

TTFX
® M a r i n e



***MECHANICAL
ENGINE CONTROLS
CABLES
AND ACCESSORIES***



MECHANICAL ENGINE CONTROLS CABLES AND ACCESSORIES

TFX marine controls and cables have a long history of installation by leading engine manufacturers and boat builders world-wide.

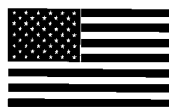
TFX controls are available for top or side mount applications and are suitable for use with outboards, inboards and stern drives.

The controls can be installed with single or twin engines in single or dual stations.

TFX controls features - dual and single action levers, Interlock and Power Trim functions, self locking throttle clutch, push-pull operation and (optional) safety switch.

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Products marked with the US flag are manufactured in the USA.

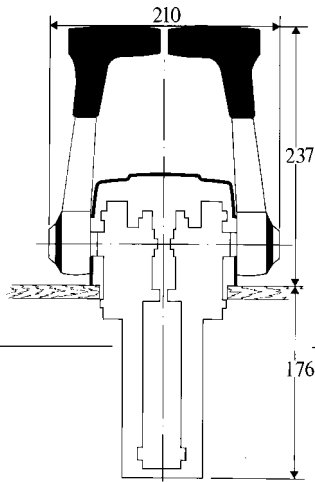
DUAL ACTION CONTROLS 700 SERIES

TFX CONTROLS 700 TD, 700 TDT, 700 TDL

- Top mounted twin engine control.
- Twin dual action levers, alternatively twin single action levers, (separate throttle and gear).
- Available with Power Trim (700 TDT) or Neutral Lever Interlock (700 TDL).
- "Start-in-gear protection" Safety Switch, optional.

ORDER INFORMATION			
TYPE OF CONTROL	TOP MOUNTED COMPLETE CONTROLS		
	FEATURES	B+B MECHANISMS DOUBLE ACTION ORDER NO	C+D MECHANISMS SINGLE ACTION ORDER NO
700 TD	STANDARD	172109	171104
700 TDT	WITH POWER TRIM	172149	
700 TDL	WITH INTERLOCK	172198	

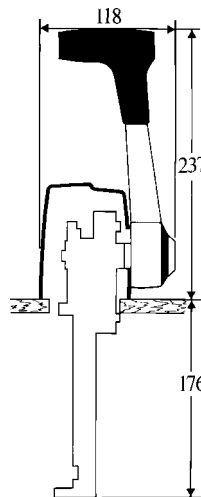
Suitable for power boats with twin or single engine and one or two helm station applications.
For "start-in-gear protection" see special section; Neutral Safety Switch.



TFX CONTROLS 700 TS, 700 TST, 700 TSL, 700 TSLT

- Top mounted single engine control.
- For power boats with one inboard, I/O or outboard engine with one or two helm stations.
- Single dual action lever.
- Available with Power Trim (700 TST).
 - Neutral Lever Interlock (700 TSL).
 - Power Trim and Neutral Lever Interlock (700 TSLT).

ORDER INFORMATION			
TYPE OF CONTROL	TOP MOUNTED COMPLETE CONTROLS		
	FEATURES	B-MECHANISM DOUBLE ACTION ORDER NO	A-MECHANISM DOUBLE ACTION ORDER NO
700 TS	STANDARD	172107	172106
700 TST	STANDARD WITH POWER TRIM	172135	
700 TSL	STANDARD WITH INTERLOCK	172122	
700 TSLT	STANDARD WITH INTERLOCK & POWER TRIM	172123	



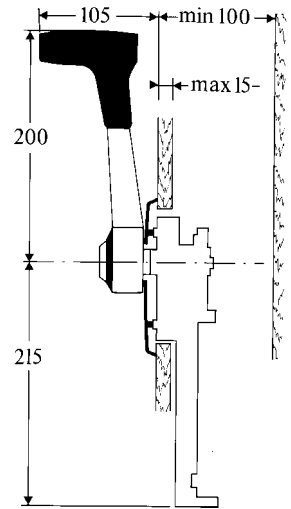
For "start-in-gear protection" see special section; Neutral Safety Switch.

TFX CONTROLS 700 SM, 700 SMT, 700 SML, 700 SMLT

- Flush mounted single lever control.
- For power boats with one inboard or I/O engine.
- Dual action single lever.
- Available with - Power Trim (700 SMT).
 - Neutral Interlock (700 SML).
 - Power Trim and Neutral Interlock (700 SMLT).

