eqss™ Gen-3 LMS
Telehandler Load Management System

Installation Manual for Privilege MT1840 A / EP
Manual Tool Recognition

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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Table of Contents

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
- Locktite thread locker
- Side cutters
- Stanely 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

Item	*Component Description*
1	Cable Reeler
2	Main Lift Cylinder Pressure Sensors
3	Compensation Cylinder Pressure Sensors
4	Can Pressure Input Module (CPIM)
5	Forward Camera
6	Light Tower
7	Rear Camera
8	Can Cabin Interface Module (CCIM)
9	Display Module
10	User Control Dial
11	Stabiliser Connections
12	Joystick (X67)
13	Cutout
14	Cabin Fuse Box

Table 1: Component Installation Index

Colour	*Cable Description*
Yellow	Boom Cable
Dark Green	Main Cylinder Pressure Sensor Cables
Dark Blue	Compensation Cylinder Pressure Sensors Cables
Light Blue	Forward Camera Cable
Violet	Light Tower Cable
Aqua	Rear Camera Cable
Dark Purple	CCIM Cable
Yellow/Green	Cutout Cable Harness
Brown	Joystick Cable Harness
Dark Yellow	Stabiliser Harness
Red	Display Cable
Orange	User Input Control Cable

Table 2: Cable Installation Index

Illustration 1: Machine Boom

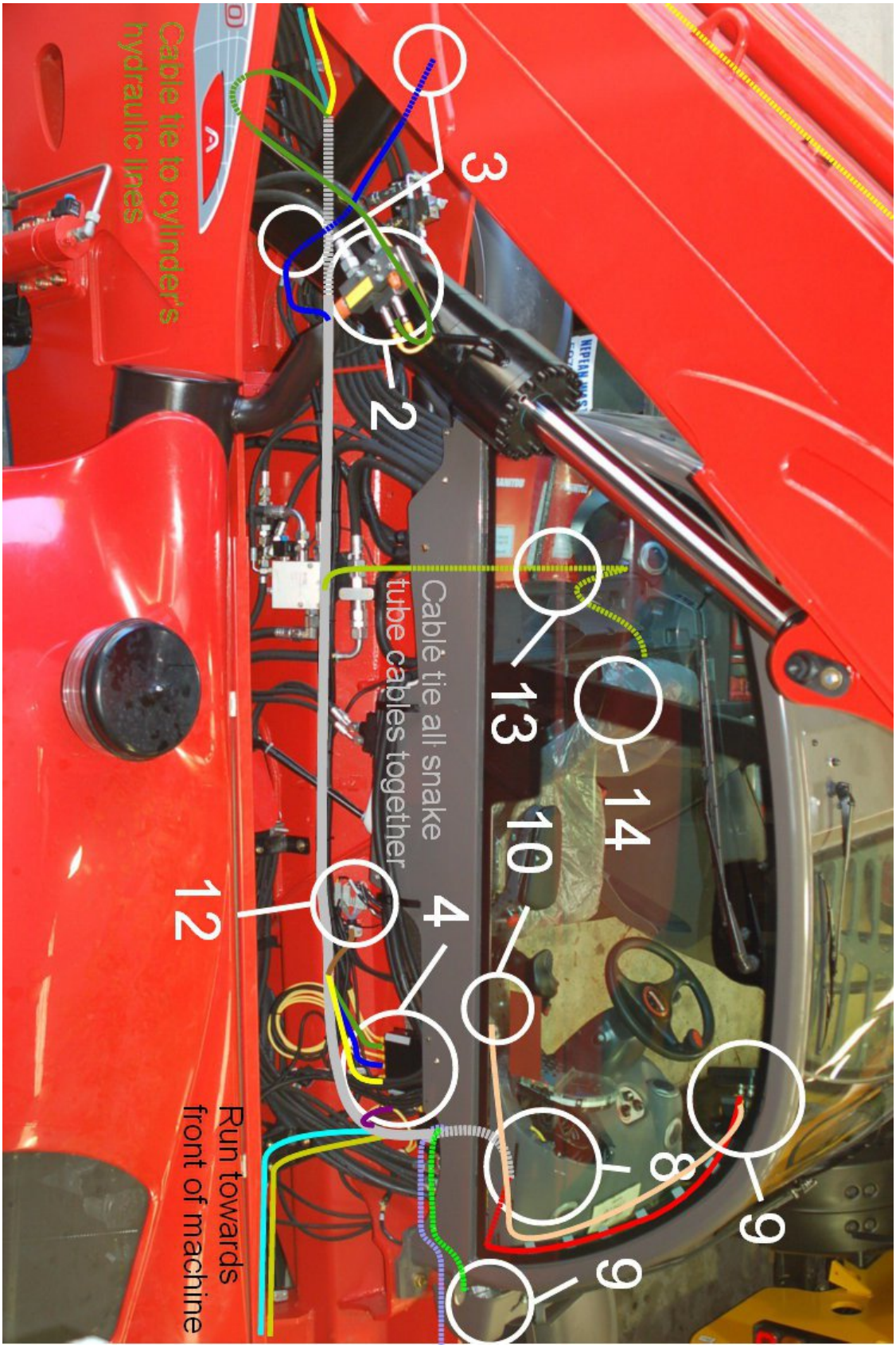


Illustration 2: Machine Chassis

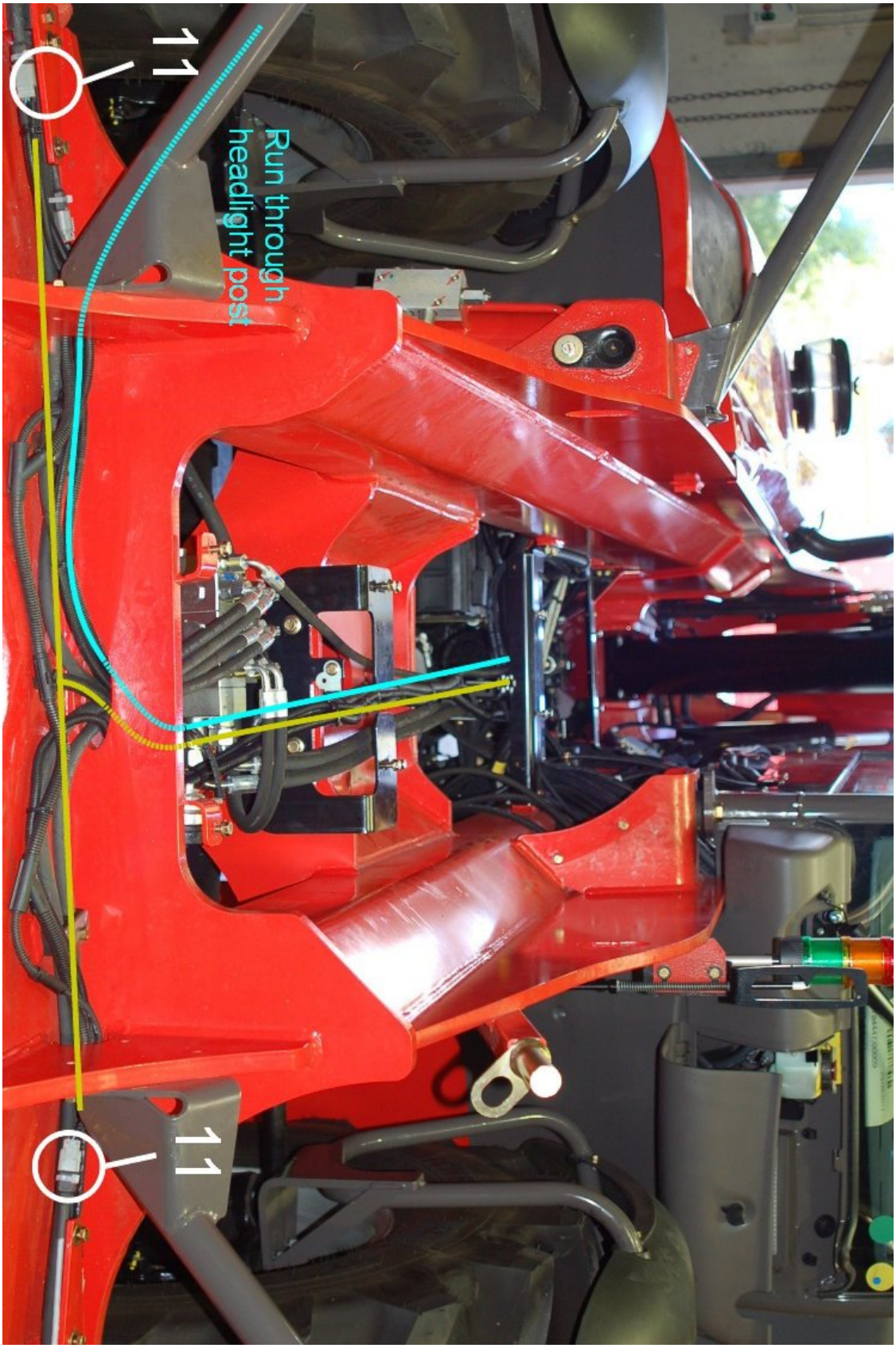
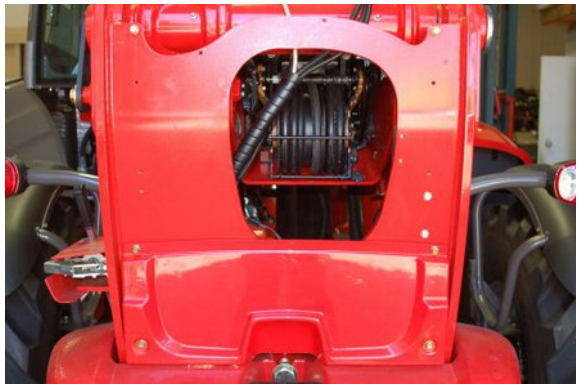


