



Harsco Track Technologies

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SERVICE BULLETIN MAINTENANCE OF WAY EQUIPMENT

DATE: 7-9-2002 **BULLETIN NO:** 02-017

TITLE: 199948 SOFTWARE UPGRADE GROUP

RATING:

<input type="checkbox"/>	DIRECTIVE (Action Is Required)	<input type="checkbox"/>	ALERT (Potential Problem)
<input type="checkbox"/>	INFORMATION (Action Is Optional)	<input checked="" type="checkbox"/>	PRODUCT IMPROVEMENT (Enhance Product)

PRODUCT SERIES / MODEL: W96 Series E3 TOP GUN™ Spike Drivers

SERIAL NO: Models E3-27 / 28 / 29 Only

SUMMARY: This Software Upgrade Includes:

- Hydraulic Soft-Start.
- Spike Depth Control.
- Nipper / Gauger Brake Inhibit.
- Expanded Help and Error Messages.
- Expanded DTAM Features including Diagnostic Screens.

OPERATIONAL IMPACT: To enhance product by improving machine performance, reducing maintenance and providing additional information.

ACTION: This installation of this Software Upgrade requires:

- Installing the new software.
- Rewiring the work / travel select switch.
- Rewiring the auto brake switch.
- Adding a relay and wiring for the hydraulic soft-start feature.
- Adding a pressure switch, air piping and wiring for the brake inhibit feature.
- Re-calibrating the driver position sensors on the machine.

CONTACT: If you have any questions or if we can be of any service, please contact the Service Department at the Columbia, SC. facility, (803) 822-9160.

SAFETY INFORMATION

- **FOLLOW APPLICABLE RAILROAD LOCKOUT - TAGOUT PROCEDURE TO REMOVE ALL ENERGY SOURCES FROM MACHINE. FAILURE TO COMPLY COULD RESULT IN SEVERE BODILY INJURY.**

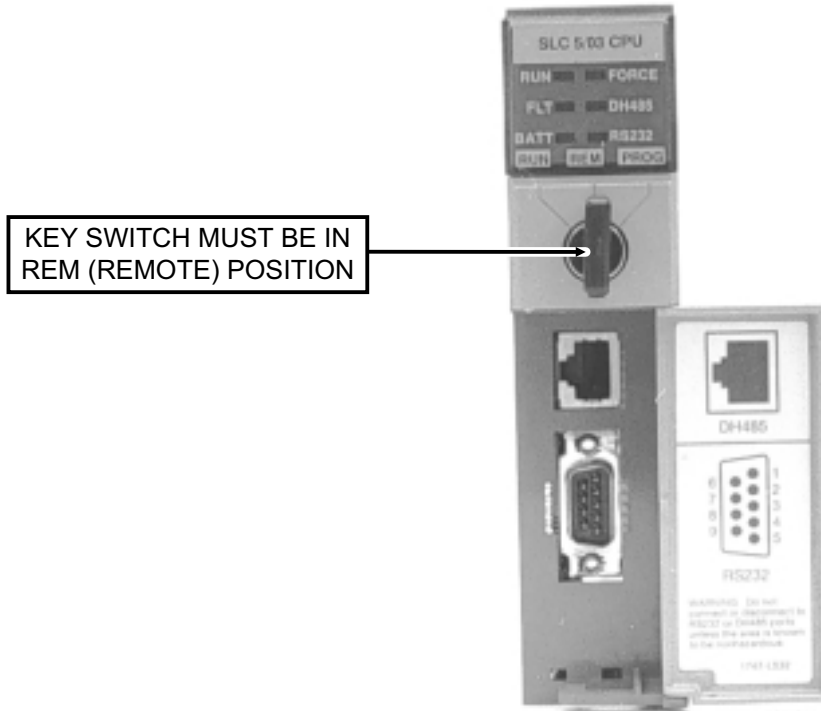
INSTALLING NEW SOFTWARE - See Figure 1, Figure 2 and Parts List

1. MAKE SURE the Master Disconnect switch is shut OFF.
2. Locate the CPU Module inside of the CPU Box.
3. Remove the CPU Module as follows:
 - 3.1 Open the module cover.
 - 3.2 Disconnect the DTAM communications cable from the CPU module.
 - 3.3 Depress both the top and bottom locks and pull the module out straight.
4. Remove the existing EEPROM program chip from the module.
5. Install the new EEPROM program chip (13) on the module.
6. Verify the jumper is on the left and center terminals of the module.
7. Re-install the CPU Module as follows:
 - 7.1 Push the module in straight until both the top and bottom locks engage.
 - 7.2 Reconnect the DTAM communications cable to the CPU module.
 - 7.3 Close the module cover.
 - 7.4 Rotate the key switch in the module to the vertical REM (remote) position.
8. **Important:** Consult the Factory for instructions on how to load the new software.

