



Livorsi DTS Controls Installation and Operation Manual

for Triple/Quad Engine Digital Throttle and Shift Controls

Revised JUNE 2017

Table of Contents

Introduction	3
Important Safety Notes	3
Electrical Requirements.....	3
Control Dimensions and Clearances.....	4
Architecture Drawing Single/Dual Engine (Wiring Diagram).....	5-6
Operation	9-10
Control Quadrant Operation.....	9-10
Neutral Safety Switch.....	10
Installation	11-20
Installation Location	10
Control Configuration for Install	10
Cutting the Control Console Opening	11
Installing the Control to the Console	11
Adjusting Detent and Friction.....	12
Rigging the Control	13-15
Connecting the SmartCraft Harness (Single).....	13
Connecting the SmartCraft Harness (Dual Engine)	14-15
Mounting Templates	16-21
Maintenance	22
Control Quadrant Maintenance.....	22
Handle Switch Maintenance.....	22
Corrosion Protection.....	22
Warranty	23

Introduction

Safety Notes

NOTICE

This document is written to aid our dealers, boat builders, and company service personnel in the proper installation or service of our products. Persons who are not familiar with these or similar products produced by Livorsi Marine, Inc., and who have not been trained in the recommended servicing or installation procedures should have the work performed by an authorized Mercury Marine dealer technician. Improper installation or servicing of the Mercury Marine or Livorsi Marine product could result in damage to the product or personal injury to the installer or persons operating the product.

NOTICE

After completing installation, these instructions should be kept with the product for the owner's future use.

Notice to Personnel Installing this Kit

The installation of this product requires an installer who is specifically trained to work on Mercury Marine's or Livorsi Marine's digital throttle and shift (DTS) systems. The installer must be trained in the proper installation, electronic calibration, and operation of the DTS system. Failure to correctly install this product may make this product and /or the DTS system inoperable or unsafe for use.

CAUTION

Avoid possible injury or equipment damage. After installing this control, electronically calibrate the digital throttle and shift (DTS) system. Do not attempt any calibration unless you have been specifically trained in Mercury Marine's DTS systems. Improper electronic calibration of the DTS system will make this control and/or the DTS system inoperable or unsafe.

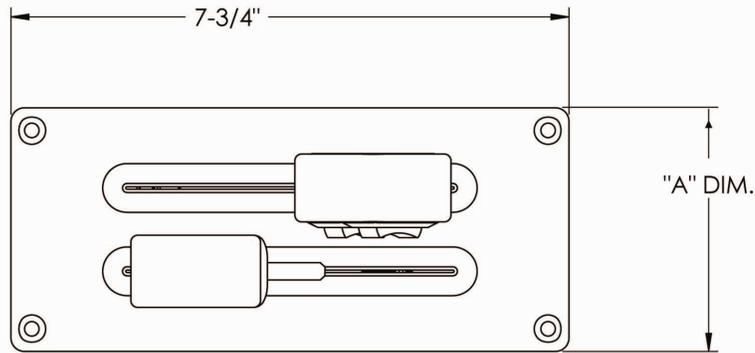
Electrical Requirements

DTS equipped boats require that the electrical systems meet the following guidelines:

- Use only marine starting batteries with a 1000 mca /800 cca/ 180 amp hour rating or higher. Deep cycle batteries do not deliver the power required for the DTS system.
- Secure all battery cables with standard hex nuts, tightened to 13.5 Nm (120 lb. in.) Do not use wing nuts, as they will not secure the battery cables properly.
- Ensure that the battery cable size (cross section) meets the minimum size requirements for the length of cable used. Refer to the installation manual supplied with the engine.
- Ensure that all power supply connections are clean and tight.

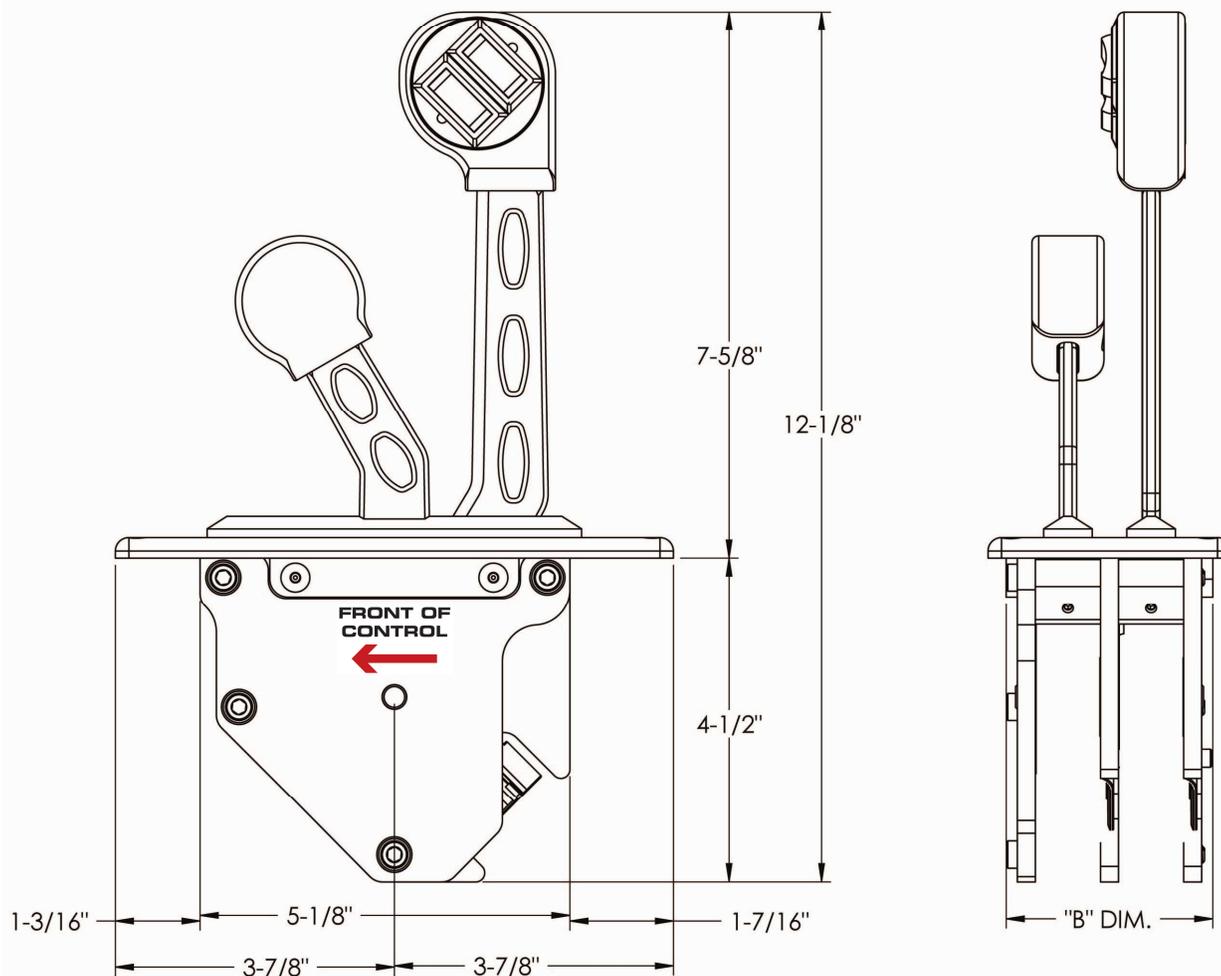
Livorsi DTS Control Dimensions

See cutout templates at the end of this manual.



