

MECHANICAL STEERING 19

STEERING CABLE REPLACEMENT SELECTION GUIDE 19.02

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STEERING SYSTEM SELECTION GUIDE

Speed, hull, horsepower, engine type, displacement and size are major factors in boat performance and handling characteristics. We do not recommend these systems for outboards 25HP or less. Although mechanical helms are rated to high HP ratings, we strongly recommend hydraulic steering to be fitted to all motors above 115kW (150HP) or boats that exceed 50mph for optimum performance and maximum customer satisfaction. **This selection guide should be used as a general reference only. Always follow engine manufacturer's instructions.**

**Sterndrive engines not equipped with power steering can create very high steering loads. Our hydraulic steering systems are recommended for these types of boats.*

Steering Helm System	OUTBOARD Boat length up to 9m (30ft)		INBOARD	STERNDRIVE*
	Optimal Engine Power	Max. Engine Power	Boat length up to 10.5m (35ft)	Power Assisted
T85	75HP	115HP	No	Yes
T91	150HP	225HP	Yes	Yes
T93ZT	150HP	225HP	Yes	Yes
T81FC	150HP	225HP	Yes	Yes
T71FC	150HP	225HP	Yes	Yes
T73NRFC	150HP	225HP	Yes	Yes
T72FC (Twin Cable)	200HP	275HP	Yes	Yes
T74NRFC (Twin Cable)	200HP	275HP	Yes	Yes

MECHANICAL STEERING CABLE REPLACEMENT SELECTION GUIDE

Helm Model	Cable Marking Model	Replacement Cable
UltraFlex		
T85	M66	M66 or M90
T81FC	M66	M66 or M90
T71FC	M66	M66 or M90
T72FC	M66	M66 or M90
T73NRFC	M66	M66 or M90
T74NRFC	M66	M66 or M90
T91	M90	M90
T93ZT	M90	M90
T101	M90	M90
T103ZT	M90	M90

TeleFlex

Quick Connect 3 Turn	SSC62 or SSC92	M66
Quick Connect 3 Turn Twin	SSC62 or SSC92	M66
Quick Connect 4 Turn	SSC62 or SSC92	M66
NFB 4.2	SSC62 or SSC92	M66 or M90
NFB 4.2 Twin	SSC62 or SSC92	M66 or M90
NFB Safe TII	SSC62 or SSC92	M66 or M90
Safe TQC	SSC62 or SSC92	M66 or M90

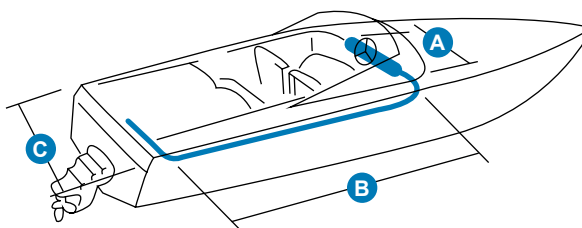
Morse

D290	D345, 190845, SSC290	M66 or M90
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HOW TO MEASURE FOR NEW STEERING CABLE INSTALLATION

One of the major factors in selecting a steering system is proper cable length. Due to specific routing in each boat, these approximate lengths will vary. Final selection should be made with the assistance of a qualified technician.

Add **A** + **B** + **C** then subtract 10cm for each 90° bend in the cable. For installation through the engine tilt tube, add 30.5cm to the measure calculated above. Always round up to calculate the total order length.



