
EVINRUDE
Johnson
GENUINE PARTS
BRP
EVINRUDE
E-TEC
UP
MENU
DOWN
I-COMMAND
EVINRUDE
E-TEC
BRP
UP
DOWN
MENU
PAGES
ENTER
EXIT
EVINRUDE
300
I-COMMAND
Digital Network Guide

SAFETY INFORMATION

This booklet is written for qualified, factory-trained technicians who are already familiar with the use of *Evinrude®/Johnson®* Special Tools. This booklet is not a substitute for work experience. It is an organized guide for installation of the *I-Command* system.

This booklet uses the following signal words identifying important safety messages.

DANGER

Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, CAN result in severe injury or death.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate personal injury or property damage. It also may be used to alert against unsafe practices.

IMPORTANT: Identifies information that will help prevent damage to machinery and appears next to information that controls correct assembly and operation of the product.

These safety alert signal words mean:
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

Always follow common shop safety practices. If you have not had training related to common shop safety practices, you should do so to protect yourself, as well as the people around you.

It is understood that this booklet may be translated into other languages. In the event of any discrepancy, the English version shall prevail.

DO NOT perform any installation until you have read the instructions and checked the pictures relating to the installation procedures.

Be careful, and never rush or guess a service procedure. Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, unfamiliarity with the product, and drugs and alcohol use, to name a few. Damage to a boat and outboard can be fixed in a short period of time, but injury or death has a lasting effect.

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

Torque wrench tightening specifications must be strictly followed. Replace any locking fastener (locknut or patch screw) if its locking feature becomes weak. Definite resistance to turning must be felt when reusing a locking fastener. If replacement is specified or required because the locking fastener has become weak, use only authorized *Evinrude/Johnson Genuine Parts.*

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

Before working on any part of the outboard, read the following SAFETY information.

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.

TABLE OF CONTENTS

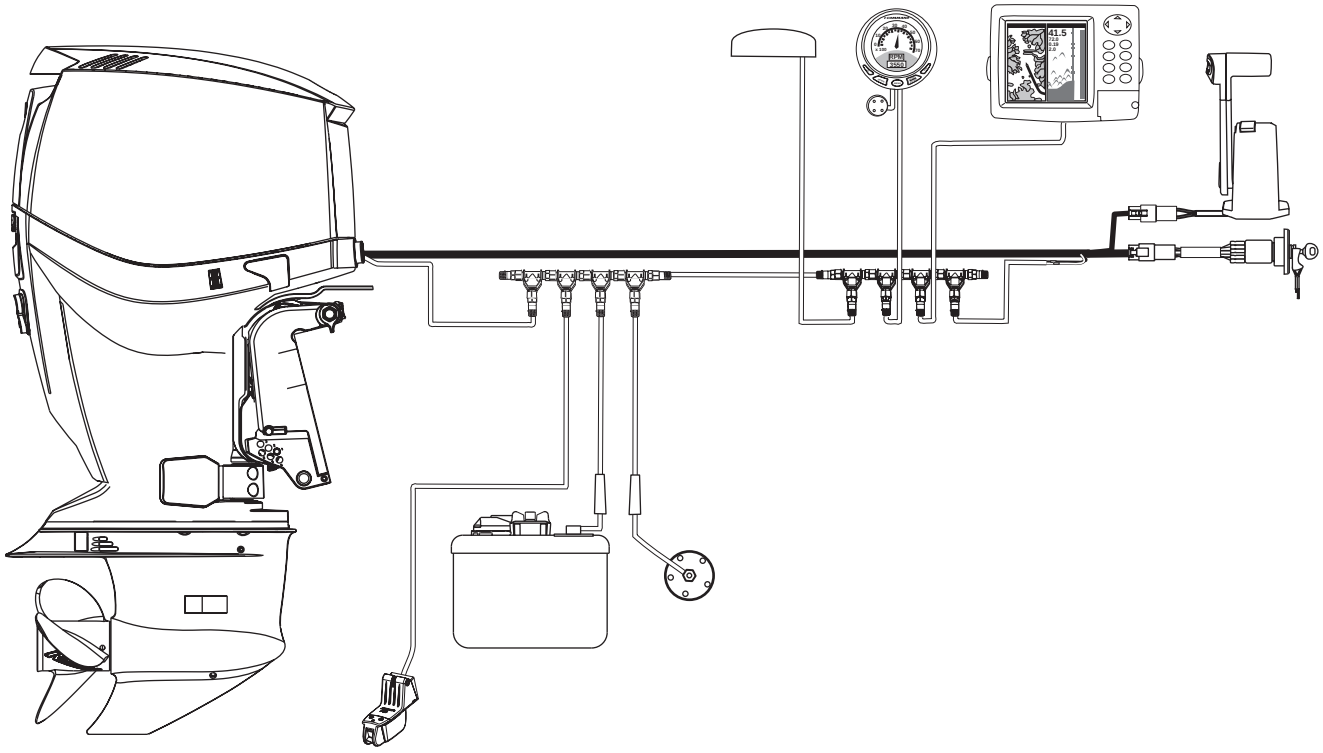
I-COMMAND SYSTEM

I-COMMAND INSTALLATION

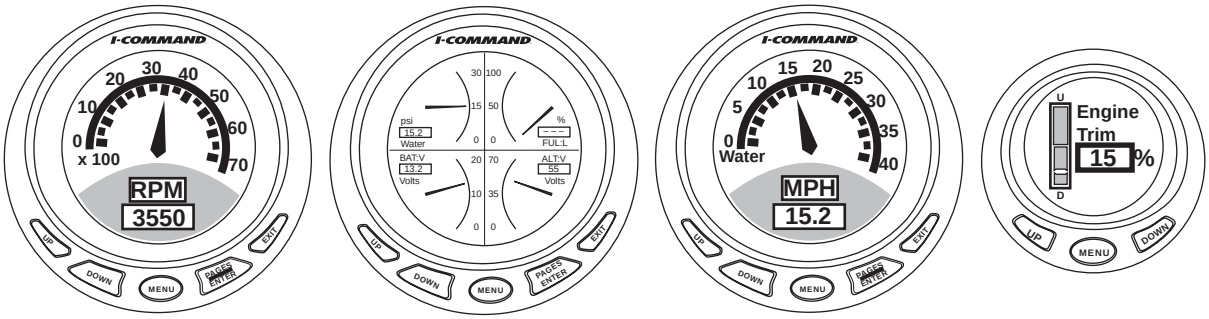
I-COMMAND SYSTEM

DESCRIPTION

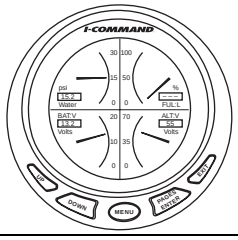
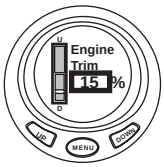
The *I-Command*™ Digital Integrated Performance System uses “plug and play” networking technology based on NMEA 2000† data communications standards (National Marine Electronics Association). These standards provide communications through a serial data network utilizing a Controller Area Network (CAN) integrated circuit (IC). This network operates at 250 kb/second and allows multiple electronic devices to be connected together on a common channel for easy information sharing. Multiple digital displays can be used to monitor and broadcast equipment and engine data.



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 “DIGITAL” SERIES FEATURES

I-Command **“Digital” Series Multifunction 3 ½ in. and 2 in. Displays**	**3 ½ in. Display** 	**2 in. Display** 
Functions & Screen Displays		
System Setup	✓	✓
Adjustable Display Contrast and Audio	✓	✓
Engine Warning Displays	✓	✓
Single, Dual or Quad Page Display	✓	Single or Dual Page Display
Displays in English or Metric Units	✓	✓
Multi Engine RPM on Single Page Display (two or three engines)	✓	✓
Tachometer	✓	✓
Speedometer(1)or(2)	✓	✓
GPS Position Longitude and Latitude(1)	✓	✓
GPS Time(1)	✓	✓
Engine Hour Meter	✓	✓
Engine Trim Position(3)	✓	✓
Engine Temperature	✓	✓
Water Pressure(4)	✓	✓
Alternator voltage (*Evinrude E-TEC* - 55 volt system)	✓	✓
Battery voltage	✓	✓
Engine Load – percent of throttle	✓	✓
Temperature(5) Sensor (water / air / fluid – limit three)	✓	✓
Barometric Pressure	✓	✓
Fuel Tank Level(6)or(9)or(10) (three tank/engine limit)	✓	✓
Oil Tank Level(7) (three tank limit)	✓	✓
Depth(8)	✓	✓
Fuel Flow Rate(9) (three engine limit)	✓	✓
Fuel Consumption(9)and(10)	✓	✓
Fuel Economy and Range(1)and(10) (three engine limit)	✓	✓
Fuel Remaining and Fuel Used(6)and, or(10)	✓	✓
Low Fuel Warning – programmable	✓	✓
Trip Fuel and Seasonal Fuel(10)	✓	✓

(1) Requires NMEA 2000 GPS receiver/antenna connected to network. Provides speed over ground (SOG).
(2) Requires water speed input device - provides speed over water (SOW).
(3) Available on V4/V6 *Evinrude E-TEC* outboards. (Not available on 25 HP through 90 HP Evinrude E-TEC.)
(4) Requires accessory water pressure transducer kit.
(5) Requires NMEA 2000 depth transducer/triducer with temperature output or temperature sensor kit(s).
(6) Requires accessory fuel tank level converter for each tank. See “Select Fuel Remaining Source” on page 33.
(7) Requires accessory oil tank sending unit kit for each oil tank.
(8) Requires NMEA 2000 depth transducer.
(9) Requires *EMM* interface.
(10) Requires memory module. See “Select Fuel Remaining Source” on page 33.

I-Command “Digital” Displays

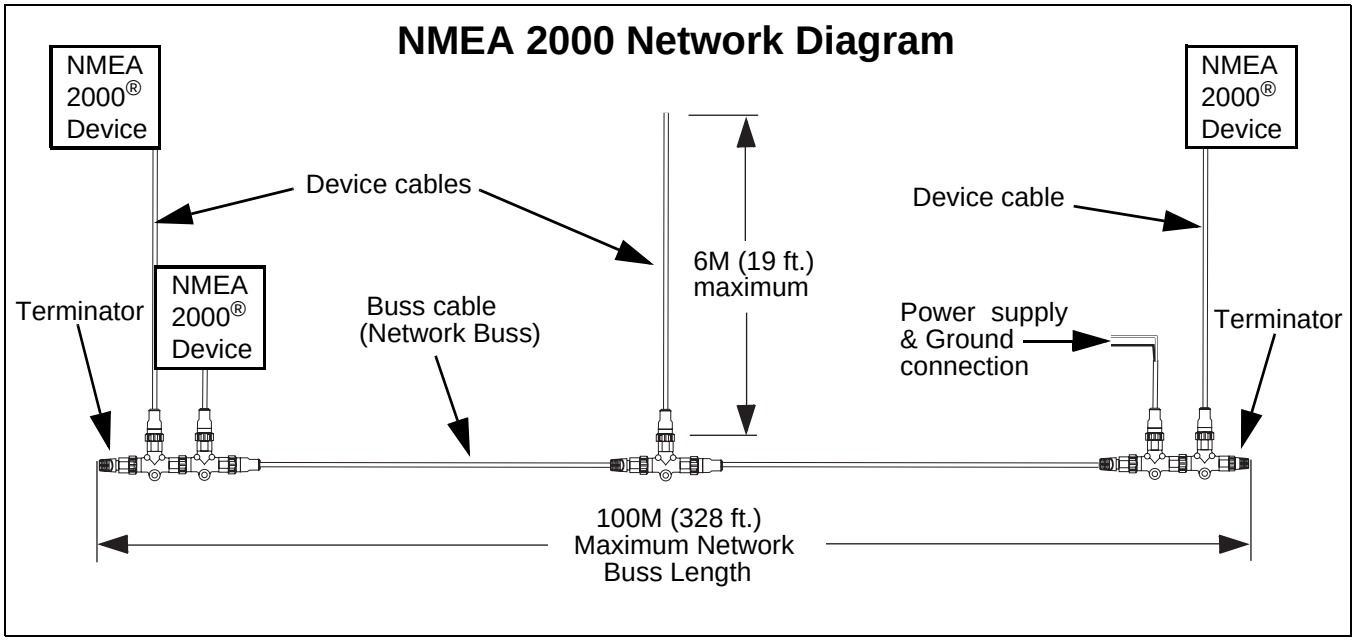
Digital Display (black bezel)	3 ½ in.	2 in.
	764175(1)	764177(1)
	764176(1)(2)	764178(1)(2)

(1) Includes T-connector, PN 764151
(2) Includes adaptor, PN 764187

Accessory Bezels	3 ½ in.	2 in.
Gold	764011	764610
White	764013	764012
Chrome	764640	764641
Black	764595	764594

Trim Rings	3 ½ in.	2 in.
Blue	764257	764256
Red	764259	764258
Black	764261	764260
White	764263	764262
Gold	764265	764264
Chrome	764267	764266
Platinum	764269	764268

NETWORK SPECIFICATIONS



Cable Requirements

NMEA 2000 specifies wire requirements as follows:

NMEA 2000 Cable (Light / Micro Buss)	
Maximum Current	4 AMPS
Resistance - Power Wire(s)	5.40 Ω per 100 M
Power Wire Size	22 AWG
Data Wire Size	24 AWG

NMEA 2000 specifies wire colors as follows:

NMEA 2000 Wire Designation	Color
Power supply (+VDC)	Red
Ground (–VDC)	Black
Shield (Drain)	Bare
Data HI (Signal)	White
Data LOW (Signal)	Blue

Grounding

The network should be grounded at a SINGLE location. This is normally done at the power supply connection to the network and should be robustly connected to the boat's grounding system. There must be no other ground connections on the network to avoid ground loops, which can cause problems with network performance.

