PARTS & SERVICE NEWS

REF NO.	AA00221
DATE	November 8, 2000

SUBJECT: WA800-2LC AND WA900-1LC JOYSTICK STEERING SYSTEM INTERMITTENT INTERRUPTIONS/ERROR SIGNALS

PURPOSE: To introduce instructions for procedures to modify the joystick steering system to prevent intermittent system interruptions and error signals.

APPLICATION: WA800-2LC Wheel Loader Serial Numbers A20020 and up
WA900-1LC Wheel Loader Serial Numbers A20008 and up

FAILURE CODE: 43A05C

DESCRIPTION: The joystick steering system for both the WA800-2LC and WA900-1LC loaders have had problems with intermittent interruptions and error signals. Loose wiring connections may occur causing the joystick steering controller to go into fault mode (usually code #36) and disable the joystick system. The operator must then steer by wheel until the loader is restarted to clear the fault code.

This Parts and Service News is designed to eliminate the intermittent system interruptions/error codes by providing instructions to: 1) provide for the correct adjustment of the potentiometer, 2) provide for the correct adjustment of the system cutoff switch and 3) to modify the wiring going to the joystick controller from the floor harness for a more flexible wire connection by adding an additional harness.

PREPARATIONS FOR WORK

IMPORTANT: Please observe all safety and precautionary standards as dictated by the environment and work conditions under which the equipment will be inspected, reworked, and repaired. Consult the "Shop Manual" for the model you are working on and your Komatsu district service manager with any and all questions regarding safety.

1. Park the machine on a flat level surface, lower the boom and bucket to the ground. Shut off the engine and cycle the controls to remove any residual hydraulic pressure from the boom and bucket circuits. Fully apply the parking brake.
2. Place chocks at the front and rear of all wheels to prevent the machine from moving.
3. Install the safety bar on the machine.
4. Remove the key from the start switch and retain it until the repairs are complete. ALWAYS attach the WARNING TAG to the steering wheel or control lever in the operator's cab to alert others that you are working on the machine. These tags are available from your Komatsu distributor. (Part No. 09963-03000)
5. Welding operations must always be carried out by a qualified welder and in a place equipped with the proper equipment. Gas is generated and there is danger of fire or electrocution when carrying out welding, so never allow any unqualified personnel to carry out welding. The qualified welder must follow the precautions given below:
   • Disconnect the battery terminals to prevent explosion of the battery.

- Remove paint from the place being welded to prevent gas from being generated.
- If hydraulic equipment or piping or places close to these are heated, flammable vapor or spray will be generated and there is a danger of this catching fire, so avoid applying heat to such places.
- If heat is applied directly to rubber hoses or piping under pressure, they may suddenly burst, so cover them with fireproof sheeting.
- Always wear protective clothing.
- Ensure that there is good ventilation.
- Clean up any flammable materials and make sure there is a fire extinguisher at the workplace.

1. List of Parts

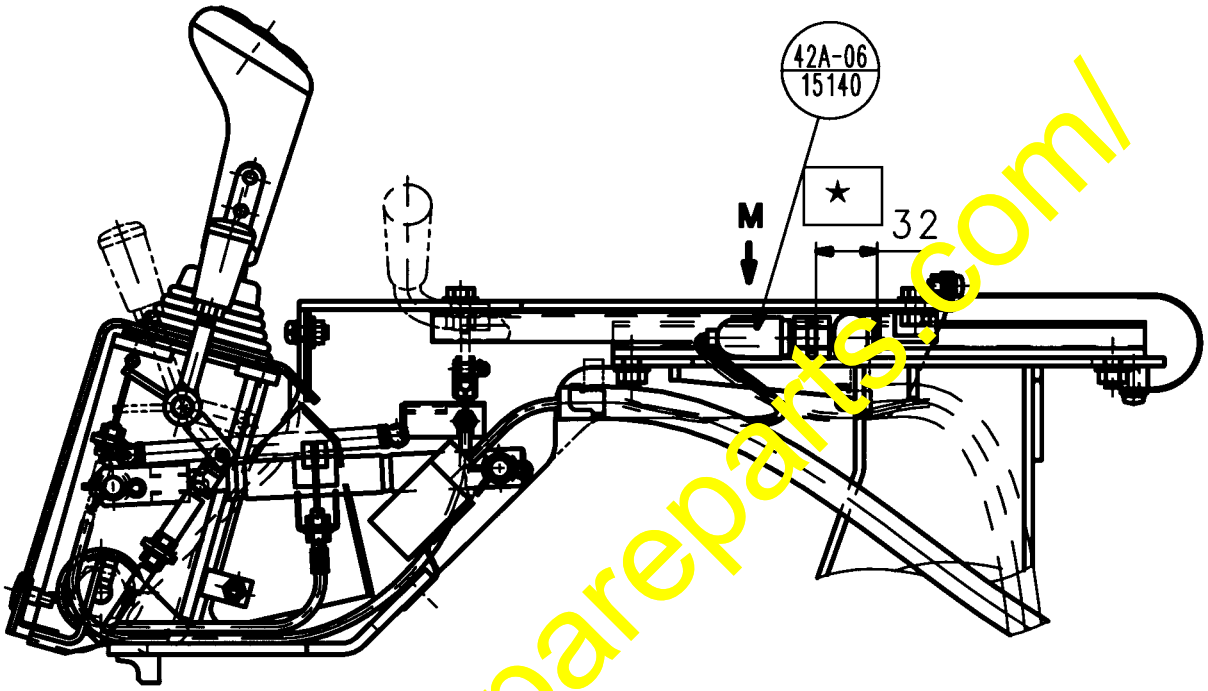
These parts are required for the modification procedures that follow:

Part Number	Description	Qty.	Notes
01571-01016	Seat	1	For rework of joystick controller wiring
EJ 1 551	Harness, Str. JSC Controller	1	For rework of joystick controller wiring
LW428-51	Sleeve, Insulating - Size #1/4	15	For rework of joystick controller wiring
MM 0 036	Screw, Cap - M10x1.50x20	1	For rework of joystick controller wiring
MM 0 461	Washer, Flat - M10	1	For rework of joystick controller wiring
MM 0 57[illegible]	Nut, Weld - M10x1.50	4	For rework of joystick controller wiring
VH 2 929	Connector, Terminal Butt 16-14 AWG	15	For rework of joystick controller wiring
VY 8 331	Clamp, Vinyl - .250 ID	1	For rework of joystick controller wiring

Note: The modification procedures for the potentiometer and for the system cutoff switch do not require any additional parts. The potentiometer adjustment requires three tools: a T-branch connector (see potentiometer adjustment instructions), a digital multimeter (similar to Komatsu service tool part number 79A-264-0210) and a Mechatro-Harness checker (Komatsu service tool part number 799-601-2500). These tools should be made available before starting these adjustments.

2. Adjustment of the system cutoff switch

For the system cutoff switch to function correctly and consistently, the following adjustment needs to be made. Adjust the setup dimension to 36mm as shown below using the jam nuts on the switch and then reinstall the switch into the console.



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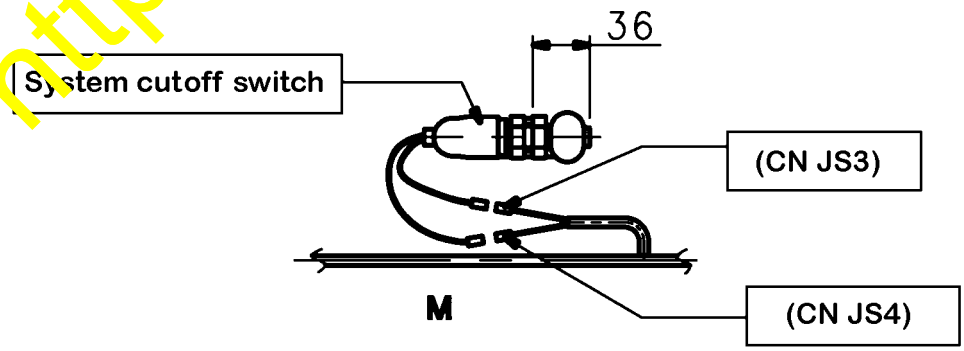
NOTE: The console assembly has the system cutoff switch at 32mm. Readjust the cutoff switch to the 36mm shown for a more positive switch engagement.



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3. Adjustment of the potentiometer

To provide for the correct function of the joystick steering lever, the following potentiometer adjustment procedure should be followed. This procedure will require the following tools: T-branch connector, digital multimeter and a Mechatro harness checker.

Steps:
(1) Remove the knob and cover shown in Fig. 1.

(Note 1) Keep the knob and cover since they can be used again after the adjustment.

(2) Loosen the potentiometer mounting screws.
✷ (See below)
(3) Connect a T-branch (X-type, 3 poles) to the potentiometer connector CN3.

(Note 2) The key switch must be in the off position.

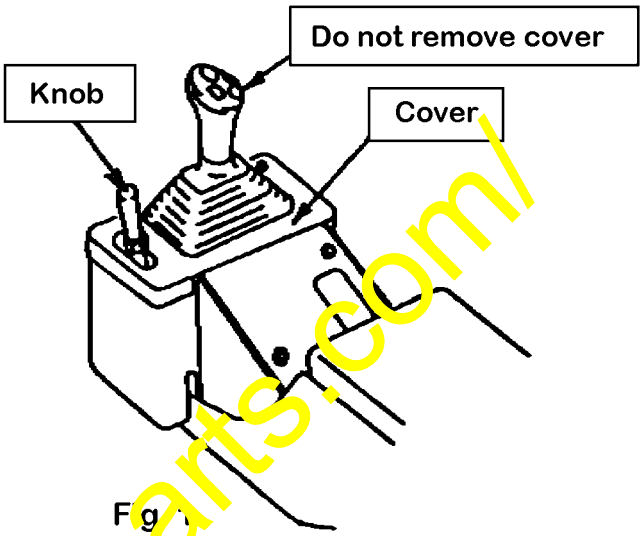
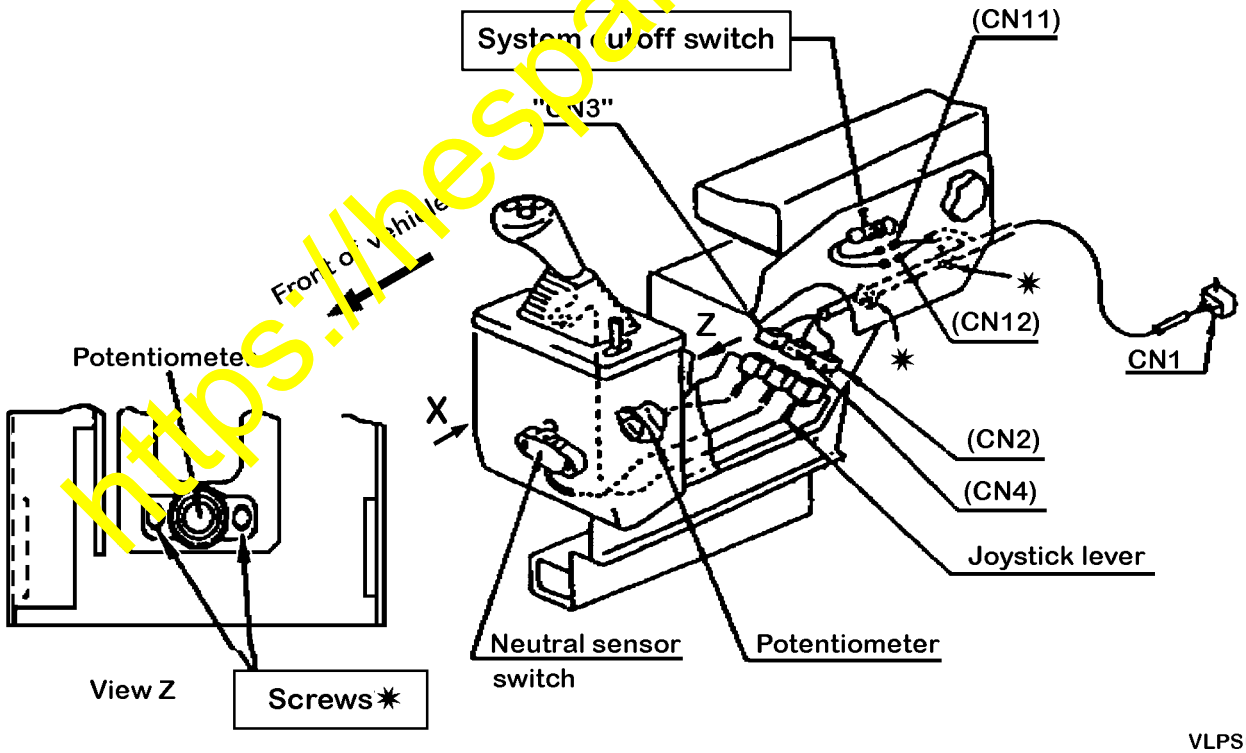


