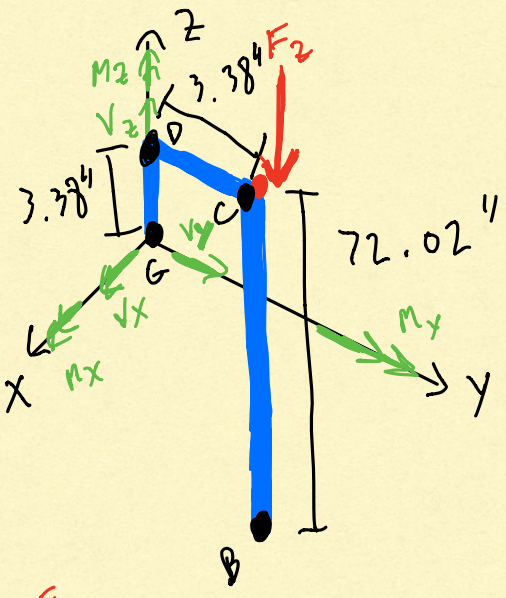
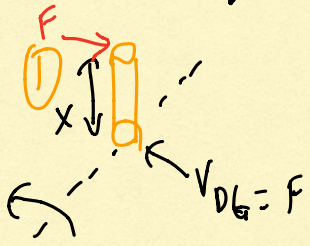
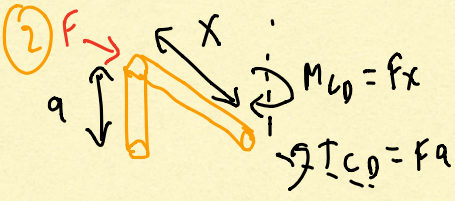
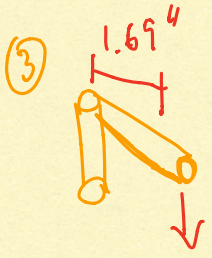
Valve Branch





$M_{DG} = Fx$





$M = (0.40375\ lb)(1.69")$

$= 0.68231\ lb.in$

Analysis

$L_{PR} = 1.69" + 0.5" + 2.0" = 4.19"$

$L_{PS} = 1.2" + 1.02" = 2.22"$

$L_{FS} = 8.5" + 0.75" + 0.25" + 2.27"$

$= 11.77"$

$m_{PR} = 0.3\ lb$

$m_{PS} = 0.33\ lb$

$m_{FS} = 0.7\ lb$

$F_1 = (0.3\ lb)(4.19") = 1.257\ lb.in$

$F_2 = (0.33\ lb)(2.22") = 0.7326\ lb.in$

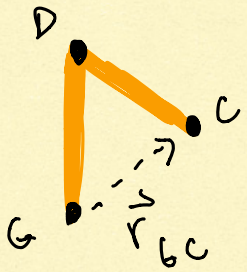
$F_3 = (0.7\ lb)(11.77") = 8.239\ lb.in$

$\sum F_z = 0;$

$F_z = F_1 + F_2 + F_3 = \underline{10.2286\ lb.in}$

$T_x = (3.38")(10.2286\ lb.in) = \underline{34.578\ lb.in^2}$

Continued...



$$\vec{r}_{GC} = C(0, 3.38, 3.38) - G(0,0,0)$$

$$= (3.38\hat{j} + 3.38\hat{k})$$

$$\vec{F} = \frac{0\hat{i} + 0\hat{j} - 10.2286\hat{k}}{\sqrt{10.2286^2}} = -1\hat{k}$$

$$M_G = r_{GC} \times F = \begin{bmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 3.38 & 3.38 \\ 0 & 0 & -1 \end{bmatrix}$$

$$= [-3.38\hat{i} + 0\hat{j} + 0\hat{k}] \text{ lb.in}$$