

Troubleshooting Program (G1 D-1500)

D-1500 Troubleshooting Program	1	
To enter the program:	1	
Group 100 - Left Spindle	2	
Group 200 - Right Spindle	2	
Group 300 - Traverse	3	
Group 400 - Input Ports	4	
INPUT PORT 5 - S1 SWITCHES	4	
INPUT PORT 6 - S2 SWITCHES	4	
INPUT PORT 7 - OPTIONAL SWITCHES	5	
Group 500 - Output Ports	6	
OUTPUT PORT 16-10H-S1 AIR VALVES	6	
OUTPUT PORT 17-11H-S2 AIR VALVES	6	
OUTPUT PORT 18-(12H)	7	
OUTPUT PORT 19-13H-OPORT	7	
Group 600 - Length Scalar, Enter Code & Factory Defaults		8
Interrupts	11	
Input Ports	12	
3-A/D	12	
4-KEYPAD	12	
Output Ports	13	
0-INDIS 0-INTERRUPT DISABLE	13	
1-INDIS 1-INTERRUPT DISABLE	13	
2-INDIS 2-INTERRUPT DISABLE	13	
3-CON 1	14	
4-CON 2	14	
8-MEMCON (MEMORY CONTROL)	14	
9-LEDS	15	
10-0AH-LEDS 2	15	
11-0BH-A/D CONTROL	15	

D-1500 Troubleshooting Program

The troubleshooting program enables the technician/electrician to test the machine electrically and mechanically.

To enter the program:

1. Hold down the TRANSFER button and momentarily press the RESET button. After 2 to 3 seconds, the 16 LED'S will flash.
2. The LED's will stop after releasing the TRANSFER button.
3. To exit the program, press the EMERGENCY STOP button.

If EMERGENCY STOP is pressed, the extruder may be shut down. Turning off the main power will turn off the D-1500 but not affect the extruder.

The program is now in a program select mode. You will always know when you are in this mode because the CPU LED is on. There are 31 programs to select from. There are 6 major groups:

GROUP	FUNCTION
100	S1 (Left SPINDLE)
200	S2 (Right SPINDLE)
300	TRAVERSE (Cam)
400	INPUT PORTS
500	OUTPUT PORTS
600	LENGTH SCALAR, ENTER NEW CODE & FACTORY DEFAULTS

The keypad is used to tell the computer which program to run. The ENTER key tells it when to run. The TRANSFER button returns you to the program select mode while running a program.

First we must test the keypad to insure that it is working properly. Press 1, 2, 3...9, 0, 1. The number will always come up in the units position and shift left as you enter more. Pressing the A key will turn on the LENGTH LED, B the HOLESIZE, C the UPPER GAIN, Up Arrow the LOWER GAIN and the Down Arrow the PRESET1 LED.

For an example, we will view the Left spindle counters. Push in 130 and momentarily press the ENTER button. The 16 LED's will flash and the Left spindle counters should be displayed in the readout. This program does not automatically return to the program select mode although some do. Momentarily press the TRANSFER button to return to the program select mode.

See the descriptions on the following pages for details. See Block diagram of D-1500 WB for blocks of electronics tested. The TRANSFER button will always get you to the program select mode.

Group 100 - Left Spindle

- 100 Stops S1 (Left) motor. Returns to the program select mode. BLOCKS TESTED - A, B, H, V or R
- 110 Turns on the S1 (Left) motor with the master speed switch controlling speed. Returns to the program select mode. BLOCKS TESTED - A, B, H, O, P, V or R. Because of the safety interlocks, first run program 500, push 500, press the ENTER button, push 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the left arm up and in. Then press TRANSFER and push 110 and ENTER.
- 120 Turns on the S1 (Left) motor with the LOW SPEED POT controlling speed. Returns to the program select mode. BLOCKS TESTED - A, B, H, O, P, V or R. Because of the safety interlocks, first run program 500, push 500, press ENTER, push 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the left arm up and in. Then press TRANSFER and push 120 and ENTER.
- 130 The S1 (Left) counters are displayed on the readout. Turn the left spindle at least two revolutions in the clockwise direction guarantee the zero point. The numbers should vary from 0 to 719. The numbers should count up when the S1 rotates clockwise and count down when rotating in reverse. The spindle positions at 70 or 430 degrees during transfer. Momentarily, press the TRANSFER button to return to the program select mode. BLOCKS TESTED - A, F or E
- 140 Turns on S1 (Left) motor with the D/A controlling speed. Numbers from 0 to 255 can be pushed into the display. After pressing the ENTER button, the motor will run your desired speed. 255 is approximately 200 RPM forward, 0 is approximately 200RPM reverse with 128 being approximately zero RPM. Press the TRANSFER button to go to "Program Select Mode". BLOCKS TESTED A, B, D, V, S, P or R. Because of the safety interlocks, first run program 500, push 500, press the ENTER button, push 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the left arm up and in. Then press TRANSFER and push 140 and ENTER.
- 150 Turns on the S1 (Left) motor with JOG Pot controlling speed. Returns to program select mode. BLOCKS TESTED - A, B, D, V, S, P or R. Because of the safety interlocks, first run program 500, push 500, press the ENTER button, push 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the left arm up and in. Then press TRANSFER and push 150 and ENTER.

