MACDON D60/D65/D1 OPERATORS MANUAL

PRIMARY SALES AUSTRALIA

PRIMARYSALES.COM.AU/FEEDSTORM

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by Primary Sales Australia Pty. Ltd.

The instructions contained in this operator's manual are strictly for the MacDon FeedStorm.

SERIAL NUMBER: _____

DATE OF MANUFACTURE: _____

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SAFETY WARNING

The installation and operation instructions contained in this manual must be complied with at ALL times.

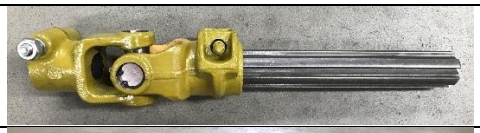
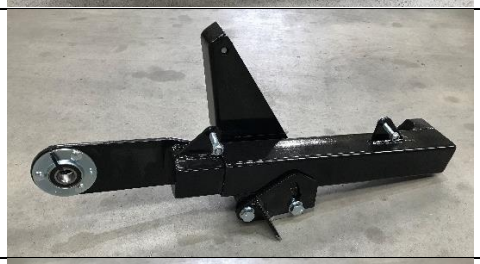
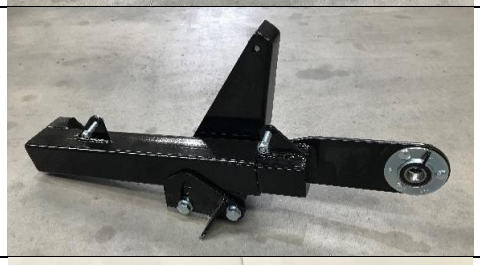
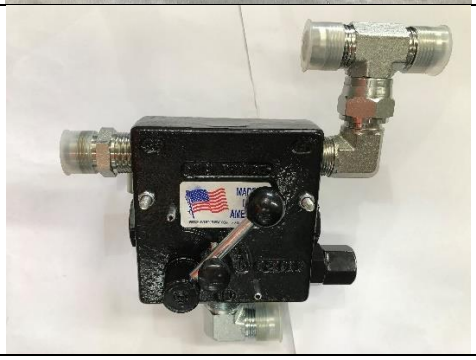
Failure to comply with these instructions may result in compromised machinery operation, possibly causing ineffective operation and machinery damage.

Failure to comply with these instructions may result in compromised personal safety and the safety of others, possibly causing injury or death.

Primary Sales Australia Pty. Ltd. **is not liable for any damages caused due to incorrect installation or operation.**

FEEDSTORM KIT CONTENTS

REF. NO.	DESCRIPTION	QTY.	REFERENCE IMAGE (NOT TO SCALE)
1A	**Bracket Assembly Left Hand Side**	1	
1B	Weld on Bracket Mount L.H.S.	1	
1C	40FT Brace	1	
1D	45FT Brace L.H.S.	1	
2A	**Bracket Assembly Right Hand Side**	1	
2B	Weld on Bracket Mount R.H.S.	1	

2C	40FT Brace		1	
2D	45FT Brace R.H.S.		1	
3	**Auger Barrel Left Hand Side**		1	
4	**Hydraulic Motor Subassembly**		1	
5	**Auger Barrel Centre & Centre Paddle Kit**		1	
6	**Auger Barrel Right Hand Side**		1	
7	**Universal Joint Assembly**		2	
8	**Adjustable Actuator Arm Assembly Left Hand Side**		1	
9	**Adjustable Actuator Arm Assembly Right Hand Side**		1	
10A	**Hydraulic Assembly**	Flow Controller Subassembly	1	

FEEDSTORM™ PRIMARY SALES AUSTRALIA

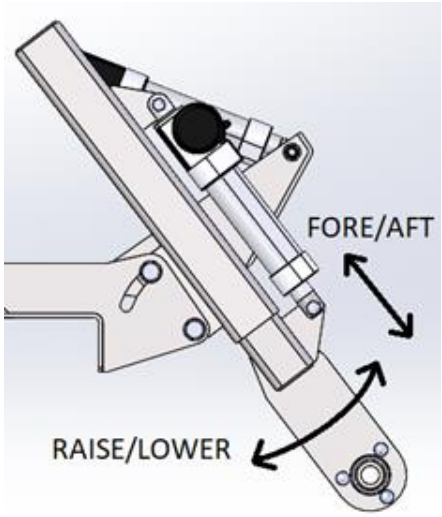
10B		Hydraulic Hoses (4 hoses)	1		
10C		Loose Fittings Pack (3 fittings)	1		
10D		Hose Clamp Kit (2 clamps)	1		
11A	**Electrical Assembly**	Actuators	4		

11B		Electrical Harness, Long and Short	1	
11C		Voltage Converter & Controller Subassembly	1	
11D		Remote Controller Subassembly	1	
11E		Actuator Reset Tool	1	
11F		Actuator Safety Stops	2	

11G		Electrical Harness Plug Mount	1	

Actuation Terminology

The terminology for the actuators used in this manual is as shown below. This is meant to match the normal terminology for the reel, but note that it doesn't necessarily match the direction of movement of the auger, as this is dependent on the angle of the bracket.



INSTALLATION

MECHANICAL FITMENT

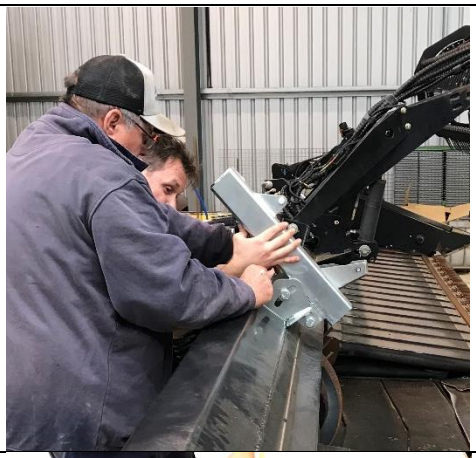
These instructions refer to the diagram attached titled *Mechanical Fitment Diagram*, use for reference upon installation.

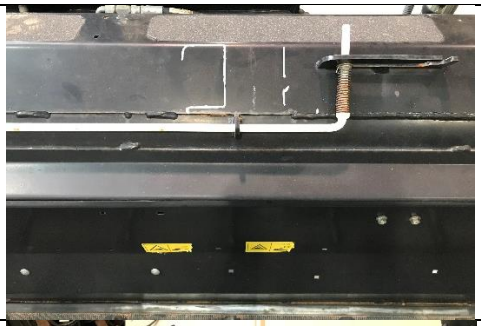
Refer to the attached drawing UCA-MCD-ASM as support to the detailed instructions for further information.

