



eqss™ Gen-3 LMS

Telehandler Load Management System

Installation Manual for JCB 541-70 Waste Master

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

Installation Index

The components and cables of the Gen-3 Telehandler Load Management System are outline in the tables below. The following pages show where the components are installed and the cable routing.

See the appropriate manual section for a detailed installation description for each component.



Refer to this section for any component placement or cable routing issues

<i>Item</i>	<i>Component Description</i>
1	Cable Reeler
2	Main Lift Cylinder Head Pressure Sensor
3	Main Lift Cylinder Rod Pressure Sensor
4	Can Pressure Input Module (CPIM)
5	Forward Camera
6	Light Tower
7	Can Cabin Interface Module (CCIM)
8	Display Module

Table 1: Component Installation Index

<i>Colour</i>	<i>Cable Description</i>
Red	Boom Cable
Dark Green	Main Cylinder Head Pressure Sensor Cable
Brown	Main Cylinder Rod Pressure Sensor Cable
Dark Blue	Compensation Cylinder Pressure Sensors Cables
Light Blue	Forward Camera Cable
Violet	Light Tower Cable
Aqua	Rear Camera Cable
Dark Purple	CCIM Cable
Light Green	Cutout Harness
Dark Yellow	Machine Input Harness
Light Purple	Height Limiter Cable
Orange	Display Cable