Group 200 - Right Spindle

- 200 Stops S2 (Right) motor. Returns to program select mode. BLOCKS TESTED - A, B, H, V or Y.
- 210 Turns on the S2 (Right) motor with master speed switch controlling speed. Returns to the program select mode. BLOCKS TESTED - A, B, H, O, X, V or Y. Because of the safety interlocks, first run program 510, push "510", hit ENTER, push "2" then ENTER, push "18" then ENTER, push "17" then ENTER. This brings the right arm up and in. Then press TRANSFER and push "210" and ENTER.
- 220 Turns on the S2 (Right) motor with LOW SPEED pot controlling speed. Returns to program select mode. BLOCKS TESTED - A, B, H, O, X, V or Y. Because of the safety interlocks, first run program 510, push 510, press the ENTER button, push 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the right arm up and in. Then press TRANSFER and push 220 and ENTER.
- 230 The S2 (Right) counters are displayed on the readout. Turn the right spindle at least two revolutions in the counterclockwise direction guarantee the zero point. The spindle positions at 70 or 430 degrees during transfer. The numbers should vary from 0 to 719. The numbers count up when S2 rotates counter clockwise and down when rotating in reverse. Momentarily press the TRANSFER button to return to the program select mode. BLOCKS TESTED - A, D or C.
- 240 Turns on the S2 (Right) motor with the D/A controlling speed. Numbers from 0 to 255 can be pushed into the display. After pressing the ENTER button, the motor will run your desired speed. 255 is approximately

200 RPM forward, 0 is approximately 200-RPM reverse with 128 being approx. 0 RPM. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, T, X, Y or V. Because of the safety interlocks, first run program 510, push 510, press the ENTER button, poke 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the right arm up and in. Then press TRANSFER and push 240 and ENTER.

- 250 Turns on the S2 (Right) motor with JOG pot controlling speed. Returns to program select mode. BLOCKS TESTED - A, B, H, O, X, V or Y. Because of the safety interlocks, first run program 510, push 510, press the ENTER button, push 2 then ENTER, push 18 then ENTER, push 17 then ENTER. This brings the right arm up and in. Then press TRANSFER and push 250 and ENTER.

Group 300 - Traverse

- 300 Stops Traverse motor. Returns to program select mode. BLOCKS TESTED - A, B, H or V.
- 310 The Traverse motor follows the speed of the S1 (Left) motor through the velocity loop. You may want to turn on the S1 motor. (See Group 100) Returns to program select mode. BLOCKS TESTED - A, B, H, P, R, W, Z or V.
- 320 The Traverse motor follow the speed of the S2 (Right) motor through the velocity loop. You may want to turn on the S2 motor. (See Group 200) Returns to program select mode. BLOCKS TESTED - A, B, H, X, Y, W, X or V.
- 330 The Traverse counters are displayed. When looking at the output of the Traverse (cam) box (arm and connecting rod side), turn the Traverse at least two revolutions in the clockwise direction guarantee the zero point. The Traverse positions at 115 or 585 degrees during transfer and at 360 degrees just prior to the transfer arm's movement. The numbers should vary from 0 to 719. The numbers should count up when the motor is rotating forward and count down when rotating in reverse. Press the TRANSFER to go to the program select mode. BLOCKS TESTED - G or AE
- 340 Turns on the Traverse motor with the D/A controlling speed. Numbers from 0 to 255 can be pushed into the display. After pressing the ENTER button, the motor will run at the desired speed. 255 will be full speed forward, 0 full speed reverse and 128 approx. zero RPM. The position (POS.) adjusts maximum speed. Press the TRANSFER to go to the program select mode. BLOCKS TESTED - A, B, H, U, W, Z or V.
- 350 Turns on the Traverse motor with the D/A controlling speed and the integrator released. Operates like program 340. BLOCKS TESTED - A, B, H, U, W, Z or V.

Group 400 - Input Ports

400 Displays machine switches on S1 (Left). Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, I or AD.

INPUT PORT 5 - S1 SWITCHES

BIT	VALUE	DESCRIPTION
0	1	Left Endform In Switch
1	2	Left Endform In Out Switch
2	4	Endform OFF (Optional)
3	8	ENDFORM ON BUTTON
4	16	Left Arm Up Switch
5	32	Left Arm Down Switch
6	64	Low Pressure Switch / Safety Vertical Guard Extended Switch (if guarding is present)
7	128	Left Rotocyl Down Switch

410 Displays machine switches on S2 (Right). Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, I or AD.

INPUT PORT 6 - S2 SWITCHES

BIT	VALUE	DESCRIPTION
0	1	Right Endform In switch
1	2	Right Endform Out switch
2	4	Left Safety Door Switch - NC
3	8	Feet/Meters Switch
4	16	Right Arm Up Switch
5	32	Right Arm Down Switch
6	64	Right Safety Door Switch - NC
7	128	Right Rotocyl Down switch

420 Displays INPUT PORT 7. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, I or AD.

INPUT PORT 7 - OPTIONAL SWITCHES

BITS	VALUE	DESCRIPTION
0	1	Program Lock
1	2	Table Left switch
2	4	Table Right switch
3	8	Open-REELEX/Closed SPOOLER
4	16	Open-Normal count Mode/Closed- Sequential
5	32	Y3 Timer Relay / Spooler Safety Door Switch - NC (if equipped with guarding)
6	64	Safet Vertical Guard Retract Switch (if equipped with guarding)
7	128	COUNT UP/DOWN

430 Displays INPUT PORT 8 (See Chart). To be used in conjunction with Program 500 reads back what was outputted. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, J or AC

440 Displays INPUT PORT 9 (See Chart). To be used in conjunction with Program 510 reads back what was outputted. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, J or AC

450 Displays INPUT PORT 10 (See Chart). To be used in conjunction with Program 520 reads back what was outputted. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, J or AC

The following applies if machine is equipped with safety guarding:

BITS	VALUE	DESCRIPTION
0	1	Left Safety Door Key Inserted
1	2	Right Safety Door Key Inserted
2	4	Spooler Safety Door Switch
3	8	Left Movable Door Bar
4	16	Right Movable Door Bar
5	32	Open/Close Left Door Push Button
6	64	Open/Close Left Door Push Button
7	128	

Group 500 - Output Ports

- 500 Turns on air valves for S1 (Left). (OUTPUT PORT 16 - See chart). Push in a number from 0 to 255. Press the ENTER button for the number to be outputted. The air cylinder will move! Be careful not to crash parts! The program will not allow you to turn on opposing valves. 3, 12, 48 and 192 cannot be outputted. Press the TRANSFER button to return to program select mode. BLOCKS TESTED - A, B, H, J or AC. Because of the safety interlocks, after turning on left endform out or left cutter in or left arm up, press ENDFORM ON button to energize valve.

OUTPUT PORT 16-10H-S1 AIR VALVES

BITS	VALUE	DESCRIPTION
0	1	Left Endform In Valve
1	2	Left Endform Out Valve
2	4	Left Cutter In Valve
3	8	Left Cutter Out Valve
4	16	Left Endform Arm Up Valve
5	32	Left Endform Arm Down Valve
6	64	Left Transfer Arm Up Valve
7	128	Left Transfer Arm Down Valve

- 510 Turns on air valves for S2 (Right). OUTPUT PORT 17 (See Chart). Push in a number to be outputted. The air cylinder will move! Be careful not to crash parts! The program will not allow you to turn on opposing valves. 3, 12, 48 and 192 can not be outputted. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, J or AC. Because of the safety interlocks, after turning on right endform out or right cutter in or right arm up, press ENDFORM ON push-button to energize valve.

