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SECTION 1

INTRODUCTION AND OVERVIEW

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Introduction

The SmartCraft Technical Manual has been designed to provide OEM's and dealerships with the necessary information needed to properly rig and service boats with Mercury Marine's SmartCraft instrumentation.

This manual is arranged in Sections:

Section 1-Includes a comprehensive SmartCraft system overview. The system overview includes a brief system description and rigging specifications.

Section 2-Contains information on engine family compatibility. From the engine forward, all helm connections are universal between all engine families.

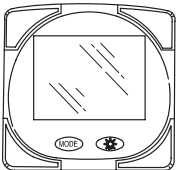
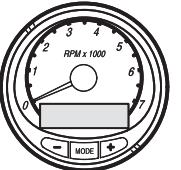
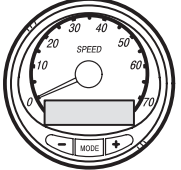
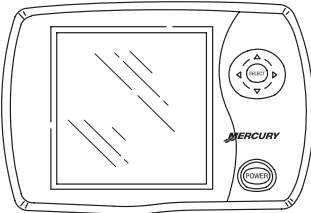
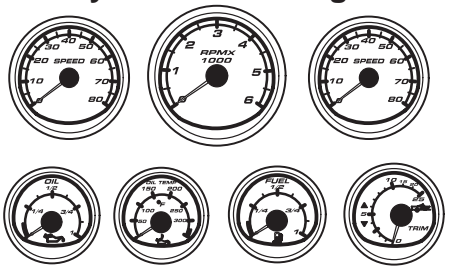
Section 3-Explains the gauges and engine harness connections within the engine families.

Section 4-Describes how to properly calibrate SmartCraft gauges.


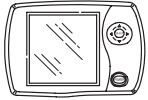
Section 5-Addresses some of the most frequently asked questions regarding SmartCraft operation and rigging.

Section 6-Covers basic troubleshooting techniques to correct any problems you may have within the SmartCraft system.

SmartCraft Products

<p>System Monitor</p> 	<p>System</p> <div data-bbox="982 1018 1161 1234"> <p>Tachometer</p>  </div> <div data-bbox="1242 1018 1421 1234"> <p>Speedometer</p>  </div>
<p>System View (SC5000 Series)</p> 	<p>System Link Gauges</p> 

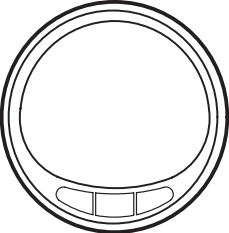
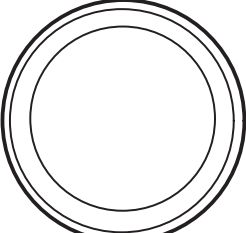
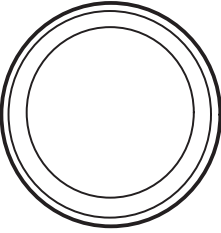
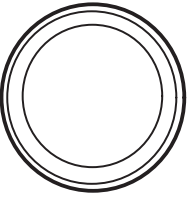
Instrument and Display Screen Features

Basic Features	Display Screens	System Tachometer 	+System Speedometer 	System Monitor 	System View 
Light Brightness		*	*	*	*
Light Contrast Adjustment		*	*		*
Engine Alarm Displays		*		*	*
Troll Control		*	*		cruise
Smart Link Accessory Gauge Connection		*		*	*
Interchangeable Bezels		*	*	*	*
GPS Connection			*		*
Engine Sync Display			*		*
Preventive Maintenance Schedule					*
	Digital Tachometer	*		*	*
	Digital Speedometer		*		*
	Engine Hour Meter	*		*	*
	Power Trim Angle	*		*	*
	Fuel Flow	*		*	*
	Engine Temperature	*		*	*
	Battery Voltage	*		*	*
	Engine Coolant Pressure	*		*	*
	Clock		*		*
	Outside Air Temperature		*		*
	Lake Water Temperature		*		*
	Fuel Tank Level		*	alarm	*
	Oil Tank Level		*		*
	Fuel Economy		*		*
	Fuel Range		*	*	*
	Trip Log		*		*
	Fresh Water				*
	Waste Water				*
	Water Depth	*		*	*
	Oil Temperature	*		*	*
	Oil Pressure	*		*	*
	Fuel Used	*		*	*
	COG/SOG		*		*
	FTW		*		*

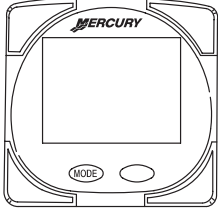
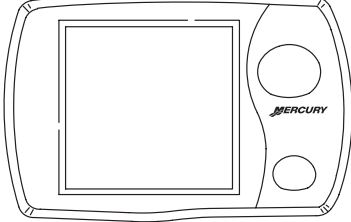


SmartCraft Product Accessory Components

Multi-Colored Bezel Covers for System Tachometer, Speedometer and System Link Gauges



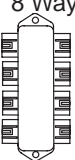


System Tachometer and Speedometer		System Link	
			
Black 859074-1 White 859074-2 Chrome 859074-3	Black 879949-1 White 879949-2 Chrome 879949-3	Black 879872-1 White 879872-2 Chrome 879872-3	Black 879871-1 White 879871-2 Chrome 879871-3

Faceplates For System Monitor and System View

System Monitor	System View
	
Black 879895-1 White 879895-2	Bezel Black/Silver 879947T1 Bezel White/Silver 879947T02 Sun Cover Gray 879948T1 Sun Cover White 879948T03

SmartCraft Product Rigging Components

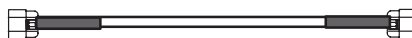
Wiring Accessories

Junction Boxes			* Junction Box Terminator/Resistor	** Junction Box Weather Cap
4 Way 	6 Way 	8 Way 		
878492A4	878492A6	878492A8	859318T-1	859318T-2

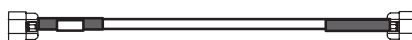
* For correct placement on these terminator/resistors, refer to wiring installation guidelines preceding and typical installation configurations following.

** All unused junction box ports must be covered using these weather caps.

SC1000 SERIES DATA HARNESS FOR NON-DIGITAL THROTTLE AND SHIFT SYSTEMS (BLUE CABLE)



Blue Data Harness without Terminator/Resistor		
Length	Part Number	Bulk Part Number (24)
2 m (6 ft.)	84-879968T6	84-879968B6
3 m (10 ft.)	84-879968T10	84-879968B10
5 m (15 ft.)	84-879968T15	84-879968B15
6 m (20 ft.)	84-879968T20	84-879968B20
8 m (25 ft.)	84-879968T25	84-879968B25
9 m (30 ft.)	84-879968T30	84-879968B30
15 m (50 ft.)	84-879968T50	—
24 m (80 ft.)	84-879968T80	—

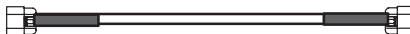


Blue Data Harness with Terminator/Resistor On One End		
Length	Part Number	Bulk Part Number (24)
3 m (10 ft.)	84-879981T10	84-879981B10
5 m (15 ft.)	84-879981T15	84-879981B15
6 m (20 ft.)	84-879981T20	84-879981B20
8 m (25 ft.)	84-879981T25	84-879981B20
9 m (30 ft.)	84-879981T30	84-879981B30
15 m (50 ft.)	84-879981T50	—
24 m (80 ft.)	84-879981T80	—



Blue Data Harness with Terminator/Resistor On Both Ends		
Length	Part Number	Bulk Part Number (24)
6 m (20 ft.)	84-879982T20	84-879982B20
8 m (25 ft.)	84-879982T25	84-879982B25
9 m (30 ft.)	84-879982T30	84-879982B30

SC5000 SERIES-SYSTEM VIEW DIGITAL THROTTLE AND SHIFT SYSTEMS (YELLOW CABLE)



Yellow Data Harness without Terminator/Resistor		
Length	Part Number	Bulk Part Number (24)
2 m (6 ft.)	84-879969T6	84-879969B6
3 m (10 ft.)	84-879969T10	84-879969B10
5 m (15 ft.)	84-879969T15	84-879969B15
6 m (20 ft.)	84-879969T20	84-879969B20
9 m (30 ft.)	84-879969T30	84-879969B30

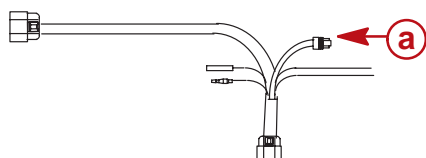


Yellow Data Harness with Terminator/Resistor On One End		
Length	Part Number	Bulk Part Number (24)
3 m (10 ft.)	84-879980T10	84-879980B10
6 m (20 ft.)	84-879980T20	84-879980B20
9 m (30 ft.)	84-879980T30	84-879980B30

SC100 SERIES-LINK CABLES

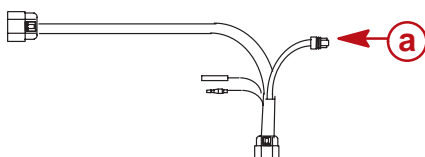


System Link Extension Harness		
Length	Part Number	Bulk Part Number (24)
31 cm (1 ft.)	84-880756T1	84-880756B1
1 m (3 ft.)	84-880756T3	84-880756B3
3 m (10 ft.)	84-880756T10	84-880756B10
9 m (30 ft.)	84-880756T30	84-880756B30



a - Air temp sensor connector





System Speed Harness		
Length	Part Number	Bulk Part Number (24)
1 m (3 ft.)	84-879978T1	84-879978B1



a - System Link Gauge connector

System Tachometer and Monitor Harness		
Length	Part Number	Bulk Part Number (24)
1 m (3 ft.)	84-879979T1	84-879979B1

System Gauges





Description	White	Gray	Qty.	Measure
 SC1000 System Tachometer	79-879897K11	79-879897K1	1	English
	79-879897B11	79-879897K1	24	
 SC1000 System Speedometer	79-879899K11	79-879897K1	1	English
	79-879899B11	79-879897B1	24	
	Front Mount	Rear Mount	Qty.	Measure
 SC1000 System Monitor	79-879896K4	79-879896K3	1	English
	79-879896B4	79-879896B3	24	
Description	White	Gray	Qty.	Measure
 SC5000 System View (Non-DTS)		79-879875K2	1	English

Sensor Kits



Description	P/N
Basic System Monitor Kit with Monitor, CAN line, Outboard Trim Sender, Paddle Wheel and boat Harness	891954A01
Same as the Basic Kit with the exception of the Paddle Wheel which is replaced with an Oil Tank	891954A02



Link Gauges

Tachometers


Description	White	Gray	Qty.	Measure
 6000 RPM 110 mm (4 11/32 in.)	879942K11	879942K1	1	English
 6000 RPM 85 mm (3 3/8 in.)	879904K11	879904K1	1	English
		879904B1 (Bulk)	24	
 8000 RPM 110 mm (4 11/32 in.)	879943K11	879943K1	1	English
 8000 RPM 85 mm (3 3/8 in.)	879903K11	879903K1	1	English

Speedometers


Description	White	Gray	Qty.	Measure
 SPEED 0-65 110 mm (4 11/32 in.)	879944K11	879944K1	1	English/Metric
 SPEED 0-80 110 mm (4 11/32 in.)	879945K11	879945K1	1	English/Metric

 SPEED 0-80 85 mm (3 3/8 in.)	879905K11	879905K1	1	English/Metric
		879905B1 (Bulk)	24	
 SPEED 0-120 85 mm (3 3/8 in.)	879906K11	879906K1	1	English/Metric


4 in 1

Description	White	Gray	Qty.	Measure
 85 mm (3 3/8 in.)	879946K11	879946K1	1	English


Fuel Level

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879910K11	879910K1	1	English
	879910B11 (Bulk)	879910B1 (Bulk)	24	


Fuel Flow

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879912K11	879912K1	1	English
	879913K11	879913K1	1	Metric


Fuel Level Dual Tank

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879941K11	879941K1	1	English


Oil Level

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879911K11	879911K1	1	English


Oil Temperature

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879908K11	879908K1	1	English
	879909K11	879909K1	1	Metric


Oil Pressure

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879916K11	879916K1	1	English
	879917K11	879917K1	1	Metric


Water Level

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879922K11	879922K1	1	English


Water Pressure

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879918K11	879918K1	1	English
	879919K11	879919K1	1	Metric


Engine Synchronization

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879924K11	879924K1	1	English


Engine Temperature

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879920K11	879920K1	1	English
	879920B11 (Bulk)	879920B1 (Bulk)	24	
	879907K11	879907K1	1	Metric


Trim

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879914K11	879914K1	1	English
	879914B11 (Bulk)	879914B1 (Bulk)	24	


Rudder Angle

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879915K11	879915K1	1	English


Voltage

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879921K11	879921K1	1	English


Waste Level

Description	White	Gray	Qty.	Measure
 52 mm (2 1/16 in.)	879923K11	879923K1	1	English



System Tach/Speed Single Engine Helm Kit

Description	White	Gray	Qty.	Measure
 85 mm (3 3/8 in.)	879899K11	879899K1	1	English

System Tach/Speed Dual Engine Helm Kit

Description	White	Gray	Qty.	Measure
 85 mm (3 3/8 in.)	879899K12	879899K2	1	English

System Tach/Speed Triple Engine Helm Kit

Description	White	Gray	Qty.	Measure
 85 mm (3 3/8 in.)	879899K12	879899K1	1	English
 85 mm (3 3/8 in.) Includes 3 ft. harness	879897K12	879897K2	1	English

Complete System Packages

Package A – Single Engine w/ SC1000 System Monitor			
	Quantity Req'd	Part Number	Description
Choose	1	79–879896K 4	SC 1000 System Monitor – Front Mount
Only One	1	79–879896K 3	SC 1000 System Monitor – Rear Mount
Choose	1	84–879982T20	SC 1000 2RSL 20' Data Harness (2 terminator resistors)
Only One	1	84–879982T30	SC 1000 2RSL 30' Data Harness (2 terminator resistors)
	1	816492A 1	Horn Assembly
Package B – Single Engine w/ SC1000 System Tachometer			
	Quantity Req'd	Part Number	Description
Choose		79–879897K 1	SC 1000 System Tachometer – Gray face
Only One		79–879897K11	SC 1000 System Tachometer – White face
Choose		84–879982T20	SC 1000 2RSL 20' Data Harness (2 terminator resistors)
Only One		84–879982T30	SC 1000 2RSL 30' Data Harness (2 terminator resistors)
	1	816492A 1	Horn Assembly
Package C – Single Engine w/ SC1000 System Tachometer & Speedometer			
	Quantity Req'd	Part Number	Description
Choose	1	79–879899K 1	SC 1000 System Tachometer & Speedometer – Gray face
Only One	1	79–879899K11	SC 1000 System Tachometer & Speedometer – White face
	1	84–879981T10	SC 1000R 10' Data Harness (1 terminator resistor)
Choose	1	84–879981T15	SC 1000R 15' Data Harness (1 terminator resistor)
Only One	1	84–879981T20	SC 1000R 20' Data Harness (1 terminator resistor)
	1	84–879981T30	SC 1000R 30' Data Harness (1 terminator resistor)
	1	859318T 1	Terminator Resistor
	1	816492A 1	Horn Assembly
Package D – Single Engine w/ SC5000 System View (Display Only)			
	Quantity Req'd	Part Number	Description
	1	79–879875K 2	SC 5000 System View Display
	1	84–879981T10	SC 1000R 10' Data Harness (1 terminator resistor)
Choose	1	84–879981T15	SC 1000R 15' Data Harness (1 terminator resistor)
Only One	1	84–879981T20	SC 1000R 20' Data Harness (1 terminator resistor)
	1	84–879981T30	SC 1000R 30' Data Harness (1 terminator resistor)
	1	878492T 4	4–way Junction Box
	1	859318T 2	Weather Cap
	1	859318T 1	Terminator Resistor
	1	816492A 1	Horn Assembly
Package E – Dual Engine w/ SC1000 System Monitors			
	Quantity Req'd	Part Number	Description
Choose	2	79–879896K 4	SC 1000 System Monitor – Front Mount
Only One	2	79–879896K 3	SC 1000 System Monitor – Rear Mount
	2	84–879979T 1	SC 1000 System Tachometer/Monitor Harness
	1	84–879981T10	SC 1000R 10' Data Harness (1 terminator resistor)
Choose	1	84–879981T15	SC 1000R 15' Data Harness (1 terminator resistor)
One Per	1	84–879981T20	SC 1000R 20' Data Harness (1 terminator resistor)
Engine	1	84–879981T30	SC 1000R 30' Data Harness (1 terminator resistor)
	1	878492T 4	4–way Junction Box
	2	816492A 1	Horn Assembly

Complete System Packages Cont.

Package F – Dual Engine w/ SC1000 System Tachometers			
	Quantity Req'd	Part Number	Description
Choose Only One	2	79-879897K 2	SC 1000 System Tachometer – Gray face
	2	79-879897K12	SC 1000 System Tachometer – White face
Choose One Per Engine	1	84-879981T10	SC 1000R 10' Data Harness (1 terminator resistor)
	1	84-879981T15	SC 1000R 15' Data Harness (1 terminator resistor)
	1	84-879981T20	SC 1000R 20' Data Harness (1 terminator resistor)
	1	84-879981T30	SC 1000R 30' Data Harness (1 terminator resistor)
	1	878492T 4	4-way Junction Box
	2	816492A 1	Horn Assembly
Package G – Dual Engine w/ SC1000 System Tachometers & Speedometer			
	Quantity Req'd	Part Number	Description
Choose Only One	1	79-879899K 2	SC 1000 Dual System Tachometer & Speedometer – Gray face
	1	79-879899K12	SC 1000 Dual System Tachometer & Speedometer – White face
Choose One Per Engine	1	84-879981T10	SC 1000R 10' Data Harness (1 terminator resistor)
	1	84-879981T15	SC 1000R 15' Data Harness (1 terminator resistor)
	1	84-879981T20	SC 1000R 20' Data Harness (1 terminator resistor)
	1	84-879981T30	SC 1000R 30' Data Harness (1 terminator resistor)
	1	878492T 6	6-way Junction Box
	1	859318T 2	Weather Cap
	2	816492A 1	Horn Assembly
Package H – Dual Engine w/ SC5000 System View (Display Only)			
	Quantity Req'd	Part Number	Description
Choose Only One	1	79-879899K 2	SC 1000 Dual System Tachometer & Speedometer – Gray face
	1	79-879899K12	SC 1000 Dual System Tachometer & Speedometer – White face
Choose One Per Engine	1	84-879981T10	SC 1000R 10' Data Harness (1 terminator resistor)
	1	84-879981T15	SC 1000R 15' Data Harness (1 terminator resistor)
	1	84-879981T20	SC 1000R 20' Data Harness (1 terminator resistor)
	1	84-879981T30	SC 1000R 30' Data Harness (1 terminator resistor)
	1	878492T 6	6-way Junction Box
	1	859318T 2	Weather Cap
	1	816492A 1	Horn Assembly

SECTION 2

RIGGING

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to Paddle Wheel, Oil Tank and Fuel Tank	3	881879A13 - 4.3-6.2 Small Block -	
V6 Rigging Kits 2002 Model Year		For 0-80 Speedometers	11
(Not for use with prior model year engines.) .	4	881879A15 - 496 - For 0-80	
Rigging Prep Kit for Optimax & V6 EFI		Speedometers	11
Single Engine Applications	4	MerCruiser MPI SmartCraft Wiring	
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The SmartCraft SC1000 System Monitor		Temp, Fuel, Tank, Waste Tank and	
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V6 Rigging Kits 2002 Model Year		MerCruiser MCM 496 MAG and	
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Outboard Rigging

Outboard Harness and Sensor Matrix

ENGINE APPLICATIONS	HARNESS	SENSOR	HARNESS AND SENSOR TYPE	P/N
V6 EFI		PITOT SPEED	100 PSI KIT	859210A1
			200 PSI KIT FOR 120 MPH GAUGE	881879A3
V6 EFI AND OPTIMAX		PADDLE WHEEL	TRANSOM MOUNT	859223
			THRU HULL INCLUDING 19 ft HARNESS	883090
			BOAT HARNESS (SPEED, OIL, FUEL)	859743T2
			TRANSOM MOUNT	881931A1
V6 EFI, OPTIMAX AND 30-60 4-STROKE		DEPTH TRANSDUCERS	THRU HULL INCLUDING 10 ft HARNESS WITH CONNECTOR	888828
			THRU HULL INCLUDING 19 ft HARNESS WITHOUT MOUNTED CONNECTOR	881933A1
			THRU HULL INCLUDING 19 ft HARNESS WITH MOUNTED CONNECTOR	888828 1
			IN HULL INCLUDING 10 ft HARNESS WITH CONNECTOR	881932A1
			DIGITAL TRIM SENDER. NEEDS TO BE ADDED ON 2-STROKE EFI AND 3 CYL OPTIMAX	859187-A1
V6 EFI		TRIM		
V6 EFI AND OPTIMAX	FUEL		BOAT HARNESS (SPEED, OIL, FUEL)	859743T2
V6 EFI AND OPTIMAX	OIL		OIL TANK WITH SENSOR	8742A21
			OIL TANK WITHOUT SENSOR	8742A22
			BOAT HARNESS (SPEED, OIL, FUEL)	859743T2

NOTE: Air Temperature sensors and harnesses are included with SmartCraft Display Products.

NOTE: Select aftermarket GPS units can be connected to SmartCraft products-purchased separately.

Kit Summary

Model Year 2002 - Optimax and V6 EFI (Includes Monitor) 879932A2

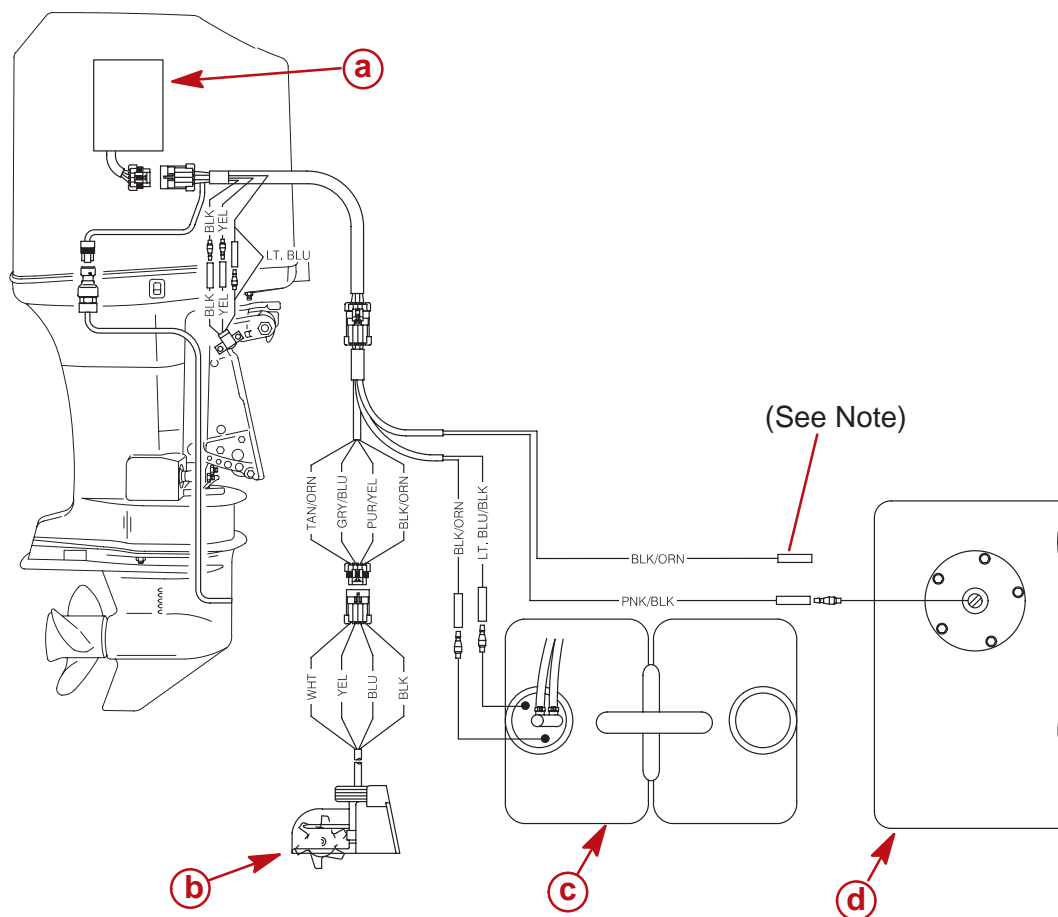
Model Year 2002 and newer - Single Optimax 879934A2

Model Year 2002 - Dual Optimax and V6 EFI 879935A3

Model Year 2002 and newer - 3 Cyl Optimax 891954A01

Model Year 2002 and newer -V6 EFI Rigging Kit
(Includes Trim Sender) 891954A02

Outboard SmartCraft Wiring Connections to Paddle Wheel, Oil Tank and Fuel Tank



- a** - Electronic Control Module (ECM)
- b** - Paddle Wheel Speed and Water Temp Sensor
- c** - Oil Tank
- d** - Fuel Tank

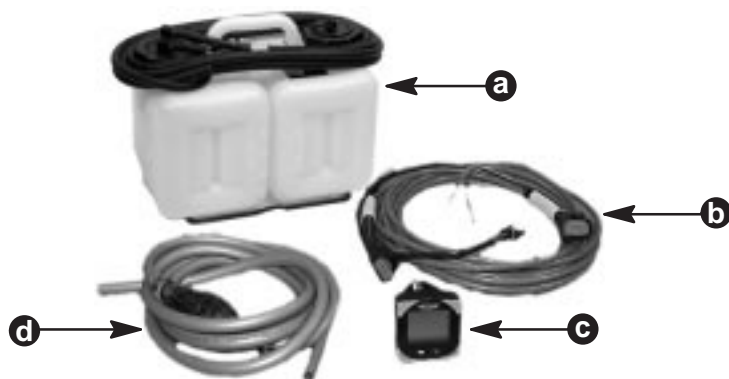
NOTE: If you have a bonded fuel tank, it is important that you **DO NOT** connect the ground (BLACK/ORANGE) to the tank. It should only be grounded if tank is plastic.

V6 Rigging Kits 2002 Model Year

(Not for use with prior model year engines.)

Rigging Prep Kit for Optimax & V6 EFI Single Engine Applications (879932A2)

For use with 2002 model year Optimax Outboards - single and dual engine applications. For dual engine applications, purchase two (2) kits. Standard Analog Gauges are not included in this kit and must be purchased separately.



REF.	QTY.	DESCRIPTION	PART NUMBER
a	1	Oil Tank with Oil Level Sender	1257-8742A21
b	1	SmartCraft SC1000-2RSL 9.1 m (30 ft.) Harness	84-879982T30
c	1	SmartCraft System Monitor	79-879896K4
d	1	Fuel Line	32-858610A31
*		For V6 EFI applications add Digital Trim Sender Kit	859187A1

Configurations

The SmartCraft SC1000 System Monitor with standard analog gauges.



The SmartCraft SC1000 System Monitor Displays:

1. RPM, fuel range in miles/kilometers, fuel flow in gallons/liters (reset log for fuel used), water depth (when the SmartCraft depth transducer is connected), engine trim angle, engine hours, temperature, oil level, water pressure, fuel level, battery voltage and Engine Guardian display.
2. The SC 1000 System Monitor will fit into any 52mm (2 1/8 in.) hole pattern.

V6 Rigging Kits 2002 Model Year

(Not for use with prior model year engines.)

Rigging Prep Kit for Optimax (879934A2)

For use with 2002 model year Optimax and V6 EFI Outboards - single engine applications. Gauges and the Paddle Wheel Speed Sensor option (859223) are not included in this kit and must be purchased separately.



REF.	QTY.	DESCRIPTION	PART NUMBER
a	1	Oil Tank with Oil Level Sender	1257-8742A21
b	1	SmartCraft SC1000-2RSL 9.1 m (30 ft.) Harness	84-879982T30
c	1	Harness to Oil, Fuel and Paddle Wheel	84-859743T2
d	1	Fuel Line	32-858610A31
*	1	For V6 EFI applications add Digital Trim Sender Kit	859187A1

Configurations

Use this Rigging Kit for any of these SmartCraft configurations.



SmartCraft System Monitor with System Link Gauges



SmartCraft System Tachometer with optional System Link Gauges



SmartCraft System Tachometer and System Speedometer with optional System Link Gauges
NOTE: Paddle Wheel Speed Sensor option sold separately (859223)



SmartCraft System View with optional System Link Gauges
NOTE: Paddle Wheel Speed Sensor option sold separately (859223)

V6 EFI Rigging Kits 2002 Model Year

(Not for use with prior model year engines.)

Rigging Prep Kit (891954A02)

For use with 2002 model year V6 EFI Outboards - single engine applications. Gauges and the Paddle Wheel Speed Sensor option (859223) are not included in this kit and must be purchased separately.

QTY	DESCRIPTION	PART NUMBER
1	Oil Tank without Oil Level Sender	1257-8742A22
1	Trim Sender	859187A1
1	SC1000 - 2RSL Harness	84-879982T25
1	Harness Assembly	84-859743T2

Configurations

Use this Rigging Kit for any of these SmartCraft configurations.



SmartCraft System Monitor with System Link Gauges



SmartCraft System Tachometer with optional System Link Gauges



SmartCraft System Tachometer and System Speedometer with optional System Link Gauges

NOTE: Paddle Wheel Speed Sensor option sold separately (859223)



SmartCraft System View with optional System Link Gauges

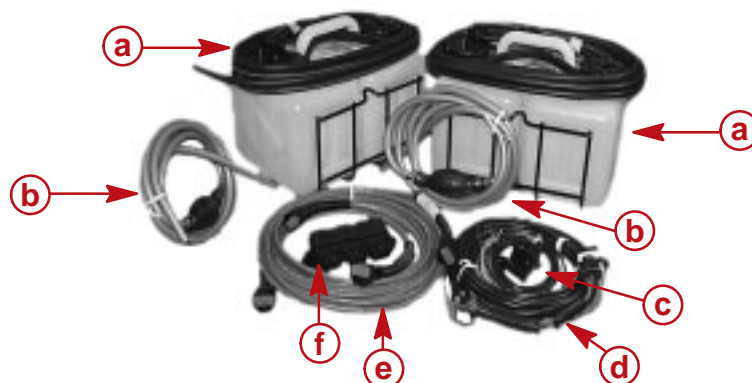
NOTE: Paddle Wheel Speed Sensor option sold separately (859223)

V6 Rigging Kits 2002 Model Year

(Not for use with prior model year engines.)

Rigging Prep Kit for Optimax & V6 EFI Dual Engine Applications (879935A3)

For use with 2002 model year Optimax and V6 EFI Outboards - dual engine applications. Gauges are not included in this kit and must be purchased separately.



REF.	QTY.	DESCRIPTION	PART NUMBER
a	2	Oil Tank with Oil Level Sender	1257-8742A21
b	2	Fuel Line	32-858610A31
c	1	Speed/Temp Sender	859223
d	2	Harness to Oil, Fuel and Paddle Wheel	84-859743T2
e	2	SC1000R-30 9.1 m (30 ft.) Harness	84-879981T30
f	1	Six Plug Junction Box	878492T6
-	1	Weather Cap	859318A2
-	1	Connector with three (3) Caps	881175A1
-	1	Connector with three (3) Caps	881176A1
*	2	For V6 EFI applications add Digital Trim Sender Kit	859187A1

Configurations

Use this Rigging Kit to connect 2002 Model Year Optimax or V6 EFI with System Tach and Speed, System View and Monitor.



Two (2) System Tachometers, one (1) System Speedometer and optional System Link gauges.

NOTE: There are numerous SmartCraft configurations - the above is only an example.)