Livorsi DTS Control Dimension Chart

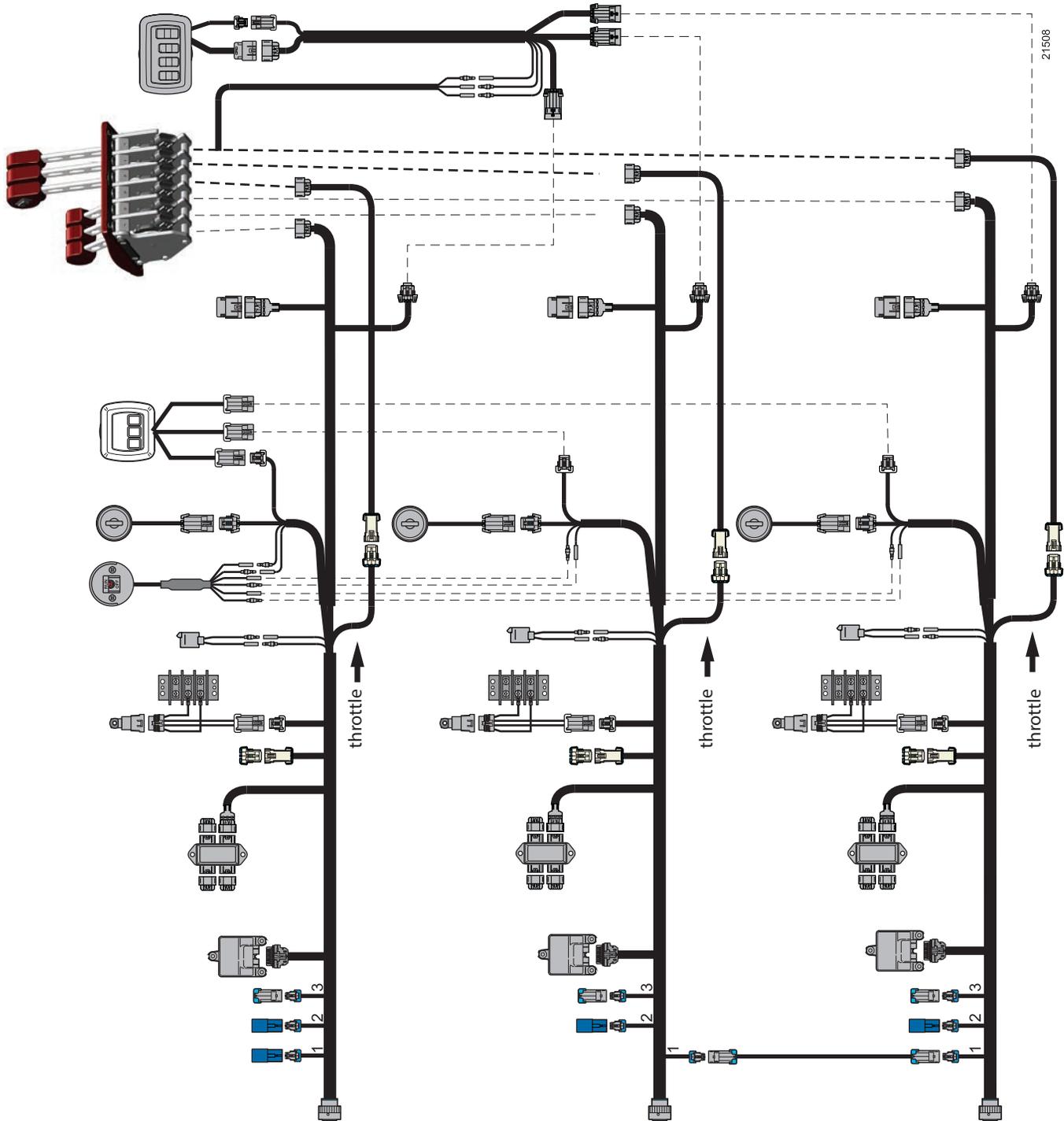
# of handles	"A" DIM	"B" DIM
3 handle	4- 1/2 in.	4- 1/64 in.
4 handle	5- 11/16 in.	5- 3/16 in.
6 handle	8 in.	7- 1/2 in.
8 handle	10- 5/16 in.	9- 13/16 in.



Architecture Drawing - Triple Engine

The following information has been gathered from Mercury Marine and may not be current. Please contact Mercury Marine at 920-929-5000, for up to date installation and wiring diagrams.

For Shadow Mode applications, please contact Livorsi Marine, 847.752.2700 for information.
For detailed instructions on how to install Shadow Mode for a three or four engine application, please contact Mercury Marine, 920-929-5000.

