AG SHIELD

OPERATOR'S HANDBOOK AND PARTS MANUAL 2008+FIELD SPRAYER with 7700 AG SHIELD PA BOOM

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Printed in Canada March 9, 2009 REV 8 -Part No 129202

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1 INTRODUCTION AND SIGN-OFF FORM

Congratulations! on your choice of an Ag Shield 7700 Floating Boom Sprayer. This equipment has been designed and manufactured to meet the spraying needs of the discerning farmers and custom applicators.

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

Ag Shield follows the general safety standards specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Ag Shield Sprayer must read and clearly understand ALL Safety, Operating, and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Review this information annually before season start-up. Make these reviews of safety and operation a standard practice for all of your equipment. An untrained operator is **not qualified** to operate this machine.

A sign off sheet is provided for your record keeping proving that all personnel who will be working with the equipment. I have read and understood the information in the Operators Handbook and have been instructed in the use of the equipment.

SIGN-OFF FORM

DATE	OPERATORS SIGNATURE	EMPLOYERS SIGNATURE

2 SAFETY

SAFETY ALERT SYMBOL

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

The Safety Alert symbol identifies important safety messages on the Ag Shield Field Sprayer And in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS:

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

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

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

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

2.1 SAFETY OVERVIEW

YOU are responsible for the **SAFE** operation and maintenance of your Ag Shield Sprayer. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Sprayer be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the Sprayer.

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

- Sprayer owners must give operating instructions to operators or employees before allowing them to operate the Sprayer, and at least annually thereafter per OSHA regulation 1928.57.

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

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

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

- Think SAFETY! Work SAFELY!

2.2 GENERAL SAFETY

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

1. Only trained competent persons shall operate the Sprayer. An untrained operator is not qualified to operate the machine.
2. Have a first-aid kit available for use should the need arise and know how to use it.

1. Have a fire extinguisher available for use should the need arise and know how to use it.
2. Do not allow riders.

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

   - A hard hat
   - Protective shoes with slip resistant soles
   - Protective glasses or goggles
   - Heavy gloves
   - Wet weather gear
   - Hearing protection
   - Respirator or filter mask

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

8. Read chemical manufacturers warnings, instructions and procedures before starting and follow them exactly.
9. Find the phone number for the poison control center for your area.

10. Review safety related items with all personnel annually.

2.3 OPERATING SAFETY

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

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

3. Before spraying a field, be familiar with all potential hazards: trees, rocks ditches, gullies, etc. Plan the spraying route to avoid hazards. Keep sprayer width in mind when maneuvering to avoid obstacles.

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

5. Keep all shields and guards in place when operating.

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

7. Clear the area of all bystanders, especially children, before starting.

8. Stay away from machine when folding booms. Keep others away.

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

10. Do not breathe, touch or ingest chemicals. Always wear protective clothing and follow safe handling procedures. If you should spill or contact chemical, wash immediately and discard clothing.

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

12. Dispose of chemical containers in a manner approved by the local authorities.

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

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

15. Do not eat in the field when spraying.

16. Before applying pressure to the hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are not damaged.

17. Before applying pressure to the hydraulic system make sure that the breakaway cylinder is fully extended, and that no persons are in the arc that the boom wings swing through.

18. Review safety instructions annually.

2.4 CHEMICAL SAFETY

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

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

3. Before applying chemicals to a field, be familiar with all potential hazards: trees, rocks, ditches, gullies, etc. Plan the application route to avoid hazards. Keep machine width in mind when maneuvering to avoid obstacles.

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

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

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

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

8. Check with local authorities regarding the disposal of small quantities of chemicals, chemical containers and wash water.

9. Do not burn the containers or leave them lying in the field or ditches. Dispose of them in a manner approved by the local authorities.

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

11. Do not eat in the field when spraying.

12. In case of chemical poisoning, get immediate medical attention.

13. Most provinces and states have regional poison control centers. Please find the current poison control center phone number for your area, and indicate in the following space.

Poison Control Center (Regional)

Phone : _____
Fax : _____

14. Thoroughly wash clothing and equipment contaminated by chemicals.

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

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

17. Do not use the Sprayer to transport drinking water.

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

2.5 MAINTENANCE SAFETY

1. Review the Operators Manual and all safety items before working with, maintaining or operating the sprayer.

2. Stop the tractor engine, place all controls in neutral, set park brake, remove ignition key, wait for all moving pads to stop before servicing, adjusting, repairing or unplugging.

3. Before applying pressure to a hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are not damaged.

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

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

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

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

1. Wear safety goggles, rubber gloves and protective clothing when working on the Sprayer when filled with active chemical or on the boom wind shields.

2. Wash machine to remove all chemical residue before working on unit. Wear appropriate protective gear at all times.

3. Protect yourself from chemical contamination.

2.6 HYDRAULIC SAFETY

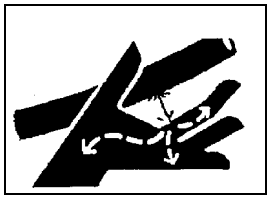
1. Always place all tractor hydraulic controls in neutral before dismounting.

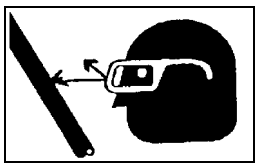
2. Make sure that all components in the hydraulic system are kept in good condition and are clean.

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

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

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





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

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

2.7 TRANSPORT SAFETY

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

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

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

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

5. Install additional lights on the rear of the sprayer to safeguard against rear end collisions. Daybreak and dusk are particularly dangerous and pilot vehicles are recommended.

6. Ensure that the trailer is hitched positively to the towing vehicle. Always use a safety chain between the machine and the tractor.

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

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

9. Never transport with the tank filled with water or chemical.

2.8 STORAGE SAFETY

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

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

2.9 REFUELING SAFETY

1. Handle fuel with care. It is highly flammable.

1. Do not refuel the machine while smoking or when near open flame or Sparks.

2. Stop engine before refueling. Clean up spilled fuel before restarting engine.

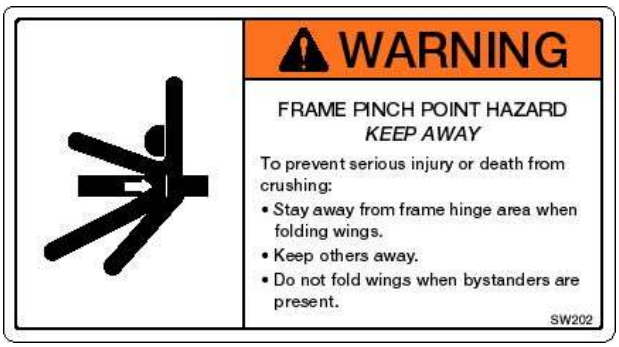
2.10 TIRE SAFETY

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.

4. Operate the tires at the pressures, loads, and speeds suggested by the manufacturer.

2.11 Safety Decals

Please Become Familiar with these safety decals.



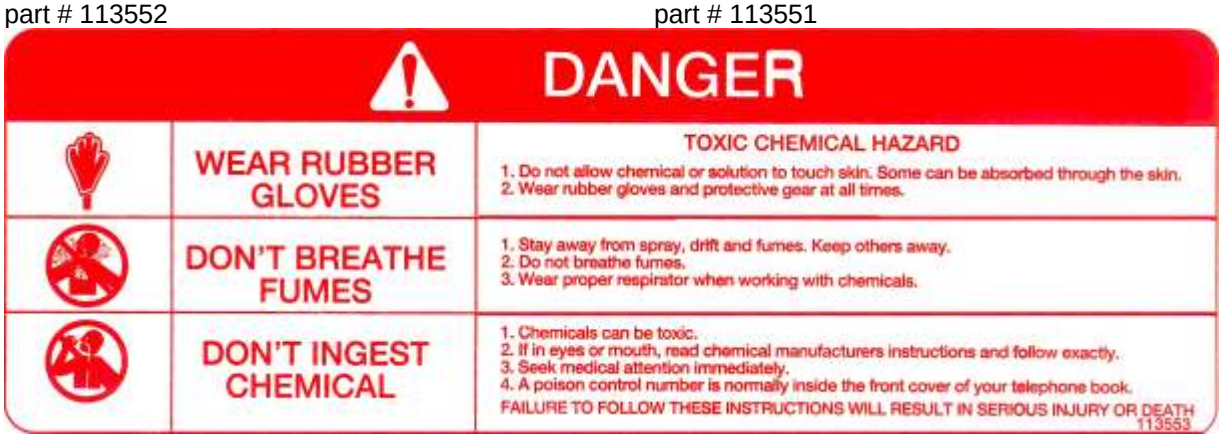
part # SW202

Part # SW201

Part # SW901

part # 113552

part # 113551



Part # 113553

Part # 113548

3 BOOM OPERATIONS

3.1 PRINCIPLES OF OPERATION

Many features are incorporated to allow convenient operation in virtually all conditions.

Your boom is now equipped with a Spray Shield which when **properly** adjusted and **consistently** operated at a correct distance from the ground and/or crop will:

1. Allow spraying in winds of up to 25 mph (40 km/h).

2. Bend over the plants in the field to allow the chemicals to cover all parts of plants.

3. Retain the spray mist under the canopy to minimize drift.

The front vertical segment of the shield is set to contact the top of the plant canopy and bend it forward while traveling over the field. This action exposes the bottom side of the plant leaves for a more complete coating action of the chemical. By creating a zero wind chamber, the spray droplets and mist fill the chamber and are retained within it to efficiently coat all sides of the plant. Drift is minimal. The most effective spray action is obtained when the spray from the nozzles is directed into the gap in the crop foliage as it bends over coming under the front shield. Straight down has given good results at approx. 15 mph.

IMPORTANT

Considerable drift can occur when the booms are operated too high, allowing pesticide to escape outside of the shield. Ag Shield is not responsible for any claims or compensation arising from operation of unit allowing drift to occur.

IMPORTANT

If the boom is operated too low, the front shields may be bent back into the nozzle pattern. Raise the boom to eliminate spraying on the front shield. Spraying the front shield wastes chemical and will give inconsistent chemical application and weed control.

Adjust the main boom (center section) to brush the crop. As the machine moves through the field, the wings should be adjusted as required to maintain the shields brushing the crop. If the wind is able to get under the edge of the shields, some drift may occur.

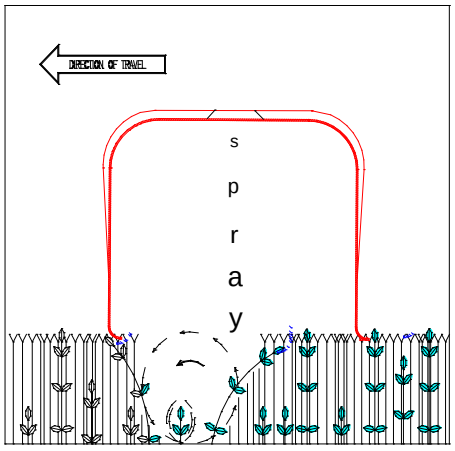


FIGURE 1 AG SHIELD ACTION

To make it possible for the operator to keep boom to ground adjustment, ground speed should be reduced on rolling fields. . If there is no wind, this is less critical.

The optional **GFS (Ground Following System)** is designed specifically to assist the operator in keeping larger booms in proper relationship to target weeds and the ground during pre seeding burn off through to post emergence until the crop is 8” tall. GFS may be retrofitted to most Ag Shield floating booms

When operating in dry conditions there are two considerations

1. Operating the shields too close to the ground may bring up excessive dust interfering with good weed control. Operators should watch for this condition, and raise the boom when applying sensitive products.

2. Operating with the boom too high up at the center can lead to dust from the tires going under the shield, again causing reduced pesticide activity.

To minimize weeping of spray from the shields, **only 80 degree**(not 110 degree) flat fan tips are recommended. Preliminary testing with 110 degree Turbo Teejet tips appears quite positive. The larger VMD(droplet size) compared to a flat fan tip of similar output seems to give superior coverage without the weeping off of the sheets expected with the 110 degree flat fan tips. The shield openings will accommodate all models of air induction tips and in smaller sizes these may enhance drift control under high wind conditions.

3.2 Transporting and Folding

DANGER

WATCH FOR OVERHEAD POWER LINES AND OTHER OBSTACLES WHEN FOLDING BOOMS. <u>NEVER FOLD NEAR OVERHEAD POWER LINES</u>

3.2.1 ROAD TO FIELD

When folding the boom to FIELD position, follow the sequence below:

1. Remove the lock pins with chains, and place below the booms to free booms for folding

2. Push the top of the MAST SWITCH to confirm that the boom is in highest position.

3. Push the top of both LEFT AND RIGHT SHOULDER switches *momentarily* to raise wings (prefer both at same time) to clear the boom rest.

4. Push the wing FOLD SWITCH until cylinders are fully extended to hold both wings in proper field position

5. Push RAISE/LOWER SWITCH to adjust the main boom to operating height

6. Push the bottom or Field side of the boom TIP SWITCH to extend the wing tips to spraying position. To reduce stress on the boom, **release the switch** to allow both boom tips to free fall by gravity for the last 25 degrees forward to field position

The wing tips must be extended during spraying. If a narrow area is encountered, turn quarter turn valve on left hand fold cylinder hose to freeze left hand boom in field position. Follow step 4(Field to Road) below to fold right wing into road position.

DANGER

Booms automatically reset from breakaway position. If booms are in field position, before starting motor, <u>clear all persons</u> in area where a swinging boom could strike them.

3.2.2 FIELD TO ROAD

When folding the boom to ROAD position, follow the sequence below:

1. Push the top of the MAST SWITCH to raise boom to highest position

2. Push the top of the boom TIPS SWITCH to road to fold the wing tips back. To reduce impact of the tips striking main boom, be certain to **HOLD the switch continuously** until both tips touch the main boom . Observe the tip locks on small cylinders are holding the tips in road position.

3. Push the LEFT SHOULDER SWITCH until cylinder has near correct extension to cause the boom to strike the boom rest when fold cylinders are engaged in step 4 below. Repeat using the RIGHT SHOULDER SWITCH.

4. Push the top of BOOM FOLD SWITCH to fold the wings against boom stopper posts on the boom rest. In most cases, the boom rest passes through the inner booms and holds tips in place for transport.

5. Push the bottom of LEFT SHOULDER SWITCH and the RIGHT SHOULDER to lower the booms into the cradles.

6. Install the lock pin with chain over the booms to secure boom in the boom rests for road transport.

Step 2 may be skipped if it is planned to transport with the tips extending well forward of the front of towing vehicle. TO AVOID UNEXPECTED BOOM TIP FOLDING, THE BREAKAWAY BOOM TIPS MUST BE LOCKED SECURELY IN PLACE BY TYING ACROSS BETWEEN THE TIPS

3.3 BOOM ADJUSTMENTS

The 7700 boom for Ag Shield sprayer cart uses the Ag Shield 5 section hydraulic block. Some of the variable flow controls are located on the cylinders and can be adjusted to give optimum operating speeds. Refer to the schematic for full details.
Flow Controls
The flow controls on the cylinders should be adjusted to give the following performance:

Function	Mark	Performance
Mast Up	in flow	approx 12 sec/5 GPM
Mast Down	MDR	12 sec/76"
Left tip Raise	LUR	tip 2 ft/sec vertical
Left tip Down	LDR	tip 1.3 ft/sec vertical
Right tip Raise	RUR	tip 2 ft/sec vertical
Right tip Down	RDR	tip 1.3 ft/sec vertical
Boom Fold Field	needle	22 secs both wings
Boom Fold Road	on cyl	13 secs both wings
Tips to Field	flow con each tip	12 sec total 2 sides fall 45 deg 4 sec
Tips to Road	TRR	15 sec total 2 sides

Flow controls normally restrict the oil flow **out** of the exit port of the cylinder, not the flow to the cylinder. The flow **to** the cylinder is controlled by a needle valve on the barrel end of each individual boom fold cylinder. All flow controls and needle valves allow faster movement when adjusting knob is turned counter clockwise and conversely cause slower movement when turned clockwise.

Boom Tip Spring
The boom tip spring holds the tip forward and in optimum spraying position during sudden turns, while spraying into head winds, and assists gravity in returning to field position a boom that has been broken back by an obstacle. Tightening the spring too much results in excessive pressure being required to fold to the road position, and may contribute to damage to the end section when an obstacle is encountered. The correct adjustment is approximately 4" of preload from the not extended position. The overall length will be near 31" to the extreme ends of spring for a 15 ft tip, up to 3 inches more for larger booms operating inti significant head winds.

Tip Fold Latch Spring
The tip fold latch spring should be adjusted to allow the boom tips to get under latch using the 15 second swing rate for both tips as chart above.

Rear Stabilization Springs
The 7700 floating boom has been designed with a single mounting pivot point holding up the entire boom. The cart tires can dip into a hole and out again without pulling the boom tip into the ground. The two springs located 30" to either side of the center of the rear of boom allow this flexibility, yet hold the boom parallel to the ground on the steepest side hills. Proper adjustment of these springs is at overall length of 8.0" for a 90 ft boom 7.5" for larger booms as shown in Figure ?? If the tip of the boom is pushed down or raised up by hand, and released, it should return to the original height each time. If not, the poly sliders at boom center need to be checked for excessive tightness. Loosen ¾" bolt with self locking nuts slightly as required, add shims for permanent adjustment.

Accumulator adjustment
The Ag Shield 7700 Floating boom has 4 dry nitrogen charged accumulators, 1 on each shoulder cylinder, and 1 on the mast cylinder to dampen the sharp vibrating motion common in floating booms. The fold cylinders also have accumulators to allow panic stops without undue strain to the folding/holding mechanisms. Pressures are factory set and not field adjustable. Normally charged accumulators will allow the cylinders to "work" plus or minus ¼" on extreme terrain.

Lubrication
The only lubrication required on the Ag Shield 7700 floating boom is standard gun grease DAILY to 15 positions as listed below.

decal marks zerk locations.

Location	# of zerks
breakaway hinge-tip fold	2 each side
inner hinges main boom	3 each side
main boom pivot	1 center
base shoulder cyllinder	1 each side
Shoulder cylinder pivot ball joint	1-2 each side
120' boom outer hinge (see 5.9)	2 each side

IMPORTANT
During aggressive cornering the breakaway cylinder(center rear) may become slightly compressed(partial breakaway). On the 7700 model boom the breakaway will reset itself automatically after cornering, there is **no** need to reset the boom breakaway periodically as you operate the boom.

3.4 Automatic Reset Inner Boom Breakaway on 7700 Floating boom

On self propelled or pull type Ag Shield 7700 model booms, on closed center hydraulic systems, the inner booms may breakaway up to 65 degrees before a mechanical stop at the hinge is contacted. The inner

boom will reset as soon as the obstacle is cleared e.g. if it is a post as soon as the post clears the boom tip the inner will swing forward to original field position whether or not the forward motion of boom is stopped, a true automatic reset on the fly. It is recommended that the operator pause or reduce speed while the boom is resetting. The operator may wish to stop and check for damage to plumbing components, to ensure that a quality spray job is still being done.

DANGER

Booms automatically reset from breakaway position. If booms are in field position, before starting motor, <u>clear all persons</u> in area where a swinging boom could strike them.

It is normal for the breakaway cylinder to shorten slightly as the boom is put through more extreme maneuvers, or high speed cornering. This is part of the protection that the breakaway provides and will contribute to longer component life.

3.5 Boom tip breakaways

There are **2 variations** of the boom tip breakaway:

A. The boom tip is 9 spray tips long and is hooked directly to the boom fold cylinder. When folding to field or road only this portion of boom moves on tip fold switch
B. The boom tip is 6-9 tips long, and hooked to an extension, likely 3-6 tips long. The extension is hooked to the tip fold cylinder.

In instance **<u>A</u>** the boom tip can fold back 90 degrees and then either drop forward or continue into road or transport position. To reset this folded tip, stop forward motion, and touch the fold to field switch, the same as when the boom was placed in field position at the beginning of the field. The hydraulic restrictor limits the rate of fall forward. When folding to field position, always allow the boom tip to free the last 20 degrees into field position by releasing the fold switch at that time.

In instance **<u>B</u>** the tip folds back 85 degrees from the field position, and automatically resets itself by dropping forward using a rubber pad to slow the fall. The units folds at the hydraulic cylinder location, in normal field operation the hydraulic cylinder is locked to prevent any breakaway movement at this joint.

Call factory (1-800-561-0132) for correct accumulator charges for your particular size of boom

To test for correct accumulator charge on fast stops, wings should move 3-4 ft if one husky hard working individual whips the boom as hard as he can and the fold cylinders should move 1/8” of stroke during these maneuvers.
On the 7700 booms the accumulator to cushion fast starts has been eliminated in favor of lower set on the breakaway valve.

3.6 APPLICATION RATE CHARTS

TABLE 1 APPLICATION RATE *IMPERIAL* GALLONS PER ACRE (TIPS 20"SPACING)

TIP SIZE	LIQUID PSI	IGPM /TIP	4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	10 MPH	12 MPH	14 MPH	16 MPH
XR	20	.042	2.9	2.3	2	1.6	1.5	1.2	1.0	0.83	
800067	25	.046	3.3	2.6	2.2	1.9	1.7	1.3	1.1	0.9	
	30	.051	3.6	2.8	2.4	2.1	1.8	1.4	1.2	1.0	0.9
100	40	.056	4.1	3.3	2.7	2.3	2.1	1.7	1.4	1.2	1.0
mesh	60	.067	5.1	4.1	3.4	2.9	2.6	2.1	1.7	1.4	1.25
XR	20	.06	4.4	3.6	2.9	2.5	2.2	1.8	1.5	1.2	1.1
8001	25	.07	4.9	3.9	3.2	2.8	2.4	2.1	1.7	1.4	1.2
	30	.075	5.3	4.3	3.6	3.1	2.6	2.2	1.7	1.5	1.3
	40	.08	6.2	5.1	4.2	3.5	3.1	2.5	2.1	1.7	1.6
100	50	.09	6.9	5.6	4.6	3.9	3.5	2.8	2.3	2.0	1.7
mesh	60	.1	7.6	6.2	5.1	4.3	3.8	3.1	2.5	2.2	1.9
XR	20	.09	6.5	5.3	4.6	4.2	3.6	3.1	2.4	2.1	1.8
80015	25	.10	7.3	5.9	4.6	4.2	3.6	3.1	2.4	2.1	1.8
	30	.11	8.1	6.4	5.3	4.6	4.0	3.3	2.7	2.3	2.0
	40	.12	9.3	7.4	6.1	5.3	4.6	3.8	3.1	2.7	2.3
100	50	.14	10.3	8.3	6.9	5.9	5.1	4.2	3.5	3.0	2.6
mesh	60	.15	11.3	9.1	7.6	6.5	5.6	4.6	3.8	3.2	2.8
XR	20	.12	8.8	7.1	5.8	5.0	4.4	3.5	2.9	2.5	2.2
8002	25	.13	9.8	7.8	6.5	5.6	4.9	3.9	3.2	2.8	2.4
	30	.14	10.8	8.6	7.1	6.1	5.3	4.3	3.6	3.1	2.7
	40	.17	12.3	9.8	8.2	7.1	6.1	4.9	4.2	3.5	3.1
50	50	.19	13.8	11.1	9.2	7.9	6.9	5.5	4.6	3.9	3.5
mesh	60	.21	15.1	12.1	10.0	8.6	7.6	6.1	5.1	4.3	3.8
XR	20	.15	10.9	8.7	7.3	6.2	5.5	4.4	3.6	3.1	2.7
80025	25	.16	12.2	9.8	8.1	7.0	6.1	4.9	4.1	3.5	3.1
	30	.18	13.4	10.7	8.9	7.6	6.7	5.4	4.5	3.8	3.3
	40	.21	15.5	12.4	10.3	8.8	7.7	6.2	5.2	4.4	3.9
50	50	.23	17.3	13.8	11.5	9.9	8.6	6.9	5.8	4.9	4.3
mesh	60	.25	18.9	15.1	12.6	10.8	9.5	7.6	6.3	5.4	4.7
XR	20	.17	13.1	10.5	8.7	7.5	6.6	5.3	4.4	3.7	3.2
8003	25	.21	14.7	11.8	9.7	8.4	7.3	5.9	4.9	4.2	3.7
	30	.22	15.8	12.8	10.7	9.1	8.1	6.4	5.3	4.6	4.0
	40	.25	18.3	14.8	12.4	10.5	9.2	7.4	6.1	5.3	4.6
50	50	.28	20.8	16.7	13.8	11.8	10.4	8.3	6.9	5.9	5.1
mesh	60	.31	22.5	18.3	15.1	12.9	11.3	9.1	7.5	6.5	5.6
XR	20	.23	18	14.	11.6	10.0	8.7	7.1	5.8	5.0	4.4
8004	25	.27	20	15.8	13.0	11.1	9.7	7.8	6.5	5.6	4.9
	30	.29	22	17.5	14.3	12.2	10.7	8.6	7.1	6.1	5.3
	40	.33	25	20.0	16.4	14.1	12.4	9.9	8.2	7.1	6.1
50	50	.37	28	22.5	18.3	15.8	13.8	11.1	9.2	7.9	6.9
mesh	60	.41	30	24.2	19.9	17.4	15.1	12.2	10.0	8.6	7.6
XR	20	.29	22	17.5	14.5	12.5	10.9	8.8	7.3	6.2	5.5
8005	25	.33	24	19.0	16.3	13.9	12.2	9.8	8.1	7.0	6.1
	30	.36	27	21.7	17.4	15.3	13.4	10.8	8.9	7.6	6.6
	40	.42	31	25.0	20.8	17.4	15.4	12.4	10.3	8.8	7.7
50	50	.47	35	27.0	23.2	19.9	17.4	13.8	11.5	9.9	8.6
mesh	60	.51	38	30.0	24.9	21.5	19.1	15.2	12.6	10.8	9.5
XR	20	.36	27	21	17	15	13	10.6	8.7	7.5	6.6
8006	25	.39	29	23	19	17	15	11.7	9.7	8.4	7.3
	30	.43	32	26	22	18	16	12.8	10.7	9.1	8.3
	40	.50	37	30	25	21	18	14.8	12.4	10.5	9.2
50	50	.56	42	33	27	23	21	16.5	13.8	11.8	10.4
mesh	60	.61	46	36	30	26	22	18.0	15.1	12.9	11.3
XR	20	.47	35	28	23	20	17	14	11.6	10.0	8.7
8008	25	.52	39	31	26	22	19	16	13.0	11.1	9.7
	30	.57	43	34	28	24	22	17	14.3	12.2	10.7
	40	.66	49	40	33	28	25	20	16.4	14.1	12.4
50	50	.74	55	44	37	32	27	22	18.3	15.8	13.8
mesh	60	.81	60	48	41	35	30	24	20.0	17.4	15.0
XR	20	.59	44	35	29	25	22	17	14.5	12.5	10.9
8010	25	.65	49	39	32	28	24	19	16	13.9	12.2
	30	.72	53	42	36	31	27	22	17	15.3	13.4
50	40	.83	61	49	42	35	31	25	21	17.4	15.4
mesh	60	1.02	76	61	51	43	37	30	25	22.0	19.0

TABLE 2 APPLICATION RATE *US* GALLONS PER ACRE (TIPS 20"SPACING)

TIP SIZE	LIQUID PSI	USGPM /TIP	4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	10 MPH	12 MPH	14 MPH	16 MPH
XR	20	.05	3.5	2.8	2.4	2.0	1.8	1.4	1.2	1.0	
800067	25	.055	3.9	3.2	2.6	2.3	2.0	1.6	1.3	1.1	
	30	.06	4.3	3.5	2.9	2.5	2.2	1.7	1.4	1.2	1.1
	40	.067	5.0	4.0	3.3	2.8	2.5	2.0	1.7	1.4	1.2
100	50	.07	5.6	4.5	3.7	3.2	2.8	2.2	1.9	1.6	1.4
mesh	60	.08	6.1	4.9	4.1	3.5	3.1	2.4	2.0	1.7	1.5
XR	20	.07	5.3	4.2	3.5	3.0	2.6	2.1	1.8	1.5	1.3
8001	25	.08	5.9	4.7	3.9	3.4	2.9	2.4	2.0	1.7	1.5
	30	.09	6.4	5.1	4.3	3.7	3.2	2.6	2.1	1.8	1.6
	40	.10	7.4	5.9	5.0	4.2	3.7	3.0	2.5	2.1	1.9
100	50	.11	8.3	6.6	5.5	4.7	4.2	3.3	2.8	2.4	2.1
mesh	60	.12	9.1	7.3	6.1	5.2	4.6	3.6	3.0	2.6	2.3
XR	20	.11	7.9	6.3	5.3	4.5	3.9	3.2	2.6	2.3	2.0
80015	25	.12	8.8	7.0	5.9	5.0	4.4	3.5	2.9	2.5	2.2
	30	.13	9.7	7.7	6.4	5.5	4.8	3.9	3.2	2.8	2.4
	40	.15	11.1	8.9	7.4	6.4	5.6	4.5	3.7	3.2	2.8
100	50	.17	12.5	10.0	8.3	7.1	6.2	5.0	4.2	3.6	3.1
mesh	60	.18	13.6	10.9	9.1	7.8	6.8	5.5	4.6	3.9	3.4
XR	20	.14	10.5	8.4	7.0	6.0	5.3	4.2	3.5	3.0	2.6
8002	25	.16	11.7	9.4	7.8	6.7	5.9	4.7	3.9	3.4	2.9
	30	.17	12.9	10.3	8.6	7.4	6.4	5.1	4.3	3.7	3.2
	40	.20	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7
50	50	.23	16.6	13.3	11.1	9.5	8.3	6.6	5.5	4.7	4.2
mesh	60	.25	18.2	14.6	12.1	10.4	9.1	7.3	6.1	5.2	4.6
	20	.18	13.1	10.5	8.8	7.5	6.6	5.3	4.4	3.8	3.3
XR	25	.20	14.7	11.7	9.8	8.4	7.3	5.9	4.9	4.2	3.7
80025	30	.22	16.1	12.9	10.7	9.2	8.0	6.4	5.4	4.6	4.0
	40	.25	18.6	14.9	12.4	10.6	9.3	7.4	6.2	5.3	4.6
50	50	.28	20.8	16.6	13.8	11.9	10.4	8.3	6.9	5.9	5.2
mesh	60	.31	22.7	18.2	15.2	13.0	11.4	9.1	7.6	6.5	5.7
XR	20	.21	15.8	12.6	10.5	9.0	7.9	6.3	5.3	4.5	3.9
8003	25	.24	17.6	14.1	11.7	10.1	8.8	7.0	5.9	5.0	4.4
	30	.26	19	15.4	12.9	11.0	9.7	7.7	6.4	5.5	4.8
	40	.30	22	17.8	14.9	12.7	11.1	8.9	7.4	6.4	5.6
50	50	.34	25	19.9	16.6	14.2	12.5	10.0	8.3	7.1	6.2
mesh	60	.37	27	22.0	18.2	15.6	13.6	10.9	9.1	7.8	6.8
XR	20	.28	21	16.8	14.0	12.0	10.5	8.4	7.0	6.0	5.3
8004	25	.32	23	18.8	15.7	13.4	11.7	9.4	7.8	6.7	5.9
	30	.35	26	21.0	17.2	14.7	12.9	10.3	8.6	7.4	6.4
	40	.40	30	24	19.8	17.0	14.9	11.9	9.9	8.5	7.4
50	50	.45	33	27	22	19.0	16.5	13.3	11.1	9.5	8.3
mesh	60	.49	36	29	24	21.0	18.2	14.6	12.1	10.4	9.1
XR	20	.35	26	21	17.5	15.0	13.1	10.5	8.8	7.5	6.6
8005	25	.40	29	23	19.5	16.8	14.7	11.7	9.8	8.4	7.3
	30	.43	32	26	21	18.4	16.1	12.9	10.7	9.2	8.0
	40	.50	37	30	25	21	18.6	14.9	12.4	10.6	9.3
50	50	.56	42	33	28	24	20.0	16.6	13.8	11.9	10.4
mesh	60	.61	45	36	30	26	23.0	18.2	15.2	13.0	11.4
XR	20	.42	32	25	21	18	15.8	12.6	10.5	9.0	7.9
8006	25	.47	35	28	23	20	17.8	14.1	11.7	10.0	8.8
	30	.52	39	31	26	22	19.3	15.4	12.9	11.0	9.7
	40	.60	45	36	30	25	22	17.8	14.9	12.7	11.1
50	50	.67	50	40	33	28	25	19.9	16.5	14.2	12.5
mesh	60	.74	55	44	36	31	27	22.0	18.2	15.6	13.6
XR	20	.57	42	34	28	24	21	16.8	14.0	12.0	10.5
8008	25	.63	47	38	31	27	23	18.8	15.7	13.4	11.7
	30	.69	52	41	34	29	26	21	17.2	14.7	12.9
	40	.80	59	48	40	34	30	24	19.8	17.0	14.9
50	50	.89	66	53	44	38	33	27	22.0	19	16.5
mesh	60	.98	73	58	49	42	36	29	24.0	21	18.2
XR	20	.71	53	42	35	30	26	21	17.5	15	13.1
8010	25	.79	59	47	39	34	29	23	19.5	16.8	14.7
	30	.87	64	51	43	37	32	30	25	21	18.6
	40	1.00	74	59	50	42	37	30	25	21	18.6
50	50	1.12	83	66	55	47	42	33	28	24	21
mesh	60	1.23	91	73	61	52	45	36	30	26	23

TABLE 3 APPLICATION RATE *LITERS PER HECTARE* (TIPS 50 CM SPACING)

TIP SIZE	LIQUID kPA	l/M /tip	6 km/h	8 kmph	10 km/h	12 km/h	14 km/h	16 MPH	18 km/h	20 km/h	24 km/h
XR	150	.19	37	38	22	18.7	16.0	14.0	12.4	11.2	9.3
800067	200	.22	43	32	26	22	18.5	16.2	14.4	12.9	10.8
	250	.24	48	36	29	24	21	18.1	16..1	14.5	12.0
	300	.26	53	40	32	26	23	19.8	17.6	15.8	13.2
100	350	.29	57	43	34	29	24	21	19	17.1	14.3
mesh	400	.31	61	46	37	30	26	23	20	18.3	15.2
XR	150	.28	56	42	33	28	24	21	18.6	16.7	13.9
8001	200	.32	64	48	39	32	28	24	21	19.3	16.1
	250	.36	72	54	43	36	31	27	24	22	18.0
	300	.39	79	59	47	39	34	30	26	24	19.7
100	350	.43	85	64	51	43	37	32	28	26	21
mesh	400	.46	91	68	55	46	39	34	30	27	23
XR	150	.42	84	63	50	42	36	31	28	25	21
80015	200	.48	97	72	58	48	41	36	32	29	24
	250	.54	108	81	65	54	46	40	36	32	27
	300	.59	118	89	71	59	51	44	39	35	30
100	350	.64	128	96	77	64	55	48	43	38	32
mesh	400	.68	137	102	82	68	59	51	46	41	34
XR	150	.56	112	84	67	56	48	42	37	34	28
8002	200	.65	129	97	77	64	55	48	43	39	32
	250	.72	144	108	86	72	62	54	48	43	36
	300	.79	158	118	95	79	68	69	53	47	39
50	350	.85	171	128	102	85	73	64	57	51	43
mesh	400	.91	182	137	109	91	78	68	61	55	46
XR	150	.70	139	104	84	70	60	52	46	42	35
80025	200	.80	161	121	97	80	69	60	54	48	40
	250	.90	180	135	108	90	77	67	60	54	45
	300	.99	197	148	118	99	84	74	66	59	49
50	350	1.06	213	160	128	106	91	80	71	64	53
mesh	400	1.14	227	171	136	114	97	85	76	68	57
XR	150	0.84	167	126	100	84	72	63	56	50	42
8003	200	0.97	193	145	116	97	83	72	64	58	48
	250	1.08	220	162	130	108	93	81	72	65	54
	300	1.18	240	178	142	118	101	89	79	71	59
50	350	1.28	260	192	153	128	110	96	85	77	64
mesh	400	1.37	270	210	164	137	117	103	91	82	68
XR	150	1.12	220	167	134	112	96	84	74	67	56
8004	200	1.29	260	193	155	129	111	97	86	77	64
	250	1.44	290	220	173	144	124	108	96	86	72
	300	1.58	320	240	189	158	135	118	105	95	79
50	350	1.71	340	260	200	171	146	128	114	102	85
mesh	400	1.82	360	270	220	182	156	137	122	109	91
XR	150	1.40	280	210	167	140	120	105	93	84	70
8005	200	1.61	320	240	193	161	138	121	107	97	81
	250	1.80	360	270	220	180	154	135	120	108	90
	300	1.97	390	300	240	197	169	148	132	118	99
50	350	2.13	430	320	260	210	183	160	142	128	107
mesh	400	2.28	460	340	270	230	195	171	152	137	114
XR	150	1.68	330	250	200	167	144	126	112	100	84
8006	200	1.93	390	290	230	193	166	145	129	116	97
	250	2.16	430	320	260	220	185	162	144	130	108
	300	2.37	470	360	280	240	200	178	158	142	118
50	350	2.56	510	380	310	260	220	192	171	154	128
mesh	400	2.74	550	410	330	270	230	210	182	164	137
XR	150	2.23	450	330	270	220	191	167	149	134	112
8008	200	2.58	520	390	310	260	220	193	172	155	129
	250	2.88	580	430	350	290	250	220	192	173	144
	300	3.16	630	470	380	320	270	240	210	189	158
50	350	3.41	680	510	410	340	290	260	230	200	170
mesh	400	3.65	730	550	440	360	310	270	240	220	182
XR	150	2.79	560	420	330	280	240	210	186	167	140
8010	200	3.22	640	480	390	320	280	240	210	193	161
	250	3.60	720	540	430	360	310	270	240	220	180
	300	3.95	790	590	470	390	340	300	260	240	197
50	350	4.26	850	640	510	430	370	320	280	260	210
mesh	400	4.56	910	680	550	460	390	340	300	270	230

3.7 WILGER FLOWTUBE NOZZLE MONITOR

A Wilger Flowtube Monitor is standard equipment to monitor the flow to groups of nozzles along the boom). Each tube is plumbed to a set of 3 nozzles, unless the total number of tips is not divisible by three, in which case there will be groups of 2 or 4 tips plumbed beside each other to give a flow comparison. The group of three tips to the extreme right will be connected to the extreme right flow tube, and so on across the boom. Normally one flow tube feeds the nozzles under one top and rear plastic sheet.

A ball is suspended by the flow in each tube and spins around the inside of the tube in normal operation The density of the ball and flow rate determine the height of the ball in the tube. If the flows through each tube are the same, the balls will rise to the same height. A l**ower** ball indicates a screen or nozzle is plugged or the line is pinched. Clean or replace the nozzle or reroute the line before proceeding. A **higher** ball indicates a higher flow, this is usually caused by a damaged hose, tip, or nozzle body. An erratic and rapidly changing ball height can result from operation in rough ground, or operating at a **transition rate**. See the following section.

Speed, Flow, and <u>Transition Rate</u>

When operating a rate controller it is common to have pressures change from 25 to 60 psi as speed changes, a variation in flow rate of about 1.6 to 1. If all balls were level at 25 psi in e.g. the C level it is probable that all balls will be at the D level at 60 psi. Since the inside of the Wilger Flowtube monitor is not tapered, but a series of straight wall steps, balls will normally make the transition from C - D over a 10 - 12 psi range - not all balls moving simultaneously to D. If your normal spraying speed leaves the balls at a transition rate, operate at different speed for a short distance once per round to get a flow rate where all balls are level unless a tip is plugged.

Ball selection charts are provided as a reference for choosing ball densities for your Wilger Flowtube head. Since different nozzle types correspond to different flow rates, ball densities depend on tip size. Both tables are based on 3 spray tips per flowtube.

TABLE -1: MONITOR BALL SELECTION

TIP SIZE	BALL 1ST CHOICE	BALL 2ND CHOICE
8001	Red Celcon	Blue Glass
80015	Blue Glass	1/2" Stainless
8002	1/2" Stainless	Blue Glass
8003	1/2" Stainless	7/16" Stainless
8004 AND UP	7/16" Stainless	N/A

TABLE -2: TIP SELECTION

BALL	TIP SIZE
Red Celcon	8001,
Blue Glass	8001,80015,8002
Stainless 1/2" diameter	80015,8002,8003,8004
Stainless 7/16" diameter	8003 AND UP

Wilger Flowtube may be distinguished from Redball Nozzle monitors by their overall design. A Wilger Flowtube is a single tube assembled with O-ring seal clip lock joints, the Redball has threads at each port. Also, with the Wilger, the smallest unit of tubes is one rather than 4 for the Redball.

Controllers "hunting" rate

With a flowtube plumbing system, when using tips smaller than 80015, and after running the tank dry and pumping air into the 1/2" hoses, some rate controllers may "hunt" rates. Typically, as the air in the lines compresses and decompresses, the rate controller goes through wide swings in pressure change required, and some controllers oscillate 5-10 cycles of high and low pressure and then "go to sleep" meaning that the controller stops functioning until turned off and on again.

The solution is to roll over to a higher rate nozzle and run 1-3 minutes to remove air from lines, then revert to smaller nozzle and commence spraying as usual. If no larger tip is in the circuit, consider removing the tip farthest from the controller, and operating system for a few moments to purge the unwanted air from the small lines.

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4 CART OPERATION

FIGURE 2 CART 1000 US GAL TANK

FIGURE 3 CART 1500 US GAL TANK

4.1 OPERATING SAFETY

Read and understand the following key safety pointers. Following these simple rules can greatly reduce the potential for costly and unnecessary damage to people and property.

CAUTION

1. Read and understand the Operator's manual and all safety signs before using.

2. Before servicing, make sure that: all controls are set to neutral, ignition key has been removed, and all moving parts are at rest.

3. Before spraying a particular field, familiarize yourself with all potential hazard, i.e., trees, rocks, gullies, etc. Plan your spraying route to avoid such hazards. Also, keep sprayer width in mind when maneuvering to avoid obstacles.

