

# GARMIN™

## TR-1 Gold

### Cylinder & Bracket Mounting Instructions

Honda 8 HP: 2001 & Newer  
Honda 9.9 HP: 2001 & Newer  
Honda 15 HP: 2003 & Newer  
Honda 20 HP: 2003 & Newer

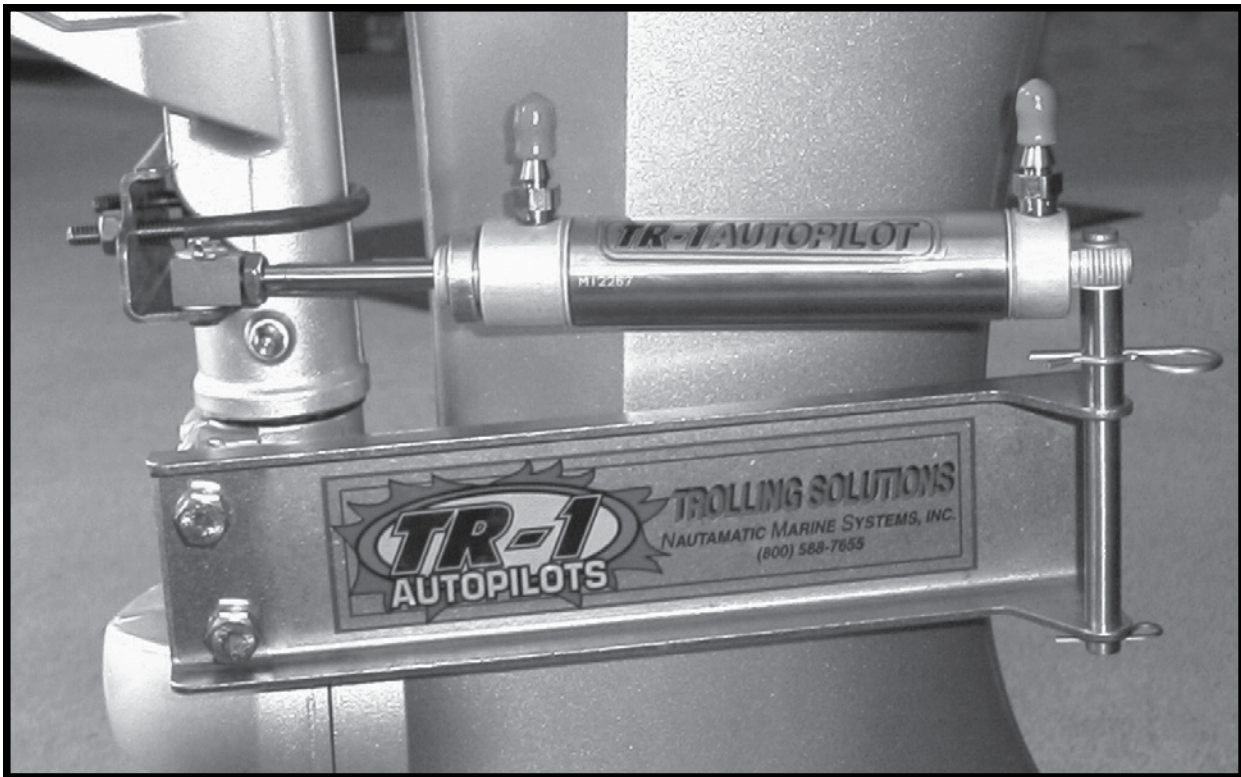


Figure 1 Finished steering actuator

**CAUTION:** This kit fits the long and extra long shaft motors only. It will not fit the short shaft version.

## Cylinder Mounting Parts

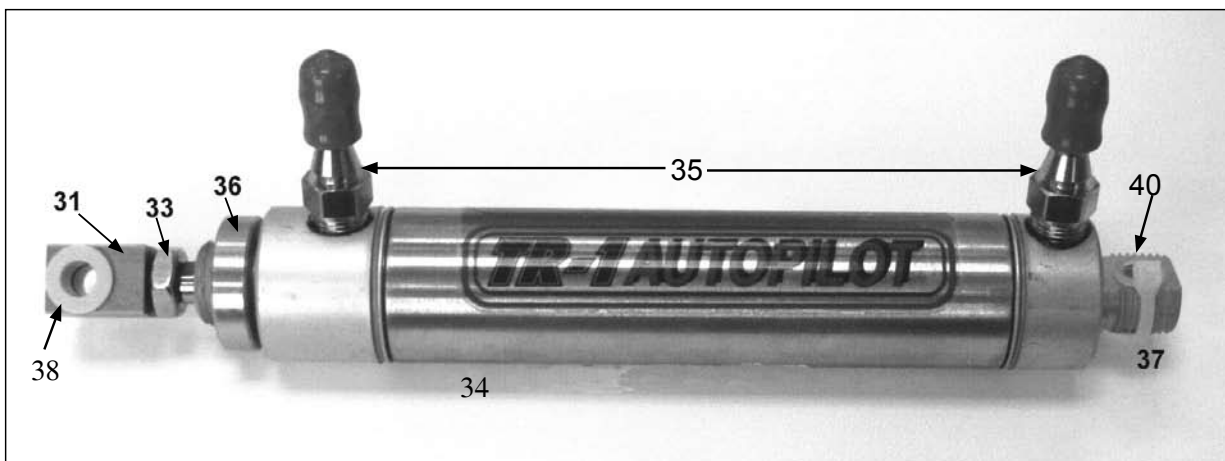


Bracket Kit  
Honda 8-20 HP  
PN 120-1070-00

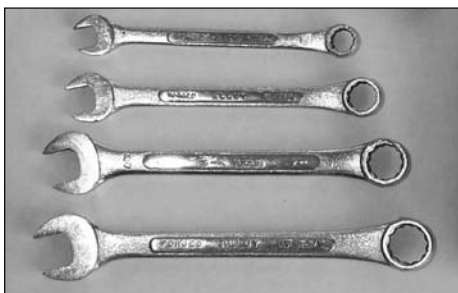
ITEM	PART No.	QTY	NAME
2	330-1071-01	1	Standoff, Upper (Short)
3	330-1071-02	1	Standoff, Lower (Long)
4	130-1072-00	1	Bracket, Rod Eye Mounting
5	330-1013-00	1	Pin, Stern Pivot
6	380-1074-00	1	Channel, Cylinder MTG.
7	380-1075-00	2	Plate, Channel Doubler
8	310-0260-90	2	Hex Cap M8 X 90 MM
10	130-0084-02	1	"U" Bolt 2" ID 1/4-20
