Boom Recirculation Installation Manual for Case IH Patriot 50 Series and Trident 5550 (2024 and newer) Sprayers

016-0171-727 Rev. C *9/2023* *E47446*

CHAPTER 1 IMPORTANT INFORMATION

SAFETY

NOTICE

Follow the operation and safety instructions included with the implement and/or controller and read this manual carefully before installing or operating this Raven system.

- Follow all safety information presented within this manual. Review implement operation with your local dealer.
- Contact a local Raven dealer for assistance with any portion of the installation, service, or operation of Raven equipment.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. Contact a local Raven dealer to obtain replacements for safety labels.

Observe the following safety measures when operating the implement after installing this Raven system:

- Do not operate this Raven system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Be alert and aware of surroundings and remain in the operator seat at all times when operating this Raven system.
    - Do not operate the implement on any public road with this Raven system enabled.
    - Disable this Raven system before exiting the operator seat.
    - Determine and remain a safe working distance from obstacles and bystanders. The operator is responsible for disabling the system when a safe working distance has diminished.
    - Disable this Raven system prior to starting any maintenance work on the implement or components of this Raven system.
- Do not attempt to modify or lengthen any of the system control cables. Extension cables are available from a local Raven dealer.

⚠ WARNING

AGRICULTURAL CHEMICAL SAFETY

Follow all federal, state, and local regulations regarding the handling, use, and disposal of agricultural chemicals, products, and containers. Triple-rinse and puncture or crush empty containers before properly disposing of them. Contact a local environmental agency or recycling center for additional information.

- Always follow safety labels and instructions provided by the chemical manufacturer or supplier.
- Always wear appropriate personal protective equipment as recommended by the chemical and/or equipment manufacturer.
- When storing unused agricultural chemicals:
    - Store agricultural chemicals in the original container and do not transfer chemicals to unmarked containers or containers used for food or drink.
    - Store chemicals in a secure, locked area away from human and livestock food.
    - Keep children away from chemical storage areas.
- Fill, flush, calibrate, and decontaminate chemical application systems in an area where runoff will not reach ponds, lakes, streams, livestock areas, gardens, or populated areas.
- Follow all label instructions for chemical mixing, handling, and disposal.
- Avoid direct contact with agricultural chemicals or inhaling chemical dust or spray particulate. Seek immediate medical attention if symptoms of illness occur during, or soon after, use of agricultural chemicals or products.
- After handling or applying agricultural chemicals:
    - Thoroughly wash hands and face after using agricultural chemicals and before eating, drinking, or using the restroom.
    - Thoroughly flush or rinse equipment used to mix, transfer, or apply chemicals with water after use or before servicing any component of the application system.

⚠ CAUTION

ELECTRICAL SAFETY

- Always verify that power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the Raven system or other components.
- To prevent personal injury or fire, replace defective or blown fuses with only fuses of the same type and amperage.
- Do not connect the power leads to the battery until all system components are mounted and all electrical connections are completed.
- Always start the machine before initializing this Raven system to prevent power surges or peak voltage.
- To avoid tripping and entanglement hazards, route cables and harnesses away from walkways, steps, grab bars, and other areas used by the operator or service personnel when operating or servicing the equipment.

RECOMMENDATIONS AND BEST PRACTICES

HOSE ROUTING

The word “hose” is used to describe any flexible, fluid carrying components. Use the following guidelines and recommendations when connecting and routing hoses while installing or maintaining this Raven system:

- Leave protective caps/covers over hose ends until connecting the end into the hydraulic system to help prevent contaminants from entering the system.
- Follow existing hose runs already routed on the implement as much as possible. Proper hose routing should:
    - Secure hoses and prevent hoses from hanging below the implement.
    - Provide sufficient clearance from moving components and operational zones around shafts; universal joints and suspension components; pulleys, gears, belts, and chains; moving linkages, cylinders, articulation joints, etc.
    - Protect hoses from field debris and surrounding hazards (e.g. tree limbs, fence posts, crop stubble, dirt clumps or rocks that may fall or be thrown by the implement).
    - Protect hoses from sharp bends, twisting, or flexing over short distances and normal implement operation.
    - Ensure sufficient length for free movement of the implement during normal operation and prevent pulling, pinching, catching, or rubbing, especially in articulation and pivot points. Clamp hoses securely to force controlled movement of the hose.
    - Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.
    - Avoid areas where the operator or service personnel might step or use as a grab bar.
- Do not over tighten threaded joints.
- Use thread sealant on all threaded joints.
- Do not connect, affix, or allow hoses to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of hose components.
    - Hoses should be protected or shielded if routing requires the hose to be exposed to conditions beyond hose component specifications.
- Avoid routing hoses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).

HARNESS ROUTING

The word “harness” is used to describe any electrical cables and leads, both bundled and unbundled. Use the following guidelines and recommendations when connecting and routing harnesses while installing or maintaining this Raven system:

- Leave protective caps/covers over harness connectors until needed to avoid dirt and moisture from contaminating electrical circuits.
- Secure the harness to the frame or solid structural members at least every 12 in [30 cm].
- Follow existing harness runs already routed on the implement as much as possible. Proper harness routing should:
    - Secure harnessing and prevent the harness from hanging below the implement.
    - Provide sufficient clearance from moving components and operational zones around shafts; universal joints and suspension components; pulleys, gears, belts, and chains; moving linkages, cylinders, articulation joints, etc.

  - Protect harnessing from field debris and surrounding hazards (e.g. tree limbs, fence posts, crop stubble, dirt clumps or rocks that may fall or be thrown by the implement).
  - Protect harnessing from sharp bends, twisting, or flexing over short distances and normal implement operation.
  - Connectors and splices should not be located at bending points or in harness sections that move.
  - Ensure sufficient length for free movement of the implement during normal operation and prevent pulling, pinching, catching, or rubbing, especially in articulation and pivot points. Clamp harnessing securely to force controlled movement of the harness.
  - Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.
- Do not connect, affix, or allow harnessing to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of harness components.
  - Harnessing should be protected or shielded if routing requires the hose to be exposed to conditions beyond harnessing component specifications.
- Avoid routing harnesses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).
- Avoid routing harnesses in areas where the operator or service personnel might step or use as a grab bar.

IMPORTANT: Avoid applying direct spray or pressure washing of electrical components and connections. High pressure streams and sprays can penetrate seals, cause corrosion, or otherwise damage electrical components. When performing maintenance:

- Inspect electrical components and connectors for corrosion, damaged pins or housings, etc. Repair or replace components or harnessing as necessary.
- Ensure connectors are kept clean and dry. Apply dielectric grease to the sealing surfaces of all connections exposed to moisture, dirt, debris, and other contaminates. Repair or replace harnessing as necessary.
- Clean electrical components with pressurized air, aerosol electrical cleaning agent, or low pressure rinse.
- Remove visible surface water from electrical components and connections using pressurized air or an aerosol cleaning agent. Allow components to dry thoroughly before reconnecting cables.

CHAPTER 2 INTRODUCTION

Thank you for purchasing the boom recirculation system. This system is designed to allow the equipment operator to prime the boom or agitate chemical in the boom plumbing without spraying chemical on the ground. This system allows the operator to adjust the recirculation flow based upon the spray system or the chemical needs.

This manual applies to the following machines:

Make. Case IH

Model.
- Patriot 3250, 4350, and 4450
- Trident 5550 (model year 2024 and newer)

Boom Configurations.

Width (ft.)	Sections	Nozzle Spacing (in.)	Boom Construction
90	5	20	Steel
	6	20	
100	6	20	
120	7	20	
	7	20 or 30	
132	7	22	Aluminum
135	7	20	
Possible Configurations Available:			
90	5	20 or 30	Steel
135	7	15	Aluminum

System Requirements.

- Must have AIM Command Flex™ II with the CNHi RCM-Sprayer ECU
- Boom plumbing kit installed
- Product cable with the required electronic recirculation valve connection
- Recirculation authorization code (P/N 077-0180-296)

NOTE: The recirculation authorization code may be included with some ECUs. Contact your local dealer for additional information regarding authorization codes.

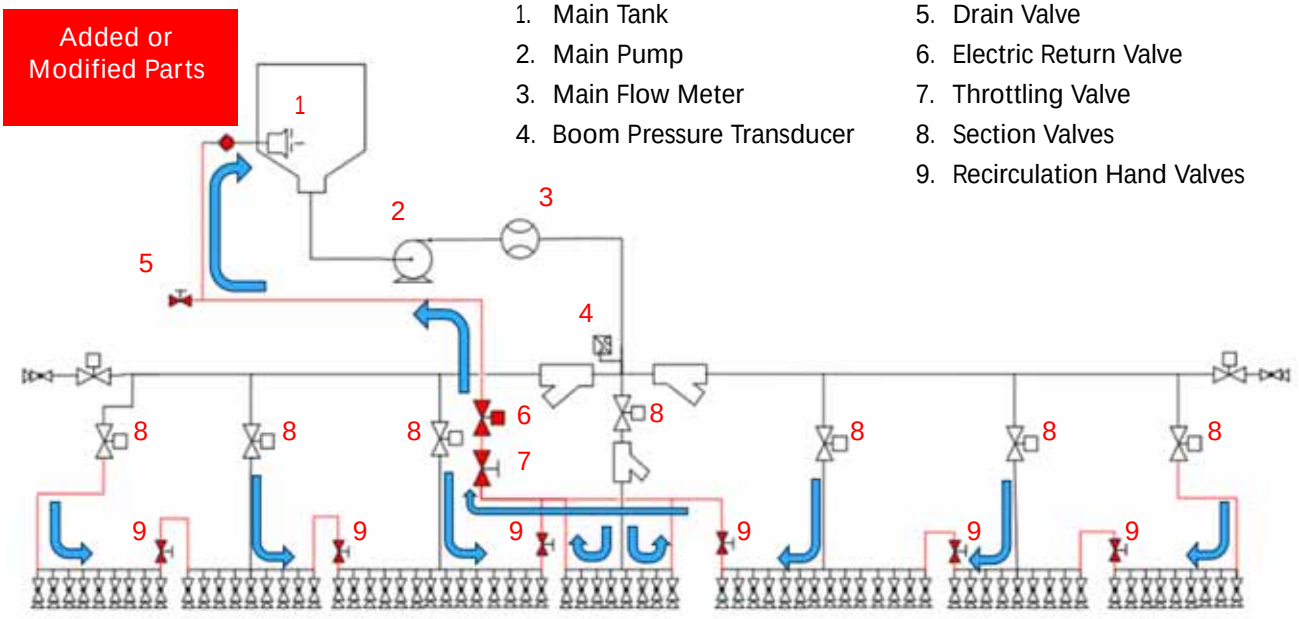
THEORY OF OPERATION

When the recirculation system is active, the spray system is not spraying, and nozzle control valves (NCVs) are off, the electric return valve opens fully. The main pump circulates the spray liquid from the main tank through the existing supply plumbing to the section valves.

Section valves actuate open in pairs, starting with the outermost left and right sections and progressing inward. The section valves turn on and off to circulate fluid for the user-defined auto-operation time for each section of the spray system. This keeps the liquid circulating, allowing the system to purge any air, break up chemical deposits, and agitate any separated chemicals through the system without having to spray out of the nozzles.

Product returns through the throttling valve and electric return valve until the electric return valve automatically turns off when spraying resumes. The throttling valve is used to dampen the pressure spike affects of the electric return valve closing when spraying resumes. The individual recirculation hand valves should be used to separate sections when not using NCVs (Bypass and High Flow/High Flow VP Modes) and to isolate boom plumbing sections if maintenance is required or damage to a plumbing component occurs that causes a leak.

FIGURE 1. Example of the Boom Recirculation System



CAUTION

- Use thread sealant on all threaded joints.
- Do not over tighten threaded joints.
- Hose lengths shown are for reference only. Ensure hoses are routed to prevent interference, pinching, or stretching while folding or unfolding the booms.
- Use provided hose-protectors where sharp edges contact hoses.

PREPARING FOR INSTALLATION

Before installing boom recirculation, park the machine where the ground is level, clean, and dry. Leave the machine turned off with the booms unfolded for the duration of the installation process.

During the installation process, follow good safety practices. Be sure to carefully read the instructions in this manual as you complete the installation process.

RECOMMENDATIONS

During the installation process:

1. Assemble the recirculation and throttling valves. Refer to the *Assemble and Mount the Recirculation and Throttling Valves* section on page 13.
2. Connect the cabling to the existing RCM-Sprayer harness. Refer to the *Connect the Electronic Return Valve* section on page 15.
3. Plumb the drain and tank return. Refer to one of the following:
    - *Tank Return and Drain without Eductor - Patriot* section on page 16
    - *Tank Return and Drain With Eductor - Patriot* section on page 20
4. Identify the section-boom width configuration for the sprayer. Review one of the following chapters for boom plumbing details:
    - Chapter 4, *Section Plumbing for 5 and 7 Section Steel Booms (90' and 120')*
    - Chapter 5, *Section Plumbing for 6 Section Steel Booms (90' and 100')*
    - Chapter 6, *Section Plumbing for 7 Section Aluminum Booms (132' and 135')*
5. Plumb the boom from the center section out to the boom tip.

NOTE: Do not secure any hose until all fittings and hoses are routed.

6. Turn all hand valves to the open position.
7. Turn all combo-rate boom end flush valves (CR-BEFVs) to the recirculation position with the open arrow pointing upwards.

For the most optimal installation:

- Remove all standard BEFV and tube end threaded adapters.
- Remove sweeping tee feed points and tube end threaded adapters where indicated.
- For hose-to-hose barb connections, use two hose clamps that are oriented in opposite tightening directions to secure the hose to the hose barb fitting.
- Make sure that the gasket is correctly aligned and fully seated in flanged fittings. Keep the clamp aligned with the flange when tightening the clamp. Do not over-tighten the clamp as this may cause the clamp threads to strip or break.
- Hose lengths shown are for reference only. Ensure hoses are routed to prevent interference, pinching, or stretching while folding or unfolding the booms. Use provided hose protectors where sharp edges may contact hoses.
- Route any new hose runs following the existing hose plumbing.
- Orient all fittings and hoses to avoid moving parts, pinch points, and hose kinks.
- Use the provided p-clamps, hose guard, and zip ties to secure the hose around fold joints and all boom tube plumbing.

Raven recommends the following best practices before operating the boom recirculation system for the first time or at the start of the season:

- Visually inspect the system for any damage including cracked or broken fittings, worn or pinched hoses, corrosion around electronics and cables, etc.
- Set the system to operating position with the hand valves and throttling valve open with the flush valves closed. Then perform a leak test.
- Rinse the boom and perform a boom air blowout to thoroughly clean the system.

TOOLS NEEDED

The following tools are recommended for installation of the boom recirculation system:

- Tape measure
- Hose cutter for up to 2” OD spray hose
- 2 Slip Joint Pliers (approx. 10” size)
- Metric and Imperial Wrench Set
- 5/16” Nut Drivers for hose and flange clamps
- Side cutters
- Corrosion X-HD spray

POINT OF REFERENCE

The instructions in this manual assume that you are standing behind the machine, looking toward the cab.

KIT CONTENTS

This section contains a list of the components that are included in the boom recirculation kit. Before beginning the boom recirculation installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

FIGURE 2. Boom Recirculation Kit for Case IH Patriot 50 Series Sprayers (P/N 117-2005-059 Rev. C)

THIS KIT TO CONTAIN THE FOLLOWING ITEMS LISTED BELOW:

#	QTY	PART #	DESCRIPTION	C
	1	053-0159-400	CRATE, SHIPPING	
	1	053-0159-079	BOX, SHIPPING, 17"X16-3/4"X11-1/4" (LABELED 1 OF 3)	
	1	115-2500-040	CABLE, CASE PATRIOT 50 SERIES, BOOM RECIRC, ADAPTER 3'	
	1	107-0172-762	BRACKET, CASE PATRIOT 50 SERIES, BOOM RECIRC, RETURN I	
	1	107-0172-753	BRACKET, CASE PATRIOT 50 SERIES, BOOM RECIRC, CENTER F	
	1	107-0172-759	BRACKET, CASE PATRIOT 50 SERIES, TIP SHIELD, LEFT	
	1	107-0172-760	BRACKET, CASE PATRIOT 50 SERIES, TIP SHIELD, RIGHT	
	2	107-0172-761	BRACKET, CASE PATRIOT 50 SERIES, TIP SHIELD, MOUNT	
	1	334-0001-081	VALVE, ASSEMBLY, ON/OFF, POLY, M200, 1" SS BL, CLOSE, FB	
	36	214-3000-001	GUARD, HYDRAULIC HOSE, 6", WITH THREE CABLE TIES	
	18	434-2000-011	P-CLAMP, 1-3/4" ID, APPROX 1-1/2" CL TO CL, .406 SCREW H	
	45	435-1000-041	TIE, CABLE, BLACK, AERIAL SUPPORT, 17.4"	
	1	053-0159-015	ENVELOPE, PLASTIC, 12"X16"	
	1	311-4051-224N	HEX BOLT, ISO4014, M10X1.5, 30MM, 10.9 STEEL, CLASS V	
	4	107-0172-511	U-BOLT, M10X1.5, 52W X 82L	
	9	312-6001-043N	HEX NUT, NYLOCK, DIN985, M10X1.5, CLASS V	
	10	313-6000-016N	WASHER, DIN125, M10, STEEL, CLASS V	
	6	311-4051-179N	HEX BOLT, ISO4014, M8X1.5, 20MM, 10.9 STEEL, CLASS V	
	6	312-6001-028N	HEX NUT, NYLOCK, DIN985, M8X1.25, CLASS V	
	12	313-6000-013N	WASHER, DIN125, M8, STEEL, CLASS V	
	10	311-0050-155	HEX BOLT, 1/4-20 UNC-2A, 1", GRADE 8, CLASS V	
	4	107-0172-764	U-BOLT, 1/4-20 UNC-2A, 2.375W X 3.75L	
	18	312-4000-057	HEX NUT, NYLOCK, 1/4-20 UNC-2B, GRADE 2, ZINC PLATED	
	28	313-2300-011	WASHER, FLAT, STEEL, 1/4", CLASS V	
	1	053-0159-015	ENVELOPE, PLASTIC, 12"X16"	
	1	016-0171-727	MANUAL, CASE PATRIOT 50 SERIES, BOOM RECIRCULATION	

FIGURE 3. Boom Recirculation Kit for Case IH Patriot 50 Series Sprayers (P/N 117-2005-059 Rev. C)

THIS KIT TO CONTAIN THE FOLLOWING ITEMS LISTED BELOW:

#	QTY	PART #	DESCRIPTION	O
	1	117-0171-894	(LABELED BOX 2 OF 3) KIT, CASE PATRIOT 50 SERIES, BOOM RECIRC, BOOM PLUMBIN	
	1	117-0171-895	(LABELED BOX 3 OF 3) KIT, CASE PATRIOT 50 SERIES, BOOM RECIRC, WILGER PLUMBI	

FIGURE 4. Boom Plumbing Kit for Case IH Patriot 50 Series Sprayers (P/N 117-0171-894 Rev. C)

THIS KIT TO CONTAIN THE FOLLOWING ITEMS LISTED BELOW:

#	QTY	PART #	DESCRIPTION	OEM P/N
			(BUNDLE HOSE, LEAVE OUTSIDE BOX)	
	10'	X	BUMBLE BEE NYLON BRAIDED HOSE, 1-1/2"	003 KF150
	150'	X	EPDM DOUBLE BRAIDED HOSE, 1-1/4"	003 TB125
	36'	X	EPDM DOUBLE BRAIDED HOSE, 1"	003 TB100
			(LABELED BOX 1 OF 1)	
			(BOOM FLANGE FITTINGS)	
	100	X	CABLE TIE STRAP, 14-1/4"	150 Z014
	15	X	CABLE TIE STRAP, 36"	150 Z036
	25	X	M100 X 1-1/4" HB	102 M100125B
	12	X	M100 X M100 90 ELBOW	102 M10090
	4	X	M100 X M100 45 ELBOW	102 M10045
	12	X	M100 X M100 COUPLING	102 M100C
	4	X	M100 PLUG	102 M100P
	9	X	M100 X M100 X M100 TEE LONG	102 M101T
	66	X	FLANGE GASKET, VITON, 1"	102 M100GV
	110	X	FLANGE CLAMP, 1"	102 MFC100
	7	X	BALL VALVE, 1", FLANGE	102 MSUV100FF
	1	X	FLANGED POLY CHECK VALVE, 1", 1 PSI	102 MCV100
	1	X	FLANGED 4-BOLT VALVE, M200 X M200	102 MC200CF
	2	X	M200 X M200 X M200 TEE	102 M200T
	2	X	M200 X M200 X M100 TEE	102 M200100T
	3	X	M200 X M100 COUPLING	102 M200100C
	1	X	M200 X M200 90 ELBOW	102 M20090
	1	X	M200 X 1-1/4" HB 90 ELBOW	102 M200125E
	1	X	M200 X 1-1/2" HB	102 M200150B
	5	X	M200 PLUG	102 M200P
	1	X	M200 X M200 CHECK VALVE	102 MCV200
	12	X	FLANGE GASKET, VITON, 2"	102 M150GV
	12	X	FLANGE CLAMP, 2"	102 MFC200
	4	X	HOSE MENDER, 1-1/4" X 1-1/4"	102 HM125
	2	X	HOSE MENDER, 1" X 1"	102 HM100
	2	X	HOSE MENDER ELBOW, 1-1/4" X 1-1/4"	150 BE125
	100	X	HOSE CLAMP - #24, 1-1/4"	003 HC125
	4	X	HOSE CLAMP - #28, 1-1/2"	003 HC150

FIGURE 5. Boom Recirculation Wilger Plumbing Kit for Case IH Patriot 50 Series Sprayer (P/N 117-0171-895 Rev. C)

THIS KIT TO CONTAIN THE FOLLOWING ITEMS LISTED BELOW:

I #	QTY	PART #	DESCRIPTION	OEM P/N
	16	X	COMBO-RATE BEFV	27361-00
	26	X	QF100 X 1-1/4" HB 90 SWEEP	27343-00
	3	X	QF100 X 1-1/4" HB 45 SWEEP	27342-00
	8	X	QF100 X 1" HB 90 SWEEP	27333-00
	40	X	2PC END ADAPTER, CASE IH TWS	27313-00
	40	X	FLANGE END SEALS, CASE IH TWS	27316-02

UPDATES

Updates for Raven manuals as well as software updates for Raven consoles, and product controllers are available at the Applied Technology Division web site:

https://portal.ravenprecision.com

The Raven Service Tool and a laptop PC are required to perform software updates to the ECU. Refer to the Raven Service Tool Operation manual for additional assistance with updating the ECU.

Sign up for e-mail alerts to receive notifications when updates for your Raven products are available on the Raven web site.

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-Boom Recirculation Installation Manual for Case IH Patriot 50 Series Sprayers
-016-0171-727 Rev. B
-Any comments or feedback (include chapter or page numbers if applicable).
-Let us know how long have you been using this or other Raven products.

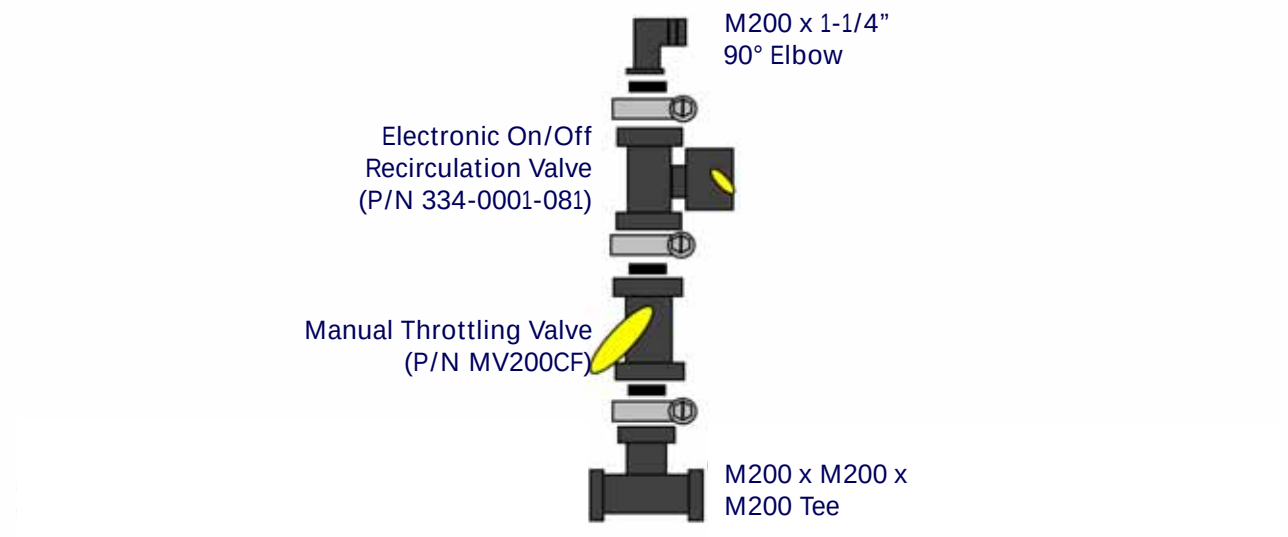
We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

CHAPTER 3 PLUMB THE RECIRCULATION AND THROTTLING VALVES

ASSEMBLE AND MOUNT THE RECIRCULATION AND THROTTLING VALVES

FIGURE 1. Assembly of the Throttling and Electric Recirculation Valves



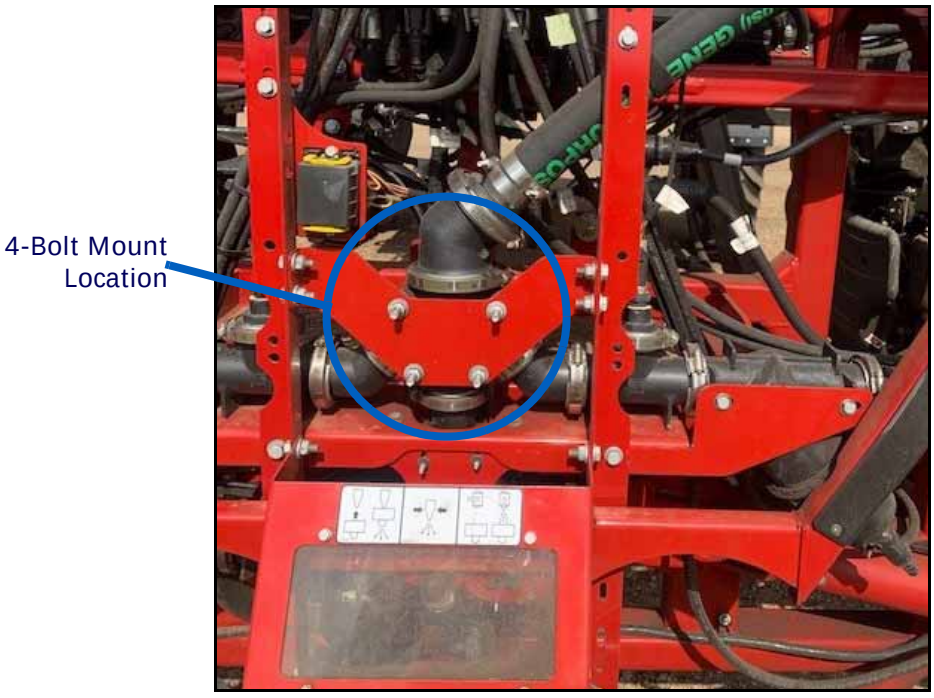
1. Assemble the Electronic Recirculation Valve (P/N 334-0001-081) throttling valve and other fittings as shown in Figure 1 on page 13.

NOTE: Assemble with the cable of the electronic recirculating valve facing down and the handle of the throttling valve pointing away from the return valve when in the open position.

2. Mount the throttling valve assembly to the center rack mounting bracket (P/N 107-0172-753) using two U-bolts with 1/4” washer and 1/4” lock nuts.
3. Loop the U-bolts over the center M200 tee and secure to bracket.
4. Once assembly is complete, mount the bracket to the center rack at the rear of the machine using the existing 4-bolt mounting pattern.

