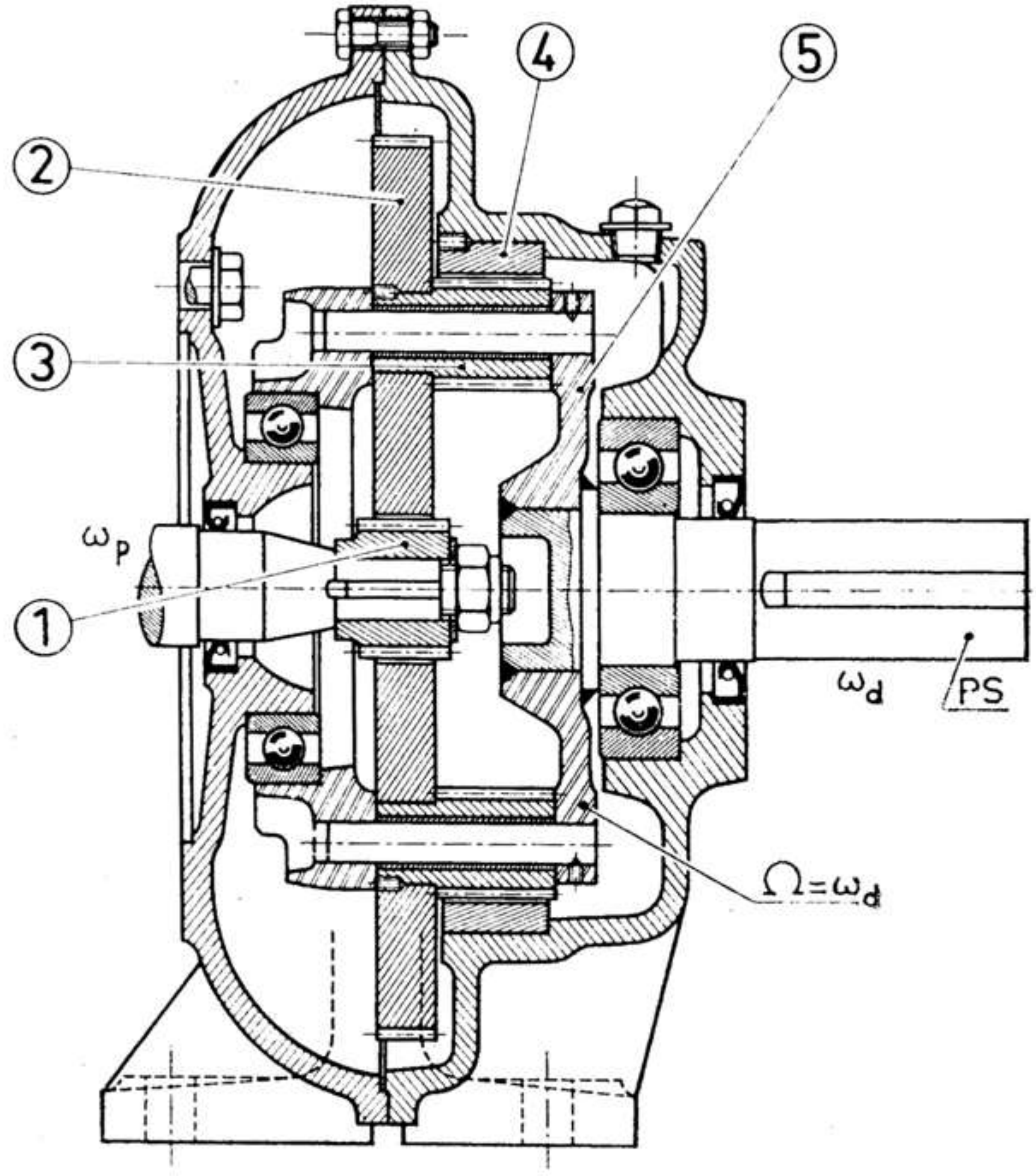
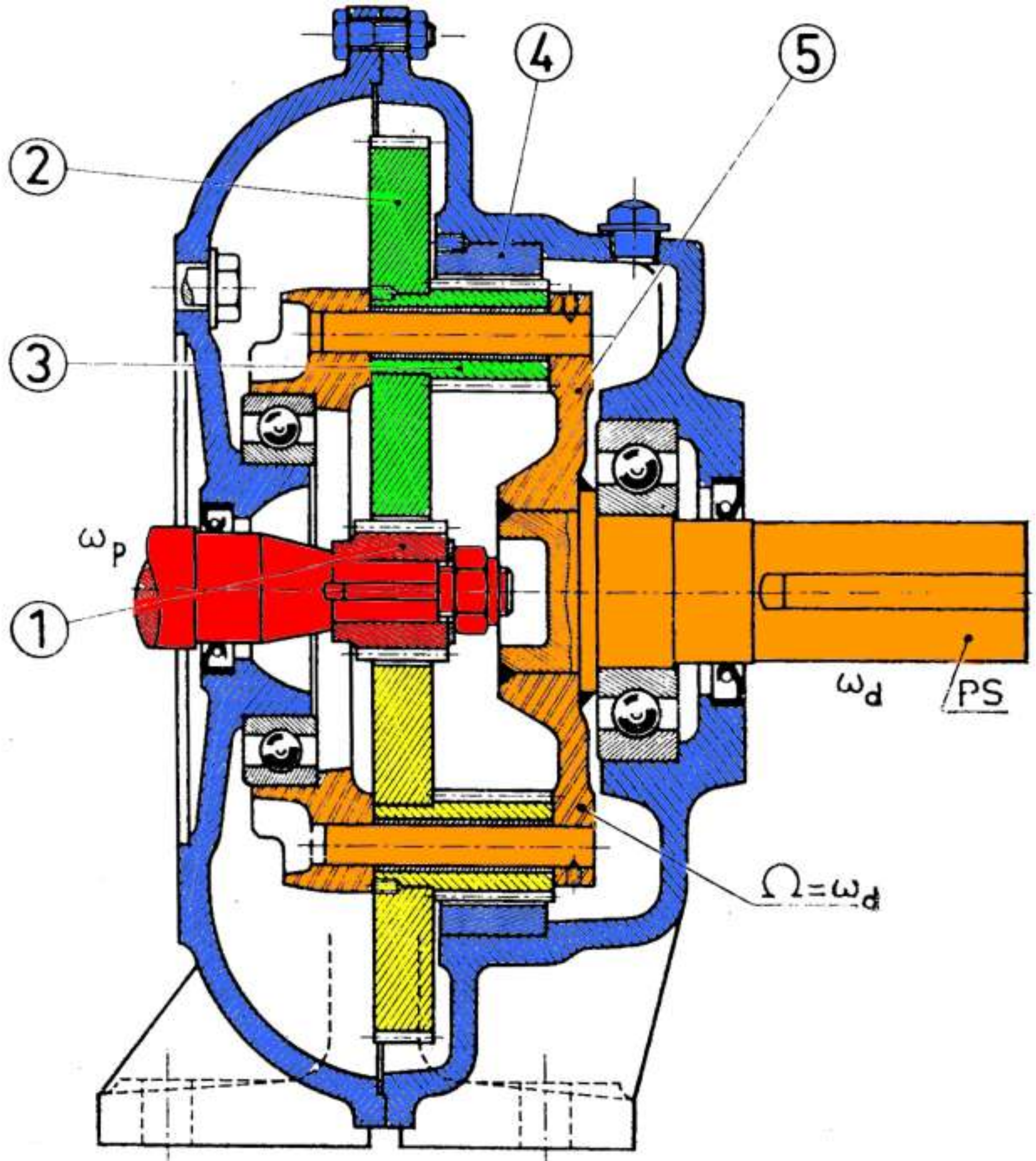
