Sprayflex
SPRAYERS INC.

1500P

1450SS

2000SS

3000SS

1600SS/RM & 2000 SS/RM

SELF-PROPELLED & PULL TYPE SPRAYERS FIELDSTAR 1500P, 1450SS, 2000SS, 3000SS, 1600SS/RM & 2000SS/RM

OPERATOR'S MANUAL

SPRAYFLEX SPRAYERS, INC. EQUIPMENT WARRANTY

Sprayflex Sprayers, Inc. (hereinafter "Sprayflex") warrants to the original retail purchaser of each item of new Sprayflex equipment (hereinafter "Equipment") purchased from an authorized independent sales representative of Sprayflex or directly from Sprayflex that the Equipment is free from material defects in workmanship, under normal and reasonable use and service, for a period of two years from the original date of the receipt of the Equipment by Original retail purchaser. Any Equipment shown to not be free from material defects in that time period, under those circumstances, shall be considered to be "defective" for purposes of this warranty. If such Equipment is found to be defective within two years from the original date of the receipt of the Equipment by original retail purchaser, the obligation of Sprayflex under this warranty is limited to the repairing or replacing (excluding the cost of transportation) of any such Equipment or parts that are reasonably deemed to be defective, which option to repair or replace will be determined in the sole discretion and judgment of Sprayflex.

All Equipment or parts of Equipment claimed to be defective must be made available for inspection by Sprayflex at the place of business of an authorized independent sales representative of Sprayflex, or, upon the request by Sprayflex, shipped to the Sprayflex factory in Detroit Lakes, Minnesota. Sprayflex shall have no obligation to pay the cost of transportation relating to the shipping of the Equipment or any replacement equipment. Sprayflex will pay internal shop rates on the modification or repair of defective parts of Equipment if repair and modification is selected by Sprayflex to remedy defective Equipment versus replacement of Equipment or its parts.

This warranty covers only defects in the workmanship of the Sprayflex Equipment itself. It does not cover depreciation or damage caused by normal wear, accident, improper assembly, improper adjustments, or improper maintenance, including, but not limited to, lack of proper lubrication, improper winterization, or improper use. Damage caused to the Sprayflex Equipment by parts or accessories installed by someone other than Sprayflex or an authorized independent sales representative of Sprayflex shall not be covered under this warranty if the damage is caused, in whole or in part, by the installation.

Sprayflex's liability under this warranty shall not be effective or actionable unless the Equipment is maintained and operated in accordance with the Operating Instructions (Owners' Manual) accompanying the Equipment. Sprayflex shall have no liability under this warranty if the Equipment has been altered or in any way modified without the written authorization of Sprayflex. Sprayflex does not warrant commercial components not manufactured by Sprayflex. But, if new, these components may be by the manufacturer thereof.

The only remedies any purchaser has in connection with the breach or performance of any warranty of Sprayflex are those set forth in this warranty. In no event shall Sprayflex be liable for incidental or consequential damages or injuries including, but not limited to, loss of crops, loss of profits, rental of substitute equipment or other commercial loss.

This warranty is expressly provided in lieu of any other express or implied warranties including any implied warranty of merchantability or warranty of fitness for particular purpose and of any other potential obligations on the part of Sprayflex.

Sprayflex makes no warranties, representations or promises, express or implied, as to the quality or performance of Equipment other than those set forth in this warranty. Neither the authorized independent sales representative of the Sprayflex Equipment nor any other person has any authority to make any representations, warranties or promises on behalf of Sprayflex unless provided directly by Sprayflex in writing.

Sprayflex parts and equipment, which are furnished under this warranty for defective Equipment, shall be warranted to the same extent and for the same warranty duration period as the original Equipment under this warranty. The replacement parts and replacement equipment do not start a new warranty period.

No warranty request will be considered and Sprayflex will have no liability or obligation under this warranty, unless the
Sprayflex Equipment Delivery Checklist and Warranty Registration Forms have been properly filled out and returned to Sprayflex Sprayers, Inc., at 1128 B Cormorant Ave, Detroit Lakes, MN 56501, within fifteen (15) days of the receipt of the Equipment by the original retail purchaser.

Sprayflex Claim Forms must be filled out with every claim. Claims must be submitted by the : independent sales representative to Sprayflex's home office or directly with Sprayflex. All claims made under warranty must be made within the 30 days of failure of Equipment or of parts for Equipment or reasonable discovery of the defect, whichever occurs first. No claim will be accepted that exceeds this 30-day period.

1128 B Cormorant Ave • Detroit Lakes, MN 56501
Phone • 855-777-3539 Fax • 218-844-5382
WWW.SPRAYFLEXSPRAYERS.COM

CERTIFICATE OF QUALITY

To Whom It May Concern:

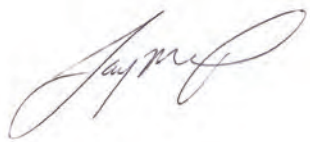
We, Sprayflex Sprayers Inc., the Manufacturer of Sprayflex Sprayers certify that unless otherwise stated, the following agricultural machines and equipment are manufactured in accordance with rules, regulations and norms valid in the United States of America, the Country of Manufacture.

Agricultural Machine:
Sprayflex Field Sprayer – **Model#**_____ **Serial #**_____

The above-mentioned good is for agricultural purposes only; it is new, unused, and quality-tested in our factory. We certify that this machine will answer its purpose.

ISSUE DATE:_____
==========

Sprayflex Sprayers Inc.



Authorized Company Signature

1128 B Cormorant Ave • Detroit Lakes, MN 56501
Phone • 855-777-3539 Fax • 218-844-5382
WWW.SPRAYFLEXSPRAYERS.COM

CERTIFICATE OF MANUFACTURE

This certifies that this Sprayflex Sprayer has been manufactured in the United States with the following specifications:

MAKE: **Sprayflex Field Sprayer**

MODEL: _____

SERIAL NUMBER: _____
(Sprayer)

BOOM WIDTH: _____

NOZZLE SPACING: _____

TIRE BRAND: _____

TIRE SPECIFICATION**: Front _____ Rear _____**

SERIAL NUMBER: _____
(Chassis VIN#)

ISSUE DATE: _____
==========

Sprayflex Sprayers Inc.

Authorized Company Signature

SPRAYFLEX SPRAYERS, INC.

SELF-PROPELLED SPRAYER FIELDSTAR 1500P, 1450SS, 2000SS, 3000SS, 1600SS/RM & 2000SS/RM

WARRANTY REGISTRATION FORM & INSPECTION REPORT

WARRANTY REGISTRATION

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery..

Customer's Name _____

Address _____

City, State/Prov., Code _____

Phone Number (_____) _____

Dealer's Name _____

Address _____

City, State/Prov., Code _____

Sprayer Model _____

Serial Number _____

Delivery Date _____

DEALER INSPECTION REPORT

_____ All Fasteners Tight
_____ Wheel Bolts Torqued
_____ Hydraulic Hoses Free
_____ Hydraulic Fittings Tight
_____ Chemical Lines Free
_____ Lubricate Machine
_____ Check Tire Pressure
_____ Screens Clean
_____ Frame and Wings Level
_____ Monitors and Controllers Function
_____ Wiring and Controller Harness Connected
_____ Check Power Unit Fluid Levels

SAFETY

_____ All Guards Installed
_____ All Decals Installed
_____ Reflectors Clean
_____ Lights and Bulbs Working
_____ Review Operating and
_____ Safety Instructions

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. Signature _____

Signature _____

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

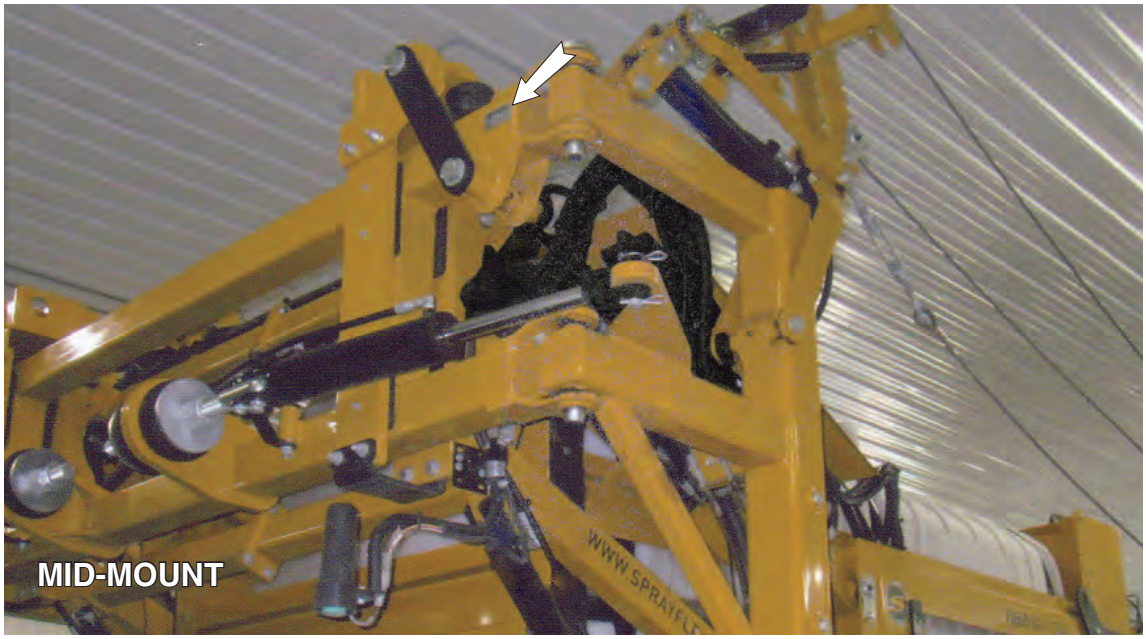
Date _____ Owner's Signature _____

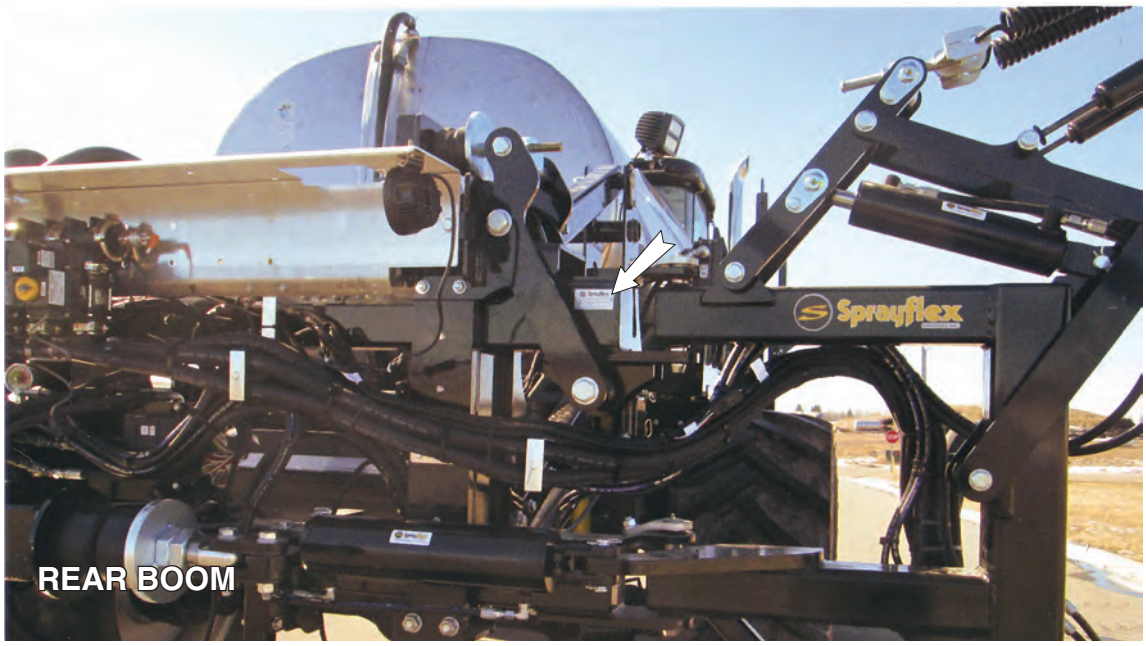
WHITE	YELLOW	PINK
SPRAYFLEX	DEALER	CUSTOMER

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your SprayFlex Sprayers Inc., FieldStar Field Sprayer when ordering parts or requesting service or other information.

The serial number plate is mounted on the side of the boom frame where indicated. Please mark the number in the space provided for easy reference.





Serial Number _____

Production Year _____

Chassis Serial Number _____

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1 INTRODUCTION

Congratulations on your choice of a Sprayflex Self-Propelled FieldStar 1500P, 1450SS, 2000SS, 3000SS, 1600SS/RM & 2000SS/RM Field Sprayers to complement your farming operation. This equipment has been designed and manufactured to meet the needs of a discriminating buyer for the efficient spraying of crops.

Safe, efficient and trouble free operation of your Sprayflex Self-Propelled FieldStar Field Sprayer requires that you and anyone else who will be operating or maintaining the Sprayer, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained in the Operator's Manual.

This manual covers Sprayflex Self-Propelled FieldStar 1500P, 1450SS, 2000SS, 3000SS, 1600SS/RM & 2000SS/RM Field Sprayers. Use the Table of Contents or Index as a guide when searching for specific information.

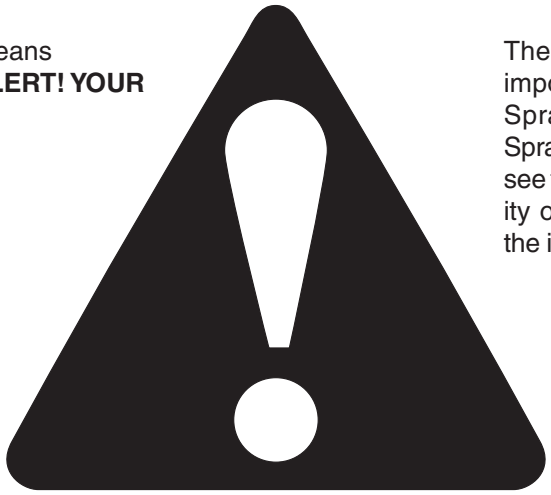
Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Sprayflex dealer or distributor if you need assistance or information.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout this manual, are as seen from the vehicle driver's seat and facing in the direction of travel.

2 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Sprayflex Self-Propelled FieldStar Sprayer and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER, WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

DANGER - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Sprayflex Sprayers, Inc., Phone: 218-844-5371 or Toll Free: 1-855-777-3539, 1128 B Cormorant Avenue, Detroit Lakes, MN 56501, Email: info@sprayflexsprayers.com, or at the website: www.sprayflexsprayers.com

SAFETY

YOU are responsible for the **SAFE** operation and maintenance of your Sprayflex Self-Propelled FieldStar 1500P, 1450SS, 2000SS, 3000SS, 1600SS/RM & 2000SS/RM Field Sprayers. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Sprayer be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the Sprayer.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- FieldStar Sprayer owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.

- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. Most accidents can be avoided.

- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.

- Think SAFETY! Work SAFELY!

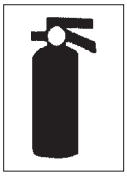
2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or unplugging the Sprayer.

2. Only trained competent persons shall operate the Sprayer. An untrained operator is not qualified to operate the machine.

3. Have a first-aid kit available for use should the need arise and know how to use it.

4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.



5. Do not allow riders.

6. Do not allow children, spectators or bystanders within hazard area of machine.

7. Wear appropriate protective gear. This list includes but is not limited to:

   - A hard hat
   - Protective shoes with slip resistant soles
   - Protective goggles
   - Neoprene gloves
   - Water repellent clothing
   - Hearing protection
   - Respirator or filter mask

8. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.

9. Read chemical manufacturer's warnings, instructions and procedures before starting and follow them exactly.

10. Post Poison Control Emergency telephone number for your area on Sprayer before using Agricultural chemicals.

    Ottawa: (613) 992-5606
    Washington: (202) 962-4525

11. Review safety related items annually with all personnel who will be operating or maintaining the Sprayer.

2.2 SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.

2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.

3.  It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.

4. **Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your auxiliary equipment, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself. It is the machine owner's responsibility to make certain that the operator, prior to operating:**

   a. **Reads and understands the operator's manuals.**

   b. **Is instructed in safe and proper use.**

5. Know your controls and how to stop the engine and any other auxiliary equipment quickly in an emergency. Read this manual and the one provided with your other equipment.

6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.

2.3 PREPARATION

1. Never operate the truck or tractor and machine until you have read and completely understand this manual, the auxiliary equipment Operator's Manual, and each of the Safety Messages found on the safety signs on the sprayer and auxiliary equipment.

2.  Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing or jewelery to be around equipment.

3. **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!** Motors or equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.

4. For tractor model, operate only with a tractor equipped with an approved Roll-Over-Protective-Structure (ROPS). Always wear your seatbelt. Serious injury or death could result from falling off the tractor - particularly during a turn-over when the operator could be pinned under the ROPS or the tractor.

5. Clear working area of debris, trash or hidden obstacles that might be hooked or snagged, causing injury, damage or tripping.

6. Operate only in daylight or good artificial light.

7. Be sure machine is properly anchored, adjusted and in good operating condition.

8. Ensure that all safety shielding and safety signs are properly installed and in good condition.

2.4 OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before using. Review safety instructions annually.

2. Place all controls in neutral, stop engine, turn monitor off, set park brake, remove ignition key, wait for nozzles to stop spraying before servicing, adjusting, repairing or unplugging.

3. Before spraying a field, be familiar with all potential hazards: trees, rocks, ditches, gullies, etc. Plan the spraying route to avoid hazards. Remember you are driving a wide machine.

   USE CAUTION WHEN CORNERING.

4. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

5. Do not allow riders on the sprayer, tractor or truck during operation or transporting.

6. Clear the area of all bystanders, especially small children, before starting or filling with water or chemical.

7. Stay away from boom pinch points when folding or extending wings. Keep others away.

8. Stay away from power lines when extending or folding booms. Electrocution can occur without direct contact.

9. Read chemical manufacturers warnings, instructions and procedures before starting and follow them exactly.

10. Do not breathe, touch or ingest chemicals. Always wear protective clothing and follow safe handling procedures.

11. Spray only when potential for chemical drift is at a minimum. Even small amounts can affect neighboring crops or sensitive plants and people.

12. Dispose of chemical containers by triple rinsing them into the sprayer tank or thoroughly rinsing, crushing and delivering to regional disposal site.

13. In case of poisoning, get immediate medical attention.

14. Only rinse sprayer while still in the field. Spray the rinse thinly over the field already sprayed. Never contaminate the farmyard or drainage systems with sprayer rinse.

15. Do not eat in the field when spraying.

16. Before applying pressure to the hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition.

17. Before applying pressure to chemical system make sure that all connections are tight and that all hoses and fittings are in good condition.

2.5 CHEMICAL SAFETY

1. Some Agricultural chemicals are among the most toxic substances known to man. Minute quantities can contaminate clothing, machinery, the workplace and the environment. Follow the chemical manufacturers' instructions exactly. Death can result from their improper use.

2. Misuse, including excessive rates, uneven application, wind drift, and label violations can cause injury to crops, livestock, persons and the environment.

3. Do not breathe, touch or ingest chemicals, Always wear protective clothing and follow safe handling procedures.

4. Follow the manufacturers' instructions for chemical storage. Avoid unnecessary storage by purchasing only the quantity needed for the crop year.

5. Keep all chemicals out of reach of children and away from livestock and animals.

6. Store chemicals only in their original containers and in a locked area.

7. Check with state environment department regarding the disposal of small quantities of chemicals, chemical containers and wash water. Follow their disposal instructions.

8. Do not burn the containers or leave them lying in the field or ditches. Dispose of them by triple rinsing and leaving at a pesticide container disposal site.

9. Wash thoroughly before eating. Use a detergent to remove all chemical residue. Rinse carefully and dry with disposable towels.

10. Do not eat in the field when spraying.

11. In case of chemical poisoning, get immediate medical attention. Have container label handy when seeking medical attention.

12. Post Poison Control Emergency telephone number for your area on Sprayer before using Agricultural chemicals.

    Ottawa: (613) 992-5606
    Washington: (202) 962-4525

    Have container label handy when seeking medical attention.

13. Thoroughly wash clothing and equipment contaminated by chemicals.

14. Do not allow children or workers on contaminated sprayer.

15. Rinse sprayer while still in the field. Spray the rinse thinly over the field already sprayed. Never contaminate the farmyard or drainage systems with sprayer rinse.

16. Do not use the sprayer to transport drinking water.

17. Wash down the Sprayer immediately after field work. Dispose of the wash water in an environmentally safe manner. Wash water can contaminate the soil or a clean water supply.

2.6 MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Sprayer.

2. Place all controls in neutral, stop the engine, turn monitor off, set park brake, remove ignition key, wait for nozzles to stop spraying before servicing, adjusting, repairing or unplugging.

3. Follow good shop practices:

   - Keep service area clean and dry.
   - Be sure electrical outlets and tools are properly grounded.
   - Use adequate light for the job at hand.

4. Before applying pressure to a hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition.

5. Before applying pressure to chemical system make sure that all connections are tight and that all hoses and fittings are in good condition.

6. Relieve pressure from hydraulic circuit before servicing or disconnecting from power unit.

7. Keep hands, feet, clothing and hair away from all moving and/or rotating parts.

8. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments or filling.

9. Place stands or blocks under the frame before working beneath the machine.

10. **Wear safety goggles, neoprene gloves and protective clothing when working on the sprayer filled with active chemical.**

11. **Wash machine to remove all chemical residue before working on unit. Wear appropriate protective gear at all times to protect yourself from chemical contamination.**

2.7 HYDRAULIC SAFETY

1. Always place all hydraulic controls in neutral before dismounting.

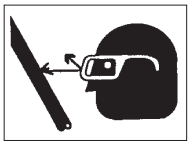
2. Make sure that all components in the hydraulic system are kept in good condition and are clean.

3. Replace any worn, cut, abraded, flattened or crimped hoses and steel lines.

4. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

5. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.

6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.



7. Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are in good condition.

2.8 TRANSPORT SAFETY

1. Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when operating the Sprayer in the field and/or on the road.

2. Check with local authorities regarding sprayer transport on public roads. Obey all applicable laws and regulations.

3. Always travel at a safe speed. Use caution when making corners or meeting traffic.

4. When a tractor is the power unit, make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

5. When a tractor is the power unit, be sure that the Sprayer is hitched positively to the tractor. Always use a retainer through the pin and a safety chain between the machine and the tractor.

6. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.

7. Do not exceed 20 mph (32 kph) when the tanks are full. Reduce speed on rough roads and surfaces.

8. Always use hazard warning flashers on tractor when transporting unless prohibited by law.

9. Never transport faster than 20 mph (32 kph) with the tank filled with water or chemical.

2.9 TIRE SAFETY

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

3. Have a qualified tire dealer or repair service perform required tire maintenance.

2.10 STORAGE SAFETY

1. Store unit in an area away from human activity.

2. Do not permit children to play on or around the stored sprayer.

3. Store in the transport configuration.

2.11 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.

2. Replace safety signs that are missing or have become illegible.

3. Replaced parts that displayed a safety sign should also display the current sign.

4. Safety signs are available from your Distributor or the factory.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

2.12 SIGN-OFF FORM

Sprayflex Sprayers, Inc. follow the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Sprayer must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

SIGN-OFF FORM

DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE

3. SAFETY SIGN LOCATIONS

The types of safety signs and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!

A

CAUTION

- Read Operator's Manual before starting. Review all safety instructions with operators annually.
- Read Chemical manufacturers' WARNINGS, instructions and procedures before starting and follow them exactly.
- Stop engine, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, unplugging or filling.
- Always wear proper eye, breathing and clothing protection.
- Stay away from chemicals, soray and drift. Keep others away.
- Install and secure all guards before starting.
- Keep hands, feet, hair and clothing away from moving parts.
- Do not allow riders.
- Keep all chemical and hydraulic lines, fittings and couplers tight and free of leaks before starting and operating.
- Stay away from overhead power lines.
- Clear the area of bystanders before extending or unfolding booms.

30100

B

DANGER

HIGH PRESSURE FLUID HAZARD

To prevent serious injury or death:

- Relieve pressure on system before repairing or adjusting.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Keep all components in good repair.

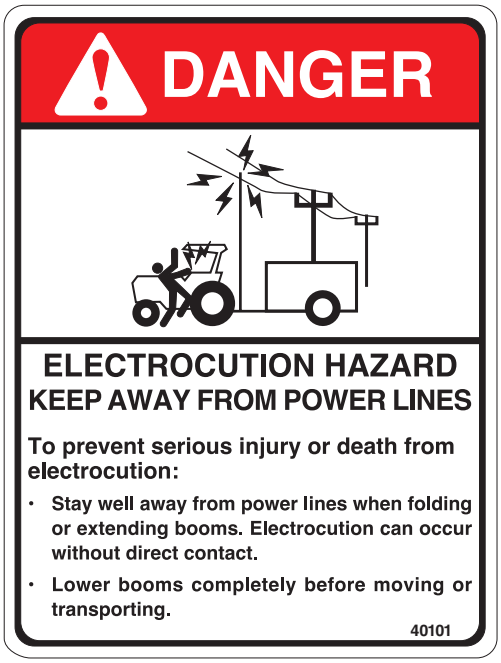
40100

REMEMBER - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety designs, new signs must be applied. New safety signs are available from your authorized dealer.

The types of safety signs and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!

C



D

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- Think SAFETY! Work SAFELY!

E

F

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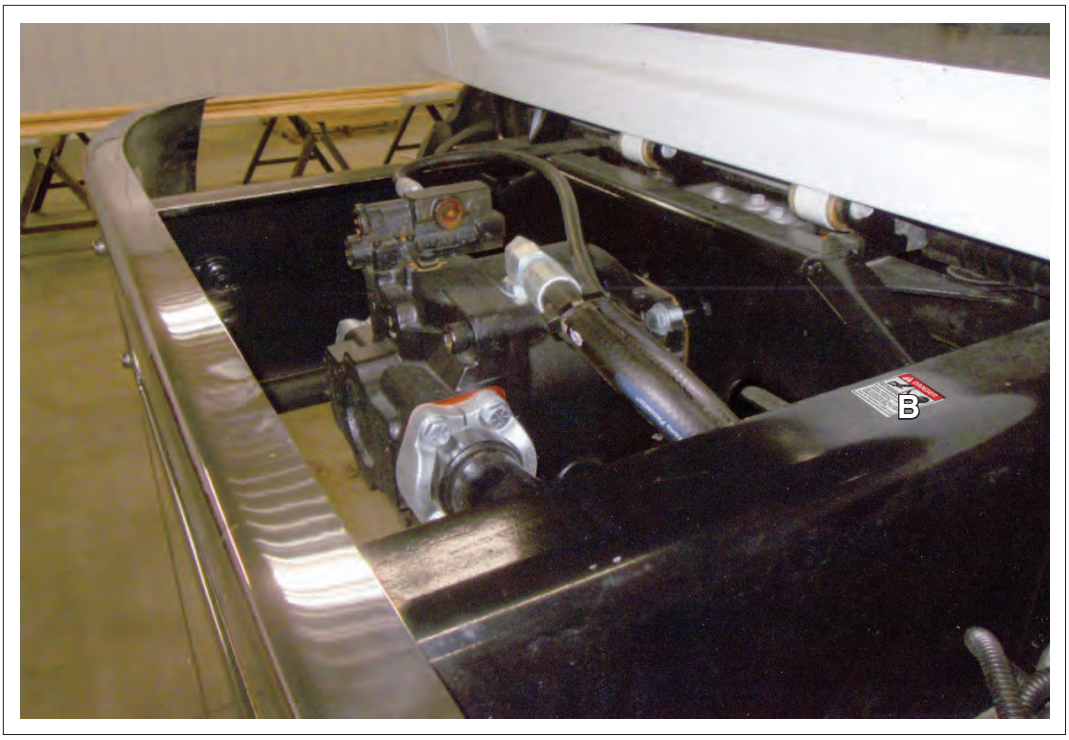
- Think SAFETY! Work SAFELY!



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- Think SAFETY! Work SAFELY!

J

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- Think SAFETY! Work SAFELY!

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- Think SAFETY! Work SAFELY!

REMEMBER - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety designs, new signs must be applied. New safety signs are available from your authorized dealer.

4. OPERATION

OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before using. Review safety instructions annually.
- Place all controls in neutral, stop engine, turn monitor off, set park brake, remove ignition key, wait for nozzles to stop spraying before servicing, adjusting, repairing or unplugging.
- Before spraying a field, be familiar with all potential hazards: trees, rocks, ditches, gullies, etc. Plan the spraying route to avoid hazards. Remember you are driving a wide machine.

  USE CAUTION WHEN CORNERING.
- Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
- Do not allow riders on the sprayer, tractor or truck during operation or transporting.
- Clear the area of all bystanders, especially small children, before starting or filling with water or chemical.
- Stay away from boom pinch points when folding or extending wings. Keep others away.
- Stay away from power lines when extending or folding booms. Electrocution can occur without direct contact.
- Read chemical manufacturers warnings, instructions and procedures before starting and follow them exactly.
- Do not breathe, touch or ingest chemicals. Always wear protective clothing and follow safe handling procedures.
- Spray only when potential for chemical drift is at a minimum. Even small amounts can affect neighboring crops or sensitive plants and people.
- Dispose of chemical containers by triple rinsing them into the sprayer tank or thoroughly rinsing, crushing and delivering to regional disposal site.
- In case of poisoning, get immediate medical attention.
- Only rinse sprayer while still in the field. Spray the rinse thinly over the field already sprayed. Never contaminate the farmyard or drainage systems with sprayer rinse.
- Do not eat in the field when spraying.
- Before applying pressure to the hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition.
- Before applying pressure to chemical system make sure that all connections are tight and that all hoses and fittings are in good condition.

4.1 TO THE NEW OPERATOR OR OWNER

Today's Agricultural industry works closely with the chemical industry to develop and use the appropriate compound for control of insects, weeds and fungus. Effective results are closely related to application methods and techniques. Sprayflex Sprayers has designed a field sprayer that will place the chemicals exactly where they are needed.

It is the responsibility of the owner or operator to read this manual and the chemical container label before starting. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the environment.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent on awareness, concern and prudence of all personnel involved in the operation, transport, maintenance and storage of equipment or in the use and maintenance of facilities.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency. By following the operating instructions in conjunction with a good maintenance program, your Sprayer will provide many years of trouble-free service.

4.2a MACHINE COMPONENTS

The Sprayflex Sprayers FieldStar 1500P, 1450SS, 2000SS, 3000SS, 1600SS/RM & 2000SS/RM Field Sprayer consist of a large transportable tank with spray booms to distribute chemicals over a wide area. Chemicals can be added directly into the tank through the top tank lid or bottom fill line. The system is pressurized by a hydraulically powered pump mounted on the front frame ahead of the engine that provides flow for tank agitation, tank washing and boom pressure.

A 100 gallon wash tank is mounted behind the main tank and is used to rinse the main tank and provide clean water to the operator if required.

The chemical circuit is plumbed into the tank for agitation to keep the solution mixed or to the rotating ball wash heads for washing or rinsing the tank. A solenoid to each boom controls the flow to the wings and a butterfly valve and flow sensor maintains the system pressure. Nozzles along the wings distribute the chemical solution over the field. A screen in the line next to the pump removes contaminants from the system. The chemical system controller (selected by the customer) is mounted in the cab for easy operation.

The booms attach to and are suspended from the center of the frame. The booms swing out at right angles to the frame for field operation. The outer booms swing out for field operation. The wing extensions swings back if they hit an obstruction.

The boom position controls are mounted in the cab for easy operation.

A 1500 gallon poly and 1450 and 2000 stainless steel tank is available for use with the sprayer depending on the application.