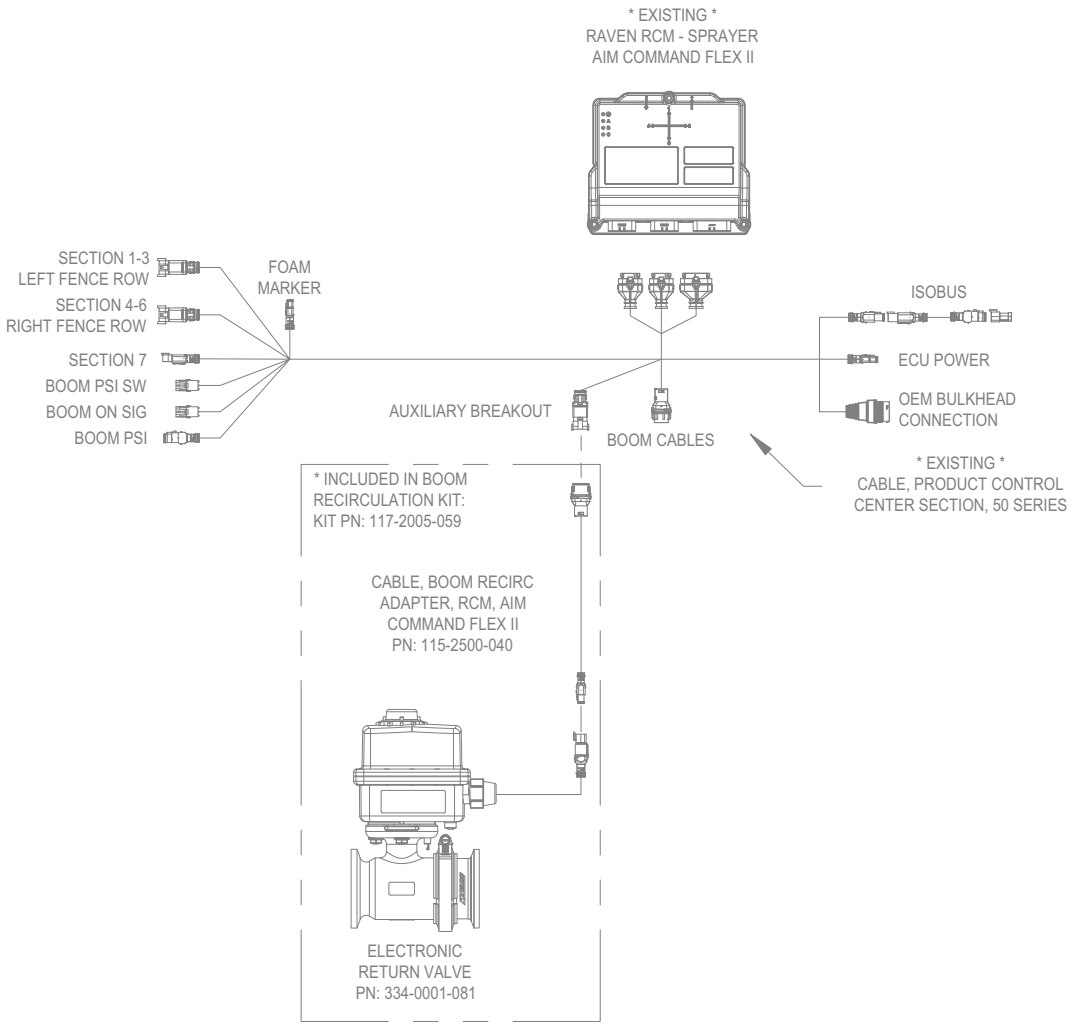
NOTE: Mount the bracket after the existing nuts to use them as spacers. Use the provided washers and nuts to secure.

FIGURE 2. Center Rack Return Bracket Mounting Location



CONNECT THE ELECTRONIC RETURN VALVE

FIGURE 3. Boom Recirculation for Case Patriot 50 Series and Trident 5550 System Drawing - Electronic Components (P/N 054-2005-027 Rev. A)

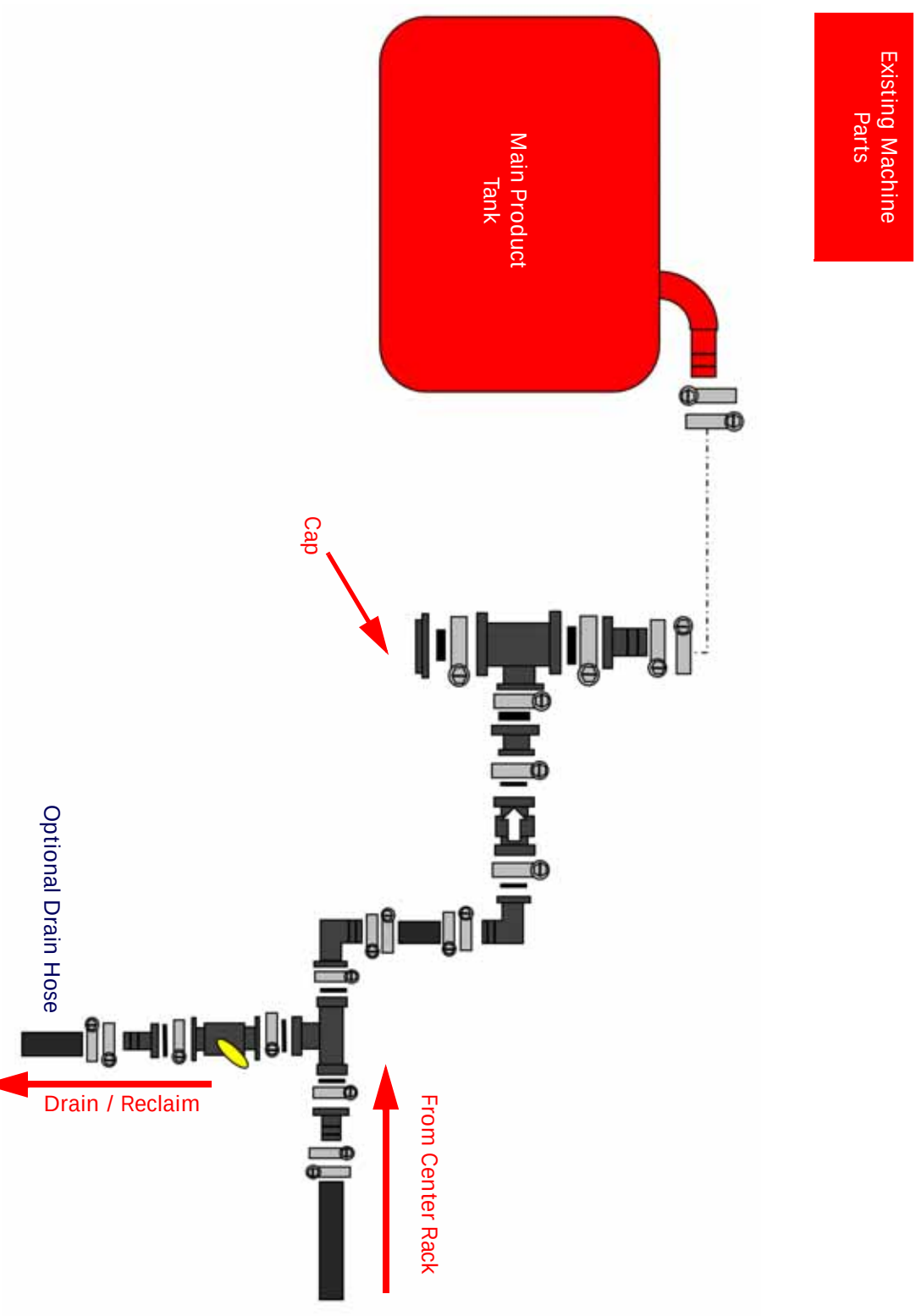


1. Connect the Boom Recirculation Adapter cable (P/N 115-2500-040) to the valve connector.
2. Locate the connector labeled AUXILIARY BREAKOUT on the existing machine product control cable. The connector may be found tucked into other harnessing and hydraulic line in front of the mounting location of the throttling valve assembly.
3. Remove the dust cap from the auxiliary breakout connector and connect to the adapter cable to allow the RCM-S ECU to operate the electronic recirculation valve.
4. Secure any loose sections of the cable using the supplied zip ties.

PLUMB THE DRAIN AND TANK RETURN

TANK RETURN AND DRAIN WITHOUT EDUCTOR - PATRIOT

FIGURE 4. Tank and Drain Recirculation Plumbing Diagram without Eductor



1. Mount the M200 x M200 tee to the black return mounting bracket (P/N 107-0172-764) with two U-bolts, 1/4" washers, and 1/4" lock nuts.
2. Assemble the 1" check valve and M200 to M100 adapter to the side port of the tee as shown in Figure 4 on page 16.

NOTE: Pay close attention to the arrow on the check valve to allow flow to return from the boom to the tank.

3. Cap the open port on the bottom of the tee fitting.

FIGURE 5. Example Plumbing of Tank Top Hose Barb Outlet

NOTE: Eductor hose may need to be shortened to accommodate assembly.

4. Route the "bumble bee" hose from the tee up to the 1.5" steel hose barb outlet located on the top of the tank.
5. Route the 1.25" boom hose from the 1" check valve across the back of the tank.
6. Plumb in the drain tee and hand valve.

CAUTION

Route hose away from moving parts and pinch points, generally following existing hose routing.

Install hose protectors as needed along sharp edges.

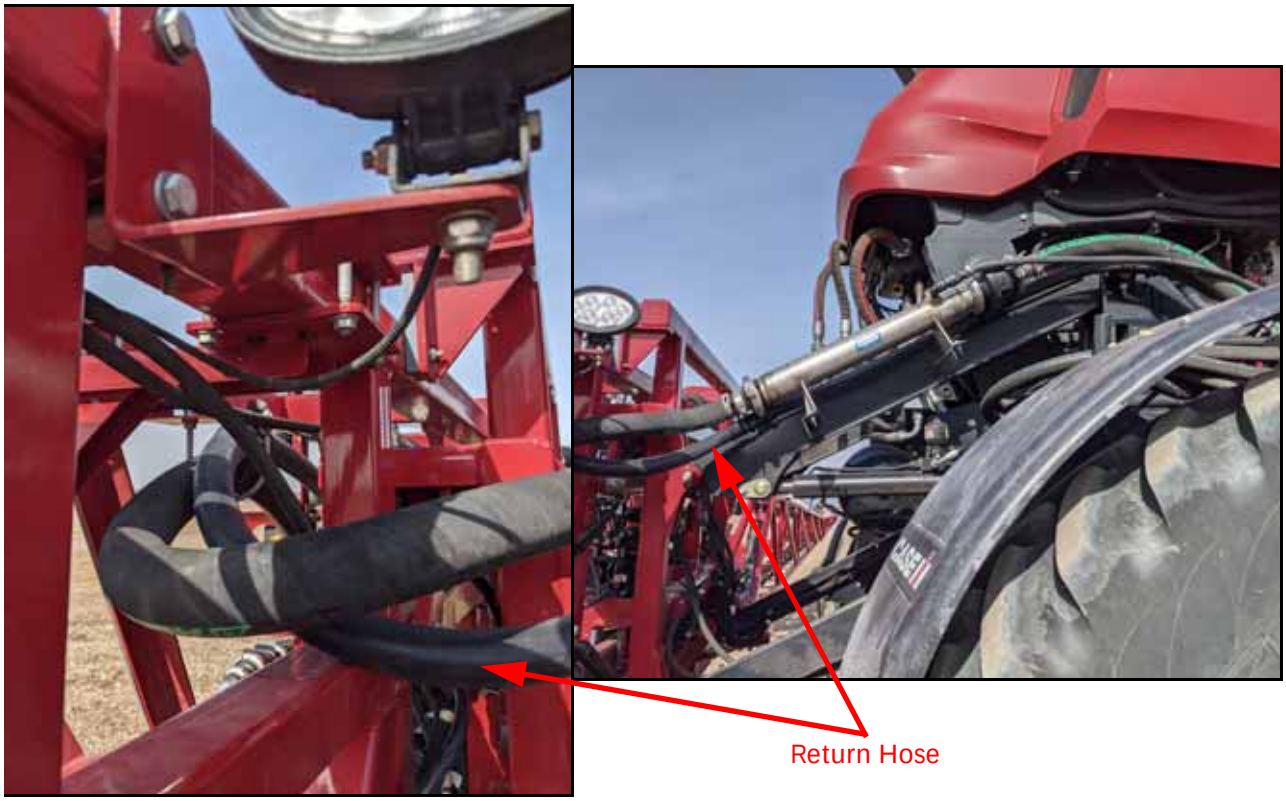
FIGURE 6. Example Plumbing for Return Valve to Drain Valve

Return

Drain

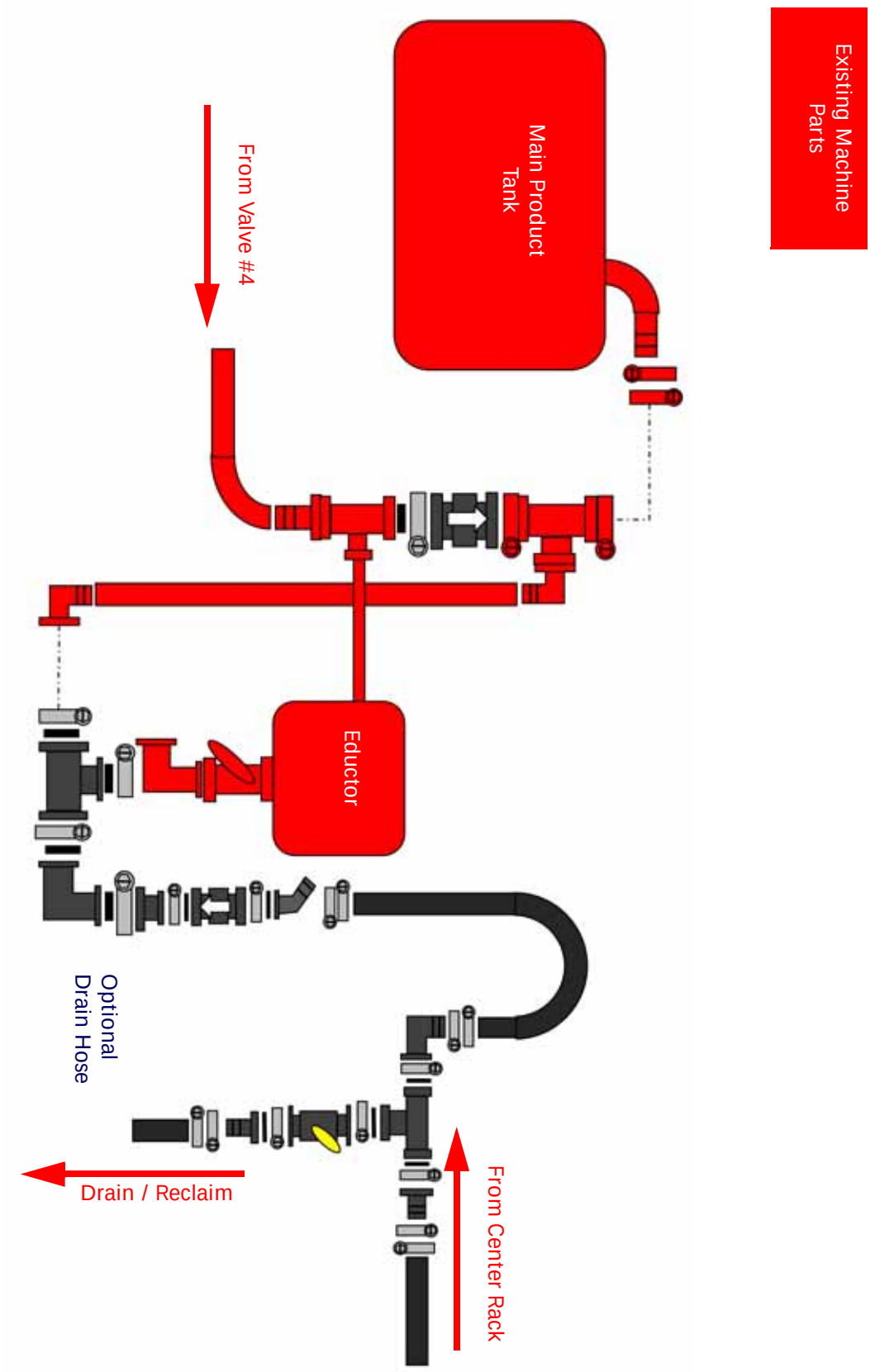
7. Route the 1.25” boom hose from the drain tee back to the electric valve on the center rack by following the product supply hose along the side of the sprayer and onto the center rack.

FIGURE 7. Example Plumbing for Return Hose



TANK RETURN AND DRAIN WITH EDUCTOR - PATRIOT

FIGURE 8. Tank and Drain Recirculation Plumbing Diagram with Eductor



1. Locate the existing hose routing from the eductor to the product tank.
2. Disconnect the existing M200 hose barb elbow located at the bottom of the eductor/eductor valve.

NOTE: Leave the flanged elbow connected to the eductor valve and the hose barb elbow connected to the existing “bumble bee” hose.

3. Mount the middle/branch port of the supplied M200 x M200 tee to the elbow below the eductor valve.

FIGURE 9. Eductor Plumbing

4. Attach the existing M200 hose barb elbow to the tee as show in Figure 9 on page 21.
5. Assemble the M200 elbow, M200 to M100 adapter, M100 45 elbow, and 1" check valve together as shown in Figure 8 on page 20. Mount the assembly to the open port on the M200 tee.
6. Disconnect the existing eductor venturi tee and the eductor rinse tee fittings.
7. Install the 2" check valve between the two tees as shown in Figure 10 on page 22.

NOTE: Pay close attention to the arrow on the check valve to allow flow to up to the tank inlet.

CAUTION

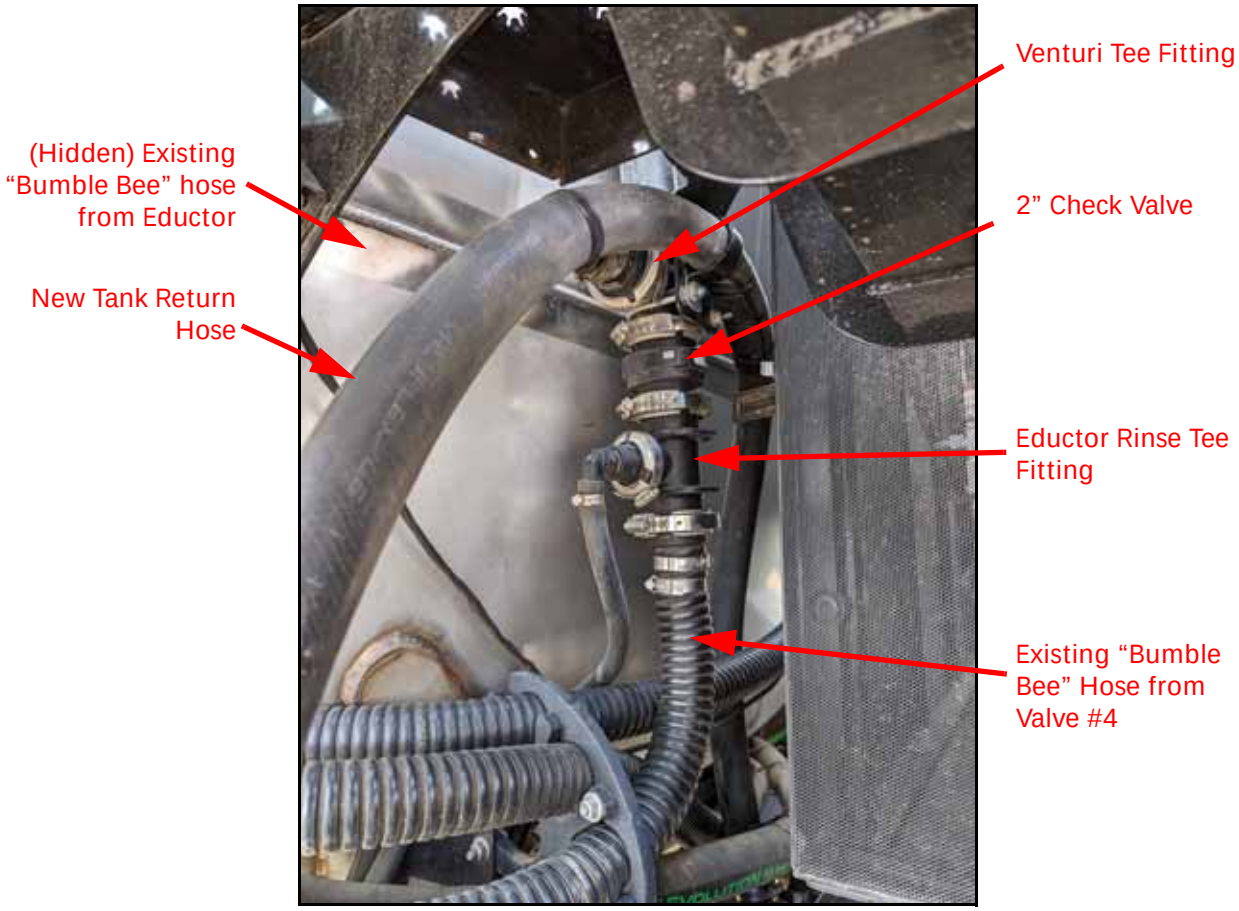
Route hose away from moving parts and pinch points, generally following existing hose routing.

Install hose protectors as needed along sharp edges.

8. Route the 1-1/4" hose along the existing “bumble bee” hose up to the eductor venturi tee as shown in Figure 10 on page 22.

NOTE: The 1-1/4” hose does not connect to the venturi tee fitting.

FIGURE 10. Route the 1-1/4” Hose



9. Continue routing the hose from the eductor along the back of the tank to plumb the drain tee and hand valve.

CAUTION

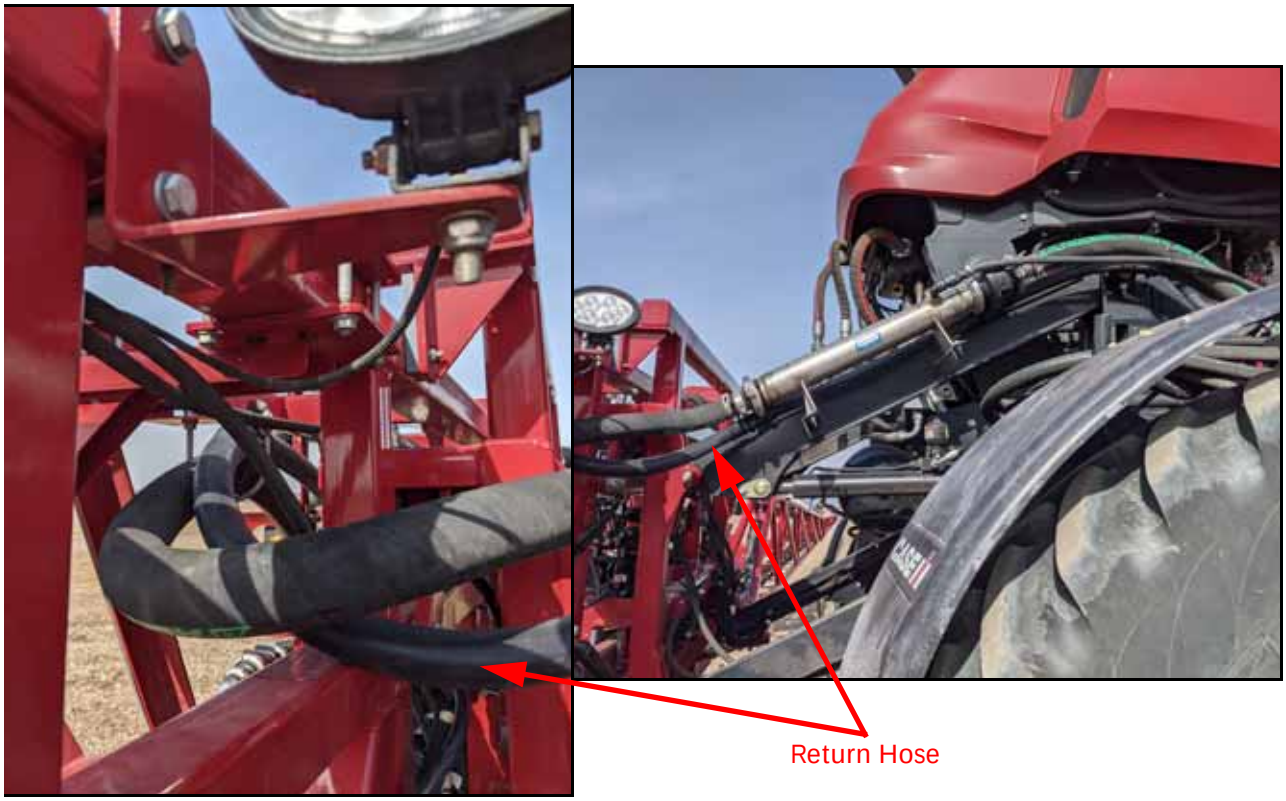
Route hose away from moving parts and pinch points, generally following existing hose routing.

Install hose protectors as needed along sharp edges.

FIGURE 11. Example Plumbing for Return Valve to Drain Valve

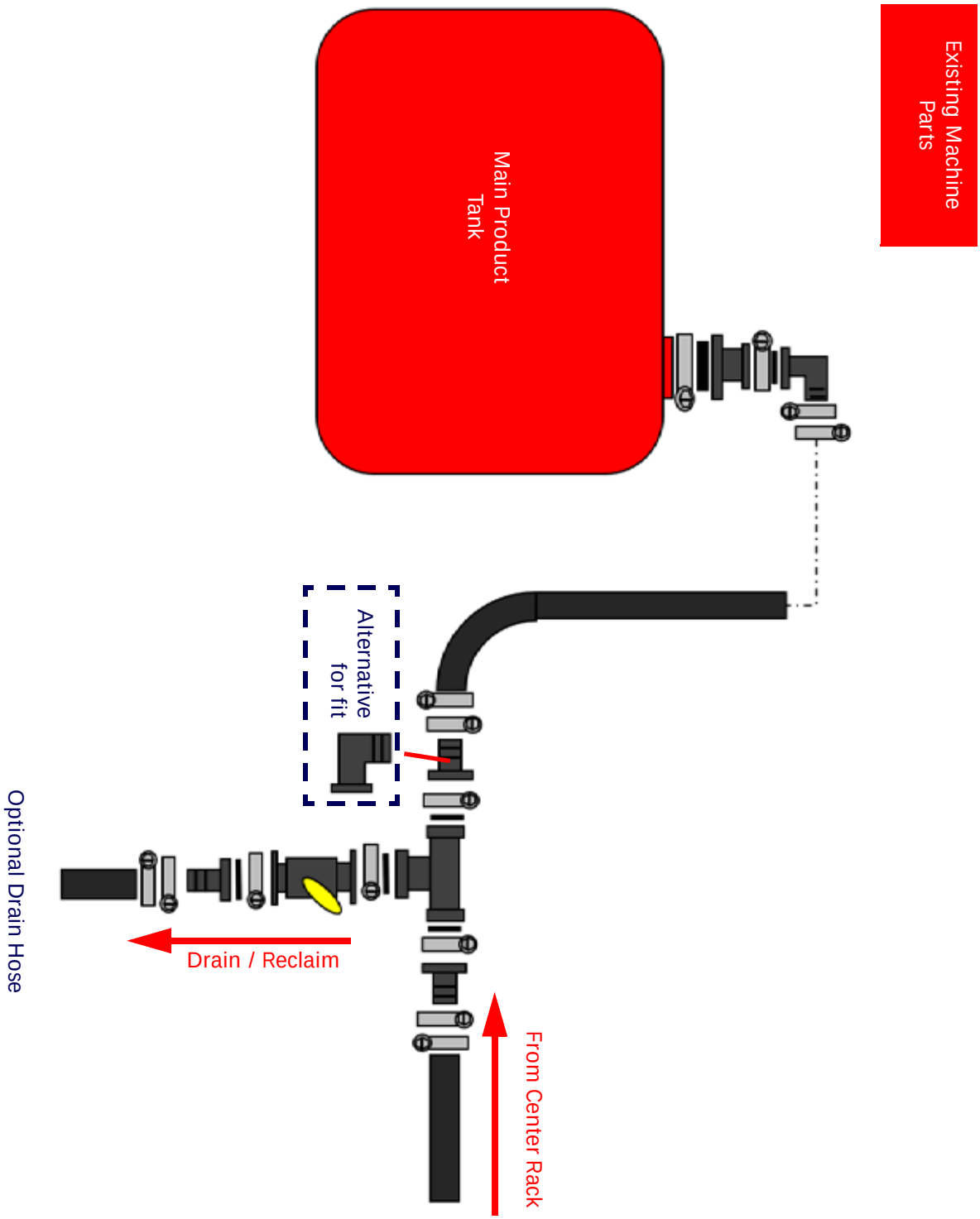
10. Route the 1.25” boom hose from the drain tee back to the electric valve on the center rack by following the product supply hose along the side of the sprayer and onto the center rack.

