LQS120 C650 INSTALLATION GUIDE

DOCUMENT NO.	MAN0042
REVISION	B
REVISION DATE	25/07/2023
APPROVED BY	

Contents

Disclaimer

PLB Australasia Pty Ltd trading as Liquid Systems (SA) - ph: +61 8 8357 4437
Contact information is available on the company website at www.liquidsystems.com.au.
Originally published October 2021.

1. IMPORTANT INFORMATION

1.1 About this Manual

This document provides instructions for installing the LQS120-C650 Module to John Deere C650 Air Cart.

Safety and Damage Warnings

WARNING, CAUTION and NOTE symbols are used throughout this manual to stress the importance of personal safety, potential machinery damage and useful operating information.

WARNING: Indicates the strong possibility of severe personal injury or damage to machinery if instructions are not followed.

CAUTION: Highlights hazards, unsafe or unwise practices which could cause personal injury, property damage, damage to your machinery or loss of potential crop yield if instructions are not followed

NOTE: Refers to important and useful information which should not be overlooked.

Important Safety Instructions

WARNING: Always wear protective gloves, eyewear, footwear and clothing when installing and commissioning the system.

To avoid injury, use mechanical assistance wherever necessary when lifting heavy items.

Use appropriate safety equipment when working at heights.

2. SPECIFICATIONS

2.1 About the System

The LQS120 C650 System includes components to add liquid application functionality to a John Deere C650 Cart with liquid centre tank. This includes:

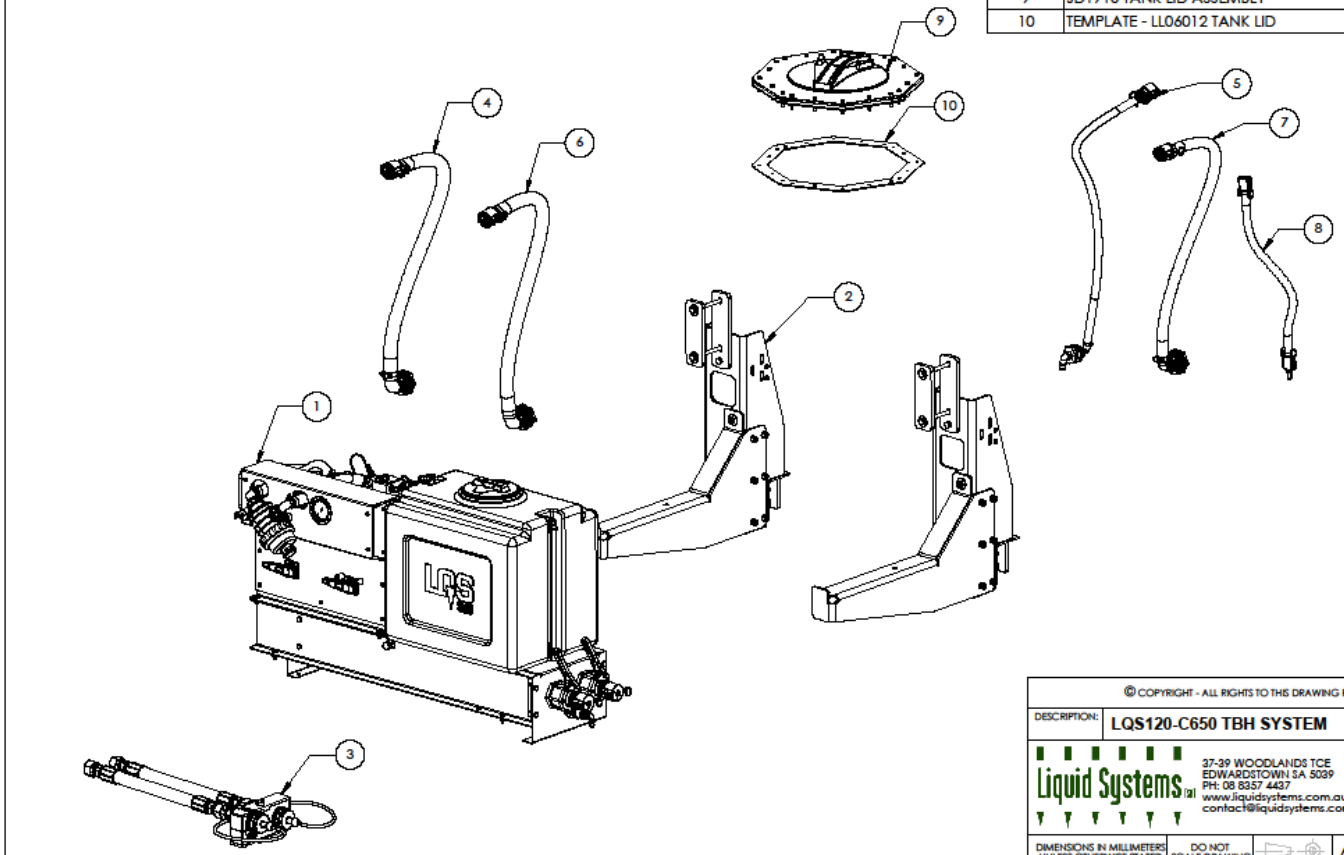
- LQS120 pump & control module (refer to LQS120 Operators Manual for specifications and operating instructions)
- 300 Litre clean water flush tank and tank fill station
- Chassis mounting kit
- Tank plumbing kit including tank lid assembly
- Hydraulic power lines

2.2 System Components

LQS120-C650 TBH System

REVISIONS			
REV.	DESCRIPTION	DATE	DRN BY
A	Drawing Release	02/06/2020	RG
B	Item 10 added	16/07/2021	DH
C	Updated item no. 2 to high clearance JD C650 Mounting Assemby - TBH	25/07/2023	FW

ITEM NO.	DESCRIPTION	PART NUMBER	QTY
1	LQS120-300 COMBINATION MODULE	LL01032	1
2	JD C650 MOUNTING ASSEMBLY - TBH	LL06018	1
3	JD C650 TBH HYDRAULICS SUPPLY HOSE KIT	LL04050	1
4	JD C650 2" TANK VENT / OVERFLOW LINE	LL04053	1
5	JD C650 1" BYPASS / AGITATION LINE	LL04054	1
6	JD C650 2" FILL / DRAIN LINE	LL04055	1
7	JD C650 1.5" PUMP SUCTION LINE	LL04056	1
8	1" UMBILICAL LINE KIT ASSEMBLY	LL04007	1
9	JD1910 TANK LID ASSEMBLY	LL06012	1
10	TEMPLATE - LL06012 TANK LID	L09009	1



DESCRIPTION: LQS120-C650 TBH SYSTEM

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MATERIAL:	N/A
COLOUR:	N/A
FINISH:	N/A
DATE:	02/06/2020
DRAWN BY:	RG
SHEET:	1 of 1
SCALE:	1:10

DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED | DO NOT SCALE DRAWING | A3

GENERAL TOLERANCES: 0 DECIMAL [0] ±0.5, 1 DECIMAL [0.0] ±0.2, 2 DECIMAL [0.00] ±0.1, [0.00] ±0.2, ANGLE ±0.2

DWG NO: LL01036 REVISION: C

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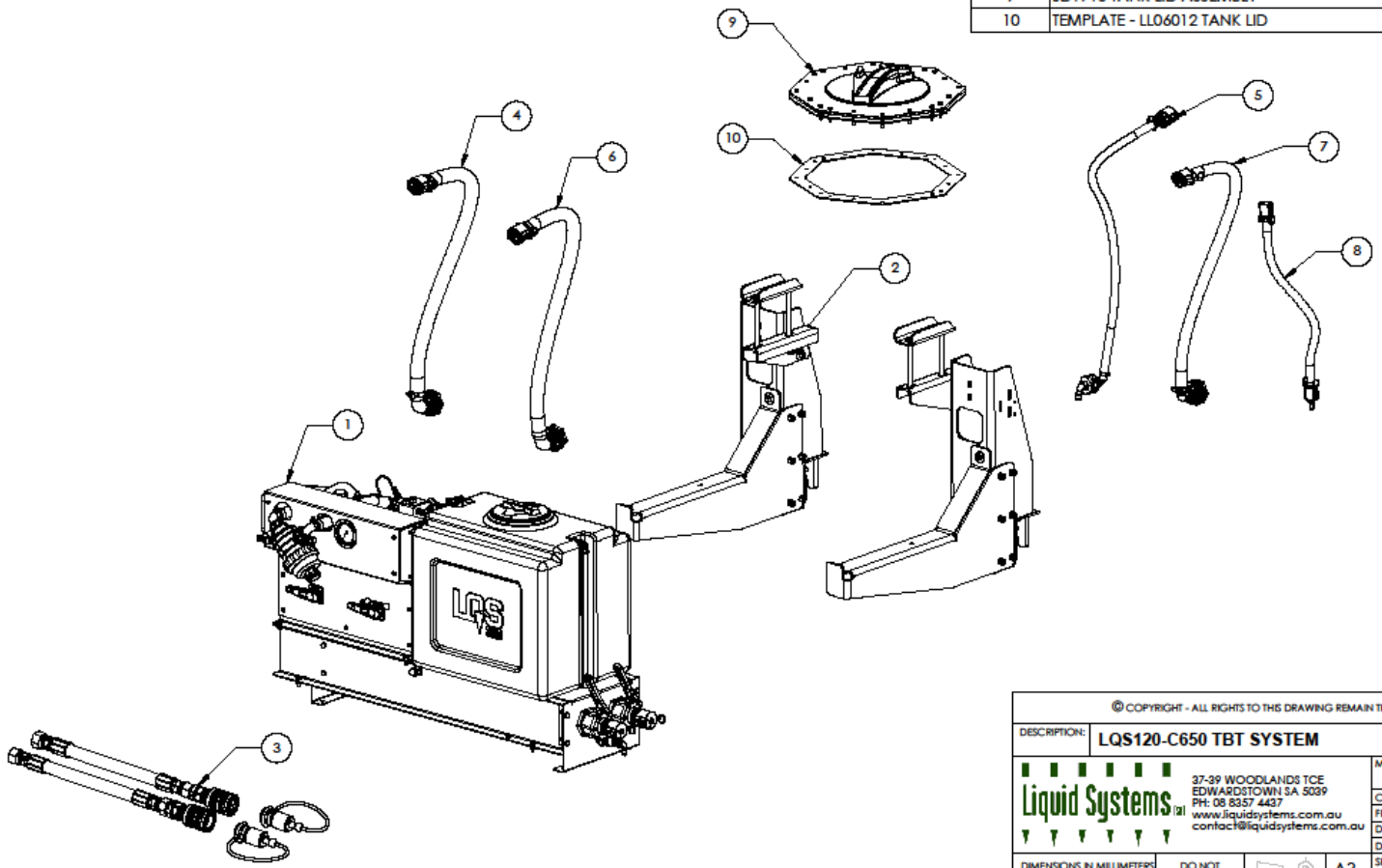
LQS120-C650 TBT System

REVISIONS			
REV.	DESCRIPTION	DATE	DRN BY
A	Drawing Release	02/06/2020	RG
B	Item 10 added	16/07/2021	DH
C	Updated item no. 2 to high clearance model JD C650 Mounting Assembly - TBT	25/07/2023	FW

ITEM NO.	DESCRIPTION	PART NUMBER	QTY
1	LQS120-300 COMBINATION MODULE	LL01032	1
2	JD C650 MOUNTING ASSEMBLY - TBT	LL06017	1
3	JD C650 TBT HYDRAULICS SUPPLY HOSE KIT	LL04057	1
4	JD C650 2" TANK VENT / OVERFLOW LINE	LL04053	1
5	JD C650 1" BYPASS / AGITATION LINE	LL04054	1
6	JD C650 2" FILL / DRAIN LINE	LL04055	1
7	JD C650 1.5" PUMP SUCTION LINE	LL04056	1
8	1" UMBILICAL LINE KIT ASSEMBLY	LL04007	1
9	JD1910 TANK LID ASSEMBLY	LL06012	1
10	TEMPLATE - LL06012 TANK LID	L09009	1



DESCRIPTION: LQS120-C650 TBT SYSTEM

Liquid Systems Pty Ltd
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MATERIAL:	N/A
COLOUR:	N/A
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DATE:	02/06/2020
DRAWN BY:	RG
SHEET:	1 of 1
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DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED | DO NOT SCALE DRAWING | A3

