



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Condition Summary

Load Condition Parameters

Condition #	Weight (kgf)	Model Trim (deg)	Model Heel (deg)	VCG (m)
1	12150.000	0.000	0.000	0.46
2	13150.000	0.000	0.000	0.46

Resulting Model Attitude and Hydrostatic Properties

Condition #	Sinkage (m)	Trim(deg)	Heel(deg)	Ax(m ²)
1	0.021	0.000	0.000	0.00
2	0.053	0.000	0.000	0.00

Condition #	Displacement(kgf)	LCB(m)	TCB(m)	VCB(m)	Wet Area (m ²)
1	12150.00	5.104	0.000	-0.202	35.96
2	13150.00	5.117	0.000	-0.184	36.94

Condition #	Awp(m ²)	LCF(m)	TCF(m)	VCF(m)
1	30.87	5.265	0.000	0.021
2	31.30	5.284	0.000	0.053

Condition #	BMt(m)	BMI(m)	GMt(m)	GMI(m)
1	2.266	19.124	1.60	18.46
2	2.161	18.086	1.52	17.44

Condition #	Cb	Cp	Cwp	Cx	Cws	Cvp
1	0.500	0.000	0.807	0.000	3.178	0.619
2	0.509	0.000	0.809	0.000	3.133	0.629



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Notes

1. Locations such as the center of buoyancy and center of flotation are measured from the origin in the Rhinoceros world coordinate system.
2. The orientation of the model for an Orca3D hydrostatics solution is defined in terms of "sinkage," "trim," and "heel." The sinkage value represents the depth of the body origin (i.e. the Rhino world origin) below the resultant flotation plane, and is sometimes referred to as "origin depth." Heel and trim represent angular rotations about the Rhino longitudinal and transverse axes, respectively, and are taken in that order. For a more detailed description of these terms see the Orca3D documentation.
3. Hull form coefficients are non-dimensionalized by the waterline length.
4. Calculation of C_p and C_x use Orca sections to determine A_x . If no Orca sections are defined, these values will be reported as zero.



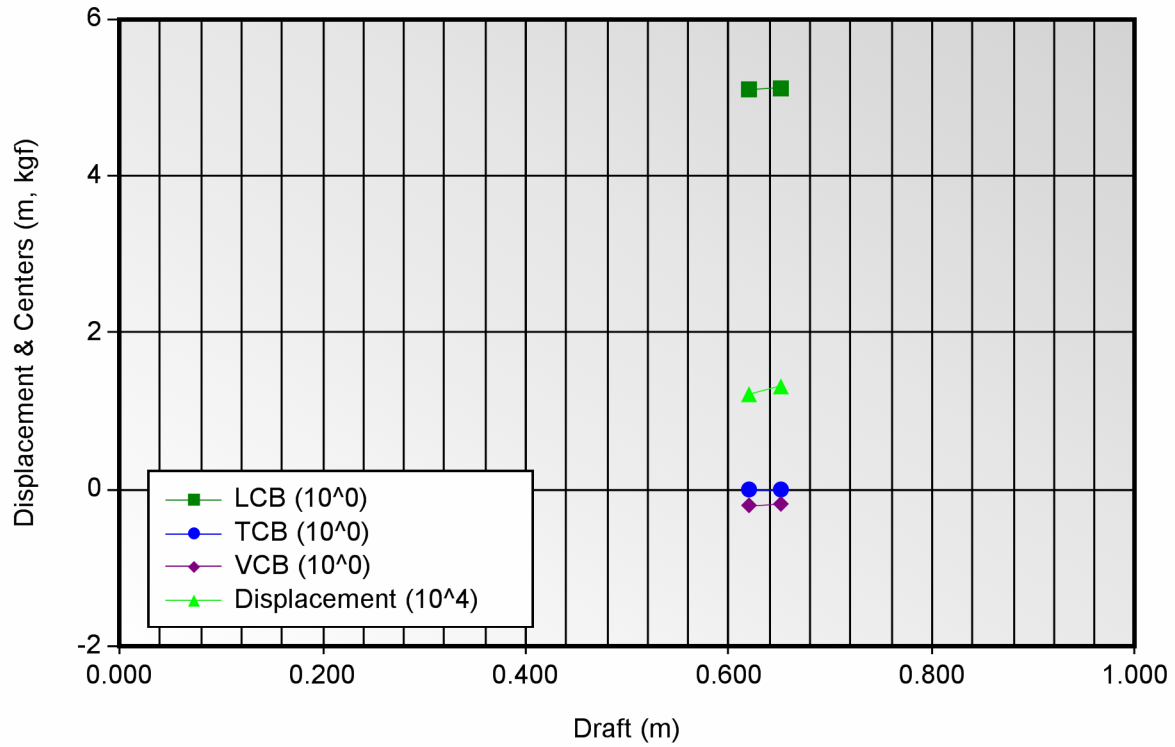
Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Volumetric Properties





