

# Mechanical Steering

## SUGGESTIONS AND WARNINGS WHEN SELECTING A MECHANICAL STEERING SYSTEM

Selection of the right mechanical steering system is important for the safety and functionality of your boat. The combination of engine power, hull type and boat speed influence the selection of the steering system. Load on the steering system increases with boat speed and engine power; torque generated by the propeller rotation in high power outboard applications can make it hard to steer. Big boats with displacement hulls and inboard or non power assisted stern drive engines, can generate high rudder loads: in these cases a mechanical steering system will be inadequate and we suggest the use of an Ultraflex hydraulic steering system. We always recommend consulting our qualified personnel when selecting, installing and maintaining a steering system.

## SUGGESTIONS AND WARNINGS WHEN SELECTING A MECHANICAL STEERING SYSTEM

- Fast Connect Cable, simple installation
- Cable stroke: 228mm (9")
- Minimum Steering Cable bend radius: 200mm (8")
- Maximum Steering Wheel Diameter: 406mm (16")
- Standard 19mm (3/4") Tapered Steering Wheel Shaft
- Exceeds EN 28848 Safety Standards
- Exceeds ABYC P17 Safety Standards
- Compact Mounting to suit limited clearances
- Corrosion resistant materials
- Not to be used on boats equipped with engines that exceed the maximum HP rating of the boat.

### Recommended application for New Zealand marine conditions:

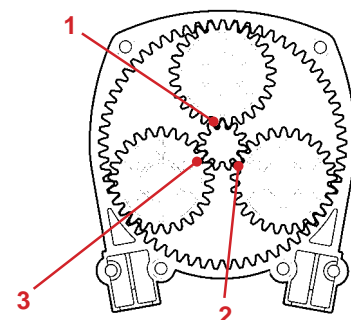
T85:	Engines up to 60HP. Expect some feedback from propeller torque
T71FC / T72FC	Engines up to 125 HP. Reduced feedback from propeller torque
T73FC / T74FC	Engines up to 175 HP. Eliminates propeller torque.

## ADVANTAGES OF PLANETARY GEAR DESIGN

Ultraflex mechanical steering helms T71FC, T73NRFC as well as dual cable versions and tilt wheel versions use a Planetary Gear Design.

A Planetary Gear Design has three satellite gears that rotate on their axis and at the same time rotate around the central helm axis. This allows for equal distribution of engine torque over **three** points of the central gear, dividing and balancing the system loads.

The benefits of this special design are increased system longevity, increased efficiency and less engine feedback compared to single pinion gear helms. There is no wear on gears that causes backlash.



## THE IMPORTANCE OF A NON-REVERSIBLE STEERING SYSTEM FOR INCREASED SAFETY

If, for any circumstance, the driver does not hold the steering wheel, a dangerous situation may occur caused by a sudden change of direction of the boat due to external forces (waves, currents, etc.) or internal forces such as rudder torque originated by the rotation of the propeller. Engine torque usually generates a load on the steering system that must be continually compensated for by the driver even when the boat is going straight. The additional effort by the driver to maintain a true course can often cause fatigue.

With Ultraflex Non-Reversible steering helms T73NRFC, T74NRFC, T83NRFC, T84NRFC the loads applied to the steering system are no longer a problem. A special patented device allows the helm shaft to lock until turned by the driver, maintaining the boat direction and neutralizing the feedback loads on the steering cable. This mechanism is engaged when the driver is not turning the wheel and is automatically disengaged as soon as the driver applies pressure on the wheel to change direction of the boat. The Ultraflex Non-Reversible mechanism makes driving a boat safer and easier.

## USE AND MAINTENANCE

The steering cable must be installed avoiding excessive and/or tight bends. This will provide the driver with easy handling at all speeds, helping to reduce inefficiency and excess play in the system.

Marine corrosion may cause the materials to deteriorate affecting manoeuvring efficiency and in the worst case, system failure. The steering cable end fittings and the engine cable support must be cleaned and greased periodically; these simple operations minimize wear and corrosion in the system.

The steering cable must be regularly inspected. If steering becomes hard, inconsistent, cuts on the conduit surface are noticed, or any other component found damaged, the cable must be replaced immediately.

When storing your boat for an extended period of time we recommend removing the steering cable end fitting from its engine side support and cleaning it adequately.

