PULBLAST *A/R PUMP*

READ THIS MANUAL BEFORE OPERATING

06.20.18

Rears Manufacturing Company Inc. www.rearsmfg.com 800 547 8925

Sprayer Safety: Operator Training

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

READ THE OPERATOR'S MANUAL

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

READ THE OPERATOR'S MANUAL

It has been said, *the best safety device is an informed, careful operator*. We ask you to be that kind of an operator. It is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow these. Accidents can be avoided.

READ THE OPERATOR'S MANUAL

Working with unfamiliar equipment can lead to careless injuries. *Read this manual and the manual for your tractor* before assembly or operation, to acquaint yourself with the machines. If this machine is used by any person other than the owner or is loaned or rented, it is the owner's responsibility to make certain that the operator has instruction for the safe and proper use of the machinery and that the operator reads and understands the operator's manuals.

Know your controls and how to stop the tractor, engine, and implement quickly in an emergency. Read this manual and the one provided with the tractor.

Train all new personnel and review instructions frequently with existing workers. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

Do not allow children to operate this machine.

Sprayer Safety: Preparation

Never operate the tractor and implement until you read and completely understand this manual, the tractor operator's manual, and each of the safety messages found on the safety decals on the tractor and the implement.

Personal protection equipment, including a hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintenance, repair, removal, or transport of this implement. Do not allow long hair, loose fitting clothing or jewellery to be around moving parts.

Tractors, with or without implements, can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the operator's position exceeds 80db. Long-term exposure to noise over 85db can cause severe hearing loss. Long-term exposure to noise over 90db may cause permanent, total hearing loss. **NOTE: Hearing loss from loud noise (from tractors, chain saws, radio earphones) is cumulative over a lifetime without hope of natural recovery.**

Operate the implement only with a tractor equipped with an approved Roll-Over-Protection-System (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off a tractor– particularly during a turnover, when the operator could be pinned under the tractor.

Operate only in daylight or good artificial light.

Ensure the implement is properly mounted and in good operating condition.

Safety shielding and safety decals must be properly installed and in good condition.

Sprayer Safety: Starting & Stopping

Implement operating power is supplied from the tractor's PTO. Refer to your tractor manual for PTO engagement and disengagement instructions. Always operate the implement at its required PTO speed: either 540 or 1000 rpm. Know how to stop the tractor and implement quickly in case of an emergency. Keep children away at all times.

When engaging the PTO, the engine RPM should always be low. Once engaged, raise the PTO speed to the implement's required operating speed: either 540 or 1000 rpm.

Check the tractor master shield over the PTO stub shaft. Make sure it is in good condition and fastened securely to the tractor. Purchase a new shield if the old shield is damaged or missing. A tractor salvage yard is a good source for older tractors.

Tractors without a *live* PTO need to be equipped with an over-running PTO clutch attachment, available through most farm equipment suppliers. NOTE: the addition of an over-running PTO clutch attachment will change the length of the PTO driveline required. Pay extra attention to the instructions on PTO driveline installation.

Sprayer Safety: Chemicals

Never provide agricultural chemicals to anyone unless that person has been properly trained or licensed.

Make certain the entire manufacturer's label appears on the chemical container. Always follow the manufacturer's instructions for storage, handling, and application.

Before a spraying operation is started the spray system should be rinsed and all nozzles, screens, and strainers cleaned. The best time to rinse and clean the spray system is at the END of daily operations, before storing the implement for the night. If cleaning is conscientiously included in day-end procedures, rinsate and the disposal of cleaning solution can easily be incorporated into your spray plan. Be careful if re-applying rinse solution to treated area: do not exceed the maximum rate for which the chemical is labeled.

Wear proper protective equipment when adding chemicals to the spray tank. The area where you are mixing must have adequate ventilation: powders, dust, and granuals can become airborn when adding to the spray tank; concentrated vapors can pose health or flammability hazards.

Mix only enough chemical for the particular job. Preventing chemical surplus is the best way to prevent a disposal problem.

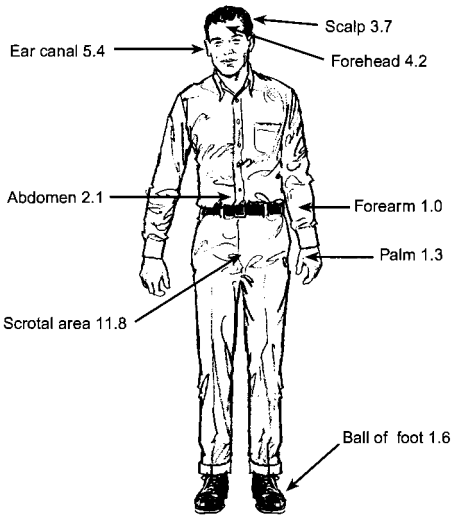
Be aware of meteorological conditions and plan spray applications during opportune times. High winds and low humidity will increase drift and adversely affect your spray program.

Be alert for nozzle clogging and changes in nozzle patterns. Use strainers and nozzle screens appropriate for your water source and chemical use.

Use a brush or wood toothpick to clear nozzles- never a metal object. A metal object can damage the spray orifice and significantly alter your application rate. Never attempt to clear a spray tip by blowing through it. Operators should carry spare spray tips.

If nozzles clog or other troubles occur in the field, shut the sprayer off and move to an unsprayed area before dismounting from the sprayer to work on it.

The skin on various body parts does not absorb pesticides at the same rate. The figure, right, illustrates skin absorption rates based on a numerical scale in which the value of 1 for the forearm represents the lowest dermal absorption rate. That value forms the basis for the assignment of values to the other body parts.



Skin absorption rates
in relation to forearm (1.0)

If concentrated liquid chemical is spilled on your clothing (not including rubber gloves, boots, or aprons) immediately remove the clothing and throw away. Undiluted chemicals cannot be cleaned from clothing. Dispose of contaminated clothing as required by local regulations.

Always treat clothes worn when using agricultural chemicals as contaminated. Keep them separate from your other clothes or the family washload.

Contact your local extension service for instructions for cleaning work clothes contaminated by chemical handling. Most state agricultural universities and farm bureaus have detailed instructions for the decontamination of work clothes.

Line dry your work clothes to avoid contaminating your dryer.

Chemical resistant gloves make a big difference BUT don't rub contaminated gloves on your skin. **A good safety practice before eating, drinking, smoking, or using the bathroom: rinse your gloves thoroughly *BEFORE* removing them then take off your gloves and wash your hands.**

Trained personnel should thoroughly clean the inside and outside of mixing and application equipment immediately after use. Follow all chemical handling directions supplied by the manufacturer and wear recommended safety equipment. Clean and neutralize the pump system, spray manifolds, and spray tank as recommended by the chemical manufacturer. Cleaning between implement uses will reduce corrosion, extend pump life, and keep your chemical tools from reacting with residual incompatible mixes.

Always follow the chemical manufacturer's instructions and environmental regulations when disposing of chemical waste and empty chemical containers.

The information included in this **Chemical Safety** section was compiled from the following government and community education programs:

Oregon Occupational Safety & Health

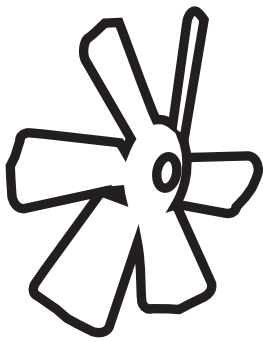
Alliance for a Clean Rural Environment

University of Missouri Outreach & Extension

California Dept. of Pesticide Regulation

All listed source organizations have more detailed information on the internet.

Sprayer Safety: Pre-operation



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

Frequently check fan blades. They should be free of nicks and cracks. The fan guard must be kept clean and in good repair.

The mechanical cabinet access guards, fan guard, sag chains, driveline shields, and gearbox shields should be used and maintained in good working condition. They should be inspected carefully, at least daily, for missing or broken cable, chain links, shields, or guards. Missing, broken or worn items must be replaced at once to reduce the possibility of injury from thrown objects or entanglement.

Check that all fasteners are tight.

Always follow the chemical manufacturer's instructions for storage, handling, and application of agricultural chemicals. When handling spray equipment, valves, nozzles, strainers: wear the safety equipment recommended by the chemical manufacturer.

Before a spraying operation is started, rinse out the sprayer; remove and clean all nozzles, nozzle screens and strainers. Make sure all spray orifices are sized correctly for your application and not worn. Use strainers and nozzle screens appropriate for your water source and chemical use.

Check all lines, valves and seals for leaks after filling with water and during calibration. Replace all weather cracked or worn hoses.

Wear proper protective equipment when adding chemicals to the spray tank. The area where you are mixing must have adequate ventilation: powders, dust, and granuals can become airborn when adding to the spray tank; concentrated vapors can pose health or flammability hazards.

Always follow the chemical manufacturer's instructions and environmental regulations when disposing of chemical waste and empty chemical containers.

Mix only enough chemical for the particular job. Preventing chemical surplus is the best way to prevent a disposal problem.

Have a plan for application of end-of-day tank-mix and rinse water. In some cases small amounts of surplus chemical can be diluted and reapplied to the treated area. Always follow the manufacturer's application instructions. Do not exceed the maximum application rate for which the chemical is labelled.

Be aware of the meteorological conditions and plan spray applications during opportune times. High winds and low humidity will increase drift and adversely affect your spray program.

Avoid spraying near lakes, streams, pastures, population areas (houses, schools, playgrounds, hospitals) beehives or sensitive non-target crops. Always spray downwind from these sensitive areas and do not spray during adverse wind or low humidity conditions.

Follow your sprayer lubrication schedule.

Sprayer Safety: Operation

The use of this equipment is subject to certain hazards which cannot be protected against by mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to use. If there is something in this manual you do not understand, ask your supervisor, dealer, or call the manufacturer.

Most accidents occur because of neglect or carelessness. Keep all helpers and bystanders at least several hundred feet away from the operating implement. Only properly trained people should operate this machine. Keep children away at all times.

The majority of accidents invlolve entanglement on a driveline, and operators being knocked off the tractor by low hanging limbs and run over. Accidents are most likely to occur with untrained operators or machines that are loaned or rented to someone who has not read the owner's manual and is not familiar with the implement.

Always stop the tractor, set the brake, shut off the engine, remove the ignition key before dismounting the tractor. **Never leave equipment unattended with the tractor running.**

Never place any part of your body in the mechanical compartment with tractor engine running or before you are sure all motion has stopped.
Stay clear of all moving parts.

Do not reach or place yourself under equipment until it is blocked securely.

Engage the PTO at low RPM and then bring the PTO speed up to operating speed.

Do not engage the implement PTO with the tractor and implement at right angles. Lessen strain on drivetrain by starting PTO when tractor and implement are in-line.

PAKBLAST AND PULBLAST UNITS: Never engage the fan at high speed.

POWERBLAST UNITS: When engaging the fan clutch the engine speed should be 1000RPM. Engaging the clutch at this speed, not greater or less, will ensure long clutch life.

Do not disengage the PTO while turning.

Take all possible precautions when leaving unit unattended: disengage PTO, set parking brake, stop engine, and remove key from ignition.

Do not allow riders on the implement or tractor at any time. There is no safe place for any riders.

Disengage PTO and place transmission into neutral before attempting to start the engine.

Do not operate unless all personnel, livestock, and pets are out of your application area. Never direct discharge toward anyone. Keep children away at all times.

Inspect the entire machine periodically as indicated in the maintenance section of this manual. Look for loose fasteners, worn or broken parts, pinched hydraulic hoses, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. Install and secure all guards and shields before starting or operating.

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

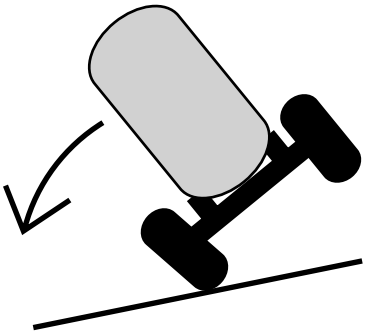
This implement is designed for use only on tractors with 540/1000 RPM power-take-off. **DO NOT EXCEED YOUR IMPLEMENT'S RATED PTO SPEED.**

If possible when applying chemical, work your way up-wind through your application area. By approaching the application such that drift goes into already treated rows the amount of chemical that will be blown onto the operator is reduced.

Be alert for nozzle clogging and changes in nozzle patterns. If nozzles clog or other troubles occur in the field, shut the sprayer off and move to an unsprayed area before dismounting from the tractor.

Never try to unclog a nozzle by blowing through it. Always carry extra spray tips.

Never operate tractor and implement under trees with low hanging limbs: the operator can be knocked off the tractor and run-over.



Stay alert for holes, rocks and roots in the terrain and other hidden hazards. Keep away from drop-offs.

Use extreme care and maintain minimum ground speed when transporting on hillside, over rough ground and when operating close to ditches or fences. Be careful when turning sharp corners.

Reduce speed on slopes and sharp turns to minimize tipping or loss of control. Be careful when changing directions on slopes. Do not start or stop suddenly on slopes. Avoid operation on steep slopes.

When using an implement, 20% of the combined tractor and implement weight (at a minimum!) must be on the tractor's front wheels. Without this weight, the tractor could tip over, causing personal injury or death. The weight may be attained with a front end loader, front wheel weights, ballast in the tires or front tractor weights. When attaining this minimum 20% front wheel weight, you must not exceed the ROPS weight rating. Weigh the tractor and the implement. Do not guess or estimate!

Be careful when operating the tractor and implement on uneven ground to avoid upsetting.

In extremely uneven terrain, front wheel weights, front tractor weights, and/or tire ballast should be used to improve stability.

Pass diagonally through sharp dips and avoid sharp drops to prevent *hanging up* the tractor and implement. Practice improves skills in maneuvering rough terrain.

Avoid sudden starts and stops while travelling up or downhill.

Always travel down slopes, never across the face. Avoid operation on steep slopes. Slow down on sharp turns and slopes to prevent tipping and/or loss of control.

Sprayer Safety: Tires

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

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

Inflating or servicing tires can be dangerous. Whenever possible, trained personnel should be called to service and/or mount tires.

Always order and install tires and wheels with appropriate capacity to meet or exceed the anticipated weight to be placed on them.

Sprayer Safety: Maintenance

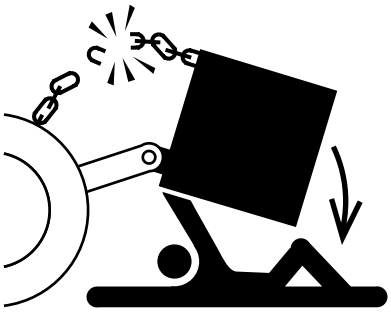
Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

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

Make sure there is plenty of ventilation. Never operate gas/diesel engines in a closed building. The exhaust fumes may cause asphyxiation.

When handling spray equipment, pumps, valves, nozzles, strainers: wear the safety equipment recommended by the chemical manufacturer. Before working on the equipment, be certain the components are clean and neutralized as instructed by the chemical manufacturer.

Before working on this machine, disengage the PTO, shut off the engine, set the brakes and remove the key from the ignition.



Be certain all moving parts on tractor and implement have come to a complete stop before attempting to perform maintenance.

Never work under equipment unless it is blocked securely.

When performing any service or maintenance, always use personal protection devices such as eye, hand and hearing protection.

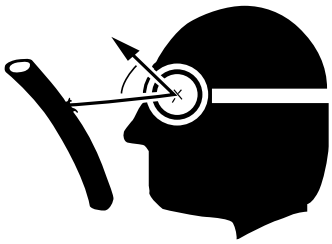
Trained personnel should throughly clean the inside and outside of equipment immediately after use. Follow all chemical handling directions supplied by the manufacturer and wear recommended safety equipment. Clean and neutralize the pump system, spray manifolds, and spray tank as recommended by the chemical manufacturer. Cleaning between implement uses will reduce corrosion, extend pump life, and keep your chemical tools from reacting with residual incompatible mixes.

Frequently check fan blades. They should be free of nicks or cracks and kept clean.

Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to insure unit is in a safe condition.

When completing a maintenance or service function, make sure all safety shields and devices are installed before placing the unit back in service.

Remove hydraulic pressure prior to doing any maintenance. Block the implement securely, disengage the PTO, and turn off the engine.



Never use your hands or any part of your body to locate a hydraulic leak. Use a piece of cardboard or wood to pass along the hydraulic line and determine the location of any leak. Wear protective gloves and glasses. Hydraulic fluid escaping under pressure can penetrate the skin. Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. If injured by escaping hydraulic fluid, see a doctor at once. Gangrene and death can result. Without immediate medical treatment, serious infection and reactions can occur.

When disconnecting hydraulic lines, shut off supply: relieve all hydraulic pressure.

Before pressurizing system, inspect all components. Make sure fittings are tight and lines are not worn, kinked or damaged.

After servicing, be sure all tools, parts and service equipment are removed.

Do not allow grease or oil build up on any deck or platform.

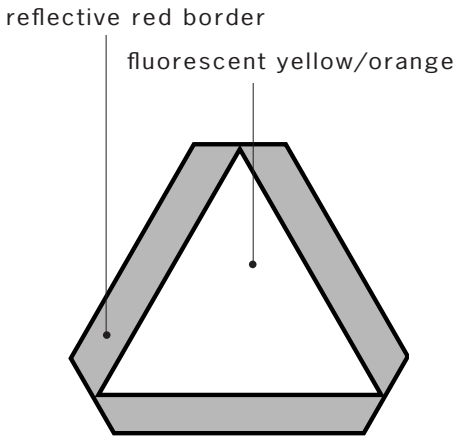
Never replace hex bolts with less than grade 5 bolts unless otherwise specified, i.e. shear bolts. Refer to bolt torque chart for head identification markings.

Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use.

If equipment has been altered in any way from the original design, the manufacturer does not accept any liability for injury or warranty.

A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this or any equipment.

Sprayer Safety: Transport



slow moving vehicle emblem

Comply with state and local laws governing highway safety and movement of farm machinery on public roads.

The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.

When driving the tractor and equipment on the road or highway under 20mph (32kph) at night or during the day, use flashing amber warning lights and a slow moving vehicle identification emblem (SMV).

Plan your route to avoid heavy traffic.

Always install transport locks, pins or brackets before transporting.

Do not drink and drive.

Watch out for traffic when operating near or crossing roadways.

When driving hills or curves, slow down and make gentle turns. Make certain that at least 20% of the total weight of tractor and implement is on the front wheels to maintain safe steerage. Slow down on rough or uneven surfaces.

Use extreme care and maintain minimum ground speed when transporting on hillsides, rough ground, or when travelling close to ditches and fences. Be careful when steering around sharp corners.

Never allow riders on either the tractor or implement. Falling off can kill.

Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.

Do not exceed 20mph (32kph). Reduce speed on rough roads and surfaces.

Use hardened hitch pins with retainers when attaching to pull-type machines.

Use a safety chain to prevent unexpected separation with pull-type models.

Sprayer Safety: Storage

With pull-type units, never unhitch the implement without using the tongue jack. The tongue is very heavy. Attempting to lift the tongue without using the tongue jack could cause personal injury. Overloading the jack can cause failure with possible serious injury or even death.

Trained personnel should thoroughly clean the inside and outside of equipment immediately after use. Personnel should wear protective equipment as recommended by the chemical manufacturer.

Before storing the sprayer for an extended period flush the plumbing with a light weight oil mixture with water (approx. 1 gallon of oil for 40 gallons of water). When draining spray manifolds, remove the check-valve cap from the top-most nozzle assembly to release vacuum. Flush pump and system with RV antifreeze solution and leave solution in the pump for storage. Remove nozzle tips and screens and store in a can of light oil to prevent corrosion. Plug the nozzle openings with blanks.

Lubricate as instructed in the maintenance schedule.

Inspect all lines, hoses, valves before storing. Damage to pump and plumbing should be repaired before storage. Make a list of replacement parts needed and order early. For the best performance next season, have your dealer service the machine prior to storage.

Re-paint all parts where the paint has been worn.

Store the implement away from activity.

Do not park equipment where it will be exposed to livestock. Damage to equipment or injury to livestock could result.

Do not permit children to play on or around the implement.

Make sure the parked unit is on a hard, level surface with all safety devices in place and in good working condition. Block up frame to lighten load on tires. Do not deflate tires. Cover tires if exposed to sunlight, grease, or oil.

Sprayer Safety: Safety Decals

This is the SAFETY-ALERT symbol. This symbol is used to visibly mark operating hazards. YOU MUST FOLLOW THE DIRECTIONS POSTED BESIDE THE SAFETY-ALERT SYMBOL TO AVOID BODILY INJURY OR DEATH. Before you operate any machinery, read the operator's manual. A copy of every SAFETY-ALERT decal on your implement is included in your operator's manual with a map of each decal on your implement. With your operator's manual in hand, walk around the implement: find, read, and UNDERSTAND every SAFETY-ALERT decal.

EVERY OPERATOR OF THIS IMPLEMENT MUST DO THIS FOR THEIR OWN SAFETY.

On Safety Decals, there is often a signal word: DANGER, WARNING, CAUTION. These signal words indicate the level of hazard or degree of seriousness for the described hazard on the decal.

⚠ WARNING — Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

⚠ CAUTION — Indicates a potentially hazardous situation that, if not avoided, may result in death or serious injury.

⚠ DANGER — Indicates an area of extreme danger- machine components and hazardous operations that, for functional purposes, cannot be guarded and, if not avoided, could result in death or serious injury.

IMPORTANT — Warns the operator of potential machine damage if indicated procedure is not followed.

decals won't help if you can't read them

Keep safety decals clean and legible at all times and replace safety decals that are missing or have become illegible.

When parts that bear safety decals are replaced, the replacement parts must have a current safety decal. Safety decals are available from your dealer or direct from the manufacturer.

install the decals properly and they'll stick around

When applying a safety decal, be sure the application surface is clean (free of dirt and grease) and dry. The surface you are applying the decal to should be above 50°F (10°C).

OPERATOR RESPONSIBILITIES

MAINTAIN ALL FASTENERS FOR TIGHTNESS:
WHEEL HUB BOLTS, AXLE CLAMPS, TANK MOUNTS, PUMP MOUNTING BOLTS, GEARBOX MOUNTING BOLTS, STRAINER MOUNTING BOLTS, ETC.

DAMAGE TO EQUIPMENT DUE TO LOOSE FASTENERS IN THE RESPONSIBILITY OF THE OPERATOR AND NOT COVERED BY WARRANTY.

10

⊕ CAUTION

1. Keep All Shields in Place.
2. Before Serving, Adjusting or Working on Machine: Disengage Power, Shut Off Engine and Make Sure All Moving Parts Have Stopped.
3. Do Not Stand Near Machine When in Operation.

Rear's Mfg. Co.
2140 Prairie Rd.
Eugene, OR 97402

11

⚠ DANGER

DANGER
SHIELD MISSING
DO NOT OPERATE

LZ WEASLER 13-10022-00

DANGER
SHIELD MISSING
DO NOT OPERATE

LZ WEASLER 13-10022-00

DANGER

88

⚠ DANGER

– ROTATING DRIVELINE –

KEEP ALL SHIELDS AND GUARDS SERVICED AND IN PLACE. INJURY OR DEATH CAN RESULT FROM WRAPPING OR ENTANGLEMENT.

KEEP ALL SHIELDS AND GUARDS SERVICED AND IN PLACE. INJURY OR DEATH CAN RESULT FROM WRAPPING OR ENTANGLEMENT.

Decal 89

89

CAUTION

BEFORE MIXING SPRAYS OR SPRAYING BE SURE YOUR PROTECTIVE CLOTHING, GLOVES, FACE SHIELD AND RESPIRATOR ARE ALL IN PERFECT CONDITION.

READ AND OBSERVE ALL PRECAUTIONS ON LABELS OF MATERIALS BEING USED.

BE A GOOD NEIGHBOR; DO NOT SPRAY UNDER CONDITIONS THAT WILL CAUSE DRIFT FROM THE TARGET AREA.

REAR'S MANUFACTURING EUGENE, OREGON

DECAL111

111

⚠ WARNING

HIGH-PRESSURE FLUID HAZARD
- Relieve pressure on system before repairing or adjusting.
- Wear proper hand & eye protection when searching for leaks,use wood or cardboard not hands.

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.

91

Rear's Mfg. Co. EUGENE, OR

THIS UNIT NOT INTENDED FOR HIGHWAY USE

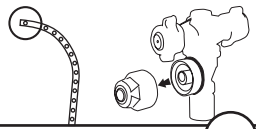
15

STAINLESS STEEL TANK AND MECHANICAL AGITATION

16

ATTENTION!

WHEN DRAINING MANIFOLD, REMOVE CHECK VALVE CAP FROM THE TOP MANIFOLD NOZZLE ASSEMBLY.



129

⚠ DANGER

NO RIDERS
NO PASAJEROS

195

SPRAYER OPERATION

DO NOT RUN PUMP WITH SUCTION VALVE CLOSED

HYPRO nylon roller pumps	Do not run dry
HYPRO piston pumps	Grease daily Do not run with leaky piston cups
REARS centrifugal pumps HYPRO centrifugal pumps	Do not run dry
WANNER pumps	Grease daily when bearings are warm If weep hole leaks, replace cups
A/R pumps	Maintain oil level (30wt) on fill neck.

Diaphragm and piston pumps use an air dome to reduce **PUMP PULSATION.** When pump is not operating, charge air dome to 1/10 working pressure. Start pump to check pulsation. Minor pressure increase or decrease can make significant changes: adjust for smoothest performance.

If **PRESSURE DROPS** during operation, check the following, in the order listed: ① Plugged suction line or strainer. ② Check belt tension on belt driven pumps. ③ Worn relief valve- repair if tightening valve does not prevent excessive return flow to tank. ④ Worn pump valves. ⑤ Worn nozzles.

MAINTENANCE

daily
1. visually check belts and keep adjusted.
2. check strainers often and keep clean.
3. visually check agitator chain- keep clean.
4. grease u-joint and agitator lube points.
5. flush tank and system to prevent chemical build-up.

winterizing
1. flush tank & system with water.
2. flush pump & system with RV antifreeze solution.
3. leave antifreeze solution in pump for storage.
4. lubricate all u-joints & agitator bearings.

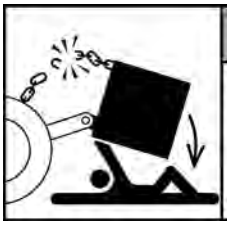
!WARNING!

DO NOT engage PTO with tractor and implement at right angles
DO NOT engage PTO suddenly.
DO NOT engage PTO at high engine RPM.

DO NOT RUN PUMP WITH SUCTION VALVE CLOSED

DECAL05

5

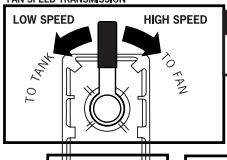


⚠ WARNING

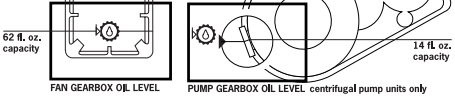
DO NOT PLACE ANY PART OF BODY UNDER RAISED IMPLEMENT.

102

FAN SPEED TRANSMISSION



⚠ WARNING
DO NOT SHIFT TRANSMISSION WITH PTO ENGAGED.

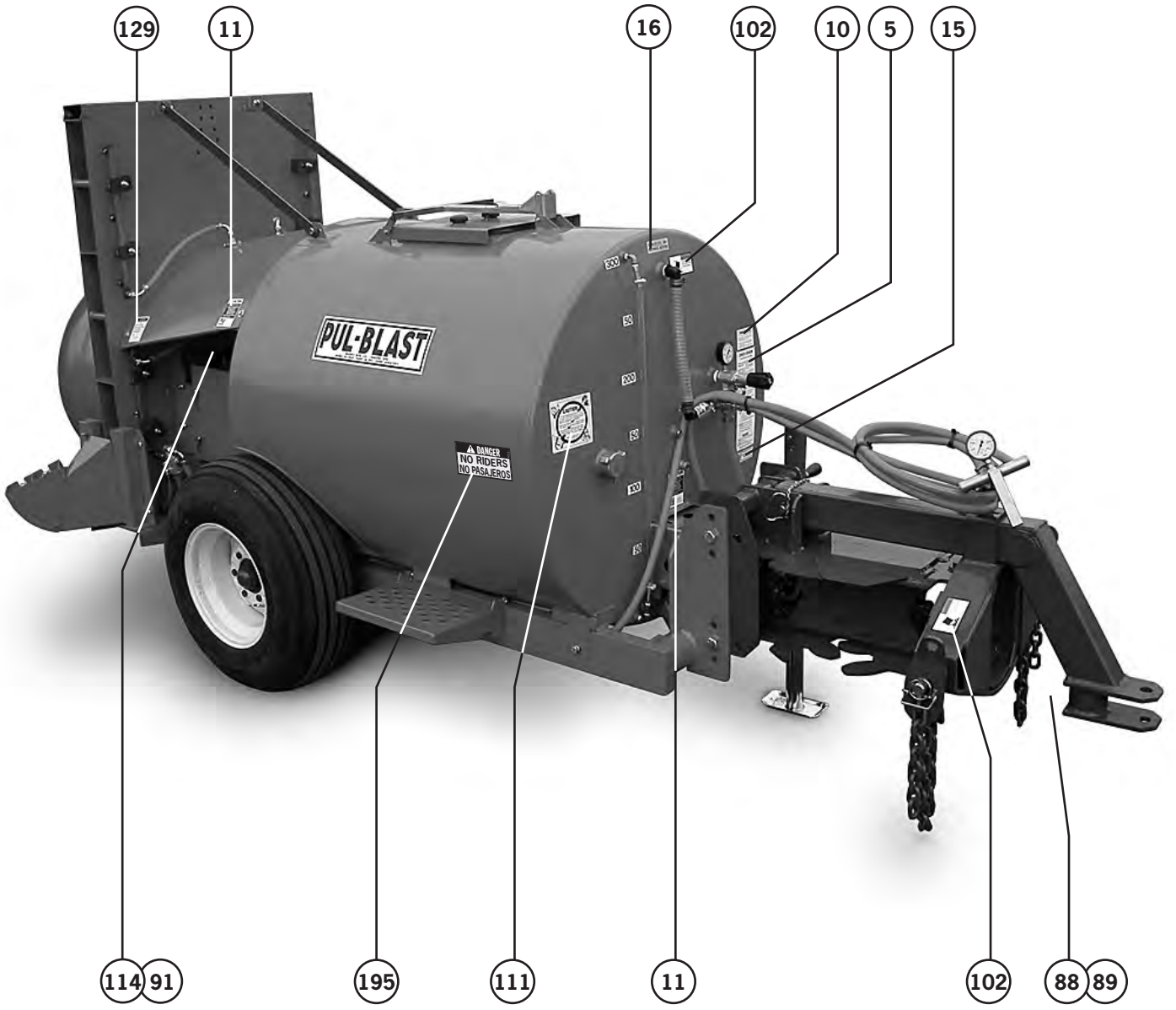


FAN GEARBOX OIL LEVEL
PUMP GEARBOX OIL LEVEL centrifugal pump units only

FREQUENCY	GEARBOX MAINTENANCE
Daily fan and pump gearbox	Check the oil level (the location of oil level sight gauges are indicated on the diagrams, above). Top off with an **AGMA No. 2EP** rated gear lubricant, such as **Mobilgear 626.**
200 HRS or **Seasonally** whichever comes first	Gearbox oil change. Drain the gearbox while warm and refill with **AGMA No. 2EP** rated gear lubricant, such as **Mobilgear 626.**
fan and pump gearbox	For gearbox oil capacity see diagrams, above.

AGITATOR BELT	PUMP BELT

114



implement driveline

Safety Decal Locations

For the safety of operators, maintenance workers, and bystanders, familiarize yourself with the safety decals on the sprayer. Decals indicated on the illustration, above, are reproduced on the previous page.

Decal 88 and 89 are on the implement driveline. Decal 88 can only be seen if a guard is removed.

Decal 91 is only present on units with hydraulic controls.

Make certain all decals listed here are present on the sprayer and in good condition. Replacement decals are available from your dealer or direct from Rears.

