

FAST[™]
AG SOLUTIONS

**OPERATION AND
MAINTENANCE
MANUAL**

**BW500 / BW750
Trailer Sprayer**







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WARRANTY REGISTRATION FORM

Limited Warranty

FAST AG Solutions warrants to the buyer that the new machinery is free from defects in material and workmanship.

This warranty is only effective as to any new machinery which has not been altered, changed, repaired or treated since its delivery to the buyer, other than by FAST AG Solutions or its authorized dealers or employees, and does not apply to accessories, attachments, tools or parts, sold or operated with the new machinery, if they have not been manufactured by FAST AG Solutions.

FAST AG Solutions shall only be liable for defects in the materials or workmanship attributable to faulty material or bad workmanship that can be proved by the buyer, and specifically excludes liability for repairs arising as a result of normal wear and tear of the new machinery or in any other manner whatsoever, and without limiting the generality of the foregoing, excludes application or installation of parts not completed in accordance with this operator's manual, specifications, or printed instructions.

Written notice shall be given by registered mail, to the Manufacturer within seven (7) days after the defect shall have become apparent or the repairs shall have become necessary, addressed as follows:

FAST AG Solutions
4130 Commerce Boulevard
Windom, MN 56101

This warranty shall expire one (1) year after the date of delivery of the new machinery.

If these conditions are fulfilled, FAST AG Solutions shall at its own cost and at its own option either repair or replace any defective parts provided that the buyer shall be responsible for all expenses incurred as a result of repairs, labor, parts, transportation or any other work, unless FAST AG Solutions has authorized such expenses in advance.

The warranty shall not extend to any repairs, changes, alterations, or replacements made to the new equipment other than by FAST AG Solutions or its authorized dealers or employees.

This warranty extends only to the original owner of the new equipment.

Rubber parts (including tires, hoses, grommets) are not warranted.

This warranty is limited to the terms stated herein and is in lieu of any other warranties whether express or implied, and without limiting the generality of the foregoing, excluded all warranties, express or implied or conditions whether statutory or otherwise as to quality and fitness for any purpose of the new equipment. the Manufacturer disclaims all liability for incidental or consequential damages.

This Sprayer is subject to design changes and FAST AG Solutions shall not be required to retrofit or exchange items on previously sold units except at its own option.

Warranty void if not registered.



WARRANTY REGISTRATION FORM

FAST BW500 / BW750 TRAILER SPRAYER

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 Name				
Address				
City		State		Zip
Phone				
Dealer Name				
Address				
City		State		Zip
Sprayer Model				
Serial Number				
Delivery Date				

DEALER INSPECTION REPORT

- All Fasteners Tight
- Wheel Bolts Torqued
- Hydraulic Hoses and Fittings Free and Tight
- Boom Hoses and Fittings Free and Tight
- Wheel Drive Turns Freely
- Lubricate Machine
- Check Tire Pressure
- Frame and Wings Level
- Monitors and Controllers Function
- Wiring Harness Connected

SAFETY

- Safety Chain Installed
- All Guards Installed
- All Safety Signs Installed
- Reflectors, SMV and Lights Clean
- 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 _____

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 - FAST
 Yellow - Dealer
 Pink - Customer



WARRANTY REGISTRATION FORM

FAST BW500 / BW750 TRAILER SPRAYER

SPRAYER APPLICATOR SERIAL NUMBER

DATE PURCHASED _____ / _____ / _____

TANK SIZE _____

BOOM LENGTH _____

PUMP MANUFACTURER:

(CIRCLE ONE)

ACE 150 Belt Driven

ACE FMC150



WARRANTY REGISTRATION FORM



FAST GLOBAL
SOLUTIONS

FOREWARD

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in direction implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in Specification section. Accurately record all numbers to help in tracing machine should it be stolen. Your dealer also needs these numbers when you order parts. File identification numbers in a safe place off machine.

BEFORE DELIVERING THIS MACHINE, your dealer performed a pre-delivery inspection.



FOREWARD

THIS SPRAYER IS DESIGNED SOLELY for use in customary agricultural or similar operations for the purpose of applying crop protection chemicals ("INTENDED USE"). Use in any other way is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user. Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for the intended use.

THIS SPRAYER SHOULD BE OPERATED, serviced and repaired only by persons familiar with all its particular characteristics and acquainted with the relevant safety rules (accident prevention). The accident prevention regulations, all other generally recognized regulations on safety and occupational medicine and the road traffic regulations must be observed at all times. Any arbitrary modifications carried out on this SPRAYER will relieve the manufacturer of all liability for any resulting damage or injury.

WARRANTY is provided as part of FAST's support program for customers who operate and maintain their equipment as described in this manual. Warranty is explained on warranty certificate which you should have received from your dealer.

This warranty provides you assurance that FAST will back its products where defects appear within warranty period. In some circumstances, by FAST also provides field improvements, often without charge to customer, even if product is out of warranty. Should equipment be abused, or modified to change its performance beyond original factory specifications, warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

TIRE MANUFACTURER'S warranty applicable to your machine may not apply outside U.S.

If you are not the original owner of this machine, it is in your interest to contact your local FAST dealer to inform them of this unit's serial number. This will help FAST notify you of any issues or product improvements.



Pre-Delivery

After machine has been completely assembled, inspect to be sure it is in good running order before delivering to customer. The following checklist is a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustment is made.

- NO parts on the unit have been damaged in shipment. Check for such things as dents and loose or missing parts; correct or replace components as required.
- SMV emblem installed; protective shipping tape removed from reflectors and lights are installed.
- All grease fittings have been lubricated. (See LUBRICATION AND MAINTENANCE section in this manual.)
- Inspect to be sure all nuts have been tightened to proper torque and all cotter pins spread.
- Tires are properly inflated. Tighten wheel bolts to specified torque.
- Adjust axles per customer's wheel spacing request.
- Warning lights are properly installed and operational.
- Make sure all customer-ordered attachments have been installed or are available for delivery.
- Any parts scratched in shipment have been touched up with paint.
- Remove all shipping decals.
- Rotating PTO shields turn freely.
- Verify correct nozzle spacing.
- As applicable, the cylinders, hoses and fittings are NOT damaged, leaking or loosely connected.
- This machine has been thoroughly checked and to the best of my knowledge is ready for delivery to the customer.

Signed: _____

Date: _____



Delivery

At the time machine is delivered, following checklist is a reminder of information which should be conveyed directly to the customer. Check off each item as it is fully explained to customer.

- Tell customer to use proper tools.
- Explain to customer that life expectancy of this or any other machine depends on regular lubrication as directed in operator's manual.
- Give operator's manual to customer and explain all operating adjustments.
- Make customer aware of all safety precautions that must be followed while using this machine.
- When machine is transported on a road or highway at night or during day, accessory lights and devices should be used for adequate warning to operators of other vehicles. In this regard, tell customer to check local governmental regulations.
- To the best of my knowledge, this machine has been delivered ready for field use and customer has been fully informed as to proper care and operation.

Signed: _____

Date: _____



After-Sale

The following is a suggested list of items to be checked at a dealer-customer mutually agreeable time during the first operating season.

- Check with customer as to performance of machine. Make certain proper operating adjustments are understood.
- If possible, operate machine to see that it is functioning properly.
- Acquaint customer with any special attachment which will help do a better job.
- Go over entire machine for loose or missing hardware.
- Check for broken or damaged parts.
- Ask customer if recommended periodic lubrication has been performed.
- Review operator's manual with customer and stress importance of proper lubrication and safety precautions.

Signed: _____

Date: _____



FOREWARD

Owner Register

Name		Model Number
Post Office		P.I.N. Number
County	State	Date Purchased

SAFETY**Recognize Safety Information**

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

Understand Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your FAST dealer.

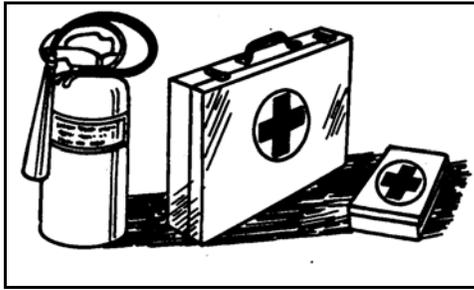
There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your FAST dealer.

Prepare for Emergencies



Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for poison control center, doctors, ambulance service, hospital, and fire department near your telephone.

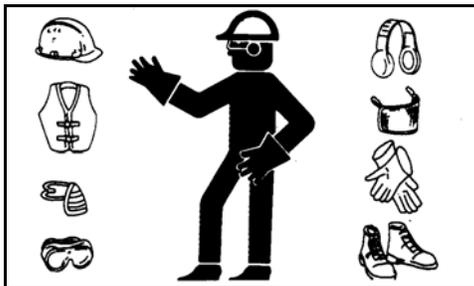
Protect Against Noise



Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Wear Protective Clothing



Wear close fitting clothing and safety equipment appropriate to the job.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

Practice Safe Maintenance



Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the

ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Support Raised Equipment



Always use a safety support when working on, under, or around machine. Transport/Service locks can be used for this purpose.

Shut off tractor engine and remove key when working on machine.

If air has been allowed to enter hydraulic hoses or cylinders, bleed hydraulic system before use. If there is a failure in hydraulic system, unsupported raised equipment could suddenly lower, causing serious personal injury or death.

If support is not available, completely lower wings and frame, relieve hydraulic pressure and disconnect hoses from tractor.

Avoid Heating Near Pressurized Fluid Lines



Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.

Avoid High-Pressure Fluids



Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with FAST approved replacement parts.

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other

lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

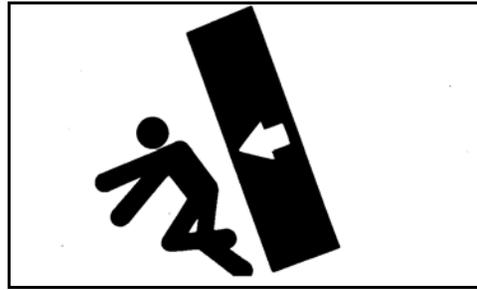
Inspect Lift Circuit Hoses



Avoid serious injury or death while working under a raised implement.

Hydraulic hoses between the lift cylinders and hydraulic lock-up valves should be inspected frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage. Worn or damaged hose assemblies can fail during use and should be replaced immediately. See your FAST dealer for replacement hoses.

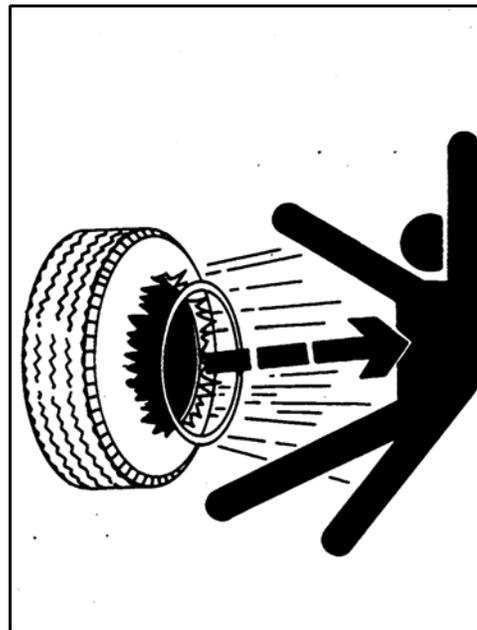
Store Attachments Safely



Stored attachments such as dual wheels can fall and cause serious injury or death.

Securely store attachments and implements to prevent falling. Keep playing children and bystanders away from storage area.

Service Tires Safely



! **CAUTION: Explosive separation of a tire and rim parts can cause serious injury or death.**

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

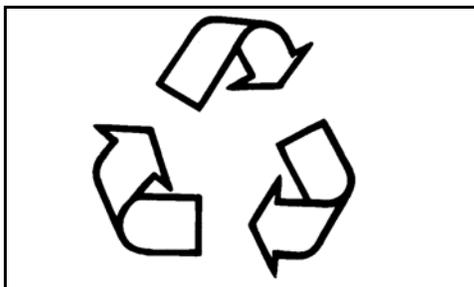
Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.

Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

Dispose of Waste Properly



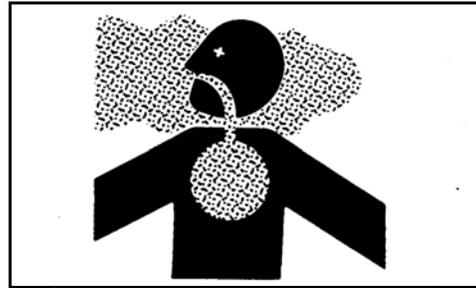
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Handle Agricultural Chemicals Safely



Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides, and fertilizers can be harmful to your health or the environment if not used carefully.

Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

Reduce risk of exposure and injury:

Wear appropriate personal protective equipment as recommended by the manufacturer. In the absence of manufacturer's instructions, follow these general guidelines:

Chemicals labeled 'Danger': Most toxic. Generally require use of goggles, respirator, gloves, and skin protection.

Chemicals labeled 'Warning': Less toxic. Generally require use of goggles, gloves, and skin protections.

Chemicals labeled 'Caution': Least toxic. Generally require use of gloves and skin protection.

Avoid inhaling vapor, aerosol or dust.

Always have soap, water, and towel available when working with chemicals. If chemical contacts skin, hands, or face, wash immediately with soap and water. If chemical gets into eyes, flush immediately with water.

Wash hands and face after using chemicals and before eating, drinking, smoking, or urination.

Do not smoke or eat while applying chemicals.

After handling chemicals, always bathe or shower and change clothes. Wash clothing before wearing again.

Seek medical attention immediately if illness occurs during or shortly after use of chemicals.

Keep chemicals in original containers. Do not transfer chemicals to unmarked containers or to containers used for food or drink.

Store chemicals in a secure, locked area away from human or livestock food. Keep children away.

Always dispose of containers properly. Triple rinse empty containers and puncture or crush containers and dispose of properly.

Handle Chemical Products Safely



Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with FAST equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (M/SDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the M/SDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

Operate Safely

Before operating, make sure air has been bled from wing-fold hydraulic system.

Be sure area around machine is clear before raising or lowering machine frame or wings.

Do not operate with wings folded.

Do not operate close to the edge of a ditch, creek, gully or steep embankment.

Avoid holes, ditches and obstructions which may cause tractor, machine, or towed equipment to roll over, especially on hillsides.

Avoid sharp turns on hillsides.

Slow down when turning or traveling over rough ground, and when turning on inclines.

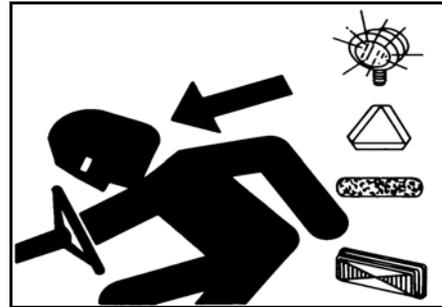
Always shut off tractor and shift to PARK or set brakes when leaving tractor. Remove key when leaving tractor unattended.

Always have tractor stopped on level ground when raising or lowering wings.

Operate machine from tractor seat only.

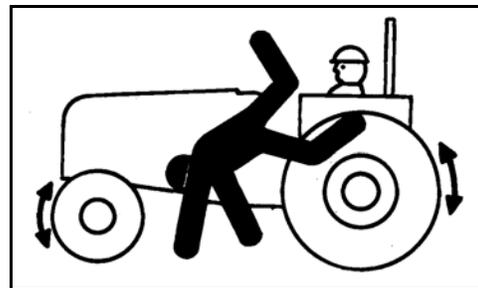
If chemicals are used, follow manufacturer's recommendations for handling and storage.

Tow machine behind a properly equipped tractor only.

Use Safety Lights and Devices

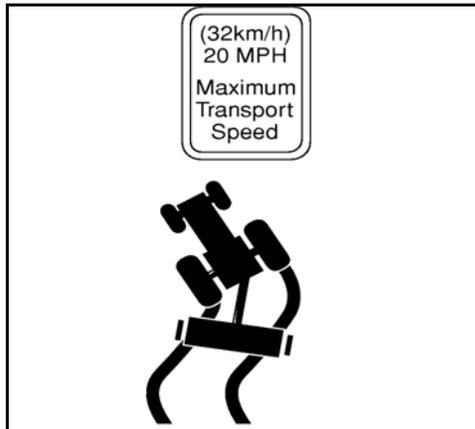
Prevent collisions between other road users, slow moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use turn signal lights.

Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible, clean, and in good working order. Replace or repair lighting and marking that has been damaged or lost.

Keep Riders Off Machine

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

Observe Maximum Transport Speed

CAUTION: Be sure all bystanders are clear of sprayer.

IMPORTANT: Transport sprayer only with tank **EMPTY** to prevent sprayer damage.

This sprayer is not equipped with service or parking brakes.

The maximum transport speed for this implement is 20 mph (32 km/h).

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed.

Exceeding the implement's maximum transport speed can result in:

Loss of control of the tractor/implement combination

Reduced or no ability to stop during braking

Implement tire failure

Damage to the implement structure or its components

Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

For transport, the weight of the **EMPTY** sprayer must not be more than 1.5 times the weight of the tractor. Minimum towing tractor weight for the BW500 / BW750 Trailer Sprayer is 3,000 lbs (1361 kg).

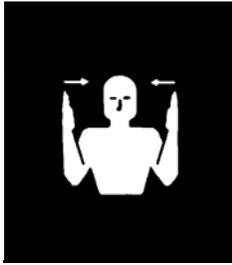
Never tow this implement with a motor vehicle. Tow only with a properly ballasted tractor.

EC Compliance Notification

WARNING: Environmental transportation hazard. A loaded machine driven on public roads has a high risk of tire failure. Do not use the machine for transporting product on public roads.

Never transport with the tank filled with water or chemical.

Use a Signal Person



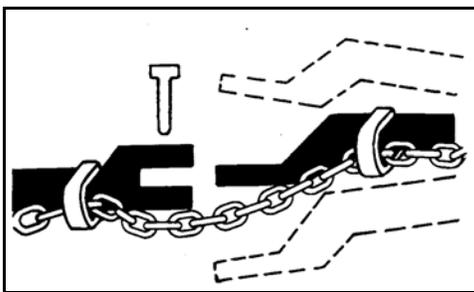
Use a signal person to direct movement of the tractor/fertilizer cart combination, whenever the tractor operator's view is obstructed.

Designate one individual as THE signal person. Always have signal person stand in clear view. Be sure signal person stays a safe distance away from the machine when it is moving.

Prior to starting the tractor, discuss hand signals and what each signal means to avoid misunderstandings and confusion which could result in a serious injury or fatal accident for someone.

Keep all bystanders away whenever the machine is moved.

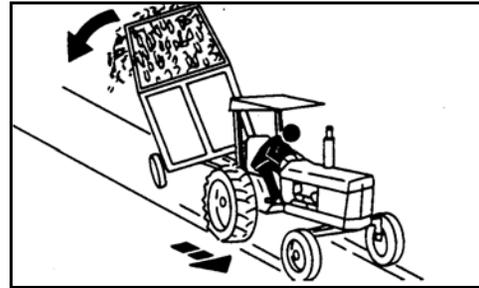
Use a Safety Chain



A safety chain will help control drawn equipment should it accidentally separate from the drawbar.

Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning.

Tow Loads Safely



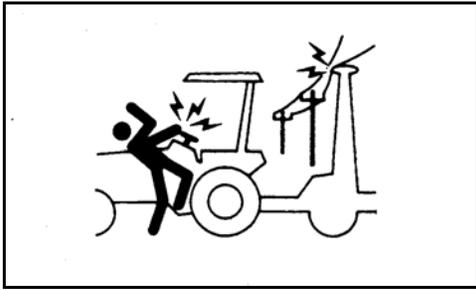
Stopping distance increases with speed and weight of towed loads, and on slopes. Towed loads with or without brakes that are too heavy for the tractor or are towed too fast can cause loss of control. Consider the total weight of the equipment and its load.

Observe these recommended maximum road speeds, or local speed limits which may be lower:

If towed equipment does not have brakes, do not travel more than 32 km/h (20 mph) and do not tow loads more than 1.5 times the tractor weight.

Ensure the load does not exceed the recommended weight ratio. Add ballast to recommended maximum for tractor, lighten the load, or get a heavier towing unit. The tractor must be heavy and powerful enough with adequate braking power for the towed load. Use additional caution when towing loads under adverse surface conditions, when turning, and on inclines.

Avoid Overhead Power Lines



CAUTION: Keep away from overhead power lines. Serious injury or death may result. Proceed cautiously under overhead power lines and around utility poles. Know the transport height of your machine. Electrocution can occur without direct contact with overhead electrical lines.

Prepare for Transport

CAUTION: Avoid serious injury or death to your or others. Never tow machine behind a truck or other motor vehicle. This machine is designed only to be towed with a properly sized and ballasted tractor.

Use a tractor large enough to maintain control. Properly ballast tractor for towing your machine. Refer to tractor operator's manual and this manual to ensure that machine can be safely transported with your tractor.

Be aware of height and width restrictions to avoid collision with overpasses or other road users.

Always fold wings fully. If wing fold cylinders are removed, chain wings together to prevent accidental lowering.

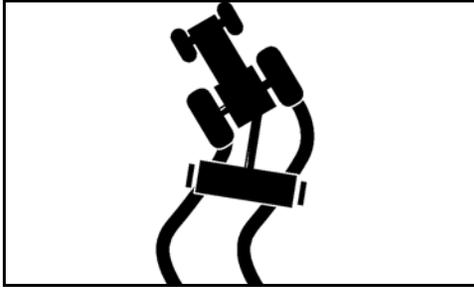
Fully raise frame, close hydraulic lock-up valve (if equipped) and install transport/service locks before transporting.

Latch the tractor brakes together.

Attach proper size safety chain for load being towed. Refer to USE A SAFETY CHAIN (in this section).

IMPORTANT: Do not transport on a roadway unless machine is equipped with proper functioning lights and reflective marking/emblems. Ensure that the lights and reflective marking/emblems are clean and visible. Contact your FAST dealer for lights and lighting harnesses.

