SUMMERS®

Operator's Manual

TRUCK MOUNTED
2 POINT & 3 POINT
SUPERSPRAYER

IMPORTANT

THE OPERATOR IS RESPONSIBLE FOR ADJUSTING THE MACHINE SINCE MACHINE DOES NOT COME "FIELD READY" FROM FACTORY.

CAUTION

READ & UNDERSTAND OPERATOR'S MANUAL BEFORE USING MACHINE.

SUMMERS MANUFACTURING CO., INC.

WEB SITE: www.summersmfg.com

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DEVILS LAKE, NORTH DAKOTA 58301 ..... (701) 662-5391

8Z1103

Printed in USA

Warranty

Summers warrants only products of its manufacture against operational failure caused by defective materials or workmanship which occur during normal use within 12 months from the date of purchase by the end user from Summers' dealer. Summers' obligation is to replace free of charge any part of any product that Summers inspection shows to be defective excluding transportation charges to Maddock, ND or Devils Lake, ND and return and also excluding all transportation costs from Summers' dealer to the dealer's customer and all other costs such as removal and installation expense. Summers shall not be liable for loss of time, manufacturing costs, labor, material, loss of profits, consequential damages, direct or indirect, because of defective products whether due to rights arising under the contract of sale or independently thereof, and whether or not such claim is based on contract, tort or warranty. Written permission for any warranty claim return must be first obtained from authorized Summers' personnel. All returns must be accompanied with a complete written explanation of claimed defects and the circumstances of operational failure. Written warranty for all component parts used in the manufacture of Summers products is available upon request. Warranty of such component parts will be determined by said component manufacturer upon their inspection of the claimed defective part. This express warranty is the sole warranty of Summers. There are no warranties, which extend beyond the warranty herein expressly set forth. The sales for products of Summers under any other warranty or guarantee express or implied is not authorized. This warranty voids all previous issues

SUMMERS MANUFACTURING CO. INC.

MADDOCK, NORTH DAKOTA 58348 DEVILS LAKE, NORTH DAKOTA 58301

2/95

INTRODUCTION

This manual provides the following information about your Summers Field Sprayer.

SECTION CONTENTS

Section 1 – SAFETY explains important safety precautions and familiarizes the Operator with the decals and their locations.

Section 2 – GENERAL INFORMATION describes standard and optional features of the sprayer.

Section 3 – SPRAYER OPERATION provides all necessary information for the operation and adjustment of the sprayer.

Section 4 – MAINTENANCE covers both spraying system and mechanical maintenance plus proper cleaning and storage.

Section 5 – TROUBLESHOOTING provides a quick reference to solving problems.

Section 6 – SPECIFICATIONS lists important dimensions, capacities and other technical information.

Section 7 – PARTS

OTHER ITEMS OF IMPORTANCE

A. Summers Mfg. Co., Inc. strongly recommends that each Field Sprayer Operator READ and UNDERSTAND the Operator's Manual before using the machine. In addition, this Operator's Manual should be REVIEWED at least ANNUALLY thereafter.

B. It is the policy of this company to improve its products whenever possible and practical to do so. We reserve the right to make changes or improvements in the design or construction of parts at any time without incurring obligations to install such changes on products previously delivered.

C. Reference to "right" and "left" in this manual is determined from a seated position in the drivers seat.

D. Parts are referenced in each drawing with the Summers Manurfacturing Part Number. Use this Part Numer when ordering replacement parts from your Summers dealer. See back section of manual for description of each Part Number.

OWNER REGISTER

Name _____ Size _____

Address _____ Serial Number _____
(located on frame)

City _____

State/Prov. _____ Date Purchased _____

Mail Code _____ Dealer _____

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NOTES

1.1 SAFETY-ALERT SYMBOL

This symbol is used to indicate a potential personal injury hazard. This symbol means:

ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!

Definition of each **Signal Word** used in conjunction with the **Safety-Alert** symbol.

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to limited to the most extreme situations.

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

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

USING CHEMICALS?

HIGH HAZARD REQUIRES:
*goggles
*respirator
*avoid fumes
*rubber gloves and skin protection

MODERATE HAZARD REQUIRES:
*goggles
*avoid fumes
*rubber gloves and skin protection

LOW HAZARD REQUIRES:
*avoid fumes
*rubber gloves and skin protection

PROTECT YOURSELF!

1. REFER TO SIGNAL WORD AND REQUIRED PERSONAL PROTECTIVE EQUIPMENT WHEN USING CHEMICALS.

2. ALWAYS READ AND FOLLOW CHEMICAL MANUFACTURERS' WARNINGS, INSTRUCTIONS AND PROCEDURES BEFORE USING.

3. HANDLE CHEMICALS WITH EXTREME CARE.

4. IN CASE OF POISONING, GET IMMEDIATE MEDICAL ATTENTION. A CONTAINER LABEL MAY BE BENEFICIAL FOR QUICK TREATMENT.

5. BE SAFE!

1.2 GENERAL SAFETY PRACTICES

1. **READ AND UNDERSTAND** Operator's Manual before using machine. Review at least annually thereafter.

2. **VERIFY** all safety devices and shields are in place before using machine.

3. **KEEP** hands, feet, hair and clothing away from moving parts.

4. **STOP** engine, place all controls in neutral, set parking brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, maintaining or unplugging.

5. **BE CAREFU**L when working around high-pressure hydraulic system.

6. **DO NOT ALLOW RIDERS**.

7. **USE EXTREME CARE** when cleaning, filling or making adjustments.

8. **ALWAYS READ** chemical container label carefully and follow chemical manufacturers' WARNINGS, instructions and procedures before using.

9. **AVOID** having excess chemical stored after spraying.

10. **ONLY STORE** chemicals in their original containers in a locked area.

11. **KEEP CHILDREN AWAY** from chemicals and sprayer equipment.

12. **ALWAYS** make sure that pressure is relieved from hydraulic circuits before servicing or disconnecting from tractor.

13. **NEVER** allow anyone to walk or work under a raised piece of equipment.

1.3 SAFETY DURING TRANSPORT

1. **ONLY TRANSPORT** at a safe speed. Use caution when making corners or meeting traffic. Abrupt maneuvering may cause a loss of control.

2. **USE** a safety pin and clip on boom rest to secure boom when transporting. Booms must be folded and secured during transport. SPRING LOADED LATCH IS NOT DESIGNED TO SECURE BOOMS DURING TRANSPORT.

3. **MOUNT** a red flag to outer width of sprayer when transporting long distances to warn motorists of an over wide machine. Operator is responsible for following all local laws governing transport of farm machinery.

1.4 SAFETY DECALS

1. **KEEP SAFETY DECALS CLEAN**.

2. **REPLACE** missing or unreadable decals. New decals are available from your Summers dealer (by stating correct part number (PN) located on the decal).

3. DECAL FOR COMPANY IDENTIFICATION (PN 8Z0079 & 8Z0202).

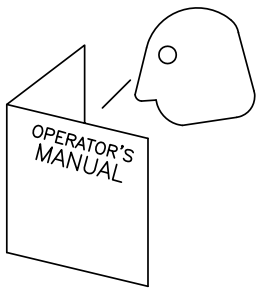
SUMMERS®

MADDOCK, ND 58348 DEVILS LAKE, ND 58301

TM

8Z0202

4. DECAL FOR GENERAL CAUTION (PN 8Z0276).



8Z0276

⚠ CAUTION

1. **Read and understand Operator's Manual before using machine.**
2. **For Sprayers:**
   a. **Read and follow chemical manufacturers' WARNINGS, instructions and procedures before using.**
   b. **Use recommended personal protective equipment to reduce or eliminate chemical contact.**
   c. **Never run pump dry.**
3. **Verify all safety devices and shields are in place before using machine.**
4. **Keep hands, feet, hair and clothing away from moving parts.**
5. **Stop engine, place all controls in neutral, set parking brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, maintaining or unplugging.**
6. **Be careful when working around high pressure hydraulic system.**
7. **Do not allow riders.**
8. **Check all wheel bolts DAILY for tightness.**
9. **Refer to Operator's Manual for periodic and annual maintenance.**
10. **For Towed Implements; DO NOT EXCEED 20 MPH.**

5. DECAL FOR RELEASING BOOMS TO FIELD POSITION (8Z0080).

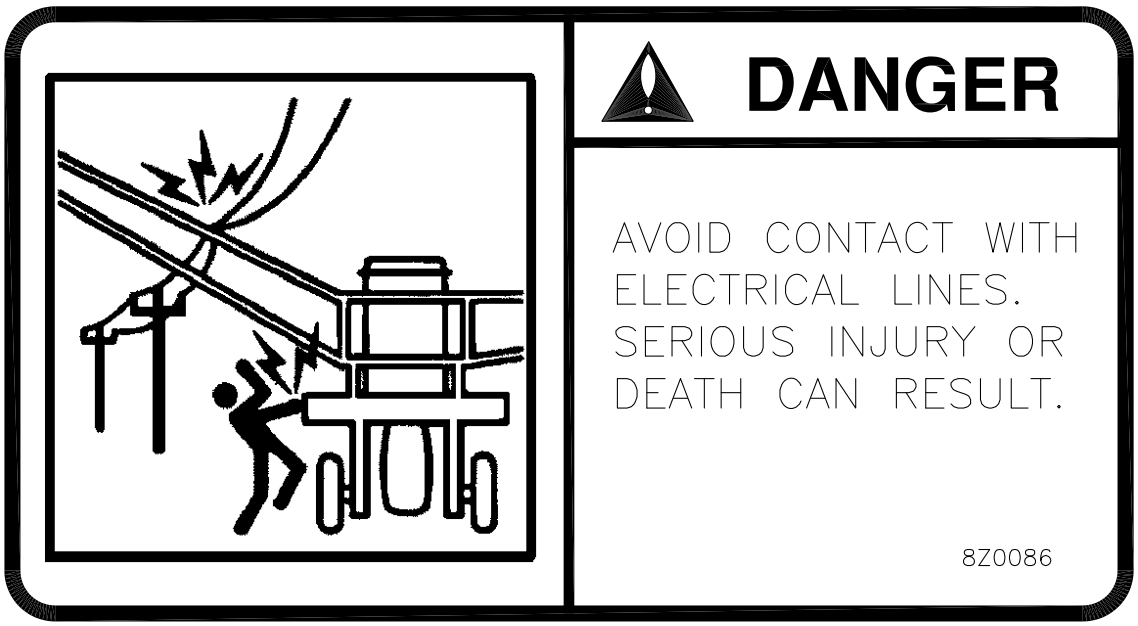
IMPORTANT

WHEN RELEASING BOOM TO FIELD POSITION
1. LOWER BOOM SLOWLY
2. INSURE BOOM CABLES ARE FREE TO FULLY EXTEND.

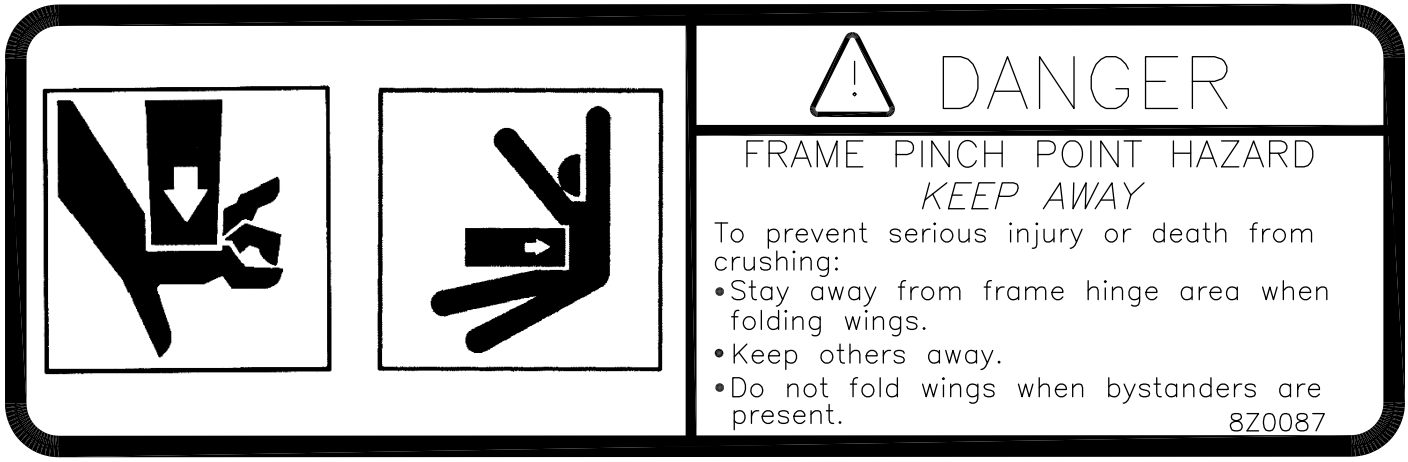
8Z0080

6. DECAL WARNING SWING LOCK MUST BE ENGAGED (8Z0088).

7. ELECTROCUTION DANGER FOR 2-POINT SPRAYER (8Z0086).



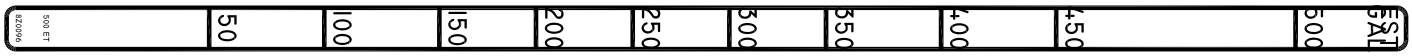
8. PINCH POINT DECAL (8Z0087).



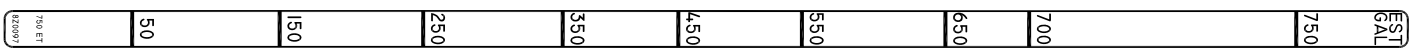
9. CONFINED SPACE DECAL (8Z0089).

10. PARKING DECAL (8Z0082).

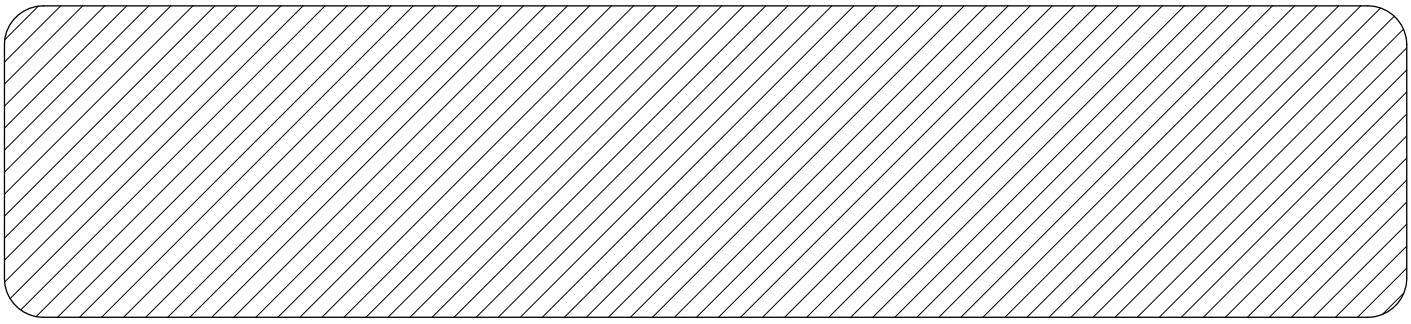
11. SIGHT TUBE DECAL 500 GALLON (8Z0096).



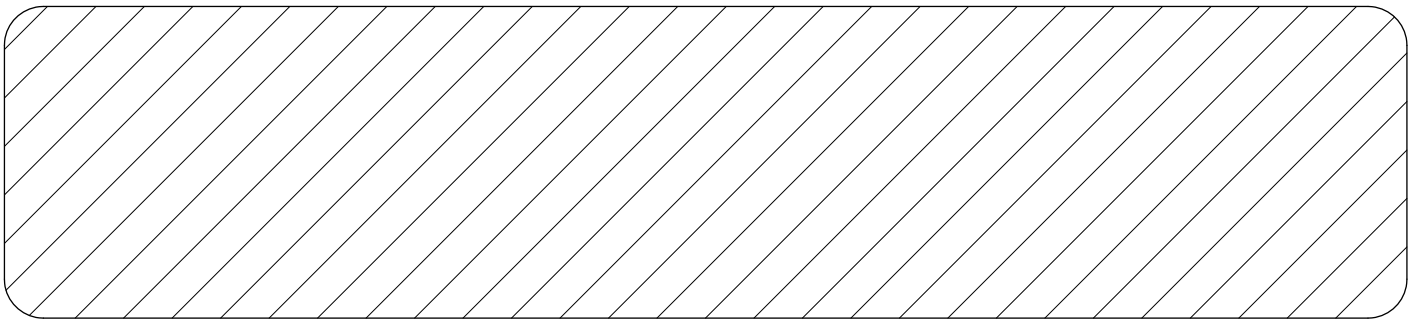
12. SIGHT TUBE DECAL 750 GALLON (8Z0097).



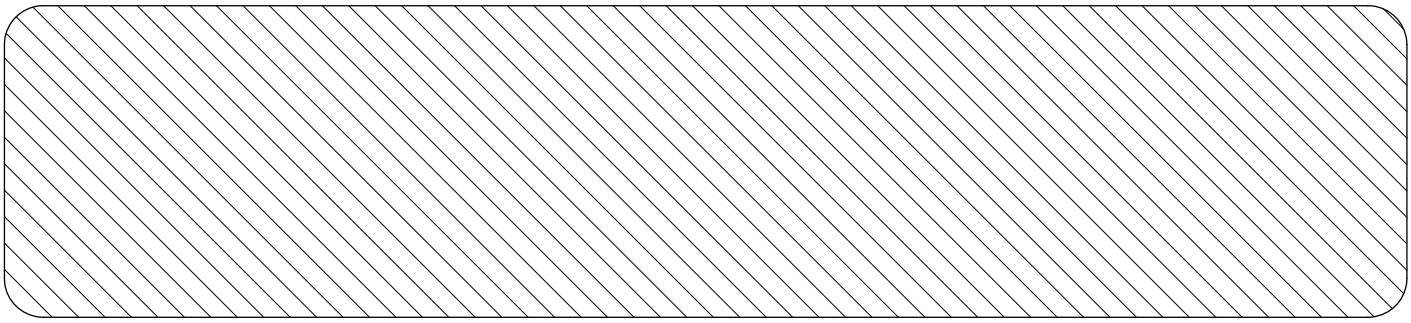
13. AMBER REFLECTOR (8Z0800).



14. RED-ORANGE REFLECTOR (8Z0805).

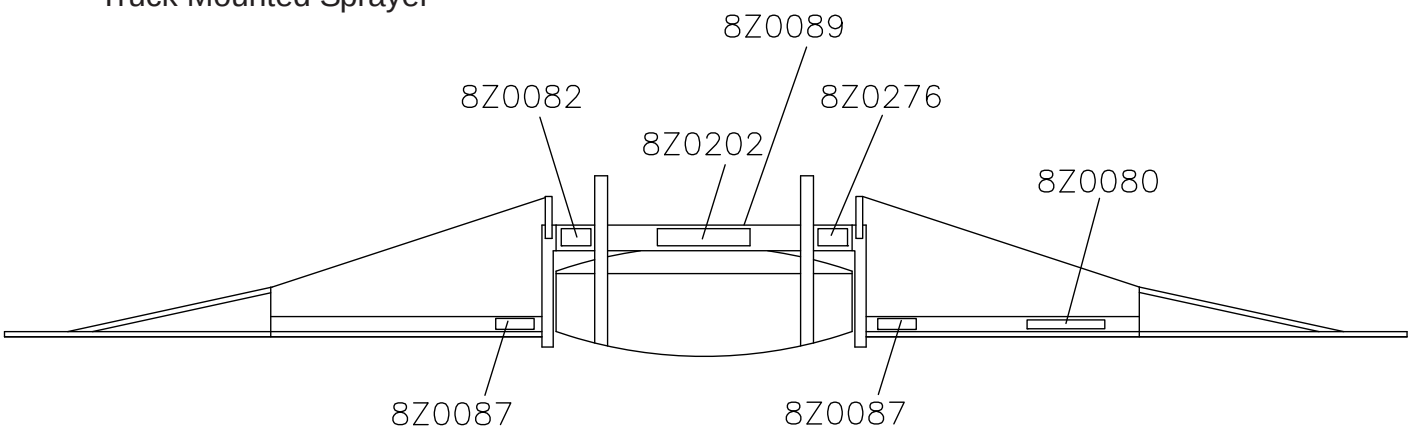


15. RED REFLECTOR (8Z0810).

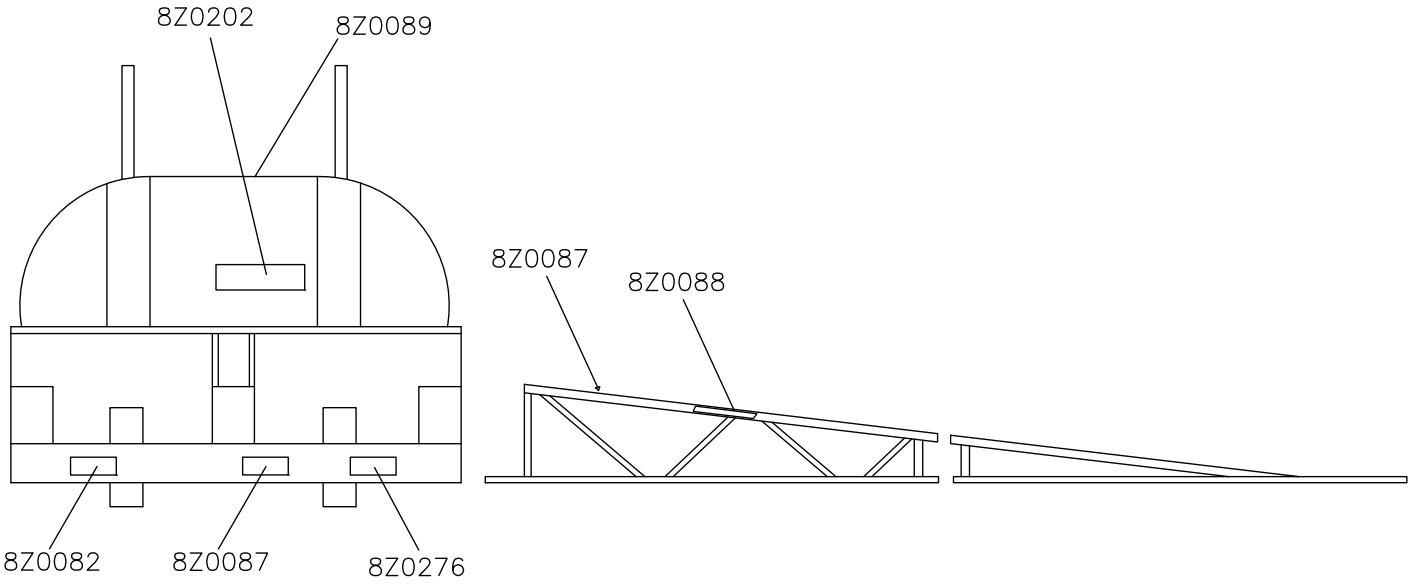


1.5 DECAL LOCATIONS

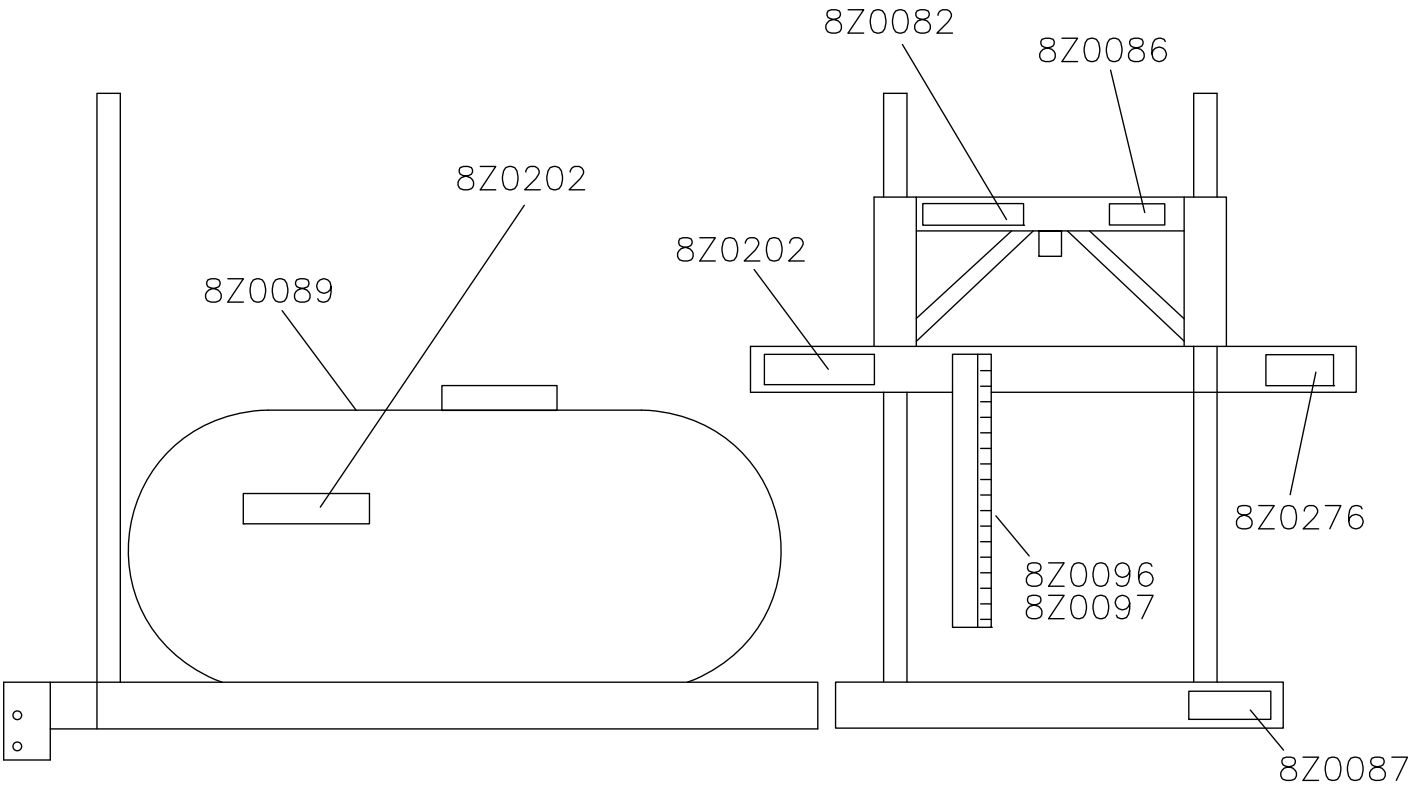
Truck Mounted Sprayer



3-Point Mounted Sprayer



2-Point Sprayer



NOTES

2.1 STANDARD FEATURES

60 to 90 foot wetboom Truck Mounted Sprayers

* Electric-Hydraulic tip lift.
* Vertically adjustable spray height.
* Tank is tapered to sump, fore, aft, and sideways.
* Two section boom system with separate ball valves.
* Hydraulically damped flex action booms with spring return.
* Midmount booms for better visibility and weight distribution.
* Sturdy truss-type two part boom system with separate spray ball valves.
* 1 inch inside diameter aluminum wet boom with adjustable spray angle.
* Self supporting stand with two side crank jacks for one man loading and unloading.
* Raven 205 Control provides pressure reading and adjustment plus on/off control of each boom.
* 8 HP Honda engine with high capacity direct drive centrifugal Scot pump on sprayers 73-90'.
* 5.5 HP Honda engine with high capacity direct drive centrifugal Hypro pump on sprayers 60-70'.
* Boom break away reduces damage should booms collide with obstacles causing excessive boom pull.
* Quick jet dripless triple pinwheel nozzles equipped with 80 degree XR (extended range) stainless steel tips are factory spaced at 20": 36 per 60', 38 per 63'4", 40 per 66'8", 42 per 70', 44 per 73'4", 46 per 76'8", 48 per 80', 50 per 83'4", 52 per 86'8", and 54 per 90'.

60 to 90 foot wetboom 2-Point Tractor Mounted Sprayers

* Elliptical poly tank.
* Sturdy truss-type booms.
* Double acting tip lift cylinders.
* Fits category II and III 3 point hitch.
* Tank level sight tube.
* Operator platform and ladder.
* Three boom control ball valves.
* Safety Light Package
* Self supporting stand for one man hook up.
* 30" of hydraulically adjustable spray height.
* Row crop adjustable 12.5L x 15" 360 degree caster wheels.
* Hydraulically damped flex action booms with spring return.
* 1 inch inside diameter aluminum wet boom with adjustable spray angle.
* Raven 205 Control provides pressure reading and adjustment plus on/off control of each boom.
* Boom break away reduces damage should booms collide with obstacles causing excessive boom pull.
* Quick jet dripless triple pinwheel nozzles equipped with 80 degree XR (extended range) stainless steel tips are factory spaced at 20": 36 per 60', 38 per 63'4", 40 per 66'8", 42 per 70', 44 per 73'4", 46 per 76'8", 48 per 80', 50 per 83'4", 52 per 86'8", and 54 per 90'.

3-Point Tractor Mounted

* Boom mounted nozzles
* Self supporting stands for one man hook up.
* Vertically adjustable spray height.
* Safety Light Package
* Boom fold spring assist on sizes greater than 50'.
* Three section boom system with separate ball valves.
* Raven 205 Control provides pressure reading and adjustment plus on/off control of each boom.
* Boom break away reduces damage should booms collide with obstacles causing excessive boom pull.
* Quick jet dripless nozzles equipped with 80 degree XR (extended range) stainless steel tips are factory spaced at 20".

2.2 MAJOR OPTIONS

60 to 90 foot wetboom Truck Mounted Sprayers

* Windshields.
* Two tank sizes (350 or 500 gallon).
* Ten application widths (60', 63'4", 66'8", 70', 73'4", 76'8", 80', 83'4", 86'8", 90').

60 to 90 foot wetboom 2-Point Tractor Sprayers

* PTO or hydraulic pump.
* Two tank sizes 500 or 750 gallon).
* 11L x 15" 360 degree caster wheels.
* 12.5L x 15" 360 degree caster wheels with lug tires.
* Ten application widths (60', 63'4", 66'8", 70', 73'4", 76'8", 80', 83'4", 86'8", 90').
* Chemical tank rinse system.
* Chemical sprayer wash wand.

3-Point Tractor Sprayer

* Hydraulic tip lift.
* PTO or hydraulic pump.
* Two tank sizes (300 to 500 gallon).
* Five application widths (50', 53'4", 56'8", 60', and 66')

2.3 OTHER OPTIONS

* Hand wand option.
* Chemical fill wand.
* 2 inch bottom fill kit
* Remote sprayer control.
* Middle boom ball valve kit.
* 110 degree XR stainless steel tips.
* Foam marker.
* Electric end nozzle.
* Chemical rinse wand.
* Equal boom width option.
* Sprayer mounted radar sensor.
* Clean water tank w/gloves and goggles.
* End nozzle kit with manual shut-off valve.
* Electric start engine on truck mounted sprayers.
* Dual or triple swivel nozzles change spray tips with a simple twist.
* Raven 450 Control provides computer controlled application based on ground speed.
* Mix and fill kit with 1-1/4" built-in bottom fill provides foam reduced filling of sprayer tank using chemical and/or water from nurse tank.

3.1 SPRAYER OPERATION SAFETY

CAUTION

REVIEW SECTION 3 SPRAYER OPERATION SAFETY BEFORE PROCEEDING.

1. **READ AND UNDERSTAND** Operator's Manual before using machine.
2. **DO NOT ALLOW RIDERS OUTSIDE OF OPERATOR COMPARTMENT**.
3. **ONLY TRANSPORT** at a safe speed. Use caution when making corners or meeting traffic. Abrupt maneuvering may cause uncontrollable results.
4. **USE** a safety pin and clip on boom rest to secure boom when transporting. Booms must be folded and secured during transport. SPRING LOADED LATCH IS NOT DESIGNED TO SECURE BOOMS DURING TRANSPORT.
5. **KEEP CHILDREN AWAY** from chemicals and sprayer equipment.
6. **USE EXTREME CARE** when cleaning, filling or making adjustments.
7. **ALWAYS READ** chemical container label carefully and follow chemical manufacturers' WARNINGS, instructions and procedures before using.
8. **WHEN WORKING AROUND CHEMICALS**:

USING CHEMICALS? PROTECT YOURSELF!

HIGH HAZARD REQUIRES:
*goggles
*respirator
*avoid fumes
*rubber gloves and skin protection

MODERATE HAZARD REQUIRES:
*goggles
*avoid fumes
*rubber gloves and skin protection

LOW HAZARD REQUIRES:
*avoid fumes
*rubber gloves and skin protection

1. REFER TO SIGNAL WORD AND REQUIRED PERSONAL PROTECTIVE EQUIPMENT WHEN USING CHEMICALS.

2. ALWAYS READ AND FOLLOW CHEMICAL MANUFACTURERS' WARNINGS, INSTRUCTIONS AND PROCEDURES BEFORE USING.

3. HANDLE CHEMICALS WITH EXTREME CARE.

4. IN CASE OF POISONING, GET IMMEDIATE MEDICAL ATTENTION. A CONTAINER LABEL MAY BE BENEFICIAL FOR QUICK TREATMENT.

5. BE SAFE!

9. **BE CAREFUL** when working around a high pressure hydraulic system.
10. **ALWAYS** make sure that pressure is relieved from hydraulic circuits before servicing or disconnecting any hydraulic component.
11. **VERIFY** all safety devices and shields are in place before using machine.
12. **KEEP** hands, feet, hair and clothing away from moving parts.
13. **NEVER** allow anyone to walk or work under a raised piece of equipment.

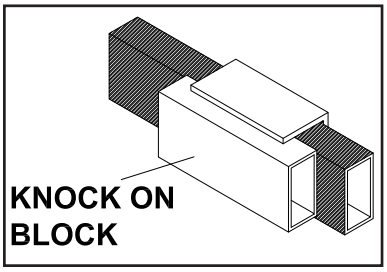
3.2 INITIAL SETUP AND ADJUSTMENT OF MECHANICAL SYSTEM

1. **COMPLETE WARRANTY REGISTRATION CARD**
   A. Complete and return WARRANTY REGISTRATION CARD located at the beginning of this manual. **RETURNING CARD ENTITLES YOU TO A FREE GIFT AND ASSURES THAT PRODUCT INFORMATION BULLETINS WILL BE SENT DIRECTLY TO YOU.**

   B. Complete the OWNER REGISTRATION also located at the beginning of this manual. **REMEMBER TO BRING OWNER REGISTER INFORMATION WHEN ORDERING PARTS.**

2. **PREPARE TO LOAD SPRAYER**.

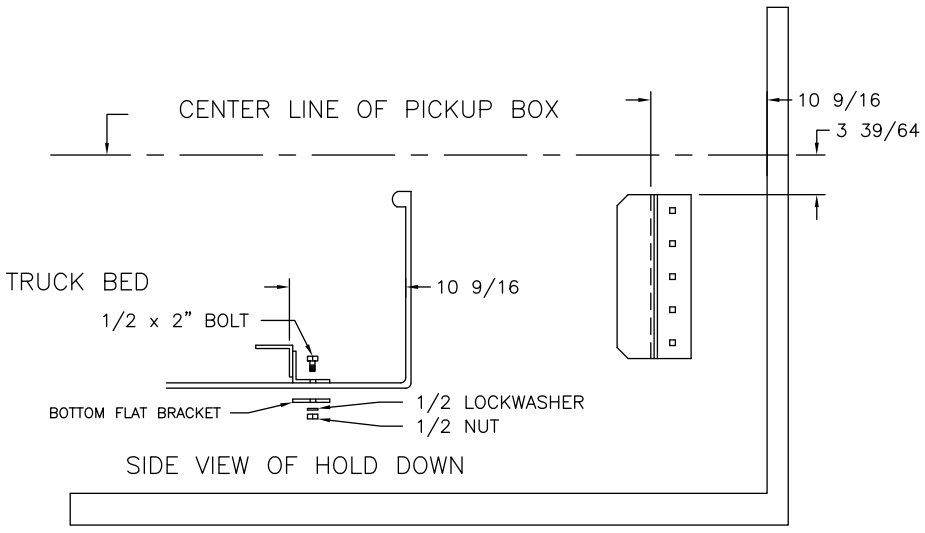
   A. **TRUCK MOUNTED SPRAYERS**



   1. Service gasoline engine as recommended by manufacturer.
   2. Check bands securing tank for tightness.
   3. Check all hose connections.
   4. Check oil level in Electric-Hydraulic tip lift motor.
   5. Locate or drill a hole in left front corner of the truck bed to attach the sprayer ground cable.
   6. Mount sprayer hold down bracket to front of truck bed. See template below.
   7. Verify knock on blocks are in place between sprayer frame and truck wheel wells to prevent shifting in the pickup box.

MOUNTING INSTRUCTIONS FOR HOLD DOWN BRACKET.

1. LOCATE HOLD DOWN BRACKET PER DIMENSIONS SHOWN.
2. DRILL TWO 17/32" HOLES IN BED OF TRUCK.
   USE HOLES THAT MISS FRAME MEMBERS.
3. ASSEMBLE AS SHOWN IN SIDE VIEW.



FRONT RIGHT CORNER OF PICKUP BOX

TOP VIEW

B. TRACTOR MOUNTED SPRAYERS

1. Check bands securing tank for tightness.
2. Check all hose connections.
3. Inspect hydraulic hoses for damage and fraying.
4. Inspect sprayer mount for loose or missing fasteners.

IMPORTANT!

TO PREVENT DAMAGE TO PLUMBING COMPONENTS FROM FREEZING, THE SUCTION AND AGITATION HOSES ON 3-POINT SPRAYERS HAVE NOT BEEN CONNECTED. PRIOR TO USING THE SPRAYER, THESE HOSES MUST BE INSTALLED AND SECURED, WITH HOSE CLAMPS, TO THE LOWER TANK FITTINGS.

3. LOAD SPRAYER

A. TRUCK MOUNTED SPRAYER

1. Retract jacks and remove. Lift rear of sprayer and pin legs in the up position.
2. Secure Skid with rear box locks provided at the two corners.
3. Make wiring connections per diagram on page 15.
   a. one battery positive connection.
   b. one battery switched and fused connection.
   c. one ground connection.
4. To connect tip lift electrical system to pickup electrical system follow these steps:
   a. Attach ground cable to the hole in pickup box using a 3/8" bolt and nut.
   b. Route power cord to engine compartment and connect to positive battery terminal or main battery power distribution source.
   c. Connect single small RED wire to a SWITCHED and FUSED terminal in the pickup fuse box. This may require additional wire.

WARNING!

POWER CORD MUST NOT CONTACT EXHAUST OR MOVING PARTS. THE CABLE HAS NO CIRCUIT PROTECTION AND ANY DAMAGE TO THE CABLE INSULATION COULD RESULT IN PERMANENT BATTERY DAMAGE.

CAUTION!

DO NOT CONNECT RED WIRE TO ANY NON-SWITCHED TERMINAL. AN INCORRECT POWER SUPPLY WILL PERMIT TIP LIFT OPERATION AT ANY TIME WITHOUT THE IGNITION SWITCH IN THE ON POSITION AND COULD RESULT IN SERIOUS BODILY INJURY OR DAMAGE TO THE SPRAYER.

B. TRACTOR MOUNTED SPRAYERS

1. Connect sprayer to 3-point of tractor.
2. Secure 3-point latches.
3. Unfold booms to field position.
4. Remove Safety Transport Locks on dry boom 3-point only.
5. Connect TIP-LIFT hoses to tractor remotes.
6. Fully charge cylinders by raising each boom slowly.
7. Hook up PTO pump if equipped.
8. Make other hydraulic connections.

HYDRAULIC TIP-LIFT 3-POINT SPRAYERS ONLY!

SAFETY TRANSPORT LOCKS (Part Number 8G7170, painted red) HAVE BEEN INSTALLED ON THE TIP LIFT CYLINDERS TO PREVENT POSSIBLE INJURY WHILE UNFOLDING THE BOOMS BEFORE FULLY CHARGING THE CYLINDERS ON SPRAYER.

HYDRAULIC PUMP NOTES:

Many tractor hydraulic systems route return lines through filters or other restrictive elements which can cause an increase in return circuit pressure. Hypro's hydraulic motor oil seals are designed to withstand 300 PSI continuous pressure. However, whenever possible, it is recommended to utilize either a standard (or purchase an optional) low pressure return circuit. This will allow for less oil heat generation, lower horsepower consumption, and longer oil seal life. Consult with your tractor manufacturer to see if your tractor is or can be equipped in this way.

The Return (or Tank) ports on Hypro hydraulic motors are equipped with an anti-reversing check valve. This is to prevent the motor from accidentally being operated backwards. Backward operation of the motor will cause almost immediate oil seal failure. **Do Not Remove Check Valve.**

HM2 and HM4 models of Hypro's hydraulic motor driven centrifugal pumps can be equipped with a metering orifice in the inlet port. The orifice is intended to be used on older model tractors with Closed Center systems that do not have flow control

valves. Consult with your tractor manufacturer to determine if you have this type of system and require an orifice. Further information is available with your pump's operating manual.

Hypro hydraulic motors are equipped with a bypass adjustment screw. These are only to be adjusted when used on Open Center hydraulic systems. Please see the installation instructions included with the pump for directions on how to use the bypass. Closed Center hydraulic systems do not require any bypass. Be sure that the bypass adjustment is screwed all the way in and the lock nut is tight when operating on Closed Center systems.

There are four basic positions for each type of spool valve. They are Raise, Neutral, Lower, and Float (in order, from back to front). The names used for these positions vary somewhat between manufacturers, but the order of the positions do not.

To properly operate a hydraulic motor-driven centrifugal pump on a tractor hydraulic circuit, only the Lower and Float positions should be used. Use Lower for "On" and Float for "Off". The Float position is recommended for turning the motor off because it allows the remote circuit to flow in a continuous loop allowing the motor to free wheel to a stop and also does not trap pressure in the circuit.

HYDRAULIC VERTICAL BOOM ADJUSTMENT SPRAYERS!

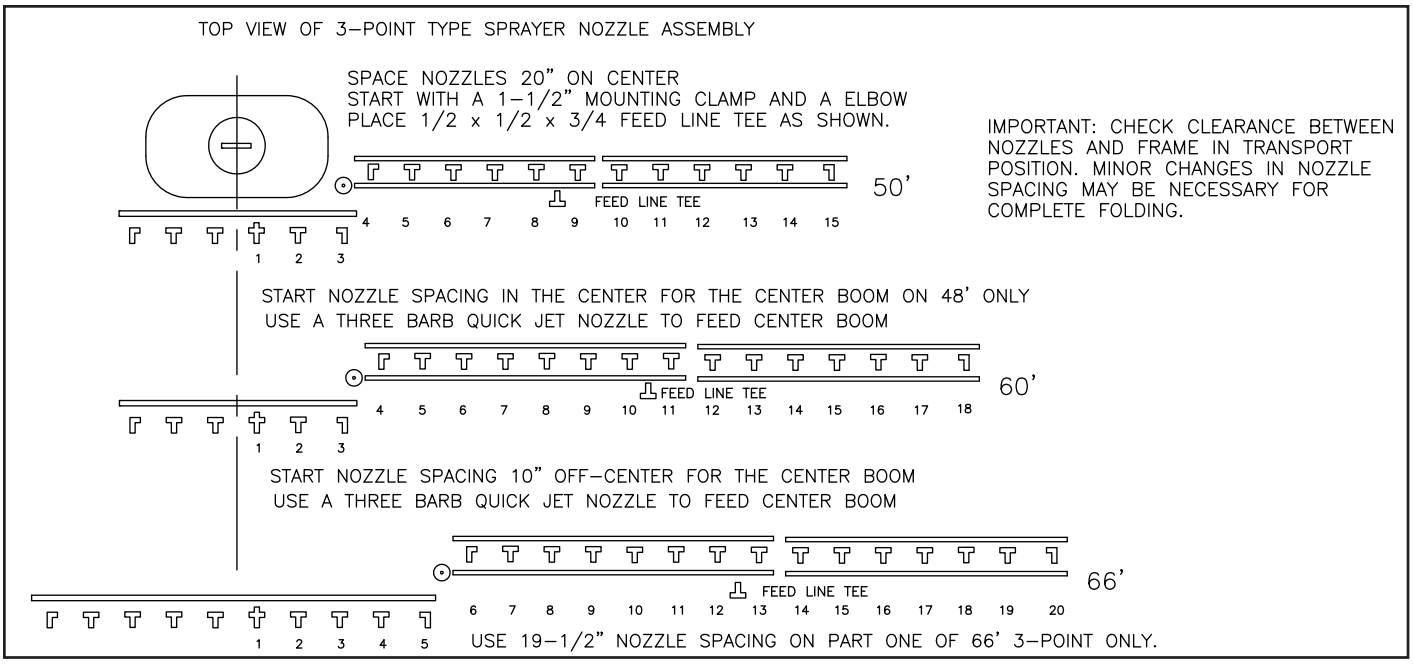
VERTICAL BOOM HEIGHT MUST NOT BE ACTIVATED WITH THE BOOMS IN THE FOLDED POSITION OR DAMAGE TO SPRAYER WILL RESULT. VERTICAL ADJUSTMENT MUST ONLY BE PERFORMED WITH THE BOOMS IN FIELD POSITION.

IMPORTANT!

BEFORE ACTIVATING SPRAY PUMP HYDRAULIC SYSTEM VERIFY DIRECTION OF OIL FLOW IS CORRECT. OIL MUST FLOW INTO THE PRESSURE PORT OF HYDRAULIC MOTOR. THIS CAN BE CHECKED BY MOMENTARILY ACTIVATING THE HYDRAULIC SYSTEM. THE HOSE LEADING TO THE PRESSURE PORT SHOULD FLEX OR STIFFEN WHEN SYSTEM IS ACTIVATED. IF WRONG HOSE FLEXES, EITHER REVERSE HOSES AT THE TRACTOR OUTLET OR MOVE HYDRAULIC LEVER IN OPPOSITE DIRECTION. A CHECK VALVE INSTALLED ON THE TANK SIDE OF THE MOTOR PREVENTS OIL FROM FLOWING THROUGH THE MOTOR IN THE WRONG DIRECTION.

5. 50 TO 60, AND 66 FOOT 3-POINT DRY BOOM SPRAYERS NOZZLE SPACING

Nozzle spacing for the Summers dry boom 3-Point sprayers is at 20 inches with equal distance from sprayer center line. The first nozzle is 10 inches from the sprayer centerline on rear boom. Nozzle spacing for the 66 foot Summers dry boom 3-Point sprayer is as follows. The first nozzle is 10 inches from the sprayer centerline on rear boom. Nozzles on the first section of boom are spaced evenly at approximately 19-1/2" beginning with a 19-1/2" spacing from last nozzle on center boom to first nozzle on first boom section. On second boom section all remaining nozzles are spaced in 20 inch increments.



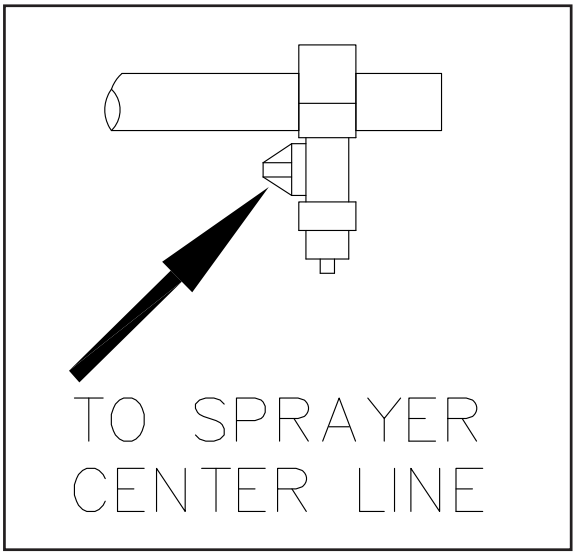
6. FEED LINES FOR 3-PT. DRY BOOM SPRAYERS

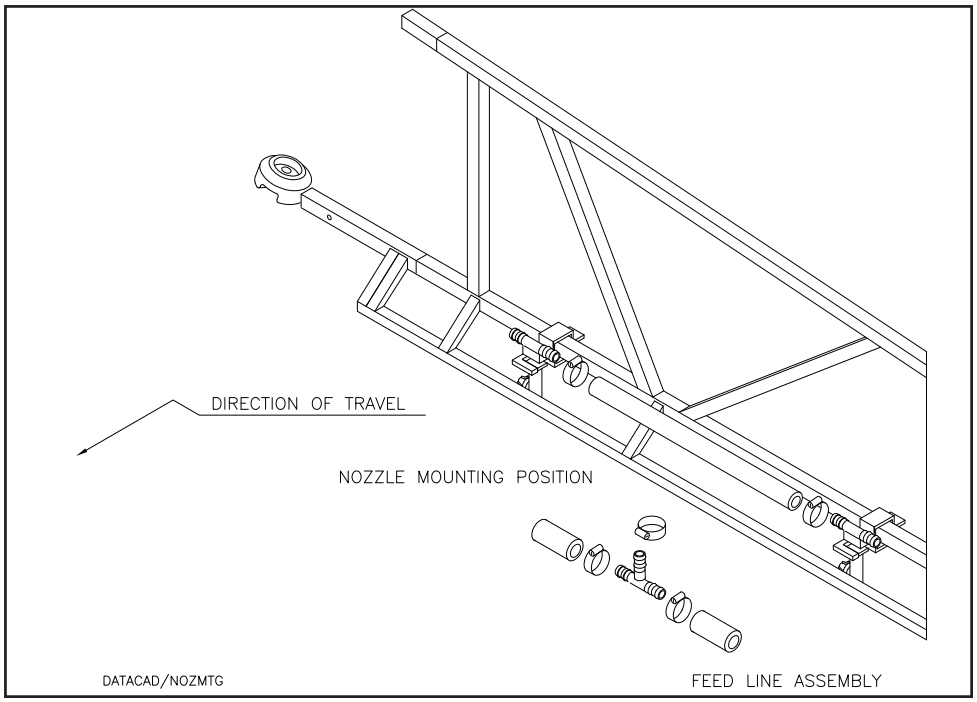
The center boom is fed from center electronic ball valves to 3-way nozzle tee on center boom using 1/2" line. Left and Right booms are fed with 3/4" feed line from left and right ball valves respectively. Hose clamps are used to fasten 1/2" and 3/4" feed lines. Feed lines must be routed so there is enough slack to allow machine to be placed in transport position. Left and right boom feed lines should run under boom transport guide on each main boom. Allow enough slack in feed lines to prevent over stretching in transport position.

7. 60 TO 90 FOOT CABLE SUSPENDED BOOM NOZZLE SPACING

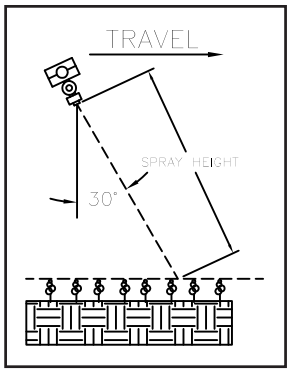
Nozzle spacing for the Summers wet boom field sprayers is 20 inches with equal distance from sprayer centerline. The first nozzle is 10 inches from the sprayer centerline on rear center boom with each consecutive nozzle in 20 inch increments.

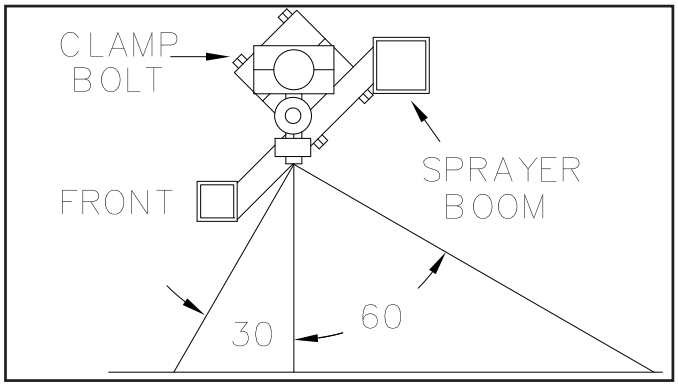
8. NOZZLE TO BOOM ORIENTATION





9. WET BOOM ROTATION ADJUSTMENT

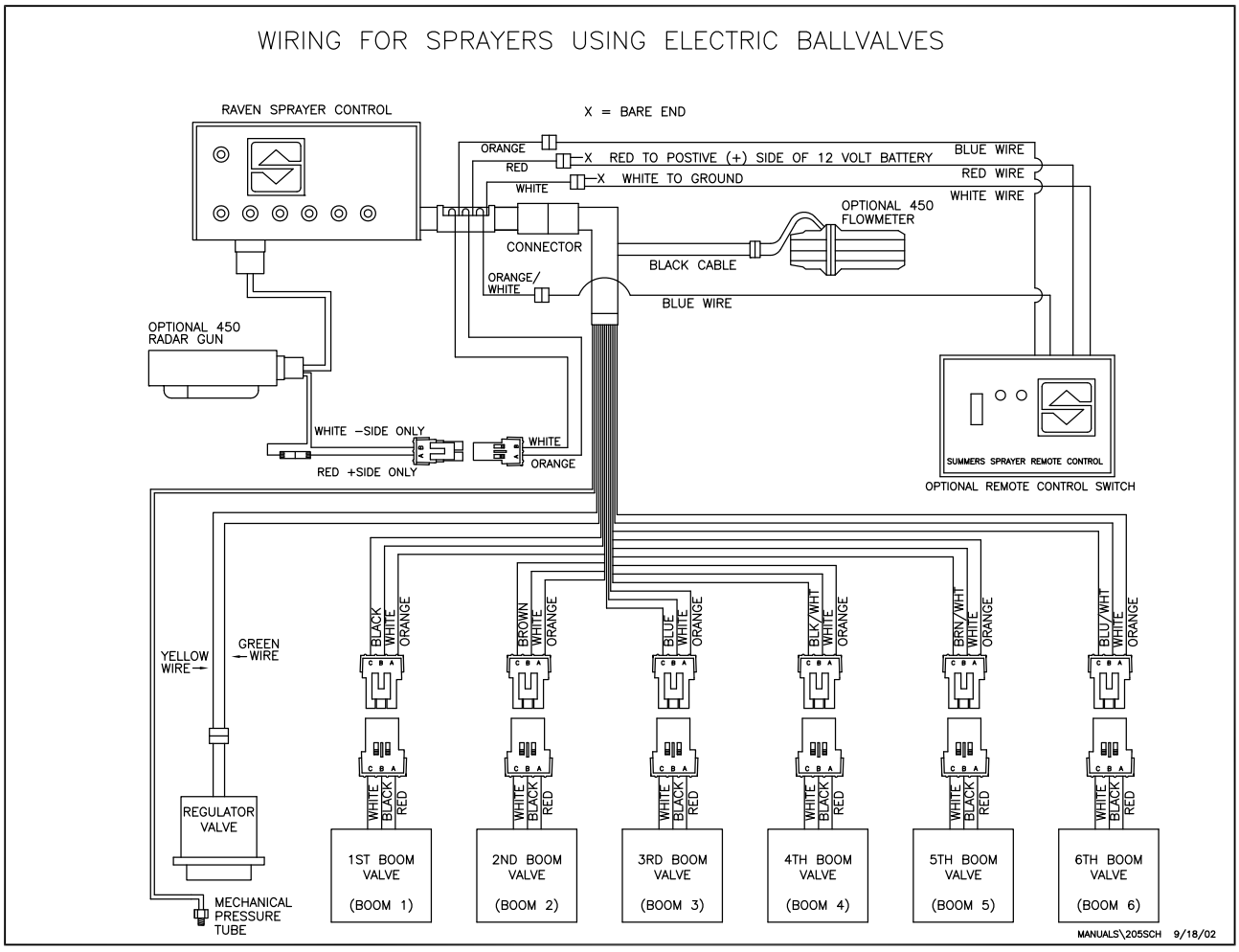




The wet boom can be rotated from 30 degrees forward to 60 degrees rearward depending on operator preference. The factory setting is vertical. To perform a rotation adjustment, loosen clamp bolts securing wet boom and rotate nozzles to desired setting. With the booms in position tighten all the holding hardware to maintain the proper nozzle space setting between the rear center boom and side booms.

10. CONNECTING SPRAYER CONTROLS

Follow the wiring diagram below to properly connect the electronic controls of your Summers sprayer. Attach appropriate wire leads to the electronic ball valves. The remaining leads may be used for connecting electric end nozzles, any unused leads should be taped back to the harness. See your Raven instruction manual for additional information on the sprayer control or electronic flowmeter and pressure regulator valves.



