

Motor Yacht 19m-18112016

Planing Hull Resistance

Razmik Baharyan

Report Time: 11 декември 2016 г., 20:48:40

Model Name: C:\Users\Razmik\Documents\My Works,07092014\Orca3D v1.3 and 1.4-WIP\Hull_01,probi
\Motor Yacht 19m\Motor Yacht 19m,half hull,18112016-for planing analysis.3dm

Prediction Parameter	Value	Vessel Data	Value
Method	Savitsky	MaxPlaningLength	17,362 m
SpeedCheck	OK	MaxPlaningBeam	3,8703 m
HullCheck	OK	DisplacementBare	44,444 tonne-f
DesignMarginPercent	10	LCGFwdTransom	6,8678 m
DesignSpeed	25 kt	VCGAboveBL	1,8149 m
WaterType	Salt	ShaftAngle	7 deg
WaterDensity	1025,9 kg/m3	LCEFwdTransom	1,5988 m
WaterViscosity	1,1883E-06 m2/s	VCEAboveBL	-0,60505 m
Propulsive Efficiency	60 %		

Parameter Check	Value	Minimum	Maximum	Type
LcgBchRatio	1,7745	0,6	3	Computed
FnBchMax	2,0876	1,43	13	Computed
DeadriseMidLen	14,727 deg	0	30	Computed
CLBmax	0,32912	0	0,5	Computed

Speed (kt)	Fnv	Trim (deg)	Rbare (N)	Rtotal (N)	PEtotal (kW)	PPtotal (kW)
20,000	1,753	5,973	72611,1	79872,2	821,8	1369,7
21,000	1,841	6,210	72625,2	79887,8	863,1	1438,4
22,000	1,928	6,413	72652,2	79917,4	904,5	1507,5
23,000	2,016	6,581	72518,3	79770,2	943,9	1573,1
24,000	2,104	6,705	72284,2	79512,6	981,7	1636,2
25,000	2,191	6,792	71918,6	79110,5	1017,4	1695,7
26,000	2,279	6,834	71420,1	78562,1	1050,8	1751,4
27,000	2,367	6,842	70814,0	77895,5	1082,0	1803,3
28,000	2,454	6,815	70130,7	77143,8	1111,2	1852,0
29,000	2,542	6,762	69376,9	76314,6	1138,5	1897,5
30,000	2,630	6,683	68600,1	75460,2	1164,6	1941,0

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Speed (kt)	FnBch	Eff Planing Beam (m)	Eff Deadrise (deg)	Rbare/W	Porpoising	Prediction Check
20,000	1,679	3,831	14,738	0,167	Check	Check=3
21,000	1,762	3,831	14,735	0,167	Check	OK
22,000	1,846	3,832	14,732	0,167	Check	OK
23,000	1,930	3,832	14,729	0,166	Check	OK
24,000	2,014	3,832	14,727	0,166	Check	OK
25,000	2,098	3,832	14,726	0,165	Check	OK
26,000	2,182	3,832	14,726	0,164	Check	OK
27,000	2,266	3,832	14,726	0,163	Check	OK
28,000	2,350	3,832	14,727	0,161	Check	OK
29,000	2,434	3,832	14,728	0,159	Check	OK
30,000	2,518	3,832	14,730	0,157	Check	OK

Sensitivity Analysis	Index	To Reduce Drag
Eff planing beam	0,31221	Increase
Eff deadrise	0,22431	Decrease
LCG fwd transom	2,7831	Increase
Shaft angle to BL	0,15357	Increase

Prediction Checks

1. A wetted keel length greater than the boat length indicates that the boat is running at small trim and the bow will be immersed. In this condition, the prismatic analysis of the Savitsky prediction will be unreliable and can significantly under-predict the actual drag. However, as this condition typically occurs at pre-planing speeds, the internal hump speed correction accounts for this in the prediction of drag. There is no correction for trim.

2. The Froude number based on chine beam (FnBch) is a good indicator of the development of the spray root and the magnitude of the planing lift coefficient. Results for speeds outside of the Savitsky data set (most often for low speeds below the range) may be unreliable.

3. The lift coefficient (CLb) is a ratio of displacement to the square of speed and chine beam, with a correction for deadrise. This coefficient is a measure of the weight loading for the given planing geometry. We caution against using this method for hulls that produce this data range error.

4. The original testing of the models used in the Savitsky analysis were limited to a given range of trim values. Predicted trim values that are beyond the range of the original data set may be unreliable.

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Notes

A Sensitivity index with a higher value has a greater influence on drag. Sensitivity values greater than 1.0 are considered significant.