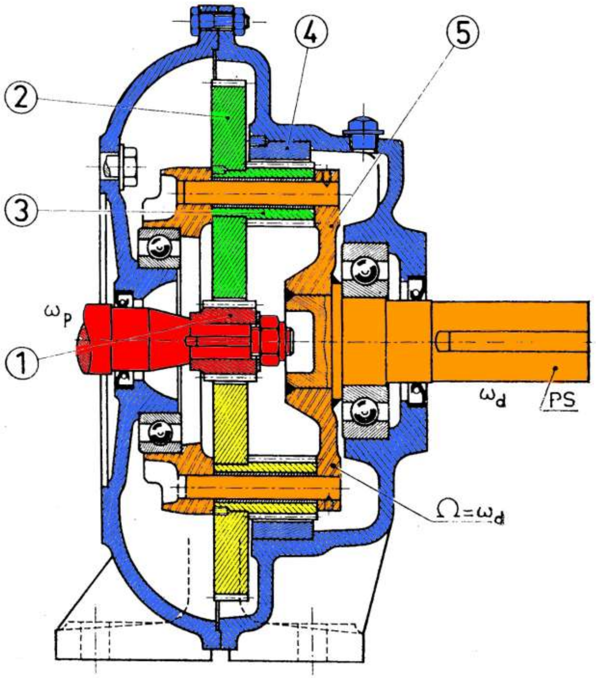