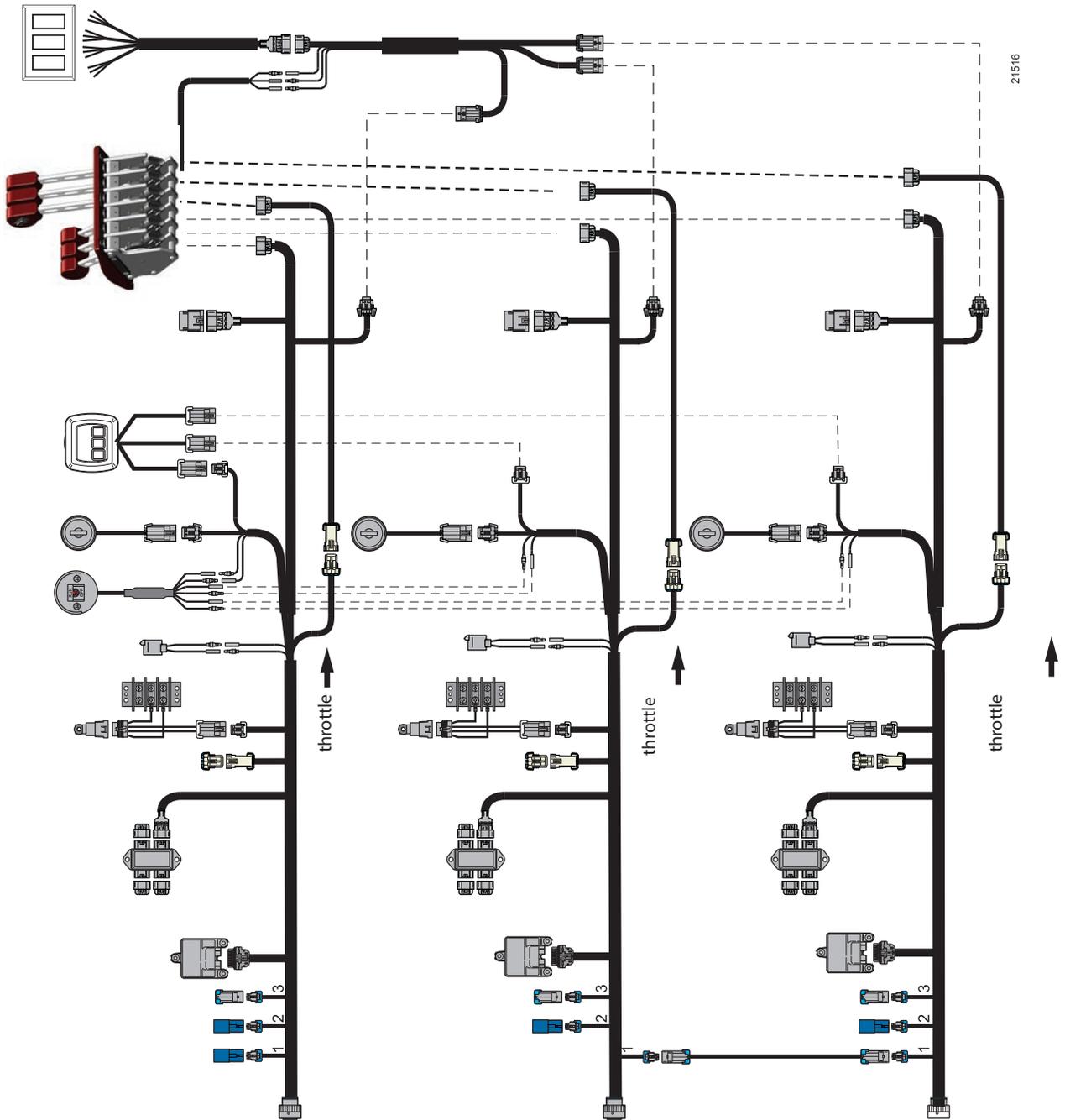


Architecture Drawing - Triple Engine

OEM Supplied Trim Switches

The following information has been gathered from Mercury Marine and may not be current. Please contact Mercury Marine at 920-929-5000, for up to date installation and wiring diagrams.

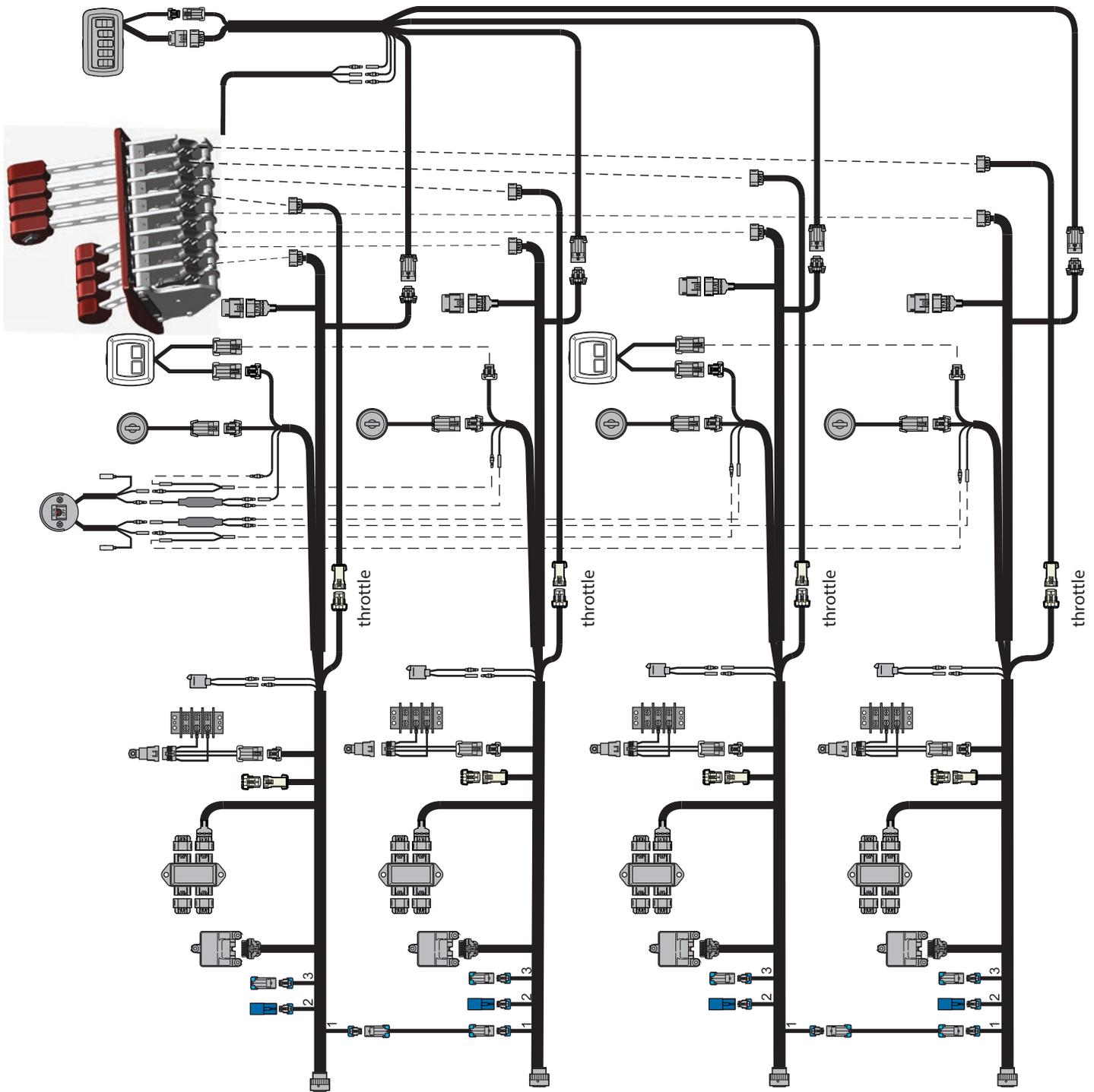
For Shadow Mode applications, please contact Livorsi Marine, 847.752.2700 for information . For detailed instructions on how to install Shadow Mode for a three or four engine application, please contact Mercury Marine, 920-929-5000.



Architecture Drawing - Quad Engine

The following information has been gathered from Mercury Marine and may not be current. Please contact Mercury Marine at 920-929-5000, for up to date installation and wiring diagrams.