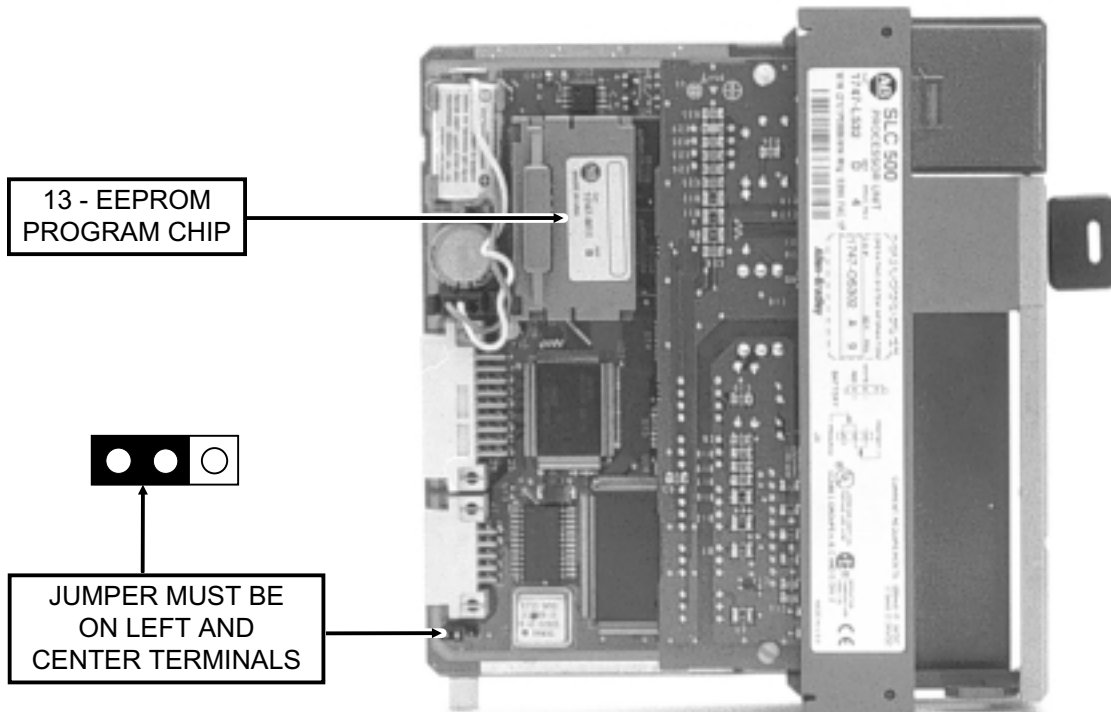
Note: The software must be loaded to test the wiring modifications that will be made.

INSTALLING NEW SOFTWARE

99-142 FIGURE 1
CPU MODULE 5/03



99-143 FIGURE 2
CPU MODULE 5/03



WORK / TRAVEL SELECT SWITCH - See Figure 3 and Parts List

1. In the Air Panel, remove the Work Mode switch S2580 and the Motor Speed switch (added previously).
2. In the Control Box, remove the cables that were connected to the Work Mode switch S2580 and the Motor Speed switch (added previously). Plug the cable hole in the Control Box with the hole seal (8).
3. In the Air Panel, install the Select switch S3600 (12).
4. Install the Cable (4) from the Control Box to the Select switch S3600. Wire and label as listed in the following Chart. Seal the Cable (4) in the Control Box with the Cable Grip (3) and Lock Nut (7).

Travel HI/LO SW CTRL			F016189 S3600		120,36 MISC	
RUN	COLOR	WIRE #	FROM	TERM #	TO	TERM #
1	BK	3604	TB1 -46	NONE	S3600-3	F011285K
2	W	3600	TB16-16	NONE	S3600-2	F011285K
3	R	3602	TB1 -39	NONE	S3600-1	F011285K
4	GN	3610	TB1 -34	NONE	S3600-6	F011285K

5. Connect a Jumper wire (14 or 15) between the Select switch S3600-2 and S3600-5 terminals. Label wire #3600.
6. In the Control Box and CPU Box, locate the Red / White and Blue / White conductors in the CNTL-CPU cable. Wire and label as listed in the following Chart.