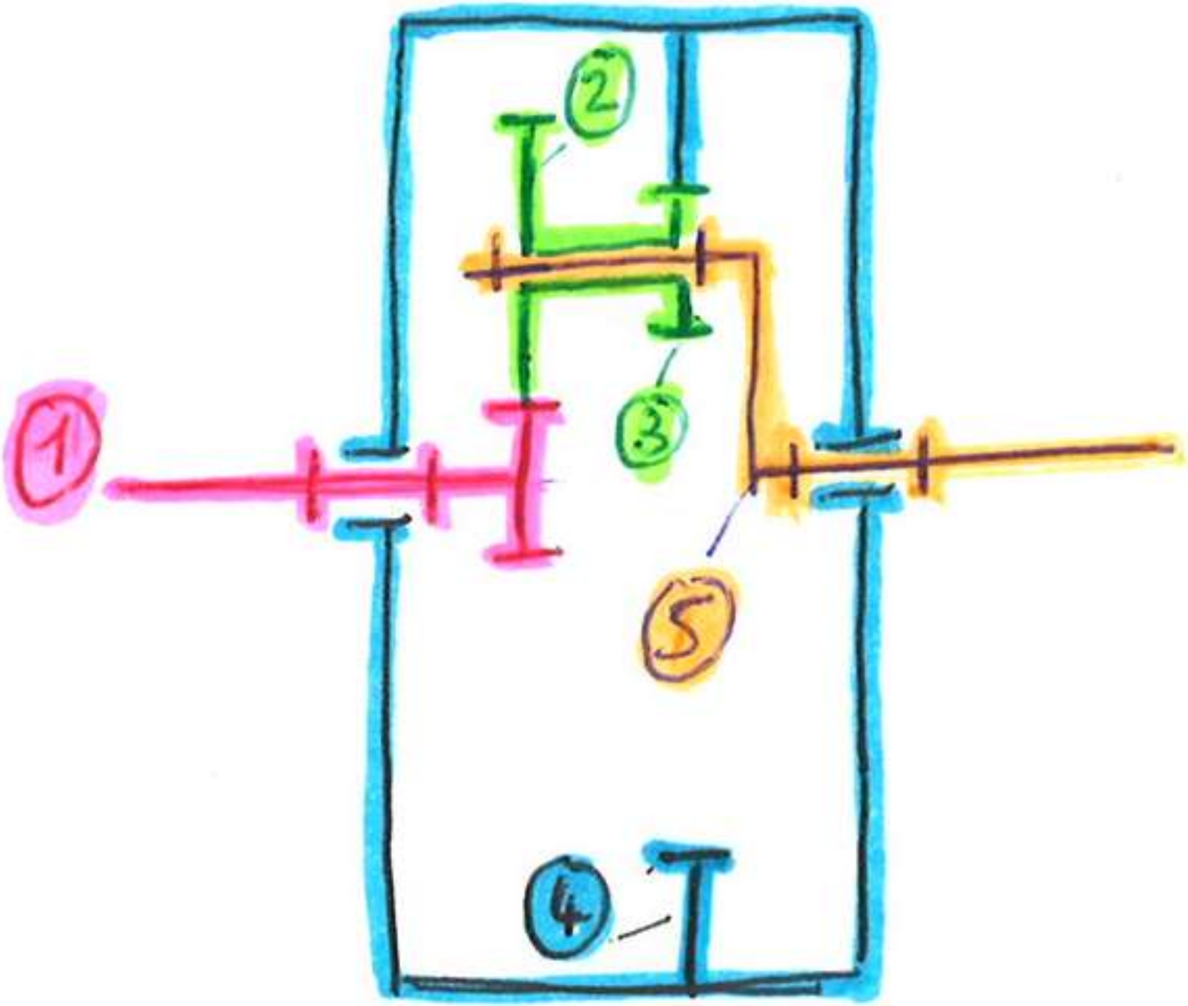
4
5
2
3
ωp
1
ωd
PS
Ω=ωd

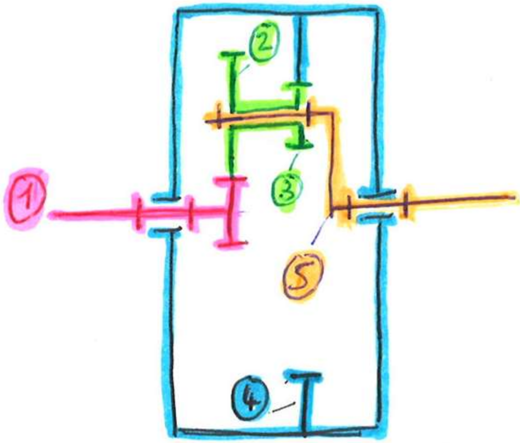


4
5
2
3
ωp
1
ωd
PS
Ω=ωd

Schéma cinématique





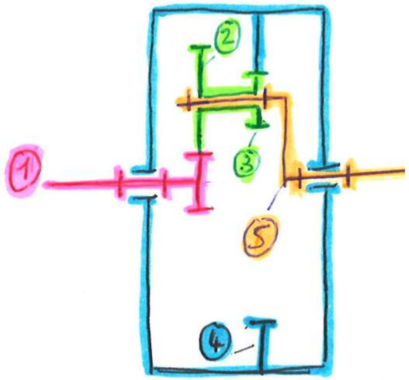


Relation cinématique.

On se place sur le porte satellite (5), on suppose que (1) est l'entrée et (4) la sortie.

$$\frac{\omega_{4/PS}}{\omega_{1/PS}} = (-1)^1 \cdot \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4}$$

$$\frac{\omega_{4/0} - \omega_{5/0}}{\omega_{1/0} - \omega_{5/0}} = - \frac{Z_1}{Z_2} \cdot \frac{Z_3}{Z_4}$$



Relation cinématique.

On se place sur le porte satellite ⑤, on suppose que ① est l'entrée et ④ la sortie.

$$\frac{\omega_{4/PS}}{\omega_{1/PS}} = (-1)^1 \cdot \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4}$$

$$\frac{\omega_{4/0} - \omega_{5/0}}{\omega_{1/0} - \omega_{5/0}} = - \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4}$$

