

# **MEASURING CABLE REPLACEMENT INSTRUCTIONS FOR PT1 SERIES**

For Models

PT1A, PT1DC, & PT1MA

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## MEASURING CABLE REPLACEMENT

1. Remove the two socket head cap screws from the cover and set aside.
2. Gently lift off the cover. There are still wires connected between the rotational sensor in the unit and the cover; be careful not to force or pull too hard. If the cover is stuck use a twisting motion.
3. If the cable is still intact and can be extended and retracted, proceed with step 4. Otherwise, skip to step 32.
4. There are two set screws offset 90 degrees holding the spool to the potentiometer shaft. While looking through the access hole in the frame, extend the cable so one of the set screws can be seen.
5. With an allen wrench, loosen the set screw.
6. Extend the cable again until the other set screw is visible and loosen the set screw
7. Grasp the potentiometer and its mounting plate and pull straight out of the spool. The screws and spacers on either end of the mounting bracket don't have to be loosened or removed.
8. Check potentiometer for damage. If cable has been free-released or broken, the potentiometer may be broken. Turn the potentiometer shaft all the way in both directions. If the transducer is a 2 inch or 5 inch range, the shaft should rotate smoothly with no resistance. If the transducer is a 10 inch or greater range, the shaft should rotate smoothly with no resistance until it suddenly stops. If rough spots, resistance, or "soft" stops are felt, the potentiometer is damaged and must be replaced. Contact Celesco for new potentiometers and replace if necessary.
9. Extend the measurement cable a short distance and cut it with a pair of wire cutters.

### CAUTION

The spring motor can be dangerous while it has tension. The spring, if allowed to, can suddenly uncoil itself by shooting out of the spring housing. It's sharp and can cause injuries. Be careful when doing anything with the spring exposed. Wear gloves and safety goggles.

10. Loosen the #8-32 screws holding the spring housing. If the spring still has tension, when the bolts are removed the spring housing will spin. Get a firm grip on the frame and spring housing remove the bolts and set aside.
11. Carefully let the spring housing rotate until all spring tension is released, while keeping the housing against the spring side plate.
12. The spring is probably still hooked to the spring arbor. **BE CAREFUL TO NOT** pull the spring housing off yet or the spring might shoot out of the housing.
13. Separate the spring housing from the frame just enough to get a flathead screwdriver between the housing and the spring side plate.
14. Insert the flathead screwdriver and use it to slide the spring off the spring arbor and into the spring housing.
15. Remove the spring/spring housing and set aside.
16. Remove the spring side plate and set aside.

17. Skip to step 34.
18. Remove the screws and spacers on either end of the potentiometer mounting bracket so it may spin freely.

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19. Loosen the #8-32 screws holding the spring housing. If the spring still has tension, when the bolts are removed the spring housing will spin. Get a firm grip on the frame and spring housing remove the bolts and set aside.
20. Carefully let the spring housing rotate until all spring tension is released, while keeping the housing against the spring side plate.
21. The spring is probably still hooked to the spring arbor. **BE CAREFUL TO NOT** pull the spring housing off yet or the spring might shoot out of the housing.
22. Separate the spring housing from the frame just enough to get a flathead screwdriver between the housing and the spring side plate.
23. Insert the flathead screwdriver and use it to slide the spring off the spring arbor and into the spring housing.
24. Remove the spring/spring housing and set aside.
25. Remove the spring side plate and set aside.
26. While looking through the access hole in the frame, rotate the spring arbor with fingers until one of the set screws is visible.
27. Using an allen wrench, loosen the set screw.
28. Rotate the arbor again until the other set screw is visible.
29. Loosen the set screw.
30. Pull the potentiometer straight out of the spool.
31. Check potentiometer for damage. If cable has been free-released or broken, the potentiometer may be broken. Turn the potentiometer shaft all the way in both directions. If the transducer is a 2 inch or 5 inch range, the shaft should rotate smoothly with no resistance. If the transducer is a 10 inch or greater range, the shaft should rotate smoothly with no resistance until it suddenly stops. If rough spots, resistance, or "soft" stops are felt, the potentiometer is damaged and must be replaced. Contact Celesco for new potentiometers and replace if necessary.
32. Remove the pot side plate and set aside.
33. Remove the spool from the frame.
34. Remove any old cable and discard.
35. Insert the replacement measurement cable down through the cable guide and through the angled hole in the spool.
36. Place a crimp over the end of the cable (inside the spool) with as little excess cable showing as possible.
37. Squeeze the crimp with a crimp tool or a pair of pliers to secure it on the cable.
38. While keeping slack out of the measurement cable, replace the spool in the frame.

39. Replace the pot side plate and, without replacing the cover, temporarily screw in the socket head cap screws that hold the cover on. Make sure the bearings are seated correctly.
40. Replace the spring side plate. Make sure the bearings are seated correctly.
41. Replace the phenolic disk against the spring side plate. If necessary, place a small amount of silicon oil on the disk before replacing.
42. Replace the spring motor/housing assembly. Make sure the hook on the inner spring coil hooks over one of the forks of the spring arbor.
43. Keep tension on the measurement cable. This is best done by hooking the end onto a fixed point.
44. Wind the cable on the spool by gently turning the spring housing in the direction of the arrow. As the spring winds, move the transducer body towards the cable end to reel in the cable. Watch through the access whole to ensure the cable doesn't wind over on itself. Continue winding until the rubber snubber on the cable end butts up against the cable guide.
45. Unhook the cable end from the fixed point.
46. Turn the spring motor an additional two to three turns to load tension on the cable.
47. Replace the #8-32 screws that hold the spring housing and spring side plate to the frame and snug them down. Be careful not to over-tighten or the plastic spring housing may be damaged.
48. Fully extend and retract the cable a few times to ensure smooth cable travel.
49. Loosen the large nut holding the potentiometer to the pot mounting plate just enough so it can rotate freely.
50. If spacers and #4-40 screws that hold the mounting bracket in place were removed, replace them now.
51. Replace the potentiometer and mounting bracket assembly, inserting the pot shaft into the spool all the way.
52. While looking through the access hole in the frame, extend the cable so one of the set screws can be seen.
53. With an allen wrench, tighten the set screw.
54. Extend the cable again until the other set screw is visible and tighten the set screw.
55. Carefully allow the cable to retract fully
56. Connect a 10 VDC power supply to the potentiometer terminals so +10VDC is connected to CCW and -10VDC is connected to CW.
57. Connect a voltage meter to potentiometer terminals so positive lead is connected to S and negative lead is connected to CW.
58. Rotate entire potentiometer body so output is between 0.04 and 0.1 VDC.
59. Tighten large nut to lock potentiometer in place on the mounting bracket.
60. Fully extend and retract the cable a few times to ensure smooth cable travel.
61. Remove the long socket head pan screws holding the pot side plate in place.
62. Replace the cover and the two socket head pan screws that hold it in place. Make sure the gasket is seated correctly to prevent leaks.