⚠ Note:

- **Installation process is minimum a two-person task.**
- **Ensure the header front is detached from the header and resting on a flat stable surface for accessibility and safety during installation.**
- **Place boards over draper belt in locations requiring access for installation, to protect the belts from damage and provide a stable surface.**

MOUNT BRACKETRY

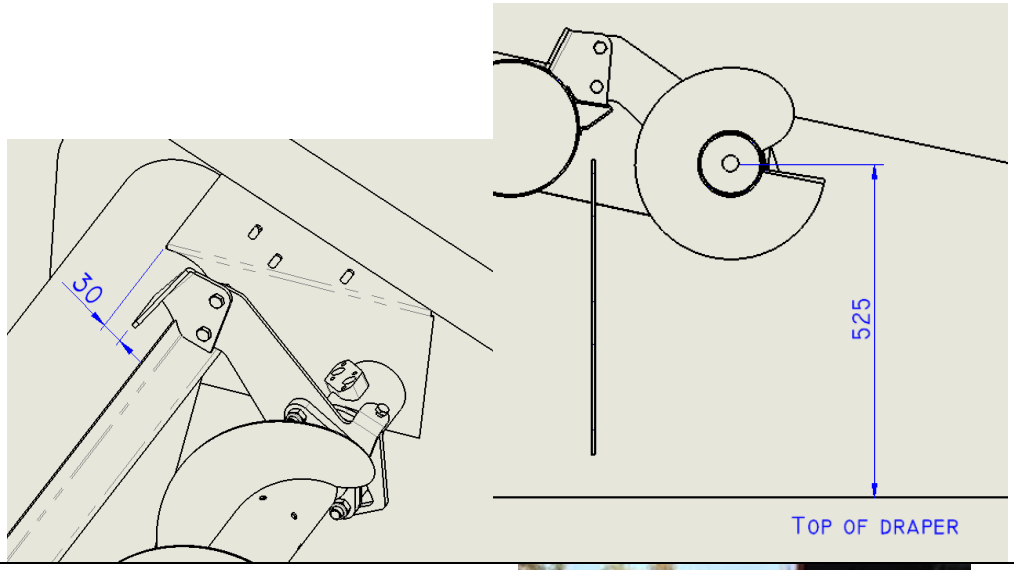
STEP	INSTRUCTION	REFERENCE IMAGE
1	Mark locations of fixture points on the header front for Parts 1B, 2B, 8 and 9, as per attached drawing UCA-MCD-ASM. Bracket mounts, Parts 1B and 2B may be preexisting on header front. If preexisting, conduct a dimensional check, to ensure the bracketry spacing is correct as per the attached drawing.	
2	Align base plates of Parts 8 and 9 to the flat plate profile of the header front, on the marked locations (centered to the 'fore and aft', forwards and rearwards linear motion actuators), as depicted in drawing UCA-MCD-ASM. Mark out plate profiles.	

		
3	Prepare immediate surfaces of the header front in the proposed fixture locations, by grinding away surface finish and rust until the bare metal surface is visible.	
4	Prepare the bracketry of the FeedStorm kit, Parts 8 and 9, by grinding off any protective coatings on the underside of the brackets, and 10mm around the edges, where foreseeably welding. ⚠ **Isolate the header battery if the header front is currently attached to the header.**	
5	Tack weld the base plates of Parts 8 & 9 to the header front as a short-term fixture. Ensure to do so without disassembling the base plates from the assemblies. Tack weld enough to support the self-weight of the assembled FeedStorm; approximately 50kg per auger barrel section.	

6 IF the end plate bracket mounts, Parts 1B and 2B are not preexisting in the marked locations on the header front, align the supplied brackets as depicted in drawing UCA-MCD-ASM.

7 IF REQUIRED: Tack weld Parts 1B and 2B mounting brackets to the header front as a short-term fixture. Enough to support the self-weight of the assembled FeedStorm; approximately 50kg per auger barrel section.

If there is no triangular pressing on the machine to orient the height of the brackets use these reference dimensions below:

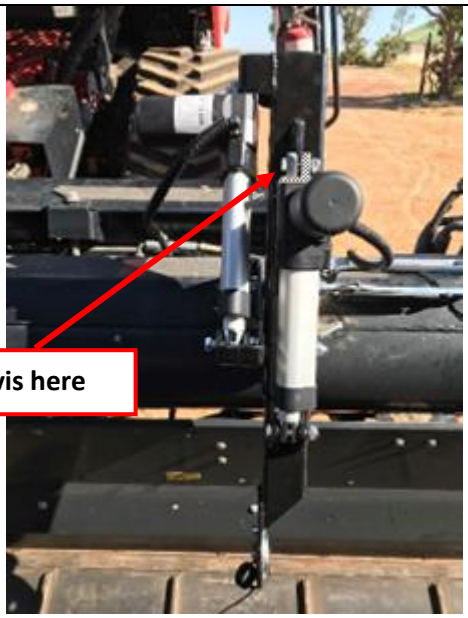


8 Ensure the entire subassembly of Parts 1, 2, 8 and 9, are in their correct position and aligned relative to each other on the header front. Insert the 4 actuators, 11A, as shown to the bracketry, 8 and 9. Ensure the actuators labelled "*LH/RH Fore & Aft*", that have a black painted clevis, are located correctly.

IMPORTANT

The actuators with black painted clevis must be mounted in the Fore/Aft position as shown to avoid creeping down during operation. These have a reversed brake.

LH Side

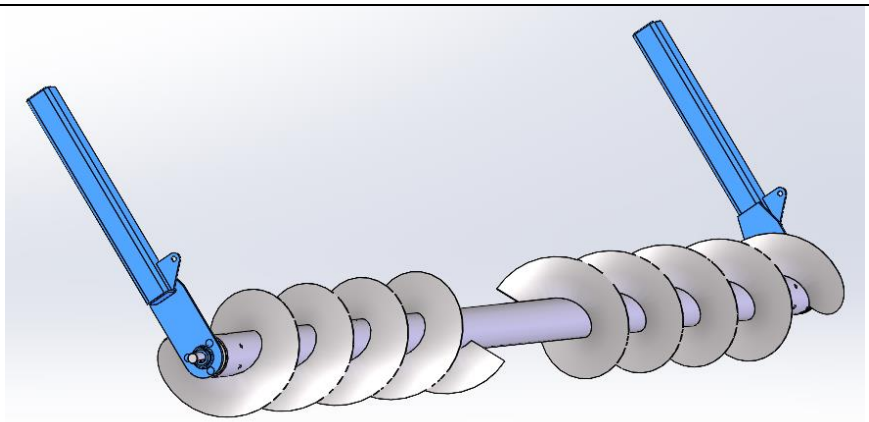


9 For a 40ft header front, the left and right end bracket braces, Parts 1C and 2C, are supplied overlength. For each brace, drill the bolt hole in the required location for fastening to the header front and cut off excess length.
Touch up end of brace with black paint.
Fasten to the header front with the fasteners supplied loose once the paint has dried.

For a 45ft header front use the longer braces, 1D and 2D. The longer brace fastens to two preexisting tapped holes on the header front. If the holes are not present, weld the head of the bolts to the header front in position as shown.