Maximum Number of Devices

A maximum of 50 devices can be attached to a NMEA 2000 network.

Load Equivalency

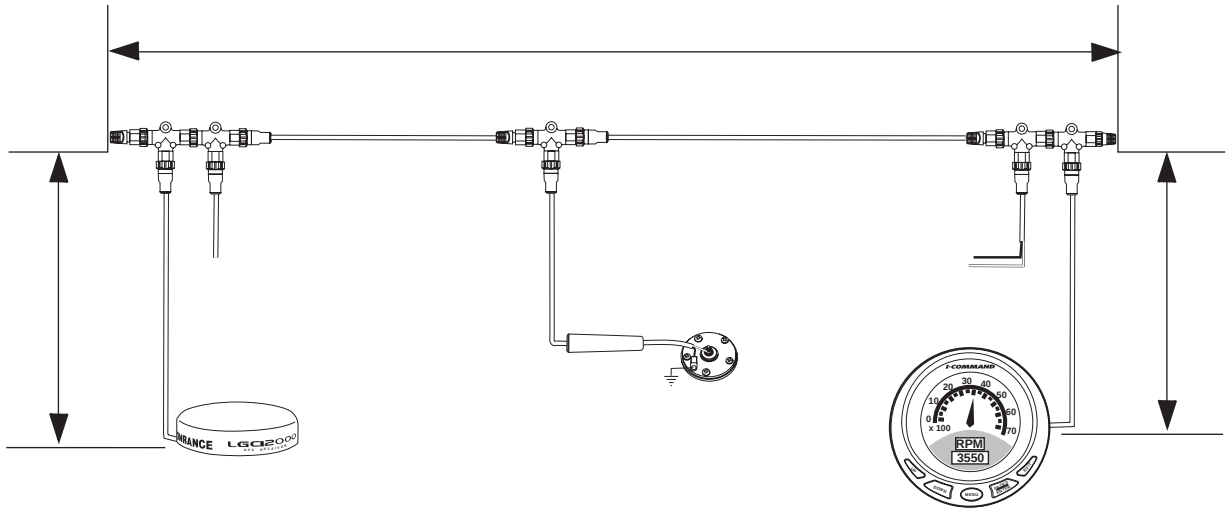
The *Engine Management Module* (*EMM*) on *Evinrude E-TEC* outboards has a load equivalency number of 1. Less than 50 mA of the network's (CAN) power is used by the *EMM*.

Linear Architecture

NMEA 2000 networks use a "linear" architecture. Linear describes the network buss as connected in a line. This design is easy to assemble and expand. The linear architecture must be maintained whenever an additional device is added to the network or the network is modified. This type of network also requires one terminator at each end of the network buss.

Connect buss cables, terminators, and T-connectors to the buss connectors (side connectors) of the T-connectors. Connect devices to the device connector (center point) of the T-connector.

Network Buss Length Diagram



Network Buss Length

The distance between any two points on the network must not exceed 100 meters (328 ft.).

Measure the distance from the T-connector to the last device at each end of the network.

Device cable lengths at the ends of the network must be included in the total network buss length calculation.

Device Cable Lengths

Network device cable lengths:

- Must not exceed 6 meters (19 ft.) for single device cable lengths
- Must not exceed 78 meters (256 ft.) for total device cable lengths

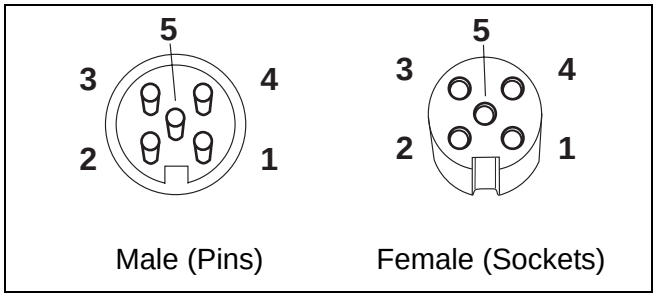
Open Network Device Connectors

Remove T-connectors to eliminate “open” network device connectors. There should be no “open” or unused network device connectors.

QUICK CONNECT STYLE CONNECTORS

Connector Identification

Connectors have two configurations – Male (pins) and Female (sockets).

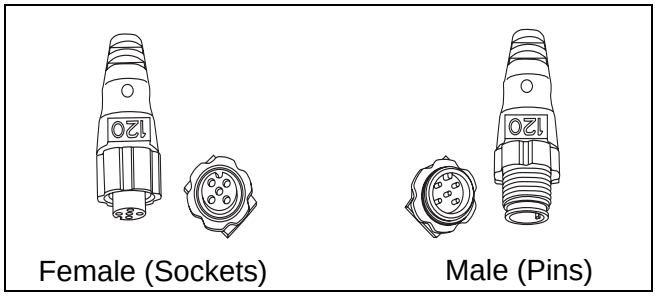


DeviceNet™ style
1. *Shield (Drain) - Bare wire*
2. *Power (+VDC) - Red wire*
3. *Ground (–VDC) - Black wire*
4. *Data HI (Signal) - White wire*
5. *Data LOW (Signal) - Blue wire*

Terminating Resistors

Terminating resistors are required for accurate network transmissions. Networks must be assembled with terminators positioned at both ends of the network buss. Each terminator uses a 120 Ω, 1/4 watt resistor to terminate data transmissions on the network.

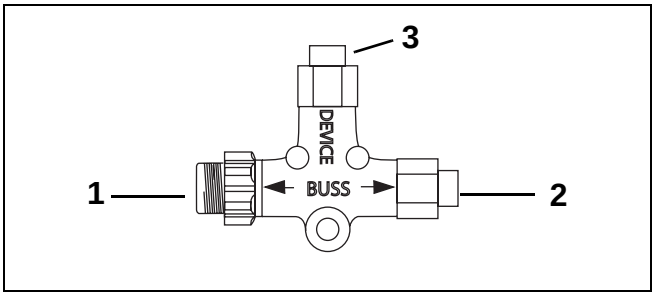
One terminator must be installed at each end of the *I-Command* network.



DeviceNet™ style) terminators

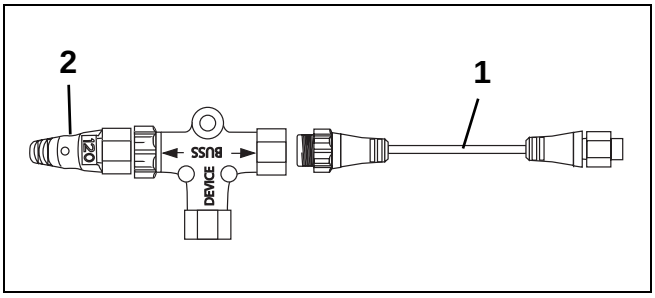
T-Connectors and Buss Cables

T-connectors provide device access to the network. T-connectors have two buss connectors and one device connector. Network devices must be connected to the device connector of the T-connector.



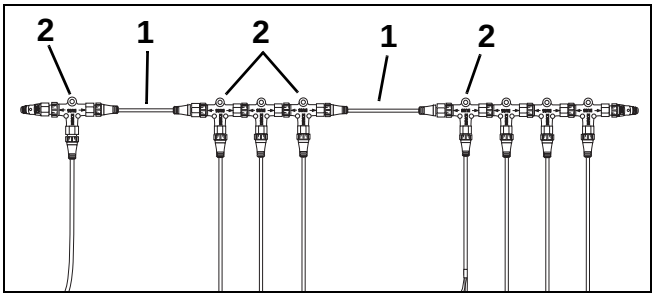
DeviceNet™ style
1. *Male buss connector*
2. *Female buss connector*
3. *Female device connector*

T-connectors can be installed at the end of a network. Connect a network buss cable to one side and a terminator into the other



1. *Buss cable*
2. *Terminator*

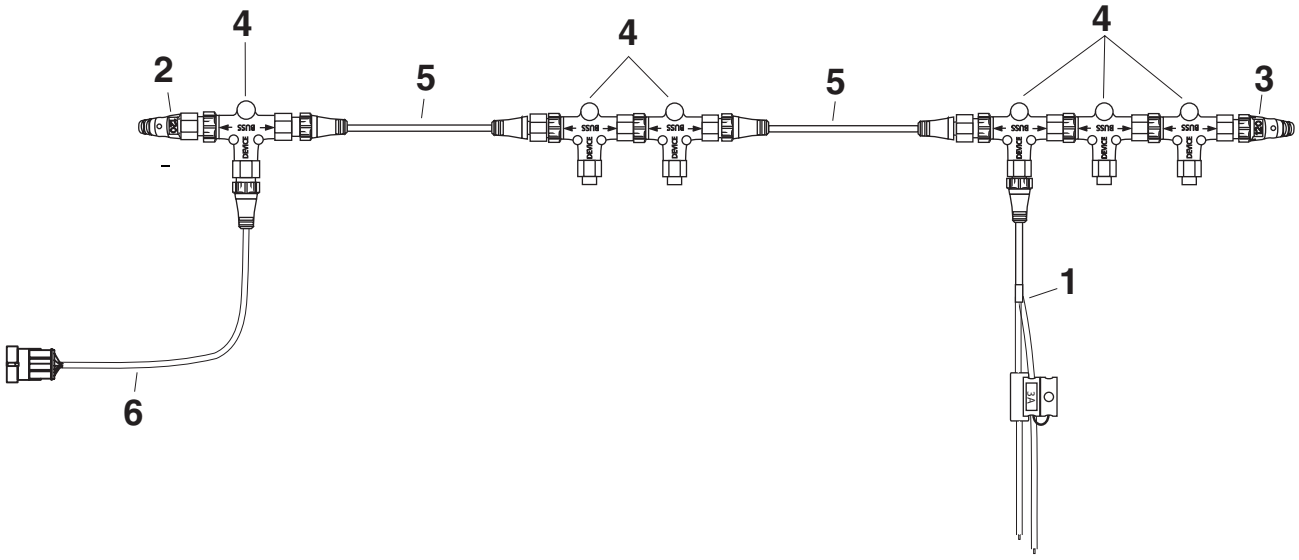
Multiple T-connectors can be installed in the middle or the end of a network. Use network buss cables to connect T-connectors



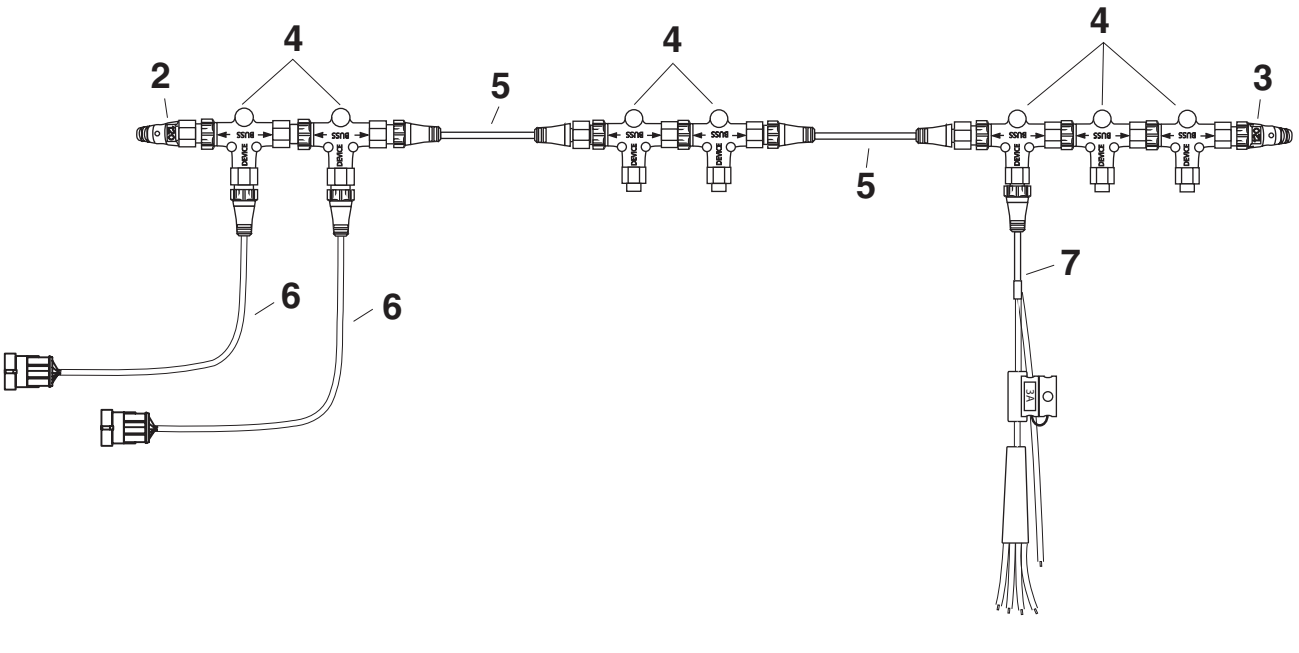
1. *Buss cable*
2. *T-connectors*

IMPORTANT: An engine interface cable is required to connect an *Evinrude E-TEC* outboard to the network.

