SST-3

Start-Stop-Throttle

Installation & Operation Guide

Revision 1.1

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CONTENTS

INSTALLATION OF WIRED RITE SYSTEMS SST-3 ENGINE CONTROLLER WITH DUAL THROTTLE AND EMERGENCY POWER CONTROL

INTRODUCTION:

Wired Rite Systems, Inc would like to thank you for purchasing the latest in Start/Stop/Throttle/E-Power technology - ***SST-3***. ***SST-3*** is designed to simplify installation and customization for the vehicle builder while providing the highest level of performance and reliability to the vehicle operator. Please refer to this guide for installation, programming and troubleshooting procedures.

HARDWARE MOUNTING:

For maximum weatherproofing, mount the *SST-3* enclosure with the wire harness pointing down.

CONNECTIONS:

- ***SST-3* in conjunction with a Wired Rite Integrated Power System (IPS):**

When installing the *SST-3* in an IPS, insert the 12-pin connector from the *SST-3* to the J4 connector slot on the Power Distribution Center (PDC) base of the IPS as shown in Figure 1. The wire connections for the J4 connector are discussed in the next section. The Throttle (J7) connector and the Emergency Power (J10) connector from the *SST-3* will need to be connected independently, also shown in the next section.

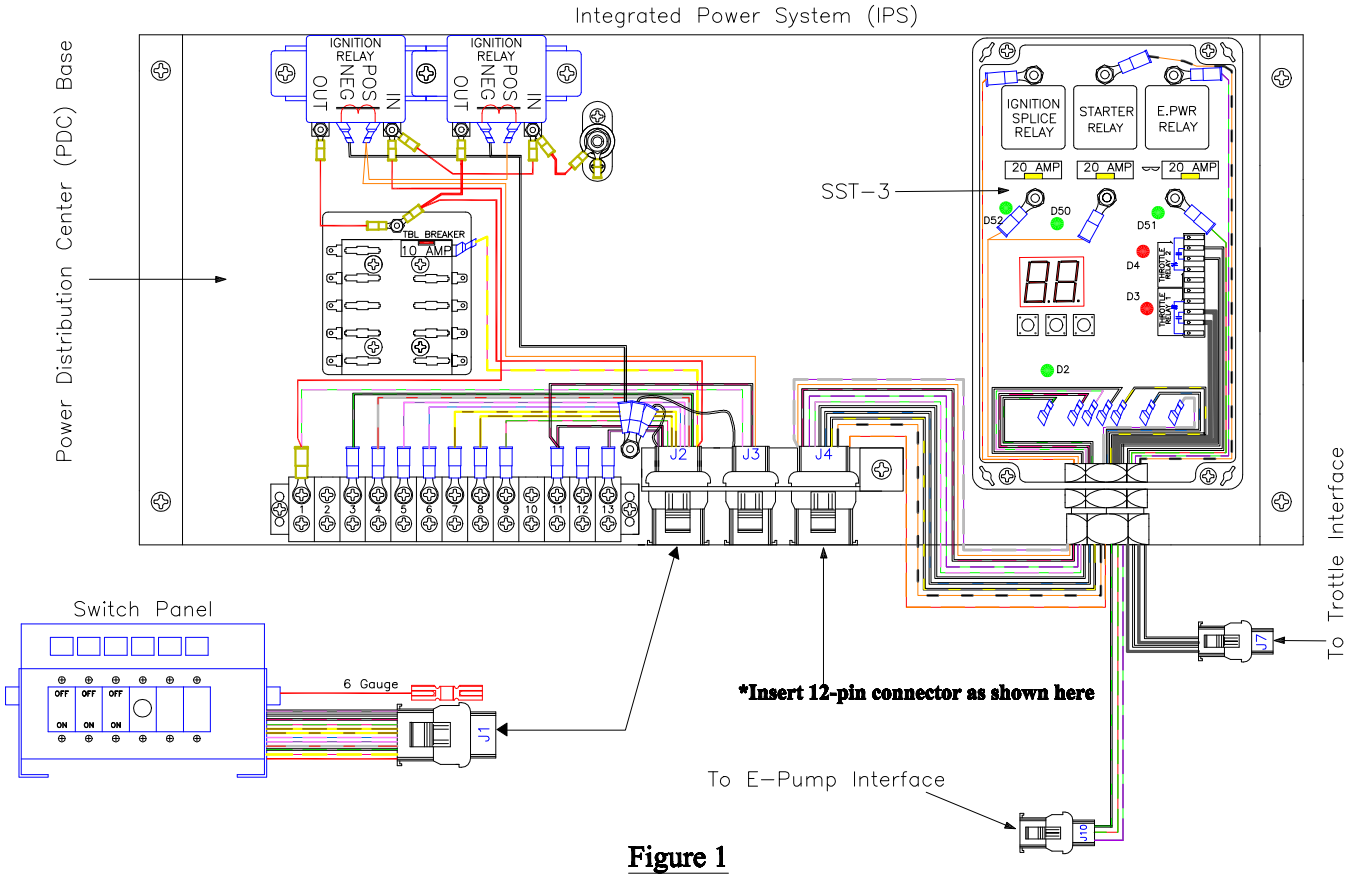


Figure 1

CONNECTIONS (cont.):

- ***SST-3* as a stand-alone system:**

  The following is a list of connections that need to be made to the *SST-3* connectors J4, J7, and J10 to complete the installation process.

***NOTE:** The E-Power (EP), Throttle (TH), and Start/Stop (SS) inputs are all triggered on-demand. This means that they can be either *positive* or *negative* triggered inputs with no additional circuitry or modifications needed.

J4 Connections

FROM		*THRU*	*TO*			
SST-3 Circuit Board Nomenclature	**Function**	**J4 Pin #**	**Vehicle**	**Wire Color**	**Wire Label**	**AWG**
Ignition Splice J59 stud	Supplies power to ignition & starter relays	1	"Key" side of splice	Orange	IGN	14
J53 (PW)	Supplies +12V to processor on board	2	Battery (+)	Pink / Green	SST POS	16
J54 (GND)	Ground (Do not use chassis!)	3	Battery (-)	White	NEG	16
J5 (MS)	Enables Board Operation	5	"Master" enable switch	Red / White	MASTER POS	14
