



# **eqss™ Gen-3 LMS**

## **Telehandler Load Management System**

### **Installation Manual for JCB 540-200**

**Failure To Follow Installation Manual Will Void Warranty**

## Documentation Conventions

The list below highlights important documentation conventions.



Text presented in this manner is intended to provide the user with some general information. The user should ensure information presented in this manner is clearly understood.



Text presented in this manner provides the user with information to assist in completion of the current procedure being explained.



Text presented in this manner indicates that a failure to follow directions could result in damage to equipment, loss of information, bodily harm, or loss of life.

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# Tools Required for Installation



The tools required to perform the installation of the TSS are listed below

- Pencil or Texta
- Drill
- Drill bits
  - 3.3 mm
  - 4.5 mm
  - 5 mm
  - 6.25 mm
  - 6.8 mm
  - 8.5 mm
- Centre punch
- Tap T-Handle
- Taps
  - M6
  - M7 x 0.75
  - M8
- Drill and tap oil
- Metric Allen keys
- Phillips Head screw driver
- Spanners and sockets
  - 7 mm
  - 10 mm
  - 13 mm
- Loctite thread locker
- Side cutters
- Stanley knife
- Crimpers
- Wire strippers

# Covers

Remove the following covers before starting the installation



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	Remove the bar in front of the fuse panel	
2.	Remove the fuse/relay panel cover inside the cabin	
3.	Release the dashboard display bolts	

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
4.	Remove the indicator display behind the steering wheel	
5.	Remove the outer cover beside the cabin	


*Table 3: Cover removal*

# Cable Reeler Installation

The cable reeler is used to measure the boom extension to determine the maximum lifting capacity.

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Drill and tap holes for the cable reeler according to the mounting diagram on page 10.</p> <p>Mount using the supplied bolts.</p>	
2.	<p>Drill and tap an M8 hole for the cable anchor. Ensure the cable anchor is positioned so the cable runs in line with the boom</p> <p>Mount the cable anchor and attach the cable with the supplied M8 washer and the M8 nylock nut.</p> <p>Drill and tap the M6 holes for the stow switch trigger. Ensure the stow switch arm is pressed/switched when the boom is retracted.</p> <p>Mount the stow switch trigger using the supplied M6 bolts.</p>	



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
3.	<p>Connect the supplied M12 10 metre cable (CB001027) into the cable reeler connection.</p> <p>Cable tie to the hydraulic pipes running underneath the boom then onto the flexible hydraulic hoses down to the chassis. Make sure the cable isn't pinched or stretched when the boom is raised or lowered.</p>	

