eqss™ Gen-3 LMS
Telehandler Load Management System

Installation Manual for Privilege MT1440/1840 Std Manual Tool Recognition – 2021 Model

*****Do Not Swap Components between Gen3-LMS kits*****

When installing multiple Gen3-LMS kits, make sure the serial number on the sticker matches the serial number on the machine.

*****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
11	Cutout

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
Dark Yellow	Stabiliser Harness
Red	Display Cable
Orange	User Control Cable

Table 2: Cable Installation Index

Illustration 1: Machine Boom

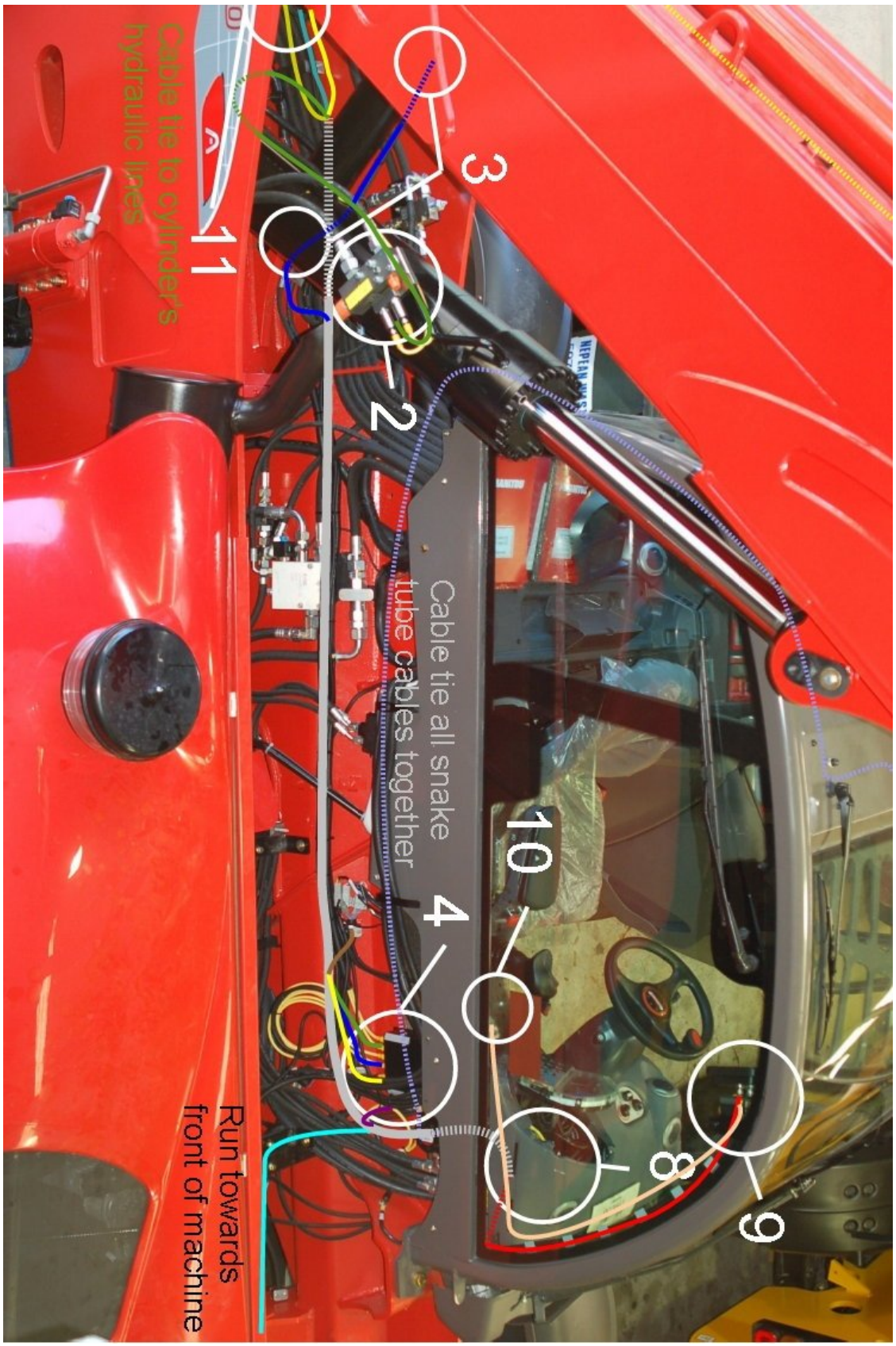


Illustration 2: Machine Chassis

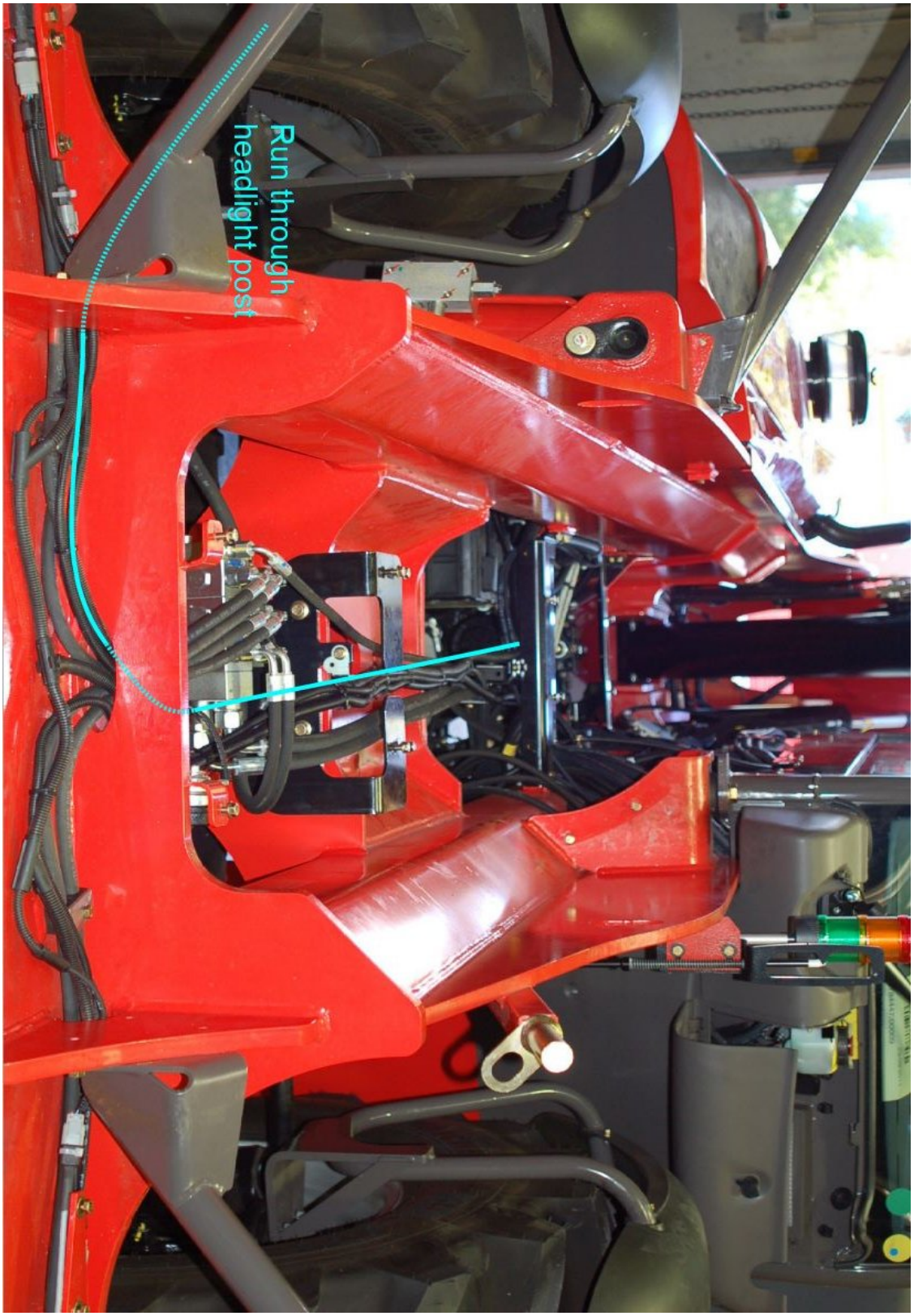
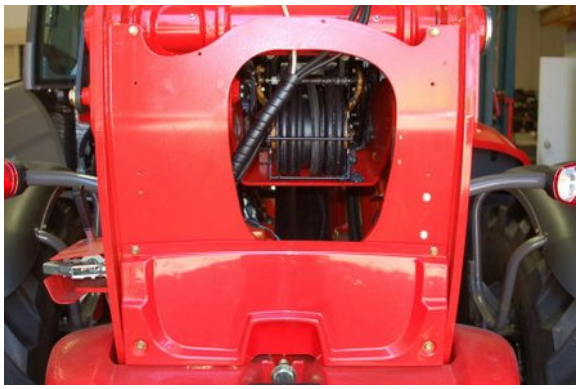
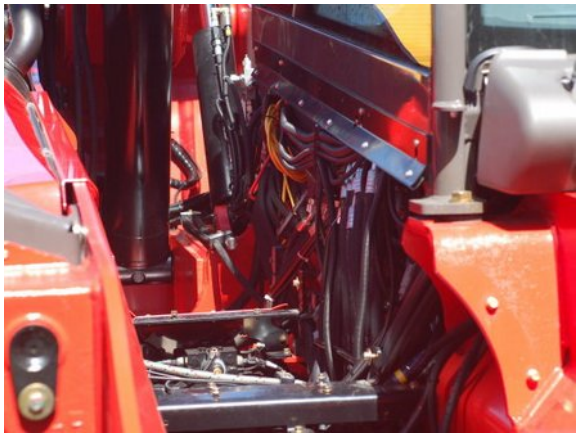


