

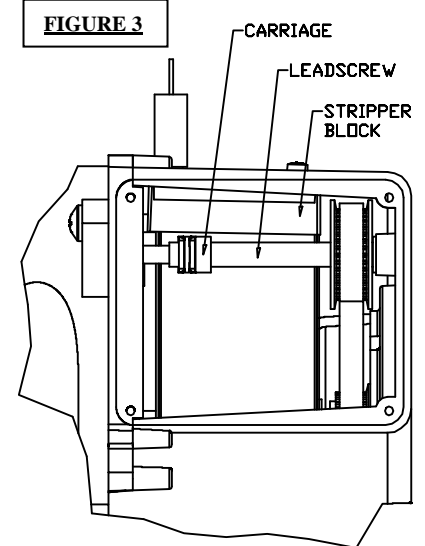
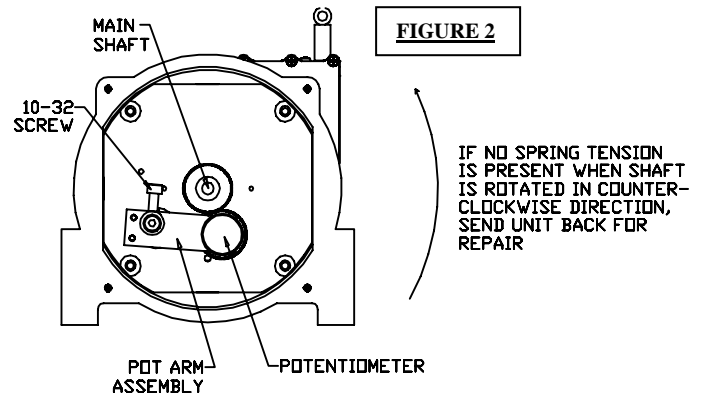
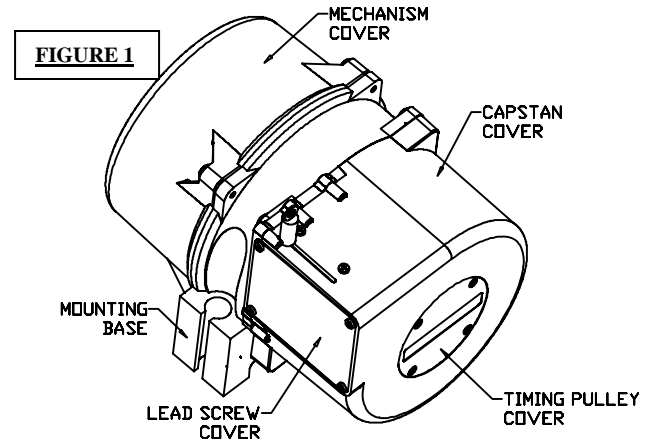
The following procedure describes the steps required to replace the wire rope on UniMeasure HX series transducers with measurement ranges of 100" (2.5m) and greater.

### Preliminary Notes

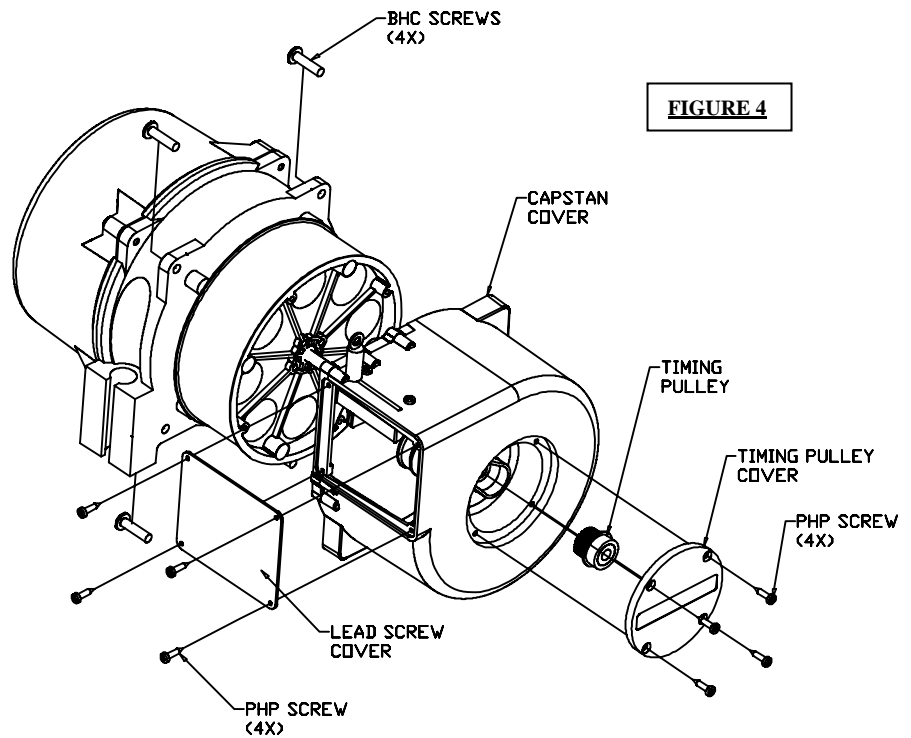
1. Read entire instruction manual before proceeding.
2. Refer to Figures 1-6 for part descriptions and Table 1 for dimensional information where necessary.
3. Where thread sealant is required, use Loctite 242 or equivalent.