*Table 4: Cable Reeler Installation*

# Cable Reeler Mounting Position

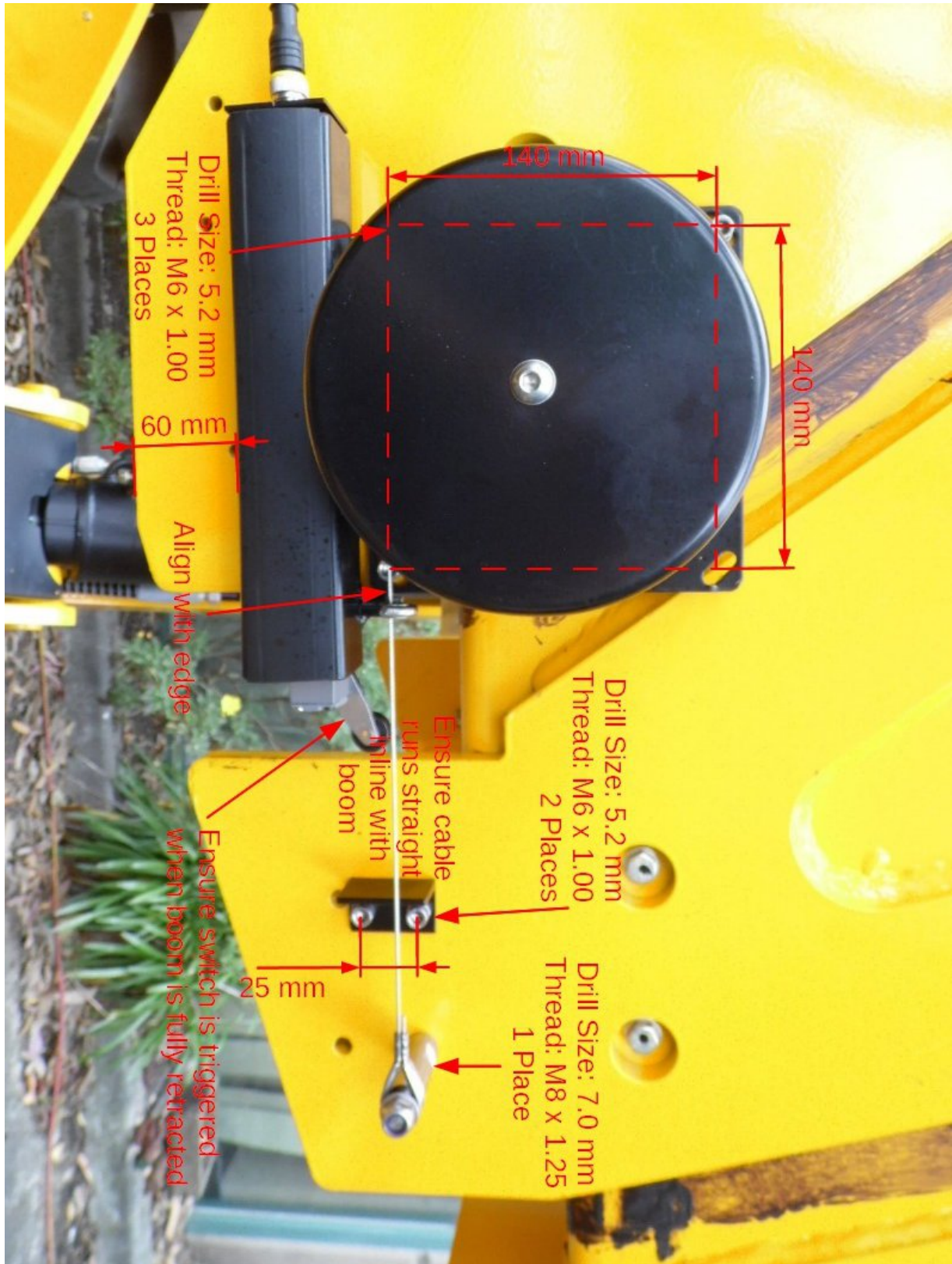
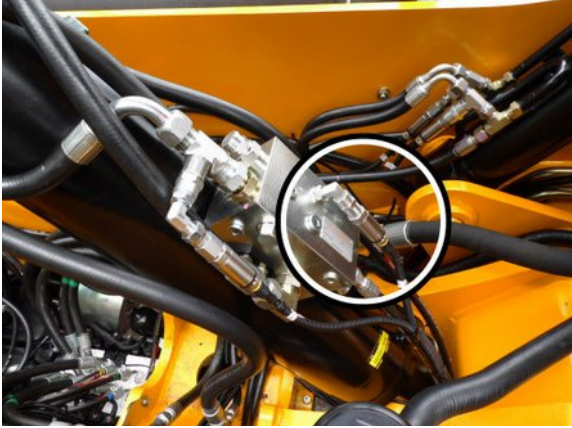




Illustration 1: Cable Reeler Mounting Position

# Pressure Sensor Installation

The hydraulic pressure sensors are used to measure the lifting load of the telehandler.