Illustration 3: Front of Machine

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.	

Step	Description	Diagram
4.	Remove the cover between the cabin and front left wheel. Note: The cover doesn't need to be completely removed as long as the wiper connections are accessible	
5.	Remove the cover behind the cabin	
6.	Inside the cabin remove the dashboard display. Remove the fuse box cover.	

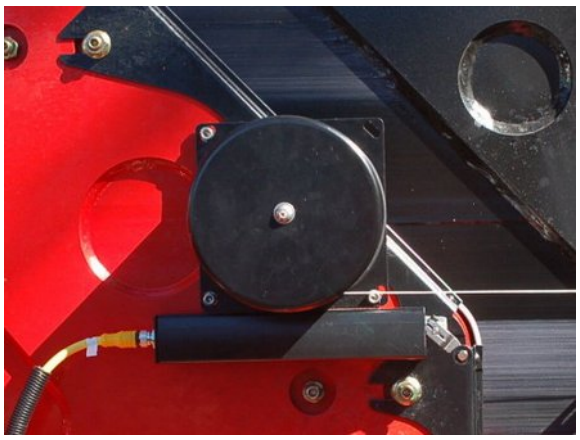
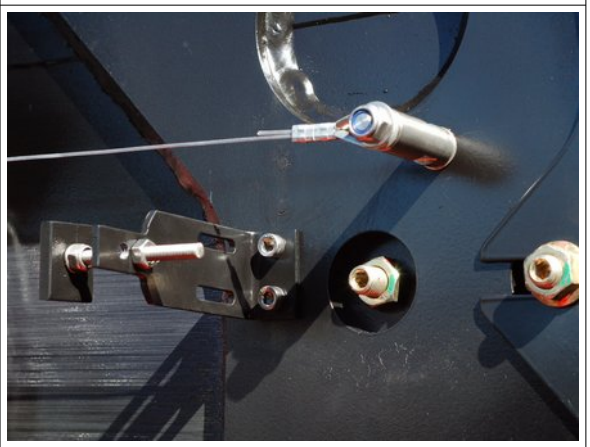
Table 3: Cover removal

Cable Reeler Installation

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

A false N07 fault can occur if the boom jumps off the stow switch due to pressurising the hydraulic system and without operating the boom extension control. Ensure the stow switch arm is correctly adjusted to prevent this error.

When mounting the cable anchor ensure it is mounted on the first extendable section not on the last section. If mounted on the last section the cable reeler will be damaged when the boom is extended.

Step	*Description*	*Diagram*
1.	Drill and tap the holes for the cable reeler according to the mounting diagram on page 15. Mount using the supplied M6 x 16 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. Mount the cable anchor and attach the cable. Note: Ensure the anchor is mounted on the first extendable section not on the last section. If mounted on the last section the cable reeler will be damaged when the boom is extended.	

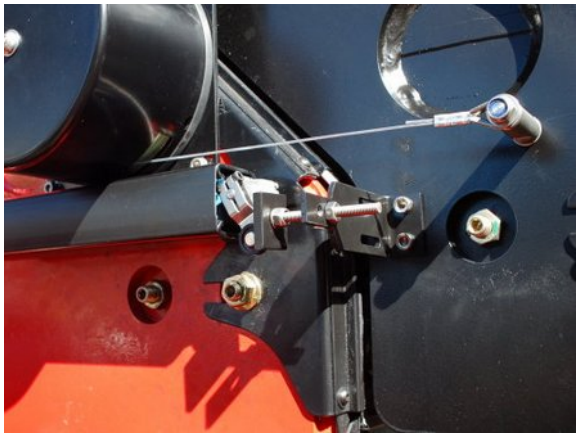
Step	Description	Diagram
3.	Drill and tap the M6 holes for the stow switch trigger bracket. Mount the stow switch trigger bracket using the supplied M6 x 12 mm bolts and washers. Adjust the length of the trigger plate to ensure the stow switch is pressed when the boom is retracted.	
4.	Connect the supplied 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 26.	

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

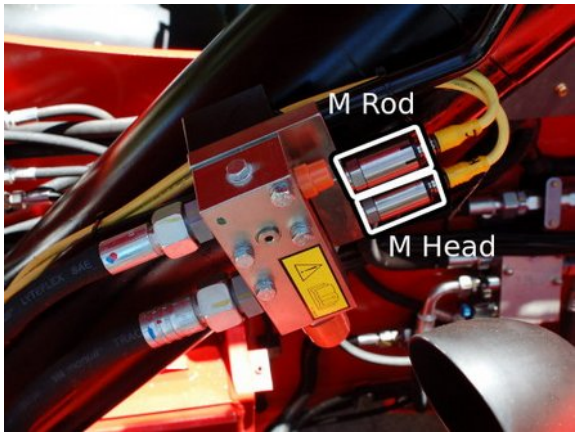
Illustration 4: Cable Reeler Mounting Position

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 26.	