Mercury Harness and Sensor Matrix

ENGINE APPLICATION	SENSOR	HARNESS	P/N
MCM 4.3 MPI V6 5.0, 350 MAG MX 6.2 SMALL BLOCK ALPHA OR BRAVO	STEERING AND PITOT		863188A3
		TRANSOM HARNESS (REQUIRED)	863931A1
	FUEL	FUEL TANK HARNESS	864218
	STEERING ONLY (18 FT HARNESS)		863188A5
	PITOT ONLY (80 MPH) (1)		881879A13
	PADDLE WHEEL SPEED/SEA TEMP (CHOOSE ONLY 1)		
	TRANSOM MOUNT		859223
	THRU-HULL		883090
	DEPTH TRANSDUCER (CHOOSE ONLY 1)		
	TRANSOM MOUNT		881931A1
	IN-HULL, PLASTIC		881932A1
	THRU-HULL, PLASTIC 10 FT		888828
	THRU-HULL, PLASTIC 19 FT		888828 1
	THRU-HULL, BRONZE		884207A1
MCM 496 MAG AND 496 MAG HO	STEERING AND PITOT		863188A3
		EXTENSION 10 FT, 10-PIN (2)	863872A1
	FUEL	FUEL TANK HARNESS	864218
	STEERING ONLY (18 FT HARNESS)		863188A5
	PITOT ONLY (80 MPH) (1)		881879A15
	PADDLE WHEEL SPEED/SEA TEMP (CHOOSE ONLY 1)		
	TRANSOM MOUNT		859223
	THRU-HULL		883090
	DEPTH TRANSDUCER (CHOOSE ONLY 1)		
	TRANSOM MOUNT		881931A1
	IN-HULL, PLASTIC		881932A1
	THRU-HULL, PLASTIC 10 FT		888828
	THRU-HULL, PLASTIC 19 FT		888828 1
	THRU-HULL, BRONZE		884207A1
MIE AND TOW SPORT	STEERING AND PITOT		863188A3
		TRANSOM HARNESS (REQUIRED)	863931A1
		EXTENSION 10 FT, 4-PIN (3)	864988
	FUEL	FUEL TANK HARNESS	864218
	STEERING ONLY (18 FT HARNESS) (4)		863188A5
	PITOT ONLY (80 MPH) (1,5)		881879A13
	PADDLE WHEEL SPEED/SEA TEMP (CHOOSE ONLY 1)		
	THRU-HULL		883090
	DEPTH TRANSDUCER (CHOOSE ONLY 1)		
	IN-HULL, PLASTIC		881932A1
	THRU-HULL, PLASTIC 10 FT		888828
	THRU-HULL, PLASTIC 19 FT		888828 1
	THRU-HULL, BRONZE		884207A1

FOOTNOTE

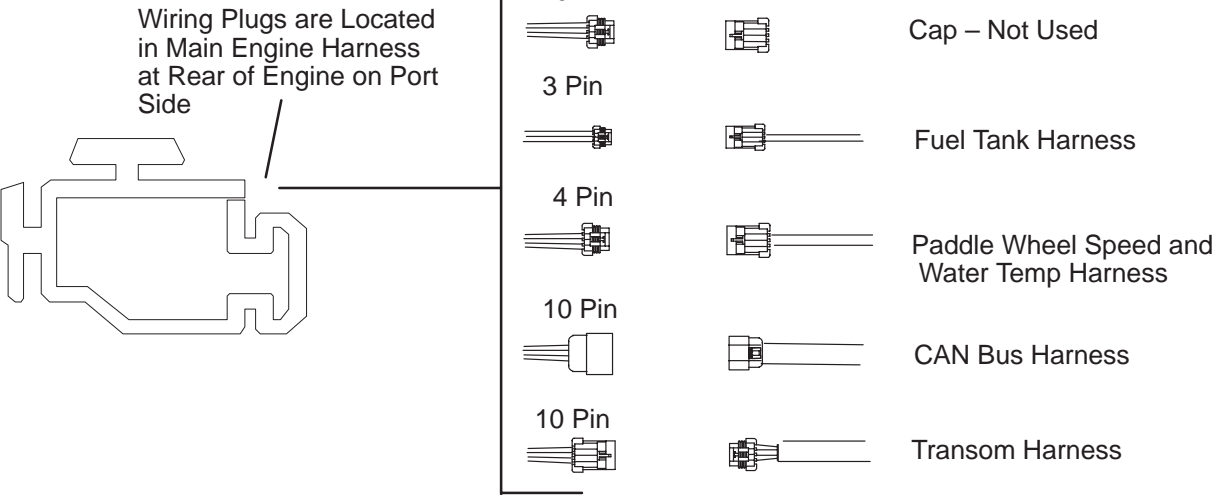
1. MCM Driveshaft Extension(DSE) Applications Require additional speedometer hose (P/N 54950-25, 25 ft, or 54650-53, 53 ft.)
2. For Driveshaft Extension Applications only.
3. This harness can be used as an extension harness for all Steering and/or Pitot Speed Sensors, Paddle Wheel Speed Sensors, and Depth Finder Transducers.
4. Requires additional Steering Sensor linkage not available from Mercury Marine.
5. MIE & Tow Sports Applications require a separate pitot speedometer pick-up and additional speedometer hose (P/N 54950-25, 25 ft or 54650-53, 53 ft.)

IN-HULL TRANSDUCER -Glues to the inside of the hull.

THRU-HULL TRANSDUCER -Mounts through a 2 in. hole in the hull.

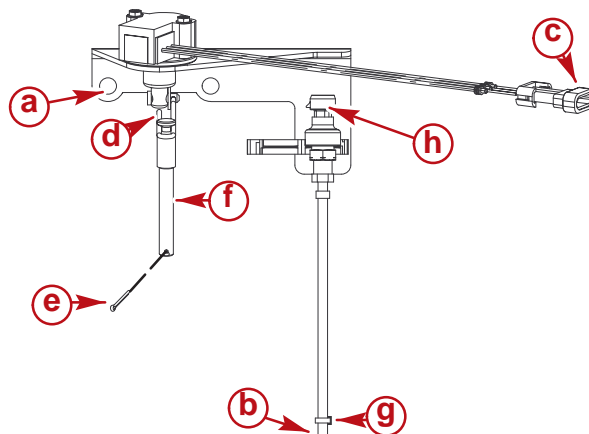
TRANSOM MOUNT TRANSDUCER -Are used for Sterndrive and Outboard applications and mount to the outside of the transom.

MerCruiser MPI Engine Harness Connections for SmartCraft



863188A3**SENSOR STEERING/PITOT ASSEMBLY
MERCUISER ONLY****863188A5****STEERING ANGLE KIT ALSO AVAILABLE****For Mercruiser MPI Engines Smart-Craft Application**

This assembly mounts to the two studs of the inner transom plate. It contains the steering position sensor (hall effect) and the speedometer pressure transducer that mounts directly to the pitot tube. In the kit is a new clevis pin for steering for the guide to mount to that drives the sensor. This replaces the old clevis pin.

Installation

77442

- a** - Transom Stud Holes
- b** - Pitot Tube Connection
- c** - Plug
- d** - Guide
- e** - Cotter Pin
- f** - Clevis Pin
- g** - Sta-strap
- h** - Pitot Sensor (Pitot Sensor only kit is also available)

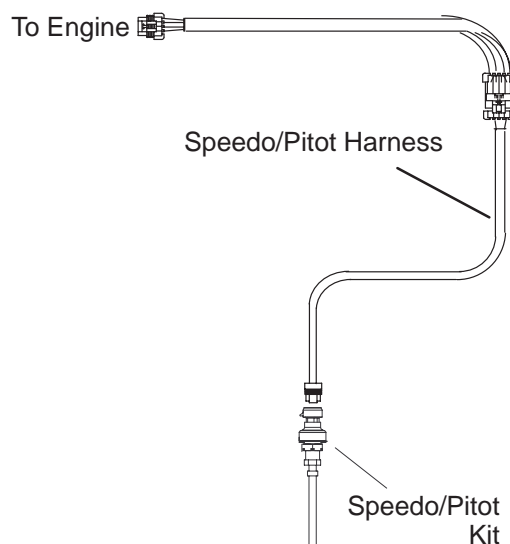
1. Take 2 nuts off of upper 2 transom studs.
2. Remove cotter pin.
3. Remove and discard clevis pin.
4. Replace clevis pin with the new clevis pin.
5. Slide guide over the clevis pin and bolt to transom.
6. Attach pitot tube and sta-strap.
7. Plug sensor into transom harness.

SPEEDO/PITOT SENSOR KITS

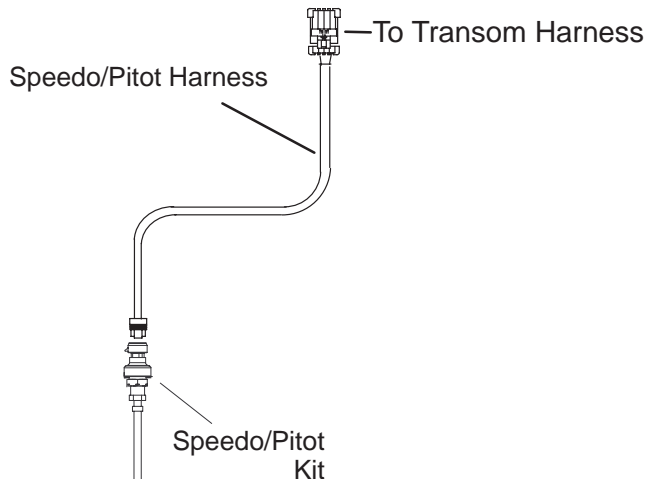
For Mercruiser MPI Engines SmartCraft Application

100 PSI Speedo/Pitot Sensor Kits

881879A13 - 4.3-6.2 Small Block - For 0-80 Speedometers

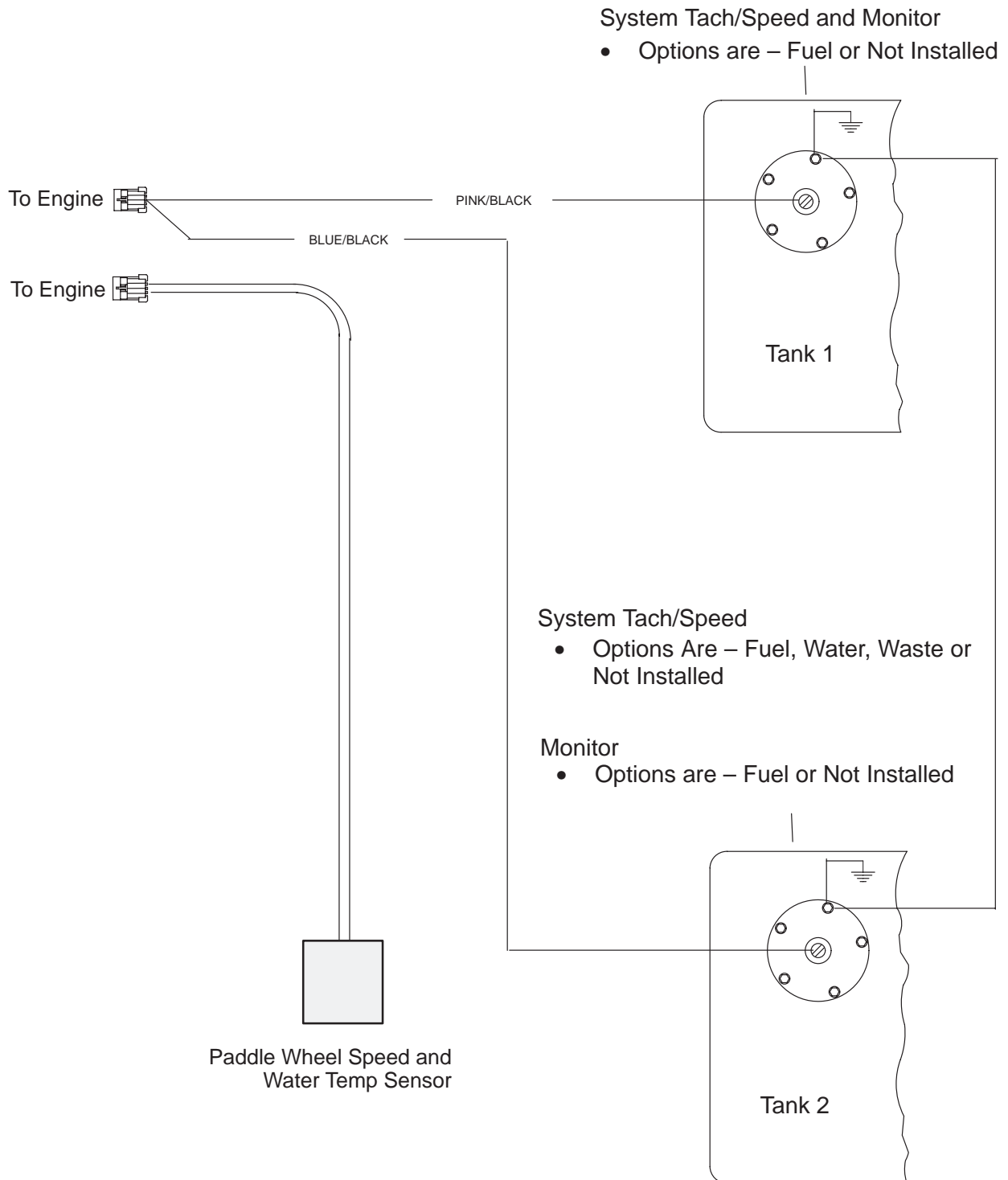


881879A15 - 496 - For 0-80 Speedometers

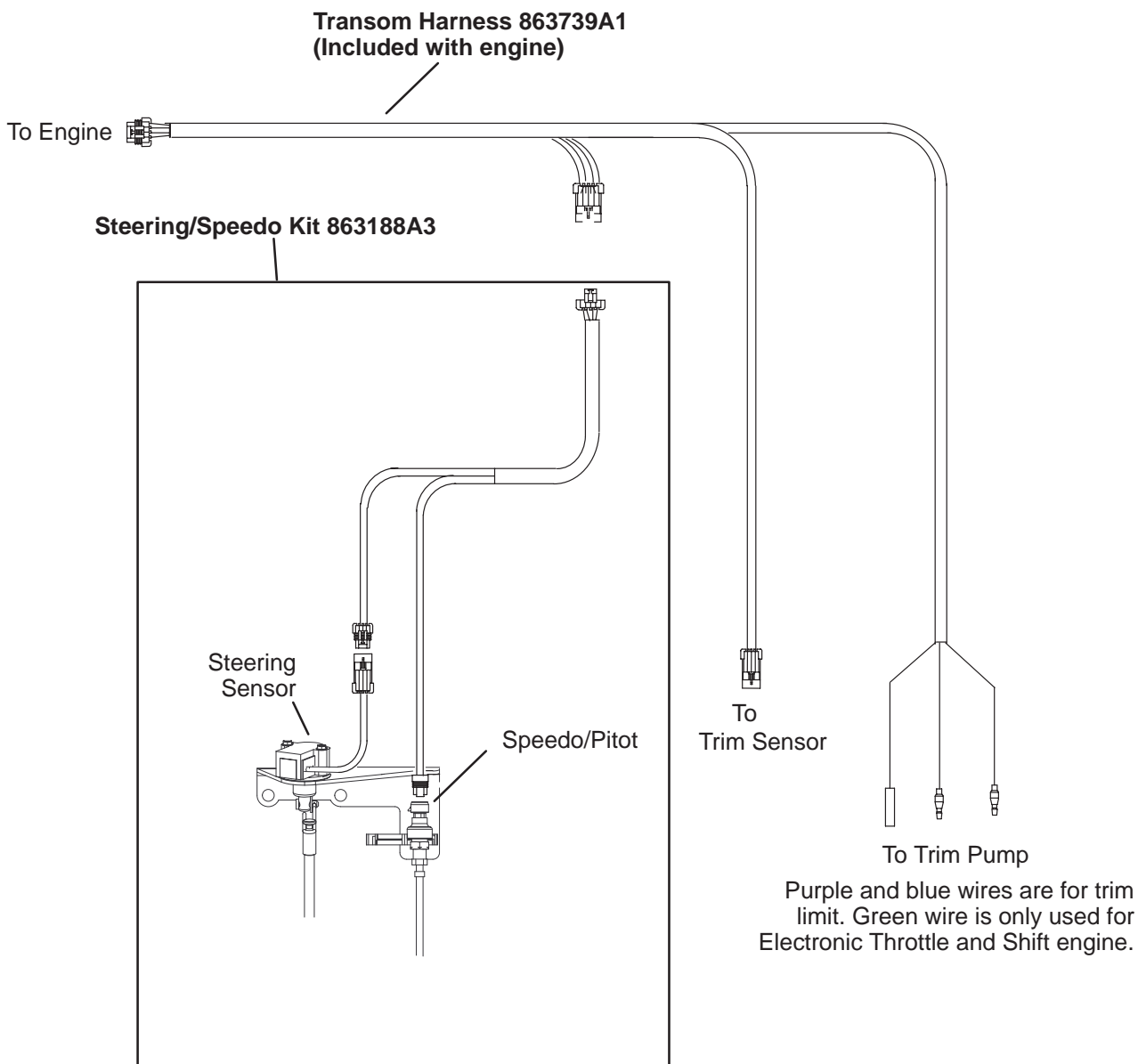


NOTE: Use replacement 200 PSI Speedo/Pitot Sensor 881879A6 with either kit for 0-120 Speedometers.

MerCruiser MPI SmartCraft Wiring Connections to Paddle Wheel, Water Temp, Fuel, Tank, Waste Tank and Water Tank



MerCruiser MCM 496 MAG and 496 MAG HO SmartCraft Wiring Connections to Steering/Pitot Sensors, Trim Sensor and Trim Pump

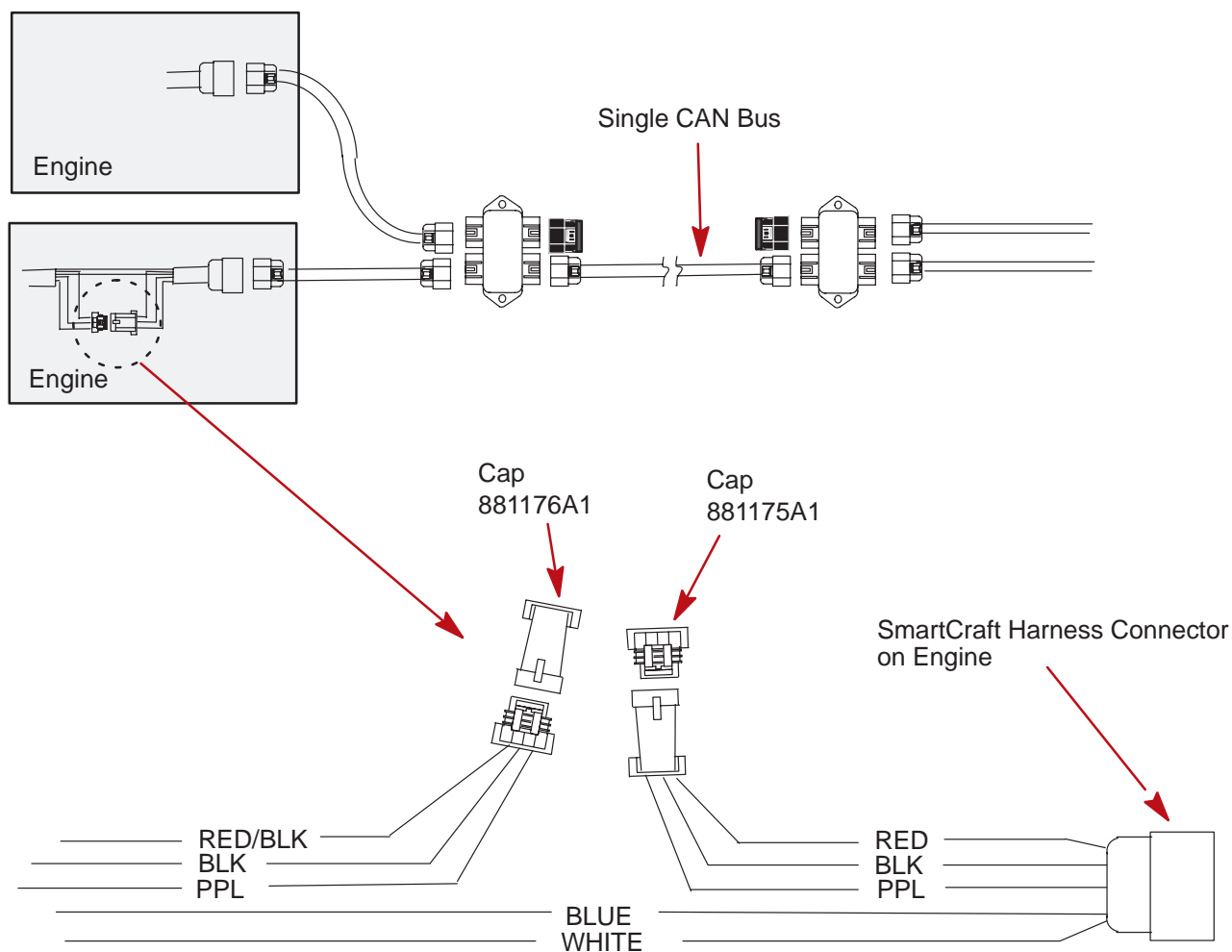


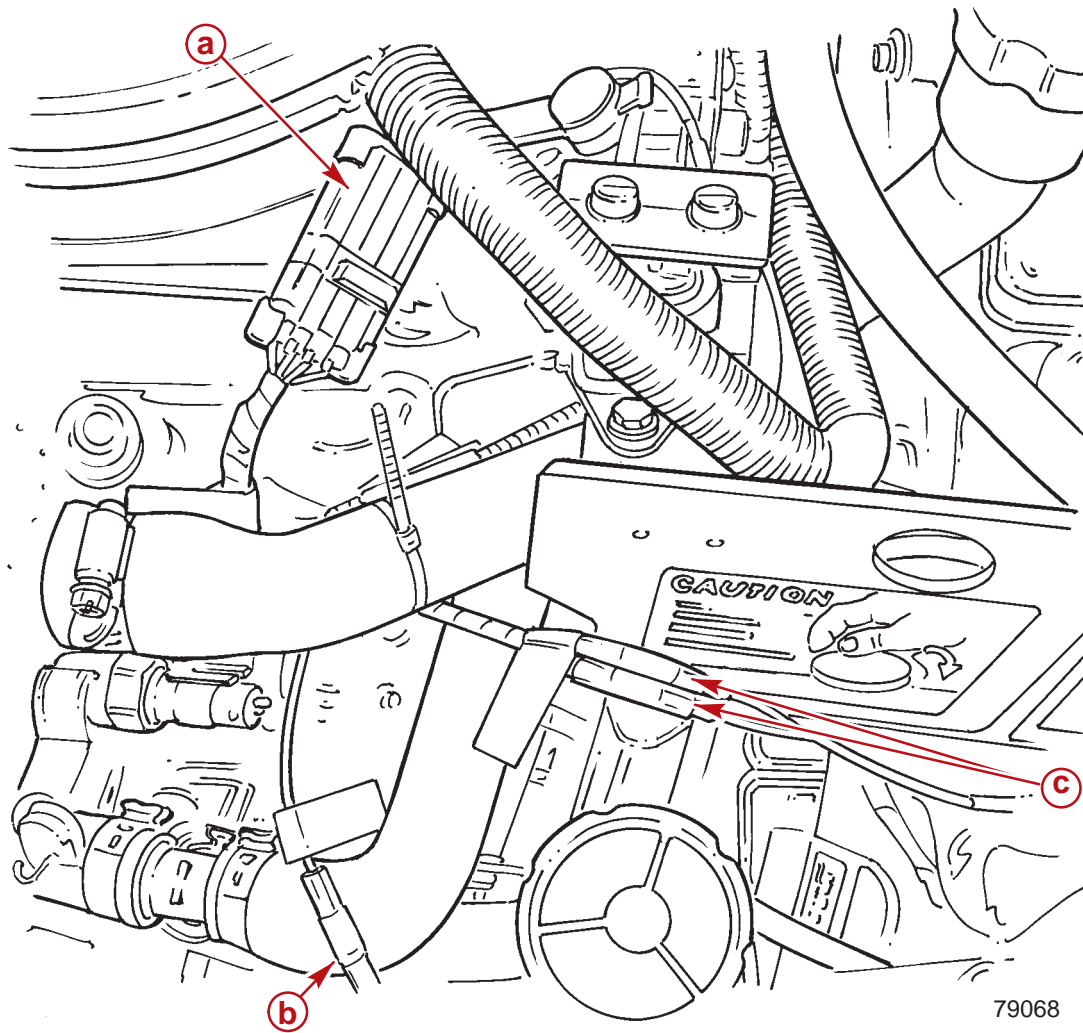
MerCruiser Rigging

Wiring Installation Guidelines

WIRING DISCONNECT FOR MULTIPLE ENGINES WITH SINGLE CAN BUS

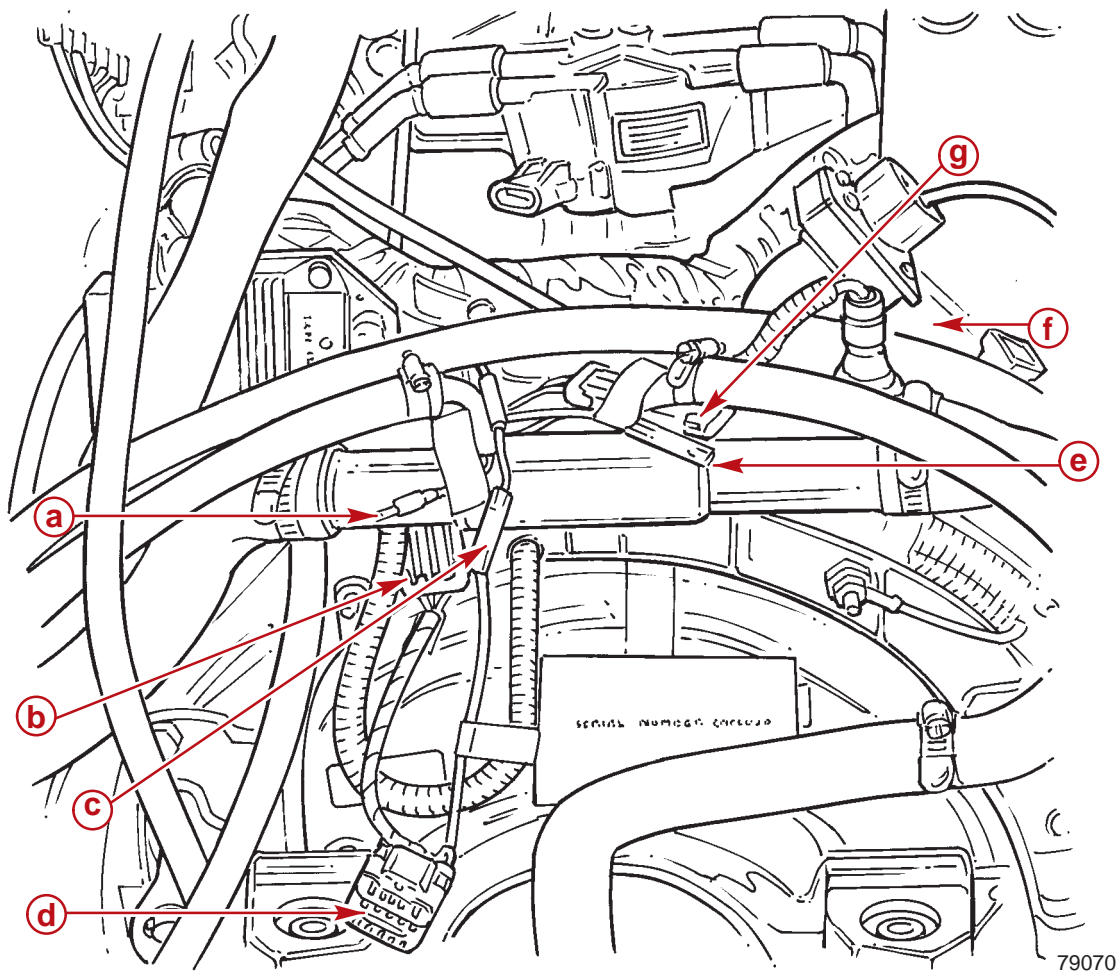
Each CAN Bus must only be powered from one engine. On dual engine installations using a common CAN Bus (as shown), the CAN Bus power (3 wire) connector on one of the engines must be disconnected. The CAN Bus power connector is located in the engine wiring approximately 3 in. from the SmartCraft Harness connector. Seal both ends of the power connector with caps. On triple engine installations, the CAN Bus power connector must be disconnected on 2 engines.



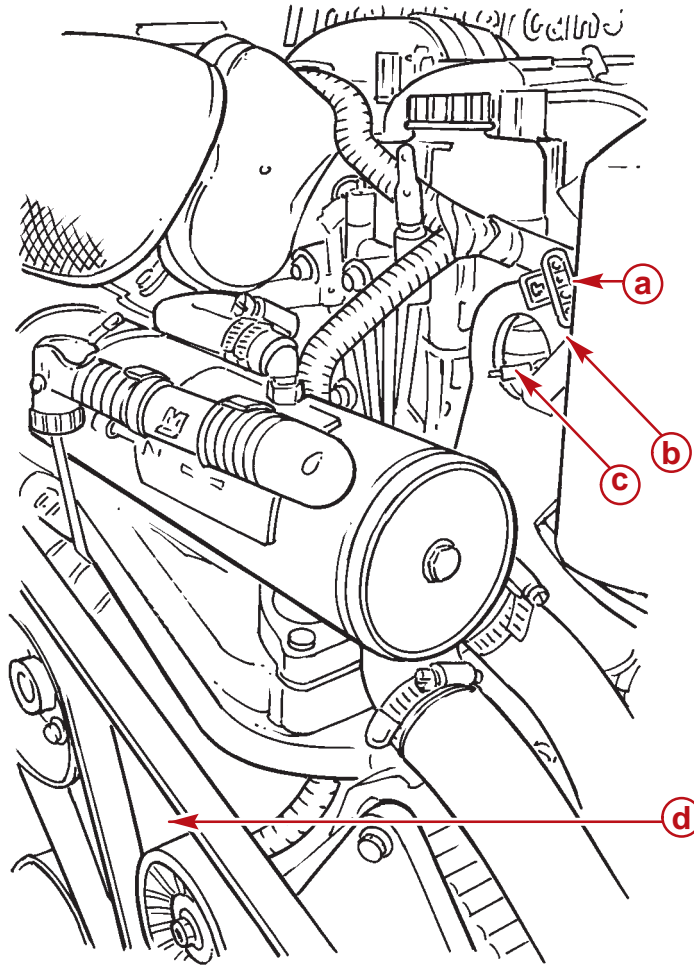
4.3L MPI, 5.0L MPI, 350 MAG MPI, MX6.2 MPI (Front)

79068

- a** - Diagnostic connector
- b** - Tach
- c** - Gear lube monitor

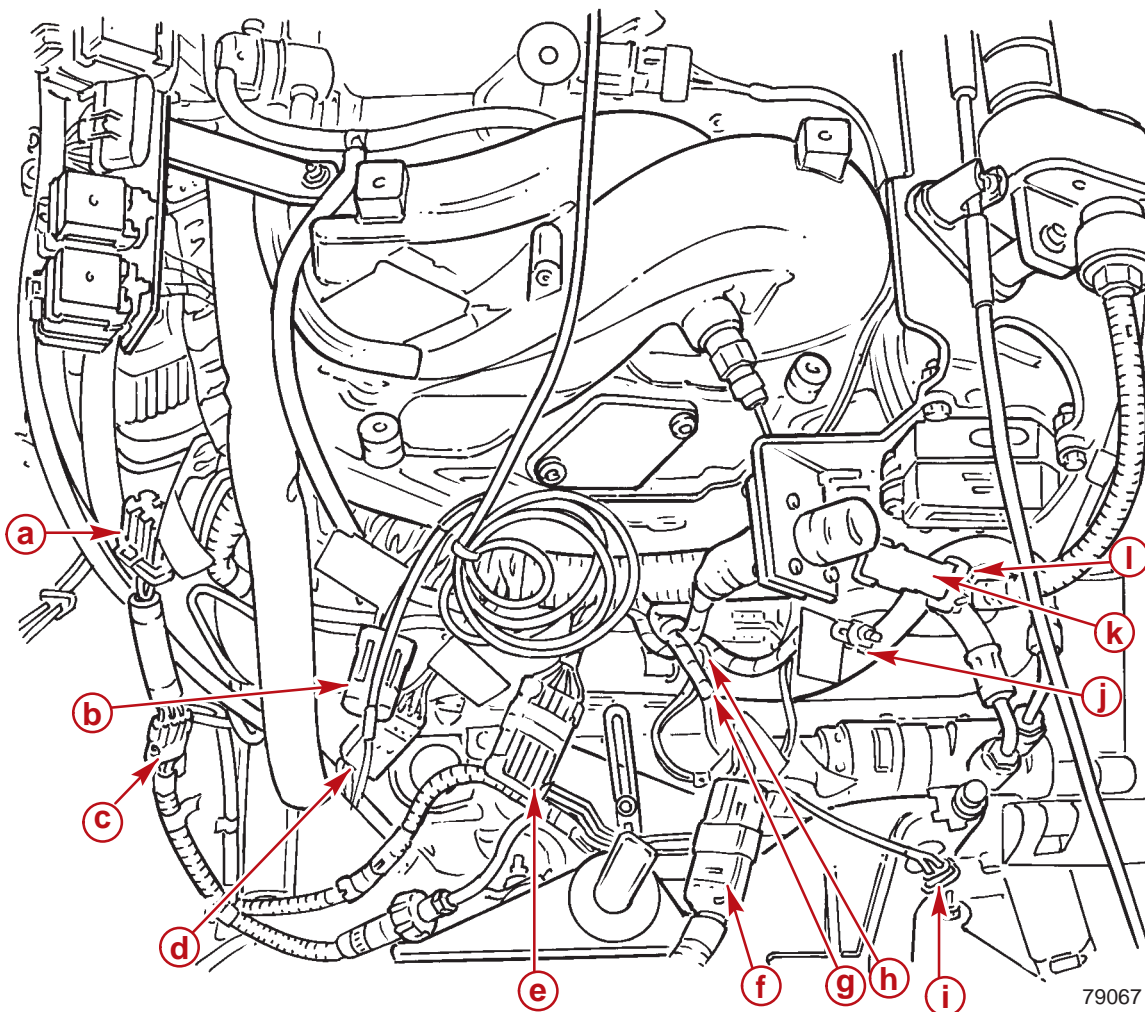
4.3L MPI, 5.0L MPI, 350 MAG MPI, MX6.2 MPI (Rear)

- a** - Trim / transmission overtemperature ground
- b** - Digital trim
- c** - Multi-engine power disconnect
- d** - CAN line
- e** - Analog trim
- f** - Transom harness (not visible)
- g** - Not labeled (has jumper)

496 MAG MPI (Front)

79069

- a** - Depth or diagnostic connector
- b** - Tach (not visible)
- c** - Gear lube
- d** - CPS (not visible)

496 MAG MPI (Rear)

- a** - Transom
- b** - Steering/speed/pitot
- c** - Fuel 1 and 2
- d** - Paddlewheel
- e** - Tabs
- f** - CAN line
- g** - Transmission
- h** - CHL power
- i** - Trim
- j** - Overtemp
- k** - Multi-engine power disconnect
- l** - Shift

SECTION 3

GAUGE INSTALLATION

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Wiring for SmartCraft Gauges

Requirements

SmartCraft communications are via the Controller Area Network (CAN), electrically implemented on a twisted pair of wires. signals. Note: SmartCraft harnesses include other wires besides CAN.