Illustration 3: Front of Machine

Covers

Remove the following covers before starting the installation

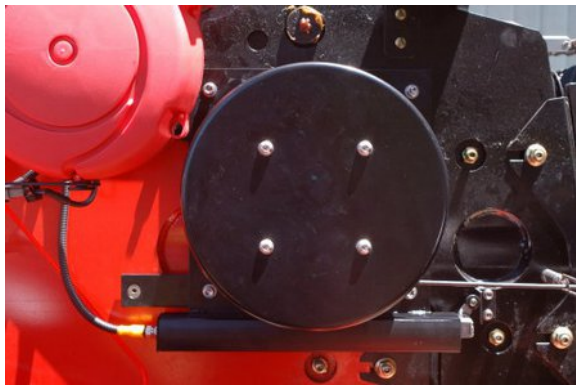
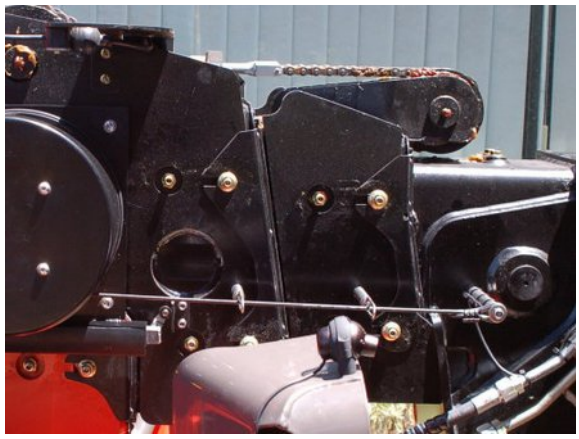
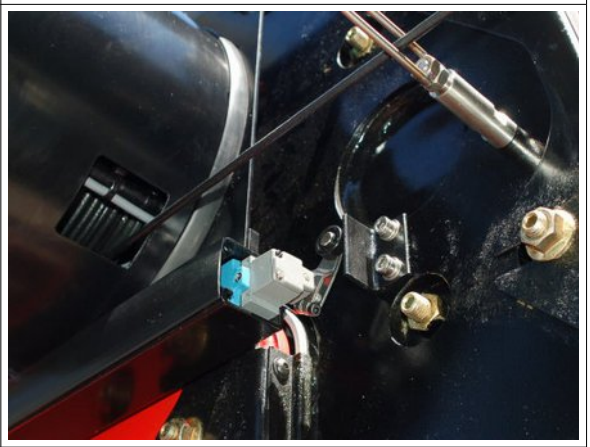
Step	*Description*	*Diagram*
1.	Remove the top rear cover behind the boom.	
2.	Remove the side panel next to the cabin under the boom.	
3.	Remove the covers under the boom. Remove the covers over the stabiliser connections	

Step	*Description*	*Diagram*
4.	Remove the cover behind the cabin	
5.	Inside the cabin remove the dashboard display. Remove the fuse box cover.	

Table 3: Cover removal

Cable Reeler Installation

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

Step	*Description*	*Diagram*
1.	Drill and tap the holes for the cable reeler support brackets according to the mounting diagram on page 16. Mount using the supplied countersunk M8 x 16 mm bolts. Mount the cable reeler to the support brackets using the supplied M8 x 12 mm bolts and washers.	
2.	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. Drill and tap an M8 hole for the cable guides. Mount the cable anchor and guides. Run the cable through the guides and secure to the cable anchor.	
3.	Drill and tap the M6 holes for the stow switch trigger. Ensure the stow switch is pressed when the boom is retracted. Mount the stow switch trigger using the supplied M6 x 12 mm bolts and washers.	

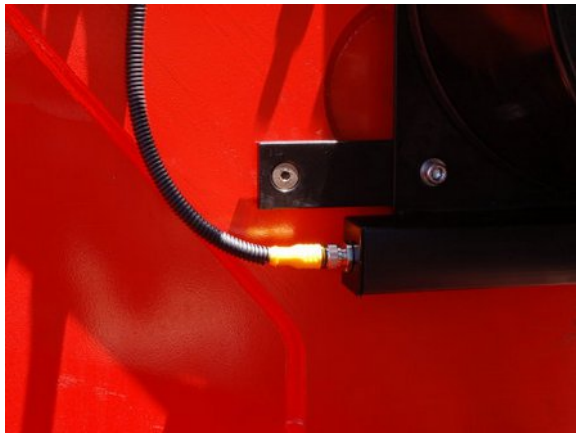
Step	Description	Diagram
4.	Connect the supplied M12 10 metre cable (CB001027) into the cable reeler connection.	
5.	Run the cable along the hydraulic pipes running down the boom, secure using cable ties every 150 mm to 200 mm. Cable tie to the flexible hydraulic hoses down to the chassis. Make sure the cable isn't pinched or stretched when the boom is raised or lowered. Run the remainder of the cable towards the cabin and insert into snake tube with the reverse camera cable during External Cable Completion on page 36.	

Table 4: Cable Reeler Installation

For further details on running the boom cable refer to the Installation Index on page 7

Cable Reeler Mounting Position

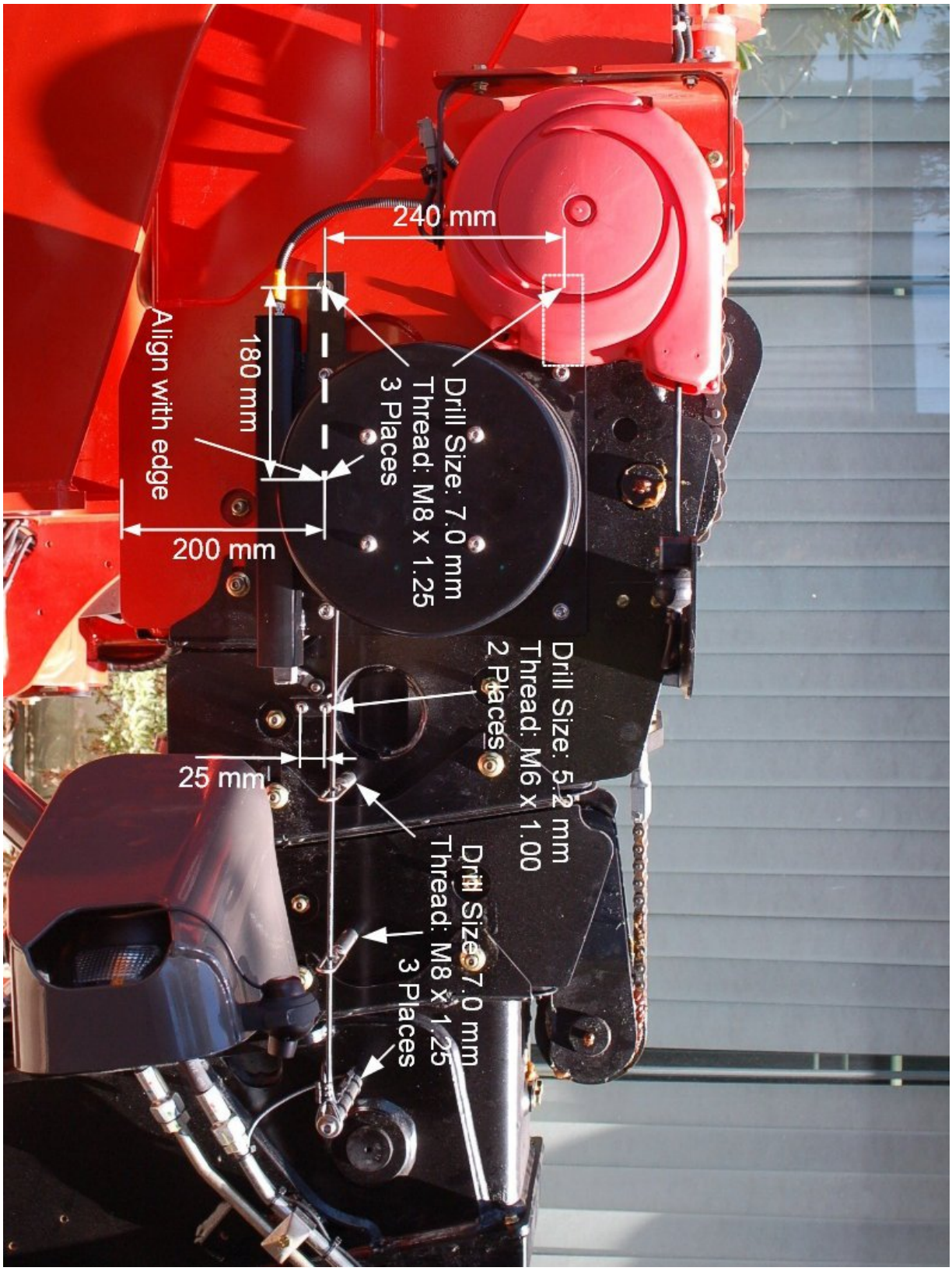
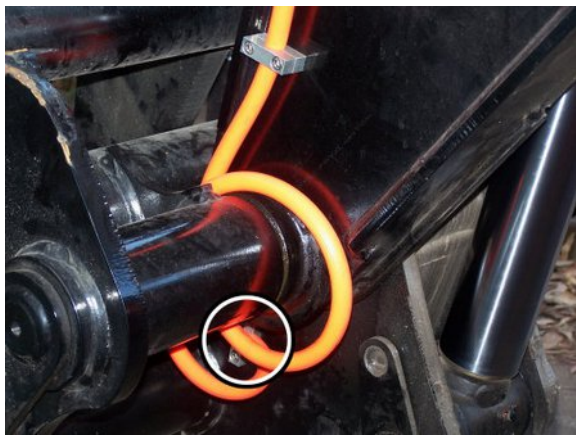
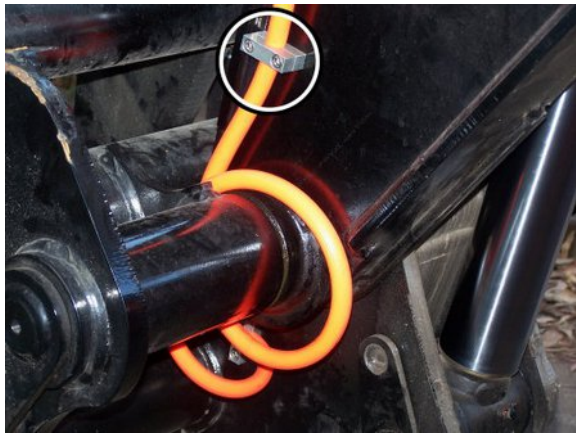