FIGURE 12. Example Plumbing for Return Hose



TANK RETURN AND DRAIN WITHOUT EDUCTOR - TRIDENT

FIGURE 13. Tank and Drain Recirculation Plumbing Diagram without Eductor



1. Locate the M220 cap in the top port of the tank on the left side of the machine.
2. Remove the cap and assemble the M220 x M100 coupling into the port.
3. Assemble the M100 x 1.25” HB sweep onto the coupling.

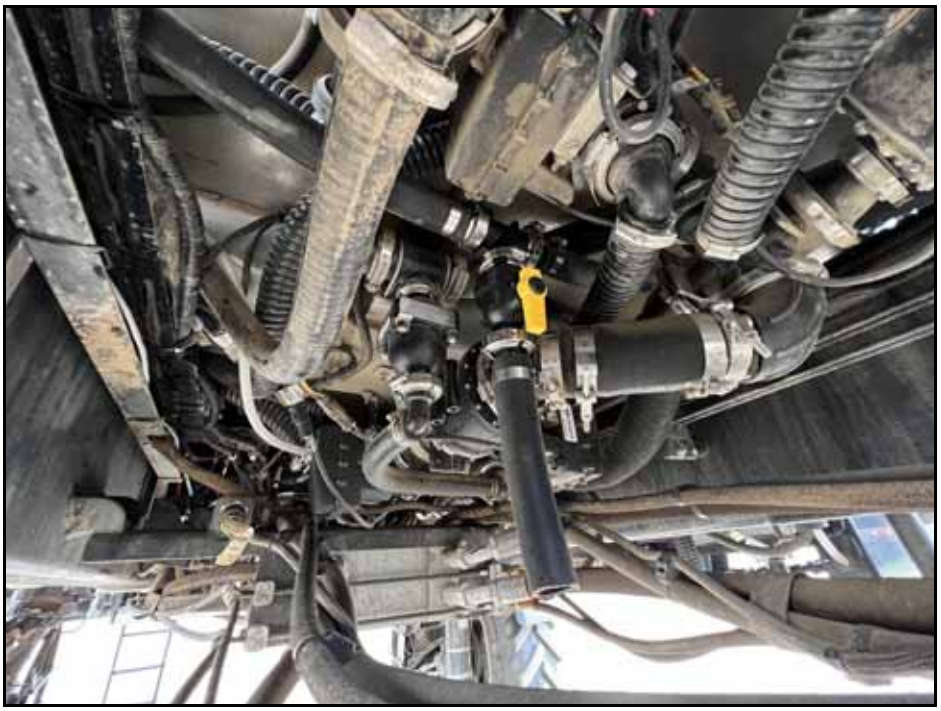
FIGURE 14. Tank Return on Trident 5550 Sprayers

4. Route the 1.25" boom hose from the sweep down the side of the tank and underneath the tank.

NOTE: Make sure to route the hose above the structural chassis to allow the sprayer skid to be removed.

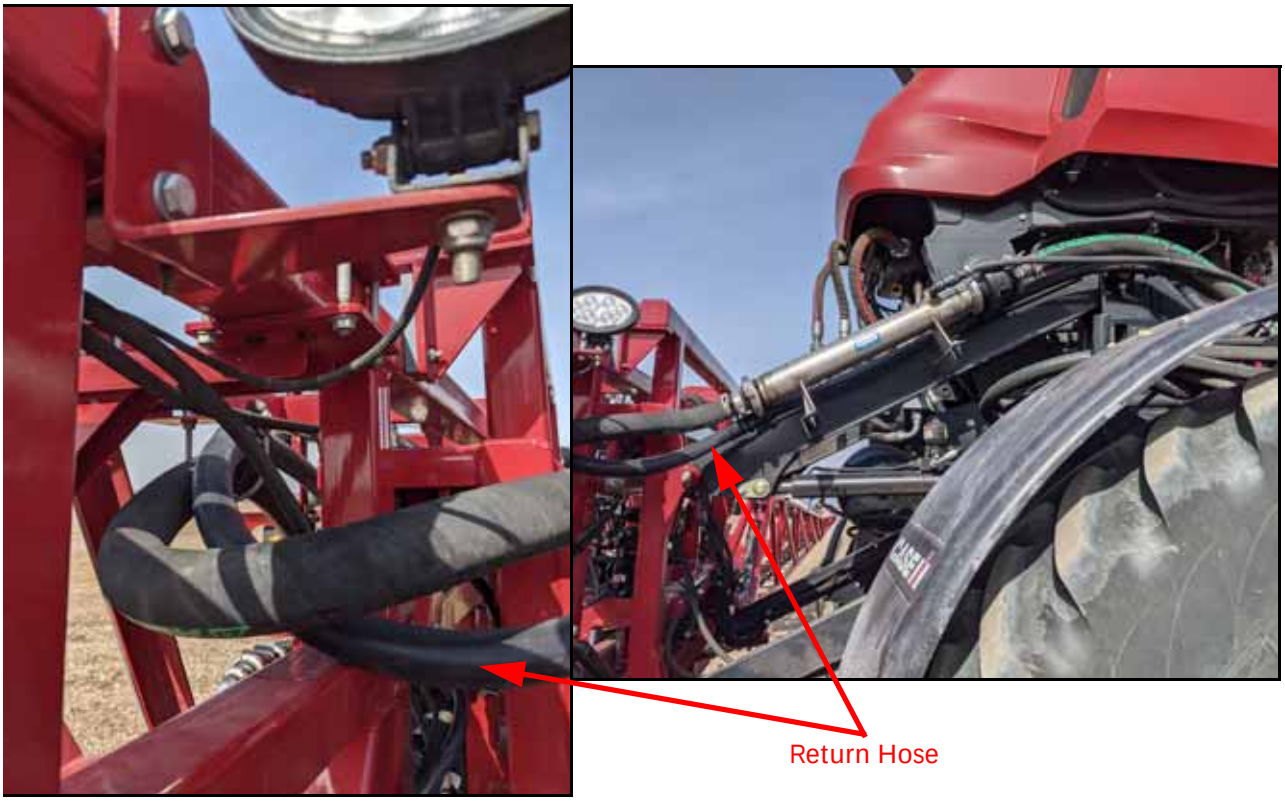
5. Plumb the drain tee and hand valve along the bottom of the tank.

FIGURE 15. Tank Return on Trident 5550 Sprayers



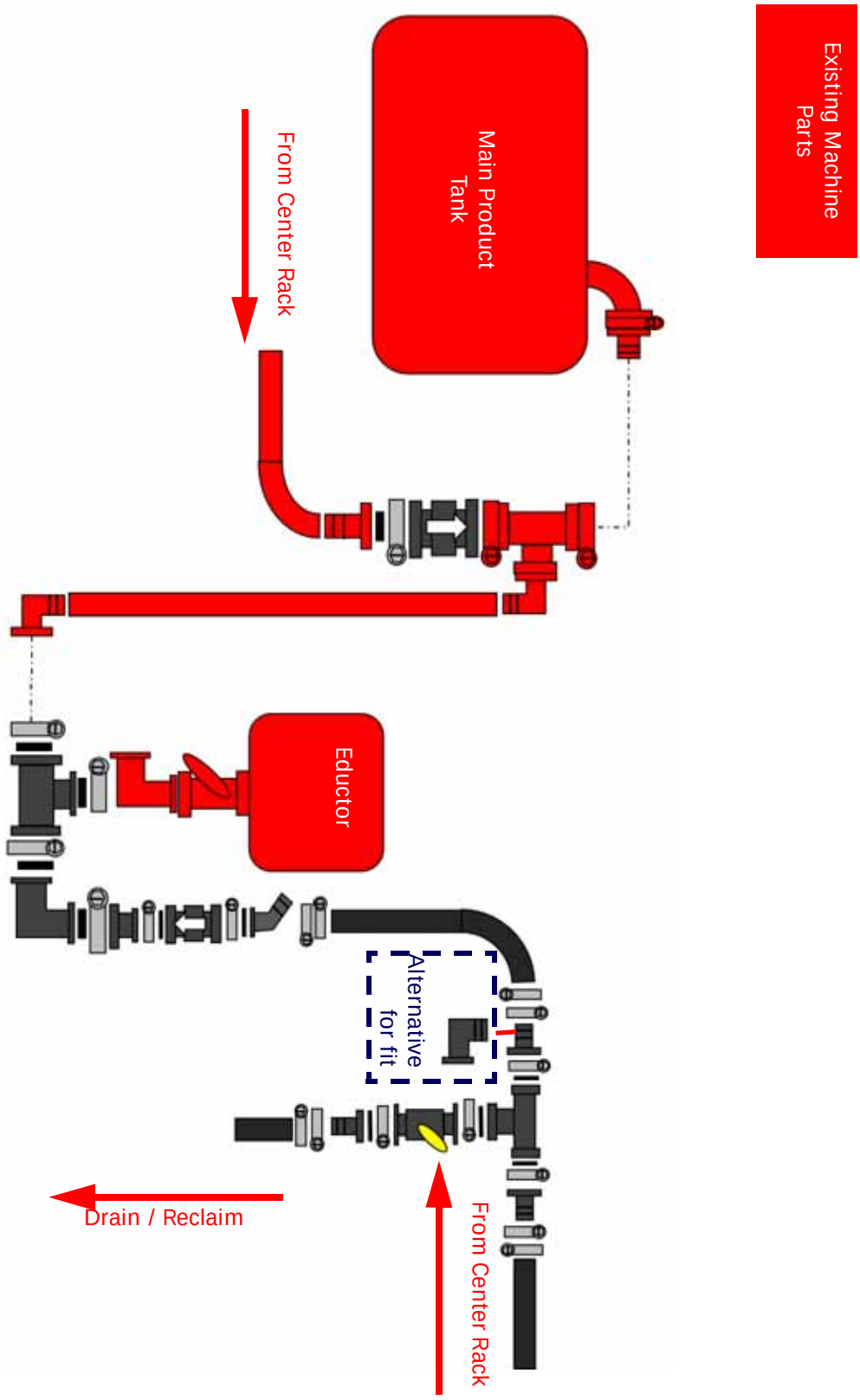
6. Route the 1.25" boom hose from the drain tee back to the electric valve on the center rack by following the product supply hose along the side of the sprayer onto the center rack.

FIGURE 16. Example Plumbing for Return Hose



TANK RETURN AND DRAIN WITH EDUCTOR - TRIDENT

FIGURE 17. Tank and Drain Recirculation Plumbing Diagram without Eductor



1. Locate the existing hose routing from the eductor to the product tank.
2. Disconnect the existing M200 hose barb elbow located at the bottom of the eductor/eductor valve.

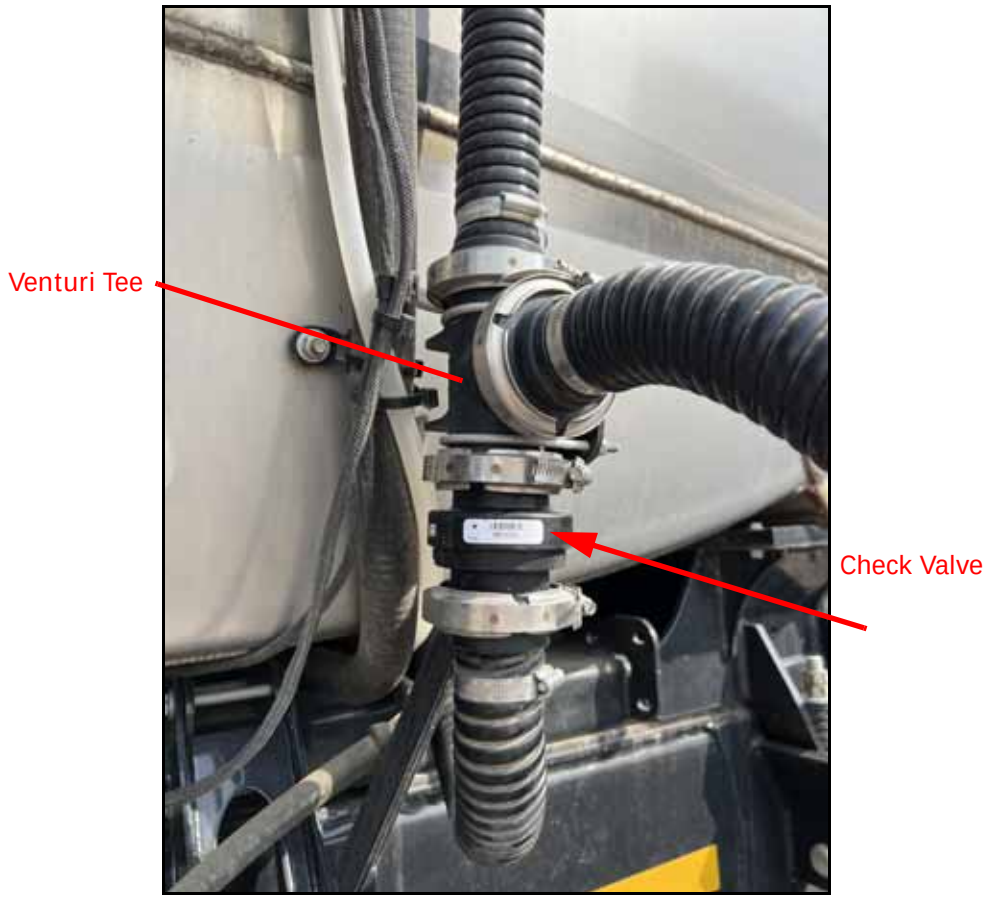
NOTE: Leave the flanged elbow connected to the eductor valve and the hose barb elbow connected to the existing “bumble bee” hose.

3. Mount the middle/branch port of the supplied M200 x M200 tee to the elbow below the eductor valve.

FIGURE 18. Eductor Plumbing

4. Attach the existing M200 hose barb elbow to the tee as show in Figure 18 on page 28.
5. Assemble the M200 elbow, M200 to M100 adapter, M100 45 elbow, and 1" check valve together as shown in Figure 17 on page 27. Mount the assembly to the open port on the M200 tee.
6. Disconnect the M200 hose barb from the eductor venturi tee mounted above the eductor on the left side of the tank.
7. Install the 2" check valve between the hose barb and tee as shown in Figure 19 on page 29.

FIGURE 19. Eductor Check Valve



NOTE: Pay close attention to the arrow on the check valve to allow flow up to the tank inlet.

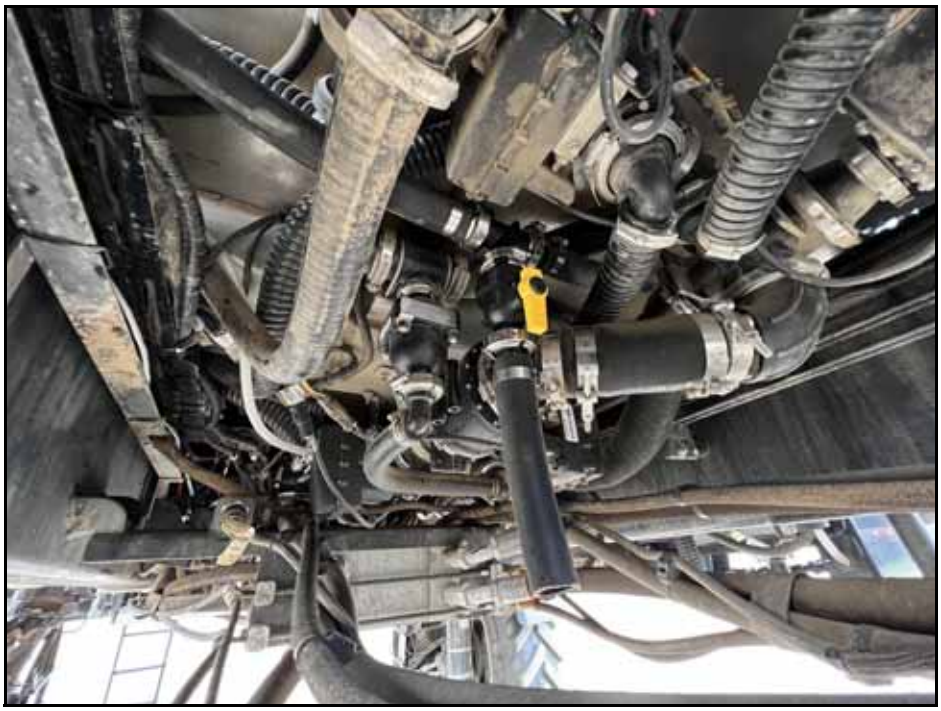
8. Route the 1.25" boom hose along the existing "bumble bee" hose from the M100 fittings up to the eductor venturi tee as shown in Figure 20 on page 30.

FIGURE 20. Eductor Hose

NOTE: The 1.25" hose does not connect to the venturi tee fitting.

9. Continue routing the hose from the eductor venturi tee underneath the tank to plumb the drain tee and hand valve.

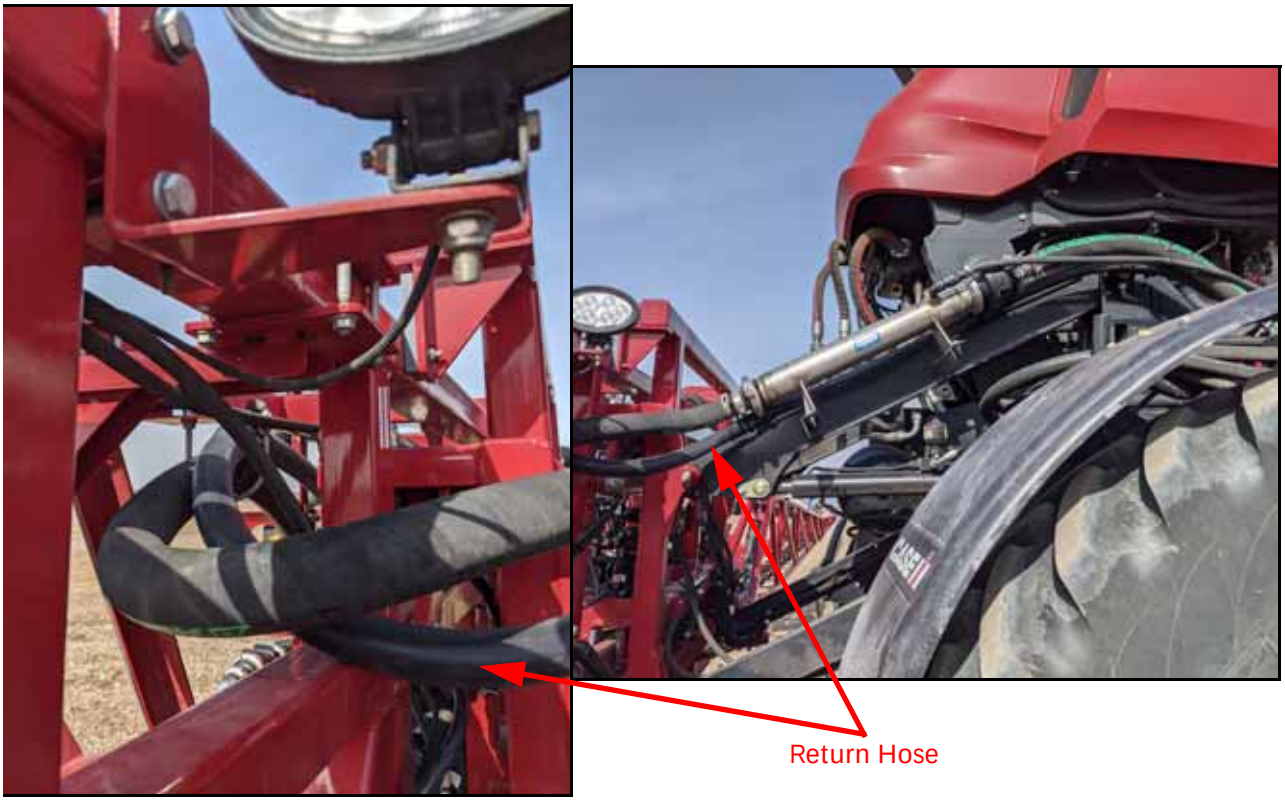
FIGURE 21. Tank Return on Trident 5550 Sprayers



NOTE: Make sure to route the hose above the structural chassis to allow the sprayer skid to be removed.

10. Route the 1.25" boom hose from the drain tee back to the electric valve on the center rack by following the product supply hose along the side of the sprayer and onto the center rack.

FIGURE 22. Example Plumbing for Return Hose



CHAPTER 4

SECTION PLUMBING FOR 5 AND 7 SECTION STEEL BOOMS (90’ AND 120’)