The maximum distance between any two modules on the SmartCraft bus is 40 meters (130 feet). This distance is calculated as the total harness length between the modules (trunk length plus drop lengths).

There should be exactly two termination resistors on the CAN bus.

No more than 20 modules may be connected to the bus. This is the maximum number of connections supported by the engine control module software.

Installation Guidelines

SmartCraft installations should use Mercury Marine harnesses and junction boxes. This assures a robust mechanical implementation as well as proper connection of all signals.

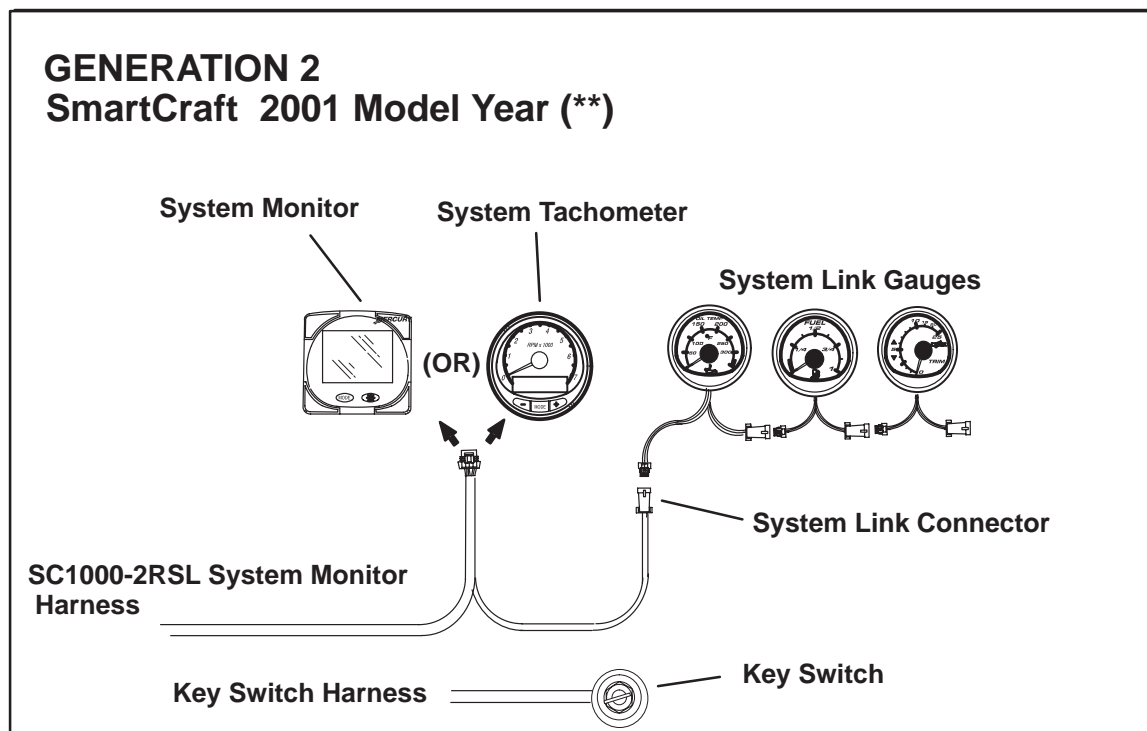
The ideal installation uses a single trunk line with short drops to individual modules. Two termination resistors, one at each end of the trunk line, minimize signal reflections. Signal reflections can increase radio frequency interference and the potential for bit errors on the bus.

The trunk line is not defined by junction boxes. The trunk should be considered to be the distance between the termination resistors. Drops may be at the ends of the trunk line or anywhere else that is convenient for the installation. Note that the trunk line can “loop-back” in some installations.

- The single engine System Monitor example illustrates a trunk line with two drops of essentially zero length, one at the engine and the other at the gauge.
- The single engine System Tach and Speedo example illustrates a trunk line with one zero length drop at the engine and two three foot drops at the gauges.
- The dual engine examples illustrates a 60 foot trunk line with two zero length drops at the engines and two (or three) three foot drops at the gauges.
- The triple engine example illustrates a 45 foot trunk line with a zero length drop at one engine, two 10 foot drops (at the other engines), and four three foot drops at the gauges.
- The trunk line in the single engine dual station example is the length of “a” plus the length of “f” There is a zero length drop at the engine and two three foot drops to the monitors.

SmartCraft Product Rigging Components

Typical System Layouts – Single Engine Product Configurations



* Generation 1 supports SmartTach and SmartSpeed on Optimax engines only.

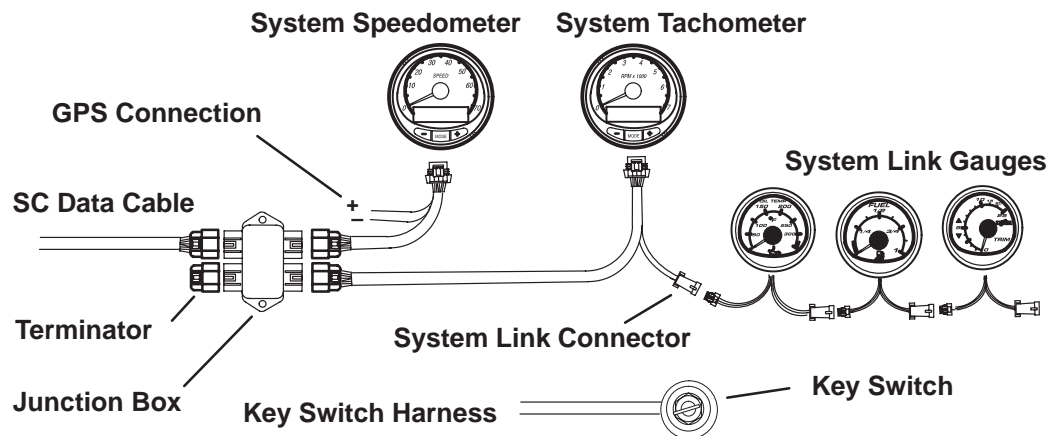
** Generation 2 supports all “System” products, System Tach/Speed, System Monitor and System View on all engines after and including the 2001 model year.

NOTE: Additional products will be compatible with System Tachometer and System Speedometer. Contact your Mercury Marine Sales Department for additional SmartCraft product compatibility and availability.

SmartCraft Product Rigging Components

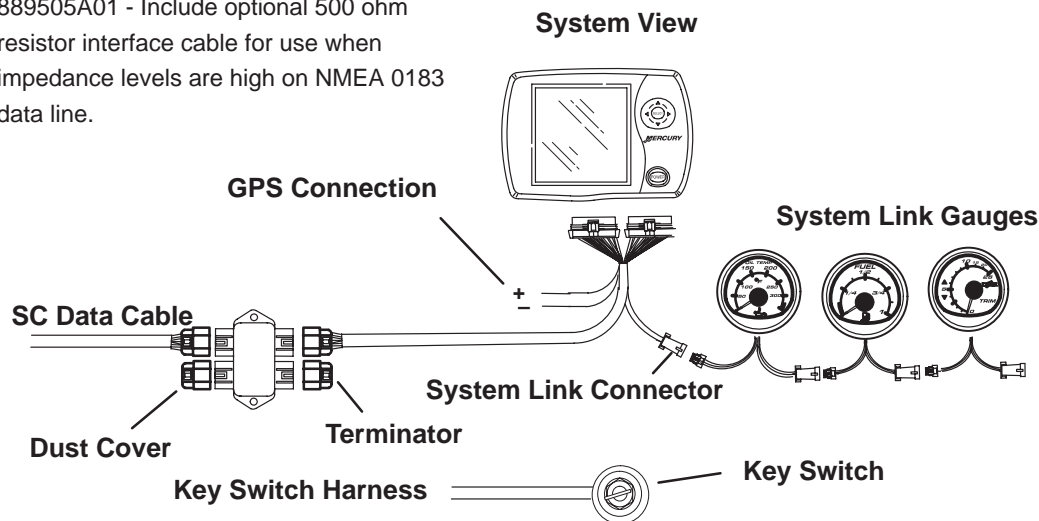
Typical System Layouts – Single Engine Product Configurations

System Speedometer and System Tachometer



System View

889505A01 - Include optional 500 ohm resistor interface cable for use when impedance levels are high on NMEA 0183 data line.

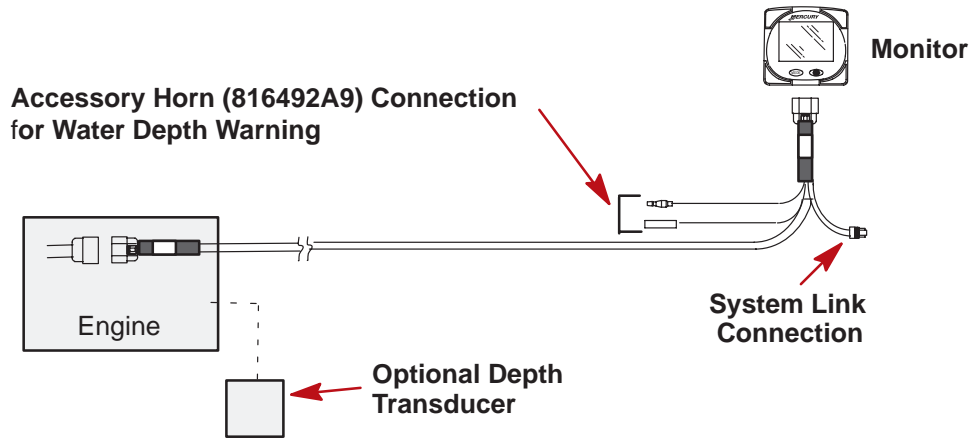


Typical Installation Configurations

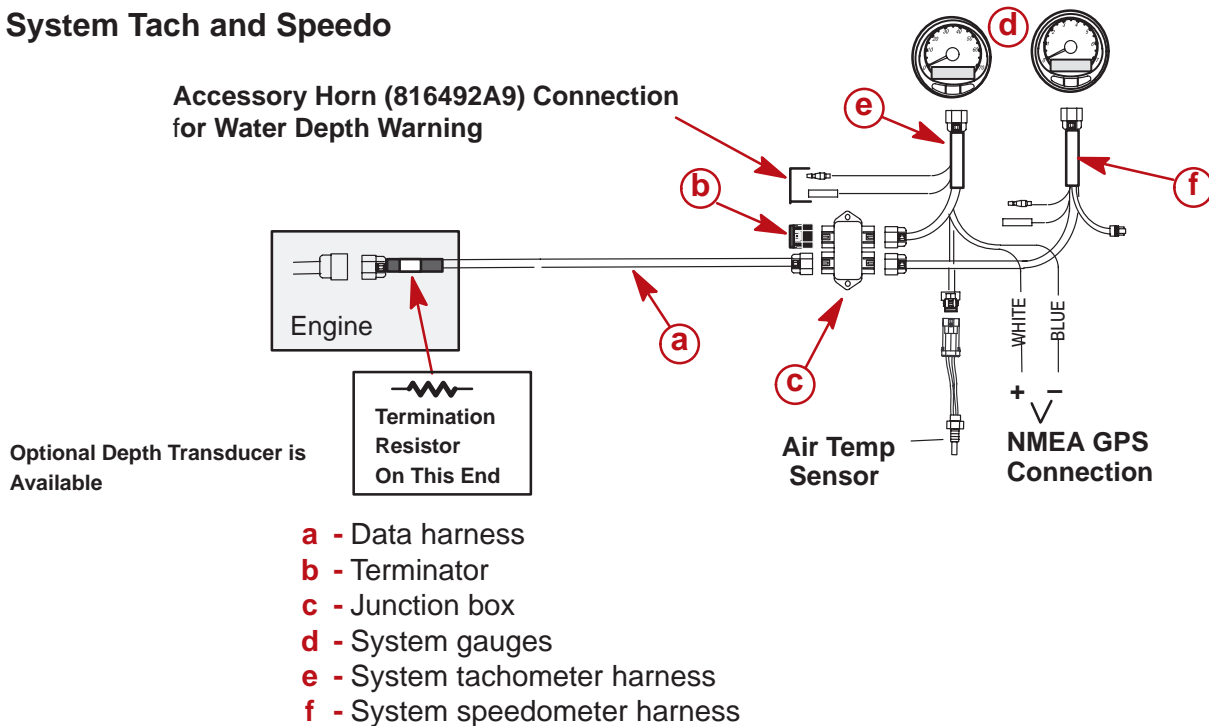
NOTE: The typical installation configurations shown are the lowest cost solutions. Other solutions are also possible.

Single Engine Applications - 2000 and Newer

System Monitor



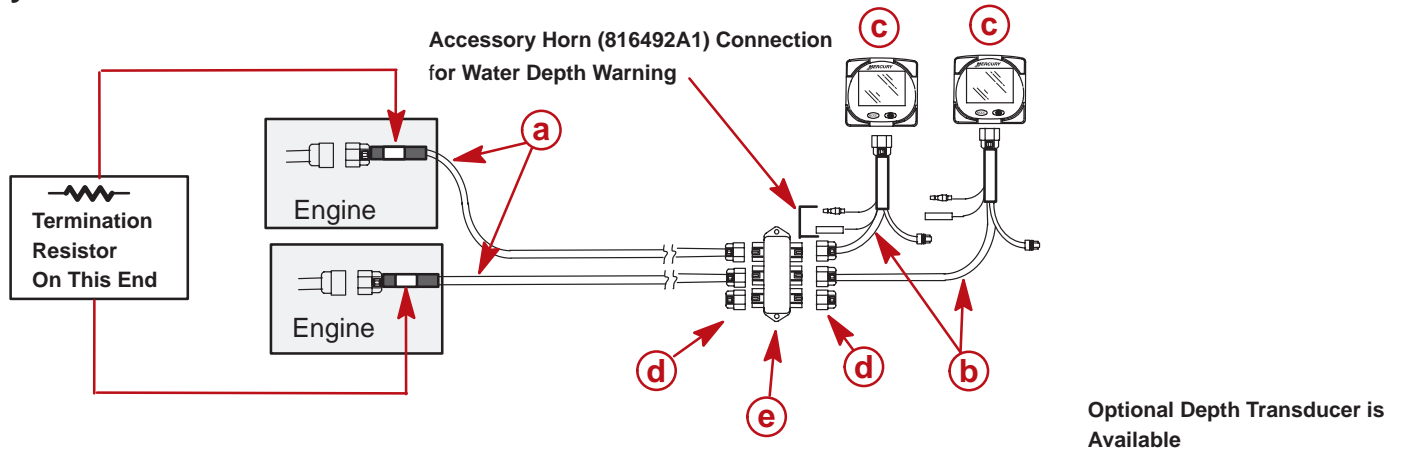
System Tach and Speedo



Typical Installation Configurations

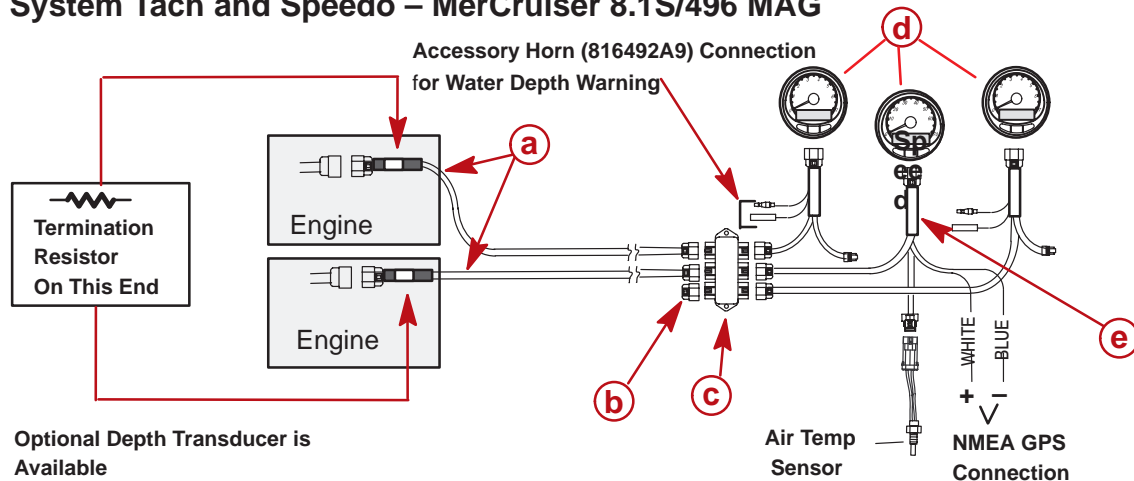
Dual Engine Applications - 2000 and Newer

System Monitor2001



- a** - Data harnesses
- b** - System tach/speed harnesses
- c** - System Monitor
- d** - Weather cap
- e** - Junction box

System Tach and Speedo – MerCruiser 8.1S/496 MAG



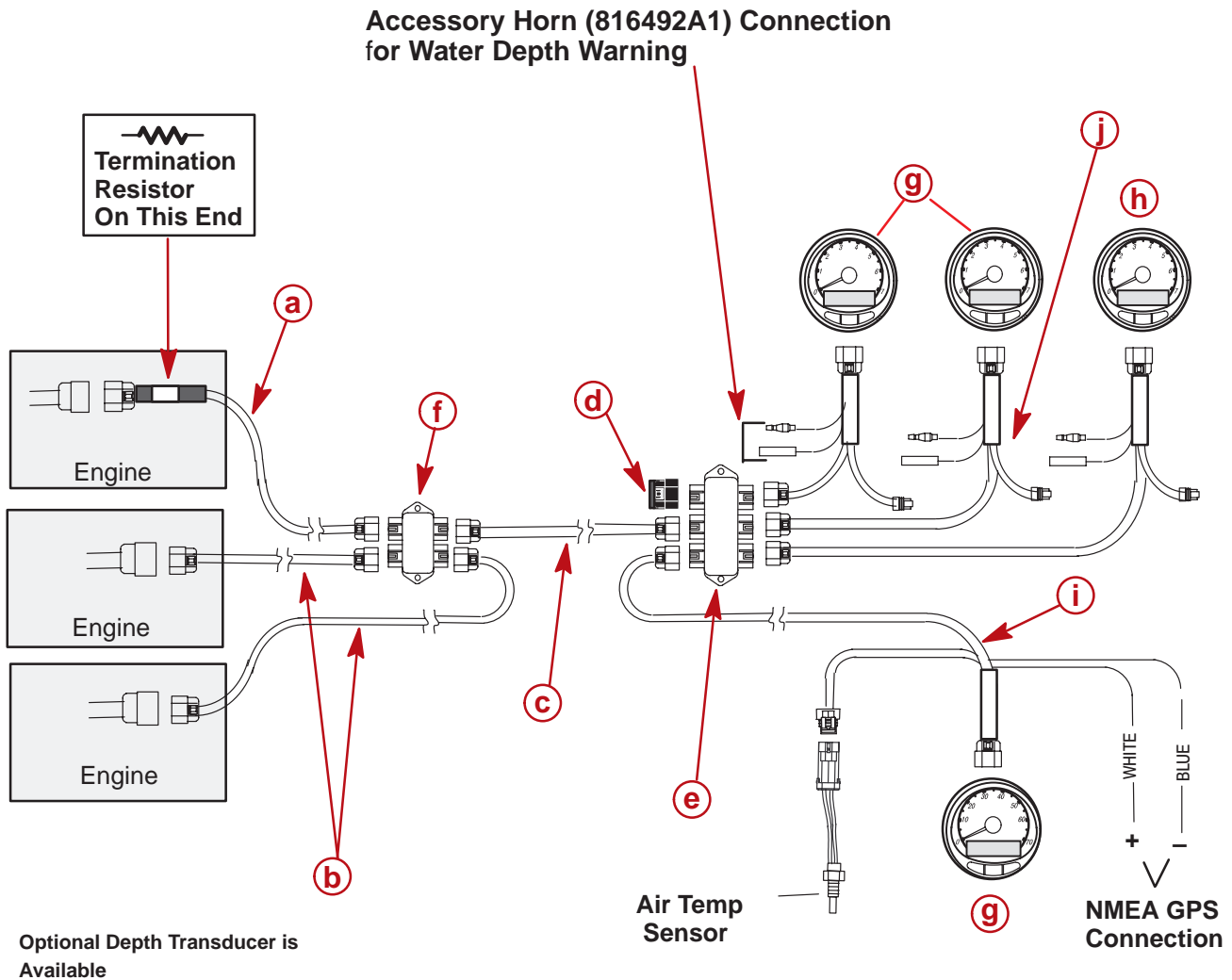
- a** - Data harnesses
- b** - Weather cap
- c** - Junction box
- d** - System gauges
- e** - System gauge harnesses

NOTE: A junction box may be added to connect dual engine installation to single wiring harness running forward to dash. See wiring installation guidelines, page 15.

Typical Installation Configurations

Triple Engine Applications - 2001 and Newer

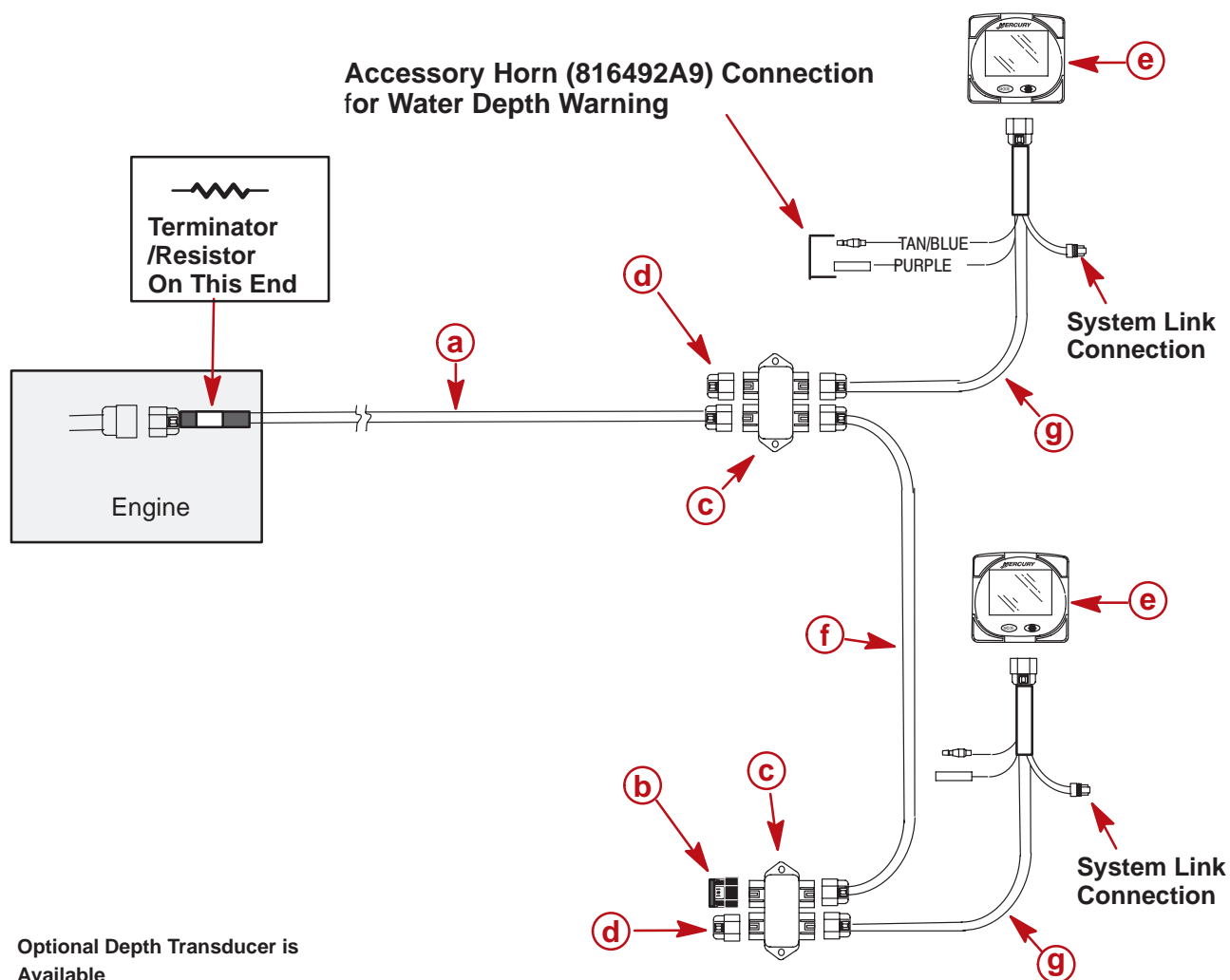
System Tachometer and Speedometer



- a - Data harnesses
- b - Data harnesses
- c - Data harnesses
- d - Terminator
- e - Junction box
- f - Junction box
- g - System tachometer
- h - System tachometer
- i - System speedometer
- j - System tachometer harness

Typical Installation Configurations

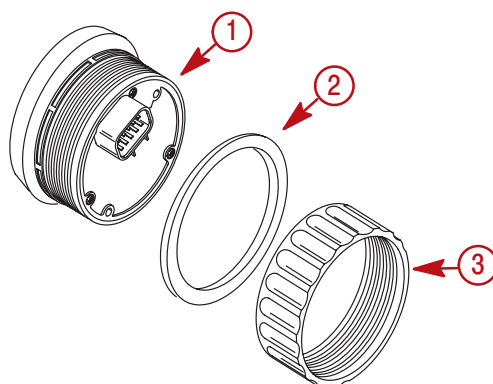
Dual Station



- a** - Data harness
- b** - Terminator
- c** - Junction box
- d** - Weather cap
- e** - System Monitor
- f** - Data harness
- g** - System tach/monitor harness

SMARTCRAFT SYSTEM TACHOMETER INSTALLATION

Components Contained in Kit:



1	Tachometer Gauge	1
2	Seal 85 mm Dia. (12-859656)	1
3	Retainer Nut (11-859073)	1

NOTE: Tachometers shipped in bulk cartons do not contain harness (84-859314A1).

System Tachometer Operation, Calibration and Wiring Instructions

Refer to Instructions in one of the following manuals:

1. Operation, Maintenance and Warranty Manual (provided with engine).
2. Engine Installation Manual (provided with engine).
3. Product Service Manual.

Special Instructions

Clean lens with water only.

Installation Information

WARNING

Disconnect both battery cables at battery before attempting to install gauges

Before cutting any holes, check area behind dashboard for obstructions (braces, cables, wiring, etc.)

CUTTING TIPS

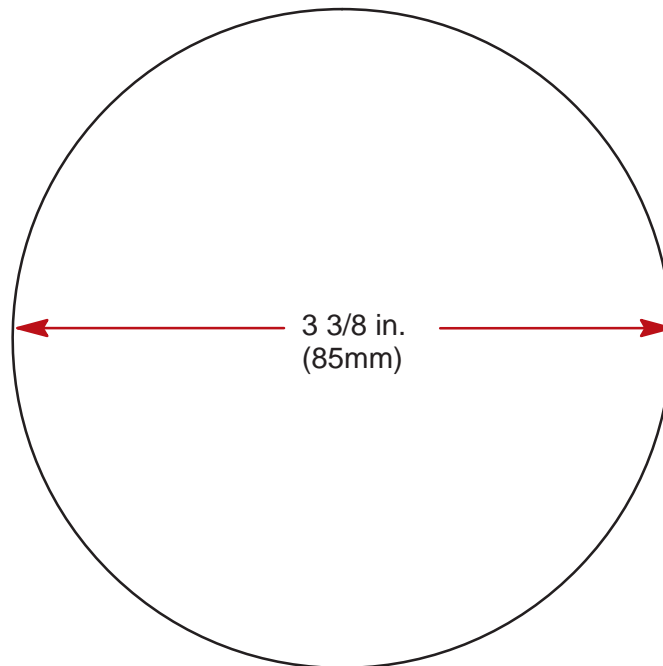
Fiberglass – apply masking tape to area to be cut to prevent dashboard from cracking.

Vinyl Covered – Remove vinyl from area to be cut with razor blade to keep vinyl from tearing.

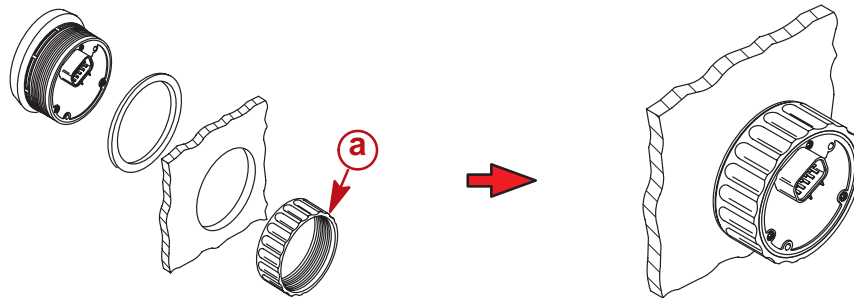
Gauge Installation

1. Select a location for the gauges that affords good visibility and accessibility from behind dashboard.

2. Drill a 3-3/8 in. (85mm) mounting hole using a hole saw.



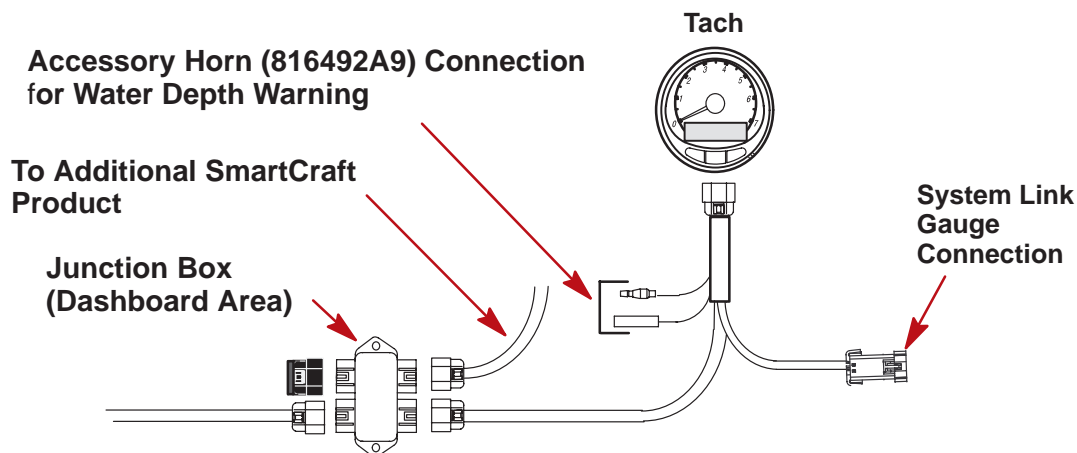
3. Place gauge into dashboard and secure with retainer nut.



a - Retainer Nut

NOTE: For thick dashboards, reverse the retainer nut for additional thread engagement.

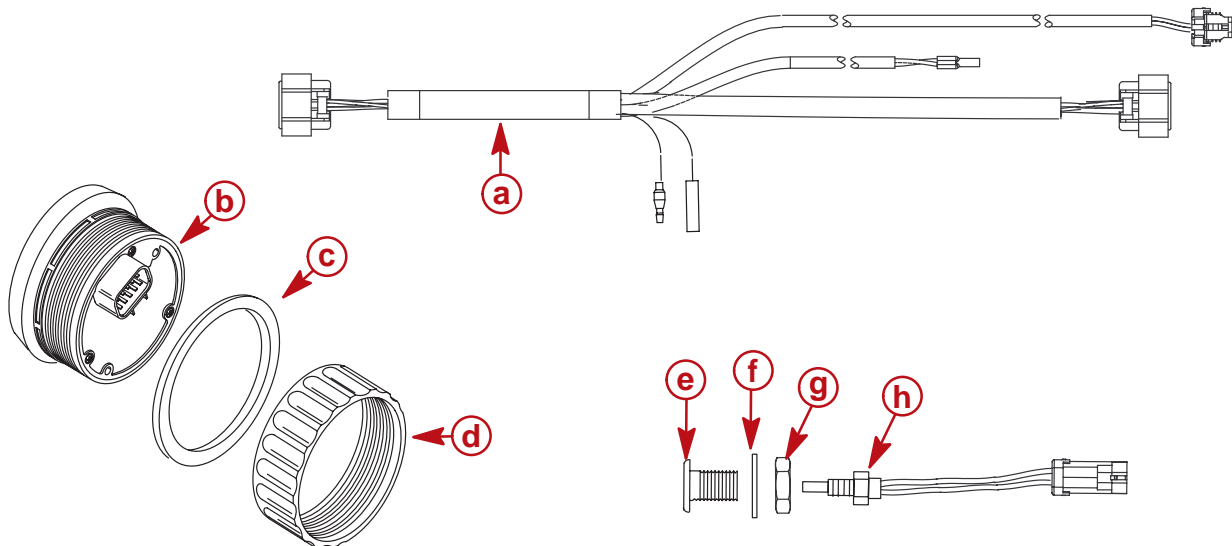
Wiring



NOTE: System Tachometer can also be wired directly to a single engine when a System Speedometer is not being used. Use harness (879982T).