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

5. Keep all shields and guards in place when operating.
6. Do not allow riders on the sprayer or truck during operation or transportation.
7. Clear the area of bystanders, especially small children, before starting.
8. Stay away from machine when folding booms. Keep others away.
9. Read chemical manufacturers warnings, instructions and procedures before starting, and follow them exactly.
10. Do not breath, touch, or ingest chemicals. Always wear protective clothing and follow safe handling procedures.

11. Spray only when potential for chemical drift is at a minimum. Depending on conditions, shielded sprayers will also have some associated drift. Small amounts of chemical, in some cases, can affect neighboring crops, sensitive plants, and people.

12. Dispose of chemical containers in a manner approved by local authorities.
13. In case of poisoning, get immediate medical attention.

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

15. Do not eat in the field when spraying.

16. Review safety instructions annually.

CAUTION

1. Read and follow chemical label instructions exactly.
2. Do not allow riders outside of vehicle.
3. Maintain a safe speed.
4. Always wear protective gear when handling chemicals.
5. Chemicals may be toxic and dangerous. Protect yourself and others.

4.2 CART OVERVIEW

Two models of caddies are available from Ag Shield, 840 gal(1000 USG) tank and 1250gal(1500 USG) tank. See Figure 2 CART 1000 US GAL TANKCART (part no 221001) and Figure 2 CART 1000 US GAL TANKRT (part no 221005). The frames are the same and the tank may be changed to the other size.

Both units feature a long frame and may be updated later to a double tank with the purchase of the 400gal (500 USG) double tank kit (part no 222130). The single tank model is used for the application of a single chemical or tank mixes. The double tank model is used in applications where dual chemical or spot spraying is beneficial. The double tank unit may be used as one large tank.
Both cart models may have a floating boom attached to form a complete sprayer. The standard 840 cart tank has a deep Vee sump to ensure complete tank clean out at the end of each load without damage to pump seals. The standard hydraulic drive pump will self load from a flooded intake at 120 US GPM(450 liters/min) and educt chemicals at the same time.
The sparge tube agitator will keep even the most difficult to mix products in a homogenous mixture at all times.
Each unit is equipped with several standard safety features to reduce the operators exposure to chemicals, e.g. hand and eye fresh water wash station with tool kit for gloves, goggles, and tips, to promote chemical free cab, and tank washing valve to eliminate trips inside the tank.

4.3 BREAK-IN

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

After operating for 1/2 hour

1. Re-torque all the wheel bolts. See section 8.4 for proper torque'.
2. Re-torque all other fasteners and hardware.
3. Check that all electrical connections are tight.
4. Check that no hoses are pinched or being crimped. Re-align as required.
5. Check that all nozzles are working properly. Clean, unplug or replace as required.

After 5 hours and 10 hours of operation

1. Re torque all wheel bolts, fasteners, and hardware.
2. Check hose routing.
3. Check that all nozzles are working properly.

Refer to the normal servicing and maintenance schedule as defined in the Maintenance Section.

4.4 CART PRE OPERATION CHECKLIST

Efficient and safe operation of the Ag Shield Field Sprayer requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section.

A pre-operational checklist is provided for the operator. It is important for both personal safety and maintaining the good mechanical condition of the Sprayer that this checklist be followed.

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

1. Lubricate the machine per the schedule outlined in the "Maintenance Section".
2. Use only a tractor of adequate power and weight to operate the Sprayer, a larger tractor is required to operate in uneven terrain
3. Ensure that the machine is properly attached to the tractor. Be sure that a drawbar pin with provisions for a mechanical lock is used. Install the retainer.
4. Be sure that the safety chain is connected.

5. Ensure that the hydraulic reservoir in the tractor is filled to the highest level. Maximum oil levels will assist in cooling the hydraulic system.
6. Inspect all hydraulic lines, hoses, fitting and couplers for tightness. Use a clean cloth to wipe any accumulated dirt from the couplers before connecting to the hydraulic system of the tractor.

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

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

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

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

11. Remove the polyethylene/stainless mesh line filter and wash with clean water. Reinstall.

12. Check that all chemical fittings and connections are tight and not leaking.

4.5 HYDRAULIC DRIVEN WATER PUMP OPERATION

To ensure reliable and cool operation of the tractor hydraulic system, the system must first be identified as open or closed center system. If it is an open center system, determine the gallons per minute of oil produced at the intended tractor motor speed.

Match your system to the water pump using Table 4-1: FLOW US GAL/MIN

The following guidelines apply to sprayers with the **standard Hypro HM1 model**. The pump model is on a tag on the top of pump body. If there is any doubt about the pump or the tractor consult the your dealer or Ag Shield for more information.

TABLE 4-1: FLOW US GAL/MIN

PUMP MODEL	OPEN CENTER	CLOSED CENTER
HM1(STD)	11-15	11-11.5
HM2(OPT)	5-7	5+
HM3(OPT)	18-25	20+
HM4(OPT)	7-10	7+

1. For **open** center systems, open the bypass screw “SCREW” (see Figure 4 PUMP ORIFICE AND BYPASS SCREW) as follows: open 2 turns and close until sufficient water flow has been reached, and re-tighten the lock nut.

2. For **closed** center hydraulic systems <u>without</u> a flow control on the tractor outlet, install a number 3+ orifice (5/32" hole, Ag Shield part no 111413) in hydraulic pump ”PRESS” port. This will allow the tractor to deliver sufficient oil to give proper water pressure using an HM1 model pump. See Figure 4 PUMP ORIFICE AND BYPASS SCREW

FIGURE 4 PUMP ORIFICE AND BYPASS SCREW

3. For **closed** center hydraulic systems that have an in circuit flow control (rabbit-turtle valve), operate without an orifice in the PRESS port of the hydraulic motor. In this case, adjust the tractor flow control until desired water pressure is reached. See throttle valve setting instructions section 4.12 THROTTLE VALVE SETTING GUIDE ON MICROTRAK RATE CONTROLLERS

All water pumps have a **one-way check valve (**longer fitting in Figure 4 PUMP ORIFICE AND BYPASS SCREW installed in the tank port of the hydraulic motor, to prevent pump rotation intake wrong direction. If your pump does not turn, apply pressure to the other port.

4.6 ATTACHING CART TO TRACTOR

A. When attaching, follow this procedure:

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

2. Make sure there is enough room and clearance to safely back up to the sprayer.

3. Back slowly up to the sprayer and align the drawbar with the hitch.

4. Stop the tractor engine, place all controls in neutral, set park brake and remove ignition key before dismounting.

5. Adjust the height of the Perfect Hitch to meet the height of the drawbar with the frame of the caddy level.
6. Install a drawbar pin that has provisions for a mechanical retainer such as a Klik pin. Install the retainer.

IMPORTANT
Use a hardened draw pin of at least 1 1/4" or 32 mm diameter.

FIGURE 4-6 PERFECT HITCH

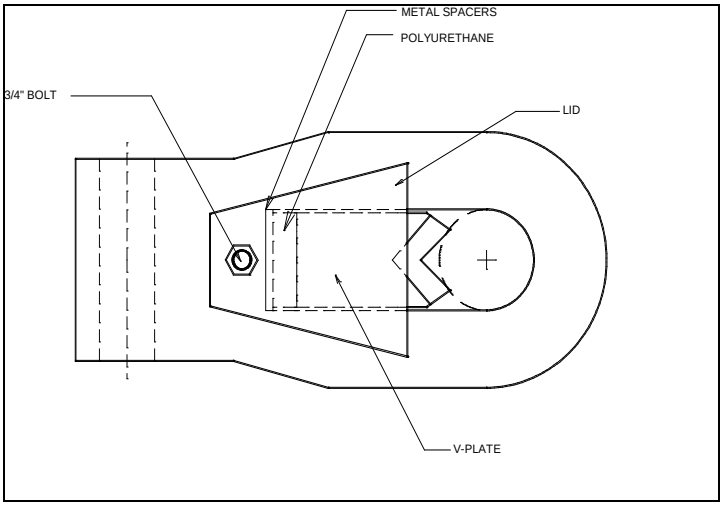


FIGURE 4-7: PERFECT HITCH

8. The Perfect Hitch is factory adjusted to a 1.5 inch OD draw pin. If this is not you size of draw pin, adjust the Perfect Hitch to fit the draw pin as follows:

- Undo 3/4" bolt and remove lid

- Adjust stack of spacers and the urethane cushion to cause tight fit of v plate to draw pin. Extra shims may be purchased as Ag Shield part no 205969.

- Replace lid and re-install the bolt.

- The urethane cushion must always be part of the stack of shims, it may be either laid on its side or standing up for some adjustment.

The purpose of this hitch is to allow the operator to always use the full size tractor draw pin and maintain a tight, **yet flexible** connection. The V plate connection will allow units to go through runways with breaking.

The second large advantage is the tightness of the draw pin prevents the boom from yawing, or swaying, and greatly increasing accuracy of application.

This cushion also acts as a shock absorber to reduce drive line stress, giving drive line components longer life. DO NOT REMOVE THE CUSHION!

9. Attach the safety chain. Be sure it is routed to prevent binding when making turns

I. Follow this procedure when connecting hoses to the tractor hydraulic system:

a) Use a clean cloth or paper towel to clean the dirt from around the couplers.

b) Clean the male tips as well.
c) Insert the male ends into the couplers. Make sure they are locked in position.

d) For the pump, connect the high-pressure side to the hose screwed into short “PRESS” outlet and the return to the other outlet or to the tractor reservoir as specified in the tractor owner’s manual.

NOTE
The pump is equipped with a one way valve to ensure that oil flow enters the PRESS port and exits the TANK port.

f) Connect the couplers for the boom circuit.

g) Route the hydraulic hoses and other cables through the hose holder . Secure in position. Be sure they do not touch moving parts and will not be pinched or crimped. The hose holder has been designed to be nearly above the draw pin pivot point, little slack is required for turning.

10. Connect the wiring harness to the monitor or the controller. Be sure the connectors are firmly pushed together and locked in place. Route the harness over the hose holder and secure in place to prevent dragging, entangling or pinching. The hose holder is placed very nearly over the draw pin or turning point, so very little slack is required to allow even the tightest turns.

11. Connect the nylon line to the pressure gauge if so equipped. Route it with the wiring harness through the hose holder and secure.
12. Connect the wiring harness with the power wires if the unit is equipped with the self-contained hydraulic system. Route the harness through the hose holder and secure in position.

13. Raise the jack to transfer the hitch weight to the drawbar. When the jack is in its highest position, remove the mounting pin, rotate jack into the storage position and re-pin.

Figure 8 HOSE HOLDER

4.7 INSTALLING IN CAB CONTROL CENTER

FIGURE 9 CONTROL CENTER

An in cab control center (Figure 9 CONTROL CENTER) is provided with each Sprayer. The control center is mounts all of the optional equipment control boxes so that only mount one unit needs to be mounted to have all units mounted. Some control heads are equipped with a swinging "U" bracket secured by knobs on each end of the box. it provides a universal mounting system adaptable to any configuration.

The components of the control center are:
1. Microtrak 3405 rate controller
2. Peacock foam marker control
3. Ag Shield boom control
4. Ag Shield GFS control
5. Foam marker switch

Mount the frame to provide good visibility and easy access for controlling or calibrating.
Each control box has a wiring harness that should be routed out the back of the cab for connection to the harness on the sprayer. Extensions are optional and available for all applications e.g. 4wd tractors may require extension to reach the cab set farther from the draw pin. Clip, tape, or tie the harness securely in place.

Each box has a pair of wires out the back to supply power. Connect the supply harness as per Table 4-2: WIRING COLOUR CODES

TABLE 4-2: WIRING COLOUR CODES

Brand Name	12vdc positive	12vdc negative
Ag Shield	red	black
Spray Systems	red	black
Microtrak	white	black

IMPORTANT

Do not connect across a 24 volt system. This procedure will damage internal electrical components.

4.8 IN CAB SPRAYER CONTROL

If your sprayer is equipped with a Spraying Systems electric in cab control, follow these instructions. Review the owner's manual provided with the control head for additional details.

1. Front Panel
   a) Pressure Gauge: Displays the pressure at the spray tip. It reads from 0 to 100 psi. A 1/8" OD nylon tube is connected between the plumbing and the back of the controller.

   b) Pressure Adjusting Switch: Move the switch to change the boom pressure. A continually rotating butterfly valve controls the boom pressure by allowing more or less of pump output to flow back into pump intake. Moving the switch rotates the valve. When the valve rotates to a closed position, the pressure increases. As it continues to rotate, the valve opens and the pressure decreases. Hold the switch until the desired pressure level is reached.

   c) Master ON/OFF Boom Switch: Use this switch for cornering , when it is desirable to shut off all booms simultaneously.

   d) Individual Boom ON/OFF Switches: Each switch is labeled L, C or R to represent the Left, Center or Right boom. These switches are operative only when the Master ON/OFF switch is ON. They are normally used when finishing a field and only partial sprayer width is required.

2. Rear Panel
   a) Output Cable Connector: Provides connections to the boom section, regulating valve and Master ON/OFF. Make sure the terminals are securely connected.

   b) Pressure Gauge Inlet Connector: The connection for the nylon pressure line.

   c) Power Input Cable Connector: This is the power input connector for the controller and power for controller light.

   d) Fuse Holder: Provides electrical protection to the controller with a 15 Amp fuse.

4.9 SPRAYER PLUMBING FAMILIARIZATION

To become familiar with your sprayer operation, compare the photos of the plumbing to the schematic diagram Figure 14 SPRAYER CIRCUIT VALVES and labels on the following page.

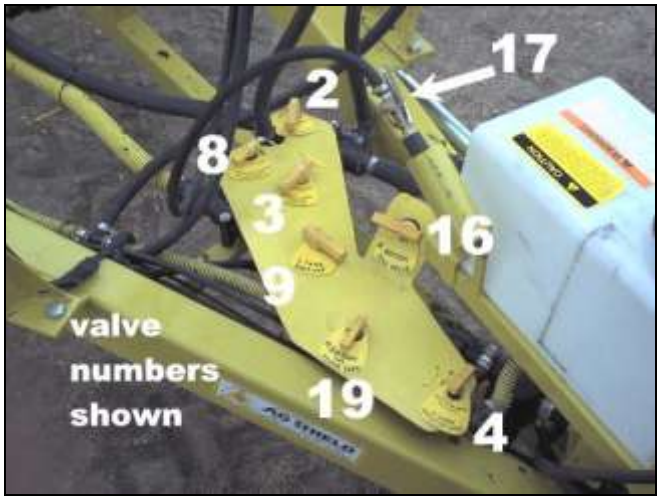


FIGURE 10 VALVE NUMBERS LOWER PLUMBING

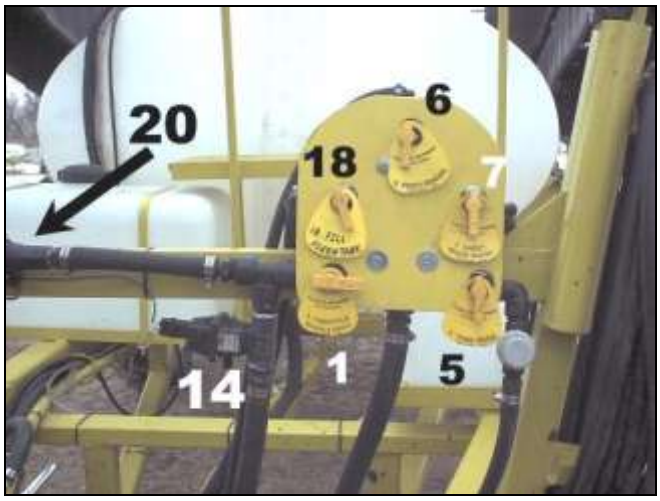


FIGURE 11 VALVE NUMBERS UPPER PLUMBING

Boom Control Valves
The Boom control valves are upstream from the Wilger flow tube monitor in the plumbing. Several ball valves are included in the plumbing circuit of the sprayer to provide a convenient method of adjusting the flow pathways in the unit. See Figure 12 BOOM VALVES, FLOW TUBES to determine their location.

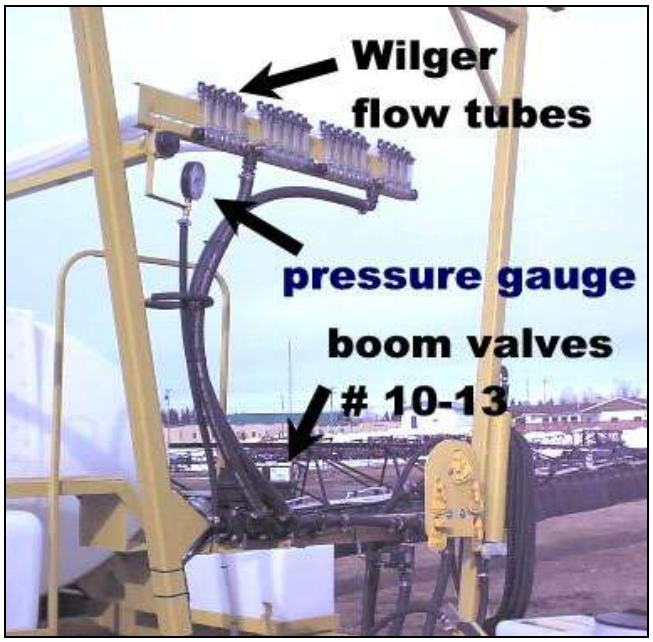


FIGURE 12 BOOM VALVES, FLOW TUBES

To help identify each tank, refer to photo below, the marker is optional and a second variation that has pre made foam in a metal pressure tank may be substituted. The 500 US Gal tank for spot spraying is not shown.

FIGURE 13 TANKS FOR ALL REASONS

4.10 CART VALVE SETTING QUICK REFERENCE

O OPEN
X CLOSED
OX PARTIALLY OPEN OR SET

TABLE 4-3: QUICK REFERENCE FOR VALVE SETTING

VALVE NUMBER FUNCTION	1	2	3	4	5	6	7	8	9	10 13	16	18	19	15
SPRAYING	OX	OX	X	X	X	X	X	O	O	O	X	X	X	X
SELF LOAD, EDUCTING	OX	OX	O	OX	X	O	X	O	X	X	X	X	X	X
TOP FILL WITH WATER	OX	OX	X	X	X	X	X	O	O	X	X	X	X	X
BOTTOM FILL WATER	OX	OX	O	X	X	X	X	O	O	X	O	X	X	X
SELF LOAD WATER	OX	OX	O	X	X	X	X	O	X	X	O	X	X	X
EDUCTING CHEMICAL	OX	OX	X	OX	X	X	X	O	O	X	X	X	X	X
FILLING FLUSH TANK	OX	X	X	X	X	X	X	O	X	X	O	O	X	X
DRAW FROM FLUSH TANK	OX	OX	X	X	X	X	X	O	X	X	X	X	O	X
RINSING CHEM CONTAINER	OX	OX	X	X	X	O	X	O	O	X	X	X	X	X
RINSING TANK	OX	OX	X	X	O	X	X	O	O	X	X	X	X	X
WASHING SHEETS	OX	OX	X	X	X	X	O	O	O	X	X	X	X	X
FLUSHING STRAINER	X	X	X	X	X	X	X	X	O	X	X	X	X	O

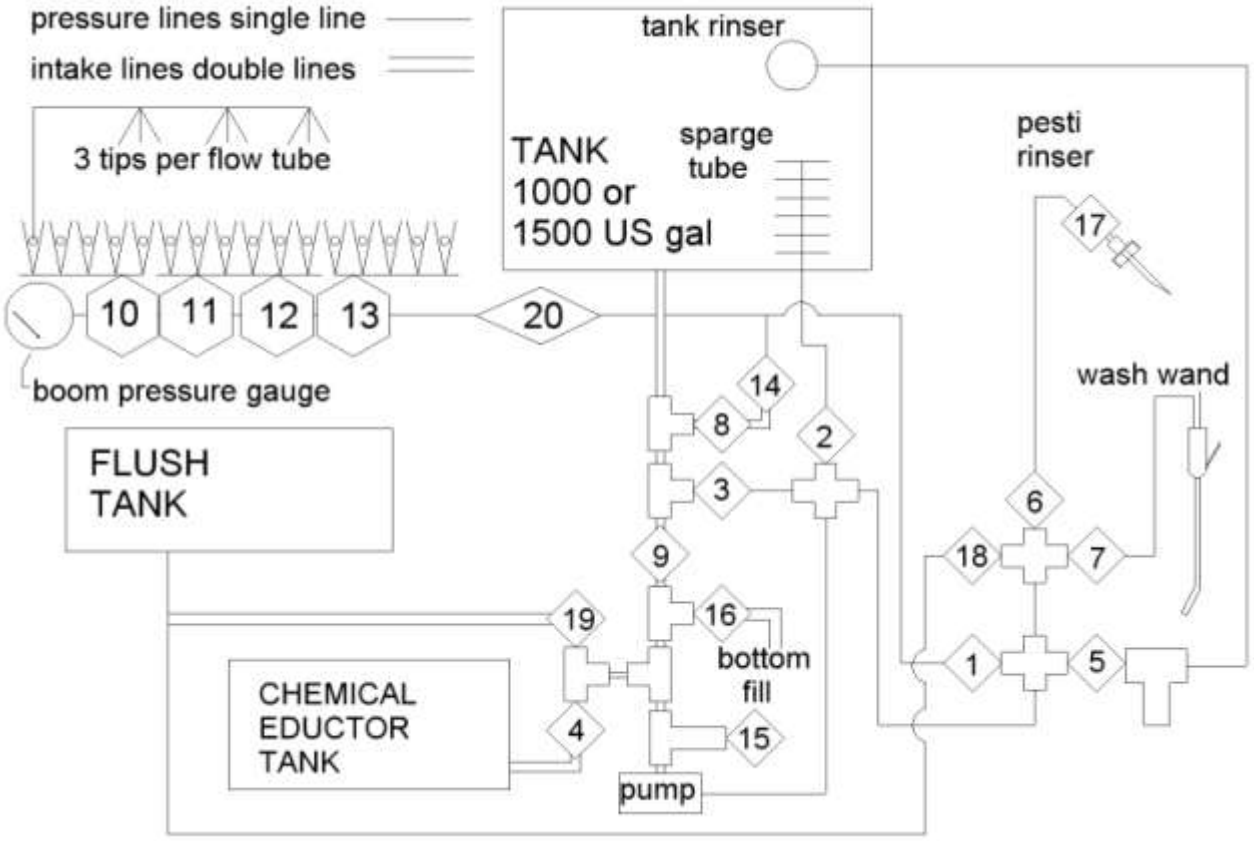


FIGURE 14 SPRAYER CIRCUIT VALVES

1. THROTTLE	10-13. BOOM SOLENOIDS OR END NOZZLES
2. AGITATION	14. PRESSURE REGULATOR
3. SELF LOAD - RANGE	15. STRAINER FLUSH (OPT)
4. CHEMICAL EDUCTOR	16. BOTTOM FILL VALVE
5. TANK RINSE	17. PESTI-RINSER HANDLE VALVE
6. PESTI RINSER	18. FILL FLUSH TANK
7. SHEET WASH WAND	19. SUCTION FROM FLUSH TANK
8. RETURN FROM BOOMS	20. FLOW SENSOR
9. TANK SHUT OFF	

4.11 MICROTRAK SPRAYER RATE CONTROLLER

An optional sprayer rate controller is available to provide the operator with a constant rate of chemical application on all areas of a field. As the tractor speed varies, the controller changes tip pressure to compensate for speed changes. Review the Installation and Operation Manual supplied with the your particular controller for detailed instructions.

4.12 THROTTLE VALVE SETTING GUIDE ON MICROTRAK RATE CONTROLLERS BY PASS ONLY

For in line Microtrak servo valve see next section.

Throttle valves are recommended by Microtrak and installed on all Ag Shield sprayers because a **properly adjusted** throttle valve will decrease the time required by the Microtrak control head to make a pressure adjustment when a speed change has occurred. A system without a properly adjusted throttle valve is slower to respond, particularly if the pump capacity is large compared to the capacity of the servo valve. Imagine a situation where the sprayer slows down. The computer senses that excess gallons per acre are being applied. The Microtrak head will open the by-pass servo valve in an effort to decrease the flow to the tips. In a system without a throttle valve, as the servo is opened, the system pressure at all locations is decreased. The centrifugal pump will immediately and automatically increase the number of gallons per minute it produces effectively negating part of the change the servo valve has made. In a system with a properly adjusted throttle valve, the pump is operating on the higher pressure side of the throttle valve, and the pump will not be aware that change has been made in the system pressure downstream from throttle valve. the throttle valve has effectively protected the servo from increases in pump volume.
The same applies when speed increases, but even more pronounced because the Microtrak control head is programmed to increase system flows and pressure slowly to avoid overshooting the target rate and damaging crop in the present or future years.

Oil flow and Throttle valve setting-Ag Shield Caddy with HM1 pump

1. The oil flow to the hydraulic motor should be 11.5 USGPM. This can be determined with an oil flow meter **or** by closing valve numbers 3, 4, 5, 6, 7, 8, 10-13, and changing oil flow until there is 65 psi of water pressure against the open agitator. The oil should be up to normal operating temperature for this adjustment, if set with cold oil, the pump will under perform on hotter oil later.

NOTE: On some tractors, attempting to set oil flow too high causes the tractor hydraulic system to go into high standby, thereby reducing the flow to the hydraulic motor on the water pump.

2. Close the agitation valve number 2 until the pressure increases to 75 psi for tips 8002 and smaller, or 90 psi for 8003 and larger. The valve will appear well closed, but a visual inspection of the tank will show more than adequate agitation.

3. Open valve number 8 boom return

4. Place the control head into manual position, turn on any one boom switch, and hold +/- switch up to + for 30 seconds, or until pressure maximizes.

5. Turn on all boom valves (10-13) and observe that there is 60-65 psi system pressure remaining.

6. Close the throttle valve number 1 until pressure observed in step above goes down 1-2 psi. The throttle valve is now protecting the servo from over capacity of the pump. The throttle valve setting needs to be changed with each significant change in the tip size.

4.13 MICROTRAK IN LINE SERVO VALVES.

For Microtrak in line servo valves , there is no throttle valve setting required. The in line configuration may require adjustments to the Microtrak 3405 FII settings in the special calibrations section, “valve adjust speed” at the 4 oclock position of the center indicator. To enter special calibration mode, shut off the control head, hold down “CAL” buttons, and turn the control head back on.

To identify the in line versus by pass, observe the servo valve is “in the line “ headed for the flow sensor in the line before the strainers, and the boom valves.

PHOTOOOOOOOOOOOOOOOOOOOO

4.14 SPARGE TUBE AGITATOR

The sparge tube agitator is a more thorough agitator than even four jet agitators. The entire bottom of the tank is kept constantly moving, there are two streams angled into the bottom of the deep vee sump, 6 holes point to the left and 6 holes to the right in tank. Sparge tubes create less foam than jet agitators, especially with low liquid levels in the tank.

The tube must be checked occasionally to see that it is on the correct rotation. The manufacturers lettering is at the top of the tube , the 6 holes of agitator tube are pointed directly left and right, and two jets are angled down the sump when the agitator is correctly rotated.

The tube is threaded into a bulkhead installed in the front of tank, correct rotation by turning tube with a pipe wrench from inside the tank.

IMPORTANT

NEVER ENTER A TANK WITHOUT A BUDDY ON THE OUTSIDE, ALWAYS CONSIDER AIR QUALITY BEFORE ENTERING A TANK.

4.15 MICROTRAK GROUND SPEED SENSOR

The ground speed sensor is located on the right axle as shown in Figure 15 GROUND SPEED SENSOR. The sensor has a magnet on each wheel stud on the 8 and 10 bolt wheel studs. The multiple magnet pick up gives a rapid indication of changes in ground speed, top allow the rate controller to make equally rapid changes in the rate applied. Magnets are glued with metal filled epoxy onto stud with alternating North and South poles of the magnets facing the stud.

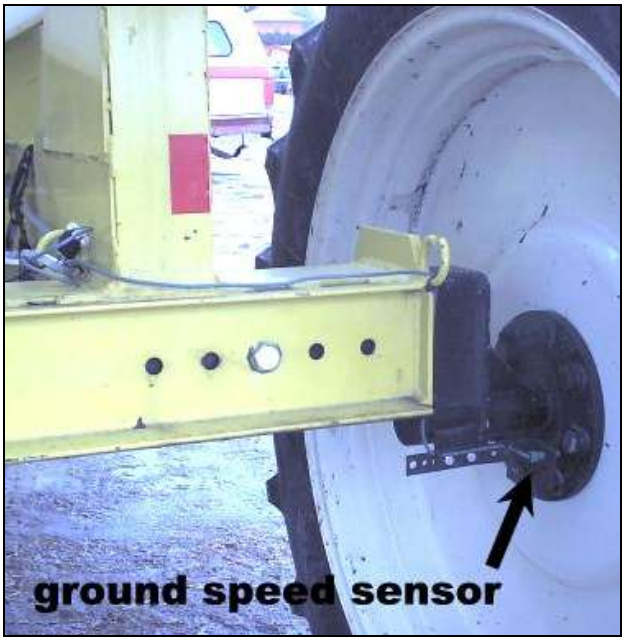


FIGURE 15 GROUND SPEED SENSOR

4.16 PESTI-RINSER (OPTIONAL)

A Pesti Rinser (optional) is available to allow the operator to rinse the inside of the chemical container when it is emptied (see Figure 14 SPRAYER CIRCUIT VALVES). The unit is equipped with a sharp piercing point to puncture the container and rinse the inside. A spring loaded valve on the head turns the rinser on. The valve to the circuit should be turned OFF when the rinser is not being used.

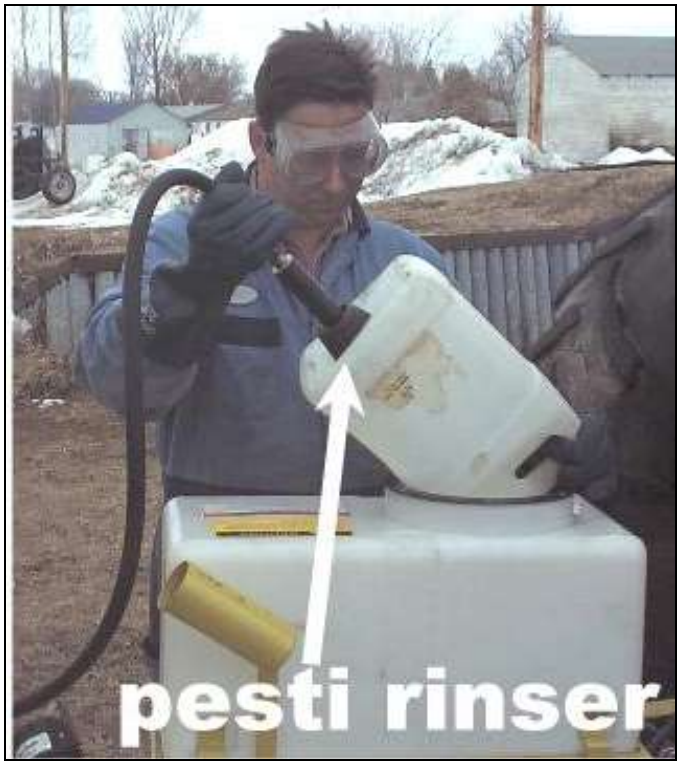


FIGURE 16 PESTIRINSER IN USE

FIGURE 17 SHEET WASH WAND IN USE

4.17 SHEET WASH WAND (OPTIONAL)

A sheet wash wand (optional) is available to allow the operator to wash off the sprayer and sheets (see Figure 14 SPRAYER CIRCUIT VALVES). Enough hose is supplied with the wand option to reach the outermost part of the sprayer. The wand is equipped with a spring loaded handle to turn on the wand.

4.18 TANK RINSER

A tank rinser is installed on spray carts (optional on truck mounts) which enables the operator to wash the inside of the spray tank without entering or looking into the tank. Fluid under pressure flows to the rinser head mounted 10” below the top of the tank. The rinser head contains many small offset holes. Flow causes the head to rotate, spraying all areas of the tank. To operate the tank rinser, load 10-50 gals clean water with a tank cleaning agent into the main tank, turn on system pump, and open tank rinser valve. Clean water may be drawn in from optional flush tanks.(see).

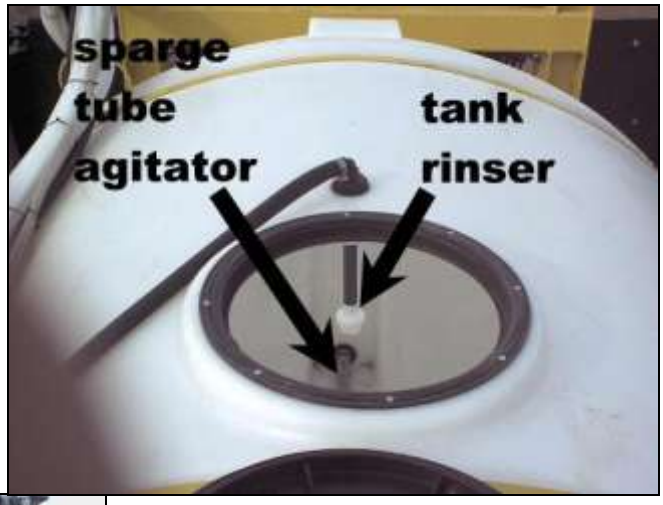


FIGURE 18 TANK RINSER-SPARGE TUBE

4.19 FIELD OPERATION

CAUTION

1. ead and follow chemical container
   tructions exactly.
2. Do not allow riders.
3. Maintain a safe speed. Slow down for obstacles, ditches and rough conditions.
4. Always wear protective gear when using chemicals.
5. Chemicals are toxic and dangerous. Protect yourself and others.

Follow this procedure when using the sprayer:

1. Attach sprayer to the tractor.

2. Review and follow the pre-operation checklist (see section 4.4).

3. Review the location and function of all controls

4. Read and follow chemical manufacturers' instructions.

5. Calibrate the sprayer so you know exactly how much chemical is being applied (see section 8.1). The application of excess chemicals, even in small amounts, can have detrimental affects. Re-calibration at the start of the season or when changing chemicals is a must.

6. Transport the sprayer to the working area (see section 5.18)

IMPORTANT

Operate the pump only when the pump is flooded with liquid to lubricate pump shaft seals. The bleeder valve on pump allows air to be replaced with liquid before starting pump.

7. Fill the sprayer with water see section 4.21.

8. Add chemical to sprayer see section 4.22.2

9. Thoroughly rinse chemical containers see section .

10. If excessive foaming occurs, add an anti-foaming additive to the tank and/or partially close valve # 2(agitation) (see Table 4-3: QUICK REFERENCE FOR VALVE SETTING on page 30). If system pressure becomes too high, open valve 3 until you can get a satisfactory pressure.

11. Add water until you have the desired amount of solution.

12. Close and secure the lid on the tanks.

13. Run the pump for 2 to 3 minutes before starting to spray to allow time to thoroughly mix the solution. Units equipped with a **sparge tube** and loaded through the **chemical eductor** need no more agitation after tank is filled.

14. After the filling and mixing process is completed, move or back away from the water supply vehicle

15. Before starting, be sure:

    a) The boom height and angle are set.

    b) Tractor gear, RPM and ground speed have been determined.

16. Check the boom operating section to see that all recommendations are considered as well.

17. Turn the control box and the monitor ON to activate the system.

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

19. It is recommended that the operator make one pass around a field to start then travel back and forth to obtain the best results. See Figure 4-19: TRAVEL PATTERN.

20. Turn all booms ON with the Boom Master switch as the nozzles pass over the edge of the already sprayed headland and come to the area to be sprayed. Use the individual boom switches as appropriate when finishing a field.

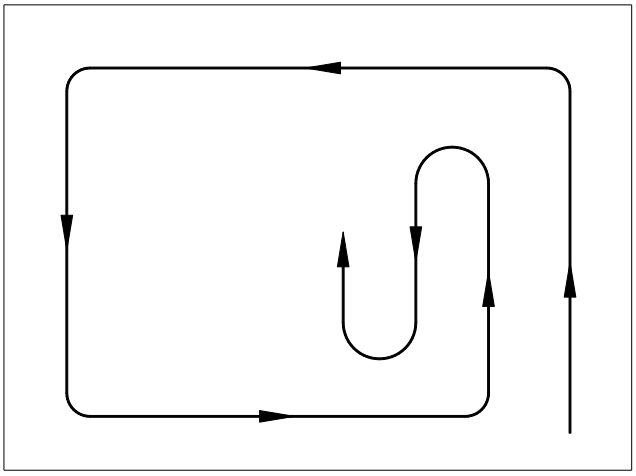


FIGURE 4-19: TRAVEL PATTERN

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

22. Turn only short enough to stop inside end of boom. Do not back the inside end of boom up when turning as this will cause overlap when starting to spray again.

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

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

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

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

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

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

    b) Run the pump and agitator and tank rinse valve for 5 minutes to circulate and rinse the inside of the tank.

    c) Use the optional sheet wash wand to rinse the shields with the solution.

    d) Spray the balance of the rinsate over the previously sprayed field.

    e) When changing chemicals follow the manufacturers instructions on cleaning agents to prevent carryover to sensitive crops. When the tank is washed, the Shields should be rinsed as well. The optional sheet wash wand kit makes this easy.

WARNING

Do not dispose of rinsate in the farm-yard or in drainage ditches.

28. When spraying is finished for the season or when switching chemicals, wash the sprayer using the salt amine method described in the Maintenance section.

29. All sprayers are equipped with 80° nozzles from the factory.

IMPORTANT

Use **only 80 degree tips** in your Ag Shield, The nozzle position has been calculated using that size of pattern. Also there will be significantly more fines produced by 110 degree tips, and these suspended particles will become moisture on the Shields and weep off of the bottom of Shields.

4.20 CHEMICAL SAFETY

CAUTION

1. Mix only the quantity of spray required for the job. Excess chemicals are difficult to store and dispose of. Do not dispose of them in the farmyard or your drainage system. They will contaminate these areas; always take them to a chemical container disposal depot.

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

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

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

5. When spraying is done, machine should be cleaned in the field where the spraying occurred. Add clean water to tank, start engine and re circulate, open the tank rinse valve to completely clean inside of tank. Use the sheet wash wand to spray rinsate against spray shields.

WARNING

Do not dispose of rinsate in the farmyard or in drainage ditches**.**

6. When spraying is finished for the season or when switching chemicals, wash the sprayer using the salt and amine method described in the Maintenance section.

7. All sprayers are equipped with 80° nozzles from the factory

4.21 ADDING WATER

There are three possible ways of adding water to the truck mount tank. These are top fill, bottom fill, and self load. Each of these filling methods will be discussed in the following paragraphs.

4.21.1 TOP FILL

a) Remove the top lid and insert the hose into the tank.

b) Be sure all components are clean to prevent dirt, trash and debris from entering the system.

c) Start the engine on the supply vehicle, and fill the caddy mount tank

IMPORTANT

Always tighten lid with sharp raps from the heel of your hand to ensure that lid will not loosen and come off.

4.21.2 BOTTOM FILL

1. Attach the hose to the fitting near valve 16 (see Figure 4-20: BOTTOM FILL), and secure the over center clamps.

2. Set circuit ball valves as per Table 4-3: QUICK REFERENCE FOR VALVE SETTING.

3. Start the engine on the supply vehicle to fill the truck mount tank.

FIGURE 4-20: BOTTOM FILL

NOTE

If the water source is below the level of the pump, it is strongly recommended to use a foot valve on the intake hose to prevent water from the spray tank from flowing back into the water source.

4.21.3 SELF LOADING

1. Attach the intake hose to fitting near valve 16 and secure with over center clamps.

2. Set the circuit ball valves for self load operation. as per Table 4-3: QUICK REFERENCE FOR VALVE SETTING.

3. Start the pump and fill the tank. It may be necessary to open the bleeder valve at the bottom of the pump (if equipped) to let air out of the system and to prime the pump.

IMPORTANT

Do not allow the sprayer pump to run dry as the shaft seals are damaged by dry operation.

4.21.4 FILLING THE FLUSH TANK WITH WATER

Water may be top loaded to ensure that the tank contains the purest water available for rinsing. Water may be bottom loaded by opening valve #18 Fill flush tank while self load bottom filling the main sprayer tank. To ensure that the water is not contaminated, open the fill valve only after considerable clear water has been pumped from the water source to the tank, effectively rinsing the pump and plumbing. Be certain to close the valve before the flush tank overflows through the vented lid, or before chemical eduction is started.

4.21.5 DRAWING FLUSH WATER INTO THE PUMP

Refer to plumbing diagram Section 4.10 CART VALVE SETTING QUICK REFERENCE. Reduce water pump rpm by idling tractor to a low rpm, or turning the hydraulic oil flow valve. Open valve #19 and close valve #9 to allow water to enter the pump. If

4.22 ADDING CHEMICALS

Liquid chemicals are normally added through the top tank lid unless an optional chemical eductor tank is present on the caddy. The top fill and chemical eductor procedures are covered in the following sections.

4.22.1 TOP FILL

a) Start the procedure by having the tank half full of water, the system pump running, and the agitation valve open (valve 2, Table 4-3: QUICK REFERENCE FOR VALVE SETTING).

NOTE

Exercise extreme caution when lifting chemicals to the top of the tank.

DANGER

1. Wear rubber gloves, eye protection and protective clothing whenever handling chemicals.
2. Do not breathe vapour or ingest chemicals.
3. Avoid contact with exposed skin.
4. Follow chemical manufacturer's instructions.

a) Be sure the area is clean to avoid getting dirt, trash and debris into the system.

b) Follow chemical manufacturers recommendations regarding the order of adding various products to the tank when tank mixing.

c) If using wettable powders, slowly add the powder through the top lid. Be sure the tank is half full of water and the pump is running with agitation on.

d) When the container is empty, add clean water and rinse. Pour the resulting rinsate into the sprayer tank. Rinse each container at least three times to clean the inside thoroughly.

