http://www.engineeringinspiration.co.uk/brakecalcs.html

HYDRAULIC BRAKES

Brake Fluid Volume Requirements

When an hydraulic brake is applied fluid is required to move through the pipes. If the fluid source is a master cylinder it has a finite capacity. The following components need fluid:-

Foundation Brake Requirements

Brake fluid is required to take up running clearance.

$$V_{f1} = \frac{A \cdot Rc}{1000}$$

where :

V_{f1}	=	fluid volume to take up running clearance (cc
A	=	total piston area (mm^2)
Rc	=	running clearance (mm^2)

It is also needed to compensate for lack of stiffness of the brake housing. For a disc brake the following approximation can be used:

$$V_{f2} = p \cdot (0.007 d_p - 0.2365)$$

where :

V_{f2}	=	fluid volume to take up disc brake housing sti
p	=	pressure in brake system (MPa)
d_p	=	brake piston diameter (mm)