ORDER INFORMATION			
TYPE OF CONTROL	TOP MOUNTED COMPLETE CONTROLS		
	FEATURES	B-MECHANISM DOUBLE ACTION ORDER NO	A-MECHANISM DOUBLE ACTION ORDER NO
700 SM	STANDARD	172105	172104
700 SMT	STANDARD WITH POWER TRIM	172133	
700 SML	STANDARD WITH NEUTRAL INTERLOCK	172120	
700 SMLT	STANDARD WITH POWER TRIM & NEUTRAL INTERLOCK	172121	

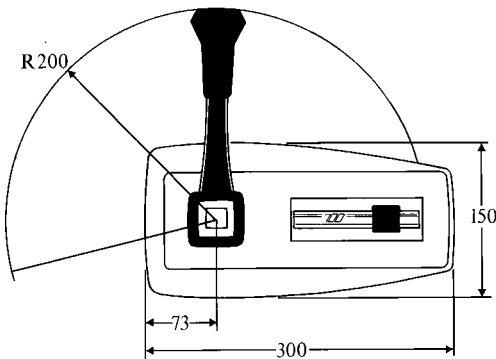
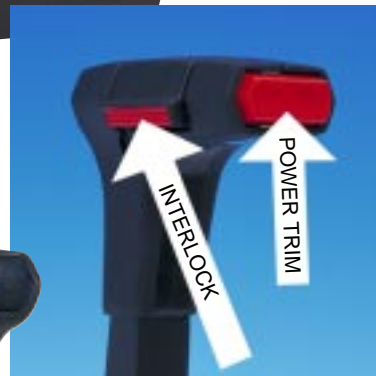
For "start-in-gear protection" see special section; Neutral Safety Switch.



TFX CONTROLS 700 SO, 700 SOT, 700 SOL, 700 SOLT

- Surface mounted single lever control.
- For power boats with outboard motors.
- Dual action single lever control.
- Available with - Power Trim (700 SOT).
 - Neutral Interlock (700 SOL).
 - Power Trim and Neutral Interlock (700 SOLT).

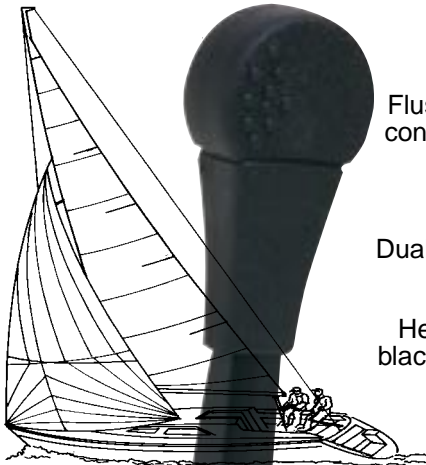
ORDER INFORMATION			
TYPE OF CONTROL	SIDE MOUNTED, OUTBOARD MOTOR, COMPLETE CONTROLS		
	FEATURES	B-MECHANISM DOUBLE ACTION ORDER NO	A-MECHANISM DOUBLE ACTION ORDER NO
700 SO	STANDARD	172101	172100
700 SOT	STANDARD WITH POWER TRIM	172131	
700 SOL	STANDARD WITH NEUTRAL INTERLOCK	172118	
700 SOLT	STANDARD WITH POWER TRIM & NEUTRAL LOCK	172119	



For "start-in-gear protection" see special section; Neutral Safety Switch.



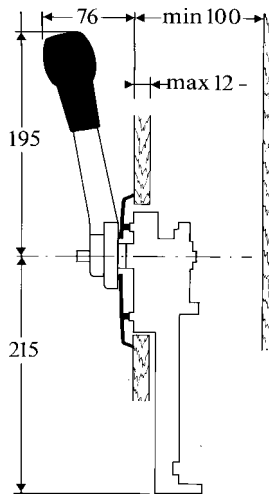
SAILBOAT CONTROL 700 SS



- Flush mounted engine control for sailing boats or motorboats.

- Dual action single lever.

- Heavy duty lever in black polyester powder coated finish.



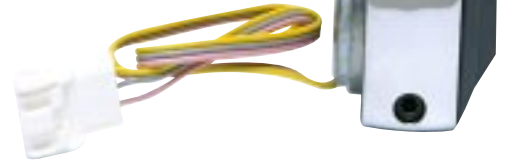
ORDER INFORMATION			
TYPE OF CONTROL	SIDE MOUNTED, SAILING BOATS, COMPLETE CONTROL		
	FEATURES	B-MECHANISM DOUBLE ACTION ORDER NO	A-MECHANISM DOUBLE ACTION ORDER NO
700 SS	STANDARD	172103	172102

For "start-in-gear protection" see special section; Neutral Safety Switch.

INTERLOCK AND POWER TRIM EXCHANGE HANDLES

Conversion of a standard 700 series control to an Interlock/Power Trim Control. When a boat is equipped with a standard 700 series control type B 700 TD, B 700 TS, B 700 SM or B 700 SO of later models you can convert your control to an Interlock/Power Trim control by exchanging the handle only.

Depending on the type of standard 700 series control originally fitted to the boat - use the following exchange handle kit.



TYPE STANDARD CONTROL FITTED	USE EXCHANGE HANDLE KIT		
	POWER TRIM *) ONLY ORDER NO	INTERLOCK ONLY ORDER NO	INTERLOCK AND POWER TRIM *) ORDER NO
B 700 TD	003935	003953	
B 700 TS	003955	003953	003954
B 700 SM	003952	003950	003951
B 700 SO	003952	003950	003951

*) The exchange handle kit with power trim contain also the male connection to the female socket.