A Main Tank
B Wash Tank
C Tank Access Platform/Steps
D Boom
E Outer Boom
F Boom Support Cables
G Nozzles
H Solenoids
J Wash System
K Centrifugal Pump
L Boom Control
M System Controller
N Boom Position Valves
O Main Tank Fill Valve
P Rinse Tank Fill Valve
Q Rear Tank Drain Valve
R Rear Control Panel
S Hydraulic Tank
T Hydraulic Pump
U Steering Control (Optional)
V Rear Camera Screen (Optional)
W Tank Volume Tube

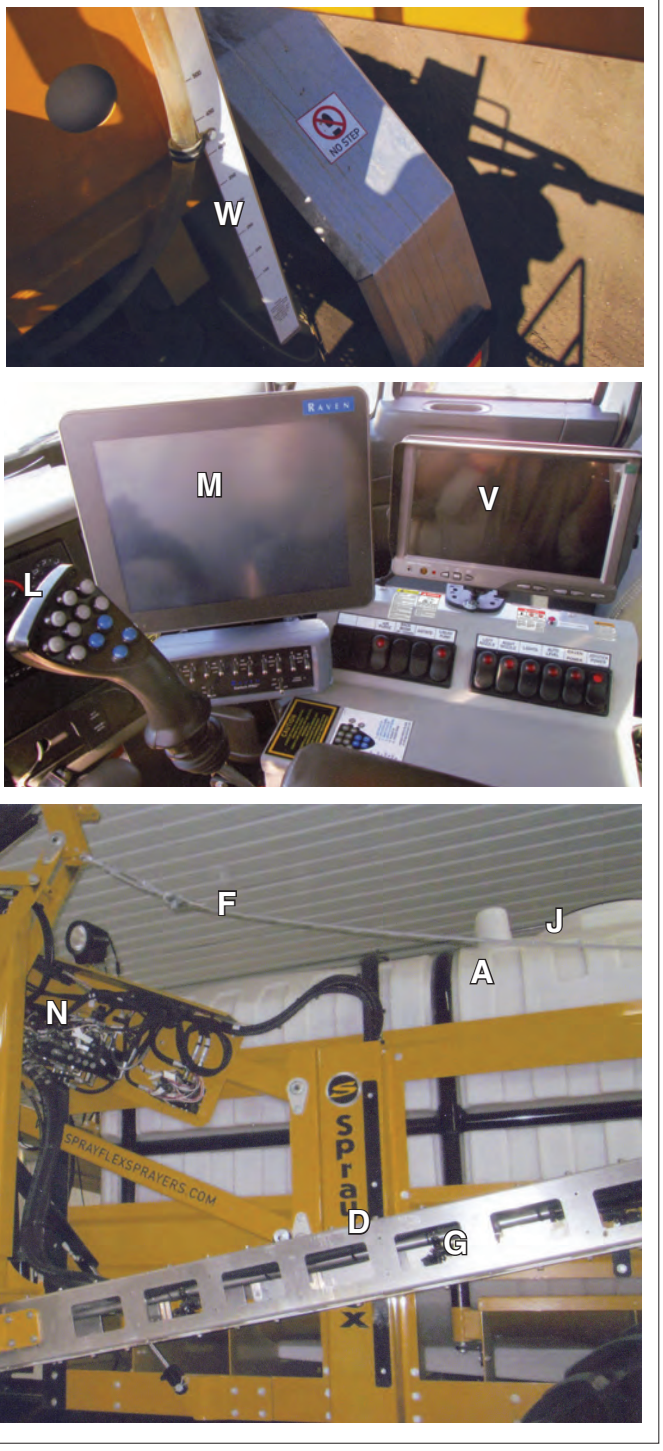

FIG. 1 MACHINE COMPONENTS


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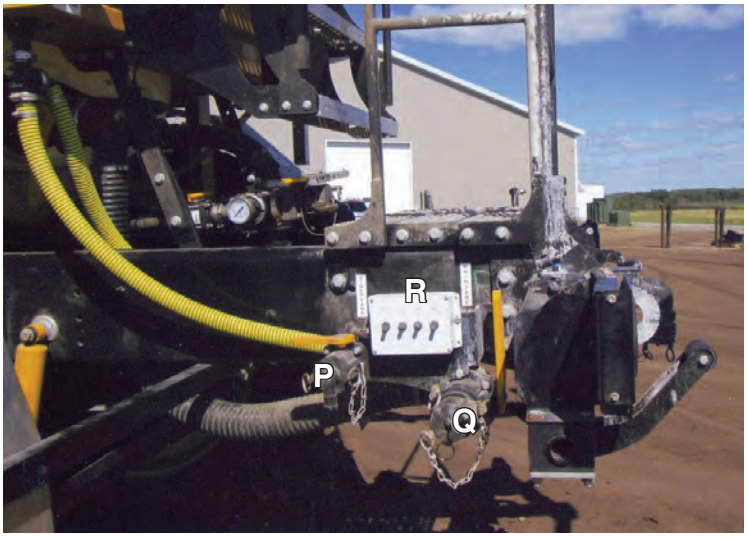
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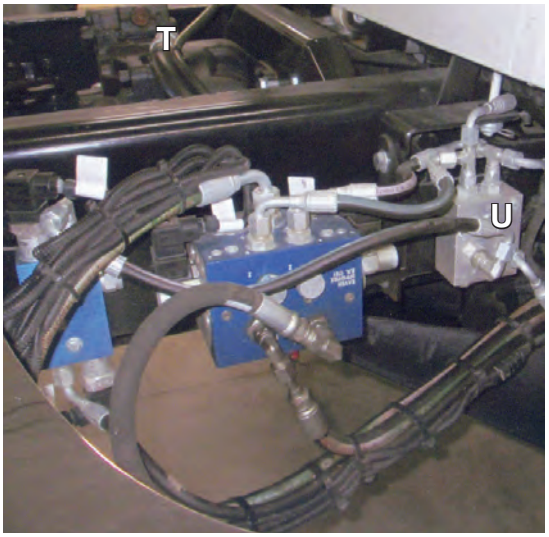
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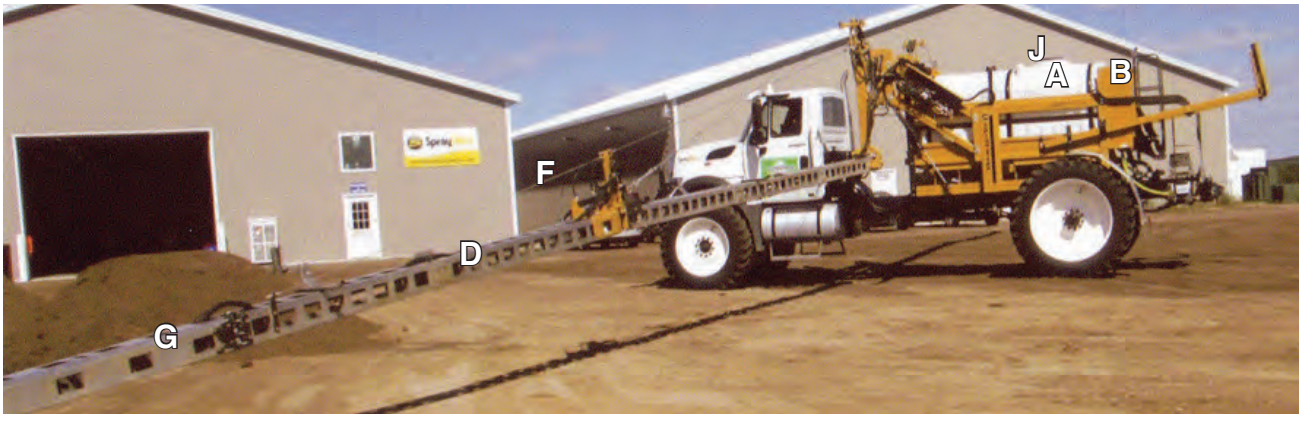

J
A
B
F
D
G

4.2b MACHINE COMPONENTS

These photos and component listings refer to the 1600SS/RM and 2000SS/RM models. They are designed to be removed from the chassis and allow the power unit to be used in other applications.

A	Main Tank	B	Rinse Tank
C	Fresh Water Tank	D	Center Boom
E	Inner Boom	F	Outer Boom
G	Boom Support Cables	H	Nozzles
J	Solenoids	K	Flow Meter
L	Eductor Tank	M	System Pressure Gauge
N	Pneumatic Lines	O	Hydraulic Lines
P	Frame Anchor Bolt	R	Controller

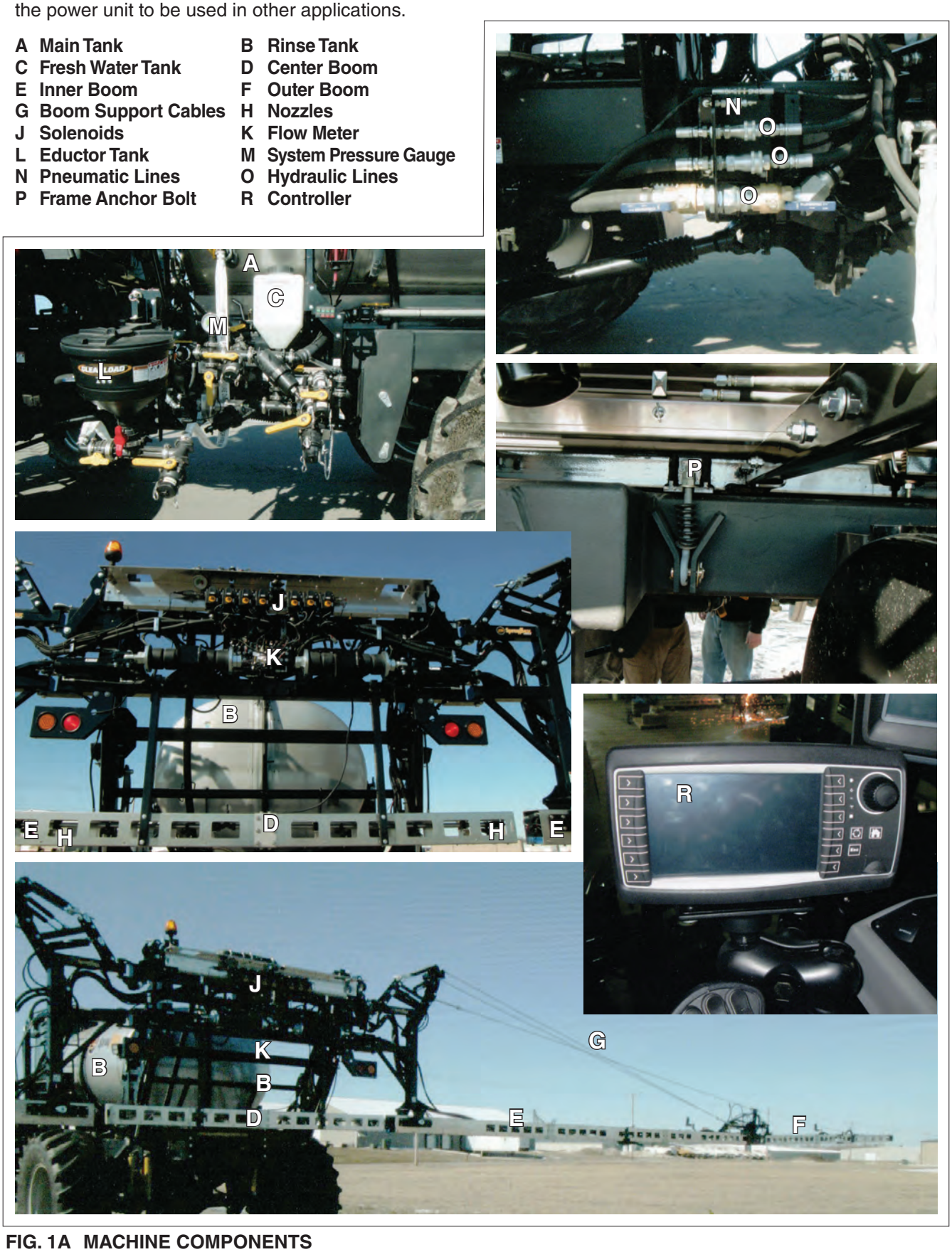


FIG. 1A MACHINE COMPONENTS

4.3 BREAK-IN

Although there are no operational restrictions on the sprayer when used for the first time, it is recommended that the following mechanical items be checked:

A. After operating for 1/2 hour:

1. Retorque all fasteners, hardware and wheel bolts.

2. Check that all electrical connections are tight.

4. Check that no chemical or hydraulic lines are being pinched or crimped. Re-align as required.

5. Check that all nozzles are working properly. Clean or replace as required.

6. Lubricate all grease fittings.

B. After 5 hours and 10 hours of operation:

1. Retorque all wheel bolts, fasteners and hardware.

2. Check chemical and hydraulic line routing.

3. Check that all nozzles are working properly.

4. Then go to the normal servicing and maintenance schedule as defined in the Maintenance Section.

4.4 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Sprayflex FieldStar Sprayer requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operational checklist is provided for the operator. It is important for both personal safety and maintaining the good mechanical condition of the Sprayer that this checklist be followed.

Before operating the Sprayer and each time thereafter, the following areas should be checked off:

1. Lubricate the machine per the schedule outlined in the “Maintenance Section.”

2. Ensure that the machine is properly attached to the power unit.

3. Check the hydraulic system. Ensure that the hydraulic reservoir on the frame is filled to the required specifications.

4. Inspect all hydraulic lines, hoses, fittings and other components for tightness.

5. Check the tires and ensure that they are inflated to the specified pressure.

6. Calibrate the sprayer if it is the start of the season or a new chemical is being used.

7. Check the condition and routing of all chemical hoses and lines. Replace any that are damaged. Re-route those that are rubbing, pinched or crimped.

8. Check the spray pattern of each nozzle. Remove and clean or replace any that have an unusual pattern.

9. Remove the steel mesh line filters and wash with clean water. Reinstall.

10. Fill the fresh water tank with clean water.

11. Check that all connections in the electrical system are connected and tight.

4.5 CONTROLS

All functions on the sprayer are operated by the Controllers mounted in the cab. It is recommended that all operators review this section of the manual to familiarize themselves with the location and function of all machine controls before starting. Refer to the manual supplied with the chemical controller to familiarize yourself with the calibration, operation and troubleshooting procedures for the chemical circuit.

4.5.1 Truck

1. **Spray Circuit Controller:**
   A microprocessor-based controller selected by the customer is mounted in the cab to set, monitor, adjust and display several spray circuit parameters for the operator. Review and follow the calibration procedure at the start of the season and when changing chemicals or nozzles. Familiarize yourself with each controller function and control before starting.

FIG. 2 SPRAY CIRCUIT CONTROLLER (TYPICAL)

2. **Sprayer System Controls:**
   The sprayer system controls are positioned in the cab to the right of the driver. Review this list before starting.

   a. **Air Purge:**
   This two-position rocker switch controls the power to the air purge system. Depress the top portion of the switch to open the valve to the truck air system. When opened, the red light on the upper portion of the switch will be lit. Use this system to blow the liquid out of the spray circuit. Depress the lower position of the switch to stop the air purge.

   b. **Back Boom UP/DOWN:**
   This three-position spring-loaded-to-center-neutral rocker switch controls the position/height of the rear center boom. Depress and hold the top portion to raise the back boom. Depress and hold the lower portion to lower the boom. Release the switch and the boom will stop moving.

   c. **Agitate:**
   This two-position rocker switch controls the power to the agitate solenoid. Depress the top portion of the switch to open the valve and agitate the solution. Depress the bottom portion to stop agitation.

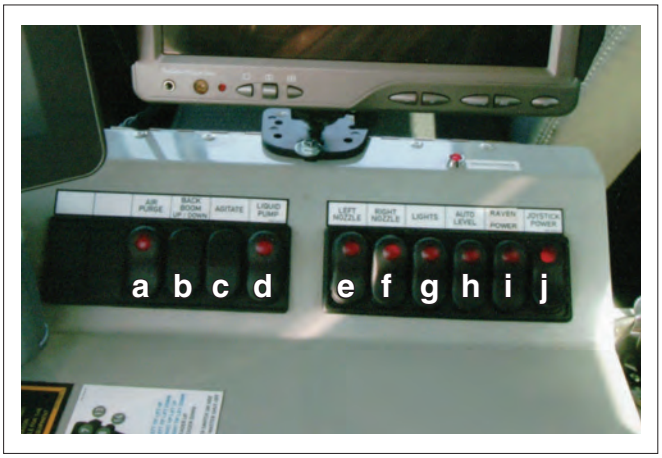


FIG. 3 SPRAYER SYSTEM CONTROLS

d. **Liquid Pump:**
This two-position rocker switch controls the flow of pressurised oil to the hydraulic motor on the sprayer circuit pump. Depress the top portion to turn the pump on. When turned on, the red light on the upper portion of the switch will illuminate. Depress the lower portion of the switch to turn the pump off.

e. **Left Fence Row Nozzle:**
This two-position rocker switch controls the chemical flow to the fence row nozzle on the left boom. Depress the top portion of the switch to turn the flow ON to the left boom. When the flow is turned on the red light in the upper portion of the switch will illuminate. Depress the bottom portion to turn off the flow to the left fence row nozzle.

f. **Right Fence Row Nozzle:**
This two-position rocker switch controls the chemical flow to the fence row nozzle on the right boom. Depress the top portion of the switch to turn the flow ON to the left boom. When the flow is turned on the red light in the upper portion of the switch will illuminate. Depress the bottom portion to turn off the flow to the right fence row nozzle.

g. **Lights:**
This two-position rocker switch controls the power to the working lights on the machine. Depress the top portion of the switch to turn the lights ON. When the lights are turned on, the red light on the top portion of the switch will illuminate. Depress the bottom portion to turn the lights OFF.

h. **Auto Level:**
This two-position rocker switch controls power to the automatic boom leveling system. Depress the top portion of the switch to turn the leveling system ON. When the leveling system is turned on, the red light on the top portion of the switch will illuminate. Depress the bottom portion to turn the leveling system OFF and level the booms manually.

i. **Raven Power:**
This two-position rocker switch controls the power to the chemical system controller (on this machine, a Raven system). Depress the top portion of the switch to turn power ON to the controller. When the power is turned on, the red light on the top portion of the switch will illuminate. Depress the bottom portion to turn the controller OFF.

FIG. 4 SPRAYER SYSTEM CONTROLS

j. **Joystick Power:**
This two-position rocker switch controls the power to the joystick and boom controls. Depress the top portion of the switch to turn the power ON to the joystick. When the power is turned on, the red light on the upper portion of the switch will illuminate. Depress the bottom portion to turn power to the joystick OFF.

3. **Joystick:**

a. **Left Outer Wing Out:**
Depress and hold this switch to extend left outer wing.

b. **Left Outer Wing In:**
Depress and hold this switch to fold left outer wing.

c. **Left Inner Wing Out:**
Depress and hold this switch to extend left inner wing.

d. **Left Inner Wing In:**
Depress and hold this switch to fold left inner wing.

e. **Right Main Boom Out:**
Depress and hold this switch to extend right main boom.

f. **Right Inner Wing In:**
Depress and hold this switch to fold right inner wing.

g. **Right Outer Wing Out:**
Depress and hold this switch to extend right outer wing.

h. **Right Outer Wing In:**
Depress and hold this switch to fold right outer wing.

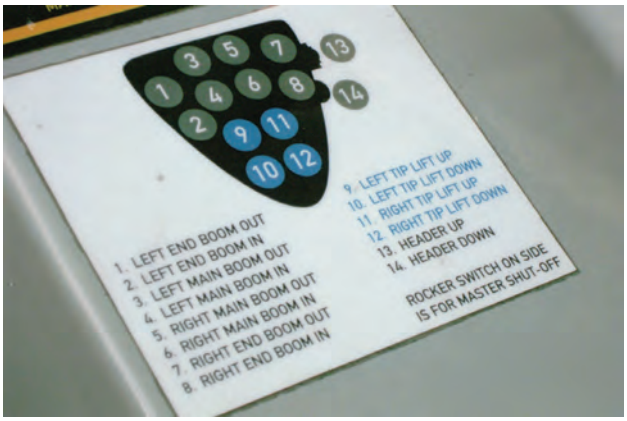
i. **Left Tip Lift Up:**
Depress and hold this switch to lift the left boom tip.

j. **Left Tip Lift Down:**
Depress and hold this switch to lower the left boom tip.

k. **Right Tip Lift Up:**
Depress and hold this switch to lift the right boom tip.

l. **Right Tip Lift Down:**
Depress and hold this switch to lower the right boom tip.

Joystick



Key

FIG. 5 JOYSTICK

m. **Center Mast Up:**
Depress and hold this switch to raise the complete boom assembly.

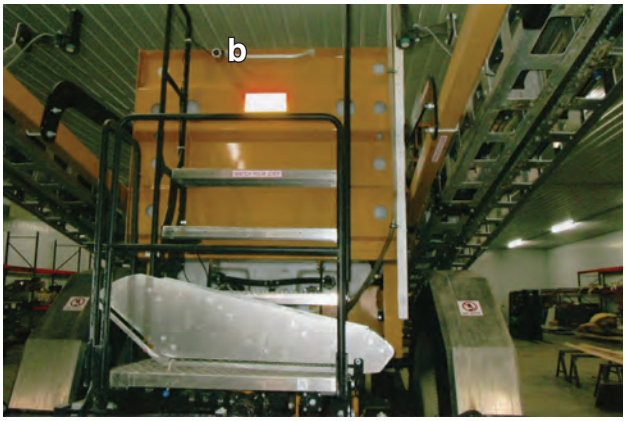
n. **Center Mast Down:**
Depress and hold this switch to lower the complete boom assembly.

4. **Back-Up Camera (optional):**
   There is an optional back-camera available for the sprayer. This screen displays what the optional back-up camera sees.

   a. **Screen**

   b. **Camera**

Screen



Camera

FIG. 6 BACK-UP CAMERA

5. **Tank Volume Tube:**
   This clear tube next to the right rear corner of the tank indicates the amount of liquid in the tank and can be seen by the operator filling the tank.

6. **Rear Control Panel:**
This panel is located on the left rear corner of the frame and provides a way for the operator to perform certain functions while standing at the back of the machine. In order for these controls to function, the engine must be running to provide pressurized oil to the systems.

   a. **Liquid Pump:**
   This two-position toggle switch controls the power to the chemical circuit pump. Move the switch up to turn the pump ON and down to turn OFF.

   b. **Agitate:**
   This two-position toggle switch opens the valve to direct some of the flow from the chemical circuit pump through the tank agitation circuit. Move the switch up to open the agitation valve and down to close. The chemical pump must be ON to provide flow for the agitation circuit.

   c. **Rear Boom:**
   This two-position toggle switch controls the height of the rear or center boom. Move the switch up to raise the boom and down to lower the boom.

   d. **Air Purge:**
   This two-position toggle switch controls the boom air purge system. Move the switch up to turn the purge On and down to turn OFF. When turned on, the truck air system is used to purge the chemical solution out of the circuit and booms.

FIG. 7 REAR CONTROL PANEL

7. **Pressure Gauge:**
This gauge displays the chemical circuit pressure. Generally the system operates between 60 and 100 psi.

8. **Pressure Gauge:**
This gauge displays the hydraulic system pressure.

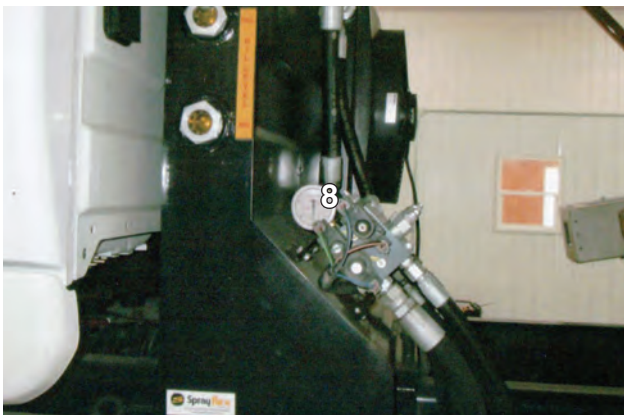


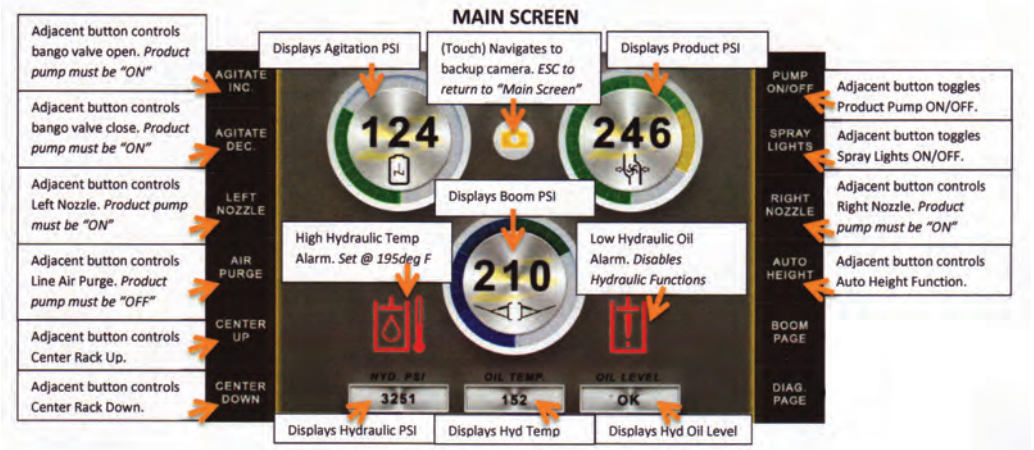
FIG. 8 HYDRAULIC PRESSURE GAUGE

4.5.1 Power Unit - 1600SS/RM & 2000SS/RM

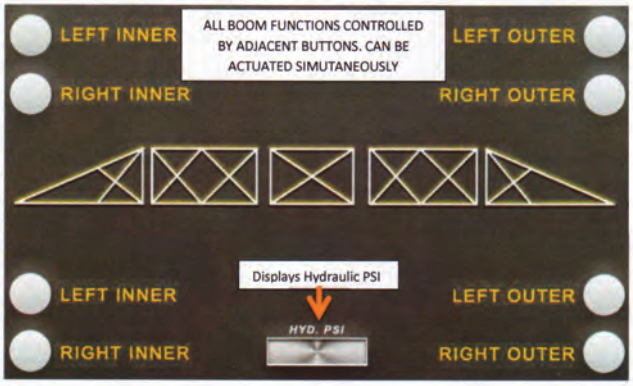
1. **Spray Circuit Controller:**
   A microprocessor-based controller selected by the customer is mounted in the cab to set, monitor, adjust and display several spray circuit parameters for the operator. Review and follow the calibration procedure at the start of the season and when changing chemicals or nozzles. Familiarize yourself with each controller function and control before starting.

2. **Sprayer System Controls:**
   The sprayer system controls are positioned in the cab to the right of the driver. Review this list before starting.

Spray Circuit Controller



Boom Screen



Diagnostic Screen

FIG. 9 SPRAYER SYSTEM CONTROLS

OTHER NOTES

1. Ignition "kills" power to all components listed on Diagnostic Screen. HMI does not shut off complete, but goes to "Low Power" mode for battery conservation.

2. Hydraulic Cooler Fan turns "ON" at 90° F and back "OFF" at 75° F.

3. "Auto Height" is a constant 12 V DC signal supplied to 1P weather pack on valve harness. Turns "ON" "Priority Valve".

4. Oil Temperature annunciator alarm can be silenced by tapping the icon. This feature is programmed as an indicator only.

5. "Spray Pump" overrides "Air Purge" then allows Nozzles and Agitate functions to operate when "ON".

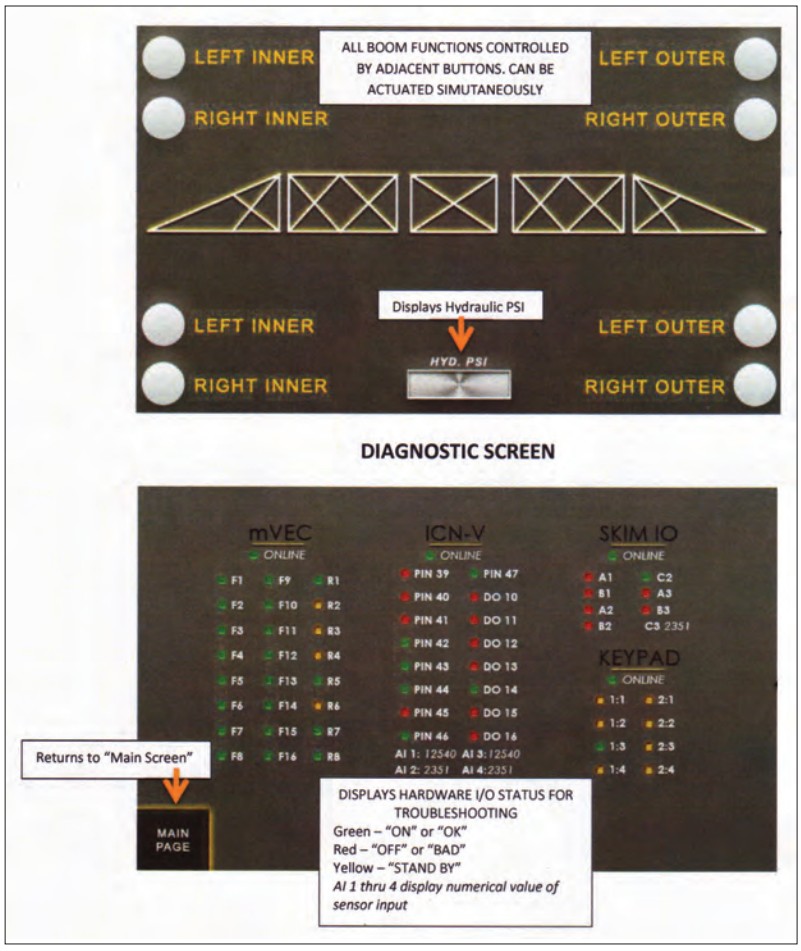


FIG. 10 SPRAYER SYSTEM CONTROLS

3. **Joystick:**

a. **Left Outer Wing Out:**
Depress and hold this switch to extend left outer wing.

b. **Left Outer Wing In:**
Depress and hold this switch to fold left outer wing.

c. **Left Inner Wing Out:**
Depress and hold this switch to extend left inner wing.

d. **Left Inner Wing In:**
Depress and hold this switch to fold left inner wing.

e. **Right Main Boom Out:**
Depress and hold this switch to extend right main boom.

f. **Right Inner Wing In:**
Depress and hold this switch to fold right inner wing.

g. **Right Outer Wing Out:**
Depress and hold this switch to extend right outer wing.

h. **Right Outer Wing In:**
Depress and hold this switch to fold right outer wing.

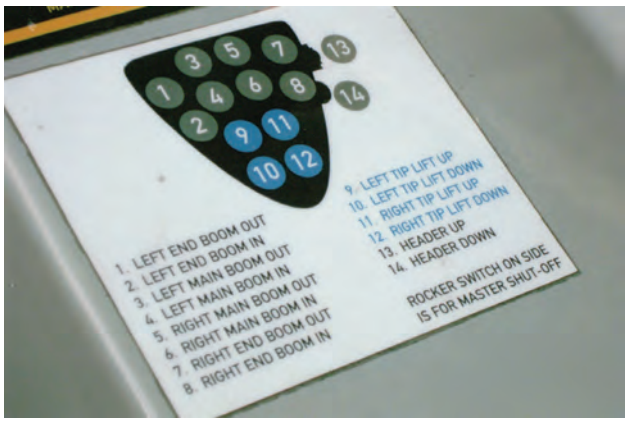
i. **Left Tip Lift Up:**
Depress and hold this switch to lift the left boom tip.

j. **Left Tip Lift Down:**
Depress and hold this switch to lower the left boom tip.

k. **Right Tip Lift Up:**
Depress and hold this switch to lift the right boom tip.

l. **Right Tip Lift Down:**
Depress and hold this switch to lower the right boom tip.

Joystick



Key

FIG. 11 JOYSTICK

m. **Center Mast Up:**
Depress and hold this switch to raise the complete boom assembly.

n. **Center Mast Down:**
Depress and hold this switch to lower the complete boom assembly.