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DWG NO: LL01037 REVISION: C

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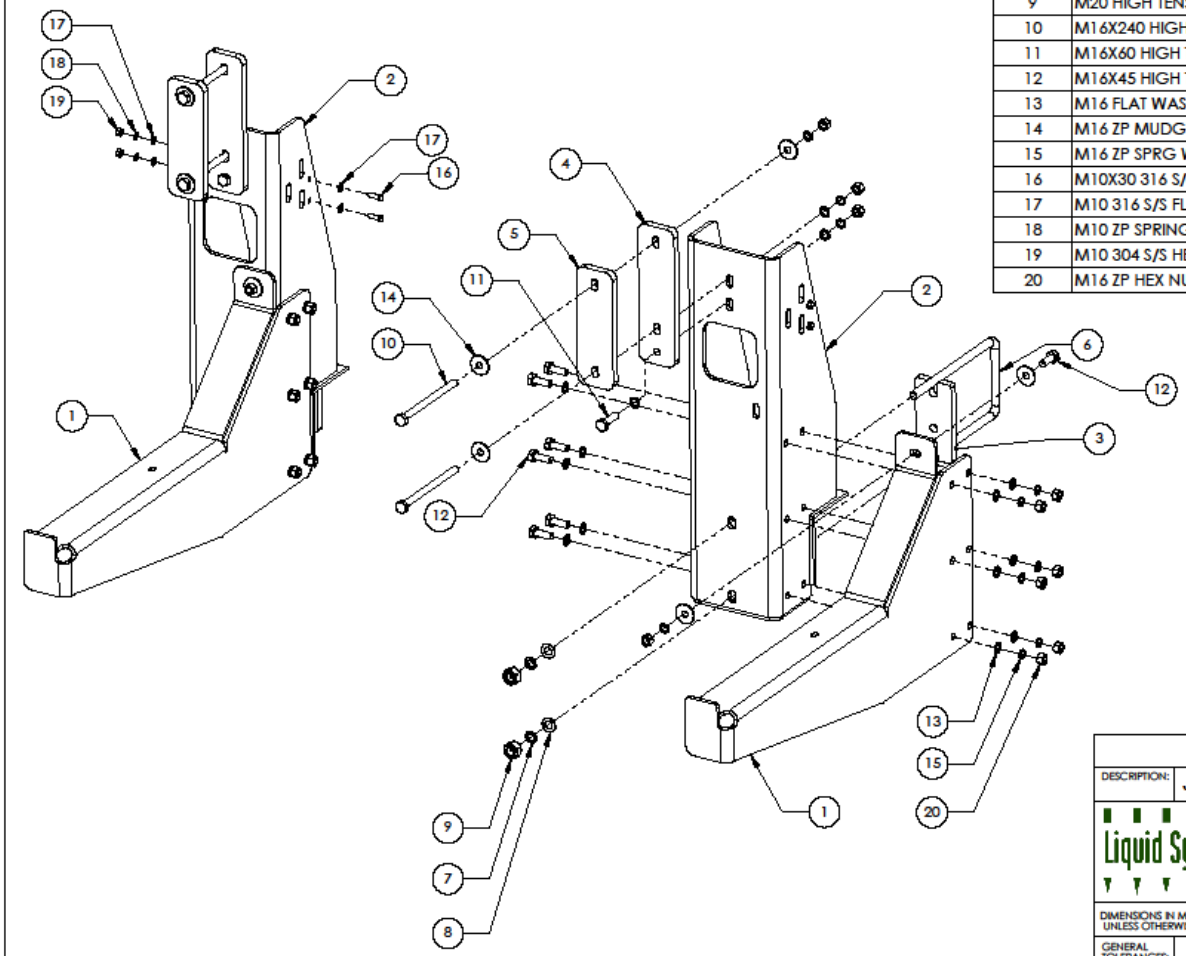
Mounting Frame Assembly – TBH Cart

REVISIONS			
REV.	DESCRIPTION	DATE	DRN BY
A	Drawing Release	24/07/2019	BJM
B	Replaced Stainless fasteners with High Tensile Zinc Plated	19/02/2020	BJM
C	Added 2 x M10 Assembly (See prt 17 - 20)	14/05/2020	RG
D	Updated item no. 2 to high clearance model	25/07/2023	FW



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	JD C650 LANDING PLATE WELDED ASSEMBLY	LL02074	2
2	JD C650 SUPPORT MOUNT WELDED ASSEMBLY	LL02072	2
3	JD C650 U-BOLT SPACER PLATE	L02122	2
4	JD C650 TBH MOUNT SPACER PLATE	L02134	2
5	JD C650 TBH MOUNT FIXING PLATE	L02135	2
6	U BOLT M20x194x375	L02131	2
7	M20 ZP SPRING WASHER	CF-20X6X4MZPSW	4
8	M20 ZP FLAT WASHER	CF-20MZPW	4
9	M20 HIGH TENSILE ZP HEX NUT	CF-20M8ZPN	4
10	M16X240 HIGH TENSILE ZP HEX BOLT	CF-16X240M10.9ZPB	4
11	M16X60 HIGH TENSILE ZP SET SCREW	CF-16X60M88ZPSS	2
12	M16X45 HIGH TENSILE ZP SET SCREW	CF-16X45M8.8ZPSS	14
13	M16 FLAT WASHER	CF-16MZPW	30
14	M16 ZP MUDGUARD WASHER	CF-16X50X3MZPW	10
15	M16 ZP SPRG WASHER FLAT SECT	CF-16X5X3.5MZPSW	20
16	M10X30 316 S/S SET SCREW	CF-10X30MG316SS	4
17	M10 316 S/S FLAT WASHER	CF-10MG316W	8
18	M10 ZP SPRING WASHER	CF-10MG316SW	4
19	M10 304 S/S HEX NUT	CF-10MG304N	2
20	M16 ZP HEX NUT	CF-16M8ZPN	20

DESCRIPTION: JD C650 MOUNTING FRAME ASSEMBLY - TBH

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MATERIAL:	Not Specified
COLOUR:	N/A
FINISH:	N/A
DATE:	24/07/2019
DRAWN BY:	BJM
SHEET:	1 of 1
SCALE:	1:10

DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED | DO NOT SCALE DRAWING | A3