Fig.

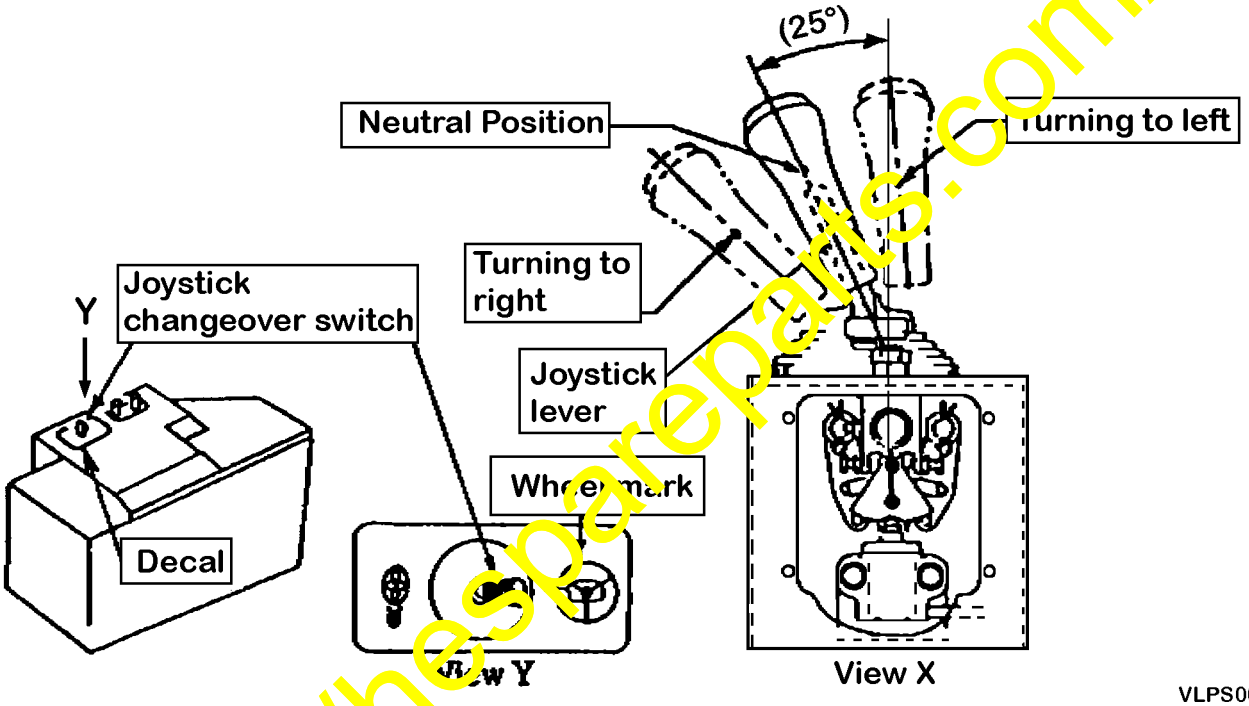
VLPS0057



VLPS0058

(4) a. Turn the joystick changeover switch to the wheel mark position.
b. Set the joystick lever to the neutral position. (The lever returns to the neutral position automatically.)
c. Turn the key switch to the ON position.

(Note 3) Do not start the engine.



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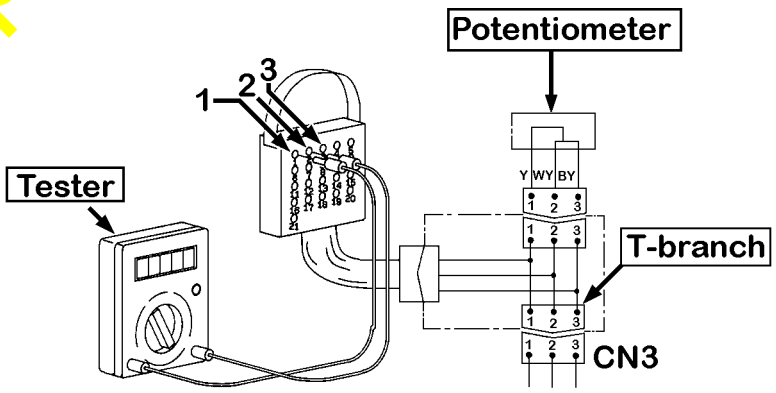
(5) Confirm that the voltage between pins 2 (+) and 3 (GND) of the T-branch is DC 5V ±0.05V. Then slowly turn the potentiometer body to the position at which the voltage between pins 1 and 3 is DC 2.5V ±0.1V (2.4 - 2.6V). Tighten the potentiometer mounting screws✷.