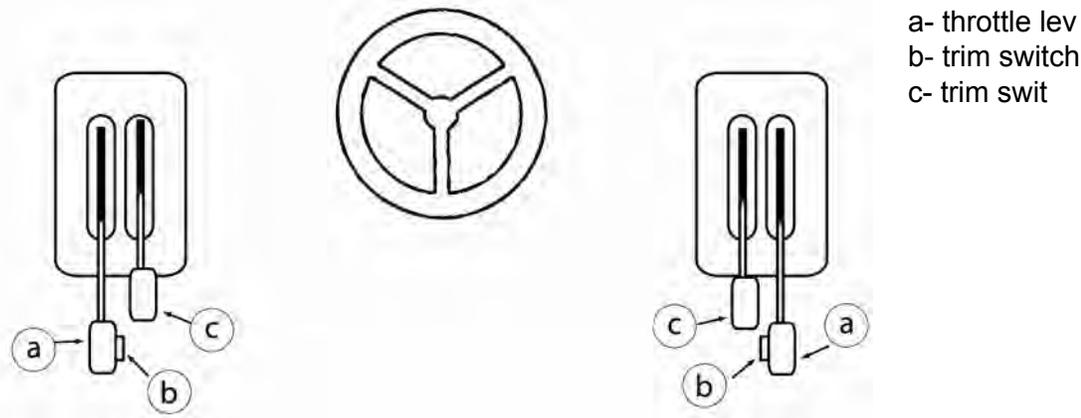
For Shadow Mode applications, please contact Livorsi Marine, 847.752.2700 for information.
For detailed instructions on how to install Shadow Mode for a three or four engine application, please contact Mercury Marine, 920-929-5000.



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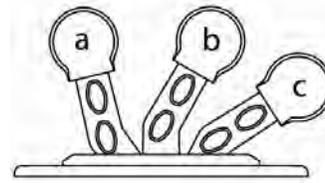
Operation

Control Quadrant Operation



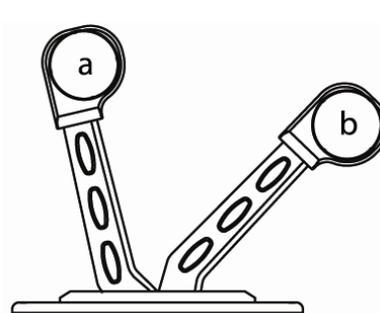
Shift Lever

- Shift into reverse by moving the shift lever to its aft position.
- Shift into neutral by moving the shift lever into its center position.
- Shift into forward by moving the shift lever into its forward position.

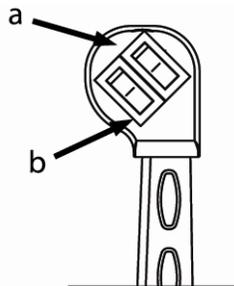


Throttle Lever

- Increase the RPM by moving the throttle lever forward. Achieve wide open throttle (WOT) by placing the throttle lever in its full forward position.
- Decrease RPM by moving the throttle lever back. Achieve minimum RPM (idle) by placing the throttle lever in its full aft position.



In-Handle Trim Switch



- a- trim up/out
- b- trim down/in

1. To trim the outboard or drive up/out, press the top area of the trim button.
2. To trim the outboard or drive down/in, press the bottom area of the trim button.

Neutral Safety Switch

The Livorsi DTS Control does not have a neutral safety switch. The start-in-gear protection is controlled electronically by the propulsion control module (PCM).

Installation

Installation location:

Installing the Control:

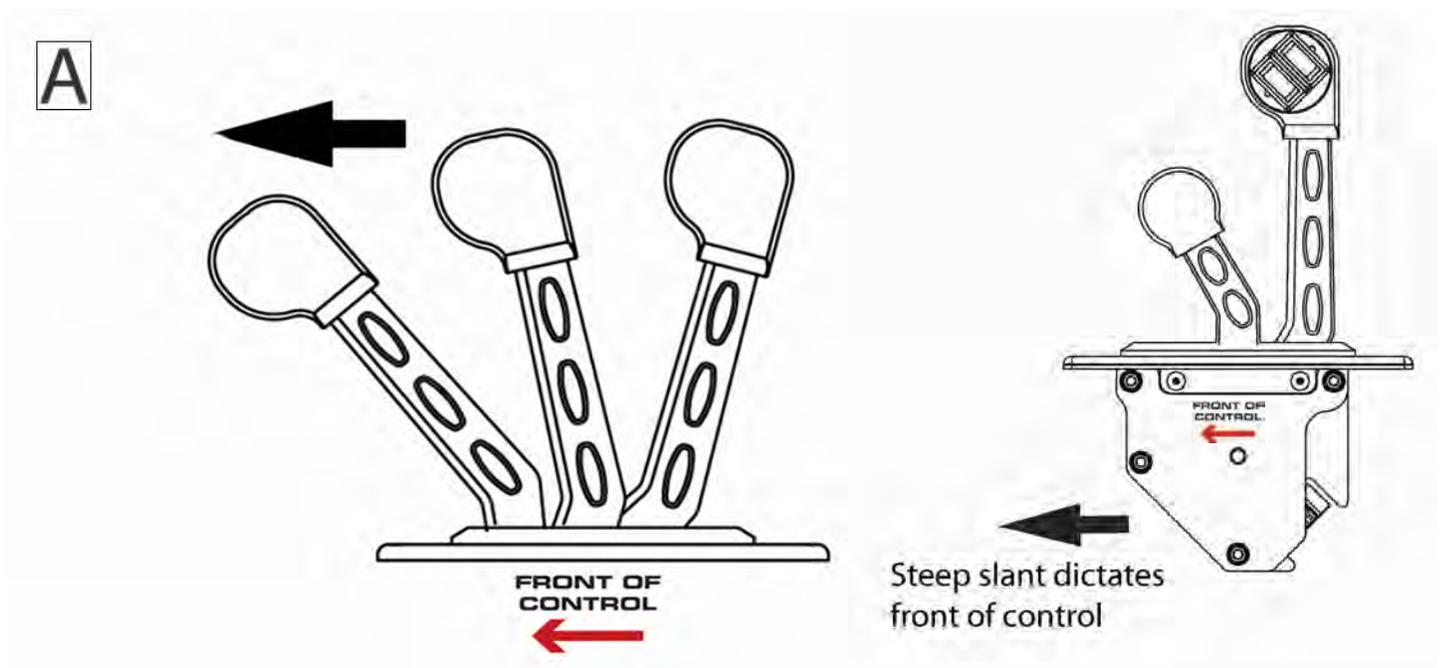
Understand the following criteria when selecting a Livorsi DTS Control location:

- Mount the control to provide the boat operator with a comfortable and controlling position during operation and allow sufficient hand and shift/throttle lever clearance.
- Mount the control to provide enough space for harnesses and wiring beneath the console panel.
- If equipped with a trim switch, locate the switch on the side of the throttle lever closest to the steering wheel.

