Salford AutoBoom®
Installation Manual

P/N 016-0230-134 Rev. A *04/18* *E31194*

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CHAPTER 1 IMPORTANT SAFETY INFORMATION

NOTICE

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the AutoBoom® system.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.
- Follow all safety labels affixed to the AutoBoom system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact your local Raven dealer.

When operating the machine after installing AutoBoom, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate AutoBoom or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when AutoBoom is engaged.
- Disable AutoBoom when exiting from the operator's seat and machine.
- Do not drive the machine with AutoBoom enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling AutoBoom when the safe working distance has been diminished.
- Ensure AutoBoom is disabled prior to starting any maintenance work on AutoBoom or the machine.

⚠ WARNING

- When starting the machine for the first time after installing AutoBoom, be sure that all persons stand clear, in case a hose has not been properly tightened.
- The machine must remain stationary and switched off, with the booms unfolded, during installation or maintenance.

⚠ CAUTION

HYDRAULIC

GENERAL

- Raven Industries recommends that appropriate protective equipment be worn at all times when working on the hydraulic system.
- Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when opening a system that has been previously pressurized.
- When disconnecting the hydraulic hoses or purging is required, be aware that the hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.
- Any work performed on the hydraulic system must be done in accordance with the machine manufacturer's approved maintenance instructions.
- When installing SmarTrax hydraulics or performing diagnostics, maintenance, or routine service, ensure that precautions are taken to prevent any foreign material or contaminants from being introduced into the machine's hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the SmarTrax hydraulic valve.

INSTRUCTIONS FOR HOSE ROUTING

The word "hose" is used to mean all flexible fluid carrying components. Follow existing hoses as much as possible and use these guidelines:

Hoses should not contact or be attached to:

- Components with high vibration forces
- Components carrying hot fluids beyond component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps

Routing should not allow hoses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of hose components
- Hoses should be protected or shielded if it needs to route near hot temperatures beyond hose component specifications

Hoses should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in SmarTrax and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For hose sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp hoses securely to force controlled movement to occur in the desired hose section
- Avoid sharp twisting or flexing of hoses in short distances

Protect hoses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures
- High pressure wash

ELECTRICAL

GENERAL

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Ensure that the power cable is the last cable to be connected.
- A minimum of 12 VDC is required for system operation with a maximum of 15 VDC.

INSTRUCTIONS FOR WIRE ROUTING

The word “harness” is used to mean all electrical leads and cables, bundled and unbundled. When installing harness, secure it at least every 30 cm (12in) to the frame. Follow existing harness as much as possible and use these guidelines:

Harness should not contact or be attached to:

- Lines and hoses with high vibration forces or pressure spikes
- Lines and hoses carrying hot fluids beyond harness component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads

- Ends of adjustable hose clamps
- Wire exiting conduit without protection, either ends or side of conduit
- Hose and tube fittings

Routing should not allow harnesses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of harness components
- Wiring should be protected or shielded if it needs to route near hot temperatures beyond harness component specifications

Harnessing should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in SmarTrax and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For harness sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp harnesses securely to force controlled movement to occur in the desired harness section
- Avoid sharp twisting or flexing of harnesses in short distances
- Connectors and splices should not be located in harness sections that move

Protect harnesses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures

IMPORTANT:

- Avoid directly spraying electrical components and connections with high pressure water. High pressure water sprays can penetrate seals and cause electrical components to corrode or otherwise become damaged. When performing maintenance:
- Inspect all electrical components and connections for damage or corrosion. Repair or replace components, connections, or cable as necessary.
- Ensure connections are clean, dry, and not damaged. Repair or replace components, connections, or cable as necessary.
- Clean components or connections using low pressure water, pressurized air, or an aerosol electrical component cleaning agent.

- Remove visible surface water from components, connections, or seals using pressurized air or an aerosol electrical component cleaning agent. allow components to dry completely before reconnecting cables.

CHAPTER 2 INTRODUCTION

Congratulations on your purchase of the Raven AutoBoom system! This system is designed to provide automated boom height adjustment for agricultural equipment.This manual applies to the machines listed below:

MAKE: Salford
MODEL: 9600

FIGURE 1. Salford 9600

PREPARING FOR INSTALLATION

Before installing AutoBoom:

- Park the machine on dry, clean, and level land.
- Leave the machine off during the installation process.
- Read the instructions in this manual as you complete the installation process.

RECOMMENDATIONS

Raven Industries recommends the following best practices before installing or operating the AutoBoom system for the first time, at the start of the season, or when moving the AutoBoom system to another machine:

- Ensure the machine's hydraulic filters have been recently changed and there are no issues with the machine's hydraulic system (e.g., pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic hoses, etc.).

- Operate each of the machine's boom hydraulic functions (i.e., tilt, fold, center rack, tongue extension, or other hydraulic valve functions) three times to ensure the machine's hydraulic valve is using fresh oil and debris is flushed from the hydraulic hoses, valves, and filters.
- Upon installation of the AutoBoom system, operate the boom and center rack raise/lower functions (if equipped) through the machine's manual control functions first before operating them via the AutoBoom controller/field computer to ensure the hydraulic system has been installed correctly and air is released from the system.

Raven Industries recommends the following best practices when installing the AutoBoom system.

- Use part numbers to identify the parts.
- Do not remove the plastic wrap or caps from parts until ready for installation.

TOOLS NEEDED

The following tools are recommended for installation of the AutoBoom system:

- SAE standard-sized wrenches
- Cable ties
- Set of tools

POINT OF REFERENCE

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

HYDRAULIC FITTINGS

This manual may reference the following types of hydraulic fittings:

- SAE O-ring fittings
- ORFS (O-Ring Face Seal) fittings
- JIC fittings

SAE O-ring fitting

ORFS fitting

JIC fitting

UPDATES

Software and manual updates are available on the Raven Applied Technology website:

https://portal.ravenprecision.com/

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

-Salford AutoBoom® Installation Manual
-P/N 016-0230-134 Rev. A
-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.