90’ WIDTH, 20” SPACING, 5-SECTION

FIGURE 1. Section 3 - Center Rack and Return for 90’/20” 5-Section Boom

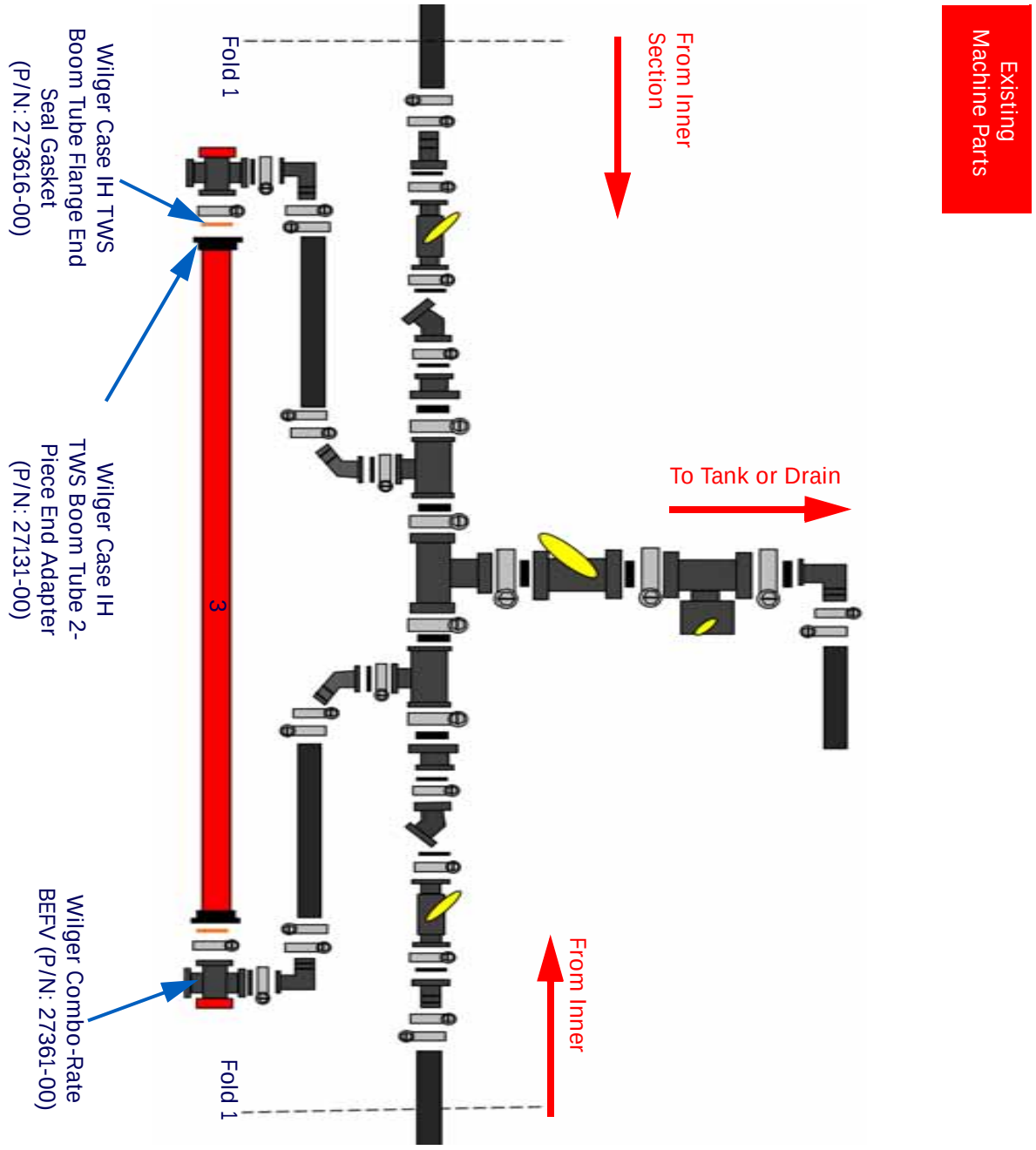


FIGURE 2. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

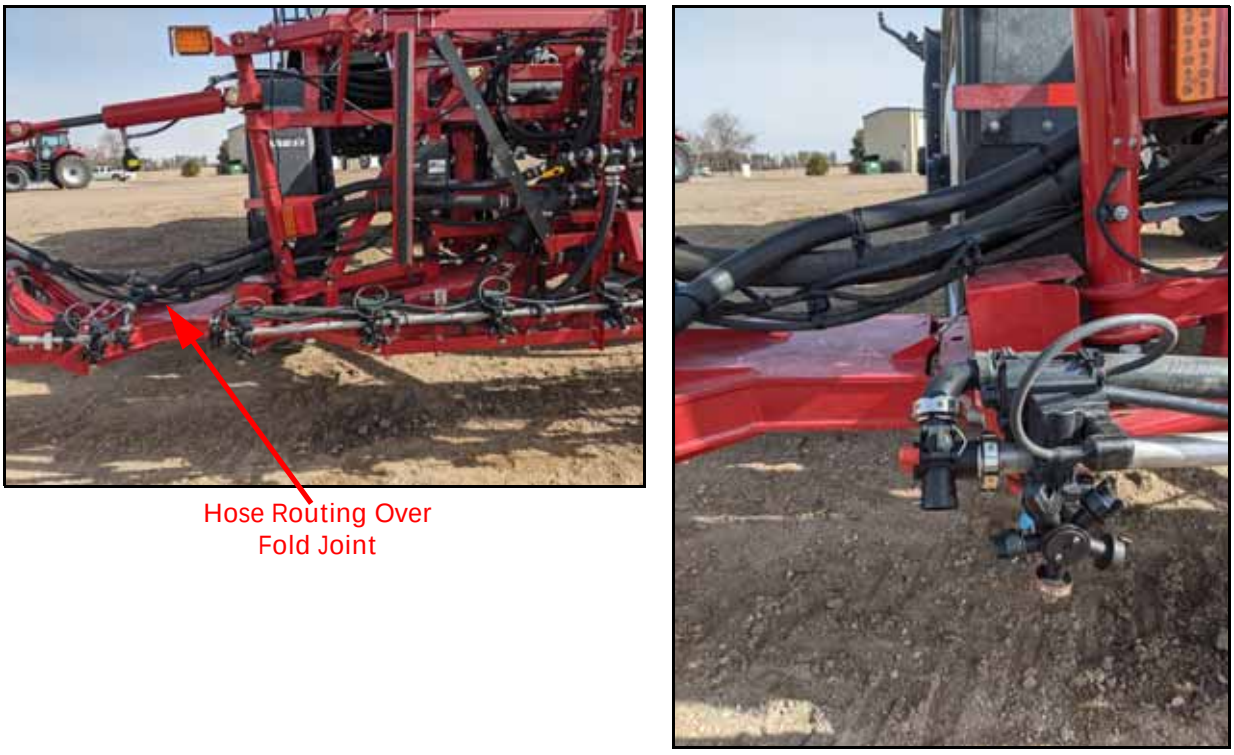


FIGURE 3. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

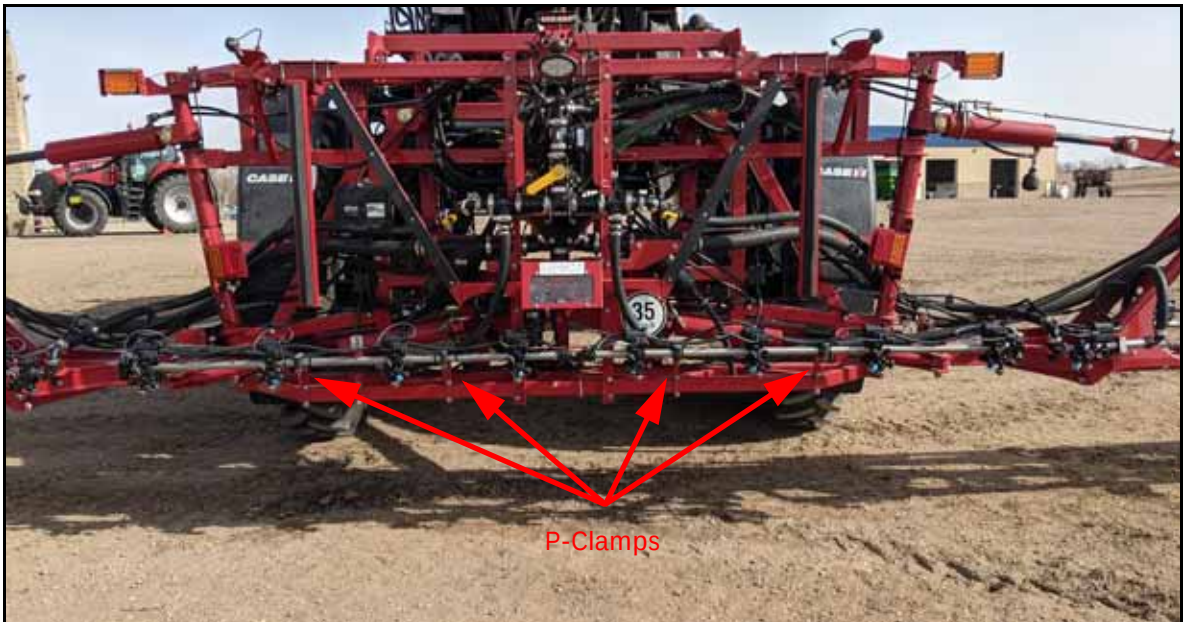
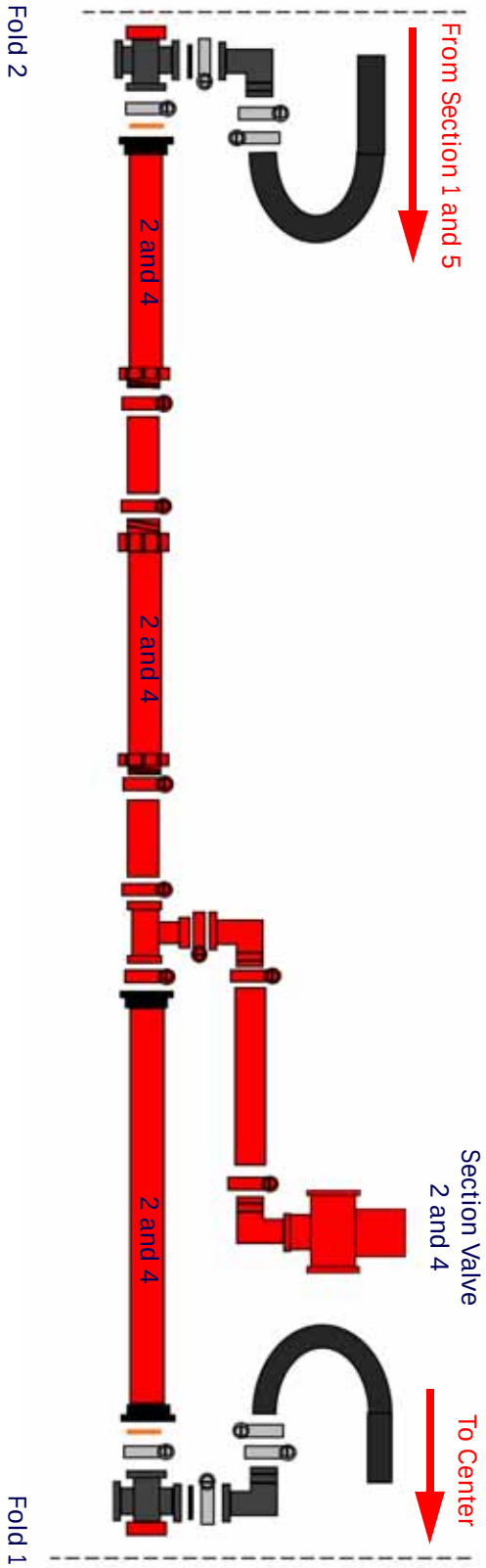
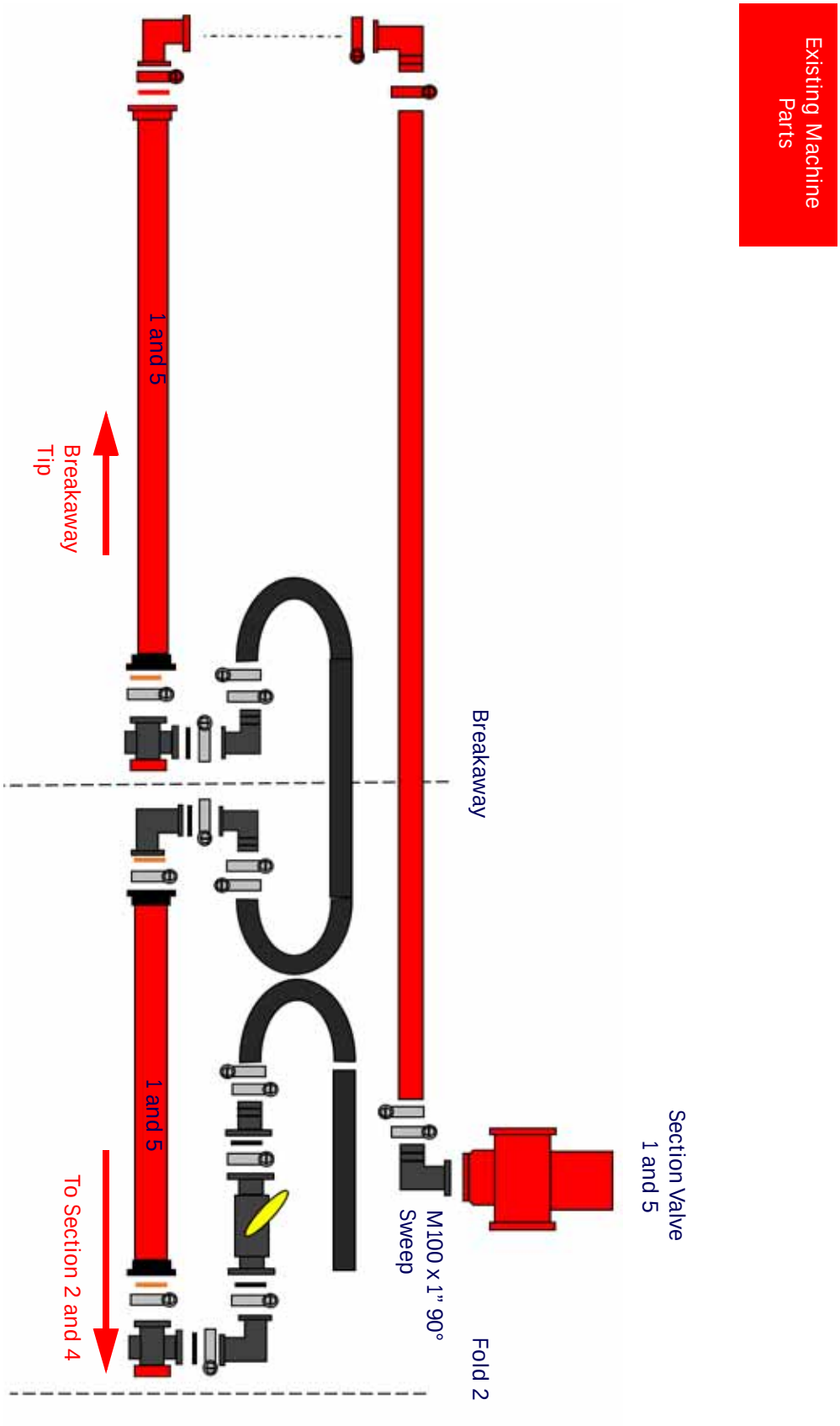


FIGURE 4. Sections 2 and 4 - Inner Boom for 90’/20” 5 Section Boom



Existing Machine Parts

FIGURE 5. Sections 1 and 5 - Outer Boom and Breakaway for 90'/20" 5-Section Boom



120’ WIDTH, 20” SPACING, 7-SECTION

FIGURE 6. Section 3 - Center Rack for 120’/20” 7-Section Boom

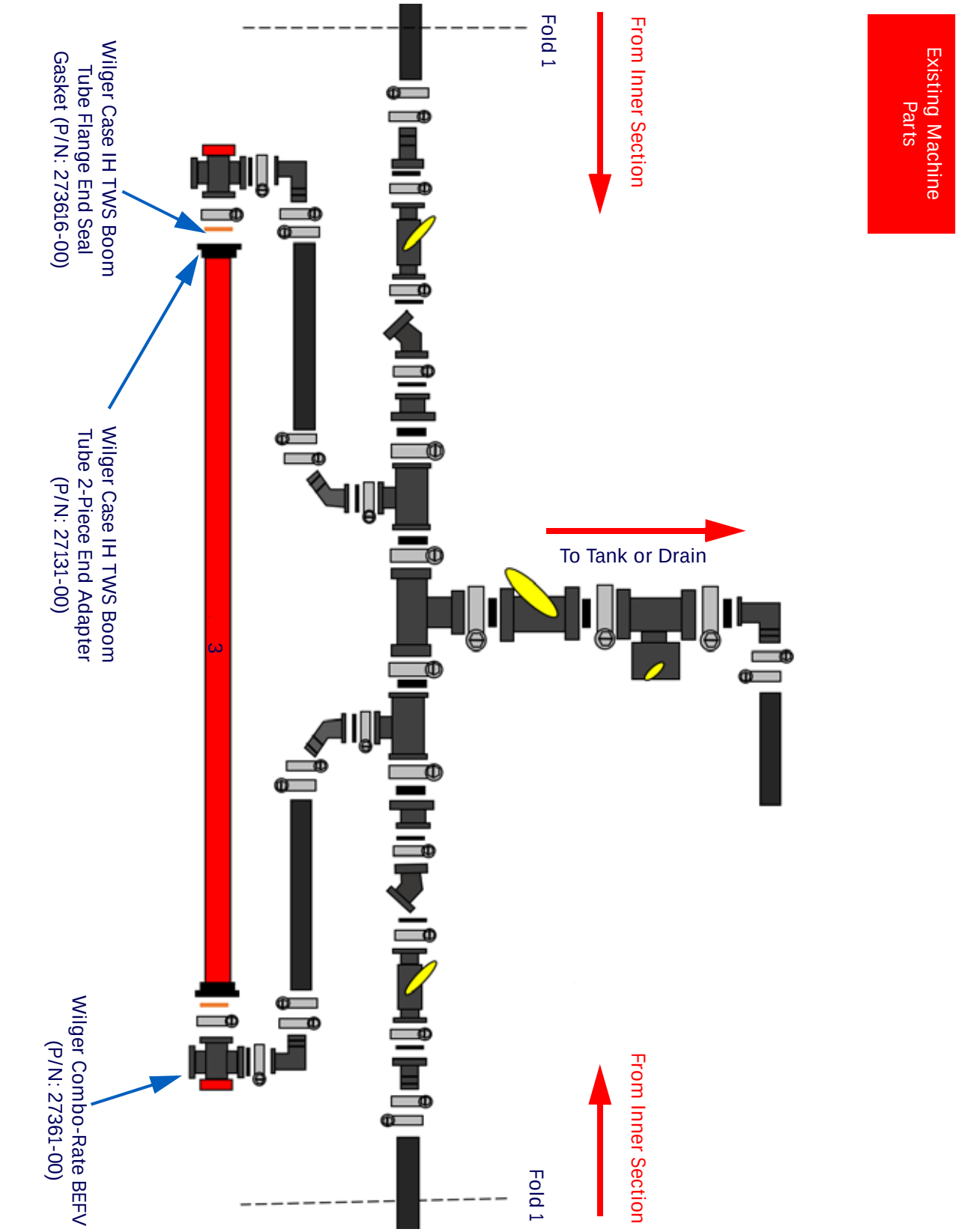


FIGURE 7. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

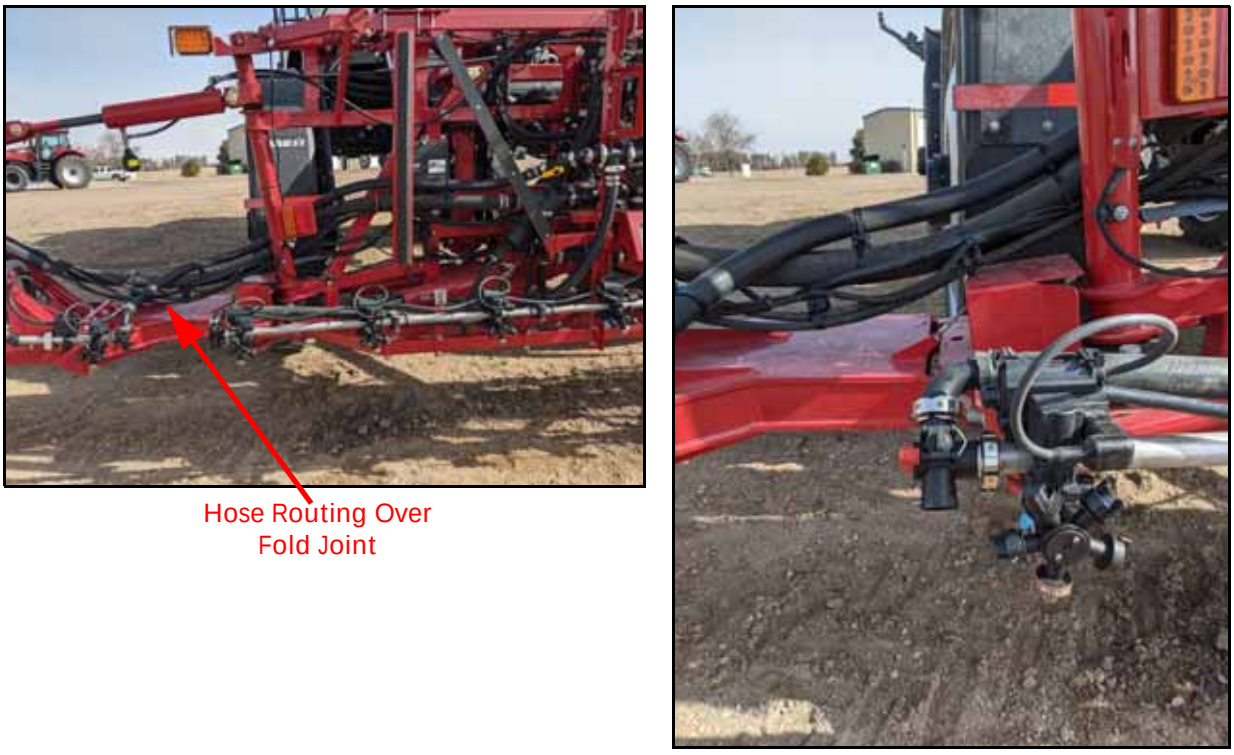


FIGURE 8. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

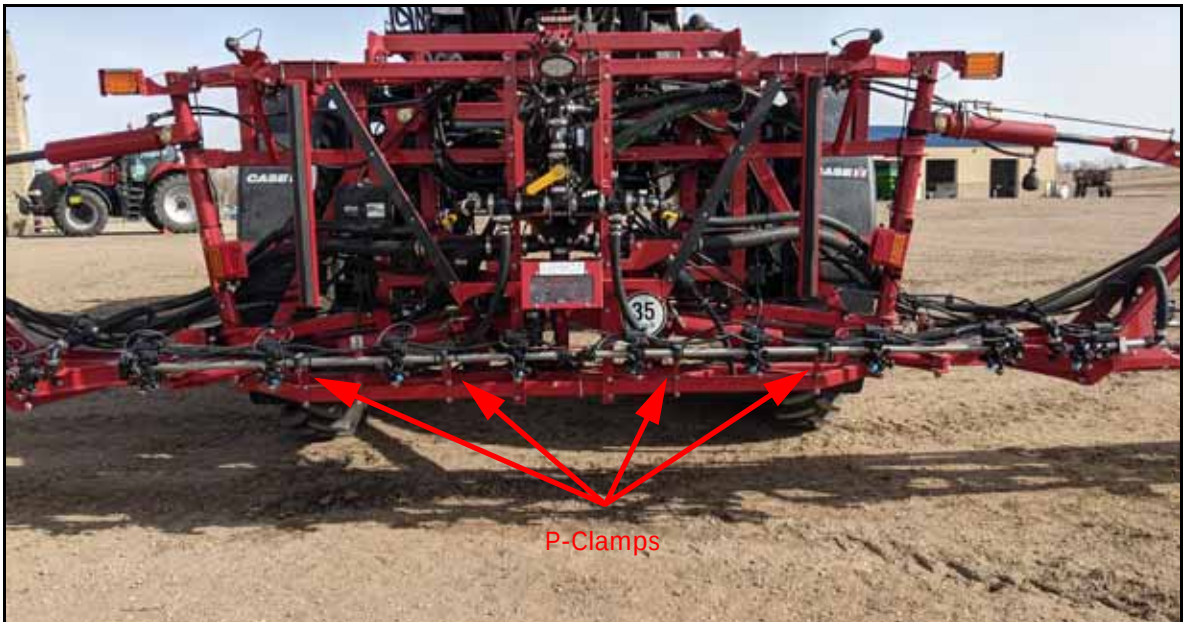


FIGURE 9. Sections 2, 3, 4, and 5 - Inner Boom for 120’/20” 7-Section Boom

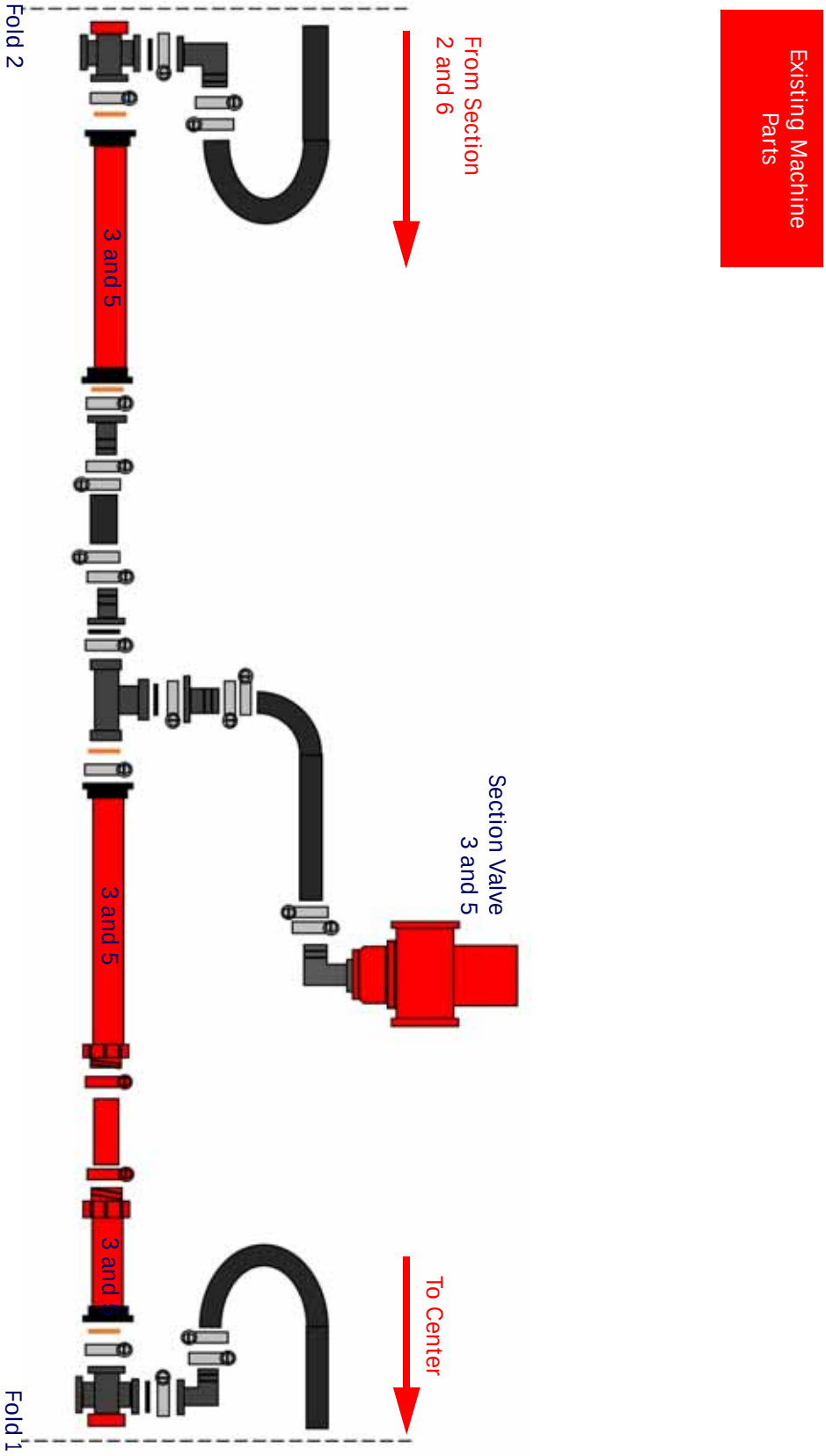


FIGURE 10. Example Plumbing of Inner Boom Sections 3 and 5

FIGURE 11. Sections 2 and 6 - Mid-Boom for 120’/20” 7-Section Boom

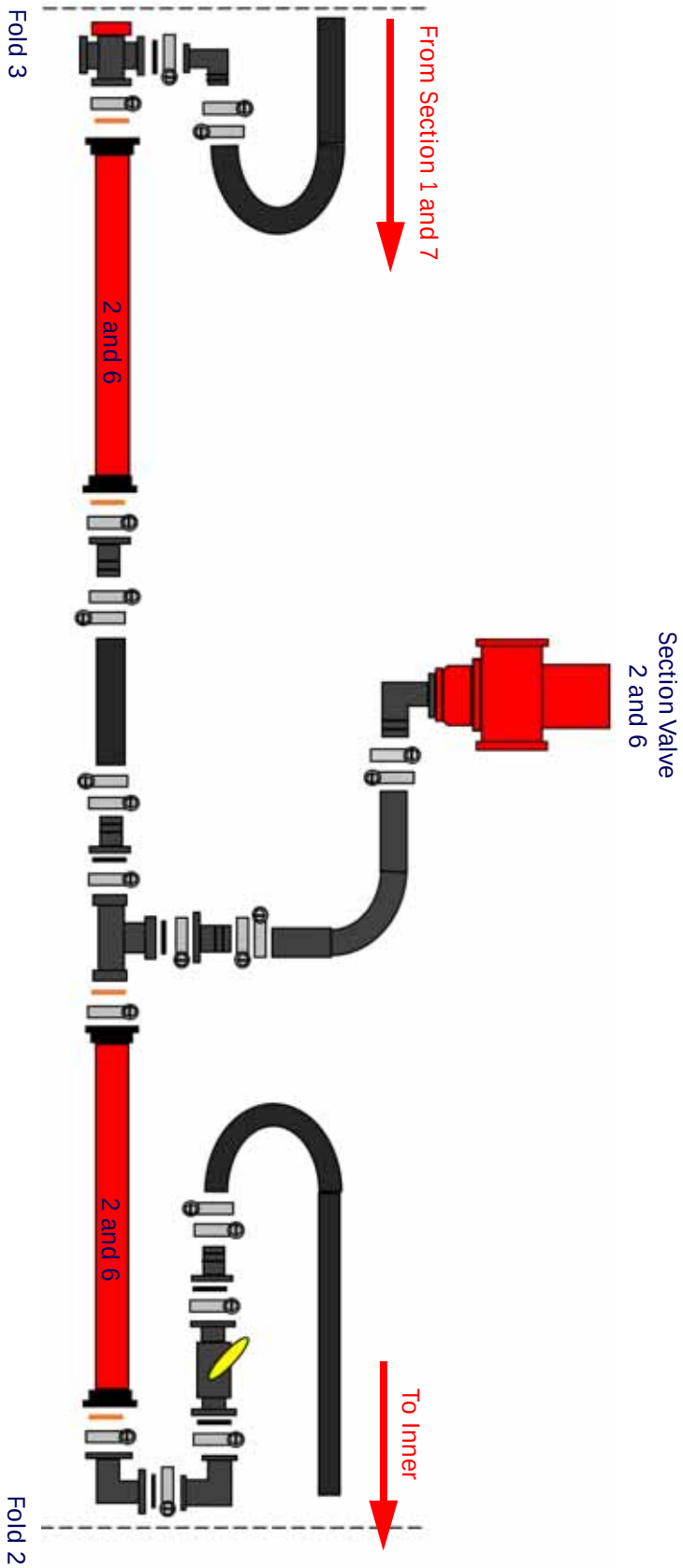


FIGURE 12. Sections 1 and 7 - Outer Boom and Breakaway for 120'/20" 7-Section

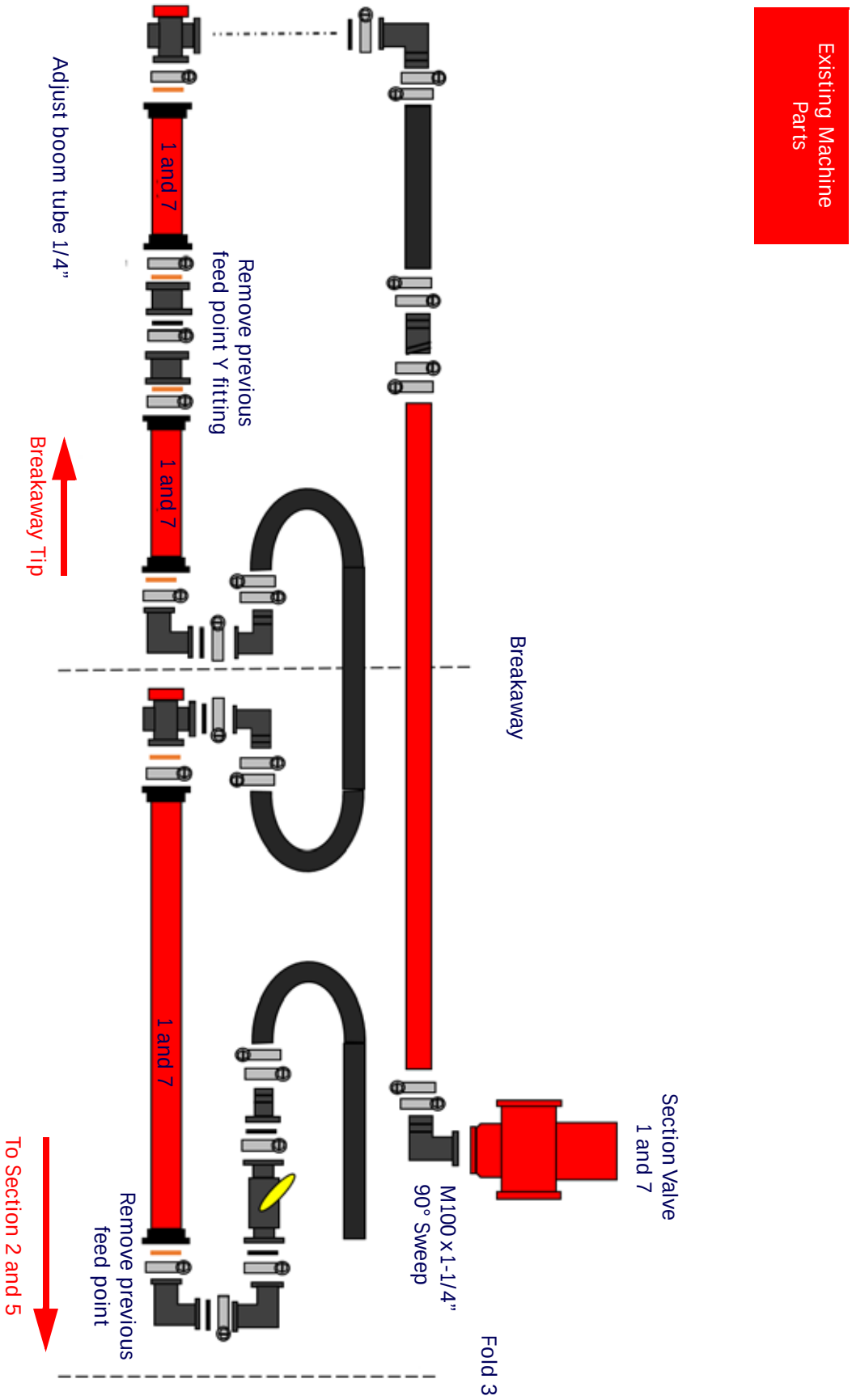


FIGURE 13. Example Plumbing of Outer Boom Section Valve for Sections 1 and 7

FIGURE 14. Example Plumbing of Breakaway Tip and Protection Shield for Sections 1 and 7

