

# Calculation



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Job No: 22007-011-120/6050

Calculation No: BUF-96-108

Date: October 4, 1996

Subject: Compactor Pad Contact Stresses

Purpose: Estimate contact stresses of pads on Ingersoll Rand SD-100F and Caterpillar 433 compactors to check if the contact stresses of the IR SD-100F equal or exceed those of the CAT 433 and therefore could be expected to provide equal or greater kneading action.

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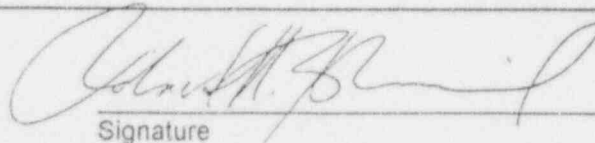
## References:

None.

## Approach:

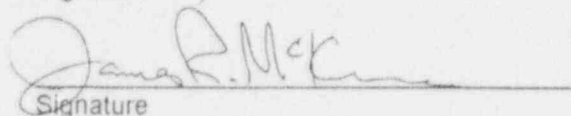
Assume pads sink into soil until soil contacts drum. Estimate portion of pads which will sink into soil on the basis of the included angle of the pads which sink into soil. Divide drum weight by the area of the portion of the pads which sink into soil.

Prepared by:

  
Signature

10/4/96  
Date

Checked by:

  
Signature

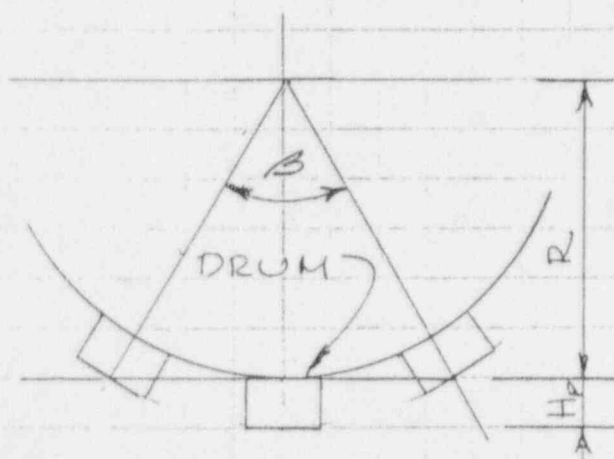
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Sheet 1 of 3

DATA PROVIDED BY SEVENSON (A.E.I.A 10/3/96)

PARAMETER	CAT 433	IR SD-100F
DRUM WEIGHT (LB)	8,030	15,880
$H_p$ = PAD HEIGHT (IN)	3.75	4
PAD AREA (IN <sup>2</sup> )	14	21
NUMBER OF PADS	96	120
$Z_R$ = DRUM DIAMETER (IN)	48	59
DRUM LENGTH (IN)	66	84



SECTION THROUGH DRUM

TO CHECK KNEADING ACTION,  
ASSUME PADS SINK TILL  
DRUM CONTACTS SOIL & CHECK  
STRESS ON PADS WHICH  
PENETRATE SOIL.

FOR CAT 433

$$\beta/2 = \cos^{-1} \frac{R}{R+H_p} = \cos^{-1} \frac{24}{24+3.75} = 30.1^\circ$$

$$\text{PAD AREA IN SOIL} = \frac{60.2}{360^\circ} (96)(14) = 224 \text{ IN}^2$$

$$\text{PAD STRESS} = \frac{8,030}{224} = 36 \text{ LB/IN}^2$$

Job No. 22007-D11-120/6050 Job MIXED WASTE POND CLOSUREClient BP CHEMICALS Subject COMPACTOR CONTACT STRESSESFOIL IR SD-100F

$$\beta/2 = \cos^{-1} \frac{29.5}{29.5 + 4} = 28.3^\circ$$

$$\text{PAD AREA IN SOIL} = \frac{56.6^\circ}{360^\circ} (120)(21) = 396 \text{ IN}^2$$

$$\text{PAD CONTACT STRESS} = \frac{15,880}{396} = 40 \text{ LB/IN}^2$$

CONTACT STRESS OF IR SD-100F IS GREATER THAN  
THAT OF THE CAT 433