Hook-up instructions *Modular Tongue*

1. Read and understand all instructions before beginning.
2. Adjust tractor drawbar *fig.1*. **For drivetrain longevity, it is important that these alignments be within specified tolerances.**
3. Connect implement hitch pin to tractor. DO NOT install driveline.
4. As illustrated in *fig ii*, position tractor and implement at maximum angle.
5. Install the driveline onto the tractor PTO shaft and implement drive shaft: spline lock must snap into shaft groove. Be certain u-joints align exactly as illustrated in *fig ii*.

   If connection cannot be made, contact your **dealer** for tractor drawbar modification.

   Never engage PTO when tractor and implement are at an angle. For long drivetrain life, the tractor and implement should be in-line when engaging or disengaging the PTO drive.

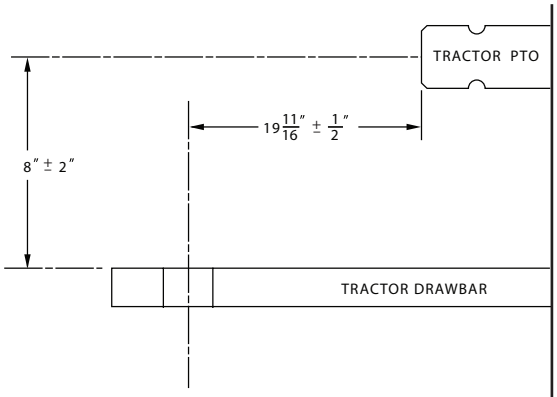


fig i

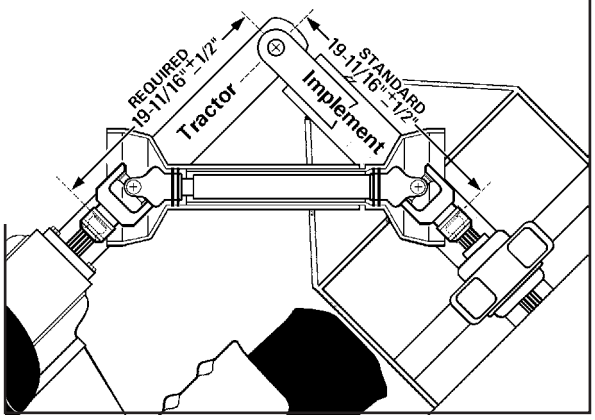


fig ii

U-Joints must be aligned as shown (in phase) or damage will occur.

NEVER engage PTO when tractor and implement are at an angle.

Hook-up instructions *Tongue Mounted Pump*

1. Read and understand all instructions before beginning.

2. Adjust tractor drawbar *fig.1*.

Measure the horizontal distance between the pump shaft spline lock groove and the hitch pin as illustrated in *fig. 1* (the **min/max** dimension).

See the chart, below. Be certain you have the correct driveline for your pump shaft-hitchpin measurement.

For drivetrain longevity, it is important that these alignments be within specified tolerances.

3. Connect implement hitch pin to tractor drawbar. DO NOT install driveline.

4. As illustrated in *fig i*, check the shaft height offset:

- Measure tractor PTO shaft center height.
- With implement frame parallel to the ground, measure hitch center-link shaft center height. If the center-link shaft height is within 3" (+/–) of the PTO shaft height, *fig. i*, continue to the next step. If the difference is greater than 3", adjust the hitch height as follows.
- To safely adjust the hitch/pump mount height: block the sprayer wheels and block up the hitch assembly.
- Make a note of the shaft-height difference BEFORE you remove the hitch bolts *fig. ii*. Remove the 4 bolts that mount the hitch to the frame mast.
- Using the sprayer jack, adjust the height of the hitch: to LOWER the hitch height, raise the sprayer height; to RAISE the hitch, lower the sprayer.
- Re-use the mount fasteners to bolt the hitch to the mast holes closest to your desired height.

5. Install the driveline onto the tractor PTO shaft and pump shaft: spline lock must snap into shaft groove.

Never engage PTO when tractor and implement are at an angle. For long drivetrain life, the tractor and implement should be in-line when engaging or disengaging the PTO drive.

NEVER engage PTO when tractor and implement are at an angle.

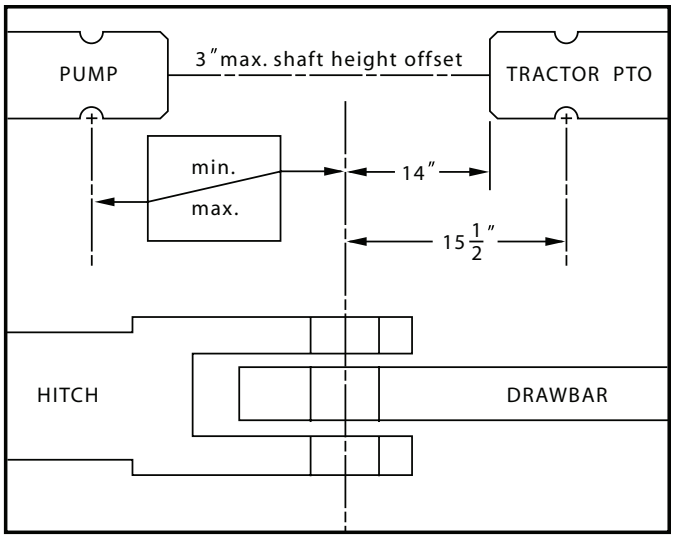


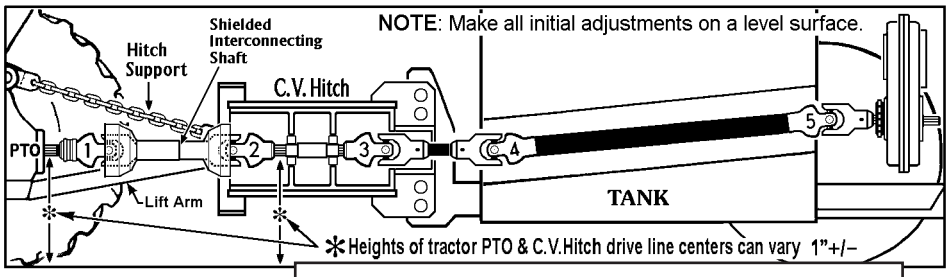
fig i

fig ii

min - max *inches*	cross centers *inches*	driveline *part no.*	series
$17\frac{1}{8}$ - $18\frac{5}{8}$	$19\frac{3}{8}$	**DL205**	14
$18\frac{1}{2}$ - $22\frac{3}{4}$	$21\frac{3}{8}$	**DL301**	35
$22\frac{3}{16}$ - $25\frac{3}{8}$	23	**DL202**	14

Hook-up instructions *CV Hitch*

fig i



It is important that all drive train **u-joints 1-5** are *in-phase*, or aligned as shown. As delivered from the factory, all shafts and drivelines are indexed for proper alignment.
If an unindexed interconnecting shaft is ever used, or if any part of the drive train is disassembled, **be certain u-joints 1-5 align as shown.**

1. Read and understand all instructions before beginning.

2. Position tractor and implement on a level surface. Check air pressure in all tires.

3. Set axle offset in desired position. *See axle section for more information.*

4. Align PTO shaft and CV hitch center-link shaft.

- Measure tractor PTO shaft center height.
- With implement frame parallel to the ground, measure hitch center-link shaft center height. If the center-link shaft height is within 1" (+/–) of the PTO shaft height, *fig. i*, continue to the next step.
  If the difference is greater than 1", adjust the hitch height as follows.
- To safely adjust the CV Hitch height: block the sprayer wheels and block up the CV Hitch assembly.
- Make a note of the shaft-height difference BEFORE you remove the mast mount bolts. Remove the 4 bolts that mount the hitch to the frame mast.
- Using the sprayer jack, adjust the height of the hitch: to LOWER the hitch height, raise the sprayer height; to RAISE the hitch, lower the sprayer.
- Re-use the mount fasteners to bolt the hitch to the mast holes closest to your desired height.

5. With the towing tongue secured out of the way, install the CV Hitch half of the driveline with the roll pin in place.

6. As illustrated in *fig ii*, slide check chains onto CV Hitch mount pins. Tractor lift arms slide onto CV Hitch mount pins next, secured with klick-pins. Quick hitch systems may require a longer mount pin, provided by Rears.

7. Attach check chains to their respective keyhole brackets and adjust as illustrated in *fig i & ii*. Chains should be equal length to center the hitch behind the tractor. Tractors with an offset PTO shaft may require that chains be adjusted unequally to achieve the required alignment.

8. Lower 3-point mount arms until all slack is out of check chains. The weight should be carried by the lift arms, not the chains.

Check alignment and adjust chains as needed. Viewed from above and the side, the tractor PTO shaft and the hitch center-link shaft should be in-line and level.

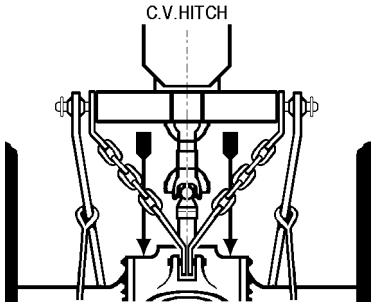


fig ii

9. Install the tractor half of the driveline. The telescoping shafts are indexed- the male half will only slide in if aligned properly.

Slide the driveline onto the tractor PTO shaft: the spline-lock must snap into shaft-groove.

10. Attach hydraulics- keep hoses clear of driveline.

11. Rotate lift-jack or remove to storage point.

12. Connect handset controls. Take care when connecting wires to tractor battery.

NEVER ENGAGE PTO WITH TRACTOR & IMPLEMENT AT RIGHT ANGLES.

NEVER ENGAGE PTO AT HIGH SPEED.

NEVER DIS-ENGAGE PTO WHEN TURNING.

NEVER OPERATE WITHOUT SAG-CHAINS.

NEVER ENGAGE FAN CLUTCH AT HIGH SPEED.

NEVER RUN THE PUMP DRY.

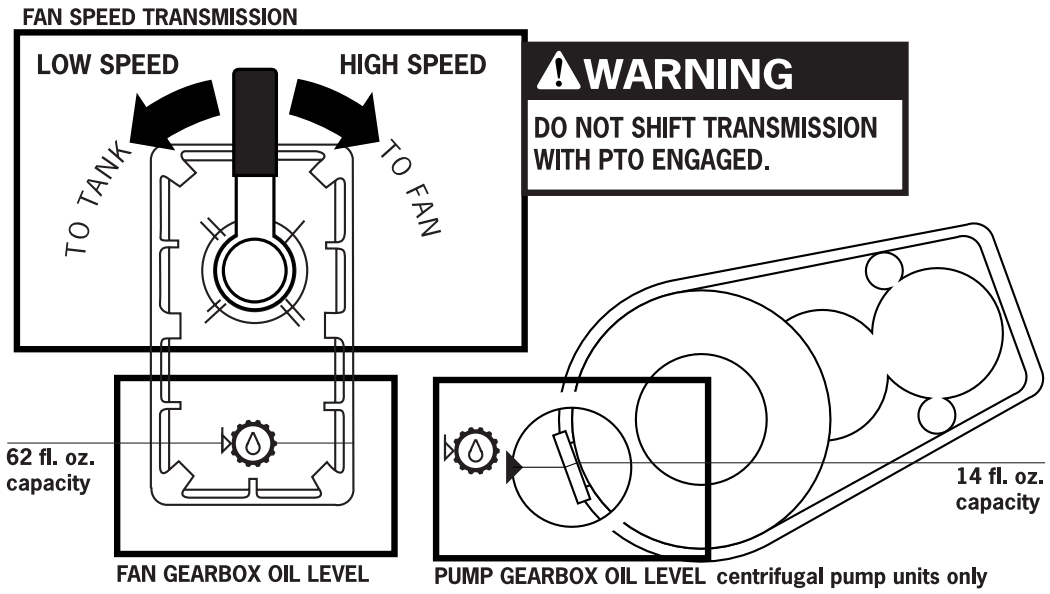
Pre-operation check list

1. **Be certain operators have read and understand the operators manual. DO NOT skip the safety instructions at the beginning of this manual.**
2. Top off the gearbox oil if needed. Oil capacities and sight gauges are illustrated below for the fan gearbox and centrifugal pump gearbox. Use an **AGMA No.2EP** rated gear lubricant, such as *Mobilgear 626*.
3. Properly lubricate all grease points as instructed in the lubrication schedule.

   Agitator bearings require only light greasing and minimal attention. Apply grease only until you feel resistance. Do not over grease: excess will enter tank.
4. For oil lubricated pumps (piston actuated diaphragm pumps) check pump oil level. The level should be above the half-mark on the transparent fill tube. Top off with a quality grade 30wt non-detergent motor oil.
5. Clean suction and discharge strainers.
6. Check fan blades: blades should be free of nicks and cracks. The fan guard should be in good repair.
7. When connecting PTO drivelines: make sure spline locks snap into the shaft groove; make sure all roll pins are properly installed.
8. Check all plumbing lines and connections.

   Fill tank with water above the level of the pump.

   With suction valve OPEN, run pump to clear air from the system: fully open relief valve and open discharge to tank to recirculate.
9. If pump is vibrating excessively, adjust air-dome pressure *see the pump section of this manual*.
10. Check tire pressure.
11. After 1 hour of initial operation, check all fasteners for tightness. Check belts for alignment and wear.



Operating instructions

1. Set fan speed with the lever on the gearbox, illustration on previous page, BEFORE engaging the PTO drive. Engage the PTO at low RPM then gradually increase to operating speed.

   DO NOT engage PTO with tractor and implement at an angle (as if going around a corner). For drive-train longevity the PTO drive shaft and Pul-Blast *Power Tongue* assembly should be in-line whenever engaging or dis-engaging the PTO. *Models with CVHitch option* should also only engage the PTO with the tractor and implement in-line.

2. Fully open relief valve during start-up for proper pump priming and to prevent water hammer damage.

3. To accurately set a prescribed working pressure, the spray systems have to be operating: airboom manifolds, spray boom or handgun line, as required. When these spray systems are turned off the pressure gauge will show an increase in system pressure.

4. **Maximum ground speed** will vary depending on foliage density, ground condition, target distance, application rate, and tractor horsepower. Use the *Calibration Instructions for Rears Airblast Sprayers* to select an operating gear and speed for your application.

5. **Never close the suction valve when the system is running- pump damage will occur.** First disengage the pump system, before closing the suction valve (when checking the suction strainer, for example).

6. **A clogged suction strainer can cause pump damage.** Check and clean the suction strainer often: ideally when refilling the tank (especially if using ditch or cloudy well water).

7. **DO NOT OVERSPEED THE PUMP** Damage will result. The pump is designed to operate at 540RPM or below.

8. Do not shut off the PTO when turning a corner. Wait until the tractor and implement are in-line, then reduce the PTO speed and dis-engage the PTO drive.

9. **Always wear proper protective equipment-** read the labels of all materials being used and observe all handling instructions.

10. Be alert for clogging and changes in nozzle patterns. If nozzles clog or other troubles occur in the field, shut the sprayer off and move to an unsprayed area before dismounting from the tractor.

11. Never try to unclog a nozzle by blowing through it. Always carry extra spray tips.

Operation, cont'd

12. **Flush tank and pump system** with clean water at the end of each day to keep plumbing clear. Fully open relief valve to discharge back to tank at **ZERO pressure** on gauge.

13. **Do not clean, lubricate, or adjust the implement while the PTO is rotating or the tractor is running.**

14. **If excessive vibration develops, shut down immediately.** Possible causes: pump diaphragm, drive train bearings, drivelines, u-joint crosses, or fan have become damaged or worn.

Beginning of season

1. Follow the lubrication schedule.
2. Check air pressure in tires.
3. Drain and refill gearbox to correct level.
4. Tighten all fasteners.
5. Replace worn spray tips.
6. Check pump belt tension.
7. Inspect belts and fan blades- keep clean.
8. Review this operator's manual.

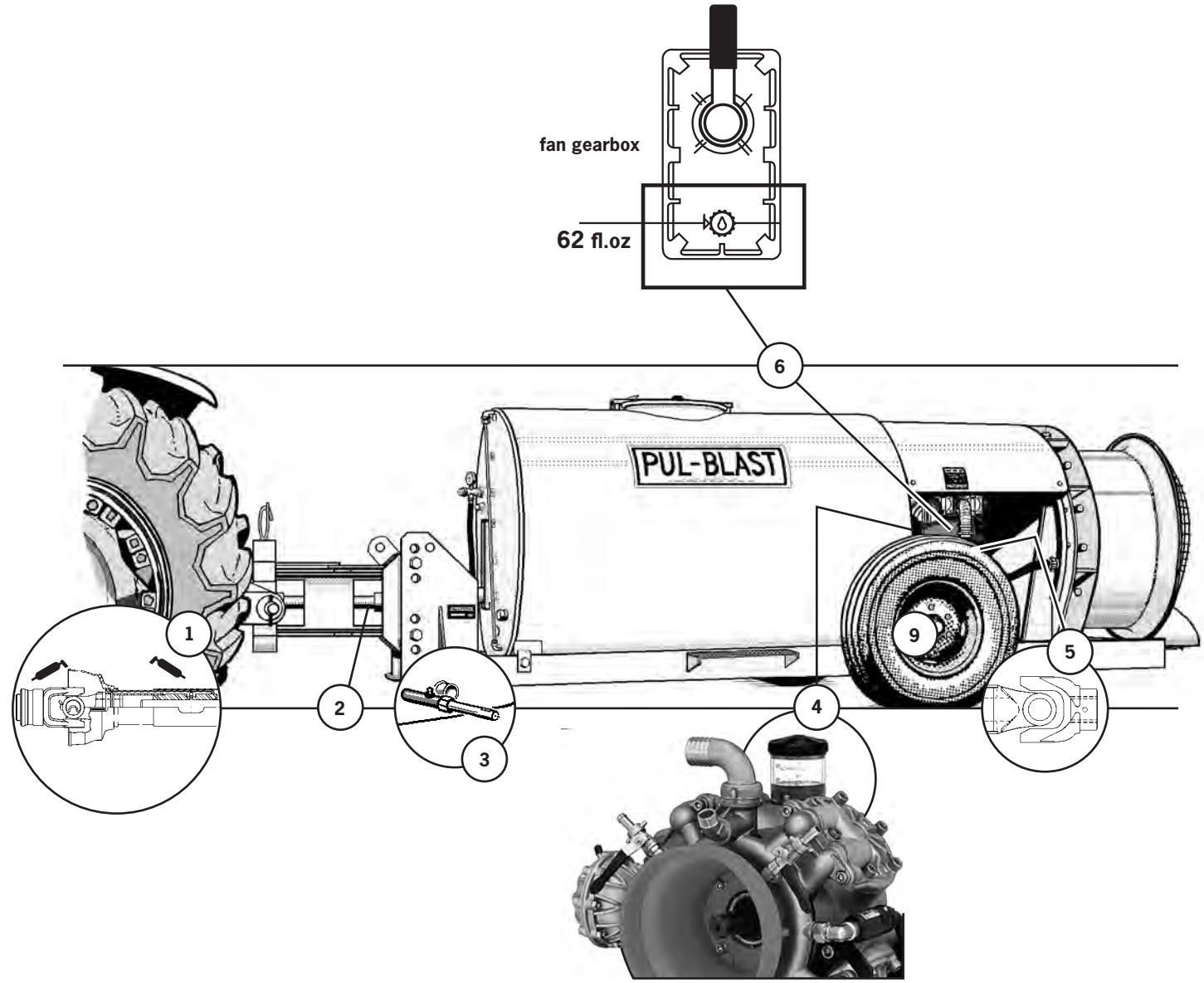
End of season and storage

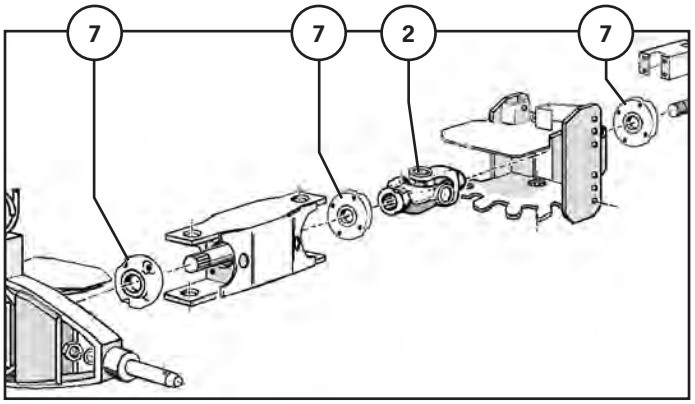
1. Shelter sprayer in a dry place.
2. Clean thoroughly, inside and out. Flush tank and pump system with water.
3. Flush pump & system with RV antifreeze solution.

   When draining spray manifolds, remove the check valve cap from the top-most nozzle assembly to release vacuum.

   Leave antifreeze solution in the pump for storage.

4. Lubricate as instructed in the schedule.
5. Remove fan and inspect thoroughly for damage or cracks. Replace if needed.
6. Re-paint all parts where paint has been worn.
7. Block up frame to lighten load on tires. Do not deflate tires. Cover tires if exposed to sunlight, grease, or oil.
8. Make a list of replacement parts needed and order early. For the best performance next season, have your dealer service the machine prior to storage.


fan gearbox
62 fl.oz
6
PUL-BLAST
1
2
3
4
9
5


7
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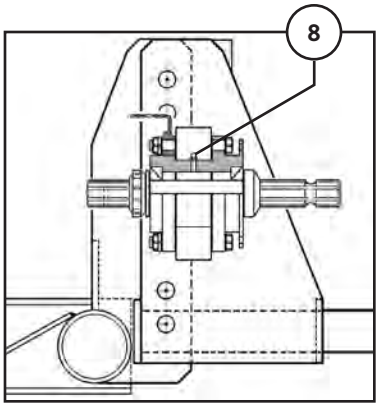
2
7


8

Lubrication and maintenance

All lube points have been made accessible. Lubrication does not require disassembly.

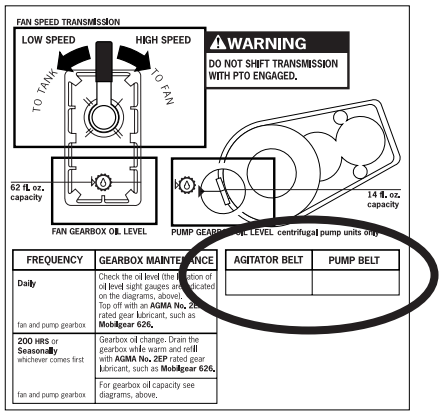
Always use a Lithium base NLGI Grade 2 EP grease. We recommend Texaco Multifak EP2, Shell Alvania 2EP, and Mobil Mobilux EP2.

Use an oil compatible with your pump or gearbox- listed on the schedule, below.

For first time use, grease all lube points as instructed on the lubrication schedule, below (except agitator shaft bearings).

No	Description	Special Instructions	Hours	Pump
1	Tractor driveline	Both crosses and telescoping slip collar	4	1-2
2	CVHitch rear U-Joint	Lube point at cross	4	1-2
3	Agitator bearing, front and rear	1 point each bearing- do not over grease, purges to tank: **Stop pumping when you feel restriction.**	16	1-2
	Agitator bearing extension	Only on models with access limitation, 1 point	16	1-2
4	Pump oil fill level- clear fill neck *A/R pump units only*	Oil level should be above the half mark on the neck Use a quality grade 30wt non-detergent motor oil.	daily	-
5	Thru-tank driveline crosses	Lube point at cross, each end	4	1-2
6	Fan gearbox	Oil level should be visible in plug window, as illustrated Use an **AGMA No.2EP** rated gear lubricant, such as *Mobilgear 626*	daily	-
7	CVHitch center link bearings CVHitch output shaft bearing	51 series hitch with ball bearings, purge vents at seal	do not grease	
		51 ser. hitch with roller bearings, purge vent opposite zerk	8	purge*
8	Bearing block *modular tongue only*	1 point on housing	8	2-3
9	Wheel hub	1 point each wheel	40	purge*

* *Purge: As you pump, watch for grease to vent: stop pumping as the grease emerges at the vent site.*



Write your Serial Number here.

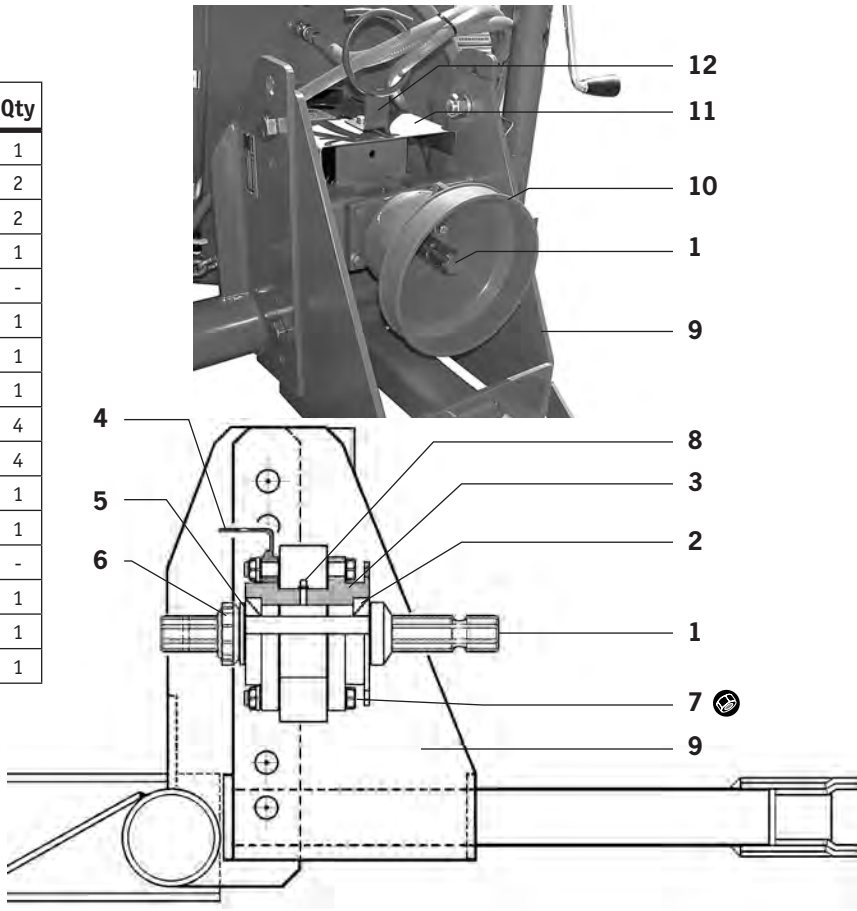
SERIAL NUMBER	

Find this decal in the mechanical cabinet of your sprayer: write the belt numbers here.

AGITATOR BELT	PUMP BELT

Parts list: modular tongue assembly

No.	Part #	Description	Qty
1	FL5131	1"3/8, 6 spline shaft	1
2	13621	bearing cup	2
	13600LA	bearing cone	2
3	FL5132	bearing block only	1
	FL5133	bearing block with shaft and bearings	-
4		rear plate with guard mount	1
5	VMIN432	spacer	1
6	BH1-07	bearing retainer nut	1
7	0500400CH5	1/2" x 4" gr.5 bolt	4
	050NYS	1/2" nylock nut	4
8	1641-B	1/4"-28 straight zerk	1
9	LBP202	tongue hitch only, no bearing assy	1
	LBP201	complete modular tongue assembly	-
10		guard bell	1
11		thru-tank driveline guard	1
12		pigtail	1

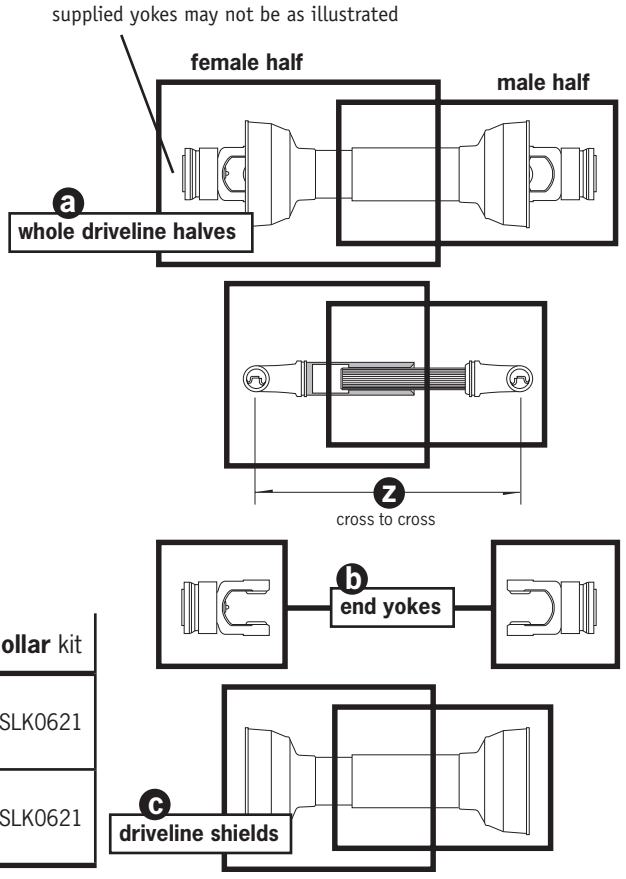


PTO driveline for *Modular Tongue* system

A telescoping implement driveline is shipped with your sprayer to mount between your tractor and implement.

See previous section **Hook-up instructions Modular Tongue** for driveline installation instructions.

The standard driveline delivered with your sprayer is a DL334. The parts list for this driveline is given below.



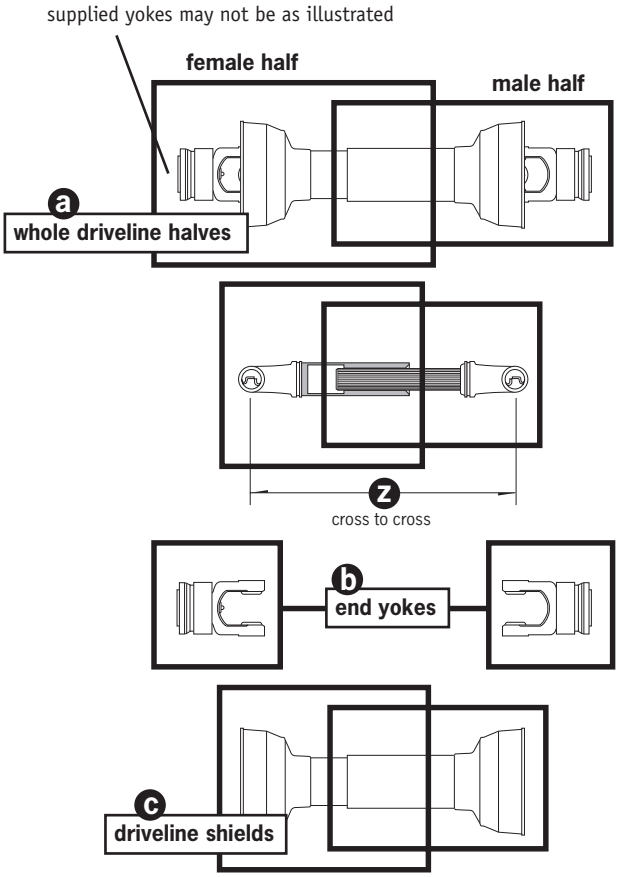
driveline	ⓩ		ⓐ	ⓑ	ⓒ	**cross** kit	**collar** kit
DL334	23-1/2"	**female** 1.375" 6 spline	DL334F	Y301	DLS334M	CPL35RW	SSLK0621
		male 1.375" 6 spline	DL334M	Y301	DLS334F	CPL35RW	SSLK0621

PTO driveline for *Tongue Mount Pump* system

A telescoping implement driveline is shipped with your sprayer to mount between your tractor and implement.

See previous section **Hook-up instructions Tongue Mounted Pump** for driveline installation instructions.