AN : $Z_1 = 20$ planétaire

$Z_2 = 60$ } satellite
$Z_3 = 20$ }

$Z_4 = 100$ couronne

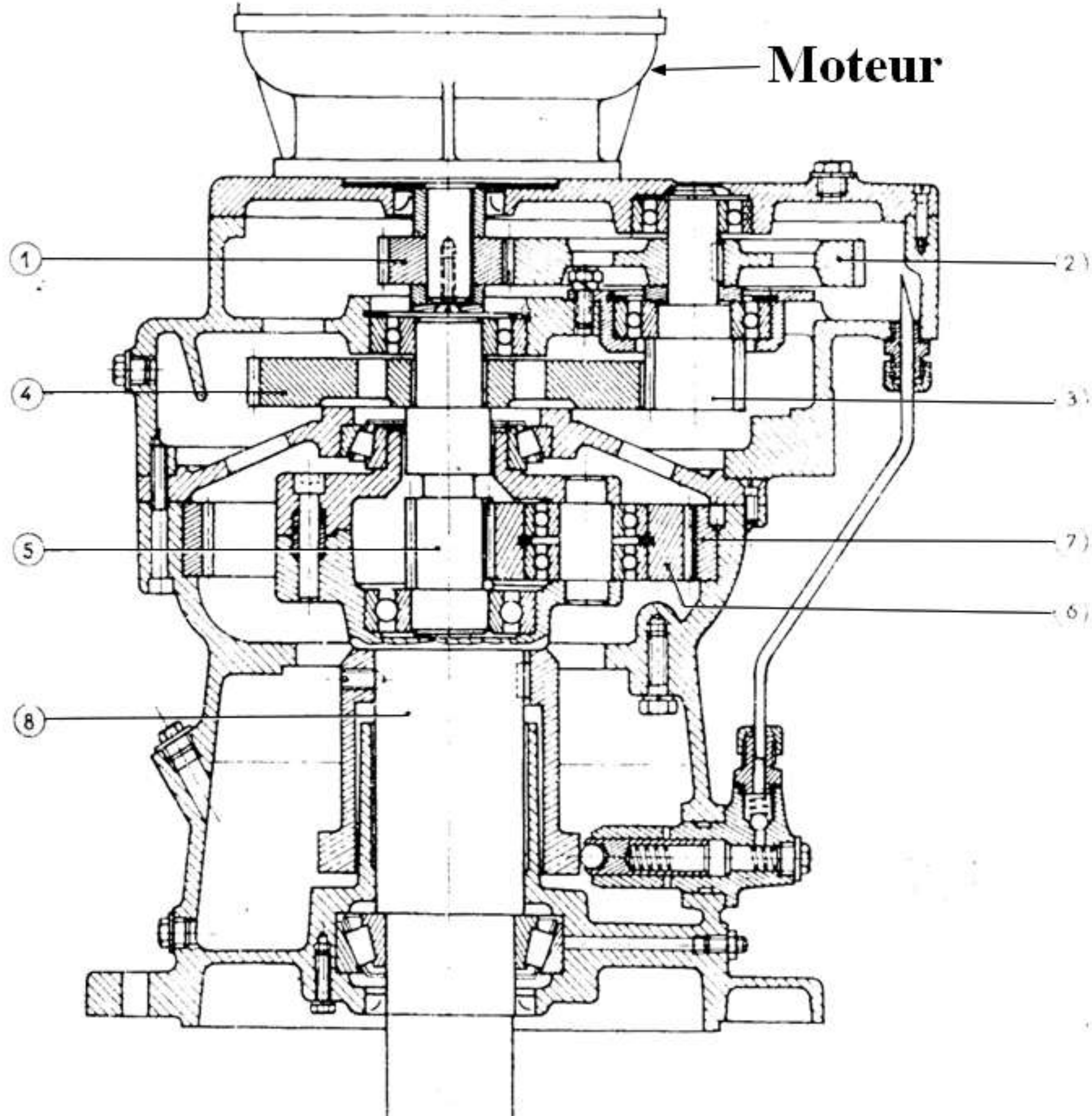
⑤ Porte satellite

$$\frac{\omega_{4/0} - \omega_{5/0}}{\omega_{1/0} - \omega_{5/0}} = - \frac{20}{60} \times \frac{20}{100} = -0,00667 \quad \left(= -\frac{1}{15}\right)$$

Or $\omega_{4/0} = 0$ car lié au bâti

$$\Rightarrow \frac{-\omega_{5/0}}{\omega_{1/0} - \omega_{5/0}} = -\frac{1}{15} \Rightarrow -15 \cdot \omega_{5/0} = -\omega_{1/0} + \omega_{5/0}$$