Example (cm):

A = 50 **B** = 250 **C** = 80

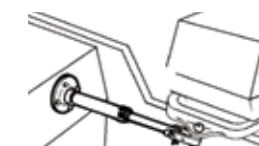
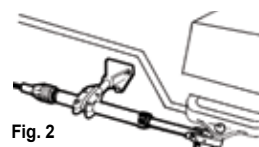
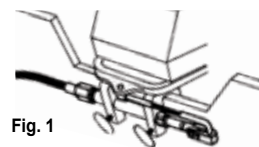
Fig. 1: Tilt Tube Mounting
 $50 + 250 + 80 = 380 - 20$ (for two 90° bends) = 360cm

• For a thru-tube installation:
 $360cm + 30.5 = 390.5cm$

Fig. 2 and 3: Transom Support or Splashwell Mounting
 $50 + 250 + 80 = 380 - 20$ (for two 90° bends) = 360cm

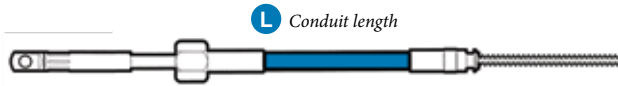
To convert length to feet, divide total by 30.5 and round up to the next whole foot.

See page opposite for how to measure replacement steering cables.



MEASURING FOR REPLACEMENT STEERING CABLES

Order Length = **L** + 56cm (1.8ft)



Example (m): **L** = 305cm
 305 + 56 = 361cm (3.61m)
 Order length (round up) = 3.66m

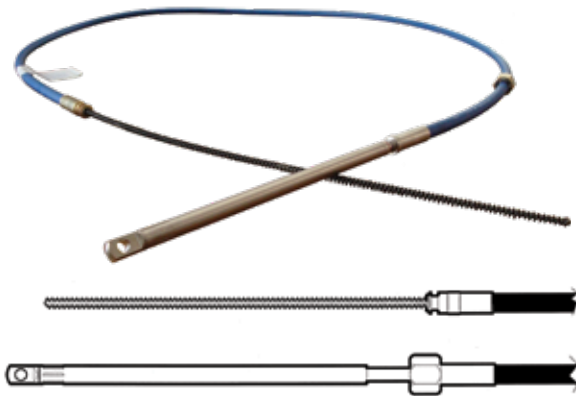
Example (ft): **L** = 10ft
 10 + 1.8 = 11.8ft
 Order length (round up) = 12ft

Ultraflex M90 MACH Mechanical Steering Cables



Specifically designed for high performance and efficiency applications, the M90 Mach cable (patented) offers increased flexibility and durability with top quality materials and construction.

- Ideal solution for long cable runs and tight bend applications.
- Corrosion resistant materials, stainless steel engine side output fitting.
- Minimal feedback.
- Fast connect, simple installation, patented end fitting.
- Steering Cable bend radius 150mm (5.9").
- M90 Patented cable end fitting will fit with most Ultraflex steering helms (T85, T71FC, T72FC, T73NRFC, T74NRFC, T81FC, T83NRFC, T91, T83ZT, T101 and T103ZT).
- Suits Teleflex NFB 4.2 and Morse D290 helms.
- Exceeds both EN 28848 and ABYC P17 safety standards.



Part No.	Length	
	(ft)	(m)
JPW18750	10	3.05
JPW18751	11	3.35
JPW18752	12	3.66
JPW18753	13	3.96
JPW18754	14	4.27
JPW18755	15	4.57
JPW18756	16	4.88
JPW18757	17	5.18
JPW18758	18	5.49
JPW18759	19	5.79
JPW18760	20	6.10
JPW18761	21	6.40

Ultraflex M90 MACH Mechanical Steering Cable Kits



These Ultraflex mechanical steering kits include a high performance planetary gear helm, 90° bezel and highly flexible M90 cable available in various lengths.

- Fast connect, simple to install, patented end fitting.
- Compact for mounting, with minimal feedback.
- Specifically designed for high performance and high efficiency applications.
- Stainless steel cable output end, engine side, featuring patented gasket.
- Helm max. allowable steering wheel diameter: 406mm
- Manufactured with corrosion resistant materials.
- M90 cable min. bend radius: 150mm
- Stroke: 228mm
- Standard 3/4" tapered shaft.
- Exceeds EN 28848 and ABYC P17 safety standards.

Note: Not to be used on boats equipped with engines that exceed the maximum horsepower rating of the boat. For boats faster than 80 kph or 43knots, our hydraulic steering systems are recommended.

