

CS 140RC

Joystick Controller Configuration and Set-up Manual



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This manual is intended to help you understand the features of the CS-140 and the methods of operation. Additional documentation is provided for your specific unit.

Please view attached OSD (order specific documentation) for the following items:

- Face layout
- Valve layout cable(s)
- Connection layout
- Lighting output cable(s)
- Modes of operation diagram

1 Installation Recommendations

1.1 Step 1

Unpack all the supplied parts and check the packing list for completeness.

1.2 Step 2

Untie and layout all the cables supplied, to ensure proper lengths.

Note: Electromagnetic Devices such as relays, magnetic switches and solenoids, can generate large negative voltage spikes. These large spikes are conducted into the vehicle's electrical system and may adversely affect all electronic devices including engine computers. It is strongly recommended that these electromagnetic devices be electrically suppressed. See warnings and instructions in Body Builder manuals.

1. Connect the Controller 12V power supply and the ground wire using a dedicated circuit only. (Connect to the disconnect switch, if available. Otherwise, connect directly to the battery.)
2. Connect 12V power and ground for all peripheral equipment such as GPS, Material Detection etc., to the same dedicated circuit only.
3. Ensure wiring for transmission devices such as radios, etc. are not attached to the controller or bundled with the controller wiring.
4. Make sure all mounting posts are properly grounded; a direct ground wire to the negative battery post is recommended. Floor mats and undercoating will interfere with proper grounding.
5. Disconnect the battery terminals before welding on a vehicle with electronic equipment.
6. Disconnect the negative battery terminal when wiring electronic devices.
7. Mount the consoles so that they do not interfere with vehicle controls or obstruct visibility.
8. Route cables so that they will not be abused or damaged.
9. When routing cables through metal opening, always use grommets to prevent cable damage.
10. When running wires around a dump box pivot point, ensure no connectors can be separated when the hoist is activated.
11. Tie wrap cables clear of all moving parts like drive-axles or conveyor chains.
12. Observe the cable labeling (under the clear cover) for the proper termination of inputs and outputs.
13. Consult the vehicle manufacturer for Ground Speed connections; improper connections will void all vehicle warranties.

14. Use dielectric grease on all external cable connections and pins to ensure proper corrosion protection.
15. Thoroughly clean all power and ground terminals before connecting power harness.
16. Stand clear of any hydraulic functions when first powering up the system.
17. DO NOT drill holes in any of the enclosures.
18. DO NOT attempt to mount components onto the sides, top or front of the CS-140.
19. DO NOT attempt to re-wire any of the consoles.
20. The cylindrical post on which the CS-140 armrest rests is the only point that may be used for mounting purposes as no circuitry or wiring is present inside it.
21. It is recommended that you connect the CS-140 armrest post to battery ground with a large gauge wire. This ensures a common ground between the armrest enclosure and power distribution box enclosure.