SINGLE OUTBOARD

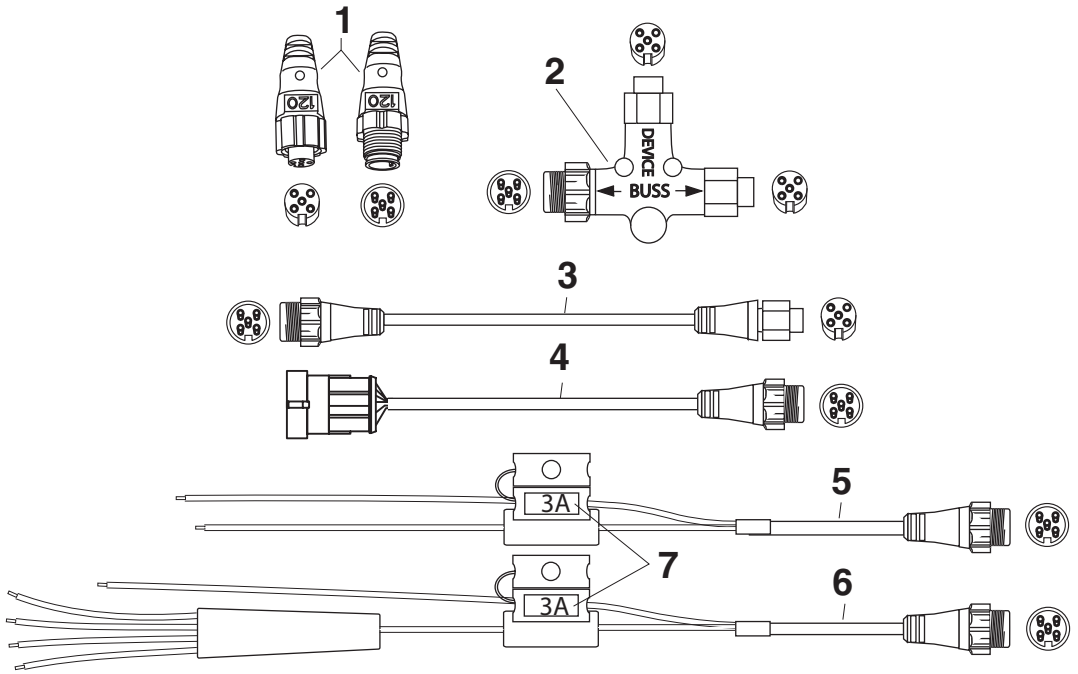


TWIN OUTBOARD



1. *Power harness, single engine*
2. *Terminator (Male)*
3. *Terminator (Female)*
4. *T-Connector*
5. *Buss cable*
6. *Engine Interface Cable (network to E-TEC outboard)*
7. *Power harness, multi-engine*

QUICK CONNECT COMPONENTS



No.	Description	Part Number
	DeviceNet Style Connector	
1	Terminator Kit (contains 1 male and 1 female)	764155
2	T-Connector	764151
3	Network Buss Cable - 1 ft.	764160
3	Network Buss Cable - 6 ft.	764161
3	Network Buss Cable - 15 ft.	764162
3	Network Buss Cable - 25 ft.	764163
4	Engine Interface Cable Kit (15 ft.)(1)	764164
5	Power Supply Kit - Single Engine(1)	764157
6	Power Supply Kit - Multiple Engines(1)	764159
7	Fuse	ATO/ATC 3 Amp: 764538

(1) Includes T-Connector, P/N 764151

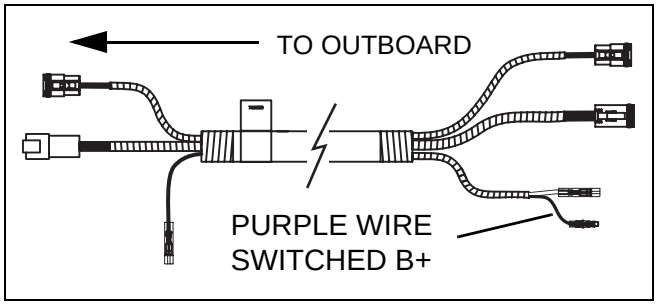
IGNITION AND TRIM/TILT HARNESSES

IMPORTANT: Do not use a MWS harness (or any other harness) in place of an *I-Command* Ignition and Trim/Tilt Harness or an *I-Command* Ignition and Trim/Tilt Adaptor Harness. These *I-Command* harnesses are built with 47 ohm resistors for the trim sender circuit and provide a switched B+ circuit for *EMM* operation.

Ignition and Trim/Tilt Harness

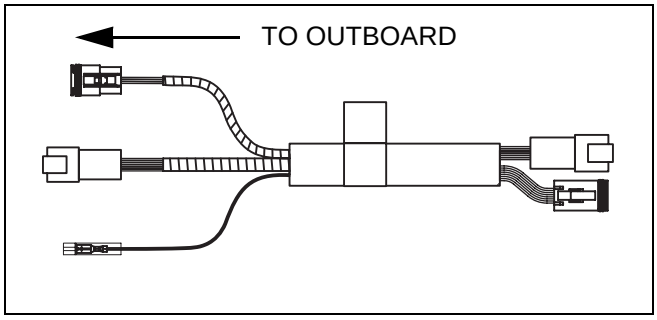
Outboards rigged with *I-Command* use a unique Ignition and Trim/Tilt Harness. This harness provides a switched B+ connection for the *EMM* Harness and a 47 ohm resistor for the trim sender circuit.

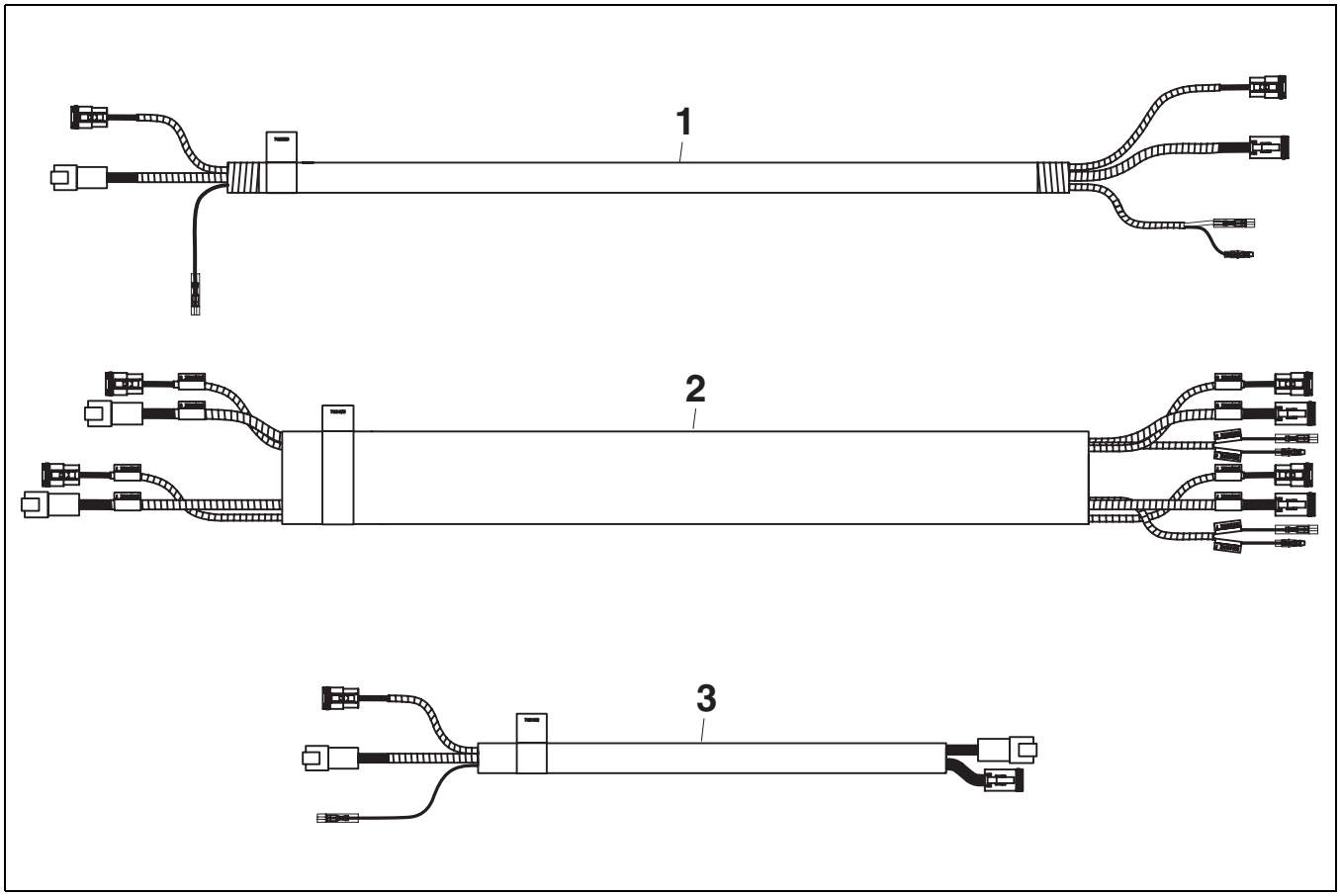
The Ignition and Trim/Tilt Harness is offered in various lengths and engine configurations. Single, twin and triple engine configurations are available. All twin and triple harnesses require the use of one Ignition and Trim/Tilt Adaptor Harness for each outboard. See **Ignition and Trim/Tilt Adaptor Harness – Used for Two and Three Engine Installations** on p. 13



Ignition and Trim/Tilt Adaptor Harness – Used for Two and Three Engine Installations

The Ignition and Trim/Tilt Adaptor Harness is used for twin and triple engine installations and connects to the outboard and a twin or triple Ignition and Trim/Tilt Harness. This **required** harness includes the 47 ohm resistor for the trim sender circuit.

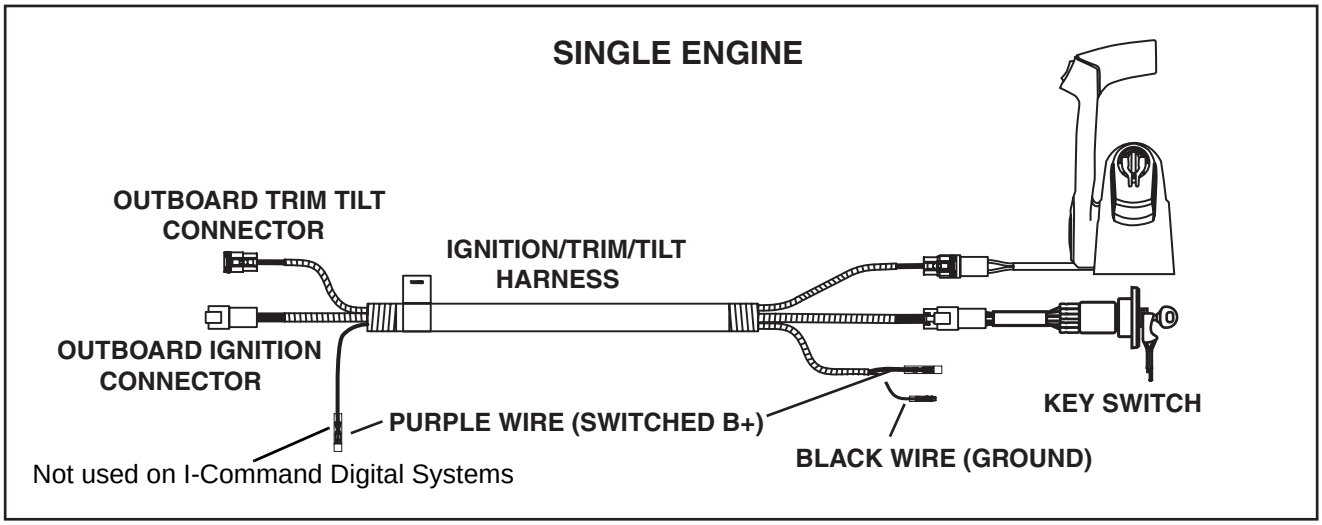


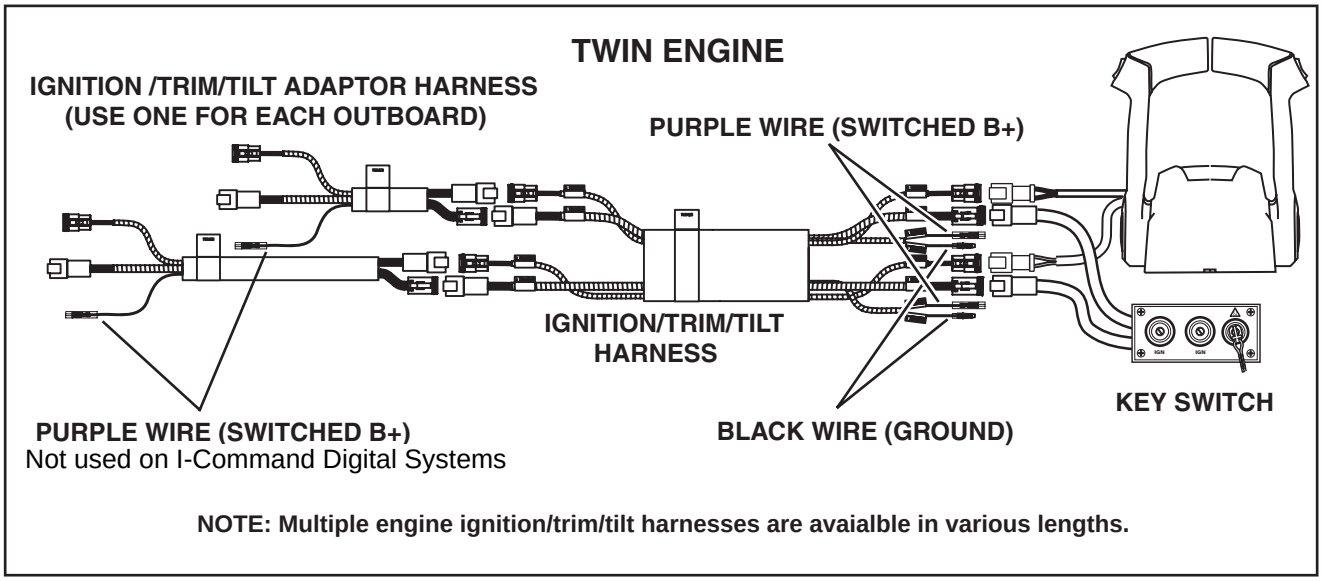


No.	Description	Part Number				
	Harness Lengths	12 ft.	15 ft.	20 ft.	25 ft.	28 ft.
1	Singe Outboard Ignition and Trim/Tilt Harness	763542	763543	763544	763545	763546
2	Twin Outboard Ignition and Trim/Tilt Harness		763547	763548	763549	
	Triple Outboard Ignition and Trim/Tilt Harness(1)			763550	763551	
3	Ignition and Trim/Tilt Adaptor Harness(2)	6 ft. - 763552 or 10 ft. - 763553				

(1) Not shown
(2) Must be used with Twin Outboard Ignition and Trim/Tilt Harness and Triple Outboard Ignition and Trim/Tilt Harness to connect to outboards. Use one Ignition and Trim/Tilt Adaptor Harnesses for each outboard (contains 47 ohm 1/4 watt resistor for trim sender circuit).

