

INSTALLATION INSTRUCTIONS

AR4102 Standard Rudder Reference

For Use with Teleflex Hydraulic Steering Cylinder HC5345

Your Kit should contain the following:

- 1 Magnet Bracket
- 1 Gear Clamp, SS
- 1 Port Mounting Bracket (universal)
- 1 Starboard Mounting Bracket (universal)
- 1 Rudder Reference Probe with Electronics Box
- 2 FHMS, 100° #8-32 x 1/2", stainless steel
- 2 Cable Clamps, aluminum
- 1 Cable Clamp, plastic, black
- 2 Nuts, Nylok®, #8-32, stainless steel
- 1 Nut, Nylok®, #6-32, stainless steel
- 1 Splice Kit - includes:
 - 4 pieces heatshrink 1/8" dia.
 - 1 piece adhesive lined heatshrink 3/8" dia.
- 1 Connector, 3-pin (Cetrek Pilots Only)
- Spare Fasteners

Supported Autopilots

AUTOPILOT	RUDDER REFERENCE	RED JUMPER	BLACK JUMPER
Autohelm / Raytheon	AR4102	CUT	-
Brooks & Gatehouse	AR4102	-	CUT
Cetrek	AR4102	-	-
Comnav 1001	AR4102	-	CUT
Comnav 2001	AR4102	-	-
Furuno Navpilots*	AR4102	-	CUT
Robertson / Simrad	AR4202	N/A	N/A
TeleflexMorse	AR4102	-	-

* Confirm that Processor Unit Jumper JP-2 is set to #1-2 and set RRU to LINEAR SENSOR in the DOCKSIDE SET UP MENU.

Table A.

Performance Specifications

- Input Voltage 4 Vdc - 15 Vdc
- Operating Temperature -30°C to 55°C
- Storage Temperature -50°C to 75°C
- Maximum Cylinder Travel Speed 1 in/s
- Maximum Cylinder Stroke 8 in

Installation Procedures

⚠ CAUTION

The Electronics Box can be mounted to any interior surface allowed by the length of the probe cable.

Do not lengthen the probe cable. Failure to comply with this may result in the AR4102 malfunctioning.

If there is a difficulty with inserting the probe through the splashwell, the probe cable can be cut at approximately one foot from the Electronics Box (so that the splice is on the inside of the splashwell), and spliced back together using the splice kit provided. Ensure that the shield grounding wire (bare) is reconnected. Failure to reconnect the shield wire could result in damage to the Autopilot.

⚠ CAUTION

When routing the cables, ensure that there is no possibility of the cables being pulled or pinched. Cable ties (not provided) are a good means of bundling cables. If the cable is bundled with hydraulic lines, ensure that there is enough slack in the cable to allow full cylinder movement relative to the probe.

Installing the Magnet Brackets

Referring to the diagrams on pages 3 or 4, using the clamp (Item 12), clamp the magnet bracket (Item 1) in approximately the middle of the cylinder. Ensure that the magnet bracket (Item 1) is on the rear of the cylinder and that it is positioned as shown in the insets on pages 3 or 4.

Always ensure that the arrow on the magnet bracket (Item 1) points to the cable end of the probe.

NOTICE

Complete steps 1-5 before tightening magnetic clamp bracket.

INSTALLATION INSTRUCTIONS

Mounting the Probe

CAUTION

- Step 1:** Referring to the diagrams on page 3 or 4, remove the nut & washer of the cylinder shaft as indicated.
 - Step 2:** Install the correct mounting brackets (Items 5 & 6) as shown. Replace washers and nuts and tighten nuts fully.
 - Step 3:** With the cable of the probe on the port side, slide the cable clamps (Item 7) onto the probe approximately 1/8" from each end, such that the cable clamps are oriented toward the cylinder as shown.
Do not damage the protective sleaving on the probe (Item 4) as the probe must be isolated from all metal contact.
 - Step 4:** With the cable clamps on the probe, install the probe onto the brackets as indicated and tighten nuts (Item 8) fully.
 - Step 5:** Secure the cable end of the probe using the plastic cable clamp (Item 11) ensuring the clamp is pointed towards the rear of the boat, as shown.
- Note:** If the probe cable is desired on the starboard side, Item 1 must be inverted such that the labeled arrow is again facing the cable end of the probe.

