080030

Downey Farms

4RSPH W/65" AH

2014 Johnson Bros inc

#08030 DOWNEY FARMS 4RSPH W/ 65" A.H. / TANK 7/15/08

30A 15	30A 14	30A 13	30A 12	30A 11	20A 10	30A 9	30A 8	20A 7	30A 6	30A 5	20A 4	30A 3	30A 2	30A 1
LT. REAR LIGHT RELAY [BLACK	RT. REAR LIGHT RELAY [BLUE	A/C	ACT'S [WHITE [85 (1)	BACK UP SWITCH [BROWN [88 (1) BACKUP RELAY [BROWN BACKUP WARN. [BROWN [088 (4)	FUEL [RED [081 (1)	CAB FIELD LIGHTS RELAY [BROWN	CAB O.H. [RED [22 (3) AUX. OUTLET [BLACK [156 (3) POWER VIEW [RED [022 (3)	CYL'S [ORANGE [143 (2) 2-SPEED [BLACK [0012 (1) GA PANEL [RED [21 (4)	RADIO [RED [12 (3) WIPER [RED [18 (3) POWERVIEW [PURPLE [012 (3)	CONV'S [YELLOW [89 (1)	BRAKE [BLACK [017 (1) DTS-0160 [RED WARNING [GRD DRV. BLU/BLK 8 [AH FAN YEL/BLK 10 [HYD LEVEL YEL/ORG 25 [CROSS XP BLACK 60	CONV'S [ORANGE [90 (1)	AH CLEAN BIN FILL [GREEN [91 (1) CYBER TECH [GREEN [091 (4)	HAZ. STAT [YELLOW TURN STAT [BROWN

HAZ. STAT

[CB1-YELLOW
_YELLOW 92 (1)

TURN STAT

[CB1-BROWN
_BROWN 502 (5)

[GREEN 607 (2)
[CB 4 - RED
[BLACK

DTS-0160

SIGNAL BLACK]
12V DC BROWN]
GROUND BLUE]

R E L A Y S

4X4 LOCK

85 GRD.
86
87
30

85 GRD.
86 BLACK 1
87 BLACK 1
30 BLACK 01 (2)

85 GRD.
86
87
30

BACK UP LTS.

85 GRD.
86 B ROWN 06 (2)
87 CB11 - BROWN
30 BROWN 6

4X4 RELAY

85 GRD.
86 ORANGE 144 (2)
87 BLACK 1
30 BLACK 01 (2)

85 GRD.
86
87
30

START RELAY

85 GRD.
86
87
30

85 GRD.
86 ORANGE 144 (2)
87 GREEN 422 (3)
30 WHITE 104 (5)

85 GRD.
86
87
30

CAB FIELD LTS.

85 GRD.
86 BROWN 504 (3)
87 CB9 - BROWN
30 BROWN (H) 507 (3)

RIGHT REAR LIGHT RELAY

85 GRD.
86 BROWN 505 (2)
87 CB14 - BLUE
30 BLUE 36

RIGHT FRONT LIGHT RELAY

85 GRD.
86 BROWN 505 (2)
87 CB18 - BLUE
30 BLUE 360

CAB ROAD LTS.

85 GRD.
86 BROWN 503 (3)
87 CB17 - BROWN
30 BROWN (H) 526 (3)

LEFT REAR LIGHT RELAY

85 GRD.
86 BROWN 572 (3)
87 CB15 - BLACK
30 BLACK 34

LEFT FRONT LIGHT RELAY

85 GRD.
86 BROWN 572 (3)
87 CB19 - BLACK
30 BLACK 340

A.H. CLEANER TIMER

8 - BLUE 26 -15(1)
9 - WHITE 27 -14(1)
10/11 - PURPLE 28 -13(1)
6/2 - GROUND

30A 19	30 A 18	30 A 17	20 A 16
LT FRT LTS RELAY [BLACK	RT FRT LTS RELAY [BLUE	CAB RD LTS RELAY [BROWN	FOOT PED. [RED [52 (1) AUX PED [RED [052 (7)

ST 95

I	I	I
12V DC	RED 13 (5)	
RED 11(5)	PURPLE [013 (3)	CB1-7 / 14-15

ST 95

I	I	I
12V DC	RED 13 (5)	CB 9-13

ST 95

I	I	I
12V DC	RED 13 (5)	CB 16-19

GROUND WIRES

BLACK	20 - 4(3)	(CAB)
WHITE	31	(A H)
BLACK	020 (4)	(CYBER TECH)
BLACK	0020	(KAR-TECH)
BLACK	15	
BLACK	015	
BLACK	0015	
BLACK	000015	

PANEL GROUND

5773 Crystal Rd. ~ Vestaburg, MI. 48891 ~Phone: 989-268-5711 ~Fax: 989-268-5630

BOTTOM OF PANEL TO CAB 6'6"
MARK @ 5'9"

ELECTRONIC GAUGES

#08030

DOWNEY FARMS **7/15/08**
4RSPH W/ 65" - TANK

SCREEN	1		
		GROUND DRIVE	10,000#
		LEFT PRIMARY	5,000#
		RIGHT PRIMARY	5,000#
		SECONDARY	5,000#
SCREEN	2		
		GROUND DRIVE CHARGE	1,000#
		AIRHEAD CHARGE	1,000#
		PRIMARY CHARGE PRESSURE	600#
		SECONDARY CHARGE	600#
SCREEN	3		
		AIRHEAD	10,000#
		BRAKE CHARGE	1,000#
		STEERING	3,000#
SCREEN	4		
		RIGHT STAR	3,000#
		LEFT STAR	3,000#
		STAR TABLE DIST.	3,000#
		CROSS	3,000#
SCREEN	5		
		SIDE	3,000#
		BIN FILL	3,000#
		BIN UNLOAD	3,000#

Project : OHIO Power Systems

5.1 Sensor Scaling

All data scaling for each of the displayed parameters will be done within the CANtrak S/W & the GPSI shall transmit raw (unscaled) data acquired from the sensors.

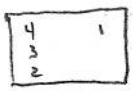
The pressure sensors are assumed to produce an output signal in the range 0-10V with the max. pressure producing the max. voltage.

The ranges and the scaling factors applied to the parameters described above are detailed below.

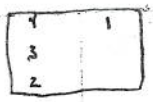
Only the initial digits of the part number are specified as the remaining requirements are not known.

BELDEN 9444 20AWG 4C

GPSI	INPUT	
1	A1	GROUND DRIVE
	A2	LEFT PRIMARY
	A3	RIGHT PRIMARY
	A4	SECONDARY
	A5	GROUND DRIVE CHG. PRESS.
	A6	AIR HEAD CHARGE PRESS.
	A7	PRIMARY CHARGE PRESS.
2	A1	SECONDARY CHARGE PRESS.
	A2	AIR HEAD
	A3	
	A4	BRAKE CHARGE PRESS.
	A5	STEERING
	A6	RIGHT STAR TABLE
	A7	LEFT STAR TABLE
3	A1	STAR TABLE DISTRIBUTOR
	A2	CROSS
	A3	SIDE
	A4	BIN FILL
	A5	BIN UNLOAD
	A6	
	A7	



1 BIN FILL
2 SIDE
3 CROSS
4 BIN UNLOAD



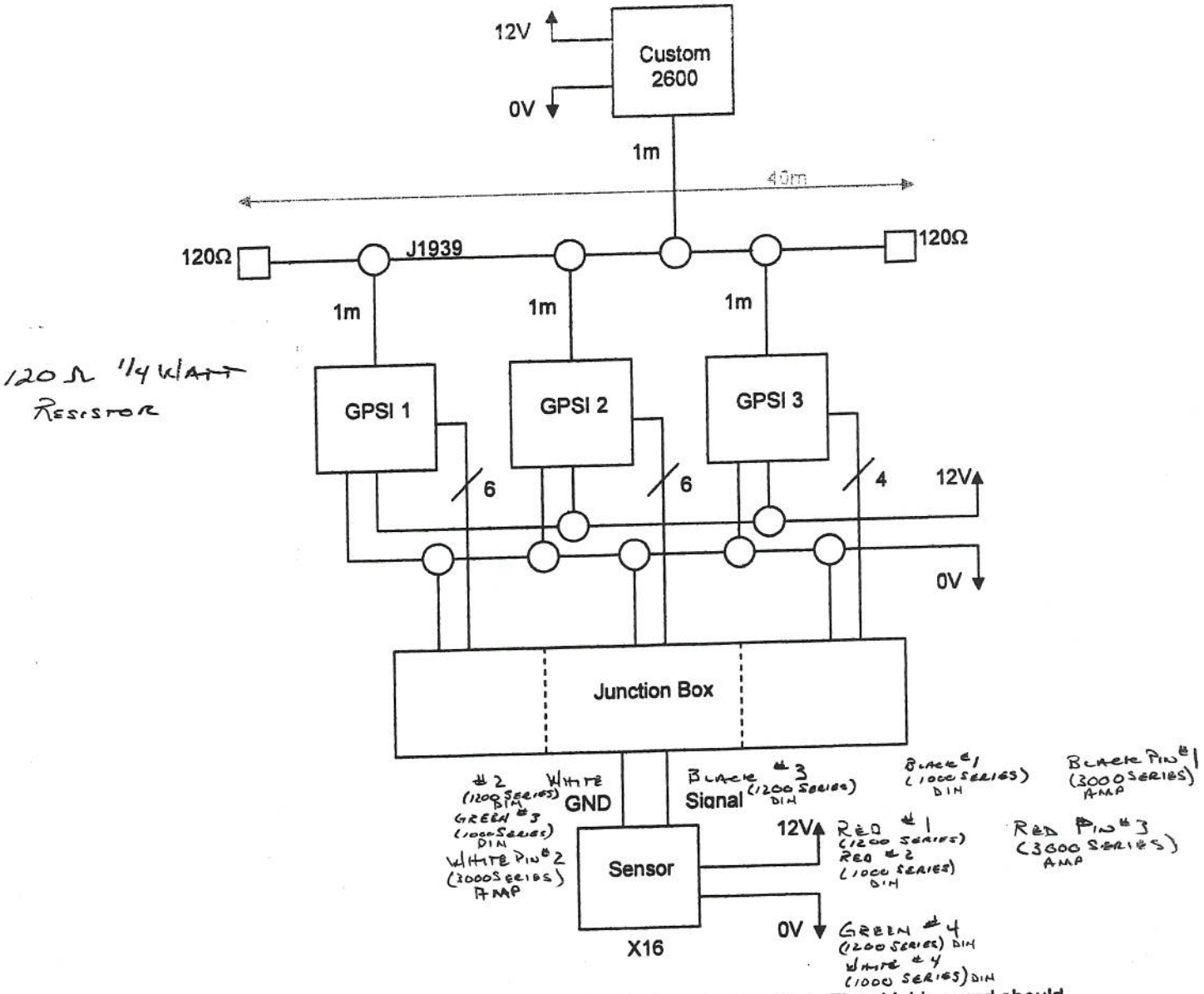
1 OPEN
2 LT. STAR
3 RT. STAR
4 RT STAR DIST.