Find your driveline in the chart column **Z** below: measure the distance between cross centers when your driveline is collapsed to it's shortest length.



whole **driveline**	ⓩ		ⓐ	ⓑ	ⓒ	**cross** kit	**collar** kit
DL202	23"	**female** 1.375" 6 spline	DL223	Y201	DLS202M	CPL14N	SLVLK14
		male 1.375" 6 spline	DL221	Y201	DLS202F	CPL14N	SLVLK14
DL205	19-3/8"	**female** 1.375" 6 spline	DL217	Y201	DLS205M	CPL14N	SLVLK14
		male 1.375" 6 spline	DL215	Y201	DLS205F	CPL14N	SLVLK14
DL301	21-3/8"	**female** 1.375" 6 spline	DL313	Y301	DLS301M	CPL35RW	SSLK0621
		male 1.375" 6 spline	DL311	Y301	DLS301F	CPL35RW	SSLK0621

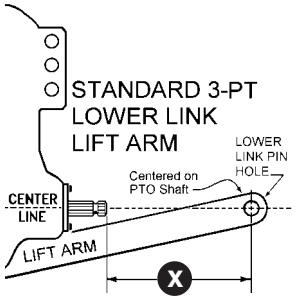
PTO driveline for *CV Hitch* system

A telescoping implement driveline is shipped with your sprayer to mount between your tractor and implement.

Rears has a wide selection of implement drivelines to accomodate your tractor. To determine the right telescoping driveline for your tractor, you need to have the following information:

your tractor PTO shaft size and spline

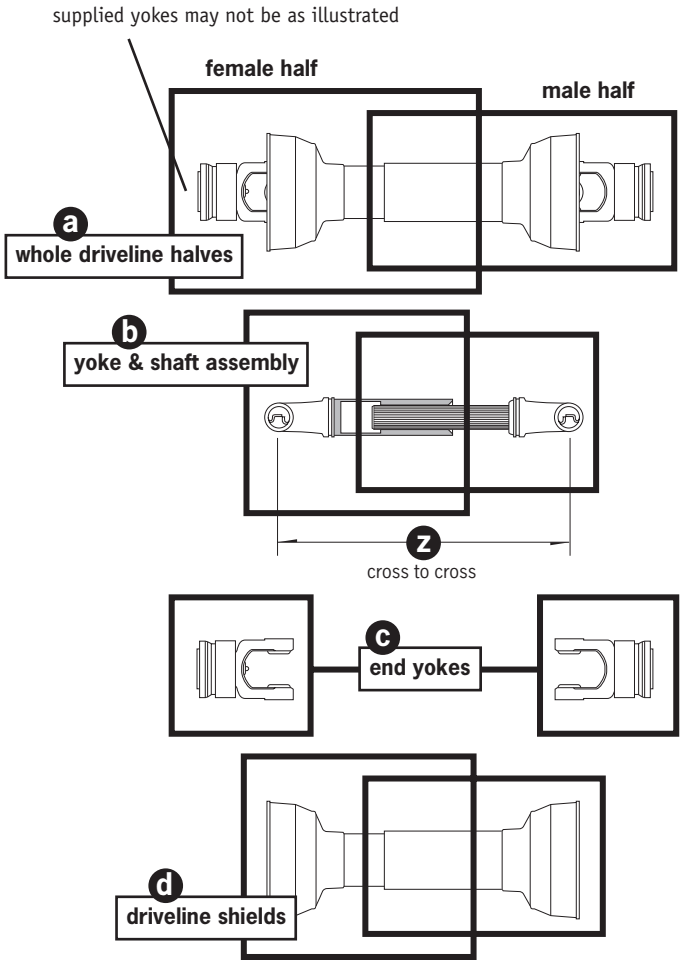
the distance between the end of your tractor's PTO output shaft and the center of the lifting balls **x** as illustrated, above right. This distance must be measured when the lift balls and shaft are in-line.



Using *chart b*, page over: find the available drivelines for your lift balls distance, **x**, and select the female driveline spline that matches your tractor's output shaft.

The provided telescoping driveline will match most tractors within the range for **x** indicated in *chart b*. Some tractors may require driveline length modification: see *chart a*.

For your **x** value in *chart a*, find what **y** modification is required. If modification is needed, shorten the driveline shield and the male shaft of the driveline by the **y** listed amount. As illustrated, the shield and the shaft must be measured and cut independently. The final modified cross-to-cross distance of your driveline, **z** (measured when collapsed) is given for reference. Do not cut more than 2-1/2" off the driveline half.



ⓧ	ⓨ	ⓩ
18"	2 1/2"	15"
18 1/2"	2"	15 1/2"
19"	1 1/2"	16"
19 1/2"	1"	16 1/2"
20"	1/2"	17"
20 1/2 - 23"	0"	17 1/2"
23 1/2"	1/2"	20 1/4"
24 - 28"	0"	20 3/4"
28 1/2 - 32 1/2"	0"	24 3/4"

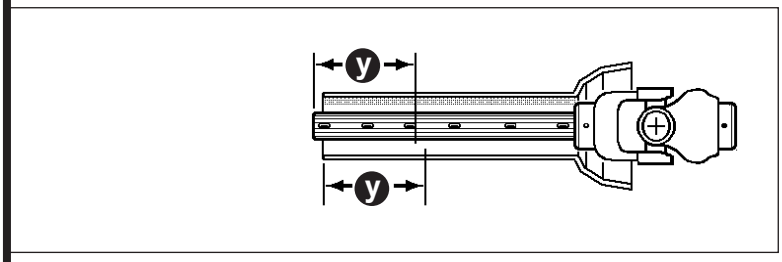
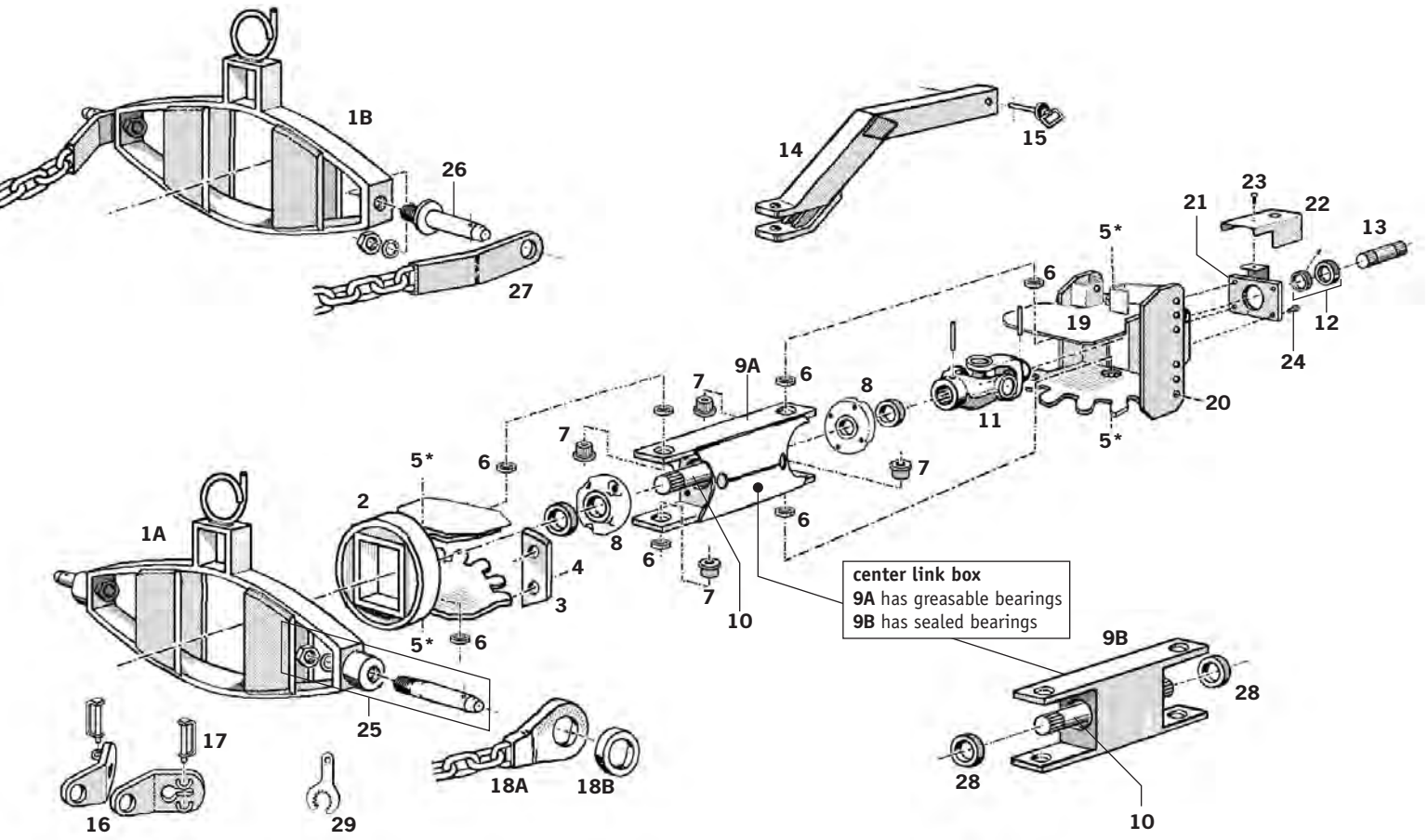


chart a

Implement driveline

ⓧ	whole **driveline** part #	**pto**speed		ⓐ	ⓑ	ⓒ	ⓓ	**cross** kit	**collar** kit
18-23”	order by halves **see column a**	540	**female** 1.375” 6 spline	DLF511S6	Y585	Y501	DLS510M	CPL55E	SSLK0621
			male 1.5” 17 spline	DLM515T17	Y586	Y514	DLS510F	CPL55E	–
23.5-28”	order by halves **see column a**	540	**female** 1.375” 6 spline	DLF517S6	Y582	Y501	DLS501M	CPL55E	SSLK0621
			male 1.5” 17 spline	DLM515T17	Y586	Y514	DLS510F	CPL55E	–
28.5-32.5”	order by halves **see column a**	540	**female** 1.375” 6 spline	DLF521S6	Y580	Y501	DLS502M	CPL55E	SSLK0621
			male 1.5” 17 spline	DLM515T17	Y586	Y514	DLS510F	CPL55E	–

chart b



Parts list: 51 series constant velocity hitch

No.	Part #	Description	Qty
1A	CVH71-TRN1	CAT I width trunion, no pins included	1
	CVH71-TRN2	CAT II width trunion, no pins included	
1B	CVH-TRN1AR	CAT I width trunion, no pins included	1
2	CVH51-15AR	hitch front half	1
3	CVH41-WP2AR	wear plate	2
4	0620150CH5	5/8" x 1-1/2" bolt gr.5	4
5	0620125CH5*	5/8" x 1-1/4" bolt gr.5	4
6	CVH51-5	outer bushing	8
7	CVH51-6	flanged inner bushing	4
8	CVH51-11B	1.5" ball bearing *for center link* **9A**	2
9A	CVH51-13BA	center link *includes bearings* **8** *& bushings* **6**	1
9B	CVH51-13ASSY	center link *includes bearings* **28** *& bushings* **6**	
10	CVH51-12	center link shaft	1
11	UJ514/514	complete 55 series u-joint	1
	UJ514	1.5" 17 spline 55 ser yoke only	2
	CPL55N	cross kit	1
	0310250RP	roll pin	2
12	CVH51-11COL	1.5" sealed bearing with collar	1
13	CVH51-8055	55mm splined shaft	1
14	CVH51-16	top mount towing tongue	1
15	0750500HP	hitch pin	1
16A	HS42L	cat. II left chain bracket	1
	HS42L-3	cat. III left chain bracket	
16B	HS42R	cat. II right chain bracket	1
	HS42R-3	cat. III right chain bracket	
17	0310275SNAP	5/16" x 2"3/4 snap pin	1

No.	Part #	Description	Qty
18A	HS43CH3	check chain *for trunion* **1A**	2
18B	CVPIN1373	spacer for CAT II pin	2
19	CVH51-1401	hitch rear half	1
20	0870200CH5	7/8" x 2" gr.5 bolt	4
	087NF	7/8" nut	4
	087WS	7/8" lock washer	4
21	CVH51-19PB	bearing mount bracket	1
22	CVH51-18	output shaft shield	1
23	0250050STS	1/4" x 1/2" self tapping screw	1
24	0500175CH5	1/2" x 1"3/4 gr.5 bolt	4
	050NF	1/2" nut	4
	050WS	1/2" lock washer	4
25	CVH7117-2	CAT II pin *for trunion* **1A**	2
	CVH5117-3	CAT III pin *for trunion* **1A**	
	112WS	1"1/8 lock washer	2
	113NJ	1"1/8-12 half-nut	2
	7524	click pin	2
26	CVH5117-1	CAT I pin *for trunion* **1B**	2
	CVH5117-2	CAT II pin *for trunion* **1B**	
	112WS	1"1/8 lock washer	2
	112NF	1"1/8 nut	2
	7524	click pin	2
27	HS43CH1	cat. I/II check chain	2
28	CVH51-11	1.5" sealed bearing *for center link* **9B**	2
29	CVH71TOOL	pin wrench	1

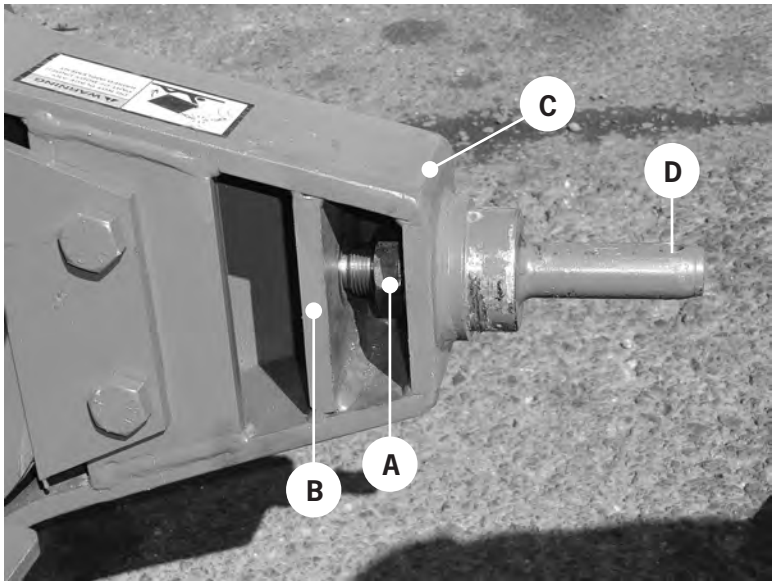
**Install with 242 Loc-Tite or equivalent*

77 series hitch pin removal

The hitch pin is a tapered fit in bushing.

1. Apply lube to threads.
2. Using the supplied crowfoot wrench* (bolted to the hitch trunion) loosen nut **A** and thread to inside plate **B**.
3. Rotate nut to apply heavy force against the support plate **B**. To aid in separation, strike point **C** with a heavy steel hammer.

   Use heat as needed.



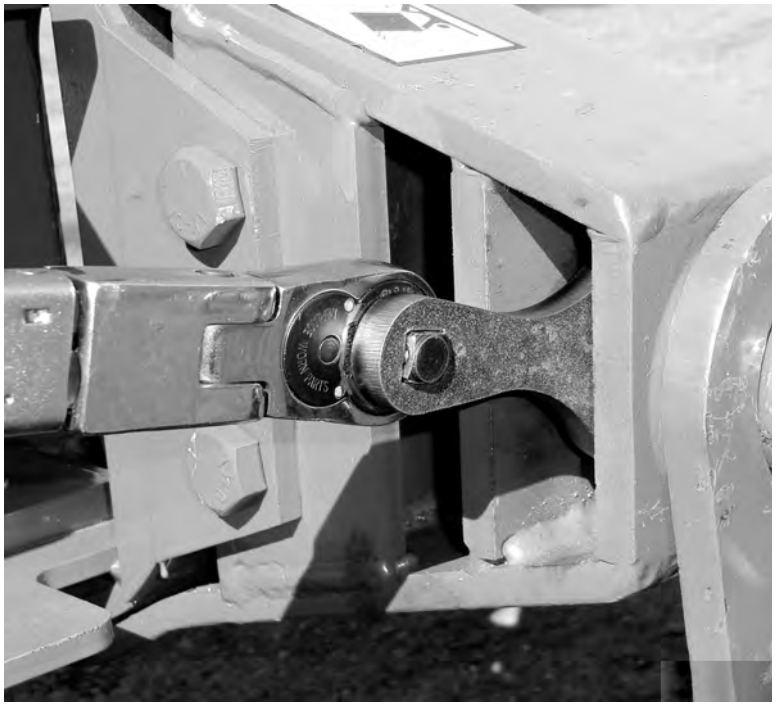
77 series hitch pin installation

1. Parts should be clean prior to installation. Apply a light film of oil to taper and threads
2. With the pin partially inserted, install the lock washer and thread the nut **A** onto the pin.

   The retainer pin hole **D** should be vertical as you finger tighten the nut.
3. Tap the end of the hitch pin to seat the pin and prevent pin rotation when tightening the nut **A**.
4. Using the supplied crowfoot wrench, tighten the hitch pin nut using a ratchet or breaker bar.
5. Using a torque wrench as shown, torque nut to 110 ft-lbs.

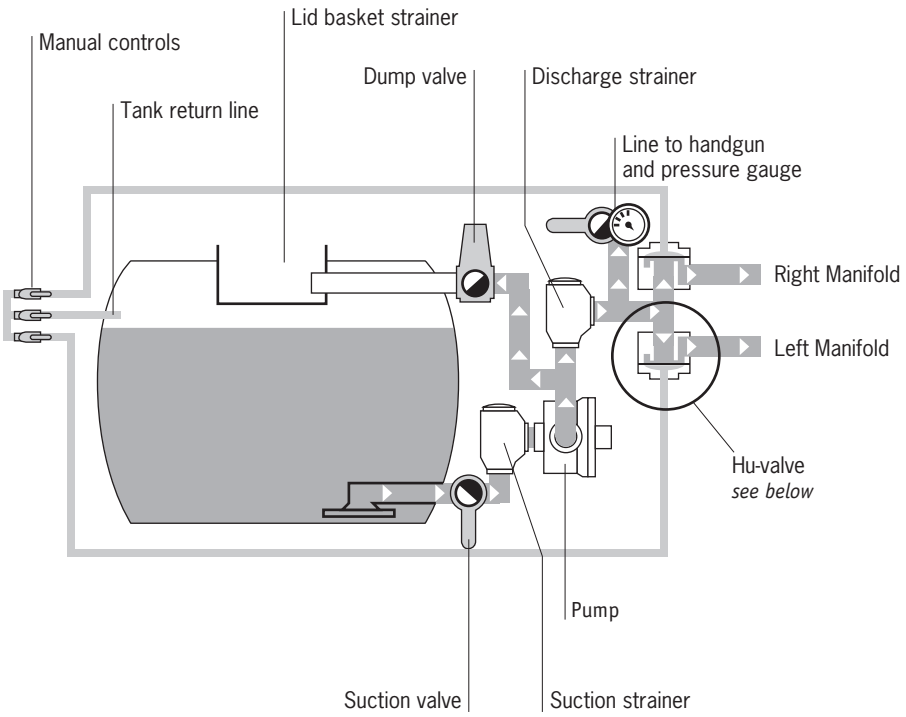
   Important: the torque wrench and crowfoot wrench must be in-line as shown.

*Pin wrench is installed on the torque wrench **in-line***

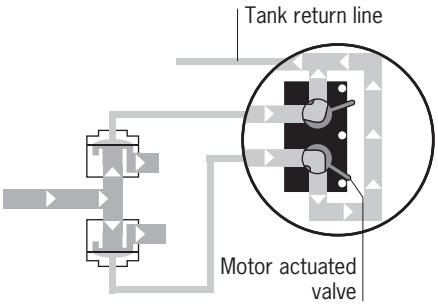


* If your hitch does not have the 3/8" thick crowfoot wrench, please contact the factory to order an upgrade or replacement *part number CVH71TOOL*.

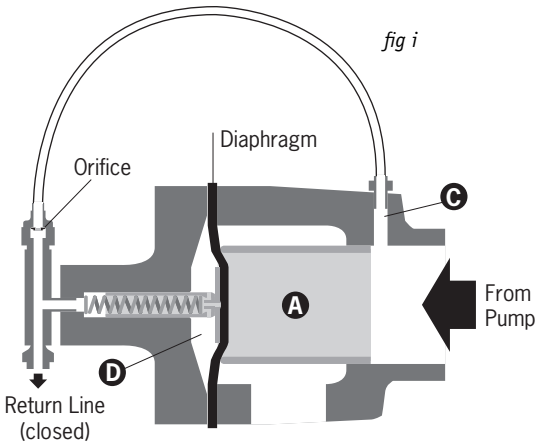
pulblast plumbing

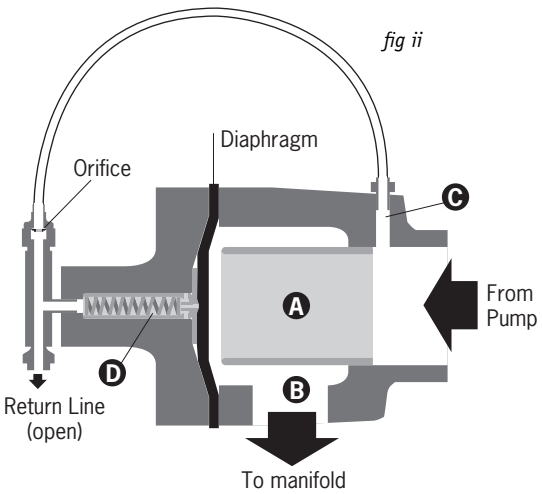


pulblast electric spray controls



HUV500 operator block





In *fig i, above*, the Hu-Valve is closed. You have switched *off* your manifold using your handset (electric or manual controls) and what this does, quite simply, is close the return line from the Hu-Valve to the tank. When you switch your manifold *on, fig ii*, water from the pump flows into the Hu-Valve and splits into two channels: the majority flows through **A,** into **B**, and on to the manifold; a lesser amount through **C** to the return line. From **C** the water passes through an orifice and back to the tank. It is this return line that feeds chamber **D**. When the return line to the tank is open, the water pressure in chamber **D** is low- lower than the pressure in chamber **A**, the valve seat. The greater pressure in **A** displaces the diaphragm, *fig ii*, and opens the passage to the manifold: the valve is open.

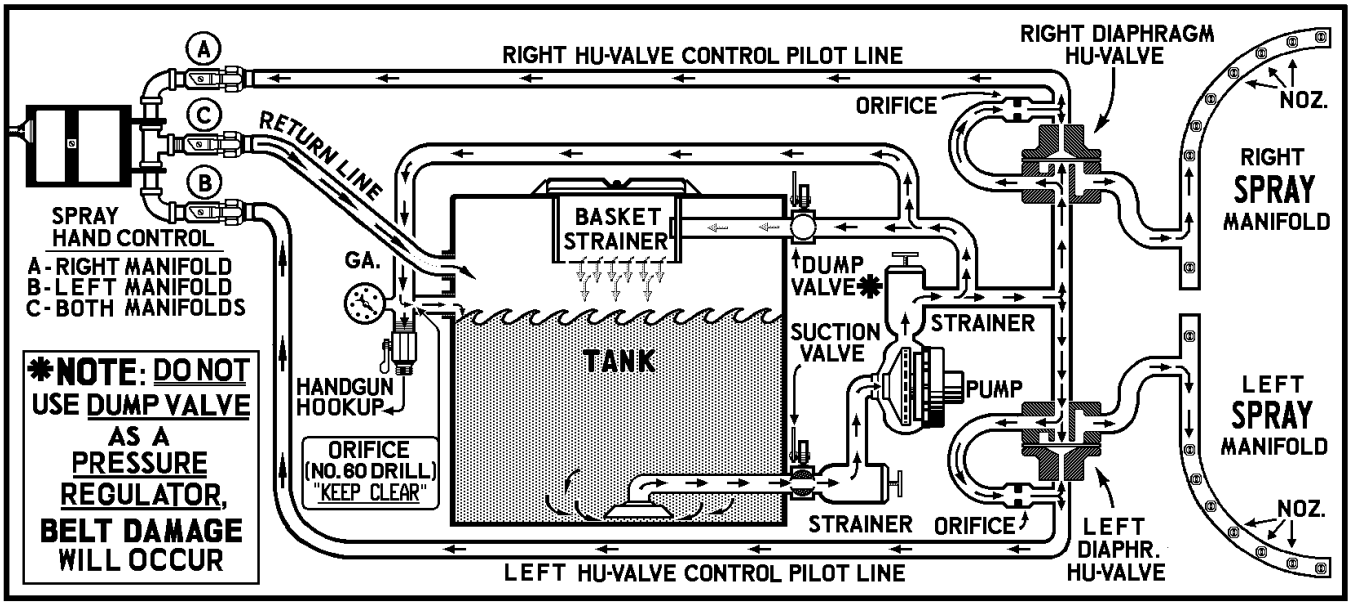
When you switch your manifold *off* the return line to the tank is closed, *fig i*, and water backs up into chamber **D**, equalizing the water pressure in **A** and **D**. The diaphragm will close the valve because chamber **D** has a mechanical advantage over **A**: the pressurized surface area of the diaphragm on side **D** is 10 times greater than that of side **A**.

troubleshooting: excessive pressure drop

Check the dump valve. When spraying, the dump valve must be completely closed. Using the dump valve to control spray pressure will result in early belt failure.

Check the tension of the pump drive belt: see the pump maintenance section of this manual.

Check the suction and discharge strainers- clean screens.



troubleshooting: spray manifold will not spray

Check that there is liquid in the tank.

Check that pressure is adequate on pressure gauge. If not, refer to the pressure drop section, above.

Check the hand control pilot line (manual controls) for crimping. Bleed off air at the handgun hookup valve.

Check the hand control pilot line (manual controls) for blockage. Some chemicals can build up in the line or react with the hose lining. If this is a problem, replace the 3/8" lines with 1/2" hose.
NOTE: Rinse spray system daily.

Check the handset return line (manual controls) for crimping or blockage.

Check the handset valves (manual controls) for blockage.

If you have Hu-valve electric controls, check the spool rotation (see appropriate parts page for HVC block assembly illustration). If the spool rotates easily by hand but not by the motor, check the wiring.

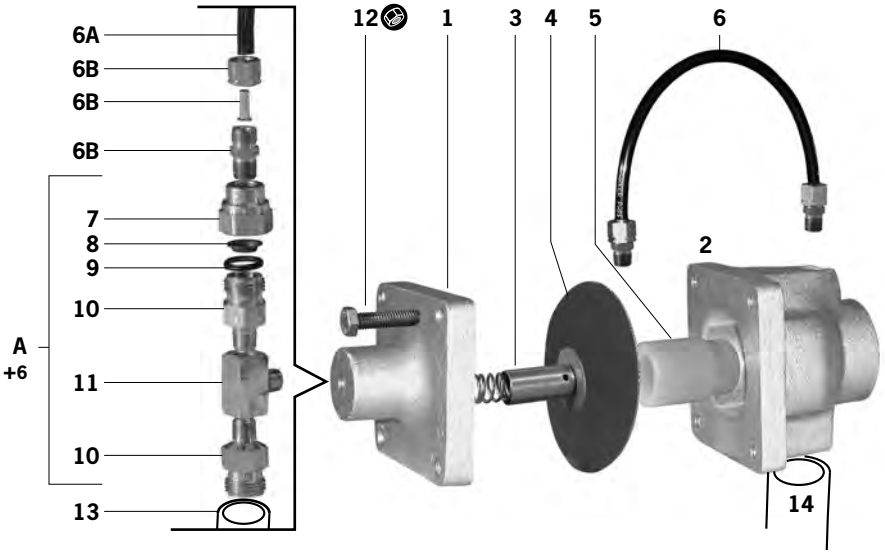
troubleshooting: spray manifold will not shut off

Check Hu-valve orifice and tube for blockage.

Check Hu-valve for ruptured diaphragm.

If you have Hu-valve electric controls, check the spool rotation (see appropriate parts page for HVC block assembly illustration). If the spool rotates easily by hand but not by the motor, check the wiring.

If you have Hu-valve electric controls and the unit continues to spray with HVC spools in the OFF position, a blockage caused the valve control to slip, see the HVC block parts page for repair instructions.