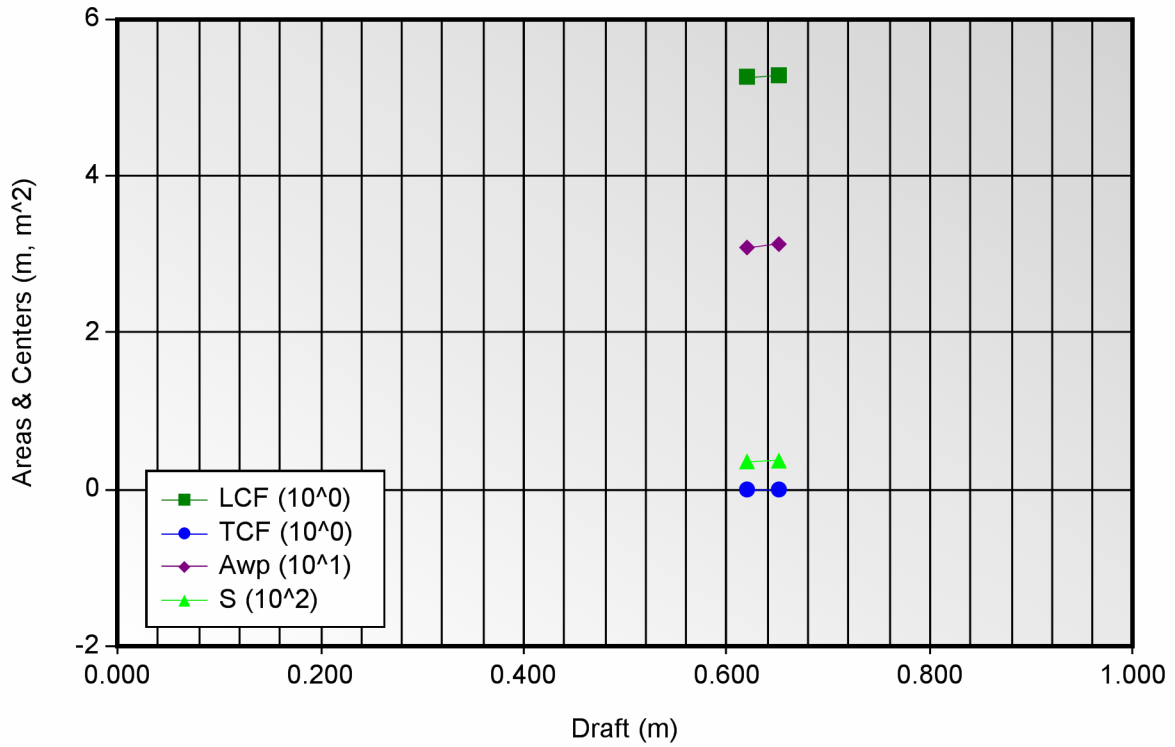
Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Area Properties





