

	Test Case	TC52 Test AWS/AWA correction /w heel	
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Belongs to Plan(s): TP5 dashboard_tactics...

Belongs to Suite(s): TS18 NMEA simulator ...

Case Type: Functionality

Label(s): windows linux

Test Quality:  **GOOD** Test Case Passing

Assign To:  Petri Makijarvi

Case Priority: Medium


Estimate: 180



Is Automated

Precondition

Pre-requisite for this test is successful execution of TC51. In this test we use NMEA simulator [http://www.kave.fi /Apps/](http://www.kave.fi/Apps/) to create and control speed on water, it is also to make the apparent wind consistent with the heel. The NMEA Simulator not sending XDR-sentences for heel, they are generated with NMEA Converter plugin.

Steps

Click "Tab" or "Shift + Tab" to navigate grid 

- 1  In order to understand what is searched to be accomplished here, please study the principle of operation defined in Section 4.2 Heel Angle Corrections in 

Sailboat Performance Testing Techniques

By Arvel Gentry

Boeing Commercial Airplane Company

Proceedings of the Eleventh AIAA Symposium on the Aero/Hydronautics of Sailing

September 12, 1981

Seattle, Washington

Please study the requirement capture for this function https://github.com/canne/dashboard_tactics_pi/issues/23

and observe the conclusions of the discussion, which conclude that we shall follow the conclusions of the paper:

```
awa_corrected_for_heel = atan ( tan(awa_measured) / cos(heel) )
```

but instead of the method suggested by the paper

```
aws_corrected_for_heel = aws_measured * cos(awa_measured) /  
cos(awa_corrected)
```

we shall use the following approximation for easier implementation in OpenCPN event driven (no DB) which would require to create intermediate buffers about the preceding (or following!) AWA correction. The below formula is safe estimation of paper's observation about issues a cup-anemometer has with heel: which you call cosine response. It is noteworthy to mention that this approximation is probably not valid with ultrasonic instruments.

```
aws_corrected_for_heel = aws_measured / cos(heel)
```

.



- 2  Continue with the same settings for NMEA sentences as with the preceding static tests:



Options

General NMEA0183 NMEA2000 Track Limits

NMEA0183 Port COM29 ☒ Use list


NMEA0183 baud rate 4800

NMEA0183 HDX send delay (ms) 1000

NMEA0183 sentences to be sent

HDT	<input type="checkbox"/> Heading	RSA	<input type="checkbox"/> Rudder Sensor Angle	MWD	<input type="checkbox"/> (True wind info)
GLL	<input checked="" type="checkbox"/> True heading	MTW	<input type="checkbox"/> Mean Temperature of Water	MWV	<input checked="" type="checkbox"/> (Relative wind info)
A1C	<input checked="" type="checkbox"/> Geographic Position	DPT	<input type="checkbox"/> Depth of Water	MWV	<input type="checkbox"/> (True wind info)
GGA	<input type="checkbox"/> Recomm. Min. Nav. Info.	VHW	<input checked="" type="checkbox"/> Water speed and heading	VWR	<input type="checkbox"/> (Relative wind info)
VTG	<input checked="" type="checkbox"/> Global Pos. System Fix Data	RPM	<input type="checkbox"/> Engine RPM		
ZDA	<input type="checkbox"/> Ground speed				
	<input checked="" type="checkbox"/> Time,date,UTC,dmy,time zone				



- 3  Use same wind from starboard and same speed on water as before as depicted below.



3000 RPM

Throttle Gear 0.0

Speed (SOW, kn) 5.0

Speed (SOG, kn) 5.0

Course (COG) 10.0

Depth (m) 15.0

Wind direction 50

Wind speed (m/s) 6.2

Apparent wind 29 ° 8.4 m/s

Current direction 0

Current speed (kn) 0.0

True Heading 10.0

Magnetic Heading 5.5

Deviation 1.5 W



Variation 6.0 E

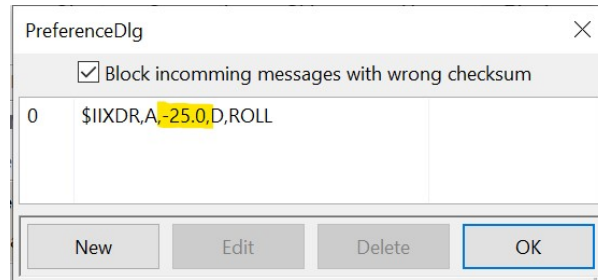
Latitude 43° 07.93572' N

Longitude 4° 00.50870' E

Altitude 1.0





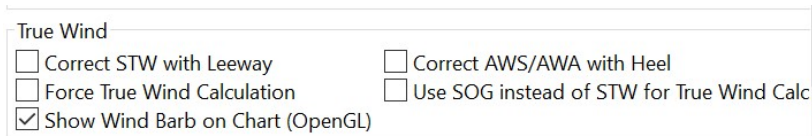
- 4  Use the NMEA converter to make the boat heel 25 degrees on port side 




- 5  Set the wind speed to m/s , boat speed unit is indifferent: 




- 6  Untick all corrections. 