CONTROLS CTRL			F018248K CNTL - CPU		120,36 CPU	
RUN	COLOR	WIRE #	FROM	TERM #	TO	TERM #
13	R/W	3610	TB1-34	NONE	TB4-33	NONE
15	BU/W	3604	TB1-46	NONE	TB4-32	NONE

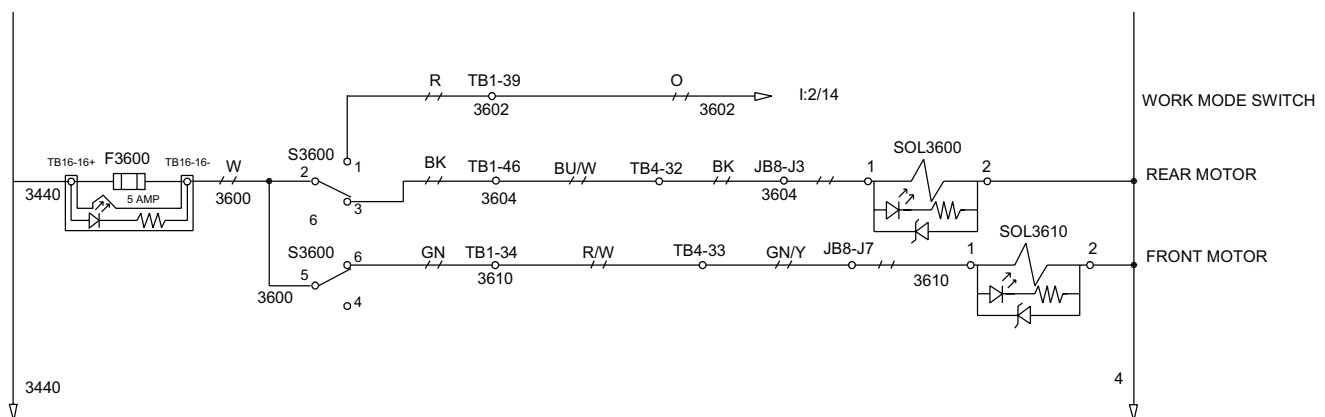
7. In the CPU Box, locate the Black and Green / Yellow conductors in the J8 Turck Block cable. Wire and label as listed in the following Chart.
 - 7.1. Disconnect wire #3600 from Output O:17/17 and reconnect it to TB4-32. Re-label wire #3604.

TURCK			183644 JB8 -			
RUN	COLOR	WIRE #	FROM	TERM #	TO	TERM #
1	BK	3604	TB4-32	NONE	JB8-J3	EXISTS
15	GN/Y	3610	TB4-33	NONE	JB8-J7	EXISTS

WORK / TRAVEL SELECT SWITCH - See Figure 3 and Parts List

8. In the Control Box, install a 5 amp Fuse (11) at TB16-16.
9. Test the Work / Travel Select switch wiring modification as follows:
 - 9.1 Turn on the Master Disconnect switch.
 - 9.2 DO NOT start the engine.
 - 9.3 Pull out the Neutral Start switch.
 - 9.4 Place the Select switch S3600 in the LO position and verify:
 - a. PLC Work Mode Input I:2/14 is ON.
 - b. Rear Propel Motor solenoid SOL3600 is OFF.
 - c. Front Propel Motor solenoid SOL3610 is OFF
 - 9.5 Place the Select switch S3600 in the MID position and verify:
 - a. PLC Work Mode Input I:2/14 is ON.
 - b. Rear Propel Motor solenoid SOL3600 is OFF.
 - c. Front Propel Motor solenoid SOL3610 is ON.
 - 9.6 Place the Select switch S3600 in the HI position and verify:
 - a. PLC Work Mode Input I:2/14 is OFF.
 - b. Rear Propel Motor solenoid SOL3600 is ON.
 - c. Front Propel Motor solenoid SOL3610 is ON.