M90 Mechanical Steering Kits with T91 helm

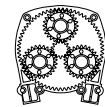


Part No.	M90 Cable Length	
	(ft)	(m)
JPW18762	12	3.66
JPW18763	13	3.96
JPW18764	14	4.27
JPW18765	15	4.57
JPW18766	16	4.88
JPW18767	17	5.18
JPW18768	18	5.49
JPW18769	19	5.79
JPW18770	20	6.10
JPW18771	21	6.40



Kit Contains:

- M90 Steering Cable
- T91 helm
- X34 90deg bezel



Planetary Gear Design

M90 Mechanical Steering Kits with T93ZT Zero Torque Helm

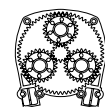


Part No.	M90 Cable Length	
	(ft)	(m)
JPW18772	12	3.66
JPW18773	13	3.96
JPW18774	14	4.27
JPW18775	15	4.57
JPW18776	16	4.88
JPW18777	17	5.18
JPW18778	18	5.49
JPW18779	19	5.79
JPW18780	20	6.10
JPW18781	21	6.40



Kit Contains:

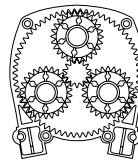
- M90 Steering Cable
- T93ZT Zero Torque helm
- X34 90deg bezel



Planetary Gear Design

Ultraflex T71FC and T72FC Steering Helms

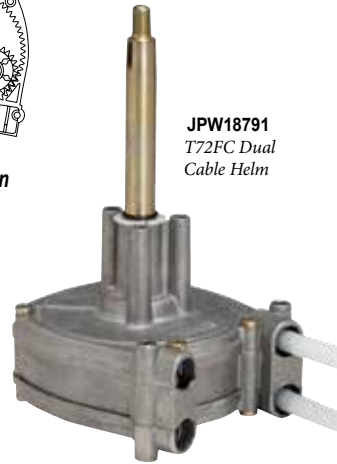
- Fast connect and simple installation.
- Made from corrosion resistant materials.
- Particularly suitable where clearance is limited.
- Optional 90° or 20° mounting bezel.
- Features a standard 3/4" tapered shaft.
- Steering wheel turns approximately 3.8x from lock to lock.
- Compact for mounting with minimum feedback.
- For use with outboard engines from 25HP to a maximum of 225HP.
- For boats exceeding 80km/h, the twin cable steering system T72FC is recommended.
- Uses M66 cable, M90 cable or SSC62 cable (the T72FC helm requires two cables).
- Mounting bezels required: X34 and X35 - sold separately.
- Exceeds both EN 28848 and ABYC P17 safety standards.



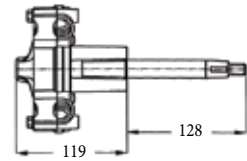
Planetary Gear Design



JPW18790
T71FC Single Cable Helm

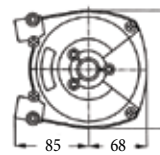


JPW18791
T72FC Dual Cable Helm

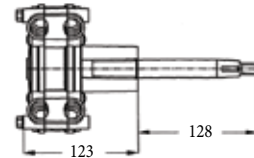


T71FC Single Cable Helm

Part No.	Model	Cable Stroke (mm)	Max. Steering Wheel Dia (mm)	Suggested bend radius (mm)
JPW18790	T71FC Single Cable	228	406	200
JPW18791	T72FC Dual Cable	228	406	200



(Dimensions in mm)

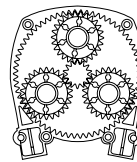


T72FC Dual Cable Helm

Ultraflex T73NRFC and T74NRFC Anti-Feedback Steering Helms

Ultraflex anti-feedback steering helms. 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.

