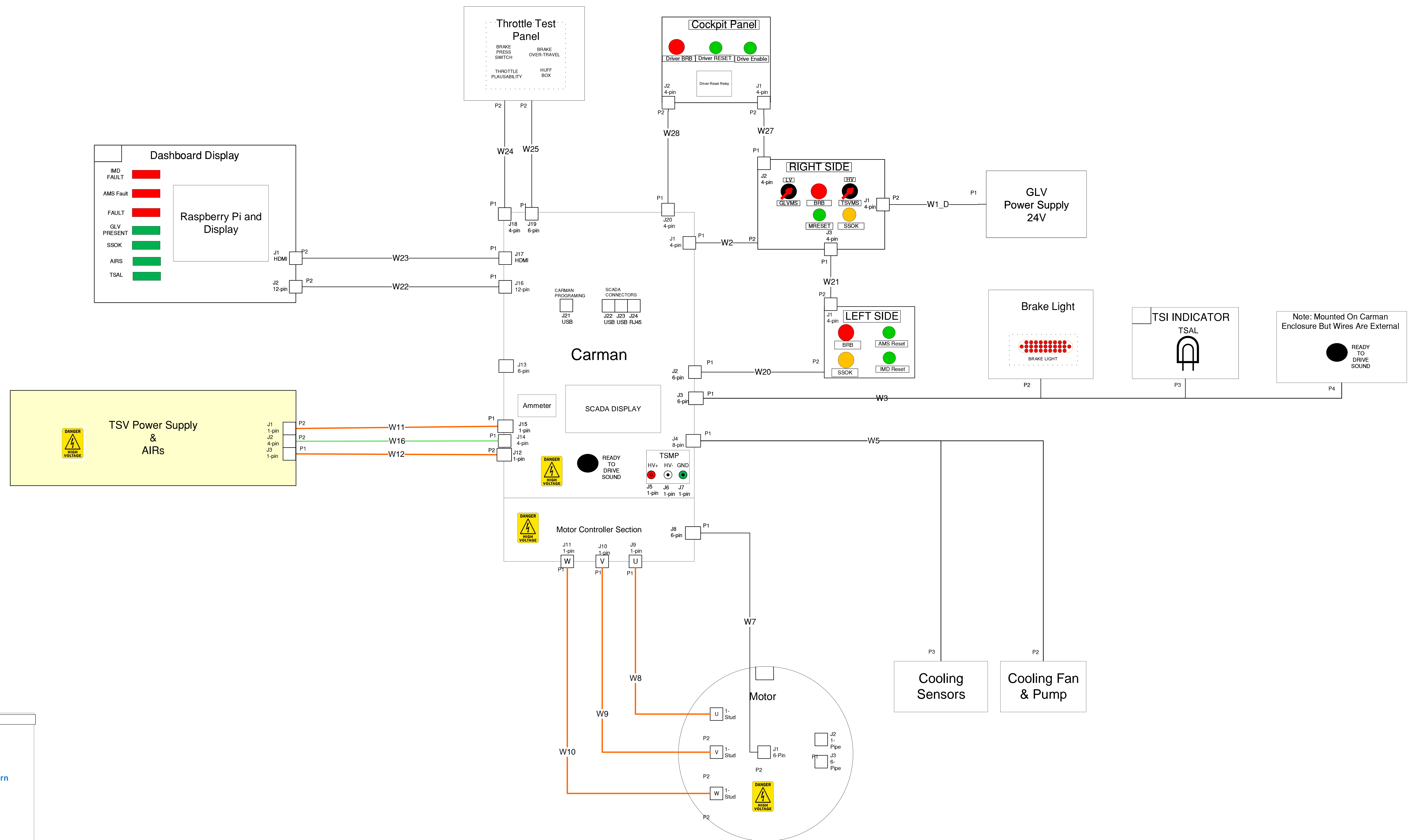


Legend

- HV Shielded
- Six pin CAN and GLV Power/Return
- Safety Loop
- GLV

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DRAWN BY Benjamin Surman					
APPROVED BY ECE		TITLE <b>LCFSAE ELECTRICAL SYSTEM DIAGRAM</b>			
APPROVED BY ME		SIZE DWG NO		ASSIGNMENT	
DATE 2021 - 03 - 23		F TOP LEVEL		SENIOR DESIGN I1	
		COURSE		SHEET	
		TOP LEVEL		1 OF 4	
				REV 2.1.9	