SCS-205 Control has Mechanical Pressure Sensing (Less Pressure Transducer).
12' extension cable assemblies are available.
Order PN 8A1285 for SCS-205 Control.
Order PN 8A4340 for SCS-450 Control.

11. ELECTRIC - HYDRAULIC TIP LIFT ON TRUCK SPRAYERS

The electric-hydraulic tip lift is a self-contained hydraulic system. It requires little maintenance other than clean oil filled to the proper level, a good 12-volt power source, and a secure ground.

3.3 INITIAL SETUP OF SPRAY SYSTEM

1. DETERMINE TIP SIZE

Determine tip size by examining a nozzle tip for the stamped number.

PART NUMBER	TIP SIZE	TIP MATERIAL	DEGREE TIP	COLOR CODE
8F3411X	XR8001	STAINLESS STEEL	80°	ORANGE
8F3413X	XR80015			GREEN
8F3415X	XR8002			YELLOW
8F3417X	XR8003			BLUE
8F3419X	XR3004			RED
8F3421X	XR8005			BROWN
8F3423X	XR8006			GRAY
8F3425X	XR8008			WHITE
8F3511X	XR11001VS	STAINLESS STEEL	110°	ORANGE
8F3513X	XR110015VS			GREEN
8F3515X	XR11002VS			YELLOW
8F3517X	XR11003VS			BLUE
8F3519X	XR11004VS			RED
8F3521X	XR11005VS			BROWN
8F3523X	XR11006VS			GRAY
8F3525X	XR11008VS			WHITE

2. DETERMINE APPLICATION RATE

a. Choose a desired ground speed within factory recommended range of 4 to 12 miles per hour (mph).

b. By knowing tip size and desired ground speed, refer to English or Metric Application Rate Chart (shown on following pages) to determine application rate (U.S. gallons per acre or liters per hectare) based on different operating pressures.

c. Example of how to obtain 5.0 U.S. gallons per acre application rate:

1. Determined tip size to be XR8001.
2. Select a desired ground speed of 6 miles per hour (mph).
3. Refer to English Application Rate Chart (shown on following page) to see that XR8001 tips traveling at 6 mph will deliver 5.0 U.S. gallons per acre at 40 psi operating pressure.

d. Spraying solutions other than water: All tabulations in this manual are based on spraying water, which weighs 8.34 lbs per gallon. Conversion factors must be used when spraying solutions that are heavier or lighter than water. To determine the proper size nozzle for the solution to be sprayed, multiply the desired rate by the conversion factor. Then use the new converted GPM or GPA rate to select the proper size nozzle.

Example: Desired application rate is 20 GPA of 28% N. Determine the correct nozzle size as follows:

GPA (solution) x Conversion Factor = GPA (from table)
20 GPA (28%) x 1.13 = 22.6 GPA (water)

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

Weight of Solution	Specific Gravity	Conversion Factors	Weight of Solution	Specific Gravity	Conversion Factors
7.0 lbs. per gallon	0.84	0.92	10.65 lbs. per gallon	1.28	1.13
8.0 lbs. per gallon	0.96	0.98	11.0 lbs. per gallon	1.32	1.15
8.34 lbs. per gallon - water	1.00	1.00	12.0 lbs. per gallon	1.44	1.2
9.0 lbs. per galon	1.08	1.04	14.0 lbs. per gallon	1.68	1.3
10. lbs. per gallon	1.20	1.10			

3. <u>DETERMINE END NOZZLE SIZE</u>

END NOZZLE SIZING CHART					
80° TIP SIZE	END NOZZLE SIZE	PRESSURE PSI	GALLONS PER MINUTE	SPRAY WIDTH @ H=18"	GALLONS PER ACRE @ 5 MPH
8001	OC04	30	0.35	91"	4.6
		40	0.40	93"	5.1
		50	0.49	94"	6.2
80015	OC06	30	0.52	99"	6.2
		40	0.60	101"	7.1
		50	0.73	102"	8.5
8002	OC08	30	0.69	100"	8.2
		40	0.80	102"	9.3
		50	0.98	104"	11.2
8003 8004	OC12 OC12	30	1.04	102"	12.1
		40	1.20	104"	13.7
		50	1.47	105"	16.6
8005 8006	OC16 OC16	30	1.39	132"	12.5
		40	1.60	138"	13.8
		50	1.96	143"	16.3

SUMMERS MANUFACTURING CO., INC.
APPLICATION RATE CHART (ENGLISH)
U.S. GALLONS PER ACRE - 20" SPACING

TIP NO. Color Screen	PSI	Capacity 1 Nozzle in GPM oz/min	SPEED - MPH					
			5	6	7	8	10	12
8001 11001 Orange 100 mesh Green	15	.06 / 8	3.6	3.0	2.6	2.3	1.8	1.5
	20	.07 / 9	4.2	3.5	3.0	2.6	2.1	1.8
	30	.09 / 11	5.3	4.5	3.7	3.2	2.6	2.1
	40	.10 / 13	5.9	5.0	4.2	3.7	3.0	2.5
	50	.11 / 14	6.5	5.4	4.7	4.1	3.3	2.7
	60	.12 / 15	7.1	5.9	5.1	4.5	3.6	3.0
	*75	.14 / 18	8.3	6.9	5.9	5.2	4.2	3.5
	*90	.15 / 19	8.9	7.4	6.4	5.6	4.5	3.7
80015 110015 Green 100 mesh Green	15	.09 / 12	5.3	4.5	3.8	3.3	2.7	2.3
	20	.11 / 14	6.5	5.4	4.7	4.1	3.2	2.6
	30	.13 / 17	7.7	6.4	5.5	4.8	3.9	3.2
	40	.15 / 19	8.9	7.4	6.4	5.6	4.5	3.7
	50	.17 / 22	10.1	8.4	7.2	6.3	5.0	4.2
	60	.18 / 23	10.7	8.9	7.6	6.7	5.5	4.6
	*75	.21 / 27	12.5	10.4	8.9	7.8	6.2	5.2
	*90	.23 / 29	13.7	11.4	9.8	8.5	6.8	5.7
8002 11002 Yellow 50 mesh Red	15	.12 / 15	7.1	5.9	5.1	4.5	3.5	3.0
	20	.14 / 18	8.3	6.9	5.9	5.2	4.2	3.5
	30	.17 / 22	10.1	8.4	7.2	6.3	5.0	4.2
	40	.20 / 26	11.9	9.9	8.5	7.4	5.9	5.0
	50	.22 / 28	13.1	10.9	9.3	8.2	6.5	5.4
	60	.24 / 31	14.3	11.9	10.2	8.9	7.1	5.9
	*75	.27 / 35	16.0	13.4	11.5	10.0	8.0	6.7
	*90	.30 / 38	17.8	14.9	12.7	11.1	8.9	7.4
8003 11003 Blue 50 mesh Red	15	.18 / 23	10.7	8.9	7.6	6.7	5.3	4.5
	20	.21 / 27	12.5	10.4	8.9	7.8	6.2	5.2
	30	.26 / 33	15.4	12.9	11.0	9.7	7.7	6.4
	40	.30 / 38	17.8	14.9	12.7	11.1	8.9	7.4
	50	.34 / 44	20.0	16.8	14.4	12.6	10.1	8.4
	60	.37 / 47	22.0	18.3	15.7	13.7	11.0	9.2
	*75	.41 / 52	24.0	20.0	17.4	15.2	12.2	10.1
	*90	.45 / 58	27.0	22.0	19.1	16.7	13.4	11.1
8004 11004 Red 50 mesh Red	15	.24 / 31	14.3	11.9	10.2	8.9	7.1	5.9
	20	.28 / 36	16.6	13.9	11.9	10.4	8.3	6.9
	30	.35 / 45	21.0	17.3	14.9	13.0	10.4	8.7
	40	.40 / 51	24.0	19.8	17.0	14.9	11.9	9.9
	50	.45 / 58	27.0	22.0	19.1	16.7	13.4	11.1
	60	.49 / 63	29.0	24.0	21.0	18.2	14.6	12.1
	*75	.55 / 70	33.0	27.0	23.0	20.0	16.3	13.6
	*90	.60 / 77	36.0	30.0	25.0	22.0	17.8	14.9
8005 11005 Brown 50 mesh Red	15	.31 / 40	18.4	15.3	13.2	11.5	9.2	7.7
	20	.35 / 45	21.0	17.3	14.9	13.0	10.4	8.7
	30	.43 / 55	26.0	21.0	18.2	16.0	12.8	10.6
	40	.50 / 64	30.0	25.0	21.0	18.6	14.6	12.4
	50	.56 / 72	33.0	28.0	24.0	21.0	16.6	13.9
	60	.61 / 78	36.0	30.0	26.0	23.0	18.1	15.1
	*75	.68 / 87	40.0	34.0	29.0	25.0	20.2	16.8
	*90	.75 / 96	45.0	37.0	32.0	28.0	22.3	18.6
8006 11006 Gray 50 mesh Red	15	.37 / 47	22.0	18.3	15.7	13.7	11.0	9.2
	20	.42 / 54	25.0	21.0	17.8	15.6	12.5	10.4
	30	.52 / 67	31.0	26.0	22.0	19.3	15.4	12.9
	40	.60 / 77	36.0	30.0	25.0	22.0	17.8	14.9
	50	.67 / 86	40.0	33.0	28.0	25.0	19.9	16.6
	60	.73 / 95	44.0	36.0	31.0	27.0	22.0	18.2
8008 11008 White 50 mesh Red	15	.49 / 63	29.0	24.0	21.0	18.2	14.5	12.0
	20	.57 / 73	34.0	28.0	24.0	21.0	16.8	14.0
	30	.69 / 88	41.0	34.0	29.0	26.0	21.0	17.2
	40	.8 / 102	48.0	40.0	34.0	30.0	24.0	19.8
	50	.89 / 113.5	53.0	44.0	38.0	33.0	27.0	22.0
	60	.98 / 125	58.0	49.0	42.0	36.0	29.0	24.0

* TURBO TEEJET TIPS ARE RECOMMENDED FOR PRESSURES GREATER THAN 60PSI. BASED ON WATER @ 8.34 LB/GAL.

SUMMERS MANUFACTURING CO., INC.
APPLICATION RATE CHART (METRIC)
LITERS PER HECTARE - .508 m (20") SPACING

TIP NO. Color Screen	KPA/100 (PSI)	Capacity 1 Nozzle in L/min	SPEED - KM/HR (MPH)					
			8 (5)	10 (6.2)	12 (7.5)	14 (8.7)	16 (9.9)	18 (11.2)
8001 11001 Orange 100 mesh Green	1.0 (14.5)	.23	34.5	27.6	23.0	19.7	17.3	15.3
	1.5 (21.8)	.28	42.0	33.6	28.0	24.0	21.0	18.7
	2.0 (29.0)	.32	48.0	38.4	32.0	27.4	24.0	21.3
	2.5 (36.3)	.36	54.0	43.2	36.0	30.9	27.0	24.0
	3.0 (43.5)	.39	58.5	46.8	39.0	33.4	29.3	26.0
	3.5 (50.7)	.42	63.0	50.4	42.0	36.0	31.5	28.0
	4.0 (58.0)	.45	67.5	54.0	45.0	38.6	33.8	30.0
	*5.0 (72.5)	.50	75.0	60.0	50.0	42.9	37.5	33.3
	*6.0 (87.0)	.55	82.5	66.0	55.0	47.1	41.3	36.7
80015 110015 Green 100 mesh Green	1.0 (14.5)	.34	51.0	40.8	34.0	29.1	25.5	22.7
	1.5 (21.8)	.42	63.0	50.4	42.0	36.0	31.5	28.0
	2.0 (29.0)	.48	72.0	57.6	48.0	41.1	36.0	32.0
	2.5 (36.3)	.54	81.0	64.8	54.0	46.3	40.5	36.0
	3.0 (43.5)	.59	88.5	70.8	59.0	50.6	44.3	39.3
	3.5 (50.7)	.64	96.0	76.8	64.0	54.9	48.0	42.7
	4.0 (58.0)	.68	102.0	81.6	68.0	58.3	51.0	45.3
	*5.0 (72.5)	.76	114.0	91.2	76.0	65.1	57.0	50.7
	*6.0 (87.0)	.83	125.0	99.6	83.0	71.1	62.3	55.3
8002 11002 Yellow 50 mesh Red	1.0 (14.5)	.46	69.0	55.2	46.0	39.4	34.5	30.7
	1.5 (21.8)	.56	84.0	67.2	56.0	48.0	42.0	37.3
	2.0 (29.0)	.65	97.5	78.0	65.0	55.7	48.8	43.3
	2.5 (36.3)	.72	108.0	86.4	72.0	61.7	54.0	48.0
	3.0 (43.5)	.79	119.0	94.8	79.0	67.7	59.3	52.7
	3.5 (50.7)	.85	128.0	102.0	85.0	72.9	63.8	56.7
	4.0 (58.0)	.91	137.0	109.0	91.0	78.0	68.3	60.7
	*5.0 (72.5)	1.02	153.0	122.0	102.0	87.4	76.5	68.0
	*6.0 (87.0)	1.12	168.0	134.0	112.0	96.0	84.0	74.7
8003 11003 Blue 50 mesh Red	1.0 (14.5)	.68	102.0	81.6	68.0	58.3	51.0	45.3
	1.5 (21.8)	.83	125.0	99.6	83.0	71.1	62.3	55.3
	2.0 (29.0)	.96	144.0	115.0	96.0	82.3	72.0	64.0
	2.5 (36.3)	1.08	162.0	130.0	108.0	92.6	81.0	72.0
	3.0 (43.5)	1.18	177.0	142.0	118.0	101.0	88.5	78.7
	3.5 (50.7)	1.27	191.0	152.0	127.0	109.0	95.3	84.7
	4.0 (58.0)	1.36	204.0	163.0	136.0	117.0	102.0	90.7
	*5.0 (72.5)	1.52	228.0	182.0	152.0	130.0	114.0	101.0
	*6.0 (87.0)	1.67	251.0	200.0	167.0	143.0	125.0	111.0
8004 11004 Red 50 mesh Red	1.0 (14.5)	.91	137.0	109.0	91.0	78.0	68.3	60.7
	1.5 (21.8)	1.12	168.0	134.0	112.0	96.0	84.0	74.7
	2.0 (29.0)	1.29	194.0	155.0	129.0	111.0	96.8	86.0
	2.5 (36.3)	1.44	216.0	173.0	144.0	123.0	108.0	96.0
	3.0 (43.5)	1.58	237.0	190.0	158.0	135.0	119.0	105.0
	3.5 (50.7)	1.71	257.0	205.0	171.0	147.0	128.0	114.0
	4.0 (58.0)	1.82	273.0	218.0	182.0	156.0	137.0	121.0
	*5.0 (72.5)	2.04	306.0	245.0	204.0	175.0	153.0	136.0
	*6.0 (87.0)	2.23	335.0	268.0	223.0	191.0	167.0	149.0
8005 11005 Brown 50 mesh Red	1.0 (14.5)	1.14	171.0	137.0	114.0	97.7	85.5	76.0
	1.5 (21.8)	1.39	209.0	167.0	139.0	119.0	104.0	92.7
	2.0 (29.0)	1.61	242.0	193.0	161.0	138.0	121.0	107.0
	2.5 (36.3)	1.80	270.0	216.0	180.0	154.0	135.0	120.0
	3.0 (43.5)	1.97	296.0	236.0	197.0	169.0	148.0	131.0
	3.5 (50.7)	2.13	320.0	256.0	213.0	183.0	160.0	142.0
	.04.0 (58.0)	2.27	341.0	272.0	227.0	195.0	170.0	151.0
	*5.0 (72.5)	2.54	381.0	305.0	254.0	218.0	191.0	169.0
	*6.0 (87.0)	2.79	419.0	335.0	279.0	239.0	209.0	186.0
8006 11006 Gray 50 mesh Red	1.0 (14.5)	1.37	206.0	164.0	137.0	117.0	103.0	91.3
	1.5 (21.8)	1.68	252.0	202.0	168.0	144.0	126.0	112.0
	2.0 (29.0)	1.94	291.0	233.0	194.0	166.0	146.0	129.0
	2.5 (36.3)	2.16	324.0	259.0	216.0	185.0	162.0	144.0
	3.0 (43.5)	2.37	356.0	284.0	237.0	203.0	178.0	158.0
	3.5 (50.7)	2.56	384.0	307.0	256.0	219.0	192.0	171.0
	4.0 (58.0)	2.74	411.0	329.0	274.0	235.0	206.0	183.0
8008 11008 White 50 mesh Red	1.0 (14.5)	1.82	273.0	218.0	182.0	156.0	137.0	121.0
	1.5 (21.8)	2.23	335.0	268.0	223.0	191.0	167.0	149.0
	2.0 (29.0)	2.58	387.0	310.0	258.0	221.0	194.0	172.0
	2.5 (36.3)	2.88	432.0	346.0	288.0	247.0	216.0	192.0
	3.0 (43.5)	3.16	474.0	379.0	316.0	271.0	237.0	211.0
	3.5 (50.7)	3.41	512.0	409.0	341.0	292.0	256.0	227.0
	4.0 (58.0)	3.65	548.0	438.0	365.0	313.0	274.0	243.0

* TURBO TEEJET TIPS ARE RECOMMENDED FOR PRESSURES GREATER THAN 4 KPA.

BASED ON WATER @ 1 gm/cm³.

3.4 TESTING AND ADJUSTMENT OF SPRAYER SYSTEM

1. ADD WATER TO MAIN TANK

Add approximately 150 gallons of water to main tank through optional bottom fill kit or through top fill well. With water in the tank verify that tank straps are secure.

2. PRIME SPRAYER SYSTEM PUMP

a. Prime PTO driven pump

1. Engage tractor PTO system and increase to normal field PTO speed in order to circulate water from the tank to the pump and back to the tank again through the agitators. Immediately verify agitator flow by looking through top fillwell.

2. Disengage tractor PTO system.

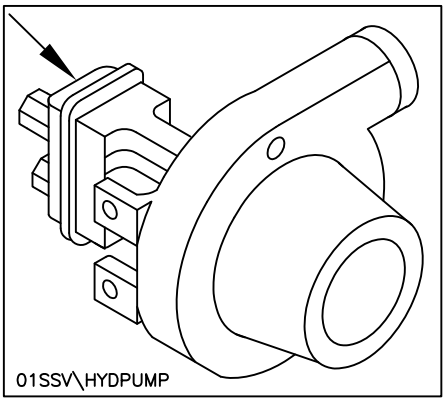
b. Prime hydraulically driven pump:

1. Engage tractor hydraulic system and increase to normal field rpm speed in order to circulate water from the tank to the pump and back to the tank again through the agitators. Immediately verify agitator flow by looking through top fillwell.

2. Disengage tractor hydraulic system by moving hydraulic lever to float position. This allows pump to coast to a stop.

3. ADJUST HYDRAULICALLY DRIVEN PUMP SYSTEM

The hydraulically driven pump system must be adjusted to produce a maximum pressure of 80 psi in order to stay within the 0 to 150 psi operating range of the plumbing system.



a. Adjust **CLOSED CENTER** pump:

1. Loosen jam nut for bypass screw located on top of hydraulic motor and turn screw completely in. Secure jam nut.
2. Adjust flow control valve for tractor hydraulic system to allow minimum oil flow.
3. Close agitator control ball valve and verify boom switches are off. LEAVE MAIN SUPPLY VALVE OPEN!
4. Engage tractor hydraulic system and increase to normal field RPM speed.
5. Adjust flow control valve for tractor hydraulic system until pressure gauge reads the recommended maximum pressure of 80 psi.
6. Disengage tractor hydraulic system by moving hydraulic lever to “float” position. This allows pump to coast to a stop.
7. Setup Normal Spraying.

b. Adjust **OPEN CENTER** pump:

1. Loosen jam nut for bypass screw located on top of hydraulic motor and turn screw out 3 revolutions from factory setting.

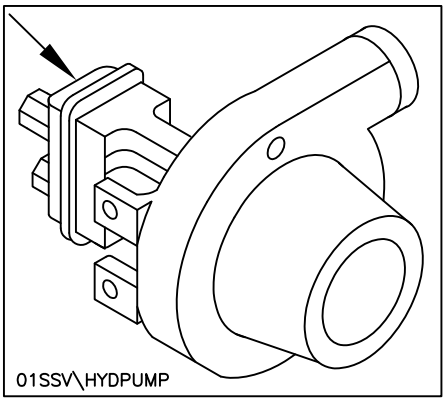
2. Close manual agitator control valve and verify booms switches are off. LEAVE MAIN SUPPLY VALVE OPEN!

3. Engage tractor hydraulic system and increase to normal field rpm speed.

4. Slowly turn bypass screw in until pressure gauge reads the recommended maximum pressure of 80 psi. Secure jam nut.

5. Disengage tractor hydraulic system by moving hydraulic lever to "float" position. This allows pump to coast to a stop.

6. Setup Normal Spraying.



NOTE!

IN SITUATIONS WHERE THE TRACTOR IS EQUIPPED WITH A FLOW CONTROL IT WOULD BE ADVANTAGEOUS TO CONTROL THE PUMP WITH THIS METHOD. IF THE BYPASS SCREW METHOD IS USED IT WILL USE MORE HYDRAULIC FLOW. THIS WILL GENERATE HEAT AND CONSUME POWER.

4. TEST OPTIONAL MIX AND FILL KIT WITH BUILT-IN BOTTOM FILL

a. Test Drawing Chemical

1. Add approximately 15 gallons of water to mix and fill tank.

2. Start engine and activate pump.

3. Setup Drawing Chemical by opening ball valve on chemical tank. Partially close main supply valve to draw chemical. When chemical tank is empty OPEN MAIN SUPPLY VALVE FULLY TO KEEP FROM RUNNING PUMP DRY.

IMPORTANT!

NEVER ALLOW PUMP TO RUN DRY. SEALS WILL BURN UP IN LESS THAN 15 SECONDS WITHOUT LIQUID TO RUN IN. THIS DAMAGE IS NOT COVERED UNDER WARRANTY.

5. START-UP RAVEN CONTROL

a. Start-up **Raven SCS-205** Control:

1. Place all BOOM ON/OFF switches to OFF.

2. Place MASTER ON/OFF switch to ON.

3. Start pump drive engine and increase to normal field rpm speed

4. Alternate each BOOM ON/OFF switch to on and verify that respective boom ball valve operates and that all nozzles on that section are spraying including end nozzle, if equipped.

5. With all BOOM ON/OFF switches to on, hold the manual pressure adjust switch one way and then the other to learn maximum and minimum spray pressures, with and without agitation. The regulator valve is fully closed when the pressure is at its lowest reading. The motorized regulator valve rotates slowly clockwise or counter clockwise depending on switch position and could take up to 90 seconds to go from fully open to fully closed position.

6. Adjust manual agitator control valve.

    a. Partially close agitator control valve to increase maximum operating pressure.

    b. Under most spraying conditions, agitator control should be fully open. If operator wishes to empty tank completely the agitator should be closed on last spray pass.

7. If maximum operating pressure is still too low, verify that there is sufficient engine speed and that main line strainer screen is not obstructed.

b. Start-up **Raven SCS-450** Control:

1. Complete instructions for the SCS-450 Sprayer Control are provided in the SCS-450 INSTALLATION AND SERVICE MANUAL which is included in the sprayer console box.

HELPFUL HINTS FOR 450 CONTROL PROGRAMMING

1. Write down meter cal, valve cal, speed cal, and boom cal numbers in manual for quick, easy reference.

2. If any component fails and is replaced calibration will change and must be updated.

3. Disconnect console before jump starting, charging battery or welding on equipment.

4. Suspension type fertilizers and slurry mixtures will reduce life of plastic parts in flow meter and control valve. Check rotor and hub frequently for worn parts. Excessive wear will affect accuracy.

5. Summers Manufacturing uses only standard close valves (C-sd).

6. SP1 is for wheel drive speed sensor. SP2 is for radar and interface cable speed sensors.

7. Summers Manufacturing uses 6 magnets for wheel drive speed sensor reading, other companies normally use 4 magnets. This provides a more accurate speed reading.

8. If console is flashing “CAL” it has not received enough calibration input to function.

9. To change some settings the console must be cleared. Data from Hint 1 will be useful in this case.

NOTE!

SUMMERS MFG. CO. RECOMMENDS THAT THE OPTIONAL COMPUTERIZED CONTROL CONSOLE BE MOUNTED TO A SECURE SUPPORT INSIDE THE CAB OF THE SPRAY MACHINE.

Special instructions included in the section deal with the following:

1. Determining boom width.

2. Initial system start up.

3-PT DRY BOOM SPRAYERS			
SPRAYER SIZE	**BOOM 1**	**BOOM 2**	**BOOM 3**
50' 3-Pt	240"	120"	240"
60' 3-Pt	300"	120"	300"
66' 3-Pt	296"	200"	296"

End nozzle boom width is calculated with end-nozzles covering 6' on each boom. If angle of end nozzles is set for coverage of more or less than 6', recalculate Boom 1 and Boom 3 widths. For sprayers with only two boom controls the operator must pay attention to which boom the center is controlled from. To calculate the boom width for this type of configuration the center width is added to the left or right boom width, depending on which two are supplied from the same value.

2-PT & TRUCK WET BOOM SPRAYERS			
SPRAYER SIZE	**BOOM 1**	**BOOM 2**	**BOOM 3**
60'	300"	120"	300"
63'4"	320"	120"	320"
66'8"	340"	120"	340"
70'	360"	120"	360"
73'4"	380"	120"	380"
76'8"	400"	120"	400"
80'	420"	120"	420"
83'4"	440"	120"	440"
90'	460"	120"	460"

6. PERFORM SPRAYER SYSTEM DAILY MAINTENANCE

a. Check all sprayer system components for leaks.

b. Clean sprayer system strainer.

c. Check tank hold down straps for tightness.

d. Verify all sprayer mounts are secure.

e. Check nozzle patterns. If a nozzle pattern is distorted:

1. Remove nozzle tip.

2. Clean with tooth brush, wooden or plastic probe. Never use a metal object since damage will occur.

4. Replace nozzle tip if necessary.

5. Install nozzle tip back onto sprayer.

f. During periods of use in freezing temperatures:

1. (Flush entire sprayer system with 100% RV antifreeze.) RV antifreeze is nontoxic and safe for the environment. It must be used in 100 percent concentrations, but it is more economical then permanent antifreeze to purchase and will not harm plastic spray components. Read and follow antifreeze container instructions.

2. Spray solution through nozzles.

3. Allow dripless nozzles to drain by loosening each diaphragm check valve nut.

IMPORTANT!

LIQUID REMAINS IN THE 1 INCH WET BOOM EVEN WITH THE NOZZLE DIAPHRAGM CHECK VALVES LOOSENED. WITH BOTH BOOMS IN TRANSPORT POSITION LIQUID ACCUMULATES NEAR THE BOOM PIVOT POINT. TO ALLOW DRAINAGE, REMOVE THE BOOM END CAP OR END NOZZLE AND SUPPLY HOSE FROM EACH BOOM.

g. When changing chemicals, follow chemical manufacturers' WARNINGS, instructions and procedures concerning sprayer system cleaning.

3.5 MECHANICAL FIELD OPERATION AND ADJUSTMENT

1. OPEN TO FIELD POSITION

a. Remove transport clevis pins.

b. Unfold booms to field position one side at a time. On windshield sprayers, the pin that prevents the part one from folding up is easiest to install if it is done after the booms have been released from the transport rest and before the part two is unfolded.

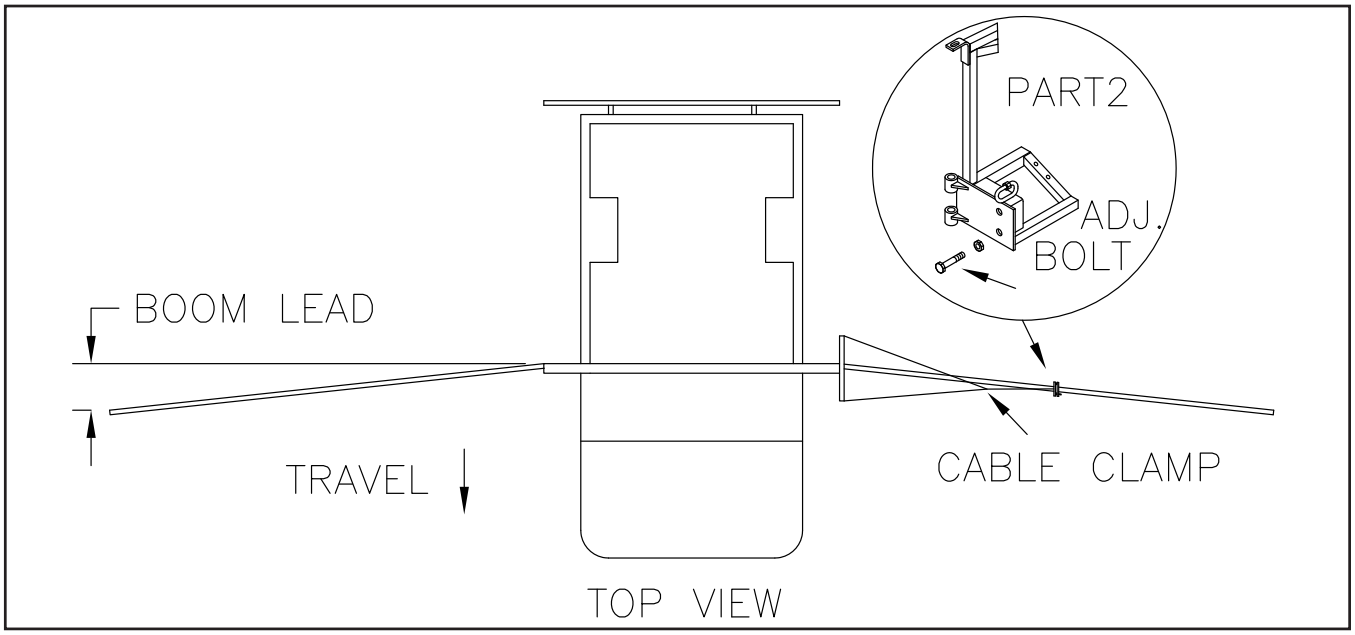
c. Pin outside boom to inside boom on non cable suspended booms only.

d. Unlock swinging center beam to allow free movement from side to side.

IMPORTANT!

WHEN FOLDING AND DURING TRANSPORT THE CENTER BEAM SWING LOCKS MUST BE LOCKED TO PREVENT THE CENTER BEAM FROM MOVING. WHEN SPRAYING, THE CENTER BEAM MUST BE UNLOCKED TO ALLOW PROPER FLOATING BOOM OPERATION.

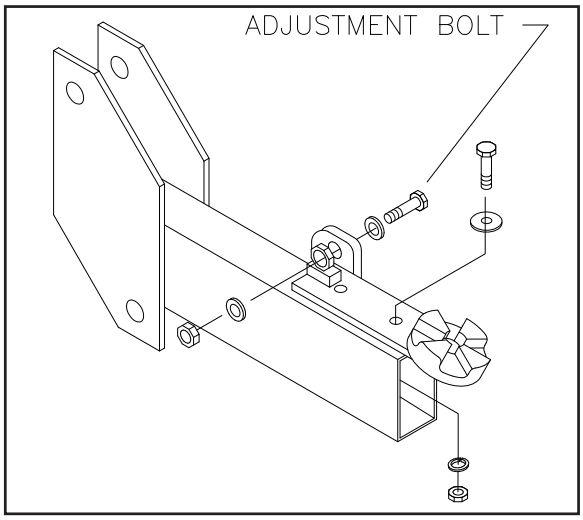
2. <u>SETTING BOOM LEAD ON CABLE SUSPENDED BOOMS</u>



Boom lead is the distance the outer end of the boom leads the inner end of boom. Adjustment from the factory setting of 1 to 3 feet is accomplished by loosening the clamp at outer ends of the spring loaded cable and moving the boom to the preferred position and tightening the cable clamp. The outer boom can be set to lead the inner boom by adjusting the gap distance at the middle hinge. Gap distance is adjusted by loosening the 5/8" jam nuts and turning the 5/8" bolts inward or outward. If the gap between the booms is too small the boom will be less likely to break away at the middle hinge point when the boom collides with a fixed object.

3. <u>BOOM LEAD ON 3-POINT SPRAYERS</u>

3-Point sprayers have an adjustable boom lead at the center where the breakaway bolts at the center boom. To adjust boom lead loosen bolts securing breakaway pivot and adjust rear bolt to rotate the pivot breakaway to a desired position. After adjustment is performed tighten bolts securing breakaway and verify that cast breakaways are meshed together accurately.



WARNING!

THE BOOMS ON SUMMERS SPRAYERS ARE NOT DESIGNED TO CONTACT THE GROUND OR SOLID OBSTRUCTIONS AT FIELD SPEEDS. THE OPERATOR MUST SLOW DOWN TO PREVENT DAMAGE, IF BOOM IS IN DANGER OF CONTACTING AN OBJECT. THIS IS TRUE EVEN WITH THE BOOM SPRING PRESSURE PROPERLY ADJUSTED. SUMMERS SPRAYER BOOMS ARE NOT WARRANTED FROM DAMAGE BECAUSE OF A COLLISION WITH AN OBSTRUCTION.

4. LEVELING BOOMS

Booms on the Summers cable suspended boom skid sprayer are factory set to be level but may need to be periodically leveled due to cable stretch. For minor adjustments of 2 or 3 inches the booms are leveled by adjusting the locking nut on the eye bolts that control spring tension. The adjusting nuts are on top of the boom pivot arms. Major adjustments are as follows:

a. Loosen nuts on eye bolts to approximately 1/2" from end of eye bolt.
b. Remove tension from cables by supporting booms with jack stands or some other means.
c. Detach chain from quick link and shorten by one link, reconnect chain to quick link and remove support from booms.
d. Finish leveling inner boom by adjusting the lock nuts on the eye bolt.
e. If the inner boom is still not level, repeat steps 3 and 4.
f. To level outer boom, adjust turnbuckle on single cable to raise or lower end of the outer boom.

5. BOOM BREAKAWAY

CAUTION!
THE BREAKAWAY IS UNDER HIGH SPRING TENSION.

The adjustment of the boom breakaway spring is important. The spring controls the pressure between the two ductile cast breakaway clutches. Since the clutch parts are made of ductile cast, a certain amount of break-in wear is normal during the first few hours of operation. The factory adjustment MUST BE CHECKED AFTER THE FIRST HOUR OF USE. The spring pressure is properly adjusted when the boom can be "broken away" with moderate force applied to the end of the boom. If the boom spring pressure is set too loose, the booms may break away during acceleration or at increased spraying speeds. If the boom spring pressure is set too tight, the booms may not break away when colliding with an obstruction.
Two point Sprayers and those equipped with windshields have a stabilizer latch attached to each part 1 boom.

The stabilizer assists the break away in keeping the boom in field position. The eye bolt must be adjusted to preload the stabilizer spring. This is accomplished as follows:

a. Unfold booms from transport position to a configuration where they are still folded in the middle.
b. The pin for the stabilizer latch should just slide into the hole with 1/16 to 1/8" to spare between the pin and the eye bolt.
c. If adjustment is necessary loosen the jamb nuts on the eye bolt and adjust the eye to take up most of the slack on the pin. The pin should still be free to permit removal and insertion.
d. Unfold booms completely and verify pin is tight and spring is preloaded. Pin should not be able to be removed when boom is in spray position. If pin is loose eyebolt breakage may occur more often.

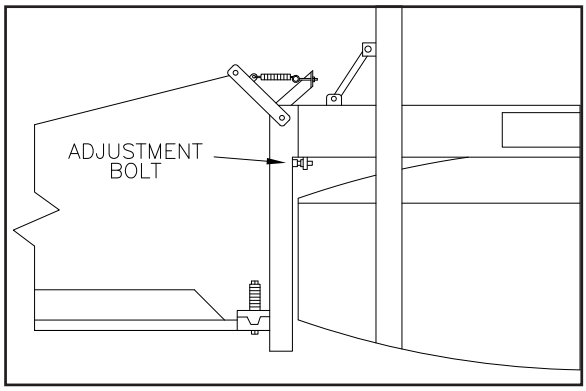
6. PART 2 LATCH

Part 2 latches are preset at the factory to a spring installed height of 1-15/16". Field adjustment of latches may be necessary to provide enough pressure to suit operator needs. Excessive tightening will increase damages if the boom strikes a secure object. After adjustment the operator should force part 2 booms to break away insuring that the spring has room to collapse and boom will break away.

7. PIVOT ARM STOP BOLT ADJUSTMENT

Pivot stops are adjusted at the factory, but adjustment may be required due to wear in. Pivot and cylinder stops must be adjusted at the same time. Adjustment is performed as follows:

1. Place sprayer on a level surface and verify the pivot arms are vertical.
2. Activate tip lift slightly to remove pressure on stop bolts.
3. Adjust bolts to desired position.
4. Retract cylinder to verify that it contacts the stop at the same instant cylinder closes.
5. Cylinder is adjusted by loosening the clevis pinch bolt and turning the clevis to the desired setting.
6. Tighten clevis pinch bolt after reaching desired setting.



WARNING!

THE OPERATOR MUST ADJUST BOTH THE BOOM PIVOT STOP AND CYLINDER CLEVIS TO INSURE THAT STOP BOLTS ARE NOT CONTACTED BEFORE THE CYLINDER IS COMPLETELY RETRACTED. IF STOPS ARE CONTACTED BEFORE CYLINDER IS RETRACTED, THE PIVOT ARM WILL BEND AND IS NOT COVERED UNDER WARRANTY.

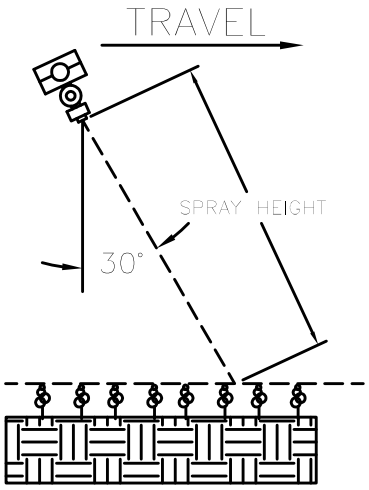
IMPORTANT!

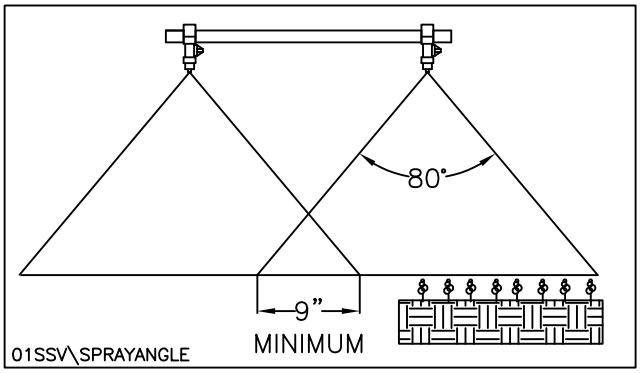
DURING NORMAL OPERATION, BOOMS EQUIPPED WITH HYDRAULIC TIP LIFT SHOULD REST ON STOP BOLTS. ACTIVATE TIP LIFT ONLY WHEN REQUIRED FOR PROPER GROUND CLEARANCE.

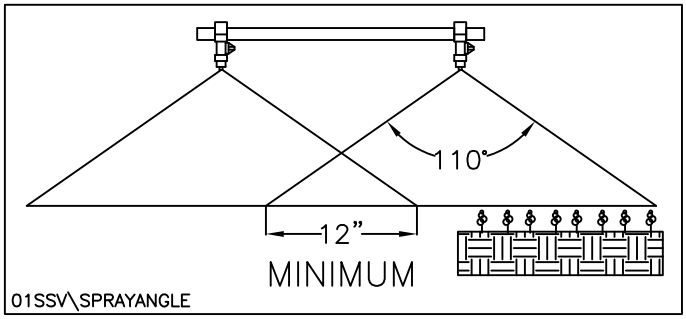
3.6 SPRAYER SYSTEM FIELD OPERATION

1. ADJUST SPRAY HEIGHT

Adjust spray height to final setting BASED ON MINIMUM OVERLAP OF SPRAY PATTERNS by adjusting boom height.







1. Adjust the spray height to your spray tip using the table as a guideline. For sprayers with manual height adjustment, use the following procedure:

1. Loosen set screws if equipped.

2. Lower jacks until locating pins are loose in vertical slide.

NOTE

AFTER ADJUSTING BOOM HEIGHT, THE TRANSPORT LOCK BRACKETS WILL NEED TO BE ADJUSTED.

3. Remove clips and pins.

4. Adjust booms to desired spray height.

5. Replace pins and retaining clips.

6. Tighten set screws and remove jacks.

MINIMUM SUGGESTED SPRAY HEIGHTS	
DEGREE TIP	**SPRAY HEIGHT TIP TO TARGET**
80°	18" TO 19"
110°	12" TO 14"

NOTE

ALL WET BOOM SPRAYERS AND TRUCK SPRAYERS HAVE ANOTHER PROVISION FOR HEIGHT ADJUSTMENT. THE BOLTS SUPPORTING THE SWING ARMS CAN BE LOCATED TO DIFFERENT HOLES ON VERTICAL SLIDE.

2. CALIBRATION OF SPRAYER SYSTEM

A. CHOOSE AND MEASURE OFF one of the following three fixed distances:

(LONGER DISTANCES PRODUCE MORE ACCURATE RESULTS).

1. 1/4 mile = 1320 feet

2. 1/2 mile = 2640 feet

3. 1 mile = 5280 feet

B. COMPLETELY FILL the main tank and verify tank straps are tight.

C. SHUT-OFF OPTIONAL END NOZZLES using manual shut-off valve.

D. SPRAY THE CHOSEN DISTANCE using:

1. Desired ground speed within factory recommended range of 4 to 12 miles per hour (mph).

2. Desired operating pressure.

E. MEASURE the gallons of water required to completely refill the main tank.

F. CALCULATE APPLICATION RATE using correct formula for measured distance chosen:

a. For 1/4 mile:

$$\text{U.S. Gallons per Acre} = \frac{\text{Measured Gallons of Water x 33}}{\text{Actual Spraying Width (feet)}}$$

2. For 1/2 mile:

$$\text{U.S. Gallons per Acre} = \frac{\text{Measured Gallons of Water x 16.5}}{\text{Actual Spraying Width (feet)}}$$

3. For 1 mile:

$$\text{U.S. Gallons per Acre} = \frac{\text{Measured Gallons of Water x 8.25}}{\text{Actual Spraying Width (feet)}}$$

G. EXAMPLE

28 gallons of water was required to completely refill the main tank of a 90'-0" sprayer over a 1/2 mile distance.

$$\frac{\text{28 gallons of Water x 16.5}}{\text{90 Feet}} = \text{5.1 U.S. Gallons per Acre}$$

3. ADD CHEMICAL TO MAIN TANK

USING CHEMICALS?

HIGH HAZARD REQUIRES:
*goggles
*respirator
*avoid fumes
*rubber gloves and skin protection

MODERATE HAZARD REQUIRES:
*goggles
*avoid fumes
*rubber gloves and skin protection

LOW HAZARD REQUIRES:
*avoid fumes
*rubber gloves and skin protection

PROTECT YOURSELF!

1. REFER TO SIGNAL WORD AND REQUIRED PERSONAL PROTECTIVE EQUIPMENT WHEN USING CHEMICALS.

2. ALWAYS READ AND FOLLOW CHEMICAL MANUFACTURERS' WARNINGS, INSTRUCTIONS AND PROCEDURES BEFORE USING.

3. HANDLE CHEMICALS WITH EXTREME CARE.

4. IN CASE OF POISONING, GET IMMEDIATE MEDICAL ATTENTION. A CONTAINER LABEL MAY BE BENEFICIAL FOR QUICK TREATMENT.

5. BE SAFE!

A. ADD CHEMICAL TO MAIN TANK by using one of the following methods:

1. Add chemical through top fill well.
2. Add chemical through optional mix and fill kit.

4. ADJUST MANUAL VALVE FOR AGITATOR CONTROL

IMPORTANT!

1. BECAUSE OF THE WIDE RANGE OF SPRAYING CONDITIONS, THE OPERATOR IS RESPONSIBLE FOR ACCOMPLISHING BOTH PROPER AGITATION AND DESIRED APPLICATION RATE.

2. UNDER MOST SPRAYING CONDITIONS, THE MANUAL VALVE SHOULD BE FULLY OPEN.

3. BE SURE JET AGITATORS ARE NOT PLUGGED.

4. MIX CHEMICAL THOROUGHLY BEFORE SPRAYING.

4.1 MAINTENANCE SAFETY

CAUTION

REVIEW SECTION 4.1 MAINTENANCE SAFETY BEFORE PROCEEDING!

1. **STOP** engine, place all controls in neutral, set parking brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, maintaining or unplugging.
2. **KEEP CHILDREN AWAY** from chemicals and sprayer equipment.
3. **USE EXTREME CARE** when cleaning, filling or making adjustments.

USING CHEMICALS? PROTECT YOURSELF!

HIGH HAZARD REQUIRES:
*goggles
*respirator
*avoid fumes
*rubber gloves and skin protection

MODERATE HAZARD REQUIRES:
*goggles
*avoid fumes
*rubber gloves and skin protection

LOW HAZARD REQUIRES:
*avoid fumes
*rubber gloves and skin protection

1. REFER TO SIGNAL WORD AND REQUIRED PERSONAL PROTECTIVE EQUIPMENT WHEN USING CHEMICALS.
2. ALWAYS READ AND FOLLOW CHEMICAL MANUFACTURERS' WARNINGS, INSTRUCTIONS AND PROCEDURES BEFORE USING.
3. HANDLE CHEMICALS WITH EXTREME CARE.
4. IN CASE OF POISONING, GET IMMEDIATE MEDICAL ATTENTION. A CONTAINER LABEL MAY BE BENEFICIAL FOR QUICK TREATMENT.
5. BE SAFE!

4. **BE CAREFUL** when working around a high pressure hydraulic system.
5. **ALWAYS** make sure that pressure is relieved from hydraulic circuits before servicing or disconnecting any hydraulic component.
6. **KEEP SAFETY DECALS CLEAN**.
7. **REPLACE** missing or unreadable decals. New decals are available from your SUMMERS dealer by stating correct part number (PN) located in lower right hand corner. See Section 1 for DECAL LOCATIONS.
8. **VERIFY** all safety devices and shields are in place before using machine.
9. **KEEP** hands, feet, and clothing away from moving parts.

4.2 DAILY MAINTENANCE

CAUTION

REVIEW SECTION 4.1 MAINTENANCE SAFETY BEFORE PROCEEDING!

Your Summers field sprayer will give you better service and last longer if it is properly maintained.

1. Grease all points shown.

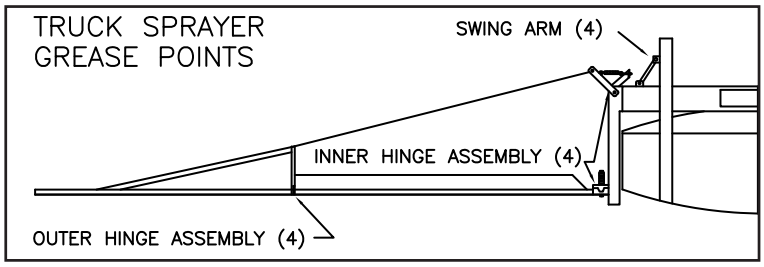
2. Check all hydraulic components for leaks.

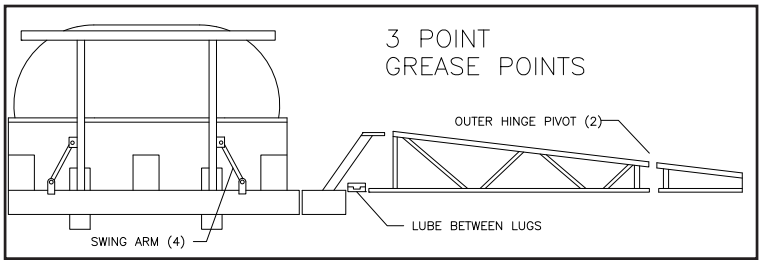
3. Check all sprayer system components for leaks.

4. Clean sprayer system strainer.

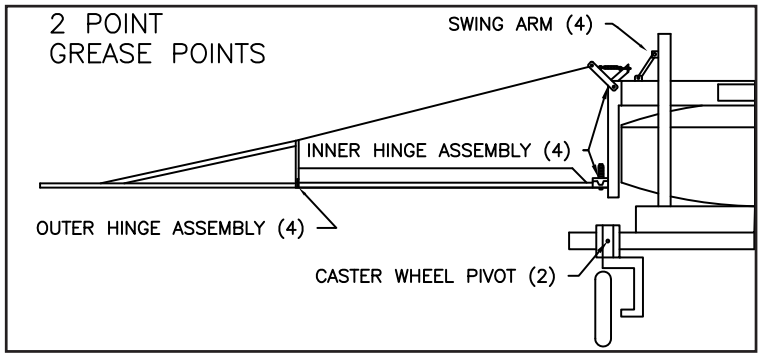
5. Check tank hold down straps.

6. Check nozzle patterns. If a nozzle pattern is distorted:
   a. Remove nozzle tip.
   b. Clean with tooth brush, wooden or plastic probe. Never use a metal object since damage will occur.
   c. Blow out nozzle tip with compressed air no greater than 40 psi. Never use your mouth to blow out a nozzle tip.
   d. Replace nozzle tip if necessary.
   e. Install nozzle tip back onto sprayer.





7. During periods of use in freezing temperatures:
   a. (Flush entire sprayer system with 100% RV antifreeze.) RV antifreeze is nontoxic and safe for the environment. It must be used in 100 percent concentrations, but it is more economical then permanent antifreeze to purchase and will not corrode plastic spray components. Read and follow antifreeze container instructions.
   b. Spray solution through nozzles.
   c. Allow dripless nozzles to drain by loosening each diaphragm check valve nut. With both booms in transport position liquid accumulates near the boom pivot point. To permit drainage, remove the boom end cap or end nozzle and supply hose from each boom.



8. When changing chemicals, follow chemical manufacturers' WARNINGS, instructions and procedures concerning sprayer system cleaning.

4.3 OFF SEASON STORAGE

1. Clean main tank and optional mix and fill tank:

   a. Flush each tank with clean water, then drain.

   b. Wash each tank using a strong detergent and mop, then drain.

   c. Rinse each tank with clean water, then drain.

CAUTION

REVIEW SECTION 4.1 MAINTENANCE SAFETY BEFORE PROCEEDING!

2. Clean entire sprayer system:

   a. Partially fill each tank with clean water and add one part household ammonia for every 100 parts water.

   b. Start pump and circulate solution through entire sprayer system. Spray solution through nozzles, then drain.

3. Winterize entire sprayer system:

   a. (Flush entire sprayer system with 100% RV antifreeze.) RV antifreeze is nontoxic and safe for the environment. It must be used in 100 percent concentrations, but it is more economical then permanent antifreeze to purchase and will not harm plastic spray components. Read and follow antifreeze container instructions.

   b. Spray solution through nozzles.

   c. Allow dripless nozzles to drain by loosening each diaphragm check valve nut.

IMPORTANT!

Some liquid remains in the 1 inch wet boom even with the nozzle diaphragm check valves loosened. With both booms in transport position liquid accumulates near the boom pivot point. To allow drainage, remove the boom end cap or end nozzle and supply hose from each boom.

4.4 PRESEASON ANNUAL MAINTENANCE

1. READ AND UNDERSTAND Operator's Manual before using machine.

2. Check tire pressure.

3. Inspect sprayer components.

4. Inspect hydraulic components.

5. Grease wheel bearings and inspect for looseness.

6. Check tank(s) for cracks and verify straps are tight.

7. Tighten each diaphragm check valve nut on dripless nozzles.

8. Refer to SECTION 3 - SPRAYER OPERATION for setup and start-up procedures.

9. Flush winterizing antifreeze solution from entire sprayer system with clean water. Spray rinse water through nozzles. (If automotive antifreeze was used, it is a hazardous material and must be disposed of properly.)

IMPORTANT!

WHEN NOT IN USE TANK SHOULD BE STORED IN A DRY DARK PLACE. ALTHOUGH ULTRA VIOLET STABILIZERS ARE ADDED TO PROTECT THE TANKS FROM SUNLIGHT DAMAGE, ALL POLYOLEFIN MATERIALS WILL DETERIORATE IN TIME. TANK MANUFACTURERS RECOMMEND STORAGE OUT OF SUNLIGHT TO LENGTHEN THE LIFE OF ALL PLASTIC TANKS. DO NOT DROP, STRIKE, OR KICK TANK AT LOW TEMPERATURES. ALL POLY MATERIALS ARE INCREASINGLY SUBJECT TO CRACKING AS THE TEMPERATURES FALL BELOW 20°F.

5.1 SPRAYER SYSTEM TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTION
1. Pump does not develop pressure.	A. Insufficient water to prime pump.	Fill tank to a point above pump level. Open agitation valves.
	B. Frozen impeller.	Split water pump and free impeller.
	C. Incorrect pump.	See Hypro Pump Selection guide for more information.
	D. Defective shaft seals	Replace seals as necessary.
	E. Hydraulic bypass set incorrectly.	Adjust pump bypass.
	F. Pump does not run fast enough.	Adjust engine RPM.
2. Raven SCS-205 Control does not work properly.		See Raven Sprayer Control Systems manual for more information.
3. Raven SCS-450 Control does not work properly.		See Raven SCS-450 manual for more information.
4. Regulator valve does not regulate pressure.	A. Master switch must be ON and one or more boom switches must be ON.	Turn master switch ON and turn one or more boom switches ON.
	B. Regulator valve is in a neutral position.	Hold pressure adjust switch up to 90 seconds until valve moves into adjusting range.
	C. Improper voltage or poor electrical connection.	Listen to motor while switch is activated. If nothing is heard, check voltage and connections. If motor runs but pressure does not change, replace regulator valve.
5. Ball Valves do not open or close.	A. No electrical power to valve. Should hear motor run when turned on and off.	Check electrical connections. See Ball Valve manual for more information.
	B. Incorrect power supply.	Positive and negative leads may be reversed or there is an open circuit in wiring to valve.
6. Not getting application rate for a given pressure setting.	A. Plugged strainer.	Clean strainer.
	B. Plugged nozzle screens.	Clean nozzle screens.
	C. Speed reading incorrect.	Recalibrate speed signal.
7. Booms do not break away freely.	A. Break-away tension spring improperly adjusted.	Adjust spring pressure. (Grease break-always daily.)
8. Booms strike the ground often.	A. Self leveling feature inoperative.	Unlock swinging center and lube swing arms.
	B. Out of adjustment.	Adjust boom level and suspension.
	C. Rough uneven terrain.	Reduce travel speed.
9. Booms do not go into transport rests.	A. Out of adjustment.	Adjust transport rests.
	B. Center section not locked.	Apply swing locks.
10. Sprayer does not quit spraying when master boom switch is turned off.	A. Sprayer remote not turned on.	Remote control must be left on at all times while Raven 450 console is operating.
	B. Diaphragm caps on nozzle bodies not shutting off.	Diaphragm gaskets need cleaning, too low psi diaphragm for spray pressure being used.
11. Sprayer remote does not function.	A. Remote not wired correctly.	Two blue wires on remote connect to orange & orange/white wires on Raven wire harness.
	B. Raven 450 console wire harness connected wrong.	450 console harness must have power leads hooked closest to console.
12. Spray pressure falls off when boom valves turned on.	A. Plugged main line strainer (filter).	Flush filter with cleaner and blow off with compressed air.
	B. Supply line to pump is restricted.	Check for debris in main suction line.
	C. Speed reading is not correct.	Check speed cal. number.

6.1 SPRAYER SIZE DIMENSIONS

Transport width = the maximum outer width dimension of sprayer.
Height from bed = maximum height from the truck bed. Tractor-mounted sprayers are measured from the ground in free standing position.

PRODUCT	TRANSPORT WIDTH	HEIGHT FROM BED (MIN/MAX)	LENGTH
50-60' 3-Pt	150"	120" overall	54"
66' 3-Pt	210"	132" overall	54"
60-90' Truck (Wet Boom)	128"	98"/107"	20'
60-90' 2-Pt (Wet boom)	128"	120" overall	20'

6.2 TIP LIFT AND TRANSPORT WIDTH DIMENSIONS

Tip lift height = distance the booms move up from level position.
Inside transport width = the maximum width of truck that will fit under truck mounted sprayer.