$$\Rightarrow \boxed{\omega_{1/0} = 16\, \omega_{5/0}}$$


Moteur
1
2
4
3
5
7
6
8

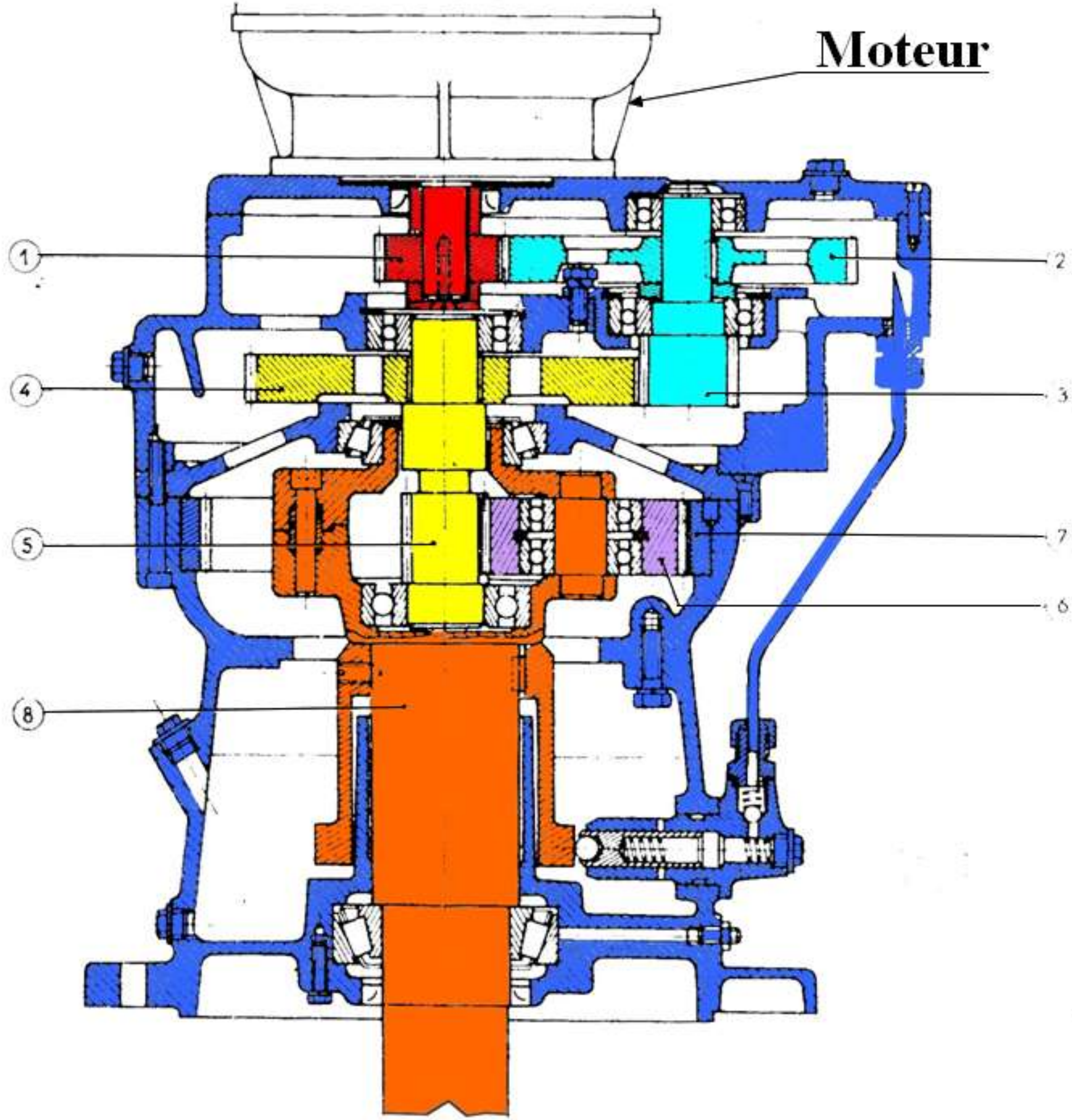

Moteur
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