Legend

- HV Shielded
- Six pin CAN and GLV Power/Return
- Safety Loop
- GLV

EDITED BY				<b>LAFAYETTE</b>	Lafayette College Easton, Pa ECE Department
DRAWN BY	Benjamin Surman				
APPROVED BY ECE				TITLE <b>LCFSAE DYNO ROOM ELECTRICAL SYSTEM DIAGRAM</b>	
APPROVED BY ME				SIZE	DWG NO
DATE	2021 - 04 - 01			F	TOP LEVEL
				ASSIGNMENT	REV
				SENIOR DESIGN I1	2.1.9
				COURSE	SHEET
				TOP LEVEL	2 OF 4

**Instance Wiring List**

Discription Of Connection	Connects To	Conn Name	Pin Out (Of Housing/Connector)	Signal	Cable	Wire	Signal	Pin Out (Of Housing/Connector)	Conn Name	Connects To
GLV Battery	GLV Battery	P1	1	GLV+	W1	W1.1	GLV+	+ TERMINAL	P2	RIGHT SIDE PANEL J1
			2	GLV_RTN (TO BATT)		W1.2	GLV_RTN (TO BATT)	- TERMINAL		
Right Side Panel	CARMAN J1	P1	1	SL (TSVMS_RTN)	W2	W2.1	SL (TSVMS_RTN)	1	P2	RIGHT SIDE PANEL
			2	SL (MRESET+)		W2.2	SL (MRESET+)	2		
			3	OIL_RTN & MRESET_COIL		W2.3	COIL_RTN & MRESET_COIL	3		
			4	SAFE_LED (SSOK)		W2.4	SAFE_LED (SSOK)	4		
BRAKE LIGHT, TSAL, AND RTDS	CARMAN J3	P1	1	BP_LIGHT+	W3	W3.1	BP_LIGHT+	1	P2	BRAKE LIGHT
			2	BP_LIGHT_RTN		W3.2	BP_LIGHT_RTN	2		
			3	TSAL+		W3.3	TSAL+	3	P3	TSAL
			4	TSAL_RTN		W3.4	TSAL_RTN	4		
			5	RTDS+		W3.5	RTDS+	5		
			6	RTDS_RTN		W3.6	RTDS_RTN	6		
COOLING POWER & SENSORS	CARMAN J4	P1	1	FLOWRATE	W5	W5.1	FLOWRATE	1	P2	COOLING POWER
			2	FLOWRATE_5V+		W5.2	FLOWRATE_5V+	2		
			3	FLOWRATE_RTN		W5.3	FLOWRATE_RTN	3	P3	COOLING SENSORS
			4	COOLTEMP_IN		W5.4	COOLTEMP_IN	4		
			5	COOLTEMP_RTN		W5.5	COOLTEMP_RTN	5		
			6	X		W5.6	X	6		
			7	12V+		W5.7	12V+	7		
			8	12V_RTN		W5.8	12V_RTN	8		
MOTOR ENCODER	CARMAN J8	P1	1	V_A	W7	W7.1	SIN	A	P2	MOTOR ENCODER
			2	V_B		W7.2	COS	M		
			3	GND		W7.3	GND	L		
			4	V_dd		W7.4	VCC	K		
			5	MOTOR_TEMP_1		W7.5	MOTOR_TEMP_1	J		
			6	MOTOR_TEMP_2		W7.6	MOTOR_TEMP_2	H		
MOTOR PHASE WIRING	CARMAN J9	P1	1	MOTOR_PHASE_U	W8	W8.1	MOTOR_PHASE_U	U	P2	MOTOR U