6. **Rear Control Panel:**
This panel is located on the left rear corner of the frame and provides a way for the operator to perform certain functions while standing at the back of the machine. In order for these controls to function, the engine must be running to provide pressurized oil to the systems.

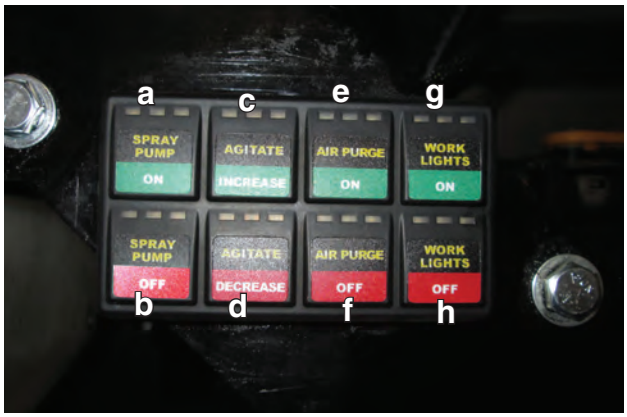


FIG. 12 REAR CONTROL PANEL

a. **Spray Pump ON:**
This two-position green latching switch controls the oil flow to the spray system pump. Depress switch to turn pump ON. When this switch is depressed, it releases the "Spray Pump Off" switch below it.

b. **Spray Pump OFF:**
This two-position red latching switch controls the oil flow to the spray system pump. Depress switch to turn pump OFF. When this switch is depressed, it releases the "Spray Pump On" switch above it.

c. **Agitate Increase:**
This two-position spring-loaded-to-off green switch controls the solenoid to increase the amount solution flowing through the system agitation circuit. Depress and hold the switch down to increase the amount of solution flowing through the agitation circuit. Release the switch and the agitation volume will remain the same.

d. **Agitate Decrease:**
This two-position spring-loaded-to-off red switch controls the solenoid to decrease the amount solution flowing through the system agitation circuit. Depress and hold the switch down to decrease the amount of solution flowing through the agitation circuit. Release the switch and the agitation volume will remain the same.

e. **Air Purge ON:**
This two-position spring-loaded-to-off green switch controls the solenoid to the air purge system. Depress the switch to turn the air purge system ON. Depressing this switch will release the off switch below.

f. **Air Purge OFF:**
This two-position spring-loaded-to-off red switch controls the solenoid to the air purge system. Depress the switch to turn the air purge system OFF. Depressing this switch will release the on switch above.

g. **Work Lights ON:**
This two-position spring-loaded-to-off green switch controls the power to the work lights. Depress the switch to turn the work lights ON.

h. **Work Lights OFF:**
This two-position spring-loaded-to-off red switch controls the power to the work lights. Depress the switch to turn the work lights OFF.

7. **Pressure Gauge:**
This gauge displays the chemical circuit pressure. Generally the system operates between 60 and 100 psi.

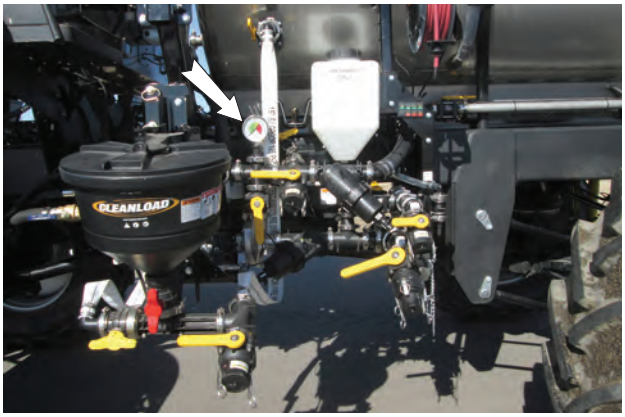


FIG. 13 CHEMICAL CIRCUIT PRESSURE GAUGE

9. **PTO ON/OFF:**
This two-position rocker switch controls the power to the PTO clutch. Depress the top portion of the switch to turn the PTO ON and the bottom portion to turn OFF. The PTO must be on to provide oil flow to the chemical circuit pump and boom position cylinders.

FIG. 14 PTO SWITCH

10. **Pressure Gauges:**
These gauges display the chemical circuit pressures at the booms.

    a. **Pump Pressure:**

    b. **Boom Pressure:**

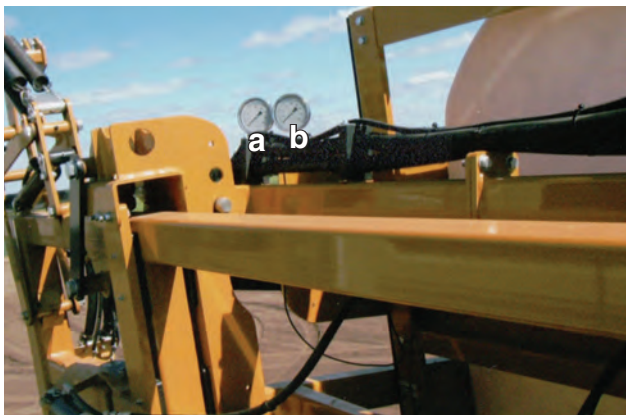


FIG. 15 BOOM PRESSURES

4.6 MACHINE PREPARATION

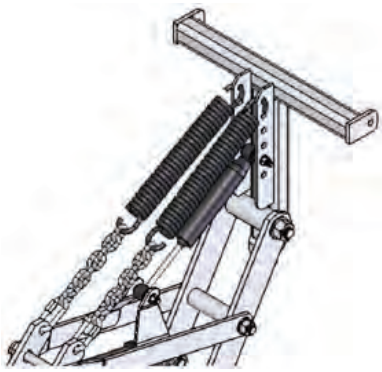
The sprayer can only perform in the field if it is prepared, adjusted and calibrated properly. Review this section before starting, to be sure the machine is prepared.

4.6.1 BOOM LEVELING

Chemical effectiveness in the field is dependent on setting the nozzles at an even height above the ground. The boom must be straight and level to apply chemicals evenly to the crop.

1. Clear the area of bystanders, especially small children.
2. Fully extend both booms and lower fully.
3. Verify that the 'T' anchor frame is vertical. To adjust 'T' angle:
   a. Reposition spring loop into new anchor hole.
   b. Reposition anchor chain loop.

Machine

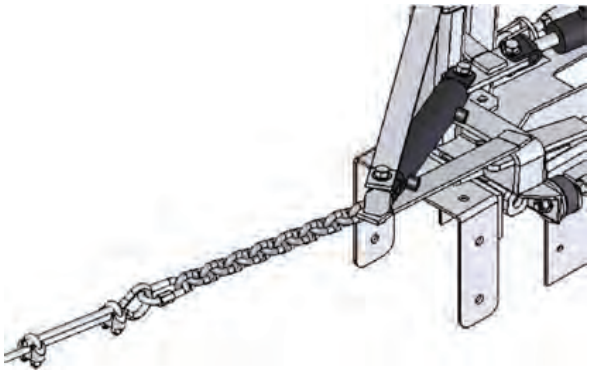


Schematic

FIG. 16 'T' ANCHOR FRAME (TYPICAL)

4. Adjust chain at boom joint to level boom if required by:
   a. Reposition turnbuckle to new chain loop.
   b. Adjust turnbuckle.

Machine



Schematic

FIG. 17 BOOM JOINT CHAIN (TYPICAL)

5. Sight along the boom to verify that it is level.

6. Repeat procedure with other boom.

FIG. 18 BOOM LEVEL

4.6.2 BOOM STRAIGHTENERS

Each boom joint is designed with a stop bolt that can be adjusted to keep the boom straight in the lateral direction. To adjust straightness, follow this procedure:

1. Clear the area of bystanders, especially small children.

2. Fully extend booms and position in their fully down position.

3. Sight along the boom. It should be straight.

4. To adjust each joint:

   a. Loosen adjusting bolt jam nut.

   b. Move adjusting bolt slightly to change joint angle.

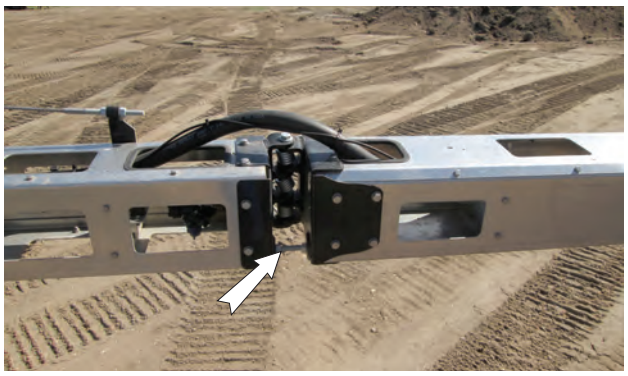
   c. Sight along boom to check for straightness.

   d. Move adjusting bolt again if required.

   e. Tighten jam nut to its specified torque.

   f. Repeat with other boom.

Inner Joint



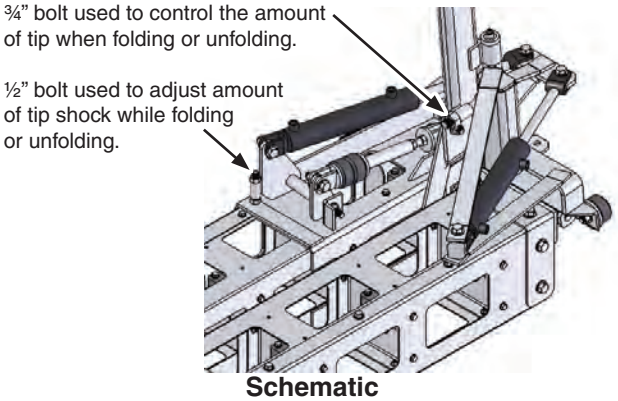
Outer Joint

FIG. 19 BOOM STRAIGHTNESS (TYPICAL)

4.6.3 BOOM FOLDING

Adjustments are available on the boom joints that aid when folding and extending the boom. Loosen jam nuts, move the adjusting bolts in 1/4 turn increments and fold/extend to determine the difference. Tighten jam nuts to their specified torque.

Machine Joint



Schematic

FIG. 20 FOLDING ADJUSTMENTS (TYPICAL)

4.6.4 SPRAYER CALIBRATION

A sprayer can only apply the proper amount of chemicals when each component in the system is functioning properly. Chemical action in the field is dependent upon the accurate application of minute amounts of the spray compound. A complete calibration of the machine is required at the start of each season or when changing chemicals during the spray season.

It is the responsibility of the customer to determine the amount of chemical that they want to apply for their particular application. Many factors affect how much chemical is applied such as: nozzle flow rate, chemical circuit pressure, pump speed, ground speed to name a few. In this section, instructions are given on how to accurately determine flow rates or application rates and how to change them. It is recommended that this procedure be followed carefully so you know exactly how much chemical is being applied.

Work closely with your chemical supplier, nozzle manufacturer and pest control specialists to equip and operate your machine to obtain the best results. Several nozzle types are available for the sprayer. Use the type appropriate for your application.

1. **Engine RPM:**
   Although the exact value of the engine speed is not particularly important to sprayer function, it is recommended that it always be set at 2/3 or more throttle position. This will insure that there will be sufficient oil flow through the hydraulic system and sufficient power to maintain the ground speed.

   Select the desired engine RPM and always perform the calibration and run in the field at the same setting.

2. **Controller Calibration:**
   The controller must be set and calibrated for your specific machine. Refer to the Controller manual and follow its Calibration procedure. Use the same controller settings during sprayer component calibrations as used in the field.

   The automatic controller will adjust the chemical circuit to provide for a uniform application rate when ground speed changes up to + 20%. However the system must be calibrated to determine the application rate at the nominal starting point.

3. **Nozzle Calibration:**
   Consult your dealer or the factory to determine the type of nozzles on your machine and their specific nominal flow rate. To determine or set the application rate, the flow rate of solution through the nozzles must be known. Operate the engine at the same RPM and hydraulic setting as if running in the field. Start with the chemical circuit pressure at 60 psi. Increase or decrease pressure as required to obtain desired flow rate.

   a. Remove all the nozzles from the sprayer.

   b. Replace with new nozzles or:

   c. Use clean water to wash each nozzle and clean the check valve.

   d. Reinstall the nozzles in the booms.

   e. Add clean water until the tank is 1/2 full.

   f. Place a calibration cup under all the nozzles on each boom.

   NOTE
   Measuring the flow rate for each nozzle will insure a consistent and uniform spray pattern across the entire machine.

   g. Run the engine at the RPM selected in Section 4.6.5 Operate the chemical circuit pump at the desired pressure and measure the time that it takes to spray a quart or liter through each nozzle.

      Use Table 1 (next page) to determine flow rate for the nozzle.

   h. Replace all nozzles giving more than 10% above the nominal flow rate.

   i. Reclean all nozzle components from nozzles 10% below the flow rate and then recheck.

Table 1: Nozzle Flow Rates

US Gallons		Imperial Gallons		Metric	
Time Time/qt min:sec	Flow Rate fl. oz./min.	Time Time/qt min:sec	Flow Rate fl. oz./min.	Time Time/liter min:sec	Flow Rate fl. liter/min.
6:24	5.0	8:00	5.0	7:00	143
6:40	4.8	8:20	4.8	7:18	137
6:57	4.6	8:42	4.6	7:38	131
		8:53	4.5	7:45	129
				7:56	126
7:07	4.5	9:05	4.4		
7:16	4.4	9:31	4.2	8:20	120
7:37	4.2			8:46	114
		10:00	4.0		
8:00	4.0	10:32	3.8	9:10	109
8:25	3.8			9:43	103
8:53	3.6	11:07	3.6		
		11:26	3.5	10:00	100
9:09	3.5	11:46	3.4	10:19	97
9:25	3.4			10:59	91
10:00	3.2	12:30	3.2	11:38	86
10:40	3.0				
		13:20	3.0	12:30	80
11:26	2.8				
		14:17	2.8	13:31	74
12:18	2.6				
12:48	2.5	15:23	2.6	14:05	71
13:20	2.4	16:00	2.5	15:30	69
		16:40	2.4	15:52	63
14:32	2.2				
		18:11	2.2		
16:00	2.0			16:33	57
		20:00	2.0		

4. **Machine Yard Calibration:**
After the nozzles have been calibrated, it is recommended that the entire system be calibrated. A yard run is the simplest method to determine total volume delivered. To calibrate in the yard, follow this procedure:

   a. Fill the tank full of water (no chemicals).

   b. Check that all screens are clean.

   c. Set the chemical system and boom pressure to the desired value and run the tractor at the selected engine RPM.

   d. Spray in a stationary position for a known period of time.

   e. Refill the tank and measure accurately the amount of water used.

   f. This will give the amount of spray used per time.

   The total volume can be changed by increasing or decreasing the chemical system pressure. However if a change is made, it is recommended that the entire system be calibrated again to determine the new volumes.

5. **Ground Speed Calibration:**
For optimum spraying results, it is important to maintain a known constant speed to spray the required chemical over a given area. Because of wheel slippage, the operator cannot rely on the speedometer reading to give the value of true ground speed. The unit must be timed over a known distance to determine true ground speed. To calibrate, follow this procedure:

   a. Mark off distance of 100, 200 or 300 feet in the field to be sprayed (longer distances provide greater accuracy).

   b. Place the power unit (truck) in the gear to give a speed between 6 and 8 mph (9.5 and 13 kph) and at the selected engine RPM.

   c. With the tank 1/2 full of water, drive the sprayer through the measured distance.

   d. Record the time required to travel the measured distance.

   e. Using Tables 2a and 2b, determine the actual travel speed. You can shift gears to change speed but it is recommended that you go through the measured distances again to determine true ground speed when using the manual controller.

   IMPORTANT
   Always operate at the engine RPM determined in Section 1.

   f. If the machine is equipped with the automatic controller, the ground speed can be changed by up to 20% without acquiring adjustments. However, do not decrease the throttle below its 2/3 setting.

Table 2a: Ground Speed Calibration mph

Speed	Travel Time in Seconds			Travel Time 1/2 Mile
mph	100 ft.	200 ft.	300 ft.	minutes:seconds
5.0	13.6	27.3	40.9	6:00
5.4	12.6	25.3	37.8	5:33
5.6	12.2	24.4	36.5	5:21
5.8	11.8	23.5	35.3	5:10
6.0	11.4	22.7	34.1	5:00
6.2	11.0	22.0	33.0	4:50
6.4	10.7	21.3	32.0	4:41
6.6	10.3	20.7	31.0	4:33
6.8	10.0	20.1	30.1	4:23
7.0	9.7	19.5	29.2	4:17
7.2	9.5	18.9	28.4	4:10
7.4	9.2	18.4	27.6	4:03
7.6	9.0	17.9	26.9	3:57
7.8	8.8	17.5	26.3	3:52
8.0	8.5	17.0	25.6	3:45
8.2	8.3	16.6	24.9	3:40
8.4	8.1	16.2	24.4	3:34
8.6	7.9	15.8	23.7	3:29
8.8	7.7	15.5	23.2	3:25
9.0	7.6	15.2	22.7	3:20
9.2	7.4	14.8	22.2	3:16
9.4	7.3	14.5	21.8	3:11
9.6	7.1	14.2	21.3	3:08
10.0	6.8	13.6	20.5	3:00

Table 2b: Ground Speed Calibration kph

Speed	Travel Time in Seconds			Travel Time 1 kilometer
kph	30.5 m.	61.0 m.	47.6 m.	minutes:seconds
7.0	15.9	31.7	47.6	8:44
7.5	14.8	29.5	43.2	8:08
8.0	13.6	27.3	40.9	7:30
8.5	12.9	25.9	38.7	7:05
9.0	12.2	24.4	36.5	6:41
9.5	11.6	23.2	34.7	6:21
10.0	11.0	22.0	33.0	6:02
10.5	10.5	21.0	31.5	5:46
11.0	10.0	20.1	30.1	5:29
11.5	9.6	19.2	29.2	5:21
12.0	9.1	18.2	27.3	5:00
12.5	8.7	17.5	26.3	4:49
13.0	8.4	16.8	25.3	4:38
13.5	8.1	16.2	24.4	4:27
14.0	7.8	15.7	23.5	4:19
14.5	7.6	15.2	22.7	4:10
15.0	7.3	14.7	22.0	4:02
15.5	7.1	14.0	21.3	3:55
16.0	6.9	13.8	20.7	3:47

6. **Area Covered:**
To determine application rates, it is necessary to know the area covered by the sprayer during one pass. Table 4 gives the area for three widths:

Table 3: Actual Sprayer Coverage

Sprayer	Acres		Hectares	
Width	1/2 Mile	1/4 Mile	1/2 km	1/4 km
90'	5.45	2.73	2.18	1.09
120'	7.28	3.64	2.90	1.45

7. **Field Calibration:**
To verify the application rates in the field, follow this procedure:

a. Fill the tank to the neck with water and mark the level of water.

b. Check that all screens are clean.

c. Set the chemical system pressure to the desired value and run the power unit at the selected engine RPM in the selected gear.

d. Drive through the measured distance while spraying.

e. Refill the tank to the same mark and me sure the amount required.

f. Divide the amount of liquid sprayed by the area covered to determine the application rate.

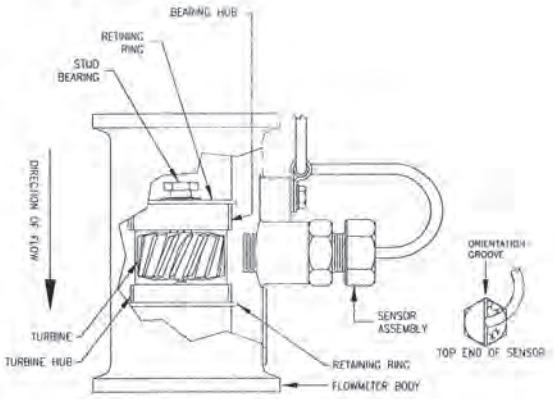
$$\text{Appl. Rate} = \frac{\text{Volume Sprayed}}{\text{Area Covered}} = \frac{\text{gals (liters)}}{\text{acre (hectare)}}$$

Table 4: Conversions

1 km	0.62 mile
1 ha	2.5 acres
1 g	0.035 oz.
1 kg	2.2 lbs.
1 g/ha	0.014 oz/acre
1 kg/ha	0.88 lb/acre
1 ml	0.035 fl. oz.
1L	0.264 gal (US)
1L	0.22 gal (Imp.)
1L/s	15.85 gpm (US)
1L/s	13.20 gpm (Imp.)
1 kPa	0.145 psi
1 mm	0.04 in.
1 m	3.28 ft.
1 L/ha	0.106 gal (US)/acre
1 L/ha	0.088 gal (Imp.)/acre

RFM 60 P FLOWMETER MAINTENANCE AND ADJUSTMENT PROCEDURE

1) Remove Flowmeter from Sprayer, brush away any debris and flush with clean water to remove any foreign material.
2) Remove the retaining rings carefully. Remove the bearing hub, turbine hub, and turbine from inside Flowmeter housing.
3) Clean the turbine and hubs of metal filings and any other foreign material. Use pressurized air to blow metal fillings and debris out of both hubs and turbine. Confirm that the turbine blades are not worn. Hold turbine and bearing hub in your hand and spin turbine. It should spin freely with very little drag.
4) If bearing hub stud is adjusted or replaced, verify the turbine fit before reassembling: Put turbine hub and retaining ring in place. Put bearing hub with turbine against turbine hub inside the Flowmeter housing. (Make sure stud keys inside Flowmeter housing are lined up in the groove on the hub). Put the retaining ring into the groove, to lock bearing hub in place. Spin turbine by blowing on it. Tighten bearing hub stud until turbine stalls. Loosen the stud 1/3 of a turn. The turbine should spin freely.
5) Use a low pressure (5 psi) [34.5 kPa] jet of air thru Flowmeter in the direction of flow and again in opposite direction to verify that the turbine spins freely. If there is drag, loosen the stud on the bearing hub 1/16 turn until the turbine spins freely.
6) If turbine spins freely and the cables have checked out O.K., but the Flowmeter is not totalizing properly, verify that the Sensor Assembly is threaded all the way into the Flowmeter body, and the orientation groove on top of sensor is parallel with Flowmeter body. If Flowmeter still does not totalize, replace Sensor Assembly.



Note: For best performance of RFM 60 P Flowmeter, allow 6" straight pipe, 1 1/2" diameter on both ends of Flowmeter (or use 2" BANJO Flange fittings instead). Do not use plumbing size smaller than 1 1/2" diameter or change the direction of plumbing within 6" at each end of Flowmeter.

PROCEDURE TO RE-CALIBRATE FLOWMETER

1) Enter a METER CAL number of 10 [38] in [METER CAL 5].
2) Enter a TOTAL VOLUME of 0 in [TOTAL VOLUME].
3) Switch OFF all booms.
4) Remove a boom hose and place in calibrated 5 gallon [19 liter] container.
5) Switch ON appropriate boom switch and MASTER switch. Pump exactly 10 gallons [38 liters].
6) Readout in TOTAL VOLUME is the new METER CAL number. This number should be within +/- 3% of the number stamped on the tag on Flowmeter.
7) Repeat this procedure several times to confirm accuracy. (Always "zero out" the TOTAL VOLUME display before retesting).

NOTE: For greatest precision, set METER CAL to 100 [378] and pump 100 gallons [378 liters] of water.

8) To verify Flowmeter calibration, fill applicator tank with a predetermined amount of measured liquid (i.e. 250 gallons). **DO NOT RELY ON GRADUATION NUMBERS MOLDED INTO APPLICATOR TANK.** Empty the applicator tank under normal operating conditions. If the number displayed under TOTAL VOLUME is different from the predetermined amount of measured liquid by more than +/- 3%, complete the following calculation.

EXAMPLE:
METER CAL = 720 [190]
TOTAL VOLUME = 260 [983]
Predetermined amount of measured liquid = 250 [945]

$$\text{Corrected METER CAL} = \frac{\text{METER CAL} \times \text{TOTAL VOLUME}}{\text{Predetermined amount of measured liquid}}$$

ENGLISH UNITS:
$= \frac{720 \times 260}{250} = 749$

METRIC UNITS:
$= \frac{[190] \times [983]}{[945]} = [198]$

Corrected METER CAL = 749 [198]

9) Enter corrected METER CAL before resuming application.

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9. **RFM 100 Flowmeter:**

RFM 100 FLOW METER MAINTENANCE AND ADJUSTMENT PROCEDURE

1) Remove Flow Meter from sprayer and flush with clean water to remove any chemicals.
2) Remove flange bolts or clamp from the Flow Meter.
3) Remove the turbine hub and turbine from inside Flow Meter.
4) Clean turbine and turbine hub of metal filings and any other foreign material, such as wettable powders. Confirm that the turbine blades are not worn. Hold turbine and turbine hub in your hand and spin turbine. It should spin freely with very little drag.
5) If transducer (XDCR) assembly is replaced or if turbine stud is adjusted or replaced, verify the turbine fit before reassemling. Hold turbine hub with turbine on transducer. Spin turbine by blowing on it. Tighten turbine stub until turbine stalls. Loosen turbine stud 1/3 turn. The turbine should spin freely.
6) Re-assemble Flow Meter.

> *IMPORTANT: DO NOT OVERTIGHTEN FLOW METER BAND CLAMP. TIGHTEN BAND CLAMP UNTIL CLAMP FLANGES ARE .375 APART. SEE FIGURE 2. OVERTIGHTENING MAY DAMAGE FLOW METER.

7) Use a low pressure (5 psi) [34.5 kPa] jet of air thru Flowmeter in one direction and then again in opposite direction to verify that the tubine spins freely. If there is drag, loosen hex stud on the bottom of turbine hub 1/16 turn until the turbine spins freely.
8) If turbine spins freely, and if cables have checked out O.K., but Flow Meter is still not totalizing properly, replace Flow Meter transducer.

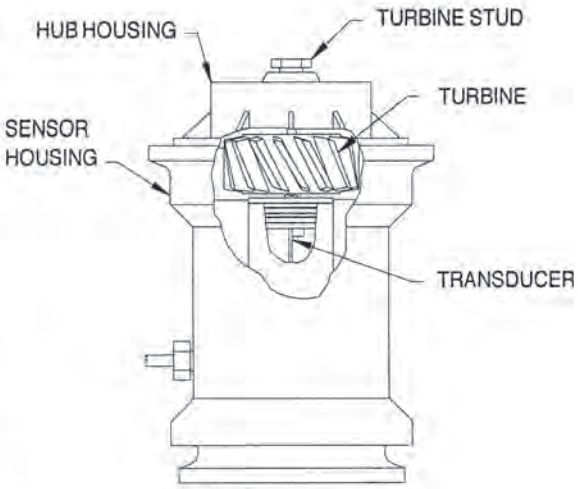

Figure 1

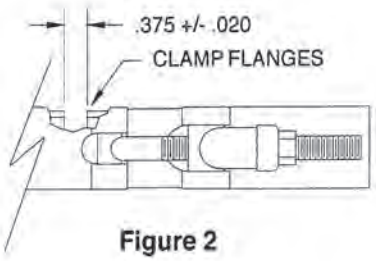

Figure 2

PROCEDURE TO RE-CALIBRATE FLOW METER

1) Enter a METER CAL number of 10 [38] in 

.

2) Enter a TOTAL VOLUME of 0 in 

.

3) Switch OFF all booms.
4) Remove a boom hose and place in calibrated 5 gallon [19 liter] container.
5) Switch ON appropriate boom switch and MASTER switch. Pump exactly 10 gallons [38 liters].
6) Readout in TOTAL VOLUME is the new METER CAL number. This number should be within +/- 3% of the number stamped on the tag on Flow Meter.
7) Repeat this procedure several times to confirm accuracy. (Always "zero out" the TOTAL VOLUME display before retestng).

> **NOTE:** For greatest precision, set METER CAL to 100 and pump 100 gallons (378 liters) of water.

8) To verify Flow Meter calibration, fill applicator tank with a predetermined amount of measured liquid (i.e. 250 gallons).

> **DO NOT RELY ON GRADUATION NUMBERS MOLDED INTO APPLICATOR TANK.**

Empty the applicator tank under normal operating conditions. If the number displayed under TOTAL VOLUME is different from the predetermined amount of measured liquid by more than +/- 3%, complete the following calculation. See Example, Figure 3.

9) Enter corrected METER CAL before resuming application.

EXAMPLE:
METER CAL = 680 [164]
TOTAL VOLUME = 260 [984]
Predetermined amount of measured liquid =250 [946]

Corrected METER CAL =

$$\frac{\text{METER CAL} \times \text{TOTAL VOLUME}}{\text{Predetermined amount of measured liquid}}$$

ENGLISH UNITS: $= \frac{680 \times 260}{250} = 707$

METRIC UNITS: $= \frac{[164] \times [984]}{[946]} = [170]$

Corrected METER CAL = 707 [170]

Figure 3

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4.7 FIELD OPERATION

OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before using. Review safety instructions annually.
- Place all controls in neutral, stop engine, turn monitor off, set park brake, remove ignition key, wait for nozzles to stop spraying before servicing, adjusting, repairing or unplugging.
- Before spraying a field, be familiar with all potential hazards: trees, rocks, ditches, gullies, etc. Plan the spraying route to avoid hazards. Remember you are driving a wide machine.

  USE CAUTION WHEN CORNERING.
- Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
- Do not allow riders on the sprayer, tractor or truck during operation or transporting.
- Clear the area of all bystanders, especially small children, before starting or filling with water or chemical.
- Stay away from boom pinch points when folding or extending wings. Keep others away.
- Stay away from power lines when extending or folding booms. Electrocution can occur without direct contact.
- Read chemical manufacturers warnings, instructions and procedures before starting and follow them exactly.
- Do not breathe, touch or ingest chemicals. Always wear protective clothing and follow safe handling procedures.
- Spray only when potential for chemical drift is at a minimum. Even small amounts can affect neighboring crops or sensitive plants and people.
- Dispose of chemical containers by triple rinsing them into the sprayer tank or thoroughly rinsing, crushing and delivering to regional disposal site.
- In case of poisoning, get immediate medical attention.
- Only rinse sprayer while still in the field. Spray the rinse thinly over the field already sprayed. Never contaminate the farmyard or drainage systems with sprayer rinse.
- Do not eat in the field when spraying.
- Before applying pressure to the hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition.
- Before applying pressure to chemical system make sure that all connections are tight and that all hoses and fittings are in good condition.

Follow this procedure when using the sprayer:

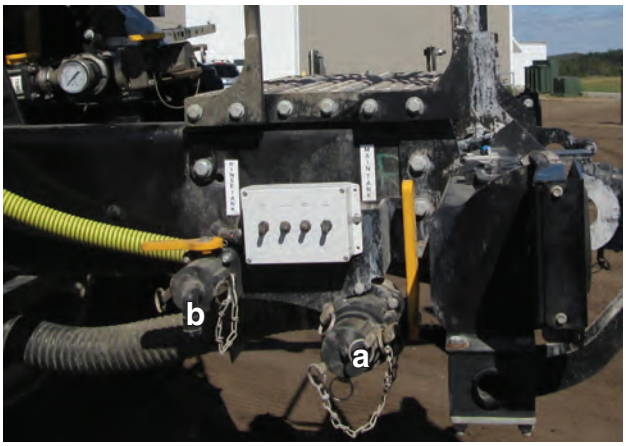
1. Review and follow the pre-operation checklist (see Section 4.4).
3. Review the location and function of all controls (see Section 4.6).
4. Read and follow chemical manufacturers' instructions.
5. Calibrate the sprayer so you know exactly how much chemical is being applied (see Section 4.6.3). The application of excess chemicals, even in small amounts, can have detrimental affects. Re-calibrate at the start of the season or when changing chemicals is a must.
6. Transport the sprayer to the working area (See Section 4.8).
7. Review chemical circuit schematic and valve information before starting.