GENERAL TOLERANCES: 0 DECIMAL (0) ±0.5, 1 DECIMAL (0.0) ±0.2, 2 DECIMAL (0.00) ±0.1, ANGLE (0.00) ±0.2

DWG NO: LL06018 REVISION: D

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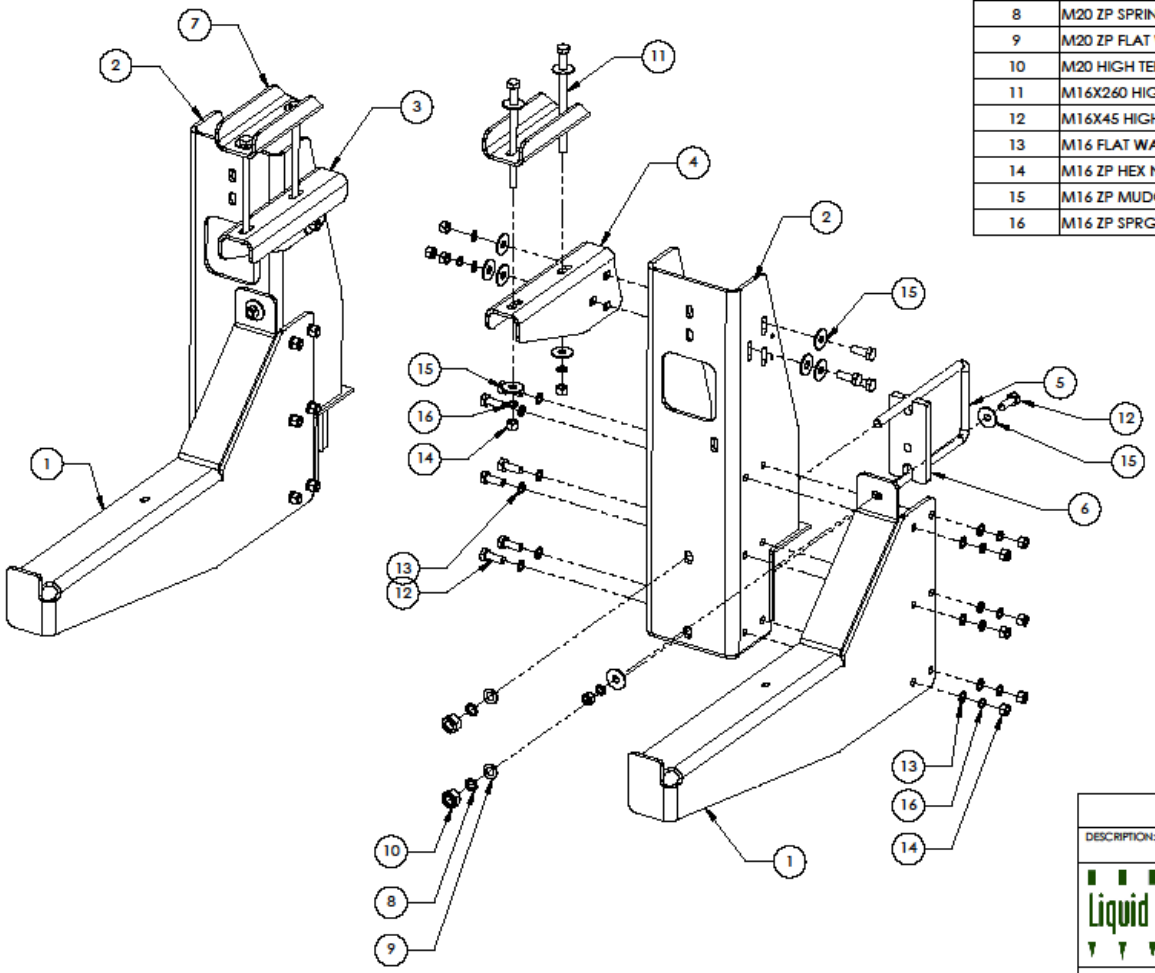
Mounting Frame Assembly – TBT Cart

REVISIONS			
REV.	DESCRIPTION	DATE	DRN BY
A	Drawing Release	28/05/2019	BJM
B	Updated part no. & description for item 14	16/06/2019	BJM
C	Replaced Stainless fasteners with High Tensile Zinc Plated	19/02/2020	BJM
D	Updated item no.2 to high clearance model	25/07/2023	FW

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	JD C650 LANDING PLATE WELDED ASSEMBLY	LL02074	2
2	JD C650 SUPPORT MOUNT WELDED ASSEMBLY	LL02072	2
3	JD C650 TBT U-BOLT BRACKET LH	L02121	1
4	JD C650 TBT U-BOLT BRACKET RH	L02130	1
5	U BOLT M20x194x375	L02131	2
6	JD C650 U-BOLT SPACER PLATE	L02122	2
7	JD C650 TBT CLAMP BRACKET	L02120	2
8	M20 ZP SPRING WASHER	CF-20X6X4MZPSW	4
9	M20 ZP FLAT WASHER	CF-20MZPW	4
10	M20 HIGH TENSILE ZP HEX NUT	CF-20M8ZPN	4
11	M16X260 HIGH TENSILE ZP HEX BOLT	CF-16X260M10.9ZPB	4
12	M16X45 HIGH TENSILE ZP SET SCREW	CF-16X45M8.8ZPSS	20
13	M16 FLAT WASHER	CF-16MZPW	24
14	M16 ZP HEX NUT	CF-16M8ZPN	24
15	M16 ZP MUDGUARD WASHER	CF-16X50X3MZPW	24
16	M16 ZP SPRG WASHER FLAT SECT	CF-16X5X3.5MZPSW	24



DESCRIPTION: JD C650 MOUNTING FRAME ASSEMBLY - TBT

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DRAWN BY:	BJM
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SCALE:	1:10

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DWG NO: LL06017 REVISION: D

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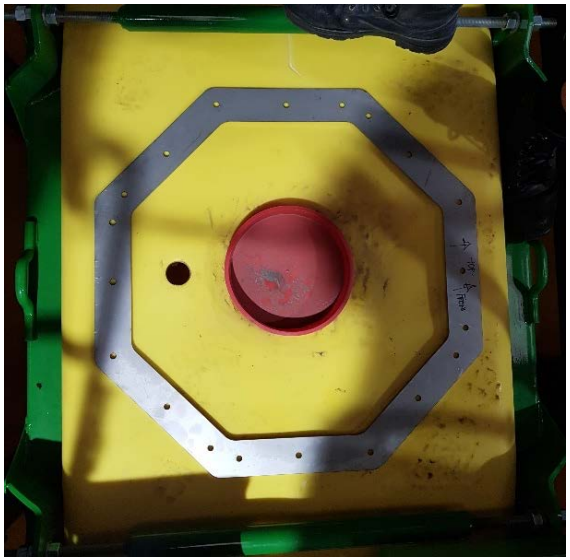
3. INSTALLATION

3.1 Cut Tank Holes & Install Tank Fittings

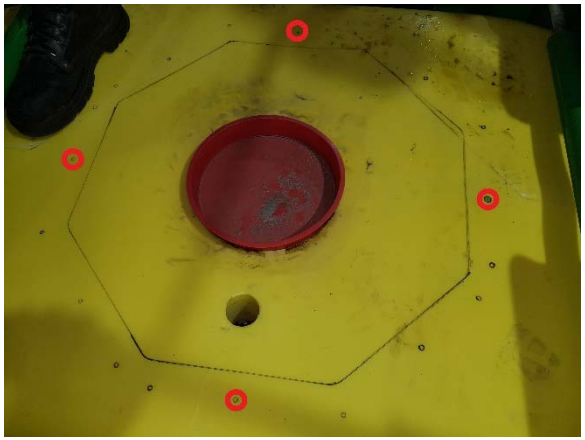
3.1.1 Cut Tank Lid Holes

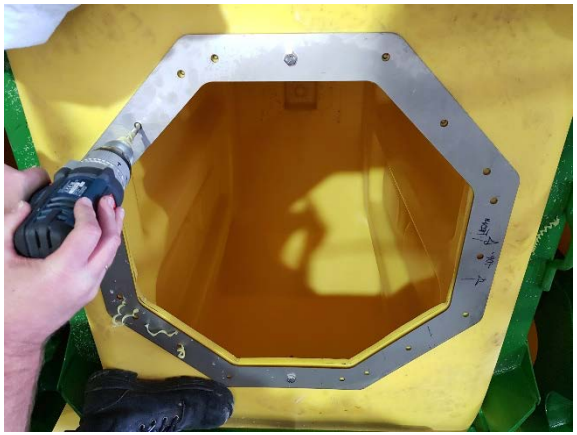
Place the cut-out template centrally on top surface of the tank (with the lid to open away from the walkway).