J7 (SS)	Triggers start circuitry on board	6	Bucket start switch	White / Blue	START TRIG	16
J6 (TH)	Triggers throttle circuitry on board	8	Bucket throttle switch	White / Yellow	THROTTLE TRIG	16
J56 stud	Supplies power to starter when relay is enabled	10	Output from key "Start"	Orange / Black	STARTER	14
J60 stud	Interrupts power to ECM when relay is enabled	12	ECM side of splice	Orange / Red	FUEL SOL	14

J7 Connections (Throttle)

FROM		*THRU*	*TO*			
SST-3 Circuit Board Nomenclature	**Function**	**J7 Pin #**	**Vehicle**	**Wire Color**	**Wire Label**	**AWG**
J2 (pin #2)	Input to throttle control relay #1	3	Throttle Circuitry	Black	RLY-1-30	18
J2 (pin #3)	Output from throttle control Relay #1	6	Throttle Circuitry	Black	RLY-1-87	18
J2 (pin #8)	Input to throttle control relay #2	1	Throttle Circuitry	White	RLY-2-30	18
J2 (pin #9)	Output from throttle control Relay #2	4	Throttle Circuitry	White	RLY-2-87	18

CONNECTIONS (cont.):

J10 Connections (Emergency Power)

FROM		*THRU*	*TO*			
SST-3 Circuit Board Nomenclature	**Function**	**J10 Pin #**	**Vehicle**	**Wire Color**	**Wire Label**	**AWG**
E. Pump J58 stud	Supplies power to the E-Pump relay	1	E-Power battery	Red / Green	FROM E-BATT	14
J57 stud	Supplies power to the E-Pump when the relay is enabled	2	E-Pump	Purple / Green	TO E-PUMP	14
J4 (EP)	Triggers E-Power circuitry on the board	3	Bucket E-Pump switch	White / Green	E-PUMP	14

***NOTE: For Emergency Power operation-**

- **If using a separate E-Power Battery the fuse or circuit breaker for the E-Pump relay on the SST-3 must be connected between the J64 & J63 female push-on connectors.**
- **If a separate E-Power battery is NOT being used, the fuse or circuit breaker must be connected between the J64 & J65 female push-on connectors.**

OPERATION & TROUBLESHOOTING:

After all of the connections have been made, and the box has been mounted securely, the *SST-3* is ready to be powered up. With the ignition switch in the ON position, turn on the "Master" switch to power up the *SST-3*. On initial power up the *SST-3* will perform a self-diagnostic test to verify that all of the functions are operating correctly. If no faults are detected, the *SST-3* will go into "Run mode" and a rotating segment will be visible on the dual-7-segment display (refer to Figure 2).