3000 SERIES (WEATHER PACK CONNECTOR) 3000PSI

PIN #1	+OP	BLACK
2	0V(⏚)	WHITE
3	+ IN	RED

Project : OHIO Power Systems

6 Appendix A – Circuit Block Diagram for CANtrak & GPSI to OHIO Power System's Sensors



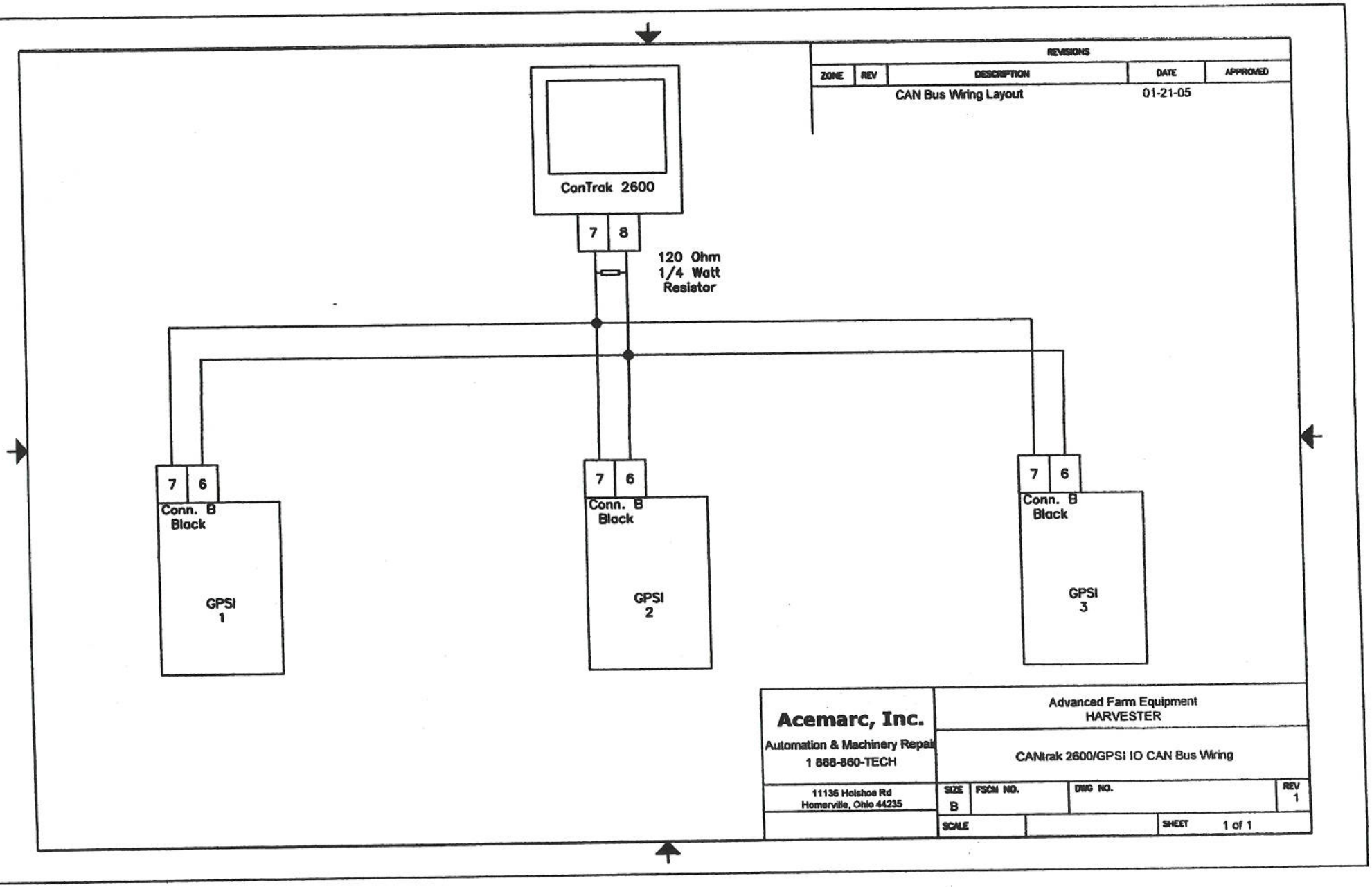
The CAN bus should be a shielded twisted pair, with impedance 120Ω. The shield ground should be connected to 0V.
'CAN+' (App.B GPSI Connector B pin 6) and 'CAN HI' (App.C CANtrak pin 8) should be linked.
'CAN –' (App.B GPSI Connector B pin 7) and 'CAN LO' (App.C CANtrak pin 7) should be linked.
GPSI Ground (App.B Connector B pin 1) and CANtrak Ground (App.C CANtrak pin 1) should be common.
GPSI Power (App B Connector B pin 12) should be tied to +12V.

OUT+ of each sensor should be connected to the relevant Analog input on GPSI (see 4.1)
Each sensor's Ground and Earth should be common and IN+ tied to 12V.

GPSI Cable Harness Connections

GRAY Connector A.		GPSI 1A		GPS 2 A		GPSI 3 A		
Deutsch pin#	Function							
1	Ground		GREEN TO GRD BAR		GREEN TO GRD BAR		GREEN TO GRD. BAR	1
2	Fuel Sensor 1							2
3	Analogue Input 7	PRIMARY CHARGE	BLACK 1-7	LEFT STAR TABLE	BLACK 2-7			3
4	Analogue Input 5	GRD. DRIVE CHARGE	BLACK 1-5	STEERING	BLACK 2-5	BIN UNLOAD	BLACK 3-5	4
5	Analogue Input 3	RIGHT PRIMARY	BLACK 1-3			SIDE	BLACK 3-3	5
6	Analogue Input 1	GROUND DRIVE	BLACK 1-1	SECONDARY CHG.	BLACK 2-1	STAR TABLE DIST.	BLACK 3-1	6
7	Analogue Input 2	LEFT PRIMARY	BLACK 1-2	AIRHEAD CHG.	BLACK 2-2	CROSS	BLACK 3-2	7
8	Analogue Input 4	SECONDARY	BLACK 1-4	BRAKE CHG. PRESS.	BLACK 2-4	BIN FILL	BLACK 3-4	8
9	Analogue Input 6	A.H. CHARGE	BLACK 1-6	RIGHT STAR TABLE	BLACK 2-6			9
10	Fuel Sensor 2							10
11	Fuel Sensor Supply							11
12	Voltage Reference		RED TO JUNC BLOCK 1		RED TO JUNC BLOCK 2		RED TO JUNC BLOCK 3	12

BLACK Connector B.								
Deutsch pin#	Function	GPSI 1 B		GPSI 2 B			GPSI 3 B	
1	Ground	GREEN TO GRD BAR		GREEN TO GRD. BAR	-		GREEN TO GRD BAR	
2	Digital Output				-		-	
3	Tach H				-		-	
4	RS232 TxD / RS485A / J11708A				-			
5	CAN Supply + (isolated version only)	RED TO JUNC. BLOCK	7	RED TO JUNC. BLOCK	8		RED TO JUNC. BLOCK	9
6	CAN H	BLACK TO JUNC BLOCK	15	BLACK TO JUNC. BLOCK	15	)	BLACK TO JUNC BLOCK	17
7	CAN L	CLEAR TO JUNC. BLOCK	16	CLEAR TO JUNC. BLOCK	16	)	CLEAR TO JUNC. BLOCK	18
8	CAN Supply – (isolated version only)	BLACK TO GRD BAR		BLACK TO GRD. BAR	-		BLACK TO GRD. BAR	
9	RS232 RxD / RS485B / J1708B				-			
10	Tach L				-		-	
11	Battery Sense				-		-	
12	Supply +	RED TO JUNC BLOCK	4	RED TO JUNC. BLOCK	5		RED TO JUNC. BLOCK	6


REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
CAN Bus Wiring Layout
01-21-05
ConTrak 2600
7
8
120 Ohm
1/4 Watt
Resistor
7
6
Conn. B
Black
GPSI
1
7
6
Conn. B
Black
GPSI
2
7
6
Conn. B
Black
GPSI
3
Acemarc, Inc.
Automation & Machinery Repair
1 888-860-TECH
11136 Holshoe Rd
Homerville, Ohio 44235
Advanced Farm Equipment
HARVESTER
CANtrak 2600/GPSI IO CAN Bus Wiring
SIZE
B
FSCM NO.
DWG NO.
REV
1
SCALE
SHEET
1 of 1

7 Appendix B - GPSI Pinouts

The GPSI housing contains 2 Deutsch 12 pin connectors that contain all power & signal connections as detailed below.

Connector A (Grey)	
Signal	Pin Number
1	Ground
2	Switched Input 1
3	Analogue Input 7
4	Analogue Input 5
5	Analogue Input 3
6	Analogue Input 1
7	Analogue Input 2
8	Analogue Input 4
9	Analogue Input 6
10	Switched Input 2
11	Fused +5V Supply Output
12	4.096V Reference Supply Output

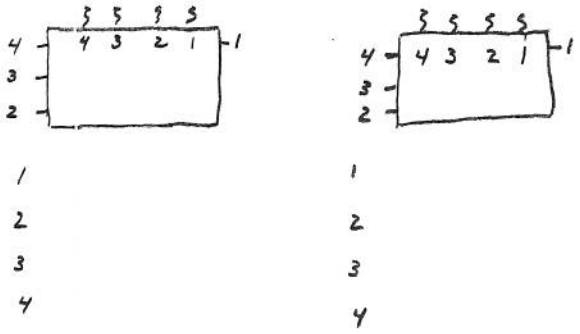
Connector B (Black)	
Signal	Pin Number
1	Ground
2	Digital Output
3	Tachometer High Input
4	RS232 Tx
5	* CAN Power Input +
6	CAN Bus High
7	CAN Bus Low
8	* CAN Power Input -
9	RS232 Rx
10	Tachometer Low Input
11	High Voltage Input
12	Power Supply Input +

BELDEN 9444
TRANSDUCER WIRING

3000 SERIES
AMP CONNECTOR

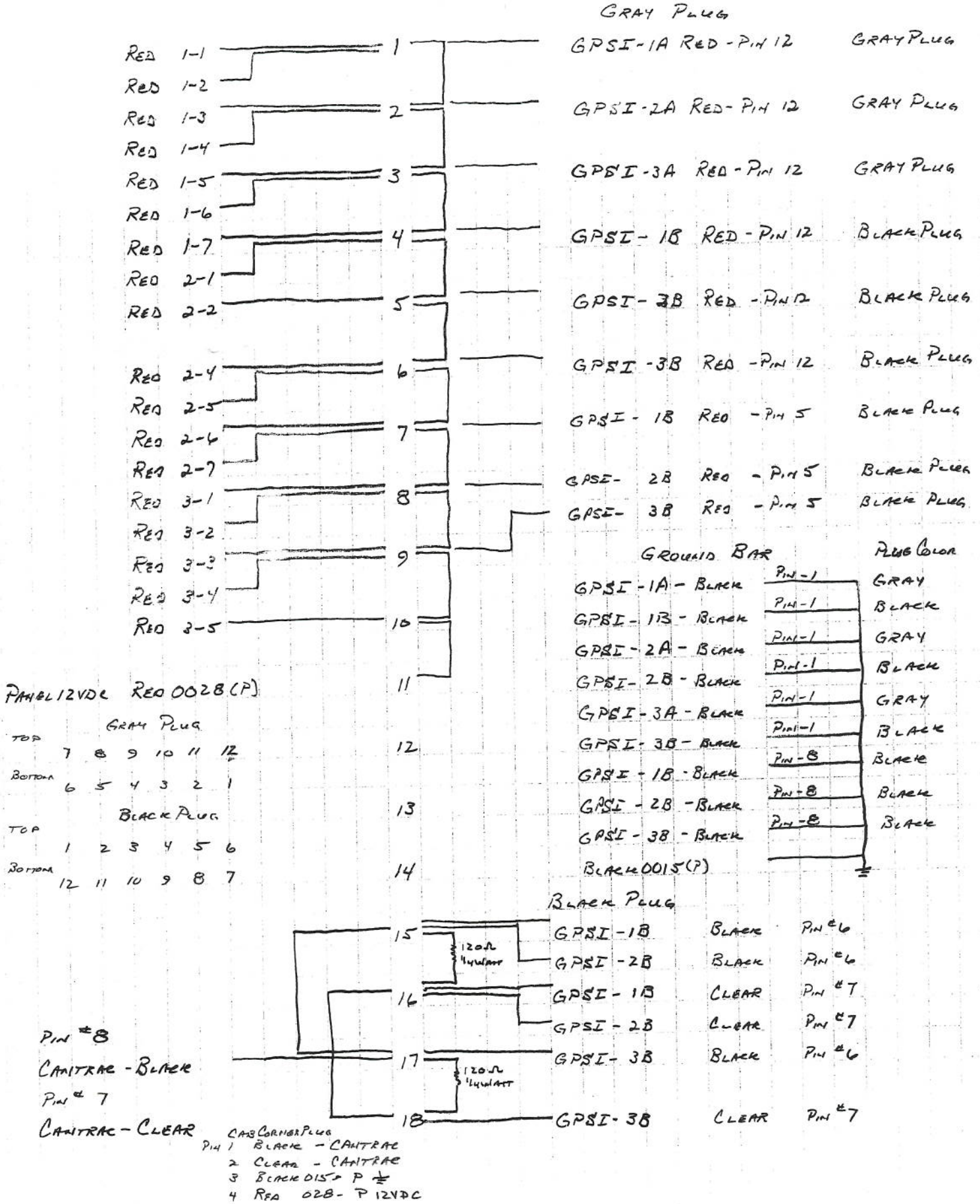
PIN # 1	+OP	BLACK
2	0V(⏚)	WHITE
3	+ IN	RED