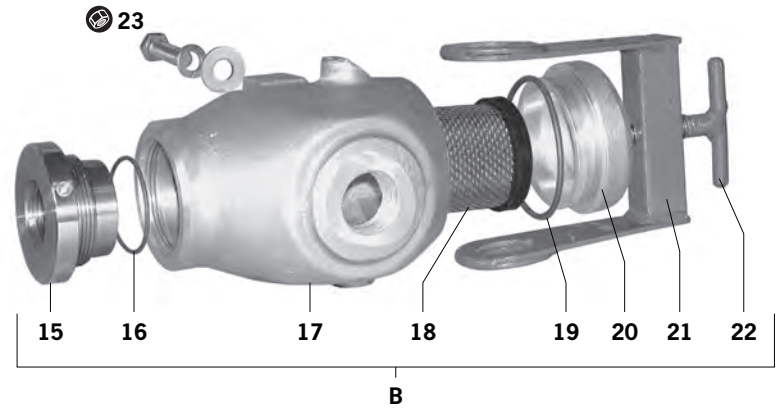


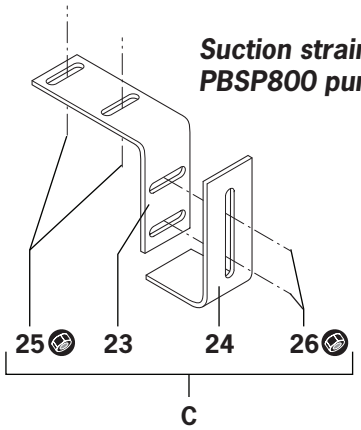
Hu-Valve Parts, *qty listed for one assembly*

No.	Part #	Description	Qty
	HUV2100	complete hu-valve assembly	-
1	HUV100C	hu-valve cap	1
2	HUV101B	hu-valve body	1
3	HUV102G	plunger	1
	HUV105S	plunger spring	1
4	HUV104DV	diaphragm, viton	1
5	HUV110	valve seat	1
6	HUV-LOOP	diaphragm bypass loop	1
6A	HUVTUBE	1/4" x 9" nylon tube	1
6B	HUV012CB	1/8"MPT brass compression fitting	2
7	4676-1/8	1/8"FPT x female TeeJet adapter	-
8	D6	D-6 orifice, install dish side down	1
9	12-2.5MMN70	o-ring	1
10	1/8"TT	TeeJet body	2
11	HUV012TB	1/8" tee	1
12	0310125CHSS	5/16"-18 x 1"1/4 hex cap screw, SS	4
13	CALL	control hose	1
14	CALL	right manifold hose	1
	CALL	left manifold hose	1
A	HUV-EXT	complete loop and tee assembly	

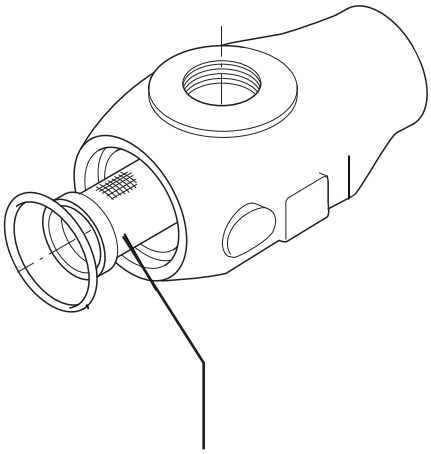
Strainer Parts

No.	Part #	Description	Qty
15	STHP2100	Inlet adapter, 1"	1
	STHP2150	Inlet adapter, 1-1/2"	
16	STHP2-140	o-ring	1
17	STHP3100	strainer body, 1" port	1
	STHP3150	strainer body, 1-1/2" port	
18		*see following screen selection chart*	1
19	11-232	o-ring	1
20	STHP1010	line strainer cap	1
21	SPST7GM	strainer bale	1
22	SPST7H	T-screw	1
23	PBSP851	strainer mount, upper angle	1
24	PBSP850	strainer mount, lower angle	1
25	0370100CHSS	3/8"-16 x 1" stainless steel bolt	2
	037WSS	3/8" stainless steel flat washer	2
	037WS	3/8" lockwasher	2
26	0370125CP	3/8"-16 x 1-1/4" carriage bolt	2
	037NF	3/8" nut	2
	037WSS	3/8" stainless steel flat washer	2
	037WS	3/8" lockwasher	2
B	SPST7100	complete 1" strainer, includes #15-22	
	SPST7150	complete 1-1/2" strainer, includes #15-22	
C	PBSP850KIT	mount bracket kit, includes #23-26	



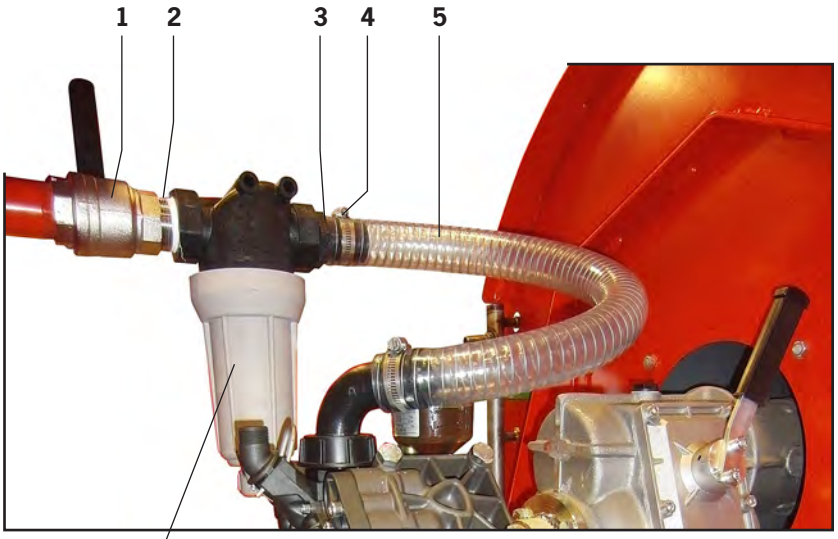


Suction strainer mount kit PBSP800 pump



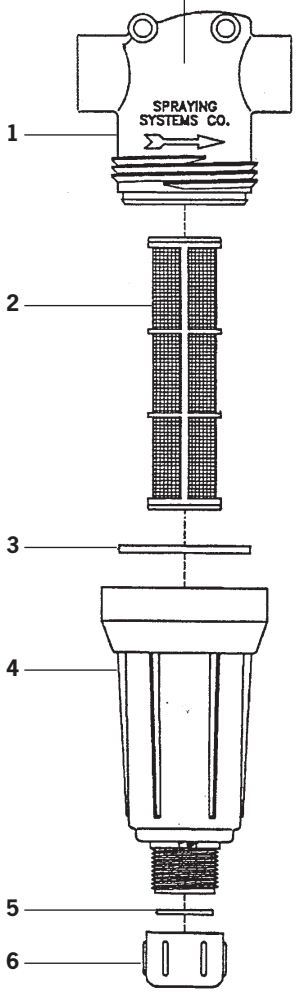
Strainer screen options, SPST7 strainers

Screen Mesh	Frame Color	Frame Material	Part #	
6M	Orange	Poly	SPST7D6	*standard for centrifugal pump suction strainer*
10M	Green	Poly	SPST7D10	
16M	Black	Poly	SPST7D16	*standard for diaphragm pump suction strainer*
24M	Yellow	Poly	SPST7D24	
	Stainless	Stainless Steel	SPST7D24SS	
50M	Blue	Poly	SPST7D50	*standard for discharge strainer*
	Stainless	Stainless Steel	SPST7D50SS	
80M	Red	Poly	SPST7D80	
	Stainless	Stainless Steel	SPST7D80SS	



Suction plumbing

No.	Part #	Description	Qty
1	B150FP	1-1/2" ball valve	1
2	SSN150CLOSE	1-1/2" stainless steel close nipple	1
3	ETC150KNPOLY	1-1/2" king nipple	1
4	WC6825	worm clamp	2
5		1-1/2" *Armorvin* hose, provide length	1

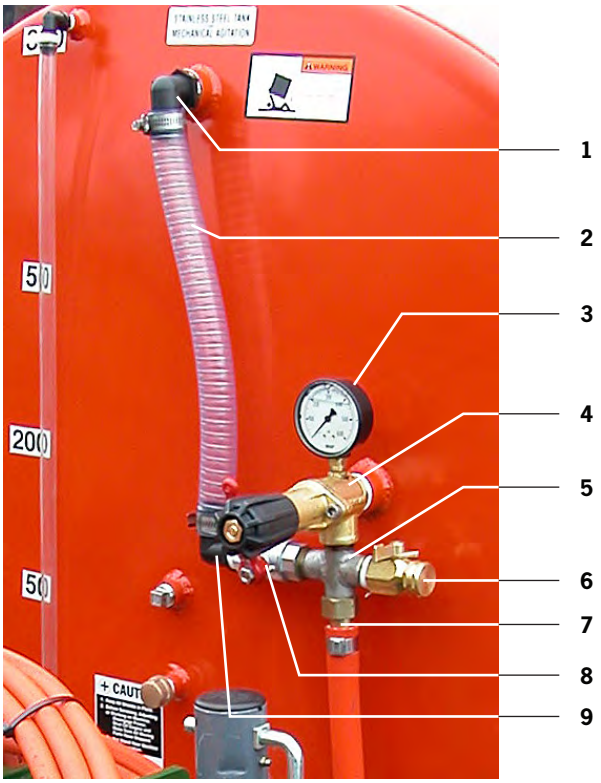


126 Line Strainer Assembly

No.	1" inlet	1-1/4" inlet	1-1/2" inlet	Description	Qty
-	126ML-4- mesh #	126ML-5- mesh #	126ML-6- mesh #	complete strainer- include screen mesh	-
1	50492-1-PP	63065-1-1/4PP	63066-1-1/2PP	strainer head	1
2	16903-1-SSPP	15941-1-SSPP		16 mesh screen, gray	1
	16903-3-SSPP	15941-2-SSPP		30 mesh screen, yellow	
	16903-4-SSPP	15941-3-SSPP		50 mesh screen, red	
	16903-5-SSPP	15941-4-SSPP		80 mesh screen, blue	
	16903-6-SSPP	15941-5-SSPP		100 mesh screen, green	
3	50494-EPR	48656-EPR		large strainer gasket	1
4	50493-PP	48654-PP		strainer bowl, poly	1
5	63150-EPR			small strainer gasket	1
6	48655-PP			cap	1

Parts list: spray pressure cluster assembly

No.	Part #	Description	Qty
1	NYEL100100HB	elbow, 1”MPT x 1”HB nylon	1
2	HNP100	1” armorvin hose, give length	1
3	LFG600	600psi liquid filled gauge	1
4	BR411-1510	pressure relief valve	1
5	MBW106	cross (3x)3/4”MPT x 3/4”MGHT	1
6	V58	brass ball valve 3/4”MGHT x 3/4”FPT	1
7	5PVC075	3/4” pvc hose, give length	1
	HFB075075	3/4”FGHT x 3/4”HB fitting	2
8	B075FP	brass ball valve 3/4”FPT	1
9	NYEL075100HB	elbow, 3/4”MPT x 1”HB nylon	1



Spray and dump valve operation

When spraying always have the dump valve **8** closed.

Adjust the relief valve **4** to set your working pressure.

Open the dump valve **8** when starting the pump and when refilling the tank: the system recirculates at zero pressure, easing load on pump.

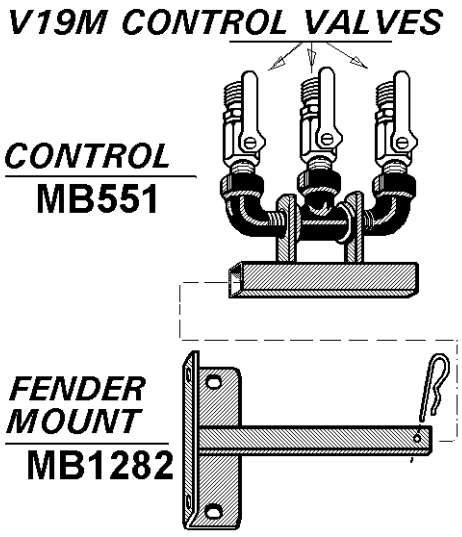
Spray manifold- manual operation

The center valve on the manual spray control is the system return line. For proper independent control of the left and right manifold, the center control valve should remain open.

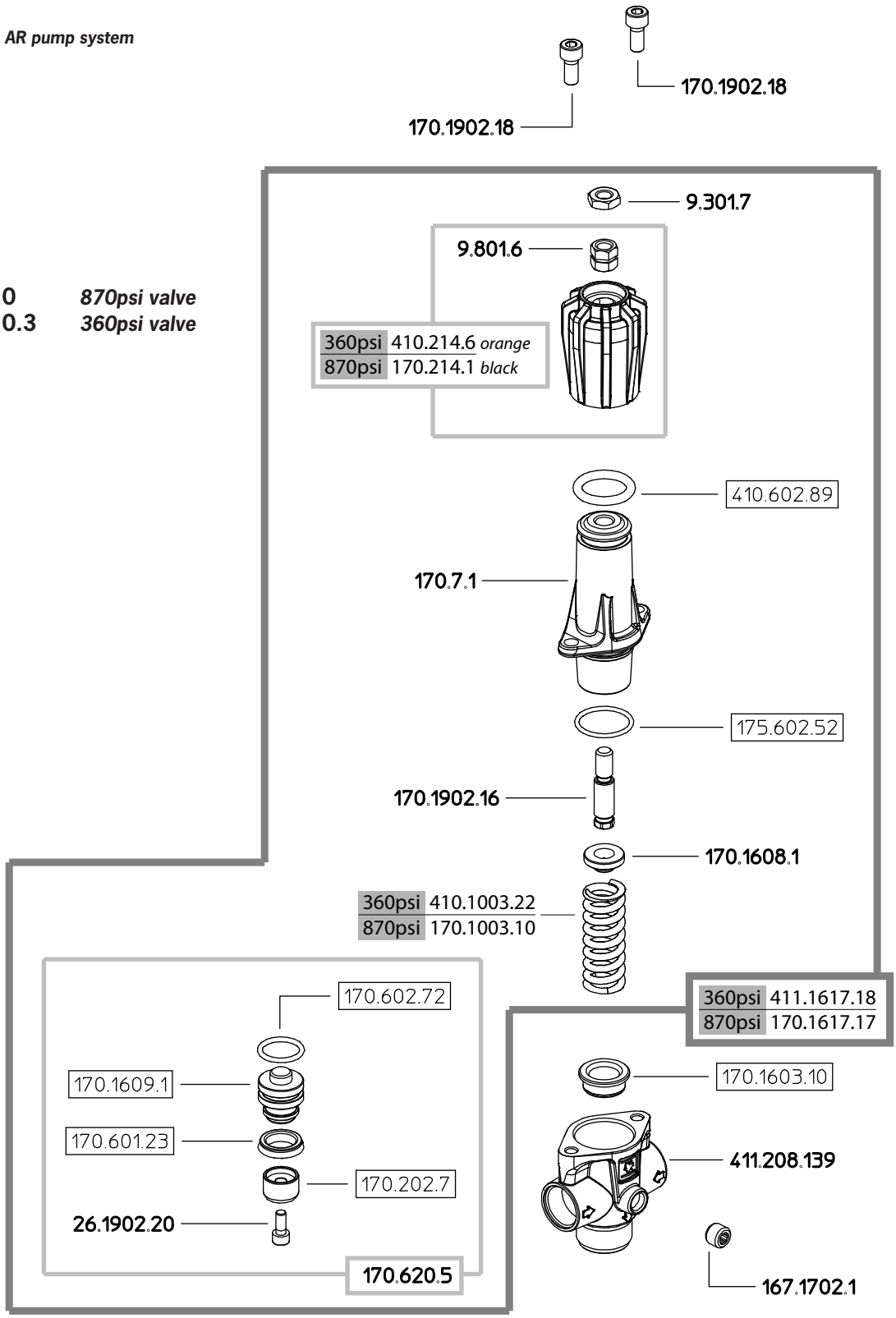
The outside valves control the left and right spray manifolds. If the outside valve is closed, the corresponding spray manifold will be ON.

If the outside valve is open, the corresponding manifold will be OFF.

If the spray manifold will not shut off, make certain the center control valve return line is open and not clogged.



BR411-1510 ***870psi valve***
BR411-1510.3 ***360psi valve***



PART NUMBER — individual components

PART NUMBER — subassembly order number

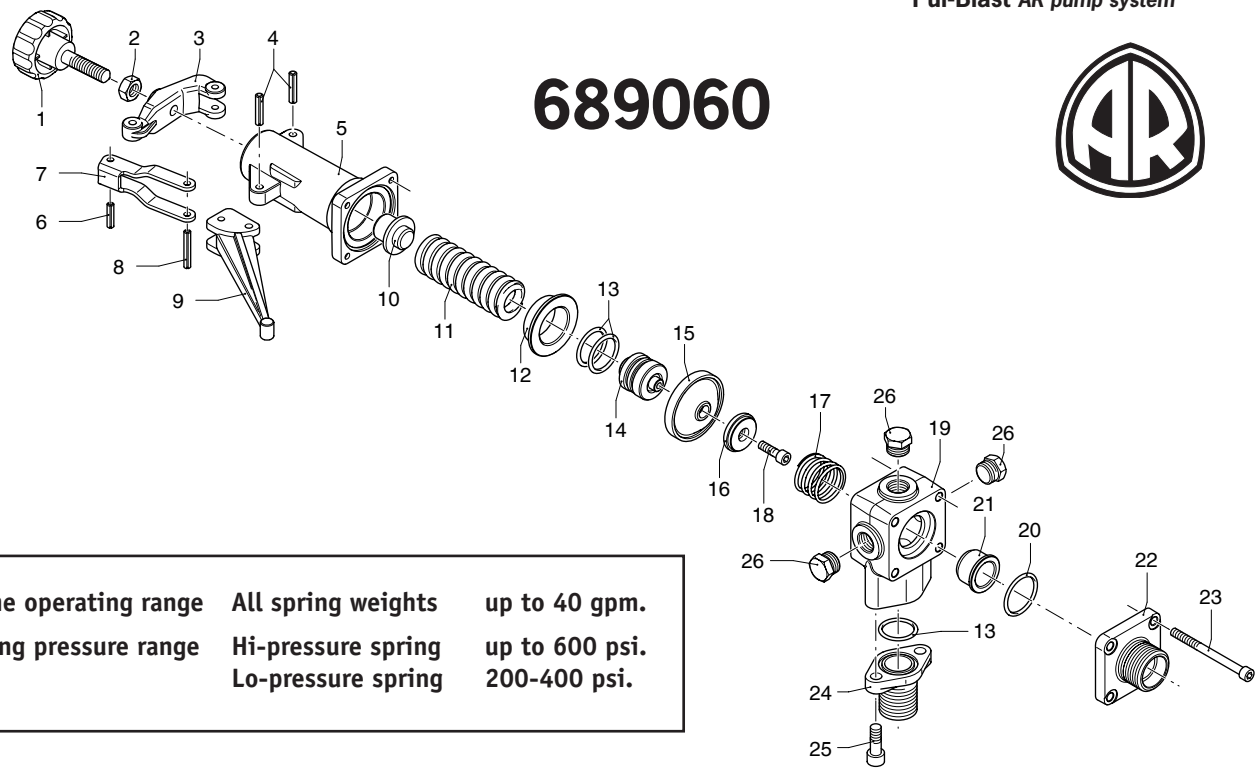
PART NUMBER — basic assembly order number

PART NUMBER — component included in a spare parts kit
kits listed, right

AVAILABLE SPARE PARTS KITS

410.302.36 ***spare parts kit***

689060



Volume operating range	**All spring weights**	**up to 40 gpm.**
Working pressure range	**Hi-pressure spring**	**up to 600 psi.**
	Lo-pressure spring	**200-400 psi.**

689060 relief valve, operating instruction

When starting the pump and during chemical refill and mix operation keep the lever handle **9** in released position. When fully released the system circulates pumped material back to the tank with minimal restriction, easing load on the pump.

Setting working pressure:

When operating the pump the suction valve must be open. When setting system pressure there must be liquid in the tank.

1 Set the working pressure with your spray nozzles closed: you should not be spraying.

2 With the lever handle **9** engaged and the pump shaft turning at operating speed, loosen the jam nut **2** and adjust the pressure screw **1**. Turn the handle on the pressure screw to set working pressure: clockwise to increase pressure; counterclockwise to reduce.

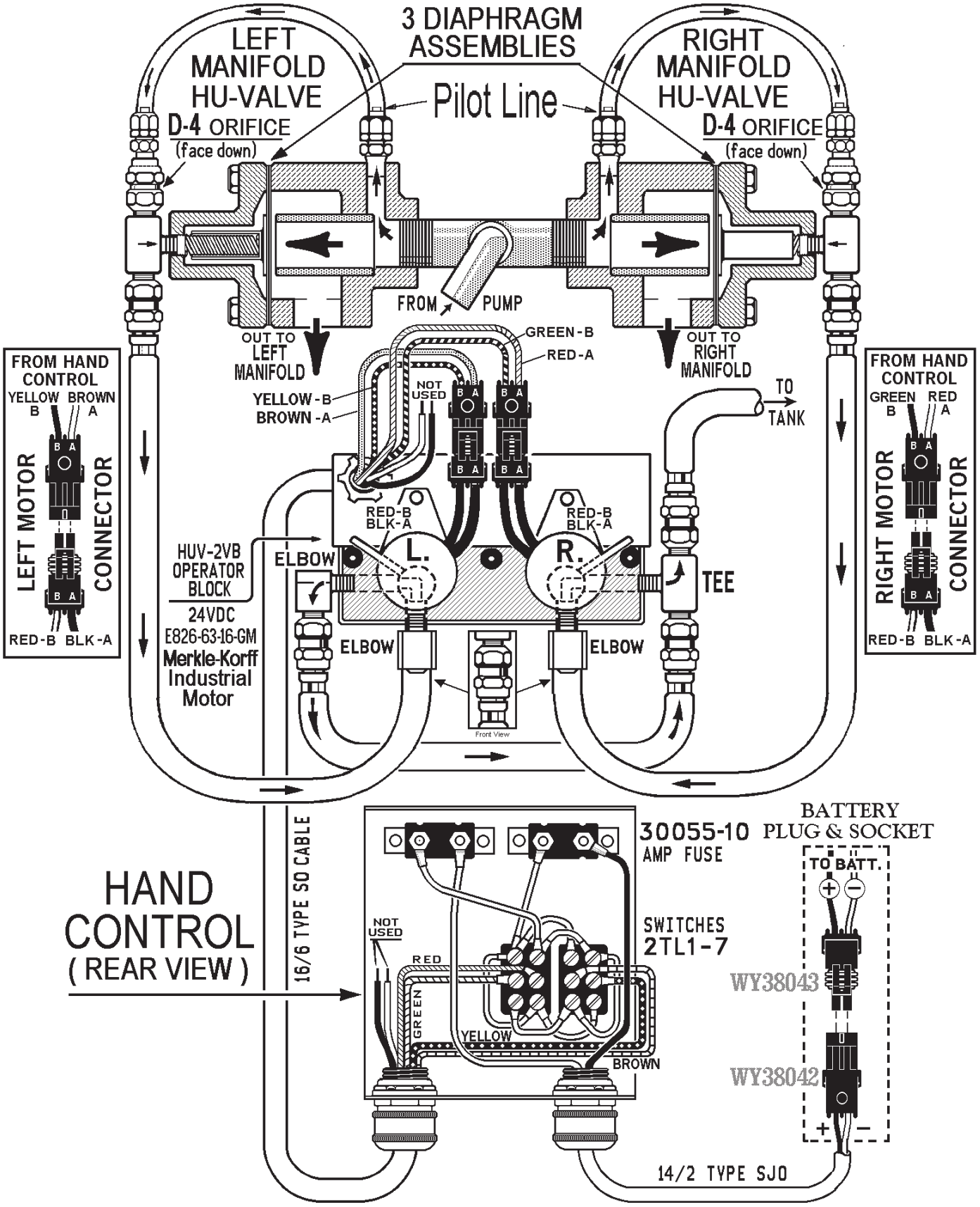
3 If using a gun or boom applicator, begin spraying and watch the pressure gauge: adjust pressure as needed.

4 When you have reached your desired pressure, tighten the jam nut **2** against the fork **3** to lock the setting.

Parts list

No.	Part #		Description	Qty
	689060		complete relief valve	-
	KIT68		repair kit *includes all • items*	-
1	660130		adjusting screw	1
2	180150		jam nut, 10mm	1
3	680442		fork	1
4	680540		roll pin 5 x 24	2
5	680423		housing	1
6	680530		roll pin 5 x 20	1
7	680520		lever guide	1
8	680550		roll pin 5 x 35	1
9	680452		lever handle	1
10	680510		spring guide	1
11	680500		heavy spring- high pressure	1
	680501		medium spring- low pressure	
12	680490		diaphragm support	1
13	550350	•	o-ring	3
14	680480		piston	1
15	390740	•	diaphragm	1
16	680470	•	valve	1
17	320420	•	spring seat	1
18	680700	•	6mm x 20mm socket head bolt	1
19	680412		body	1
20	280220	•	o-ring	1
21	680460	•	valve seat	1
22	680432		discharge flange	1
23	680570		6mm x 60mm socket head bolt	4
24	850711		flange 3/4"BST	1
25	620610		8mm x 30mm socket head bolt	2
26	130171		plug 1/4"BST	3

electric hu-valve control- wiring



electric hu-valve control- daily maintenance

When flushing the plumbing at day's end, cycle fresh water through the spray lines, turning the spray ON and OFF several times.

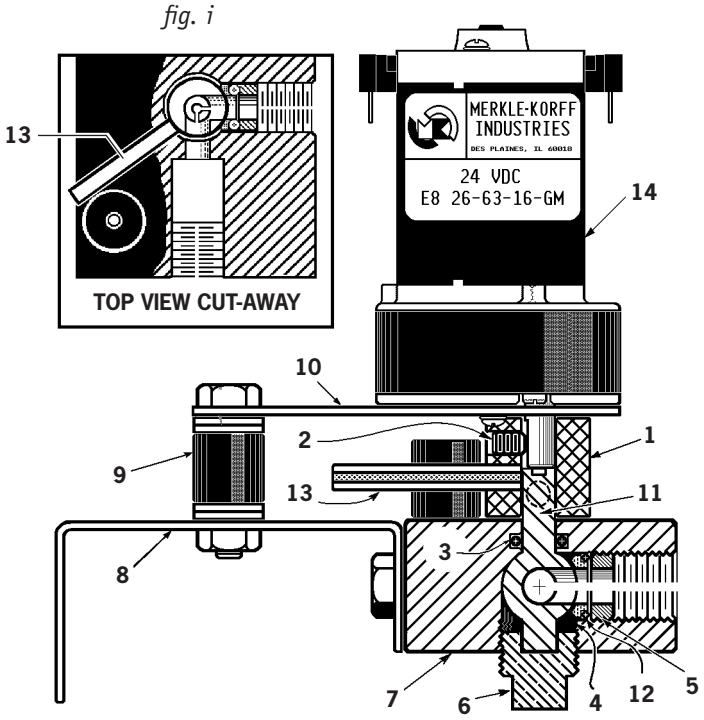
electric hu-valve control- seasonal storage

Perform the line flush, as above.

Disconnect the vinyl lines and inject oil into the upper and lower chambers of the Hu-Valves and into the HVC block.

Re-connect the vinyl lines.

fig. i



troubleshooting: spray manifold will not spray

Check that there is liquid in the tank.

Check that pressure is adequate on pressure gauge. If not, refer to the pressure drop section in the spray troubleshooting section.

Check the spool rotation, **13**. If the spool rotates easily by hand but not by the motor, check the wiring.

troubleshooting: spray manifold will not shut off

Check Hu-valve orifice and tube for blockage.

Check Hu-valve for ruptured diaphragm.

Check the spool rotation, **13**. If the spool rotates easily by hand but not by the motor, check the wiring.

If the unit continues to spray with HVC spools in the OFF position, a blockage caused the coupler **1** to slip on the spool **11**. Remove the motor **14** and loosen set screws **2**. Align the roll pin **13** with the incised line of flow marks on the spool **11** as illustrated in *fig. i*, above. Tighten the set screws **2** and re-install the motor **14**.

HVC block parts

No.	Part #		Description	Qty
	HUV510		complete operator block, does not include motor or mount brackets	-
1	HUV5116		coupler	2
2	HUV5119		set screw	8
3	HUV5112	●	o-ring	2
4	HUV5113	●	teflon seat	2
5	HUV5115	●	keeper	2
6	HUV5118		bushing	2
7	HUV512		HVC operator block	1
8	HUV525		block mount bracket	1
9	HUV515	●	apex motor mount	3
10	HUV5202		torque bracket	2
11	HUV5111		spool	2
12	HUV5114	●	o-ring seat	2
13	HUV5117		roll pin	2
14	HUV5201		motor	1
15	HUV529		shield (not pictured)	1

	HUV500KIT	repair kit includes all ● parts

KZ electric ball valve

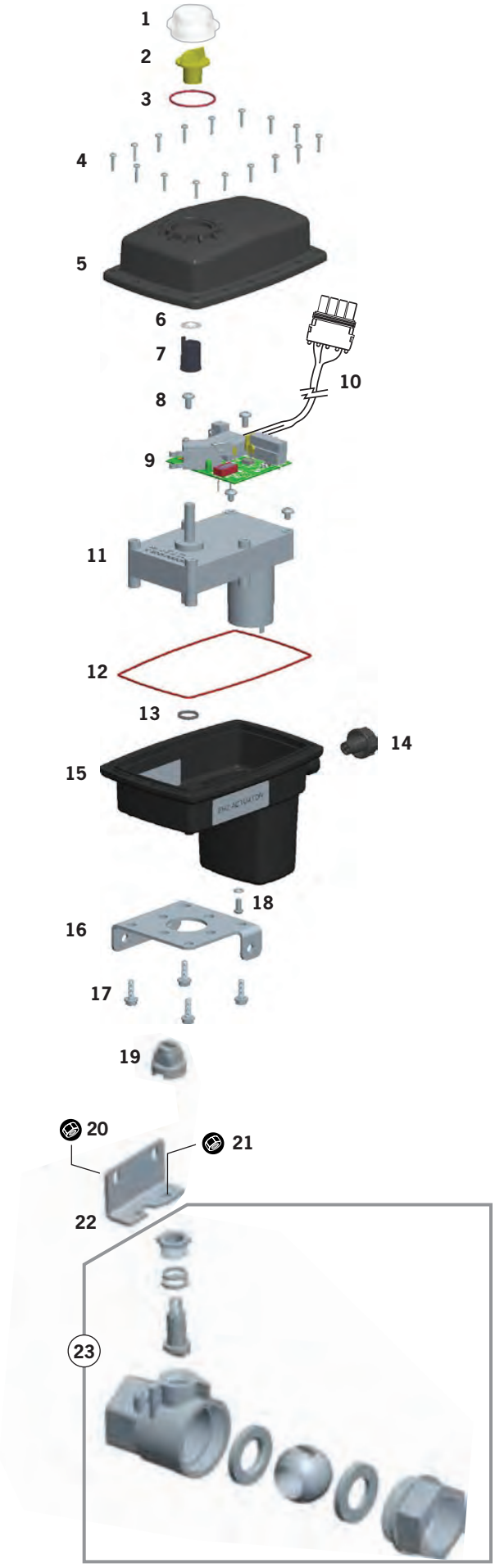
DC 12 volt, 1.5A

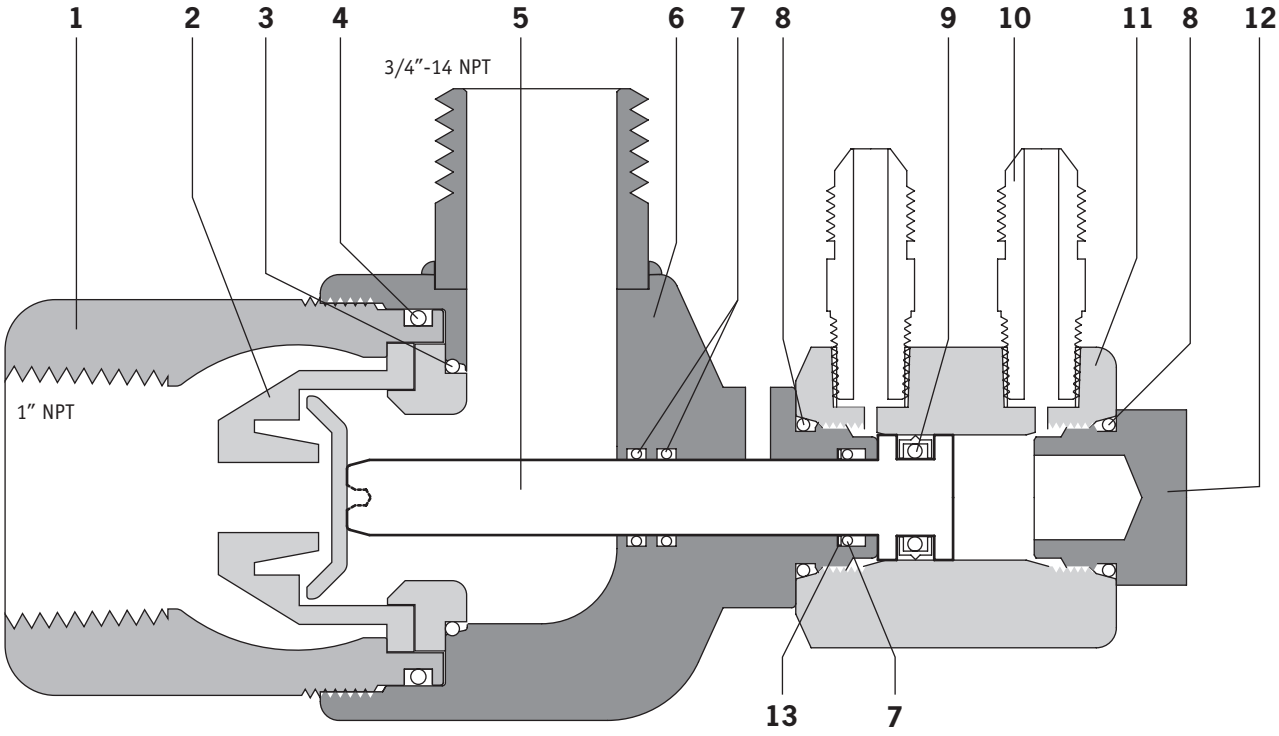
No.	Part #	Description	Qty
	KZ075	complete 3/4" ball valve	-
	KZ100	complete 1" ball valve	-
1	KZ114	dome	1
2	EH3-115Y	yellow flag	1
3	EH-130	o-ring, silicone, #027	1
4		screw #5 x 9/16"SS	16
5	EH2-1201	upper case half with dome	1
6	EH-104	retainer	1
7	EHPT-1144	cam	1
8		screw 10-32 x 3/8"SS	2
9	EH2-660B	circuit board	1
10	EH2-660CABLE	cable and tower connector	1
	38047	tower connector only	1
11	EH2-432	motor	1
12	EH2-1221	case o-ring, silicone	1
13	KZ140	o-ring, viton, #112	1
14		wire harness fitting	1
15	EH2-1200	lower case half	1
16	KZ160	bracket, SS	1
17		screw, #10-32 x 5/8" machine hex washer head	4
18	EH-139	o-ring, viton, #008	1
		screw, 8-18 x 3/8"SS	1
19	EHPT-208-0050	coupler	1
20		screw, 1/4"-20 x 1/2" hex flange	2
		nut, 1/4"-20 flanged, serrated	2
21		screw, #10-24 x 3/8"SS socket head	2
		lockwasher .197IDx.334ODx.047, SS	2
		flat washer, #10 18-8 SS	2
22	KZ129	mount bracket	1
23	KZ71-104	3/4" ball valve assembly, brass	1
	KZ71-105	1" ball vavle assembly, brass	

Attention: If valve requires repair before 1 year warranty expires, consult factory. Removing cover may void warranty.

