SPREADER BAR

I.D. Nº 20 COLOR OF BAR : _____

LOAD CAPACITY PAINTED
ON BAR 10 TONS.

DATE CAP. & I.D. Nº PAINTED
ON BAR 8-17-88

DATE OF LAST LOAD
TEST. August 9, 1988 & Aug 15, 1988

	SINGLE PICK POINT	USING TOP 2 PICK POINTS
TEST LOAD WEIGHT	11.4 TONS	12.15 TONS
TEST LOAD %	114%	122%

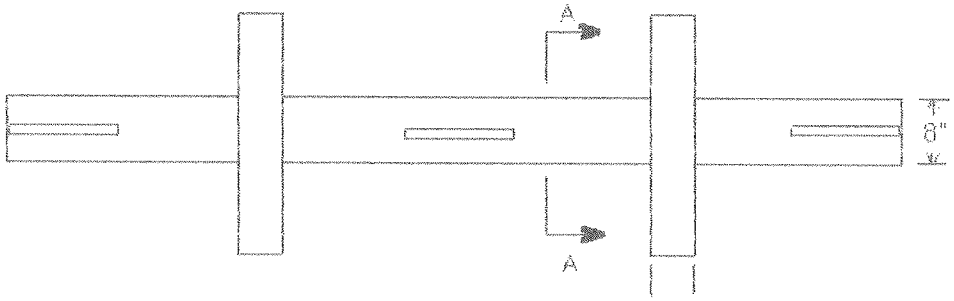
STRESS CALCULATIONS:
DONE BY BoseK

DATE Aug. 1988

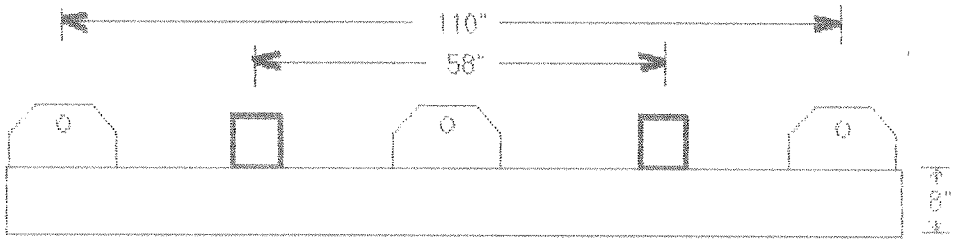
REMARKS : TESTED OK

Gray #20

Top

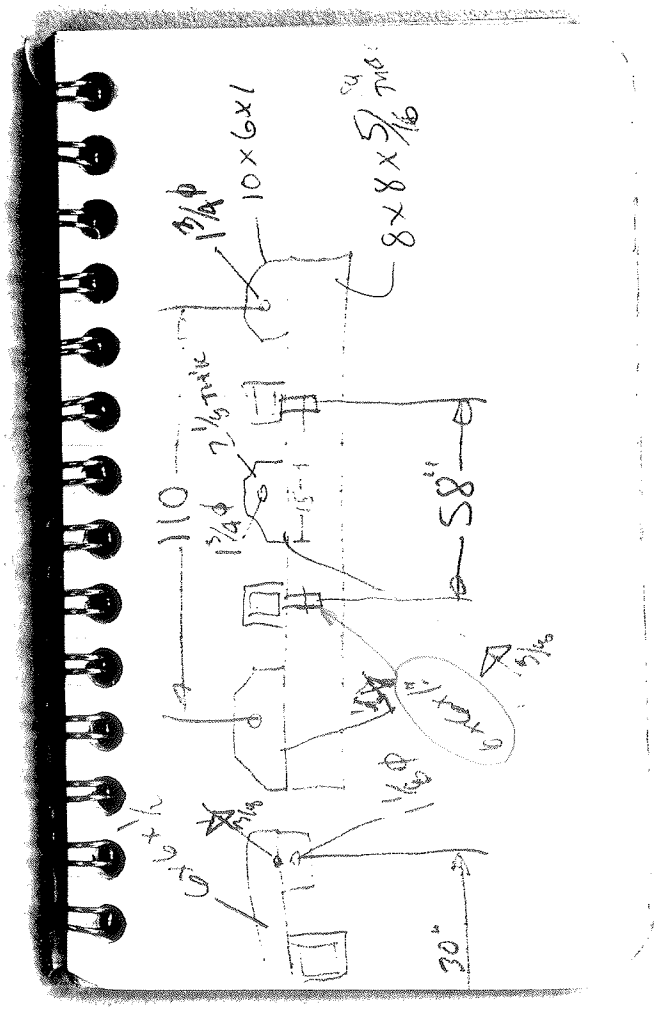


Side

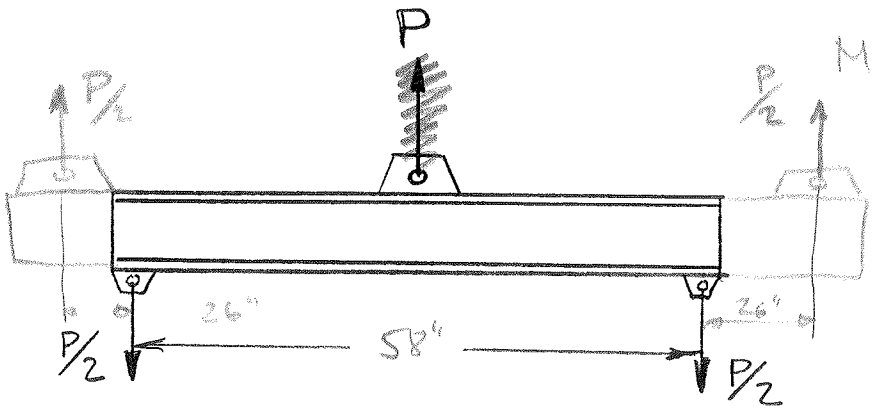


Section AA

BAR #20


110
30°
58°
8 x 8 x 5/16 TYP.
10 x 6 x 1
1 1/4 ϕ
1 1/4 ϕ
2 1/8 TYP.
1 1/2 x 6 x 0
6 x 4 x 1
5/16
5/16
1 1/4 ϕ

SPREADER BAR Nº 20 PAINT COLOR _____



MAIN BEAM END PIECE

BEAM SIZE 8 x 8 x 5/16 WALL SQ TUBE

$d = 8$

$L = 110$

$d/A_f = 3.2$

$S_x = 22$

$t_w = .625$

$A_w = d \cdot t_w = 5$

$M = \frac{PL}{4} = 13P$