Trace around the internal octagon and 4 holes (90 degrees apart).

Remove the template and drill 4 marked holes using Ø11mm drill bit.





Replace the template on the tank and insert M10 bolts in the 4 holes to locate the template in the correct position.

Cut along the octagon trace to create an opening for the lid.

Drill remaining holes on the tank using Ø11 mm drill bit.

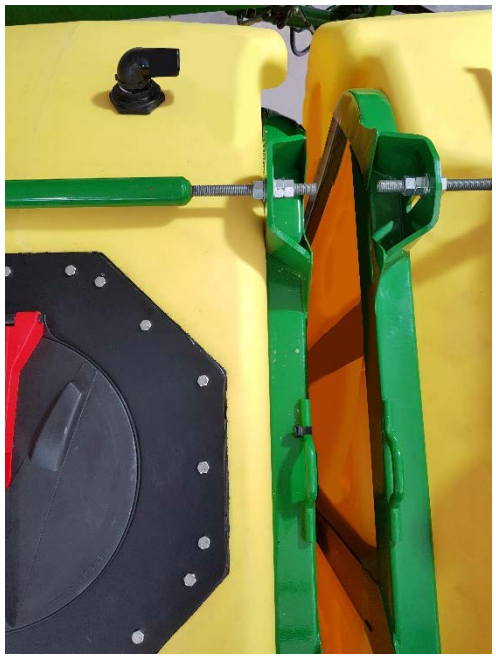
Remove any sharp edges / swarf from the opening.

CAUTION: DO NOT ATTACH TANK LID AT THIS STAGE.
Install all tank fittings before attaching tank lid. Access into tank is required to install tank fittings.

3.1.2 Tank Vent Fitting

- Mark a spot approx. 250 mm from both the side of tank and tie rod and cut a Ø76 mm hole using a hole saw.
- Remove any sharp edges / swarf from the cut.

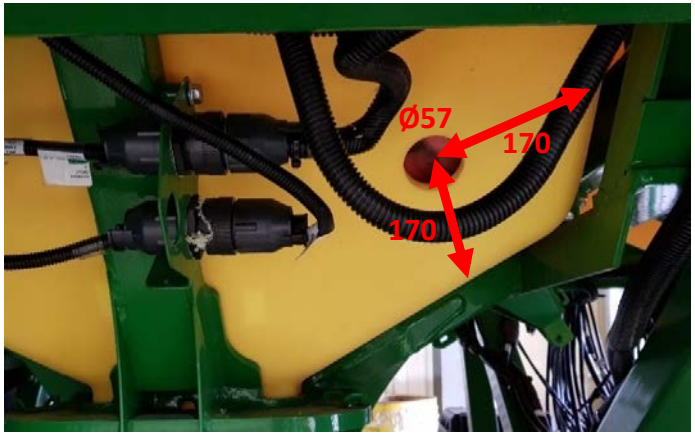
- Insert tank fitting into the hole from inside of tank and tighten the lock nut (from outside the tank).

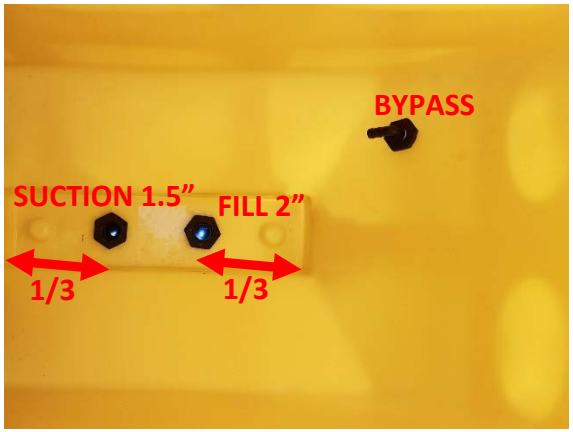


Cut all 4 holes first (see following pages) before getting inside the tank to minimise time spent inside

3.1.3 Bypass/Agitation Fitting

- Mark a spot approx. 170 mm from both the side and bottom of tank and cut a Ø57 mm hole using a hole saw.
- Remove any sharp edges / swarf from the cut.
- Insert tank fitting into the hole and tighten the lock nut. Connect hose tail inside the tank, pointing towards the bottom of tank, but away from the sump.





3.1.4 Tank Fill & Pump Suction Fittings

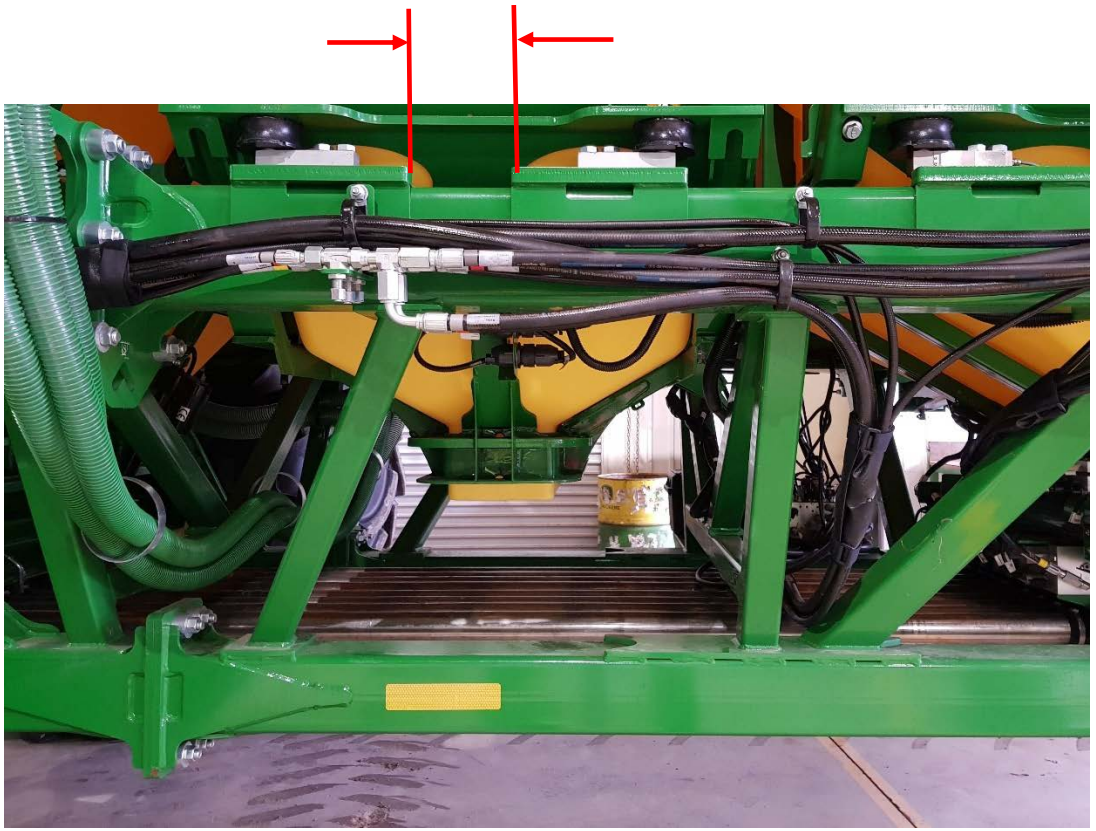
- Mark spots 1/3 distance in from the ends of the rectangular bottom surface of tank.
- Cut 2 x Ø76 mm holes using a hole saw.
- Remove any sharp edges / swarf from the cut.
- Insert tank fitting into the holes and tighten the lock nut.
- Attach right angle hose tails on outside of tank fitting