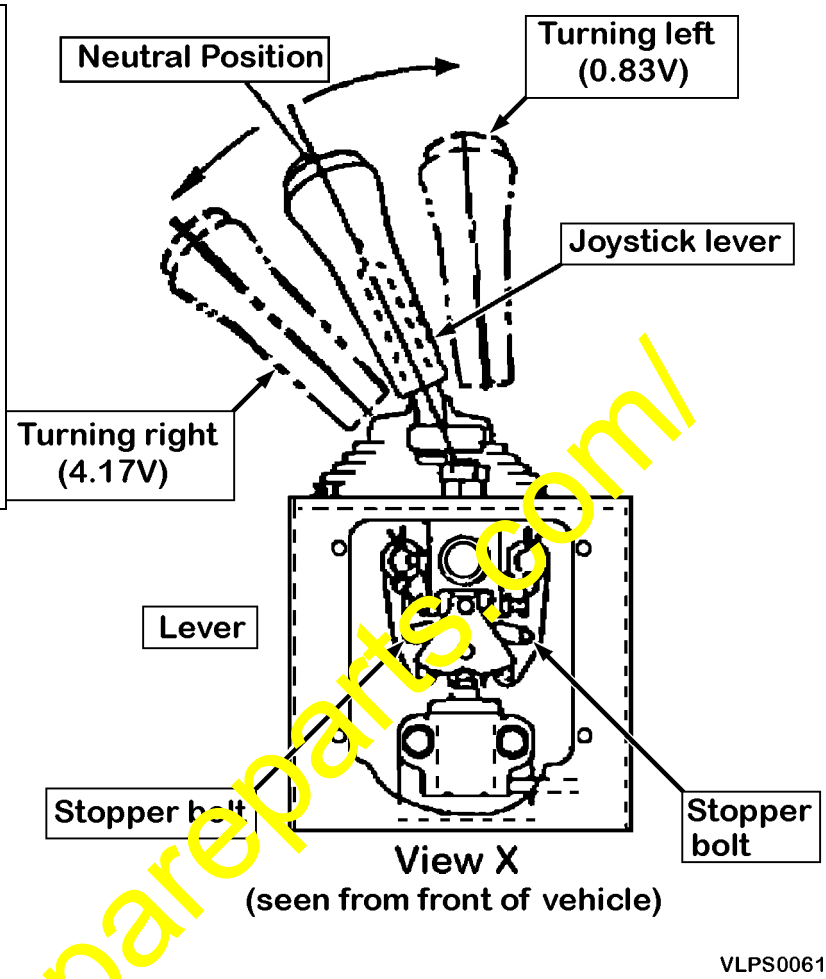


VLPS0060

(6) Set the voltages for turning to the right and left.
Move the joystick lever until the following voltages are obtained, then tighten the stopper bolt.

Turning left: DC 0.83V±0.1V
Turning right: DC 4.17V ±0. 1V

(Note 4) The stopper bolt can be checked by removing the front cover of the lever box.



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(7) After adjustment, function the lever multiple times (approximately 25 times using considerable force) and check the voltages again. Readjust as required.

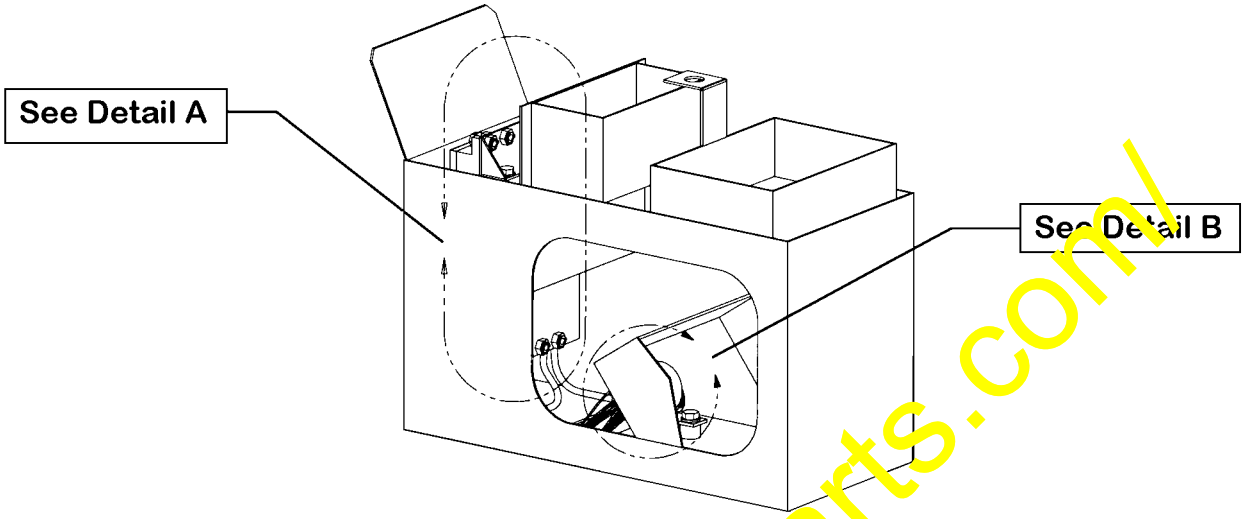
(8) If the proper adjustment is not obtainable, it may be necessary to replace the potentiometer. The mechanic on site will need to make that determination.

