

**Fluctuating Winch Speed Values At Slow Speeds  
Originated by Dan Fitzgerald (U. Hawaii) on Dec 12, 2013**

From Dan Fitzgerald (U. Hawaii) on Thu, 12 Dec 2013

Aloha,

We are experiencing an issue with our Dynacon Trawl winch when running at slow speeds (<10 meters/min). In particular, the winch speed values fluctuate from ~2 to 24 meters/min when attempting to haul in or payout at slow speeds.

The problem is only with the speed data from the LCI-90i; one can visually confirm that the winch is moving at a constant speed even though the speed values are erratic. We have also confirmed that we have the correct number of pulses per meter entered in the winch controller.

Has anyone else encountered this issue, and, if so, have you been able to remedy it?

Please let me know if you need more info.

Mahalo,

Dan

\*\*\*\*\*

Daniel S. Fitzgerald

Senior Tech, Ocean Technology Group

University of Hawaii at Manoa, SOEST

---

Reply From: Steve Poulos (U. Hawaii) on Thu, 12 Dec 2013

Hi Dan,

wondering if internal connections are solid or corroded??, if it is dropping pulses due to connectivity could affect the internal counts. Vibration problems of the internal connections or just plain ol age related issues?

steve

---

Reply From: Marc Willis (OSU) on Thu, 12 Dec 2013

Dan,

We experienced a similar phenomenon on the Dynacon traction winch on the dearly departed WECOMA. It turned out that the output of the proximity sensor pickups on the metering sheave had a tendency to "flutter" when the magnets were moving slowly past the sensor - giving a spurious high speed reading. This could be duplicated when rotating the sheave slowly by hand. In fact, if you stopped the wheel at the right spot, you could

get a high speed reading when the sheave was not moving at all. This was a while ago, and I don't have a specific recollection of a solution - we may just have lived with it.

Marc

-----

Marc Willis  
Marine Science Technical Director  
SIKULIAQ Shipyard Project Office

---

Reply From: Alex Ren (LUMCON) on Fri, 13 Dec 2013

I've noticed something similar on our Dynacon Trawl winch, the model's an 805 by the way. It only occurs while paying out very light loads. At first I thought something was wrong with either the LCI90i or the electronic signals. However, what I realized is that because of the low tension some of the time the cable paying out was not turning the sheave in the levelwind. Maybe take a look when it's happening and make sure that the sheave is actually turning or not.

Good luck!  
Alex

---

Reply from Dan Fitzgerald (U. Hawaii) on Fri, 13 Dec 2013

Hi,

Thank you all for the feedback and suggestions.

I will have to try Mark Willis' suggestion of turning the sheave by hand to detect flutter in the proximity sensor signal.

The fluctuation of winch speed values that we are seeing at slower speeds is definitely independent of tension, and we have verified that the metered sheave is turning at a constant slow speed during these events.

We have two identical storage drums -- one with 0.681" EOM cable and the other with 9/16" 3x19 trawl wire -- that use the same traction winch and LCI-90i controller, and we see the same noise in speed values with both tension members and with packages of different weights -- gravity corers, CTDs, ROVs, MOCNESS, etc.

Experienced winch operators aboard the ship say this problem first surfaced with the install of the LCI-90i controllers.

Dynacon has also replied to me, and suggested that I adjust the "Speed Filter" and "Speed Response Time" settings in the calibration menu of the LCI-90i.

They indicated that their default values for this type of winch are Speed Filter=2 (of a range 1-5) and Speed Response Time = 10seconds (of a range 2-20 seconds), and I found our settings to be 2 and 4, respectively.

It seems to me that lengthening the Speed Response Time to a longer window should smooth out the noise at slow speeds, so I'll experiment with some different combinations of filter and response time settings.

I'll let you know if we're able to smooth our erratic slow speed values.

Mahalo,  
Dan

\*\*\*\*\*

Daniel S. Fitzgerald  
Senior Tech, Ocean Technology Group  
University of Hawaii at Manoa, SOEST

---

Reply From: "David OGorman" (OSU) on Mon, 16 Dec 2013

Dan,

The problem we encountered on the Wecoma (as described by Marc and matching the symptoms you described; erratic speed w/accurate payout/ no missed counts) was a result of three things:

- A (relatively) short averaging period on our LCI-90(i)
- The sensors on our metering sheave being placed close together and the target 'strips' on the sheave being strips of metal (as opposed to regular pie-shaped slices)
- 'Fluttering' of pickups due to slow moving targets

The way our sensors and targets are set up they trigger four (or two depending on your 'quad Xx' setting, we use 4x) counts over about 10 degrees of rotation and then don't trigger at all for the next 35 degrees, so if the wheel is moving slowly enough it appears to spike a fair bit. Also the 'payout' is based off of (Trigger Events)/(time) and the pickups do have some flutter. They have enough hysteresis that it doesn't affect the pulses at higher speeds, but a slower moving target will cause the pickup output to flutter as the target comes 'into view'. The reason that the payout is still accurate is that the pickups are arranged to detect the targets in a 'quadrature' (or 2bit gray code if you're retro) pattern, so even though one of the pickups is fluttering, the payout counter sees it as fluttering between 5.0 and 5.1M out. That's a long way of saying that we turned up the averaging time period and lived with the jumpy speed reading (after checking the payout calibration).

Dave

David O'Gorman

Marine Technician Superintendent - OOSU CEOAS

STARC

---