SIMRAD

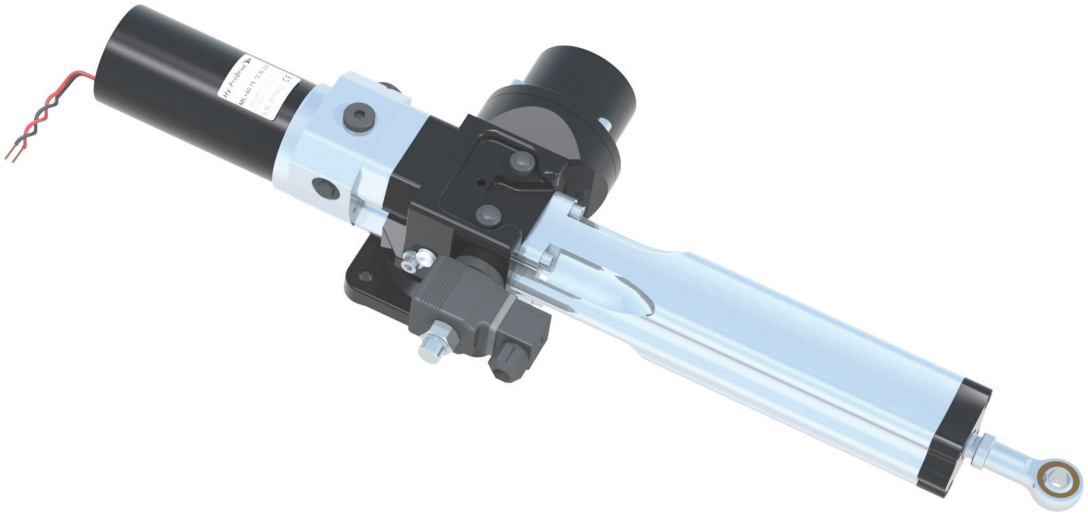
B&G

RAM T0

Marine Linear Actuator

User Manual

ENGLISH



bandg.com

simrad-yachting.com

This precision engineered product was designed and manufactured in the United Kingdom.

Please keep this manual in a safe place

The information in this manual was, to the best of our knowledge, correct when it went to press and Simrad or B&G cannot be liable for any inaccuracies or omissions. There may also be differences between the specifications in the manual and the product as a result of ongoing development for which we accept no liability.

CONTENTS

IMPORTANT SAFETY INFORMATION

Failure to install and maintain this equipment in accordance with the instructions contained in this manual could result in damage or injury. This equipment must be installed and maintained by a person who is qualified to do so. This equipment is only for use with marine autopilots within the limitations stated in the following pages. Autopilot steering systems are navigational aids and the user must still maintain a permanent watch.

This equipment meets the latest EMC (Electromagnetic Compatibility) standards required for use in the marine environment. In order to ensure conformance and to prevent interference with electronic systems the unit must be properly bonded to earth and the supply cables screened.

Caution! 

In operation, this unit can rotate the vessel's wheel rapidly.
Keep clear of the wheel when this unit is engaged to avoid entrapment.

Beware of hot motor and solenoid components and the risk of entrapment from moving parts.

Do not flash test.

COMPLIANCE STATEMENT

The RAM T0 complies with CE under directive 2014/30/EU. The relevant Declaration of Conformity is available in the following websites under model documentation section:
www.simrad-yachting.com or www.bandg.com

- Complies with the requirements of level 2 devices of the Radio communications (Electromagnetic Compatibility) standard 2017.