## Main Cylinder Pressure Sensors

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Raise the boom to approximately 40 degrees.</p> <p>Support and secure the boom using an A Frame or similar apparatus. <b>It must support at least 2 tons.</b></p> <p>Apply the handbrake and insert chock under wheels.</p> <p>Release the blanking cap on the hydraulic port labelled M1.</p> <p><b>Removing the blanking cap will release the hydraulic pressure which may result in a spray of oil.</b></p> <p>Install the supplied pressure sensor and ensure it is tightly sealed.</p>	
2.	<p>Install the tee connector and pressure sensor into the rod of the main lift cylinder, where the flexible hose is connected into the counterbalance valve attached to the lift cylinder.</p> <p><b>Start the machine, pressurise the boom and check for leaks.</b></p>	

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
3.	<p>Connect the supplied M12 4 metre cables (CB001026) into each of the pressure sensors.</p> <p>Cable tie the head pressure sensor cable to the flexible hydraulic hoses connected to the main lift cylinder. Make sure the cable isn't pinched or stretched when the boom is raised or lowered.</p> <p>Run the cables towards the cabin and cable tie with the other cables during External Cable Completion on page 21.</p>	

*Table 5: Pressure Sensor Installation*

# Compensation Pressure Sensors




<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Undo the hydraulic connection for the head compensation into the flexible hydraulic line on the left compensation cylinder.</p> <p>Install the supplied tee piece and pressure sensor in line with the hydraulic connection.</p>	 <p>View from under the boom</p>
2.	<p>Undo the hydraulic connection for the rod compensation into the flexible hydraulic line on the right compensation cylinder.</p> <p>Install the supplied tee piece and pressure sensor in line with the hydraulic connection.</p> <p><b>Start the machine, pressurise the boom and check for leaks.</b></p>	 <p>View from under the boom</p>
3.	<p>Connect the supplied M12 4 metre cables (CB001026) into each of the pressure sensors.</p> <p>Run the cables towards the cabin and cable tie with the other cables during External Cable Completion on page 21.</p>	 <p>View from under lift cylinder</p>

Table 6: Compensation Pressure Sensor Installation

# Reverse Camera

The rear camera video is displayed on the screen when the machine is in reverse gear to allow the operator to see behind the telehandler while reversing.



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Drill a 31mm hole in the location shown. Making sure to leave enough room for a license plate</p> <p>Insert the camera through the hole and adjust the angle using the alignment washers.</p> <p>Connect the camera power and signal connectors to the supplied 5m camera cable (CB001032).</p> <p>Note; The white connector is not used.</p> <p>Secure the camera cable to the license plate light cables</p> <p>Run the remainder of the cable towards the cabin and cable tie with the other cables during External Cable Completion on page 21.</p>	

Table 7: Reverse Camera Installation



The camera's viewing angle may need to be adjusted once the system is installed and the display is operational.

# Forward Camera

The forward camera video is displayed on the screen when the machine is in forward gear to allow the operator to see past the boom to obstructions that would damage the right front tyre.




<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	Mount the camera to the side mirror using the p-clips in the location shown.	
2.	<p>Secure using two M6 nuts.</p> <p>Connect the camera power and signal connectors to the supplied 5m camera cable (CB001032).</p> <p>Note; The white connector is not used.</p> <p>Run the cable along the same path as the headlight cable, run it through the headlight post, then under the chassis to the side of the cabin.</p> <p>Cable tie with the light tower cable during External Cable Completion on page 21.</p>	

Table 8: Forward Camera Installation



The camera's viewing angle may need to be adjusted once the system is installed and the display is operational.

# Light Tower Installation

The light tower warns other workers when the telehandler is lifting loads close to it's maximum capacity.