PPtotal represents the total propulsive power. Its precise definition depends on how the user specified the propulsive efficiency. If the user input the quasi-propulsive efficiency, then PPtotal is the total delivered power. If the user specified overall propulsive efficiency then PPtotal is the brake power.

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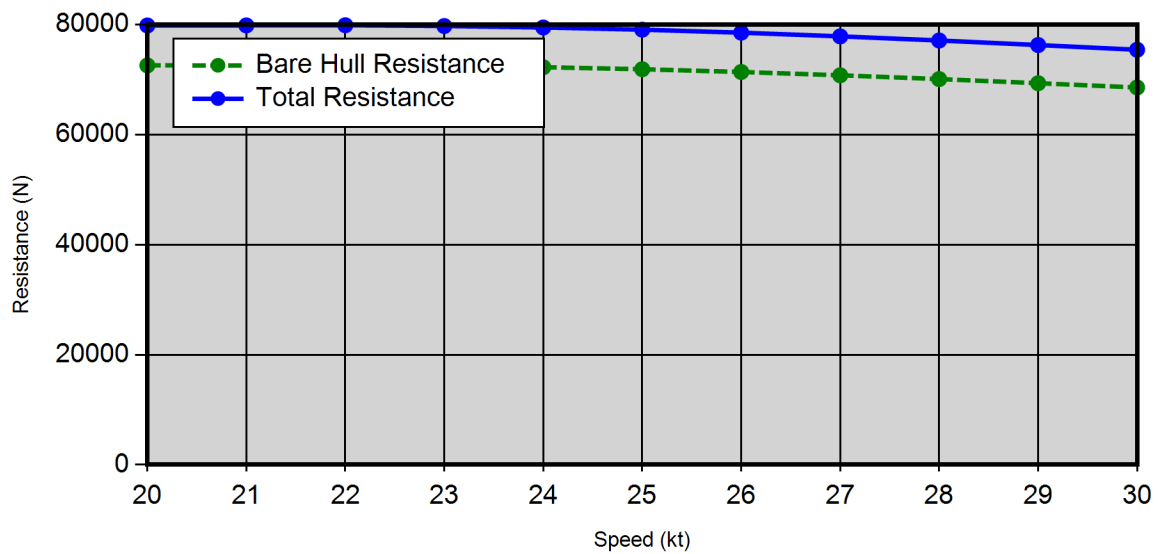
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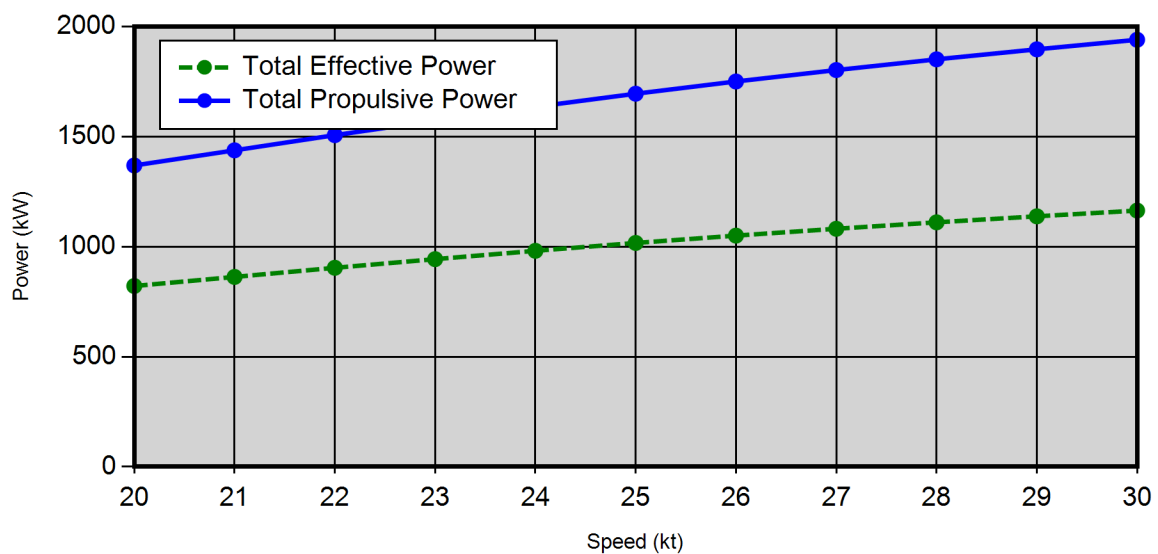
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Orca3D Planing Analysis (Resistance)



Orca3D Planing Analysis (Power)



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Orca3D Planing Analysis (Trim Angle)