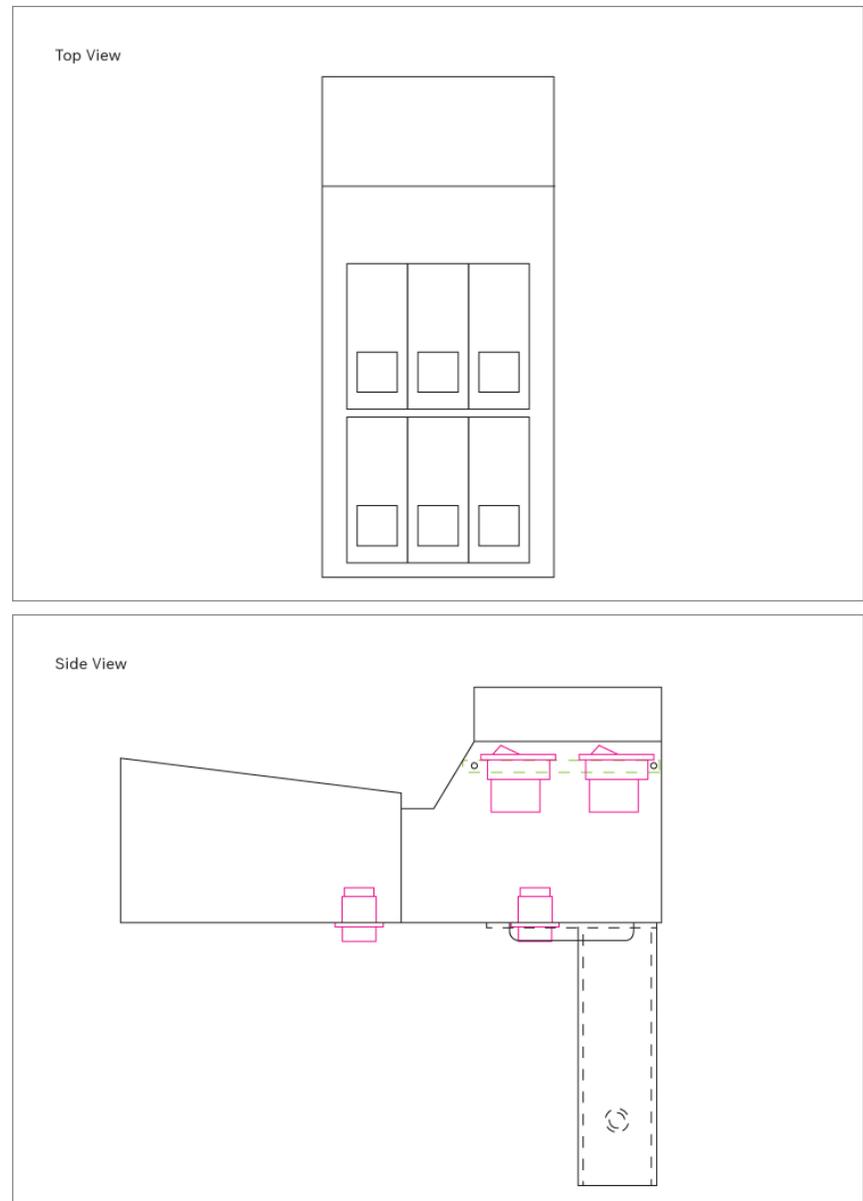
Failure to follow the recommendations will void your warranty.

2 CS-140 Module Descriptions

2.1 Armrest Module

The Armrest module in the closed cover position allows the driver to steady his arm while manipulating the joystick; for Plow, Wing and Dump box functions, for example.

The module also houses 6 lighting function switches for activating various lights required in the spreading or plowing mode such as Blue, Amber and running lights. A power distribution unit is also required for the lighting circuit to prevent overloading of the electrical system.

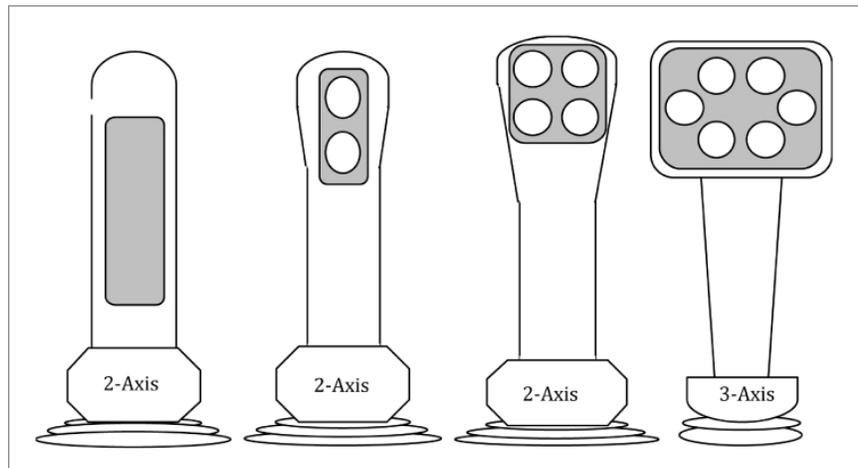


2.2 Joystick Module

The Joystick Module contains the joystick, the Min/Max nulling buttons and 3 function switches for lighting or On/Off hydraulic functions.