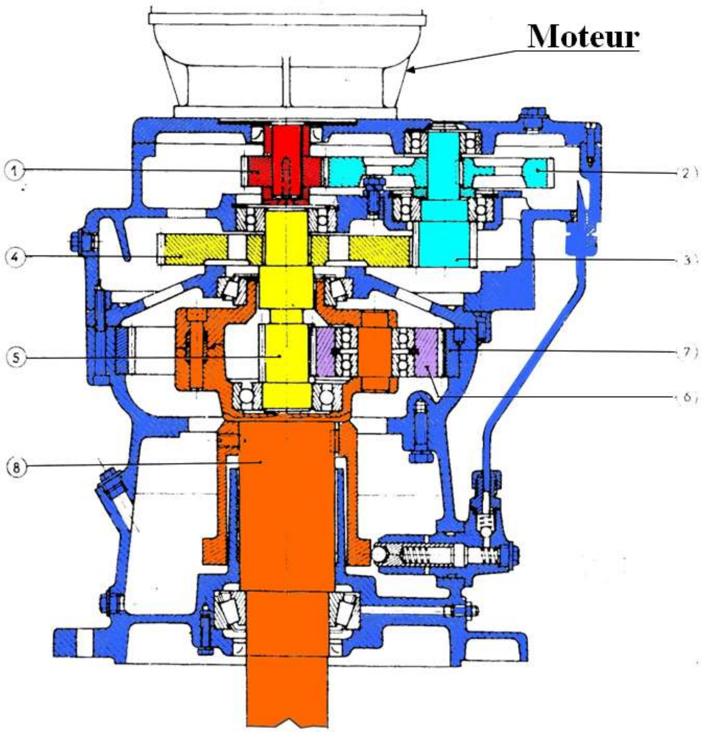
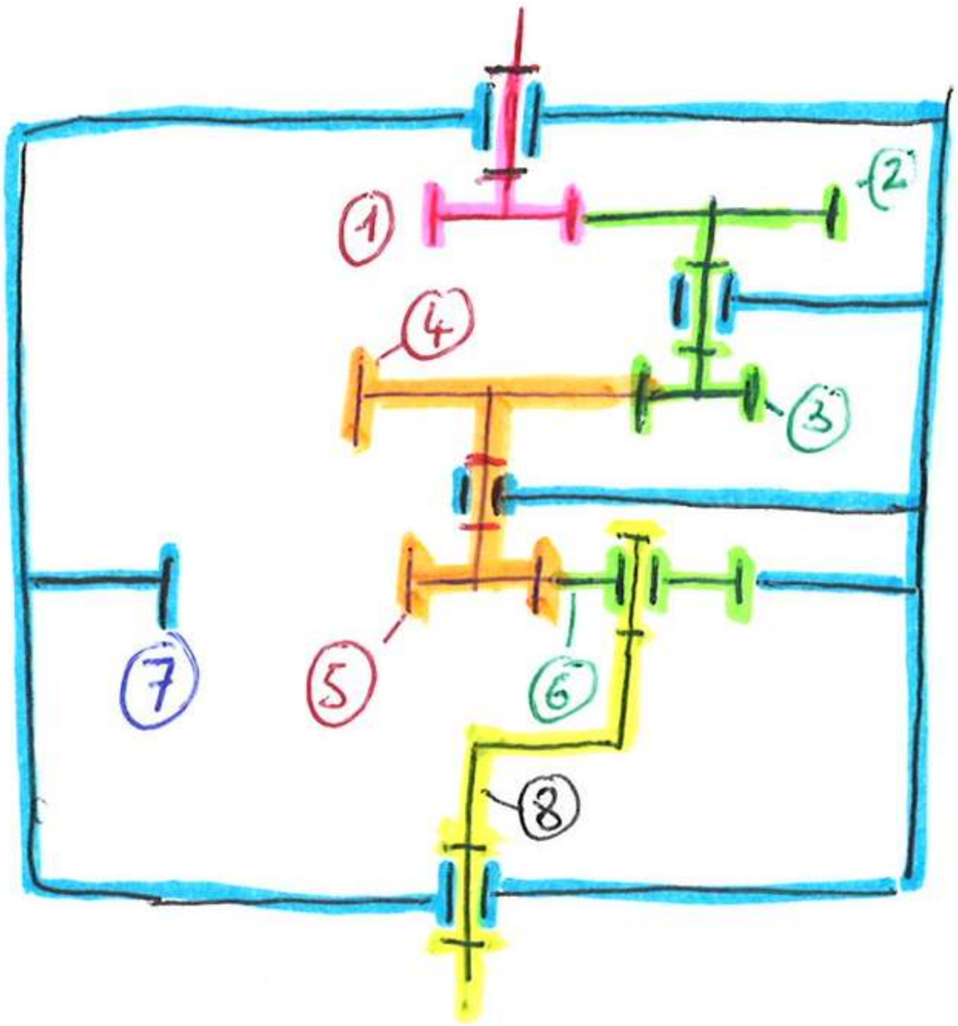
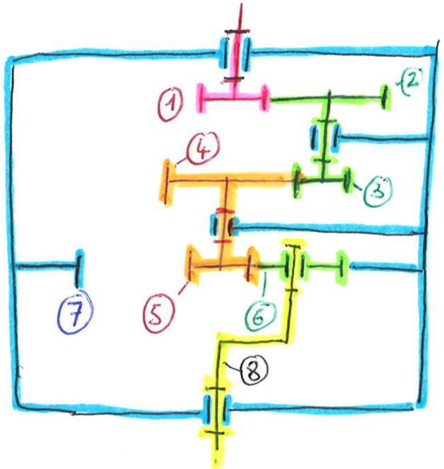
Schéma cinématique







