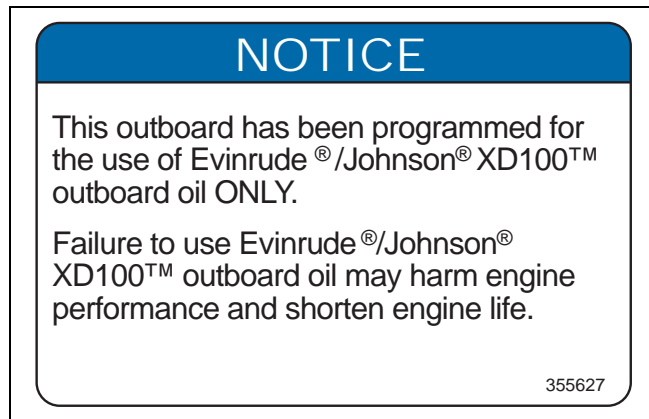
OIL REQUIREMENTS

Powerhead oil programming labels are provided to identify *EMM* oil programming. Install the correct label to alert user to specific oil requirements.



1. Evinrude/Johnson XD30 outboard lubricant (TC-W3) 004964
YELLOW label
2. Evinrude/Johnson XD100 outboard lubricant (Premium)
BLUE label (Installed)

An *XD100* Outboard Oil Decal, P/N 352369, is available to label boats equipped with outboards that have been programmed for the reduced oil injection ratio.



XD100 Outboard Oil Decal

355627

Install decals in a highly visible location, such as one of the following:

- Dashboard/deck of boat, next to key switch
- Deck of boat, next to the remote oil fill
- Deck of boat, next to oil tank assembly
- Oil tank cover
- Cover of oil tank compartment
- Attach to oil tank or oil fill cap.

IMPORTANT: Make sure the engine label and boat decals match *EMM* programming.

Break-In Oiling

IMPORTANT: DO NOT add oil in the fuel tank on *Evinrude E-TEC* models.

The Engine Management Module (*EMM*) will automatically supply extra oil to the engine as follows:

- 90° V6: First two hours above 2000 RPM
- 60° V4 & V6: First five hours above 2000 RPM
- 40 – 90 HP: First two hours above 2000 RPM
- 15 – 30 HP: First two hours above 2000 RPM

Follow these steps for outboard set-up:

- Use *Evinrude Diagnostics* software to make sure the break-in program has been started.
- The oil tank should be filled and the oil level marked for reference.

NOTICE The operator must monitor the oil tank level to confirm oil consumption. This may require several hours of operation above idle.

OIL SUPPLY PRIMING

⚠ WARNING

Always use caution while working around machinery with moving parts. The following set-up procedures require running tests that are performed with the outboard's motor cover removed.

250 – 300 HP 90° V6 (3.4 L) Models

Oil Hose Priming

Insert the oil supply hose from the oil tank into a suitable container. Squeeze the oil primer bulb until oil flows from the oil tank into the container.

Once oil supply hose from the oil tank is filled with oil, connect the hose to the oil supply fitting on outboard and secure with *Oetiker* clamp.

Oil Pump Priming

Squeeze the oil primer bulb until oil flows from the oil supply hose, through the oil filter, and into the crankcase oil pump (front oil pump).

IMPORTANT: Inspect oil filter to make sure it is filled with oil. All air must be eliminated from the oil filter during priming procedure.

Continue to squeeze the oil primer bulb until oil flows through the front oil pump, into the oil distribution hoses, and to the crankcase fittings.

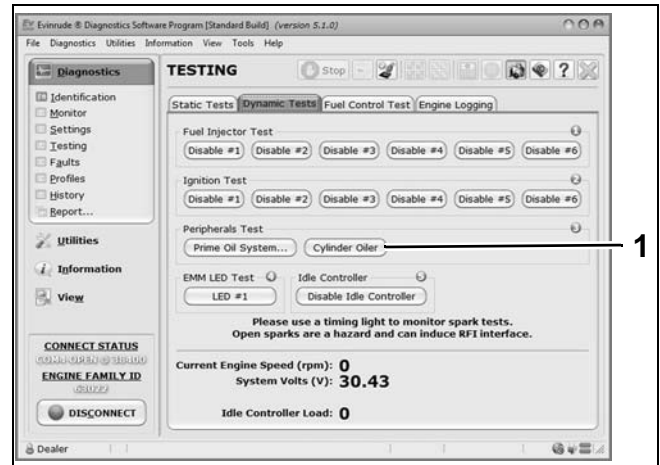
Use *Evinrude Diagnostics* software to make sure the *EMM* is programmed for the type of oil being used.

Start the outboard. Use the oil priming functions in the software to make sure the system is completely primed.

IMPORTANT: The outboard should be running during the priming procedure to avoid pumping too much oil into the crankcase, which could cause a hard-starting condition.

Prime the rear oil pump **FIRST** (cylinder oil pump).

Use the *Prime Cylinder Oiler* button of the *Dynamic Test* screen to prime the rear oil pump.



Dynamic Test Screen

1. *Prime Cylinder Oiler* button

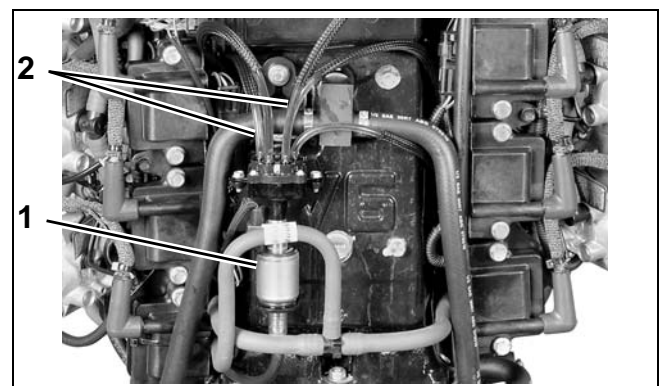
008570

4

With the *Prime Cylinder Oiler* function activated, continue to squeeze the oil primer bulb until oil flows through the oil distribution hoses of the rear oil pump.

NOTICE The software priming function must be used along with the primer bulb for two reasons:

- The primer bulb alone will not move oil through the rear pump assembly unless the pump is running.
- The pump assembly cannot prime itself until it has been filled with oil.



1. *Rear oil pump*
2. *Oil distribution hoses*

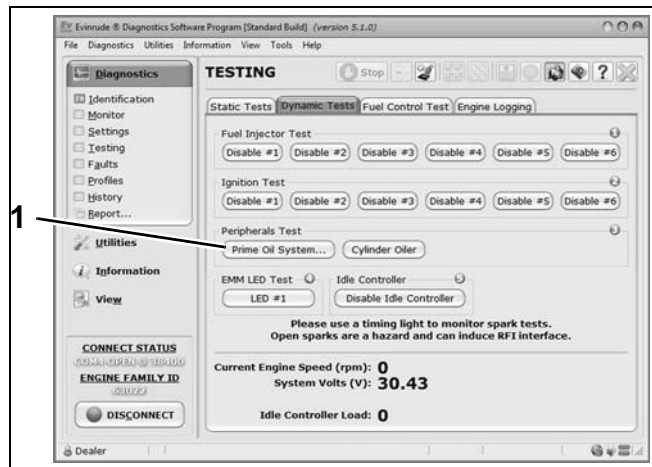
008391

FUEL AND OIL PRIMING

OIL SUPPLY PRIMING

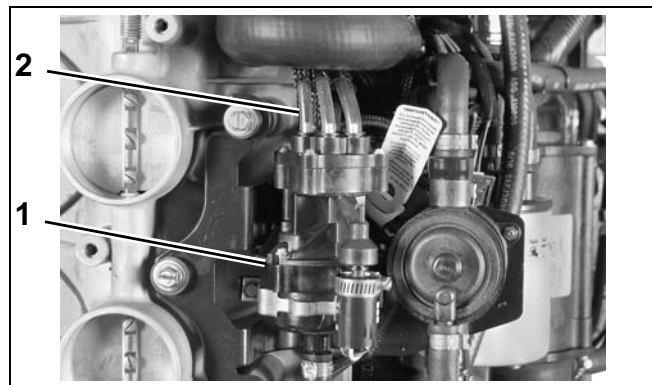
Prime the front oil pump assembly LAST.