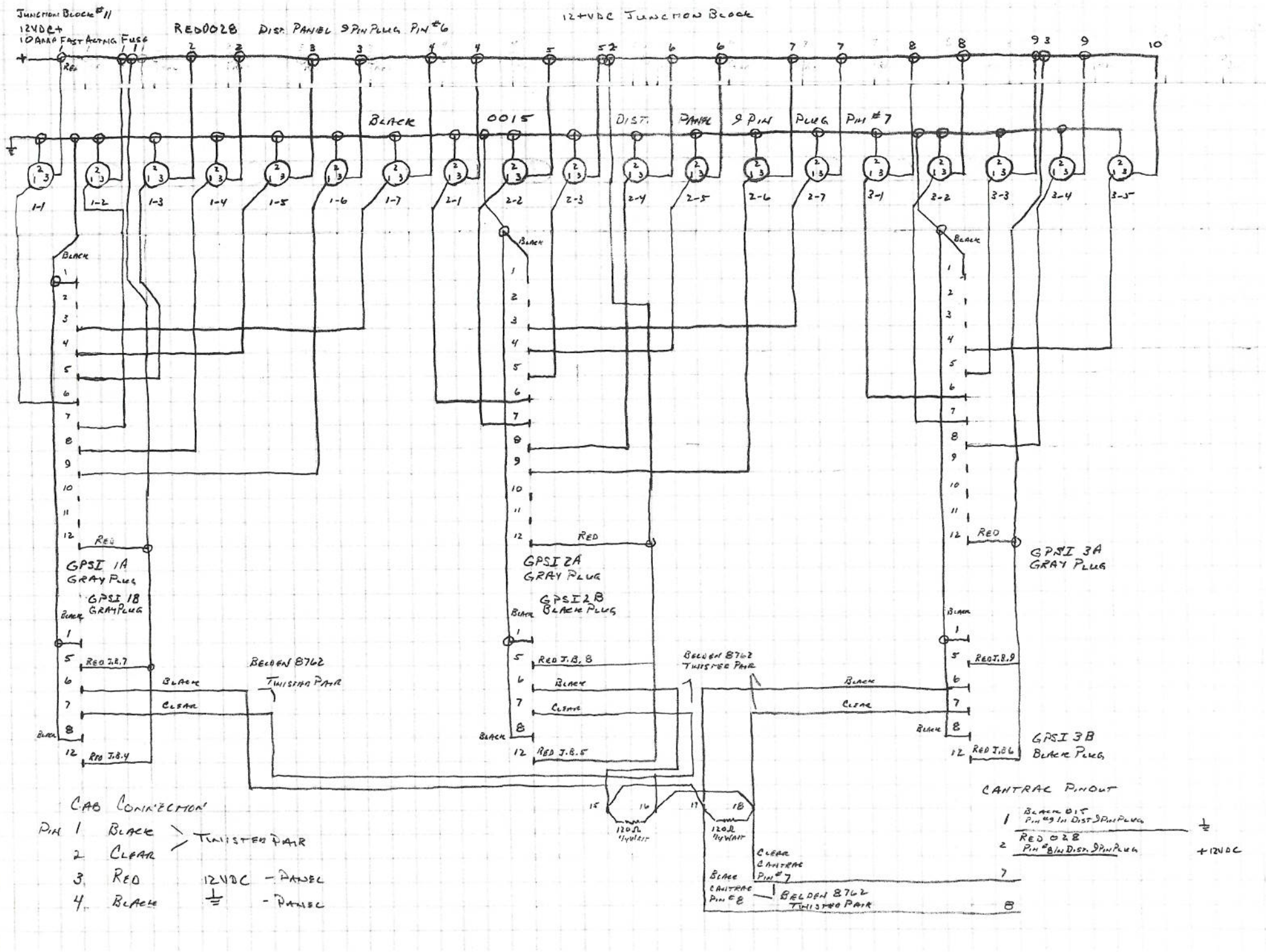
DTS-0373B

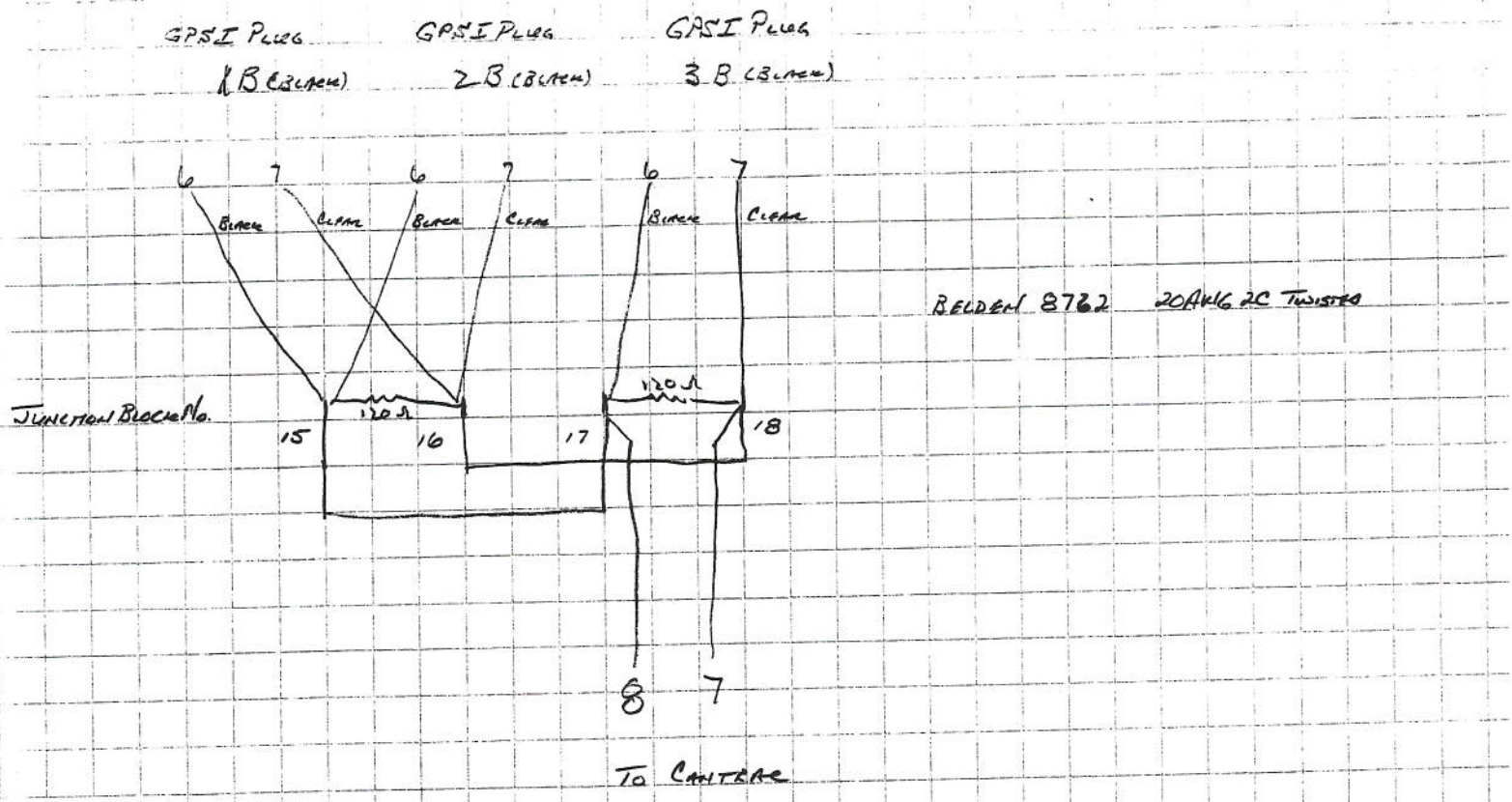


(6/20/05) 2/20/06

GAUGE GPSI's (19 GAUGES)
JUNCTION BLOCK




JUNCTION BLOCK #1
12VDC+
10 AMP FAST ACTING FUSE
RED0028 DIST. PANEL 9 PIN PLUG PIN #6
12+VDC JUNCTION BLOCK
BLACK 0015 DIST. PANEL 9 PIN PLUG PIN #7
GPSI 1A GRAY PLUG
GPSI 1B GRAY PLUG
GPSI 2A GRAY PLUG
GPSI 2B BLACK PLUG
GPSI 3A GRAY PLUG
GPSI 3B BLACK PLUG
BELDEN 8762 TWISTED PAIR
CAB CONNECTION
PIN 1 BLACK
2 CLEAR
3 RED 12VDC - PANEL
4 BLACK - PANEL
CANTRAC PINOUT
1 BLACK 015 PIN #9 IN DIST 9 PIN PLUG
2 RED 028 PIN #8 IN DIST. 9 PIN PLUG
+12VDC
120Ω 1/4WATT
CLEAR CANTRAC PIN #7
BLACK CANTRAC PIN #8
BELDEN 8762 TWISTED PAIR


GPSI Plug
1B (Black)
GPSI Plug
2B (Black)
GASI Plug
3B (Black)
6
7
Black
Clear
120Ω
Junction Block No.
15
16
17
18
8
7
To Canbus
Belden 8762 20AWG 2C Twisted

For Chris

ADVANCED FARM EQUIPMENT 19 GAUGE GPSI LAYOUT

			CABLE NUMBER
GROUND DRIVE	,	// A1 - GPSI 1	1-1
LH PRIMARY	,	// A2	1-2
RH PRIMARY	,	// A3	1-3
SECONDARY	,	// A4	1-4
GD CHARGE	,	// A5	1-5
AIRHEAD CHARGE	,	// A6	1-6
PRIMARY CHARGE	,	// A7	1-7
SECONDARY CHARGE	,	// A1 - GPSI 2	2-1
AIRHEAD	,	// A2	2-2
ROCK CRUSHER	,	// A3	2-3
BRAKE CHARGE	,	// A4	2-4
STEERING	,	// A5	2-5
RH STAR	,	// A6	2-6
LH STAR	,	// A7	2-7
STAR TABLE DIST	,	// A1 - GPSI 3	3-1
CROSS	,	// A2	3-2
SIDE	,	// A3	3-3
BIN FILL	,	// A4	3-4
BIN UNLOAD	,	// A5	3-5
UNUSED	,	// A6	
UNUSED	,	// A7	

};

HJV EQUIPMENT

Fax

To:	AFE	**From:**	HJV
Fax:	989-268-5630	**Pages:**	
Phone:		**Date:**	5-4-05
Re:	LEVESQUE	**CC:**	LAYOUT

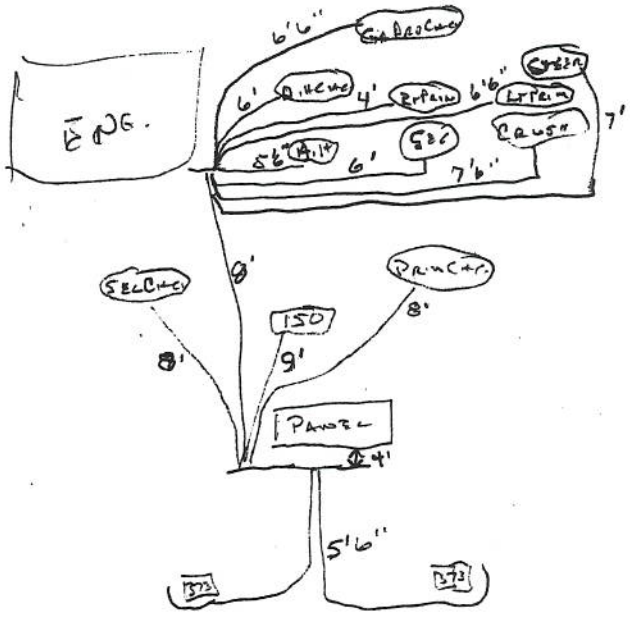
☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• **Comments:**

#05007 LEVESQUE
#01009 TOBIQUE

THIS WOULD BE MY CHOICE FOR LAYOUT

1	GROUND DRIVE
5	LH PRIMARY
6	RH PRIMARY
8	SECONDARY
2	GROUND DRIVE CHARGE
7	AIRHEAD CHARGE
4	PRIMARY CHARGE
10	SECONDARY CHARGE
3	AIRHEAD
9	ROCK CRUSHER (#05007)
18	BRAKE CHARGE
19	STEERING
11	RT STAR
17	LH STAR
12	STAR TABLE DIST
13	CROSS
14	SIDE
15	BIN FILL
16	BIN UNLOAD



Alliston Location: (Head Office)
R.R. #3, 5770 County Road #15
Alliston, Ont. L9R 1V3
705.435.3226 • FAX 705.435.8893

Hensall Location:
72090 London Road, R.R. #1
Hensall, Ont. N0M 1X0
519.263.2450 • FAX 519.263.2455