Relation cinématique

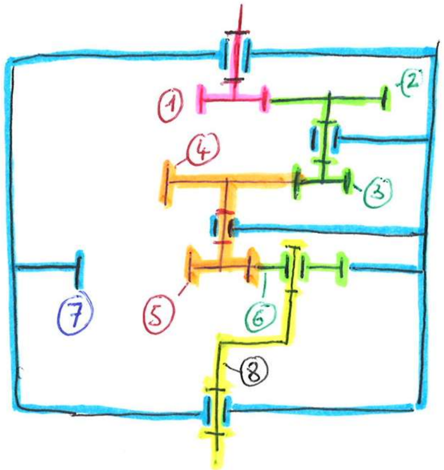
1er train 1/2/3/4 → Train simple

$$\frac{\omega_{4/0}}{\omega_{1/0}} = (-1)^2 \cdot \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4} = \frac{20}{48} \times \frac{16}{52} = \frac{5}{39}$$

2ème train → Train épy.

On se place sur le porte satellite ⑧.

$$\frac{\omega_{7/8}}{\omega_{5/8}} = (-1)^1 \times \frac{Z_5}{Z_6} \times \frac{Z_6}{Z_7} = -\frac{Z_5}{Z_7} = -\frac{14}{82} = -\frac{7}{41}$$



Relation cinématique

1er train 1/2/3/4 → train simple

$$\frac{\omega_{4/0}}{\omega_{1/0}} = (-1)^2 \cdot \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4} = \frac{20}{48} \times \frac{16}{52} = \frac{5}{39}$$

2ème train → train épy.

On se place sur le porte satellite ⑧.

$$\frac{\omega_{7/8}}{\omega_{5/8}} = (-1)^1 \times \frac{Z_5}{Z_6} \times \frac{Z_6}{Z_7} = -\frac{Z_5}{Z_7} = -\frac{14}{82} = -\frac{7}{41}$$

$$\frac{\omega_{7/0} - \omega_{8/0}}{\omega_{5/0} - \omega_{8/0}} = -\frac{7}{41}$$ Or 7 est fixe

$$\frac{0 - \omega_{8/7}}{\omega_{5/7} - \omega_{8/7}} = -\frac{7}{41} \rightarrow -\omega_{8/7} = -\frac{7}{41}\left(\omega_{5/7} - \omega_{8/7}\right)$$

$$+\frac{7}{41} \cdot \omega_{5/7} = \omega_{8/7}\left(1 + \frac{7}{41}\right)$$

Or $\omega_{5/7} = \omega_{4/7} = \frac{5}{39} \times \omega_{1/7}$ (Relation du 1er train)

$$\frac{7}{41} \times \frac{5}{39} \times \omega_{1/7} = \omega_{8/7}\left(1 + \frac{7}{41}\right) = \omega_{8/7}\left(\frac{48}{41}\right)$$

$$\boxed{\omega_{8/7} = \frac{7 \times 5}{39 \times 48} \cdot \omega_{1/7}} \quad \boxed{\simeq \frac{1}{53,5} \cdot \omega_{1/7}}$$