120’ WIDTH, 20” OR 30” SPACING, 7-SECTION

FIGURE 15. Section 4 - Center Rack and Return for 120’/20-30” 7-Section Boom

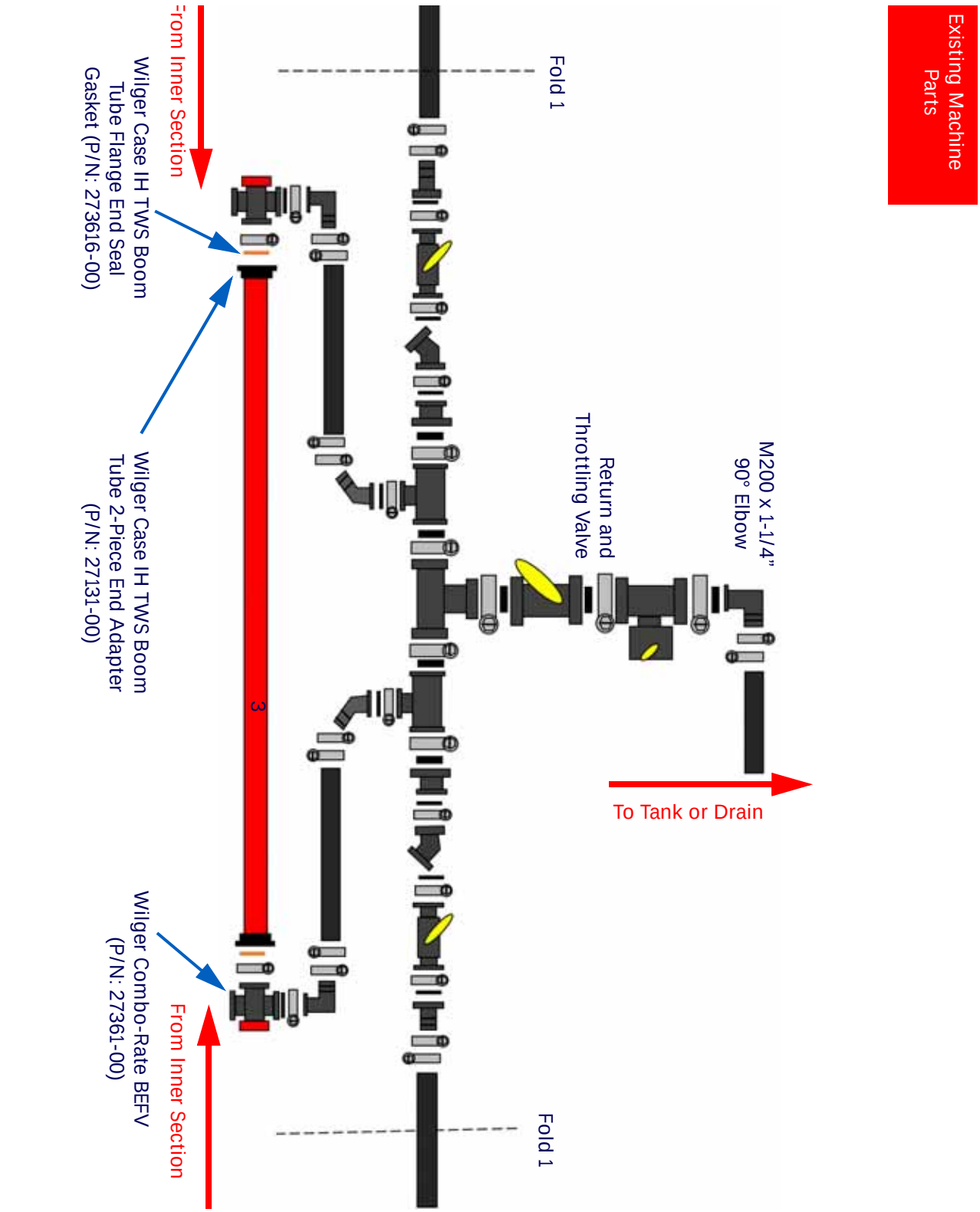


FIGURE 16. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

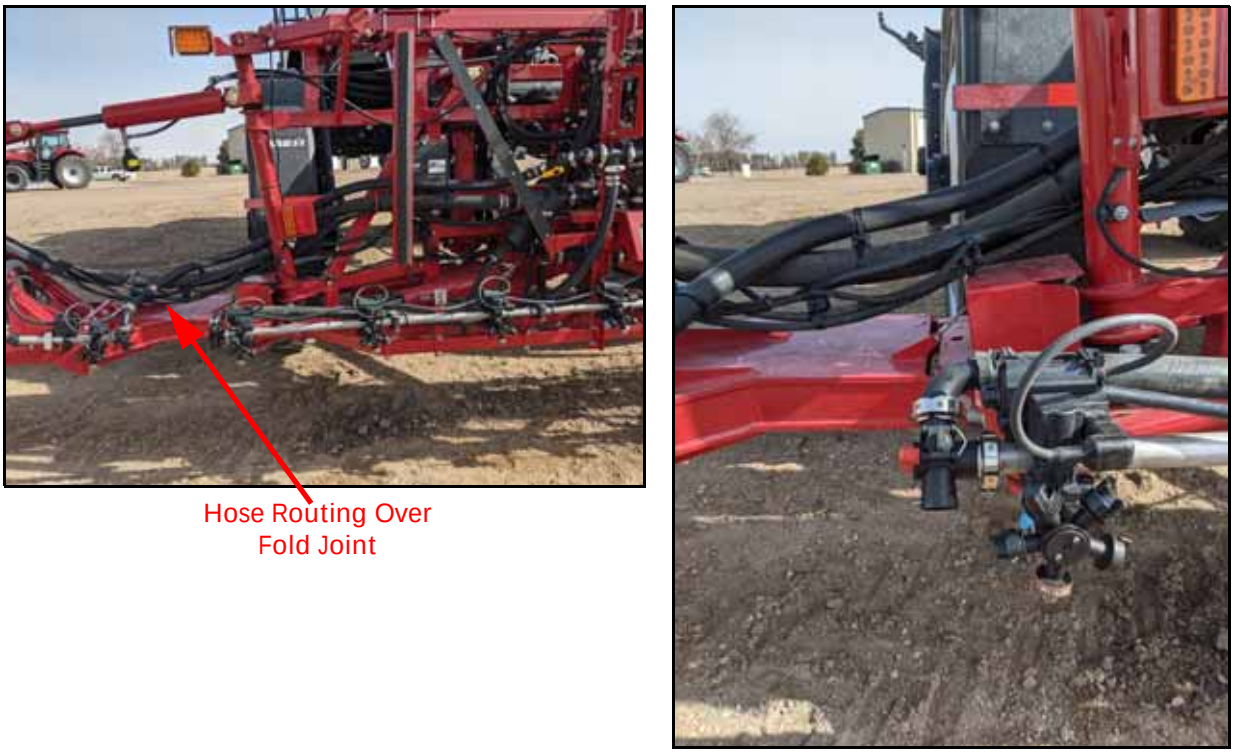


FIGURE 17. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

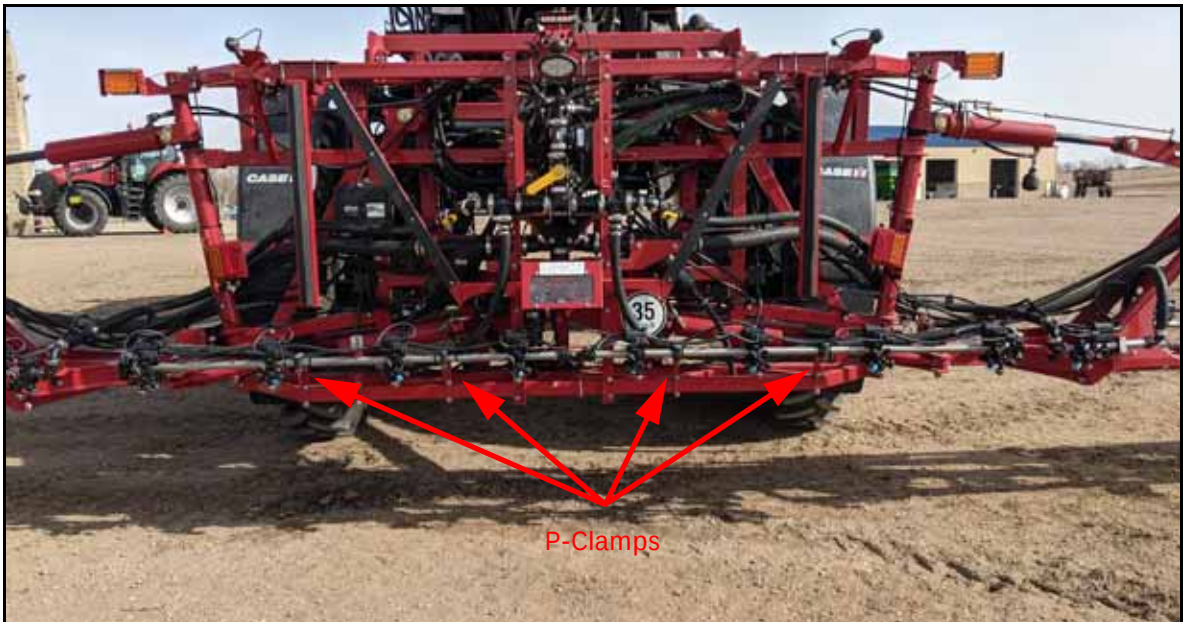


FIGURE 18. Sections 3 and 5 - Inner Boom for 120’/20-30”, 7-Section Boom

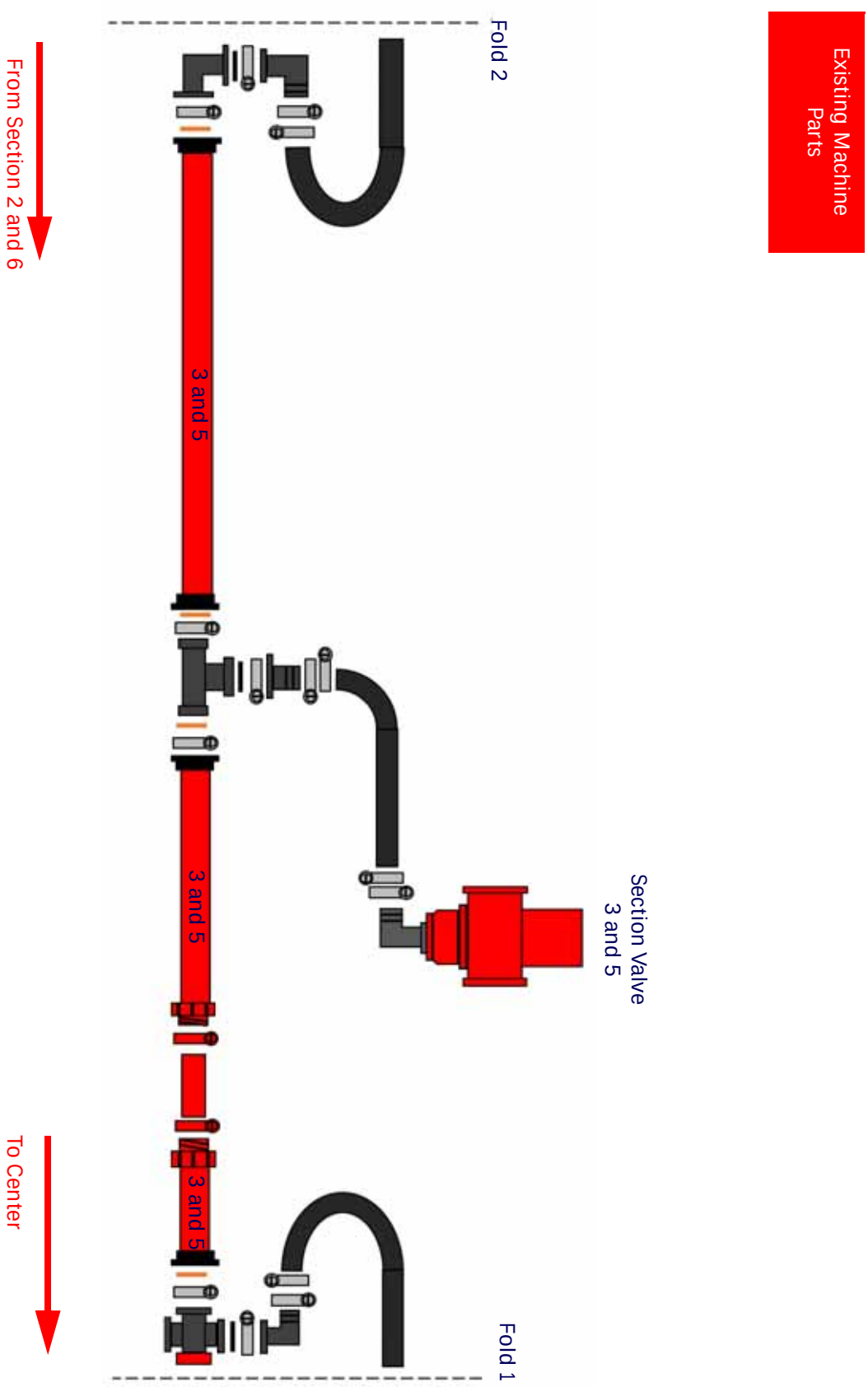


FIGURE 19. Sections 2 and 6 - Mid-Boom for 120'/20-30", 7-Section Boom

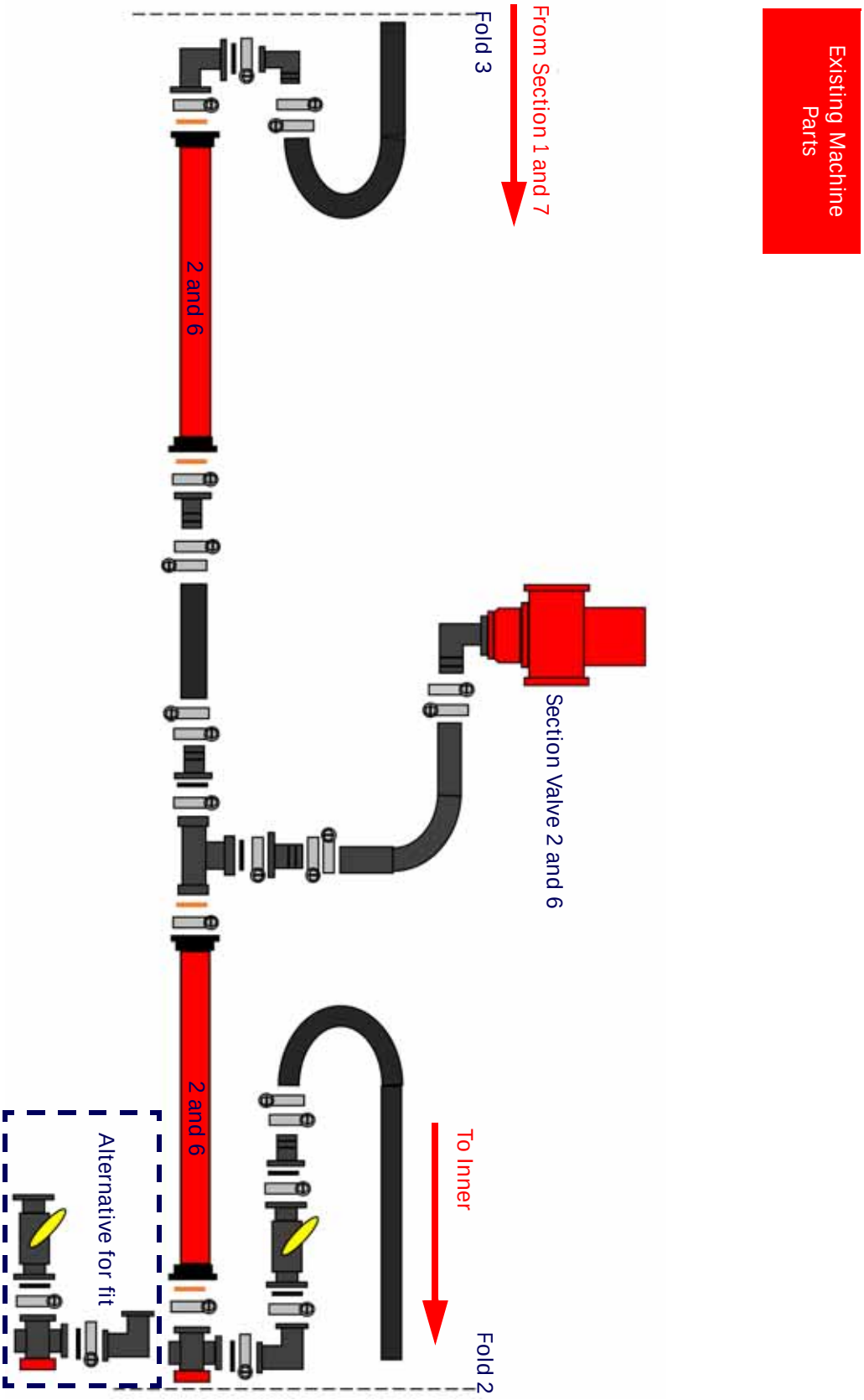
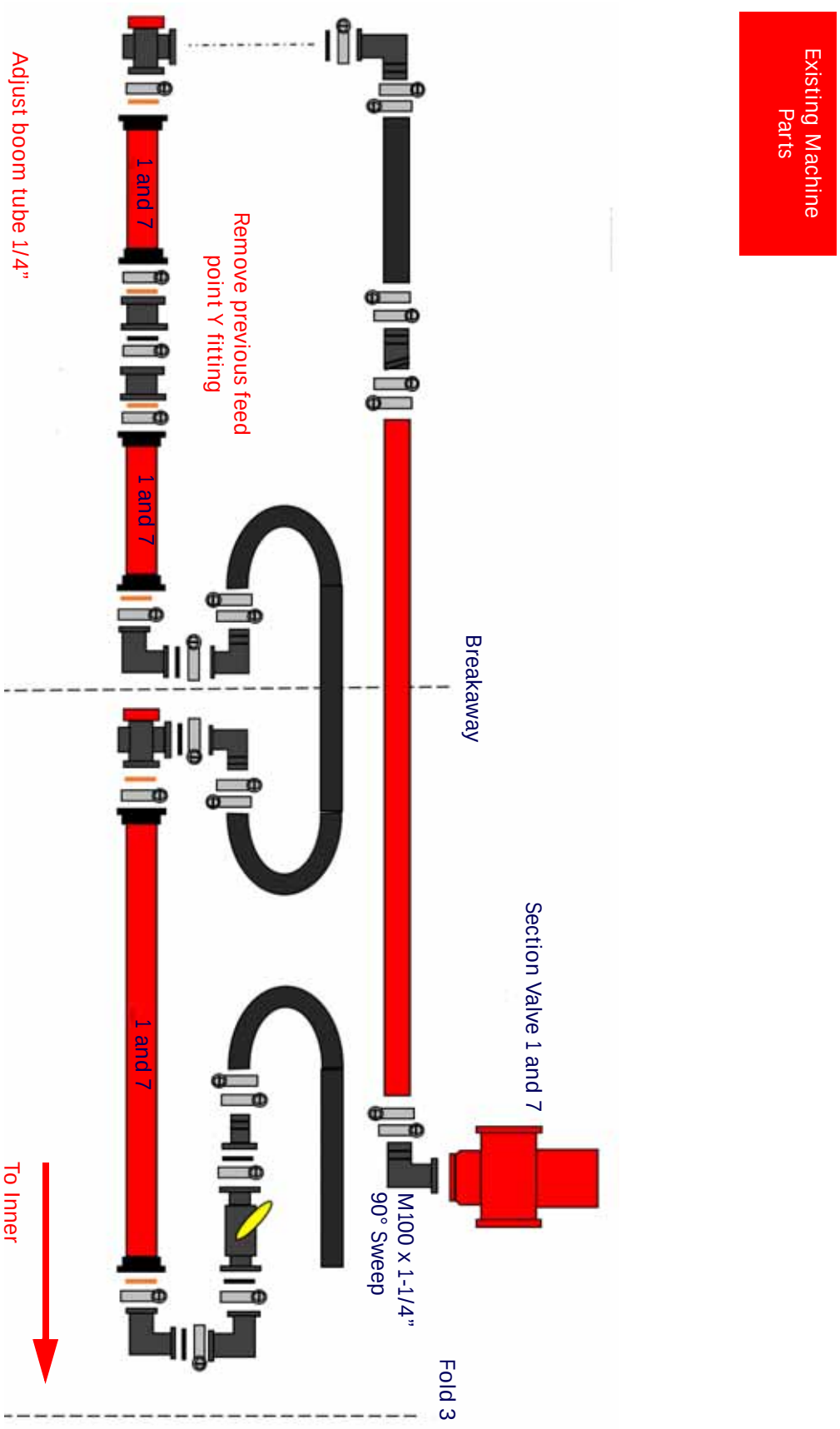


FIGURE 20. Example Plumbing of Mid-Boom Sections 2 and 6

FIGURE 21. Sections 1 and 7 - Outer Boom and Breakaway for 120'/20-30", 7-Section Boom

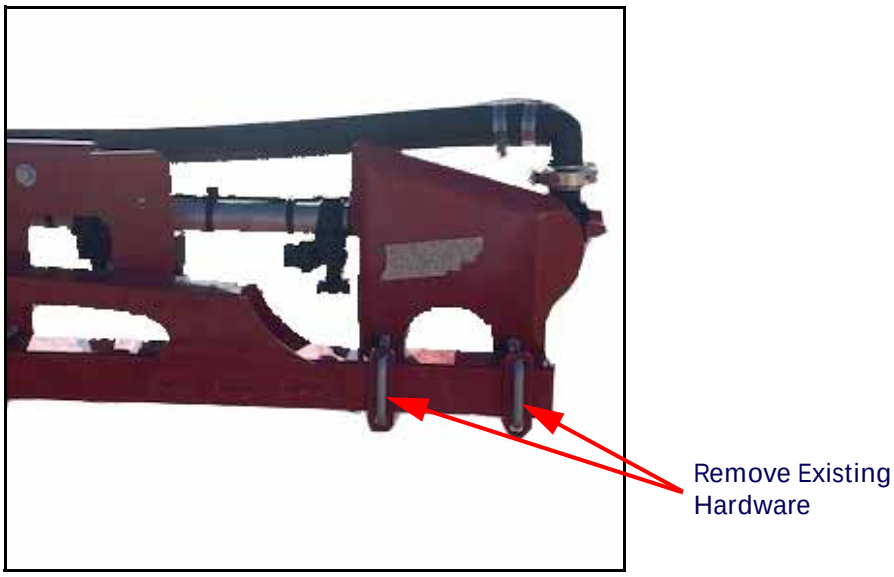


TIP PROTECTOR BRACKET

NOTE: Tip protector brackets (P/N 107-0172-759, P/N 107-0172-760, and P/N 107-0172-761) are not used on 135’ and 132’ boom configurations.

1. Locate the foam marker bracket or a standard tip protector shield bracket at the outer end of each boom tip.

FIGURE 22. Standard Tip Protector Shield Bracket with Boom Recirculation Installed



2. Remove the existing machine hardware. Set it aside as it will be reused to mount the tip protector bracket.
3. Utilize the existing machine hardware to mount the left and right tip protector brackets to the boom structure. The bracket will be replaced in the same location as the standard bracket.

NOTE: For 90’ and 100’ booms, use the tip protector shield brackets (P/N 107-0172-759 and 107-0172-760).

For 120’ booms, the tip protector shield tube mount bracket (P/N 107-0172-761) is also needed. Use the provided M8 hardware to fasten the mount bracket to the protector shield.

