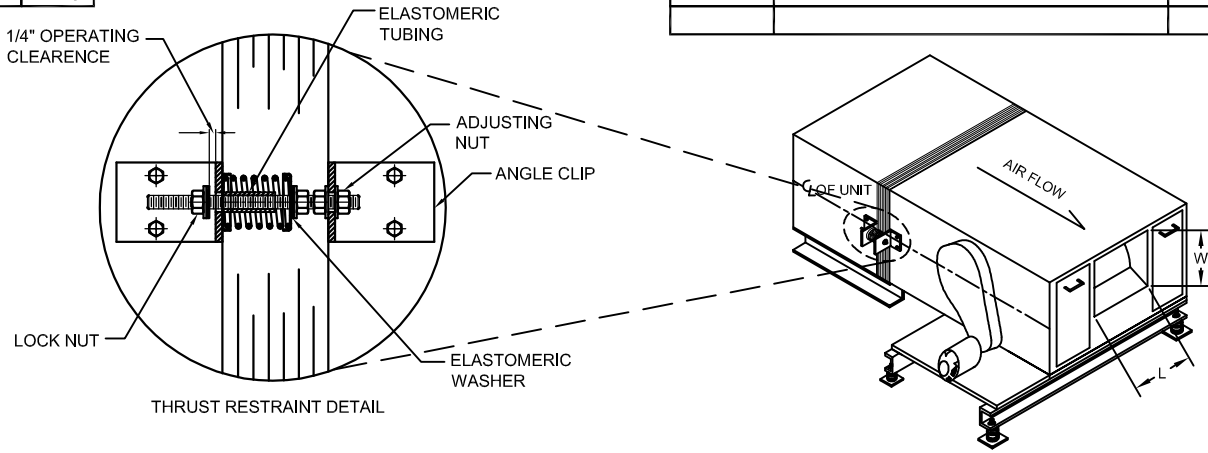


REV.	DESCRIPTION	DATE	BY



THE THRUST FORCE CREATED BY A FAN IS A FUNCTION OF THE TOTAL STATIC PRESSURE AND THE CROSS SECTIONAL AREA OF THE FAN OUTLET. TO ESTIMATE THRUST FORCE, USE THE FOLLOWING FORMULA:

$$F_t = \frac{(P_t)(L)(W)(5.2)}{144}$$

- WHERE:
- F_t = TOTAL THRUST FORCE, IN UNITS OF POUNDS
 - P_t = TOTAL PRESSURE OR TOTAL STATIC PRESSURE, IN UNITS OF INCHES WG
 - L = FAN OUTLET LENGTH, IN UNITS OF INCHES
 - W = FAN OUTLET WIDTH, IN UNITS OF INCHES
 - 5.2 = CONSTANT, 1 INCH WG = 5.2 POUNDS PER FOOT SQUARED
 - 144 = CONSTANT, 1 FOOT SQUARED = 144 INCHES SQUARED

FOR EXAMPLE, A FAN WITH DISCHARGE DIMENSIONS OF 18" X 24" AND A STATIC PRESSURE OF 3" WATER WILL CREATE A THRUST FORCE OF 46.8 POUNDS.

$$F_t = \frac{(3)(18)(24)(5.2)}{144} = 46.8 \#$$

THRUST RESTRAINTS ARE REQUIRED WHEN THE RESULTING DISPLACEMENT OF THE ISOLATORS EXCEEDS 1/4" FOR OPEN SPRINGS AND 1/8" FOR HOUSED OR SEISMIC SPRINGS. TO CALCULATE THE RESULTING DISPLACEMENT OF THE ISOLATORS, USE THE FOLLOWING FORMULA

$$x = \frac{(F_t)}{(k)}$$

- WHERE:
- x = TOTAL SPRINGS DISPLACEMENT, IN UNITS OF INCHES
 - F_t = TOTAL THRUST FORCE, IN UNITS OF POUNDS
 - k* = SPRING CONSTANT = $\frac{\text{TOTAL RATED CAPACITY OF ISOLATORS}}{\text{RATED DEFLECTION OF ISOLATORS PER INCH}}$, IN UNITS OF POUNDS

IF A FAN, MOTOR AND BASE ARE INSTALLED ON FOUR (ONE ON EACH CORNER OF BASE) MODEL A-2E-1000 OPEN SPRING, 2-INCH DEFLECTION ISOLATORS WITH A RATED CAPACITY OF 1000 POUNDS EACH AND A TOTAL RATED CAPACITY OF 4000 POUNDS. THE 46.8-POUND THRUST FORCE WILL CAUSE THE ISOLATORS TO BE DISPLACED LESS THAN 1/32", A RELATIVELY INSIGNIFICANT AMOUNT.

$$x = \left(\frac{46.8}{4000/2} \right) = 0.0234$$



HOWEVER, IF THE FAN, MOTOR AND BASE ARE INSTALLED ON FOUR MODEL INTEGRATED A-2D-75 OPEN SPRING, 2-INCH DEFLECTION ISOLATORS WITH A RATED CAPACITY OF 75 POUNDS EACH AND A TOTAL RATED CAPACITY OF 300 POUNDS, THE ISOLATORS WILL BE DISPLACED MORE THAN 1/4", REQUIRING THE ADDITION OF THRUST RESTRAINTS.

$$x = \left(\frac{46.8}{300/2} \right) = 0.312$$

* THIS ASSUMES A $\frac{k_x}{k_y} \sim 1.0$; ALL VMC GROUP ISOLATORS MEET THIS REQUIREMENT.

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

(SUPERSEDES DRAWING H-1053 PER ECN-R0414)

CERTIFIED FOR: JOB NAME: _____ CUSTOMER: _____ CUSTOMER P.O.: _____ SALES ORDER: _____	MODEL TRK CALCULATION OF THRUST AND RESULTING DISPLACEMENT FOR FAN WITH RECTANGULAR OUTLET	 THE VMC GROUP <i>The Power of Together</i> Bloomingdale, NJ 07403 Houston, TX 77041	SCALE:	Member 
			NONE	
			SHEET:	
			DRAWING NO.:	