



YOUR LANES | OUR PASSION

INSTALLATION INSTRUCTIONS

PART NUMBER	154-8853Z
PART DESCRIPTION	A1 PROGRAM UPGRADE KIT
REV DATE	5/2/2014
MACHINE MODELS	KUSTODIAN PLUS



Basic knowledge of the ALL aspects of the lane machine, including mechanical, electrical and operating software

TOOLS NEEDED:

KOSI Software (be sure to check the latest update)

Phillips Screwdriver

PARTS INCLUDED:

- (4) 158-1462 24V RELAY DPDT 10A W/ DIODE
- (30") 153-1303 WIRE ASSEMBLY - RED 18AWG
- (3") 153-1309 WIRE ASSEMBLY - GRAY 18AWG
- (3") 153-1319 WIRE ASSEMBLY - YELLOW/RED 18AWG
- (12) 153-1047 WIRE TIE (4 INCH)

Please thoroughly read the instructions prior to performing the installation of this assembly. To avoid any potential problems, if at any time during the process you have a question, stop and contact our Tech Support department at the numbers listed below



- Place orders with Distributor
- Maintenance reminders on phone
- Software updates
- How to videos

Take full control of your lane machine at
My.kegel.net

Kegel's Lane Maintenance Central:
Within USA - 1-800-280-2695
Outside USA - +1 863-734-0200
via e-mail at LMC@Kegel.net
website www.kegel.net



Rev. 3.14

*****NOTE: A1 is for both Kustodian Plus machines with a DC or AC cleaner pump. The program will download for a DC cleaner pump motor. If you have an AC cleaner pump, HR410 will need to be turned on.**

Also, if you have the one piece transfer brush system, make sure the brush chop function is working. If not, you will need to turn on HR408. If using the DUO Transfer system it is recommended to have this function turned OFF.***

ALL changes listed below *must* be done. If coil wires are not corrected on CR7 and CR8 and a LY2 diode relay is inserted in either socket, it will result in arcing the output contacts together inside the PLC from a dead short due to the diode relay. This means you will have to replace your PLC.

Before plugging in your cables for Kosi make sure to turn the machine on first to make sure everything is wired correctly. Failure to do so could have a result of needing a new computer.

Kustodian Plus with 9T or below

Steps to change the relay coil wires for CR9 and CR10.

1. Move the Brown wire off of CR9-7 and reconnect it to CR9-8. This is to correct the polarity of the coil for the LY2 Diode Relay.
2. Move the Brown wire off of CR10-7 and reconnect it to CR10-8. This is to correct the polarity of the coil for the LY2 Diode Relay.
3. Move the Grey wire from CR9-8 and reconnect it on CR9-7.
4. Move the Yellow/Red wire from CR10-8 and reconnect it on CR10-7.



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Steps to change the power and motor wires

1. Move the Red wire from CR10-6 and reconnect it to CR10-5.
 2. Move the Red wire from CR9-6 and reconnect to CR10-6.
 3. Move the Gray wire from CR9-4 and reconnect it to CR9-2 and add small Gray jumper from the kit to CR9-2 to CR9-1.
 4. Move the Yellow / Red wire from CR10-4 and reconnect it to CR9-4 and add new small Yellow / Red jumper from the kit to CR9-4 to CR9-3.
 5. Locate Red wire in Kit, each end of the wire will have a small jumper connect one end to CR10-4 and CR10-3 then connect the other end to CR9-6 and CR9-5 this completes incoming power.
- This completes rewiring of CR9 and CR10. CR9 will be known as the Oil Head Reversing Relay and CR10 will be known as the Oil Head Power Relay.

Steps to change relay coil polarity for CR7 and CR8.

1. Remove wires off of CR7-7 and CR7-8. Reconnect the Brown wire to CR7-8, reconnect the Blue / Yellow wire from PLC to CR7-7 and Blue / Yellow wire from speed control to CR7-6.
2. Remove wires off of CR8-7 and CR8-8. Reconnect the Brown wire to CR8-8 and reconnect the Blue / Black wire to CR8-7.