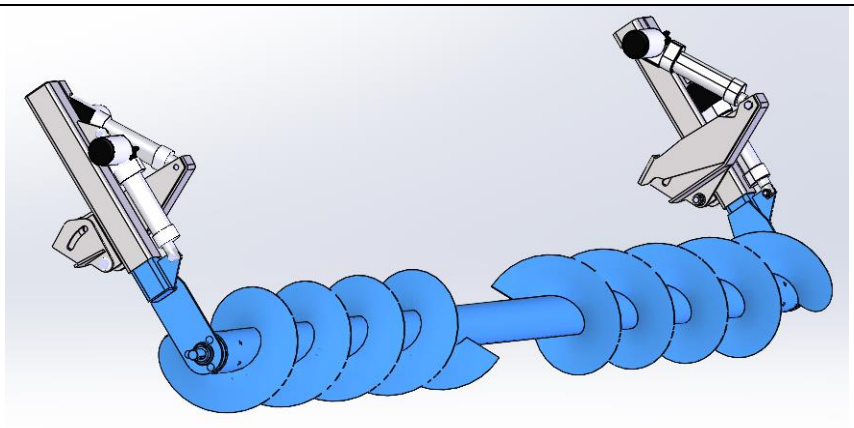
AUGER BARREL ASSEMBLY

10

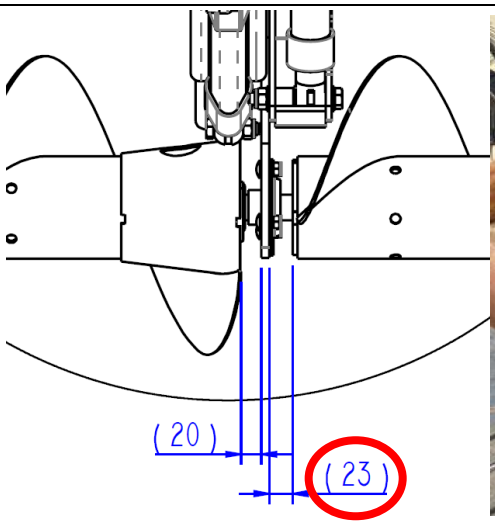


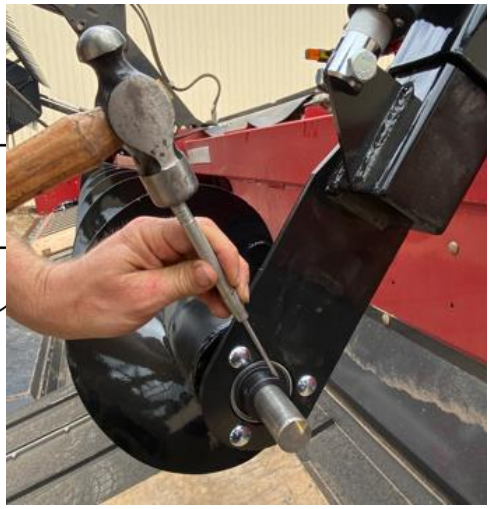
Attach the inner telescoping arms of the center bracket assemblies Parts (8 & 9) onto the Center barrel (Part 5).
Ensure the auger flighting is the correct orientation, to feed inwards and downwards from the front orientation, towards the center barrel of the header front when in operation.
Leave the bearing locking collars loose for now and also the bearing flanges to allow the bearings to self-align.

11



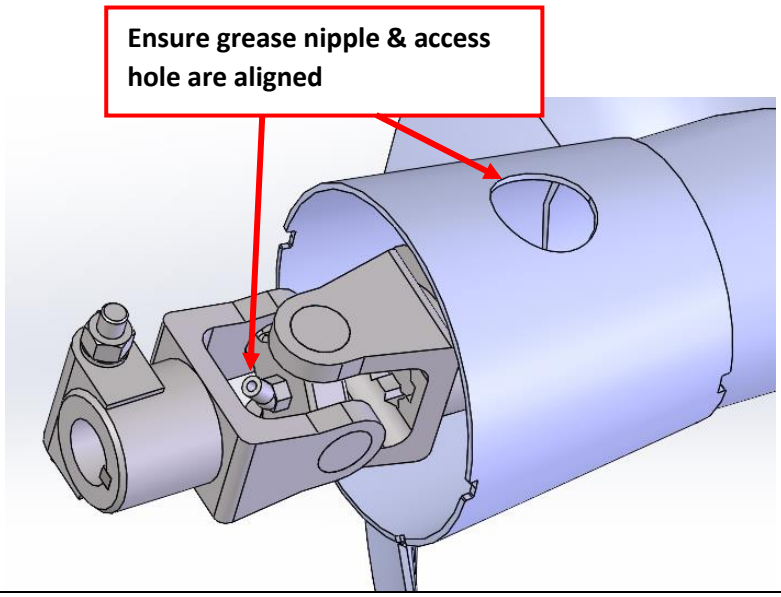
Lift the assembly above into the center bracket assemblies on the header front and fasten to the 'fore and aft' actuators to hold in place. Tighten the bearing flange bolts.



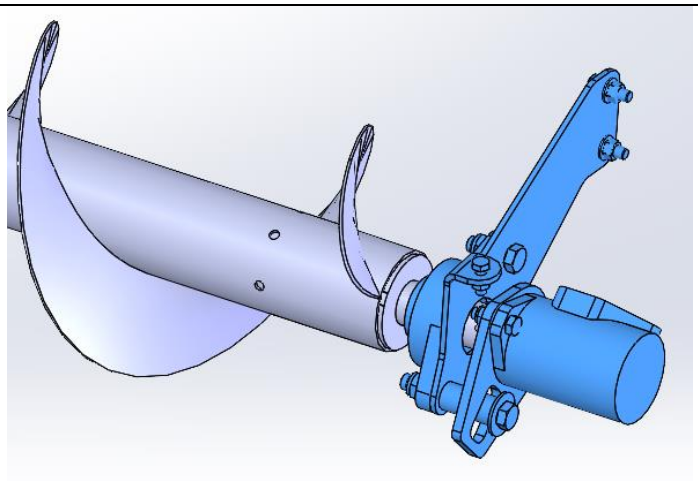


Centralize the barrel between the two sides to achieve close to the 23mm gap as shown above on both sides. Then tighten the bracket clamp bolts and the actuator bolts. Then lock the eccentric bearing collars tight using a punch tangentially striking the collar and then tighten the bearing grub screws.

12 Insert a universal joint assembly, Part 7, into the inside facing end of the left-hand side auger barrel, Part 3.
For longevity of the adjustable fitment, coat the spline with an anti-seize product prior to inserting.
Alternatively the universal joint can be attached to the center shaft first but can be difficult to align the splines this way around.