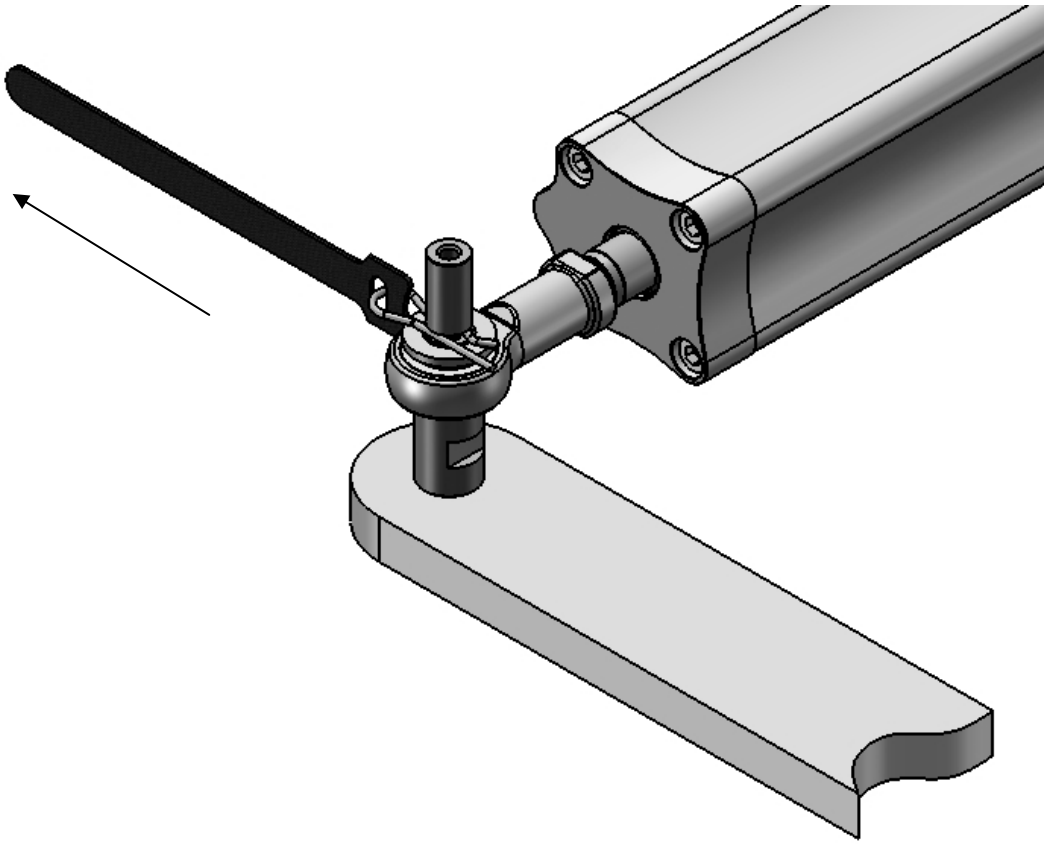
Warning! 

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

EMERGENCY QUICK RELEASE

In the unlikely event of failure of the actuator a quick release R-Clip is fitted to the tiller bolt which secures the actuator to the steering quadrant.

Pull the red tab to release the R-Clip and then manually lift the actuator clear of the steering quadrant.



EMERGENCY STEERING - PRIMARY STEERING FAILURE

If the primary steering fails it may be possible to steer the boat via the autopilot controls.

DESCRIPTION

The RAM T0 Hydraulic linear actuator combines a cylinder, pump, motor, clutch and reservoir in a pre-filled, sealed unit. Designed to be used on vessels fitted with mechanical primary steering that can be back driven. When the clutch is disengaged the cylinder is free and moves with the primary steering. To operate the unit in autopilot mode the course computer energises the clutch solenoid coil and runs the bi-directional motor to extend and retract the ram. Internal relief valves protect the unit and its mountings from rudder strikes, grounding etc.

TECHNICAL DATA

Voltage	12 VDC	
	Typical Amp-hour 60 kg at 25% duty	Typical Current Intermittent 350 kg
Current	1.3 A	14.0 A
Hard-over time	12 seconds (Nominal)	
Volume (average)	234cc	
Ingress protection	IP67	
EMC Protection	BS EN 60945:2002 (DC)	
Ignition Protection	BS EN 28846:1993	
Declaration of Conformity	EMC Directive 2014/30/EU	
Ambient op' temp	-15 to + 55 deg C	
Max op' thrust	350 kg (Intermittent)	
Orientation	Red lead to positive - Extends Black lead to positive - Retracts	
Clutch coil	12 watt	
Clutch connection	DIN 43650 (6-8 mm cable)	
Fluid	ISO VG10 to VG40 hydraulic mineral fluid to ISO 6743-4 HV	
Suitable commercial	Fluids: Fuchs Renolin B 15 HV1 Seastar HA5430	
Weight	8 kg	

LOCATION

The RAM T0 Actuator is designed for under-deck installations only. When considering where to mount the actuator the following points should be taken into account.

: Keep cable runs short.