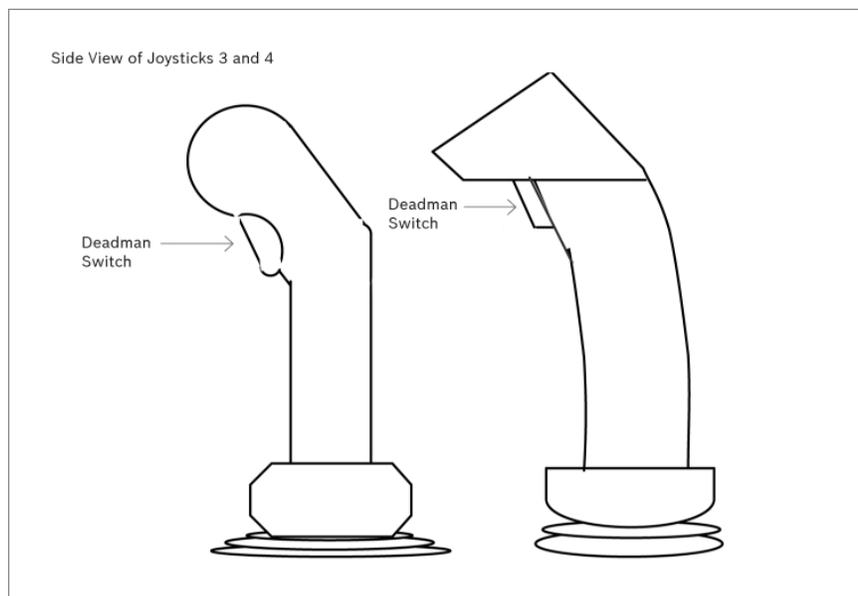
Joysticks options include (depicted from left to right):

1. A 2-Axis version with only a Deadman switch;
2. A 2-Axis, 2 Hatswitch version with a Deadman switch;
3. A 2-Axis, 4 Hatswitch version with a Deadman switch; and
4. A Tall “3 Axis/6 Hatswitch” version with a Deadman switch.



2.2.1 Deadman Switch

All Joysticks are equipped with a “Deadman” switch which must be “triggered and held” in order for the joystick to function. This prevents the accidental activation of the hydraulic functions.



2.2.2 Programming Key

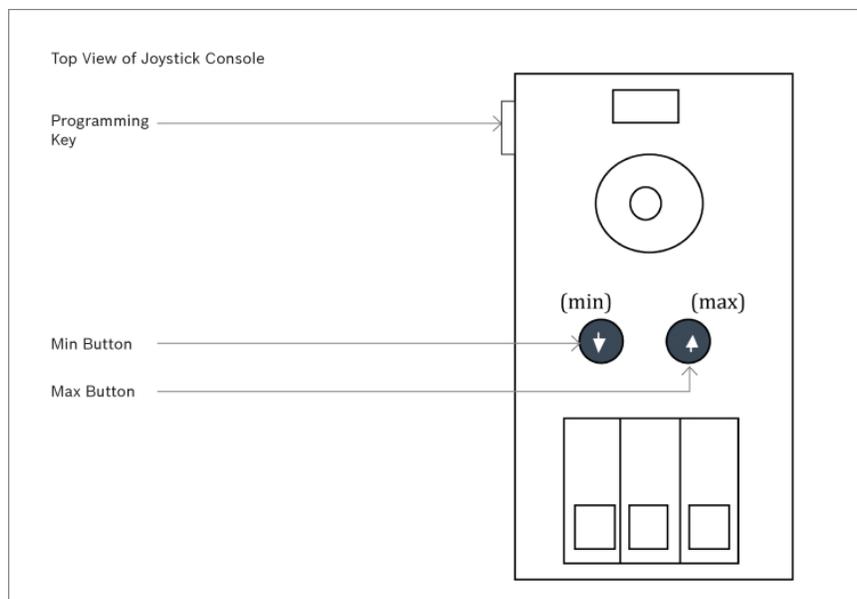
The programming key slot is located at the left of the Joystick module.