Now replace the 4 24-volt coil relays (CR7, 8, 9 & 10) with the NEW 24V RELAY DPDT 10A W/ DIODE (158-1462)

Kustodian Plus with 9U, 9X or 9Y

Steps to change the relay coil wires for CR9 and CR10

1. Remove the Gray wire from CR9-8 and CR10-1, this is a jumper wire that will not be used.
2. Remove the Yellow / Red wire from CR10-8 and CR9-1, this is a jumper wire that will not be used.
3. Move the Brown wire off of CR9-7 and reconnect it to CR9-8. This is to correct the polarity of the coil for the LY2 Diode Relay.
4. Move the Brown wire off of CR10-7 and reconnect it to CR10-8. This is to correct the polarity of the coil for the LY2 Diode Relay.
5. Move the Gray wire from CR10-5 and reconnect it on CR9-7.
6. Move the Yellow / Red wire from CR9-5 and reconnect it on CR10-7.

Steps to change the power and motor wires

1. Move the Red wire from CR10-6 and reconnect it to CR10-5.
2. Move the Red wire from CR9-6 and reconnect to CR10-6.
3. Move the Gray wire from CR9-4 and reconnect it to CR9-2 and add small Gray jumper from the kit to CR9-2 to CR9-1.



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4. Move the Yellow / Red wire from CR10-4 and reconnect it to CR9-4 and add new small Yellow / Red jumper from the kit to CR9-4 to CR9-3.
5. Locate Red wire in Kit, each end of the wire will have a small jumper connect one end to CR10-4 and CR10-3 then connect the other end to CR9-6 and CR9-5 this completes incoming power.
6. This completes rewiring of CR9 and CR10. CR9 will be known as the Oil Head Reversing Relay and CR10 will be known as the Oil Head Power Relay.

Steps to change relay coil polarity for CR7 and CR8

1. Remove wires off of CR7-7 and CR7-8. Reconnect the Brown wire to CR7-8, reconnect the Blue / Yellow wire from PLC to CR7-7 and Blue / Yellow wire from speed control to CR7-6.
2. Remove wires off of CR8-7 and CR8-8. Reconnect the Brown wire to CR8-8 and reconnect the Blue / Black wire to CR8-7.

Now replace the 4 24-volt coil relays (CR7, 8, 9 & 10) with the NEW 24V RELAY DPDT 10A W/ DIODE (158-1462)