Clean swarf and other debris from inside the tank before getting out.

3.2 Install Mounting Frame Assembly – TBH Cart

LHS Support Frame - Preparation

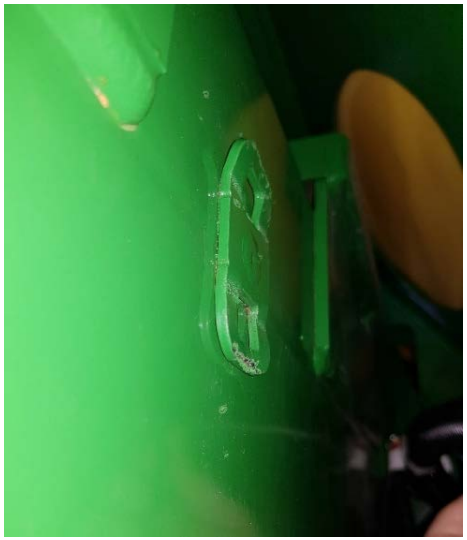
Frame is to be mounted centrally between the two gusset plates welded to the top chassis rail in front of the liquid tank.



- Unbolt the electrical connector bracket from the liquid tank frame.

- Untie electrical cables along the back of top chassis rail by cutting cable ties.

- Flatten any metal retaining brackets welded to the back of top chassis rail.



LHS Support Frame – Installation

Tie a sling thru the square hole on the Support Mount and place it over the top chassis rail to help with lifting.

- Lift Support Mount (LL02072) onto the bottom chassis rail with the top portion of the mount behind the top chassis rail. Locate the Mount in the centre of space between the two gusset plates on the top chassis rail.

- Lean the top of Support Mount away from the top chassis rail and slide a Spacer Plate (L02134) up between the Mount and the top chassis rail.

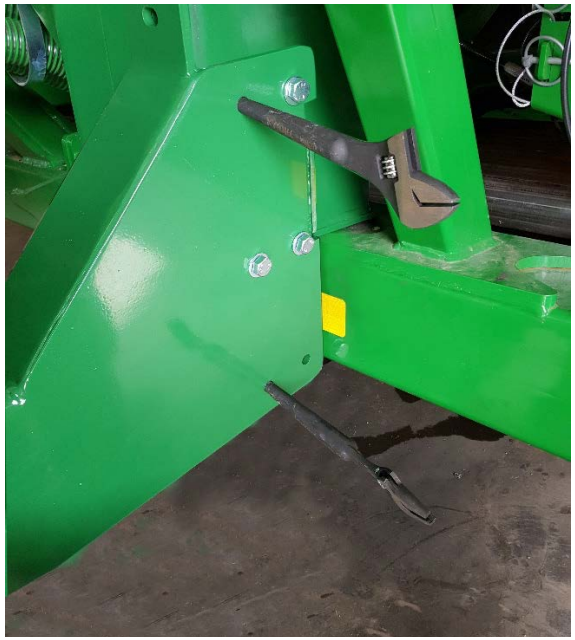
- Insert a M16X60 bolt into the bottom hole on the Spacer Plate and tighten – ensure the Plate is vertical.

- Check the Spacer Plate is centred between the gusset plates. Manoeuvre the Support Mount into position if required.

- Place a Fixing Plate (L02135) in front of top chassis rail. Assemble to Spacer Plate using 2 X M16X240 bolts and tighten.

- Place a U-Bolt Spacer Plate (L02122) behind the bottom chassis rail and assemble to Support Mount using M20 U-bolt.

- Assemble Landing Plate (LL02074) to Support Mount using 7 X M16X45 bolts.



Use Podger bars to help with aligning of bolt holes

- Assemble electrical connector bracket removed earlier to Support Mount using 2 X M10X30 bolts.

RHS Support Frame - Preparation

- Untie electrical cables along the back of top chassis rail by cutting cable ties.
- Flatten any metal retaining brackets welded to the back of top chassis rail.

RHS Support Frame – Installation

- Measure 1125 mm from the inside edge of LHS Support Mount and place a texta mark on the bottom chassis rail.

- Lift Support Mount (LL02072) onto the bottom chassis rail with the top portion of the Mount behind the top chassis rail. Place the inside edge of the Mount on the texta mark.

- Lean the top of Support Mount away from the top chassis rail and slide a Spacer Plate (L02134) up between the Mount and the top chassis rail.

- Insert a M16X60 bolt into the bottom hole on the Spacer Plate and tighten – ensure the Plate is vertical.

- Ensure Support Mount is still in position. Place a Fixing Plate (L02135) in front of top chassis rail. Assemble to Spacer Plate using 2 X M16X240 bolts and tighten.

- Place a U-Bolt Spacer Plate (L02122) behind the bottom chassis rail and assemble to Support Mount using M20 U-bolt.

- Assemble Landing Plate (LL02074) to Support Mount using 7 X M16X45 bolts.

Support Frames mounted onto TBH Chassis

3.3 Install Mounting Frame Assembly – TBT Cart

LHS Support Frame - Preparation

Frame is to be mounted centrally in the space between the two vertical support beams.

- Move electrical cables at the back of top chassis rail out of the way if required by cutting cable ties.

LHS Support Frame – Installation

- Lift Support Mount (LL02072) onto the bottom chassis rail with the top portion of the mount behind the top chassis rail. Locate the Mount in the centre of space between the two vertical support beams.

Tie a sling thru the square hole on the Support Mount and place it over the top chassis rail to help

- Assemble LH U-bolt Bracket (L02121) to the right-hand side of Support Mount using 3 X M16X45 bolts and tighten until they touch but still allow sliding movement.

- Place Clamp Bracket (L02120) on the top surface of top chassis rail and assemble to LH U-bolt Bracket below using 2 X M16X260 bolts and finger tighten.

- Place a U-Bolt Spacer Plate (L02122) behind the bottom chassis rail and assemble to Support Mount using M20 U-bolt and finger tighten.