WARNING

1. Do not burn chemical containers as toxic fumes could contaminate the area.
2. Do not discard chemical containers in ditches.
3. Do not place containers in landfills unless approved by local authorities.
4. Take container to disposal site.

4.22.2 ADDING CHEMICALS THROUGH CHEMICAL EDUCTOR

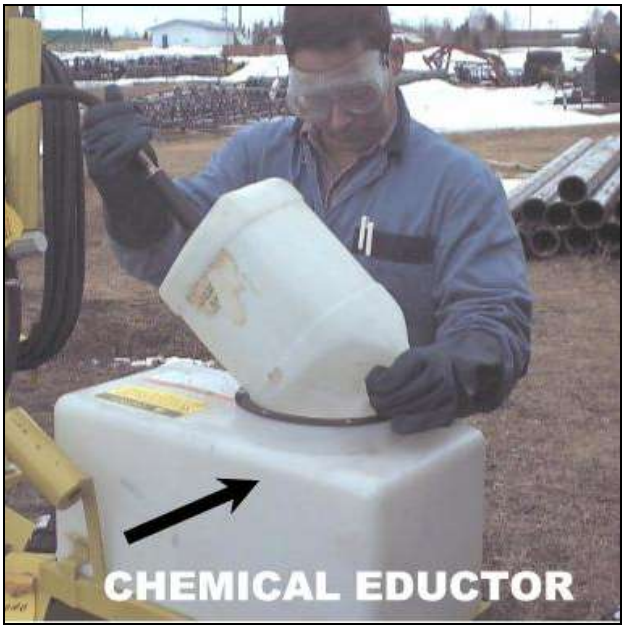


FIGURE 21 CHEMICAL EDUCTOR

a) Make sure system pump is running and drawing water or solution from either the supply vehicle or the sprayer tank.

Set circuit ball valves appropriately. Refer to 30

b) Pour chemical into the chemical eductor tank,

c) When containers are empty, add clear water and rinse.

d) Rinse each container at least three times.

e) Pour the rinsate into the chemical tank.

f) To educt chemical into the main tank, open valve 4 (see Table 4-3: QUICK REFERENCE FOR VALVE SETTING).

g) To increase chemical intake rate, close valve 9 slightly to obtain more draw through valve 4 (see).

h) Add water to rinse chemical eductor tank and draw rinsate into the system.

i) Close valve 4.

IMPORTANT

The valve near the bottom of the chemical eductor must be closed except when educting chemical. If the valve is not closed, erratic system pressure will result as pump alternately loses and regains prime. This may damage pump seals.

4.23 CHEMICAL CONTAINER RINSING

WARNING

1. Do not burn chemical containers as toxic fumes could contaminate the area.
2. Do not discard chemical containers in ditches.
3. Do not place containers in landfills.
4. Dispose of containers at nearest container disposal site.

There are two methods of rinsing chemical containers: the standard method, and the Pesti-rinser option method. Operating procedures will be covered in the following sections.

4.23.1 RINSING WITHOUT PESTI RINSER

a) Empty the chemical into either the top or chemical eductor tank (if present).
b) Add clean water to the container, swish around to rinse the inside thoroughly and pour the rinsate into the tank.

c) Repeat the rinsing process at least two more times. Always pour the rinsate into the tank.

d) Take rinsed container to the nearest container disposal site designated for chemical containers.

4.23.2 PESTI-RINSER WITH CHEMICAL EDUCTOR METHOD

a) Open the chemical container.

b) With the chemical containers spout positioned inside the chemical eductor tank, punch a breather hole in the container with the Pesti-rinser.

c) Remove the Pesti-rinser, and allow the chemical to drain. Open valve 6 (see Table 4-3: QUICK REFERENCE FOR VALVE SETTING). This will enable Pesti-rinser operation.

d) Insert the Pesti-rinser again as far as possible, **being sure that the black seal is against the container to avoid splash back onto the operator.**

e) Squeeze handle on Pesti-rinser and rotate back and forth until the container is thoroughly rinsed.

a) When chemical eductor tank has been emptied, use the Pesti-rinser to rinse the tank. Draw the rinsate into the system and close valve 4. (see Table 4-3: QUICK REFERENCE FOR VALVE SETTING)

b) Replace the Pesti-rinser into it's protective holder and close valve 6
c) Take the container to the nearest container disposal site.

DANGER

1. Wear rubber gloves, eye protection, and protective clothing whenever handling chemicals.
2. Do not breath vapors, ingest chemicals, and avoid contact with skin.
3. Follow chemical manufacturer's instructions.

4.24 ADJUSTING BOOM REST

The sprayer is provided with an adjustable boom rest to allow each sprayer to be fit to the pulling tractor. The boom rest has two set bolts that allows the owner to adjust the clearance from to top of the cab to the bottom of the boom sheets to be a minimum of 8" vertically and more if rugged terrain and approaches are anticipated while in the folded for road mode. As this height can cause the overall height of sprayer to become greater than 13.5' (4.1m) extreme caution is required near power lines, low shop doors, or other medium height obstacles.

FIGURE 22 CAB CLEARANCE

To adjust the boom rest:
Estimate the height change required with the boom in the rack
Use the system hydraulics to remove the boom from the rack
Loosen the stop bolt in the boom rest and change to the desired height, and reset the stop bolt with ft lb torque.

For overnight storage (frosty nights) inside 11 ft doors, hang the booms on a chain from the boom rest to lower overall height, then back sprayer straight into shop.

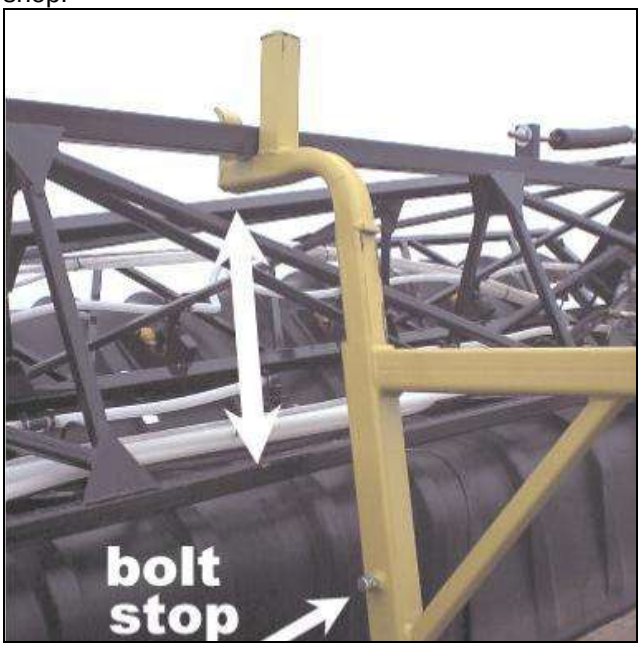


FIGURE 23 BOOM REST ADJUST

4.25 AXLE OR TREAD CENTER ADJUSTMENT

With the standard tread center kit of up to 120", the tread centers on a standard sprayer are adjustable from 90" on 12.4 wide tires to 120" on all sizes of tires.

Using the optional 144" tread center kit (part number 222455 8 bolt, 222460 10 bolt), axles may be adjusted from 114 up to 144" centers.
The procedure for changing axle width is as follows:

1. Be sure the tank is empty to reduce weigh.
2. Attach the sprayer to 100 + hp tractor to serve as a brake or stopping device. Park on a level piece of ground, place boom in road position set the park brake, turn off the motor, and remove the key from the ignition.
3. Jack up the left wheel with a hydraulic jack and secure stable blocking under the bottom of axle, insert a safety stand, lower the axle onto safety stand
4. Remove the ¾ inch bolt,
5. If preferred, the tire and wheel may be removed to allow easier sliding of axle. Slide the axle to the desired position, where the center of the wheel is 50% of the desired tread center distance from the center of the cart axle. There is a hole every 2.5" and an additional hole could be drilled BETWEEN PRESENT HOLES ONLY.
6. Replace the bolt, put on the self locking nut and tighten to snug only so that the axle is not compressed.
7. Raise the jack, remove safety stand, lower the axle until tire is on the ground, (replace tire if removed) and repeat on the right side.

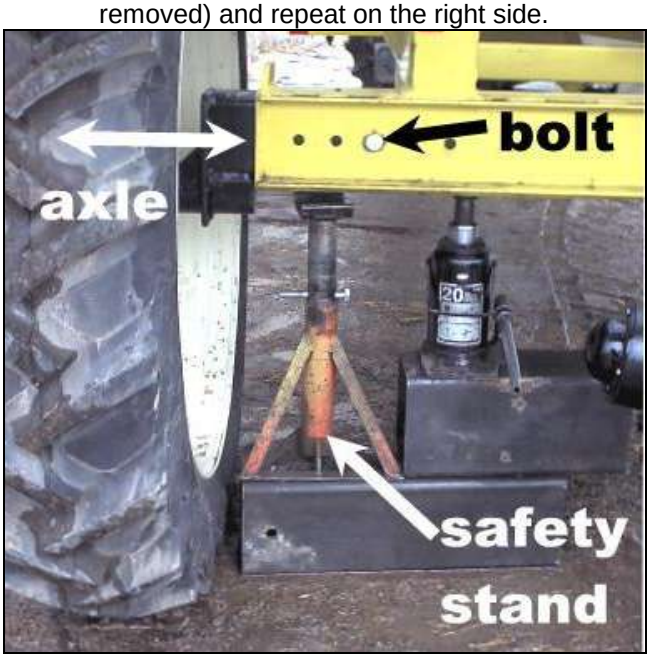


FIGURE 24 AXLE ADJUSTMENT

FIGURE 25 AXLE LENGTHS

To identify whether you have the 120 " or 144" parts , note that the overall length of the tube as shown in Figure 25 AXLE LENGTHS is 36" or .91 m. with this part the tread center may never exceed 60" to tire centerline from the axle centerline, or a total of 120 inches (4.72m). If greater tread center is required , purchase the factory option kit the allow the sprayer to safely operate with wider tread settings.

4.26 HIGH CROP OPERATION

Your Ag Shield sprayer may be operated at a maximum tip height of 95" with most tire combinations. The tractor drawbar is often the limit to efficient high crop operation Ag Shield can provide a series of parts to allow efficient operation in tall crop position. Note the crop dividers and bottom sheet for the tractor as well as for the cart. The bottom sheet (part # 221250) and the dividers of varying part numbers may be ordered separately for the cart. Contact your local dealer or factory at 800-561-0132 for details on these products.

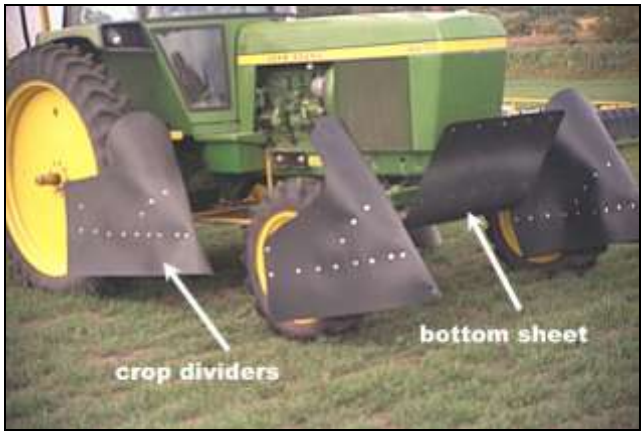


FIGURE 26 CROP DIVIDERS, BOTTOM SHEET

FIGURE 27 BOOM IN HIGH POSITION

4.27 TROUBLE SHOOTING CART

The Ag Shield ™ Field Sprayer uses a pressure circuit to deliver a chemical compound in a solution to a series of nozzles for application to crops. In the following section, we have listed some of the possible problems, causes and solutions to the problems that you may encounter.

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

PROBLEM	CAUSE	SOLUTION
Sprayer or booms are not stable Moves from side to side	Low tire pressure. Loose wheel bolts.	• Inflate to proper pressure as per the specifications page. • Tighten wheel bolts.
Booms yaw when driving in field	Draw pin too small. Worn hitch parts allowing the drawing to move left and right as driving	• Use larger draw pin. Adjust perfect hitch Replace parts, or replace pins with bolts and wedge washers to stop all side movement, very important to accurate spraying with wide booms
System looses pressure.	Intake Screen Plugged Worn pump. Faulty suction hose. Faulty pressure regulator. Hose or fitting leaking. Chemical eductor valve open.	• Clean suction line screen • Inspect pump, repair or replace accordingly. • Check for collapsed suction hose. Replace hose. • Close valve # 8, if pressure increases dramatically your pressure regulator is seized open. Replace regulator valve. • Replace hose, or tighten fitting as required. • Air in intake line allows unit to surge and pressure to rise and fall in surges. Close valve.
Sprayer pressure too high.	Return hose plugged. Agitator valve closed # 2 Faulty pressure sensor. Regulator valve not opening Faulty regulator valve.	• Clean, or replace hose. • Open valve #8 return Open agitator valve slightly. • Calibrate sensor. Replace as required. • Calibrate flow or speed sensors Repair or replace valve.
Nozzles or filter plugging.	Dirty water. Water has long thin sand particles Poorly mixed chemicals.	• Flush and clean the system. Use clean water. Use finer mesh strainers Mix chemicals slower. Follow mixing instructions.
The liquid flow is irregular.	Filter plugged. One or more valves are seating improperly.	• Clean filter. • Examine the valve seating and clean them.

PROBLEM CAUSE SOLUTION

Pump does not draw water.	Pump is air locked.	• Bleed air from pump.
	Suction line is plugged or collapsed.	Examine suction line. Replace as required. Clean filter.
	Inlet line has leaks allowing air to enter disabling pump from achieving prime.	• Check inlet line for hoses fitting properly, clamps being tight, etc.
	Pump faulty.	Repair or replace pump.
Pressure reading fluctuates.	The pump is sucking in air through the intake or air has not been entirely evacuated from the pump.	• Be sure the suction hose is sound. Run the pump with the outlet hose open to evacuate air from pump. • Stop pump, drain from bottom drain valve to purge air, restart pump Close chemical eductor valve # 4.
Can't develop enough pressure.	Agitator openings too large.	Replace agitator. Close agitator valve # 2 slightly. Refer to 4:12 THROTTLE VALVE SETTING GUIDE ON MICROTRAK RATE CONTROLLERS
	Broken pressure regulator.	• Replace pressure regulator.
	Worn pump.	Replace or repair pump.
	Leaking hose or fitting.	• Replace hose or tighten fitting.
	Pump running too slow.	• Increase pump speed.
	Too little oil to pump.	• HM1 models require 11 gpm @ 1400 psi for best performance.
No pressure reading.	Poor connection at joiner near draw pin Defective sensor.	• Push connection firmly together. • Replace sensor.
	Defective gauge.	• Replace gauge.
	Deflective pressure line.	Replace pressure line.
	Pressure regulator valve stuck open.	Repair or replace pressure regulator valve.
Spray won't come on some tips.	Nozzle diaphragms stuck or dirt built behind -can't open	• Clean diaphragm valve, install new black cap no 128111.
Spray won't shut off	Defective switch in control head.	• Replace switch.
	Observe yellow arrow in top off KZCO valve for rotation, if rotates faulty ball valve, if no rotation faulty electrical to the valve.	Wiring or electrical connections cleaned
Tank rinser not turning	Foreign material between two parts of the tank rinser valve In line T filter plugged	Disassemble and clean tank rinser. Clean filter strainer

4.28 SPECIFICATIONS-CART- CART WITH BOOM

DIMENSIONS:

	Standard Frame	With a 90 ft boom folded
Length:	256 inches (6.5 m)	297 inches(7.5m)
Width:	123 inches (3.12 m)	196 inches(4.98m)
Height top of boom rest	144 inches (3.66 m)	144 inches(3.66m)
Tread center-std	90-120 inches (2.29m)	
Optional 144"	- 144"	
Axle above ground	29"(.74M)	29"(.74M)

WEIGHT:

Empty 1000gal:	2470 lb (1120 kg)	5370lb (2436kg)
Full (water):	10,870 lb (4930 kg)	
Empty 1500 gal	2500 lb	5400 lb (2450kg)
Full 1500 gal	23370 (10600kg)	26270 lb (11916kg)

WATER PUMP: Hypro Model 9303P-HM1C std hydraulic driven std
REQUIRES OIL 11 gpm (41 lpm) at 1400 psi (9646 kPa)
PUMP OUTPUT 100 gpm (375 lpm) transfer

TANK: Low density polyethylene 1000 gal US, 833 gal Imp., 3750 liters 12' deep Vee sump

Or LDPE 1500 US gal 1250 Imp Gal, 5680 litres box sump

SCREEN: 50 mesh polypropylene with stainless steel std, optional strainers 80, 100, 200 mesh.

SOLENOIDS: KZCO rotary ball valves

AGITATION: 14 hole sparge tube 1.5 Schedule 80 PVC

TIRES:

Standard	12.4 x 38 traction 5star (14 ply) at 45 psi	56" high
Optional	14.9 x 38 traction 3 star (8ply)at 26 psi	63" high
Optional	18.4 x 26 traction 2 star (6ply)?? ply at 16-24 psi	56"' high
Optional	18.4 x 26 turf & field 3 star (8ply)at 26 psi	56'high
Optional	14.9 x 46 traction 3 star (8ply)at 30 psi	74' high
Optional	18.4 x 38 traction 3 star (8 ply) at 30psi	

Boom hydraulics 5 way block requires 3gpm, @ minimum 2200 psi plus open or closed center.
Prefers 6 gpm @ 2750 psi, in addition to the water pump drive.
With optional GFS (Ground Following System)
6 gpm (23 lpm) for the 2 wings, plus 10 gpm (38 lpm) if center sensor at > 2200 psi

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

4.29 LUBRICATION-CART ONLY

The only items on the cart requiring lubrication are the 2 axles with tapered roller bearings. Eight bolt wheels require annual greasing. Remove the hub cap and pump gun grease through the grease zerk on the inside of hub until it appears coming through the outside bearing. Replace the hub cap. Repeat on the other hub.
Ten bolt hubs require annual greasing, If the hub does not have grease nipples, jack up the cart using the procedure in 4.25 AXLE OR TREAD CENTER ADJUSTMENT, remove the wheel, remove the hub, grease both the inner and outer bearings, and reassemble. Set the wheel bearing tension on the castellated nut to have some friction as the wheel is turned, and back off the nut 1/12 to 1/6 until the cotter pin aligns with a hole in the spindle. Repeat on the other side.

5 GFS (GROUND FOLLOWING SYSTEM)

5.1 GFS OPERATIONS

DANGER

– Never walk or work under elevated spray boom. If a component should fail, or co worker move a hydraulic control, severe injury or death could result.

GFS is a simple system which when properly adjusted will:

- Improve sprayer accuracy, and reduce spray drift.
- Enhance performance of chemical by ensuring uniform application.
- Reduce stress on the operator.

The GFS system incorporates a **gauge** wheel on each section, to feel the ground level as the sprayer moves forward with a hydraulic assist that carries more than 80% of the boom weight on the hydraulic cylinder. When the GFS master switch is in the *OFF* position, the boom is a normal manual controlled boom and must not be operated with the wheel contacting the ground.

FIGURE 28 IN CAB CONTROL BOX

GFS off mode is selected for:

- folding,
- transport either driving down the road or on a trailer,
- service work, cleaning and checking nozzles or greasing the boom,
- spraying crop or stubble that is too high to be sprayed with the boom wheel on the ground, typically those crops that are more than 8" high, or those that pull back too hard on the wheel, such that boom damage may result.
- Spraying with one or more of the boom tips folded back to make the boom narrower.
-

DANGER

- **Always turn off master switch before folding boom tips. – With one or more boom tips folded, the shorter booms can raise in spite of operator efforts to control. If the boom tips raise and contact a high voltage line, severe injury or death could result.**

GFS on mode is selected for:

- those conditions where the boom wheel may run on the ground without being pulled too far back by crop or stubble,
- for conditions where only one boom is required to clear an obstacle while the other boom is normally following the ground with GFS functioning.

A typical sequence in a field would be as follows:

1.
2. Raise both boom wheels up approximately 6 feet (2 m) or as high as a man's head.
3. Move the GFS master switch to *ON* position.
4. Tap the left boom *DOWN* switch, and observe that the boom floats to the ground in 2-3 seconds normal for a GFS equipped boom. If the boom goes down faster than 2 seconds, consider a pressure adjustment as per 5.5.1GFS Hydraulic Pressure Adjustments page 50 and 5.5.2 GFS Trouble shooting later in this section. If the boom takes more than 3 seconds to reach the ground, watch the performance of the booms to see that the booms are not hanging up in the air coming off of rises in the field. If the boom does not move, the GFS needs service as per 5.5.2 GFS Trouble shooting. The green light under "L" on the switch box light should come on and stay on until the *UP* switch is activated. The green light means that that boom is in GFS mode.
5. Tap the right boom *Down* switch, and repeat observations above. The GFS has been checked and is now ready to proceed across the field. During normal operation, observe that boom wheels are frequently just skimming the ground, when the wheel leaves the top of a sharp rise, the tire should not follow the ground for a short distance (10 to 50 feet) depending on forward ground speed and sharpness of drop

6. When a washout, stone pile, or other obstacle is encountered, use the *UP* switch to lift the one boom that needs to be carried over the obstacle to raise the boom. Note that the green GFS indicator light for that boom will go out. When the boom *UP* switch is released, the boom will stay up until past the obstacle.
7. After passing the obstacle, tap **(not hold)** the *DOWN* switch to reactivate the GFS on that side, the green light should immediately come back on and the boom should float to the ground.
8. Check that the green light for both booms is on periodically as the field is sprayed.
9. If a plugged nozzle is noticed, stop forward motion , move GFS master switch to *OFF*, press the *UP* switch to raise the boom wheels clear of the ground, follow all other safety procedures, and service the spray tip. When ready to commence spraying, move the GFS switch to *ON*, tap both boom *DOWN* switches to reactivate GFS, observe that booms float down, and that the green lights under L and R come on, and proceed to spray.
10. When the field is finished, move the GFS master switch to *OFF.*

DANGER

Always turn off master switch before folding boom tips. – With one or more boom tips folded, if the master switch is on, the shorter booms can raise in spite of operator efforts to lower. If the boom tips raise and contact a high voltage line, severe injury or death could result.

11. Fold up the booms and proceed to the next field, and start the process all over again.

IMPORTANT

When the boom wheels are contacting the ground, the GFS must be turned on and working on all sections, or damage to boom components or GFS gauge wheels may result.

For operation in solid seeded crops above 8" high, the GFS wheel might be raised to high position and boom operated with GFS off.

When there is no likelihood of having crop less than 8 " high for a period of time, boom wheels may be removed

5.2 Auto Lock out Mode 2009 and later GFS

All GFS control boxes shipped after March 12, 2009 have an Auto Lockout safety feature. The GFS control now has 3 modes:

1) "active" for normal operation, Master Switch is ON, controls booms, no sound is normal
2) "locked out" – Auto Lockout – Master Switch is ON, the cab control will NOT control the booms, Master Switch is ON, cab control emits burst of 3 1 second chimes, prevents operator from touching RIGHT DOWN or LEFT DOWN and accidentally engaging GFS on a folded boom section.
3) "off" -Master Switch is in OFF position.

Before 2009, an operator could temporarily disable both the left and right GFS solenoids by raising both the right and left booms, and continue to do folding functions with the belief that he was operating the boom safely. Since the GFS system is normally adjusted to **nearly** lift the weight of a boom with the tip extended, the GFS will rapidly lift a folded boom to the end of the stroke of the lift cylinder. The only way to stop the system from raising the boom to the end of the stroke would be to shut the Master switch off, and by this time the operator may not remember that the GFS system was left ON while folding.
The Auto Lockout feature prevents the GFS box from making an output to the GFS solenoids after both the left and right GFS circuits have both been shut off for 10 consecutive seconds. The control box will enter "locked out" mode, a cycle of sound output, 3 one second pulses in 6 seconds, followed by 6 seconds off, then another 3 pulses and so on. To "**RESET**" to active mode and have GFS functions, the operator simply shuts the Master Switch OFF, and turns the Master Switch ON again. Operators will be unable to fold the boom tips in less than 10 seconds. The GFS cannot become active until the operator consciously turns the system OFF and ON again to "**RESET**"

5.3 2006 and later GFS kits

GFS kits from 2006 and later have a different cab control box and GFS control box with 2 additional features:

1. A cab buzzer will signal the operator whenever the GFS master switch is turned on and one side of the GFS system has been off for more

than 10 seconds. Operators sometimes lift a boom to carry the GFS gauge wheel over a water hole, and forget to turn that side of the GFS on after the hole is past. Later in the field, when the ground comes up to raise the wheel, there is no GFS hydraulic assist. The gauge wheel must act as a ground wheel and this could cause reduced life in some boom and GFS parts. After 2005, the operator has a audible reminder to keep both sides of the GFS engaged during normal operation.

2. **For users with open center systems only**, the open center output now has a delay time adjustment after the low pressure signal is received. On an open center hydraulic system when the system pressure drops below the preset level, an optional pressure switch closes, which in turn closes the open center by pass valve. In pre 2006 units, the pressure would build up and instantly turn off the open center bypass, allowing a situation where the system could turn on and off several times per "hill" or lift cycle. With the later than 2005 model, the pressure switch signals the start of the closed cycle and that cycle can be field adjusted to extend the closed time for up to 5 seconds. This will reduce the number of cycles on the valves and switches, resulting in greater dependability over the long term.

Although there is additional features, the same basic functionality and part numbers have been retained, and either of the in cab or rear GFS control boxes may be substituted back into 2005 machines. If both are substituted, then both new features will be available.

5.3.1 Adjusting the GFS time delay

The GFS time delay will be factory set to have an on time of 2.5 seconds each time a low pressure is detected. The delay is easily checked by timing the red light on cycle in the cab. If the unit is being operated in extremely rolling terrain, and the red indicator light on the cab box is staying on for 2.5 seconds, then flashing off and instantly back on, the cycle could be increased to 4-5 seconds.
If the hydraulic oil system is getting hotter than 160 degree F or 60 degree C, shorten the cycle to reduce oil flow over the relief valve when the open center by pass is closed.

1. Turn on the cab box, engage the hydraulics if necessary, have a person lift a boom tip to decrease GFS system pressure.
2. Watch the red "open center output" light, record the open center output time,
3. Turn off the GFS cab switch to power down the GFS box
4. Use a 3/16" wide blade driver to remove the external screw.
5. Reach through the threaded hole with a 1/16" wide blade driver, gently rotate the slot inside approximately 1/3 clockwise to adjust from 2.5 up to 5 seconds per cycle, or 1/3 turn counter clockwise to adjust to .5 seconds per cycle.
6. Turn on the cab box, engage the hydraulics if necessary, have a person lift a boom to decrease pressure.
7. Record the open center output time, and compare to time written down in step one.
8. If the change in time is satisfactory, replace the external screw and gasket to seal the box again.

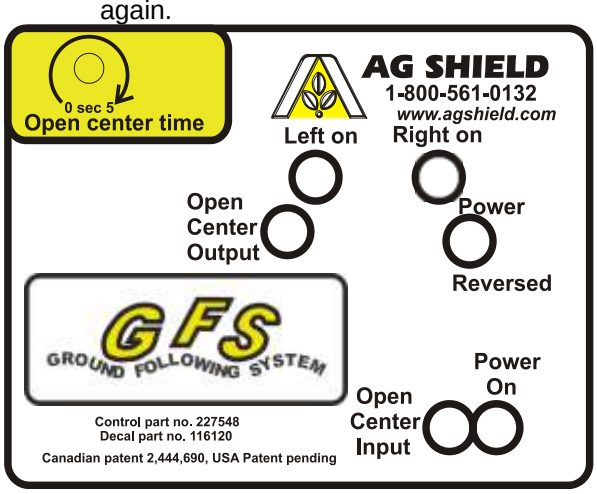


FIGURE 29 2006 GFS ADJUSTABLE CONTROL VALVE

5.3.2 OPEN CENTER OPERATION(option)

If open center option is installed, the red LED on in cab control near "OC" should light each time any hydraulic function is used, whether it is the GFS or a manual switch operation. A red LED should light at the rear of machine on the control box as shown in Figure 2 Page 19

Each time either of the GFS gauge wheels rises higher above the level of the sprayer chassis, the red light under OC on the in cab box should light indicating that the open center valve is closing and the boom hydraulics are pulling the excessive weight off of the boom wheel.

Each time the main pressure setting is changed, the open center pressure must also be changed. To set the open center switch pressure, follow the steps marked open center in section 5.5.1.

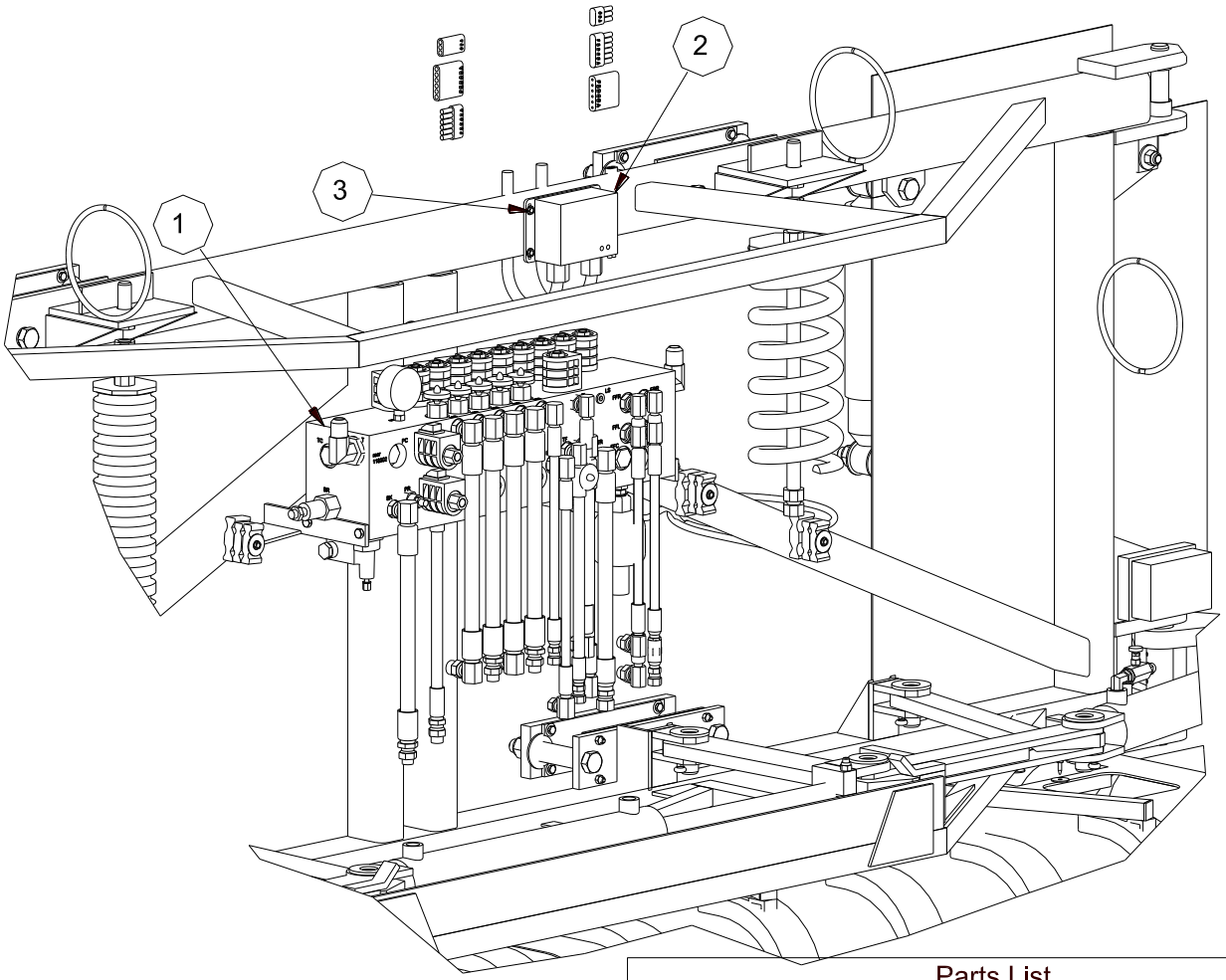
5.4 GFS installation

1. Using 4 drill tape screws provided and a 3/8 hex driving bit, install the mount plate (#227534) and

GFS assembly to the tubing above the RH end of block so that the rear edge of mount is 2.5” ahead of forward side of 1.5 square tube. Refer to diagram below.

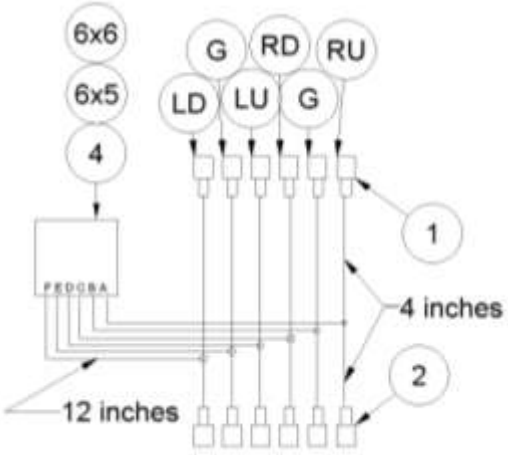
2. Install the GFS cab control box in cab. It is preferred to have the green LED’s shaded from direct sunlight for best visibility. The electrical connection must be fused not greater than 15 amps, and off with key off is preferred.
3. Make the electrical connections as per Figure 2, GFS electrical, page 23. Clear all personal from the area, park far from any building or vehicles, check the electrical connections for correctness by moving the boom function switches and observing that the wings respond normally.
4. Raise the boom tips up 36” above the ground. Install the left GFS gauge wheel mount (part # 227513) as per Section 5.6.2 page 52. Using the studs provided, bolt the tire and wheel on to the #227530 spindle, slide in to the mount and tighten the set bolts so that the bottom of the tire is 4” below the bottom edge of sheet. Repeat for the right side.
5. Carefully lower the left and right boom onto the wheels. such that there is no pressure on the cylinder to holding the boom tips up. (On shorter booms, this may also be done by raising the boom to the highest position with tips folded, and lowering the wing until cylinder is at end of stroke, and then work off of a step ladder to do balance of install.)
6. Carefully remove the hoses from the barrel end of the shoulder cylinders, being certain that there is no remaining oil pressure. Remove the hoses from the mounting blocks, the small ¼” hoses are not used in this application.
7. Attach the 3/8” hoses from the GFS assembly to the RU and LU ports, 2nd and 4th from the left end of boom block. The 3/8” hose from the valve with pressure gauge goes to the LU port. Before final attachment, the air must be purged from the ½” lines by having one individual operate the left boom *UP* and right boom *UP* switches, while a second individual wearing protective eye glasses catches the oil in a mostly closed top container.
8. Attach the ½” x 120” hoses from the GFS directly to the cylinders, with as little restriction as possible. The hose from the valve with the pressure gauge attached goes to the left cylinder.
9. Follow the instructions in section 5.5.1 GFS Hydraulic Pressure Adjustments page 50, to get a proper pressure setting, To have the least stress on boom components, maintain the lowest differential pressure to allow satisfactory ground following performance.
10. Snap tie all hoses and wires properly to avoid chaffed hoses and wires in the future.

5.5 GFS INSTALLATION –BASIC PARTS



Parts List		
ITEM	QTY	PART NUMBER
1	1	118302 hyd block fltg boom gfs assy
2	1	227549 Junction Box with plugs
3	4	103212 screw sm d t 14 x 1 lg

Kit of parts with hyd 227528 GFS Adapter cable for spade lug coils on block (6700 and early 6800 booms) 227529



ITEM	QTY	PART NUMBER
1	6	113292 male quick disconect
2	6	113291 female quick disconect
3	1	16 inches of 18 guage 6 wires
4	1	113270 6 pin gm weather pack shroud
5	6	113254 male pin gm wp
6	6	113261 grey wire seal
hyd fittings		
ITEM	QTY	PART NUMBER
	2	118050 run T 08 pt mmf
	1	118197 adapter 08 mpt x 12 mjic
	1	118175 adapter 08 mpt x 08 mjic
4	1	113270 6 pin gm weather pack shroud

5.5.1 GFS Hydraulic Pressure Adjustments

WARNING When making pressure adjustments or doing pressure tests, the boom could start to go up and not stop until cylinder reaches maximum stroke. Be sure that there are no overhead obstructions, particularly power lines, before making any pressure adjustments.

***Before any pressure adjustments are made do the following tests:

Test 1, turn off GFS system master switch, raise the boom wheels clear of the ground, read the pressure on the GFS pressure gauge, e.g. could be 1600 psi of boom weight hanging on the cylinder reading on the gauge. Record the pressure reading
If your unit is *equipped with an open center* switch, it must be adjusted at this time. Start motor and engage hydraulic pressure to the boom system. Turn the allen head screw clockwise until the red LED comes on at either the control switch in cab or the GFS switch box at the boom. The light indicates that the open center valve is closed and additional hydraulic oil can be supplied to lift the booms. Do test 2 below on your open center unit.
Test 2, then with motor running, hydraulic pressure to boom engaged, and GFS turned on, tap both boom control switches *DOWN,* and both L and R green lights lit on cab box, and the GFS gauge wheels will be on the ground, read the GFS pressure gauge, e.g. could be 1300 psi of pressure supplied to the cylinder. Record the pressure reading

On open center equipped units, final adjust the pressure by turning the allen head screw on the pressure switch counterclockwise until the red light go off. Then turn 1/12 turn clockwise again to give a turn on the light setting very slightly (100psi less than) under the GFS setting pressure.

Compare the 2 pressure readings found in test 1 versus test 2.

It is normal to have a 325 psi greater reading in test 1 than test 2,
a difference of 250 psi would reduce pressure on the wheel and extend the life of boom components,
a difference of 350 psi should be largest allowable, more would be placing excessive weight on GFS gauge wheel ,
your reading will vary but the difference between the 2 readings is the important factor.
please call 1-800-561-0132 if system appears to need a larger spread than 350 psi to work satisfactorily.

To adjust pressure upwards turn the GFS valve screw clockwise, use a small increment of 1/12 of a turn at a time, with or without the hydraulic pressure applied to get approximately 75 psi change up or down. Tighten the lock nut on the adjusting thread each time an adjustment is made.

Tire Pressures
Tire Pressures in the GFS gauge wheels is maximum 10 psi, but prefer to run at 6 psi to take advantage of suspension in the tire.