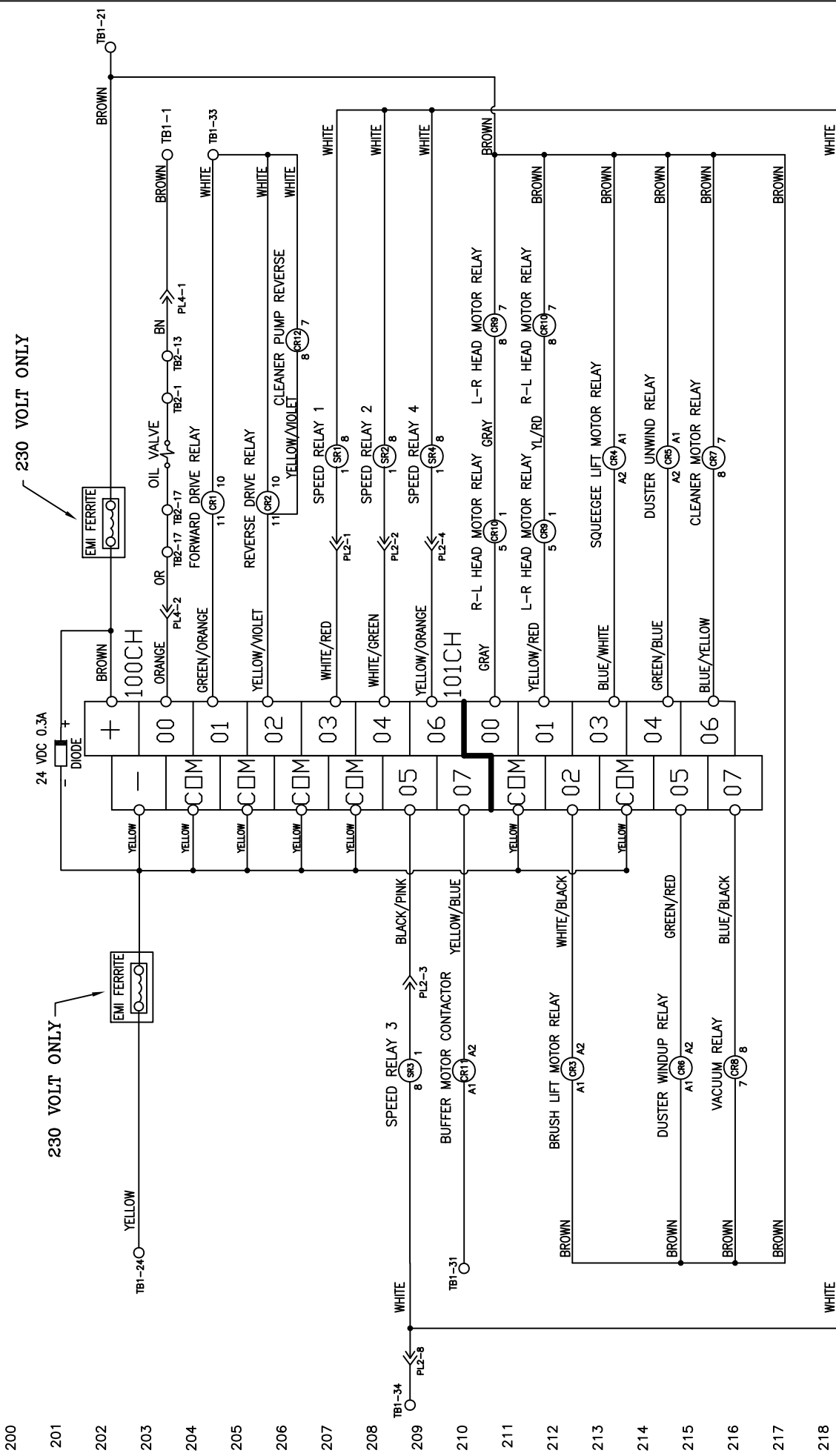
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DMRON SYSMAC
CPM2A OUTPUTS



REV.	LTR.	DATE	DESCRIPTION
N/A			
MATERIAL			
N/A			
DESCRIPTION			
OUTPUT WIRING SCHEMATIC			
KUSTODIAN PLUS MODEL B			
DO NOT SCALE DRAWING			
DRAWN BY	DATE	REV.	QTY/MACHINE/PART NUMBER
SLS	06/22/11		
APPROVED:	REV. DATE	C	SCALE
HFG		N/A	ALL 17-51XX MODELS
DOC. NO.	REV.	SCALE	SHEET
		N/A	2 OF 17

REV.	LTR.	DATE	DESCRIPTION
FU1			PLC INPUT POWER (0.5A - 115V) (500mA - 230V)
FU2			PC OUTPUT COMMON (0.5A - 115V) (6.3A - 230V)
FU3			DRIVE MOTOR BOARD L1 (4A - 115V) (4A - 230V)
FU4			DRIVE MOTOR BOARD L2 (4A - 115V) (4A - 230V)
FU5			OIL PUMP MOTOR (0.75A - 115V) (315mA - 230V)
FU6			CLEANER MOTOR (4A - 115V) (1.6A - 230V)
FU7			VACUUM MOTOR (10A - 115V)
FU8			PC RELAY COMMON (4A - 115V) (4A - 230V)