KIT CONTENTS

TABLE 1. AutoBoom Installation Kit (P/N 117-0232-134)

Item Description	Part Number	Qty.
Manual - AutoBoom Calibration and Operation	016-0130-078	1
Sheet - Help/Warranty	016-0171-649	1
Valve - AutoBoom Hydraulic	063-0131-126	1
Node - ISO AutoBoom	063-0130-016	1

TABLE 1. AutoBoom Installation Kit (P/N 117-0232-134)

Item Description	Part Number	Qty.
Sensor - Right Ultrasonic	063-0130-012	1
Sensor - Left Ultrasonic	063-0130-014	1
Bracket - Valve Mounting	107-0171-619	1
Bracket - Node Mounting	107-0172-084	1
Bracket - Ultrasonic Sensor Mounting	107-0172-600	2
Cable - 40' Ultrasonic Sensor Extension	115-0171-602	2
Cable - AutoBoom Harness	115-0230-168	1
Cable - Raven ISO Tee Adapter	115-0230-169	1
Magnets	418-0000-013	3
Shim	107-0171-620	2
Tubing - 6' Heat Shrink	434-0105-268	1

TABLE 1. AutoBoom Installation Kit (P/N 117-0232-134)

Item Description	Part Number	Qty.
Bolt - 1/4"-20 x 3/4" Hex	311-0049-103	3
Bolt - 5/16"-18 x 7/8" Grade 5 Hex	311-0052-104	4
Bolt - 3/8"-16 x 1-1/4" Hex	311-0054-106	12
Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	15
Nut - 1/4"-20 Zinc Flanged Lock	312-4000-164	3
Washer - 5/16" Lock	313-1000-019	4
Washer - 1/4" Flat	313-2300-010	3

TABLE 2. Hydraulic Kit (P/N 117-0134-134)

Item Description	Part Number	Qty.
Fitting - 3/4" Internal Hex O-Ring Plug	333-0012-037	4
Fitting - -8 JIC M/M/F Swivel Run Tee Adapter	333-0012-039	1
Fitting - -6 ORB (M) to -8 JIC (M) Straight Adapter	333-0012-055	2

TABLE 2. Hydraulic Kit (P/N 117-0134-134)

Item Description	Part Number	Qty.
Fitting - -8 JIC M/F 90° Swivel Elbow	333-0012-064	2
Fitting - -8 ORFS (M) to -8 JIC (M) Straight Adapter	333-0012-093	3
Fitting - -6 SAE O-Ring Plug	333-0012-194	3
Fitting - -8 JIC M/M/M Union Tee	333-0012-316	2
Hydraulic Hose - -8 JIC (F) to -8 JIC (F) 90° - 18″	214-1000-627	1
Hydraulic Hose - -8 JIC (F) to -8 JIC (F) 90° - 48″	214-1000-736	2

TABLE 3. Cable Installation Kit (P/N 117-0171-213)

Item Description	Part Number	Qty.
Sheet - Installation	016-0159-459	1
Grease - Dielectric	222-0000-013	2
Tie - Cable	435-1000-003	15

TABLE 4. Switch Box Installation Kit (P/N 117-0137-081)

Item Description	Part Number	Qty.
Box - Raven AutoBoom Switch	063-0174-006	1
Cable - Raven AutoBoom Switch Box	115-0172-513	1
Cable - Implement AutoBoom Switch Box	115-0172-514	1

CHAPTER 3 HYDRAULIC INSTALLATION

⚠ WARNING

The machine must remain stationary and switched off, with the booms folded and in the transport position, during installation or maintenance.

Bleed pressure from the hydraulic system by operating the boom tilt functions while the key is on, but the machine's engine is off.

⚠ CAUTION

When installing AutoBoom hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material from being introduced into the machine's hydraulic system.

Objects that are able to bypass the machine's hydraulic filtration system will reduce performance and possible damage the AutoBoom hydraulic valve.

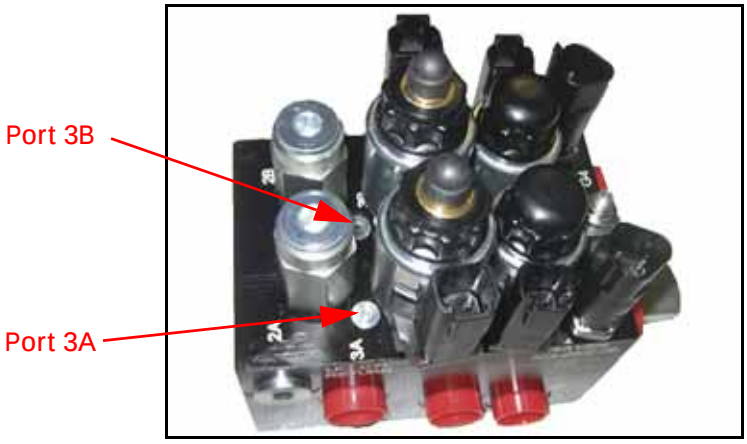
NOTICE

The appearance of the AutoBoom hydraulic valve may vary slightly from the images contained in this manual. However, the fittings, hose connections, and cable connections remain the same.

REMOVE THE ORIFICE FITTINGS

Before populating the hydraulic fittings on the AutoBoom valve, it is necessary to remove orifice fittings from the valve. Failure to remove these fittings from the valve will restrict the down speed of the booms when the system is enabled.

FIGURE 1. Port 3A and 3B Location



1. Locate Ports 3A and 3B on the AutoBoom valve (P/N 063-0131-126).

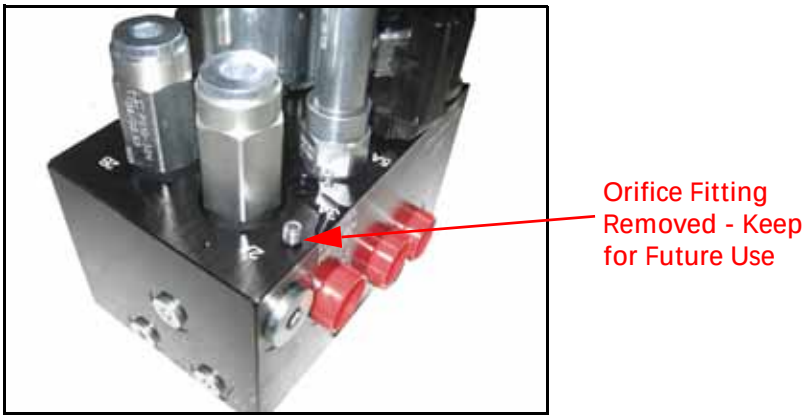
FIGURE 2. Coil Removed from the AutoBoom Valve

2. Remove the coils from the solenoids near Ports 3A and 3B to gain easy access to those ports.

FIGURE 3. Port Plugs Removed from the AutoBoom Valve

3. Use an Allen wrench to remove the plugs from Ports 3A and 3B.

FIGURE 4. Orifice Fitting Removed from the AutoBoom Valve



4. Remove the orifice fittings from Ports 3A and 3B.

NOTE: Tip the AutoBoom valve on its side and use the Allen wrench to remove the orifice from the cavity, taking care not to let the fitting fall into the valve.