PRODUCT	TIP LIFT HEIGHT	INSIDE TRANSPORT WIDTH	PRODUCT	TIP LIFT HEIGHT	INSIDE TRANSPORT WIDTH
50' 3-Pt	57"	-	73'4" Wet boom	90"	108"
60-66' 3-Pt	71"	-	76'8" Wet boom	95"	108"
60' Wet boom	71"	108"	80' Wet boom	99"	108"
63'4" Wet boom	76"	92"	83'4" Wet boom	104"	92"
66'8" Wet boom	80"	92"	86'8" Wet boom	109"	92"
70' Wet boom	85"	92"	90' Wet boom	114"	92"

6.3 TIRE PRESSURE

PRESSURE (PSI)	TIRE SIZE	PLY RATING	MAX LOAD (LBS)
36	11L x 15	8	2540
36	12.5L x 15 Rib	8	3000
36	12.5L x 15 Lug	8	3000

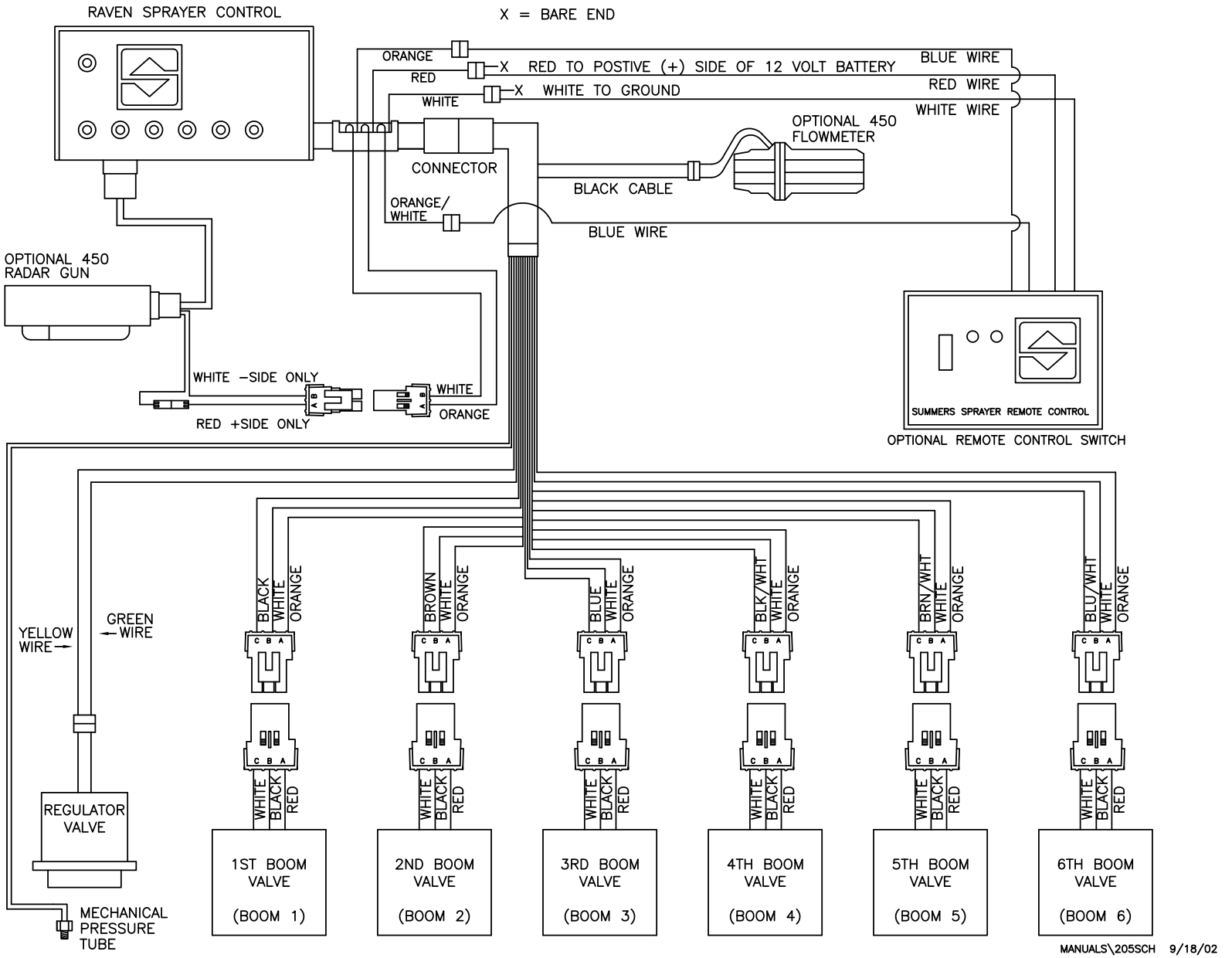
6.4 IDEAL TRUCK BED HEIGHT

32-34 Inches from ground empty.

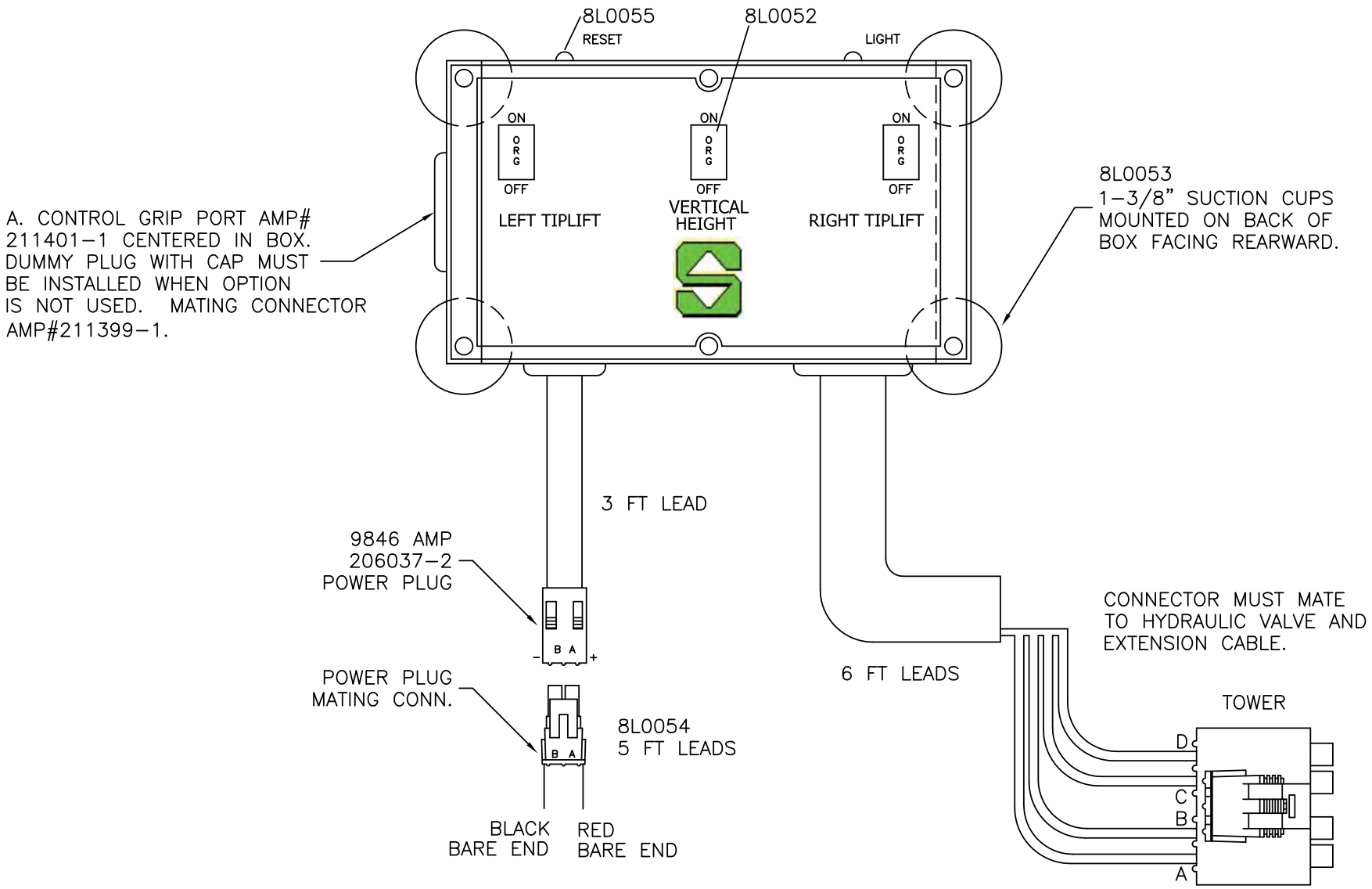
6.5 HOSE LENGTHS AND NOZZLES

MODEL	TOTAL NOZZLES	FEED LINE HOSES			BOOM HOSE	TOTAL HOSE		
		LEFT	CENTER	RIGHT		1/2"	3/4"	1"
50' 3-Pt	30	3/4x240"	1/2x40"	3/4x240"	1/2x19 (25) 1/2x40 (2)	55'	52'	-
60' 3-Pt	36	3/4x240"	1/2x40"	3/4x240"	1/2x19 (31) 1/2x40 (2)	64'	52'	-
66' 3-Pt	40	3/4x360"	1/2x56"	3/4x360"	1/2x18.5 (14) 1/2x19 (21) 1/2x40 (2)	72'	60'	-
60-90' Wet boom Truck	36-54	1x180"	3/4x104"	1x204"	1x36" (2)	-	104"	456"
60-90' 2-Pt Wet Boom	36-54	1x130"	3/4x100"	1x148"	1x36" (2)	-	100"	350"

WIRING FOR SPRAYERS USING ELECTRIC BALLVALVES



2 PT ELECTRIC HYDRAULIC CONTROL BOX



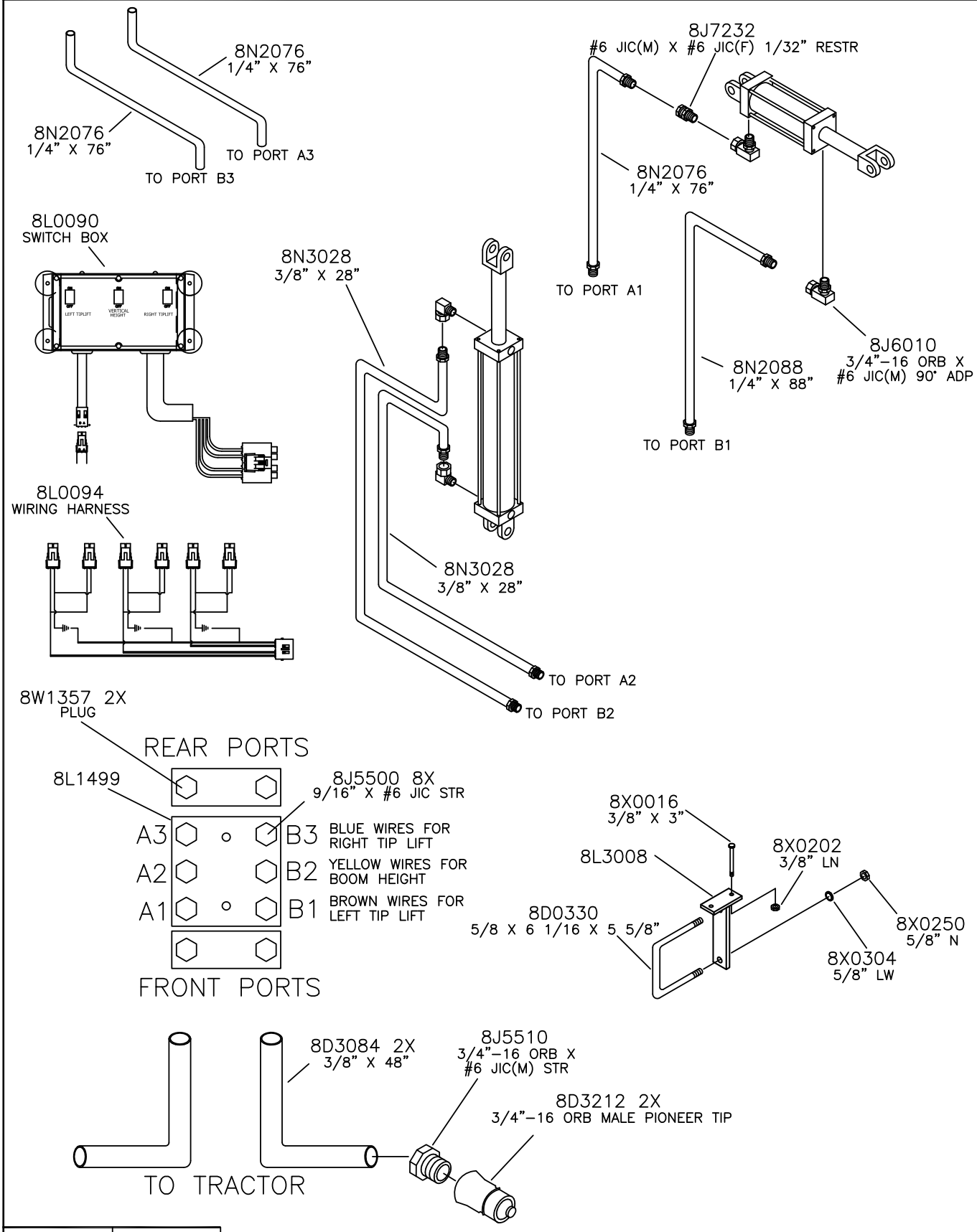
11/13/06	8L0090

2PT HYDRAULIC VALVE HARNESS

8 FEET OVER ALL LENGTH ENCASED IN
CONVOLUTED LOOM EXCEPT AS NOTED

10/6/01 8L0094

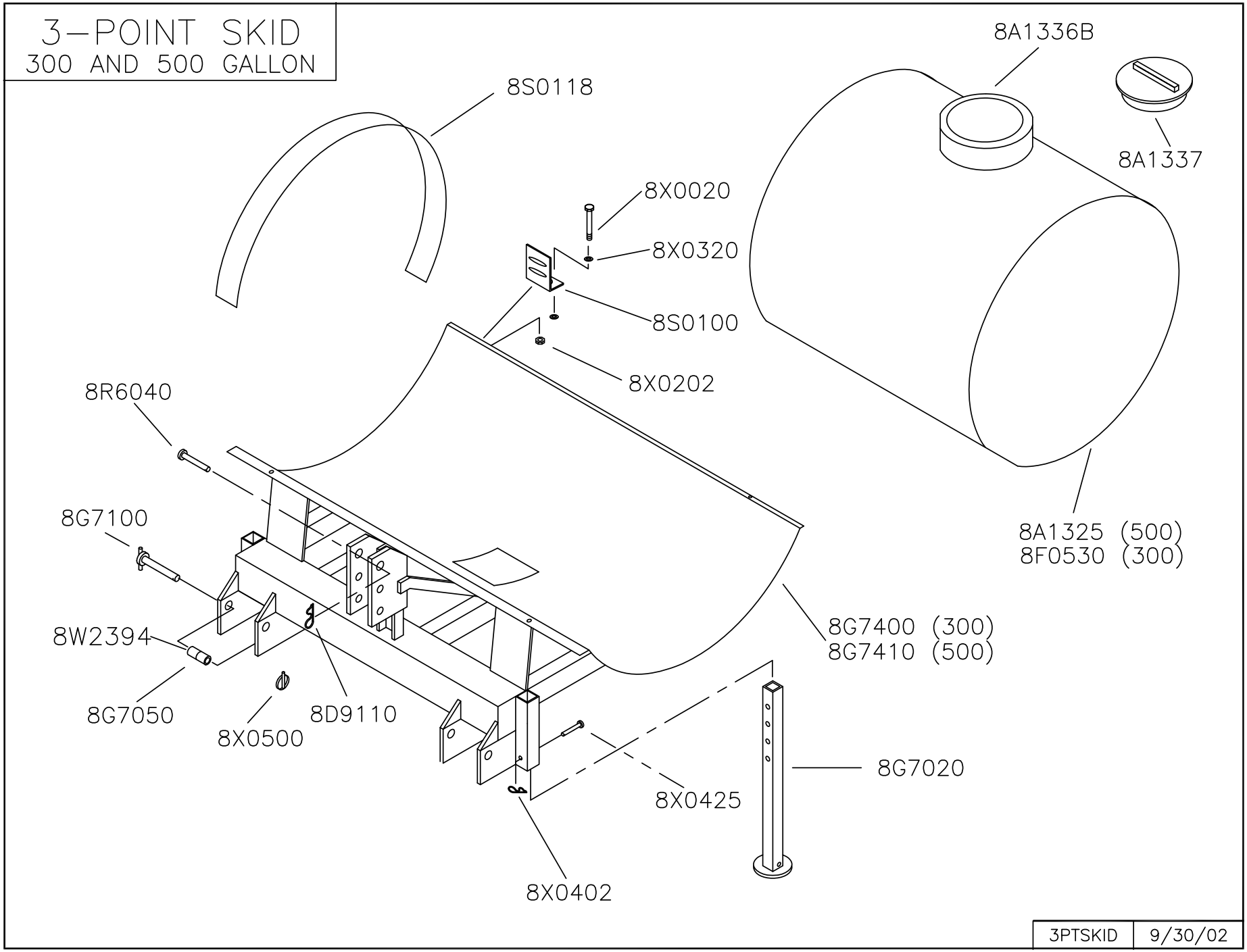
3 - 1 ELECTRIC OVER HYDRAULIC MULTIPLIER OPTION



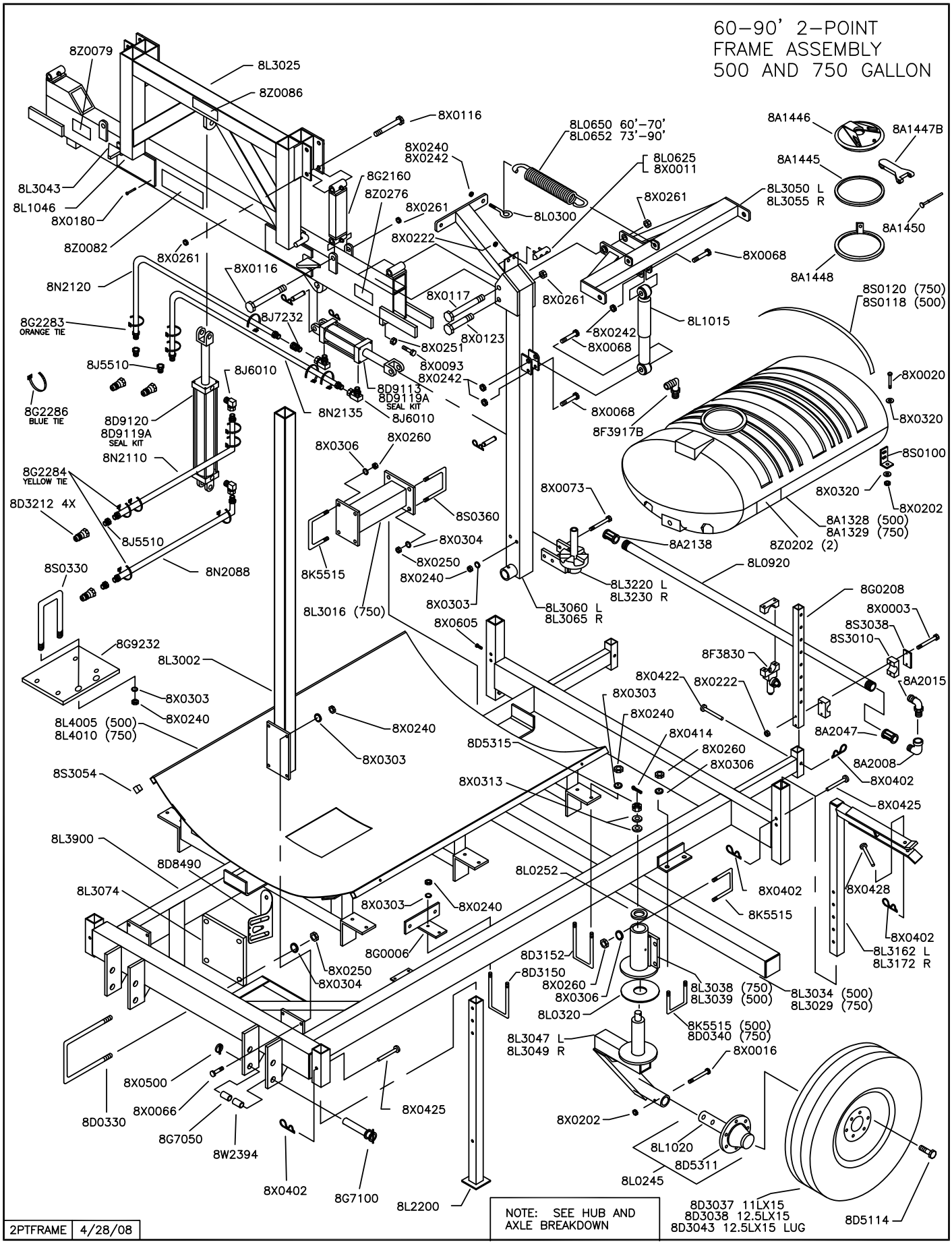
8L1513	8/9/02

REMEMBER TO BRING OWNER REGISTER INFORMATION LOCATED AT THE BEGINNING OF THIS MANUAL WHEN ORDERING PARTS. SERIAL NUMBER INFORMATION IS REQUIRED FOR ISSUE OF CORRECT PART.

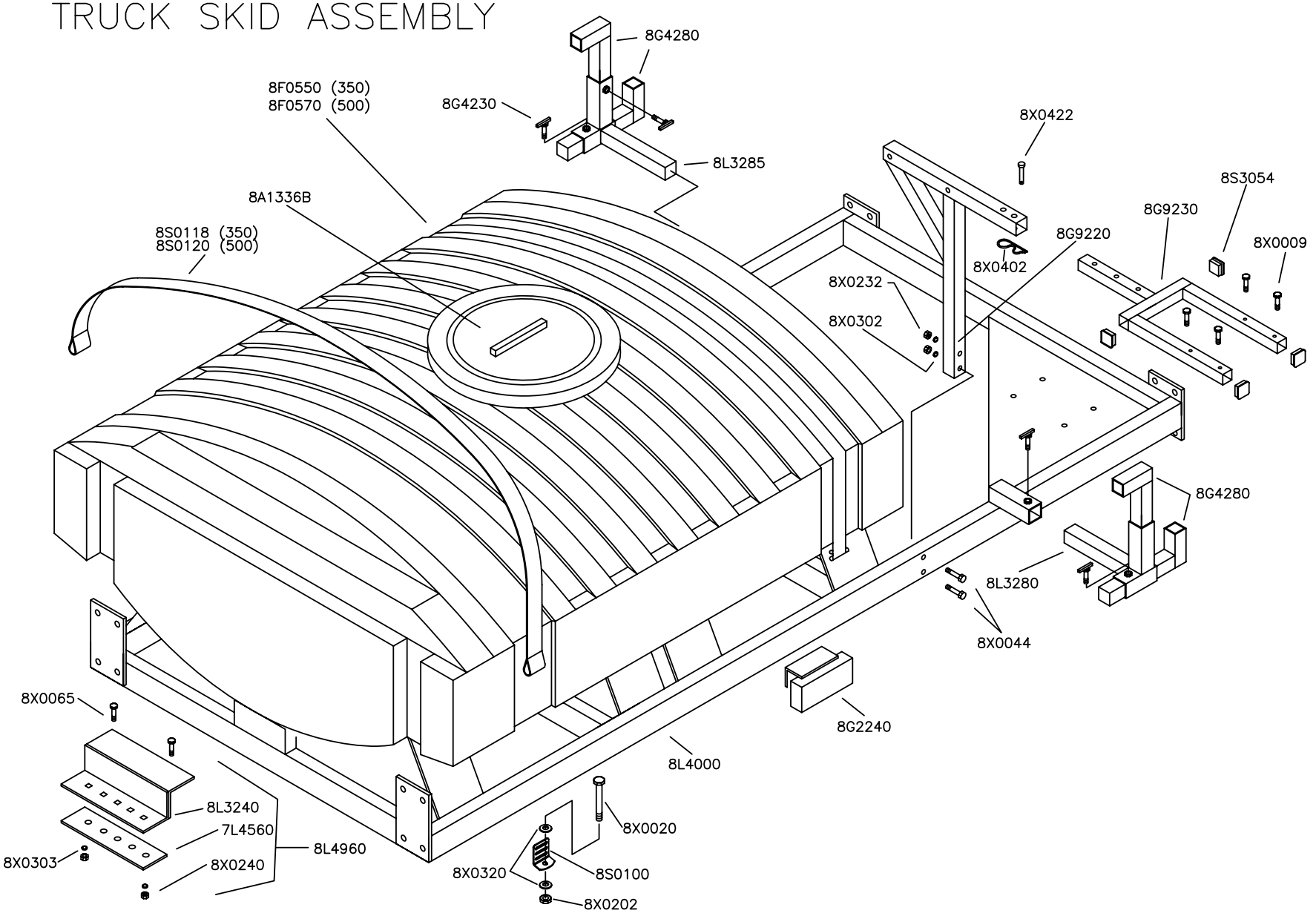
3–POINT SKID
300 AND 500 GALLON



3PTSKID	9/30/02

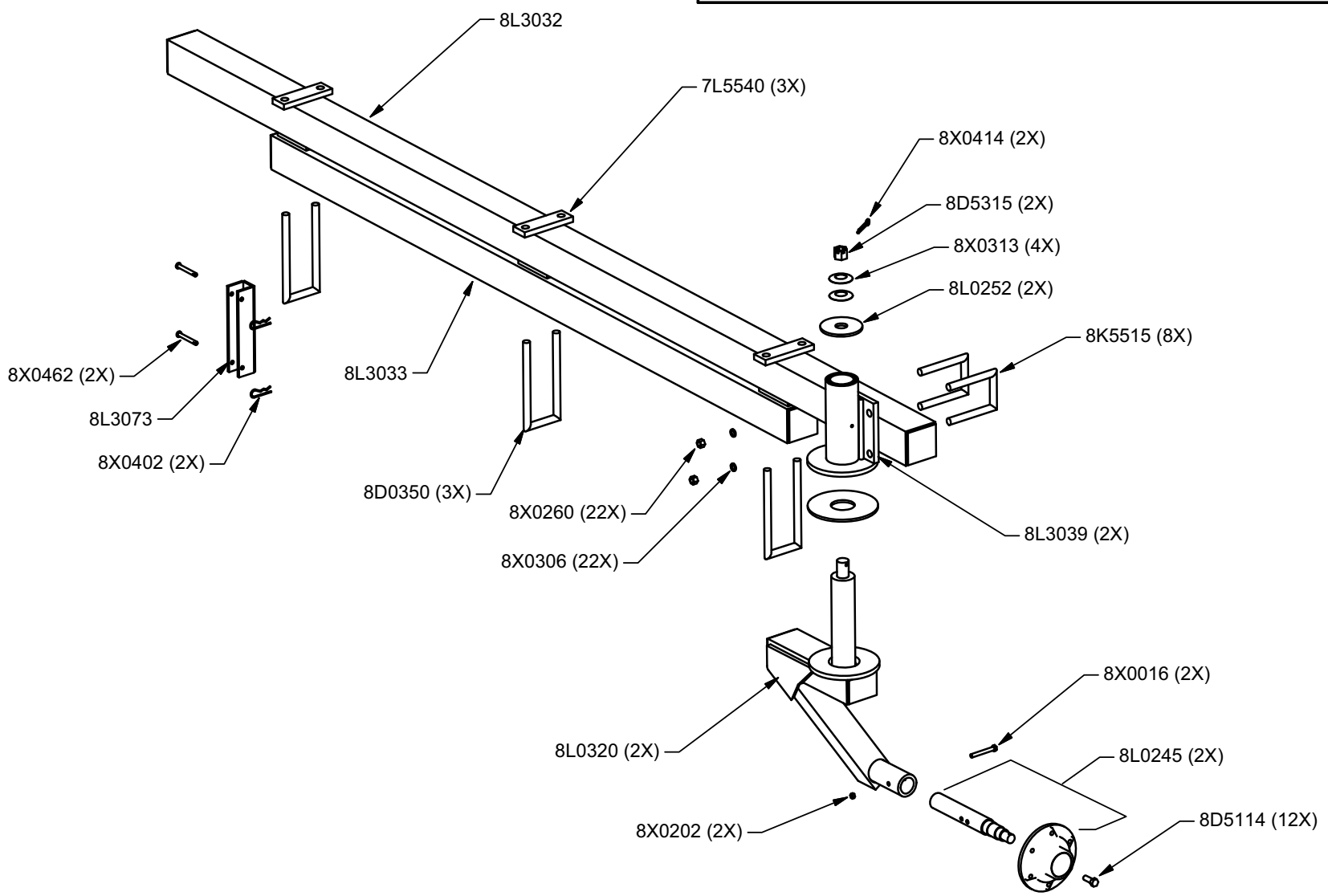

60–90' 2–POINT
FRAME ASSEMBLY
500 AND 750 GALLON
8Z0079
8L3025
8Z0086
8X0116
8L0650 60'–70'
8L0652 73'–90'
8X0240
8X0242
8L0625
8X0011
8A1446
8A1447B
8A1445
8L3050 L
8L3055 R
8L3043
8L1046
8X0180
8G2160
8Z0276
8X0261
8L0300
8X0261
8A1450
8Z0082
8X0222
8X0068
8A1448
8X0261
8X0116
8N2120
8X0117
8X0261
8S0120 (750)
8S0118 (500)
8G2283
ORANGE TIE
8J7232
8L1015
8X0123
8X0242
8X0251
8X0068
8J5510
8X0093
8X0242
8J6010
8X0020
8D9113
8D9119A
SEAL KIT
8G2286
BLUE TIE
8D9120
8D9119A
SEAL KIT
8N2135
8J6010
8F3917B
8X0320
8X0260
8X0306
8S0100
8N2110
8X0320
8G2284
YELLOW TIE
8X0073
8X0202
8D3212 4X
8S0360
8A1328 (500)
8A1329 (750)
8J5510
8A2138
8Z0202 (2)
8X0304
8S0330
8X0250
8L0920
8N2088
8X0240
8K5515
8L3220 L
8L3230 R
8X0303
8L3016 (750)
8L3060 L
8L3065 R
8G0208
8X0605
8X0003
8S3038
8G9232
8S3010
8L3002
8F3830
8X0422
8X0222
8A2015
8X0303
8X0303
8X0240
8L4005 (500)
8L4010 (750)
8X0240
8A2047
8X0414
8X0240
8D5315
8X0260
8X0306
8A2008
8S3054
8X0313
8X0402
8X0425
8L3900
8D8490
8L0252
8X0402
8X0428
8L3074
8X0303
8X0240
8K5515
8X0402
8G0006
8L3162 L
8L3172 R
8X0250
8X0304
8D3152
8D3150
8X0260
8X0306
8L3038 (750)
8L3039 (500)
8L3034 (500)
8L3029 (750)
8L0320
8K5515 (500)
8D0340 (750)
8L3047 L
8L3049 R
8X0016
8X0500
8X0066
8X0425
8X0202
8D0330
8G7050
8W2394
8L1020
8D5311
8L0245
8X0402
8G7100
8L2200
NOTE: SEE HUB AND AXLE BREAKDOWN
8D3037 11LX15
8D3038 12.5LX15
8D3043 12.5LX15 LUG
8D5114
2PTFRAME
4/28/08