(9) Once the adjustment has been completed, install the cover and the other parts.

4. Modification of wiring for the joystick controller.

Procedure:

(1) Disassemble the right hand console box to expose the joystick controller. Set aside all components to reinstall after the modifications have been completed.



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RIGHT HAND CONSOLE BOX

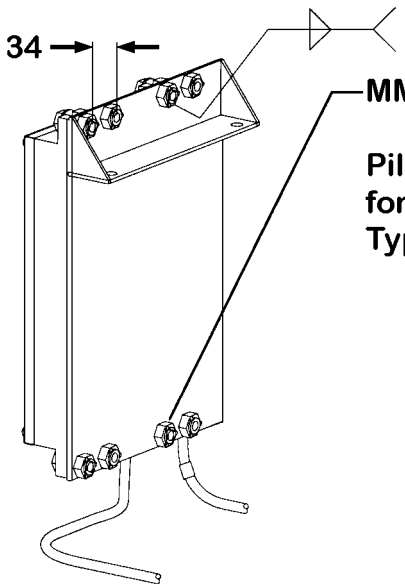
(2) Remove the joystick controller and the mounting plate from the right hand console box.

(3) Remove the joystick controller from the mounting plate.

(4) Drill four new mounting holes to shift the position of the joystick controller on the mounting plate by 34mm as shown below in Detail A.

(5) Add four new weld nuts to mount the joystick controller to the mounting plate. (See Detail A)

Note: Detail A shows the controller bolted to the mounting plate in the new position. (Shifted 34mm)



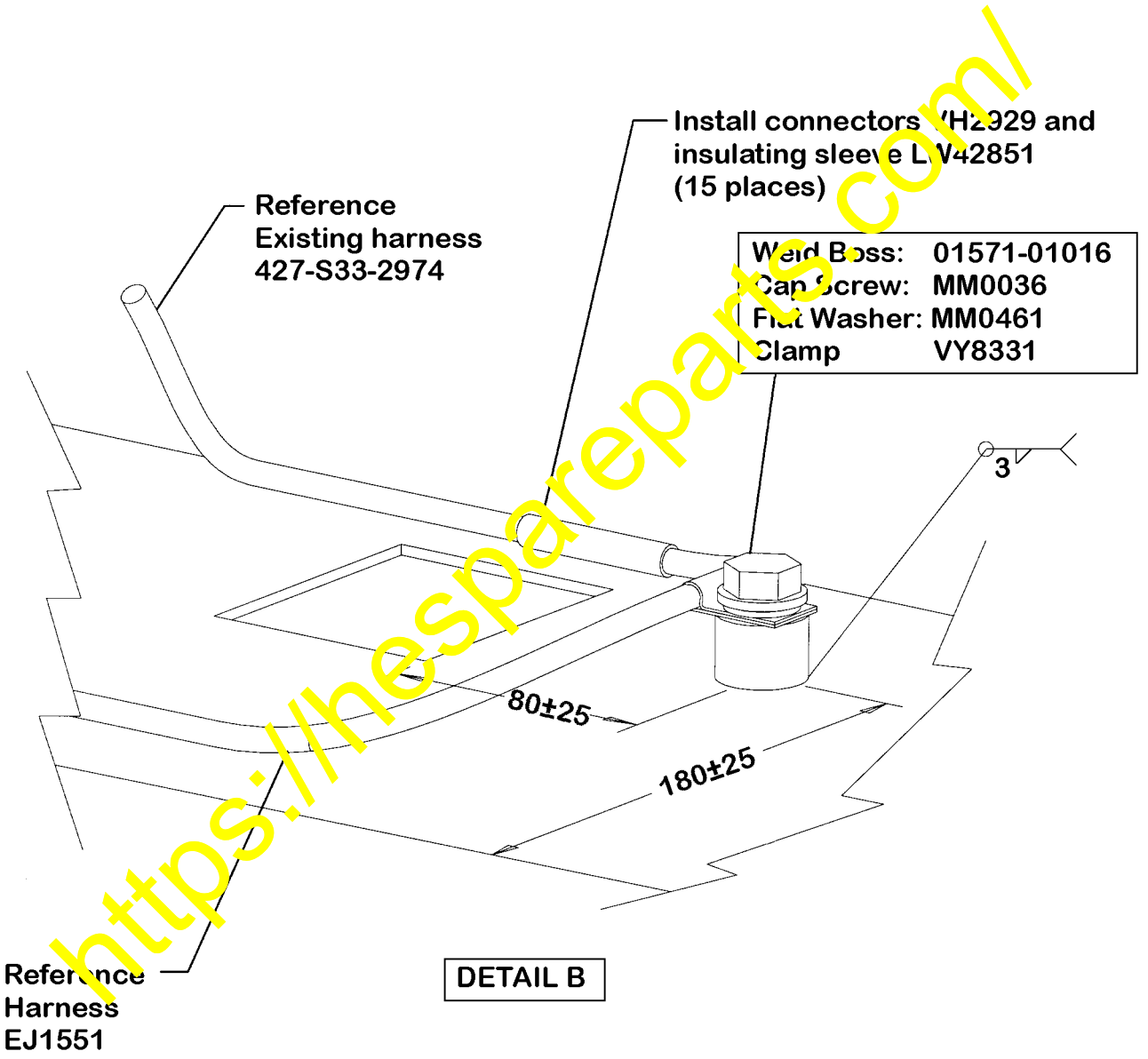
Detail A

VLPS0063

(6) Remove the existing JS1 and JS2 connectors from the existing controller harness 427-S33-2974.

