The Sprayer

Operator's Manual

EAGLE™ SPB/SPC BOOM

Instruction book

67024003 - Version 1.11
US - 11.2021

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Welcome letter

Dear Owner,

Thank you for purchasing a HARDI® product and welcome to the ever-increasing family of HARDI® sprayer owners.

Our sprayers and accessories are rapidly becoming a familiar sight on North American farms. We believe that this results from growers becoming increasingly conscious of crop protection input costs and the vital need for cost effective spray application equipment.

Please take the time to thoroughly read the Operator's Manual before using your equipment. You will find many helpful hints as well as important safety and operation information.

Some of the features on your HARDI® sprayer were suggested by growers. There is no substitute for "on farm" experience and we invite your comments and suggestions. If any portion of this instruction book remains unclear after reading it, contact your HARDI® dealer or service personnel for further explanation before using the equipment.

For Product, Service or Warranty Information:

- Please contact your local HARDI® dealer.

To contact HARDI® directly:

- Please use the HARDI® Customer Service number: 1-866-770-7063
- Or send your email to service@hardi-us.com

Visit us online at: www.hardi-us.com

HARDI® NORTH AMERICA INC.
7301 Vine Street Court
Davenport, Iowa 52806
Phone: (563) 386-1730
Fax: (563) 386-1280

Operator safety

Symbols

These symbols are used throughout the book to designate where the reader needs to pay extra attention.


This symbol means DANGER. Be very alert as your safety is involved!


This symbol means WARNING. Be alert as your safety can be involved!


This symbol means ATTENTION. This guides you to better, easier and safer operation of your sprayer!


This symbol means NOTE.

General info

Before using the sprayer, read the following recommendations and safety instructions.

- Read and understand this instruction book before using the equipment. It is equally important that other operators of this equipment read and understand this book.
- If any portion of this instruction book remains unclear after reading it, contact your HARDI® dealer for further explanation before using the equipment.
- Local law may demand that the operator is certified to use spray equipment. Adhere to the law.
- Wear protective clothing. Wash and change clothes after spraying.
- Wash tools if they have become contaminated. Rinse and wash equipment after use and before servicing.
- Never service or repair the equipment while it is operating.
- Always replace all safety devices or shields immediately after servicing.
- Do not eat, drink or smoke while spraying or working with contaminated equipment.
- In case of poisoning, immediately seek medical advice. Remember to identify chemicals used.
- Keep children away from the equipment.
- Be careful not to hit people or surroundings when maneuvering the sprayer, especially when backing.
- Do not fold or unfold boom near overhead wires. Serious injury or death could result if contact is made with electric wires.
- Slow down when driving in uneven terrain, as the machine might be in risk of turning over.
- Pressure test with clean water prior to filling with chemicals.
- Disconnect electrical power before servicing and depressurize equipment after use and before servicing.
- Do not go under any part of the sprayer unless it is secured. The boom is secure when placed in the transport brackets with rear transport lock secured.
- If an arc welder is used on the equipment or anything connected to the equipment, disconnect power leads before welding. Remove all flammable or explosive material from the area.

Local poison information center

If you live anywhere in the United States, the following toll free number will connect you to your Local Poison Information Center.

PHONE NO. 1 - 800 - 222 - 1222

If you live outside the United States, find the number for the poison control center in your phone book and write it in the space below:

PHONE NO._____ - _____ - _____

Keep a list, in the space provided below, of all the chemicals that you have in use.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Boom

Boom types and sizes

The HARDI® EAGLE™ booms are available in the following types and sizes:

SPB sizes: 45', 50', 60' & 66'

The 45' - 66' SPB booms are built with the same basic components. There are differences in the outer wing sections to give the range of boom widths. The 45' & 50' booms incorporate the breakaway into the folding hinge point between the inner/outer wings. The 60' & 66' booms include breakaway sections in the outer wing.

SPC sizes: 75', 80', 88', 90' & 100'

The 75' - 100' SPC booms are built with the same basic components as the SPB booms. The main differences are in the size of the boom steel profiles, the folding hinge area between the inner/outer wings and the type of breakaway sections.

SPC Dual Fold sizes: 90'/60' & 120'/90'

The SPC booms are also available in Dual Fold models; 90'/60' & 120'/90'. The outer sections of the dual fold booms fold vertically to allow for two different spraying widths.

Components cannot be exchanged between the EAGLE™ SPB and SPC booms. Also, the 120'/90' Dual Fold SPC booms are equipped with a different center section than the other SPC booms.

Note: Individual boom wing fold is not possible using the 120'/90' Dual Fold SPC booms.

Hydraulic systems

The HARDI® EAGLE™ booms are available in four different hydraulic system versions; HY, HV, HZ (trailed) & HZ (self-propelled).

1. SPB-HY & SPC-HY

These types of booms are operated directly via the tractor hydraulics. Hydraulic lift cylinders are used for boom height adjustment and fold cylinders are used for simultaneous boom wing fold and unfold.

2. SPB-HV

This type of boom has the same features as the HY model, but also allows for individual boom wing fold and unfold. Hydraulic lift cylinders are used for boom height adjustment and fold cylinders are used for individual boom wing fold and unfold. The SPB-HV hydraulics are controlled with an electrical hydraulic control box.

3. SPB-HZ & SPC-HZ (trailed)

These types of booms have two boom wing tilt cylinders that give the ability to obtain individual boom wing tilt. Hydraulic lift cylinders are used for boom height adjustment and fold cylinders are used for individual boom wing fold and unfold. The hydraulics are controlled with various different electrical hydraulic controls depending on the model of sprayer.

4. SPC-HZ (self-propelled)

This type of boom has two boom wing tilt cylinders that give the ability to obtain individual boom wing tilt. Hydraulic lift cylinders are used for boom height adjustment and fold cylinders are used for simultaneous boom wing fold and unfold. The hydraulics are controlled with the HARDI® Spray center and the multifunctional Grip handle.

Note: Individual boom wing fold is not possible using the HY Hydraulic system (1) or the HZ self-propelled system (4).

3 - Description

Boom terminology

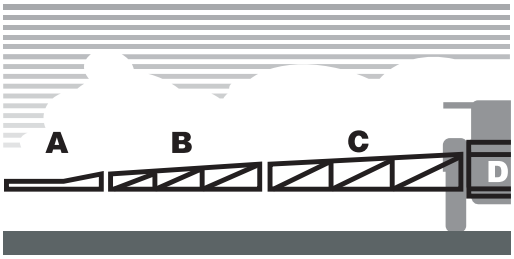
The terminology for the SPB/SPC boom sections is as follows:

A - Breakaway section

B - Outer section

C - Inner section

D - Center section



Note: The outer sections (B) on the 45' & 50' SPB booms are also the breakaway sections (A). So A & B are combined.

The terminology for the Dual Fold SPC boom sections is as follows:

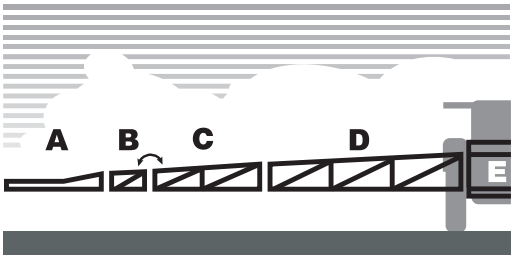
A - Breakaway section

B - 2nd Outer section

C - 1st Outer section

D - Inner section

E - Center section



Electrical Hydraulic controls

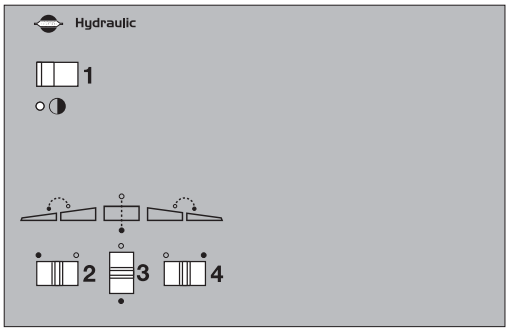
General info

The electrical controls used to operate the boom hydraulics vary depending on the model of sprayer.

HV Hydraulic control box (Ranger 550)

The switches on the HV hydraulic control box control the following functions:

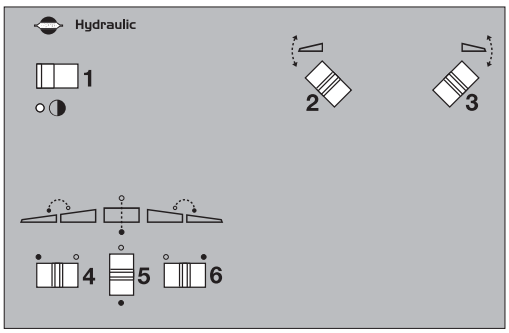
1. Power ON/OFF
2. Boom folding (left side)
3. Boom lift raise/lower
4. Boom folding (right side)



HZ Hydraulic control box (Ranger 550)

The switches on the hydraulic control box control the following functions:

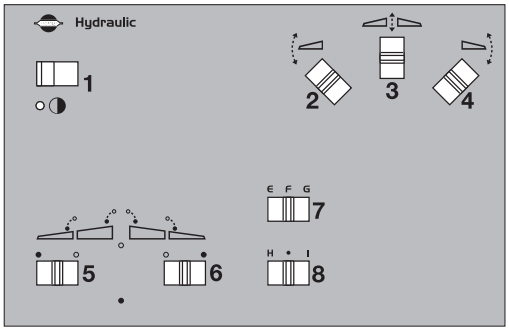
1. Power ON/OFF
2. Boom tilt left
3. Boom tilt right
4. Boom folding (left side)
5. Boom lift raise/lower
6. Boom folding (right side)



HZ Hydraulic control box (Ranger 2000, Navigator)

The switches on the hydraulic control box control the following functions:

1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (left side)
6. Boom folding (right side)
7. Optional function
8. Optional function

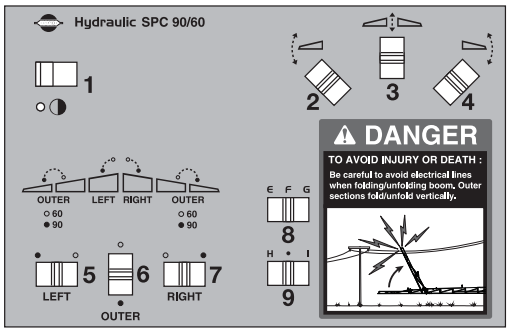


3 - Description

HZ Hydraulic control box - 90'/60' SPC Dual Fold booms (Navigator)

The switches on the hydraulic control box control the following functions:

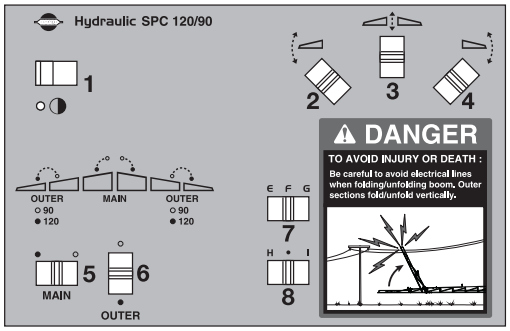
1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (left)
6. Boom folding (outer)
7. Boom folding (right)
8. Optional function
9. Optional function



HZ Hydraulic control box - 120'/90' SPC Dual Fold booms (Navigator)

The switches on the hydraulic control box control the following functions:

1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (main)
6. Boom folding (outer)
7. Optional function
8. Optional function

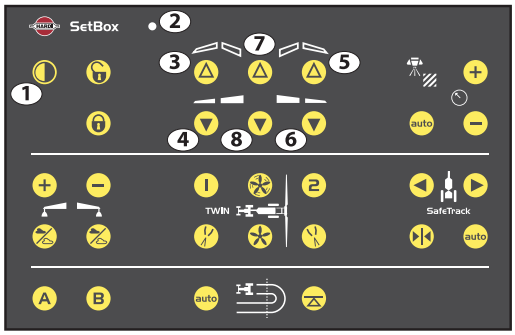


SetBox controls for sprayers equipped with ISOBUS

The SetBox controls secondary functions. The keys are grouped into control areas to simplify operator understanding.

Note: Self-propelled sprayers do not have a SetBox as the controls are built-in to the cabin.

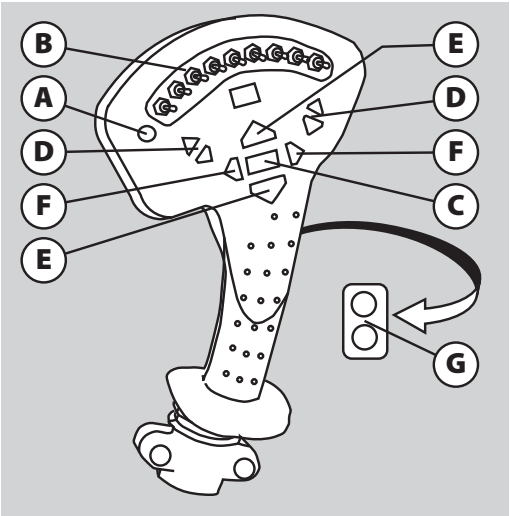
1. Power ON/OFF.
2. Status diode.
3. Left boom fold.
4. Left boom unfold.
5. Right boom fold.
6. Right boom unfold.
7. 2nd outer section fold (Dual Fold booms only).
8. 2nd outer section unfold (Dual Fold booms only).



ATTENTION! The Grip cannot be switched ON/OFF separately. It is automatically switched ON when tractor power is turned ON (ISOBUS).

HZ Hydraulic controls on the Grip handle (ISOBUS & PRESIDIO)

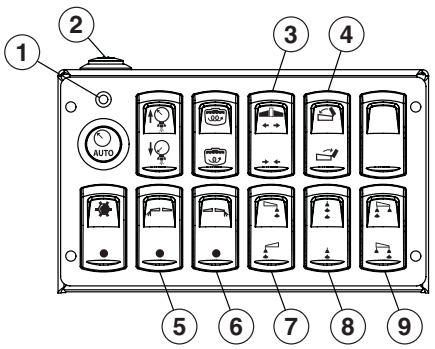
A. Status LED.
B. Boom section controls.
C. Main ON/OFF.
D. Tilt.
E. Boom height.
F. Boom slant.
G. Not used.



HZ Hydraulic controls on the HARDI® spray center (PRESIDIO)

The boom controls on the HARDI® spray center work in combination with the Grip controls. The buttons on the console control the following functions:

1. Status LED.
2. Main ON/OFF.
3. Unfold/Fold boom.
4. Unfold/Fold second outer section (90'/60' booms only).
5. Left End Nozzle ON/OFF (optional).
6. Right End Nozzle ON/OFF (optional).
7. Foam Marker Left/Right.
8. Foam Marker blob interval.
9. Foam Marker Inner/Outer (optional).



Hydraulic systems

General info

Ensure that snap couplers are clean before connection!

After having operated the boom and the system has been filled with oil, check tractor's hydraulic oil level and add oil if necessary.

DANGER! Test of the hydraulic system should be done very cautiously. There may be air trapped in the system which can cause violent movements of the boom.

DANGER! Hydraulic leaks: Never use your fingers to locate a leakage in any part of the hydraulic system. Due to high pressure, hydraulic oil may penetrate the skin.

Requirements - tractor (SPB/SPC HY-model)

Connection requirements are:

- One single acting outlet for the lift function of the spray boom.
- One double acting outlet for the folding function.

Ensure that snap couplers are clean before connection!

The boom's hydraulic system requires an oil flow of approximately 0.8 GPM (3 liters/min.) and a minimum pressure of 1,950 PSI (130 bar).

ATTENTION! After having operated the boom and the system has been filled with oil, then check tractor's hydraulic oil level and add oil if necessary.

WARNING! Due to the variation in tractor hydraulic systems and capacities, care should be exercised when initially operating the sprayer hydraulic cylinders. It is advisable to adjust the hydraulic flow control down to the minimum rate before operating the system. Adjust/increase the flow control after the system is bled of any air, if necessary.

Requirements - tractor (SPB HV-model)

Connection requirements are:

- One double acting outlet for the lift and folding function of the spray boom.

Ensure that snap couplers are clean before connection!

The hydraulic hoses are marked with arrows and colored tie straps to indicate direction of oil flow. Red tie strap = pressure. Green tie strap = Return to tank. The hoses must be hooked up to the correct outlet for the hydraulics to function properly (pressure hose to pressure outlet, return hose to tank outlet).