USEFUL SPARE PARTS FOR 700 SERIES CONTROLS



PIVOT KIT
ORDER NO
190008



LOCK PIN
ORDER NO
001354



PUSH BUTTON
ORDER NO
007361



RED BUTTON
FOR B 700 SS
ORDER NO
000094



LOCKING SCREW
FOR B 700 SS
HANDLE
ORDER NO 050600



TFX DECAL
ORDER NO
003104

MOUNTING KITS FOR 700 SERIES CONTROLS

For improved logistics some of the controls in the B 700 series can be supplied with controls mechanism (common for several models) and mounting kits (handle and cover) as two separate parts.

ORDER INFORMATION		
TYPE OF MOUNTING KIT	DESCRIPTION	ORDER NR
700 SS	Side mounted for sailing boats or single engine power boat.	177200
700 SM	Flush mounted for single engine power boat.	177201
700 TSK	Top mounted for single engine power boat.	177203
700 TDK	Top mounted for twin engine power boat.	177205

MECHANISMS FOR 700 SERIES CONTROLS

These mechanisms are used in TFX 700 series controls described in this brochure.

TFX mechanisms are of a sturdy and long lasting design in zinc casting material.

They have proved themselves in millions of control applications.

700 series mechanisms are designed to accept Universal type control cables F2003 and F 3003/3300 + USA spec (page 10) or similar.

A complete control is fitted with one or

two of these mechanisms. Type of mechanism to be used depends on what type of function is required of the control (check respectively features under pictures).

The mechanism is the working part of the control which relays the movement of the handle to the throttle and gear levers of the engine via the control cables.

All these mechanisms can be fitted with Neutral Safety Switch to prevent engine start while gear is engaged (see page 7).

A-MECHANISM

(Dual function)
SUITABLE
FOR ALL CONTROLS
For smaller outboards (normally below 25 hp). Requiring extra throttle when engaging gear.

ORDER NO 172150



One lever both gear & throttle. DS-unit required for fly bridge installation (see page 8).

B-MECHANISM

(Dual function)
SUITABLE
FOR ALL 700 SERIES
CONTROLS AND CONTROLS
WITH TRIM SWITCH
AND/OR INTERLOCK ONLY

ORDER NO 172152



For larger outboards and inboards. Normally above 25 hp. Will keep the engine idling while engaging gear. One lever for both gear & throttle operation (Double action control). DS-unit required for fly bridge installation (see page 8).

C-MECHANISM

(Single function)
SUITABLE
FOR 700 SERIES
CONTROLS TYPE 700 TS
AND 700 TD

ORDER NO 171150



Throttle function only or operation of for instance an adjustable propeller. Can be connected in series for fly bridge installation. (DS-units not required) (see page 8).

D-MECHANISM

(Single function)
SUITABLE
FOR 700 SERIES
CONTROLS TYPE 700 TS
AND 700 TD

ORDER NO 171152



Gear function only with indication of neutral position. Can be connected in series for fly bridge installation. (DS-units not required) (see page 8).

B 700 CONTROLS FEATURES*)



NEUTRAL INTERLOCK

For your safety the lever locks in the neutral position. The TFX neutral interlock prevents the control lever from being accidentally put into gear. Thus eliminating the chance of the boat moving off - out of control. The locking mechanism release is a one handed operation as you select gear and throttle position, by lifting the red coloured neutral interlock trigger with your fingers. The function built into the handle grip disengages the locking mechanism, enabling the lever to move freely either forwards or backwards. This design feature allows the TFX 700-series of controls to be mounted in either a port or starboard position.
 Note: U.S.A. legislation makes it compulsory for all sidemounted controls to have a safety lock device when used in connection with engines exceeding 20 hp (ABYC).



POWER TRIM

In the same handle as throttle and gear functions the outboard engine or I/O drive trim angle can now be adjusted while under way, safely and quickly, giving better comfort and performance. Trim angle adjustment is made by means of a thumb operated switch built into the end of the controls handle.



DISENGAGING OF GEAR FUNCTION FOR THROTTLE MOVEMENT

As with previous TFX remote controls the 700 series are fitted with a push button on the lower section of the lever arm. By pressing the button the gear will be disengaged to allow throttle movement only.

*) Features depending of which order no chosen.



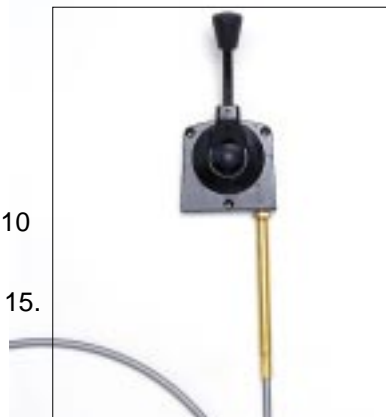
NEUTRAL SAFETY SWITCH

As an extra accessory, the TFX 700 series remote controls can be fitted with a neutral safety switch. This prevents the engine starting while in gear. Ordering no 178000 (without relay). Also certain cases restarting of the

engine while running can be eliminated (depending on electrical connections of the engine). Ordering no 178001 (with relay). This is particularly useful in boats with twin engines. Because when one engine is started up it is not always possible to hear the other engine starting.