Table 2: Cable Installation Index

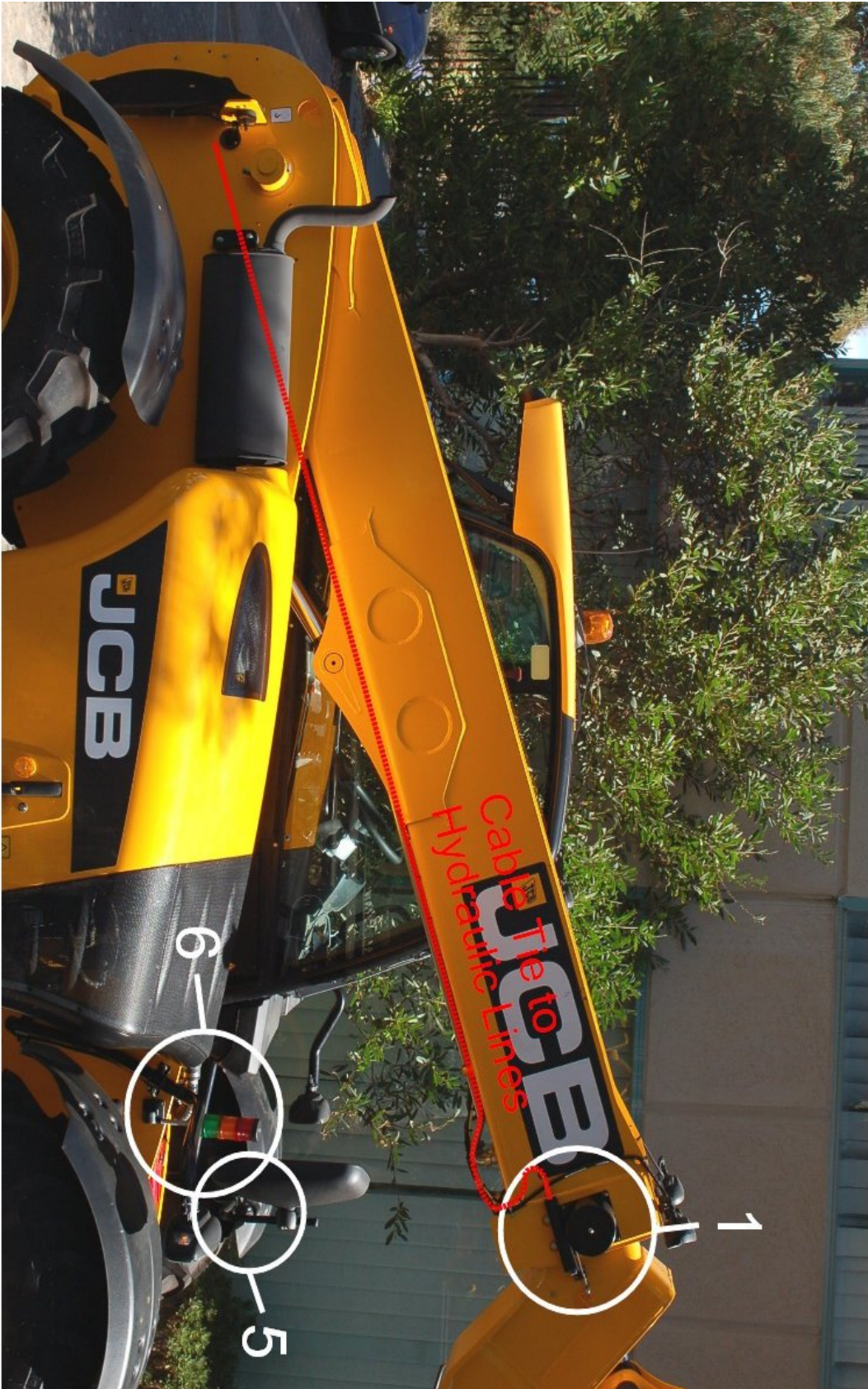


Illustration 1: Machine Boom

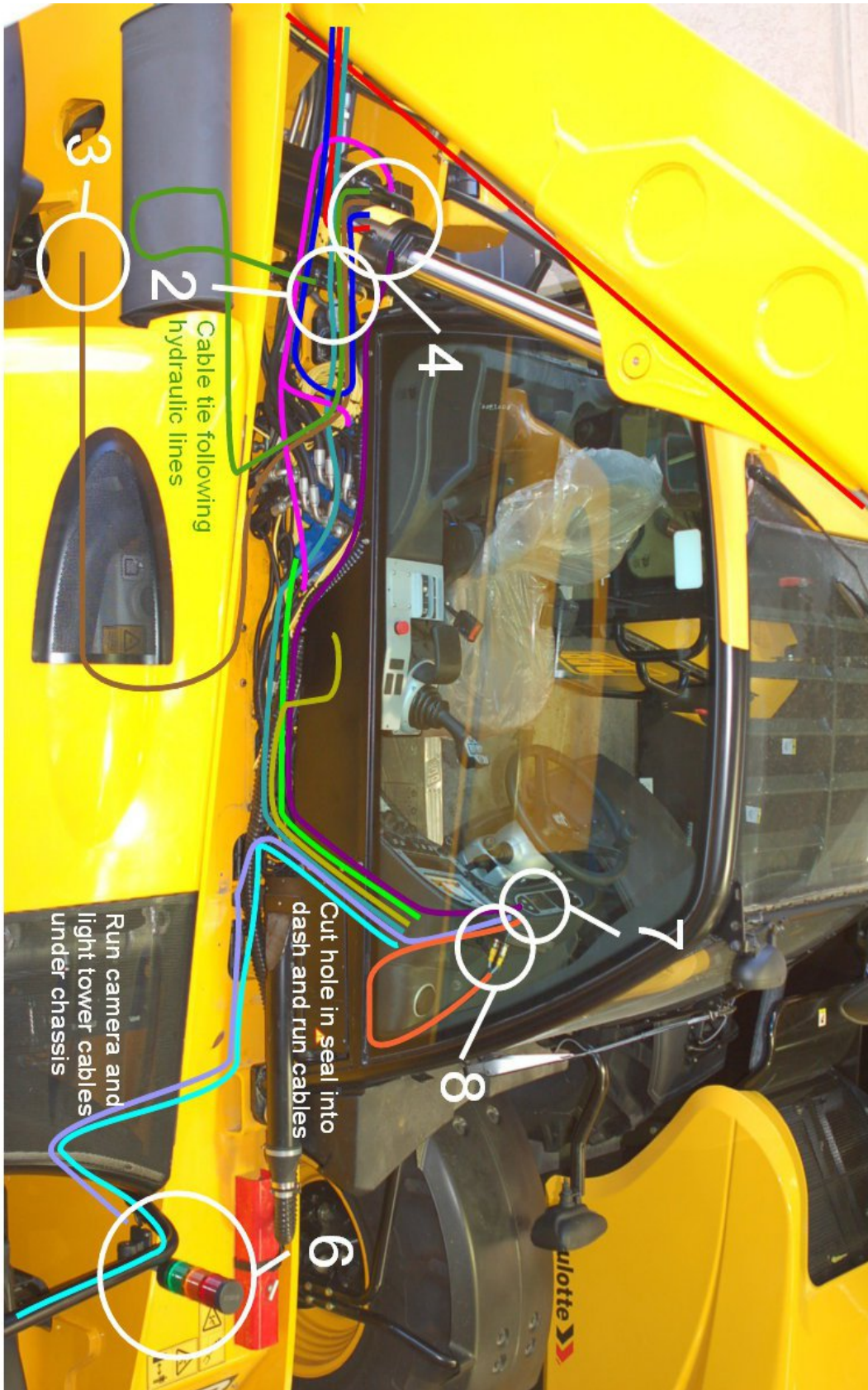





Illustration 2: Machine Chassis

Covers

Remove the following covers before starting the installation

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	Release the dashboard display bolts	
2.	Remove the indicator display behind the steering wheel	
3.	Release the cover beside the joystick	






<i>Step</i>	<i>Description</i>	<i>Diagram</i>
4.	Remove the side panel next to the cabin under the boom.	
5.	Remove the covers under the boom.	