<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Drill and tap two diagonal M6 holes required to mount the light tower bracket to the left of the headlight post as shown.</p> <p>Secure using the supplied M6 bolts and washers.</p>	

Table 9: Light Tower Installation



# Can Pressure Input Module (CPIM)


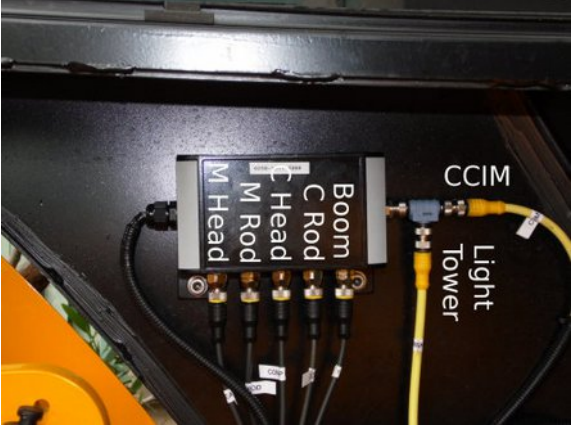
The CPIM is responsible for processing the information sent from the pressure sensors.



Accidentally swapping the pressure sensor connections will not damage system and can be determined if the display is showing a negative load.



Do not plug the pressure sensor cable into the far right side boom cable. This will damage the system.

Step	Description	Diagram
1.	<p>Drill two M8 holes for the CPIM bracket in the side of the cabin.</p> <p>Mount using the supplied M8 bolts and nuts.</p>	 <p>View from underneath boom towards cabin</p>
2.	<p>Connect the cables for the pressure sensors, boom cable and light tower to the CPIM according to the picture shown. Use the provided tee connector for the light tower cable.</p> <p>Connect the supplied M12 4 metre cable (CB001026) into the free tee connection out of the right side of the CPIM for the CCIM cable.</p> <p>Run the CCIM cable towards the hole into the cabin.</p>	



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
3.	<p>Run the height limiter cable from out the left side of the CPIM to the rear of the machine to the hydraulic block.</p> <p>Connect the tee connector labelled Raise from the height limiter cable to the raise pilot connector on the spool control block and the tee connector labelled Extend from the height limiter cable to the extend pilot connector on the spool control block.</p> <p>Place a single cable tie to hold the cable's position then disconnect the tee's from the raise and extend pilot connectors, otherwise the boom will not move.</p> <p>Complete the cable installation during External Cable Completion on page 21.</p>	 <p>View from underneath the boom</p>

Table 10: Can Pressure Input Module (CPIM) Installation



For further details on running the height limiter cable refer to the Installation Index on page

# Cutout Harness

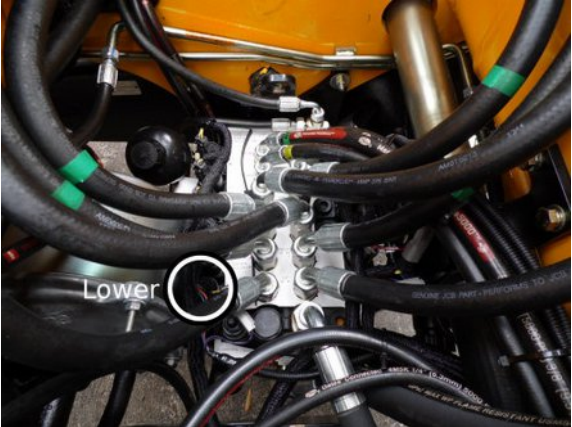
<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Connect the tee connector labelled Lower from the cutout harness to the lower pilot connector on the spool control block.</p> <p>Place a single cable tie to hold the cable's position then disconnect the tee's from lower pilot connector, otherwise the boom will not move.</p> <p>Run the other side of the harness with the 6 pin connector towards the cabin and cable tie with the other cables during External Cable Completion on page 21.</p>	 <p>View from underneath the boom</p>

Table 11: Cutout Harness Installation

# Can Cabin Interface Module (CCIM)

The CCIM connects the system into the machine electronics.



