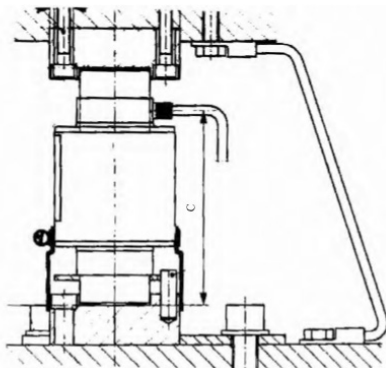


汽车衡用称重传感器受力旋转现象分析

[摘要]

[关键词]

一、引言



1.1



1.2

二、现有解决称重传感器旋转问题的方法列举

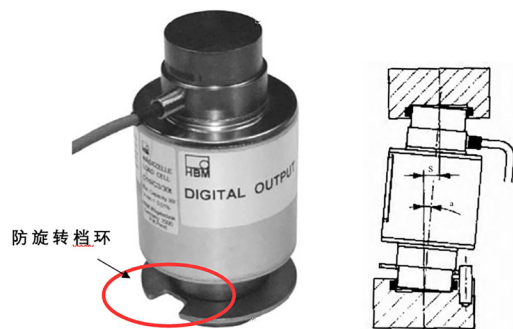
2.1

3mm~5mm

2mm~4mm

20mm

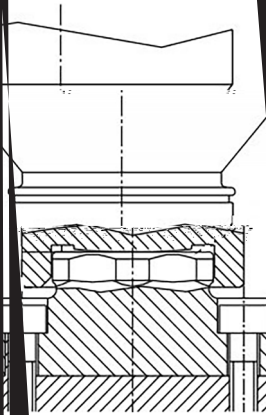
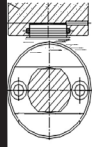
[1]



2.1

2.2

2.3



?

中厨

50t

JTG D60-2004

:

$$f < 1.5\text{Hz} \quad \mu = 0.05$$

$$1.5\text{Hz} \leq f \leq 14\text{Hz} \quad \mu = 0.176\ln f - 0.157$$

$$f > 14\text{Hz} \quad \mu = 0.45;$$

f (Hz)

$$\omega_{\text{秤体}} = \sqrt{\frac{48EI}{(M + \frac{17\rho l}{35})l^3}} \approx 8$$

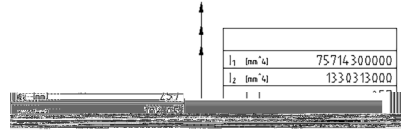
E—— 206000MPa

I—— 75.71× 109mm⁴

M—— 5t

l—— 6m

p—— 5t/6m=0.83t/m



$$f_n = \frac{8}{2\pi} = 1.27\text{Hz} , \quad 2\text{Hz} \quad 2$$

$$\mu = 0.176\ln f - 0.157 \approx 0.1$$

1.1

$$F_{\text{冲}} = \text{汽车载荷} \times \text{冲击系数} \times \text{放大系数} = 50\text{t} \times 0.1 \times 1.1 = 5.5\text{t}$$

E E z

32 33

AEB CED Z

E

yz x y

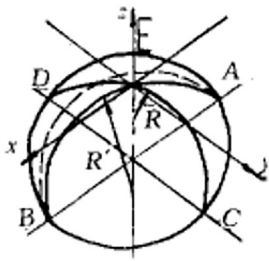
X Y z x1 x2 y1 y2

P z

a x b y

z z P₀

P



32

$$\frac{P^2}{P_0^2} + \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

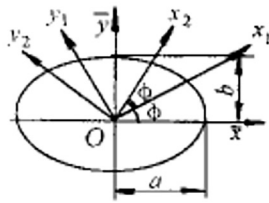
$$P = P_0 \sqrt{1 - \frac{x^2}{a^2} - \frac{y^2}{b^2}}$$

$R_1 \quad R_2$

$$a = b = 1.109^3 \sqrt{\frac{P R_1 R_2}{E R_1 - R_2}}$$

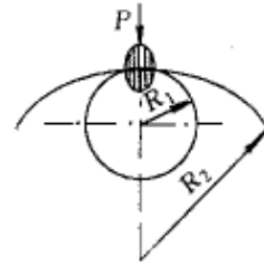
$$\sigma_{\max} = 0.388^3 \sqrt{PE^2 \left(\frac{R_2 - R_1}{R_1 R_2}\right)^2}$$

$$\delta = 1.231^3 \sqrt{\left(\frac{P}{E}\right)^2 \frac{R_2 - R_1}{R_1 R_2}}$$



P

$E_1 = E_2 = E$



33

a

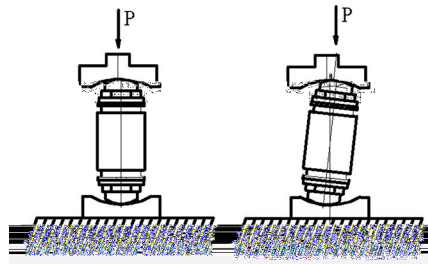
$\mu_1 = \mu_2 = 0.3$

P
P f

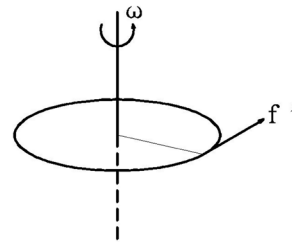
34

f

35



34



35

F

31

F'

2019

[参考文献]

- [1] . [J]. 2013 11
- [2] . [J]. 2013 11