MOTOR PHASE WIRING	CARMAN J10	P1	1	MOTOR_PHASE_V	W9	W9.1	MOTOR_PHASE_V	V	P2	MOTOR V
MOTOR PHASE WIRING	CARMAN J11	P1	1	MOTOR_PHASE_W	W10	W10.1	MOTOR_PHASE_W	W	P2	MOTOR W
PACKS TSV	CARMAN J15	P1	1	TSV+	W11	W11.1	TSV+	1	P2	RIGHT PACK J1
PACKS TSV RETURN	LEFT PACK J6	P1	1	TSV_RTN	W12	W12.1	TSV_RTN	1	P2	CARMAN J12
INTER-PACK SL	RIGHT PACK J5	P1	1	SL (AIRS_RTN)	W13	W13.1	SL (AIRS_RTN)	1	P2	LEFT PACK J2
			2	SL (AIRS+)		W13.2	SL (AIRS+)	2		
			3	AMS_RTN		W13.3	AMS_RTN	3		
			4	AMS_IN		W13.4	AMS_IN	4		
INTER-PACK CAN BUS + GLV POWER	RIGHT PACK J4	P1	1	CHASIS_GND	W14	W14.1	CHASIS_GND	1	P2	LEFT PACK J3
			2	24V+		W14.2	24V+	2		
			3	24V_RTN		W14.3	24V_RTN	3		
			4	CAN_LOW		W14.4	CAN_LOW	4		
			5	CAN_HIGH		W14.5	CAN_HIGH	5		
			6	CAN_SHIELD		W14.6	CAN_SHIELD	6		
CAN BUS + GLV POWER TO PACKS	CARMAN J13	P1	1	CHASIS_GND	W15	W15.1	CHASIS_GND	1	P2	RIGHT PACK J3
			2	24V+		W15.2	24V+	2		
			3	24V_RTN		W15.3	24V_RTN	3		
			4	CAN_LOW		W15.4	CAN_LOW	4		
			5	CAN_HIGH		W15.5	CAN_HIGH	5		
			6	CAN_SHIELD		W15.6	CAN_SHIELD	6		
SL TO PACKS	CARMAN J14	P1	1	SL (AIRS_RTN)	W16	W16.1	SL (AIRS_RTN)	1	P2	RIGHT PACK J2
			2	SL (AIRS+)		W16.2	SL (AIRS+)	2		
			3	AMS_RTN		W16.3	AMS_RTN	3		
			4	AMS_IN		W16.4	AMS_IN	4		
INTER-PACK TSV SERIES CONNECTION	RIGHT PACK J6	P1	1	TSV+	W17	W17.1	TSV+	1	P2	LEFT PACK J1
SL1-SL2 JUMPER	LEFT PACK J5	P1	1	PACK_TERMINATING_JUMPER	W18	W18.1	PACK_TERMINATING_JUMPER	2	P2	LEFT PACK J5
PACK CAN BUS + GLV POWER TERMINATING JUMPERS	LEFT PACK J4	P1	1	TERMINATING_RESISTOR+	W19	W19.1	TERMINATING_RESISTOR_RTN	2	P2	LEFT PACK J4
			2	24V+		W19.2	24V_RTN	6		
			3	24V+		W19.3	24V_RTN	6		
			4	24V+		W19.4	24V_RTN	6		
LEFT SIDE PANEL TO CARMAN	CARMAN J2	P1	1	GLV+ (LBRB_RTN)	W20	W20.1	GLV+ (LBRB_RTN)	1	P2	LEFT SIDE PANEL
			2	GLV_RTN		W20.2	GLV_RTN	2		
			3	IMD_STATUS		W20.3	IMD_STATUS	3		