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Connect the CCIM cable from the CPIM to the M12 bulkhead connector on the CCIM.</p> <p>Connect the Power/Camera and IO Harnesses to the bulkhead connectors on the CCIM.</p> <p>Position the CCIM underneath the dashboard using double sided velcro tape.</p> <p>Note: Make sure to leave enough room for the connectors and that the dashboard displays can be reinstalled.</p>	
2.	<p>Install the backup battery behind the indicator display using double sided velcro tape.</p>	

Table 12: CCIM Installation

# External Cable Completion

All external cabling is completed in this step.




<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Locate the reverse camera, cutout, boom and pressure sensor cables at the rear of the machine and cable tie to the existing snake tube and hydraulic lines running towards and underneath the cabin.</p> <p>Coil up any additional cable and store under the side panel beside the cabin.</p>	 <p>View from under the boom towards the rear of the machine</p>
2.	<p>At the front of the machine cable tie the light tower and front camera cables up to the side of the cabin.</p>	
3.	<p>Run the CCIM, cutout and camera cables through the hole into the cabin.</p>	 <p>View from under the boom in the middle of the chassis towards the cabin</p>

Table 13: External Cable Completion

# Dashboard Switches

The user input control and override switch are installed in the dashboard.



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	Remove a blanking switch plate from the dashboard and install the override switch.	
2.	<p>Drill a 34 mm hole into the dashboard.</p> <p>Install the user input control dial in the dashboard, aligned so the Enter cap is facing up.</p>	

Table 14: Dashboard Switches Installation

# Display Installation

The display shows the current safety status of the telehandler.

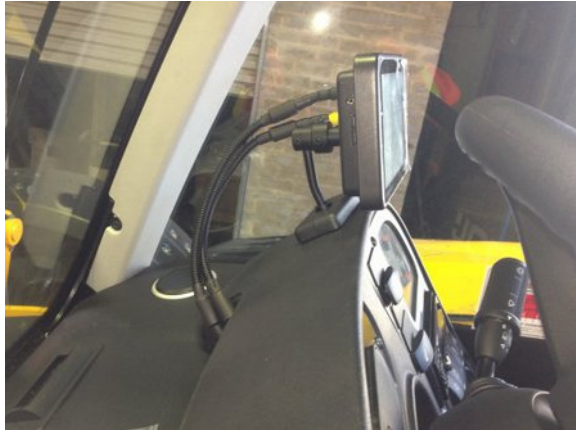


<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Position the display bracket in the top right of the dashboard in the approximate location shown.</p> <p>Drill two 7 mm holes to attach the bracket to the dashboard.</p> <p>Secure the bracket to the dashboard using the supplied large washers and nuts</p> <p>Attach the display to the bracket and tighten the grub screw</p>	
2.	<p>Run the 8 pin cable from the CCIM and the 5 pin cable from the user control dial out between the dashboard and cabin plastic mounts and attach to the connectors in the back of the display.</p>	

Table 15: Display Installation



Adjust the display bracket for optimal viewing angle once the display is powered

# Machine Connections

The following procedures connect the safety systems to the existing electronics in the machine.



Isolate the main battery before starting the machine connections

Step	Description	Diagram						
1.	<p>Splice the following wire colours from the cable with the 2 pin connector into connector J2 behind the dashboard for the stabiliser signals.</p> <table border="1" data-bbox="306 969 710 1093"> <thead> <tr> <th>Wire Colour</th> <th>J2 Pin</th> </tr> </thead> <tbody> <tr> <td>Blue</td> <td>9</td> </tr> <tr> <td>Green</td> <td>12</td> </tr> </tbody> </table>	Wire Colour	J2 Pin	Blue	9	Green	12	
Wire Colour	J2 Pin							
Blue	9							
Green	12							
2.	<p>Splice the following wire colours from the cable with the 4 and 8 pin connector into the connector for the left steering column switch (marked with red tape).</p> <p>Note: Remove the steering wheel height adjustment lever, to move the steering wheel higher, to get better access to the switch connector</p> <table border="1" data-bbox="306 1659 821 1783"> <thead> <tr> <th>Wire Colour</th> <th>Wire Number</th> </tr> </thead> <tbody> <tr> <td>Orange</td> <td>809</td> </tr> <tr> <td>Red</td> <td>808</td> </tr> </tbody> </table>	Wire Colour	Wire Number	Orange	809	Red	808	
Wire Colour	Wire Number							
Orange	809							
Red	808							