### Procedure

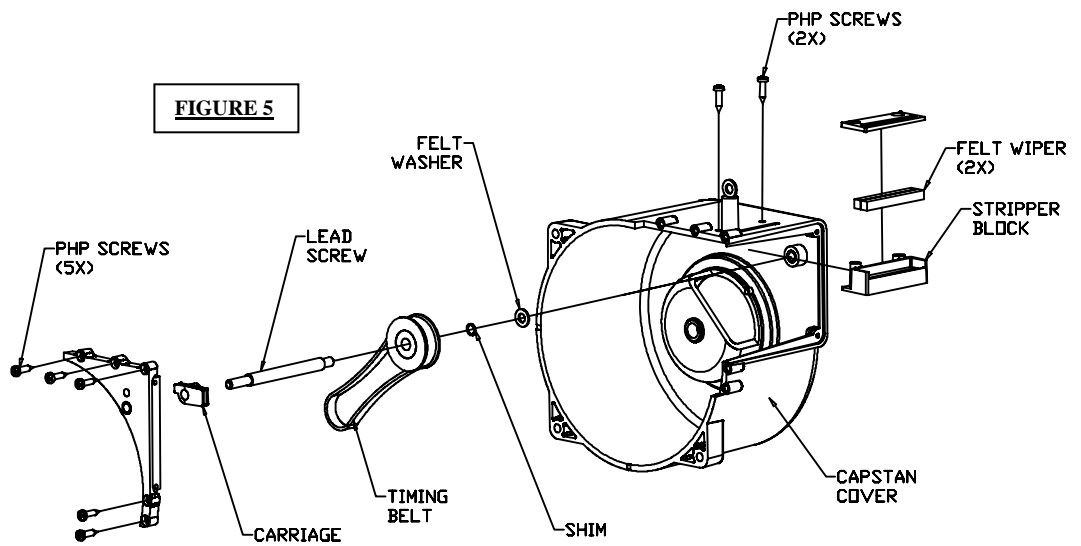
1. Securely clamp transducer mounting base into a vise or attach unit to a base which can be mounted rigidly to ensure that the transducer stays stationary while repair is performed.
2. With 0.125" hex driver remove the four button head cap screws that secure the Mechanism Cover (ref: Fig. 1) to the Mounting Base. Remove the cover gently to avoid damaging wires or interior components.
3. Loosen 10-32 screw on potentiometer arm assembly (ref: Fig. 2).
4. Remove shoulder screw holding potentiometer arm in place and remove arm, potentiometer, and gear assembly.
5. Referring to Fig. 1, remove both the Lead Screw Cover and the Timing Pulley Cover from the Capstan Cover.
6. **If the wire rope is broken**, skip to step #12. If not broken, proceed to step #7.
7. Fully extend wire rope and retain Capstan from backwinding (this may be done with help from a second person or with a screw driver placed through a hole in the flange of the Capstan). **Caution: Do not allow the Capstan to backwind unrestrained. Otherwise the internal torsion spring may dislodge from the Capstan driveshaft.**
8. Cut the wire rope and remove completely from Capstan.
9. Install new wire rope by threading it through the Capstan Cover, Stripper Block and Lead Screw Carriage. Insert wire rope into  $\text{Ø}0.055$  ( $\text{Ø}1.4\text{mm}$ ) hole in Capstan and guide it until it exits the area exposed by the Timing Pulley Cover. Be sure to avoid kinking the wire rope.
10. With heavy pliers tightly crimp the stainless steel ball from the cable replacement kit approximately 0.06" (1.5mm) from the end of the wire rope. Lightly grip the wire rope next to the ball with 0.125" (3mm) wide pliers and bend cable approximately 60°. Draw the wire rope towards the Capstan (i.e., extract wire rope from top of unit as it would retract normally) so that the ball seats against the Capstan.