Turning the programming key allows you to go into programming mode where you can perform the 'Nulling' procedure, change the emergency raise outputs or a system reset.

2.2.3 Min/Max Buttons

Used for the joystick 'Nulling' procedure. These are activated using a programming key.

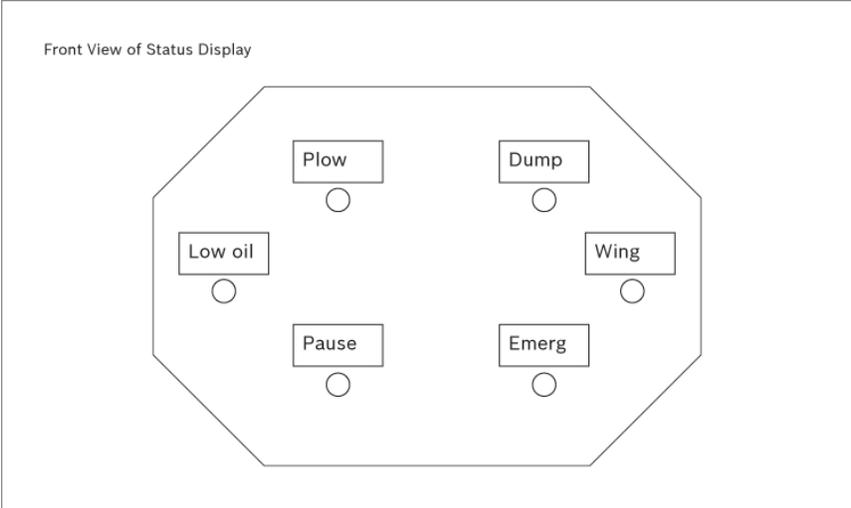
(Nulling instructions provided on page 12.)



2.3 Remote Status Display

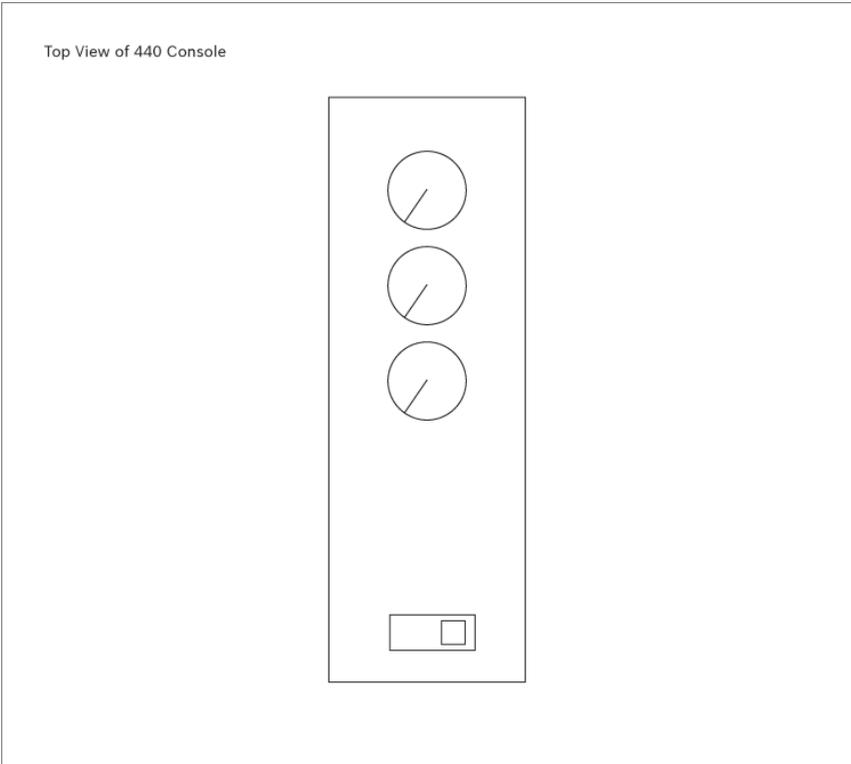
The Remote Status Display Module allows the driver to monitor the status of the various functions. This display can be remote mounted at a convenient location in the driver's line of vision.