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 the holes for the cable reeler according to the mounting diagram on page 14.</p> <p>Mount using the supplied M6 x 12 mm bolts and washers.</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 secure the cable to the anchor.</p>	
3.	<p>Drill and tap the M6 holes for the stow switch trigger. Ensure the stow switch is pressed when the boom is retracted.</p> <p>Mount the stow switch trigger using the supplied M6 x 30 mm bolts and 17 mm standoffs.</p>	



<i>Step</i>	<i>Description</i>	<i>Diagram</i>
4.	Connect the supplied M12 10 metre cable (CB001027) into the cable reeler connection.	
5.	<p>Run the cable along the hydraulic pipes running down the boom, secure using cable ties every 150 mm to 200 mm.</p> <p>Cable tie to 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> <p>Run the cable towards the cabin and cable tie with the other cables during External Cable Completion on page 27.</p>	

Table 4: Cable Reeler Installation


 For further details on running the boom cable refer to the Installation Index on page 6

Cable Reeler Mounting Position

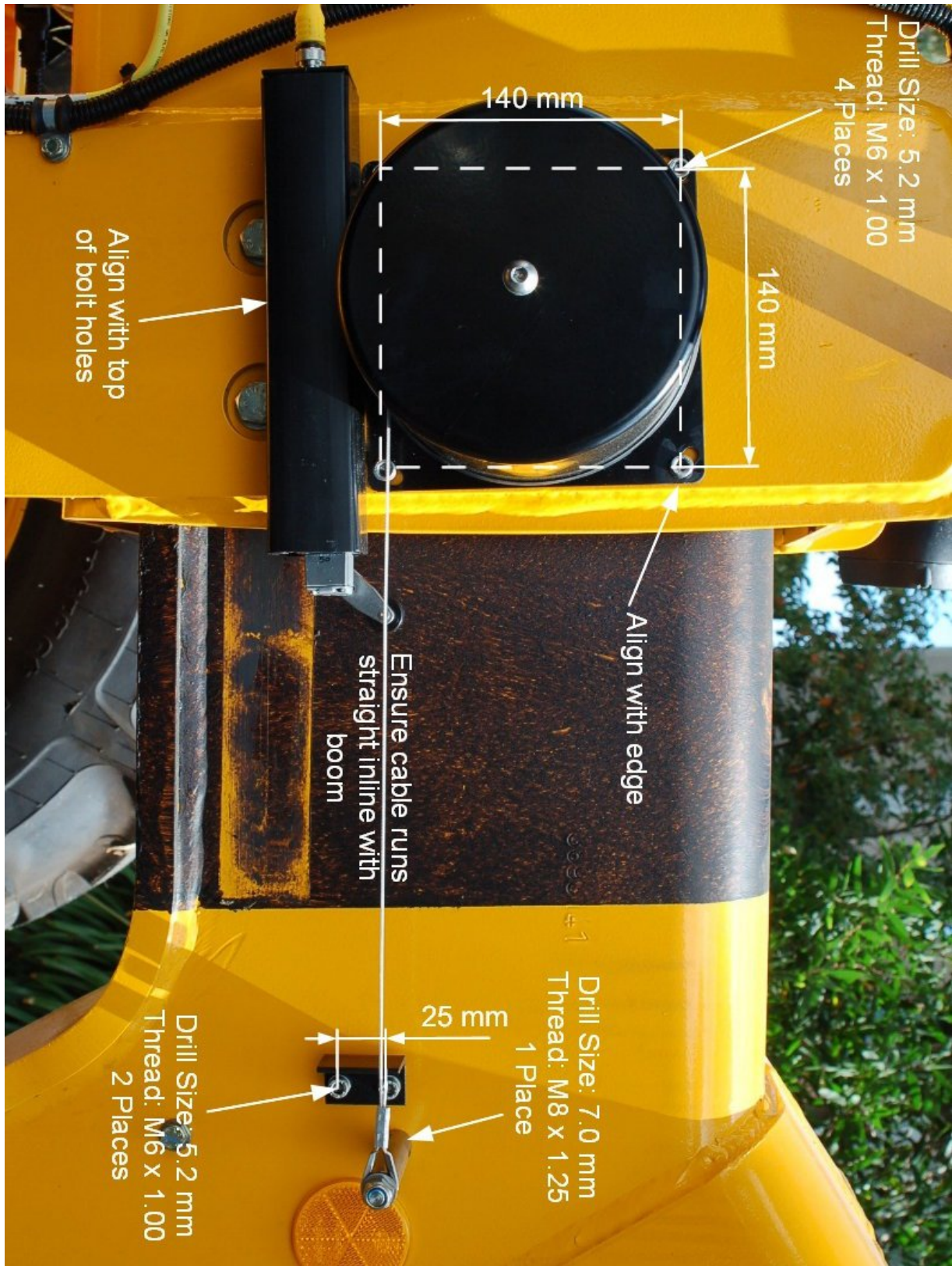




Illustration 3: Cable Reeler Mounting Position

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. It must support at least 2 tons.</p> <p>Apply the handbrake and insert chock under wheels.</p> <p>Release the blanking cap on the hydraulic tee.</p> <p>Removing the blanking cap will release the hydraulic pressure which may result in a spray of oil.</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 to the solid hose on the chassis under the lift cylinder.</p> <p>Start the machine, pressurise the boom and check for leaks.</p>	 <p>View from under the main lift cylinder</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 27.</p>	