- Ensure there is no interference between Mounting Frame Assembly and surrounding electrical and/or hydraulic lines and fittings and tighten M20 U-bolt to Support Mount.

- Tighten 2 X M16X260 bolts between the Clamp Bracket and LH U-bolt Bracket. Ensure there is sufficient clearance (5 mm minimum) between the back of bracket and the tank frame.

- Tighten 3 X M16X45 bolts between LH U-bolt Bracket and the Support Mount.

- Assemble Landing Plate (LL02074) to Support Mount using 7 X M16X45 bolts.

Use Podger bars to help with aligning of bolt holes

RHS Support Frame – Preparation

- Move electrical cables at the back of top chassis rail out of the way if required by cutting cable ties.

RHS Support Frame – Installation

- Measure 980 mm from the inside edge of LHS Support Mount and place a texta mark on the bottom chassis rail.

- Lift Support Mount (LL02072) onto the bottom chassis rail with the top portion of the mount behind the top chassis rail. Place the inside edge of the Mount on the texta mark.

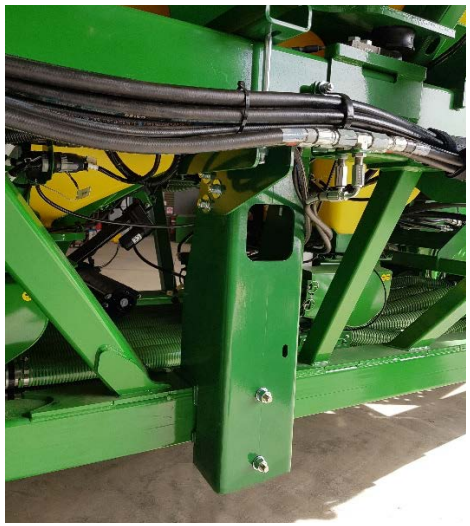
Tie a sling thru the square hole on the Support Mount and place it over the top chassis rail to help

- Assemble RH U-bolt Bracket (L02130) to the left-hand side of Support Mount using 3 X M16X45 bolts and tighten until they touch but still allow sliding movement.

- Place Clamp Bracket (L02120) on the top surface of top chassis rail and assemble to RH U-bolt Bracket below using 2 X M16X260 bolts and finger tighten.

- Place a U-Bolt Spacer Plate (L02122) behind the bottom chassis rail and assemble to Support Mount using M20 U-bolt and finger tighten.

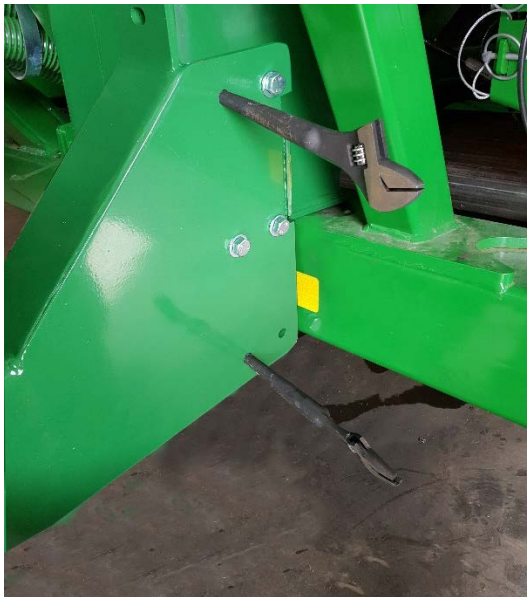
- Ensure there is sufficient clearance between Mounting Frame Assembly and surrounding electrical and/or hydraulic lines and fittings and tighten M20 U-bolt to Support Mount.



- Tighten 2 X M16X260 bolts between the Clamp Bracket and RH U-bolt Bracket. Ensure there is sufficient clearance (5 mm minimum) between the back of bracket and the tank frame.

- Tighten 3 X M16X45 bolts between RH U-bolt Bracket and the Support Mount.

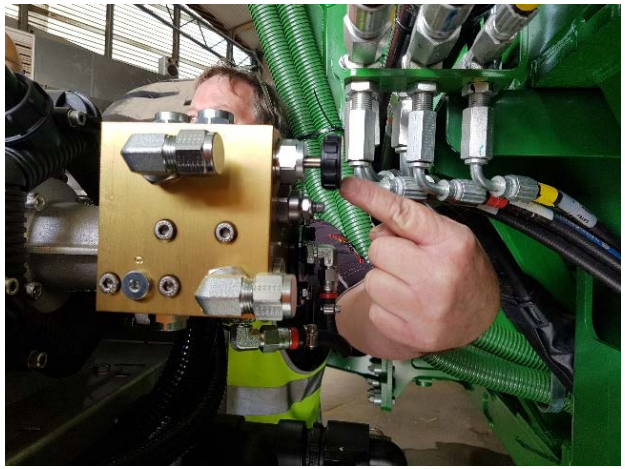
- Assemble Landing Plate (LL02074) to Support Mount using 7 X M16X45 bolts.



Support Frames mounted onto TBT Chassis

3.4 Install Module onto Mounting Frames

- Use a forklift to lift LQS Module onto the mounting frames. Ensure there is no contact between the Module and the cart during lifting to avoid damaging the Module.



- Align mounting holes and assemble Module to the frames using 4 X M12X35 bolts.

If required, loosen bolts holding RHS Landing Plate to Support Mount to bring Module into alignment with the frames. Re-tighten bolts

3.5 Connect Liquid Lines

3.5.2 Connect Tank Vent Line

- Push hose end over the 2” hose tail and tighten clamp.
- Route the hose down the cart in the space between tanks to overflow connection port on left side of module. Cut to length.
- Attach hose to 2” coupler with clamp.
- Connect coupler to overflow connection port.

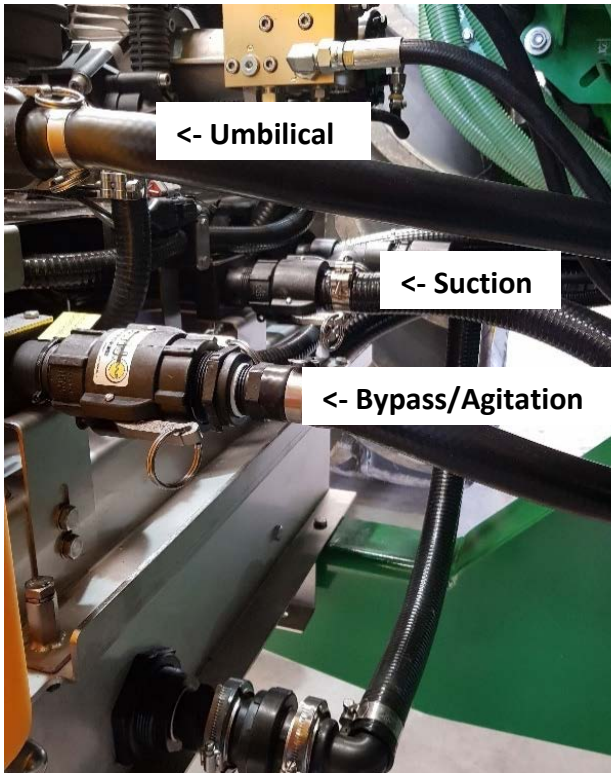
3.5.3 Connect Tank Fill Line

- Push 2” hose end over the hose tail and tighten clamp.
- Route hose to fill connection port on left side of module. Cut to length.
- Attach hose to 2” coupler with clamp.
- Connect coupler to fill connection port.