The text on top of each LED is chosen by the customer.



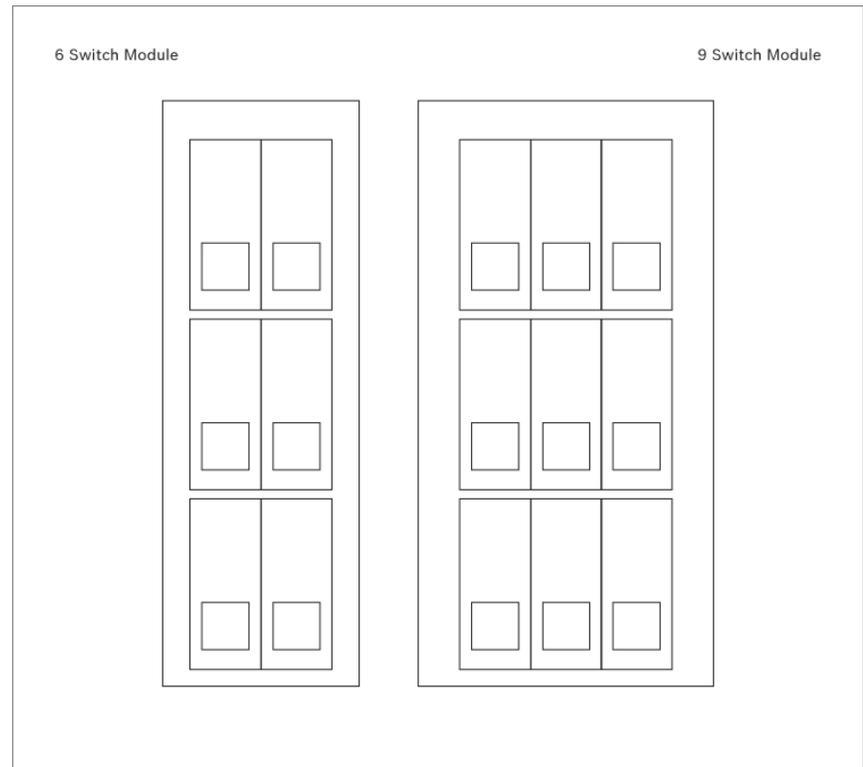
2.4 440 Spreader Controller Module

The CS-440 system consists of the Spreader Controller mounted alongside the Joystick module and the remotely mounted CS-440 Controller and auxiliary components. (See CS-440 Configuration and Set-up Manual.)



2.5 Function Switches Module

Two versions of this module are available: a 6 switch or a 9 switch module. These can be used for various truck functions, pulling all switch functions into one readily available console.



2.6 Power Distribution Box

The power distribution box contains 3 items:

1. The RC controller, which is the “brains” of your 140RC.
2. The Multiplexer board, which is responsible of allocating outputs to the function you want to control at any moment.
3. The Power Distribution board, which provides outputs for lighting functions and On/Off hydraulic functions.
 - 16 channels
 - 10A self-resettable fuse per channel
 - LED indication
 - Suppression diodes
 - 100A MAX board output



3 Commissioning the CS-140

Each module of the CS-140 has its own unique commission procedure.

