$Cd := 1.5$ $Diameter := 8\ in$ $DensitySW := 1025 \cdot \frac{kg}{m^3}$

Eurzvh#iru#Hp djhII

$PlatformVelocity := 0.1 \cdot \frac{m}{s}$

$Area := \frac{\pi}{4} \cdot Diameter^2$

$ForceDrag10 := \frac{1}{2} \cdot Cd \cdot Area \cdot DensitySW \cdot PlatformVelocity^2 = 0.249\ N$

$Clinearize := \frac{ForceDrag10}{PlatformVelocity} = 2.493\ \frac{kg}{s}$

$ForceDrag20Theoretical := ForceDrag10 \cdot 2^2 = 0.997\ N$

$ForceDrag20Linearized := 0.2 \cdot \frac{m}{s} \cdot Clinearize = 0.499\ N$

$PumpEff := 0.6$ $PumpDisplacement := .156 \cdot \frac{cm^3}{rev}$ $pumpSpeed := 1 \cdot \frac{rev}{s}$

$PumpVolFlowRate := PumpEff \cdot PumpDisplacement \cdot pumpSpeed = \left(9.36 \cdot 10^{-8}\right) \frac{m^3}{s}$

$ForceBuoyancy := PumpVolFlowRate \cdot DensitySW \cdot g = \left(9.409 \cdot 10^{-4}\right) \frac{N}{s}$

$PlatformMassActual := 38 \cdot kg$

$PlatformMassVirtual := PlatformMassActual \cdot 1.25 = 47.5\ kg$

$Zero := \frac{d}{dt} PlatformVelocity - \left(\frac{1}{PlatformMassVirtual} \cdot \left(DensitySW \cdot g \cdot \int PumpVolFlowRate\, dt - \frac{1}{2} \cdot DensitySW \cdot Cd \cdot Area \cdot Clinearize \cdot PlatformVelocity \right) \right)$

$a := \left(DensitySW \cdot g\right)$ $b := \frac{1}{2} \cdot DensitySW \cdot Cd \cdot Area \cdot Clinearize$ $m := PlatformMassVirtual$

$Zero := PV(s) \cdot s - \frac{1}{m} \cdot \left(\frac{a}{s} \cdot PumpVflowRate(s) + b \cdot PV(s) \right)$

$Zero := PV(s) \cdot (s) + \frac{a}{s \cdot m} \cdot PVFlowRate(s) + \frac{b}{m} \cdot PV(s)$

$PV(s) + bPV(s) = ?$

$OpenLoopTF := \frac{PV(s)}{PumpVolFlowRate(s)}$ $OpenLoopTF := \frac{a}{s \cdot (s \cdot PlatformMassVirtual + b)}$