SMARTCRAFT SYSTEM SPEEDOMETER INSTALLATION

Components Contained in Kit:



- a** - Speedometer harness
- b** - Speedometer gauge
- c** - Seal
- d** - Retainer nut
- e** - Mounting adaptor
- f** - Washer
- g** - Nut
- h** - Outside air temperature sensor

Speedometer Operation and Calibration

Refer to Instructions in one of the following manuals:

1. Operation, Maintenance and Warranty Manual (provided with engine).
2. Engine Installation Manual (provided with engine).
3. Product Service Manual

Special Instructions

Clean lens with water only.

Installation Information

WARNING

Disconnect both battery cables at battery before attempting to install gauges

Before cutting any holes, check area behind dashboard for obstructions (braces, cables, wiring, etc.)

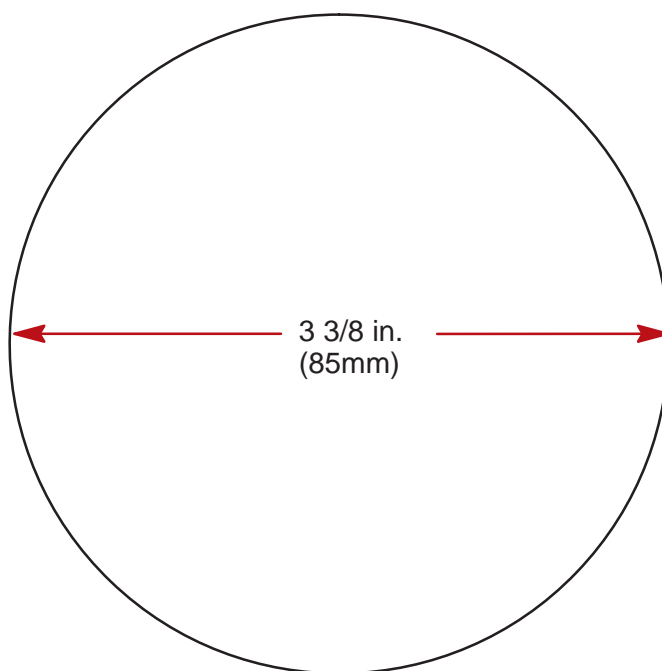
CUTTING TIPS

Fiberglass – apply masking tape to area to be cut to prevent dashboard from cracking.

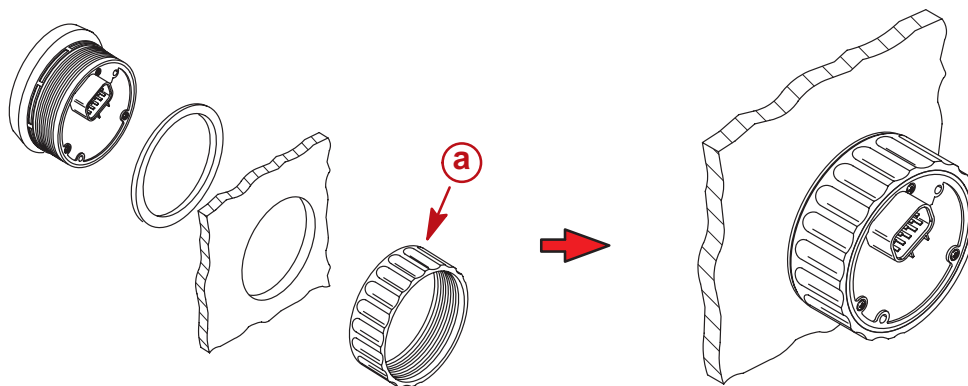
Vinyl Covered – Remove vinyl from area to be cut with razor blade to keep vinyl from tearing.

Gauge Installation

1. Select a location for the gauges that affords good visibility and accessibility from behind dashboard.
2. Drill a 3-3/8 in. (85mm) mounting hole using a hole saw.



3. Place gauge into dashboard and secure with retainer nut.

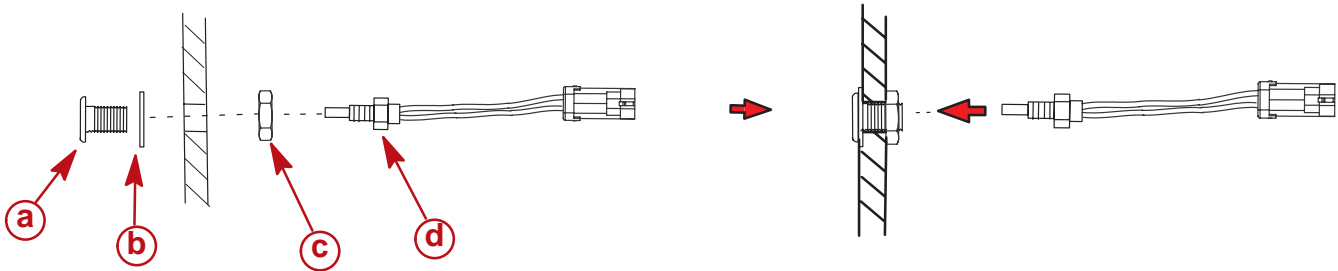


a - Retainer Nut

NOTE: For thick dashboards, reverse the retainer nut for additional thread engagement.

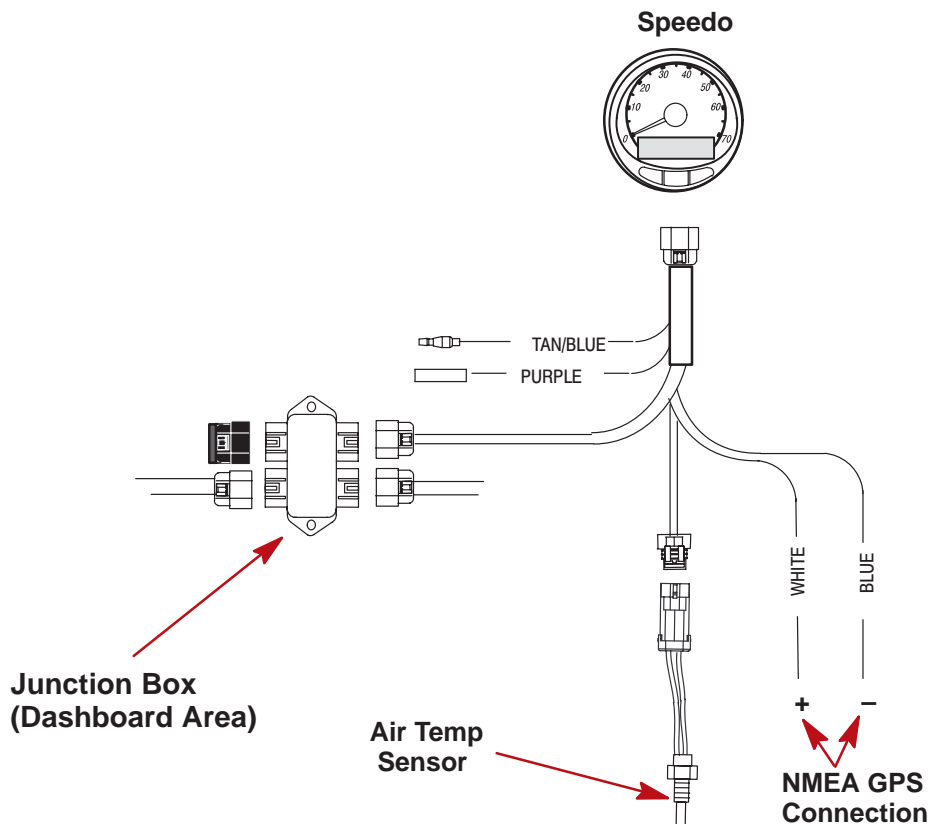
Outside Air Temperature Sensor Installation (Kit 889449A01)

1. Mount the sensor where it will be exposed to outside air and will not be in direct sunlight.
2. Select a location and drill a 3/4 in. (19 mm) mounting hole.
3. Install the mounting adaptor as shown.
4. Thread the air temperature sensor into the mounting adaptor.



- a** - Mounting Adaptor
b - Gasket
c - Nylon Nut
d - Air Temperature Sensor

Wiring Diagram



Connecting GPS Unit to the SmartCraft System Speedometer

The question of connecting GPS to SmartCraft is a commonly asked one. The specific connection is somewhat dependant on the approach to wiring which the GPS supplier uses.

Although this connection requires a little attention to detail, the result will be the display on the SmartCraft gauge of valuable boating information like distance to waypoint (DTW) and fuel to waypoint (FTW), course over ground (COG) and speed over ground (SOG). With the latest System View product, you can even view bearing to waypoint (BTW) and speed to waypoint (STW) on its “Course Up” and “Waypoint Information” screens.

Let’s describe a few key items to keep in mind when connecting your GPS to SmartCraft.

These items include:

1. SmartCraft to GPS wiring
2. GPS output requirements
 - a. NMEA v1.5 vs. v2.0
 - b. Turning off the GSV, and VTG Sentences (on GPS products sending v2.0 to the System Speed gauge)
 - c. We are not compatible with NMEA 2.3 and later
3. Use of termination harness, 84-88951A02 (System View only)

SmartCraft to GPS Wiring

SmartCraft brings in GPS data on the Dark Blue/White tracer wire (Input Data -) and the White/Light Blue tracer wire (Input Data +). Typically your GPS will have a (GPS Data +) and (GPS Data -) wire. In some cases only the (GPS Data +) wire will be provided. In this case, the GPS’s ground (typically Black) wire is used for (GPS Data -) and must be connected to SmartCraft’s Dark Blue/White tracer wire (Input Data -), as well as boat ground.

A typical GPS connection might look like the following:

SmartCraft/Vessel	Connects To	GPS (Garmin example)
Constant 12V (Red)	Connects To	Red 12V Power
Black Boat Ground, and; Dark Blue/White tracer wire (Input Data -)	Connects To	Black Ground (and Yellow may need to be connected if supplied)
White/Light Blue tracer wire (Input Data +)	Connects To	White (GPS Data +)
	Not Used	Blue (GPS Data -)

GPS Output Requirements

SmartCraft is presently compatible with any GPS using the NMEA 0183 format v1.5. Most GPS companies have moved forward to v2.0+. SmartCraft System View is compatible with v2.0+, but due to the length of some portions of the v2.0 sentence SmartCraft SystemSpeed may experience intermittent GPS data loss. To eliminate data loss when using NMEA 0183 v2.0 you may be able to turn off the “GSV” and “VTG” sentences in many of the GPS devices. GSV and VTG are too long for System Speed’s buffer. Turning off GSV and VTG sentences will not have an adverse impact on other data received by System Speed. Our product is not at all compatible with NMEA v2.3+.

We have contacted many of the GPS companies in order to help you identify which products are directly compatible, and which products may need the GSV sentence turned off. The VTG sentence is turned off as default in most GPS products, But you should confirm with the manufacturer.

- **Raymarine:** All product is v2.0+ or later, but all models do give you the option of turning off the GSV, and VTG sentences. Refer to the owner’s manual to turn this sentence off for best performance. Depending on the SmartCraft product used an 84–88951A02 adaptor harness provided by SmartCraft will have to be added.
- **Garmin:** Most display products are v2.0+ or later. For the antenna-only products you can turn the GSV and VTG sentences off by purchasing a software program from Garmin. **[Remember SmartCraft is not compatible with any Garmin product that is v2.3 or later.]** (Garmin 17N)
- **Furuno:** All of the products are configurable to NMEA v1.5. If you choose to v2.0+ you can also turn off the GSV and VTG sentences. If the product is NMEA v2.0 or later you will need to use NMEA v1.5 mode only.
- **Magellan:** All models are v2.0+. Certain models have configurable sentencing. Magellan suggests calling their service department with model number to confirm specification. Remember SmartCraft is not compatible with any Magellan product that is v2.3 or later.
- **Simrad:** All products are v2.0+ or later, but some models give you the option of turning off the GSV sentence. Refer to the owner’s manual and turn this sentence off for best performance. Remember SmartCraft is not compatible with any Simrad product that is v2.3 or later.

Navigation/Fuel Data Screens

IMPORTANT: This device is intended as a navigation aid and should not take the place of paper charts. A careful navigator never relies on one method to obtain position information.

NOTE: For use of the navigation screens, your vessel must include a GPS receiver with NMEA 0183 V1.5 or V2.0+ output and be connected to the System View.

The System View features two different navigation screens: Vessel Course and Next Waypoint Data. Next waypoint data provides course guidance to a destination waypoint, if programmed into your GPS navigation electronics.

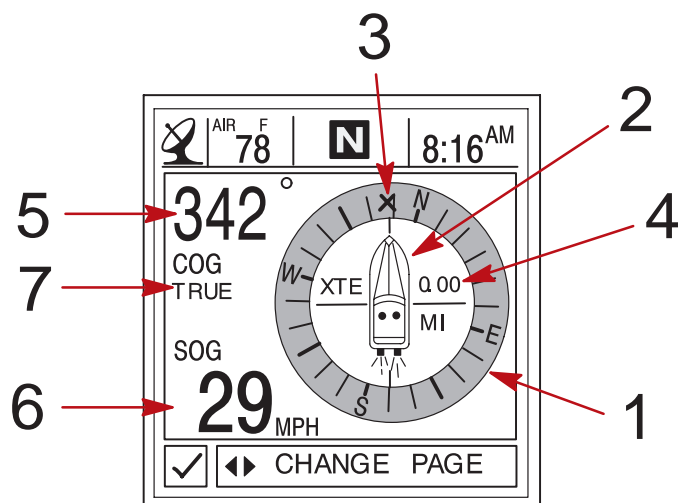
SCREEN # 1 – VESSEL COURSE – COURSE UP

This vessel course – course up screen has a rotating compass ring that not only shows your direction of travel, but also the direction to a targeted waypoint. When you are not navigating to a waypoint, the compass will show your direction of travel. The boat pointer in the center of the compass ring shows current direction.

When a waypoint is set using a separate GPS unit, an X mark will appear on the compass ring. This X mark will indicate your waypoint. For instance, if the X mark lines up with the center of the boat pointer, you are going directly to the waypoint. If the boat pointer does not line up with the X mark, steer toward the X mark until it lines up with the center of the boat pointer– then continue in this direction until you reached your current target waypoint.

The middle of the compass shows the current cross track error (XTE). This is the distance you are off-course relative to the desired course.

Anytime a compatible GPS is connected, the current Speed Over Ground (SOG) as well as the Course Over Ground (COG) are displayed on the screen.



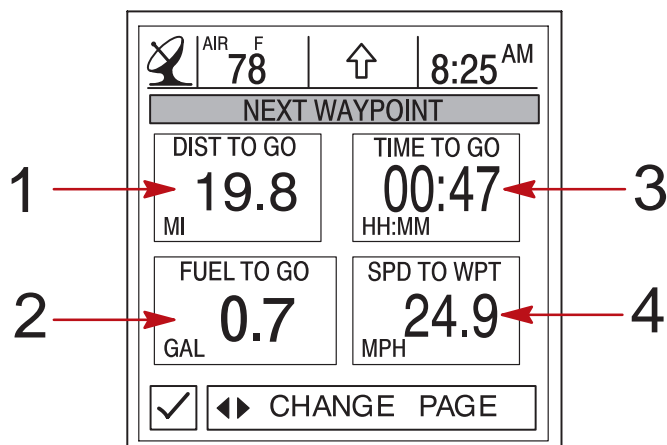
- 1 - Compass ring
- 2 - Boat pointer
- 3 - X – Mark (Gives the Direction to Steer)
- 4 - Cross track error
- 5 - Course over ground (COG)
- 6 - Speed over ground (SOG)
- 7 - GPS Heading – True or Magnetic – Refer to “Settings/Preference/GPS Heading” menu in Section 6

Navigation/Fuel Data Screens

SCREEN # 2 – NEXT WAYPOINT DATA

When navigating to a waypoint, this screen will give you the following navigation information:

1. **DIST TO GO** – Remaining distance to the next waypoint.
2. **TIME TO GO** – Is the time that it will take to reach your waypoint at your present speed.
3. **FUEL TO GO** – Is the fuel it will take to get to your waypoint.
4. **SPD TO WPT** – Is the speed your making towards your waypoint.

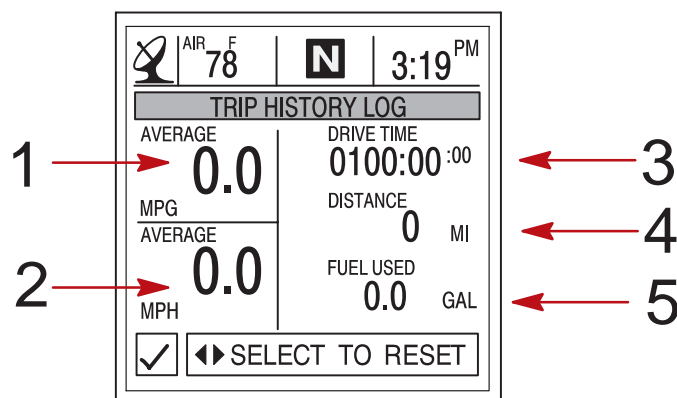


Trip History Log

This screen tracks your boats progress since last reset. Displays average fuel economy, average boat speed, total drive time, along with a corresponding distance traveled, and fuel used.

To **Reset** trip history log, press and hold down **SELECT** for 5 seconds.

1. Displays the average distance per gallon or liter of fuel since the unit was last reset.
2. Displays the average speed of the boat since the unit was last reset.
3. Displays the time in hours of the engine usage since the unit was last reset.
4. Displays the total distance traveled since the unit was last reset.
5. Displays the total fuel used since the unit was last reset.



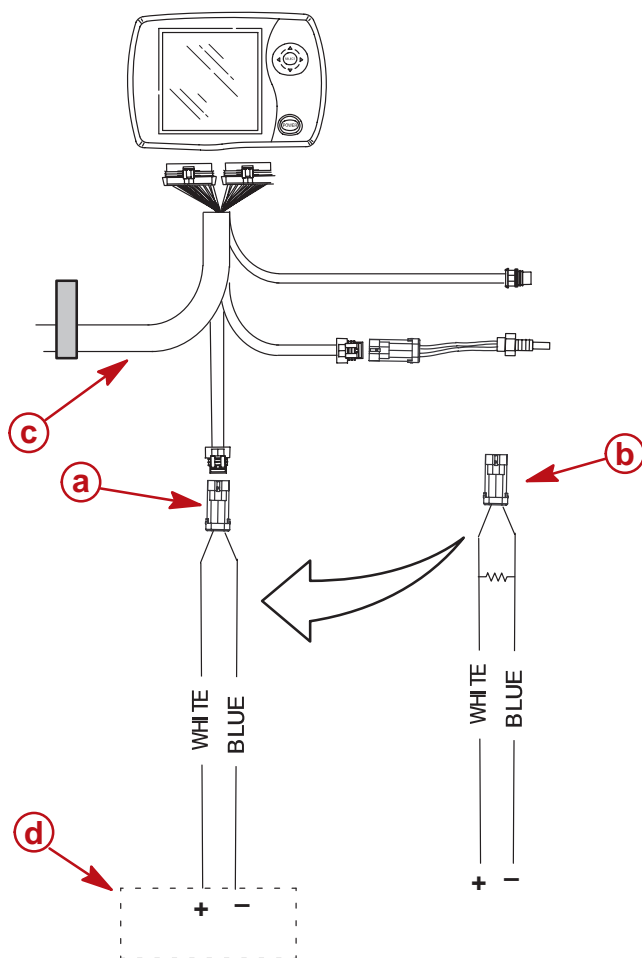
Using SmartCraft Termination Harness to Connect (System View) to GPS

84-88951A02 SYSTEM VIEW GPS ADAPTOR HARNESS (WITH RESISTOR)

Notice to Installer

In some applications, when the System View is connected to certain NMEA 0183 (GPS, Radar, Chart plotter) devices, the System View may experience full lost or intermittent lost of GPS data. In these instances, the installation of this GPS adaptor harness (with resistor) may correct the data transmission issue.

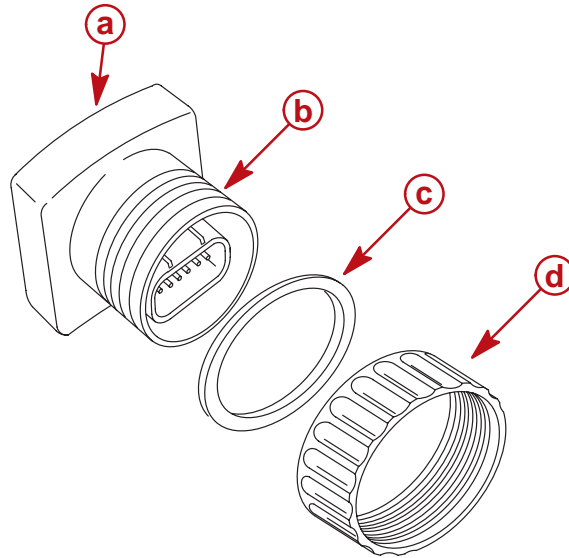
NOTE: This GPS adaptor (with resistor) harness is not needed in all installations. Therefore, we recommend that it is only used when needed.



- a** - GPS adaptor harness without resistor
- b** - GPS adaptor harness with resistor
- c** - System View harness
- d** - NMEA 0183 (GPS, radar, chart plotter) device

SYSTEM MONITOR INSTALLATION

Components Contained in Kit:



- a** - Bezel
- b** - System Monitor
- c** - Seal
- d** - Retainer nut

System Monitor Operation, Calibration and Wiring Instructions

Refer to Instructions in one of the following manuals:

1. Operation, Maintenance and Warranty Manual (provided with engine).
2. Engine Installation Manual (provided with engine).
3. Product Service Manual.

Special Instructions

Clean lens with water only.

Installation Information

WARNING

Disconnect both battery cables at battery before attempting to install monitor

Before cutting any holes, check area behind dashboard for obstructions (braces, cables, wiring, etc.)

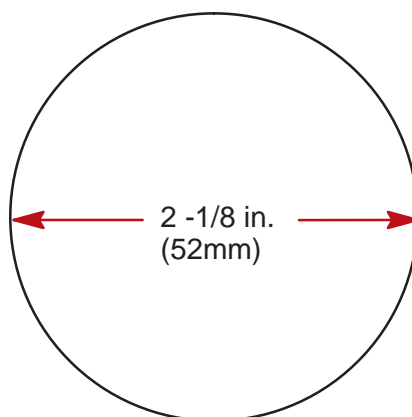
CUTTING TIPS

Fiberglass – apply masking tape to area to be cut to prevent dashboard from cracking.

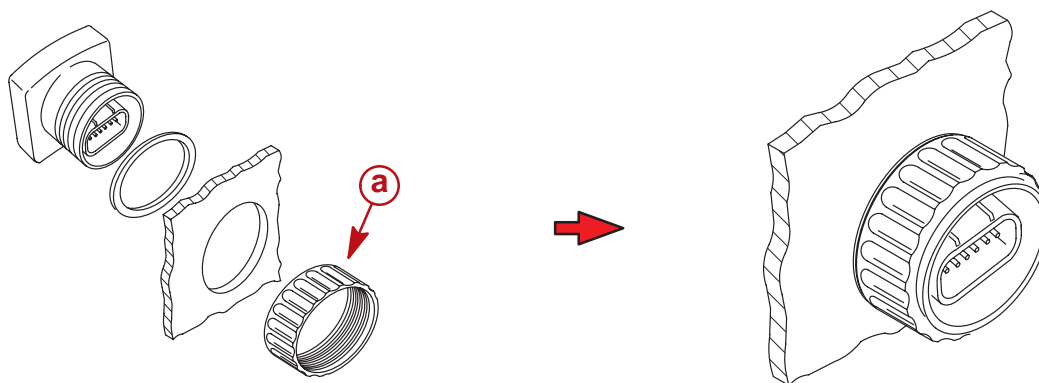
Vinyl Covered – Remove vinyl from area to be cut with razor blade to keep vinyl from tearing.

Gauge Installation

1. Select a location for the system monitor that affords good visibility and accessibility from behind dashboard.
2. Drill a 2-1/8 in. (52mm) mounting hole using a hole saw.



3. Place system monitor along with seal into dashboard and secure with retainer nut.



a - Retainer Nut

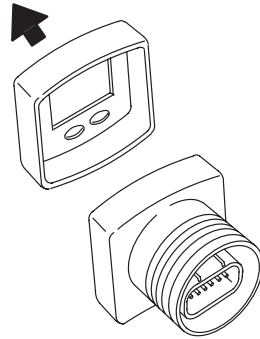
NOTE: For thick dashboards, reverse the retainer nut for additional thread engagement.

REAR MOUNTING SYSTEM MONITOR

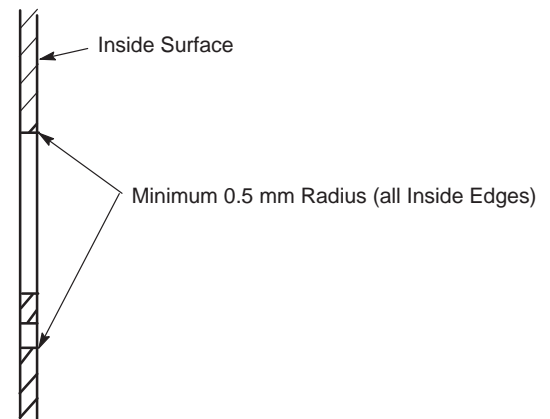
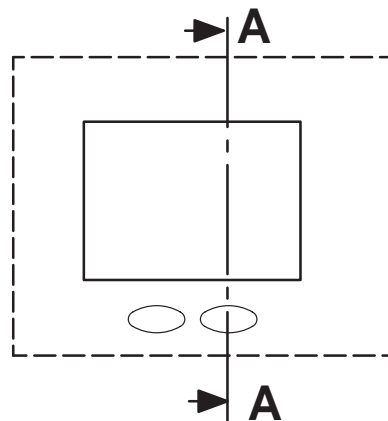
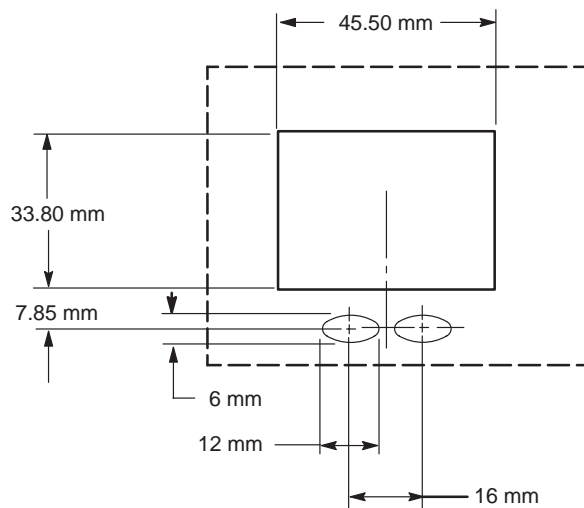
Order Rear Mounting Kit 879496K3.

Remove and discard front bezel from monitor.

Follow the panel cutout drawing below and cutout panel at the selected mounting location.
Install monitor into cutout.



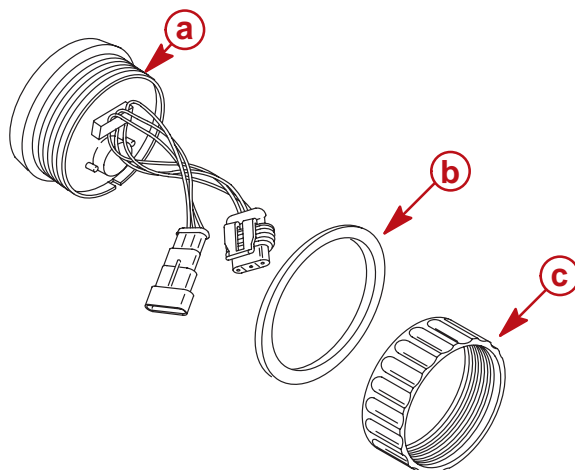
Panel Cutout Dimensions for Rear Mounting System Monitor



A-A
Cross Section
Side View

SYSTEM LINK GAUGE INSTALLATION

Components Contained in Kit:



52mm Diameter Gauges:

- a** - System Link Gauge
- b** - Seal - 879925
- c** - Retainer nut - 879900

85mm Diameter Gauges:

- a** - System Link Gauge
- b** - Seal - 859656
- c** - Retainer nut - 859073

Special Instructions

Clean lens with water only.

Installation Information

⚠ WARNING

Disconnect both battery cables at battery before attempting to install gauges

Before cutting any holes, check area behind dashboard for obstructions (braces, cables, wiring, etc.).

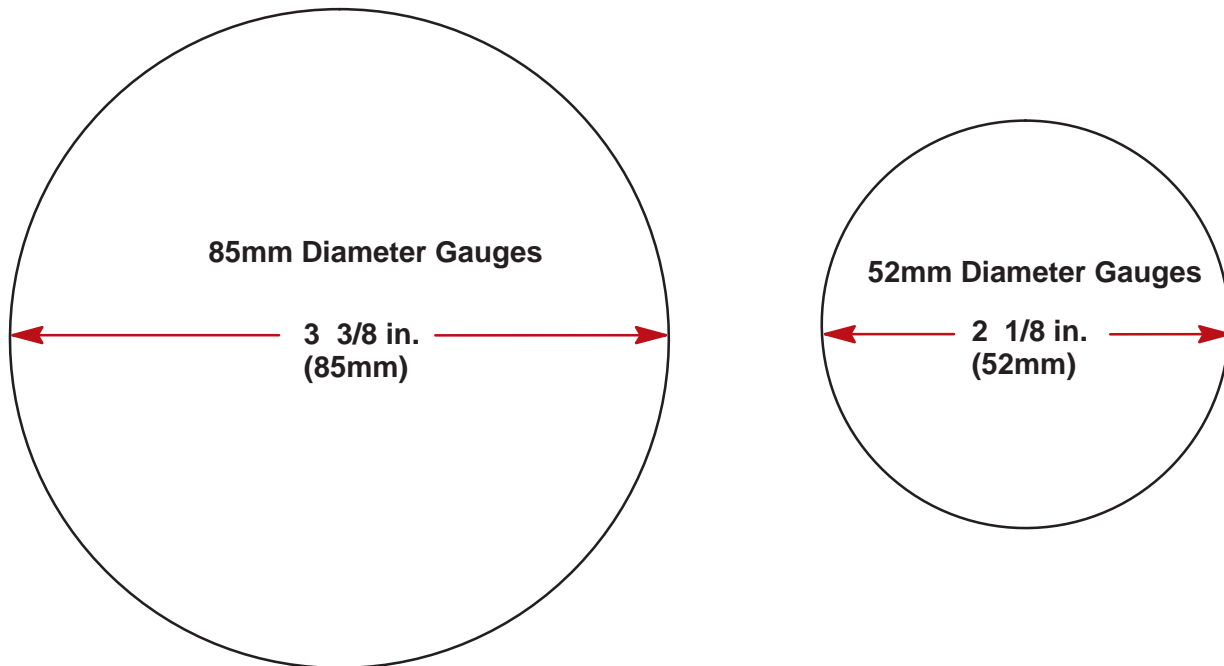
CUTTING TIPS

Fiberglass – apply masking tape to area to be cut to prevent dashboard from cracking.

Vinyl Covered – Remove vinyl from area to be cut with razor blade to keep vinyl from tearing.

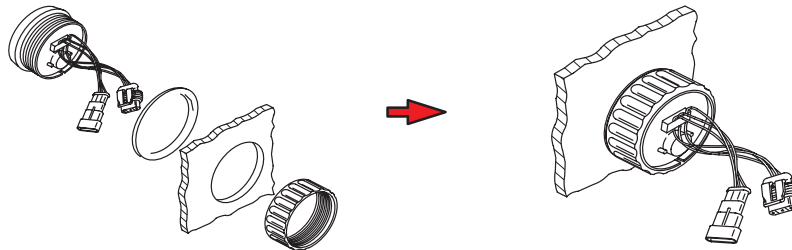
Gauge Installation

1. Select a location for the gauges that affords good visibility and accessibility from behind dashboard.
2. Drill mounting hole using a hole saw.