8. After arriving at the field, fill the sprayer.

9. Extend the hose from the supply vehicle or pump to the sprayer.

IMPORTANT

It is recommended that the water supply system be equipped with a pump for transferring water and the eductor system.



a. Main Tank b. Rinse Tank

FIG. 21 FILLING

10. Engage the PTO on the 1600SS/RM and 2000SS/RM Models.

FIG. 22 PTO CONTROL

11. **Filling Main Tank:**

NOTE

See schematic and key on next page.

a. Remove cover on bottom fill fitting, attach hose and secure with cam-locks.

b. Open the top lid cover on the tank if using the 3 inch line from the supply vehicle to fill.

c. Open valves 3 and 4 between the bottom fill coupler and the main tank.

d. Open the valve at the supply vehicle, start the supply source pump and fill the sprayer.

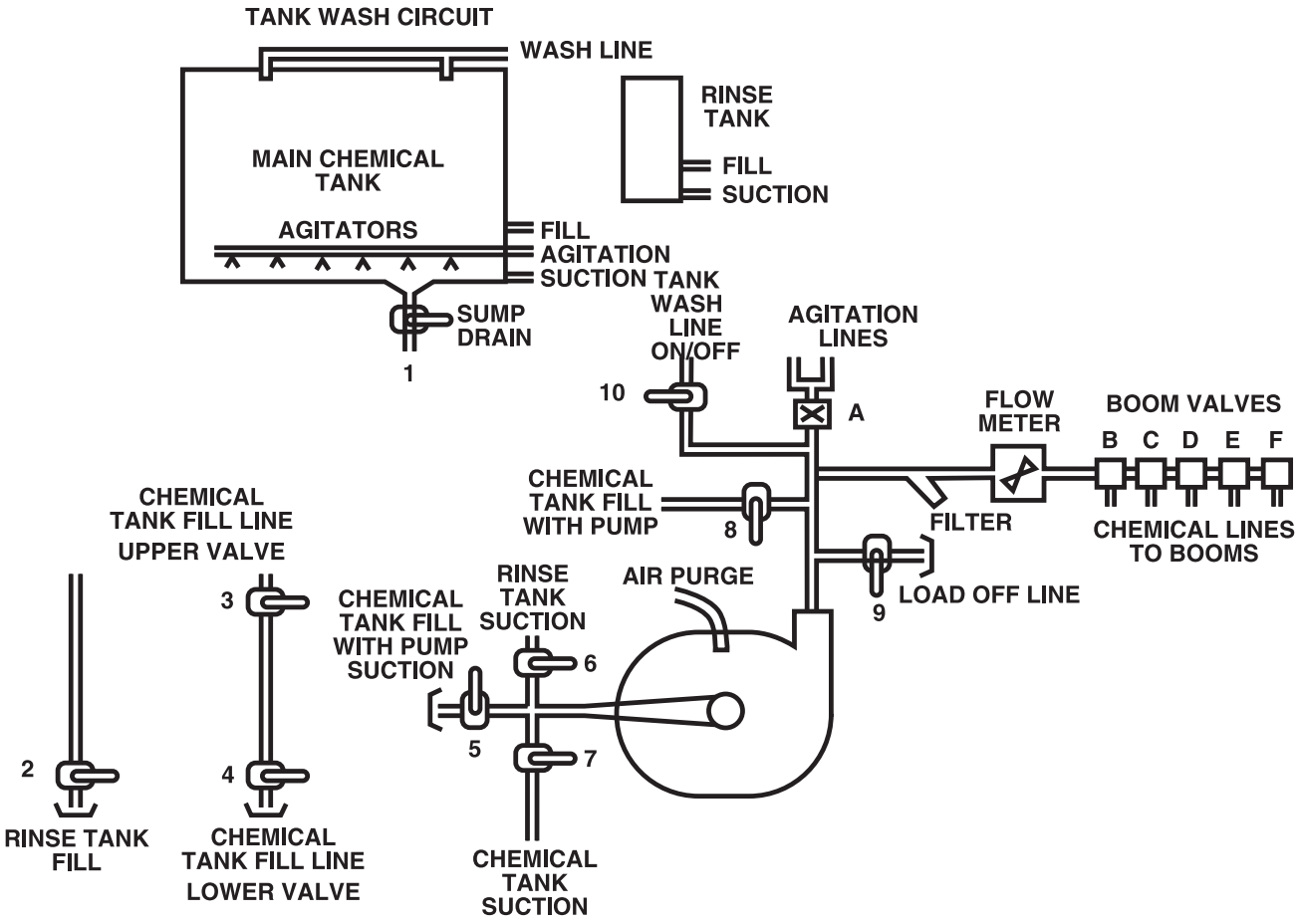
e. Start the sprayer pump to circulate water through the system when the tank is 1/4 filled.

IMPORTANT

Be sure the water is clean. Clean water is necessary to prevent screen and check valve plugging.

IMPORTANT

Do not start the sprayer pump until the water from the supply vehicle has started to flow. Water is necessary to cool and lubricate the pump seals. Without water, the seals will fail in a few minutes.



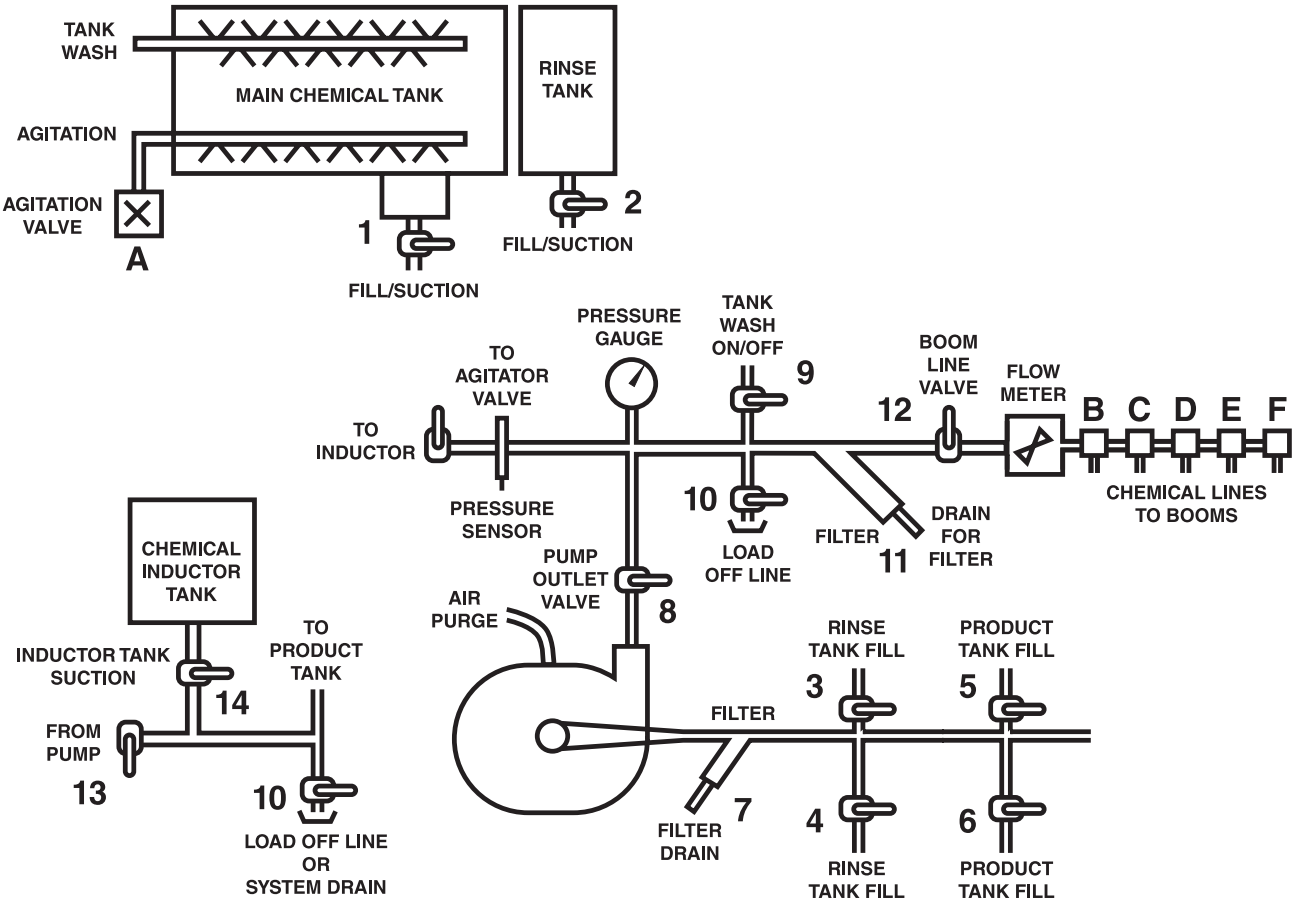
Manually Operated Valves:

1. Sump Drain
2. Rinse Tank Fill Line
3. Chemical Tank Fill Line - Upper Valve
4. Chemical Tank Fill Line - Lower Valve
5. Chemical Tank Fill with Pump
6. Rinse Tank Suction
7. Chemical Tank Suction
8. Chemical Tank Fill with Pump
9. Load Off Line
10. Tank Wash Line Hand Valve - On/Off

Chemical Controller Valves:

A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

FIG. 23 CHEMICAL CIRCUIT SCHEMATIC FOR TRUCK MODEL AND KEY



Manually Operated Valves:

1. Sump Fill/Suction
2. Rinse Tank Fill/Suction Line
3. Rinse Tank Fill - Upper Valve
4. Rinse Tank Fill - Lower Valve
5. Product Tank Fill Line - Upper Valve
6. Product Tank Fill Line - Lower Valve
7. Suction Filter - Drain
8. Pump Outlet
9. Tank Wash Line Hand Valve - On/Off
10. Load Off Line - System Drain
11. Pressure Filter - Drain
12. Boom Lines
13. Inductor Tank Suction with Pump
14. Inductor Tank Suction

Chemical Controller Valves:

A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

FIG. 24 CHEMICAL CIRCUIT SCHEMATIC FOR 1600SS/RM, 2000SS/RM AND KEY

e. While the tank is filling, add the chemical.

i. Start the sprayer pump for agitation.

ii. Add the chemical through the eductor tank on the water supply vehicle.

IMPORTANT

The sprayer pump must be running to circulate the solution in the system and provide agitation.

iii. Or use the optional eductor tank on the left side of the sprayer frame.

- Use the optional two inch main tank fill line to fill tank.
- Connect water line to coupler.
- Open valves 11 and 12.
- Pump water into tank.
- Add chemical into eductor tank.
- Open valve 13 to draw chemical into main tank.
- Place chemical jug/pail over wash head inside eductor tank to rinse.
- Open valve 14 to rinse jug/pail into eductor tank.
- Close valve 14 when container is rinsed.
- Dispose of jug/pail at a chemical disposal site.
- Repeat with next container.
- Close eductor tank lid and use the container rinse function to wash the inside of the tank.
- Close valve 13 when all the rinse water has been pulled into the main tank.
- Close valves 11 and 12 when main tank has been filled.
- Raise eductor tank into its storage position.

DANGER

- **Wear rubber gloves, eye protection and protective clothing whenever handling chemicals.**
- **Do not breathe vapor or ingest chemicals and avoid contact with exposed skin.**
- **Follow chemical manufacturer's instructions.**

Tank

Rinsing

Wash Head

FIG. 25 OPTIONAL EDUCTOR TANK

iv. Triple rinse each chemical container when empty.

v. Repeat with the next container until all the chemical has been added.

vi. Discard used containers at your nearest chemical container disposal site.

f. When the tank is full, close Valve 2 at the sprayer, close valve at the supply vehicle and stop the pump on the supply vehicle. This will prevent back flushing from the sprayer.

NOTE

Watch the tank sight tube to monitor how full the tank is. Do not use the scale as an accurate volume indicator.

FIG. 26 TANK SIGHT TUBE

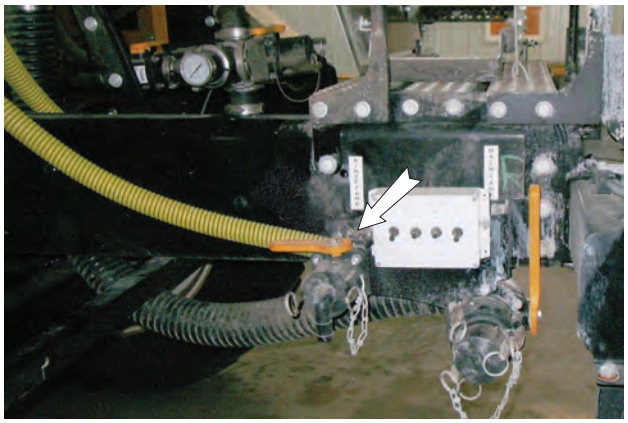
g. Disconnect the water hose and secure the cap.

h. Run the pump to allow the solution to circulate. Mix for 2 minutes before starting to spray.

12. Fill the 100 gallon rinse tank as required. Attach water line from the supply vehicle, open valve 2 and start pump on supply vehicle to fill tank.

13. When full, stop pump, disconnect water line and secure cap.

Rinse Tank



Fill Fitting

FIG. 27 RINSE TANK

14. Move the supply vehicle out of the way.

14. **Filling Main Tank with Sprayer Pump:**

a. Remove cover on line next to valve 5, attach water hose and secure with cam-locks.

b. Open valves 5 and 8 to allow water to flow into the main tank.

c. Open valve on the supply vehicle to start the flow of water.

IMPORTANT

The supply vehicle must be positioned at a higher elevation than the pump to keep the pump primed before it is started. Check that the air purge line on the pump is filled with water to verify pump is primed before running pump.

d. Start engine, turn pump on and fill tank.

e. Refer to step 11 - e to add the chemical to the system.

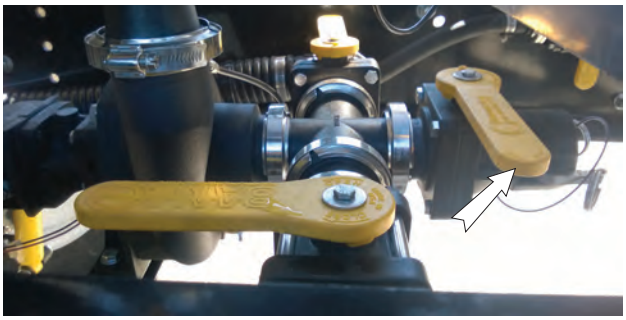
f. Close valve 8 when tank is full.

NOTE

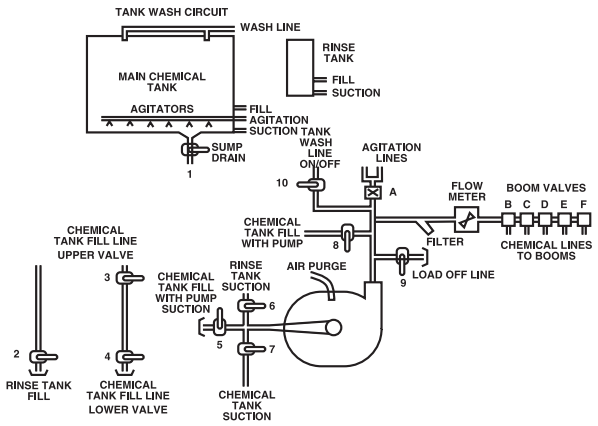
Watch tank sight tube to monitor tank level.

g. Stop pump and close valve on supply vehicle line.

h. Disconnect water line and install cap and secure with cam locks.



Tank Fill Cap



Schematic

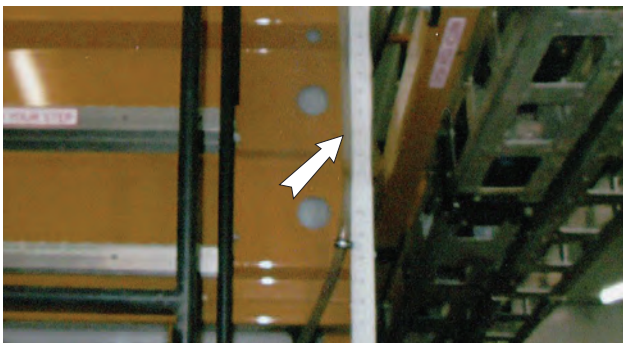
Manually Operated Valves:

1. Sump Drain
2. Rinse Tank Fill Line
3. Chemical Tank Fill Line - Upper Valve
4. Chemical Tank Fill Line - Lower Valve
5. Chemical Tank Fill with Pump
6. Rinse Tank Suction
7. Chemical Tank Suction
8. Chemical Tank Fill with Pump
9. Load Off Line
10. Tank Wash Line Hand Valve - On/Off

Chemical Controller Valves:

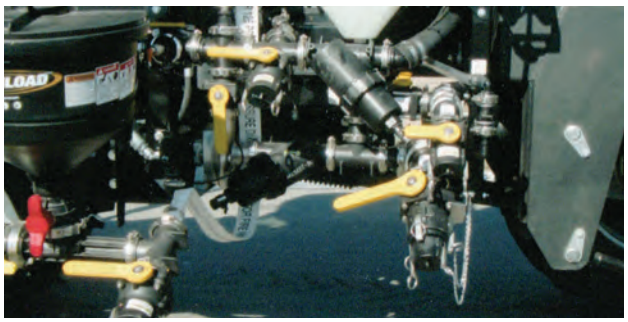
A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

Key

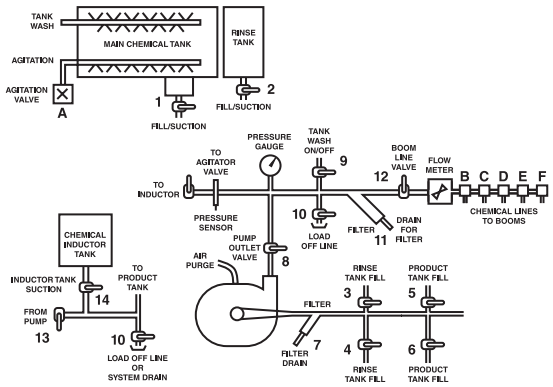


Tank Sight Tube

FIG. 28 FILLING WITH PUMP (TRUCK MODEL)



Tank Fill Cap



Schematic

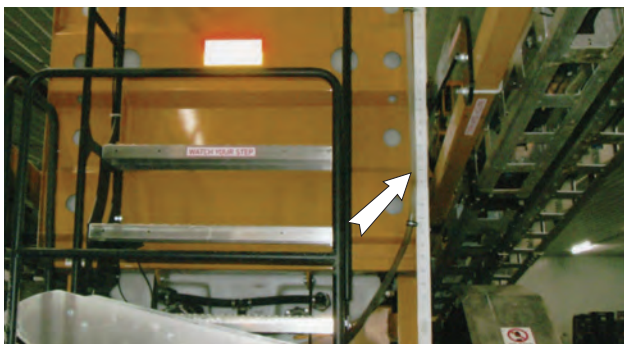
Manually Operated Valves:

1. Sump Fill/Suction
2. Rinse Tank Fill/Suction Line
3. Rinse Tank Fill - Upper Valve
4. Rinse Tank Fill - Lower Valve
5. Product Tank Fill Line - Upper Valve
6. Product Tank Fill Line - Lower Valve
7. Suction Filter - Drain
8. Pump Outlet
9. Tank Wash Line Hand Valve - On/Off
10. Load Off Line - System Drain
11. Pressure Filter - Drain
12. Boom Lines
13. Inductor Tank Suction with Pump
14. Inductor Tank Suction

Chemical Controller Valves:

A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

Key



Tank Sight Tube

FIG. 29 FILLING WITH PUMP (1600SS/RM)

15. Although well water is recommended, surface water can be used if it is thoroughly filtered. Be sure to keep the filters clean when using this method.

16. If using wettable powders slowly add the powder. Be sure the tank is at least 1/2 full of water and the pump is running.

    If the powder is not added slowly, clumps of powder will be drawn into the suction line and plug the screen in the filter.

IMPORTANT

It is recommended that the wettable powder be pre-mixed in hot water before adding to the sprayer. This prevents clumps from plugging the filters. Triple rinse the mixing container when it is empty.

17. If foaming occurs, add an anti-foaming additive to the tank.

18. **Nozzle Height (Broadcast):**
    The nozzle is adjustable from 20 to 72 inches (500 to 1750 mm dependant on tire size). Set the height so the spray pattern from the nozzles overlap a couple of inches above the crop canopy or plants.

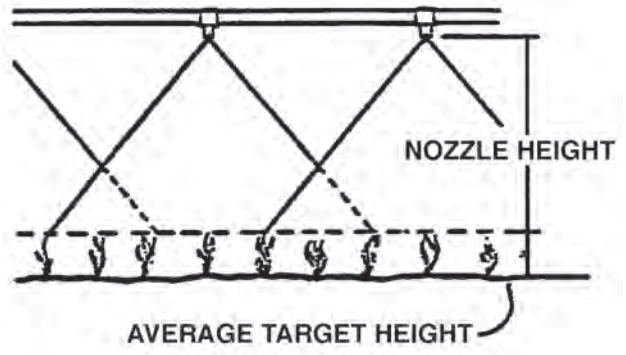
19. **Travel Speed:**
    Crop and plant type will determine the travel speed for spraying.

    a. **Cereal crops - broadcast planting:**
    A travel speed of 6 to 12 mph (9.7 to 19 kph) is recommended for most operating is appropriate for the conditions.

    b. **Row Crops:**
    A travel speed of 5 to 10 mph (8.1 to 16 Km hr) is recommended in row crops. For crops that have a dense foliage canopy, a slower speed gives more time for the spray to open the plant canopy and allow the chemical to get inside and coat the underside of the leaves. However operate at a speed that is appropriate for the conditions.

Field

Boom



Diagram

FIG. 30 NOZZLE HEIGHT

20. **For broadcast spraying:**
    It is recommended that the operator make one pass around a field to start and then spray back and forth to obtain the best results. Using a marker system helps to prevent skips or overlap.

    If your field has headlands, be sure to allow sufficient space for turning.

21. For row crop spraying, start at one edge of the field and go back and forth until the field is completed.

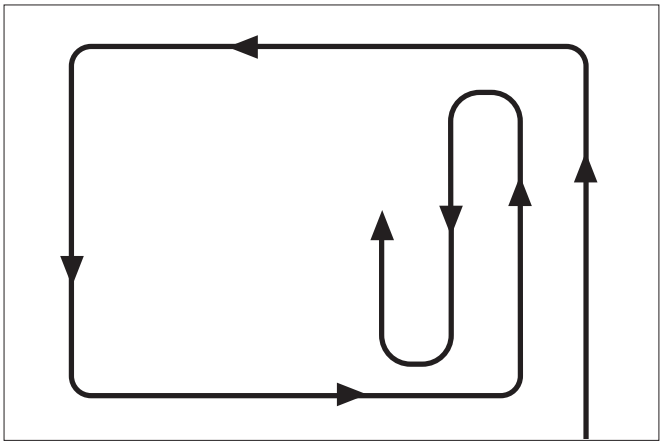


FIG. 31 TRAVEL PATTERN (BROADCAST)

22. Be sure the sprayer is calibrated, the nozzle height and pressure are known and the transmission gear and RPM are determined before starting to spray (see Section 4.6).

23. Proceed down the field at a constant speed. Use the selected gear, engine RPM and ground speed determined during the calibration of the machine application rate.

24. Refer to the chemical circuit controller to determine how to operate sprayer.

25. Use the circuit and GPS to control the operation.

FIG. 32 CONTROL BOXES (TYPICAL)

26. When completing a pass and approaching the sprayed headland, maintain the engine RPM and ground speed until the nozzles have covered all the plants. This will insure a consistent application rate at the ends of the field.

FIG. 33 SPRAYING

27. **Boom Tilt:**
Each side of the boom is equipped with a tilt cylinder that allows the operator to tilt the individual boom up at the ends of the field or whenever required to clear obstacles.

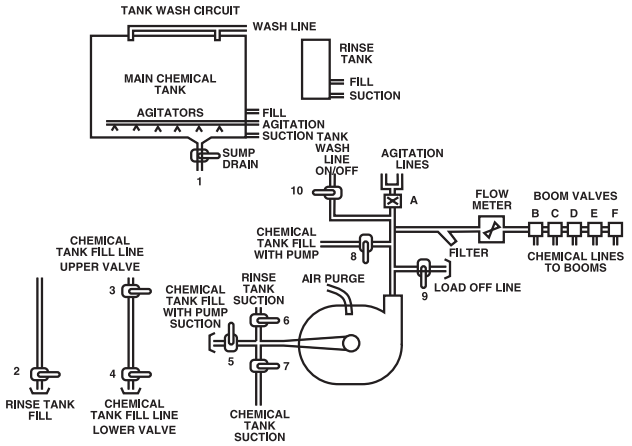
FIG. 34 BOOM TILT CYLINDERS (TYPICAL)

28. **Boom Break-Away:**
Each boom is designed with a break-away hinge between the outer booms and the boom extension. Each of these hinges will break-away when the boom strikes an obstruction to prevent damaging the boom.

FIG. 35 BOOM BREAK-AWAY JOINT (TYPICAL)

29. **Valve Settings:**
The chemical circuit is designed with 10 valves that are manually operated and six that are operated by the circuit controller. Review the schematic to understand how the system works.

Turn the handle parallel to the line to open the valve and at right angles to close the valve. Open the appropriate valve for the operation being performed and close it when finished. Refer to schematic, key and other annotated photos.



Schematic

Manually Operated Valves:

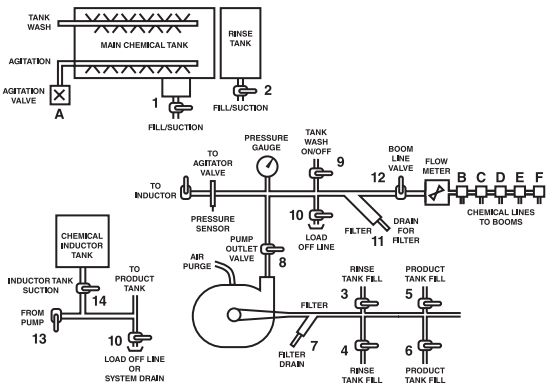
1. Sump Drain
2. Rinse Tank Fill Line
3. Chemical Tank Fill Line - Upper Valve
4. Chemical Tank Fill Line - Lower Valve
5. Chemical Tank Fill with Pump
6. Rinse Tank Suction
7. Chemical Tank Suction
8. Chemical Tank Fill with Pump
9. Load Off Line
10. Tank Wash Line Hand Valve - On/Off

Chemical Controller Valves:

A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

Key

FIG. 36 CHEMICAL DIAGRAM (TRUCK MODEL)



Schematic

Manually Operated Valves:

1. Sump Fill/Suction
2. Rinse Tank Fill/Suction Line
3. Rinse Tank Fill - Upper Valve
4. Rinse Tank Fill - Lower Valve
5. Product Tank Fill Line - Upper Valve
6. Product Tank Fill Line - Lower Valve
7. Suction Filter - Drain
8. Pump Outlet
9. Tank Wash Line Hand Valve - On/Off
10. Load Off Line - System Drain
11. Pressure Filter - Drain
12. Boom Lines
13. Inductor Tank Suction with Pump
14. Inductor Tank Suction

Chemical Controller Valves:

A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

Key

FIG. 37 CHEMICAL DIAGRAM (1600SS/RM)

30. **Components:**

a. **Tanks**

Tanks

b. **Fill Intakes**

Fill Intakes

c. **Fill Lines**

Fill Lines

d. **Agitation Components**

Agitation Components

FIG. 38 COMPONENTS

e. **Pump Intake**

Pump Intake

f. **Pump Outlet**

Pump Outlet

g. **Boom Valves**

Boom Valves

FIG. 39 COMPONENTS

31. **Rinse Tank:**
The machine is equipped with a 100 gallon rinse tank on the rear of the frame. It should be used at the end of each working day to flush out the pump and booms to prevent corrosion. Or use it to flush out the system prior to performing any maintenance work on the machine. Refill the tank again with clean water when refilling the main tank.

FIG. 40 RINSE TANK

32. **Fresh Water Tank:**
The machine is equipped with a fresh water tank to be used to wash and clean operators if they come in contact with the chemical or solution. Fill with fresh clean water on a daily basis or more often if the tank is used.

FIG. 41 FRESH WATER TANK (TYPICAL)

33. **Air Purge:**
The machine is designed with a system that uses pressurized air from the truck's air brake system to blow out the fluid/liquid from the chemical circuit. Blow out the circuit at the end of the day, when changing chemicals or before placing in storage. The air purge system is controlled by switches in the cab. Air is directed into the pump body and flows through the metering and boom systems.

Extend booms into field configuration. Close valves 5,6,7,8,9 and 10 plus turn agitation system off to isolate chemical system. Turn air purge system on in truck cab when the engine is running to insure the truck air system is fully pressurized. Operate air purge system until spray stops coming out of all the nozzles.

When operating air purge system, follow this procedure:

a. Rinse system twice with clean water from the rinse tank.

b. Extend booms into field configuration.

c. Close valves 5, 6, 7, 8, 9 and 10.

d. Turn agitation system off.

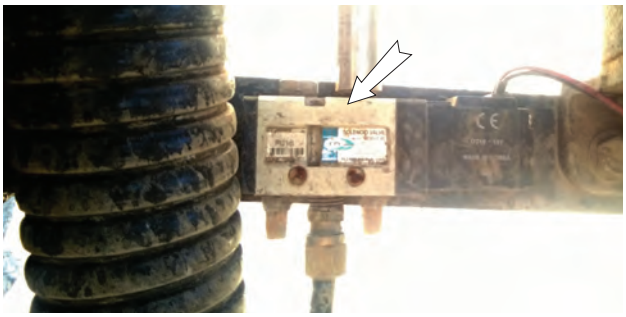
e. Turn air purge system on.

NOTE

When switch is turned ON pressurized air will blow through system to blow out water/chemical from everything past water pump. All valves must be OFF when air purge system is ON.

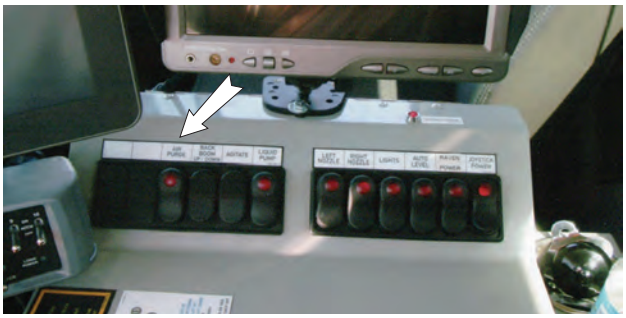
f. Run air purge system until spray/fluid stops coming out of the nozzles.

g. Stop air purge system and place booms into storage configuration.



Air Purge Valve

Air Purge Line



Cab Control

Boom Extended

Rear Control

FIG. 42 AIR PURGE SYSTEM

34. **Extending Wings:**

A. **Truck Models:**
Follow this procedure when converting from transport to field configuration and preparing to spray.:

a. Clear the area of bystanders, especially small children.

b. Start engine and run at mid-range RPM.

c. Turn power to "joystick" (refer to Section 4.5, Controls) to allow the use of the joystick wing controls.

FIG. 43 JOYSTICK CONTROL

d. Raise each wing up out of its transport cradle.

NOTE

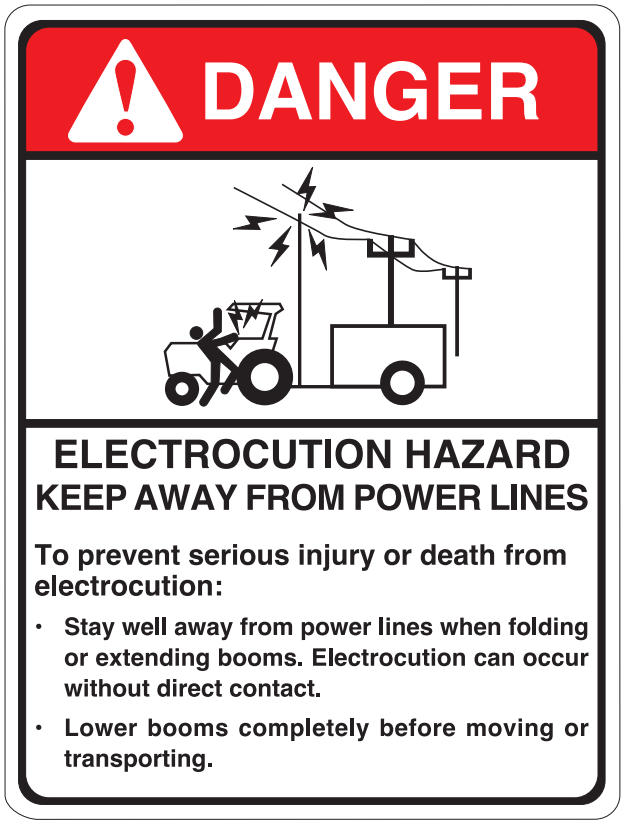
Each wing position function has its own control switch. Depress and hold the switch to move the wing into the desired position.