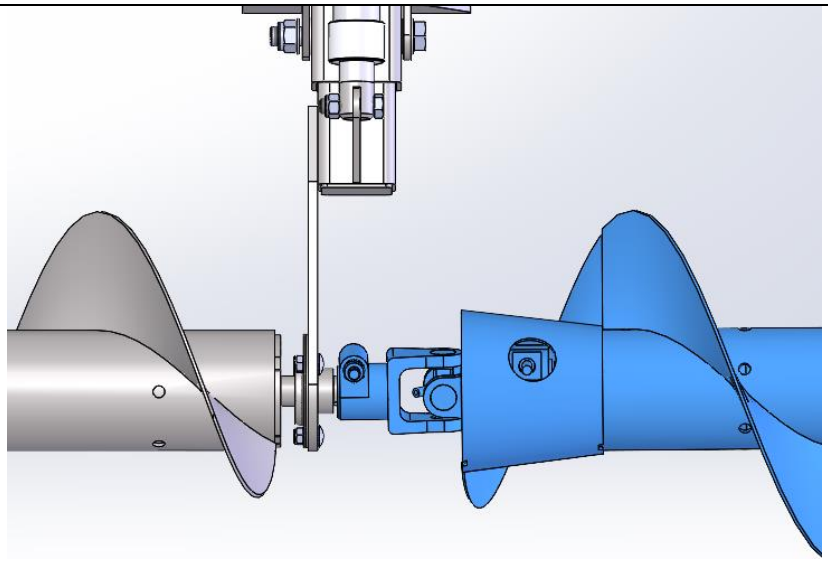


12



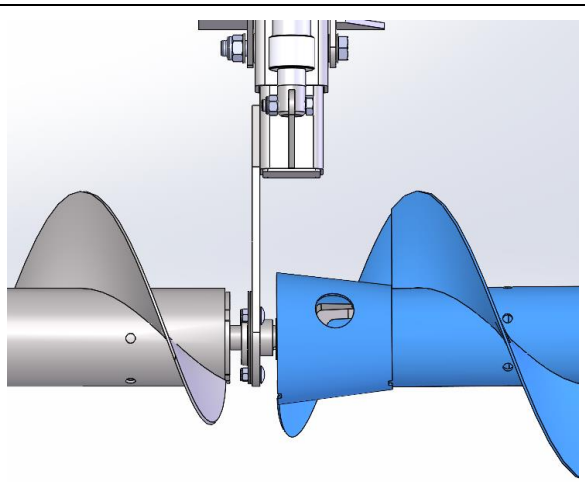
With the LH auger barrel on the ground, attach the drive end mount bracket onto the LH barrel end (ensure the eccentric locking collar is loosely attached to the bearing). Insert the hydramotor shaft into the end of the LH barrel end. Leave locking collars & grub screws loose at this stage.

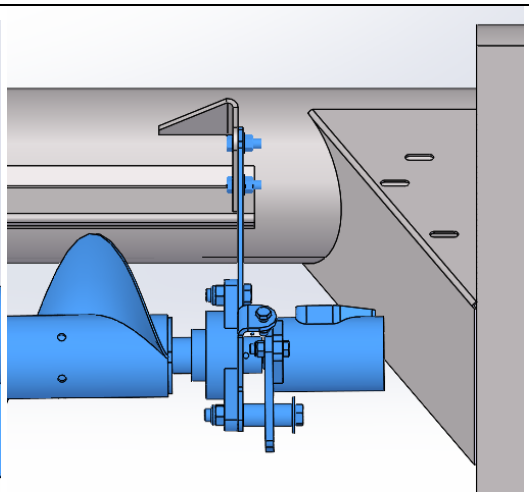
13



Attach the LH barrel assembly with the uni-joint yoke onto the center barrel end shaft lining up the key. Tighten the yoke clamp bolt and the grub screw. At this stage the drive end of the barrel may need to stay back to give room to manoeuvre the barrel in.

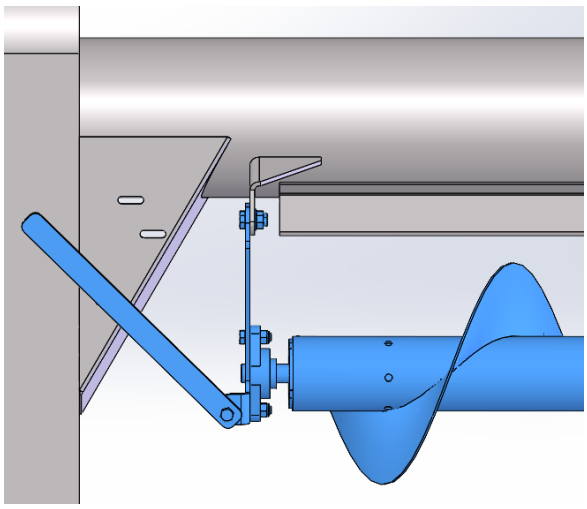
14

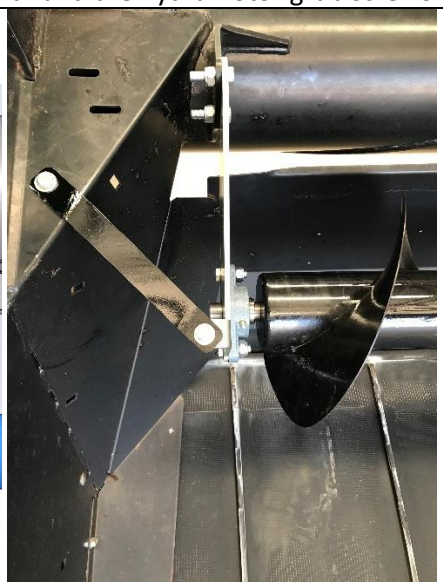




Move push the LH barrel over fully onto the spline and bolt the drive end bracket onto the machine. Leave minimum 10mm clearance between the uni-joint shroud and the bracket allowing for swivel.
Tighten the bracket bolts, the bearing locking collar and the hydramotor grub screws.

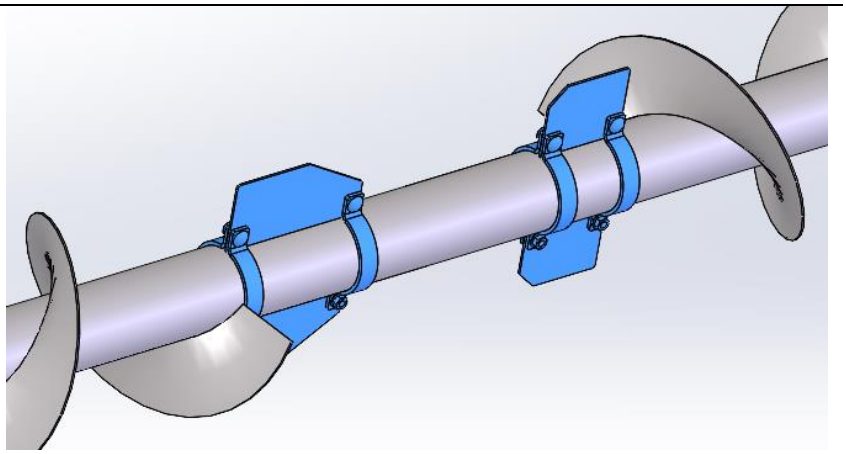
15





Perform the same steps 12-14 on the RH barrel and install the side braces on both sides.

