

Motor Yacht 19m-18112016

Planing Hull Resistance

Razmik Baharyan

Report Time: 18 ноември 2016 г., 20:18:36

Model Name: C:\Users\Razmik\Documents\My Works,07092014\Orca3D v1.3 and 1.4-WIP\Hull_01,probi\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	3,8841 m
HullCheck	OK	DisplacementBare	25,086 tonne-f
DesignMarginPercent	10	LCGFwdTransom	6,3198 m
DesignSpeed	40 kt	VCGAboveBL	1,6949 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	50 %		

Parameter Check	Value	Minimum	Maximum	Type
LcgBchRatio	1,6271	0,6	3	Computed
FnBchMax	3,3342	1,43	13	Computed
DeadriseMidLen	14,489 deg	0	30	Computed
CLBmax	0,073145	0	0,5	Computed

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Speed (kt)	Fnv	Trim (deg)	Rbare (N)	Rtotal (N)	PEtotal (kW)	PPtotal (kW)
20,000	1,929	4,618	32753,7	36029,1	370,7	741,4
21,000	2,025	4,758	33041,6	36345,7	392,7	785,3
22,000	2,121	4,865	33239,9	36563,9	413,8	827,6
23,000	2,218	4,937	33360,6	36696,6	434,2	868,4
24,000	2,314	4,977	33402,1	36742,3	453,6	907,3
25,000	2,411	4,985	33399,1	36739,0	472,5	945,0
26,000	2,507	4,964	33342,0	36676,2	490,6	981,1
27,000	2,603	4,922	33262,4	36588,6	508,2	1016,4
28,000	2,700	4,859	33170,7	36487,7	525,6	1051,2
29,000	2,796	4,781	33070,4	36377,4	542,7	1085,4
30,000	2,893	4,703	33020,3	36322,3	560,6	1121,1
31,000	2,989	4,605	32949,7	36244,7	578,0	1156,0
32,000	3,086	4,493	32870,2	36157,2	595,2	1190,5
33,000	3,182	4,385	32842,0	36126,2	613,3	1226,6
34,000	3,278	4,277	32857,1	36142,9	632,2	1264,4
35,000	3,375	4,169	32901,9	36192,1	651,7	1303,3
36,000	3,471	4,058	32970,5	36267,5	671,7	1343,3
37,000	3,568	3,952	33080,9	36389,0	692,6	1385,3
38,000	3,664	3,845	33226,6	36549,3	714,5	1429,0
39,000	3,761	3,741	33404,8	36745,3	737,2	1474,5
40,000	3,857	3,647	33646,6	37011,2	761,6	1523,2
41,000	3,953	3,548	33892,8	37282,1	786,4	1572,7
42,000	4,050	3,451	34172,1	37589,3	812,2	1624,4
43,000	4,146	3,357	34483,2	37931,5	839,1	1678,2
44,000	4,243	3,268	34833,0	38316,3	867,3	1734,6
45,000	4,339	3,180	35204,4	38724,9	896,5	1793,0

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Speed (kt)	FnBch	Eff Planing Beam (m)	Eff Deadrise (deg)	Rbare/W	Porpoising	Prediction Check
20,000	1,675	3,846	14,477	0,133	Check	OK
21,000	1,759	3,846	14,475	0,134	Check	OK
22,000	1,843	3,847	14,474	0,135	Check	OK
23,000	1,926	3,847	14,473	0,136	Check	OK
24,000	2,010	3,847	14,472	0,136	Check	OK
25,000	2,094	3,847	14,472	0,136	Check	OK
26,000	2,178	3,847	14,472	0,136	Check	OK
27,000	2,262	3,847	14,473	0,135	Check	OK
28,000	2,345	3,847	14,474	0,135	Check	OK
29,000	2,429	3,846	14,475	0,134	Check	OK
30,000	2,513	3,846	14,476	0,134	Check	OK
31,000	2,597	3,846	14,477	0,134	Check	OK
32,000	2,680	3,846	14,479	0,134	Check	OK
33,000	2,764	3,846	14,480	0,134	Check	OK
34,000	2,848	3,846	14,481	0,134	Check	OK
35,000	2,932	3,846	14,483	0,134	Check	OK
36,000	3,016	3,846	14,484	0,134	Check	OK
37,000	3,099	3,846	14,485	0,135	Check	OK
38,000	3,183	3,846	14,486	0,135	Check	OK
39,000	3,267	3,846	14,488	0,136	Stable	OK
40,000	3,351	3,846	14,489	0,137	Stable	OK
41,000	3,435	3,846	14,490	0,138	Stable	OK
42,000	3,518	3,846	14,491	0,139	Stable	OK
43,000	3,602	3,846	14,491	0,140	Stable	OK
44,000	3,686	3,845	14,492	0,142	Stable	OK
45,000	3,770	3,845	14,493	0,143	Stable	OK

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Sensitivity Analysis	Index	To Reduce Drag
Eff planing beam	0,0472	Decrease
Eff deadrise	0,27239	Decrease
LCG fwd transom	0,5492	Decrease
Shaft angle to BL	0,035553	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.