IGNITION AND TRIM/TILT WIRING DIAGRAMS





NOTE: Multiple engine ignition/trim/tilt harnesses are avaialble in various lengths.

ACCESSORIES

Various NMEA 2000 accessories are available to interface to the *I-Command* Digital System. This is achieved by adding an additional tee connector to the network buss.

Description of Kit	P/N
Triducer, transom mount, Speed/Depth/Temp	764334(1)
Triducer, thru-hull, Plastic, Speed/Depth/Temp	764336(1)
Transducer, transom mount, Depth/Temp (No speed)	764335(1)
GPS Receiver/antenna	764179(1)
SOW Paddle Wheel Kit	764193(1)
Water Speed /Pressure Sensor Kit	764195(1)
Memory Module Kit (Fuel Manager)	764181(1)
Fluid Level Converter (unconfigured)	764166(1)(2)(3)
Fuel Level Converter Kit – one fuel tank (instance 0)	764168(1)(4)
Fuel Level Converter Kit – two fuel tanks (instance 0 and 1)	765047(1)(4)
Fuel Level Converter Kit – three fuel tanks (instance 0, 1 and 2)	765051(1)(4)
Fuel Flow / Level Transducer Kit	764191(1)(2)(4)
Oil Tank Level Kit, 1.8 Gallon – one engine one oil tank (instance 0)	764271(1)(4)
Oil Tank Level Kit, 1.8 Gallon – two engines two oil tanks (instance 0 and 1)	764273(1)(4)
Oil Tank Level Kit, 3.0 Gallon – one engine one oil tank (instance 0)	764272(1)(4)
Oil Tank Level Kit, 3.0 Gallon – two engines two oil tanks (instance 0 and 1)	764274(1)(4)
Oil Tank Level Kit, 3.0 Gallon – three engines three oil tanks (instance 0, 1 and 2)	764275(1)(4)
Oil Tank Level Converter Kit, 10 Gallon – one oil tank (instance 0)	763737
Engine Water Pressure Sensor – (See “Engine Water Pressure Sensor Kit” on page 20)	5008300(3)
NMEA 2000 Pressure Sensor Kit – (See “NMEA 2000 Pressure Sensor Kits” on page 20)	765038(1)(2)(4)
Temperature Sensor (water / air / fluid – unconfigured)	764183(1)(2)
3.5 inch I-Command Gauge Horn and Hardware Kit	764593
2 inch I-Command Gauge Horn and Hardware Kit	764676

(1) Includes T-connector(s), P/N 764151
(2) Configure using *I-Command* Digital display
(3) Configure using *Evinrude Diagnostics* software
(4) Connect to specific engine or accessory for correct network data to be displayed (Instance 0, 1, or 2)

Instance Numbers

I-Command networks (*NMEA 2000*) allow multiple electronic devices to be connected together on a common network and can be configured to support many instances of duplicate or similar devices on the same network.

Device identities and instance numbers are used to identify devices on a network.

Additional devices (accessories) are added through careful network configuration.

Refer to “NETWORK SETUP” on page 32” or I-Command User’s Guides for engine and boat setup, fuel tank setup, oil tank setup, pressure sensor setup, and temperature sensor setup.

Engines are identified from PORT to STARBOARD on the transom. See instance numbers in chart.

Number of Outboards	Instance Number		
	Port	Starboard or Center	Starboard
1	0		
2	0	1	
3	0	1	2

Fuel and oil tanks must be connected to the correct converter to provide accurate *I-Command* network information. Label converters and wiring by instance number (engine location or device location).

Identify water pressure sensors and temperature sensors; and accurately label converters and wiring by instance number (engine location or device location).

Device Description(1)	Instance Number	Engine Location or Device Location	Is Device Configured on Network
Engine 1	0	Port	YES
Engine 2	1	Starboard or Center	YES
Engine 3	2	Starboard	YES
Fuel Tank 1	0	Main fuel tank or tank 1	YES
Fuel Tank 2	1	Auxiliary fuel tank or tank 2	–
Fuel Tank 3	2	Auxiliary fuel tank 2 or tank 3	–
Oil Tank 1	0	Label oil tank 1	YES
Oil Tank 2	1	Label oil tank 2	–
Oil Tank 3	2	Label oil tank 3	–
Engine Water Pressure Sensor	Use *Evinrude Diagnostics*	Port, Center, Starboard	NO
NMEA 2000 Pressure Sensor 1	0	Port	YES
NMEA 2000 Pressure Sensor 2	1	Starboard or Center	YES
NMEA 2000 Pressure Sensor 3	2	Starboard	YES
Temperature Sensor 1	0	Port or device location	YES
Temperature Sensor 2	1	Starboard / Center or device location	–
Temperature Sensor 3	2	Starboard or device location	–

(1) This chart provides device descriptions and instance numbers on a typical *I-Command* network and represents a boat assembled with three (3) engines.

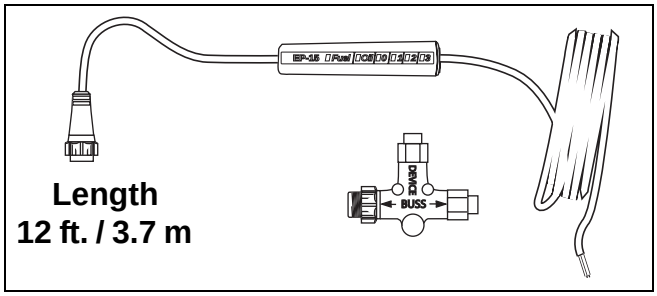
Fuel Tank Level Converter Kits

Fuel tank level converter kits contain the fuel tank level converter(s) needed for specific *I-Command* network installations. Use the chart below to select the required kit or converter.

Fuel tank level converters (analog to digital converters) must be installed to coincide with fuel tank instance (position). Refer to user information and setup information to reconfigure the instance numbers of converters. See “Instance Numbers” on page 17.

Number of Fuel Tanks	Fuel Tank Level Converter Kit P/N	Fuel Tank Converter Instance	Converter P/N
1	764168(1)(2)	0	764168(1)(2)
2	765047(1)(2)	0	764168(1)(2)
		1	764170(1)(2)
3	765051(1)(2)	0	764168(1)(2)
		1	764170(1)(2)
		2	765044(1)(2)

(1) Includes T-connector(s), P/N 764151
(2) Connect the fuel tank level converter configured with the appropriate instance number to the specific fuel tank sending unit.

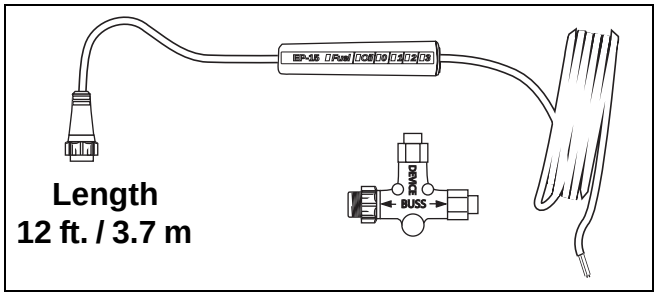


Fluid Level Converters

Fluid level converters (analog to digital converters) must be configured to provide proper input to the *I-Command* network. Fluid level converters must be configured to support a specific sending unit. Select fluid level converter(s) for fuel level, oil level, and water level as needed. Fluid level converters must be configured to support *I-Command* Digital displays. Refer to user information and setup information to reconfigure the instance numbers of converters. See “Instance Numbers” on page 17.

Fluid Level Converter	P/N
Unconfigured	764166(1)(2)

(1) Includes T-connector, P/N 764151
(2) Configure with *I-Command* Digital display

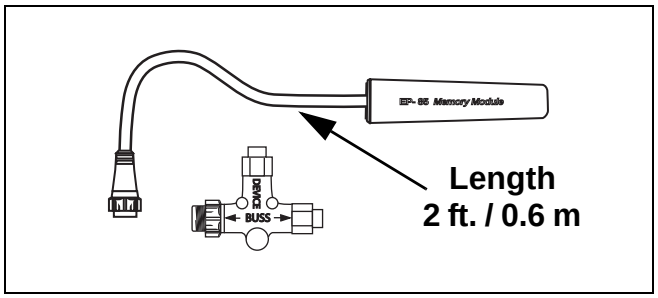


Memory Module Kit

A memory module kit provides fuel level and fuel management data for the *I-Command* network. Use with *I-Command* Digital displays ONLY.

Memory Module Kit	P/N
	764181(1)

(1) Includes T-connector, P/N 764151



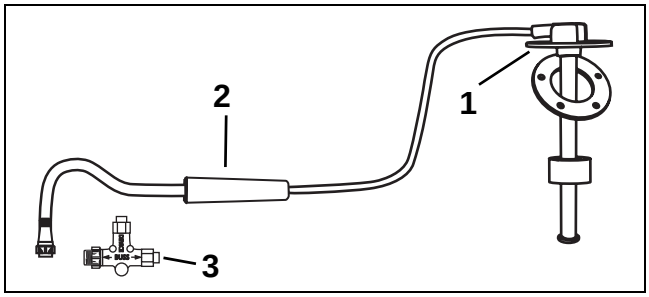
Oil Tank Level Kits

I-Command oil tank level kits include oil tank sending unit(s) and oil tank level converter(s).

Oil tank level converters (analog to digital converters) provide oil tank information to the *I-Command* network and must be installed to coincide with oil tank instance (position). Refer to user information and setup information to reconfigure the instance numbers of converters. See “Instance Numbers” on page 17.

Number of Oil Tanks	Number of Sending Units and Converters Included in Kit	Oil Tank Level Converter Instance	Kit P/N
1.8 Gallon Oil Tank Level Kits			
1	1	0	764271(1)(2)
2	2	0	764273(1)(2)
		1	
3.0 Gallon Oil Tank Level Kits			
1	1	0	764272(1)(2)
2	2	0	764274(1)(2)
		1	
3	3	0	764275(1)(2)
		1	
		2	

(1) Kit includes T-connector(s), P/N 764151
(2) Install the oil tank sending unit kit with the pre-configured oil tank level converter(s) in the appropriate oil tank. See “Oil Tank Level Converters” on page 19



1. Sending Unit
2. Converter
3. T-connector

Oil Tank Level Converters

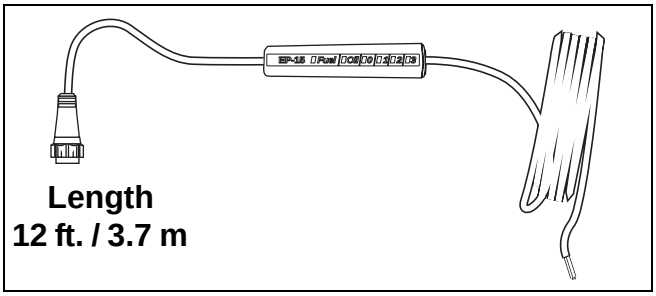
A 10 gallon oil level converter kit is used in a single or a multiple engine installation which use one common oil tank. The oil level converter supplied with this kit is instance “I0”.

10 Gallon Oil Tank Level Converter Kit		
Number of Converters Included in Kit	**Instance**	**Converter P/N**
1	0	763737

Oil tank level converters must be installed to coincide with engine and oil tank instance (position). Refer to user information and setup information to reconfigure the instance numbers of converters. See “Instance Numbers” on page 17.

Outboard Instance	Engine Position	Converter P/N
0	Single engine	764171
	Port engine on two or three engine installation	
1	Starboard engine on two engine installation	764172
	Center engine on three engine installation	
2	Starboard engine on three engine installation	764173
Unconfigured		764166(1)

(1) Configure using the *I-Command* Digital display

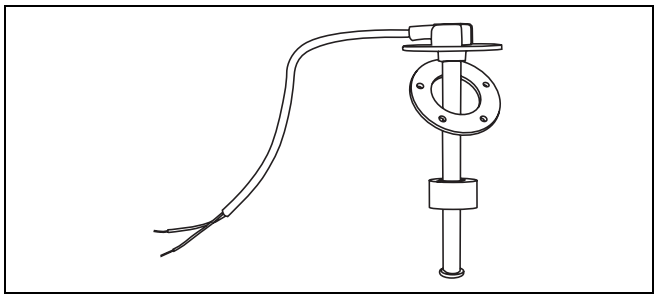


Oil Tank Sending Units

Oil tank sending units below are used to service *I-Command* digital oil tank sending unit kits.

Sending Unit Height	P/N
6.5 in. (1.8 gallon tank)	763407(1)
8.5 in. (3.0 and 10 gallon tank)	763408(1)

(1) An oil tank level converter is required to connect to network

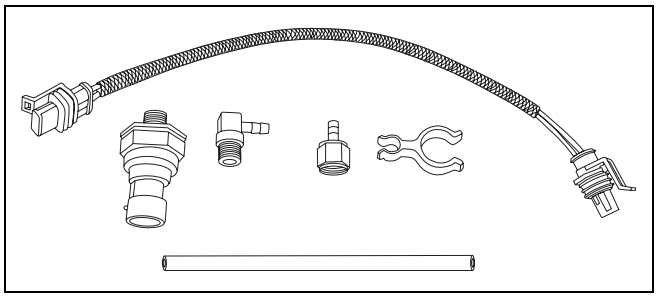


Engine Water Pressure Sensor Kit

An engine water pressure sensor kit provides water pressure input to the outboard's *EMM*. This input is processed by the *EMM* of the outboard then broadcast to the *I-Command* network. Used on 115 HP and larger *Evinrude E-TEC* outboards only. Configure this sensor using *Evinrude Diagnostics* software program. See "NETWORK SETUP" on page 32.