PARTS FOR OLDER UNITS:

These parts are for EH2 control units. Some parts are compatible with older models. Call for more information.

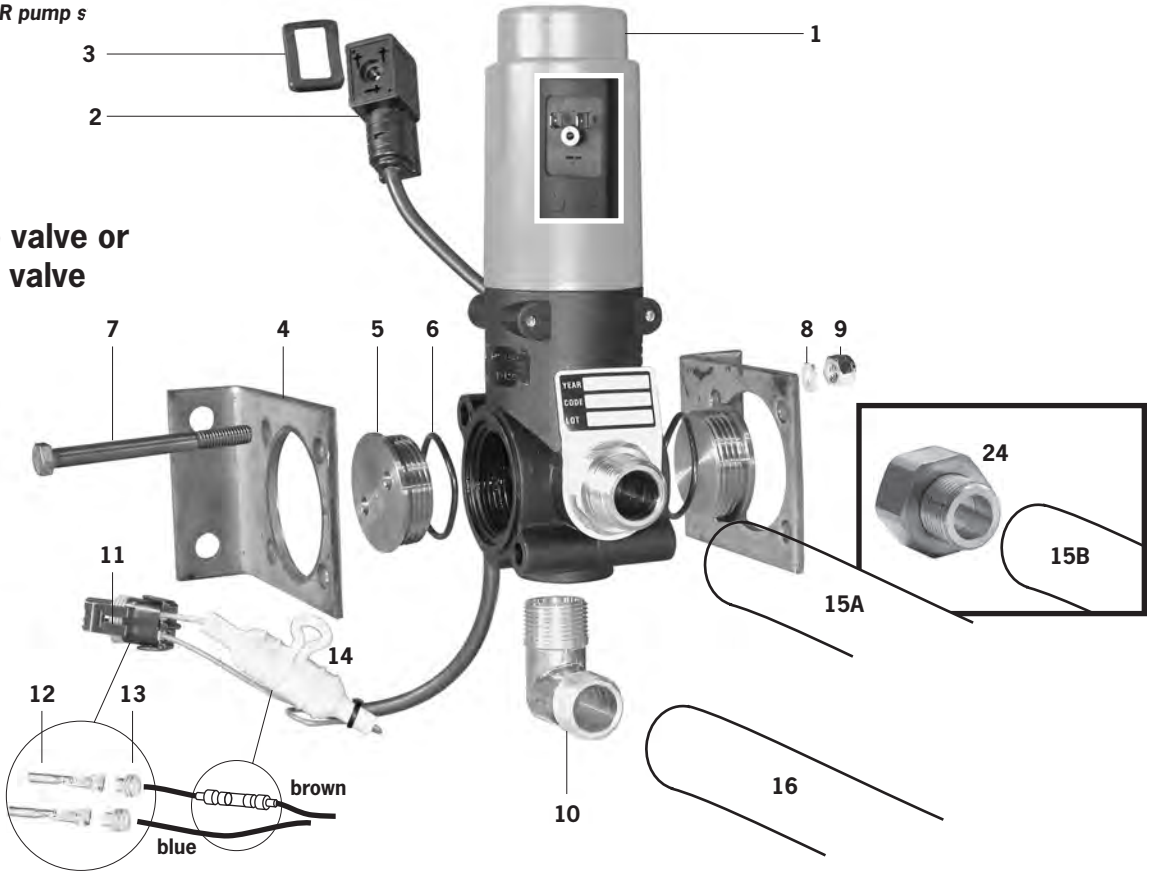




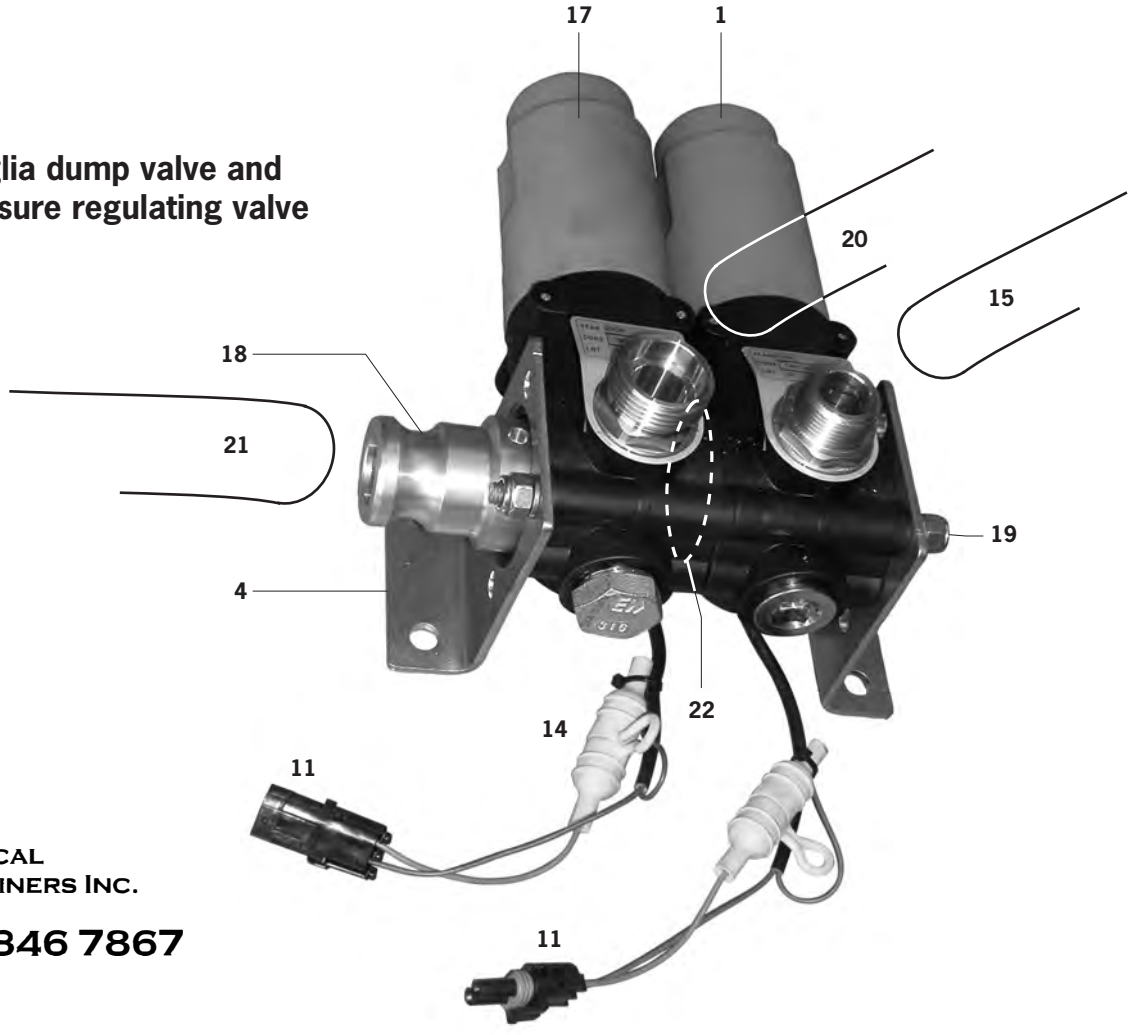
R7 hydraulic spray valve

No.	Part #		Description	Qty
	DAH2W075		R7 hydraulic actuated valve, complete	
	DAHV2WKIT		repair kit *includes all • items*	
1	DAH2WV13		valve body inlet	1
2	759051		valve assembly	1
3	V75-026	•	o-ring, viton	1
4	V75-131	•	o-ring, viton	1
5	DAH2WV20		piston rod	1
6	DAH2WV11		valve body	1
7	V90-012	•	o-ring, viton	3
8	-908	•	o-ring	2
9	CP-204	•	piston seal	1
10			SAE J514,37deg flare -4 size	2
11	DAH2WV25		hydraulic cylinder	1
12	DAH2WV18		o-ring plug	1
13	T8-012		split backup ring	1

braglia dump valve or spray control valve

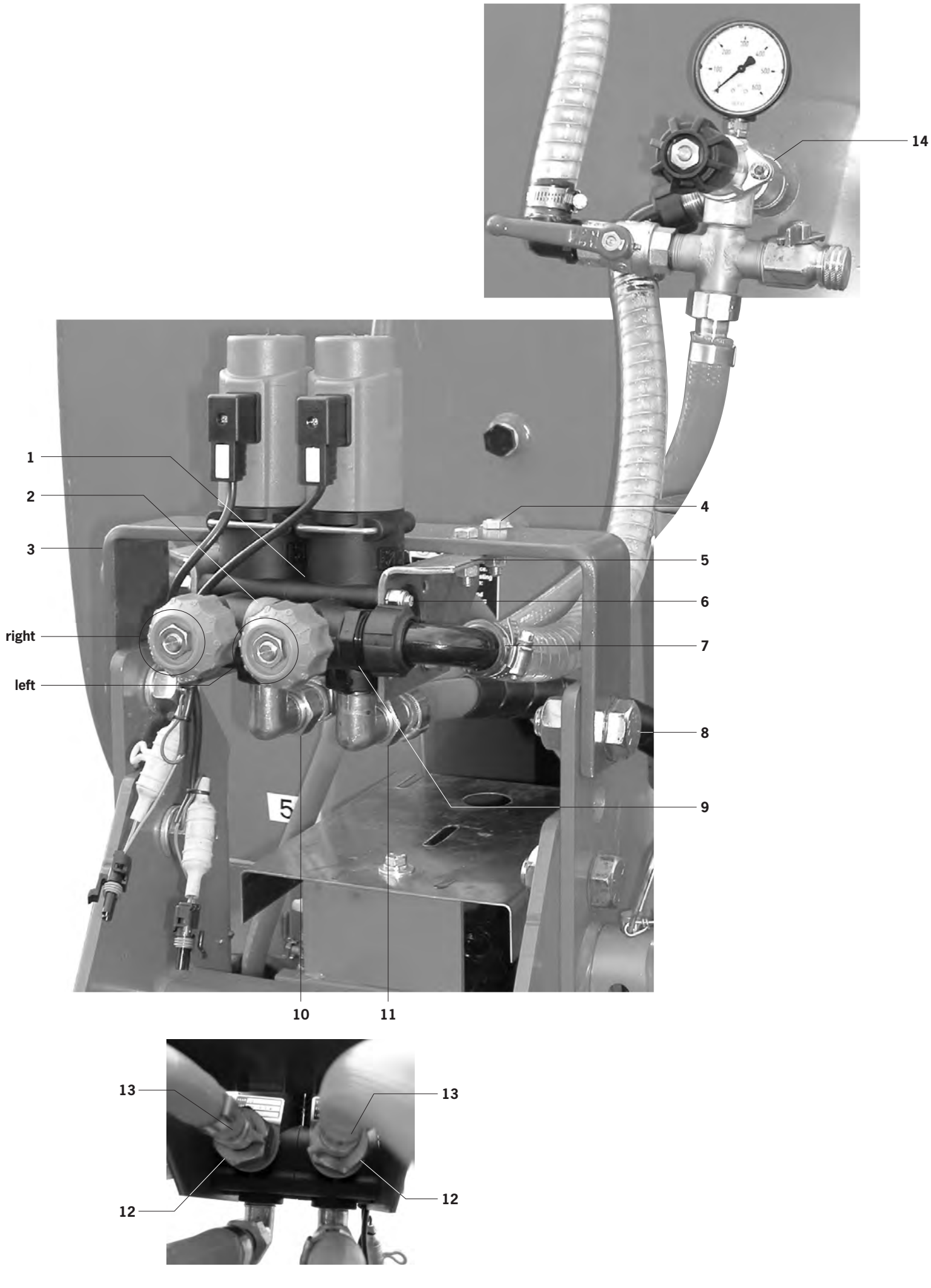


braglia dump valve and pressure regulating valve



Braglia valve assemblies

No.	Part #	Description	Qty	
1*	180.1910.9HS	Dump valve, 1" port, *black cap*	1	
	180.1910.9	Dump valve, 1" port, *orange cap, obsolete*		
	180.1910.19HS	Dump valve, 3/4" port, *black cap*		
	180.1910.19	Dump valve, 3/4" port, *orange cap, obsolete*		
2	180.232.6	valve signal control cable	1	
3	call	cable connector gasket	1	
4	180.1610.2R	valve mount plate	2	
5	180.1702.27B	port plug	2	
6	2-127	port plug o-ring	2	
7	0310350CHSS	5/16" x 3"1/2 stainless steel bolt	2	
8	031WS	5/16" lock washer	2	
9	031NY	o-ring, viton	2	
10	170.201.7	brass elbow, 3/4"MBSP	1	
11	38043	waytek male quick connect	1	
	38042	waytek female quick connect		
12	31035	terminal for 38043 connector	2	
	31034	terminal for 38042 connector		
13	39000	connector grommet	2	
14	MDL1-1/4KIT	weathertite fuse casing with fuse	1	
	MDL1-1/4	1-1/4A time delay fuse	1	
15A	1" call			DUMP VALVE PLUMBING
	1" FBSP100100HB			
	1" HFC075100			
	3/4" call	3/4" pvc hose, give length	1	
	3/4" FBSP0750750HB	3/4"FBSP hose fitting	1	
	3/4" HFD075075	3/4"FPT hose fitting	1	
15B	call	1/2" pvc hose, give length	1	SPRAY MANIFOLD PLUMBING
	HFD050050	1/2"FPT wingnut x 1/2"straight hosebarb	1	
	EL050F050HB	1/2"FPT wingnut x 1/2"90° hosebarb	1	
16	call	3/4"pvc hose, give length	1	
	FBSO750750HB	3/4"FBSP hose fitting	1	
	HFD075075	3/4"FPT hose fitting	1	
17	180.1910.10	Braglia pressure regulator, *green cap*	1	
18	180.1702.27ETC	1"ETC x 1-1/4"BSP brass fitting	1	
19		5/16" threaded rod, 6"1/4 long	2	
	031NYS	5/16" nylock nut	4	
20	call	1" rubber hose, give length	1	
	FBSP100100HB	1"FBSP hose fitting	1	
	HFC100100	1"MPT hose fitting	1	
21	call	1" rubber hose, see chart, right	1	
	ETC100CAL	1" camlock hose fitting	2	RPA PUMP ONLY
	ETC100CAL	1" camlock hose fitting	1	SELF PRIMING PUMP ONLY
	ETC125100KN	1"1/4MPT hose fitting	1	
	ETC125DAL	1"1/4FPT camlock hose fitting	1	
22	180.602.48	valve body o-ring	1	
23	SSPLG075	3/4" stainless steel plug	2	
24	FBSP075050MPT	3/4"FBSP x 1/2"MPT adapter	1	


14
1
2
3
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5
6
right
7
left
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12

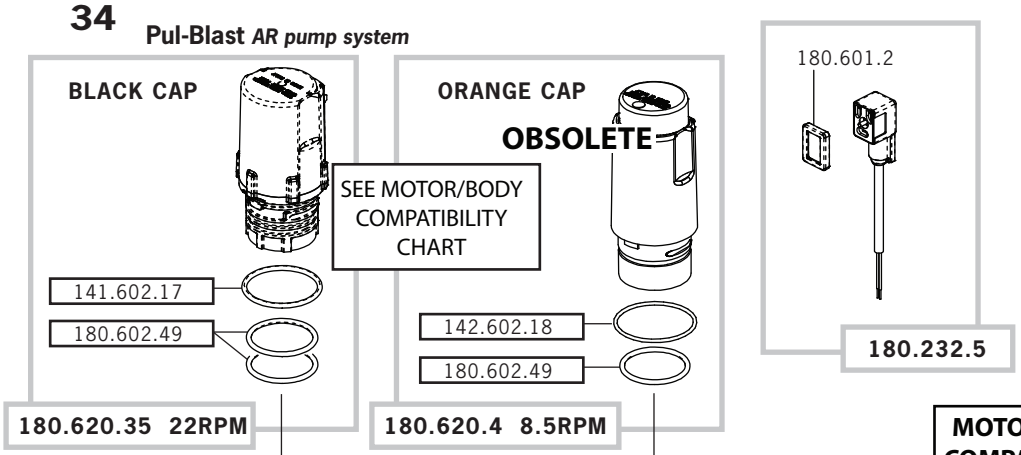
braglia metered bypass set-up

Before calibrating your metered bypass valves be sure you have water in your spray tank. The tank should be at least 1/4 full before engaging the PTO. Make sure the dump valve and handgun valve are closed. The spray tips installed should match your desired application rate. When you change your application rate, you will need to recalibrate your bypass valves.

1. Set the orange knobs of the **bypass valves** to NO bypass.
2. With the tractor running, engage the PTO to start pump.
3. Set your desired operating pressure on the **pressure regulator**.
4. Turn ON the left side spray manifold.
5. Adjust the **pressure regulator** to return to desired pressure.
6. Turn OFF the left side spray manifold.
7. OPEN the left side **bypass valve** until pressure returns to desired setting.
8. Turn ON the right side spray manifold.
9. Adjust the **pressure regulator** to return to desired pressure.
10. Turn OFF the right side spray manifold.
11. OPEN the right side **bypass valve** until pressure returns to desired setting.
12. The spray pressure should now remain constant with either or both spray manifolds on. Record your bypass valve settings for this application rate.

braglia metered bypass assembly **only parts unique to assembly are listed. see dump valve and pulblast plumbing for common parts.**

#	Part Nº	Description	Qty	
1	**180.602.48**	Valve body o-ring	1	
2	**180.601.41**	Bypass valve coupling seal	1	
3		Hitch mount bracket	1	
4	**0370100CH5**	Hex cap screw, 3/8" x 1" Gr5	4	
	037NF	Nut, 3/8" NC	4	
	037WS	Lock washer, 3/8"	4	
5		Left valve mount plate	1	
		Right valve mount plate	1	
6	**0310600CHSS**	Hex cap screw, 5/16" x 6" stainless steel	2	
	031NYSS	Nylon insert nut, 5/16"	2	
	031WS	Lock washer, 5/16"	2	
7	**HNP100**	1" x 16" armorvin hose	1	*bypass dump line*
	WC6816	Worm clamp, #16	2	
	559242	Nut, 1"FBSP	2	
	550370	90° elbow, 1"HB	2	
8	**0870200CH5**	Hex cap screw, 7/8" x 2" Gr5	2	
	087NF	Nut, 7/8" NC	2	
	087WS	Lock washer, 7/8"	2	
9	**180.1101.3**	3/4"MBSP x 1"MBSP adapter	1	*pressure out line*
10	**call**	3/4"x 16" pvc hose. 3/4"FBSP x 3/4"FGHT	1	*pressure in line*
11	**call**	3/4"x 17" pvc hose. 3/4"FBSP x 3/4"FGHT	1	
12		3/4"FBSP x 1/2"MPT adapter	2	*manfiold supply line*
13	**call**	1/2"x 10' pvc hose. 1/2"FPT wingnut (x2)	2	
14	**SSTEE100**	Tee, 1" stainless steel	1	
	SSN100CLOSE	Close nipple, 1" stainless steel	2	



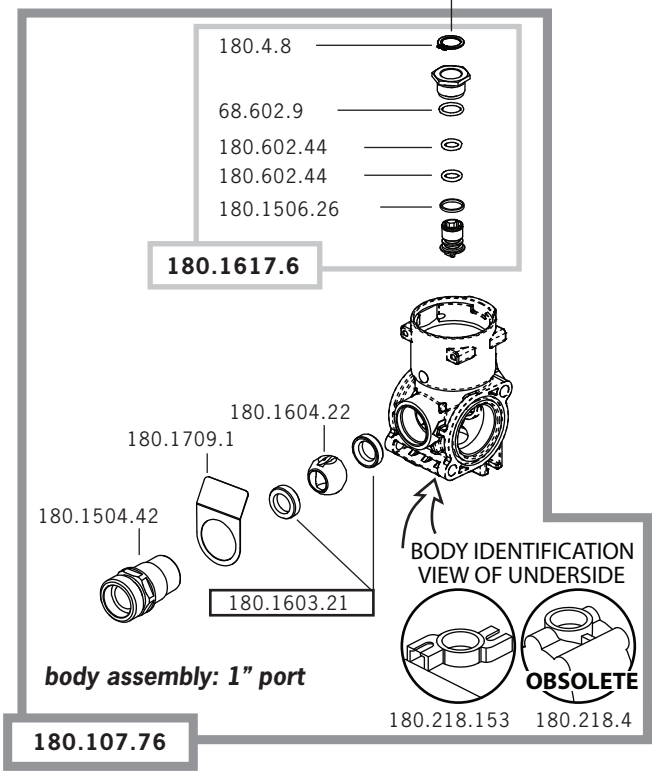
180.1910.9HS
1" port valve parts

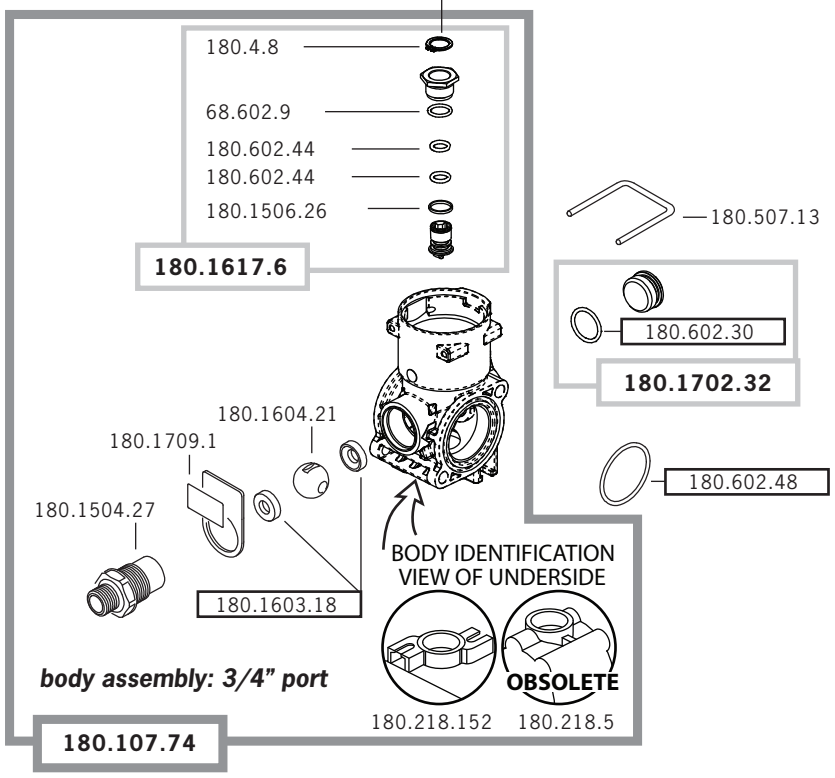
180.1910.19HS
3/4" port valve parts

MOTOR/BODY COMPATIBILITY CHART

BODY	MOTOR 180.620.35 BLACK CAP	MOTOR 180.620.6* ORANGE CAP
180.218.153	YES	NO
180.218.4*	YES	YES
180.218.152	YES	YES
180.218.5*	YES	YES

*OBSOLETE PART, LIMITED AVAILABILITY





PART NUMBER — individual components

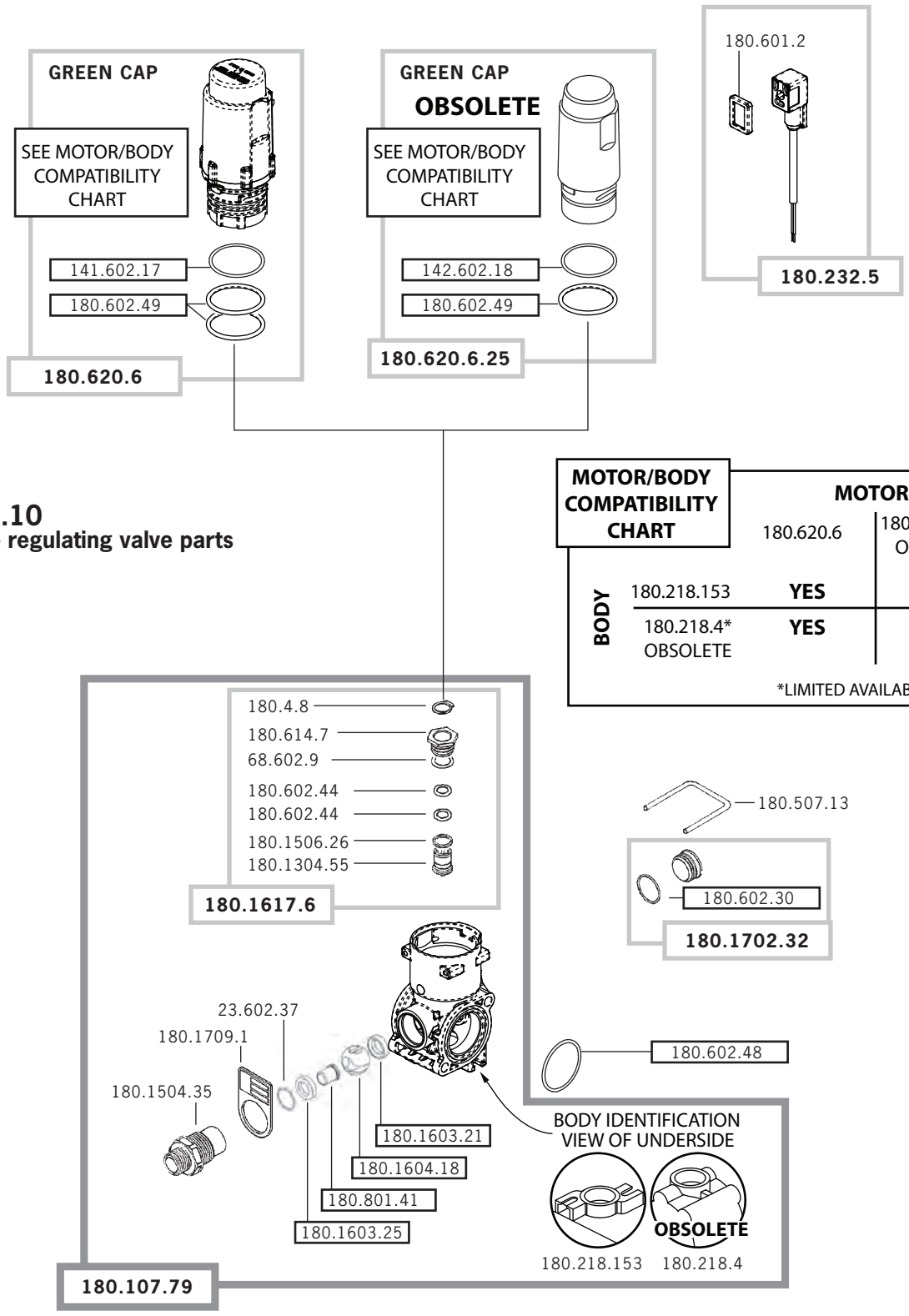
PART NUMBER — subassembly order number

PART NUMBER — basic assembly order number

PART NUMBER — component included in a spare parts kit
kits listed, right

AVAILABLE SPARE PARTS KITS

180.302.31 ***spare parts kit***



180.1910.10
pressure regulating valve parts

PART NUMBER — individual components

PART NUMBER — subassembly order number

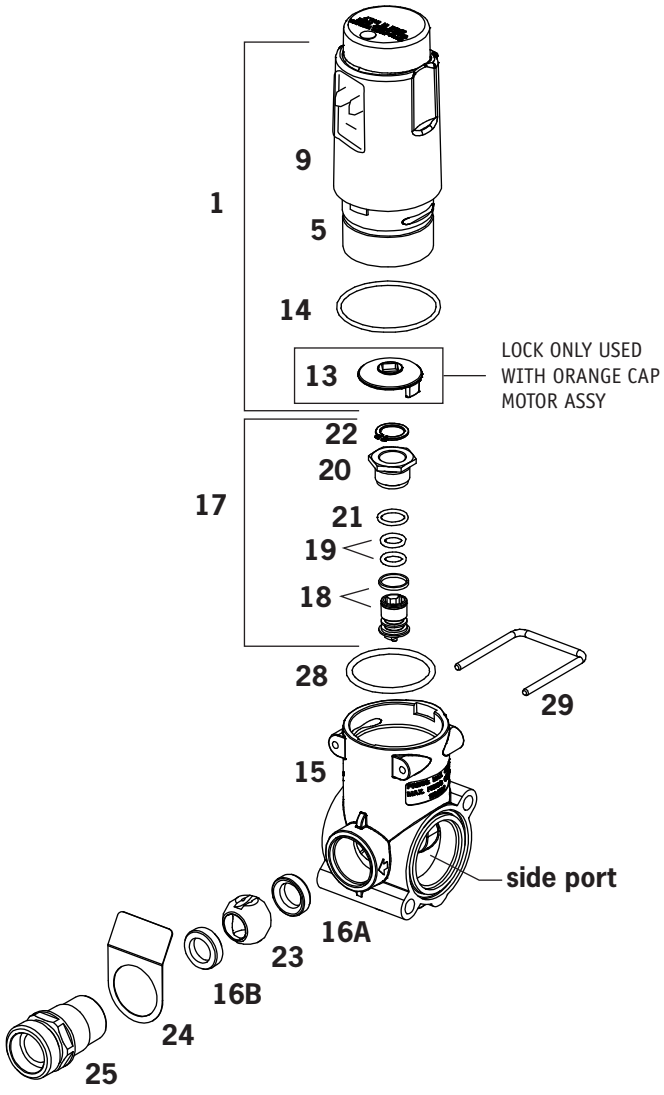
PART NUMBER — basic assembly order number

PART NUMBER — component included in a spare parts kit
kits listed, right

AVAILABLE SPARE PARTS KITS

180.302.33 ***spare parts kit***

180.1910.9HS/180.1910.19HS
180.1910.9/180.1910.19
valve repair



valve troubleshooting

Valve doesn't activate.

Check cable connections- look for oxidation and clean.

Check fuse. ONLY USE 1.25A time delay fuse.

Repeated fuse blow out.

Disconnect power cable and remove lock **29** with screwdriver. Remove unit **1** from valve body. Take care with O-ring **28**.

Check the rotation of ball **23** using Ø10 flat screwdriver inserted in the square of stud **18**. If the rotation is not smooth replace seals **16A, 16B** and ball **23**: instructions follow. After checking rotation align the notch on stud **18** as illustrated in *fig. i*, right.

If the rotation of ball **23** is smooth, check the motor unit **1** by connecting the blue and brown wires to a 12Vdc line: correct rotation is 90° between microswitches:

Black cap motor: with brown wire to (+) pole, gearmotor cam position is as illustrated in *fig. iii*, right.

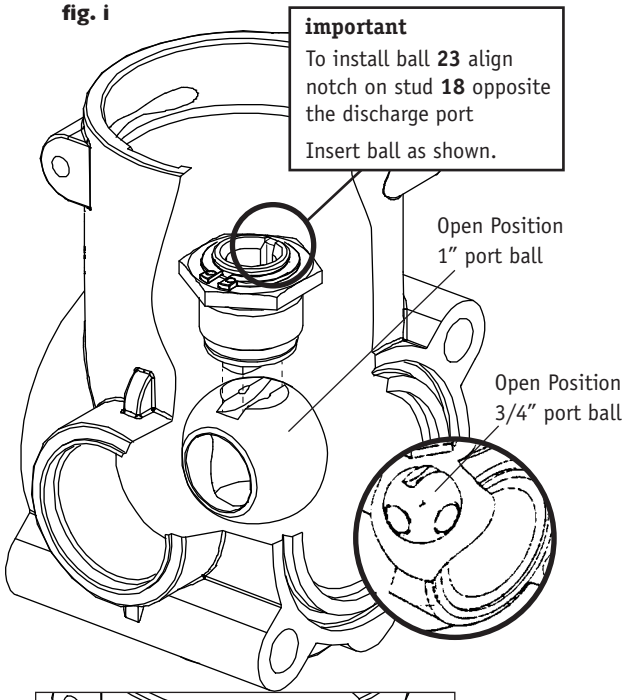
Orange cap motor: with brown wire to (+) pole, gearmotor cam position is as illustrated in *fig. iv*, right.