Always follow local and national regulations for equipment size, lighting and marking before driving on public roadways. You are responsible for understanding and complying with all requirements regarding roadway transport. Refer to USE SAFETY LIGHTS AND DEVICES (in this section).

Transport Safely

IMPORTANT: When transporting, always travel at a reasonable and safe speed which permits adequate control of steering and stopping. Reduce speed considerably when traveling over rough ground. Be certain everyone is clear of machine.

Refer to **OBSERVE MAXIMUM TRANSPORT SPEED** (in this section).

Do not exceed weight and speed guidelines (in this section).

Towed loads can swerve, upset or cause loss of control. Refer to **TOW LOADS SAFELY** (in this section).

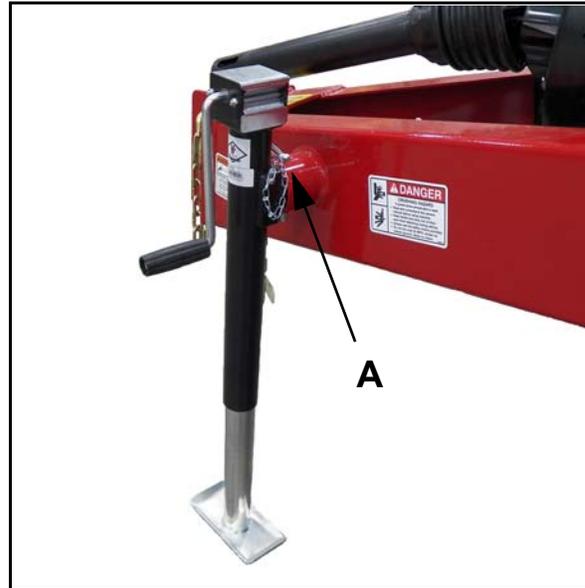
Shift tractor into a lower gear when transporting down steep slopes or hills; never coast. Stop slowly.

Wide turns may be required with machine in tow. Use caution in traffic and in congested areas.

To improve stability when traveling through the field, wings should be unfolded from transport position as soon as possible after leaving the roadway.

IMPORTANT: When transporting machine on a roadway, **ALWAYS USE** appropriate lamps and devices for adequate warning to operators of other vehicles.

Refer to **USE SAFETY LIGHTS AND DEVICES** (in this section).

Park Safely**Parked Jack Position**

A - Pin

Park machine on a level surface, lower jack, and retain with pin (A). Block implement wheels.

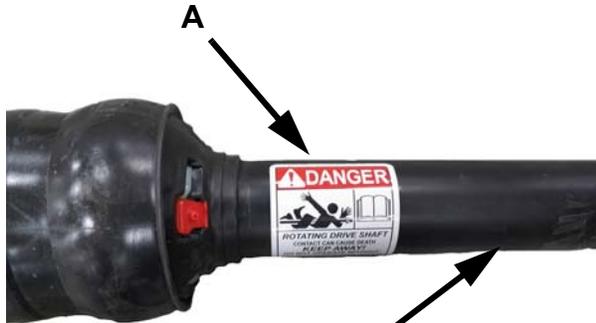
Replace Safety Signs

Replace missing or damaged safety signs. Use this operator's manual for correct safety sign placement.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Safety Sign Locations

Safety signs and locations on machine are shown in the following illustrations. Familiarize yourself with safety signs, type of warning and area, or particular function related to that area, that requires your SAFETY AWARENESS.





Decal A



Decal C



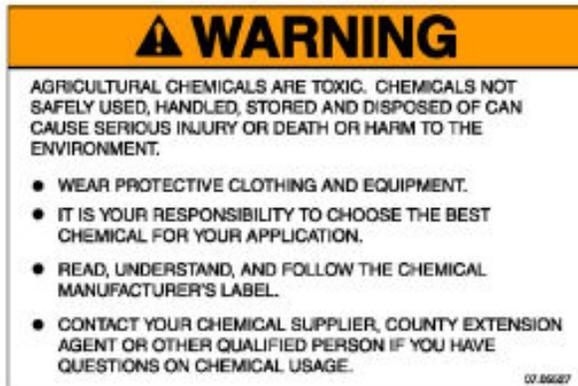
Decal B



Decal D



Decal E



Decal H



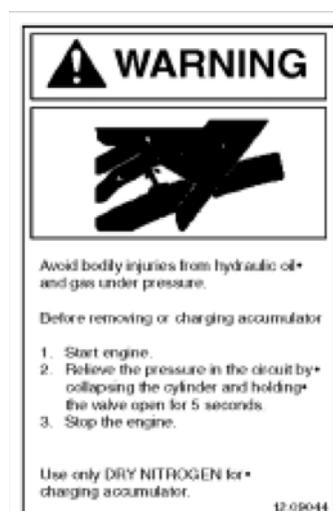
Decal I



Decal F



Decal J



Decal G



Decal K



Decal L

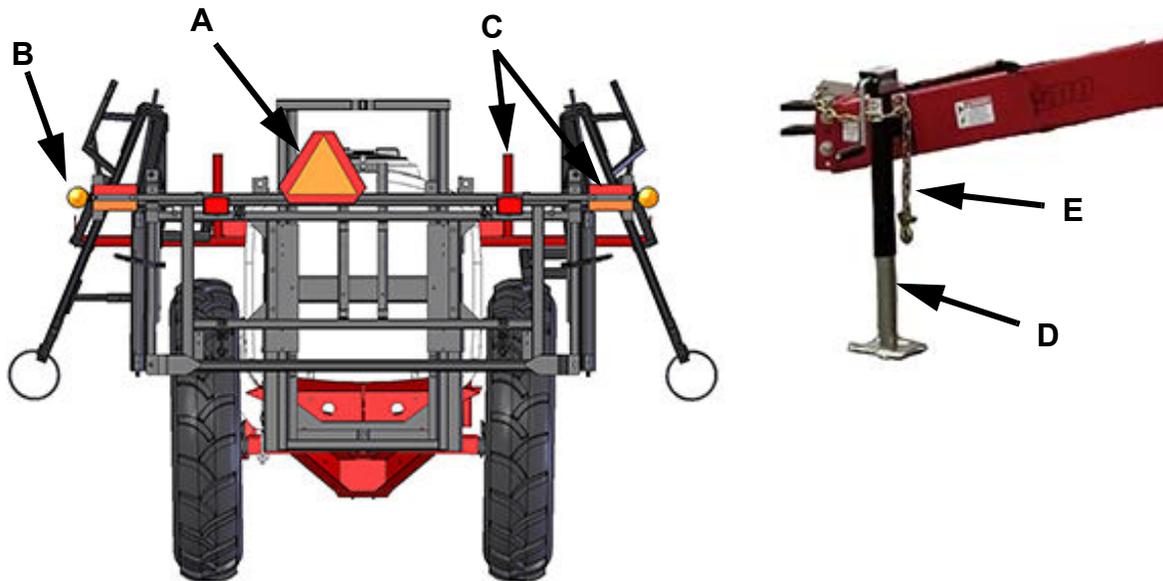


Reflective Decal Locations

- 1 - Yellow Reflector (Qty. 2) (Part No. 907220) Not Shown, One On Each Side Of Hitch
- 2 - Yellow Reflector (Qty. 2) Left Side Shown (Part No. 907220)
- 3 - SMV Emblem (Part No. 907224)
- 4 - Red Reflector (Qty.2) Left Side Shown (Part No. 907219)
- 5 - Yellow Reflector (Qty. 2) (Part No. 907220)



Safety Features



- A - SMV Emblem
- B - Warning Lights
- C - Reflectors
- D - Jack
- E - Safety Chain

BW500 / BW750 Trailer Sprayer: In addition to the safety features shown here, other components, systems, safety signs on the machine, safety messages and instructions in the operator's manual contribute to the safe operation of this machine when combined with the care and concern of a capable operator.

The construction of this implement may not meet all local or national requirements for transport on a public roadway. In regions or countries that have national certification requirements for roadway transport, it may be impossible for this implement to be approved for such roadway transport. The customer is responsible for understanding and complying with all local, regional, and national requirements regarding roadway transport.

- A—SMV Emblem identifies slow-moving equipment and alerts traffic approaching from rear.
- B and C—REFLECTORS and WARNING LIGHTS alert other drivers to presence and width of slow-moving machinery on roadways and signal turns.
- D—Jack prevents machine from falling when in storage.
- E—Safety Chain will help control machine should it accidentally separate from tractor drawbar.

PREPARING MACHINE**Use Tractor Operator's Manual**

Always refer to tractor operator's manual for specific detailed information regarding operation of equipment.

Pre-Operation Checklist

Efficient and safe operation of the machine requires that each operator reads and understands 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 sprayer, check the following items:

1. Lubricate machine per schedule outlined in LUBRICATION AND MAINTENANCE section.
2. Use only a tractor of adequate power and weight to operate sprayer. See SPECIFICATIONS section for recommendations.
3. Be sure that machine is properly attached to tractor. Be sure that a mechanical retainer is installed through drawbar pin and safety chain is installed.
4. Inspect all hydraulic lines, hoses, fittings and couplers for tightness.
5. **IMPORTANT:** Extend the axles out of the shipping width setting and set the width for your application. Unit is shipped with axles to the narrowest setting using the shipping holes for shipping purposes only.
6. Check tires and verify they are inflated to specified pressure.
7. Calibrate sprayer if at start of season or a new spray rate is being used.
8. Check condition and routing of all fluid hoses and lines. Be sure that all lines are routed in large arcs. Replace any that are damaged. Re-route those that are rubbing, pinched or crimped.
9. Check placement components. Remove and replace any that are worn.
10. Remove all entangled material.
11. Raise the boom and turn metering pump slightly. Check that there is liquid coming out of each nozzle. Unplug or connect lines as required. Replace any nozzles that are plugged.



PREPARING MACHINE

Checking and Lubricating Machine

Check tire pressure and inflate as necessary. (See CHECKING TIRE PRESSURE in this section.)

Perform required lubrication. (See Lubrication section.)

Inspect for loose, damaged or missing parts. Repair or replace parts before entering field.

Make sure hydraulic hoses and harnesses do not interfere with moving parts. Relocate hoses and harnesses, and retain with clamps.

Checking Tire Pressure



CAUTION: Avoid loss of vehicle control during transport from failure of overloaded tires, which could cause serious injury or death to you or others.

Equal pressure in all tires is necessary for even penetration. A low tire will cause deeper penetration on one side than other. Increased penetration on one side will result in side draft of machine. Inflate tires to shown specification.

Tire Size	Pressure
12.4-24 6 ply tires	165 kPa (1.66 bar) (24 psi)
11.2-38 4 ply tires	124 kPa (1.24 bar) (18 psi)
13.6-38 12 ply tires	290 kPa (2.9 0bar) (42 psi)

Checking Wheel Nuts

Check tightness of all wheel nuts during first week of operation and periodically after that.

Tighten all wheel bolts to specification.

Item	Specification
(A) Wheel Nut	183 N-m (135 ft-lbs)

Tightening Hardware

Check tightness of ALL BOLTS, U-BOLTS and CAP SCREWS after first 10-15 hours of operation and again at end of first week (50 hours) of operation. Tighten all bolts to torques specified in Service section unless otherwise noted. Check tightness of hardware periodically.

Sprayer Setup And Assembly

Wheel Spacing

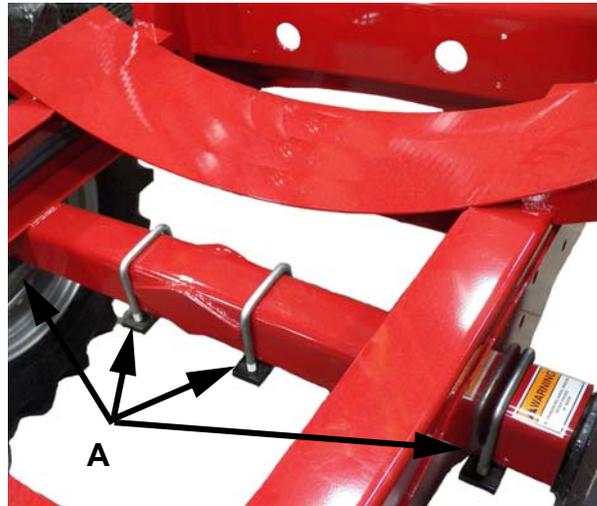
Wheel spacing can be adjusted from 62 inches (minimum) to 80 inches (maximum).

To change wheel spacing proceed as follows:

! **DANGER**

Sprayer can fall during wheel spacing adjustment and crush person working under sprayer. Death or serious injury will result. Support the sprayer securely when adjusting wheel spacing.

1. Hitch sprayer to tractor (refer to the "Hitching" section on page 37 of this manual). Place chocks or blocks in front of and behind wheel on opposite side of wheel to be adjusted.
2. Measure and mark center of sprayer frame to assure equal spacing of wheels from sprayer centerline.
3. Place a hydraulic or screw jack under the sprayer frame behind the axle on the same side as the wheel to be adjusted. Jack up the sprayer high enough to raise the wheel from the ground.
4. Block the sprayer frame to keep sprayer from dropping if jack should fail or lose pressure.
5. Loosen the nuts on the U-bolts (A) securing the wheel and hub assembly to the sprayer frame.
6. Slide the wheel and hub assembly in or out to the desired distance. Measure from the centerline of the sprayer to the centerline of the tire. DO NOT exceed the minimum 62 inch or maximum 80 inch distances.
7. Tighten the hex nuts on the U-bolts.
8. Lower the wheel to the ground.
9. Repeat steps 3 through 8 for the wheel assembly on the other side of the sprayer.

**Implement Driveline (PTO Drive Pumps Only)****!** **WARNING**

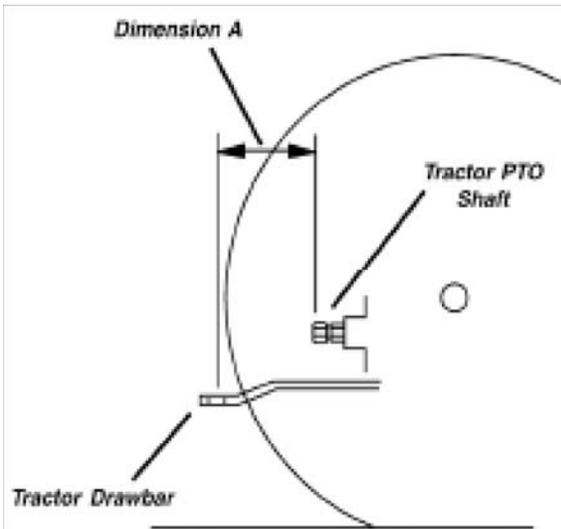
Before working on PTO shaft or connecting or disconnecting it, STOP tractor, apply the parking brake, and make sure that the tractor motor has stopped turning.

The FAST Sprayer is designed to be used with a tractor having a 540 RPM PTO unless your sprayer has a 1000 RPM centrifugal pump (Optional).

Adjust the tractor drawbar so the distance from the end of the PTO shaft to the center of the drawbar hitch pin hole (Dimension A) is 14.00" for 540 RPM PTO or 16.00" for 1000 RPM PTO.

NOTE: If the hitch pin hole is located well behind the tractor tires, the operator can make a turn sharp enough to damage the driveline.

PREPARING MACHINE



Hitching Sprayer To Tractor



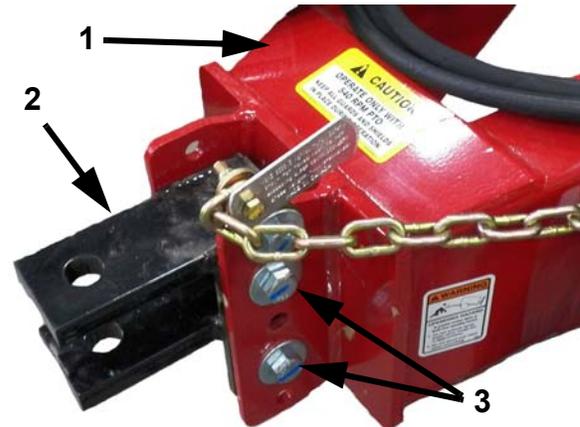
CAUTION

DO NOT stand between the tractor and sprayer when hitching or unhitching the sprayer unless tractor engine is stopped and parking brake is set. Make sure that all bystanders are clear of working area.

Hitching

1. Align the tractor drawbar with the sprayer clevis hitch.
2. Shut down and lockout the power source. Refer to "Power Source Shutdown Procedure" on Page 3 of this manual. Follow these procedures to correctly lockout the power source.
3. If necessary, adjust the position of the hitch so that the sprayer is as level as possible when hitched to the tractor. Adjust the hitch as follows:
 - a. Remove the four bolts securing the hitch to the flanges on the sprayer tongue.

- b. Raise or lower the hitch or rotate the hitch 180° to a position that will ensure that the sprayer is as level as possible.
- c. Insert all four bolts through the flanges on the sprayer tongue and the hitch. Tighten securely.



1 - Sprayer Tongue

2 - Hitch

3 - Bolts

4. Remove the hitch pin and clip from their storage positions.

5. Install the hitch pin. Insert the clip through the side of the hitch pin to lock in place.

6. Turn the leveling crank on the jack stand until the jack no longer touches the ground.

NOTE: Safety chains are available for your sprayer by ordering from FAST Global Solutions

7. Store the jack during operation.

a. Remove the pin and clip from the jack mount on the sprayer hitch.

b. Remove the jack from the mount.

8. Check that the sprayer hydraulic system is compatible with tractor hydraulics. Change sprayer if required. Do not operate unless tractor and sprayer hydraulics are compatible.

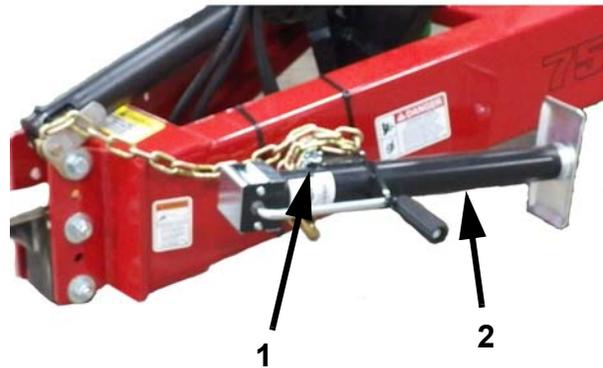


1 - Pin and Clip

2 - Jack In Hitch/Unhitch Position

c. Position the jack onto the storage mount on the sprayer frame.

d. Secure in place with the pin and clip.



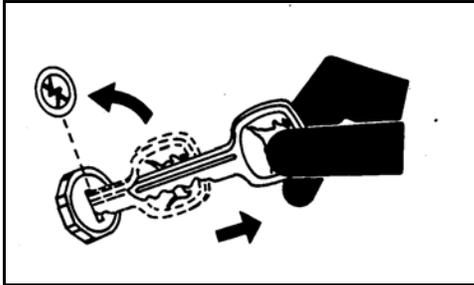
1 - Pin and Clip

2 - Jack In Stored Position

Important: Always secure the jack in the storage position before beginning any operation or transport of the sprayer. Damage to the jack can result if jack is not stored during operation or transport.

ATTACHING AND DETACHING

Attach Machine Safely



CAUTION: Prevent personal injury caused by unexpected movement of machine. Engage parking brake and/or place transmission in PARK, shut off engine, and remove key before working around hitch.

Making Proper Hose Connections



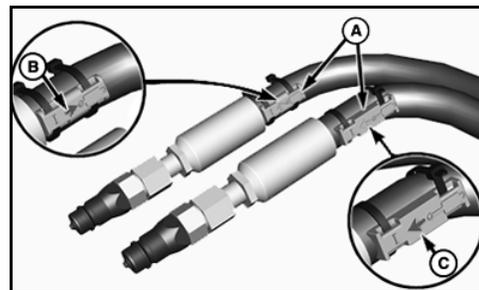
CAUTION: Escaping fluid under pressure can penetrate skin causing serious injury. Avoid hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected in skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a

knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

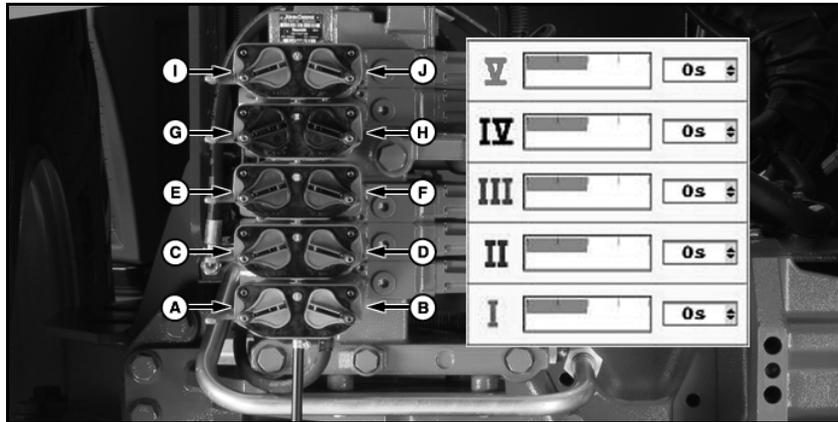
IMPORTANT: All hydraulic couplers must be clear of debris, dust, and sand. Use protective caps on fluid openings until ready to make connection. Foreign material can damage hydraulic system.



A - SCV Marker
B - Pressure Marking
C - Return Marking

Identify SCV marker (A) color, then use pressure (B) and return (C) arrows to connect to correct SCV outlet. (See SCV Identification chart.)