3.1 Armrest Module

As these switches are concealed during normal operation, the lights to be operated by these switches are the lights the driver would need each time the truck is used for spreading and/or plowing. As the lighting functions are all operated via the power distribution unit, each light function should be tested individually.

3.2 Proportional Joysticks

The minimum and maximum outputs should be set during the 'nulling' process. The 'nulling' procedure is explained on the next page.

3.3 Power Float Function

The designated switch turns ON the Power Float function. The Power Float function will be active until you turn the switch off. If you raise the plow and return the joystick to the neutral position the plow will drop to the position set when the power float is on. This may be a rapid descent so care must be taken when the power float is active and you are making plow height adjustments. There is also an optional proximity switch that can be added to the circuit to automatically shut off the power float function when the plow is raised above a predetermined set point. For calibration of the Power-Float System, see the CS Power-Float Manifold Installation Manual.

3.4 Remote Pause

The designated switch turns ON the Pause function, to deactivate the Pause function press the designated switch again. For all other Pause function settings see the controller Configuration Manual.

3.5 Low Oil Override

To turn on the low oil override function press and hold the designated switch for the Low Oil Override function. Once the switch is depressed this function is deactivated.

3.6 440 Spreader Controller Module

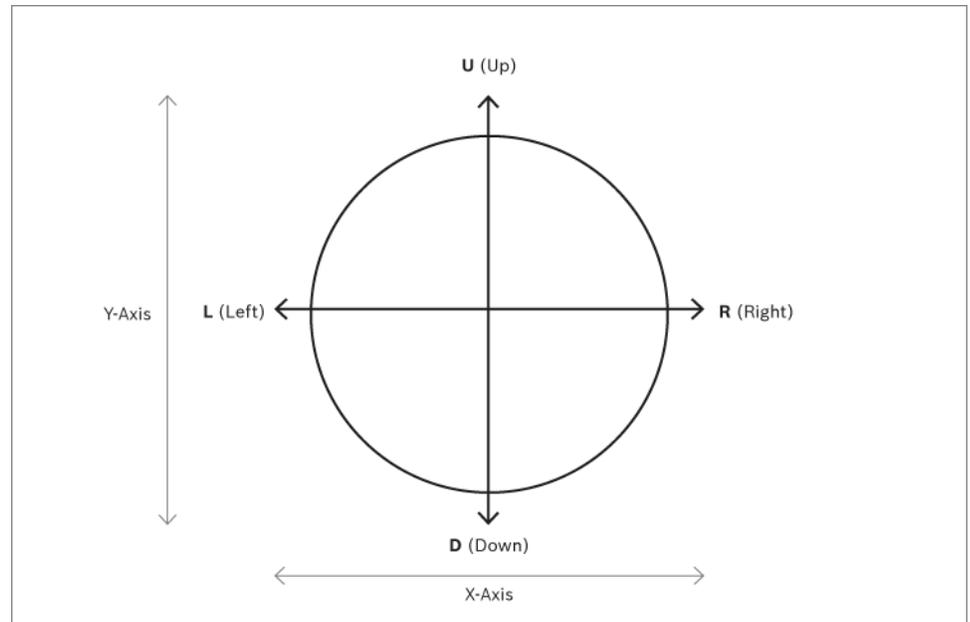
See the CS-440 Set-up Manual for the Configuration, Setup, Ground speed calibration and Material calibration procedures of the 440.

3.7 Function Switches Module

As the lighting functions are all operated via the power distribution unit, each light function should be tested individually.

4 Nulling of the Joystick Outputs

The Joystick movements are along an UP/DOWN Axis known as the “Y-Axis”, along a LEFT/RIGHT Axis known as “X-Axis” and along a twist LEFT/RIGHT axis known as the “Z-Axis”:



Each Axis has 2 functions attached to it, thus the Y-Axis could be assigned the Plow Up/Down function as shown above and the X-Axis could be assigned the Plow Right/Left function as shown above. Let us assume the Z-Axis on this mode is not used.

