TS Airbus A320 le 01/02/18

1 Machine au fonctionnement nominal

1.1 $f = 400\,Hz \longrightarrow \omega = 2\pi f = \boxed{2513\,rad/s = \omega_N}$

1.2 $f = 400\,Hz$ et $N_{r/0} = N_{s/0} = 12000\,tr/min = \frac{60.F}{p}$

$\rightarrow p = \frac{60 \times 400}{12000} = 2 \Rightarrow$ 4 pôles. $\boxed{p = 2}$

1.3 $S_N = 3 V_N . J_N = 80.10^3\,VA \rightarrow J_N = \frac{20\,000}{3 \times 115}$

$\boxed{J_N = 261\,A}$

2) Modèle de Behn Eschenburg.

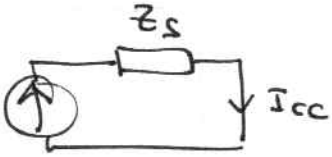
Essai à vide à N_N $J_e \longrightarrow E_V = K.J_e = V$

i.e. $J_e = 50\,A$ $E_V = 220\,V$ Courbe $K = \frac{220}{50} = 4,4\,V/A$ à N_N = 12000 tr/min

Essai en ch $\Rightarrow V = 0$

2.1. et $I_{cc} = 3,07\,I_e$ pour $I_e = 50\,A$

$= 153,5\,A$



AN

$Z_S = \frac{E_V}{I_{cc}}$ pour I_e donné $\Rightarrow Z_S = \frac{220}{153,5} = 1,43\,\Omega$

$\boxed{Z_S = 1,43\,\Omega}$

2.2 $Z_S = \sqrt{R_S^2 + X_S^2} \Rightarrow X_S = \sqrt{Z_S^2 - R_S^2} \Rightarrow X_S \simeq 1,43\,\Omega$

R_S négligeable.

3) Point nominal de fonct $\rightarrow J_e = ?$

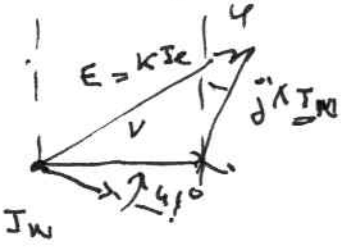
3.1 $k_e = 4,4\,V/A$ pour $N_n = 12000$ tr/min $\boxed{E = K.J_e \frac{N_n}{12000}}$

$E = K \varphi . \Omega$

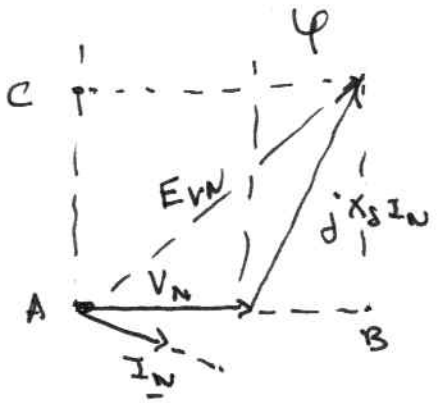
V / Wb

3.2 A vide $I = 0$ $E_V = V = 115\,V \longrightarrow J_e = \frac{115}{4,4} = 26,1\,A$

3.3 En charge $I_N = 461\,A$ et $\varphi = \text{Arc cos } 0,75 = 41,4°$.



$E =$



Point nominal

$E_{VN} = \sqrt{(AB)^2 + (AC)^2}$

$\Rightarrow AB = V_N + X_S I_N \sin\varphi$

$AC = X_S I_N \cos\varphi$.

$E = \sqrt{(V_N + X_S I_N \sin\varphi)^2 + (X_S I_N \cos\varphi)^2}$

$= 1$

$X_S I_N = 373\,V$

$E = \sqrt{V_N^2 + 2 X_S I_N \sin\varphi + (X_S I_N)^2}$

$\sqrt{115^2 + 2 \cdot 1{,}43 \cdot 261 \cdot \sin 41{,}4^\circ + (1{,}41 \cdot 261)^2}$

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$= \sqrt{149\,150}$

$E = \sqrt{(115 + 373 \sin 41{,}4^\circ)^2 + (373 \cos 41{,}4^\circ)^2} = 386\,V$

$= \sqrt{361^2 + 280^2} = 456\,V = E_{VN}$

$I_e = \frac{E_{VN}}{K} = \frac{456}{4{,}4} \simeq 103\,A = I_{eN}$

si $\varphi < 0 = -41{,}4^\circ \Rightarrow$ Nouveau tracé