REV.	LTR.	DATE	DESCRIPTION
CR1			FORWARD DRIVE RELAY (LY3)
CR2			REVERSE DRIVE RELAY (LY3)
CR3			BRUSH LIFT MOTOR RELAY
CR4			SQUEEGEE LIFT MOTOR RELAY
CR5			DUSTER UNWIND MOTOR RELAY
CR6			DUSTER WINDUP MOTOR RELAY
CR7			CLEANER MOTOR RELAY (LY2 24VDC)
CR8			VACUUM RELAY (LY2 24VDC)
CR9			L-R HEAD MOTOR RELAY (LY2 24VDC)
CR10			R-L HEAD MOTOR RELAY (LY2 24VDC)
CR11			BUFFER BRUSH MOTOR CONTACTOR
CR12			CLEANER PUMP REVERSE RELAY
SR1			SPEED RELAY 1 (PCB)
SR2			SPEED RELAY 2 (PCB)
SR3			SPEED RELAY 3 (PCB)
SR4			SPEED RELAY 4 (PCB)

REV.	LTR.	DATE	DESCRIPTION
PL1			MAIN PLUG - 10-PIN SIDE (15)
PL2			DRIVE CIRCUIT BOARD PLUG (12)
PL3			DRIVE SPEED BOARD PLUG (9)
PL4			PLC INPUT PLUG - 10-PIN SIDE (9)
PL5			PLC INPUT PLUG - 7-PIN SIDE (6)
PL6			MAIN PLUG - 7-PIN SIDE (15)
PL7			DC CLEANER SPEED BOARD PLUG (9)
TB1			TERMINAL BLOCK 1 (MAIN)
TB2			TERMINAL BLOCK 2 (10-PIN SIDE)
TB3			TERMINAL BLOCK 3 (7-PIN SIDE)
TB4			TERMINAL BLOCK 5 (HANDLE)
TB5			POWER INLET PLUG
PP1			HEAD DRIVE MOTOR CAPACITOR
C1			OIL PUMP MOTOR CAPACITOR
C2			CIRCUIT BREAKER (15A-115V)(10A-230V)
CB1			CIRCUIT BREAKER (15A-115V)(10A-230V)
CB2			VACUUM CIRCUIT BREAKER (8A - 230V)