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

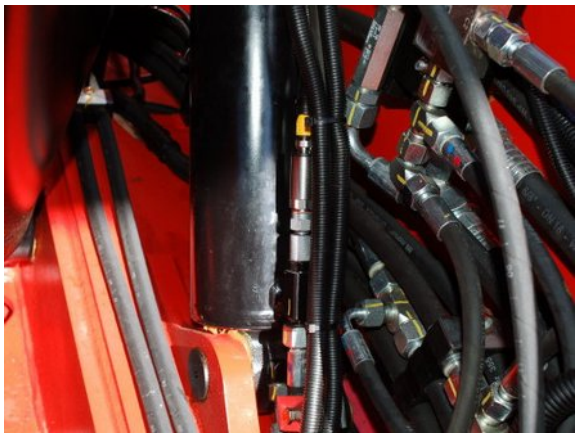
Step	*Description*	*Diagram*
1.	Install the pressure sensor with the U shaped hydraulic connection into the rod of the compensation cylinder	 View from behind the cabin towards the rear of the machine
2.	Install the head compensation pressure sensor into the compensation cylinder **Start the machine, 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 26.	 View from under the boom towards the rear of the machine

Table 6: Compensation Pressure Sensor Installation

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.	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 26.	

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.

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 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.

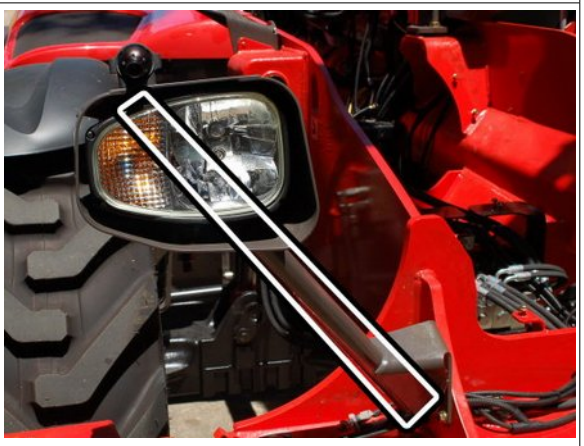
Step	*Description*	*Diagram*
1.	Drill two 7 mm holes spaced 25 mm apart on the top of the right headlight to mount the camera. Mount the camera to the top of the headlight and secure using the supplied nuts.	
2.	Connect the camera power and signal connectors to the supplied 5m camera cable (CB001032). 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 26.	

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

Signal Light Installation

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

Ensure the power supply voltage is greater than 13.5V otherwise the signal light may not illuminate correctly.

Step	*Description*	*Diagram*
1.	Mount the signal light on the top of the roof past the roof window towards the cabin door.	
2.	Run the cable towards the boom side of the roof and push through the hole near the window wiper. Note: It might be necessary to cut a hole in the plastic roof cover to fit the cable. Run the cable under the cover towards the rear corner.	

Step	Description	Diagram
3.	Run the cable along the pipes under the cover towards the chassis. Cable tie with the other cables during External Cable Completion on page 26.	

Table 9: Signal Light 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.

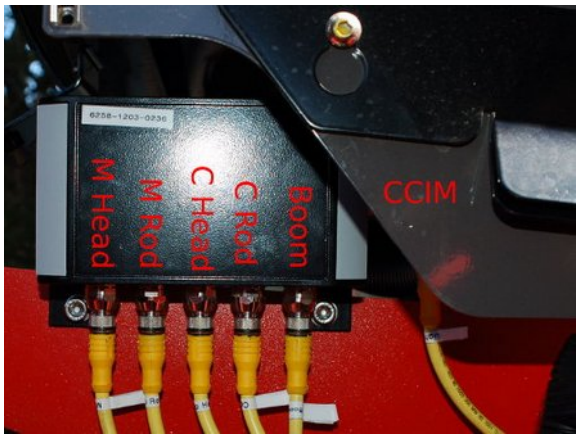
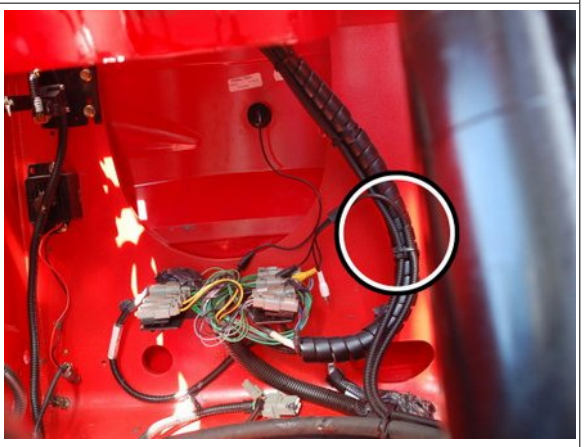
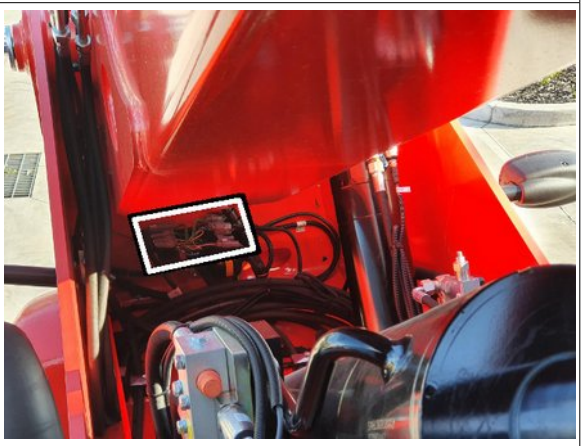
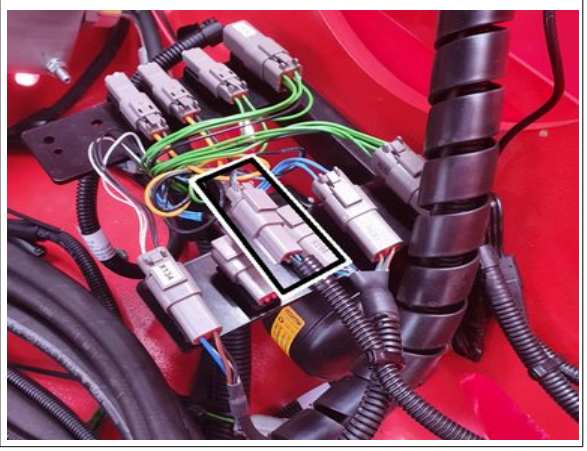
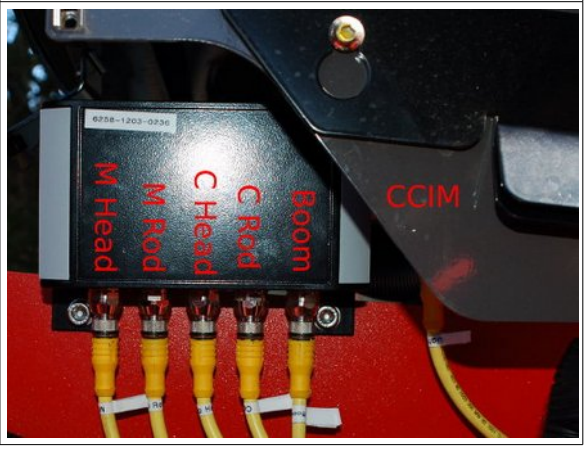
Step	*Description*	*Diagram*
1.	Drill and tap two M8 holes for the CPIM bracket in the chassis side panel. **Ensure the cover behind the cabin can still be attached.** Mount using the supplied M8 x 12mm bolts and washers.	
2.	Connect the cables for the pressure sensors and boom cable to the CPIM according to the picture shown. Note: The CCIM cable will be installed during External Cable Completion on page 26.	