ATTACHING AND DETACHING



Legend	SCV Identifier	Flow Type	Hose Color	SCV Usage
A	I	Pressure	Gray	BW500EF & EFT Main Lift (single acting, powered up, gravity down) BW750/60 (double acting, controls all folding functions)
B	I	Return	Orange	BW500EF & EFT Main Lift (single acting, powered up, gravity down) BW750/60 (double acting, controls all folding functions)
C	II	Pressure	Purple	BW500EF & EFT (folds wings in or out)
D	II	Return	Brown	BW500EF & EFT (folds wings in or out)
E	III	Pressure	Red	Pump Pressure - Run in Constant Flow
F	III	Return	Yellow	Pump Return - Run in Constant Flow

IMPORTANT: Hose colors do not match SCV color



SPRAY PUMP HYDRAULIC FLOW

SPRAY PUMP HYDRAULIC FLOW

REGULATING HYDRAULIC FLOW TO THE SPRAYER PUMP

Locate your tractor model and follow the appropriate setup instructions.

WARNING: FAILURE TO REGULATE OIL FLOW WILL CAUSE MOTOR FAILURE.

WARNING: NOT SUITABLE FOR PUMPING FLAMMABLE LIQUIDS.

LOAD SENSING CLOSED CENTER SYSTEM (LS CLOSED)

Regulate oil flow with tractor's **FLOW CONTROL** and **FLOW LIMITER**.

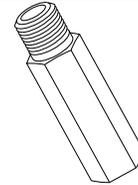
(Do not use restrictor orifice.)

Setup Instructions:

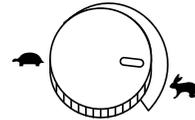
1. (Optional) Remove adapter and install flow limiter in motor inlet port (marked **I**).
2. Close motor needle valve: loosen jam nut, screw needle valve clockwise until seated, and lock jam nut. (factory setting)
3. Shut off sprayer boom and agitation valves.
4. Adjust tractor flow control to minimum flow setting (turtle).
5. Move hydraulic lever to "Lower/Retract" position to start pump.
6. Adjust tractor flow control until sprayer shut-off pressure is below maximum shown in table on page 3.

Note: If the flow limiter stops oil flow to the motor:

- 6a) Move hydraulic lever to "Float" or "Neutral" to remove oil pressure from the flow limiter.
 - 6b) Adjust tractor flow control to a lower flow position.
 - 6c) Repeat steps 5 and 6.
7. Open the sprayer agitation valve to get desired spraying pressure.



FLOW LIMITER



FLOW CONTROL

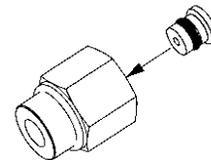
PRESSURE COMPENSATING CLOSED CENTER SYSTEM (PC CLOSED)

Regulate oil flow by using a **RESTRICTOR ORIFICE**.

(Do not use flow limiter.)

Setup Instructions:

1. Install restrictor orifice insert inside the adapter/restrictor body in the motor inlet port (marked **I**).
2. Close motor needle valve: loosen jam nut, screw needle valve clockwise until seated, and lock jam nut. (factory setting)
3. Set "Rabbit/Turtle" flow control to "Turtle".
4. Move hydraulic lever to the "Lower/Retract" position to start pump.
5. Adjust "Rabbit /Turtle" flow control and sprayer agitation valve to get desired spraying pressure.



RESTRICTOR ORIFICE

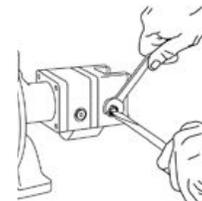
OPEN CENTER SYSTEM (OPEN)

Select motor size closest to tractor's hydraulic system capacity. Regulate oil flow with motor **NEEDLE VALVE**.

(Do not use restrictor orifice or flow limiter.)

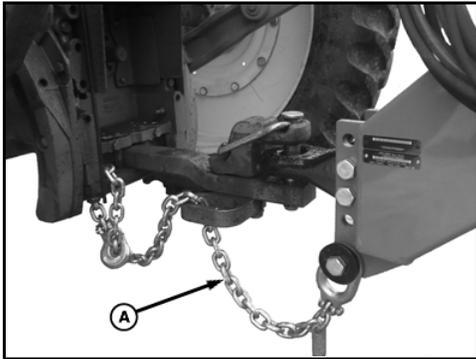
Setup Instructions:

1. Shut off sprayer boom and agitation valves.
2. Loosen jam nut on motor and back out needle valve 3 or 4 turns counter clockwise.
3. Set tractor throttle to sprayer operating speed.
4. Move hydraulic lever to "Lower/Retract" position to start pump.
5. Screw needle valve clockwise until sprayer shut-off pressure is below maximum shown in table on page 3 and lock jam nut.
6. Open the sprayer agitation valve to get desired spraying pressure.



NEEDLE VALVE

Attach Safety Chain to Tractor



A - Safety Chain

CAUTION: A safety chain (A) will help control drawn equipment should it accidentally separate from drawbar while transporting. A runaway machine can cause serious injury or death to you or others. Using appropriate adapter parts, attach chain to tractor drawbar support. Provide only enough slack in chain to permit turning. See your FAST dealer for a chain with a strength rating equal to or greater than gross weight of towed machine.

Prior to operating implement, insure all electrical harnesses, hydraulic hoses and safety chain are routed properly to avoid damage.

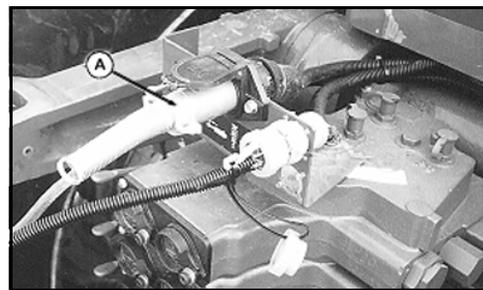
When storing machine, keep safety chain up off ground and hook to machine support assembly on hitch.

Always replace a safety chain if one or more links or end fittings are broken, stretched or otherwise damaged.

Verify all chains for towed implements are adequately sized for safe transport.

Attach Warning Light Plug

CAUTION: When transporting machine on a road or highway at night or during day, use warning lights and devices for adequate warning to operators of other vehicles. In this regard, check local governmental regulations. Various safety lights and devices are available from your FAST dealer.



A - 7-Pin Connector Warning Light Plug

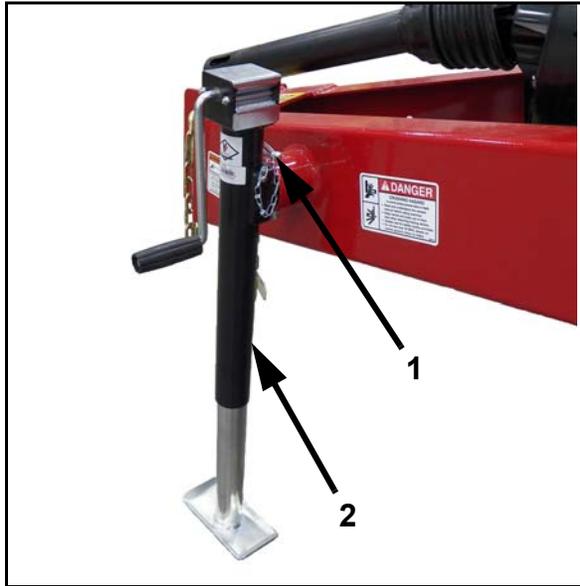
Attach warning light plug (A) to tractor outlet socket.

Be sure warning lights, reflectors, and SMV emblem are clean.

Connect Rate Controller or Sprayer System Wiring

See manufacturer's manuals for connecting controller cables to tractor.

Detach Machine from Tractor



A - Pin

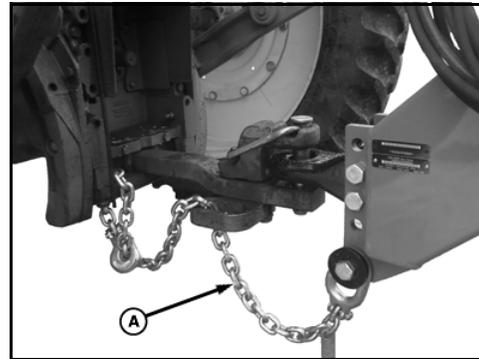
1. Secure jack (2) as shown using pin (1). Remove weight from hitch by turning crank handle to lower jack.



CAUTION: Prevent serious injury or death.

Relieve hydraulic system pressure before disconnecting hydraulic hoses.

3. Disconnect hydraulic hoses and place in storage position.



A - Safety Chain

4. Disconnect safety chain (A).

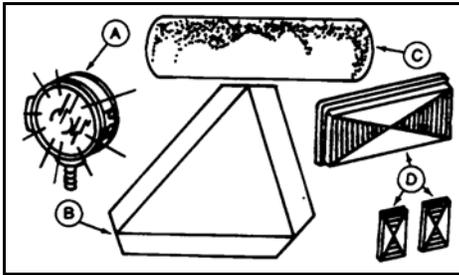


*Wiring Harness and Hose
Storage Position*

2. Disconnect wiring harness and place in storage position.

TRANSPORTING

Following Safe Transport Procedures



- A - Lights
- B - SMV Emblem
- C - Reflector Tape
- D - Reflectors

CAUTION: When transporting machine on a road or highway at night or during day, use warning lights and devices for adequate warning to operators of other vehicles.

Check local governmental regulations. Various safety devices are available from your FAST dealer. Keep safety items in good condition. Replace missing or damaged items.

Upward force on hitch may cause instability when transporting. Add ballast to tractor as required.

BEWARE of overhead wires and narrow gates. KNOW transport height and width of your machine. (See SPECIFICATIONS section.)

Travel at a reasonable and safe speed; REDUCE speed over rough or uneven terrain, slopes, and when turning.

BE SURE SMV emblem, reflectors, and warning lights are clean, visible, and in good condition.

BE SURE your safety chain has a strength rating greater than gross weight of machine.

CAUTION: Be sure all bystanders are clear of sprayer.

IMPORTANT: Transport Sprayer only with tank EMPTY to prevent sprayer damage.

CAUTION: See “Observe Maximum Transport Speed” in the Safety section for towing information.

Be sure that sprayer is properly connected to tractor. Always attach safety chain between the sprayer and the tractor and install a retainer through drawbar pin.

Install transport cylinder locks on cylinders before transporting.

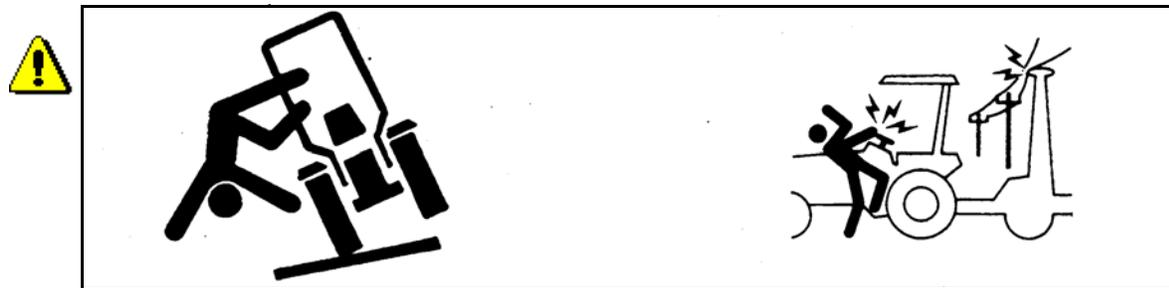
Using Warning Lights

CAUTION: When transporting machine on a road or highway at night or during day, use accessory lights and devices for adequate warning to operators of other vehicles. Check local governmental regulations. Various safety lights and devices are available from FAST dealer. Keep safety items in good condition. Replace missing or damaged items.

During periods of limited visibility, use pilot vehicles and use extra lights on machine.

During normal transport, both amber warning lights will flash in unison at high intensity and both red lamps will illuminate steady at low intensity.

When a turn is signaled, red and amber tail lamps in direction of turn will flash at high intensity and in unison. Opposite side amber and red lamps will illuminate steady at high intensity.



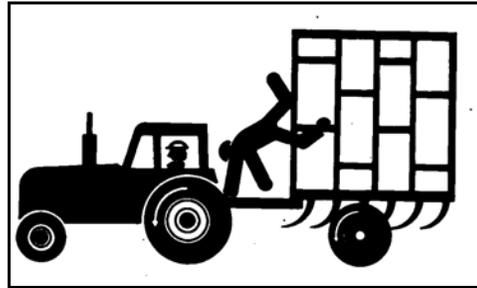
CAUTION: ALL MACHINES —When transporting machine on a smooth surface road, do not exceed maximum transport speed of 20 mph (32 km/h). Reduce speed considerably when traveling over rough ground.

Reduce speed when turning. Do not uncouple tractor brake pedals and apply individually in an attempt to make a tighter turn.

Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electric lines to avoid contact. Know transport height and width of machine. Check local regulations before transporting. (See SPECIFICATION section for transport height and width of machine.)

Transport with booms fully folded. Never raise or lower booms when moving. After folding, ALWAYS place boom fold lever in neutral position for transport.

Keep Riders Off Machine



CAUTION: Keep riders off. Riders are subject to injury such as being struck by foreign objects and being thrown off machine. Riders obstruct operator's view resulting in machine being operated in an unsafe manner.

AVOID sudden turns which may reduce operator control of the tractor or cause sprayer to tip. Sprayers tend to be top heavy when tank is filled and wheels are set at 62 inches. If boom fold cylinders are removed, chain booms together to prevent injury or death caused by accidental falling of booms on you or others.

 **WARNING**

Connect 540 RPM sprayer pumps ONLY to 540 RPM tractor PTO output shafts. Connect Optional 1000 RPM sprayer pumps ONLY to 1000 RPM tractor PTO output shafts.

5. Pull the collar on the tractor end of the driveline to the rear (toward the sprayer), and slide the driveline onto the tractor's PTO output shaft as far as possible.

6. Release the collar. Pull the driveline to the rear (toward the sprayer) until the collar snaps into the locked position, and the driveline cannot be moved forward or backward.

 **WARNING**

Be certain that the driveline is securely attached to the PTO shaft on the power source. Install all shield system components before beginning operation.





HYDRAULIC DRIVE PUMP (OPTIONAL)

HYDRAULIC DRIVE PUMP (OPTIONAL)

Hydraulic Hose Hook Up:



WARNING

Hydraulic oil under pressure can spray into eyes and cause physical injury. Follow tractor operator manual instructions for shutting off hydraulic supply and relieving hydraulic pressure before connecting or disconnecting hydraulic hoses.

Assemble the sprayer hydraulic pump hoses to the tractor hydraulic couplers.

IMPORTANT: Assemble the hoses to the tractor, but DO NOT activate hydraulics until the pump has been properly primed.

2. Place the tractor hydraulic control lever in the position next to the float position. The pump should operate. If the pump does not operate, place the tractor hydraulic control lever in the float position.

3. Disconnect and reverse the sprayer hose connections at the tractor. The pump should operate.

IMPORTANT: Always use the float position to STOP the hydraulic sprayer pump.

NOTE: If sprayer is being hitched to the tractor for the first time, charge the sprayer hydraulic system with oil.

IMPORTANT: The storage slots for the hydraulic hoses should ONLY be used when sprayer is disconnected from the tractor and being stored. Hydraulic hoses MUST always be connected to tractor during transport of sprayer.

Control Box Installation

Electrical Connections To Tractor

When connecting the electrical control boxes to the tractor, it is recommended that you purchase a wiring harness pigtail

adaptor from your tractor dealer or your Fast dealer.

Be sure to ONLY connect to tractors with a 12 Volt Positive electrical system.

Electric Sprayer Controls

NOTE: Refer to the separate control box owner's manual for detailed installation instructions.

1. Turn OFF all switches.
2. Install control box in the tractor cab in a location where it can be used easily and is readily visible.
3. Determine best routing for control cable and pressure tube. Be sure the cables and/or tubes DO NOT interfere with any moving parts on tractor or sprayer.
4. Install Mounting bracket.
5. Make tractor connections for power input, ground and pressure tubing if so equipped.

TeeJet Controller (Standard)



- a. Connect the 2 RED wires to the 12 volt power source (positive).
- b. Connect the 2 BLACK wires to a ground point on the tractor (negative).
- c. Connect the single BLUE wire to the tractor headlight system. The BLUE wire powers the light in the pressure gauge and



HYDRAULIC DRIVE PUMP (OPTIONAL)

does not turn OFF with the control box switch. DO NOT connect directly to a power source that does not disconnect when the tractor is shut OFF.

d. Using the pressure tube coupler and fittings, connect the tube in the control wiring harness to the tube in the extension wiring harness. Install the coupler outside the tractor cab in case it would leak.

A gauge isolator (Part No. 07.17961) is available to use in place of the pressure tube coupler. If it is installed outside the tractor cab, it prevents chemicals from entering the tractor cab. It also protects the control box gauge when liquid nitrogen is sprayed.

Raven Rate Controller (Optional):



a. Connect the RED wire directly to the battery (12 volt - positive). DO NOT connect to a remote power source.

b. Connect the WHITE wire directly to the battery (12 volt - ground). DO NOT connect to a remote ground source.

c. The Raven rate controller will need to be programmed. See Raven rate controller manual for proper procedure. Verify the values and note them in the controller book for reference.

6. Complete the final assembly and make the final connections. Test system to make sure it is working properly.

Hydraulic Hose Connections - Boom Control

There are three types of booms available for your sprayer.

- EF Hydraulic fold with boom width of: 45 ft.
- EFT Hydraulic fold & wing tilt with boom width of: 45 ft.
- HC Hydraulic fold with boom width of: 60 ft.



WARNING

Hydraulic oil under pressure can spray into eyes and cause physical injury.

Follow tractor operator manual instructions for shutting off hydraulic supply and relieving hydraulic pressure before connecting or disconnecting hydraulic hoses.

EF & EFT Boom Hydraulic Hose Connections

1. The EF & EFT boom utilizes three separate hydraulic hoses which must be connected to the appropriate couplers on the tractor. All three male tips are an ASAE standard tip (Pioneer).

•The single hose will operate the entire boom UP or DOWN & for EFT boom with switch activated will tilt left wing UP or DOWN.

•The pair of hoses will operate the fold IN or OUT & for EFT boom with switch activated will tilt right wing UP or DOWN

2. The hoses on the sprayer are marked with colored tie wraps to identify the hoses



HYDRAULIC DRIVE PUMP (OPTIONAL)

for proper connection to the tractor. The pair of hoses for the fold IN or OUT will have one color and the boom UP or DOWN will be another color.

3. There is an extra set of the colored tie wraps shipped with your sprayer. Attach these tie wraps to the proper tractor hydraulic couplers to aid in the correct reattaching of the sprayer hydraulic hoses.

Note: If sprayer is being hitched to the tractor for the first time, charge the sprayer hydraulic system with oil.

IMPORTANT: The storage slots for the hydraulic hoses should ONLY be used when sprayer is disconnected from the tractor and being stored. Hydraulic hoses MUST always be connected to tractor during transport of sprayer.

EFT Boom Electrical Connections

There are three wires that are to be connected to the tractor.

1. Connect the two RED wires to the positive (+) 12 volt power source of the tractor. The RED wires can be connected directly to the battery or to an auxiliary connection such as the fuse block.

2. Connect the WHITE wire to the negative (-) ground source of the tractor. The WHITE wire can be connected directly to the negative battery or to an auxiliary connection as long as a good ground is maintained.

HC Boom Hydraulic Hose and Electrical Connections

Your sprayer has been shipped from the factory set-up for use with a tractor that has "Closed Center" Hydraulics. Determine if your tractor has this type of hydraulics. Connect sprayer hydraulic hoses to the tractor hydraulic system. When the HC boom is in use, the hydraulic valve on the tractor MUST be locked open to assure a

constant supply of oil to the cylinder valve control bank located at the back of the sprayer.

HC Boom Electrical Connections

There are two wires that are to be connected to the tractor.

1. Connect the RED wire to the positive (+) 12 volt power source of the tractor. The RED wire can be connected directly to the battery or to an auxiliary connection such as the fuse block.

2. Connect the WHITE wire to the negative (-) ground source of the tractor. The WHITE wire can be connected directly to the negative battery or to an auxiliary connection as long as a good ground is maintained.

If your tractor has "Closed Center" Hydraulics, turn the flow rate on your tractor hydraulic system down to 5 to 6 GPM and try the sprayer boom functions. If the sprayer functions are not satisfactory, the valve block located at the rear of the boom can be altered to operate with "Open Center" Hydraulic systems.

To change from "Closed Center" Hydraulic system set-up to "Open Center" Hydraulics:

1. Locate the valve block at the rear of your sprayer on the rear tower.

2. Locate the plug on the left hand end of block, remove and insert cartridge p/n 630036 (FV273017) into block (torque to 25 ft/lb), install coil and torque to 5 ft/lb. Connect loose lead to coil.

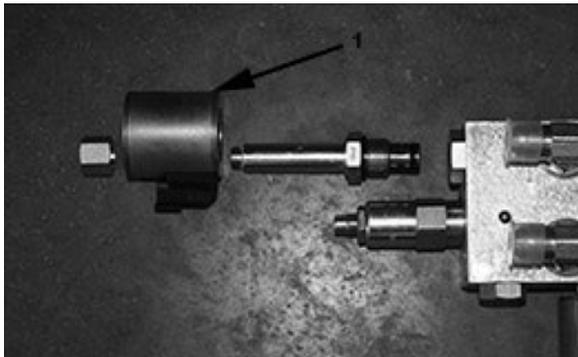
3. Your sprayer is now set-up to be used with "Open Center" Hydraulics.

NOTE: If sprayer is being hitched to the tractor for the first time, charge the sprayer hydraulic system with oil.



HYDRAULIC DRIVE PUMP (OPTIONAL)

IMPORTANT: The storage slots for the hydraulic hoses should ONLY be used when sprayer is disconnected from the tractor and being stored. Hydraulic hoses MUST always be connected to tractor during transport of sprayer.



Valve Block

1 - Replace This Wire Coil and Open Center Bypass Valve With Plug For Closed Center Hydraulics

Sprayer Accessories

Make all required electrical connections for sprayer accessories. Refer to the "Accessories" section of this manual for proper instructions on electrical connections.