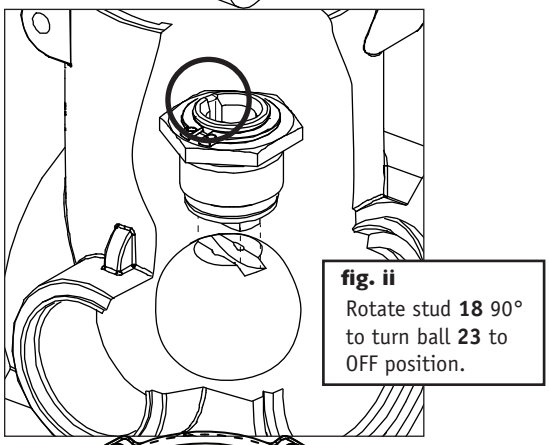
If unit **1** does not rotate correctly replace the whole unit.

Leakage from seals.

Replace seals using the repair kit 180.302.31. Follow assembly instructions, right.

fig. i





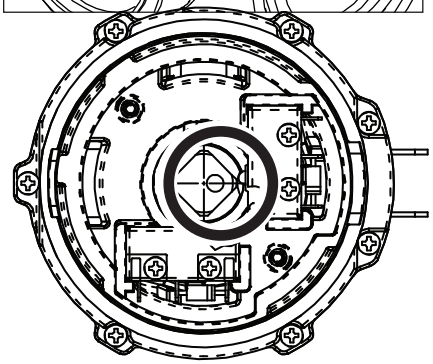
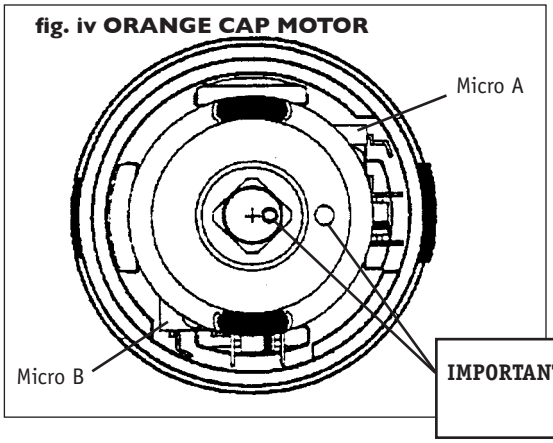


fig. iii BLACK CAP MOTOR

fig. iv ORANGE CAP MOTOR



valve disassembly

Disconnect power supply and remove all lines from valve ports.

Hold the valve firmly, gripping the **side ports**, and remove nipple **25** from valve using a CH32 wrench. Take care of plate **24**. *When gripping the valve body* **15** *protect the* **side port** *O-ring seats*.

Inspect seal **16B** on nipple **25** and replace if necessary.

Remove ball **23** and replace seal **16A** on the valve body.

Pull clamp **29** with Ø10 screwdriver.

Remove the gearmotor unit **1** from valve body. Inspect O-rings **14, 28** and replace if necessary.

Use CH24 socket wrench to remove the sub assembly **17**.

Remove the lock ring **22** with pliers and pull the stud and washer **18**. Check and replace O-rings **19, 21** and stud **washer**.

valve assembly

Before beginning assembly all parts should be clean and dry- *no residual sealants*. Lubricate all O-rings and sliding surfaces. Subassemblies should be ready before valve assembly: Nipple/seal **25/16B**; Drive subassembly **17**.

Assemble and lubricate seal **16A** in valve body. Do not damage seal surface.

Apply thread sealant on guide **20** of subassembly **17** and screw the assembly onto the valve body. Using a CH24 wrench, tighten assembly until flush with housing.

Use a Ø10 flat screwdriver to position the notch on stud **18** as illustrated in *fig. i*, at left.

Insert ball **23** on stud **18** as illustrated in *fig. i*. This is the OPEN position: the ball orifice is visible when looking through the discharge port.

Using the screwdriver, rotate the stud and ball 90° as illustrated in *fig. ii*. The ball orifice is rotated to the OFF position and is not visible in the discharge port.

Lubricate seal **16B** on nipple with waterproof grease. Apply thread sealant on nipple **25**.

Position plate **24** and with a CH32 wrench thread nipple **25** with seal **16B** into valve until flush with body. **Important: maximum torque 35Nm.**

Using the screwdriver, return the stud and ball to the starting position: align the notch on stud **18** as illustrated in *fig. i*.

Place O-ring **28** into valve body.

Before gearmotor operation, install 1.25A time delay fuse.

Check the gearmotor assembly:

Black cap motors: the mark on gearmotor **cam** must be aligned as illustrated in *fig. iii*. When assembling the gearmotor and the valve body, this mark should align with the notch on stud **18.**

Orange cap motors: the mark on lock **13** and gearmotor **cam** must be aligned as illustrated in *fig. iv*. When assembling the gearmotor and the valve body, these marks should align with the notch on stud **18.**

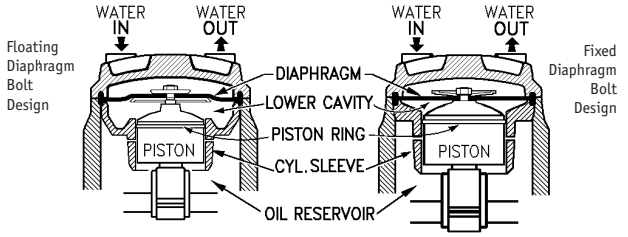
Lubricate O-ring **14**. Insert unit **1** inside the valve body. the cap **9** must install flush against the valve body **15**.

Install lock **29**. Attach plumbing lines and electrical.

PUMP OPERATION

Maintain proper oil level

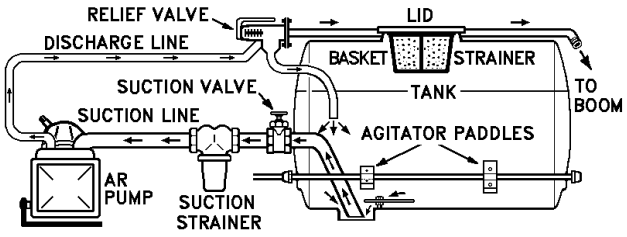
The crankcase oil serves two important functions. The oil lubricates all moving parts in the pump *and* affects the hydraulic action for optimal pump capacity. The pump diaphragms are supported by the crankcase oil during each pressure upstroke of the piston: to assure maximum performance of your pump and protect your pump diaphragms ***maintain the oil level*** *marked on the transparent filler spout.*



How the AR diaphragm pump works

Each *downstroke* of the piston/diaphragm assembly draws spray material into the upper head cavity. Simultaneously, crankcase oil from the lower head cavity is expelled as the cycling piston ring passes a vent in the cylinder sleeve, *see above illustration*. Each upstroke of the piston injects a measured amount of oil back into the lower head cavity, expanding the diaphragm as the piston cycle tops-out and expelling the spray material from the upper chamber. **Low oil level lowers performance.**

For optimal hydraulic diaphragm actuation, piston assembly lubrication, diaphragm membrane support: check the oil level frequently- the transparent oil-fill makes level checks easy. Maintain the indicated level.



Don't starve the suction

The pump will not suffer if run dry when the tank is empty. A **clogged suction strainer** or **closed suction valve**, however, will **starve the pump** and cause premature diaphragm failure.

When mixing powders, avoid clogging the suction strainer by *sluicing* heavy concentrations of wettable powders through the lid basket into an already half-filled tank. Agitator paddles will mix the powder into solution, preventing material deposits at the bottom of the tank which plug the suction strainer.

The suction valve is provided to shut off flow from the tank: for emergency plumbing repair or for strainer cleaning. **To prevent possible pump damage, SHUTDOWN SYSTEM** ***before*** **closing the suction valve.**

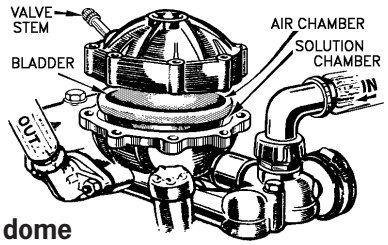
How clean is your water source? You may need to clean your suction strainer before each tank refill.

Do not over-speed your pump

Refer to the performance chart for your specific pump to find the **maximum operating speed**. Your pump is designed to operate at or below this speed. Over-speeding will cause valves to prematurely fail and could cause other internal damage.

Before pump operation

Check tightness of suction line fittings and strainer cap. Follow airdome pressurizing instructions, below.



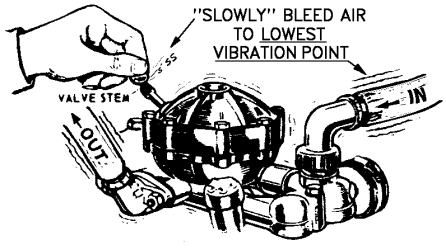
Pressurizing the air dome

Piston and piston-like pumps (diaphragm pumps) will have pulsation vibration, *water hammer*, because of the rapid change in piston direction. The **air dome** pulsation dampener reduces vibration by providing a cushion of air to bump against: *inflate or deflate this cushion to reduce vibration*. The AR airdome uses a rubber bladder to separate the air cushion from the spray material. The bladder eliminates water-logging problems common in static-air type dampeners.

If you have a pressure gauge the basic rule is to charge the air dome to 10% of the system working pressure: for a handgun pressure of 100psi, we recommend an air dome pressure of 10psi. Always shut down pump before adding air to the airdome with either a compressor or manual pump. The air cushion is small, making pressure checks challenging. Take care applying the pressure gauge evenly on the air valve to prevent air from leaking out of the air dome. It is not uncommon to lose 5-10 psi checking the pressure.

If you do not have a pressure gauge charge the air dome *with the pump shut down* to 70-80 psi: sufficient for 700 psi working pressure. Start up the pump (expect pump vibration) and adjust the relief valve to your desired working pressure. Slowly bleed off air dome pressure while watching the vibration of the pump discharge hose. Continue bleeding until vibration is eliminated or minimized. Replace stem cap tightly. *It may take a couple attempts to get the feel for* minimum vibration.

Too much air in the air dome is as bad as too little.



PUMP MAINTENANCE

HANDLE AGRICULTURAL CHEMICALS WITH CARE

USE THE PERSONAL PROTECTIVE EQUIPMENT RECOMMENDED BY THE CHEMICAL MANUFACTURER WHEN MAINTAINING SPRAY EQUIPMENT!

After each use

Run pump for five minutes with *clean* water. These few minutes of flushing are well spent: extend diaphragm life, minimize chemical buildup throughout your spray system.

After every 200 hours AND at season's end

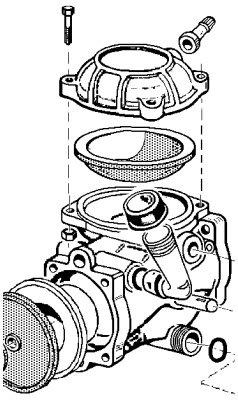
Inspect diaphragms for wear marks, swelling, and stretching. *See the diaphragm replacement instructions, below.*
Check valves for spring fatigue and seat wear.
Change the oil- the crankcase oil capacity is in your pump manual. Use a **30W non-detergent oil**. Rotate the pump shaft by hand while filling to evacuate air pockets. With pump level, the crankcase is full when oil level reaches the indicator on the transparent fill neck. Run pump for 10 minutes under **no load** conditions to evacuate remaining air pockets. Recheck oil level. During first field run, **check oil color closely**. If it should turn milky, the diaphragms were not correctly seated.

Winter storage

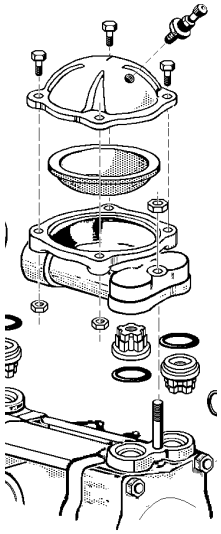
Run pump for five minutes with *clean* water. Then, with suction and discharge valves *open* and the tank empty, run pump five minutes to ensure complete drainage of pump heads and lines. A gallon of anti-freeze recirculated through the system and left in place after shut down completes your winterizing. Allow anti-freeze to replace any possible water in hoses and booms. If a handgun is in the system, run anti-freeze through the hose and handgun, returning the spray into the tank through the lid. Two gallons of anti-freeze may be required to winterize systems with handgun lines.

Replacing air dome diaphragm

Bleed off air pressure in the air dome. Remove the 13mm bolts holding the assembly together. Use a flat head screwdriver to remove the old diaphragm. Install the new diaphragm and re-install air dome. See previous page for air dome charging instructions.



AR202/19 style



AR30/50 style

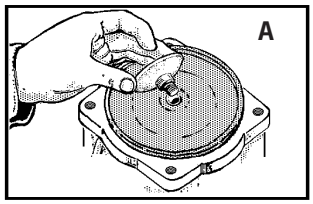
Replacing diaphragms

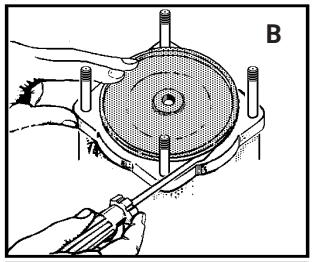
Drain the crankcase. Slowly turn pump shaft by hand until all oil is drained. Older AR30/50 pumps without a drain plug require a head and diaphragm to be removed to empty oil.

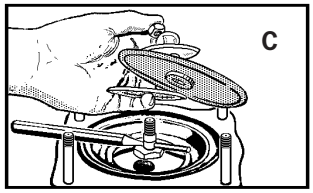
Remove the manifold: take care not to lose or damage input/output port o-rings.

Head removal- repair one head at a time. Remove fasteners securing head to body- some pumps use bolts (*fig.* **A**) others have nuts on mount studs (*fig.* **B**). You may need to lightly pry the head cover with a flathead screwdriver to loosen.

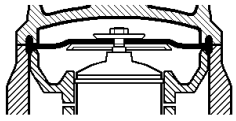
Remove the old diaphragm. Top out the piston/diaphragm assembly by turning the pump shaft. Remove the diaphragm retaining nut (*fig.* **A**) If the nut holds and the retaining bolt loosens from the piston head, this creates no problem. (*Some bolts have a hole* (*fig.* **C**) *to insert a 8" pin punch and hold bolt when removing nut & washer.*) Using a flathead screwdriver (*fig.* **B**) pry the diaphragm from its seat.



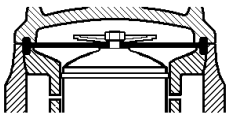




Install the new diaphragm. If your model uses a diaphragm support washer (see *washer installation diagram*, above) be certain it is installed as illustrated. Pour 2 Tbsp **30W non-detergent oil** into lower diaphragm cavity. Tap new diaphragm into seat groove with the handle of a screwdriver. Reassemble retaining washer and nut as illustrated and re-assemble head and manifold.



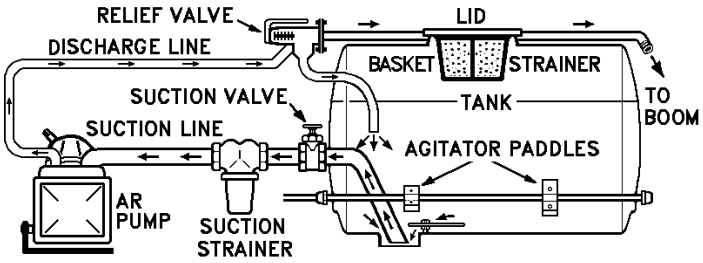
Diaphragm WITH support washer



Diaphragm WITHOUT support washer

Fill the crankcase with oil. The crankcase oil capacity is in your pump manual. Use a **30W non-detergent oil**. Rotate the pump shaft by hand while filling to evacuate air pockets. With pump level, the crankcase is full when oil level reaches the indicator on the transparent fill neck. Run pump for 10 minutes under **no load** conditions to evacuate remaining air pockets. Recheck oil level. During first field run, **check oil color closely**. If it should turn milky, the diaphragms were not correctly seated.

TROUBLESHOOTING



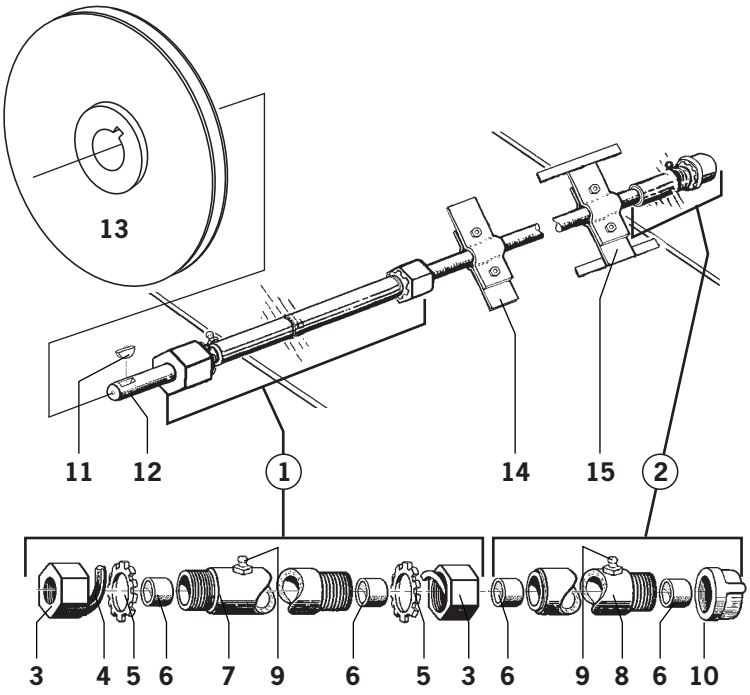
The AR diaphragm pump delivers volume determined by pump speed.
Set pressure with your adjustable relief valve.

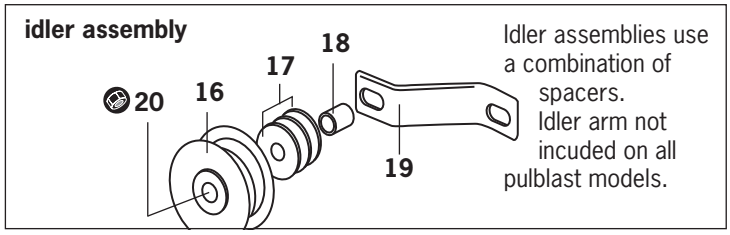
Problem	Source	Fix
No pressure	Plugged strainer	Clean screen- see *suction care* on pump operation page.
Very little pressure	Suction hose obstruction	Clear obstruction
	Collapsed suction hose outside or inside tank	Replace collapsed hose
Pressure drops below working range when relief valve is open to spray applicator	Pump sucking air	Hoses and unions should be tightly fitting and have no holes
	Nozzle volume greater than pump capacity	Adjust relief valve Reduce nozzle orifice size Reduce number of nozzles in use
	Excessive tank foam	Refill tank if foaming because of low volume Move agitator paddle if too close to suction
	Pressure relief valve stuck or worn	Check relief valve for wear- repair or replace
	Pump inlet/outlet check valve worn	Replace check valve(s)
Pressure gauge fluctuates wildly	Air dome pressure too low or high	See *pressurizing instructions* on pump operation page
	Pump sucking air	Hoses and unions should be tightly fitting and have no holes
	Faulty suction strainer	Check strainer and connections for suction leaks
	Air in pump cavity	Run pump with open discharge to completely evacuate air
No pump suction	Check valve seating improperly	Examine and clean all check valve seats in the pump
Milky pump oil **Transparent filler spout overflows**	Diaphragm rupture	Check diaphragms and replace where necessary See *diaphragm replacement* on pump maintenance page
Output drops **Pump noisy**	Low oil level	Add oil to fill level indicated on fill neck Use 30W non-detergent oil
Excessive pulsation	Air dome pressure too low or high	See *pressurizing instructions* on pump operation page

Mechanical agitation

No.	Part #		Description	Qty
	5/8" shaft	3/4" shaft		
1	AG06210ASSY	AG07510ASSY	complete rear bearing	1
2	AG06203ASSY	AG07503ASSY	complete front bearing	1
3	AG062ESS	AG075ESS	packing nut w/packing	2
4	AG025 (6")	AG025 (11")	packing	-
5	AG062C	AG075C	locking ring	2
6	AGBSH062	AGBSH075112	bushing	4
7	AG06210	AG07510	rear housing w/busings	1
8	AG06203	AG07503	front housing w/busings	1
9	1641-B	1641-B	zerk fitting	2
10	BRCAP075	BRCAP100	cap	1
11	KW018087SS	KW018087SS	key	1
12	AG062___	AG075___	agitator shaft, *provide length*	1
13	AGP06206	AGP07506	agitator pulley	1
14	AG23		standard paddle *one comple set*	-
15	PB50		large paddle *one comple set*	-
16	MB702		idler pulley	1
17	062WUSS		5/8" flatwasher	see inset
18	MBIN651		spacer	
19	MBIN404		6" idler arm	
	PLIN5611LS		10" idler arm	
20	062_____CH5		5/8"-11 Gr.5 bolt, *provide length*	1
	062WUSS		5/8" flatwasher	1
	062WS		5/8" lockwasher	1
	062NF		5/8"-11 nut	1

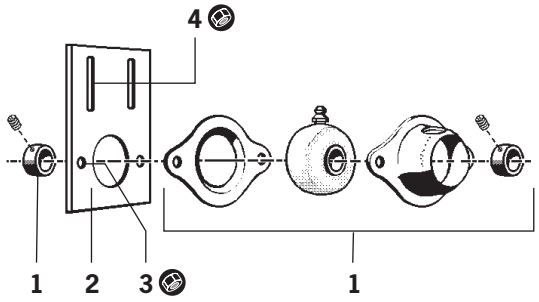
AGITATION DRIVE BELT: SEE LUBRICATION & MAINTENANCE PAGE

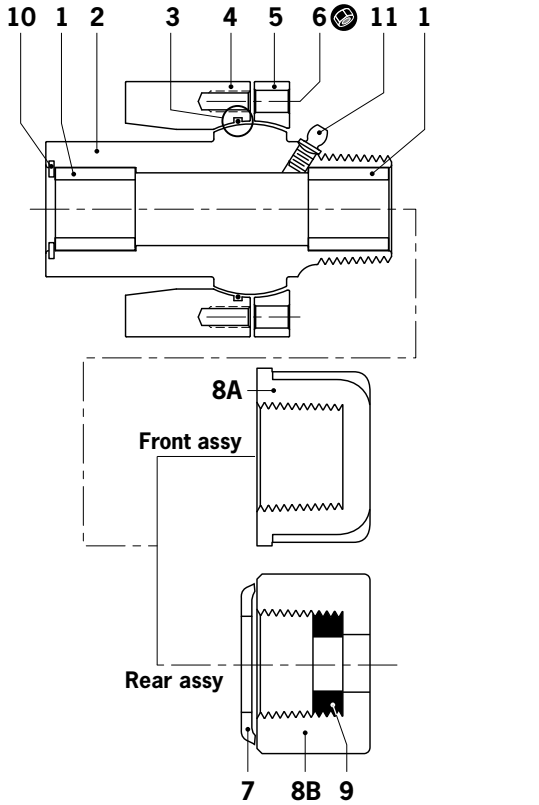




Outboard bearing

No.	Part #	Description	Qty
1	AGOB062T	outboard bearing, 5/8" shaft	1
	AGOB075T	outboard bearing, 3/4" shaft	
2	AGPL062____	5/8" bearing plate *provide plate height*	1
	AGPL075____	3/4" bearing plate *provide plate height*	
3	0310075CP	5/16"-18 x 3/4" carriage bolt	2
	031WS	5/16" lockwasher	2
	031NF	5/16"-18 nut	2
4	0370100CP	3/8"-16 x 1" carriage bolt	2
	037WUSS	3/8" flatwasher	2
	037WS	3/8" lockwasher	2
	037NF	3/8"-16 nut	2

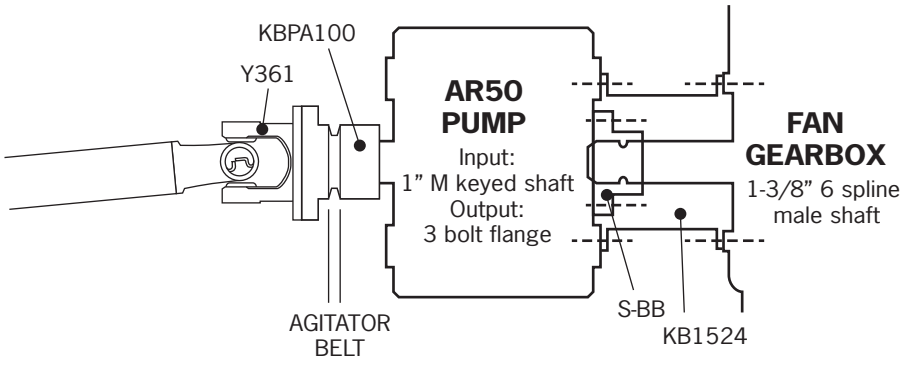


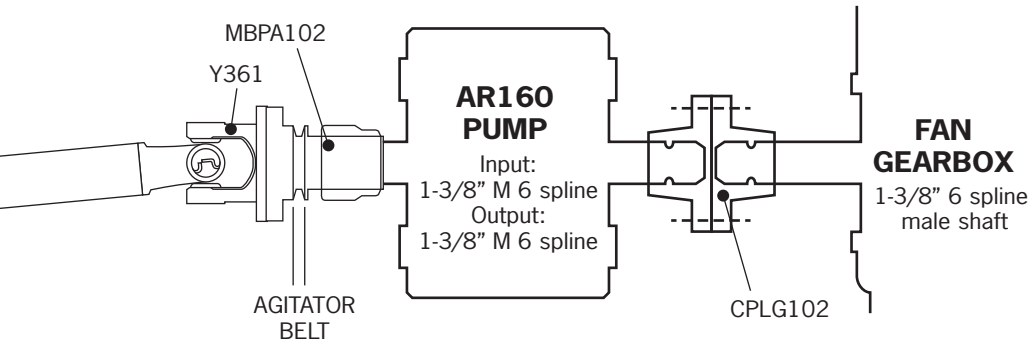


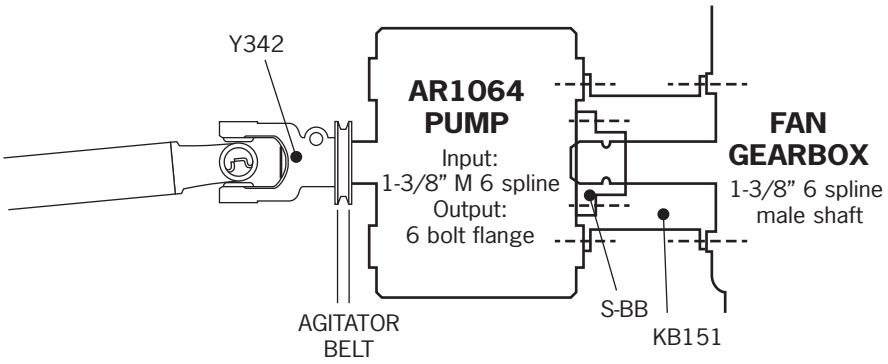
R7 agitator bearing, *qty listed for one assembly*

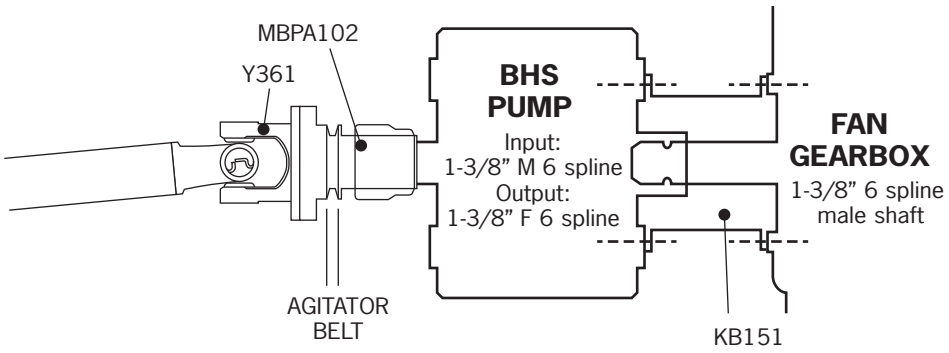
No.	Part #	Description	Qty
1	AGBSH075R7	bushing for 3/4" agitator shaft	2*
2	AG075R72	agitator shaft bearing housing	1*
3	2-033V75	o-ring	1*
4	AG075R74	bearing housing socket *welded to tank*	1*
5	AG075R76	agitator bearing housing cap	1*
6	0250087CKSS	1/4"-20 x 7/8" stainless steel	4*
	025WSSS	1/4" lockwasher, stainless steel	4*
7	AG075C	3/4" locking ring	1*
8A	BRCAP075	brass cap *front assembly*	1
8B	AG075ESS	packing nut with packing *rear assembly*	1
9	AG025	packing only, @ 11" each nut	-
10	RR-100-S02	snap ring	1
11	1641B	zerk	1

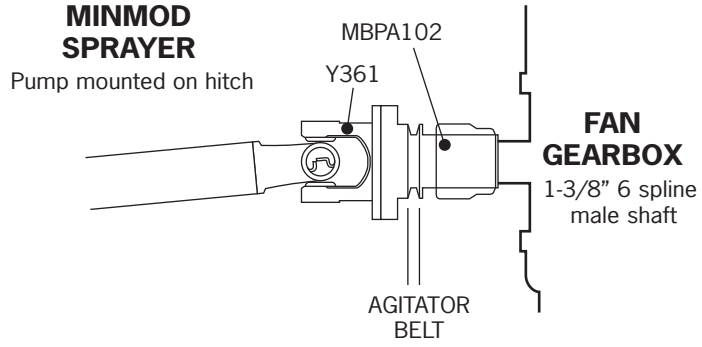
* Listed quantities are per bearing assembly





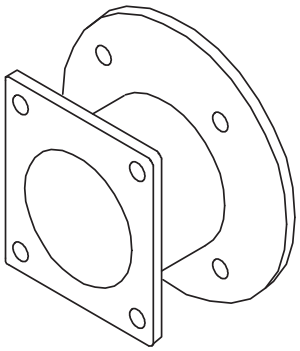






pump and gearbox adapters

S-BB



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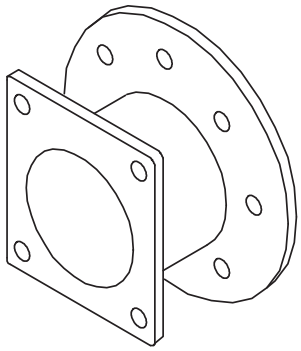

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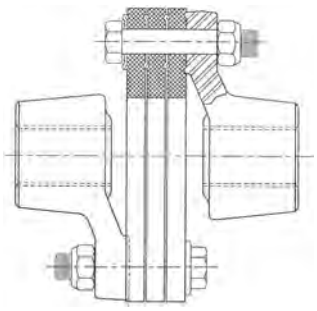
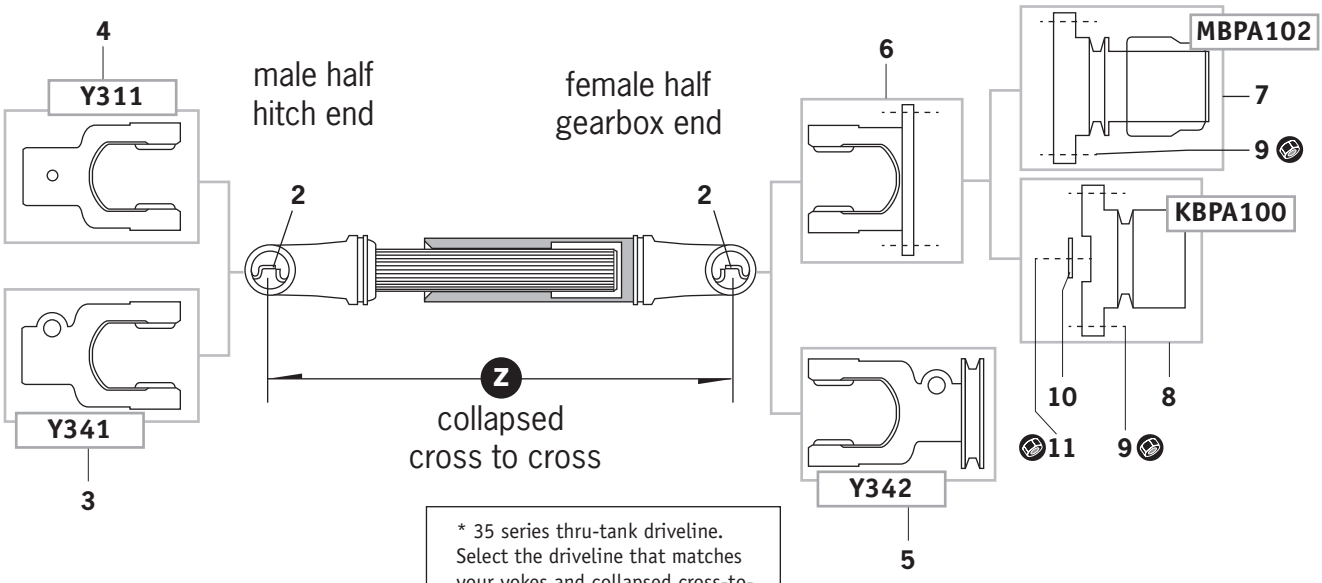


CPLG102
See flex coupler parts page



* 35 series thru-tank driveline. Select the driveline that matches your yokes and collapsed cross-to-cross measurement OR provide your serial number to a Rears dealer for driveline identification.