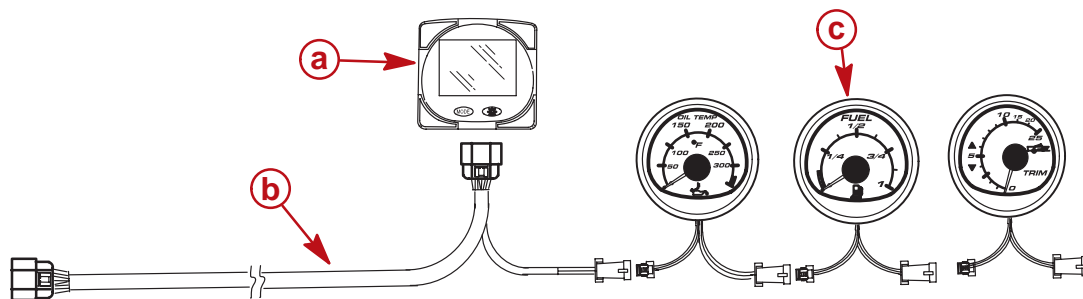
3. Place gauge into dashboard and secure with retainer nut.

NOTE: For thick dashboards, reverse the retainer nut for additional thread engagement.



Wiring

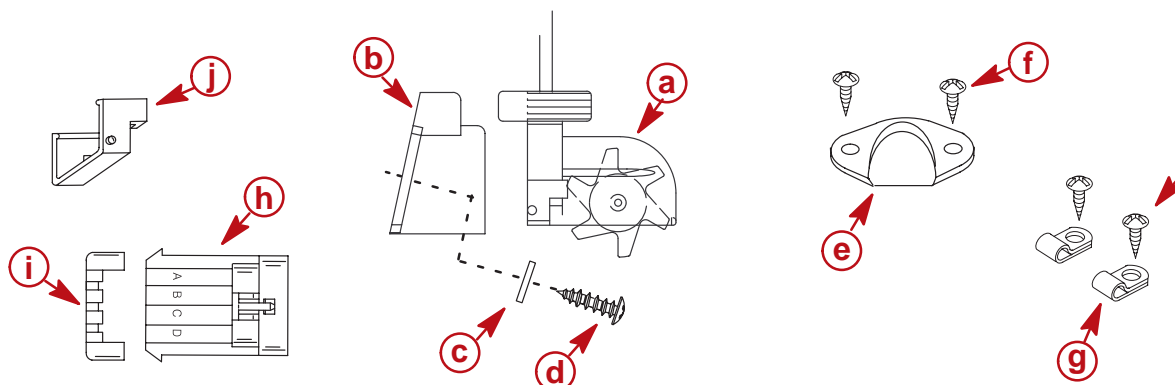
NOTE: Accessory Extension Wiring Harnesses for the System Link Gauges are available in 3ft, 10ft and 30ft lengths. (84-880756T-3,10,30)



- a** - SmartCraft Product – System Monitor, System Tach or System View
- b** - System Wiring Harness
- c** - System Link Gauge(s)

PADDLE WHEEL SPEEDOMETER SENSOR INSTALLATION

PARTS PROVIDED



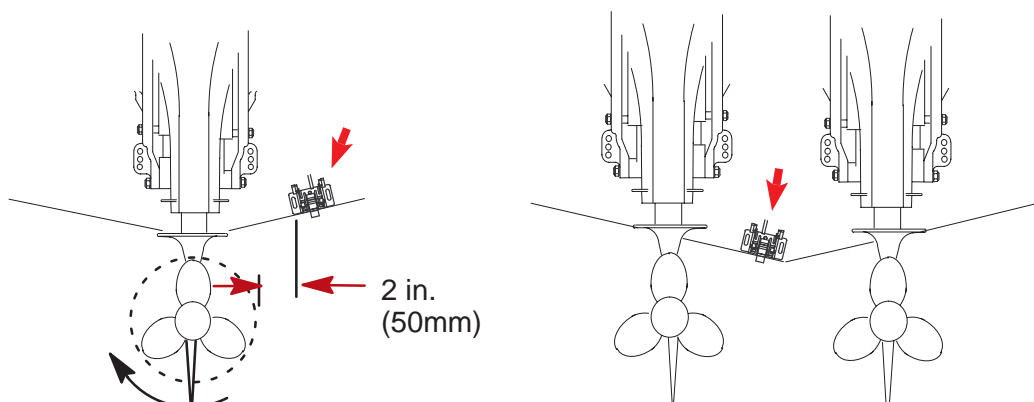
- a** - Paddle Wheel (859223)
- b** - Bracket
- c** - Flat Washer (2)
- d** - #10 - 3/4 in. (19 mm) Screw (2)
- e** - Cable Cap
- f** - # 6 - 1/2 in. (12 mm) Screw (4)
- g** - Clamp (2)
- h** - Connector
- i** - Wire Retainer
- j** - Spare Pin Yoke

SELECTING LOCATION

Single engine installation – Mount paddle wheel on the transom where the propeller blade is rotating downward. [usually the right (starboard) side] to minimize cavitation. If feasible, mount at least 2 in. (50mm) beyond the swing radius of the propeller.

Dual engine installation – Mount the paddle wheel between the engines as close to the center line (keel) of the boat as possible. On slower, heavier displacement boats, however, positioning it farther from the keel is acceptable.

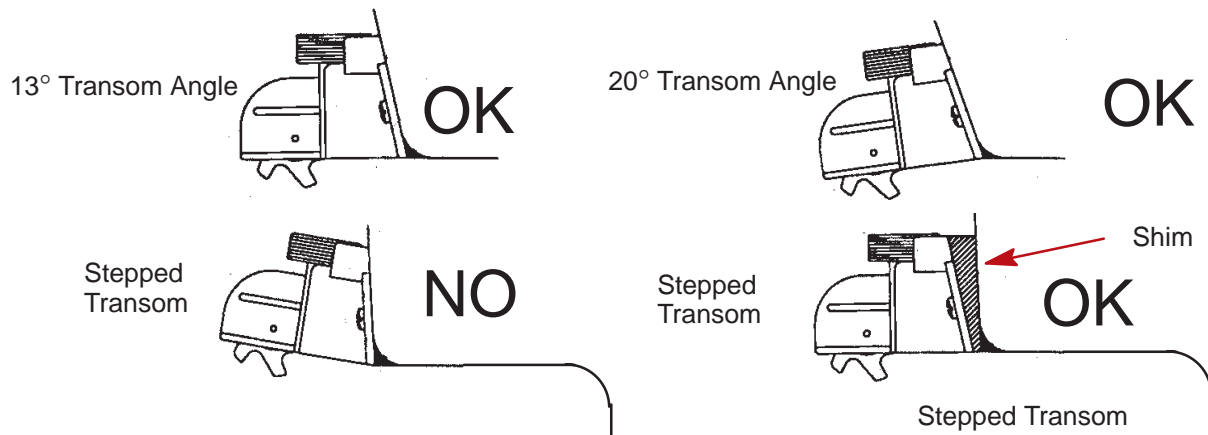
NOTE: Do not mount the paddle wheel directly behind any strakes, ribs, intakes or outlets for live wells or any protrusion that may cause turbulence or cavitation.



TRANSOM ANGLE REQUIREMENTS

Standard 13° to 20° transoms – No special adjustments required.

Stepped or undercut transom with 3° angles – A small shim of tapered plastic, metal or wood must be fabricated and installed as shown. Mount the paddle wheel on the step for best performance.

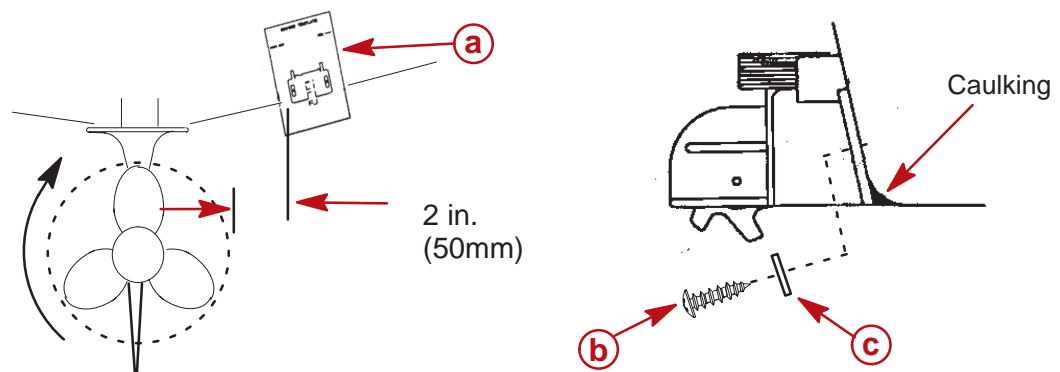


INSTALLING BRACKET

1. Cut out the template at the end of this installation manual.. At the location you've selected, tape the template to the transom. Make sure the black dotted line on the template is aligned with the transom's bottom edge, as shown.
2. Using a #28 or 9/64 in. bit, drill two 7/8 in. (22 mm) deep where indicated on the template. To prevent drilling too deeply, wrap masking tape around the drill 7/81 (22 mm) from the point.

NOTE: In fiberglass hulls, first chamfer the gelcoat using a 1/4 in. (6mm) drill and drilling about 1/16 in. (15 mm) deep to prevent surface cracks.

3. To prevent water seepage into the transom, apply a marine sealant (such as RTV) to the two #10 screws provided. Using the washers provided, attach and tighten the bracket to the hull making sure the bracket is flush with the underside of the hull.
4. Fill any gap between the housing and the transom with a caulking material, as shown. Using a putty knife, smooth the surface to ensure proper water flow.



- a** - Template
- b** - #10 Screw (2)
- c** - Flat Washer (2)

ROUTING THE CABLE

NOTE: You can choose to drill a hole through the transom for routing the cable, or you can route the cable over the transom or through a drain hole above the water line.

If you choose to drill a hole through the transom, follow these instructions:

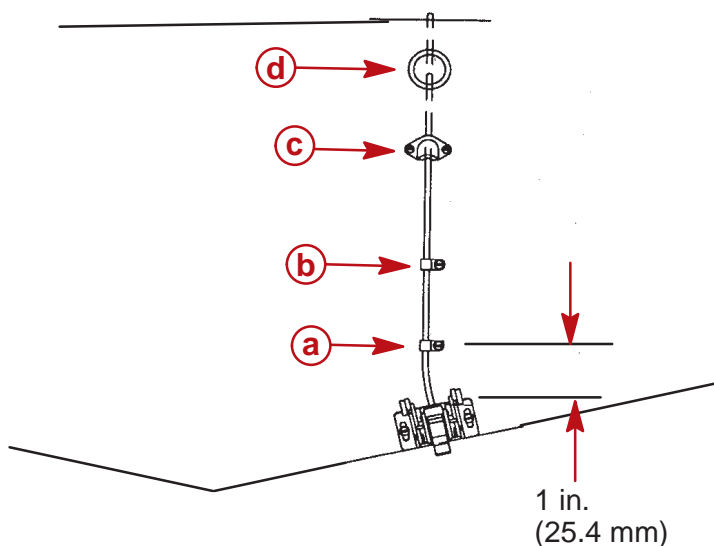
1. Select a transom location *for the hole above the water line* that does not interfere with other cables and controls.
2. Drill a 5/8 in. (15 mm) diameter hole.
3. Route the cable through the drilled hole. Seal the transom hole with silicone (RTV) or a comparable marine sealant after you routed the cable through.

NOTE: The hole for the first clamp should be 1 in. (25 mm) above the paddle wheel. The hole for the second clamp should be positioned halfway between the first clamp and the cap covering the transom hole you drilled for the cable.

4. Using a 7/64 in. (2.8 mm) bit, drill holes for the clamps and cap approximately 1/2 in. (13 mm) deep.
5. Apply silicone (RTV) or a comparable marine sealant to the screw threads and install the cable clamps and the cable feed-thru cap.

If you choose not to drill a hole through the transom:

If you prefer not to drill a hole, route the cable over the transom or through a drain hole that is above the water line.

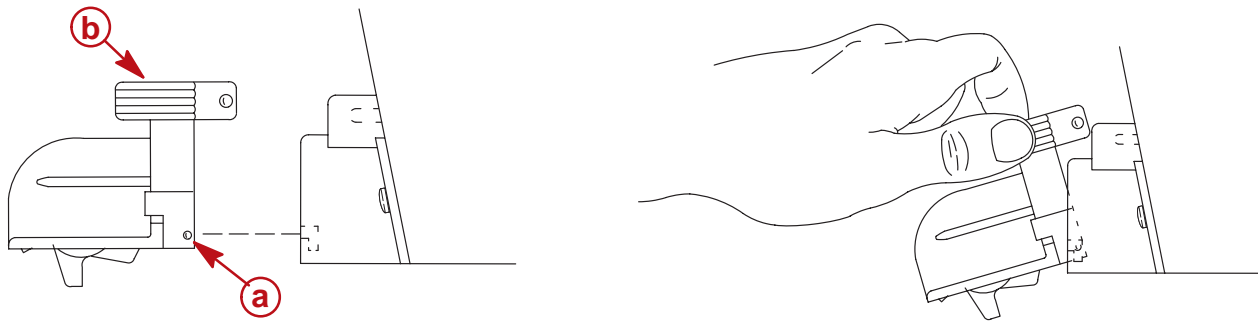


- a** - The First Clamp Should be Placed 1 in. (25 mm) Above the Paddle Wheel
- b** - The Second Clamp Should be Positioned Halfway Between the First Clamp and the Cable Cap
- c** - Cable Cap
- d** - If You Prefer Not to Drill A Hole, Route the Cable Over the Transom or Through a Drain Hole

INSTALLING AND REMOVING THE PADDLE WHEEL

Installation – slide the pins into the slots in the bracket and snap the tabs into place.

Removal – squeeze open (unlock) the tabs and pull up on the paddle wheel.



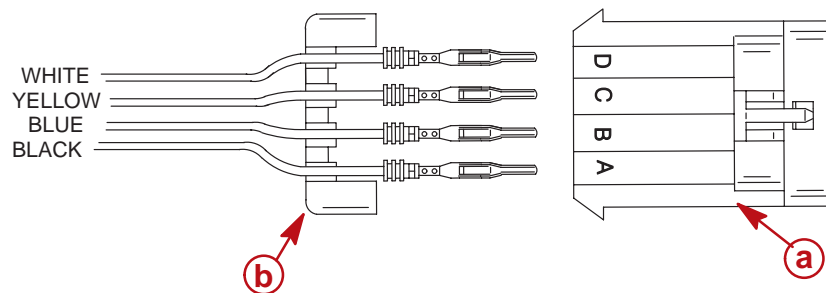
a - Pins
b - Tabs

WIRE CONNECTIONS

IMPORTANT: Before making wire connections, make sure wires are routed through the transom.

NOTE: Wires can only be pushed into the connector one way. Align the wire terminal with the tabs inside the connector.

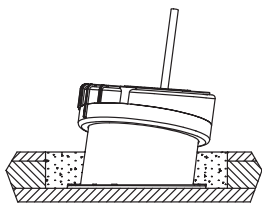
1. Have the wiring routed through the transom.
2. Push each wire terminal into its respective location in the connector. Push wires in until they snap into place.
3. Secure wires into connector with the wire retainer.



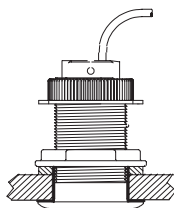
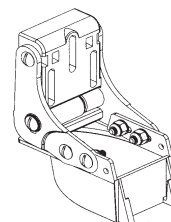
a - Connector
b - Wire Retainer

DEPTH TRANSDUCERS

Depth Transducers



In Hull (881932A1)

Thru Hull (881933A1)
Thru Hull (888828)
Thru Hull (888828 1)

Transom Mount (881931A1)

Depth Transducer Installation

Install depth transducer following installations provided with the depth transducer.

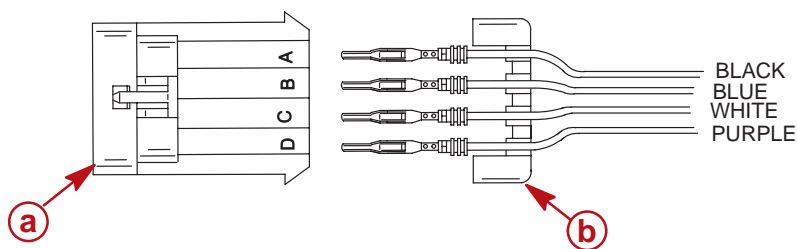
Making the Wiring Connections

INSTALLING CONNECTOR ON TRANSDUCER CABLE

IMPORTANT: Before making wire connections, make sure the transducer cable is routed up to the engine.

NOTE: Wires can only be pushed into the connector one way. Align the wire terminal with the tabs inside the connector.

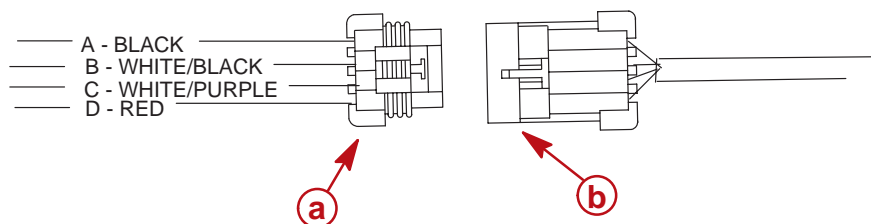
1. Have the wiring routed up to the engine.
2. Push each wire terminal into its respective location in the connector. Push wires in until they snap into place.
3. Secure wires into connector with the wire retainer.



- a** - Connector
b - Wire Retainer

MerCruiser MPI Installation

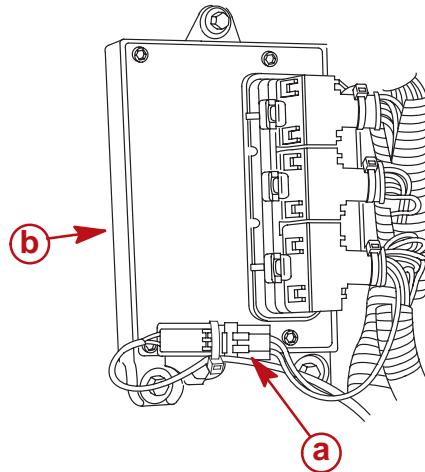
1. Install the transducer cable connector to the connector located on the engine.



- a** - Connector Located on Engine. Connector is near the PCM.
b - Transducer Cable Connector

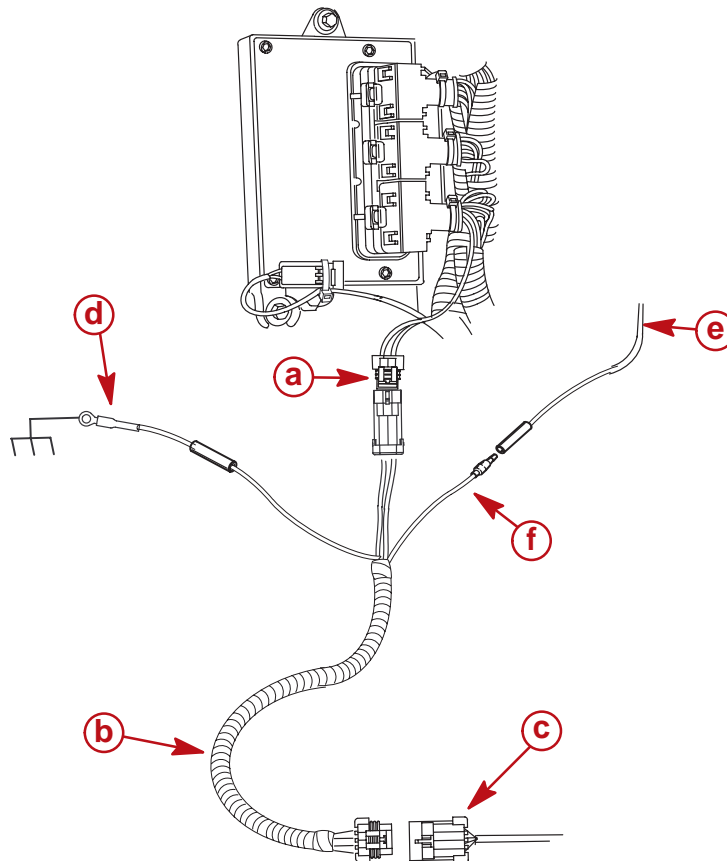
Optimax Installation

1. Disconnect the diagnostic test plug from the connector located on the engine.



a - Diagnostic Test Plug
b - ECM

2. Connect wiring harness (84-881244A1) between the diagnostic test plug and the transducer cable connector. Connect the black and purple wires from the wiring harness as shown.



a - Diagnostic Test Plug
b - Wiring Harness (84-881244A1)
c - Transducer Cable Connector
d - Black Wire – Connect to Engine Ground
e - Purple Wire – Extends out of the Wiring Harness on the Engine
f - Purple Wire

SECTION 4

CALIBRATION

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System Tach and Speed

Quick Cal Calibration

Quick Cal – This calibration is for setting lighting and contrast.

1. Press in the **MODE** and **TROLL +** buttons for up to 2 seconds to get to Quick Cal screen.
2. Press **MODE** to advance through the calibration selections.

CAL 1 Tachometer Calibration

Cal 1 – This calibration level lets you turn on and off the system screens. You may configure the system to display as little or as much information as you prefer.

1. Press in the **MODE** and **TROLL +** buttons and hold for approximately 7 seconds until you see the *Cal 1* screen.
2. Press **MODE** to advance through the calibration selections.

<div>REMOTE SCREENS?</div> <div>[NO] [SAVE] [YES]</div>	<p>If yes is selected, then screen changes made on this SC1000 tach will effect any other SC1000 tach in the system.</p> <p>NOTE: all tach will need to have this screen turned to "Yes" for this function to work.</p>
<div>REMOTE LCD LIGHT?</div> <div>[NO] [SAVE] [YES]</div>	<p>If yes is selected, then lighting levels made on this SC1000 tach will effect any other SC1000 tach in the system.</p> <p>NOTE: all tach will need to have this screen turned to "Yes" for this function to work.</p>
<div>REMOTE LCD CONTRAST?</div> <div>[NO] [SAVE] [YES]</div>	<p>If yes is selected, then contrast levels made on this SC1000 tach will effect any other SC1000 tach in the system.</p> <p>NOTE: all tach will need to have this screen turned to "Yes" for this function to work.</p>
<div>TRIM POP-UP?</div> <div>[NO] [SAVE] [YES]</div>	<p>Do you want power trim display screen to pop up momentarily when you trim the engine?</p>
<div>TRIM CALIBRATION</div> <div>[SKIP] [EDIT]</div> <div>TRIM FULL DOWN THEN PRESS PLUS BUTTON</div> <div>[DFLT] [SKIP] [SAVE]</div> <div>TRIM FULL UP THEN PRESS PLUS BUTTON</div> <div>[DFLT] [SKIP] [SAVE]</div> <div>TRIM TO TRAILER POINT THEN PRESS PLUS BUTTON</div> <div>[DFLT] [SKIP] [SAVE]</div>	<p>Choosing edit allows you to calibrate the gauge to the standard 0–10 unit trim and 11–25 trailer position scale.</p>
<div>DISPLAY UNITS</div> <div>[DOWN] [SAVE] [UP]</div>	<p>Lets you change units of measure between English (standard) or Metric.</p>

<p>SPEED UNITS</p> <p>[DOWN] [SAVE] [UP]</p>	<p>Lets you select speed units. You can choose from MPH (Miles Per Hour), KN (Nautical Miles Per Hour) or KMH (Kilometers Per Hour).</p>
<p>DEPTH SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the depth screen? (Remember: You must have a SmartCraft depth transducer connected to the system for this screen to operate)</p>
<p>ENGINE TEMP SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the engine temp screen?</p>
<p>OIL TEMP SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the oil temp screen?</p>
<p>OIL PRESS SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the oil pressure screen?</p>
<p>TRIM AND PSI SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the trim and water pressure split screen?</p>
<p>WATER PSI SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the water pressure screen?</p>
<p>TRIM AND RPM SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the trim and RPM split screen?</p>
<p>RPM SCREEN?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on the digital RPM screen?</p>
<p>SIMULATOR MODE?</p> <p>[NO] [SAVE] [YES]</p>	<p>Do you want to turn on a simulation mode? (used for demonstration purposes).</p>
<p>EXIT?</p> <p>[NO] [SAVE] [CAL2]</p>	<p>Do you want to exit calibration? Or jump straight into calibration level 2?</p>

CAL 2 Tachometer Calibration

CAL 2 – This calibration level lets you configure the system sensor inputs.

1. Press in the **MODE** and **TROLL +** buttons and hold for approximately 10 seconds for calibration2 (*Cal2*) screen.
2. Press **MODE** to advance through the calibration selections.

<div>EXTERNAL SENSORS</div> <div>[SKIP] [EDIT]</div>	This section lets you enable or disable the following external sensor inputs.
<div>PITOT SENSOR?</div> <div>[NO] [SAVE] [YES]</div>	Is the boat equipped with a pitot sensor to measure boat speed?
<div>PADDLE SENSOR?</div> <div>[NO] [SAVE] [YES]</div>	Is the boat equipped with a paddle wheel to measure boat speed?
<div>TRIM SENSOR?</div> <div>[NO] [SAVE] [YES]</div>	Is the boat equipped with a trim sensor?
<div>SEA TEMP?</div> <div>[NO] [SAVE] [YES]</div>	Is the boat equipped with a water temperature sensor?
<div>INVERT STEERING</div> <div>[NO] [SAVE] [YES]</div>	Is steering angle showing up on the link gauge opposite the direction that it should be? If it is then this feature will reverse the signal so it is displayed properly.
<div>SPEED OPTION</div> <div>[SKIP] [EDIT]</div>	This section lets you configure the following speed sensors.
<div>PITOT SENSOR?</div> <div>[NO] [SAVE] [YES]</div>	Select pitot transducer type. You can choose 100 or 200 PSI. (100 PSI is the most common)
<div>PITOT SENSOR MULTIPLIER</div> <div>[DOWN] [SAVE] [UP]</div>	Adjust the pitot pressure sensor for correcting display readings that are to high/low.
<div>PADDLE SENSOR PULSE FACTOR</div> <div>[DOWN] [SAVE] [UP]</div>	Adjust paddle wheel frequency for display readings that are too high/low.
<div>PADDLE TO PITOT TRANSITION</div> <div>[DOWN] [SAVE] [UP]</div>	Set the speed at which the gauge stops looking at the paddle wheel and starts using pitot to measure boat speed.

There are three methods for calibrating fuel tank level monitoring feature:

First: Do nothing. Linear readout based on raw sensor values. This mode does not factor in irregular tank shapes.

Second: By following the tank calibration procedure described on next page, but without actually adding fuel. System Tach will supply an estimated range value based on linear interpolation of the sensor range values. This mode does not factor in irregular tank shapes.

Third: By following the tank calibration procedure described on next page completely, which means adding fuel at each calibration point. System Tach will display an estimated range value that factors in the tank shape.

<p>FUEL TANK CAPACITY</p> <p>[DOWN] [SAVE] [UP]</p>	<p>Lets you enter the capacity of your boats fuel tank. This option is the same for tank 1 as it is for tank 2.</p>
<p>CALIBRATION FUEL TANK</p> <p>[SKIP] [EDIT]</p>	<p>Lets you enter the mode where you can calibrate your fuel tank. Fuel tank calibration procedure is the same for tank 1 as it is for tank 2.</p>
<p>EMPTY TANK THEN PRESS PLUS BUTTON</p> <p>[DFLT] [SKIP] [SAVE]</p>	<p>You can choose to have an empty tank and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.</p>
<p>FILL TO 1/4 THEN PRESS PLUS BUTTON</p> <p>[DFLT] [SKIP] [SAVE]</p>	<p>You can choose to have tank at 1/4 and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.</p>
<p>FILL TO 1/2 THEN PRESS PLUS BUTTON</p> <p>[DFLT] [SKIP] [SAVE]</p>	<p>You can choose to have tank at 1/2 and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.</p>
<p>FILL TO 3/4 THEN PRESS PLUS BUTTON</p> <p>[DFLT] [SKIP] [SAVE]</p>	<p>You can choose to have tank at 3/4 and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.</p>
<p>FILL TO FULL THEN PRESS PLUS BUTTON</p> <p>[DFLT] [SKIP] [SAVE]</p>	<p>You can choose to have tank at full and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.</p>
<p>DEPTH SENSOR OFFSET</p> <p>[DOWN] [SAVE] [UP]</p>	<p>Lets you electronically configure a depth offset. Entering a negative number gives you a water line offset. A positive number gives you a keel offset.</p>
<p>DEPTH ALARM</p> <p>[DOWN] [SAVE] [UP]</p>	<p>Lets you enter a depth value. When the depth transducer reads that value or below, the shallow water alarm will sound.</p>

Quick Cal Calibration

Quick Cal – This calibration is for setting lighting and contrast.

1. Press in the **MODE** and **TROLL +** buttons for up to 2 seconds to get to Quick Cal screen.
2. Press **MODE** to advance through the calibration selections.

CAL 1 Speedometer Calibration

Cal 1 – This calibration level lets you turn on and off the system screens. You may configure the system to display as little or as much information as you prefer.

1. Press in the **MODE** and **TROLL +** buttons and hold for approximately 7 seconds until you see the *Cal 1* screen.
2. Press **MODE** to advance through the calibration selections.

<div>REMOTE LCD LIGHT?</div> <div>[NO] [SAVE] [YES]</div>	Enables you to set the lighting levels on all the SC1000 simultaneously from this gauge.
<div>REMOTE LCD CONTRAST?</div> <div>[NO] [SAVE] [YES]</div>	Enables you to control the contrast from another System TACH/Speed simultaneously from this gauge.
<div>TIME</div> <div>[NO] [SKIP] [EDIT]</div>	Allows you to set the time.
<div>TIME FORMAT</div> <div>[DOWN] [SAVE] [UP]</div>	Choose between a 12 hour and 24 hour format.
<div>USE GPS TIME?</div> <div>[DOWN] [SAVE] [UP]</div>	If you have a GPS connected this feature enables the gauge to let the GPS update the gauges internal clock.
<div>CALIBRATION HOUR 12:00 AM</div> <div>[DOWN] [SAVE] [UP]</div>	Adjust the gauges internal clock to match your local time. First set the hours then press MODE button to set the minutes.
<div>DISPLAY UNITS</div> <div>[DOWN] [SAVE] [UP]</div>	Lets you change units of measurement between English (standard) or Metric.
<div>SPEED UNITS</div> <div>[DOWN] [SAVE] [UP]</div>	Lets you select the units at which speed is displayed. You can choose from MPH (Miles Per Hour), KTS (Knots), or KMH (Kilometers Per Hour).
<div>TO WAYPOINT SCREEN?</div> <div>[NO] [SAVE] [YES]</div>	If you have a GPS connected you can turn on the screen that shows your distance and fuel to a waypoint.

<div>SIMULATOR MODE?</div> <div>[NO] [SAVE] [YES]</div>	Do you want to turn on a simulation mode? (Used for demonstration purposes).
<div>EXIT?</div> <div>[NO] [YES] [CAL2]</div>	Do you want to exit calibration? Or jump straight into calibration level 2?

CAL 2 Speedometer Calibration

CAL 2 – This calibration level lets you configure the system sensor inputs.

1. Press in the **MODE** and **TROLL +** buttons and hold for approximately 10 seconds for calibration2 (*Cal2*) screen.
2. Press **MODE** to advance through the calibration selections.

<div>EXTERNAL SENSORS</div> <div>[SKIP] [EDIT]</div>	This lets you enable or disable external sensor inputs.
<div>AIR TEMP?</div> <div>[NO] [SAVE] [YES]</div>	Are you using a air temp. sensor?
<div>GPS?</div> <div>[NO] [SAVE] [YES]</div>	Do you have a GPS sensor installed?
<div>USE GPS SPEED?</div> <div>[NO] [SAVE] [YES]</div>	Use the GPS input to drive the speed display?
<div>WATER TEMPERATURE ADJUST</div> <div>[DOWN] [SAVE] [UP]</div>	Adjust water temp. transducer to match actual sea water temperature.


System Monitor – Version 2.0

Basic Operation

The Monitor is an LCD multi-function display gauge. A variety of displays can be activated using the **MODE** button.

Pressing the **MODE** button scrolls the following displays: fuel used, tachometer (RPM), fuel flow, power trim position, engine temp, water pressure, battery voltage, range (if calibrated), and water depth (if equipped with transducer).

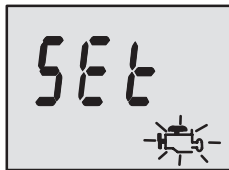
The Monitor will power up when the ignition is turned on.

The display includes a backlight which allows you to read it at night. The backlight brightness is adjustable using the  button.

In the event of a warning alarm, the warning icon(s)  will be displayed.

Initial Power Up (Or After Master Reset)

Unit will display software level then flash the word “**SEt**” in conjunction with engine icon.



Press the **MODE** button.

AUTO-DETECTION

The unit will begin its “**Auto-detection**” of engine type procedure. In this procedure the Monitor checks with the engine control module (ECM) to see what type of engine you have and presets the data monitoring screens accordingly, (e.g., If Monitor detects an inboard engine connected to the data network it will turn off all engine/drive TRIM functions as these functions are not used in an inboard engine installation). The intention is to make initial setup easier.