Unhitching Sprayer From Tractor



CAUTION

DO NOT stand between the tractor and sprayer when hitching or unhitching the sprayer unless tractor engine is STOPPED and parking brake is applied.



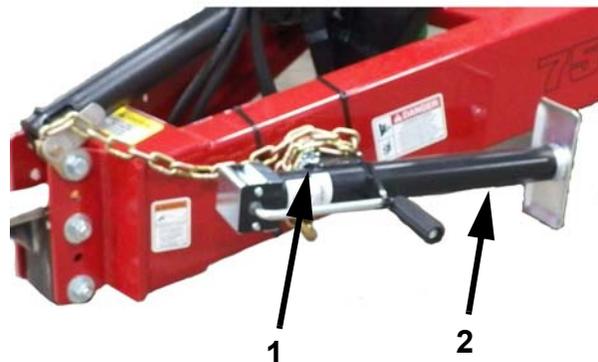
WARNING

Before disconnecting the PTO shaft, make sure that the tractor motor has stopped turning before getting off the tractor.

1. Park sprayer on a firm, level surface. Block both sprayer wheels to prevent any unexpected movement when the sprayer is unhitched from the tractor.

2. Shut down and lockout the power source. Refer to "Power Source Shutdown Procedure" on Page 3 of this manual. Follow these procedures to correctly lockout the power source.

3. Remove the pin and clip from the jack mount and remove the jack from the stored position on the sprayer frame.



1 - Pin and Clip

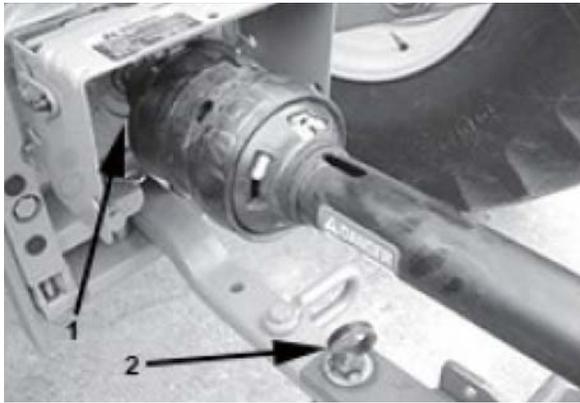
2 - Jack In Stored Position

4. Position the jack onto the mounting hub on the sprayer hitch. Align the holes in the jack with the holes in the mount and insert the pin and clip to secure the jack in place.

5. Turn the leveling crank on the jack until the hitch begins to rise up off the tractor drawbar.



HYDRAULIC DRIVE PUMP (OPTIONAL)



- 1 - Collar On Tractor End Of Driveline
2 - Hitch Pin

IMPORTANT: The storage slots for the hydraulic hoses should **ONLY** be used when sprayer is disconnected from the tractor and being stored. Hydraulic hoses **MUST** always be connected to tractor during transport of sprayer.

Sprayer Accessories

Listed are the accessories available and the connection instructions if required.

For ease of connecting accessories to your tractor, see your tractor or Fast dealer for an accessory connecting pigtail harness that connects directly to your tractor electrical system and allows your accessory to be “keyed” to the tractor ignition.

NOTE: If your sprayer is equipped with the HC boom, all connections for these accessories will be incorporated into the HC control box and wire harness.

The instructions listed are for sprayers with EF booms only.

Foam Marker Switch Box

A foam marking system is an optional accessory. If your sprayer is equipped with a foam marker, refer to the owner’s manual supplied with the unit for installation instructions.

Connect the foam marker kit as follows:

- Connect the **WHITE** wire to the Positive (+) 12 volt power source on your tractor.
- Connect the **BLACK** wire to the Negative (-) ground source on your tractor or a good ground.

Fence Line Kit

(Right Side, Left Side or Both)

A fence line kit is an optional accessory. Refer to the “Optional Accessories” section later in this manual for operation of this accessory.

NOTE: This system is not fused. It is recommended that this system be connected to a fused power source on the tractor.

Connect the fence line kit as follows:

Connect the **RED** wire to the Positive (+) 12 volt power source on your tractor.

Connect the **BLACK** wire to the Negative (-) ground source on your tractor or a good ground.

In-Cab Electric 50 Gallon Rinse System

An in-cab electric rinse system is an option for your sprayer. This system requires connection to the tractor electrical system.

Connect the in-cab rinse system as follows:

- Connect the **RED** wire to the Positive (+) 12 volt power source on your tractor.
- Connect the **BLACK** wire to the Negative (-) ground source on your tractor or a good ground.

NOTE: This system is not fused. It is recommended that this system be connected to a fused power source on the tractor.



HYDRAULIC DRIVE PUMP (OPTIONAL)

Operation

Read and understand Operator's Manual and all safety signs before using.



Lower machine to the ground, 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.



Install and secure all guards and shields before starting or operating.



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



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



Clear area of all bystanders, especially children, before starting or filling with chemical or fertilizer.



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



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



Stay away from booms when folding or extending booms. Keep others away.



Clean reflectors, SMV and lights before transporting.



Attach securely to towing unit using a hardened pin with a retainer and a safety chain.



Do not exceed a safe travel speed.



Use hazard flasher on tractor when transporting.



Stay away from overhead power lines when folding or extending the booms and during transport.



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



Review safety instructions before operating machine.

New Operator Or Owner

The FAST sprayer is designed to meter out and distribute liquid chemical or fertilizer and place it where required.

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. 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 area around the work site. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this



HYDRAULIC DRIVE PUMP (OPTIONAL)

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.

Break-In

Perform the following steps on a new sprayer:

A. After 1 hour of operation:

1. Tighten all wheel lugs to 135 ft-lbs of torque.
2. Tighten all other fasteners and hardware to required torque.
3. Check that no chemical or hydraulic lines are being pinched or crimped. Re-route as required.
4. Check that all nozzles and placement components are clean and working properly. Clean as required.
5. Check that the pump is functioning properly. Adjust as required.
6. Lubricate all grease fittings.

B. After 5 hours of operation:

1. Tighten all wheel lugs to 135 ft-lbs of torque.

C. After 10 hours of operation:

1. Tighten all fasteners and hardware to required torque.
2. Check chemical and hydraulic line routing.
3. Check that all placement components are clean and working properly

D. After 50 hours of operation:

1. Tighten all wheel lugs to 135 ft-lbs of torque.

2. Then follow normal servicing and maintenance schedule as defined in Maintenance Section.

Pre-Operation Checklist

Efficient and safe operation of the Fast sprayer requires that each operator reads and understands 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 sprayer, check the following items:

1. Lubricate machine per schedule outlined in "Maintenance Section".
2. Use only a tractor of adequate power and weight to operate sprayer.
3. Be sure that machine is properly attached to tractor. Be sure that a mechanical retainer is installed through drawbar pin and safety chain is installed.
4. Inspect all hydraulic lines, hoses, fittings and couplers for tightness.
5. Check tires and verify they are inflated to specified pressure.
6. Calibrate sprayer if at start of season or a new sprayer rate is being used.
7. Check condition and routing of all fluid hoses and lines. Be sure that all lines are routed in large arcs. Replace any that are damaged. Re-route those that are rubbing, pinched or crimped.
8. Check placement components. Remove and replace any that are worn.
9. Remove all entangled material.



HYDRAULIC DRIVE PUMP (OPTIONAL)

Measuring Travel Speed

Measure a test course in the area to be sprayed or in an area with similar surface conditions. Minimum lengths of 100 and 200 feet are recommended for measuring speeds up to 5 and 10 miles per hour, respectively. Determine the time required to travel the test course.

To help ensure accuracy, conduct the speed check with a loaded sprayer and select the engine throttle setting and gear that will be used when spraying. Repeat the above process and average the times that were measured. Use the following equation or the table to determine ground speed

Calculate speed when flow rate, application rate and nozzle spacing are known:

$$S = 5940 \times \text{GPM} / \text{GPA} \times W$$

Convert speed from feet per second to miles per hour:

$$S = \text{Feet per second} \times 0.682$$

Speed (mph)	Travel Time Required (seconds)		
	100 Feet	200 Feet	300 Feet
3.0	23	45	68
3.5	20	39	58
4.0	17	34	51
4.5	15	30	45
5.0	14	27	41
6.0	-	23	34
7.0	-	19	29
7.5	-	18	27
8.0	-	17	26
9.0	-	15	23

Useful Formulas and Conversions

GPA = Application rate in gallon per acre

GPM = Flow rate in gallons per minute

S = Speed in miles per hour

W = Nozzle spacing in inches

Calculate flow rate per nozzle when application rate, speed and nozzle spacing are known:

$$\text{GPM (per Nozzle)} = \text{GPA} \times S \times W / 5940$$

Calculate application rate when nozzle spacing, speed and flow rate are known:

$$\text{GPA} = 5940 \times \text{GPM} / S \times W$$



HYDRAULIC DRIVE PUMP (OPTIONAL)

Adjust Ground Speed

It will be necessary to establish travel speed and then set flow to give desired application rate. Always run at established travel speed.

However, best results are obtained ground speed is 8 - 13 kph (5 - 8 mph). Ground speed variations in the field will automatically be compensated.

Always operate at a comfortable speed. Do not operate so fast that tool bar or tank bounce while going through field.

Effective results require that liquid be applied at a consistent depth in a consistent manner. Machine bouncing will prevent this required consistency.

Spraying Solutions Other Than Water

Since all the tabulations are based on spraying water, which weighs 8.34 lbs. per US gallon, conversion factors must be used when spraying solutions which are heavier or lighter than water. To determine the proper size nozzle for the solution to be sprayed, first multiply the desired GPM or GPA of solution by the water rate conversion factor. Then use the new converted GPM or GPA rate to select the proper size nozzle.

Example:

Desired application is 20 GPA of 28%N.

Determine the correct nozzle size as follows:

GPA (solution) x Conversion factor = GPA (from table)

20 GPA (28%) x 1.13 = 22.6 GPA (water)

The sprayer operator should choose a nozzle size that will supply 22.6 GPA of water at the desired pressure.

Weight Of Solution	Specific Gravity	Conversion Factors
8.34 lbs per gallon - Water	1.0	1.0
10.65 lbs per gallon - 28% Nitrogen	1.28	1.13
11.0 lbs per gallon - 32% Nitrogen	1.32	1.15

Tip Selection

Proper application of agricultural chemicals is essential to good performance. Applying the correct amount and effectively covering the target are key factors in proper application. Too often, poor weed, disease, or insect control can be traced to problems with spray distribution along the boom.

Spray distribution refers to the uniformity of spray coverage across the boom swath. The goal in broadcast spraying is even (uniform) spray distribution. Factors affecting spray distribution include nozzle type, spray pattern angle, nozzle spacing and boom height. When selecting nozzles to be used on a boom for broadcast application, finding the correct combination of these factors is important. The nozzle spray angle and the height of the boom will determine the overlap between adjacent tips, which is critical to uniform distribution.

Unless otherwise specified at the time of manufacture, your sprayer is equipped with flat fan spray nozzles having the following characteristics:

- Volume: approximately 20 GPA at 30 psi at 5 mph
- Spray angle: 110 degrees
- Nozzle spacing: 20 inches



HYDRAULIC DRIVE PUMP (OPTIONAL)

If you want to change the application rate or the type of nozzle, the tables on the following pages provide the information needed to help you choose the right nozzle for common applications. (Refer to the FAST AG Solutions Parts and Equipment Catalog for more specific information).

IMPORTANT: Your chemical supplier can give you accurate information about the recommended chemical mixture and the application rate. Check with your supplier before you select a different tip.

Hydraulic System

Tractor hydraulic system must be capable of 8 gpm (24 lpm) at 2000 psi (13,800 kPa) to operate lift cylinders and drive motor. Either closed center or open-centered systems can be used. However an open centered hydraulic system is limited to 8 gpm maximum.

NOTE: Contact factory for an optional flow control for use with high flow open center system.

Two or three remote outlets are required to operate the sprayer.

1. BW500 EF & EFT main lift (single acting, powered up, gravity down). BW750/60 (double acting, controls all folding function).
2. BW500 EF & EFT, folds booms in or out.
3. For optional hydraulic drive centrifugal pump.

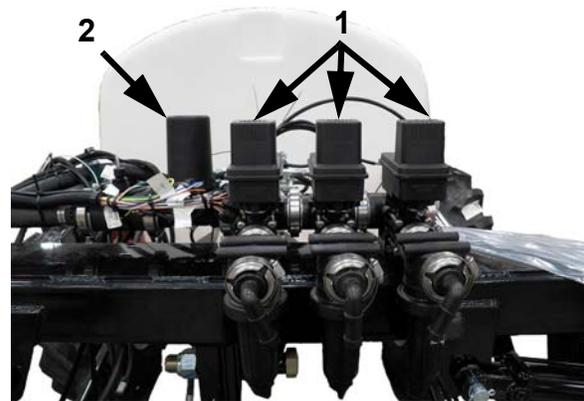
NOTE: Always place hydraulic control lever in detent to provide a constant flow of oil to pump drive motor.

Sprayer Controls

Sprayer operation and liquid flows are controlled by a combination of controls on the tractor and the sprayer.

Triple Electric Control

This system consists of three electric ball valves and a electric pressure regulating valve which are all mounted on the top of the boom mid section of the sprayer. The control box is mounted on the tractor.



- 1 - Electric Ball Valves
- 2 - Electric Pressure Regulating Valve



Standard Control Box

2. Control Box:

The control box consists of the following components:



HYDRAULIC DRIVE PUMP (OPTIONAL)

- MASTER ON/OFF switch which controls power to the valves for each boom section. When power is supplied to the valves, the valves open, allowing liquid to flow to the boom sections.

NOTE: The toggle switches for the individual boom sections must be ON to energize the valves.

- Individual toggle switches which allow the operator to control flow to the individual boom sections (L, left; C, center; and R, right). Turning a switch OFF allows the valve for that section to close.

- PRESSURE ADJUST toggle switch which allows the operator to INCREASE (+) or DECREASE (-) the pressure of the liquid supplied to the boom sections. When the operator releases the switch after adjusting the pressure, the switch automatically returns to its center NEUTRAL position.

NOTE: When making adjustments, monitor pressure carefully. The control system does not have automatic HIGH or LOW pressure limit switches.

- PRESSURE GAUGE which indicates the pressure of the liquid supplied to the operating boom sections.

If the operator shuts OFF a boom section, the pressure of liquid supplied to the other two boom sections will increase because the same volume of liquid is being pumped through fewer nozzles. The operator must use the pressure adjust switch on the control box to manually reduce the pressure to the operating pressure desired.



- 1 - Pressure Gauge
- 2 - Pressure Adjust Switch
- 3 - Master ON/OFF Switch
- 4 - Boom Section Switches

Optional Automatic Rate Controller

Automatic rate controllers are an optional accessory on all sprayers. Refer to the separate owners manual for detailed instructions for using the system.

Optional Four-Way Electric Control System with RAVEN Rate Control System Only

The four-way electric control system has the same features as the three-way control system. However, it uses four motorized ball valves which allow the boom to be split into four sections: Left, Left Center, Right Center and Right. The control box has additional switches to provide four section boom control.

Valve Control Center

The valve control center is located in front of the sprayer platform. The number of valves on the control center will vary, depending upon if the sprayer is equipped with group "A" or "C" option package.

Each valve controls the following (top to bottom)

- Top Valve is for hand spray gun



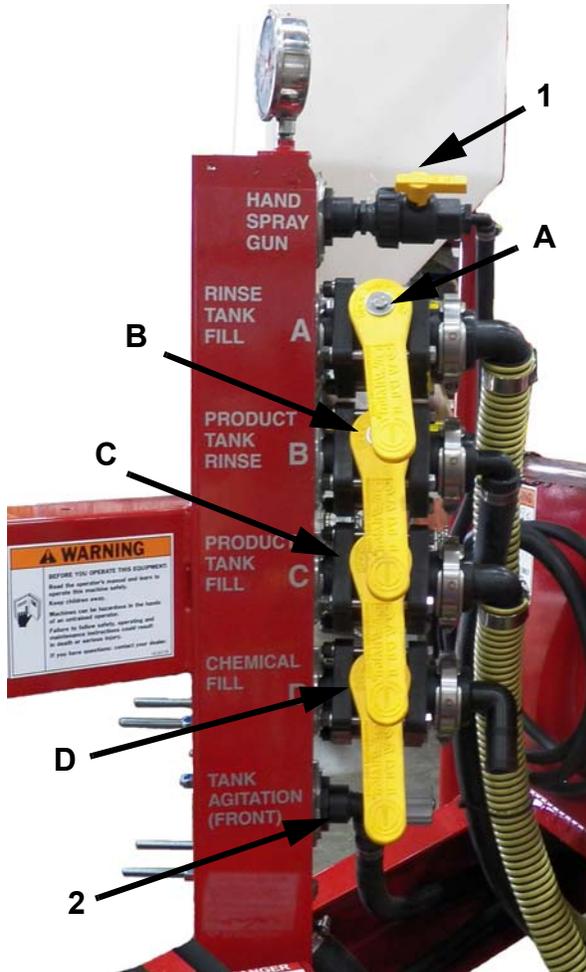
HYDRAULIC DRIVE PUMP (OPTIONAL)

- Valve A is for rinse tank fill
- Valve B is for product tank rinse
- Valve C is for product tank fill
- Valve D is for the chemical inductor
- Bottom Valve is the agitation throttling valve

Agitation System

Your sprayer is equipped with an adjustable agitation system. The throttling valve to adjust the system can be located in one of two locations, depending on which accessories your sprayer is equipped with.

If the sprayer does not have a self cleaning filter, the agitation throttling valve will be located near the front left corner of the sprayer platform.



1 - Agitation Throttling Valve

If the sprayer has a self cleaning filter, the agitation throttling valve will be the first valve located at the bottom of the valve control center tower. See preceding page for location.

There are three agitation jets inside the product tank. Two are located in the sump near the front of the tank and one is located at the rear of the tank.

NOTE: If the sprayer is equipped with a self cleaning filter the jet at the rear of the tank will be controlled by the self cleaning filter. See the self cleaning filter section for details. It is recommended that you have the agitation throttling valve completely OPEN unless foaming occurs.

- Valve Control Center
- 1 - Hand Gun Valve
 - A - Valve A
 - B - Valve B
 - C - Valve C
 - D - Valve D

2 - Agitation Throttling Valve



HYDRAULIC DRIVE PUMP (OPTIONAL)

Standard Primary Filter

Your sprayer is equipped with a primary filtration system. This filter could be in the form of a “Y” strainer (standard) or a self cleaning filter (optional). The filter is located on the right side of the sprayer under the sprayer platform. The filter is installed on the pressure side of the pump and has a 50 mesh screen. Other size mesh screens are available through your FAST dealer.



A - Screen

NOTE: Always turn sump valve off whenever working on liquid circuit components to isolate the liquid in tank.

The liquid system is equipped with a screen (A) in suction line to remove dirt and impurities.

Close valve, remove screen and wash with clear water daily. Clean liquid is required to prevent nozzle plugging.

In Line Filter Kit

The in line filters are located on the mid section of the boom and are attached to the ON/OFF valves. There will be one filter per ON/OFF valve and are equipped with 50 mesh screens. Optional size screens

are available through your FAST dealer.



WARNING

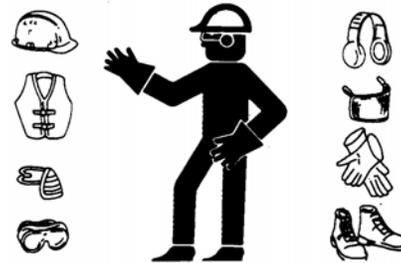
Wear protective clothing (such as goggles, rubber or chemical resistant gloves and a respirator) while handling or working with chemicals. Keep protective clothing clean and in good condition or discard.

Keep face away and open the tank cover and container lids slowly, pressurized chemical vapors or mist may escape.

To clean screens:



DANGER



Handle ALL agricultural chemicals with care. Use chemicals ONLY as directed on the manufacturer’s warning label.

Agricultural chemicals are TOXIC. Chemicals not safely used, handled, stored and disposed of properly can cause serious injury or death to individuals or harm the environment.

Wear protective clothing (such as goggles, rubber or chemical resistant gloves and a respirator) while handling chemicals. Keep protective clothing clean and in good condition or discard.

Wash hands and face thoroughly with clean water after handling chemicals.



HYDRAULIC DRIVE PUMP (OPTIONAL)

Never eat, smoke, drink or put hands to mouth before washing.

Contact your chemical supplier, county extension agent or other qualified person if you have questions on chemical usage. Check chemical or fertilizer M/SDS for proper handling instructions.

1. Use caution when removing filter canisters or boom lines. There could be residual pressure in the filter or boom lines.
2. Place a container under the filter canister.
3. SLOWLY loosen and remove the drain plug from the bottom of the canister and let filter drain completely.
4. Unscrew the filter canister, remove the screen and rinse in clean water.
5. Wipe the inside of the canister with a clean rag.
6. Lightly oil the O-rings on the filter canister and the drain plug.
7. Reassemble the filter screen into the canister and the canister to the filter head. DO NOT over tighten.
8. Reinstall the drain plug into the canister. DO NOT over tighten.
9. Dispose of the waste material properly.

Self Cleaning Filter (Optional)

Refer to the "Maintenance" section of this manual for filter maintenance interval and procedures.

A self cleaning filter is an optional accessory. This filter has a throttling valve located in the front left hand side of the sprayer. A quick coupler system and hose is mounted to the bottom of the filter canister. The unmixed chemical that does not go through the 50 mesh screen is returned to the product tank through the rear agitation jets, reagitated and sent back through the system.

- The throttling valve should remain completely open for the self cleaning filter to operate properly.

When the canister is removed from the filter head, the throttling valve MUST be closed.