: Mount away from sources of heat.

: Install the actuator above areas liable to flooding.

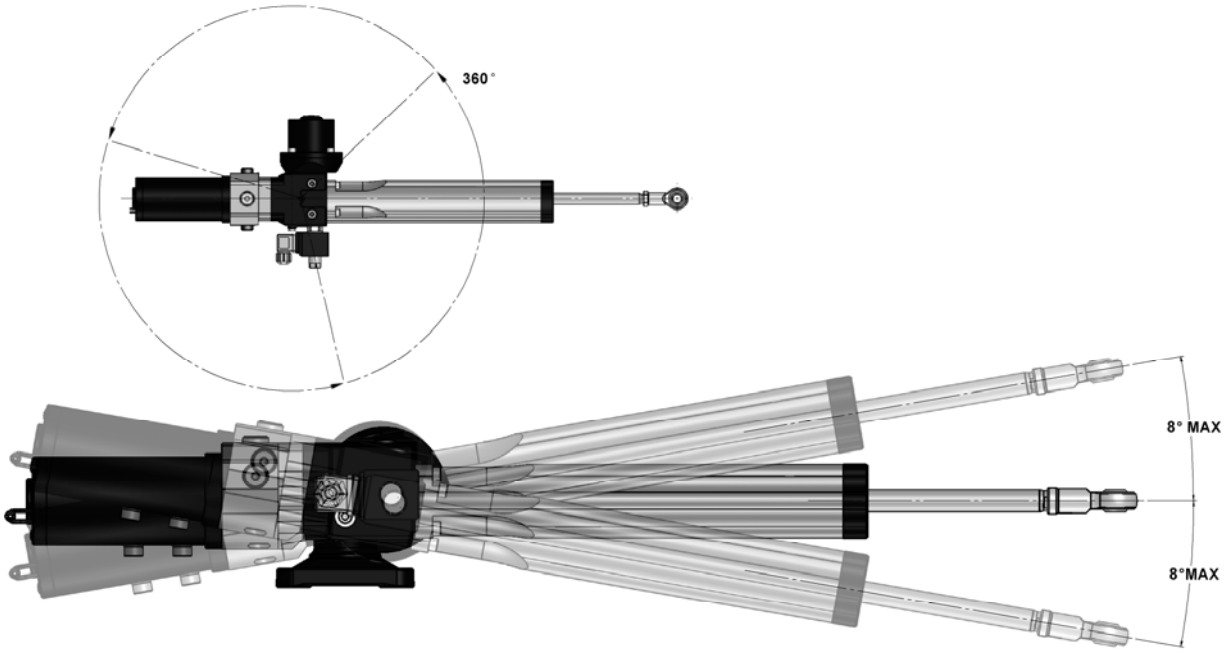
: Use a solid surface, capable of supporting the large thrusts generated by this unit.

: Ensure that piston movement is limited by the rudder hard stops and not by the actuator end stops.