5.5.2 GFS Trouble shooting

Symptom	Possible cause	Possible solution
GFS master switch on, GFS gauge wheel does not drop to ground, no green lights	check that the *DOWN* boom control switch for that side has been tapped	Tap DOWN switch, green light should come on, boom should drop
When GFS master turned on, no action	blown fuse in the circuit input wire disconnected, power cable	Get input power working
During start of field test, green cab light comes on, boom won't drop	Green light indicates there is power in box being sent to that solenoid, check for magnetism at coil for that side	If no magnetism, check for 12v on coil and circuit back ***If magnetism, consider lowering system pressure by turning set screw CCW 1/12 turn on GFS valve
During start of field test, green cab light comes on, boom wheel drops 6 ft in less than 2 seconds	Pressure in GFS valve too low	Reduce boom weight by washing off mud and crop residue ***Increase pressure by turning set screw on GFS valve 1/12 turn CW

GFS gauge wheel stays up in air for too long (50 ft) after crest of rise	Pressure in GFS too high	***consider lowering system pressure by turning set screw CCW 1/12 turn on GFS valve

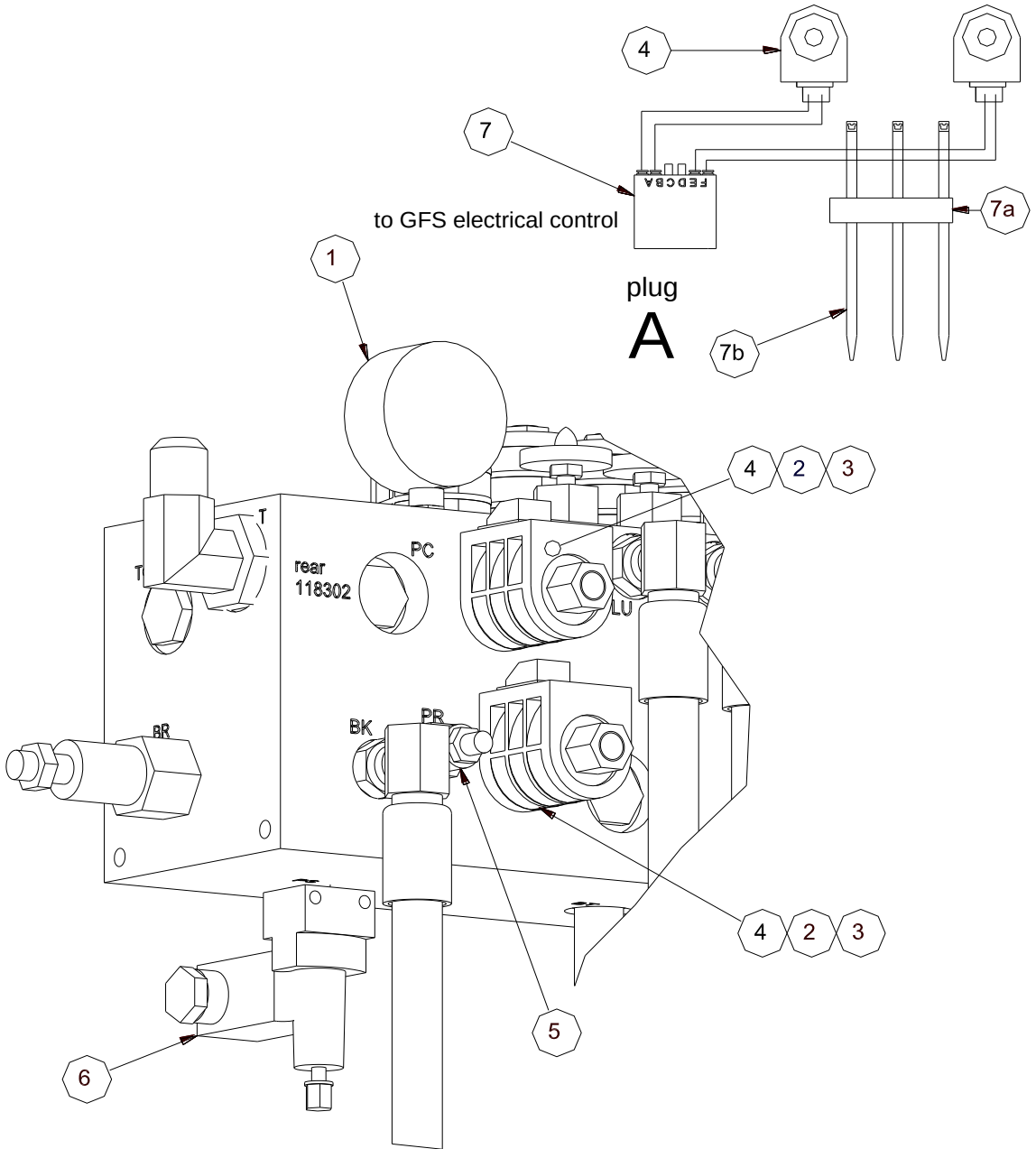
5.6 GFS PARTS

5.6.1 GFS HYDRAULIC COMPONENTS

GFS hyd components 118302 Rev 3, 05/25/04

ITEM	QTY	PART NUMBER
1	1	112300 gauge 3000 psi 1/4 mpt btm mt
2	2	117019 HYD CART DP DE S2I 00 NC
3	2	117019 nut with cartridge
4	13	117051 coil dp ddl12 39610030
5	1	118469 valve under lappep sun X-963

ITEM	QTY	PART NUMBER
6	1	227551 open cntr bypass GFS optnl
7	1	227526 GFS coil and plug
7a	1	113344 loom 3/8 wire covering 11"
7b	1	112301 snap ties 5 1/2 black

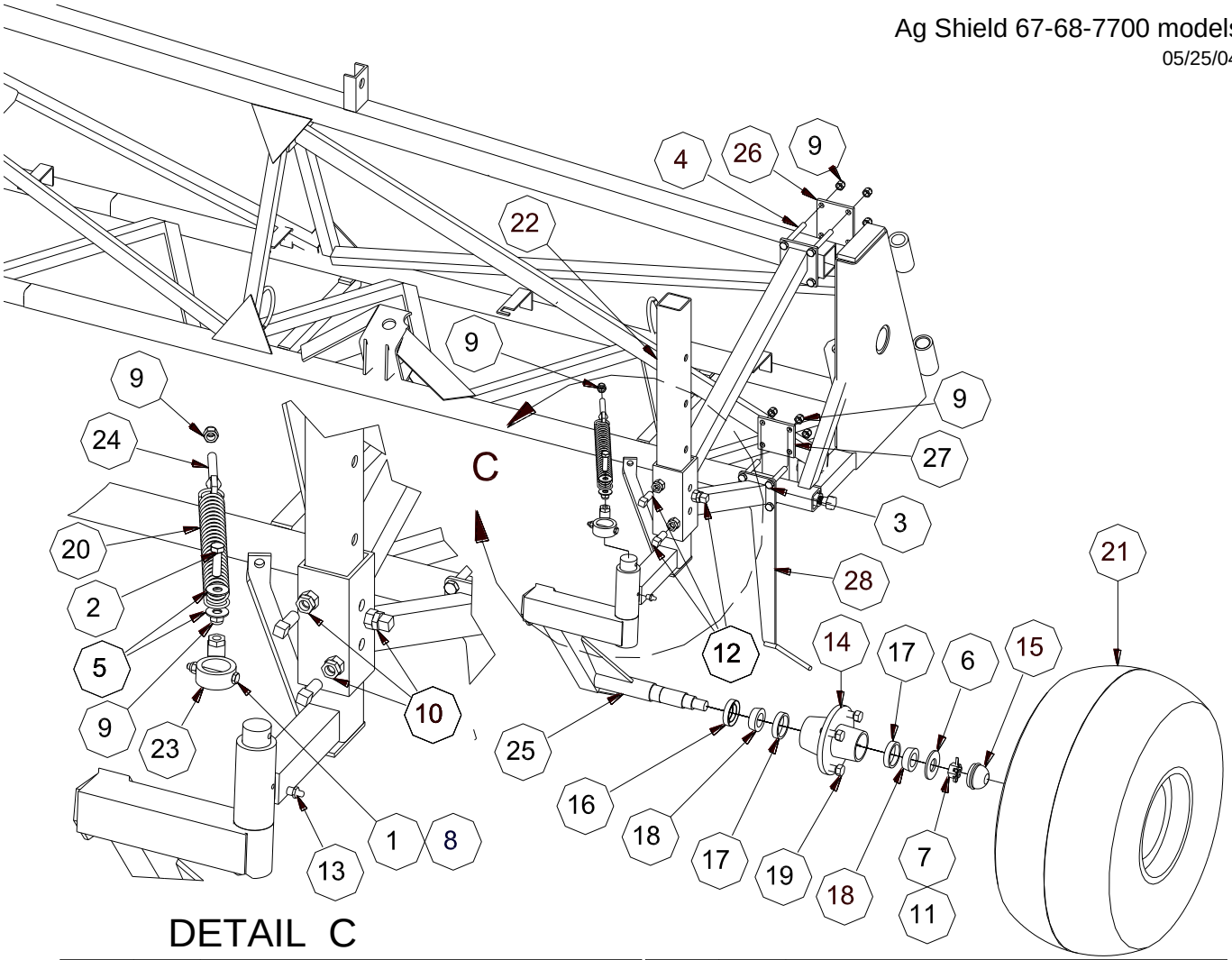


5.6.2 GFS WHEEL MOUNT ASSEMBLY

227538 GFS Piviot Wheel and Truss Mount Assembly

Ag Shield 67-68-7700 models

05/25/04



DETAIL C

ITEM	QTY	PART NUMBER
1	2	100408 bolt 1-4 X 2 1-4 nc
2	2	100603 bolt 3-8 X 1 1-4 gr5 pltd nc
3	4	100608 bolt 3-8 X 2 1-2 gr5 pltd nc
4	4	100611 bolt 3-8 X 3 1-4 gr5 pltd nc
5	4	101105 flat washer 3-8
6	1	101108 washer flat 34 in
7	1	102111 castle nut 3 4 inch
8	2	102121 nut nylok 1-4 nc gr5 pltd
9	12	102123 nut nylok 3-8 nc gr5 pltd
10	3	102134 nut 1/2 NF jam 1/2 hgt pltd
11	1	104902 COTTER PIN 1 8 X 1 1 4
12	3	105510 set screw sq head 1/2 nc x 1
13	1	105607 grease nipple 125 MPT str
14	1	113603 Hub HD211 4 bolt
15	1	113604 dust cap dc 11

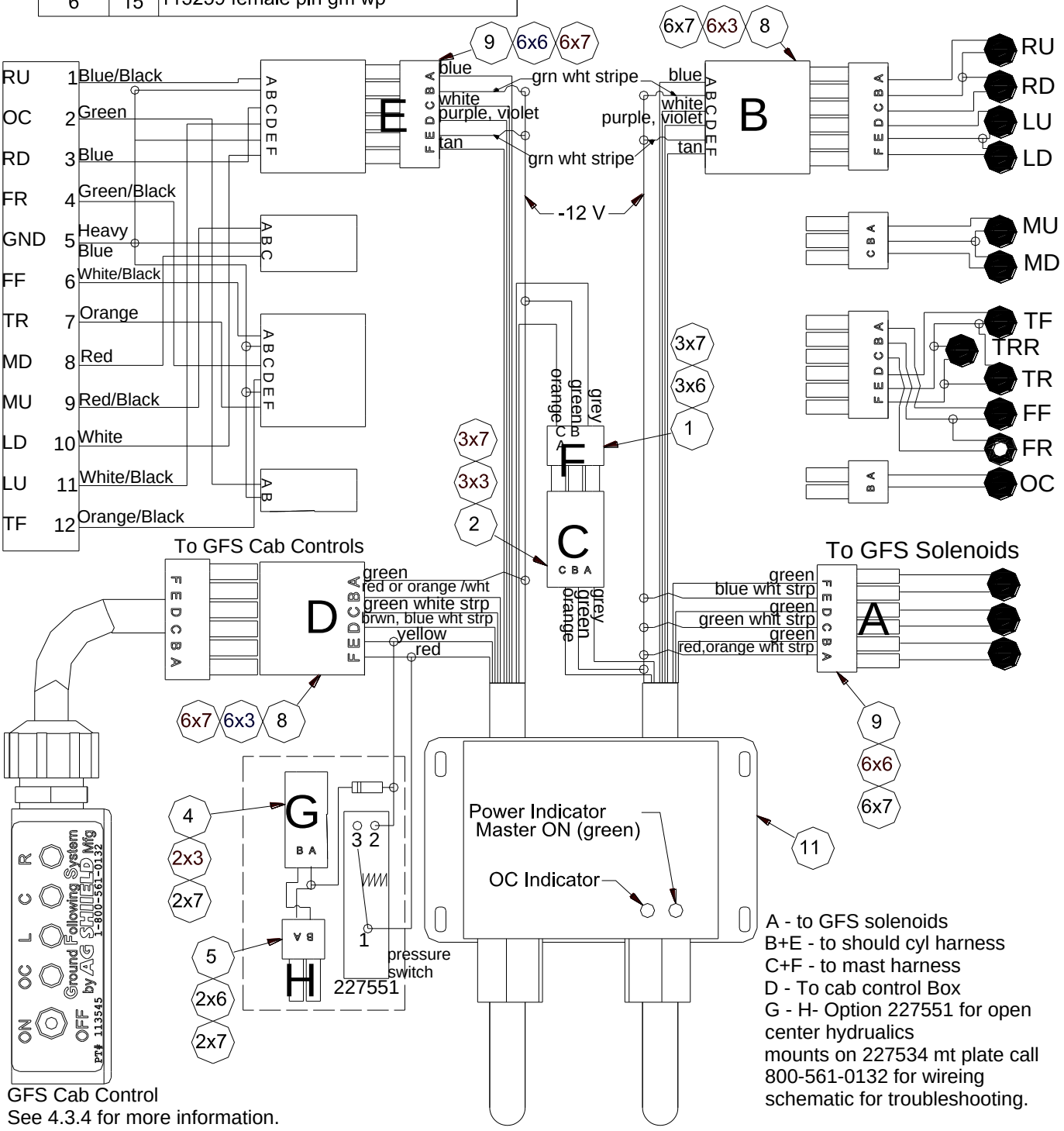
ITEM	QTY	PART NUMBER
16	1	113605 SEAL CR 67 298 CTD SE10
17	2	113606 bearing cup
18	2	113607 bearing cone L 44643
19	4	113609 wheel bolt 1/2 NF X 1 WB10
20	2	113946 spring ext 8.5 lg x 1od
21	1	113970 tire AT22X11 8 c w 4bolt rim
22	1	227565 hgt adjust GFs pivot wheel
23	1	227576 lock collar
24	2	227585 draw bolt
25	1	227590 axle gsf pivot
26	2	227668 bolt plate truss mnt
27	1	227669 bolt plate truss mnt lower
28	1	227683 truss mnt gfs wheel LH
	1	227684 truss mnt gfs wheel RH

5.6.3 GFS ELECTRICAL

I

ITEM	QTY	PART NUMBER
1	2	113208 three cavity tower gm wp
2	2	113209 three cavity shroud gm wp
3	15	113254 male pin gm wp
4	2	113255 two cavity shroud gm wp
5	2	113256 two cavity tower gm wp
6	15	113259 female pin gm wp

ITEM	QTY	PART NUMBER
7	27	113261 grey wire seal
8	4	113270 6 pin gm weather pack shroud
9	4	113271 6 pin gm weather pack tower
10	2	113276 blue wire seal
11	1	227550 Junction Box



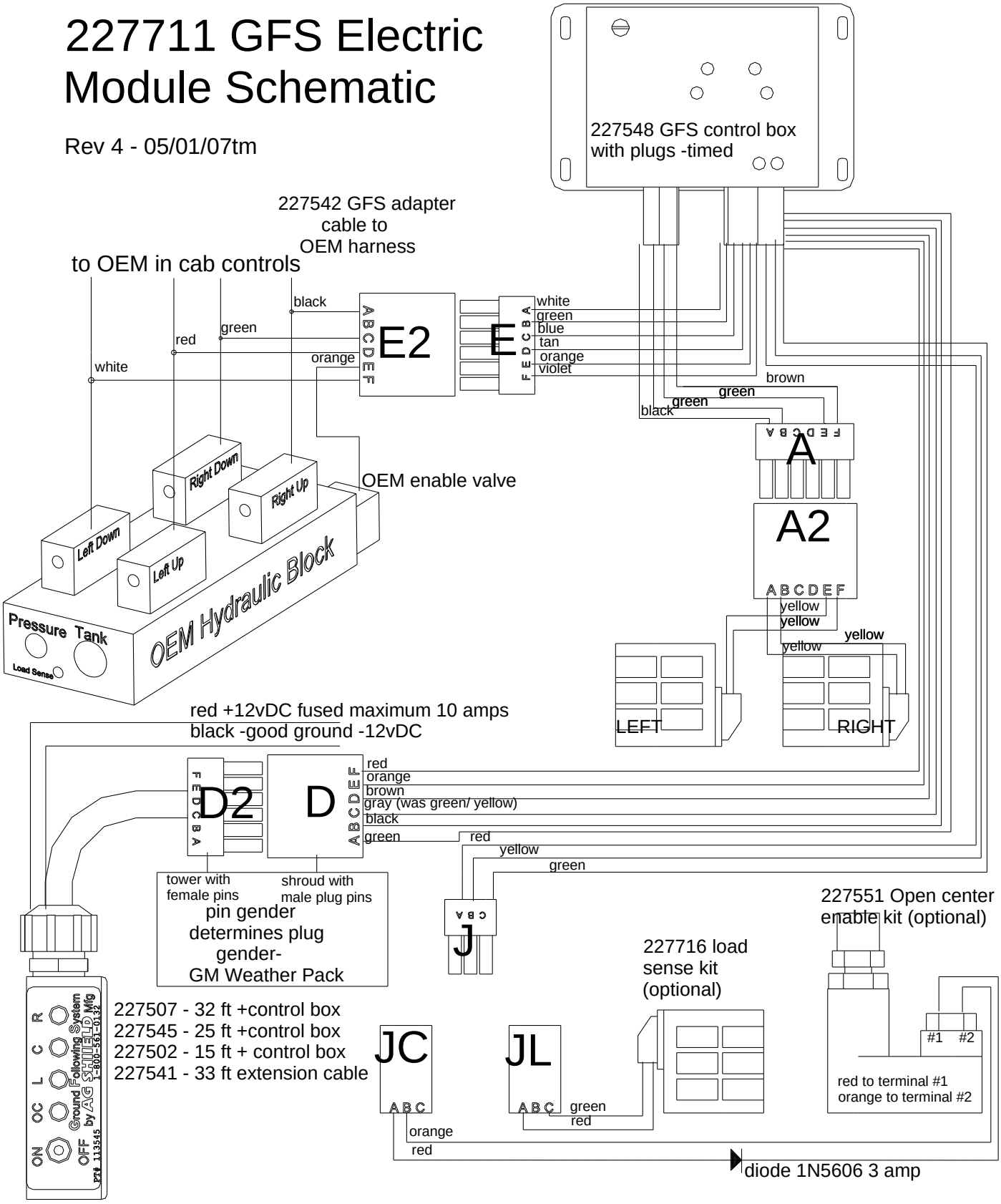
GFS Cab Control
See 4.3.4 for more information.

A - to GFS solenoids
B+E - to should cyl harness
C+F - to mast harness
D - To cab control Box
G - H- Option 227551 for open center hydrualics
mounts on 227534 mt plate call 800-561-0132 for wireing schematic for troubleshooting.

5.6.4 GFS Wiring Schematic 2006 +

227711 GFS Electric Module Schematic

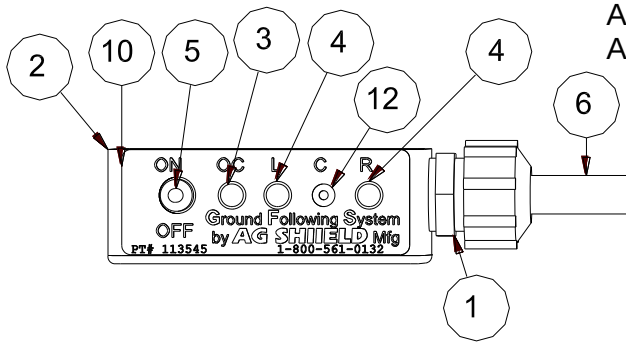
Rev 4 - 05/01/07tm



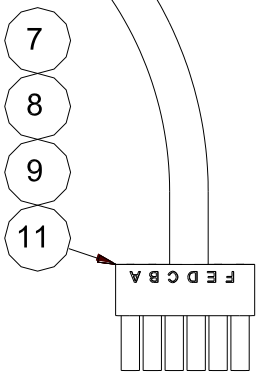
5.6.5 GFS CAB CONTROL BOX

GFS cab control box #227502 Rev 2 Mar, 2008

ASM carts without 4 wheel drive tractors get 15' #227502
ASM carts with 4 wheel drive tractors get 25' #227545
All others 32' #227507

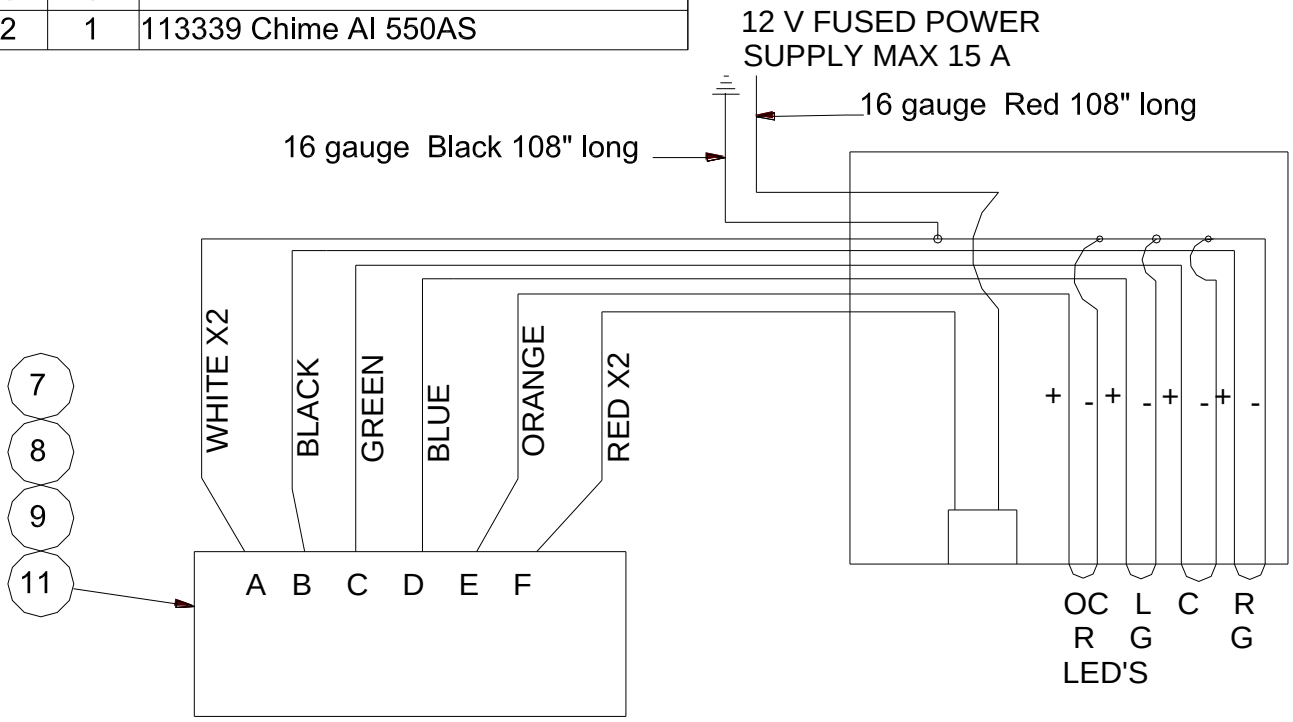


Parts List		
ITEM	QTY	PART NUMBER
1	1	113342 strain relief
2	1	227540 switch and LED box
3	1	113496 LED red
4	2	113495 LED green
5	1	113371 switch SP ST
6	1	113363 18 -8C type SOOW 15ft
7	4	113261 grey wire seal
8	6	113259 female pin GM WP
9	2	113276 Blue wire seal
10	1	113545 GFS decal
11	1	113271 6 pin gm weather pack tower
12	1	113339 Chime AI 550AS



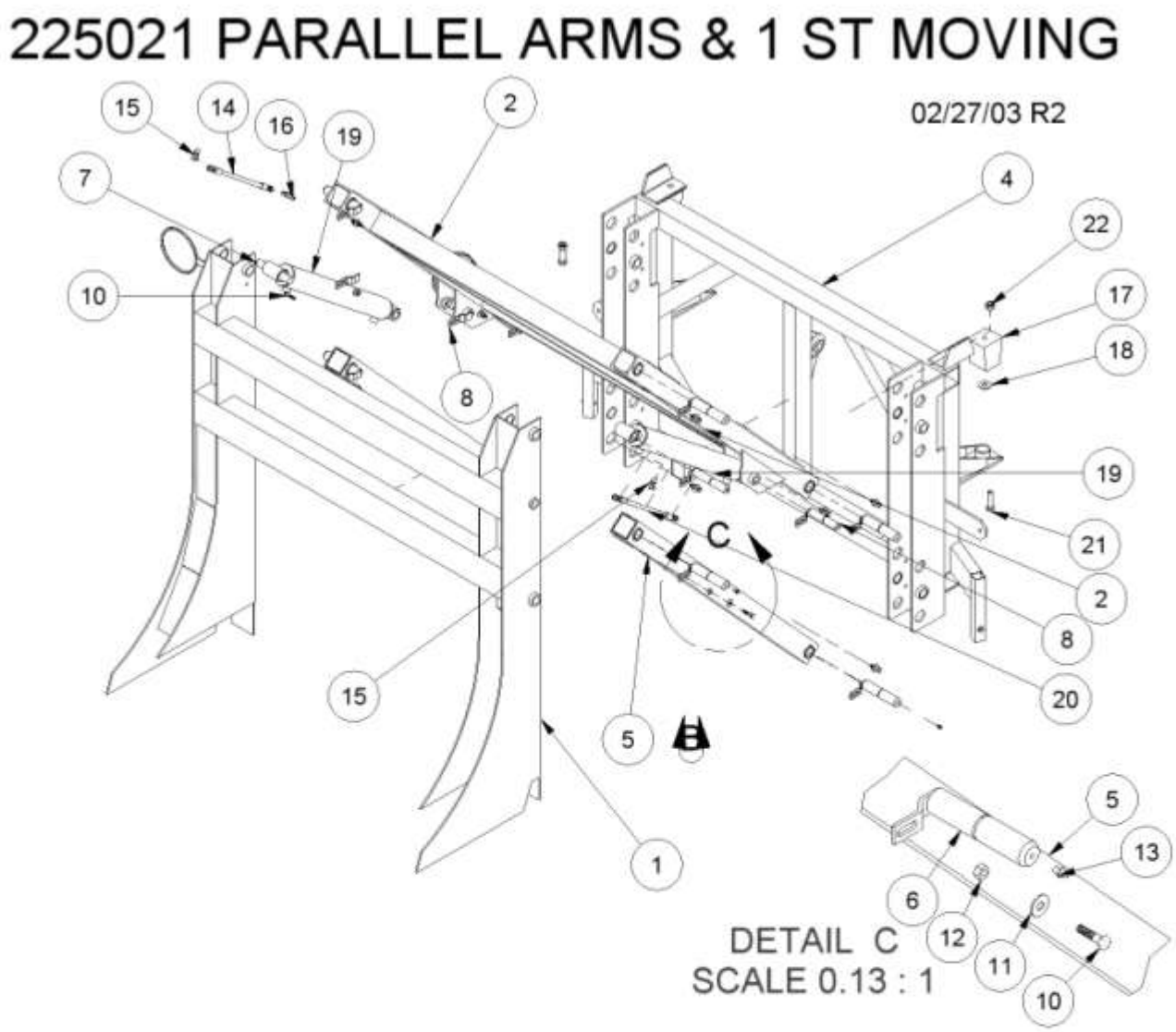
Note: stamp D2 onto plug

D2



6 PARTS

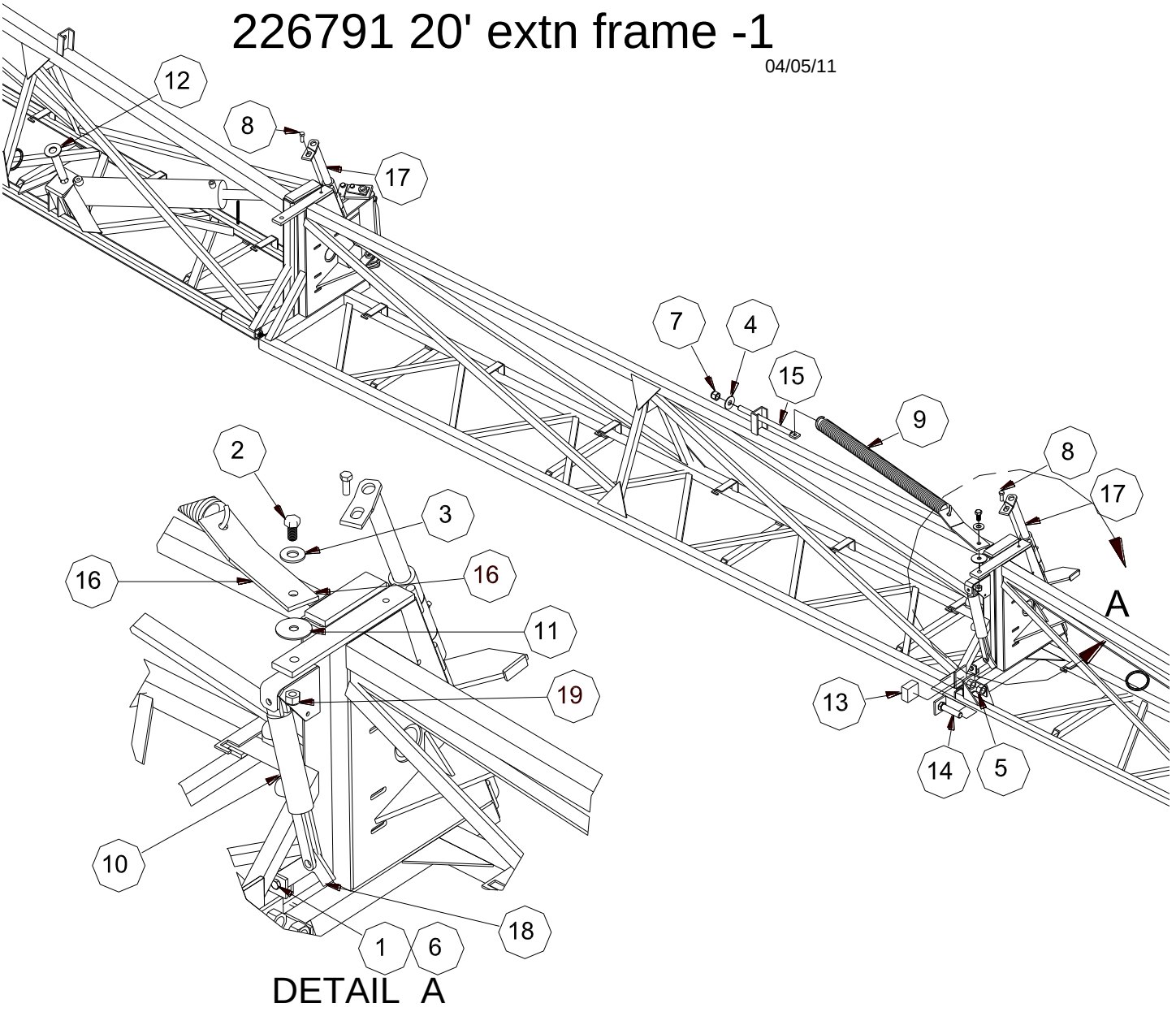
6.1 225021 PARALLEL ARM MAST AND 1ST MOVING



225021 PARALLEL ARMS & 1 ST MOVING		
ITEM	QTY	PART NUMBER
1	1	221100 boom mt pa CART02
2	1	233327 prll arm wldt up CT02
3		233327 prll arm Apache 790
4	1	233300 1ST moving pa A790HI
5	2	233258 arm prll low ASM & Apache
6	8	233370 pin first moving A790
7	2	233380 pin 1x 6 cyl lift up pa A790
8	2	233371 pin 1 5 cyl lift up pa A790
9		*SEE HYD SECTION PAGE 4.8*
10	12	100604 BOLTS 3 8NC 1 1 2 GR5 PLT D HEX
11	12	101105 washer flat 38

225021 PARALLEL ARMS & 1 ST MOVING		
ITEM	QTY	PART NUMBER
12	12	102123 NUT 3 8 NYLOC NC
13	12	105607 grease niple 125 MPT ST
14	1	117841 HOSE 1 4 X24 06 FJICSX06F JICS
15	2	117973 06 ORB MALE X 06 JIC MALE 90
16	1	118060 tee 06mpt x 06 mjic x 06mjic
17	2	223348 bumper block rubber
18	2	101107 WASHER FLAT 5 8
19	2	117990 CYLhtd 25x18 ctube assy
20	1	117827 HOSE 1 4 X60 06 FJICSX06F JICS
21	2	100804 BOLT 5 8 X 2 5 NC
22	2	102127 nut 58 nc nylock

6.2 226791 EXTENSION 20FT FOR 7700 BOOM

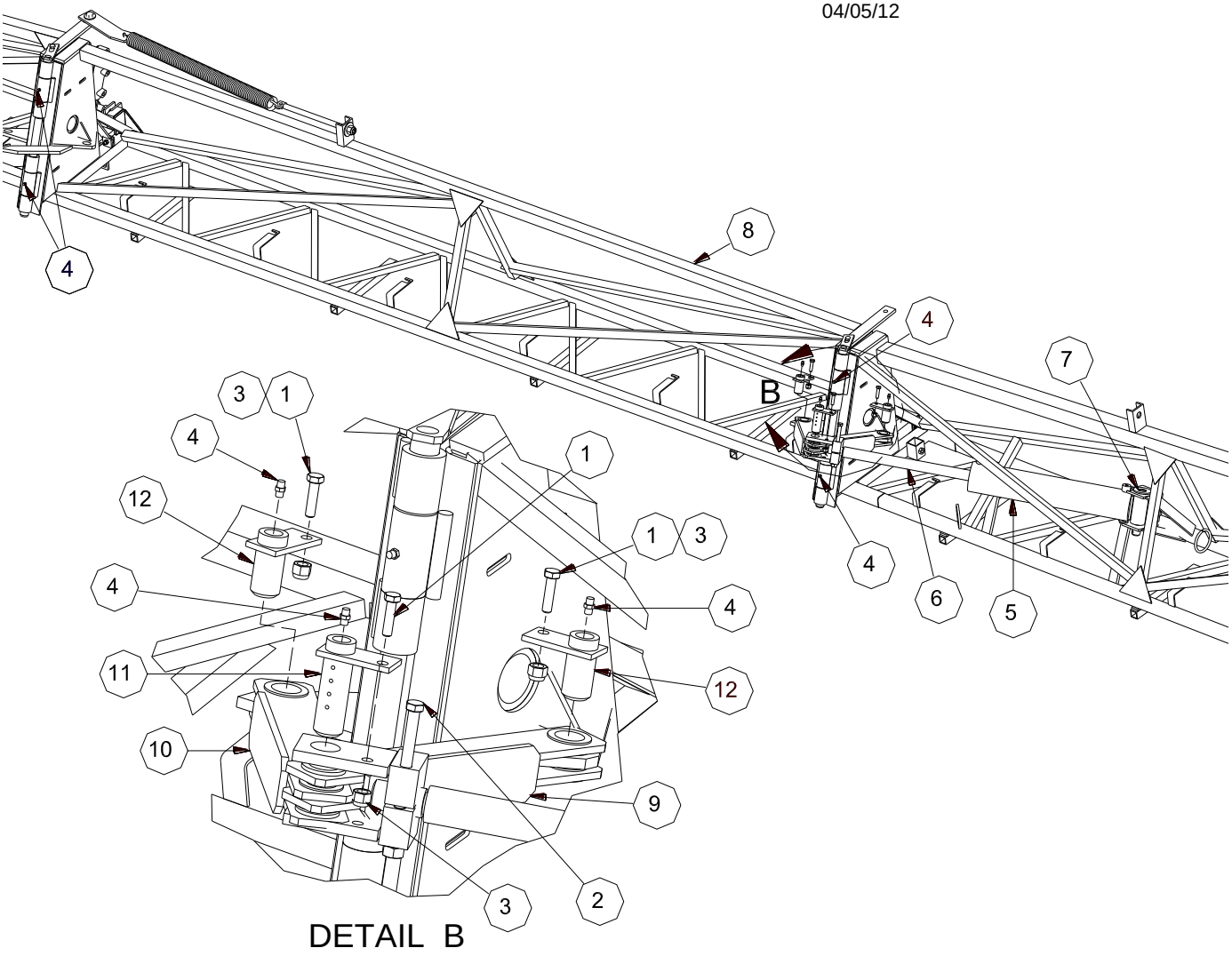


ITEM	QTY	PART NUMBER
1	4	100504 bolt 5/16X1 1/4 gr5 pltd nc
2	1	100701 bolt 1/ 2 x1 nc hex
3	1	101106 washer flat 1/2
4	1	101107 flat washer 5/8
5	1	102109 nut 3/4 nc std
6	1	102122 nut nylok 5/16 nc gr5 pltd
7	1	102127 nut nylok 5/8 nc gr5 pltd
8	2	103218 bolt 3/8 x 1 hex threading
9	1	113944 SPRING EXT
10	1	117935 cylinder tip lock 1X3

ITEM	QTY	PART NUMBER
11	1	208212 washer 2 od x1/2 id plastic
12	1	223169 pin wldt fold cyl wb
13	1	223170 composit rubber pad
14	1	223173 adjustable stop rubber
15	1	223725 bolt wldt breakaway spring
16	1	223783 swivel extn break spring
17	2	223803 pin wldt hinge 1 OD RH
	2	223802 pin wldt hinge 1 OD LH
18	1	228201 hook tip lock

226791 20' extn frame -2

04/05/12



DETAIL B

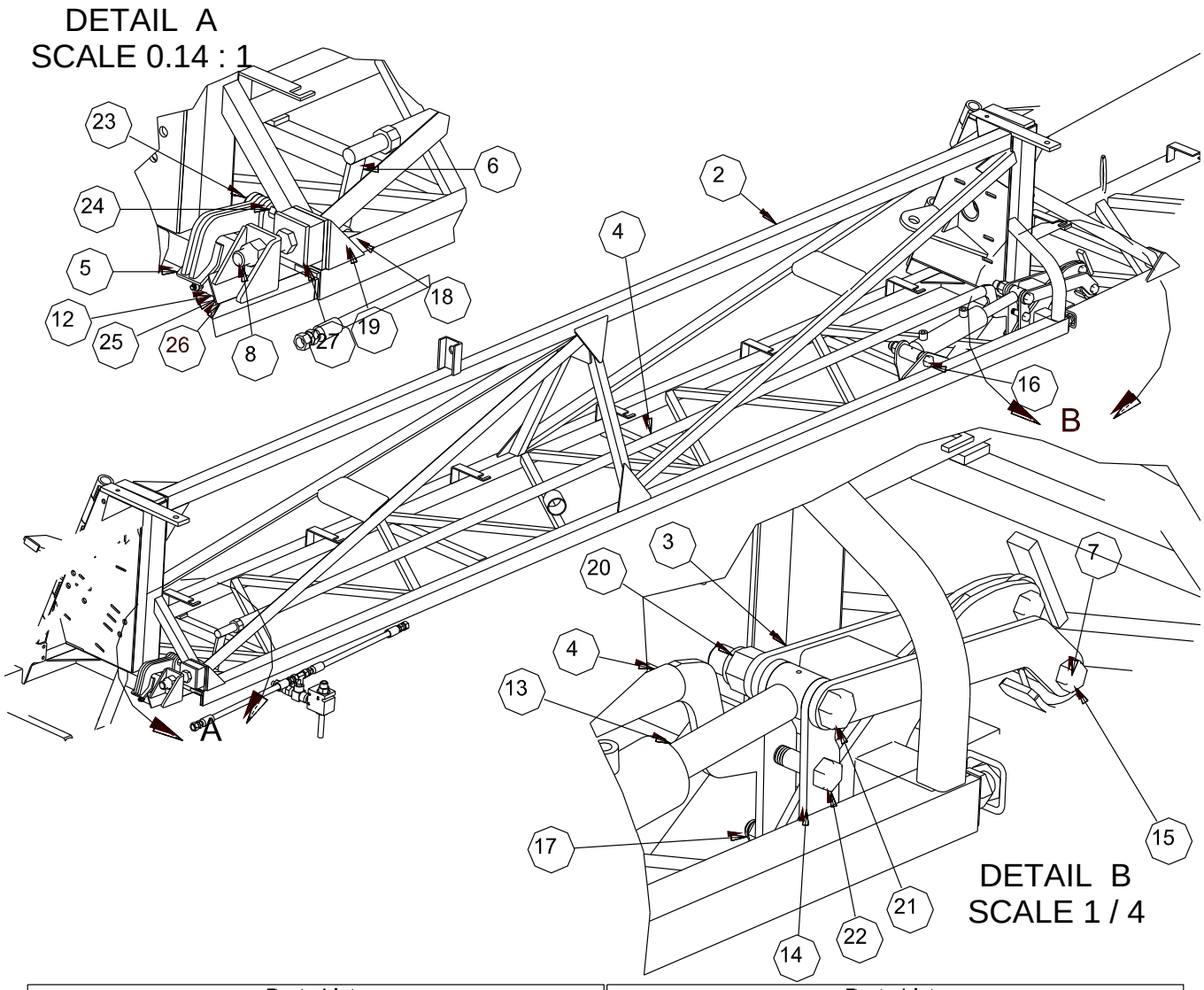
Parts List		
ITEM	QTY	PART NUMBER
1	4	100504 bolt 5-16 X 1 1-4 gr5 pltd nc
2	1	100642 bolt 3-8 X 3 1-2 gr8 pltd nf
3	3	102123 nut nylok 3-8 nc gr5 pltd
4	7	105609 grease zerk
5	1	117872 tip fold cyl 3 25 x15 625
	1	117873 seal kit for 3.25 cylinder
6	1	117874 tip fold 3 25 shaft

Parts List		
ITEM	QTY	PART NUMBER
7	1	223169 pin wldt fold cyl wb
8	1	227600 6 nozzle mid extension
9	1	228600 fold arm wldt 11 rein wear base
10	1	228605 fold arm wldt 10 rein wear base
11	1	228615 pin wldt grease cyl clevis
12	2	228619 grease pin tip fold

6.3 EXTENSION ELECTRICAL AND HYDRAULIC COMPONENTS

20ft Extension Kit

Part# 226791 Rev.2 031405dk



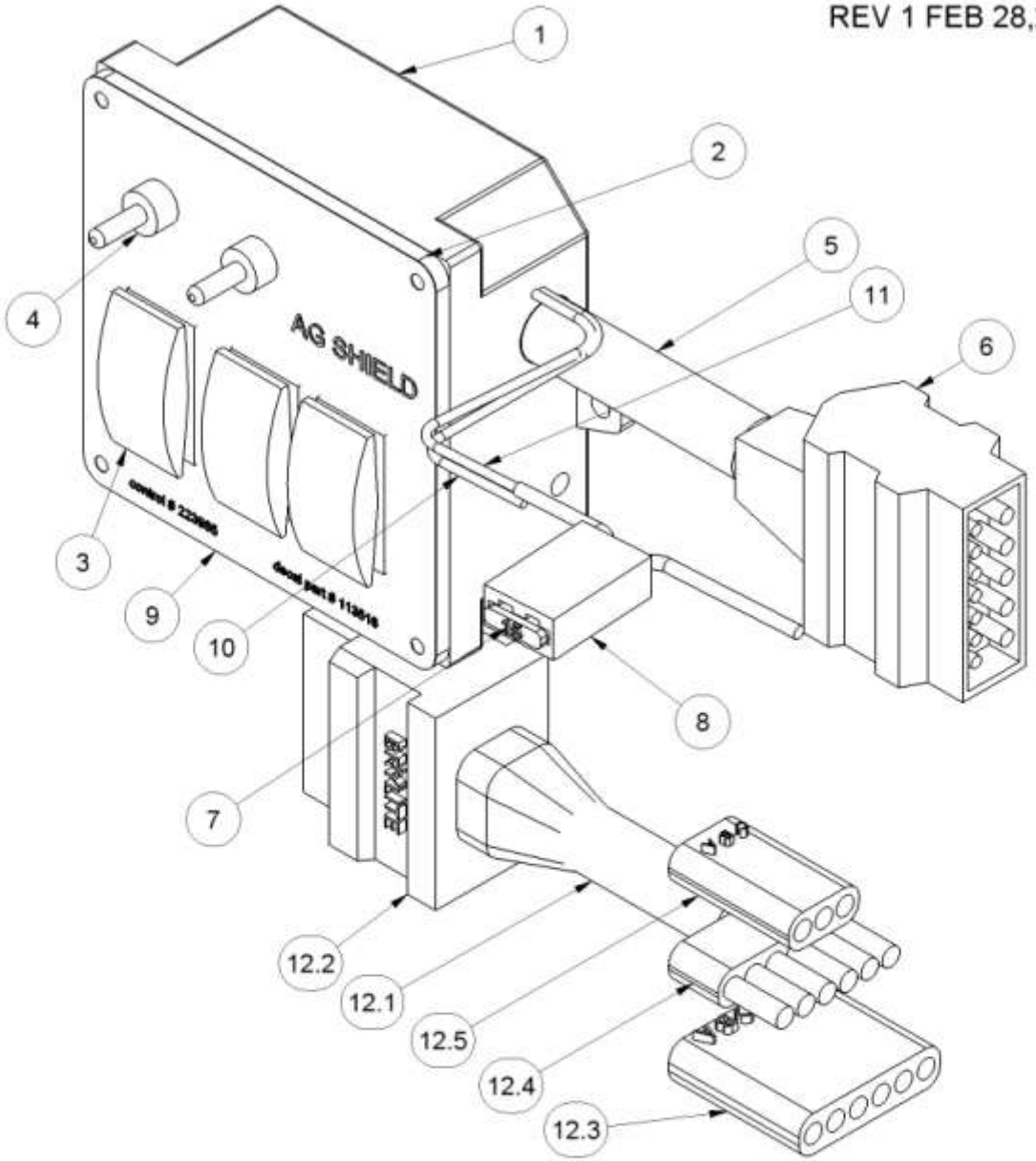
Parts List		
ITEM	QTY	PART NUMBER
1	1	227600 6 nozzle mid extension
2	1	227599 6 nozzle mid extension RH
3	2	228292 bl plate side clevis wldt
4	2	228285 rod push lock wldt
5	2	228213 hook tip lock wldt
6	2	228288 rod adjust lock wldt
7	1	228413 cam lock 10ft ext wldt
8	2	223173 adjustable stop rubber
9	1	228422 cam lock 10ft ext wldt LH
10	1	228427 hydraulic kit 20ft ext
11	1	228428 electrics kit - 20ft ext
12	2	228218 guard lock alum tip
13	2	228424 cyl shaft 10ft ext lock x_tube cut down
14	4	228280 lever ext lock
15	2	100706 BOLT 1 2NC 3 1 2 GR5 PLTD HEX