Installing the Control:

Control Configuration

Important: Canting refers to the direction of bend in handle. Install the Livorsi DTS Controls in the orientation specified (Forward-cant only).

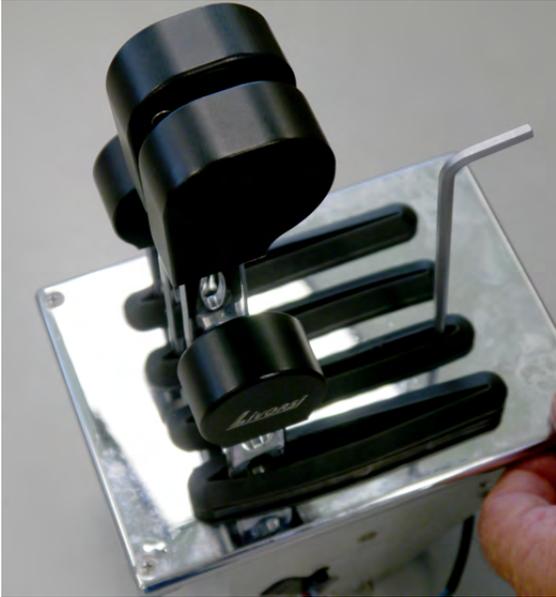


A) Forward cant models; arrow pointing to the ship's bow

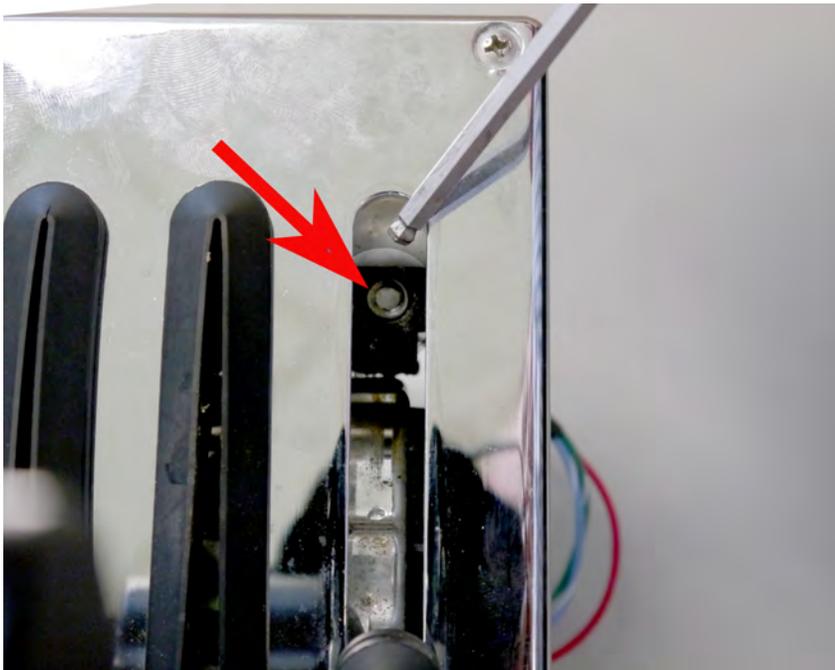
Adjusting Detent and Friction:

NOTE: All adjustments can be done WITHOUT removing control. You will NOT need to remove the dust boot or contour base to make adjustments.

1. Before adjusting make sure control is properly lubricated (See page 18)
2. Using a 3/16ths Allen wrench insert into adjusting block at FRONT of throttle.



4. Turn clockwise to increase friction / detent. Turn counter clockwise to decrease friction / detent
5. Make small $\frac{1}{4}$ turn adjustment and test control movement. Repeat if necessary



NOTE: Dust boot removed only for photo purposes to show adjusting block

Rigging the Control:

Connecting the SmartCraft Harness (Single Engine)

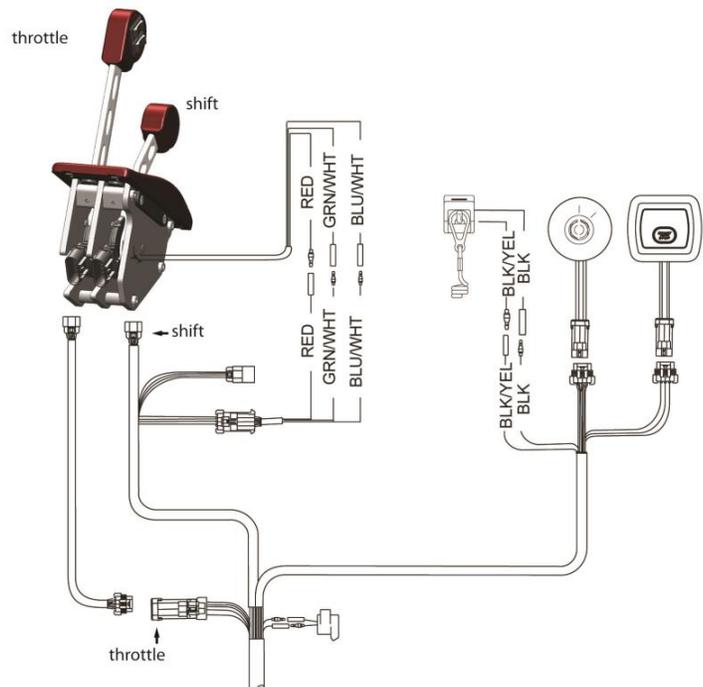
The following procedure explains how to connect the DTS Command Module Harness.

NOTE: The following information has been gathered from Mercury Marine and may not be current. Please contact Mercury Marine at 920-929-5000, for up to date installation and wiring diagrams.

*****For an explanation of Shadow Mode and its applications, please contact Livorsi Marine, 847.752.2700. For detailed instructions on how to install Shadow Mode for a three or four engine application, please contact Mercury Marine, 920-929-5000.



Please note that the arrows point to the hole locations where it is recommended to loop and zip tie the associated harness. Refer to step 7 below.