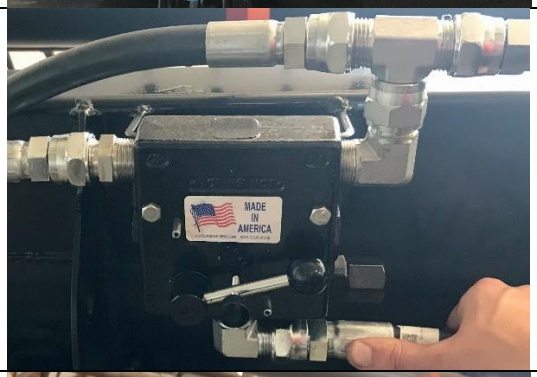
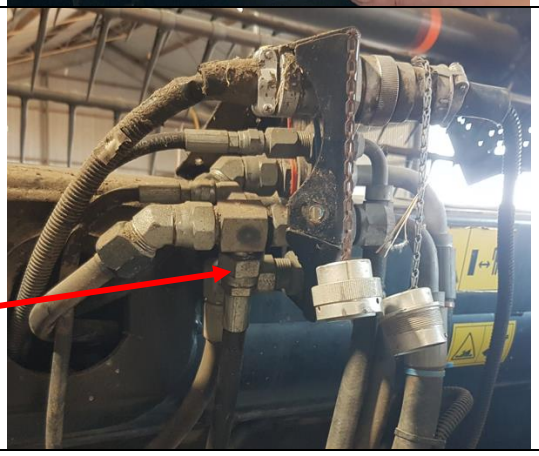
16 Install the clamp-on paddles on the center barrel. Ensure the bolt heads are facing the direction of rotation to reduce catching. The narrower paddles need to go on the LH side to clear the reel finger timing plate.

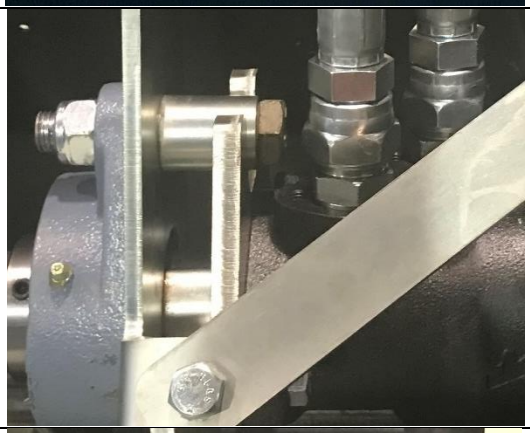
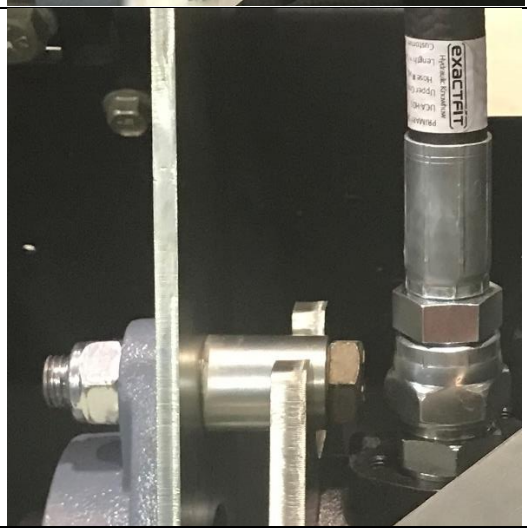


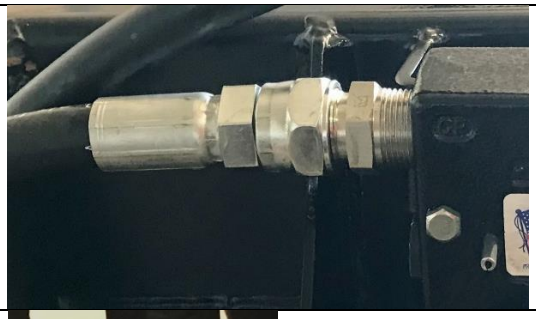
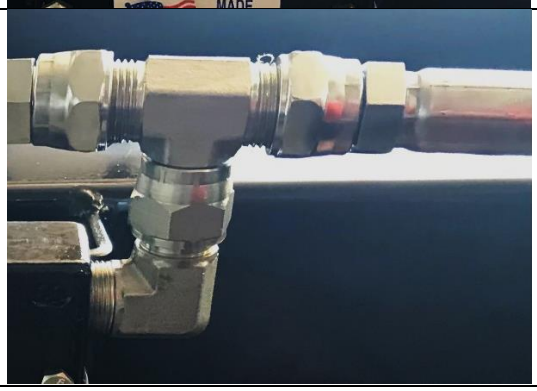
Ensure reel timing plate clears

HYDRAULIC FITMENT

Refer to the attached drawing UCA-H01 as support to the detailed instructions for further information.

STEP	INSTRUCTION	REFERENCE IMAGE
1	To mount the Flow Controller Subassembly, Part 10A, to the rear of the header front, on the left-hand side, between the draper belt hydraulics and FeedStorm hydraulic motor, prepare the surface, by removing paint coating in location for welding, as pictured.	
2	⚠ **Isolate the header battery if the header front is currently attached to the header.** Weld the flow controller bracket in position. Paint black with spray can supplied.	
3	Once the paint has dried, mount the Flow Controller to the Bracket with the fastenings supplied loose.	
4	Disconnect the draper return hose from the tee.	

5	Connect the hydraulic line inlet, H4, of drawing UCA-H01, to the existing draper belt return line. Use the hydraulic fitting supplied loose, 10C.	
6	Connect other end of H4 to the Flow Controller inlet, labelled “IN”.	
7	Fasten the hydraulic motor fittings if supplied loose, 10C, to the hydraulic motor.	
8	Connect hydraulic line, H2, to the inlet of the Hydraulic Motor, the port closest to the flange face as pictured.	

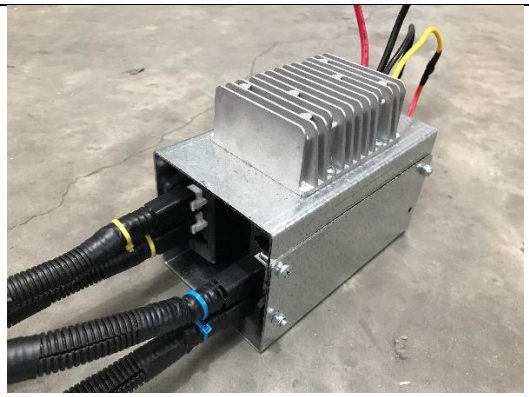
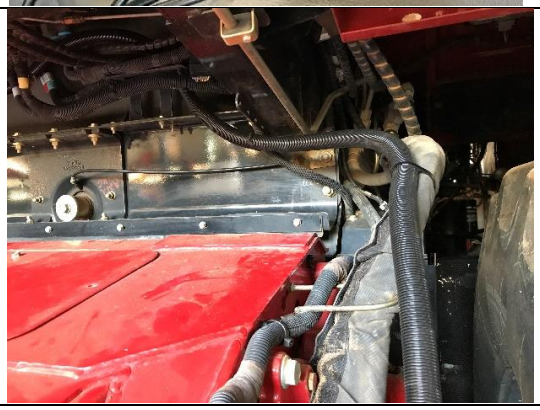
9	Connect the other end of hydraulic line, H2, to the controlled flow “CF” labelled outlet of the Flow Controller.	
10	Connect hydraulic line, H1, to the other hydraulic motor fitting; the outlet.	
11	Connect the other end of the hydraulic line, H1, to the tee at the exhaust flow “EF” labelled outlet of the Flow Controller.	
12	Connect hydraulic line, H3, to the other end of the tee, at the exhaust flow “EF” labelled outlet.	