Transport

Raised

FIG. 44 CRADLES (TYPICAL)

e. Extend each inner wing to clear cradles.



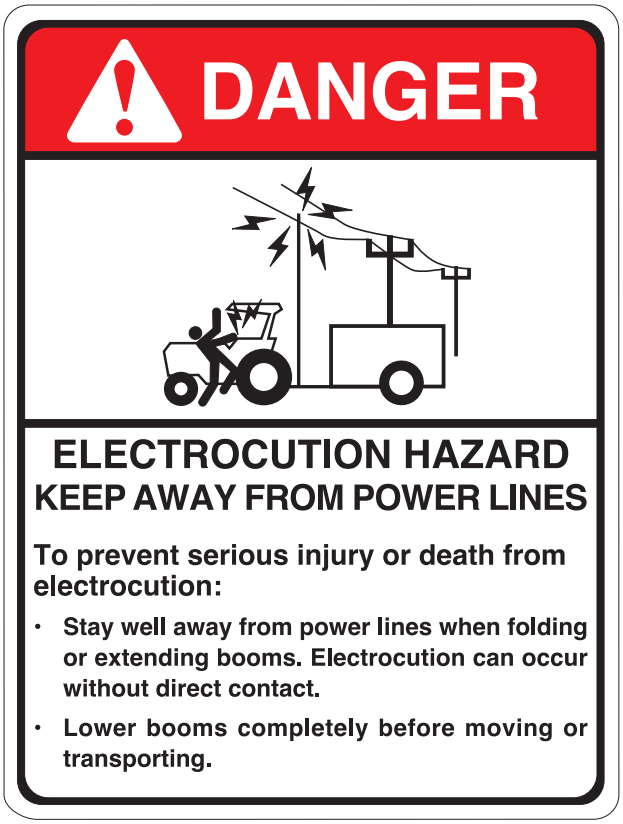
Starting

Extending

Extended

FIG. 45 EXTENDING INNER WINGS (TYPICAL)

f. Extend outer wings.



Starting

Extending

Extended

FIG. 46 EXTENDING OUTER WINGS (TYPICAL)

g. Set height appropriate for your application.

NOTE

Be sure to check that wings are straight.

High

Low

FIG. 47 WING HEIGHT (TYPICAL)

h. Reverse the above procedure when converting from field to transport or storage configuration.

IMPORTANT

Always set the wings in the cradle with the support cables in their slack position.

B. **1600SS/RM & 2000 SS/RM Model:**
Follow this procedure when converting from transport to field configuration and preparing to spray.:

a. Clear the area of bystanders, especially small children.

b. Start engine and run at mid-range RPM.

c. Turn power to "joystick" (refer to Section 4.5, Controls) to allow the use of the joystick wing controls.

FIG. 48 JOYSTICK CONTROL

d. Raise each wing up out of its transport cradle.

NOTE

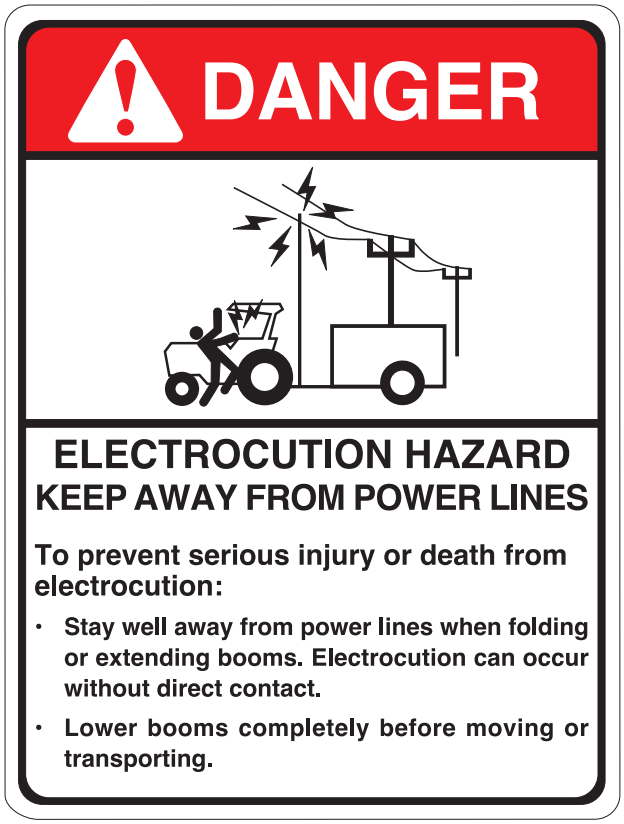
Each wing position function has its own control switch. Depress and hold the switch to move the wing into the desired position.

Transport

Raised

FIG. 49 CRADLES (TYPICAL)

e. Extend each inner wing to clear cradles.



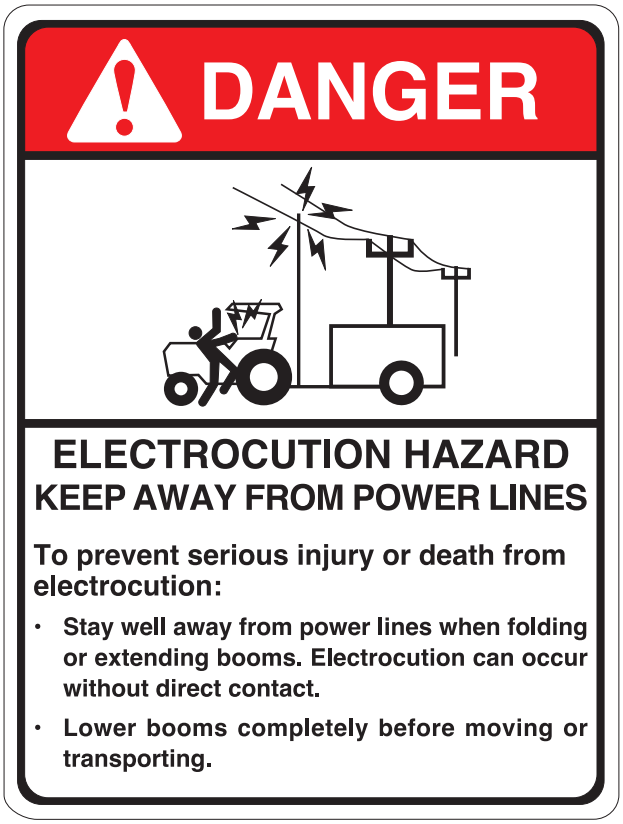
Starting

Extending

Extended

FIG. 50 EXTENDING INNER WINGS (TYPICAL)

f. Extend outer wings.



Starting

Right

Left

Extended

FIG. 51 EXTENDING OUTER WINGS (TYPICAL)

g. Set height appropriate for your application.

NOTE

Be sure to check that wings are straight.

High

Low

FIG. 52 WING HEIGHT (TYPICAL)

h. Reverse the above procedure when converting from field to transport or storage configuration.

IMPORTANT

Always set the wings in the cradle with the support cables in their slack position.

34. **Pesticide Hazards:**
Extreme care must be taken when working around chemicals. Be familiar with the toxicity levels of the chemicals you are using and recommended protective gear that each operator should use before starting.

a. **Toxicity Levels:**
Every pesticide container has a label on it that designates its level of toxicity. This toxicity level then requires the operator to use specific protective gear whenever working with this chemical.

Table 5 - Toxicity Level

Toxicity Level	Protective Gear
DANGER POISON	Goggles, Respirator, Gloves and Skin Protection. Avoid Fumes.
WARNING POISON	Goggles, Gloves and Skin Protection. Avoid Fumes.
CAUTION POISON	Gloves and Skin Protection. Avoid Fumes.

High - DANGER

Medium - WARNING

Low- CAUTION

FIG. 53 TOXICITY LEVELS

B. **Personal Protection:**
To reduce or eliminate contact with herbicides, it is necessary to wear adequate protective clothing, respirators, boots, goggles and gloves. The use of this equipment is essential for good health especially when applying some of the more toxic herbicides.

a. **Respirators -** Protection against inhalation (but no skin contact) is provided quite economically by the use of face mask respirators. Choose a mask that will fit your face and check with the company about the details of filters and chemical cartridges used in the respirator model. Note that full and half face masks cannot be worn securely by men with beards, whiskers, sideburns and moustaches. Instructions on the operational life and performance of filters and cartridges generally accompany the products. However, when carrying out spray operations, it is wise to change the filters each day and the cartridges should be replaced when chemical odour is noticed. Wash the face mask with warm water and soap before installing a new cartridge and filter. Do not store cartridge and filters in the chemical storage area, as they can absorb the chemical even when not in use.

b. **Goggles -** When a full mask is not worn, the use of protective goggles is necessary and is recommended to protect the eyes from pesticide vapour, solids, and accidental splashes particularly. Safety supply companies offer a range of goggles. Many goggles are resistant to chemicals, some have specially treated lenses to reduce fogging, others have anti-fogging ventilation. Prescription type glasses are also available to which side shields can be attached.

c. **Gloves -** Non-absorbent gloves should be worn at all times when handling, mixing and applying pesticides. Neoprene has been found to be superior to rubber in resisting the penetration of pesticides. Other factors to be considered in selecting suitable gloves include sense of touch, wet grip, and cut and abrasion resistance. Gloves should not have fabric wristbands or lining and should fit properly. Always wash the glove inside and out after use. Leather gloves are not suitable.

d. **Footwear -** Non-absorbent footwear should be worn when applying pesticides. It is suggested that the most suitable boot is one that is knee length, acid and solvent resistant and ribbed to prevent slippage. Neoprene is considered much superior to rubber. Leather boots are not suitable.

e. **Clothing -** For general protection coveralls should be worn, along with gloves and a hat to minimize the hazard of the skin absorbing pesticides. Clothing should be changed and washed regularly following spraying. You can now purchase disposable clothing that provides protection against exposure resulting from pesticide drift, splashing or spills. These garments (overalls, shirts and pants, head cover, and aprons) are light weight and cooler than rubber articles. Protective equipment and clothing are available from safety supply companies. Never use leather garments e.g. jackets, gloves, or shoes during the handling or applications of pesticides. Leather can absorb the chemical and it is very difficult to decontaminate leather articles.

35. **Chemical Application:**

a. **Dilution:**
Pest control is dependent upon the application of minute amounts of a toxic substance. This process starts with the proper mixing of the toxic material with water. It is very important that the operator read the mixing and dilution instructions on the chemical container before starting. Combine the chemical and water in the proportions recommended on the container only. Improper mixing can damage the crops or not affect the pests.

b. **Wettable Powders:**
It is recommended that wettable powders be pre-mixed in the mixing tank before drawing into the main tank or added very slowly through the top cover. Be sure to allow at least 5 minutes of circulation and agitation before starting to spray. Any clumps or sludge can clog the suction screen or nozzles. Unless you stop and clean the machine, skipping and poor coverage will occur.

37. **Rinse Tank Access:**
The rinse tank is mounted on the rear of the frame to provide clean rinse water when required. Although the tank is filled from the left side of the frame, the tank can be accessed through the lid from the top. Always refill with clean water after using the water from the rinse tank.

Tank

Tank Lid

FIG. 54 RINSE TANK

38. **Steps (Truck Model):**
The rear frame is designed with a platform and access steps. The steps can be raised or lowered as required for accessing the tank. Position the steps in the up and folded position whenever the sprayer will be moved or operated.

Up

Down

FIG. 55 REAR STEPS (TRUCK)

39. **Steps (1600SS/RM Model):**
The front frame is designed with a side access platform and access steps. The steps are lowered when the park brake is engaged and raised when the brake is released.

Down

Up

FIG. 56 FRONT STEPS (1600SS/RM)

40. **Chemical Circuit Control System:**
Sprayers are equipped with chemical circuit control components that are mounted on each side of the frame and actuated by the controls in the cab.

41. Mix only the quantity of spray required for the job. Excess chemicals are difficult to store and dispose of. Do not dispose of them in the farmyard or your drainage system. They will contaminate these areas.

42. Store chemicals only in their original containers under lock and key to prevent children or animals from touching them.

43. Be very careful to wear the proper protective gear such as rubber gloves and goggles to protect yourself. Thoroughly wash all protective gear with a good detergent after use to remove all chemicals.

44. Never allow chemicals or solutions to touch the skin. Some can be absorbed through the skin. Should such a contact occur, flush the affected area immediately with clear water. Wash the area thoroughly with detergent to remove any residue.

45. When spraying is done, the machine should always be rinsed. Follow this procedure:

    a. Add 25 to 50 gallons of water to the tank.

    b. Run the pump, wash circuit and agitator for 5 minutes to circulate and rinse the inside of the tank.

    c. Spray the rinse thinly over the previously sprayed field.

46. When spraying is finished for the season or when switching chemicals, wash the sprayer using the method described in the Maintenance Section.

Sprayer Valves

Hydraulic Valves

FIG. 57 MACHINE VALVES

WARNING

Do not dispose of it in the farmyard or in drainage ditches.

47. **Operating Hints:**

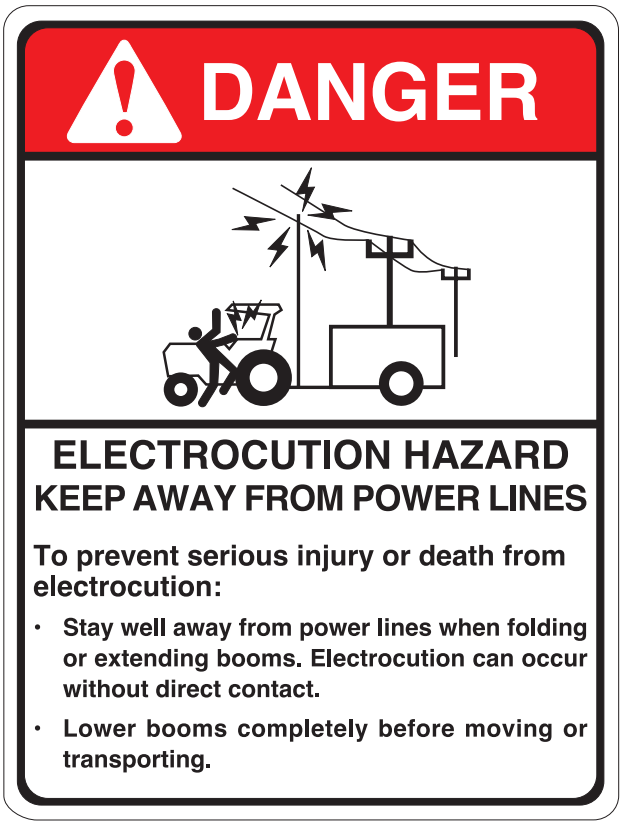
a. Always wear appropriate PPE (Personal Protective Equipment) when operating Sprayer.

b. Always calibrate machine before spraying and when changing chemicals. Chemical application involves applying very dilute mixtures to crops. Only by knowing how the system and each nozzle perform can the operator be sure exactly how much chemical is being applied.

c. Always read and follow chemical manufacturer's instructions exactly before using chemical.

d. Stay away from power lines when extending or folding booms to prevent electrocution. Remember, electrocution can occur without direct contact.

e. Rinse and wash out chemical system twice with clean water from the rinse tank at the end of the day, when changing chemicals or before storage/transport.



f. Use the air purge system to remove all liquid/fluid from the chemical circuit before storing or when encountering freezing temperatures.

FIG. 58 AIR PURGE SYSTEM

4.8 SPRAYER REMOVAL

MAINTENANCE SAFETY

- Review the Operator's Manual and all safety items before working with, maintaining or operating the Sprayer.
- Place all controls in neutral, stop the engine, turn monitor off, set park brake, remove ignition key, wait for nozzles to stop spraying before servicing, adjusting, repairing or unplugging.
- Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
- Before applying pressure to a hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition.
- Before applying pressure to chemical system make sure that all connections are tight and that all hoses and fittings are in good condition.
- Relieve pressure from hydraulic circuit before servicing or disconnecting from power unit.
- Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments or filling.
- Place stands or blocks under the frame before working beneath the machine.
- **Wear safety goggles, neoprene gloves and protective clothing when working on the sprayer filled with active chemical.**
- **Wash machine to remove all chemical residue before working on unit. Wear appropriate protective gear at all times to protect yourself from chemical contamination.**

Models 1600SS/RM and 2000SS/RM are designed to mount to a Vector Self-Propelled granular fertilizer spreader when the box has been removed.

Follow this procedure when removing and mounting the sprayer to the power unit:

1. **Site Preparation:**

   a. Select a wide-open area that provides access to all sides of the machine.

   b. Provide a means to raise and support the fertilizer spreader and sprayer when removing or mounting.

NOTE

Construct an "A" frame with a chain hoist on each corner to attach to the machines. It must be twenty feet high and 20 feet wide to allow for clearance on all sides.

   c. Use the "A" frame to raise the machine and position it on a trailer for transporting or moving.

   d. Move the machine out of the working area.

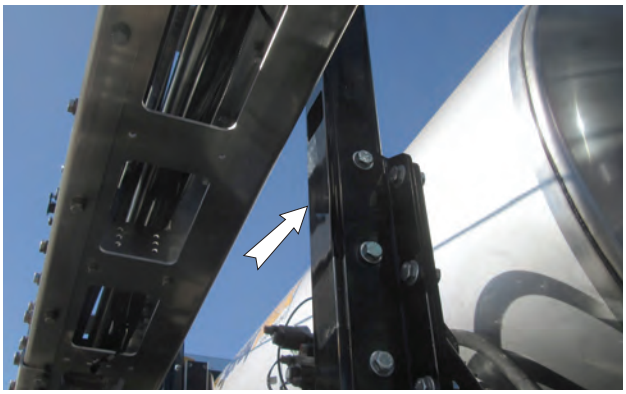
FIG. 59 "A" FRAME

2. Prepare the sprayer before moving under the "A" frame.

   a. Raise the booms into their fully UP position.

   b. Install the boom support bracket.

      - Bring support brackets to the side of the machine.
      - Slide the upper end of bracket into anchor slot and pull down to secure.
      - Repeat on other side of frame.



Anchor Slot

In Slot

Support Bracket

FIG. 60 BOOM SUPPORT BRACKET

- Lower boom to support brackets.

NOTE

Be sure both sections of boom frame are inside the bracket stop.

Installed

Right Side

Left Side

FIG. 61 BRACKETS INSTALLED

3. Drive machine into "A" frame.

   a. Align so booms clear the hoists on each side.

   b. Drive in until centered under frame.

   c. Position hoists over the machine lift brackets.

Aligning

Entering

Positioned

Lift Brackets (Typical)

FIG. 62 "A" FRAME (TYPICAL)

4. Lower hoists and attach to lift brackets on each corner.

FIG. 63 LIFT BRACKETS (TYPICAL)

5. Remove the four rear anchor bolts.

Bolts

Removed

FIG. 64 REAR ANCHOR BOLTS

6. Loosen and "flip down" four frame anchor bolts.

a. Loosen jam nut on rear anchor bolts.

b. Loosen anchor nut.

c. Flip anchor bolts down.

d. Repeat with other anchor bolt on opposite side.

e. Repeat process with two front anchor bolts.

Rear Anchor Bolt

Jam Nut

Flipped Down

Front Anchor Bolt

FIG. 65 FRAME ANCHOR BOLTS

7. Disconnect the main and rinse tank lines.

Lines

Rinse Tank

Main Tank

FIG. 66 LINES

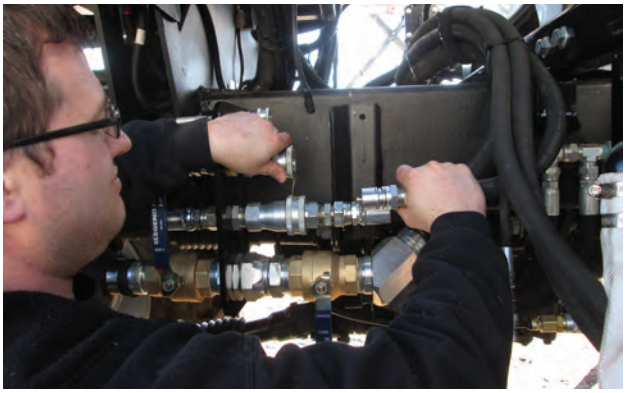
8. Disconnect the air line using the quick coupler.

Line

Disconnected

FIG. 67 AIR LINE

9. Disconnect hydraulic lines using the quick couplers.



Top Line

Bottom Line

FIG. 68 HYDRAULIC COUPLERS

10. Disconnect the large hydraulic line:

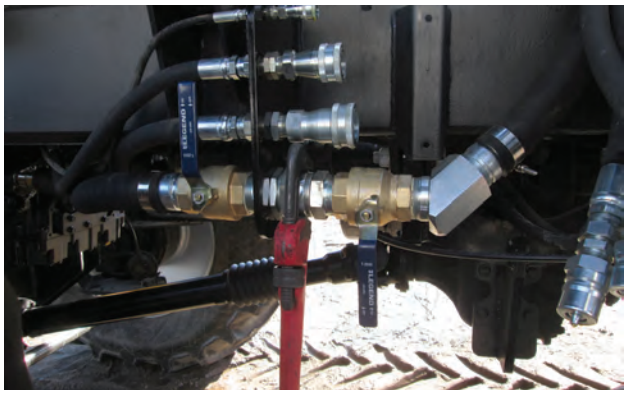
    a. Turn the valves OFF (handles at 90° to the lines) on each side of the connection.

    b. Use a large wrench to loosen and remove the attaching nut.

NOTE

Use a rag or towel under the connection to collect any spilled or lost oil to prevent contaminating the workplace.

Valves Off



Wrench

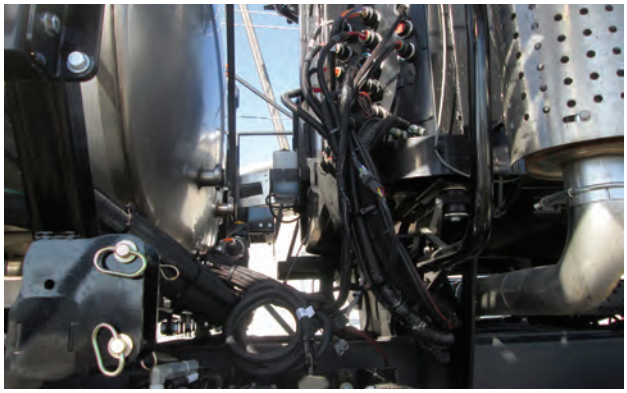
Opened

FIG. 69 LARGE HYDRAULIC LINE

11. Disconnect front electrical harness:

a. Disconnect wiring connection.

b. Disconnect plug from cab terminal panel.



Terminal Panel

Connection

Disconnected

Unplugging

FIG. 70 FRONT ELECTRICAL HARNESS

12. Raise the sprayer frame above the chassis:

    a. Attach the hoists at each lift bracket.

Lift Bracket (Typical)

Hoist (Typical)

    b. Use the hoists to raise the sprayer above the chassis.

Raising

Raise More

FIG. 71 RAISE FRAME

13. Disconnect wiring harness to rear lights.

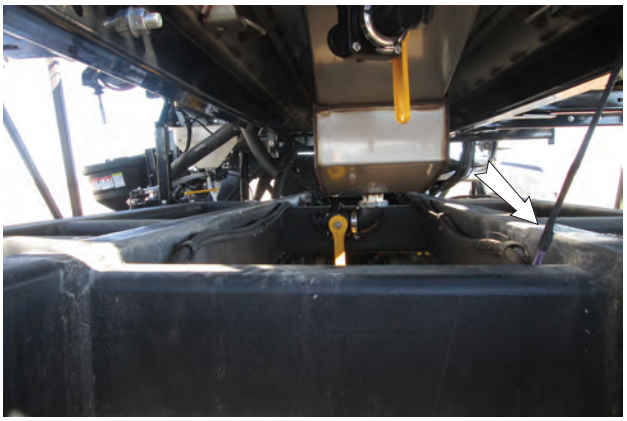


FIG. 72 REAR LIGHTS

14. Raise sprayer frame to clear chassis:

    a. Use the corner hoists to evenly raise frame.

Hoists

    b. Raise the frame until it is clear of the chassis.

Raised

FIG. 73 RAISE SPRAYER

15. Drive chassis forward to clear sprayer:

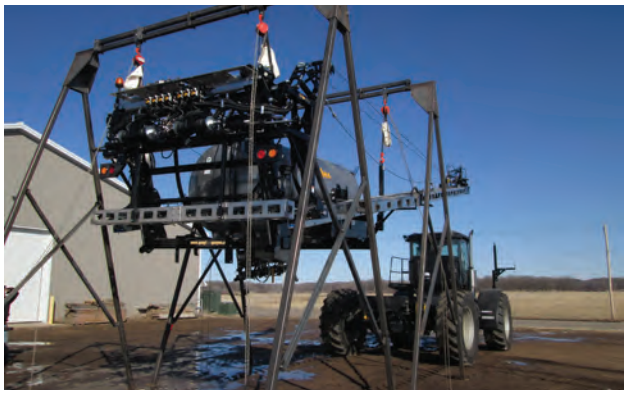
    a. Check that all sprayer components are raised high enough to clear chassis.

Raised

    b. Move chassis slowly forward.

Forward

    c. Clear sprayer frame.



Cleared

FIG. 74 DRIVE FORWARD

16. Move trailer into position.

FIG. 75 TRAILER POSITIONED

17. Attach stands to sprayer frame:

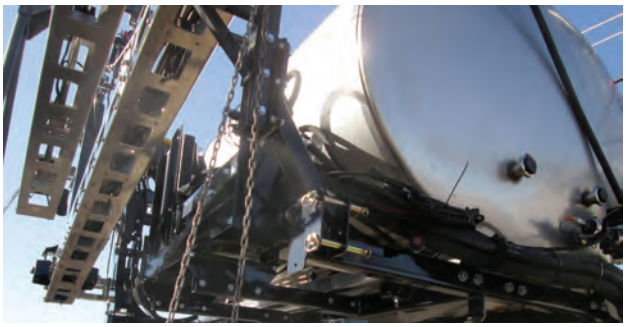
a. Position stands at the corners of the sprayer frame.

Stand Positioned

b. Use the hoists to lower the frame.

Lowering

c. Align the stands with mounting anchor brackets.



Aligning

d. Install mounting pins and retainers.

Mounting Pins

e. Repeat with other stands.

Other Stand (Typical)

FIG. 76 STANDS

18. Lower stand to trailer and unhook hoists.

19. Attach power unit and move to storage area.

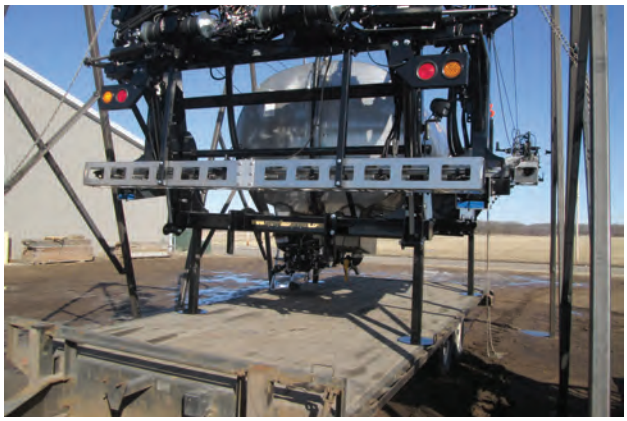


FIG. 77 TRAILER

4.9 TRANSPORT

TRANSPORT SAFETY

- Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when operating the Sprayer in the field and/or on the road.
- Check with local authorities regarding sprayer transport on public roads. Obey all applicable laws and regulations.
- Always travel at a safe speed. Use caution when making corners or meeting traffic.
- When a tractor is the power unit make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
- When a tractor is the power unit be sure that the Sprayer is hitched positively to the tractor. Always use a retainer through the pin and a safety chain between the machine and the tractor.
- Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.
- Do not exceed 20 mph (32 km/h) when the tanks are full. Reduce speed on rough roads and surfaces.
- Always use hazard warning flashers on tractor when transporting unless prohibited by law.
- Never transport faster than 20 mph (32 km/h) with the tank filled with water or chemical.

Sprayflex Sprayers are designed to be easily and conveniently moved from field to field. When transporting, follow this procedure:

1. Be sure all bystanders are clear of the machine.
2. Check that tires are at the required pressure.
3. Check that wheel bolts are tightened to their specified torque.
4. Make sure all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
5. Raise rear steps and fold them over the platform.

FIG. 78 REAR STEPS

6. It is not recommended that the machine be transported faster than 20 mph (32 kph) when the tanks are filled.

7. Fully fold the booms.

8. Lower booms and rest them in their cradles with support cables slack.

IMPORTANT

Cables must be slack to rest boom weight on cradles.

9. Do not allow riders on the machine or tow unit.

10. During periods of limited visibility, use pilot vehicles with the sprayer.

11. Always use hazard flashers when transporting unless prohibited by law.

Truck Model

1600SS/RM Model

FIG. 79 CABLES SLACK

FIG. 80 TRANSPORT CONFIGURATION

4.10 STORAGE

STORAGE SAFETY

- Store unit in an area away from human activity.
- Do not permit children to play on or around the stored sprayer.
- Store in the **transport** configuration.

4.10.1 PLACING IN STORAGE

At the end of the spray season, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the beginning of the next season. Follow this procedure:

1. Thoroughly wash the machine using a hose or a pressure washer to remove all dirt, mud, debris or residue.

2. Thoroughly wash the inside of the tank and spray system with the wash cycle to remove all chemical residue using the method described in the Maintenance Section.

3. In climates that encounter freezing temperatures during the storage period, the following preparation should be done:

    a. Add 10 gallons (40 liters) of a 50:50 mixture of potable RV antifreeze to the rinse tank.

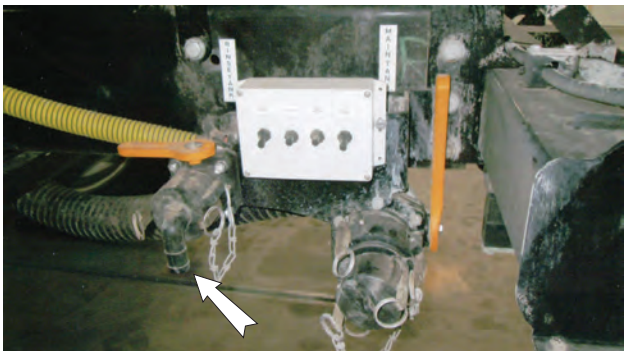
    b. Run unit for 5 minutes in the wash and spray cycles to circulate solution to all parts of the circuit.

    c. While circulating the fluid, open and close all the valves in the chemical circuit several times to flush all the water from the system.

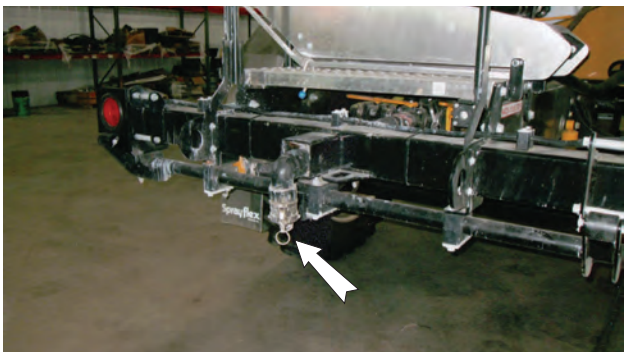
    d. Draw the solution out of the chemical tank.

    e. Flush the solution out the booms.

    f. Open all disconnects and drain hoses, pumps, filters, solenoids, booms and tanks.



