



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- YW/RED 18AWG |
| (12) 153-1047 WIRE TIE (4 INCH) | |



TECHNICAL NOTE

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.

Please visit our growing library of videos to see if these instructions are available!



www.youtube.com/user/KegelBowling81



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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)



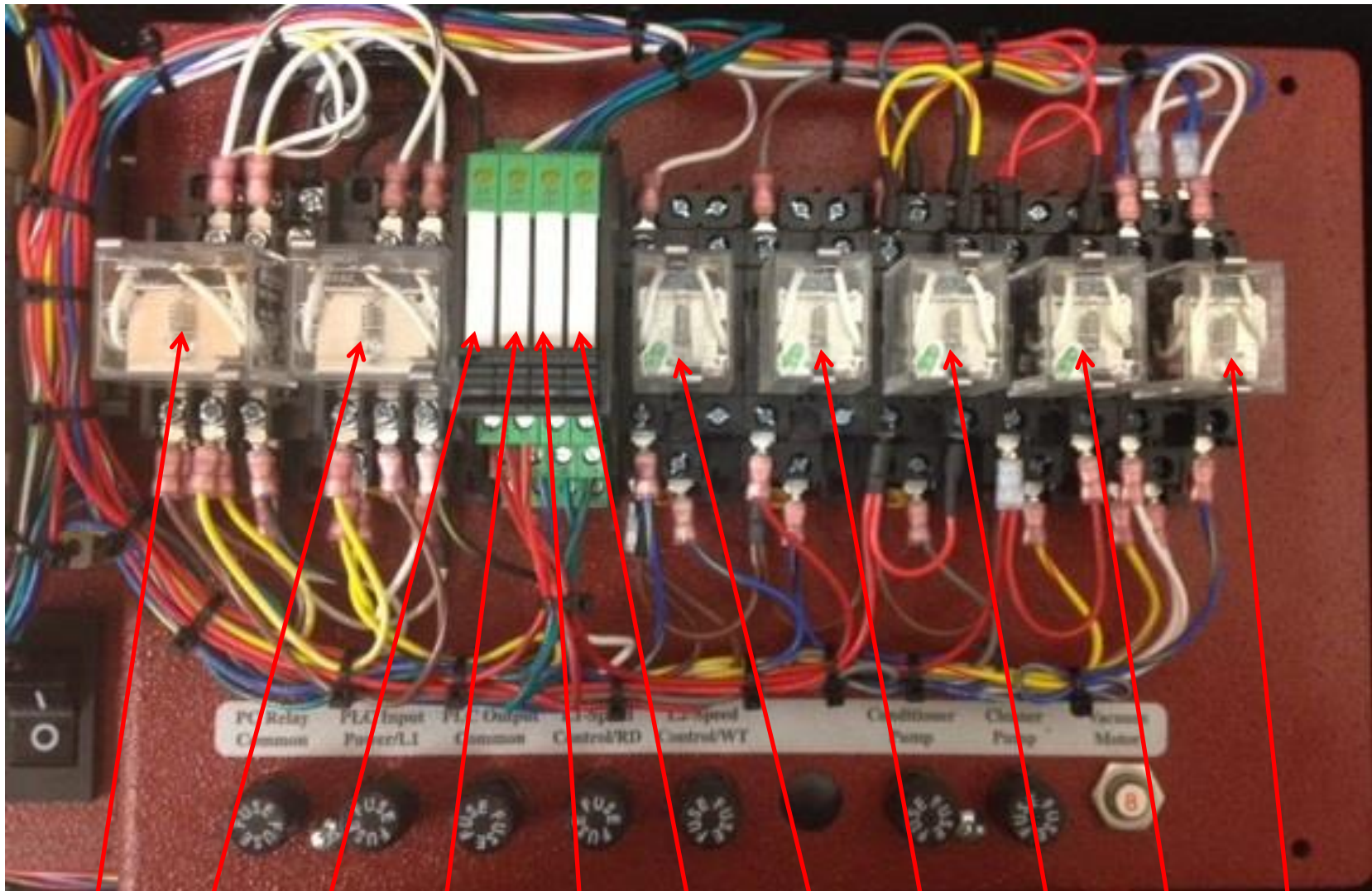
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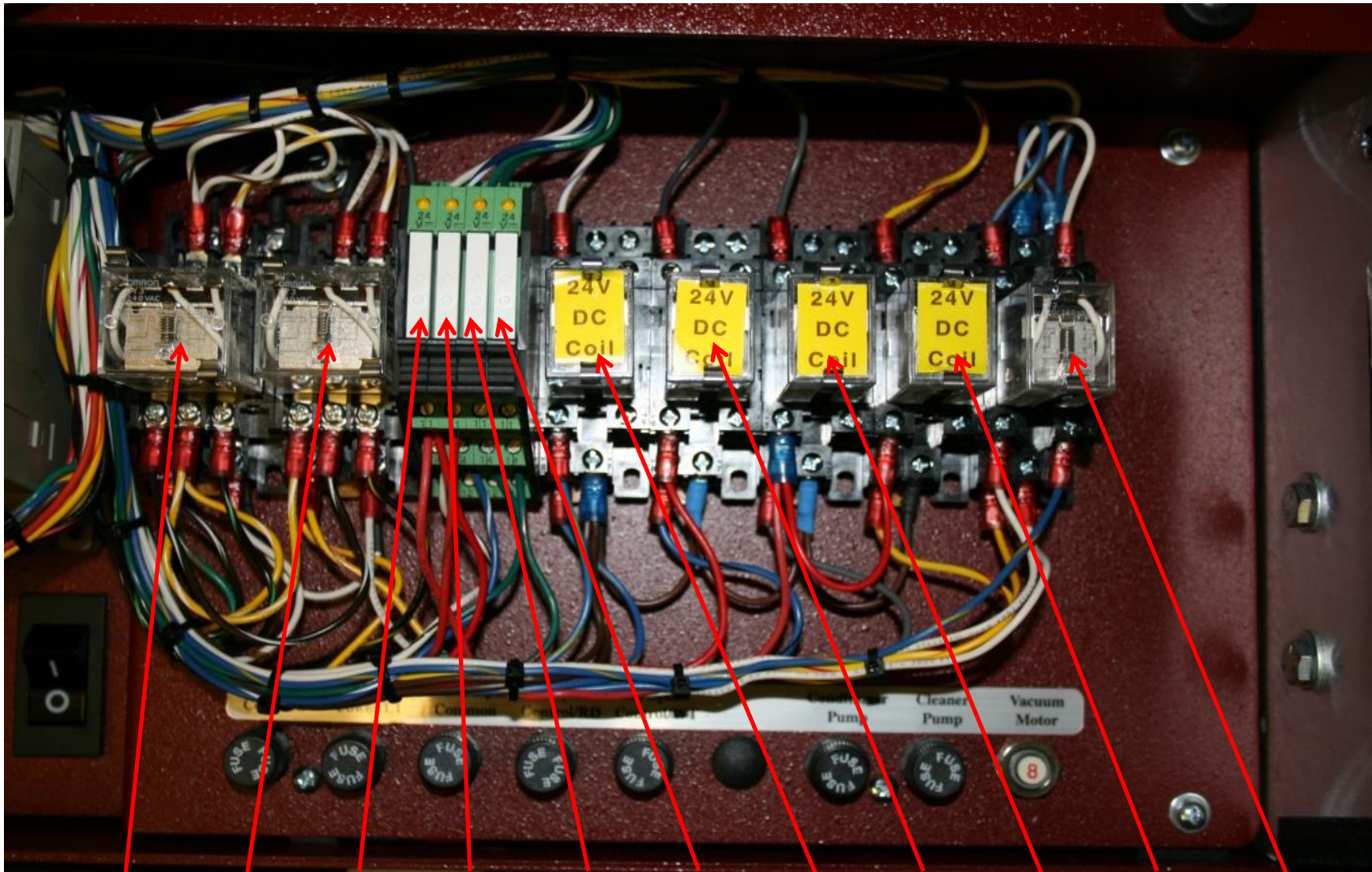