FIGURE 5. Port Plug Reinstalled on the AutoBoom Valve

5. Use the Allen wrench to reinstall the port plugs on Ports 3A and 3B of the AutoBoom valve.

FIGURE 6. Coil Reinstalled on the AutoBoom Valve

6. Reinstall the coils on the solenoids of the AutoBoom valve.

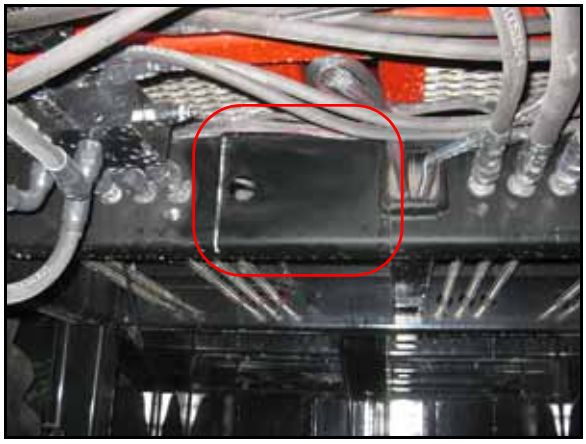
INSTALL THE FITTINGS ON THE AUTOBOOM VALVE

Before mounting the AutoBoom valve (P/N 063-0131-126) on the machine, install the proper fittings on the valve. This prepares the valve for installation and simplifies the hose connection process later in the procedure. Refer to the following table to install the fittings in the appropriate ports of the AutoBoom valve.

Fitting	Part Number	Port
Fitting - -6 ORB (M) to -8 JIC (M) Straight Adapter	333-0012-055	LC, RC
Fitting - -8 JIC M/F 90° Swivel Elbow	333-0012-064	LC, RC
Fitting - -6 ORB Plug	333-0012-199	LV, RV
Fitting - -8 ORFS (M) to -8 JIC (M) Straight Adapter	333-0012-093	Left T, P, EF
Fitting - -8 JIC M/M/F Swivel Run Tee Adapter	333-0012-039	Left T

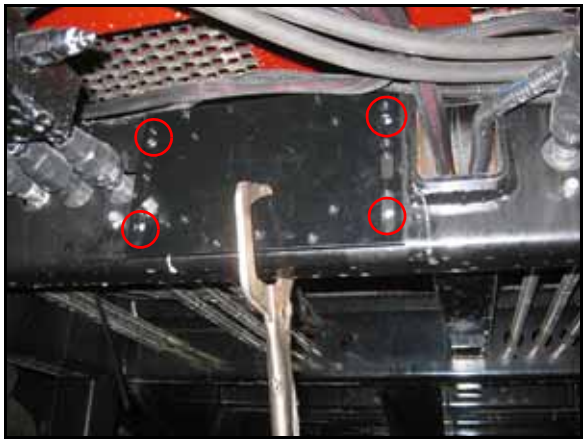
MOUNT THE AUTOBOOM VALVE

FIGURE 7. Valve Mounting Location



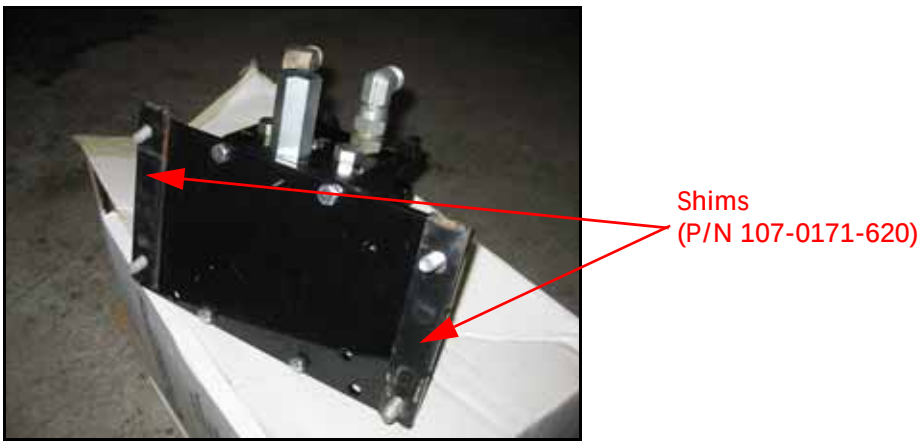
1. Identify the valve mounting location in the center of the cross-member at the rear of the machine.

FIGURE 8. Valve Clamped to Machine's Cross-member



2. Clamp the valve mounting bracket (P/N 107-0171-619) to the machine's rear cross-member.
3. Using the valve mounting bracket as a template, drill a 3/8" hole in the machine's cross-member at each corner of the valve mounting bracket.

FIGURE 9. AutoBoom Valve Installed on Valve Mounting Bracket



4. Unclamp the valve mounting bracket and remove the bracket from the machine's cross-member.
5. Install the AutoBoom valve (P/N 063-0131-126) on the valve mounting bracket using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16" lock washers (P/N 313-1000-019).
6. Insert four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) through the holes in the corners of the valve mounting bracket.
7. Align the valve mounting bracket with the holes previously drilled in the machine's cross-member.
8. Insert shims (P/N 107-0171-620) between the machine's cross-member and the valve mounting bracket.

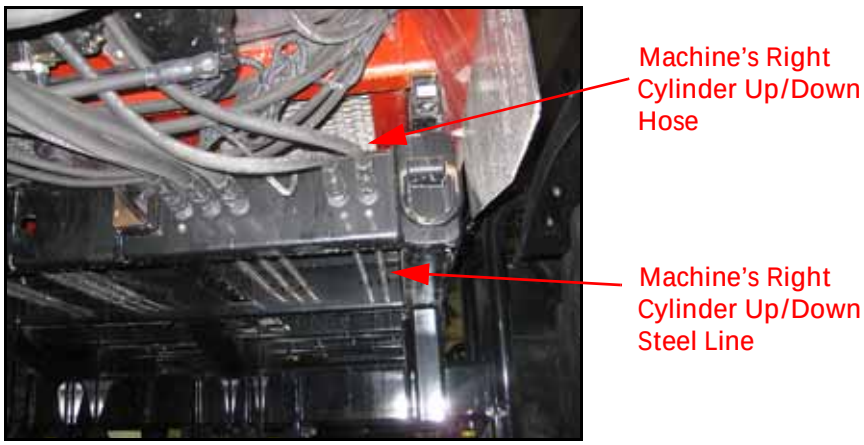
FIGURE 10. Valve Installed on Machine's Cross-member

9. Secure the valve mounting bracket to the machine's cross-member using four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

INSTALL THE LEFT AND RIGHT CYLINDER HOSES

1. Cut three 6" pieces of heat shrink tubing (P/N 434-0105-268).

FIGURE 11. Machine's Right Cylinder Hoses



2. On the machine's right-rear frame cross-member, locate the machine's right cylinder hose connected to the right cylinder up/down steel line.