Thru-Tank Driveline Selection

Hitch End Yoke	Gearbox End Yoke	Complete Driveline Part Number* Z Collapsed Cross - Cross				crosskit	splinelock kit or rollpin	
		46"	62-1/2"	72-1/2"	81-3/4"		hitch end	gearbox end
Y311	Y342					CPL35RW	0310225RP	SAF-T-PIN6
Y341	Y342					CPL35RW	SAF-T-PIN6	SAF-T-PIN6
Y311	KBPA100					CPL35RW	0310225RP	*see parts*
Y341	KBPA100					CPL35RW	SAF-T-PIN6	*see parts*
Y311	MBPA102					CPL35RW	0310225RP	SSLK0621
Y341	MBPA102					CPL35RW	SAF-T-PIN6	SSLK0621

Thru-Tank Driveline Parts

No.	Part #	Description	Qty
2	CPL35RW	cross kit	2
Yoke on male driveline half, hitch end			
3	Y341	1-3/8" 6spline 35 ser yoke with pin lock	1
	SAF-T-PIN6	pin lock repair kit	
4	Y311	1-3/8" 6spline 35 ser yoke with rollpin	
	0310225RP	5/16" x 2-1/4" rollpin	
Yoke on female driveline half, gearbox end			
5	Y342	1-3/8" 6spline pin lock yoke w/pulley	1
	SAF-T-PIN6	pin lock repair kit	
6	Y361	35 series 4 bolt flange yoke	
7	MBPA102	1-3/8" 6spl slide lock adapter w/pulley	
	SSLK0621	35 series slide lock repair kit	
8	KBPA100	1" shaft adapter w/pulley *includes 10, 11*	

No.	Part #	Description	Qty
9	0440100CH8	7/16"-20 X 1" Gr.8 bolt	4
	043WSAE	7/16" hardened lock washer	4
	LOCTITE 24205	Loctite 242 .5Ml tube	1
10	KBPA101	retaining washer for KBPA100	1
11	M8-1.25X25MM	8 x 25 bolt	1
	038WS	3/8" lockwasher	1

universal joint disassembly

Remove all (4) snap rings in cross assembly **1**.

Position joint in loose vice **2**. Strike top arm of unsupported yoke to drive the top cup up. Repeat on the opposite side.

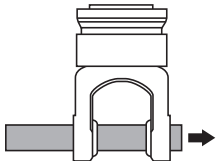
Grip loosened cup in vice **3** and strike yoke arm to drive yoke off cup. Repeat on opposite cup.

Support cross in loose vice **4** and strike yoke arm to drive the top cup up. Repeat on opposite side.

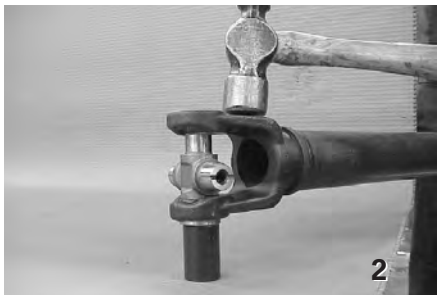
Repeat step **3** to remove the remaining two cups.

Note: Yoke arms must be true. If a yoke arm is *sprung* by striking with excessive force, the cross will bind in operation.

True yoke test- slide a machined rod (a few thousandths under cup diameter) through the yoke arms. The yoke must be replaced if the yoke won't slide completely onto the rod.



55 series rod diameter	*1.530"*
35 series rod diameter	*1.247*



universal joint reassembly

Clean bearings **1** before assembling cross. Cups should be free from dirt- and be certain the seal from the previous cross does not remain in the cup. Smear grease in the clean bearing.

Make certain all needle bearings are seated properly.

Clean bearing seat in yoke arms. Check for burrs (in new yokes also). File out any burrs: bearing seat should be smooth and clean.

Yoke arms must be true (see *true yoke test*, above).
If a yoke arm is *sprung* by striking with excessive force, the cross will bind in operation.

Where a *spacer* is required, select a diameter that evenly distributes force around the outer edge of the bearing cup. Choosing a spacer of insufficient diameter or using no spacer at all will drive the bearings unevenly and cause the joint to bind in operation.

You should assemble the joint in a clean area.

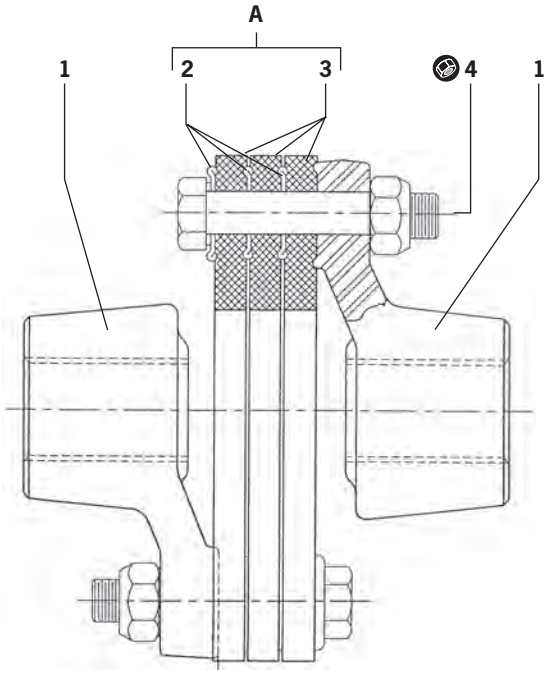
Insert the cup and cross **2** and drive in with a spacer.

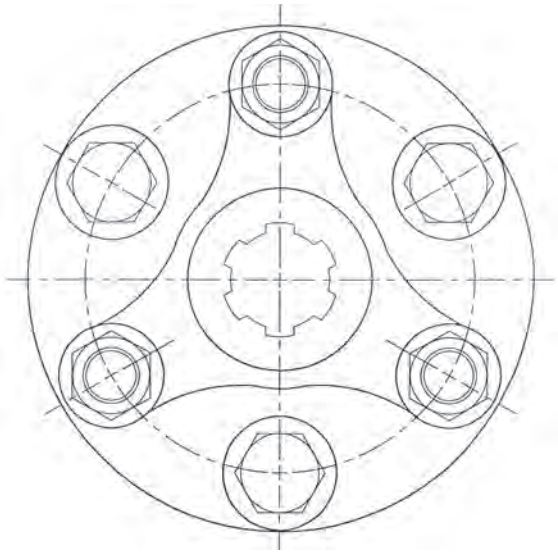
Insert snap ring **3**.

Insert second cup **4** and hold cross in place to drive on cup. Drive cup down with spacer and insert snap ring.

To loosen cross, strike yoke arm **5** and check cross for free rotation.

Position second yoke on cross **6** and repeat steps **2** to **5**.



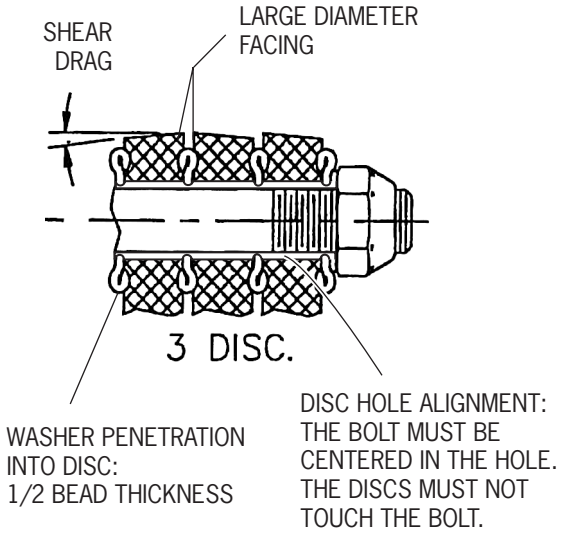


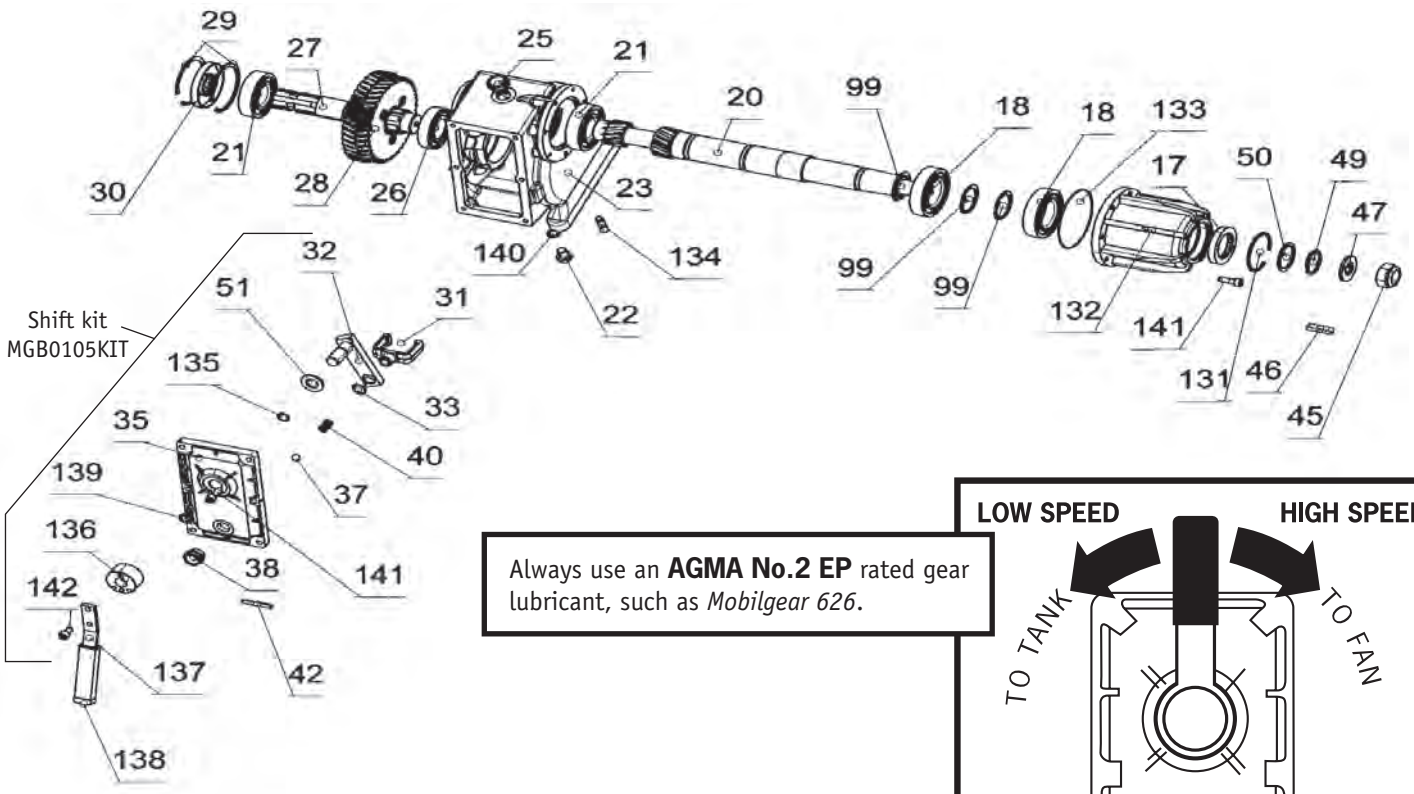
CPLG102 flex coupling

No.	Part #	Description	Qty
A	CPLG1000	repair kit	1
1	CPLG1025	spider, 1-3/8" 6-spline	2
2	CPLG1022	beaded washer	18
3	CPLG1024	shock absorbing disc	3
4	CPLG1021	1/2"-20 X 2-11/16" Gr.5 bolt	6
	CPLG1023	1/2"-20 slotted nut	6

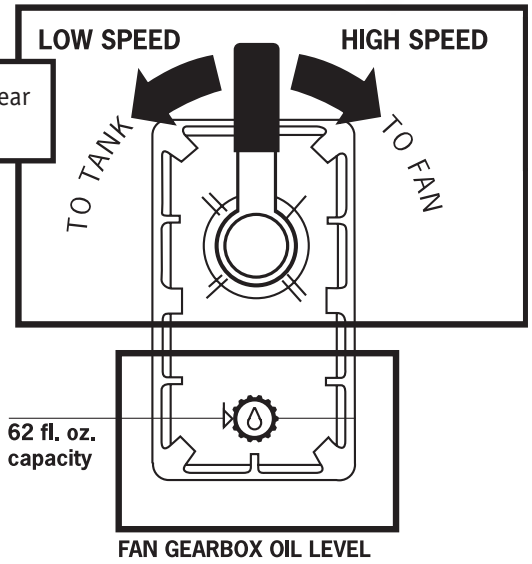
Flex coupling assembly

1. Always rotate bolt head.
2. Each Disc **3** has a large diameter side (shear drag side). Stack your discs as illustrated at right.
3. A 1-3/8" shaft will help align the components. All Disk bolt holes must be aligned: it is important that the discs do not touch the Bolts **4**.
4. Install Beaded Washers **2** as illustrated at right: the open edge of washer toward disc on first and last disc; between middle discs the open edge can be oriented in either direction.
5. Pre-assembly, snug up the Fasteners **4**. Take care that the discs do not shift when tightening: it is important to keep the discs from touching the bolts.
6. Final assembly, tighten fasteners on one Spider **1** and then the other.
7. Beaded Washers **2** must recess into Disc one-half the thickness of the bead. If not, tighten nuts to obtain bead penetration into the Disc.





Always use an **AGMA No.2 EP** rated gear lubricant, such as *Mobilgear 626*.

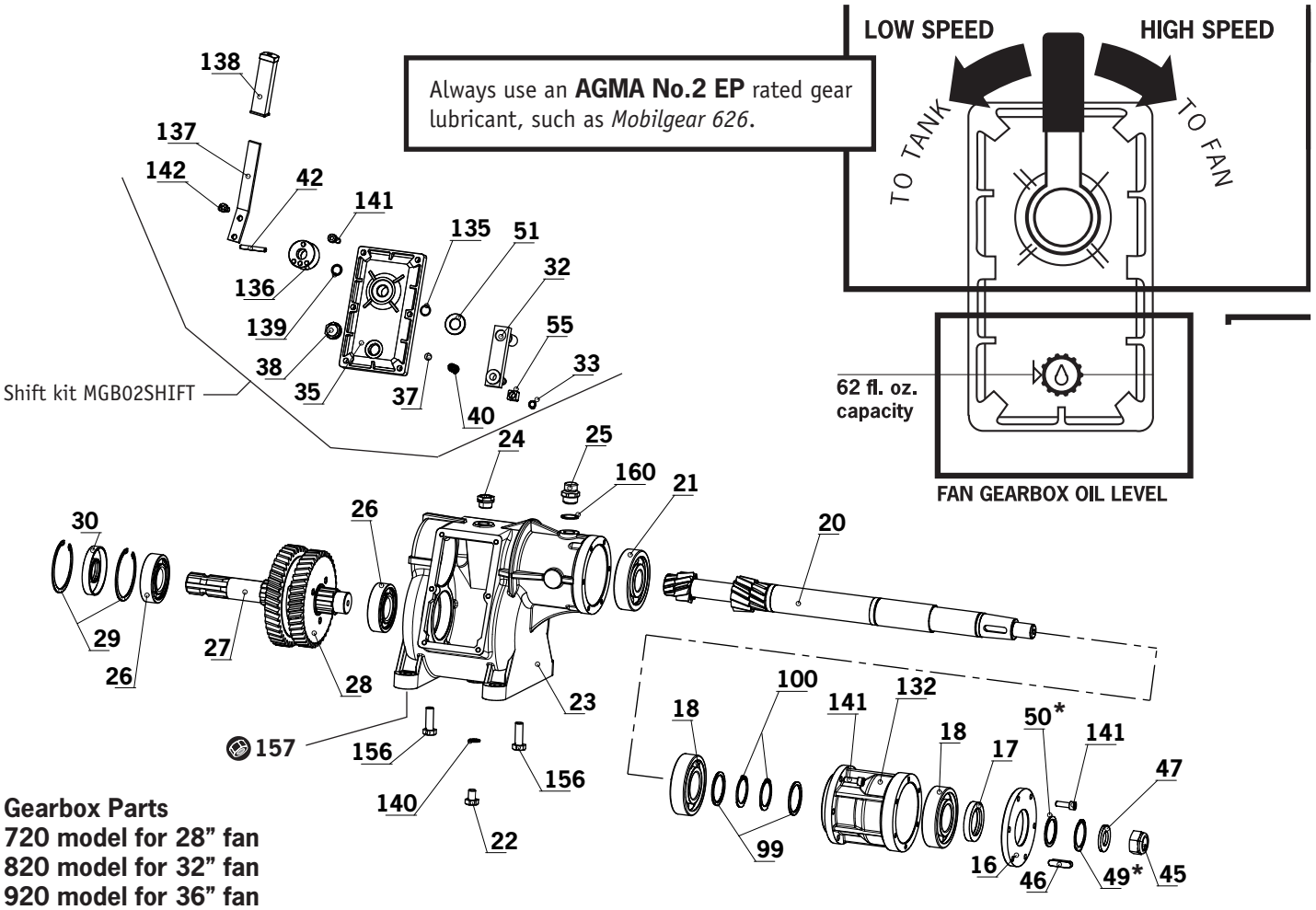


FAN GEARBOX OIL LEVEL

Gearbox Parts MGB242SPCM9P for 24" fan

No.	Part #	Description	Qty
17	MGB0456510	seal 45 x 65 x 10	1
18	6209	bearing	2
20	MGB02101	fan shaft Z10-12	1
21	6307	bearing	2
22	MGB01005	plug 12 x 16	1
23	MGB010021	gearbox case	1
25	MGB01020	breather	1
26	6207	bearing	1
27	MGB0212	input shaft, 6 spline	1
28	MGB0211	gear Z48-50	1
29	N5000-315	snap ring (seeger I 80)	2
30	MGB0358010	seal 35 x 80 x 10	1
31	MGB01055INF	fork	1
32	MGB01032	shifting guide	1
33	SEG00003	snap ring (seeger E 18)	1
35	MGB02023	cover plate *install w/liquid gasket*	1
37	MGB0106	11D sphere	1
38	LIV0001	oil level sight gauge	1
40	MLL00020	spring	1

No.	Part #	Description	Qty
42	MGB01040	pin 6 x 45	1
45	MF870	locknut 24mm	1
46	MF878	key 8 x 7 x 40	1
47	MF248	washer 24 x 44 x 4	1
49	MF2409	snap ring (seeger E 35)	1
50	MF2450	spacer 45 x 30 x 2	
99	5100-177	snap ring (seeger E 45)	3
131	SEG00012	snap ring (seeger I 65)	1
132	FUS00026	extension housing	1
133	OR000003	oring	1
134	PRI00008	stud 10 x 20	6
135	OR000002	oring	1
136	POR00002	indexing lever base	1
137	LEV00001	lever	1
138	MAN00002	grip	1
139	OR000001	oring	1
140	RON00300	washer, 12 x 17 x 1.5, aluminum	1
141	M8X25SHC	bolt M8-1.25 x 25	13
142	M8X16SHC	bolt M8-1.25 x 16	2

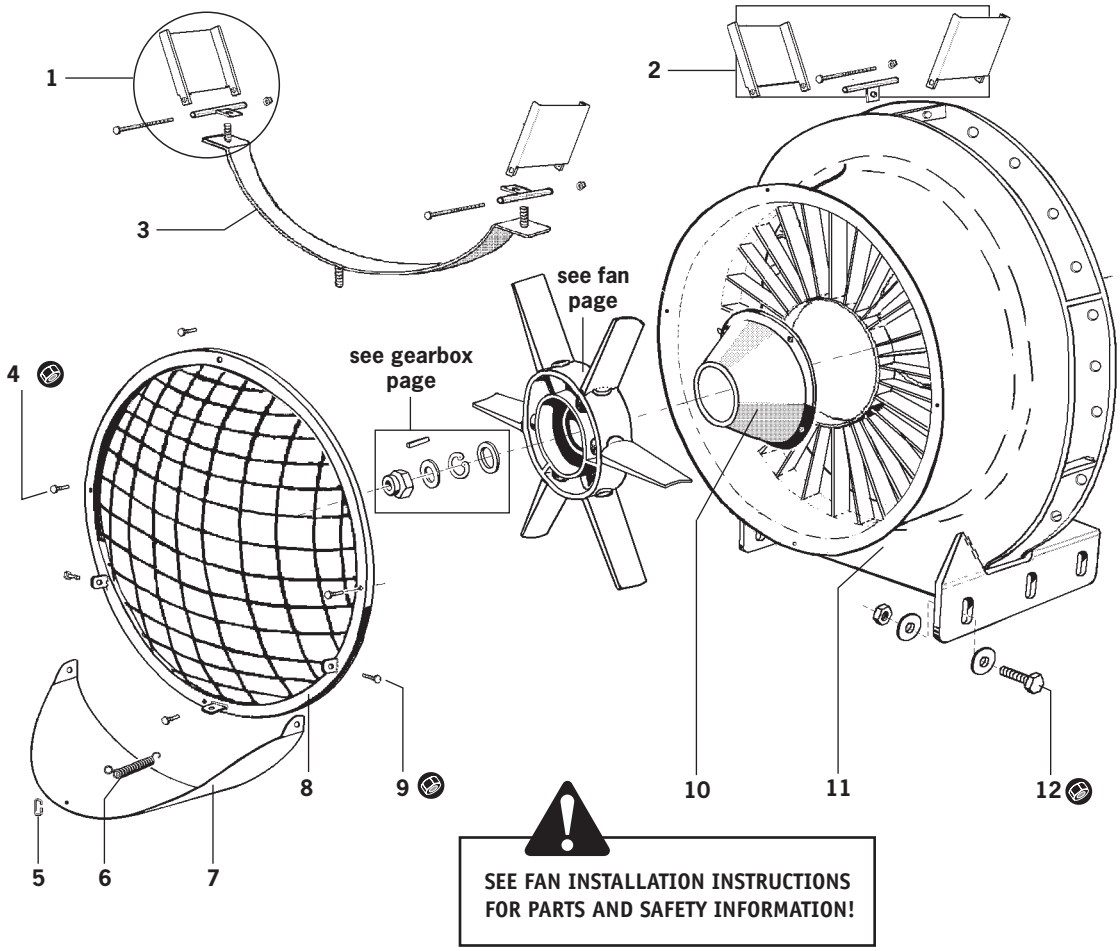


Gearbox Parts
720 model for 28" fan
820 model for 32" fan
920 model for 36" fan

No.	Part #	Description	Qty
16	MGB01104	follower	1
17	MGB0456510	seal 45 x 65 x 10	1
18	6309	bearing	2
20	MGB0214	fan shaft, 28" fan	1
	MGB0215B	fan shaft, 32" fan	
	MGB0215A	fan shaft, 36" fan	
21	6407	bearing	1
22	MGB01005	plug, 12M x 16M	1
23	MGB01003C3	housing *includes 17, 21, 26, 30*	1
24	MGB01010	oil fill cap	1
25	MGB01020	air vent	1
26	6307	bearing	2
27	PER00004	input shaft	1
28	MGB0213B	2-speed gear, 28"&32" fans	1
	MGB0213A	2-speed gear, 36" fan	
29	N5000-315	snap ring (seeger I 80)	2
30	MGB0358010	seal 35 x 80 x 10	1
32	MGB01032	shifting guide	1
33	MGB01033	snap ring (seeger E 10)	1
35	MGB01023	cover plate *install w/liquid gasket*	1
37	MBG0106	ball 9/32"	1
38	LIV00001	oil level sight gauge	1
40	MLL00020	spring	1
42	MGB01040	pin 6M x 45M	1
45	MF870	24MM nylock nut	1
46	MF878	key, 28" fan, 8 x 7 x 40	1
	MF879	key, 32"&36" fan, 10 x 8 x 40	

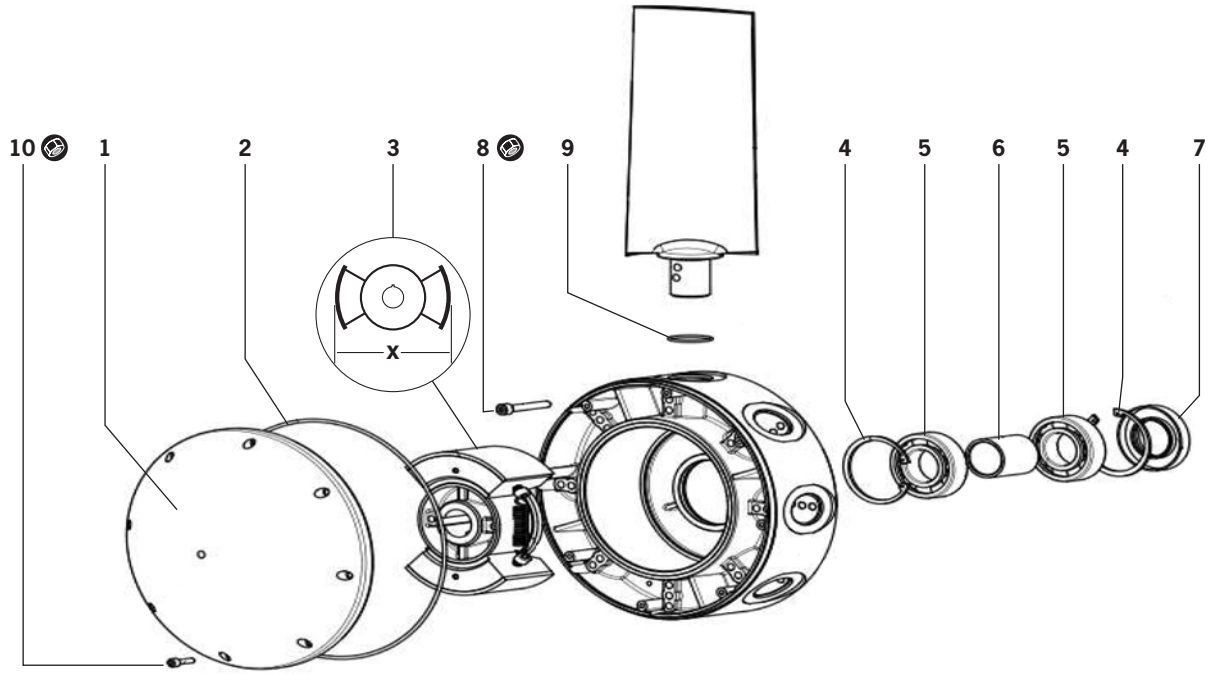
No.	Part #	Description	Qty
47	MF248	washer 24 x 44 x 4	1
49*	MF2409	snap ring, 24"-28" fan (seeger E 35)	1
	MF840	snap ring, 32"-36" fan (seeger E 40)	
50*	MF2450	spacer, 24"-28" fan	1
	MF850	spacer, 32"-36" fan	
51	RON00101	washer 18 x 34 x 3	1
55	MGB01055	shifting cube	1
99	MGB0206	spacer	2
100	5100-177	snap ring (seeger E 45)	2
132	MGB01103	extension	1
135	OR000002	oring 2056 NBR	1
136	POR00002	indexing lever base	1
137	LEV00001	shift lever	1
138	MAN00002	grip	1
139	OR000001	oring	1
140	RON00300	washer 12 x 17 x 1.5	1
141	M8X25SHC	bolt M8-1.25 x 25	18
142	M8X16SHC	bolt M8-1.25 x 16	2
156	M12-1.75X30	bolt M12-1.75 x 30	2
	M12LW	lockwasher M12	2
	050WSAE8	1/2" hardened flatwasher	2
157	0500225CH8	bolt 1/2"-13 x 2-1/4" Gr.8	4
	050WSAE8	1/2" hardened flat washer	8
	050WS	1/2" lockwasher	4
	050NF	1/2" nut	4
160	GUA00006	washer 21 x 27 x 1.5 aluminum	1

**not included in gearbox or fan assembly*



Fan Housing

No.	Part #	Description	Qty
1	DEF	one complete lower deflector	2
2	DEF-2	one complete upper deflector	1
3		obsolete part, call for information	
4	0310200CH2	5/16"-18 x 2" bolt	4
	031NYS	5/16"-18 nylock nut	4
5	QUICK LINK 3/16	3/16" connector, trash guard	1
6	728	spring, trash guard breakaway	1
7	MBDP	trash guard, *includes fasteners*	1
8	MBTG24	24" fan guard, *includes fasteners*	1
	MBTG28	28" fan guard, *includes fasteners*	
	MBTG32	32" fan guard, *includes fasteners*	
	MBTG36	36" fan guard, *includes fasteners*	
9	0370100CH2	3/8"-16 x 1" bolt	2
	037NYS	3/8"-16 nylock nut	2
10	MF880	cone	1
11		fan housing, *provide serial number*	1
12	0510125CH8	1/2"-20 x 1-1/4" Gr.8 bolt	6
	050WSAE8	1/2" hardened flatwasher	6
	051TLZ	1/2"-20 top lock nut	6



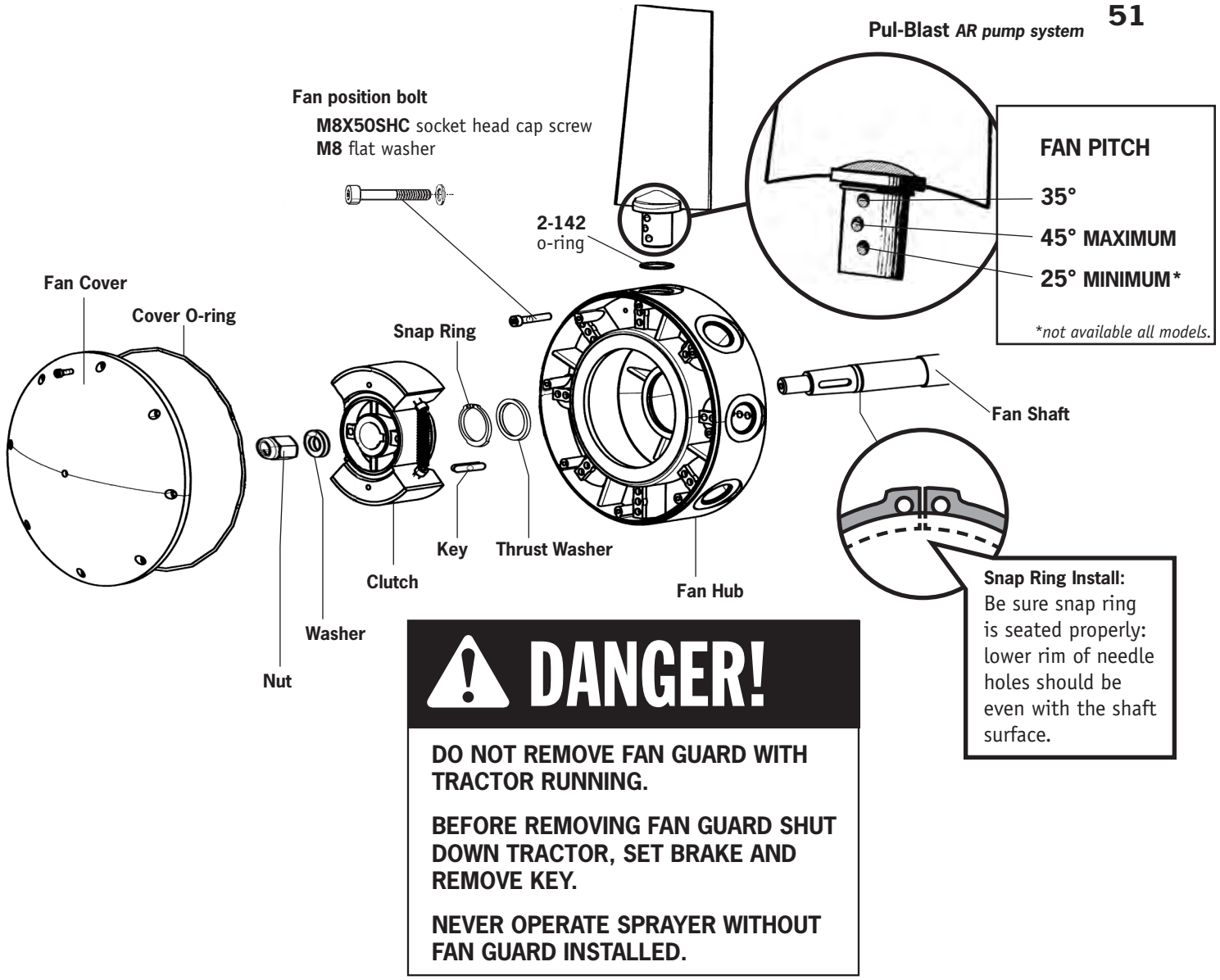
Fan: 28", 32", 36"

for 24" fan, see parts page

No.	Part #	Description			Qty
1	MF821	cover, aluminum, 28"/8 blade fan			1
	MF822	cover, aluminum, 32"-36" fan			
	MF823	cover, black poly, *all fan sizes*			
2	MF825	o-ring, aluminum cover, 28"/8 blade fan			1
	MF826	o-ring, aluminum cover, 32"-36" fan			
	MF827	o-ring, black poly cover, *all fan sizes*			
		fan	**x**		
3	MFC28	*28"*	*6"*	clutch	1
	MFC287	*28"*	*7"*	clutch	
	MFC32	32-36"	-	clutch	
4	MF830	*28"*	*6"*	snap ring *seeger I 62*	2
	MF840	*28"*	*7"*	snap ring *seeger I 80*	
	MF840	32-36"	-	snap ring *seeger I 80*	
5	60072RS	*28"*	*6"*	bearing	2
	6307-2RS	*28"*	*7"*	bearing	
	62082RS	32-36"	-	bearing	
6	MF2411	*28"*	*6"*	spacer	1
	MFDIS11	*28"*	*7"*	spacer	
	MF860	32-36"	-	spacer	
7	MGB0406210	*28"*	*6"*	seal 62/40/10	1
		28"	*7"*	*seal not required*	
	MGB0458010	32-36"	-	seal 80/45/10	
8	M8X50SHC	bolt, M8 x 50			8
9	2-142	o-ring			8
10	MF6825	bolt, M6 x 25 *aluminum cover*			1
	MF6620	bolt, M6 x 20 *poly cover*			

Complete Fan Assembly:

28" Fan	***MF288VAU-A***
32" Fan	***MF32VP***
36" Fan	***MF36VP***



⚠ DANGER!