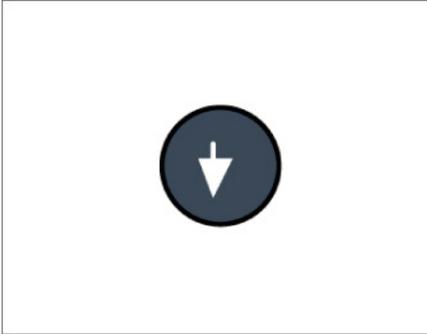
Mode switching is done using the Joystick Head switches or non-detent switches in the module. These switches have to be pressed once to activate the alternate function.

All of the proportional joystick outputs need to be nulled and the sequence needs to be completed for each of the joystick functions. Both the minimum and the maximum output must be set for each of the Joystick functions.

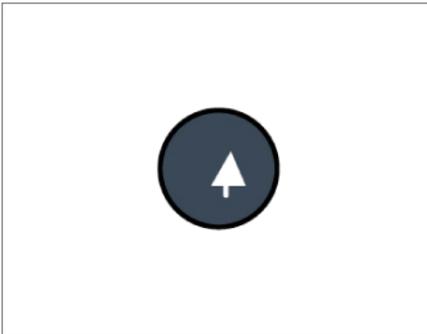
4.1 Minimum Nulling

Minimum Nulling is the process of eliminating Joystick movement required to overcome friction in the system to be activated as well as load the hydraulic cylinder to the point resulting in hydraulic cylinder movement.

NOTE: ALL OF THE FUNCTIONS LISTED BELOW MAY NOT BE CONFIGURED IN YOUR CS -140 DESIGN. NULL ONLY CONFIGURED APPLICATIONS.



1. Start the truck engine and operate the engine at 1500 RPM to ensure sufficient hydraulic oil flow.
2. Power up the controller.
3. Insert the programming key and turn clockwise $\frac{1}{4}$ turn.
4. Move the joystick in the direction of the function to be nulled.
5. When the desired minimum action of the function is observed, press the Min Key (arrow pointing towards switches). The output setting will be locked in.



4.2 Maximum Nulling

Maximum Nulling is the process of setting the Joystick output to obtain the maximum desired speed of the hydraulic cylinder action.

6. Continue to slowly move the Joystick and observe the hydraulic cylinder extension speed.
7. When the desired maximum action of the function is observed, hold the Joystick at that position and press the Max Key (arrow pointing away from switches). The output setting and corresponding cylinder speed will be locked in.

The process of nulling results in smooth, instantaneous response from the Joystick without delays caused by “dead” movement.

4.3 Nulling All Other Joystick Functions

8. Activate each of the other Joystick functions by pressing the switch for the mode you want to set and continue the nulling process for each function. As the Joystick for each function is moved the system will determine which function you are nulling.
9. Complete the minimum and maximum sequence for each function by repeating steps 4, 5, 6 and 7 above.

4.4 Clearing the Outputs (System Reset)

To clear or reset the null settings back to the default settings.

1. Insert the programming key and turn clockwise $\frac{1}{4}$ turn.
2. Press both MIN and MAX buttons at the same time and hold for 2 – 3 seconds.

5 Emergency Raise Set-up

This Emergency feature is pre-programmed for the user.

To change the configuration, perform the following steps:

1. Switch into desired mode.
2. Insert the key and turn to go into programming mode.

The emergency function can produce 2 simultaneous outputs.