Initial Power Up (Or After Master Reset)

Initial Auto-Detection Error Messages:



Flashing “**Stbd**” – More than one of the engine computers (ECM's) are configured as a starboard engine. The engines must be programmed for proper engine location using a DDT or Quicksilver Diagnostic Tool.




Flashing “**none**” – The gauge does not see any engine computers (ECM's). Please check wiring for bad connections and for proper amount of terminator resistors.



Flashing “**noSt**” – None of the engine computers (ECM's) are configured as a starboard engine. Engines may not be compatible or must be programmed for proper engine location by using a DDT or Quicksilver Diagnostic Tool.





Flashing “**2001**” – You will need to manually select your engine type. Use the  button to scroll through the choices. Stnd = Stern Drive, Inbd = Inboard, JEtd = Jet Drive, Out2 = Outboard 2 Stroke, Out4 = Outboard 4 Stroke.

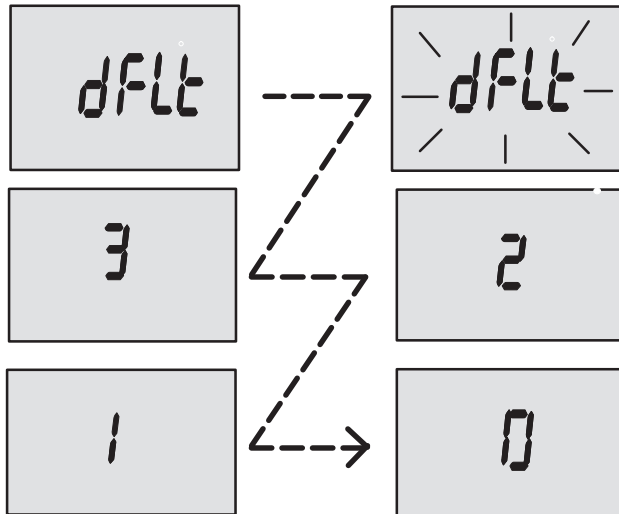
Press **MODE** to continue.

Master Reset

You can return the gauge back to factory presets through the Master Reset command.

IMPORTANT: Performing a master reset will reset the unit back to all factory defaults, thus eliminating any installation calibrations performed during set up of product.

1. Hold in **MODE** and  for approximately 12 seconds. You will see the word “dFLt” let go of the buttons.
2. Immediately press and hold in **MODE** and  again until the unit counts down to zero “0”.
3. The “SEt” message flashing on the screen indicates that the unit has been reset to factory defaults.



Standard Information Display Screens

NOTE: This manual shows all the Monitor display screens that are available. Depending on your type of engine, not all these screens will apply.



SoftwPle NeVion



Engine HouVa


Start Up

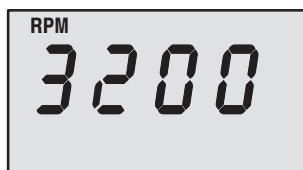
At start up, a momentary (1 second) screen displays the current monitor software version, followed by a 4 second display showing hours of engine use.



Fuel Used

Displays approximate fuel used since the last reset. **Reset** will return display back to 0.

You can **Reset** anytime by pressing and **MODE** and  buttons together momentarily.



Engine RPM

Tachometer – Displays engine speed in Revolutions Per Minute (RPM).



Fuel Flow

Displays current estimated individual engine fuel consumption in Gallons per hour (Gal/hr) or Liters per hour (Ltr/hr).



Trim Position

Displays trim position of the propulsion unit up to the maximum trim position, and then displays the trailer position.

0 = down,

10 = full trim

25 = full trailer.

NOTE: This screen can be set to pop up whenever the trim switch is used. Refer to the CAL 1 Calibrations.



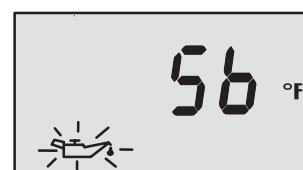
Engine Temperature

Displays the engine temperature in degrees Fahrenheit (°F) or Celsius (°C).



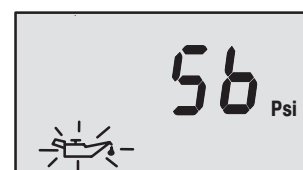
Water Pressure

Displays the engine temperature in degrees Fahrenheit (°F) or Celsius (°C).



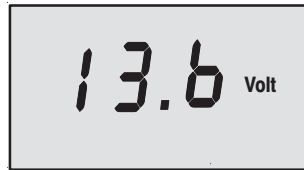
Oil Temperature

Displays the engine oil temperature in degrees Fahrenheit (°F) or Celsius (°C).



Oil Pressure

Displays engine oil pressure in Psi or Bar.



Battery Voltage

Displays voltage level (condition) of battery.

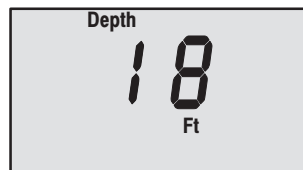


Range

Displays estimated range based on current fuel consumption and fuel remaining in the tank that is connected to the system. The number displayed is an estimate of the distance you can travel on the remaining fuel at current boat speed.

NOTE: Two requirements to activate this screen,

- 1. you must perform the fuel tank calibration in CAL 2. Refer to the CAL 2 Calibrations Section.*
- 2. You must have a speed input device connected to the system (paddle wheel or pitot pressure transducer).*



Water Depth



Displays the depth of water under the transducer if connected.

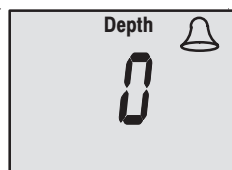
NOTE: You must have a depth transducer (purchased separately) connected to the system in order for this screen to operate.


Shallow Water Alarm

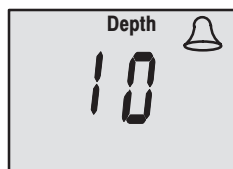
You can set an alarm to trigger whenever the boat moves into water shallower than the alarm level.

Setting Shallow Water Alarm.

1. The water depth screen must be displayed. Be sure Depth is turned on in *CAL 2*. Refer to *CAL 2* Calibration Section.
2. Press both **MODE** and  buttons together for 3 seconds.
3. The alarm on or off menu will appear.
4. Press the  button to toggle to ON.



5. Push **MODE** button to save.
6. The depth number will be flashing. Press the  button to set the flashing number to desired alarm depth. 100 ft maximum depth and 2 ft minimum depth.



7. Push **MODE** button to save.

Warning System

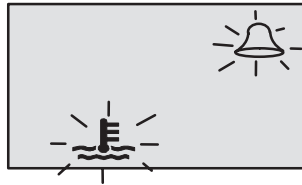
When a problem is detected with the engine, the warning display screens will alert the operator to the potential problem. Refer to the Engine Operation, Maintenance Manual for explanation of the problem and the correct action to take.

If problem can cause immediate engine damage, the Engine Guardian System will respond to the problem by limiting engine power. Immediately reduce throttle speed to idle. Refer to the Engine Operation, Maintenance Manual for further explanation of the problem and the correct action to take.

If the mode button is pressed to a different screen, the flashing alarm signal will remain flashing to indicate there still is a problem.

Warning Display Screens

IMPORTANT: Refer to the Engine Operation, Maintenance Manual for further explanation of the problem and the correct action to take.



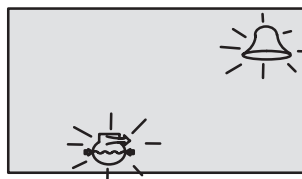
Engine Overheat

The Bell and Temperature icons are displayed. There is insufficient water pressure in the cooling system.



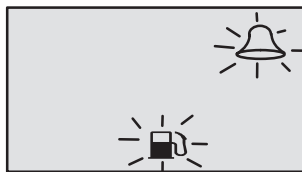
Low Oil Reserve

The bell and oil icons are displayed. The oil level is critically low in the engine mounted oil reservoir tank.



Low Water Pressure

The Bell and Water Pressure icons are displayed. There is insufficient water pressure in the cooling system.



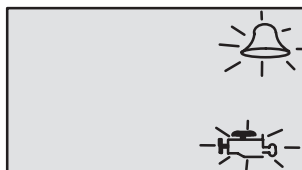
Water in Fuel

The Bell and Fuel Icon are displayed. Water in the water-separating fuel filter reached the full level.



Engine Overspeed

The Bell icon is displayed. The engine speed exceeded the maximum allowable RPM.



Engine Malfunction

The Bell and Engine Icon will appear to inform the driver that an engine problem occurred.




Oil Pump Fault


The Bell, Engine and oil icons are displayed. The oil pump has stopped functioning electrically. No lubricating oil is being supplied to the engine.

CAL 1 Calibration

Cal1 Display Calibrations:


- (On or Off) Trim Pop up Screen
- Trim Calibration
- English or Metric Units Selection
- Range Units Selection
- (On or Off) Depth, Trim, Engine Temperature, Oil Pressure, Oil Temperature, Water Pressure, Volts, Engine Hours, and Data Simulator pages.

1. Turn ignition key to the on position.
2. Press and hold **MODE** and  for 3 seconds to bring up the CAL 1 calibration screen.

NOTE: Press and hold **MODE** and  for 3 seconds to get out of the CAL 1 calibration screen.





Cal 1 Start Screen

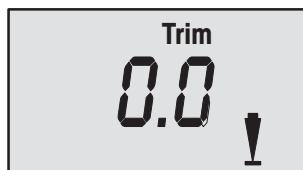
Press the **MODE** button to move to the next calibration screen. 



Trim Pop-up Screen (Turn on or off)


Select whether you want the power trim display screen to pop up whenever the trim switch is activated.

1. Have the number flashing on display screen.
2. Press the  button to select.
1 = on
0 = off
3. Press the **MODE** button to move to the next function. 

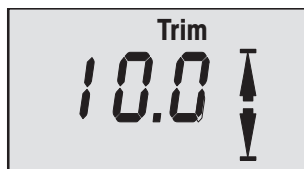


Trim Sensor 0.0 Setting

(Full Trim in Position)

1. The word "Trim" and down arrow should be blinking.
2. trim unit to the full Down/In position.
3. Press the  button to save.

4. Press the **MODE** button to advance to 10.0 setting. ⬇



Trim Sensor 10.0 Setting

(Full Trim Out Position)

5. The word "Trim" and down and up arrows should be blinking.
6. Trim unit out to the maximum trim (not trailer) position.
7. Press the button to save.
8. Press the **MODE** button to advance to 25.0 setting. ⬇



Trim Sensor 25.0 Setting

(Full Trailer Out Position)

9. The word "Trim" and up arrow should be blinking.
10. Use the trim switch and trim unit out to the maximum trailer position.
11. Press the button to save.
12. Press the **MODE** button to move to the next function. ⬇

SAE English System



Metric System



English or Metric

Select whether you want the readings in the SAE English system or the Metric system.

1. Press the button to toggle between units.
2. Press the **MODE** button to move to the next function. ⬇



Range Readings




Select whether you want the readings in Miles, Nautical Miles or Kilometers.

1. Press the button to toggle between units.
2. Press the **MODE** button to move to the next function. ⬇



Depth Display (on or off)




Select whether you want the depth screen to be displayed.

1. Press the  button to select on or off.
2. Press the  button to move to the next function. 



Trim Display (on or off)




Select whether you want the trim screen to be displayed.

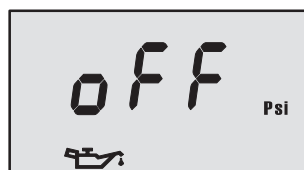
1. Press the  button to select on or off.
2. Press the  button to move to the next function. 



Coolant Temperature Display (on or off)




Select whether you want the coolant temperature screen to be displayed.

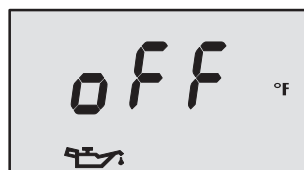
1. Press the  button to select on or off.
2. Press the  button to move to the next function. 



Oil Pressure Display (on or off)




Select whether you want the oil pressure screen to be displayed.

1. Press the  button to select on or off.
2. Press the  button to move to the next function. 



Oil Temperature Display (on or off)

Select whether you want the oil temperature screen to be displayed.

1. Press the  button to select on or off.
2. Press the  button to move to the next function. 



Water Pressure Display (on or off)

Select whether you want the water pressure screen to be displayed.

1. Press the  button to select on or off.

- Press the **MODE** button to move to the next function. ↓



Battery Voltage Display (on or off)

Select whether you want the battery voltage screen to be displayed.

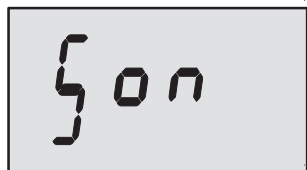
- Press the button to select on or off.
- Press and hold **MODE** and for 3 seconds to get out of the CAL 2 calibration screen.



Engine Hours Display (on or off)

Select whether you want the engine hours screen to be displayed.

- Press the button to select on or off.
- Press and hold **MODE** and for 3 seconds to get out of the CAL 2 calibration screen.



Simulator Mode (on or off)

Simulator mode will drive the Monitor display and link gauges with simulated data. This is useful for demonstration and diagnostic purposes (checking link gauges ect.).

- Press the button to select on or off.

CAL 2 Calibration

CAL2 Display Calibrations:

- Paddle Wheel Speed Sensor Frequency Setting
- Pitot Water Pressure Speed Sensor Input Setting
- Pitot Water Pressure Speed Sensor Multiplier
- Fuel Tank Calibration

- Turn ignition key to the on position.
- Press and hold **MODE** and for 3 seconds to bring up the CAL 1 calibration screen. Press and hold **MODE** and again for 3 seconds to bring up the CAL 2 calibration screen.

NOTE: Press and hold **MODE** and for 3 seconds to get out of the CAL 2 calibration screen.



Cal 2 Start Screen

Press the **MODE** button to move to the next calibration screen. ↓

Press the **MODE** button to save and move to the next function. ⬇



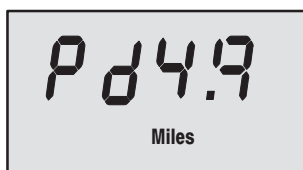
Pitot Water Pressure Sensor Input

Select the PSI input of the Pitot water pressure sensor on the engine.

NOTE: The standard speed input on production Mercury Outboards is 100 PSI. Certain High Performance applications may require a 200 Psi input.

1. Press the button to select.
1 = 100 PSI
2 = 200 PSI

2. Press the **MODE** button to move to the next function. ⬇



Paddle Wheel Speed Sensor Frequency

Frequency can be changed to match requirements of different sensors. 4.9 is the frequency of the paddle wheel speed sensor provided by Mercury Marine.

Press the **MODE** button to save and move to the next function. ⬇

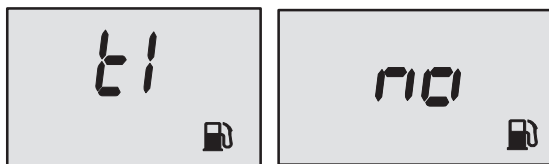
Fuel Tank Calibration

THERE ARE THREE METHODS TO SET UP THE FUEL TANK LEVEL MONITORING FEATURE:

First: Do nothing. Linear readout based on raw sensor values. This mode does not factor in irregular tank shapes.

Second: By following the tank calibration procedure, but without actually adding fuel to the tank. The Monitor will supply an estimated range value based on default sensor values. This mode does not factor in irregular tank shapes.

Third: By following the tank calibration procedure completely, which includes adding fuel at certain calibration points. Monitor will display an estimated range value that factors in the tank shape.



Tank 1 (fuel) Capacity Setting

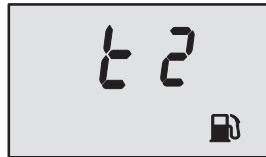
"t1" = tank 1

1. Press the **MODE** button until "t1" is displayed. "t1" = tank 1.
2. Press **MODE** once more. The word "no" and the fuel icon will be displayed.

NOTE: The word "no" will not go away unless the gauge sees a tank connected to the system. With no tank connected, you will not be able to enter a capacity.

3. Enter the capacity of tank 1 in gallons using the key.

- Press the **MODE** button to save and move to the next function. ➡



Tank 2 Capacity Setting

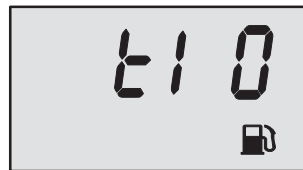
NOTE: Tank 2 does not have to be a fuel tank. It could represent an oil tank for example.

"t2" = tank 2

- Press the **MODE** button until "t2" is displayed. "t2" = tank 2.
- Press **MODE** once more. The word "no" and the fuel icon will be displayed.
- Enter the capacity of tank 2 in gallons using the key.

NOTE: The word "no" will not go away unless the gauge sees a tank connected to the system. With no tank connected, you will not be able to enter a capacity.

- Press the **MODE** button to save and move to the next function. ➡

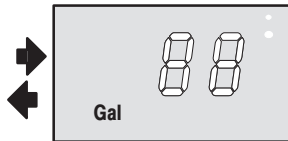


Tank 1 Calibration

Once the capacities have been entered, you need to. Select whether you want to calibrate fuel tank 1 "t1".

NOTE: The gauge will not let you calibrate the fuel tank until the capacity had been entered).

- Press the button to select 1= on, 0 = off. Selecting "1" will continue fuel tank calibration.



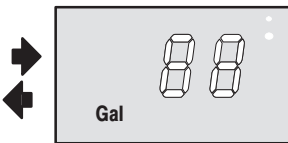
Tank 1 Calibration 0% Setting

Have the fuel tank level at empty.

- Press the button to save. Press the **MODE** button to advance to 25% setting. ➡



25 Percent



Fuel to Add

Tank 1 Calibration 25% Setting

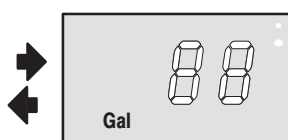
Adding the amount of fuel shown will raise fuel tank level to 25 percent.

NOTE: The quantity of "Fuel to Add" is determined by the fuel tank capacity number entered

- Add the displayed amount of fuel to the fuel tank.
- Press the button to save. Press the **MODE** button to advance to 50% setting. ➡



50 Percent





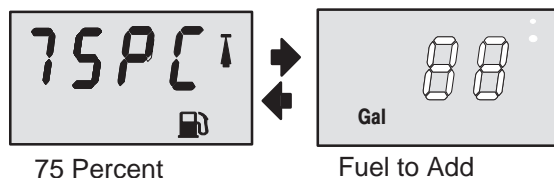
Fuel to Add

Tank 1 Calibration 50% Setting

Adding the amount of fuel shown will raise fuel tank level to 50 percent.

NOTE: The quantity of "Fuel to Add" is determined by the fuel tank capacity number entered



5. Add the displayed amount of fuel to the fuel tank.
6. Press the  button to save. Press the **MODE** button to advance to 75% setting. 

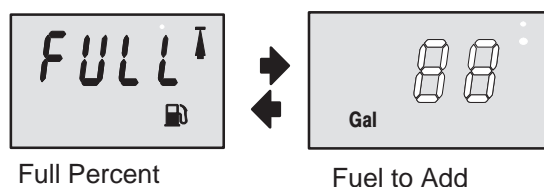


Tank 1 Calibration 75% Setting

Adding the amount of fuel shown will raise fuel tank level to 75 percent.



NOTE: The quantity of "Fuel to Add" is determined by the fuel tank capacity number entered

7. Add the displayed amount of fuel to the fuel tank.
8. Press the  button to save. Press the **MODE** button to advance to full% setting. 



Tank 1 Calibration Full Setting

Add the amount of fuel to fill the fuel tank.

9. Add the amount of fuel to fill the fuel tank.
10. Press the  button to save. Press the **MODE** button to advance to next function. 




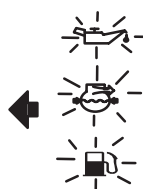
Tank 2 Calibration

Select whether you want to calibrate tank 2.

NOTE: Tank 2 does not have to be a fuel tank. It could represent an oil tank for example.



NOTE: The gauge will not let you calibrate the tank until the capacity had been entered).

1. Press the **MODE** button until "t2" is displayed. "t2" = tank 2.
2. Press the  button to select 1= on, 0 = off. Selecting "1" will continue tank 2 calibration.
3. Press the **MODE** button to continue.



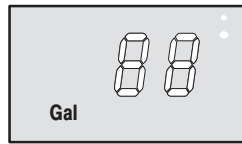
Tank 2 Calibration Icon Selection

Select one of three icons for tank 2 display screen. (oil, water/waste, fuel).

1. Press the  button, you will see a blinking icon. Using the  button, select which icon you want tank 2 to be, (oil, fuel, or water/waste).

NOTE: If you choose oil or water/waste icon, no further tank 2 calibration will be needed. If tank 2 will be for fuel, continue tank 2 procedure.

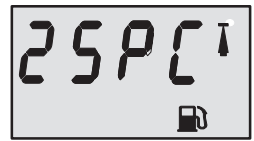
2. Press the **MODE** button to continue.



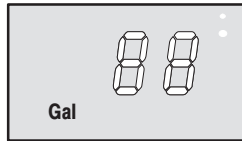
Tank 2 Calibration 0% Setting

Have the fuel tank level at empty.

3. Press the button to save. Press the **MODE** button to advance to 25% setting. ↓



25 Percent



Fuel to Add

Tank 2 Calibration 25% Setting

Adding the amount of fuel shown will raise fuel tank level to 25 percent.

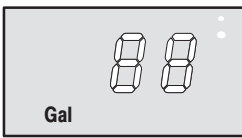
NOTE :The quantity of fuel to add is determined by the fuel tank capacity number entered.

4. Add the displayed amount of fuel to the fuel tank.

5. Press the button to save. Press the **MODE** button to advance to 50% setting. ↓



50 Percent



Fuel to Add

Tank 2 Calibration 50% Setting

Adding the amount of fuel shown will raise fuel tank level to 50 percent.

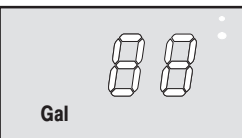
NOTE:The quantity of fuel to add is determined by the fuel tank capacity number entered.

6. Add the displayed amount of fuel to the fuel tank.

7. Press the button to save. Press the **MODE** button to advance to 75% setting. ↓



75 Percent



Fuel to Add

Tank 2 Calibration 75% Setting

Adding the amount of fuel shown will raise fuel tank level to 75 percent.

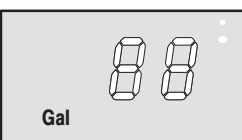
NOTE:The quantity of fuel to add is determined by the fuel tank capacity number entered.

8. Add the displayed amount of fuel to the fuel tank.

9. Press the button to save. Press the **MODE** button to advance to full% setting. ↓



Full Percent



Fuel to Add















Tank 2 Calibration Full Setting


Add the amount of fuel to fill the fuel tank.


10. Add the amount of fuel to fill the fuel tank.

11. Press the button to save. Press the **MODE** button to advance to next function. ↓

System Monitor Legend


A = 	L = 
B = 	N = 
C = 	O = 
D = 	P = 
E = 	S = 
F = 	T = 
I = 	U = 


 = Engine

 = Fuel

 = Water Temperature

 = Water Pressure

 = Oil

 = Alarm

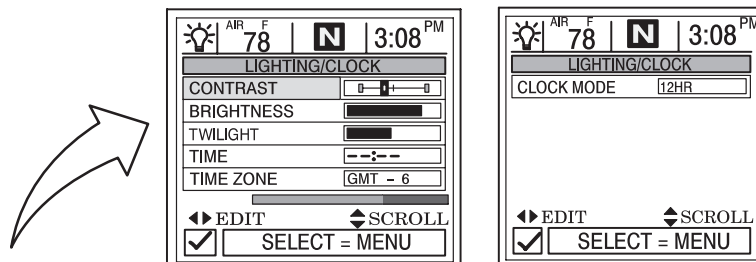
Settings Options

System View

Contrast/Lighting/Clock

To adjust a setting:

1. Press ▲▼ to highlight the desired menu selection.
2. Press ◀▶ to edit the menu box.
3. Press **SELECT** to accept settings.



CONTRAST – Provides a slide bar to adjust the display screen contrast to compensate for changes in temperature or lighting conditions.

BRIGHTNESS – Provides a slide bar to adjust the display screen lighting level.

TWILIGHT – The twilight setting is a light sensor setting that adjusts the amount of light needed to automatically turn on the System View backlighting and the System Link gauge lighting. You can manually control when the backlighting turns on by adjusting the light level slide bar.

TIME – If no GPS is connected, press the horizontal arrows to set the current time. If GPS is connected, follow time zone setting below.

TIME ZONE – Time zone setting is how many hours you are behind or ahead of Greenwich Mean Time (GMT). The chart below gives approximate GMT time zone settings for various longitudinal zones. Add one hour to the setting for daylight savings time.

CLOCK MODE – Select 12 hour or 24 hour clock set.

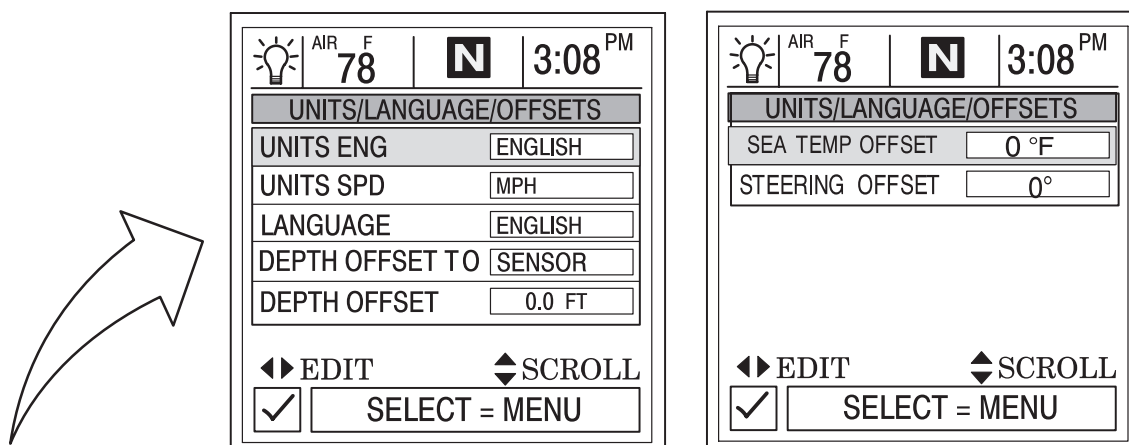
Longitudinal Zone	Time Zone Setting	DayLight Saving Time Zone Setting	Longitudinal Zone	Time Zone Setting	DayLight Saving Time Zone Setting
W180.0° to W172.5°	-12	-11	E007.5° to E022.5°	+1	+2
W172.5° to W157.5°	-11	-10	E022.5° to E037.5°	+2	+3
W157.5° to W142.5°	-10	-9	E037.5° to E052.5°	+3	+4
W142.5° to W127.5°	-9	-8	E052.5° to E067.5°	+4	+5
W127.5° to W112.5° (Pacific Standard Time)	-8	-7	E067.5° to E083.5°	+5	+6
W112.5° to W097.5° (Mountain Standard Time)	-7	-6	E082.5° to E097.5°	+6	+7
W097.5° to W082.5° (Central Standard Time)	-6	-5	E097.5° to E112.5°	+7	+8
W082.5° to W067.5° (Eastern Standard Time)	-5	-4	E112.5° to E127.5°	+8	+9
W067.5° to W052.5°	-4	-3	E127.5° to E142.5°	+9	+10
W052.5° to W037.5°	-3	-2	E142.5° to E157.5°	+10	+11
W037.5° to W022.5°	-2	-1	E157.5° to E172.5°	+11	+12
W022.5° to W007.5°	-1	0	E172.5° to E180.0°	+12	+13
W007.5° to E007.5°	0	+1			

Settings Options

Units/Language/Offsets

To adjust a setting:

1. Press ▲▼ to highlight the desired menu selection.
2. Press ◀▶ to edit the menu box.
3. Press **SELECT** to accept settings.



UNITS ENG – Lets you select english or metric format for unit measurements.

UNITS SPD – Lets you select the units at which speed is displayed. speed. You may select from MPH (Miles Per Hour), KM/H (Kilometers Per Hour or Knots).

LANGUAGE – System View displays only English at this time.

DEPTH OFFSET TO – Normally, this unit measures water depth from the face of the the transducer (sensor). Since the transducer is below the water, this distance is not the exact water depth. You can change the depth reading using this depth offset feature. You have three depth offsets selections:

1. **SENSOR** – Will measure water depth from the face of the transducer. No setting to depth offset is

necessary.

2. **WATERLINE** – Will give water depth from the surface of the water. You will need to change the Deep Offset setting below. Measure the distance between the face of the transducer and the water line. Add this measurement into depth offset menu box below.

3. **KEEL** – Will give water depth from the keel of the boat. You will need to change the deep offset setting below. Measure the distance between the transducer and the lowest part of the boat. Place this measurement into depth offset menu box below. This offset will be a negative value.

DEPTH OFFSET – Activate the depth offset feature by adding the measurement taken above to compensate for waterline or keel offset.

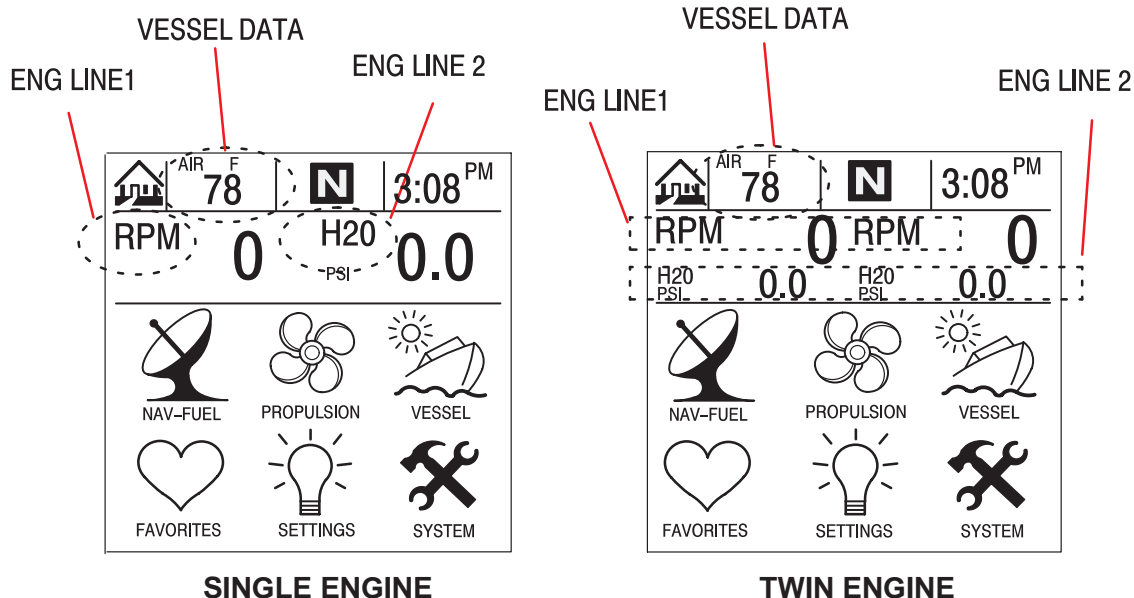
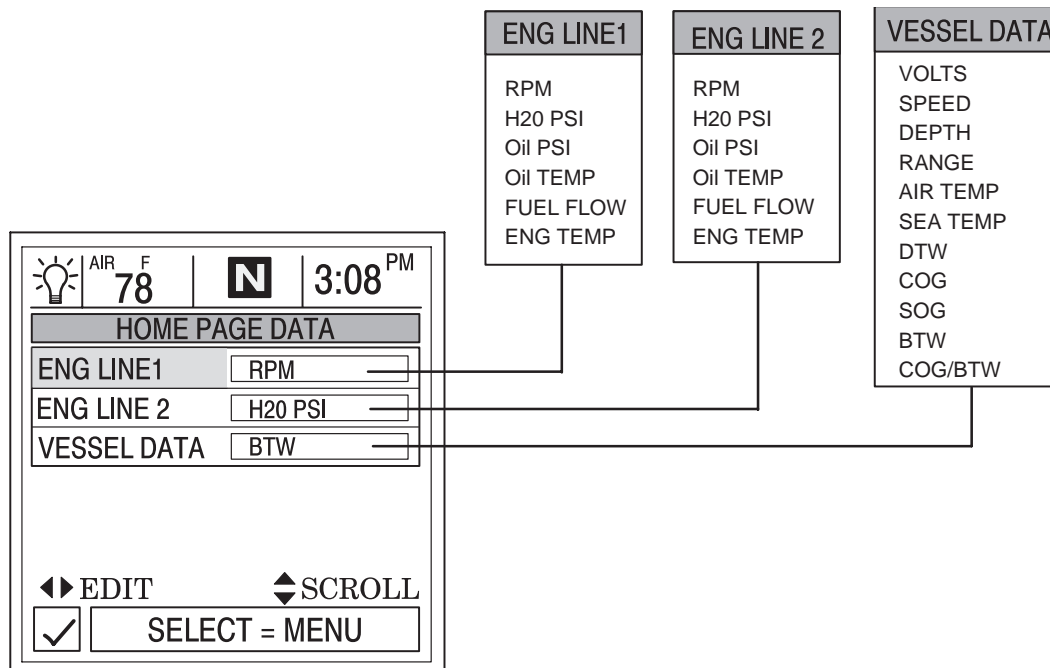
SEA TEMP OFFSET – The sea water temperature sensor can be calibrated to match actual sea water temperature Calculate the different in degrees that the sea water temperature is off and enter it into the menu window.