- Easy and safe steering, fast connect and simple installation.
- Compact rotary helm unit, particularly suitable where clearance is limited.
- Ideal for outboards and surfacing propellers.
- Features a standard 3/4" tapered shaft.
- Made exclusively with corrosion resistant materials.
- Steering wheel turns approximately 3.8x lock to lock.
- Compact for mounting with minimum feedback.
- For boats exceeding 50mph, the twin cable steering system T74NRFC is recommended.
- Uses M66 cable, M90 cable or SSC62 style cable.
- Mounting bezels required: X34 and X35 - sold separately.
- Exceeds both EN 28848 and ABYC P17 safety standards.



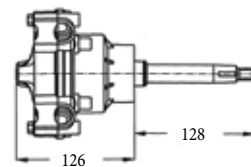
Planetary Gear Design



JPW18802
T73NRFC Single Cable Helm



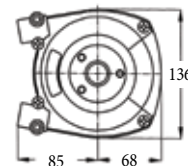
JPW18793
T74NRFC Dual Cable Helm



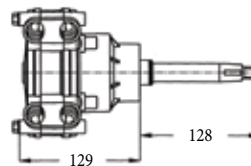
T73NRFC Single Cable Helm

Note: Not suitable for power assisted steering, stern drives.

Part No.	Model	Cable Stroke (mm)	Max. Steering Wheel Dia (mm)	Suggested bend radius (mm)
JPW18802	T73NRFC Single Cable	228	406	200
JPW18793	T74NRFC Dual Cable	228	406	200



(Dimensions in mm)



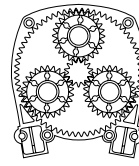
T74NRFC Dual Cable Helm



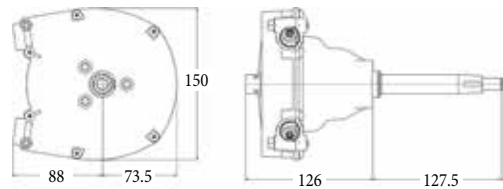
Ultraflex T91 High Performance Planetary Gear Steering Helm

Featuring a Planetary Gear design with the benefits of increased system longevity, increased efficiency and less engine feedback compared to single pinion gear helms. The T91 steering system is not to be used on boats equipped with engines that exceed the maximum horsepower rating of the boat.

- Specifically designed to be used only with the Ultraflex M90 Mach steering cable and does not suit any other make cables.
- Designed for high performance and high efficiency applications.
- Fast connect, simple installation, patented end fitting.
- Stainless steel cable output end featuring patented gasket, engine side.
- Made exclusive from corrosion resistant materials.
- Suitable where clearance is limited due to its compact design.
- Standard 3/4" tapered shaft.
- Minimal feedback.
- For boats faster than 80km/h our hydraulic steering systems are recommended.
- Mounting bezels required: X34 and X35 - sold separately.
- Exceeds EN 28848 and ABYC P17 safety standards.



Planetary Gear Design



(Dimensions in mm)

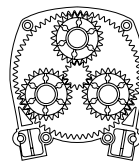
Part No.	Cable Stroke (mm)	Max. Steering Wheel Dia (mm)	Suggested bend radius (mm)
JPW18789	228	406	200

Ultraflex T93ZT Zero Torque Planetary Gear Steering Helm

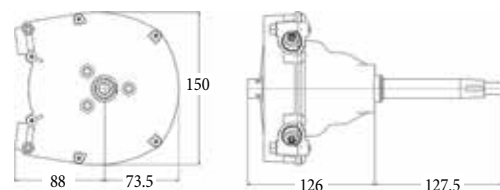


A special patented device allows the helm shaft to lock until turned by the driver, maintaining the boat direction and neutralizing the feedback loads on the steering cable. This mechanism is engaged when the driver is not turning the wheel and is automatically disengaged as soon as the driver applies pressure on the wheel to change direction of the boat.