Connecting the AR4102 to the Autopilot

CAUTION

If the readings from the probe are backwards, the wires connected to the Autopilot CANNOT be reversed. The probe and magnet bracket (Item 1) must be inverted to face the opposite direction.


The AR4102 includes 15' of cable for use in between the Electronics Box and the Autopilot. Splicing is permissible if additional length is required. Ensure that the shield grounding wire (bare) is reconnected.

- Step 1:** Route the cable from the Electronics Box to the autopilot or the autopilot distribution box. Ensure that the cable will not be subject to pinching or snagging.
- Step 2:** Locate the Rudder Reference Terminal on the autopilot or distribution box.
- Step 3:** Connect the wires as per the table below.

AUTOPILOT	PROBE CABLE WIRES			
	RED	BLACK	WHITE	BARE*
Autohelm / Raytheon	RED (+ve)	GREEN (-ve)	BLUE (Signal)	Chassis Ground
Brooks & Gatehouse	RED (+ve)	BLACK (-ve)	WHITE (Signal)	Chassis Ground
Cetrek	V+	V-	W	Chassis Ground
Comnav 1001 / 2001	+5V	GROUND	RETURN	Chassis Ground
Furuno Navpilots**	TB13-1	TB13-4	TB13-2	Shield
Robertson / Simrad	N/A	RED	WHITE	Chassis Ground
TeleflexMorse	V+	V-	WHITE (Signal)	Chassis Ground

* It is important that the bare wire be connected to the chassis ground. Otherwise electrical interference can occur.
** No connection for TB13 - 3

Table B

- Step 4:** Calibrate the AR4102 according to the Autopilot Owner's Manual. Should the autopilot readings not be centered, the magnet bracket can be loosened and moved to center the readings from the probe. Once the magnet bracket is centered, tighten fully.
- Step 5:** Ensure that the AR4102 is working properly throughout the full cylinder stroke prior to use, and that the rudder settings are correct (refer to "Rudder Setting" in the autopilot's Owner's Manual). Ensure that the probe and magnet brackets do not mechanically interfere with anything throughout the full range of steering cylinder movement and engine trim/tilt.
 It is important that the magnet bracket (Item 1) is always in the sensing region of the probe. To test this, use the Autopilot's Rudder Reference Display Mode. The Rudder Reference should give a continuous signal over the full range.
- Step 6:** Consult the table on page one to determine if a jumper wire must be cut. Ensure that the cut ends cannot come in contact. The wire(s) can be reconnected if necessary.

WARNING

Failure to follow all of the above instructions may result in the AR4102 malfunctioning, which may result in personal injury and/or property damage.
Do not use the AR4102 Rudder Reference Unit on other steering cylinder applications, or use other than specifically stated.