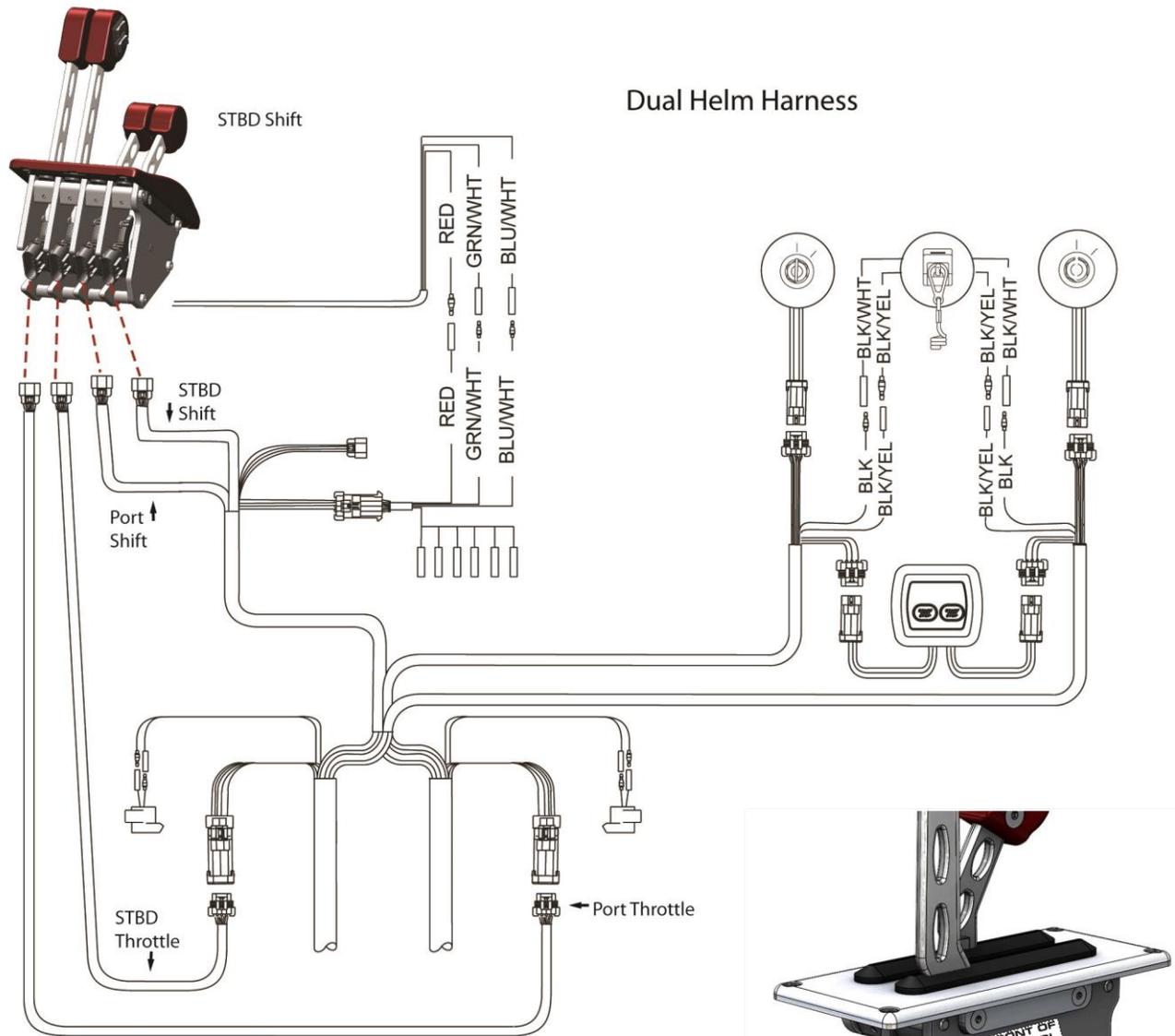


1. Connect the "LEVER 1" connector on the DTS command module harness to the shift potentiometer on the control console.
2. Connect the "FOOT THROTTLE" connector on the DTS command module harness to the throttle potentiometer on the control console using the adapter harness (P/N 89-891963A01).
3. Connect the trim adaptor harness to the DTS command module harness.
4. Connect the bullet connectors on the trim adaptor harness to the trim connections on the control.
5. Connect the start/stop switch (optional), warning horn, lanyard stop switch and key switch to the appropriate connections.
6. Make all the other DTS command module harness connections following the instructions included with the DTS Command Module kit.
7. Zip tie throttle and shift harnessing to the control base to provide appropriate strain relief.

Connecting the SmartCraft Harness (Dual Engine):

The following procedure explains how to connect the DTS Command Module Harness.

NOTE: The following information has been gathered from Mercury Marine and may not be current. Please contact Mercury Marine at 920-929-5000, for up to date installation and wiring diagrams.



Please note that the arrows point to the hole locations where it is recommended to loop and zip tie the associated harness. Refer to step 10 on the next page.



Control Connection	Harness Connection
Starboard Shift Potentiometer	"LEVER 1"
Port Shift Potentiometer	"LEVER 2"
Starboard Throttle Potentiometer	"LEVER 3"
Port Throttle Potentiometer	"LEVER 4"

1. Connect the "LEVER 1" connector on the DTS command module harness to the starboard control's shift potentiometer
2. Connect the "LEVER 2" connector on the DTS command module harness to the port control's shift potentiometer
3. Connect the "LEVER 3" connector on the DTS command module harness to the starboard control's throttle potentiometer using the adaptor harness (P/N 89-891963A01).
4. Connect the "LEVER 4" connector on the DTS command module harness to the port control's throttle potentiometer using the adaptor harness (P/N 89-891963A01).
5. Connect the trim adaptor harness to the DTS command module harness.
6. Connect the bullet connectors on the trim adaptor harness to the trim connections on the control.
7. Connect the six bullet connectors on the trim adaptor harness to the individual trim switches on the dash or console. (optional)
8. Connect the start/stop switch (optional), lanyard stop switch, and key switches to the appropriate connections, as shown.
9. Make all other DTS command module harness connections following the instructions included with the DTS Command Module kit.
10. Zip tie throttle and shift harnessing to the control base to provide appropriate strain relief.