(7) Use terminal butt connectors VH2929 or solder the wiring connections to install wiring harness EJ1551 onto the existing controller harness 427-S33-2974. Match up the circuit colors and the connector pin outs between the existing harness 427-S33-2974 and harness EJ1551. (Refer to harness drawing EJ1551 and schematic drawing 427-S33-A200 for circuit verification.) (See Detail B)

(8) Install the welding boss 01571-01016 to the floor of the right hand console box. (See Detail B)



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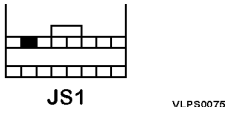
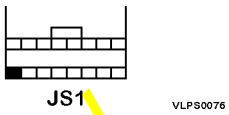
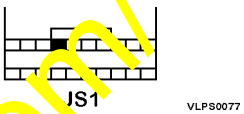
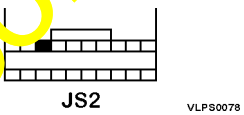
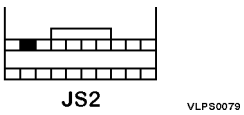
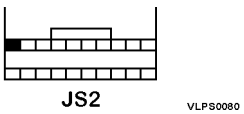
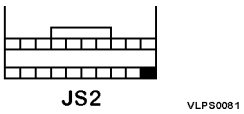
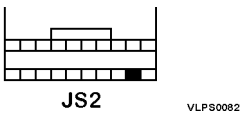
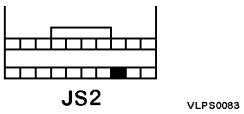
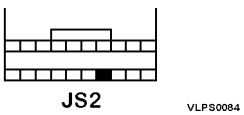
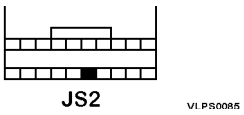
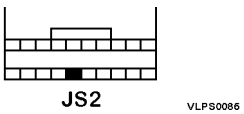
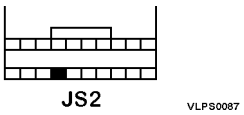
(9) Reinstall the joystick controller onto the mounting plate with the connectors facing toward the drivers' side.

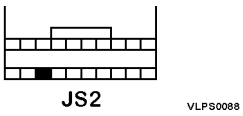
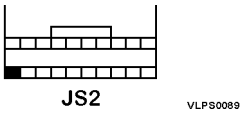
(10) Reinstall the joystick controller and mounting plate assembly into the right hand console.

(11) Install the joystick controller harness EJ1551 (connection of CNJS1 and CNJS2) to the controller. Also reinstall the CNJS3 connector to the controller, which is part of existing harness 427-S33-2974 (if the connector was removed). Use the new weld boss and hardware to secure the harness.

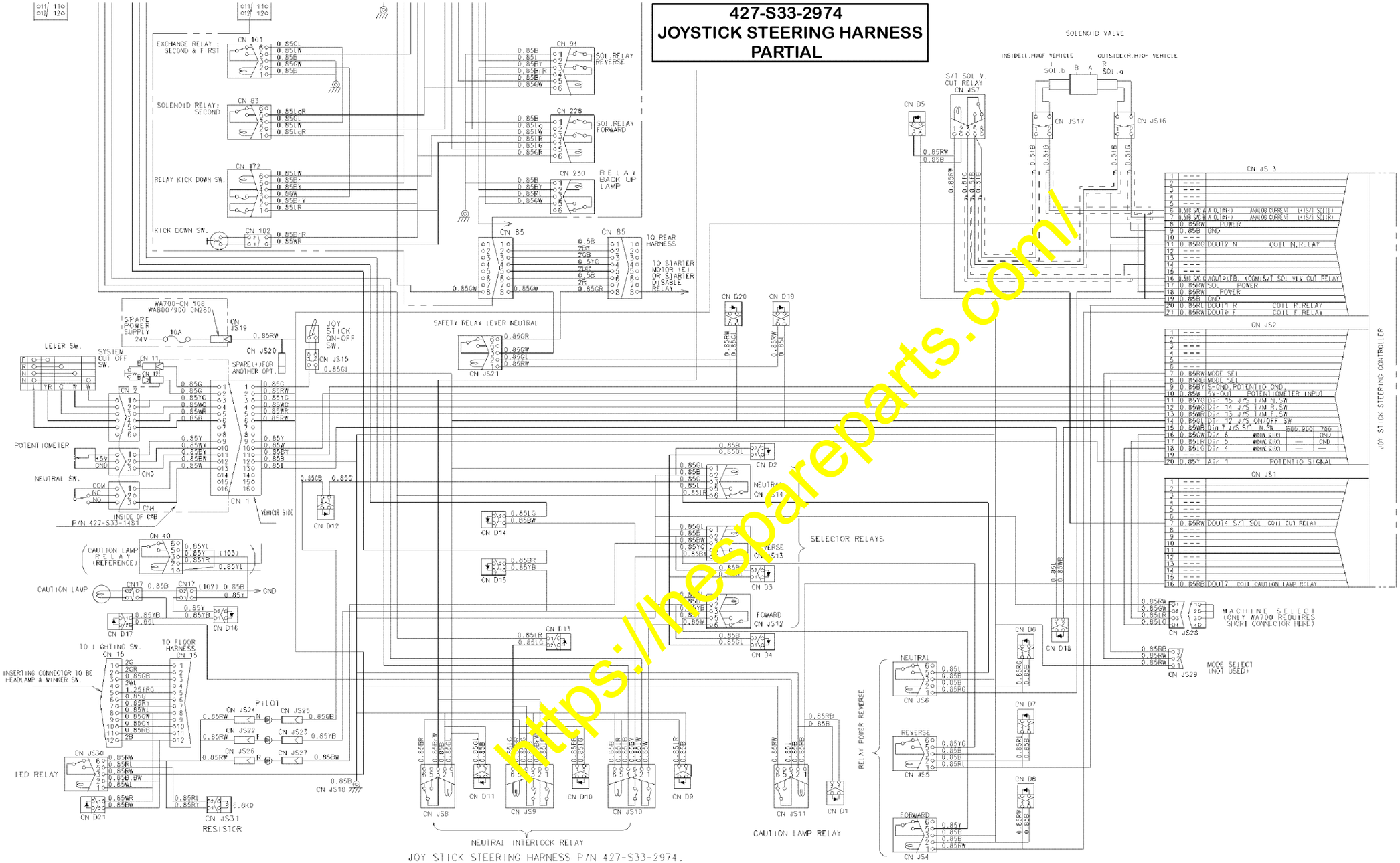
(12) Reinstall the disassembled components of the right hand console to complete the modification.

