LIFTING LUG SIZING AS PER ASME BTH-1-2008

INPUT DATA PGM RUN *V1.0*

* Item Name	E-1004	* Description	PES21

DESIGN CONDITION

1) Material	SS400		2) Yield strength, Fy	29950	psi
3) Min. Tensile Stress, Fu	53960	psi	4) Design factor, Nd	3	
5) Lifting load "Y" direction(See Note 1)	550	lb	6) Impact load factor	1.8	

LUG DIMENSION

1) Hole Diameter, Dh	1.0	in	2) Width of Lug, w	3.0	in
3) Thickness of Lug, t	0.5	in	4) Outer radius, R	1.2	in
5) Weld leg length, Leg	0.65	in			

Note 1) Lifting load shall be applied to one lug only regardless of Lug Q'ty

RESULT OF CALCULATION

1) Applied load, W in "Y" direction	=550*1.8	990.0	lb

TENSILE STRESS

1) Ft=Fy/Nd for Allowable tensile stress (eq 3-1)	=29950/3	9,983.3	psi
2) A=t*(w-Dh), Area of tensile stress	=0.5*(3.0-1.0)	1.00	in^2
3) St=W/A for tensile stress	=990/1.00	990.0	psi
CHECK St, St < Ft		O.K	

SHEAR STRENGTH THROUGH PIN HOLE

1) Av=2*(R-(Dh/2) * Cos (Radians (45))))* t as per eq 3-50	=2*(1.2-(1.0/2)*(cos(45*3.14159/180)))*0.5	0.85	in^2
2) Pv=0.7*Fu/(1.2*Nd) *Av	=0.7*53960/(1.2*3.0)*0.85	8,881.1	lb

CHECK, Pv =W < Pv		O.K	

SHEAR STRESS IN WELD

1) Exx = Fu for Tensile strength of weld filler metal		53,960.0	psi
2) Fv = 0.6*Exx / (1.2*Nd) as per eq 3-53	=0.6*53960/(1.2*3)	8,993.3	psi
3) Aw = (2*w+2*t) * (0.707*Leg) for Area of weld	=(2*3.0)+(2*0.5)*(0.707*0.65)	6.46	in^2
4) Fw=Fv*Aw for Allowable weld load	=8,993.3*6.46	58,092.9	lb
CHECK, Fw = W < Fw		O.K	

MININUM WELD THROAT

1) Weld throat, wt		0.188	in
CHECK wt = Leg*0.705 >=throat 3-3		O.K	

UNIT OPTION

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