SYSTEM DIAGRAMS

FIGURE 23. Boom Recirculation for Case Patriot 50 Series and Trident 5550 System Drawing - 7 Section Plumbing Components (P/N 054-2005-027 Rev. A) Page 1 of 4

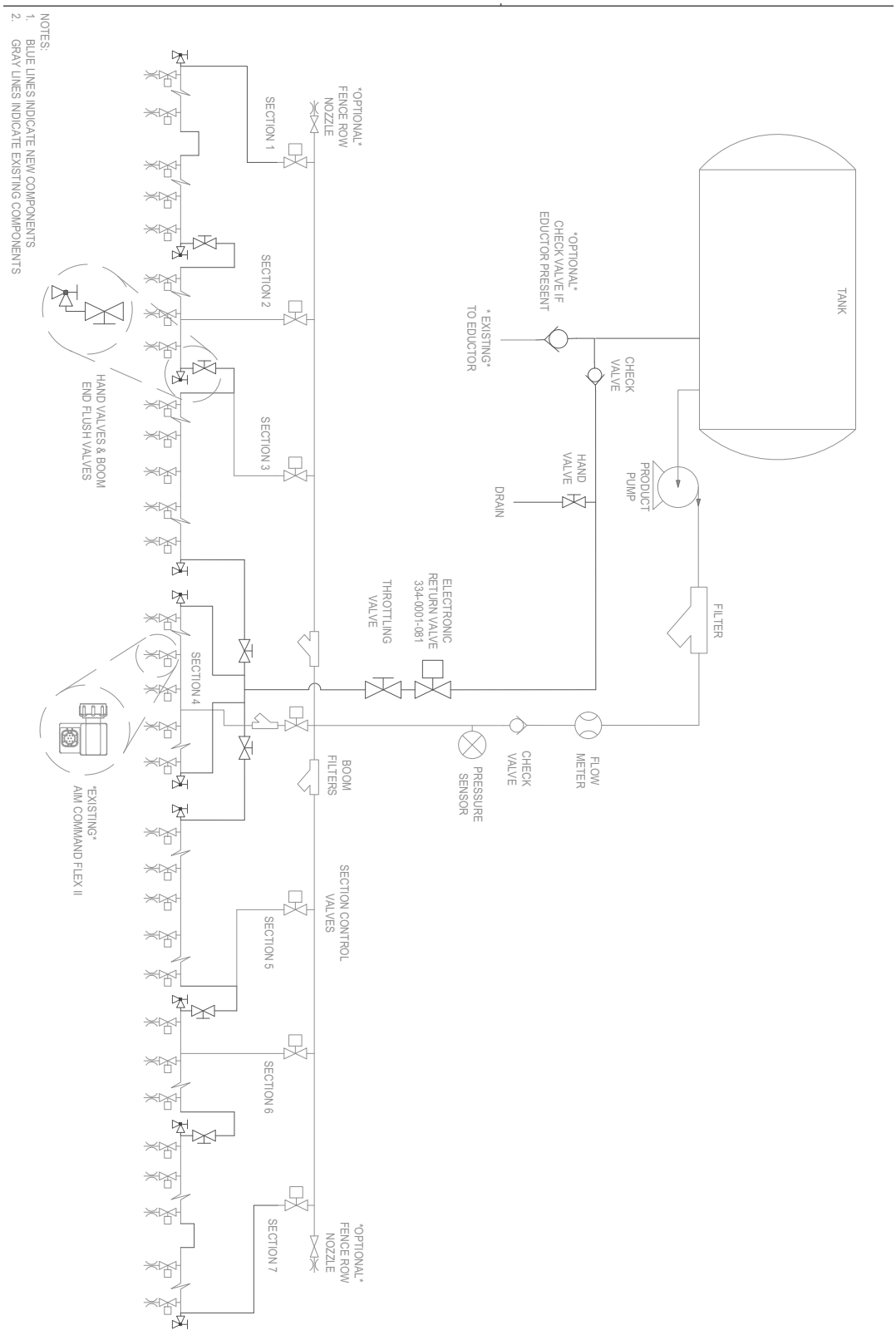
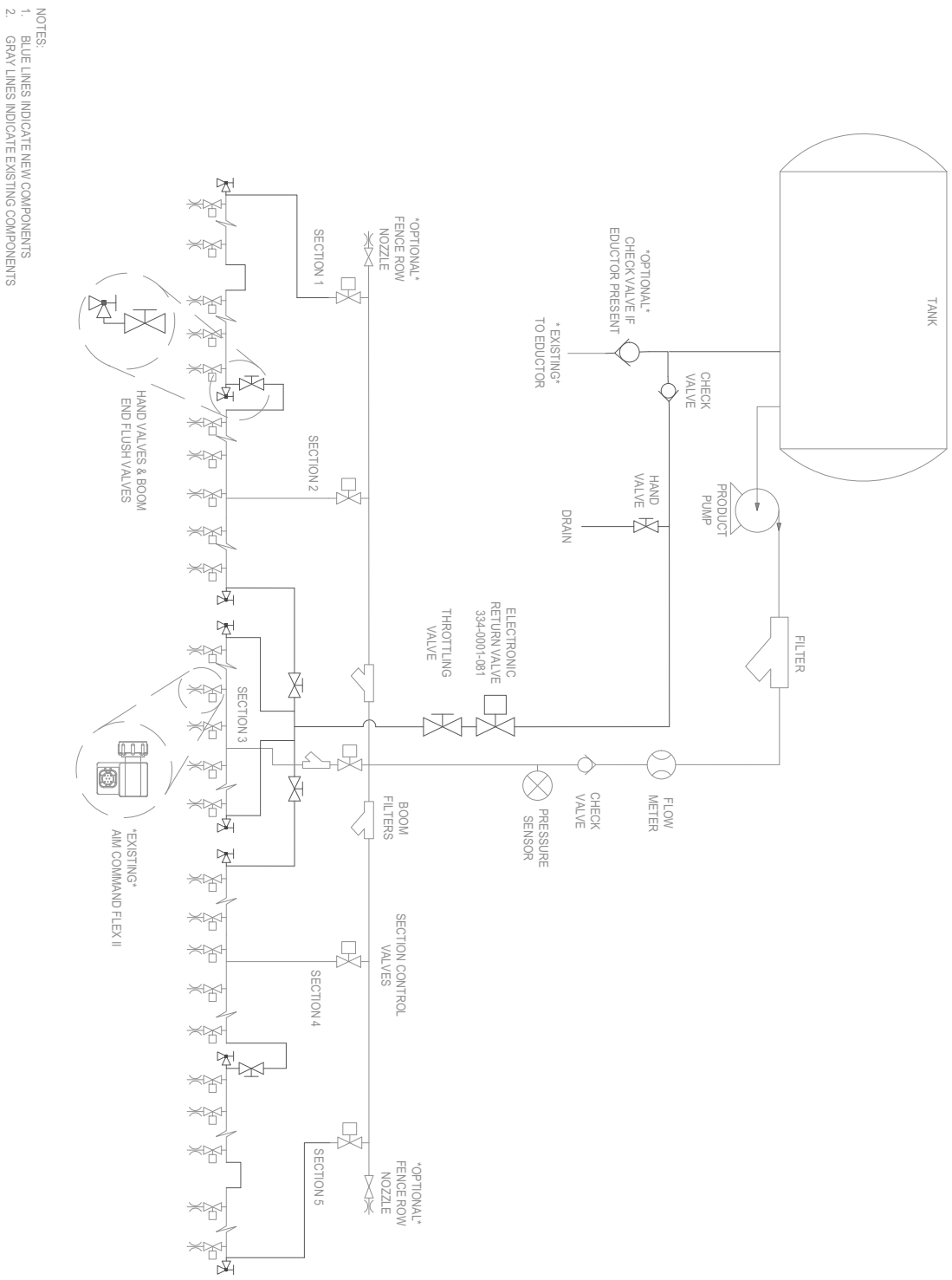


FIGURE 24. Boom Recirculation for Case Patriot 50 Series and Trident 5550 System Drawing - 5 Section Plumbing Components (P/N 054-2005-027 Rev. A) Page 3 of 4



CHAPTER 5 SECTION PLUMBING FOR 6 SECTION STEEL BOOMS (90' AND 100')

90' WIDTH, 20" SPACING, 6-SECTION

FIGURE 1. Sections 3 and 4 - Center Rack for 90'/20" 6-Section Boom

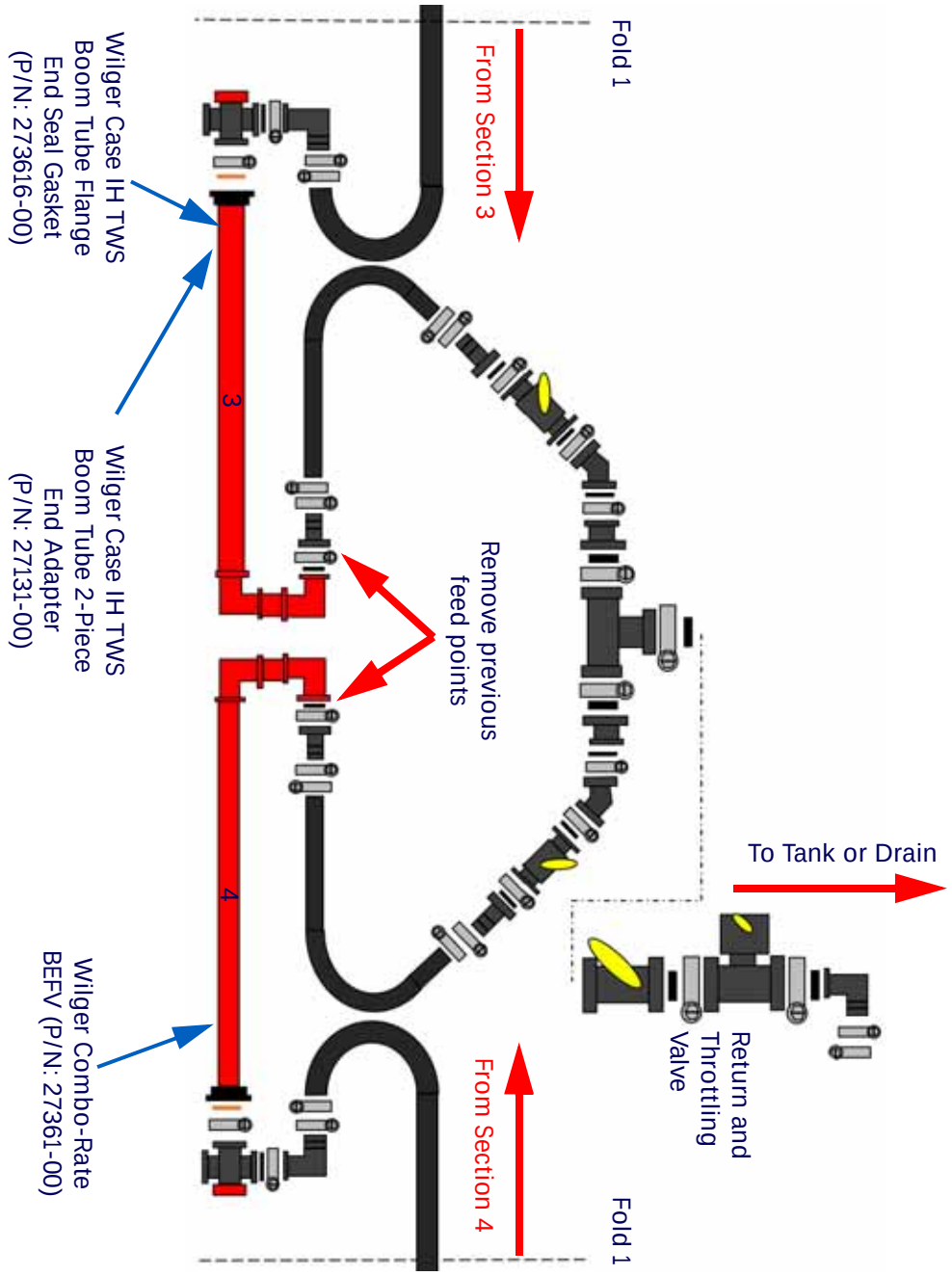


FIGURE 2. Example Plumbing of Center Rack Sections 3 and 4

FIGURE 3. Sections 2, 3, 4 and 5 - Inner Boom for 90’/20” 6-Section Boom

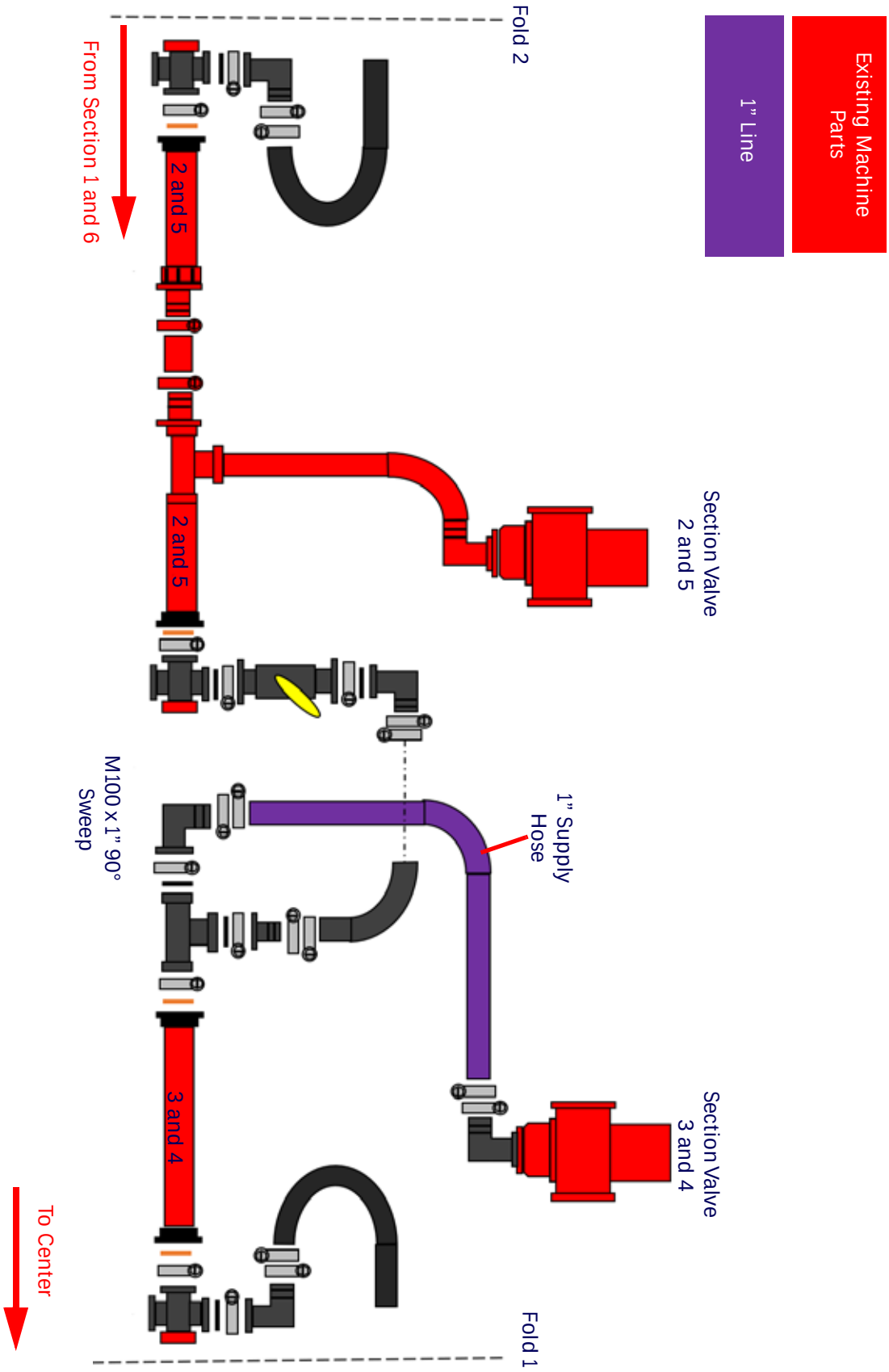
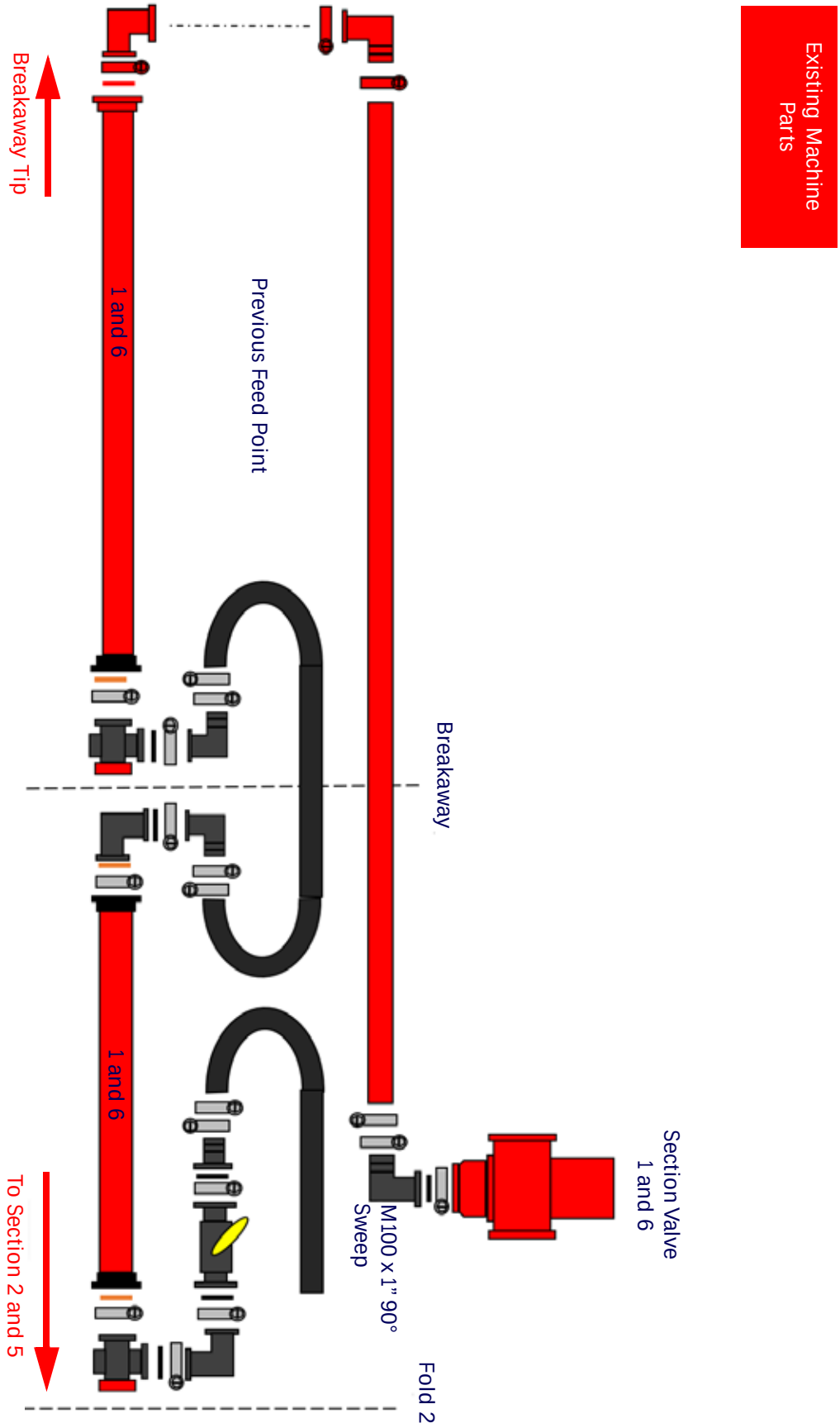


FIGURE 4. Sections 1 and 6 - Outer Boom and Breakaway for 90'/20" 6-Section Boom



100’ WIDTH, 20” SPACING, 6-SECTION

FIGURE 5. Sections 3 and 4 - Center Rack for 100’/20” 6-Section Boom

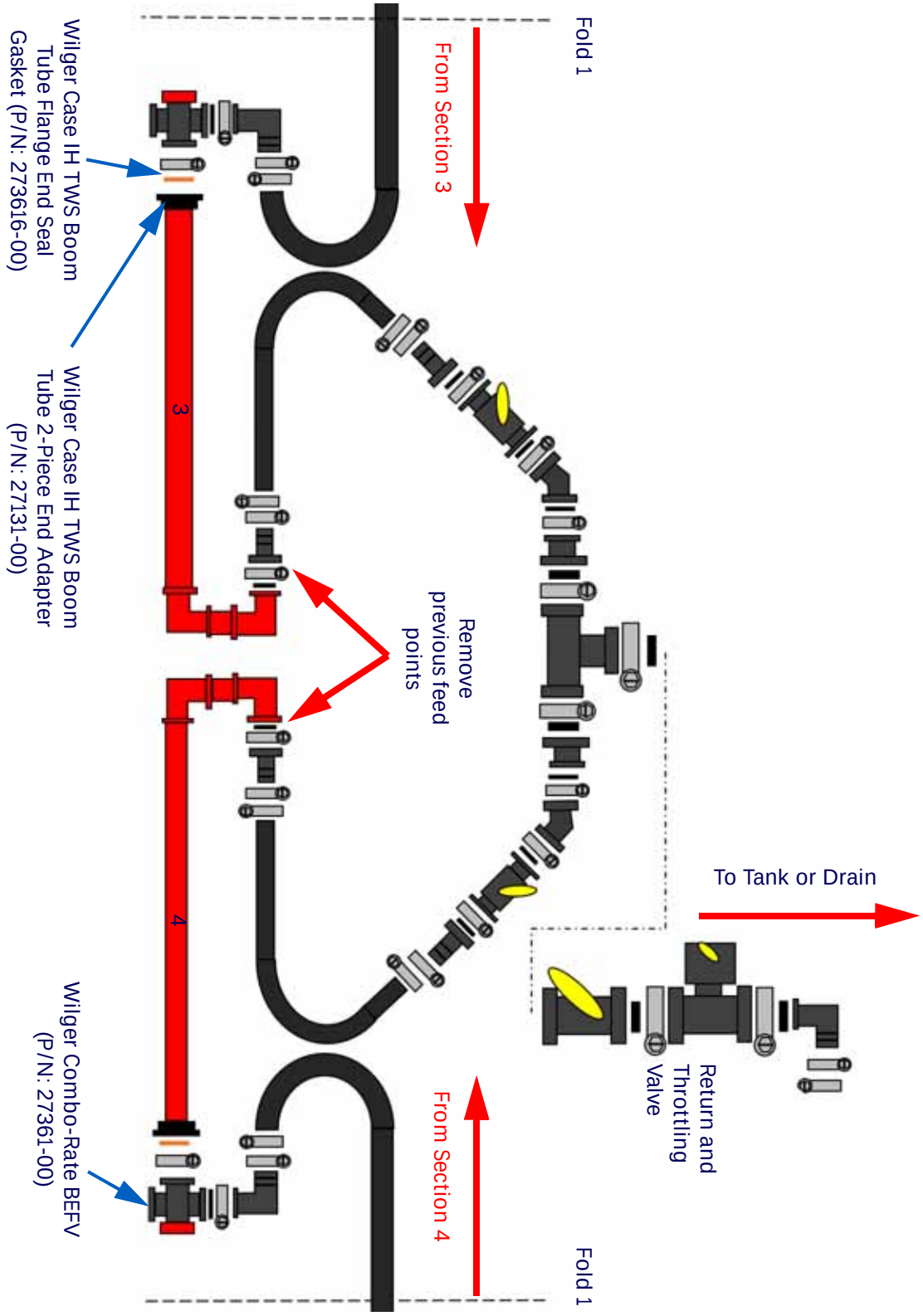


FIGURE 6. Example Plumbing of Center Rack Sections 3 and 4

FIGURE 7. Sections 2, 3, 4 and 5 - Inner Boom for 100’/20” 6-Section Boom

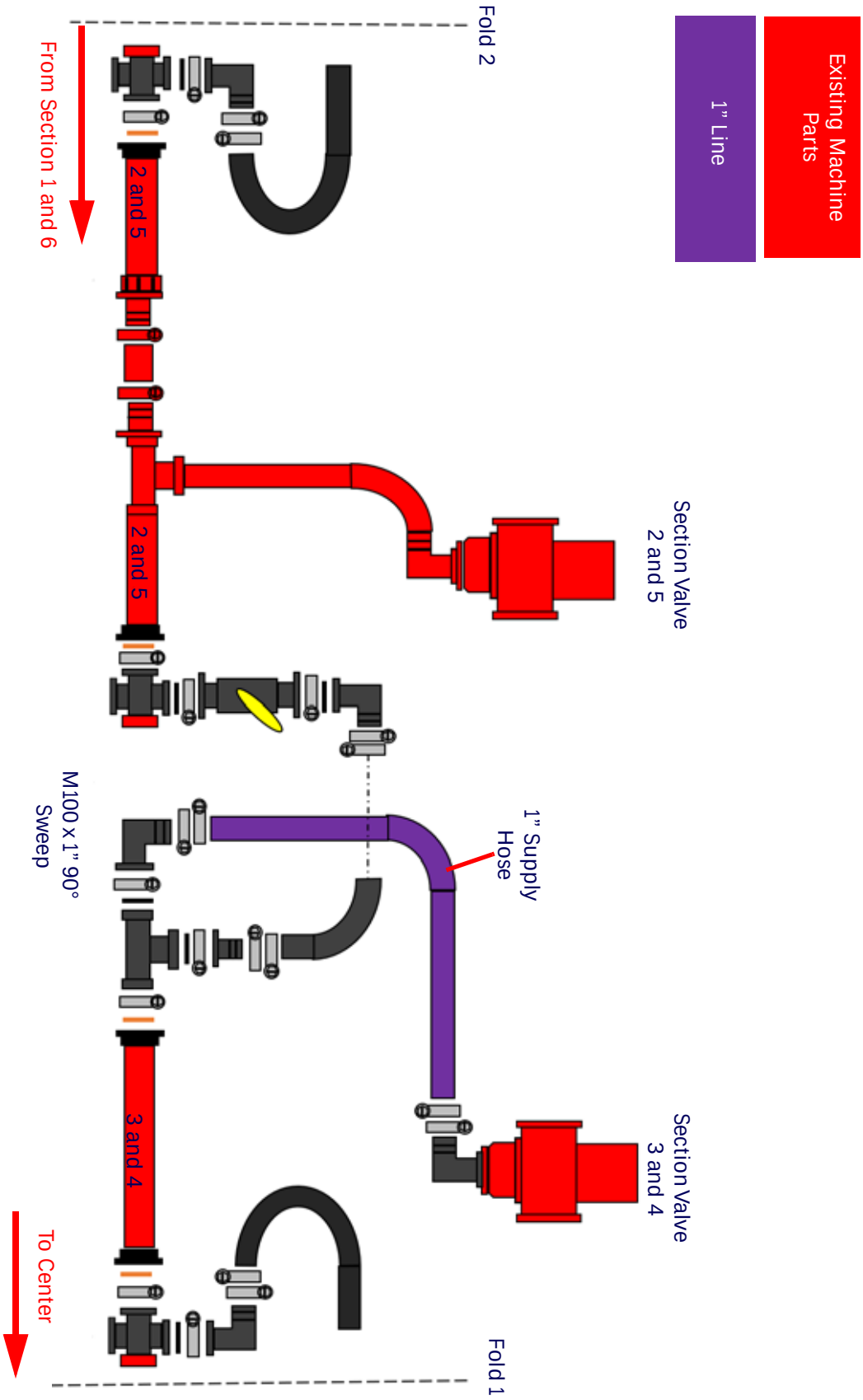
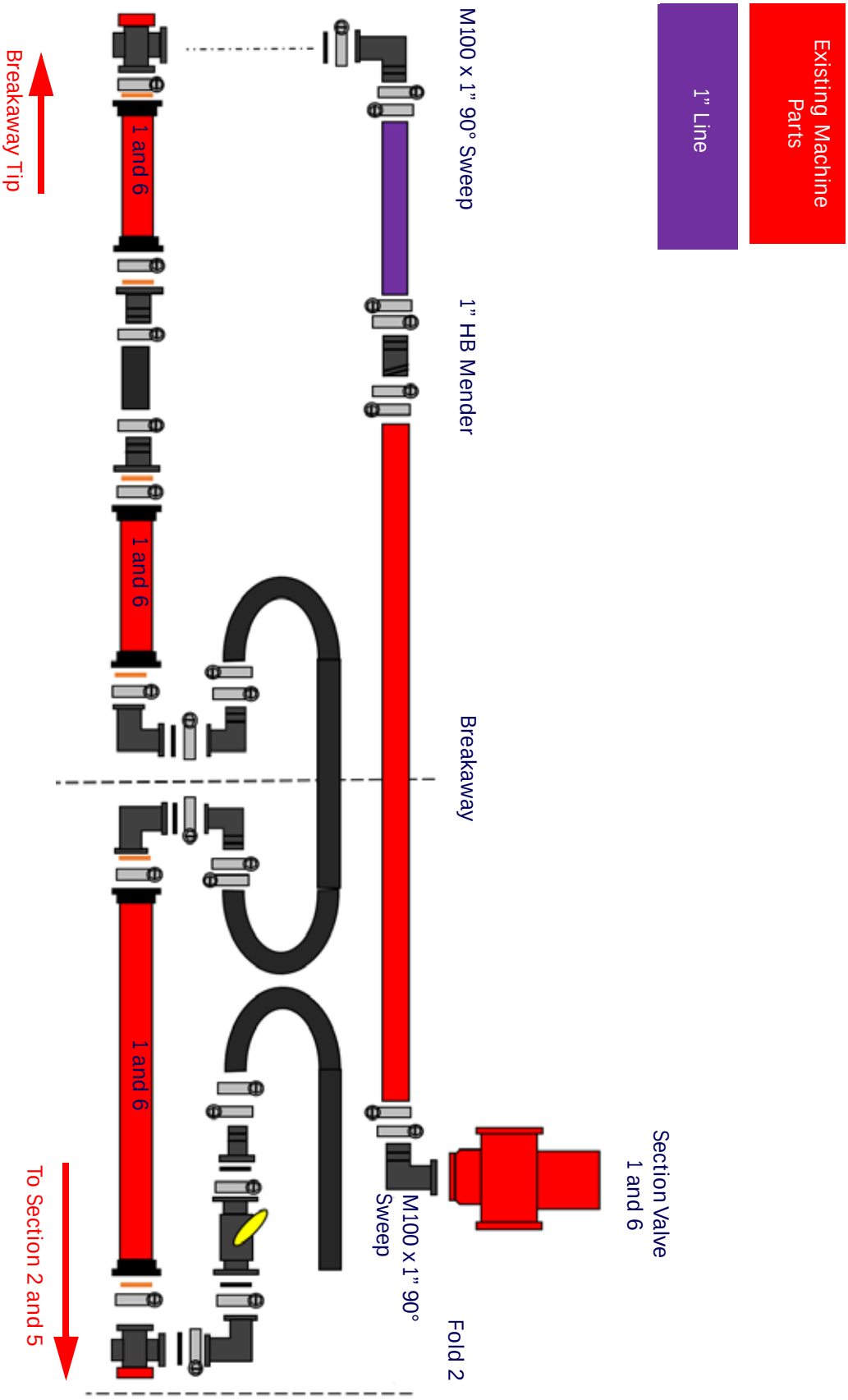