THROTTLE CONTROL F 7110

Sidemounted, max stroke 3".
 Order no 171010.
 Add control cable F 27110 in standard length 2,0 - 8,0 m.
 Order no 126091 - 126115.



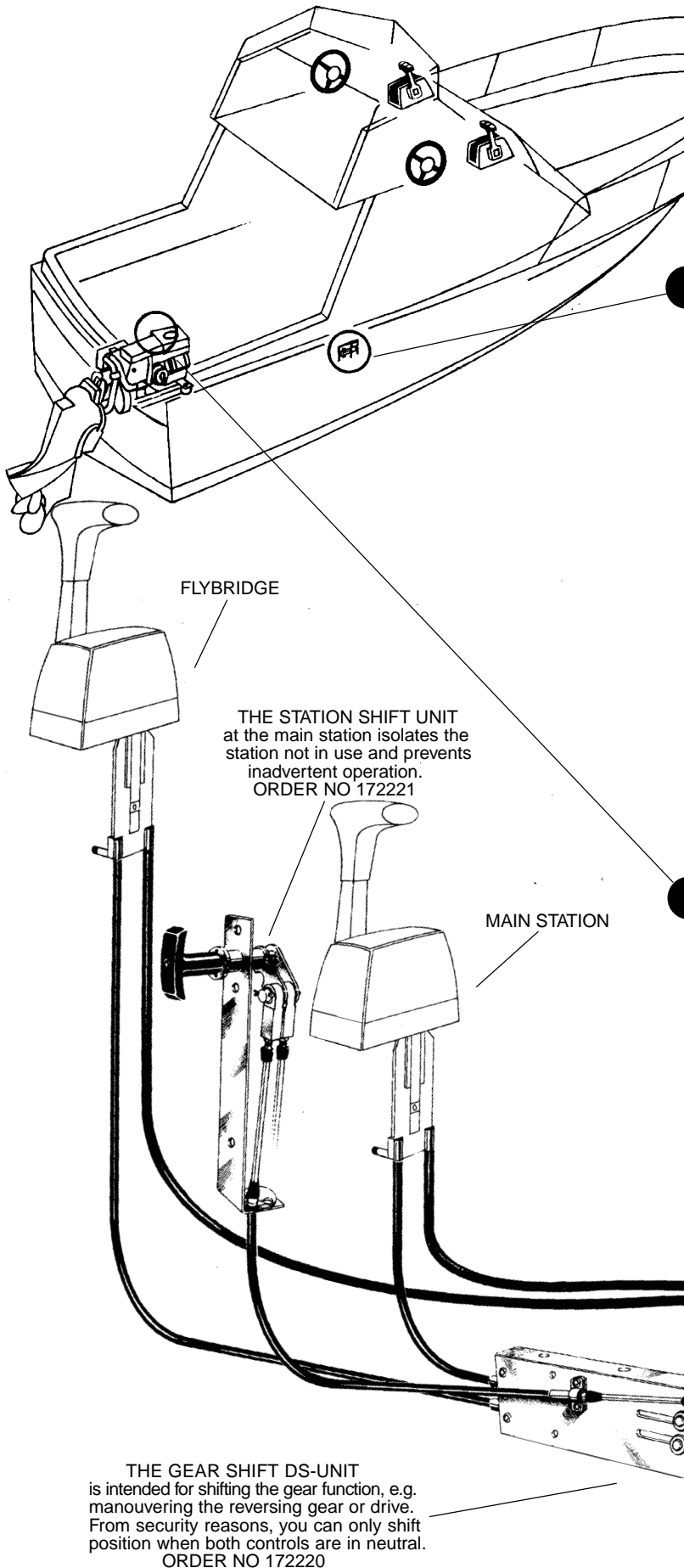
STOP/CHOKE CONTROL F 7010

T-handle only.
 Order no 000518
 Add control cable F 7010 in standard length 2,0 - 8,0 m.
 Order no 170151 - 170174.
 Connection kits order no 000694 or 000721 see page 14.



DS-UNITS

DS-UNIT (Dual station unit) is required in boats with Fly-Bridge manouvering station. The movements of the two gear controls are co-ordinated to one cable which effectuates the shifting of gear through the gear-shift-arm on the engine.



F 7801

DS-UNIT for gear (I/O drives). Order no 177025.
For throttle combine with F 7803 order no 177030.



F 7802

DS-UNIT for gear (inboards). Order no 177027.
For throttle combine with F 7803 order no 177030.

