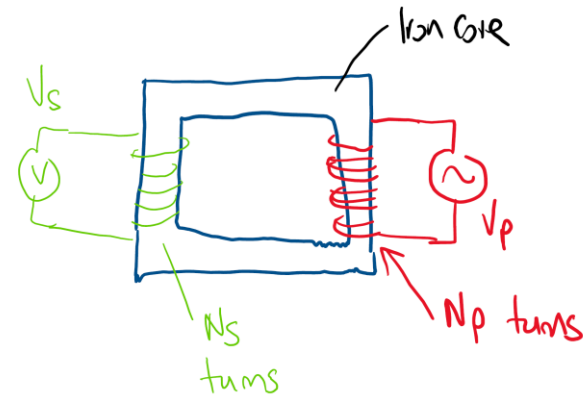


TRANSFORMER INVESTIGATION

Andy French, Winchester College P5, 30/10/2020

All voltages and currents are RMS AC (50Hz).

No secondary coil		With secondary coil				Predicted		Predicted	Measured
Primary voltage V_p /V	Primary current I_p /A	Primary voltage V_p /V	Primary current I_p /A	Primary turns N_p	Secondary turns N_s	N_p/N_s	Secondary voltage V_s /V	Secondary current I_s /A	Secondary voltage V_s /V
2.12	2.82	2.24	0.08	120	5	24.0	0.093	67.7	0.09
2.12	2.84	2.24	0.08	120	7	17.1	0.131	48.7	0.127
2.12	2.82	2.24	0.09	120	9	13.3	0.168	37.6	0.162
2.12	2.82	2.24	0.09	120	11	10.9	0.205	30.8	0.199
2.12	2.85	2.24	0.08	120	13	9.2	0.243	26.3	0.236
2.12	2.85	2.24	0.17	120	15	8.0	0.280	22.8	0.27
2.12	2.82	2.24	0.07	120	17	7.1	0.317	19.9	0.309
2.12	2.86	2.24	0.07	120	19	6.3	0.355	18.1	0.344
2.12	2.87	2.24	0.07	120	21	5.7	0.392	16.4	0.382
2.12	2.88	2.24	0.07	120	23	5.2	0.429	15.0	0.419
2.12	2.88	2.24	0.07	120	25	4.8	0.467	13.8	0.455
2.12	2.89	2.24	0.06	120	27	4.4	0.504	12.8	0.493
2.12	2.90	2.25	0.07	120	29	4.1	0.544	12.0	0.535
2.22	0.97	2.24	0.00	240	29	8.3	0.271	8.0	0.268
2.22	0.99	2.25	0.00	240	27	8.9	0.253	8.8	0.249
2.22	0.99	2.25	0.00	240	25	9.6	0.234	9.5	0.222
2.23	0.99	2.25	0.00	240	23	10.4	0.216	10.3	0.203
2.22	0.98	2.25	0.00	240	21	11.4	0.197	11.2	0.185
2.21	0.99	2.24	0.00	240	19	12.6	0.177	12.5	0.166
2.21	1.00	2.24	0.00	240	17	14.1	0.159	14.1	0.147
2.21	0.99	2.23	0.00	240	15	16.0	0.139	15.8	0.128
2.2	0.98	2.23	0.00	240	13	18.5	0.121	18.1	0.11
2.2	0.98	2.23	0.00	240	11	21.8	0.102	21.4	0.091
2.2	0.99	2.25	0.00	240	9	26.7	0.084	26.4	0.074
2.22	1.00	2.25	0.00	240	7	34.3	0.066	34.3	0.055
2.22	1.00	2.25	0.00	240	5	48.0	0.047	48.0	0.037



Ideal situation (no losses
ignore mutual induction etc)

$$\frac{V_p}{V_s} = \frac{N_p}{N_s}$$

$$I_p V_p = I_s V_s$$

(Faraday's law
but no back EMF
etc)

(100% power
transmission)