Parts List		
ITEM	QTY	PART NUMBER
16	2	100904 BOLT HEX HEAD 3 4 X 4 1 2 GR 5
17	2	100704 BOLT 1 2NC 2 1 2 GR5 PLTD HEX
18	4	100702 BOLT 1 2NC 1 1 2 GR5 PLTD HEX
19	10	102125 12 NYLOCK
20	6	102128 nut3 4 nylock gr 5 pltd
21	2	100903 BOLT HEX HEAD 3 4 X 4 GR 5
22	2	100705 BOLT 1 2NC 3 GR5 PLTD HEX
23	2	100604 BOLTS 3 8NC 1 1 2 GR5 PLTD HEX
24	2	102120 3 8 NC NUT stover lock pltd
25	4	100408 BOLTS 1 4NC 2 1 4 GR5 PLTD HEX
26	6	102121 nut 1 4 nc nylock gr 5
27	2	223170 composit rubber pad
28	2	101103 flat washer 1 4
29	2	100405 BOLTS 1 4NC 1 1 2 GR5 PLTD HEX
30	2	102151 nut 3-4 nc JAM nut

6.4 AG SHIELD SWITCH BOX AND CABLES FOR BOOM CONTROL

223985 SWITCH BOX FLOATING BOOM

REV 1 FEB 28,2003

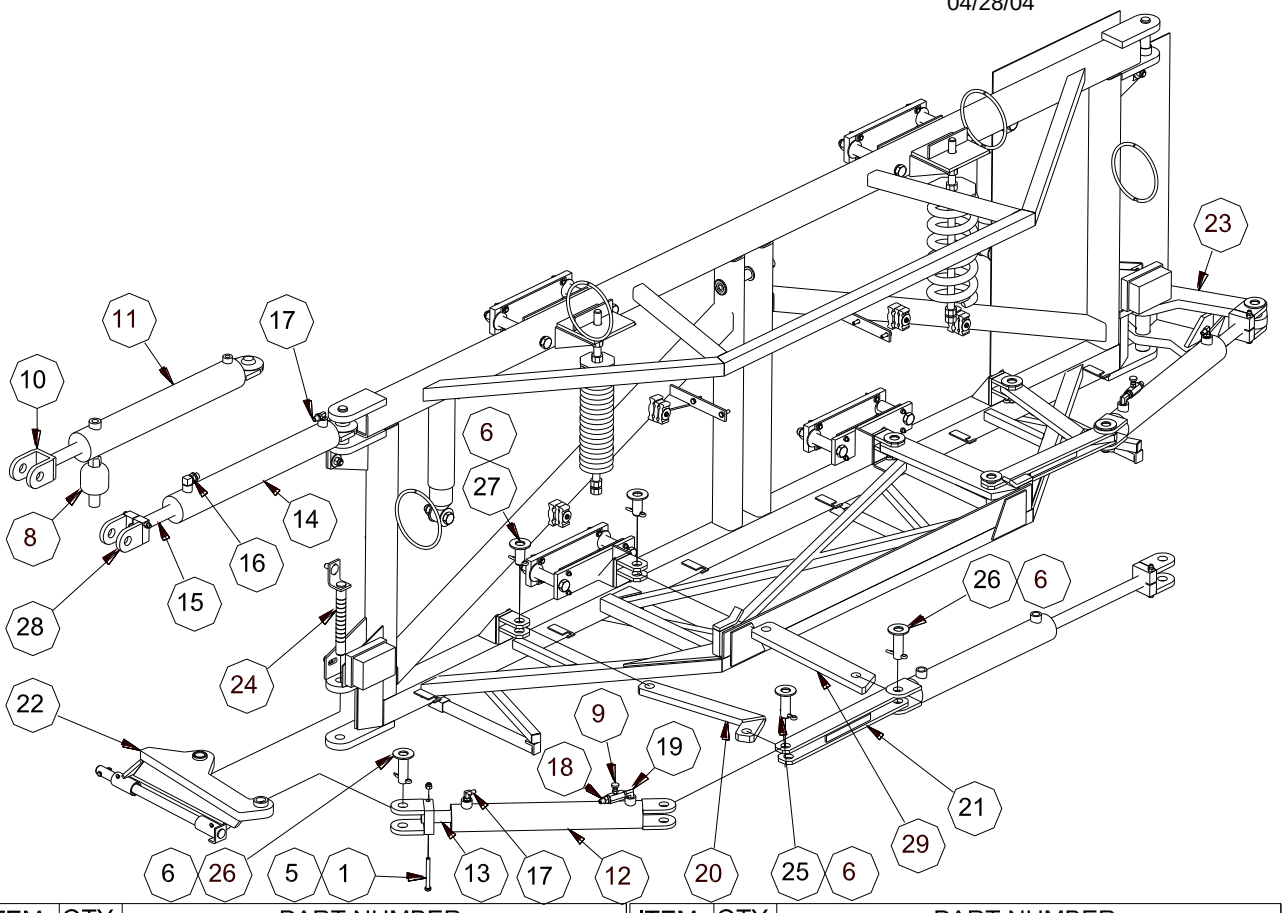


Parts List			Parts List		
ITEM	QTY	PART NUMBER	ITEM	QTY	PART NUMBER
1	1	228115 box 5x5x2 pvc control holes	10	1	113476 wire 16 ga black stranded
2	1	113331 switch box cover fltg boom	11	1	113478 wire 16 ga black stranded
3	3	113375 switch rocker dpdt 20amp	12	1	223986 wiring harness fltg cart 35ft
4	2	113373 switch dpdt mom on toggle	12.1	1	113368 wire cable 16ga 12 cond
5	1	113368 wire cable 16ga 12 cond	12.2	1	113252 plug brylite 12 pin female
6	1	113252 plug brylite 12 pin male	12.3	1	113270 6 pin gm weather pack shroud
7	1	113267 fuse ATO 15 amp	12.4	1	113271 6 pin gm weather pack tower
8	1	113285 fuse holder in line ATO 30A	12.5	1	113209 three cavity shroud gm wp
9	1	113516 decal switch box cover fltg			

6.5 CENTER SECTION-2ND MOVING

Floating Boom Second Moving -1

04/28/04

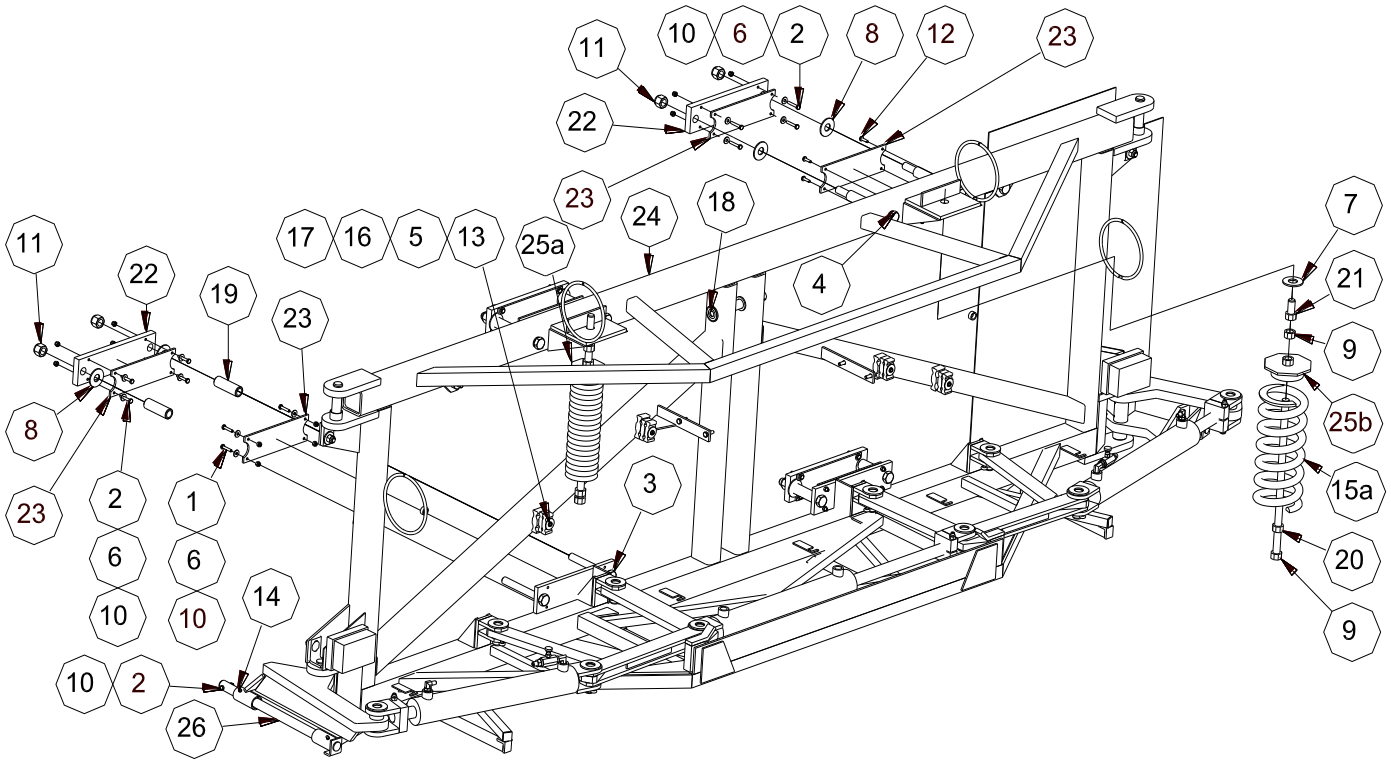


ITEM	QTY	PART NUMBER
1	4	100642 bolt 3-8 X 3 1-2 gr8 pltd nf
2	2	100821 bolt 9-16 X 3 1-2 gr5 pltd nc
3	2	101107 flat washer 5-8
4	2	102126 nut nylok 9-16 nc gr5 pltd
5	4	102139 nut nylok 3-8 nf
6	10	104907 cotter pin 1 4 X 2 5
7	2	113898 gas shock
8	1	117695 accumulater 10 ci 0 531 600 503
9	2	117698 restrictor needle valve N20SK
10	1	117877 1.25 x 18 cyl rod
11	1	117878 cyl barrel 2.75 x 18
	1	117879 seal kit 2.75 x 18
12	3	117915 HYD CYL 2.5 X 15.5 FOLD BR
13	3	117916 shaft w welded clevis
	3	117917 seal kit 2.5 x 15.5
14	1	117920 brl cyl hyd 2.5 x 18 r7 25asm 18
15	1	117921 shaft cyl 2.5 X 18 shoulder 1.25 dia

ITEM	QTY	PART NUMBER
	1	117922 seal kit 2.5 x 18 shlder
16	1	117961 adapter 90 deg 08morb x 06mjic
17	3	117973 06 ORB MALE X 06 JIC MALE 90
18	2	118177 ADAPTER STR 04 MPT X 06 MJIC
19	2	118215 adapter elbow 06 MORB x 04 JIC
20	2	223992 BREAKAWAY ARM WLDT
21a	2	223995 linkage arm wldt breakaway 2 in
21b	2	223996 linkage arm wldt breakaway
22	1	225476 HINGE WLDT IN LH BOOM 120
23	1	225477 HINGE WLDT IN RH BOOM 120
24	2	225552 PIN WLDT LOWER VERT HING
25	2	225554 pin wldt breakaway cyl BL end
26	4	225556 pin wldt breakaway cyl ram end
27	4	225558 PIN WLDT FRONT BREAKAWAY
28	1	225580 clevis wldt FL boom shldr cyl
29	2	228125 breakaway linkage arm 3 in

21a 223995 is used on all booms 90 ft and less, while 21b 228125 is used on all boom 100 ft and longer.

Floating Boom Second Moving - 2 04/28/04



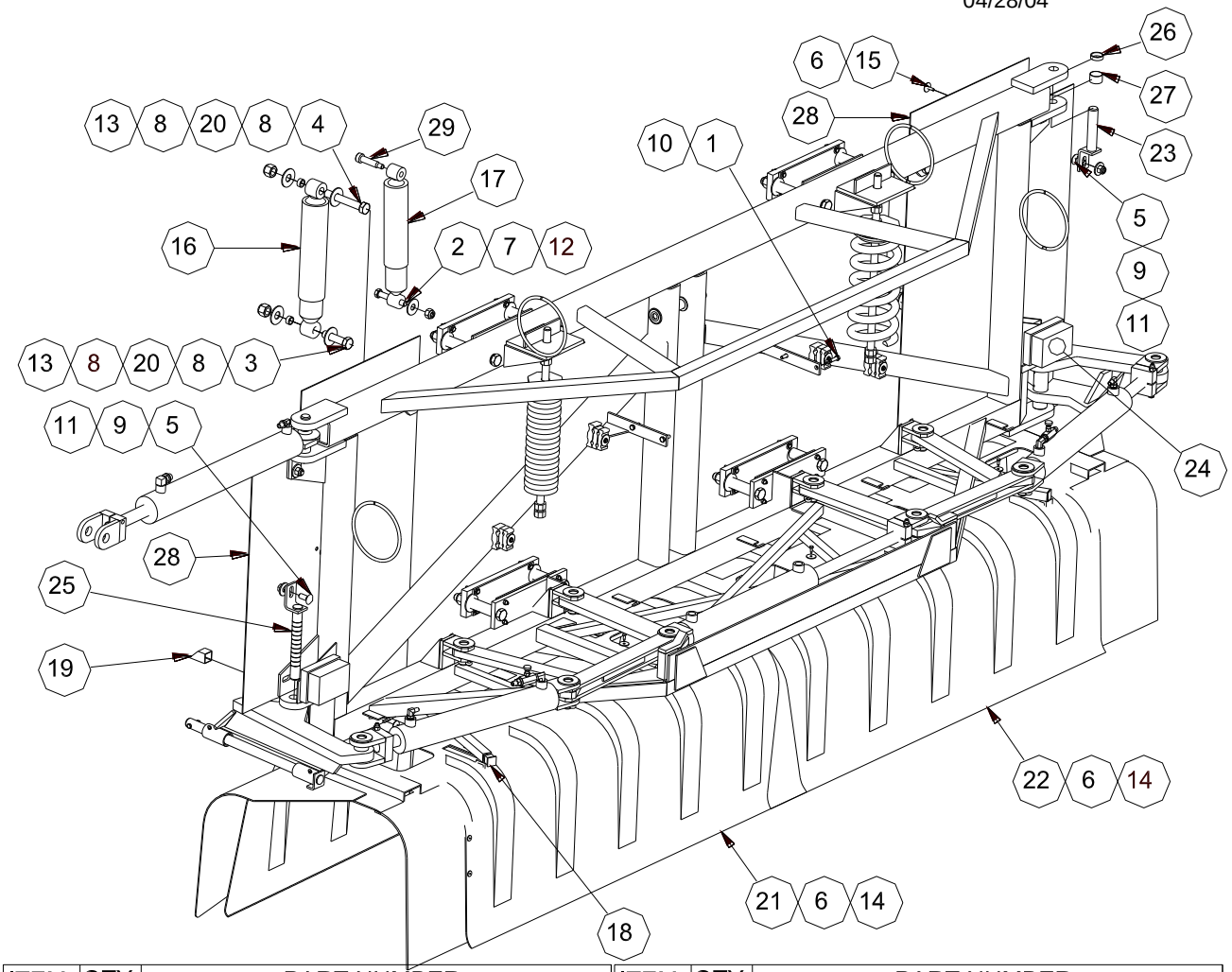
ITEM	QTY	PART NUMBER
1	8	100404 bolt 1-4 X 1 1-4 nc
2	18	100405 bolt 1-4 X 1 1-2 gr5 pltd nc
3	4	100908 bolt 3-4 X 6 gr5 pltd nc
4	4	100913 bolt 3-4 X 8 1-2 gr5 pldt nc
5	4	101101 fender washer 1-4 x 1 1-4
6	24	101103 flat washer 1-4
7	3	101108 washer flat 34 in
8	7	101118 SAE washer 3-4
9	4	102109 nut 3 4 nc
10	26	102121 nut nylok 1-4 nc gr5 pltd
11	12	102128 nut nylok 3-4 nc gr5 pltd
12	16	103212 screw sm d t 14 x 1 lg
13	4	103215 screw d t 14 x 4 lg
14	4	105609 grease zerk

ITEM	QTY	PART NUMBER
15a	1	113942 spring 812-5424-68-123C
15b	1	113943 SPRING 562 3 50 OD 11T 12 1 4
16	8	128106 HOSE HOLDER
17	4	128108 HOSE HOLDER LARGE
18	1	207605 PIN CYL PIVOT BLOCK WLDT
19	4	223417 bushing upper slider bolt 2nd mvg
20	2	223455 bolt spring wild tension adjust
21	2	223457 pin guide wldt leveling spring
22	4	223650 backg plate bolt on
23	8	223651 slider plastic 4 hole FL boom
24	1	225000 FRAME WLDT 2ND MOVING
25a	1	223564 lvling spring brckt wldt FL bm
25b	1	225143 retainer spring 77
26	2	225550 PIN WLDT INNER HING

15a 113942 spring and 25a 223564 retainer are on all 90 ft or less booms, and are replaced by 15b 113943 spring, and 25b retainer on the 100' and longer booms.

Floating Boom Second Moving -3

04/28/04



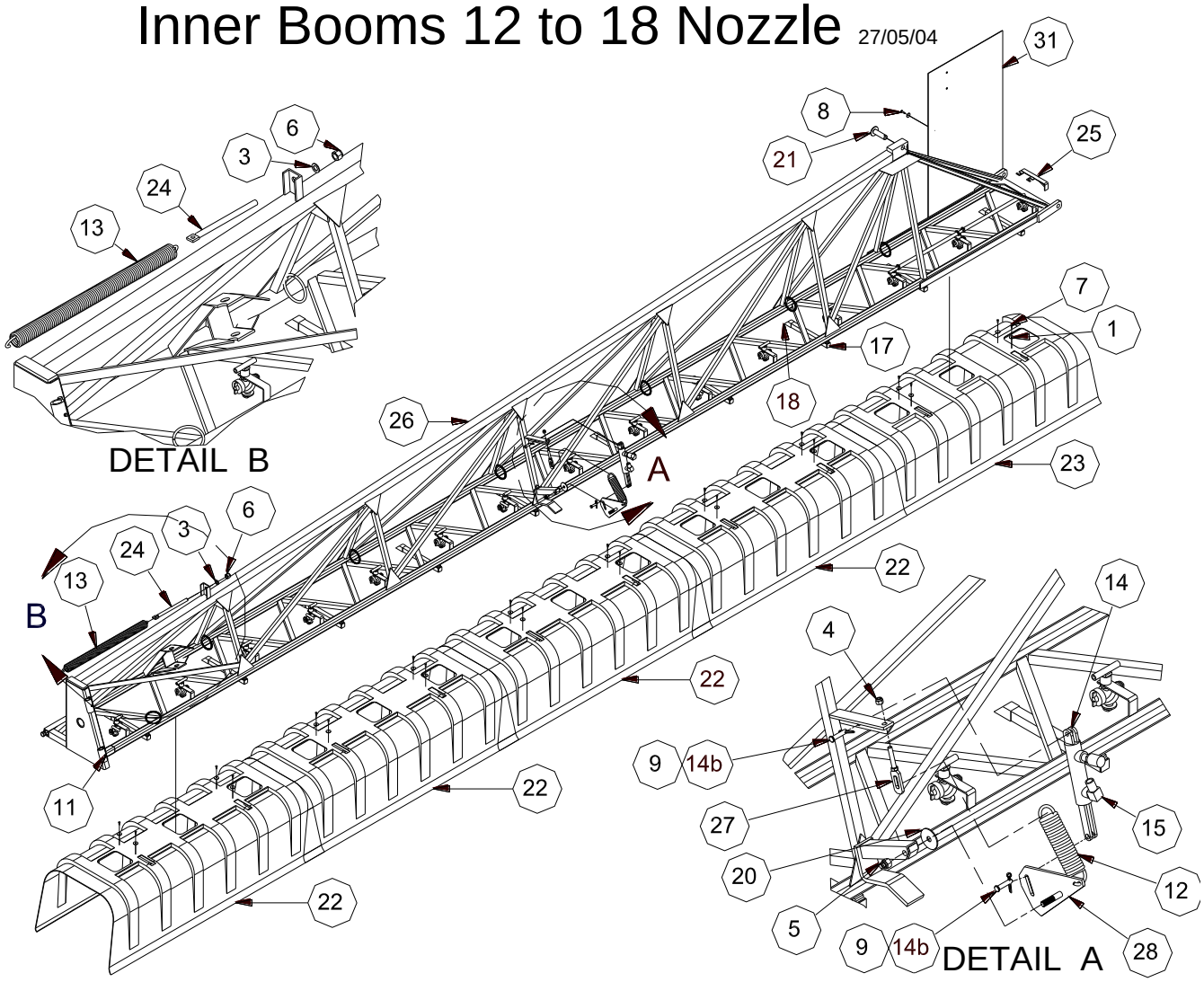
ITEM	QTY	PART NUMBER
1	4	100503 bolt 5/16 X 1 gr5 pltd nc
2	2	100821 bolt 9/16 X 3 1/2 gr5 pltd nc
3	2	100902 bolt 3/4 X 3 gr5 pltd nc
4	2	100907 bolt 3/4 X 5 gr5 pltd nc
5	4	100948 carriage bolt 1/2 X 1 1/4 nc pltd
6	16	101102 fender washer 3/16 x 1
7	2	101107 flat washer 5/8
8	8	101108 flat washer 3/4
9	4	101116 SAE washer 1/2
10	4	101143 lock washer 5/16
11	4	102125 nut nylok 1/2 nc gr5 pltd
12	2	102126 nut nylok 9/16 nc gr5 pltd
13	12	102128 nut nylok 3/4 nc gr5 pltd
14	8	103206 12 x 3/4 DRILL TAP
15	16	103212 screw sm d t 14 x 1 lg

ITEM	QTY	PART NUMBER
16	2	113897 shock absorber 83309
17	2	113898 gas shock
18	8	128062 1x1 sq tub cl240 13 ga
19	4	128118 cap 1 X 45 deg black durometer
20	4	223379 SPACER SHOCK ABSORBER
21	1	223666 shield lh cntr fl bm
22	1	223667 shield rh cntr fl bm
23	2	223714 pin wldt upper vertical hinge
24	1	225130 light assy 7700 boom
25	2	225552 pin wildt verticle hinge
26	2	225570 spacer shldr cyl clvs upper
27	2	225571 spacer shldr cyl clvs lower
28	2	225575 mud guard cntr 6800 FL boom
29	2	ShoulderBolt_metric (with 113898)

113898 gas shock is used only on pre 2004 models, all newer models have the 113897 shock. If in doubt the second two numbers in the serial number of the boom give the year in which it was made.

6.6 INNER BOOM ASSEMBLY

Inner Booms 12 to 18 Nozzle 27/05/04



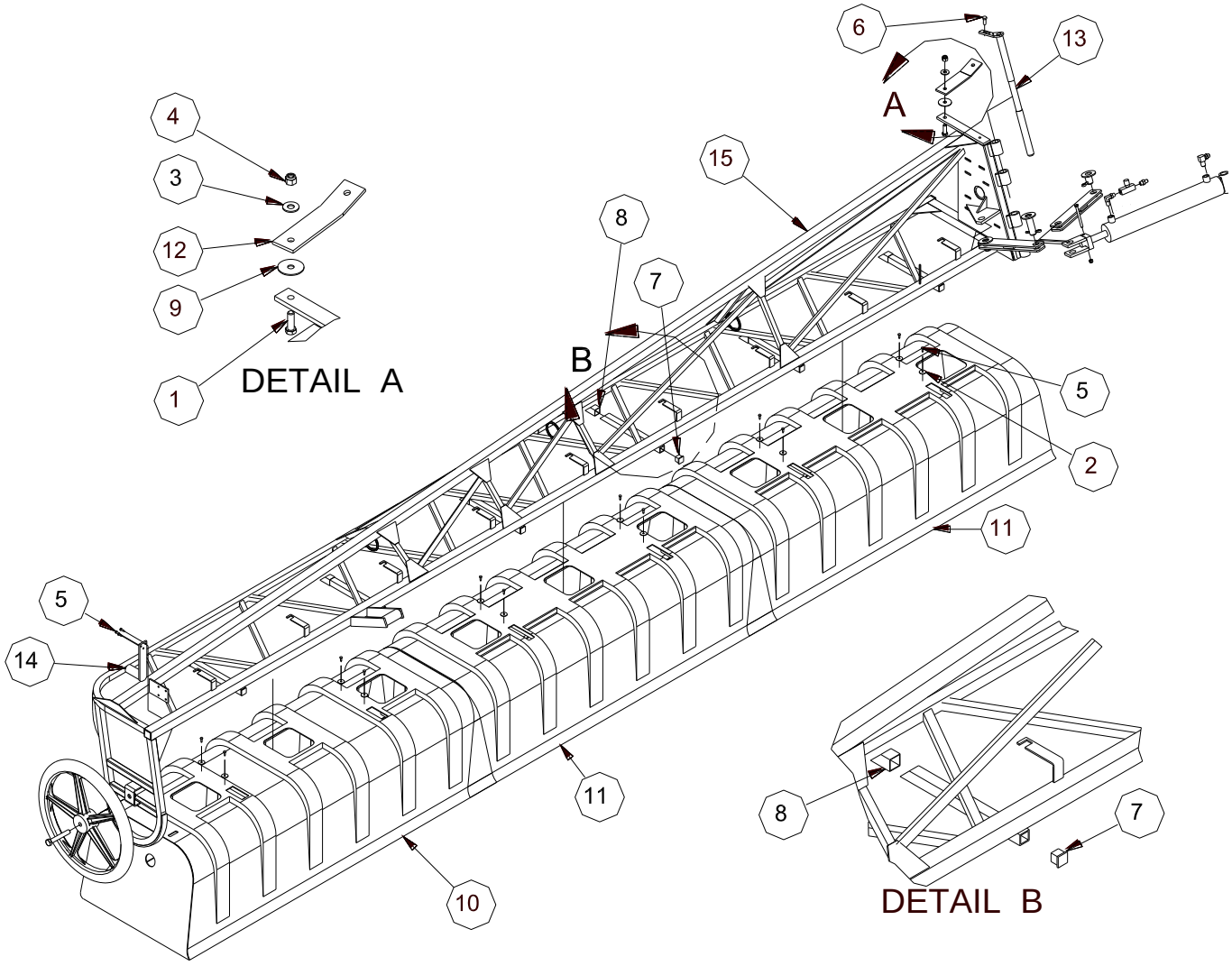
ITEM	QTY	PART NUMBER
1	8	101102 FENDER WASHER 0.188 X 1
2	2	101102 fender washer 3/16 x 1
3	1	101107 washer flat 5/8
4	1	102123 nut nylok 3/8 nc gr5 pltd
5	1	102125 nut nylok 1/2 nc gr5 pltd
6	1	102127 nut nylok 5/8 nc gr5 pltd
7	8	103206 12 x 3/4 DRILL TAP
8	2	103212 screw sm d t 14 x 1 lg
9	2	104190 cotter pin 1/8 X 1
10	1	104907 cotter pin 1/4 X 2.5
11	2	105609 grease zerk
12	1	113928 TIP LOCK SPRING
13	1	113944 SPRING EXT
14	1	117935 cyl tip lock 1X3 new 98 assm
14b	2	pins with tip lock cylinder
15	1	118121 swivel adaptor 1/4 mpt x 1/4 fps
16	1	118672 breather 06 ORB

ITEM	QTY	PART NUMBER
17	10	128062 plug for 1x1 sq tub cl240
18	10	128118 cap 1 X 45 deg black durometer
19	2	208005 1/2 hose reinforced ea 18.5
20	1	208212 WASHER PLASTIC 2 OD X 1/2 ID
21	1	208780 PIN WLDT SHOULDER CYL FLTG
22	4	223665 SHIELD ASSY STANDARD
23	1	2236689 shield assy inner end LH-RH
24	1	223725 bolt wldt breakaway spring
25	1	223749 nozzle hanger wldt double LH
	1	223750 nozzle hanger wldt double RH
27	1	223908 MOUNT TAB WLDT TIP LOCK
28	1	223949 LATCH WLDT TIP LOCK
31	1	225576 MUD GUARD WING 6800 FL BOOM
26	1	223851-2 boom inner 15 nozzle LH-RH
	1	225100-1 boom inner 12 nozzle LH-RH
	1	225200-1 boom inner 18 nozzle LH-RH

6.7 OUTER BOOM ASSEMBLY

Outer Boom 3 to12 Nozzle -1

05/10/04

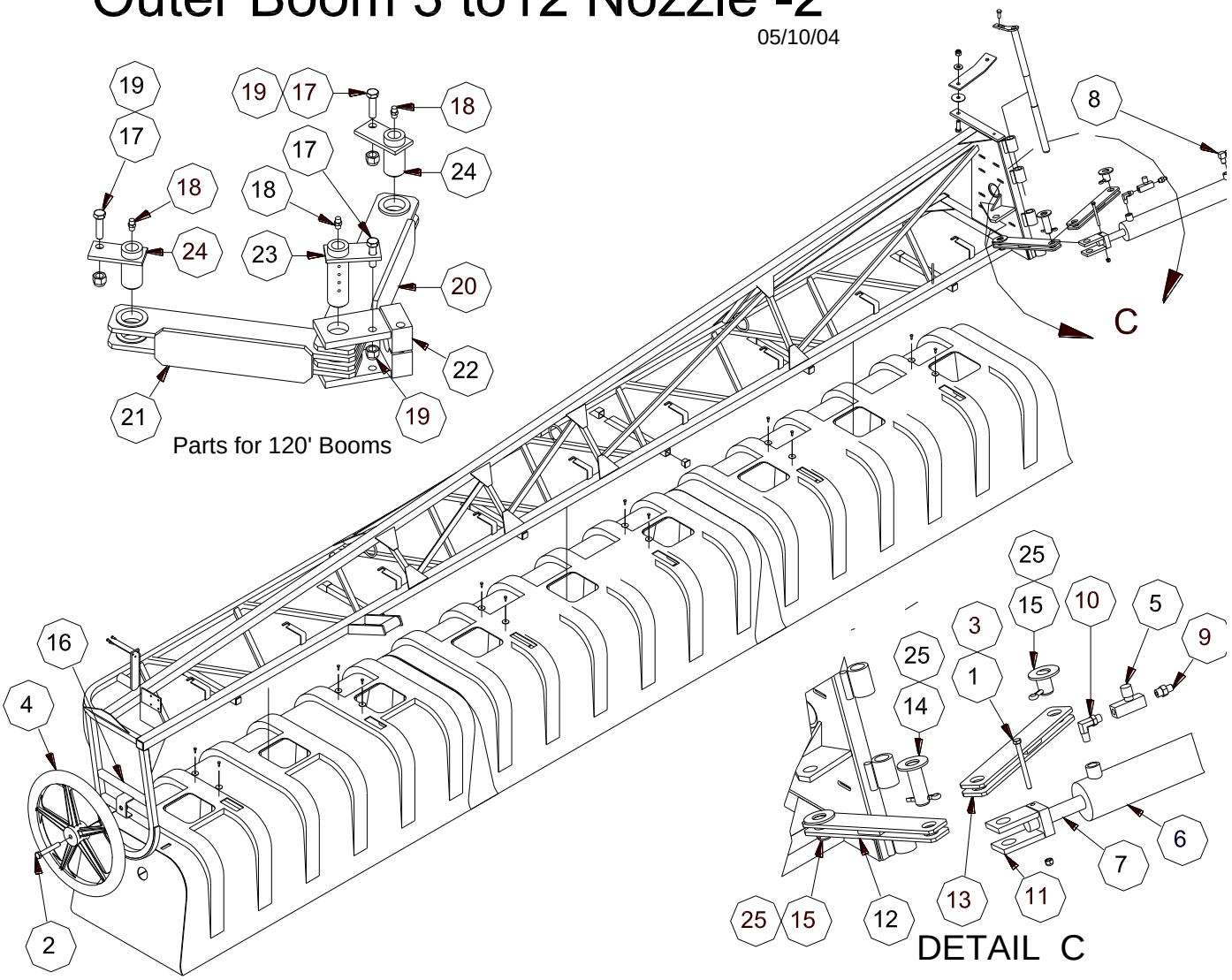


Parts List		
ITEM	QTY	PART NUMBER
1	1	100702 bolt 1-2 X 1 1-2 gr5 pltd nc
2	12	101102 fender washer 3-16 x 1
3	1	101106 flat washer 1-2
4	1	102125 nut nylok 1-2 nc gr5 pltd
5	15	103206 12 x 3 4 DRILL TAP
6	1	103218 screw hex head 3/8 x 1 threading
7	6	128062 1x1 sq tub cl240 13 ga
8	6	128118 cap 1 X 45 deg black durometer
9	1	208212 washer plastic 2 OD X 1/2 ID
10	1	223662 SHIELD ASSY LH OUTER

Parts List		
ITEM	QTY	PART NUMBER
11	2	223665 SHIELD ASSY STANDARD
12	1	223783 swivel extn breakaway spring
13	1	223802 PIN WLDT LH HINGE OUTTER
14	1	223817 nozzle hanger wldt outer
15	1	223870 OUTER BOOM 9 NZL LH
	1	223870-1 outer boom wldt 9 nozl LH-RH
	1	223890-1 outer boom wldt 6 nozl LH-RH
	1	223920-1 outer boom wldt 10 nozl LH-RH
	1	225410-1 outer boom wldt 12 nozl LH-RH
	1	228500-1 alum outer boom 9 nozl LH-RH

Outer Boom 3 to12 Nozzle -2

05/10/04



ITEM	QTY	PART NUMBER
1	1	100512 bolt 5/16 X 3 1/2 gr5 pltd nc
2	1	100807 bolt 5-8 X 4 gr5 pltd nc
3	1	102122 nut nylok 5/16 nc gr5 pltd
4	1	113972 tire and wheel 20X2 125 cw 6202-2RS 5 8 bore
5	1	117699 flow control W knob PF400S 1 4
6	1	117925 hyd cyl 2.50"x 15.625" tip fold
7	1	117926 SHAFT 2.50"X 15.625" tip fold
6b	1	117872 cyl hyd 3.25" x 15.625"
7b	1	117874 shaft 3.25" x 15.625"
8	1	117977 adptr elbow 08ORBM X 08JICM
9	1	118177 adptr str 04MPT X 06MJIC
10	1	118215 adapter elbow 06 MORB x 04 JIC
11	1	208655 clevis wldt 1NF 1 pin
12	1	225164 fold arm wldt 10 hole C L

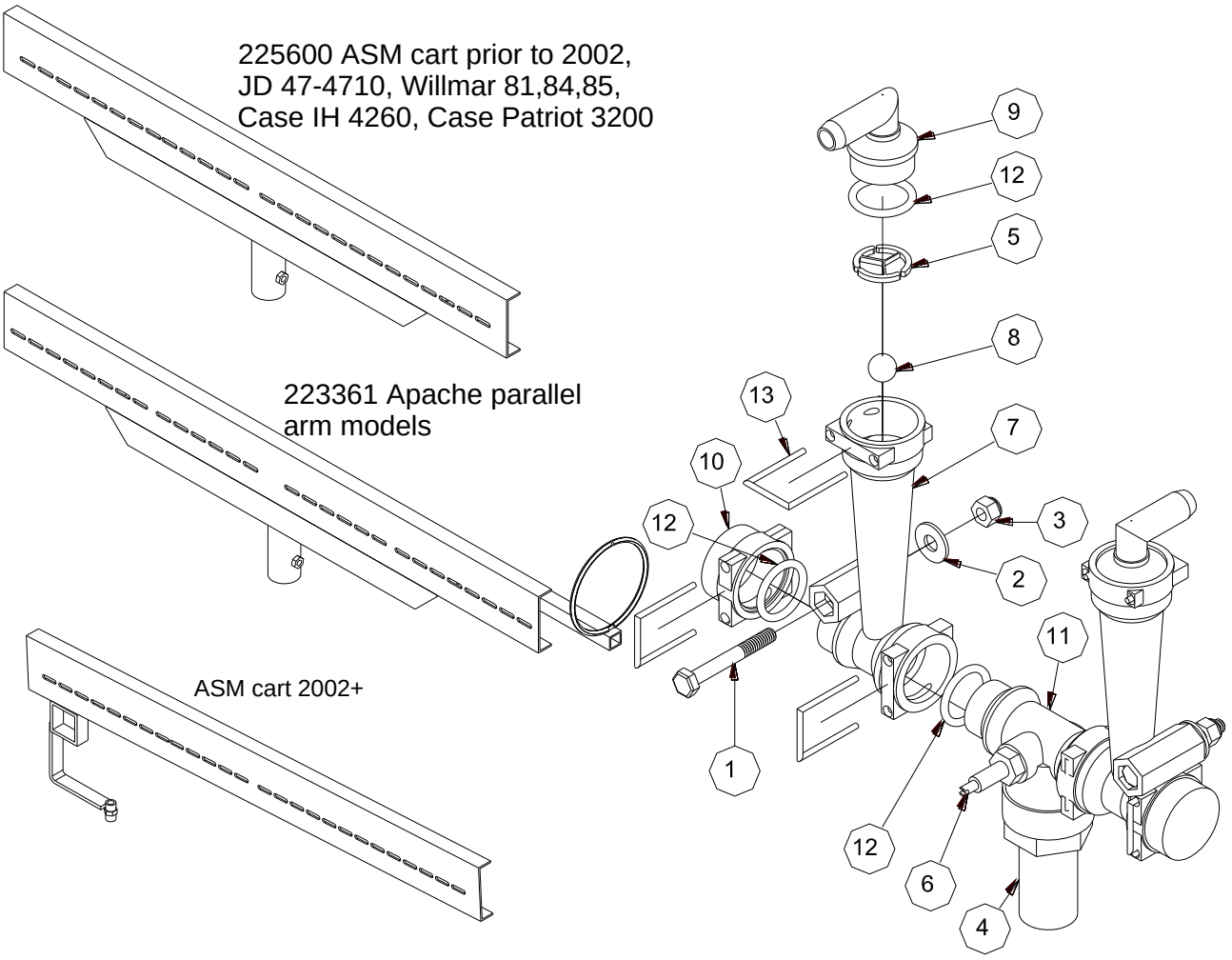
ITEM	QTY	PART NUMBER
13	1	225166 fold arm wldt 11 hole
14	1	225554 pin wldt breakaway cyl bl end
15	2	225560 pin wldt outer fold cyl
16	1	227688 outter end wheel mnt LH wldt
17	3	100504 bolt 5/16 C 1 1/4 gr5 pltd nc
18	3	105609 grease zerk
19	3	102123 nut nylock 3/8 nc gr5 pltd
20	1	228600 fold arm wldt 11 rein wear base
21	1	228605 fold arn wldt 10 rein wear base
22	1	228610 clevis tip fold cyl wb
23	1	228615 pin wldt grease cyl clevis
24	1	228619 grease pin tip fold
25	3	104907 cotter pin 1/4 X 2.5

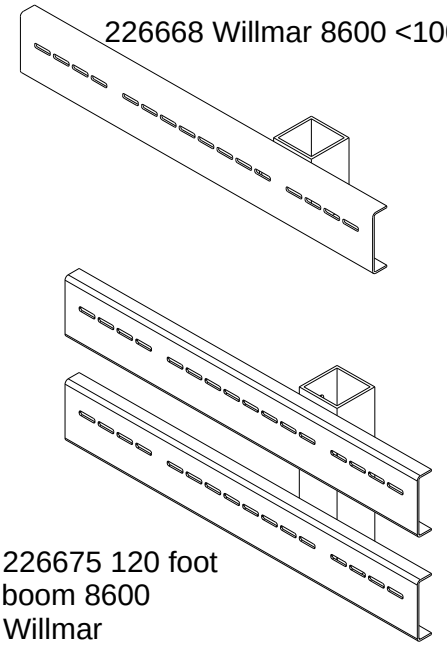
2.5" cylinder 5)117925 hyd cyl barrel 6)117926 hyd cyl shaft, and 117927 seal kit are replaced by 3.25" cylinder 5.b) 117872 hyd cyl barrell 6.b) hyd cyl shaft, and 117873 seal kit on the 120 foot booms.