Grand Falls Location:
10109-Rte #2, DSL
De St. Andre, NB E3Y 3H6
506.473.5557 • FAX 506.473.5874

www.hjv.ca

#08030

ELECTRONIC GAUGES
DOWNEY FARMS
4RSPH W/ 65" - TANK
ENCLOSURE PINOUTS

7/15/08

			PLUG #1
PIN #1	1-1	BLACK	GROUND DRIVE
2	1-1	WHITE	GROUND DRIVE
3	1-1	RED	GROUND DRIVE
4	1-2	BLACK	LEFT PRIMARY
5	1-2	WHITE	LEFT PRIMARY
6	1-2	RED	LEFT PRIMARY
7	1-3	BLACK	RIGHT PRIMARY
8	1-3	WHITE	RIGHT PRIMARY
9	1-3	RED	RIGHT PRIMARY
10	1-4	BLACK	SECONDARY
11	1-4	WHITE	SECONDARY
12	1-4	RED	SECONDARY
			PLUG #2
PIN #1	1-5	BLACK	GROUND DRIVE CHARGE PRESSURE
2	1-5	WHITE	GROUND DRIVE CHARGE PRESSURE
3	1-5	RED	GROUND DRIVE CHARGE PRESSURE
4	1-6	BLACK	AIR HEAD CHARGE PRESSURE
5	1-6	WHITE	AIR HEAD CHARGE PRESSURE
6	1-6	RED	AIR HEAD CHARGE PRESSURE
7	1-7	BLACK	PRIMARY CHARGE PRESSURE
8	1-7	WHITE	PRIMARY CHARGE PRESSURE
9	1-7	RED	PRIMARY CHARGE PRESSURE
10	2-1	BLACK	SECONDARY CHARGE PRESSURE
11	2-1	WHITE	SECONDARY CHARGE PRESSURE
12	2-1	RED	SECONDARY CHARGE PRESSURE
			PLUG #3
PIN #1	2-2	BLACK	AIR HEAD
2	2-2	WHITE	AIR HEAD
3	2-2	RED	AIR HEAD
4	2-3		
5	2-3		
6	2-3		
7	2-4	BLACK	BRAKE CHARGE PRESSURE
8	2-4	WHITE	BRAKE CHARGE PRESSURE
9	2-4	RED	BRAKE CHARGE PRESSURE
10	2-5	BLACK	STEERING
11	2-5	WHITE	STEERING
12	2-5	RED	STEERING

#08030

ELECTRONIC GAUGES
DOWNEY FARMS
4RSPH W/ 65" - TANK
ENCLOSURE PINOUTS

7/15/08

PLUG #4

PIN #1	2-6	BLACK	RIGHT STAR TABLE
2	2-6	WHITE	RIGHT STAR TABLE
3	2-6	RED	RIGHT STAR TABLE
4	2-7	BLACK	LEFT STAR TABLE
5	2-7	WHITE	LEFT STAR TABLE
6	2-7	RED	LEFT STAR TABLE
7	3-1	BLACK	STAR TABLE DISTRIBUTOR
8	3-1	WHITE	STAR TABLE DISTRIBUTOR
9	3-1	RED	STAR TABLE DISTRIBUTOR
10	3-2	BLACK	CROSS
11	3-2	WHITE	CROSS
12	3-2	RED	CROSS

PLUG #5

PIN#1	3-3	BLACK	SIDE
2	3-3	WHITE	SIDE
3	3-3	RED	SIDE
4	3-4	BLACK	BIN FILL
5	3-4	WHITE	BIN FILL
6	3-4	RED	BIN FILL
7	3-5	BLACK	BIN UNLOAD
8	3-5	WHITE	BIN UNLOAD
9	3-5	RED	BIN UNLOAD
10			
11			
12			

PLUG #6

PIN #1	BLACK		BELDEN 8762 TO CAB
2	CLEAR		BELDEN 8762 TO CAB
3	RED	0028	12V DC FROM DISTRIBUTION PANEL
4	BLACK	0015	GROUND TO DISTRIBUTION PANEL

EATON | Hydraulics

Electronic Proportional (EP) Control for Heavy Duty Series 2 Piston Pumps

Model 33
Model 39
Model 46
Model 54
Model 64

1/5/07

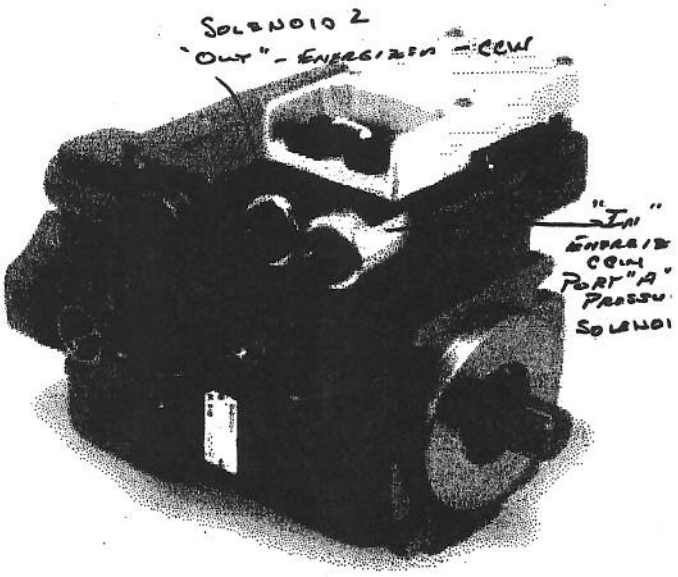
The Electronic Proportional (EP) Control is ideal for a wide range of mobile and industrial applications where electrical control of pump displacement is desired. Eaton's robust design incorporates an electronic module, proportional solenoids and a valve assembly.

Pump displacement is controlled by an input command signal which is converted into proportional current output by the electronic module. The proportional solenoid-actuated valve assembly then converts the current output into proportional pump displacement.

Designed to meet the rigorous duty cycle requirements of off-highway equipment, the EP Control utilizes an electronic module encapsulated in an aluminum enclosure and environmentally-sealed Metri-Pack® connectors to assure maximum protection from the elements. The EP Control is designed to resist Electromagnetic Interference (EMI) which could affect proper operation.

The EP Control offers maximum design and application flexibility with two different types of command input options and compatibility with both 12 and 24 Vdc power supplies. Typical input devices include joysticks (1-6 Vdc) and PLCs (±4-20 mA).

For precise, repeatable operation, closed-loop current control is used to compensate for resistance and voltage changes of the proportional solenoids due to temperature variation. In the event of a power loss or loss of signal, the EP Control automatically returns the pump to neutral. Mechanical feedback of the swashplate position provides closed-loop control to maintain the selected displacement setting over a wide range of operating conditions. Solenoids have integral manual override actuators.



EP Control Features

- Robust, flexible electronic pump control
- Electronic module encapsulated for environmental protection
- Automotive style environmentally sealed Metri-Pack® connectors
- Closed-loop current control compensates for resistance change of the proportional solenoids due to temperature variations
- Return to neutral for loss of power or loss of command input signal
- Mechanical feedback of swashplate position for closed-loop control
- Two choices for command input signal
- Operates from 12 or 24 Vdc power supply
- Ease of installation
- Operating temperature range -40° to +85° C
- On-pump mounting for many installations
- External neutral adjustment
- Manual override capability
- Drive module qualification per SAE J1455, SAE J1113, CISPR 25
- External fuse (customer supplied): 3A

Electronic Module Qualification
(Contact Eaton for Specific Levels)

- *SAE J1455 - Recommended Environmental Practices for Electronic Equipment Design*
  - Humidity/Temperature Extreme Cycling
  - Salt Spray
  - Splash & Immersion
  - Steam Cleaning/High Pressure Wash
  - Vibration
  - Mechanical Shock
  - Temperature Cycling
  - Load Dump Transients
  - Inductive Load Switching Transients
- *SAE J1113 - Electromagnetic Susceptibility Measurement Procedures for Vehicle Components*
  - EMI/EMC - Conducted & Radiated Immunity
- *CISPR 25 - International Electrotechnical Commission "Limits and Methods of Measurement of Radio Disturbance Characteristics for the Protection of Receivers used on Board Vehicles"*
  - EMI/EMC - Conducted & Radiated Emissions

EATON | Hydraulics

Electronic Proportional (EP) Control for Medium Duty 72400 Piston Pumps

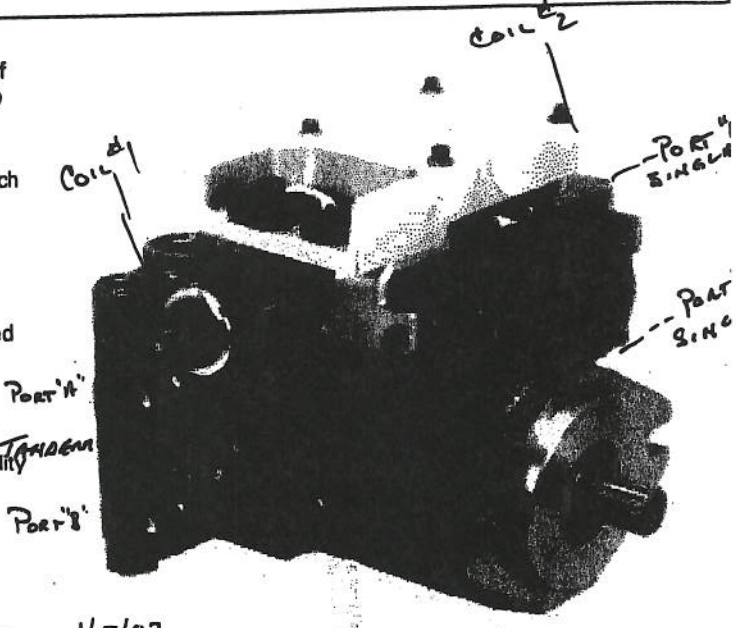
The Electronic Proportional (EP) Control is ideal for a wide range of mobile and industrial applications where electrical control of pump displacement is desired. Eaton's robust design incorporates an electronic module, proportional solenoids and a valve assembly.

Pump displacement is controlled by an input command signal which is converted into proportional current output by the electronic module. The proportional solenoid-actuated valve assembly then converts the current output into proportional pump displacement.

Designed to meet the rigorous duty cycle requirements of off-highway equipment, the EP Control utilizes an electronic module encapsulated in an aluminum enclosure and environmentally-sealed Metri-Pack® connectors to assure maximum protection from the elements. The EP Control is designed to resist Electromagnetic Interference (EMI) which could affect proper operation.

The EP Control offers maximum design and application flexibility with two different types of command input options and compatibility with both 12 and 24 Vdc power supplies. Typical input devices include joysticks (1-6 Vdc) and PLCs (±4-20 mA).

For precise, repeatable operation, closed-loop current control is used to compensate for resistance and voltage changes of the proportional solenoids due to temperature variation. In the event of a power loss or loss of signal, the EP Control automatically returns the pump to neutral. Mechanical feedback of the swashplate position provides closed-loop control to maintain the selected displacement setting over a wide range of operating conditions. Solenoids have integral manual override actuators.



1/5/07
Energized - CCW
#1 Coil Next to Pressure Ports - "In" Pressure Out Port "A"
#2 Coil Away From Ports - "Out"

EP Control Features

- Robust, flexible electronic pump control
- Electronic module encapsulated for environmental protection
- Automotive style environmentally sealed Metri-Pack® connectors
- Closed-loop current control compensates for resistance change of the proportional solenoids due to temperature variations
- Return to neutral for loss of power or loss of command input signal
- Mechanical feedback of swashplate position for closed-loop control
- Two choices for command input signal
- Operates from 12 or 24 Vdc power supply
- Ease of installation
- Operating temperature range -40° to +85° C
- On-pump mounting for many installations
- External neutral adjustment
- Manual override capability
- Drive module qualification per SAE J1455, SAE J1113, CISPR 25
- External fuse (customer supplied): 3A

Electronic Module Qualification
(Contact Eaton for Specific Levels)

- *SAE J1455 - Recommended Environmental Practices for Electronic Equipment Design*
  - Humidity/Temperature Extreme Cycling
  - Salt Spray
  - Splash & Immersion
  - Steam Cleaning/High Pressure Wash
  - Vibration
  - Mechanical Shock
  - Temperature Cycling
  - Load Dump Transients
  - Inductive Load Switching Transients
- *SAE J1113 - Electromagnetic Susceptibility Measurement Procedures for Vehicle Components*
  - EMI/EMC - Conducted & Radiated Immunity
- *CISPR 25 - International Electrotechnical Commission "Limits and Methods of Measurement of Radio Disturbance Characteristics for the Protection of Receivers used on Board Vehicles"*
  - EMI/EMC - Conducted & Radiated Emissions

)UTPUT
SELECTION

MN	= ADJUST MINIMUM SETTING
MX	= ADJUST MAXIMUM SETTING
RU	= ADJUST RAMP UP SETTING
RD	= ADJUST RAMP DOWN SETTING
O2	= OUTPUT SELECTION (1 OR 2)

'ARAMETER
ELECTION

OPORTIONAL OUTPUT SETTINGS ARE CHANGEABLE
THOUT THE PALM PILOT UTILIZING THE ON-BOARD
MPERS AND ADJUSTMENT POTENTIOMETER. USE THE
LLOWING PROCEDURE:

SELECT WHICH OUTPUT'S PARAMETERS TO CHANGE
USING THE "O2" SHORTING JUMPER. WHEN THE "O2"
IS ARE SHORTED USING THE JUMPER, PROPORTIONAL
ITPUT #2 IS SELECTED. WHEN THE PINS ARE NOT
ORTED TOGETHER, OUTPUT 1 IS SELECTED.