STEERING OFFSET – The steering sensor can be calibrated to compensate for inaccuracies. Calculate the different in degrees that the steering sensor is off and enter it into the menu window.

Settings Options

Home Page Data

4. Look at the **HOME PAGE DATA** and determine if there is any data that you would like to change. Press **▲▼** to select function. Press **◀▶** to edit the function.

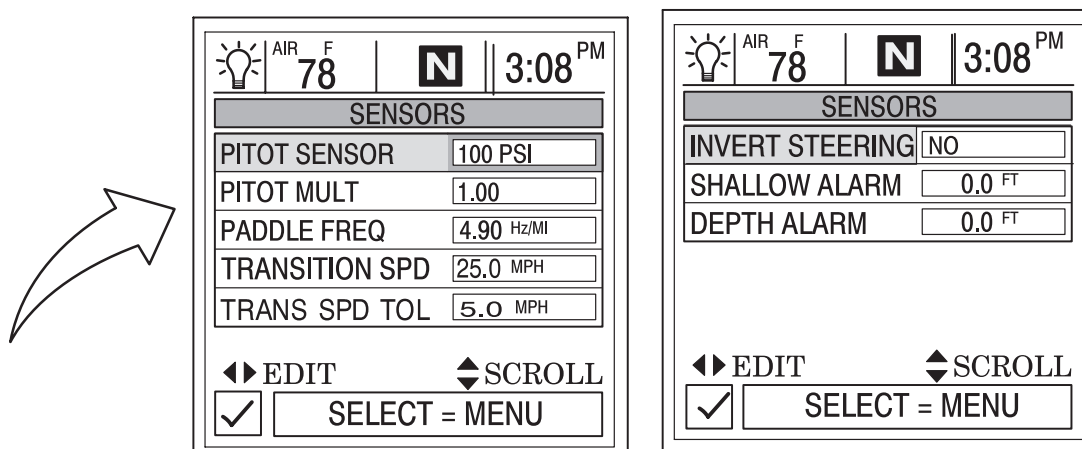


Settings Options

Sensors

To adjust a setting:

1. Press ▲▼ to highlight the desired menu selection.
2. Press ◀▶ to edit the menu box.
3. Press **SELECT** to accept settings.



PITOT SENSOR – Select the PSI input of the Pitot water pressure sensor on the engine.

NOTE: The standard speed input on production Mercury engines is 100 PSI. Certain High Performance applications may require a 200 Psi input.

PITOT MULT (Multiplier) – The pitot pressure sensor can be calibrated for correcting display readings that read to high/low. Calculate the percentage that the speed is off and enter it into the menu window.

PADDLE FREQ – Frequency can be changed to match requirements of different sensors. 4.9 Hz per mile or 5.7 Hz per knot is the frequency of the paddle wheel speed sensor provided by Mercury Marine.

TRANSITION SPD – Transition speed is the boat speed at which System View stops looking at the paddle wheel and starts using the pitot to measure boat speed. Default setting is 25 MPH. If desired, this transition speed can be changed.

TRANS SPD TOL (Transition Speed Tolerance) – Adjust for differences in sensor tolerances between the paddle wheel, GPS and pitot.

INVERT STEERING – If steering angle displayed is opposite of the direction that it should, the signal can be inverted so the steering angle can be displayed properly.

SHALLOW ALARM – The shallow water alarm can be set to sound a warning at a depth determined by the user. Activate the shallow water alarm by inputting the desired depth into the menu box. The depth range can be from 0.0 – 650.0 feet. Deactivate the shallow water alarm by setting the shallow water alarm to “0”.

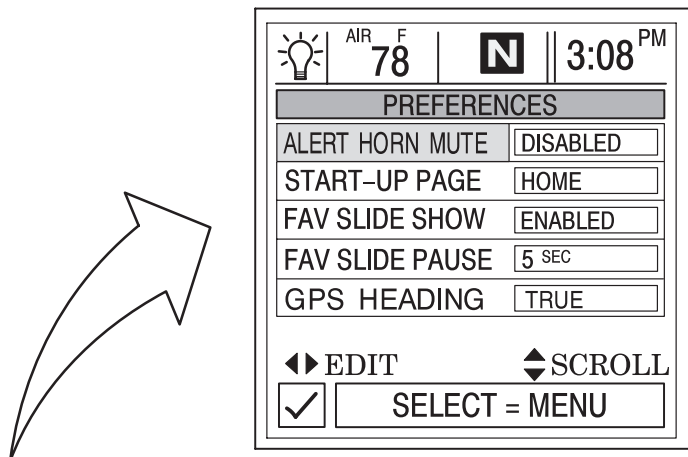
DEPTH ALARM – The deep water alarm can be set to sound a warning at a depth determined by the user. Activate the depth alarm by inputting the desired depth into the menu box. The depth range can be from 0.0 – 650.0 feet. Deactivate the depth alarm by setting the depth alarm to “0”.

Settings Options

Preferences

To adjust a setting:

1. Press ▲▼ to highlight the desired menu selection.
2. Press ◀▶ to edit the menu box.
3. Press **SELECT** to accept settings.



ALERT HORN MUTE – The System View has a warning horn alarm. You can set an alarm to sound a warning tone for various fault alarms and shallow or deep water depth warning. To use this alarm, press the right arrow to **DISABLE** the mute.

START-UP PAGE – You have two options for what start-up page you want to view. You can select the home page or you can select the last page that's showing at power off. Press the right arrow to select **HOME** or **LAST PAGE**.

FAVORITE SLIDE SHOW – This feature if desired, will automatically scroll through your selection of favorite screens. This allows the user to view each screen for the pause time selected below. Hold **SELECT** button for 3 seconds to stop the scrolling.

FAVORITE SLIDE PAUSE – Select the pause time you would prefer for viewing each favorite screen in the **Favorite Slide Show**. Select between **5** and **30** seconds.

GPS HEADING – Choose **TRUE** or **MAGNETIC** for the GPS Heading display.

NOTE: To receive BTW in both **TRUE** and **MAGNETIC**, System View must see a valid BWC sentence. If System View sees an RMB sentence, System View will display **TRUE** BTW only.

Settings Options

Favorites/Page Status

The favorites/page status allows you to select one of the two following options:

1. Allows you to choose your preferences screens and place them into the FAVORITES Directory for quick viewing. Screens will still be shown in their respected menus.
2. Allows you to turn off any un-wanted screens from all directories in System View.

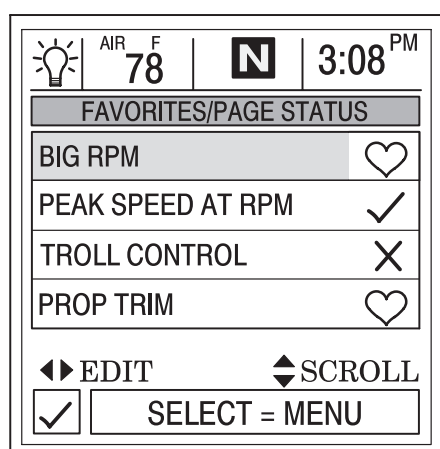
To adjust a setting:

1. Press ▲▼ to scroll through the list of screens.
2. Press ◀▶ to edit the setting as follows:

♥ Flagging the selected screen with a heart will add the screen to the **FAVORITES** directory. It will also be available in its directory.

✓ Flagging the screen selection with a check mark will turn the screen on in its directory and off in the **FAVORITES** directory.

✗ Flagging the screen selection with a “X” mark will turn the screen off in its directory and also off in the **FAVORITES** directory.



Screen Selections



BIG RPM	
PEAK SPEED AT RPM	
TROLL CONTROL	
PROP TRIM	
ENGINE DATA	
STEERING POSITION	
TANK STATUS	
FUEL	
OIL	
WASTE	
WATER	
VESSEL STATUS	
ESTIMATED FUEL RANGE	
VESSEL COURSE	
NEXT WAYPOINT	
TRIP HISTORY LOG	
DEPTH	
DEPTH PLOT	
ENVIRONMENT	
SEAWATER TEMP PLOT	

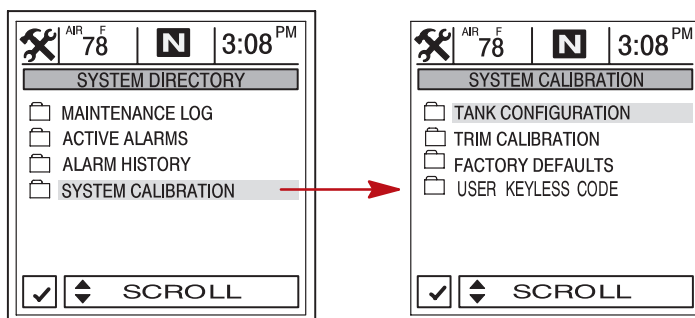
System Calibration

System Calibration

IMPORTANT: Entering into the system calibration menus will require you to shut-down the engine(s) in order to reactivate the System View.

The system calibration consists of the following menus:

- Vessel configuration
- Engine location
- Tank configuration
- Trim calibration
- Factory defaults
- User keyless code

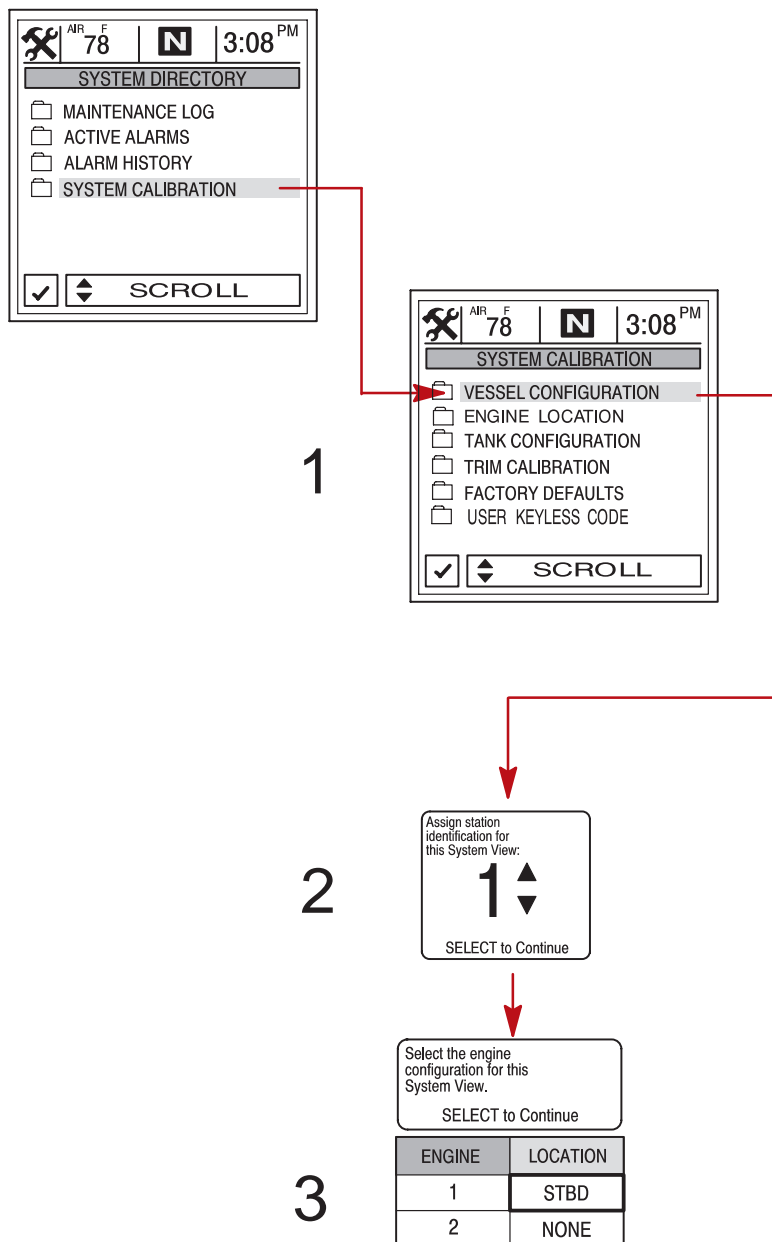


System Calibration

Vessel Configuration

To adjust a setting:

1. Open the **VESSEL CONFIGURATION** menu.
2. Assign **1** for all first station installations (most common choice). Only assign **2** if you are using the System View as a second System View in a dual station installation. Press **SELECT** to continue.
3. Select the engine configuration for the System View. Press **SELECT** to continue.





System Calibration

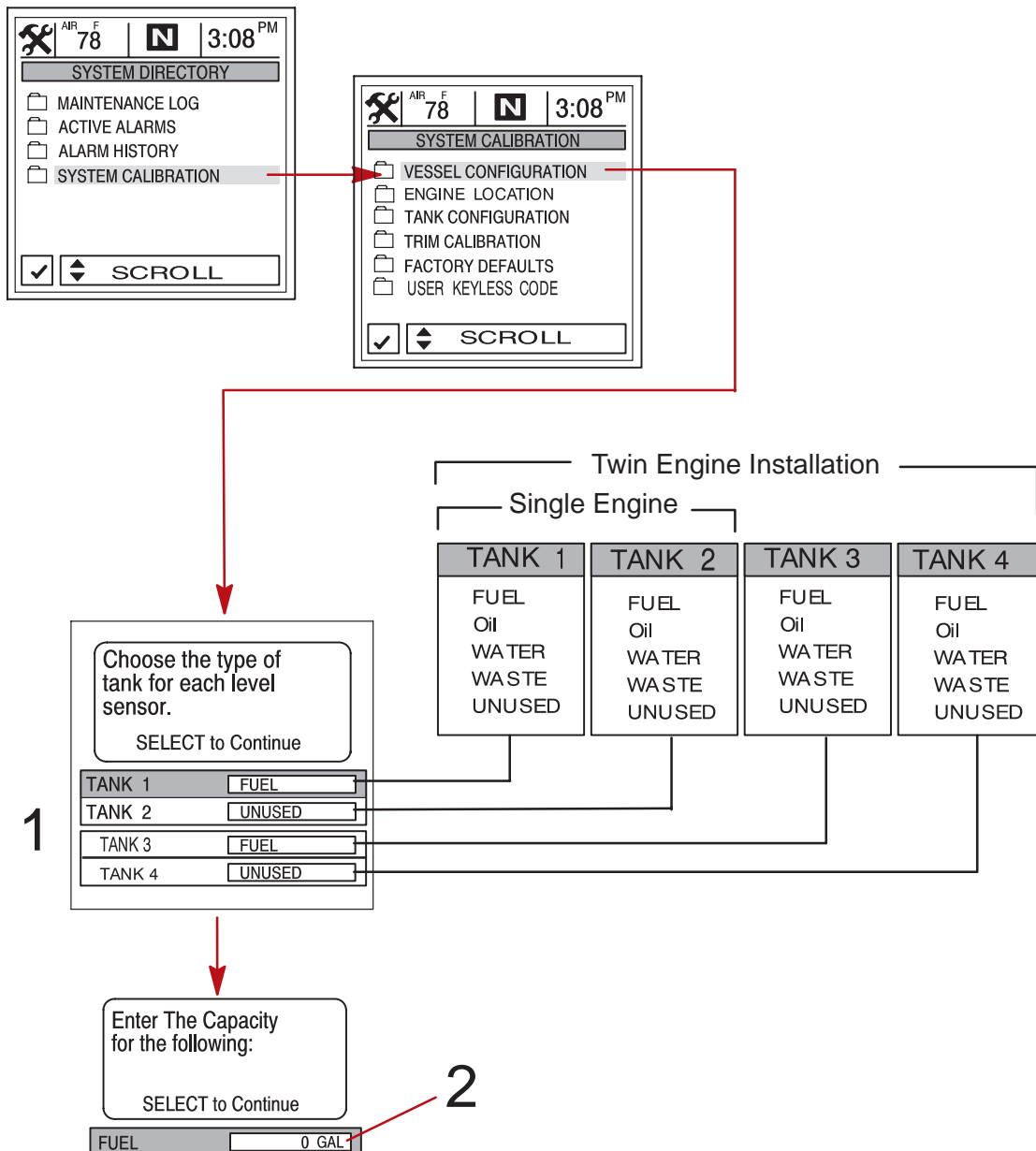
Tank Configuration

NOTE: You must perform Master Reset to access.

NOTE: System View allows you to choose the name of the tanks you want to appear on the screen. You can choose two tanks per engine.

1. If you like to change the name of the tank(s), highlight the tank you would like to change. Press  to display the list of names of available tank types. Select a name. Press **SELECT** to save.
2. Enter the capacity of the tanks. Select the tank and press  to enter the tank capacity. Press **SELECT** to save.

TANK CONFIGURATION



NOTE: "Vessel Configuration" and "Engine Location" are only accessible at initial power-up or via Master Reset.

System Calibration

Tank Configuration (Continued)

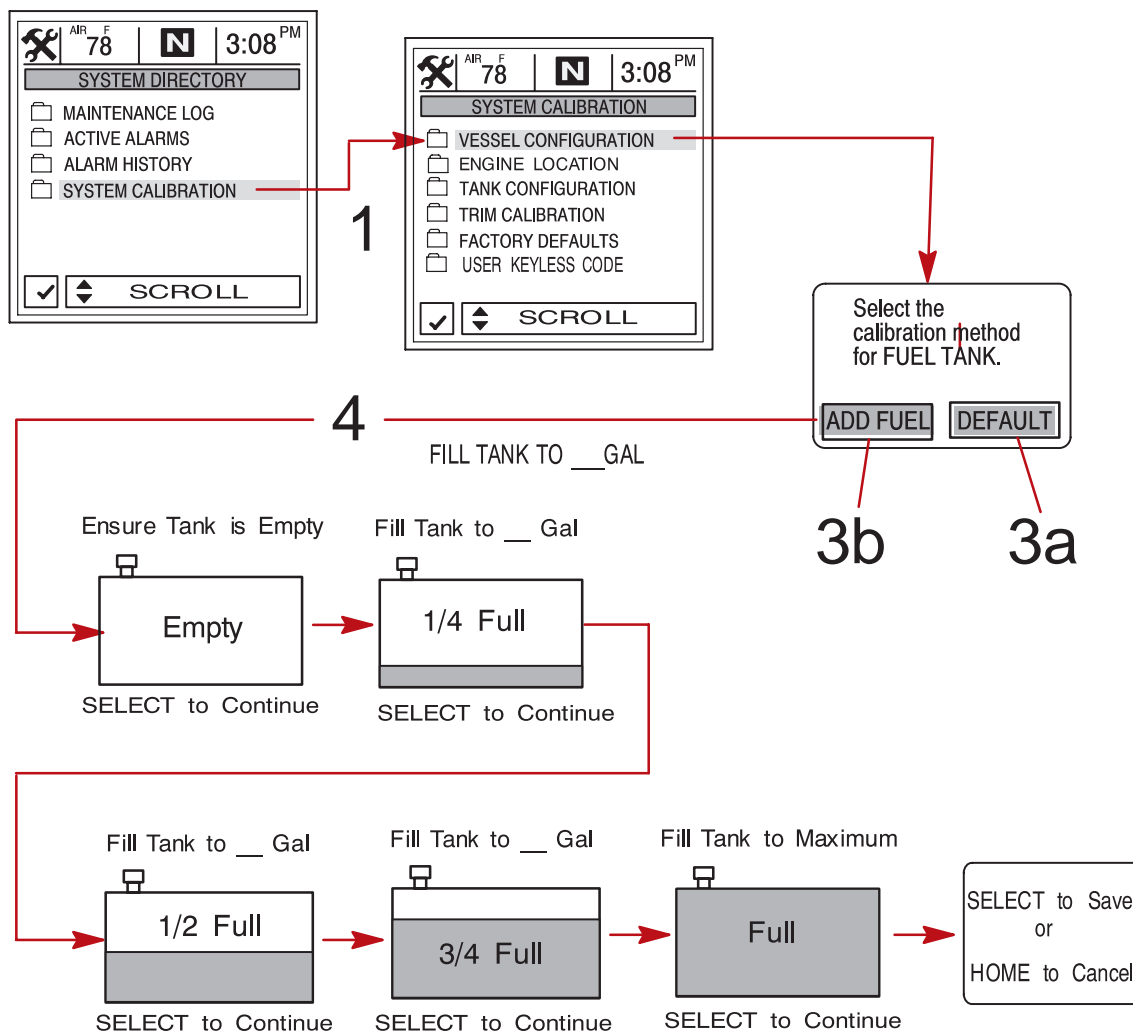
NOTE: The fuel tank will have to be calibrated in order for System View to display fuel range.

3. There are two methods for calibrating fuel tank level:

- Method 1** – Select **DEFAULT** – The System View will automatically supply an estimated range value based on default sensor values. This mode does not factor in irregular tank shapes. Press **SELECT** to save.
- Method 2** – Select **ADD FUEL** – By following this method procedure, which includes adding fuel at certain calibration points. System View will display an estimated range value that factors in the tank shape.

NOTE: You will have to start with an empty fuel tank and manually fill the tank to the values given per instruction.

4. If using **Method 2**, add fuel as shown in illustration below.



System Calibration

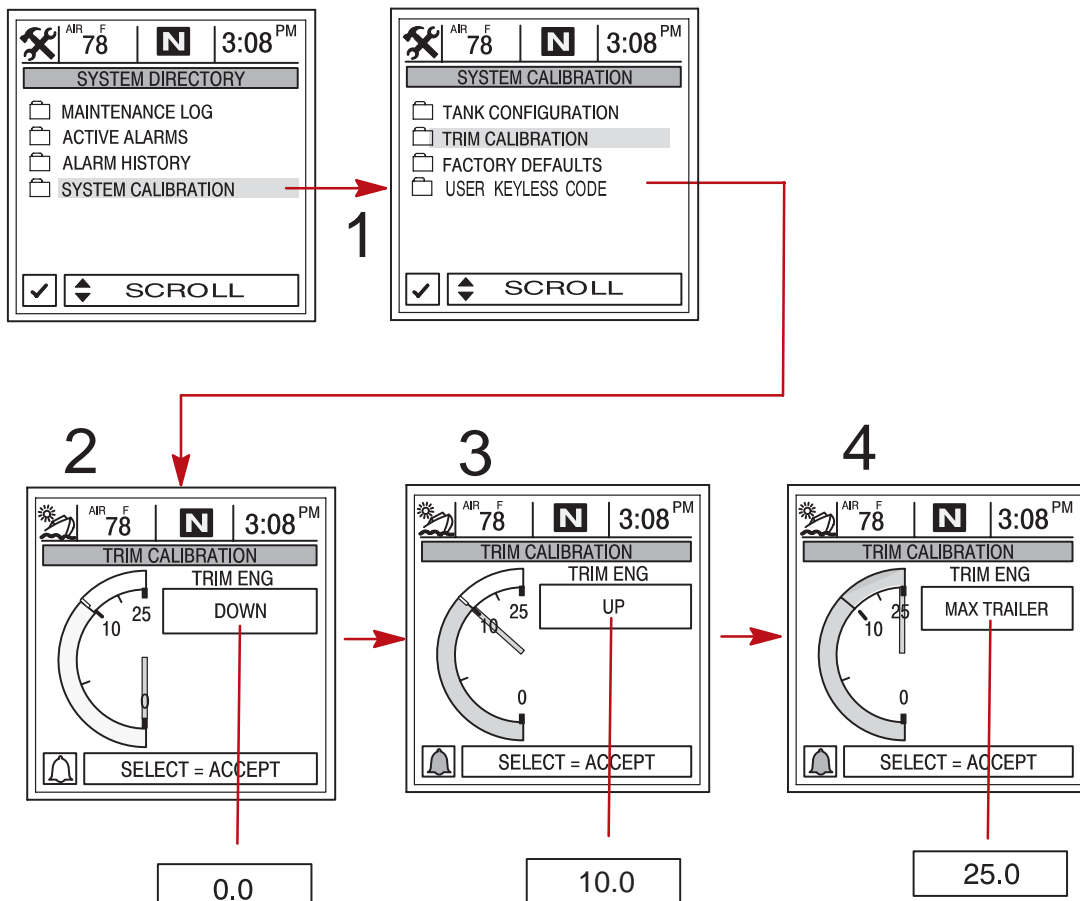
Trim Calibration

CALIBRATING THE TRIM SENSOR

To calibrate trim:

1. Open the **TRIM CALIBRATION** menu.
2. **TRIM ENG DOWN:** Press the **SELECT** key to open the **DOWN** screen. Trim the engine all the way down. Press **SELECT** to save and move to next screen.
3. **TRIM ENG UP:** The **TRIM ENG UP** screen should be open. Trim the engine all the way up. Press **SELECT** to save and move to next screen.
4. **TRIM ENG MAX TRAILER:** the **TRIM ENG MAX TRAILER** screen should be open. Trim the engine to maximum trailer position. Press **SELECT** to save.

NOTE: If trim calibration is correct, trim range should be displayed in units from 0.0 to 10.0 and 10.1 to 25.0 will correspond to the trailer range.



System Calibration

Engine Location

NOTE: MULTI ENGINE FAULT MESSAGE – If the System View should ever detect an incorrect engine location, it will alert you by displaying a multi engine fault message. If this should happen, follow one of the methods for setting engine location following.

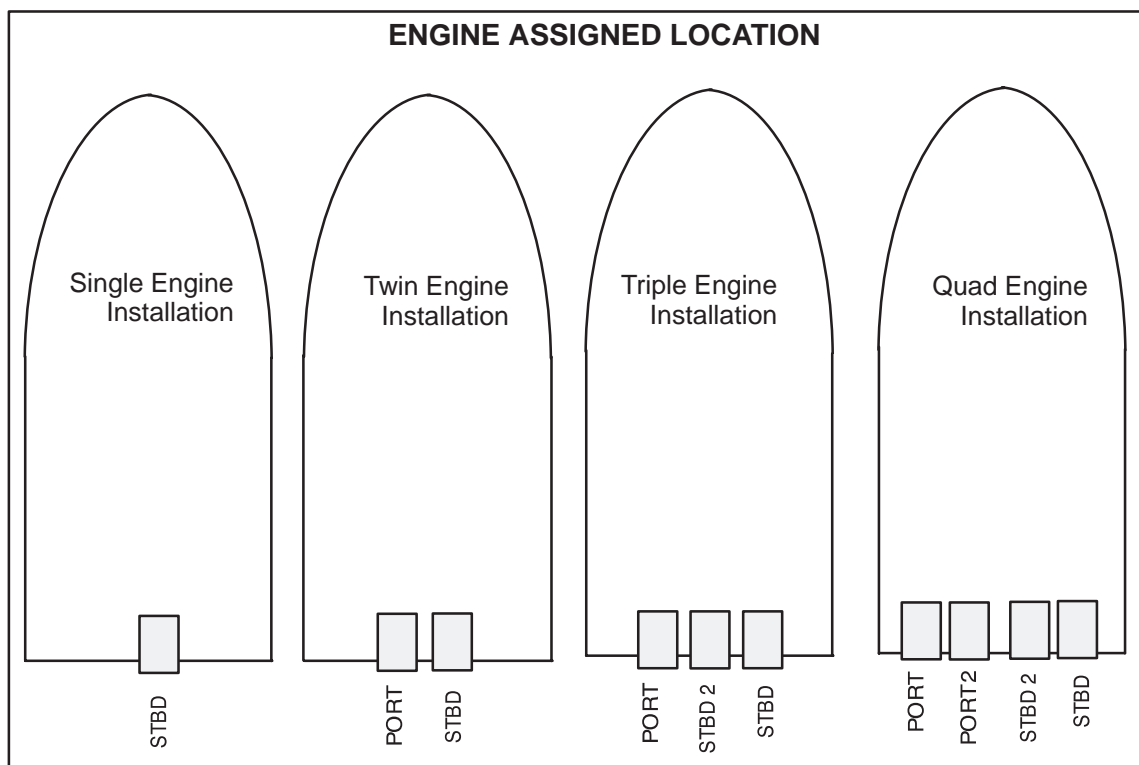
In multiple engine applications, each engine must first be assigned a location (starboard, port, starboard 2 or port 2) using the following System View procedure or with a Quicksilver Diagnostic Tool. This is required for the correct engine data to be transmitted to the System View.

There are two methods for setting engine location:

1. Set the engine locations using the Quicksilver Digital Diagnostic Terminal (DDT) along with SmartCraft Engine Diagnostic Cartridge Version 1.0 or newer.
2. Set engine location using the following System View procedures.

There are 4 assigned engine locations available:

- Starboard STBD
- Port PORT
- Starboard Inside STBD 2
- Port Inside PORT 2



System Calibration

Engine Location

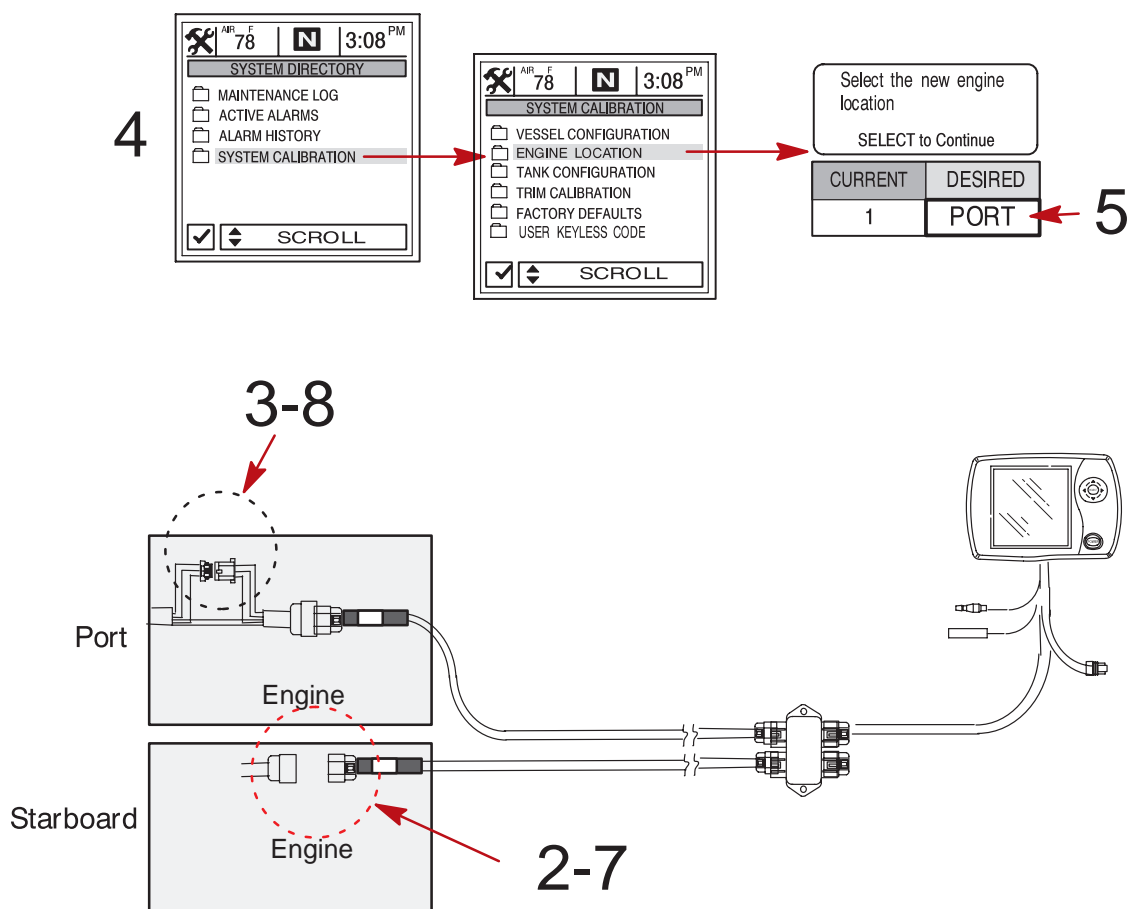
SYSTEM VIEW SET-UP FOR ENGINE LOCATION

NOTE: You must perform Master Reset to access.

Twin Engine Installations – Where System View is displaying a multiple starboard engines fault

NOTE: Engines shipped from the factory are setup for starboard engine location.

1. Turn the power off to the System View.
2. Disconnect the SmartCraft harness from the starboard engine harness.
3. If the 3 wire plug has been disconnected from the port engine harness, temporarily reconnect it.
4. Turn the ignition on to the engines and power up the System View. Open the **SYSTEM** directory and select System Configuration Menu.
5. Open the **ENGINE LOCATION** menu. Set the desired location for the current engine to read **PORT**. Press **SELECT** to save.
6. Setting should be complete.
7. Reconnect the SmartCraft harness to the starboard engine harness.
8. Disconnect the 3 wire plug if connected in step 3.



Continued on next page.