Engine Water Pressure Sensor Kit	P/N
	5008300(1)

(1) Configure using *Evinrude Diagnostics* software program

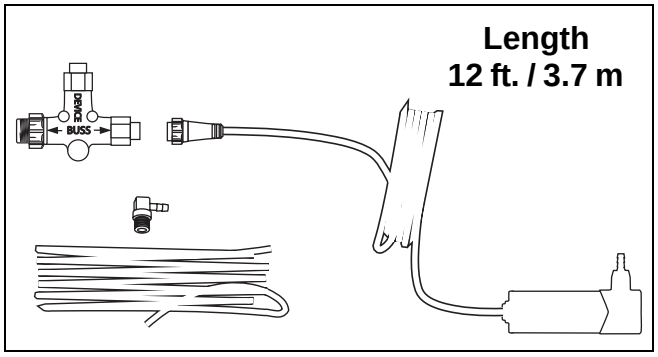


NMEA 2000 Pressure Sensor Kits

NMEA 2000 pressure sensor kits can be used to provide data for engine water pressure, fuel pressure, engine boost pressure, engine oil pressure, or transmission oil pressure. DO NOT mount this sensor under the engine cover. Refer to user information and setup information to reconfigure the instance numbers of converters. See "Instance Numbers" on page 17.

Sensors (Converters) Included in Kit	Sensor Converter Instance	Kit P/N
1	0	765038(1)(2)(3)
1	1	765040(1)(2)(3)
1	2	765042(1)(2)(3)

(1) Kit includes T-connector, P/N 764151
(2) Install the pressure sensor kit with the pre-configured pressure sensor converter(s) in the appropriate location
(3) Configure using the *I-Command* Digital display if needed

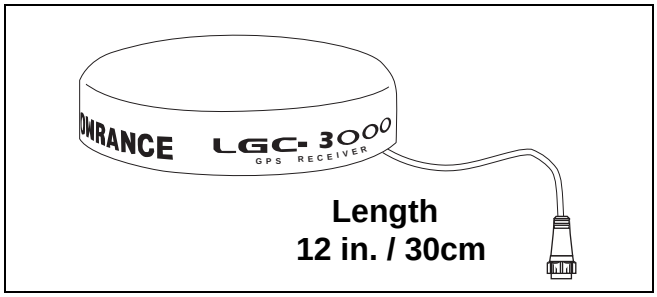


GPS Receiver/Antenna

These NMEA 2000 GPS receivers provide “location” and “speed over ground” (SOG) input to the *I-Command* network.

Network buss harnesses can be used to extend and make connections.

GPS Receiver/Antenna (NMEA 2000)	P/N
	764179

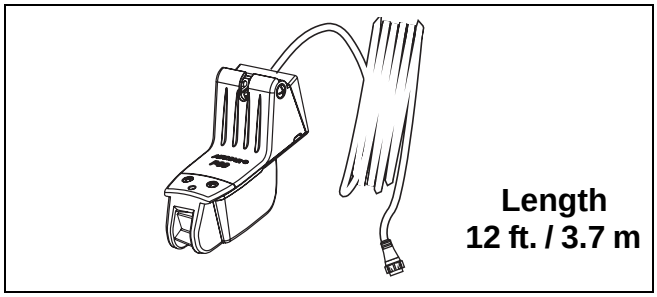


Transducers and Triducers

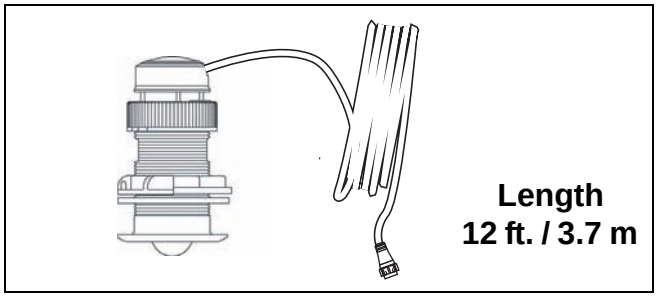
Transducers provide depth and temperature inputs to the *I-Command* network.

Triducers provide depth, temperature and “speed over water” (SOW) inputs to the *I-Command* network.

Transducers (NMEA 2000)	P/N
Transom Mount Transducer	764335
Transom Mount Triducer	764334
Thru-Hull Triducer	764336



Transom Mount Transducer



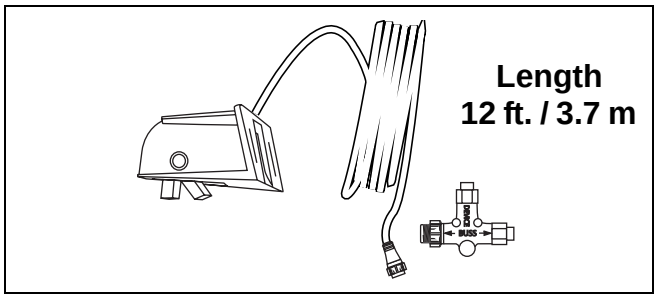
Thru-Hull Triducer (plastic)

IMPORTANT: Installations using *I-Command* Classic instruments require a Multifunction *I-Command* Classic Speedometer.

Speed Transducer - Paddle Wheel

A transom mount paddle wheel provides speed over water (SOW) input to the *I-Command* network.

Speed Transducer (NMEA 2000)	P/N
	764193

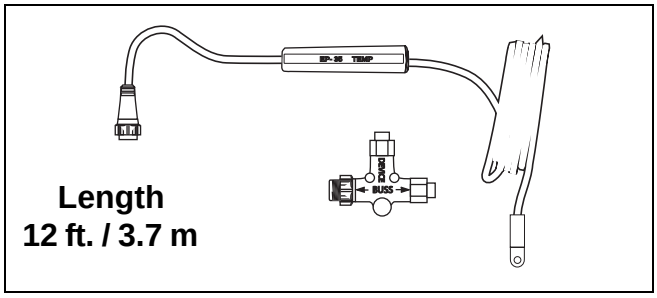


Temperature Sensor Kit

A temperature sensor kit provides air or fluid temperature. The sensor range is 4° to 176°F (-20° to 80°C).

Temperature Sensor Kit	P/N
	764183(1)

(1) Configure using *I-Command* Digital display



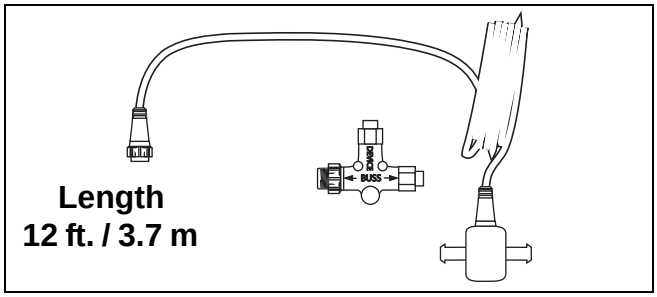
Fuel Flow Transducer Kit

Fuel flow transducer kits provide fuel flow data to the network.

IMPORTANT: DO NOT use on 40 - 300 HP *Evinrude E-TEC* outboards.

Fuel Flow Transducer Kit	P/N
	764191(1)

(1) Configure using *I-Command* Digital display



I-COMMAND INSTALLATION

INSTRUMENTS

Spacing of Instruments

The minimum distances between instruments on a panel should be as follows:

- 3 13/16 (112 mm) center to center for 3 1/2 in. instruments
- 3 1/4 in. (95.5 mm) center to center for 3 1/2 in. instruments to 2 in. instruments
- 2 5/8 in. (77 mm) center to center for 2 in. instruments

Panel Thickness

Instruments can be mounted in panels up to 1 in. thick.

Hole Sizes

IMPORTANT: Check space behind panel to be sure adequate clearance for instruments exists before drilling panel.

3 1/2 in. Multifunction Gauge

Cut 3 3/8 in. (99 mm) diameter hole in panel for 3 1/2 in. instruments. Secure instrument with nuts and bracket.

2 in. Gauge

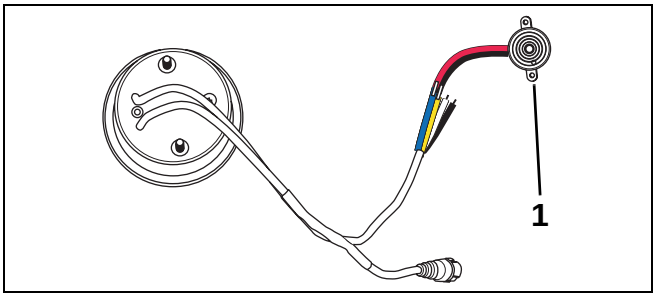
Cut 2 1/16 in. (52 mm) diameter hole in panel for 2 in. instruments. Secure instrument with spin nut.

Fastening to Panel

Insert instrument into panel hole. Thread spin nut onto threaded housing of instrument and tighten to back of panel. DO NOT exceed 10 in. lbs. (1.1 N·m) If stud and bracket kits are used, tighten nuts finger tight.

Warning Horn

Connect the yellow wire from the instrument to the black wire of the warning horn. Connect the blue wire from the instrument to the red wire of the warning horn.



1. Warning horn

Each instrument should be installed with a warning horn. Mount each warning horn in a protected area (out of the weather) and so horn is audible for operator.

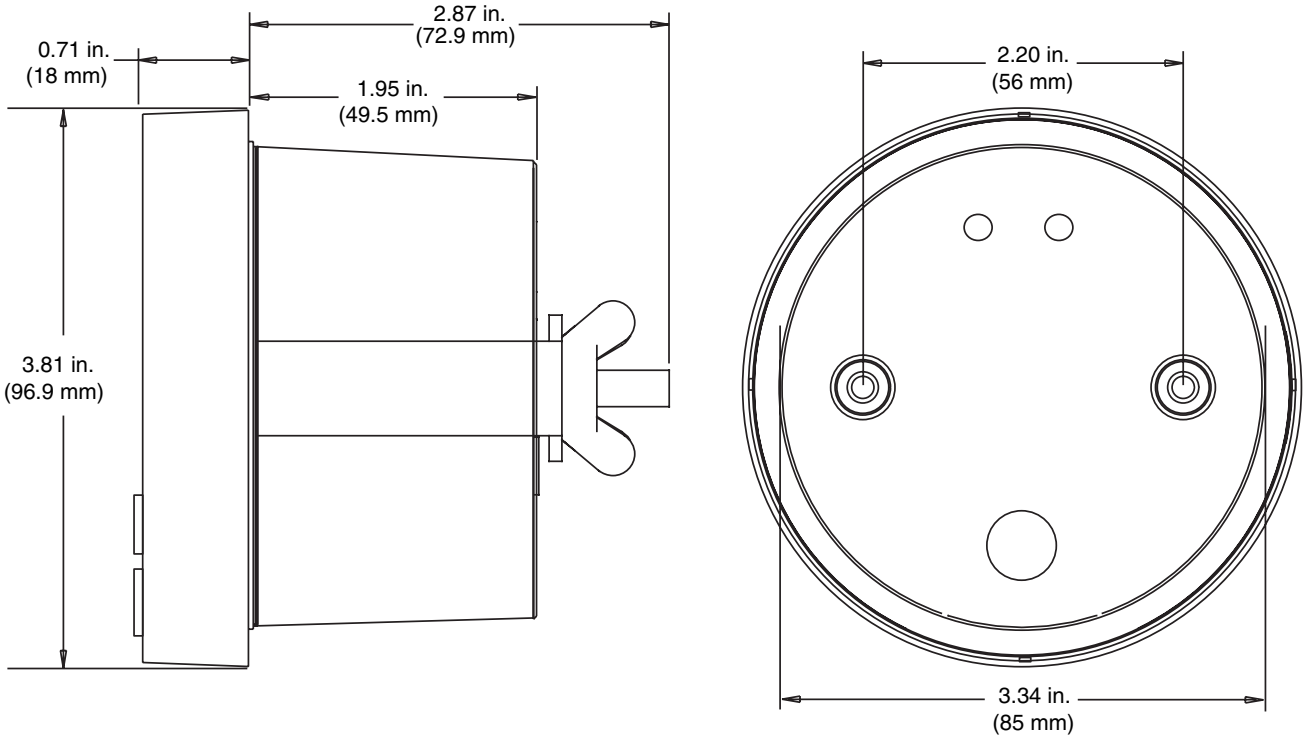
Navigation Lights

Connecting the light wiring for the *I-Command* instrument to the boat's navigation lights will provide instrument lighting if the instrument backlight setting is set to lowest setting and the boat's navigation lights are turned ON.

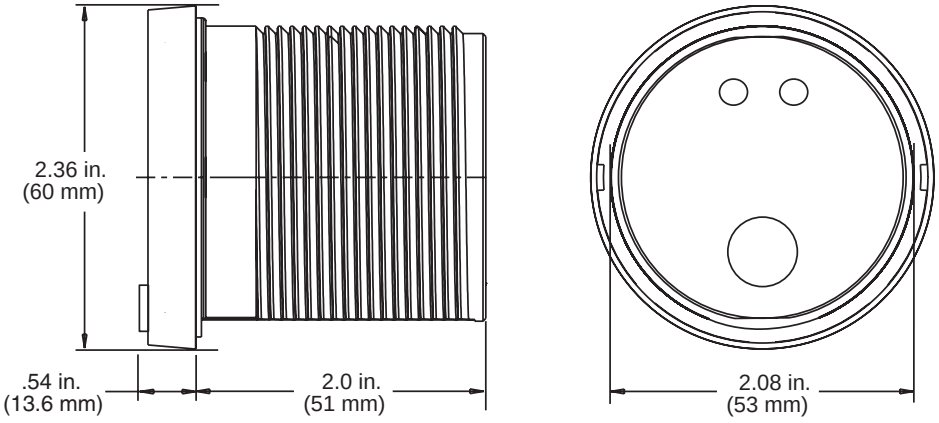
Connect the white wire from the instrument to the switched positive (B+) of the boat's navigation lights and the black wire from the instrument to ground (GND).