Rinse Tank



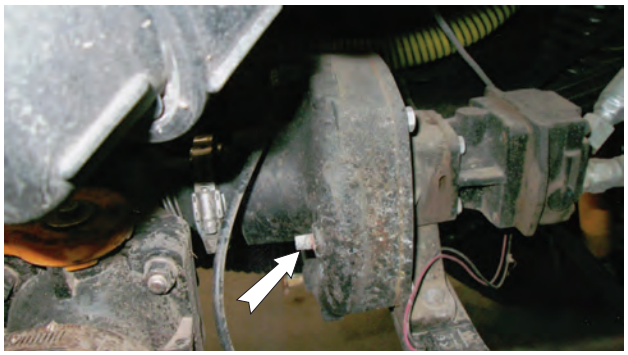
Main Tank

Tank Sump

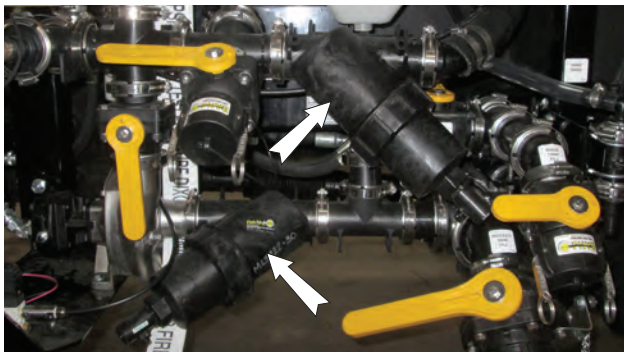
FIG. 81 DRAINS

g. Use the air purge system to blow all liquid/fluid out of the system.

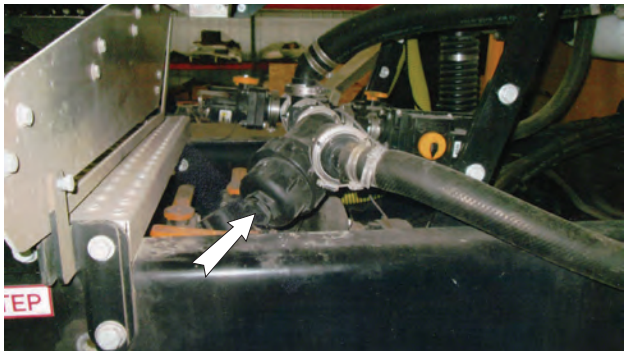
h. Remove nozzles from boom. Disassemble and wash nozzle, spring, diaphram and housing. Store inside.



Pump



Filter Housings (1600SS/RM)



Filter Housing (Truck)

Booms

FIG. 82 DRAINS

4. Lubricate all grease points. Make sure all grease cavities have been filled with grease to remove any water residue from the washing.

5. Inspect all the hydraulic hoses, couplers and fittings. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or is separating from the crimped end of a fitting.

6. Inspect all the spray hoses and fittings. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or is separating from a fitting.

7. Touch up all paint nicks and scratches to prevent rusting.

8. Move the machine to it storage position.

9. Select an area that is dry, level and free of debris.

10. Remove the control boxes from the cab and store inside.

11. The tank is made out of polyethylene. Do not use to store petroleum products. They will soften the plastic and absorb the product.

12. It is best to store the sprayer in a shaded area to minimize the long term effect of ultraviolet radiation on the plastic. If shade is not available, cover the tank with a tarpaulin and secure in place.

4.10.2 REMOVING FROM STORAGE

When removing from storage and preparing to use, follow this procedure:

1. Clear the area of bystanders, especially small children, and remove foreign objects from the machine and the working area.

2. Remove the tarpaulin if it was used for storage.

3. Check

    a. Tank for cracks.

    b. Tank hold down hardware.

    c. All hardware. Tighten as required.

    d. Tire pressure.

    e. All sprayer and hydraulic lines, fittings and connections. Tighten as required.

4. Lubricate all grease fittings.

5. Replace any defective parts.

6. Install the nozzles. Run water through booms, and check for leaks.

7. Fill the tank with 20 gallons (75 liters) of clean water and run for 5 minutes in the wash cycle. Open and close all valves several times. Flush water through the booms.

8. Repeat step 7.

9. Calibrate the pump, nozzles and sprayer before using.

10. Go through the pre-operation checklist (Section 4.4) before using.

5. SERVICE AND MAINTENANCE

MAINTENANCE SAFETY

- Review the Operator's Manual and all safety items before working with, maintaining or operating the Sprayer.
- Place all controls in neutral, stop the engine, turn monitor off, set park brake, remove ignition key, wait for nozzles to stop spraying before servicing, adjusting, repairing or unplugging.
- Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
- Before applying pressure to a hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition.
- Before applying pressure to chemical system make sure that all connections are tight and that all hoses and fittings are in good condition.
- Relieve pressure from hydraulic circuit before servicing or disconnecting from power unit.
- Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments or filling.
- Place stands or blocks under the frame before working beneath the machine.
- **Wear safety goggles, neoprene gloves and protective clothing when working on the sprayer filled with active chemical.**
- **Wash machine to remove all chemical residue before working on unit. Wear appropriate protective gear at all times to protect yourself from chemical contamination.**

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. **Grease:**
   Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multi-purpose lithium base grease.

2. **Hydraulic Oil:**
   Use a heavy-duty, all-purpose hydraulic oil or equivalent.

   Capacity: Hydraulic Oil Reservoir - 30 gal. (132 L.)

3. **Storing Lubricants:**
   Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, dirt, moisture and other contaminants.

5.1.2 GREASING

Refer to Section 5.1.1 for recommended grease. Use the Maintenance Checklist provide to keep a record of all scheduled maintenance.

1. Use only a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If a fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.1.3 SERVICING INTERVALS

8 Hours or Daily

1. Grease bushings at height linkage pins next to main frame (4 locations each side).

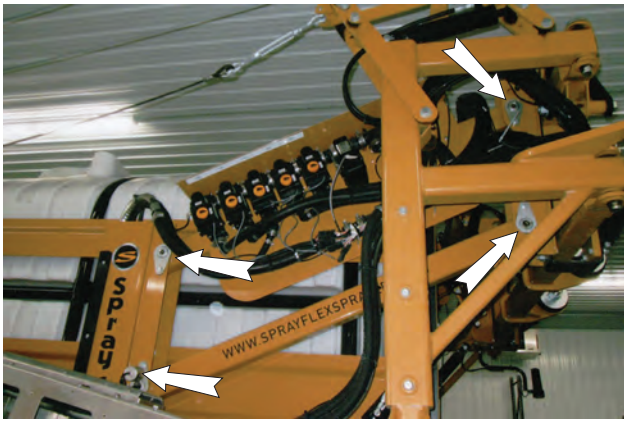
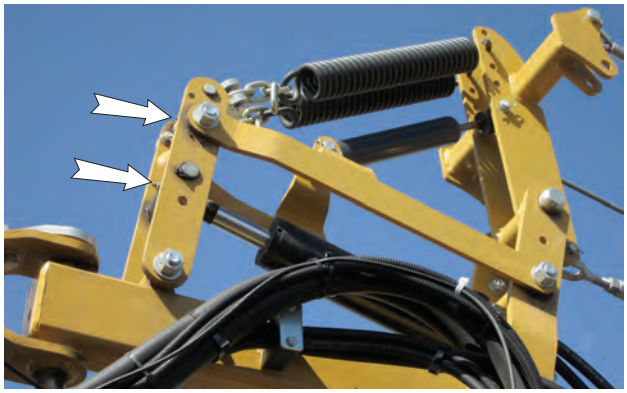
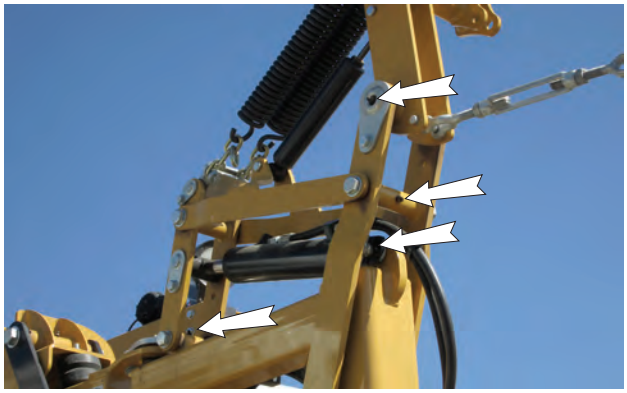


FIG. 83 HEIGHT LINKAGE PINS

2. Grease boom tilt linkage bushings (5 locations each side)



Left Side



Right Side

FIG. 84 TILT LINKAGE PIVOTS (TYPICAL)

3. Grease boom tilt pivot bushings(2 locations each side).

FIG. 85 BOOM TILT PIVOT BUSHINGS (TYPICAL)

4. Grease boom extend/fold pivot bushings (2 locations each side).

FIG. 86 EXTEND/FOLD PIVOT BUSHINGS (TYPICAL)

5. Grease the boom inner mounting pin bushings (2 locations each side).

FIG. 87 INNER BOOM PIN BUSHINGS (TYPICAL)

6. Grease boom fold joint bushings (5 locations each boom).

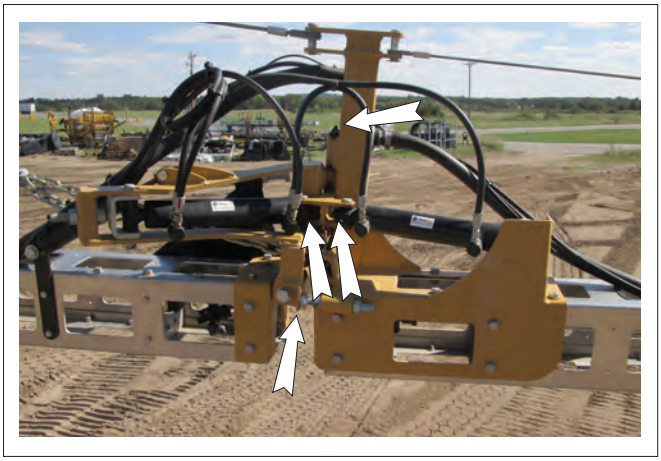


FIG. 88 BOOM FOLD BUSHINGS

7. Grease boom break-away hinge bushings (1 location each boom).

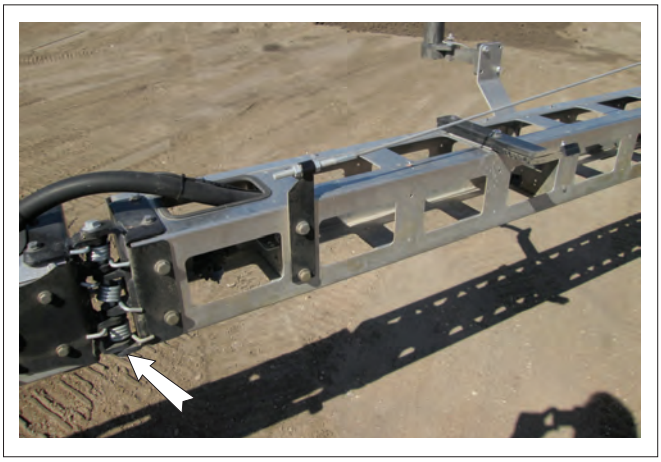


FIG. 89 BOOM BREAK-AWAY BUSHINGS

8. Clean chemical circuits screen in the chemical circuit filter housings.

   a. Truck Model - 1 location.

Truck

   b. 1600SS/RM Model - Suction side.

Suction Side

   c. 1600SS/RM Model - Pressure side.

Pressure Side

FIG. 90 SCREENS

40 Hours or Weekly

1. Check oil level in hydraulic reservoir.

   a. High

   b. Low

NOTE

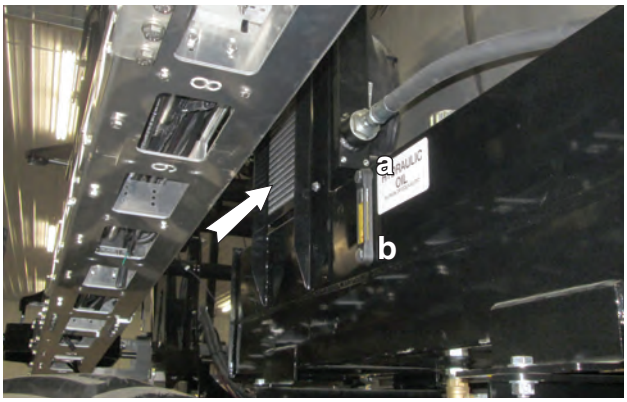
Check more frequently if hydraulic oil leaks are observed.

2. Clean oil cooler on 1600SS/RM model.

   a. High

   b. Low

Truck



1600SS/RM

FIG. 91 OIL LEVEL

Annually

1. Check condition of hydraulic oil system filter indicator. Replace filter when indicator is in the red. Change oil after third filter replacement.

FIG. 92 OIL FILTER INDICATOR

2. Wash machine.

5.1.4 SERVICE RECORD

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE:	CK	CHECK	CH	CHANGE	CL	CLEAN
	LU	LUBRICATE	RE	REPACK	IN	INSPECT

Maintenance

Hours																							
Serviced by																							
8 Hours or Daily																							
LU Height Linkage Pin Bushings																							
LU Boom Tilt Linkage Bushings																							
LU Boom Tilt Pivot Bushings																							
LU Boom Extend/Fold Pivot Bushings																							
LU Boom Inner Mounting Pin Bushings																							
LU Boom Fold Joint Bushings																							
LU Boom Break-Away Hinge Bushings																							
CL Chemical Circuit Screen																							
40 Hours or Weekly																							
CK Hydraulic Oil Level																							
CK Oil Cooler Fluid Level																							
Annually																							
CK Hydraulic Oil Filter																							
CL Machine																							

5.2 MAINTENANCE

By following a careful service and maintenance program for your machine, you will enjoy many years of trouble-free operation.

5.2.1 FILTER CLEANING

The fluid in the sprayer is continually being filtered through a screen filter in the rear frame. The sprayer must have clean water to prevent clogging of the screens and check valves when in use. This screen must be cleaned daily or more often as required. To clean, follow this procedure:

1. At the start of each day before the water and chemicals are added, the screens should be checked and cleaned.

2. If there is water or solution in the sprayer, close the Valves to isolate the screen.

3. Loosen the filter body by hand. Do not use a wrench as this could damage the filter body.

4. Remove the screen and inspect it for dirt.

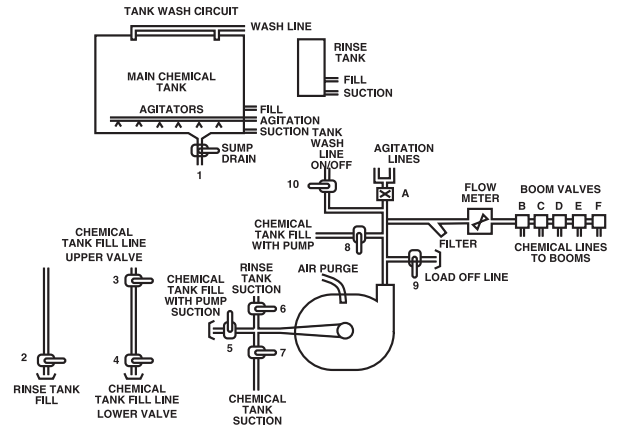
5. Clean it using clean water.

6. Inspect for holes or tears. If there is damage, replace it.

7. Install the screen and body to the filter head and tighten by hand. Do not use a wrench as this might damage the body. Do not over tighten and crack the head.

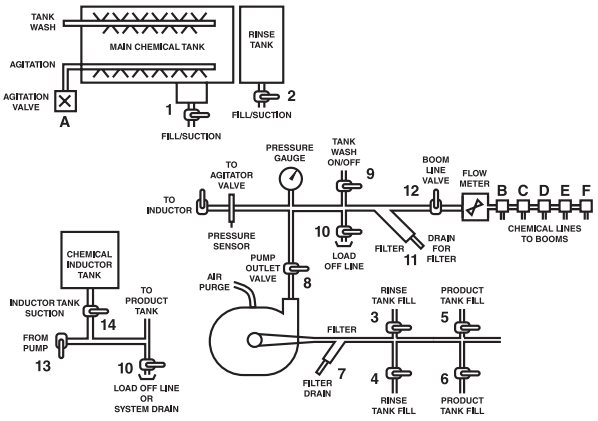
8. Open the ball valves to allow the solution to circulate.

9. Drain all screens before storage to avoid freezing.

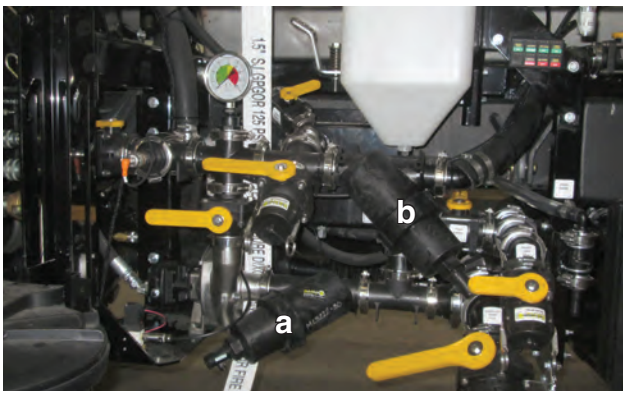


Schematic

Rear Frame (Truck Model)



1600SS/RM & 2000 SS/RM Schematics



a. Suction b. Pressure

FIG. 93 SCREENS

5.2.2 TANK CLEANING

A. **Daily Cleaning**
At the end of the working day, clean the system using this procedure:

1. After the chemical solution has been completely sprayed out through the booms, add 20 gallons (75 liters) of clear water to the tank.
2. Run at rated speed to force the solution through the agitator jets and wash head(s). Run for 5 minutes.
3. Spray the rinse lightly over previously sprayed crop.
4. Add another 30 gallons (200 liters) of clean water and run rinse/wash cycle for 5 minutes.
5. Flush the rinse solution out of the booms to clean the hoses and plumbing.
6. Rinse the system again with clean water.
7. Clean the screen and nozzles.
8. Drain tank and let dry.

B. Changing Chemicals and/or Annual Wash to Remove Salt and Amine Formations

1. Do the rinse procedure outlined for Daily Cleaning.
2. Add 50 gallons (200 liters) of clean water to the tank.
3. Remove nozzles and screen and wash separately.
4. Add 1/2 gallon (2 liters) of household ammonia to the tank (1 part ammonia to 100 parts water).
5. Run rinse/wash cycle for 5 minutes.
6. Spray half the solution out the booms.
7. Let the balance sit for a minimum of 8 hours, overnight is best.
8. Run wash cycle for 10 minutes and spray solution out the booms on the appropriate crop.
9. Rinse the system thoroughly with clean water and flush out the booms.
10. Drain the entire system and let dry.

C. **Changing Chemicals and/or Annual Wash to Remove Esters of 2, 4-D and MCPA Formations**

1. Do the wash and rinse procedures outlined for Daily Cleaning.
2. Add 50 gallons (200 liters) of clean water to the tank.
3. Remove nozzles and screen and wash separately.
4. Add dishwasher detergent to the tank (2 lbs./50 gal or 1 kg/300 l of water).
5. Run rinse/wash cycle.

6. Spray the solution out the booms on the appropriate crop and drain thoroughly.
7. Add 50 gal (200 l) of clean water to the tank.
8. Add 1/2 gal (2 l) of household ammonia to the tank (1 part ammonia to 100 parts of water).
9. Run wash cycle.
10. Spray 1/2 the solution out the booms.
11. Let the balance sit for a minimum of 8 hours, overnight is best.
12. Run rinse/wash cycle for 10 minutes and spray out the booms on the appropriate crop.
13. Rinse the system thoroughly with clean water and flush out the booms.
14. Drain the entire system and let dry.

5.2.3 BOOM BREAK-AWAY JOINTS

Each boom is designed with a break-away joint that allows it to swing backward as required when encountering an obstruction to prevent mechanical damage from the obstruction. To adjust the break-away tension, follow this procedure:

1. Clear the area of bystanders, especially small children, before starting.

2. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.

3. Use the bolt to compress or relax the spring clamping force of the break-away joint as required.

4. The proper tension will require one person pulling hard on the end of the boom to break it away.

FIG. 94 BOOM BREAK-AWAY JOINT (TYPICAL)

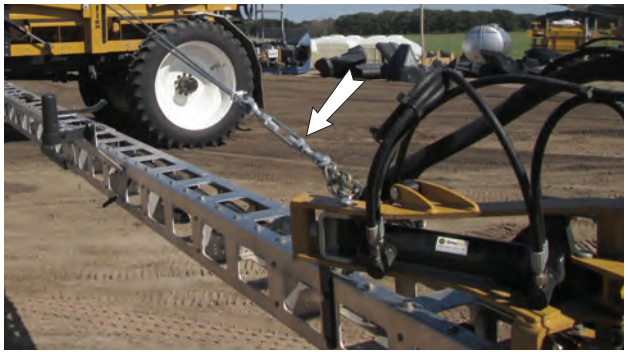
5.2.4 BOOM STRAIGHTNESS

The boom on each machine are designed with spring position, turnbuckles and set screw adjustments that provide a method to adjust for straightness. By keeping the booms straight, the sprayer produces a consistent clearance to the crop.

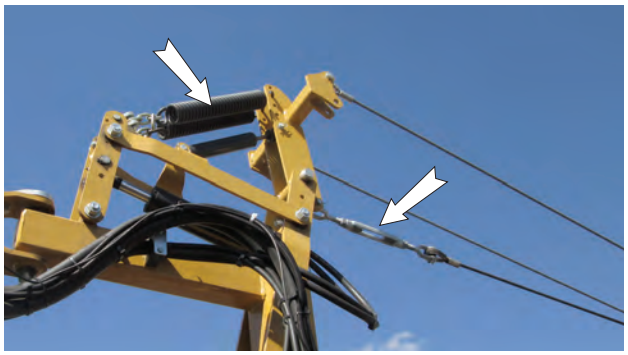
When adjusting boom straightness, follow this procedure:

1. Clear the area of bystanders, especially small children, before starting.
2. Place machine in field configuration with the boom about waist high.
3. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.
4. Sight along the boom to be sure it is straight at each hinge.
5. Loosen the position bolt jam nut on boom at breakaway joint.
6. Turn position bolt to the required position and tighten jam nut to its specified torque.
7. Repeat with other joints as required.

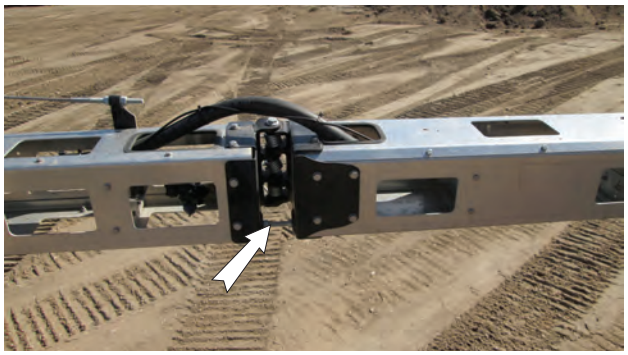
Sighting



Inner Boom



Outer Boom



Break-Away Joint

FIG. 95 BOOM STRAIGHTNESS (TYPICAL)

5.2.5 CHANGING HYDRAULIC OIL FILTER

1. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.

2. Allow the system to cool before changing the filter. Hot oil can cause burns if it contacts exposed skin.

3. Place a pan under the filter.

4. Remove the filter and allow any excess oil to drain into the pan.

5. Apply a light coat of oil to the O-ring and install the replacement filter. Snug up by hand and then tighten another 1/2 turn.

6. Run the engine for 1 to 2 minutes and check hydraulic system for leaks.

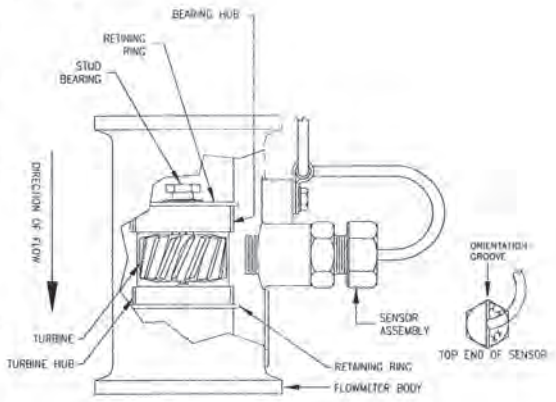
7. If leaks are found around the filter head, tighten slightly. Repeat step 6.

8. Check oil level in hydraulic reservoir. Top up as required.

FIG. 96 HYDRAULIC SYSTEM OIL FILTER

RFM 60 P FLOWMETER MAINTENANCE AND ADJUSTMENT PROCEDURE

1) Remove Flowmeter from Sprayer, brush away any debris and flush with clean water to remove any foreign material.
2) Remove the retaining rings carefully. Remove the bearing hub, turbine hub, and turbine from inside Flowmeter housing.
3) Clean the turbine and hubs of metal filings and any other foreign material. Use pressurized air to blow metal fillings and debris out of both hubs and turbine. Confirm that the turbine blades are not worn. Hold turbine and bearing hub in your hand and spin turbine. It should spin freely with very little drag.
4) If bearing hub stud is adjusted or replaced, verify the turbine fit before reassembling: Put turbine hub and retaining ring in place. Put bearing hub with turbine against turbine hub inside the Flowmeter housing. (Make sure stud keys inside Flowmeter housing are lined up in the groove on the hub). Put the retaining ring into the groove, to lock bearing hub in place. Spin turbine by blowing on it. Tighten bearing hub stud until turbine stalls. Loosen the stud 1/3 of a turn. The turbine should spin freely.
5) Use a low pressure (5 psi) [34.5 kPa] jet of air thru Flowmeter in the direction of flow and again in opposite direction to verify that the turbine spins freely. If there is drag, loosen the stud on the bearing hub 1/16 turn until the turbine spins freely.
6) If turbine spins freely and the cables have checked out O.K., but the Flowmeter is not totalizing properly, verify that the Sensor Assembly is threaded all the way into the Flowmeter body, and the orientation groove on top of sensor is parallel with Flowmeter body. If Flowmeter still does not totalize, replace Sensor Assembly.



Note: For best performance of RFM 60 P Flowmeter, allow 6" straight pipe, 1 1/2" diameter on both ends of Flowmeter (or use 2" BANJO Flange fittings instead). Do not use plumbing size smaller than 1 1/2" diameter or change the direction of plumbing within 6" at each end of Flowmeter.

PROCEDURE TO RE-CALIBRATE FLOWMETER

1) Enter a METER CAL number of 10 [38] in METER CAL 5.
2) Enter a TOTAL VOLUME of 0 in TOTAL VOLUME.
3) Switch OFF all booms.
4) Remove a boom hose and place in calibrated 5 gallon [19 liter] container.
5) Switch ON appropriate boom switch and MASTER switch. Pump exactly 10 gallons [38 liters].
6) Readout in TOTAL VOLUME is the new METER CAL number. This number should be within +/- 3% of the number stamped on the tag on Flowmeter.
7) Repeat this procedure several times to confirm accuracy. (Always "zero out" the TOTAL VOLUME display before retesting).

NOTE: For greatest precision, set METER CAL to 100 [378] and pump 100 gallons [378 liters] of water.

8) To verify Flowmeter calibration, fill applicator tank with a predetermined amount of measured liquid (i.e. 250 gallons). **DO NOT RELY ON GRADUATION NUMBERS MOLDED INTO APPLICATOR TANK.** Empty the applicator tank under normal operating conditions. If the number displayed under TOTAL VOLUME is different from the predetermined amount of measured liquid by more than +/- 3%, complete the following calculation.

EXAMPLE:
METER CAL = 720 [190]
TOTAL VOLUME = 260 [983]
Predetermined amount of measured liquid = 250 [945]

$$\text{Corrected METER CAL} = \frac{\text{METER CAL} \times \text{TOTAL VOLUME}}{\text{Predetermined amount of measured liquid}}$$

ENGLISH UNITS:
$= \frac{720 \times 260}{250} = 749$

METRIC UNITS:
$= \frac{[190] \times [983]}{[945]} = [198]$

Corrected METER CAL = 749 [198]

9) Enter corrected METER CAL before resuming application.

5.2.7 RFM 100 FLOWMETER MAINTENANCE

RFM 100 FLOW METER MAINTENANCE AND ADJUSTMENT PROCEDURE

1) Remove Flow Meter from sprayer and flush with clean water to remove any chemicals.
2) Remove flange bolts or clamp from the Flow Meter.
3) Remove the turbine hub and turbine from inside Flow Meter.
4) Clean turbine and turbine hub of metal filings and any other foreign material, such as wettable powders. Confirm that the turbine blades are not worn. Hold turbine and turbine hub in your hand and spin turbine. It should spin freely with very little drag.
5) If transducer (XDCR) assembly is replaced or if turbine stud is adjusted or replaced, verify the turbine fit before reassemling. Hold turbine hub with turbine on transducer. Spin turbine by blowing on it. Tighten turbine stub until turbine stalls. Loosen turbine stud 1/3 turn. The turbine should spin freely.
6) Re-assemble Flow Meter.

> *IMPORTANT: DO NOT OVERTIGHTEN FLOW METER BAND CLAMP. TIGHTEN BAND CLAMP UNTIL CLAMP FLANGES ARE .375 APART. SEE FIGURE 2. OVERTIGHTENING MAY DAMAGE FLOW METER.

7) Use a low pressure (5 psi) [34.5 kPa] jet of air thru Flowmeter in one direction and then again in opposite direction to verify that the tubine spins freely. If there is drag, loosen hex stud on the bottom of turbine hub 1/16 turn until the turbine spins freely.
8) If turbine spins freely, and if cables have checked out O.K., but Flow Meter is still not totalizing properly, replace Flow Meter transducer.

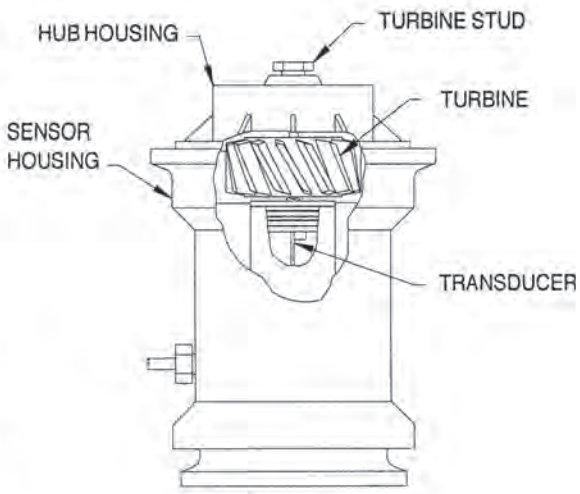


Figure 1

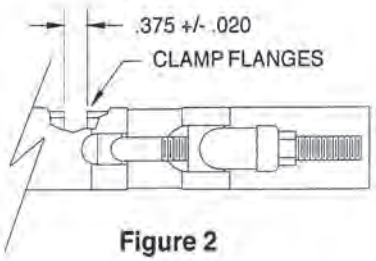


Figure 2

PROCEDURE TO RE-CALIBRATE FLOW METER

1) Enter a METER CAL number of 10 [38] in [METER CAL 5].
2) Enter a TOTAL VOLUME of 0 in [TOTAL VOLUME].
3) Switch OFF all booms.
4) Remove a boom hose and place in calibrated 5 gallon [19 liter] container.
5) Switch ON appropriate boom switch and MASTER switch. Pump exactly 10 gallons [38 liters].
6) Readout in TOTAL VOLUME is the new METER CAL number. This number should be within +/- 3% of the number stamped on the tag on Flow Meter.
7) Repeat this procedure several times to confirm accuracy. (Always "zero out" the TOTAL VOLUME display before retestng).