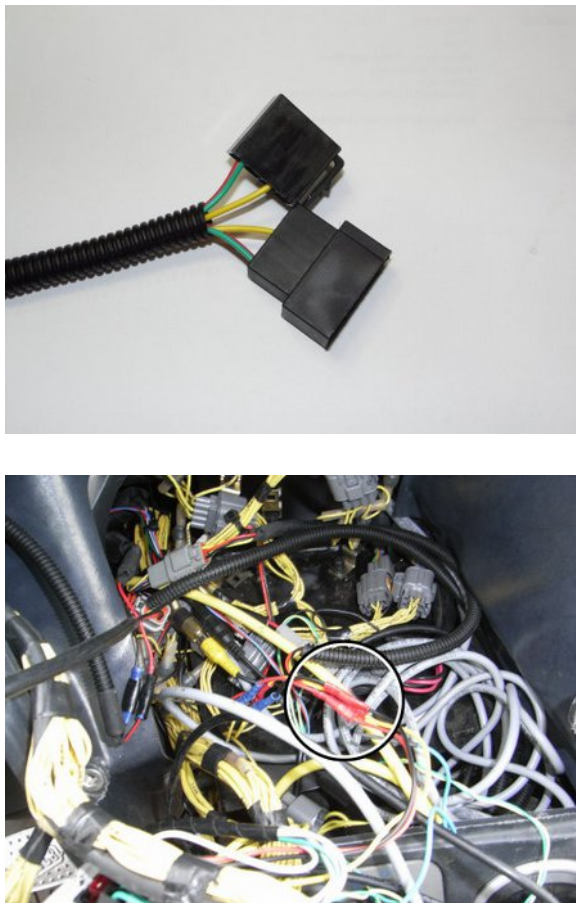
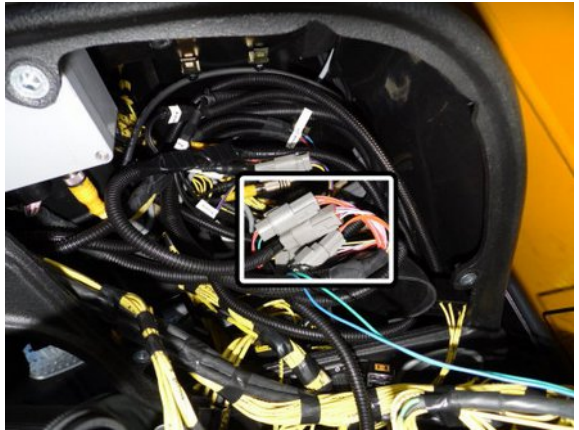
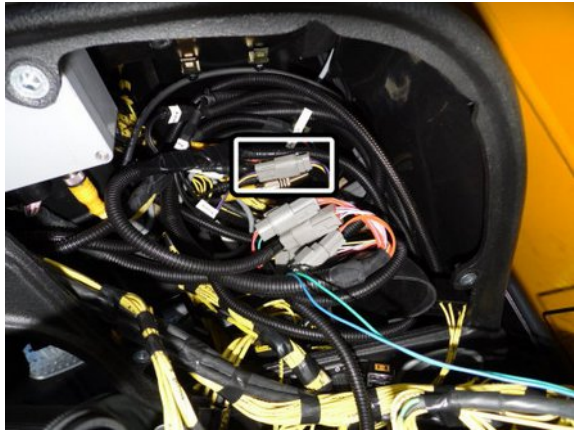
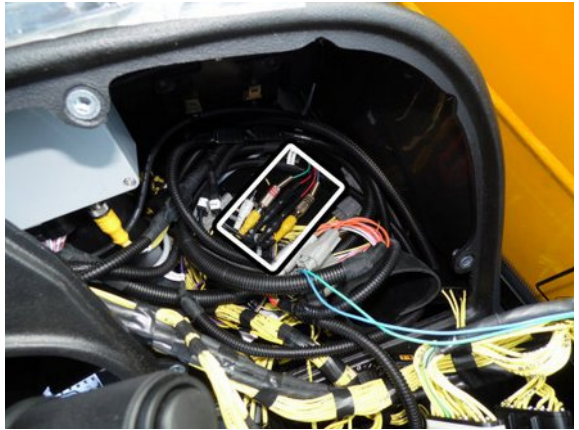