Table 10: 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 run both cables up to the CPIM.	 View from under the boom towards the rear of the machine
2.	Run the cutout harness from the cabin, to the rear of the machine. Locate the solenoid connection block and find the connector X379 that is plugged into a blank connector. Remove this connector and plug it into the cutout harness.	 

Step	*Description*	*Diagram*
3.	Cable tie the pressure sensor, boom, cutout cable harness, reverse camera and signal light together up to the CPIM. Coil up the additional cabling for the pressure sensor and boom cables and store underneath the CPIM.	
4.	At the front of the machine cable tie front camera cable up to the CPIM.	
5.	Connect the supplied M12 4 metre cable (CB001026) into the free connection out of the right side of the CPIM for the CCIM cable.	

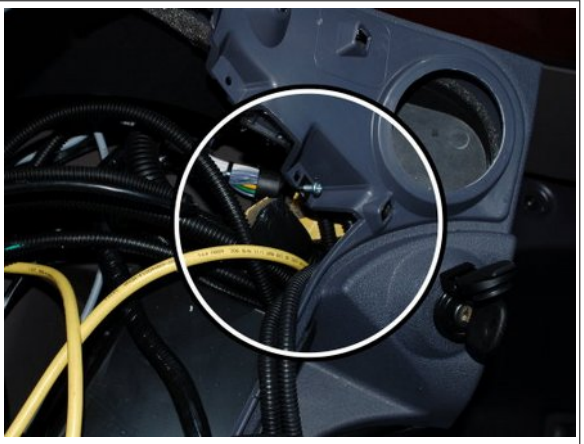
Step	*Description*	*Diagram*
6.	Run the CCIM, signal light, cutout cable harness and camera cables up through the hole into the cabin under the dashboard. Note: Pull the entire length of cable through into the cabin, excess cable will be stored under the dashboard cover in the cabin.	

Table 11: 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 bolts and nuts. Attach the display to the bracket and tighten the screw.	

Table 12: Display Installation

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

If the M12 screw lock connectors on the display are over tightened it will twist the connector pins attaching the connector to the PCB. See Appendix A: Attaching Display Connectors on page 45 for the correct method of attaching to the display connectors.

User Control

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

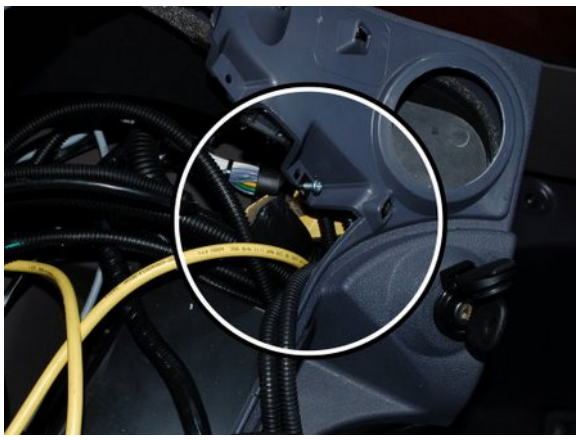
Step	*Description*	*Diagram*
1.	Drill a 40 mm hole into the cover in front of the joystick and install the user control dial. Note: Be careful while drilling not to damage the hydraulic controls positioned under the cover.	
2.	Run the cable through under the dashboard with the other cables.	

Table 13: User Input Control Installation

If the M12 screw lock connectors on the display are over tightened it will twist the connector pins attaching the connector to the PCB. See Appendix A: Attaching Display Connectors on page 45 for the correct method of attaching to the display connectors.

Can Cabin Interface Module (CCIM)

The CCIM connects the system into the machine electronics.

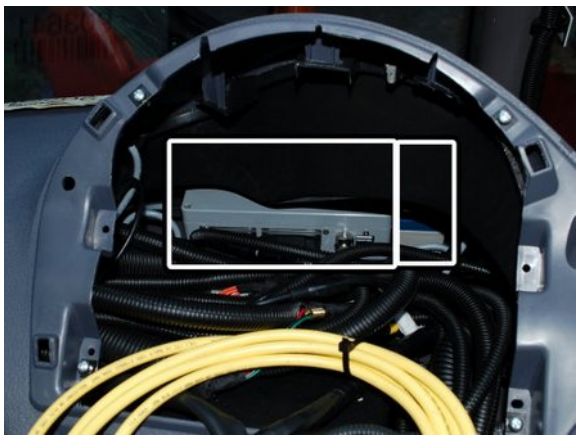
Step	*Description*	*Diagram*
1.	Position the backup battery (to the right of the CCIM) underneath the dashboard using double sided velcro tape. Position the CCIM to the left of the backup battery using double sided velcro tape. Remove the battery and CCIM from the velcro to allow the connections to be completed. Reattach to the velcro in the section Finalisation on page 34.	

Table 14: CCIM 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 signal light cables to the M12 connectors on the CCIM. Note: It doesn't matter which of the M12 connectors the CCIM and signal light cables are plugged into.	
2.	Connect the Power/Camera and IO Harnesses to the bulkhead connectors on the CCIM.	

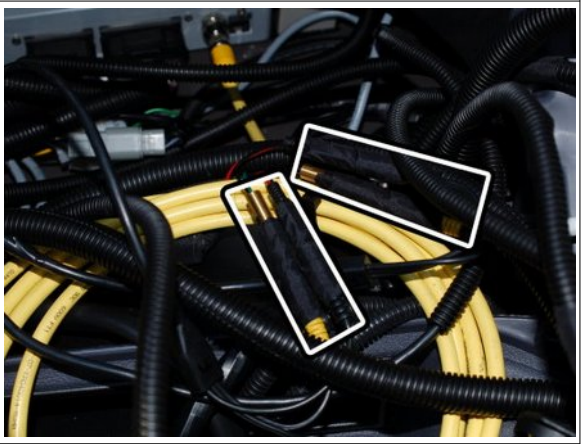
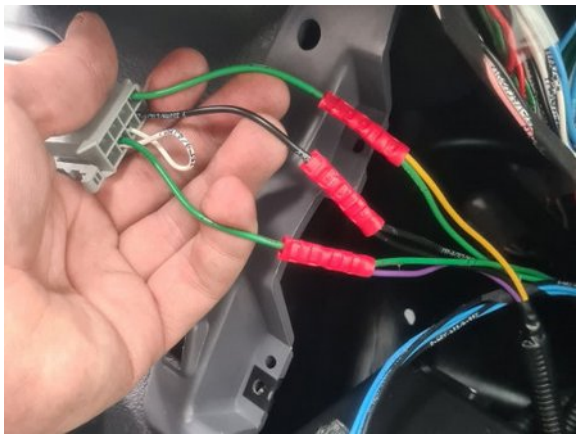
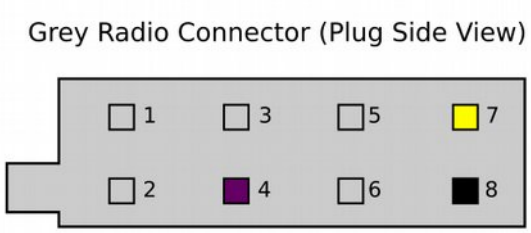
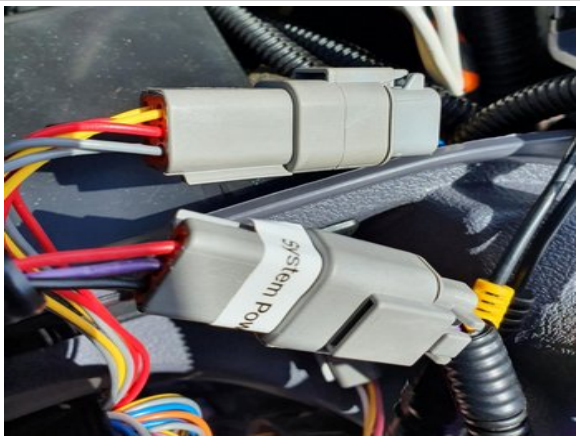
Step	Description	Diagram
3.	Connect the camera power and signal cables to the cabin loom. Note: The white connector is not used.	
4.	Run the 8 pin cable from the CCIM and the 5 pin cable from the user control through the gap between the window and the dashboard.	
5.	Run the cables through snake tube. Place cable tie points on the side of the window. Cable tie the snake tube to the cable tie points. Connect into the 8 pin and 5 pin connectors into the display	