FIGURE 12. Heat Shrink Tubing Removed from Hose

3. Cut and remove the heat shrink tubing from end of the machine's right cylinder up/down hose.
4. Disconnect the machine's right cylinder hose from the steel right cylinder up/down line.
5. Install the heat shrink tubing on the end of the machine's right cylinder hose.

NOTE: Do not apply heat to the tubing. The components will be sealed later in the installation procedure.

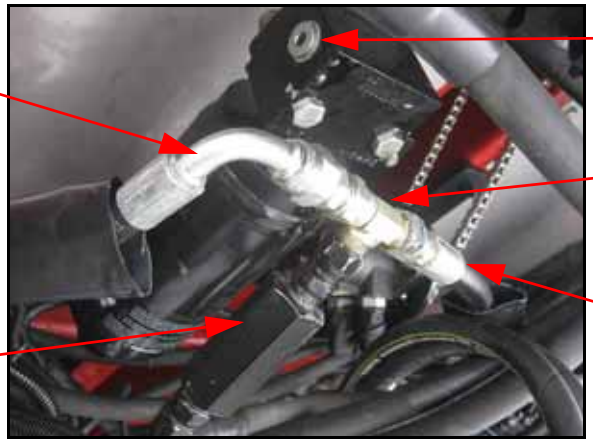
FIGURE 13. Machine's Cylinder Hoses Installed on AutoBoom Valve

6. Connect the machine's right cylinder hose (previously removed from steel line in step 4) to the fitting installed in Port RC of the AutoBoom valve.

FIGURE 14. Machine's Right Accumulator

7. Remove the existing heat shrink tubing from the straight end of the right cylinder hose installed on the machine's right accumulator, located under the rear of the machine's frame.

FIGURE 15. Accumulator Bypass Assembly



8. Disconnect the right up/down cylinder hose from the machine's accumulator.
9. Install the heat shrink tubing on the end of the machine's right cylinder up/down hose.

NOTE: Do not apply heat to the tubing. The components will be sealed later in the installation procedure.

10. Install the right cylinder up/down hose on one of the straight ends of the -8 M/M/M union tee fitting (P/N 333-0012-316).
11. Disconnect the check valve from the existing tee fitting installed in the accumulator.
12. Install the check valve on the 90° end of the installed -8 M/M/M union tee fitting.
13. Cut the heat shrink tubing from the 90° end of the machine's hose on the other side of the accumulator.
14. Disconnect the 90° hose end from the tee fitting installed on the machine's right accumulator.
15. Install the heat shrink tubing on the 90° end of the machine's right cylinder up/down hose.

NOTE: Do not apply heat to the tubing. The components will be sealed later in the installation procedure.

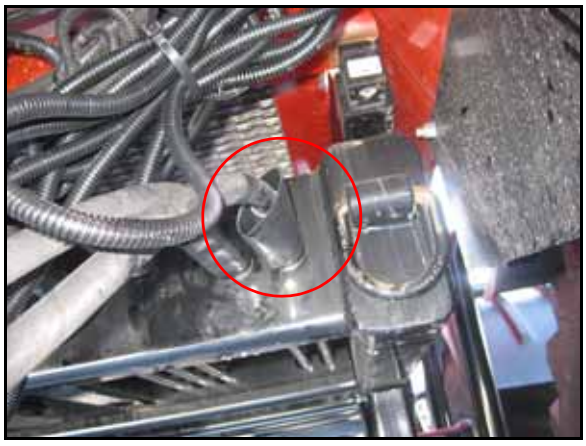
16. Install the 90° end of the right cylinder up/down hose on the remaining end of the -8 M/M/M union tee fitting.
17. Remove the tee fitting from the machine's accumulator.
18. Install -8 ORB hex plug fittings (P/N 333-0012-037) on both open ports of the machine's accumulator.
19. Repeat the steps above to install the left cylinder hoses.

INSTALL THE PRESSURE AND TANK HOSES

1. Cut two 6" pieces of heat shrink tubing (P/N 434-0105-268).
2. Install the heat shrink tubing to both ends of the supplied hydraulic hose (P/N 214-1000-736).

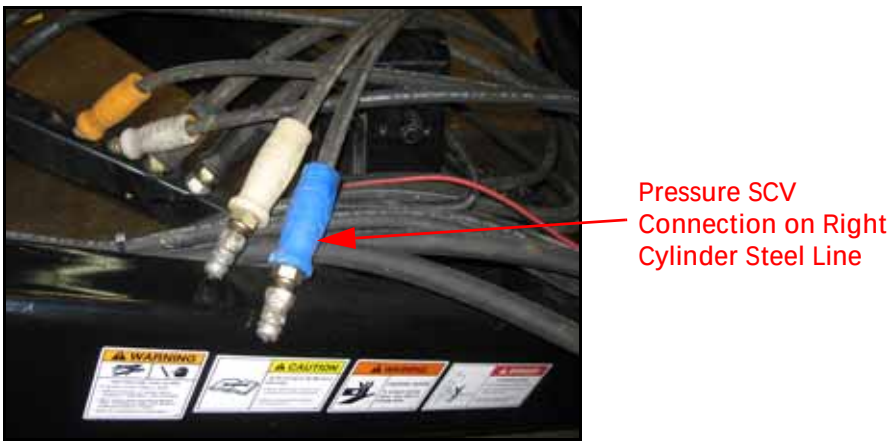
NOTE: Do not apply heat to the tubing. The components will be sealed later in the installation procedure.

FIGURE 16. Pressure Hose Installed on Machine's Open Port



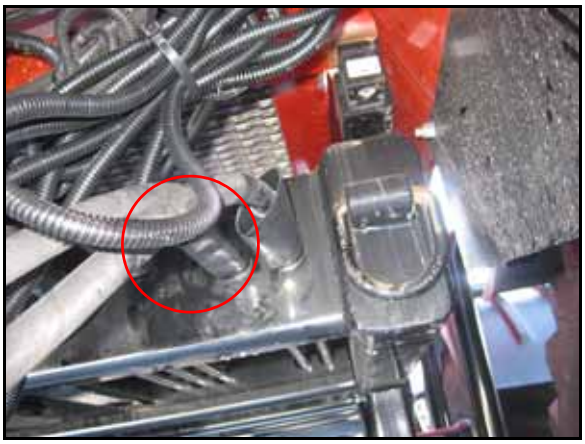
3. Install the straight end of the supplied hydraulic hose on the machine's right cylinder steel line.
4. Install the 90° end of the installed hydraulic hose to the fitting installed in Port P of the AutoBoom valve.