- Specifically designed to be used only with the Ultraflex M90 Mach steering cable and does not suit any other make cables.
- Designed for high performance and high efficiency applications.
- Fast connect, simple installation, patented end fitting.
- Stainless steel cable output end featuring patented gasket, engine side.
- Corrosion resistant materials.
- Standard 3/4" tapered shaft.
- Minimal feedback.
- Not to be used on boats equipped with engines that exceed the maximum horsepower rating of the boat.
- For boats faster than 80km/h, suggest to use our hydraulic steering systems.
- Mounting bezels required: X34 or X35 - sold separately.
- Exceeds EN 28848 and ABYC P17 safety standards.



Planetary Gear Design



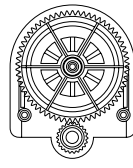
(Dimensions in mm)

Part No.	Cable Stroke (mm)	Max. Steering Wheel Dia (mm)	Suggested bend radius (mm)
JPW18788	228	406	200

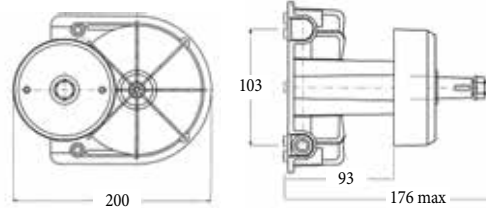
Ultraflex T85 Rotary Steering Helm Assembly with 90deg Bezel



- Fast connect and simple installation, and made from corrosion resistant materials.
- Steering wheel turns approximately 3x lock to lock.
- Includes black 90° Bezel mounting kit (102.5mm diameter).
- Compact for mounting with minimum feedback.
- Uses M66 cable, M90 cable or SSC62 style cable.
- Particularly suitable where clearance is limited.
- Standard 3/4" tapered shaft.
- For use with outboard engines from 25HP to a maximum of 115HP.
- Exceeds both EN 28848 and ABYC P17 safety standards.



Rotary Gear Design



(Dimensions in mm)

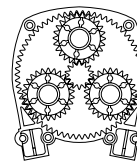
Part No.	Cable Stroke (mm)	Max. Steering Wheel Dia (mm)	Suggested bend radius (mm)
JPW18801	228	406	200

Ultraflex T81FC Tilt Helm with X52 Tilt Mechanism



With a tilt range of up to 48° and features five locking positions, this device eliminates underdash movement and boasts a simple installation and quick connection.

- Made from corrosion resistant materials with stainless steel cable output ends
- Standard 3/4" tapered stainless steel shaft.
- Steering wheel system turns approximately 3.8x from lock to lock.
- Stroke length 228mm.
- Maximum allowable steering wheel diameter: 406mm
- Minimum steering cable bend radius: 200mm
- Suitable use with outboard engines from 25HP to a maximum of 225HP.
- T81FC steering systems are not to be used on boats equipped with engines that exceed the maximum horsepower rating of the boat.
- For boats faster than 50mph hydraulic steering systems are recommended.
- Exceeds EN28848 and ABYC P17 safety standards.

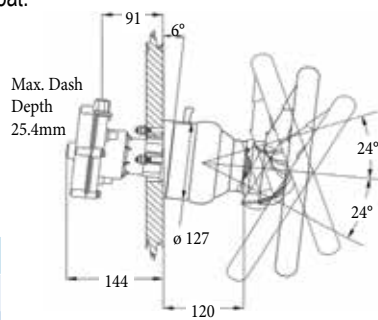


Planetary Gear Design



JPW18800 X52 Tilt Mechanism

JPW18799 T81FC Helm



(Dimensions in mm)

Note: Helm and Tilt Mechanism sold separately.

Part No.	Model
JPW18799	T81FC Single Cable Steering Helm
JPW18800	X52 Tilt Mount Mechanism

Ultraflex Mounting Helm Bezels



These mounting bezels are suitable to use with Ultraflex T71FC, T72FC, T73, T74, G86 and G88NR helms.

- Diameter: 130mm
- Height: 45mm



JPW18804



JPW18805

Part No.	Model	Type
JPW18804	X35	20° Mounting Kit
JPW18805	X34	90° Mounting Kit



Transom Clamp Block Mounting Kits

Clamp block in marine aluminium with stainless steel studs and anodized aluminium or stainless steel tube.