350 AND 500 GALLON TRUCK SKID ASSEMBLY



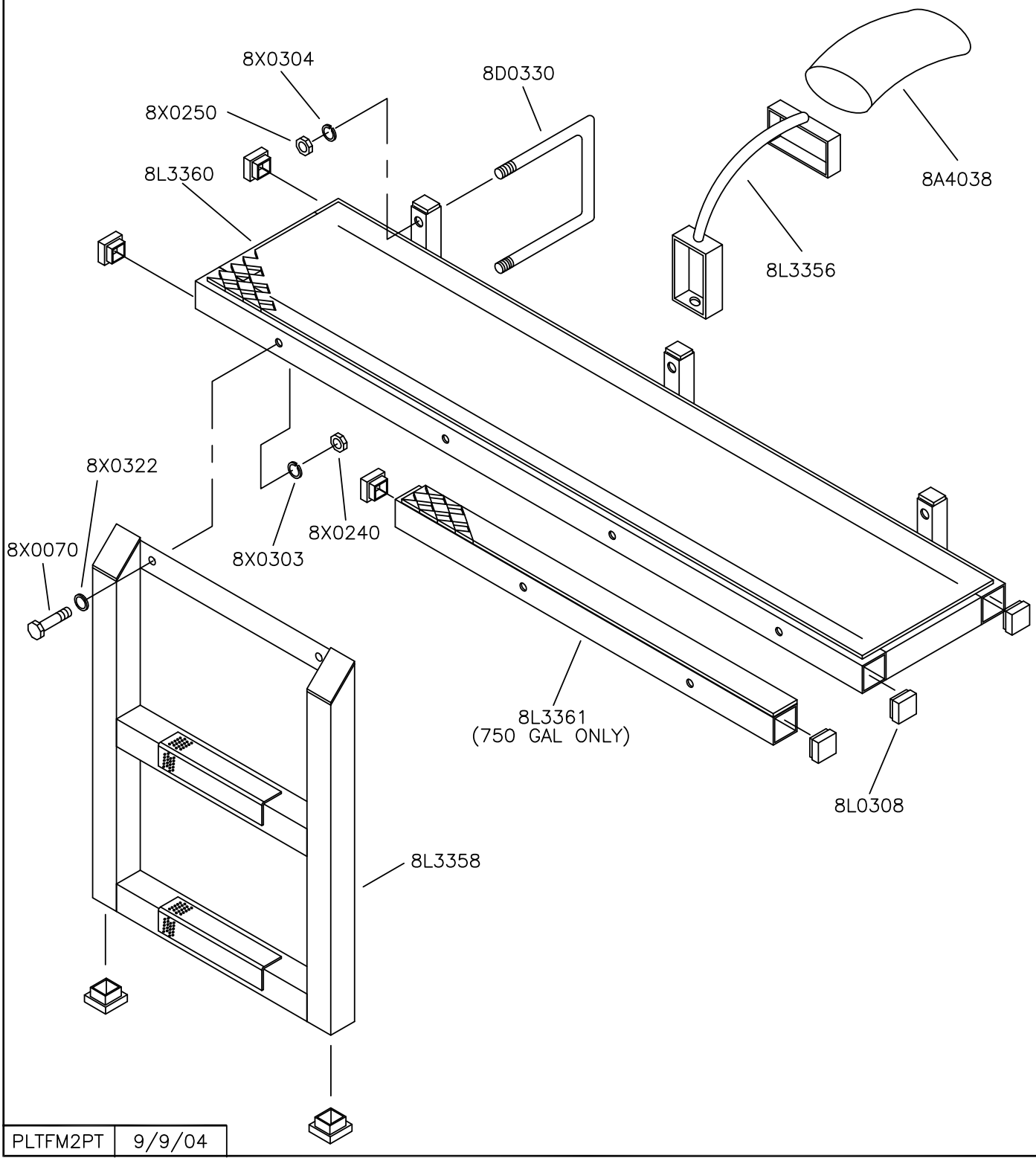
SPSKID | 11/14/06

2-POINT 500 GALLON WIDE AXLE KIT



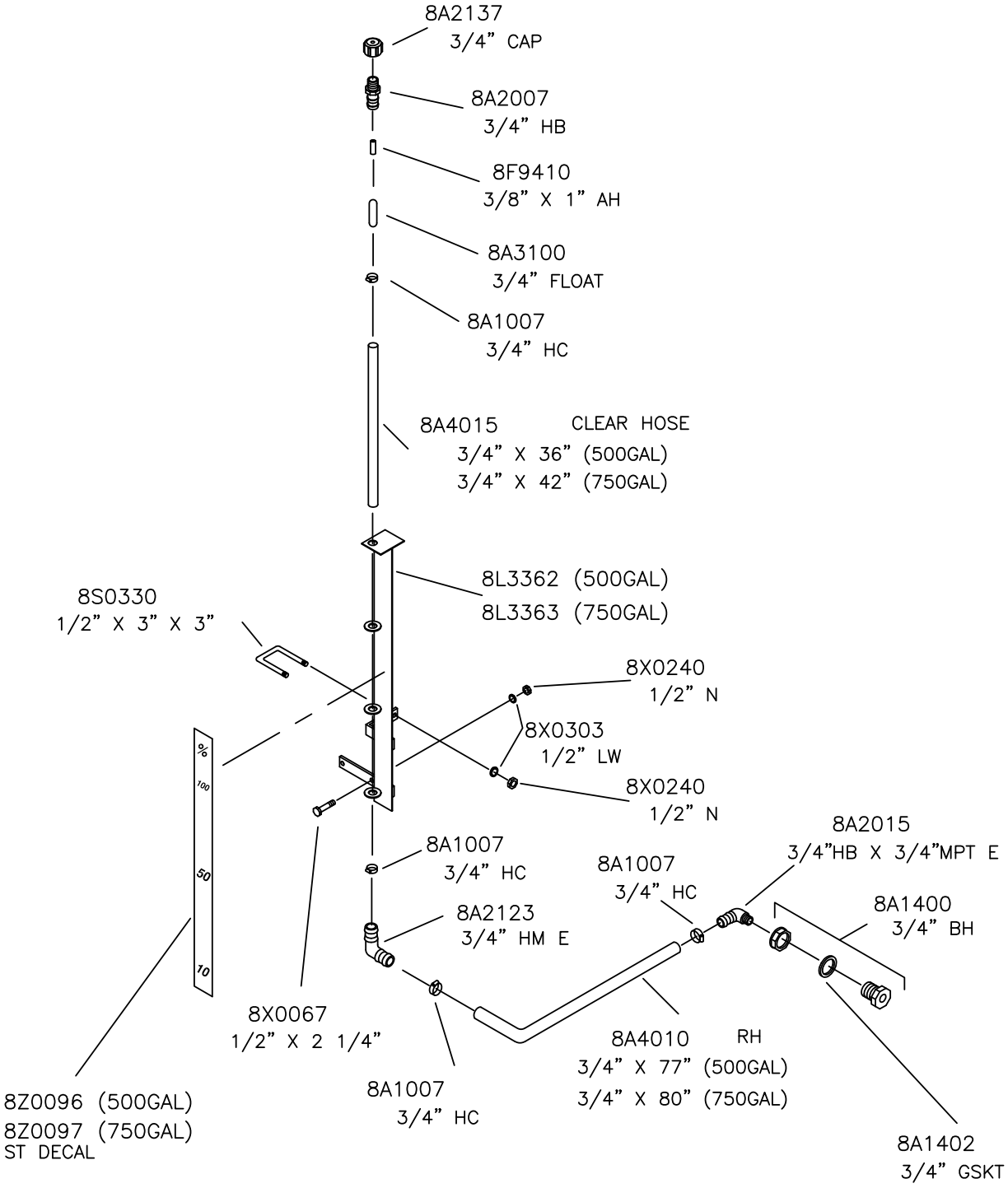
8L1312	9/9/04

2–POINT PLATFORM & LADDER KIT



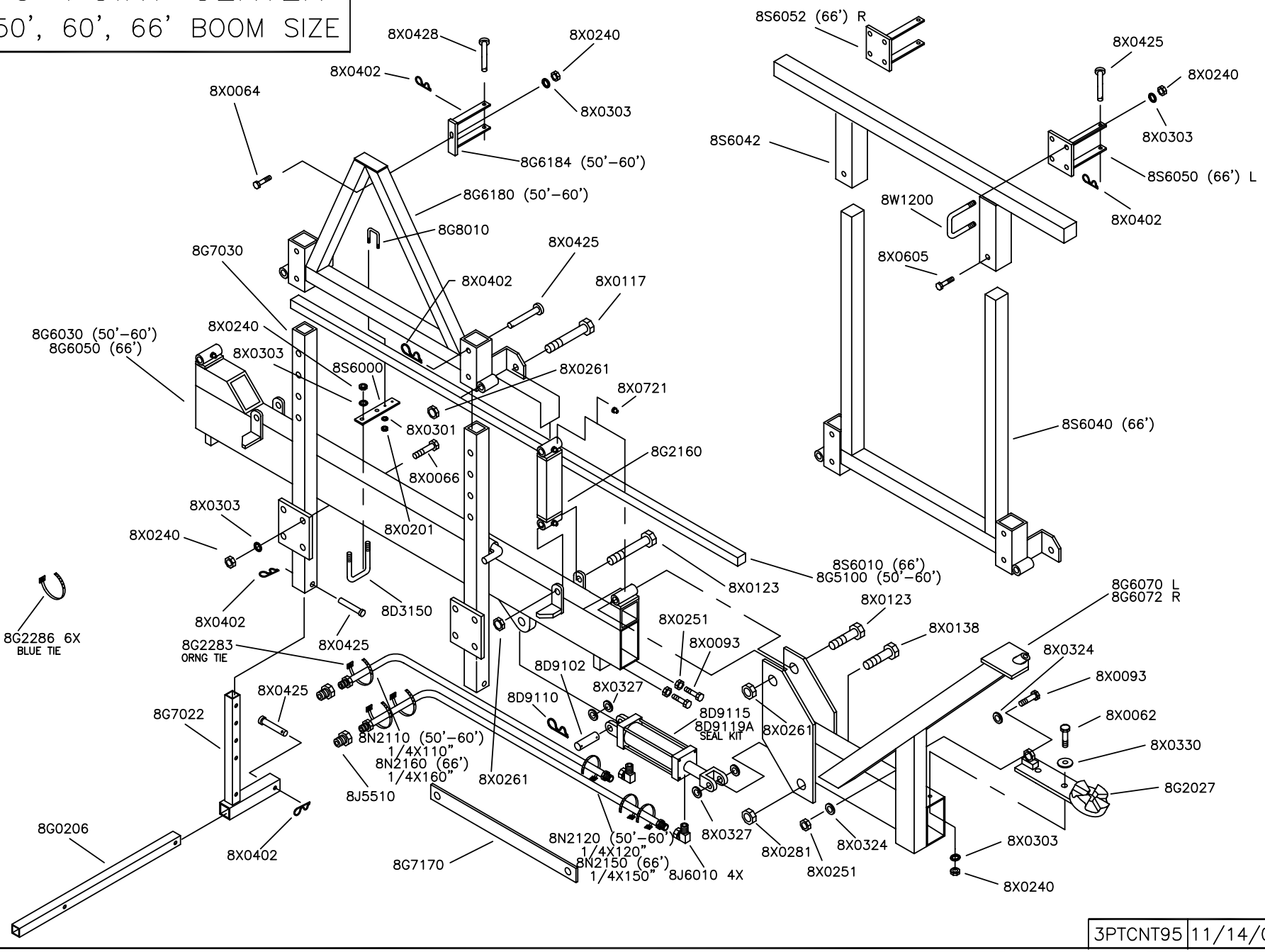
PLTFM2PT	9/9/04

2–POINT SIGHT TUBE KIT



2PTSTKIT	9/9/04

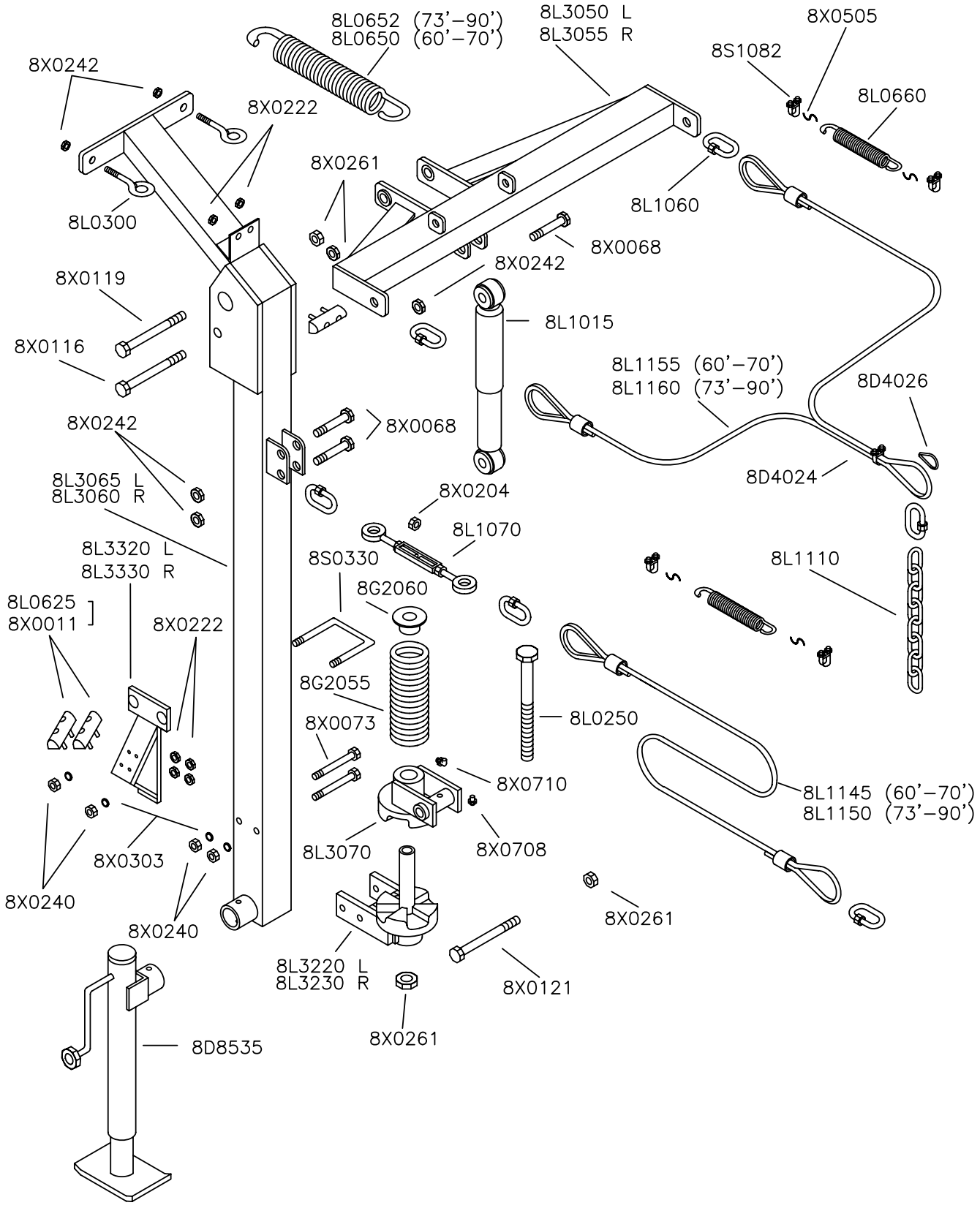
3–POINT CENTER
50', 60', 66' BOOM SIZE



3PTCNT95 | 11/14/06

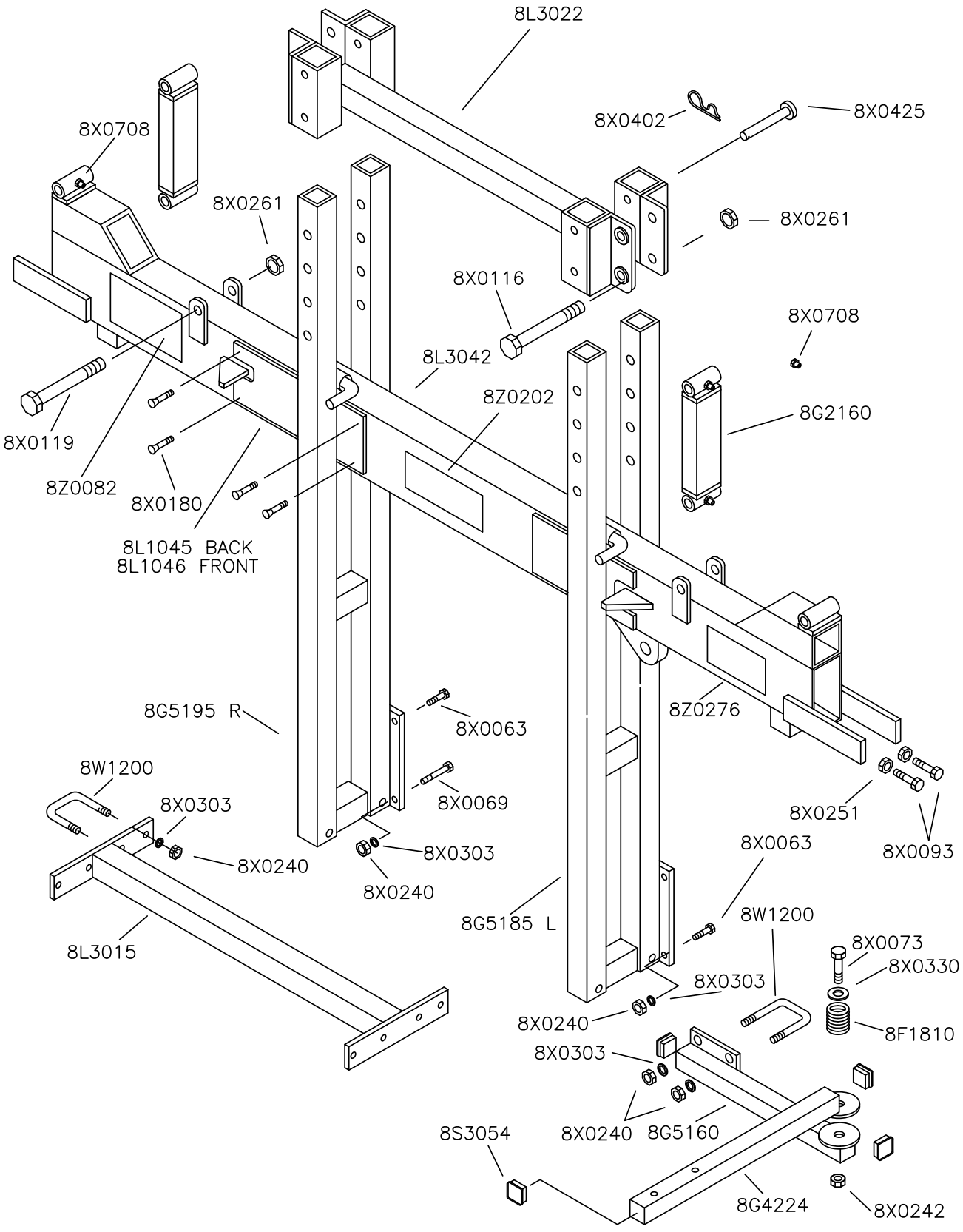
CABLE SUSPENDED BOOM PIVOT ARM ASSEMBLY

60'–70' AND 73'–90' 2–POINT & TRUCK SPRAYER



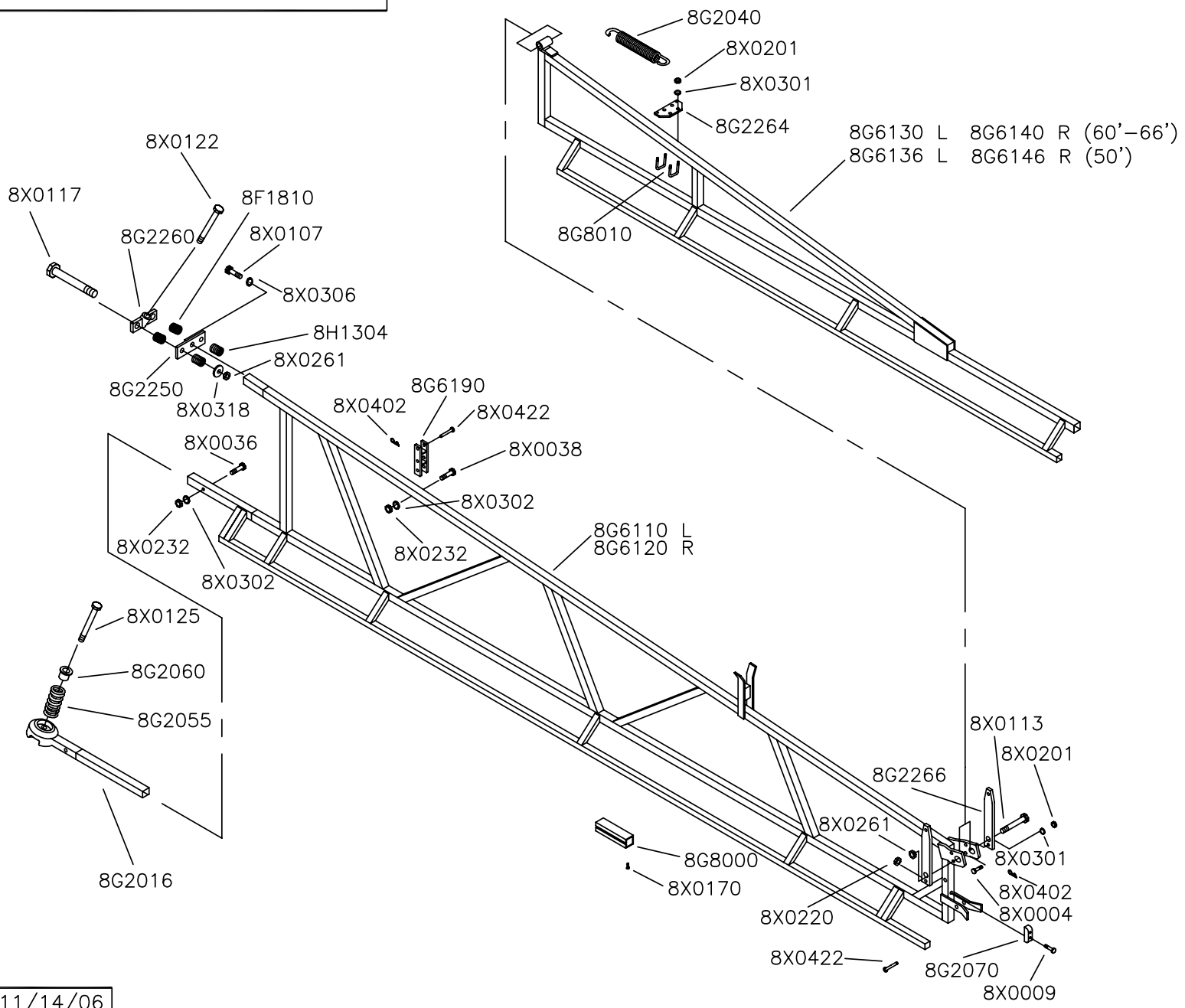
WBPIVOT	11/14/06

FRONT HEIGHT ADJUSTMENT 60–90' TRUCK SPRAYERS



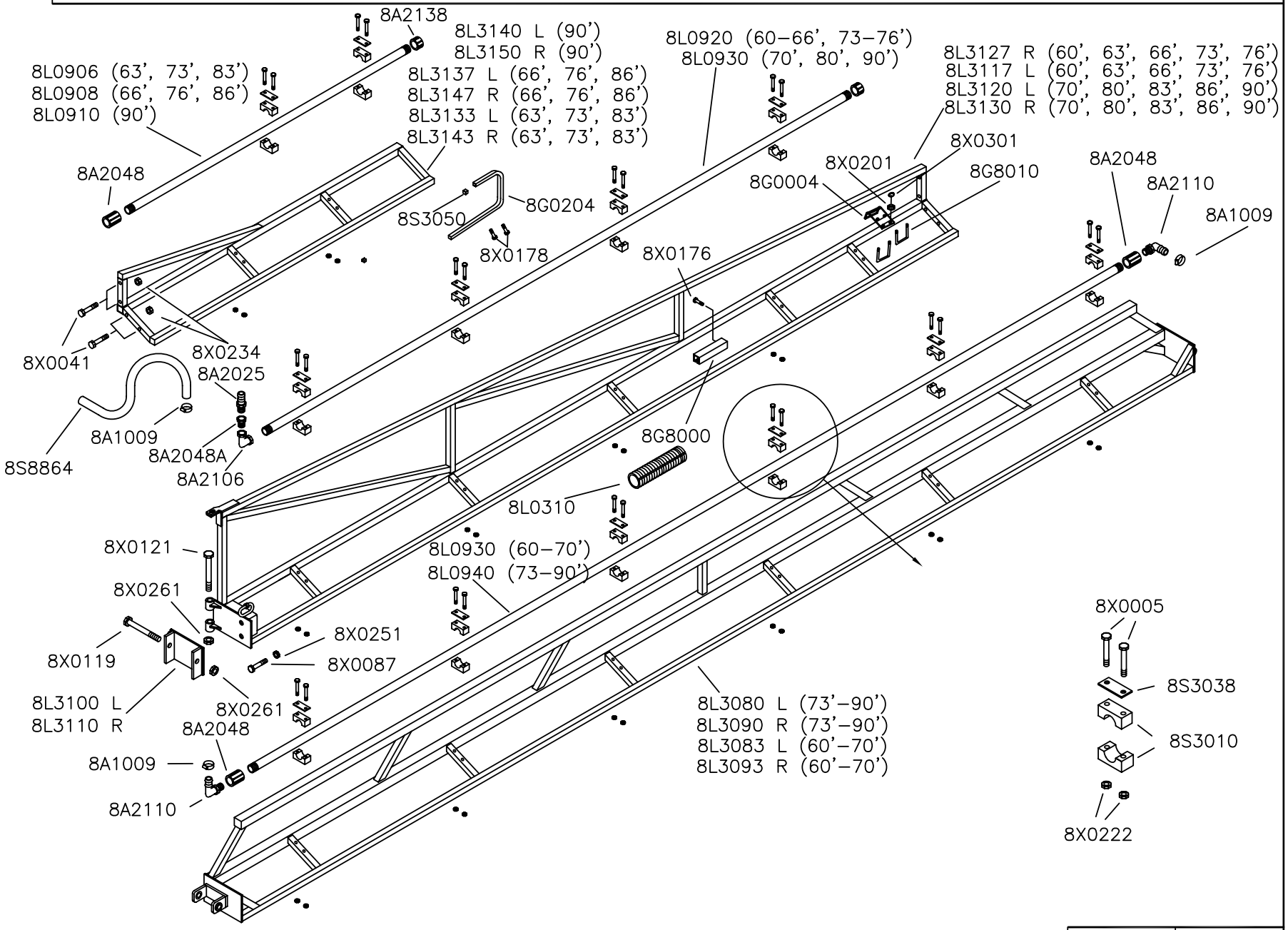
FHGHT95	4/28/08

50–66' 3 PT. BOOM



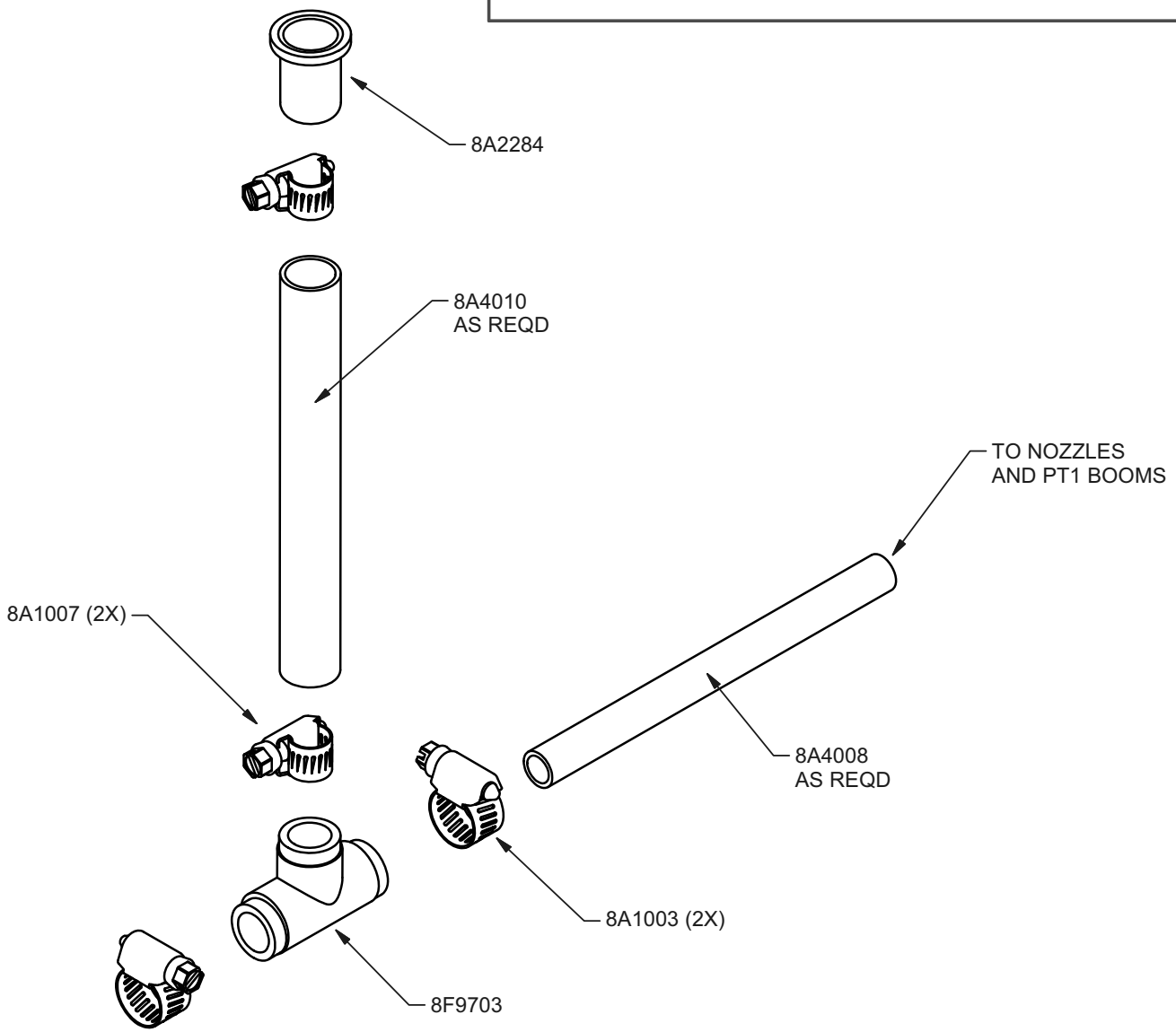
60PTARM	11/14/06

2–PT & TRUCK SPRAYER 60–90' CABLE SUSPENDED BOOM ASSEMBLY



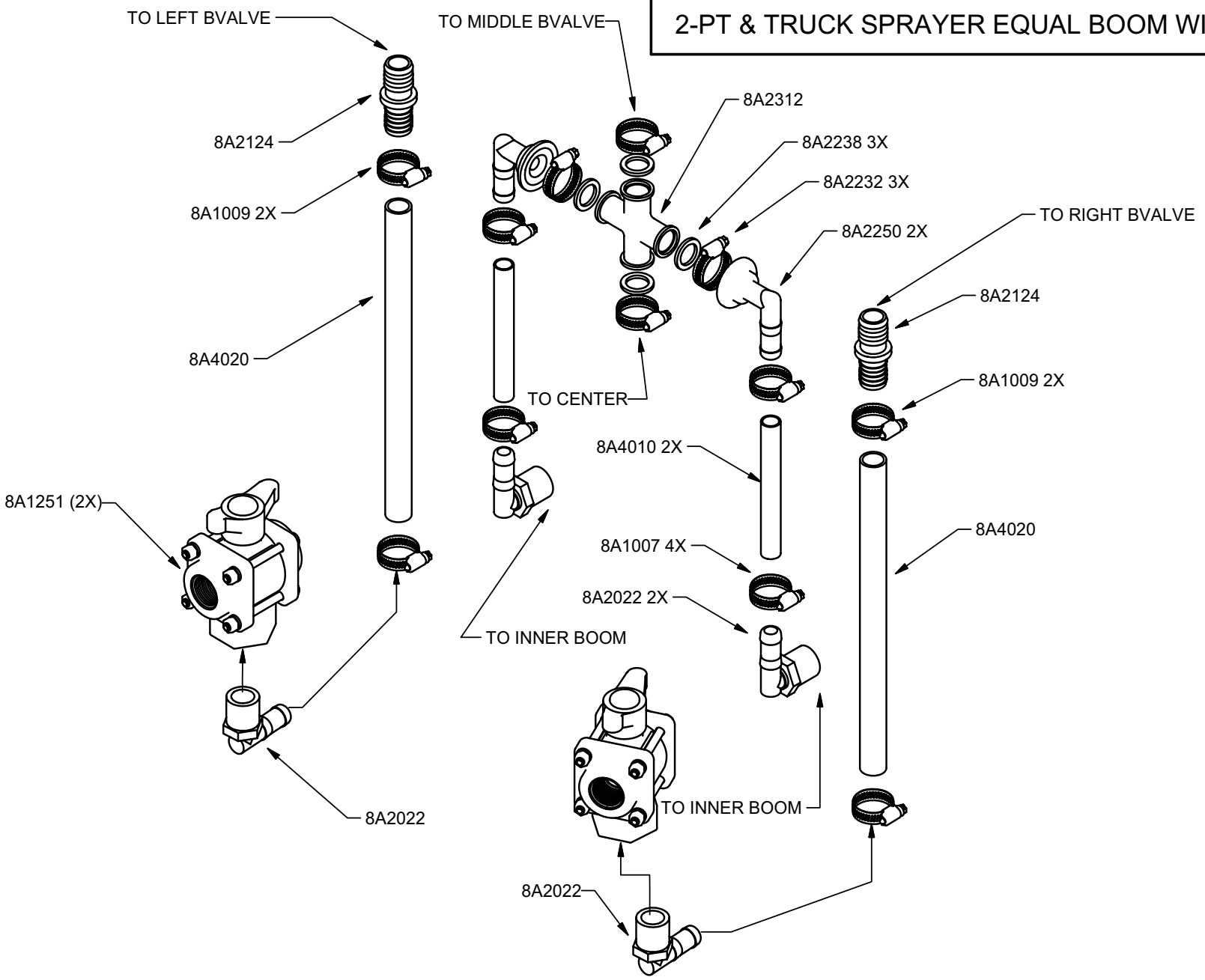
BOOMS	11/14/06

3PT EQUAL BOOM WIDTH



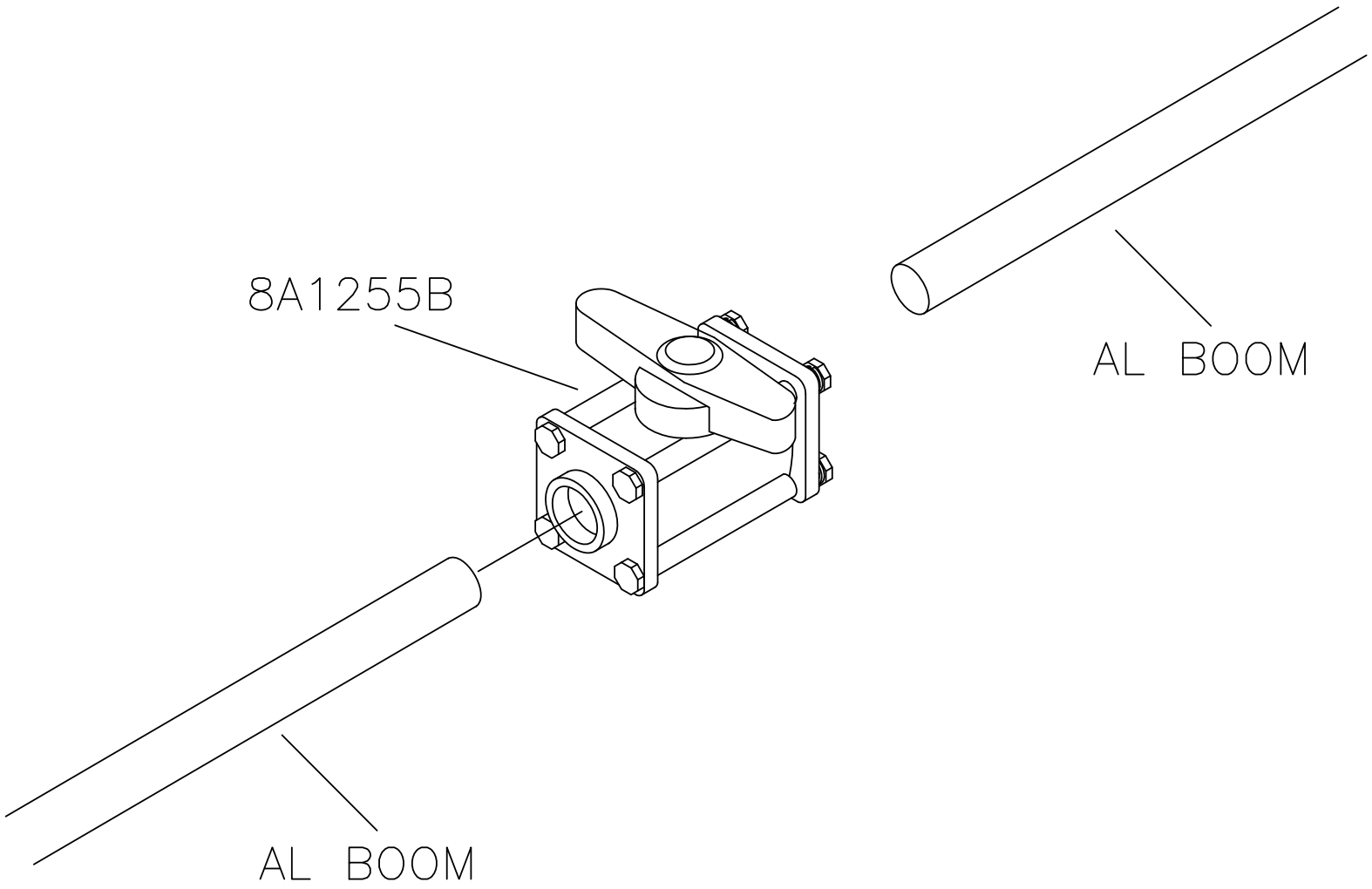
8G6300	8/27/04

2-PT & TRUCK SPRAYER EQUAL BOOM WIDTH



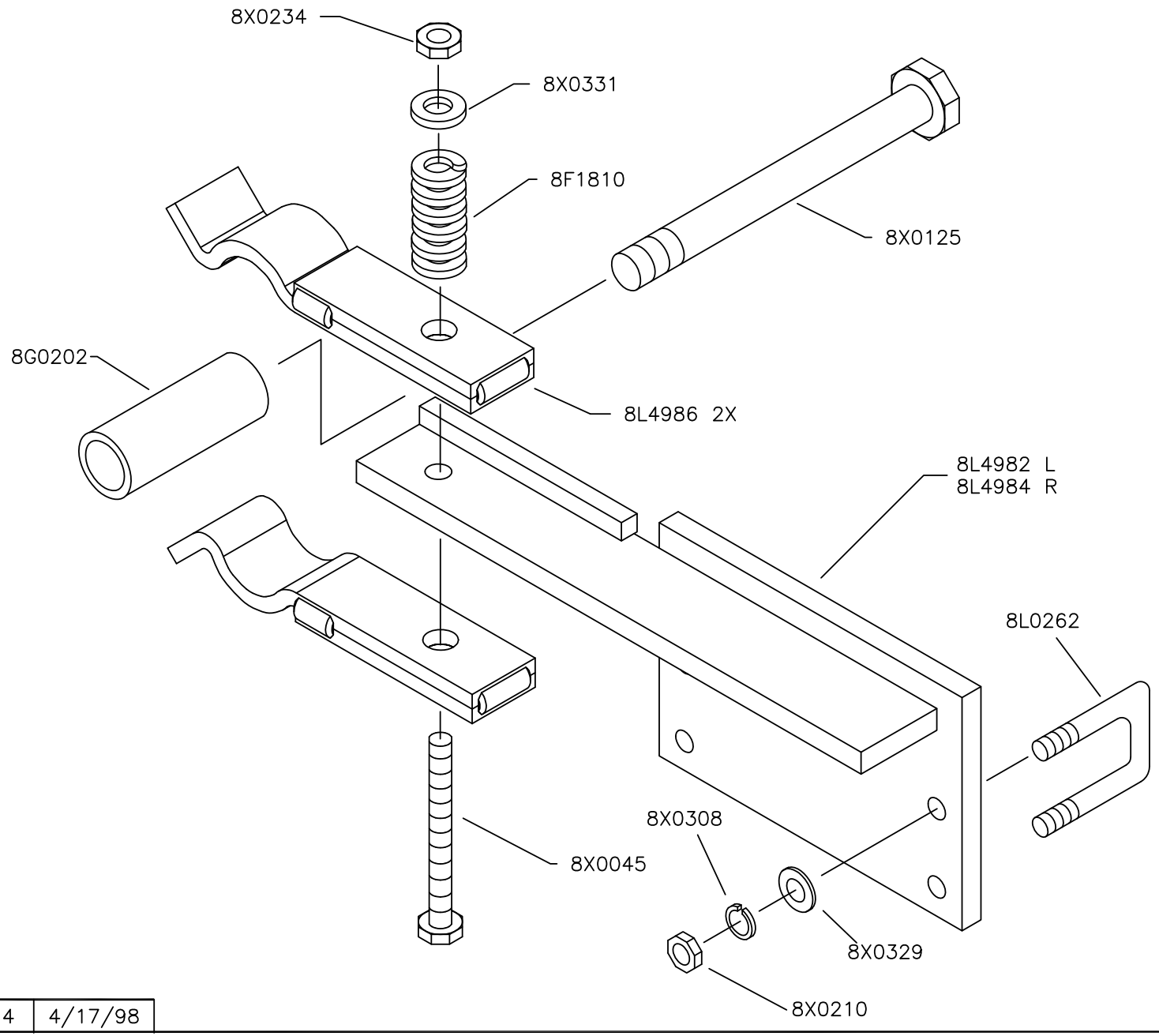
8L4955	9/1/04

2–PT & TRUCK SPRAYER
MANUAL 1" BOOM VALVE



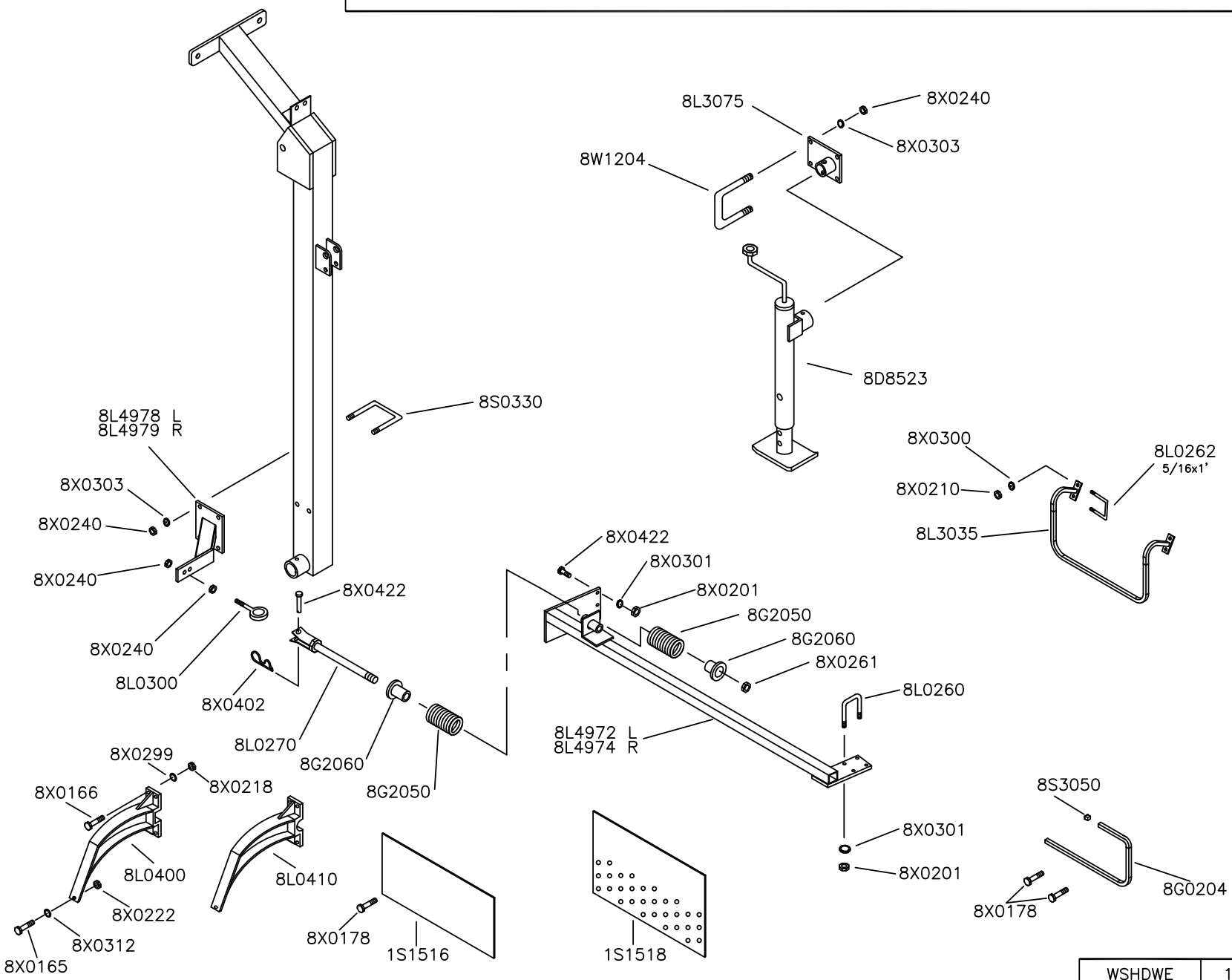
8L2913	8/18/04

2–PT & TRUCK SPRAYER WETBOOM PART 2 LATCH KIT



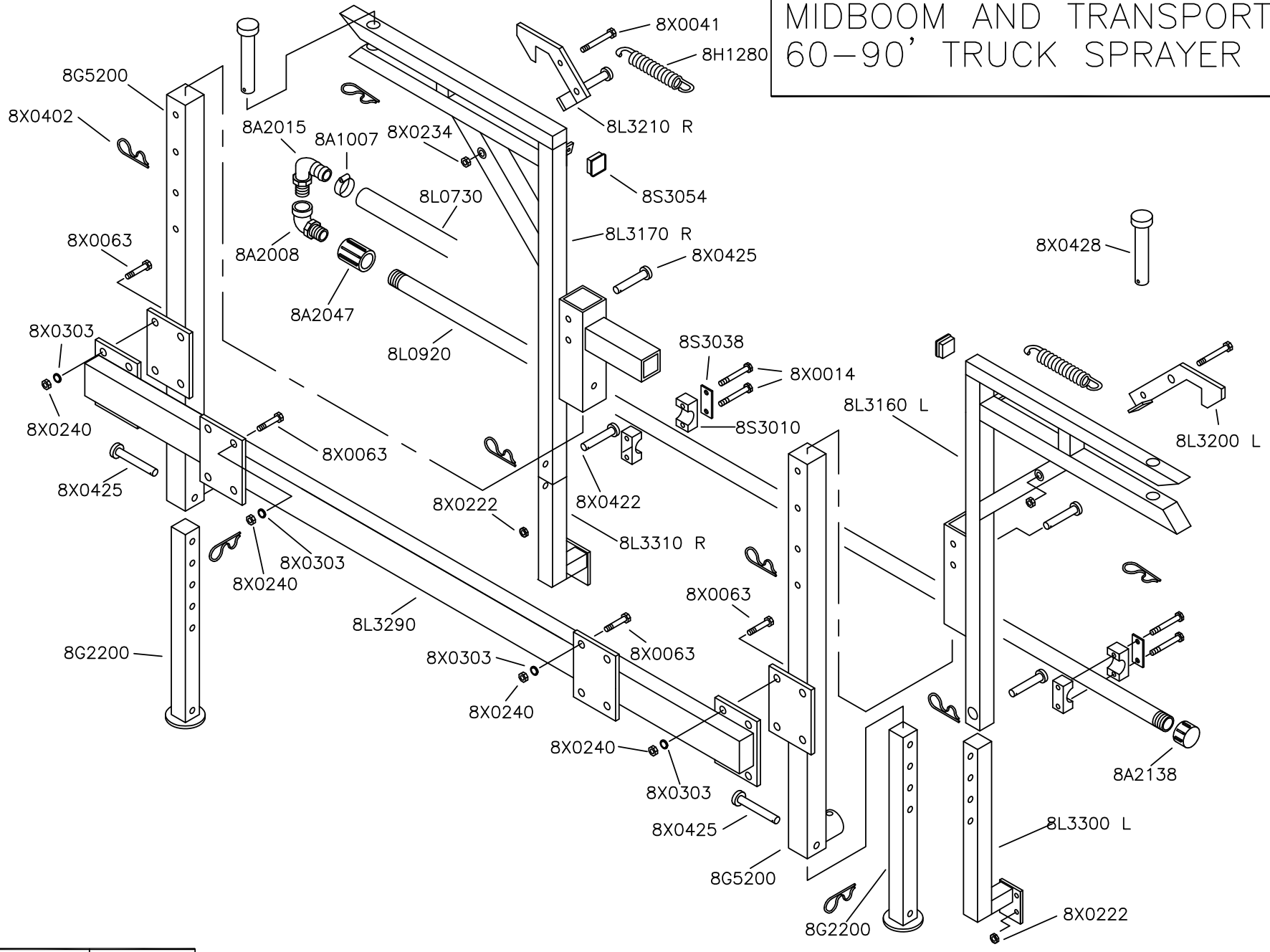
8L4814	4/17/98

2–PT & TRUCK SPRAYER WINDSHIELD HARDWARE



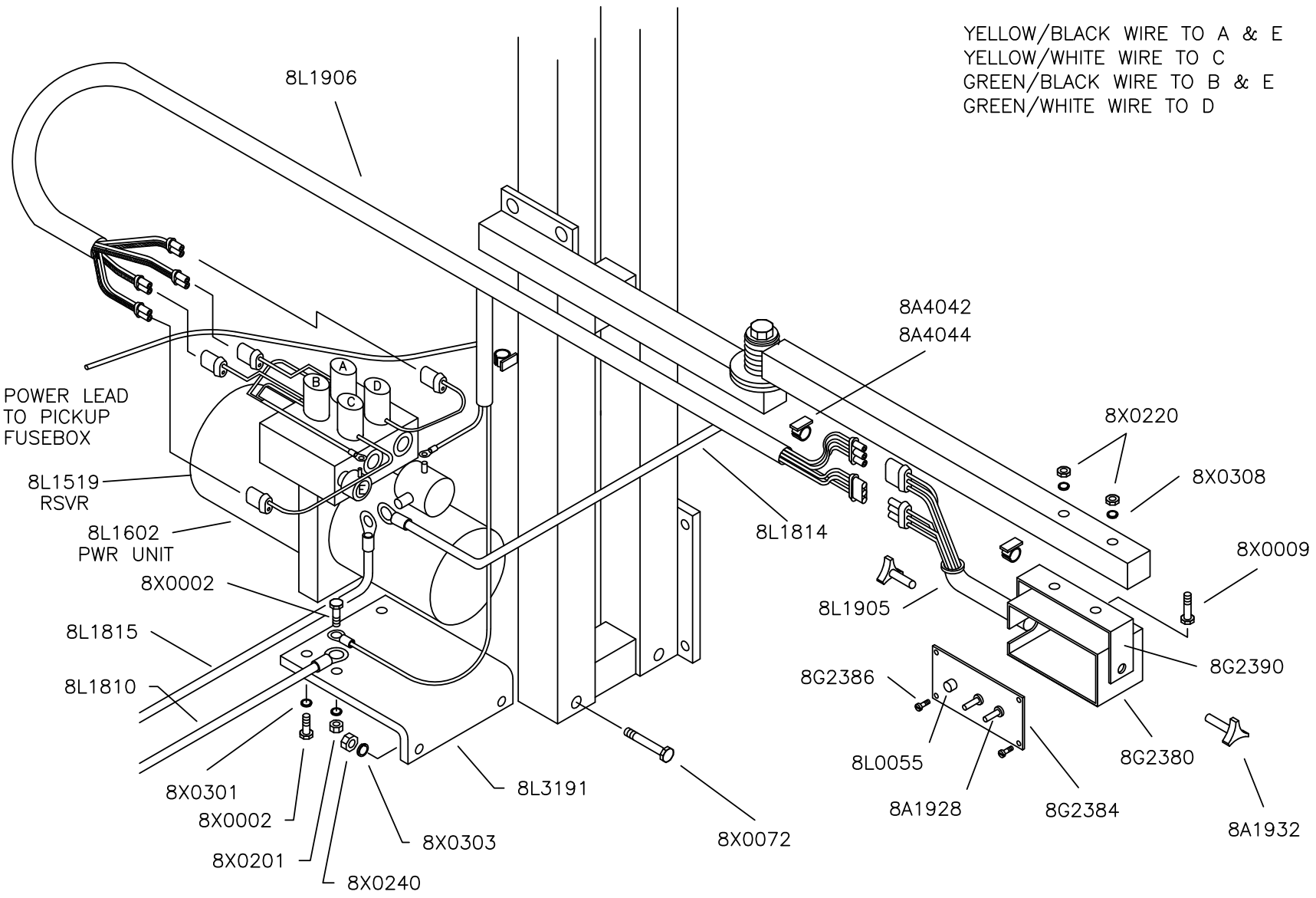
WSHDWE	11/14/06

MIDBOOM AND TRANSPORT
60–90' TRUCK SPRAYER



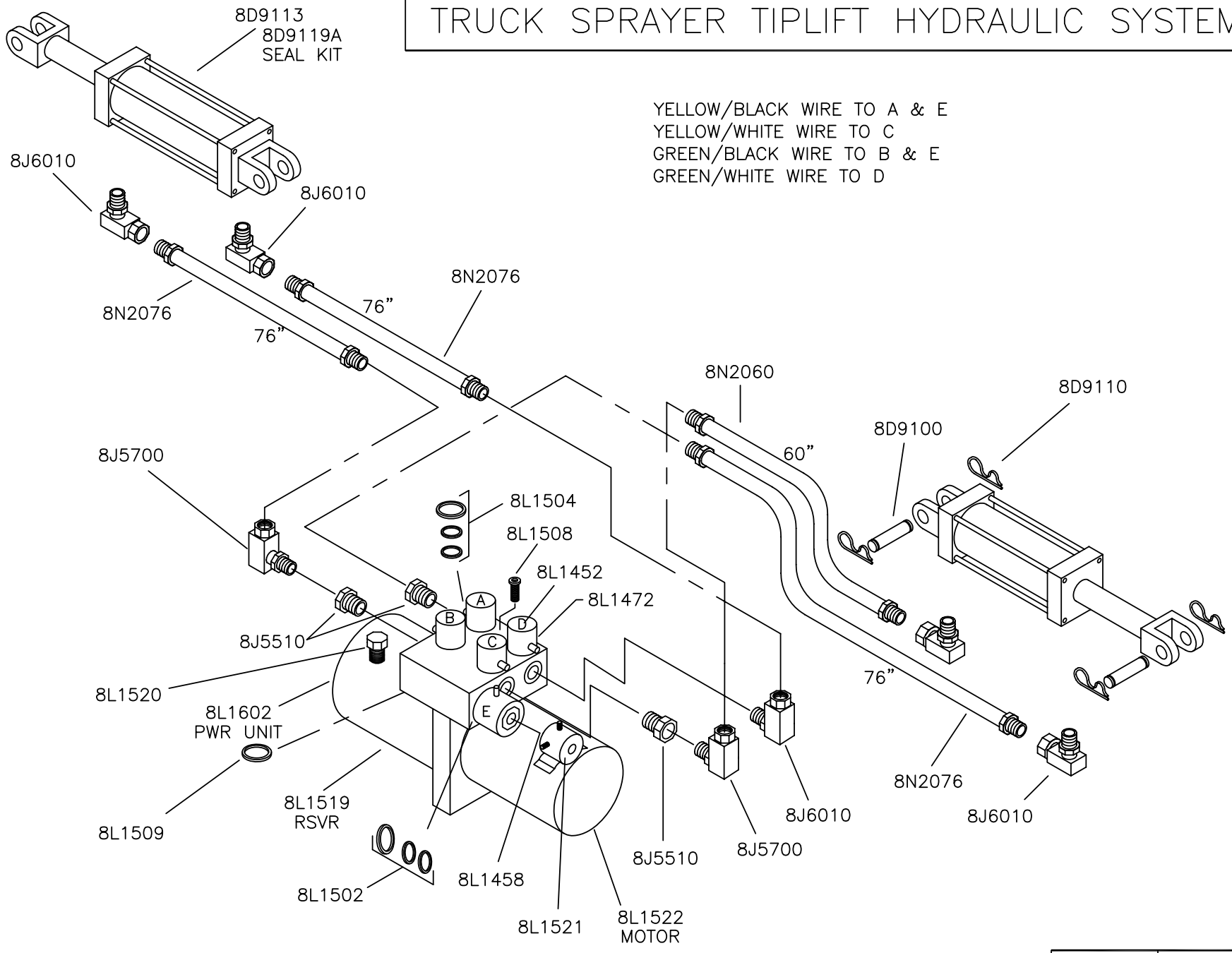
TRANWB95	10/31/02

TRUCK SPRAYER TIPLIFT ELECTRICAL SYSTEM



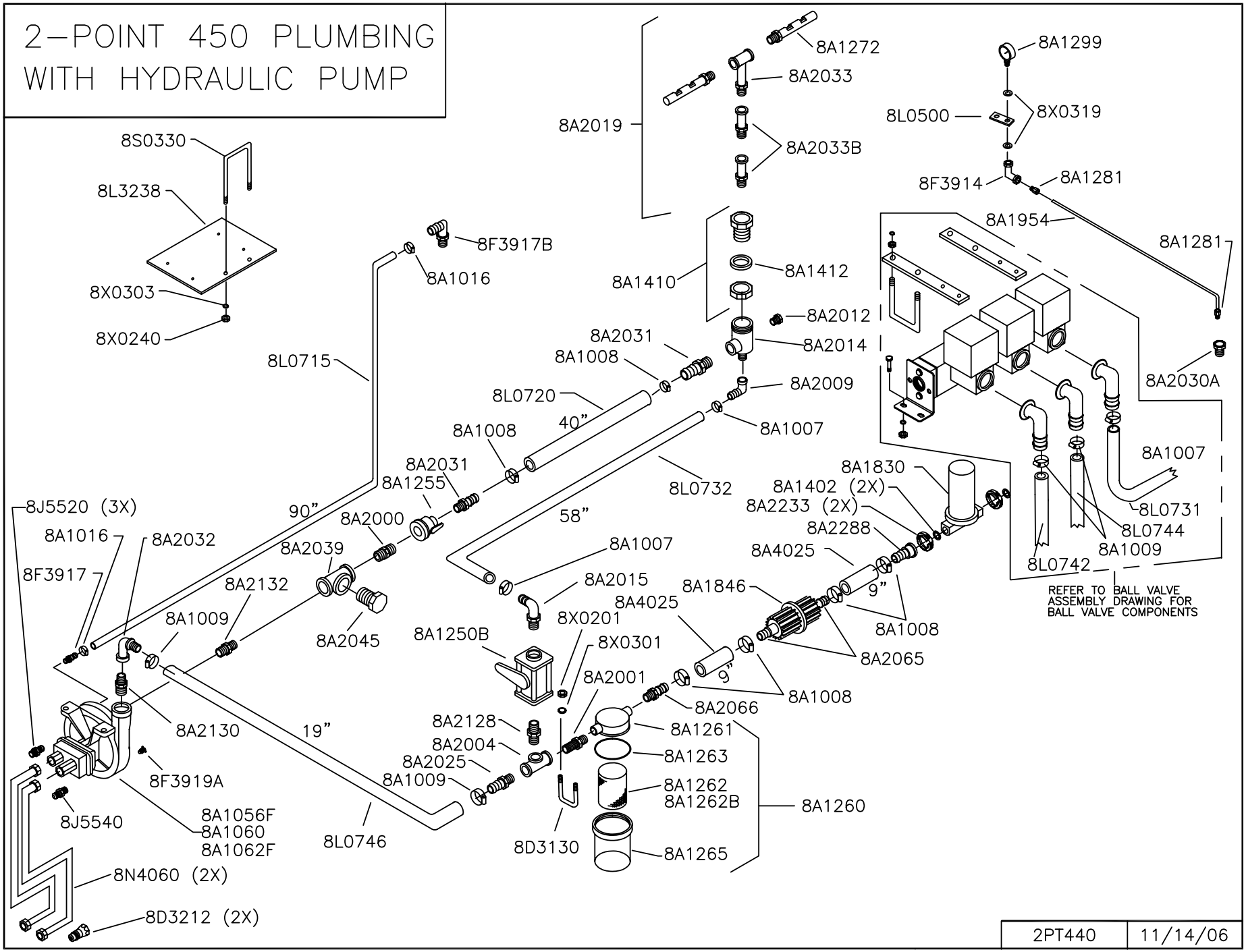
ELECSY97	7/7/03

TRUCK SPRAYER TIPLIFT HYDRAULIC SYSTEM



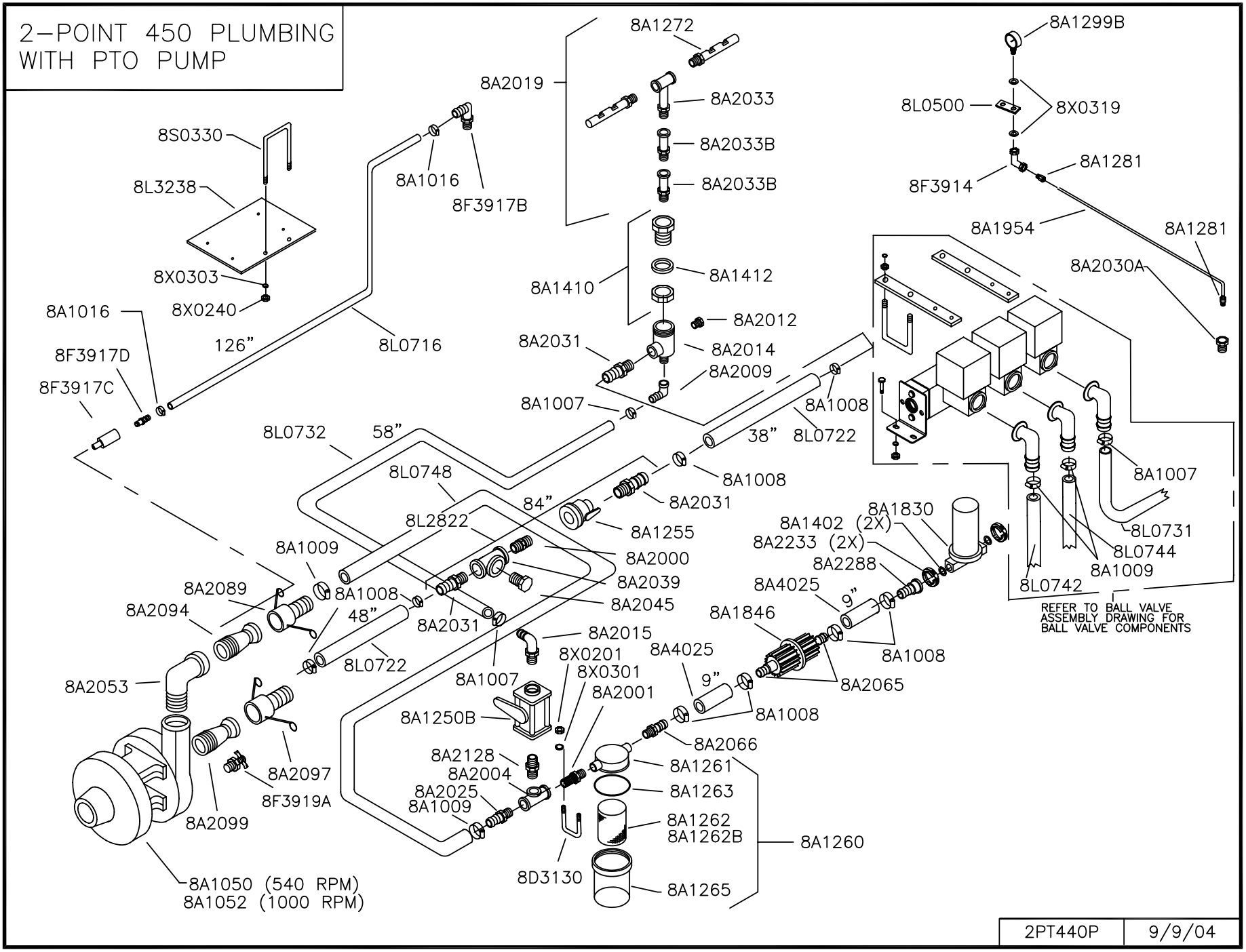
TLHYD97	9/9/04

2–POINT 450 PLUMBING WITH HYDRAULIC PUMP



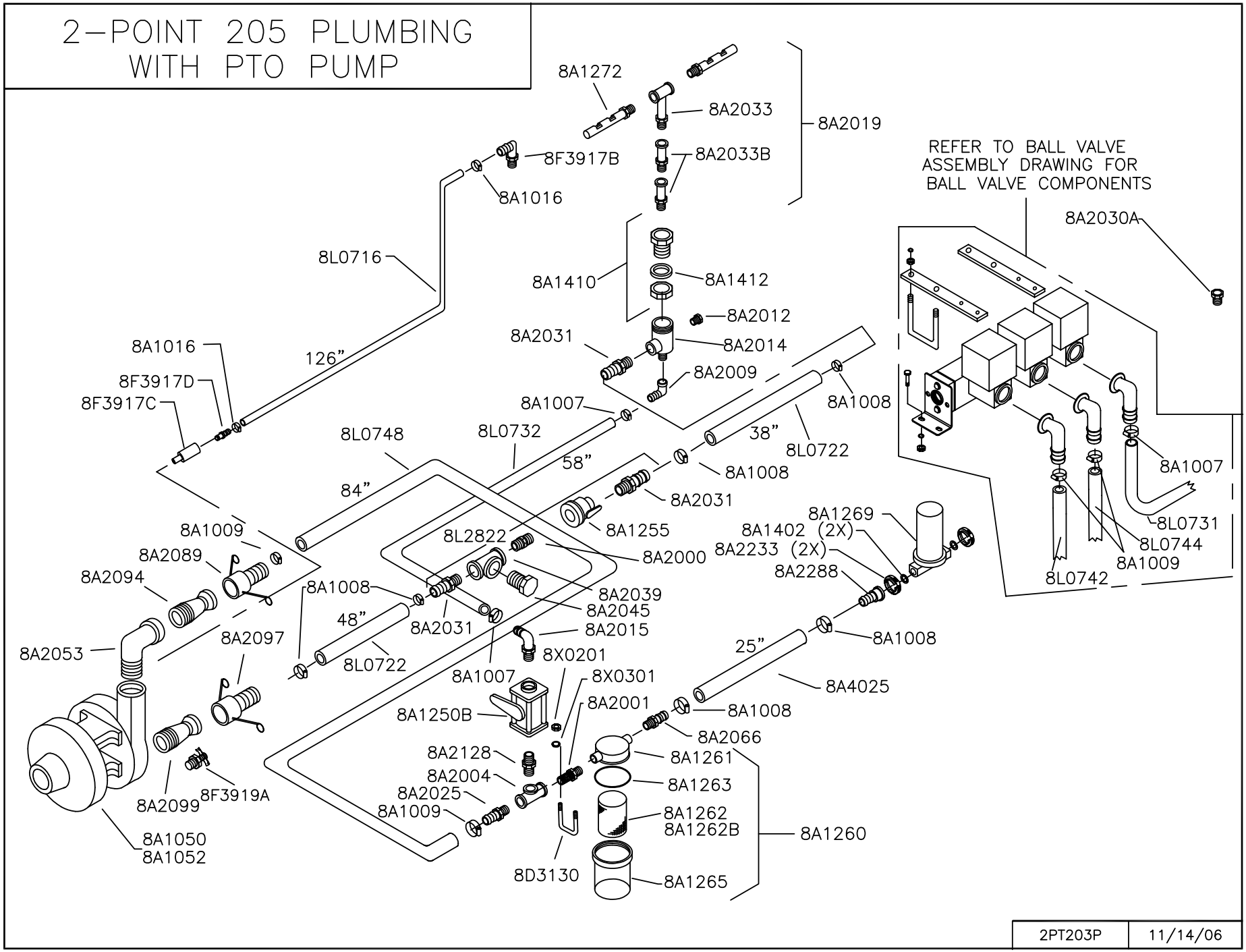
2PT440	11/14/06

2–POINT 450 PLUMBING WITH PTO PUMP



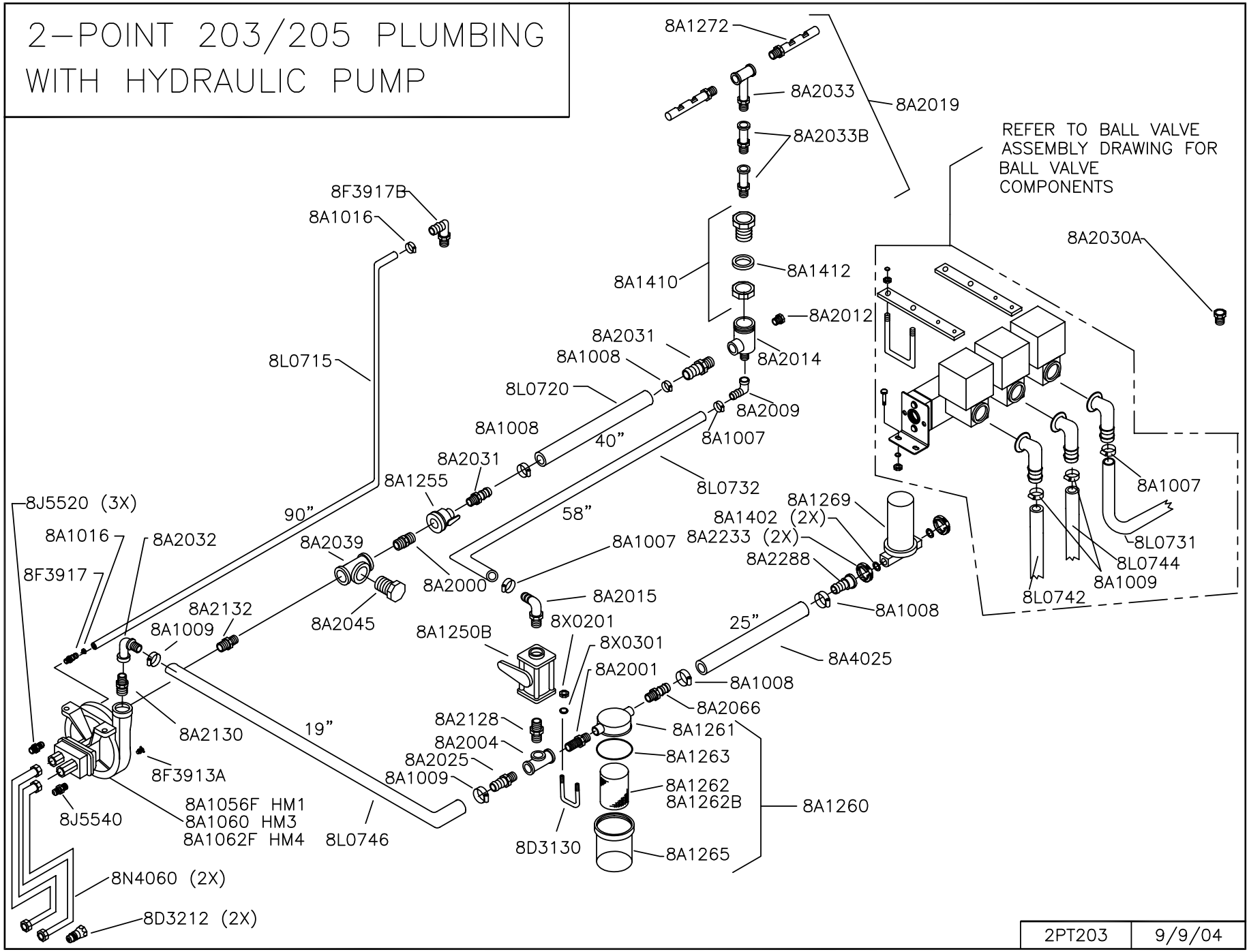
2PT440P	9/9/04

2–POINT 205 PLUMBING WITH PTO PUMP



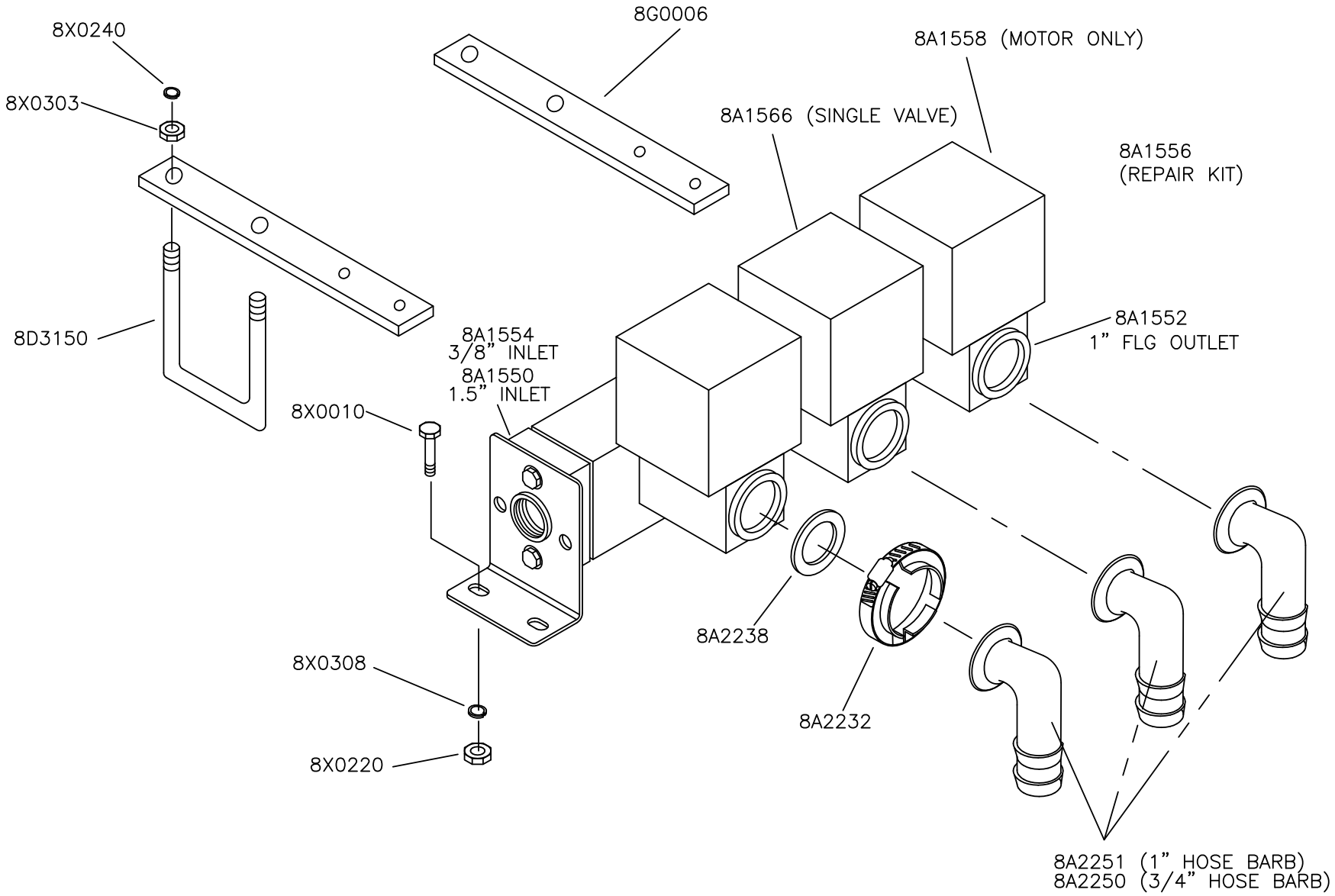
2PT203P	11/14/06

2–POINT 203/205 PLUMBING WITH HYDRAULIC PUMP



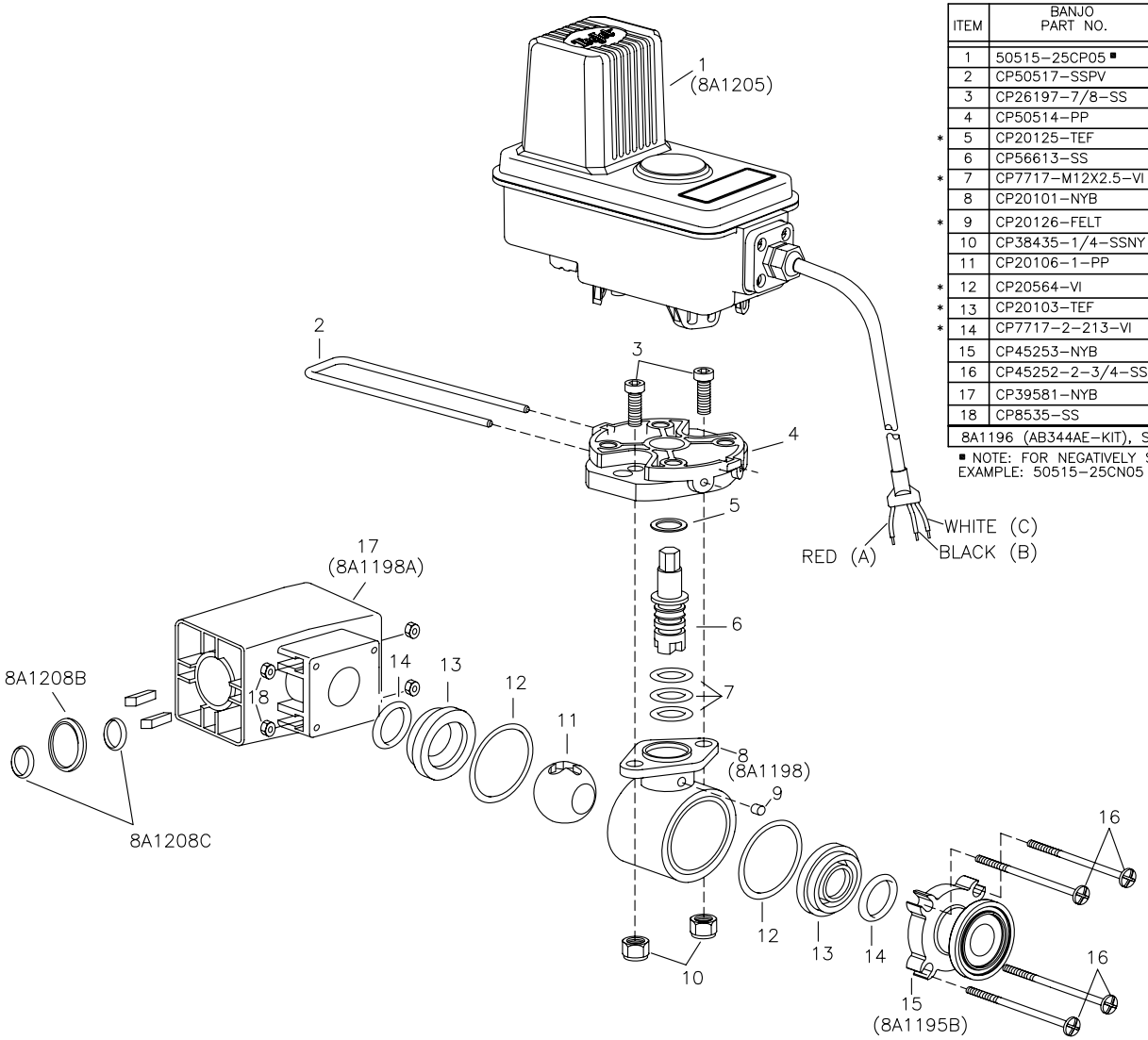
2PT203	9/9/04

2–POINT BALL VALVE ASSEMBLY



2PTBV	11/14/06

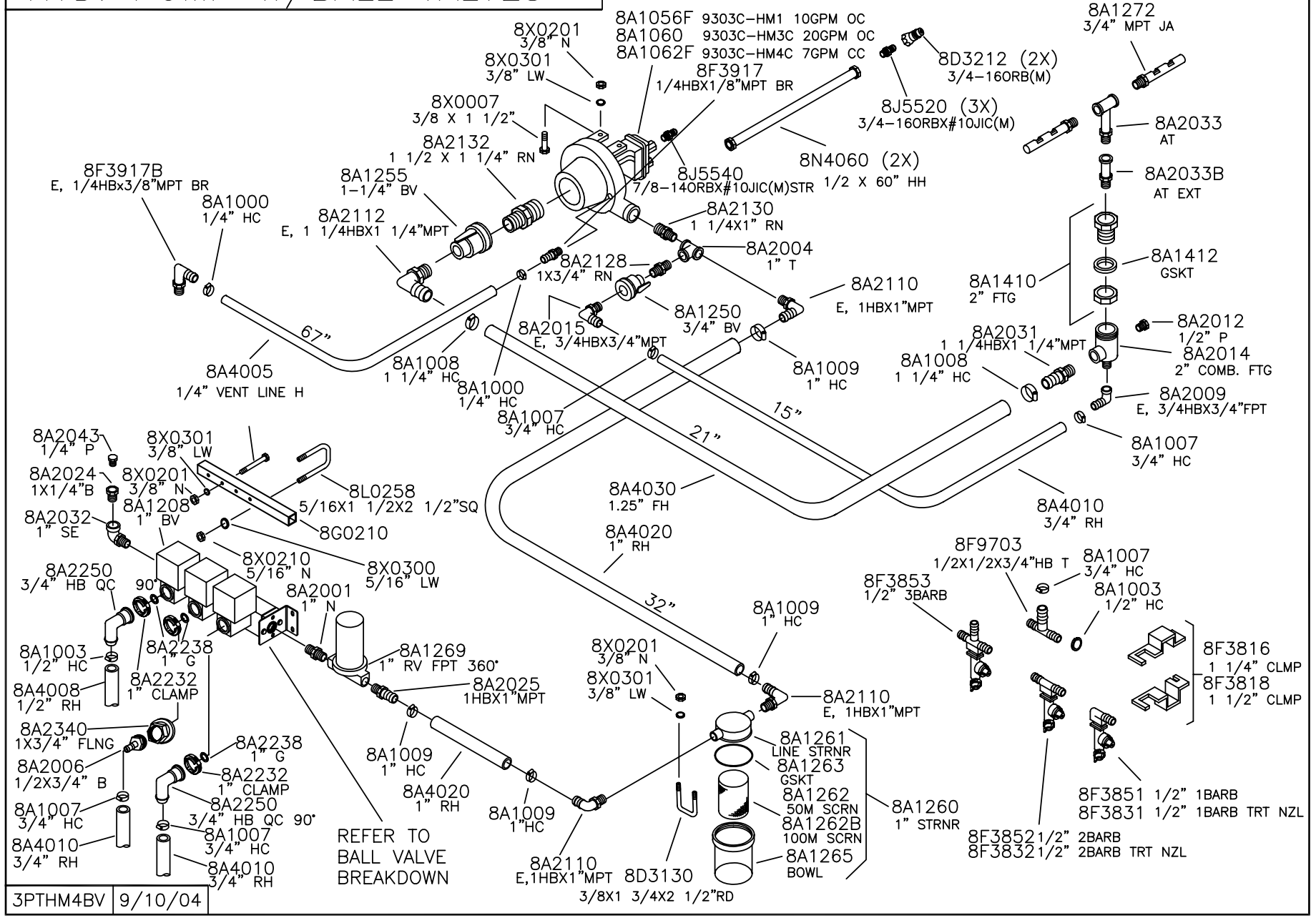
3-POINT & TRUCK SPRAYER BALL VALVE ASSEMBLY



