Vetus Hydraulic Steering Sizing Calculations

Rasmus Rudder Area Approx. 700 inches squared

Need to find the force and torque excerted on rudder Torque = Force x Lever

Force calculations
F=1.67 x A x V^2
A= area of rudder
V= top speed of boat in knots

inches squared to feet squared
inches 700
feet 4.86

Lever calculation
.37 x c in feet
c is length from center rudder post to aft edge of rudder

Area = 6 width of rudder 2 height of rudder 3

Force = 519.44 lbf
Area of rudder 4.86
Max. Velocity of boat 8

Lever = 0.703 of rudder with rudder post on the forward edge of rudder
Distance from center of rudder post to aft edge of rudder
1.9

Lever = 0.403 of rudder with rudder post not on the forward edge of rudder
Distance from center of rudder post to aft edge of rudder
1.9

Distance from center of rudder post to forward edge of rudder
0.3

Torque = 365 of rudder with rudder post lying on forward edge of rudder

Torque = 209 of rudder with rudder post not lying of forward edge of rudder

For Rasmus, the Vetus steering system would be the MTC 72 Cylinder at 376 Max. Torque and
and the HTP 20R pump at 5.3 wheel turns or HTP 30R pump at 3.5 wheel turns.