Use the *Prime Oil System* button of the *Dynamic Test* screen to prime the front oil pump.



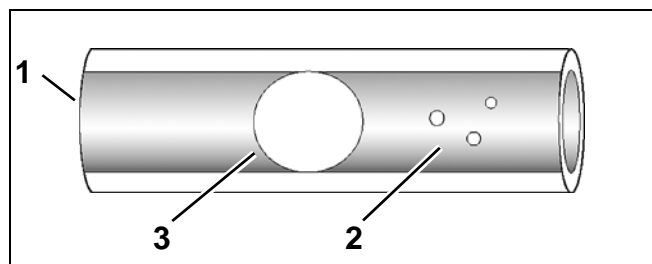
Dynamic Test Screen 008570
1. Prime Oil System button

Observe oil flow through all oil distribution hoses. Air must be purged during the priming procedure.



1. Crankcase oil pump 008392
2. Oil distribution hoses

Small bubbles are acceptable. Large bubbles must be eliminated through continued priming.



1. Oil distribution hose 004398
2. Small bubbles
3. Large bubbles

Repair any fuel or oil leaks.

115 – 200 HP 60° V4/V6 and 200 – 250 HP 90° V6 Models

Oil Hose Priming

Insert the oil supply hose from the oil tank into a suitable container. Squeeze the oil primer bulb until oil flows from the oil tank into the container.

Once oil supply hose from the oil tank is filled with oil, connect the hose to the oil supply fitting on outboard and secure with *Oetiker* clamp.

Oil Pump Priming

Squeeze the oil primer bulb until oil flows from the oil supply hose, through the oil filter, and into the oil pump assembly.

IMPORTANT: Inspect oil filter to make sure it is filled with oil. All air must be eliminated from the oil filter during priming procedure.

IMPORTANT: 60° Models – Arrow on oil filter faces incoming oil.

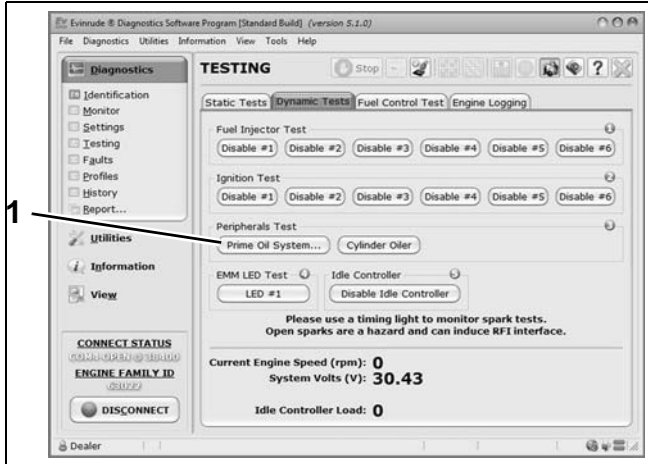
Continue to squeeze the oil primer bulb until oil flows through the oil pump, into the oil distribution hoses, and to the crankcase fittings.

Use *Evinrude Diagnostics* software to make sure the *EMM* is programmed for the type of oil being used.

Start the outboard. Use the oil priming function in the software to make sure the system is completely primed.

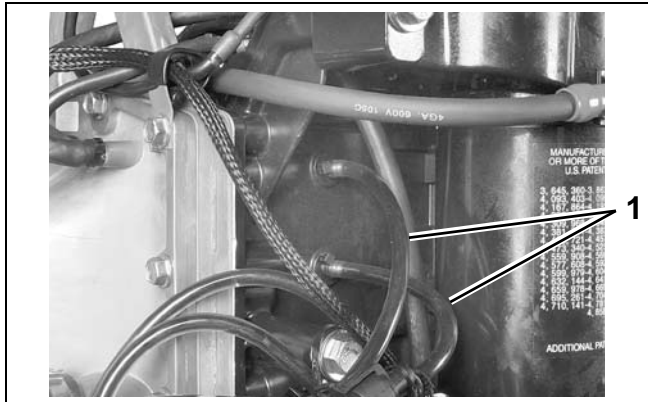
FUEL AND OIL PRIMING OIL SUPPLY PRIMING

Use the *Prime Oil System* button of the *Dynamic Test* screen to prime the oil pump.

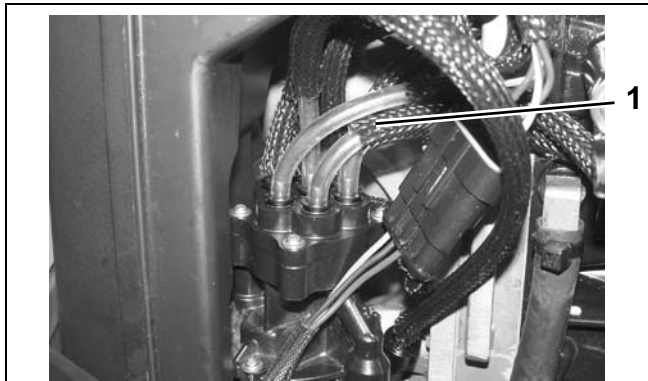


Dynamic Test Screen 008570
1. Prime Oil System button

Observe oil flow through all oil distribution hoses. Air must be purged during the priming procedure.

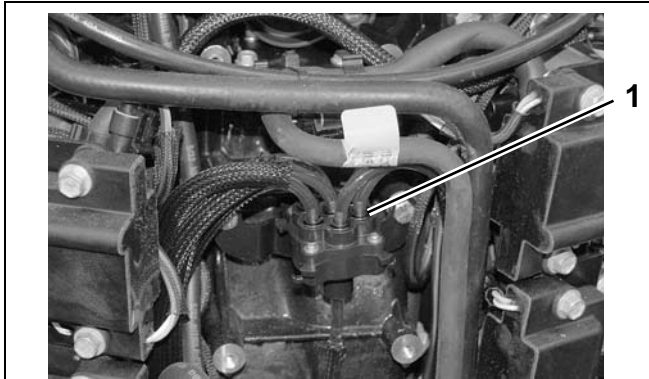


90° V6 Models 004224
1. Oil distribution hoses



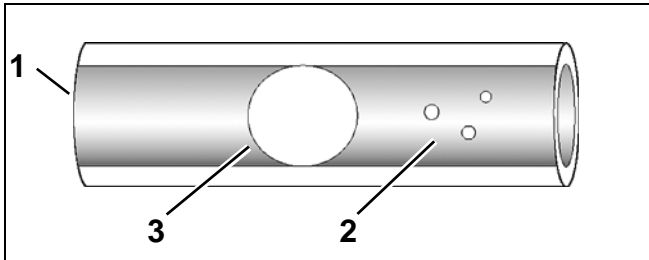
60° V4-V6 Models 004965
1. Oil distribution hoses

Make sure that oil flows through the rear oil distribution manifold to the cylinder block fittings.



1. Rear oil distribution manifold 008016

Small bubbles are acceptable. Large bubbles must be eliminated through continued priming.



1. Oil distribution hose 004398
2. Small bubbles
3. Large bubbles

Repair any fuel or oil leaks.

The oiling system on these models can also be primed using the Self-Winterizing feature if diagnostics software is not available. Refer to **Operator's Guide**.

FUEL AND OIL PRIMING

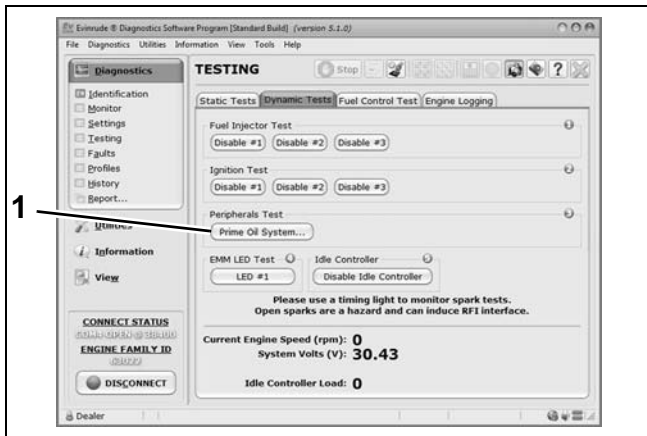
OIL SUPPLY PRIMING

15 – 90 HP Models

Use *Evinrude Diagnostics* software to make sure the *EMM* is programmed for the type of oil being used.