Illustration 4: Cable Reeler Mounting Position

ID Reader Installation

The ID reader is mounted on the front of the attachment head and is used to determine the attachment in use.

Step	*Description*	*Diagram*
1.	Drill the holes for the ID reader according to the mounting description on page 20. Remove the M4 bolts attaching the ID reader to the mounting bracket, to allow access to the bracket mounting holes. Secure the mounting plate to the attachment head using three M6 x 12 mm bolts and washers. Re-attach the ID reader to the mounting bracket.	
2.	Drill and tap two M6 holes to attach the supplied metal hose clamp to the attachment head. Ensure the clamp is pointing in the direction shown. Secure the cable hose to the hose clamp. Note: The hose shown here is orange.	

Step	*Description*	*Diagram*
3.	Drill and tap two M6 holes to attach the supplied metal hose clamp to the attachment head. Ensure the clamp is pointing in the direction shown. Wrap the cable hose around the attachment head pivot. Secure the cable hose to the hose clamp. Ensure there is approximately 950 mm of cable between the two clamps. Rotate the attachment head through its range of motion and ensure the hose is not pinched or stretched. Drill and tap an M6 hole to attach the supplied plastic hose clamp. Secure the cable hose to the hose clamp. Cable tie the remainder of the hose to the hydraulic lines leading under the front cover.	
4.	Drill and tap an M6 hole to attach the supplied plastic hose clamp. Secure the cable hose to the hose clamp. Cable tie the remainder of the hose to the hydraulic lines leading under the front cover.	

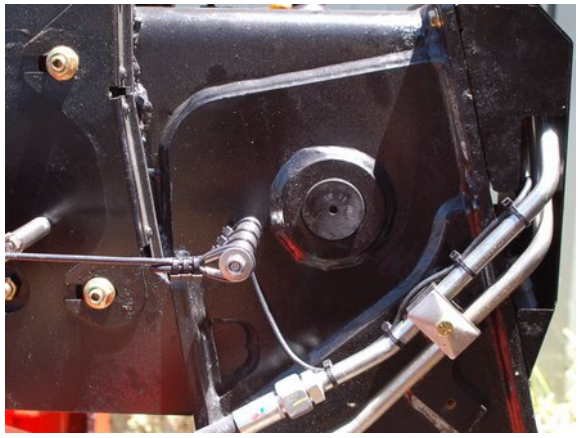
Step	*Description*	*Diagram*
5.	Cable tie the cable down the cable anchor and along the hydraulic lines leading under the front cover.	
6.	Remove the front cover and attach the 3 pin connector from the cable reeler to the ID reader connector. Replace the cover.	

Table 5: ID Reeler Installation

ID Reader Mounting Position

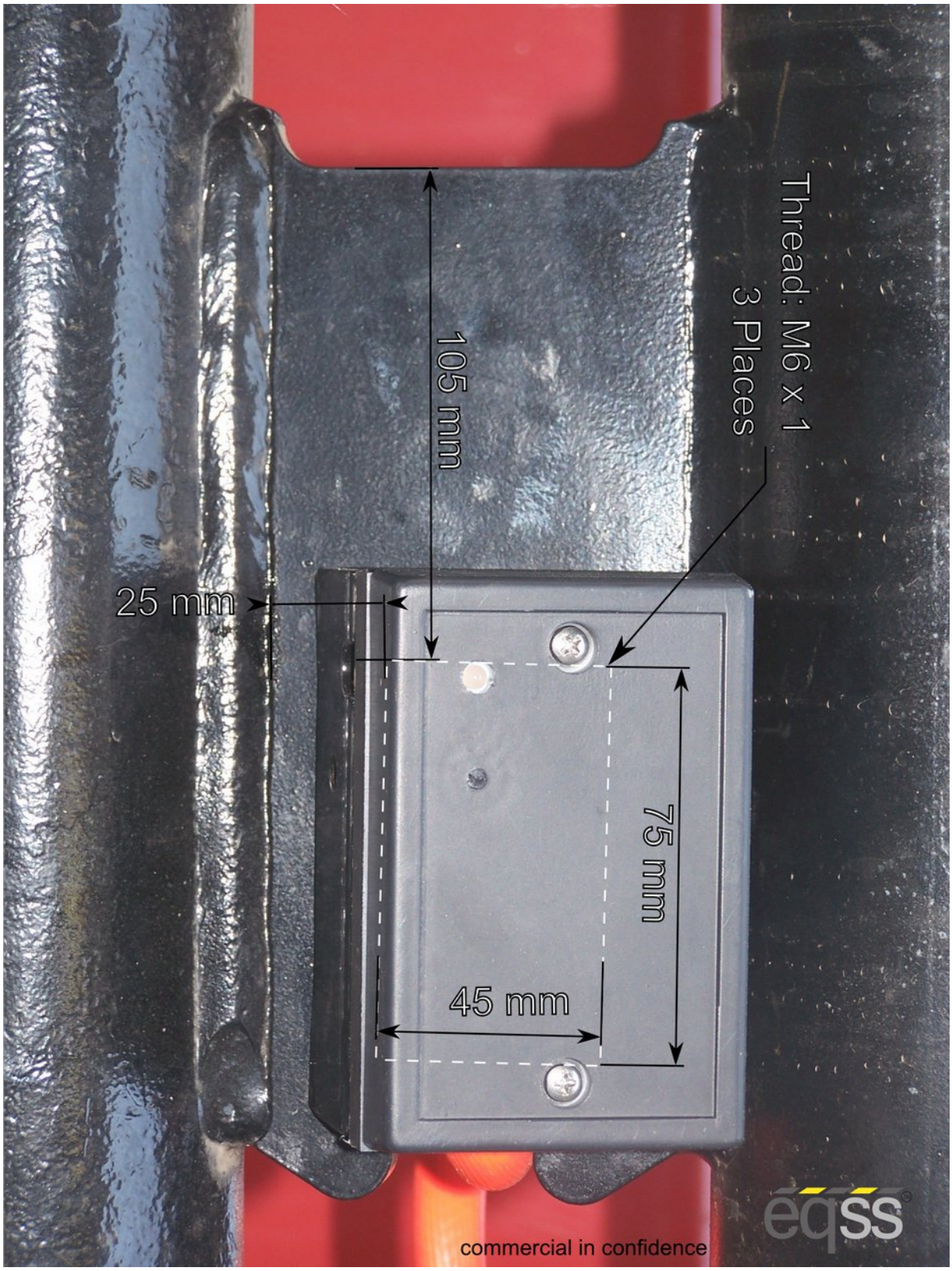


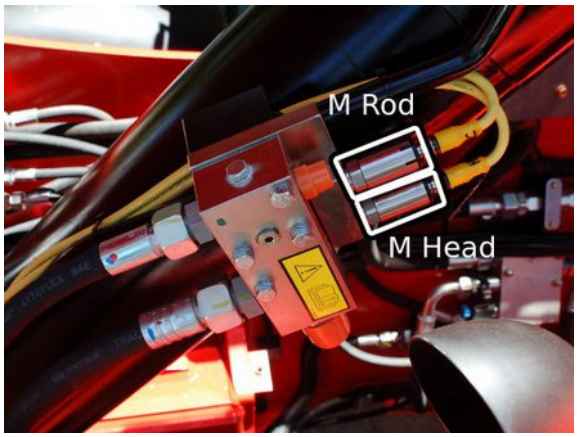
Illustration 5: ID Reader Mounting Position

Pressure Sensor Installation

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

Pressure Manifold

Failure to tighten the bolts to the correct torque on the pressure manifold may result in a pressure failure on the counterbalance valve causing an uncontrolled fall of the boom.