CR 1 CR 2 CR 3 CR 4 CR 5 CR 6 CR 7 CR 8 CR 9 CR 10 CR 12

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 RVRSE
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*NOT SHOWN - CR11 BUFFER CONTACTOR

KPLUS WIRING AFTER INSTALLING PROGRAM A1

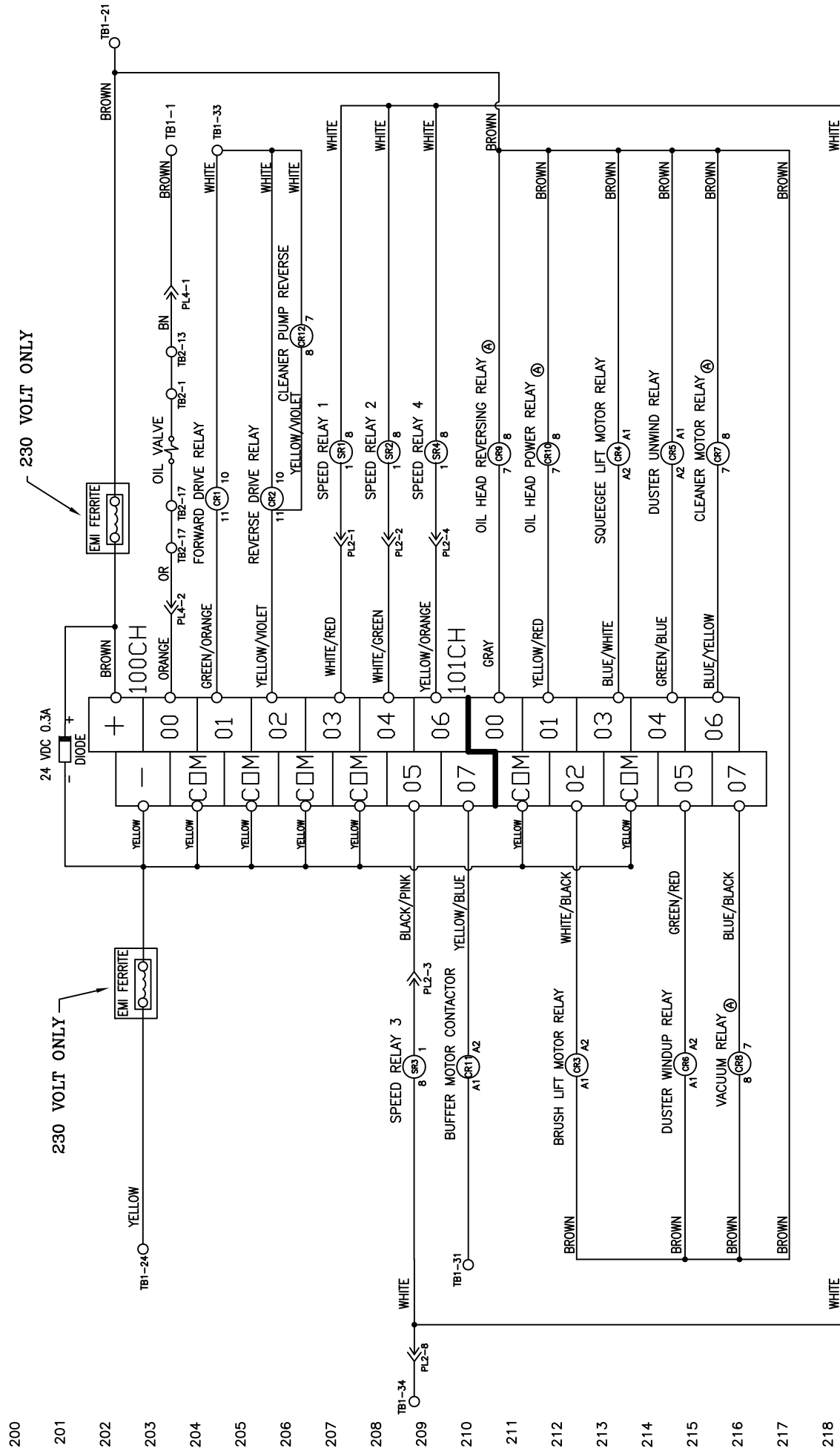


CR 1	CR 2	CR 3	CR 4	CR 5	CR 6	CR 7	CR 8	CR 9	CR 10	CR 12
FORWARD DRIVE	REVERSE DRIVE	BRUSH LIFT MTR	SQUEEGEE MOTOR	DUSTER UNWIND	DUSTER WINDUP	CLEANER PUMP	VACUUM MOTOR	L-R OIL HEAD	R-L OIL HEAD	CLEANER PUMP RVRSE

*NOT SHOWN -CR11 BUFFER CONTACTOR

KPLUS WIRING BEFORE INSTALLING PROGRAM A1

DMRON SYSMAC
CPM2A OUTPUTS



REV LTR				DATE				DESCRIPTION			
A				02/25/14				9Z PROGRAM WIRING UPDATE E/CH 14130			
MATERIAL				N/A				KEGEL			
DRAWN BY				DATE				DESCRIPTION			
SLS				06/22/11				KUSTODIAN PLUS MODEL B			
APPROVED:				REV DATE				DO NOT SCALE DRAWING			
HFG				02/25/14				C N/A ALL 17-51XX MODELS			
SCALE				N/A				SHEET 2 OF 17			