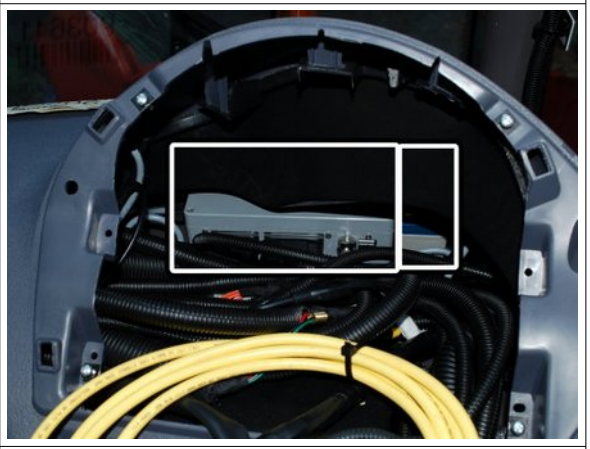
Table 15: Cabin Loom Installation

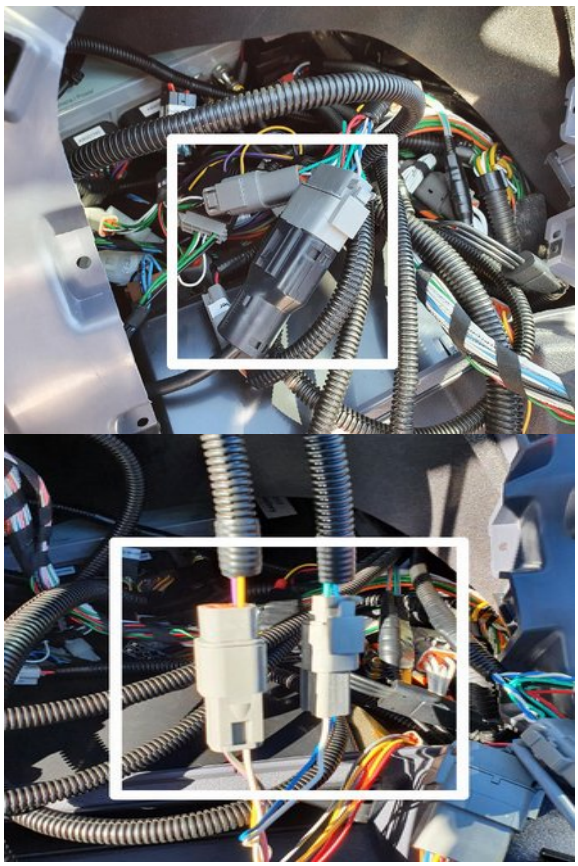
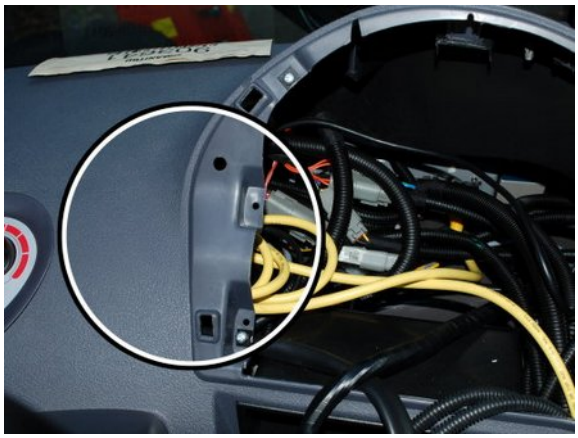
If the M12 screw lock connectors on the display are over tightened it will twist the connector pins attaching the connector to the PCB. See Appendix A: Attaching Display Connectors on page 45 for the correct method of attaching to the display connectors.

Finalisation

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

Step	*Description*	*Diagram*
1.	Splice the wires from the power connector into the grey radio power connector according to the table below. Terminal # — Wire Colour 8 — Black 4 — Violet 7 — Yellow Secure the splice joins using electrical tape Ensure the correct fuses are installed in the machine's cabin fuse box to enable the radio power.	 
2.	Connect the 6 pin and 3 pin into the cabin loom.	

Step	*Description*	*Diagram*
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.	
4.	Attach the backup battery and CCIM to the velcro strips installed earlier.	
5.	Attach the CAN I/O module near the battery using the supplied velcro.	

Step	*Description*	*Diagram*
6.	Install the T-connector from the CAN I/O module harness to connector X284. Install the 2-pin and 4-pin DTM connector from the CAN I/O module harness to the I/O harness as shown in the image.	
7.	Coil up the extra cables and store underneath the dashboard cover.	
8.	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.	

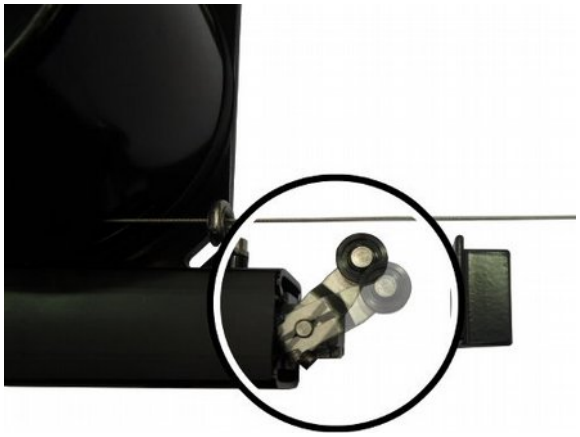
Step	*Description*	*Diagram*
9.	Adjust the display bracket for optimal viewing Set the machine into forward gear to activate the forward camera. Adjust the forward camera so the front right wheel is visible. Set the machine into reverse gear to activate the reverse camera. Adjust the reverse camera so the video is level.	
10.	Operate the boom movement controls to test if a false N07 fault occurs. If a N07 fault does occur, adjust the arm on the stow switch forwards towards the stow switch trigger. Note: The actual switch arm orientation may differ from the picture.	
11.	Perform a final check on all the cabling and sensors. Replace all the covers	

Table 16: Finalisation

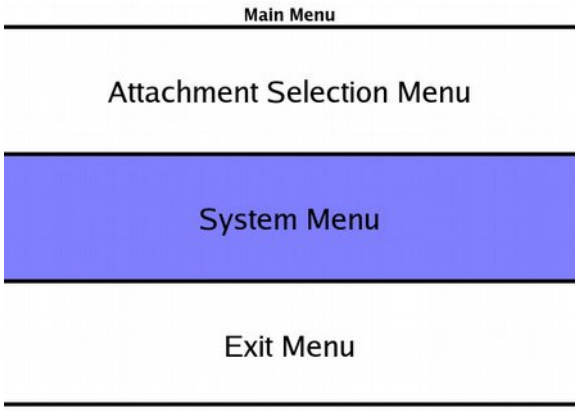
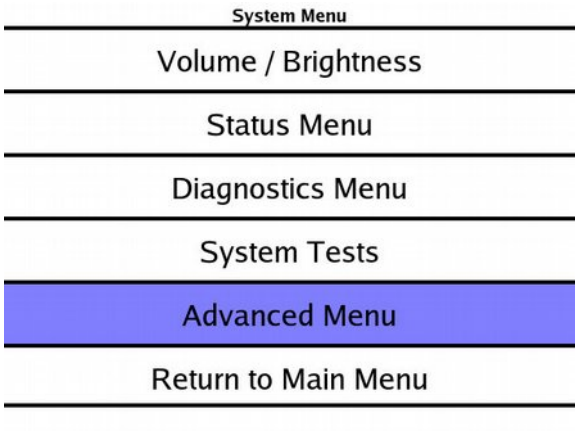
Make sure to update the machine ECU software for Australian configuration using the Manitou pad.