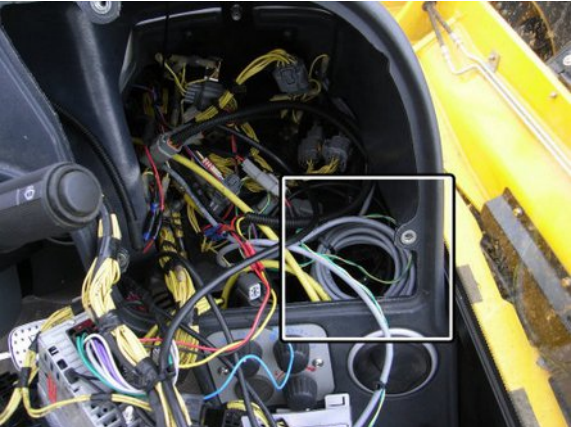
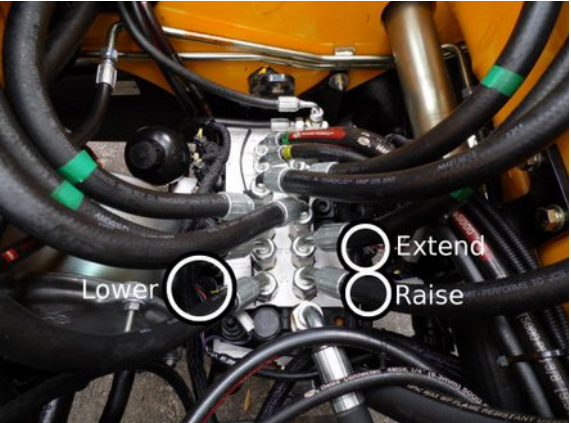

<i>Step</i>	<i>Description</i>	<i>Diagram</i>								
3.	<p>Attach the radio power harness to the radio connector.</p> <p>Note: If the radio connector is not installed in the machine. Cut off the tee connectors from the radio power harness and splice into the 4 pin radio power connector located under the dashboard according to the table below.</p> <table border="1" data-bbox="306 1003 831 1164"> <thead> <tr> <th><u>Wire Colour</u></th> <th><u>Wire Number</u></th> </tr> </thead> <tbody> <tr> <td>Black</td> <td>601AG</td> </tr> <tr> <td>Violet</td> <td>181</td> </tr> <tr> <td>Yellow</td> <td>301F</td> </tr> </tbody> </table>	<u>Wire Colour</u>	<u>Wire Number</u>	Black	601AG	Violet	181	Yellow	301F	
<u>Wire Colour</u>	<u>Wire Number</u>									
Black	601AG									
Violet	181									
Yellow	301F									

Table 16: Machine Connections

# Finalisation

This section will complete the final power connections to power the system and finish any additional items.

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	Connect the 2, 4, 6 and 8 pin connectors into the I/O harness.	
2.	Connect the 3 pin connector into the Power/Camera harness.	
3.	Connect the camera power and signal cables from the front and rear cameras to the Power/Camera harness connectors.  Note: The white connector is not used.	