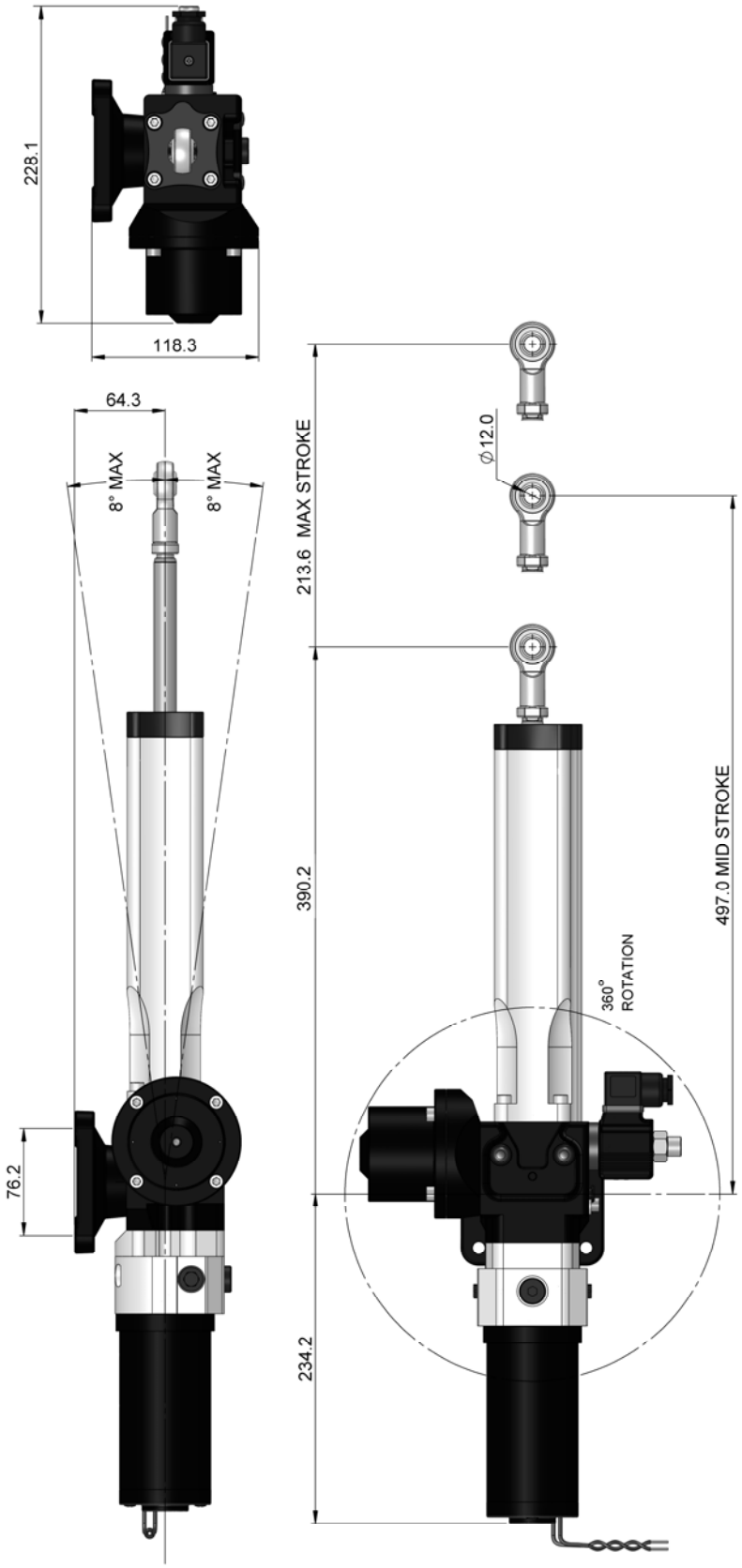
: Allow sufficient clearance for removal of the mounting pin.

: Check that no part of the actuator fouls the vessel or rudder quadrant throughout its full range of movement.

: It may be mounted in any orientation providing the limits stated are not exceeded.