> **NOTE:** For greatest precision, set METER CAL to 100 and pump 100 gallons (378 liters) of water.

8) To verify Flow Meter calibration, fill applicator tank with a predetermined amount of measured liquid (i.e. 250 gallons).

> **DO NOT RELY ON GRADUATION NUMBERS MOLDED INTO APPLICATOR TANK.**

Empty the applicator tank under normal operating conditions. If the number displayed under TOTAL VOLUME is different from the predetermined amount of measured liquid by more than +/- 3%, complete the following calculation. See Example, Figure 3.

9) Enter corrected METER CAL before resuming application.

EXAMPLE:
METER CAL = 680 [164]
TOTAL VOLUME = 260 [984]
Predetermined amount of measured liquid =250 [946]

Corrected METER CAL =
$$\frac{\text{METER CAL} \times \text{TOTAL VOLUME}}{\text{Predetermined amount of measured liquid}}$$

ENGLISH UNITS: $= \frac{680 \times 260}{250} = 707$
METRIC UNITS: $= \frac{[164] \times [984]}{[946]} = [170]$

Corrected METER CAL = 707 [170]

Figure 3

016-0159-516
9/99 REV. E
SHEET 1 OF 1

6. TROUBLE SHOOTING

The Sprayflex Sprayers Field Sprayer uses a pressure circuit to deliver a chemical compound in solution to a series of nozzles for application to crops. It is a simple and reliable system that requires minimal maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local Sprayflex dealer or distributor. Before you call, please have this Operator's Manual and the serial number from your machine ready.

PROBLEM	CAUSE	SOLUTION
Sprayer not stable. Moves from side-to-side.	Low tire pressure.	Add air to tires.
	Loose wheel bolts.	Tighten wheel bolts.
Check valves or screen plugging.	Dirty water.	Flush and clean system with clean water.
	Poorly mixed chemicals.	Mix chemicals slower. Follow mixing instructions.
High spray drift.	Boom set too high.	Lower boom.
	Too windy.	Wait for wind to die down.
Controller doesn't control sprayer.	Blown fuse.	Replace fuse.
	Poor connection.	Pull connections apart. Clean terminals. Reconnect.
	No power.	Turn power on to controller.
	Refer to controller manual.	Refer to controller manual.
Booms bouncing.	Traveling too fast.	Slow down.
Low boom pressure.	Line strainer dirty.	Clean strainer.
	Gate valve on pump output improperly adjusted.	Open valve slightly to regain boom pressure.
	Pump is "starving".	Open suction line valve on bottom of tank.
	Collapsed suction hose to pump internally.	Replace suction hose.
	Leak in pressure line.	Replace hose and/or tighten fittings.
High boom pressure.	Nozzle tips and screens plugged.	Clean tips and screens as directed in "Maintenance" section.
	Ball valve on pump output improperly adjusted.	Close ball valve on pump output side to throttle pump down.
Electric shut-off valve won't open.	No electrical power to valve.	Remove cup portion of boot and manually activate. If stem movement is free, check and clean electrical connections. Check out electrical system.
Blowing fuses.	Short circuit in power line leading to electric shut-off valve.	Inspect wire for worn insulation and check connections.
	Short within coil of electric shut-off valve.	Remove connections from coil, making sure connections do not touch. Replace fuse and activate the switch. If fuse doesn't blow, replace coil.

PROBLEM	CAUSE	SOLUTION
Streaks or voids in spray pattern.	Clogged or damaged tip.	Inspect and clean tips as directed in "Maintenance" section.
Nozzle spray pattern is narrower and heavier in the middle and/or edges.	Tip worn enough to cause uneven application.	Replace tips. Check flow in GPM against a new tip before spraying.
A sprayer tankful covers more acres than before at the same pressure and speed.	Clogged tips or screens.	Clean tips and screens as directed in "Maintenance" section.
	Field speed faster than before because of less wheel slippage.	Reduce field speed.
	Pump hose collapsed.	Replace hose.
A sprayer tankful covers fewer acres than before at the same pressure and speed.	Worn spray tips.	Replace tips. Check flow in GPM against new tip before spraying.
	Field speed slower than before because of more wheel slippage.	Increase field speed.
	Pump losing capacity/volume.	Inspect for leaks and correct.
	Leaks through hoses or connections.	Repair or replace defective hoses. Tighten fittings and clamps.
Measured GPM noticeably less than from a new tip of the same size at the same pressure.	Clogged tips or screens.	Clean tips and screens as directed in "Maintenance" section.
Measured GPM noticeably more than from a new tip of the same size at the same pressure.	Spray tip is worn.	Replace tips. Check flow in GPM against new tip before spraying.
Streaks of weeds or crop damage.	Uneven chemical application caused by worn, damaged or clogged tips or clogged screens.	Clean or replace tips and screens as directed in the "Maintenance" section.
Pressure fluctuations.	Suction home between tank and pump is collapsed internally.	Replace suction hose.

7. SPECIFICATIONS

7.1 MECHANICAL

DIMENSIONS/INCHES	FieldStar 1500P	FieldStar 1450SS	FieldStar 2000SS
Length:			
Width: Field: / Transport:			
Height: Transport:			
Weight: Empty:			
Tank Capacity (Poly) gallons:			
Tank Capacity (Stainless Steel) gallons:			
Working Spray Range:			
Wheel Tread:			
PUMP			
Hydraulically driven (input):			
Performance (output):			
Call for other pump options			
Tank agitators:			
Wash Head:			
TIRES			
Trailer:			
Tire Pressure:			
Hubs:			
Lug Nut Torque:			
OPTIONAL CONTROLLER 450 RAVEN			
Power: 12V			
Cab Fold Box:			

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

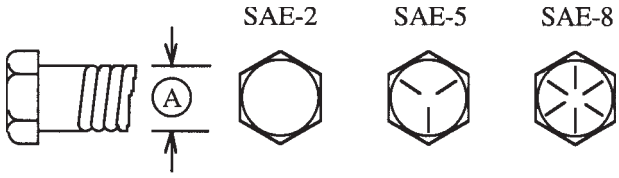
7.2 BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque * SAE 2 N.m	SAE 2 (lb-ft)	SAE 5 N.m	SAE 5 (lb-ft)	SAE 8 N.m	SAE 8 (lb-ft)
1/4"	8	(6)	12	(9)	17	(12)
5/16"	13	(10)	25	(19)	36	(27)
3/8"	27	(20)	45	(33)	63	(45)
7/16"	41	(30)	72	(53)	100	(75)
1/2"	61	(45)	110	(80)	155	(115)
9/16"	95	(70)	155	(115)	220	(165)
5/8"	128	(95)	215	(160)	305	(220)
3/4"	225	(165)	390	(290)	540	(400)
7/8"	230	(170)	570	(420)	880	(650)
1"	345	(225)	850	(630)	1320	(970)



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

7.3 HYDRAULIC FITTING TORQUE

TIGHTENING FLARE TYPE TUBE FITTINGS *

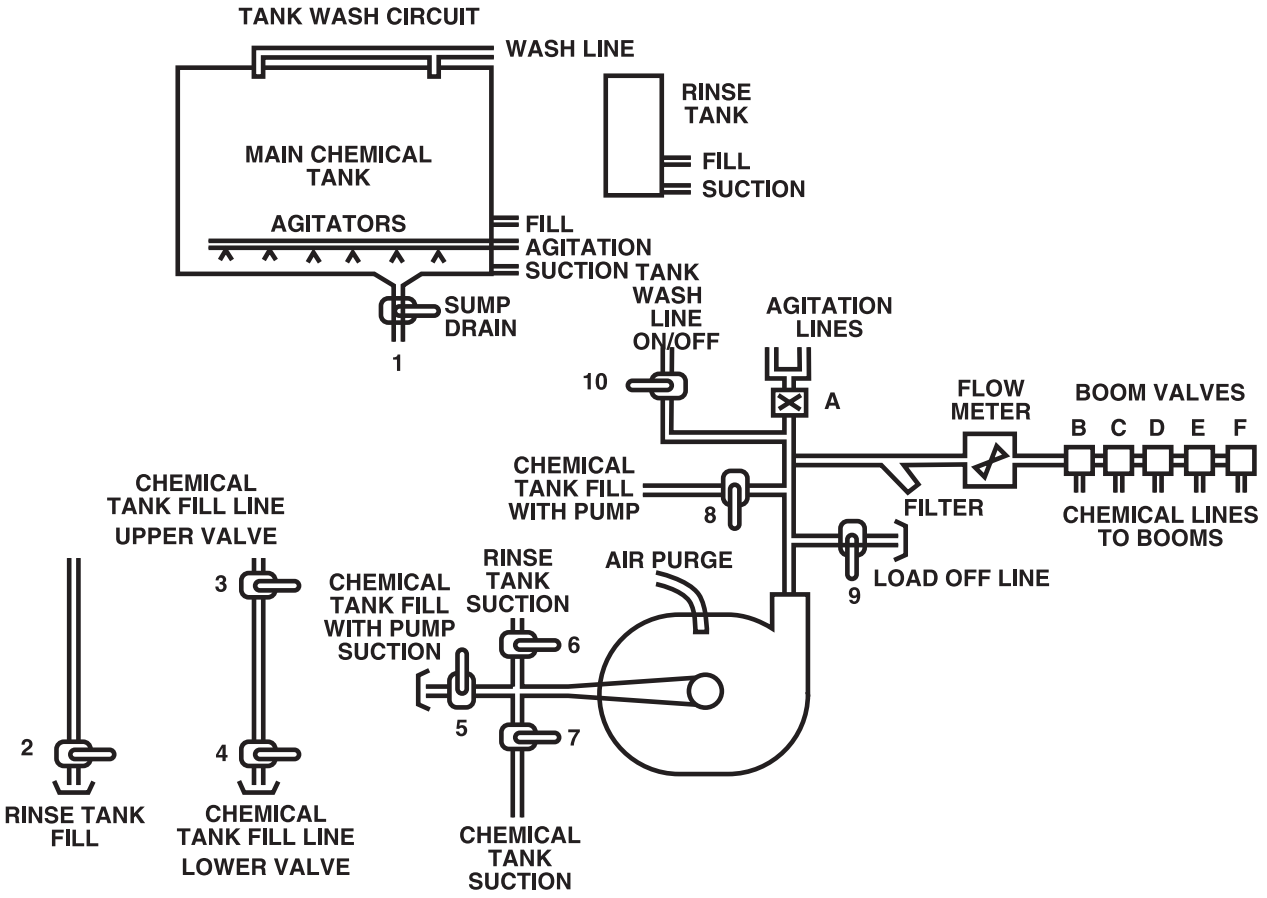
1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

* The torque values shown are based on lubricated connections as in reassembly.

Tube Size OD (in.)	Nut Size Across Flats (in.)	Torque Value* (N.m)	Torque Value* (lb-ft)	Recommended Turns to Tighten (After Finger Tightening) (Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

7.4 CHEMICAL CIRCUIT SCHEMATIC

7.4.1 TRUCK MODEL



Manually Operated Valves:

1. Sump Drain
2. Rinse Tank Fill Line
3. Chemical Tank Fill Line - Upper Valve
4. Chemical Tank Fill Line - Lower Valve
5. Chemical Tank Fill with Pump
6. Rinse Tank Suction
7. Chemical Tank Suction
8. Chemical Tank Fill with Pump
9. Load Off Line
10. Tank Wash Line Hand Valve - On/Off

Chemical Controller Valves:

A. Agitation Lines

B. Chemical Line to Boom

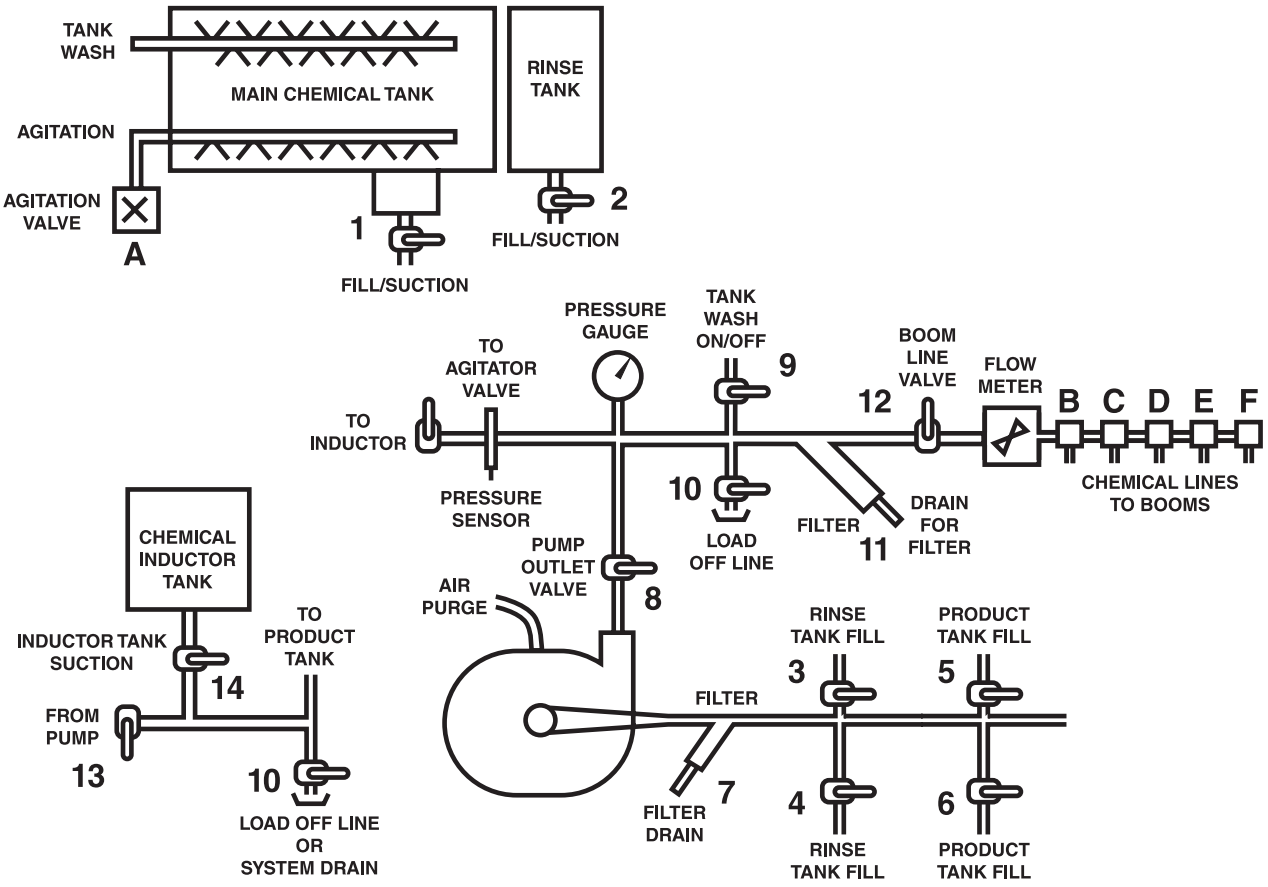
C. Chemical Line to Boom

D. Chemical Line to Boom

E. Chemical Line to Boom

F. Chemical Line to Boom

7.4.2 1600 SS/RM & 2000 SS/RM



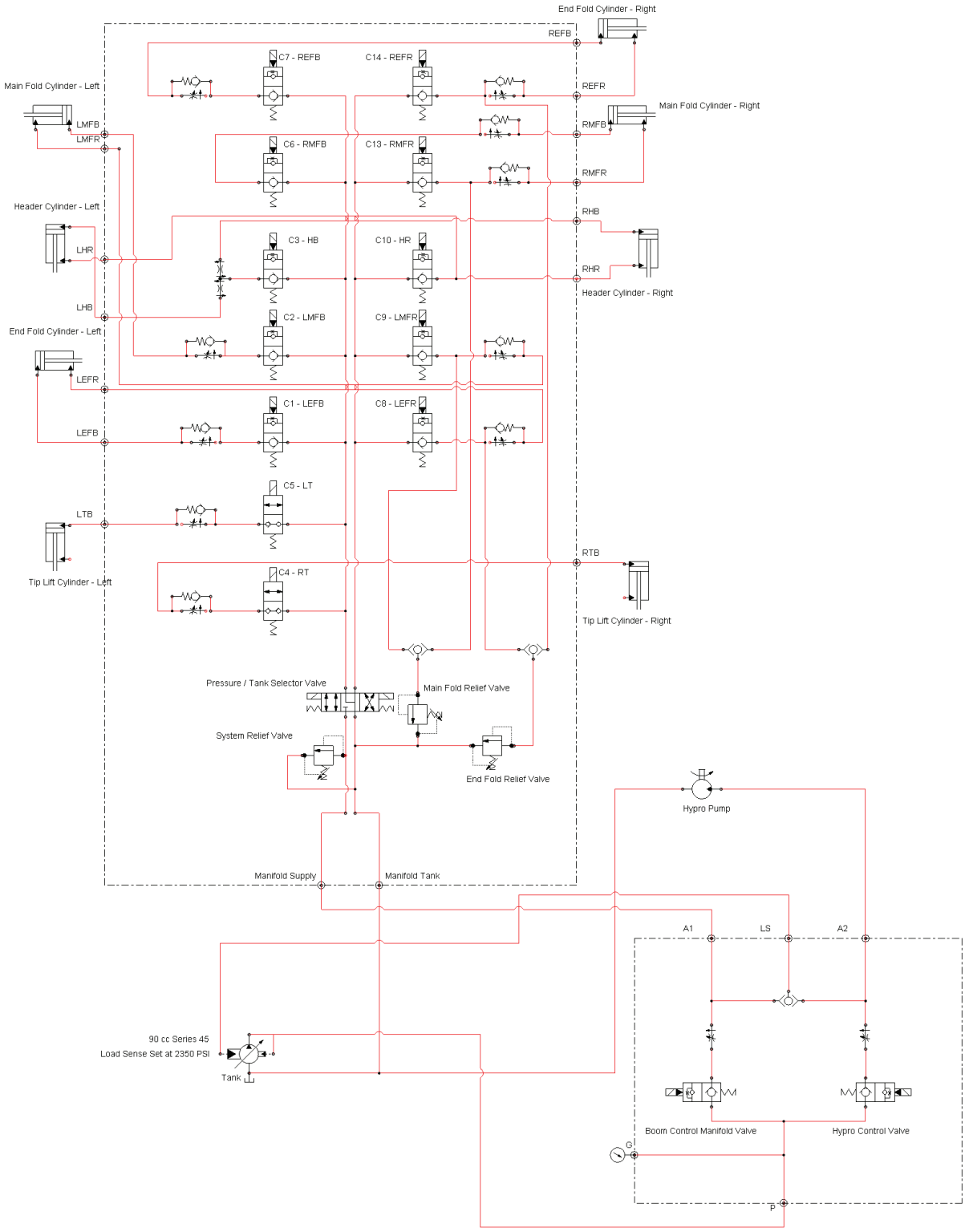
Manually Operated Valves:

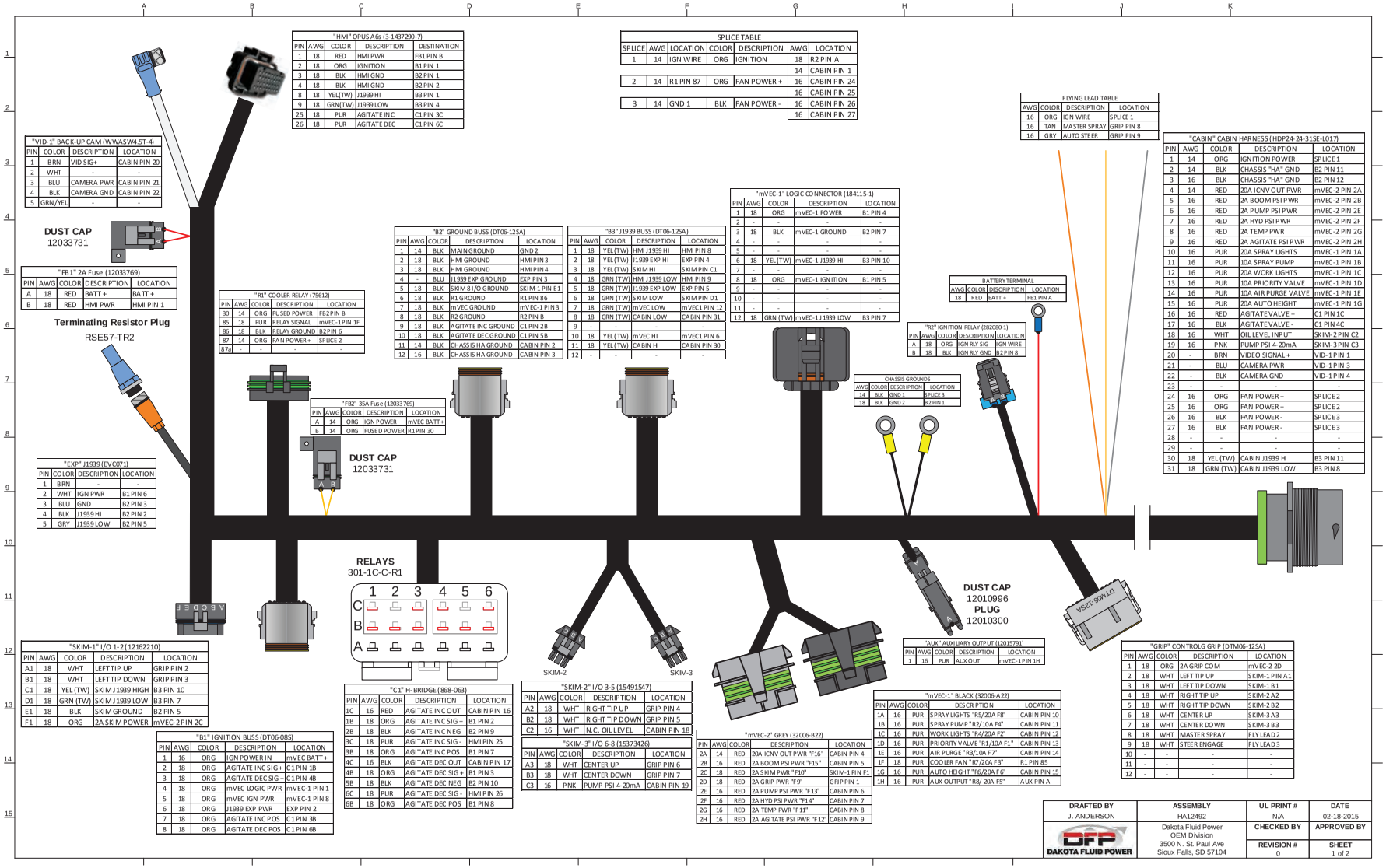
1. Sump Fill/Suction
2. Rinse Tank Fill/Suction Line
3. Rinse Tank Fill - Upper Valve
4. Rinse Tank Fill - Lower Valve
5. Product Tank Fill Line - Upper Valve
6. Product Tank Fill Line - Lower Valve
7. Suction Filter - Drain
8. Pump Outlet
9. Tank Wash Line Hand Valve - On/Off
10. Load Off Line - System Drain
11. Pressure Filter - Drain
12. Boom Lines
13. Inductor Tank Suction with Pump
14. Inductor Tank Suction

Chemical Controller Valves:

A. Agitation Lines
B. Chemical Line to Boom
C. Chemical Line to Boom
D. Chemical Line to Boom
E. Chemical Line to Boom
F. Chemical Line to Boom

7.5 HYDRAULIC SYSTEM SCHEMATICS





"HMI" OPUS A6s (3-1437290-7)

PIN	AWG	COLOR	DESCRIPTION	DESTINATION
1	18	RED	HMI PWR	FB1 PIN B
2	18	ORG	IGNITION	B1 PIN 1
3	18	BLK	HMI GND	B2 PIN 1
4	18	BLK	HMI GND	B2 PIN 2
8	18	YEL(TW)	J1939 HI	B3 PIN 1
9	18	GRN(TW)	J1939 LOW	B3 PIN 4
25	18	PUR	AGITATE INC	C1 PIN 3C
26	18	PUR	AGITATE DEC	C1 PIN 6C

SPLICE TABLE

SPLICE	AWG	LOCATION	COLOR	DESCRIPTION	AWG	LOCATION
1	14	IGN WIRE	ORG	IGNITION	18	R2 PIN A
					14	CABIN PIN 1
2	14	R1 PIN 87	ORG	FAN POWER +	16	CABIN PIN 24
					16	CABIN PIN 25
3	14	GND 1	BLK	FAN POWER -	16	CABIN PIN 26
					16	CABIN PIN 27

FLYING LEAD TABLE

AWG	COLOR	DESCRIPTION	LOCATION
16	ORG	IGN WIRE	SPLICE 1
16	TAN	MASTER SPRAY	GRIP PIN 8
16	GRY	AUTO STEER	GRIP PIN 9

"VID-1" BACK-UP CAM (WWASW4.5T-4)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	VID SIG+	CABIN PIN 20
2	WHT		
3	BLU	CAMERA PWR	CABIN PIN 21
4	BLK	CAMERA GND	CABIN PIN 22
5	GRN/YEL	-	-

"FB1" 2A Fuse (12033769)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	18	RED	BATT +	BATT +
B	18	RED	HMI PWR	HMI PIN 1

"R1" COOLER RELAY (75612)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
30	14	ORG	FUSED POWER	FB2 PIN B
85	18	PUR	RELAY SIGNAL	mVEC-1 PIN 1F
86	18	BLK	RELAY GROUND	B2 PIN 6
87	14	ORG	FAN POWER +	SPLICE 2
87a	-	-	-	-

"B2" GROUND BUSS (DT06-12SA)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	14	BLK	MAIN GROUND	GND 2
2	18	BLK	HMI GROUND	HMI PIN 3
3	18	BLK	HMI GROUND	HMI PIN 4
4	-	BLU	J1939 EXP GROUND	EXP PIN 3
5	18	BLK	SKIM-1 I/O GROUND	SKIM-1 PIN E1
6	18	BLK	R1 GROUND	R1 PIN 86
7	18	BLK	mVEC GROUND	mVEC-1 PIN 3
8	18	BLK	R2 GROUND	R2 PIN B
9	18	BLK	AGITATE INC GROUND	C1 PIN 2B
10	18	BLK	AGITATE DEC GROUND	C1 PIN 5B
11	14	BLK	CHASSIS HA GROUND	CABIN PIN 2
12	16	BLK	CHASSIS HA GROUND	CABIN PIN 3

"B3" J1939 BUSS (DT06-12SA)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	YEL (TW)	HMI J1939 HI	HMI PIN 8
2	18	YEL (TW)	J1939 EXP HI	EXP PIN 4
3	18	YEL (TW)	SKIM HI	SKIM PIN C1
4	18	GRN (TW)	HMI J1939 LOW	HMI PIN 9
5	18	GRN (TW)	J1939 EXP LOW	EXP PIN 5
6	18	GRN (TW)	SKIM LOW	SKIM PIN D1
7	18	GRN (TW)	mVEC LOW	mVEC1 PIN 12
8	18	GRN (TW)	CABIN LOW	CABIN PIN 31
9	-	-		-
10	18	YEL (TW)	mVEC HI	mVEC1 PIN 6
11	18	YEL (TW)	CABIN HI	CABIN PIN 30
12		-	-	-

"mVEC-1" LOGIC CONNECTOR (184115-1)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	ORG	mVEC-1 POWER	B1 PIN 4
2	-	-	-	-
3	18	BLK	mVEC-1 GROUND	B2 PIN 7
4	-	-	-	-
5	-	-	-	-
6	18	YEL (TW)	mVEC-1 J1939 HI	B3 PIN 10
7	-	-	-	-
8	18	ORG	mVEC-1 IGNITION	B1 PIN 5
9	-	-	-	-
10	-	-	-	-
11	-	-	-	-
12	18	GRN (TW)	mVEC-1 J1939 LOW	B3 PIN 7

BATTERY TERMINAL

AWG	COLOR	DESCRIPTION	LOCATION
18	RED	BATT +	FB1 PIN A

"R2" IGNITION RELAY (282080-1)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	18	ORG	IGN RLY SIG	IGN WIRE
8	18	BLK	IGN RLY GND	B2 PIN 8

CHASSIS GROUNDS

AWG	COLOR	DESCRIPTION	LOCATION
14	BLK	GND 1	SPLICE 3
18	BLK	GND 2	B2 PIN 1

"FB2" 35A Fuse (12033769)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	14	ORG	IGN POWER	mVEC BATT+
8	14	ORG	FUSED POWER	R1 PIN 30

"CABIN" CABIN HARNESS (HDP24-24-31SE-L017)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	14	ORG	IGNITION POWER	SPLICE 1
2	14	BLK	CHASSIS "HA" GND	B2 PIN 11
3	16	BLK	CHASSIS "HA" GND	B2 PIN 12
4	14	RED	20A ICNV OUT PWR	mVEC-2 PIN 2A
5	16	RED	2A BOOM PSI PWR	mVEC-2 PIN 2B
6	16	RED	2A PUMP PSI PWR	mVEC-2 PIN 2E
7	16	RED	2A HYD PSI PWR	mVEC-2 PIN 2F
8	16	RED	2A TEMP PWR	mVEC-2 PIN 2G
9	16	RED	2A AGITATE PSI PWR	mVEC-2 PIN 2H
10	16	PUR	20A SPRAY LIGHTS	mVEC-1 PIN 1A
11	16	PUR	10A SPRAY PUMP	mVEC-1 PIN 1B
12	16	PUR	20A WORK LIGHTS	mVEC-1 PIN 1C
13	16	PUR	10A PRIORITY VALVE	mVEC-1 PIN 1D
14	16	PUR	10A AIR PURGE VALVE	mVEC-1 PIN 1E
15	16	PUR	20A AUTO HEIGHT	mVEC-1 PIN 1G
16	16	RED	AGITATE VALVE +	C1 PIN 1C
17	16	BLK	AGITATE VALVE -	C1 PIN 4C
18	16	WHT	OIL LEVEL INPUT	SKIM-2 PIN C2
19	16	PNK	PUMP PSI 4-20mA	SKIM-3 PIN C3
20	-	BRN	VIDEO SIGNAL +	VID-1 PIN 1
21	-	BLU	CAMERA PWR	VID-1 PIN 3
22	-	BLK	CAMERA GND	VID-1 PIN 4
23	-	-	-	-
24	16	ORG	FAN POWER +	SPLICE 2
25	16	ORG	FAN POWER +	SPLICE 2
26	16	BLK	FAN POWER -	SPLICE 3
27	16	BLK	FAN POWER -	SPLICE 3
28	-	-	-	-
29	-	-	-	-
30	18	YEL (TW)	CABIN J1939 HI	B3 PIN 11
31	18	GRN (TW)	CABIN J1939 LOW	B3 PIN 8

"EXP" J1939 (EVC071)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	-	-
2	WHT	IGN PWR	B1 PIN 6
3	BLU	GND	B2 PIN 3
4	BLK	J1939 HI	B2 PIN 2
5	GRY	J1939 LOW	B2 PIN 5

"SKIM-1" I/O 1-2 (12162210)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A1	18	WHT	LEFT TIP UP	GRIP PIN 2
B1	18	WHT	LEFT TIP DOWN	GRIP PIN 3
C1	18	YEL (TW)	SKIM J1939 HIGH	B3 PIN 10
D1	18	GRN (TW)	SKIM J1939 LOW	B3 PIN 7
E1	18	BLK	SKIM GROUND	B2 PIN 5
F1	18	ORG	2A SKIM POWER	mVEC-2 PIN 2C

"C1" H-BRIDGE (868-063)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1C	16	RED	AGITATE INC OUT	CABIN PIN 16
1B	18	ORG	AGITATE INC SIG +	B1 PIN 2
2B	18	BLK	AGITATE INC NEG	B2 PIN 9
3C	18	PUR	AGITATE INC SIG -	HMI PIN 25
3B	18	ORG	AGITATE INC POS	B1 PIN 7
4C	16	BLK	AGITATE DEC OUT	CABIN PIN 17
4B	18	ORG	AGITATE DEC SIG +	B1 PIN 3
5B	18	BLK	AGITATE DEC NEG	B2 PIN 10
6C	18	PUR	AGITATE DEC SIG -	HMI PIN 26
6B	18	ORG	AGITATE DEC POS	B1 PIN 8