13	Connect the other end of the hydraulic line, H3, to the existing draper belt return tee.	
14	Ensure all connections are sealed and secure. Use thread sealant on hydraulic connections where necessary.	
15	Fasten any loose hydraulic lines to the header front to prevent wear and reduce catchment points, using the weld-on hose clamp kit, 10D, supplied. *Reference images for overall hydraulic assembly.*	

ELECTRICAL FITMENT

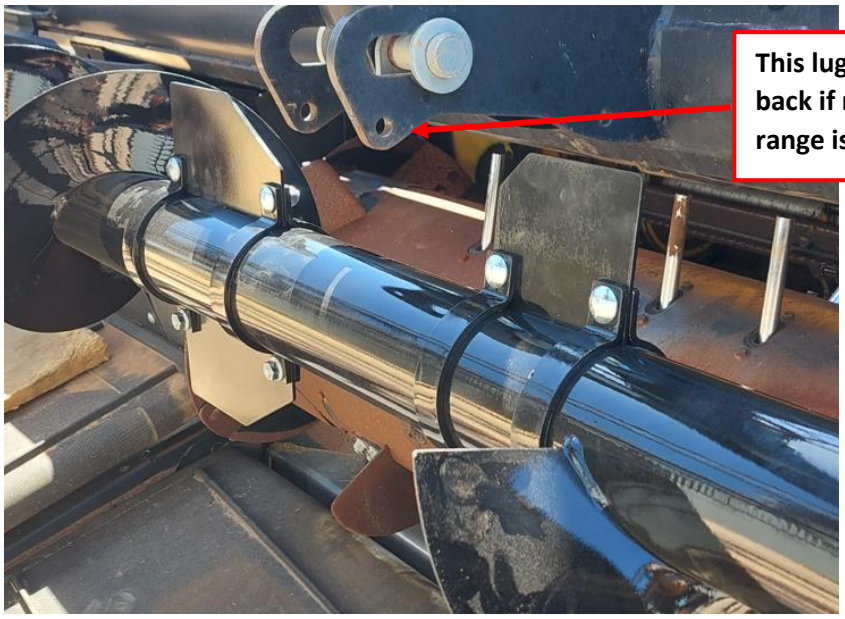
Refer to the attached drawing UCA-E01 as support to the detailed instructions for further information.

STEP	INSTRUCTION	REFERENCE IMAGE
1	Connect the shorter portion of Electrical Wiring Harness, 11B to the four Actuators, 11A. The slightly shorter (by approx. 100mm) cables plug into the “RAISE AND LOWER” Actuators. The longer cables plug into the “FORE AND AFT” Actuators. Connections are colour coded with cable ties.	
2	Fix the Remote Controller Subassembly, Part 11D, to a preferred location in the header cabin. Choose an accessible location to the operator whilst driving.	
3	Fix in a suitable location and hardwire the Voltage Converter, Part 11C, to the header power source. Ensure the power source provides 40 Amps at 12 Volts, to the converter.	

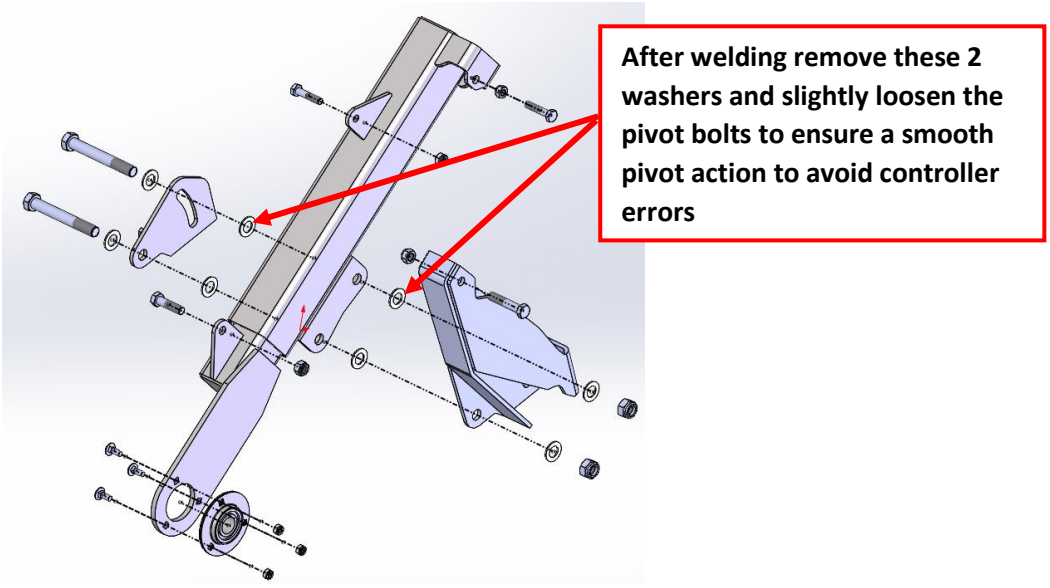
4	For permanent fitment, bring the electrical harness into the cab in the desired manner. Sheath the 4 Molex plugs if feeding through a narrow cavity, to protect from possible catchment and damage. Plug the longer portion of the Electrical Wiring Harness, Part 11B, into the Voltage Converter Box, Part 11C. Connections are colour coded with cable ties. Take the other ends to the header and front connection point.	
5	Fasten the Harness Plug Mount, Part 11F, to the header front, onto the junction box cover with existing fasteners. Fasten the barrel plug (header front portion of the harness) to the mount. Plug the longer portion of Harness into the shorter portion at the header and header front connection point.	
6	Plug the outlet cables of the Remote Controller, Part 11D, into the Voltage Converter, Part 11C, inlet ports. Connections are colour coded with cable ties.	
7	Fasten electrical harness to the header in locations clear of moving parts and potential catchment points, using cable ties, to prevent wear and damage to the harness. Excess harness length, roll up and fasten in an appropriate location. Ensure no portions of the harness are under tension or sagging in any locations.	

ADDITIONAL FITMENT NOTES

- Once completed the temporary installation of the FeedStorm Kit, trial the actuators with caution, using the Remote controller unit from the cabin. Ensure the range achievable is at the optimum intended.
  Check all clearances paying particular attention to the reel fingers, the reel mount bracket and feed drum fingers and adjust the actuator limits to suit.



- When content with the range abilities and overall positioning of the FeedStorm on the header front, proceed to completing the welding operation.



DO NOT attempt to harvest produce until the FeedStorm is permanently fixed to the header front.