11	310-0067-25	4	Lw, Split 1/4
12	310-0067-01	1	Hair Pin Cotter Lg.
13	310-0067-02	2	Hair Pin Cotter Med.
14	310-2501-25	1	Clevis Pin 1/4 D. X 1.25

Cylinder Kit PN 120-0900-00

ITEM	PART NO.	QTY	NAME
31	330-1002-00	1	Rod Eye, 5/16-24
33	310-0042-09	1	Hex Jam Nut 5/16-24
34	340-0900-00	1	Cylinder
35	321-0001-00	2	Fitting, Straight 1/8 NPT X 1/4
36	330-1101-00	1	Zinc Anode (Replaceable)
37	310-0040-26	1	Washer, Flat, Nylon 1/4 ID X .03
38	328-0901-00	2	Bushing 1/4 ID X 5/16 OD X 1/4"L
40	328-0902-00	1	Cylinder Tail Bushing



## I. Installing the Cylinder & Mounting Bracket

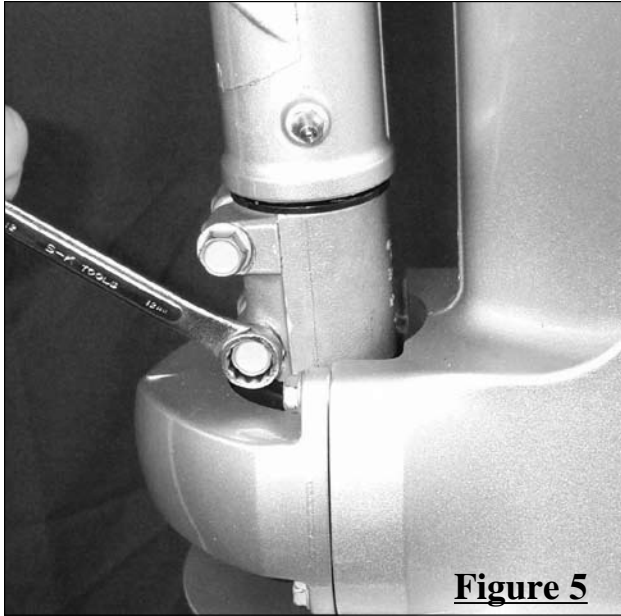


**Figure 2**

### Tools Required:

- One; Wrench 1/2 In.
- One; Wrench 10 MM
- One; Wrench 12 MM
- One; Wrench 13 MM
- Thread lock (Loctite or similar (not shown))

You may choose to use sockets and socket wrench.