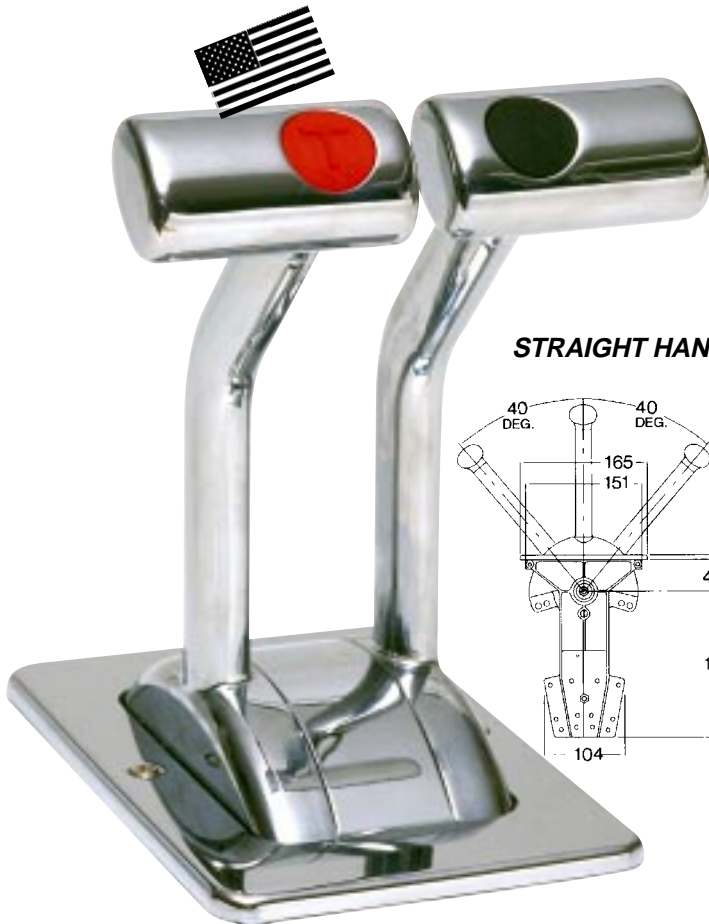


F 7803

DS-UNIT for throttle. Order no 177030.
Used in combination with F 7801, F 7802 or 172220.

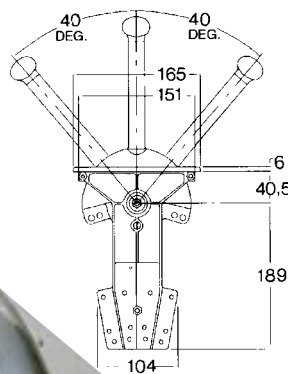
SINGLE ACTION CONTROLS

TFX CH 4400 (SAT) SERIES FLUSH MOUNTED CONTROLS

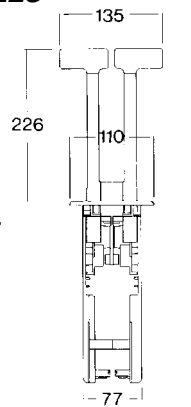


- Top mounted single action control for panel flush mounting.
- Straight or raked handles.
- Adjustable ratchet for precise throttle operation.
- Dual station capability without DS-Unit.
- Heavy duty cast zinc mechanism with handles and housing in marine grade chrome finish.
- Takes F3003/3300 (diam. 8 mm) control cables.
- Optional Neutral Safety Switch for "start-in-gear" protection.

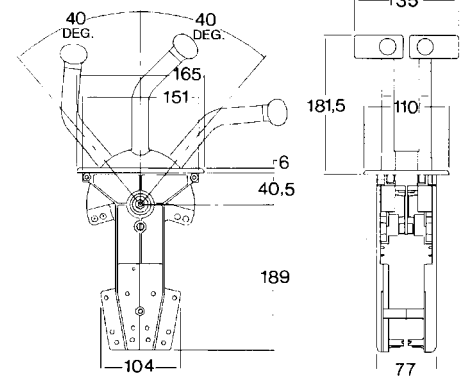
STRAIGHT HANDLES



DIMENSIONS



RAKED HANDLES



ORDER INFORMATION

HANDLE CON-FIGURATION	HANDLE BEZEL PLATE FINISH	HANDLE FRICTION	ORDER NO
Straight	Chrome/Chrome	Smooth	CH 4451
		Ratcheting	CH 4452
Raked	Chrome/Chrome	Smooth	CH 4481
		Ratcheting	CH 4482
OPTIONAL ACCESSORIES			ORDER NO
Dual station connection for F 3003/3300 control cables			
Neutral Safety Switch kit			CA 68075P

These controls are also available in black coated finish. Information on request. Separate technical leaflet available. Ask for no T 700.

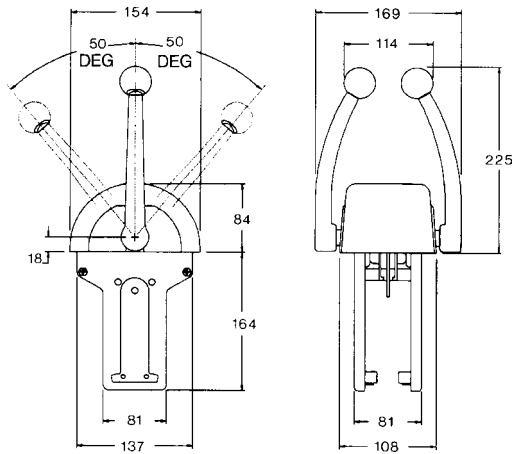


TFX CH 5600 (SLT) SELF LOCKING THROTTLE CONTROL

- Top mounted, single action control.
- Unique Self Locking Throttle clutch - locks automatically the throttle in the position it is left.
- Dual station capability without DS-UNIT.
- Takes F 3003 (diam. 8 mm) or F 4003 (diam. 12 mm) control cables.
- Optional Neutral Safety Switch for "start-in-gear" protection.
- Heavy duty diecast mechanism, stainless steel cover and levers.