Part No.	Model	Type
U31916	S39	Swivel Clamp Block with Aluminium Tube
U53930	S39T	Aluminium Tube Only
U41551	S39SS	Swivel Clamp Block with Stainless Steel Tube
U72971	S39TSS	Stainless Steel Tube Only

Transom Clamp Block Mounting Kits

Corrosion resistant painted steel clamp block.

• Two clamp sizes available.

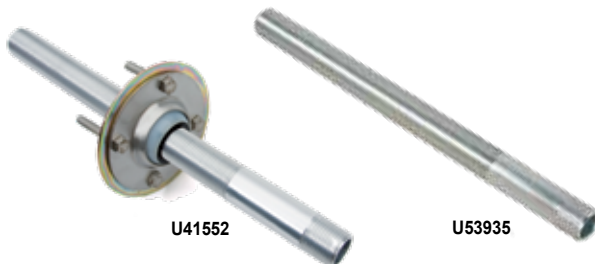


Part No.	Model	Tube Length (mm)	Clamp Height (mm)
U41554	S61	283	117
U38830	S62	283	55

Splashwell Steering Mounting Kit

Corrosion resistant splashwell mount, stainless steel flange with stainless steel tube. Aluminium tube sold separately.

- 79mm diameter mounting flange.
- Includes 6mm mounting bolts.



Part No.	Model	Type
U41552	S40SS	Splashwell Mount with Stainless Steel Tube
U53935	S40T	Aluminium Tube Only

Rudder Support Mounting Kits

Corrosion-resistant 90° rudder support stainless steel flange with aluminium or stainless steel tube.

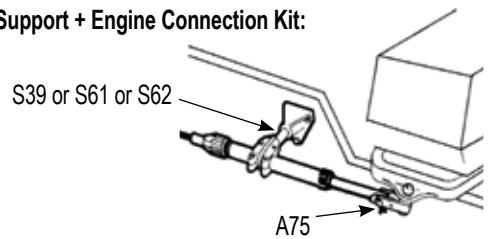


Part No.	Model	Type
U34744	S55	Rudder Support with Aluminium Tube
U41553	S55SS	Rudder Support with Stainless Steel Tube

TYPICAL ENGINE CONNECTION GUIDE

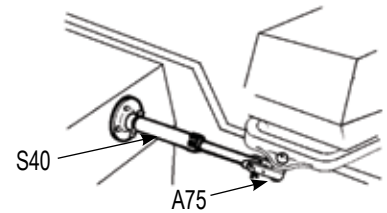
A: With Clamp Block

Cable Support + Engine Connection Kit:



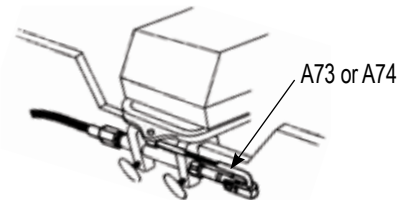
B: With Splashwell

Cable Support + Engine Connection Kit:



C: With Tiller Arm

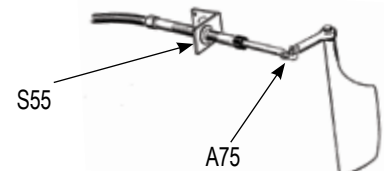
Cable Support + Engine Connection Kit:



D: With 90° Rudder Support

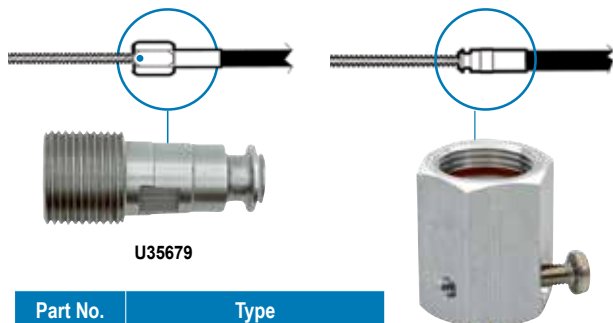
Cable Support + Engine Connection Kit:

S55 + A75



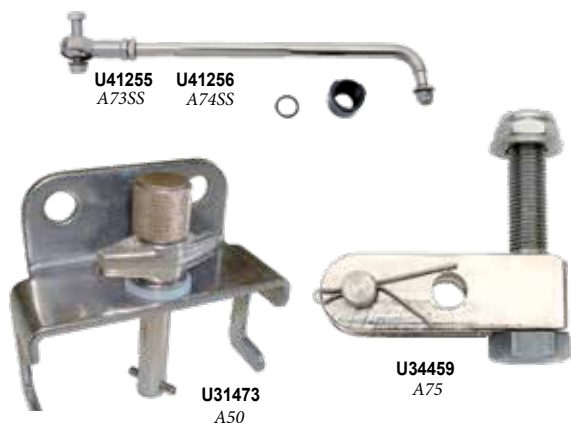
Steering Cable Adaptors

- **K46** - converts the old M47 nut to nut cable into an M66 fast connect which accepts the T85, T71FC, T72FC, T73NRFC, T74NRFC and T81FC.
- **K66** - converts the M66 fast connect cable into a M47 nut to nut cable which accepts the old T71, T72, T73NR, T74NR and T81.



Part No.	Type
U35679	K46 Steering Cable Adaptor
U38432	K66 Steering Cable Adaptor

Engine Connection Kits



Part No.	Type
U31473	A50 Yamaha Connection Kit
U41255	A73SS Tiller Drag Link Arm - Mercury, Yamaha, Suzuki
U41256	A74SS Tiller Drag Link Arm - OMC/BRP
U34459	A75 Clevis Engine Connect

Mechanical Pulley Steering Spares

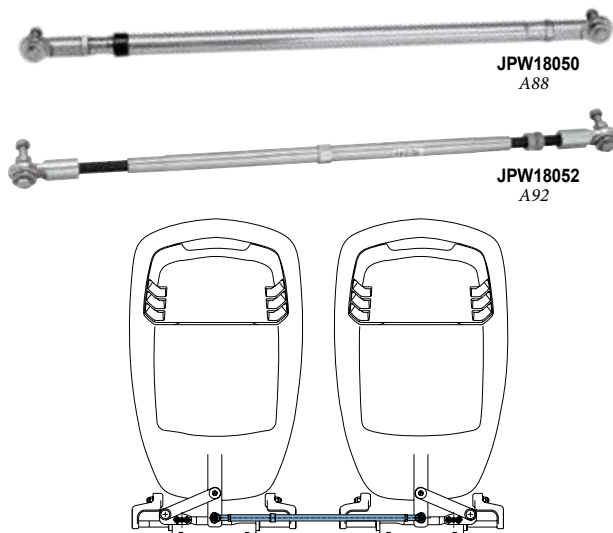


Part No.	Type	Description
JPW5251	Tiller Cable Clamp	B22 brass. U bolt type.
JPW5254	Single Steering Pulley - Swivel Top	65mm diameter pulley, 13mm inside diameter ring. 300kg max working load.
RM212	Cable Tension Spring	Stainless steel. Used with pulley steering systems.

Adjustable Tie Bars for Dual Engines

Adjustable universal tie bar suitable for all outboard applications with single or dual cylinders with up to 300HP of maximum power.

- Electro polished stainless steel ball joint.
- All stainless steel components.
- Applicable to twin outboard engines using mechanical/hydraulic steering.



Note: On those applications where the clearance between engine tiller arms and cowling is not sufficient for the use of the A88, the A92 tie bar is recommended.

Part No.	Model	Adjustable Length (mm)
JPW18050	A88	650 - 950
JPW18052	A92	550 - 700

Monofilament Polyester Braided Sleeving for Cables

Highly flexible, halogen free sleeving, with good mechanical resistance and excellent resistance to abrasion and solvent. Non-watertight.