(13) Remove any tools and other loose materials from the loader cab. Remove the WARNING TAG from the steering wheel and the safety lock bar. Make sure that the area surrounding the loader is clear of personnel and other equipment before starting the engine and testing the joystick system for proper operation of the steering function. Be sure to begin the testing slowly to ensure a measure of control prior to more vigorous testing of the steering system.

HARNESS #EJ1551		OEM HARNESS	PIN POSITION ON CONNECTOR
Wire I. D.	**Color Code**	**Wire Color**	**Looking at Female Connector**
CNJS1-7	RW	RED WIRE W/WHITE STRIPE	
CNJS1--16	RB	RED WIRE W/BLACK STRIPE	
CNJS2-7	RW	RED WIRE W/WHITE STRIPE	
CNJS2-8	RB	RED WIRE W/BLACK STRIPE	
CNJS2-9	BY	BLACK WIRE W/YELLOW STRIPE	
CNJS2-10	W	WHITE WIRE W/O ANY STRIPES	
CNJS2-11	YG	YELLOW WIRE W/GREEN STRIPE	
CNJS2-12	WG	WHITE WIRE W/GREEN STRIPE	
CNJS2-13	WR	WHITE WIRE W/RED STRIPE	
CNJS2-14	G ???	GREEN WIRE W/O ANY STRIPES	
CNJS2-15	WB	WHITE WIRE W/BLACK STRIPE	
CNJS2-16	GW	GREEN WIRE W/WHITE STRIPE	
CNJS2-17	LR	BLUE WIRE W/RED STRIPE	

HARNESS #EJ1551		OEM HARNESS	PIN POSITION ON CONNECTOR
CNJS2-18	LG ???	BLUE WIRE W/O ANY STRIPES	
CNJS2-20	Y	YELLOW WIRE W/O ANY STRIPES	

427-S33-2974
JOYSTICK STEERING HARNESS PARTIAL



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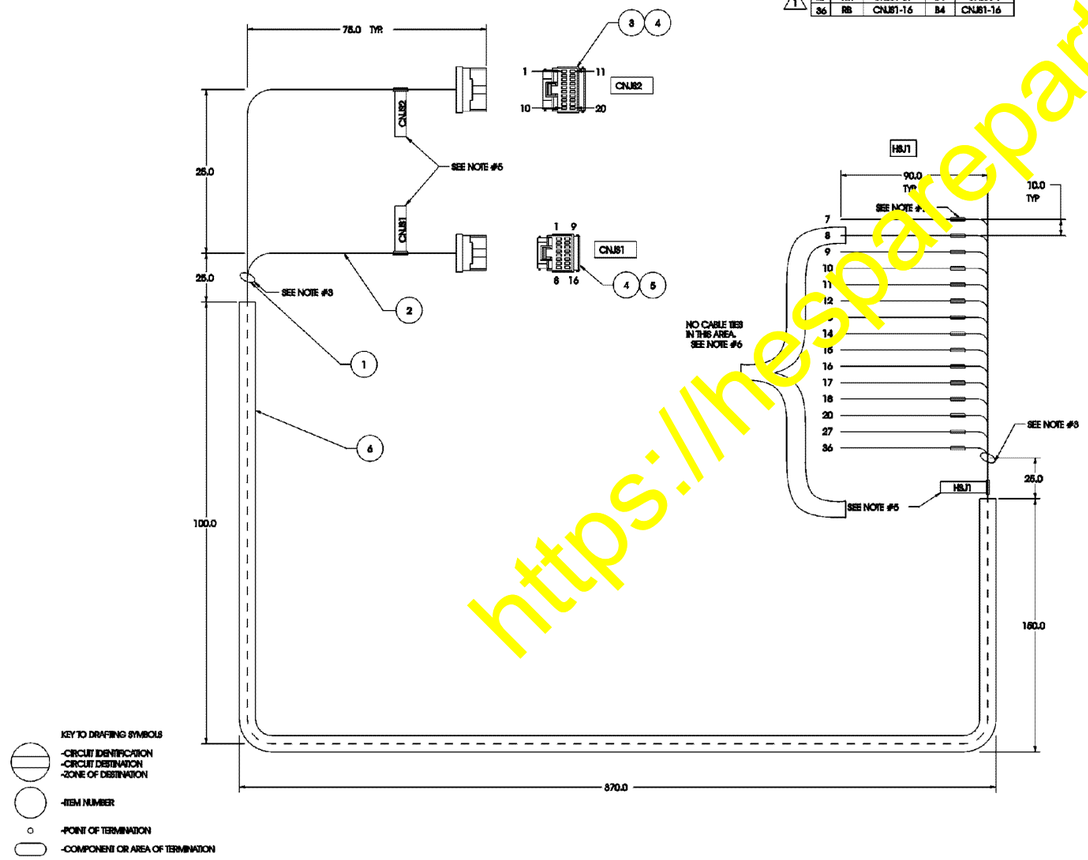
EJ1551 - JSC CONTROLLER HARNESS