Instrument Dimensions

3 1/2 in. Digital Series Multifunction Display



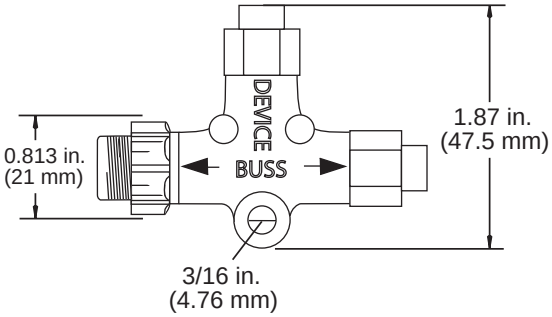
2 in. Digital Series Multifunction Display



QUICK CONNECT NETWORK COMPONENTS

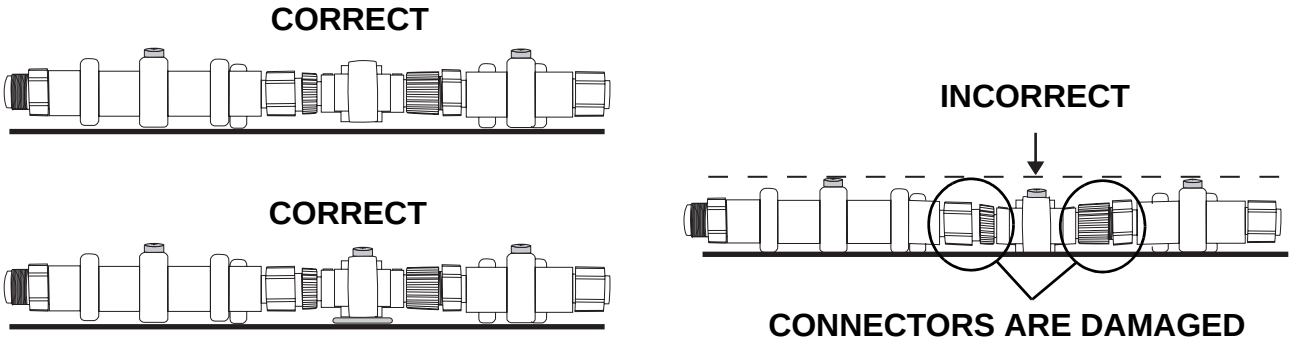
DeviceNet-Style T-Connector Dimensions

Some T-connectors have different dimensions.

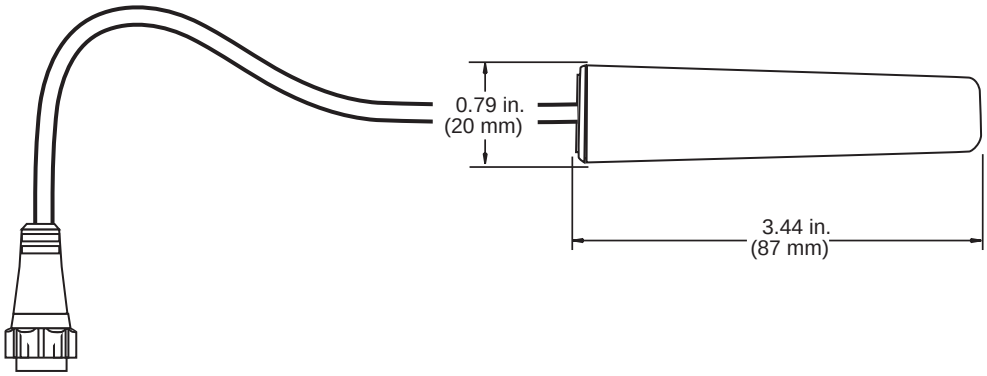


Mounting DeviceNet-Style T-Connectors

Mount T-connectors to flat mounting surfaces. Use washers or spacers behind the T-connector as needed. Check T-connector alignment. Incorrect mounting can damage the T-connectors resulting in broken wiring connections. T-connectors should be mounted with the “Device” connector facing down to prevent water intrusion. Tighten screws by hand to prevent damage. Groups of T-connectors can be stacked for mounting in larger network installations.



Converter/Memory Module Dimensions



QUICK CONNECT NETWORK

Lubricate all connector gaskets with *Electrical Grease (dielectric)* before assembly.

Refer to “QUICK CONNECT NETWORK DIAGRAMS” on page 28.

1) Install ignition and trim/tilt wire harness.

Ignition and trim/tilt harnesses are available in various lengths. Refer to “IGNITION AND TRIM/TILT HARNESSES” on page 13.

Ignition and trim/tilt harnesses are available in various lengths for twin or triple engine installations. Use one ignition trim/tilt adaptor harness for each outboard connecting to a twin or triple configuration ignition and trim/tilt harness.

2) Organize the components required for the installation.

Position components, identify harness routings, and determine locations for T-connectors. All network devices are installed by adding T-connectors.

3) Install power supply and T-connector.

The *I-Command* network must be connected to a switched power source.

Single Engine Power Supply Harness: Connect the red wire of the power supply harness to the purple switched B+ accessory wire of the ignition and trim/tilt wire harness. Connect the black wire of the power harness to the black ground wire of the ignition and trim/tilt harness.

Multiple Engine Power Supply Harness: Connect the purple wire(s) of the power supply harness to the purple switched B+ accessory wires of the ignition and trim/tilt wire harness(s). Connect each black wire of the power harness to a black ground wire of the ignition and trim/tilt harness. (Optional: connect the red wire of the power harness to a switched B+ power supply of the boat.)

Connect the network connector of the power supply harness to the device connector of the T-connector. Connect data cables, additional T-Connectors or a terminator to the buss connectors of the T-connector.

4) Connect *I-Command* instrument(s).

Add T-connectors to network as needed. Use one T-connector for each instrument. Connect the quick connect connector(s) from instrument(s) to the device connector of the T-connector.

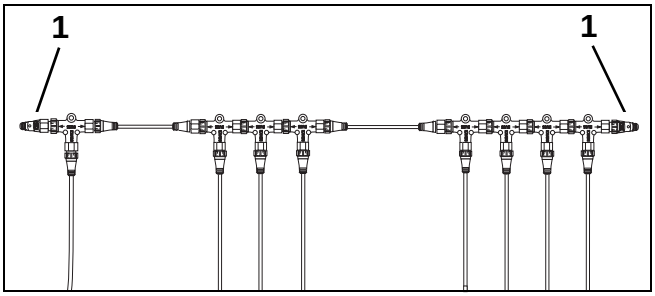
5) Install the Engine Interface cable and T-connector.

The outboard connects to the *I-Command* network as a device. Connect the 4-pin CANBus connector of the engine interface cable to the outboard. Route the 15 ft. (4.6 m) cable with the ignition and trim harness into the boat.

Install the T-connector for the engine interface on the network. Connect the quick connect connector from engine interface cable to the device connector of the T-connector.

For multiple outboards, install an additional T-connector and engine interface cable for each outboard.

Remember to install a terminator to the open end of the T-connector if it is the last buss connector on the network.



1. Terminators

6) Connect buss cable(s).

Use buss cables to extend the network’s length and to connect T-connectors. Buss cables have a male connector on one end and a female connector on the other.

Use the appropriate length buss cable to connect the T-connector group at the helm or console with

T-connectors positioned along the length of the hull.

Use buss cables to extend the cable lengths between a device and a T-connector on the network. Limit total “drop” length to 19 ft. (6 m). Refer to “NETWORK SPECIFICATIONS” on page 8

7) Adding a network device.

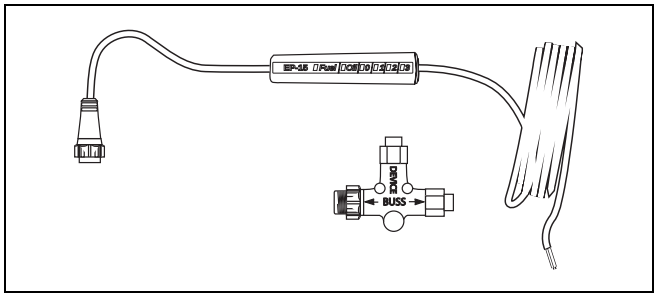
Other devices, such as another *I-Command* Digital gauge, an auxiliary fuel tank level sensor, or a GPS sensor can be added anywhere along the network buss.

Add a T-connector at the end of the network (between a T-connector and a terminator), between two T-connectors, or between a T-connector and a data cable.

Add a new device by connecting device cable connector to the device (center) connector of T-connector.

8) Install fluid level converters.

I-Command fluid level converters convert the standard analog electrical signal of sending units to the NMEA 2000 signal.

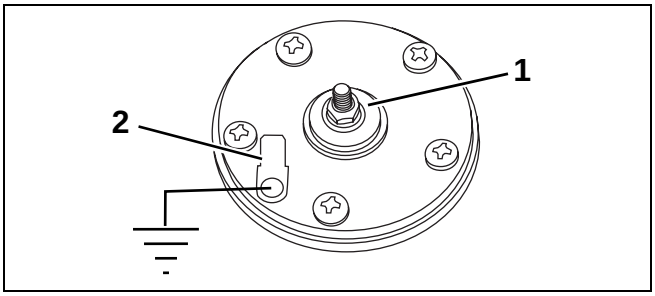


Remove excess cable length when connecting converters to sending units.

IMPORTANT: If multiple “unconfigured” fluid level converters are installed, refer to “NETWORK SETUP” on page 32. Connect one fluid level converter to the network and configure converter. Once first converter is configured, connect second converter and configure. Continue connecting and configuring converters one at a time.

Fuel Tank Level Converter

Connect the red wire of the converter to the fuel tank sending unit’s positive terminal (pink wire). Connect the black wire (ground) of the converter to the sending unit’s ground (–) terminal.



1. Positive terminal
2. Ground terminal

Connect the fuel level converter connector to the device (center) connector of the T-connector.

9) Install terminators.

Connect the appropriate terminator to the open buss connector of the T-connector at both ends of the network.

10) Set outboard identity

For the outboard, run the latest version of *Evinrude Diagnostics* program and assign the outboard an identity for the network. Refer to “Instance Numbers” on page 17 and use *Evinrude Diagnostics* software to complete procedure. This procedure is required for multi-engine installations.

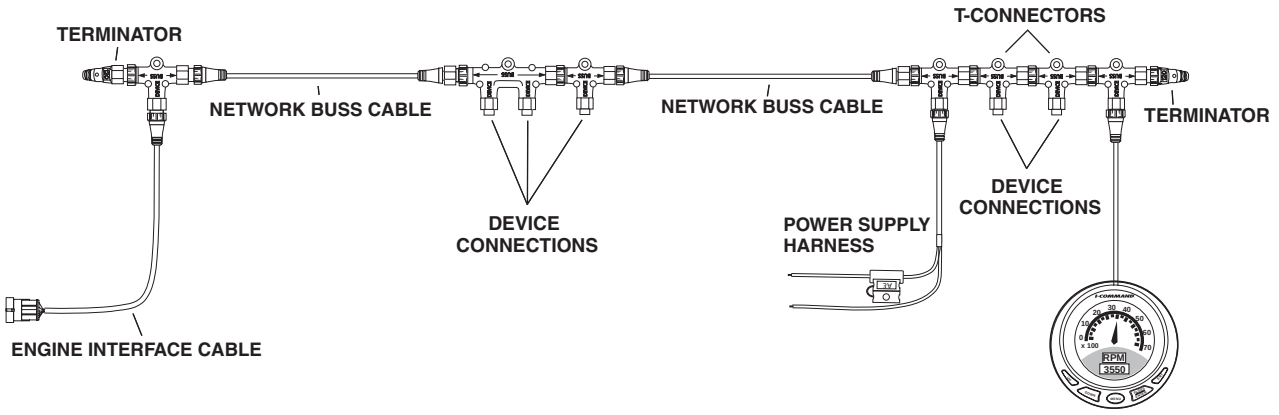
11) Check operation.

Complete programming of the *I-Command* Network using an *I-Command* Multifunction Instrument. Refer to “NETWORK TROUBLESHOOTING CHART” on page 34 and the *I-Command* User’s Guide for setup procedures.

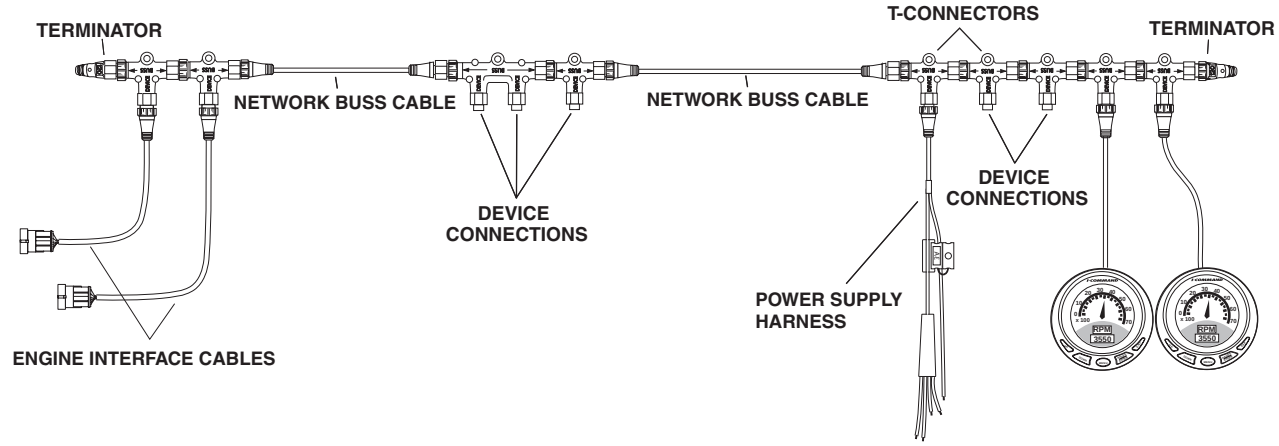
12) Carefully route and secure all harnesses, converters, adaptors, and T-connectors.