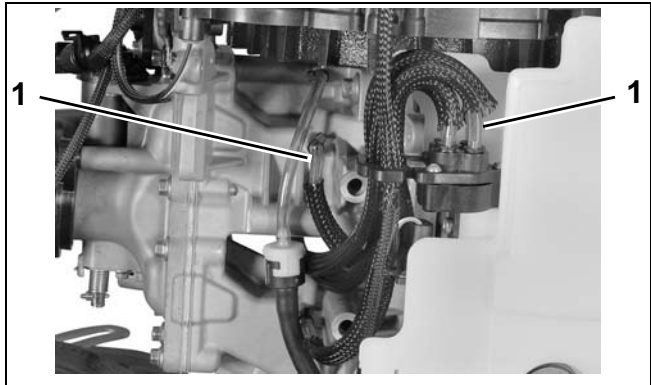
Start the outboard. Use the oil priming function in the software to make sure the system is completely primed.

Use the *Prime Oil System* button of the *Dynamic Test* screen to prime the oil pump.



Dynamic Test Screen
1. Prime Oil System button

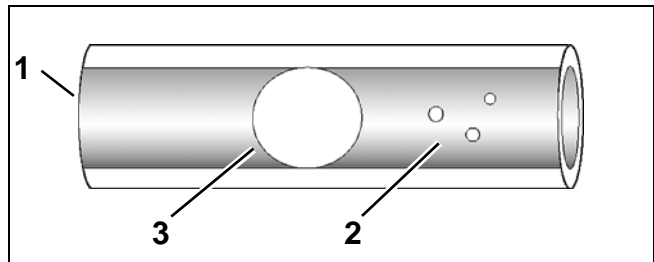
008570A



15 – 30 HP Models
1. Oil distribution hoses

007130

Small bubbles are acceptable. Large bubbles must be eliminated through continued priming.

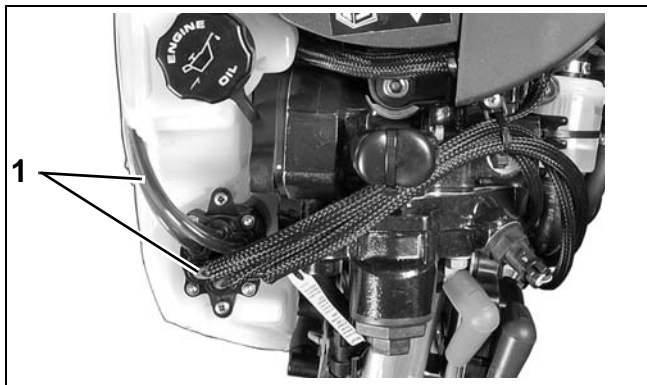


1. Oil distribution hose
2. Small bubbles
3. Large bubbles

004398

If the “LOW OIL” warning was previously tested (see **LOW OIL Warning Test** on p. 77), the warning should turn OFF during oil system priming.

Observe oil flow through all oil distribution hoses. Air must be purged during the priming procedure.



40 – 90 HP Models
1. Oil distribution hoses

007997

Repair any fuel or oil leaks.

The oiling system on these models can also be primed using the Self-Winterizing feature if diagnostics software is not available. Refer to **Operator’s Guide**.

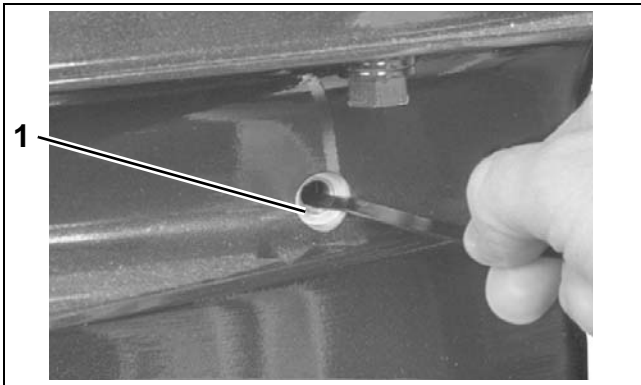
PREDELIVERY

BEFORE START-UP

Gearcase Lubricant

With outboard vertical, check the gearcase lubricant level:

- Remove the lubricant level plug. Lubricant must be even with the bottom of the threaded hole.
- A clean tie strap can be used as a “dip stick” if the lubricant level is not obvious.
- Add *HPF PRO* gearcase lubricant as needed.



1. Gearcase lubricant level

000072

Oil Level

Make sure oil tank contains an adequate supply of the correct lubricant for the outboard and that the LOW OIL warning has been tested. Refer to **Recommended Lubricants** on p. 77.

When starting the outboard for the first time, refer to **OIL SUPPLY PRIMING** on p. 79.

Trim and Tilt Fluid

⚠ CAUTION

Correct fluid level must be maintained to ensure operation of the impact protection built into the unit.

Make sure trim and tilt reservoir is full before running outboard:

- Tilt the outboard and engage the tilt support.
- Remove filler cap and check fluid level.
- **Three Ram System**—Add *Power Trim/Tilt Fluid* or *GM Dexron II*, as needed, to bring level to the bottom of the fill plug threads.



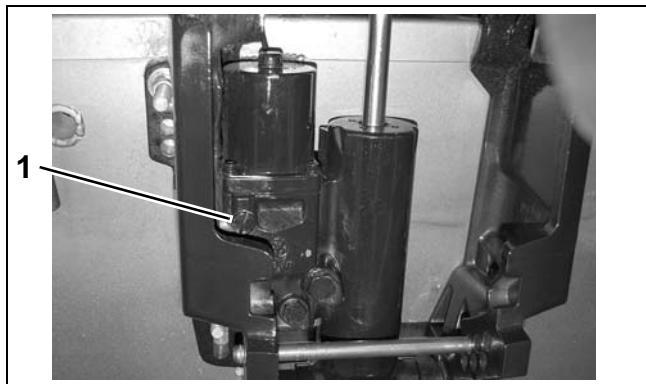
Three Ram System, 75 - 300 HP

1. Filler cap

004277

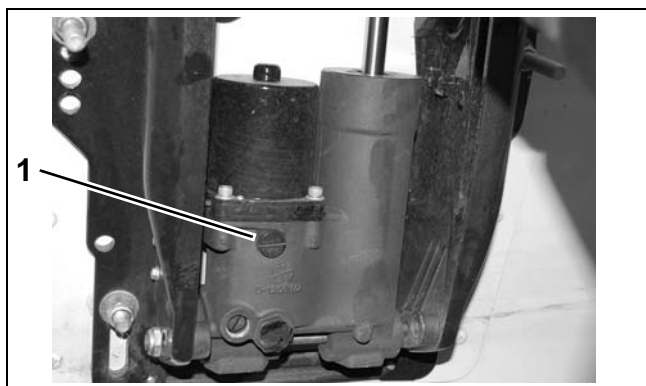
PREDELIVERY RUNNING CHECKS

- **Single Ram System**—Add *Evinrude/Johnson* Biodegradable TNT Fluid, as needed, to bring level to the bottom of the fill plug threads.



Single Ram System, 75 - 130 HP
1. Filler cap

008017



Single Ram System, 15 - 60 HP
1. Filler cap

008018

Install the filler cap and tighten to a torque of 45 to 55 in. lbs. (5 to 6 N-m).

- Disengage tilt support.
- Cycle the unit at least five complete cycles to purge all air from the system. When cycling the unit, hold the trim switch ON an additional 5 to 10 seconds after the unit reaches the end of its travel before activating the switch in the opposite direction.

RUNNING CHECKS

⚠ 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.

⚠ WARNING

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.

⚠ CAUTION

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

Engine Monitoring System

Attach emergency stop lanyard.

Turn key switch to ON. Warning horn should sound for 1/2 second.

All *SystemCheck* warning lights should turn on at the same time, then turn off one at a time.

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. Inspect all hoses and connections. Repair any leaks or misrouted hoses immediately.

Emergency Stop / Key Switch

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

Remote Control Operation

Make sure that control can be easily moved into all gear and throttle settings. Do not shift remote control when outboard is not running.