CNJ82			
POS	CKT	DESTINATION	ZONE
01	---	---	---
02	---	---	---
03	---	---	---
04	---	---	---
05	---	---	---
06	---	---	---
07	RW	HSJ1-7	B6
08	RB	HSJ1-8	B6
09	BY	HSJ1-9	B6
10	W	HSJ1-10	B6
11	YG	HSJ1-11	B6
12	WG	HSJ1-12	B6
13	WR	HSJ1-13	B6
14	GL	HSJ1-14	B6
15	WB	HSJ1-15	C6
16	GW	HSJ1-16	C6
17	LR	HSJ1-17	C6
18	LG	HSJ1-18	C6
19	---	---	---
20	Y	HSJ1-20	C6

CNJ81			
POS	CKT	DESTINATION	ZONE
01	---	---	---
02	---	---	---
03	---	---	---
04	---	---	---
05	---	---	---
06	---	---	---
07	RW	HSJ1-27	C6
08	---	---	---
09	---	---	---
10	---	---	---
11	---	---	---
12	---	---	---
13	---	---	---
14	---	---	---
15	---	---	---
16	RB	HSJ1-36	C6

HSJ1				
POS	CKT	DESTINATION	ZONE	LABEL #2
07	RW	CNJ82-7	B2	CNJ82-7
08	RB	CNJ82-8	B2	CNJ82-8
09	BY	CNJ82-9	B2	CNJ82-9
10	W	CNJ82-10	B2	CNJ82-10
11	YG	CNJ82-11	B2	CNJ82-11
12	WG	CNJ82-12	B2	CNJ82-12
13	WR	CNJ82-13	B2	CNJ82-13
14	GL	CNJ82-14	B2	CNJ82-14
15	WB	CNJ82-15	B2	CNJ82-15
16	GW	CNJ82-16	B2	CNJ82-16
17	LR	CNJ82-17	B2	CNJ82-17
18	LG	CNJ82-18	B2	CNJ82-18
20	Y	CNJ82-20	B2	CNJ82-20
27	RW	CNJ81-07	B4	CNJ81-7
36	RB	CNJ81-16	B4	CNJ81-16



ITEM	LOC	QTY	PART NO.	DESCRIPTION
1	F6	2	VH8017	CABLE TIE
2	D3	13900mm	LW24167	WIRE, S.C. #20, ETFE
3	C4	1	7821916340	CONNECTOR, 20 POSITION 040
4	C4	16	7821916010	TERMINAL, SOC. 040
5	D4	1	7821916380	CONNECTOR, 16 POSITION 040
6	E8	1	DB01780762	CONDUIT, 7 X 620 mm PLASTIC (SPLIT)

METRIC TO ENGLISH CONVERSION

2	D3	548"	LW24167	WIRE, S.C. #20, ETFE

FROM ZONE	COMP	CIRCUIT	TO COMP	WIRE ZONE	WIRE LENGTH	SIZE
B2	CNJ82-7	RW	HSJ1-7	B6	1000.0	#20
B2	CNJ82-8	RB	HSJ1-8	B6	990.0	#20
B2	CNJ82-9	BY	HSJ1-9	B6	980.0	#20
B2	CNJ82-10	W	HSJ1-10	B6	970.0	#20
B2	CNJ82-11	YG	HSJ1-11	B6	960.0	#20
B2	CNJ82-12	WG	HSJ1-12	B6	950.0	#20
B2	CNJ82-13	WR	HSJ1-13	B6	940.0	#20
B2	CNJ82-14	GL	HSJ1-14	C6	930.0	#20
B2	CNJ82-15	WB	HSJ1-15	C6	920.0	#20
B2	CNJ82-16	GW	HSJ1-16	C6	910.0	#20
B2	CNJ82-17	LR	HSJ1-17	C6	900.0	#20
B2	CNJ82-18	LG	HSJ1-18	C6	890.0	#20
B2	CNJ82-20	Y	HSJ1-20	C6	880.0	#20
B4	CNJ81-7	RW	HSJ1-27	C6	845.0	#20
B4	CNJ81-16	RB	HSJ1-36	C6	835.0	#20

NOTE:

1. WIRE TOLERANCE: 25.0 TO 125.0 ± 6.0
   125.0 & UP ± 12.0
2. ALL WIRES ARE SINGLE #20, UNLESS OTHERWISE SPECIFIED.
3. CABLE TIES SHOULD BE INSTALLED ON THE HARNESS WHERE INDICATED. DO NOT INSTALL ANY CABLE TIES UNDER THE LOOM.
4. ALL DIMENSIONS ARE FINISHED DIMENSIONS FROM O.D. OF HARNESS.
5. INSTALL COMPONENT MARKERS IN THE GENERAL AREA AS WHERE INDICATED.
6. INSULATION STRIP BACK DIMENSION: MIN. - MAX.
   TERMINAL 4 8.0 4.0
   HSJ1 (NO TERMINAL) 5.0 6.0
7. ATTACH THE LABEL#2 TO THE WIRE BUNDLE APPROX. 80 mm FROM THE END OF THE WIRE AND NEXT TO THE CIRCUIT ID LABEL. THE LABEL #2 ID'S ARE LISTED IN THE HSJ1 PINOUT CHART.

COMPONENT I.D.	DESCRIPTION
CNJ81	CONTROLLER CONNECTOR #JS1
CNJ82	CONTROLLER CONNECTOR #JS2
HSJ1	HARNESS SPLICING JOINTS #1

VLPS0074