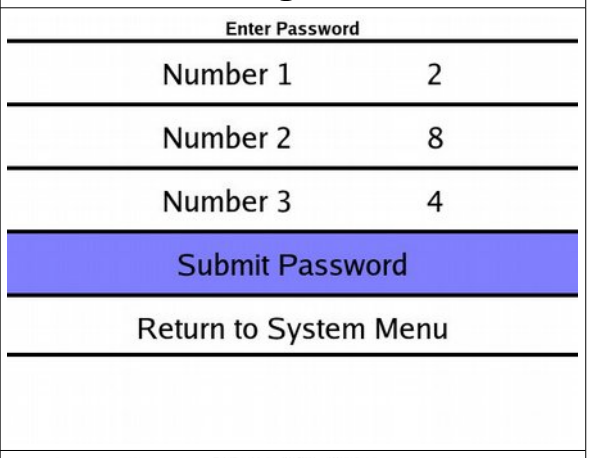
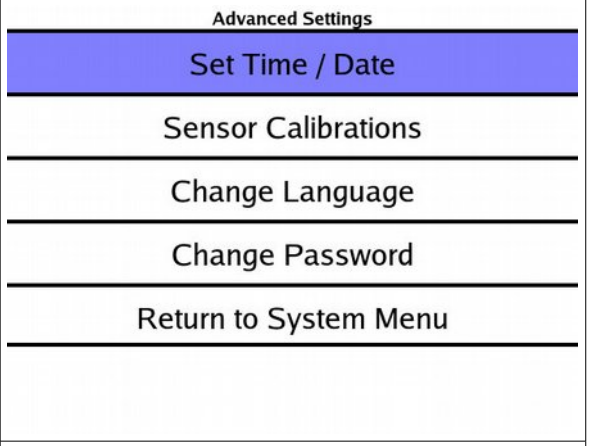
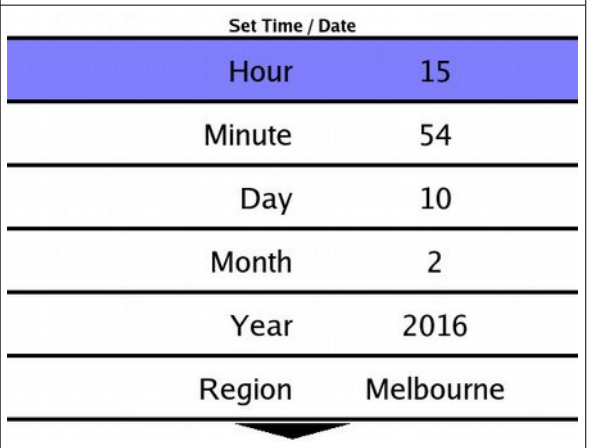
Complete the system checklist once installation has been completed.

Set Time & Sensor Calibration

Once the installation is complete, the time will need to be set and 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 Enter on the user control dial to enter the menu system. Press the arrow buttons to select System Menu. Press Enter to select the menu.	
2.	Select Advanced Menu	

Step	*Description*	*Diagram*
3.	Enter the password (Default Password: 2-8-4)	
4.	Select Set Time / Date	
5.	Enter the correct time and date for your area. Press the arrow keys to select a time/date parameter Press Enter and the parameter will change to red, press the arrow keys to change the value and then press the Enter key to store the value. Note: The hour parameter is in 24 hour clock Repeat for the rest of the time values	

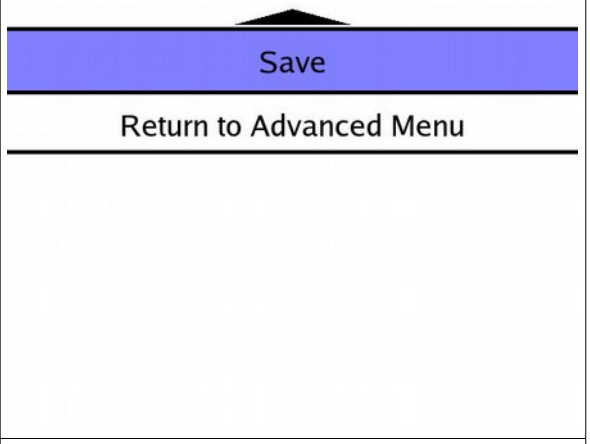
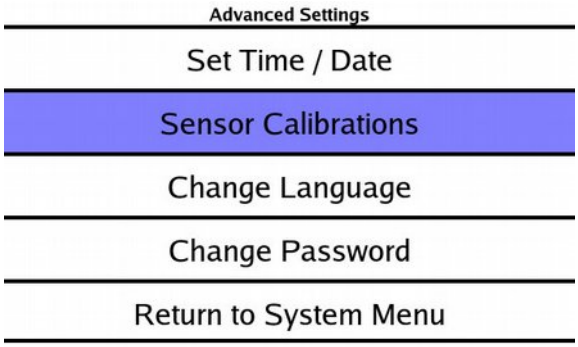
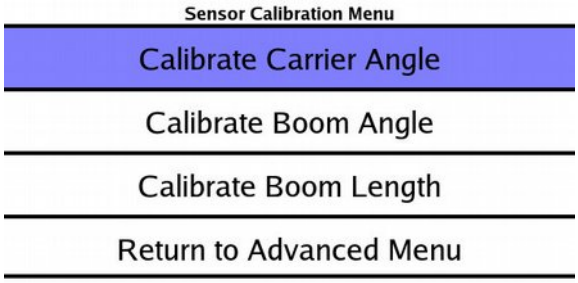
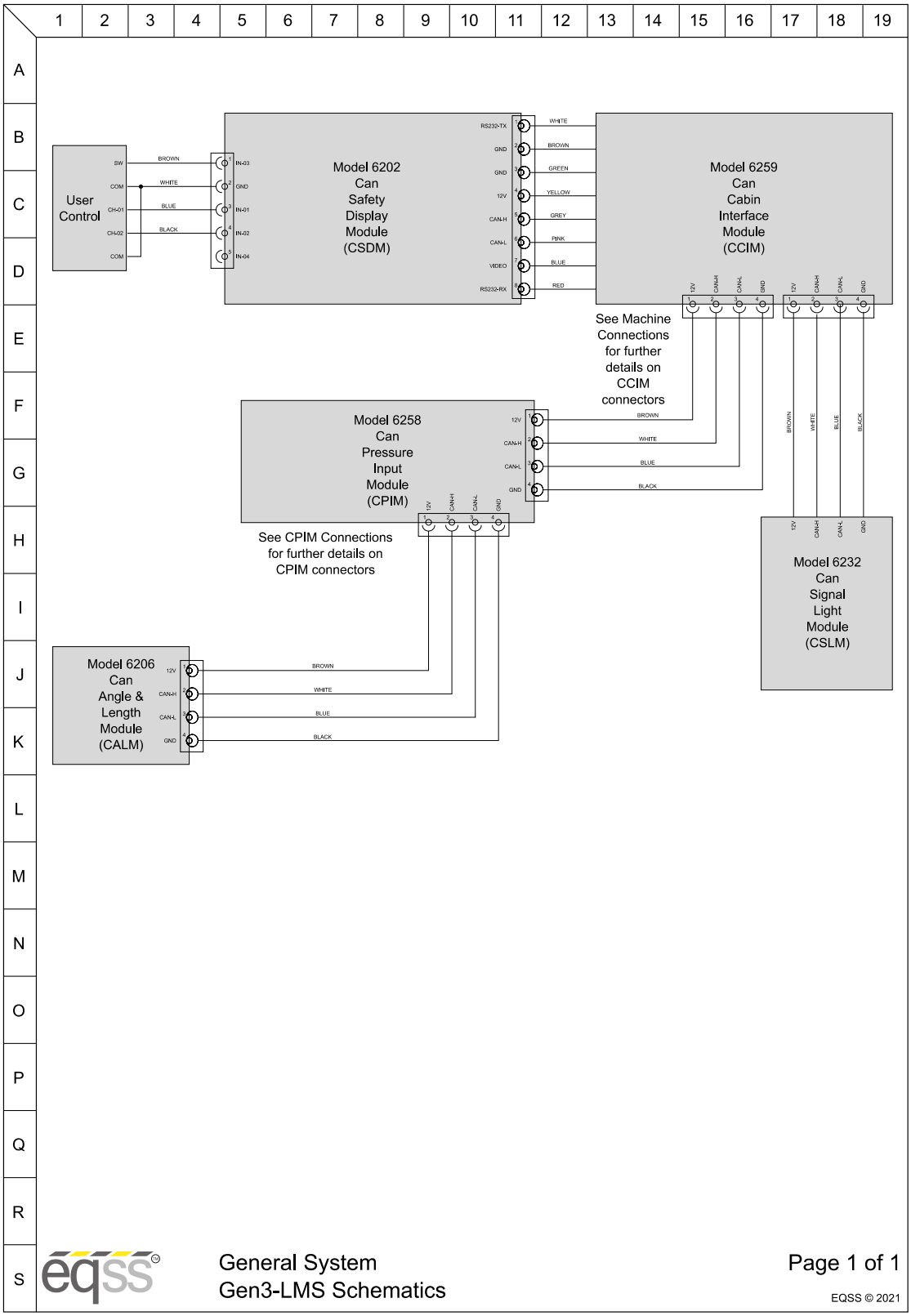
Step	Description	Diagram
6.	Scroll to the next page and select Save to store the new time/date and return to the Advanced Menu.	
7.	Select Sensor Calibrations	
8.	Select Calibrate Carrier Angle and then follow the instructions on the screen to complete the calibration. Repeat for Calibrate Boom Angle and Calibrate Boom Length.	