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
4.	<p>Connect the spade lug on the black wire to the negative (black) battery terminal.</p> <p>Connect the spade lug on the blue wire to the positive (red) battery terminal.</p>	
5.	<p>Coil up the extra cables and store underneath the dashboard cover.</p>	
6.	<p>Reconnect the tee connectors back into the hydraulic block under the boom.</p>	
7.	<p>Reconnect the main battery from the isolation switch.</p> <p>Turn the machine onto first stage /accessories and ensure the system is activated.</p>	




<i>Step</i>	<i>Description</i>	<i>Diagram</i>
8.	<p>Adjust the display bracket for optimal viewing</p> <p>Set the machine into forward gear to activate the forward camera. Adjust the forward camera so the front right wheel is visible.</p> <p>Set the machine into reverse gear to activate the reverse camera. Adjust the reverse camera so the video is level.</p>	
9.	<p>Perform a final check on all the cabling and sensors.</p> <p>Replace all the covers</p>	

Table 17: Finalisation


 Complete the system checklist once installation has been completed.

# Sensor Calibration

Once the installation is complete, the sensors will require calibration.



A sensor calibration must be performed once the cable reeler and CPIM have been mounted. If the cable reeler or CPIM have been moved/repositioned a recalibration must be performed

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Press Enter on the user control dial to enter the menu system.</p> <p>Press the up or down buttons on the user control dial to select System Menu.</p> <p>Press Enter on the user control dial to enter the menu.</p>	<p><b>Main Menu</b></p> <hr/> <p>Attachment Selection Menu</p> <hr/> <p><b>System Menu</b></p> <hr/> <p>Exit Menu</p> <hr/>
2.	Select Advanced Menu	<p><b>System Menu</b></p> <hr/> <p>Volume / Brightness</p> <hr/> <p>Status Menu</p> <hr/> <p>Diagnostics Menu</p> <hr/> <p>System Tests</p> <hr/> <p><b>Advanced Menu</b></p> <hr/> <p>Return to Main Menu</p> <hr/>

<i>Step</i>	<i>Description</i>	<i>Diagram</i>						
3.	Enter the password (Default Password: 2-8-4)	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Enter Password</b></p> <hr/> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center;">Number 1</td> <td style="width: 40%; text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">Number 2</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="text-align: center;">Number 3</td> <td style="text-align: center;">4</td> </tr> </table> <hr/> <p style="text-align: center; background-color: #0000FF; color: white; padding: 2px;"><b>Submit Password</b></p> <hr/> <p style="text-align: center;">Return to System Menu</p> <hr/> </div>	Number 1	2	Number 2	8	Number 3	4
Number 1	2							
Number 2	8							
Number 3	4							
4.	Select Sensor Calibrations	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Advanced Settings</b></p> <hr/> <p style="text-align: center;">Set Time / Date</p> <hr/> <p style="text-align: center; background-color: #0000FF; color: white; padding: 2px;"><b>Sensor Calibrations</b></p> <hr/> <p style="text-align: center;">Change Language</p> <hr/> <p style="text-align: center;">Change Password</p> <hr/> <p style="text-align: center;">Return to System Menu</p> <hr/> </div>						
5.	Select Calibrate Carrier Angle and then follow the instructions on the screen to complete the calibration.  Repeat for Calibrate Boom Angle and Calibrate Boom Length.	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Sensor Calibration Menu</b></p> <hr/> <p style="text-align: center; background-color: #0000FF; color: white; padding: 2px;"><b>Calibrate Carrier Angle</b></p> <hr/> <p style="text-align: center;">Calibrate Boom Angle</p> <hr/> <p style="text-align: center;">Calibrate Boom Length</p> <hr/> <p style="text-align: center;">Return to Advanced Menu</p> <hr/> </div>						

Table 18: Sensor Calibration

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