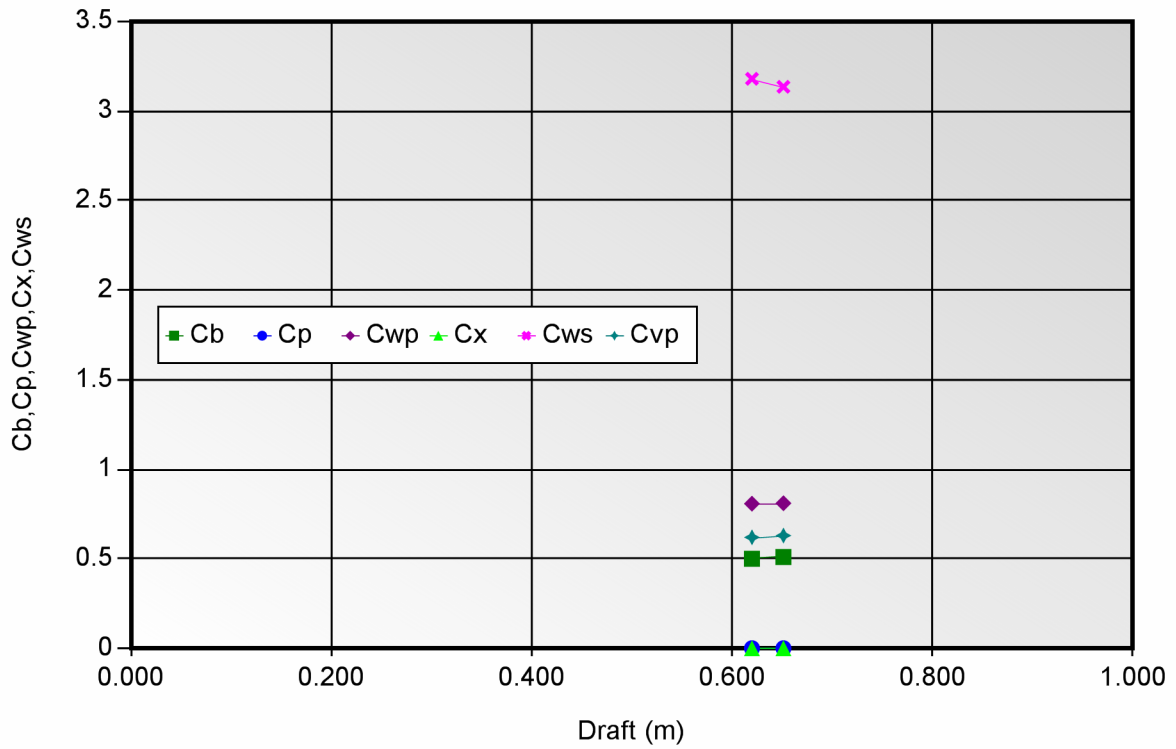
Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Hull Form Coefficients





Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Weight=12,150.00, Model Trim=0.00, Model Heel=0.00

Analysis Type FreeFloatEquilibrium

Surface Meshing Parameters

Density	0.7	Minimum edge length	0.0001 m
Maximum angle	0	Maximum edge length	0 m
Maximum aspect ratio	0	Max distance, edge to surf.	0 m
Minimum initial grid quads	0	Jagged seams	False
Refine mesh	False	Simple planes	False

Load Condition Parameters

Weight	12150.000 kgf
Model Trim	0.000 deg
Model Heel	0.000 deg
VCG	0.46 m
Fluid Type	Seawater
Fluid Density	1025.900 kg/m ³
Mirror Geometry	

Resultant Model Attitude

Trim Angle	0.000 deg	Sinkage	0.021 m
Heel Angle	0.000 deg		

Overall Dimensions

Length Overall, LOA	11.990 m	Loa / Boa	2.946
Beam Overall, Boa	4.070 m	Boa / D	1.154
Depth Overall, D	3.526 m		

Waterline Dimensions

Waterline Length, Lwl	10.812 m	Lwl / Bwl	3.056
Waterline Beam, Bwl	3.538 m	Bwl / T	5.708
Navigational Draft, T	0.620 m	D / T	5.689

**Pilot 40**

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Volumetric Values

Displacement	12150.0 kgf	Displ-Length Ratio	267.915
Volume	11.8 m ³		
LCB	5.104 m	LCB / Lwl	0.472
TCB	0.000 m	TCB / Bwl	0.000
VCB	-0.202 m		
Wetted Surface Area	35.96 m ²		