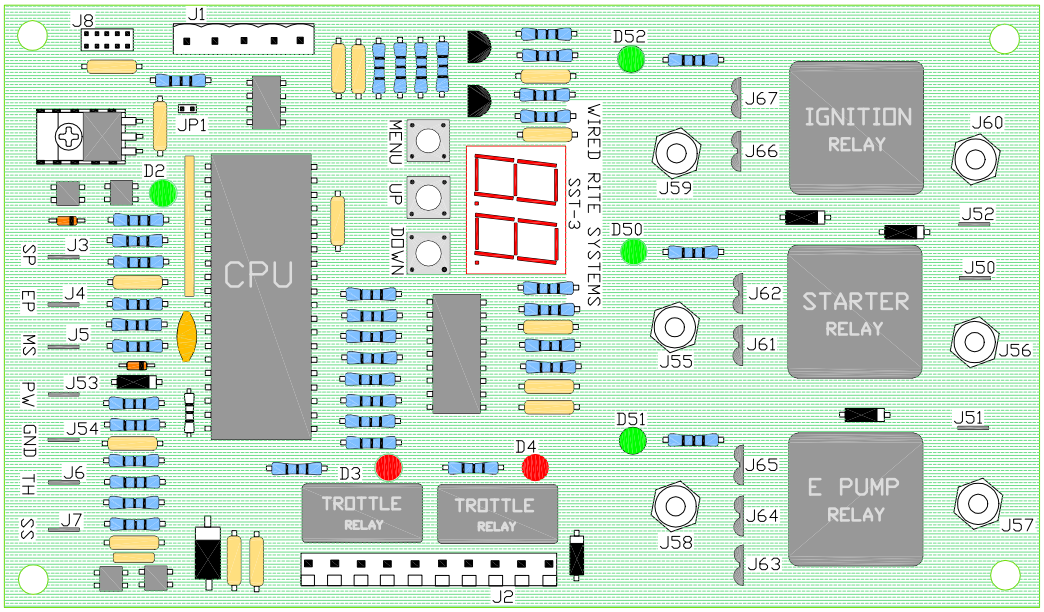


Figure-2

OPERATION & TROUBLESHOOTING (Cont.)

If a fault is detected on power up, a code will be flashing on the display indicating which circuit the fault has occurred in. Refer to the table below to identify the faulty circuit and then go to the troubleshooting flowchart page for a step-by-step process for locating the cause of the fault.

Fault Display

Display	Flashing	Description
	Yes	Fault detected in Stop circuit
	Yes	Fault detected in Start circuit
	Yes	Fault detected in Emergency Power circuit

The processor on the *SST-3* board can go into a locked-up situation if the power is toggled on and off at a rapid rate. If this occurs the processor must be reset by disconnecting the power to the board for several seconds and then reconnecting it.

Also note that the ground wire of the *SST-3* must **NOT** be connected to the chassis, but routed directly to the negative side of the battery.

If a fault occurs, the *SST-3*'s on board diagnostics will record which circuit the fault occurred in and save the location in volatile memory. To clear all of the recorded faults, simultaneously press and hold the "Up" and "Down" buttons on the board for three seconds or remove board power. This will erase the volatile memory and place the system back in the "Run mode".

An additional troubleshooting resource is the on-board LED indicators. Below is a list of the LED's and their operations in normal mode.

LED Indicators

LED #	Color	Description	On Indicates
D2	Green	Input	An input trigger is being applied
D3	Red	Throttle Relay #1	Relay is enabled
D4	Red	Throttle Relay #2	Relay is enabled
D50	Green	Starter	Power to supply side of Starter relay is present
D51	Green	Emergency Pump	Power to supply side of Emergency Pump relay is present
D52	Green	Ignition	Power to supply side of Ignition relay is present

OPERATION & TROUBLESHOOTING (Cont.):