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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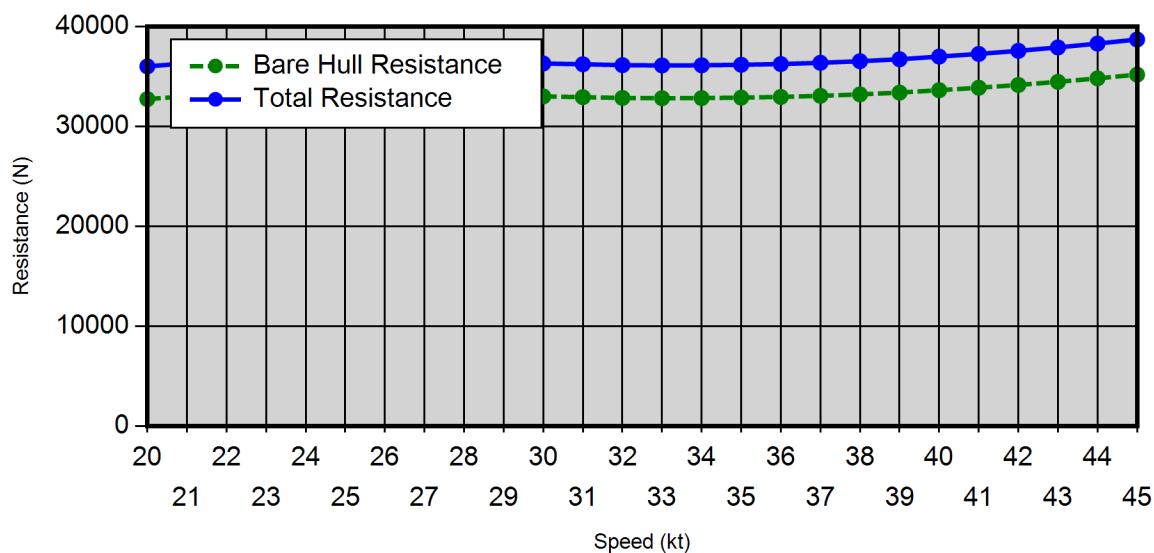
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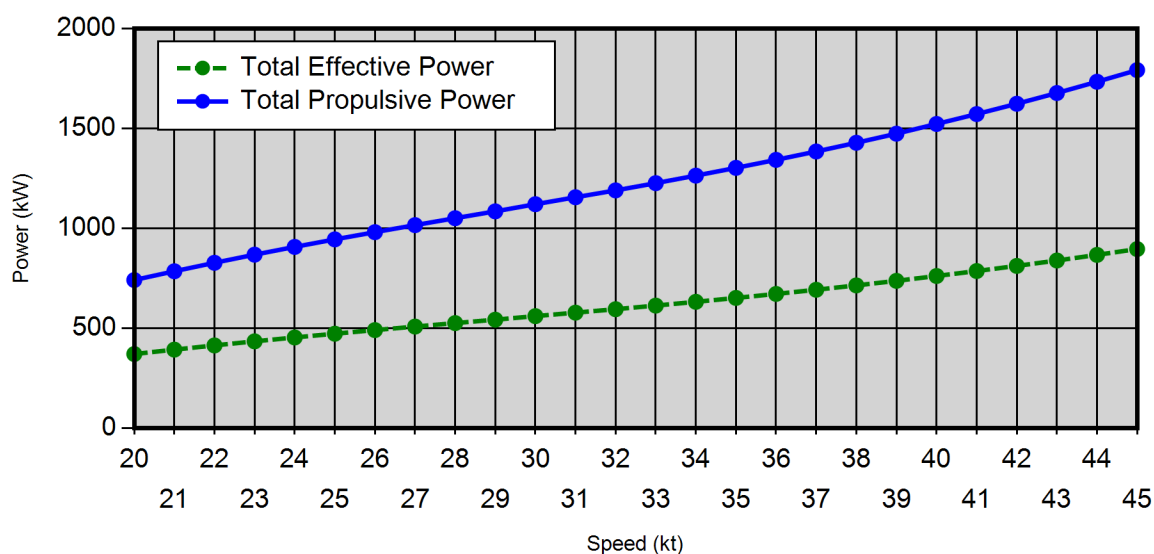
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Orca3D Planing Analysis (Resistance)



Orca3D Planing Analysis (Power)



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Orca3D Planing Analysis (Trim Angle)