Once network is assembled and functional, position all harnesses and components carefully to prevent abrasion or contact with moving objects. T-connectors can be fastened with screws. Harnesses, converters, memory devices, and adaptors should be fastened using tie straps.

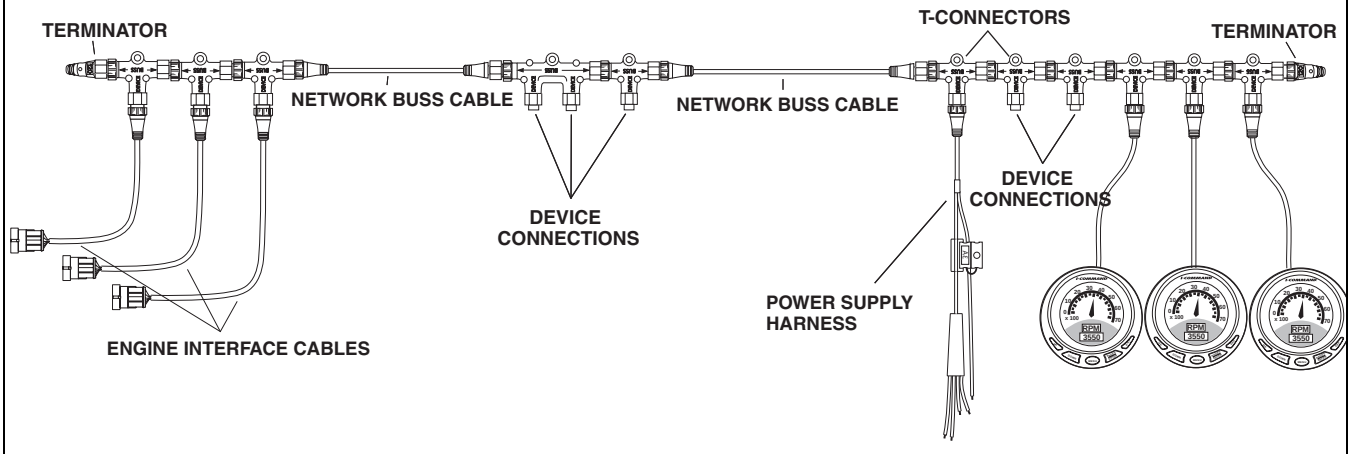
SINGLE OUTBOARD

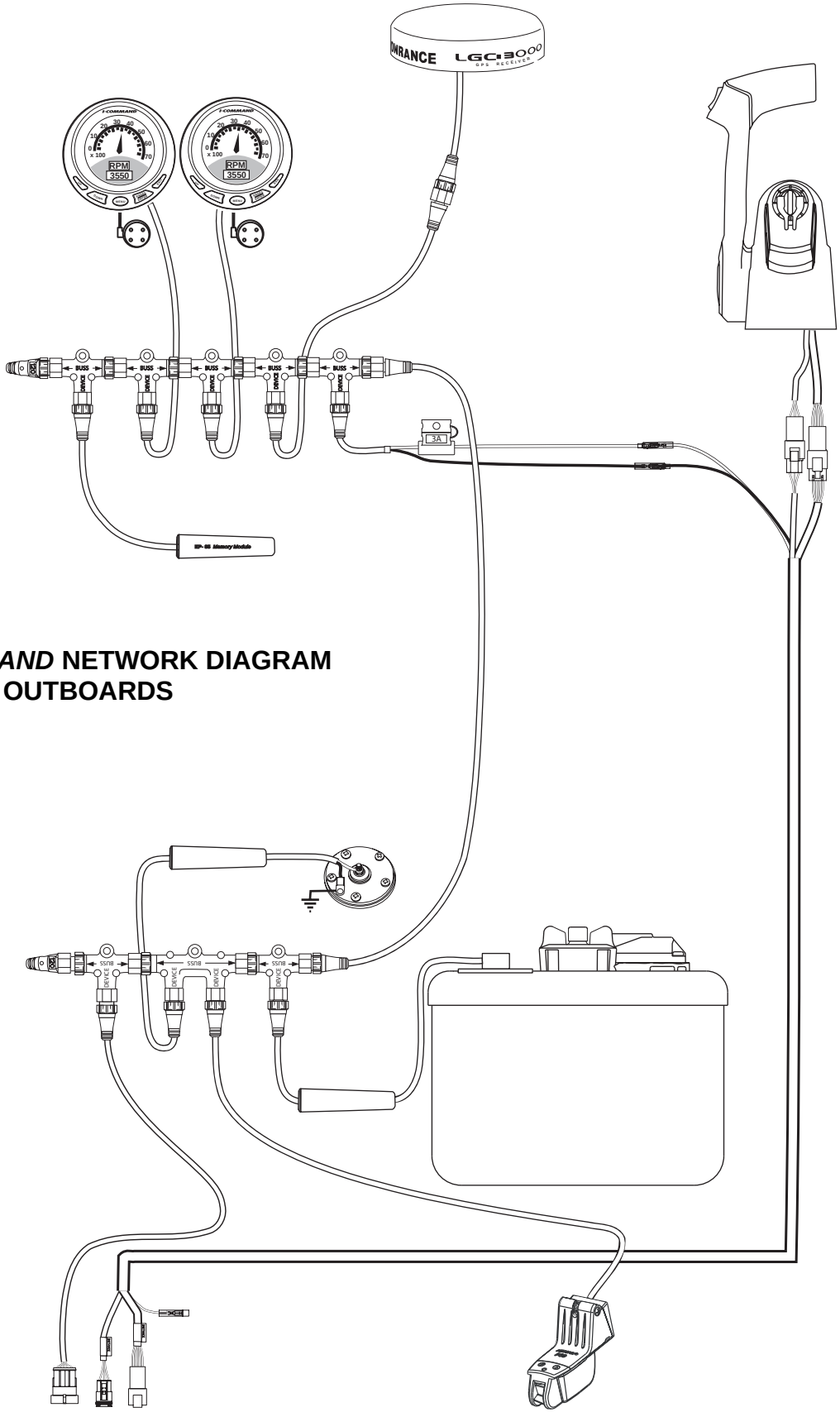


TWIN OUTBOARDS

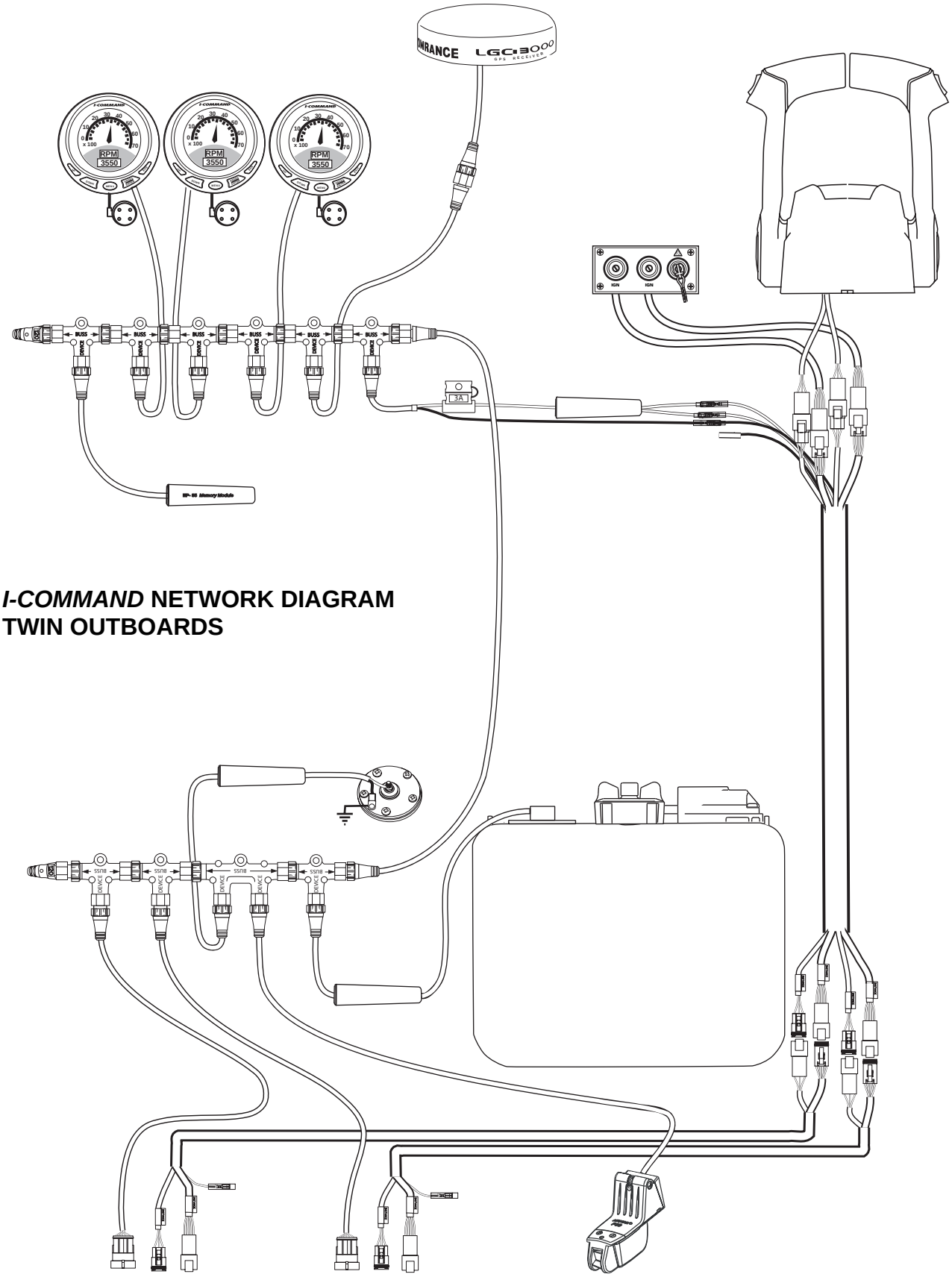


TRIPLE OUTBOARDS

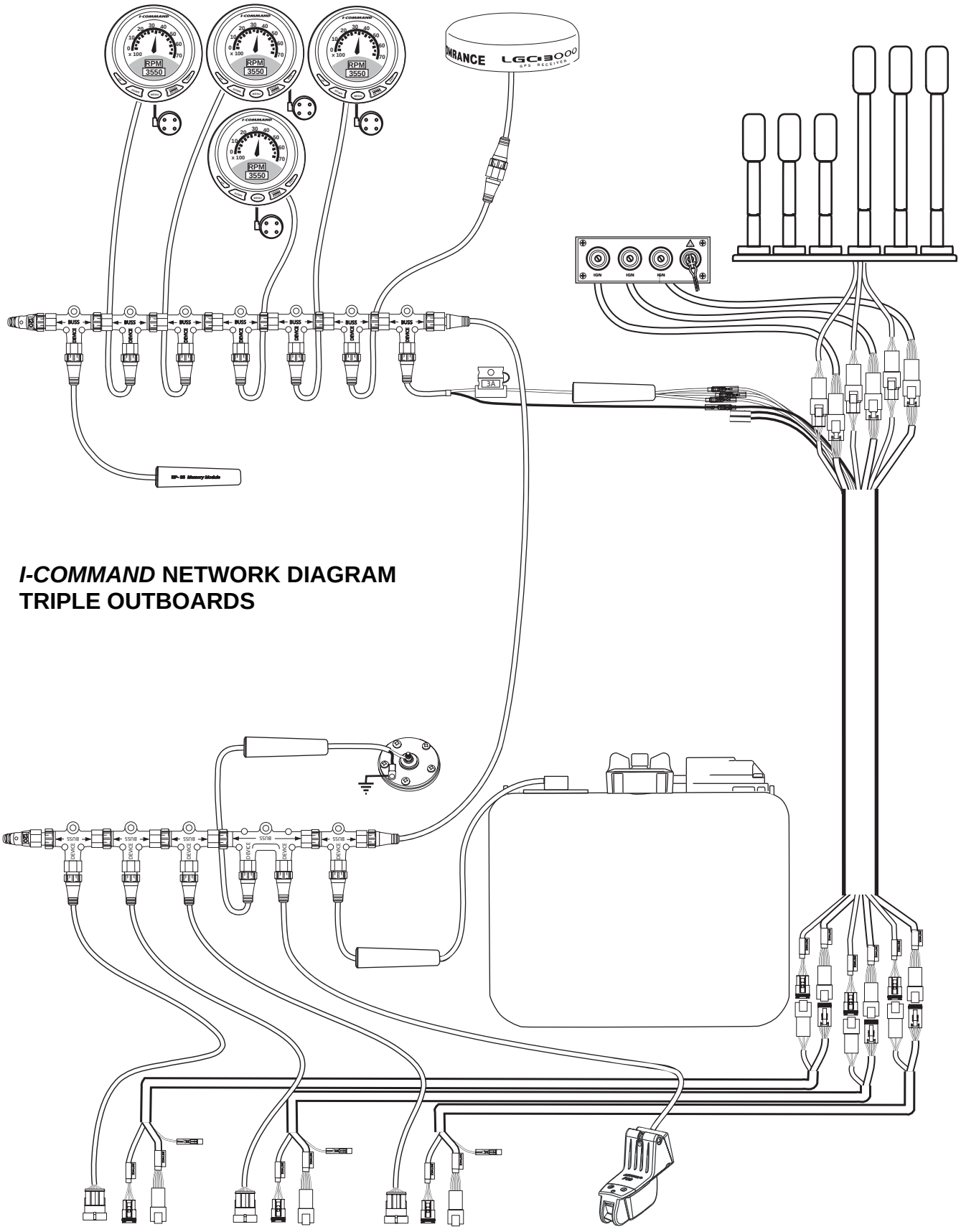




***I-COMMAND* NETWORK DIAGRAM**
SINGLE OUTBOARDS



***I-COMMAND* NETWORK DIAGRAM**
TWIN OUTBOARDS



***I-COMMAND* NETWORK DIAGRAM**
TRIPLE OUTBOARDS

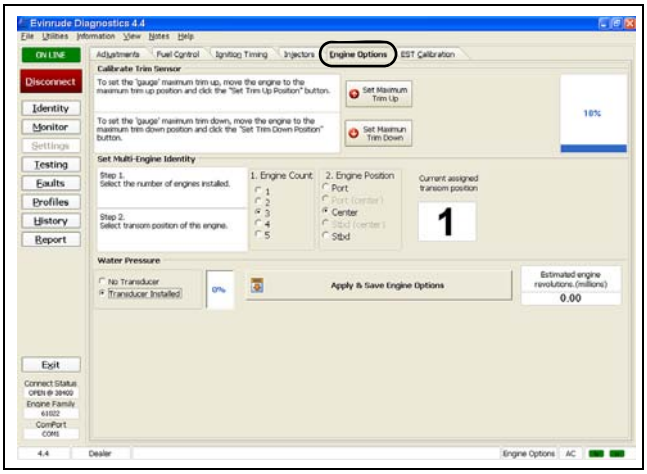
NETWORK SETUP

IMPORTANT: Set “ENGINE OPTIONS” on *Evinrude E-TEC* outboards before power is applied to the *I-Command* Network.

Engine Options

Use *Evinrude Diagnostics* software to set “ENGINE OPTIONS”. Settings include:

- Calibrate trim sensor
- Set multi engine identity (engine instance) See “Instance Numbers” on page 17
- Engine water pressure sensor (if equipped)



System Setup

Refer to User’s Guide provided with *I-Command* Digital gauge.

Turn key switch to ON position. Display(s) should turn ON. (The default for new gauges is to display BOAT SETUP.)

Boat Setup

Use BOAT SETUP to select the appropriate number of engines and fuel tanks, and to enter fuel tank capacities.

Press ENTER. Use UP / DOWN buttons to select the correct engine and tank configuration. Press ENTER.

Use UP / DOWN buttons to enter the correct fuel tank capacity for each tank. Press EXIT to return to menu.

BOAT SETUP can be re configured after initial setup. Enter MENU and select SYSTEM SETUP. Press ENTER. Select ENG/TANK CFG (engine and tank configuration) and press ENTER.

Engine Data

Use ENG DATA (engine data) to assign a gauge to an engine. ENG DATA is only used in multiple engine installations.

Enter MENU. Use UP / DOWN buttons to select SYSTEM SETUP. Press ENTER.

Use UP / DOWN buttons to select ENG DATA. Press ENTER.

Using UP / DOWN buttons select engine to be monitored. Press ENTER. Repeat for each *I-Command* gauge.

Bus Devices

Use BUS DEVICES (network buss devices) to view network devices.

IMPORTANT: Unconfigured devices such as temperature sensors and fluid level converters must be connected to network one at a time for proper identification and setup.

Enter MENU. Use UP / DOWN buttons to select SYSTEM SETUP. Press ENTER.

Use UP / DOWN buttons to select BUS DEVICES. Press ENTER.

Using UP / DOWN buttons to select unconfigured device. Press ENTER.

Continue ON-SCREEN PROCESS to configure.

Fuel Tank Calibration

Enter MENU. Use UP / DOWN buttons to select SYSTEM SETUP. Press ENTER.

Use UP / DOWN buttons to select BUS DEVICES. Press ENTER.

Use UP / DOWN buttons to select the fuel tank to be calibrated. Press ENTER.

Select CALIBRATE. Press ENTER.

Select TWO, THREE, or FIVE POINT CALIBRATION. Press ENTER.

Continue ON-SCREEN PROCESS to calibrate.

Select Fuel Remaining Source

IMPORTANT: Perform the following procedure ON EACH GAUGE. Default setting is FLUID LEV SNSR.

Enter MENU. Use UP / DOWN buttons to select SYSTEM SETUP. Press ENTER.

Use UP / DOWN buttons to select FUEL SETUP. Press ENTER.

Use UP / DOWN buttons to select FUEL REM SRC (Fuel Remaining Source). Press ENTER.

Select ENG/FFLOW or FLUID LEV SNSR

ENG/FFLOW (Engine Fuel Flow) - Requires installation of memory module kit. Uses Outboard's *EMM* software to calculate fuel consumption. Total fuel use is calculated based on *EMM* fuel tables and subtracted from fuel tank capacity entered during setup.

IMPORTANT: Fuel flow data from *EMM* is required. User must enter amount of fuel added at each fill up or perform the "refill tank" procedure in "FUEL MANAGER". A GPS antenna must be installed for Fuel Economy and Fuel Range features to be functional.

FLUID LEV SNSR (Fluid Level Sensor) - Requires installation of a fuel tank level converter. Use's fuel tank sending unit to calculate remaining fuel and fuel used. Remaining fuel is calculated based on sending unit accuracy, capacity entered during setup, and fuel consumed from tank. Use the "FIVE POINT CALIBRATION" in "TANK CALIBRATION" to achieve best performance of this option.

IMPORTANT: A GPS antenna and memory module kit must be installed to track seasonal fuel, trip fuel, fuel range, and fuel economy.

Change Units

Enter MENU. Use UP / DOWN buttons to select SYSTEM SETUP. Press ENTER.

Use UP / DOWN buttons to select CHANGE UNITS. Press ENTER.

Using UP / DOWN buttons to select option.

Display Category	Unit of Measure Options
Speed/Dist	Statute - Nautical - SI (metric)
Temperature	Farenheit - Celsius
Pressure	Imperial/US - SI (metric)
Depth	Feet - Fathoms - Meters
GPS Coordinates	Deg/Min Deg/Min/Sec
Volume	US Gallons - Liters

Speed Range

Required for gauges set to analog display.

Enter MENU. Use UP / DOWN buttons to select SYSTEM SETUP. Press ENTER.

Use UP / DOWN buttons to select SPEED RANGE. Press ENTER.

Using UP / DOWN buttons to select option.

Pages - Add

IMPORTANT: Perform the following procedure on each gauge. Add analog or digital display pages to display additional data from added devices such as fluid level sensors, water pressure transducers, water pressure sensors and temperature sensors.

Enter MENU. Use UP / DOWN buttons to select PAGES. Press ENTER.

Use UP / DOWN buttons to select ADD PAGE. Press ENTER.

Page Display Options	
Single - Analog or Digital	Trim Tabs
Dual - Analog or Digital	GPS Position
Quad - Analog or Digital	Rudder
Diagnostics	Clock
Engine Trim	Fuel Manager

NETWORK TROUBLESHOOTING CHART

SYMPTOM	POSSIBLE CAUSE / PROCEDURE(1)
I-Command System does not work	Is red wire of power supply harness connected to switched B+ (purple wire) on dash board side of Ignition / trim and tilt harness.
	Is black wire of power supply harness connected to ground?
	Is the power supply harness connected to “device connector of the T-connector?
	Blown 3 A fuse in Power Supply Harness?
	Check all wiring, connectors, T-connectors, network buss cables, and device connections. Disconnect device connectors from network. Isolate shorted T-connectors, cables, accessories or displays.