Waterplane Values

Waterplane Area, Awp	30.87 m ²		
LCF	5.265 m	LCF / Lwl	0.487
TCF	0.000 m	TCF / Lwl	0.000

Sectional Parameters

Ax	0.000 m ²		
Ax Location	0.000 m	Ax Location / Lwl	0.000

Hull Form Coefficients

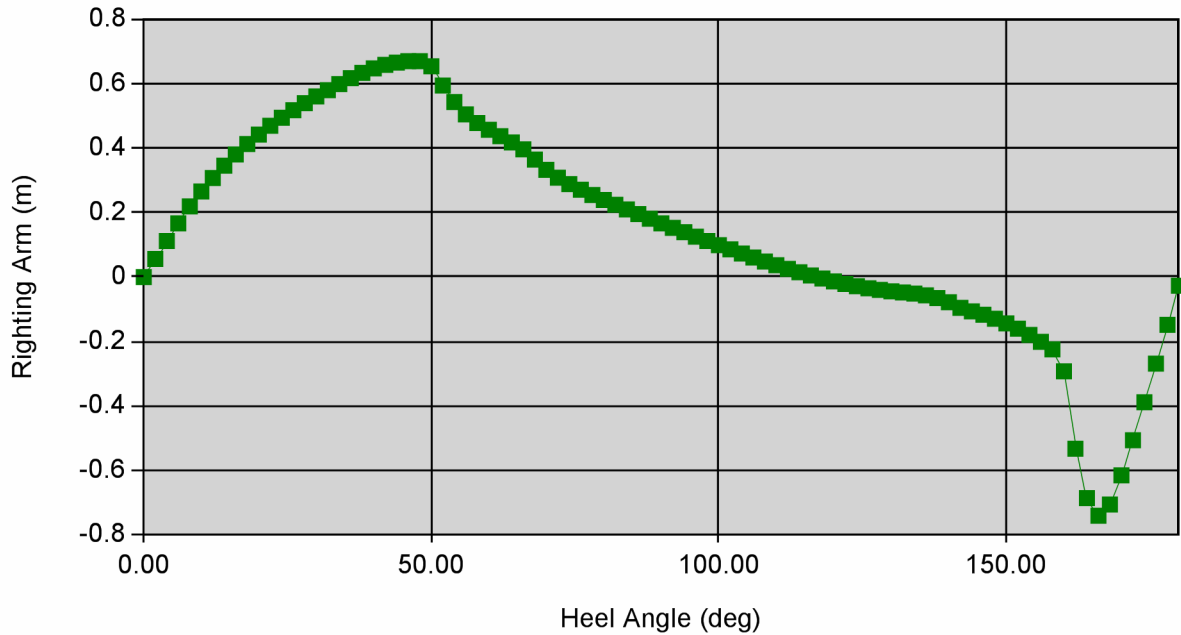
Cb	0.500	Cx	0.000
Cp	0.000	Cwp	0.807
Cvp	0.619	Cws	3.178

Static Stability Parameters

I(transverse)	26.8 m ⁴	I(longitudinal)	226.5 m ⁴
BMt	2.266 m	BMI	19.124 m
GMt	1.60 m	GMI	18.46 m



Stability Curve



Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
0.000	0.000	0.000	0.0
2.000	-0.002	0.056	679.4
4.000	-0.011	0.112	1355.7
6.000	-0.021	0.167	2024.3
8.000	-0.042	0.219	2665.3
10.000	-0.052	0.266	3228.6
12.000	-0.049	0.307	3735.0
14.000	-0.036	0.346	4198.4
16.000	-0.016	0.380	4622.8
18.000	0.010	0.413	5013.5
20.000	0.045	0.442	5371.8
22.000	0.086	0.469	5702.3
24.000	0.129	0.495	6009.0
26.000	0.177	0.518	6294.2