			4	IMD_STATUS_RTN		W20.4	IMD_STATUS_RTN	4		
			5	AMS_STATUS		W20.5	AMS_STATUS	5		
			6	AMS_STATUS_RTN		W20.6	AMS_STATUS_RTN	6		
SIDE PANELS INTERCONNECT	RIGHT SIDE PANEL J3	P1	1	GLV+ (RBRB-)	W21	W21.1	GLV+ (RBRB-)	1	P2	LEFT SIDE PANEL J1
			2	GLV_RTN		W21.2	GLV_RTN	2		
			3	RSSOK-		W21.3	LSSOK+	3		
			4	SSOK_RTN		W21.4	LSSOK_RTN (SSOK_RTN)	4		
DASHBOARD	CARMAN J16	P1	1	LED_RTN	W22	W22.1	LED_RTN	1	P2	DASHBOARD J2
			2	AIRS		W22.2	AIRS	2		
			3	SAFE_LED (SSOK)		W22.3	SAFE_LED (SSOK)	3		
			4	FAULT		W22.4	FAULT	4		
			5	TSAL		W22.5	TSAL	5		
			6	X		W22.6	X	6		
			7	IMD_FAULT		W22.7	IMD_FAULT	7		
			8	AMS_FAULT		W22.8	AMS_FAULT	8		
			9	24V_RTN		W22.9	24V_RTN	9		
			10	24V+/GLV		W22.10	24V+/GLV	10		
			11	X		W22.11	X	11		
			12	X		W22.12	X	12		
DASHBOARD HDMI	CARMAN J17	P1	1	SCADA-DASH-HDMI	W23	W23.1	SCADA-DASH-HDMI	1	P2	DASHBOARD J1
			2	SL (BOT)		W23.2	SL (BOT)	1		
BRAKE OVER TRAVEL SWITCH & BRAKE PRESS SWITCH	CARMAN J18	P1	1	SL (BOT_RTN)	W24	W24.1	SL (BOT_RTN)	2	P2	FOOT PEDALS J1
			2	BRAKE_SWITCH+ (24V+)		W24.2	BRAKE_SWITCH+ (24V+)	3		
			3	BP (BRAKE_SWITCH_RTN)		W24.3	BP (BRAKE_SWITCH_RTN)	4		
			4	BP (BRAKE_SWITCH_RTN)		W24.4	BP (BRAKE_SWITCH_RTN)	4		
THROTTLE	CARMAN J19	P1	1	APPS1_10V+	W25	W25.1	APPS1_10V+	1	P2	FOOT PEDALS J2
			2	APPS1		W25.2	APPS1	2		
			3	APPS1_RTN		W25.3	APPS1_RTN	3		
			4	APPS2_5V+		W25.4	APPS2_5V+	4		
			5	APPS2		W25.5	APPS2	5		
			6	APPS2_RTN		W25.6	APPS2_RTN	6		
COCKPIT PANEL (SL)	RIGHT SIDE PANEL J2	P1	1	SL (MRESET-)	W27	W27.1	SL (CPBRB+)	1	P2	COCKPIT J1
			2	SL (TSVMS+)		W27.2	SL (CPRELAY_RTN)	2		
			3	CPRELAY_COIL_RTN (GND)		W27.3	CPRELAY_COIL_RTN (GND)	3		
			4	X		W27.4	X	4		
			5	X		W27.5	X	5		
			6	X		W27.6	X	6		
DRIVE BUTTON	CARMAN J20	P1	1	DRIVE_BTN+	W28	W28.1	DRIVE_BTN+	1	P2	COCKPIT J2
			2	DRIVE_LED+		W28.2	DRIVE_LED+	2		
			3	DRIVE_RTN		W28.3	DRIVE_RTN	3		
			4	X		W28.4	X	4		

**Connector Convention For Packs**

J1	TSV+
J2	SL IN
J3	CAN/GLV IN
J4	GAN/GLV OUT
J5	SL-OUT

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DRAWN BY	Benjamin Surman				
APPROVED BY ECE				TITLE	
APPROVED BY ME				LCFSAE Electrical System Instance Wiring List	
DATE	2021 - 04 - 20	SIZE	DWG NO	ASSIGNMENT	REV
		F	TOP LEVEL	SENIOR DESIGN I1	2.2.0
		COURSE	SHEET		
		TOP LEVEL		3 OF 4	

Cable	Cable Strain relief	Backshe	Housing	Pin Type	Pir Cable/Wire	Color (Of Individual Wire)	Pir Pin Type	Housing	Backshe Strain relief (Heatshrink ect.)	THINGS NEEDED FOR OTHER SUBSYSTEMS			
W1	CT1	11567	1460G1	1327FP	1331	1	BLACK	1 N/A	Quickconn/lug	N/A	RSP needs snap in panel mount recepticle for W1		
				1327G6FP	1331	2	WHITE	2 N/A					
				1327G5FP	1331	3	GREEN	x x					
				1399G17	1331	4	X	x x					
W2	CT2	DT	Y	DT06-4S	0462-209-16XX	1	RED	1 N/A	72M-250-32-NL	N/A	Need what type of connector are needed for right side panel		
					0462-209-16XX	2	BLACK	2 N/A	72M-250-32-NL				
					0462-209-16XX	3	ORANGE	3 N/A	72M-250-32-NL				
					0462-209-16XX	4	BLUE	4 N/A	72M-250-32-NL				
W3	CT3	DT	Y	DT06-6S	0462-201-16XX	1		1 N/A	1/4" QUICK CONN	N/A	TIE DOWN OF SOMESORT NEAR THE COMPONENTS	2PIN DT RECEPTICLE FOR CARMAN AND 18AWG QUICK CONN FOR BRAKE LIGHT LEADS	
					0462-201-16XX	2		2 N/A	1/4" QUICK CONN				
					0462-201-16XX	3		1 N/A	1/4" QUICK CONN				
					0462-201-16XX	4	16/2	2 N/A	1/4" QUICK CONN				
					0462-201-16XX	5		1 N/A	1/4" QUICK CONN				
					0462-201-16XX	6	16/2	2 N/A	1/4" QUICK CONN				
W5	CT4	DT	Y	DT06-08SA	0462-201-16XX	1	RED	1 N/A	71M-250-32-NL	N/A	TIE DOWN OF SOMESORT NEAR THE COMPONENTS		
					0462-201-16XX	2	BLACK	2 N/A	71M-250-32-NL				
					0462-201-16XX	3	WHITE	3 N/A	71M-250-32-NL				
					0462-201-16XX	4	BLUE	4 N/A	71M-250-32-NL				
					0462-201-16XX	5	BROWN	5 N/A	71M-250-32-NL				
					0462-201-16XX	6	GREEN	6 N/A	71M-250-32-NL				
					0462-201-16XX	7	BLACK	7 N/A	72M-250-32-NL				
					0462-201-16XX	8	BEIGE	8 N/A	72M-250-32-NL				
W7	CT6	DT	Y	DT06-6S	0462-201-16XX	1	BLACK	0462-201-16XX	DT06-6S	Y	DT	DT RECEPTICLE (X2) FOR MOTOR WIRE PLATE & CARMAN, WIRE/QUICKCONN TO ENCODER	
					0462-201-16XX	2	BROWN	2 0462-201-16XX					
					0462-201-16XX	3	GREEN	3 0462-201-16XX					
					0462-201-16XX	4	RED	4 0462-201-16XX					
					0462-201-16XX	5	WHITE	5 0462-201-16XX					
					0462-201-16XX	6	BLUE	6 0462-201-16XX					
W8-12	C7	Y	N/A	PL28*-300-70	N/A	1	2/0 Shielded	ORANGE	1 N/A	LUG	N/A	METAL CORD GRIP (ON MOTOR PLATE)	
W13 & W16	C10	DT	Y	DT06-4S	0462-209-16XX	1	RED	1 0462-209-16XX	DT06-4S-XXXX	Y	DT	MAY NEED TO HAVE DIFFERENT CABELS FOR W13 AND W16 DEPENDING ON TYPE OF BACK SHELL USED.	
					0462-209-16XX	2	BLACK	2 0462-209-16XX					
					0462-209-16XX	3	ORANGE	3 0462-209-16XX					
					0462-209-16XX	4	BLUE	4 0462-209-16XX					
W14 & W15	C11	DT	Y	DT06-6S-XXXX	0462-201-16XX	1	BROWN	1 0462-201-16XX	DT06-6S-XXXX	Y	DT	x2 6pin DT recepticles MAY NEED TO HAVE DIFFERENT CABELS FOR W14 AND W15 DEPENDING ON TYPE OF	
					0462-201-16XX	2	RED	2 0462-201-16XX					
					0462-201-16XX	3	BLACK	3 0462-201-16XX					
					0462-201-16XX	4	GREEN	4 0462-201-16XX					
					0462-201-16XX	5	YELLOW	5 0462-201-16XX					
					0462-201-16XX	6	COPPER	6 0462-201-16XX					
W17	C12	Y	N/A	PL28*-300-70	N/A	1	2/0 Shielded	ORANGE	1 N/A	PL28*-300-70	N/A	Y	IF RIGHT ANLGE PLUG THEN PACKS WOULD NEED 90 DEGREE RECEPTICLE AS THE NLATCH IS AT THE TOP.
W21	C13	11567	1460G1	1327FP	1331	1	RED	1327FP	1460G1	11567	LSP J1 and RSP J3 will need 1470G1 housing as well as strain relief		
				1327G6FP	1331	2	BLACK	1331 1327G6FP					
				1327FP	1331	3	GREEN	1331 1327FP					
				1327G6FP	1331	4	WHITE	1331 1327G6FP					
W22	C14	DT	Y	DT06-12SA	0462-201-16XX	1	BLACK	1 0462-201-16XX	DT06-12SA	Y	DT	x2 12pin DT recepticle one for carman and one for dashboard	
					0462-201-16XX	2	BLACK	2 0462-201-16XX					
					0462-201-16XX	3	BLACK	3 0462-201-16XX					
					0462-201-16XX	4	BLACK	4 0462-201-16XX					
					0462-201-16XX	5	BLACK	5 0462-201-16XX					
					0462-201-16XX	6	BLACK	6 0462-201-16XX					
					0462-201-16XX	7	BLACK	7 0462-201-16XX					
					0462-201-16XX	8	BLACK	8 0462-201-16XX					
					0462-201-16XX	9	BLACK	9 0462-201-16XX					
					0462-201-16XX	10	BLACK	10 0462-201-16XX					
					X	11	BLACK	11 X					
					X	12	BLACK	12 X					
W23	C15							Pre-Assembled Cable: McMaster 1860N17					
W24 (& OLD W2)	C16	DT	Y	DT06-4S-XXXX	0462-209-16XX	1	RED	1 0462-209-16XX	1/4" QUICK CONN	N/A	TIE DOWN OF SOMESORT NEAR THE PEDALS	X1 4PIN DT RECEPTICLE FOR CARMAN AND QUICK CONNS FOR PEDALS	
					0462-209-16XX	2	BLACK	2 0462-209-16XX	1/4" QUICK CONN				
					0462-209-16XX	3	ORANGE	3 0462-209-16XX	1/4" QUICK CONN				
					0462-209-16XX	4	BLUE	4 0462-209-16XX	1/4" QUICK CONN				
W25	C17	DT	Y	DT06-6S-XXXX	0462-201-16XX	1	BLACK	1 N/A	71M-250-32-NL	N/A	TIE DOWN OF SOMESORT NEAR THE PEDALS	X1 6PIN DT RECEPTICLE FOR CARMAN AND QUICK CONNS FOR PEDALS	
					0462-201-16XX	2	BROWN	2 N/A	71M-250-32-NL				
					0462-201-16XX	3	GREEN	3 N/A	71M-250-32-NL				
					0462-201-16XX	4	RED	4 N/A	71M-250-32-NL				
					0462-201-16XX	5	WHITE	5 N/A	71M-250-32-NL				
					0462-201-16XX	6	BLUE	6 N/A	71M-250-32-NL				
W27	C19	DT	Y	DT06-6S	0462-209-16XX	1		1 0462-209-16XX	DT06-4S	Y	DT	4PIN DT RECEPTICLE FOR CARMAN 4PIN DT inline recepticle and mounting clip for RSP	
					0462-209-16XX	2		2 0462-209-16XX					
					0462-209-16XX	3		3 0462-209-16XX					
					X	4	X	4 X					
					X	5	X	5 X					
					X	6	X	6 X					
W28	C20	DT	Y	DT06-4S	0462-201-16XX	1	BROWN	1 0462-201-16XX	DT06-4S	Y	DT	X2 4PIN DT RECEPTICLE FOR CARMAN/COCKPIT	
					0462-201-16XX	2	RED	2 0462-201-16XX					
					0462-201-16XX	3	BLACK	3 0462-201-16XX					
					X	4	WHITE	4 X					
W20	C21	115G8	1460G2	1327FP	1331	1	YELLOW	1	Hard wired (what ever it is connecting	N/A	Snap-in Recepticle Black, 5 to 6 Poles 1470G2 for carman enclosure, with 3 red 1327FP and 3 Black 1327G6FP Housings and 6 Barrel terminals 200G3L-LPBK		
				1327G6FP	1331	2	14 (2)	YELLOW				2	
				1327FP	1331	3	BROWN	3					
				1327G6FP	1331	4	WHITE	4					
				1327FP	1331	5	RED	5					
W1_D	C22	11567	1460G1	1327FP	1331	1	BLACK	1331 1327FP	1460G1	11567			
				1327G6FP	1331	2	WHITE	1331 1327G6FP					
				1327G5FP	1331	3	GREEN	1331 1327G5FP					
				1399G17	1331	4	X	1331 1399G17					

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APPROVED BY ME  
DATE 2021 - 04 - 20

**LAFAYETTE**  
Lafayette College  
Easton, Pa  
ECE Department

TITLE  
**LCFSAE Electrical System Type Wiring List**

SIZE DWG NO. ASSIGNMENT REV  
**F TOP LEVEL SENIOR DESIGN I1 2.2.0**

COURSE SHEET  
**TOP LEVEL 4 OF 4**