DO NOT REMOVE FAN GUARD WITH TRACTOR RUNNING.

BEFORE REMOVING FAN GUARD SHUT DOWN TRACTOR, SET BRAKE AND REMOVE KEY.

NEVER OPERATE SPRAYER WITHOUT FAN GUARD INSTALLED.

Fan Installation: 28", 32", 36"

1. **Fan Shaft must be clean and smooth:** be certain snap ring groove and key slot are clean. Apply a thin coat of *Never-Seez* (or equivalent extreme pressure lubricant) to fan shaft mating surfaces and threads.
2. **Install Fan on Fan Shaft:** slide to shaft shoulder.
3. **Install Thrust Washer on Fan Shaft**.
4. **Install Snap Ring** *see inset illustration:* be sure that the snap ring is completely seated in the fan shaft groove. The lower rim of the snap ring needle holes should be just-touching the fan shaft surface.
5. **Install Key:** be certain it is evenly seated.
6. **Install Clutch:** slide onto shaft completely.
7. **Install Washer and Nut.** Do not over-tighten nut: tighten nut until you can no longer rotate the washer by hand.
8. **Replace Fan Cover:** check that cover o-ring is in place.

Setting fan pitch: 28", 32", 36"

1. **Remove fan cover:** if cover o-ring comes off assembly, set aside for re-install.
2. **Remove fan position bolts**.
3. **Rotate blades to desired blade pitch:** all fan blades must be set at the same position. The diagram, above, illustrates blade pitch selection: with the blade firmly seated in the fan hub socket, rotate the blade until the desired blade pitch hole is aligned with the corresponding blade socket bolt hole.
4. **Insert fan position bolts** for each blade and finger tighten. Double-check blade positions: all blades must be set at the same pitch or machine damage can result. Firmly tighten all fan position bolts.
5. **Replace Fan Cover:** check that cover o-ring is in place.

Injector hopper operation

The injection hopper is a standard component of 1000 gallon Powerblast sprayers and is available as an option for other models.

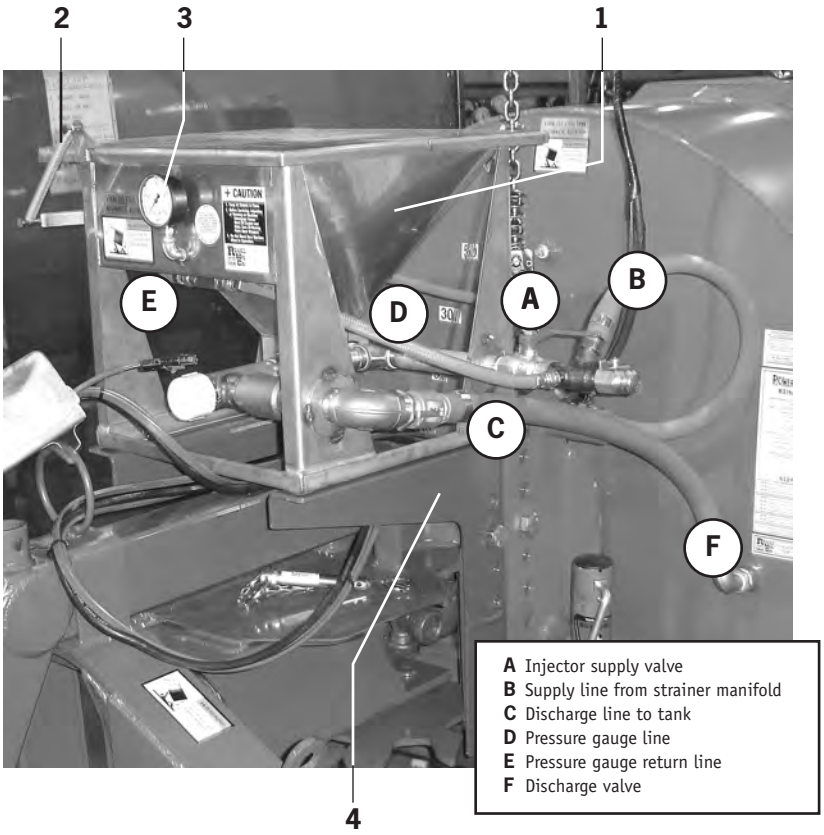
To use the injector, make certain the dump line valve at **F** is open.

With the lid closed open the supply valve **A**. You should hear the flow through the venturi nozzle.

Open the hopper lid and add the material to be mixed.

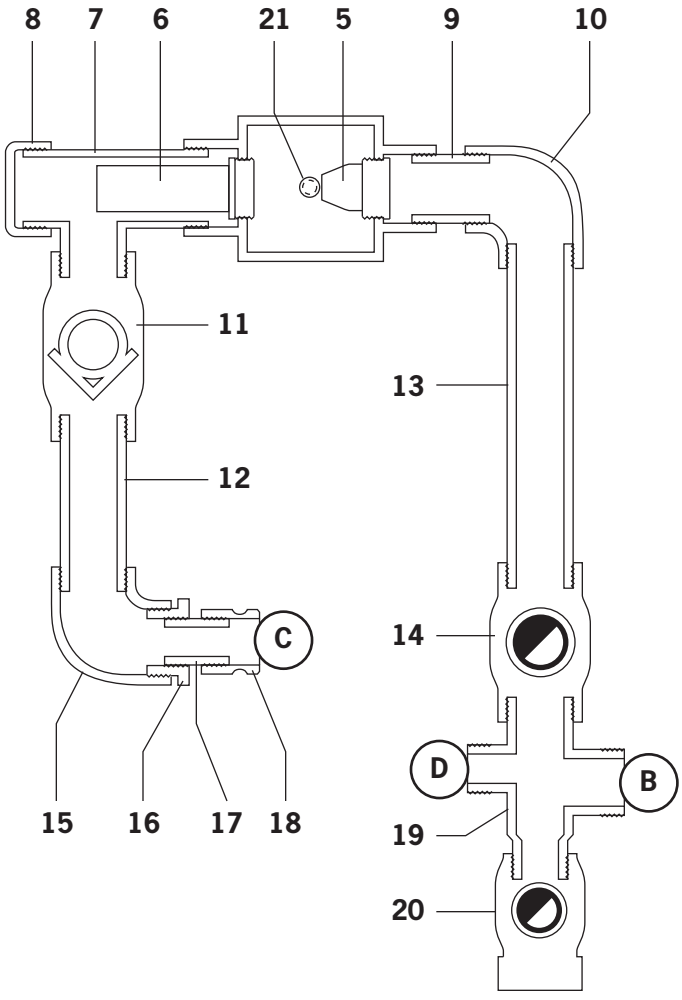
You must always wear the protective equipment required by the chemical manufacturer when handling spray materials.

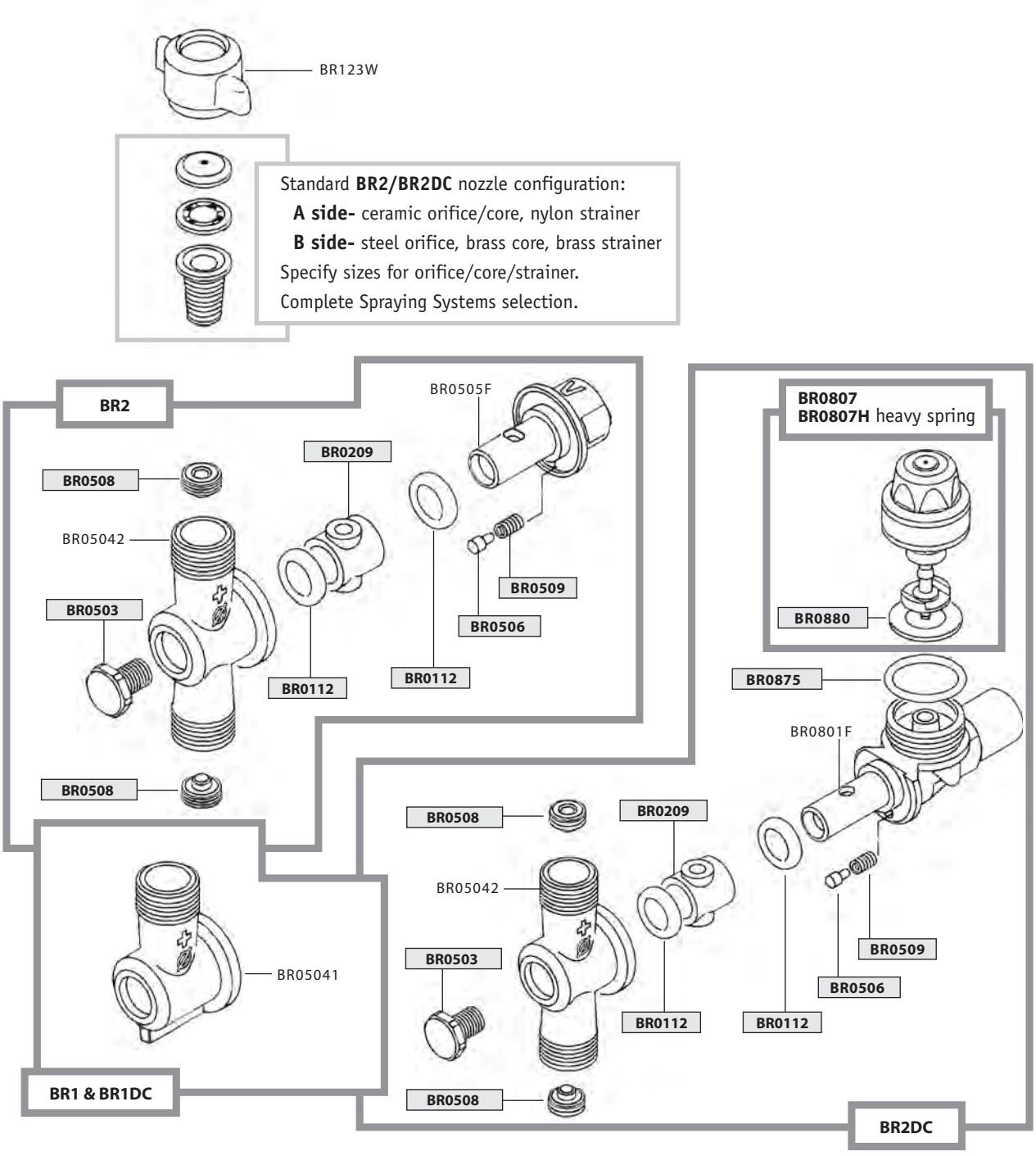
When you have completed adding materials, close the lid and shut off the supply valve **A**.



Injector hopper parts *not for 1000 gal. units*

No.	Part #	Description	Qty
1	PBMX5JH	hopper with lid, stand, N5A, T62	
2	S-595	lid spring	1
3	LFG600	600psi pressure gauge, glycerine filled	1
4	CH180L,R	mast mount brackets, left and right	1
5	N5A	nozzle	1
6	T62	venturi	1
7	PB724	discharge manifold	1
8	PVCCAP150	1"1/2 poly cap	1
9	SSN1000200	1" x 2" nipple, stainless steel	1
10	SSEL100	1" elbow, stainless steel	1
11	NTMX4032	1"1/4 check valve, brass	1
12	SSN1250400	1"1/4 x 4" nipple, stainless steel	1
13	SSN1000900	1" x 9" nipple, stainless steel	1
14	B100FP	1" ball valve, brass	1
15	SSEL125	1"1/4 elbow, stainless steel	1
16	SSBSH125100	1"1/4 x 1" bushing, stainless steel	1
17	SSN100CLOSE	1" close nipple, stainless steel	1
18	ETC100AAL	1" male camlock hose fitting	1
19	PB728	stainless steel manifold	1
20	V75	3/4"MGHT handgun ball valve	1
21	B025MF	1/4" ball valve	1





PART NUMBER — **individual components**

PART NUMBER — **subassembly order number**

PART NUMBER — **basic assembly order number**

PART NUMBER — **component included in a spare parts kit**
kits listed, right

AVAILABLE SPARE PARTS KITS

PART NUMBER	
BR2DCKIT	*parts kit for BR1DC & BR2DC*
BR2KIT	*parts kit for BR1 & BR2*

Read this manual completely before operating: follow all safety instructions.

Hub Removal

1. Remove wheel.
2. Remove grease cap or bearing buddy.
3. Remove cotter pin.
4. Unscrew the spindle nut counter-clockwise.
5. Remove spindle washer.
6. Remove hub from spindle.

Seal inspection and replacement

1. Replace seals each time the hub is removed.
2. Pry the seal from the hub with a screwdriver.
3. Tap new seal in place.

Bearing maintenance

1. Inspect the hub bearing for corrosion or wear. If any rust or wear is found on the bearing then replace.
2. If bearings are found to be in good condition, then cleaning and repacking the grease is all that is needed.

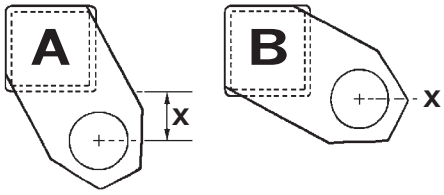
   Note: DO NOT spin bearings with compressed air.
3. Hand pack each bearing individually using a premium water resistant wheel bearing grease.

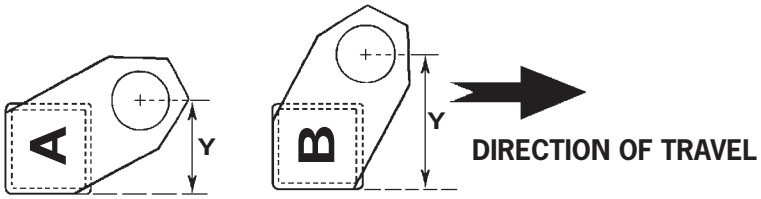
Bearing adjustment- reinstall hub

1. Before reinstalling the hub, inspect the spindle surface. The surface should be smooth and free of burrs or gouges. Use emery cloth to remove any burrs. Clean spindle surface and remove any grit.
2. Slide hub onto clean spindle, install hardened washer and loosely thread slotted nut onto spindle.
3. **Tighten the slotted nut to 50 ft-lbs. as you rotate the hub.** Rotating the hub while tightening the nut will seat the bearing on the spindle.
4. Loosen the slotted nut and finger tighten.
5. Insert a new cotter pin through the nut and spindle. If necessary loosen, ***never tighten***, nut to align the nut slot with the cotter pin hole. Bend one leg of the cotter pin over the end of the spindle and the other leg over the nut. Tap legs slightly to set: Cotter pin must be tight.
6. The hub should spin freely. If there is drag in the rotation: remove the cotter pin, loosen nut completely and repeat steps 3-5.
7. Install grease cap and mount wheel.

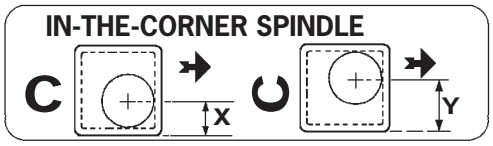
AXLE POSITIONS

SHORT OFFSET SPINDLE





IN-THE-CORNER SPINDLE



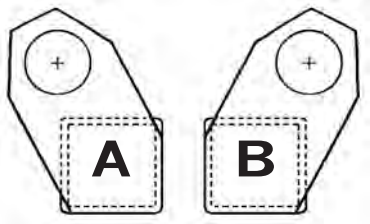
Set your desired ground clearance

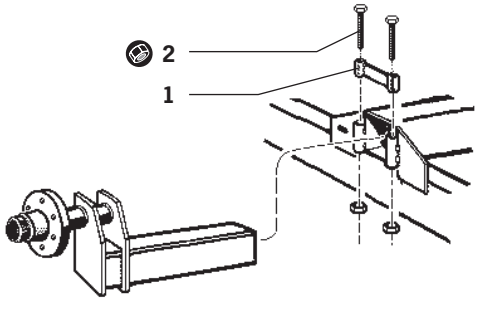
- By rotating the axle spindle assembly and/or switching the left/right spindles you can choose from 4 different ground clearance positions. Take care when positioning the axle spindle: the tire should not block the air slot.
- A variety of tires are available to accomodate your application.
- Check axle clamp **2** and wheel fasteners as part of your daily maintenance schedule.

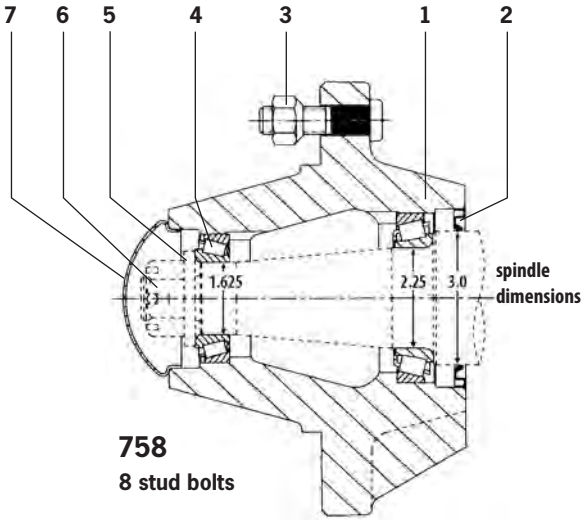
No.	Part #	Description	X	Y	Qty
A	AX401A-3	short offset spindle	2-1/4"	-3-1/2"	1
B	AX401B-3	short offset spindle	0"	-5-3/4"	1
C	AX4113	corner offset spindle	-1-3/16"	-2-3/8"	2
1	PL7B087	axle clamp			2
2	0870650CH5	7/8"-9 X 6-1/2" Gr.5			4
	087NYS	7/8" nylock nut			4

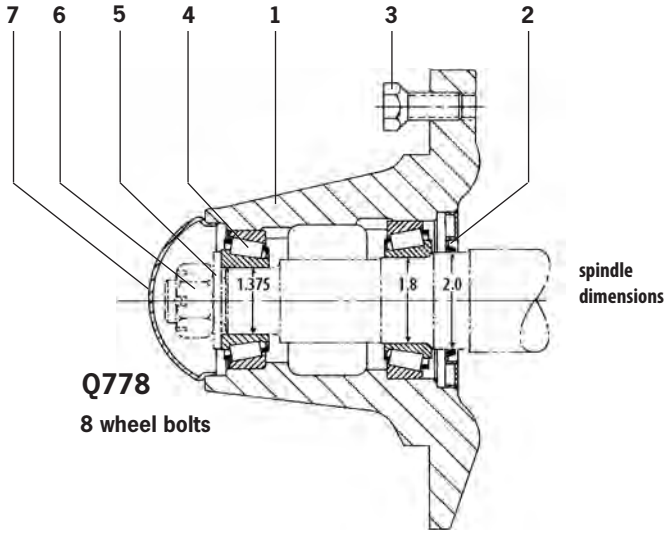
Identify A or B spindle...

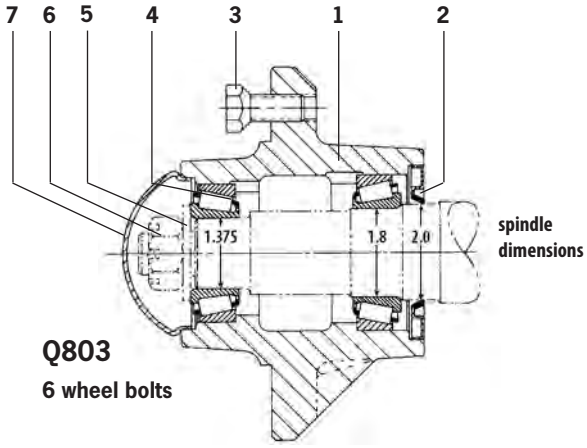
With the spindle facing you, refer to the illustration, right, to identify your A and B spindle.

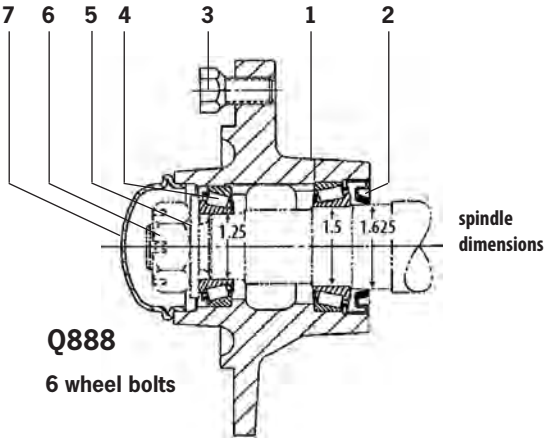




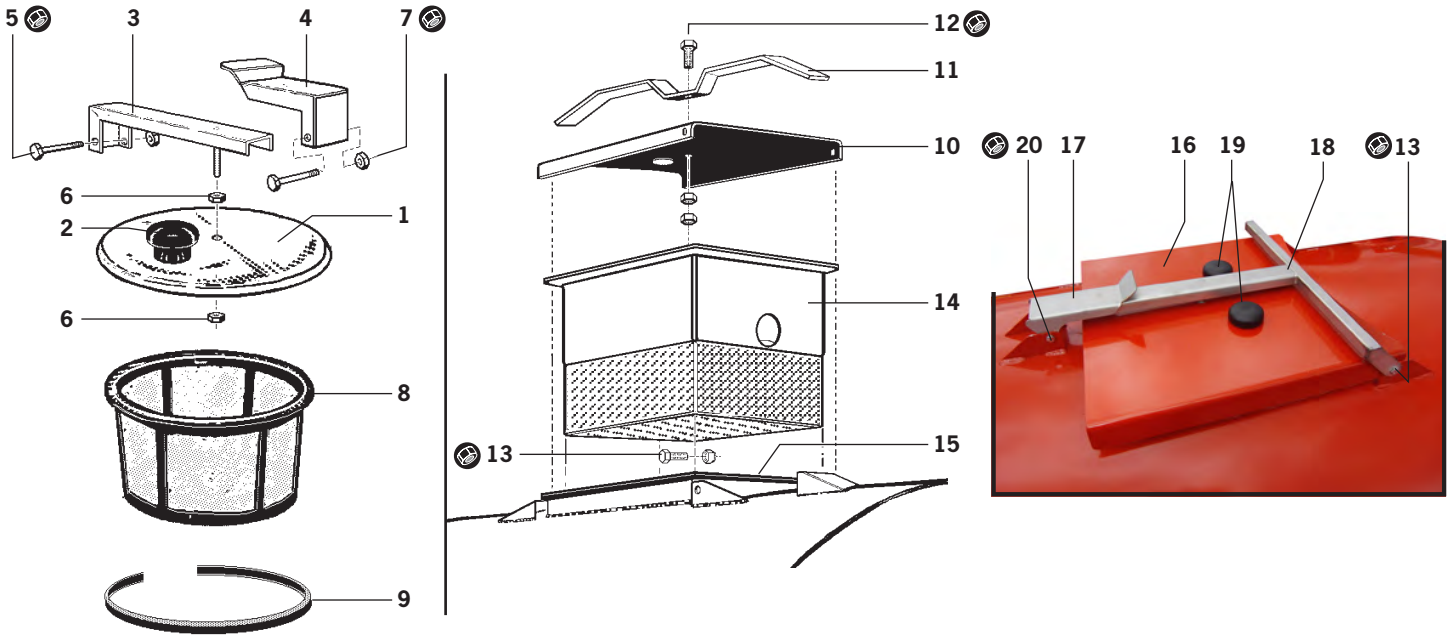








	758		Q778		Q803		Q888		
No.	**Part #**	**Qty**	**Part #**	**Qty**	**Part #**	**Qty**	**Part #**	**Qty**	**Description**
1	HA-758400-8	1	HA-Q778	1	HA-Q803	1	HA-Q888	1	armstrong hub
2	387AS	1	25590	1	25590	1	JL69349	1	inner bearing cone
	382A	1	25520	1	25520	1	JL69310	1	inner bearing cup
	CR29968	1	CR20148	1	CR20148	1	CR16289	1	seal
3			P101303	8	P101303	6	P101301	6	wheel bolt
	P151407	8							stud bolt
	P201601	8							nut
4	LM501349	1	25877	1	25877	1	LM67048	1	outer bearing cone
	LM501310	1	25821	1	25821	1	LM67010	1	outer bearing cup
	0150175CP	1	0150175CP	1	0150175CP	1	0150175CP	1	cotter pin 5/32" x 1-3/4"
5	100WUSS	1	087WUSS	1	087WUSS	1	087WUSS	1	flat washer 7/8"
6	100NSL	1	087NSL	1	087NSL	1	087NSL	1	slotted nut 7/8"
7	P502008	1	615216	1	615216	1	612016	1	hub cap



Lid options

No.	Part #	Description	Qty
1	LD160	round lid	1
2	LDVENT	lid vent, flat top ARAG	1
	LDVENTM	lid vent, mushroom shape	
3	LD160H	hinge	1
4	LD-LATCH	lid latch for LD160H	1
5	0250225CH2	1/4"-20 x 2-1/4" bolt	1
	025NYS	1/4"-20 nylock nut	1
6	037NSS	3/8"-16 nut, stainless steel	2
7	0250275CH5	1/4"-20 x 2-3/4" bolt	1
	025NYS	1/4"-20 nylock nut	1
8	LD160STR	lid basket	1
9		lid gasket	1
10	PBLID	square lid for twist latch *includes PBLID-V*	1
	PBLID-V	vent disc with pop-rivet	1
11	PBLID-LA	latch bar	1

No.	Part #	Description	Qty
12	0310100CH5	5/16"-18 x1" bolt	1
	031NF	5/16"-18 nut	2
13	0250075CHSS	1/4"-20 x 3/4" bolt, stainless steel	2
	025WSS	1/4" flatwasher, stainless steel	2
	025NYS	1/4"-20 nylock nut	2
14	PB49SS	stainless steel lid basket	1
15	PBLID-GAS	lid gasket material for square opening	1
16	PBLID-OC	square lid for over center lid latch	1
17	PBLID-OCLA	lid latch for PBLID-OC	1
18	PBLID-CROSS	hinge	1
19	LDVENTM	lid vent, mushroom shape	2
	504210PP	vent w/ball check: flat 8-sided plate	
20	0250300CH5	1/4"-20 x 3" bolt	1
	025NYS	1/4"-20 nylock nut	1

LIMITED WARRANTY

Rears Manufacturing Company Incorporated, hereafter referred to as Rears, makes every effort to assure that its products meet high quality and durability standards subject to the provisions hereinafter set forth. Rears does hereby warrant to the original purchaser of each product manufactured by Rears for a period of ninety (90) days from the date of purchase or five hundred (500) hours of operation, which-ever occurs first, that such product will be free from defects in material and workmanship under normal use with normal maintenance service. This warranty does not cover component parts of products manu-factured by Rears when such component parts are subject to a manufacturer's warranty. In addition, this warranty does not cover pressure gauges.

THE EXCLUSIVE REMEDY FOR ANY DEFECTS COVERED BY THIS WARRANTY SHALL BE THE OBLIGATION OF REARS TO REPAIR OR REPLACE ANY PARTS OF SAID PRODUCTS WHICH SHALL, WITHIN NINETY (90) DAYS FROM THE DATE OF PURCHASE OR FIVE HUNDRED (500) HOURS OF OPERATION, WHICHEVER OCCURS FIRST, BE DETERMINED TO THE SATISFACTION OF REARS UPON REARS' EXAMINATION, TO HAVE BEEN THUS DEFECTIVE.

In order to take advantage of this limited warranty the defective product must be returned for exami-nation, freight pre-paid, to Rears or an authorized dealer designated by Rears. Proof of purchase date and explanation of the defect must accompany the returned product.

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The limited warranty contained herein shall not apply to any product if it shall have been repaired or altered by personnel not authorized by Rears or if the product shall have been subject to misuse, negligence or accident.

THE REMEDIES PROVIDED HEREIN ARE THE EXCLUSIVE REMEDIES TO THE PURCHASER AND REARS SHALL NOT BE LIABLE TO THE PURCHASER OR ANY OTHER PARTY FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OR ANY CAUSE, LOSS, ACTION, CLAIM OR DAMAGE WHATSOEVER FOR INJURY TO PERSON OR PROPERTY OR ANY CONSEQUENTIAL ECONOMIC OR INCIDENTAL LOSS RESULTING FROM ANY DEFECT IN MATERIALS OR WORKMANSHIP OF THE PRODUCT SOLD.

Rears will assign to the original purchaser upon request all warranties on component parts if permitted by the manufacturer of such component parts.

Purchaser Name Purchase Date

Address City State/Zip

Model Serial Number

Dealer Name Sales person Phone

Address City State/Zip