SELECT THE DESIRED PARAMETER TO CHANGE BY
STALLING A SHORTING JUMPER ON THE
RRESPONDING SET OF PINS AS SHOWN ABOVE:

N" TO ADJUST THE MINIMUM PROPORTIONAL OUTPUT
TTING. SET ANALOG INPUT SIGNAL(POTENTIOMETER,
YSTICK) TO IT'S LOWEST POSITION, ADJSUT "MN" AND
NITOR OUTPUT TO VALVE FOR DESIRED VALUE.

X" TO ADJUST THE MAXIMUM PROPORTIONAL OUTPUT
TTING, SET ANALOG INPUT SIGNAL(POTENTIOMETER,
YSTICK) TO IT'S MAXIMUM POSITION, ADJSUT "MX" AND
NITOR OUTPUT TO VALVE FOR DESIRED VALUE.

U" TO ADJUST THE RAMP UP SETTING,
D" TO ADJUST THE RAMP DOWN SETTING,

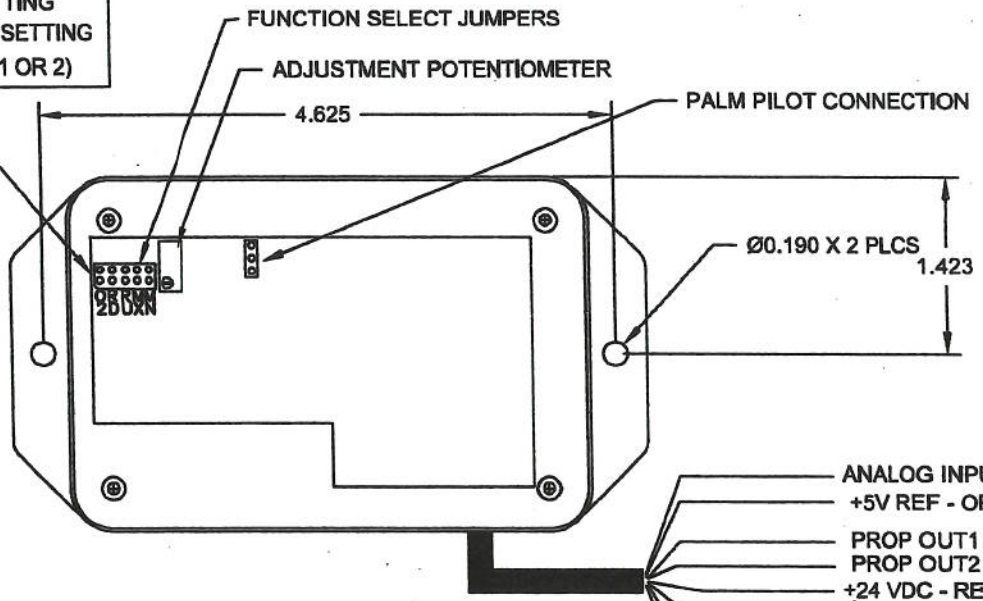
) ADJUST THE VALUE TO THE DESIRED SETTING USING
HE ADJUSTMENT POTENTIOMETER SHOWN ON THE
RAWING.

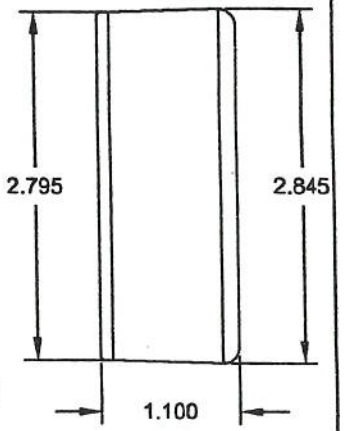
) SAVE THE PARAMETER BY REMOVING THE JUMPER
ROM THE SELECTED PARAMETER PINS. DO NOT
HANGE THE STATE OF THE "O2" PINS BEFORE
EMOVING THE JUMPER FROM THE PARAMETER PINS
R THE SETTING MAY NOT BE SAVED IN MEMORY.

.) REPEAT PROCEDURE TO CHANGE ANY AND ALL
ARAMETERS FOR THE 2 PROPORTIONAL OUTPUTS.
EMEMBER TO REMOVE THE PARAMETER JUMPER
EFORE SELECTING WHICH OUTPUT TO CHANGE USING
HE "O2" JUMPER.

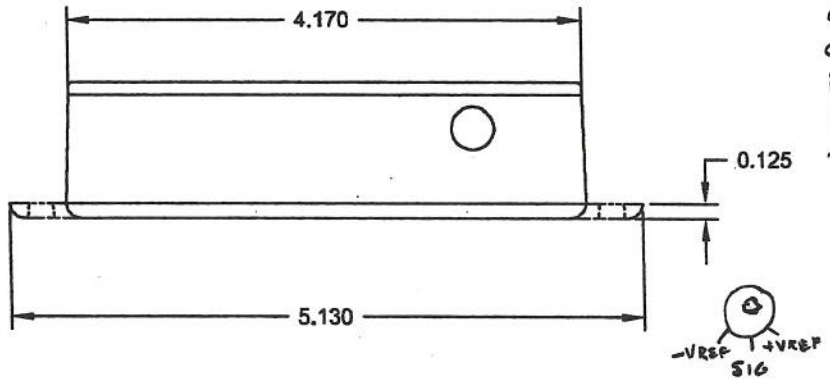
.) REMOVE BOTH JUMPERS AND PLACE HORIZONTALLY
OR STORAGE ON TWO ADJACENT PINS

EE MANUAL FOR INSTRUCTIONS ON HOW TO SET THE
'ARAMETERS USING A PALM PILOT.





BLUE TO POT SIGNAL
ORANGE TO POT +VREF W/2K RESISTOR
GREEN TO PIN 2 COIL #2
RED TO PANEL +12VDC
BLACK TO PANEL GROUND
-VREF ON POT TO PANEL GROUND W/10K RESISTOR



REF: KAR-TECH

REV	BY	DATE	DESCRIPTION
A	AJL	12-12-15	RELEASED

DO NOT SCALE PRINT

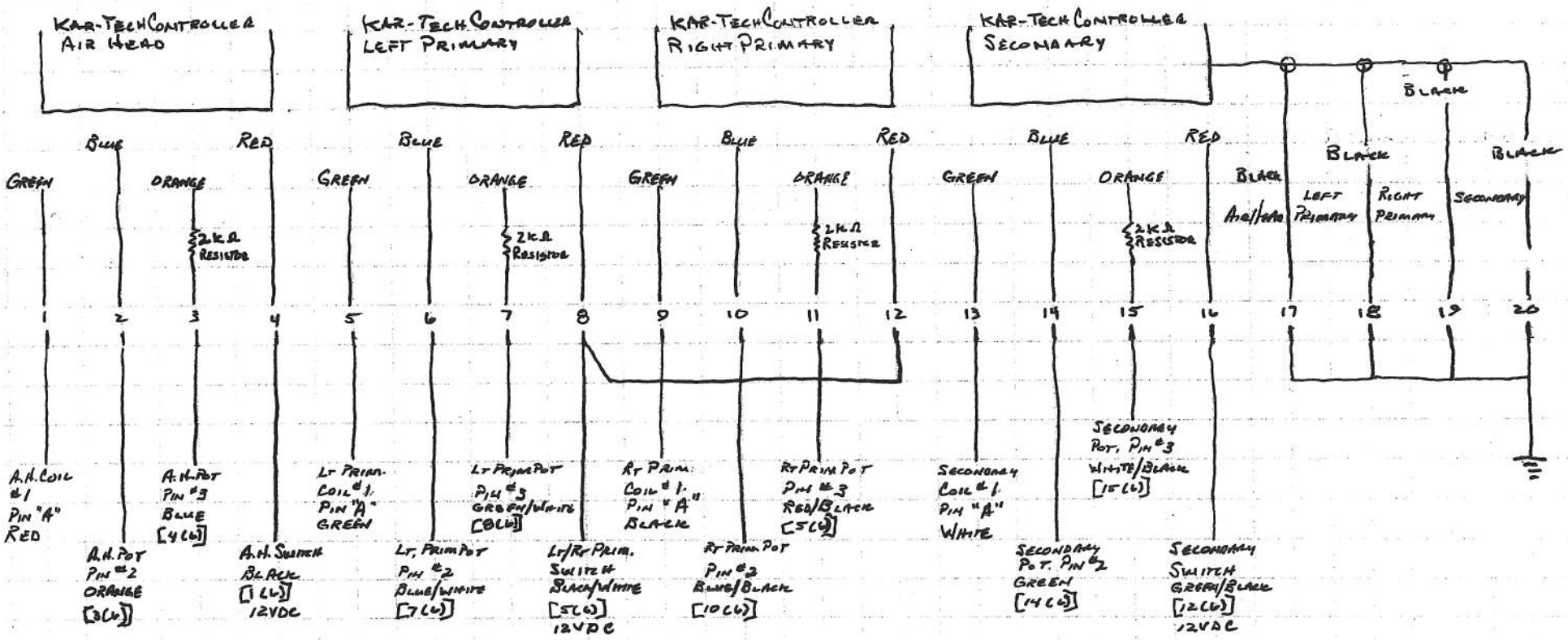
KAR-TECH
Delafield, WI 53018

DIGITAL VALVE DRIVER

CAD DRAWING DO NOT REVISE MANUALLY

UNLESS TOLERANCE	
XX	± .1
XXX	± .05
XXXX	± .005
FRACTIONAL	± 1/8
ANGULAR	± 15 deg

SCALE	DRAWN	DATE	CHECKED	APPROVED	DRAWING #
FULL	AJL	12-12-15			21-017-2-A-2 B

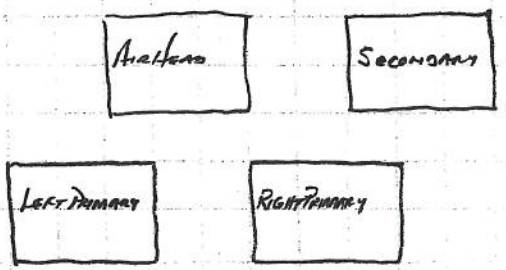


24 PIN PLUG IN CONTROLLER BOX

POTENTIOMETER TO KAR-TECH CONTROLLER

BELDEN 8468

KAR-TECH CONTROLLER TO PUMP		FULL	1/2	OFF
BELDEN M9418	GREEN	7.7	4.3	0
	BLUE	4.42	3.42	2.2
	ORANGE	4.42	4.42	4.42
	RED	12	12	0



2/26/07
KAR-TECH CONTROLS
21-017-2-A

KAR-TECH ENCLOSURE

#08030 **DOWNEY FARMS** **7/15/08**

4RSPH W/ 65" - TANK

PIN #				
1	RED		AIR HEAD COIL #1 - PIN "A"	BELDEN 9418
2	ORANGE		AIR HEAD POTENTIOMETER TERMINAL #2	8468
3	BLUE		AIR HEAD POTENTIOMETER TERMINAL #3	8468
4	BLACK		AIR HEAD SWITCH - ON / OFF	8468
5	GREEN		LEFT PRIMARY COIL #1 - PIN "A"	9418
6	BLUE/WHITE		LEFT PRIMARY POTENTIOMETER TERMINAL #2	8468
7	GREEN/WHITE		LEFT PRIMARY POTENTIOMETER TERMINAL #3	8468
8	BLACK/WHITE		LEFT / RIGHT PRIMARY SWITCH - ON / OFF	8468
9	BLACK		RIGHT PRIMARY COIL #1 - PIN "A"	9418
10	BLUE/BLACK		RIGHT PRIMARY POTENTIOMETER TERMINAL #2	8468
11	RED/BLACK		RIGHT PRIMARY POTENTIOMETER TERMINAL #3	8468
12				
13	WHITE		SECONDARY COIL #1 - PIN "A"	9418
14	GREEN		SECONDARY POTENTIOMETER TERMINAL #2	8468
15	WHITE/BLACK		SECONDARY POTENTIOMETER TERMINAL #3	8468
16	GREEN/BLACK		SECONDARY SWITCH - ON / OFF	8468
17				
18				
19				
20	BLACK	0020	KAR-TECH GROUND TO PANEL	P
21				
22				
23				
24				

LEFT PRIMARY	1
RIGHT PRIMARY	2
AIR HEAD	3
SECONDARY	4

#08030 **DOWNEY FARMS** 7/15/08

4RSPH W/ 65" - TANK
CAB PLUG.