15 PINOUT	12 PINOUT	9 PINOUT	6 PINOUT	5 PINOUT	3 PINOUT
(Diagram)	(Diagram)	(Diagram)	(Diagram)	(Diagram)	(Diagram)
PLUG 6	PLUG 2	PLUG 3 PLUG 4 PLUG 5	PLUG 7		

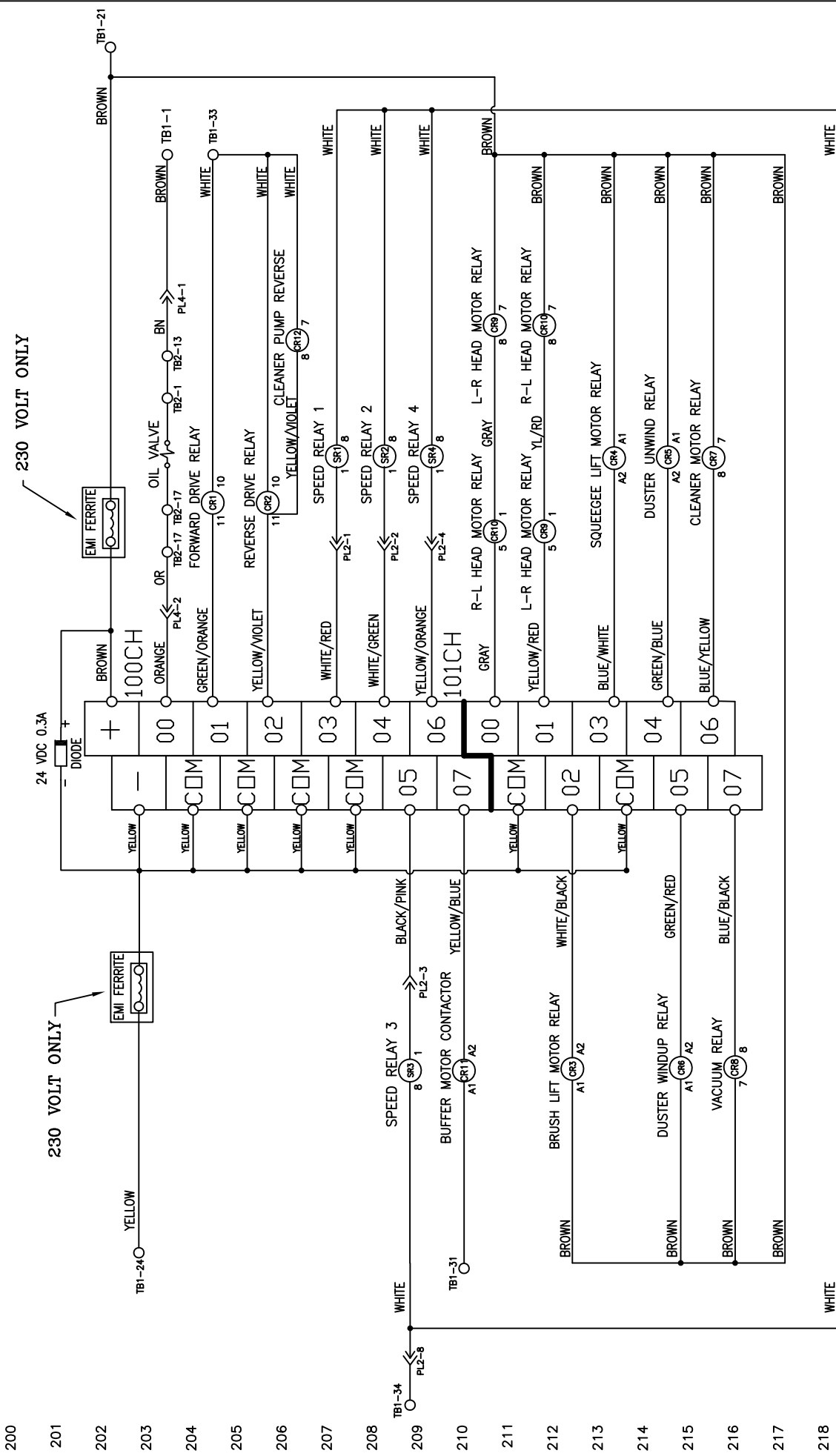
FU1	PLC INPUT POWER	(0.5A - 115V) (500mA - 230V)
FU2	PC OUTPUT COMMON	(0.5A - 115V) (6.3A - 230V)
FU3	DRIVE MOTOR BOARD L1	(4A - 115V) (4A - 230V)
FU4	DRIVE MOTOR BOARD L2	(4A - 115V) (4A - 230V)
FU5	OIL PUMP MOTOR	(0.75A - 115V) (315mA - 230V)
FU6	CLEANER MOTOR	(4A - 115V) (1.6A - 230V)
FU7	VACUUM MOTOR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