# Mechanical Steering Systems

## HELM ASSEMBLY - ROTARY GEAR



A COMPLETE SYSTEM CONSISTS OF:

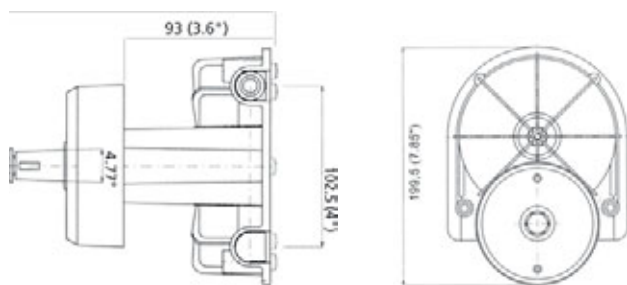
- Steering helm with black or white bezel
- Steering cable: M66 available in one foot increments
- Optional steering wheel (see steering wheels)
- Engine connection kits (see over page)

Code	Description
U-T85W	T85 with white bezel
U-T85	T85 with black bezel

- Fast Connect - Simple Installation
- Lock to lock steering wheel turns: approx. 3



U-T85W



## HELM ASSEMBLY - PLANETARY GEAR



A COMPLETE SYSTEM CONSISTS OF:

- Steering helm: single or dual
- Black bezel 90° or 20°
- Steering cable: M66 available in 1 foot increments
- Optional steering wheel (see steering wheels)
- Engine connection kits (see over page)

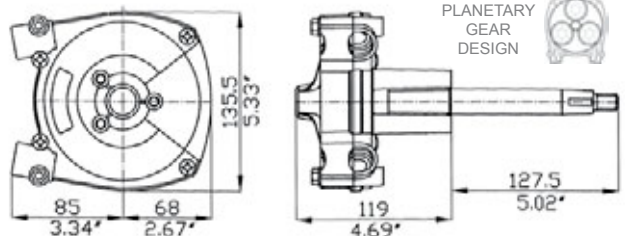
Code	Description
U-T71FC	Single cable steering helm
U-T72FC	Dual cable steering helm

- Optional 90° or 20° installation, Standard 3/4" tapered shaft
- Lock-to-lock steering wheel turns: approx. 3.8
- For boats faster than 50 mph the twin cable steering system T72FC is recommended



U-T71FC

U-T72FC



## HELM ASSEMBLY - NON FEEDBACK

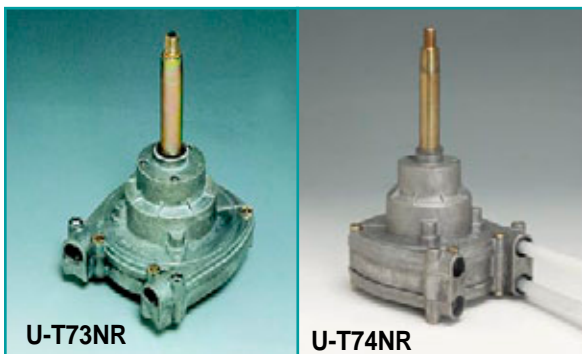


A COMPLETE SYSTEM CONSISTS OF:

- Steering helm: single or dual cable with 90° or 20° black bezel
- Steering cable: M66 available in one foot increments
- Optional steering wheel (see steering wheels)
- Engine connection kits (see over page)

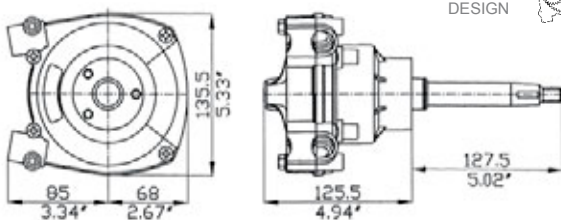
Code	Single / Dual Cable
U-T73NR	Single Cable
U-T74NR	Dual Cable

- Easy and safe steering: a patented non-reversible mechanism eliminates the continuous load on the operator caused by the propeller torque.
- Compact rotary helm unit: the central location of the steering shaft makes these systems the most compact in their class.
- Ideal for larger outboards and surfacing propellers.
- Optional 90° or 20° installation. Standard 3/4" tapered shaft.
- Lock-to-lock steering wheel turns: approx 3.8
- For boats faster than 50 mph use the twin cable steering system U-T74NR



U-T73NR

U-T74NR



U-T73NR - U-T74NR

## HELM ASSEMBLY - TILT



A COMPLETE SYSTEM CONSISTS OF:

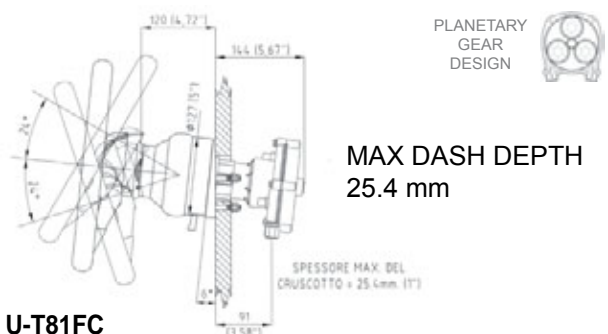
- Steering helm: single or dual cable, reversing or non reversing
- Steering cable: M66 available in one foot increments
- Tilt Mechanism U-X52. NB Steering wheel optional
- Engine connection kits (see over page)