10,11,12,13,14,25 are replaced by 17,18,19,20,21,22,23 for the 120 foot booms.

6.8 WILGER FLOW TUBES AND FLOW TUBES MOUNTS

Wilger flow tube assembly 112959 Feb 27,2003

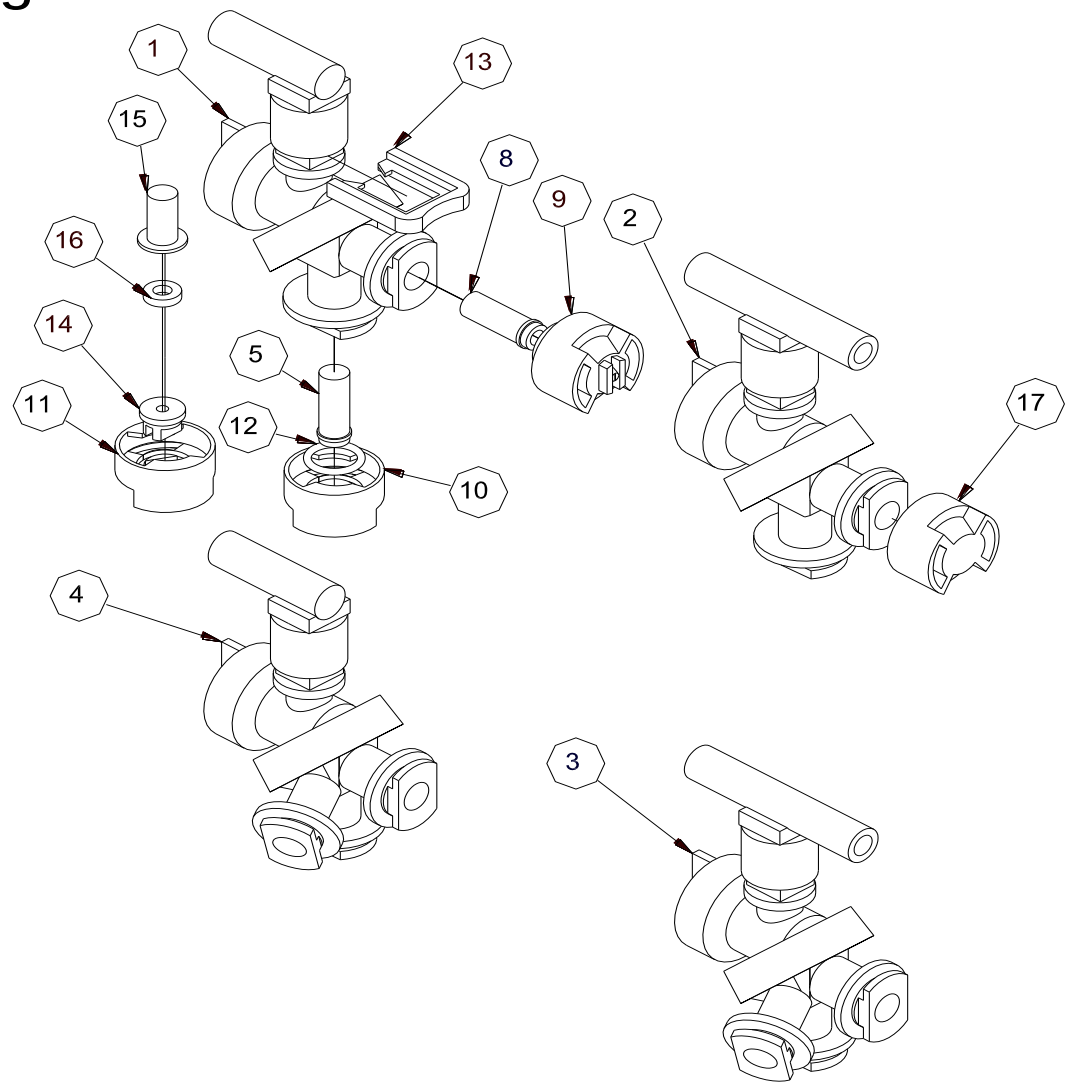




ITEM	QTY	PART NUMBER
1	2	100407 bolt 1 4 nc gr 5
2	2	101103 flat washer 1 4
3	2	102121 nut 1 4 nc nylock gr 5
4	1	111524 hose barb pp 1 mpt x 1 barb
5	2	112288 ball retainer flow tube
6	1	112291 snifter valve
7	2	112959 flow tube indicator body 20460 01
8	2	112961 1 2 stainless ball
8a	1	112963 red glass
8b	1	112964 7 16 stainless ball
9	2	112966 flow ind ors x1 2 90 hb
10	2	112968 ft assy ors cap
11	1	112969 ft assy T mors x mors x 1 fnpt
12	6	112980 rubber seal
13	6	112981 lock u clip

6.9 WILGER NOZZLE BODIES AND TIPS

Wilger nozzle bodies 112890 Feb 28 2003

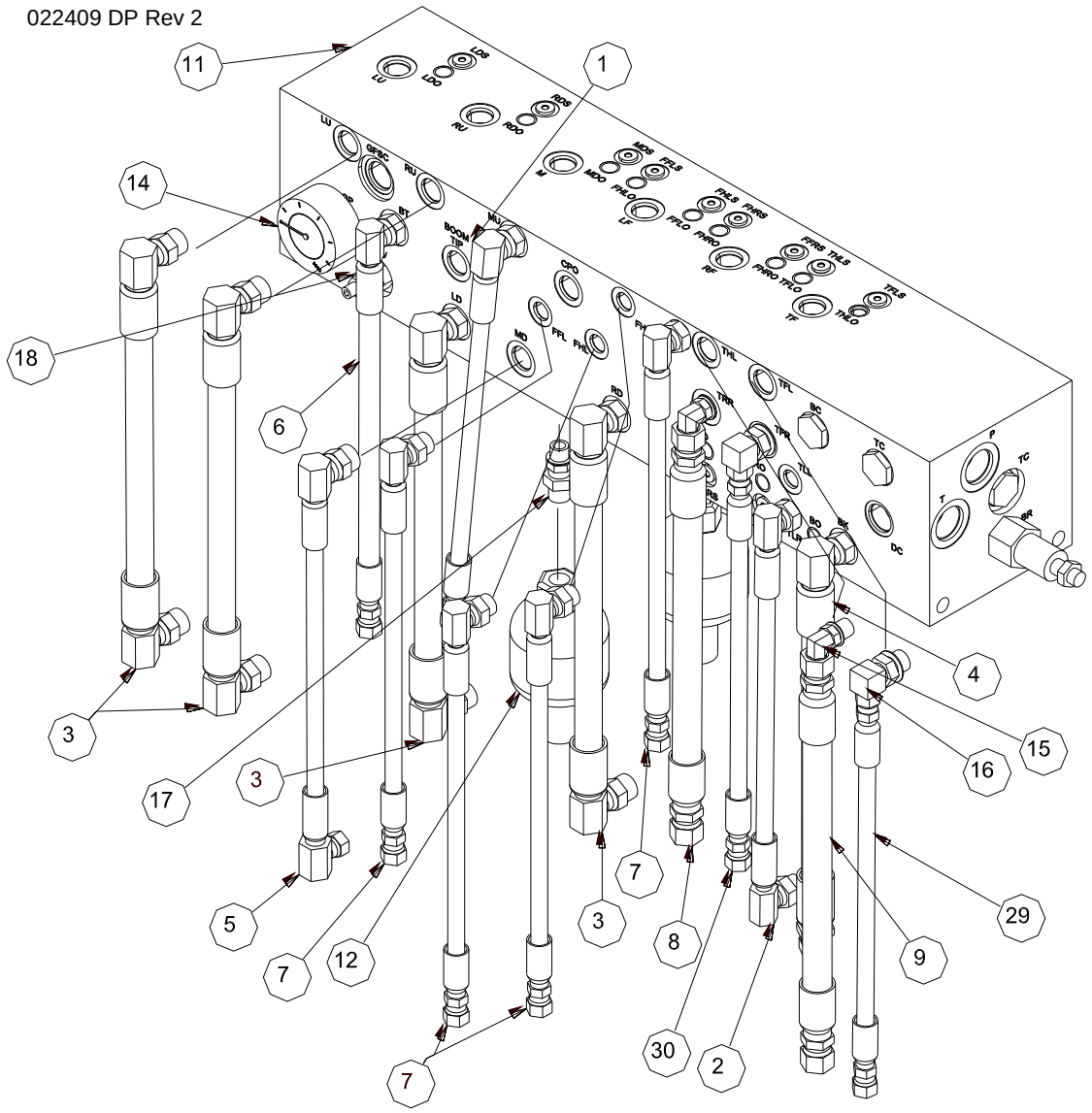


ITEM	QTY	PART NUMBER	ITEM	QTY	PART NUMBER
1	1	112892 nozzle body double 1/2" hb L	12	2	112916 nozzle seal combo-jet
2	1	112893 nozzle body double 1/2" hb T	13	1	112950 retainer for 5/8" sq nozzle
3	1	112895 triple Wilger nozzle body 1/2" hb T	14	1	112510 xr8001vs spray tip spray systems
4	1	112894 triple Wilger nozzle 1/2" hb L		1	112511 xr 80015vs spray tip
5	1	112915 strainer combo-jet 100 mesh		1	112512xr 8002vs spray tip
8	1	112914 strainer combo-jet 50 mesh		1	112513 xr 8003vs spray tip
9	1	112907 radial lock combo-jet 80-02 tip		1	112514 xr 8004vs spray tip
10	1	112909 radial lock combo-jet 80-04		1	112515 xr 8005vs spray tip
	1	112905 radial lock combo-jet 80-01		1	112516 xr 8006vs spray tip
	1	112906 radial lock combo-jet 80-015		1	112517 xr 8008vs spray tip
	1	112908 radial lock combo-jet 80-03	15	1	112886 strainer flanged 50 mesh
	1	112910 radial lock combo-jet 80-05		1	112887 strainer flanged 100 mesh
	1	112911 radial lock combo-jet 80-06	16	1	112885 nozzle gasket universal
11	1	112884 universal cap radial lock	17	1	112882 cap raidialock plug

6.10 225907 assembly of 118303 6 function block with GFS

225970 Hydraulic Kit 7700 Block 120-

022409 DP Rev 2

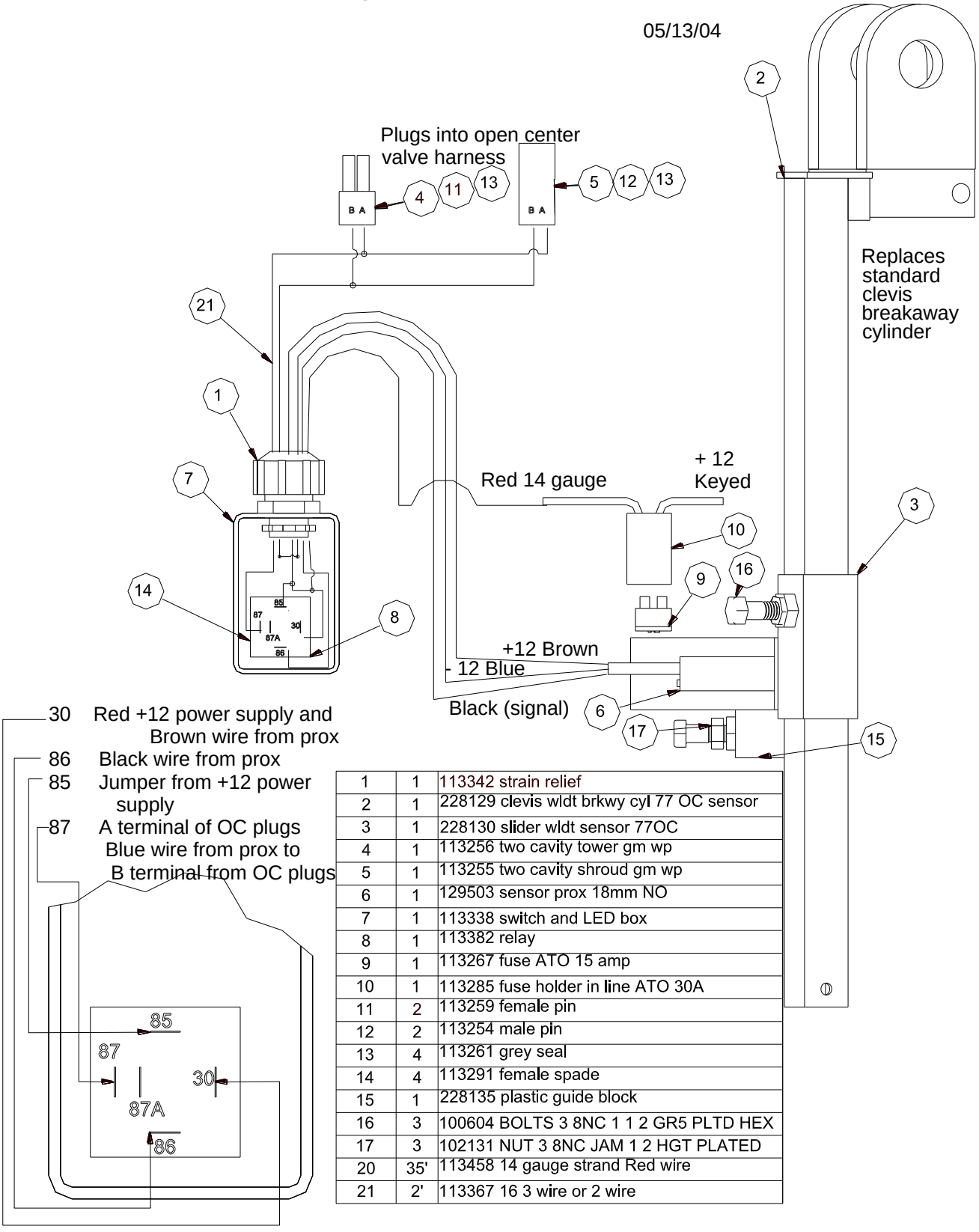


Parts List		
ITEM	QTY	PART NUMBER
1	1	118602 hose 3 8x78 08morb90x08fjics
2	1	118607 hose 1 4x324 06morb90x06morb90
3	4	118614 hose 1 2x112 08morb90x06morb90
4	1	118608 hose 1 2x22 08morbs90x06morbs
5	1	118603 hose 3 8x107 08morb90x06fjics90
6	1	118609 3 8x27 08morbs90x0fjics
7	4	118601 hose 1 4x80 06morb90X06jicf
8	1	118611 hose 1 2 hosex413 08 fjicx08fjic
9	1	118617 1 2 hosex432 08 fjicxo8fjic

Parts List		
ITEM	QTY	PART NUMBER
11	1	118303 block with fold hyd valv E24675R1 Scaled
12	2	117695 accumulater 10 ci 0 531 600 503
13	2	117019 HYD CART DP DE S2I 00 NC
14	1	112300 gauge 3000 psi 1 4 mpt center back
15	2	117972 adapter 90 deg 08morb X 08mjic
16	2	117961 adapter 90 deg 08morb x 06mjic
17	2	118098 adapter 08MORBx06MORB
34	2	118610 06 x 398 hose 06fjicx06fjic

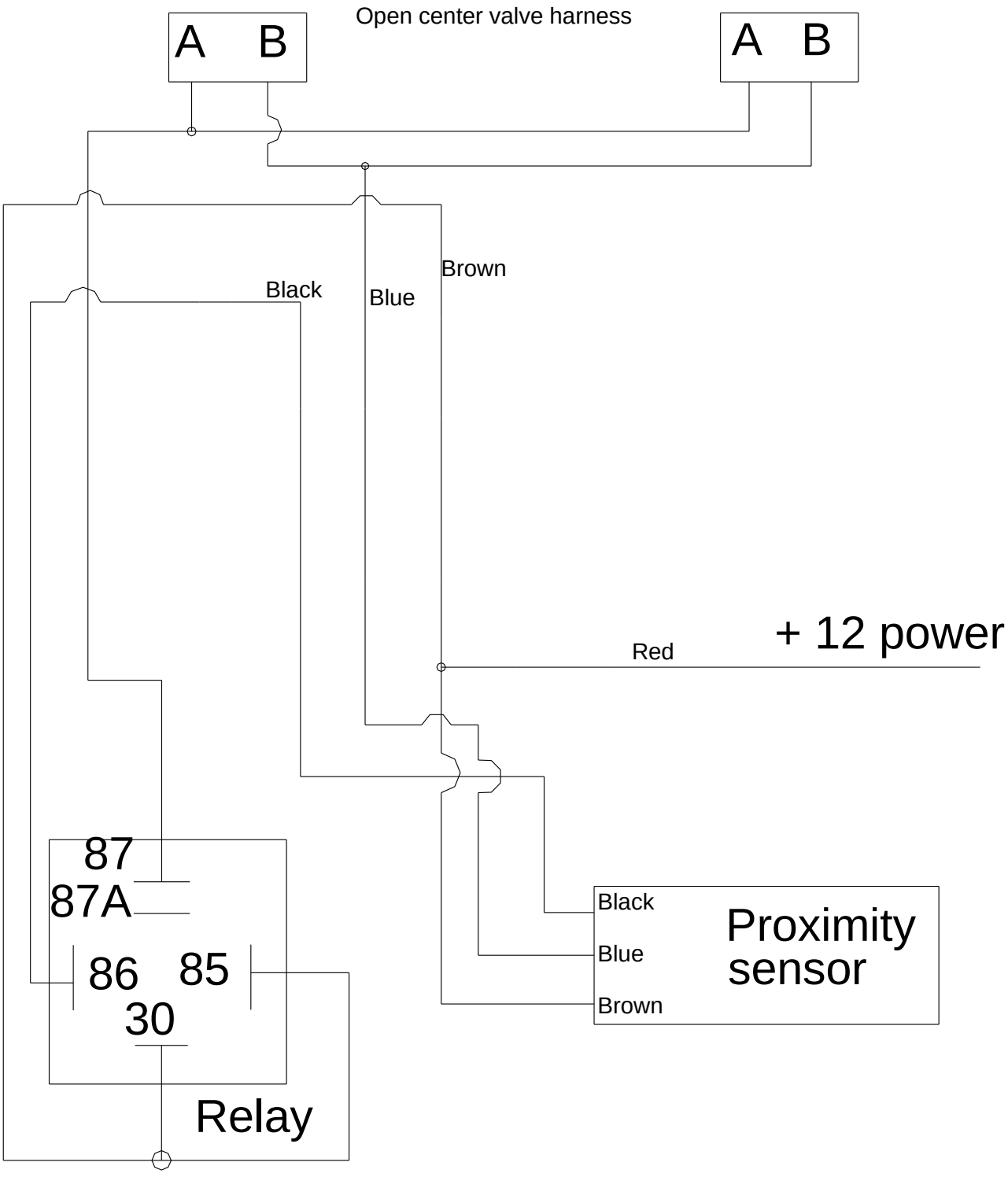
6.11 OPEN CENTER KIT AUTO RESET 7700 BOOMS

228124 Open Center Kit 7700 booms

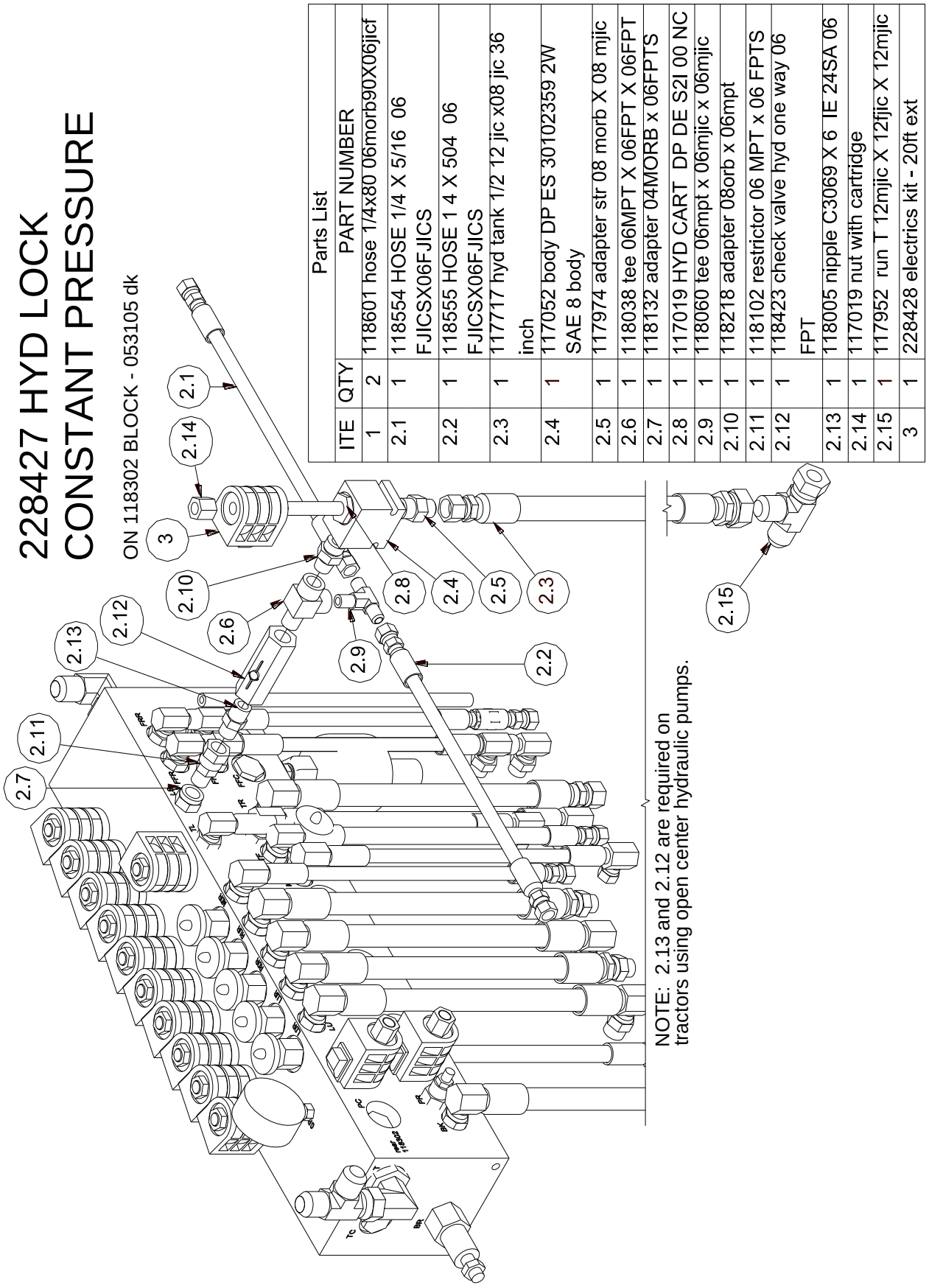


1	1	113342 strain relief
2	1	228129 clevis wldt brkwy cyl 77 OC sensor
3	1	228130 slider wldt sensor 77OC
4	1	113256 two cavity tower gm wp
5	1	113255 two cavity shroud gm wp
6	1	129503 sensor prox 18mm NO
7	1	113338 switch and LED box
8	1	113382 relay
9	1	113267 fuse ATO 15 amp
10	1	113285 fuse holder in line ATO 30A
11	2	113259 female pin
12	2	113254 male pin
13	4	113261 grey seal
14	4	113291 female spade
15	1	228135 plastic guide block
16	3	100604 BOLTS 3 8NC 1 1 2 GR5 PLTD HEX
17	3	102131 NUT 3 8NC JAM 1 2 HGT PLATED
20	35'	113458 14 gauge strand Red wire
21	2'	113367 16 3 wire or 2 wire

Auto reset proximity sensor 7700 open center 228123

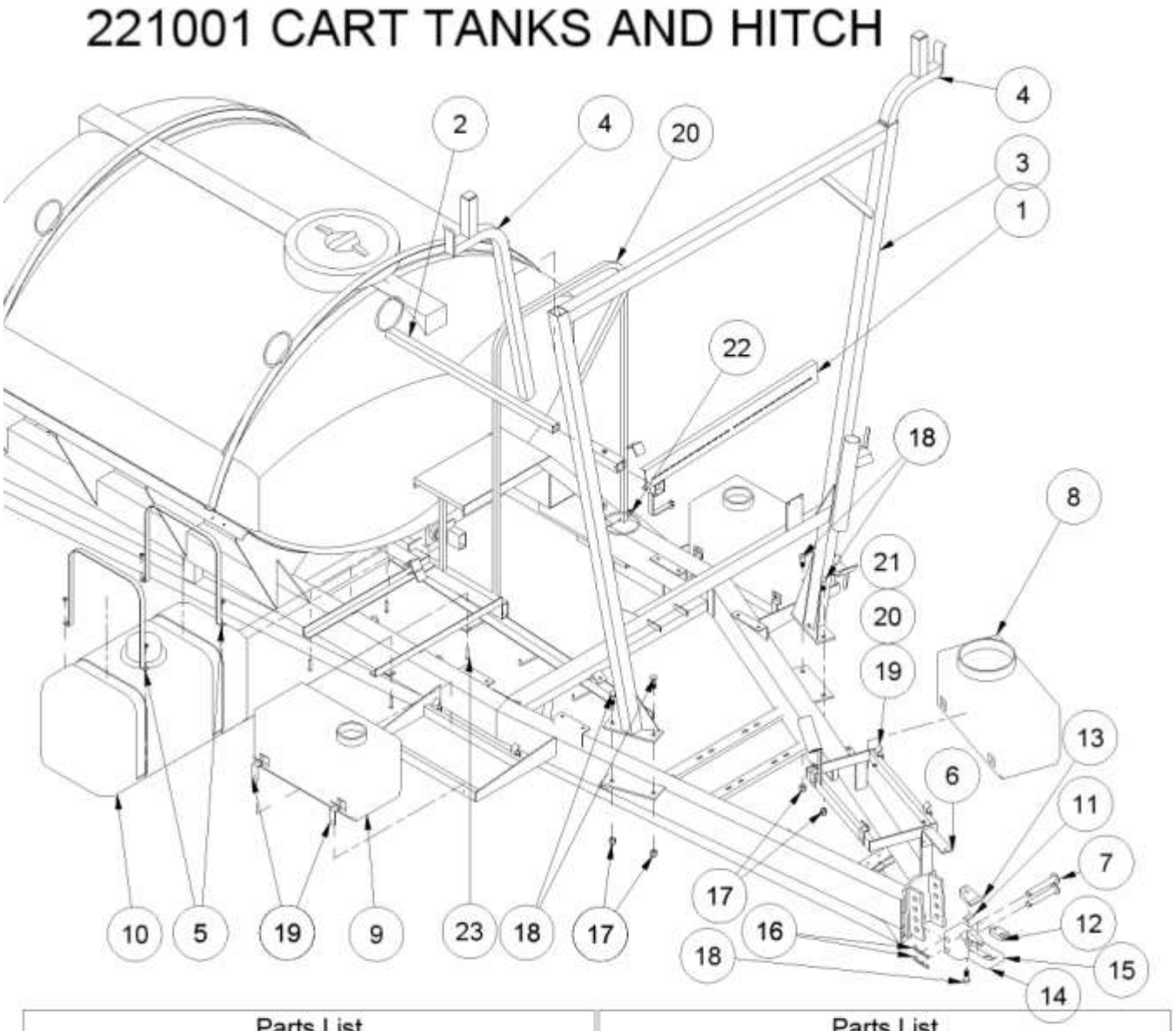


6.12 Boom block 20 ft Extension kit 228427-428



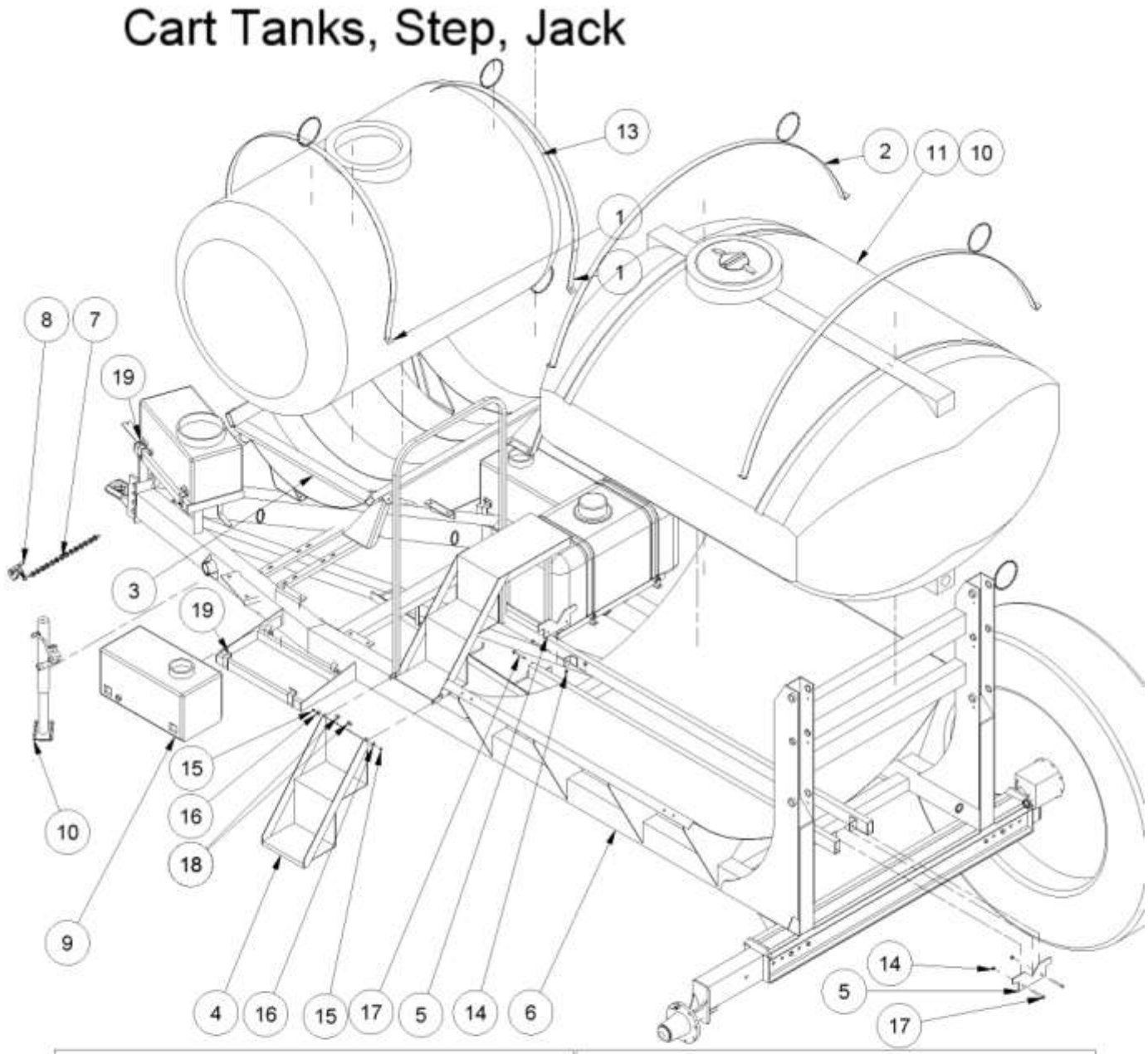
Parts List		
ITE	QTY	PART NUMBER
1	2	118601 hose 1/4x80 06morb90X06jicf
2.1	1	118554 HOSE 1/4 X 5/16 06 FJICSX06FJICS
2.2	1	118555 HOSE 1 4 X 504 06 FJICSX06FJICS
2.3	1	117717 hyd tank 1/2 12 jic x08 jic 36 inch
2.4	1	117052 body DP ES 30102359 2W SAE 8 body
2.5	1	117974 adapter str 08 morb X 08 mjic
2.6	1	118038 tee 06MPT X 06FPT X 06FPT
2.7	1	118132 adapter 04MORB x 06FPTS
2.8	1	117019 HYD CART DP DE S2I 00 NC
2.9	1	118060 tee 06mpt x 06mjic x 06mjic
2.10	1	118218 adapter 08orb x 06mpt
2.11	1	118102 restrictor 06 MPT x 06 FPTS
2.12	1	118423 check valve hyd one way 06 FPT
2.13	1	118005 nipple C3069 X 6 IE 24SA 06
2.14	1	117019 nut with cartridge
2.15	1	117952 run T 12mjic X 12fjic X 12mjic
3	1	228428 electrics kit - 20ft ext

6.13 CART TANKS AND FRONT HITCH



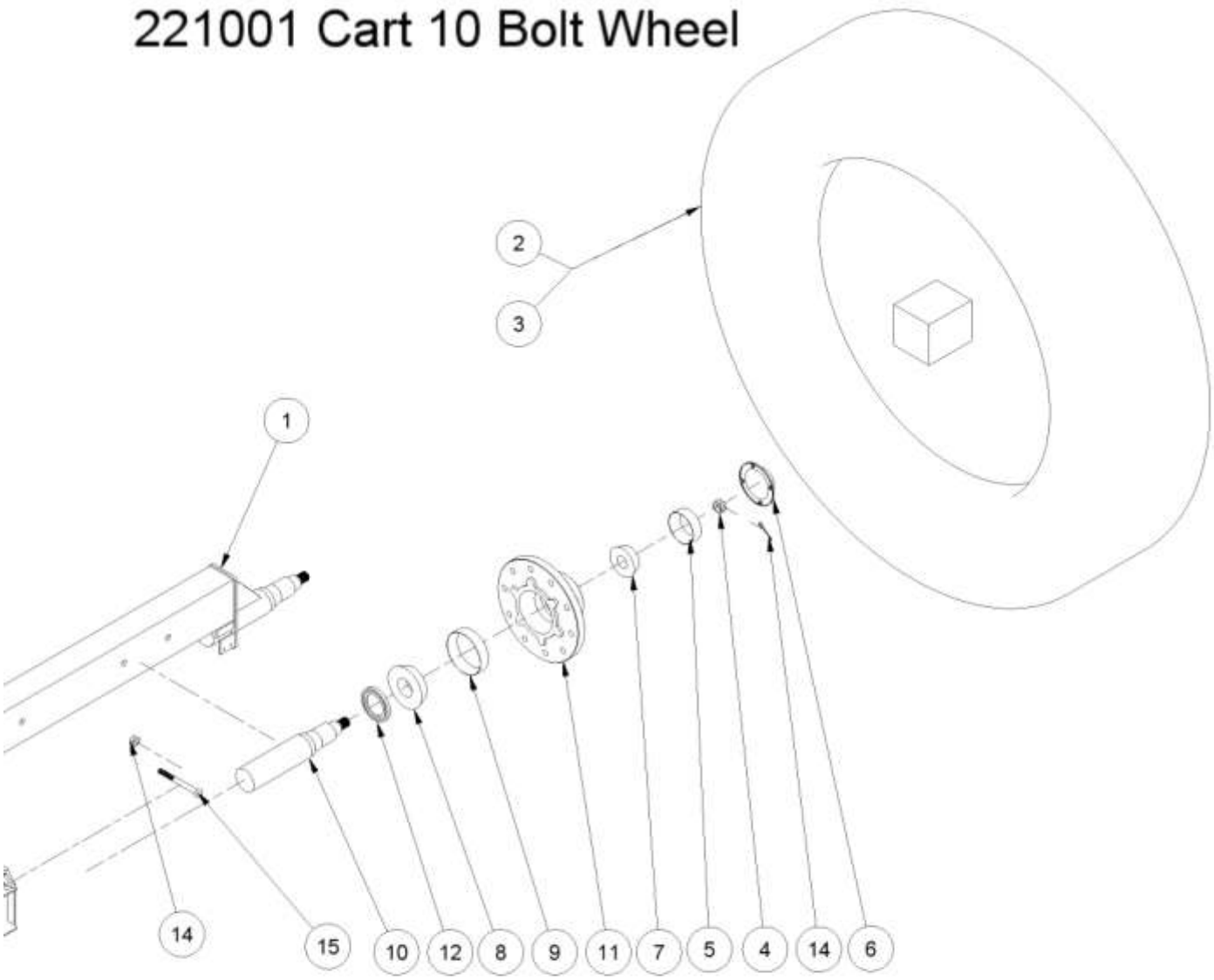
Parts List			Parts List		
ITEM	Q	PART NUMBER	ITEM	Q	PART NUMBER
1	1	221173 flowtube bckg plat wldt C2	13	1	113642 PERFECT HITCH TOP PLATE
2	1	221169 hose spport wldt C2	14	1	113641 PERFECT HITCH BODY
3	1	221160 boom rest tele C2	15	1	113640 power pin hitch cat2 V design
4	2	221140 boomrest tele wldt	16	2	104401 hairpin 1/4 x 4-1/2
5	2	221080 strap rinse tank C2	17	4	102128 nut 3/4 nylock gr 5 pltd
6	1	221065 hyd hose mt C2	18	5	100901 bolt 3/4 nc x 2 hex
7	2	205963 crosspin wldt perfct hitch	19	6	206250 hold down saddle bag tank
8	1	128037 tank 12igal 8lid chem eductor	20	2	100406 bolt 1 4NC 1 3 4 GR5 pltd hex
9	1	128035 tank 12igal 5lid marker	21	2	102121 nut 1 4 nc nylock gr 5
10	1	116055 tank 17h 18w 37L poly	22	1	100602 bolt 3 8NC 1 GR5 pltd hex
11	1	113644 power pin hitch cushion urethn	23	4	100606 bolt 3 8NC 2 GR5 pltd hex
12	1	113643 PERFECT HITCH V-PLATE			

6.14 CART TANKS, STEP, JACK



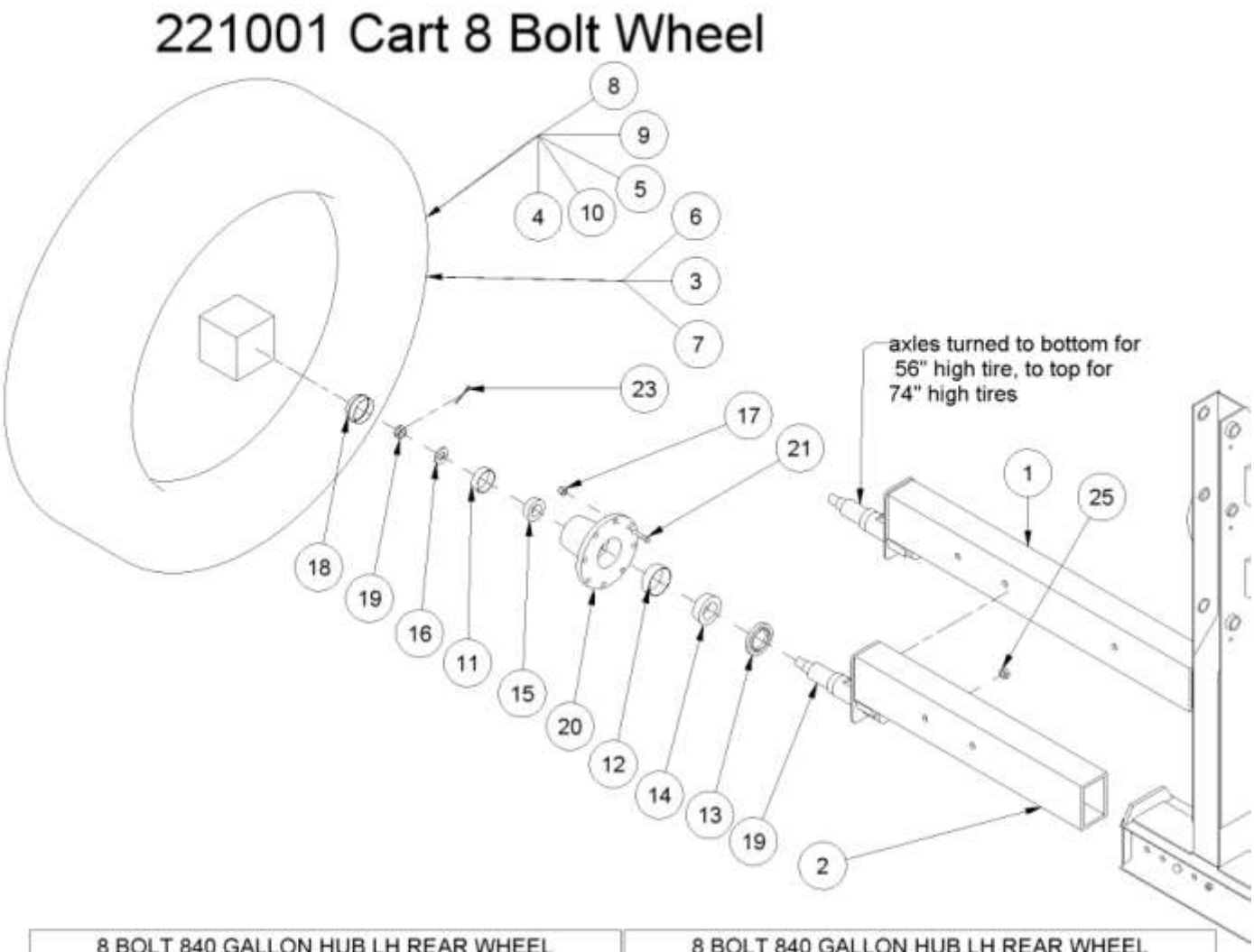
Parts List			Parts List		
ITEM	QTY	PART NUMBER	ITEM	QTY	PART NUMBER
1	2	221237 tank strap wldt 400 gal 840 cart	11	1	116101 TANK, 840 IMP DEEP VEE
2	2	221230 strap wldt 840g curve C2	12	1	116061 1250 gal tank polly
3	1	221120 tank skid wldt 420 igal cyl	13	1	116044 420 imp 500 us gal tank
4	1	221066 step wldt tip up C2 11	14	8	102123 NUT 3/8 NYLOC NC
5	2	221033 retainer tank rear C2	15	2	102106 3/8 NC STD NUT
6	1	221020 mainframe wldt 840 cart02	16	2	101105 washer flat 3/8
7	1	205578 safety chain hook lock assy	17	4	100627 bolt 3/8 X 3 gr5 pltd hex all thr
8	1	205574 safety hook w lock	18	2	100601 bolt 3/8NC X 3/4 GR5 pltd hex
9	1	128038 tank 12igal 5lid fresh water	19	6	206250 hold down saddle bag tank
10	1	116907 HITCH JACK 5015 SW			