ITEM	BANJO PART NO.	DESCRIPTION
1	50515–25CP05 ■	BEC MOTOR, 25–RPM (0.6–SEC), 0.5–METER CABLE, POSITIVELY SWITCHED
2	CP50517–SSPV	RETAINING CLIP, 304 STAINLESS STEEL
3	CP26197–7/8–SS	SOCKET HEAD CAP SCREW, STAINLESS STEEL (2 REQ'D)
4	CP50514–PP	MOTOR ADAPTER, POLYPROPYLENE (BLACK)
* 5	CP20125–TEF	THRUST WASHER, TEFLON
6	CP56613–SS	STEM, 303 STAINLESS STEEL (FOR POLYPROPYLENE BALL)
* 7	CP7717–M12X2.5–VI	O–RING, VITON (3 REQ'D)
8	CP20101–NYB	BODY, NYLON (BLACK) (2–WAY)
* 9	CP20126–FELT	DUST PLUG, FELT
10	CP38435–1/4–SSNY	ELASTIC LOCKNUT, STAINLESS STEEL (2 REQ'D)
11	CP20106–1–PP	BALL, POLYPROPYLENE (WHITE) (2–WAY)
* 12	CP20564–VI	GASKET, VITON (2 REQ'D)
* 13	CP20103–TEF	SEAL, TEFLON (2 REQ'D)
* 14	CP7717–2–213–VI	O–RING, VITON (2 REQ'D)
15	CP45253–NYB	#50 FLANGED END CAP, NYLON (BLACK)
16	CP45252–2–3/4–SSPV	PAN HEAD SCREW, STAINLESS STEEL (4 REQ'D)
17	CP39581–NYB	MANIFOLD BODY, NYLON
18	CP8535–SS	HEX NUT, STAINLESS STEEL (6 REQ'D)
8A1196 (AB344AE–KIT), SPARE PARTS KIT (INCLUDES ALL ITEMS MARKED WITH *)		

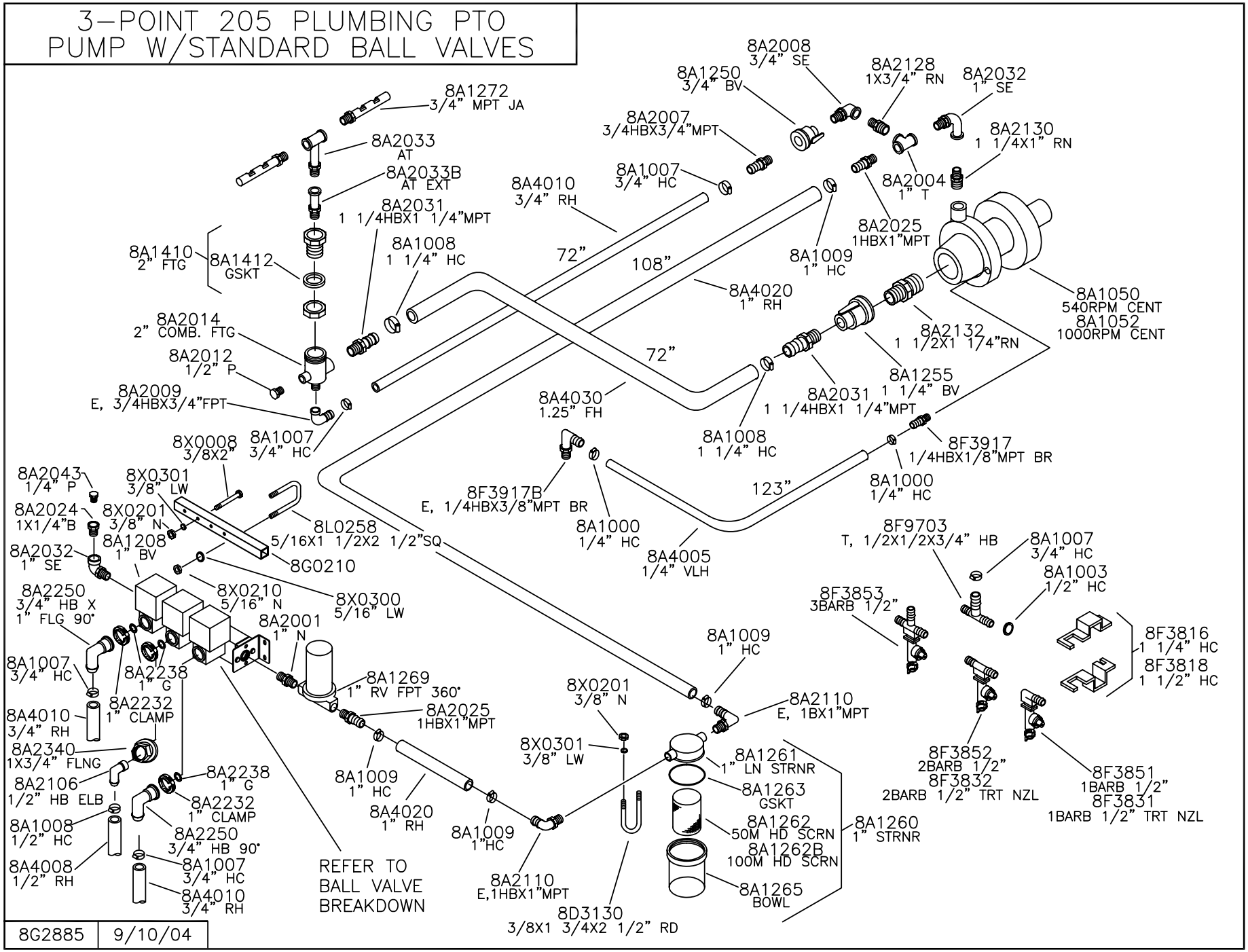
■ NOTE: FOR NEGATIVELY SWITCHED MOTORS SPECIFY "N" RATHER THAN "P" IN MOTOR PART NUMBER EXAMPLE: 50515–25CN05

3–POINT 205 PLUMBING
HYD. PUMP W/BALL VALVES



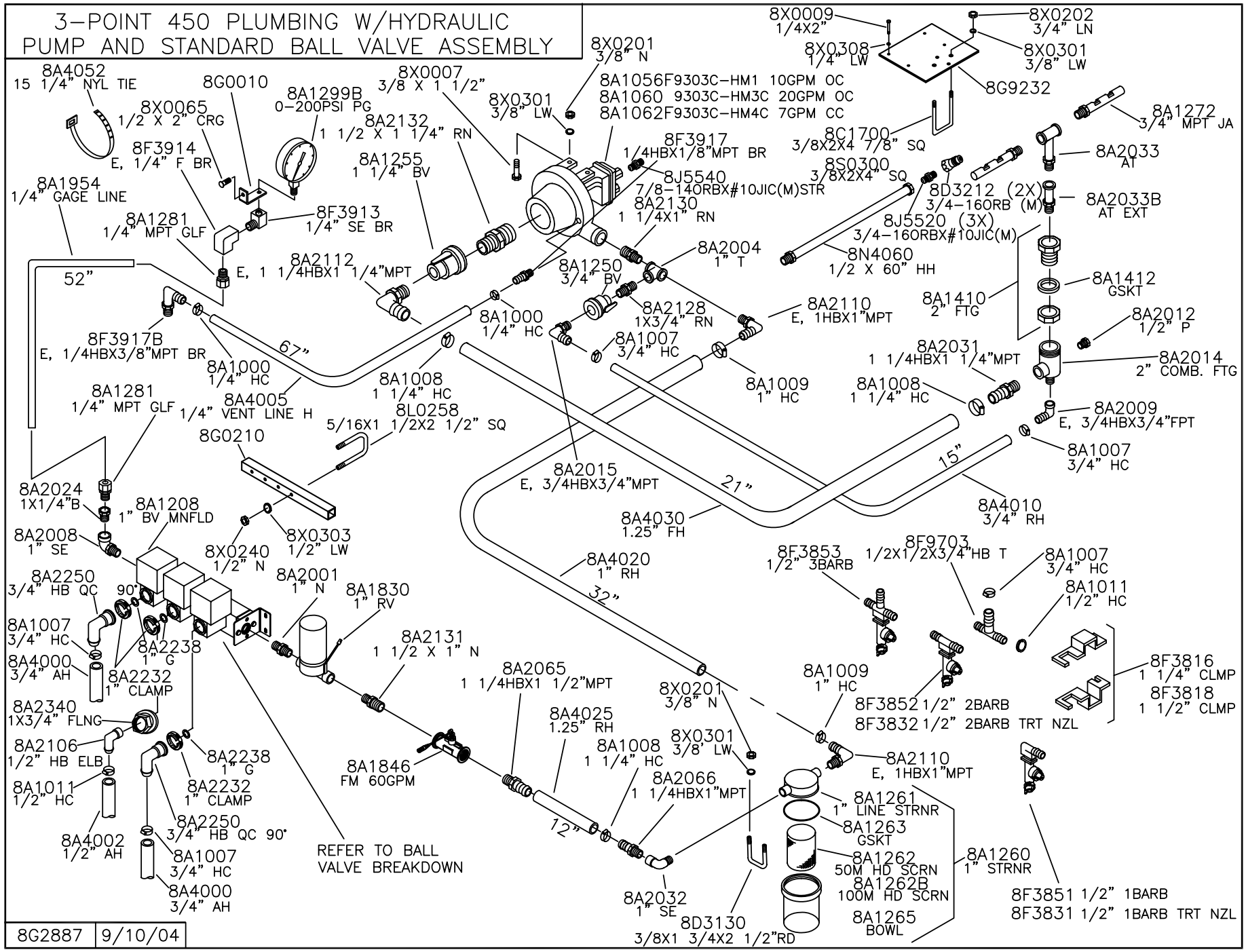
3PTHM4BV	9/10/04

3–POINT 205 PLUMBING PTO PUMP W/STANDARD BALL VALVES



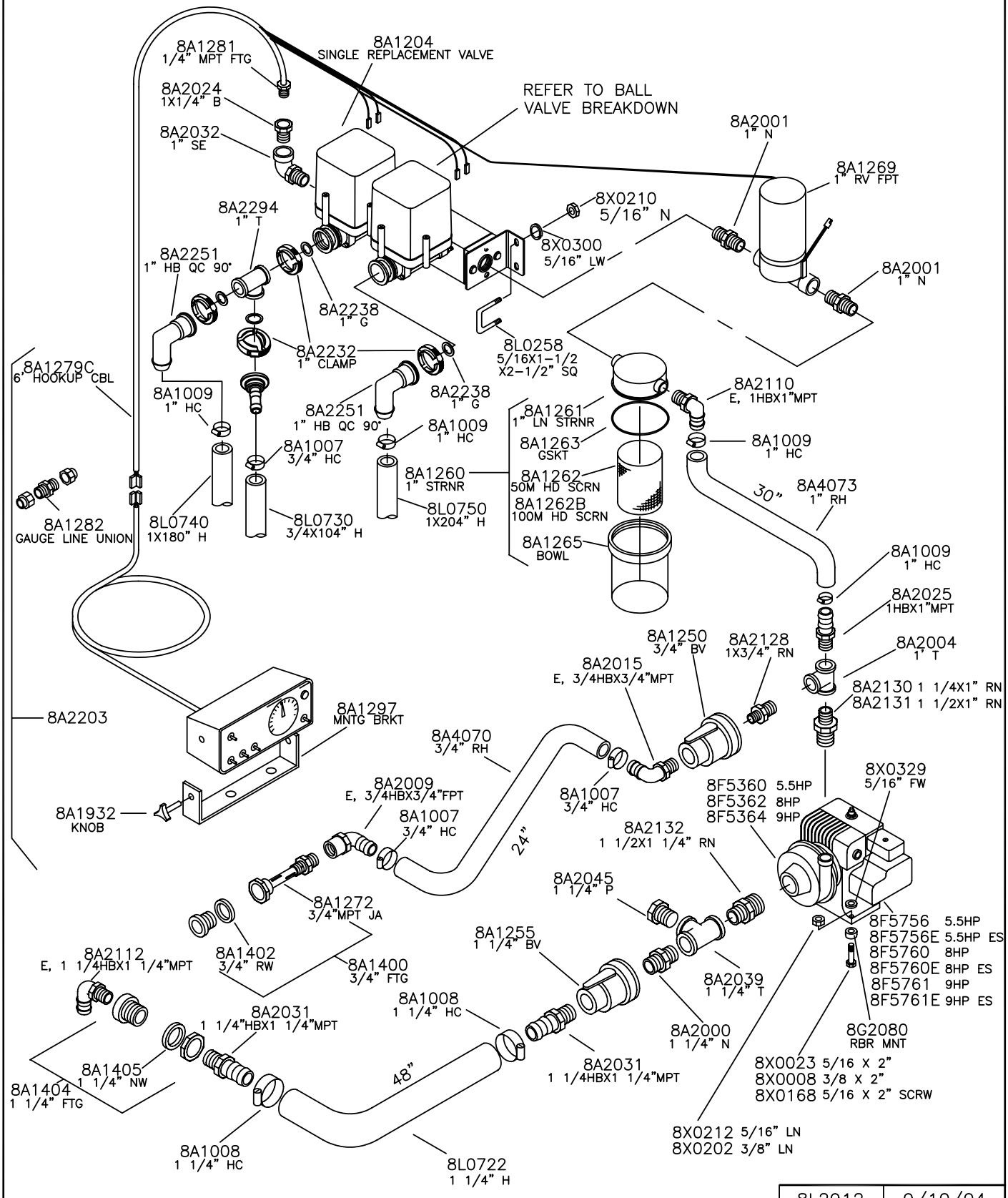
8G2885	9/10/04

3–POINT 450 PLUMBING W/HYDRAULIC PUMP AND STANDARD BALL VALVE ASSEMBLY



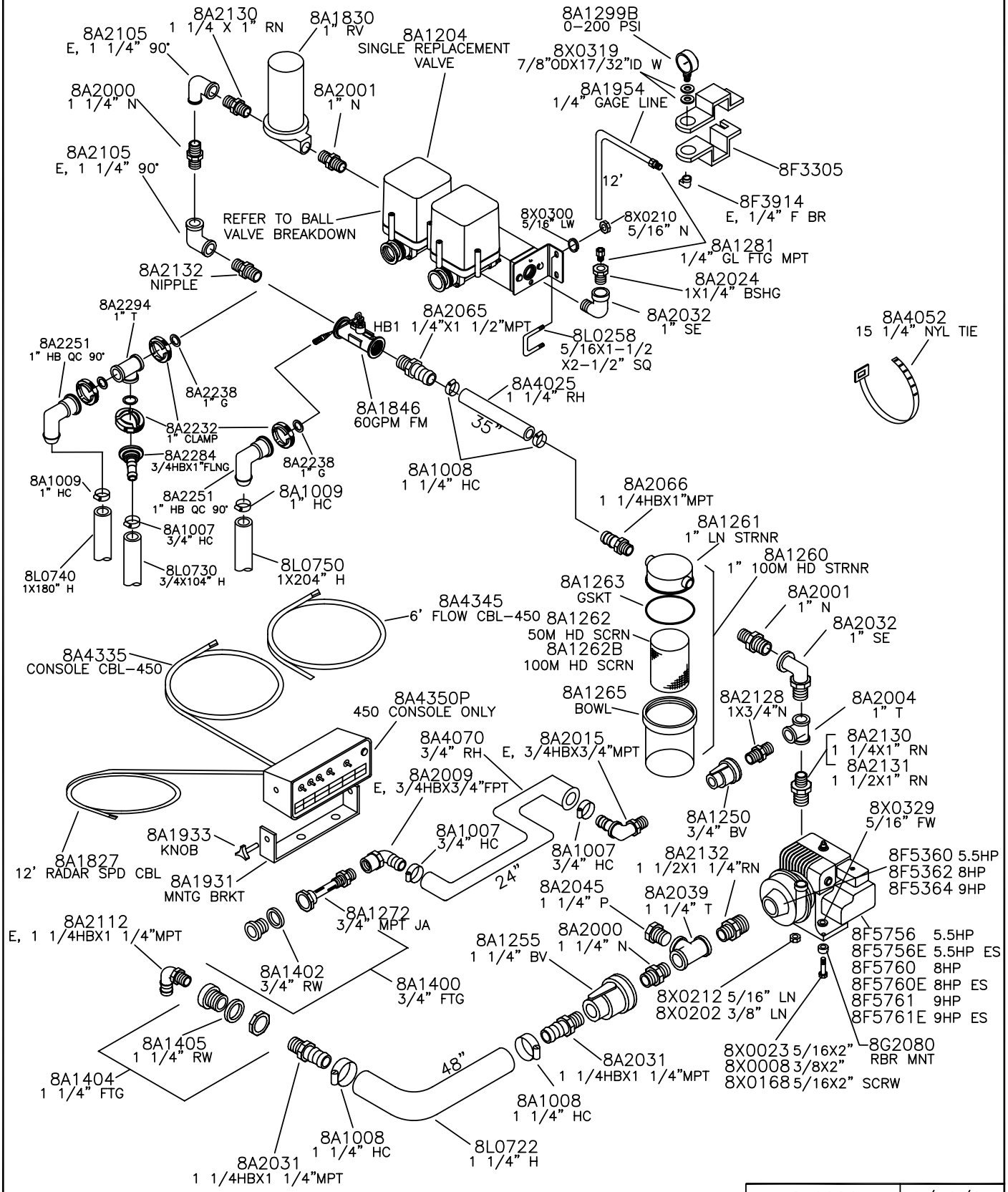
8G2887	9/10/04

60–90' TRUCK SPRAYER PLUMBING
205 WITH STANDARD BALL VALVES



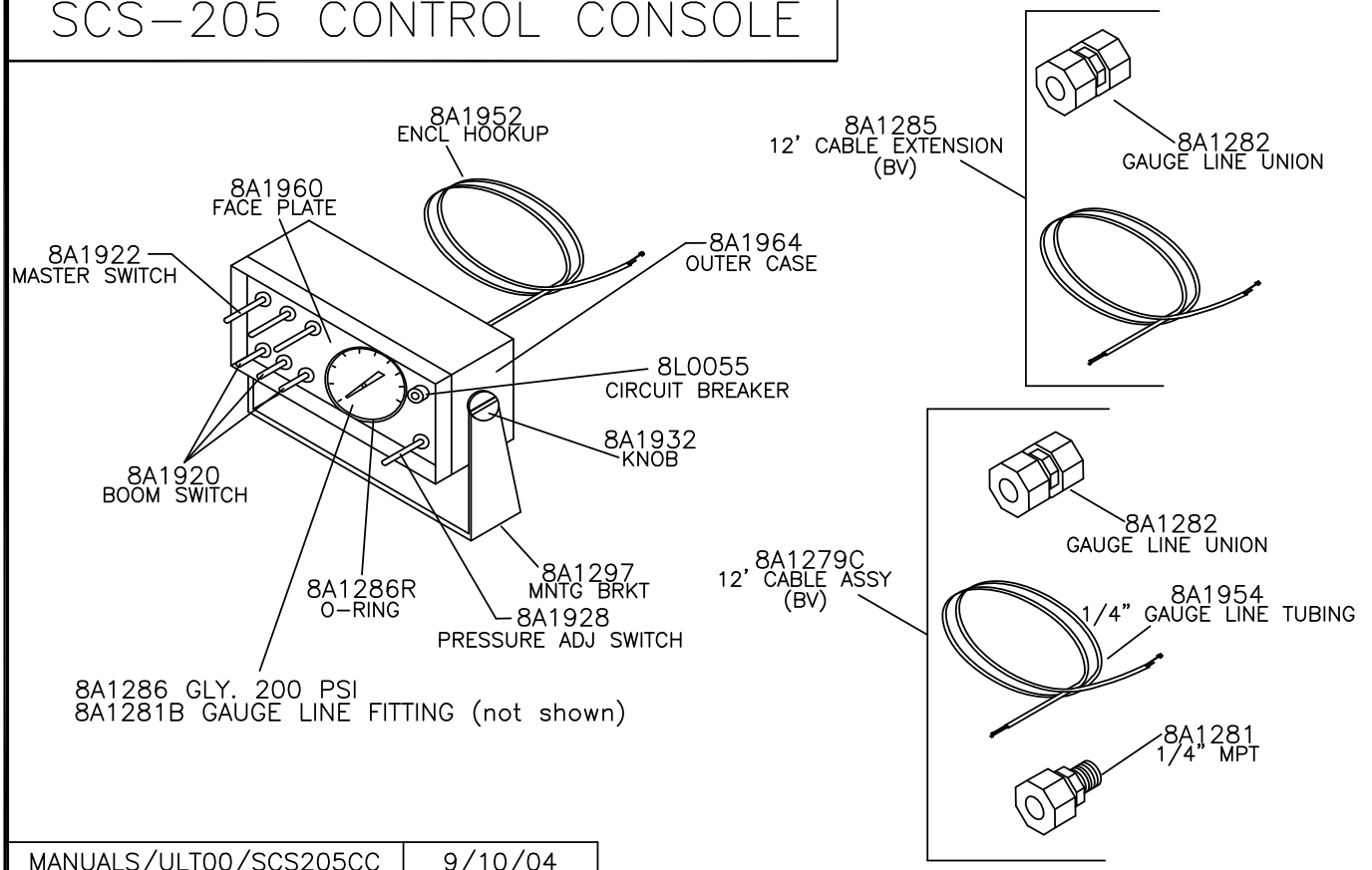
8L2912	9/10/04

60–90' TRUCK SPRAYER PLUMBING
450 WITH STANDARD BALL VALVES



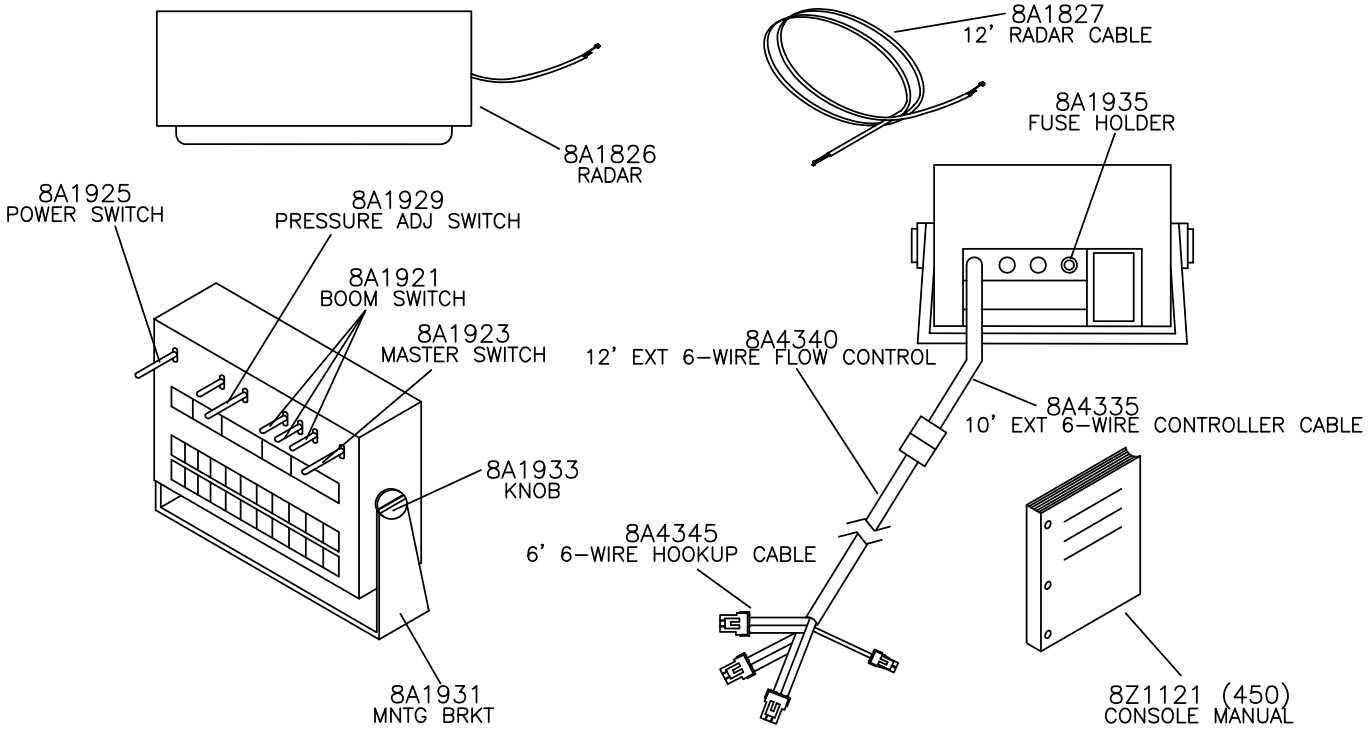
8A0226	9/10/04

SCS–205 CONTROL CONSOLE



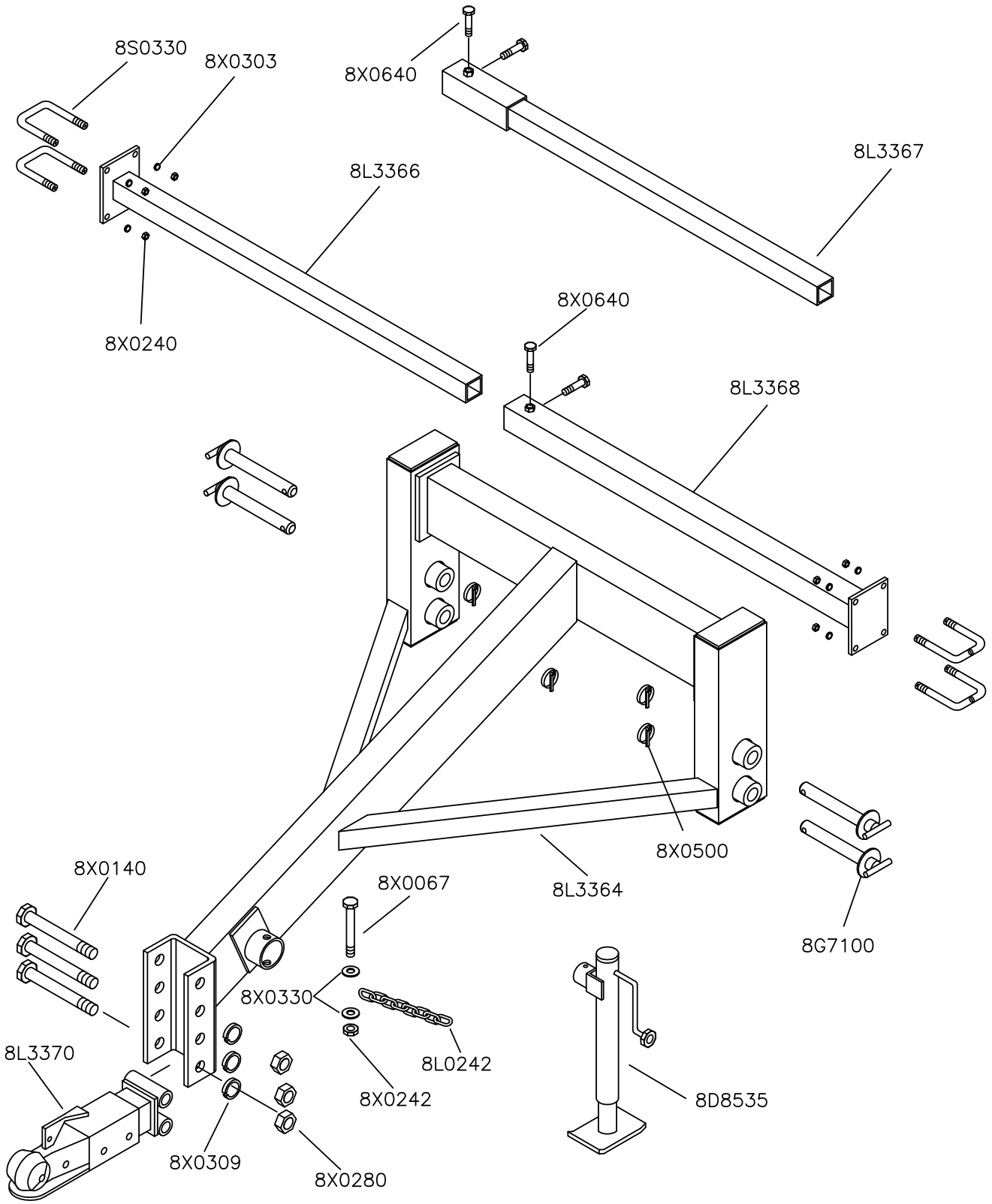
MANUALS/ULT00/SCS205CC | 9/10/04

SCS–440/450 CONTROL CONSOLE



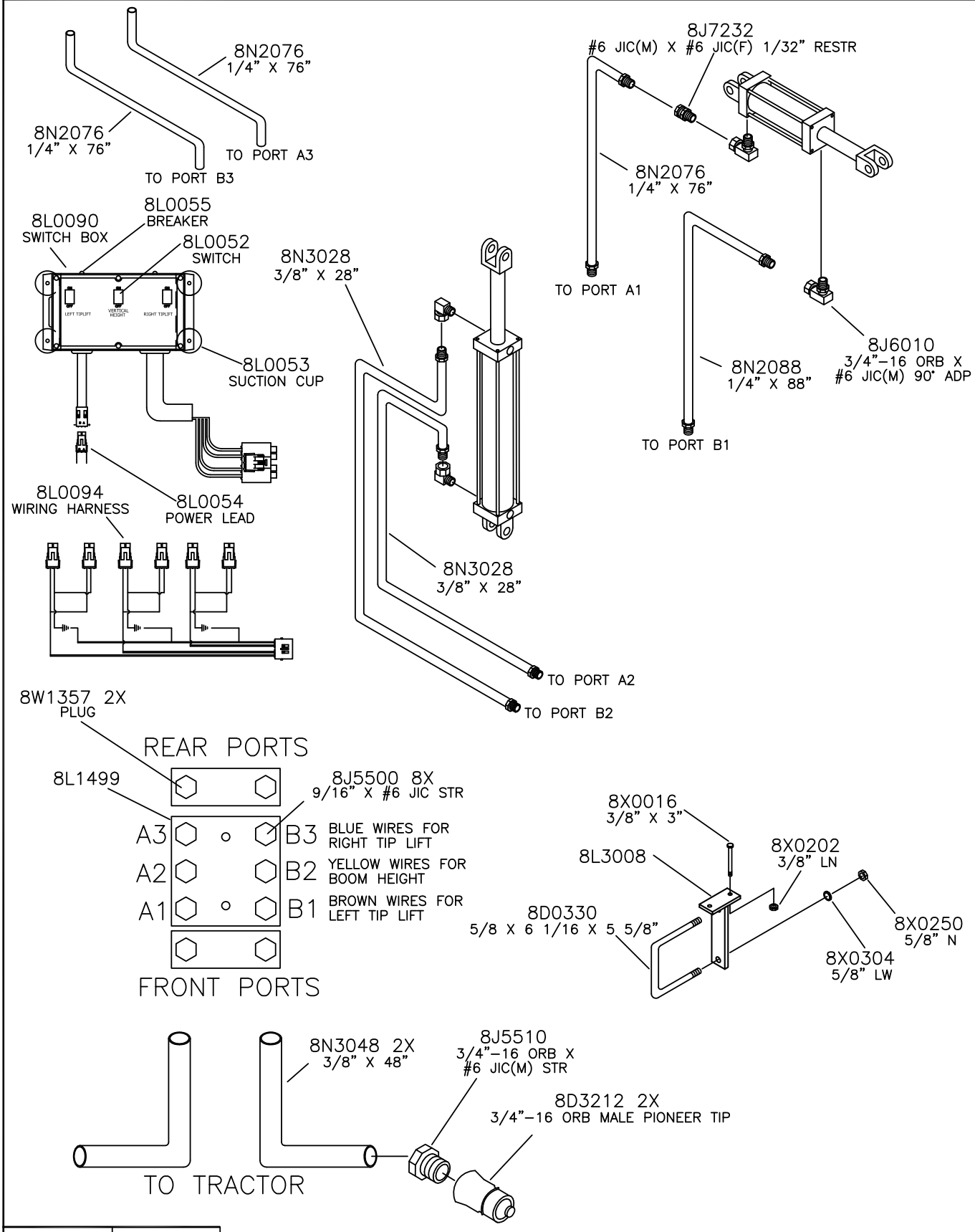
9/10/04

2–POINT TOW HITCH KIT



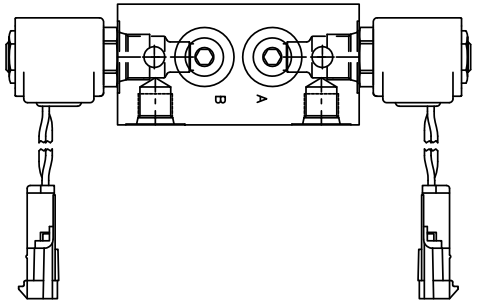
8L4820	3/14/00

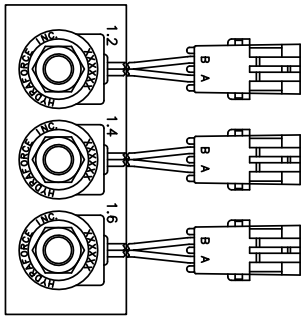
2-PT 3 - 1 ELECTRIC OVER HYDRAULIC MULTIPLIER OPTION

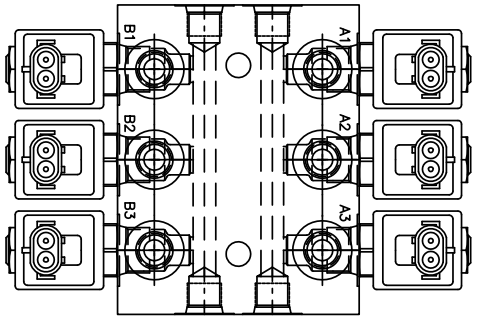


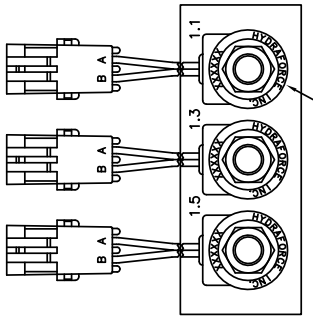
8L1513	9/10/04

ELECTRIC 3 BANK HYDRAULIC VALVE

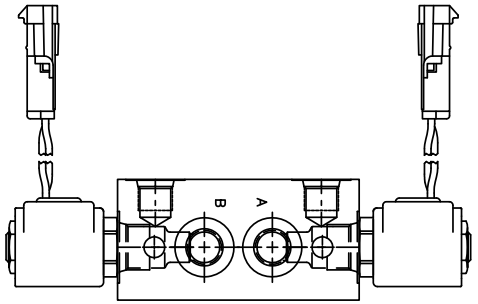








8L1452 CARTRIDGE
8L1472 COIL
8L1504 SEALS
8L1468 CAP & ORINGS
6 PLACES

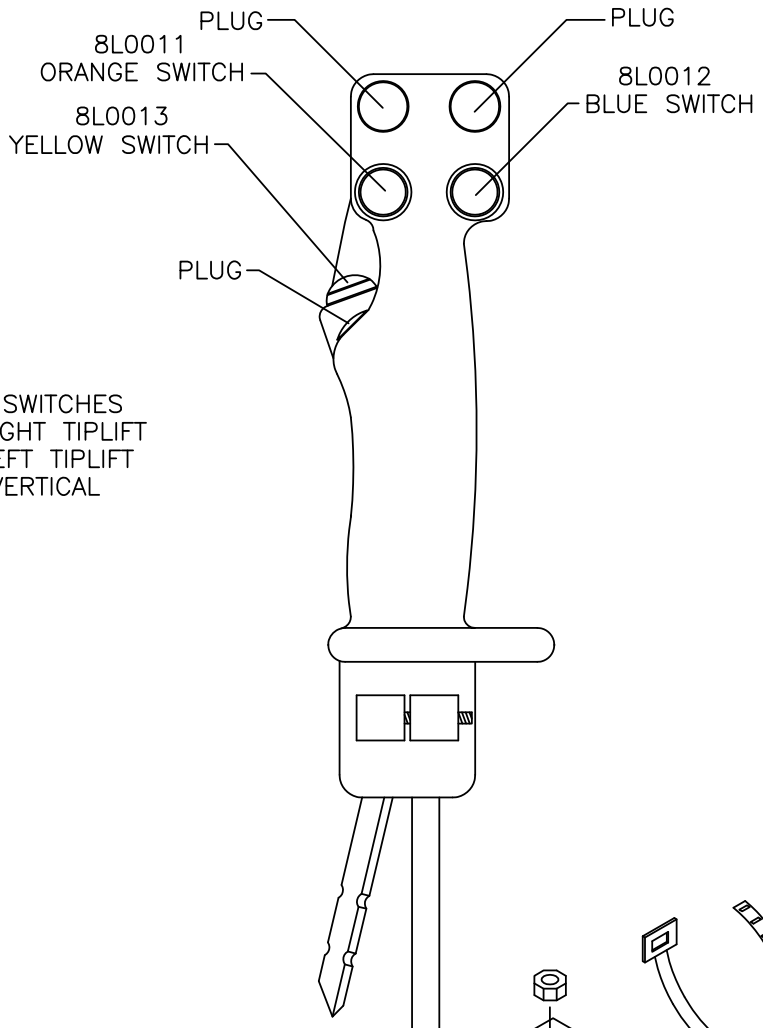


PORT SIZES:
ALL PORTS: SAE #6, 9/16–18 UNF–2B THREAD.

8L1499	8/16/00

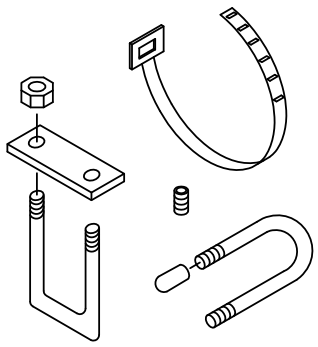
SUMMERS MFG. CO., INC.

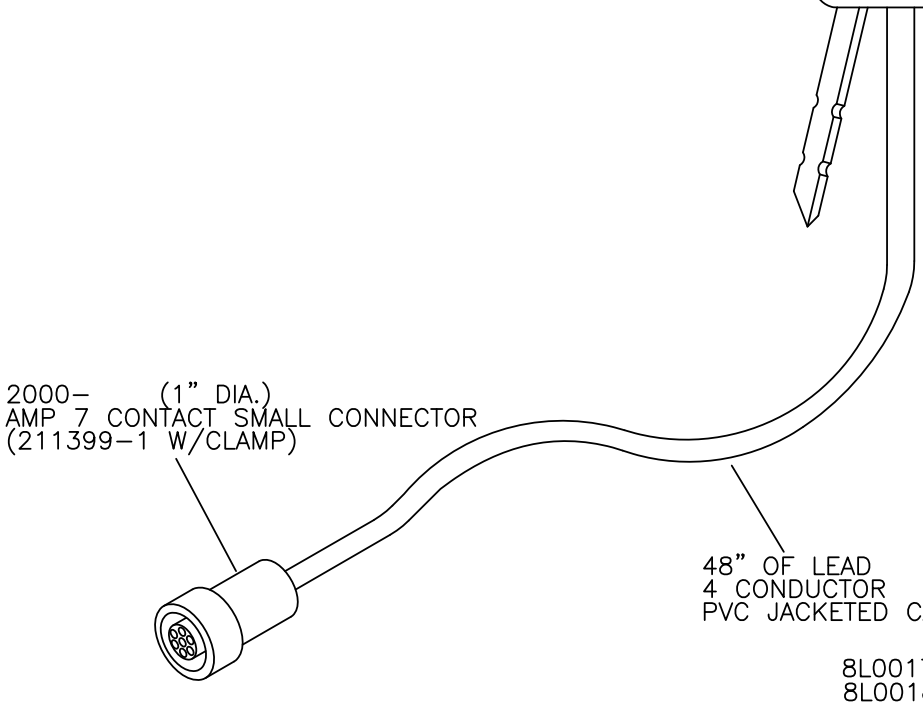
3–SWITCH FASSE CONTROL GRIP FOR 8L9901



WIRING SCHEMATIC:

PORT 2 – BATTERY ⊕ TO ALL SWITCHES
PORT 5 – BLUE SWITCH RIGHT TIPLIFT
PORT 3 – ORANGE SWITCH LEFT TIPLIFT
PORT 4 – YELLOW SWITCH VERTICAL





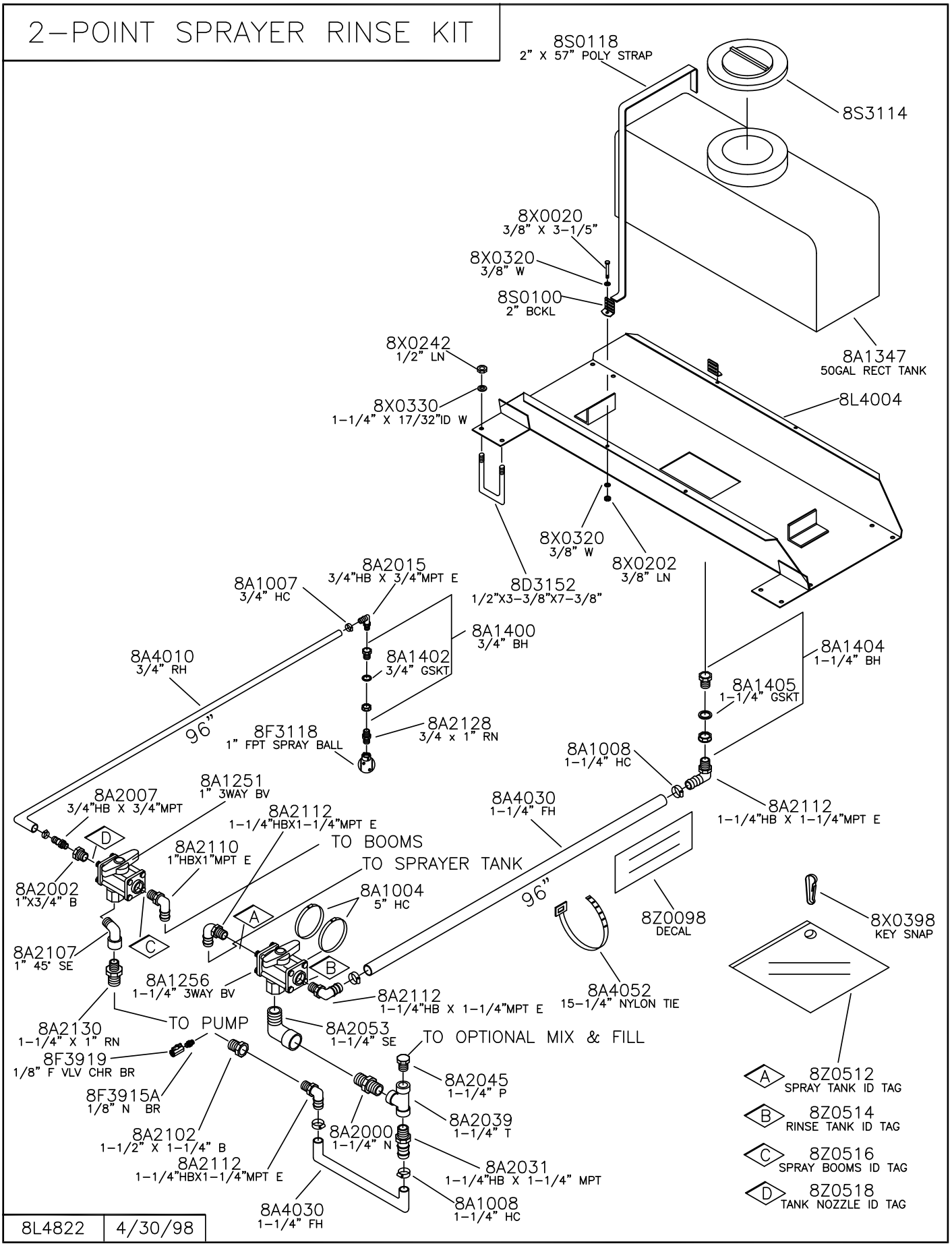
8L0017 – FASSE PN 319–976
8L0018 – FASSE PN 319–976

CONTROL GRIP PURCHASED WITH:

BRACKET – FASSE PN 214–001
MOUNTING HARDWARE KIT – FASSE PN 300–034

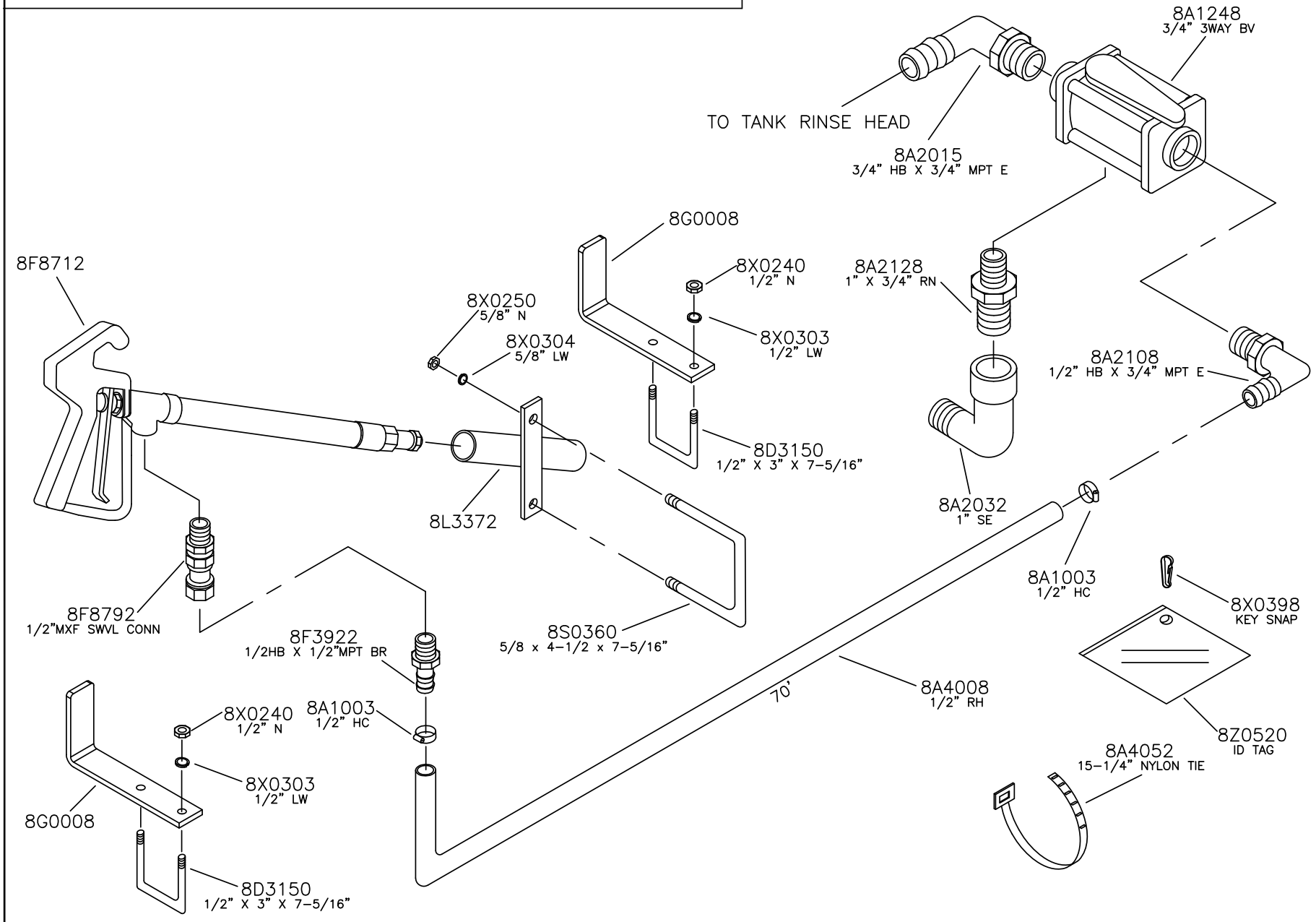
9/23/04	8L0017
	8L0018

2–POINT SPRAYER RINSE KIT



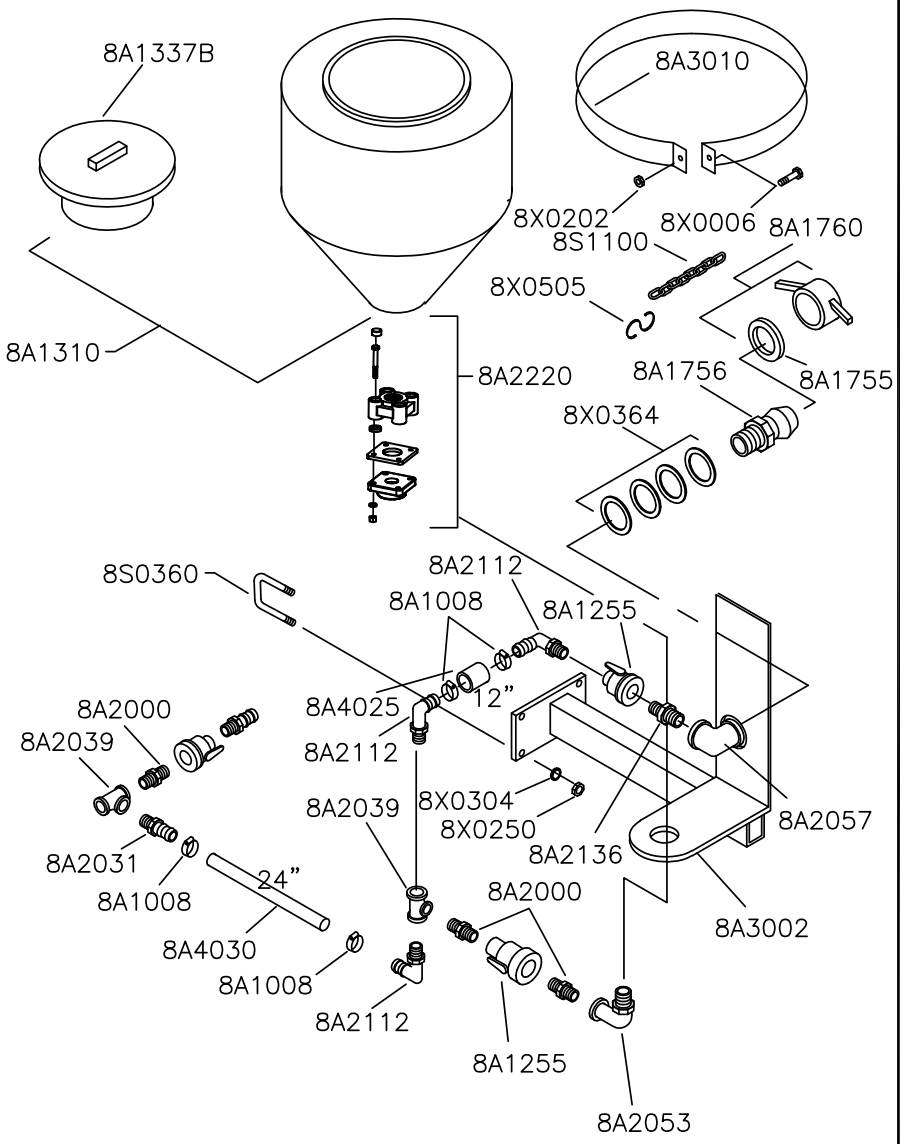
8L4822	4/30/98

2 POINT SPRAYER WASH WAND KIT

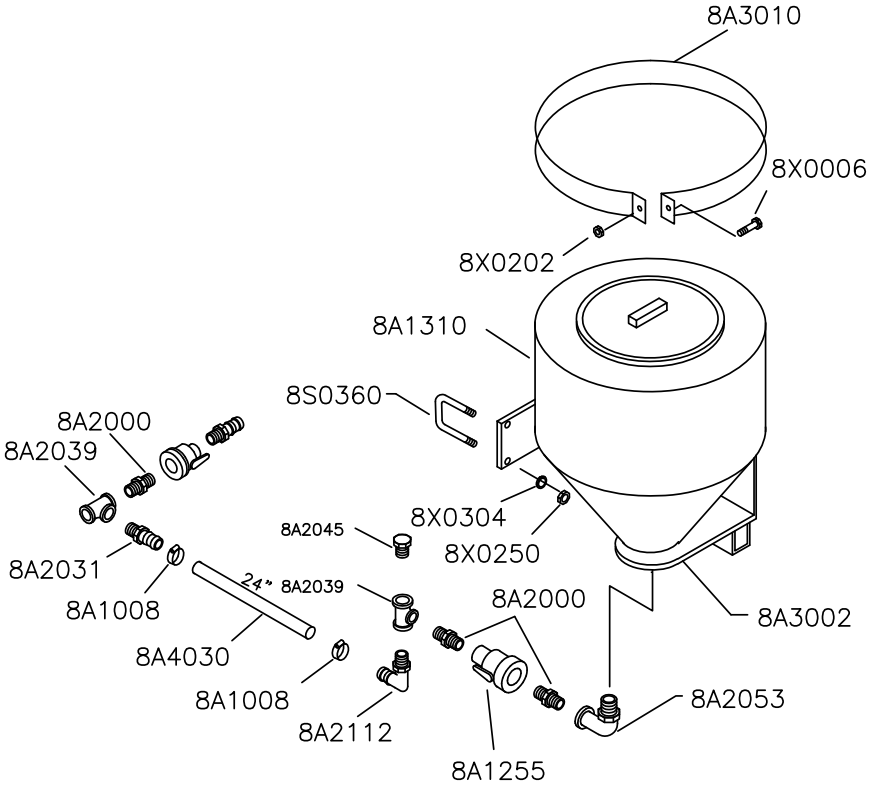


8L4826	5/16/00

2–POINT MIX AND FILL KIT

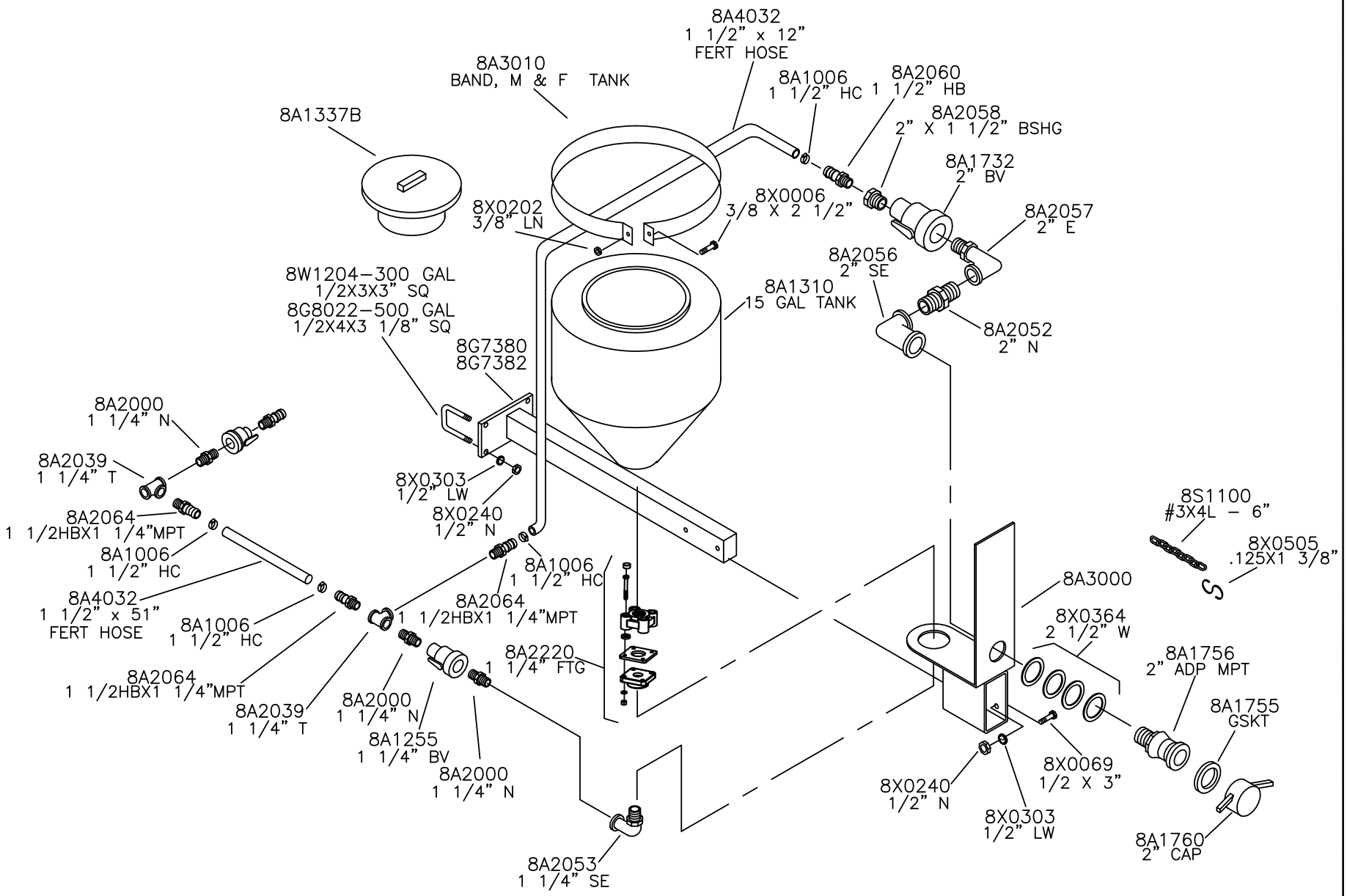


2–POINT CHEMICAL DRAW OPTION



8A3365	8A3371	3/20/00

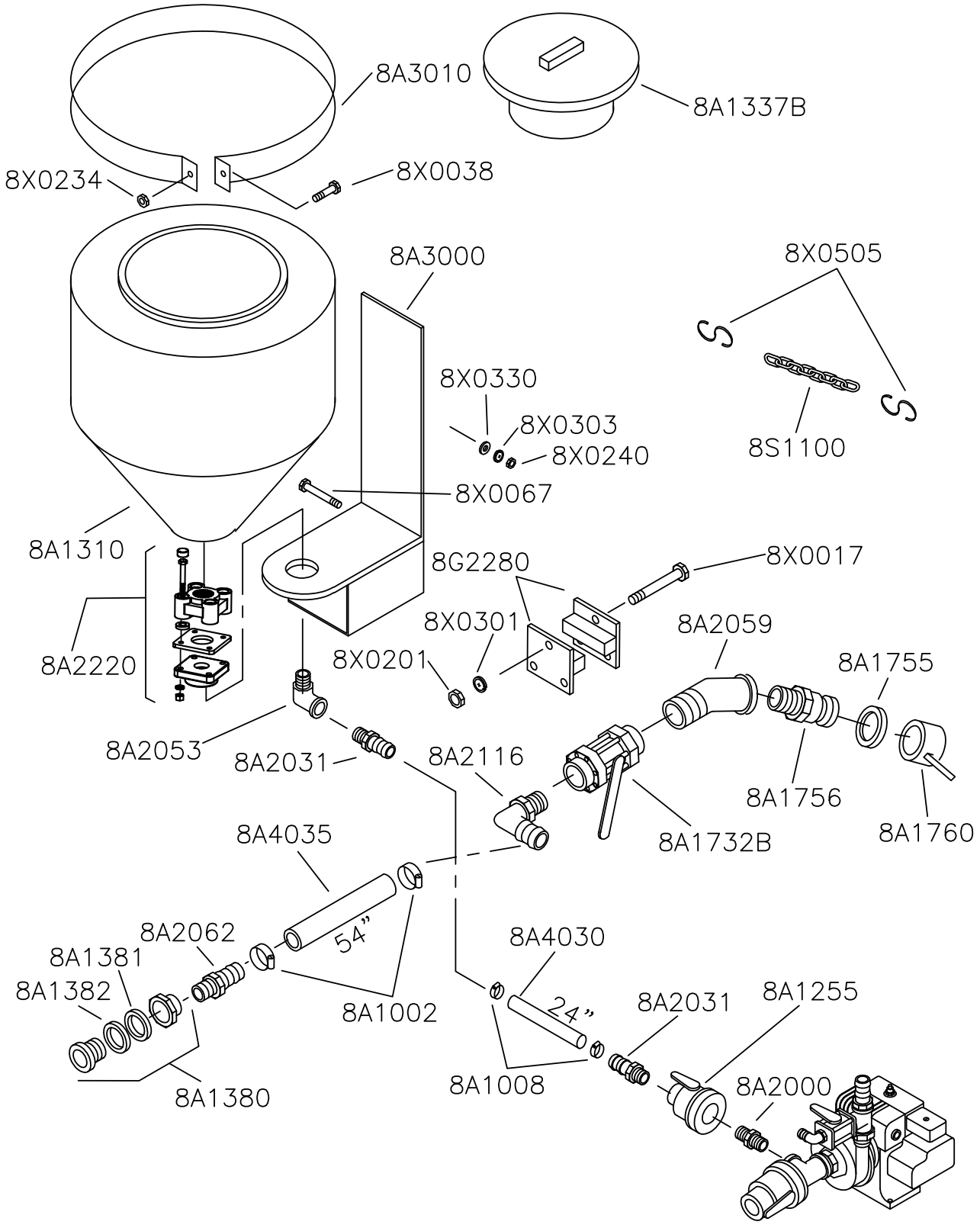
3–POINT SPRAYER MIX AND FILL OPTION



8A3340 – 300 GAL	3/23/00
8A3342 – 500 GAL	

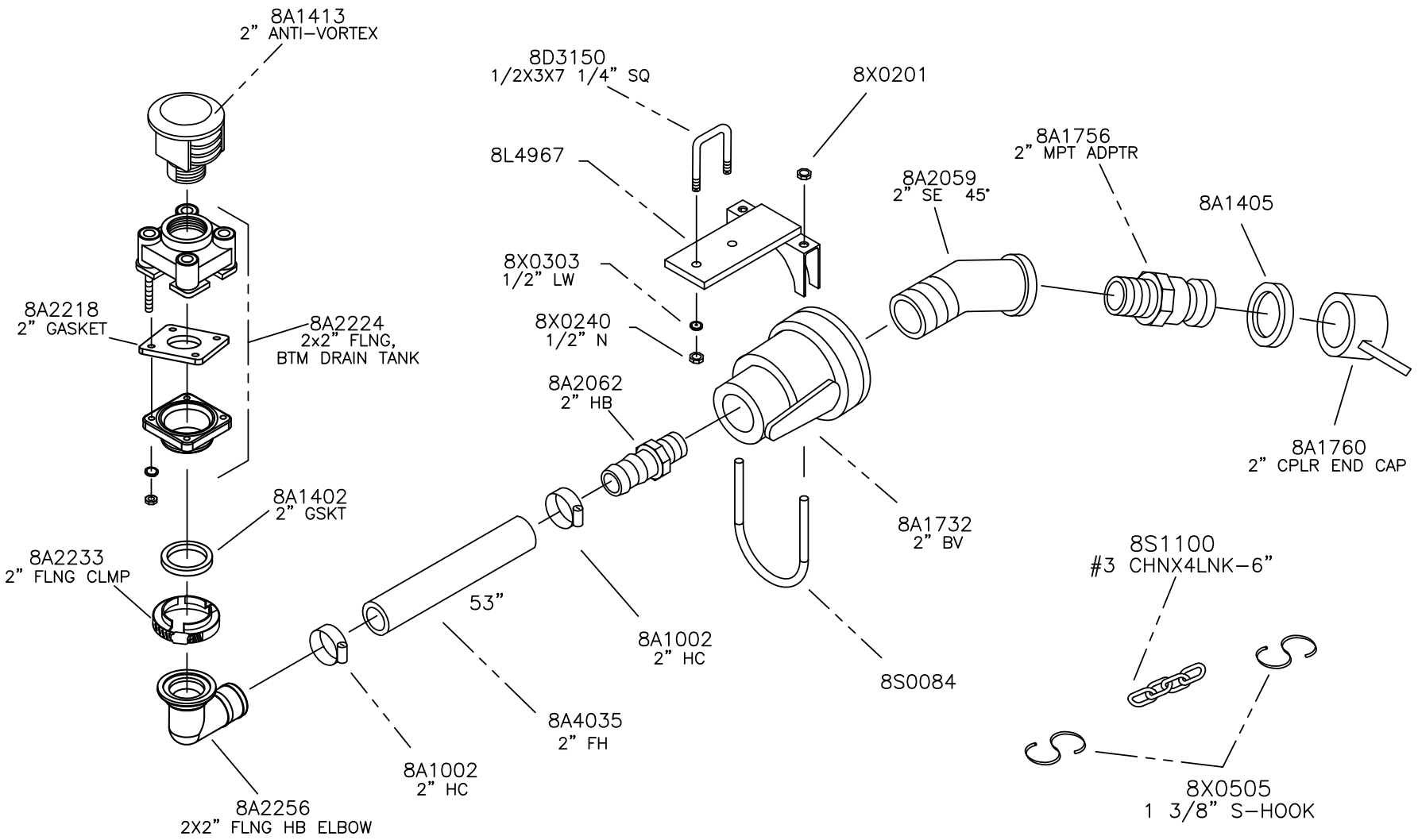
INSTALL 1 1/4" TEE BETWEEN PUMP INLET AND 1 1/4" BALL VALVE. (AS SHOWN)

TRUCK SPRAYER HIGH CAPACITY MIX & FILL KIT



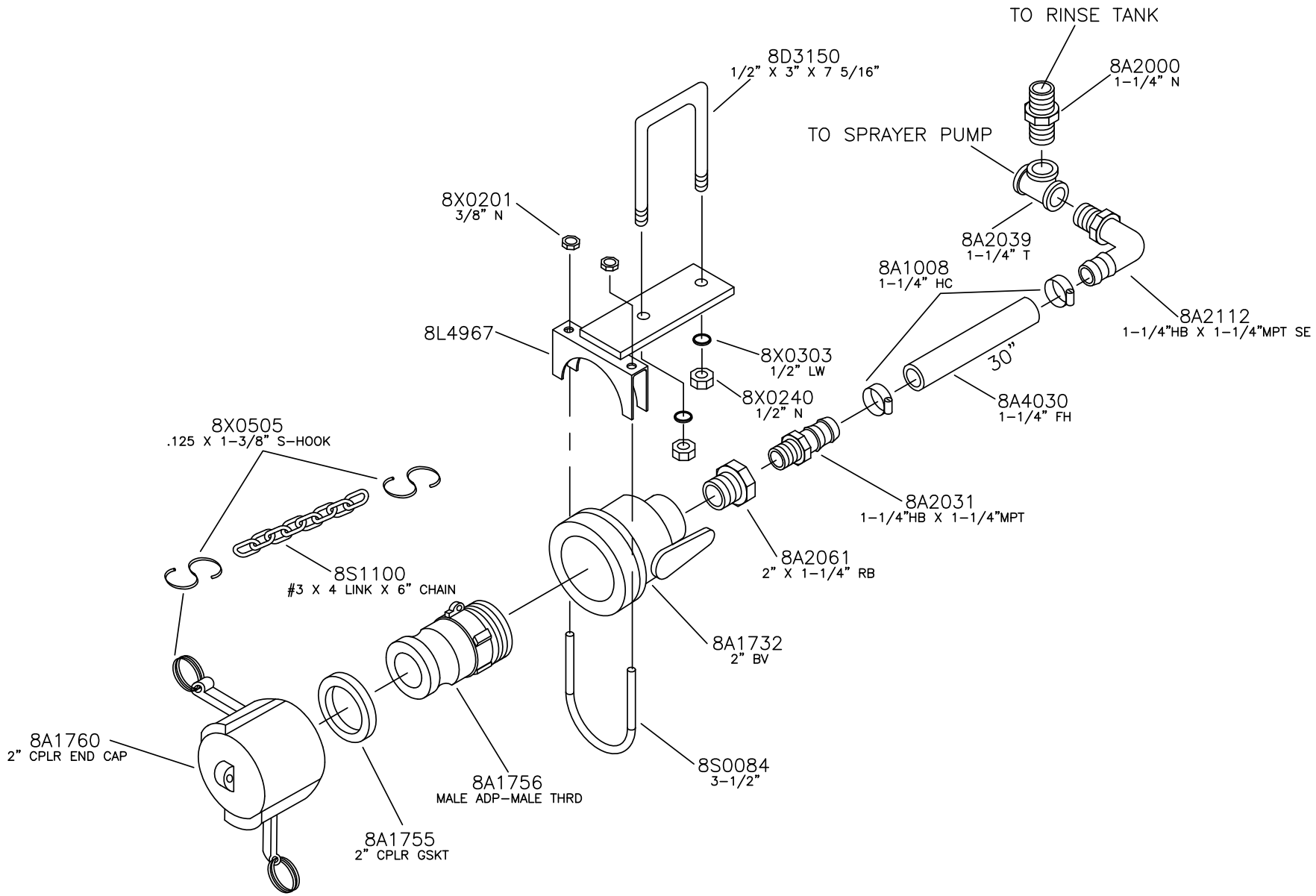
8A3360	10/31/02

2–POINT 2" BOTTOM FILL OPTION



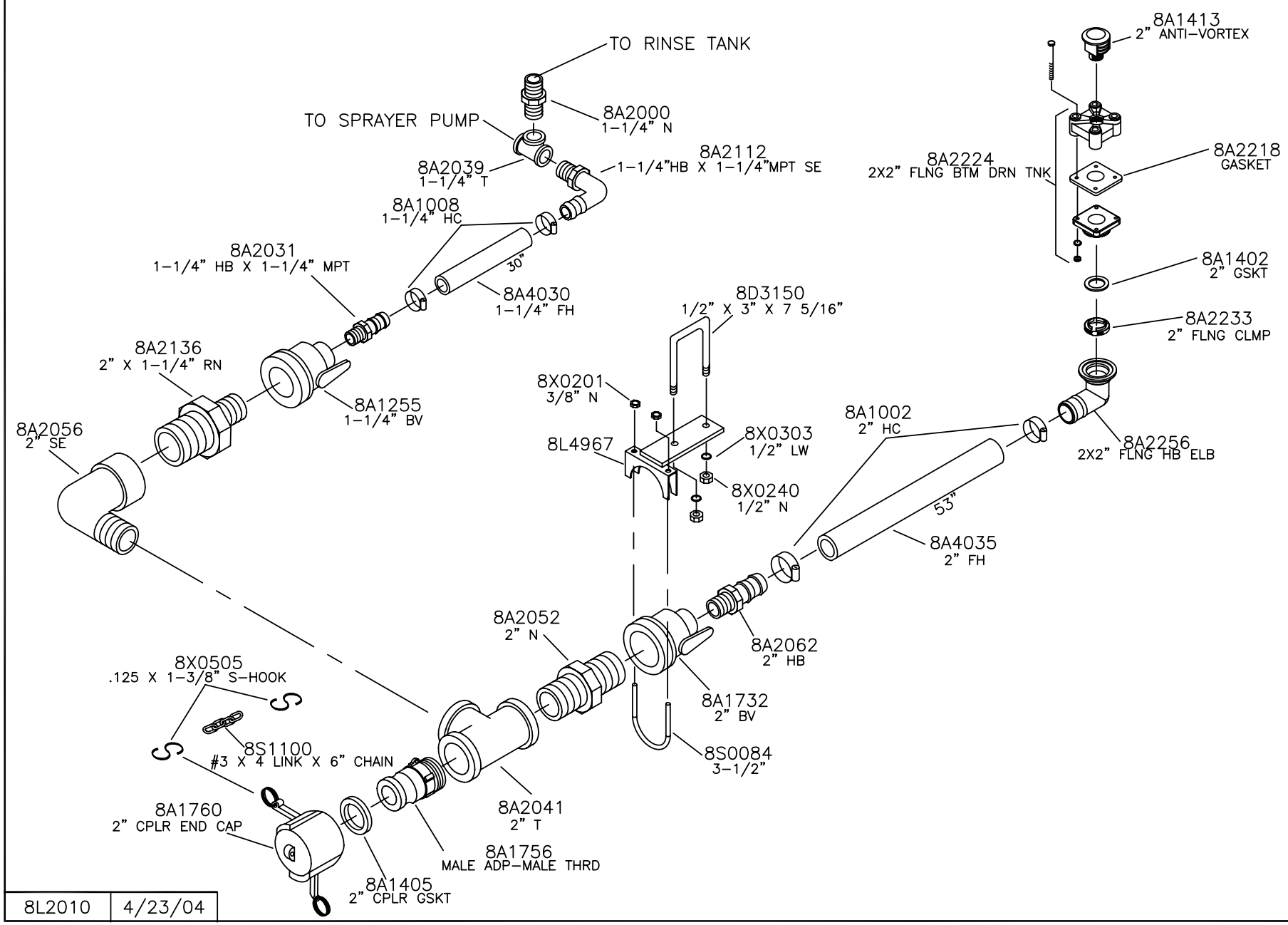
8L2008	2/3/04

2–POINT RINSE TANK BOTTOM FILL



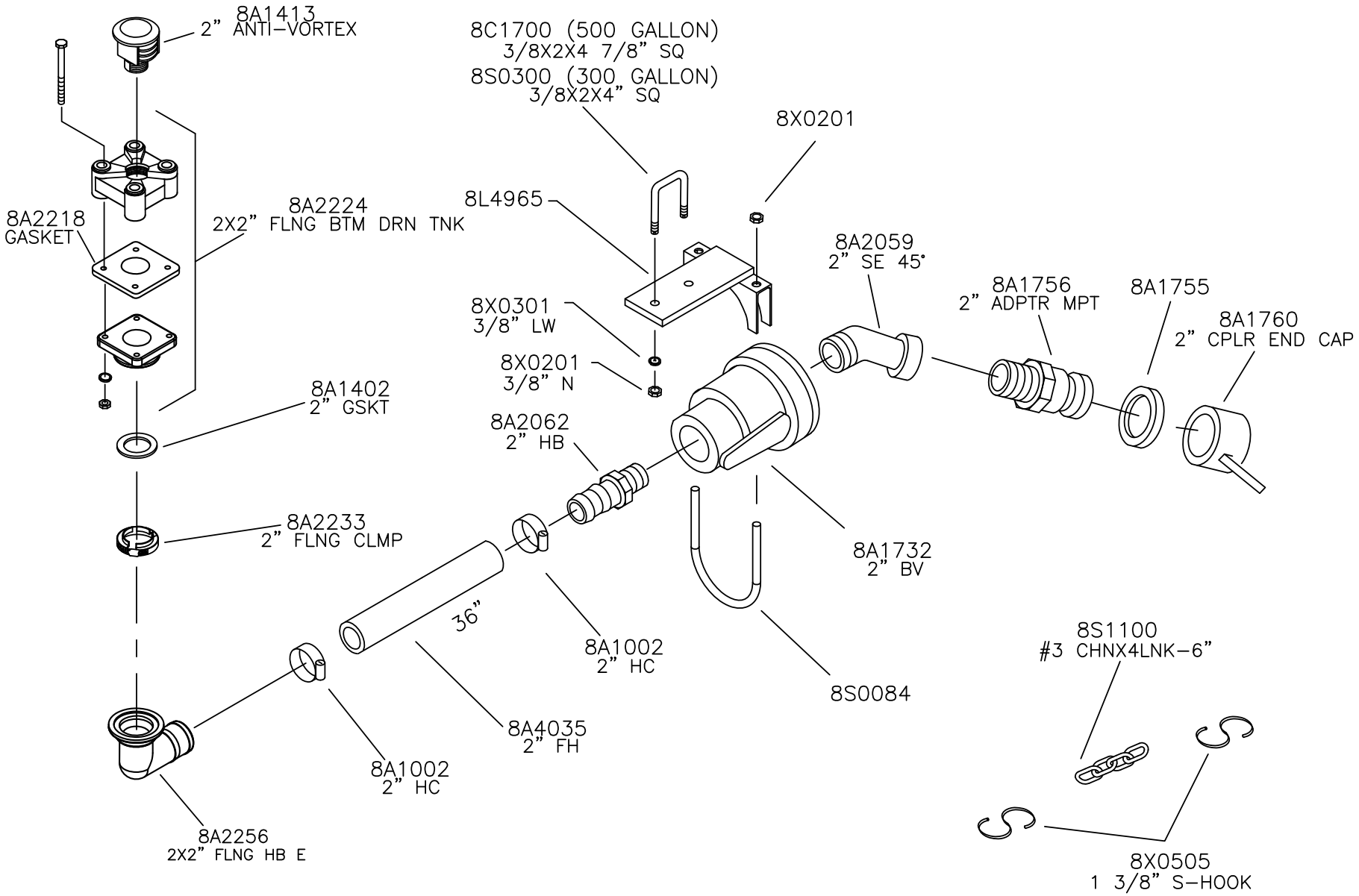
8L2009	3/17/00

2–POINT COMBINATION RINSE AND SPRAYER TANK BOTTOM FILL



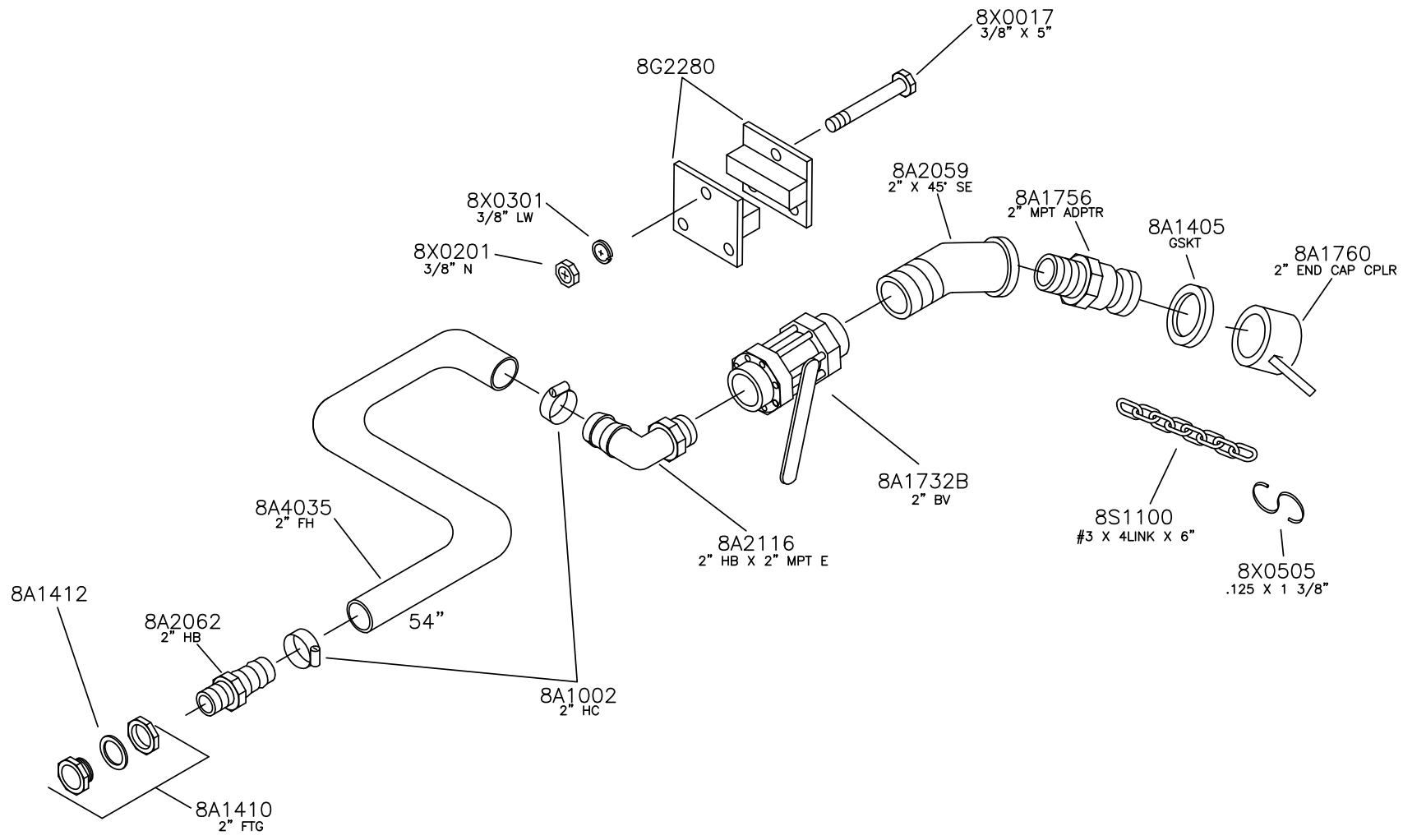
8L2010	4/23/04

3–POINT 2" BOTTOM FILL OPTION



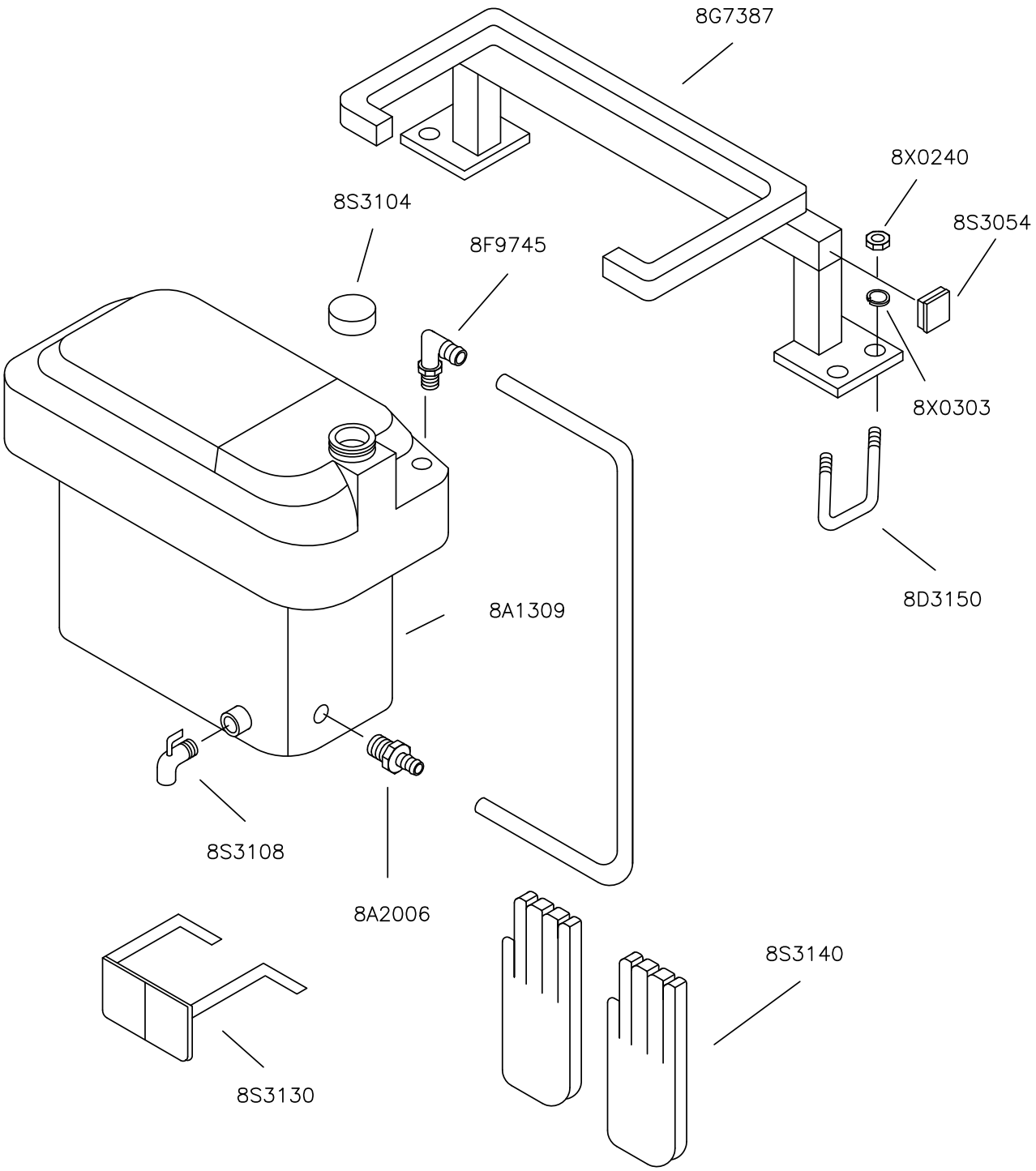
8L2004	4/19/01

TRUCK SPRAYER 2" BOTTOM FILL



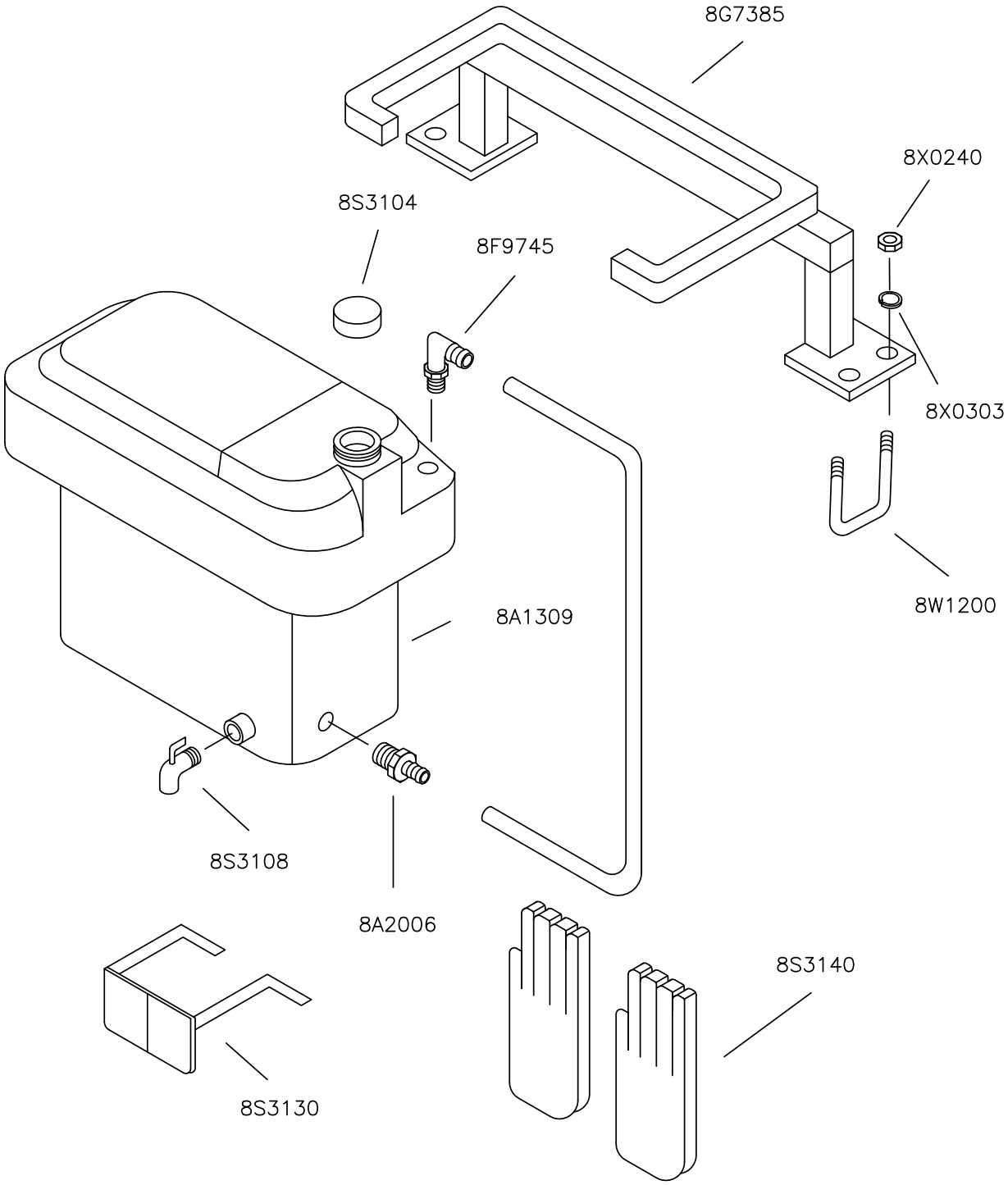
8L2006	3/17/00

2–POINT SAFETY WATER KIT



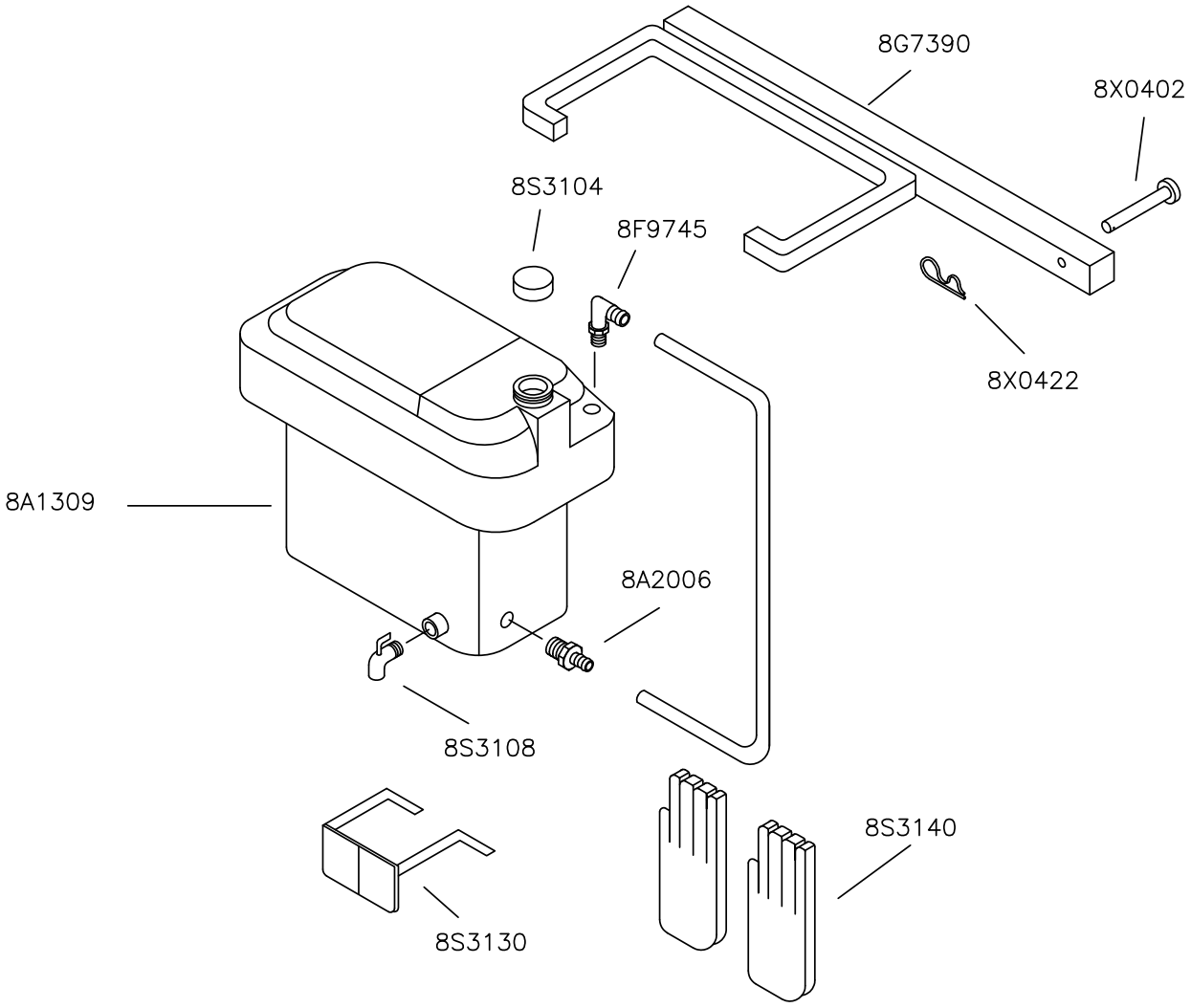
8A3042	3/20/00

3–POINT SAFETY WATER KIT



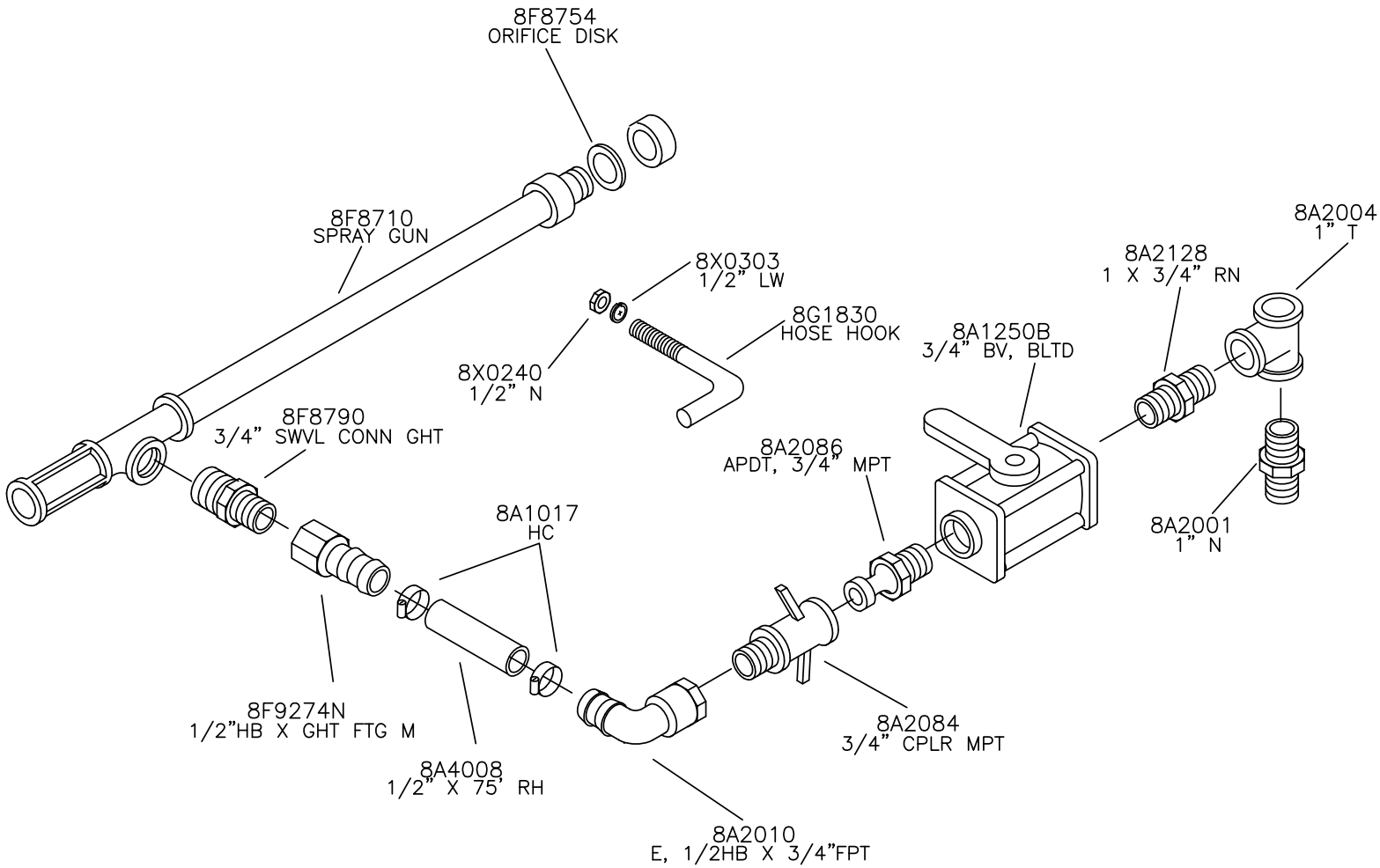
8A3040	3/20/00

TRUCK SPRAYER SAFETY WATER KIT



8A3035	3/20/00

HAND WAND OPTION W/THREADED FITTINGS

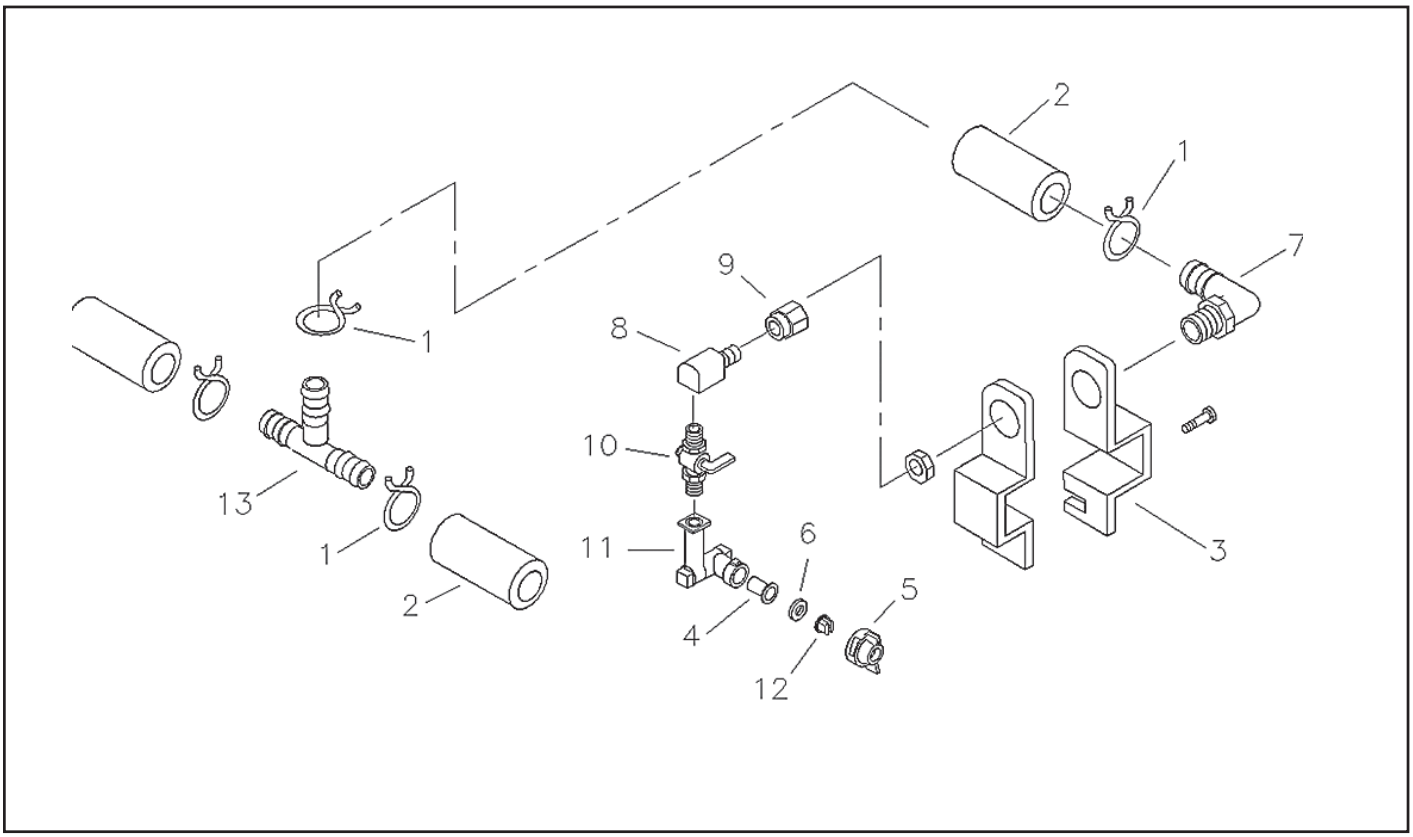


8F8700	4/26/02

BALL VALVE REPLACEMENT COMPONENTS

PART #	DESCRIPTION	BRAND	PART # HANDLE	PART # STEM	PART # BODY	PART # END CAP	PART # VALVE KIT	PART # BALL SEAT	PART # STEM O-RING	PART # VALVE BALL	PART # BODY O-RING
8A1250	3/4" UNION	BANJO	8A1237	---	UV07254	8A1238	---	8A1240	8A1236	8A1239	8A1241
8A1250B	3/4" BOLTED	BANJO	8A1465	8A1466	8A1467	8A1468	8A1469	IN KIT	IN KIT	IN KIT	IN KIT
8A1248	3/4" 3W BTM-LD	BANJO	8A1460	8A1461	8A1462	8A1463	---	8A1464	---	---	---
8A1255B	1" BOLTED	SS	---	---	8A1198	8A1195	8A1479	IN KIT	IN KIT	IN KIT	IN KIT
8A1255B	1" BOLTED	BANJO	8A1451	8A1452	8A1453	8A1473	8A1455	8A1464	8A1456	8A1457	8A1458
8A1251	1" 3W BTM-LD	BANJO	8A1460	8A1461	8A1472	8A1473	---	8A1464	---	---	---
8A1204	1" ELECTRIC	SS	---	IN KIT	8A1198	8A1195	8A1196*	IN KIT	IN KIT	IN KIT	IN KIT
8A1255	1 1/4" UNION	BANJO	8A1246A	---	---	8A1258	---	8A1245	8A1246B	8A1244	8A1246
8A1256	1 1/4" 3W BTM-LD	BANJO	8A1480	8A1481	8A1482	8A1483	---	8A1484	---	---	---
8A1732	2" UNION	BANJO	8A1247E	---	---	8A1247C	---	8A1247A	8A1247F	8A1247	8A1247B
8A1732B	2" BOLTED	BANJO	8A1733	8A1496	8A1502	8A1503	8A1504	IN KIT	IN KIT	IN KIT	IN KIT
8A1735	2" 3W SIDE-LD	BANJO	8A1495	8A1496	8A1497	8A1498	---	8A1499	---	---	---
8A2350	FLANGE 1" FULL PORT	BANJO	(V10353T)	8A1452	8A1453	(V10278)	---	8A1464	8A1456	8A1457	8A1458
8A2354	FLANGE 2"	BANJO	(V20353T)	(V20151M)	---	(V20294)	---	---	(V20163)	(V20255A)	(V20264)
8A2356	FLANGE 2" FULL PORT	BANJO	(V25353T)	(V25151B)	8A1502	(V25478)	---	8A1499	(V25163)	(V25255A)	(V25264)
8A2360	FLANGE 1" 3W FP	BANJO	(V10353TB)	8A1452	(MV10354B)	(VE10278)	---	(V10258)	8A1456	(V10355B)	(VE10264)
8A2367	FLANGE 2" 3W FP SL	BANJO	8A1495	(V25151B)	(MV25354S)	(V25378)	---	(V25258)	(V25163)	(V25355S)	(V25264)

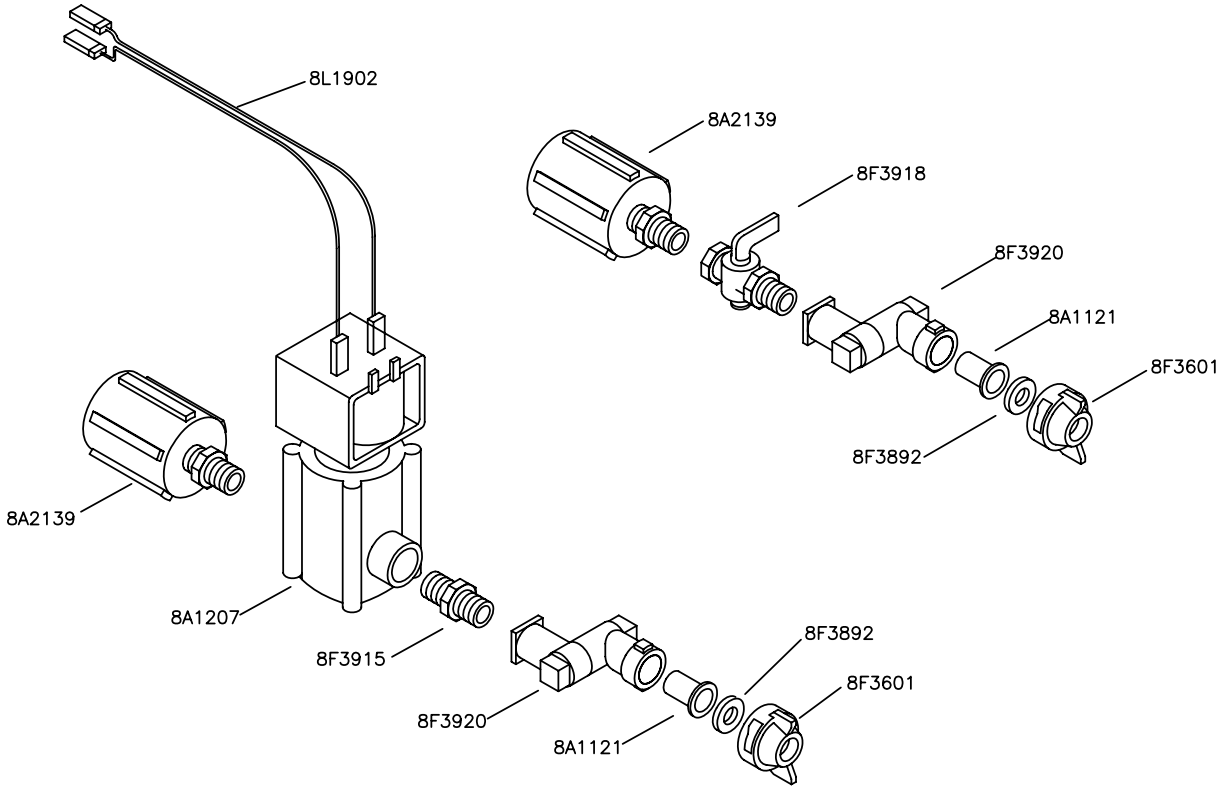
*Also used on manifold style 1" electric ball valves



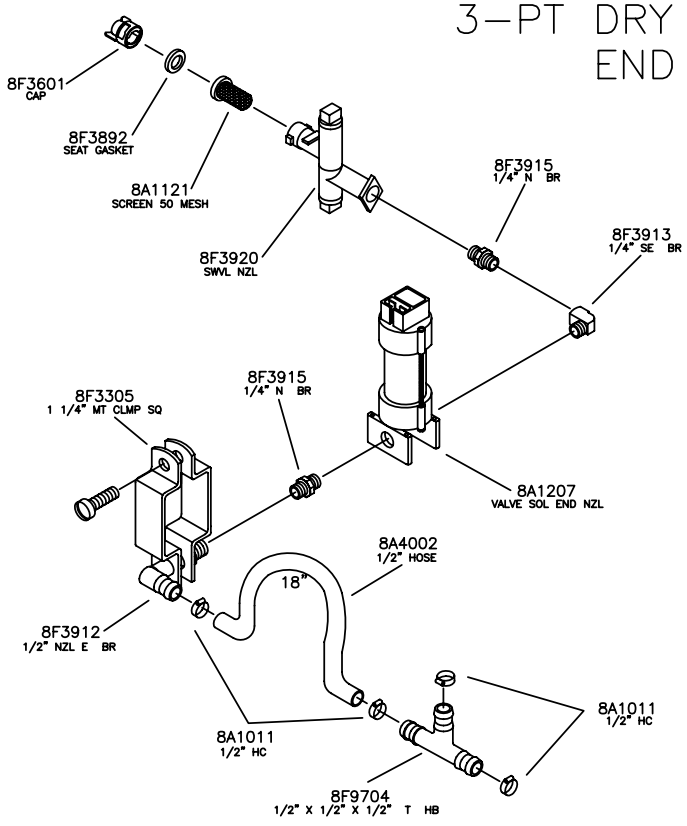
3-POINT DRY BOOM END NOZZLE ASSEMBLY - 8F3900

REF.	PART NUMBER	QTY.	DESCRIPTION
1	8A1003	4	HOSE CLAMP, 1/2" mini
2	8A4008	X	HOSE, 1/2” ID x 18”
3	8F3305	1	CLAMP, mounting, 1-1/4” sq.
4	8A1121	1	STRAINER, 50 mesh dripless teejet-poly
5	8F3601	X	CAP, black Floodjet QJ
6	8F3892	1	GASKET, seat (EPDM - Quick Jet)
	8F3894	X	GASKET, seat (Viton - Quick Jet)
7	8F3912	1	ELBOW, nozzle 1/2” (Brass)
8	8F3913	1	ELBOW, street 1/2” (Brass)
9	8F3916	1	OUTLET ADAPTER, 1/4” (Brass)
10	8F3918	1	VALVE, 1/4” NPT-M
11	8F3920	1	SWIVEL NOZZLE, single (Quick Jet)
12	8F3930	X	TIP, off center (Teejet OC02, Brass)
	8F3932	X	TIP, off center (Teejet OC03, Brass)
	8F3934	X	TIP, off center (Teejet OC04, Brass)
	8F3936	X	TIP, off center (Teejet OC06, Brass)
	8F3938	1	TIP, off center (Teejet OC08, Brass - Standard)
	8F3940	X	TIP, off center (Teejet OC12, Brass)
	8F3942	X	TIP, off center (Teejet OC16, Brass)
13	8F9704	1	TEE, 1/2 x 1/2 x 1/2” HB