Table 5: Pressure Manifold Installation


 For further details on running the pressure sensor cables refer to the Installation Index on page 6

Compensation Pressure Sensors

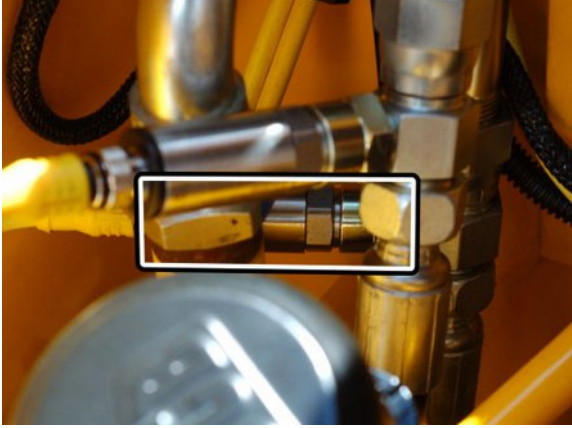


Step	Description	Diagram
1.	<p>Release the cover behind the machine.</p> <p>Undo the hydraulic connection for the head compensation into flexible hydraulic line at the rear of the machine.</p> <p>Install the supplied tee piece and pressure sensor in line with the hydraulic connection.</p>	
2.	<p>Undo the hydraulic connection for the rod compensation into flexible hydraulic line at the rear of the machine.</p> <p>Install the supplied tee piece and pressure sensor in line with the hydraulic connection</p> <p>Start the machine, pressurise the boom and check for leaks.</p>	
3.	<p>Connect the supplied M12 4 metre cables (CB001026) into each of the pressure sensors.</p> <p>Add both cables to 2 m of snake tube.</p> <p>Run the snake tube and cables towards the cabin and cable tie with the other cables during External Cable Completion on page 27.</p>	

Table 6: Compensation Pressure Sensor Installation




Angle the tee connections to ensure the hydraulic connections and pressure sensor do not hit the boom when the boom is lowered



For further details on running the pressure sensor cables refer to the Installation Index on page 6

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.

 Do not disconnect the camera power connection while the system is operating as this can damage the fuse.




Step	Description	Diagram
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>	
2.	<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 27.</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.



For further details on running the camera cable refer to the Installation Index on page 6

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.



Do not disconnect the camera power connection while the system is operating as this can damage the fuse.

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Mount the camera to the side mirror using the p-clips as shown.</p> <p>Secure using two M6 nuts.</p>	
2.	<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 27.</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.



For further details on running the camera cable refer to the Installation Index on page 6

Light Tower Installation

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


<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Drill and tap the holes required to mount the light tower bracket on the chassis according to the mounting diagram on page 24.</p> <p>Secure using the supplied bolts as described on page 24.</p> <p>Run the cable down the headlight post and through the hole for the headlight cable towards the cabin.</p> <p>Cable tie with the front camera cable during External Cable Completion on page 27.</p>	

Table 9: Light Tower Installation



For further details on running the light tower cable refer to the Installation Index on page 6