FIGURE 3
WORK / TRAVEL SELECT ELECTRICAL SCHEMATIC



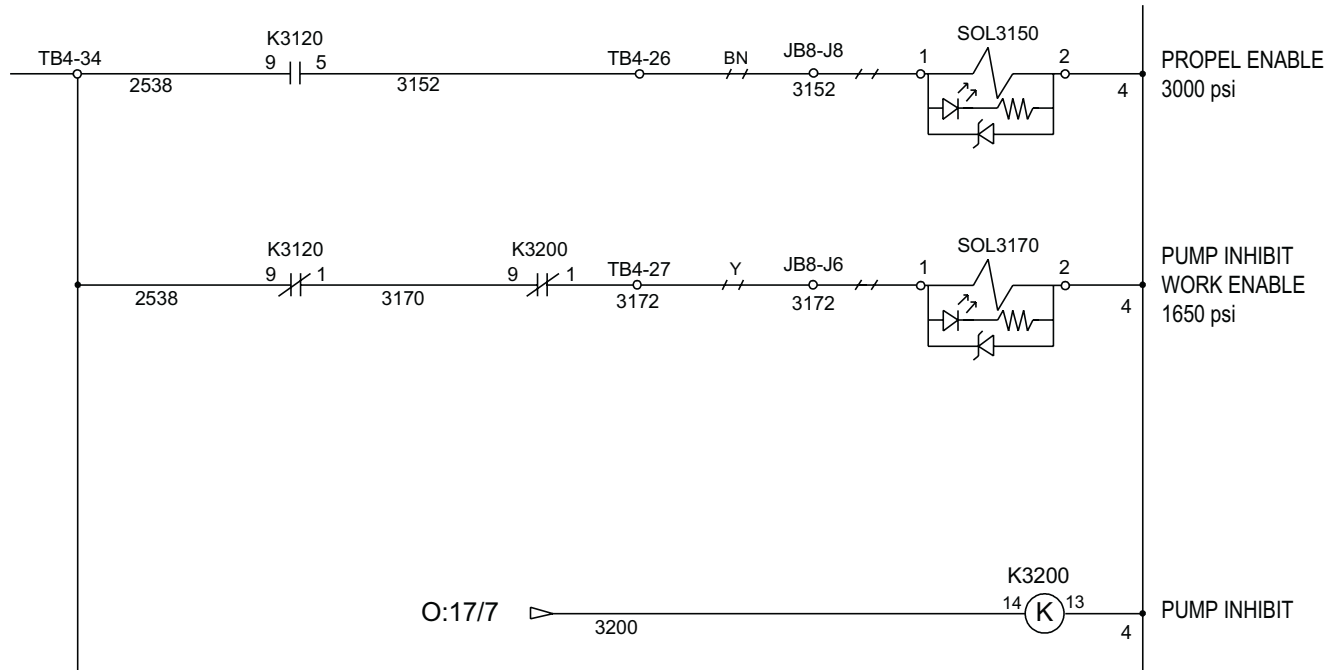
HYDRAULIC SOFT-START FEATURE - See Figure 4 and Parts List

Note: Output O:17/7 is needed for the Hydraulic Soft-Start Feature. The Work / Travel Select Switch modifications must be completed before the Hydraulic Soft-Start Feature can be added.

1. In the CPU Box, install the Relay (16), Relay Socket (10) and Relay Bail (9) on the top of the TB-4A DIN rail. Label Relay K3200. Wire Relay as follows:
 - 1.1. **Important:** Verify that there is no wire connected to Output O:17/7 and that the black wire #3604 of the J8 Turck Block cable is connected to TB4-32. If not, complete the Work / Travel Select Switch modification before proceeding.
 - 1.2. Connect a White wire (15) from Output O:17/7 to Relay K3200-14. Label wire #3200.
 - 1.3. Connect a Black wire (14) from Relay K3200-13 to GND on TB4. Label wire #4.
 - 1.4. Disconnect wire #3170 from Relay K3120-1 and reconnect it to Relay K3200-1. Re-label wire #3172.
 - 1.5. Connect a White wire (15) from Relay K3120-1 to Relay K3200-9. Label wire #3170.
2. Test the Hydraulic Soft-Start Feature wiring modification as follows:
 - 2.1 Turn on the Master Disconnect switch.
 - 2.2 DO NOT start the engine.
 - 2.3 Pull out the Neutral Start switch and note Output O:17/7 and the Work Enable solenoid SOL3170.
 - a. Work Enable solenoid SOL3170 is energized momentarily as the PLC initializes.
 - b. After the PLC initializes, Output O:17/7 is turned ON for 2.5 seconds and energizes Relay K3200 which causes the Work Enable solenoid SOL3170 to be turned OFF.
 - c. After 2.5 seconds, Output O:17/7 turns OFF and de-energizes Relay K3200 which causes the Work Enable solenoid SOL3170 to energize and load the hydraulic pump at full work system pressure.