6.15 CART AXLE 10 BOLT



10 BOLT 840 GALLON HUB RH REAR WHEEL			10 BOLT 840 GALLON HUB RH REAR WHEEL		
ITEM	QTY	PART NUMBER	ITEM	QTY	PART NUMBER
1	1	221150 axle wldt 10 b hvy 120"	7	1	113660 cone out 1.75 bore 10 b
1	1	222461 axle wldt out 10 b hvy max trd 144	8	1	113659 cone in 2.5 bore 10 b
2	2	113925 18.4x26 TURF & FIELD 10 BOLT C/W DW 16X26X10 BOLT WHEEL	9	1	113658 brg inner cup 1010 hub 39520
			10	1	113647 spindle hvy 10 bolt hub
3	2	113923 TIRE 18.4X26 TRACTION FIELD & ROAD (TRACTOR TREAD) 10 bolt	11	1	113646 HUB HA 1010 10 BOLT
			12	1	113645 SEAL SE 48 FOR 1010 HUBS
4	1	113666 nut 1-1/4 12unf 1010 spindle	13	1	104906 cotter pin 3/16 X 2
5	1	113663 brg outer cup 1010hub 453A	14	2	100902 bolt 3/4 nc x 3
6	1	113661 cap dust 10 b hub	15	2	100915 BOLT 3 4 X 6 1 2 NC GR5 PLTD

6.16 CART 8 BOLT AXLE AND WHEEL



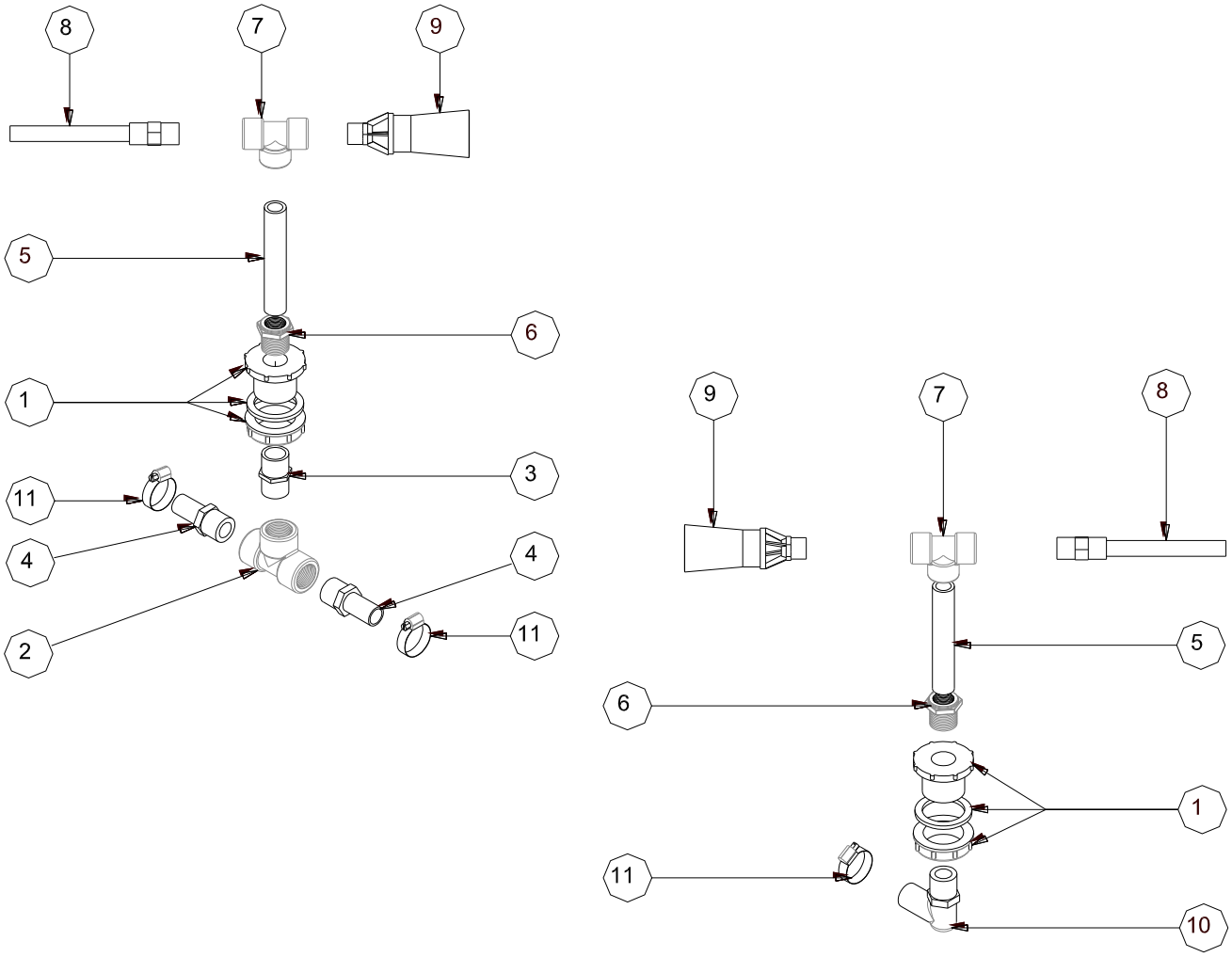
8 BOLT 840 GALLON HUB LH REAR WHEEL		
ITEM	QT	PART NUMBER
1	1	222460 axle wldt 8 bolt max trd 144
2	2	222450 axle wldt 8 bolt max 120"tread
3	2	113926 18.4X26 traction field & road 8 bolt
4	2	113924 tire 21.5X16.1 traction imp. c/w W16C X 16.1 X 8 BOLT
5	2	113923 tire 18.4X26 traction field & road (tract or tread) 10 bolt
6	2	113922 tire 12.4 X 38 tra trd 8 bolt rim 14 ply ti re
7	2	113919 18.4 X 26 turf & field C/W DW16 X 26 X 8 bolt ag wheel
8	2	113918 tire 16.5LX16.1 10ply pow. imp C/ W W14CX16.1 8 bolt rim
9	2	113917 16.5L X 16.1 turf 10PLY W/W14C rim
10	2	113916 tire 21.5 X 16.1 turf&field W/ 16w 8 x 8 x 6 wheel

8 BOLT 840 GALLON HUB LH REAR WHEEL		
ITEM	QT	PART NUMBER
11	2	113878 brg cup outer 4t 2720
12	2	113877 brg cup inner 4t 3720
13	2	113876 wheel seal SE 17
14	2	113874 BRG CONE INNER
15	2	113873 BRG CONE OUTER
16	2	113676 spindle washer 1 X 2 WA17 CTD
17	1	113655 wheel nut 9/16 nf wb40
18	2	113653 HUB CAP DC-17
19	1	113651 SPINDLE 14 INCH CART
20	2	113650 HUB 8 BOLT 6 PILOT 840 CART
21	1	113649 stuf wb41 for 812 hubs
19	2	113648 nut wb33 812 spindle
23	1	104906 cotter pin 3/16 X 2
25	2	100902 bolt 3/4 nc x 3

6.17 Agitation Plumbing Components

240200 Agitation Plumbing

Rev 1 021009 DP



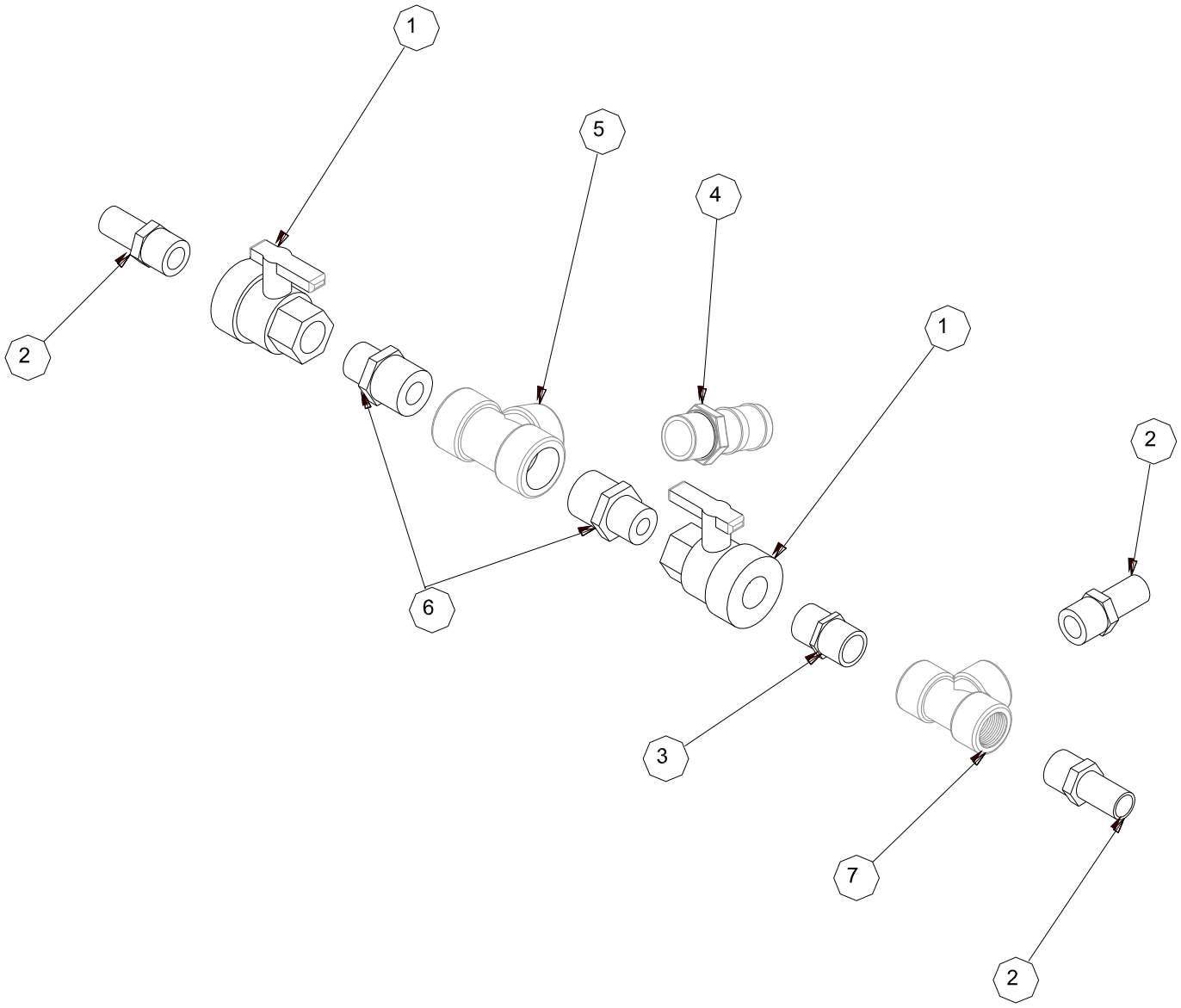
Parts List		
ITEM	QTY	PART NUMBER
1	2	111005 1 bulkhead complete
2	1	110806 tee pp 1 x 1 x 1 fpt tt100
3	1	110506 nipple pp 1 mpt x 1 mpt
4	2	111524 hose barb pp 1 mpt x 1 barb
5	2	111083 3_4 x 6 pipe
6	2	110319 red bushing 1x 3_4

Parts List		
ITEM	QTY	PART NUMBER
7	2	110805 3_4 tee
8	2	111076 agitator
9	2	111077 hypro agitator
10	1	111563 elbow pp 1 mpt x 1 barb el1010
11	3	112402 HOSE CLAMP ALL SS HAS 16

6.18 222606 Pressure Manifold lower plumbing

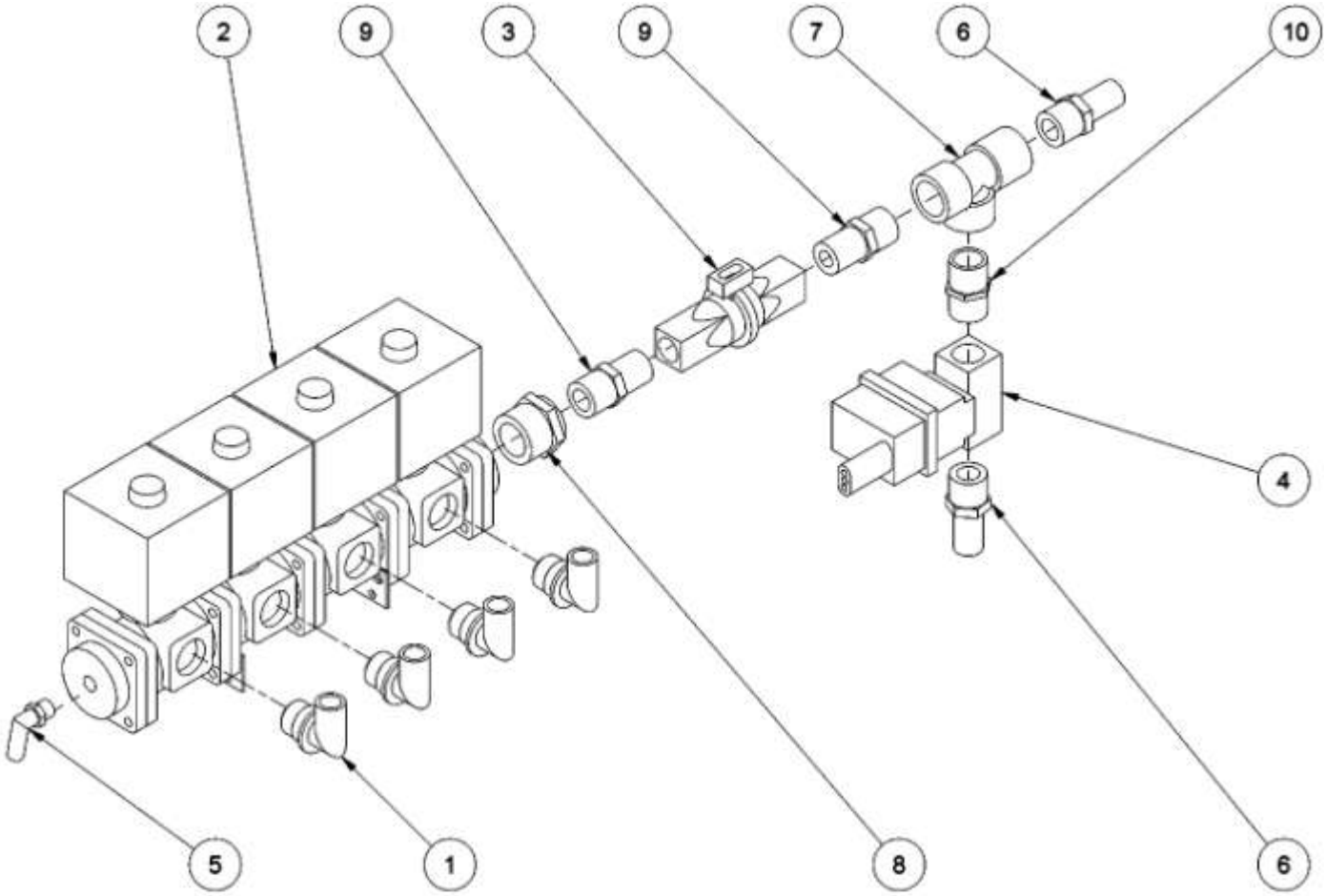
222606 Pressure Manifold Lower Plumbing

Rev.1 021009 DP



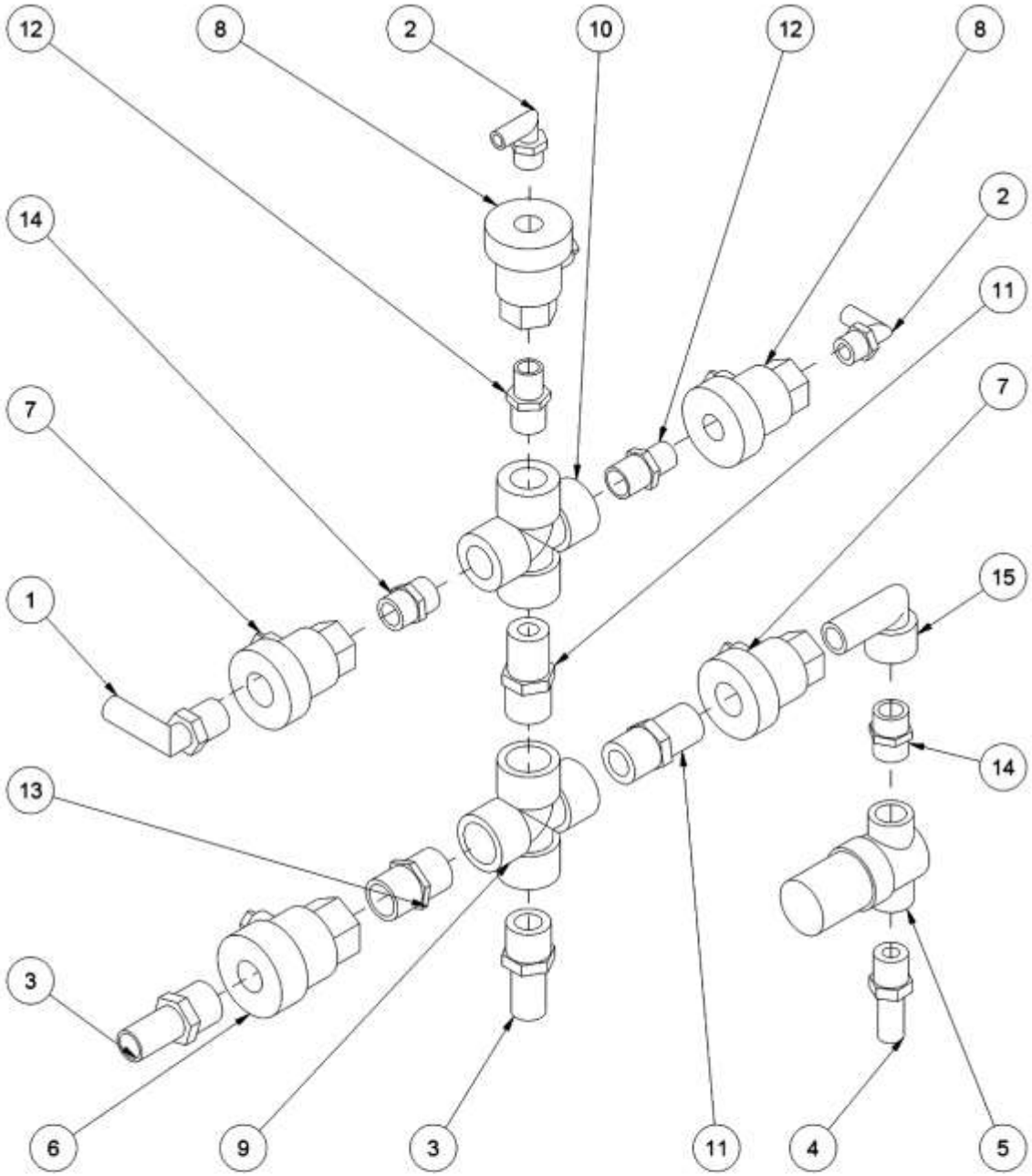
Parts List		
ITE	QTY	PART NUMBER
1	2	111242 banjo valve 1 uv 100fp
2	3	111524 hose barb pp 1 mpt x 1 barb
3	1	110506 nipple pp 1 mpt x 1 mpt
4	1	111529 hose barb pp 1.25mpt x 1.5 hb
5	1	110807 tee pp 3 x 1 1/4 fpt
6	2	110520 reducing nipples PP 1 X 1 1/4
7	1	110806 tee pp 1 x 1 x 1 fpt tt100

6.19 PLUMBING – BOOM SHUT OFF VALVES, FLOW SENSORS



Parts List		
ITEM	QTY	PART NUMBER
1	4	112790 kzco hb90 1 hairpin fitting for qc3 valves
2	1	112787 valve kzco ball assy 4
3	1	112688 FLOWMETER FM750 GFN #11501
4	1	112671 SERVO VALVE 1 MT 150 PSI
5	1	111548 elbow pp 3/8 mpt x 1/2 barb
6	5	111524 hose barb pp 1 mpt x 1 barb
7	2	110806 tee pp 1 x 1 x 1 fpt tt100
8	1	110730 pp red bush 1-1/2 mpt x 1 fpt
9	4	110521 REDUCING NIPPLES PP 1 X 3/4
10	4	110506 nipple pp 1 mpt x 1 mpt m1000

6.20 PLUMBING - PRESSURE MANIFOLD



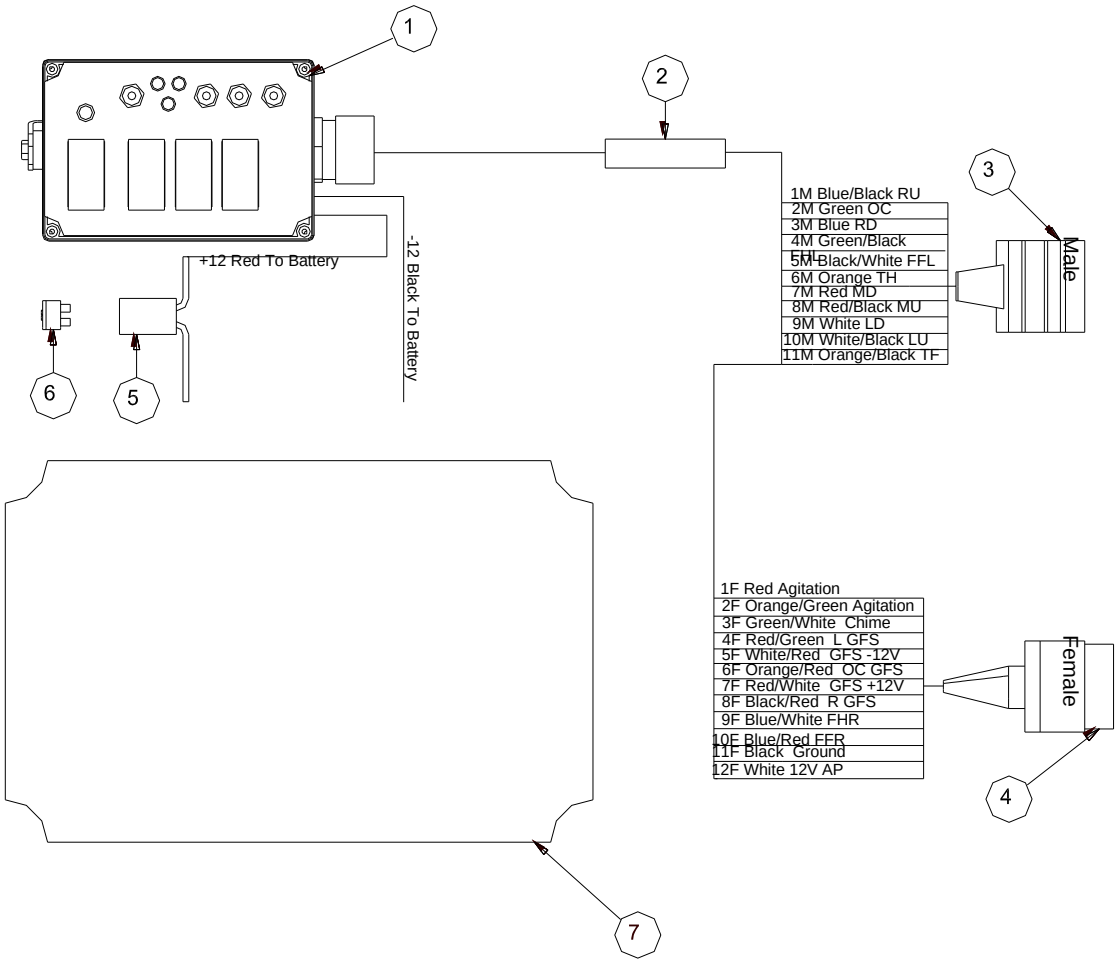
Parts List		
ITEM	QTY	PART NUMBER
1	1	111559 elbow pp 3/4 mpt x 3 4 barb
2	2	111552 elbow pp 1/2 mpt x 1/2 barb
3	5	111524 hose barb pp 1 mpt x 1 barb
4	1	111521 hose barb pp 3/4 mpt x 3/4 brb
5	1	111288 strainers poly t 3/4 aa122 34 pp with 100mesh screen
6	4	111242 banjo valve 1 uv 100fp
7	2	111241 banjo valve 3/4 uv 075fp
8	2	111240 banjo valve 1 2 uv 050 fp

Parts List		
ITEM	QTY	PART NUMBER
9	1	110941 cross poly cr100 1
10	1	110940 cross poly cr075 3/4 fpt
11	4	110521 REDUCING NIPPLES PP 1 X 3/4
12	2	110519 red nipple pp 3/4 x 1/2 mpt rmm0406
13	4	110506 nipple pp 1 mpt x 1 mpt m1000
14	2	110505 nipple pp 3/4 mpt x 3/4 mpt m3400
15	1	110305 str el pp 3/4 mpt x 3/4 fpt se34

6.21 Control Box wiring to Drawpin

240100 Control Box Wiring to Draw Pin

01/30/09 DP

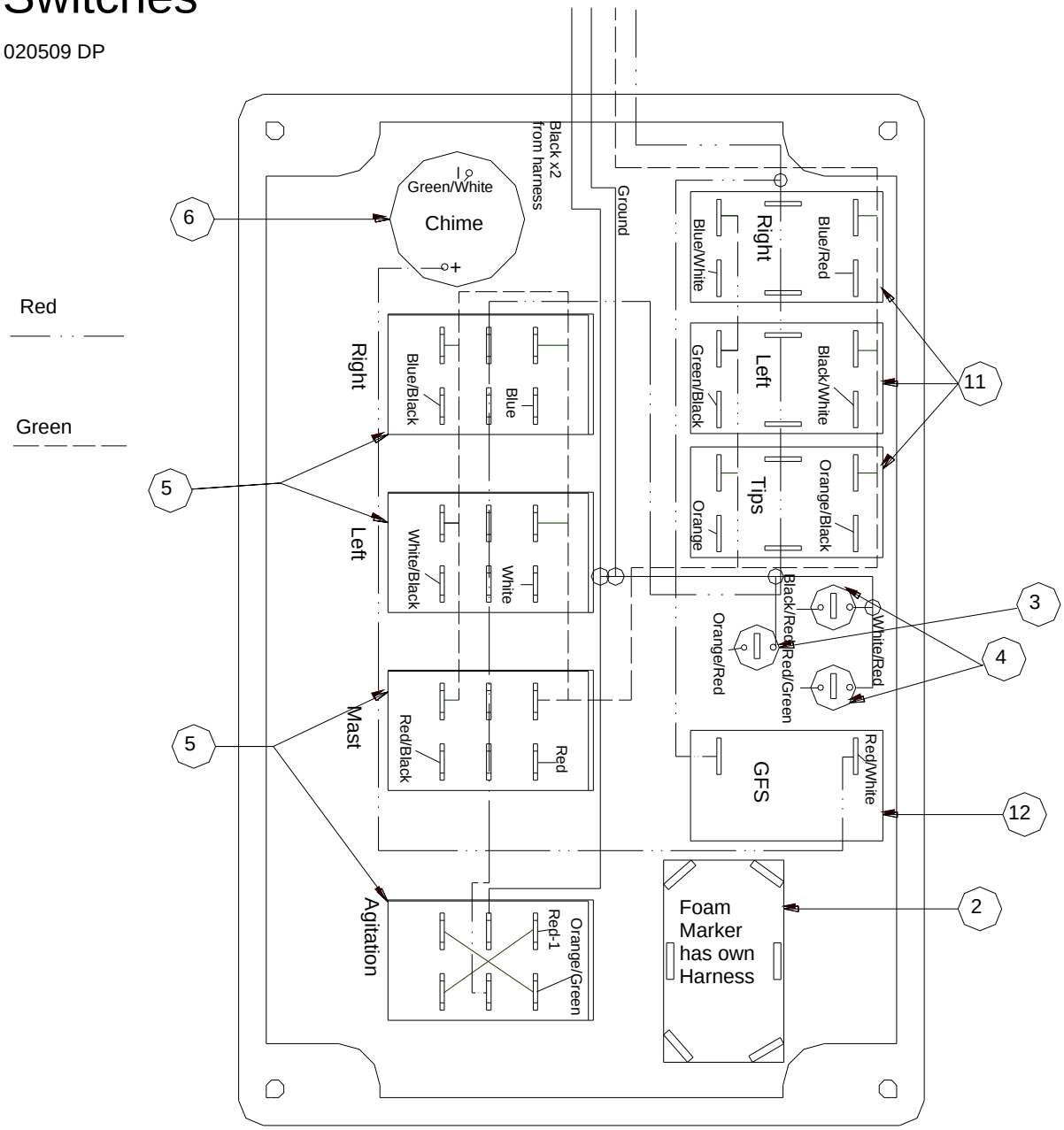


Parts List		
ITEM	QTY	PART NUMBER
1	1	240104 control box assembly
2	8ft	113353 wire 16-24 SOW 600V cord
3	1	113252 plug brylite 12 pin male
4	1	113253 plug brylite 12 pin female
5	1	113285 fuse holder in line ATO 30A
6	1	113269 fuse ato auto 30amp
7	1	240101 control box decal

6.22 240105 Control Box Wiring diagram

240105 Wiring Schematics for Control Box Switches

020509 DP

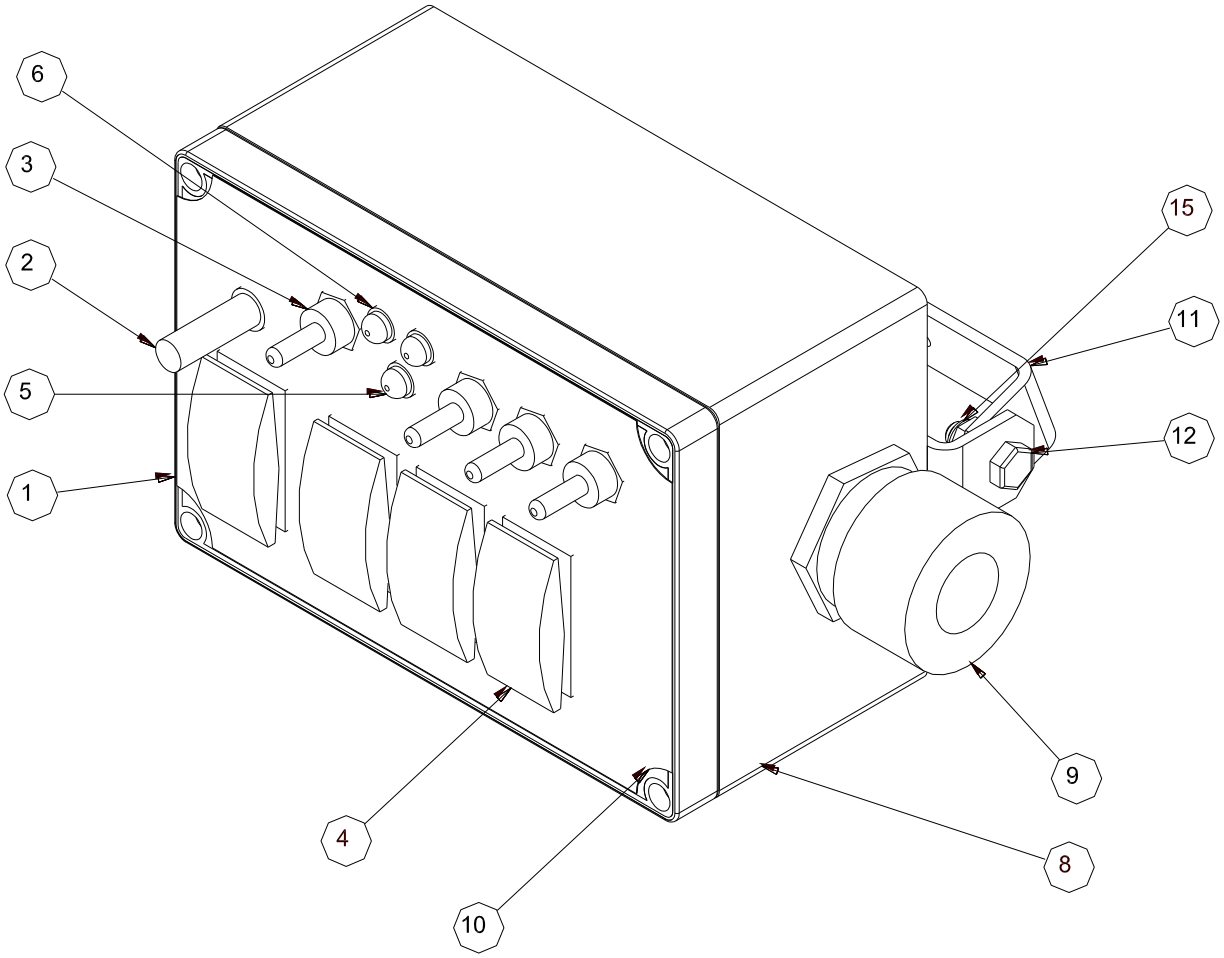


Parts List		
ITEM	QTY	PART NUMBER
1	1	240102 control box lid
2	1	150203 foam switch
3	1	113496 LED red
4	2	113495 LED green
5	4	113375 switch rocker dpdt 20amp
6	1	113339 Chime GFS

Parts List		
ITEM	QTY	PART NUMBER
7	16	113279 TERMINAL T TAP FEMALE
8	8	113291 FEMALE QUICK DISCONNECT
9	9	113287 RING TERMINAL 14-16GA
10	8	113494 QUICK DISCONNECT FEM.TAB .187"
11	3	113373 switch dpdt mom on toggle
12	1	113371 SWITCH SPST TOGGLE 10A

6.23 240104 control Box 2008 + - Cart with 6 function block

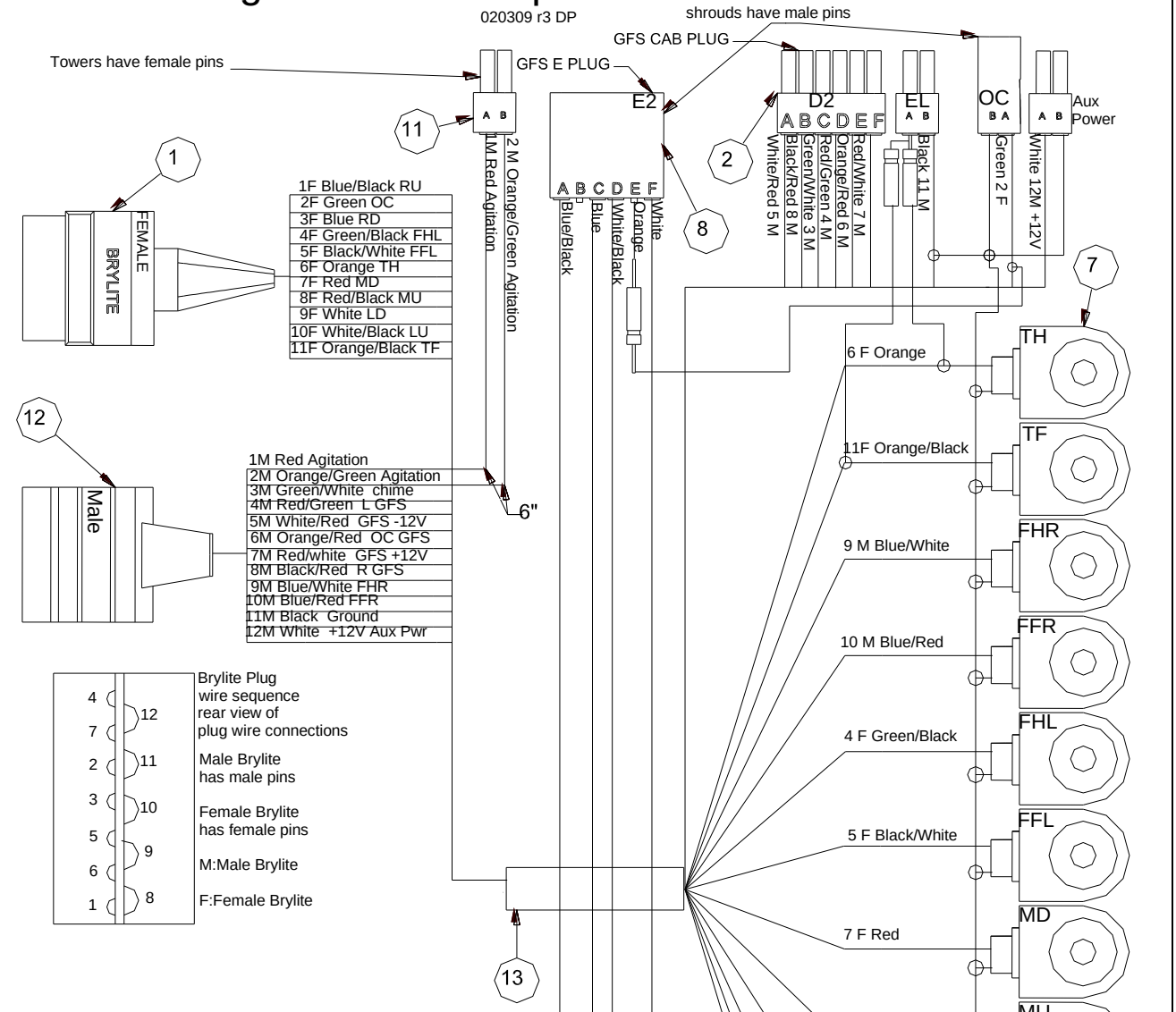
240104 Control Box 2008+
Cart 6 Function Block Rev 1 020209 DP



Parts List		
ITEM	QTY	PART NUMBER
1	1	240102 control box lid
2	1	150203 foam switch
3	4	113373 switch dpdt mom on toggle
4	4	113375 switch rocker dpdt 20amp
5	1	113496 LED red
6	2	113495 LED green
7	1	113339 Chime GFS
8	1	240103 control box bottom

Parts List		
ITEM	QTY	PART NUMBER
9	1	1133425 Cord Conn. Str. Male Alum
10	1	240101 decal sprayer control box 2009
11	2	240110 bracket for control box
12	4	100402 BOLTS 1 4 NC 3 4 GR5 PLTD HEX
13	2	101101 fender washer 1/4 x 1-1/4
14	2	101144 washer lock 1/4
15	4	102099 nut 1 4 nc nylock SS

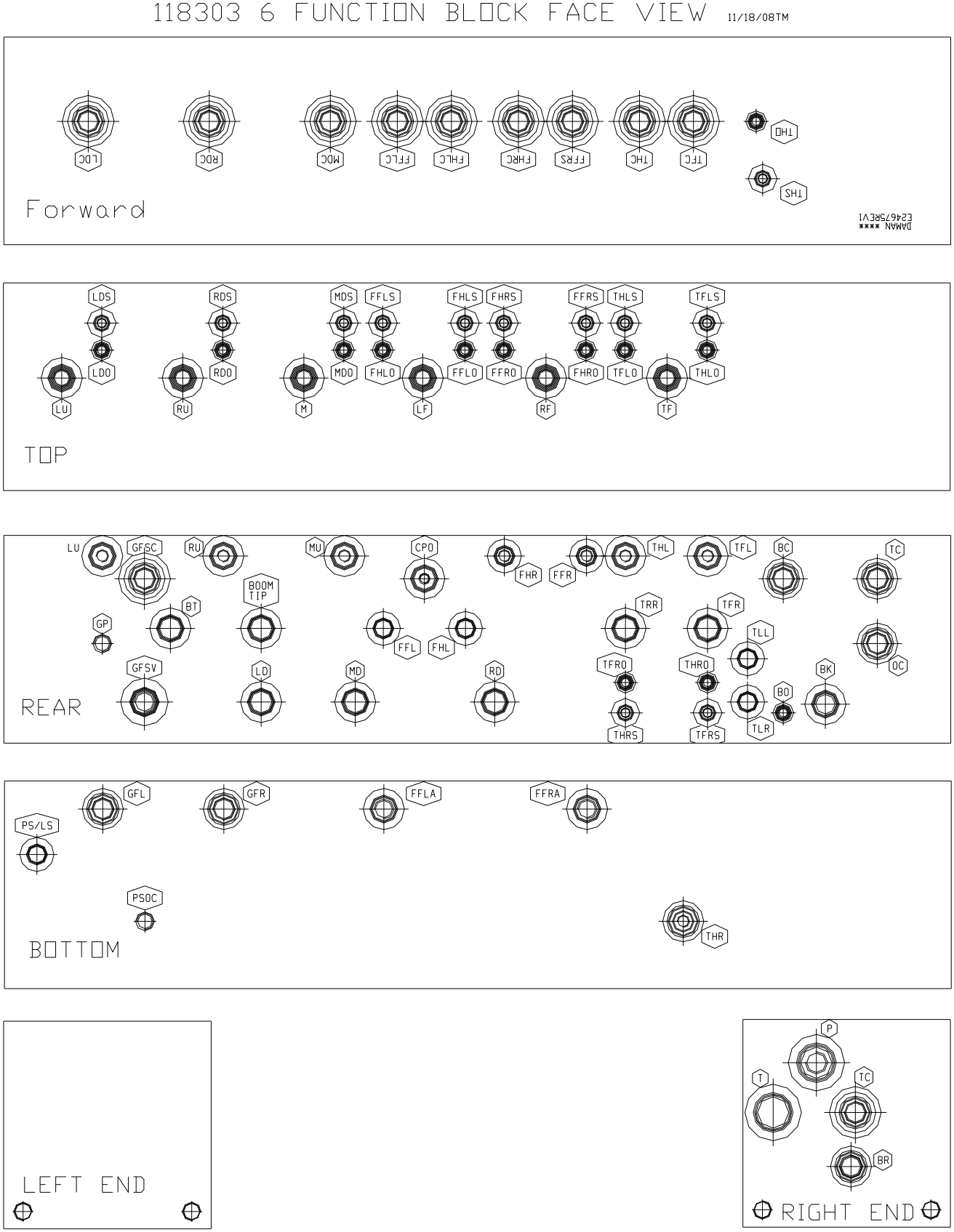
6.24 Wiring Schematic Hydraulic Boom Block to Drawpin