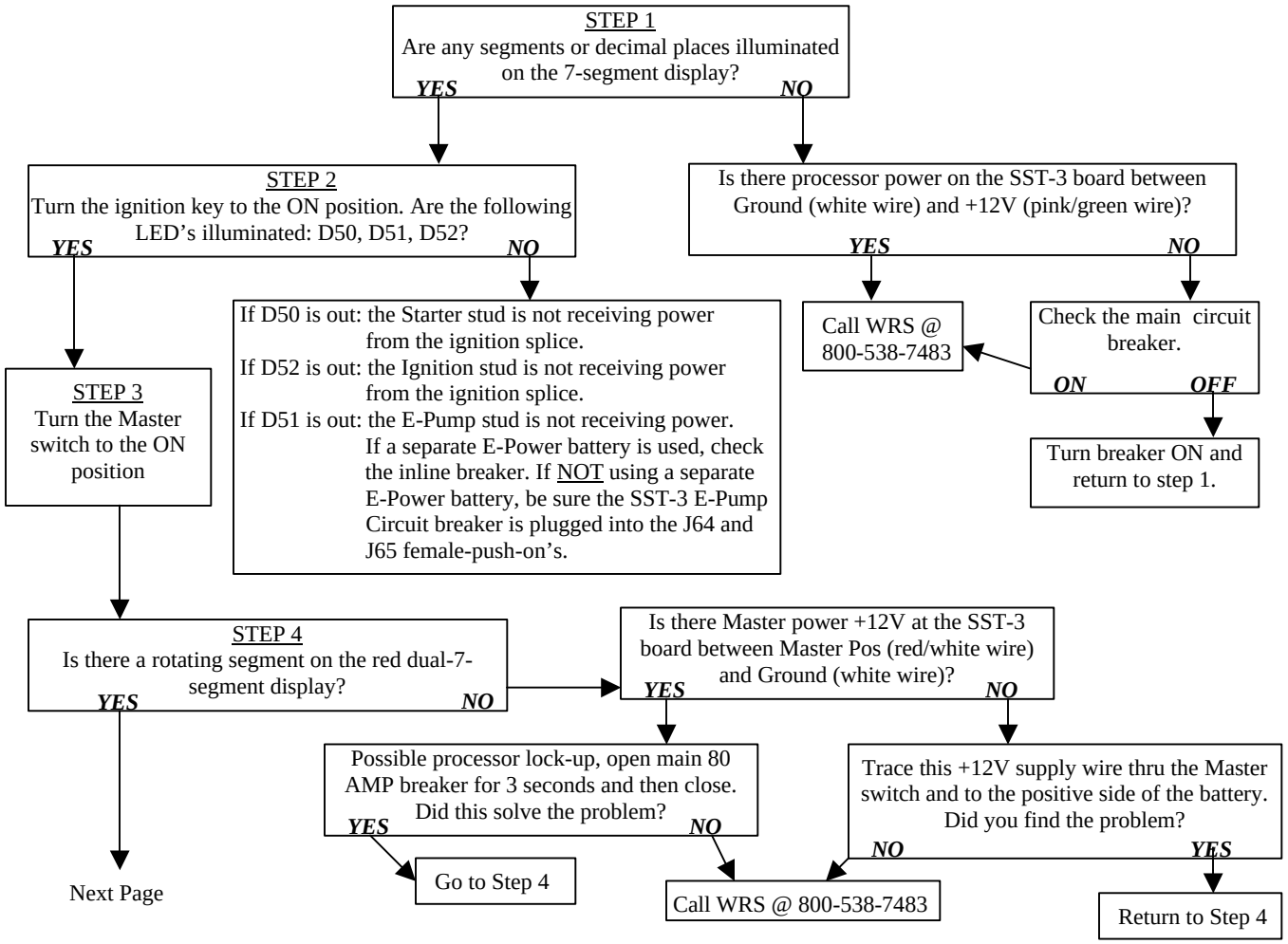
After all of the faults have been cleared and the *SST-3* is operating in normal mode, the following chart outlines the different display codes and the operations which they indicate.