The boom's hydraulic system requires an oil flow of approximately 0.8 GPM (3 liters/min.) and a minimum pressure of 1,950 PSI (130 bar).

ATTENTION! After having operated the boom and the system has been filled with oil, then check tractor's hydraulic oil level and add oil if necessary.

WARNING! Due to the variation in tractor hydraulic systems and capacities, care should be exercised when initially operating the sprayer hydraulic cylinders. It is advisable to adjust the hydraulic flow control down to the minimum rate before operating the system. Adjust/increase the flow control after the system is bled of any air, if necessary.

Requirements - tractor (SPB/SPC HZ-model)

Connection requirements are:

- One double acting hydraulic outlet for the lift and folding functions of the sprayer.

Ensure that snap couplers are clean before connection!

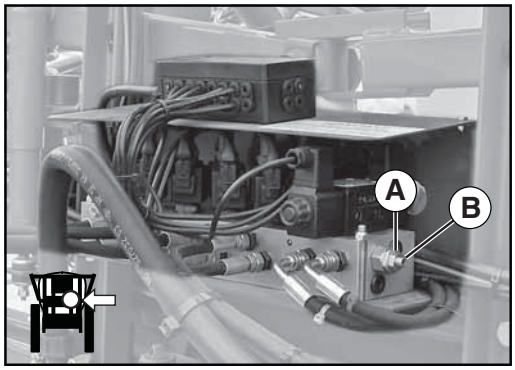
The hydraulic hoses are marked with arrows and colored tie straps to indicate direction of oil flow. Red tie strap = pressure. Green tie strap = Return to tank. The hoses must be hooked up to the correct outlet for the hydraulics to function properly (pressure hose to pressure outlet, return hose to tank outlet).

The boom's hydraulic system requires an oil flow of approximately 0.8 GPM (3 liters/min.) and a minimum pressure of 1,950 PSI (130 bar).

ATTENTION! After having operated the boom and the system has been filled with oil, then check tractor's hydraulic oil level and add oil if necessary.

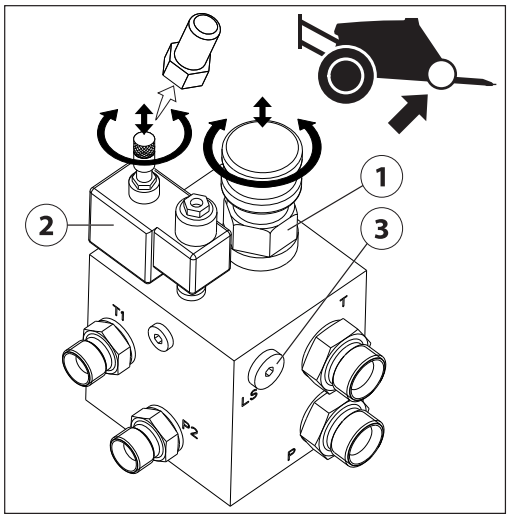
WARNING! Due to the variation in tractor hydraulic systems and capacities, care should be exercised when initially operating the sprayer hydraulic cylinders. It is advisable to adjust the hydraulic flow control down to the minimum rate before operating the system. Adjust/increase the flow control after the system is bled of any air, if necessary.

HZ hydraulic block



The hydraulic flow can be adjusted on the HZ hydraulic block if necessary. First set the hydraulic flow on the tractor so the boom raises and lowers at the desired speed. Then check the speed of the fold and tilt functions. If adjustment is necessary, loosen jam nut (A) and turn throttle valve (B) all the way in using an allen wrench. Then turn throttle valve (B) back out 1-1/2 turns. If the fold and tilt functions are too slow, turn throttle valve (B) out more. If the fold and tilt functions are too fast, turn throttle valve (B) in more. Tighten jam nut (A) when the desired speed is reached.

Open center hydraulics (trailed - optional equipment)



The open center hydraulic block is needed if the tractor uses open center hydraulics and/or if load sensing will be used.

The valve (1) on the side of the block is factory set for open center hydraulics, but if closed center hydraulics will be used (also in combination with load sensing) then screw in the valve.

Certain tractor models are able to use Load Sensing without connecting an external sensing line. But if optimal sensing control pressure cannot be obtained, an external sensing line needs to be mounted (3). Please consult your tractor dealer for correct setup and correct connection.

Before operating the hydraulics, the valve should be adjusted according to the specific tractor model. If you have doubt about which type of hydraulic system your tractor is equipped with, please consult your tractor dealer.

List of setting combinations for flow element and circuit value:

Valve no.	1	2	3 (LS port)
Open center	out	out	Not conn.
Closed center	in	in	Not conn.
Load sensing (LS)	in	out*	Connected

*if tractor requires pressure relief.

WARNING! Always be sure to fully extract or retract the open/closed center selection valve (1). Failure to do so can result in damages to vital pump parts.

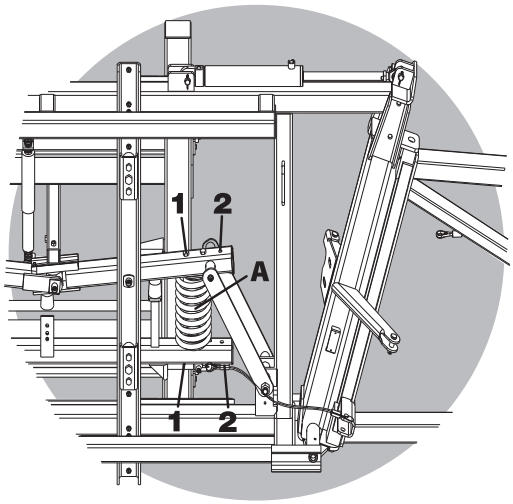
WARNING! It is of essential importance that connectors on sensing line are kept totally clean. Failure to do so can result in impurities entering the pump and thereby cause damages to vital pump parts.

Boom

Suspension effect adjustment (80'-100' SPC only)

The SPC boom features adjustable suspension for 80'-100' booms. The spring (A) has two assembly positions as shown on the illustration below. Position (1) can be used for 80'-90' booms and position (2) can be used for 100' booms.

Moving the assembly position further away from center (e.g. from pos. 1 to pos. 2) gives stiffer trapeze effect. The factory setting is position (1).



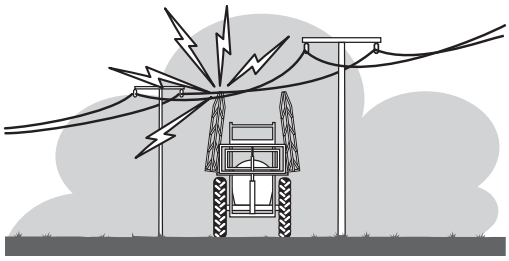
Boom

Safety info

WARNING! The boom must not be folded/unfolded while driving! Never use the folding/unfolding functions before sprayer has been stopped! Failure to do so will cause damage to the boom.

DANGER! When folding or unfolding the boom, make sure that no persons or objects are in the operating area of the boom.

DANGER! Always follow the guidelines listed below when driving in areas with overhead power lines:



- Never use the folding/unfolding functions in areas with overhead power lines.
- Unintended boom movements can cause contact with overhead power lines.

ATTENTION! Decal #10533003 is located either on the sprayer's drawbar (trailed) or inside the cabin (self-propelled). This label must be visible to the operator when hooking up a trailed sprayer or from the driver's seat of a self-propelled sprayer.

ATTENTION! Only fold and unfold the boom on level ground.

Maneuvering of the SPB booms - HY version (Ranger)

The SPB booms with hydraulic HY-version are operated as follows:

1. Activate the single acting hydraulic outlet to raise the boom and release it from the transport brackets.
2. Activate the double acting hydraulic outlet to unfold the boom. Both wings will now unfold simultaneously.
3. When the boom is completely unfolded, it can be raised or lowered to the desired spray height by activating the single acting hydraulic outlet.
4. Before attempting to fold the boom back into transport position, it must be raised all the way to the top by activating the single acting outlet. This will enable the rear cylinder transport lock.
5. The boom is folded by activating the double acting outlet in the opposite direction that was used to unfold the boom. The boom can now be lowered into the transport brackets.
6. The rear cylinder transport lock will automatically engage when lowering the boom after it has been raised all the way to the top. To disengage the rear transport lock, simply raise the boom back up a few inches and then lower it again.


WARNING! Ensure that the rear cylinder transport locks are properly engaged before transport.


WARNING! The folding function must only be operated when the sprayer is stationary! Failure to do so will damage the boom.


ATTENTION! Only unfold and fold the boom on level ground.


Note: Individual boom wing fold is not possible using the HY Hydraulic system.

Maneuvering of the SPB and SPC booms - HY version (Navigator)

Both SPB and SPC booms with hydraulic HY-version are operated as follows:

1. Activate the single acting hydraulic outlet to raise the boom and release it from the transport brackets.
2. Activate the double acting hydraulic outlet to unfold the boom. Both wings will now unfold simultaneously. Rear transport hooks disengage automatically.
3. When the boom is completely unfolded, it can be raised or lowered to the desired spray height by activating the single acting hydraulic outlet.
4. Before attempting to fold the boom back into transport position, it should be raised all the way to the top by activating the single acting outlet.
5. The boom is folded by activating the double acting outlet in the opposite direction that was used to unfold the boom. The boom can now be lowered into the transport brackets.


WARNING! Ensure that the rear transport hooks are firmly engaged before transport.


WARNING! The folding function must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

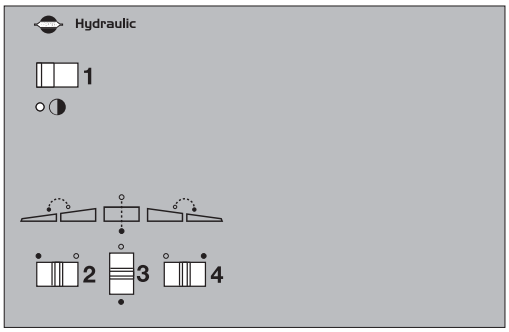

ATTENTION! Only unfold and fold the boom on level ground.


Note: Individual boom wing fold is not possible using the HY Hydraulic system.

Maneuvering of the SPB booms - HV version (Ranger 550)

The switches on the HV hydraulic control box control the following functions:

1. Power ON/OFF
2. Boom folding (left side)
3. Boom lift raise/lower
4. Boom folding (right side)



To unfold the boom, do the following:

1. Engage the tractor's double acting remote outlet lever and lock it in the engaged position.
2. Push switch (3) upwards to lift the boom clear of the transport brackets.
3. Push switches (2) and (4) outwards to unfold both wings simultaneously.
4. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then push switch (2) or (4) inwards to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
5. When the boom is completely unfolded, it can be raised or lowered to the desired spray height by pushing switch (3) upwards or downwards.

To fold the boom, do the following:

6. Before attempting to fold the boom back into transport position, it must be raised all the way to the top by pushing switch (3) upwards. This will enable the rear cylinder transport locks.
7. Push switches (2) and (4) inwards to fold the boom. The boom can now be lowered into the transport brackets.
8. The rear cylinder transport locks will automatically engage when lowering the boom after it has been raised all the way to the top. To disengage the rear transport lock, simply raise the boom back up a few inches and then lower it again.

WARNING! Ensure that the rear cylinder transport locks are properly engaged before transport.

WARNING! The folding function (switches 2 & 4) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! Only unfold and fold the boom on level ground.

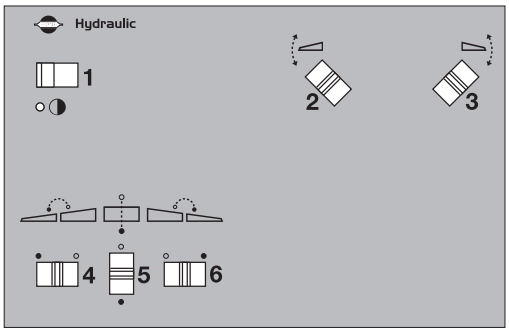
ATTENTION! The SPB-HV booms cannot be operated with tractor's hydraulic levers.

ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

5 - Operation

Maneuvering of the SPB booms - HZ version (Ranger 550)

The switches on the hydraulic control box control the following functions:



1. Power ON/OFF
2. Boom tilt left
3. Boom tilt right
4. Boom folding (left side)
5. Boom lift raise/lower
6. Boom folding (right side)

To unfold the boom, do the following:

1. Engage the tractor's double acting remote outlet lever and lock it in the engaged position.
2. Push switch (5) upwards to lift the boom clear of the transport brackets.
3. Push switches (2) and (3) downwards to lower the individual tilt rams.
4. Push switches (4) and (6) outwards to unfold both wings simultaneously.
5. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then push switch (4) or (6) inwards to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
6. When the boom is completely unfolded, it can be raised or lowered to the desired spray height by pushing switch (5) upwards or downwards.

To tilt the boom, do the following:

7. Push switch (2) and/or (3) up or down to tilt the left and/or right wings up or down.

To fold the boom, do the following:

8. Before attempting to fold the boom back into transport position, it must be raised all the way to the top by pushing switch (5) upwards. This will enable the rear cylinder transport locks.
9. Push switch (4) and (6) inwards to fold the boom.
10. Push switches (2) and (3) upwards to raise the individual tilt rams. The boom can now be lowered into the transport brackets.
11. The rear cylinder transport locks will automatically engage when lowering the boom after it has been raised all the way to the top. To disengage the rear transport lock, simply raise the boom back up a few inches and then lower it again.

WARNING! Ensure that the rear cylinder transport locks are properly engaged before transport.

WARNING! The folding function (switches 4 & 6) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

WARNING! Never attempt to fold boom to transport position when wings are tilted. Always let wings down to horizontal position prior to folding.

WARNING! Never attempt to work on or around wing section when tilted up.

WARNING! Unexpected boom movements may occur if wings are tilted when folding.

WARNING! Never use tilt function when boom is folded into transport position.

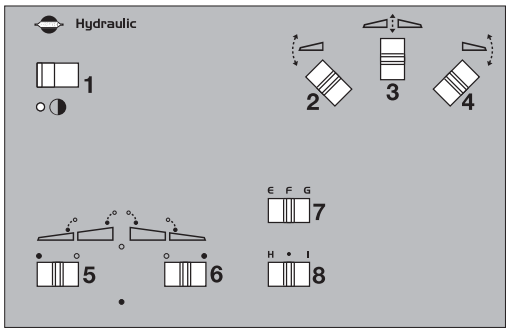
ATTENTION! Only unfold and fold the boom on level ground.

ATTENTION! The SPB-HZ booms cannot be operated with tractor's hydraulic levers.

ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

Maneuvering of the SPB booms - HZ version (Ranger 2000)

The switches on the hydraulic control box control the following functions:



1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (left side)
6. Boom folding (right side)
7. Optional function
8. Optional function

To unfold the boom, do the following:

1. Engage the tractor's double acting remote outlet lever and lock it in the engaged position.
2. Push switch (3) upwards to lift the boom clear of the transport brackets.
3. Push switches (2) and (4) downwards to lower the individual tilt rams.
4. Push switches (5) and (6) outwards to unfold both wings simultaneously.
5. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then push switch (5) or (6) inwards to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
6. When the boom is completely unfolded, it can be raised or lowered to the desired spray height by pushing switch (3) upwards or downwards.

To tilt the boom, do the following:

7. Push switch (2) and/or (4) up or down to tilt the left and/or right wings up or down.

To fold the boom, do the following:

8. Before attempting to fold the boom back into transport position, it must be raised all the way to the top by pushing switch (3) upwards. This will enable the rear cylinder transport locks.
9. Push switches (5) and (6) inwards to fold the boom.
10. Push switches (2) and (4) upwards to raise the individual tilt rams. The boom can now be lowered into the transport brackets.
11. The rear cylinder transport locks will automatically engage when lowering the boom after it has been raised all the way to the top. To disengage the rear transport lock, simply raise the boom back up a few inches and then lower it again.

WARNING! Ensure that the rear cylinder transport locks are properly engaged before transport.

WARNING! The folding function (switches 5 & 6) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

WARNING! Never attempt to fold boom to transport position when wings are tilted. Always let wings down to horizontal position prior to folding.

WARNING! Never attempt to work on or around wing section when tilted up.