Table 17: Sensor Calibration

Schematics


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
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)
See CPIM Connections for further details on CPIM connectors
Model 6232 Can Signal Light Module (CSLM)
Model 6206 Can Angle & Length Module (CALM)
BROWN
WHITE
BLUE
BLACK
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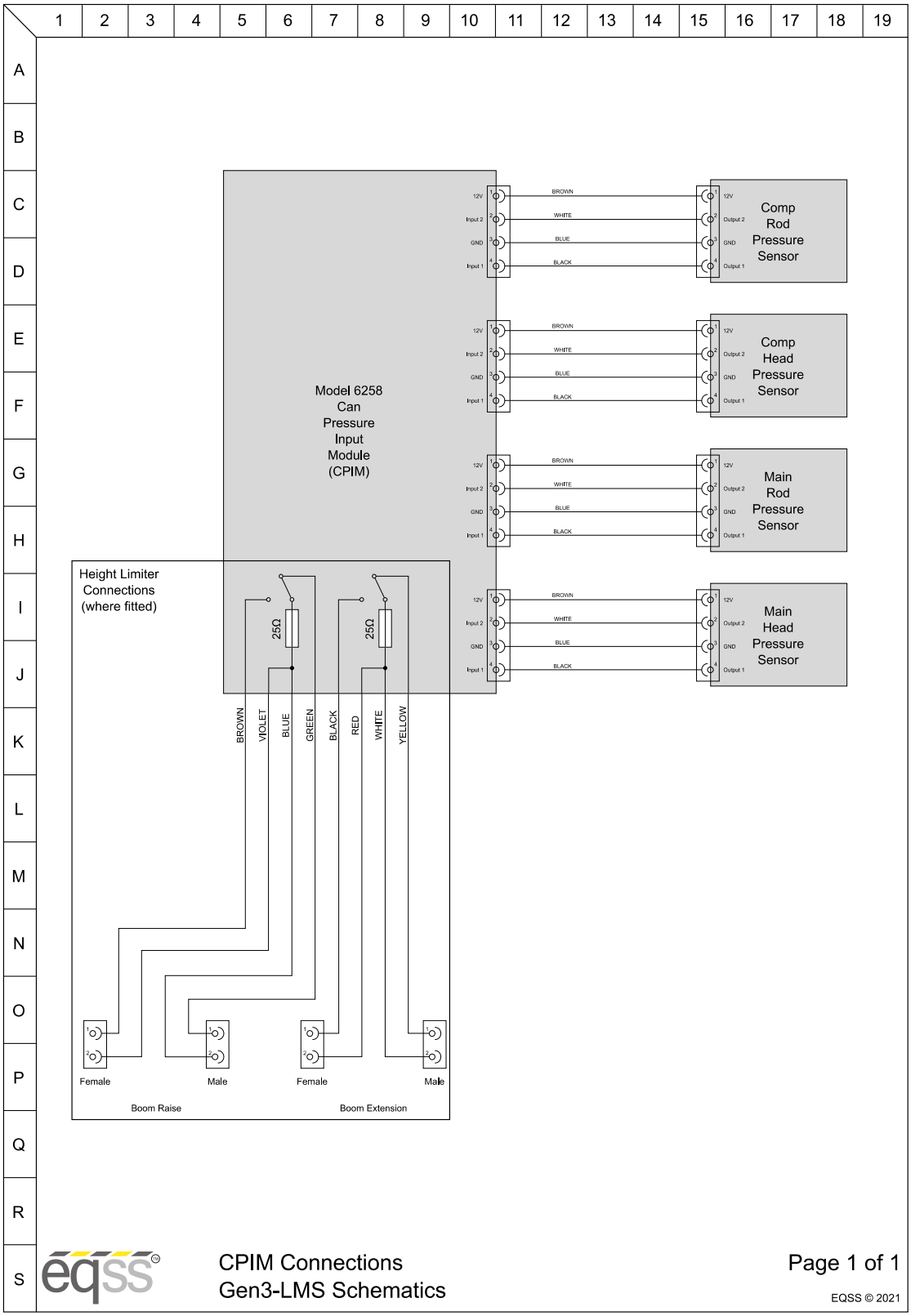
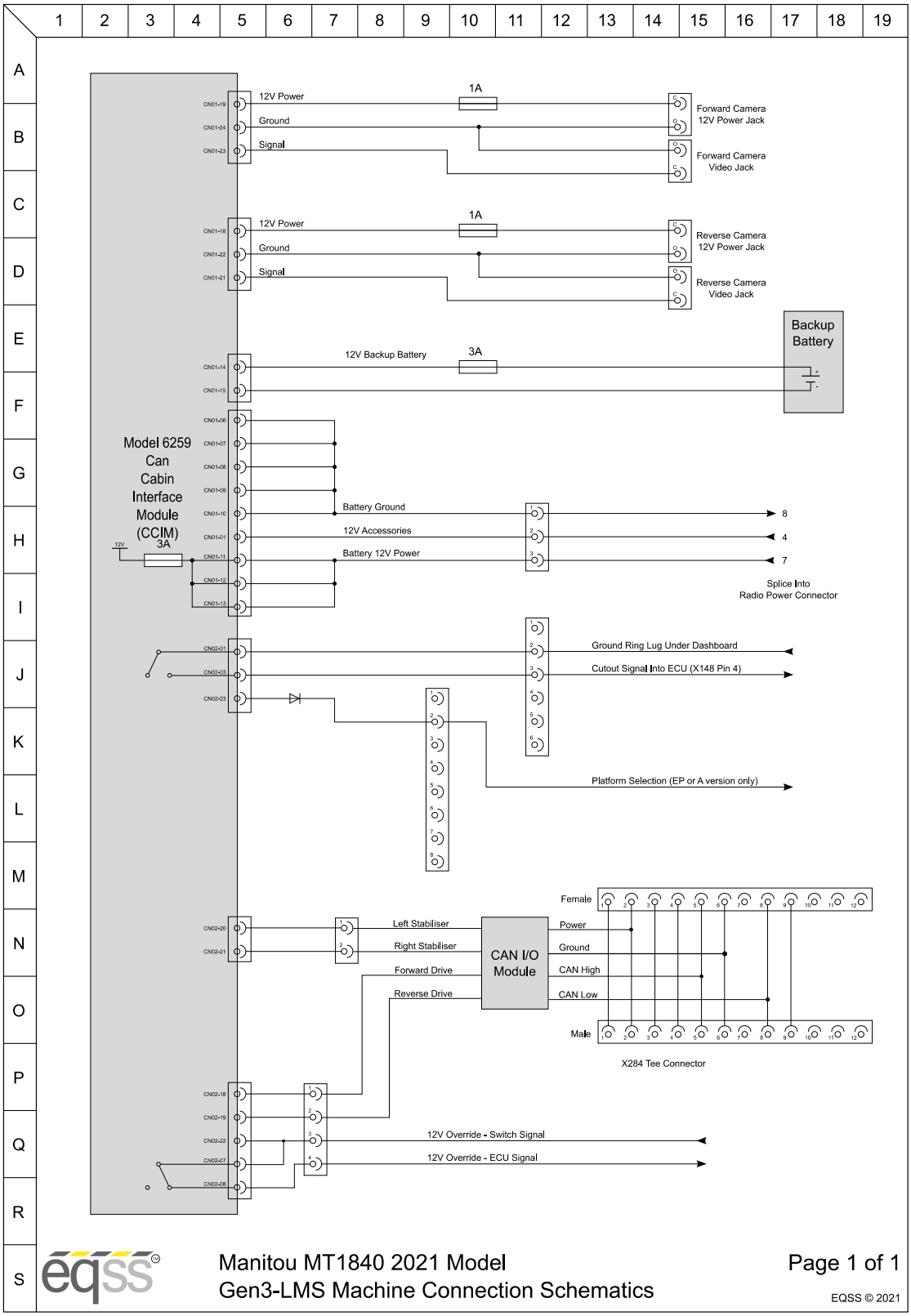