DIMENSIONS


228.1
118.3
64.3
8° MAX
8° MAX
76.2
213.6 MAX STROKE
Ø12.0
390.2
234.2
497.0 MID STROKE
360°
ROTATION

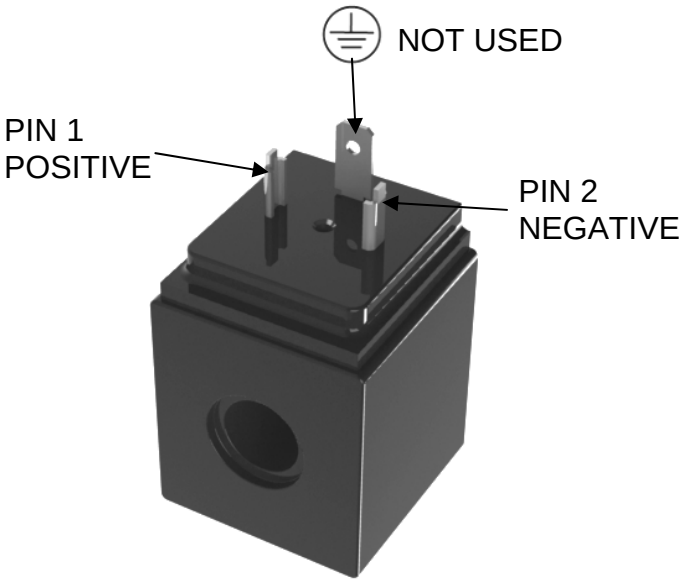
QUADRANT

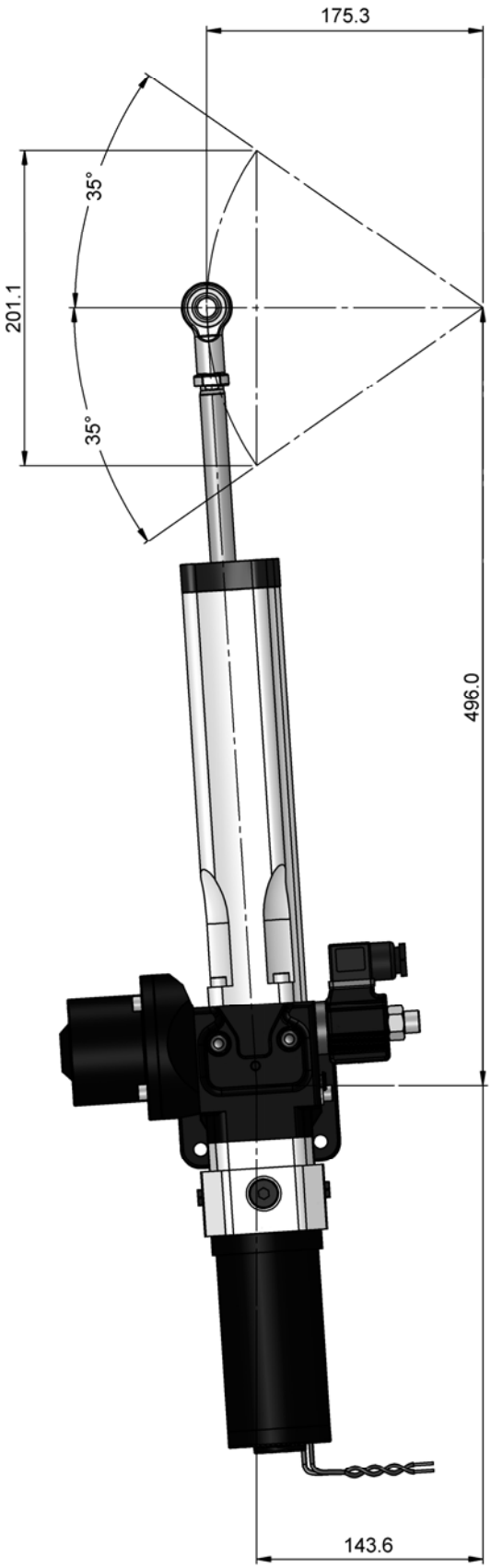
Typical installation for an 6.9” (177 mm) radius with total rudder angle of 70 degrees.

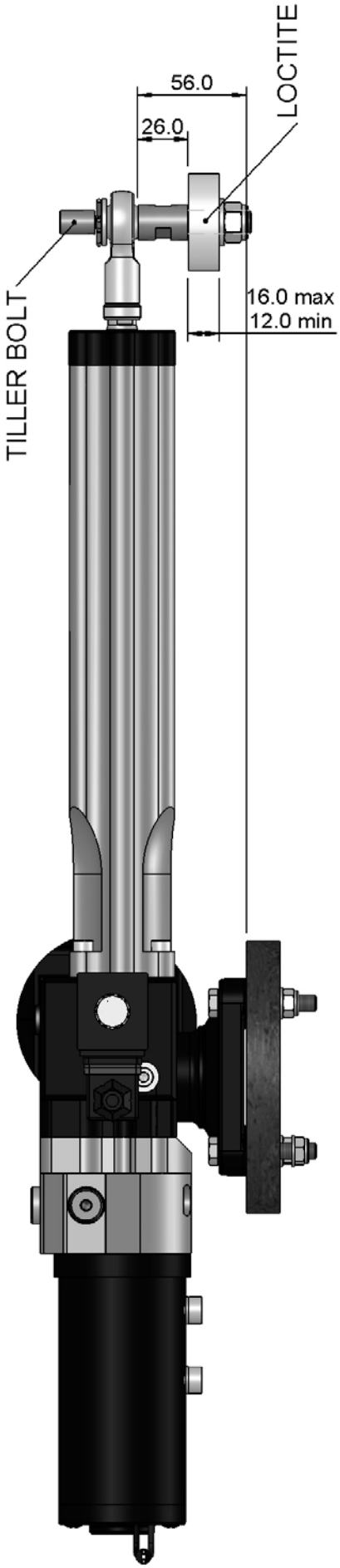
CONSIDERATIONS

Allow sufficient clearance for removal of the mounting pin and rod end from the tiller bolt.