HYDRAULIC SOFT-START FEATURE

FIGURE 4
HYDRAULIC SOFT-START ELECTRICAL SCHEMATIC



NIPPER / GAUGER BRAKE INHIBIT FEATURE - See Figure 5, Figure 6 and Parts List

Note: An additional Input is required for the Brake Inhibit Feature. Input I:2/12 of the Auto Brake Feature will be re-wired to free-up the needed input.

1. See Figure 7 and Figure 8. Mount the Brake Inhibit air pressure switch (17) to the engine side of the firewall behind the right operator using appropriate hardware, not supplied.
2. Plumb the Brake Inhibit pressure switch (17) into the right rear service brake air line using appropriate fittings and hoses, not supplied.
3. In the Control Box, re-wire the Auto Brake switch S2590 as follows:
 - 3.1. Remove the White / Red wire #2538 from TB1-42 and reconnect it to TB1-36. Re-label wire #3190.
 - 3.2. Connect the Orange / Black wire of CTRL-CPU2 cable to TB1-36. Label wire #3190.
 - 3.3. At TB1-35, re-label the Blue / Black wire #2590 as #3192 and the White wire #2590 as #3192.
 - 3.4. Re-label the Auto Brake switch S2590 as S3190.
4. In the CPU Box, re-wire the Auto Brake switch S3190 (formerly S2590) as follows:
 - 4.1. Disconnect the Red wire #3190 of JB8 cable from Output O:17/6 and reconnect it to TB4-28. Re-label wire #3192.
 - 4.2. Disconnect the Blue / Black wire #2590 from Input I:2/12 and reconnect it to Output O:17/6. Re-label wire #3190.
5. In the CPU Box, wire the Brake Inhibit switch Input as listed in the following Chart:
 - 5.1. Locate the Green / Black wire in the CTRL-CPU2 cable and connect it to Input I:2/12. Label wire as #4622.

CONTROLS CTRL			F018249K CTRL – CPU2		240,36 CPU	
RUN	COLOR	WIRE #	FROM	TERM #	TO	TERM #
9	GN/BK	4622	TB1-60	NONE	I:2/12	NONE

6. Install the Cable (6) from the Control Box to the Brake Inhibit pressure switch S4620 (17). Seal the Cable (6) in the Control Box using the Cable Grip (2) and Lock Nut (7).

NIPPER / GAUGER BRAKE INHIBIT FEATURE - See Figure 5, Figure 6 and Parts List

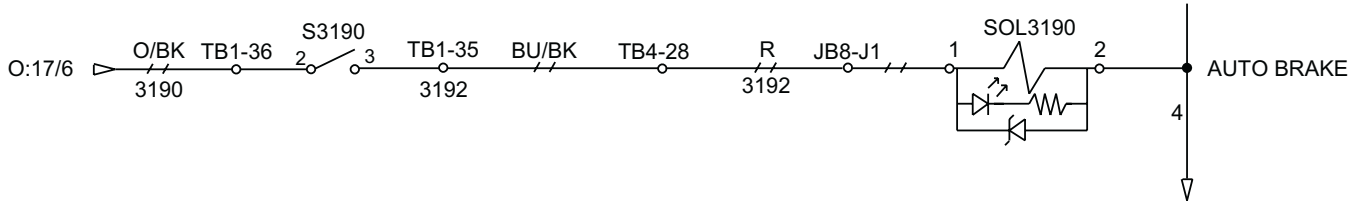
7. In the Control Box, wire the Brake Inhibit pressure switch as listed in the following Chart:
- 7.1. Install a 5 amp Fuse (11) at TB1-20.
- 7.2. Locate the Green / Black wire in the CTRL-CPU2 cable and connect it to TB1-60. Label the wire as #4622

Brake Inhibit PS CTRL			F012388 S4620		250,42 MISC	
RUN	COLOR	WIRE #	FROM	TERM #	TO	TERM #
1	BK	4622	TB1 -60	NONE	S4620-4	F017139
2	W	4620	TB16-20	NONE	S4620-3	F017139