LEGEND

VIEW OF FORM CONTROLLER

15 PINOUT

12 PINOUT

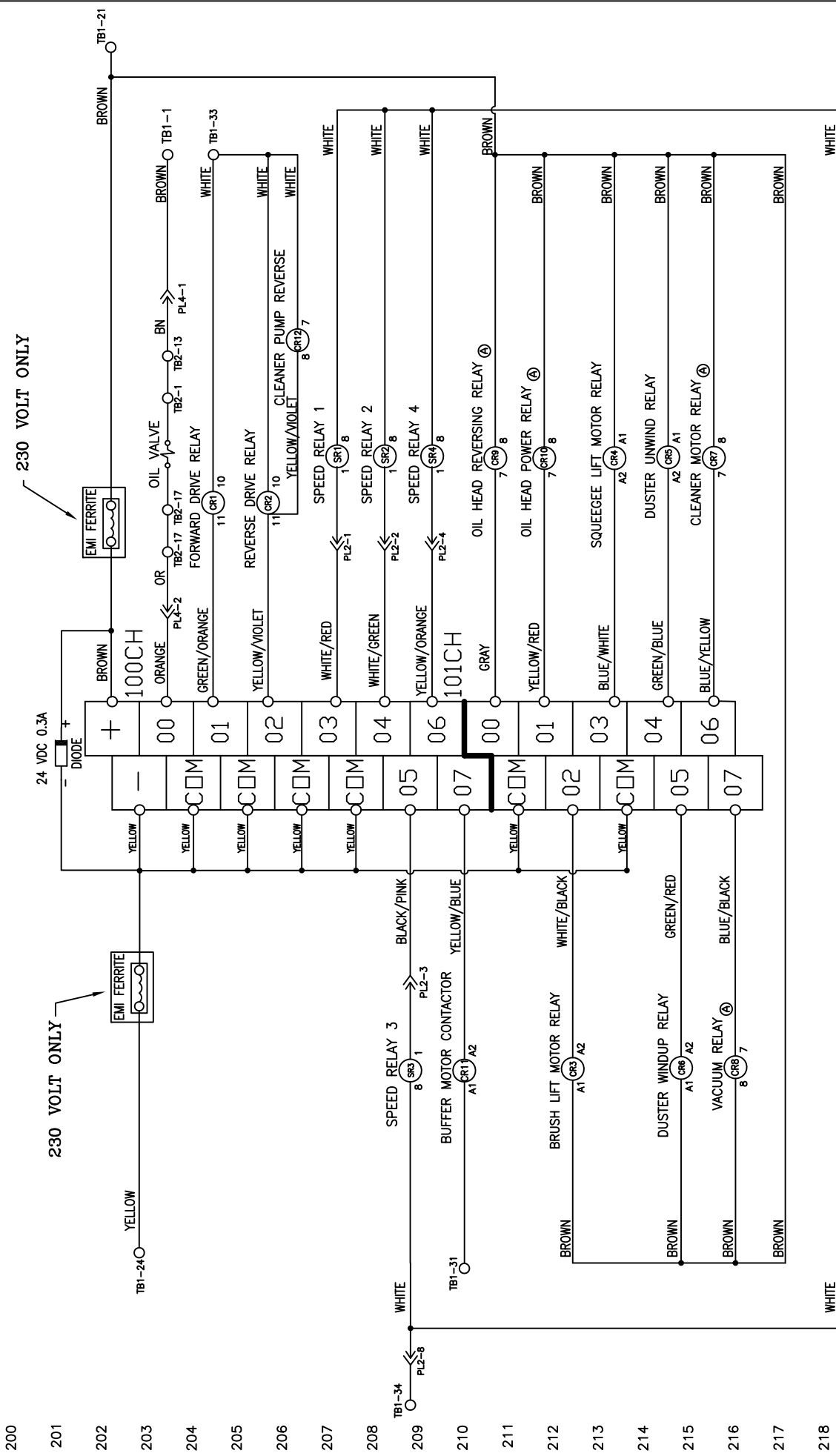
9 PINOUT

6 PINOUT

5 PINOUT

3 PINOUT

OMRON SYSMAC
CPM2A OUTPUTS



230 VOLT ONLY

230 VOLT ONLY

24 VDC 0.3A

DIODE

EMI FERRITE

EMI FERRITE

100CH

101CH

VIEW OF PLUGS FROM CONTROLLER

5 PINOUT

3 PINOUT

9 PINOUT

12 PINOUT

15 PINOUT

REV LTR DATE DESCRIPTION

A 02/25/14 9Z PROGRAM WIRING UPDATE E/C# 14130

MATERIAL N/A

DESCRIPTION OUTPUT WIRING SCHEMATIC

DATE 06/22/11

SLS 06/22/11

REV DATE 02/25/14

APPROVED: HFG

SIZE QTY/MACHINE PART NUMBER

C N/A

SCALE N/A

SHEET 2 OF 17

KEGEL

1981 LONGLEAF BLVD.
LAKE WALKER, TX 75849
(866) 794-0600

DRAWN BY

DATE

REV DATE

APPROVED:

SIZE QTY/MACHINE PART NUMBER

C N/A

SCALE N/A

SHEET 2 OF 17

FU1 - PLC INPUT POWER (0.5A - 115V) (500mA - 230V)

FU2 - PC OUTPUT COMMON (0.5A - 115V) (6.3A - 230V)

FU3 - DRIVE MOTOR BOARD L1 (4A - 115V) (4A - 230V)