FIGURE 17. Machine's Pressure SCV Connection



5. Trace the right cylinder steel line to the front of the tractor.
6. Locate the machine's pressure hose that has the blue coupler at the end.
7. Connect the blue coupler to the machine's dedicated pressure SCV port.

FIGURE 18. Tank Hose Installed on Machine's Open Port

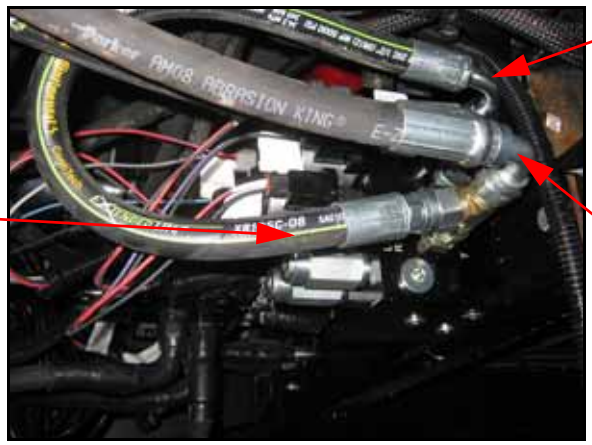


8. Cut two 6" pieces of heat shrink tubing (P/N 434-0105-268).
9. Install the heat shrink tubing to both ends of the supplied hydraulic hose (P/N 214-1000-736).

NOTE: Do not apply heat to the tubing. The components will be sealed later in the installation procedure.

10. Install the straight end of the supplied hydraulic hose on the machine's left cylinder port.

FIGURE 19. Tank Hose Installed on AutoBoom Valve

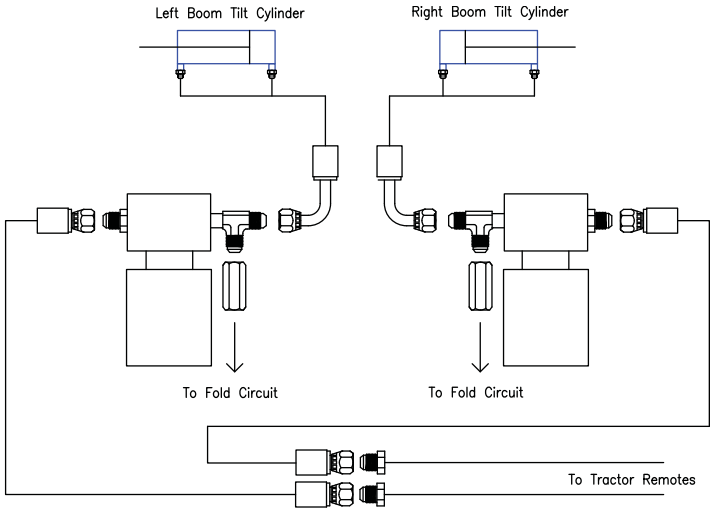


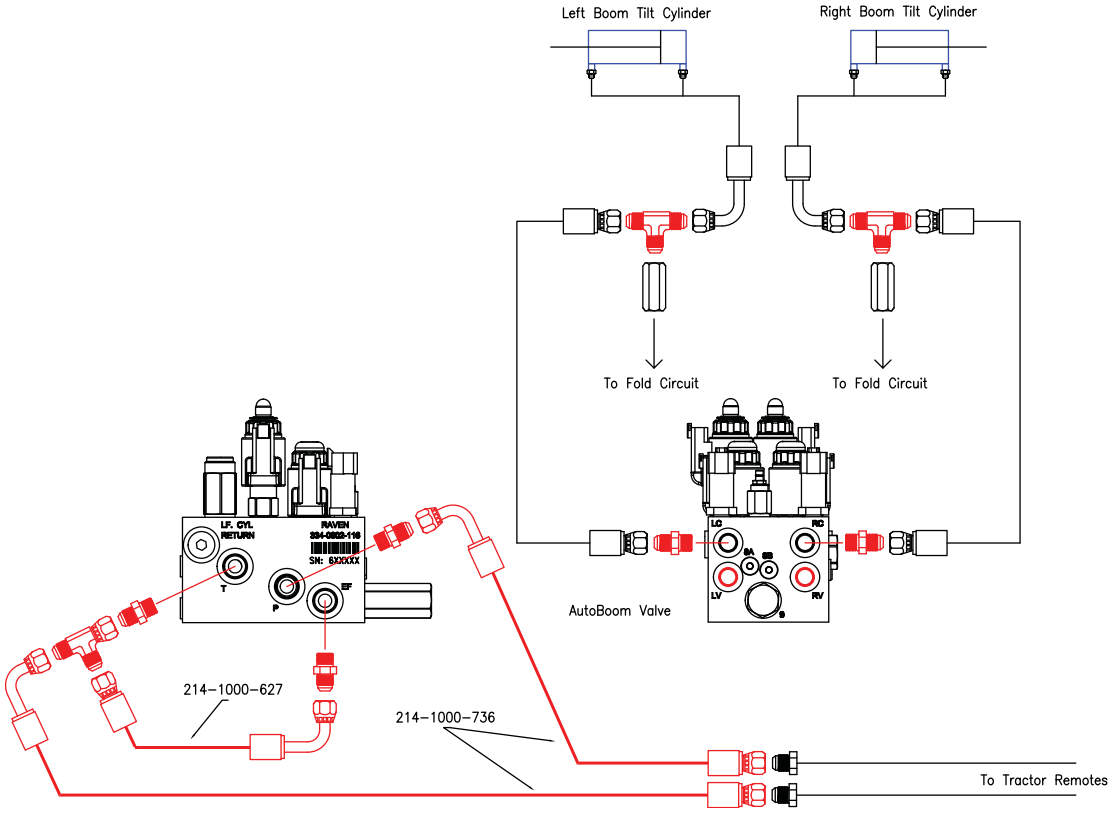
11. Install the 90° end of the installed hydraulic hose on the straight end of the tee fitting installed in Port T of the AutoBoom valve.
12. Cut two 6" pieces of heat shrink tubing (P/N 434-0105-268).
13. Install the heat shrink tubing to both ends of the supplied hydraulic hose (P/N 214-1000-627).
14. Install the straight end of the supplied hydraulic hose on the 90° end of the tee fitting installed in Port T of the AutoBoom valve.
15. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port EF of the AutoBoom valve.

FIGURE 20. Machine's Tank SCV Connection

16. Trace the left cylinder steel line to the front of the tractor.
17. Locate the machine's tank hose that has the white coupler at the end.
18. Connect the blue coupler to the machine's dedicated tank SCV port.