Start-In-Gear Prevention

⚠ WARNING

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.

Start outboard and shift to FORWARD.

Turn outboard OFF while control is in FORWARD.

Try to restart the outboard. Outboard should not start.

Shift back to NEUTRAL and restart outboard.

Shift to REVERSE. Turn outboard OFF while control is in REVERSE.

Try to restart the outboard. Outboard should not start.

Tachometer Pulse Setting (SystemCheck)

Confirm accuracy of tachometer reading.

- Adjust dial on back of tachometer to required setting (the outboard should not be running).

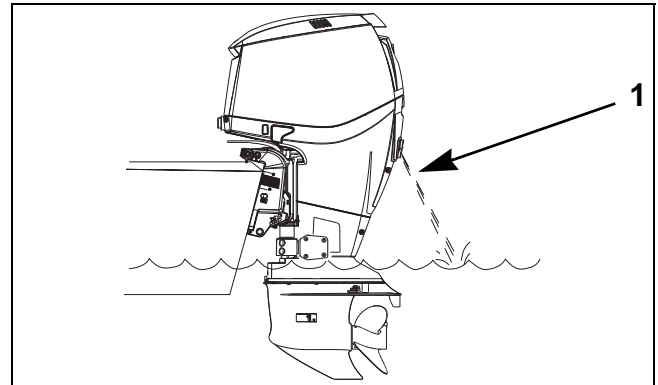
Outboard Model	Tachometer Setting
15–300 HP	6 Pulse or 12 Pole

I-Command Set up

Complete basic set up of *I-Command* gauges. Configure engine and fuel tank, set fuel tank capacity etc. Refer to *I-Command* User's Guide.

Water Pump Overboard Indicator

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



1. Water pump overboard indicator

008469B

5

Operating Temperature

An outboard run at idle speed should achieve a temperature based on the engine's thermostatic control. In general, the powerhead temperature should reach at least 104°F (40°C) after five minutes of idling. Check that the powerhead reaches idle temperature.

Idle Speed

Make sure the outboard idles within the specified idle RPM range. If the outboard is run on a flushing device, the idle speed and quality may not be representative of actual in water use.

Break-In

Evinrude E-TEC outboards require no break in. When the outboard is delivered, refer the customer to the Oiling System information in the *Operator's Guide*.

PROPELLERS

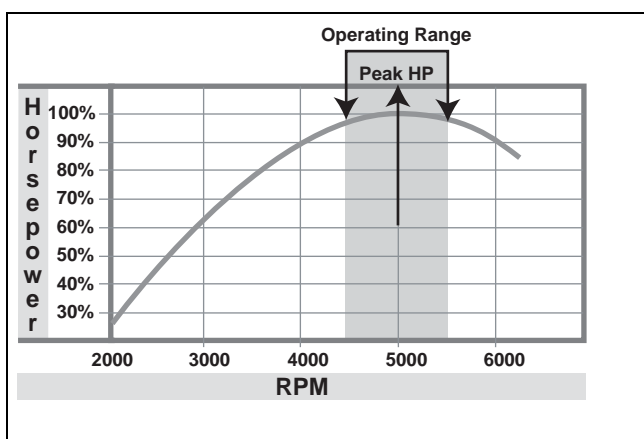
Propeller Selection

⚠ CAUTION

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

Water testing with various propeller designs and sizes is the best method of propeller selection.

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 **SERVICE SPECIFICATIONS** in the **Service Manual** for RPM range.

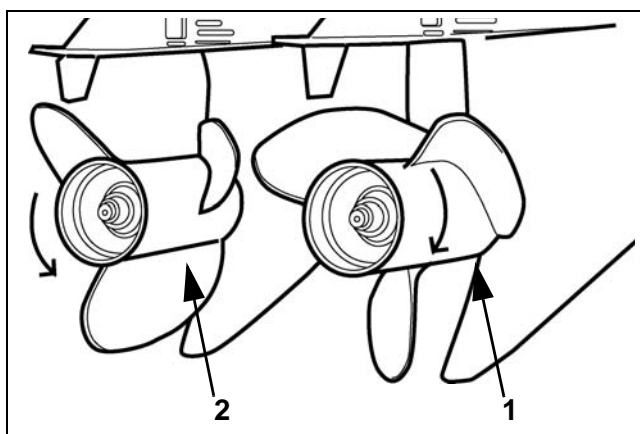


008329

NOTICE If the propeller blades have too much pitch, the engine will operate below its normal range at full throttle. Power will be lost, and powerhead damage could occur. If the propeller blades have too little pitch, the engine will operate above its normal range and damage from overspeeding could occur.

When selecting a propeller, consider the following:

- Use an accurate tachometer to determine the engine's full-throttle RPM.
- The outboard should be trimmed for top speed.
- 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.
- Occasionally, one propeller will not cover a wide range of boat applications — water skiing to high speed performance boating. In such cases, it might be necessary to have a propeller for each situation.
- Refer to the *Evinrude/Johnson Genuine Parts and Accessories Catalog* for propeller styles and sizes.
- Right-hand propellers are considered standard rotation propellers. When propelling a boat forward, the propeller rotates in a right-hand (clockwise) direction as viewed from the rear.
- Left-hand propellers are considered counter-rotation propellers. When propelling a boat forward, the propeller rotates in a left-hand (counterclockwise) direction as viewed from the rear.



000033

⚠ WARNING

For dual-outboard installations, always check to be sure propellers are installed on the correct engines before aggressively operating the boat.

Propeller Hardware Installation

⚠ WARNING

To prevent accidental starting while servicing, twist and remove all spark plug leads.

IMPORTANT: Depending on propeller style, different thrust bushings, spacers, and cotter pin keepers are used. See the *Evinrude/Johnson Genuine Parts and Accessories Catalog* for correct propeller hardware.

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

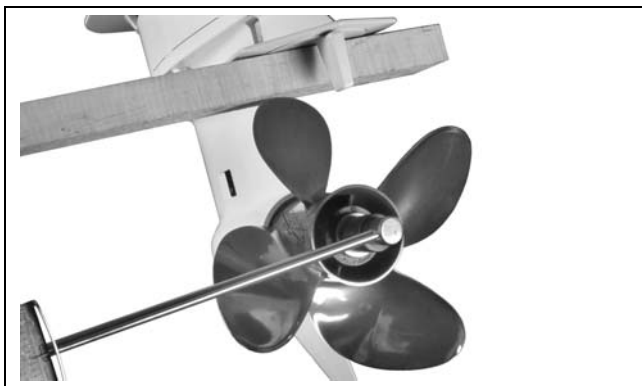
Install thrust bushing onto propeller shaft with taper of bushing matching taper of shaft.

If installing a propeller with an interchangeable hub, assemble the propeller following instructions provided with the propeller.

Align splines of propeller and shaft. Push propeller until seated on the thrust bushing.

Install the spacer over the propeller shaft splines.

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



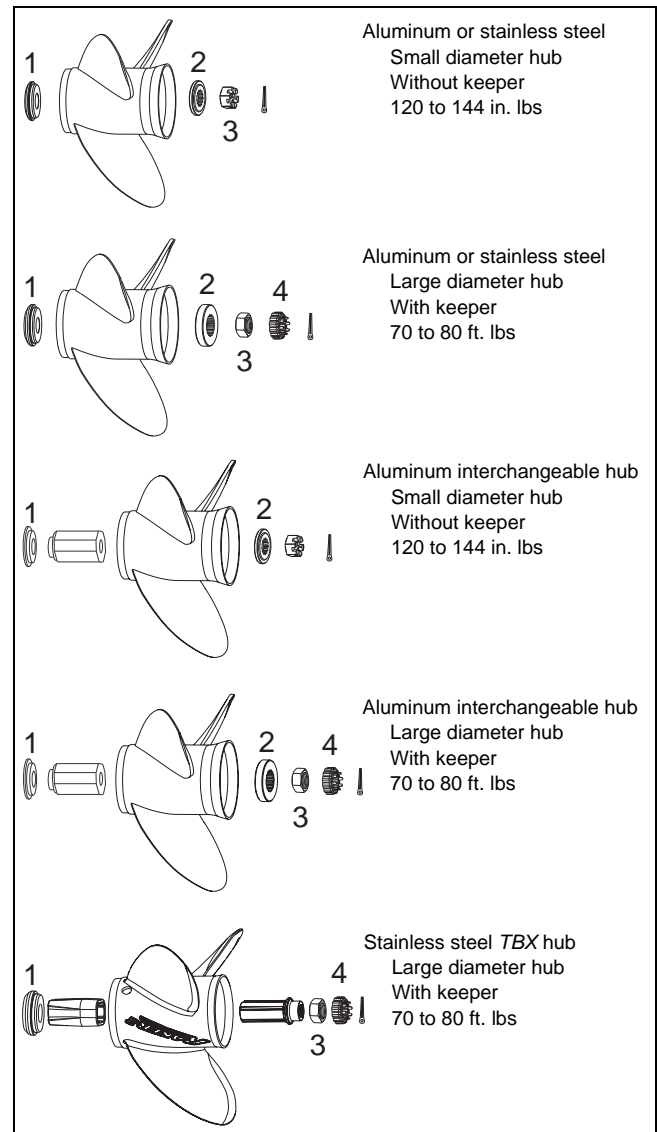
001992

Install the propeller nut and tighten to a torque of:

- With Keeper – 70 to 80 ft. lbs. (95 to 109 N·m)
- Without Keeper – 120 to 144 in. lbs. (13.6 to 16.3 N·m)

If cotter pin holes in the nut (without keeper) and shaft do not align, tighten further. Do not loosen.

Install keeper (if applicable). Install new cotter pin.



1. Thrust bushing
2. Spacer
3. Propeller nut
4. Keeper

008057

IMPORTANT: After installation, 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.

PREDELIVERY

WATER TEST AND FINAL ADJUSTMENTS

WATER TEST AND FINAL ADJUSTMENTS

An in the water test is required to make sure the outboard(s) and boat are rigged correctly, propeller selection is correct, and that all accessories function properly.

Pay special attention to the following, especially if the boat is repowered with new outboard(s):

- Engine mounting height
- Jack plate adjustment
- Correct propeller selection and WOT RPM
- Fuel system vacuum
- Engine water pressure/optional water screens

Make all needed adjustments or repairs and retest before delivery.

When ready for delivery, give all instruction sheets, operating instructions and user guides provided with accessories to the owner. Advise the owner of any special operation or maintenance information contained in the instructions.

IMPORTANT: Complete the Predelivery Checklist and obtain owner's signature at the time of delivery. The Predelivery Checklist must be kept on file for seven years.

Engine Mounting Height and Jack Plate Adjustment

Goals include:

- Engine RPM within the full throttle operating range
- Best acceleration and top speed
- No excessive ventilation while boat is coming onto plane.

Start with the engine lower on the transom. Make a test run, taking note of engine RPM, water pressure, trim level and boat speed. Refer to the **Water Pressure Chart** on p. 89.

Raise the engine or jack plate and repeat the process until the best acceleration and boat speed are achieved.

Fuel System Vacuum

Test fuel system vacuum. Refer to the appropriate service manual. The maximum inlet fuel vacuum should not exceed 4 in. Hg. (13.5 kPa) at the inlet to the fuel lift pump under any operating conditions (IDLE to WOT).

A higher vacuum indicates an excessive restriction in the fuel supply. Repair as needed.

Engine Water Pressure

Check engine water pressure. Confirm adequate water pressure at all engine speeds and in turns. Refer to the **Water Pressure Chart** on p. 89.

If water pressure falls below acceptable levels, adjust outboard alignment (multiple engine installations), or consider installing optional high flow water screens. Refer to appropriate parts catalog for available water screens.

Water Pressure Chart

This chart lists typical water pressure readings for 2012 model outboards for boat speeds up to 50 mph (80 kph/43 knots). Water pressure readings can vary depending on water screen type, hull design, set up, and operating conditions.

RPM	Idle	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
Model	Water Pressure (psi/kpa)										
40–65 HP	4-5 (27-34)	5-6 (34-41)	7-9 (48-62)	10-11 (68-75)	14-15 (96-103)	15-17 (103-117)	16-18 (110-124)	16-18 (110-124)	14-16 (96-110)	12-14 (82-96)	10-12 (68-82)
75–90 HP	5-6 (34-41)	10-11 (68-75)	12-14 (82-96)	15-17 (103-117)	16-18 (110-124)	16-18 (110-124)	13-15 (89-103)	15-17 (103-117)	16-18 (110-124)	19-21 (131-144)	20-22 (137-151)
115–130 HP 60° V4	5-6 (34-41)	9-10 (62-68)	12-14 (82-96)	15-17 (103-117)	18-20 (124-137)	20-21 (137-144)	20-22 (137-151)	21-23 (144-158)	21-23 (144-158)	21-23 (144-158)	21-23 (144-158)
150–200 HP 60° V6	4-5 (27-34)	9-11 (62-75)	14-16 (96-110)	17-19 (117-131)	19-21 (131-144)	20-22 (137-151)	20-22 (137-151)	21-23 (144-158)	22-24 (151-165)	23-25 (158-172)	24-26 (165-179)
200–250 HP 90°V6 (3.3L)¹	3-5 (27-34)	7-9 (48-62)	8-10 (55-68)	9-11 (62-75)	10-12 (68-82)	11-13 (75-89)	12-14 (82-96)	13-15 (89-103)	14-16 (96-110)	15-17 (103-117)	16-18 (110-124)
250–300 HP 90°V6 (3.4L)¹	4-6 (27-41)	7-11 (48-75)	9-12 (62-82)	10-14 (68-96)	12-15 (82-103)	14-16 (96-110)	15-18 (103-124)	16-19 (110-131)	18-20 (124-137)	18-25 (124-172)	20-30 (137-207)

Notes:

1. Water pressure readings in excess of 40 psi (275 kpa) are possible for these models at boat speeds above 50 MPH (80 KPH/43 knots).



PREDELIVERY
WATER TEST AND FINAL ADJUSTMENTS

Tilt Limit Switch Adjustment
(75 – 300 HP)

⚠ WARNING

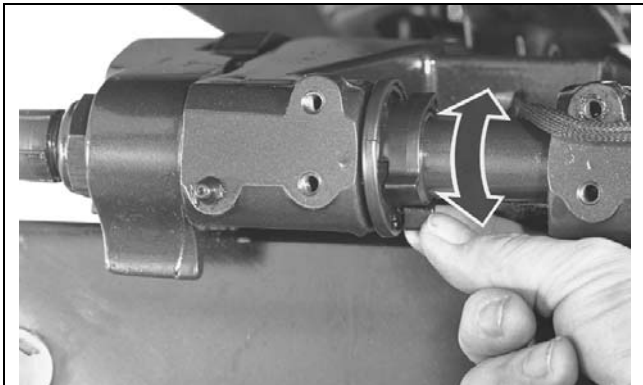
If the outboard does not clear all boat parts when tilted fully or turned side to side, safety related parts could be damaged in the course of such outboard movement. Injuries could result from loss of boat control.

Adjust the tilt limit switch on all new outboard installations.

Check the clearance between outboard(s) and the boat's motor well and transom area. Tilt outboard(s) to highest point of clearance and turn the steering system lock to lock.

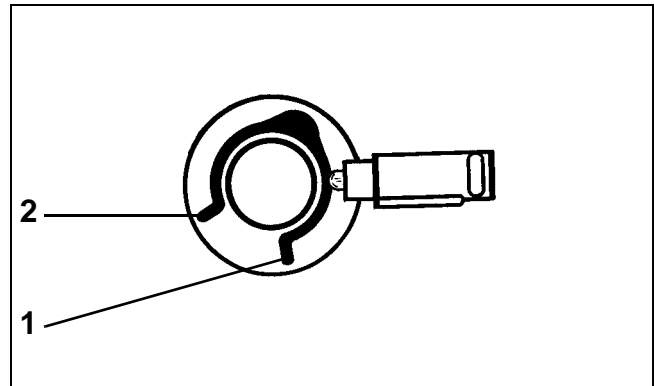
If the outboard contacts the boat's motor well when fully tilted, adjust the tilt limit cam to reduce full-tilt position.

NOTICE The tilt limit cam will not prevent the outboard from overriding the adjustment if the outboard is tilted manually.



Place the outboard in normal operating position.