2-PT & TRUCK SPRAYER MANUAL/ELECTRIC END NOZZLES

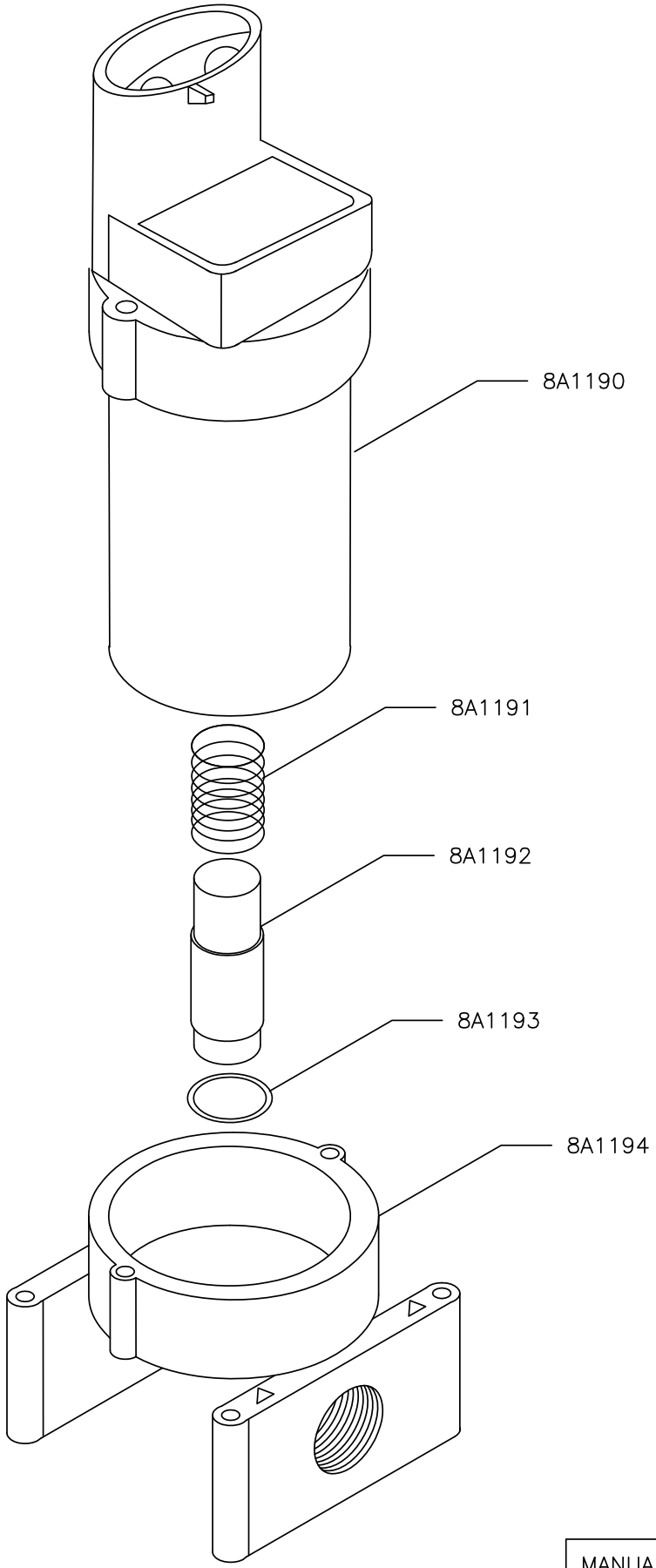


3–PT DRY BOOM ELECTRIC END NOZZLE



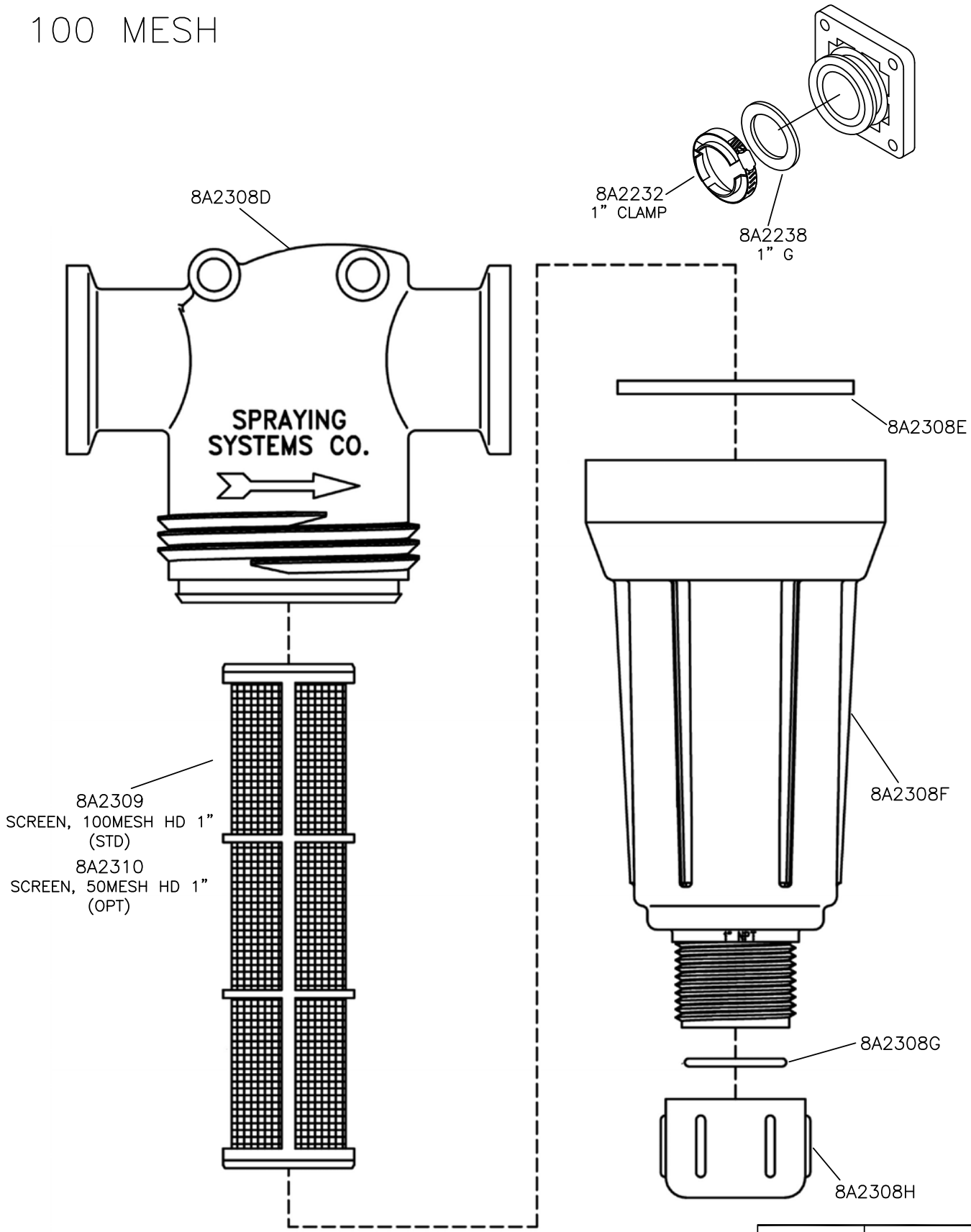
SUSBOOM\ENDNOZ	11/14/06

ELECTRIC END NOZZLE SOLENOID



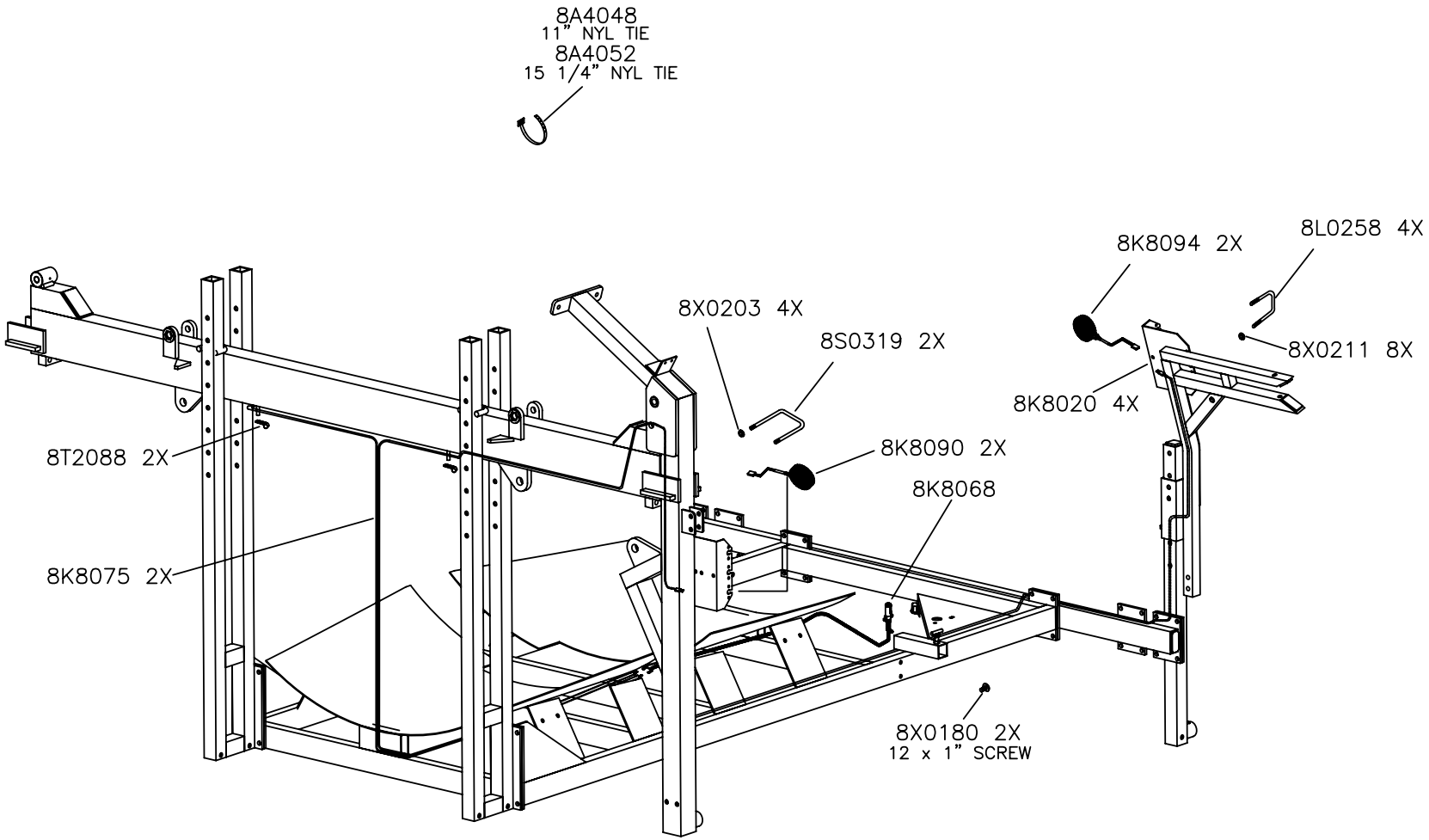
MANUALS\01SSV\ENOZ	11/02/01

SPRAYING SYSTEMS BOOM LINE STRAINER PKG 100 MESH



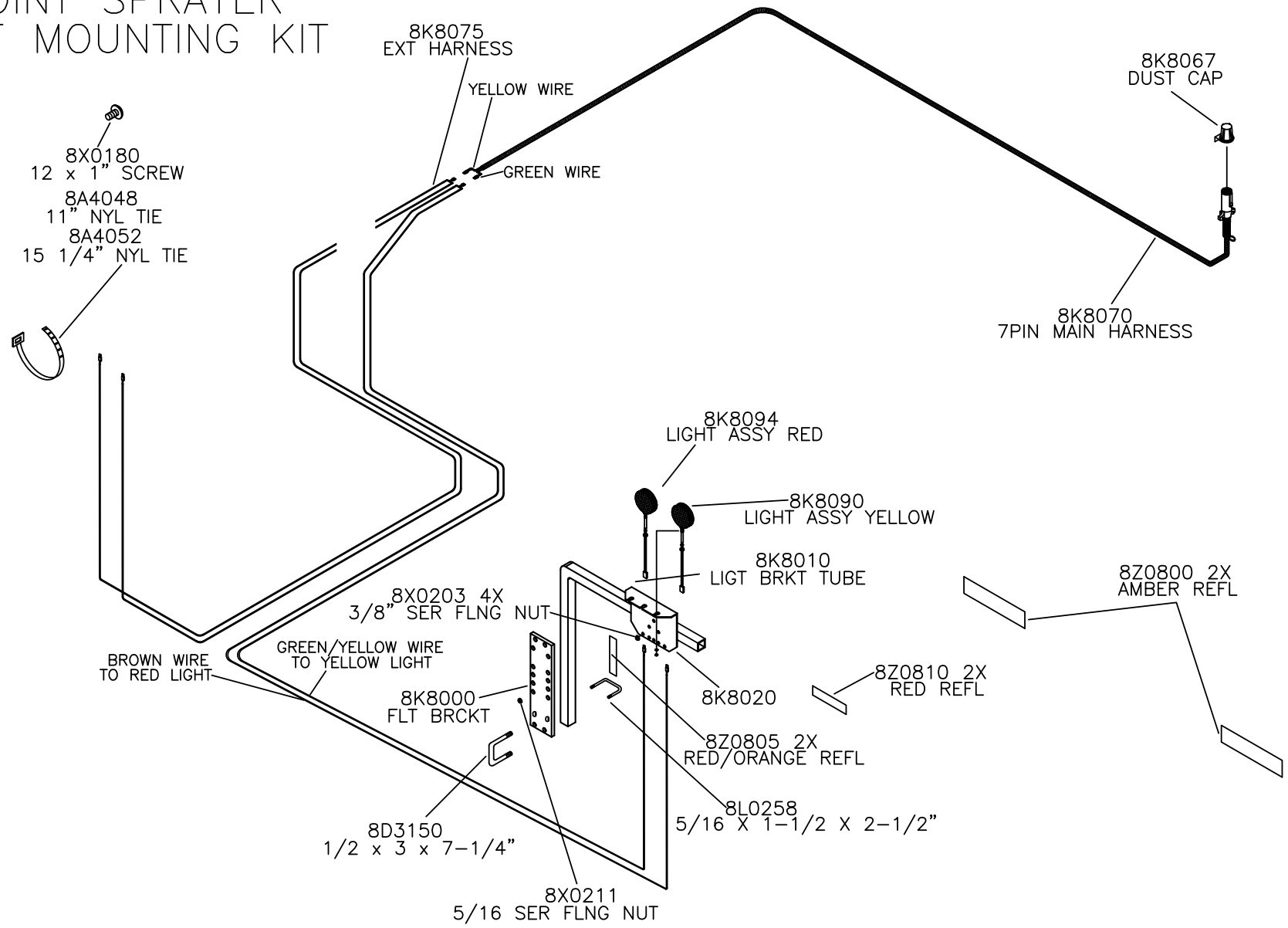
8S8716	5/5/04

TRUCK SPRAYER LIGHT MOUNTING KIT



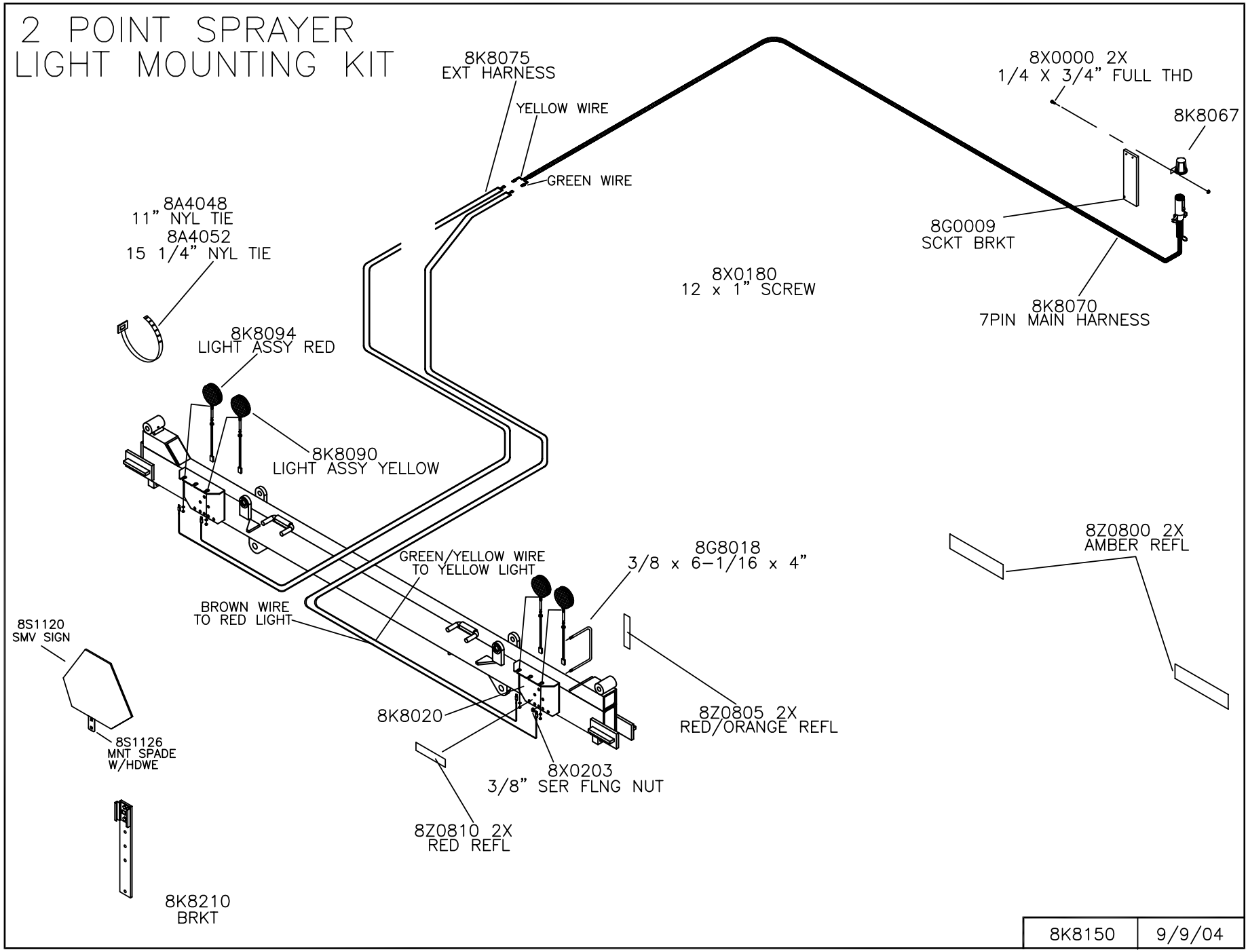
8K8130	9/21/04

3 POINT SPRAYER
LIGHT MOUNTING KIT



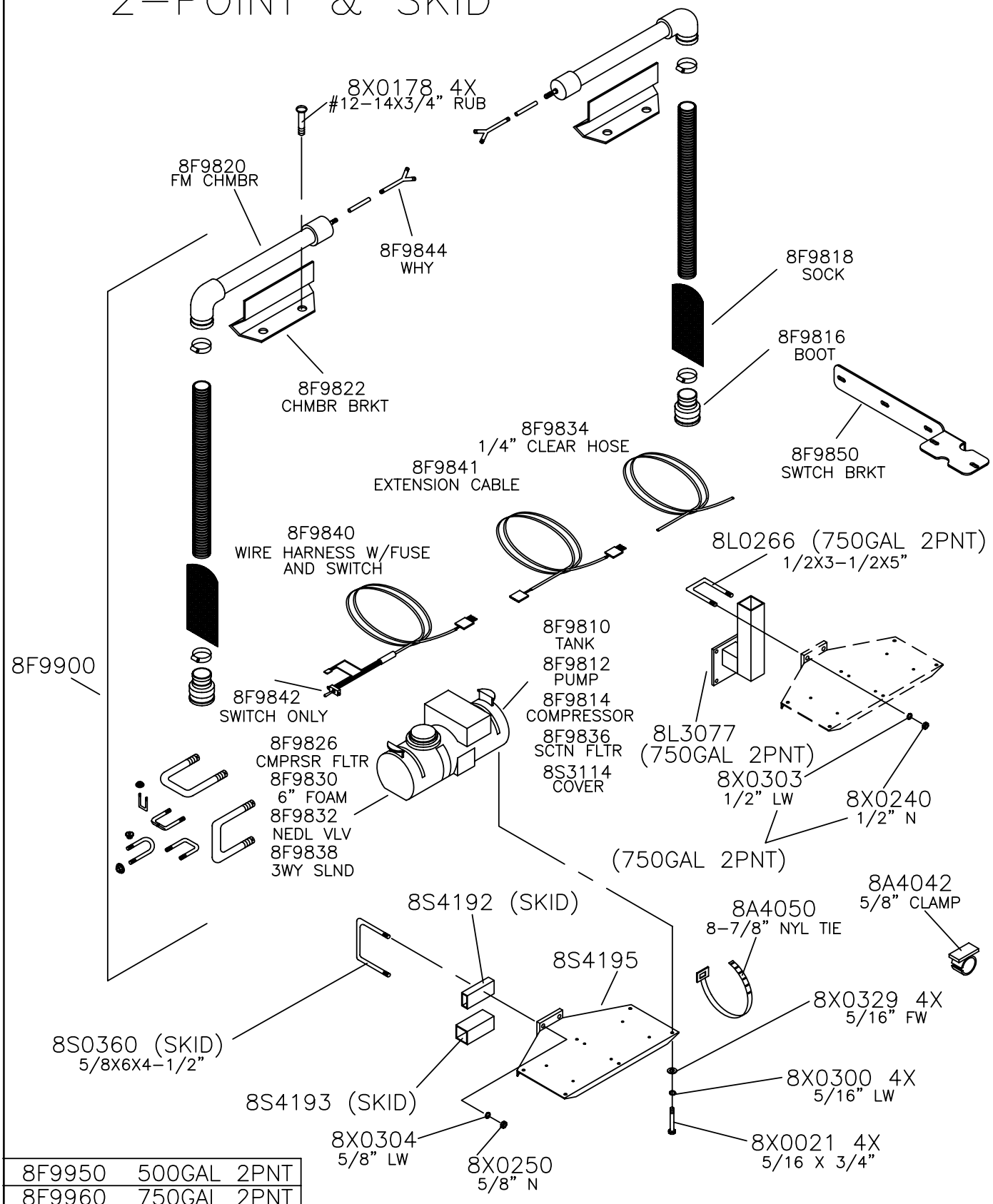
8K8140	10/18/02

2 POINT SPRAYER
LIGHT MOUNTING KIT



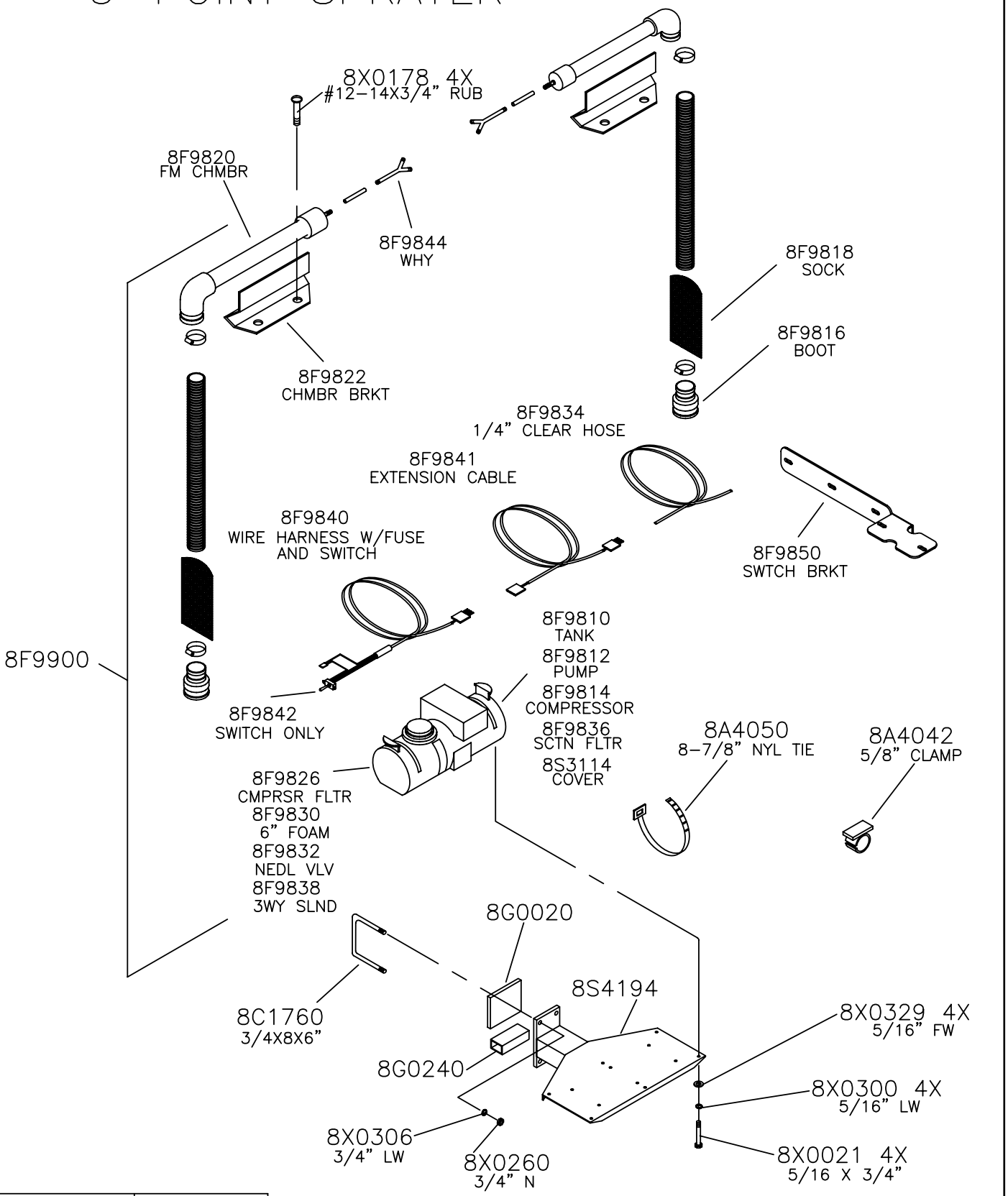
8K8150	9/9/04

FOAM MARKER OPTION
2–POINT & SKID



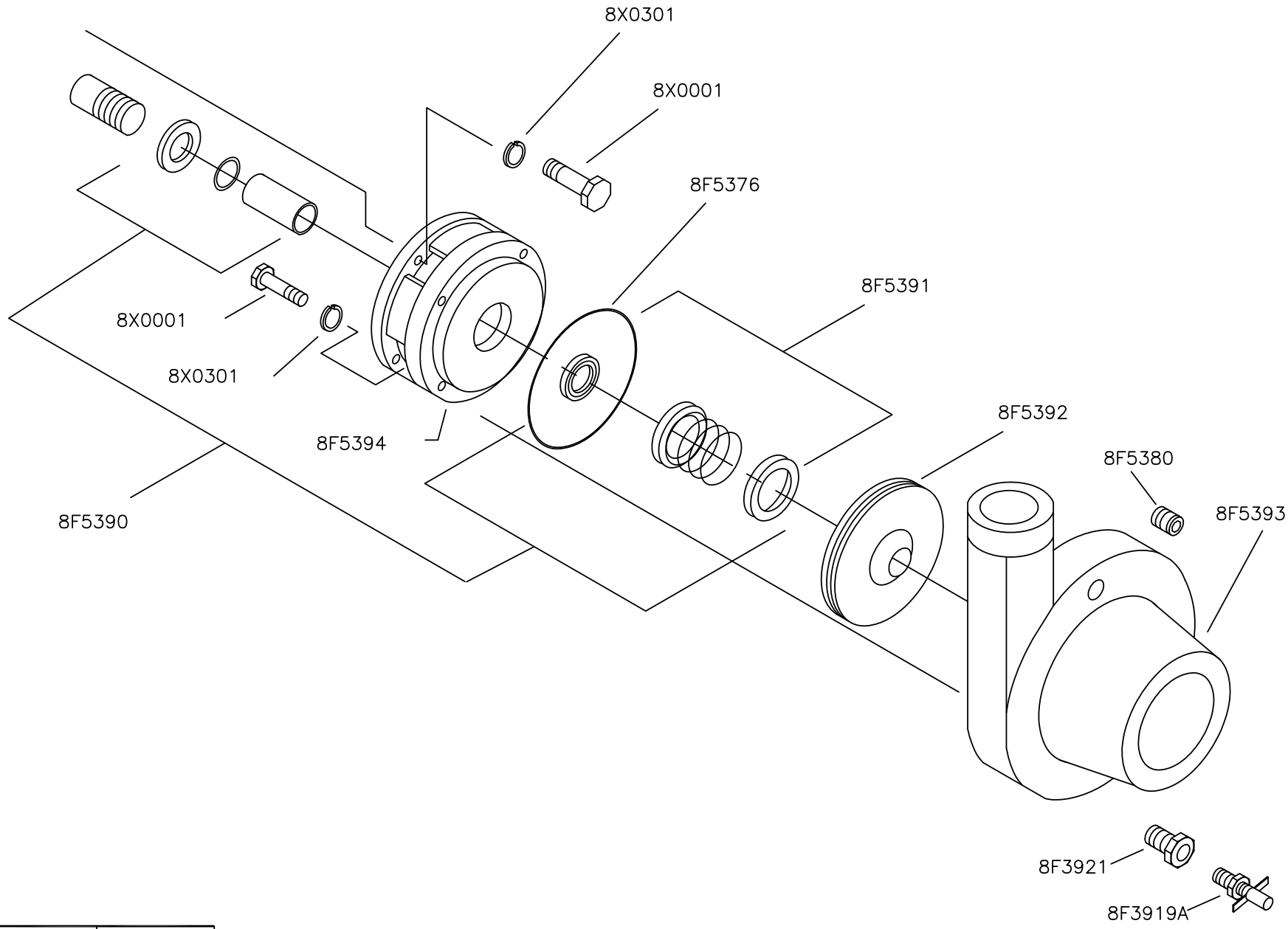
8F9950	500GAL 2PNT	
8F9960	750GAL 2PNT	
8F9970	SKID	2/12/04

FOAM MARKER OPTION
3–POINT SPRAYER



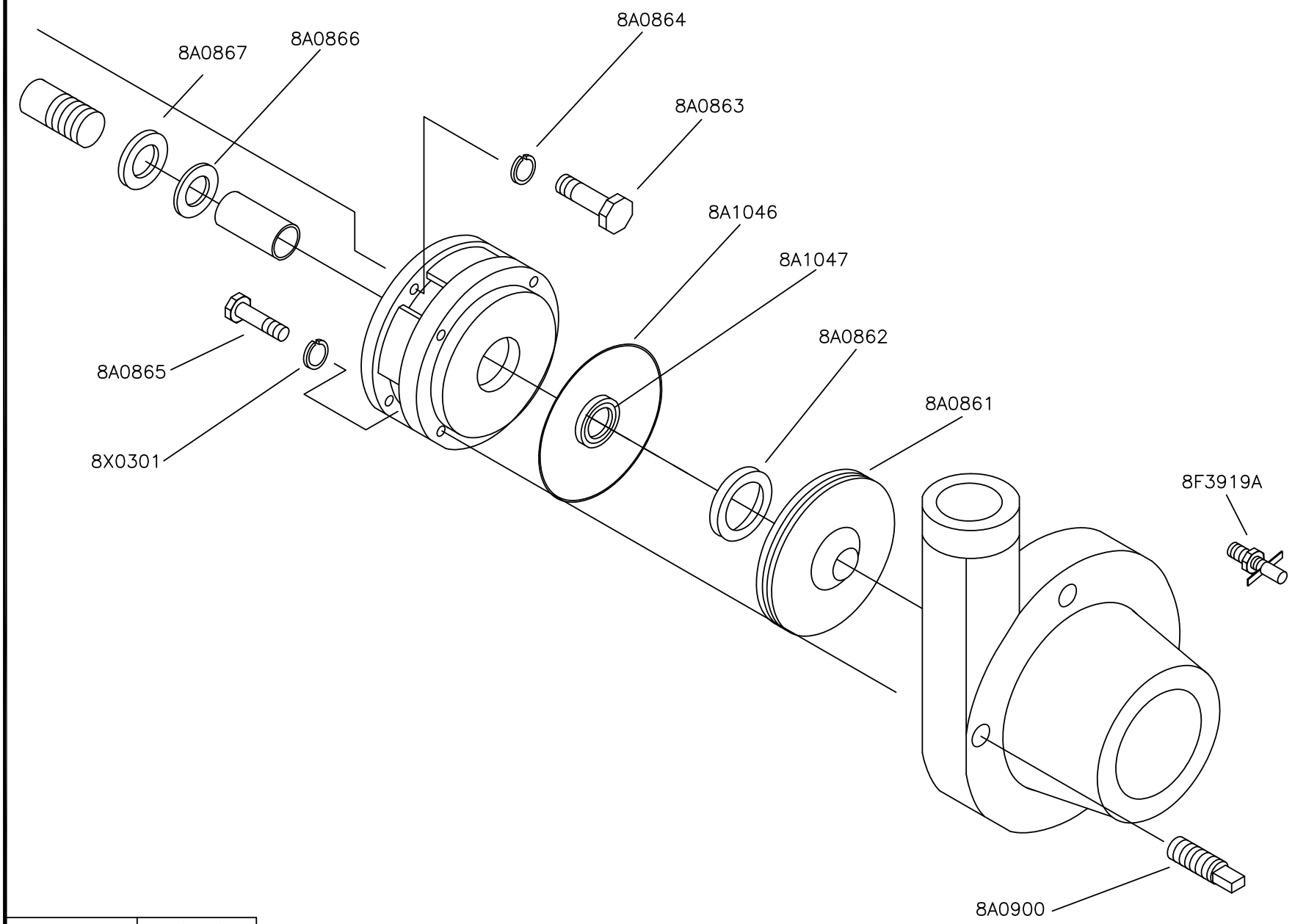
8F9972	2/12/04

TRUCK SPRAYER 420 SCOT PUMP FOR 8HP ENGINE – 8F5362



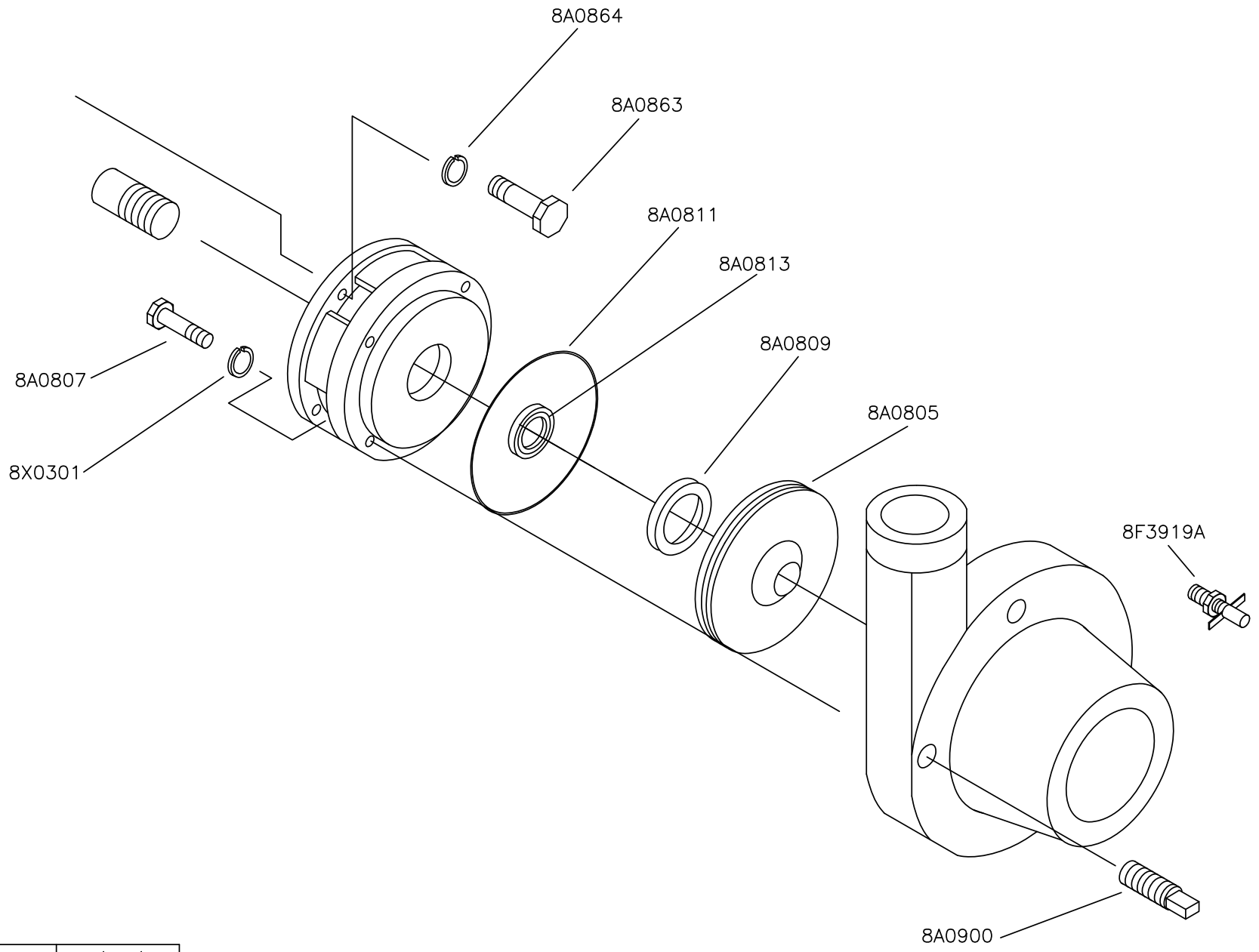
420SCOT	11/14/06

TRUCK SPRAYER HYPRO 1538 FOR 5.5HP ENGINE – 8F5360

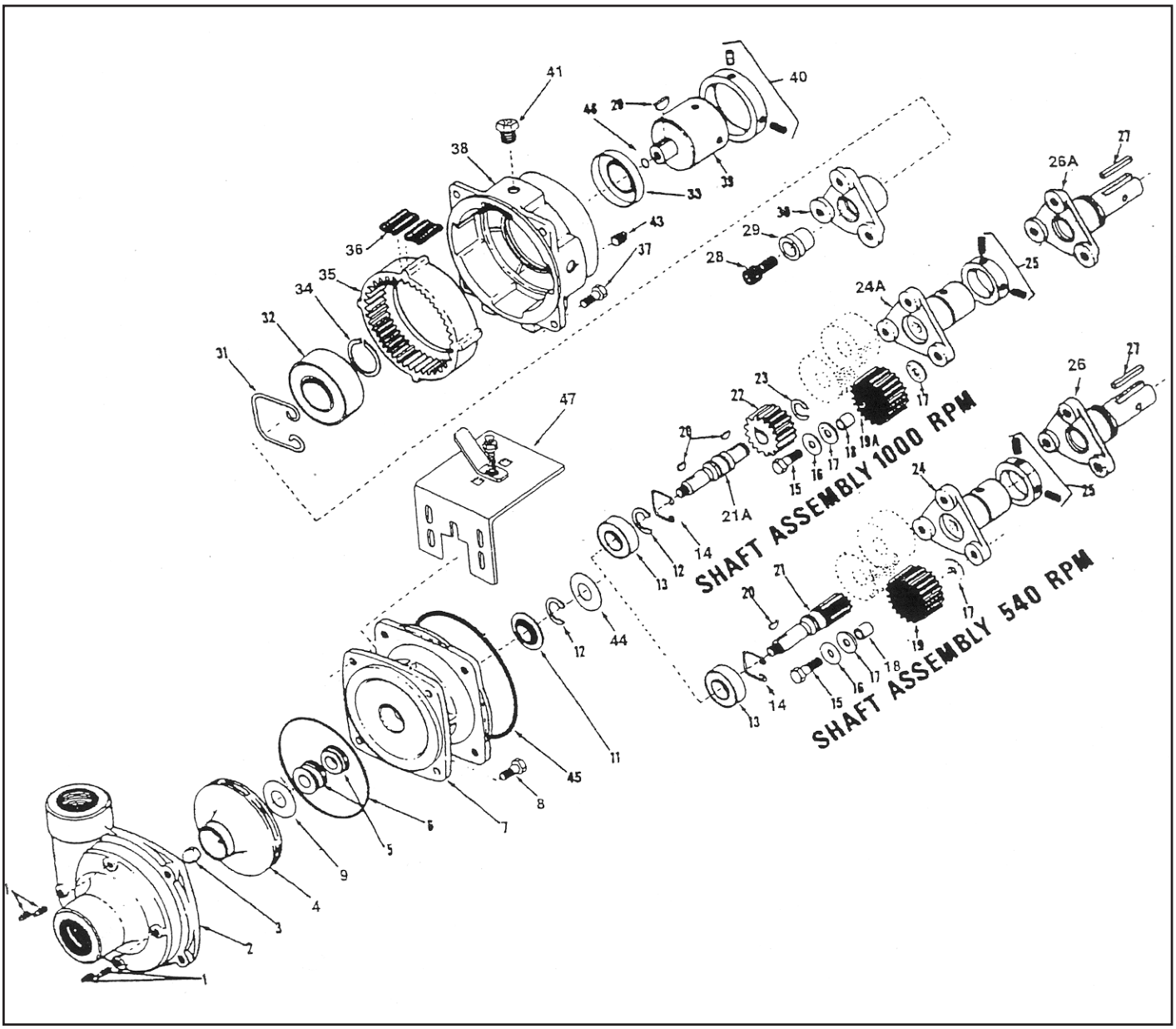


HYPRO1538 | 11/14/06

TRUCK SPRAYER HYPRO 1551 FOR 9HP ENGINE – 8F5364

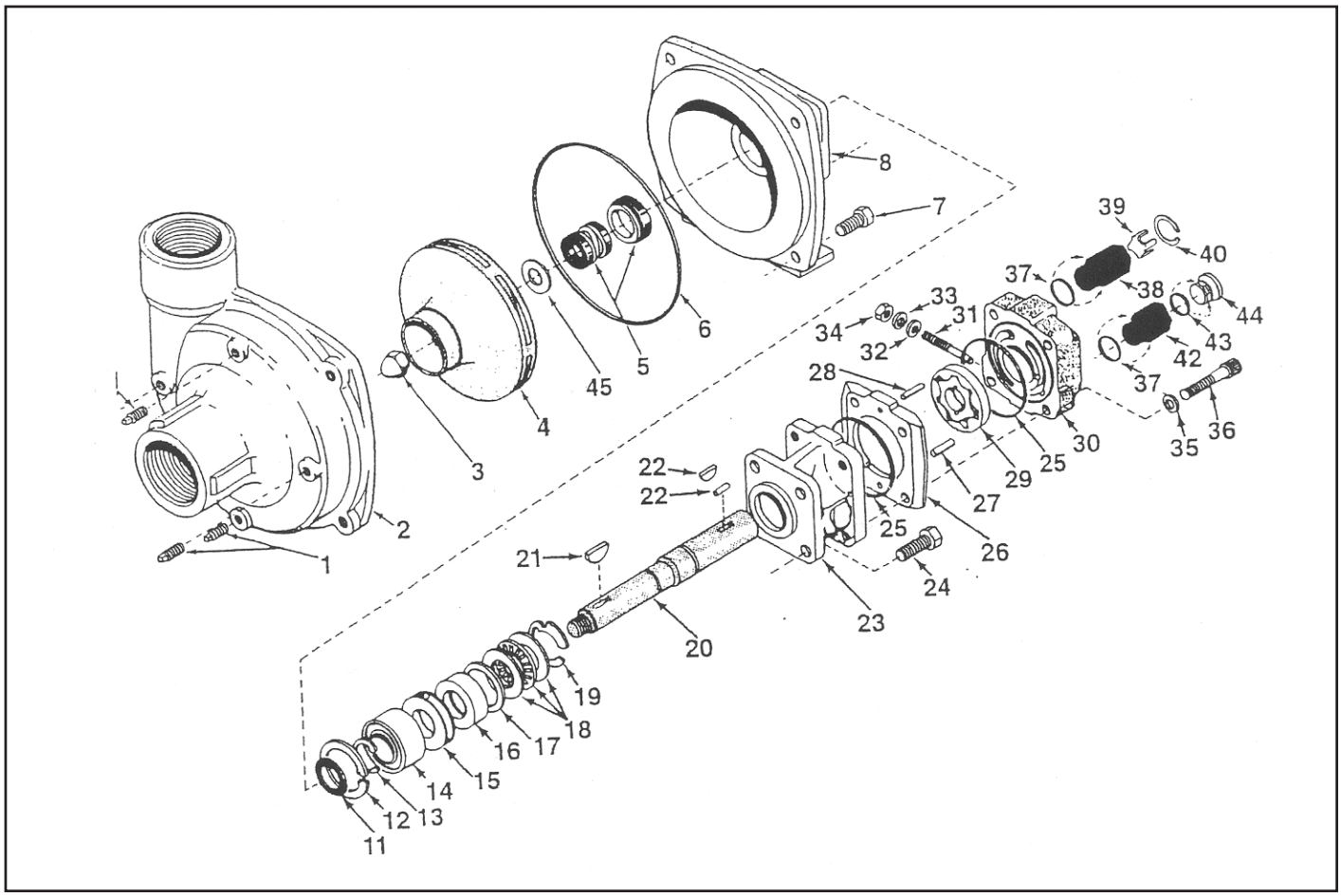


HYPRO1551	11/14/06



CENTRIFUGAL PUMP ASSEMBLY
(Hypro Series 9000 Gear Driven)

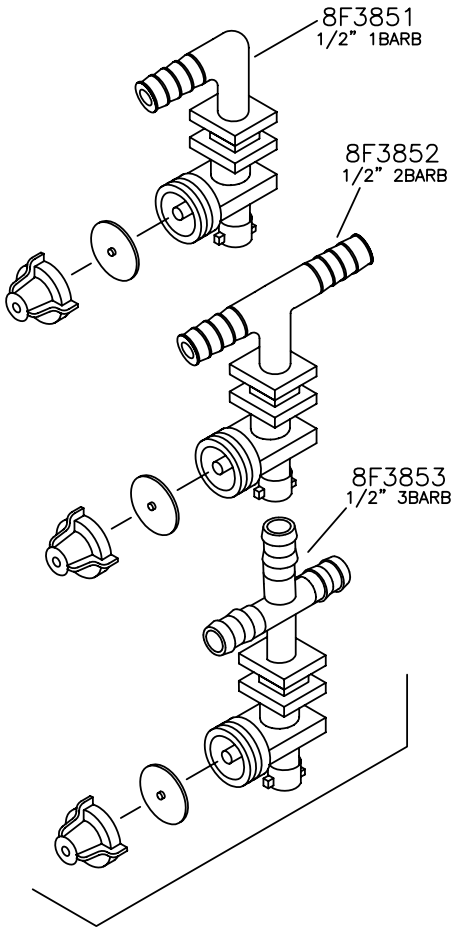
Ref. No.	SMC Part No.	Hypro Part No.	Description	Ref. No.	SMC Part No.	Hypro Part No.	Description
1	8A0900	2406-0007	Drain Plug	20	8A0912	1610-0012	Woodruff Key
2	8A0903		Pump Casing	21	8A0830	3900-0010	Imp. Shaft/P.Gear (540rpm)
3	8A0802	2253-0001	Impeller Nut	21A	8A0832	0500-9002	Imp. Shaft (1000rpm)
4	8A0804	0400-9000P	Impeller (Nylon)	22	8A0834	3900-0013	Sun Gear (1000rpm)
5	8A0806	2120-0011	Mechanical Seal (Viton)	23	8A0836	1810-0011	Retaining Ring (1000rpm)
6	8A1046	1720-0083	O-ring	24	8A0838	0562-9000D	Driver Hub (9006C)
7	8A0858	0752-9000C	Mounting Flange Adapter	24A	8A0840	0562-9002D	Driver Hub (9008C)
8	8A0865	2210-0020	Hex Head Cap Screw	25	8A1180		Locking Collar Kit (Hollow Shaft Only)
9	8A0816	1700-0101	Gasket	31	8A0847	1800-0014	Retaining Ring
11	8A0816	2130-0018	Bearing Lip Seal	32	8A0848	2005-0002	Ball Bearing
12	8A0810	1810-0013	Retaining Ring	33	8A0828	2102-0025	Oil Seal
13	8A0812	2008-0001	Ball Bearing	34	8A0852	1810-0001	Retaining Ring
14	8A0814	1820-0025	Retaining Ring	35	8A0854	3900-0009	Ring Gear
16	8A0818	2270-0003	Washer	36	8A0856	1450-0004	Cushion Bumper
17	8A0820	2265-0003	Thrust Washer	37	8A0860	2210-0026	Hex Head Cap Screw
18	8A0822	2007-0022	Bearing Inner Race	38		0754-9000C	Gear Casing
19	8A0824	3900-0039	Driver Gear w/Brg (540rpm)	47	8A1178	1520-0034	Mounting Clip
19A	8A0826	3900-0040	Driver Gear w/Brg (1000rpm)				

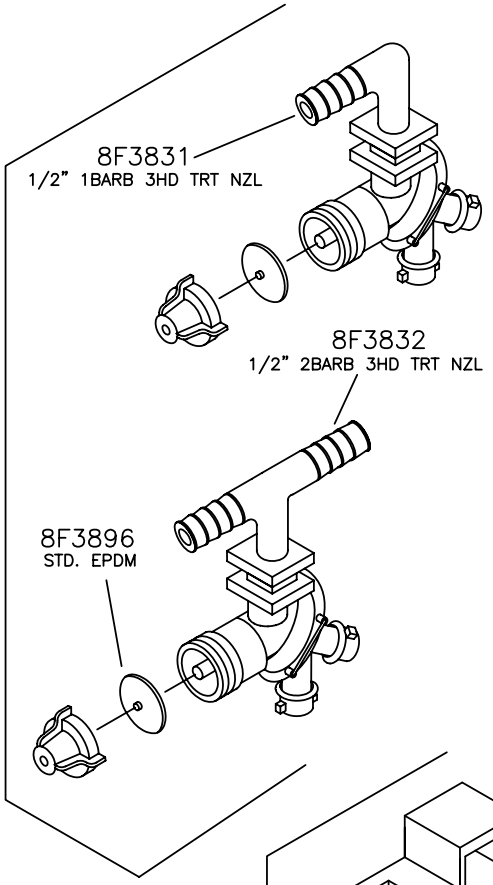


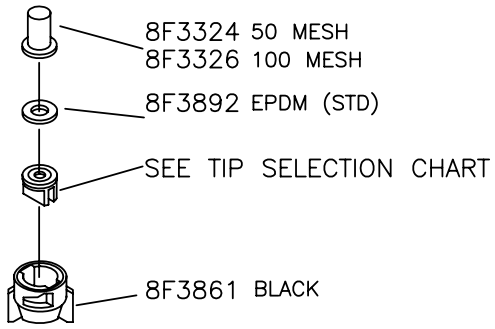
CENTRIFUGAL PUMP AND HYDRAULIC ASSEMBLY

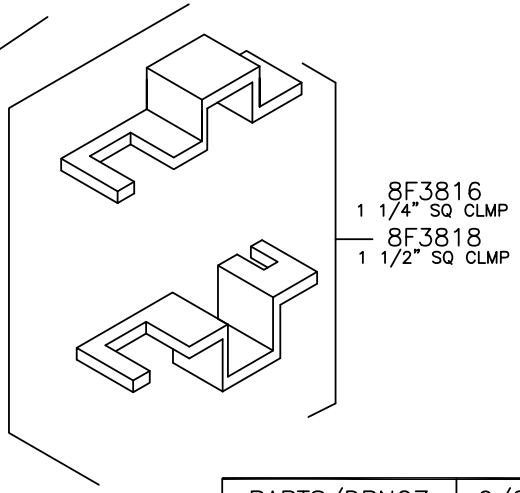
Ref. No.	SMC Part No.	Hypro Part No.	Description
1	8A0900	2406-0007	Drain/Vent Plug
2	8A0903		Pump Casing (w/SS wear ring)
3	8A0904	2253-0002	Impeller Nut
4	8A0906	0401-9100P	Impeller (Nyglass, std)
5	8A1047	2120-0009	Mechanical Seal (Viton)
6	8A1046	1720-0083	O-ring
7	8A0865	2210-0020	Hex Head Cap Screw
8	8A0907	0750-9300C	Mounting Flange
11	8A0908	1410-0056	Slinger Ring
12	8A0922	1820-0013	Retaining Ring
13	8A0924	1810-0014	Snap Ring
14	8A0926	2000-0010	Ball Bearing
15	8A0931	1410-0073	Spacer
16	8A0930	2104-0005	Shaft Seal
17	8A0928	1410-0074	Seal Spacer
18	8A0932	2029-0014	Thrust Bearing Assy Consists of (1) Thrust Bearing and (2) Thrust Bearing Races
19	8A0934	1810-0026	Snap Ring
20	8A0935	0509-2500	Shaft (HM4C) 6-3/4”
20	8A0936	0511-2501	Shaft (HM1C) 7”
20		0510-2500	Shaft (HM3C) 7-1/2”
21	8A0912	1610-0012	Woodruff Key
22	8A0938	1610-0032	Roll Pin (HM4C)
22	8A0939	1610-0031	Roll Pin (HM1C & HM5C)
22			
23	8A0942	0151-2500C	Motor Body w/Main Brg
24	8A0914	2210-0005	Hex Head Cap Screw
25	8A0944	1720-0110	O-ring
26			Gerotor Housing (HM1C) 1/2” Wide
26			Gerotor Housing (HM3C) 1” Wide
26			Gerotor Housing (HM4C) 5/16” Wide
27	8A0949	1600-0045	Dowel Pin (HM4C)
27		1600-0044	Dowel Pin (HM1C & HM5C)
27		1600-0052	Dowel Pin (HM3C)
28	8A0952	1600-0042	Dowel Pin (HM4C)
28		1600-0037	Dowel Pin (HM1C & HM5C)
28		1600-0068	Dowel Pin (HM3C)
29		3900-0022	Gerotor (HM1C)
29		3900-0024	Gerotor (HM3C)
29	8A0959	3900-0025	Gerotor (HM4C)
		3900-0048	Gerotor (HM5C)
30	8A0960	0251-2500C	Motor End Plate w/Main Brg
31	8A0962	3220-0029	Bypass Adjusting Screw
32	8A0964	1700-0047	Gasket
33	8A0966	2270-0027	Washer
34	8A0968	2250-0038	Lock Nut
35		2270-0039	Washer
36	8A0972	2220-0045	Cap Screw (HM4C)
36	8A0971	2220-0021	Cap Screw (HM1C & HM5C)
36		2220-0044	Cap Screw (HM3C)
37	8A0920	1720-0108	O-ring
38	8A1041		Tank Port Adapter
42		3360-0021	Pressure Port Adapter
43		1720-0105	Orifice O-ring (HM4C)
44		3373-0020	Metering Orifice Size 1
44		3373-0021	Metering Orifice Size 2 (HM4C Only)
44		3373-0022	Metering Orifice Size 3
45	8A0862	1700-0100	Rubber Gasket

3–PT DRY BOOM NOZZLE ASSEMBLIES

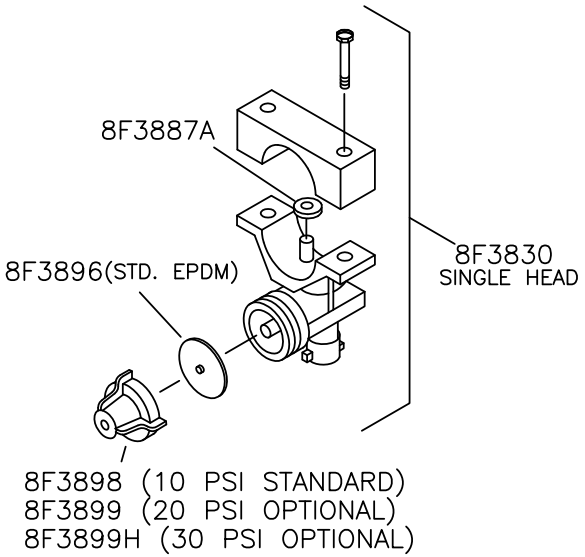


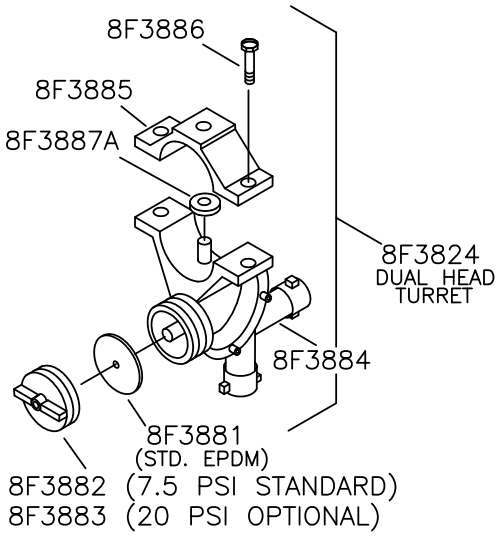


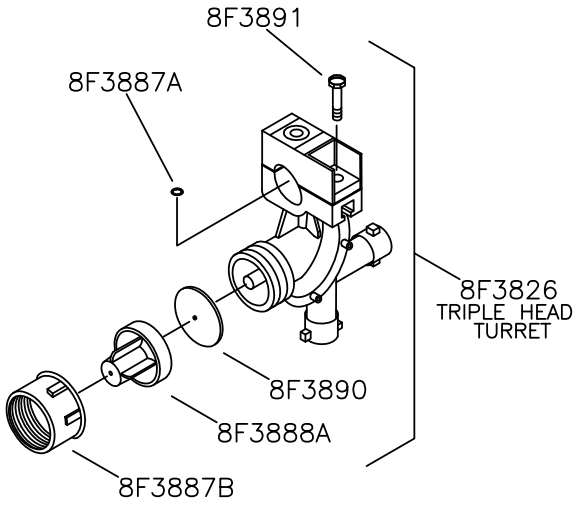


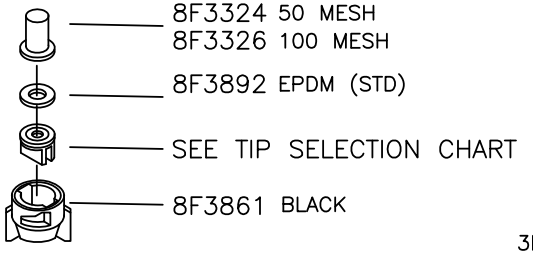


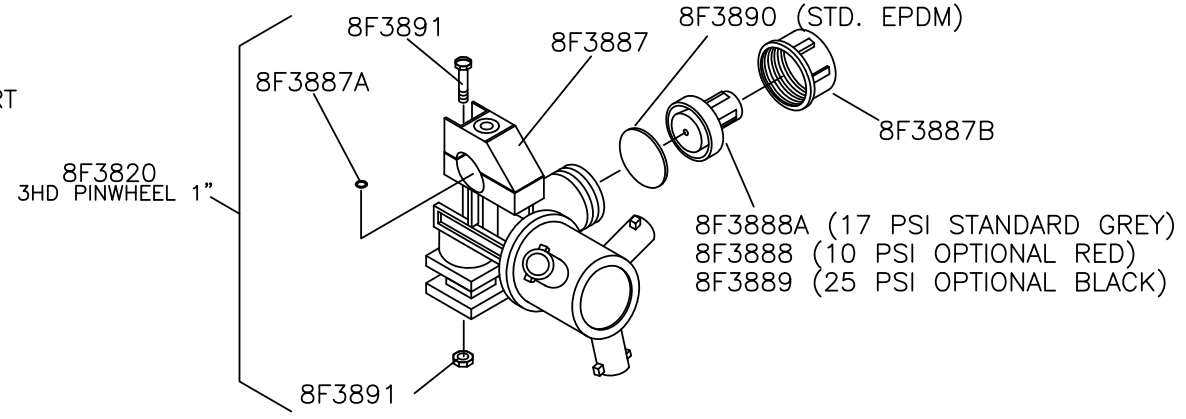
2–PT & TRUCK SPRAYER WET BOOM NOZZLE ASSEMBLIES

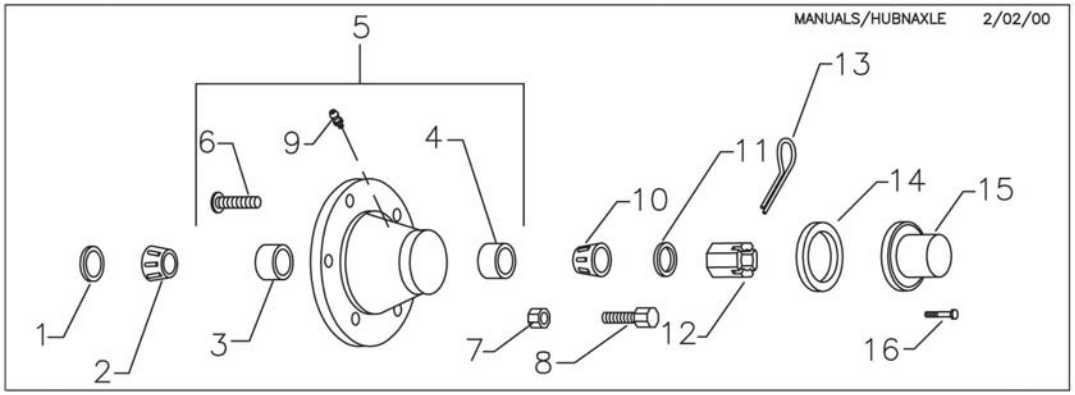












2-PT
HUB AND AXLE COMPONENTS

Assembly Notes:

A. Before towing machine, pack wheel bearings and fill 1/2 of hub cavity with high quality bearing grease.

B. Tighten axle nut to 50 ft.-lbs, loosen nut until first slot is aligned with hole in axle, install cotter pin and bend to retain.

