

QUESTION 12 (18 marks)

Based on the Entity concept parameters detailed below:

IS POWER SUPPLY		IS SOLENOID	
U ₀	11.2V	U ₁	12V
I ₀	2A	I ₁	2.5A
C ₀	15 μ F	C ₁	10 μ F
L ₀	95mH	L ₁	5mH
L/R	50 μ H/10m		

Cable Parameters are: Capacitance = 8 fF/m
Inductance = 0.5 μ H/m
L/R = 80 μ H/10m

- Given the capacitance values for the power supply, cable and solenoid, what will be the maximum permitted cable length? (2 Marks)
- In considering your answer for part a), and the inductance values of each component, what can the maximum length of the cable be? (2 Marks)
- The solenoid is controlled from an output of the relay mounted in the main enclosure on the machine. The output contact of the relay is not shown in the parameter drawing above. Does it need to be considered when evaluating the circuit parameters? (1 Mark)
- What information would you expect to be displayed on the nameplate of the solenoid? (2 Marks)
- The label on the solenoid has "T2" marked on it. What specific installation requirement would have to be in place for this solenoid to be used on a continuous miner? (1 Mark)

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Ying-Ying Zheng



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