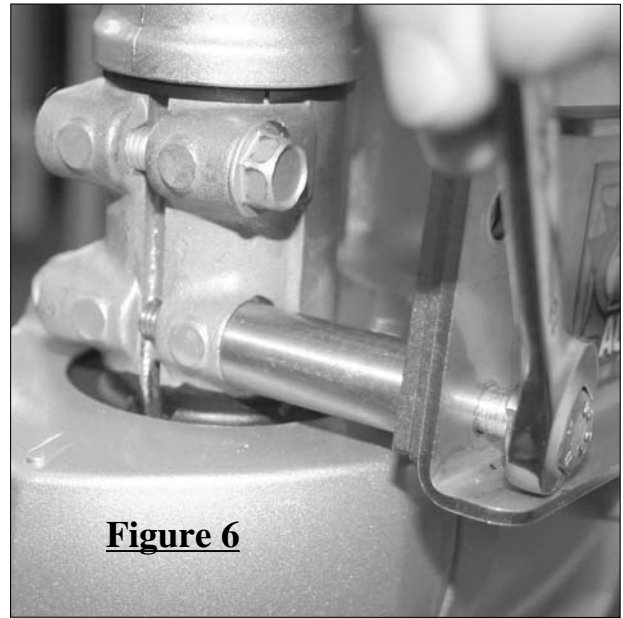


**Figure 5**

**Step One:**

Turn the steering friction lock in the motor (just above the clamps and below the shift lever) all the way to the left. (Full free steering rotation. See motor manual if necessary.) The motor must steer very freely for the autopilot to work. If there is still any drag in the steering loosen the nut that is controlled by the friction lever to eliminate it. Tip the motor to the down position. Remove the lower clamp bolt from the lower motor vibration isolation mount. Be sure the upper bolt is tight or the unit can slide down on the inner shaft. **Do not remove both bolts at the same time.**

**Put a little thread lock on the bolt.** Install an 8 MM Bolt (*item 8*) through a Lock Washer (*item 9*), through the lower front hole in the Cylinder Mounting Channel (*item 6*), both Doubler Plates (*item 7*), the Lower Long Standoff (*item 3*), and into the lower motor vibration isolation mount. Lightly snug the bolt.



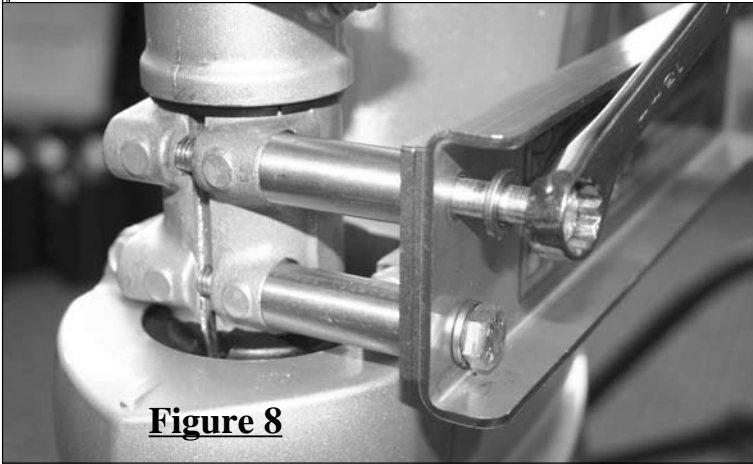
**Figure 6**

Now remove the upper clamp bolt from the motor vibration isolation mount.



**Figure 7**

Tip: Use the bolt you removed from the lower motor vibration mount in the upper hole of the mounting channel to keep the channel doubler plates aligned. See Figure 7.



**Figure 8**

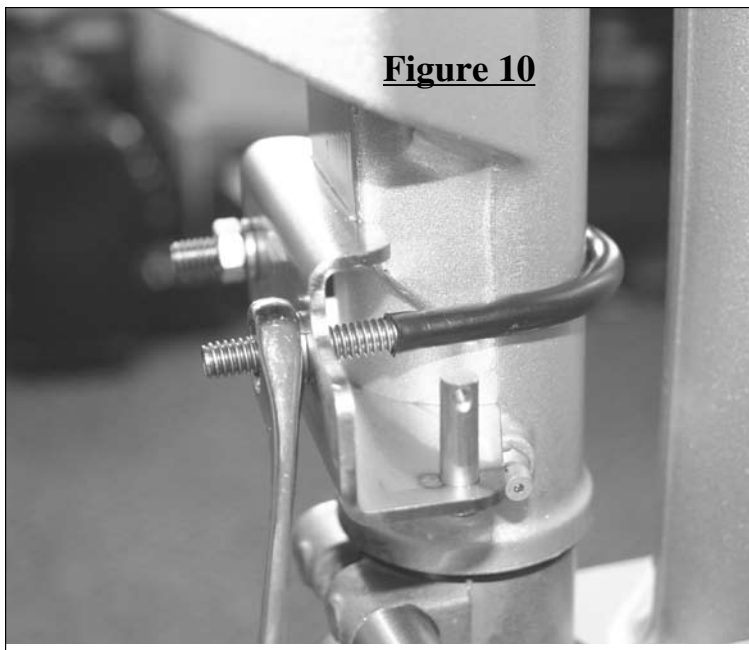
Put a little thread locker on the second 8MM (*item 8*) bolt and install it through the other Lock Washer (*item 9*), the sandwich of the Cylinder Mounting Channel (*item 6*) and Doubler Plates (*item 7*) created at Fig. 6, the upper Short Standoff (*item 2*), and into the upper motor vibration isolation mount. Keep the Channel perpendicular to the motor down shaft and tighten the bolt.