For easier attachment, heat ends of hoses with hot water or hot air before pushing onto hose barbs.

3.5.4 Connect Bypass/Agitation Line

- Push hose end over the hose tail and tighten clamp.
- Route hose to Bypass port at rear of module. Cut to length.
- Attach hose to coupler and tighten with clamp.
- Attach coupler to module.



3.5.5 Connect Product Suction Line

- Push hose end over the hose tail and tighten clamp.
- Route hose to Product Suction port at rear of module. Cut to length.
- Attach hose to coupler and tighten with clamp.
- Attach coupler to module.

3.5.6 Connect Umbilical Line

- Umbilical Line connects the Module to the Stacker distribution system.
- Push hose end over the hose tail of camlock coupling and tighten clamp.
- Run the hose along the route to Stacker Induction Filter and cut to length.
- Push hose end over the hose tail of camlock coupling and tighten clamp.

3.6 Attach Tank Lid

Ensure all activities to be done from inside the tank are complete before proceeding with this step as access will be impossible once the lid is assembled to the tank.

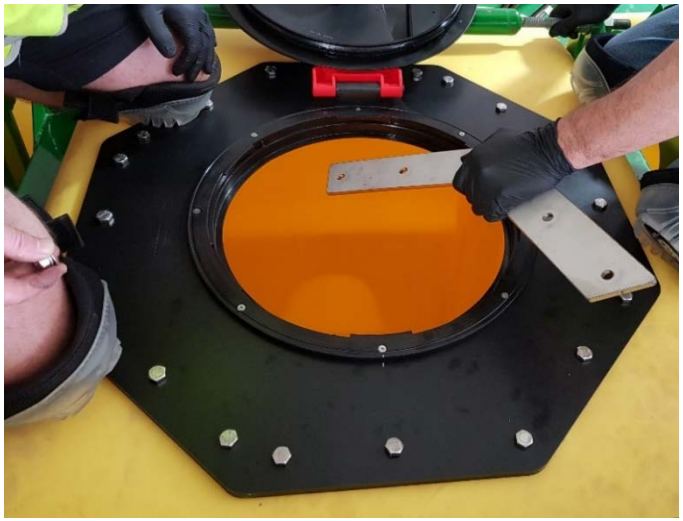
3.6.2 Test Tank Fittings for Leaks

- Fill tank with water to level above tank fittings in lower part of tank
- Check tank fittings for leaks and reseal where necessary

3.6.3 Attach Lid

- Apply a continuous bead of Sikaflex sealant around and between holes.
- Place the lid over the opening and place bolts in the holes.

- Hold a backing plate under matching section of lid.
- Push the centre bolt thru the plate and finger tighten.
- Push thru and finger tighten remaining bolts.
- Repeat for the other 3 backing plates.
- Tighten all bolts.



- Apply a bead of Sikaflex sealant around the edge of lid. Smooth bead to ensure a sound seal between lid and the tank

Wear disposable gloves to prevent getting Sikaflex sealant on hands

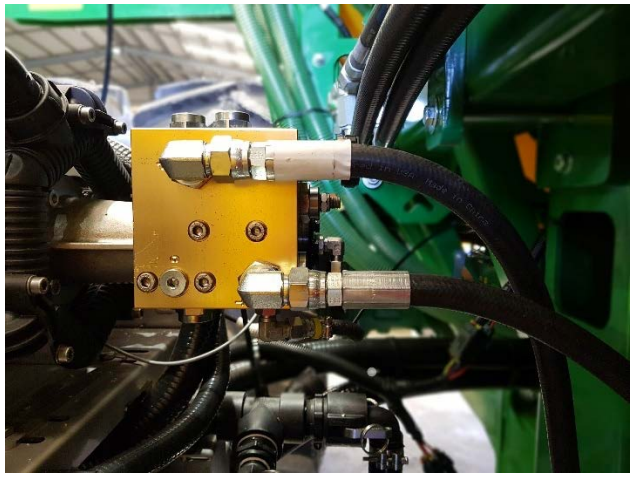
3.7 Install Hydraulic Hoses

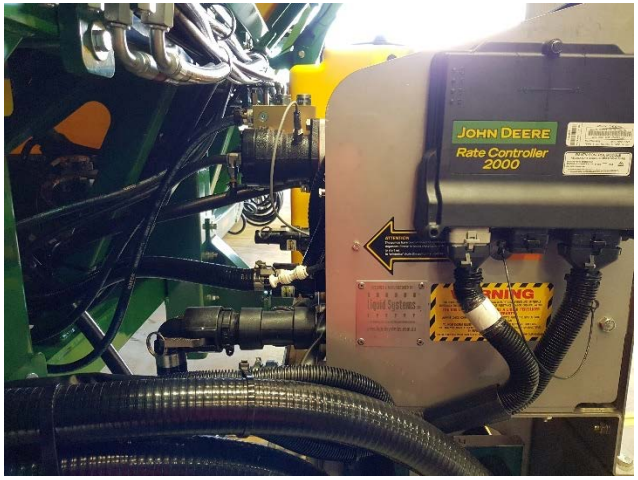
3.7.2 TBH Cart

- Mount breakaway bracket on existing hydraulic bracket on the front hitch (using existing hex. nut).

- Insert female quick release couplings into the bracket and route hoses back to the Module along existing hydraulic hose run on the chassis.

- Assemble the other end of hoses to mating nipples on the hydraulic flow control block on the Module. Inlet port is marked with a **P** and outlet port is marked with a **T** on the block. Do not cable tie last ~2 metres of hose to the chassis to allow the Module to swing out freely on the pivot pin.





- Wrap spiral guard around hoses to protect against rubbing on the chassis.

3.7.3 TBT Cart

- Route the hoses from the Module to the front of the cart along the existing hydraulic hose run on the chassis.

- Assemble hoses to mating nipples on the hydraulic flow control block on the Module. Inlet port is marked with a **P** and outlet port is marked with a **T** on the block. Do not cable tie last ~2 metres of hose to the chassis to allow the Module to swing out freely on the pivot pin.

- Route the hoses to the front of the cart along the existing hydraulic hose run on the chassis.