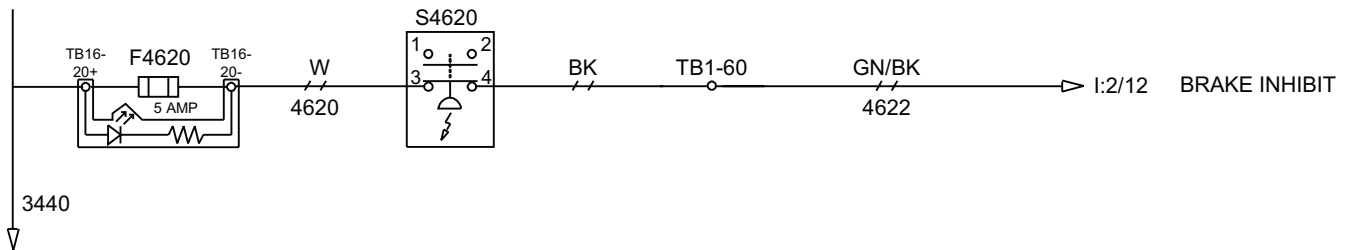
8. Test the Nipper / Gauger Brake Inhibit Feature wiring modification as follows:
- 8.1 See Figure 7 and Figure 8. Adjust the Brake Inhibit pressure switch as follows:
- Remove the cover from the pressure switch.
 - Adjust the thumb wheel (A) to a setting of 20 - 30 PSI (1.38 - 2.07 bar).
 - Re-install the cover on the pressure switch.
- 8.2 Turn on the Master Disconnect switch.
- 8.3 Start the engine.
- 8.4 The service brake air pressure **MUST BE** at its normal operating pressure of 70 - 80 PSI (4.83 - 5.52 bar).
- 8.5 Pull out the Neutral Start switch.
- 8.6 With the service brakes **RELEASED**, verify:
- Input I:2/12 is ON.
 - Attempt to start the operation of the Nipper cycle and/or Gauger cycle.
 - They **MUST NOT** start operation with the service brakes released.
- Note: The Help Screen "Press Foot Brake To Enable Function" will display on the DTAM. The Help Screen will automatically clear after 2 seconds.*
- 8.7 With the service brakes **APPLIED**, verify:
- Input I:2/12 is OFF.
 - Attempt to start the operation of the Nipper cycle and/or Gauger cycle.
 - They **MUST** start operation with the service brakes applied.

NIPPER / GAUGER BRAKE INHIBIT FEATURE

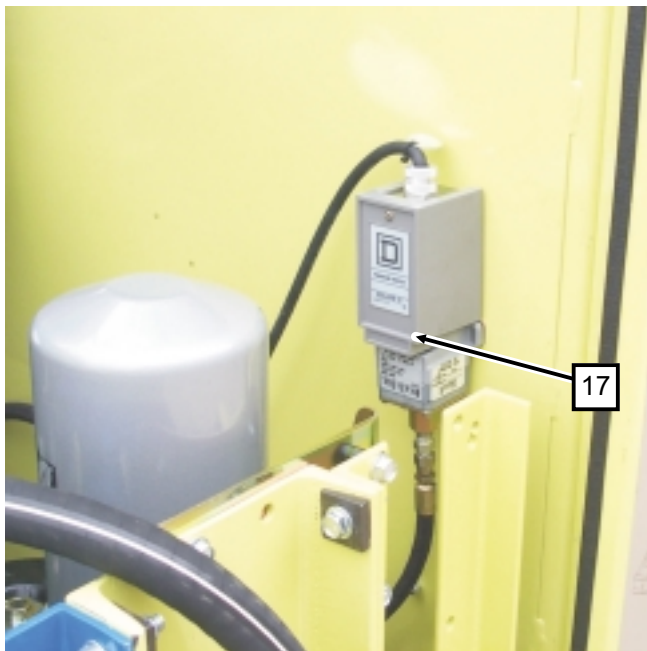
**FIGURE 5
AUTO BRAKE ELECTRICAL SCHEMATIC**