Code	Non Feedback	Single / Dual
U-T81FC	-	Single Cable
U-T82FC	-	Dual Cable
U-T83NR	Non Feedback	Single Cable
U-T84NR	Non Feedback	Dual Cable

- Tilt range of 48° and five locking positions
- Tilt device eliminates underdash movement
- Lock-to-lock steering wheel turns: approx. 3.8
- For boats faster than 50 mph the twin cable steering systems U-T82FC and U-T84NR are recommended



U-T81FC + X52



U-T81FC

# Steering Cables & Accessories

## M66 STEERING CABLE

228 mm stroke with all stainless steel cable output ends

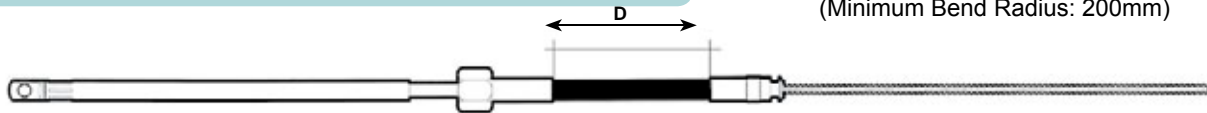
Code	Length (feet)	Length (metres)	Code	Length (feet)	Length (metres)
U-M66/07	7	2.14	U-M66/19	19	5.80
U-M66/08	8	2.44	U-M66/20	20	6.10
U-M66/09	9	2.75	U-M66/21	21	6.41
U-M66/10	10	3.05	U-M66/22	22	6.72
U-M66/11	11	3.36	U-M66/23	23	7.03
U-M66/12	12	3.66	U-M66/24	24	7.33
U-M66/13	13	3.97	U-M66/25	25	7.62
U-M66/14	14	4.27	U-M66/26	26	7.93
U-M66/15	15	4.59	U-M66/27	27	8.23
U-M66/16	16	4.88	U-M66/28	28	8.54
U-M66/17	17	5.19	U-M66/29	29	8.84
U-M66/18	18	5.49			



M66 CABLE

### HOW TO MEASURE FOR REPLACEMENT CABLES

**Order Length:** D + 56cm and round up to the next cable size (Minimum Bend Radius: 200mm)



D = Conduit Length

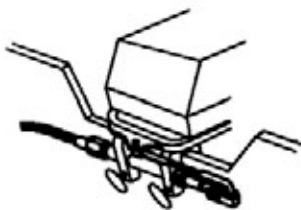
M66 Cables are a direct replacement for Teleflex - Morse Cables

### HOW TO MEASURE FOR NEW CABLES

Add. A + B + C and subtract 10 cm for each 90° bend in the cable.

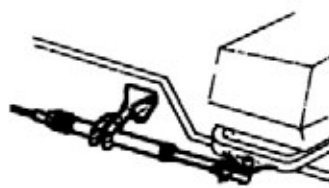
For installation through the engine tilt tube, add 30.5 cm to the length calculated above.

To order in feet, divide by 30.5 and round off to the next whole foot.



TILT TUBE MOUNTING

Example (dimensions in cm):  
 $A (50) + B (250) + C (80) = 380 - 20$  (for two 90° bends) = 360 + 30.5  
 For a thru-tube installation 390.5 cm : 30.5 = 12.8 ft; round off to 13 ft

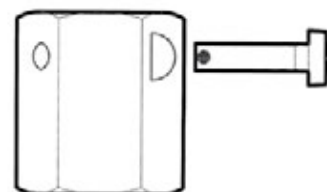


TRANSOM SUPPORT OR SPLASHWELL MOUNTING

Example (dimensions in cm):  
 $A (50) + B (250) + C (80) = 380 - 20$  (for two 90° bends) = 360  
 Round up to 3.66 metres (12 feet)




### STEERING CABLE ADAPTORS

Adapt your cable to an ultraflex system



Code	Description
U-K66	Adapts M66 cable to T71, T72, T73NR, T74NR Ultraflex steering systems

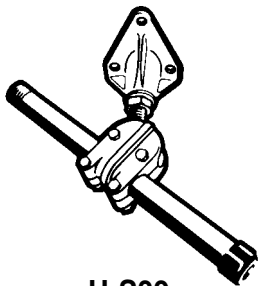
## STEERING SYSTEM APPLICATION GUIDE

Application	Boat Length	Steering system
 <b>OUTBOARD</b>	up to 30' (9m)	T85 - T71FC - T81FC - T73NRFC - T83NRFC
		Twin cable rotary steering systems
 <b>INBOARD</b>	up to 35' (10.5m)	T85 - T71FC - T81FC - T73NRFC - T83NRFC
		Twin cable rotary steering systems
 <b>STERNDRIVE POWER ASSISTED</b>		T85 - T71FC - T81FC - T73NRFC - T83NRFC
		Twin cable rotary steering systems

Twin cable systems are recommended for boats that exceed 50 mph. Always follow engine manufacturer's instructions.