Light Tower Bracket Mounting Position

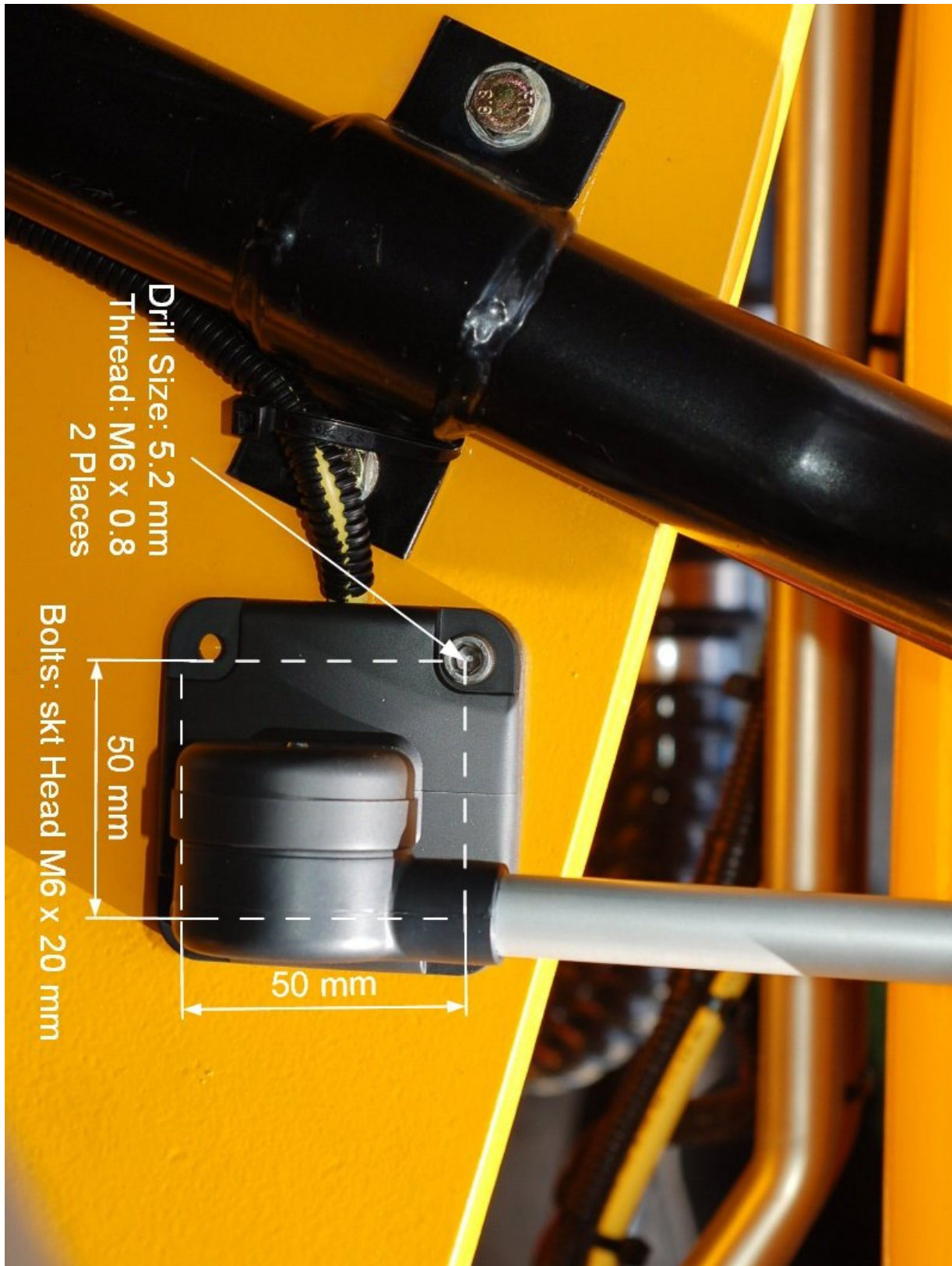


Illustration 4: Light Tower Bracket Mounting Position

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.

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	<p>Drill and tap two M8 holes for the CPIM bracket in the chassis behind the cabin.</p> <p>Mount using the supplied M8 x 12mm bolts and washers.</p>	
2.	<p>Connect the cables for the pressure sensors and boom cable to the CPIM according to the picture shown.</p> <p>Connect the supplied M12 4 metre cable (CB001026) into the connection out of the right side of the CPIM for the CCIM cable.</p> <p>Run the CCIM cable towards the cabin.</p>	