HYDRAULIC DRAWING

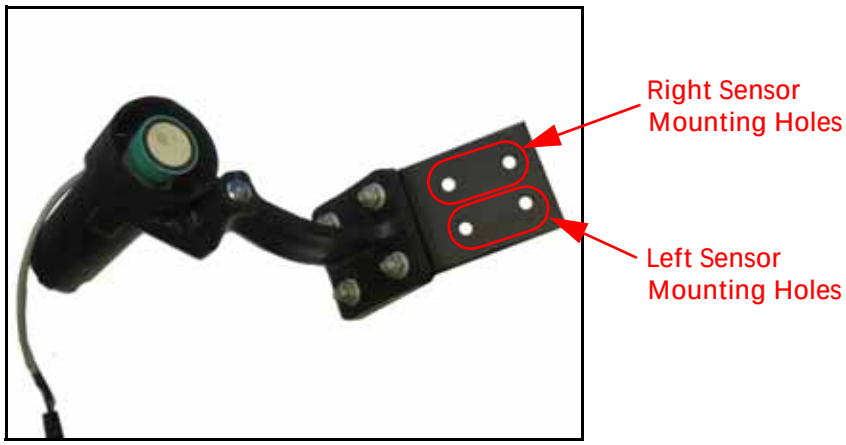




CHAPTER 4 SENSOR INSTALLATION

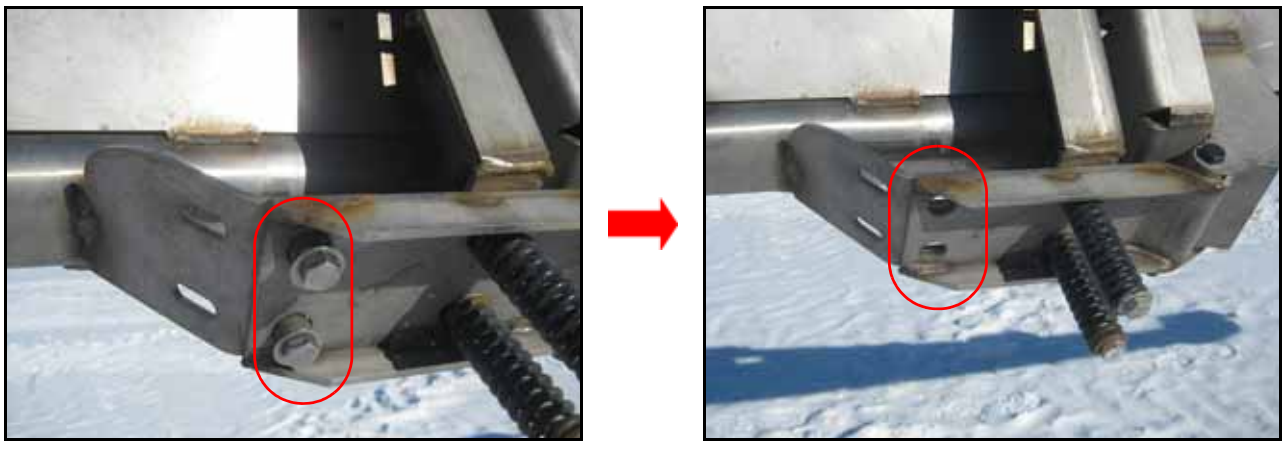
INSTALL THE BOOM SENSORS

FIGURE 1. Boom Sensor Installed on Mounting Bracket



1. Secure the sensors (P/N 063-0130-012 and 063-0130-014) to the sensor mounting brackets (P/N 107-0172-600) using eight 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-106) and eight 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

FIGURE 2. Boom Breakaway Hardware Removed



2. Remove the nuts, bolts, and spacers on the machine's breakaway locks located at the hinges of the main booms.

FIGURE 3. Sensor Mounted on Boom

Top View

Front View

3. Using the machine's hardware, install the sensors on the breakaway locks.
4. Tighten the hardware to ensure the sensors are mounted securely.

CONNECT THE SENSOR CABLES

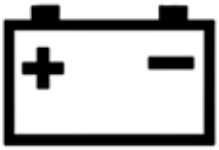
FIGURE 4. Sensor Cable Routing

1. Use a fish puller (not supplied) or similar cable routing device to feed the 40' sensor extension cable (P/N 115-0171-602) through the right boom channel to the right sensor.
2. Connect the 40' sensor extension cable to the right boom sensor (P/N 063-0130-012).
3. Loop and tie-off any excess cabling, allowing enough cable for boom folding and extension.
4. Repeat the steps above to connect the remaining sensor cable.

NOTE: The 40' sensor extension cables will be connected to the AutoBoom harness cable later in the installation procedure.

CHAPTER 5 CAB COMPONENT INSTALLATION

WIRING CONNECTIONS



⚠ CAUTION

Always connect the power cable as the last step in the wiring process and verify that the power leads are connected with the correct polarity. Reversing power leads can cause severe damage to the equipment.

For wiring connections made outside the cab, apply dielectric silicone grease (P/N 222-0000-006) generously on both the male and female ends of the connectors. Application of the grease will prevent corrosion to the pins and wires.

INSTALL THE AUTOBOOM NODE

FIGURE 1. Node Mounting Location

1. Remove the cover of the electrical box located at the left-rear of the machine.

FIGURE 2. Magnets Installed on Node Mounting Bracket

2. Install three magnets (P/N 418-0000-013) on the back (side without mounting studs) of the node mounting bracket (P/N 107-0172-084) using three 1/4"-20 x 3/4" hex bolts (P/N 311-0049-103), three 1/4" flat washers (P/N 313-2300-010), and three 1/4"-20 zinc flanged lock nuts (P/N 312-1000-168).

FIGURE 3. Node Installed on Node Mounting Bracket

3. Install the AutoBoom node (P/N 063-0130-016) on the node mounting bracket using three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-168).

FIGURE 4. Node Mounted in Electrical Box

4. Mount the AutoBoom node inside the machine's electrical box.
5. Feed the large, rectangular node connectors on the AutoBoom harness cable (P/N 115-0230-168) through the hole in the bottom of the electrical box.
6. Connect the node connectors into the correct ports of the AutoBoom node.
7. Tighten the bolts on the node connectors to secure the connections.

INSTALL THE SWITCH BOX

1. Choose the switch box mounting location in the machine's cab.

NOTE: The switch box should be mounted in the machine's cab so that the operator has easy access to it.

2. Connect the switch box power wire to a switched power source.
3. Plug the 6-pin connector of the Raven AutoBoom switch box cable (P/N 115-0172-513) into the back of the switch box.
4. Route the rest of the cable out of the cab and to the implement's hitch.