I-Command instrument display is erratic	Are two terminators installed in the network, one at each end? Check all wiring, connectors, T-connectors, network buss cables, and device connections. Check “NMEA Line Voltage” listed in the NMEA Information Menu.
I-Command instrument turns on but “----” is displayed on LCD	Is the *EMM* cable connected to the engine’s *EMM*?
	Is the *EMM* cable connected to the device connector (center connector) of the T-connector? Check T-connector. Is housing cracked or pins bent?
	Is *EMM* programmed for engine position (instance). Set to 0, 1 or 2 using *Evinrude Diagnostic* software. This is required for multi-engine installations.
	Is *I-Command* display configured to match engine position (instance)?
I-Command instrument displays are inconsistant. Some pages display data correctly and some pages only display dash marks “----”.	Pages displaying dash marks “----” are not receiving data from the device assigned to the page. Check related connections. Verify the device is listed on the BUS DEVICES list and configured properly.
On a multi-engine installation, *I-Command* instruments display data for one engine.	Is *EMM* programmed for engine position (instance). Set to 0, 1 or 2 using *Evinrude Diagnostic* software. This is required for multi-engine installations.
	Is *I-Command* display configured to match engine position (instance)?
	Check the *EMM* cables and the *EMM* cable connections for each engine.

SYMPTOM	POSSIBLE CAUSE / PROCEDURE(1)
Fuel level will not display	Requires FLUID LEVEL CONVERTER (FUEL) and *I-Command* display configured with FUEL REM SRC set to FLUID LEV SNSR or memory module kit and *I-Command* display configured with FUEL REM SRC set to ENG/FFLOW.
	Is fuel tank sending unit correct - resistance range from 33 ohms to 240 ohms? Is the float arm of the sending unit moving without obstruction?
	Is the FLUID LEVEL CONVERTER connected to the fuel tank sending unit? Connect the red wire of FLUID LEVEL CONVERTER to the center terminal (positive terminal) of the fuel tank sending unit and black wire to ground terminal (black).
	Is the network connector of the FLUID LEVEL CONVERTER connected to “device” connector of the T-connector?
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
	Is FUEL LEVEL on the BUS DEVICES list of the I-Command display?
	Is a page for FUEL LEVEL or FUEL MANAGER added and configured?
	Is FLUID LEVEL calibrated for fuel tank(s)?
Fuel Manager Data will not display	Requires MEMORY MODULE and setup of the *I-Command* display.
	Is MEMORY MODULE on the BUS DEVICES list of the I-Command display?
	Is a page for FUEL MANAGER added and configured?
	Is I-Command display configured with FUEL REM SRC set to ENG/FFLOW? See Setup.
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
Oil tank level does not display	Requires FLUID LEVEL CONVERTER (OIL) with the proper “instance” program.
	Is the network connector of the FLUID LEVEL CONVERTER connected to “device” connector of the T-connector?
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
	Is OIL TANK on the BUS DEVICES list of the I-Command display?
	Is a page for OIL LEVEL added and configured?
	Is *I-Command* display configured with correct oil tank instance (position)?

SYMPTOM	POSSIBLE CAUSE / PROCEDURE(1)
Speed-Over-Ground (SOG) does not display	Requires input from a NMEA 2000 GPS receiver.
	Is NMEA 2000 GPS receiver connected to “device” connector of a T-connector of the network?
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
	Is GPS MODULE on the BUS DEVICES list of the I-Command display?
	Is a page for Speed-Over-Ground (SOG) added?
Speed-Over-Water (SOW) does not display	Requires input from a NMEA 2000 speed transducer.
	Is NMEA 2000 speed transducer connected to “device” connector of a T-connector of the network?
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
	Is SPEED OVER WATER on the BUS DEVICES list of the I-Command display?
	Is a page for Speed-Over-Water (SOW) added?
Water depth does not display	Requires input from NMEA 2000 depth transducer.
	Is NMEA 2000 depth transducer connected to “device” connector of a T-connector of the network?
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
	Is WATER DEPTH TRANSDUCER on the BUS DEVICES list of the I-Command display
	Is a page for Water depth added?
Temperature does not display	Requires input from NMEA 2000 temperature transducer.
	Is *I-Command* display configured with correct temperature sensor information?
	Is the T-connector damaged? Is T-connector housing cracked or electrical pins bent?
	Is TEMPERATURE TRANSDUCER on the BUS DEVICES list of the I-Command display
	Is a page for Temperature transducer added?
Engine Trim information is not accurate or does not display	Is the proper I-Command Ignition and Trim harness installed?
	For multiple engine installation, are Ignition and Trim ADAPTOR HARNESSES installed?
	Use the *EVINRUDE DIAGNOSTICS* software to set “UP” and “DOWN” trim limits (115 HP and higher)
	Is a page for Engine Trim added?
Water Pressure does not display (NMEA 2000 pressure sensor)	Is a page for WATER PRESSURE added to the I-Command display and is the display configured for correct WATER PRESSURE information?
	Is the T-Connector damaged? Is the T-Connector housing cracked or electric pins bent? (NMEA 2000 sensor)
	Is the WATER PRESSURE sensor on the bus devices list of the I-Command display? (NMEA 2000 sensor).

SYMPTOM	POSSIBLE CAUSE / PROCEDURE(1)
Water Pressure does not display (*Evinrude E-TEC* water pressure sensor)	Is the WATER PRESSURE sensor setup using the *Evinrude Diagnostics* software?
	Is a page for WATER PRESSURE added to the I-Command display? Note: WATER PRESSURE is not listed on the Buss Devices list.

(1) *I-Command* device must be connected to device connector (center) of T-connector. Check condition of all T-connector(s). Inspect pins and sockets of T-connectors and device connectors carefully. Damaged or shorted connectors can damage 5 amp fuse.


F
F.Flow
----
gal/h
E
UP
MENU
DOWN
I-COMMAND
0
20
40
60
80
RPM
VOLTS
Bat
x 100
0.00
11.6
0
5
10
15
20
EXIT
PAGES
ENTER
UP
DOWN
MENU

355008