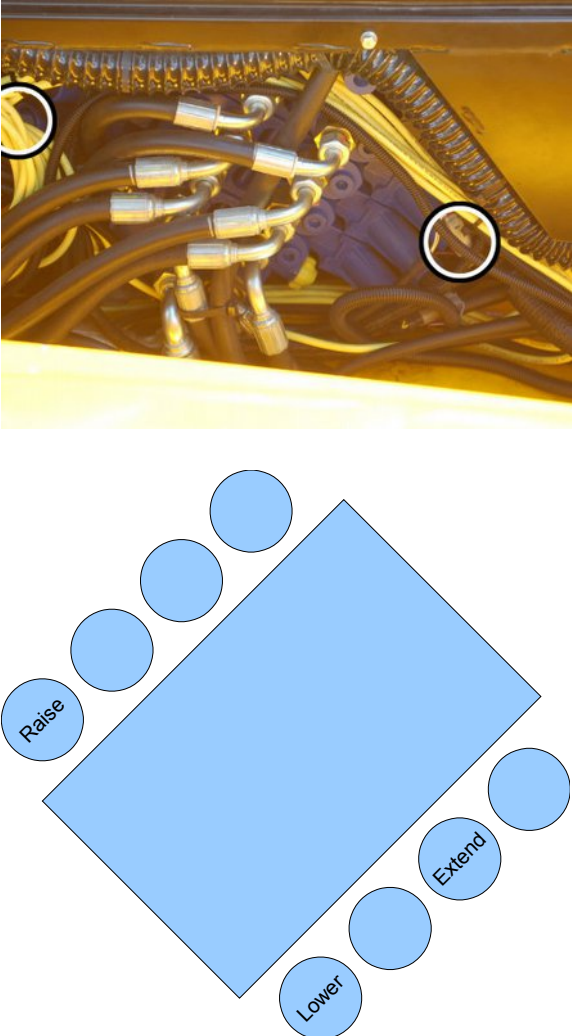

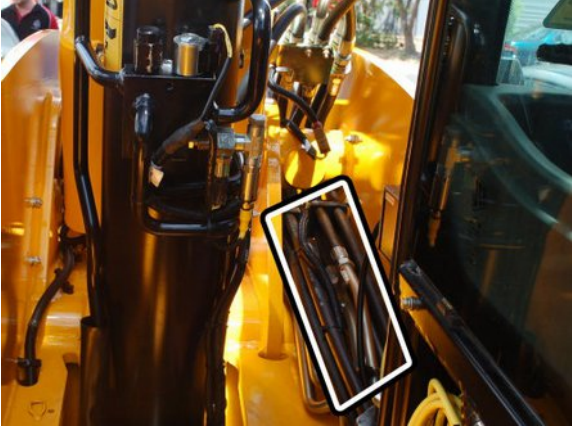

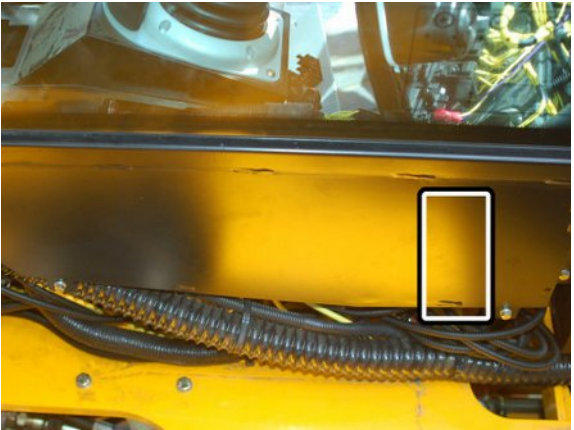
<i>Step</i>	<i>Description</i>	<i>Diagram</i>
3.	<p>Run the height limiter cable from out the left side of the CPIM to the hydraulic block beside the cabin.</p> <p>Connect the tee connector labelled “Raise” from the height limiter cable to boom raise (top left) connector on the hydraulic block and the tee connector labelled “Extend” from the height limiter cable to boom extend (down second from right) connector on the hydraulic block.</p> <p>Place a single cable tie to hold each cable position then disconnect the tee's from the raise and extend connectors, otherwise the boom will not move.</p> <p>Complete the cable installation during External Cable Completion on page 27.</p>	 <p>The diagram consists of two parts. The top part is a photograph of a hydraulic system with various hoses and connectors. Two specific connectors are circled in black. The bottom part is a schematic diagram of a blue hydraulic block with several circular connectors. Three of these connectors are labeled: 'Raise' on the left side, 'Extend' on the right side, and 'Lower' at the bottom.</p>

Table 10: Can Pressure Input Module (CPIM) Installation

 For further details on running the cables refer to the Installation Index on page 6

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, boom and compensation pressure 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 together up to the side of the cabin.</p>	
3.	<p>Run the CCIM, light tower and camera cables through the hole into the cabin</p>	

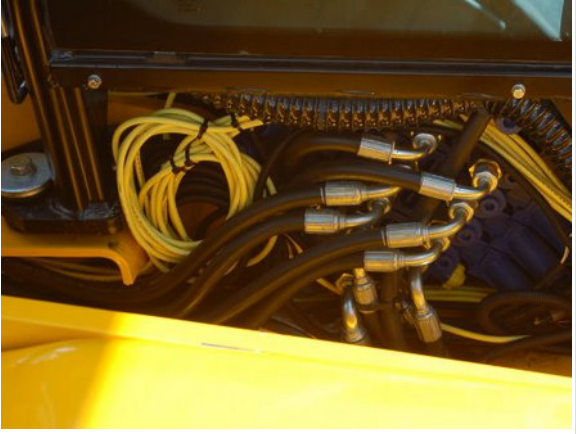
<i>Step</i>	<i>Description</i>	<i>Diagram</i>
4.	<p>Secure all the cables from the CPIM and from out the holes into the cabin from the joystick and dashboard.</p> <p>Coil up any additional cable and store under the side panel beside the cabin.</p>	

Table 11: External Cable Completion

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 and light tower cables to the M12 connectors on the CCIM.</p> <p>Note: It doesn't matter which of the M12 connectors the CCIM and light tower cables are plugged into.</p>	
2.	<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>	
3.	<p>Install the backup battery behind the indicator display using double sided velcro tape.</p>	

Table 12: CCIM Installation

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 13: 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>	