"SKIM-2" I/O 3-5 (15491547)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A2	18	WHT	RIGHT TIP UP	GRIP PIN 4
B2	18	WHT	RIGHT TIP DOWN	GRIP PIN 5
C2	16	WHT	N.C. OIL LEVEL	CABIN PIN 18

"SKIM-3" I/O 6-8 (15373426)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A3	18	WHT	CENTER UP	GRIP PIN 6
B3	18	WHT	CENTER DOWN	GRIP PIN 7
C3	16	PNK	PUMP PSI 4-20mA	CABIN PIN 19

"mVEC-2" GREY (32006-B22)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
2A	14	RED	20A ICNV OUT PWR "F16"	CABIN PIN 4
2B	16	RED	2A BOOM PSI PWR "F15"	CABIN PIN 5
2C	18	RED	2A SKIM PWR "F10"	SKIM-1 PIN F1
2D	18	RED	2A GRIP PWR "F9"	GRIP PIN 1
2E	16	RED	2A PUMP PSI PWR "F13"	CABIN PIN 6
2F	16	RED	2A HYD PSI PWR "F14"	CABIN PIN 7
2G	16	RED	2A TEMP PWR "F11"	CABIN PIN 8
2H	16	RED	2A AGITATE PSI PWR "F12"	CABIN PIN 9

"mVEC-1" BLACK (32006-A22)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1A	16	PUR	SPRAY LIGHTS "R5/20A F8"	CABIN PIN 10
1B	16	PUR	SPRAY PUMP "R2/10A F4"	CABIN PIN 11
1C	16	PUR	WORK LIGHTS "R4/20A F2"	CABIN PIN 12
1D	16	PUR	PRIORITY VALVE "R1/10A F1"	CABIN PIN 13
1E	16	PUR	AIR PURGE "R3/10A F7"	CABIN PIN 14
1F	18	PUR	COOLER FAN "R7/20A F3"	R1 PIN 85
1G	16	PUR	AUTO HEIGHT "R6/20A F6"	CABIN PIN 15
1H	16	PUR	AUX OUTPUT "R8/ 20A F5"	AUX PIN A

"AUX" AUXILIARY OUTPUT (12015791)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	PUR	AUX OUT	mVEC-1 PIN 1H

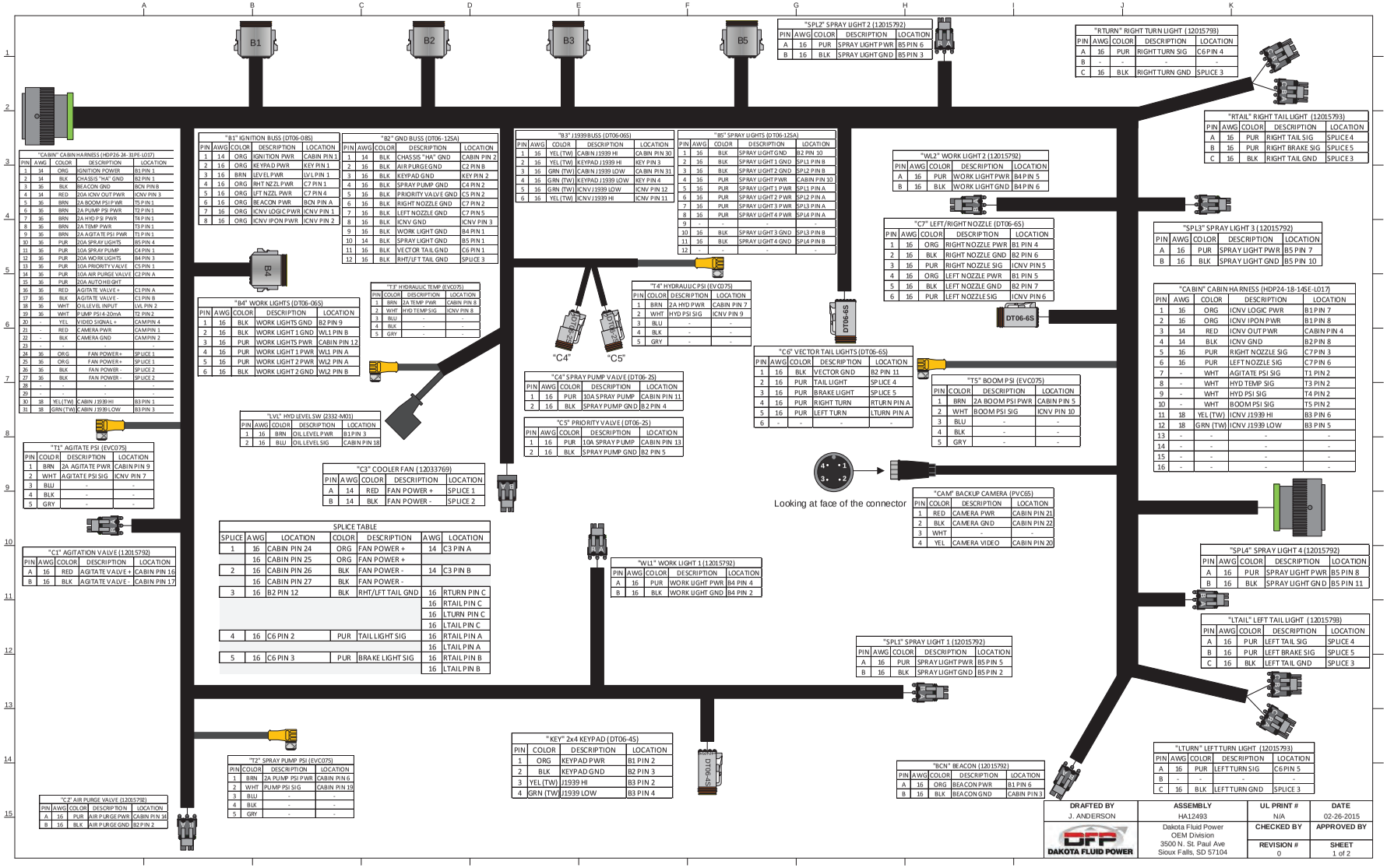
"GRIP" CONTROLG GRIP (DTM06-12SA)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	ORG	2A GRIP COM	mVEC-2 2D
2	18	WHT	LEFT TIP UP	SKIM-1 P IN A1
3	18	WHT	LEFT TIP DOWN	SKIM-1 B1
4	18	WHT	RIGHT TIP UP	SKIM-2 A2
5	18	WHT	RIGHT TIP DOWN	SKIM-2 B2
6	18	WHT	CENTER UP	SKIM-3 A3
7	18	WHT	CENTER DOWN	SKIM-3 B3
8	18	WHT	MASTER SPRAY	FLY LEAD 2
9	18	WHT	STEER ENGAGE	FLY LEAD 3
10	-	-	-	-
11	-	-	-	-
12	-	-	-	-

"B1" IGNITION BUSS (DT06-08S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	ORG	IGN POWER IN	mVEC BATT+
2	18	ORG	AGITATE INC SIG +	C1 PIN 1B
3	18	ORG	AGITATE DEC SIG +	C1 PIN 4B
4	18	ORG	mVEC LOGIC PWR	mVEC-1 PIN 1
5	18	ORG	mVEC IGN PWR	mVEC-1 PIN 8
6	18	ORG	J1939 EXP PWR	EXP PIN 2
7	18	ORG	AGITATE INC POS	C1 PIN 3B
8	18	ORG	AGITATE DEC POS	C1 PIN 6B

DRAFTED BY	ASSEMBLY	UL PRINT #	DATE
J. ANDERSON	HA12492	N/A	02-18-2015
DAKOTA FLUID POWER	Dakota Fluid Power OEM Division 3500 N. St. Paul Ave Sioux Falls, SD 57104	CHECKED BY	APPROVED BY
		REVISION # 0	SHEET 1 of 2



"CABIN" CABIN HARNESS (HDP26-24-31PE-L017)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	14	ORG	IGNITION POWER	B1 PIN 1
2	14	BLK	CHASSIS "HA" GND	B2 PIN 1
3	16	BLK	BEACON GND	BCN PIN B
4	14	RED	20A ICNV OUT PWR	ICNV PIN 3
5	16	BRN	2A BOOM PSI PWR	T5 PIN 1
6	16	BRN	2A PUMP PSI PWR	T2 PIN 1
7	16	BRN	2A HYD PSI PWR	T4 PIN 1
8	16	BRN	2A TEMP PWR	T3 PIN 1
9	16	BRN	2A AGITATE PSI PWR	T1 PIN 1
30	16	PUR	20A SPRAY LIGHTS	B5 PIN 4
31	16	PUR	10A SPRAY PUMP	C4 PIN 1
32	16	PUR	20A WORK LIGHTS	B4 PIN 3
33	16	PUR	10A PRIORITY VALVE	C5 PIN 1
34	16	PUR	10A AIR PURGE VALVE	C2 PIN A
35	16	PUR	20A AUTO HIGHT -	-
36	16	RED	AGITATE VALVE +	C1 PIN A
37	16	BLK	AGITATE VALVE -	C1 PIN B
38	16	WHT	OIL LEVEL INPUT	LVL PIN 2
39	16	WHT	PUMP PSI 4-20mA	T2 PIN 2
20	-	YEL	VIDEO SIGNAL +	CAMPIN 4
21	-	RED	CAMERA PWR	CAMPIN 1
22	-	BLK	CAMERA GND	CAMPIN 2
23	-			
24	16	ORG	FAN POWER +	SPLICE 1
25	16	ORG	FAN POWER +	SPLICE 1
26	16	BLK	FAN POWER -	SPLICE 2
27	16	BLK	FAN POWER -	SPLICE 2
28	-	-	-	-
29	-	-	-	-
30	18	YEL (TW)	CABIN J1939 HI	B3 PIN 1
31	18	GRN (TW)	CABIN J1939 LOW	B3 PIN 3

"B1" IGNITION BUSS (DT06-08S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	14	ORG	IGNITION PWR	CABIN PIN 1
2	16	ORG	KEYPAD PWR	KEY PIN 1
3	16	BRN	LEVEL PWR	LVL PIN 1
4	16	ORG	RHT NZZL PWR	C7 PIN 1
5	16	ORG	LFT NZZL PWR	C7 PIN 4
6	16	ORG	BEACON PWR	BCN PIN A
7	16	ORG	ICNV LOGIC PWR	ICNV PIN 1
8	16	ORG	ICNV IPON PWR	ICNV PIN 2

"B2" GND BUSS (DT06-12SA)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	14	BLK	CHASSIS "HA" GND	CABIN PIN 2
2	16	BLK	AIR PURGE GND	C2 PIN B
3	16	BLK	KEYPAD GND	KEY PIN 2
4	16	BLK	SPRAY PUMP GND	C4 PIN 2
5	16	BLK	PRIORITY VALVE GND	C5 PIN 2
6	16	BLK	RIGHT NOZZLE GND	C7 PIN 2
7	16	BLK	LEFT NOZZLE GND	C7 PIN 5
8	16	BLK	ICNV GND	ICNV PIN 3
9	16	BLK	WORK LIGHT GND	B4 PIN 1
10	14	BLK	SPRAY LIGHT GND	B5 PIN 1
11	16	BLK	VECTOR TAIL GND	C6 PIN 1
12	16	BLK	RHT/LFT TAIL GND	SPLICE 3

"B3" J1939 BUSS (DT06-06S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	YEL (TW)	CABIN J1939 HI	CABIN PIN 30
2	16	YEL (TW)	KEYPAD J1939 HI	KEY PIN 3
3	16	GRN (TW)	CABIN J1939 LOW	CABIN PIN 31
4	16	GRN (TW)	KEYPAD J1939 LOW	KEY PIN 4
5	16	GRN (TW)	ICNV J1939 LOW	ICNV PIN 12
6	16	YEL (TW)	ICNV J1939 HI	ICNV PIN 11

"B5" SPRAY LIGHTS (DT06-12SA)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	BLK	SPRAY LIGHT GND	B2 PIN 10
2	16	BLK	SPRAY LIGHT 1 GND	SPL1 PIN B
3	16	BLK	SPRAY LIGHT 2 GND	SPL2 PIN B
4	16	PUR	SPRAY LIGHT PWR	CABIN PIN 10
5	16	PUR	SPRAY LIGHT 1 PWR	SPL1 PIN A
6	16	PUR	SPRAY LIGHT 2 PWR	SPL2 PIN A
7	16	PUR	SPRAY LIGHT 3 PWR	SPL3 PIN A
8	16	PUR	SPRAY LIGHT 4 PWR	SPL4 PIN A
9	-	-	-	-
10	16	BLK	SPRAY LIGHT 3 GND	SPL3 PIN B
11	16	BLK	SPRAY LIGHT 4 GND	SPL4 PIN B
12	-	-	-	-

"SPL2" SPRAY LIGHT 2 (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	SPRAY LIGHT PWR	B5 PIN 6
B	16	BLK	SPRAY LIGHT GND	B5 PIN 3

"RTURN" RIGHT TURN LIGHT (12015793)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	RIGHT TURN SIG	C6 PIN 4
B	-	-	-	-
C	16	BLK	RIGHT TURN GND	SPLICE 3

"RTAIL" RIGHT TAIL LIGHT (12015793)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	RIGHT TAIL SIG	SPLICE 4
B	16	PUR	RIGHT BRAKE SIG	SPLICE 5
C	16	BLK	RIGHT TAIL GND	SPLICE 3

"WL2" WORK LIGHT 2 (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	WORK LIGHT PWR	B4 PIN 5
B	16	BLK	WORK LIGHT GND	B4 PIN 6

"C7" LEFT/RIGHT NOZZLE (DT06-6S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	ORG	RIGHT NOZZLE PWR	B1 PIN 4
2	16	BLK	RIGHT NOZZLE GND	B2 PIN 6
3	16	PUR	RIGHT NOZZLE SIG	ICNV PIN 5
4	16	ORG	LEFT NOZZLE PWR	B1 PIN 5
5	16	BLK	LEFT NOZZLE GND	B2 PIN 7
6	16	PUR	LEFT NOZZLE SIG	ICNV PIN 6

"SPL3" SPRAY LIGHT 3 (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	SPRAY LIGHT PWR	B5 PIN 7
B	16	BLK	SPRAY LIGHT GND	B5 PIN 10

"CABIN" CABIN HARNESS (HDP24-18-14SE-L017)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	ORG	ICNV LOGIC PWR	B1 PIN 7
2	16	ORG	ICNV IPON PWR	B1 PIN 8
3	14	RED	ICNV OUT PWR	CABIN PIN 4
4	14	BLK	ICNV GND	B2 PIN 8
5	16	PUR	RIGHT NOZZLE SIG	C7 PIN 3
6	16	PUR	LEFT NOZZLE SIG	C7 PIN 6
7	-	WHT	AGITATE PSI SIG	T1 PIN 2
8	-	WHT	HYD TEMP SIG	T3 PIN 2
9	-	WHT	HYD PSI SIG	T4 PIN 2
10	-	WHT	BOOM PSI SIG	T5 PIN 2
11	18	YEL (TW)	ICNV J1939 HI	B3 PIN 6
12	18	GRN (TW)	ICNV J1939 LOW	B3 PIN 5
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	-	-	-	-

"B4" WORK LIGHTS (DT06-06S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	BLK	WORK LIGHTS GND	B2 PIN 9
2	16	BLK	WORK LIGHT 1 GND	WL1 PIN B
3	16	PUR	WORK LIGHTS PWR	CABIN PIN 12
4	16	PUR	WORK LIGHT 1 PWR	WL1 PIN A
5	16	PUR	WORK LIGHT 2 PWR	WL2 PIN A
6	16	BLK	WORK LIGHT 2 GND	WL2 PIN B

"T3" HYDRAULIC TEMP (EVC075)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	2A TEMP PWR	CABIN PIN 8
2	WHT	HYD TEMP SIG	ICNV PIN 8
3	BLU	-	-
4	BLK	-	-
5	GRY	-	-

"T4" HYDRAULIC PSI (EVC075)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	2A HYD PWR	CABIN PIN 7
2	WHT	HYD PSI SIG	ICNV PIN 9
3	BLU	-	-
4	BLK	-	-
5	GRY	-	-

"C6" VECTOR TAIL LIGHTS (DT06-6S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	BLK	VECTOR GND	B2 PIN 11
2	16	PUR	TAIL LIGHT	SPLICE 4
3	16	PUR	BRAKE LIGHT	SPLICE 5
4	16	PUR	RIGHT TURN	RTURN PIN A
5	16	PUR	LEFT TURN	LTURN PIN A
6	-	-	-	-

"T5" BOOM PSI (EVC075)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	2A BOOM PSI PWR	CABIN PIN 5
2	WHT	BOOM PSI SIG	ICNV PIN 10
3	BLU	-	-
4	BLK	-	-
5	GRY	-	-

"C4" SPRAY PUMP VALVE (DT06-2S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	PUR	10A SPRAY PUMP	CABIN PIN 11
2	16	BLK	SPRAY PUMP GND	B2 PIN 4

"C5" PRIORITY VALVE (DT06-2S)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	PUR	10A SPRAY PUMP	CABIN PIN 13
2	16	BLK	SPRAY PUMP GND	B2 PIN 5

"VL" HYD LEVEL SW (2332-M01)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	BRN	OIL LEVEL PWR	B1 PIN 3
2	16	BLU	OIL LEVEL SIG	CABIN PIN 18

"C3" COOLER FAN (12033769)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	14	RED	FAN POWER +	SPLICE 1
B	14	BLK	FAN POWER -	SPLICE 2

"T1" AGITATE PSI (EVC075)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	2A AGITATE PWR	CABIN PIN 9
2	WHT	AGITATE PSI SIG	ICNV PIN 7
3	BLU	-	-
4	BLK	-	-
5	GRY	-	-

"C1" AGITATION VALVE (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	RED	AGITATE VALVE +	CABIN PIN 16
B	16	BLK	AGITATE VALVE -	CABIN PIN 17

SPLICE TABLE

SPLICE	AWG	LOCATION	COLOR	DESCRIPTION	AWG	LOCATION
1	16	CABIN PIN 24	ORG	FAN POWER +	14	C3 PIN A
	16	CABIN PIN 25	ORG	FAN POWER +		
2	16	CABIN PIN 26	BLK	FAN POWER -	14	C3 PIN B
	16	CABIN PIN 27	BLK	FAN POWER -		
3	16	B2 PIN 12	BLK	RHT/LFT TAIL GND	16	RTURN PIN C
					16	RTAIL PIN C
					16	LTURN PIN C
					16	LTAIL PIN C
4	16	C6 PIN 2	PUR	TAIL LIGHT SIG	16	RTAIL PIN A
					16	LTAIL PIN A
5	16	C6 PIN 3	PUR	BRAKE LIGHT SIG	16	RTAIL PIN B
					16	LTAIL PIN B

"WL1" WORK LIGHT 1 (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	WORK LIGHT PWR	B4 PIN 4
B	16	BLK	WORK LIGHT GND	B4 PIN 2

"CAM" BACKUP CAMERA (PVC65)

PIN	COLOR	DESCRIPTION	LOCATION
1	RED	CAMERA PWR	CABIN PIN 21
2	BLK	CAMERA GND	CABIN PIN 22
3	WHT	-	-
4	YEL	CAMERA VIDEO	CABIN PIN 20

"SPL4" SPRAY LIGHT 4 (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	SPRAY LIGHT PWR	B5 PIN 8
B	16	BLK	SPRAY LIGHT GND	B5 PIN 11

"LTAIL" LEFT TAIL LIGHT (12015793)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	LEFT TAIL SIG	SPLICE 4
B	16	PUR	LEFT BRAKE SIG	SPLICE 5
C	16	BLK	LEFT TAIL GND	SPLICE 3

"SPL1" SPRAY LIGHT 1 (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	SPRAY LIGHT PWR	B5 PIN 5
B	16	BLK	SPRAY LIGHT GND	B5 PIN 2

"T2" SPRAY PUMP PSI (EVC075)

PIN	COLOR	DESCRIPTION	LOCATION
1	BRN	2A PUMP PSI PWR	CABIN PIN 6
2	WHT	PUMP PSI SIG	CABIN PIN 19
3	BLU	-	-
4	BLK	-	-
5	GRY	-	-

"KEY" 2x4 KEYPAD (DT06-4S)

PIN	COLOR	DESCRIPTION	LOCATION
1	ORG	KEYPAD PWR	B1 PIN 2
2	BLK	KEYPAD GND	B2 PIN 3
3	YEL (TW)	J1939 HI	B3 PIN 2
4	GRN (TW)	J1939 LOW	B3 PIN 4

"BCN" BEACON (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	ORG	BEACON PWR	B1 PIN 6
B	16	BLK	BEACON GND	CABIN PIN 3

"LTURN" LEFT TURN LIGHT (12015793)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	LEFT TURN SIG	C6 PIN 5
B	-	-	-	-
C	16	BLK	LEFT TURN GND	SPLICE 3

"C2" AIR PURGE VALVE (12015792)

PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	16	PUR	AIR PURGE PWR	CABIN PIN 14
B	16	BLK	AIR PURGE GND	B2 PIN 2

Looking at face of the connector

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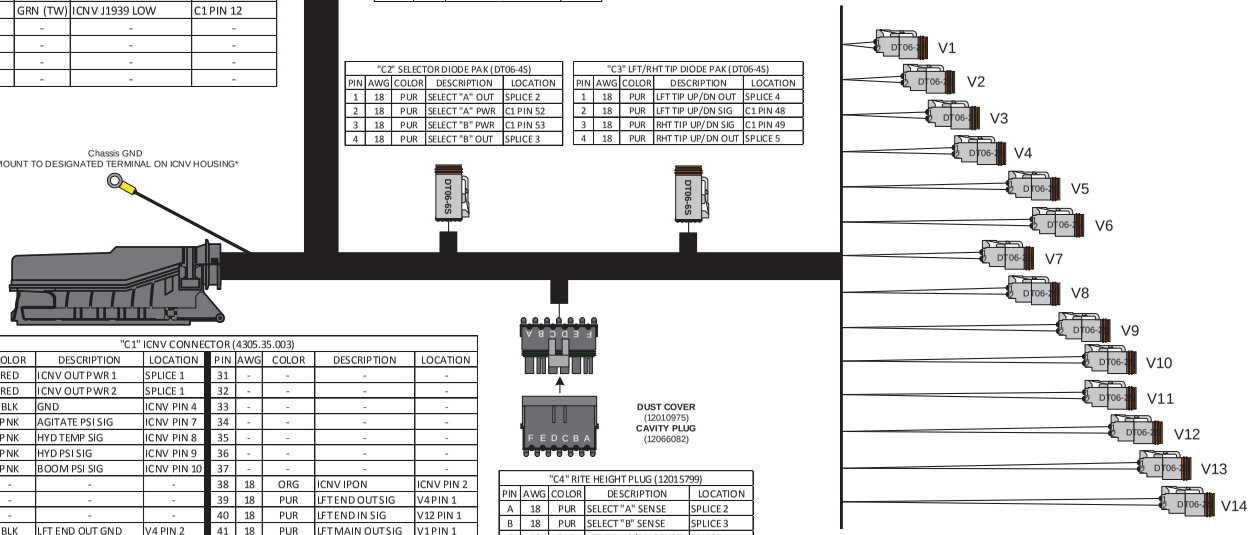
"ICNV" ICNV HARNESS (HDP26-18-14PE-L017)				
PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	ORG	ICNV LOGIC PWR	C1 PIN 20
2	18	ORG	ICNV IPON PWR	C1 PIN 38
3	14	RED	ICNV OUT PWR	SPLICE 1
4	14	BLK	ICNV GND	C1 PIN 3
5	18	PUR	RIGHT NOZZLE SIG	C1 PIN 55
6	18	PUR	LEFT NOZZLE SIG	C1 PIN 54
7	18	PNK	AGITATE PSI SIG	C1 PIN 4
8	18	PNK	HYD TEMP SIG	C1 PIN 5
9	18	PNK	HYD PSI SIG	C1 PIN 6
10	18	PNK	BOOM PSI SIG	C1 PIN 7
11	18	YEL (TW)	ICNV J1939 HI	C1 PIN 13
12	18	GRN (TW)	ICNV J1939 LOW	C1 PIN 12
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	-	-	-	-

SPLICE TABLE							
SPLICE	AWG	LOCATION	COLOR	DESCRIPTION	AWG	LOCATION
1	14	ICNV PIN 3	ORG	ICNV OUT PWR 1	16	C1 PIN 1
			ORG	ICNV OUT PWR 2	16	C1 PIN 2
2	18	SELECT "A" OUT	PUR	SELECT "A" VALVE	18	V5 PIN 1
	18	SELECT "A" SENSE	PUR			
3	18	SELECT "B" OUT	PUR	SELECT "B" VALVE	18	V6 PIN 1
	18	SELECT "B" SENSE	PUR			
4	18	LFT TIP UP/DN OUT	PUR	LFT TIP UP/DN VALVE	18	V7 PIN 1
	18	LFT TIP UP/DN SENSE	PUR			
5	18	RHT TIP UP/DN OUT	PUR	RHT TIP UP/DN VALVE	18	V8 PIN 1
	18	RHT TIP UP/DN SENSE	PUR			

"C2" SELECTOR DIODE PAK (DT06-4S)				
PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	PUR	SELECT "A" OUT	SPLICE 2
2	18	PUR	SELECT "A" PWR	C1 PIN 52
3	18	PUR	SELECT "B" PWR	C1 PIN 53
4	18	PUR	SELECT "B" OUT	SPLICE 3

"C3" LFT/RHT TIP DIODE PAK (DT06-4S)				
PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	PUR	LFT TIP UP/DN OUT	SPLICE 4
2	18	PUR	LFT TIP UP/DN SIG	C1 PIN 48
3	18	PUR	RHT TIP UP/DN SIG	C1 PIN 49
4	18	PUR	RHT TIP UP/DN OUT	SPLICE 5



"C1" ICNV CONNECTOR (4305.35.003)									
PIN	AWG	COLOR	DESCRIPTION	LOCATION	PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	16	RED	ICNV OUT PWR 1	SPLICE 1	31	-	-	-	-
2	16	RED	ICNV OUT PWR 2	SPLICE 1	32	-	-	-	-
3	14	BLK	GND	ICNV PIN 4	33	-	-	-	-
4	18	PNK	AGITATE PSI SIG	ICNV PIN 7	34	-	-	-	-
5	18	PNK	HYD TEMP SIG	ICNV PIN 8	35	-	-	-	-
6	18	PNK	HYD PSI SIG	ICNV PIN 9	36	-	-	-	-
7	18	PNK	BOOM PSI SIG	ICNV PIN 10	37	-	-	-	-
8	-	-	-	-	38	18	ORG	ICNV IPON	ICNV PIN 2
9	-	-	-	-	39	18	PUR	LFT END OUT SIG	V4 PIN 1
10	-	-	-	-	40	18	PUR	LFT END IN SIG	V12 PIN 1
11	18	BLK	LFT END OUT GND	V4 PIN 2	41	18	PUR	LFT MAIN OUT SIG	V1 PIN 1
12	18	GRN (TW)	ICNV J1939 LOW	ICNV PIN 12	42	18	PUR	LFT MAIN IN SIG	V11 PIN 1
13	18	YEL (TW)	ICNV J1939 HI	ICNV PIN 11	43	18	PUR	RHT MAIN OUT SIG	V3 PIN 1
14	18	BLK	LFT END IN GND	V12 PIN 2	44	18	PUR	RHT MAIN IN SIG	V10 PIN 1
15	-	-	-	-	45	18	PUR	RHT END OUT SIG	V2 PIN 1
16	18	BLK	LFT MAIN OUT GND	V1 PIN 2	46	18	PUR	RHT END IN SIG	V9 PIN 1
17	18	BLK	LFT MAIN IN GND	V11 PIN 2	47	14	BLK	CHASSIS GND	CHASSIS
18	18	BLK	RHT MAIN OUT GND	V3 PIN 2	48	18	PUR	LFT TIP UP/DN SIG	C3 PIN 2
19	18	BLK	RHT MAIN IN GND	V10 PIN 2	49	18	PUR	RHT TIP UP/DN SIG	C3 PIN 3
20	18	ORG	ICNV LOGIC PWR	ICNV PIN 1	50	18	PUR	CENTER UP SIG	V14 PIN 1
21	18	BLK	RHT END OUT GND	V2 PIN 2	51	18	PUR	CENTER DOWN SIG	V13 PIN 1
22	18	BLK	RHT END IN GND	V9 PIN 2	52	18	PUR	P/T SELECT A SIG	C2 PIN 2
23	18	BLK	LFT TIP UP/DN GND	V7 PIN 2	53	18	PUR	P/T SELECT B SIG	C2 PIN 3
24	18	BLK	RHT TIP UP/DN GND	V8 PIN 2	54	18	PUR	LEFT NOZZLE SIG	ICNV PIN 6
25	-	-	-	-	55	18	PUR	RIGHT NOZZLE SIG	ICNV PIN 5
26	18	BLK	CENTER UP GND	V14 PIN 2					
27	18	BLK	CENTER DOWN GND	V13 PIN 2					
28	18	BLK	P/T SELECT A	V5 PIN 2					
29	18	BLK	P/T SELECT B	V6 PIN 2					
30	-	-	-	-					

"C4" RITE HEIGHT PLUG (12015799)				
PIN	AWG	COLOR	DESCRIPTION	LOCATION
A	18	PUR	SELECT "A" SENSE	SPLICE 2
B	18	PUR	SELECT "B" SENSE	SPLICE 3
C	18	PUR	LFT TIP UP/DN SENSE	SPLICE 4
D	18	PUR	RHT TIP UP/DN SENSE	SPLICE 5
E	-	-	-	-
F	-	-	-	-

VALVE LIST (DT06-2S)				
PIN	AWG	COLOR	DESCRIPTION	LOCATION
1	18	PUR	LFT MAIN OUT SIG	C1 PIN 41
2	18	BLK	LFT MAIN OUT GND	C1 PIN 16
1	18	PUR	RHT END OUT SIG	C1 PIN 45
2	18	BLK	RHT END OUT GND	C1 PIN 21
1	18	PUR	RHT MAIN OUT SIG	C1 PIN 43
2	18	BLK	RHT MAIN OUT GND	C1 PIN 18
1	18	PUR	LFT END OUT SIG	C1 PIN 39
2	18	BLK	LFT END OUT GND	C1 PIN 11
1	18	PUR	P/T SELECT "A" SIG	SPLICE 2
2	18	BLK	P/T SELECT "A" GND	C1 PIN 28
1	18	PUR	P/T SELECT "B" SIG	SPLICE 3
2	18	BLK	P/T SELECT "B" GND	C1 PIN 29
1	18	PUR	LFT TIP UP/DN SIG	SPLICE 4
2	18	BLK	LFT TIP UP/DN GND	C1 PIN 23
1	18	PUR	RHT TIP UP/DN SIG	SPLICE 5
2	18	BLK	RHT TIP UP/DN GND	C1 PIN 24
1	18	PUR	RHT END IN SIG	C1 PIN 46
2	18	BLK	RHT END IN GND	C1 PIN 22
1	18	PUR	RHT MAIN IN SIG	C1 PIN 44
2	18	BLK	RHT MAIN IN SIG	C1 PIN 19
1	18	PUR	LFT MAIN IN SIG	C1 PIN 42
2	18	BLK	LFT MAIN IN GND	C1 PIN 17
1	18	PUR	LFT END IN SIG	C1 PIN 40
2	18	BLK	LFT END IN GND	C1 PIN 14
1	18	PUR	CENTER DOWN SIG	C1 PIN 51
2	18	BLK	CENTER DOWN GND	C1 PIN 27
1	18	PUR	CENTER UP SIG	C1 PIN 50
2	18	BLK	CENTER UP GND	C1 PIN 26

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