WARNING! Unexpected boom movements may occur if wings are tilted when folding.

WARNING! Never use tilt function when boom is folded into transport position.

ATTENTION! Only unfold and fold the boom on level ground.

ATTENTION! The SPB-HZ booms cannot be operated with tractor's hydraulic levers.

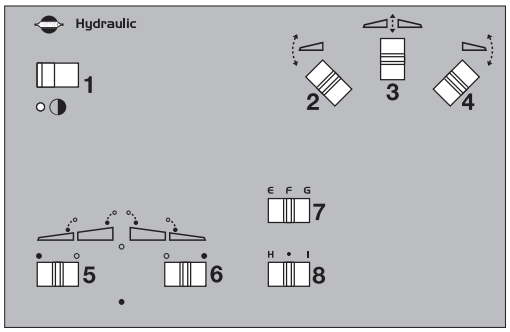
ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

5 - Operation

Maneuvering of the SPB and SPC booms - HZ version (Navigator)

The switches on the hydraulic control box control the following functions:

1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (left side)
6. Boom folding (right side)
7. Optional function
8. Optional function



To unfold the boom, do the following:

1. Engage the tractor's double acting remote outlet lever and lock it in the engaged position.
2. Push switch (3) upwards to lift the boom clear of the transport brackets.
3. Push switches (2) and (4) downwards to lower individual tilt rams.
4. Push switches (5) and (6) outwards to unfold the boom. Rear transport hooks disengage automatically.
5. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then push switch (5) or (6) inwards to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
6. Push switch (3) downwards to lower the boom to correct height above crop or ground level.

To fold the boom, do the following:

1. Push switch (3) upwards to raise the boom to highest possible position.
2. Push switches (5) and (6) inwards to fold the boom. Make sure to fold the boom against the vertical slide pads.
3. Push switches (2) and (4) upwards to raise the individual tilt rams.
4. Push switch (3) downwards to lower the boom until the rear transport hooks are firmly engaged.
5. Push switches (2) and (4) downwards to lower the individual tilt rams until they rest on the transport brackets.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

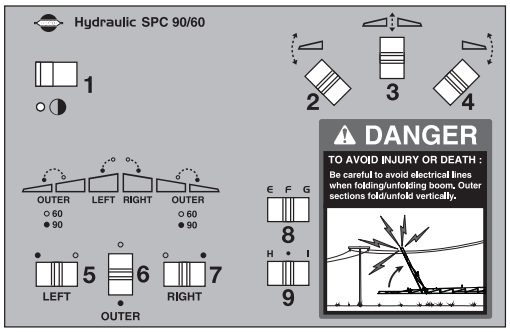
WARNING! The folding functions (switches 5 and 6) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! The SPB & SPC HZ booms cannot be operated with the tractor's hydraulic levers.

ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

Maneuvering of the 90'/60' SPC Dual Fold boom (Navigator)

The switches on the hydraulic control box control the following functions:



1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (left)
6. Boom folding (outer)
7. Boom folding (right)
8. Optional function
9. Optional function

To unfold the boom, do the following:

1. Engage the tractor's double acting remote outlet lever and lock it in the engaged position.
2. Push switch (3) upwards to lift the boom clear of the transport brackets.
3. Push switches (2) and (4) downwards to lower individual tilt rams.
4. Push switches (5) and (7) inwards to unfold the boom. Rear transport hooks disengage automatically. Boom will be at 90' working width.
5. Push switch (3) downwards to lower the boom to correct height above crop or ground level.
6. For 60' working width, push switch (6) upwards to simultaneously fold both of the 2nd outer wings completely in.
7. Remember to set the outer section valves on the spray control unit to match the working boom width.

To fold the boom, do the following:

1. Start with the sprayer stationary and boom completely unfolded in either 90' or 60' working width.
2. If at 60' working width, push switch (6) downwards to simultaneously unfold both of the 2nd outer wings.
3. Push switch (3) upwards to raise the boom to highest possible position.
4. Push switch (5) to the right and (7) to the left to fold the boom. Make sure to fold the boom against the vertical slide pads.
5. Push switches (2) and (4) upwards to raise the individual tilt rams.
6. Push switch (3) downwards to lower the boom until the rear transport hooks are firmly engaged.
7. Push switches (2) and (4) downwards to lower the individual tilt rams until they rest on the transport brackets.

DANGER! Be careful to avoid electrical lines when folding/unfolding boom. Outer sections fold/unfold vertically.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

WARNING! Never transport sprayer with boom in 60' working width. The front end of the folded boom will be taller and further forward. Always check for safe clearance from tractor, overhead wires, etc.

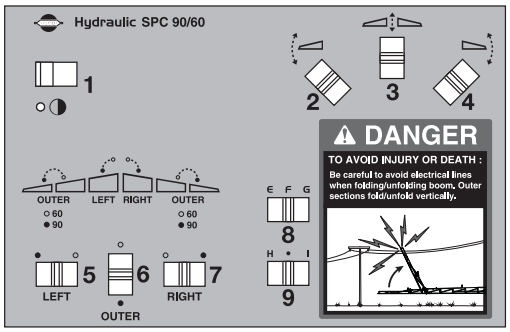
WARNING! The folding functions (switches 5, 6 and 7) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! There are stop switches located in the hydraulic lines of Dual Fold booms to prevent accidental damage by folding/unfolding the 2nd outer sections while in transport position. Switch (6) (vertical fold) will only function when the inner wings (horizontal fold) are completely unfolded in the operating position.

ATTENTION! The 90'/60' SPC Dual Fold HZ boom cannot be operated with the tractor's hydraulic levers.

Single-sided folding of the 90’/60’ SPC Dual Fold boom (Navigator)

It is possible to spray with only one side of the boom unfolded. If this is desired, start with the boom completely unfolded in either the 90’ or 60’ spraying position. Then push switch (5) or (7) inwards to fold in the left or right wing only. On the spray control unit also turn off the spray sections placed on the folded side.

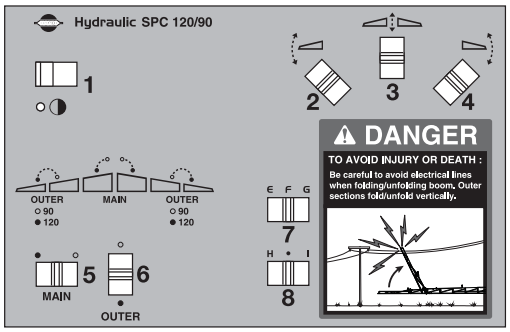


WARNING! Take extra care while operating with one side folded at 60’ working width. The front end of the folded side will be taller and further forward. Always check for safe clearance from tractor, overhead wires, etc.

ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

Maneuvering of the 120'/90' SPC Dual Fold boom (Navigator)

The switches on the hydraulic control box control the following functions:



1. Power ON/OFF
2. Boom tilt left
3. Boom lift raise/lower
4. Boom tilt right
5. Boom folding (main)
6. Boom folding (outer)
7. Optional function
8. Optional function

To unfold the boom, do the following:

1. Engage the tractor's double acting remote outlet lever and lock it in the engaged position.
2. Push switch (3) upwards to lift the boom clear of the transport brackets.
3. Push switches (2) and (4) downwards to lower individual tilt rams.
4. Push switch (5) to the left to simultaneously unfold the main boom sections. Rear transport hooks disengage automatically.
5. Push switch (3) downwards to lower the boom to correct height above crop or ground level. Boom will be at 90' working width.
6. For 120' working width, push switch (6) downwards to simultaneously unfold the 2nd outer boom sections.
7. Remember to set the outer section valves on the spray control unit to match the working boom width.

To fold the boom, do the following:

1. Start with the sprayer stationary and boom completely unfolded in either 120' or 90' working width.
2. If at 120' working width, push switch 6 upwards to simultaneously fold both of the 2nd outer wings completely in.
3. Push switch (3) upwards to raise the boom to highest possible position.
4. Push switch (5) to the right to fold the boom completely in.
5. Push switches (2) and (4) upwards to raise the individual tilt rams. Make sure the boom is against the vertical slide pads.
6. Push switch (3) downwards to lower the boom until the rear transport hooks are firmly engaged.
7. Push switches (2) and (4) downwards to lower the individual tilt rams until they rest on the transport brackets.

DANGER! Be careful to avoid electrical lines when folding/unfolding boom. Outer sections fold/unfold vertically.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

WARNING! The folding functions (switches 5 and 6) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! There are stop switches located in the hydraulic lines of Dual Fold booms to prevent accidental damage by folding/unfolding the 2nd outer sections while in transport position. Switch (6) (vertical fold) will only function when the inner wings (horizontal fold) are completely unfolded in the operating position.

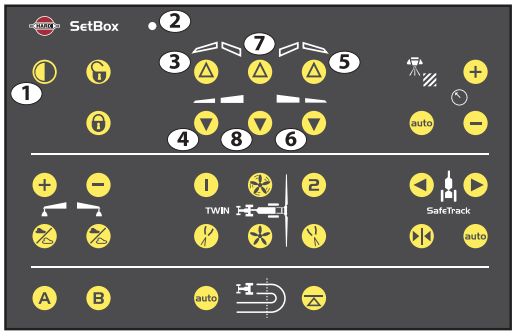
ATTENTION! The 120'/90' SPC Dual Fold HZ boom cannot be operated with the tractor's hydraulic levers.

Note: Single-sided folding of the 120'/90' SPC Dual Fold boom is not possible.

Maneuvering of the SPB booms - (Ranger with ISOBUS)

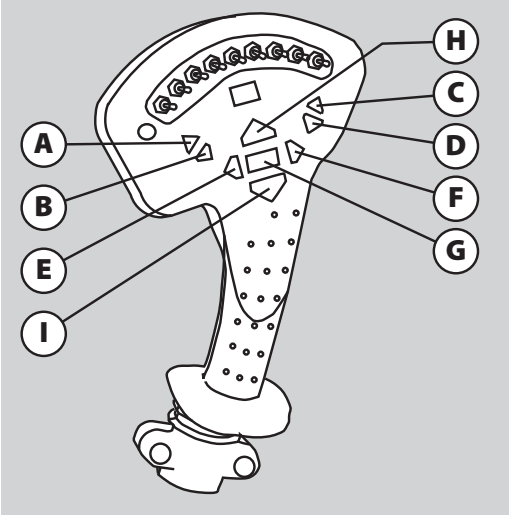
To unfold the boom, do the following:

1. Press switch (H) to raise the boom clear of the transport brackets.
2. Press switches (B) and (D) to lower individual tilt rams.
3. Press switches (4) and (6) to unfold both wings simultaneously.
4. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then press switch (3) or (5) to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
5. Press switch (I) to lower the boom to correct height above crop or ground level.



To fold the boom, do the following:

1. Before attempting to fold the boom back into transport position, it must be raised all the way to the top by pressing switch (H). This will enable the rear cylinder transport locks.
2. Press switches (3) and (5) to fold the boom.
3. Press switches (A) and (C) to raise the individual tilt rams. The boom can now be lowered into the transport brackets.
4. The rear cylinder transport locks will automatically engage when lowering the boom after it has been raised all the way to the top. To disengage the rear transport lock, simply raise the boom back up a few inches and then lower it again.



WARNING! Ensure that the rear cylinder transport locks are properly engaged before transport.

WARNING! The folding functions (switches 3 - 6) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

WARNING! Never attempt to fold boom to transport position when wings are tilted. Always let wings down to horizontal position prior to folding.

WARNING! Never attempt to work on or around wing section when tilted up.

WARNING! Unexpected boom movements may occur if wings are tilted when folding.

WARNING! Never use tilt function when boom is folded into transport position.

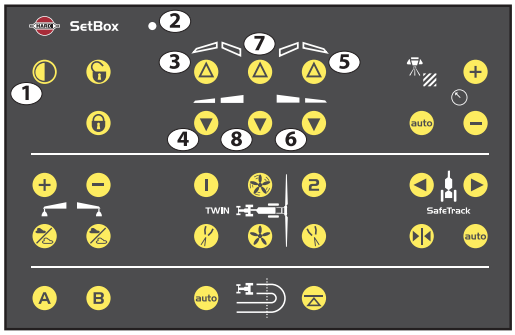
ATTENTION! Only unfold and fold the boom on level ground.

ATTENTION! The SPB-HZ booms cannot be operated with the tractor's hydraulic levers.

ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

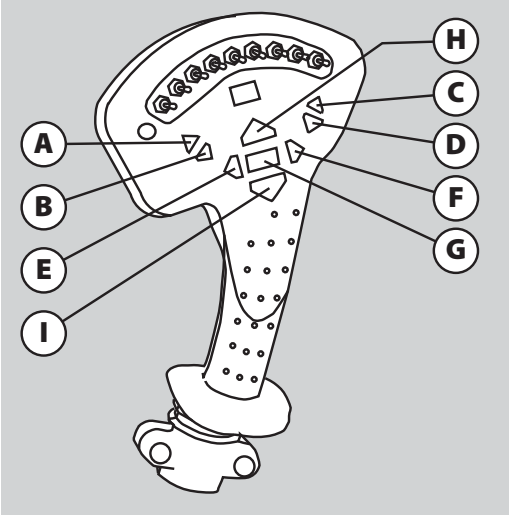
Maneuvering of the SPB, SPC & 90'/60' Dual Fold SPC booms - (Navigator with ISOBUS)

To unfold the boom, do the following:



1. Press switch (H) to raise the boom clear of the transport brackets.
2. Press switches (B) and (D) to lower individual tilt rams.
3. Press switches (4) and (6) to unfold the boom. Rear transport hooks disengage automatically.
4. If only one side of the boom is to be used for spraying, first unfold the boom completely. Then press switch (3) or (5) to fold the desired side back in. Turn off the spray sections for the folded side on the spray control unit.
5. Press switch (I) to lower the boom to correct height above crop or ground level.
6. If equipped with 90'/60' Dual Fold boom, push switch (7) to fold 2nd outer sections in to 60' working width.

To fold the boom, do the following:



1. If equipped with 90'/60' Dual Fold boom, start with boom at 90' working width. If necessary, unfold 2nd outer sections using switch (8).
2. Press switch (H) to raise the boom to highest possible position.
3. Press switches (3) and (5) to fold the boom. Make sure to fold the boom against the vertical slide pads.
4. Press switches (A) and (C) to raise the individual tilt rams.
5. Press switch (I) to lower the boom until the rear transport hooks are firmly engaged.
6. Press switches (B) and (D) to lower the individual tilt rams until they rest on the transport brackets.

DANGER! Be careful to avoid electrical lines when folding/unfolding Dual Fold boom. Outer sections fold/unfold vertically.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

WARNING! The folding functions (switches 3 - 8) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! There are stop switches located in the hydraulic lines of Dual Fold booms to prevent accidental damage by folding/unfolding the 2nd outer sections while in transport position. Switches (7) & (8) (vertical fold) will only function when the inner wings (horizontal fold) are completely unfolded in the operating position.

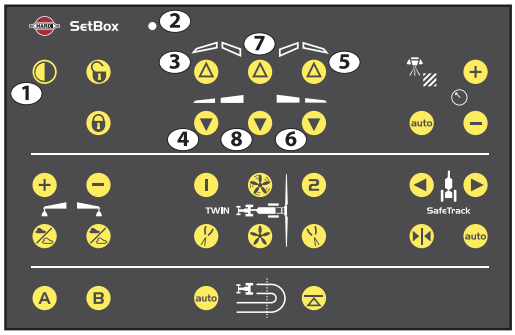
ATTENTION! The SPB, SPC & Dual Fold SPC HZ booms cannot be operated with the tractor's hydraulic levers.

ATTENTION! It is not advisable to go directly from transport position to spray position with one side only. Both wings must first be completely unfolded and then one side folded back in.