Step	*Description*	*Diagram*
1.	Raise the boom to approximately 40 degrees. Support and secure the boom using an A Frame or similar apparatus. It must support at least 2 tons. Apply the handbrake and insert chock under wheels. Remove the counterbalance valve on the side of the hydraulic lifting ram. Removing the counterbalance valve will release the hydraulic pressure which may result in a spray of oil. Secure the pressure manifold using the supplied 70 mm bolts and seals. Tighten the bolts for the manifold to 25 NM using a torque wrench. Start the machine, pressurise the boom and check for leaks.	

Step	Description	Diagram
2.	Connect the supplied M12 4 metre cables (CB001026) into each of the pressure sensors. Add both cables to 3 m of snake tube. Cable tie 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. Run the snake tube and cables towards the cabin and cable tie with the other cables during External Cable Completion on page 36.	

Table 6: Pressure Manifold Installation

For further details on running the pressure sensor cables refer to the Installation Index on page 7

Compensation Pressure Sensors

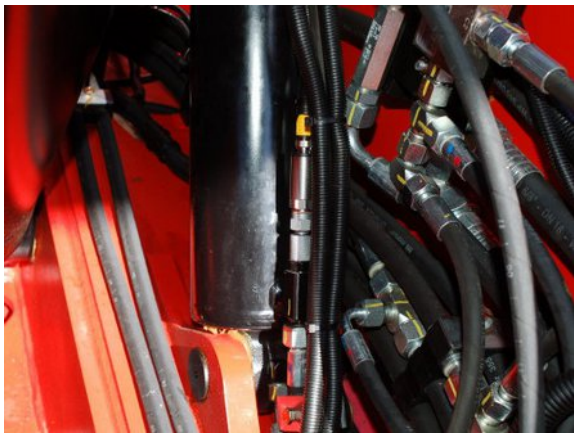
Step	*Description*	*Diagram*
1.	Install the pressure sensor with the U shaped hydraulic connection into the rod of the compensation cylinder	 View from behind the cabin towards the rear of the machine
2.	Install the head compensation pressure sensor into the compensation cylinder **Start the machine, pressurise the boom and check for leaks.** Connect the supplied M12 4 metre cables (CB001026) into each of the pressure sensors. Add both cables to 3 m of snake tube. Run the snake tube and cables towards the cabin and cable tie with the other cables during External Cable Completion on page 36.	 View from under the boom towards the rear of the machine

Table 7: Compensation Pressure Sensor Installation

For further details on running the pressure sensor cables refer to the Installation Index on page 7

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.	Remove the cover at the rear of the machine. Drill a 31mm hole in the location shown. Making sure to leave enough room for a license plate Insert the camera through the hole and adjust the angle using the alignment washers.	
2.	Connect the camera power and signal connectors to the supplied 5m camera cable (CB001032). Note; The white connector is not used. Secure the camera cable using a single cable tie to maintain the connector location. Run the remainder of the cable towards the cabin and insert into snake tube with the boom cable during External Cable Completion on page 36.	

Table 8: Reverse Camera Installation

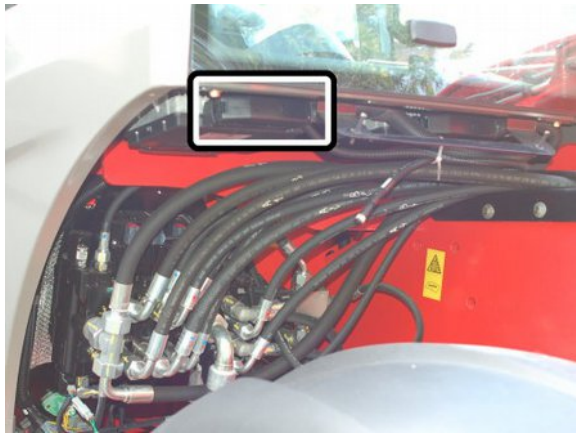
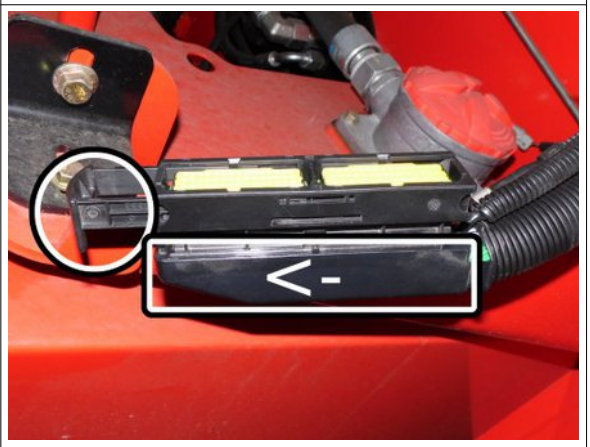
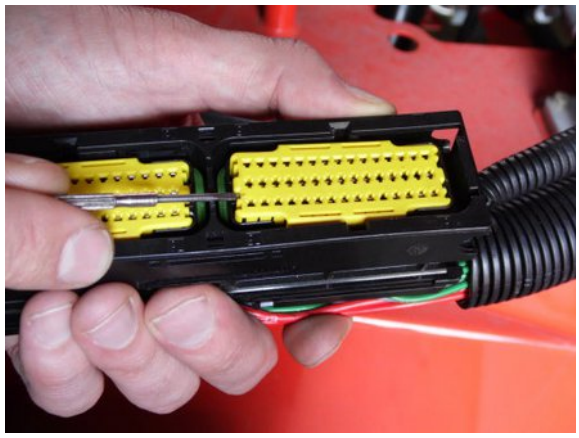
The camera's viewing angle may need to be adjusted once the system is installed and the display is operational.

Once the cable has secured with a cable tie disconnect the cable to remove the rear cover until the installation is finalised

For further details on running the camera cable refer to the Installation Index on page 7

Cutout Cable Harness

Isolate the main battery before connecting into the machine wiring

Step	*Description*	*Diagram*
1.	Remove connector X148 from the ECU MP1.	
2.	Pull the connector on the left of the connector to disconnect from the ECU. Slide the protective cover off the end of the connector to access the wires.	
3.	Remove the pin support bracket from the left connector, by levering the corners with a small screwdriver.	

Step	*Description*	*Diagram*
4.	Remove the blanking pin from the connector in slot 4 and insert the blue wire from the cutout harness. Note: The pin numbers are written on the front of the connector	
5.	Replace the pin support bracket and the protective cover. Replace any tape that was removed to secure the snake tube of the protective cover. Reattach the connector to the ECU module.	
6.	Push the snake tube containing the green wire through the seal into the fuse box up to the start of the snake tube. Cable tie the snake tube into the existing tube going into the seal.	
7.	Run the cable from behind the cabin to the side of the chassis following the existing snake tube.	

Step	Description	Diagram
8.	Run the snake tube and cables towards the cabin and cable tie with the other cables during External Cable Completion on page 36.	

Table 9: Cutout Cable Harness Installation

For further details on running the cutout cable harness refer to the Installation Index on page 7

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.

Step	*Description*	*Diagram*
1.	Drill two 7 mm holes spaced 25 mm apart on the top of the right headlight to mount the camera. Mount the camera to the top of the headlight and secure using the supplied nuts.	
2.	Connect the camera power and signal connectors to the supplied 5m camera cable (CB001032). Note; The white connector is not used. Run the cable along the same path as the headlight cable through the headlight post. Run the remainder of the cable towards the cabin and cable tie with the stabiliser cable harness during External Cable Completion on page 36.	

Table 10: 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 7

Stabiliser Cable Harness

Isolate the main battery before connecting into the machine wiring

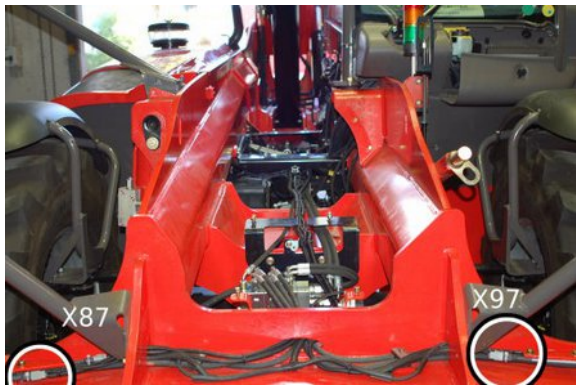
Step	*Description*	*Diagram*
1.	Locate the stabiliser down pressure switch connections at the front of the machine. Connect the 3 pin tee connector labelled left stabiliser into X97 and the connector labelled right stabiliser into X87 on the stabiliser cable harness.	
2.	Cable tie to the existing snake tube. Run the remainder of the cable towards the cabin and cable tie with the front camera cable harness during External Cable Completion on page 36.	

Table 11: Stabiliser Cable Harness Installation

For further details on running the stabiliser cable harness refer to the Installation Index on page 7

Light Tower Installation

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

Step	*Description*	*Diagram*
1.	Drill and tap the holes required to mount the light tower bracket on the chassis according to the mounting diagram on page 33. Secure using the supplied bolts as described on page 33. Run the cable through the gap between the chassis and the cabin towards the side of the cabin. Complete the cable installation during External Cable Completion on page 36.	