OUTPUT PORT 17-11H-S2 AIR VALVES

BITS	VALUE	DESCRIPTION
0	1	Right Endform In Valve
1	2	Right Endform Out Valve
2	4	Right Cutter In Valve
3	8	Right Cutter Out Valve
4	16	Right Endform Arm Up Valve
5	32	Right Endform Arm Down Valve
6	64	Right Transfer Arm Up Valve
7	128	Right Transfer Arm Down Valve

- 520 Allows you to output numbers to port 18. (See Chart) Will not turn on adjacent OAC5 relays 3,12,48 and 192. Push a number from 0 to 255 into display. Press the ENTER button to be outputted. Press the TRANSFER button to go to program select mode. BLOCKS TESTED-A, B, H, J or AC.

OUTPUT PORT 18-(12H)

BITS	VALUE	DESCRIPTION
0	1	Run Light
1	2	Stop Bit (Function A6)
2	4	Sparker Indicator
3	8	PRESET 1 Indicator
4	16	PRESET 2 Indicator
5	32	PRESET 3 Indicator
6	64	On in Spooler Mode
7	128	

- 530 Allows you to output numbers to port 19. (See Chart) Will not turn on adjacent OAC5 relays 3,12,48 and 192. Push number from 0 to 255 into display. Press the ENTER button to be outputted. Press the TRANSFER button to go to program select mode. BLOCKS TESTED - A, B, H, I or AB.

OUTPUT PORT 19-13H-OPORT

BITS	VALUE	DESCRIPTION
0	1	Left Coil Sparker Error
1	2	Right Coil Sparker Error
2	4	Multiple Spark Error
3	8	Transfer Ready Indicator
4	16	Oiler
5	32	Wire Clamp
6	64	Table Left Valve
7	128	Table Right Valve

- 540 Allows you to output numbers to port 20. (See Chart). Will not turn on adjacent OAC5 relays 3,12,48 and 192. Poke number from 0 to 255 into display. Push a number from 0 to 255 into display. Press the ENTER button to be outputted. Press the TRANSFER button to go to program select mode. BLOCKS

TESTED - A, B, H, I or AB

Output a 32 in program 540 to energize the dump valve. Because of the safety interlocks, close and lock both safety doors. Applies to machines equipped with safety guarding.

BIT	VALUE	DESCRIPTION
0	1	Lock Left D-1500 Safety Door
1	2	Lock Right D-1500 Safety Door
2	4	Lock Spooler D-1500 Safety Door
3	8	Extend Vertical Guard
4	16	Retract Vertical Guard
5	32	Dump Valve
6	64	Close Left Door if High / Open if Low
7	128	Close Right Door if High / Open if Low

550 NOT USED

Group 600 - Length Scalar, Enter Code & Factory Defaults

600 This program allows you to read or write to any port without constraints (No protections). After entering this program the S2 LED will be on to indicate that you are in the port select mode. If you want to read a port, place the FEET/METERS switch in the FEET position and in the METERS position for writing to a port. Push in the port number into the keypad and press the ENTER button. Press the TRANSFER button to go to program select mode.

READING The computer continuously reads the port selected and displays the number. Press the TRANSFER button to go to port select mode.

WRITING Push a number from 0 to 255 in the display. After pressing the ENTER button the number will be outputted to the selected port. Press the TRANSFER button to go to port select mode.

610 Enters factory default values into NVRAM.

050	Holesize
32	Upper Gain
29	Lower Gain
800	PRESET1
1000	PRESET2
2000	PRESET3
A1	01 Online Mode

A2	10
A3	10
A4	00
1.0000	Footage Scalar
0.0348	Meters Scalar

620 See FEET/METERS scalar.

630 Enter New Code.

PORT NUMBER	INPUT	OUTPUT
0H=0	INTERRUPT	INSIS0
1H=1	INTERRUPT	INSIS1
2H=2	INTERRUPT	INSIS2
3H=3		CONTROL PORT1
4H=4	KEYPAD	CONTROL PORT2
5H=5	S1 SWITCHES	NOT USED
6H=6	S2 SWITCHES	NOT USED
7H=7	OPTIONAL SWITCHES	NOT USED
8H=8		MEMORY CONTROL
9H=9		LEDS1 (0-7)
AH=10		LEDS2 (8-15)
BH=11	NOT USED	A/D CONTROL
CH=12	NOT USED	READOUT (UNITS & TENS)
DH=13	NOT USED	READOUT (HUNDS & THOUS.)
EH=14		S1 D/A
FH=15		TRAVERSE (CAM) D/A
10H=16		S1 AIR VALVES
11H=17		S2 AIR VALVES
12H=18		OPORT 6
13H=19		NOT USED
14H=20		NOT USED