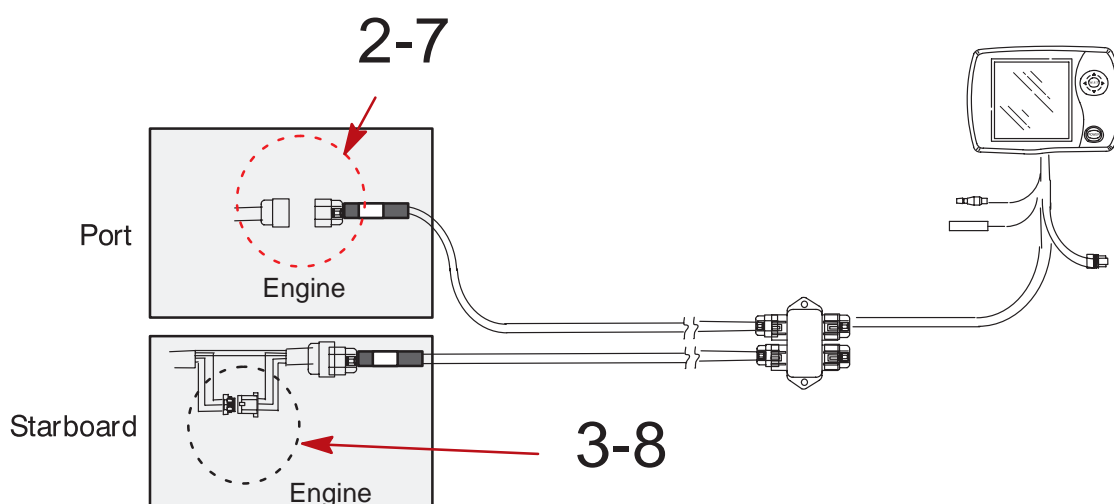
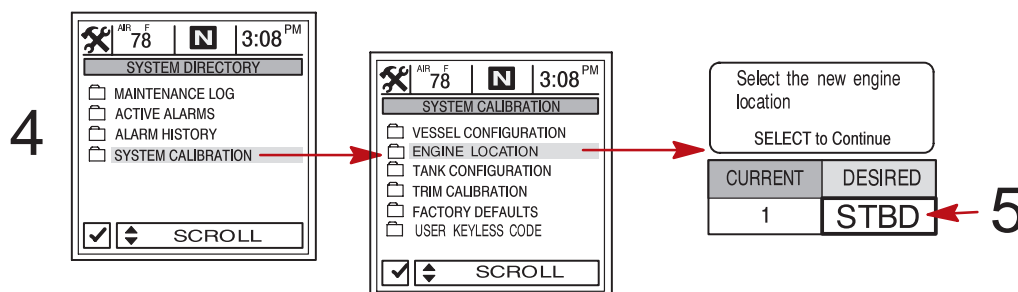
System Calibration

Engine Location

SYSTEM VIEW SET-UP FOR ENGINE LOCATION

Twin Engine Installations – Where System View is displaying a multiple port engines fault

1. Turn the power off to the System View.
2. Disconnect the SmartCraft harness from the port engine harness.
3. If the 3 wire plug has been disconnected from the starboard engine harness, temporarily reconnect it.
4. Turn the ignition on to the engines and power up the System View. Open the **SYSTEM** directory and select **SYSTEM CALIBRATION** menu.
5. Open the **ENGINE LOCATION** menu. Set the desired location for the current engine to read **STBD**. Press **SELECT** to save.
6. Setting should be complete.
7. Reconnect the SmartCraft harness to the port engine harness.
8. Disconnect the 3 wire plug if connected in Step 3.



System Calibration

Factory Defaults

RESET SETTINGS DIRECTORY

Restores all settings to back to SystemView's original setup values.

To restore settings back to original setup values:

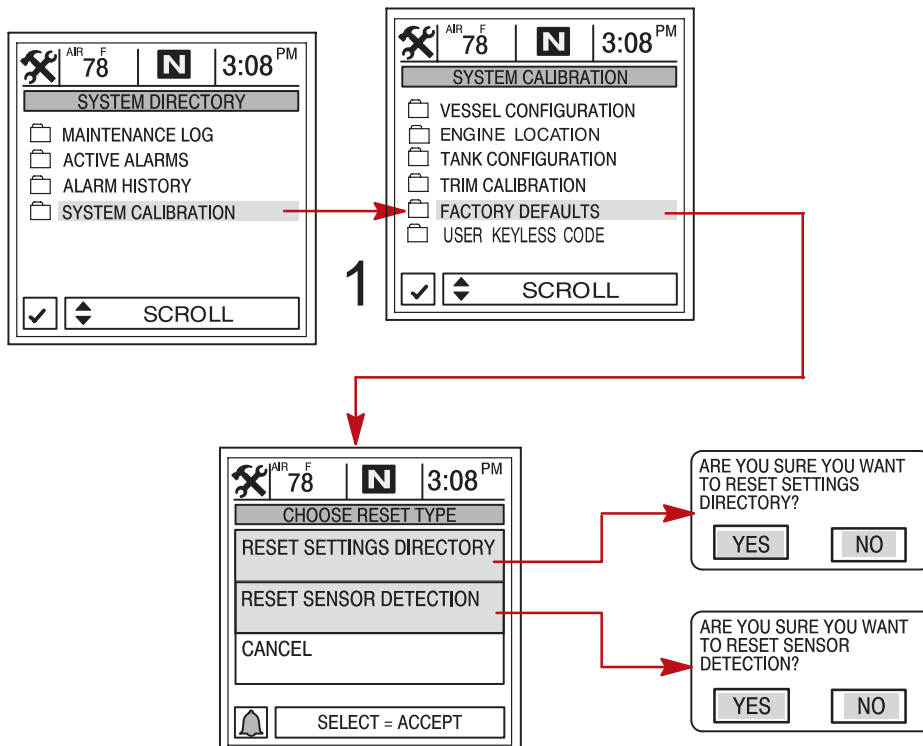
1. Open **FACTORY DEFAULTS** menu.
2. Press ▲▼ to highlight selection.
3. Press **YES** to reset or **NO** if you want to cancel.

RESET SENSOR DETECTION

At first power up, the System View will automatically detect all the sensors connected to it. If you would like the System View to re-start this sensor detection process over again, use the following procedure.

To reset sensor detection:

1. Open **FACTORY DEFAULTS** menu.
2. Press ▲▼ to highlight selection.
3. Press **YES** to reset or **NO** if you want to cancel.



SECTION 5

QUICK TIPS

Table of Contents

Frequently Asked Questions	2
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Frequently Asked Questions

Question: What components are compatible with each other?

Answer: See chart for compatibility.

Models	Products		
	System Monitor	System Tach & Speed	System View
5 Pin Tach Harness	No	No	No
System Link Gauges	Yes	Yes	Yes
Blue Cable	Yes	Yes	Yes
Resistors	Yes	Yes	Yes

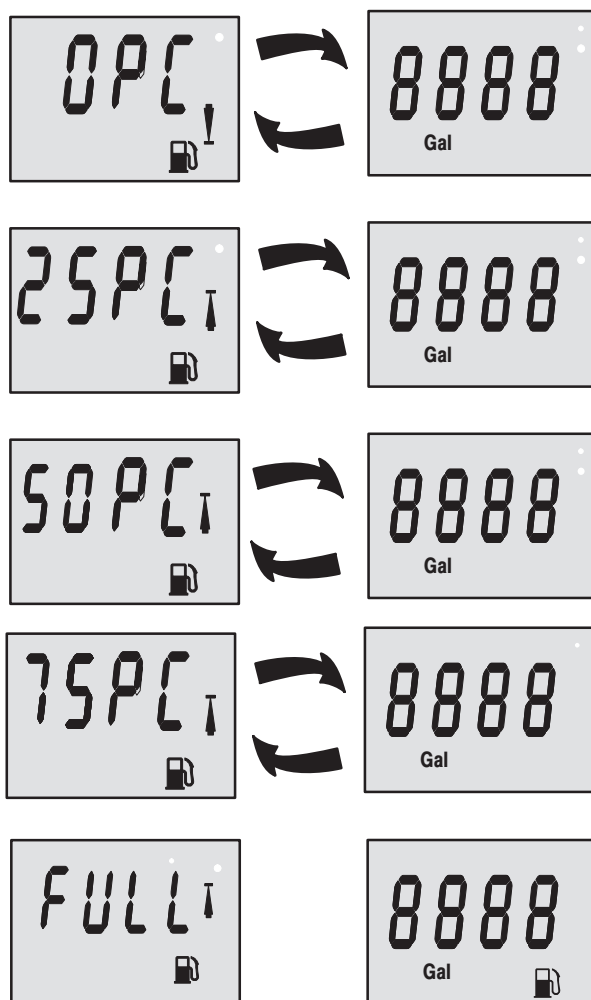
Question: What is the test procedure for testing the harness on the System Monitor?

Answer: First perform a continuity test on the blue and white wires in the blue harness. Then check to make sure the terminator resistors have not failed by performing an ohm test. They should read 60 ohms total. If you read 120 ohms you only have 1 terminator functioning or installed.

Question: What are the options when calibrating fuel and oil for System Monitor?

There are 3 ways to calibrate the gauge. Before starting make sure that the fuel sender harness (part number 84-859743T 2) has been installed.

4. In (CAL 2) "fuel tank calibration" select "0". No other input is required from here. The Monitor will use raw fuel values from the fuel sender. Calibrating this way will not give you a range reading.
5. Put in the tank capacity by going to the "fuel tank capacity" setting in Cal 1. Then go to the Cal 2 section and into "fuel tank calibration". Select "1". Next depress the light button at each level without adding fuel or changing the resistance of the fuel sender. This will put default values in using the capacity as a reference. If you have a System Link Speedometer installed you will also get range. Accuracy of the range will depend on how square the fuel tank is. Calibrating this way will give an estimated range based off of a square tank.
6. Put in a "tank capacity" as described above. Then calibrate the fuel tank by going to the Cal 2 section and, again, select "1". Here you need to add fuel and save as described in the operations manual. Calibrating the fuel tank this way will give you an estimated range based off the true shape of the fuel tank.

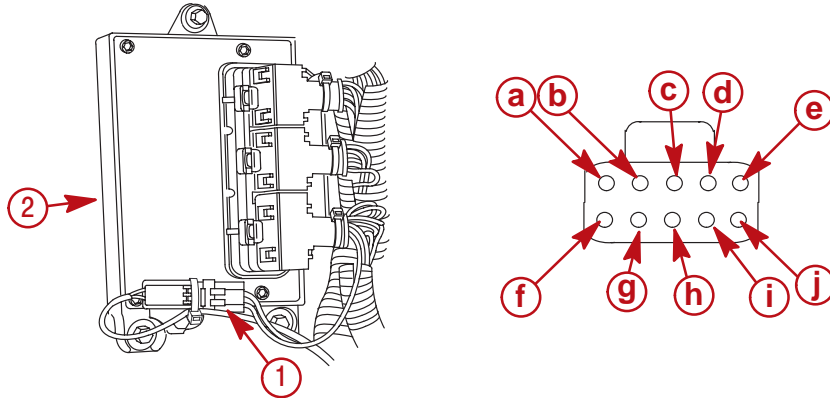


E=0%, $\frac{1}{4}$ =25%, $\frac{1}{2}$ =50%, $\frac{3}{4}$ =75% and F (Full). If you have a System Link Speedometer you will now get true range.

Question: We are setting up a System Monitor and we cannot calibrate it. It shows 4 dashes - - - when the gauge is turned on. What is wrong?

Answer: There are several items that could cause this type of problem. The reason for the 4 dashes is that there is a communication break between the ECM and the gauge. Items to check are:

1. 15 amp. fuse. Make sure it hasn't failed
2. Make sure all the wires in both ends of the harness are fully pushed into the black plug.
3. Make sure that the blue and white wires are not switched in the ends of the harness.



- 1** - Diagnostic/Test Plug
- 2** - ECM
- a** - Red
- b** - Black
- c** - Open
- d** - Open
- e** - Yellow (2RSL gauge end only)
- f** - Purple
- g** - Tan/Blue (2RSL gauge end only)
- h** - Purple/White (2RSL gauge end only)
- i** - White
- j** - Blue

4. Check the ECM to ensure that it is set to match the gauge i.e. Starboard to Starboard (STB) or Port to Port (PRT).
5. Reset the gauges engine location to its original setting. This is done in CAL 2 by changing the setting (STB or PRT) to one of the other locations. Then depress the mode and light button to save. Next reset the gauge to its original setting (STB or PRT) and, again, depress mode and light to save. The Monitor is now reset to its original location.
6. The gauge should also be set to the correct station (STN). Single station for a single station boat. If it is a dual station boat the second gauge should be set to the second station.
7. Check for too many (more than two), or failed, terminator resistors.
8. Possible break in the blue cable. Confirm by performing a continuity check.
9. ECM failure
10. Gauge head failure

Question: Our System Monitor keeps getting a constant fuel & bell icon with no horn sound. What is the problem?

Answer: This is an indication that there is a fuel capacity amount calibrated into the Monitor without a harness connected to the fuel-sending unit. The capacity should be set to "0". Follow the procedure below to rectify.

PROGRAM PROCEDURE

1. Power up the system.
2. Press both MODE and LIGHT button for 4 seconds until Cal "1" is displayed.
3. Press MODE button and scroll through the menu until the fuel tank capacity is displayed. (Gas pump and gallons displayed) This screen should read 0 gallons.
4. If not push and hold LIGHT button until the capacity goes back to zero. (Capacity goes from 0 to 999 gallons or 0 to 3780 liters)
5. Depress and hold both the MODE and LIGHT buttons, until the rpm screen appears.
6. Power the SC1000 monitor down.
7. Power up the SC1000 monitor and verify that it is now calibrated correctly.



Question: Will the System Speedometer work without the Tachometer Installed.

Answer: No. The tachometer must be installed to allow the speedometer to work. The speedometer gets its power from the tachometer.

Question: When does the paddle wheel transition to the pitot system?

Answer: On the Smart Speedometer the transition is at 15mph. On the new System Speedometer (2002) this transition can be calibrated between 5 and 25 mph.

Question: Will the new System Tachometer and Speedometer work with my 2001 OptiMax engine?

Answer: No. The ECM on the 2001 product will not work with the System Tachometer and Speedometer. They will work on 2002 product and up.

Question: Is the ECM on the OptiMax set to Starboard when we receive them?

Answer: Yes. All engines leave the factory set for a Starboard installation. The System Monitor is also set to Starboard. If the engine setup is a dual application with a single trunk line, both the Port engine and Monitor must be set to Port. The engine is changed with the DDT.



Question: The CAN cable in the boat is black shouldn't it be blue?

Answer: Yes it should be blue. Some early System Monitor cables were black. They should be replaced with the blue or yellow cable.

Question: Why does the number 4095 show up on our System Monitor.

Answer: This is a default value telling the user that there is no input for fuel range at this time. Either the fuel sender is open or there is not a harness installed.

Question: What happens if I accidentally hook an analog fuel gauge to the sending unit with the SmartCraft fuel harness also hooked up?

Answer: The 12-volt battery source from the analog gauge would feed back into the ECM's 5 volt, sensor reference circuit, damaging the circuit and ***FAILING THE ECM.***

Question: Will SmartCraft technology be utilized on additional product?

Answer: Yes. 2002 product will see limited applications on 4stroke product as well as V-6 EFI's.

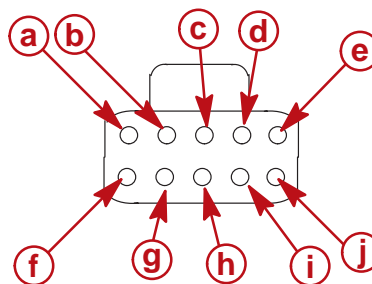
Question: Is there a cover/cap for the harness, on the engine, that is used for the paddle wheel, fuel and oil sender?

Answer: Yes. The part number is 881065A1.

Rigging

Question: The large connector on the SC1000 (blue) harness used with the System Monitor and link gauges, is sometimes difficult to route through the boat from the helm to the engine. Is there an easier method to use when routing the cable?

Answer: The connector can be removed by “popping off” the purple cap to release the locking tabs and pulling the wires from the rear of the plug. The wire ends and a pull cord/rope can then be wrapped with electrical tape to protect the wire ends. Care must be taken to reinstall the wires in the correct location.



- a - Red
- b - Black
- c - Open
- d - Open
- e - Yellow (2RSL gauge end only)
- f - Purple
- g - Tan/Blue (2RSL gauge end only)
- h - Purple/White (2RSL gauge end only)
- i - White
- j - Blue

Question: Is there a method to prevent the plastic corrugated ends on the blue harness from sliding down the cable?

Answer: A small plastic tie wrap will hold the corrugated end in place.



Question: I installed a blue cable for future use with a System Monitor and link gauges but currently the boat has the Smart Tach and Speed installed. After the engine is started, a data bus error is showing up on the tach with all systems functioning properly, why?

Answer: If the blue cable is installed and not attached to a gauge but plugged in to the engine harness it will cause this type of data error message. Disconnecting the plug from the engine will solve this problem.

Question: If the purple cap comes off the end of the cable, what can I do?

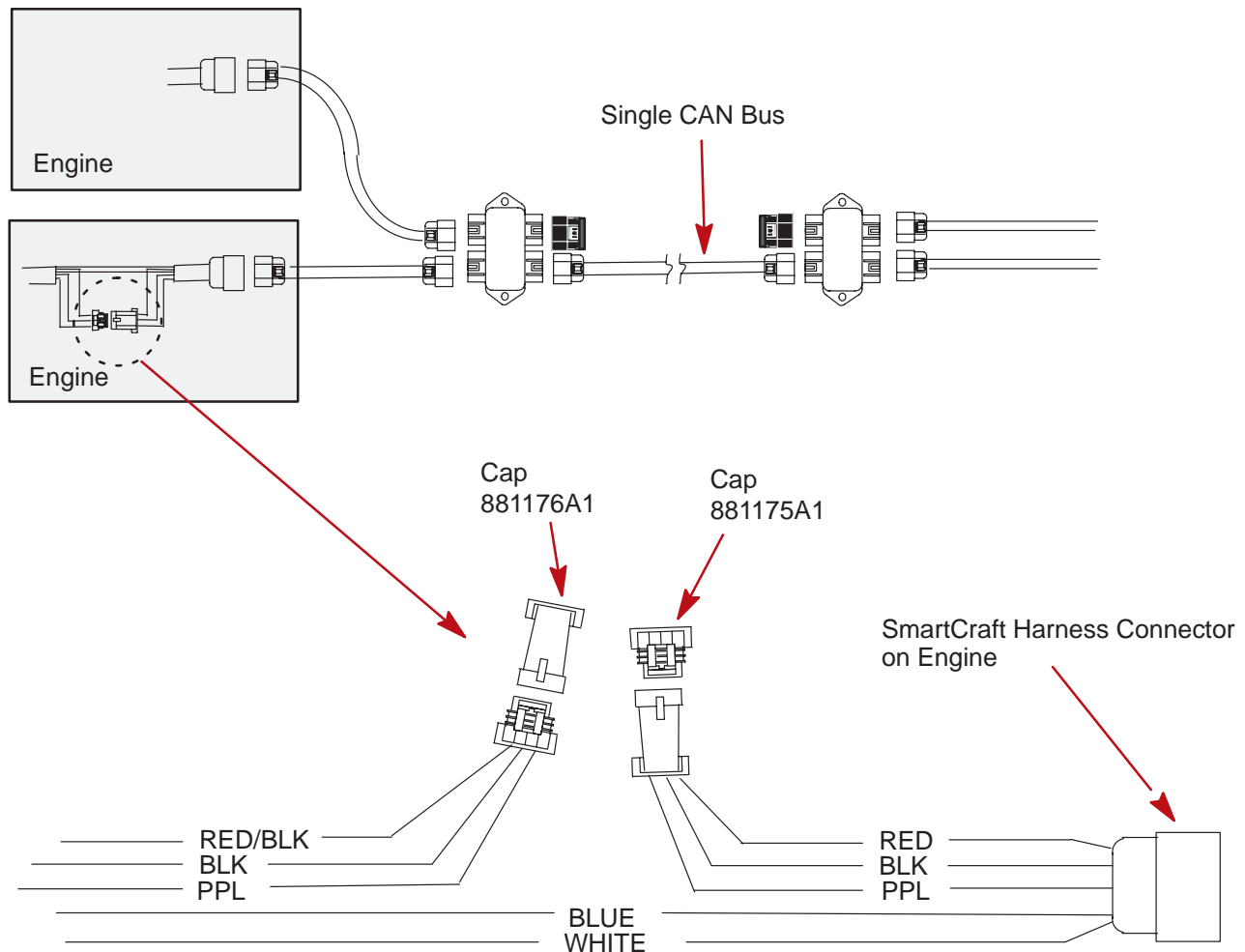
Answer: With the power off remove the purple cap from the junction box and reinstall it onto the cable. When installing the cap back into the cable make sure it is secured properly.



Question: Why do we need to disconnect the three-wire engine harness when rigging multi engine applications?

Answer: On multi engine applications using any of the SC1000 gauges, with a single trunk line, it is necessary to disconnect the three wire harness because it may cause damage to the ECM, alternator or the ability to shut the engine off. On a triple application this harness should be disconnected on two engines.

Dual Engine



NOTE: On Multi-engine applications using any of the SmartCraft gauges on a single CAN Bus, it is necessary to disconnect the 3-wire harness on all engines except one.

Question: On a multi engine application I want to troll with one engine but don't want to build any additional hours idling the second engine. What needs to be changed to power the system with either engine when using the System Monitor?

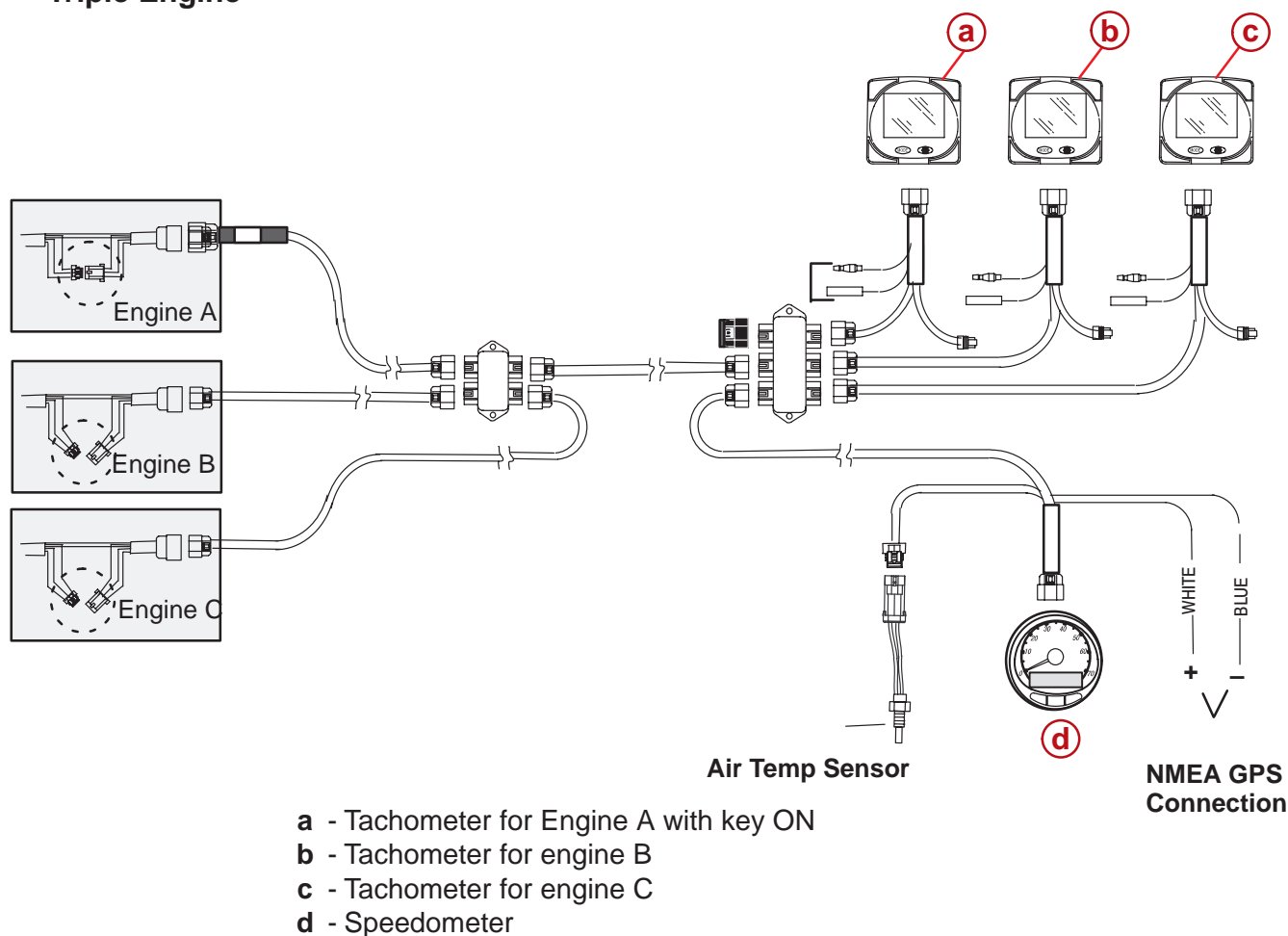
Answer: On a SmartCraft installation you can use one engine one day with the speedometer paddle wheel calibrated into the tach, allowing the use of the speedometer to set the troll control. The other tach would have to have the paddle wheel and pitot calibrated out. When the second engine is to be used for trolling, you can either run the troll control off the tach or install a second paddle wheel and calibrate the first engine's paddle wheel and pitot out when the second engine is used.

Question: How do I troll but keep the engine hours from building up on one engine over the other?

When using the System Monitor the SmartCraft troll control is not an option. But having one engine powered up and not the other it will add time to that engines screen but not the other. If one engine is preferred for trolling and switching engines is desired to keep the hours equal, then one of the following procedures should be used depending on your cable installation.

1. If two separate, blue, harnesses are used for each engine (two trunk lines) then no additional inputs to either the engines or gauges are required. Just run one engine one day and the other the next.
2. If both engines are connected to a single, blue, trunk line the internal three-wire (power) harness should be disconnected on one engine. The engine (A) that does not have the harness disconnected must have the key switch turned on (supplying power) to operate the gauges on the engine (B or C) with the disconnected harness when this engine is used for trolling. Having the key on will not accumulate run hours on the engine (A).

Triple Engine



SECTION 6

TROUBLESHOOTING

Table of Contents

System Tach/Speed	2	System Monitor 2	3
System Monitor 1	3	System View	4

System Tach/Speed

DESCRIPTION	SOLUTION
Screen says "data bus error"	Are there 2 terminators connected? - ECM not communicating, check Blue and White wire in Data Harness (See Quick Tip0 Section)
How do I wire my Speed transducer 4 pin plug?	A=Black B=Blue C=Yellow D=White
What colors are on the MerCruiser side for depth?	A=Black B=White/Black C=White/Purple D=Red
How do I wire my Depth transducer 4 pin plug?	A=Black B=Blue C=White D=Red
How do I perform a Master Reset?	Hold both Troll – and Troll + until the two bars on the graphic display collide.
Won't drive Link Gauges	Make sure the end of the tach harness that has the link connector is connected to the gauge not the J-box.
GPS does not work	Make sure the end of the tach harness that has the link connector is connected to the gauge not the J-box.
GPS data is intermittent	Switch to NMEA 0183 v1.5 or turn off GSV sentence (Contact GPS manufacturer)
Speed jumps all over	GPS speed is turned on but no GPS is connected.
My data cable is Black the book states it should be Blue	We did manufacture a small amount of Black cables. These cables were recalled. Please return the cable.
How do I check a Blue cable to make sure it is ok?	Blue and White are your communication wires. Ohm across those 2 wires. You should get 60 ohms with two terminators installed and 120 ohms with only one installed.
Can I use a System Speedometer by itself? Can I use SC1000 gauges by themselves?	No. You will need a System Tachometer or System Monitor to run a System Speedometer/Links.
Can I hook up an analog fuel gauge as well as a SmartCraft fuel gauge?	No. This will cause a ground loop through the 5 volt transducer bus and could damage the ECM. Switch to WEMA 2 output Fuel Sender.
Is there any special wiring need for dual engine applications?	On one of the engines you need to disconnect the 3 pin connector attached to the 10 pin, so that the engines will not back feed 12 volts to each other.
After a Master Reset one of the Tachometers is saying no starboard engine	First make sure both engines are configured properly. Second unplug any Link Gauges connected to that Tachometer. The Link Gauges can freeze temporarily on a Master Reset.
How do I check pinout on a 10 pin CAN connector?	A=Red B=Black C=Yellow (gauge end only) D=Blue E=White F=Purple
Gauge says "Multiple Starboard Engine"	Both engine ECM's are set to starboard. You need to make one port with a DDT or Rinda tool.
Gauge says "No Starboard Engine"	One (on a single) or both engines are set to port. You need at least one starboard engine for the gauge to work. Set one engine to starboard with a DDT or Rinda tool. You will see this a lot, because all counter rotators are sent out as port.
No Tacho Display on Speedometer	Tachometer needs to be programmed before Speedometer.
Erratic readings on all gauges	On dual engine applications using single CAN line one engine must have the three wire harnesses disconnected.
How is the fuel burned zeroed out?	Depress Mode and Troll - on Speedometer

System Monitor 1

DESCRIPTION	SOLUTION
Fuel tank and bell icons continually flash	Capacity was entered into fuel tank calibration, but there is not a fuel tank sender on the boat. Calibrate the gauge to read zero fuel capacity.
How do I perform a Master Reset?	Go to Cal2 and change engine type to something else (port or starboard) and save. Go back to Cal2 and change back to the original setting. Save.
Won't drive Link Gauges	Make sure the end of the M1 harness that has the link connector is connected to the gauge not the J-box.
How do I check a Blue cable to make sure it is ok?	Blue and White are your communication wires. Ohm across those 2 wires. You should get 60 ohms with two terminators installed and 120 ohms with only one installed.
When gauge comes on it shows 4 dashes and nothing else	Monitor is set to the wrong engine type. Got to Cal2 and change engine type to match the engine you are hooked up to (port or starboard.) Check 15 AMP fuse. Make sure all wires are properly connected. Make sure Blue and White wires are not reversed. Make sure gauge is set to station 1. Check for failed resistor.
How do I check pinout on a 10 pin CAN connector	A=Red B=Black C=Yellow (gauge end only) D=Blue E=White F=Purple
Monitor is showing the number 4095	Monitor is seeing no fuel sender. Either none is installed or it is bad.
Can I hook up an analog fuel gauge as well as a SmartCraft fuel gauge?	No. This will cause a ground loop through the 5 volt transducer bus and will damage the ECM.
Is there any special wiring need for dual engine applications?	On one of the engines you need to disconnect the 3 pin connector attached to the 10 pin, so that the engines will not back feed 12 volts to each other.
When powering down Engine and Bell icon will display for several seconds	Engine still in break-in or audio alarm is disabled.
Erratic readings on all gauges	On dual engine applications using single CAN line one engine must have the three wire harnesses disconnected.

System Monitor 2

DESCRIPTION	SOLUTION
Gauge is showing moving rpm and data but engine has not yet been started	Monitor is in simulator mode.
Won't drive Link Gauges	Make sure the end of the M2 harness that has the link connector is connected to the gauge not the J-box.
How do I check a Blue cable to make sure it is ok?	Blue and White are your communication wires. Ohm across those 2 wires. You should get 60 ohms with two terminators installed and 120 ohms with only one installed.
Can I hook up an analog fuel gauge as well as a SmartCraft fuel gauge?	No. This will cause a ground loop through the 5 volt transducer bus and could damage the ECM.
Is there any special wiring need for dual engine applications?	On one of the engines you need to disconnect the 3 pin connector attached to the 10 pin, so that the engines will not back feed 12 volts to each other.
How do I check pinout on a 10 pin CAN connector	A=Red B=Black C=Yellow (gauge end only) D=Blue E=White F=Purple
When powering down Engine and Bell icon will display for several seconds	Engine still in break-in or audio alarm is disabled.
Fuel and Bell icon displays with no audio warning	Calibrate the gauge to read zero fuel capacity.
Erratic readings on all gauges	On dual engine applications using single CAN line one engine must have the three wire harnesses disconnected.

System View

DESCRIPTION	SOLUTION
Fuel tank shows full all of the time	Performed add fuel calibration on an empty tank and never added the fuel.
Unit is not saving calibrations	You must key off until screen goes blank or data may not save.
How do I check a Blue cable to make sure it is ok?	Blue and White are your communication wires. Ohm across those 2 wires. You should get 60 ohms with two terminators installed and 120 ohms with only one installed.
Can I use a Blue cable with System View or only Yellow?	If you are using System View in a non-Drive by Wire application you can use Blue. When Drive by Wire is involved you must use Yellow.
Can I hook up an analog fuel gauge as well as a SmartCraft fuel gauge?	No. This will cause a ground loop through the 5 volt transducer bus and could damage the ECM.
Is there any special wiring need for dual engine applications?	On one of the engines you need to disconnect the 3 pin connector attached to the 10 pin, so that the engines will not back feed 12 volts to each other.
How do I check pinout on a 10 pin CAN connector	A=Red B=Black C=Yellow (gauge end only) D=Blue E=White F=Purple