To clean the filter screen:

1. Turn the product pump OFF.
2. Turn the emergency shut off valve (located under tank) OFF.
3. Turn the agitation throttling valve (located in front of sprayer) OFF.
4. Turn self cleaning filter on/off (located in front of sprayer) OFF - If so equipped.
5. Place a container under the filter, remove the canister and screen, rinse the screen off with clean water.
6. Lightly oil the O-ring on the canister. Reinstall the canister and screen. DO NOT over tighten.
7. OPEN all valves previously closed.



HYDRAULIC DRIVE PUMP (OPTIONAL)

8. Dispose of all captured chemicals properly.



CAUTION: Prevent serious injury or death.

Check chemical or fertilizer M/SDS for proper handling instructions.

Toxic chemicals can enter the body by breathing spray or contact with bare skin.

Do not take a chance with your health and safety.

IMPORTANT: Transport machine with tank EMPTY to prevent machine damage.

NOTE: Add only the amount of liquid to the tank that is required for the job.

Filling The Product Tank

NOTE: All poly tanks are not identical in capacity due to different tank molds, heat and/or cold. Tank sizes can and do vary. It is recommended that you measure by an independent means the amount of liquid being loaded. The sprayer can be equipped in one of three ways:

- No fast fill attachment - Standard configuration
- 2" Fast Fill via transfer pump - Optional (Group A)
- 2" Fast Fill via transfer pump or sprayer pump - Optional (Group C)

NOTE: If Group C is ordered, you have the option of manual or Electric controls for the rinse system. Refer to the appropriate set of instructions that follows, depending on your sprayers configuration.

Fill Through Top Lid (Standard Configuration)

1. Remove the lid from the top of the product tank. Fill the tank using a garden hose or similar means.

2. Replace the lid when complete.

Filling With Transfer Pump

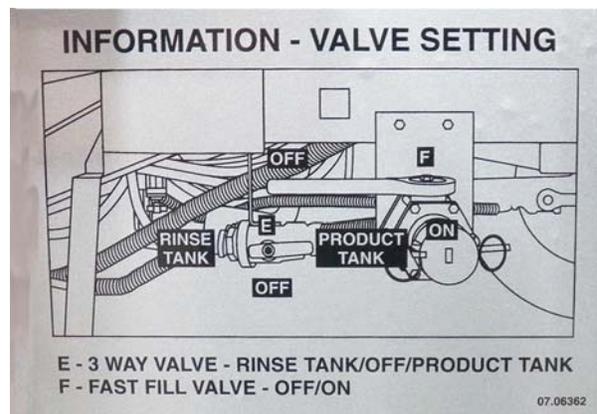
Your sprayer is equipped with a 2" male fast fill connector and a ON/OFF valve (identified as "Valve F") located on the left side of the sprayer, directly behind the step.

Fill as follows:

1. Connect the fill hose to the 2" connector.
2. Charge the fill hose with water using the transfer pump.

If Equipped With Manual Control Rinse System:

- Turn the manual three way ball valve identified as "Valve E" (located under the platform on left side of sprayer) to "Product Tank" (handle pointed toward rear of sprayer).





HYDRAULIC DRIVE PUMP (OPTIONAL)

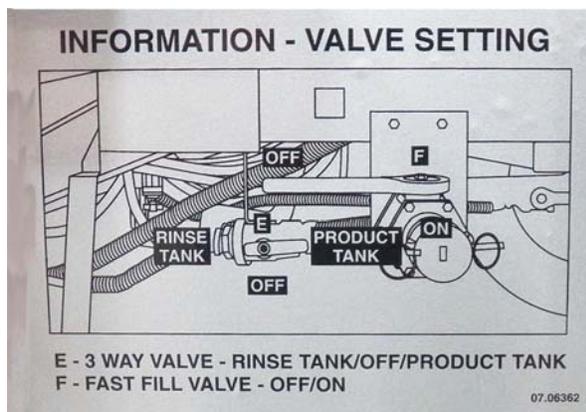
If Equipped With Electric Control Rinse System:

- Locate the electric rinse control switch on the tractor control box and move the switch to the “Product Tank” position.

3. Slowly open the “Fast Fill” valve, marked as “Valve F” and let run until the product tank is full, turn off the “Fast Fill” valve. There is a breather on the product tank lid to allow air to escape during the filling operation.

IMPORTANT: If you are filling with a high volume transfer pump, it may be necessary to remove the center lid from the manhole cover.

4. Close the “Fast Fill” Valve.



5. Disconnect the fill hose and replace the dust cap. Use care when removing the fill hose from the connector, there could still be liquid in the line.

6. Replace the center lid on the manhole cover, if it was removed.

Filling With Sprayer Pump

Your sprayer has the ability to fill itself by using the sprayer product pump.

Your sprayer is equipped with a 2” male fast fill connector and a ON/OFF valve (identified as “Valve F”) located on the left side of the sprayer, directly behind the step.

Fill as follows:

1. Connect the fill hose to the 2” connector.
2. Open the water supply valve to fill the hose.

IMPORTANT: The water source MUST be higher than the sprayer pump. NEVER run the sprayer pump dry. The sprayer pump will not draw water from a source lower than the pump, until the pump is primed.

If Equipped With Manual Control Rinse System:

- Turn the manual three way ball valve identified as “Valve E” (located under the platform on left side of sprayer) to the “OFF” position (handle pointed down).

If Equipped With Electric Control Rinse System:

- Located under the operator platform on the left side of the sprayer is an electric three way ball valve. Directly behind this valve is a manual ON/OFF valve with a yellow handle. Turn this valve OFF (handle should point toward rear of sprayer). When handle is pointed toward right side of sprayer the valve is ON.

3. Open the “Fast Fill” valve marked as “Valve F.”

4. Start the product pump and run at full



HYDRAULIC DRIVE PUMP (OPTIONAL)

capacity.

5. Slowly open the “Product Tank Fill” valve marked “Valve C” located on the front control stand. Let run until the product tank is full, then turn OFF “Product Tank Fill” valve. There is a breather on the product tank lid to allow air to escape during filling.

6. Stop the product pump.

7. Close the “Fast Fill” valve.

With Manual Control Rinse System:

- Turn the manual three way ball valve identified as “Valve E” (located under the platform on left side of sprayer) to the “Product Tank” position (handle pointed toward rear of sprayer).

With Electric Control Rinse System:

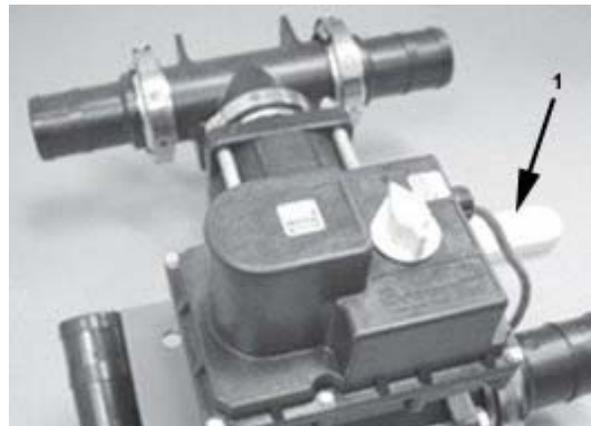
- Located under the operator platform on the left side of the sprayer is an electric three way ball valve. Directly behind this valve is a manual ON/OFF valve with a yellow handle. Turn this valve ON (handle should point toward right side of sprayer). When handle is pointed toward rear of sprayer the valve is OFF.

8. Turn off the external water source.

9. Remove the fill hose and replace the dust cap. Be careful when removing the fill hose from the connector, there could still be some liquid in the line



1 - Valve C



1 - Yellow Handle

Priming The Sprayer

NOTE: Before you prime the sprayer, make sure you are familiar with the information in the pump owner’s manual.

1. Determine appropriate operating pressure for the sprayer system.



HYDRAULIC DRIVE PUMP (OPTIONAL)

2. Fill the sprayer tank half full of water. DO NOT add chemicals.

IMPORTANT: Water must be in pump before pump is started. Pump may be damaged if pump and suction lines are empty. Use the transfer pump or fill through top port.

3. Open the emergency shut-off valve to allow water to flow from the tank into the suction line and pump. Make sure the three-way valve (if so equipped) is open to the product tank.

4. Fold out the boom. (Refer to the “Hydraulic Booms” section of this manual for instructions).

5. Start the tractor. Start the pump and operate at desired speed.

6. Toggle the MASTER switch on the sprayer control box to the ON position to open the boom control valves. The individual boom switches on the control box must also be ON.

7. Make the pressure adjustment using the PRESSURE ADJUST switch on the control box.

8. Check and adjust for adequate agitation in the sprayer tank. If the pressure drops, adjust the pressure setting at the sprayer control box.

9. Check for uniform flow at all the spray nozzles.

The sprayer is now ready for calibration.

Priming The Sprayer Equipped With A RAVEN Rate Controller

If your sprayer is equipped with a RAVEN rate controller, you must do the following to allow the spray boom to function while standing still.

1. Disconnect the radar cable between the tractor and the sprayer.

2. Turn RAVEN console master switch ON.

3. Press the “Self Test” button so the red light stays on.

4. Press “Enter” so the red light stays on.

5. Press the No.5 key and the No. 0 key.

6. Press “Enter” again.

Now the RAVEN rate controller is programmed with a signal telling it that it is moving, allowing the spray boom to operate while standing still.

To Disengage Signal

1. Reconnect the radar cable between the tractor and the sprayer.

2. Move the tractor and sprayer or turn the rate controller OFF and then back ON.

Calibrating The Sprayer

Your sprayer will be equipped with one of two different control systems:

- TeeJet Electric Control System (standard)
- Raven Rate Control System (optional)

The two systems need to be calibrated in different ways.



HYDRAULIC DRIVE PUMP (OPTIONAL)

TeeJet Electric Control System

1. Make sure sprayer is clean.
2. Select nozzle and pressure.
3. Fill sprayer half full with water. DO NOT add chemical.
4. Set up two stakes at the following measurements, depending on nozzle spacing:
 - 272 feet apart for 15" nozzle spacing
 - 204 feet apart for 20" nozzle spacing
 - 136 feet apart for 30" nozzle spacing
 - 102 feet apart for 40" nozzle spacing
5. Under field conditions and at spraying speed, drive the distance and note both engine RPMs and the time. Do this at least twice to get the average time.
6. Stop the tractor. Put the tractor in park.
7. Unfold the sprayer booms. (Refer to the "Hydraulic Booms" section of this manual for instructions).
8. Start the sprayer and run at desired RPMs and pressure.
9. While parked, collect the liquid from the nozzle. Hold a container graduated in ounces below a nozzle. Record the output for the same time period as the average driving time determined in step 5. The average output in ounces is equivalent to the application rate in gallons per acre (GPA).

NOTE: Measuring the output from each tip helps assure balanced spraying from the tips. It will also help you identify worn tips which may need replacement.

10. Repeat the procedures for the remaining nozzles.

11. Compare the actual application rate with the intended rate. If the actual rate varies from the desired rate, you must adjust the pressure or speed or change tip size to compensate.

Raven Rate Control System (Optional)

The rate controller needs to be programmed for your sprayer. You should verify that the programming matches your sprayer specifications. It is very important that the radar gun calibration number is correct. Refer to the Raven owner's manual.



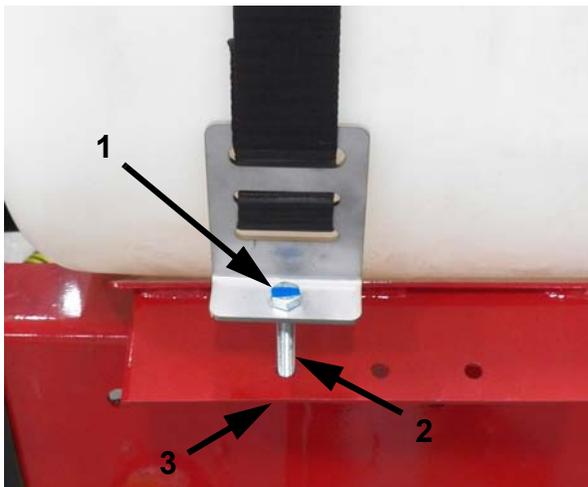
HYDRAULIC DRIVE PUMP (OPTIONAL)

Tank Tie Down Straps

IMPORTANT NOTE: Sprayer tanks will change shape and “Settle In” to the tank saddle when fully loaded. Retighten the tank tie down straps on all the tanks when the tanks are filled the first time each year. Check all the tie down straps for proper tightness.

1. Fill all tanks completely.
2. Check the straps for proper tightness. Straps should be snug around the tank.
3. If straps require tightening, adjust each strap by tightening the hex nut on the appropriate strap adjusting bolt.

NOTE: Check the tension of the tie down straps periodically during the spraying season and tighten as required.



- 1 - Tank Tie Down Straps
- 2 - Strap Adjusting Bolt
- 3 - Hex Nut



VALVE SETTING INSTRUCTIONS

VALVE SETTING INSTRUCTIONS

Valve Settings For Accessory Kits
Refer To The Operator's Manual For Detailed Instructions

Valve Setting Instructions

Refer To The Operator's Manual For Detailed Instructions

FAST FILL VIA SPRAYER PUMP

1. To Fill Product Tank:

Valves: A, B, D & E (OFF)
Valves: C & F (ON)

Start Sprayer Pump

2. To Fill Rinse Tank:

Valves: B, C, D & E (OFF)
Valves: A & F (ON)

Start Sprayer Pump

CHEMICAL INDUCTOR

Start Sprayer Pump

Valves: A, B, C & F (OFF)
Valve: D (ON)
Valve: E (PRODUCT TANK)

RINSE SYSTEM

1. To Rinse Pump, Controls And Boom Only:

Valves: A, B, C, D & F (OFF)
Valve: E (RINSE TANK)

Start Sprayer Pump
Boom Controls ON - Spray
Water On Field

NOTE: To prevent rinse water from entering the product tank, the agitation and self-cleaning filter valves (if so equipped) must be turned OFF.

2. To Rinse Pump And Product Tank Only:

Valves: A, C, D & F (OFF)
Valve: B (ON)
Valve: E (RINSE TANK)

Start Sprayer Pump
After Tank Has Been Rinsed

Valves: A, B, C, D & F (OFF)
Valve: E (PRODUCT TANK)

Start Sprayer Pump
Boom Controls ON - Spray
Water On Field

FAST FILL VIA TRANSFER PUMP

1. To Fill Product Tank:

SPRAYER PUMP OFF
Valves: A, B, C & D (OFF)
Valve: E (PRODUCT TANK)
Valve: F (ON)

Start Transfer Pump

2. To Fill Rinse Tank:

SPRAYER PUMP OFF
Valves: A, B, C & D (OFF)
Valve: E (RINSE TANK)
Valve: F (ON)

Start Transfer Pump

07.09306

TANK SYSTEMS**Chemical Inductor (Optional)**

The 5 gallon Chemical Inductor is an optional accessory and is mounted on the front left corner of the spray platform. The chemical inductor is used to add chemical to the product tank from ground level.

**DANGER**

Handle ALL agricultural chemicals with care. Use chemicals ONLY as directed on the manufacturer's warning label.

Wear protective clothing (such as goggles, rubber or chemical resistant gloves and a respirator) while handling chemicals. Keep protective clothing clean and in good condition or discard.

Wash hands and face thoroughly with clean water after handling chemicals.

Never eat, smoke, drink or put hands to mouth before washing.

Follow these procedures to properly use the chemical induction system:

1. Sprayer product tank **MUST** have at least 50 gallons of water.
2. Check that the emergency shut off valve located under the product tank is **OPEN**.
3. Start the product pump and run at rated speed.
4. **OPEN** the Chemical Fill Control valve.
5. If you are going to use the measuring marks on the chemical inductor tank to measure the amount of chemical being added, make sure the valve on the bottom of the chemical inductor tank is **CLOSED**. Add desired amount of chemical, then

OPEN the valve at the bottom of the chemical inductor tank. The chemical will be transferred from the chemical inductor tank to the product tank.

NOTE: Poly tanks can vary in size and expand and contract from hot to cold weather. It is not recommended to use the measuring marks on the chemical inductor tank for precise measuring.

If you do not need to use the chemical inductor tank to measure, you can **OPEN** the valve at the bottom of the chemical inductor tank prior to adding the chemical. The chemical inductor will transfer the chemical to the product tank as you are filling.



- 1 - Chemical Inductor Tank Cover
- 2 - Chemical Inductor Tank
- 3 - Close This Valve To Measure Chemical
- 4 - Chemical Fill Control Valve

6. When transfer is complete, use the hand rinse gun to rinse the chemical inductor tank. Allow the rinse water to go through the chemical inductor into the product tank.

NOTE:

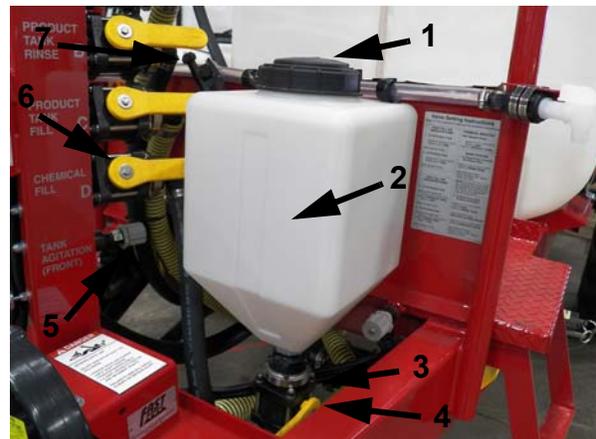
- If the hand rinse gun is supplied with water from the product pump, the water will come from the product tank and will be contaminated with diluted chemical.

- If the hand rinse gun is supplied with water from the optional 12 volt electric pump, the water will come from the rinse tank.

7. Always turn the valve under the chemical inductor tank OFF before turning the “Chemical Fill” valve OFF.

8. Replace the chemical inductor tank lid.

9. Fully OPEN the “Agitation” valve and allow the product pump to run long enough to thoroughly mix the product tanks contents.



- 1 - Chemical Inductor Tank Cover
- 2 - Chemical Inductor Tank
- 3 - Chemical Inductor Venturi
- 4 - Valve At Bottom Of Inductor Tank
- 5 - Agitation Control Valve
- 6 - Chemical Fill Control Valve
- 7 - Hand Rinse Gun

NOTE: Some chemicals tend to foam when agitated. If foaming occurs, throttle back the agitation valve until the foaming stops. If you change the agitation valve setting, you may have to adjust the pressure on the tractor control box. This adjustment would not be necessary with a RAVEN rate controller.

NOTE: There are anti foaming agents available:

- Part No. 07.06881 Shakedown, Liquid - 1 Pint
- Part No. 07.06880 Shakedown, Dry - 1/2 lb. jar
- Part No. 07.06879 Shakedown, Water Soluble Packets - 30 per case



1 - Hand Rinse Gun

10. If you are mixing more than one chemical into the product tank, you should check with your chemical supplier to make sure you add the chemicals in the correct

sequence to insure proper mixing.

11. Be certain to clean and dispose of empty chemical containers properly. Follow the instructions on the container.

NOTE: DO NOT use the chemical inductor system for powder type chemicals. Flowable granular chemicals are acceptable.

IMPORTANT: The “Tee” fitting at the bottom of the chemical inductor is a special fitting with a venturi nozzle on the inside. NEVER operate the chemical inductor without the venturi nozzle installed.



Control Box

- 1 - Pressure Gauge
- 2 - Pressure Adjust Switch

Hand Rinse Gun for Chemical Inductor (Optional)

The chemical inductor is supplied with a hand gun with approximately 5 feet of hose to rinse the chemical inductor tank.

There are two ways the hand gun can be supplied with water:

- Standard system via the product pump
- Optional electric system via a 12 volt

electric pump

Standard System

- The standard system supplies water from the sprayer tank via the product pump and has an ON/OFF valve located at the top of the control center. The control center is located at the front of the sprayer.

- The water supplied will be contaminated with diluted mixed chemical.

To Operate:

1. Start the product pump. Be certain to have water in the product tank and the emergency shut off valve under the product tank is open.
2. Open the ON/OFF valve located at the top of the control center.
3. Remove the hand gun from the storage bracket and rinse the chemical inductor tank.
4. When finished close the ON/OFF valve, point the hand gun into the chemical inductor tank and squeeze the trigger to drain the pressure from the hand gun and hose.
5. Replace the hand gun to the storage bracket and replace the lid on the chemical inductor tank.

Optional Electric System

- The optional electric system has a 12 volt pump located under the 50 gallon rinse water tank.
- There is an electric ON/OFF switch located at the top of the control center.
- The water is supplied from the 50 gallon rinse water tank.

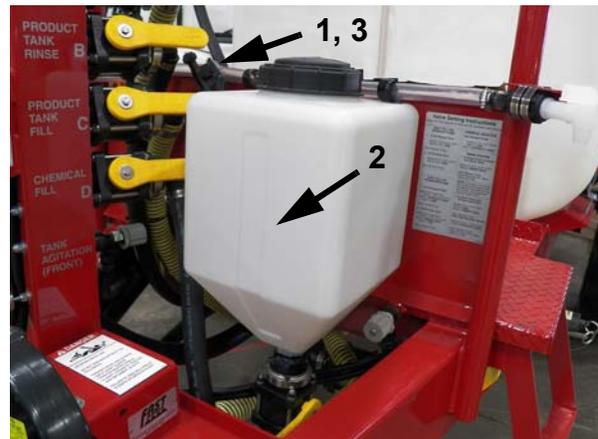
To Operate:

1. There must be water in the 50 gallon rinse water tank.
2. Turn ON the electric switch located at the top of the control center.
3. Remove the hand gun from the storage bracket and rinse the chemical inductor tank.
4. When finished turn OFF the electric switch, point the hand gun into the chemical inductor tank and squeeze the trigger to drain the pressure from the hand gun and hose.
5. Replace the hand gun to the storage bracket and replace the lid on the chemical inductor tank.

NOTE: There is a filter assembly located on the electric 12 volt pump. This filter should be serviced at least once per season. Rinse tank must be empty to remove filter.