PLUG #6

1	BLACK	AIR HEAD CONTROLLER POWER SUPPLY PIN "4"
2	RED	
3	ORANGE	AIR HEAD CONTROLLER COMMAND SIGNAL PIN "2"
4	BLUE	AIR HEAD CONTROLLER COMMAND SIGNAL PIN "3"
5	BLACK / WHITE	LEFT / RIGHT PRIMARY CONTROLLAER POWER SUPPLY PIN "8"
6	RED / WHITE	
7	BLUE / WHITE	LEFT PRIMARY CONTROLLER COMMAND SIGNAL PIN " 6 "
8	GREEN / WHITE	LEFT PRIMARY CONTROLLER COMMAND SIGNAL PIN " 7 "
9	ORANGE / BLACK	
10	BLUE / BLACK	RIGHT PRIMARY CONTROLLER COMMAND SIGNAL PIN "10"
11	RED / BLACK	RIGHT PRIMARY CONTROLLER COMMAND SIGNAL PIN "11"
12	GREEN / BLACK	SECONDARY CONTROLLER POWER SUPPLY PIN "16"
13	WHITE	
14	GREEN	SECONDARY CONTROLLER COMMAND SIGNAL PIN "14"
15	WHITE / BLACK	SECONDARY CONTROLLER COMMAND SIGNAL PIN "15"
16		

LEFT / RIGHT PRIMARY - SECONDARY -- COIL #2 PIN "D" TO GROUND
AIR HEAD -- COIL #1 PIN "B" TO GROUND

CANTRAC DISPLAY
CAB CORNER PINOUT

PIN# 1	BLACK		BELDEN 8762
2	CLEAR		BELDEN 8762
3	RED	0028	12VDC FROM DISTRIBUTION PANEL
4	BLACK	0015	GROUND TO DISTRIBUTION PANEL

DISPLAY PINOUT

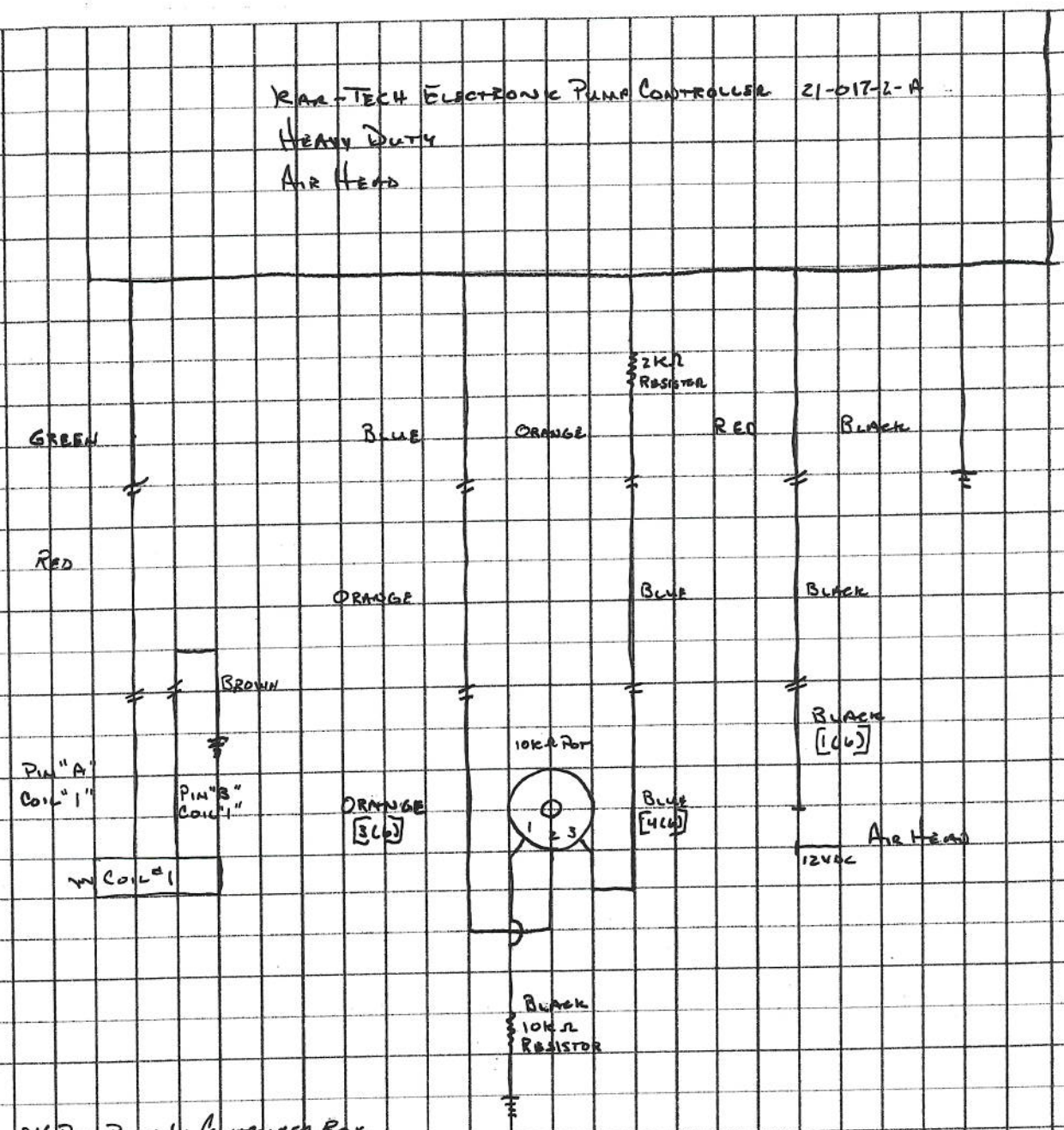
PIN# 1	BLACK	015	GROUND
2	RED	028	12VDC
7	CLEAR		BELDEN 8762
8	BLACK		BELDEN 8762