FU4 - DRIVE MOTOR BOARD L2 (4A - 115V) (4A - 230V)

FU5 - OIL PUMP MOTOR (0.75A - 115V) (315mA - 230V)

FU6 - CLEANER MOTOR (4A - 115V) (1.6A - 230V)

FU7 - VACUUM MOTOR (1.0A - 115V)

FU8 - PC RELAY COMMON (4A - 115V) (4A - 230V)

CR1 - FORWARD DRIVE RELAY (LY3)

CR2 - REVERSE DRIVE RELAY (LY3)

CR3 - BRUSH LIFT MOTOR RELAY

CR4 - SQUEEGEE LIFT MOTOR RELAY

CR5 - DUSTER UNWIND MOTOR RELAY

CR6 - DUSTER WINDUP MOTOR RELAY

CR7 - CLEANER MOTOR RELAY (LY2 24VDC)

CR8 - VACUUM RELAY (LY2 24VDC)

CR9 - OIL HEAD REVERSING RELAY (LY2 24VDC)

CR10 - OIL HEAD POWER RELAY (LY2 24VDC)

CR11 - BUFFER BRUSH MOTOR CONTACTOR

CR12 - CLEANER PUMP REVERSE RELAY

SR1 - SPEED RELAY 1 (PCB)

SR2 - SPEED RELAY 2 (PCB)

SR3 - SPEED RELAY 3 (PCB)

SR4 - SPEED RELAY 4 (PCB)

PL1 - MAIN PLUG - 10-PIN SIDE (15)

PL2 - DRIVE CIRCUIT BOARD PLUG (12)

PL3 - DRIVE SPEED BOARD PLUG (9)

PL4 - PLC INPUT PLUG - 10-PIN SIDE (9)

PL5 - PLC INPUT PLUG - 7-PIN SIDE (6)

PL6 - MAIN PLUG - 7-PIN SIDE (15)

PL7 - DC CLEANER SPEED BOARD PLUG (9)

TB1 - TERMINAL BLOCK 1 (MAIN)

TB2 - TERMINAL BLOCK 2 (10-PIN SIDE)

TB3 - TERMINAL BLOCK 3 (7-PIN SIDE)

TB4 -

TB5 - TERMINAL BLOCK 5 (HANDLE)

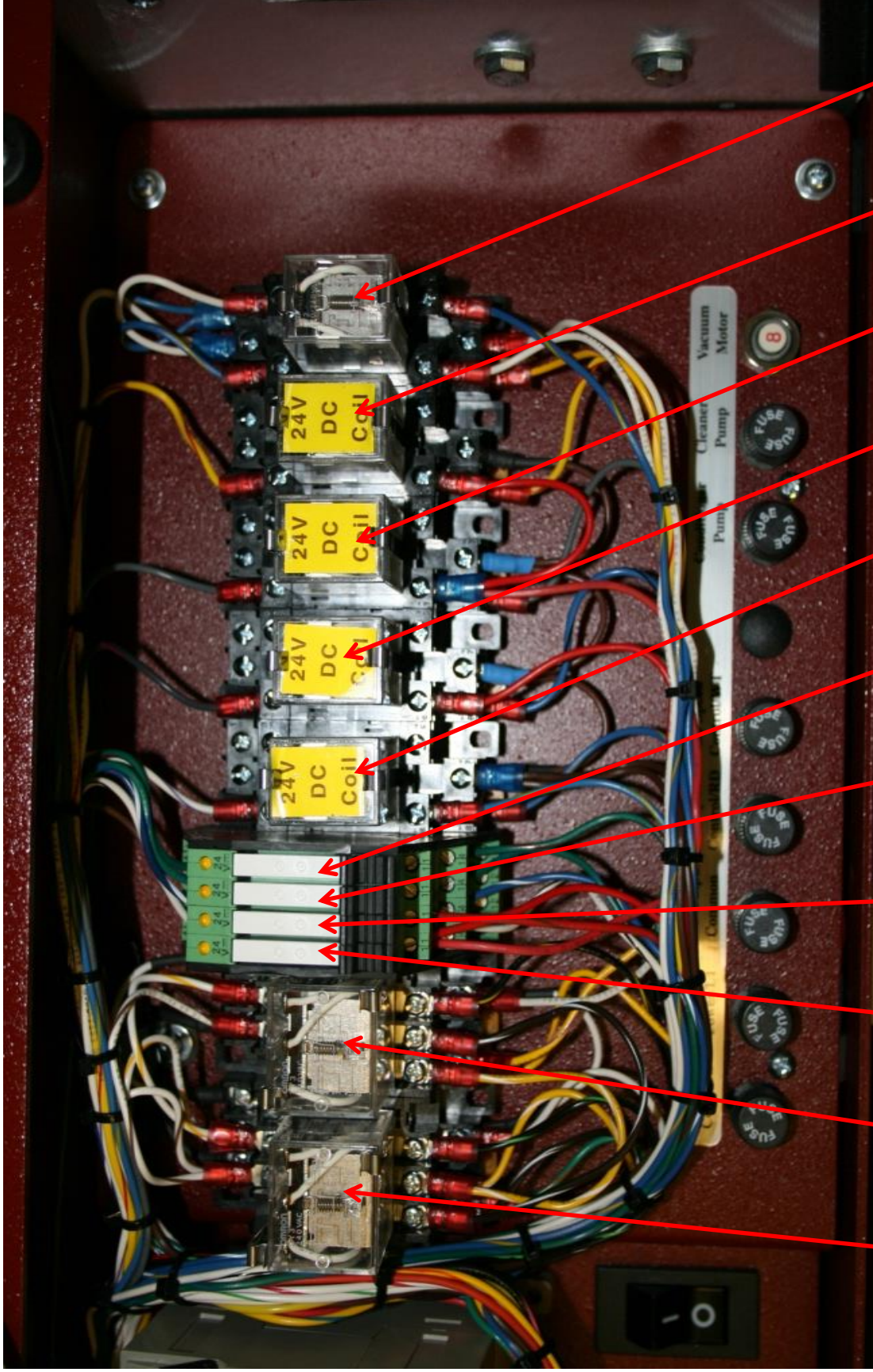
PP1 - POWER INLET PLUG

C1 - HEAD DRIVE MOTOR CAPACITOR

C2 - OIL PUMP MOTOR CAPACITOR

CBI - CIRCUIT BREAKER (15A-115V)(10A-230V)