Rotate the LOWER adjustment tab UP to reduce the maximum tilt. Rotate the UPPER adjustment tab DOWN to increase the maximum tilt position.



- 1. Lower adjustment tab
- 2. Upper adjustment tab

Check the adjustment by tilting the outboard fully.

Repeat this procedure until the tilt limit switch stops the outboard's upward travel before it contacts the motor well.

To prevent damage to equipment, provide additional motor well clearance when needed. Consider either changing the outboard mounting position or modifying the boat if the possibility for interference and damage exists.

⚠ WARNING

Adjusting the tilt limit cam will NOT prevent the outboard from tilting fully and contacting the motor well if the gearcase hits an object at high speed. Such contact could damage the outboard and boat and injure boat occupants.

Trim Sending Unit Adjustment (75 – 300 HP)

Tilt the outboard and engage the tilt support.

Temporarily install a thrust rod, P/N 436541, in the number 3 hole.



29072

Loosen the sending unit screws, to allow the sending unit to pivot.



1. Screws

27339

Disengage the tilt support. Lower the outboard against the thrust rod.

Observe the trim gauge. If the needle does not show center position, tilt the outboard up and adjust the sending unit by pivoting it up or down.



1. Needle at center position

000662

Lower the outboard against the thrust rod to check adjustment. Repeat adjustment, if necessary.

After adjustment is correct, tilt the outboard up, tighten the two sending unit screws, and remove the thrust rod.

Trim Limiter Rod

The trim limiter rod prevents excessive trim down.

As the engine is trimmed to the full down position, the bow of the boat goes deeper into the water.

- If the trim limiter rod is left out, the bow could plow into the water causing the boat to “bow steer” resulting in a loss of control.
- If the trim limiter rod is set too far out, the propeller could ventilate, resulting in poor acceleration when the boat is coming onto plane.

Set the trim limiter rod to prevent excessive trim down and provide good acceleration. The trim limiter rod can be used to prevent the gearcase or spray deflector from contacting the transom.

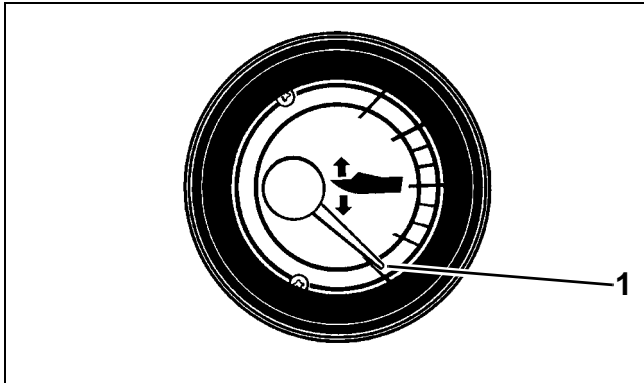
⚠ WARNING

When the outboard is returned to the customer, the trim limiter rod must be installed and in the same location as it was when the motor was brought in for service. Leaving the trim limiter rod out, or changing the adjustment, could allow the motor to unexpectedly trim in too far and cause loss of control.

PREDELIVERY
WATER TEST AND FINAL ADJUSTMENTS

**Trim Sending Unit Adjustment
(25 – 60 HP)**

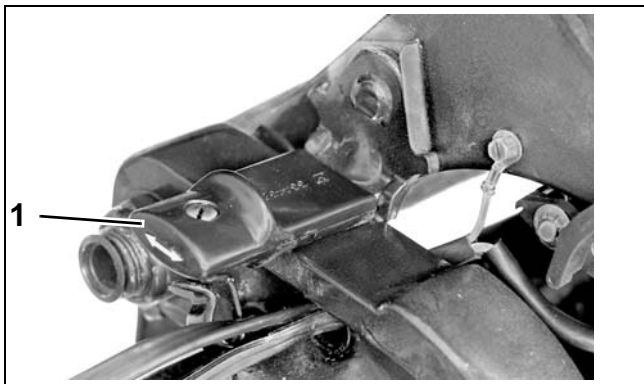
The sending unit eccentric cam must be adjusted so that the gauge needle is aligned with the lowest gauge mark with the outboard trimmed all the way DOWN.



1. Lowest gauge mark

DR2827

Check if the gauge needle is above or below the lowest gauge mark. Tilt engine UP and engage trailing lock.



1. Trailing lock

18954

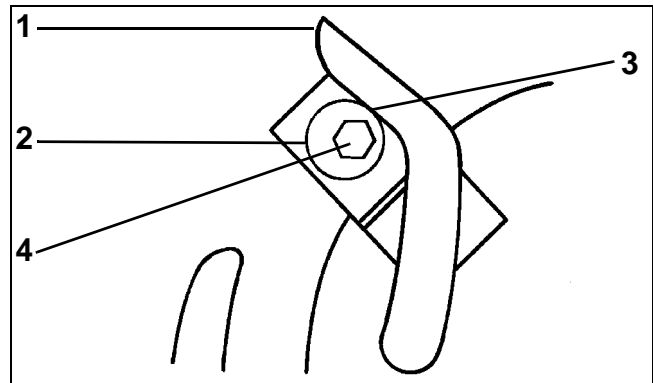
⚠ WARNING

To avoid personal injury, do not adjust the sending unit eccentric cam while the engine is being tilted.

When the outboard is trimmed all the way DOWN, the sending unit lever touches the eccentric cam just forward of the top of the cam at the contact point.

Loosen cam screw and rotate eccentric cam to adjust full down gauge position:

- If the needle was above the lowest mark, move the thick part of the cam TOWARD the contact point. Tighten the screw, and recheck the gauge reading.
- If the needle was below the lowest mark, move the thick part of the cam AWAY from the contact point. Tighten the screw, and recheck the gauge reading.



1. Lever
2. Eccentric cam
3. Contact point
4. Cam screw

DR5090

Tighten eccentric cam retaining screw and check needle position at full trim DOWN.

Trim Tab Adjustment

⚠ WARNING

Improper trim tab adjustment can cause difficult steering and loss of control.

A propeller will generate steering torque when the propeller shaft is not running parallel to the water's surface. The trim tab is adjustable to compensate for this steering torque.

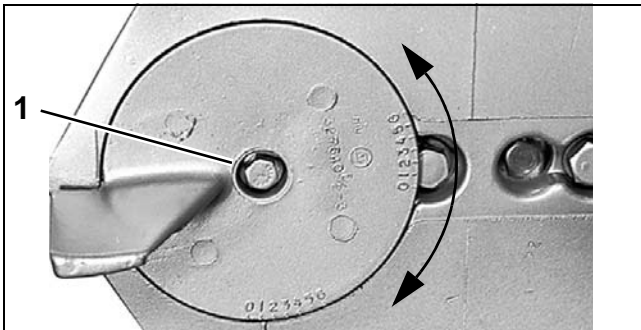
IMPORTANT: A single trim tab adjustment will relieve steering effort under only one set of speed, outboard angle and load conditions. No single adjustment can relieve steering effort under all conditions.

If the boat pulls to the left or right when its load is evenly distributed, adjust the trim tab as follows:

- With the remote control in NEUTRAL and the engine OFF, loosen the trim tab screw.
- If the boat pulled to the right, move rear of the trim tab slightly to the right.
- If the boat pulled to the left, move rear of the trim tab slightly to the left.

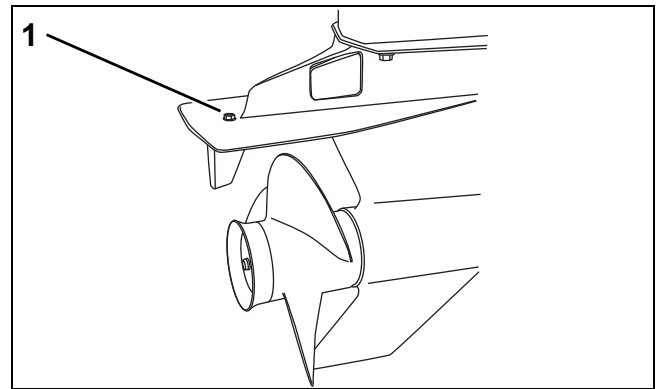
Tighten the trim tab screw as follows:

- **40 – 300 HP:** 35 to 40 ft. lbs. (47 to 54 N·m).
- **15 – 30 HP:** 60 to 80 in. lbs. (7 to 9 N·m).