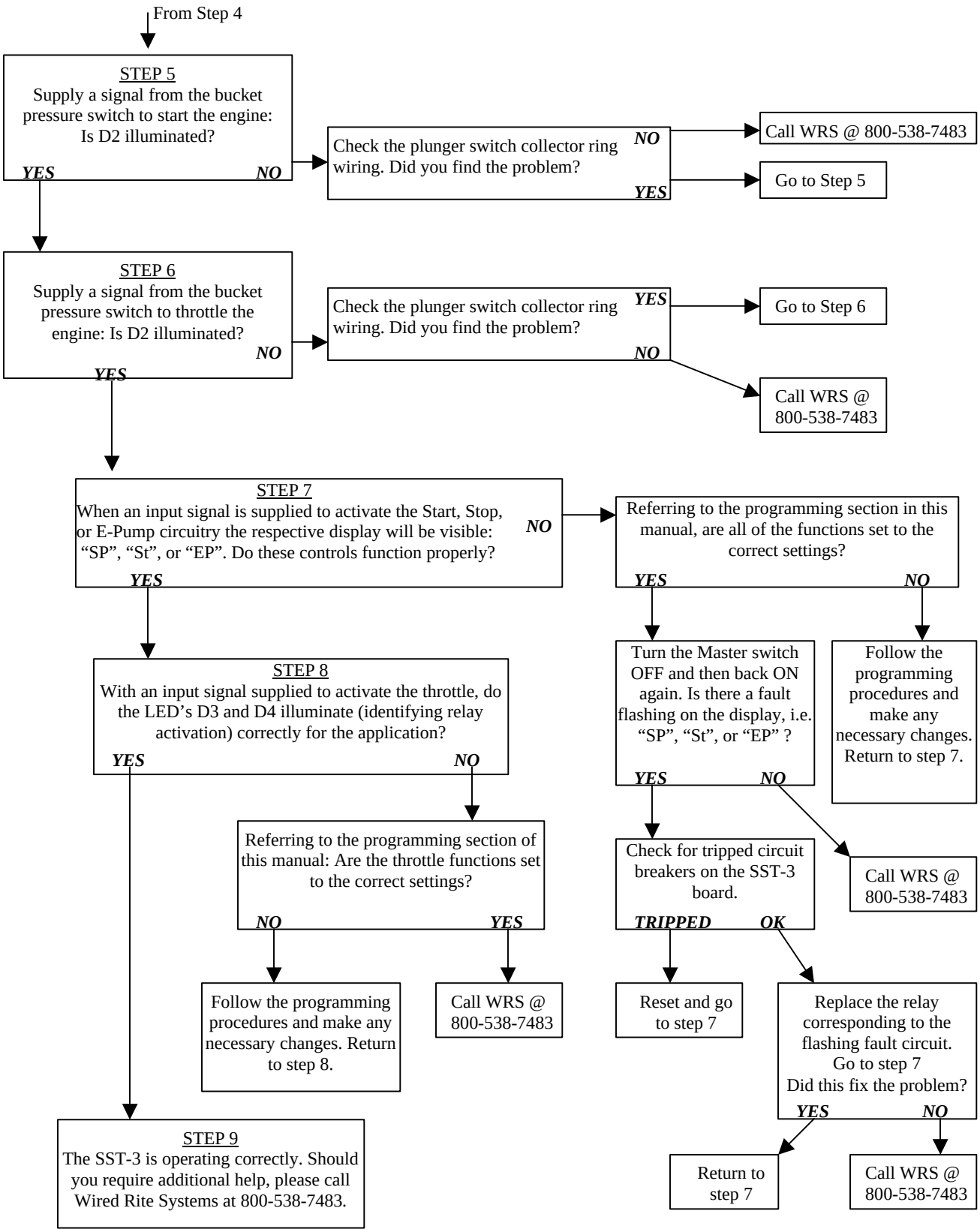
Display In Normal Mode

Display	Flashing	Description
".."	Yes	No master power
rotating segment	No	Run mode
"SP"	No	Stop mode
"gP"	No	Start signal active, glow plugs on
"St"	No	Start signal active, starter on
"tP"	No	Throttle Plunger input active
"EP"	No	Emergency Power input active

TROUBLESHOOTING FLOWCHART:

*The following flowchart should be used in conjunction with the wiring diagram on page 10.




From Step 4
STEP 5
Supply a signal from the bucket pressure switch to start the engine: Is D2 illuminated?
YES
NO
Check the plunger switch collector ring wiring. Did you find the problem?
NO
YES
Call WRS @ 800-538-7483
Go to Step 5
STEP 6
Supply a signal from the bucket pressure switch to throttle the engine: Is D2 illuminated?
NO
YES
Check the plunger switch collector ring wiring. Did you find the problem?
YES
NO
Go to Step 6
Call WRS @ 800-538-7483
STEP 7
When an input signal is supplied to activate the Start, Stop, or E-Pump circuitry the respective display will be visible: "SP", "St", or "EP". Do these controls function properly?
NO
YES
Referring to the programming section in this manual, are all of the functions set to the correct settings?
YES
NO
Turn the Master switch OFF and then back ON again. Is there a fault flashing on the display, i.e. "SP", "St", or "EP" ?
YES
NO
Follow the programming procedures and make any necessary changes. Return to step 7.
STEP 8
With an input signal supplied to activate the throttle, do the LED's D3 and D4 illuminate (identifying relay activation) correctly for the application?
YES
NO
Referring to the programming section of this manual: Are the throttle functions set to the correct settings?
NO
YES
Check for tripped circuit breakers on the SST-3 board.
TRIPPED
OK
Call WRS @ 800-538-7483
Follow the programming procedures and make any necessary changes. Return to step 8.
Call WRS @ 800-538-7483
Reset and go to step 7
Replace the relay corresponding to the flashing fault circuit. Go to step 7 Did this fix the problem?
YES
NO
Return to step 7
Call WRS @ 800-538-7483
STEP 9
The SST-3 is operating correctly. Should you require additional help, please call Wired Rite Systems at 800-538-7483.