Legend:

SMC	Part Number
INDUSTRY	Part Number or Size

HUB	1. SEAL	2. INNER BEARING	3. INNER RACE	4. OUTER RACE	5. HUB ASSY	6. WHEEL STUD	7. WHEEL NUT	8. WHEEL BOLT	9. HUB ZERK	10. OUTER BEARING	11. AXLE WASHER	12. AXLE NUT	13. COTTER PIN	14. HUB CAP GASKET	15. HUB CAP	16. HUB CAP BOLT
H413	8D5120	8D5117	8D5336	8D5330	M6527850	N/A	N/A	8D5114	8X0708	8D5118	8X0317	8D5112	8X0410	N/A	M6527846	N/A
	SE11	LM67048	LM67010	LM11910	H413			WB10	1/4-28NF	LM11949	3/4" I.D.	3/4"-16	8/16X1"		DC24	
H511	8D5120	8D5117	8D5336	8D5330	8D5111	N/A	N/A	8D5114	8X0721	8D5118	N/A	8D5112	8X0410	N/A	8D5113	N/A
	SE11	LM67048	LM67010	LM11910	H511			WB10	5/16-24NF	LM11949		3/4"-16	3/16X1"		DC12	
H517	8D5220	8D5217	8D5332	8D5336	8D5211	8D5215	8D5214	N/A	8X0721	8D5117	8S5219	8D5212	8X0415	N/A	8D5213	N/A
	SE13-OLD	LM48548	LM48510	LM67010	H517	WB16	1/2-20UNF		5/16-24NF	LM67048	7/8" I.D.	7/8"-14	3/16X1-1/2"		DC13	
H611	8D5221	8D5317	8D5334	8D5336	8D5311	N/A	N/A	8D5114	8X0708	8D5117	8D5319	8D5312	8X0415	N/A	8D5213	N/A
	SE13	LM29749	LM29710	LM67010	H611			WB10	1/4-28NF	LM67048	1" I.D.	1"-14	3/16x1-1/2"		DC13	
H614	8R6922**	8R6917	8R6925	8D5332	8R6911	N/A	N/A	8R6914	8X0708	8D5217	8D5319	8D5312	8X0415	N/A	8R6913	N/A
	SE57	LM603049	LM603011	LM48510	H614			WB12	1/4-28NF	LM48548	1" I.D.	1"-14	3/16x1-1/2"		DC15	
HD812	***8K7127 SEAL SE77	8K7117	8K7130	8K7132	8K7111	8K7115-9/16"*	8K7116-9/16"*	N/A	8X0708	8K7118	8D5319	8D5312	8X0415	N/A	8K7113	N/A
						8K7122-5/8"	8K7123-5/8"									
	8K7128 SLEEVE SE77-1	LM3780	LM3720	LM2720	HD812	WB41	WB40		1/4-28NF	LM2790	1" I.D.	1"-14	3/16X1-1/2"		DC17	
						WB46	WB118									
H1010 LT	8K7220	7K7217	8K7230	8K7232	8K7211	8K7215	8K7216	N/A	8X0708	8K7218	8X0328	8D5314	8X0414	8K7212	8K7213	8K7214
	SE48	39585	39520	453A	H1010-9	WB51	WB52		1/4-28NF	460	1.312 I.D.	1-1/4"-12	1/4X2"	SE49	DC27	WB53
H1010 HVY	8K7221	8K7219	8K7231	8K7232	8K7210	8K7215	8K7216	N/A	8X0708	8K7218	8X0328	8D5314	8X0414	8K7212	8K7213	8K7214
	SE67	33275	33462	453A	H1010-11	WB51	WB52		1/4-28NF	460	1.312 I.D.	1-1/4"-12	1/2X2"	SE49	DC27	WB53

* Pre 1997
** GBGI (Not Shown), 8R6921 Triple Lip (Shown)
*** Pre 2006 8K7120(SE17)

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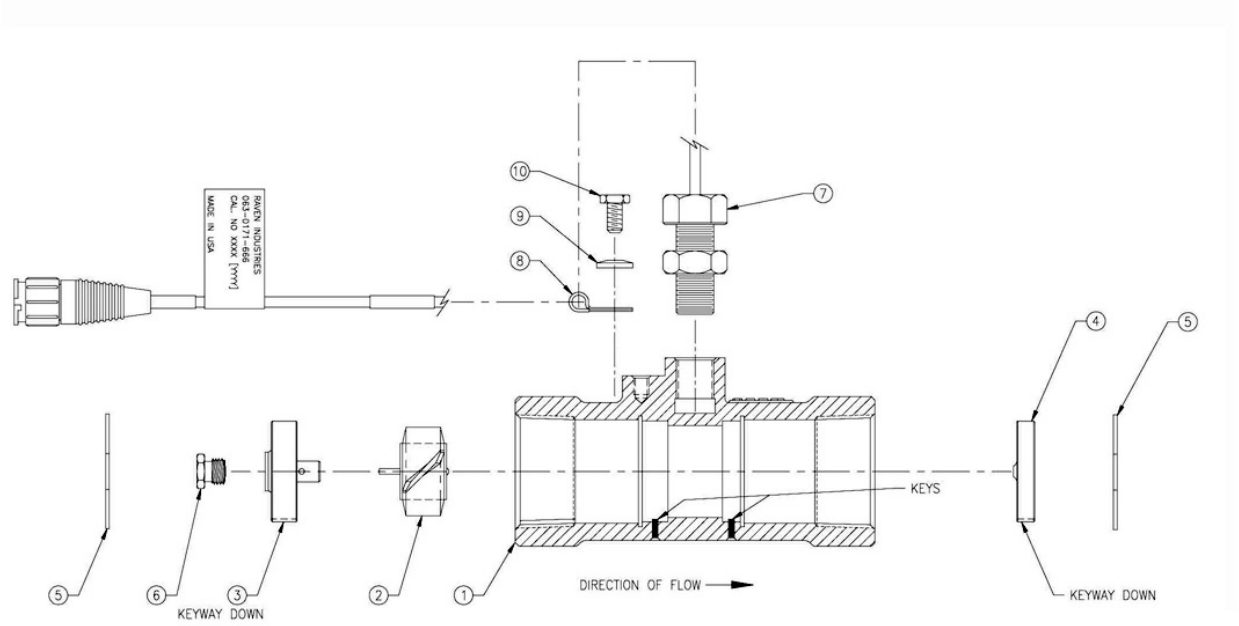
8A1846
RFM 60s FLOW METER REPLACEMENT PARTS

063-0171-666

ITEM	SMC PART #	DESCRIPTION	RAVEN PART #
1		Body, RFM 60s Flow Meter	107-0171-246
2		Rotor/Magnet Assembly	063-0171-673
3		Hub/Bearing Assembly, Upstream	063-0171-674
4		Hub, Assembly, Downstream	063-0171-769
5		Ring, Retaining Internal	335-0000-278
6		Stud Bearing	063-0159-570
7	8A1847	Sensor Assembly	063-0171-669
8		Clamp, Cable Insulated	435-3001-042
9		Washer, Spring	313-2400-001
10		Bolt, Hex Head	311-0050-254



054-0159-144
7/01 REV. F
SHEET 1 0F 1

RFM 60 P FLOWMETER MAINTENANCE AND ADJUSTMENT PROCEDURE

1) Remove Flowmeter from Sprayer, brush away any debris and flush with clean water to remove any foreign material.

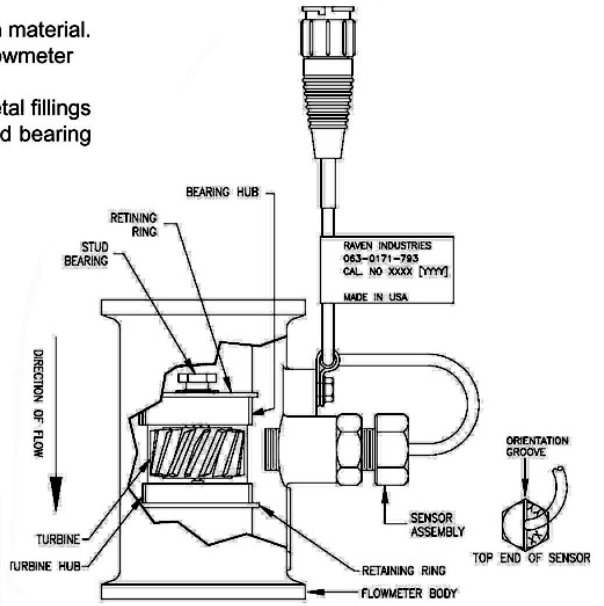
2) Remove the retaining rings carefully. Remove the bearing hub, turbine hub, and turbine from inside Flowmeter housing.

3) Clean the turbine and hubs of metal filings and any other foreign material. Use pressurized air to blow metal fillings and debris out of both hubs and turbine. Confirm that the turbine blades are not worn. Hold turbine and bearing hub in your hand and spin turbine. It should spin freely with very little drag.

4) If bearing hub stud is adjusted or replaced, verify the turbine fit before reassembling: Put turbine hub and retaining ring in place. Put bearing hub with turbine against turbine hub inside the Flowmeter housing. (Make sure stud keys inside Flowmeter housing are lined up in the groove on the hub). Put the retaining ring into the groove, to lock bearing hub in place. Spin turbine by blowing on it. Tighten bearing hub stud until turbine stalls. Loosen the stud 1/3 of a turn. The turbine should spin freely.

5) Use a low pressure (5 psi) [34.5 kPa] jet of air thru Flowmeter in the direction of flow and again in opposite direction to verify that the turbine spins freely. If there is drag, loosen the stud on the bearing hub 1/16 turn until the turbine spins freely.

6) If turbine spins freely and the cables have checked out O.K., but the Flowmeter is not totalizing properly, verify that the Sensor Assembly is threaded all the way into the Flowmeter body, and the orientation groove on top of sensor is parallel with Flowmeter body. If Flowmeter still does not totalize, replace Sensor Assembly.



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

PROCEDURE TO RE-CALIBRATE FLOWMETER

1) Enter a METER CAL number of 10 [38] in [METER CAL 5].

2) Enter a TOTAL VOLUME of 0 in [TOTAL VOLUME].

3) Switch OFF all booms.

4) Remove a boom hose and place in calibrated 5 gallon [19 liter] container.

5) Switch ON appropriate boom switch and MASTER switch. Pump exactly 10 gallons [38 liters].

6) Readout in TOTAL VOLUME is the new METER CAL number. This number should be within +/- 3% of the number stamped on the tag on Flowmeter.

7) Repeat this procedure several times to confirm accuracy. (Always "zero out" the TOTAL VOLUME display before retesting).

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

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

EXAMPLE:

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

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

ENGLISH UNITS:

$$= \frac{720 \times 260}{250} = 749$$

METRIC UNITS:

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

Corrected METER CAL = 749 [198]

9) Enter corrected METER CAL before resuming application.

016-0159-757
1/99 REV. A
SHEET 1 0F 1

Stock #	Description
1S1516	POLY 16" WIDE PER/FT
1S1518	PERFORATED POLY 18" WIDE PER/FT
8A0802	IMPELLER NUT
8A0804	IMPELLER (PLASTIC)
8A0805	IMPELLER 1551 HYPRO PUMP
8A0806	MECHANICAL SEAL VITON
8A0807	BOLT HYPRO 1551 PUMP HOUSING
8A0809	GASKET 1551 HYPRO PUMP
8A0810	BEARING RETAINER RING
8A0811	O-RING HYPRO 1551 PUMP
8A0812	BALL BEARING
8A0813	SEAL VITON 1551 HYPRO PUMP
8A0814	RETAINING RING
8A0816	LIP SEAL BEARING 9006C/9008C
8A0818	WASHER
8A0820	THRUSTWASHER
8A0822	BEARING INNER RACE
8A0824	DRIVER GEAR WITH BEARING 9006C
8A0826	DRIVER GEAR WITH BEARING 9008C
8A0828	OIL SEAL DRIVER 9006C/9008C
8A0830	PINION GEARED IMPELLER SHAFT
8A0832	IMPELLER SHAFT
8A0834	SUN GEAR
8A0836	RETAINING RING (FOR SUN GEAR)
8A0838	DRIVER HUB 9006C
8A0840	DRIVER HUB 9008C
8A0847	RETAINING RING
8A0848	BALL BEARING
8A0850	SLINGER
8A0852	RETAINING RING
8A0854	RING GEAR
8A0856	CUSHION BUMPER
8A0858	GEAR CASING
8A0860	HEX HEAD CAPSCREW
8A0861	IMPELLER 1538 HYPRO PUMP
8A0862	GASKET 1538 HYPRO PUMP IMPELR
8A0863	BOLT HYPRO 1538 PUMP - ENGINE
8A0864	BOLT SEAL HYPRO 1538 PUMP
8A0865	BOLT HYPRO 1538 FLANGE-CASING
8A0866	SPACER HYPRO 1538 PUMP
8A0867	BEARING SHIELD HYPRO 1538
8A0900	DRAIN/VENT PLUG
8A0902	PUMP CASTING 1-1/2" X 1-1/4"
8A0903	PUMP CASTING BODY 220 X 200 FLNGD
8A0904	IMPELLER NUT
8A0906	IMPELLER
8A0907	MOUNTING FLANGE
8A0908	SLINGER RING
8A0912	WOODRUFF KEY
8A0914	HEX HEAD CAPSCREW
8A0920	O-RING FOR HYDRAULIC PORTS
8A0922	RETAINING RING
8A0924	SNAP RING
8A0926	BALL BEARING
8A0928	SPACER
8A0930	SHAFT SEAL
8A0931	SEAL SPACER
8A0932	THRUST BEARING ASSEMBLY
8A0934	SNAP RING
8A0935	SHAFT HM2&4
8A0936	SHAFT HM1
8A0937	SHAFT HM3
8A0938	ROLL PIN HM2&4
8A0940	WOODRUFF KEY HM3
8A0942	MOTOR FRONT BODY
8A0944	O-RING
8A0948	GEROTOR HOUSING HM4
8A0949	DOWEL PIN HM2&4
8A0952	DOWEL PIN HM2&4
8A0959	GEROTOR HM4
8A0960	MOTOR END PLATE
8A0962	BYPASS ADJUSTING SCREW
8A0964	GASKET
8A0966	WASHER
8A0968	LOCK NUT
8A0971	SOCKET HEAD CAPSCREW HM1
8A0972	SOCKET HEAD CAPSCREW HM2&4
8A0974	TANK PORT ADAPTER
8A1000	HOSE CLAMP 1/4" MINI
8A1002	HOSE CLAMP 2" #36
8A1004	HOSE CLAMP 5" #72
8A1006	HOSE CLAMP 1-1/2" #24
8A1007	HOSE CLAMP 3/4" #12
8A1008	HOSE CLAMP 1-1/4" #20
8A1009	HOSE CLAMP 1" #16
8A1017	HOSE CLAMP SIZE J .820- .930
8A1040	TANK CHECK VALVE ASSEMBLY
8A1044	PORT ADAPTER HYPRO PUMP
8A1046	O-RING (BUNA-N)
8A1047	MECHANICAL SEAL (VITON)
8A1050	C9006 540 RPM CENT PUMP VITON
8A1052	C9008 1000 RPM CENT PUMP VITON
8A1056F	9303C-HM1C CNTRFGL FLGD HYDPMP
8A1057	9303S-HM1C CNTRFGL PUMP HYDDRV
8A1060	9303C-HM3C CNTRFGL PUMP HYDDRV
8A1062F	9303C-HM4C CNTRFGL FLGD HYDPMP
8A1078	ORIFICE O-RING
8A1080	METERING ORIFICE SIZE #1
8A1081	METERING ORIFICE SIZE #2
8A1082	METERING ORIFICE SIZE #3
8A1121	DRIPLESS SCREEN 50 MESH
8A1178	MOUNTING CLIP HYPRO PTO PUMP
8A1180	LOCKING COLLAR KIT PTO PUMP
8A1190	ELEC. END NOZZLE COIL WP
8A1191	ELEC. END NOZZLE SPRING
8A1192	ELEC. END NOZZLE PLUNGER VITON
8A1193	ELEC. END NOZZLE VITON O-RING
8A1194	ELEC. END NOZZLE VALVE BODY
8A1195B	ELEC BVALVE 1" FLANGE OUTLET
8A1195C	SCREW SS HEX HEAD CAP 3"
8A1195D	SCREW SS PHILLIPS PAN HEAD 3"
8A1196	ELECTRIC BALLVALVE REBUILD KIT
8A1198	ELEC. BALL VALVE NYLON BODY
8A1198A	ELEC BALL VALVE MANIFOLD BODY
8A1205	MOTOR ONLY 344 BVLVE 25 RPM

8A1208	1" TRPL BVALVE MANIFOLD W/CONT
8A1208A	INLET 1" NPT BALLVALVE MANIFOLD
8A1208B	INNER CONNECTOR BVALV MANIFOLD
8A1208C	0-RING BODY TO BODY BVLV MANIF
8A1208D	1" DBL BVALVE MANIFOLD W/CONT
8A1400	BANJO 3/4" FITTING COMPLETE
8A1402	GASKET EDPM 3/4 & 1-1/2" BANJO
8A1404	BANJO 1-1/4" FITTING COMPLETE
8A1405	GASKET EDPM 1-1/4 & 2" BANJO
8A1410	BANJO 2" FITTING COMPLETE
8A1412	GASKET EDPM 2 & 3" BANJO
8A1413	BANJO 2" ANTI-VORTEX NO SCREEN
8A1414	TRANSMITTER ONLY REMOTE CNTRL
8A1417	MNT BRCKT ONLY REMOTE CONTROL
8A1420	REMOTE CONTROL 12VDC PKG
8A1445	SEAL 16" ARAG HINGED COVER
8A1446	16" HINGED CVR LESS HANDL PREC
8A1447B	RED ARM W/BAFFLE FOR ARAG COVR
8A1448	16" HINGED FILLWELL RING PREC
8A1450	PIN HINGED COVER
8A1460	HANDLE (BANJO) 3/4 & 1" 3W BV 98-
8A1461	STEM (BANJO) 3/4 & 1" 3W BV 98-
8A1462	BODY (BANJO) 3/4" 3WAY BV 98-
8A1463	END CAP(BANJO) 3/4" 3WAY BV 98-
8A1464	BLLSEAT(BANJO) 3/4 & 1" 3W BV 98-
8A1465	HANDLE (BANJO) 3/4" BLTD BV 98-
8A1466	STEM (BANJO) 3/4" BLTD BV 98-
8A1467	BODY (BANJO) 3/4" BLTD BV 98-
8A1468	END CAP(BANJO) 3/4" BLTD BV 98-
8A1469	VLV KIT(BANJO) 3/4" BLTD BV 98-
8A1472	BODY (BANJO) 1" 3-WAY BV 98-
8A1473	END CAP (BANJO) 1" 3-WAY BV 98-
8A1475	HANDLE (POLY-SS) 1" BLTD BV 95-
8A1479	SPARE PARTS KIT 1" BLTD BV 95-
8A1480	HANDLE (BANJO) 1-1/4" 3W BV 98-
8A1481	STEM (BANJO) 1-1/4" 3W BV 98-
8A1482	BODY (BANJO) 1-1/4" 3W BV 98-
8A1483	END CAP (BANJO) 1-1/4" 3W BV 98-
8A1485	HANDLE (POLY-SS) 1-1/2" BV 95-
8A1486	STEM (POLY-SS) 1-1/2" BV 95-
8A1487	BODY (POLY-SS) 1-1/2" BV 95-
8A1488	END CAP (POLYPRO) 1-1/2" BV 95-
8A1489	SPARE PRTS KIT-SS 1-1/2" BV 95-
8A1492	BODY (BANJO) 2" UNION BV -
8A1495	HANDLE (BANJO) 2" 3-WAY BV 98-
8A1496	STEM (BANJO) 2" 3-WAY BV 98-
8A1497	BODY (BANJO) 2" 3-WAY BV 98-
8A1498	END CAP (BANJO) 2" 3-WAY BV 98-
8A1499	BLLSEAT (BANJO) 2" 3-WAY BV 98-
8A1502	BODY (BANJO) 2" BLTD BV -
8A1503	END CAP(BANJO) 2" BLTD BV -
8A1504	VLV KIT(BANJO) 2" BLTD BV -
8A1550	1.5"" FLANGED INLET CAP KZ BVLV
8A1552	1"" FLANGED OUTLET CAP KZ BVLV
8A1554	3/8" GAUGE PORT END CAP KZ BV
8A1556	REPAIR KIT KZ FLANGED MTR VLV
8A1558	MOTOR ASSY KZ FLANGED MTR VLV
8A1562	1" KZ TRPL BVLV MANIFOLD W/CON
8A1732	BALL VALVE 2" UNION
8A1732B	BALL VALVE 2" BOLTED
8A1733	HANDLE (BANJO) 2" BLTD BV -
8A1735	BALL VALVE 2" 3-WAY SL
8A1756	ADAPTER 2" MPT
8A1760	COUPLER END CAP 2"
8A1826	RADAR GUN W/CBL SPEED SENSOR PKG
8A1827	CABLE RADAR SPEED SENSOR 12'
8A1830	REGULATING VALVE RAVEN 1"
8A1846	FLOWMETER 60GPM POLY
8A2045	PLUG 1-1/4"
8A2106	ELBOW 1" 90 DEGREE
8A2110	ELBOW 1" HB X 1 MPT
8A2111	ELBOW 1" HB X 1-1/4" MPT
8A2112	ELBOW 1-1/4" HB X 1-1/4" MPT
8A2123	HOSE MENDER ELBOW 3/4" (A&M)
8A2124	HOSE MENDER 1"
8A2130	REDUCING NIPPLE 1-1/4 X 1"
8A2131	REDUCING NIPPLE 1-1/2 X 1"
8A2132	REDUCING NIPPLE 1-1/2 X 1-1/4"
8A2136	REDUCING NIPPLE 2 X 1-1/4"
8A2137	PIPE CAP 3/4" FPT
8A2203	RAVEN SCS-205 CONTROL L/VALVE
8A2218	FLANGE GASKET 1-1/2 & 2" EDPM
8A2220	FITTING 1.25X1.5 POLY BTM DRAIN
8A2222	FITTING 2X2 POLY BOTTOM DRAIN
8A2232	FLANGE CLAMP 1" WORM SCREW
8A2233	FLANGE CLAMP 2" SIZE 52 WORM
8A2234	FLANGE CLAMP 2" SIZE 56 WORM
8A2238	FLANGE GASKET 1" EDPM
8A2250	FLANGE 1 X 3/4" HB ELBOW
8A2251	FLANGE 1 X 1" HB ELBOW
8A2256	FLANGE 2 X 2" HB ELBOW
8A2284	FLANGE 1 X 3/4" HB
8A2288	FLANGE 2 X 1-1/4" HB
8A2294	FLANGED TEE 1"
8A2308	FLANGED 1" T-STRAINER 100 MESH
8A2308D	STRAINER HEAD 1" FLANGED SSCO
8A2308E	STRAINER BOWL GASKET SSCO
8A2308F	STRAINER BOWL 1" SSCO
8A2308G	STRAINER ORING SPRAY SYSTEMS
8A2308H	STRAINER CAP SPRAY SYSTEMS
8A2309	STRAINER SCREEN 100 MESH 1" FLNG
8A2310	STRAINER SCREEN 50 MESH 1" FLNG
8A2312	FLANGED CROSS 1"
8A2340	FLANGE 1X3/4" FPT
8A3000	SKID 15 GAL - MIX & FILL TANK
8A3002	SKID 15GAL MIX & FILL TANK 96-
8A3010	BAND 15GAL MIX & FILL TANK COATD
8A3100	FLOAT 9/16 X 2" SIGHT TUBE
8A4005	REINFORCED EVA TUBING 1/4" ID
8A4008	RUBBER HOSE 1/2" PER FT
8A4010	RUBBER HOSE 3/4" PER FT
8A4015	CLEAR VINYL TUBING 3/4" PER FT
8A4020	RUBBER HOSE 1" PER FT
8A4022	FRTLZR HOSE 1" PER FT
8A4025	RUBBER HOSE 1.25" PER FT
8A4026	RUBBER HOSE 1.5" PER FT
8A4028	RUBBER HOSE 2" PER FT

8A4030	FRTLZR HOSE 1.25" PER FT
8A4032	FRTLZR HOSE 1.5" PER FT
8A4035	FRTLZR HOSE 2" PER FT
8A4038	HOSE PVC DISCHRG 1.5" LAYFLAT
8A4042	ADHESIVE BACKED CLAMP 5/8"
8A4043	CABLE CLAMP BLACK NYLON 5/16"
8A4044	CABLE CLAMP BLACK NYLON 7/8"
8A4046	PIPE HOLDER 1/2"
8A4048	NYLON TIE .18 X 11"
8A4050	NYLON TIE .30 X 8-7/8"
8A4052	NYLON TIE .30 X 15-1/4"
8A4270	440/RADAR INTERFACE DICKEY-JOH
8A4272	440/RADAR INTERFACE CASE-IH
8A4274	RADAR INTERFACE JD 7-8-9000SER
8A4335	CABLE CONSOLE SCS-450 97-
8F3423C	TIP/CAP COMBO XRC8006VS GRAY
8F3425X	TIP TEEJET XR 8008VS WHITE
8F3511T	TIP TEEJET TT 11001VP ORANGE
8F3511X	TIP TEEJET XR 11001VS ORANGE
8F3513T	TIP TEEJET TT 110015VP GREEN
8F3513X	TIP TEEJET XR 110015VS GREEN
8F3515T	TIP TEEJET TT 11002VP YELLOW
8F3515X	TIP TEEJET XR 11002VS YELLOW
8F3517T	TIP TEEJET TT 11003VP BLUE
8F3517X	TIP TEEJET XR 11003VS BLUE
8F3519X	TIP TEEJET XR 11004VS RED
8F3521X	TIP TEEJET XR 11005VS BROWN
8F3523X	TIP TEEJET XR 11006VS GRAY
8F3525X	TIP TEEJET XR 11008VS WHITE
8F3601	CAP BLACK FLOODJET QJ
8F3606	CAP YELLOW FLOODJET QJ
8F3816	MT CLAMP 1-1/4" SQUARE QJ
8F3818	MT CLAMP 1-1/2" SQUARE QJ
8F3820	PIN WHEEL NOZZLE 3 HEAD 1" PIPE
8F3824	TURRET NOZZLE 2 HEAD 1" PIPE
8F3826	TURRET NOZZLE 3 HEAD 1" PIPE
8F3830	WET BOOM NOZZLE QJ 1" PIPE
8F3831	1 BARB 1/2" TURRET NZL W/CHK QJ
8F3832	2 BARB 1/2" TURRET NZL W/CHK QJ
8F3851	1 BARB 1/2" W/CHK LESS CLMP QJ
8F3852	2 BARB 1/2" W/CHK LESS CLMP QJ
8F3853	3 BARB 1/2" W/CHK LESS CLMP QJ
8F3861	CAP BLACK TEEJET QJ
8F3862	CAP WHITE TEEJET QJ
8F3863	CAP RED TEEJET QJ
8F3864	CAP BLUE TEEJET QJ
8F3865	CAP GREEN TEEJET QJ
8F3866	CAP YELLOW TEEJET QJ
8F3867	CAP BROWN TEEJET QJ
8F3868	CAP ORANGE TEEJET QJ
8F3881	DIAPHRAGM 1-1/32" OD SWIVEL JET
8F3882	DIAPHRAGM CAP ASSY 7.5 PSI SWJET
8F3883	DIAPHRAGM CAP ASSY 20 PSI SWJET
8F3884	LOWER DUAL BODY SWIVEL JET
8F3885	UPPER CLAMP 1" SWIVEL JET
8F3886	SCREW SWIVEL JET
8F3887	UPPER CLAMP 1" HYPRO PN WHL NOZ
8F3887A	O-RING HYPRO PIN WHEEL NOZZLE
8F3887B	DIAPHRAGM NUT ONLY HYPRO BLK
8F3888	SHUTOFF CAP HYPRO NOZ RED 10PSI
8F3888A	SHUTOFF CAP HYPRO NOZ GRY 17PSI
8F3889	SHUTOFF CAP HYPRO NOZ BLK 25PSI
8F3890	DIAPHRAGM EDPM HYPRO SHUTOFF
8F3891	SCREW & NUT FOR CLMP HYPRO PNWNZ
8F3892	SEAT GASKET EPDM QJ
8F3894	SEAT GASKET VITON QJ
8F3895	O-RING TURRET QJ
8F3896	DIAPHRAGM EPDM RUBBER QJ
8F3897	DIAPHRAGM VITON QJ
8F3898	DIAPHRAGM CAP ASSY 10PSI QJ
8F3899	DIAPHRAGM CAP ASSY 20PSI QJ
8F3899H	DIAPHRAGM CAP ASSY 30PSI QJ
8F3912	NOZZLE ELBOW 1/2" BRASS
8F3913	STREET ELBOW 1/4" BRASS
8F3914	FEMALE ELBOW 1/4" BRASS
8F3915	NIPPLE 1/4" BRASS 91-
8F3915A	NIPPLE 1/8" BRASS
8G0002	FLAT 3/8 X 3 X 15-1/2" W/HOLES 92-
8G0006	FLAT 3/8 X 1-1/2- 8-3/4" 98-
8G0008	FLAT 3/8 X 2 X 14-3/8" L 96-
8G0009	FLAT 1/4 X 2.5- 9" BRKT
8G0010	BRACKET GAUGE MOUNTING 95-
8G0020	FLAT 3/4 X 8- 7"
8G0204	TUBE SQ 3/4 X 14GA- 17.5" 98-
8G0206	TUBE SQ 1.5 X 11GA- 32" 97-
8G0208	TUBE SQ 1.5 X 11GA- 28.5" 96-
8G0210	TUBE SQ 1.5 X 11GA- 18" 99-
8G0240	TUBE REC 3 X 2 X 3T- 7"
8G1830	HOSE HOOK HAND GUN 1/2 X 13.5"
8G2015	CAST BREAKAWAY BOOM W/TUBE 4.5"
8G2027	CAST BRKAWAY CNT W/FLT ADJ4.5"
8G2040	SPRING BFSA HD 1.5 X 16" PTD
8G2050	SPRING BOOM BREAK-AWAY
8G2055	SPRING BREAKAWAY LONG
8G2060	WASHER GUIDE SPRING
8G2070	BUMPER THERMOPLASTIC
8G2072	BUMPER THERMOPLASTIC W/ BOLTS
8G2080	RUBBER ENGINE MOUNT
8G2160	SWING ARM
8G2200	JACK LEG
8G2240	SPACER BLOCK SKID KNOCK-ON
8G2250	FLAT 3/8 X 2- 5-1/2" BM SPG MNT
8G2260	PIVOT BOOM SPRING MOUNT
8G2264	FLAT 1/4 X 2- 4 1/2" FOLD
8G2266	FLAT 3/8 X 1.5- 10" FOLD
8G2270	BOOM SPRING MOUNT ASSY
8G2280	VALVE BRACKET SKID BOTTOM FILL
8G2282	NYLON TIE .187 X 7-1/2" RED
8G2283	NYLON TIE .187 X 7-1/2" ORANGE
8G2284	NYLON TIE .187 X 7-1/2" YELLOW
8G2286	NYLON TIE .187 X 7-1/2" GREEN
8G2380	CONTROL BOX LESS COVER TL
8G2384	COVER PLAIN TL
8G2386	SHEET MTL SCRW PPH #6 X 3/8" Z
8G2390	MOUNTING BRACKET TL
8G2540	CORRUGATED LOOM .500" ID

8G2542	CLIP CORRUGATED LOOM
8G2544	OUTLET CORRUGATED LOOM
8G4224	CONTROL SWING ARM 1.25" SQ
8G4230	TEE HANDLE 7/16" NC
8G4280	END STOP TUBE ASSY
8G5100	BOOM REAR CENTER (104") MID-MNT
8G5160	BASE CONTROL SWING ARM MID-MNT
8G5185	VERTICAL UPRIGHT ASSY LT 95-
8G5195	VERTICAL UPRIGHT ASSY RT 95-
8G5200	BRCKT TRNSPRT ADJ W/JACK ATTCH
8G6030	CENTER SWING 60' 3PT TIPLFT 6N
8G6050	CENTER SWING 66' 3PT TPLFT 1ON
8G6070	BOOM ATTACH-PVT LEFT HYD. TLFT
8G6072	BOOM ATTACH-PVT RGHT HYD. TLFT
8G6110	BOOM PART #1 LEFT 60' 8N
8G6120	BOOM PART #1 RIGHT 60' 8N
8G6130	BOOM PART #2 LEFT 60' 7N
8G6136	BOOM PART #2 LEFT 50' 4N
8G6140	BOOM PART #2 RIGHT 60' 7N
8G6146	BOOM PART #2 RIGHT 50' 4N
8G6180	A TRANSPORT LOCK REAR FOLD 60'
8G6184	TRNSPRT LCK CLEVIS 60' REAR FLD
8G6190	TRANSPORT LOCK # 2 BOOM 60' FS
8G8018	U-BOLT 3/8 X 4 X 6-1/16" SQ
8K8020	MOUNTING BRCKT LIGHT 88-
8K8068	7PIN MAIN HARNSS W/DUSTCP SHRT
8K8130	LIGHT MNT KIT TRCK SPRAYER 99-
8K8140	LIGHT MNT KIT 3PNT SPRAYER 99-
8K8150	LIGHT MNT KIT 2PNT SPRAYER 99-
8L0256	U-BOLT 1/4 X 1-1/2 X 2-1/2" SQ
8L0262	U-BOLT 5/16 X 1 X 2" SQ
8L0266	U-BOLT 1/2 X 3-1/2 X 5" SQ
8L0270	SLIDE BOLT LATCH ZINC PLATED
8L0300	EYE BOLT 1/2" NC X 4" 1" ID
8L0310	PROTECTOR WET BOOM 1-1/4 X 10
8L0320	PLATE 2PT CASTER WEAR 96-
8L0400	WINDSHIELD SQ MNTG BRCKT 96-
8L0410	WINDSHIELD RD MNTG BRCKT 96-
8L0500	MOUNT 440/450 GAUGE
8L0625	BUMPER THERMOPLASTIC
8L0650	SPRING BOOM SUSPENSION 12" LT
8L0652	SPRING BOOM SUSPENSION 12" HVY
8L0660	SPRING CABLE TENSION 1/2 X 24"
8L0715	HOSE VENT LINE 1/4 X 90" HYD 2PT
8L0716	HOSE VENT LINE 1/4 X 126" PTO 2PT
8L0720	HOSE PUMP SUCTION 1-1/4 X 40"
8L0722	HOSE PUMP SUCTION 1-1/4 X 48"
8L0731	HOSE MIDBOOM FEED 3/4 X 100" 2PT
8L0732	HOSE AGITATOR FEED 3/4 X 58" HYD
8L0742	HOSE LFT BOOM FEED 1 X 130" 2PT
8L0744	HOSE RGT BOOM FEED 1 X 148" 2PT
8L0746	HOSE PUMP DISCHARGE 1X19" HYD
8L0748	HOSE PUMP DISCHARGE 1 X 84" PTO
8L0906	EXT WETBOOM ALUM 21-3/8" 93-
8L0908	EXT WETBOOM ALUM 41-3/8" 93-
8L0909	TUBE WETBOOM 1 X 49" 22" SP 3NOZ
8L0910	EXT WETBOOM ALUM 59" 93-
8L0911	TUBE WETBOOM 1 X 93" 22" SP 5NOZ
8L0920	TUBE MID WETBOOM 1 X 105"
8L0922	TUBE MID WETBOOM 1 X 115" 22" SP
8L0928	TUBE WETBOOM 1 X 137" 22" SP 7NOZ
8L0930	TUBE PART 2 WETBOOM 1 X 165"
8L0940	TUBE PART 1 WETBOOM 1 X 225"
8L1015	SHOCK ABSORBER PAINTED 95-
8L1020	AXLE H611 1.75 X 12.75" 96-
8L1045	UHMW FLAT 1/4 X 5-11" CNTR 95-
8L1046	UHMW FLAT 1/4 X 5-11" W/NTCH 95-
8L1060	QUICKLINK 3/8"
8L1070	TURNBUCKLE 3/8" X 6" TAKE-UP
8L1110	CHAIN 5116 GRD 30 PRF Z 14 LINK
8L1145	SPRING CABLE 1/4X161 96-
8L1150	SPRING CABLE 1/4X219 93-
8L1155	SPRING CABLE 1/4X342 96-
8L1160	SPRING CABLE 1/4X456.5 93-
8L1452	POPPET 2WAY NORMALLY CLOSED
8L1458	SPOOL 4WAY 2POSITION TRK SPYR
8L1468	SMALL CART WATERPRF SEAL KIT
8L1472	SMALL COIL W/WPAC 12V 1.22AMPS
8L1499	MANIFOLD VALVE BLOCK HYD 3-BANK
8L1502	SEAL KIT FOR 8L1501
8L1504	SEAL KIT FOR 8L1456/1462/1503
8L1508	1/4-20X2" SOCKET HEAD CAP SCRW
8L1509	O-RINGS MANIFOLD TO POWER UNIT
8L1520	BREATHER HYDRAULIC POWER UNIT
8L1521	SOLENOID POWER UNIT MOTOR
8L1522	MOTOR ONLY FENNER POWER UNIT
8L1602	HYD POWER UNIT W/CONTRL 97-
8L1810	GROUND CABLE ASSY
8L1814	HONDA ENGINE STARTER CABLE
8L1815	POWER CABLE ASSY
8L1901	HARNESS 40' ELEC END NOZ DBOOM
8L1902	HARNESS 65' ELEC END NOZ WBOOM
8L3305	BRCKT LEFT REAR BOOM ADJ 95-
8L3310	WELD ASSY RIGHT REAR BOOM ADJ
8L3356	WELD ASSY ACCESS HANDLE 97-
8L3358	LADDER 2PNT & 1000CT (26") 97-
8L3360	WELD ASSY 2PT PLATFORM 97-
8L3361	WELD ASSY 2PT PLTFM EXT 98-
8L3362	WELD ASSY 500GAL 2PT SIGHTUBE
8L3363	WELD ASSY 750GAL 2PT SIGHTUBE
8L3364	WELD ASSY 2PT HITCH
8L3366	WELD ASSY 2PT 2" WHEEL LOCK
8L3367	WELD ASSY 2PT AXLE CONNECTER
8L3368	WELD ASSY 2PT 2.5" WHEEL LOCK
8L3370	WELD ASSY 2PT BALL HITCH 97-
8L3372	WELD ASSY RINSE GUN HOLSTR 96-
8L4004	SKID 50 GALLON RINSE TANK 98-
8L4965	WELD ASSY 3PT BOTTOM FILL 95-
8L4967	WELD ASSY 2PT BOTTOM FILL 96-
8L4972	STABILIZER LFT BOOM 2PT 96-
8L4974	STABILIZER RGT BOOM 2PT 96-
8L4978	STABILIZER LATCH ASSY LT 96-
8L4979	STABILIZER LATCH ASSY RT 96-
8L4982	BRACKET LFT PT2 LATCH 96-
8L4984	BRACKET RGT PT2 LATCH 96-
8L4986	LATCH CLIP PART 2 97-

8N2060	1/4 X 60" HYD HOSE #6FJX 3000PSI
8N2076	1/4 X 76" HYD HOSE #6FJX 3000PSI
8N2088	1/4 X 88" HYD HOSE #6FJX 3000PSI
8N2110	1/4 X 110" HYD HOSE #6FJX 3000PSI
8N2120	1/4 X 120" HYD HOSE #6FJX 3000PSI
8N2135	1/4 X 135" HYD HOSE #6FJX 3000PSI
8N2150	1/4 X 150" HYD HOSE #6FJX 3000PSI
8N2160	1/4 X 160" HYD HOSE #6FJX 3000 PSI
8N3028	3/8X 28" HYD HOSE #6FJX3000PSI
8N3048	3/8X 48" HYD HOSE #6FJX3000PSI
8N4060	1/2 X 60" HYD HOSE #10FJX 3000PSI
8R6040	PIN 1 X 5-1/2"
8S0100	BUCKLE 2" TANK STRAP 91-
8S0118	POLYESTER STRAP 2" X 114" BLK
8S0120	POLYESTER STRAP 2" X 140" BLK
8S0300	U-BOLT 3/8 X 2 X 4" SQ
8S0330	U-BOLT 1/2 X 3 X 4-1/4" SQ
8S0360	U-BOLT 5/8 X 6 X 4-1/2" SQ
8S1082	CABLE CLAMP 3/16" MALLEABLE
8S1100	CHAIN #3 X 4 LINK (6") 91-
8S1120	SLOW MOVING VEHICLE SIGN
8S1124	MOUNTING SOCKET SMV SIGN
8S1126	MNTNG SPADE W/HRDWRE SMV SIGN
8S2980	HYD HOSE CLAMP-SMALL-NYLON
8S3010	PIPE CLAMP 1" RIBBED-BLK PAIR
8S3038	CVR PLT 1-3/16 X 2-3/4" (1-1.5ID)
8S3104	CAP CLEAN WATER TANK
8S3108	SPIGOT ONLY CLEAN WATER TANK
8S3114	CROP CARE CLEAN H20 CAP 96-00
8S3115	CROP CARE CLEAN H20 CAP 01-
8S3130	CHEMICAL GOGGLE
8S3140	VINYL COATED GLOVES
8S4192	SPACER TUBE FOAM 1.5 X 3 X 7"99-
8S4193	SPACER TUBE FOAM 3SQ X 7" 99-
8S4194	PLATFORM FM 1500GAL ULT & 3PT 99-
8S6000	ATTACH CENTER BOOM 5/16 X 1.5-8"
8S6010	TUBE CENTER BOOM (15'6") FOR 66'
8S6040	""A" SLIDE & TRNSPRT LOCK 66' SS3
8X0211	NUT SER FLANG 5/16"-18NC GR2 ZDI
8X0212	NUT NY-LOCK 5/16"-18NC GR2 ZDI
8X0218	NUT SQ 1/4"-20NC GR2 SS
8X0220	NUT HEX 1/4"-20NC GR2 ZDI
8X0222	NUT NY-LOCK 1/4"-20NC GR2 ZDI
8X0223	NUT SER FLANG 1/4"-20NC GR2 ZDI
8X0232	NUT HEX 7/16"-14NC GR2 ZDI
8X0234	NUT NY-LOCK 7/16"-14NC GR2 ZDI
8X0240	NUT HEX 1/2"-13NC GR2 ZDI
8X0242	NUT NY-LOCK 1/2"-13NC GR2 ZDI
8X0250	NUT HEX 5/8"-11NC GR2 ZDI
8X0251	NUT JAM 5/8"-11NC GR2 ZDI
8X0253	NUT NY-LOCK 5/8"-11NC GR2 ZDI
8X0258	NUT SQ 3/4"-10NC GR2 PLN
8X0260	NUT HEX 3/4"-10NC GR2 ZDI
8X0261	NUT NY-LOCK 3/4"-10NC GR2 ZDI
8X0280	NUT HEX 1"-8NC GR2 ZDI
8X0281	NUT NY-LOCK 1"-8NC GR2 ZDI
8X0299	LOCKWASHER EXT TOOTH 1/4" SS
8X0300	LOCKWASHER 5/16 ZDI
8X0301	LOCKWASHER 3/8 ZDI
8X0302	LOCKWASHER 7/16 ZDI
8X0303	LOCKWASHER 1/2 ZDI
8X0304	LOCKWASHER 5/8 ZDI
8X0306	LOCKWASHER 3/4 ZDI
8X0308	LOCKWASHER 1/4 ZDI
8X0309	LOCKWASHER 1 ZDI
8X0312	WASHER FENDER 1/4 X 1-1/4" SS
8X0313	WASHER SPRING 2-1/2 OD X 1-1/4" ID
8X0314	WASHER FLT 2" OD X 49/64" ID - 1/4" BL
8X0318	WASHER FLAT 3/4 (13/16" ID) ZDI
8X0319	WASHER 7/8 OD X 17/32 ID X 16GA ZDI
8X0320	WASHER FLAT 3/8 (7/16" ID) ZDI
8X0322	WASHER FLAT 1/2 (9/16" ID) ZDI
8X0323	WASHER SAE FLAT 5/8" ZDI
8X0324	WASHER FLAT 5/8 (11/16" ID) ZDI
8X0325	WASHER FLAT 3/4 (13/16" ID) PLN
8X0326	WASHER FLAT 1-1/8 (1.25" ID) PLN
8X0327	WASHER SAE FLAT 1-1/4" ZDI
8X0329	WASHER FLAT 5/16" (3/8" ID) ZDI
8X0330	WASHER 1.25 X 17/32" ID ZDI
8X0364	WASHER 3-1/2" OD X 2-1/2" ID 14GA
8X0398	KEY SNAP NICKEL
8X0402	HAIR PIN CLIP 1/8 X 2-9/16"
8X0414	COTTER PIN 1/4 X 2" ZDI
8X0415	COTTER PIN 3/16 X 1-3/4" ZDI
8X0422	CLEVIS PIN 1/2 X 2-1/4" ZDI
8X0425	CLEVIS PIN 1/2 X 3" ZDI
8X0428	CLEVIS PIN 1/2 X 5-1/4" ZDI
8X0462	CLEVIS PIN 3/8 X 3" W/HOLE ZDI
8X0500	LYNCH PIN 7/16 X 1-3/4" ZDI
8X0505	S-HOOK .125 X 1-3/8 ZDI
8X0605	SET SCRW SQ HD 7/16-14X1" ZDI
8X0640	SET SCRW SQ HD 1/2-13X 1.5" PLN
8X0708	ZERK 1/4-28 NF STR ZDI
8X0710	ZERK 1/4-28 NF 90 DEG ZDI
8X0960	CAN SPRAY PAINT SUMMERS GREEN
8Z0079	"SUMMERS" DECAL 5X20"
8Z0080	BOOM RELEASE NOTICE DECAL 95-
8Z0082	3PT PARKING WARNING DECAL 97-
8Z0084	CASTER WHEEL ASSEMBLY TAG
8Z0086	ELECTROCUTION DANGER 2PT
8Z0087	“WARNING” PINCH POINT 2.5 X 7-1/2”
8Z0088	“WARNING” BOOM FOLD 2.25X7”
8Z0089	“DANGER” CONFINED SPACE 2.5 X 6”
8Z0096	500 ET SIGHT TUBE DECAL
8Z0097	750 ET SIGHT TUBE DECAL
8Z0202	“SUMMERS” 400 SKID DCL 4 X 13.5”
8Z0276	GENERAL CAUTION DECAL 91-
8Z0520	RINSE WAND ID TAG 2X2” 98-
8Z0800	REFLECTOR AMBER ADHSV-BCK 98-
8Z0805	REFLECTOR RED/ORANGE ADHSV-BCK 99-
8Z0810	REFLECTOR RED ADHSV-BCK 98-
8Z1103	OPER MANUAL TRUCK & TRCTR SPRAYER
8Z1107	APPLICATION RATE CARD TEEJET
8Z1121	SCS450 INSTALLN & SERVICE MANUAL

History of Summers Manufacturing Co., Inc.

1965 – Summers Manufacturing is founded by Harley Summers, who purchases patent rights for Goebel truck and pickup hoists from the Goebel Brothers of Lehr, ND. These hoists, produced in Harley Summers' blacksmith shop the first year, were distributed nationwide by a Cincinnati, Ohio, dealer. With increasing sales, the company soon outgrows the small shop. Summers wins the Herman harrow contract, beginning the company's Herman culti-harrow line. Summers builds a 7,200 square-foot factory in Maddock to meet the demand for truck and pickup hoists, as well as Herman harrows.

1969 – Firm incorporates and becomes officially known as Summers Manufacturing Company, Inc.

1970 – Summers purchases rights to manufacture/market the Herman Harrow.

1973 – Company builds new 20,000 square-foot plant and offices in Maddock, adding a 20,000 square-foot assembly plant in the fall of 1975 (completed in January 1976), bringing total square footage of Maddock factories to 47,000.

1977 – Summers introduces the Agri-sprayer, used in conjunction with the Herman culti-harrow to incorporate herbicides and liquid fertilizer.

1980 – Company purchases manufacturing and distributing rights to Crown rockpickers from Crown Manufacturers of Regina, Saskatchewan. This forces another expansion project – a 26,000 square foot factory on a 24 acre site in Devils Lake, ND Industrial Park.

1981 – Company establishes a branch facility in Regina, Saskatchewan.

1982 – Devils Lake plant begins operations in January, manufacturing supersprayers and rockpickers. The Maddock factory begins producing the Superweeder, a combination cultivator and harrow.

1983 – Summers buys manufacturing and distributing rights to the Fargo Field Sprayer line from Mid America Steel (formerly Fargo Foundry), Fargo. This field sprayer line is manufactured at the Devils Lake plant. Harley Summers is selected North Dakota's small-businessman of the year by the Small Business Administration.

1984 – Herman Diamond Disk, a disk harrow made in a diamond shape to reduce blade breakage from rocks, comes off the assembly line.

1985 – Summers signs a contract with Melroe Company of Bismarck to obtain exclusive manufacturing rights to the Melroe harrow line.

1989 – Summers purchases TorMaster Company of Hordean, Manitoba, giving the company a line of rolling packer equipment, comprised of harrow packers and hydraulic folding packer drawbars.

1992 – A new engineering office/parts department is added to the Devils Lake factory.

1993 – Company adds two new products: a pickup-mounted sprayer with booms of 80 and 90 feet, and the Summers Superharrow, an extra-heavy-duty residue-management tool designed for the minimum and no-till farmer.

1994 – a 50 by 125 foot addition to the Maddock factory is completed. Construction begins on a 24,576 square-foot addition to the Devils Lake factory, which will enable the company to increase production of truck-mounted and pull-type supersprayers and rockpickers.

1996 – 1500 square foot office area added to the Maddock plant. Company introduces Chisel Plow with floating hitch and 700# trip assembly.

1997 – 16,800 square foot warehouse in Maddock purchased from local business.

1999 - Company introduces the Ultimate suspended boom trailer sprayer with hydraulic folding booms. Additional sizes were added to the Chisel Plow line, now ranging from 28' to 54'.

2000 - Company introduces the Supercoulter, the innovative solution for excessive field residue management on no-till, minimum-till, and conventional-till farming operations.

2001 - Cold storage building completed at Devils Lake. Company extends boom lengths up to 110 feet on the Ultimate Supersprayer.

2002 - Company adds a warehouse and service man in Aberdeen, SD.

2003 - Company introduces the Ultimate NT Supersprayer featuring a bolt on axle for easier adjustment, and a new family of tanks that feature a drainable sump and a common width dimension.

2004 - A 124 ft. x 310 ft. addition is added onto the current Devils Lake plant.

2005 - The Summers Superroller is added to the "Field Tested Tough" product line. Additional sizes of 56', 58' and 60' are added to the Superchisel line.

Summers distributes on a wholesale level to dealers and distributors throughout markets in North Dakota, South Dakota, Minnesota, Montana, Iowa, Washington, Idaho, Oregon, Utah, Colorado, Kansas, Nebraska, Oklahoma, Texas, Manitoba, Saskatchewan, Alberta and British Columbia, making it an international company.


Superroller
Model 94 Mounted Harrows
Model 104 & 106 Mounted Harrows
Truck Mnt. Supersprayer
Diamond Disk
Hyd. Fold Packer & Harrow Packer
SUMMERS
Manufacturing
Superharrow Plus and Culti-Harrow
Superchisel
Model 700 Rock Picker
3-Pnt Mnt. Supersprayer
Ultra & Ultimate NT Supersprayer
Supercoulter Plus
2-Pnt Semi-Mnt. Supersprayer
4-Rank Superweeder