Table 12: Light Tower Installation

For further details on running the light tower cable refer to the Installation Index on page 7

Light Tower Bracket Mounting Position

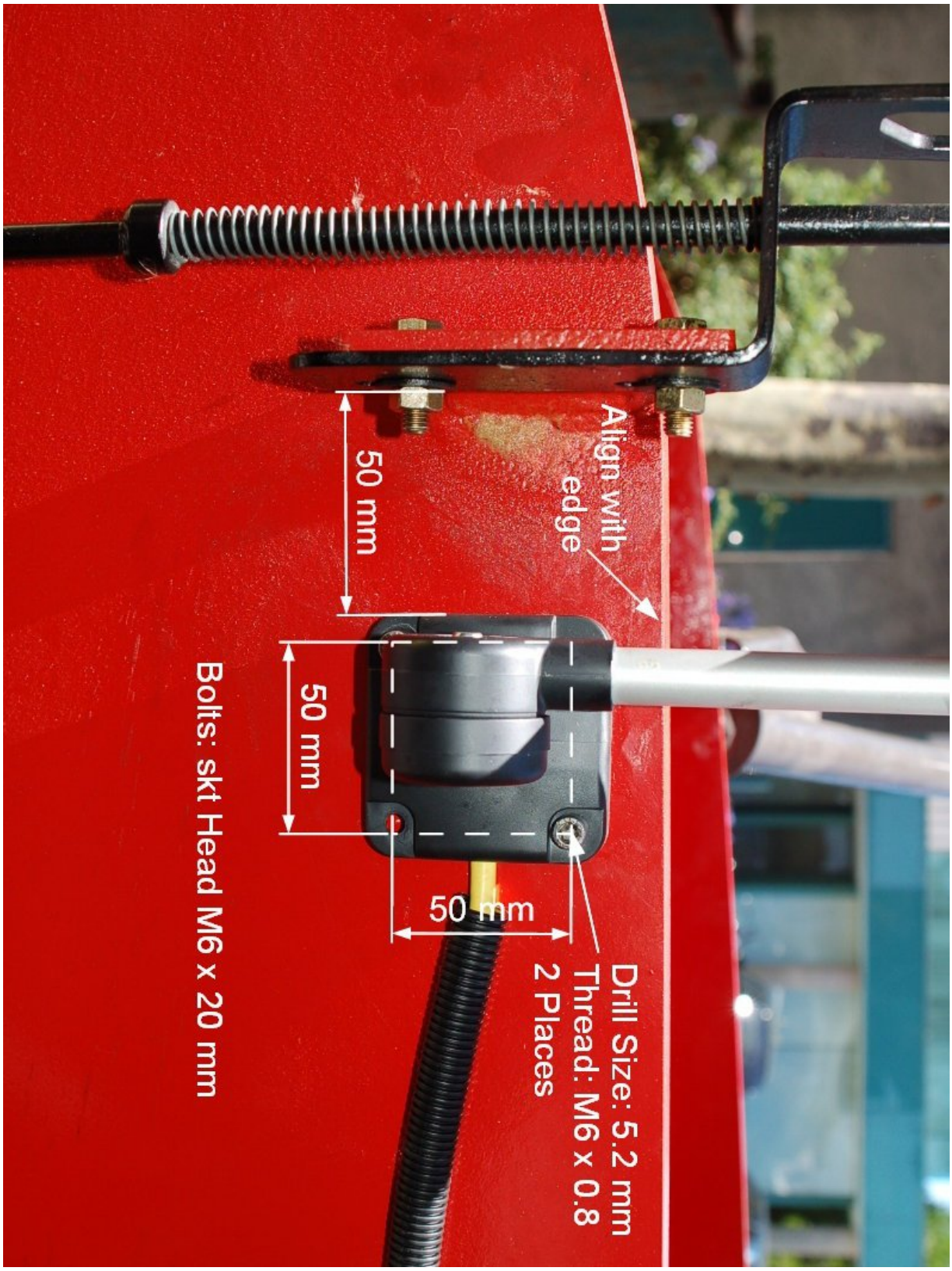


Illustration 6: Light Tower Bracket Mounting Position

Machine Input Harness

Isolate the main battery before connecting into the machine wiring

Step	*Description*	*Diagram*
1.	Locate the bundle of connectors under the boom next to the cabin, that connect into the joystick. Connect the 12 pin tee connector into X67. Run the other end of the cable with the 4 pin connector towards the cabin and cable tie with the other cables during External Cable Completion on page 36. Note: The violet and yellow wires near the 4 pin connector are not used.	

Table 13: Joystick Cable Harness Installation

For further details on running the joystick cable harness refer to the Installation Index on page 7

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.

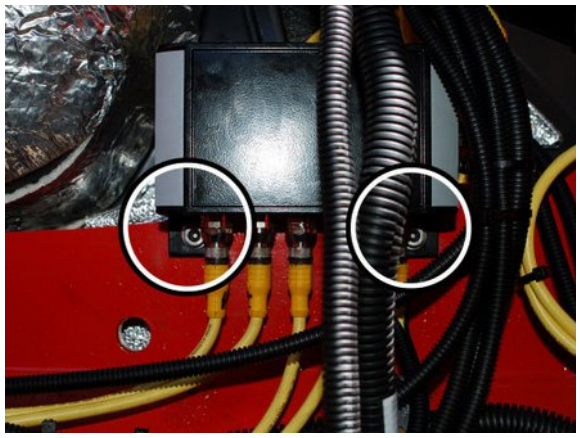
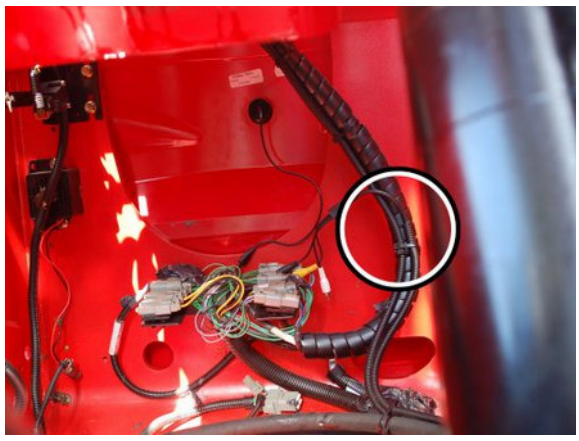
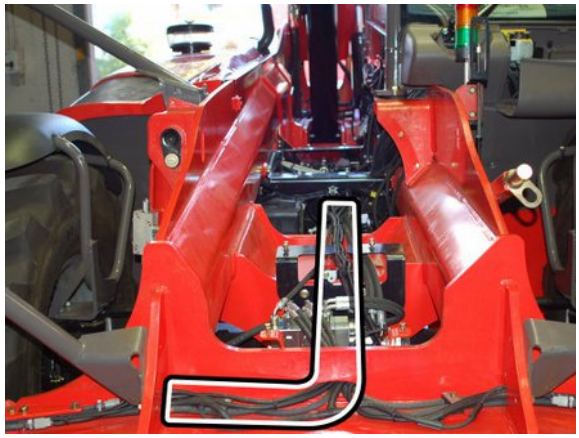
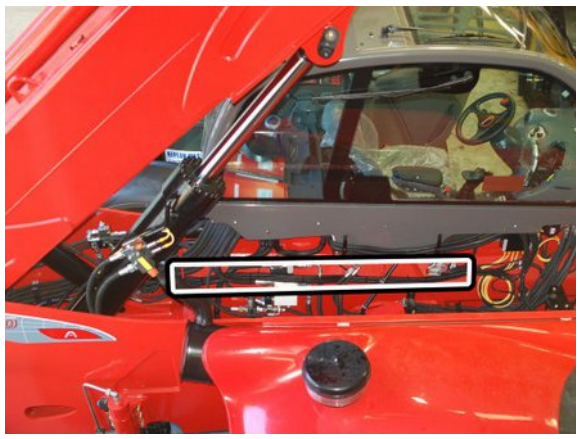
Step	*Description*	*Diagram*
1.	Drill and tap two M8 holes for the CPIM bracket in the cab side panel. Mount using the supplied M8 x 12mm bolts and washers.	
2.	Connect the cables for the pressure sensors and boom cable to the CPIM according to the picture shown. Note: The CCIM cable will be installed during External Cable Completion on page 36.	

Table 14: Can Pressure Input Module (CPIM) Installation

External Cable Completion

All external cabling is completed in this step.

Step	*Description*	*Diagram*
1.	Locate the reverse camera cable and the boom cable at the rear of the machine and run both cables through the supplied 2.5 m section of snake tube up to the CPIM.	 View from under the boom towards the rear of the machine
2.	At the front of the machine cable tie the stabiliser and front camera cables together up to the CPIM.	
3.	Cable tie the pressure sensor, boom, cutout cable harness, reverse camera and joystick cable harness together up to the CPIM. Coil up the additional cabling for the pressure sensor, boom and light tower cables and store underneath the CPIM.	