2/26/07

KAR-TECH ELECTRONIC PUMP CONTROLLER 21-017-2-A

HEAVY DUTY

AIR HEAD



24 PIN PLUG IN CONTROLLER BOX

POT TO KAR-TECH - BELDEN 8468

KAR-TECH TO PUMP - BELDEN 9418

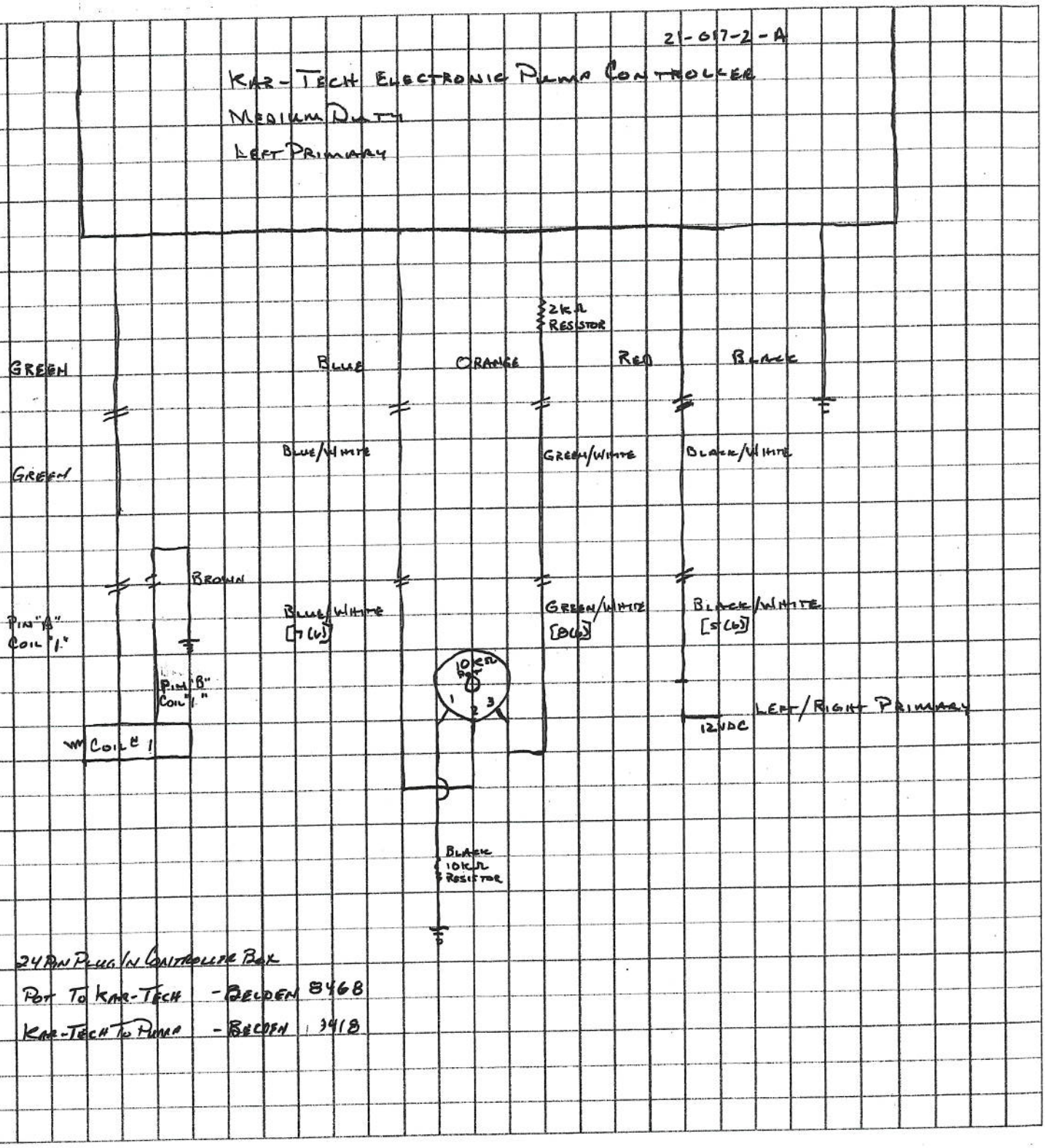
2/26/07

21-017-2-A

KAR-TECH ELECTRONIC PUMA CONTROLLER

MEDIUM DUTY

LEFT PRIMARY



24 PIN PLUG IN CONTROLLER BOX

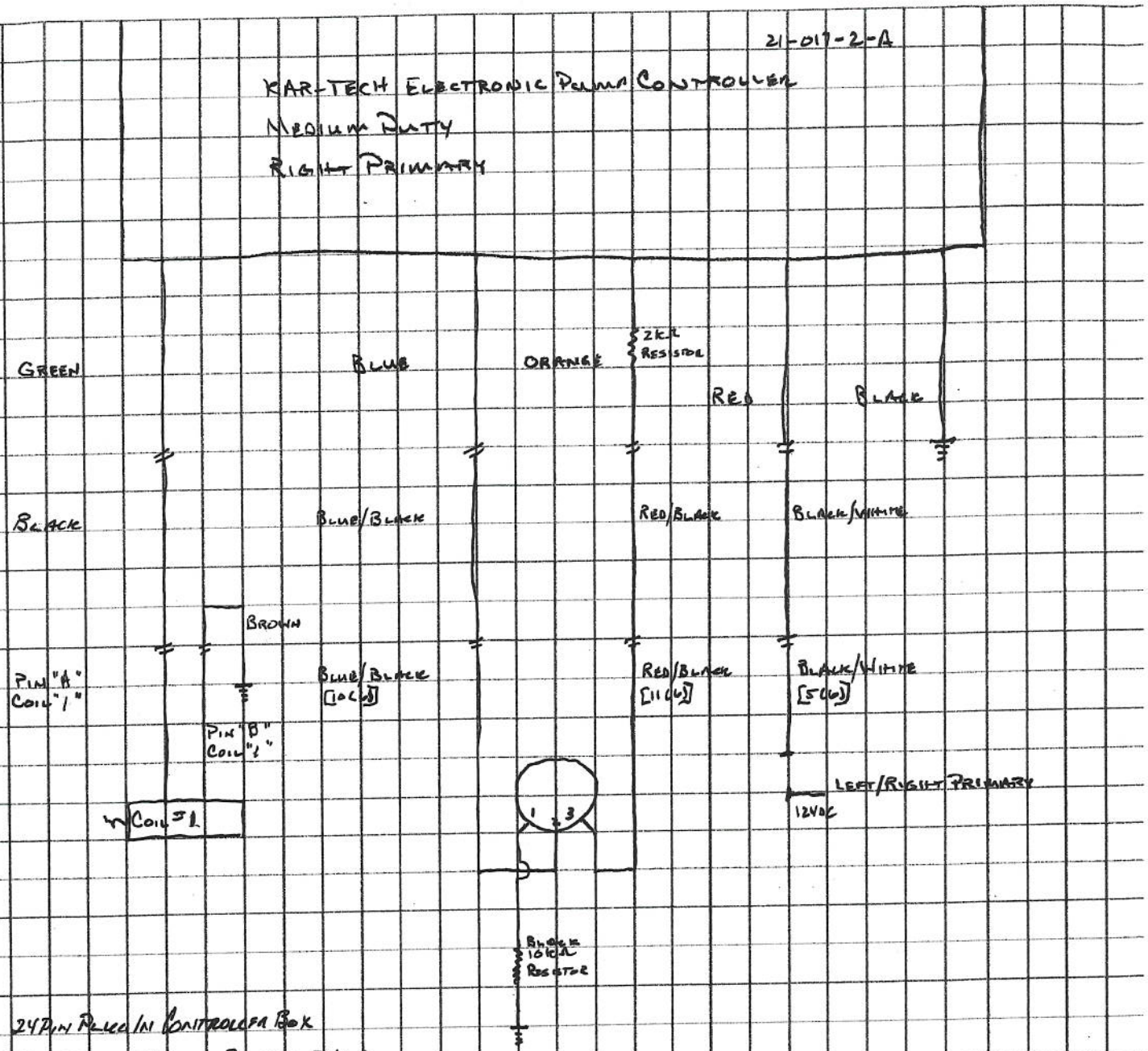
POT TO KAR-TECH - BELDEN 8468

KAR-TECH TO PUMA - BELDEN 3418

2/26/07

21-017-2-A

KAR-TECH ELECTRONIC PUMP CONTROLLER
MEDIUM DUTY
RIGHT PRIMARY



24 PIN PELCO IN CONTROLLER BOX

POT TO KAR-TECH - BECKER 8468

KAR TECH TO PUMP - BECKER . 9418

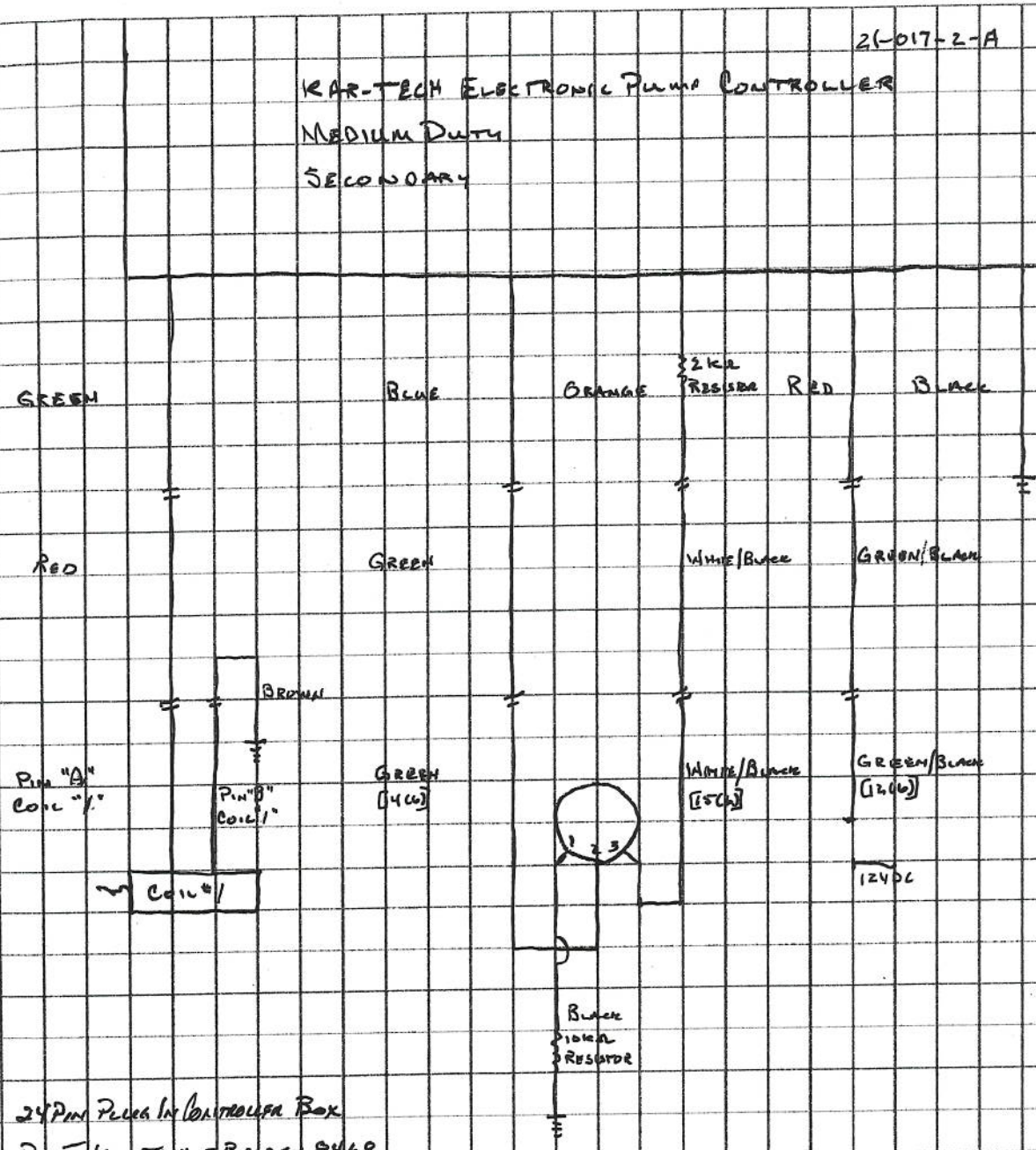
2/26/07

21-017-2-A

KAR-TECH ELECTRONIC PUMP CONTROLLER

MEDIUM DUTY

SECONDARY



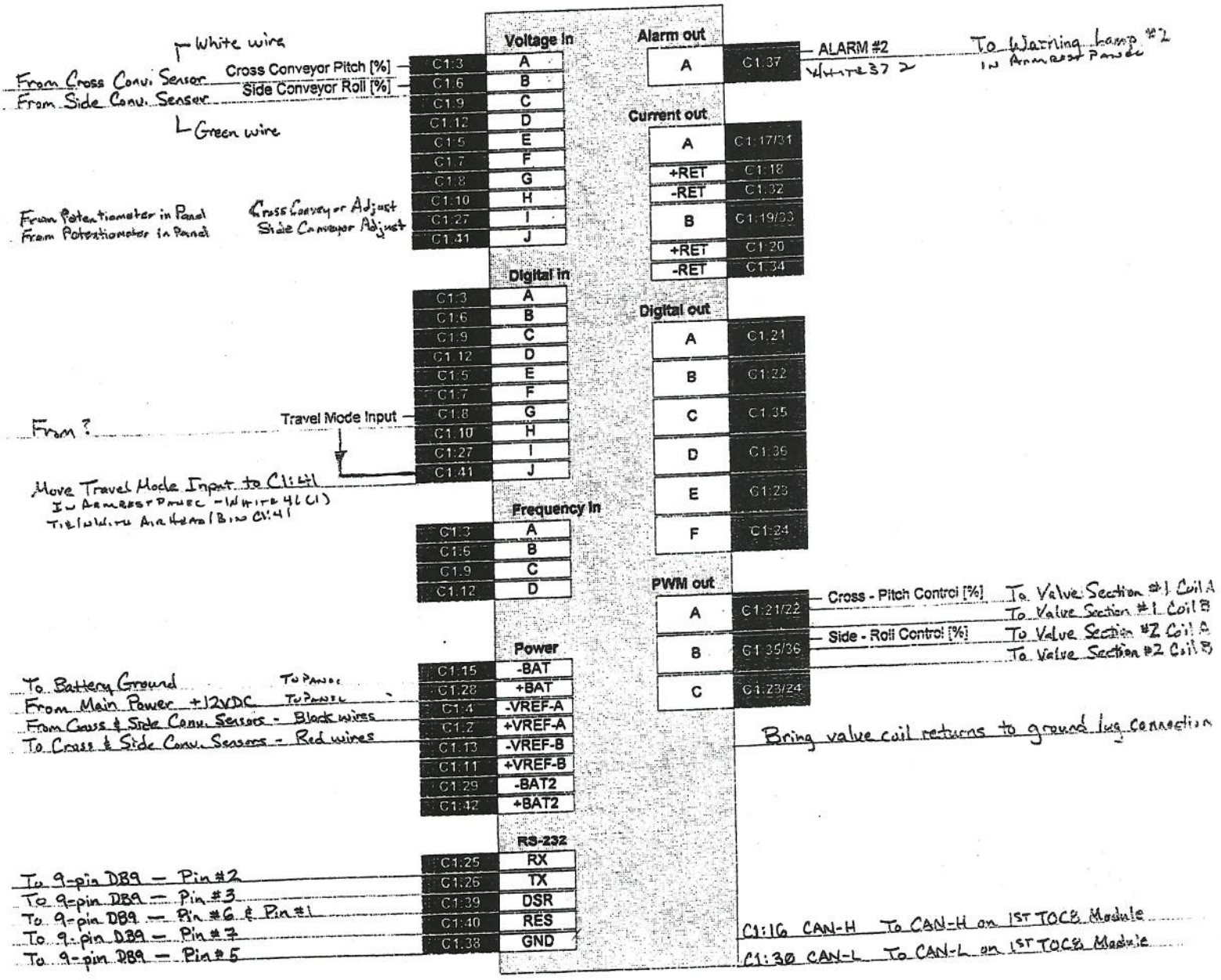
24 PIN PLUG IN CONTROLLER BOX

POT TO KAR-TECH - BELDEN 8468

KAR-TECH TO PUMP - BELDEN 9418

IQAN TOC8: CROSS & SIDE CONVEYOR LEVEL CONTROL

Serial number: 0
Hardware version: 0.00
Software version: 0.00



ADVANCED FARM EQUIPMENT

AIR HEAD / BIN LEVELING TOC 8

8/8/2007

TOC 8	PANEL RECEP.	JUNCTION BLOCK	DESCRIPTION	POTENT.	INCOMING WIRE
WHITE 2		1	TO JUNCTION BLOCK		
		1 (2 WIRES)	TO AIR HEAD PITCH/ROLL POT'S / + VREF-A	WHITE 2	
		1	TO BIN LEVEL POT / + VREF-A	WHITE 2	
	1-1	1	TO AIR HEAD SENSOR / + VREF-A		RED #1
WHITE 3	1-2		FROM AIR HEAD SENSOR / - PITCH		WHITE #1
WHITE 4		2	TO JUNCTION BLOCK		
		2 (2 WIRES)	TO AIR HEAD PITCH/ROLL POT'S / - VREF-A	WHITE 4	
		2	TO BIN LEVEL POT / - VREF-A	WHITE 4	
	1-3	2	FROM AIR HEAD SENSOR / - VREF-A		BLACK #1
WHITE 5	2-1		BIN LEVEL MANUAL UP FROM ARMREST		ORANGE 72 20(4)
WHITE 6	1-4		FROM AIRHEAD SENSOR / ROLL		GREEN #1
WHITE 7		3	TO JUNCTION BLOCK		EXT. WHITE
	1-5	3	BIN LEVEL SENSOR (IN)		WHITE #9-EXT WHITE
		3	CONNECT TO C1:15 W/ 250 OHM REISTOR		
WHITE 8			BIN LEVEL ADJUST (IN) FROM POT.	WHITE 8	
WHITE 9		9	A.H. RPM SENSOR INPUT		
WHITE 9	1-6	9	FROM A.H. RPM SENSOR TO C1:9		GREEN 605
WHITE 9	2-2	9	TO AIR HEAD FAN RPM READOUT IN CAB		GREEN 605 15(4)
WHITE10			A.H. PITCH ADJUST (IN) FROM POT	WHITE 10	
WHITE 12	2-3		BIN MANUAL DOWN FROM ARM REST		BLUE 71 19(4)
BLACK 15		4	TO JUNCTION BLOCK		
	1-7	4	TO DISTRIBUTION PANEL PLUG		BLACK 15 (P)
		4	CONNECT TO C1:7 W/250 OHM RESISTOR		
WHITE 21	3-1		A.H. PITCH CONTROL VALVE COIL-A / #4		BLACK #4 VALVE
WHITE 22	3-2		A.H. PITCH CONTROL VALVE COIL-B / #4		RED #4 VALVE
WHITE 23	3-3		BIN LEVEL CONTROL VALVE COIL-A / #8		BLACK #8 VALVE
WHITE 24	3-4		BIN LEVEL CONTOLL VALVE COIL-B / #8		RED #8 VALVE
WHITE 27			A.H. ROLL ADJUST (IN) FROM POT	WHITE 27	
RED 28	1-8		TO MAIN POWER IN DIST. PANEL PLUG		RED 28 (P)
WHITE 35	3-5		A.H. ROLL CONTROL VALVE COIL-A / #5		BLACK #5 VALVE
WHITE 36	3-6		A.H. ROLL CONTROL VALVE COIL-B / #5		RED #5 VALVE
WHITE 37	2-4		A.H. / BIN LEVEL ALARM TO ARM REST		WHITE 371 23(4)
WHITE 41		5	TO JUNCTION BLOCK		
WHITE 41	2-5	5	TO TRAVEL MODE SWITCH IN ARM REST		WHITE 41 22(4)
RED 75	2-6	6	FROM BIN FILL AUTO SWT TO BIN FILL SENSOR		RED 75 21(4)
BROWN #9	1-11	6	12VDC FROM ARM REST TO BIN FILL SENSOR		BROWN #9-EXT RED
BLUE #9	1-12	4	BIN FILL SENSOR TO GROUND		BLUE #9-EXT GREEN
WHITE #4	3-7	14	A.H. PITCH CONTROL VALVE COIL-A / #4		WHITE #4 VALVE
GREEN #4	3-8	14	A.H. PITCH CONTROL VALVE COIL-B / #4		GREEN #4 VALVE
WHITE #5	3-9	13	AH. ROLL CONTROL VALVE COIL-A / #5		WHITE #5 VALVE
GREEN #5	3-10	13	A.H. ROLL CONTROL VALVE COIL-B / #5		GREEN #5 VALVE
WHITE #8	3-11	12	BIN FILL CONTROL VALVE COIL-A / #8		WHITE #8 VALVE
GREEN #8	3-12	12	BIN FILL CONTROL VALVE COIL-B / #8		GREEN #8 VALVE
BLUE 16		7	CAN-H TO CAN-H ON A.H. / BIN TOC 8	CONNECT 7/8 W/ 120 OHM RESISTOR	
WHITE 30		8	CAN-L TO CAN-L ON A.H. / BIN TOC 8		
WHITE 25					
WHITE 26					
WHITE 39					
WHITE 46					
WHITE 38					