COIL CONNECTIONS







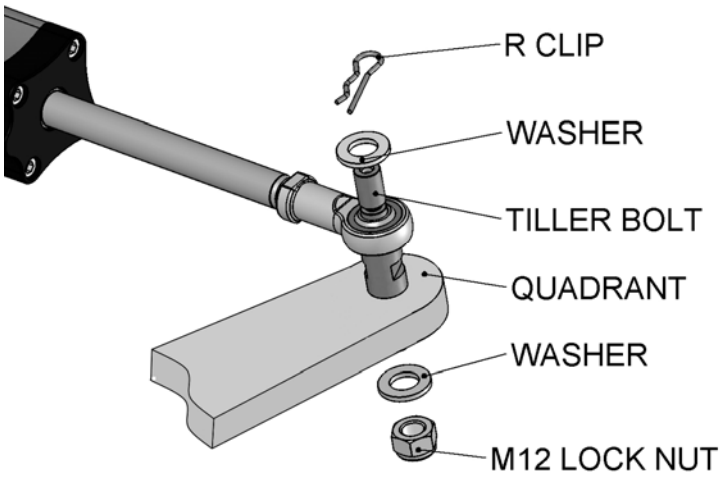
TILLER BOLT

The tiller bolt supplied is suitable for a quadrant thickness of 12 to 16 mm.

The tiller bolt mounting hole should be drilled Ø12.2 to 12.3 mm.

An application of Loctite 638 or equivalent where shown is recommended.

Tighten the M12 nut to 27 Nm Torque.



MOUNTING FOOT

The four M8 nuts, bolts and washers supplied are suitable for mounting the actuator ono a surface of between 12 mm and 24 mm thick

Tighten the four M8 nuts to 17 Nm

DISMOUNTING THE UNIT FROM ITS BASE

The RAM T0 features a quick-dismount base.

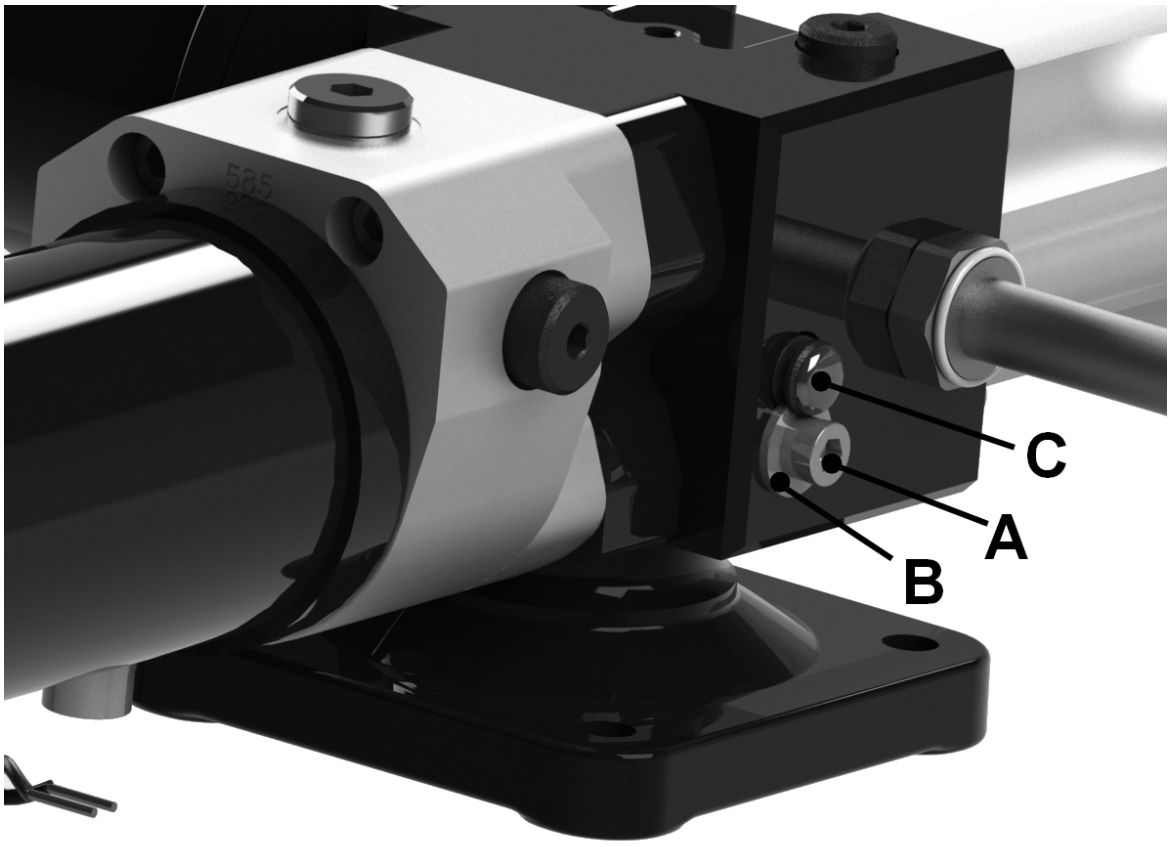
To remove the base from the unit first take off the coil which is secured by a 17 mm A/F nut. Next, undo and remove the Allen screw ‘A’ and the retaining plate ‘B’ . Withdraw the mounting pin ‘C’ which will release the base.