**Step Two:**

Slide the small end of the Stern Pivot Pin (*item 5*) through the holes at the rear of both flanges. Secure the Pivot Pin in place by inserting a Medium Hair Pin Cotter (*item 13*) through the hole below the bottom flange. See Figure 9.



**Figure 9**



**Figure 10**

**Step Three:**

Install the Rod Eye Bracket (*item 4*) by putting the lower channel flange against the top of the motor grease fitting boss (as shown in Fig. 10), slide in the "U" Bolt (*item 10*), put on the Lock Washers (*item 11*), a little thread lock, and screw on and tighten the nuts.

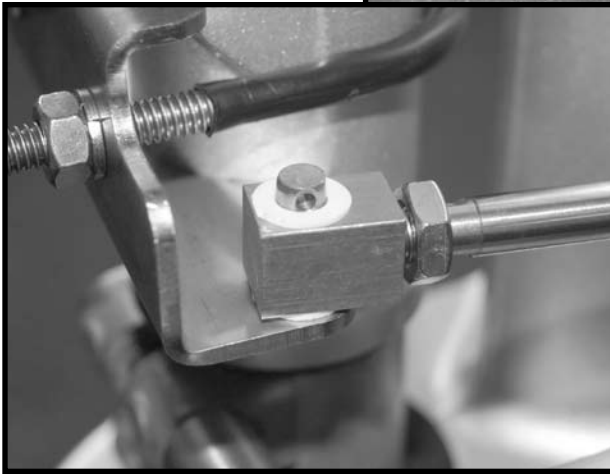


Figure 11-a



**Figure 11**

**Step Four:**

Put cylinder Rod Eye block (*item 31*) down over the pin in the Rod Eye Mounting Bracket (*item 4*). See Figure 11-a. Turn the Cylinder (*item 34*) so that the Fittings (*item 35*) point up (toward the top of the motor). Line the hole in rear end cap of the Cylinder (*item 34*) with the hole in the top of the Stern Pivot Pin (*item 5*). Slide the Clevis Pin (*item 14*) into the top hole of the Stern Pivot Pin. Line up the cross holes and put the Large Hair Pin Cotter (*item 12*) through the cross holes in both Pins. See Figure 11.



**Figure 12**

**NOTE: If for any reason you need to disconnect the steering actuator, pulling the large Hair Pin Cotter and Clevis Pin will disconnect them quickly.**

**Step Five:**

Install the Hair pin (*item 13*) on the pin in the Rod Eye Mounting Bracket (*item 4*) and against the Rod Eye block (*item 31*). See Figure 12.

**Step Six:**

**Adjust the cylinder travel both directions.**

Turn the motor hard over to port. That will retract the Cylinder rod into the Cylinder. See Figure 13. Check that the Cylinder rod is still free to retract at least a little more. Next turn the motor hard over to starboard. That will extend the Cylinder rod out of the Cylinder. See Figure 14. Check that the Cylinder rod is still free to extend at least a little more. It should have additional travel in both directions. If it does not, adjust



**Figure 13**

the position of the Rod Eye block (*item 31*) on the end of the Cylinder shaft. The Cylinder shaft should turn with your fingers if the Hex Jam Nut (*item 33*) is loose. (*If the shaft does not turn freely enough, use a thin 1/4 Inch open end wrench at the shaft's wrench flats and loosen the hex jam nut.*)

**Do not use any tool on the cylindrical part of the Cylinder shaft.** If the shaft gets scratched, bent, or dinged the seal will fail.

With the cylinder properly adjusted, secure it by **tightening the Hex Jam Nut against the Rod Eye after putting a little thread lock between them.** It is ready for plumbing the hydraulic hoses. We suggest you put the original parts to the motor in a container and, carefully, store them.



**Figure 14**