SST-3 PROGRAMMING CONFIGURATION INSTRUCTIONS:

Your new *SST-3* has been given the improved ease of on-board programming. This New feature uses two seven-segment LED displays to help navigate through the following configuration table.

Programming Configuration Table

Parameter	Value	Description
"A" Plunger Mode	1	Single plunger
	2*	Dual plunger
"B" Throttle Mode	1*	Throttle relays latch ON and OFF
	2	Throttle relays are momentary
	3	K4 latch, K5 momentary, STOP turns both OFF
	4	K4 and K5 latch, stop turns both OFF
	5	Timed operation
	6	No throttle mode
"C" Emergency Power Mode	1*	Dual plunger, Emergency Power from the THROTTLE input
	2	Dual plunger, Emergency Power from the START input
	3	Single plunger, Emergency Power from the START input
	4	Emergency power from independent power source
"D" Emergency Power Time	0-9	Time delay for Emergency Power relay actuation, See timer table below
	3*	
"E" Throttle Mode Timer	0-9	Time delay for throttle timed operation, See timer table below
	5*	
"F" Glow Plug Timer	0-9	Delay time for starter activate, See timer table below
	0*	
"H" Start Duration Timer	0-9	Maximum time for starter active, See timer table below
	5*	
"J" Emergency Power Duration Time	0-9	Maximum time for Emergency Power operation, See timer table below
	8*	

Timer Table

Value	Delay Time	Value	Delay Time
0	No delay / timeout	5	10 seconds
1	1 second	6	15 seconds
2	2 seconds	7	20 seconds
3	3 seconds	8	30 seconds
4	5 seconds	9	45 seconds

SST-3 PROGRAMMING CONFIGURATION INSTRUCTIONS (Cont.):

By pressing the “MENU” button on your SST-3 board, it will begin to display the board’s current operating configuration. If changes are desired, simply move up or down to the desired position with the “UP” and “DOWN” keys. Once you have made the changes to the configuration they must be saved by holding the “MENU” key for 5 seconds. The display will then flash “SA” to confirm the save has taken place.

If the configuration has been changed mistakenly, the SST-3 retains its previous configuration in its memory. To reload the previous settings, simultaneously hold down the “MENU” and “DOWN” keys for three seconds until “LS” is displayed. You can page through the configurations and see that it is as expected, then the settings must be saved, by holding the “MENU” key for 5 seconds. The display will flash “SA” for confirmation of the save.