**Pilot 40**

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
28.000	0.228	0.540	6559.7
30.000	0.279	0.561	6810.6
32.000	0.332	0.580	7048.6
34.000	0.387	0.599	7276.2
36.000	0.438	0.617	7498.8
38.000	0.485	0.634	7701.6
40.000	0.522	0.648	7870.7
42.000	0.547	0.658	8000.3
44.000	0.564	0.666	8089.0
46.000	0.568	0.670	8138.5
48.000	0.555	0.670	8141.5
50.000	0.137	0.654	7948.8
52.000	-1.016	0.595	7224.6
54.000	-1.368	0.543	6599.8
56.000	-1.509	0.505	6133.3
58.000	-1.524	0.478	5806.4
60.000	-1.496	0.457	5552.9
62.000	-1.376	0.437	5314.4
64.000	-1.104	0.418	5078.6
66.000	-0.581	0.397	4819.2
68.000	0.382	0.364	4428.6
70.000	1.342	0.333	4042.4
72.000	2.144	0.308	3747.0
74.000	2.836	0.288	3504.2
76.000	3.465	0.271	3290.5
78.000	4.055	0.255	3092.8
80.000	4.609	0.239	2906.3
82.000	5.130	0.224	2726.7
84.000	5.622	0.210	2549.5
86.000	6.080	0.195	2373.1



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
88.000	6.498	0.181	2198.0
90.000	6.864	0.167	2025.7
92.000	7.176	0.153	1856.3
94.000	7.433	0.139	1689.1
96.000	7.637	0.125	1523.2
98.000	7.788	0.112	1359.5
100.000	7.884	0.099	1198.8
102.000	7.931	0.086	1040.6
104.000	7.928	0.073	886.1
106.000	7.883	0.060	734.3
108.000	7.792	0.048	587.0
110.000	7.663	0.037	444.0
112.000	7.485	0.025	308.4
114.000	7.265	0.015	179.3
116.000	7.009	0.005	56.7
118.000	6.720	-0.005	-58.5
120.000	6.401	-0.014	-165.1
122.000	6.059	-0.022	-261.9
124.000	5.704	-0.029	-347.9
126.000	5.343	-0.035	-422.8
128.000	4.987	-0.040	-486.2
130.000	4.647	-0.044	-539.5
132.000	4.341	-0.048	-583.6
134.000	4.066	-0.052	-627.8
136.000	3.794	-0.057	-693.3
138.000	3.521	-0.066	-797.0
140.000	3.285	-0.078	-953.4
142.000	3.083	-0.095	-1160.2
144.000	2.868	-0.106	-1293.6
146.000	2.637	-0.117	-1425.9



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
148.000	2.391	-0.130	-1576.6
150.000	2.137	-0.144	-1752.1
152.000	1.880	-0.161	-1952.0
154.000	1.616	-0.180	-2182.2
156.000	1.344	-0.201	-2443.0
158.000	1.059	-0.225	-2727.7
160.000	0.359	-0.293	-3559.1
162.000	-0.959	-0.533	-6479.7
164.000	-1.748	-0.686	-8340.7
166.000	-2.224	-0.741	-9006.8
168.000	-2.400	-0.706	-8580.8
170.000	-2.505	-0.616	-7480.9
172.000	-2.586	-0.507	-6154.9
174.000	-2.646	-0.389	-4722.9
176.000	-2.680	-0.269	-3268.7
178.000	-2.689	-0.148	-1802.8
180.000	-2.672	-0.027	-330.1

No Points of Interest to Report



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Weight=13,150.00, Model Trim=0.00, Model Heel=0.00

Analysis Type FreeFloatEquilibrium

Surface Meshing Parameters

Density	0.7	Minimum edge length	0.0001 m
Maximum angle	0	Maximum edge length	0 m
Maximum aspect ratio	0	Max distance, edge to surf.	0 m
Minimum initial grid quads	0	Jagged seams	False
Refine mesh	False	Simple planes	False

Load Condition Parameters

Weight	13150.000 kgf
Model Trim	0.000 deg
Model Heel	0.000 deg
VCG	0.46 m
Fluid Type	Seawater
Fluid Density	1025.900 kg/m ³
Mirror Geometry	

Resultant Model Attitude

Trim Angle	0.000 deg	Sinkage	0.053 m
Heel Angle	0.000 deg		

Overall Dimensions

Length Overall, LOA	11.990 m	Loa / Boa	2.946
Beam Overall, Boa	4.070 m	Boa / D	1.154
Depth Overall, D	3.526 m		