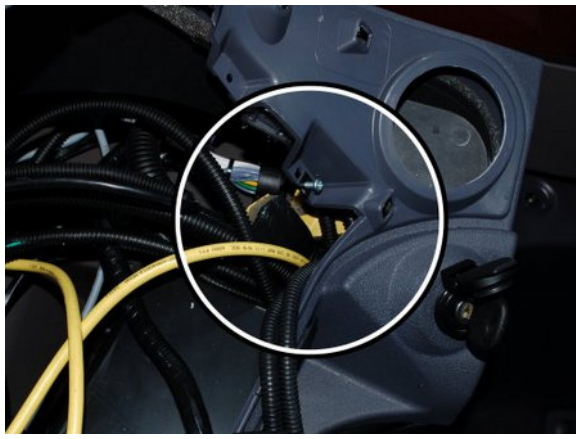
Step	*Description*	*Diagram*
4.	Connect the supplied M12 4 metre cable (CB001026) into the free connection out of the right side of the CPIM for the CCIM cable.	
5.	Run the CCIM, cutout cable harness, stabiliser cable harness, light tower, joystick cable harness and camera cables up through the hole into the cabin under the dashboard. Note: Pull the entire length of cable through into the cabin, excess cable will be stored under the dashboard cover in the cabin.	

Table 15: External Cable Completion

Display Installation

The display shows the current safety status of the telehandler.

Step	*Description*	*Diagram*
1.	Attach the display bracket to the level indicator in the top right corner using the supplied M6 x 35 mm bolts and nuts. Attach the display to the bracket and tighten the grub screw	

Table 16: Display Installation

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

User Input Control

The user input control consists of a 5 button switch mounted in the dashboard.

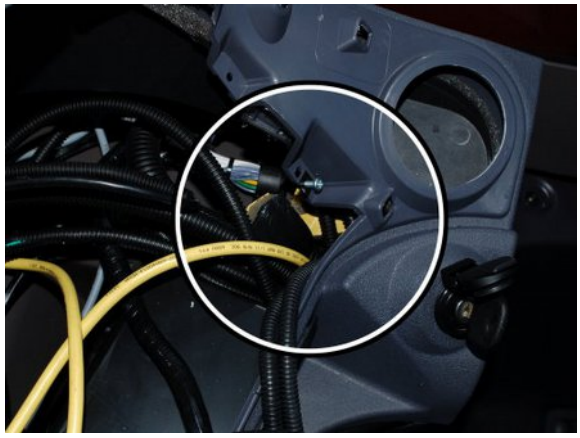
Step	*Description*	*Diagram*
1.	Drill a 34 mm hole into the cover in front of the joystick and install the user control dial. Note: Be careful while drilling not to damage the hydraulic controls positioned under the cover.	
2.	Run the cable through under the dashboard with the other cables.	

Table 17: User Input Control Installation

Can Cabin Interface Module (CCIM)

The CCIM connects the system into the machine electronics.

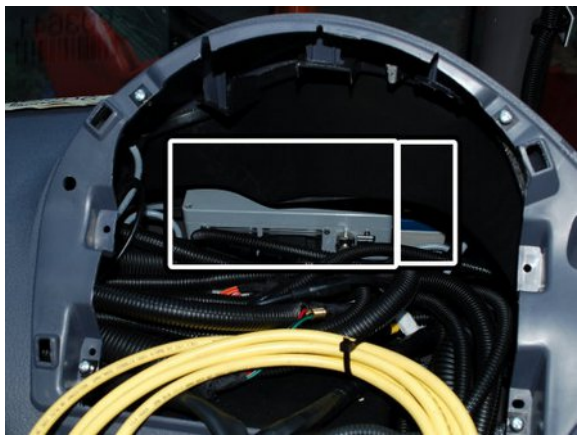
Step	*Description*	*Diagram*
1.	Position the backup battery (to the right of the CCIM) underneath the dashboard using double sided velcro tape. Position the CCIM to the left of the backup battery using double sided velcro tape. Remove the battery and CCIM from the velcro to allow the connections to be completed. Reattach to the velcro in the section Finalisation on page 45.	

Table 18: CCIM Installation

Cabin Fuse Box Wiring

The following connections are located near the fuse box beside the seat in the cabin.

> Isolate the main battery before connecting into the machine wiring

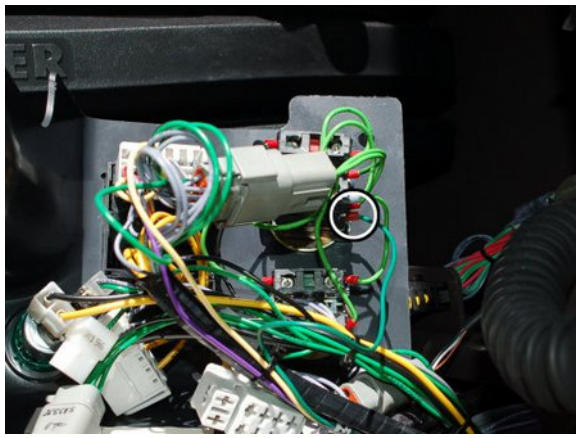
Step	*Description*	*Diagram*
1.	Locate the function selection switch (S52). Insert the green wire from the cutout cable harness into the terminal with the existing green wires of the access mode switch block (the switch position shown). Note: The switch block terminal may already be full, the green wire may need to be spliced into one of the existing green wires into the terminal.	 

Table 19: Cabin Fuse Wiring Installation

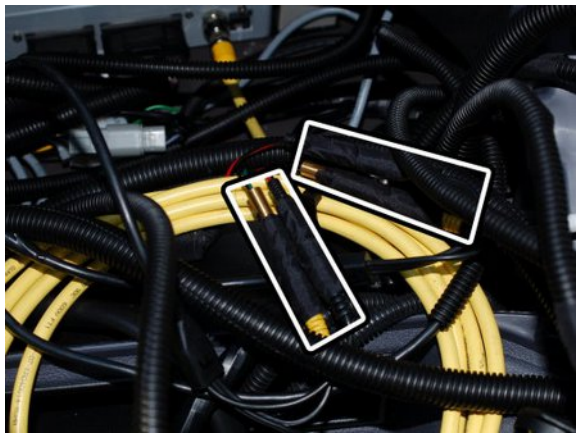
Cabin Loom

The cabin loom connects the CCIM to the machine connections and the other modules of the system.

Isolate the main battery before connecting into the machine wiring

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

Step	*Description*	*Diagram*
1.	Connect the CCIM and light tower cables to the M12 connectors on the CCIM. Note: It doesn't matter which of the M12 connectors the CCIM and light tower cables are plugged into.	
2.	Connect the Power/Camera and IO Harnesses to the bulkhead connectors on the CCIM.	

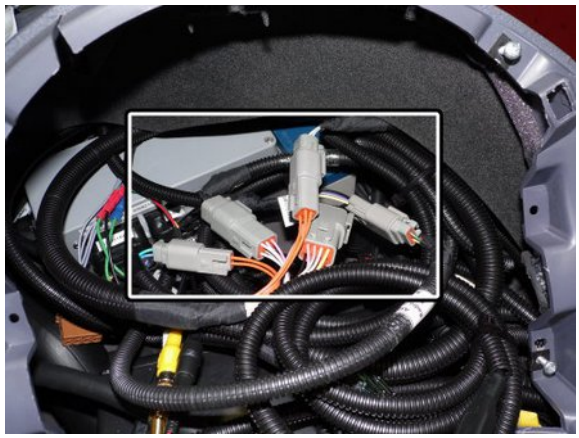
Step	*Description*	*Diagram*
3.	Attach the ring lug from the cutout harness to the ground point underneath the dashboard.	
4.	Connect the camera power and signal cables to the cabin loom. Note: The white connector is not used.	
5.	Run the 8 pin cable from the CCIM through the gap between the window and the dashboard. Connect into the 8 pin connector into the display	
6.	Run the 5 pin user control cable along the top of the side window Leave the remaining cable under the roof cover. Connect into the 5 pin connector into the display	

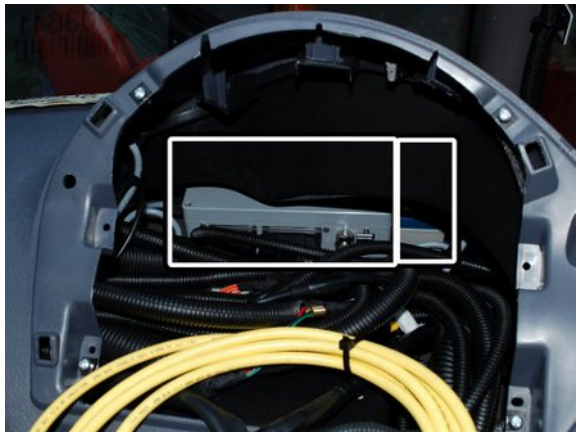
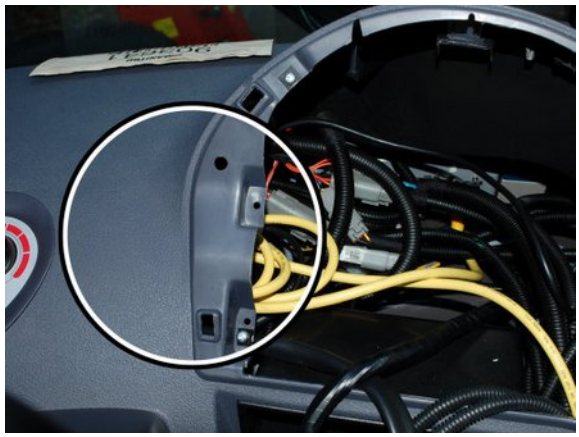
Step	*Description*	*Diagram*
7.	Run the cable through snake tube. Place cable tie points on the side of the window. Cable tie the snake tube to the cable tie points.	