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Mounting Templates

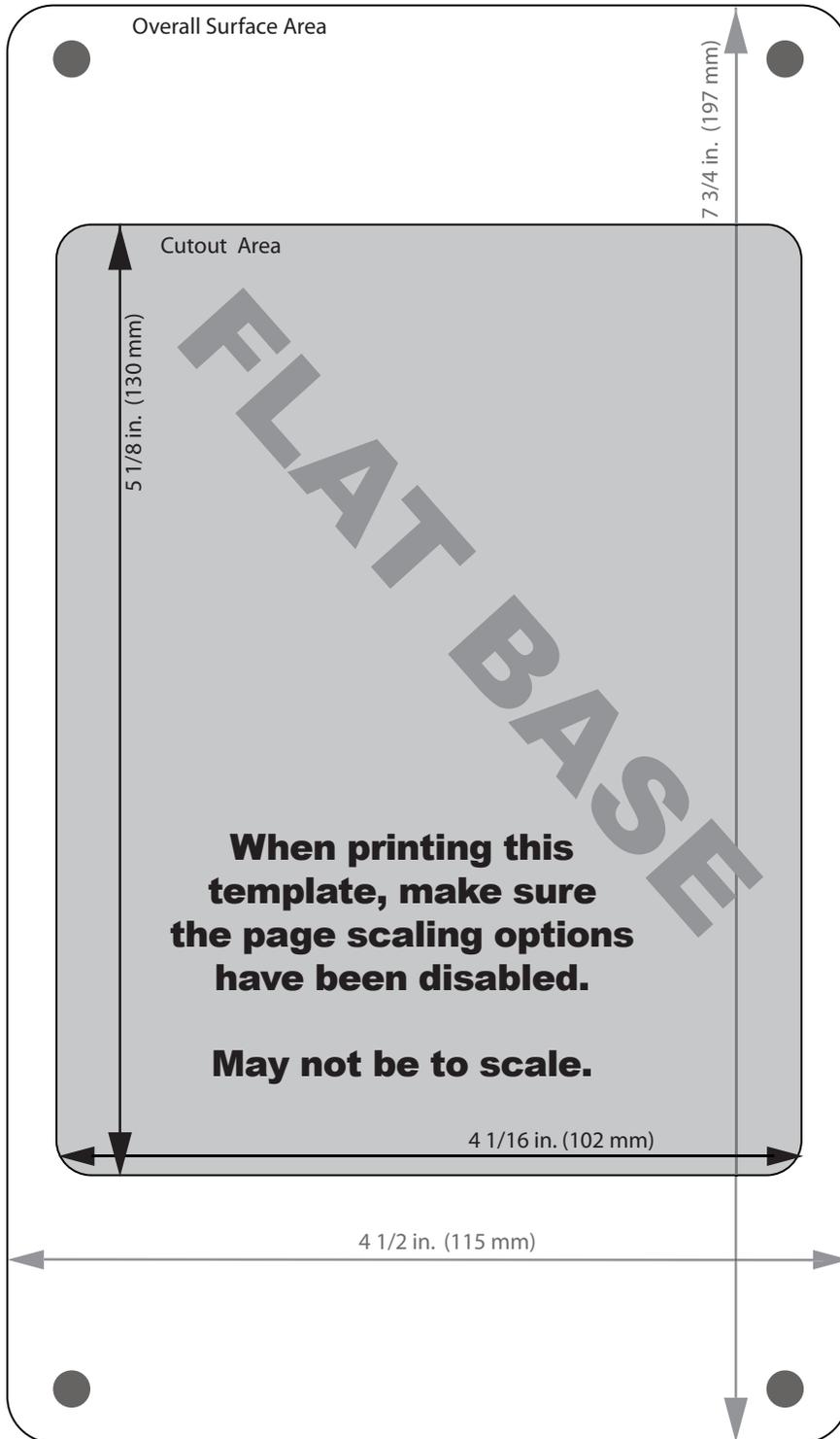
Livorsi DTS Controls **Flat Base**

Triple Engine (6 handle)



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Livorsi DTS Controls Flat Base *Triple Shift/Throttle*



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Livorsi DTS Controls Flat Base
Quad Engine (Eight handles)

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FLAT BASE

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instructions, please visit
www.livorsi.com/tools.htm

9 13/16 in. (249 mm)

Cutout Area

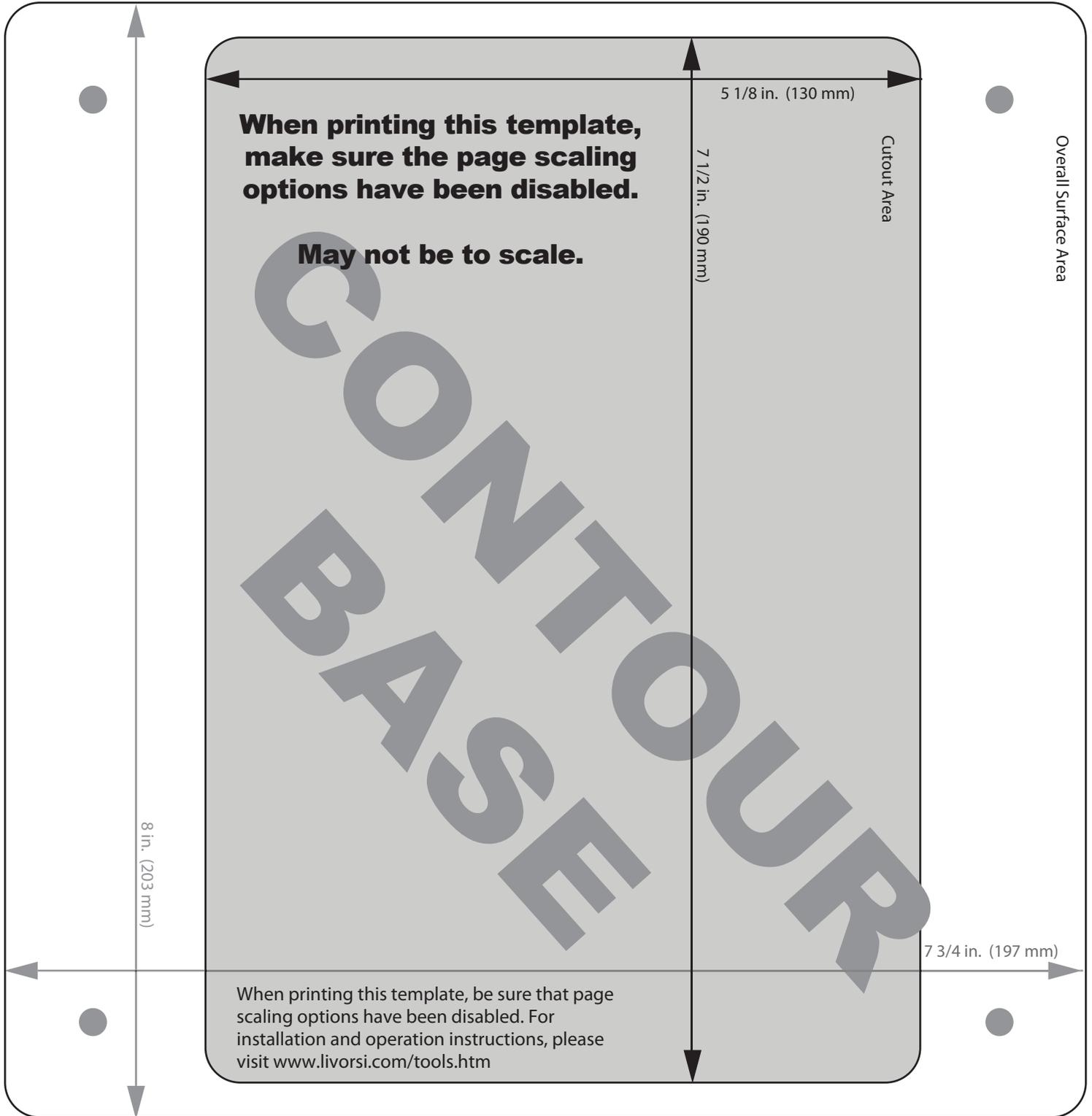
Overall Surface Area

10 5/16 in. (262mm)