Maneuvering of the 120'/90' Dual Fold SPC booms - (Navigator with ISOBUS)

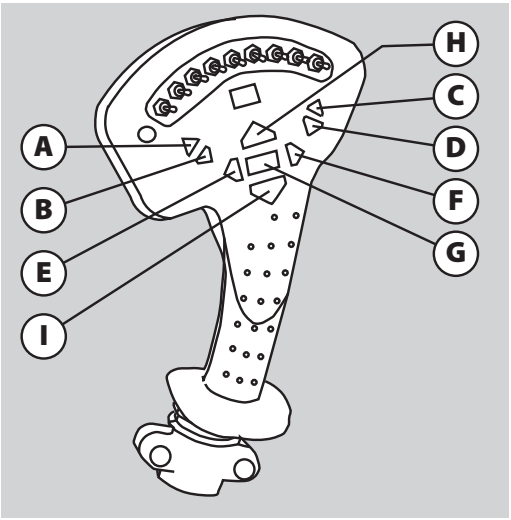
To unfold the boom, do the following:

1. Press switch (H) to raise the boom clear of the transport brackets.
2. Press switches (B) and (D) to lower individual tilt rams.
3. Press switch (4) to unfold the boom. Rear transport hooks disengage automatically.
4. Press switch (I) to lower the boom to correct height above crop or ground level. Boom will be at 90' working width.
5. For 120' working width, press switch (8) to unfold the 2nd outer sections.



To fold the boom, do the following:

1. Start with boom at 90' working width. If necessary, fold 2nd outer sections using switch (7).
2. Press switch (H) to raise the boom to highest possible position.
3. Press switch (3) to fold the boom. Make sure to fold the boom against the vertical slide pads.
4. Press switches (A) and (C) to raise the individual tilt rams.
5. Press switch (I) to lower the boom until the rear transport hooks are firmly engaged.
6. Press switches (B) and (D) to lower the individual tilt rams until they rest on the transport brackets.



DANGER! Be careful to avoid electrical lines when folding/unfolding Dual Fold boom. Outer sections fold/unfold vertically.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

WARNING! The folding functions (switches 3, 4, 7 & 8) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! There are stop switches located in the hydraulic lines of Dual Fold booms to prevent accidental damage by folding/unfolding the 2nd outer sections while in transport position. Switches (7) & (8) (vertical fold) will only function when the inner wings (horizontal fold) are completely unfolded in the operating position.

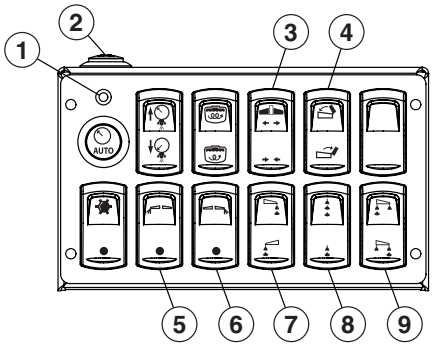
ATTENTION! The 120'/90' Dual Fold SPC HZ boom cannot be operated with the tractor's hydraulic levers.

Note: Single-sided folding of the 120'/90' Dual Fold SPC boom is not possible.

Maneuvering of the SPC booms (PRESIDIO)

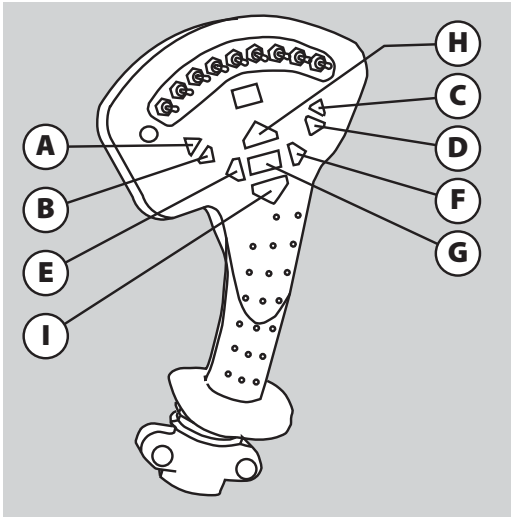
To unfold the boom, do the following:

1. Check that the rear transport lock is in the storage position.
2. Press the boom lift button (H) to lift the boom clear of the transport brackets.
3. Press and hold (B) and (D) to lower individual tilt rams.
4. Press and hold top of switch (3) to unfold the boom.
5. Press and hold the boom down button (I) to lower the boom to correct height above crop or ground level.



To fold the boom, do the following:

1. Press the boom lift button (H) to lift the boom to highest possible position.
2. Press and hold bottom of switch (3) to fold the boom.
3. Press buttons (A) and (C) to raise the individual tilt rams until the transport brackets touch the vertical slide pads.
4. Press the boom down button (I) to lower the boom until it rests on the rollers and the transport brackets are securely captured by the transport hooks.



DANGER! Be careful to avoid electrical lines when folding/unfolding boom.

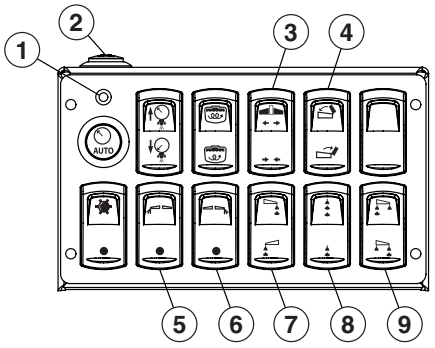
WARNING! The rear transport lock must be in storage position before folding/unfolding the boom. Failure to do so will cause damage to the boom.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

WARNING! The folding functions (switch 3) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

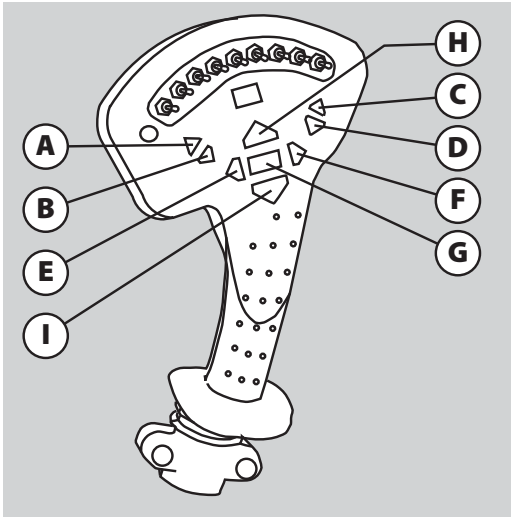
Note: Individual boom wing fold is not possible using the Presidio HZ Hydraulic system.

Maneuvering of the 90'/60' Dual Fold SPC boom (PRESIDIO)



To unfold the boom, do the following:

1. Check that the rear transport lock is in the storage position.
2. Press the boom lift button (H) to lift the boom clear of the transport brackets.
3. Press and hold (B) and (D) to lower individual tilt rams.
4. Press and hold top of switch (3) to unfold the boom. Boom will be at 90' working width.
5. Press and hold the boom down button (I) to lower the boom to correct height above crop or ground level.
6. For 60' working width, press top of switch (4) to fold the 2nd outer wings completely in.
7. Remember to set the outer section valves on the spray control unit to match the working boom width.



To fold the boom, do the following:

1. Start with the sprayer stationary and boom completely unfolded in either 90' or 60' working width.
2. If at 60' working width, press bottom of switch (4) to unfold the 2nd outer wings. Boom will be at 90' working width.
3. Press the boom lift button (H) to lift the boom to highest possible position.
4. Press and hold bottom of switch (3) to fold the boom.
5. Press buttons (A) and (C) to raise the individual tilt rams until the transport brackets touch the vertical slide pads.
6. Press the boom down button (I) to lower the boom until it rests on the rollers and the transport brackets are securely captured by the transport hooks.

DANGER! Be careful to avoid electrical lines when folding/unfolding boom. Outer sections fold/unfold vertically.

WARNING! The rear transport lock must be in storage position before folding/unfolding the boom. Failure to do so will cause damage to the boom.

WARNING! Ensure that the boom is clear from the transport brackets before unfolding.

WARNING! Never transport sprayer with boom in 60' working width. The front end of the folded boom will be taller and further forward. Always check for safe clearance from tractor, overhead wires, etc.

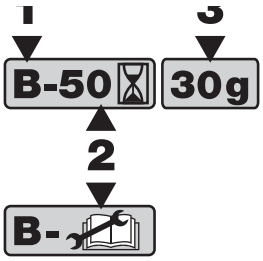
WARNING! The folding functions (switches 3 & 4) must only be operated when the sprayer is stationary! Failure to do so will damage the boom.

ATTENTION! There are stop switches located in the hydraulic lines to prevent accidental damage to the boom by folding/unfolding the outer boom while in transport position. Switch (4) for the outer wings (vertical fold) will only function when the inner wings (horizontal fold) are completely unfolded in the operating position.

Note: Individual boom wing fold is not possible using the Presidio HZ Hydraulic system.

Lubrication

General info



Always store lubricants clean, dry and cool - preferably at a constant temperature - to avoid contamination from dirt and condensed water. Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating. Avoid skin contact with oil products for longer periods.

Always follow the shown direction concerning recommended quantity. If no recommended quantity is given, feed lubricator till new grease becomes visible.

Pictograms in lubrication & oiling plans tell the following:

1. Lubricant to be used (see "Recommended lubricants").
2. Operating hours before next lubrication.

ATTENTION! If the sprayer is cleaned with a high pressure cleaner, lubrication of the entire machine is recommended.

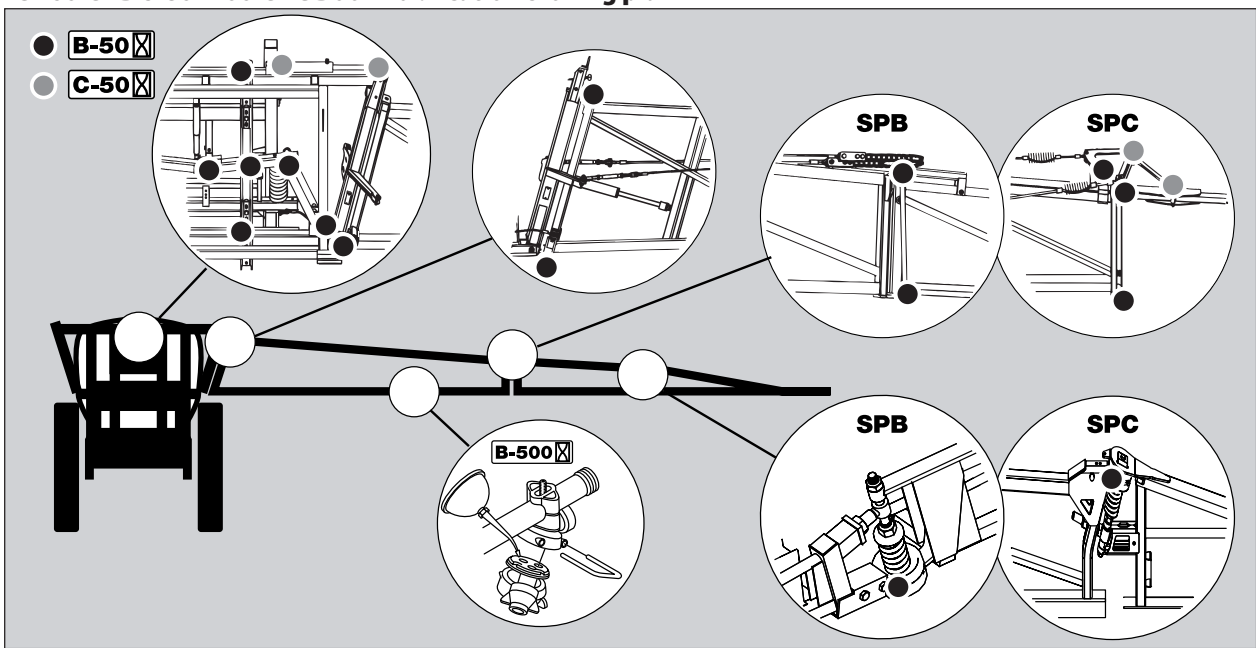
Recommended lubricants

A BALL BEARINGS:
Universal Lithium grease, NLGI No. 2
SHELL RETINAX EP2
CASTROL LMX GREASE

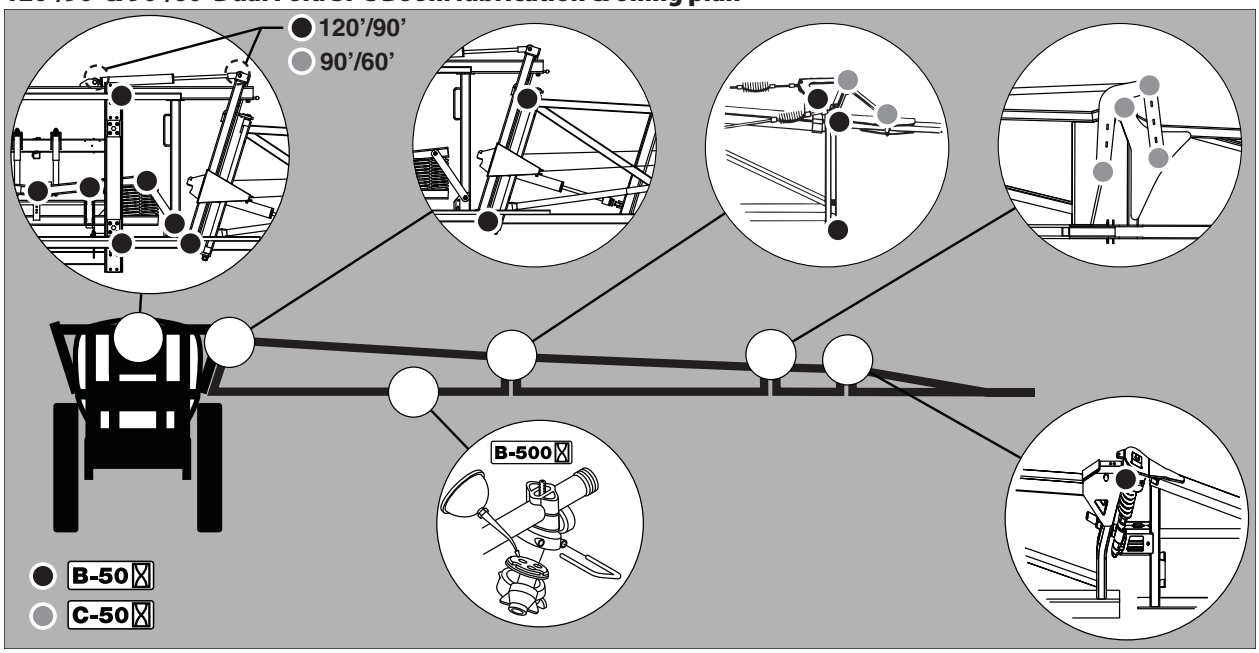
B SLIDE BEARINGS:
Lithium grease with
Molybdenumdisulphide or graphite
SHELL RETINAX HD 2 (or HDX 2)

C OIL LUB. POINTS:
TOTAL Transmission TM
SAE 80W/90
Castrol EPX 80W/90
SHELL Spirax 80W/90
Mobil Mobilube 80W/90

45'-60' SPB & 80'-100' SPC Boom lubrication & oiling plan



120’/90’ & 90’/60’ Dual Fold SPC Boom lubrication & oiling plan



Service and Maintenance intervals

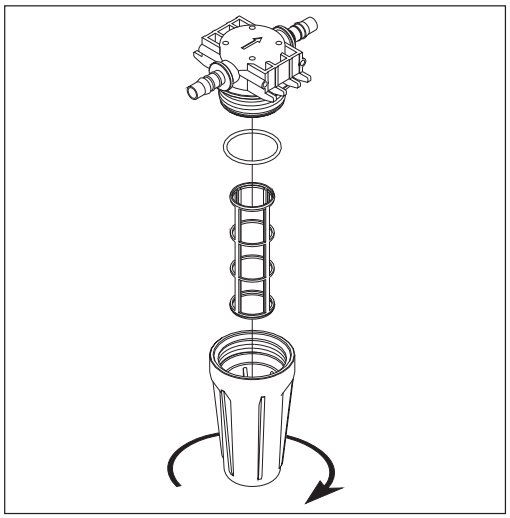
10 hours service - In-Line filter

If the boom is equipped with In-Line Filters, unscrew the filter bowl to inspect and clean the filter. When reassembling, the O-ring should be greased.

Alternative filter meshes are available. See section on Technical specifications - Filters and nozzles.

WARNING! Be careful not to splash out liquid when unscrewing the filter bowl.

WARNING! Always wear protective clothing and gloves before opening the filter!



10 hours service - Nozzle filters (optional equipment)

Check and clean.

10 hours service - Spraying circuit

Fill with clean water, operate all functions and check for leaks using higher spray pressure than normal. Check nozzle spray patterns visually using clean water.