INSTALLATION INSTRUCTIONS

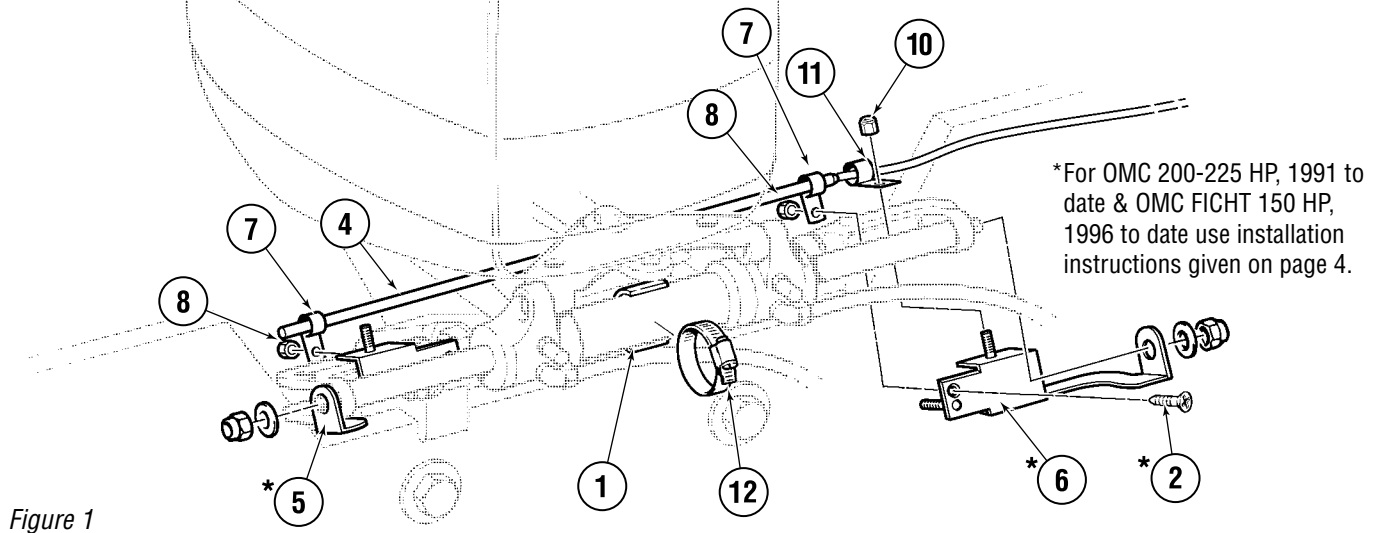
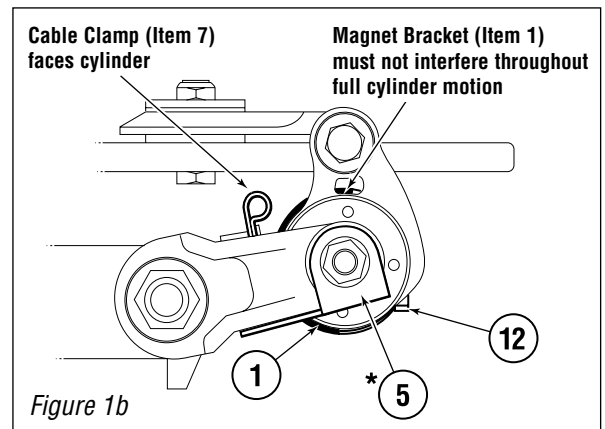
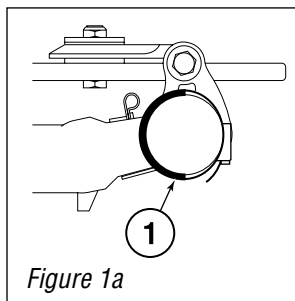
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ENGINE MANUFACTURER	YEAR	MODEL	RUDDER REFERENCE	NOTES
FORCE	1995-TO DATE	90-120 HP	AR4102	
HONDA	1996-TO DATE	75-90 HP	AR4102	
JOHNSON/EVINRUDE	1991-TO DATE	75-175 HP	AR4102	See Page 4
	*1991-TO DATE	200-225 HP		
	1991-TO DATE	250-300 HP	AR4102	
MERCURY/MARINER	1990-TO DATE	100-250 HP	AR4102	
OMC/FICHT	*1996-TO DATE	90-225 HP FICHT		See Page 4
YAMAHA	1990-TO DATE	100-250 HP	AR4102	



ITEM	PART #	QTY	DESCRIPTION
1	970955	1	Magnet Bracket Assembly
*2	185920	2	FHMS, 100°, #8-32 x 1/2", SS
4	980812	1	RR Probe w/ Electronics Box
*5	971742	1	Starboard Mounting Bracket
*6	971741	1	Port Mounting Bracket
7	971710	2	Cable Clamp, Aluminum

ITEM	PART #	QTY	DESCRIPTION
8	192832	2	Nut, Nylok®, #8-32, SS
9	971701	1	Splice Kit (not shown)
10	998875	1	Nut, Nylok®, #6-32, SS, Thin
11	971700	1	Cable Clamp, Plastic, Black
12	334532	1	Gear Clamp, SS