7 3/4 in. (197 mm)

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Livorsi DTS Controls 7 cbtour Base
Triple Engine (6 Handle)

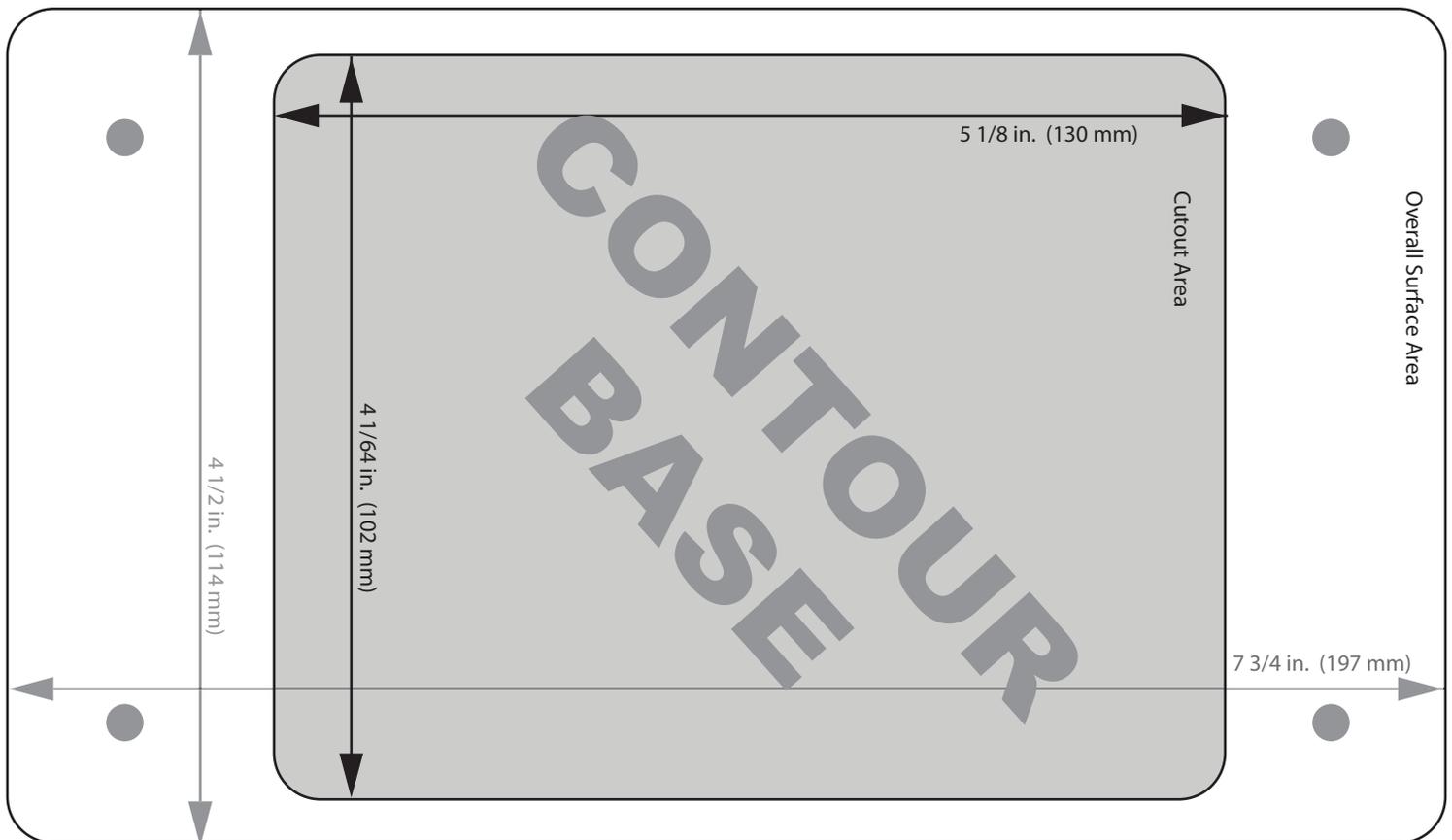


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Livorsi DTS Controls 7 cbtour Base
Triple Shift/Throttle (3 Handle)

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Overall Surface Area

Cutout Area

5 1/8 in. (130 mm)

9 13/16 in. (249 mm)

Livorsi DTS Controls 7 cbtour Base
Quad Engine (8 Handle)

**CONTOUR
BASE**

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10 5/16 in. (262 mm)

7 3/4 in. (197 mm)

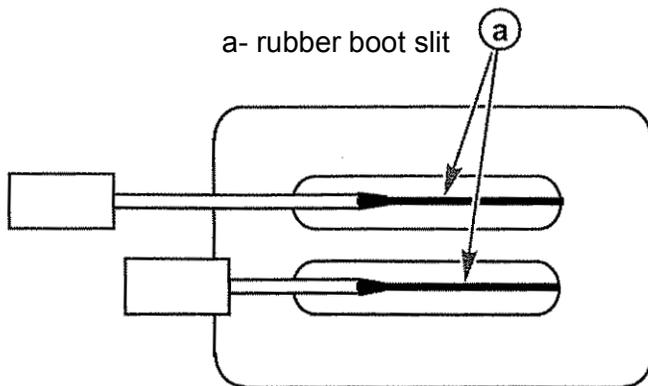
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Maintenance

Control Quadrant Maintenance:

IMPORTANT: Periodically (every 6 months) lubricate the inside slit area of the rubber boots with a good-quality, rubber-compatible marine lubricant to ensure smooth movement of the handle within the rubber boot.

SUGGESTED PRODUCT: 303 Aerospace Protectant Spray (found on amazon.com) or their 303 Aerospace Protectant Wipes (found on autogeek.net)



Handle Switch Maintenance:

IMPORTANT: If salt build up or sticking is observed on the handle switches, rinse the affected area with fresh water and apply a water displacing lubricant.

Corrosion Protection:

For maximum protection, especially in a saltwater environment, the control head and hand lever should be washed lightly with fresh water on a regular basis.

- Periodically check the control head mechanism for loose fasteners and signs of wear on moving parts.
- Keep moving parts well lubricated with a moisture-displacing lubricant.
- Periodically check the cables and engine connections for signs of wear and corrosion. Replace as necessary.

Warranty

All Livorsi Marine® products carry a limited one year warranty for repair or replacement at Livorsi's discretion. All Livorsi Marine® products are warranted to be free of defects in material and workmanship. Users/Customers of Livorsi Marine®/Livorsi® products agree not to hold Livorsi Marine, Inc., its owner or employees responsible for any damages occurring by improper installation or use of Livorsi Marine® or Livorsi® products. The company, owner or its employees will not be liable for more than the cost of the original product and in no event will Livorsi Marine® or Livorsi® be liable for special, indirect or consequential damages of any kind whatsoever.



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