250 hours service - Readjustment of the boom

See section "Occasional maintenance".

250 hours service - Hydraulic circuit

Check the hydraulic circuit for leaks and repair if any.

WARNING! Hoses for boom lifting device must be changed after every 5 years of use.

250 hours service - Hoses and tubes

Check all hoses and tubes for possible damages and proper attachment. Replace damaged hoses or tubes.

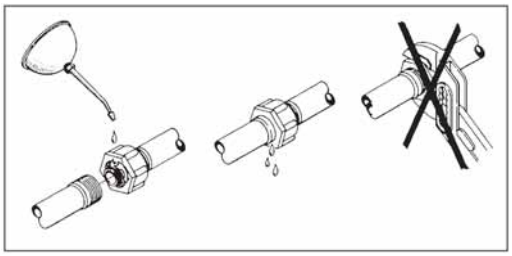
6 - Maintenance

Occasional maintenance

General info

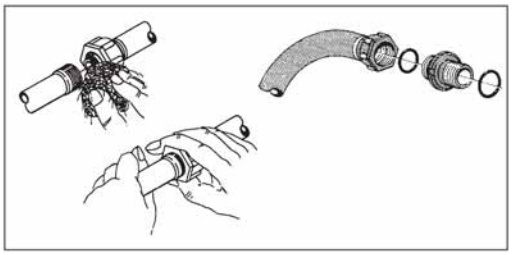
The maintenance and replacement intervals for the following will depend very much on the conditions under which the sprayer will be operated and are therefore impossible to specify.

Nozzle tubes and fittings



Poor seals are usually caused by:

- Missing O-rings or gaskets
- Damaged or incorrectly seated O-rings
- Dry or deformed O-rings or gaskets
- Foreign bodies



In case of leaks:

DO NOT overtighten. Disassemble, check condition and position of O-ring or gasket. Clean, lubricate and reassemble.

The O-ring must be lubricated ALL THE WAY AROUND before fitting on to the nozzle tube. Use non-mineral lubricant.

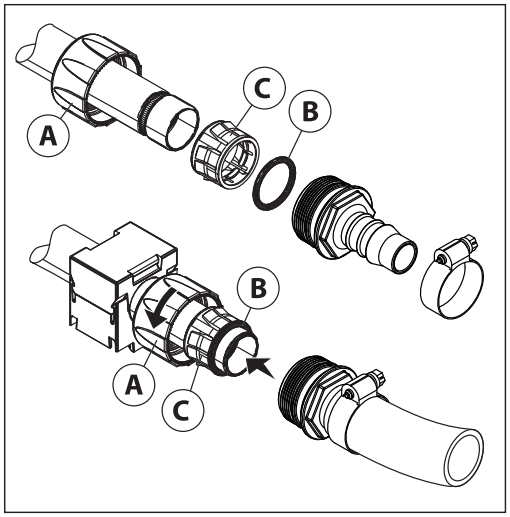
For AXIAL connections, a little mechanical leverage may be used.

For RADIAL connections only hand-tighten them.

Feed pipe snap-lock assembly (T25)

Disassembly

1. Screw the union nut (A) completely off.
2. Pull the feed piping and hose barb apart.
3. Take out the O-ring (B).
4. Inspect and oil O-ring (B). Change the O-ring (B) if worn, before reassembly.



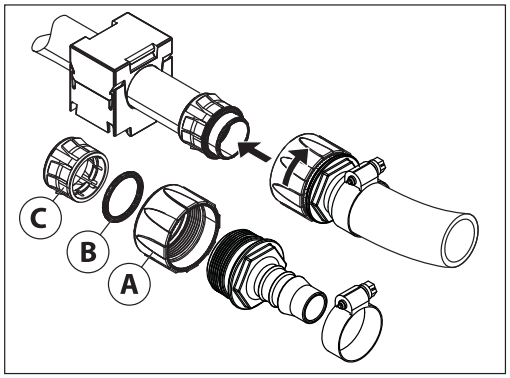
Reassembly

1. Check that the barbed lock ring (C) is fitted to the feed pipe with barb pointing away from pipe opening.
2. Fit the oiled O-ring (B) on top of the lock ring (C).
3. Push the feed pipe and hose barb together.
4. Screw the union nut (A) on the hose barb and tighten union nut (A) by hand.

Initial fitting of fittings

ATTENTION! This method can only be used for pipes not fitted into pipe clamps.

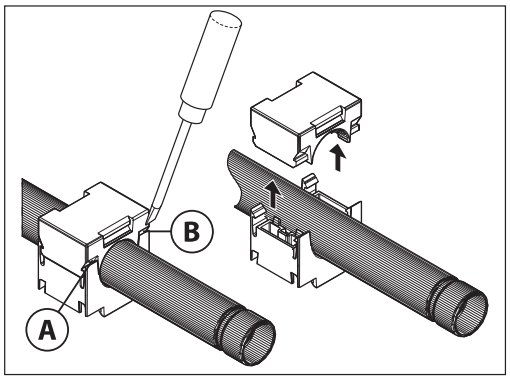
1. Fit the barbed lock ring (C) to the feed pipe with barb pointing away from pipe opening.
2. Fit the oiled O-ring (B) on top of the lock ring.
3. Screw the union nut (A) partly on the hose barb.
4. Press the feed pipe and hose barb together.
5. Tighten the union nut (A) by hand.



Feed pipe clamp assembly (T25)

A feed pipe can be removed from the pipe clamps the following way:

1. Use a flat bladed screwdriver to pry the cover off the first corner (A).
2. Hold the clamp top with your hand and pry off the opposite corner (B) with the screwdriver.
3. Pry off the other side of the pipe clamp with the screwdriver.
4. Take out the feed pipe.



Readjustment boom - general info

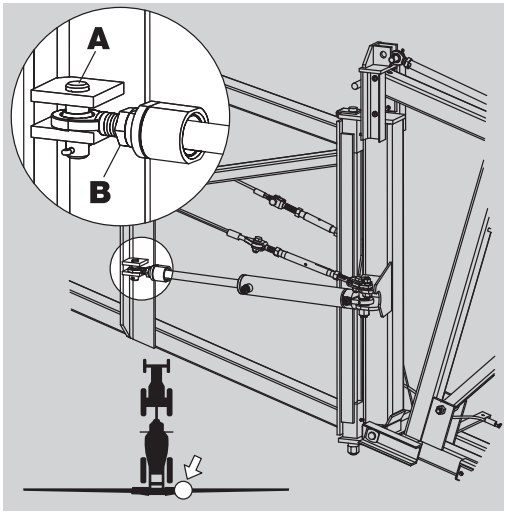
Before beginning boom adjustments, please go through this check list:

1. The sprayer must be well lubricated (see part about lubrication).
2. Connect the sprayer to the tractor.
3. Place tractor and sprayer on level ground (horizontal).
4. Unfold boom.
5. Set tilt angle of both wings to horizontal position.
6. Adjustment of hydraulic cylinders are done without pressure in the system.

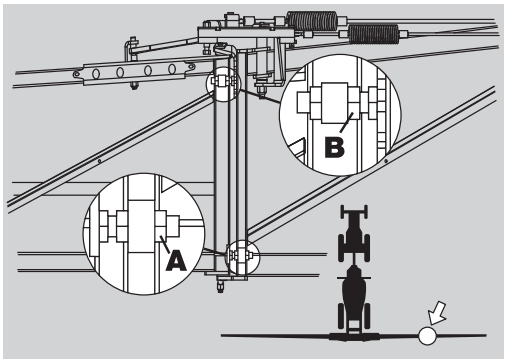
WARNING! No one is allowed to be under the boom while adjustment is carried out.

Alignment of center and inner wing sections (All booms)

1. Unfold the boom and check alignment of the inner section with the center section.
2. If adjustment is necessary, relieve pressure from the cylinder by folding the boom a few inches.
3. Disconnect cylinder rod eye (A) from the inner section. Note that some cylinder rods have a machined flat which can be used for adjustments. If using this one for adjustment, leave the rod eye pinned to the boom.
4. Loosen jam nut (B) and adjust the length of the rod eye (A).
   IN = to move the boom forward
   OUT = to move the boom rearward
5. Tighten the jam nut (B) again. (Reattach the cylinder rod to the boom again, if it has been loosened).
6. Pressurize the cylinder to check boom alignment.

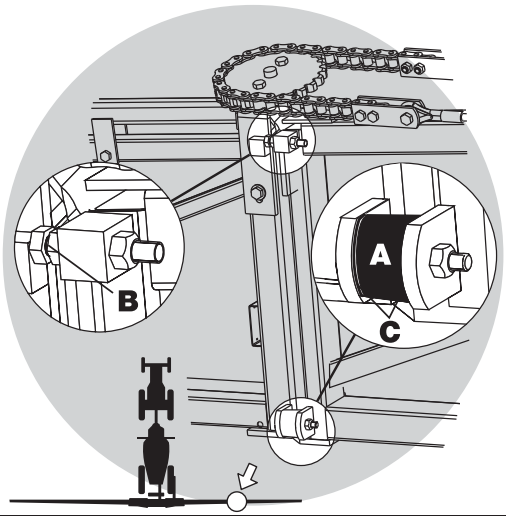


Alignment of inner and outer wing sections (All booms)



1. Unfold the boom and check that the boom wing is aligned. If adjustment is needed:
2. SPB type: Remove rubber stop (A) from the inner section. SPC type: Loosen stop device (A).
3. Adjust the position of the adjusting bolt (B) on the inner section so that the cap of the bolt head (B) contacts top stop plate on outer section with inner and outer sections aligned. Tighten it in this position.
4. SPB type: Replace rubber stop (A). SPC type: Tighten stop device (A).

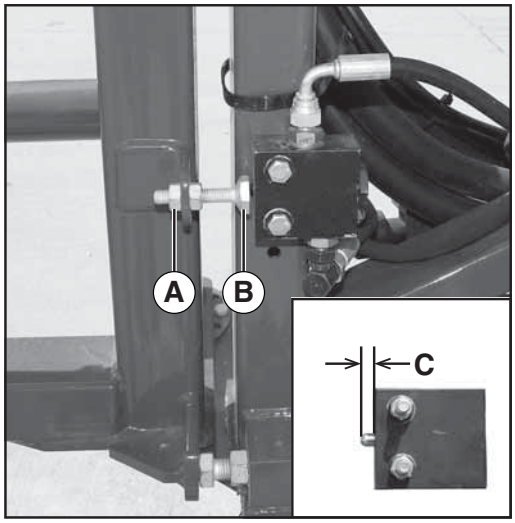
SPB only: Please note that the rubber stop (A) should be compressed 1/8" - 3/16" (3-5 mm). Therefore, check that the distance between the tabs (C) is a little less than the length of the rubber stop itself. The rubber stop may need to be spaced out with 1 or more flat washers in order to obtain correct compression. Tighten nut to hold it in place.



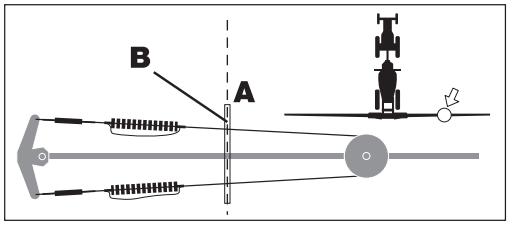
Hydraulic stop valve adjustment (Dual Fold SPC only)

The hydraulic stop valves on the Dual Fold SPC booms are factory set and should not need adjustment. If a change is made to the alignment of the inner and outer wing sections or if the valves are replaced, they should be checked for proper adjustment

If adjustment is needed, completely unfold the inner and outer wing sections. Loosen jam nut (A) and adjust bolt (B) so it depresses the button (C) on the valve 1/8" - 3/16" (3-5mm). Tighten jam nut (A).



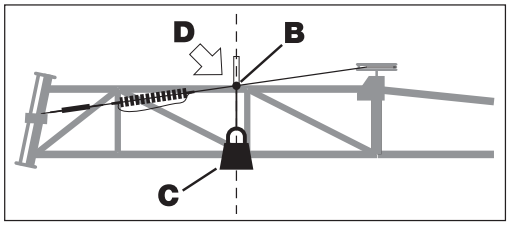
Adjusting the front fold cable (All booms)



The performance of the SPB/SPC boom while spraying depends very much on the front fold cable adjustment. A correctly adjusted cable will also control the movement of the outer section.

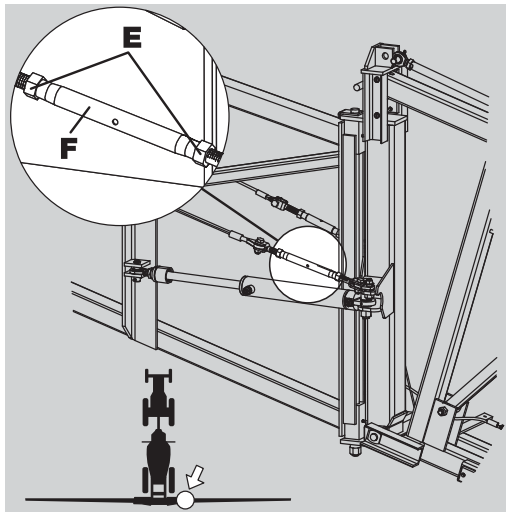
WARNING! The rear cable can snap and injure you or someone else if tensioned when the boom is unfolded. Always adjust the front cable first - with the boom unfolded and the rear cable last - with the boom folded in transport position.

1. Unfold the boom.
2. Check security of turnbuckle anchors to its hinges.
3. Secure a straight edge (A) to the top of the boom near the middle of the front cable. Make sure that the straight edge is above, or just touching the cable, without deflecting it. Accurately measure the distance from the bottom of the straight edge (D) to the top of the cable (B).
4. Suspend a 10 lb (4.5 kg) weight (C) (HARDI® part #61007503) from the cable directly below the straight edge and re-measure the distance. The difference between the two measurements should be 1/4" - 3/8" (6 - 10 mm) for all booms except 120'/90' Dual Fold boom, which needs to be 1/8" - 1/4" (3 - 6 mm).



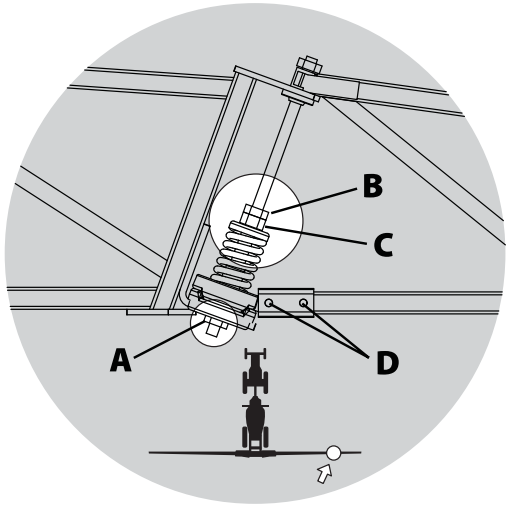
If adjustment is needed:

5. Loosen jam nuts (E) on the turnbuckle assembly and adjust turnbuckle (F) for proper cable deflection.
6. Tighten jam nuts (E) again and remove weight.



WARNING! Check boom alignment again. If front cable was tightened, the wing assembly will move a bit forward. If front cable was loosened, the wing assembly will move a bit rearward. Therefore, adjust fold cylinder, if necessary, as described in the section "Alignment of center section and inner wing sections".

Breakaway section adjustment (45'-66' SPB)



The function of the breakaway section is to prevent or reduce boom damage, should it strike an object or the ground.

Check that the lower nut (A) is fully tightened. The breakaway should release with a force of 18 lbs (80 N) at the extremity. Please note that the clutch must be well greased before adjustment is commenced.

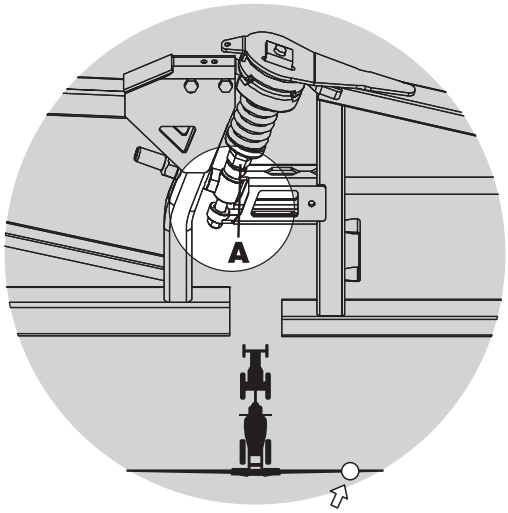
To adjust, loosen jam nut (B). Tighten nut (C) to stiffen clutch action. Tighten jam nut (B) after adjustment.