PERMANENT FIXTURE

WELDING AND FITTING

STEP	INSTRUCTION
1	Unplug Electrical and Hydraulic cables and hosing within the immediate surrounds of the welding locations. Remove excess bolted components of weld on bracketry of Parts 1a, 2a, 8 and 9 assemblies.
2	Cover the immediate surroundings of the welding locations with fire-retardant protective material to protect the surface finishes of the FeedStorm and header front from welding splatter.
3	⚠ **Isolate the header battery if the header front is currently attached to the header.** Fully weld the brackets of the Actuator Assemblies, Parts 8 and 9, with 5mm fillets. Ensure to weld the front and back sections of the bracket, both sides of the bracket for a minimum of 50mm in length. Refer to drawing UCA-MCD-ASM view SECTION A-A. Ensure appropriate weld penetration is achieved.
4	IF required: Fully weld the left and right-side Mounting Brackets, Parts 1a and 2a, with 5mm fillets. Ensure appropriate weld penetration is achieved.
5	Prepare the areas for a protective coating of paint by lightly sanding/grinding the immediate welded area, removing any welding splatter and residual impurities.
6	Border the precise area for painting, to protect surrounding surface finishes.
7	Use the supplied spray can of black paint as per the instructions to cover the welded area. Ensure all bare/exposed metal surfaces are painted for protection. Allow paint work to dry.
8	Mount all parts to their bracketry. **Remove the spacer washers between the weld on base plates and the rotating adjustable arm, of the slotted hole fastener ONLY of Parts 8 and 9. Total of two washers removed per part.** *This is to reduce unnecessary friction during operation.* Reconnect electrical and hydraulic cables.
9	Recommend using a thread locking adhesive product on all grub screws, to ensure they do not loosen during operation.

SETTING ACTUATOR LIMITS

10 Once completely assembled, complete the *Reset Procedure* for the actuators, using the remote controller, 11D. Ensure all actuators are completely retracted with no errors once the procedure is complete.

Set the limits required in the following steps, using the *Inner and Outer Limits Procedure.*
The "FORE AND AFT" actuators operate in a linear motion, extending and retracting the auger barrel from the header front.
The "RAISE AND LOWER" actuators operate in a pivoting motion, lifting and lowering the auger barrel relative to the header front.

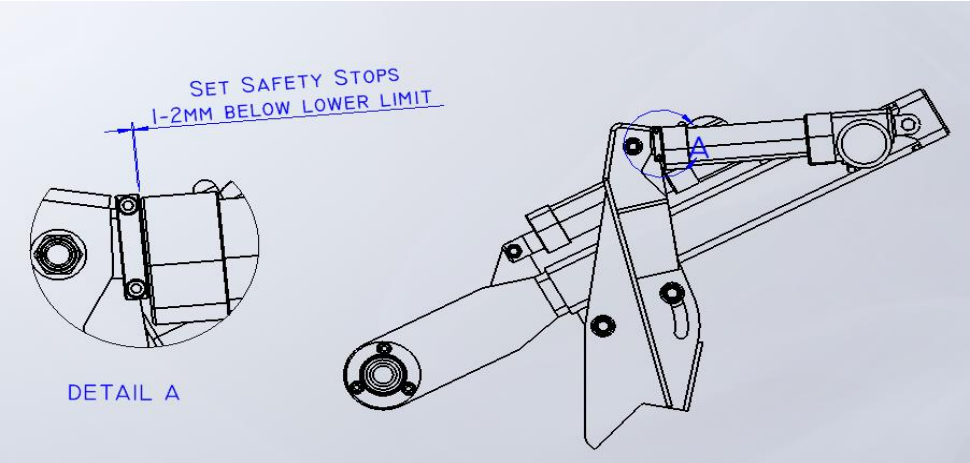
To extend the actuators, press and hold the UP Arrow button.
To retract the actuators, press and hold the DOWN Arrow button.

11 Set the OUTER limit of the "FORE AND AFT" actuators just before maximum extension at setting 5.8".
To prevent an error from occurring at maximum extension during operation.

12 Set the OUTER limit of the "RAISE AND LOWER" actuators just before the end of the curved slot in the bracketry is reached at approximately 3.5" setting. Removing the bolt from the slot will assist in visually determining this limit.
To prevent unnecessary loading on the actuator, possibly cause an error during operation.

13 Set the Inner limit of the "FORE AND AFT" actuators just before contacting other components of the header front such as the reel arm. Ensure to provide 10mm clearance from other componentry, minimum.

14 Set the inner limit of the "RAISE AND LOWER" actuators ONLY if required, due to contacting other header front componentry, which may be identified as causing an overload error or clause with other objects like the feed drum.
Install safety stops on both actuators 1 to 2 mm below the low limit, as seen below. When doing the reset procedure, it will set the new lowest point (0)



15	The limits of the actuators are now set and ready to use. To save preferred positions within the limits set, follow the *Saved Positions Procedure.*

OPERATION

ACTUATOR PROCEDURES

Reset Procedure

Reset the actuators upon initial use and in the case of an error.

1. Press and hold the DOWN Arrow button on the Remote Control until the LED display flashes "RST".
2. Release the DOWN Arrow button for 1 second and press and hold the DOWN Arrow button once more until the actuators retract completely then slightly extend before coming to a stop, displaying “0.01”. This signals the end of the reset procedure. Release the DOWN Arrow button and your system is now ready to use.

Inner and Outer Limits Procedure

The limits of the actuators must be set prior to use, to prevent default errors caused due to maximum actuator extension, and the auger barrel clashing with other components of the header front whilst in operation.

Outer Limit:

1. Move the actuator to the required extension length.
2. Press the “M” button.
3. Press the UP Arrow button.
4. Press and hold the “M” button until “999” shows.

Inner Limit:

1. Move the actuator to the required extension length.
2. Press the “M” button.
3. Press the DOWN Arrow button.
4. Press and hold the “M” button until “000” shows.

If unable to successfully set either or both limits, complete the “Reset Inner and Outer Limits to default” procedure detailed below, then attempt to set the limits again.

Reset Inner and Outer Limits to default:

1. Press the “M” button.
2. Wait one second.
3. Press and hold the “M” button until it displays “555”.

Saved Positions Procedure

Saved positions are an optional feature, providing the ability to program the actuators to preferred configurations, to maximise effectiveness during harvest.

1. Move the actuators to the desired location.
2. Press the “M” button followed by a numbered button of choice.
3. The LED display will flash an “S”, followed by the number selected. This indicates the position has been saved.

To use a saved position during operation, press any of the numbered buttons and the actuators will begin to move to the saved position.

PRIOR TO START UP

1. Ensure to grease all four lubrication points if required via the grease nipples, using high temperature resistant grease.
    - The Bearing of Parts 1A and 2A; two grease points.
    - The Universal Joints, Part 7; two grease points.
2. Familiarise the operator with the actuators, including the operation and reset procedures and the troubleshooting instructions, prior to harvesting.