Waterline Dimensions

Waterline Length, Lwl	10.843 m	Lwl / Bwl	3.040
Waterline Beam, Bwl	3.566 m	Bwl / T	5.477
Navigational Draft, T	0.651 m	D / T	5.415

**Pilot 40**

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Volumetric Values

Displacement	13150.0 kgf	Displ-Length Ratio	287.504
Volume	12.8 m ³		
LCB	5.117 m	LCB / Lwl	0.472
TCB	0.000 m	TCB / Bwl	0.000
VCB	-0.184 m		
Wetted Surface Area	36.94 m ²		

Waterplane Values

Waterplane Area, Awp	31.30 m ²		
LCF	5.284 m	LCF / Lwl	0.487
TCF	0.000 m	TCF / Lwl	0.000

Sectional Parameters

Ax	0.000 m ²		
Ax Location	0.000 m	Ax Location / Lwl	0.000

Hull Form Coefficients

Cb	0.509	Cx	0.000
Cp	0.000	Cwp	0.809
Cvp	0.629	Cws	3.133

Static Stability Parameters

I(transverse)	27.7 m ⁴	I(longitudinal)	231.8 m ⁴
BMt	2.161 m	BMI	18.086 m
GMt	1.52 m	GMI	17.44 m



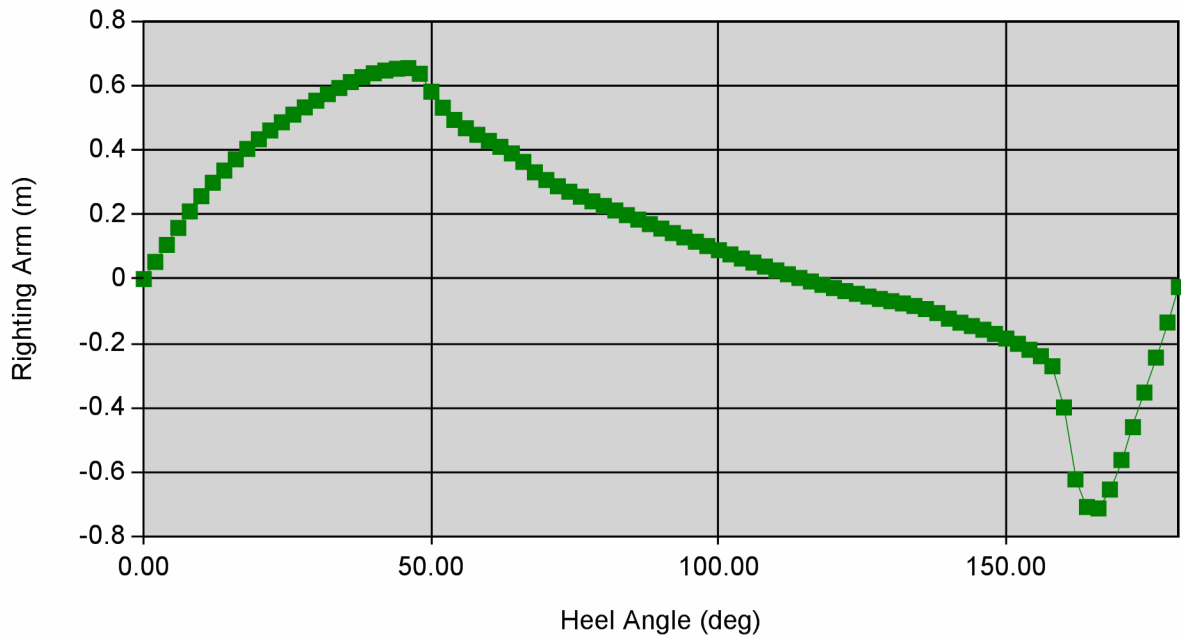
Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Stability Curve



Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
0.000	0.000	0.000	0.0
2.000	-0.001	0.053	696.8
4.000	-0.009	0.106	1392.3
6.000	-0.017	0.158	2082.9
8.000	-0.035	0.210	2757.5
10.000	-0.055	0.257	3380.7
12.000	-0.058	0.299	3928.4
14.000	-0.052	0.337	4429.4
16.000	-0.038	0.372	4888.5
18.000	-0.018	0.404	5311.8
20.000	0.012	0.434	5703.0
22.000	0.047	0.461	6063.5
24.000	0.085	0.487	6398.5
26.000	0.127	0.510	6711.9



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
28.000	0.172	0.533	7005.7
30.000	0.219	0.554	7283.1
32.000	0.267	0.574	7546.7
34.000	0.318	0.593	7800.1
36.000	0.363	0.611	8038.4
38.000	0.401	0.627	8239.8
40.000	0.427	0.639	8398.4
42.000	0.442	0.647	8513.5
44.000	0.449	0.653	8585.2
46.000	0.435	0.655	8610.4
48.000	-0.094	0.637	8377.0
50.000	-1.145	0.581	7645.1
52.000	-1.519	0.532	6991.4
54.000	-1.685	0.494	6497.2
56.000	-1.720	0.468	6154.0
58.000	-1.712	0.448	5889.5
60.000	-1.625	0.429	5640.8
62.000	-1.407	0.410	5393.3
64.000	-0.975	0.390	5125.6
66.000	-0.045	0.363	4779.0
68.000	0.967	0.331	4358.5
70.000	1.794	0.307	4041.2
72.000	2.515	0.288	3785.4
74.000	3.179	0.271	3563.4
76.000	3.805	0.256	3361.2
78.000	4.407	0.241	3169.6
80.000	4.992	0.227	2981.6
82.000	5.553	0.213	2795.3
84.000	6.086	0.199	2610.6
86.000	6.579	0.185	2426.4



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
88.000	7.028	0.171	2242.3
90.000	7.423	0.157	2059.1
92.000	7.759	0.143	1876.9
94.000	8.026	0.129	1697.5
96.000	8.221	0.116	1520.6
98.000	8.357	0.102	1345.1
100.000	8.425	0.089	1172.9
102.000	8.438	0.076	1003.1
104.000	8.399	0.064	836.5
106.000	8.323	0.051	671.1
108.000	8.205	0.039	508.7
110.000	8.055	0.027	348.7
112.000	7.862	0.015	194.4
114.000	7.632	0.003	45.5
116.000	7.373	-0.007	-98.4
118.000	7.080	-0.018	-236.6
120.000	6.760	-0.028	-367.5
122.000	6.417	-0.037	-490.8
124.000	6.056	-0.046	-606.0
126.000	5.687	-0.054	-712.7
128.000	5.319	-0.062	-810.9
130.000	4.961	-0.069	-902.3
132.000	4.613	-0.076	-995.1
134.000	4.273	-0.084	-1101.3
136.000	3.976	-0.093	-1225.0
138.000	3.714	-0.106	-1392.3
140.000	3.485	-0.123	-1621.2
142.000	3.245	-0.135	-1779.8
144.000	2.991	-0.146	-1916.8
146.000	2.721	-0.157	-2068.1



Pilot 40

Hydrostatics & Stability Analysis

Willem Nieland Design

Report Time: 8/25/2008 12:33:47 PM

Heel(deg)	Trim(deg)	Righting Arm (m)	Righting Moment (m-kgf)
148.000	2.445	-0.170	-2237.2
150.000	2.163	-0.185	-2428.6
152.000	1.875	-0.201	-2645.6
154.000	1.581	-0.220	-2888.9
156.000	1.279	-0.240	-3152.1
158.000	0.852	-0.271	-3559.9
160.000	-0.222	-0.399	-5246.5
162.000	-1.443	-0.622	-8181.1
164.000	-2.052	-0.708	-9310.3
166.000	-2.350	-0.712	-9363.6
168.000	-2.489	-0.653	-8593.3
170.000	-2.592	-0.562	-7390.3
172.000	-2.676	-0.460	-6047.0
174.000	-2.736	-0.353	-4637.7
176.000	-2.770	-0.244	-3211.8
178.000	-2.779	-0.135	-1774.3
180.000	-2.762	-0.025	-330.1

No Points of Interest to Report