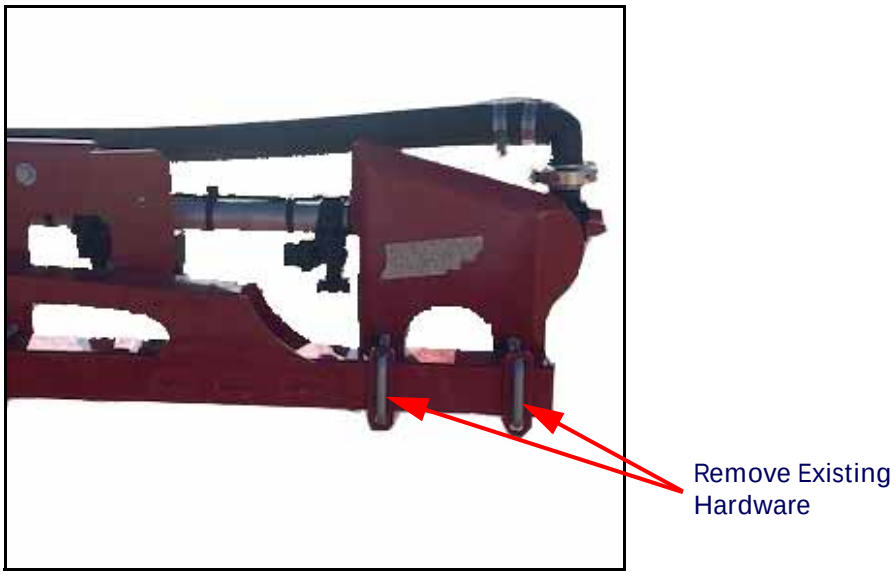
FIGURE 8. Section 1 and 6 - Outer Boom and Breakaway for 100'/20" 6-Section Boom



TIP PROTECTOR BRACKET

1. Locate the foam marker bracket or a standard tip protector shield bracket at the outer end of each boom tip.

FIGURE 9. Standard Tip Protector Shield Bracket with Boom Recirculation Installed



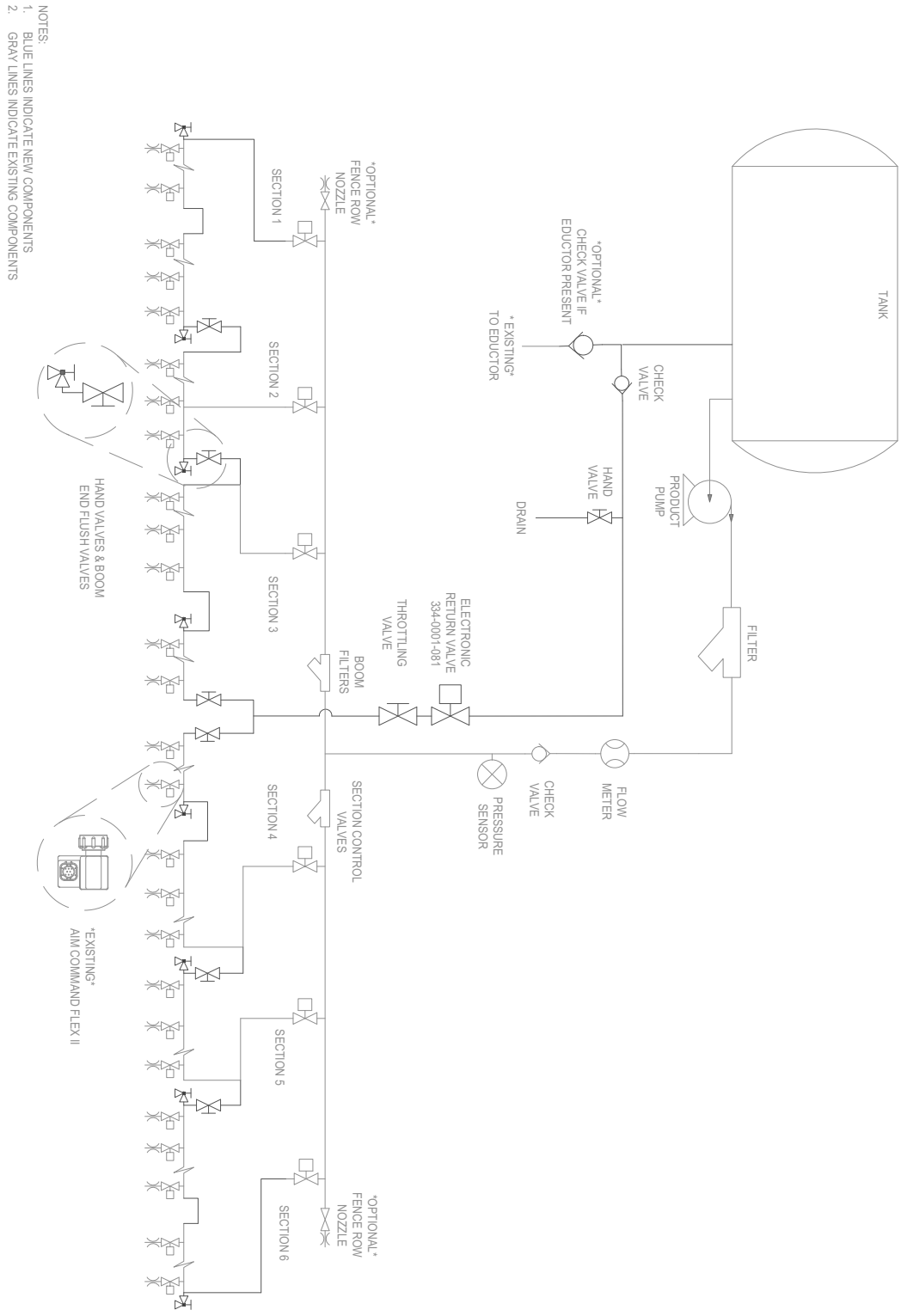
2. Remove the existing machine hardware. Set it aside as it will be reused to mount the tip protector bracket.
3. Utilize the existing machine hardware to mount the left and right tip protector brackets to the boom structure. The racket will be replaced in the same location as the standard bracket.

NOTE: For 90’ and 100’ booms, use the tip protector shield brackets (P/N 107-0172-759 and 107-0172-760).

For 120’ booms, the tip protector shield tube mount bracket (P/N 107-0172-761) is also needed. Use the provided M8 hardware to fasten the mount bracket to the protector shield.

SYSTEM DIAGRAMS

FIGURE 10. Boom Recirculation for Case Patriot 50 Series and Trident 5550 System Drawing - 6 Section Plumbing Components (P/N 054-2005-027 Rev. A) Page 2 of 4



CHAPTER 6 SECTION PLUMBING FOR 7 SECTION ALUMINUM BOOMS (132’ AND 135’)

132’ WIDTH, 22” SPACING, 7-SECTION

FIGURE 1. Section 4 - Center Rack and Return for 132’/22” 7-Section Boom

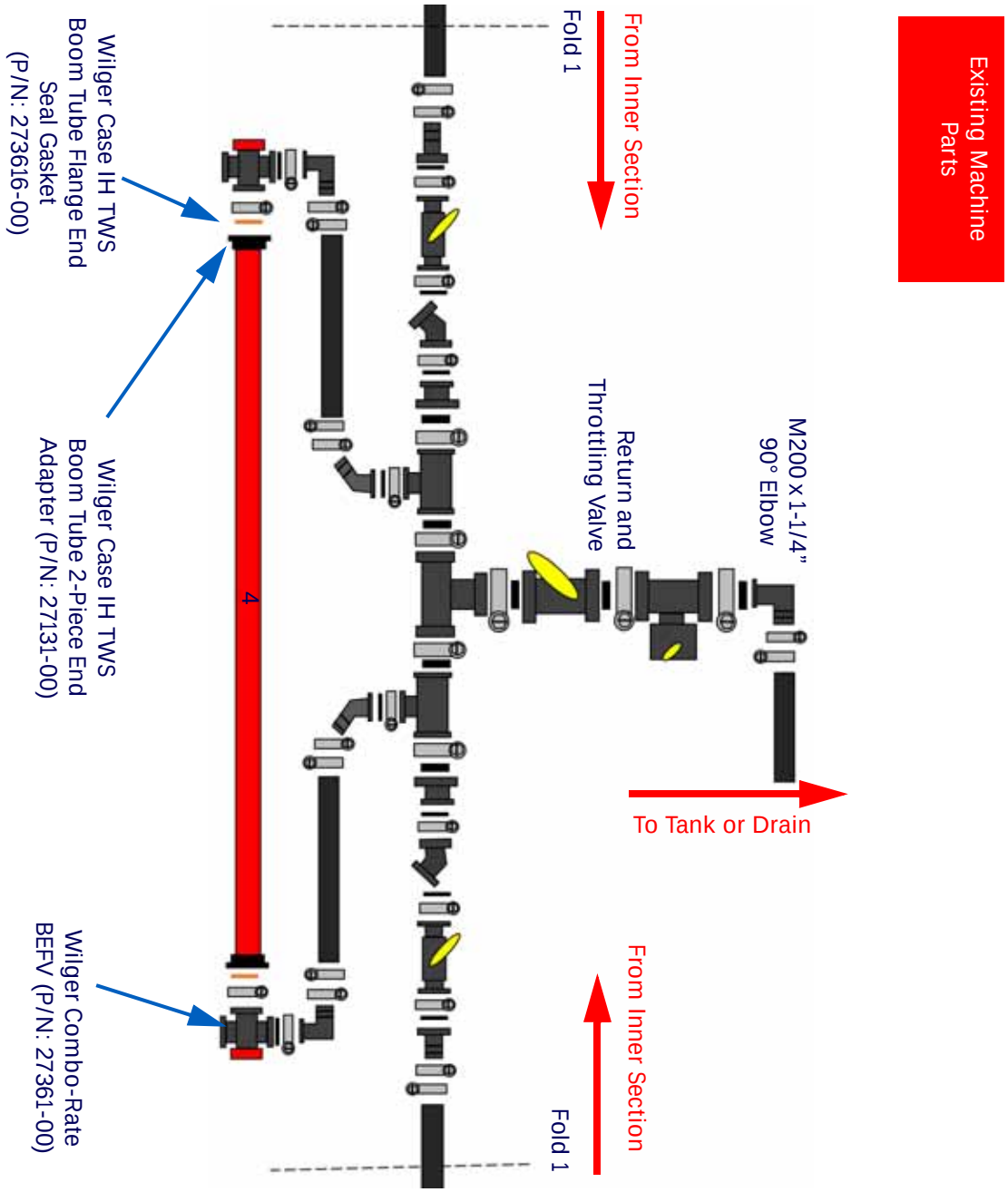


FIGURE 2. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

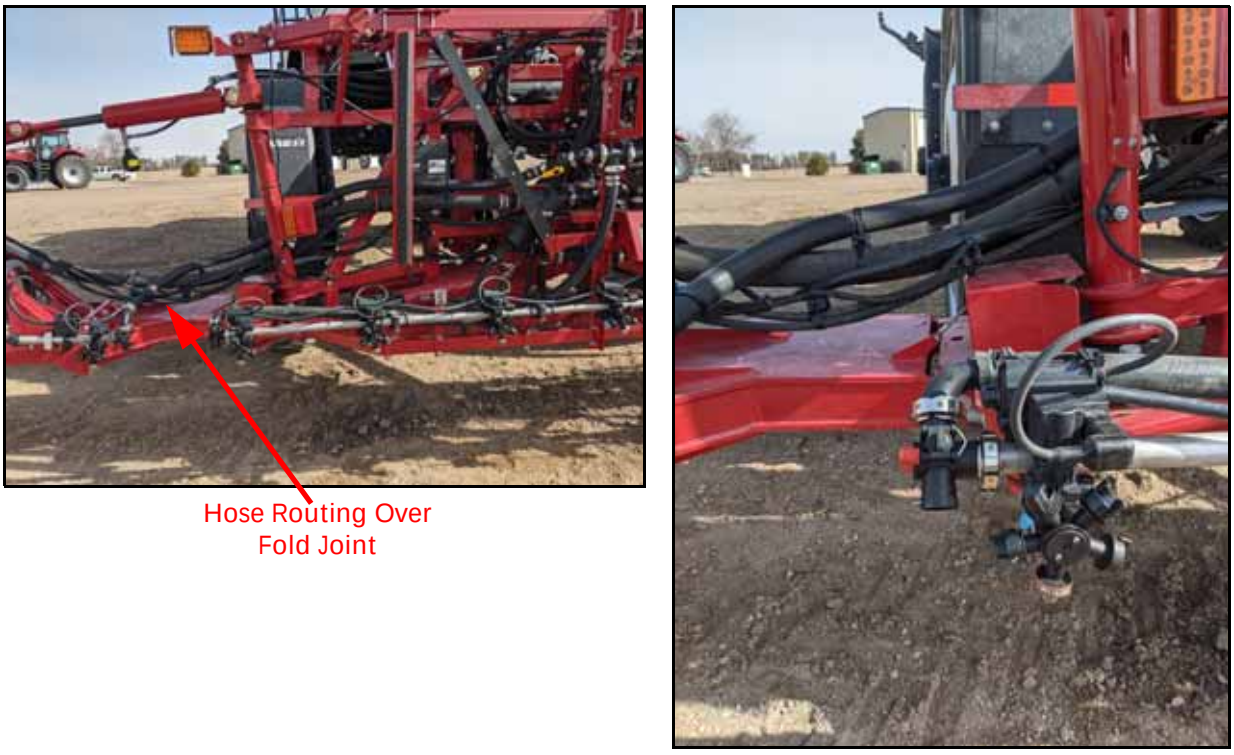


FIGURE 3. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

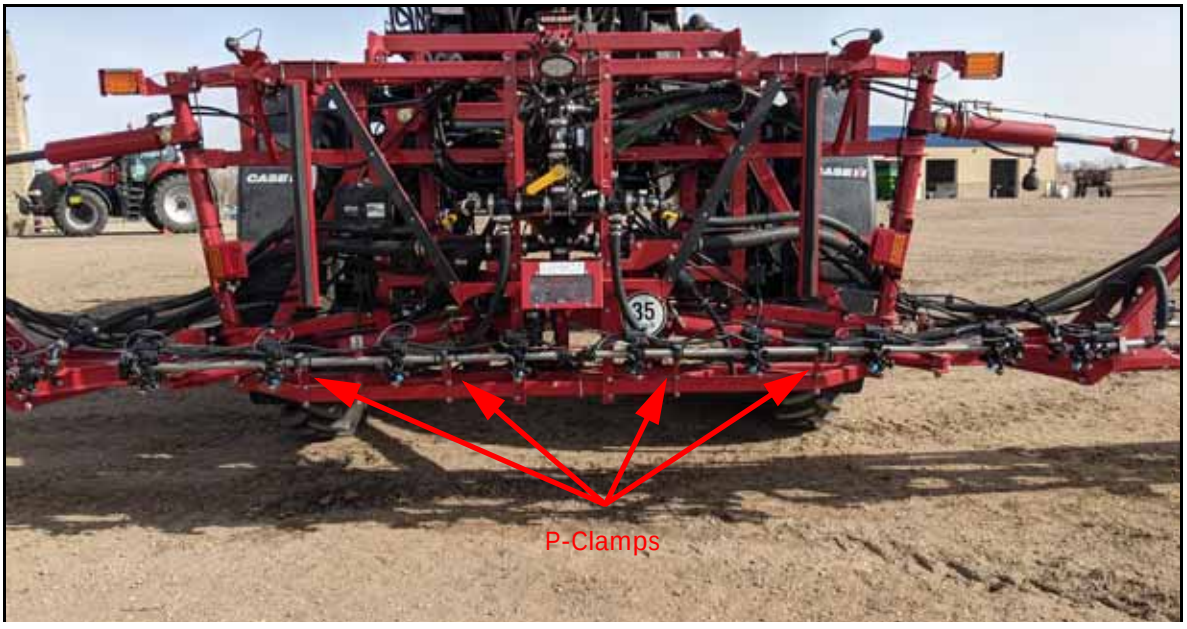


FIGURE 4. Sections 3 and 5 - Inner Boom for 132’/22” 7-Section Boom

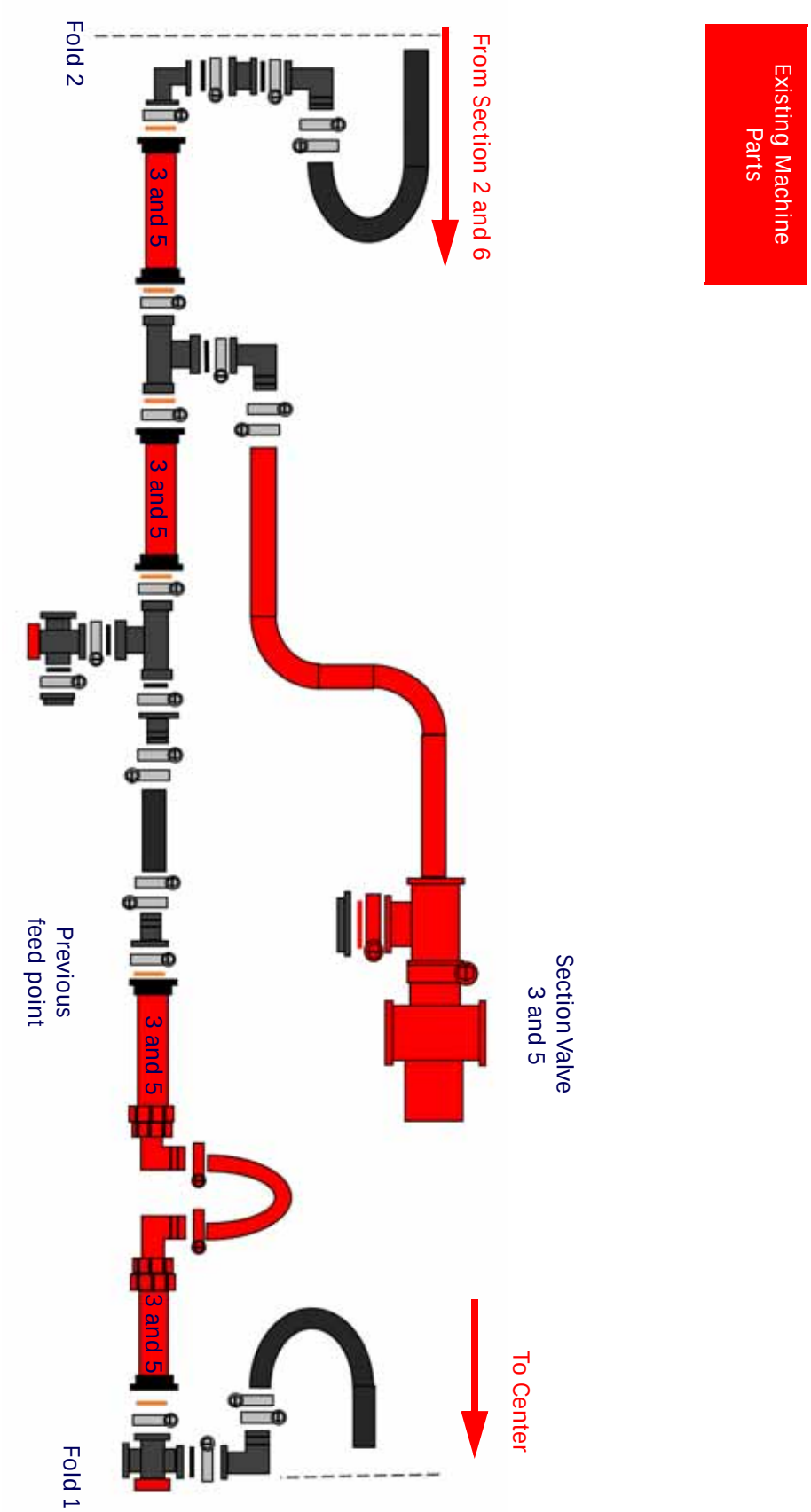


FIGURE 5. Sections 2 and 6 - Outer Boom for 132'/22" 7-Section Boom

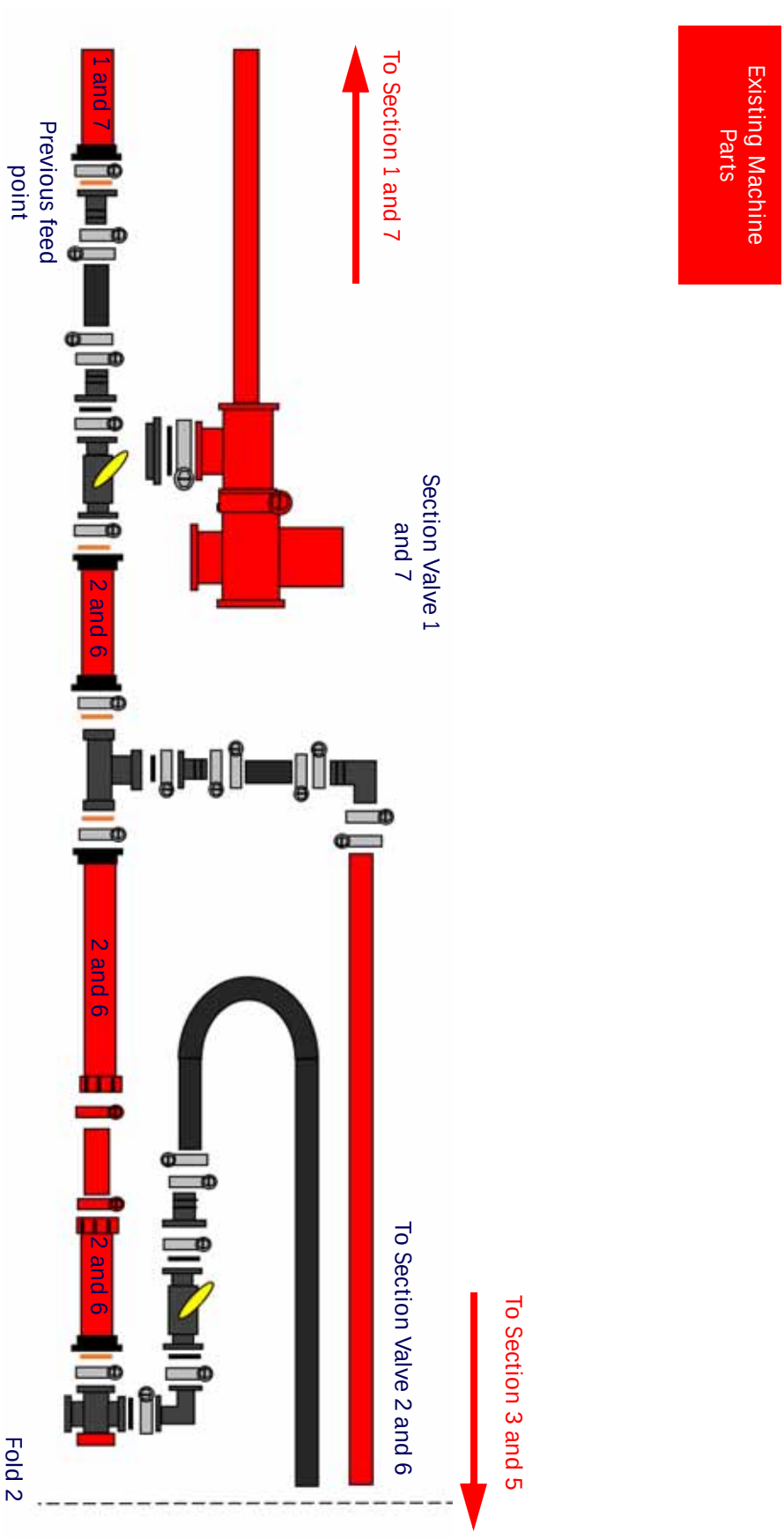
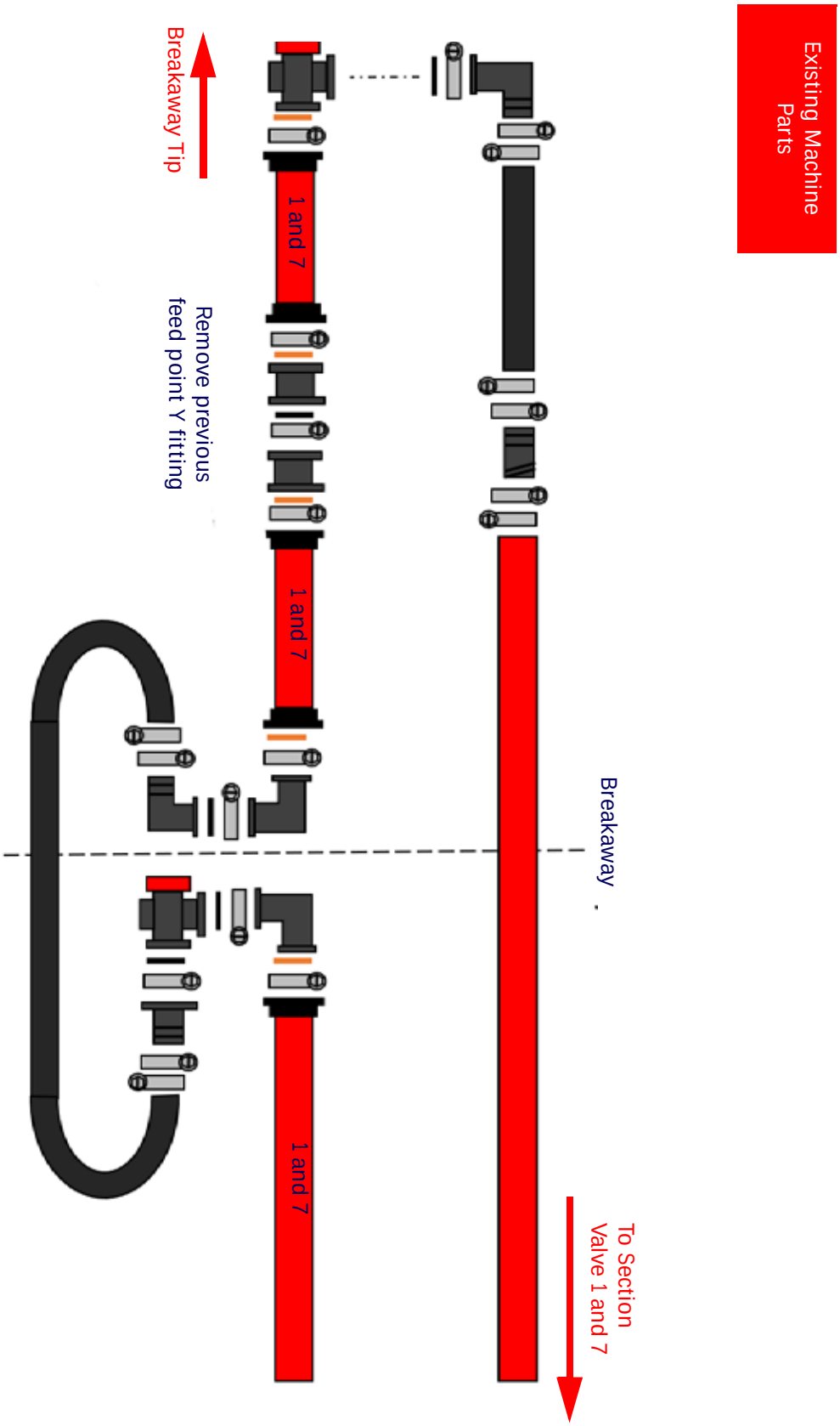