5773 Crystal Rd. ~ Vestaburg, MI. 48891 ~Phone: 989-268-5711 ~Fax: 989-268-5630

ADVANCED FARM EQUIPMENT

CROSS / SIDE CONVEYOR LEVELING TOC 8

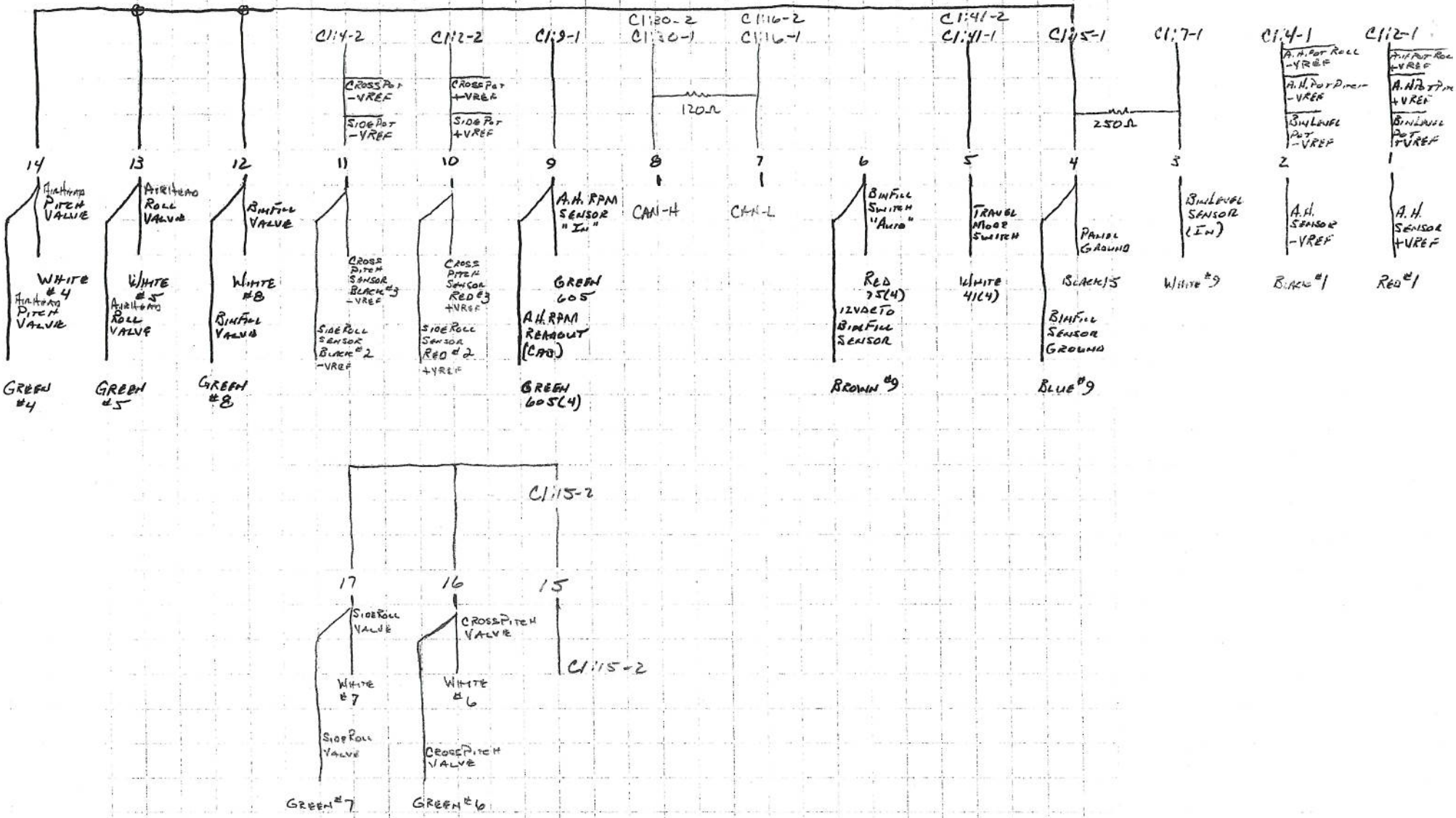
8/8/2007

TOC 8	PANEL RECEP.	JUNCTION BLOCK	DESCRIPTION	POTENT.	INCOMING WIRE
WHITE 2		10	TO JUNCTION BLOCK		
		10	TO CROSS POT / +VREF	WHITE 2	
		10	TO SIDE POT / +VREF	WHITE 2	
	4-1	10	TO CROSS PITCH SENSOR / +VREF		RED #3
	4-2	10	TO SIDE ROLL SENSOR / +VREF		RED #2
WHITE 3	4-3		FROM CROSS PITCH SENSOR		WHITE #3
WHITE 4		11	TO JUNCTION BLOCK		
		11	TO CROSS POT / -VREF	WHITE 4	
		11	TO SIDE POT / -VREF	WHITE 4	
	4-4	11	TO CROSS PITCH SENSOR / -VREF		BLACK #3
	4-5	11	TO SIDE ROLL SENSOR / -VREF		BLACK #2
WHITE 6	4-6		FROM SIDE ROLL SENSOR		WHITE #2
WHITE 10			CROSS ADJUST (IN)	WHITE 10	
BLACK 15		15	TO JUNCTION BLOCK		
	1-9	15	TO DISTRIBUTION PANEL PLUG		BLACK 000015 (P)
WHITE 21	5-1		CROSS PITCH CONTROL VALVE COIL A		BLACK #6 VALVE
WHITE 22	5-2		CROSS PITCH CONTROL VALVE COIL B		RED #6 VALVE
WHITE 27			SIDE ADJUST (IN)	WHITE 27	
RED 28	1-10		TO MAIN POWER IN DIST. PANEL		RED 000028 (P)
WHITE 35	5-3		SIDE ROLL CONTROL VALVE COIL A		BLACK #7 VALVE
WHITE 36	5-4		SIDE ROLL CONTROL VALVE COIL B		RED #7 VALVE
WHITE 37	2-9		CROSS / SIDE ALARM TO ARM REST		WHITE 372 (4)
WHITE 41		5	TO JUNCTION BLOCK W/ A.H.-BIN TOC8 C1:41		
BLUE 16		7	CAN-H TO CAN-H ON A.H./ BIN TOC 8		
WHITE 30		8	CAN-L TO CAN-L ON A.H./ BIN TOC 8	CONNECT 7/8 W/ 120 OHM RESISTOR	
WHITE #6	5-5	15	CROSS PITCH CONTROL VALVE COIL-A #6		WHITE #6 VALVE
GREEN #6	5-6	15	CROSS PITCH CONTROL VALVE COIL-B #6		GREEN #6 VALVE
WHITE #7	5-7	16	SIDE ROLL CONTROL VALVE COIL-A #7		WHITE #7 VALVE
GREEN #7	5-8	16	SIDE ROLL CONTROL VALVE COIL-B #7		GREEN #7 VALVE

WHITE 25	DB9	PIN #2		BIN LEVEL JUNCTION - BELDEN 9444	
WHITE 26	DB9	PIN #3		PIN 1 WHITE	WHITE
WHITE 39	DB9	PIN #6 / #1		PIN 2 BROWN	RED
WHITE 40	DB9	PIN #7		PIN 3 BLUE	GREEN
WHITE 38	DB9	PIN #5		PIN 4 PLUG PIN	

5773 Crystal Rd. ~ Vestaburg, MI. 48891 ~Phone: 989-268-5711 ~Fax: 989-268-5630

Bin Fill – Airhead Leveling TOCB Junction Board
Cross – Side Conveyor Leveling TOCB



AIR HEAD / BIN FILL / CROSS / SIDE POTENTIOMETER CONTROLS

AIR HEAD PITCH

10K POT

WHITE	WHITE	WHITE
2	10	4
+VREF	SIGNAL	-VRFEF

AIR HEAD ROLL

10K POT

WHITE	WHITE	WHITE
2	27	4
+VREF	SIGNAL	-VREF

BIN FILL

10K POT

WHITE	WHITE	WHITE
2	8	4
+VREF	SIGNAL	-VREF

CROSS

10K POT

WHITE	WHITE	WHITE
2	10	4
+VREF	SIGNAL	-VREF

SIDE

WHITE	WHITE	WHITE
2	27	4
+VREF	SIGNAL	-VREF

POTENTIOMETER LAYOUT

O-AIR HEAD RAISE O-AIR HEAD

O-BIN FILL

O-SIDE

O-CROSS

9 PIN DB9 PLUG

TOC 8	DB9 PIN
WHITE 25	2
WHITE 26	3
WHITE 38	5
WHITE 39	6 & 1
WHITE 40	7

BIN FILL CABLE #9 JUNCTION

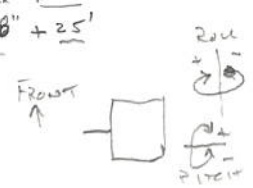
BELDEN 9444

SENSOR	EXTENSION
PIN #1 WHITE	WHITE
PIN #2 BROWN	RED
PIN #3 BLUE	GREEN
PIN #4 PLUGGED	PLUGGED

LEVELING ENCLOSURE WIRING - BELDEN M 9418 CABLE

AIR HEAD SENSOR #1

PIN #1	WHITE	PITCH
PIN #2	GREEN	ROLL
PIN #3	BLACK	-VREF
PIN #4	RED	+VREF



SIDE CONV. SENSOR #2

PIN #1	WHITE	SIGNAL
PIN #2	BLACK	-VREF
PIN #3	RED	+VREF

CROSS CONV. SENSOR #3

PIN #1	WHITE	SIGNAL
PIN #2	BLACK	-VREF
PIN #3	RED	+VREF

5773 Crystal Rd. ~ Vestaburg, MI. 48891 ~Phone: 989-268-5711 ~Fax: 989-268-5630

ADVANCED FARM EQUIPMENT

AIR HEAD PITCH CONTROL VALVE

	PIN #				
BLACK	10	COIL A - PIN A			
RED	11	COIL B - PIN A			
WHITE	22	COIL A - PIN B	GROUND	# 4 VALVE	18'
GREEN	23	COIL B - PIN B	GROUND		

AIR HEAD ROLL CONTROL VALVE

BLACK	15	COIL A - PIN A			
RED	16	COIL B - PIN A			
WHITE	24	COIL A - PIN B	GROUIND	# 5 VALVE	18'
GREEN	25	COIL B - PIN B	GROUND		

BIN LEVEL CONTROL VALVE

BLACK	12	COIL A - PIN A			
RED	13	COIL B - PIN A			
WHITE	26	COIL A - PIN B	GROUND	# 8 VALVE	9'
GREEN	27	COIL B - PIN B	GROUND		

CROSS PITCH CONTOL VALVE

BLACK	COIL A - PIN A			
RED	COIL B - PIN A			
WHITE	COIL A - PIN B	GROUND	# 6 VALVE	9'
GREEN	COIL B - PIN B	GROUND		

SIDE ROLL CONTROL VALVE

BLACK	COIL A - PIN A			
RED	COIL B - PIN A			
WHITE	COIL A - PIN B	GROUND	# 7 VALVE	9'
GREEN	COIL B - PIN B	GROUND		

20	39000	GREEN CABLE SEAL
20	30034	20-18AWG MALE TERMINAL
10	38042	2 CONTACT SHROUD HALF

BELDEN 9418

5773 Crystal Rd. ~ Vestaburg, MI. 48891 ~Phone: 989-268-5711 ~Fax: 989-268-5630