- Flammability: self extinguishing
- Expansion ratio: from 1 to 2



Part No.	Diameter (mm)	Length (m)	Colour
JPW18040	20	100	Black
JPW18041	30	100	Black



Steering Grommets



Part No.: **U38060**
 Type: R1 Large
 Colour: Black
 Outer Ø (mm): 152mm
 Hole Ø (mm): 12
 Height (mm): 110



Part No.: **U38061**
 Type: R2 Small
 Colour: Black
 Outer Ø (mm): 105
 Hole Ø (mm): 9
 Height (mm): 65



Part No.: **U38062**
 Type: R3 2 Hole
 Colour: Black
 Outer Ø (mm): 105
 Hole Ø (mm): 5
 Height (mm): 52



Part No.: **U38827**
 Type: R4 Adjustable
 Colour: Black
 Outer Ø (mm): 105
 Hole Ø (mm): 55
 Height (mm): 68



Part No.: **U38956**
 Type: R4 Adjustable
 Colour: White
 Outer Ø (mm): 105
 Hole Ø (mm): 55
 Height (mm): 68



Part No.: **JPW17880**
 Type: -
 Colour: Black
 Outer Ø (mm): 105
 Hole Ø (mm): 12
 Height (mm): 65



Part No.: **JPW17881**
 Type: -
 Colour: Black
 Outer Ø (mm): 150
 Hole Ø (mm): 12
 Height (mm): 115



Part No.: **JPW17882**
 Type: -
 Colour: Black
 Outer Ø (mm): 90
 Hole Ø (mm): N/A
 Height (mm): 100



Part No.: **JPW17883**
 Type: Small Adjustable
 Colour: Black
 Outer Ø (mm): 117
 Hole Ø (mm): 55
 Height (mm): 70

High Quality Slop Stoppers and Trim Rings

Trim rings protect wiring and plumbing from chafing by neatly finishing holes in bulkheads, engine wells, etc.

- Made from soft PVC plastic for excellent weather and chemical resistance.
- Splash-proof round slop stopper boots prevent damage to cables and hoses in engine wells etc.



Part No.: **JPW5292**
 Type: Round Trim Ring
 Colour: Black
 Hole Ø (mm): 65
 Total Dimensions (mm): 90
 Cut-out (mm): 65
 Max. panel thickness (mm): 6
 Intrusion (mm): -



Part No.: **JPW5293**
 Type: Oval Trim Ring
 Colour: Black
 Hole Ø (mm): 115 x 60
 Total Dimensions (mm): 135 x 82
 Cut-out (mm): 120 x 62
 Max. panel thickness (mm): 5
 Intrusion (mm): -



Part No.: **JPW5294**
 Type: Round Slop Stopper
 Colour: White
 Hole Ø (mm): 50
 Total Dimensions (mm): 90
 Cut-out (mm): 62
 Max. panel thickness (mm): 6
 Intrusion (mm): 45



Part No.: **JPW5300**
 Type: Round Slop Stopper
 Colour: Black
 Hole Ø (mm): 50
 Total Dimensions (mm): 90
 Cut-out (mm): 62
 Max. panel thickness (mm): 6
 Intrusion (mm): 45



Part No.: **JPW5301**
 Type: Oval Slop Stopper
 Colour: Black
 Hole Ø (mm): 115 x 60
 Total Dimensions (mm): 135 x 80
 Cut-out (mm): 120 x 62
 Max. panel thickness (mm): 5
 Intrusion (mm): 45

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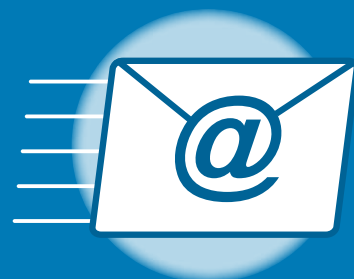


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