Model 6258
Can
Pressure
Input
Module
(CPIM)
12V
Input 2
GND
Input 1
BROWN
WHITE
BLUE
BLACK
Comp
Rod
Pressure
Sensor
Comp
Head
Pressure
Sensor
Main
Rod
Pressure
Sensor
Main
Head
Pressure
Sensor
Output 2
Output 1
Height Limiter
Connections
(where fitted)
25Ω
25Ω
BROWN
VIOLET
BLUE
GREEN
BLACK
RED
WHITE
YELLOW
Female
Male
Female
Male
Boom Raise
Boom Extension
CPIM Connections
Gen3-LMS Schematics
Page 1 of 1
EQSS © 2021


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
12V Power
Ground
Signal
1A
Forward Camera 12V Power Jack
Forward Camera Video Jack
Reverse Camera 12V Power Jack
Reverse Camera Video Jack
12V Backup Battery
3A
Backup Battery
Model 6259 Can Cabin Interface Module (CCIM)
Battery Ground
12V Accessories
Battery 12V Power
Splice Into Radio Power Connector
Ground Ring Lug Under Dashboard
Cutout Signal Into ECU (X148 Pin 4)
Platform Selection (EP or A version only)
Left Stabiliser
Right Stabiliser
Forward Drive
Reverse Drive
CAN I/O Module
Power
Ground
CAN High
CAN Low
Female
Male
X284 Tee Connector
12V Override - Switch Signal
12V Override - ECU Signal
Manitou MT1840 2021 Model
Gen3-LMS Machine Connection Schematics
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Appendix A: Attaching Display Connectors

The procedure below describes the correct method of attaching the cables to the screw lock connectors on the display.

> If the M12 screw lock connectors on the display are over tightened, it will twist the connector pins attaching the connector to the PCB.

Step	*Description*	*Diagram*
1.	Connect the cable from the user control to the top 5 pin connector on the display. Connect the cable from the CCIM to the bottom 8 pin connector on the display.	
2.	Line up the alignment hole on the cable connector with the alignment notch on the display connector.	

Step	*Description*	*Diagram*
3.	Push the female connector from the cable into the male connector on the display.	
4.	Rotate the nut on the female connector by hand in a clockwise direction, until the tension on the nut starts to increase.	
5.	Push the cable in again and repeat steps 3 and 4 until the connector is secure.	

Table 18: Install Display Connector Procedure

The method to correctly secure the cable is to push-twist-push-twist until the connector is fully inserted and secure. This will minimise the twisting force applied to the connector.

Below is a picture of a damaged connector on the PCB inside the display. This damaged occurred because the connector was over tightened.

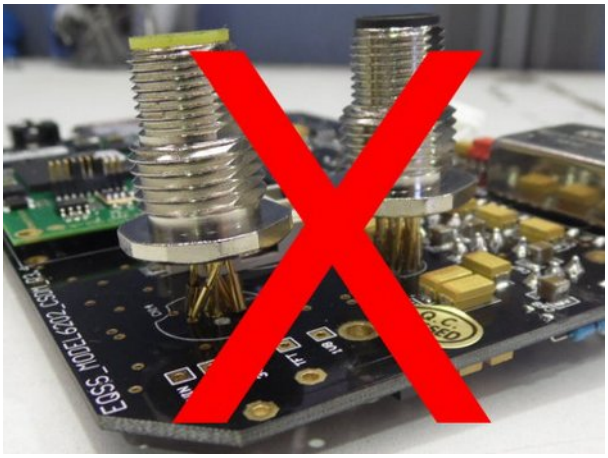

Illustration 5: Damaged Display Connector

Do not use any tools to tighten the connector.

Illustration 6: Do Not Use Tools To Tighten Connector

Do not over-tighten the nuts on the back of the display connectors. These nuts should only be hand tightened. If the nuts are overtightened it will damage the PCB inside the display.

Illustration 7: Do Not Over Tighten Nuts

Damage to the display connectors is not covered under warranty.

Indexes and Tables

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