AUGER BARREL RPM

- The recommended rotational speed of the auger barrels is to be operating in sync with the draper belt speed. Note: the linear speed of both the draper belt and the auger screw should be approximately the same, adjust the flow controller to increase or decrease the auger RPM as required.
- If the auger begins to vibrate noticeably when operating at high RPM, excess of 300 RPM, reduce the operating RPM until this effect subsides.

POWER SUPPLY

The FeedStorm unit requires a 12VDC power source. The voltage converter, a part of 11C subassembly, requires an input voltage of 12VDC with a maximum input current of 40A, and outputs 24VDC with a maximum output current of 20A. This converter offers protection against overheating and overcurrent.

MAINTENANCE

- The recommendation is to complete a routine check of the FeedStorm at regular intervals, after initial installation at the cautious discretion of the operator. The recommendation hereafter is to complete a routine check every day / 12 hours of operation.
    - **A routine check includes:**
        1. Inspect FeedStorm bracketry. Ensure no stressed components. Ensure all components are appropriately fastened.
        2. Inspect all FeedStorm electrical cables and hydraulic hoses, for their condition and fastening. Ensure no abrasive wear is occurring and the lines are fastened at regular intervals.

- Grease all four lubrication points as required via the grease nipples, using high temperature resistant grease.
    - The Bearing of Parts 1A and 2A; two grease points.
    - The Universal Joints, Part 7; two grease points.
- Grease the Universal Joints', Part 7, splines annually.

STORAGE

- When the header front is not in use, fully retract the actuators so minimal shaft length is exposed to the surrounding environment. This will assist optimum function and longevity of the actuators.

- Storage of the header front in a protected location from the elements is recommended for the preservation of the FeedStorm.

- If the header front cannot be stored as recommended and is exposed to wet weather for a duration of time outside of harvest season, such as in a dealership's yard throughout winter, remove the electrical components from the front. If the actuators are to be left on the front, ensure they are fully sealed at electrical joins and are further protected with waterproof coverings.

- **DO NOT** clean the electrical components with a liquid composition. The electrical components are water resistant, not waterproof. Recommend using compressed air as an alternative to clean the electrical components.

TROUBLESHOOTING

Remote Control Error Code

Actuators do not work, after completing the Reset Procedure, an error code appears on the remote-control LED display.

Error Codes E01 to E04: Actuator Overload Error

1. Ensure no excessive weight is on the FeedStorm actuators, friction on the actuator brackets, or force required by the actuators to overcome an unforeseen obstacle or a mechanical clash point.
2. Repeat the *Reset Procedure*.

Error Codes E07 to E10: Actuator Sensor Error

1. Disconnect and reconnect all cables.
2. Check for inadequate connections and power supply.
3. Repeat the *Reset Procedure*.
4. If actuator/s do not retract, manually retract using the Actuator Reset Tool, 11E. Plug into the connection of the problematic actuator and connect the wires directly to a 12-volt power supply to fully retract. The alternative direction of power will extend the actuators.
5. Repeat the *Reset Procedure*.

Error Code H01: System Overheat Protection

1. Ensure no excessive weight is on the FeedStorm actuators or friction on the actuator brackets. Mitigate unnecessary continuous adjustment of the actuators.
2. Allow the electrical system 16 minutes to cool down before continuing to use.

Actuators Do Not Extend/Retract

When attempting to engage the actuators using the remote, the columns do not adjust.

1. Ensure all connections are supplying power to the actuators.
2. Ensure enough current is supplied to the actuators from the power source. A power source at minimum of 25A at 12VDC is required to operate the FeedStorm actuators simultaneously (when retracting and raising).
3. Increase the amperage of the power source as required.

Actuator Pair Out of Sync and Not Completely Retracting

An error code does not appear, but the actuators are as stated.

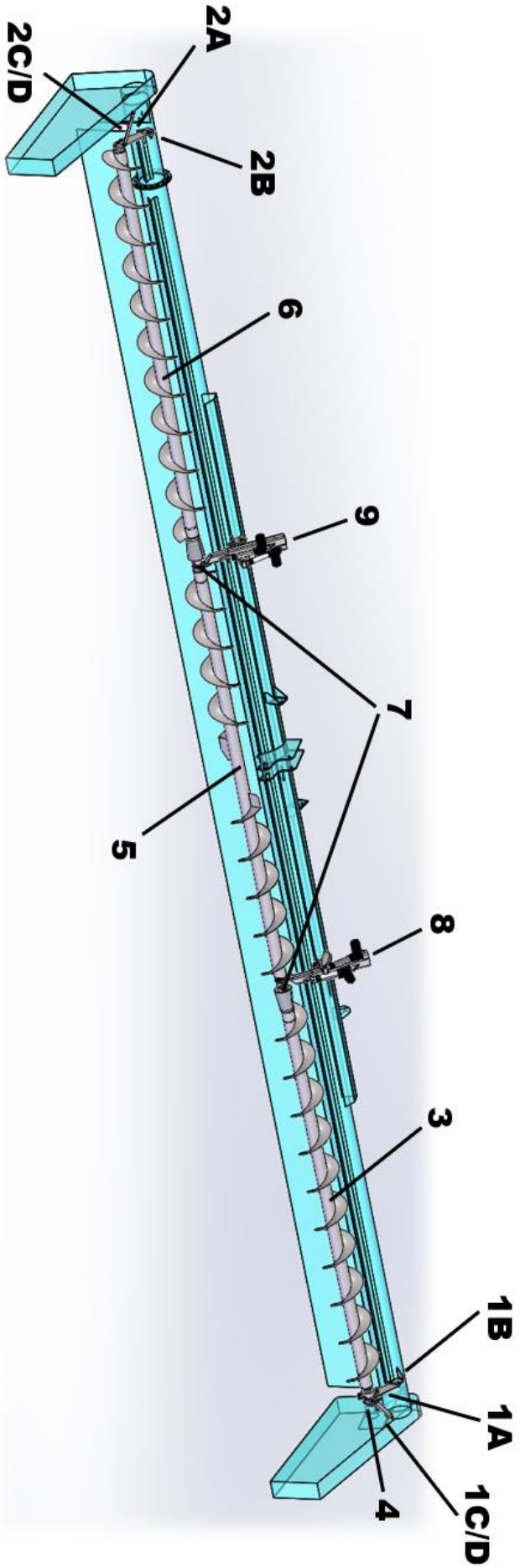
1. Reset the actuators manually using the Actuator Reset Tool, 11E.
2. Plug into the connection of the problematic actuator and connect directly to a 12-volt power supply to fully retract. The alternative direction of power will extend the actuators.
3. Repeat the *Reset Procedure*.

REFERENCE DOCUMENTS

Diagrams Attached:

- **Mechanical Fitment Diagram**

Drawings Attached:

- **FeedStorm MacDon Assembly & Fitment Drawing: UCA-MCD-ASM**
- **FeedStorm MacDon Hydraulics Diagram Drawing: UCA-H01**
- **FeedStorm MacDon Electrical Wiring Diagram Drawing: UCA-E01**

Mechanical Fitment Diagram