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW} = 12{,}000$ psi

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{110 \times 3.2} = 34{,}090$ psi } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{12000 = 13P}{22}$ $P = 20307$ LBS. $= 10.15$ TONS

SHEAR STRESS:

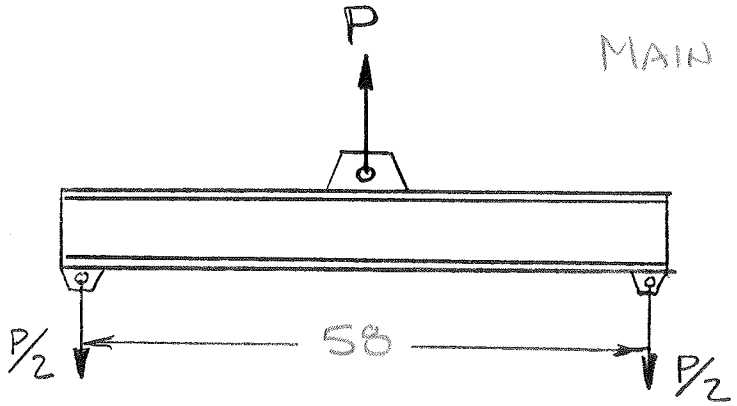
$F_{V\ ALLOW} = .4\,F_y = 4800$ psi

$\therefore f_{V\ MAX} = \frac{V}{A_w} =$ $P = 29$ TONS

SUMMARY: $\therefore P =$ 10 TONS

SPREADER BAR Nº 20 PAINT COLOR _____

MAIN BEAM



BEAM SIZE 8x8x5/16 WALL SQ. TUBE

$d = 8$

$L = 58$

$d/A_f = 3.2$

$S_x = 22\ IN^3$

$t_w = .625$

$A_w = d \cdot t_w = 5$

$M = \frac{PL}{4} = 14.5P$

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW} = 12{,}000\ psi$

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{58 \times 3.2} = 64655\ psi$ } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{12{,}000}{15{,}300} = \frac{14.5P}{22}$ ~~P = 18206~~ = ~~9.1~~ 11.6 TONS

SHEAR STRESS:

$F_{V\ ALLOW} = .4\,F_y = 4800\ psi$

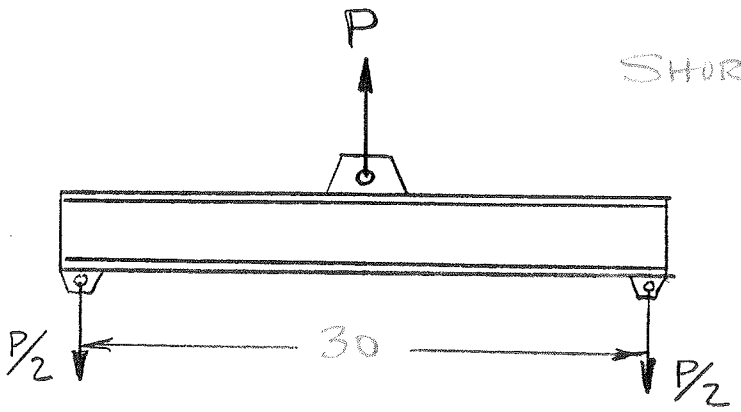
P = 24 TONS

$\therefore f_{V\ MAX} = \frac{V}{A_w} = \frac{4800}{2000} = \frac{P}{2 \times 5}$

SUMMARY: $\therefore P =$ _____ TONS

SPREADER BAR Nº 20 PAINT COLOR _____

SHORT HORIZONTAL BEAMS



BEAM SIZE 6x6x½ TAIL SQ. TUBE

$d = 6$

$L = 30$

$d/A_f = 2$

$S_x = 16.2$

$t_w = 1$

$A_w = d \cdot t_w = 12$

$M = \frac{PL}{4} = 7.5P$

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW} = 12{,}000$ psi

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{30 \times 2} = 200{,}000$ } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = 12{,}000 = \frac{7.5P}{16.2}$ $P = 25920$ LB $= 12.96$ TONS

SHEAR STRESS:

$F_{V\ ALLOW} = \frac{.4 F_y}{3} = 4800$ psi

$\therefore f_{V\ MAX} = \frac{V}{A_w} = \frac{4800}{2000} = \frac{P}{2 \times 12}$ $P = 57.6$ TONS

SUMMARY: $\therefore P =$ _____ TONS

SPREADER BAR #20

WELD STRENGHT AROUND CENTER EYE 5/8 FILLET

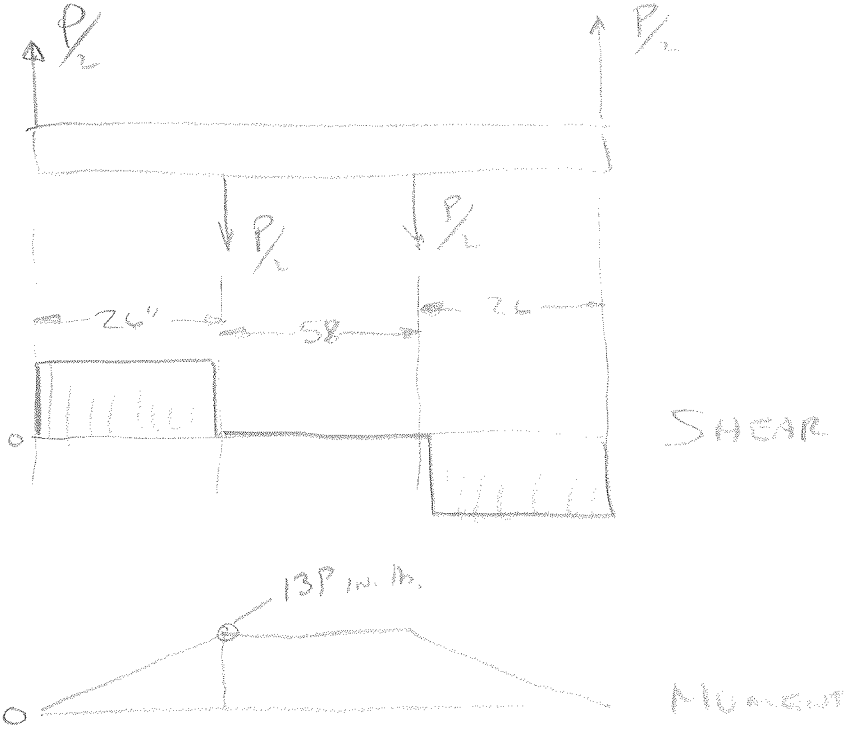
$$\left[15 \times 2 + 2\tfrac{1}{8} \times 2\right] \times \frac{4000}{2000} = 68.5 \text{ TONS}$$

SHACKLE CAP. 1¾ DIA = 17 TON

WELD STGHT AROUND OUTBOARD LOAD EYES. 3/8 FILLETS

$$\left(6 \times 2 + 1 \times 2\right) \times \frac{2900}{2000} = 16.8 \text{ TONS/EACH.}$$

SHACKLE CAP 1⅛ DIA = 6.5 TON.