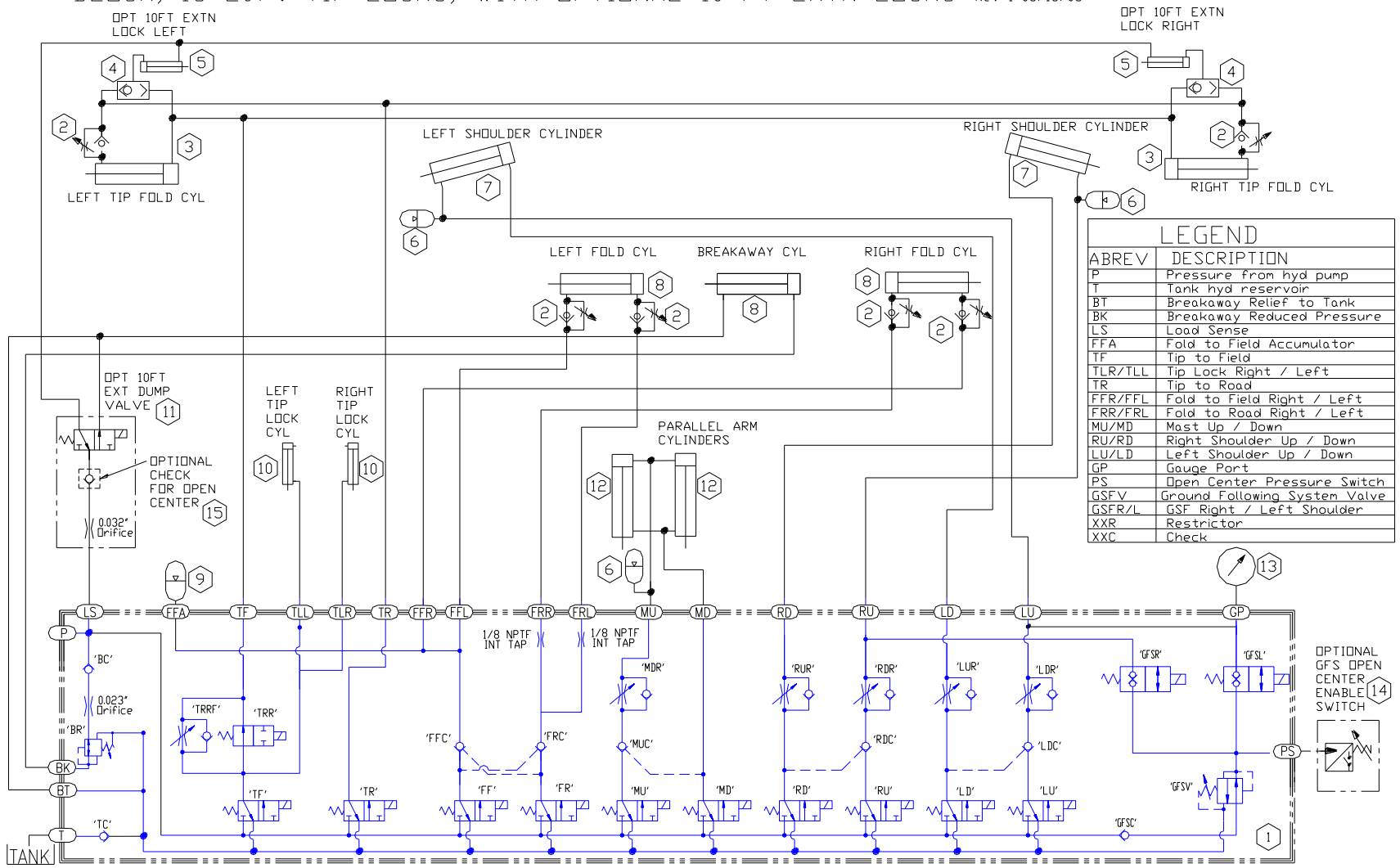
Parts List		
ITE	QTY	PART NUMBER
1	1	113253 plug brylite 12 pin female
2	1	113271 6 pin gm weather pack tower
3	12	113259 OEM packard terminal crimp 16G female
4	18	113261 OEM TERMINAL SEAL 762162
5	1	113255 two cavity shroud gm wp
6	6	113254 OEM packard terminal crimp 16G 762153
7	12	117051 coil dp ddl12 39610030
8	1	113270 6 pin gm weather pack shroud
9	2	113262 OEM CAVITY PLUGS 762155
10	3	113377 diode 600v 3 amp SEI IN5406
11	3	113256 two cavity tower gm wp
12	1	113252 plug brylite 12 pin male
13	48ft	113353 wire 16-24 SOW 600V cord

7 SYSTEM INFORMATION

7.1 HYDRAULIC BLOCK FACE VIEWS



HYD SCHEMATIC 7700 BOOM WITH SOURCE BLOCK #118302, INNER AUTO RESET, GFS IN BLOCK, 15-20ft TIP LOCKS, WITH OPTIONAL 10 FT EXTN LOCKS Rev 1 05/13/05

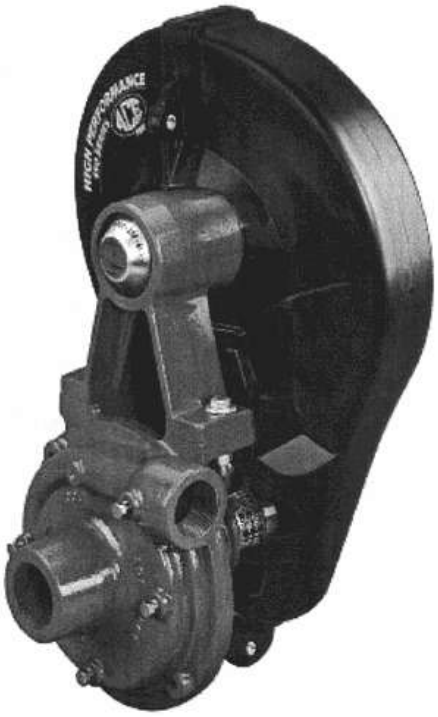


ITEM	QTY	NO.	DESCRIPTION	ITEM	QTY	NO.	DESCRIPTION	ITEM	QTY	NO.	DESCRIPTION
1.	1.	118302	7700 HYDRAULIC BLOCK WITH GFS	6	3	117696	ACCUMULATOR HYD. 20CI	11..	1	228427	10FT EXTENSION HYD. KIT 2005+
2	2	117699	FLOW CONTROL W/KNOB 1/4"	7	2	117878	CYL. HYD. 2.75" X 18" SHOULDER	12.	2	117990	CYL. HYD. 2.5" X 18" PA LIFT
3	2	117872	CYL. HYD. 3.25" X 15.625" TIP FOLD	8	3	117915	CYL. HYD. 2.5" X 15.5" FOLD & BREAK	13.	1	112300	HYD. PRESSURE GAUGE 0-3000 PSI
4	2	117660	SHUTTLE VALVE 1/4" FPT	9	1.	117695	ACCUMULATOR HYD. 10CI	14.	1	227551	OPTIONAL OPEN CENTER KIT - GFS
5	2	228424	CYL. HYD 1.5" X 4" EXT'N LOCK	10.	2	117935	CYL. HYD. 1" X 3" TIP LOCK	15.	1	118423	ONE WAY CHECK VALVE - 06 FPT

7.2 Ace PTO Driven Pump

ACE 150 SERIES HIGH PERFORMANCE PUMPS

High Performance PTO Belt Driven Centrifugal Pump



PTOC-150 SERIES

- Suction 1-1/2" - Discharge 1-1/4"
- Stainless Steel Shaft and Wear Ring
- Chemical Resistant Valox® or Optional Cast Iron Impeller
- Standard Viton Carbon/Ceramic seal or Optional Severe Duty Silicon Carbide Mechanical Seal
- Spring loaded idler absorbs shock of PTO engagement.
- Six models available - see back page
- New BAC-15-PIN feature ensures proper alignment

® Registered trademark of GE Plastics

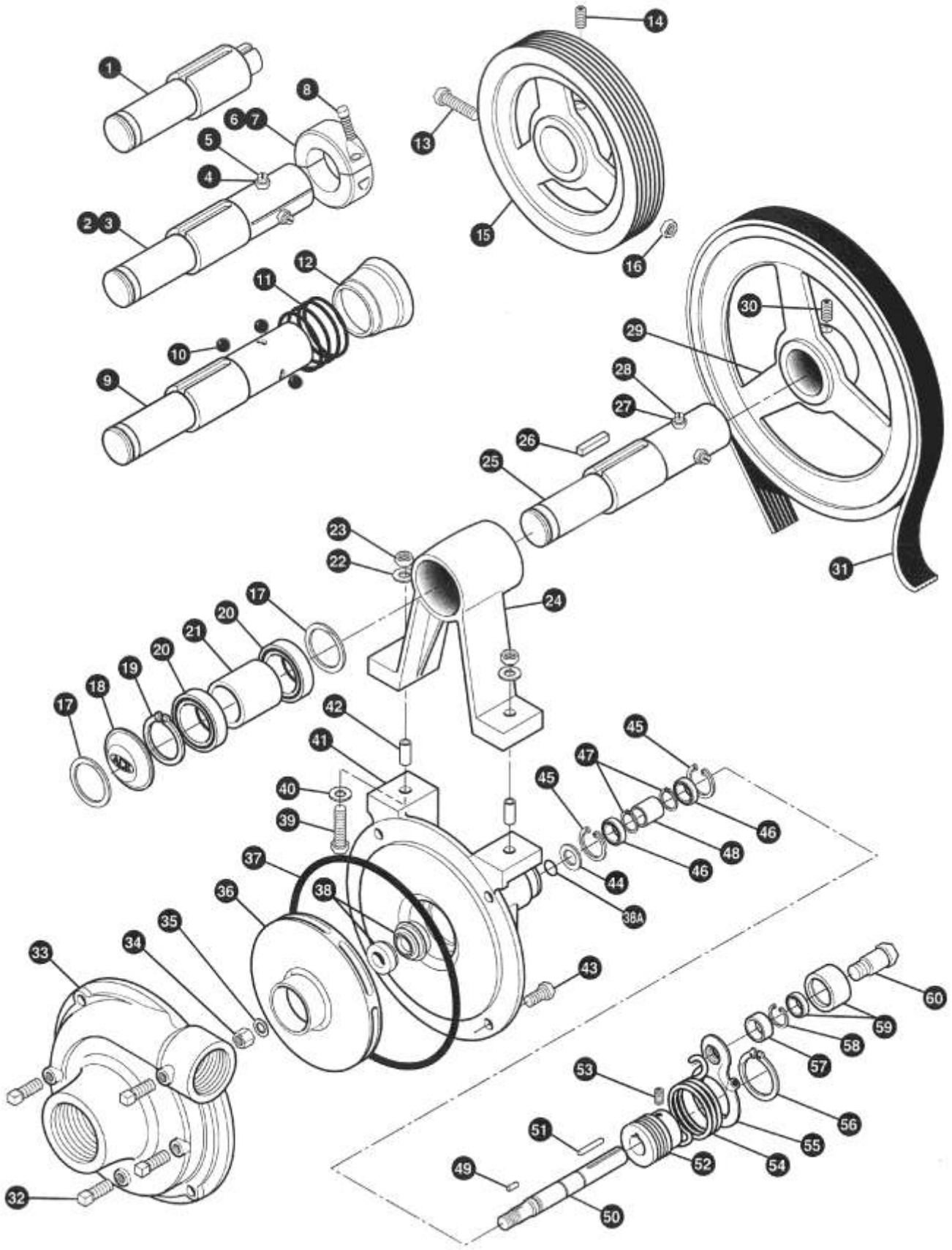
600 RPM PERFORMANCE CHART

Tractor PTO Speed	450 RPM	500 RPM	540 RPM	600 RPM
PSI	GPM	GPM	GPM	GPM
30	87	102	112	122
40	77	93	104	113
50	62	83	96	112
60	10	66	86	104
70	-	32	73	97
80	-	10	45	86
90	-	-	25	72
100	-	-	-	40

1000 RPM PERFORMANCE CHART

Tractor PTO Speed	700 RPM	800 RPM	900 RPM	1000 RPM
PSI	GPM	GPM	GPM	GPM
30	85	90	93	100
40	74	87	90	95
50	67	80	87	90
60	44	74	80	85
70	-	63	72	78
80	-	43	65	72
90	-	-	48	60
100	-	-	15	40

EXPLODED VIEW DRAWING



PARTS LIST

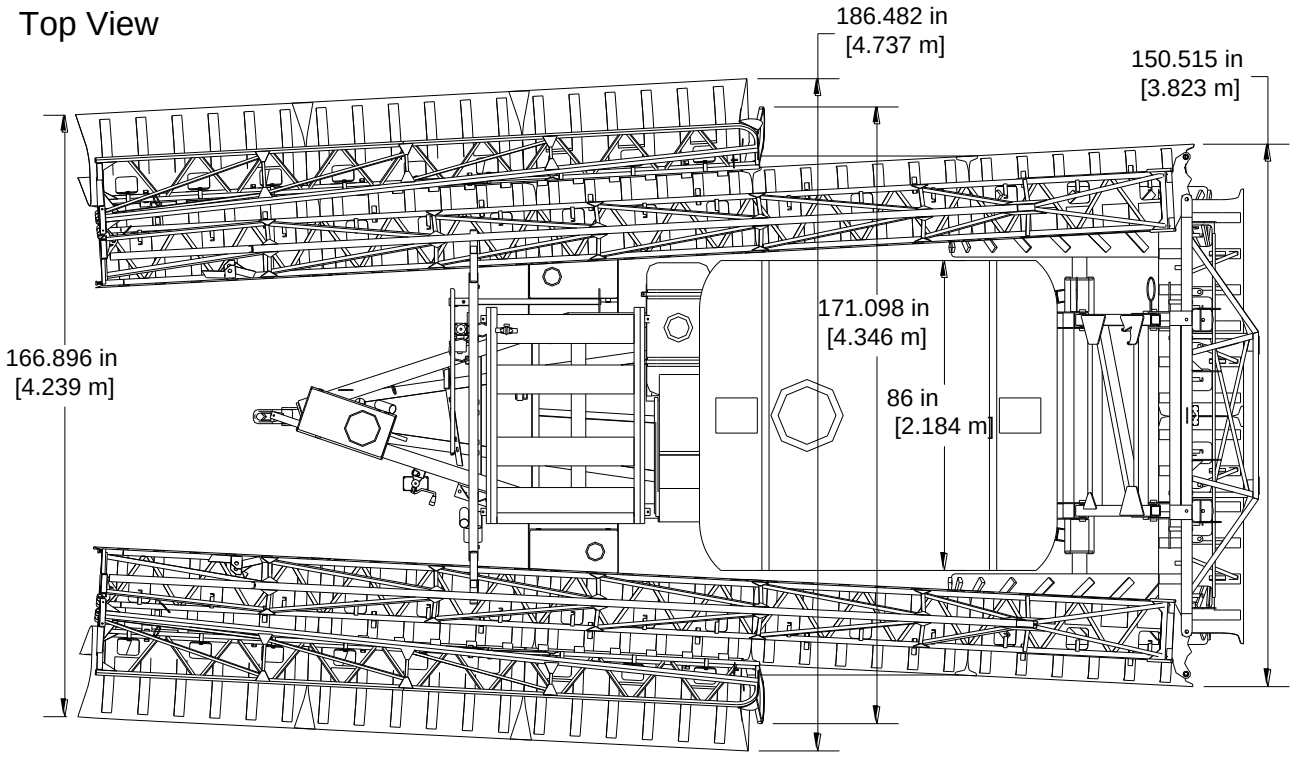
REF. #	PART #	EDP #	DESCRIPTION	REQ.
1	BAC-10-S	40190	1" Tublerod stub drive shaft	1
2	BAC-10-175-20SP	40180	1-3/4" 20 Tooth PTO spline drive shaft, includes BAC-11-175	1
3	BAC-10-21SP	40220	1 3/8" 21 Tooth PTO spline drive shaft, includes BAC-11	1
4, 27	40960	40960	3/8" NC jam nut	3
5, 28	BAC-40	40940	3/8" NC slotted set screw	3
6	BAC-11-175	40236	Locking collar, split ring (for BAC-10-175-20SP shaft)	1
7	BAC-11	40235	Locking collar, split ring (for BAC-10-21SP shaft)	1
8	BAC-11-1	40237	Set screw (for BAC-11 and BAC-11-175 locking collar)	1
9	BAC-10-6SP-QC	40210	1-3/8" 6 Tooth PTO spline drive shaft for quick coupler	1
10	BAC-83-QC	41470	Ball for quick coupler	3
11	BAC-82-QC	41460	Spring for quick coupler	1
12	BAC-81-QC	41450	Ball retainer sleeve for quick coupler	1
13	41250	41250	5/16" NC x 3-1/4" hex head cap screw	1
14, 30	41300	41300	3/8" NC x 5/8" allen head set screw	2
15	BAC-30-10-M-150	40751	7.9" P.D. x 2" Bore Poly-V pulley (for PTOC-150-1000-21SP)	1
15	BAC-30-175-150	40746	7.9"P.D x 2-3/8" Bore Poly-V pulley (for PTOC-150-1000-20SP)	1
16	BAC-63	41260	5/16" NC self locking nut for tumblerod drive	1
17	BAC-34	40830	Internal snap ring, BAC-15 bearing housing	2
18	BAC-27-150-175-M	40506	Name plate (for PTOC-150-1000-20SP)	1
18	BAC-27-150-M	40501	Name plate (for PTOC-150-1000-21SP)	1
18	BAC-27-150-600	40512	Name plate (for PTOC-150-600)	1
19	BAC-35	40840	External snap ring, BAC-10 drive shaft	1
20	BAC-31-1	40781	Sealed ball bearing, BAC-10 drive shaft	2
21	BAC-38-1	40905	Bearing spacer, BAC-10 shaft	1
22	BAC-44	40990	3/8" Lock washer	2
23	BAC-45	41010	3/8" NC Hex nut	2
24	BAC-15	40340	PTO drive shaft bearing housing	1
24	BAC-15-B	40370	Tumblerod drive shaft bearing housing with mounting base	1
25	BAC-10-6SP	40200	1-3/8" 6 Tooth PTO spline drive shaft	1
26	BAC-51	41090	3/8" x 1/2" x 1-1/2" key, PTO drive shaft	1
29	BAC-30-10-150	40741	11.6" P.D. x 2" Bore Poly-V pulley, 10 groove (for 600 RPM models)	1
31①	BAC-28-10-150	40611	Poly-V Belt, 10 groove (for PTOC-150-600)	1
31②	BAC-28-10M-150	40621	Poly-V Belt, 10 groove (for PTOC-150-1000)	1
32	41110	41110	1/8" NPT Pipe plug	3
32	41120	41120	1/8" NPT Pipe plug, stainless steel (optional)	3
33	BAC-12-150	40255	Volute 1-1/2" x 1-1/4", cast iron	1
34	BAC-23-A	40391	Nut, 3/8" NF hex, cad plated lock nut	1
35	BAC-24-HYD-SS	44000	Washer, 3/8", stainless steel	1
36	BAC-26-150	40445	Impeller, cast Iron with keyway(optional)	1
36	BAC-26-150-P	40446	Impeller, with keyway, thermoplastic	1
37①②③	BAC-4-150	40015	"O" Ring volute seal	1
38	BAC-7SC	40152	Silicon carbide mechanical seal (includes 40160) (optional)	1
38①②③	BAC-7V	40151	Viton mechanical seal (includes 40160 "O" Ring)	1
38A①②③	40160	40160	"O" ring for mechanical seal	1
39	BAC-42	40970	3/8" NC x 2" Hex head cap screw	2
40	BAC-43	40980	3/8" Flat washer	2
41	BAC-14-150-MIA	40308	Mounting frame, machined for idler arm	1
42	BAC-15-PIN	40799	Alignment pin	2
43	40930	40930	3/8" NC x 3/4" hex head cap screw, stainless steel (optional)	4
43	40950	40950	3/8" NC x 3/4" hex head cap screw	4
44	BAC-54	41130	Slinger	1
45	BAC-33	40810	Internal snap ring for mounting frame	2
46	BAC-37	40870	Sealed ball bearing for pump shaft	2
47	BAC-32	40790	External snap ring for driven pump shaft	2
48	BAC-32-S	40795	Spacer for pump shaft	1
49	BACH-25	40420	Key for impeller, 1/8" x 1/8" x 1/2"	1
50	BAC-6-150/200	40055	5/8" Driven Shaft, with keyway	1
50	BAC-6-150/200-SS	40056	5/8" Driven Shaft, with keyway, stainless steel (optional)	1
51	BAC-50	41080	3/16" x 3/16" x 1-1/4" key	1
52	BAC-29-10-1.35	40675	1.35" P.D. x 5/8" Bore Poly-V pulley, 10 groove(PTOC-150-600)	1
52	BAC-29-10-1.7	40681	1.7" P.D. x 5/8" Bore Poly-V pulley, 10 groove(PTOC-150-1000)	1
53	BAC-57	41180	5/16" NC x 5/16" allen head set screw for BAC-29-10 pulley	2
54	BAC-5-150	40035	Idler mounted torsoin spring for 150 series	1
55	BAC-13	40270	Idler arm	1
56	BAC-36	40850	External snap ring, BAC-13 idler arm	1
57	BAC-46	41020	5/8" Spacer	1
58	41070	41070	Retainer ring	1
59	BAC-55	41140	Idler bearing and outer roller assembly	1
60	BAC-47	41040	5/8" NC x 2-1/8" hex head idler cap screw	1
#	BAC-52	41100	1/4" cold shut, torque chain anchor	1
#	BAC-58	41190	Zerk fitting, 1/4" NPT, for idler arm	1
#	BAC-55-A	41150	Idler arm assembly (includes 55 through 60 and BAC-58)	-
#	BGKB-150	52605	Belt and shaft guard kit for all PTOC-150 pumps	-
①	RK-PTOC-150-600	51155	Repair kit for 600 RPM models, includes belt, seal, gasket, and "O" ring	-
②	RK-PTOC-150-1000	51255	Repair kit for 1000 RPM, includes belt, seal, gasket, and "O" ring	-
③	RK-FMC-150	52710	Repair kit for pump only, includes seal, gasket, and "O" ring	-
#	FMC-150-MIA	47008	Pump end only, machined to accept idler arm	-

Not shown in exploded view drawing.

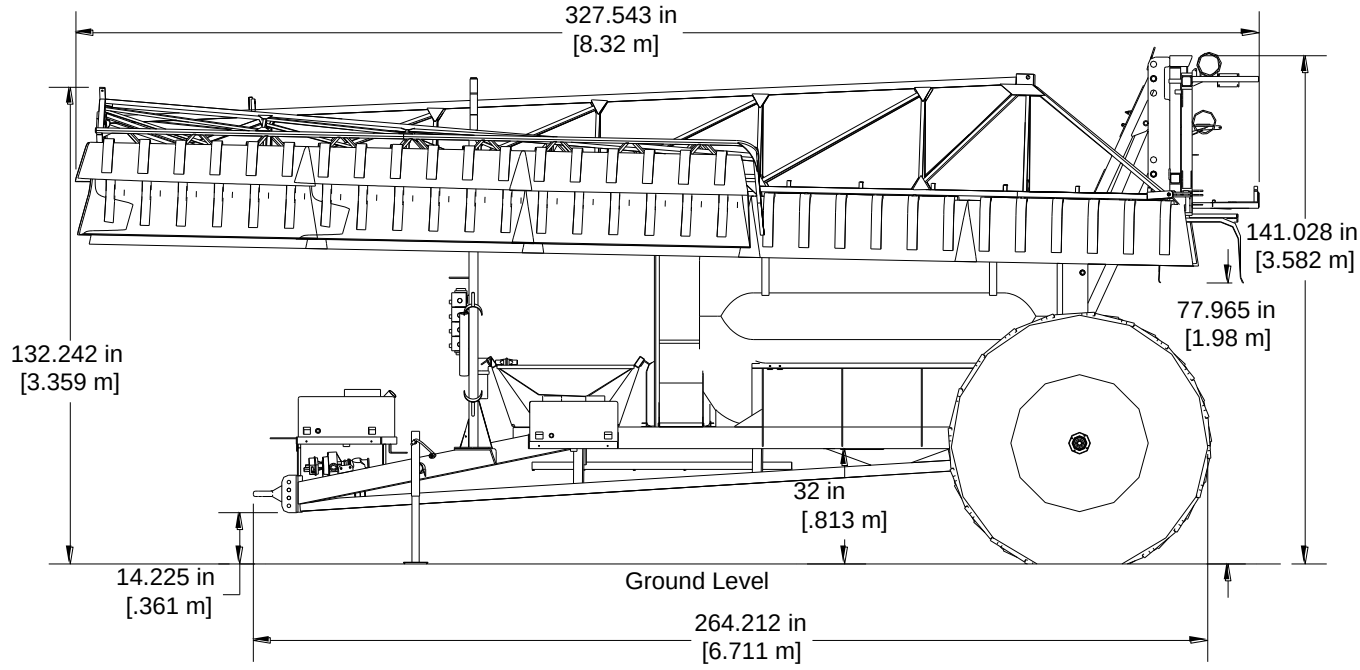
7.3 Cart Transport Dimensions

Cart with 25' Inner Booms Transport Position 06/04/07

Top View

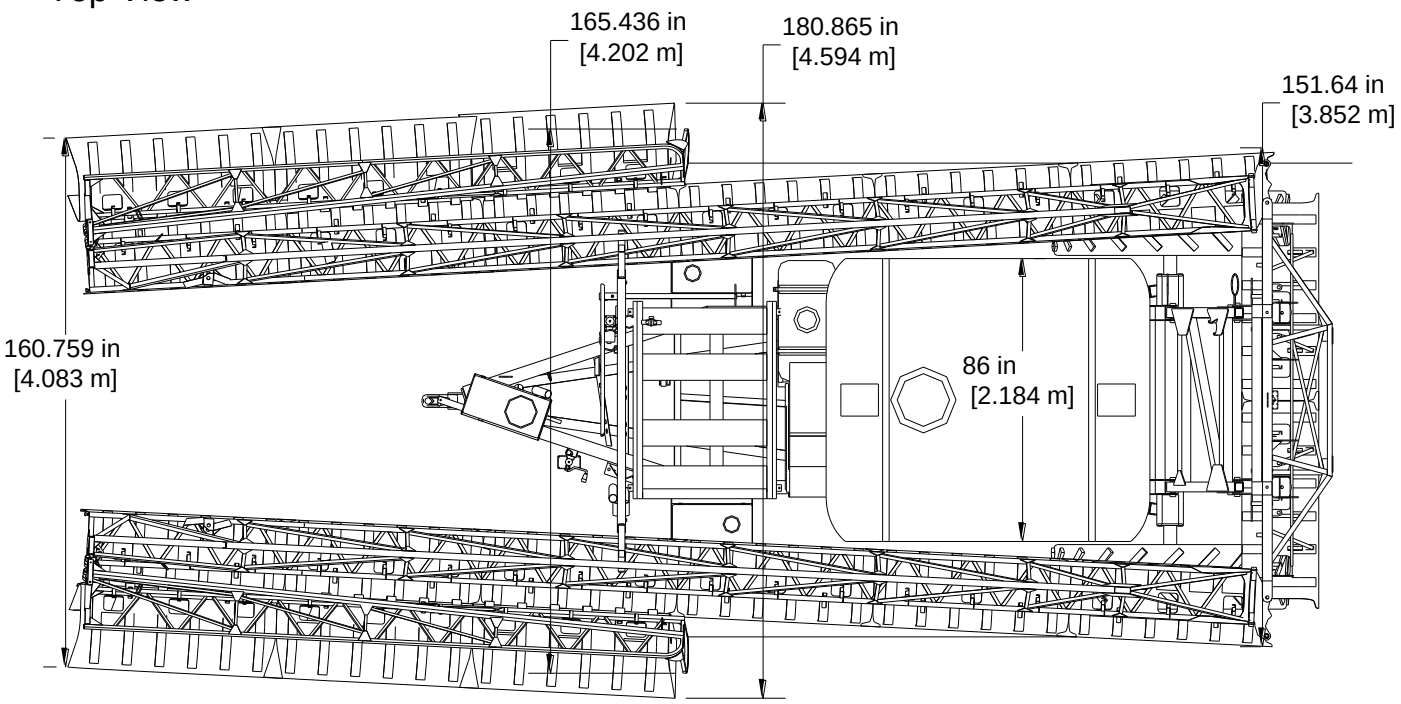


Side View

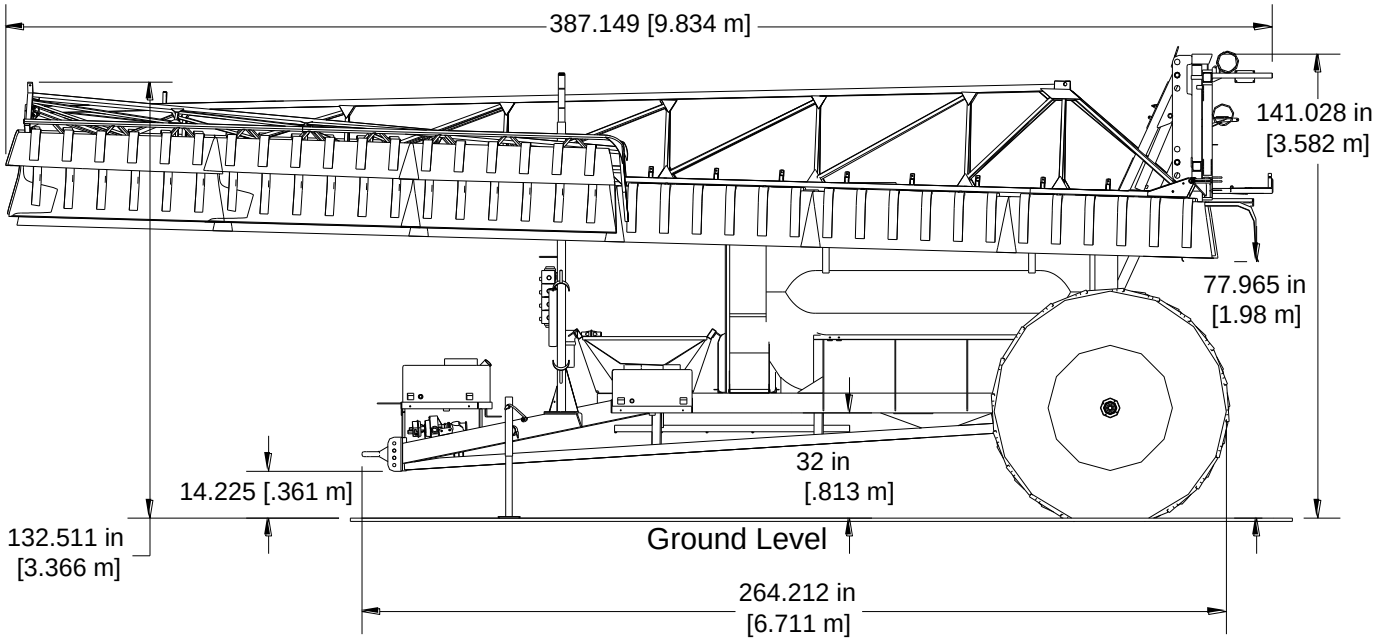


Cart with 30' Inner Booms Transport Position 06/04/05

Top View

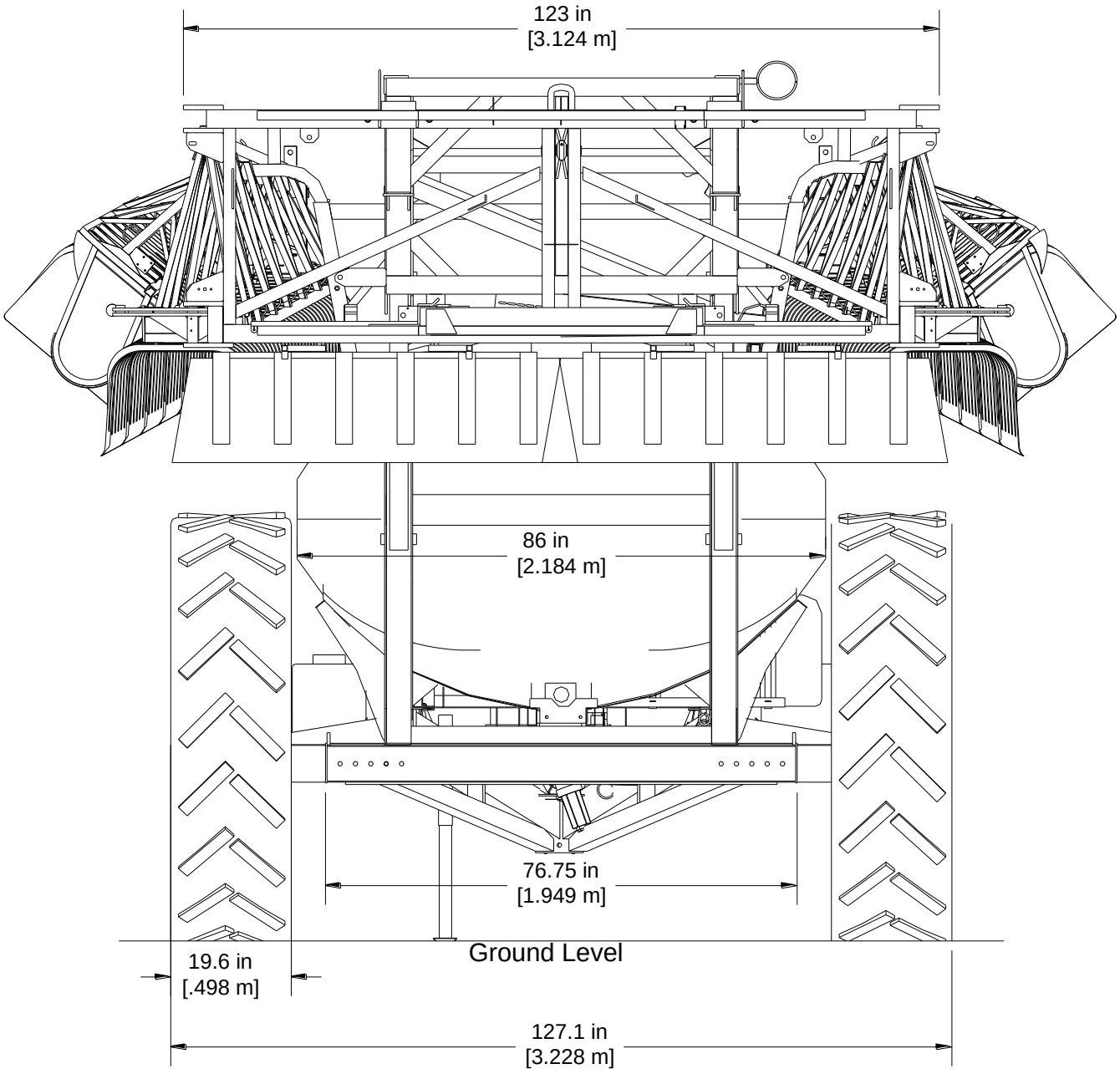


Side View



Rear View of Sprayer Cart in Transport Position

06/12/2007 R1



8 WARRANTY

Ag Shield Manufacturing warrants each new Ag Shield sprayer to be free from factory defects in material and workmanship under normal use and service, when set up and operated in accordance with factory instructions for one year from the date of delivery to the original purchaser.

Ag Shield's obligation under this warranty is limited to the supplying of replacement parts which are defective due to factory workmanship or material.

Your Ag Shield Dealer is responsible for providing warranty labour. Credit for required labour is specifically agreed to on an individual case basis.

We make no warranty as to accessories e.g. rate controllers and foam markers, but warranty is handled through Ag Shield. Warranty for Honda™ motors is supplied by the closest Honda™ dealer, and is not connected to or determined by Ag Shield.

The warranty is void on any unit which has been tampered with, or modified in any way not authorized in writing by the factory.

This warranty is void on any unit which is subject to misuse, negligence or accident, or which has had the serial number tampered or removed.

A "Warranty Claim Form" (sample at end of book) must be submitted to Ag Shield with returned parts in order for parts to be considered for warranty examination.

A warranty registration page from the front of this manual must be returned to the factory in order to qualify for warranty examination.

All returned parts must be sent to the factory freight prepaid, and warranty parts will be returned to you freight collect.

Replacement parts shipped pending receipt of parts for examination will be invoiced, and remain on your account until such time as examination indicates that a credit for those parts be issued or that payment is due.

Parts not returned for warranty examination within 30 days must be paid for at that time. Ag Shield will immediately reimburse any cash paid for items that are later determined defective.

Warranty terms and conditions are subject to provincial and state legislation.

8.1 WARRANTY CLAIM FORM

Dealer			Ag Shield Mfg Box 9, Benito, MB, R0L 0C0 ph 800-561-0132 fax 204-539-2130 ph 204-539-2000i	End User		
Address				Address		
City	State/Province	Zip/Postal		City	State/Province	Zip/Postal

DATE OF SALE	DATE FAILED	REPAIR DATE	ACRES/HOURS	MODEL	SERIAL NUMBER

LABOUR HOURS	LABOUR RATE	LABOUR AMOUNT	PARTS MUST BE RETURNED TO BENITO MB FREIGHT PREPAID TO BE CONSIDERED FOR WARRANTY. DATE SHIPPED

QUANTITY ITEM	PART NUMBER	DESCRIPTION	PRICE EACH	TOTAL PRICE	DESCRIBE THE CAUSE OF FAILURE AND CORRECTIVE ACTION TAKEN	APPROVE /REJECT
1						
2						
3						
4						
5						
6						
7						
8						

I CERTIFY THAT THE INFORMATION IS ACCURATE AND THAT THE PARTS WERE REPLACED ON THE MACHINE	PARTS		DATE PARTS RECD RECD BY	
	LABOUR		ITEMS TO SUPPLIERS	
	TOTAL			

SHADED AREAS AG SHIELD USE ONLY ---PLEASE ADD DETAILS FOR ITEM NUMBERS ON BACK

ITEM

ITEM

8.2 Transporting and Folding 6 FCN Block

DANGER

CHECK FOR OVERHEAD POWER LINES AND OTHER OBSTACLES BEFORE FOLDING BOOMS. <u>NEVER FOLD NEAR OVERHEAD POWER LINES</u>

- **DANGER**
- **Always turn off GFS master switch before folding boom tips. – With one or more boom tips folded, the shorter booms can raise in spite of operator efforts to control. If the boom tips raise and contact a high voltage line, severe injury or death could result. Refer to operators manual – GFS operations**

8.2.1 ROAD TO FIELD

When folding the boom to FIELD position, follow the sequence below:

1. If so equipped, remove the lock pins with chains, and place below the booms to free booms for folding
2. Ensure that Ag Shield GFS master switch is in the OFF position before proceeding. Consulate operators manuals of other models of automatic boom tip controllers for best procedure.
3. Push the top of the MAST SWITCH to confirm that the boom is in highest position.
4. Push the top of both LEFT AND RIGHT SHOULDER switches *momentarily* to raise wings (prefer both at same time) to clear the boom rest.
5. Push the wing FOLD SWITCH until cylinders are fully extended to hold both wings in proper field position
6. Push RAISE/LOWER SWITCH to adjust the main boom to operating height
7. Push the bottom or Field side of the boom TIP SWITCH to extend the wing tips to spraying position. To reduce stress on the boom, **release the switch** to allow both boom tips to free fall by gravity for the last 25 degrees forward to field position

DANGER

Booms automatically reset from breakaway position. If booms are in field position, before starting motor, <u>clear all persons</u> in area where a swinging boom could strike them.

8.2.2 FIELD TO ROAD

When folding the boom to ROAD position, follow the sequence below:

1. If the mast has settled, push the top of the MAST SWITCH to raise boom to a position that will allow no friction against other parts.
2. Ensure that Ag Shield GFS master switch is in the OFF position before proceeding. Consulate operators manuals of other models of automatic boom tip controllers for best procedure.
3. Push the top of the boom TIPS SWITCH to road to fold the wing tips back. To reduce impact of the tips striking main boom, be certain to **HOLD the switch continuously until both tips touch the main boom .** Observe the tip locks on small cylinders are holding the tips in road position.
4. Push the LEFT SHOULDER SWITCH until cylinder has near correct extension to cause the boom to strike the boom rest when fold cylinders are engaged in step 4 below. Repeat using the RIGHT SHOULDER SWITCH.
5. Push the top of the RIGHT AND LEFT BOOM FOLD SWITCHES to fold the wings to 3ft or 1 meter from the boom rest.
6. With the LEFT BOOM FOLD SWITCH, fold the left boom against the vertical stop post, push down on the LEFT SHOULDER SWITCH to lower the boom into the cradle.
7. With the RIGHT BOOM FOLD SWITCH, fold the right boom against the vertical stop post, push down on the RIGHT SHOULDER SWITCH to lower the boom into the cradle.
8. If so equipped, install the lock pin with chain over the booms to secure boom in the boom rests for road transport.

Step 2 may be skipped if it is planned to transport with the tips extending well forward of the front of towing vehicle. TO AVOID UNEXPECTED BOOM TIP FOLDING, THE BREAKAWAY BOOM TIPS MUST BE LOCKED SECURELY IN PLACE BY TYING ACROSS BETWEEN THE TIPS

- **DANGER**
- **Always turn off master switch before folding boom tips. – With one or more boom tips folded, the shorter booms can raise in spite of operator efforts to control. If the boom tips raise and contact a high voltage line, severe injury or death could result**.