CONNECT THE HARNESS TO THE SWITCH BOX

1. Connect the 4-pin connector of the implement switch box cable (P/N 115-0172-514) to the mating connector on the Raven switch box cable (P/N 115-0172-513).
2. Route the implement switch box cable along the machine's frame and toward the AutoBoom valve.
3. Apply dielectric grease (P/N 222-0000-013) to all cable connectors of the implement switch box cable.
4. Connect the RIGHT RAISE connector of the implement switch box cable to the RIGHT SOLENOID SENSE UP connector of the AutoBoom harness (P/N 115-0230-168).
5. Connect the RIGHT LOWER connector to unlabeled RIGHT SOLENOID SENSE connector of the AutoBoom harness.
6. Connect the LEFT RAISE connector of the implement switch box cable to the LEFT SOLENOID SENSE UP connector of the AutoBoom harness.
7. Connect the LEFT LOWER connector to unlabeled LEFT SOLENOID SENSE connector of the AutoBoom harness.

CONNECT THE HARNESS TO THE BOOM FUNCTION CONTROLS

1. Apply dielectric grease (P/N 222-0000-013) to all AutoBoom harness (P/N 115-0230-168) boom function cable connectors:
   - LEFT PRESS and RIGHT PRESS
   - LEFT SOLENOID and RIGHT SOLENOID
   - LEFT PROP and RIGHT PROP
2. Route the connectors to the to the AutoBoom valve (P/N 063-0131-126).
3. Connect the LEFT PRESS connector to Port G1 of the AutoBoom valve.
4. Connect the RIGHT PRESS connector to Port G4 of the AutoBoom valve.
5. Connect the LEFT SOLENOID connector to Port 4A of the AutoBoom valve.
6. Connect the RIGHT SOLENOID connector to Port 4B of the AutoBoom valve.
7. Connect the LEFT PROP connector to Port 5A of the AutoBoom valve.
8. Connect the RIGHT PROP connector to Port 13A of the AutoBoom valve.

CONNECT THE HARNESS TO THE SENSORS

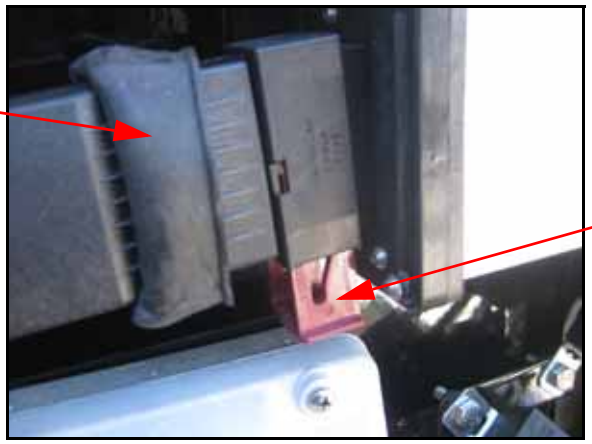
1. Apply dielectric grease (P/N 222-0000-013) to all sensor cable connectors.
2. Locate the LEFT OUTER SENSOR connector on the AutoBoom harness cable (P/N 115-0230-168).
3. Connect the LEFT OUTER SENSOR connector on the installed left sensor cable (P/N 115-0171-602).
4. Locate the RIGHT OUTER SENSOR connector on the AutoBoom harness cable.
5. Connect the RIGHT OUTER SENSOR connector on the installed right sensor cable.
6. If optional inner boom sensors are installed, repeat the steps above to connect the sensors.

INSTALL THE RAVEN ISO TEE ADAPTER CABLE

FIGURE 5. Salford/Valmar ECU

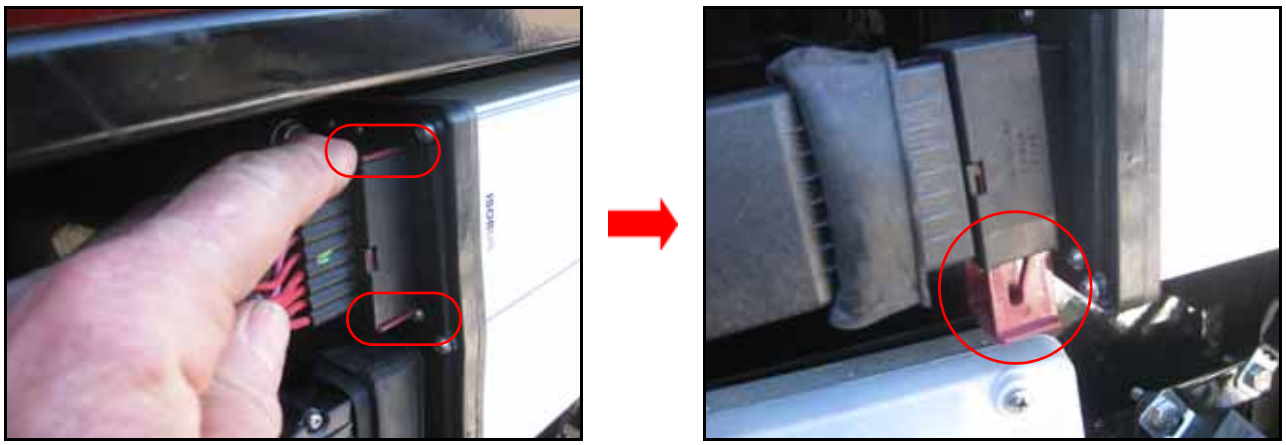
1. Locate the Salford/Valmar electronic control unit (ECU) in the upper-middle of the electrical box.

FIGURE 6. Rubber Cover to be Removed



2. Pull back on the rubber cover on the lower ECU connector to access the pink locking device.

FIGURE 7. Locking Device Release



3. Push down on the pink locking device tabs to release the lower ECU connector.
4. Repeat steps 2 - 3 above to disconnect the upper ECU connector.

FIGURE 8. Machine's ECU Connectors Connected to Raven ISO Tee Adapter Cable

5. Connect the female (top) connector of the machine's ECU harness to the male connector of the Raven ISO tee adapter cable (P/N 115-0230-169).

FIGURE 9. Raven ISO Tee Adapter Cable Installed on Machine's ECU

6. Connect the female connector of the Raven ISO tee adapter cable to the top port of the machine's ECU.
7. Push up on the locking device tabs to ensure the connector is securely installed.
8. Reinstall the lower connector of the machine's ECU harness to the lower port of the machine's ECU.
9. Push up on the locking device tabs to ensure the connector is securely installed.
10. Slide the rubber cover over the lower ECU connector.