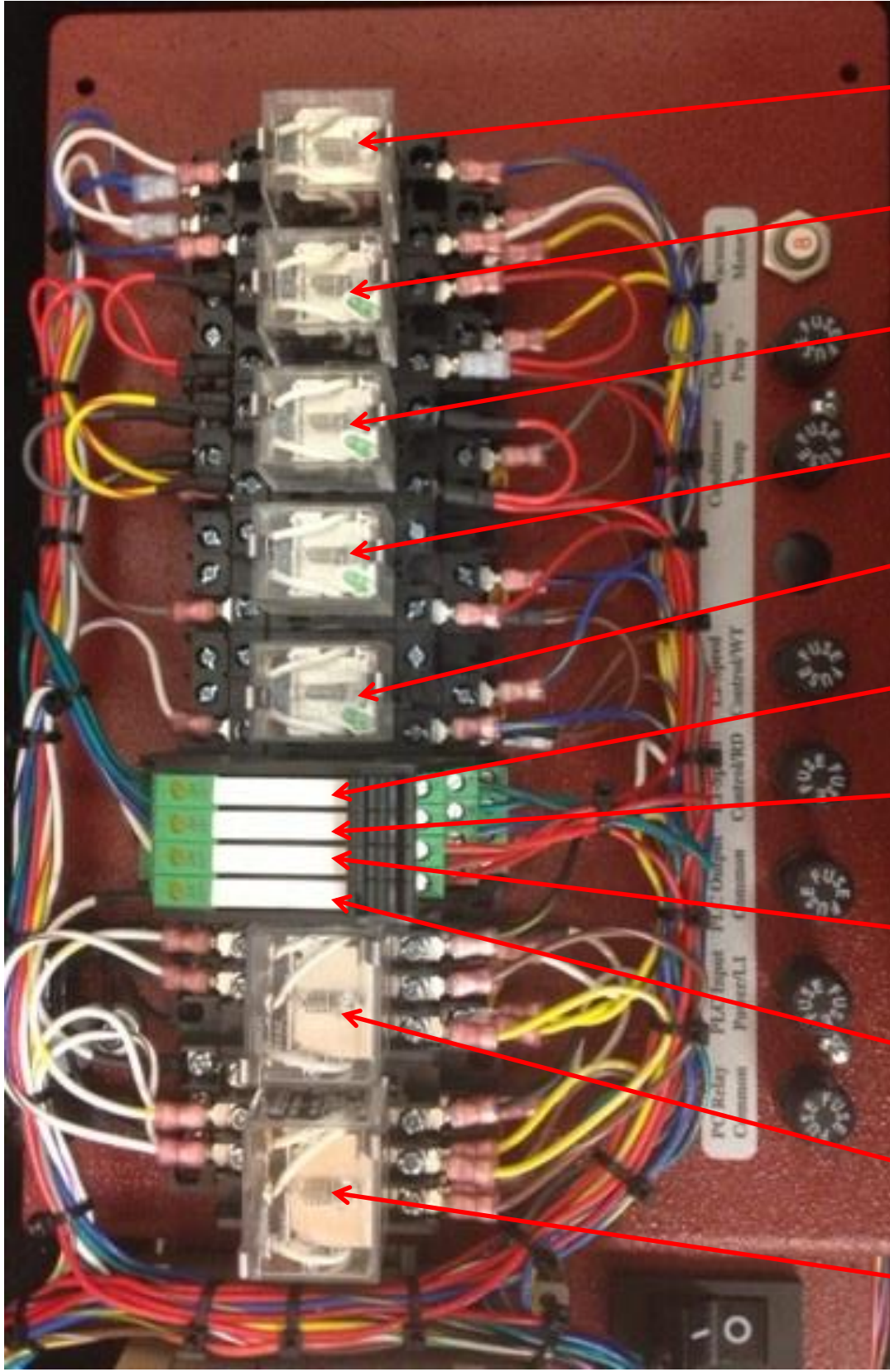
CB2 - VACUUM CIRCUIT BREAKER (8A - 230V)



CR 1	CR 2	CR 3	CR 4	CR 5	CR 6	CR 7	CR 8	CR 9	CR 10	CR 12
FORWARD DRIVE	REVERSE DRIVE	BRUSH LIFT MTR	SQUEEGEE MOTOR	DUSTER UNWIND	DUSTER WINDUP	CLEANER PUMP	VACUUM MOTOR	L-R OIL HEAD	R-L OIL HEAD	CLEANER PUMP RVRS

*NOT SHOWN - CR11 BUFFER CONTACTOR

KPLUS WIRING BEFORE INSTALLING PROGRAM A1



CR 1 CR 2 CR 3 CR 4 CR 5 CR 6 CR 7 CR 8 CR 9 CR 10 CR 12

FORWARD DRIVE	REVERSE DRIVE	BRUSH LIFT MTR	SQUEEGEE MOTOR	DUSTER UNWIND	DUSTER WINDUP	CLEANER PUMP	VACUUM MOTOR	OIL HEAD REVERSE	OIL HEAD POWER	CLEANER PUMP RVRS
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*NOT SHOWN -CR11 BUFFER CONTACTOR

KPLUS WIRING AFTER INSTALLING PROGRAM A1