U2
USBC – PD – 20V

VBUS A9

CC1 A5
CC2 B5

SHIELD GND
S1 A12

+20V

SOLN1
24V 400mA

J2
2 1

1000uF 50V (35V min)
C4

1N5408
D2

D1
1N5408

LED2
GREEN VF 3.2 IF 20mA

C1
100–470uF

U3
LM7812
VI GND VO
1   2   3

C2
0.33uF

C3
0.1uF

R5
470

R3
470

Q1
IRLZ44N

R4
220

R7
100K

J1
SIGNAL

R1
1K

U1
PC817
1 4
2 3

R2
470

LED1
BLUE VF 3.2 IF 20mA

Solenoid 24V 400mA (Max 24V 2A)
USBC Power 65W (Min 45W)

Signal 9V Battery (3V–12V) (Isolated via Optocoupler)
Leon Springs Baptist Church AWANA Program

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Title: Pinewood Derby Starting Gate Solenoid

| Size: A5 | Date: 2026–02–02 | Rev: 4 |
| KiCad E.D.A. 9.0.7 | | Id: 1/1 |