Table 20: Cabin Loom Installation

Finalisation

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

Step	*Description*	*Diagram*
1.	Connect the radio power harness into the radio power connector. Ensure there is a 2A fuse installed in F10 and a 7.5A fuse installed in F26 for radio power.	
2.	Connect the 12 pin, 6 pin, 4 pin, 3 pin and 2 pin connectors into the cabin loom.	
3.	Connect the spade lug on the black wire to the negative (black) battery terminal. Connect the spade lug on the blue wire to the positive (red) battery terminal.	

Step	*Description*	*Diagram*
4.	Attach the backup battery and CCIM to the velcro strips installed earlier.	
5.	Coil up the extra cables and store underneath the dashboard cover.	
6.	Reconnect the main battery from the isolation switch. Turn the machine onto first stage /accessories and ensure the system is activated. Note: If the system is activated as soon as the battery power is reconnected, swap pins 2 and 3 on the 3 pin connector on the radio power harness.	

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

Table 21: Finalisation

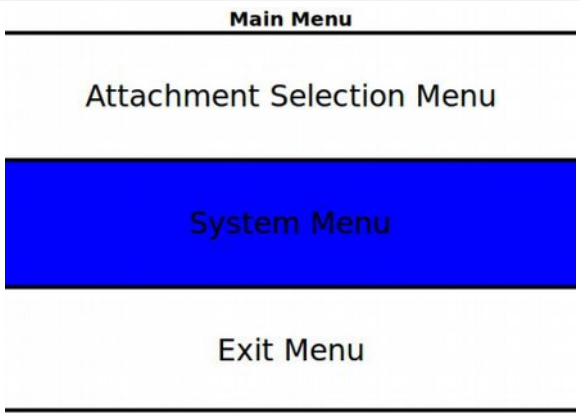
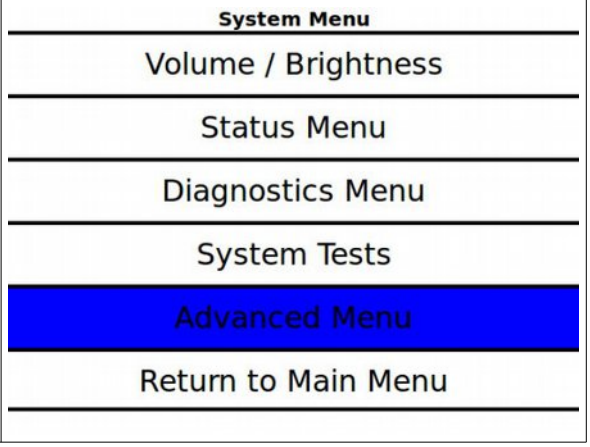
Make sure to update the machine ECU software for Australian configuration using the Manitou pad.

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

Step	*Description*	*Diagram*
1.	Press the user control dial to enter the menu system. Rotate the user control dial to select System Menu. Press the user control dial to enter the menu.	
2.	Select Advanced Menu	

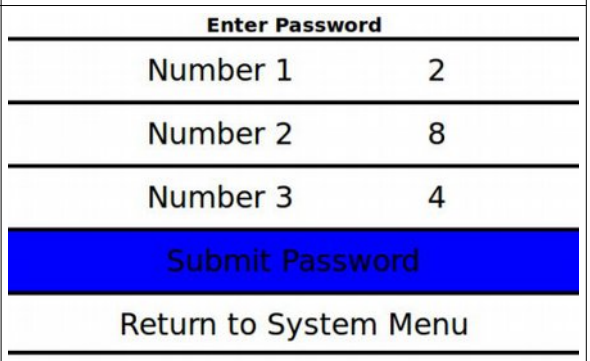
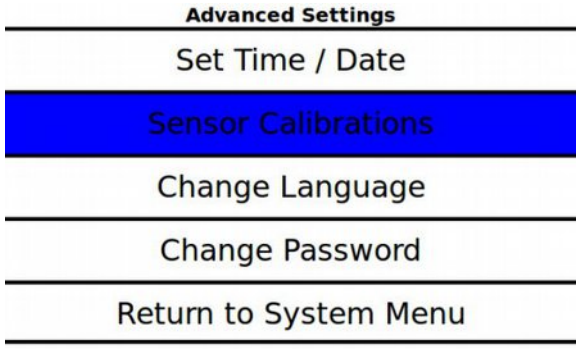
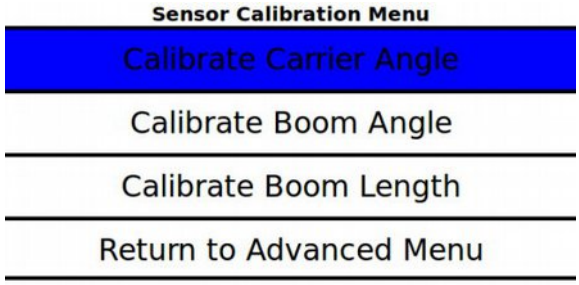
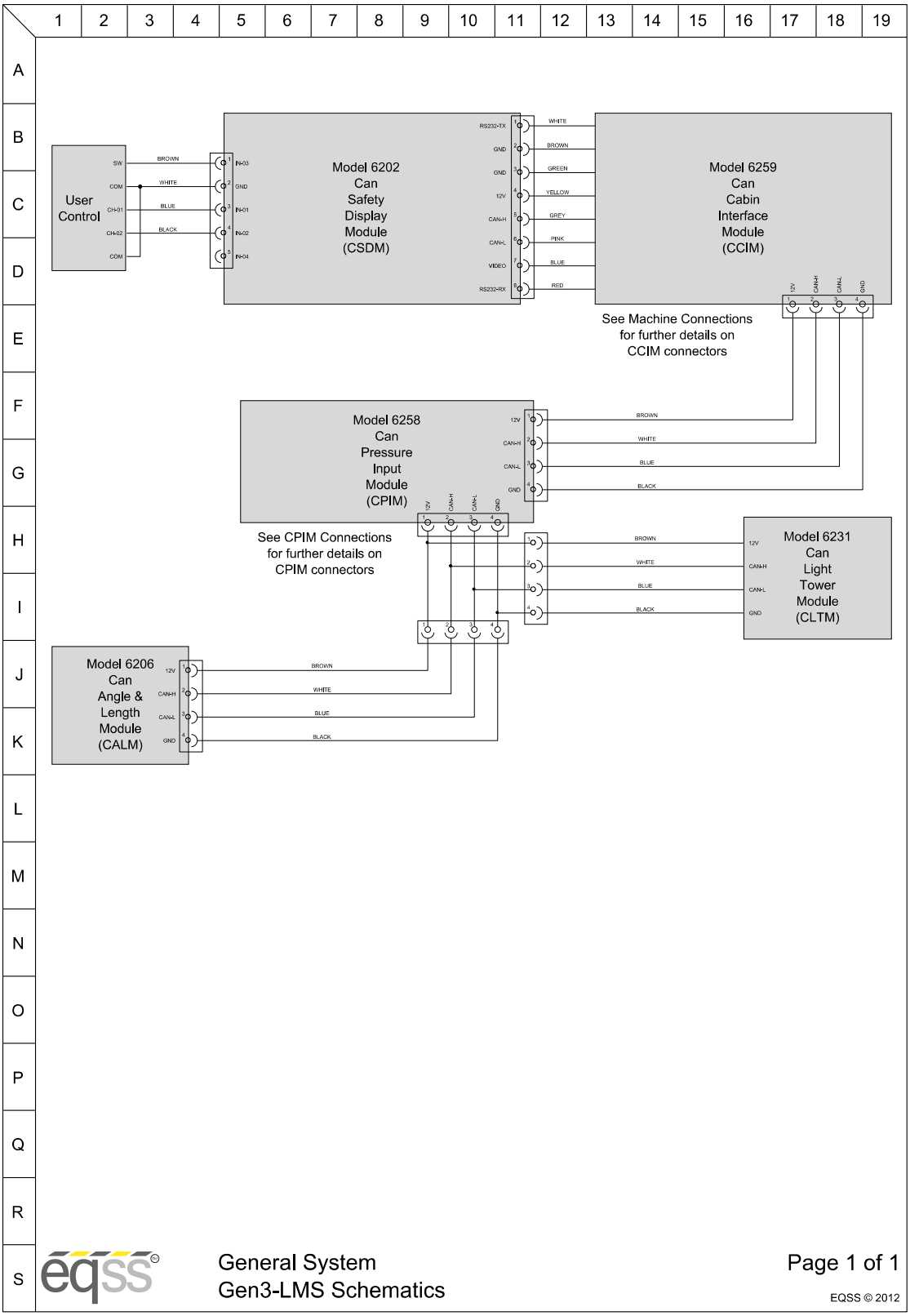
Step	*Description*	*Diagram*
3.	Enter the password (Default Password: 2-8-4)	
4.	Select Sensor Calibrations	
5.	Select Calibrate Carrier Angle and then follow the instructions on the screen to complete the calibration. Repeat for Calibrate Boom Angle and Calibrate Boom Length.	