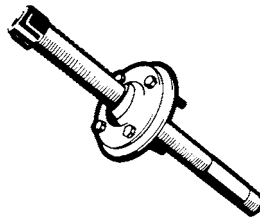
**NOTE:** Sterndrive engines not equipped with power steering can create very high steering loads. Hydraulic steering systems are recommended for these type of boats. For any further information please contact our Technical Service.

## STEERING CABLE SUPPORTS



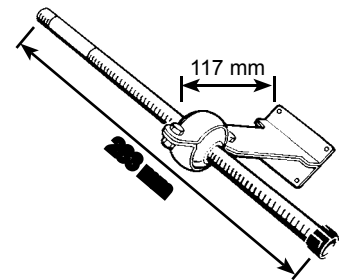
**U-S39**

Clamp Block in marine aluminium & SS. Tube Only: **U-S39T**



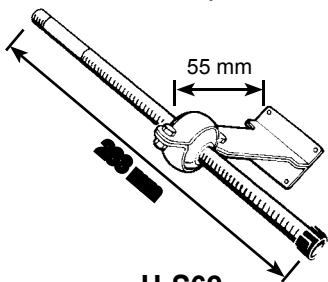
**U-S40**

Splashwell mounting, corrosion resistant. Tube Only: **U-S40T**



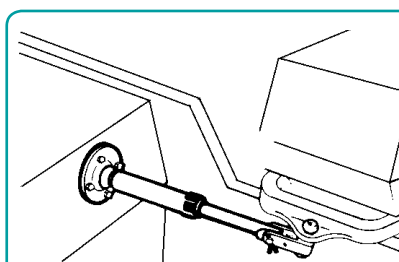
**U-S61**

Clamp block 117 mm stand off corrosion resistant painted steel

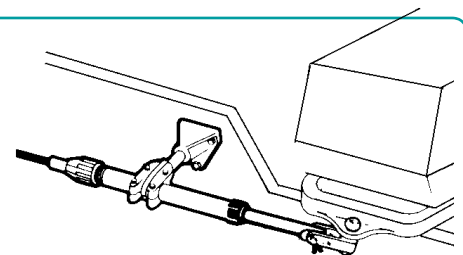


**U-S62**

Clamp block 55 mm stand off corrosion resistant painted steel

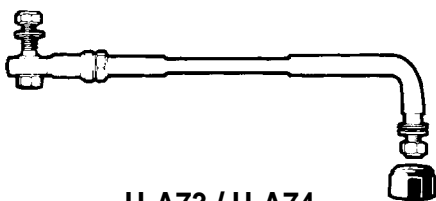


**WITH SPLASHWELL**



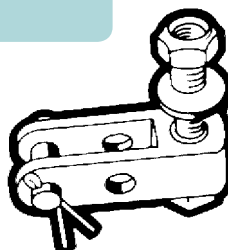
**WITH CLAMP BLOCK**

## ENGINE CONNECTION KITS



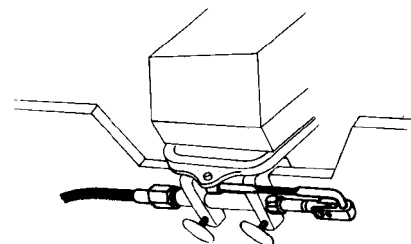
**U-A73 / U-A74**

A73: Tiller arm for Mercury engines  
A74: Tiller arm for OMC engines



**U-A75**

Clevis for tiller arms



**WITH TILLER ARM**

## CABLE GROMMETS & RINGS

Wire type cable grommets & rings

Code	Size Diameter mm	Colour	Grommet Type
U-R1	152	Black	Single hole
U-R1G	152	Grey	Single hole
U-R1W	152	White	Single hole
U-R2	105	Black	Single hole
U-R2G	105	Grey	Single hole
U-R2W	105	White	Single hole
U-R3	105	Black	2 hole
U-R3G	105	Grey	2 hole
U-R3W	105	White	2 hole
U-R4	105	Black	Adjustable
U-R4W	105	White	Adjustable