Table 14: Display Installation


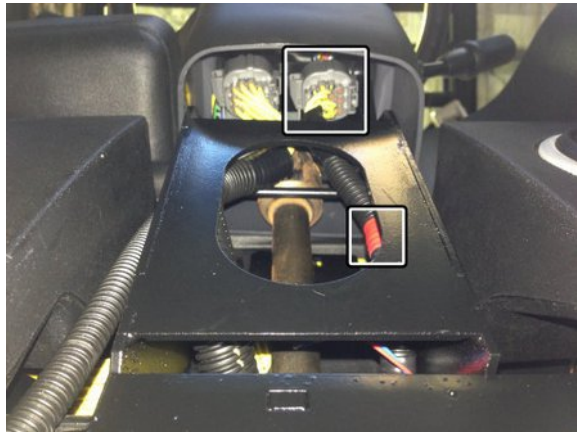



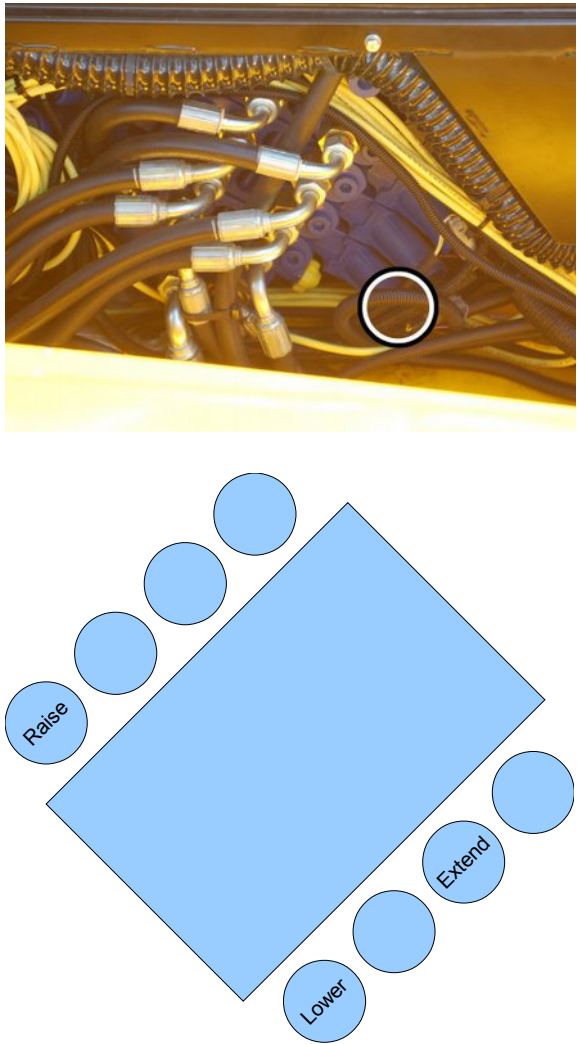
Adjust the display bracket for optimal viewing angle once the display is powered

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

<i>Step</i>	<i>Description</i>	<i>Diagram</i>						
1.	Connect the spade terminals on the green and yellow wires from the machine input harness with the 4 and 12 pin connectors into the override switch mounted in the dashboard.							
2.	<p>Splice the following wire colours from the machine input harness with the 4 and 12 pin connectors 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 style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Wire Colour</th> <th style="text-align: left; border-bottom: 1px solid black;">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>Run the snake tube with the red and white wires on the machine input harness through the hole leading outside the cabin and then through the hole leading back inside the cabin underneath the joystick.</p> <p>Locate the 8 pin connector from the joystick and splice into the matching wire colours from the machine input harness.</p>	
4.	<p>Run the two 2 pin tee connectors on the machine cutout harness through the hole leading outside the cabin, to the hydraulic block located beside the cabin.</p> <p>Connect the tee connector to the boom lower (bottom right) connector on the hydraulic block.</p> <p>Place a single cable tie to hold the cable position then disconnect the tee from the boom lower connector, otherwise the boom will not move.</p>	