FIGURE 6. Example Plumbing of Outer Boom Section for Sections 2 and 6

FIGURE 7. Sections 1 and 7 - Outer and Breakaway for 132'/22" 7-Section Boom



135’ WIDTH, 20” SPACING, 7-SECTION

FIGURE 8. Section 4 - Center Rack and Return for 135’/20” 7-Section Boom

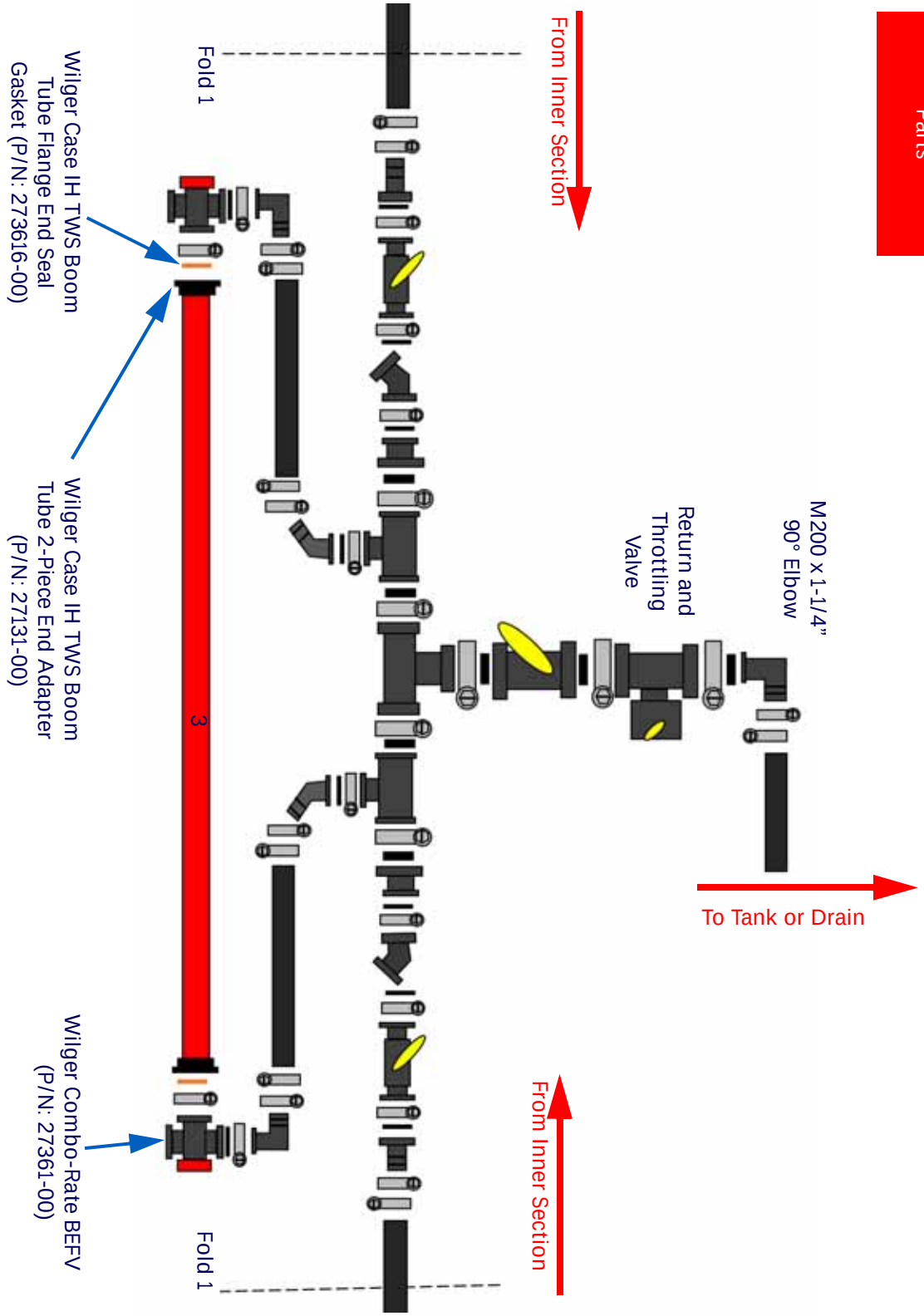


FIGURE 9. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

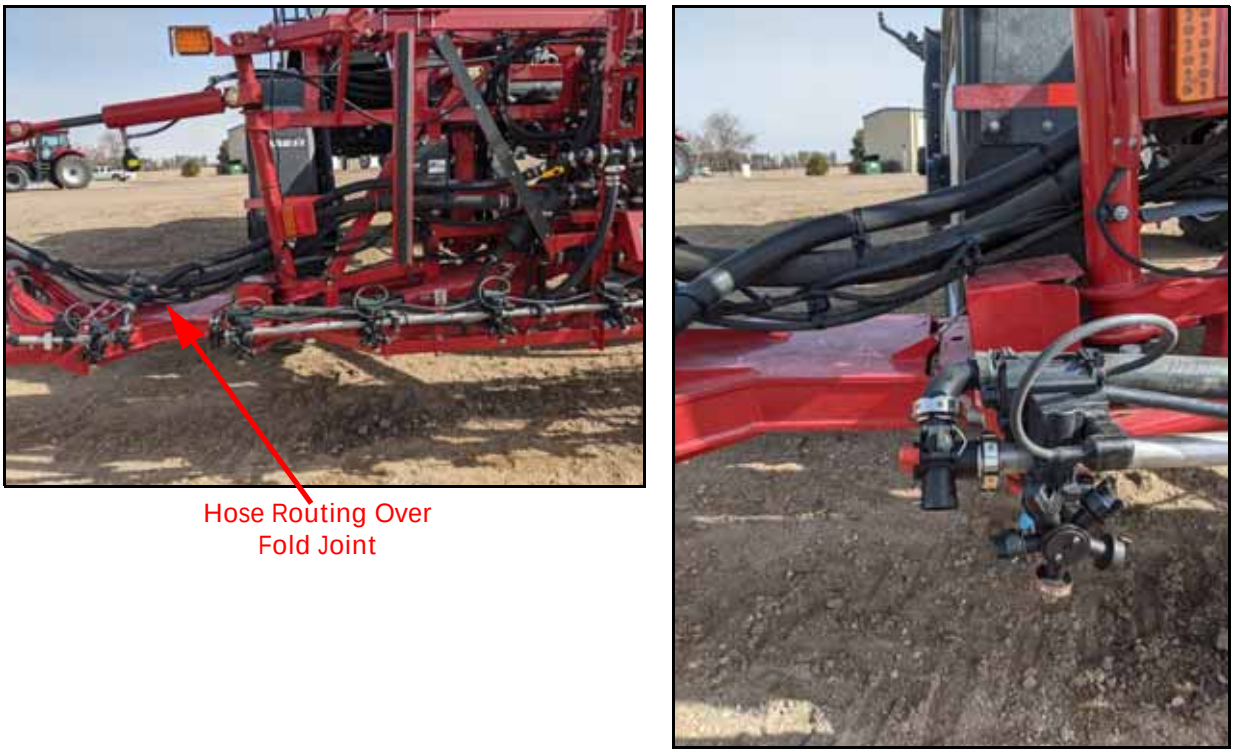


FIGURE 10. Plumbing Example for Center Boom Section for 5-Section and 7-Section Booms

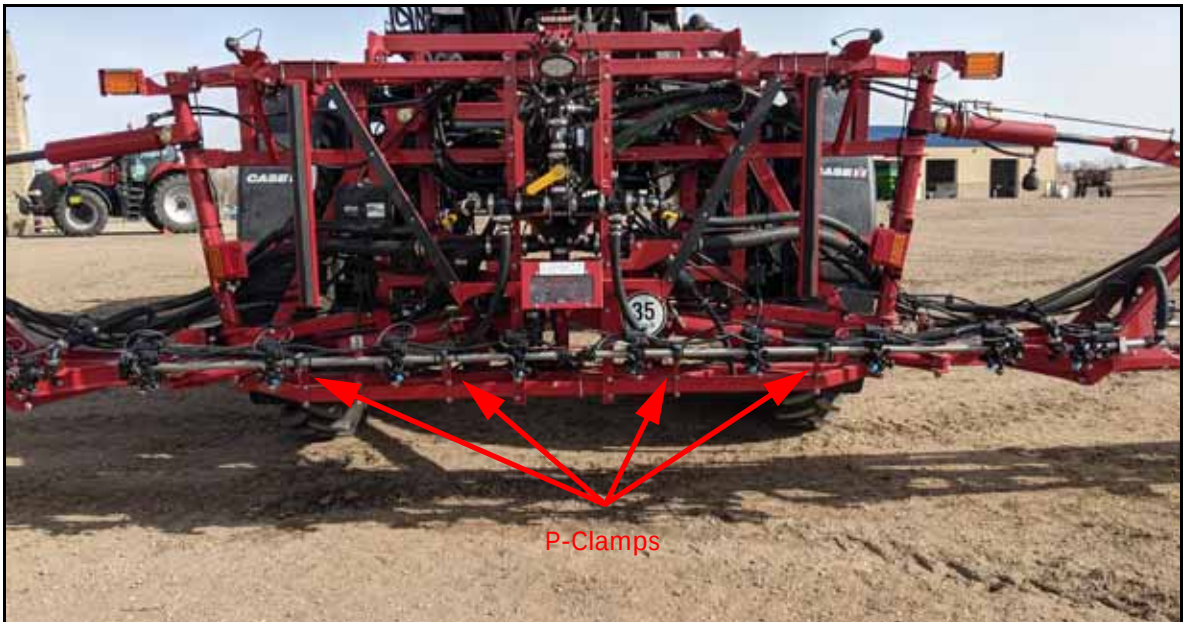


FIGURE 11. Sections 3 and 5 - Inner Boom for 135’/20” 7-Section Boom

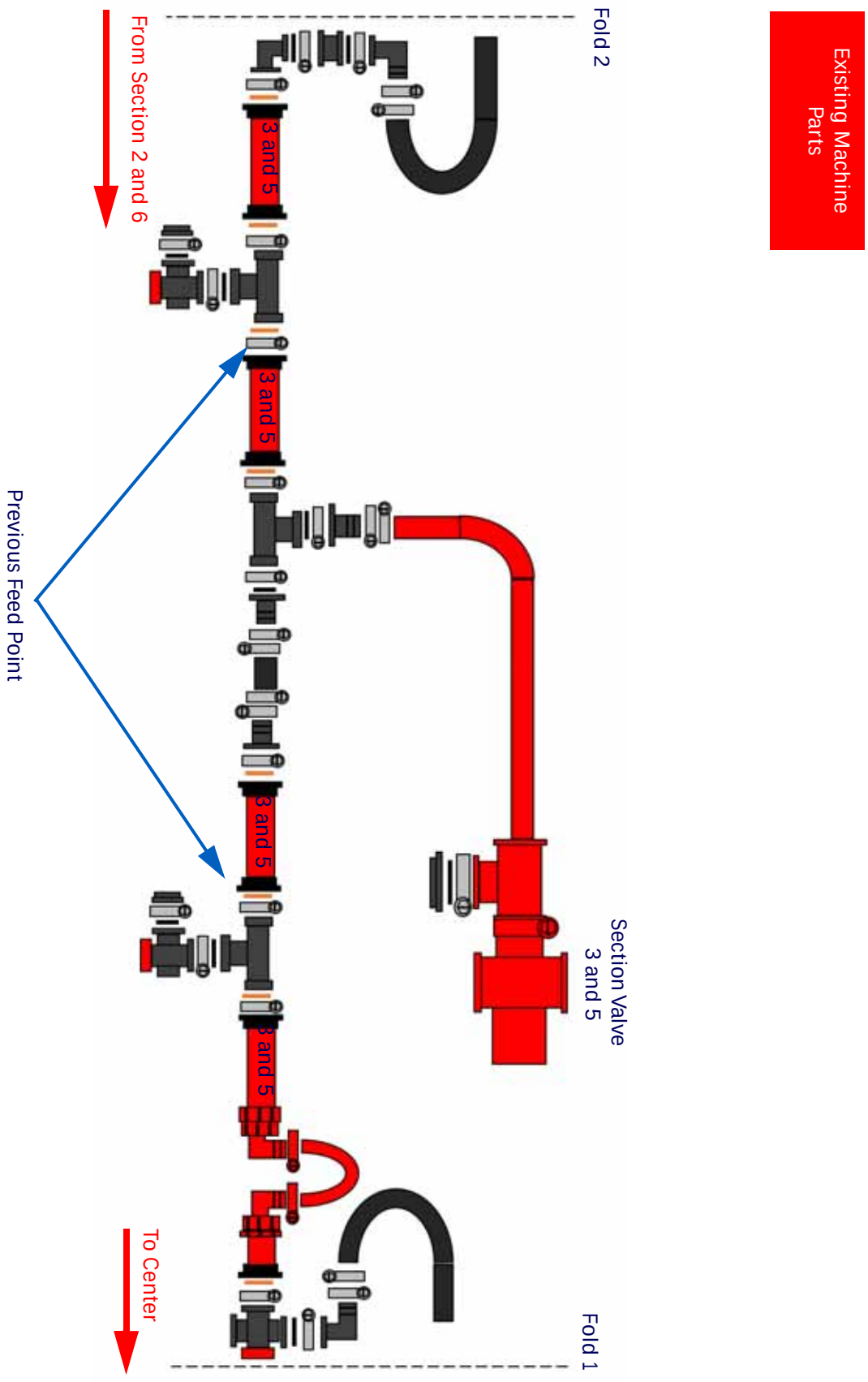


FIGURE 12. Inner Boom Fold 2 Example for 7-Section (135') Boom

FIGURE 13. Example Plumbing for Inner Boom Fold 1 for 135’/20” 7-Section Boom

FIGURE 14. Section 2 and 6 - Outer Boom for 135'/20" 7-Section Boom

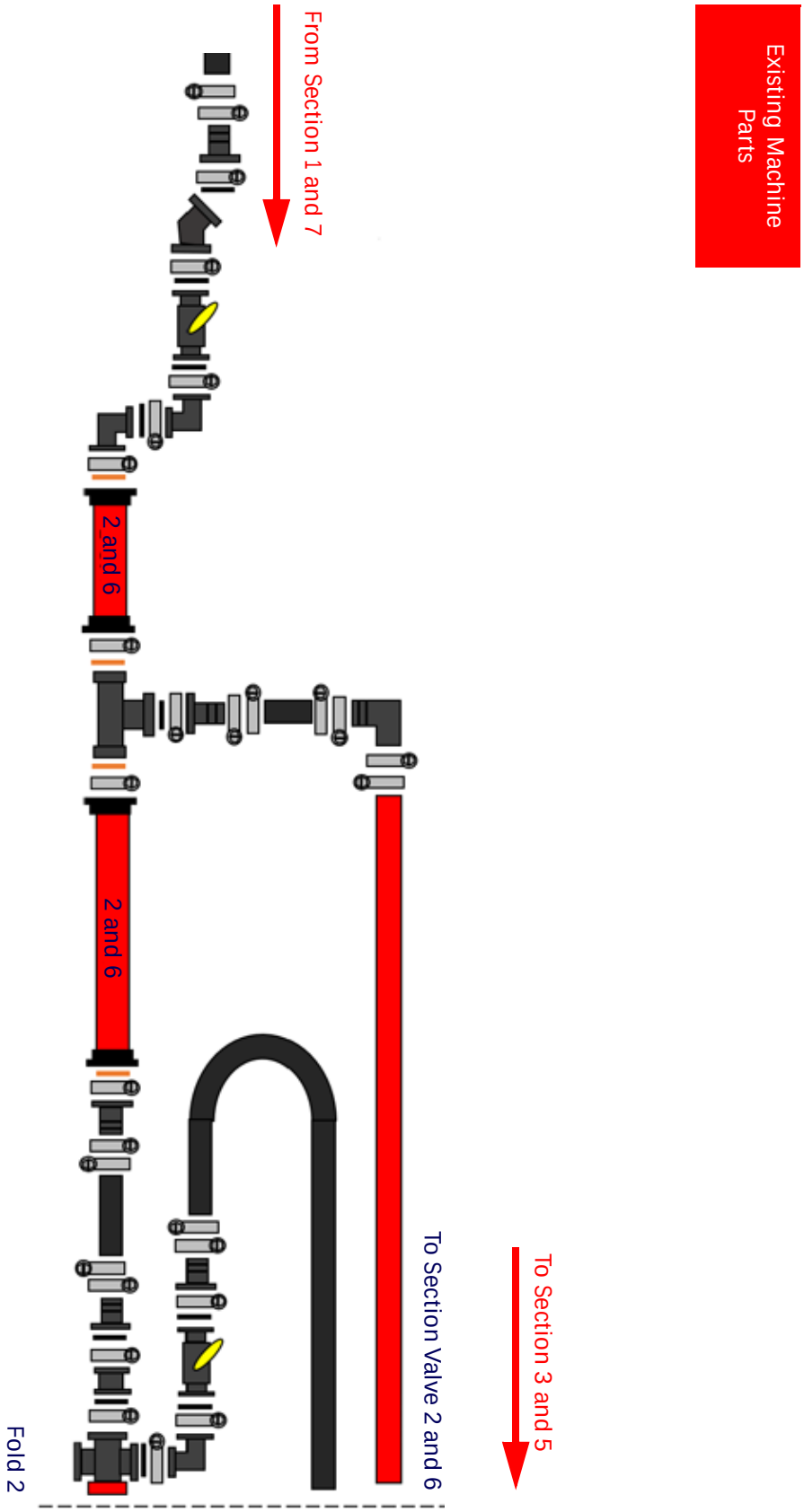
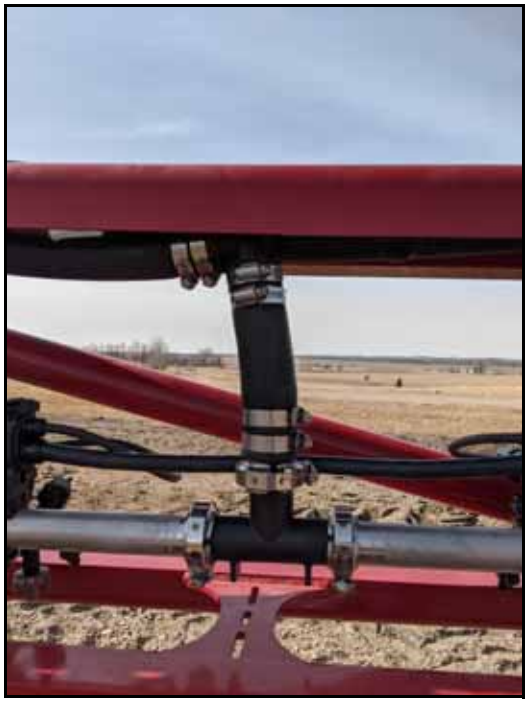


FIGURE 15. Plumbing Example for Outer Boom Section Valve for 135’/20” 7-Section Boom

FIGURE 16. Plumbing Example for Outer Boom Feed for 135’/20” 7-Section Boom



1. Disassemble the boom tube section that sticks out in the front of the boom truss.
2. Dismount the bracket holding the tube section.
3. Remount the tube bracket to the truss rib where the boom spot light is mounted.

NOTE: The boom spot may have to be moved to the other mounting holes on the rib.

4. Reuse the boom tube clamp to mount the M100 coupling to the bracket.
5. Use hose to connect the boom tube to the mounted coupling and CR-BEFV.
6. Install a turret or side take-off nozzle body to the CR-BEFV to mount the NCV.

FIGURE 17. Example Plumbing for Outer Boom Fold 2 for 135'/20" 7-Section Boom

FIGURE 18. Plumbing Example for Outer Boom Fold 2 for 135’/20” 7-Section Boom

FIGURE 19. Section 1 and 7 - Outer Boom and Breakaway for 135’/20” 7-Section Boom

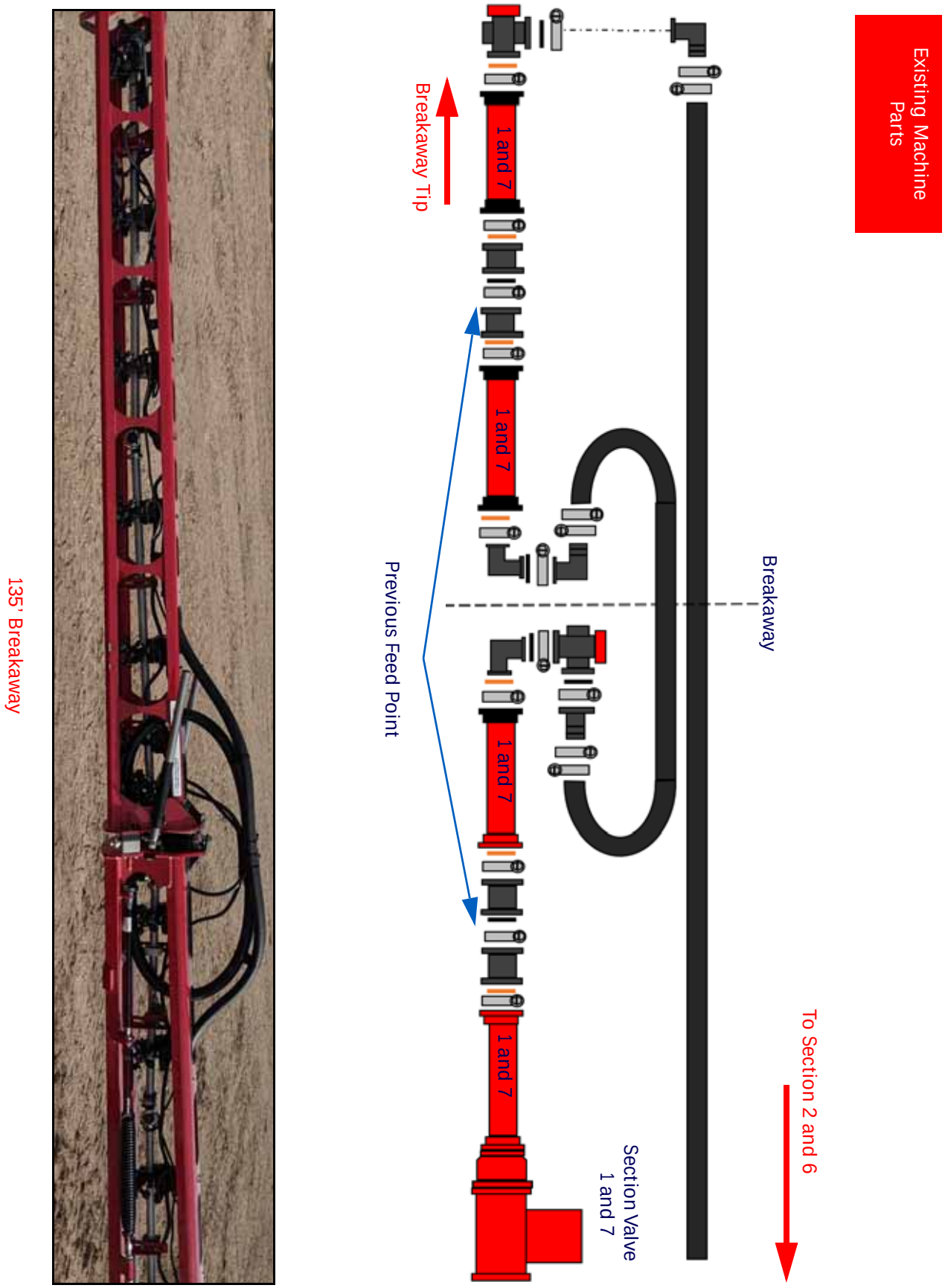


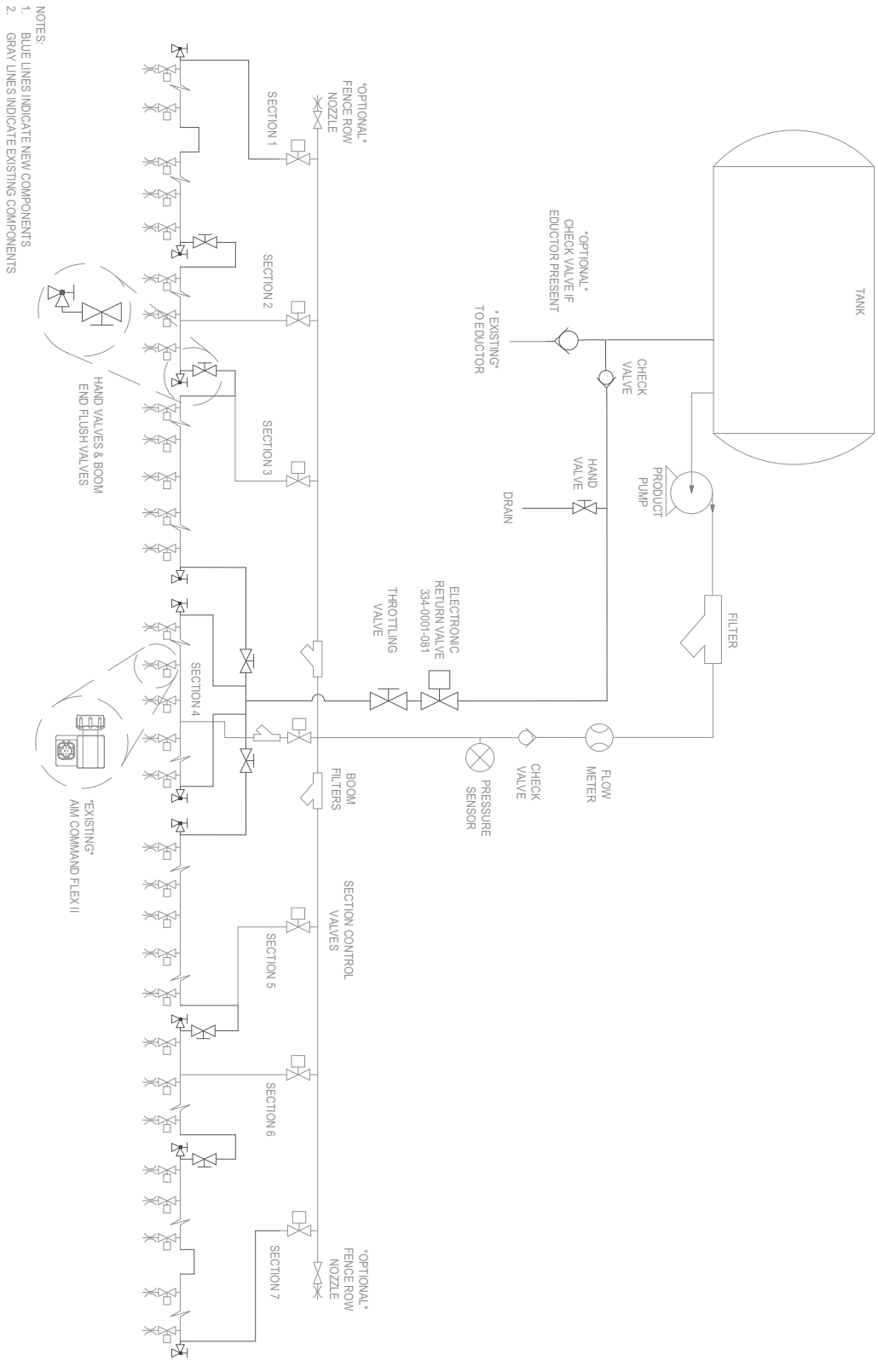
FIGURE 20. Example Plumbing for Boom Tip for 135’/20” 7-Section Boom

FIGURE 21. Example Plumbing for Breakaway Outer Boom Tip for 135’/20” 7-Section Boom

FIGURE 22. Example Plumbing for Breakaway Inner Boom Tip for 135'/20" 7-Section Boom

SYSTEM DIAGRAMS

FIGURE 23. Boom Recirculation for Case Patriot 50 Series and Trident 5550 System Drawing - 7 Section Plumbing Components (P/N 054-2005-027 Rev. A) Page 1 of 4



CHAPTER 7 OPERATION

NOTE: An activation key is required for the RCM-Sprayer ECU to unlock operation of the boom recirculation system. Please review the AIM Command FLEX™ II section within the Case IH Software Operating Guide for assistance with entering the boom recirculation activation key supplied with the boom recirculation kit.

REQUIRED CONDITIONS FOR RECIRCULATION

The following conditions are required to initiate the boom recirculation feature:

- Confirm that the Boom Recirculation feature is enabled. Review *Enable Main Product Recirculation* section on page 81.
- Ensure the tank fill feature is not enabled.
- Toggle the product pump on (switch/softkey).
- Ensure all boom sections are toggled on.
- Ensure the active spray width is zero.
- Recirculation hand valves between sections must be open.

NOTE: Boom Recirculation is not supported in Bypass, High-Flow, or High-Flow VP control modes. The crossover hand valves need to be manually closed when operating in one of those previously listed control modes.

- Either enable the Auto Recirculate feature or manually initiate recirculation by selecting the Recirculation softkey on the Home page.

WHAT TO EXPECT WHILE RECIRCULATION IS ACTIVE

NOTE: When operating in Auto Recirculation Mode, it is recommended to adjust the Standby PWM% value so that recirculation pressure is close to the application pressure used during application.

When recirculation is active:

- The main product pump runs at the “Standby PWM%” value.
- Section valves will cycle “On” sequentially in pairs from the outermost to innermost sections for the user-defined recirculation time.

NOTE: NCVs on each section will remain off.

- The system will continue to monitor the main flow meter to ensure product is circulating. If the product recirculation is less than the low limit of the flow meter, the system will display an alert, but recirculation will continue.
- The boom pressure transducer is monitored to ensure the system pressure stays within the minimum and maximum allowable pressures. The main product pump will shutdown if the boom pressure exceeds the minimum (2 PSI) or maximum (150 PSI) pressure.
- Section valves will continue to cycle sequentially unless spraying or shutdown conditions are met.
- The drain valve will be used to drain out any product in the recirculation line when rinsing the boom.

NOTE: It is recommended to rinse the system with the boom unfolded to prevent circulating with pinched supply hoses.