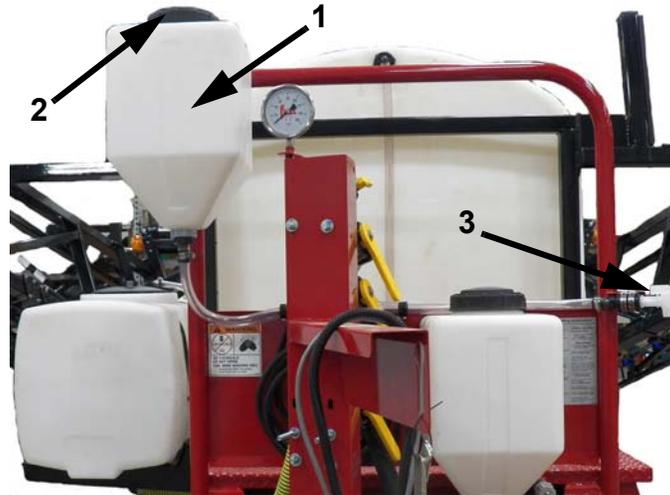


1 - Hand Rinse Gun



1 - Hand Rinse Gun
2 - Chemical Inductor Tank
3 - Storage Bracket

Hand Rinse Tank



Each machine is equipped with a fresh water rinse tank (1) on front frame. Fill rinse tank with clean fresh water whenever rinse water has been used. Do not allow tank to run low on fresh water. Use water from rinse tank to clean, rinse or wash anything that has become contaminated.



WARNING: Do not drink the water from the rinse tank.

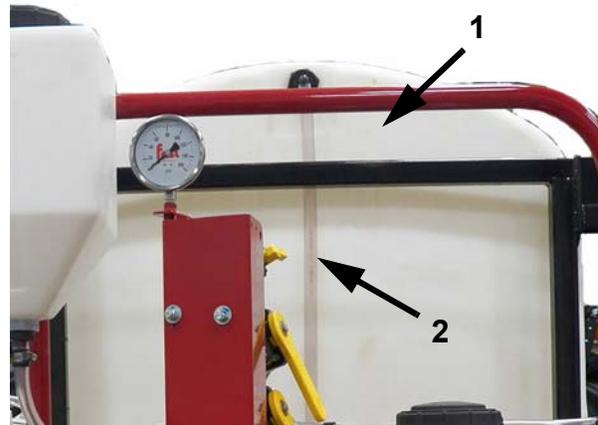
The rinse tank water may become contaminated with sprayer chemicals or other contaminants.

- 1 - Fresh Water Tank
- 2 - Fresh Water Tank Fill
- 3 - Fresh Water Tank Petcock

External Sight Gauge

An external sight gauge is available for the product tank of your sprayer. This sight gauge is a clear tube mounted to the product tank on the front side. This gauge is visible from the operators position and is used as an indicator as to how much water is left in the tank. This gauge indicates the amount of water in the tank by volume only. It does not indicate gallons.

NOTE: If the external sight gauge tube becomes discolored, it can be replaced by ordering from FAST AG Solutions.



- 1 - Product Tank
- 2 - External Sight Gauge

Rinse Tank Flush System (Optional)

A 50 gallon fresh water rinse system is an optional accessory. The major components consist of:

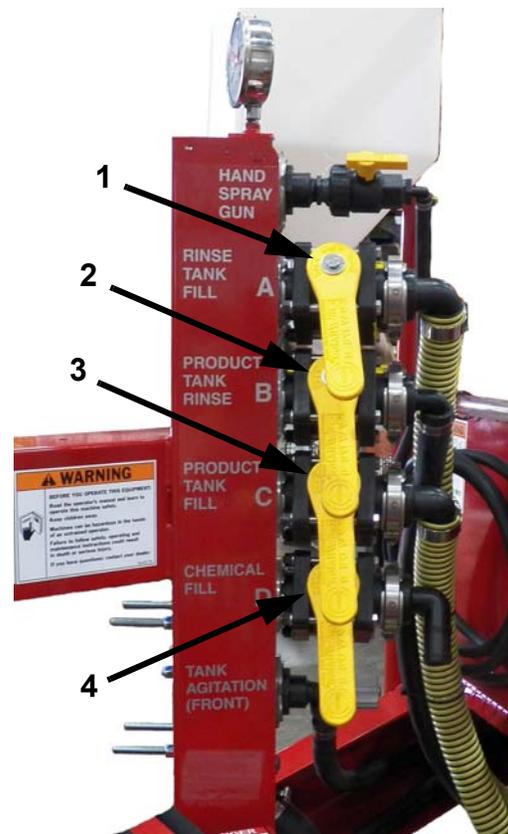
- A 50 gallon clean water tank located on the right side of the sprayer.
- Three way ball valve located on the left side of the sprayer under the operator platform.
- ON/OFF valve located at the front of the sprayer on the control stand.
- (3) rinse balls located in the product tank. The rinse system can do two different functions:

- Rinse the product pump, controls and boom lines and leave the product tank undisturbed.

- Rinse the product pump, product tank, controls and boom lines.

There are two types of control systems available for the rinse system:

- Manual controls located on the sprayer - Standard
- Electric controls located on the tractor - Optional



- 1 - Rinse Tank Fill Valve
- 2 - Product Tank Rinse Valve
- 3 - Product Tank Fill Valve
- 4 - Chemical Fill Valve

Manual Control System

Filling The Rinse Tank

The 50 gallon rinse tank can be filled 3 different ways:

Fill Through Top Lid

1. Remove the lid from the top of the rinse tank. Fill the tank using a garden hose or similar means.

2. Replace the lid when complete.

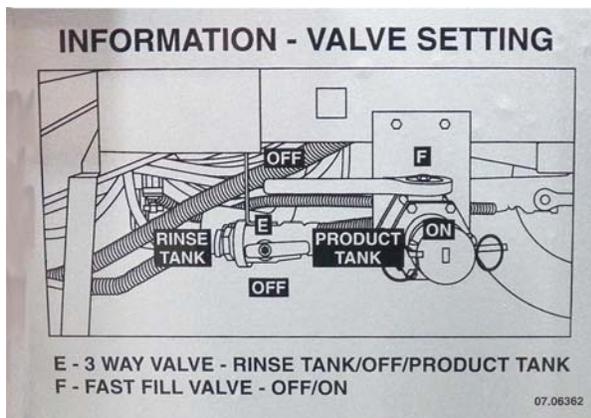
Filling With Transfer Pump

Your sprayer is equipped with a 2" male fast fill connector and a ON/OFF valve

(identified as “Valve F”) located on the left side of the sprayer, directly behind the step.

Fill as follows:

1. Connect the fill hose to the 2” connector.
2. Charge the fill hose with water using the transfer pump.



3. Turn the manual three way ball valve identified as “Valve E” (located under platform on left side of sprayer) to “Rinse Tank” (Point handle forward).
4. Slowly open the “Fast Fill” valve marked as “Valve F” and let run until rinse tank is full. Turn off “Fast Fill” valve. There is a breather hose on the rinse tank to allow air to escape.

IMPORTANT: If you are filling with a high volume transfer pump, be careful NOT to open the “Fast Fill” valve to full flow.

5. Disconnect the fill hose and replace the dust cap. Be careful removing the fill hose from the connector - there could be some liquid in the line.

Filling With Sprayer Pump

Your sprayer has the ability to fill the clean water rinse tank its self by using the sprayer product pump.

Your sprayer is equipped with a 2” male fast fill connector and a ON/OFF valve (identified as “Valve F”) located on the left side of the sprayer, directly behind the step.

Fill as follows:

1. Connect the fill hose to the 2” connector.
2. Open the water supply valve to fill the hose.

IMPORTANT: The water source MUST be higher than the sprayer pump. NEVER run the sprayer pump dry. The sprayer pump will not draw water from a source lower than the pump, until the pump is primed.

3. Turn the manual 3 way ball valve identified as “Valve E” (located under platform on left side of sprayer) to the “OFF” position (Point handle down).
4. Open the “Fast Fill” valve marked as “Valve F.”
5. Start the product pump and run at full capacity.

6. Slowly open the “Rinse Tank” valve marked as “Valve A” located on the front control stand and let run until the rinse tank is full. Turn off the “Rinse Tank Fill” valve. There is a breather hose on the rinse tank to allow air to escape.

7. Stop the product pump.
8. Return the 3 way ball valve to the desired position (“Rinse Tank” or “Product Tank”).
9. Close the “Fast Fill” valve.
10. Shut off the external water source.
11. Disconnect the fill hose and replace the dust cap. Be careful removing the fill hose from the connector - there could be some liquid in the line.



1 - Valve A

Electric Control System

Filling The Rinse Tank

The 50 gallon rinse tank can be filled 3 different ways:

Fill Through Top Lid

1. Remove the lid from the top of the rinse tank. Fill the tank using a garden hose or similar means.

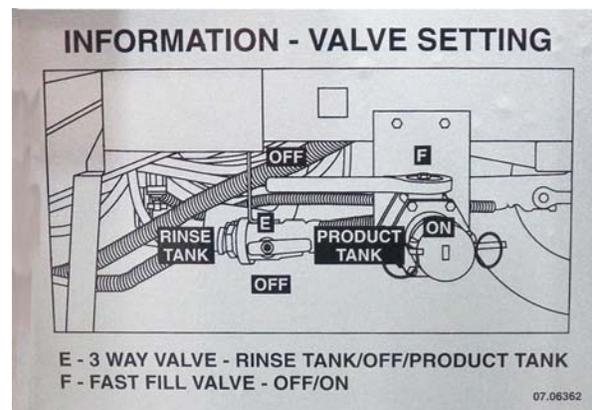
2. Replace the lid when complete.

Filling With Transfer Pump

Your sprayer is equipped with a 2” male fast fill connector and a ON/OFF valve (identified as “Valve F”) located on the left side of the sprayer, directly behind the step.

Fill as follows:

1. Connect the fill hose to the 2” connector.
2. Charge the fill hose with water using the transfer pump.



3. Locate the electric control switch on the control box on the tractor. Move the switch



TANK SYSTEMS

to “Rinse Water” or “Rinse Tank” (depending on which control switch your sprayer has).

4. Slowly open the “Fast Fill” valve marked as “Valve F” and let run until rinse tank is full. Turn off “Fast Fill” valve. There is a breather hose on the rinse tank to allow air to escape.

IMPORTANT: If you are filling with a high volume transfer pump, be careful NOT to open the “Fast Fill” valve to full flow.

5. Disconnect the fill hose and replace the dust cap. Be careful removing the fill hose from the connector - there could be some liquid in the line.

Filling With Sprayer Pump

Your sprayer has the ability to fill the clean water rinse tank its self by using the sprayer product pump. Your sprayer is equipped with a 2” male fast fill connector and a ON/OFF valve (identified as “Valve F”) located on the left side of the sprayer, directly behind the step.

Fill as follows:

1. Connect the fill hose to the 2” connector.
2. Open the water supply valve to fill the hose.

IMPORTANT: The water source MUST be higher than the sprayer pump. NEVER run the sprayer pump dry. The sprayer pump will not draw water from a source lower than the pump, until the pump is primed.

3. Located under the operator platform on the left side of the sprayer is an electric 3

way ball valve. Directly behind this valve is a manual ON/OFF valve with a yellow handle (1). Turn this valve “OFF” (handle pointed toward rear of sprayer).

4. Open the “Fast Fill” valve marked as “Valve F.”

5. Start the product pump and run at full capacity.

6. Slowly open the “Rinse Tank” valve marked as “Valve A” located on the front control stand and let run until the rinse tank is full. Turn off the “Rinse Tank Fill” valve. There is a breather hose on the rinse tank to allow air to escape.

7. Stop the product pump.

8. Close the “Fast Fill” valve.

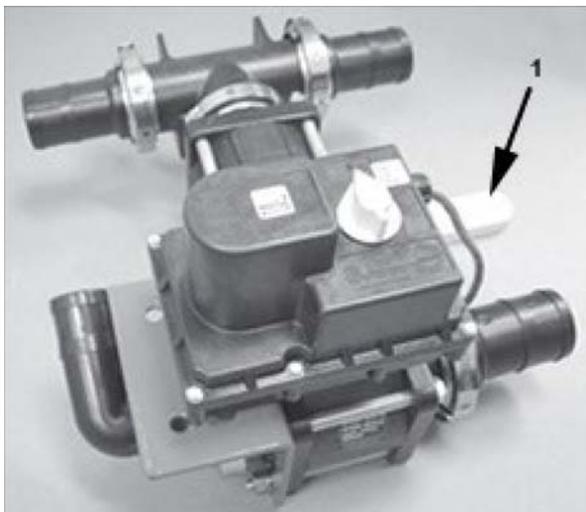
9. Turn the valve under the platform “ON” (handle pointed toward right side of sprayer).

10. Shut off the external water source.

11. Disconnect the fill hose and replace the dust cap. Be careful removing the fill hose from the connector - there could be some liquid in the line.



1 - Valve A



Electric 3 Way Ball Valve
1 - Yellow Handle

Cleaning The Sprayer

Keeping your sprayer clean helps assure a long service life. Many pesticides can quickly corrode metal parts in the spraying

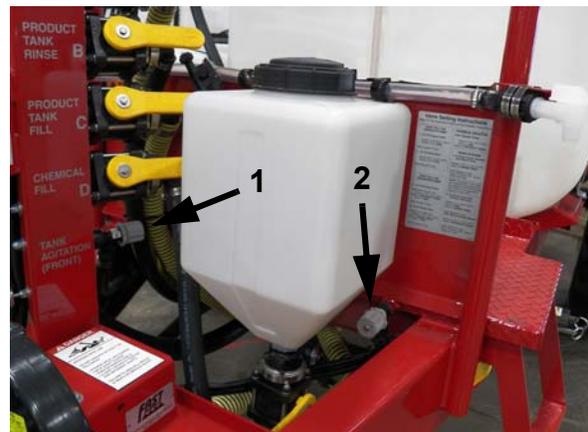
system. Chemicals remaining in the sprayer can react with a second chemical introduced to the system and offset its effectiveness.

Manual Control Rinse System

Short Term Shutdown

Rinsing the Product Pump, Controls and Boom Lines Leaving the Product Tank Undisturbed:

1. Turn OFF the “Agitation Valve” located on the front control stand - If so desired.
2. Turn OFF the Self Cleaning Filter valve located at the front left corner of the operator platform - If so desired.



1 - Agitation Valve
2 - Self Cleaning Filter Valve

3. Turn the manual 3 way ball valve identified as “Valve E” (located under platform on left side of sprayer) to “Rinse Tank” (Point handle forward).

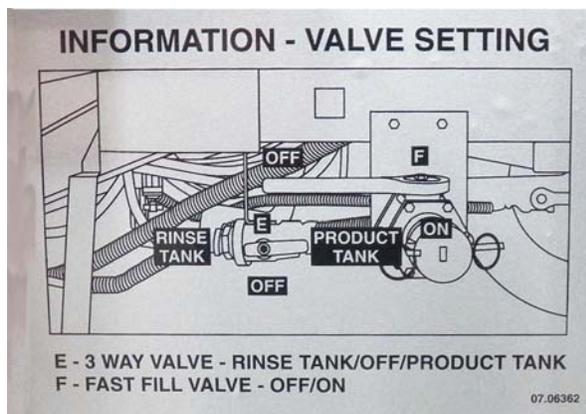
4. Start product pump, drive at normal speed, turn complete boom ON and spray

as normal until clean liquid comes out of sprayer tips.

5. Turn boom OFF, stop the product pump and stop the tractor.

6. Turn the manual 3 way ball valve identified as “Valve

E” (located under platform on left side of sprayer) to “Product Tank” (Point handle toward rear of sprayer).



7. Turn ON the “Agitation Valve” located on the front control stand - If so desired.

8. Turn ON the Self Cleaning Filter valve located at the front left corner of the operator platform.

Long Term Shutdown

Rinsing the Product Pump, Product Tank, Controls and Boom Lines:

NOTE: It is important to “Triple” rinse the system to insure proper cleaning. The use of a Neutralizer is recommended for cleaning when changing chemicals. Products are available from your FAST dealer.

1. Add the recommended amount of Neutralizer to the clean water rinse tank.

2. Turn the manual 3 way ball valve identified as “Valve E” (located under platform on left side of sprayer) to “Rinse Tank” (Point handle forward).

3. Start the product pump and run at full speed.

4. Open “Valve B” located in the front of the sprayer on the control stand. Let the pump run until you have used a third of the water in the clean water rinse tank.

5. Close “Valve B” located in the front of the sprayer on the control stand.

6. Turn the manual 3 way ball valve identified as “Valve E” (located under platform on left side of sprayer) to “Product Tank” (Point handle toward rear of sprayer).

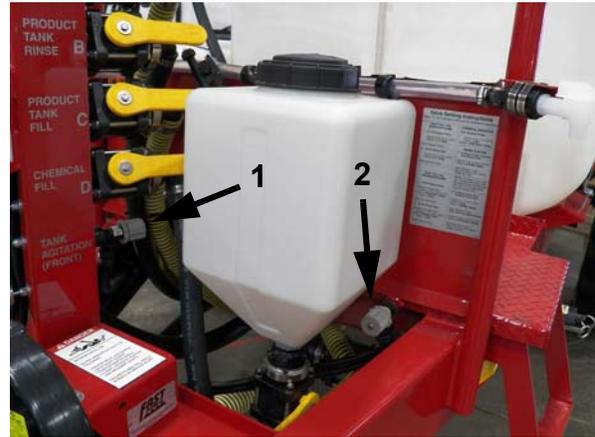
7. Drive at normal speed, turn complete boom on and spray as normal until product tank is empty.

8. Repeat the cleaning procedure two more times to ensure proper cleaning.

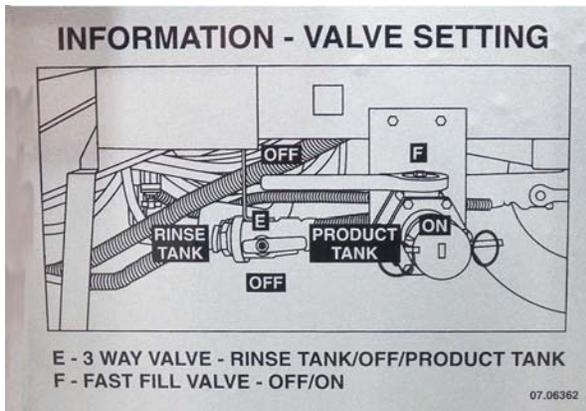
located at the front left corner of the operator platform - If so desired.



1 - Valve B



Agitation Valve (1)
Self-Cleaning Filter Valve (2)



Electric Control Rinse System Short Term Shutdown

Rinsing the Product Pump, Controls and Boom Lines Leaving the Product Tank Undisturbed:

1. Turn OFF the "Agitation Valve" located on the front control stand - If so desired.
2. Turn OFF the Self-Cleaning Filter valve

3. Locate the electric rinse control switch on the control box on the tractor. Move the switch to "Rinse Water" or "Rinse Tank" (depending on which control switch your sprayer has).

4. Start product pump, drive at normal speed, turn complete boom ON and spray as normal until clean liquid comes out of sprayer tips.

5. Turn boom OFF, stop the product pump and stop the tractor.

6. Move the electric rinse switch on the tractor control box to the "Product Tank" position.

7. Turn ON the "Agitation Valve" located on the front control stand - If so desired.

8. Turn ON the Self-Cleaning Filter valve located at the front left corner of the operator platform.



TANK SYSTEMS

Long Term Shutdown

Rinsing the Product Pump, Product Tank, Controls and Boom Lines:

NOTE: It is important to “Triple” rinse the system to insure proper cleaning. The use of a Neutralizer is recommended for cleaning when changing chemicals. Parts are available from your FAST dealer.

1. Add the recommended amount of Neutralizer to the clean water rinse tank.
2. Locate the electric rinse control switch on the control box on the tractor. Move the switch to “Rinse Water” or “Rinse Tank” (depending on which control switch your sprayer has).
3. Start the product pump and run at full speed.
4. Locate the electric control switch on the tractor control box and move the switch to “Rinse Balls” or “Product Tank Rinse” and let run until you have used a third of the water in the clean water rinse tank.
5. On the tractor control box, move the “Rinse Balls” switch to the “Product Tank” position (HC control) and or “Product Tank Rinse” switch to the “OFF” position and the “Product Tank”/ “Rinse Tank” switch to the “Product Tank” position (Standard electric control).
6. Drive at normal speed, turn complete boom on and spray as normal until product tank is empty.
7. Repeat the cleaning procedure two more times to ensure proper cleaning.

Cleaning Your Sprayer Manually

Keeping your sprayer clean helps assure a long service life. Many pesticides can quickly corrode metal parts in the spraying system. Chemicals remaining in the sprayer can react with a second chemical introduced to the system and offset its effectiveness.

Following are instructions for cleaning your sprayer if it is not equipped with a factory installed rinse system.

1. Select an area where the cleaning solution can be safely sprayed out of the system.
2. Check the label on the chemical container for specific cleaning instructions.
3. Wash the entire sprayer system using a water hose and a brush. Use a soft brush to clean nozzle tips and screens.
4. Flush with clean water.
5. Dispose of the cleaning solution properly according to local regulatory agency requirements.



HYDRAULIC BOOM OPERATION

HYDRAULIC BOOM OPERATION

Three types of hydraulically operated booms are available. They are EF Booms, EFT Booms and HC Booms.



DANGER

To avoid personal injury or death, **KEEP** clear of **ALL** electrical power lines when operating sprayer or when folding or unfolding booms.

1



WARNING

To avoid personal injury, make sure that everyone is at a safe distance from the sprayer before folding or unfolding the sprayer boom.

Keep a safe distance from the boom while in operation. Hydraulic booms may move suddenly without warning.

