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PACIFIC MARINER 85

Vessel Particulars

LOA	85.75 ft.
LWL	74.50 ft.
BEAM	21.50 ft.
BEAM LWL	18.58 ft.
DRAFT	4.00 ft.
Midship Draft (fairbody)	3.50 ft.
Station Spacing	5.00 ft.
Scale of Lines Drawing	3/8"=1'0"
Scale Factor (1/scale^2)	7.1111

Hydrostatic Summary

Displacement	137,545 lbs.
Displacement	61 long tons
Displacement volume	2,149 cubic ft.
DLR	641
LCB	0.583
LCF	0.572
PPI (lbs)	3,162 lbs.
Moment Trim 1" (calculated)	22,000 ft-lbs

Coefficients of Form

Prismatic:	$C_p = \text{displacement volume} / \text{LWL} \times \text{area of largest underwater section}$
=	1.47
Block:	$C_b = \text{displacement volume} / \text{LWL} \times \text{WL BEAM} \times \text{Midship Draft}$
=	0.44
Waterplane:	$C_w = \text{waterplane area} / \text{LWL} \times \text{WL BEAM}$
=	0.43
Midship:	$= \text{midship area} / \text{midship WL BEAM} \times \text{Midship Draft}$
=	0.49

Planimeter Readings

Station	First	Second	Third	Average
10	0.1	0.1	0.1	0.10
15	0.57	0.7	0.7	0.66
20	1.1	1.19	1.05	1.11
25	1.5	1.4	1.45	1.45
30	1.9	1.9	1.9	1.90
35	2.2	2.25	2.3	2.25
40	2.55	2.55	2.6	2.57
45	2.75	2.75	2.8	2.77
50	2.9	2.82	2.8	2.84
55	2.8	2.8	2.8	2.80
60	2.8	2.8	2.78	2.79
65	2.78	2.7	2.7	2.73
70	2.6	2.70	2.60	2.63
75	2.5	2.50	2.50	2.50
80	2.3	2.20	2.32	2.27

Displacement Volume calculated using Simpson's Rule

Station	1/2 Area	S. Multiplier	S. Functions	Station	S.Moments
10	0.10	1	0.10	0	0.00
15	0.66	4	2.63	1	2.63
20	1.11	2	2.23	2	4.45
25	1.45	4	5.80	3	17.40
30	1.90	2	3.80	4	15.20
35	2.25	4	9.00	5	45.00
40	2.57	2	5.13	6	30.80
45	2.77	4	11.07	7	77.47
50	2.84	2	5.68	8	45.44
55	2.80	4	11.20	9	100.80
60	2.79	2	5.59	10	55.87
65	2.73	4	10.91	11	119.97
70	2.63	2	5.27	12	63.20
75	2.50	4	10.00	13	130.00
80	2.27	1	2.27	14	31.83
Column Totals			90.67		740.05

Displacement Volume = (sum of S. Functions x Station Spacing x Scale Factor x 2)/3
= 2,149 ft³

Density of Seawater = 64 lbs/ft³

Displacement in lbs = 137,545 lbs

Displacement in Long = (displacement in lbs/2240)

= 61 L.T.

LCB = (sum of S. Moments/sum of S. Functions/14)

= 0.583

DLR = Disp. In L.T./ (.01 x LWL)³

= 641

Table of WL Half Breadths (ft.)

Station	Half Breadth	S. Multiplier	S. Functions	Station	S.Moments
0	0.00	1	0	0	0
1	2.19	4	8.76	1	8.76
2	4.17	2	8.34	2	16.68
3	5.88	4	23.52	3	70.56
4	7.08	2	14.16	4	56.64
5	7.75	4	31	5	155
6	7.92	2	15.84	6	95.04
7	7.67	4	30.68	7	214.76
8	7.25	2	14.5	8	116
9	6.50	4	26	9	234
10	5.08	1	5.08	10	50.8
Column Totals			177.88		1018.24

Waterplane Area (ft²) = (sum of S. Functions x Station Spacing x 2)/3

= 592.933333 sq. ft.

LCF = (sum of S. Moments/sum of S. Functions/10)

= 0.572

Pounds Per Inch Imme (waterplane area x 64 lbs/ft³)/12

= 3,162 lbs

Moment to Trim 1"

Moment to = (displ. Lbs x long. metacentric height)/(12 x LWL)

*long. metacentric radius (BMlong.) can be substituted for metacentric height (GM long.)for estimation purposes)

long. Moment of inertia (.04 x BWL x LWL^3)

$$= 307,308 \text{ ft}^4$$

BMlong. = llong./displacement volume

$$= 142.991646 \text{ ft}$$

Moment to = 21999.7109 ft-lbs.

Moment of Inertia of RWL plane:

Table of WL Half Breadths (ft.)

Station	Half Breadth (ft.)	Half Breadth cut S.	Multiplie S.	Functions
0	0.00	0.00	1	0
1	2.15	9.94	4	39.75
2	4.33	81.18	2	162.37
3	7.25	381.08	4	1524.31
4	8.50	614.13	2	1228.25
5	9.08	748.61	4	2994.45
6	9.17	771.10	2	1542.19
7	9.25	791.45	4	3165.81
8	9.25	791.45	2	1582.91
9	9.25	791.45	4	3165.81
10	9.25	791.45	1	791.45
Column Totals				16197.31

$I_{RWLP} = \text{total functions} \times 2 \times SS/3 \times 1/3$

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