ATTENTION! Properly lubricate clutch assembly before adjusting the tension. Bolts (D) must be torqued to 40 Ft/lb (55 Nm) every 40 hours to prevent boom damage. Lubricate every 8 hours to ensure maximum performance and life.

Breakaway section adjustment (80'-100' & Dual Fold SPC)

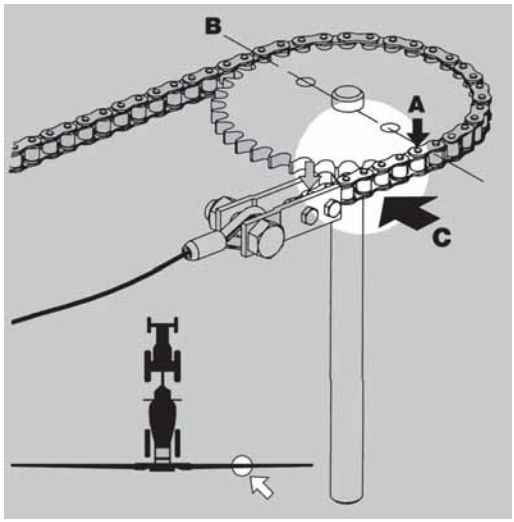
The function of the breakaway section is to prevent or reduce boom damage, should it strike an object or the ground.

Adjust the screw (A) until the breakaway will release at a force of 18 lbs (80 N) at the extremity. Please note that the clutch must be well greased before adjustment is commenced.



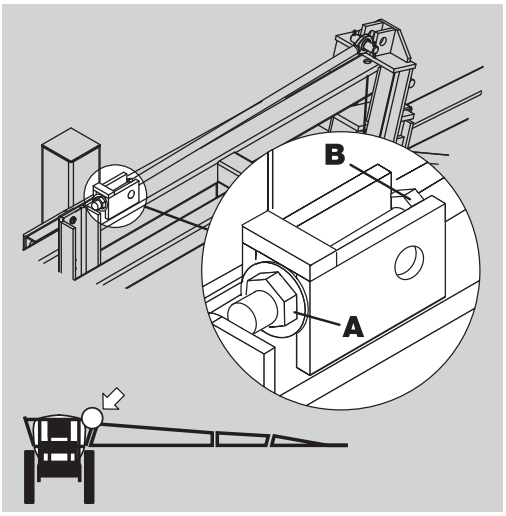
Check/adjust sprocket timing (45'-66' SPB)

1. Unfold the boom and stand on its rear side.
2. Check that the pin connection (A) in the timing chain is aligned with the center line (B) between the sprocket. Note forward driving direction (C) - adjustment is done at rearside of the boom. (A) is the 7th pin connection on the chain.
3. To adjust timing, loosen turnbuckles on the front and rear cables until slack.
4. Line up the chain and sprocket as indicated in step 2 above.



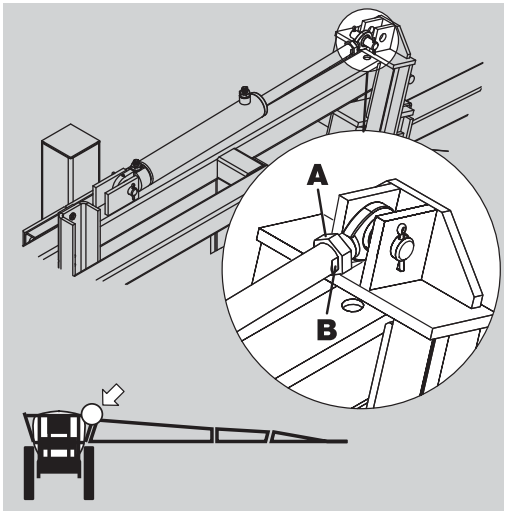
Adjusting boom level to ground (All booms)

Unfold the boom and check that the boom sections are parallel to the center frame and level to the ground. Adjust if necessary, as described below. Adjustment is carried out with the boom unfolded.



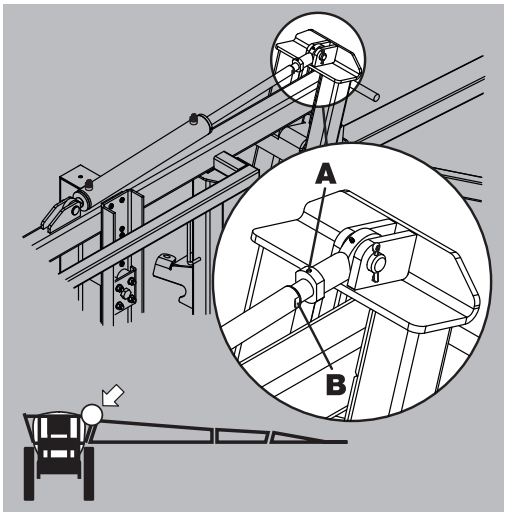
For SPB-HY & SPC-HY models, the following procedure is used:

1. Loosen lock nut (A).
2. Adjust nut (B) - in or out - until boom wing is level to the ground.
3. Secure lock nut (A) again. Same procedure applies to both sides.



For SPB-HZ & SPC-HZ models, the following procedure is used:

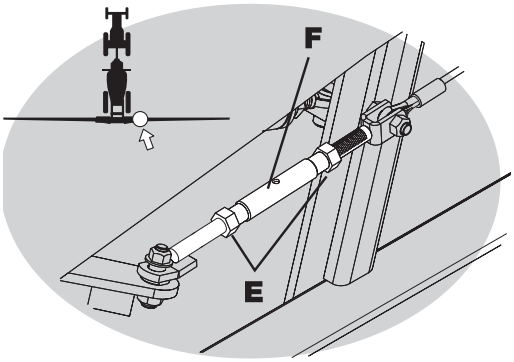
1. Ensure that cylinder is fully extended.
2. Loosen jam nut (A).
3. Apply an adjustable wrench to the machined surface at (B).
4. Turn the cylinder rod until boom is level to the ground.
5. Secure jam nut (A) again. Same procedure applies to both sides.



For 120'/90' Dual Fold SPC-HZ model, the following procedure is used:

1. Ensure that cylinder is fully extended.
2. Loosen set screw (A).
3. Apply an adjustable wrench to the machined surface at (B).
4. Turn the cylinder rod until boom is level to the ground.
5. Secure set screw (A) again. Same procedure applies to both sides.

Adjusting rear cable (All booms)



1. Raise boom to its highest position. Fold it to transport position with tilt cylinders fully extended. Make sure that fold cylinders are pressurized and that the boom is folded all the way in.
2. Ensure the boom transport brackets are in contact with the outer wing. Adjust if necessary.
3. Loosen the jam nuts (E) on the ends of turnbuckle (F). Adjust the turnbuckle (F) so that the outer section contacts the boom transport bracket.

SPB boom (45-66'): Turn the turnbuckle another 4 complete turns.

SPC boom (80-100'): Turn the turnbuckle another 3 complete turns.

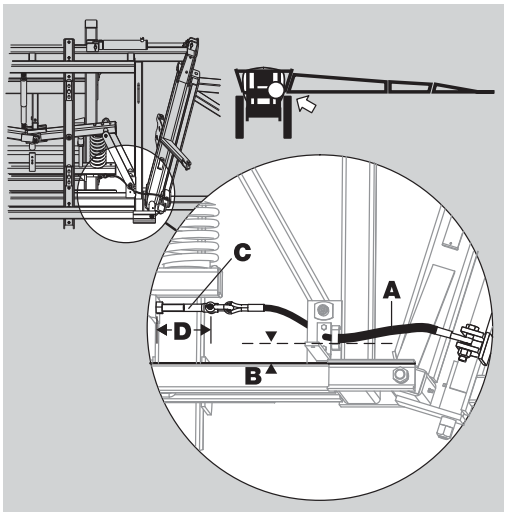
SPC dual fold boom (90'/60'): Turn the turnbuckle another 3 complete turns.

SPC dual fold boom (120'/90'): Turn the turnbuckle another 2 complete turns.

4. Secure jam nuts (E) again.

WARNING! The rear cable can snap and injure you or someone else if tensioned when the boom is unfolded. Always adjust the front cable first - with the boom unfolded and the rear cable last - with the boom folded in transport position.

Adjusting center section cables (All except 120'/90' Dual Fold)



The center section cables keep the center frame in correct position during folding procedure or when spraying with one side raised and folded (SPB-HZ only).

1. Fold the boom into transport position.
2. Check that the tilt cylinders are completely extended. Adjust if necessary (HZ only).
3. Check that center section cable (A) is routed over center section nozzle bracket (B).
4. Loosen jam nuts on the bolt assembly (C). This applies to both boom wings.
5. Adjust the threaded bolt(s) (C). Alternate from side-to-side while making adjustments. As a guideline for adjustment, the distance (D) shown at the bolt assembly should be 4-5/16" (110 mm). Properly adjusted cables will be very tight and only deflect a small amount (fractions of an inch) when pulled by hand. Note that cables will be loose when the boom is unfolded.
6. Tighten jam nuts on the bolt assembly (C) again.
7. Unfold the boom and inspect that the center frame is correctly centered.

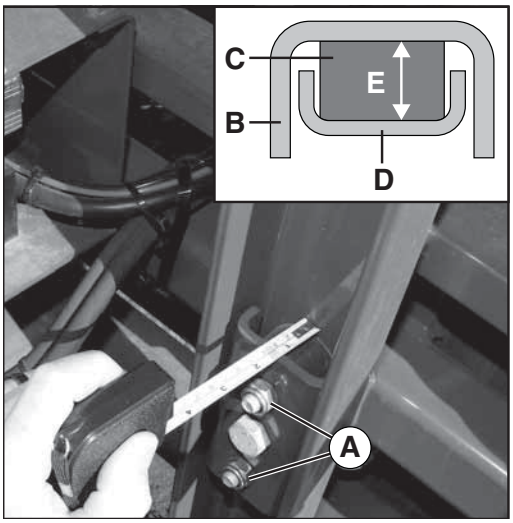
ATTENTION! Adjust both boom wings in one sequence. Adjust one cable a small amount at the time, and then the other cable, to equalize cable tension and maintain a level center frame.

WARNING! Never adjust the center cables without having folded the boom all the way into the transport position.

Yaw rubber dampers (80'-100' SPC, 90'/60' Dual Fold SPC)

Inspect basic adjustment of the rubber yaw dampers. The compression of the dampers (C) should result in a distance (E) of 1-3/32" (28 mm). Measure the compression at each rubber damper and adjust with the M12 bolts (A) if necessary.

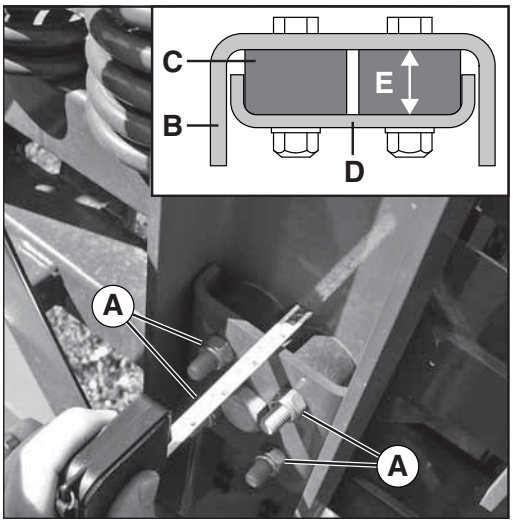
The channel section (B) is a part of the center section frame, and yaw dampers (C) are held by the plate (D).



Yaw rubber dampers (120'/90' Dual Fold SPC)

Inspect basic adjustment of the rubber yaw dampers. The compression of the dampers (C) should result in a distance (E) of 1-3/32" (28 mm). Measure the compression at each rubber damper and adjust with the M12 bolts (A) if necessary.

The channel section (B) is a part of the center section frame, and yaw dampers (C) are held by the plate (D).



Yaw damping (All booms)

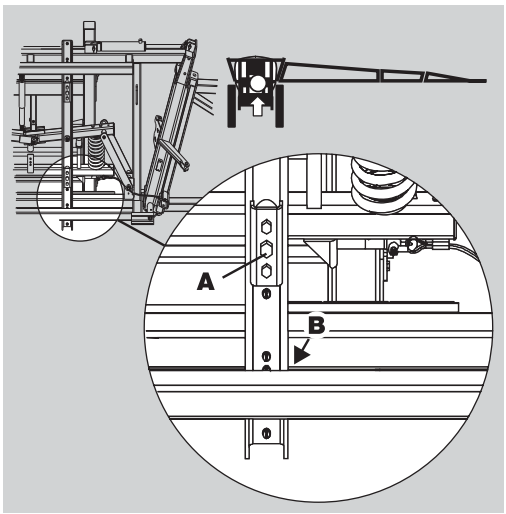
Tighten/loosen bolt (A) to adjust slack at point (B).

If boom does not work smoothly or if it works in 'steps': Loosen bolt (A).

If boom works too loosely or swings uncontrollably: Tighten bolt (A).

ATTENTION! Do not overtighten bolt (A). Only tighten till contact is reached at point (B).

ATTENTION! The center section must be properly lubricated (including all wear surfaces) before adjusting.



Operational problems

General info

Operational problems are frequently due to the same reasons:

1. Rusted of dirty hydraulics components cause bad connections and early wear.
2. A badly charged or faulty battery causes failures and misbehavior in the electrical system.

Therefore ALWAYS check:

1. Hydraulic components are clean.
2. Check tractor batteries and keep connectors clean.

7 - Fault finding

Hydraulic system - I.A.H.

FAULT	PROBABLE CAUSE	CONTROL/REMEDY
Boom slow/erratic.	Air in system.	Loosen ram connection and activate hydraulics until oil flow has no air in it (not whitish).
	Regulation valve incorrectly set.	Open or close until desired speed is achieved (clockwise = less speed).
		Remember oil must be at operating temperature.
	Insufficient hydraulic pressure.	Check oil pressure.
		Check hydraulic oil level.
	Insufficient amount of oil in hydraulic reservoir.	Check and top if needed.
Ram not functioning.	Restrictor or regulation valve blocked.	Secure boom. Dismantle and clean.
Hydraulic system fold/tilt functions will not operate.	Power supply.	Check for proper 12V power supply.
One function (fold or tilt) will not operate.	Various.	Check for defective switch(es).
		Check continuity of cables.
		Check for operation of applicable solenoid (coil not activating or plunger stuck).
		Check for short circuit in wiring junction box at rear of sprayer.
		Dirt in the restrictor port of the cylinder.
Multiple hydraulic functions with one switch activated.	Various.	Check for correct solenoid electric/hydraulic hook-up.
		Check for short circuit in wiring in the junction box at rear of sprayer.

Mechanical problems

Mechanical problems

Mechanical problems

FAULT	PROBABLE CAUSE	CONTROL/REMEDY
Boom will not fold in or out.	Cylinder.	Adjust the fold cylinder.
Boom will not fold completely.	Cables.	Check adjustment of center cables.
Boom not aligned.	Cables.	Adjust and grease complete boom cables and stops.
Boom will not stay in spraying position.	Various.	Check for hydraulic leaks through solenoid block. Check for a solenoid that is stuck open.
Wing to be kept folded swings out when unfolding other side of the boom.	Various.	Boom must be completely unfolded - then fold out the desired boom wing. Check for hydraulic leaks through solenoid block. Check for a solenoid that is stuck open.