NOTE!

The pin is a close engineered fit and if it proves difficult to remove take off the plastic cap from the head of the pin and insert screw ‘A’ into it. It will then be possible to withdraw the pin using a pair of pliers or grips.

IMPORTANT!
Avoid damage to the pin

Assembly is a reversal of the removal process. Ensure the plastic cap is re-fitted to the pin upon completion.



HYDRAULIC FLUID

Caution 

Do not use Brake fluid

Use mineral based good quality hydraulic fluid compatible with nitrile hydraulic seals.

Ref technical data on page 6

COMMISSIONING

Caution 

Be aware of the danger of moving linkages and the risk of entrapment.

The unit is pre-filled and sealed from new. Do not disassemble the unit, this will allow air to enter and necessitate refilling and bleeding the unit Ref. page 13.

Use the primary steering to check the full range of movement before commissioning the Autopilot

Caution 

Check the unit for damage and leaks after installation.

MAINTENANCE

The RAM T0 is a sealed unit, quality precision engineering will ensure many years of trouble free service if the following points are adhered to.

: Keep the piston rod free from damage.

: Avoid exposing the unit to salt water.

Perform the following checks regularly:

: Check the security of the mounting bolts and tiller pin.

: Examine electrical cables and connections for damage and corrosion.

: Lubricate the mounting pin and rod end with marine grade grease.

SERVICING

The motor is a non-serviceable item and should be replaced with a new motor and drive coupling Kit.

Part No. R4510-sk 12 50 X

Please quote your units serial number when ordering (Ref. page 15).

In the unlikely event that new seals are required a kit is available:
Hydraulic Projects Ltd Part No. ML+40sk.

Caution 

For filling and bleeding a special tool is required:
Hydraulic Projects Ltd Part no. R4051.
Failure to use this tool may result in damage to the actuator.

FAULT FINDING

Under no circumstances dismantle the unit unless it is certain that the fault is internal. Doing so will allow air into the cylinder, requiring the unit to be bled for which special tools are needed. Ref. page 13.

Caution 

Any damage to the piston rod will damage its seals and allow air into the cylinder and oil leaks.

1) Motor does not run

: check electrical connections.
: check course computer output.

2) Motor runs, but erratic or no piston movement

: check for solenoid operation.
: check for air in the cylinder and external leaks.
: check drive coupling.

3) Excessive noise

: check the motor for damage.
: check for air in the cylinder and external leaks.
: check drive coupling.

4) Failure of clutch to engage or disengage

: check solenoid operation.

GENERAL INFORMATION

Keep this manual in a safe place. Quote the model and serial numbers in all correspondence.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

Dealer: _____

_____

_____

CONTACT DETAILS

For inquiries in general, contact Simrad or B&G:

www.simrad-yachting.com or www.bandg.com

For inquiries of spare parts, contact Hydraulic Projects Limited:

www.hypro.co.uk

988-12092-001

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