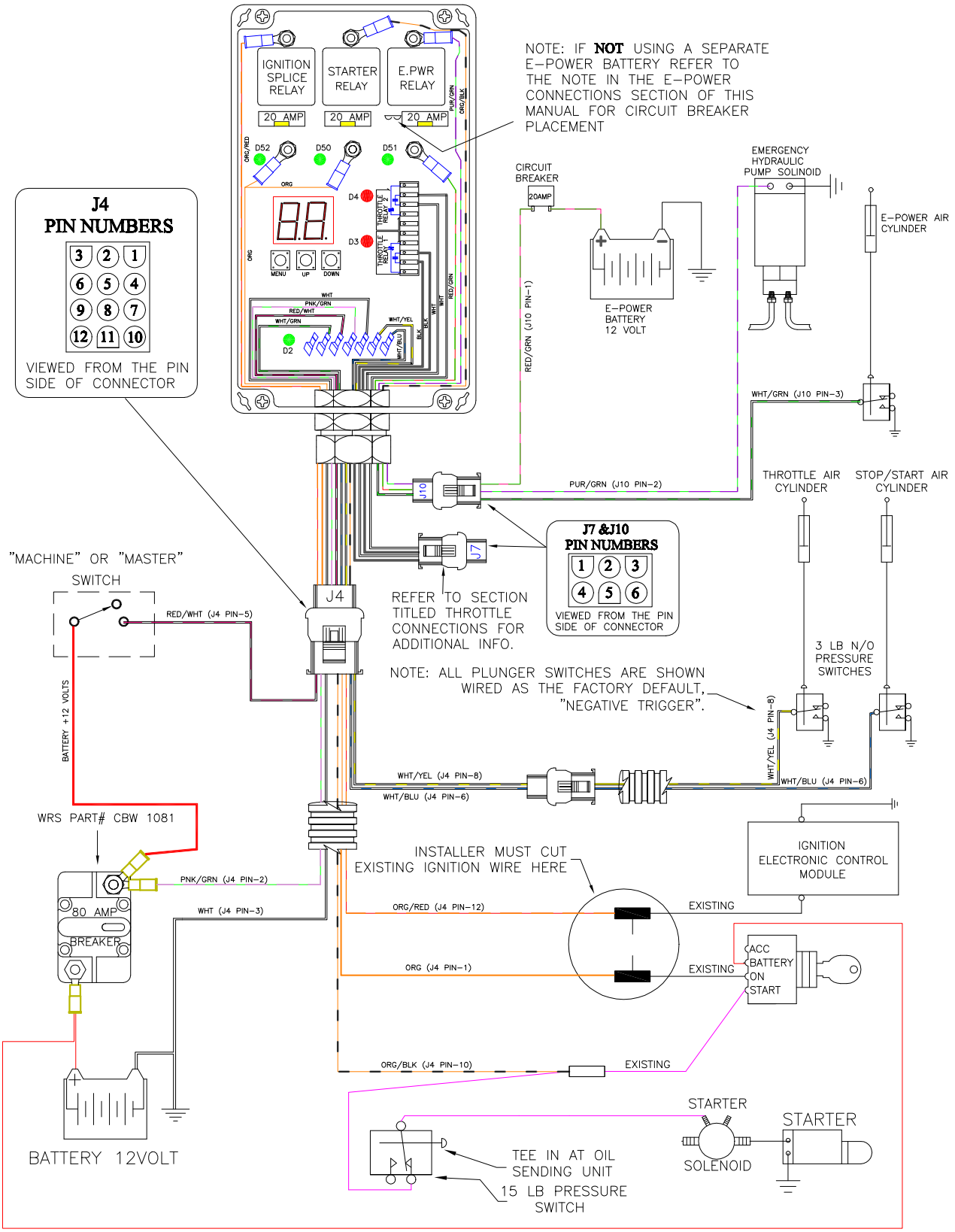
Wired Rite has also preloaded a factory default configuration to the SST-3 board. The default settings are displayed on the Programming Configuration Table with an asterisk (*). To recall these setting hold the “MENU” and “UP” keys down together for 3 seconds until “FS” is displayed. You can page through the configurations and see that it is as expected, then the settings must be saved, by holding the “MENU” key for 5 seconds. The display will flash “SA” as confirmation of the save.

TEST MODE OPERATION:

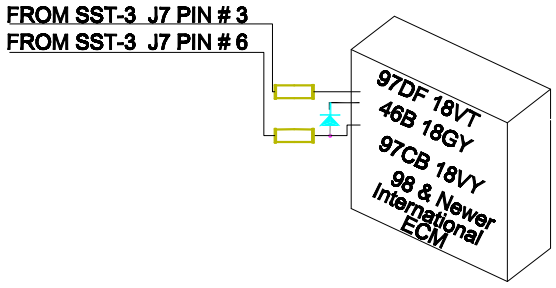
Your new *SST-3* comes equipped with a user Test Mode to assist in diagnosing faults that are detected. To enter the Test Mode depress and hold all three buttons; "Menu, Up, & Down" for 5-seconds until all of the segments flash on both of the 7-segment displays. The following table identifies the functions of the Test Mode.

Verification Of	User Action	Resulting Display
Board Power (J5)	None	
Ignition Power (J59)	Turn ignition key ON	
Power from Master switch (J53)	Turn ON Master switch	
Remote E-Power input (J4)	Activate remote E-power switch	
Remote Start/Stop input (J7)	Activate remote Start/Stop switch	
Remote Throttle input (J6)	Activate remote Throttle switch	
Ignition relay & K1 Throttle relay	With ignition ON press Menu button on SST-3 board	
Starter relay & K2 Throttle relay	With ignition ON press Up button on SST-3 board	
Emergency Pump relay	With ignition ON press Down button on SST-3 board	

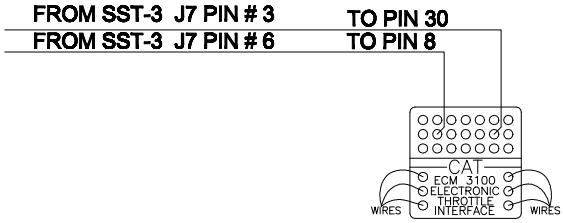
WIRING DIAGRAM FOR SST-3 WITH DUAL THROTTLE AND EMERGENCY POWER CONTROL:



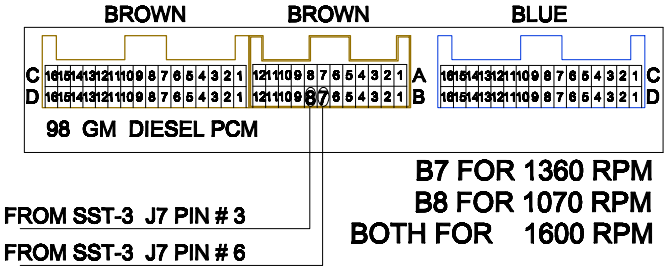
THROTTLE CONNECTIONS:



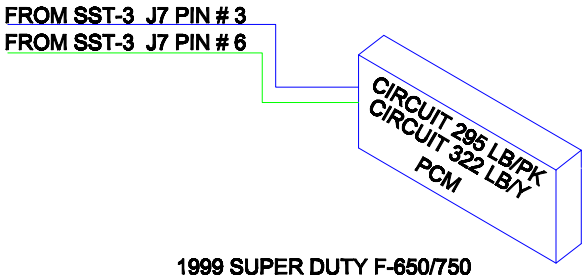
1998 INTERNATIONAL
NAVPAK



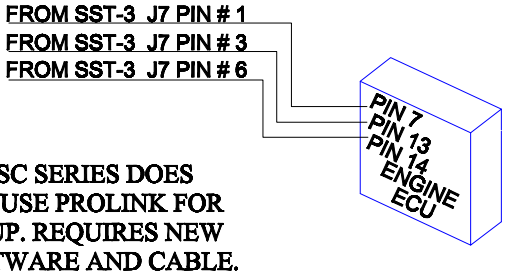
1997 CAT 3100



1996/97/98 GM
6.5L DIESEL PCM

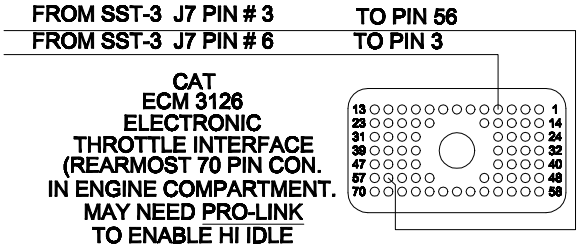


1999 SUPER DUTY F-650/750
7.3 POWER STROKE



ISB/ISC SERIES DOES
NOT USE PROLINK FOR
SETUP. REQUIRES NEW
SOFTWARE AND CABLE.
SEE CUMMINS DEALER
FOR DETAILS.

CUMMINS ISB OR ISC



1999 SUPER DUTY F-650/750
CAT 3126B

TRUCK MANUFACTURER TECH SUPPORT:

General Motors:

- www.gmupfitter.com
- Hotline 800-875-4742

Ford Motor Company:

- www.fleet.ford.com

Cummins:

- www.cummins.com
- Customer Assistance 1-800-DIESELS (1-800-343-7357)

International:

- www.internationaldelivers.com
- Tech Central Help Line 1-800-448-7825

Freightliner:

- www.freightlinertrucks.com

ADDITIONAL INFORMATION:

GM Vehicles with Passlock Modules:

When attempting to start the vehicle from a location other than the ignition switch, the Passlock Module will interrupt this as a vehicle theft and will disable the fuel injectors. This can be corrected with this minor wiring modification:

1. Select a high quality, low energy, normally closed switch. Mount in a location that is close to the Passlock Module, accessible to the driver, and will not interfere with vehicle operation.
2. Turn off the ignition switch.
3. Locate the purple class 2 data link wire that exits wire cavity B4 of the 16-way connector. Cut the wire close to Passlock Module.
4. Splice a 20 gauge purple wire to each end of the purple wire you just cut. Connect these wires to the switch contacts that are open when the switch is in the ON position.
5. Turn the switch OFF.
6. Start the vehicle to verify normal operation. If the vehicle will not start, check to be sure that the switch contacts are closed.

To enable remote start, the vehicle must be running when the modification switch is turned on. The security Telltale will indicate that the Passlock system is inoperative. Once the security Telltale has been on for 5-seconds the vehicle can be remotely started.

To disable the remote start, the modification switch can be turned OFF when the vehicle is running or not. If battery power is lost to the Vehicle Control Module, the modification switch must be turned OFF to start the vehicle.
*See the GM web site for more information.