Transformers

① $\frac{N_s}{N_p} = \frac{V_s}{V_p}$

$\frac{1}{13} = \frac{V_s}{120}$

$V_s = \frac{1(120)}{13} = \boxed{9.23\ V}$

② $\frac{N_s}{N_p} = \frac{V_s}{V_p}$

$\frac{N_s}{21} = \frac{4320}{120}$

$N_s = \frac{21(4320)}{120} = \boxed{756}$

③ Step down (voltage drops from 120 V to 10 V)

$\frac{N_s}{N_p} = \frac{V_s}{V_p} = \frac{10}{120} = \boxed{\frac{1}{12}}$

④ $\frac{N_s}{N_p} = \frac{I_p}{I_s}$

$\frac{1}{8} = \frac{I_p}{3.4}$

$I_p = \frac{1(3.4)}{8} = \boxed{0.425\ A}$

⑤ $\frac{N_s}{N_p} = \frac{V_s}{V_p}$

$\frac{43}{1} = \frac{V_s}{120}$

$V_s = \frac{120(43)}{1} = 5160\ V$

$P = IV$

$= (1.5 \times 10^{-3})(5160)$

$P = \boxed{7.74\ W}$

⑥ $P = IV$

$95 = (5.3 \times 10^{-3})V$

$V = \frac{95}{5.3 \times 10^{-3}} = 17\,924.528\ V$

$\frac{N_s}{N_p} = \frac{V_s}{V_p} = \frac{17\,924.528}{120} = \boxed{\frac{149}{1}}$