15H=21		NOT USED
16H=22		S2 D/A
28H=40	TRAVERSE (CAM) COUNTERS (U&T)	
29H=41	TRAVERSE (CAM) AND S1 (H&H)	
2AH=42	S1 COUNTERS (U&T)	
38H=56	S2 COUNTERS (U&T)	
39H=57	S2 COUNTERS (H)	

Interrupts

23	Spindle 1 Hall	
22	Spindle 2 Hall	
21	Traverse (cam) Hall	
20	Winding INT	976 Hz
19		
18		
17		
16	Spindle Positioning and/or RPM	9.2 Hz
15	Stop Button	
14	Start Button	
13	Footage Count	
12	Sparker	
11	Transfer Button	
10	Right Safety Pad	
9	Crash Stop	Payoff Stop
8	Left Safety Pad	
7	Keypad	
6	EOC	A/D
5	Length Reset	
4	Sequential Input to Transfer	
3		
2		
1		
0	Air Valve Test	1.2 Hz

Input Ports

3-A/D

CHANNEL	DESCRIPTION
0	SPIN 1 REF
1	SPIN 2 REF
2	TRAVERSE (CAM) REF
3	S1 CURRENT
4	S2 CURRENT
5	SPIN 1 MV
6	SPIN 2 MV
7	TRAVERSE (CAM) MV

4-KEYPAD

CHANNEL	DESCRIPTION
0	H5
1	H6
2	H7
3	H8
4	INTRQ
5	S1 D/A OFFSET
6	S2 D/A OFFSET
7	TRAVERSE (CAM) D/A OFFSET

Output Ports

0-INDIS 0-INTERRUPT DISABLE

BITS	DESCRIPTION
0	OUT PUT TEST – 1.9 HZ
1	
2	
3	
4	SEQUENTIAL PRINT
5	LENGTH RESET
6	EOC – A/D
7	KEYPAD

1-INDIS 1-INTERRUPT DISABLE

BITS	DESCRIPTION
0	LEFT SAFETY PAD
1	CRASH STOP – PAYOFF
2	RIGHT SAFETY PAD
3	TRANSFER BUTTON
4	SPARKER
5	FOOTAGE COUNT
6	START BUTTON
7	STOP BUTTON

2-INDIS 2-INTERRUPT DISABLE

BITS	DESCRIPTION
0	POSITION SPIN – 15.2 HZ
1	
2	
3	

4	WINDING INTERRUPT – 976 HZ
5	TRAVERSE (CAM) HALL DEVICE
6	S2 HALL DEVICE
7	S1 HALL DEVICE

3-CON 1

BIT	DESCRIPTION
0	S1 ENABLE-YA
1	S2 ENABLE-YB
2	TRAVERSE (CAM) ENABLE-YC
3	LOW SPEED-YD
4	ACCELERATION CIRCUIT-YE
5	SHORT ACCEL. CAP. (0 TO SHORT)-YF
6	TRAVERSE (CAM) INTEGRATOR-YG
7	D/A BYTE 1/BYTE 2

4-CON 2

BIT	DESCRIPTION
0	ACCEL TO S1 REF.-YH
1	S1 D/A TO S1 REF.-Y1
2	ACCEL TO S2 REF.-YJ
3	S2 D/A TO S2 REF.-YK
4	S1 MV TO TRAVERSE REF-YL
5	S2 MV TO TRAVERSE REF.-YM
6	JOG-YN
7	INTS 0-15 DISABLE

8-MEMCON (MEMORY CONTROL)

BIT	DESCRIPTION
0	H1
1	H2

2	H3
3	H4
4	SPARE
5	NO..NE
6	NOT..WE
7	NOT..DE

9-LEDS

BITS	DESCRIPTION
0	LENGTH
1	HOLESIZE
2	UPPER GAIN
3	LOWER GAIN
4	PRESET1
5	PRESET2
6	PRESET3
7	S1

10-0AH-LEDS 2

BITS	DESCRIPTION
0	CPU ON
2	S2
3	+
4	+ TRAVERSE (CAM)
5	0 POSITION
6	- ERROR
7	

11-0BH-A/D CONTROL

BITS	DESCRIPTION
0	ADD A (LSB)
1	ADD B
2	ADD C

3	ADDRESS LATCH ENABLE
4	START A/D
5	
6	
7	