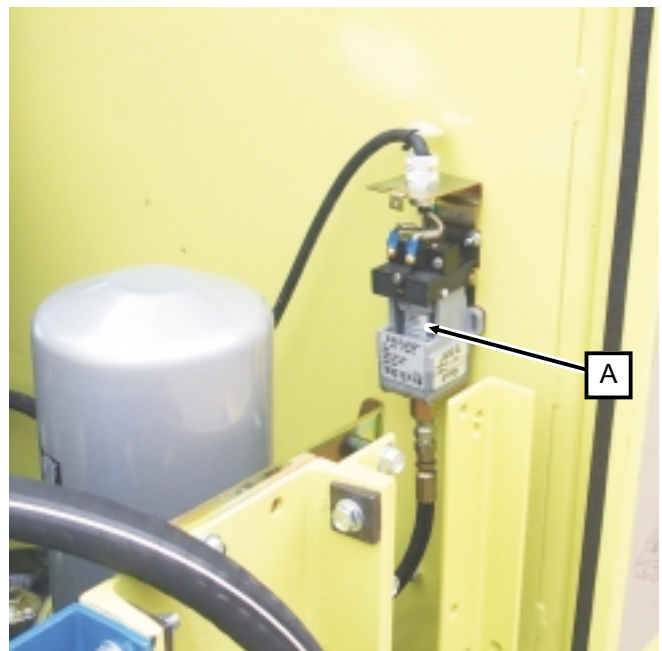
**FIGURE 6
BRAKE INHIBIT ELECTRICAL SCHEMATIC**



01-230 **FIGURE 7
BRAKE INHIBIT PRESSURE SWITCH**



01-231 **FIGURE 8
BRAKE INHIBIT PRESSURE SWITCH**



PARTS LIST

ITEM	PART NO	DESCRIPTION	QTY
	199948	SOFTWARE UPGRADE SERVICE GROUP.....	1
1	F011285K	Ring Terminal, #16 - #14 AWG / #6 Ring.....	5
2	F014874	Cable Grip, 3/8" - 7/16" Dia x 1/2" NPT	1
3	F016188	Cable Grip, 3/8" - 1/2" Dia x 1/2" NPT	1
4	F016189	Cable, #16 AWG 4 Conductor	120"
5	F017139	Ring Terminal, #16 - #14 AWG / #8 Ring.....	2
6	F018249K	Cable, #16 AWG 2 Conductor	240"
7	F019878	Lock Nut, 1/2" NPT.....	2
8	F020177	Hole Seal, 7/8" OD Max	1
9	F023443	Relay Bail	1
10	F023445	Relay Socket	1
11	F023533	Fuse, 5 Amp Automotive	2
12	F023824	Switch, 3 Position Toggle	1
13	F026079	EEPROM Memory Module Chip.....	1
14	F040160	Wire, #16 AWG Black.....	50"
15	F040161	Wire, #16 AWG White	50"
16	171956	Relay	1
17	196736	Pressure Switch, Adjustable.....	1

DRIVER HAMMER

1. **DRIVER #1** - See Figure 9
2. **DRIVER #2** - See Figure 9
3. **DRIVER #3** - See Figure 9
4. **DRIVER #4** - See Figure 9

Note: 1. The Driver Feed - Spot - Release - Hammer values can be automatically calculated and entered using the Auto Features. See PLC Operation - Auto Features in your Operator's Manual.

2. If the Auto Features are not used to set up the drivers, the starting values for Driver Feed - Spot - Release - Hammer should be set to the starting values shown in the Driver Display Flow Chart.

3. All four Driver Feed - Spot - Release - Hammer programs are identical.

Driver Feed

1. The Driver Feed value controls the start of the driver spike feed cycle. See PLC Operation - Driver Feed in your Operator's Manual for information.

Driver Spot

2. The Driver Spot value controls how close the spike in the spike jaws will be to the tie plate when the driver down switch is depressed and released. See PLC Operation - Driver Spot in your Operator's Manual for information.