For order no see page 10.

DIMENSIONS



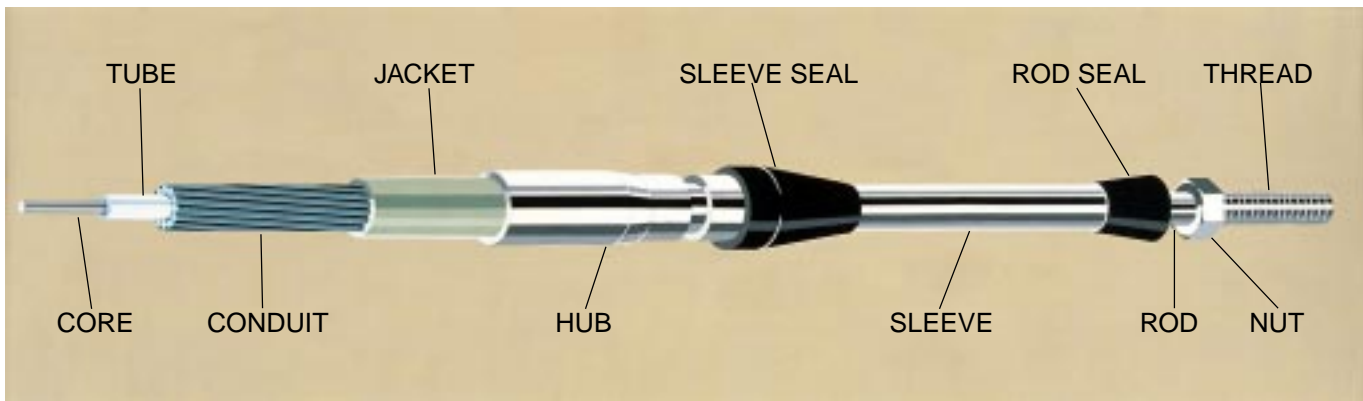
ORDER INFORMATION	ORDER NO
Complete control TFX CH 5600 SLT Content, mechanism, stainless steel cover, levers, mounting hardware, 1 detent (index) kit, F3003/3300 control cable connection kit, 1 red and 1 black knob.	CH 5600
OPTIONAL ACCESSORIES	
F 3003/3300 Dual station connection kit (for two control cables). F 4003/4300 type cable mounting kit (for two control cables). Neutral Safety Switch prevents accidental starting when engine is in gear.	CA 69015 178011 CA 69009 P

For full information on CH 5600 SLT controls ask for separate technical brochure no T 701.

CONTROL CABLES

For three decades TFX Scandinavia have manufactured Marine Control Cables known all over the world for their superb quality. In house designed and built Cable machines secure that we continuously can maintain the sophisticated tolerance levels required to pro-

duce high performance cables up to extreme lengths with a minimum of play and friction. TFX Control Cables are suitable for almost all makes of Controls and Engines on the market and are direct interchangeable with all other manufacturers universal Control Cables.



KEY FACTORS (VARIABLES) AFFECTING CABLE PERFORMANCE

EFFICIENCY

The percentage of input force (force exercised at the control) that is transmitted through the cable as output force (force at the engine arm). For example, if a 50 N force was exerted on the cable at its input end resulted in the cable exerting a 40 N output force, the cable would be 80% efficient.

CABLE ROUTING

The shorter and straighter the cable routing, the better the cable will perform. With increased length and bends, cable efficiency is reduced, while breakaway and backlash rise.

BACKLASH

The lost motion between the amount of movement put in (through the control handle) and the amount of movement which occurs at the output end (motor end) of the cable. Some motion generally lost in "take up" between the inner wire (core) of the cable and the outer casing (conduit). Backlash manifests itself as free play felt at the control handle.

BREAKAWAY

The feel of the cable when put in motion; the breakaway threshold is the force that must be applied to the cable's input end before something happens at the output end.

ENVIRONMENT

Generally, the more rugged the cable construction, the longer the cable will last. In harsh environments such as heavy salt and UV exposure, control cables with thicker conduits and stainless steel fittings will generally outlast those thinner conduits and brass or steel fittings.

UNIVERSAL CONTROL CABLES



TYPE F 2003 UNIVERSAL CONTROL CABLES STANDARD DUTIES

ORDER NO CC 230-xxxx (P)
P = packed in individual well cartons.
Without P = bulk packed. Example: CC230-0350 = F2003 universal type Control Cable, length 3,50 m, bulk packed.

For standard duty and medium length applications.