40 – 300 HP Models
1. Trim tab screw

COA3663



15 – 30 HP Models
1. Trim tab screw

007044

Test the boat and, if needed, repeat the procedure until steering effort is as equal as possible.

Outboards with High Transom Heights

The trim tab may be above the surface of the water when the outboard is trimmed out. Steering effort might increase. Lower the trim setting to submerge the trim tab and to reduce steering effort.

Dual Standard Rotation Outboards

Move both trim tabs equally and in the same direction.

Dual Outboards, One Counter and One Standard Rotation

Set both trim tabs to the center position.

5

PREDELIVERY

WATER TEST AND FINAL ADJUSTMENTS

Dual-Outboard Alignment

Dual outboards must be connected with a tie bar and adjusted to align the outboards for correct water flow to the gearcases and propellers.

Incorrect outboard alignment could cause one or more of the following:

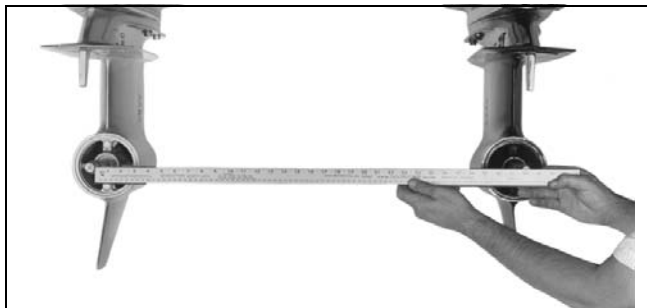
- Propeller ventilation
- Reduction of top speed
- Improper boat tracking
- Engine overheat and powerhead damage

Follow the instructions provided by the tie-bar manufacturer for tie bar installation and adjustment.

Measure Alignment

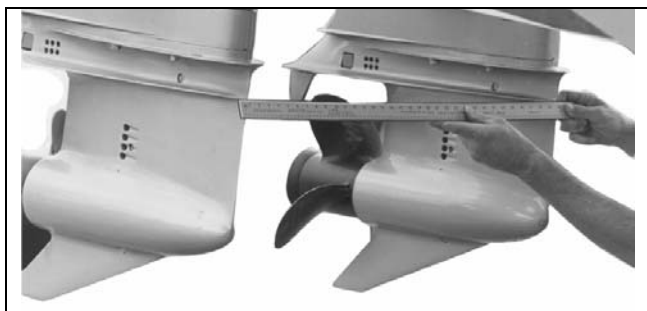
The “toe-in” (gearcase leading edges closer together than propeller shaft centers) or “toe-out” (gearcase leading edges farther apart than propeller shaft centers) is determined as follows:

- Position outboards straight with the anti-ventilation plates parallel with the bottom of the boat.
- Measure between propeller shaft centers.



6365

- Measure between leading edges of gearcase.



6340

Alignment Adjustment

Various boat/motor combinations respond differently to dual-outboard alignments. Each application must be thoroughly tested until the ideal combination of performance, steering, and cooling is found.

A common practice is to set-up the outboards parallel, or with a small amount of “toe-out,” and adjust inward until best results are achieved.

- A typical set-up, with outboards mounted directly on the transom, often runs best with a slight amount of “toe-in.”
- Outboards mounted behind the transom on motor brackets usually require parallel alignment or “toe-out.”

Adjust the outboard alignments by adjusting tie bar. Follow the tie bar manufacturer's adjustment procedures.

Check steering operation. Make sure that the steering system operates properly at various trim angles.

Confirm Alignment

To confirm proper alignment, perform the following steps:

- Water test the boat.
- Monitor the water pressure for both outboards.
- Run the boat at various trim angles.
- Perform steering maneuvers and vary the throttle settings.
- Monitor boat and outboard performance.

A sudden loss of water pressure or excessive propeller ventilation on one or both outboards may indicate a misalignment of the gearcases. Reset the outboard alignment and retest.

INDEX

A

Abbreviations 6

Accessories

- Accessory Charge Kit, P/N 5006253 17
- Fuel Filter Assembly, P/N 174176 21
- I-Command* Water Pressure Transducer Kit, P/N 765353 57, 64
- XD100* Outboard Oil Decal, P/N 352369 78

Adjustments

- Control Cable 53, 59, 65, 71
- Dual Outboard Alignment 94
- Tilt Limit Switch 90
- Trim Sending Unit 91, 92
- Trim Tab 93

B

Batteries

- Battery Charge Isolator 17
- Battery Switches 16
- Cable Routing 27
- Cables 16
- Installation 15
- Multiple Batteries 16
- Requirements 15

Break-In

- EMM* Programming 78
- Oiling 78

C

Cable, Hose, and Wire Routing 52, 58, 65, 71

Control Cable

- Adjustments 53, 59, 65, 71
- Installation 53, 59, 65, 71
- Routing 10

Cooling System

- Operating Temperatures 85
- Turbulence 31

D

Diagnostic Software

- Break-In Programming 78
- I-Command* settings 56, 63, 70
- Oil Priming 79, 80
- Oiling Rate 79, 80

Dual-Outboard

- Alignment 94
- Centerlines 33
- I-Command* settings 56, 63, 70

E

Electrical Harness

- Connections 54, 55, 56, 60, 61, 63, 67, 68, 73

Emergency Stop Switch

- Installation 8

Emissions Information 7

Engine Monitor

- Operation Check 84
- Requirement 11

F

Fuel Filter

- Requirements 21

Fuel System

- Filter 21
- Fuel Requirements 75
- Minimum Octane 75
- Priming 76
- Requirements 20

G

Gauges

- see Information Display Systems 11

Grommet 52, 58, 65, 71

H

Hoses

- Fuel System 20, 27
- Grommet 65
- Oiling System 27

INDEX

I

I-Command

- System settings 56, 63, 70
- Water Pressure Gauge 57, 64, 70

I-Command Network

- Outboard connections 55, 61, 68

ICON Network

- Outboard connections 56, 63

Information Display Systems

- Engine Monitor 11
- I-Command* Displays 11
- SystemCheck* Gauges 11
- Tachometer Setting 85

J

Jack Plates 32

L

Lubrication

- Engine Oil 77

M

Mounting the Engine

- Hull Preparation 31
- Mounting Height 48

O

Oetiker Clamp Servicing 28

Oil Tank 23

Oiling Rate 77

Oiling System

- Engine Lubricant 77
- New Engine Set-Up 23, 77
- Oil Tank 23
- Priming 79

P

Priming

- Fuel System 76
- Oiling System 79

Propeller

- Installation 87
- Selection 86

R

Remote Controls

- Cable Adjustment 53, 59, 65, 71
- Cable routing 10
- Installation 9
- Selection 8

S

Start-In-Gear Protection 85

Steering System

- Steering Torque 93

SystemCheck

- Outboard connections 54, 60, 67, 73

T

Tachometer

- Pulse Setting 85

Temperature

- Operating 85
- Operation below freezing 77

Tilt Limit Switch

- Adjustment 90

Tools

- Lifting Tool, P/N 354717 45
- Oetiker* Pincers, P/N 787145 29
- Transom Drill Fixture, P/N 434367 34

Trim Sender

- Adjustment 91, 92

W

Water Pressure Gauge 57, 64, 70

Wiring Harness Connections 55, 61

SAMPLE PREDELIVERY CHECKLIST

PREDELIVERY CHECKLIST



OB	MODEL NUMBER	SERIAL NUMBER	KEY NUMBER
1			
2			
3			
4			
5			



IMPORTANT: Use this Checklist together with the *Evinrude E-TEC* Installation and Predelivery Guide. Every *Evinrude/Johnson* Dealer is responsible to perform a complete predelivery inspection on all *Evinrude E-TEC* outboards. If an *Evinrude E-TEC* outboard was pre-rigged by the boat builder, a complete predelivery inspection is still required. Refer to the current *Evinrude E-TEC* Installation and Predelivery Guide for detailed instructions. Dealer predelivery programs should include additional inspections related to boat accessories and trailers.