Table 22: Sensor Calibration

Schematics


User Control
SW
COM
CH-01
CH-02
COM
BROWN
WHITE
BLUE
BLACK
IN-03
GND
IN-01
IN-02
IN-04
Model 6202
Can
Safety
Display
Module
(CSDM)
RS232-TX
GND
GND
12V
CAN-H
CAN-L
VIDEO
RS232-RX
WHITE
BROWN
GREEN
YELLOW
GREY
PINK
BLUE
RED
Model 6259
Can
Cabin
Interface
Module
(CCIM)
12V
CAN-H
CAN-L
GND
See Machine Connections
for further details on
CCIM connectors
Model 6258
Can
Pressure
Input
Module
(CPIM)
12V
CAN-H
CAN-L
GND
See CPIM Connections
for further details on
CPIM connectors
BROWN
WHITE
BLUE
BLACK
Model 6231
Can
Light
Tower
Module
(CLTM)
Model 6206
Can
Angle &
Length
Module
(CALM)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
A B C D E F G H I J K L M N O P Q R S
General System
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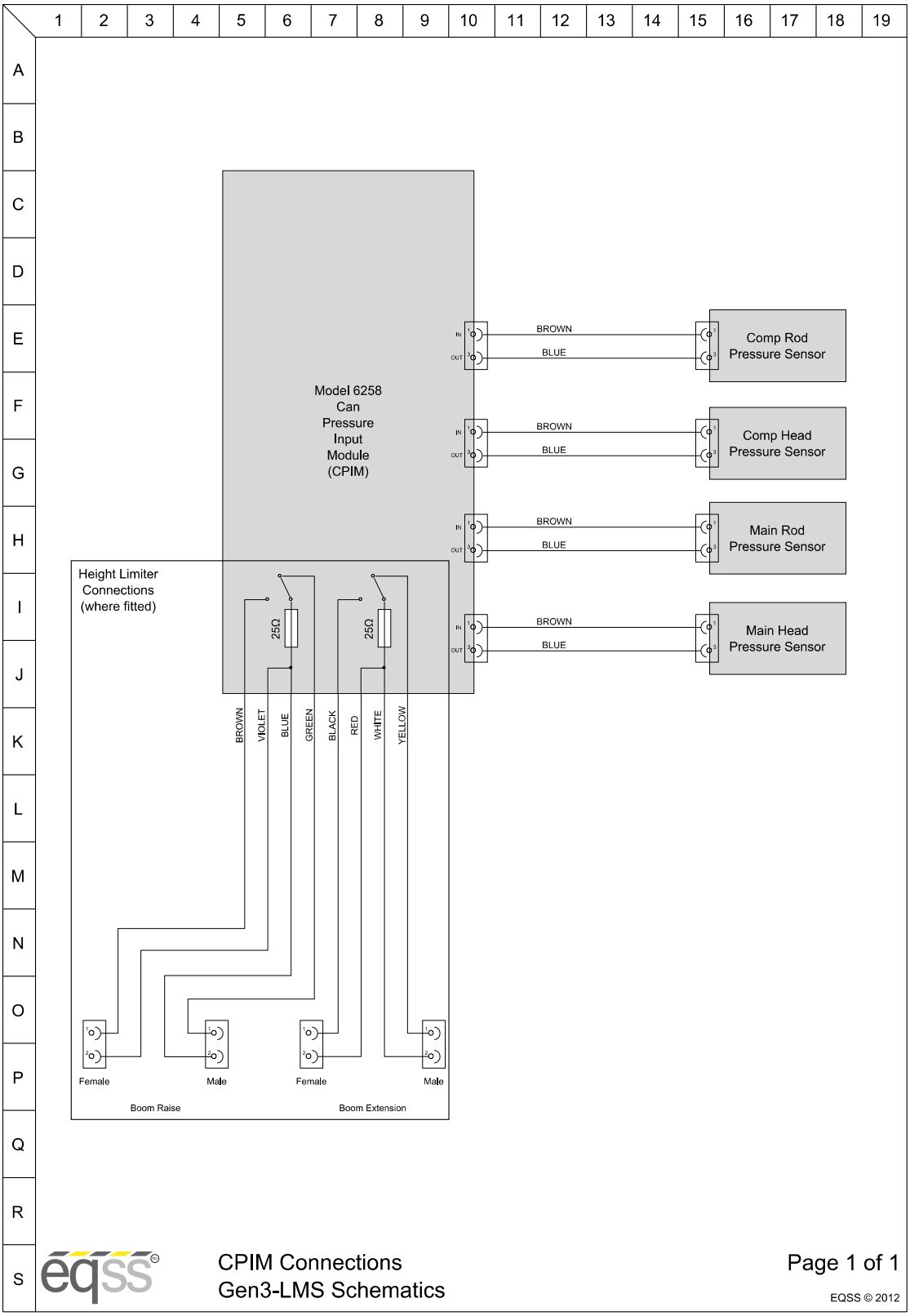
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
A B C D E F G H I J K L M N O P Q R S
Model 6258
Can
Pressure
Input
Module
(CPIM)
IN
OUT
BROWN
BLUE
Comp Rod
Pressure Sensor
Comp Head
Pressure Sensor
Main Rod
Pressure Sensor
Main Head
Pressure Sensor
Height Limiter
Connections
(where fitted)
25Ω
25Ω
BROWN
VIOLET
BLUE
GREEN
BLACK
RED
WHITE
YELLOW
Female
Male
Female
Male
Boom Raise
Boom Extension
CPIM Connections
Gen3-LMS Schematics
Page 1 of 1
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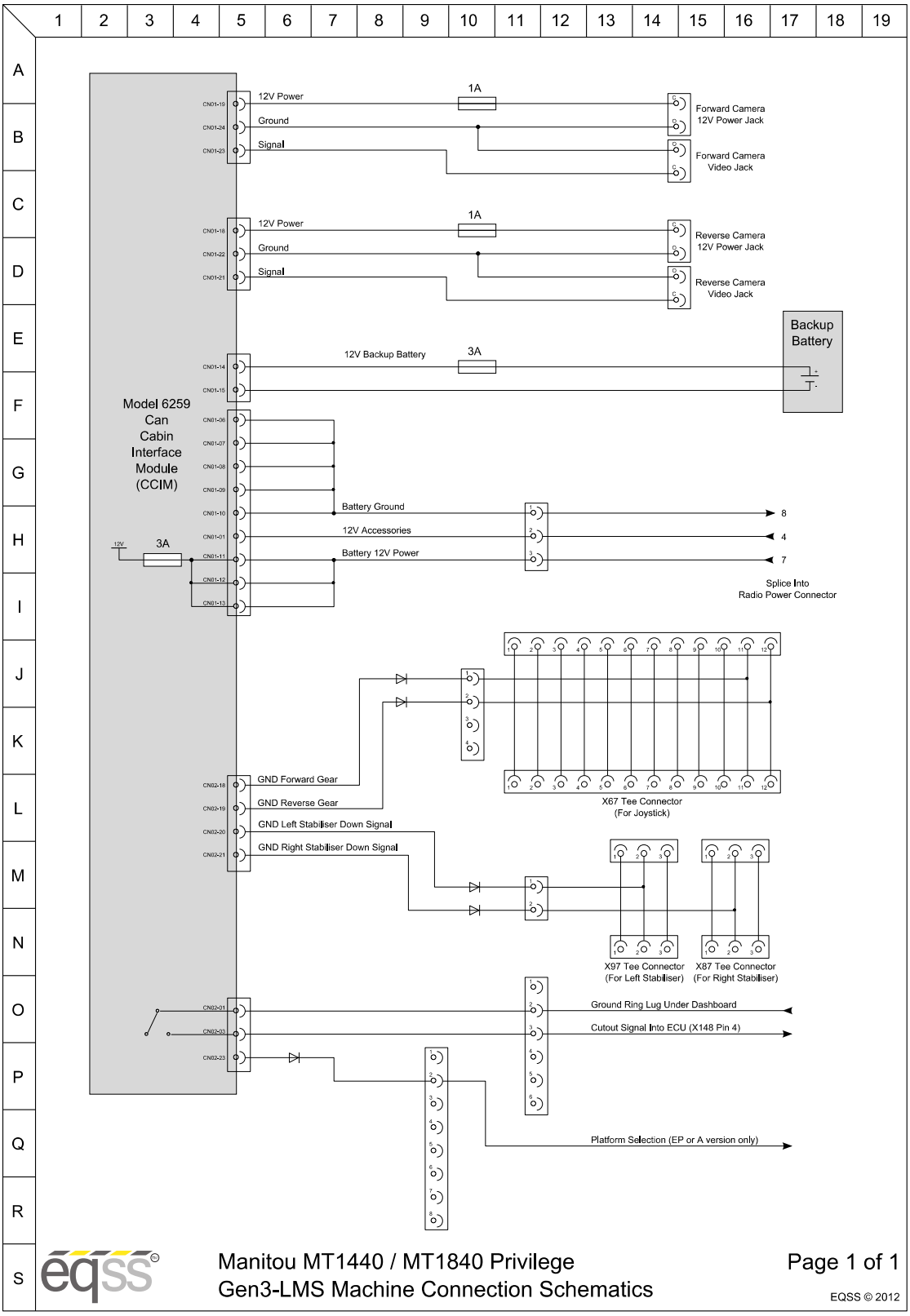

Manitou MT1440 / MT1840 Privilege
Gen3-LMS Machine Connection Schematics

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