- 7  Observe the uncorrected values and verify that they are same than announced by the NMEA Simulator:



LeewayHeel 

App. Wind Speed
8.30 m/s


App. Wind Angle
29°←

STW
5.00 kts

Heel
←25.0°

↑Leeway
←10.0°



- 8  Select AWS/AWA correction. Observe the user warnings to appear (two pop-ups).



True Wind

☐ Correct STW with Leeway

☐ Force True Wind Calculation

☒ Show Wind Barb on Chart (OpenGL)

☒ Correct AWS/AWA with Heel

☐ Use SOG instead of STW for True Wind Calc

Use with care, this is normally done by the instruments themselves as soon as you have an integrated, original equipment heel sensor



Polar - NOTF: 1Tactics instruments need your boat's polars!

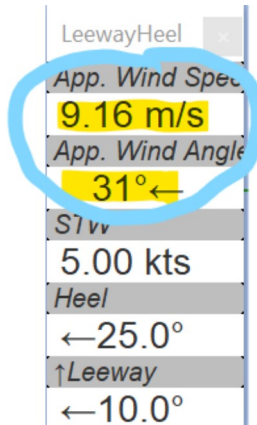
00:50

0 kts



PASS or FAIL

- 9  Observe the two calculated values and confirm that they meet the requirement specification. 



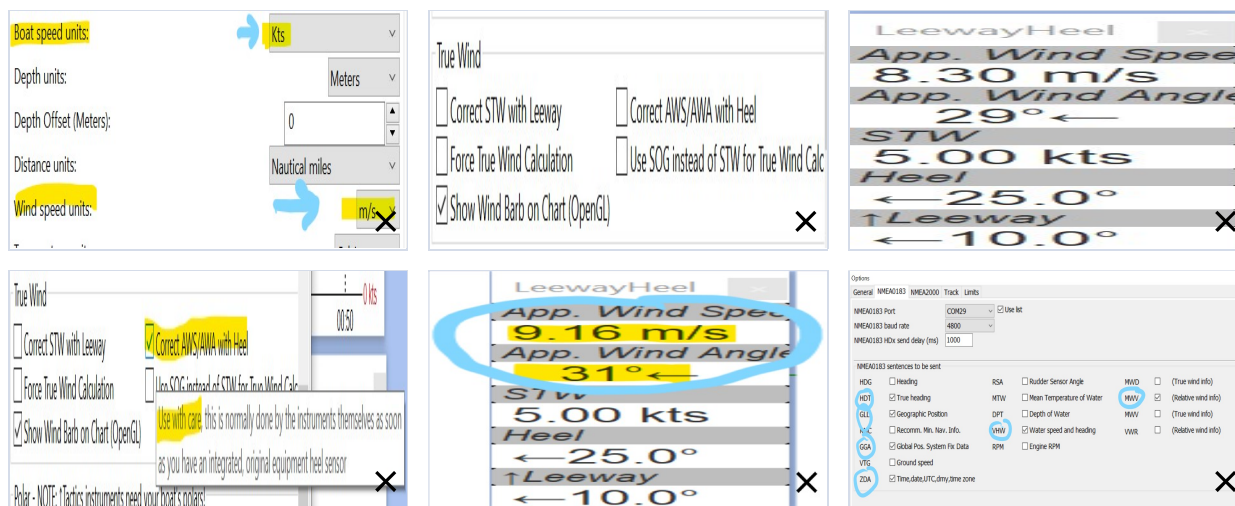
$$8.30 / \cos(25) = 9.16$$

$$\arctan(\tan(29) / \cos(25)) = 31.45$$

 PASS or FAIL



 Add Step


Attachments



« < 1 2 > »

 Add Attachments

RESULTS	DEFECTS	REQUIREMENTS			
Status	Test Plan Run	Assigned To	Updated At↑	Actions	
✓ Pass	TPR35 dashboard_tactics_pi...	 Petri Makijarvi	about a year ago		

▶▶ Skip	TPR36 dashboard_tactics_pi_...	 Petri Makijarvi	about a year ago	
✓ Pass	TPR37 dashboard_tactics_pi_...	 Petri Makijarvi	about a year ago	
▶▶ Skip	TPR41 dashboard_tactics_pi_...	 Petri Makijarvi	about a year ago	
▶▶ Skip	TPR42 dashboard_tactics_pi_...	 Petri Makijarvi	about a year ago	
<div>« < 1 2 3 4 > »</div>				

ACTIVITY	HISTORY	COMMENTS	
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