Specifications

Filters and nozzles

Filter gauze width

30 mesh: 0.58 mm

50 mesh: 0.30 mm

80 mesh: 0.18 mm

100 mesh: 0.15 mm

Temperature and pressure ranges

Hydraulics:

Operating temperature range: 36° F to 167° F (2° to 75° C)

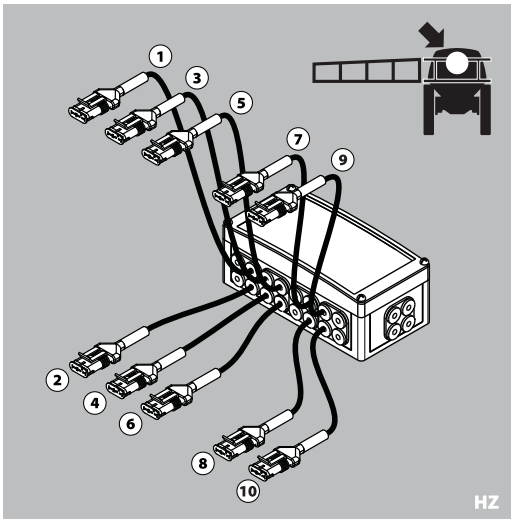
Max. operating pressure:

Tractor: 3046 psi (210 bar)

8 - Technical specifications

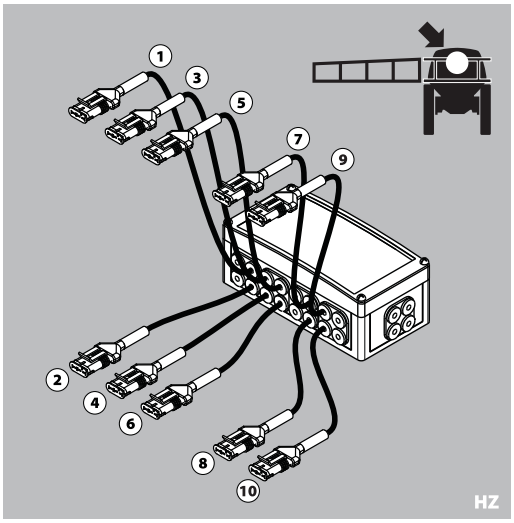
Electrical connections

Plug positions for HZ hydraulics



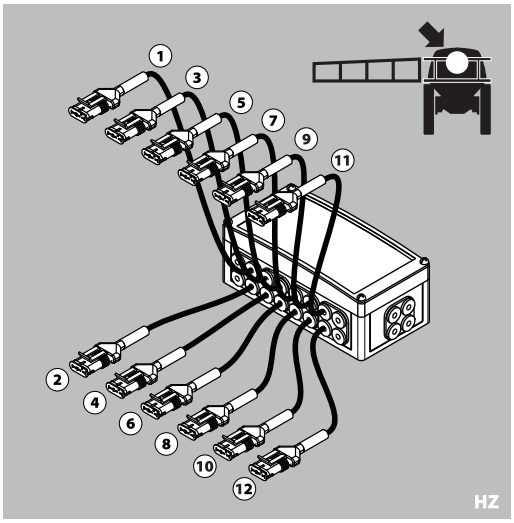
1. Fold left
2. Fold left
3. Tilt left
4. Tilt left
5. Tilt right
6. Tilt right
7. Fold right
8. Fold right
9. (B) flow reverse
10. (A) flow forward

Plug positions for HZ hydraulics (120'/90' Dual Fold boom)



1. Fold inner
2. Fold inner
3. Tilt left
4. Tilt left
5. Tilt right
6. Tilt right
7. Fold outer
8. Fold outer
9. (B) flow reverse
10. (A) flow forward

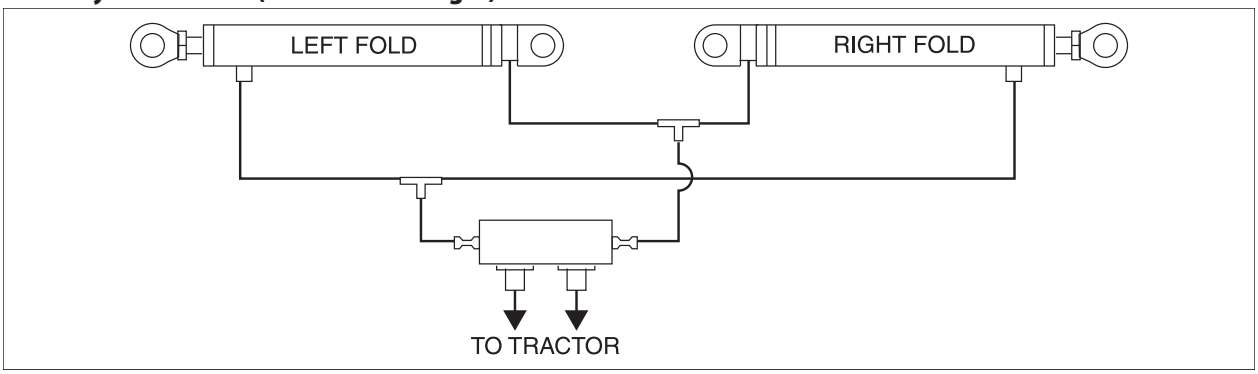
Plug positions for HZ hydraulics (90'/60' Dual Fold boom)



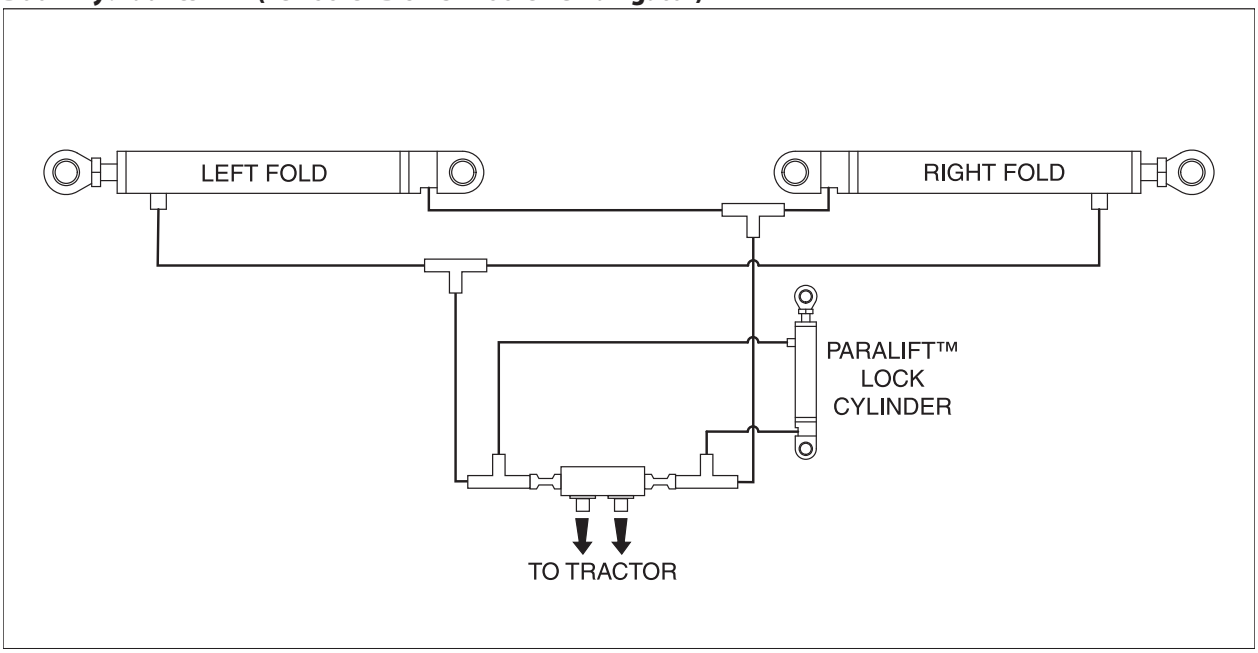
1. Fold left
2. Fold left
3. Tilt left
4. Tilt left
5. Tilt right
6. Tilt right
7. Fold 2nd outer
8. Fold 2nd outer
9. Fold right
10. Fold right
11. (B) flow reverse
12. (A) flow forward

Charts

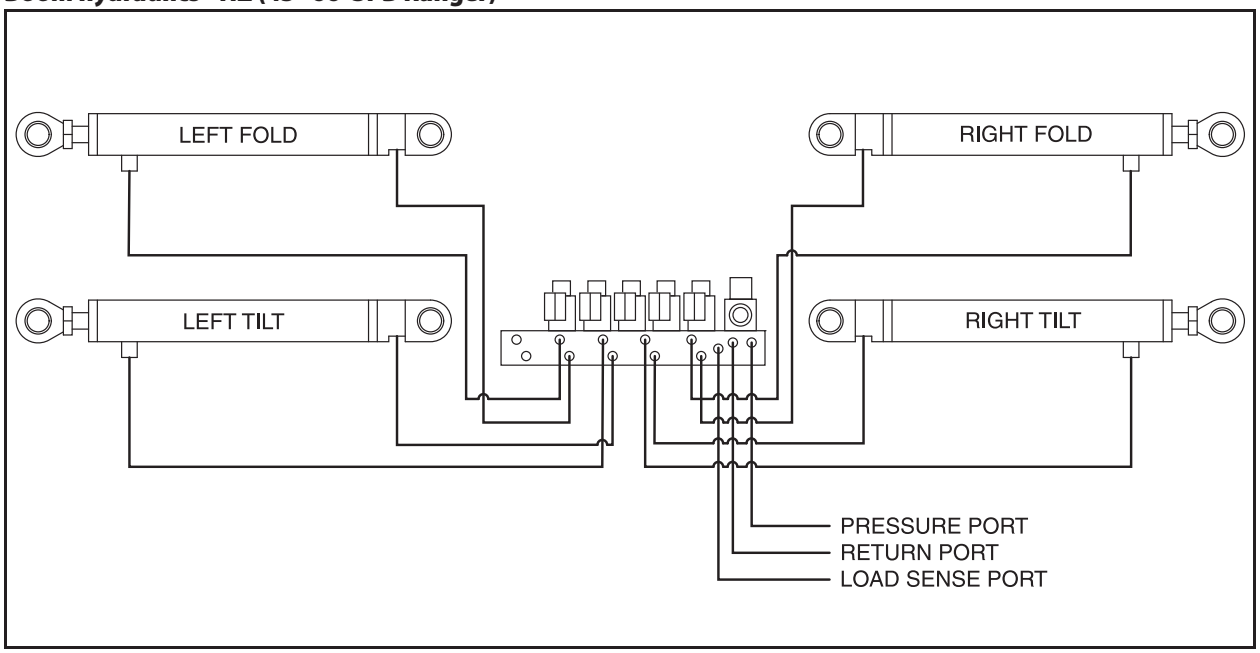
Boom hydraulics - HY (45’-66’ SPB Ranger)



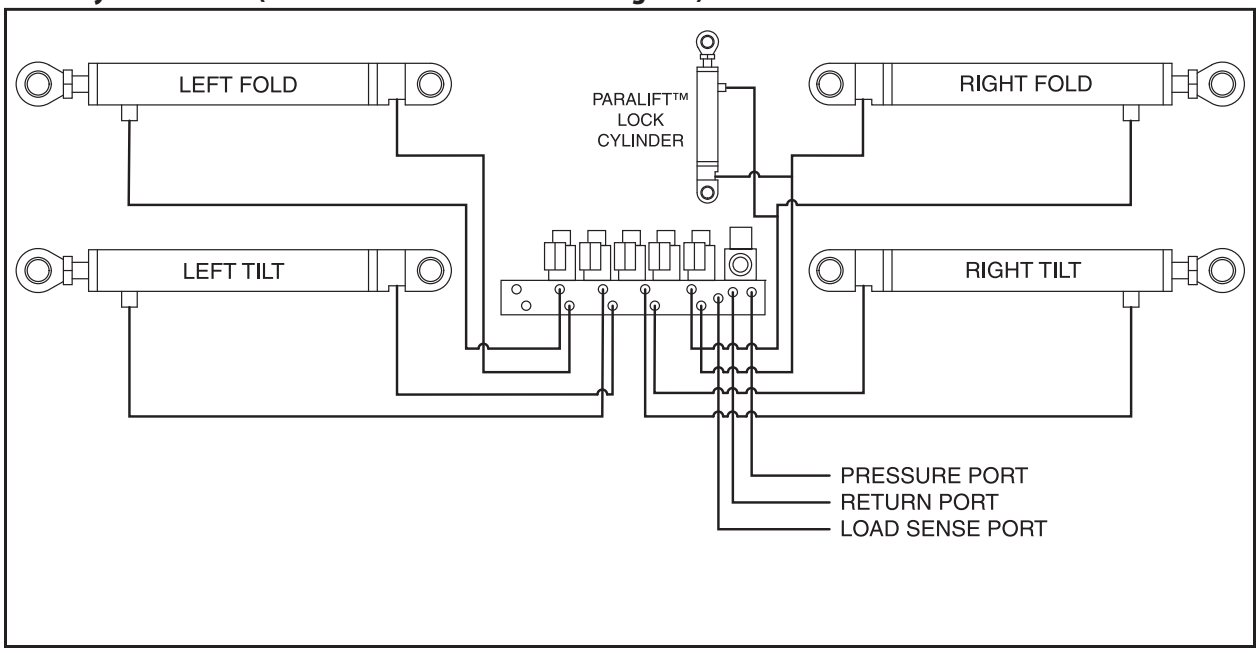
Boom hydraulics - HY (45’-66’ SPB & 75’-100’ SPC Navigator)



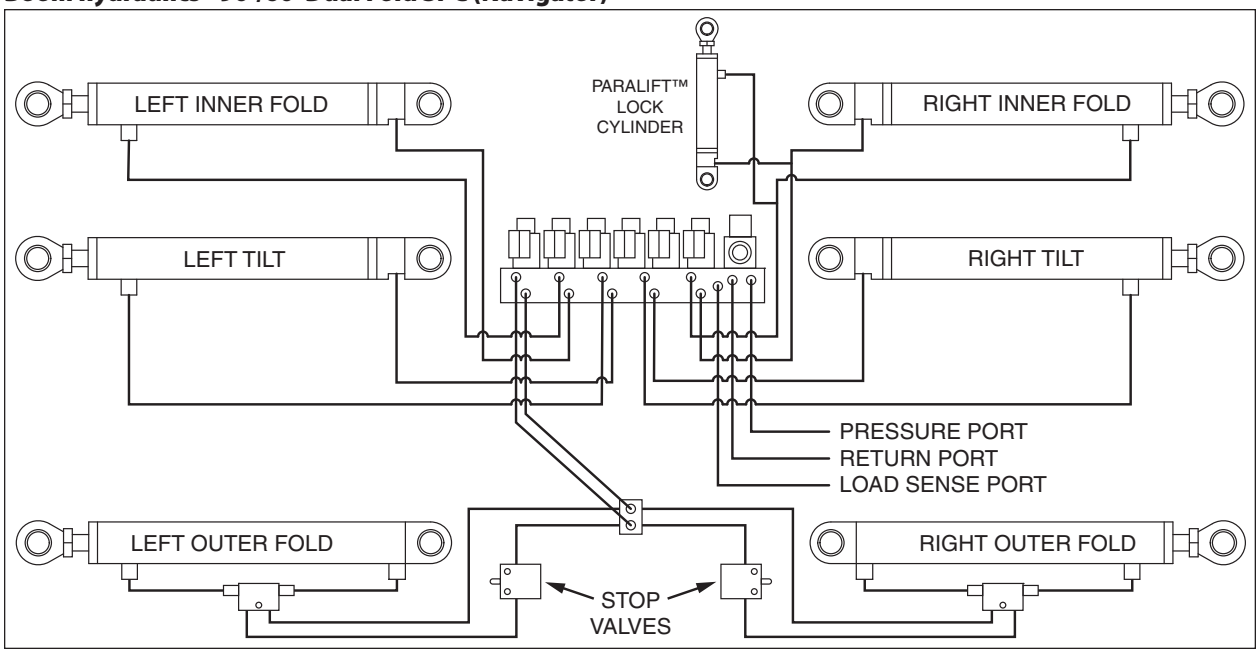
Boom hydraulics - HZ (45'-66' SPB Ranger)