11. While maintaining ample tension on the wire rope, allow the Capstan to backwind and wind the wire rope slowly onto the Capstan. **Note – in order to avoid damaging the wire rope, constant tension must be maintained on the wire rope at all times.** Insure that the wire rope spools onto the Capstan without kinking. Skip to step #33 for reassembly.
12. **If wire rope is broken**, restrain Capstan from backwinding (as described above) and then cut wire rope. **Note: If Capstan rotates freely and will not backwind, unit must be returned to UniMeasure for repair.**
13. Carefully allow the Capstan to fully unwind. **Caution: Do not allow the Capstan to backwind unrestrained. Otherwise the internal torsion spring may dislodge from the Capstan driveshaft.** Loosen 6-32 set screw on Timing Pulley with 0.062” hex wrench and remove Timing Pulley.
14. With Phillips driver, remove (4) PHP screws and slide Capstan Cover off.
15. Remove felt and shim if applicable (Fig. 5).
16. With .109” hex driver, loosen screw on Capstan and remove Capstan.
17. Referring to Fig. 5, **remove 5 each #4 SM screws and remove (2) #4 SM screws from the top.** Remove the Stripper Block , Lead Screw assembly and felt washer (save the felt washer).
18. Remove felt wiper and clean Stripper Block , housing and Carriage.
19. Remove the Carriage and install new. Make sure the new one threads on smoothly by hand. If not, thread through **with 10-24 tap**. Thread Carriage orientation shown (Fig. 5).
20. Reassemble onto unit as shown (Fig. 5), felt wiper first.
21. Re-screw (5) #4 SM screws back into cover. Do not over-tighten.
22. Insert Stripper Block through back side as shown and rescrew (2) #4 SM screws.
23. Put Capstan back on, such that screw enters detent on the main shaft. Slide felt washer back on.
24. Slide Capstan Cover onto shaft and ensure that timing belt loops around shaft, as shown.
25. Re-screw (4) PHP to Capstan Cover. Do not over-tighten.
26. Manually rotate the Lead Screw until dimension “D” (see Figure 6) is **0.90” (22.9mm)**
27. When viewing from Capstan Cover side (i.e., looking at where Timing Pulley Cover would be), rotate main shaft clockwise to the appropriate number of pre-winds (Table 1) while keeping Lead Screw stationary. Slide Timing Pulley onto shaft and while keeping capstain stationary, rotate Timing Pulley (and Lead Screw) clockwise until the setscrew aligns with detent. Tighten.



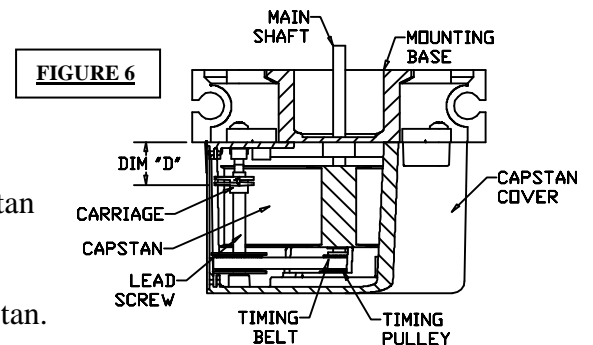
28. Rotate Capstan the additional number of winds shown in Table 1, shown in line titled “Additional Capstan Winds”.



29. Install new wire rope by threading it

through the Capstan Cover, Stripper Block and Lead Screw Carriage. Insert wire rope into Ø0.055 hole in Capstan and guide it until it exits the area exposed by the Timing Pulley Cover. **Be sure to avoid kinking the wire rope.**

30. With heavy pliers, tightly crimp the stainless steel ball approximately 0.06” (1.5mm) from the end of the wire rope. Lightly grip wire rope next to the ball with 0.125” (3mm) wide needle nose pliers and bend cable approximately 60°. Draw the wire rope towards the Capstan so that the ball seats against the Capstan.



31. With tension on the wire rope, allow the Capstan to backwind so that wire rope to slowly feeds onto the Capstan.

**Note – in order to avoid damaging the wire rope, constant tension must be maintained on the wire rope at all times.** Ensure that wire rope spools onto the Capstan without kinking.

32. **If pot is not broken**, skip to step 36. **If pot is broken**, proceed to step 34
33. Take off gear and note orientation. Remove potentiometer from pot arm by unthreading nut. Note what color wires solder where on pot. Snip off and unsolder wires from broken pot and note the orientation of pot on the arm.
34. Rethread new pot onto arm with nut in the same orientation and re-solder wires. Add gear in same orientation. Tighten setscrew.
35. Rotate gear on potentiometer counterclockwise (from view in Figure 2) until the stop is reached. Allow gear to engage with gear on main shaft. Rotate potentiometer gear clockwise one or two teeth. Then tighten 10-32 screw down. Adjust #6 locking nut so that approximately ½ gear tooth height play exists when potentiometer arm is rocked.
36. Reconnect wires from connector to potentiometer.
37. Install o-ring on mounting base. Install mechanism cover and loctite and tighten screw to 12 in-lbs.
38. Install Lead Screw cover and Timing Pulley Cover. **Caution** – tighten screws snugly, but do not over-tighten.

**TABLE 1**

Range (inch)	100	120	150	200	250	300	350	400	500	600	800	1000	1200	1600	1800	2000
Range (m)	2.54	3.05	3.81	5.08	6.35	7.62	8.89	10.16	12.70	15.24	20.32	25.40	30.48	40.64	45.72	50.80
Capstan Prewinds	22	20	19	15	12	12	8	6	25	19	10	24	14	23	25	12
Additional Capstan Prewinds	8	10	11	15	18	21	25	28	35	41	54	68	81	107	121	134