WELD STRENGHT AROUND OUTBOARD MAIN BEAM EYES ½ FILLETS

$$\left(6 \times 2 + 1 \times 2\right) \frac{3200}{2000} = 22.9 \text{ TONS/EACH.}$$

SHACKLE CAP 1¾ DIA = 17 TON

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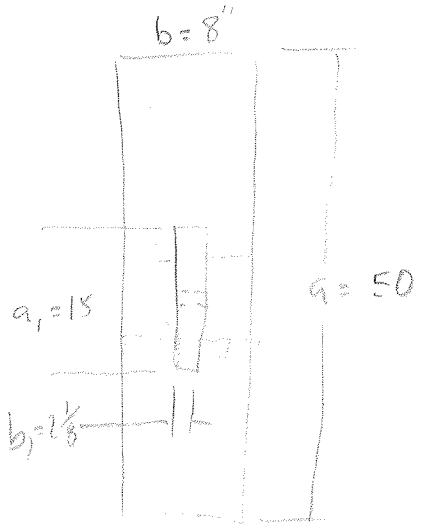


$\frac{a}{b} = 6.25$

$a = 6.25\,b$

If $a = 2b$

$\frac{a_1}{b} = \frac{15}{8} = 1.875$

$\frac{b_1}{b} = \frac{2.125}{8} = .2656$

$\therefore \beta = .53$

$$F_b = \beta \frac{W}{t^2}$$

$$12{,}000 = .53 \frac{W}{.3125^2}$$

$$W = 2211 \text{ lb.}$$

10 TONS - TEST AT 12.5 TON

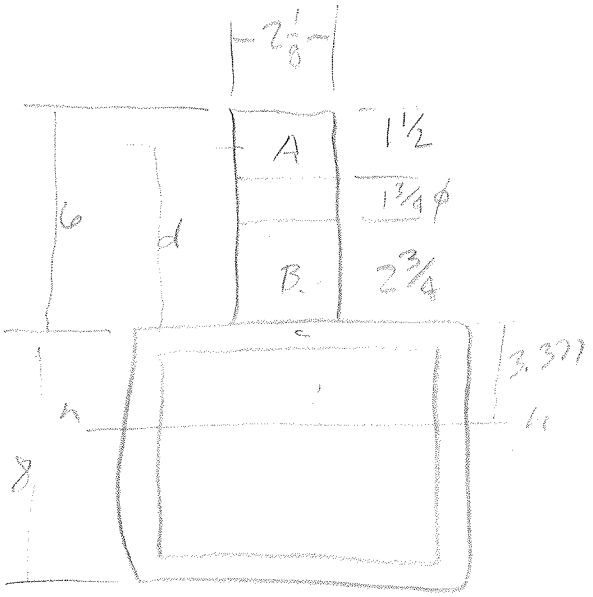
OR 3 1/8 TONS / PICK POINT

4 Q BLOCKS = $\frac{11.4}{10}$ = 114% OF CAPACITY

$\frac{11.4}{9}$ = 126.6% OF CAPACITY

4 "A" BLOCKS = $\frac{10.1 \text{ TON}}{10}$ = 101%

$\frac{10.1}{9}$ = 112.2%



	Area	d	A x d	I	h	A h²
A	3.1875	5.25	16.734	.5977	8.627	237.23
B	5.8437	1.375	8.035	3.6828	4.752	131.9595
c	9.125	4	36.76	88.1	.623	3.5469
	Σ 18.2212		Σ 61.529	Σ 92.3805		Σ = 372.756

$$h = \frac{\Sigma A d}{\Sigma A} = 3.377$$

$$I_{TOTAL} = \Sigma I + \Sigma A h^2 = 465.1365$$

$$S = \frac{I}{c} = \frac{I}{9.377} = 49.604 \text{ in}^4$$

$$F_b = \frac{M}{S} = 12{,}000 = \frac{19.5P}{49.604} \quad P = 20.5 \text{ TONS}$$

I.D. #20
TESTED 8-9-88

I.D. #20
TESTED 8-15-88

I.D. #20
TESTED 8-15-88