Stainless steel end fittings and solid core wire.

Clamp type conduit fittings.

Manufactured in lengths 0,75 m - 8,00 m in 0,25 intervals. Longer lengths on request.

May require connection kits (see connection kits page 14).



TYPE F 3003 UNIVERSAL CONTROL CABLES STANDARD/HEAVY DUTIES

ORDER NO CC 313-xxxx (P)
P = packed in individual well cartons.
Without P = bulk packed. Example: CC313-0375 P = F3003 universal type Control Cable, length 3,75 m, packed in an individual carton.

May require connection kits (see connection kits page 14).

Universal Control Cable for harsh environments. Suitable for long lengths due to use of selected materials and precision manufacturing giving the cable a high efficiency and minimizing backlash and breakaway.

Stainless steel end fittings and solid core wire.

Manufactured in lengths 0,75 m - 25 m at 0,25 m increments. Longer length on request. Manufactured also in lengths 4 ft - 60 ft at 1 ft increments.

Threaded ends 10 - 32 UNF.

Clamp type conduit fittings.

Cable core is life lubricated and the cable has an optimal smooth travel at varied loads, lengths and bends making it suitable for a number of various applications, for instance dual station installations.



TYPE F 4003 UNIVERSAL CONTROL CABLE HEAVY DUTY

ORDER NO 140902 - 140976
(packed in individual well cartons).
ORDER NO 004558 - 005989
(bulk packed).

Type F 4003 universal Control Cable is suitable for heavy duty applications and long time operation in for instance commercial boats. It is the best type of cable for long and complex routings when that cannot be avoided.

Manufactured in standard lengths 2,0 m - 25 m at 0,25 increments. Longer on request. (Cables up to 50 m in length have been supplied).

Threaded ends 1/4" UNF.

Zinc plated end fittings and stainless steel core wire.

The core wire consists of a spiral wounded flat stainless steel wire on a multi strand stainless steel wire core.

This core wire construction gives the cable low friction properties and flexibility necessary at long runs installations.

Cable core is life lubricated.

TFX Control type CH 5600 SLT can use F 4003 universal Control Cable. An excellent combination to use in commercial boating.

TFXTREME™

HIGH PERFORMANCE CONTROL CABLE CC 633, CC 635 AND CC 636

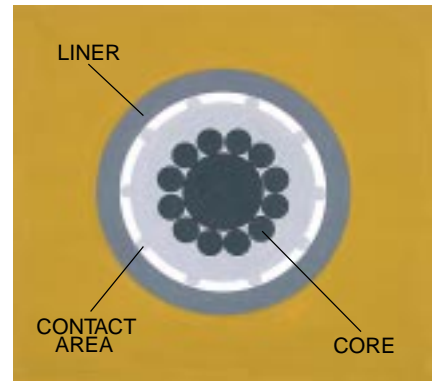
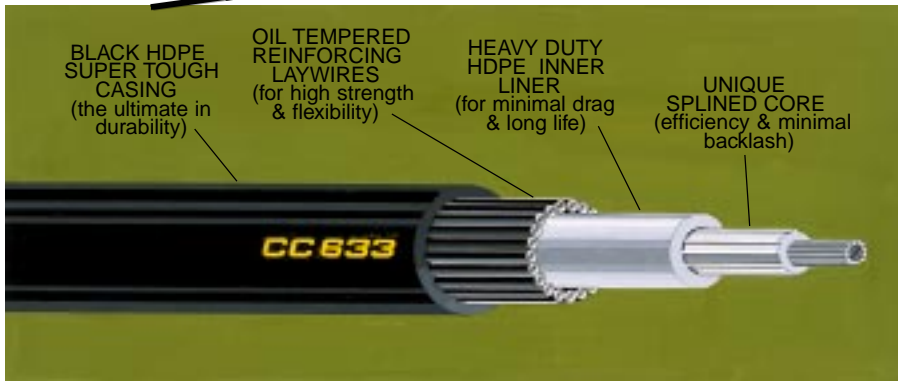
SMOOTH, EASY ACTION PLUS MINIMAL LOST MOTION

TFXtreme's unique design means incredible smoothness and efficiency, with hardly any lost motion, even in the longest and most complex cable routings.

This means superior feel at the control, especially in multi station vessels - performance that until now was considered "impossible".

SPLINED CORE CROSS-SECTION

Core has 10 contact points giving minimal contact with liner + tighter tolerances = superior feel & response.



- Patent Pending splined core for superior response and feel, especially in the most difficult cable routings.
- Replaces all universal type control cables.
- 4" minimum bend radius.
- Stainless steel conduit fittings and 10 - 32 terminals.
- Nickel-plated brass swivel tubes.
- Exceeds all industry standards.
- State-of-the-art manufacturing cell assures total performance consistency in every TFXtreme.