EF & EFT Boom

After the sprayer and hydraulic hoses have been properly attached to the tractor, unfold the boom using the following procedure:

1. Raise the complete boom until the boom wings clear the transport rest.
2. Place the tractor in park and/or set the brakes and stop the engine.
3. Remove the transport lock from the lift cylinder at the rear of the sprayer and place in the storage position provided.
4. Restart the tractor and unfold the boom wings until the boom is in the working position.

5. Lower the entire boom to the desired height.

IMPORTANT: DO NOT lower boom to the full down position. There must be a minimum of 1-1/2" of hydraulic lift cylinder shaft showing before the suspension can work properly.



Transport Lock (1)
Hydraulic Lift Cylinder (2)

EFT Boom

After the sprayer booms have been unfolded and lowered to the correct height, tilt the boom wings using the following procedure:

1. Flip the wing tilt switch on the control box to the tilt position.
2. Using the tractor hydraulic controls tilt the individual wings up or down to the desired position.

- a. The tractor control for the single hose control will tilt the left wing.
- b. The tractor control for the dual hose control will tilt the right wing.



Transport Lock In Storage Position On Boom Stabilizer Arm

Wing Tilt Switch (1)

Fold the boom using the following procedure:

NOTE: For EFT booms, level both boom wings before proceeding.

1. Raise the boom to the full lift height.
2. Fold the boom inward until the boom is over the top of the transport rest.
3. Place the tractor in park and/or set the brakes and stop the engine.
4. Remove the transport lock from the storage position on the boom stabilizer arm and put in place on the hydraulic lift cylinder.
5. Restart the tractor and lower the boom on to the boom transport rest.

HC Boom

The HC Boom uses five separate hydraulic cylinders which allow the operator maximum control of the boom. Boom components are controlled independently with the boom control box mounted on the tractor.

The switches on the control box operate the following boom functions:

- The Yellow middle switch control raises or lowers the complete boom.
- The Blue switch controls the folding of boom wings IN or OUT depending on the position of the switch.
- The RIGHT and LEFT switches, control the tilt of their respective wing UP or DOWN.



HYDRAULIC BOOM OPERATION



Control Box

The HC Boom controls are designed for a tractor with an open or closed center hydraulic system. Refer to page 2 “HC Boom Hydraulic Hose and Electrical Connections” for a detailed explanation of the hydraulic settings.

Whenever the HC boom is in use, the tractor hydraulic valve on the tractor **MUST** be locked open to assure a constant supply of oil to the cylinder valve control bank at the back of the sprayer.



Cylinder Valve Control Bank

Service And Maintenance

 Review the operator’s manual and all safety items before working with, maintaining or operating the sprayer.

 Lower machine to the ground, 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.

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, hoses and couplings are in good condition.

 Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.

 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.

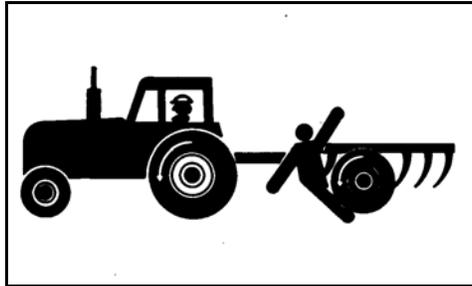
 Place stands or blocks under the frame before working beneath the machine or when changing tires.

 Be sure all guards are in place and secured when maintenance work is completed.

 Use only tools, jacks and hoists of sufficient capacity for the job.

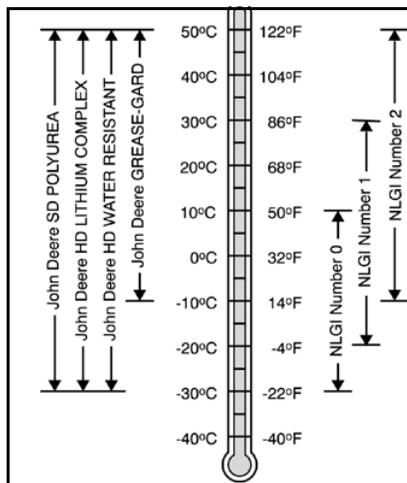
LUBRICATION AND MAINTENANCE

Lubricating and Maintaining Machine Safely



CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, be sure to service machine on a level surface. If machine is connected to tractor, engage parking brake and place transmission in **PARK**, shut off engine and remove key. If machine is detached from tractor, block wheels and use safety stands to prevent movement.

Grease



Greases for Air Temperature Ranges

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

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

IMPORTANT: Some types of grease thickeners are not compatible with others. Consult your grease supplier before mixing different types of grease.

Alternative and Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic lubricants.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.



LUBRICATION AND MAINTENANCE

Lubricant Storage

Equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

Lubrication and Maintenance Intervals

Daily

- Inner Wing Fold Pins
- Tool Bar Parallel Linkages
- Clean Strainer

Weekly

- Inner Wing Hinges
- Inner Wing-Fold Hinge

Before Each Season

- Wheel Bearings
- Jack



LUBRICATION POINTS

LUBRICATION POINTS

Daily Lubrication Interval PTO Shaft

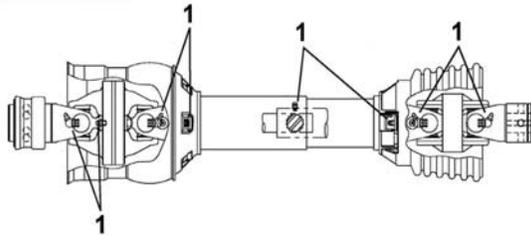
There are a total of 8 grease fittings on the PTO assembly.

Grease with a high quality grease before starting work each day or after every 8 hours of operation.

Clean and grease PTO shaft before each prolonged period of non use.

Grease the shield tubes to prevent seizing.

Follow any other service instructions from the manufacturer.



PTO Shaft
1 - Grease Fittings

Sprayer Pump



WARNING

ALWAYS replace any shielding after any servicing or lubrication of the pump.

NEVER operate the sprayer unless **ALL** shielding is in place and secure. Contact with rotating parts can cause death or personal injury.

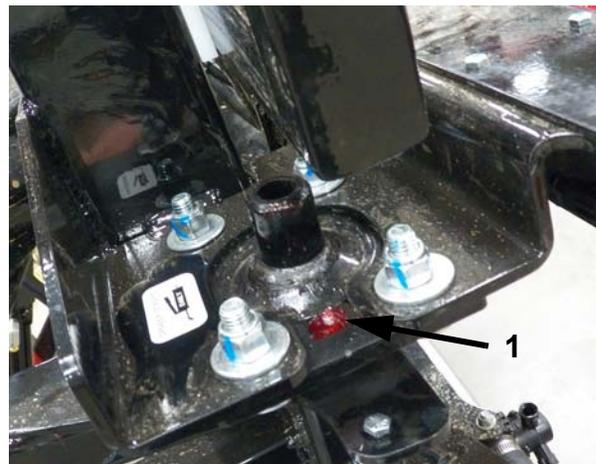
Your sprayer may be equipped with one of several pumps. To help assure proper lubrication, refer to the pump owner's manual for detailed lubrication information

Weekly Lubrication Interval

EF & EFT Boom Primary and Secondary Boom Pivot Points

Lubricate ALL the pivot points on each side of the boom assembly using a good quality grease. Clean off grease fittings before attaching grease gun. Wipe up any excess grease when finished.

NOTE: There are a total of 9 grease fittings on the EF boom assembly and 11 grease fittings on the EFT boom assembly.



Boom Pivots Upper
1 - Grease Fitting

LUBRICATION POINTS

EF & EFT Boom Center Boom Mounting Arm Pivot Points

Lubricate ALL the pivot points on each mounting arm and the center pivot using a good quality grease. The center pivot is located directly behind the slow moving vehicle (SMV) emblem. Clean off grease fittings before attaching grease gun. Wipe up any excess grease when finished.



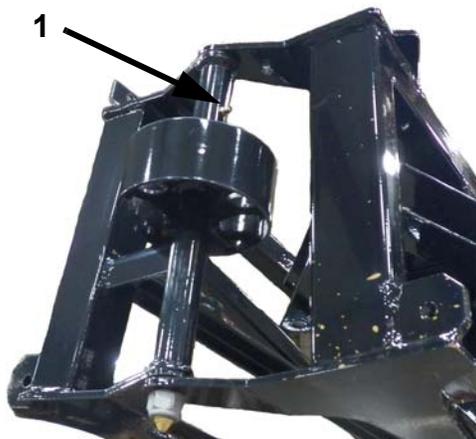
Boom Pivots Lower EF Boom
1 - Grease Fitting



Boom Pivot Center
1 - Grease Fitting



Boom Pivots Lower EF Boom
1 - Grease Fittings



Boom Pivots Secondary Boom
1 - Grease Fitting



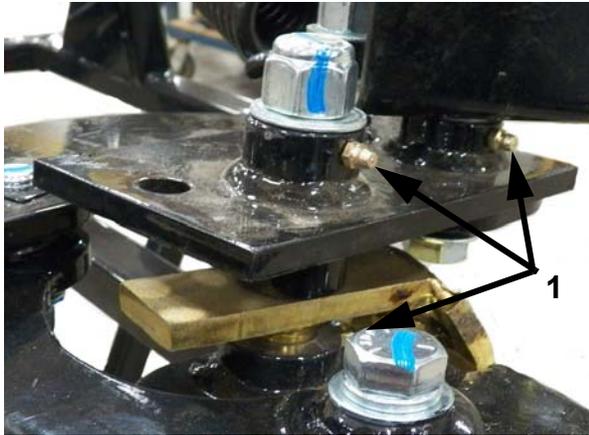
Mounting Arm Pivots (Left and Right Sides)
1 - Grease Fitting



LUBRICATION POINTS

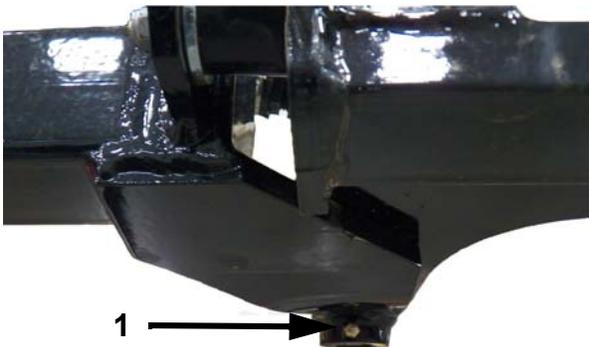
HC Boom

Lubricate ALL the pivot points on each side of the boom assembly using a good quality grease. Clean off grease fittings before attaching grease gun. Wipe up any excess grease when finished.



Secondary Boom Wing Pivot Point (Three at Top)

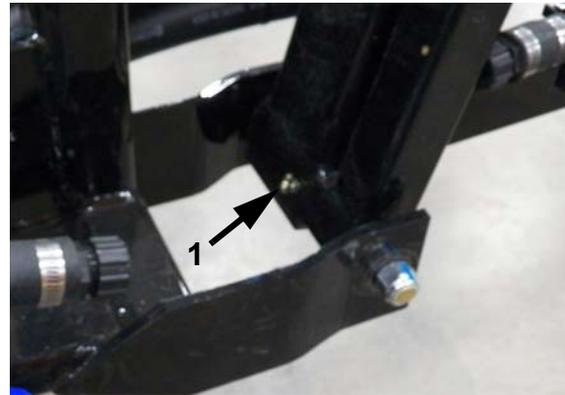
1 - Grease Fittings



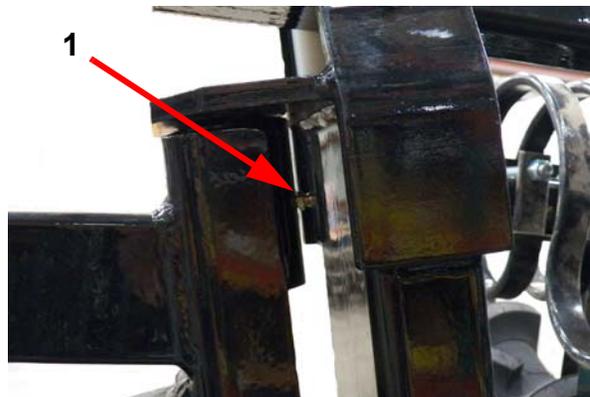
Secondary Boom Wing Pivot Point (One at Lower Pivot on each side)

1 - Grease Fitting

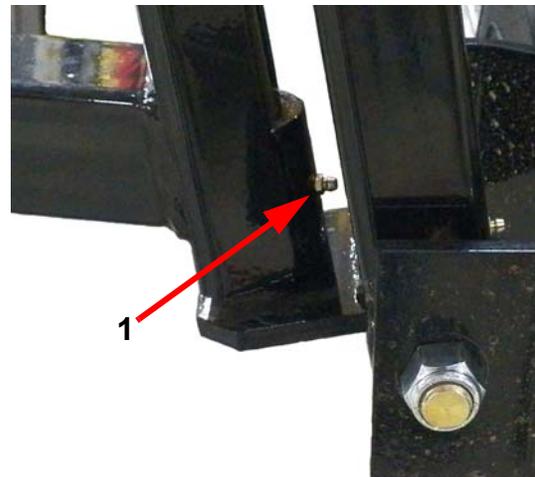
Boom Pivots (Three on each side of sprayer).



1 - Grease Fitting



1 - Grease Fitting

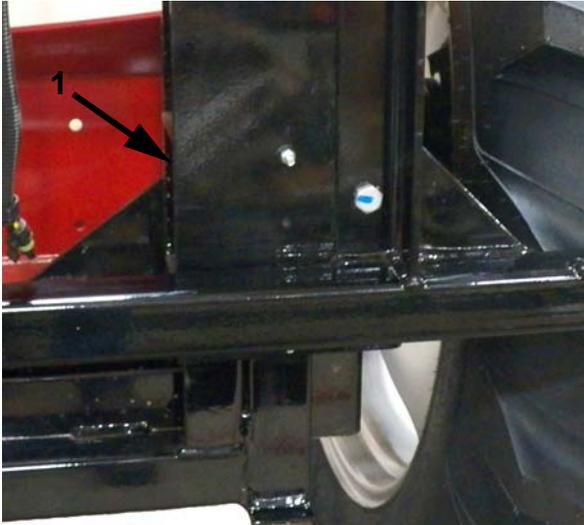


1 - Grease Fitting

Boom Tower Slides (HC Boom Only)

Weekly lubricate the boom tower slides (1) with liquid graphite.

If operating in extremely dusty conditions, shorten the lubrication interval as required.



1 - Boom Tower Slides

200 Hour Lubrication Interval

Wheel Bearings

Every 200 hours (or yearly), repack the wheel bearings using a good quality wheel bearing grease.



GENERAL MAINTENANCE

GENERAL MAINTENANCE

Repair or replace damaged or broken parts immediately.

Check all safety and operating decals. If any decals are illegible or missing, replace any decals immediately. DO NOT operate sprayer with missing or damaged decals. Refer to the "Safety Decal" section of this manual for all safety decal locations. Refer to your parts manual for all operating decals.

Fasteners

After the first hour of use, check all the fasteners and tighten any found to be loose. Thereafter, check all fasteners periodically and tighten as required.

Tire Pressure

Check the tire pressure daily.

The recommended tire pressure is:

12.4-24 6 ply tires	24 psi
11.2-38 4 ply tires	18 psi
13.6-38 12 ply tires	42 psi

Filters

Remove and clean the water filters daily. Clean the filters on the optional foam marking system at intervals as specified in the foam system owner's manual.

IMPORTANT: Always wear gloves and eye protection while servicing the sprayer.

To manually clean the self cleaning filter:

1. Make sure the product pump is turned OFF.

2. Close the emergency shut off valve under the product tank.
3. Make sure the agitation valve and self cleaning filter bypass agitation valve are both closed.
4. Place a clean empty container under the filter base to catch any water and chemicals.
5. Very carefully disconnect the bypass line from the bottom of the filter and allow the water and chemicals to flow into the container.
6. Remove the canister from the filter head by rotating counter clockwise.
7. Rinse the canister and screen in clean water.
8. Before reinstalling the canister to the filter head, lubricate the canister O-ring with clean engine oil. Reinstall the canister and hand tighten only.
9. Connect the bypass hose to the bottom of the filter, open the bypass and agitation valves. Open the emergency shut off valve at the bottom of the product tank.
10. Start the sprayer pump with water in the tank and check for leaks.
11. This procedure also applies to sprayer equipped with the standard filter.



GENERAL MAINTENANCE

Sprayer Tips

Refer to the information “Spray Tip Wear” for tip cleaning.

Storing and Winterizing

Storing your sprayer properly during the off season will help reduce the time needed to get the sprayer ready for the next spraying season. If at all possible, store your sprayer in a dry building to protect it from the harmful effects of the weather. Ultraviolet light in the sun’s rays softens and weakens rubber used for hoses and tires.



WARNING

Wear protective clothing (such as goggles, rubber or chemical resistant gloves and a respirator) while handling or working with chemicals. Keep protective clothing clean and in good condition or discard.

IMPORTANT: It is very important that you thoroughly clean the sprayer inside and out.

Cleaning the Inside of the sprayer

1. Add about 50 gallons of clean water along with a Neutralizing agent into the sprayer product tank. Refer to “Cleaning the Sprayer” in this manual.
2. Start the product pump and run at rated volume.
3. Open and close ALL valves on the sprayer to ensure you have clean water through the entire system.

NOTE: The pressure gauge hose is supplied from the rear of the sprayer and is a “dead end” circuit. The following procedure is recommended for cleaning.

- a. With the sprayer pump turned off, carefully remove the pressure line from the bottom of the pressure gauge.
 - b. Hold the end of the hose above a bucket and have an assistant start the sprayer pump momentarily at an idle **ONLY**. Leave run at idle until clean liquid comes out of the hose. Be careful of any “splash back” in the bucket.
 - c. Stop the sprayer pump and reattach the hose to the gauge.
 4. Spray liquid out through the boom at a proper location. Manually drain as much water as possible. Dispose of liquid properly.
 5. Check entire sprayer for worn or damaged components. Replace as necessary.
 6. Add approximately 20 gallons of environmentally safe antifreeze suitable for the climate in your area.
 7. Start the product pump and run at rated volume.
 8. Open and close ALL valves on the sprayer to ensure you have clean antifreeze through the entire system.
- NOTE:** The pressure gauge hose is supplied from the rear of the sprayer and is a “dead end” circuit. The following procedure is recommended for winterizing.



GENERAL MAINTENANCE

- a. With the sprayer pump turned off, carefully remove the pressure line from the bottom of the pressure gauge.
 - b. Hold the end of the hose above a bucket and have an assistant start the sprayer pump momentarily at an idle **ONLY**. Leave run at idle until clean antifreeze comes out of the hose. Be careful of any “splash back” in the bucket.
 - c. Stop the sprayer pump and reattach the hose to the gauge.
9. Turn on the boom until antifreeze begins spraying from the spray tips. Shut off the sprayer and let the antifreeze remain in the system.

Chemical Inductor

Be sure to drain the chemical inductor system, flush with clean water then run environmentally safe antifreeze (RV antifreeze) through the system. Open all inductor valves to insure antifreeze has been run through the entire inductor system.

Foam Marker

IMPORTANT: The liquid lines and tank must be drained completely prior to storage. If liquid in this system is allowed to freeze, several components may be damaged.

1. Remove the in-line filter bowl at the bottom of the tank and flush tank with warm water.
2. Replace the filter bowl. Fill the tank with at least 2 gallons of hot water. Turn on the machine and allow to run out each side until no foam is generated. Repeat if

necessary.

3. Add RV type antifreeze to the tank. Do not use windshield washer fluid because it can clog the foamer.
4. Turn on machine until antifreeze solution reaches each foamhead.
5. Check the air and liquid lines for holes and replace as required. Be sure to flush and drain all liquid from the system prior to storage in freezing temperatures.

Cleaning the outside of the sprayer

1. Thoroughly clean the outside of the sprayer with soap and water until all surfaces are clean. A high pressure washer would help this process.
2. Paint all scratched or rusty surfaces.
3. Check all safety decals, reflectors and lights that they are in good condition and function properly. Replace or repair as needed.
4. Grease and lubricate all fittings and slide areas. Refer to the “Lubrication” section of this manual.

Boom Adjustments

HC Boom Only Boom Slides

The poly slides on the boom tend to wear over time. Adjust the pressure on the poly slides as needed to compensate for wear. To adjust the pressure on the poly slide

pads, locate the large locknuts (located by each pad) on the tank side of the slide tower. Tighten the locknuts to increase the pressure on the poly slide pads. Tighten all the pads equally.

Boom Breakaways

The tension of the boom breakaways should be checked and adjusted as needed. If the tension on the breakaways is too great, the boom may be damaged if it strikes a stationary object. Tightening the nuts on the extension spring for the breakaway increases the tension. Turning the nuts out decreases the tension. The springs are located between the primary and secondary boom wings.

Boom Level

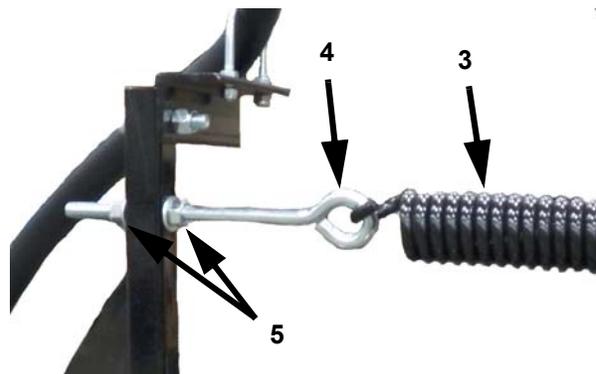
If the boom does not hang level, secure the boom with an overhead hoist or other suitable means. Loosen the six nuts on the bolts which hold the boom to the tower slides. Level the boom and retighten the nuts.

Boom Wing Alignment

Align boom inner and outer boom wings with the parallel connecting link. Remove the pin from the clevis on the end of the link. Turn the clevis in or out on the threaded shaft until the link is properly aligned. Reinstall the pin.