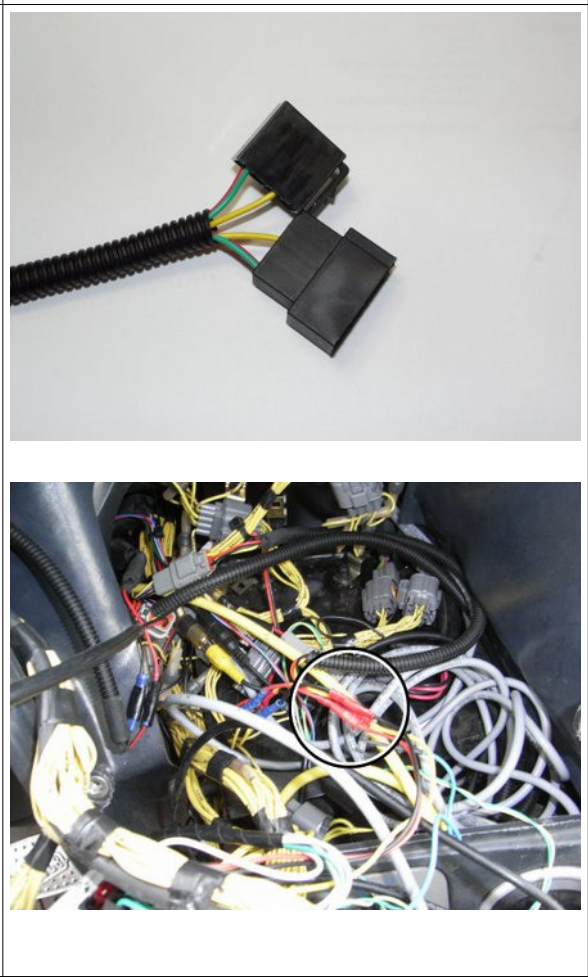


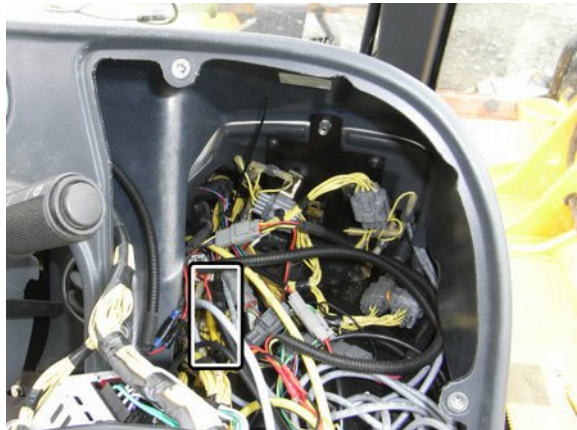
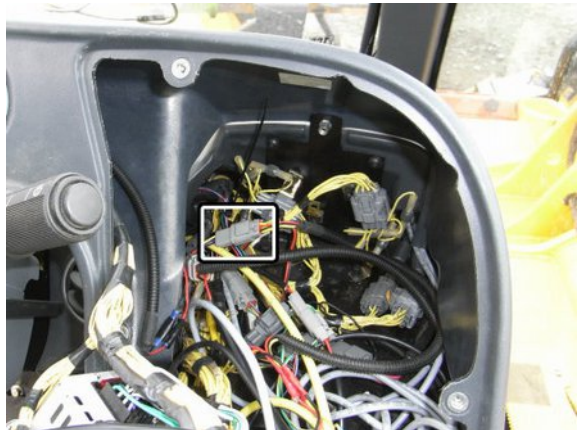
<i>Step</i>	<i>Description</i>	<i>Diagram</i>								
5.	<p>Attach the radio power harness to the radio connector.</p> <p>Note: If the radio connector is not installed in the machine. Cut off the tee connectors from the radio power harness and splice into the 4 pin radio power connector located under the dashboard according to the table below.</p> <table border="1" data-bbox="308 1003 826 1176"> <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>Red</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	Red	181	Yellow	301F	
<u>Wire Colour</u>	<u>Wire Number</u>									
Black	601AG									
Red	181									
Yellow	301F									





Table 15: Machine Connections

Finalisation

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

 Do not disconnect the camera power connection while the system is operating as this can damage the fuse.

<i>Step</i>	<i>Description</i>	<i>Diagram</i>
1.	Connect the 4, 6 and 12 pin connectors from the machine input and cutout harnesses into the I/O harness.	
2.	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.	
3.	Connect the 3 pin connector from the radio power harness into the power/camera harness.	

<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.	Coil up the extra cables and store underneath the dashboard cover.	
6.	Reconnect the tee connectors back into the hydraulic block.	
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 16: 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 the user control dial to enter the menu system.</p> <p>Rotate the user control dial to select System Menu.</p> <p>Press the user control dial to enter the menu.</p>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Main Menu</p> <hr/> <p style="text-align: center;">Attachment Selection Menu</p> <div style="background-color: blue; color: white; text-align: center; padding: 5px; margin: 5px 0;">System Menu</div> <p style="text-align: center;">Exit Menu</p> <hr/> </div>
2.	Select Advanced Menu	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">System Menu</p> <hr/> <p style="text-align: center;">Volume / Brightness</p> <hr/> <p style="text-align: center;">Status Menu</p> <hr/> <p style="text-align: center;">Diagnostics Menu</p> <hr/> <p style="text-align: center;">System Tests</p> <div style="background-color: blue; color: white; text-align: center; padding: 5px; margin: 5px 0;">Advanced Menu</div> <p style="text-align: center;">Return to Main Menu</p> <hr/> </div>

<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;">Enter Password</p> <hr/> <p style="text-align: center;">Number 1 2</p> <hr/> <p style="text-align: center;">Number 2 8</p> <hr/> <p style="text-align: center;">Number 3 4</p> <hr/> <p style="text-align: center; background-color: blue; color: white;">Submit Password</p> <hr/> <p style="text-align: center;">Return to System Menu</p> <hr/> </div>
4.	Select Sensor Calibrations	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Advanced Settings</p> <hr/> <p style="text-align: center;">Set Time / Date</p> <hr/> <p style="text-align: center; background-color: blue; color: white;">Sensor Calibrations</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;">Sensor Calibration Menu</p> <hr/> <p style="text-align: center; background-color: blue; color: white;">Calibrate Carrier Angle</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 17: Sensor Calibration

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