<p>At Time of Sale</p> <input type="checkbox"/> Explain to owner all on-product Safety Labels/Tags and the importance of reading the Operator's Guide before operating engine(s) <input type="checkbox"/> Install engine Safety Labels/Tags (language chosen by customer according to availability) <input type="checkbox"/> Explain the BRP Limited Warranty <input type="checkbox"/> Explain selection of outboard lubricant <p>Owner's outboard oil selection: <input type="checkbox"/> XD100 <input type="checkbox"/> XD50 <input type="checkbox"/> XD30 <input type="checkbox"/> Other New boat package <input type="checkbox"/> Repower <input type="checkbox"/> 15" <input type="checkbox"/> 20" <input type="checkbox"/> 25" <input type="checkbox"/> 30" transom height</p> <p>Remote Control (with start-in-gear protection) <input type="checkbox"/> EV JO BRP <input type="checkbox"/> Other (list brand) _____ <input type="checkbox"/> Mechanical <input type="checkbox"/> Electronic (EST) <input type="checkbox"/> Single lever binnacle <input type="checkbox"/> Dual lever binnacle <input type="checkbox"/> Concealed side mount <input type="checkbox"/> Surface side mnt <input type="checkbox"/> EV JO BRP shift and throttle cables <input type="checkbox"/> Other (list brand) _____ <input type="checkbox"/> Key switch with tether cord <input type="checkbox"/> MWS harnesses</p> <p>Tiller Control <input type="checkbox"/> Tiller Handle Kit (15–115HP only) optional</p> <p>BRP Electronic Controls <input type="checkbox"/> Gateway module and buss cables <input type="checkbox"/> 6 port hubs and protective covers (2) <input type="checkbox"/> Master Power/Key Switch <input type="checkbox"/> Engine Cut-off Switch Panel 2nd station <input type="checkbox"/> Accessory Power Relay Kit <input type="checkbox"/> ESM engine identity plugs (multi-engine)</p> <p>Displays, Gauges and Networks <input type="checkbox"/> I-Command digital display(s) <input type="checkbox"/> Network buss cables and T-connectors <input type="checkbox"/> Engine Interface Cable (EMM to NMEA) <input type="checkbox"/> Power Supply Kit (NMEA network) <input type="checkbox"/> Network and terminators (2) (NMEA network) <input type="checkbox"/> Tachometer pulse setting</p> <p>Batteries, Wiring, and Switches Batteries: Qty. _____ CCA Rating _____ <input type="checkbox"/> Cable size: _____ ga. Length: _____ ft. / m <input type="checkbox"/> Connections tight – NO wing nuts! <input type="checkbox"/> Battery switch operation optional <input type="checkbox"/> Auxiliary Battery Charging optional</p>	<p>Fuel System <input type="checkbox"/> Primer bulb EV JO BRP <input type="checkbox"/> 5/16 <input type="checkbox"/> 3/8 <input type="checkbox"/> Other (list brand) _____ <input type="checkbox"/> Fuel hose - "SAE J30R9 type" <input type="checkbox"/> 5/16 <input type="checkbox"/> 3/8 <input type="checkbox"/> Fuel hoses installed with <i>Oetiker</i> clamps <input type="checkbox"/> Water separating fuel filter kit recommended</p> <p>Oil System <input type="checkbox"/> Correct installation of remote oil tank <input type="checkbox"/> Oil Hose - 25 ft. [7.6 m] maximum, no splices <input type="checkbox"/> Remote oil fill kit (vent not restricted) optional</p> <p>Steering System <input type="checkbox"/> Mechanical - grease/tighten/adjust system <input type="checkbox"/> Hydraulic - fill/bleed/check system <input type="checkbox"/> Set multi-engine alignment (toe-in/toe-out)</p> <p>Outboard Installation <input type="checkbox"/> Mounting height - correct? <input type="checkbox"/> Mounting hardware - torqued? <input type="checkbox"/> Water pressure device - installed / set up? <input type="checkbox"/> <i>ICON</i> Conversion Kit (V6 optional add-on kit)</p> <p>Oil and Fuel Set Up, Check Fluid Levels <input type="checkbox"/> Check LOW OIL warning BEFORE filling oil tank <input type="checkbox"/> Fill oil tank(s) with outboard lubricant <input type="checkbox"/> Check fuel level <input type="checkbox"/> Remove blue clamp on vapor separator vent <input type="checkbox"/> Prime fuel system <input type="checkbox"/> Prime oil system - purge air from system <input type="checkbox"/> Check no fuel or oil hoses are kinked <input type="checkbox"/> Check gearcase lubricant level <input type="checkbox"/> Check power trim and tilt fluid level</p> <p>Evinrude Diagnostics Software Set Up <input type="checkbox"/> Oil "Break-In" set <input type="checkbox"/> Set "Tiller Mode" Tiller handle kit installation only <input type="checkbox"/> Set Oil Type: <input type="checkbox"/> XD100 <input type="checkbox"/> TC-W3 install tag ICON Set Up (Use <i>Evinrude Diagnostics</i> software) <input type="checkbox"/> Update engine software conversion kit only <input type="checkbox"/> Calibrate shift/throttle actuators conversion kit <input type="checkbox"/> Set station protect optional</p> <p>I-Command Set Up <input type="checkbox"/> Calibrate trim / tilt sending unit (Use <i>Ev Diag</i>) <input type="checkbox"/> Set multi-engine identity (Use <i>Ev Diag</i>) <input type="checkbox"/> Set "Engine and Fuel Tank Configuration" and "Fuel Tank Capacity" (See User's Guide) <input type="checkbox"/> Set "Engine Data" (See User's Guide)</p>	<p>Operational Checks <input type="checkbox"/> Adjust shift and throttle cables <input type="checkbox"/> Check remote control operation <input type="checkbox"/> Check start-in-gear prevention <input type="checkbox"/> Check key switch and engine cut-off switch <input type="checkbox"/> Check display/gauge operation <input type="checkbox"/> Check operation of trim and tilt switches <input type="checkbox"/> Check tilt limit switch adjustment <input type="checkbox"/> Check trim sending unit adjustment <input type="checkbox"/> Water pressure / overboard indicator <input type="checkbox"/> Check reverse lock/tilt lock operation <input type="checkbox"/> Check shallow water drive operation <input type="checkbox"/> Trailering bracket check ground clearance <input type="checkbox"/> No Fuel, Oil or Water leaks Engine temperature IDLE _____ °F or □°C</p> <p>ICON System Checks <input type="checkbox"/> Start/Stop Switch(es) <input type="checkbox"/> Engine Cut-off Switch (2nd station only) <input type="checkbox"/> Neutral Throttle Switch <input type="checkbox"/> RPM Switch <input type="checkbox"/> Trim Switch Panel (3, 4 or 5 engines only)</p> <p>Propeller(s) <input type="checkbox"/> EV JO BRP <input type="checkbox"/> Other (list brand) _____ <input type="checkbox"/> Stainless Steel <input type="checkbox"/> Aluminum Diameter _____ Pitch _____ Torque _____ □ in.lbs. □ ft.lbs. □ N·m <input type="checkbox"/> Cotter pin keeper and/or cotter pin installed</p> <p>On the Water Operational Checks Engine RPM at IDLE (in gear) _____ Engine RPM at WOT _____ Engine temperature WOT _____ □°F or □°C Boat fuel system vacuum _____ In. Hg. Water pressure at IDLE _____ psi / kPa Water pressure at WOT _____ psi / kPa Adjust multi-engine alignment (toe-in/toe-out) as needed for optimum water pressure</p> <p>At time of delivery dealer: <input type="checkbox"/> Complete electronic warranty registration <input type="checkbox"/> Must retain this document with outboard file <input type="checkbox"/> Give owner a completed copy of this form</p>
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The dealer named in this document has instructed me on the operation, maintenance, safety features, and warranty policy for my outboard, all of which I understand. I am satisfied with the predelivery set-up and inspection of my outboard. I acknowledge that I have reviewed the on product safety labels and tags. I understand the importance of reading the operator's guide that I have received completely and thoroughly before operating the engine(s).

Inspected by: _____

Dealer name: _____

Dealer number: _____

Where not already required by law: I recognize the importance of following safe boating practices.

- I have taken a safe boating course before using the outboard.
- I will take a safe boating course before using the outboard.
- I will not take a safe boating course before using the outboard.

Date _____ Dealer Signature _____ Date _____ Owner / Customer _____