ORDER INFORMATION	ORDER NO
TFXTREME 3300-TYPE CONTROL CABLE.	CC 633 XX
TFXTREME MERCURY TYPE	CC 635 XX
TFXTREME OMC TYPE	CC 636 XX
<small>(XX indicates length in feet; 12-foot cable P/N would be CC 63312).</small>	

CONTROL CABLES FOR ENGINE MANUFACTURERS CONTROLS

DIRECT REPLACEMENT TYPES

Direct replacement typ throttle/shift control cables for applications using the engine maker's controls, such as Evinrude, Force, Johnson, Mariner, Mercury and OMC. These cables are fitted with special connections suitable for respectively Maker's Controls and Engines.

They feature Lubri-Core™, which makes them smooth operating and long lasting. Brass fittings are used and core wire is of stainless steel.

Minimum bend radius is 6" (150 mm).



Engine end

Control end

**MERCURY/MERCRUISER
late model FORCE**

ORDER NO CC 179-xx (P)
P = packed in individual well cartons.
Without P = bulk packed. Example: CC 17912 P
= CC 179 type direct replacement cable, length
12 ft, packed in a well carton.

For Mercury/MerCruiser/1965 to date
and 1993 - date Force (US Marine)
& Mariner with Mercury/Mariner
Controls

Lengths available 5 ft - 25 ft.



Engine end

Control end

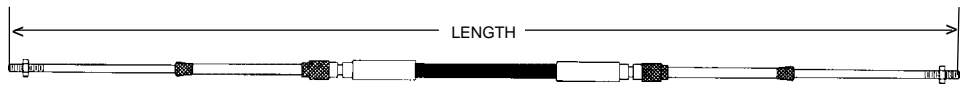
OMC/JOHNSON/EVINRUDE

ORDER NO CC 205-xx (P)
P = packed in individual well cartons.
Without P = bulk packed. Example: CC 20510
= CC 205 type direct replacement cable, length
12 ft, bulk packed.

For all 1979 - to date OMC, Johnson
& Evinrude engines with
OMC Controls.

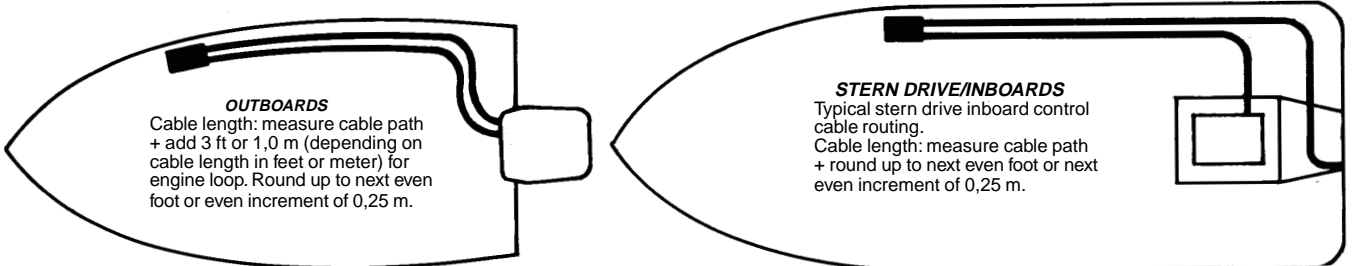
Lengths available 5 ft - 25 ft.

**HOW TO MEASURE
CONTROL CABLES
REPLACEMENT CABLES**



Control Cable length in ft or meter.
(Round up to next whole foot or
multiple of 0,25 m).

FOR A NEW INSTALLATION



ENGINE CONNECTION KITS, FITTINGS AND BELLOWS



F 9030 ENGINE CONNECTION KITS
Mercury 7,5/25 HP and Mercury
Electric Mariner 70/200 Hp.

ORDER NO 195014
(Control and engine end).
Kit for 2 cables.



F 9032 ENGINE CONNECTION KITS
Evinrude/Johnson O/B kit 1979-date.

ORDER NO 195033
(Control and engine end).
Kit for 2 cables.

FITTINGS FOR UNIVERSAL TYPE CABLES

(CC 230, CC 313, CC 633)



F 920 ORDER NO 190001



F 930 ORDER NO 190004



F 950 ORDER NO 195005



F 955 ORDER NO 195006



F 960 ORDER NO 195007



THREAD M5

M 164 ORDER NO 050164



THREAD M5

M 186 ORDER NO 050186



THREAD M5

M 168 ORDER NO 050168



ORDER NO CA 28018 P



THREAD M8

2 L- 694 ORDER NO 000694



THREAD M6

2 L- 721 ORDER NO 000721



F 9 -187 ORDER NO 195002

RUBBER GAITERS AND BELLOWS



Gaiter type F 9010 for control cable
outer diam. 6-10 mm.
ORDER NO 195500



Gaiter twin type F 9010 for control cable
outer diam. 5-8 mm.
ORDER NO 195501



Gaiter type F 9010 for control cable
outer diam. 8-13 mm.
ORDER NO 195502



Sealing cover for 195502
ORDER NO 195503



Bellow type F 9010 for steering
cable outer diam. 16-19 mm.
ORDER NO 195504



Bellow type F 9010 for steering
cable outer diam. 14-16 mm.
ORDER NO 195505

We reserve the right to alter the specification without prior notice.



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