Tower Slides (1)
Boom Level Adjustment Bolts (Three Per Slide) (2)

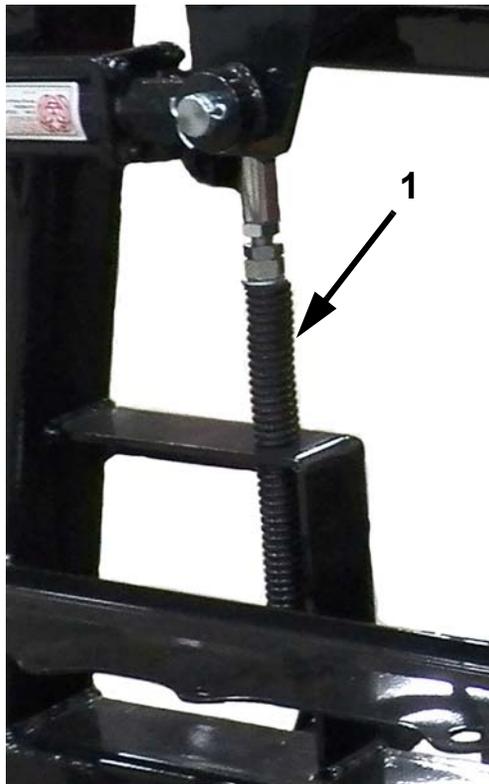


3 - Extension Springs
4 - Spring Anchor
5 - Adjustment Nuts

EF & EFT Boom Only

Boom Level

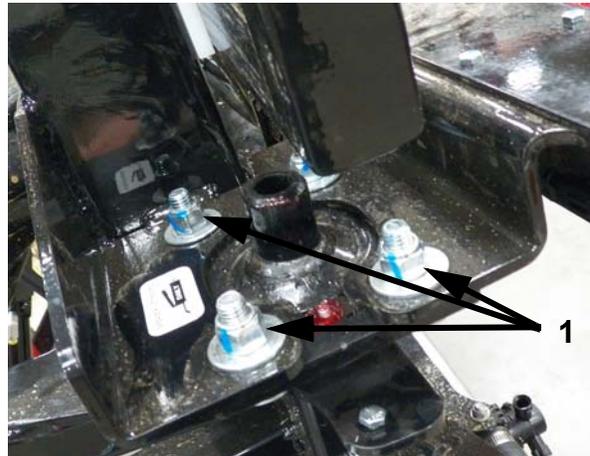
If the entire boom is not level side to side adjust the threaded rod and spring assembly at the rear of the center boom. Tighten the locknuts after adjustment is complete.



1 - Threaded Rod and Spring Assembly

Boom Wing Assembly Alignment

If the wing assemblies are not aligned (up or down), the wing assemblies can be raised or lowered. Secure the boom wing assembly with an overhead hoist or other suitable means. Loosen the four nuts at the pivot between the center boom and the primary boom wing. Use the overhead hoist to level the boom wing assembly. Tighten the four nuts securely.



Boom Wing Level Adjustment Nuts (1)

Boom Wing Fold Out Adjustment

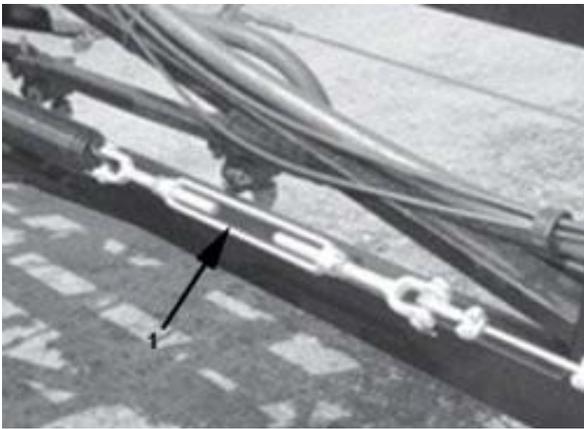
If the secondary boom wings do not unfold properly, with the boom in the folded position, adjust the turnbuckle at the rear of the primary boom wing until the cable is tight. Recheck the boom breakaway tension and adjust if necessary.



1 - Boom Fold Out Turnbuckle

Boom Breakaways

The tension of the boom breakaways should be checked and adjusted as needed. If the tension on the breakaways is too great, the boom may be damaged if it strikes a stationary object. Adjust the tension as needed by turning the turnbuckles located on the front side of the boom wings (when boom is completely unfolded). Adjust as required. Tighten the locknuts against the turnbuckle when complete.



1 - Boom Breakaway Turnbuckle

SERVICE**Practice Safe Maintenance**

Understand service procedure before doing work. Keep area clean and dry.

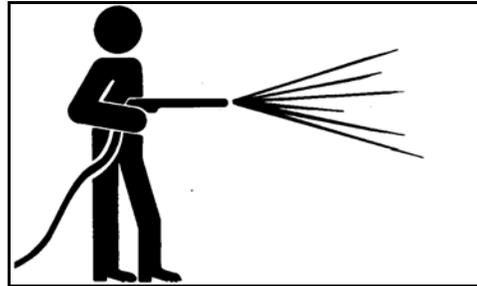
Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

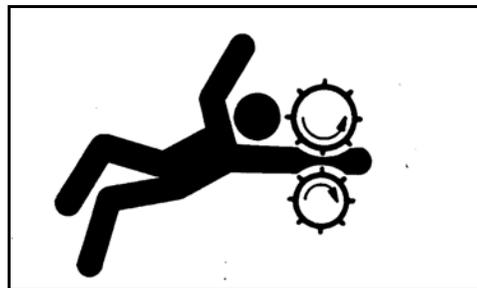
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Work in Clean Area

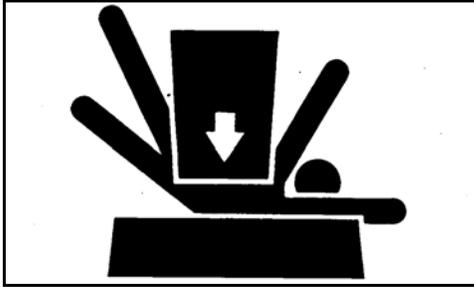
Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.

Service Machines Safely

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

Support Machine Properly

Always lower the attachment or implement to the ground before you work on the machine. If the work requires that the machine or attachment be lifted, provide secure support for them. If left in a raised position, hydraulically supported devices can settle or leak down.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.

When implements or attachments are used with a machine, always follow safety precautions listed in the implement or attachment operator's manual.

Avoid High-Pressure Fluids

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with FAST approved replacement parts.

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

Replace Hydraulic Hoses



CAUTION: Avoid hazards due to escaping fluid under pressure. See AVOID HIGH PRESSURE FLUIDS in this manual.

Hydraulic hoses between the lift cylinders and hydraulic lock-up valve should be inspected frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Worn or damaged hose assemblies can fail during use and should be replaced immediately.

See your FAST Dealer for replacement hoses.



CAUTION: If incorrectly rated hose is used, machine damage, injury or death could occur.

If hoses are to be fabricated, ensure hoses are rated at no less than 82,737 kPa (827 bar) (12,000 psi) burst pressure according to SAE standard J517, 100R17 hose specification.

Incorrect hose length or routing can increase chance of hose wear or damage. Use old hose as guide for length and hose routing.

Incorrect fittings can damage mating parts or cause leaks. Make sure to use steel fittings approved for use with hose manufacturer. Use correct size and thread type as replaced hose.

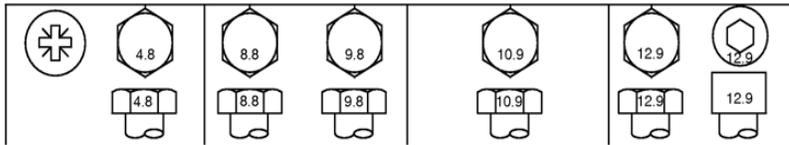
Tightening Hardware

Check tightness of ALL BOLTS, U-BOLTS and CAP SCREWS after first 10-15 hours of operation and again at end of first week (50 hours) of operation.

Tighten all bolts to torques specified in Service section unless otherwise noted.

Check tightness of hardware periodically.

Metric Bolt and Screw Torque Values



Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ¹		Dry ²		Lubricated ¹		Dry ²		Lubricated ¹		Dry ³		Lubricated ¹		Dry ²	
	N · m	lb.-in.	N · m	lb.-in.	N · m	lb.-in.	N · m	lb.-in.	N · m	lb.-in.	N · m	lb.-in.	N · m	lb.-in.	N · m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N · m	lb.-ft.	N · m	lb.-ft.	N · m	lb.-ft.	N · m	lb.-ft.
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N · m	lb.-ft.	N · m	lb.-ft.	N · m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N · m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

¹ "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

² "Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.

³ "Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.

Unified Inch Bolt and Screw Torque Values



Bolt or Screw Size	SAE Grade 1				SAE Grade 2 ¹				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ²		Dry ³		Lubricated ²		Dry ³		Lubricated ⁴		Dry ³		Lubricated ²		Dry ³	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N·m	lb.-ft.	N·m	lb.-ft.
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N·m	lb.-ft.	N·m	lb.-ft.				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N·m	lb.-ft.														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

¹ Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

² "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

³ "Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.

⁴ "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

Face Seal Fittings Assembly and Installation—All Pressure Applications

Face Seal O-Ring to Stud End Installation

1. Inspect the fitting surfaces. They must be free of dirt and/or defects.
2. Inspect the O-ring. It must be free of damage and/or defects.
3. Lubricate O-rings and install into groove using petroleum jelly to hold in place.
4. Push O-ring into groove with petroleum jelly so O-ring is not displaced during assembly.
5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.
6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. DO NOT allow hoses to twist when tightening fittings.

Face Seal Adjustable Stud End O-Ring Installation

1. Back off lock nut (jam nut) and washer to full exposed turned down section of the fitting.
2. Install a thimble over the fitting threads to protect the O-ring from nicks.
3. Slide the O-ring over the thimble into the turned down section of the fitting.
4. Remove thimble.

Face Seal Straight Stud End O-Ring Installation

1. Install a thimble over the fitting threads to protect the O-ring from nicks.
2. Slide the O-ring over the thimble into the turned down section of the fitting.
3. Remove thimble.

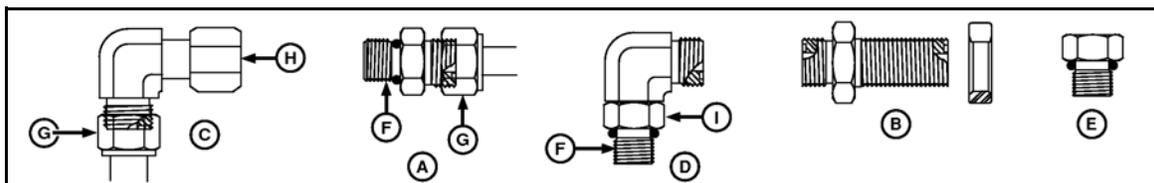
Fitting Installation

1. Install fitting by hand until snug.
2. Position adjustable fittings by unscrewing the fitting no more than one turn.
3. Apply assembly torque per table.

Assembly Torque

1. Use one wrench to hold the connector body and one wrench to tighten nut.
2. For a hydraulic hose, it may be necessary to use three wrenches to prevent twist; one on the connector body, one on the nut, and one on the body of the hose fitting.

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressures



- | | |
|--|----------------|
| A - Stud Straight and Tube Nut | G - Tube Nut |
| B - Bulkhead Union and Bulkhead Lock Nut | H - Swivel Nut |
| C - 90° Swivel Elbow and Tube Nut | I - Lock Nut |
| D - 90° Adjustable Stud Elbow | |
| E - Port Plug | |
| F - Stud End | |

Preparing for Storage



CAUTION: Store unit in an area away from human activity. Do not permit children to play on or around stored sprayer.

At end of season, thoroughly inspect and prepare sprayer for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at beginning of next season.

1. Empty remaining liquid from tank.
Flush system with water.
2. Open all liquid line connections, end cap screen canister and pump. Drain all fluids out of system.
3. Add approximately 38 L (10 gal) of RV antifreeze per 3 m (10 ft.) of boom.
4. Remove 90° elbow and recap valve block end.
5. Flush the system, then pump through screens, valve, nozzles/check valves and orifices/tips.
6. Thoroughly wash machine using a pressure washer to remove all dirt, mud, debris or residue to protect against corrosion.
7. Lubricate all grease points. Make sure all grease cavities have been filled with grease to remove any water residue from washing.
8. Inspect all hydraulic hoses, couplers and fittings. Tighten any loose fittings. Replace any hose that is damaged or separating from crimped end of a fitting.
9. Inspect all liquid lines and connections. Tighten any loose fittings. Replace any line that is cut, nicked or abraded.
10. Touch up all paint nicks and scratches to prevent rusting.
11. Fold inner and outer wings to transport configuration.
12. Install spacers on lift cylinder rams.
13. Move machine to a storage position.
14. Select an area that is dry, level and free of debris.
15. Place planks under jack for added support if required.
16. Unhook sprayer from tractor.

Removing from Storage

1. Clear area of bystanders, especially small children, and remove foreign objects from machine and working area.
2. Attach tractor to sprayer.
3. Check:
 - Attach and secure all liquid lines.
 - Nozzles.
 - All hardware. Tighten as required.
 - Tire pressure.
 - All hydraulic lines, fittings and connections. Tighten as required
4. Lubricate all grease fittings.
5. Replace any defective parts.
6. Add a small amount of liquid to tank. Turn metering pump on momentarily and check that liquid comes out of each nozzle.
7. Follow pre-operation checklist before using.



SERVICE RECORD

SERVICE RECORD

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

Action Code: CL Clean L Lubricate

Item	Hours													
	Serviced By													
8 hours Or Daily														
L Flip Wing Hinges														
L Inner Wing Hinges														
CL Strainer Screen														
L Tool Bar Parallel														
Annually														
L Wheel Bearings														
CL Wash Machine														



TROUBLESHOOTING

TROUBLESHOOTING

Following are troubleshooting guides to help you solve common operating problems. If you have difficulty resolving operating problems, call your dealer for assistance

PROBLEM	POSSIBLE CAUSE	SOLUTION	
No pressure in spray system	Air leak in suction line	Tighten clamps, check hoses for cracks or breaks	
	Dirty or clogged filter	Clean filter	
	Kinked hose	Straighten hose, route hose for gradual bends	
	Pump not primed	Prime pump (see priming pump and pump owners manual)	
	Water not flowing from tank	Empty tank; refill	
			Check tank outlet; clear debris if any
			Make sure emergency shut off valve is open
		Make sure throttling valve is open	
	Pump is defective; repair or replace		
Spray system pressure low	Primary filter beginning to plug	Clean filter	
	Pressure regulating or throttling valve out of	Adjust valve	
	Spray tips too large	Verify spray tip size	
	Speed too slow	Increase travel speed	
	Pump running too slow	Increase pump speed	
Erratic spray system pressure	Air leaks in suction line	Tighten clamp; check hoses for cracks or breaks	
	Tank getting empty	Refill tank	
	Vacuum developing in tank	Remove tank cover; clean tank vent	
Spray system pressure can't be regulated	Pressure regulating valve not working	Check electric wiring to valve; tighten electrical connections	
		Replace valve if defective	
Spray system pressure increasing	Tips plugging	Clean tips	
	Tip screens plugging	Clean screens	
	In line filter plugging	Clean in line filter	
Application rate too low	Sprayer not calibrated properly	Calibrate sprayer	
	Speed sensor not calibrated	Calibrate speed sensor	
	Spray tip too small	Verify spray tip size	



TROUBLESHOOTING

No pressure in spray system	Air leak in suction line	Tighten clamps, check hoses for cracks or breaks	
	Dirty or clogged filter	Clean filter	
	Kinked hose	Straighten hose, route hose for gradual bends	
	Pump not primed	Prime pump (see priming pump and pump owners manual) pump owners	
	Water not flowing from tank	Empty tank; refill	
		Check tank outlet; clear debris if any any	
		Make sure emergency shut off valve is open	
Make sure throttling valve is open			
Pump is defective; repair or replace			

PROBLEM	POSSIBLE CAUSE	SOLUTION
Spray system pressure low	Primary filter beginning to plug	Clean filter
	Pressure regulating or throttling valve	Adjust valve
	Spray tips to large	Verify spray tip size
	Speed to slow	Increase travel speed
	Pump running to slow	Increase pump speed
Erratic spray system pressure	Air leaks in suction line	Tighten clamp; check hoses for cracks or breaks
	Tank getting empty	Refill tank
	Vacuum developing in tank	Remove tank cover; clean tank vent
Spray system pressure can't be regulated	Pressure regulating valve not working	Check electric wiring to valve; tighten electrical connections
		Replace valve if defective
Spray system pressure increasing	Tips plugging	Clean tips
	Tip screens plugging	Clean screens
	In line filter plugging	Clean in line filter
Application rate to low	Sprayer not calibrated properly	Calibrate sprayer
	Speed sensor not calibrated	Calibrate speed sensor
	Spray tip to small	Verify spray tip size
RAVEN Controller		
No speed reading	Blown out fuse	Check and replace fuse
	Poor wire connection or bad wire	Clean and check connection
		Check for break in wire
Speed reading to slow or to fast	Wrong calibration number	Verify calibration number
	SP-1 or SP-2 setting wrong SP-1 Wheel drive SP-2 Radar gun	Verify setting - See RAVEN owners manual



TROUBLESHOOTING

No rate in rate window	Flow meter not working	Check connections and wires
		Check for foreign material in rotor
		Check transducer
		See RAVEN owners manual for instructions
Rate will not change or adjust	Regulating valve not working	Check connections and wiring
		Check for foreign material in valve
		See RAVEN owners manual for instructions
Nozzle output not equal	Tips plugging	Clean tips
	Tip screens plugging	Clean screens
	In line filter plugging	Clean in line filter
	Nozzle check valve sticky or	Clean or replace check valve
Boom section output not equal	ON/OFF valve not opening	Clean or replace ON/OFF valve
Boom section will not turn on	No signal from control box	Check connections and wires for breaks
	Circuit breaker released in ON/OFF boom ball valve	Unplug ON/OFF valve connection on sprayer for one minute and
Poor tank agitation	Agitation valve closed	Open valve
	Agitation valve not completely open	Open valve

Poor tank agitation (cont.)	Self cleaning filter ON/OFF valve not open	Open valve
	Plugged agitation nozzle(s)	Clean nozzles
Hydraulic drive pump keeps stopping	Too much oil flow from tractor	Reduce oil flow from tractor
		See pump owners manual for
EF & EFT Boom		
Boom bounces excessively	Low pressure in accumulator	See dealer for service
	Field too rough	Slow down
	Weak shock absorber	Replace shock absorber
Boom settles	Bad seals in lift cylinder	Replace seals
	Tractor hydraulic valve leaks	Replace seals in valve
Boom not level	Coil spring out of adjustment	Adjust coil spring
	Boom wing sagging	Adjust top boom wing support
HC Boom		
Boom bounces excessively	Weak S-Tine(s)	Replace S-Tine(s)
	Weak shock absorbers	Replace shock absorbers
	Field too rough	Slow down
	Tower slides out of adjustment or	Adjust tower slide and/or replace
Boom not level	Tower slides out of adjustment	Adjust tower slide
Boom settles or creeps up	Bad cylinder seals	Replace seals
	Dirt in HC valve block spool	Clean spool



Mechanical Specifications

Mechanical Specifications

Dimensions	BW500/45	BW750/60
Length	17'	17'
Width	Field 45'	60'
	Transport 8' 1"	9' 1"
Transport Height	8' 4"	8' 4"
Tank Capacity	500 Gal.	750 Gal.
Tires	12.4-24 6 ply 25 psi	42 psi
	11.2-38 4 ply 18 psi	
	13.6-38 12 ply	
Empty Weight Of Unit (lbs)	3240	4500
Loaded Tongue Weight (lbs)		
	Transport 1540	2000 est.
	Field 1280	1650 est.

Specifications subject to change without notice.

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 tubes or hoses, use two wrenches. Place one wrench on connector body and with second wrench tighten swivel nut to torque shown.

*Torque values shown are based on lubricated connections.

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



RAVEN CONSOLE CALIBRATION

RAVEN CONSOLE CALIBRATION

1	2	BOOM CAL 3	SPEED CAL 4	METER CAL 5	VALVE CAL 6	RATE 1 CAL 7	RATE 2 CAL 8	VOL TANK 9	TIME 0	SELF TEST ↑
BOOM WIDTHS			SPEED CAL	METER CAL	VALVE CAL	RATE 1 CAL	RATE 2 CAL	VOLUME-IN-TANK	TIME	SELF TEST
BOOM 1	_____									
BOOM 2	_____									
BOOM 3	_____									
BOOM 4	_____									
BOOM 5	_____									
BOOM 6	_____									



OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES

Fence Line Kit(s)

The fence line kit(s) are an optional accessory. There are three different styles of fence row kits available:

- Manual ON/OFF valve
- Electric solenoid ON/OFF valve
- Electric Ball ON/OFF valve

You may order a fence line nozzle for the left, right or both sides of the boom. (Right side is the most common).

Manual Fence Row Nozzle Operation:

1. Before operating sprayer, with the boom unfolded, adjust the spray body to the desired position (located at end of spray boom).
2. With the spray boom turned OFF walk to the end of the boom and turn ON the fence row nozzle valve. When handle is at a right angle from the valve it is in the OFF position.
3. Start the sprayer and spray as normal.
4. When finished turn OFF the boom, stop the tractor and walk to the end of the boom and turn OFF the fence row nozzle valve.
5. Resume spraying as normal.

Electric Fence Row Nozzle Operation:

1. Before operating sprayer, with the boom unfolded, adjust the spray body to the desired position (located at end of spray boom).
2. Locate the electric switch marked "Fence Row" located on the sprayer control panel.
3. This switch can be turned ON or OFF at any time. You will have the ability to spray with this nozzle if the boom is turned ON or OFF.

NOTE: The Electric Fence Row Nozzle is supplied with a non drip check valve to prevent the line from draining.



NOTES



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