FIGURE 10. Raven ISO Tee Adapter Cable and AutoBoom Harness Connections

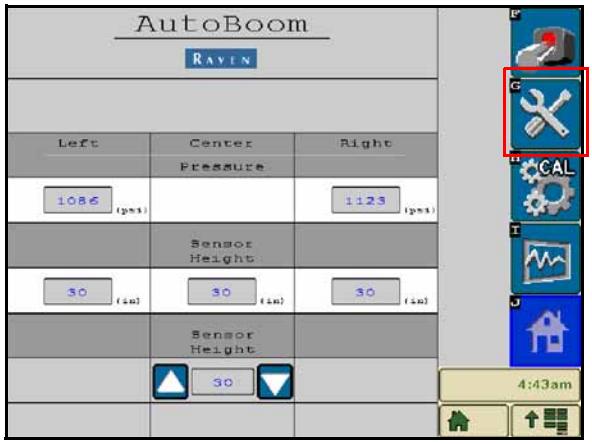
11. Apply dielectric grease (P/N 222-0000-013) to the round cable connector of the Raven ISO tee adapter cable.
12. Connect the round connector of the Raven ISO tee adapter cable to the mating connector on the AutoBoom harness cable (P/N 115-0230-168).
13. Loop excess tee adapter cable into a compact bundle and secure it with plastic cable ties (P/N 435-1000-003).
14. Reinstall the electrical box cover.

CHAPTER 6 SYSTEM SETUP

CONFIGURE THE BOOM RAISE AND LOWER FUNCTIONS

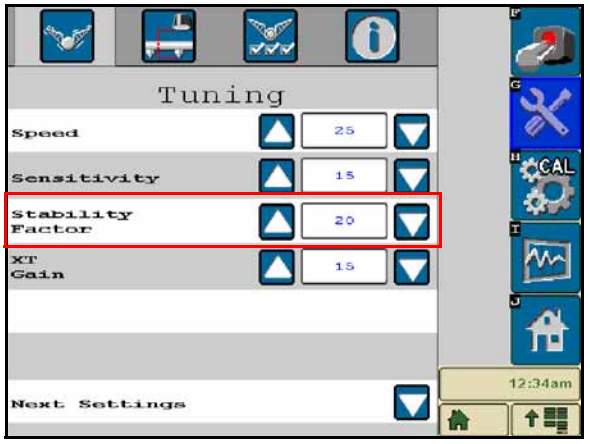
Now that the AutoBoom system has been installed on the machine, the manual boom raise and lower functions are controlled via the Raven switch box. Complete the following steps to set up the manual boom raise and lower functions via the field computer.

FIGURE 1. AutoBoom Home Screen



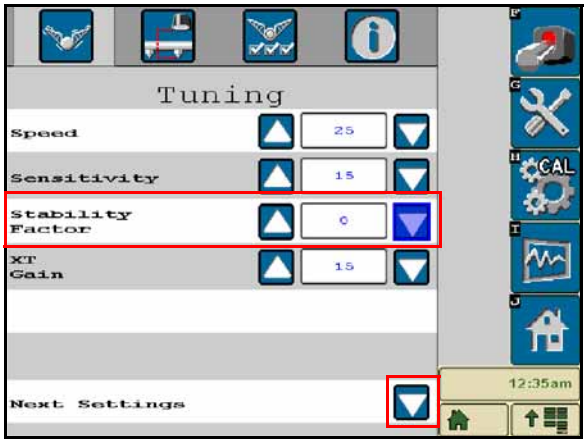
1. From the AutoBoom Home screen, select the **Setup** icon.

FIGURE 2. AutoBoom Tuning Screen



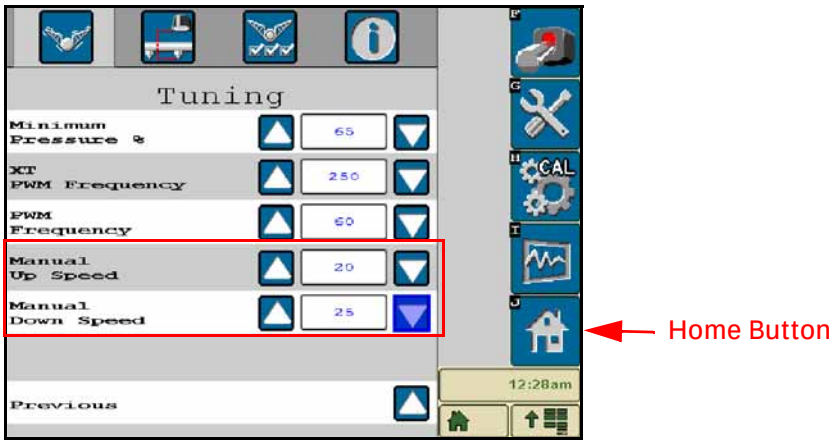
2. Locate the **Stability Factor** setting.

FIGURE 3. Stability Factor Setting Adjustment



3. Press the arrow down button to adjust the Stability Factor to set the Stability Factor setting to 0.
4. Select the Next Settings arrow to advance to the next screen.

FIGURE 4. Manual Up Speed and Manual Down Speed Adjustments



5. Use the arrow buttons to set the **Manual Up Speed** setting to 20.
6. Use the arrow buttons to set the **Manual Down Speed** setting to 25.
7. Push the raise and lower buttons on the switch box to test the speed of the boom raise and lower functions.

NOTE: If the raise and lower speed is not satisfactory, increase the Manual Up Speed and Manual Down Speed settings. The maximum value for these settings is 30.

8. Press the Home button to exit the AutoBoom Tuning screen.

STARTUP PROCEDURES

⚠ WARNING

When starting the machine for the first time after installing steering, be sure that all persons stand clear in case a hose has not been properly tightened.

⚠ WARNING

Do not use hands to check for leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death.

1. Turn on the machine.
2. Test the machine's raise and lower boom functions via the installed switch box.
3. Double-check all fittings and hose connections to ensure that:
   - Hoses are not running on or interfering with moving parts.
   - Hydraulic fluid is not leaking from the system.
4. Apply heat to heat shrink tubing (P/N 434-0105-268) installed at all steps during the AutoBoom system installation to seal the hydraulic connections.

CALIBRATE THE AUTOBOOM SYSTEM

Refer to the ISO AutoBoom Calibration and Operation Manual (P/N 016-0130-078) for further instructions on system calibration and operation.

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RAVEN

Limited Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

How Long is the Coverage Period?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

What Will Raven Industries Do?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is not Covered by this Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

016-0171-537 Rev. A, E19889

RAVEN

Extended Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

Do I Need to Register My Product to Qualify for the Extended Warranty?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

Where Can I Register My Product for the Extended Warranty?

To register, go online to www.ravenhelp.com and select Product Registration.

How Long is the Extended Warranty Coverage Period?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

What Will Raven Industries Do?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is Not Covered by the Extended Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.