Driver Release

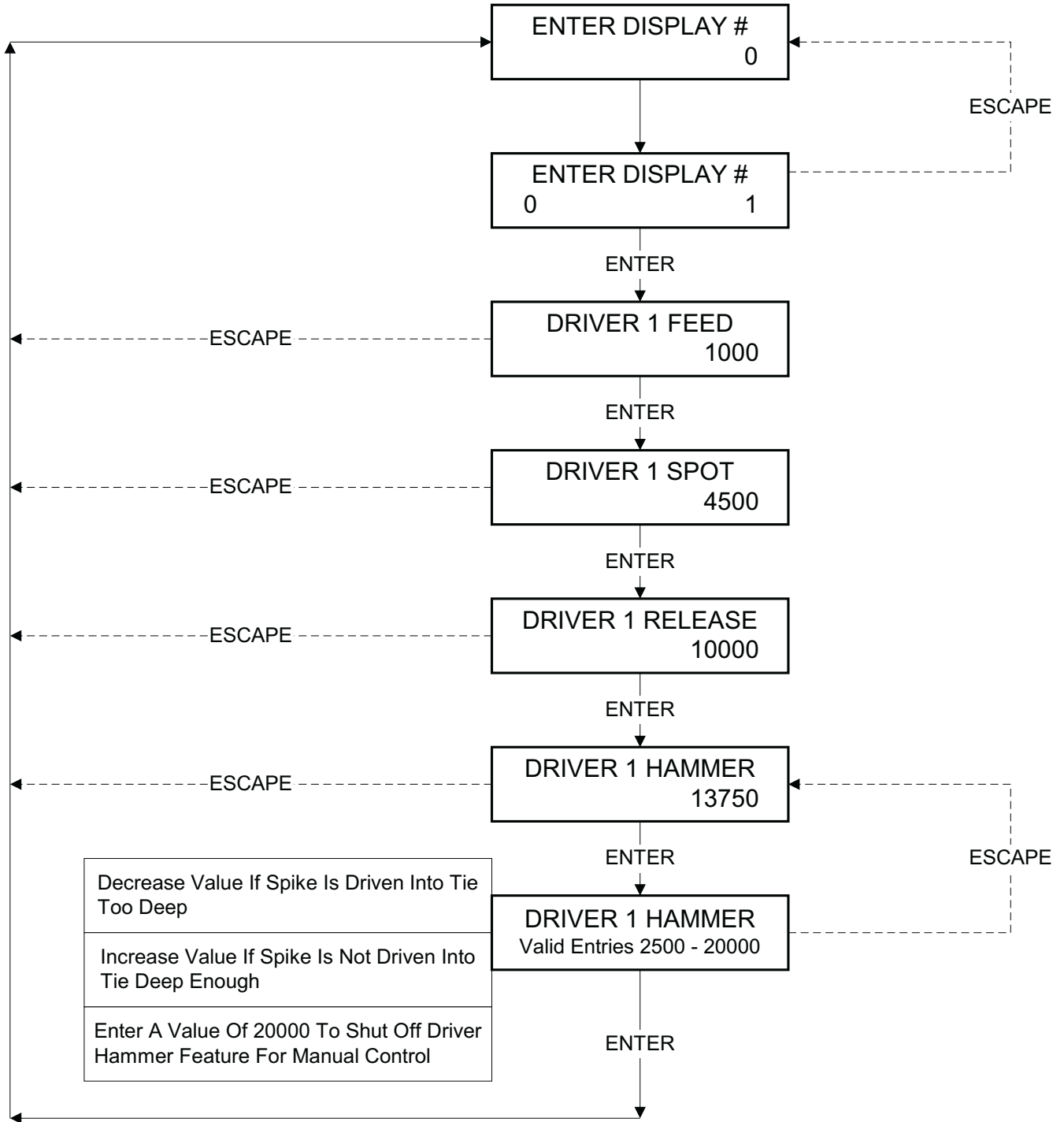
3. The Driver Release value controls the opening of the spike jaws as the driver is lowered to drive the spike into the tie. See PLC Operation - Driver Release in your Operator's Manual for information.

Driver Hammer

4. The Driver Hammer value controls the automatic stopping of the driver cycle when the driver has driven the spike into the tie to a pre-set depth.
 - 4.1 The Driver Hammer value should be set to a value 3,750 (3-3/4") more than the Driver Release value.
 - 4.2 If it is desired to shut off the Driver Hammer Feature to allow the operator to manually stop the driver cycle, enter a value of 20,000.

DRIVER HAMMER

FIGURE 9
DRIVER DISPLAY FLOW CHART



DRIVER SENSOR CALIBRATION

1. The drivers forward / reverse sensors must be re-calibrated. See PLC Operation - Driver Forward / Reverse Sensor Calibration in your Operator's Manual for information.
2. The drivers left / right sensors must be re-calibrated. See PLC Operation - Driver Left / Right Sensor Calibration in your Operator's Manual for information.
3. The drivers forward / reverse speed must be re-set. See PLC Operation - Driver Forward / Reverse Speed in your Operator's Manual for information.
4. The drivers left / right speed must be re-set. See PLC Operation - Driver Left / Right Speed in your Operator's Manual for information.
5. The carriage auto-center position must be re-set. See PLC Operation - Auto-Center in your Operator's Manual for information.

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