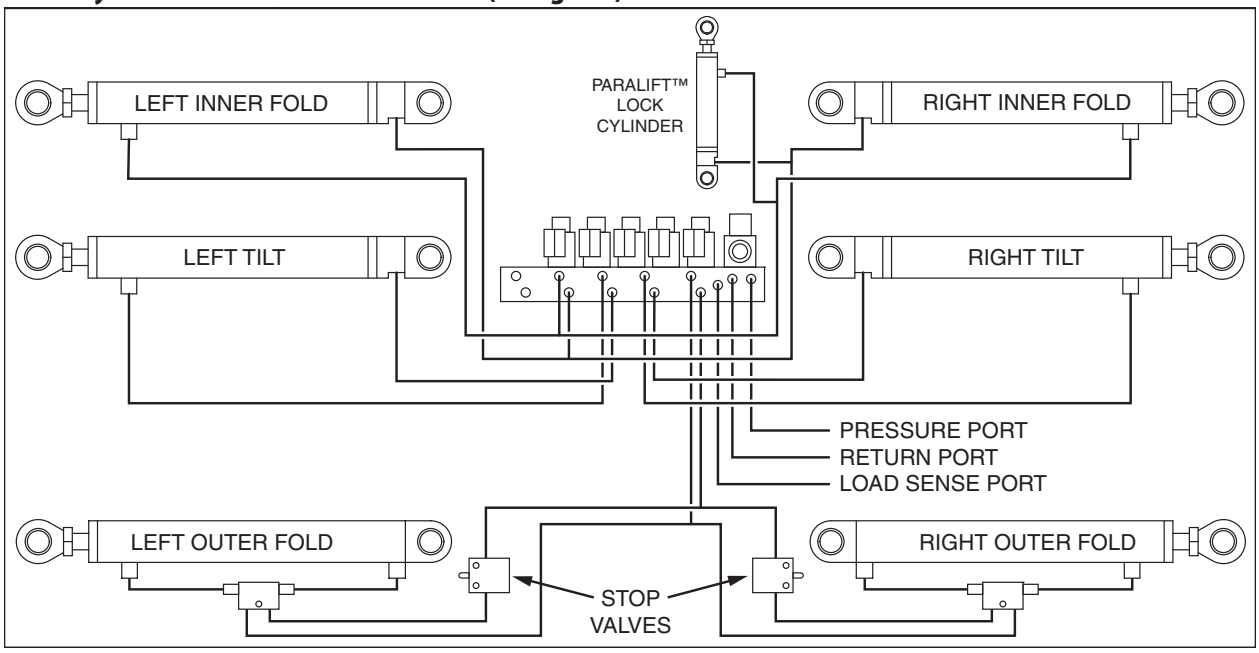
Boom hydraulics - HZ (45'-66' SPB & 75'-100' SPC Navigator)



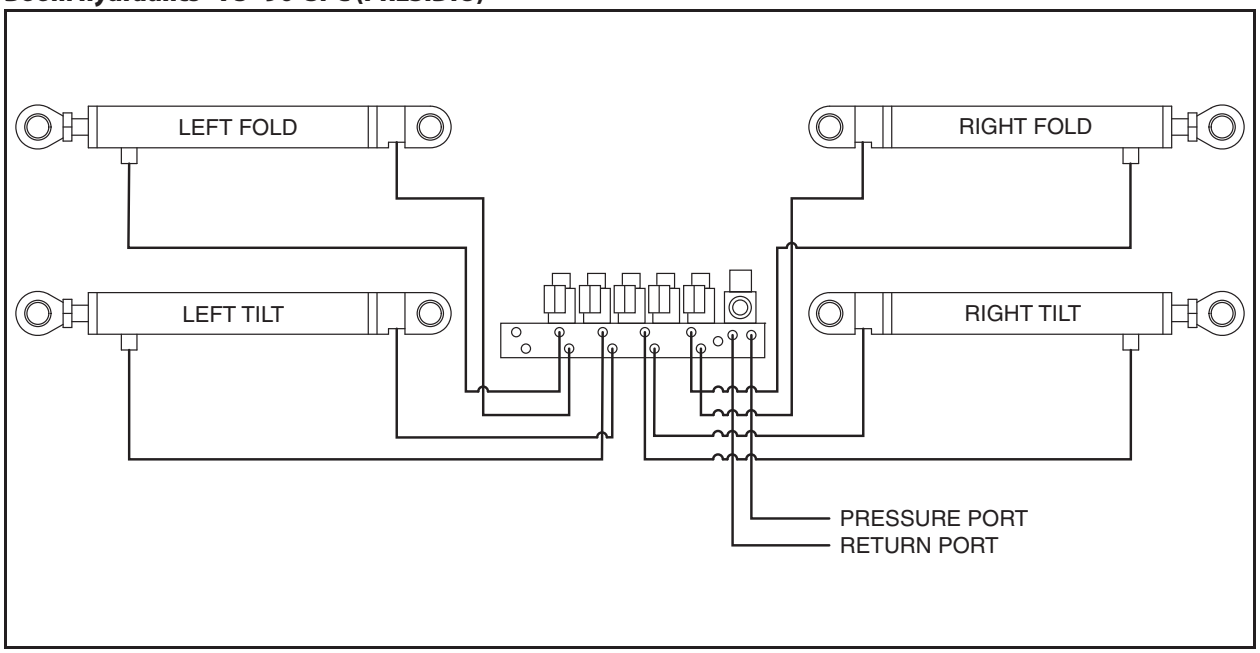
Boom hydraulics - 90'/60' Dual Fold SPC (Navigator)



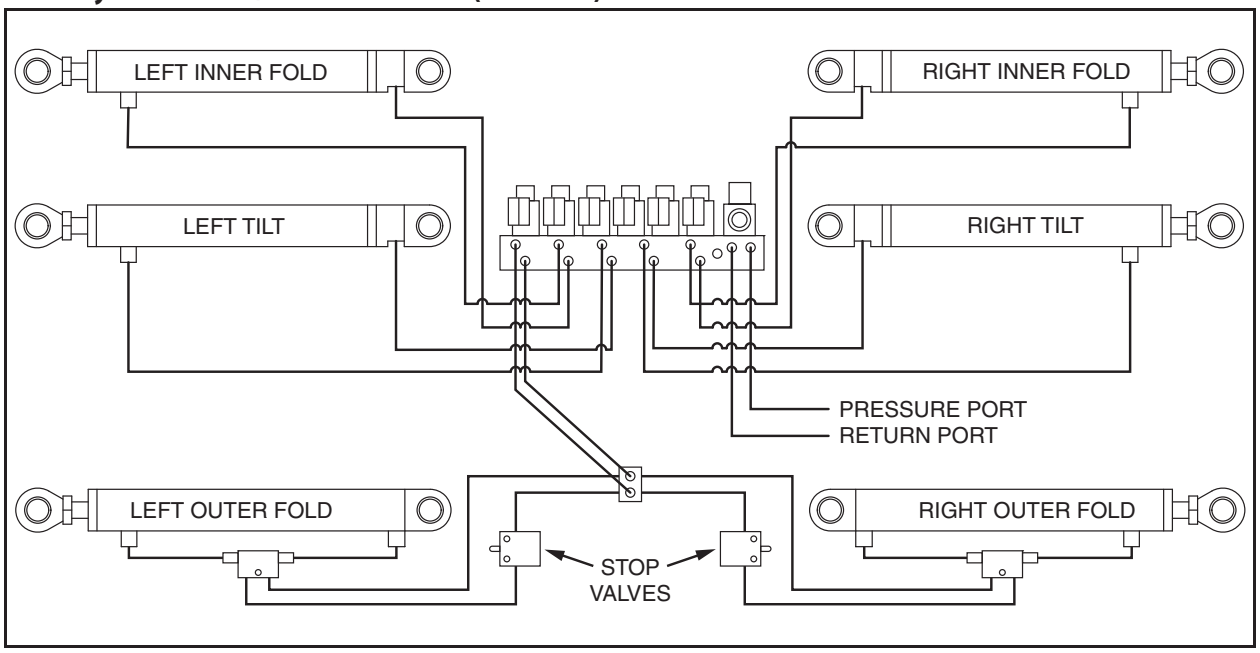
Boom hydraulics - 120'/90' Dual Fold SPC (Navigator)



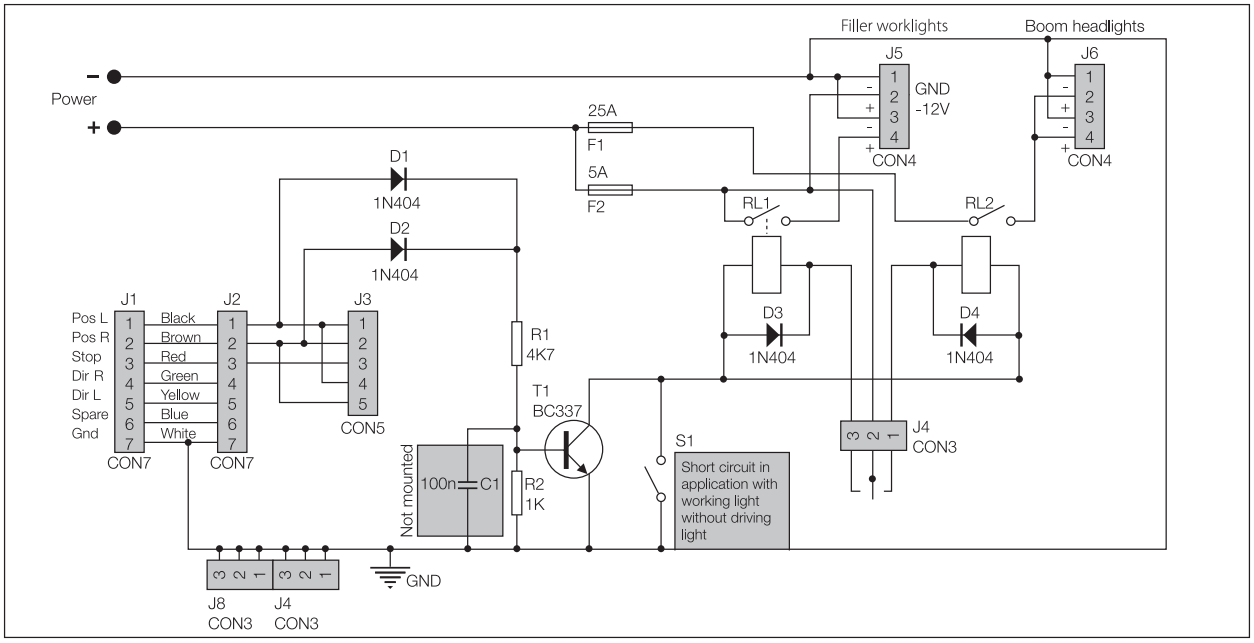
Boom hydraulics - 75'-90' SPC (PRESIDIO)



Boom hydraulics - 90'/60' Dual Fold SPC (PRESIDIO)



Electrical specifications for boom and work light (Trailed)



Warranty policy and conditions

HARDI® NORTH AMERICA INC. , 7301 Vine Street Court, Davenport, Iowa, USA hereinafter called "HARDI®", offers the following limited warranty in accordance with the provisions below to each original retail purchaser of its own manufacturer, from an authorized HARDI® dealer that such equipment is at the time of delivery to such purchaser, free from defects in material and workmanship and that such equipment will be warranted for a period of one year from the time of delivery to the end user, providing the machine is used and serviced in accordance with the recommendations in the Operator's Manual and is operated under normal farm conditions.

1. This limited warranty is subject to the following exceptions:

   a)Parts of the machine not manufactured by HARDI®, (i.e. engines, tires, tubes, electronic controls and other components or trade accessories, etc.) are not covered by this warranty but are subject to the warranty of the original manufacturer. Any claim falling into this category will be taken up with the manufacturer concerned.

   b)This warranty will be withdrawn if any equipment has been used for purposes other than for which it was intended or if it has been misused, neglected, or damaged by accident, let out on hire or furnished by a rental agency. Nor can claims be accepted if parts other than those manufactured by HARDI® have been incorporated in any of our equipment. Further, HARDI® shall not be responsible for damage in transit or handling by any common carrier and under no circumstances within or without the warranty period will HARDI® be liable for damages of loss of use, or damages resulting from delay or any consequential damage.

2. We cannot be held responsible for loss of livestock, loss of crops, loss because of delays in harvesting or any other expense or loss incurred for labor, supplies, substitute machinery, rental for any other reason, or for injuries either to the owner or to a third party, nor can we be called upon to be responsible for labor charges, other than originally agreed, incurred in the removal or replacement of components.

3. The customer will be responsible for and bear the costs of:

   a)Normal maintenance such as greasing, maintenance of oil levels, minor adjustments including the boom.

   b)Transportation of any HARDI® product to and from where the warranty work is to be performed.

   c)Dealer travel time to and from the machine or to deliver and return the machine from the service workshop for repair unless otherwise dictated by state law.

   d)Dealer traveling costs.

4. Parts defined as normal wearing items, (i.e. Pump Diaphragms, Valves, O-rings, Tires and V-belts) are not in any way covered under this warranty.

5. This warranty will not apply to any product which is altered or modified without the express written permission of the HARDI® Service and Engineering Departments and/or repaired by anyone other than an Authorized HARDI® Dealer.

6. Warranty is dependent upon the strict observance by the purchaser of the following provisions:

   a)That this warranty may not be assigned or transferred to anyone.

   b)That the Warranty Registration Certificate has been correctly completed by dealer and purchaser with their names and addresses, dated, signed and returned to the appropriate address as given on the Warranty Registration Certificate within 30 days of delivery to the purchaser.

   c)That all safety instructions in the operator's manual shall be followed and all safety guards regularly inspected and replaced where necessary.

7. No warranty is given on second-hand products and none is implied.

8. Subject to the following terms, conditions and contributions, HARDI® extends the warranty on polyethylene tanks (excluding fittings, lids and gaskets) to FIVE YEARS on field sprayers. To qualify for this extended warranty, the tank must be drained and flushed with fresh water after each day's use. HARDI®'s liability is limited to replacement of defective parts FOB our HARDI® facility at no cost to the purchaser for the first twelve months after date of purchase; at 20% of the then current retail price during the second year; at 40% during the third year; at 60% during the fourth year; and at 80% during the fifth year. This extended warranty is subject, in each instance, to the tank being inspected and approved for replacement or repair by HARDI® personnel before HARDI® will accept any liability hereunder.

9. Subject to the following terms, conditions and contributions, HARDI® extends the warranty on HARDI® diaphragm pumps (excluding wearing parts such as diaphragms, valves and o-rings) to FIVE YEARS. To qualify for this extended warranty, the pump must be drained and flushed with fresh water after each day's use. HARDI®'s liability is limited to replacement of defective parts, FOB our HARDI® facility at no cost to the to the purchaser during the first twelve months after date of purchase; at 20% of the then current retail price during the second year; at 40% during the third year; at 60% during the fourth year; and at 80% during the fifth year. This five year extended warranty is subject, in each instance, to the pump being inspected and approved for replacement or repair by HARDI® personnel before HARDI® will accept any liability hereunder.
10. HARDI® reserves the right to incorporate any change in design in its products without obligation to make such changes on units previously manufactured.
11. The judgement of the HARDI® Service Department in all cases of claims under this warranty shall be final and conclusive and the purchaser agrees to accept its decisions on all questions as to defect and the repair or exchange of any part or parts.
12. No employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by the CEO in the Davenport office. Approval of warranty is the responsibility of the HARDI® Service Department.
13. Any warranty work performed which will exceed $1000.00 MUST be approved IN ADVANCE by the Service Department. Warranty claims filed without prior approval will be returned.
14. ANY pump replacement MUST be approved by the HARDI® Service Department.
15. Claims under this policy MUST be filed with the HARDI® Service Department within thirty (30) days of when the work is performed or warranty shall be void unless prior arrangements are made.
16. Parts which are requested for return by the HARDI® Service Department must be returned prepaid within thirty (30) days for warranty settlement.
17. Warranty claims must be COMPLETELY filled out including part numbers and quantities or claims will be returned to the submitting dealer.

DISCLAIMER OF FURTHER WARRANTY

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, EXCEPT AS SET FORTH ABOVE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE PRODUCT CONTAINED HEREIN. IN NO EVENT SHALL THE COMPANY BE LIABLE FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES (SUCH AS LOSS OF ANTICIPATED PROFITS) IN CONNECTION WITH THE RETAIL PURCHASER'S USE OF THE PRODUCT.

HARDI® North America Inc.
7301 Vine Street Court - Davenport, IA 52806
Ph: (563) 386-1730

Customer Service Email: service@hardi-us.com

Email: info@hardi-us.com
Website: www.hardi-us.com