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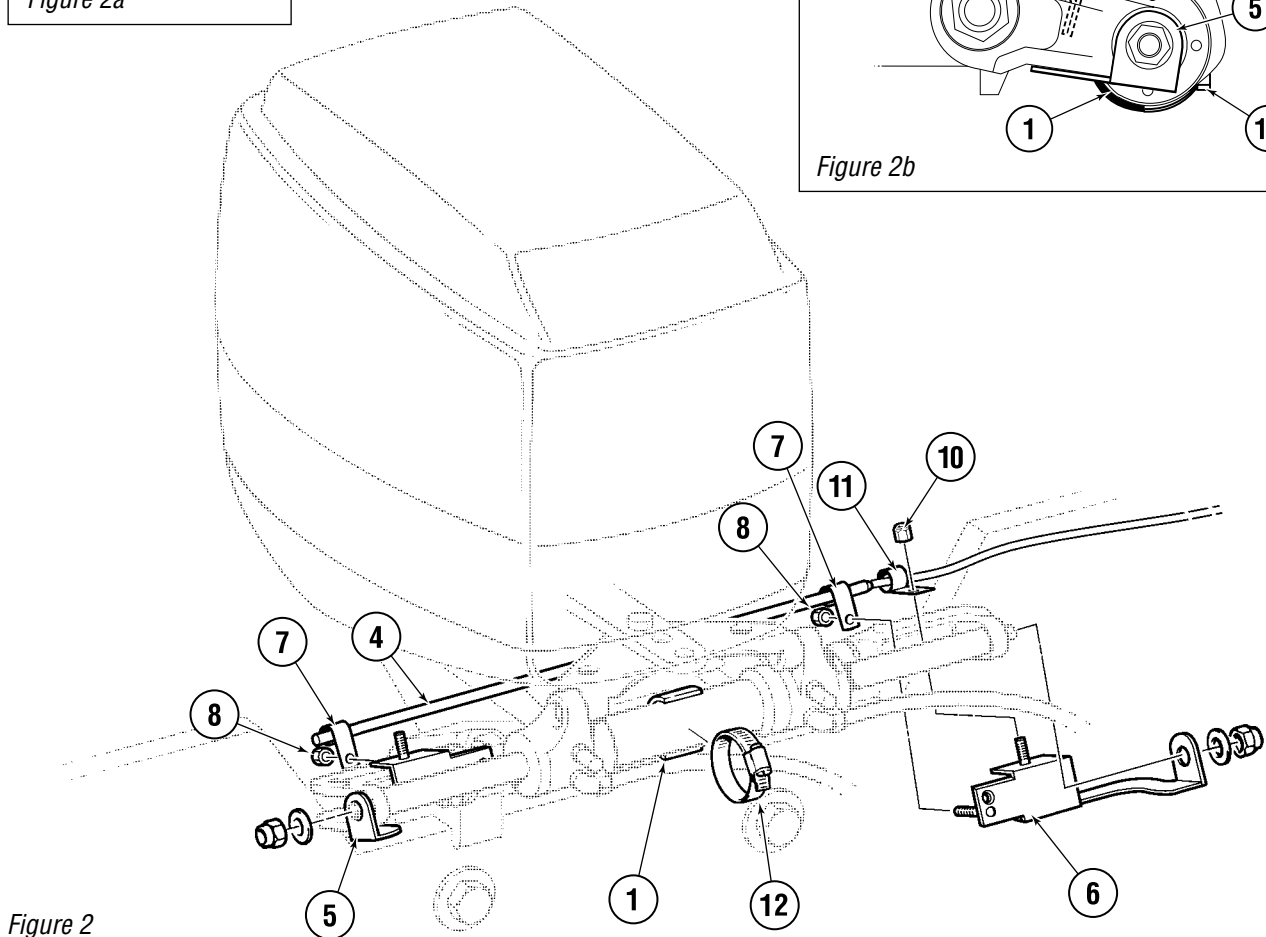
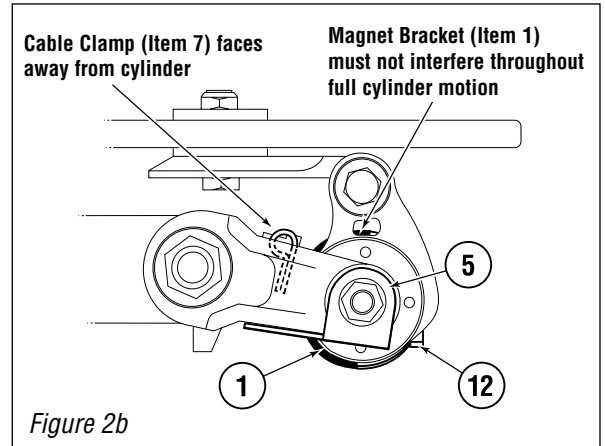
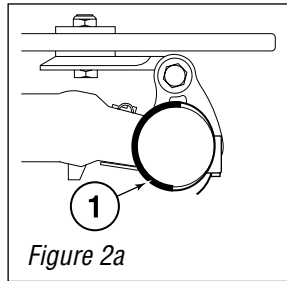
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OMC/FICHT	1996-TO DATE	90-225 HP FICHT	AR4102	



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