LEGEND

- 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 - MAIN 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 -
- 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)

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.	SCALE
SLS	06/22/11		N/A
APPROVED:	REV. DATE	SIZE	QTY/MACHINE/PART NUMBER
HFG		C	N/A
DOC. NO.	REV.	SCALE	SHEET
		N/A	2 OF 17

VIEW OF FROM CONTROLLER	DESCRIPTION
15 PINOUT	PL1 - MAIN PLUG - 10-PIN SIDE (15)
12 PINOUT	PL2 - DRIVE CIRCUIT BOARD PLUG (12)
9 PINOUT	PL3 - DRIVE SPEED BOARD PLUG (9)
5 PINOUT	PL4 - PLC INPUT PLUG - 10-PIN SIDE (9)
3 PINOUT	PL5 - PLC INPUT PLUG - 7-PIN SIDE (6)
6 PINOUT	PL6 - MAIN PLUG - 7-PIN SIDE (15)
9 PINOUT	PL7 - DC CLEANER SPEED BOARD PLUG (9)
6 PINOUT	TB1 - TERMINAL BLOCK 1 (MAIN)
6 PINOUT	TB2 - TERMINAL BLOCK 2 (10-PIN SIDE)
6 PINOUT	TB3 - TERMINAL BLOCK 3 (7-PIN SIDE)
6 PINOUT	TB4 - TERMINAL BLOCK 4 (HANDLE)
6 PINOUT	TB5 - POWER INLET PLUG
6 PINOUT	C1 - HEAD DRIVE MOTOR CAPACITOR
6 PINOUT	C2 - OIL PUMP MOTOR CAPACITOR
6 PINOUT	C3 - OIL PUMP MOTOR CAPACITOR
6 PINOUT	CB1 - CIRCUIT BREAKER (15A-115V)(10A-230V)
6 PINOUT	CB2 - CIRCUIT BREAKER (8A - 230V)
6 PINOUT	FU1 - PLC INPUT POWER (0.5A - 115V) (500mA - 230V)
6 PINOUT	FU2 - PC OUTPUT COMMON (0.5A - 115V) (6.3A - 230V)
6 PINOUT	FU3 - DRIVE MOTOR BOARD L1 (4A - 115V) (4A - 230V)
6 PINOUT	FU4 - DRIVE MOTOR BOARD L2 (4A - 115V) (4A - 230V)
6 PINOUT	FU5 - OIL PUMP MOTOR (0.75A - 115V) (315mA - 230V)
6 PINOUT	FU6 - CLEANER MOTOR (4A - 115V) (1.6A - 230V)
6 PINOUT	FU7 - VACUUM MOTOR (10A - 115V)
6 PINOUT	FU8 - PC RELAY COMMON (4A - 115V) (4A - 230V)
6 PINOUT	CR1 - FORWARD DRIVE RELAY (LY3)
6 PINOUT	CR2 - REVERSE DRIVE RELAY (LY3)
6 PINOUT	CR3 - BRUSH LIFT MOTOR RELAY
6 PINOUT	CR4 - SQUEEGEE LIFT MOTOR RELAY
6 PINOUT	CR5 - DUSTER UNWIND MOTOR RELAY
6 PINOUT	CR6 - DUSTER WINDUP MOTOR RELAY
6 PINOUT	CR7 - CLEANER MOTOR RELAY (LY2 24VDC)
6 PINOUT	CR8 - VACUUM RELAY (LY2 24VDC)
6 PINOUT	CR9 - L-R HEAD MOTOR RELAY (LY2 24VDC)
6 PINOUT	CR10 - R-L HEAD MOTOR RELAY (LY2 24VDC)
6 PINOUT	CR11 - BUFFER BRUSH MOTOR CONTACTOR
6 PINOUT	CR12 - CLEANER PUMP REVERSE RELAY
6 PINOUT	SR1 - SPEED RELAY 1 (PCB)
6 PINOUT	SR2 - SPEED RELAY 2 (PCB)
6 PINOUT	SR3 - SPEED RELAY 3 (PCB)
6 PINOUT	SR4 - SPEED RELAY 4 (PCB)