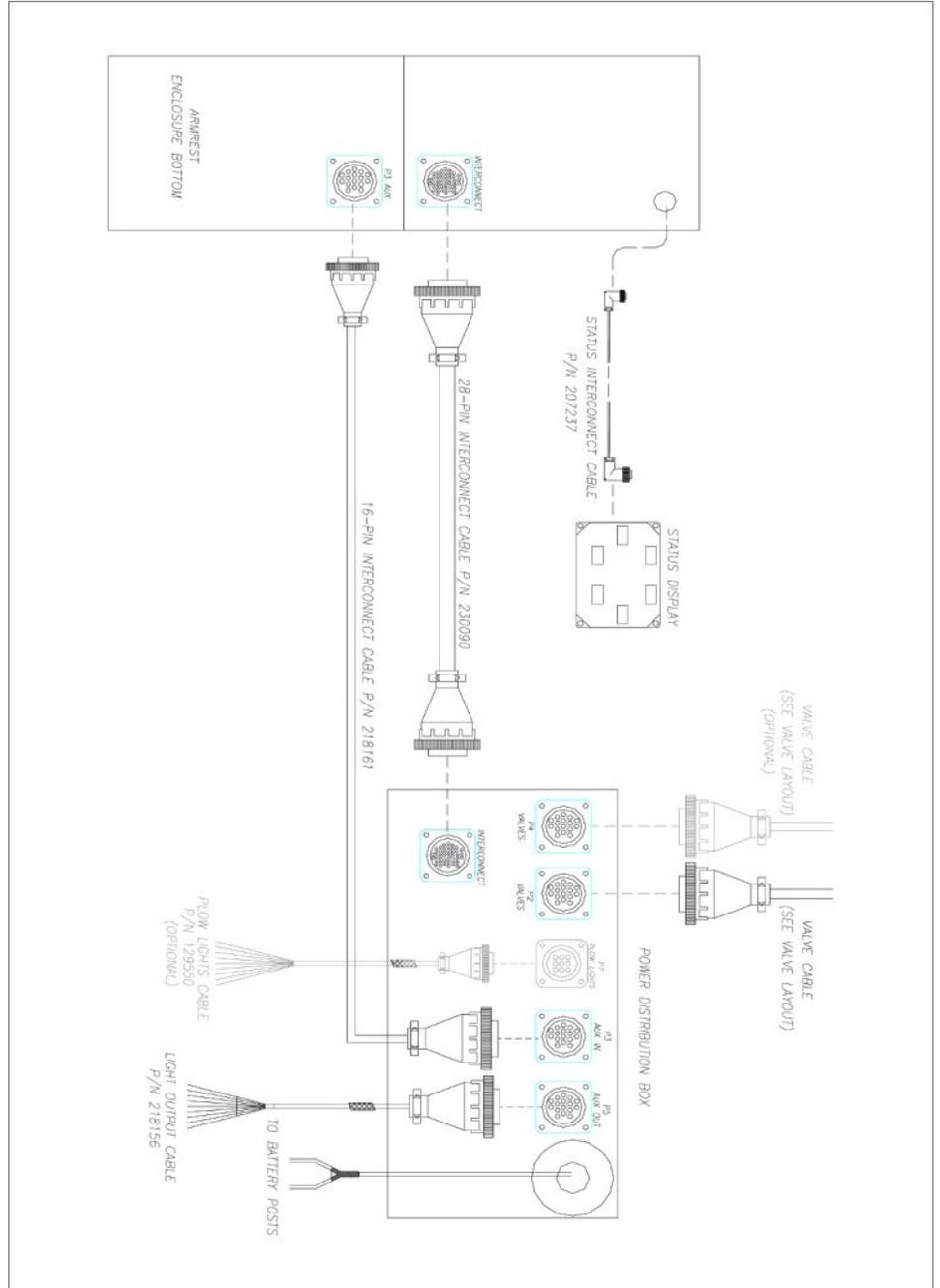
To set the first emergency output:

3. Move the joystick in the desired direction and press the emergency button.
4. Turn the key back to normal position to save your changes.

To set the second emergency output:

5. Turn the key to go into programming mode again.
6. Move the joystick in the second desired direction and press the emergency button.
7. Turn the key back to normal position to save your changes.

6 Typical Connection Diagram



Notes: