



PULBLAST *RPA PUMP*

READ THIS MANUAL BEFORE OPERATING

06.20.18



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.

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.

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.

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.

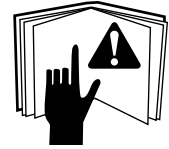
Know your controls and how to stop the tractor, engine, and implement quickly in an emergency. Read this manual and the one provided with the tractor.

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.



READ THE OPERATOR'S MANUAL



READ THE OPERATOR'S MANUAL



READ THE OPERATOR'S MANUAL

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

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 airborne 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.

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.

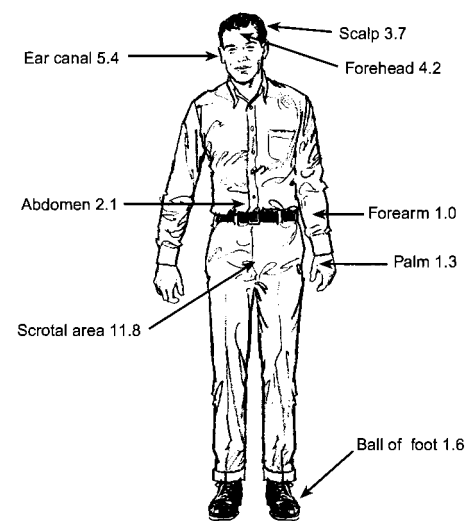
Contact your local extension service for instructions for cleaning work clothes contaminated by chemical handling. Most state agricultural universities and farm bureaus have detailed instructions for the decontamination of work clothes.

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.



Skin absorption rates
in relation to forearm (1.0)

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

Oregon Occupational Safety & Health

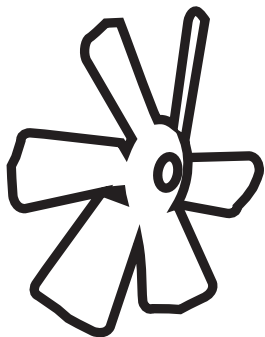
Alliance for a Clean Rural Environment

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 granules can become airborne 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 involve 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.

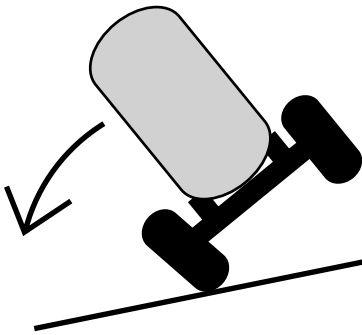
This implement is designed for use only on tractors with 540/1000 RPM power-take-off. **DO NOT EXCEED YOUR IMPLEMENT'S RATED PTO SPEED.**

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

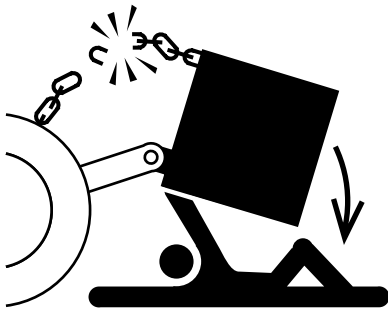
Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

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 thoroughly 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.

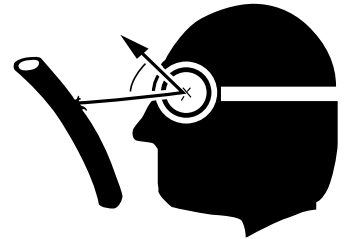
Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to insure unit is in a safe condition.

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.

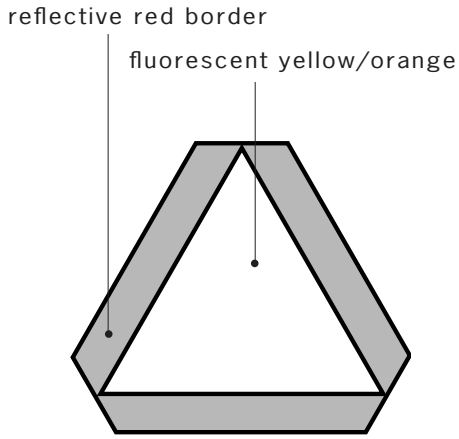
If equipment has been altered in any way from the original design, the manufacturer does not accept any liability for injury or warranty.

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

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

Sprayer Safety: Transport

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



slow moving vehicle emblem

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 steering. Slow down on rough or uneven surfaces.

Use extreme care and maintain minimum ground speed when transporting on hill-sides, 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.

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

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.



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



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



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.



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.

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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

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DANGER

SHIELD MISSING DO NOT OPERATE

DANGER

SHIELD MISSING DO NOT OPERATE

DANGER

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DANGER

-ROTATING DRIVELINE-

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

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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

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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.

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THIS UNIT NOT INTENDED FOR HIGHWAY USE

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STAINLESS STEEL TANK AND MECHANICAL AGITATION

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ATTENTION!

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

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DANGER

NO RIDERS NO PASAJEROS

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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

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WARNING

DO NOT PLACE ANY PART OF BODY UNDER RAISED IMPLEMENT.

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FAN SPEED TRANSMISSION

LOW SPEED TO TANK | HIGH SPEED TO FAN

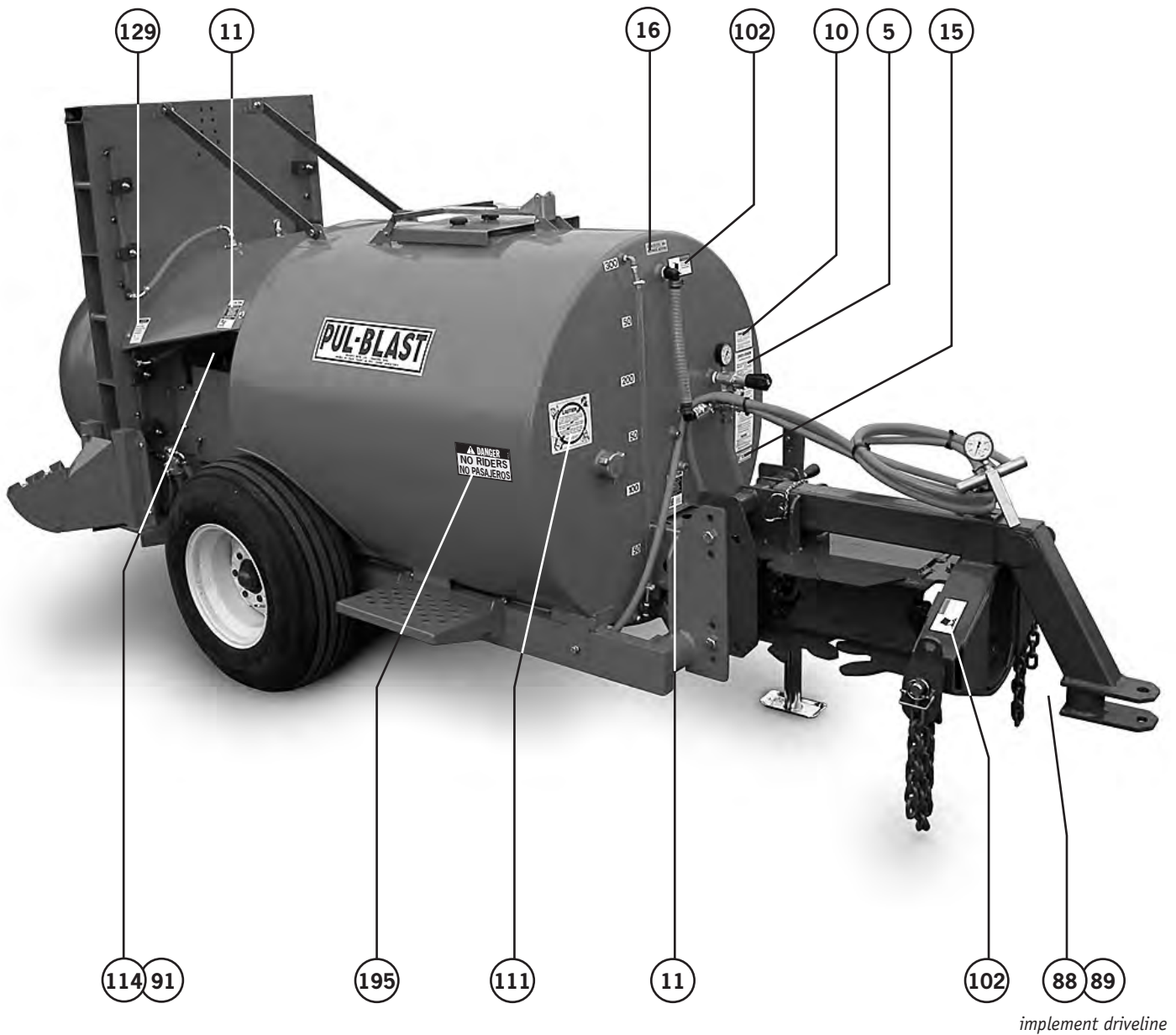
WARNING
DO NOT SHIFT TRANSMISSION WITH PTO ENGAGED.

62 fl. oz. capacity | 14 fl. oz. capacity

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

FREQUENCY	GEARBOX MAINTENANCE	AGITATOR BELT	PUMP BELT
Daily	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.		
fan and pump gearbox			
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.		

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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.

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

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.

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

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

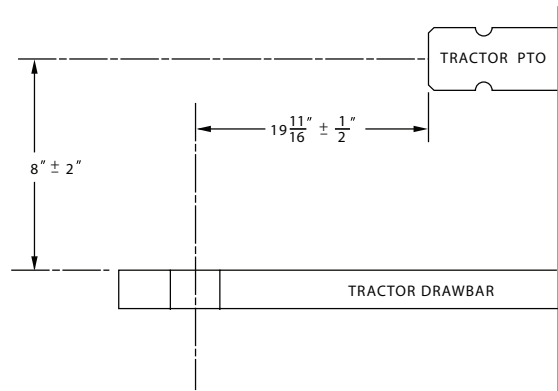


fig i

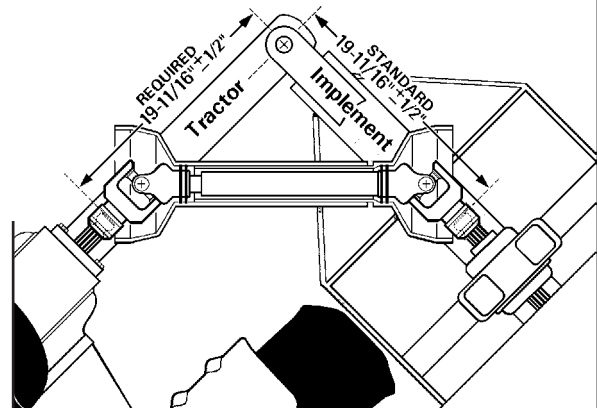
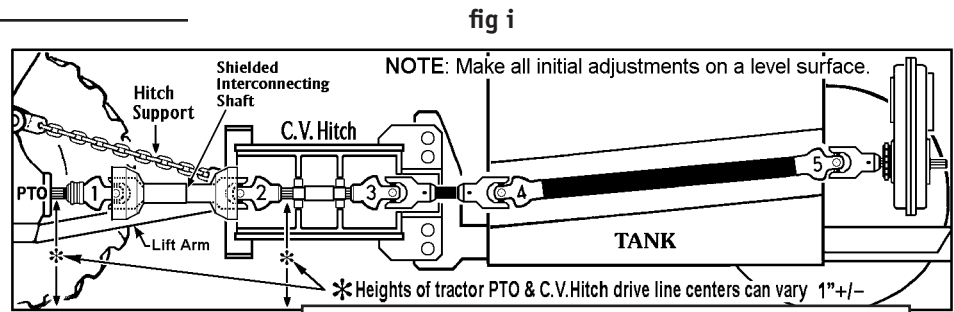


fig ii

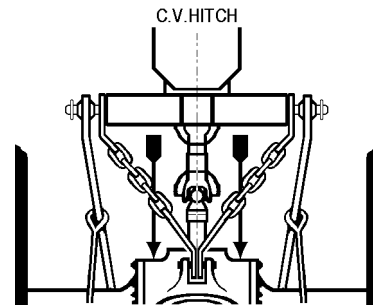
Hook-up instructions CV Hitch

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.

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.**



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.

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.

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.

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 with **Texaco No.2 Chassis Grease** or equivalent. Apply 2 shots of grease to each PTO cross and telescoping sleeve.

AG062 series agitator bearings require only light greasing and minimal attention. Apply grease only until you feel resistance. Do not over grease: excess will enter tank.

R7 agitator bearings do not require lubrication.

4. Clean suction and discharge strainers.
5. Check fan blades: blades should be free of nicks and cracks. The fan guard should be in good repair.

6. When connecting PTO drivelines: make sure spline locks snap into the shaft groove; make sure all roll pins are properly installed.

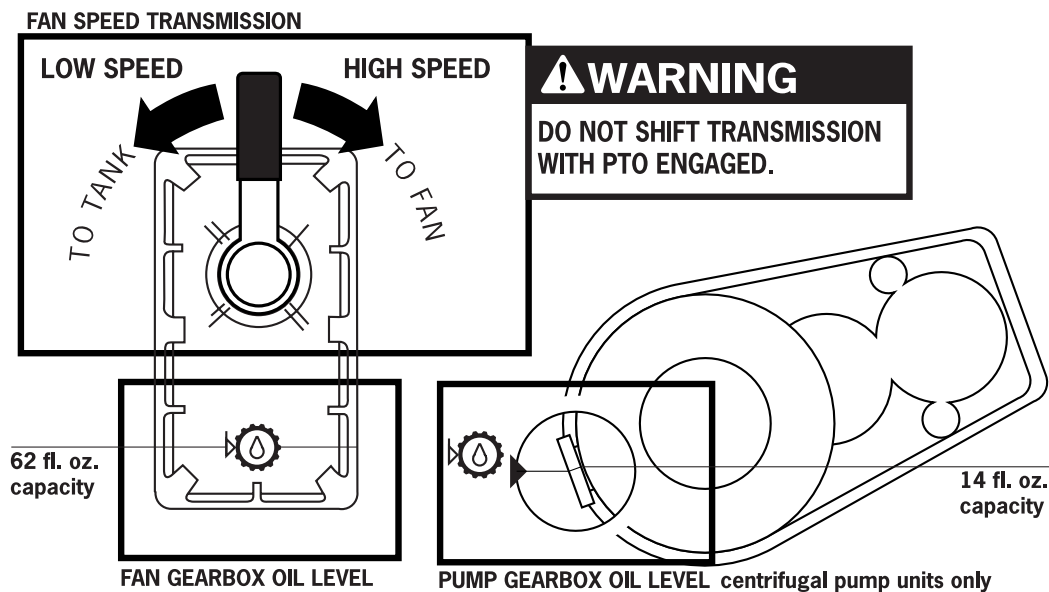
7. Check all suction lines for tightness.

Fill tank with water above the level of the pump.

With suction valve OPEN, run pump to clear air from the system: open discharge to tank to recirculate.

8. Check tire pressure.

9. After 1 hour of initial operation, check all fasteners for tightness. Check belts for alignment and wear.



Operation tips

- 1. Operate the tractor at the rated PTO speed.**
540RPM unless otherwise specified. Never overload the sprayer- lugging down the tractor creates excessive torque in the drive train.
- 2. 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.

The Centrifugal Pump will increase/decrease flow with ground speed changes, maintaining your application rate *so long as the tractor remains in the same gear.*

Tractors with hydrostatic drive will not adjust pump flow to accommodate ground speed changes. Calibrated ground speed must but must maintained.
- 3. Never run pump dry.** Be sure tank is filled above the level of the pump *BEFORE* engaging the pump.
- 4. Clean your suction and discharge screens regularly.** Starving the pump suction will cause pump damage. Check strainers when re-filling the tank.
- 5. 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 drivetrain longevity the tractor and Pul-Blast should be in-line.
- 6. DO NOT shut off and re-engage PTO when turning a corner.** PTO shut down and start up should only be done when the tractor and Pul-Blast are in-line.
- 7. Reduce PTO speed before disengaging PTO.**
- 8. Lubricate your sprayer regularly.** A lubrication schedule is provided in this manual. Clean grease fittings before injecting lubricant. Replace any lost or broken fittings immediately.
- 9. Always wear proper protective equipment-** read the labels of all materials being used and observe all handling instructions.
- 10. Flush tank and pump system** with water at the end of the day to keep plumbing clear.
- 11. Do not clean, lubricate, or adjust the implement while the PTO is rotating or the tractor is running.**

Operation tips, cont'd

- 12. If excessive vibration develops, shut down immediately.** Possible causes: drive train bearings, drivelines, u-joint crosses, or fan have become damaged or worn.
- 13. Check your spray pattern regularly.** To maintain target application rates spray nozzles need to be clean and spray tips need to be in good shape.
- 14. Close the dump valve when spraying.**

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 agitator chain and fan blades- keep clean.
8. Review this operator's manual.

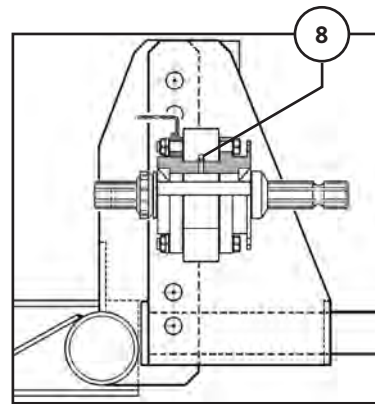
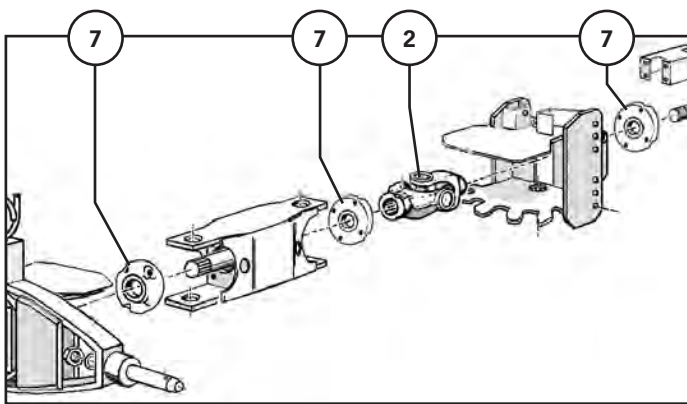
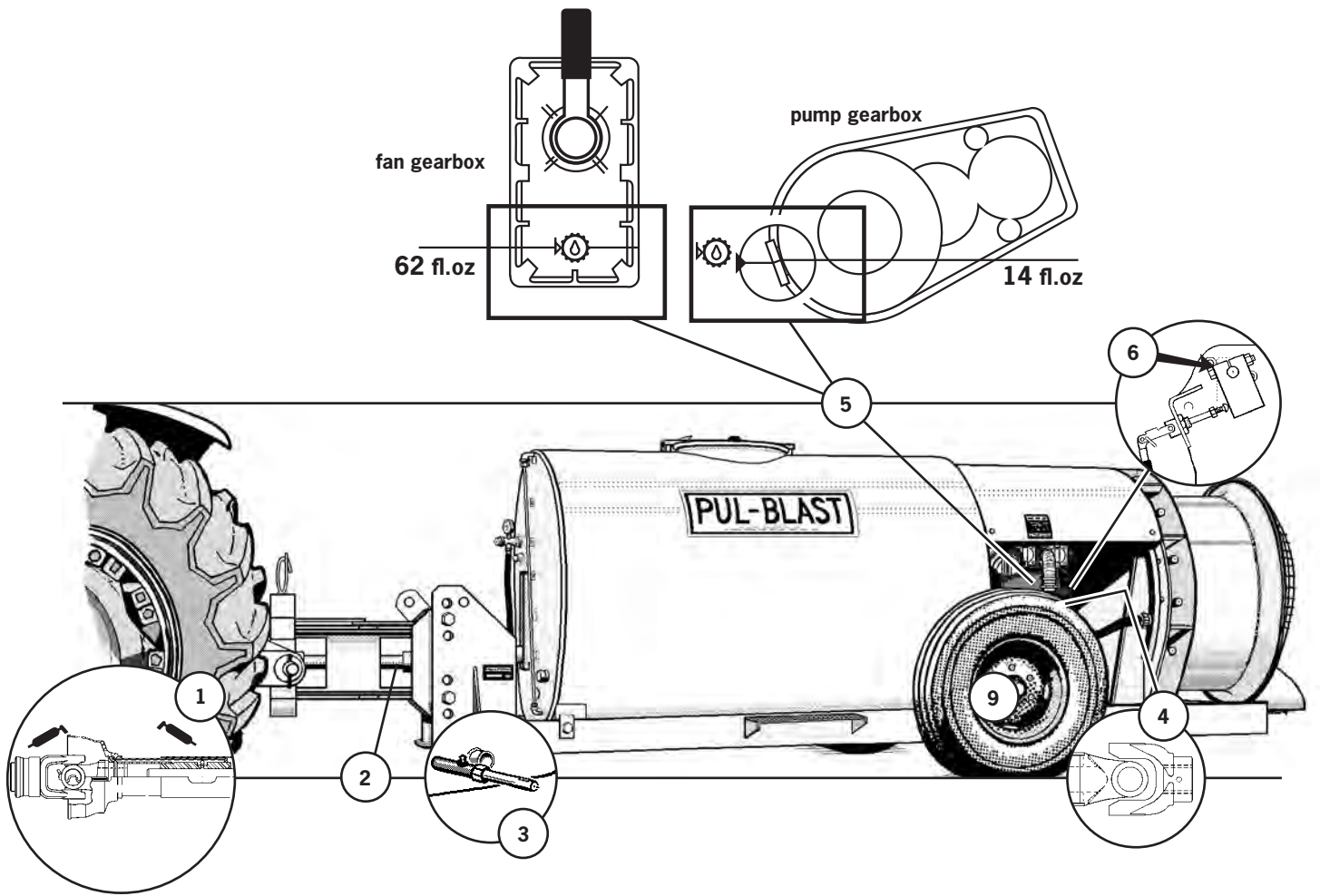
End of season and storage

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 welds and blades 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.

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



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.

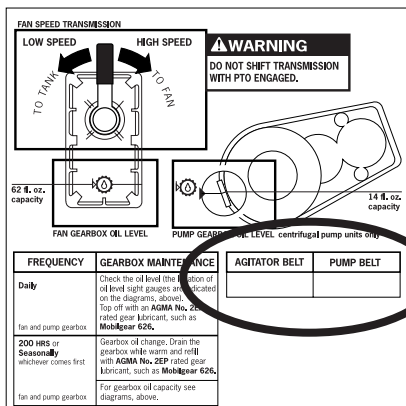


Use an oil compatible with your pump or gearbox- listed on the schedule, below.

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	16	1-2
4	Thru-tank driveline crosses	Lube point at cross, each end	4	1-2
5	Fan gearbox Pump gearbox <i>centrifugal pump only</i>	Oil level should be visible in plug window, as illustrated Use an AGMA No.2EP rated gear lubricant, such as <i>Mobilgear 626</i>	daily	-
6	Belt tension pulley bearing	1 point on bearing housing	16	1-2
7	CVHitch center link bearings	51 series hitch with ball bearings, purge vents at seal	do not grease	
	CVHitch output shaft bearing	51 ser. hitch with roller bearings, purge vent opposite zerk	8	purge*
8	Bearing block <i>modular tongue only</i>	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	
----------------------	--

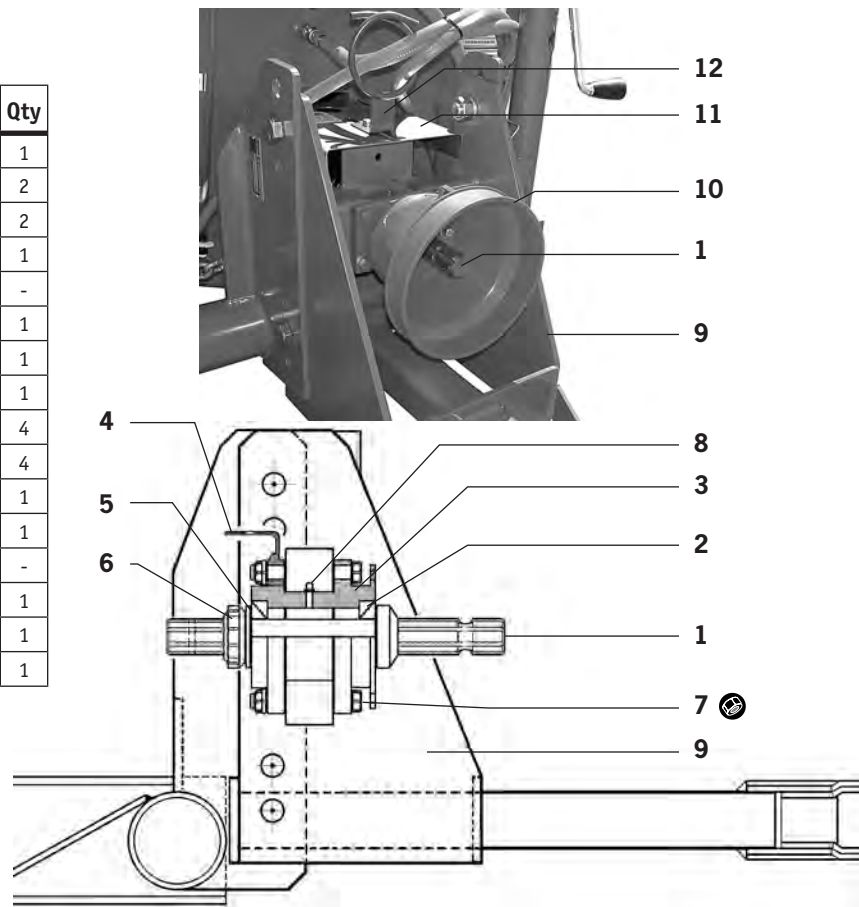
Find this decal in the mechanical cabinet of your sprayer: write the belt numbers here.

AGITATOR BELT	PUMP BELT

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

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



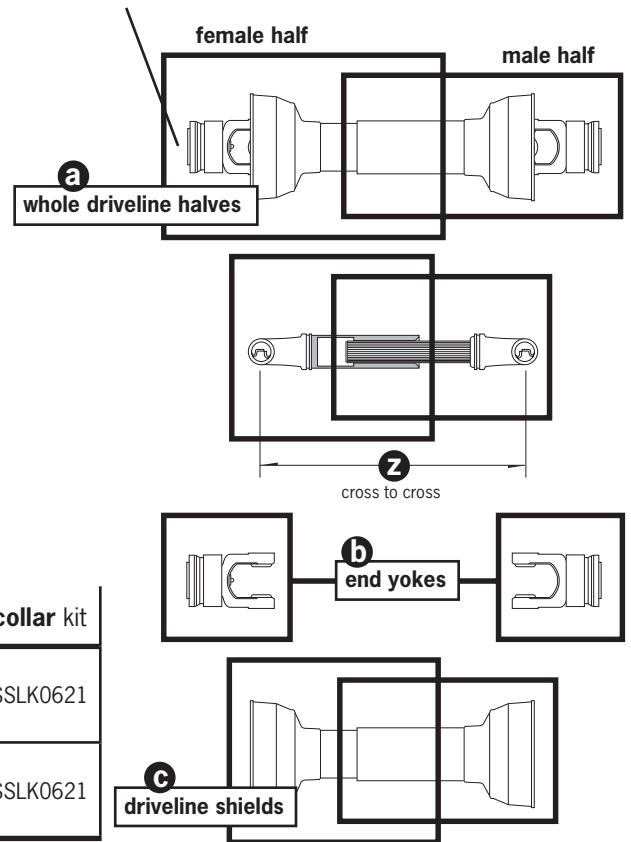
PTO driveline for Modular Tongue system

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.

supplied yokes may not be as illustrated



driveline	z		a	b	c	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

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

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 accommodate your tractor. To determine the right telescoping driveline for your tractor, you need to have the following information:

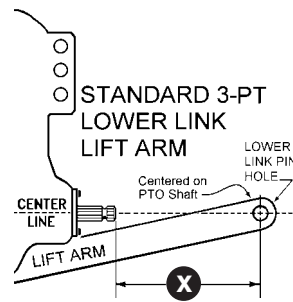
your tractor PTO shaft size and spline

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.

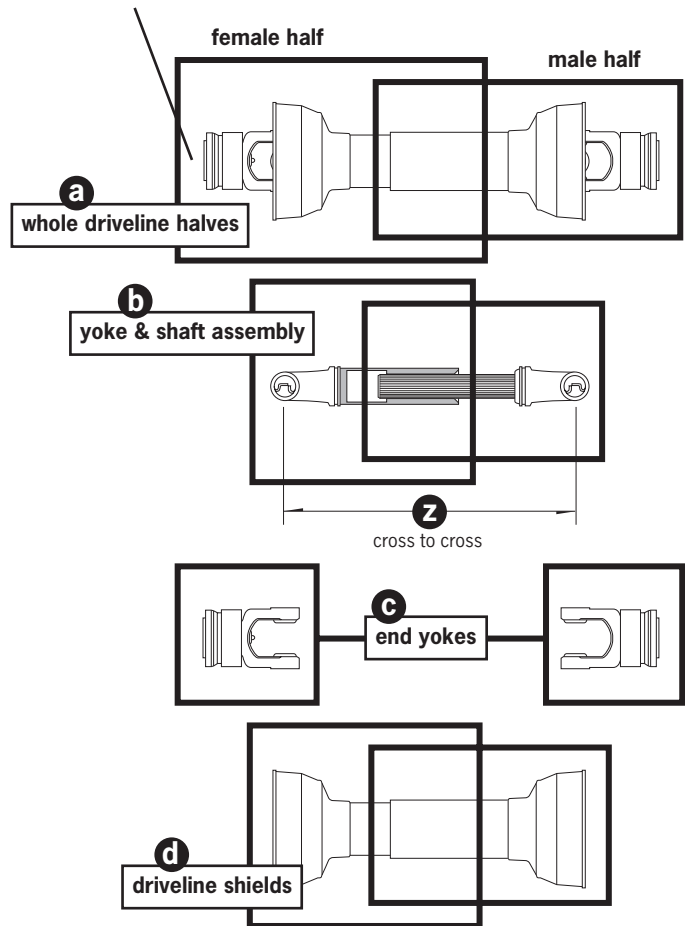
Using *chart b*, page over: find the available drivelines for your lift balls distance, **x**, and select the female driveline spline that matches your tractor's output shaft.

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.

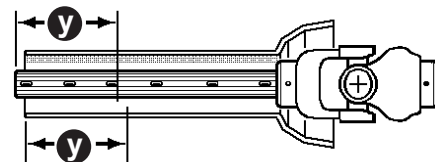


supplied yokes may not be as illustrated



x	y	z
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

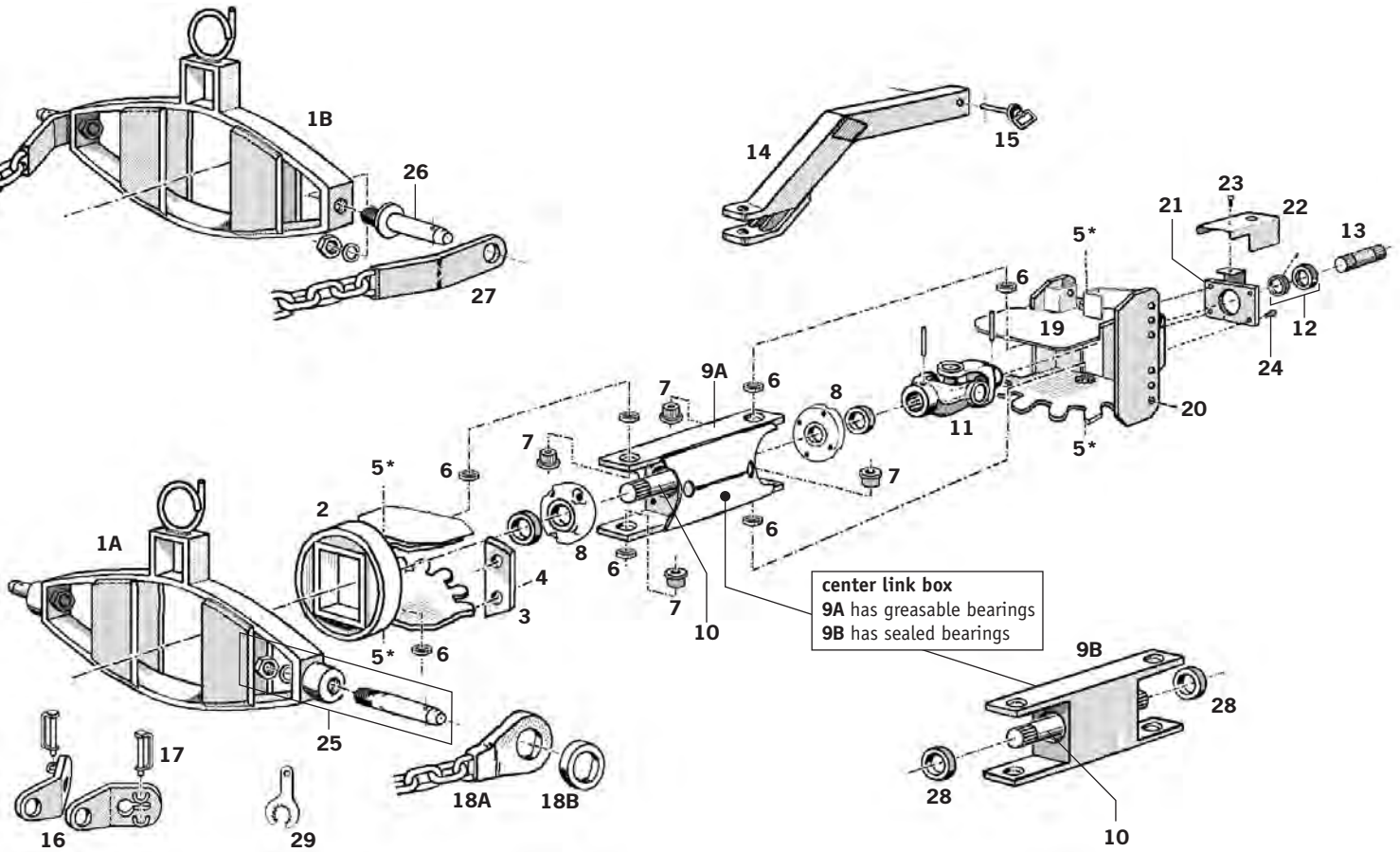


Implement driveline

(X)	whole driveline part #	ptospeed		(a)	(b)	(c)	(d)	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	DL510MC	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	DL510MC	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	DL510MC	Y586	Y514	DLS510F	CPL55E	-

chart b

14 Pul-Blast RPA pump system

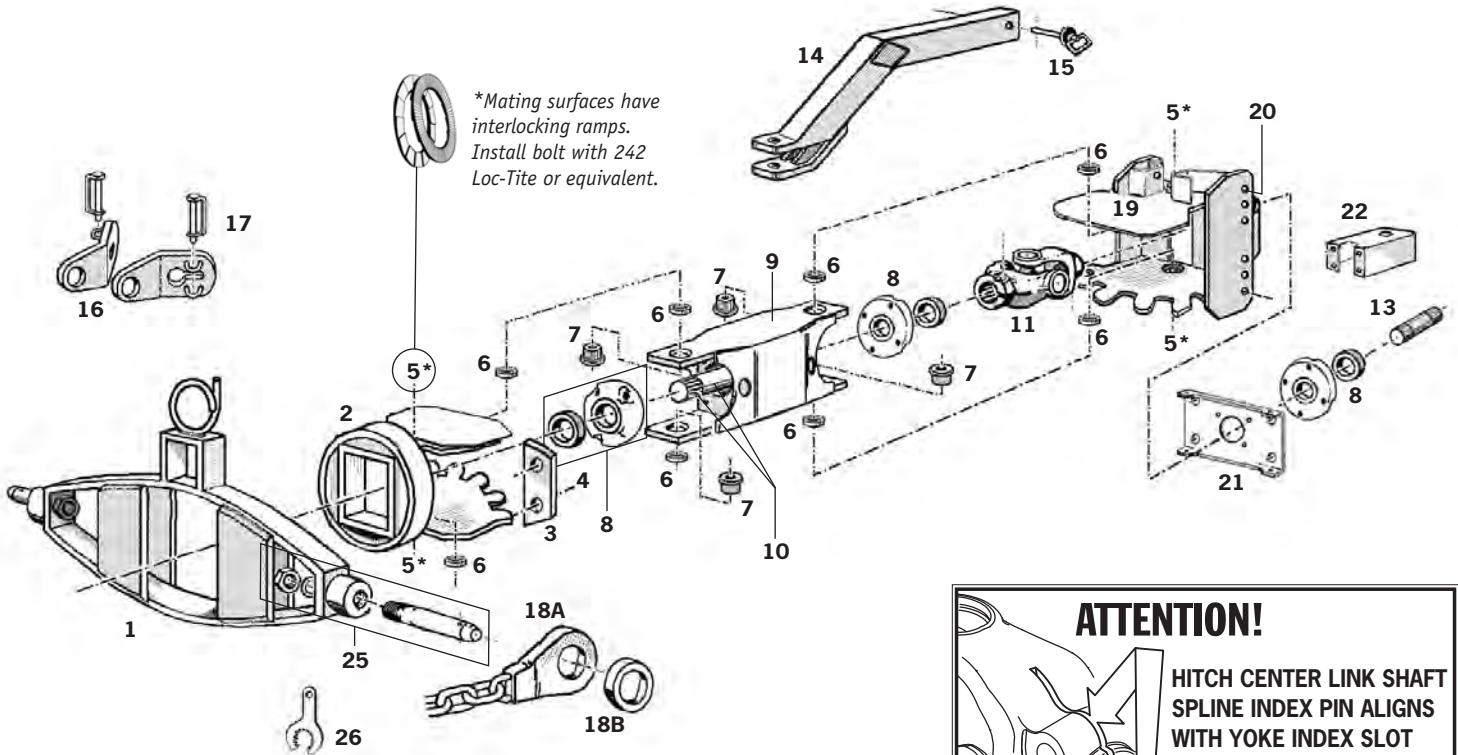


Parts list: 51 series constant velocity hitch

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

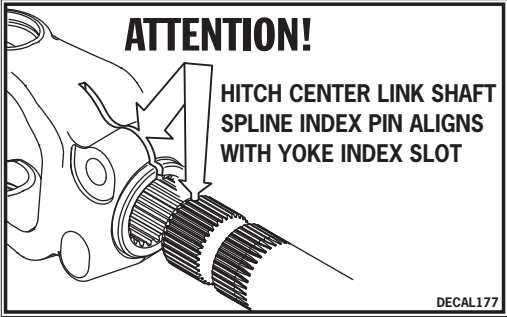
No.	Part #	Description	Qty
18A	HS43CH3	check chain for trunion 1A	2
18B	CVPIN1373	spacer for CAT II pin	2
19	CVH51-1401	hitch rear half	1
20	0870200CH5	7/8" x 2" gr.5 bolt	4
	087NF	7/8" nut	4
	087WS	7/8" lock washer	4
21	CVH51-19PB	bearing mount bracket	1
22	CVH51-18	output shaft shield	1
23	0250050STS	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
	CVH7117-2	CAT II pin for trunion 1A	2
CVH5117-3	CAT III pin for trunion 1A		
25	112WS	1" 1/8 lock washer	2
	113NJ	1" 1/8-12 half-nut	2
	7524	click pin	2
	CVH5117-1	CAT I pin for trunion 1B	2
CVH5117-2	CAT II pin for trunion 1B		
26	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



Hitch series identification

- 51 series** input shaft **10** 1-1/2" 17 spline
- 71 series** input shaft **10** 1-3/4" 20 spline



Parts list: 71 series constant velocity hitch

No.	Part #	Description	Qty
1	CVH71-TRN1	CAT I width trunion, no pins included	1
	CVH71-TRN2	CAT II width trunion, no pins included	
2	CVH71-15	hitch front half	1
3	CVH41-WP2AR	wear plate	2
4	0620150CH5	5/8" x 1-1/2" bolt gr.5	4
	0620125CH5*	5/8" x 1-1/4" bolt gr.5	
5	062WNS	5/8" nordlock washer	4
	CVH71-5	spring bushing 2" x 1.5" x .75"	
7	CVH71-6	shoulder pin	4
8	CVH71-11S	1.75" spherical roller bearing	3
	CVH71-11B	1.75" ball bearing	
9	CVH71-13AS	center link assy w/roller bearings & bushings	1
	CVH71-13AB	center link assy w/ball bearings & bushings	
10	CVH71-1220	center link shaft	1
		index roll pin	2
11	UJ553/553	complete u-joint w/(2)Y553 yokes	1
	Y553	1.75" 20 spline 55 ser yoke only	2
	CPL55E	cross kit	1
	0620350CH5	5/8"-11 x 3-1/2" bolt gr.5	2
13	062NYS	5/8" nylock nut	2
	CVH71-8055	output shaft	
14	CVH71-16	top mount towing tongue	1

No.	Part #	Description	Qty
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
18A	HS43CH1	cat. I/II check chain- right & left	1
	HS43CH3	cat. III check chain- right & left	
18B	CVPIN1373	spacer for cat. II	2
19	CVH71-1401	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	CVH71-19	mount bracket for spherical roller bearing	1
	CVH71-19B	mount bracket for ball bearing	
22	CVH71-18	output shaft shield	1
25	CVH7117-2	CAT II pin	2
	CVH7117-3	CAT III pin	
26	112WS	1" 1/8 lock washer	2
	113NJ	1" 1/8-12 half-nut	2
	7524	click pin	2
26	CVH71T00L	pin wrench	1

*Install with 242 Loc-Tite or equivalent

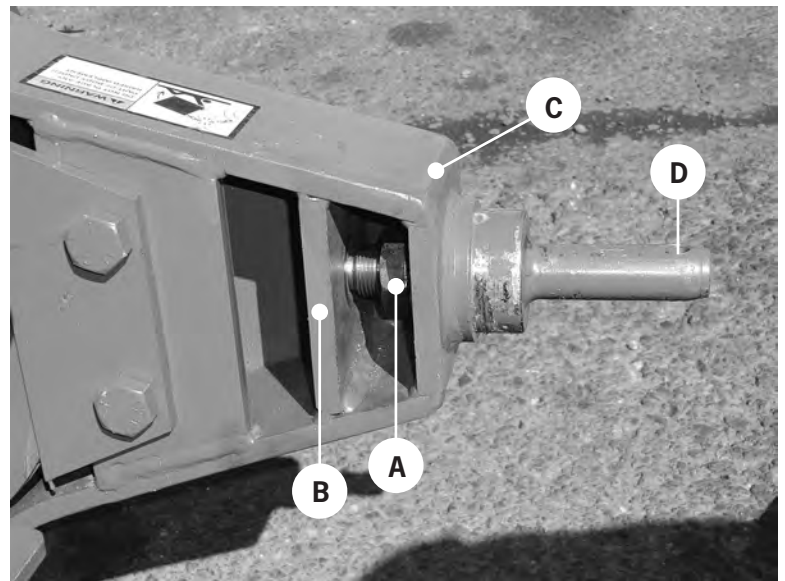
Read this manual completely before operating: follow all safety instructions.

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.

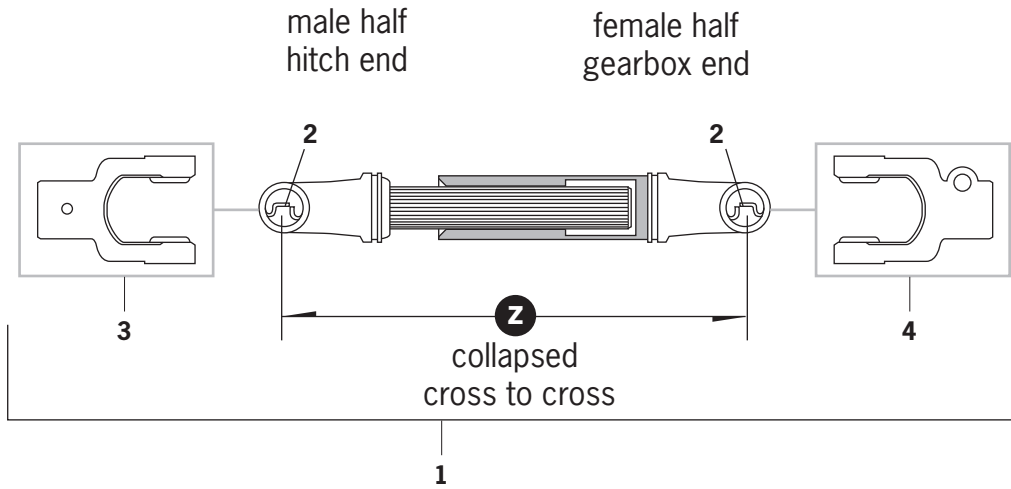
Important: the torque wrench and crowfoot wrench must be in-line as shown.



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



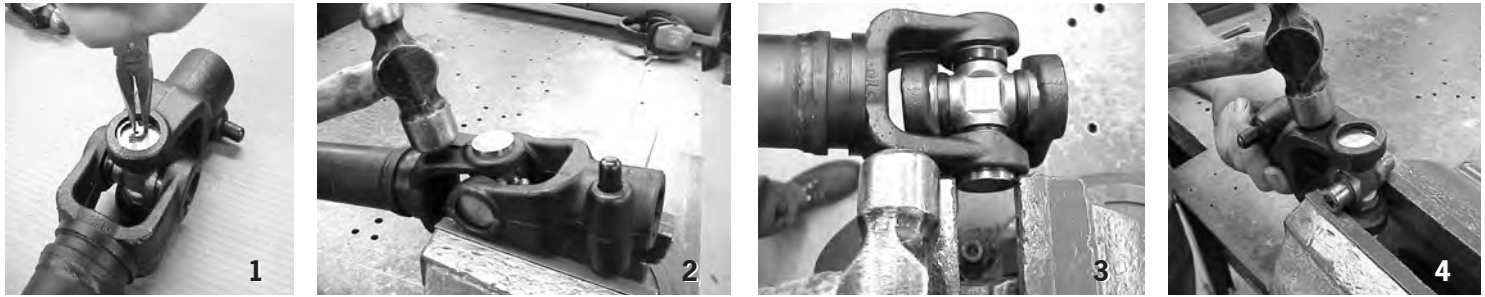
* If your hitch does not have the 3/8" thick crowfoot wrench, please contact the factory to order an upgrade or replacement *part number CVH71TOOL*.



Thru-Tank Driveline Parts

No.	Part #	Description	Qty
1	Z	DRIVELINE	1
	46"	35 series thru-tank driveline. Select the driveline that matches your collapsed cross-to-cross measurement OR provide your serial number to a Rears dealer for driveline selection.	
	62-1/2"		
	72-1/2"		
81-3/4"			
2	CPL35RW	cross kit	2
3	Y311	1-3/8" 6spline 35 ser yoke with rollpin	1
	0310225RP	5/16" x 2-1/4" rollpin	1
4	Y341	1-3/8" 6spline 35 ser yoke with pin lock	1
	SAF-T-PIN6	pin lock repair kit	-

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

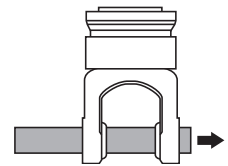


universal joint disassembly

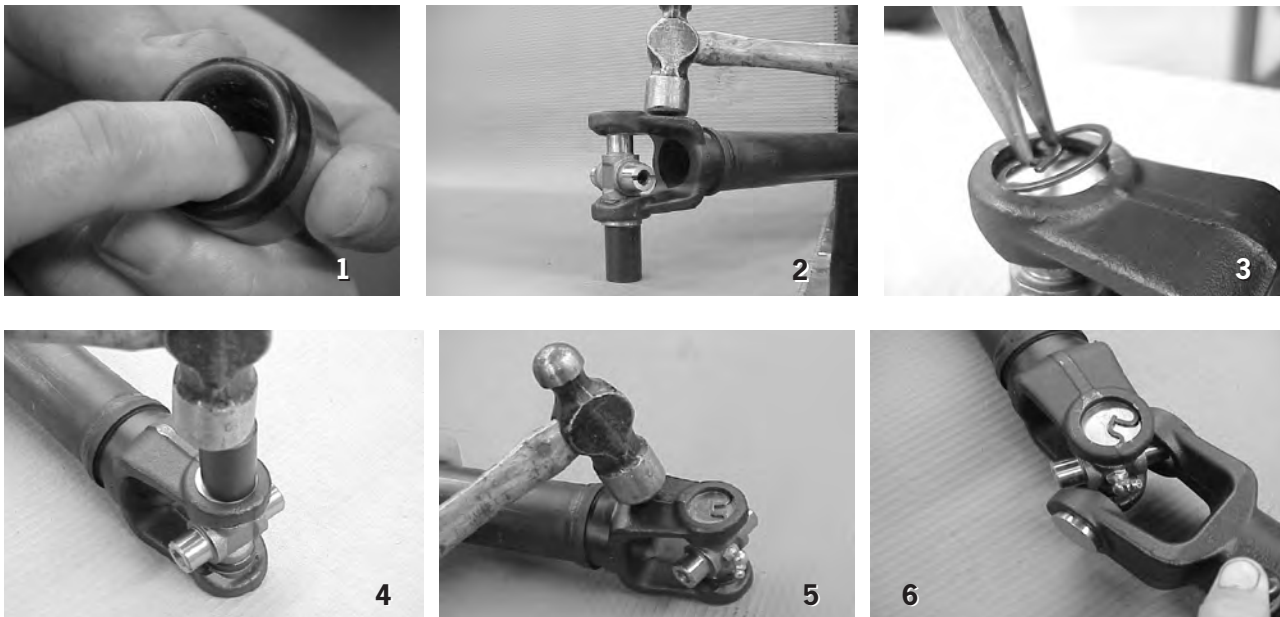
Remove all (4) snap rings in cross assembly 1.
 Position joint in loose vice 2. Strike top arm of unsupported yoke to drive the top cup up. Repeat on the opposite side.
 Grip loosened cup in vice 3 and strike yoke arm to drive yoke off cup. Repeat on opposite cup.
 Support cross in loose vice 4 and strike 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.



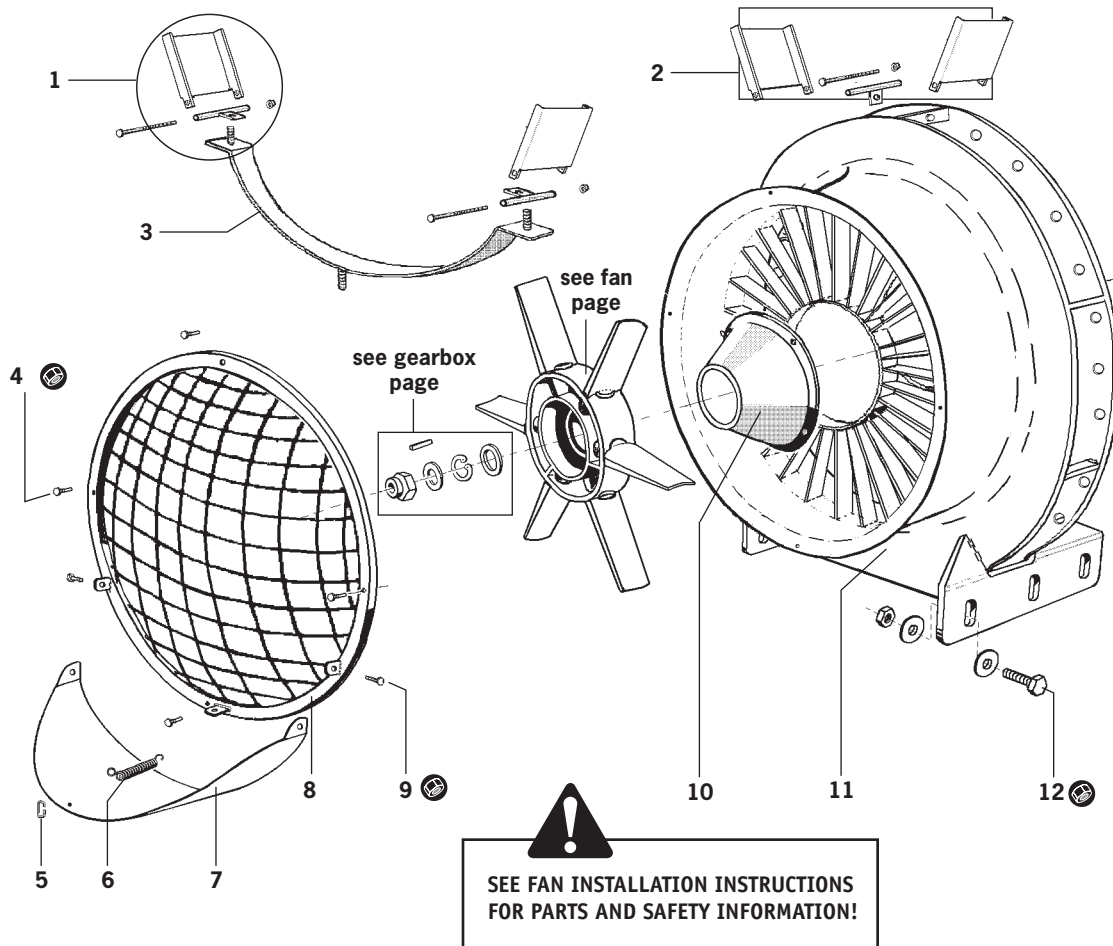
55 series rod diameter	1.530"
35 series rod diameter	1.247



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.

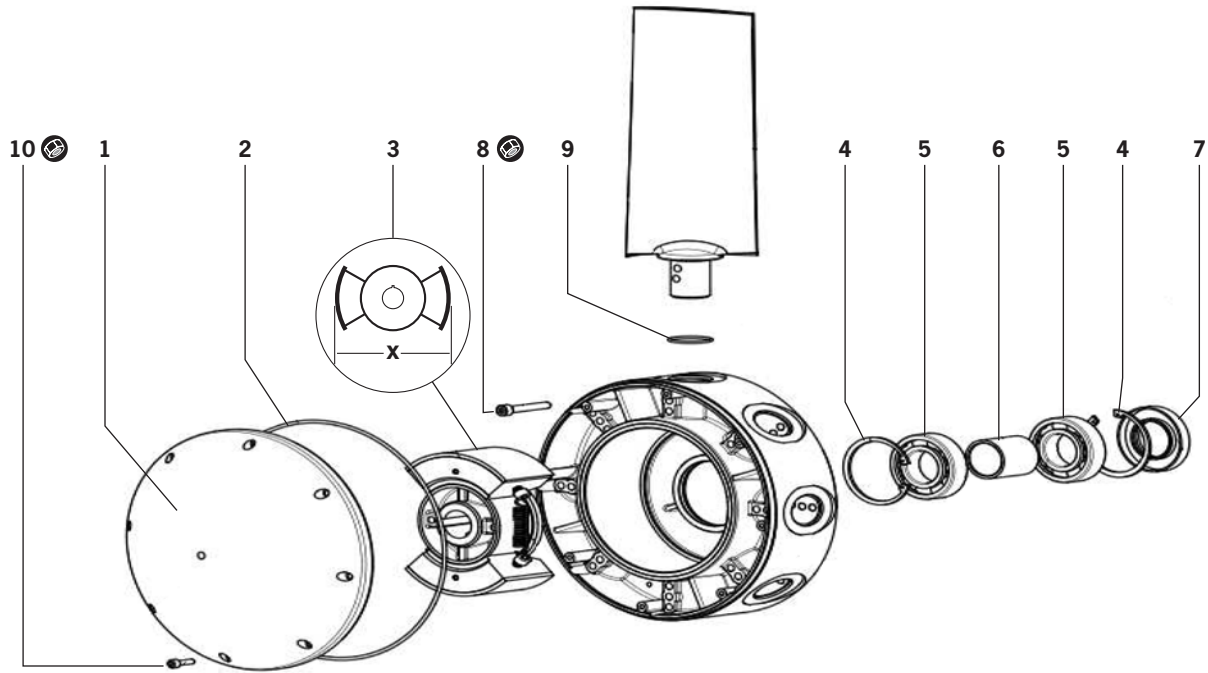
Where a *spacer* is required, select a diameter that evenly distributes force around the outer edge of the bearing cup. Choosing a spacer of insufficient diameter or using no spacer at all will drive the bearings unevenly and cause the joint to bind in operation.
 You should assemble the joint in a clean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



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, <i>includes fasteners</i>	1
8	MBTG24	24" fan guard, <i>includes fasteners</i>	1
	MBTG28	28" fan guard, <i>includes fasteners</i>	
	MBTG32	32" fan guard, <i>includes fasteners</i>	
	MBTG36	36" fan guard, <i>includes fasteners</i>	
9	0370100CH2	3/8"-16 x 1" bolt	2
	037NYS	3/8"-16 nylock nut	2
10	MF880	cone	1
11		fan housing, <i>provide serial number</i>	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

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

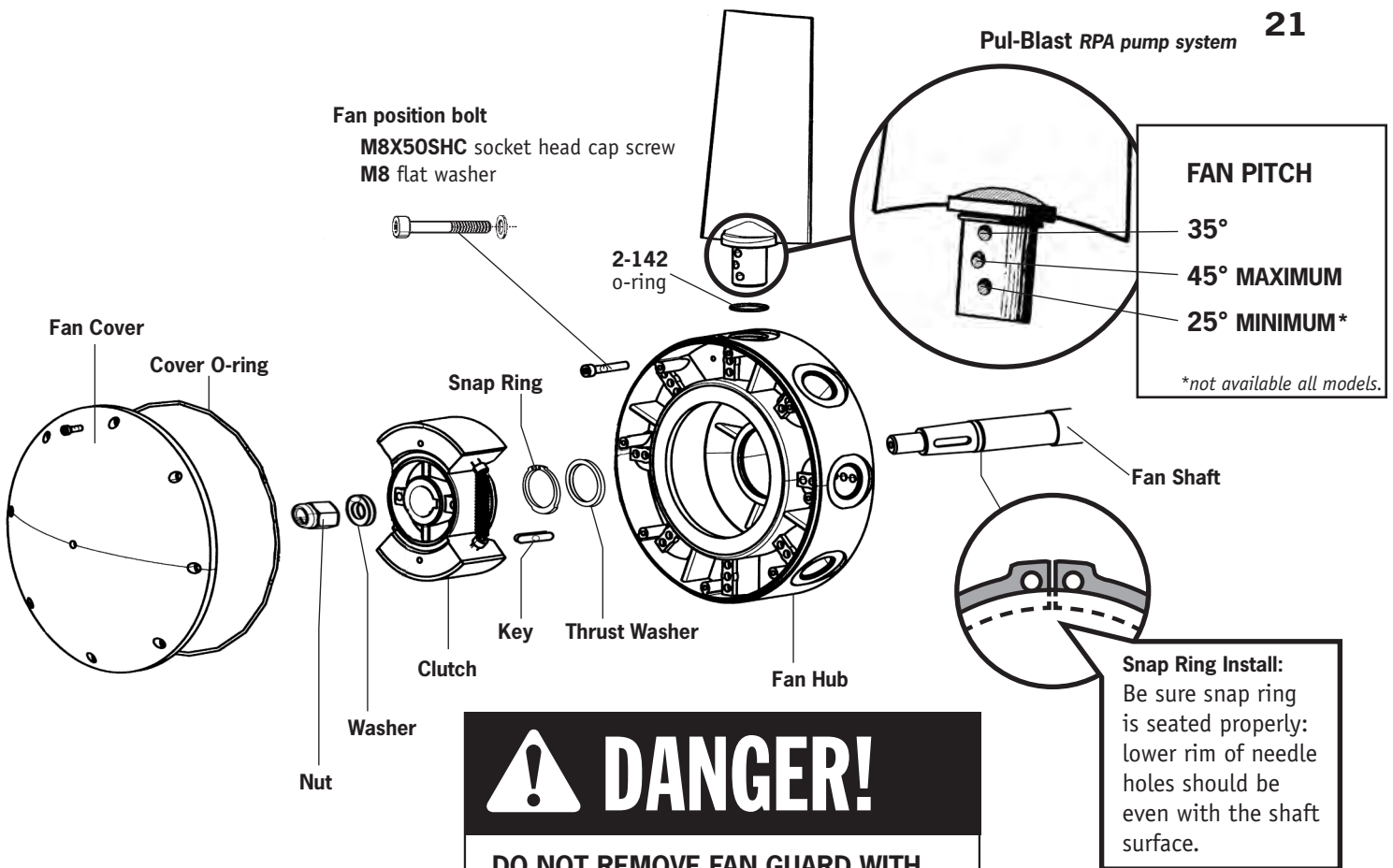


Fan: 28", 32", 36" for 24" fan, see parts page

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		
		<i>fan</i>	X	
3	MFC28	28" 6"	clutch	1
	MFC287	28" 7"	clutch	
	MFC32	32-36" -	clutch	
4	MF830	28" 6"	snap ring <i>seeeger I 62</i>	2
	MF840	28" 7"	snap ring <i>seeeger I 80</i>	
	MF840	32-36" -	snap ring <i>seeeger I 80</i>	
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.

Snap Ring Install:
Be sure snap ring is seated properly: lower rim of needle holes should be even with the shaft surface.

Fan Installation: 28", 32", 36"

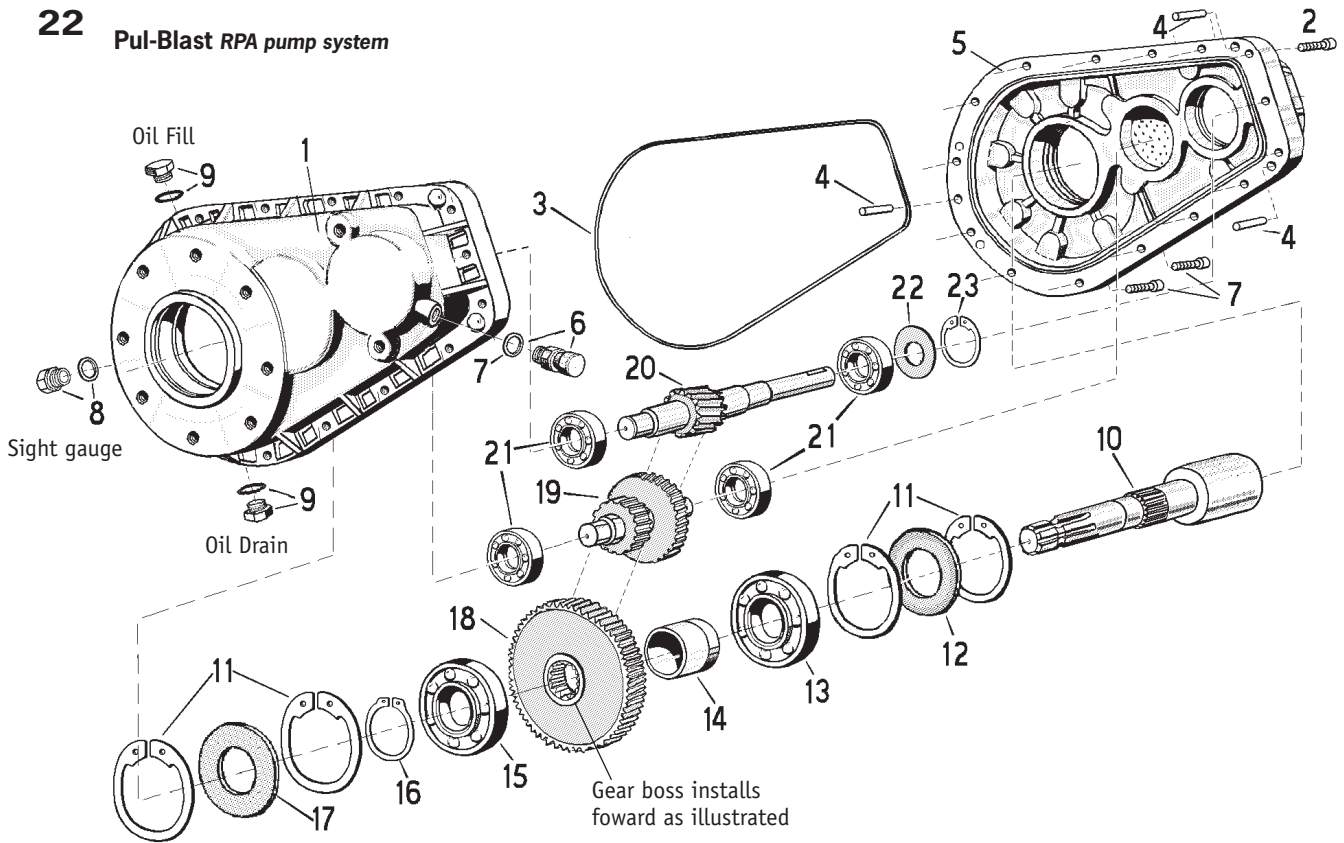
1. **Fan Shaft must be clean and smooth:** be certain snap ring groove and key slot are clean. Apply a thin coat of *Never-Seez* (or equivalent extreme pressure lubricant) to fan shaft mating surfaces and threads.
2. **Install Fan on Fan Shaft:** slide to shaft shoulder.
3. **Install Thrust Washer on 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.

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

22 Pul-Blast RPA pump system

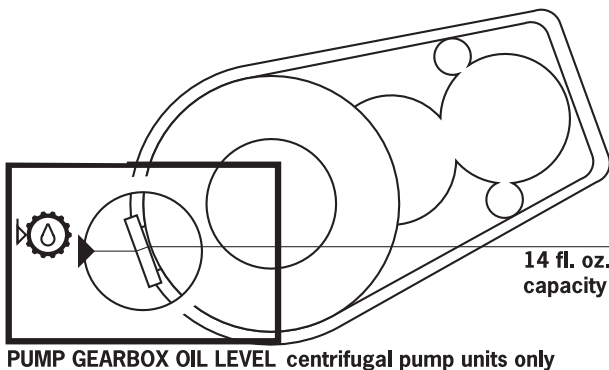


MGB7 Gearbox Parts 1:7.21 ratio

No.	Part #	Description	Qty
1	MGB701	front half gear case	1
2	M8X35SHC	bolt M8-1.25 x 35	10
3	2-174	gear case o-ring	1
4	SPI00001	pin 8 x 28	3
5	MGB705	rear half gear case	1
6	MGB706	breather	1
	MGB707	gasket	1
7	M8X40SHC	M8-1.25 x 40 bolt mounts to pump plate	5
8	MGB01037	oil level sight gauge	1
	MGB01037G	gasket	1
9	MGB0101037	plug	1
	MGB01037G	gasket	1
10	MGB710	input shaft, 6 spline, 18Z	1

No.	Part #	Description	Qty
11	MGB711	snap ring (seeger I 80)	4
12	MGB712	seal 60 x 80 x 8	1
13	6208	bearing	1
14	MGB714	spacer finished surface toward gear	1
15	6307	bearing	1
16	MF2409	snap ring (seeger E35)	1
17	MGB0358010	seal 35 x 80 x 10	1
18	MGB718-32	gear 32Z confirm tooth count*	1
19	MGB719-11	shaft/gear 11Z/37Z confirm tooth count*	1
20	MGB720	pump drive shaft, 15Z	1
21	6305	bearing	4
22	MGB722	seal 25 x 52 x 8	1
23	MGB723	snap ring (seeger I 52)	1

*earlier models have different gear tooth count



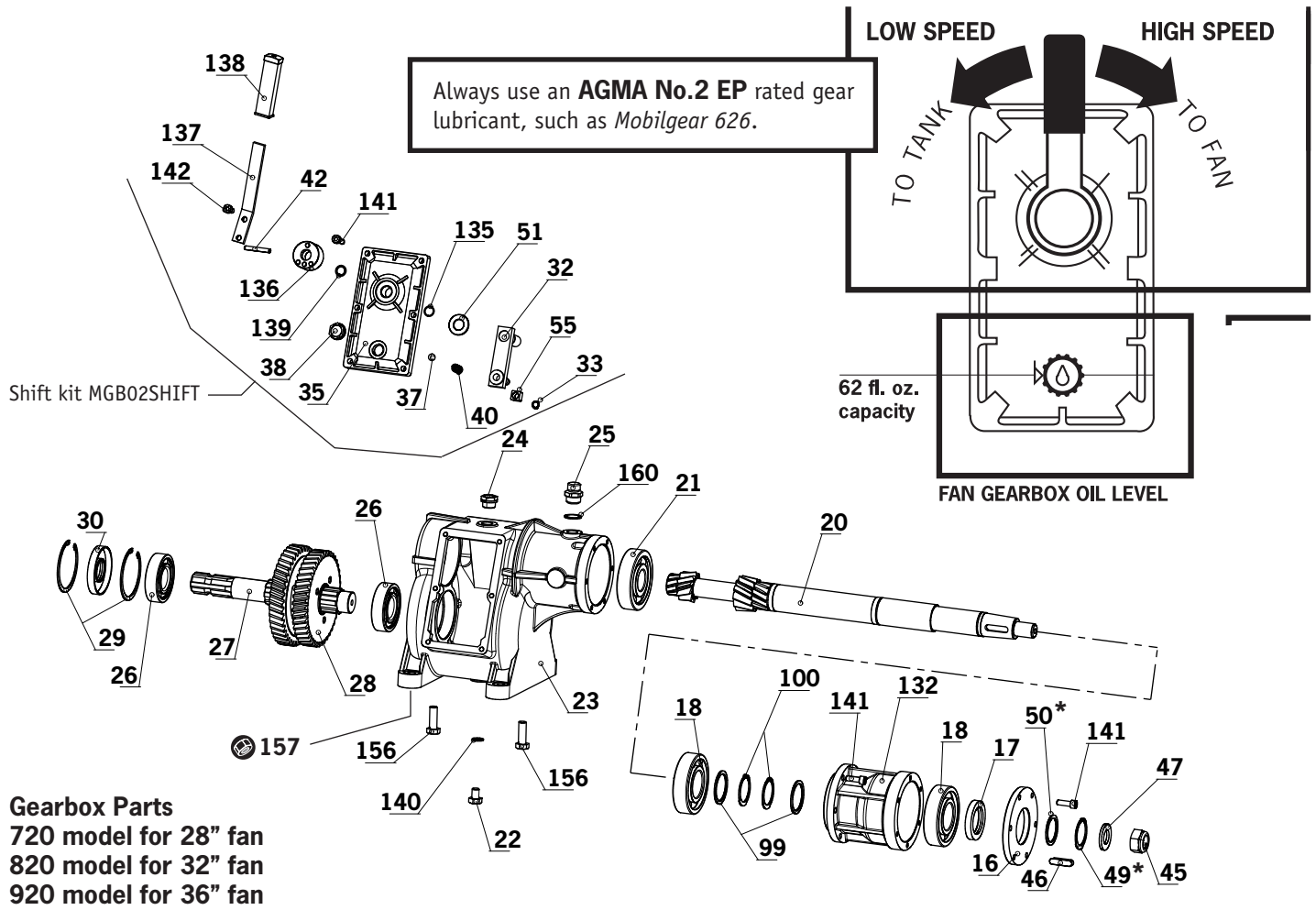
Gearbox lubrication

Oil level should be visible in the plug window.

LOW OIL ON NEW UNIT: do not top off the gearbox oil on a new unit. With the first low oil reading on a new unit, drain the gearbox while warm and refill with an **AGMA No.2 EP** rated lubricant, such as *Mobilgear 626*.

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

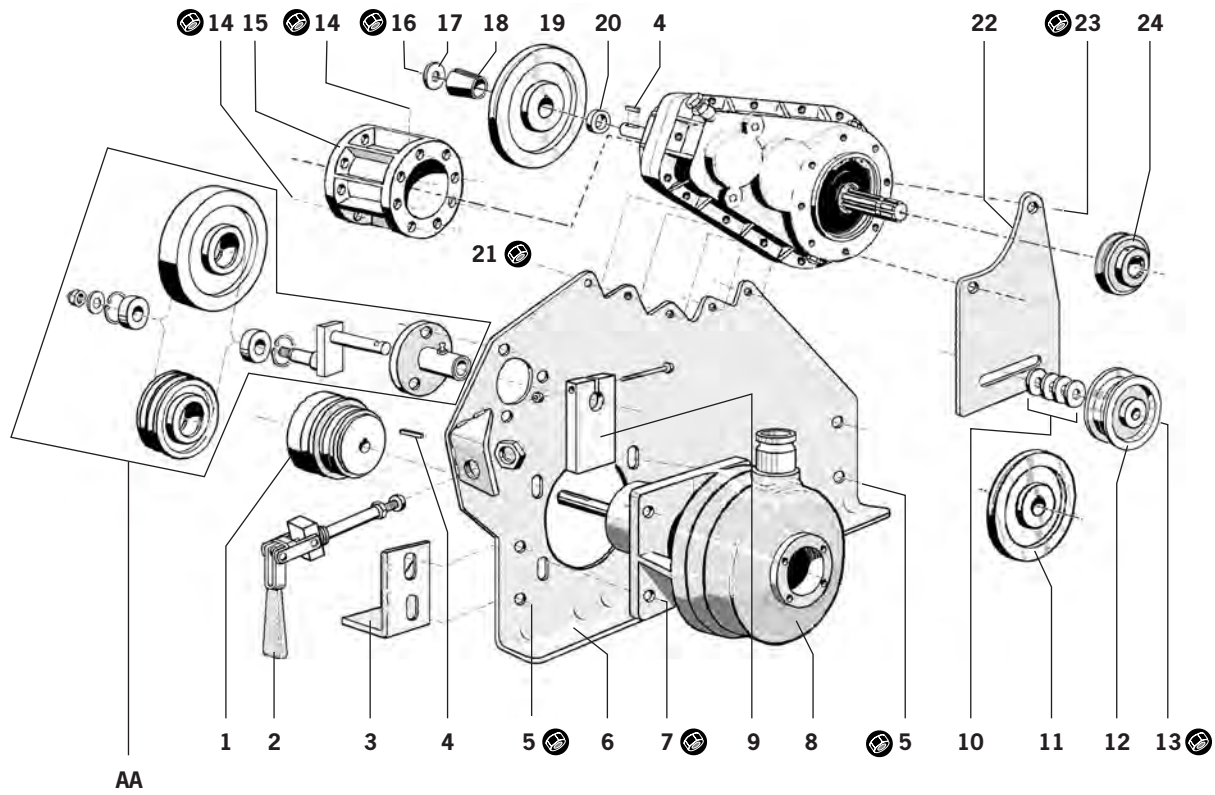
Change gearbox oil every 200 hours or seasonally, whichever comes first. Drain while warm.



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 <i>includes 17, 21, 26, 30</i>	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 <i>install w/liquid gasket</i>	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
	M8X16SHC	bolt M8-1.25 x 16	2
	M12-1.75X30	bolt M12-1.75 x 30	2
	M12LW	lockwasher M12	2
156	050WSAE8	1/2" hardened flatwasher	2
	0500225CH8	bolt 1/2"-13 x 2-1/4" Gr.8	4
	050WSAE8	1/2" hardened flat washer	8
	050WS	1/2" lockwasher	4
157	050NF	1/2" nut	4
160	GUA00006	washer 21 x 27 x 1.5 aluminum	1

*not included in gearbox or fan assembly



AA

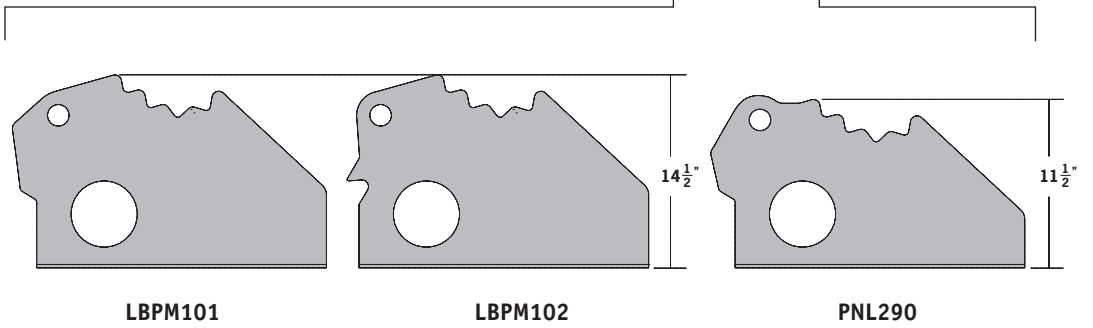
chart A

Pressure setting		Pulley color	19 pulley part #	1 pulley part #
High	Low			
125	60	Yellow	PB15A12560	RPA-SP12560
200	-	Black*	PB15A200	RPA-SP200
250	125	Green	PB15A	RPA-SP
250	150	Orange	PB15A150	RPA-SP150

* Black pulley sets require 2 belts

chart B

pump	pump plate	belt number
RPA-SP	LBPM101	11M1120
RPA-SP	call	11M1120
RPA-SP	PNL290	11M1030



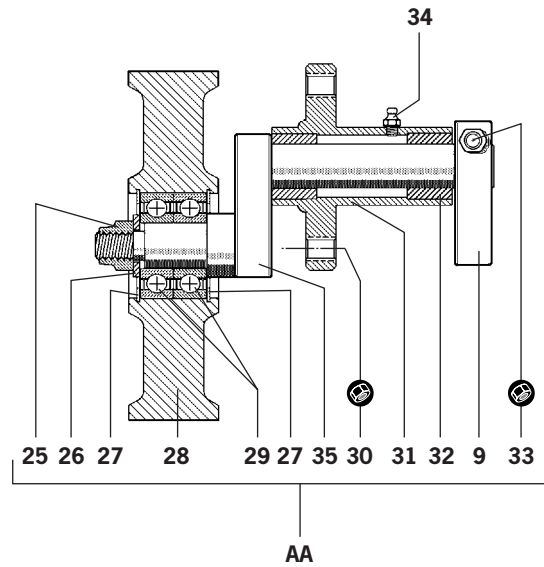
LBPM101

LBPM102

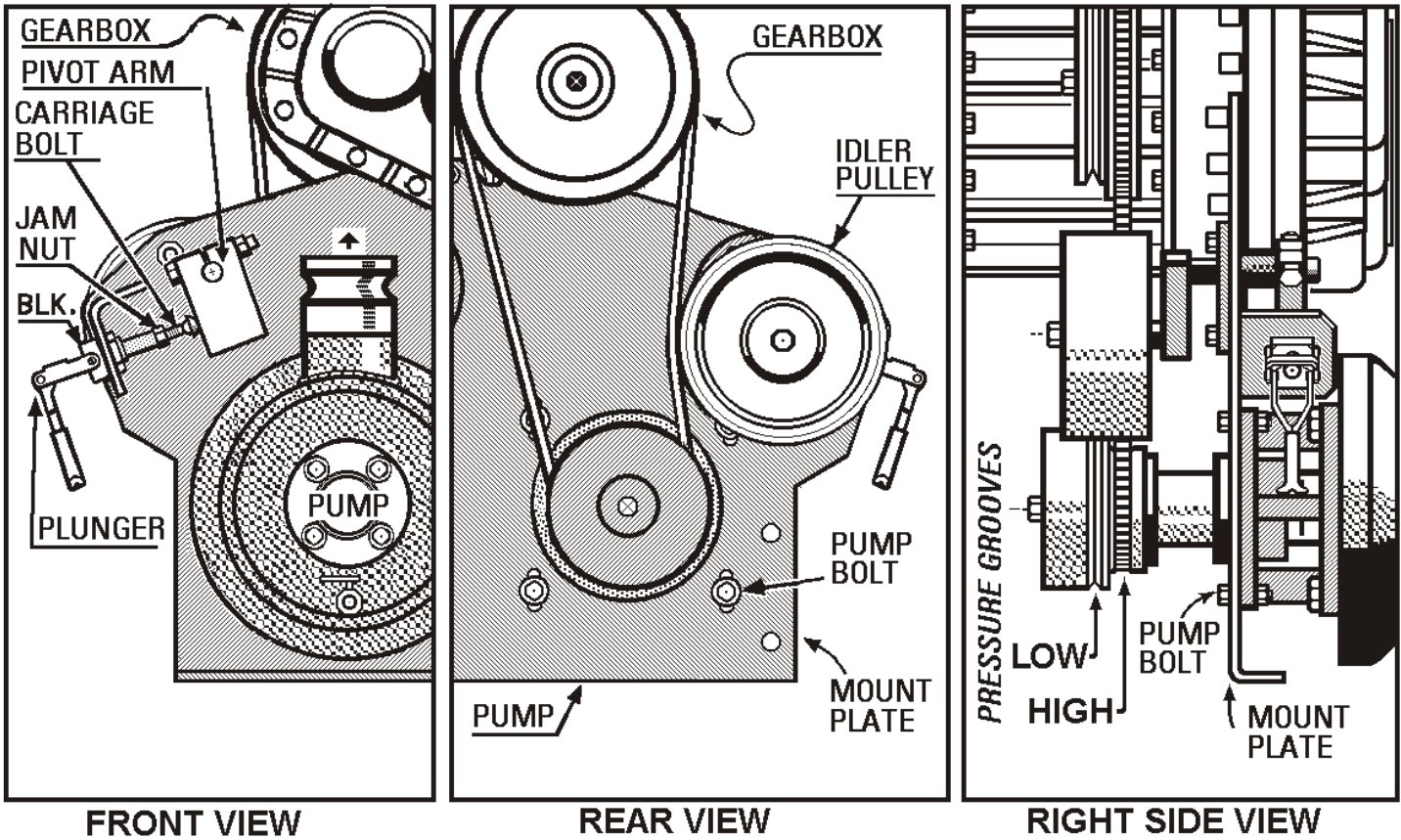
PNL290

belt drive parts *Micro-V parts see following section*

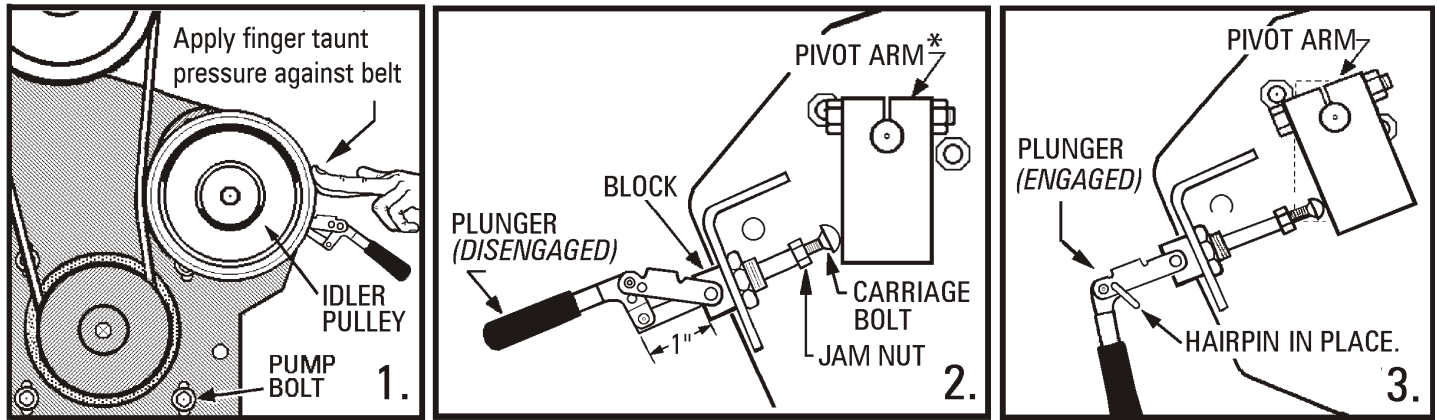
No.	Part #	Description	Qty
1		see <i>chart A</i> , previous page	1
2	PBSP725	plunger assembly	1
3	LBSP110L, R	mount bracket	2
4	KM0180175	3/16" sq. key, 1-3/4" long	2
5	0370100CH5	3/8"-16 x 1" gr.5 bolt	4
	037WS	3/8" lockwasher	4
	037NF	3/8" nut	4
6		see <i>chart B</i> , previous page	1
7	0370150CH5	3/8"-16 x 1" gr.5 bolt	4
	037WS	3/8" lockwasher	4
	037NF	3/8" nut	4
8		see pump parts page	
9	PBSP7141	idler pivot arm	1
10	062WUSS	5/8" flat washer	4
11		agitator shaft driven pulley	1
12		agitator belt idler pulley	1
13	0620250CH5	5/8"-11 x 2-1/2" bolt	1
	062WUSS	5/8" flat washer	1
	062WS	5/8" lockwasher	1
	062NF	5/8" nut	1
14	M10-1.5X30HH	10mm x 30mm bolt	16
	M10LW	10mm lockwasher	16
15	MGB7FS	gearbox coupler housing	1
16	M6-1.0X25SHCS	6mm x 25mm bolt	1
	M6LW	6mm lockwasher	1
17	SPSW-F4	retaining washer, stainless steel	1
18	PBTL44A	taper hub	1
19		see <i>chart A</i> , previous page	1
20	PB15AS	.355 spacer <i>inner bevel faces the gearbox</i>	1
21	M8X40SHC	8mm x 40mm bolt	5
22	R7P001	idler mount LBPM101 & LBPM102 plate	1
	R7P002	idler mount PNL290 plate	
23	M10-1.5X20HH	10mm x 20mm bolt	2
	M10LW	10mm lockwasher	2
24	MBP102	agitator drive pulley	1
25	050NYSS	1/2" ny-lock nut	1
26	050WSAE8	1/2" hardened flat washer	1
27	N5000-187	snap ring	2
28	PBSP7151	idler pulley	1
29	6204-2RS	bearing	2
30	037NF	3/8" nut	3
	037WUSS	3/8" lockwasher	3
	0370150CH5	3/8" x 1 1/2" gr.5 bolt	3
31	PBSP721	idler housing	1
32	AGBSH075112	bronze bushing	2
33	0310200CH5	5/16" x 2" gr.5 bolt	1
	031NY	5/16" ny-lok nut	1
34	1641-B	1/4"-28 zerk	1
35	PBSP716	idler pivot	1



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

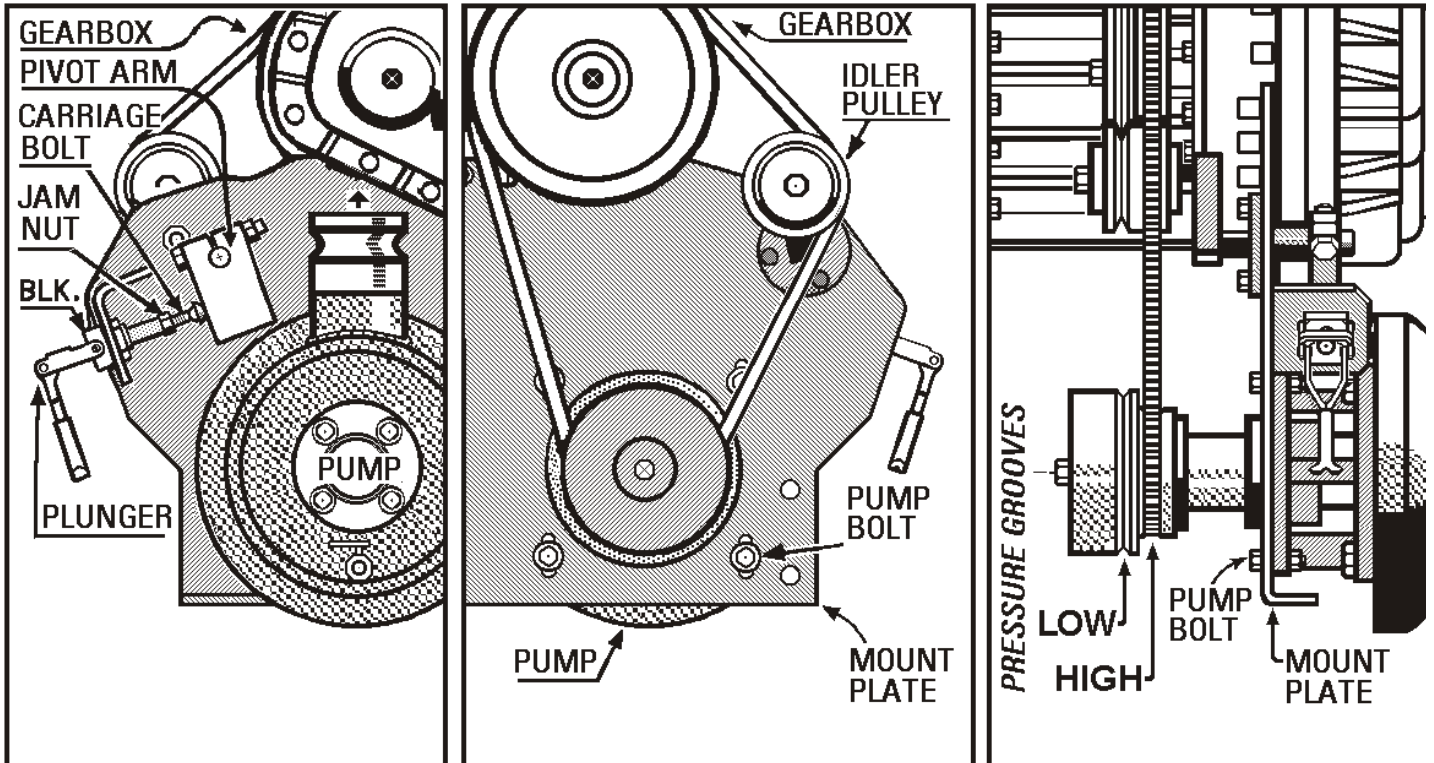


CENTRIFUGAL PUMP DRIVE BELT TENSION ADJUSTMENT:

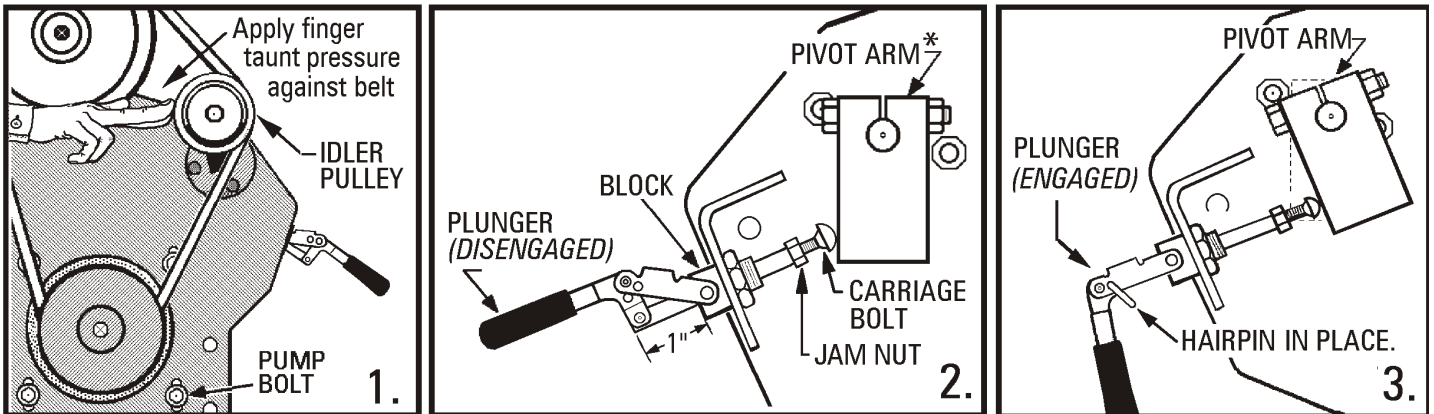


Tensioning the outside idler

1. **Installing a new pump belt:** loosen the pump mount bolts and allow the pump to slide to the bottom of the mount slots in the pump mount plate. Press the pump against the pump mount plate and snug the mount bolts.
2. With the idler tension plunger disengaged, install the belt loosely on the high pressure pulley grooves (the inner grooves) of the gearbox pulley and pump pulley.
3. **Using the fingers of one hand** rotate the pivot arm until it is vertical as illustrated in *pic.2*. If the belt tension prevents rotating the pivot arm to a vertical position, shift the pump: use a pry-bar to slide the pump upward in the pump plate mount slots. At the point you can swing the pivot arm to a vertical position with the fingers of one hand, tighten the pump mount bolts.
4. Hold the pivot arm in a vertical position and engage the idler tension plunger **until the carriage bolt head touches the pivot arm**. As illustrated, there should be 1" of plunger rod exposed when the carriage bolt contacts the vertical pivot arm. **This is important.** If carriage bolt length needs to be adjusted, loosen the jam nut and adjust accordingly. Tighten the jam nut when complete.
5. Fully engage the idler tension plunger and secure the plunger arm with hair pin.



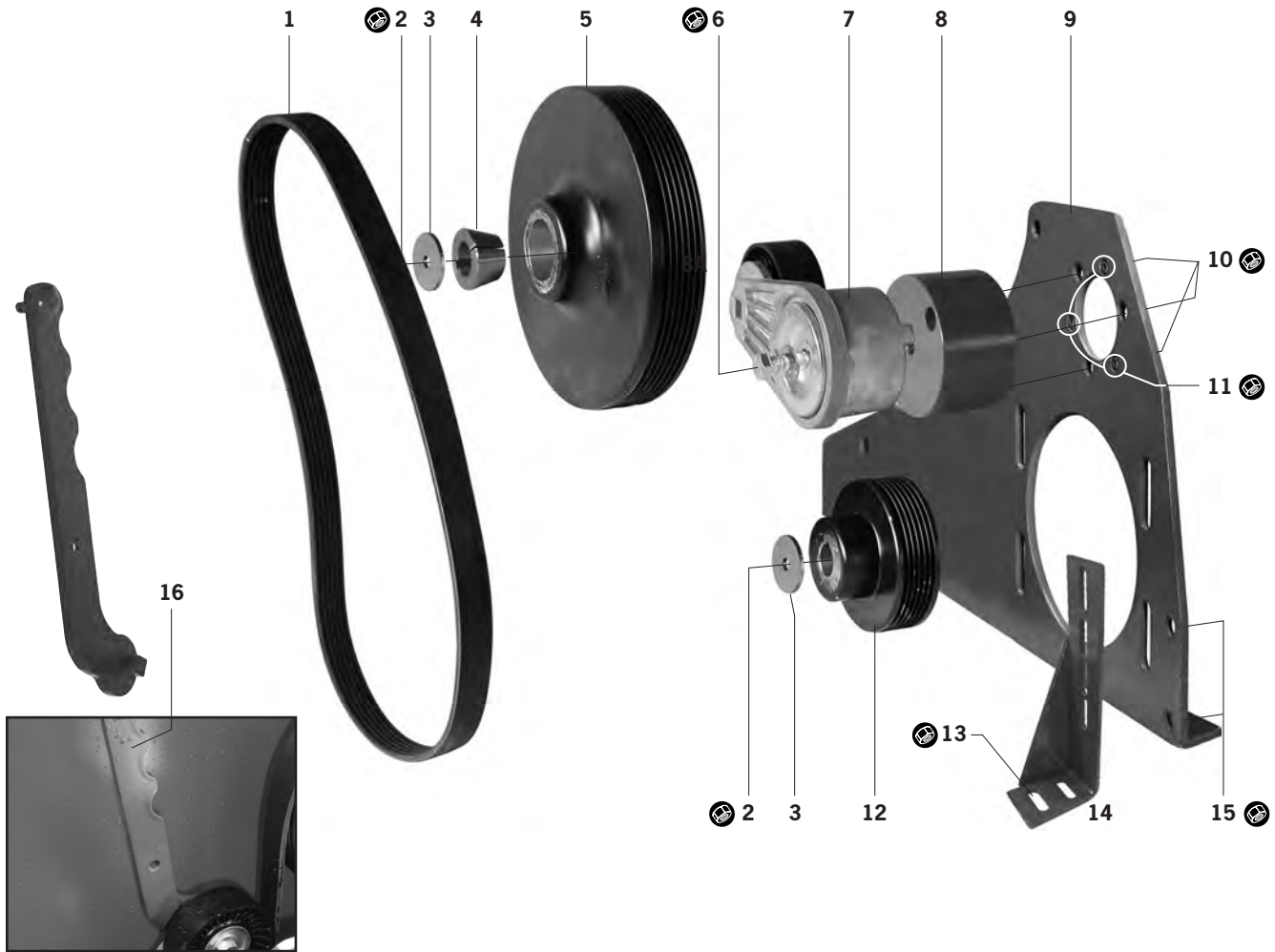
CENTRIFUGAL PUMP DRIVE BELT TENSION ADJUSTMENT:



Tensioning the inside idler

1. **Installing a new pump belt:** loosen the pump mount bolts and allow the pump to slide to the bottom of the mount slots in the pump mount plate. Press the pump against the pump mount plate and snug the mount bolts.
2. With the idler tension plunger disengaged, install the belt loosely on the high pressure pulley grooves (the inner grooves) of the gearbox pulley and pump pulley.
3. **Using the fingers of one hand** rotate the pivot arm until it is vertical as illustrated in *pic.2*. If the belt tension prevents rotating the pivot arm to a vertical position, shift the pump: use a pry-bar to slide the pump upward in the pump plate mount slots. At the point you can swing the pivot arm to a vertical position with the fingers of one hand, tighten the pump mount bolts.
4. Hold the pivot arm in a vertical position and engage the idler tension plunger **until the carriage bolt head touches the pivot arm**. As illustrated, there should be 1" of plunger rod exposed when the carriage bolt contacts the vertical pivot arm. **This is important.** If carriage bolt length needs to be adjusted, loosen the jam nut and adjust accordingly. Tighten the jam nut when complete.
5. Fully engage the idler tension plunger and secure the plunger arm with hair pin.

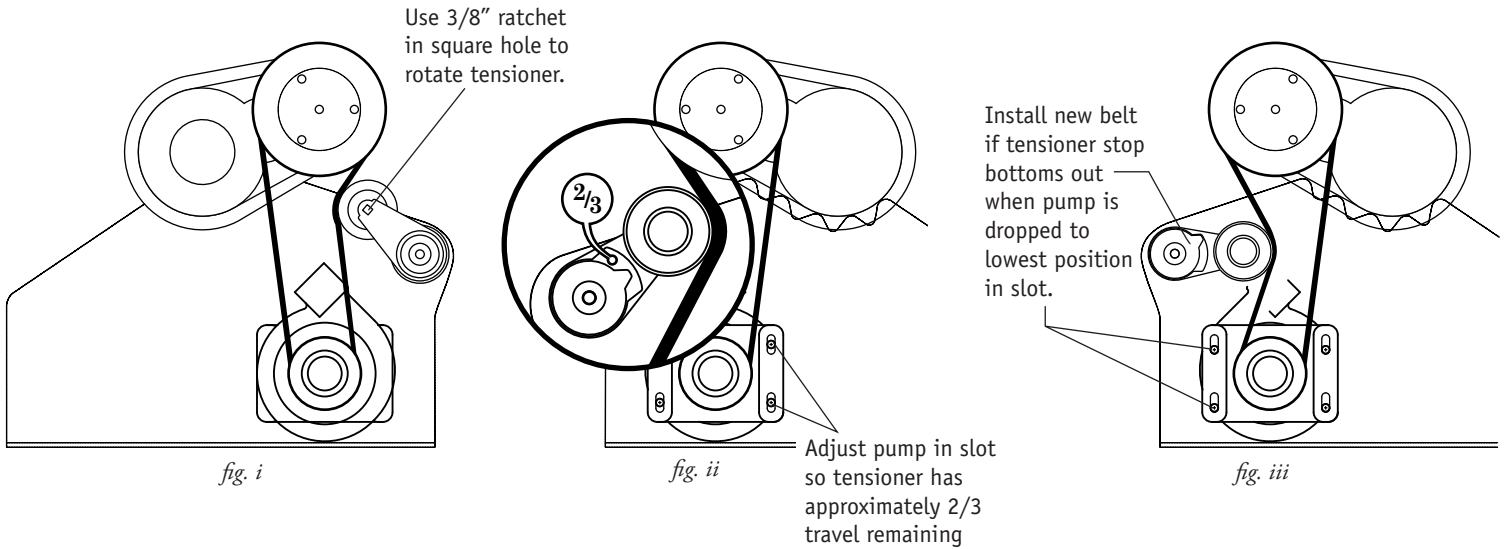
Read this manual completely before operating: follow all safety instructions.



Micro-V belt drive parts, single speed

No.	Part #	Description	Qty
1	see pump belt chart on <i>micro-v tensioning</i> page		1
2	0260075CH5	1/4"-28 x 3/4" gr5 bolt install with Loctite 242: follow Loctite installation instructions. Install wrench tight: target torque is 86 in-lbs.	2
	025WS	1/4" lockwasher	2
3	SPSW-F4	stainless steel pulley retaining washer	2
4	PBTL44A	tapered hub	1
5	PB15AMV	micro-v drive pulley, black, 200psi	1
6	0380250CH5	3/8"-24 x 2-1/2" gr5 bolt	1
	037WSAE	3/8" hardened flat washer	1
	037WS	3/8" lock washer	1
	38164	belt tensioner	1
8	PBG034	tensioner mount block	1
9	see pump plate chart on <i>micro-v tensioning</i> page		1
10	0380100CH5	3/8"-24 x 1" gr5 bolt	3
	037WS	3/8" lock washer	3

No.	Part #	Description	Qty
11	0370050SET	3/8"-16 x 1/2" cup point setscrew	3
12	RPA-MV201	micro-v drive pulley, black, 200psi	1
13	0500150CH5	1/2"-13 x 1-1/2" gr5 bolt	1
	050WUSS	1/2" flat washer	1
	050WS	1/2" lock washer	1
14		RH plate mount bracket <i>pictured above</i>	1
		LH plate mount bracket <i>not pictured</i>	1
15	0370125CH5	3/8"-16 x 1-1/4" gr5 bolt	2
	037WUSS	3/8" flat washer	2
	037WS	3/8" lock washer	2
	037NF	3/8" nut	2
16	PBIN640	pivot tool	1



Tensioning the micro-v pump belt

DO NOT ADJUST BELT WITH TRACTOR RUNNING.
DISENGAGE PTO AND TURN OFF TRACTOR BEFORE PROCEEDING.

The tensioning mechanism will not need adjustment for the life of a belt, but is designed to maintain tension as the belt stretches. The tensioner indicates when to replace the belt.

Installing a new pump belt, fig. i: Install the belt loosely on the gearbox pulley and pump pulley. Use the pivot tool* or a 3/8" ratchet (mounted in the square hole indicated) to swing the tensioner arm out of the way and position the belt as illustrated.

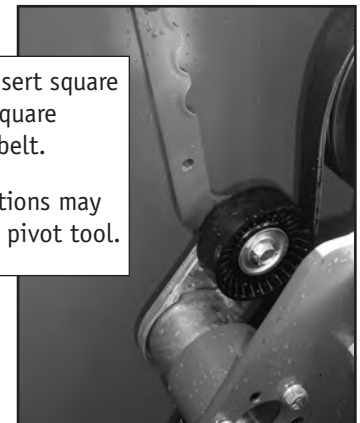
Loosen the pump mount bolts that attach the pump assembly to the pump plate. Watch the belt tension indicator, fig. ii, as you slide the pump in the mount slots. Tighten the pump mount bolts when the tensioner registers approximately 2/3 travel remaining, as illustrated.

Getting the most out of your belt. As the pump belt stretches, the tension arm will rotate to maintain proper tension on the belt. The belt is exhausted when the tension indicator on the tensioner body *bottoms out* (see fig. iii).

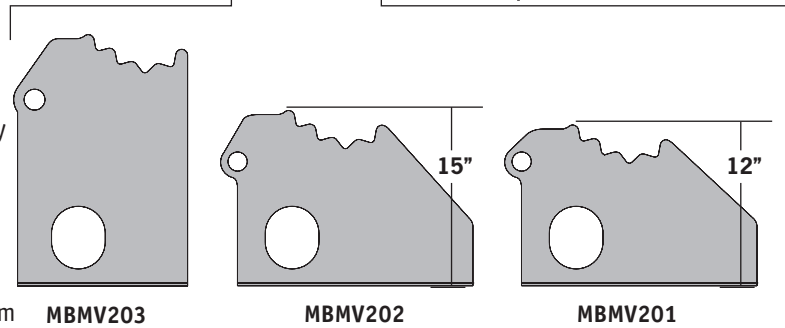
As the belt stretches and the indicator nears exhaustion, loosen the pump mount bolts that attach the pump assembly to the pump plate and lower the pump to the bottom of the mount slots on the pump plate. The tension indicator will register more belt life.

Time to get a new belt. If the tension indicator on the tension arm *bottoms out* and the pump is mounted at the bottom of the pump plate mount slot, the belt needs to be replaced. Use the pivot tool* or a 3/8" ratchet, as described in *pump installation*, above, to swing the tension arm out of the way and remove the belt.

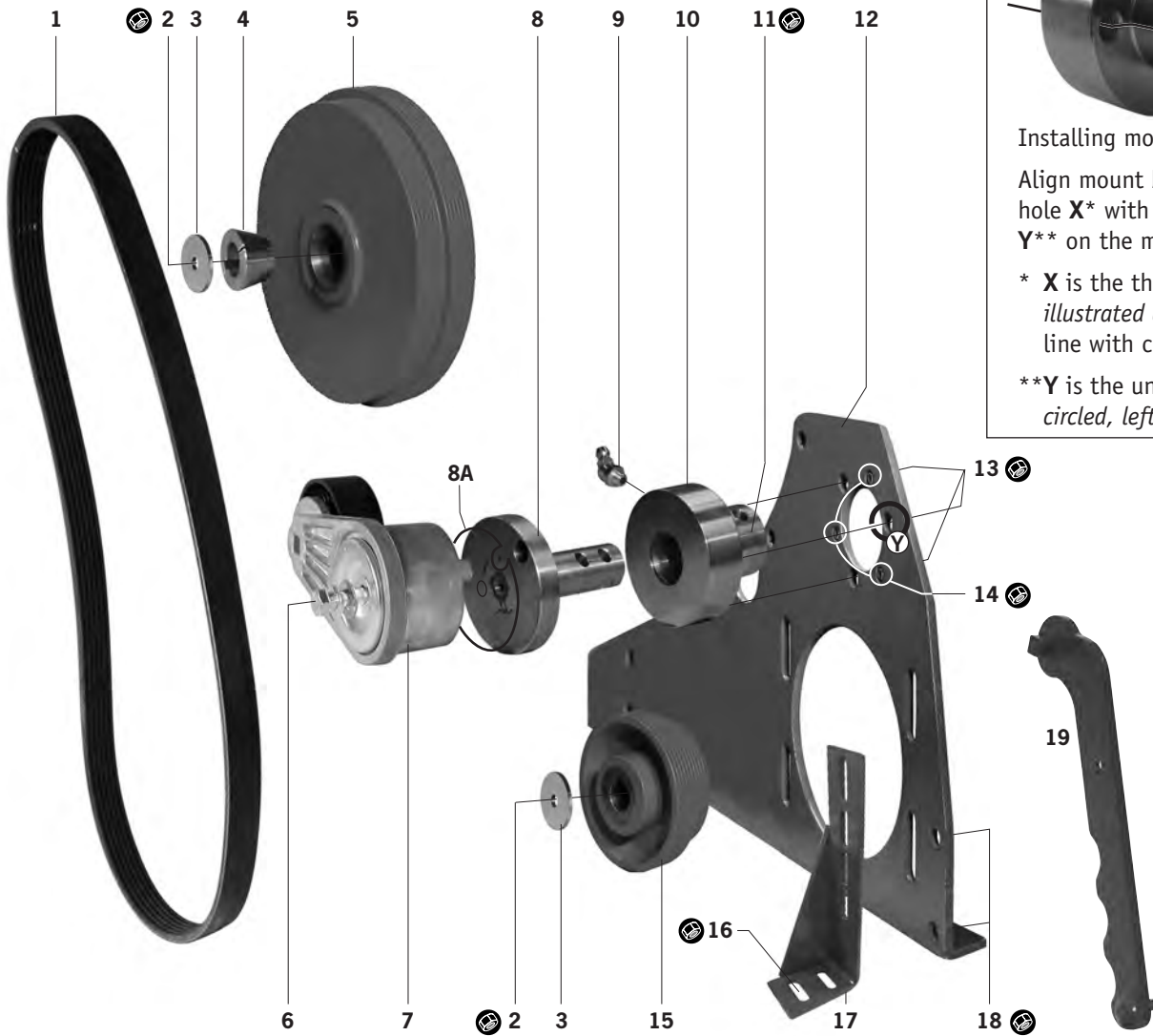
***Tensioner pivot tool:** insert square head into tensioner arm square socket, rotate away from belt.
 Retrofit tensioner installations may not have clearance to use pivot tool.



pump plate	pump	belt number
MBMV201	RPA-SP	K060388
MBMV202	RPA-SP	K060441
MBMV203	RPA-SP	K060569



30 Pul-Blast RPA pump system



Installing mount block 10:
Align mount block threaded hole X* with unthreaded hole Y** on the mount plate 12.

* X is the threaded hole illustrated above nearly in line with cross-drilled hole.

**Y is the unthreaded hole circled, left

Micro-V belt drive parts, high/low range

No.	Part #	Description	Qty
1	see pump belt chart on <i>micro-v tensioning</i> page		1
2	0260075CH5	1/4"-28 x 3/4" gr5 bolt install with Loctite 242: follow Loctite installation instructions. Install wrench tight: target torque is 86 in-lbs.	2
	025WS	1/4" lockwasher	2
3	SPSW-F4	stainless steel pulley retaining washer	2
4	PBTL44A	tapered hub	1
5	micro-v drive step pulley see <i>facing chart</i>		1
6	0380250CH5	3/8"-24 x 2-1/2" gr5 bolt	1
	037WSAE	3/8" hardened flat washer	1
	037WS	3/8" lock washer	1
7	38164	belt tensioner	1
8	PBMVT2	2 position mount rod	1
8A		shim- not required on all assemblies	-
9*	1/4-28/45	45° zerk	1
10	PBMVT	mount block	

No.	Part #	Description	Qty
11	0380250CH5	3/8"-24 x 2-1/2" gr5 bolt	1
	038NYSS	3/8"-24 nylock nut	1
12	see pump plate chart on <i>micro-v tensioning</i> page		1
13	0380100CH5	3/8"-24 x 1" gr5 bolt	3
	037WS**	3/8" lock washer	3
14	0370050SET	3/8"-16 x 1/2" cup point setscrew	3
15	micro-v drive step pulley see <i>facing chart</i>		1
16	0500150CH5	1/2"-13 x 1-1/2" gr5 bolt	1
	050WUSS	1/2" flat washer	1
	050WS	1/2" lock washer	1
17		RH plate mount bracket <i>pictured above</i>	1
		LH plate mount bracket <i>not pictured</i>	1
18	0370125CH5	3/8"-16 x 1-1/4" gr5 bolt	2
	037WUSS	3/8" flat washer	2
	037WS	3/8" lock washer	2
	037NF	3/8" nut	2
19	PBIN640	pivot tool	1

* 1-2 pumps each season or as needed

** If bolt head clearance does not allow installation of lockwasher, apply **Loctite 242** Threadlocker

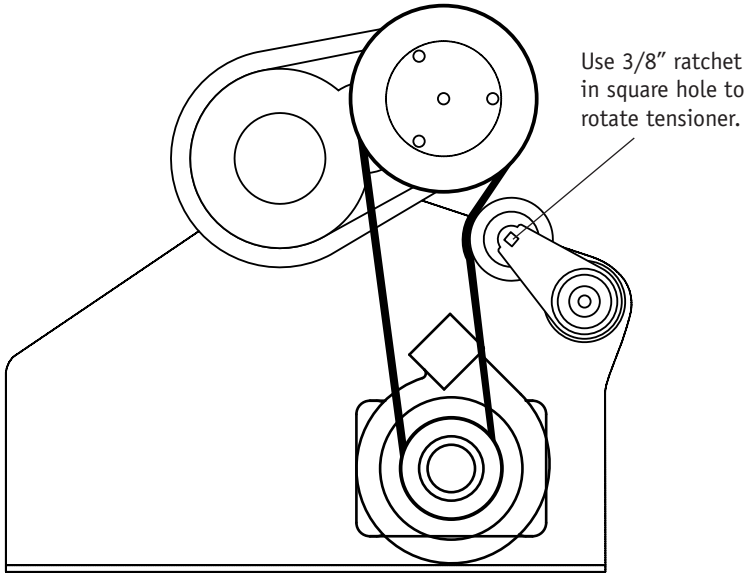


fig. i

2 speed pulley: selecting pump speed

DO NOT ADJUST PUMP SPEED WITH TRACTOR RUNNING.

DISENGAGE PTO AND TURN OFF TRACTOR BEFORE PROCEEDING.

Select between 2 speeds: High Range with the belt closest to the gearbox; **Low Range** with the belt in the far position.

Remove belt, fig. i: Use the pivot tool* or a 3/8" ratchet (mounted in the square hole indicated) to swing the tensioner arm out of the way and remove the belt.

Position tensioner, fig. ii: Remove fastener **A** and slide the tensioner assembly to the next open bolt hole. Replace fastener and secure.

Install belt, fig. i: Install the belt loosely on the desired gearbox pulley step. Use the pivot tool* or a 3/8" ratchet (mounted in the square hole indicated) to swing the tensioner arm out of the way and allow positioning the belt on the corresponding pump pulley step. Fig.ii illustrates the Low Range installation.

Now would be a good time to **Check belt tension:** See the previous section for instructions.

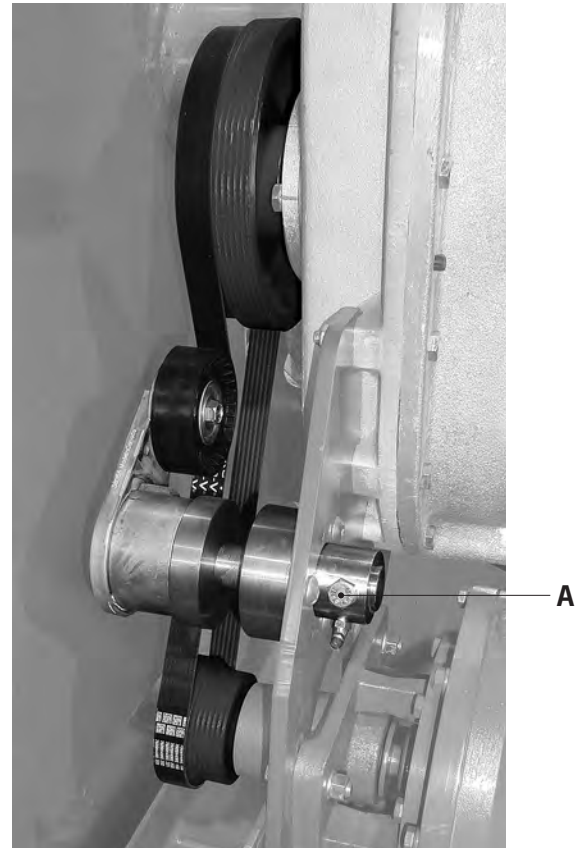


fig. ii

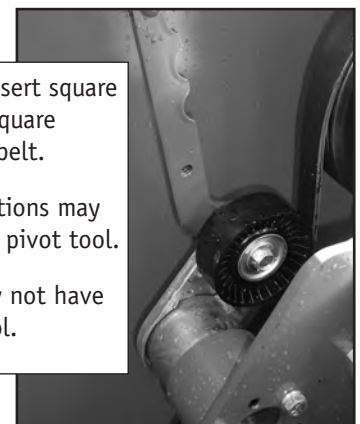
pulley color	pressure psi.		step diameter	part number
green	125/250	gearbox	6.2 "/7"	PB15AMV125
		pump	3.3"/4"	RPA-MV1
orange	150/250	gearbox	6.5"/7"	PB15AMV150
		pump	3.3"/4"	RPA-MV150
red	200/300	gearbox	6.56"/7"	PB15AMV300
		pump	3"/3.5"	RPA-MV300

For belt and pump plate chart, see the previous *Tensioning the Micro-V Pump Belt* page

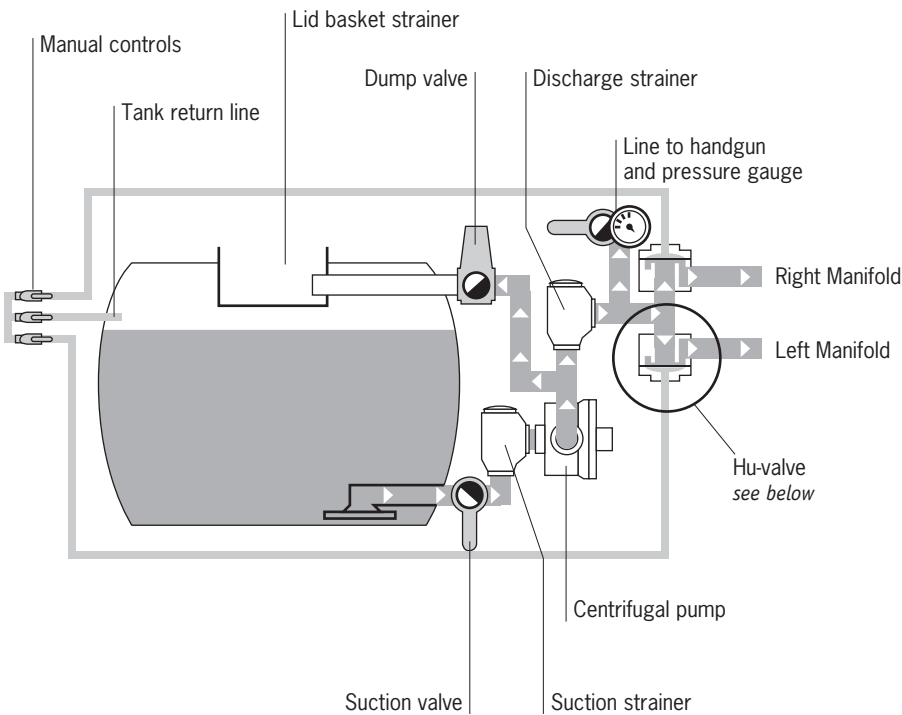
***Tensioner pivot tool:** insert square head into tensioner arm square socket, rotate away from belt.

Retrofit tensioner installations may not have clearance to use pivot tool.

Some 2 speed models may not have clearance to use pivot tool.



pulblast plumbing



pulblast electric spray controls

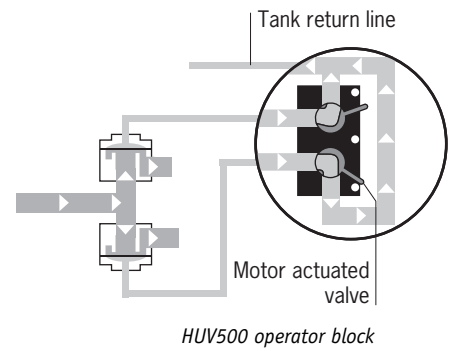


fig i

fig ii

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

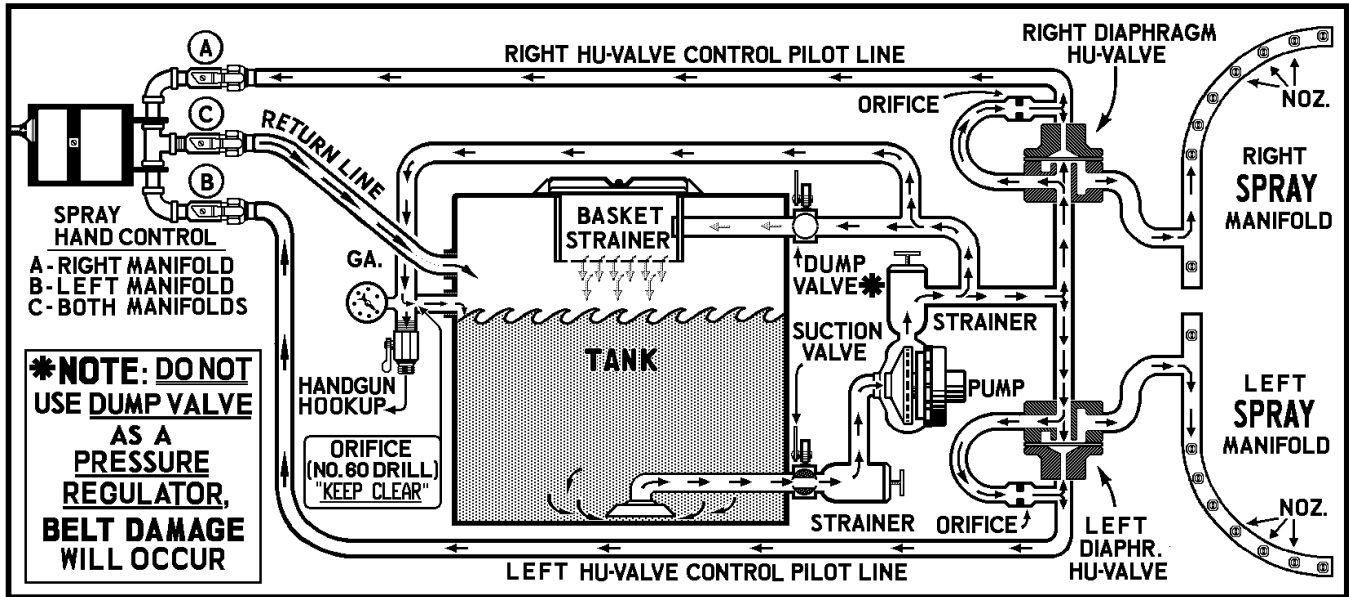
than the pressure in chamber **A**, the valve seat. The greater pressure in **A** displaces the diaphragm, *fig ii*, and opens the passage to the manifold: the valve is open. When you switch your manifold *off* the return line to the tank is closed, *fig i*, and water backs up into chamber **D**, equalizing 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

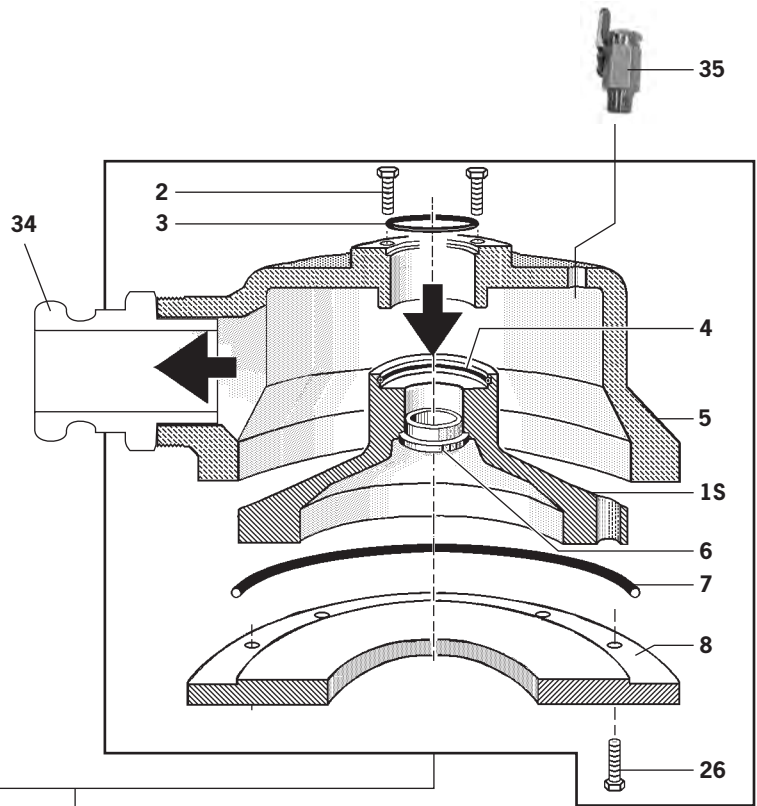
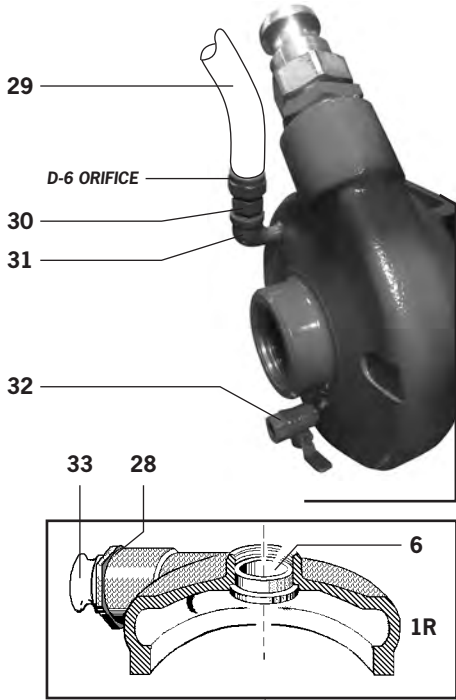
Check Hu-valve orifice and tube for blockage.

Check Hu-valve for ruptured diaphragm.

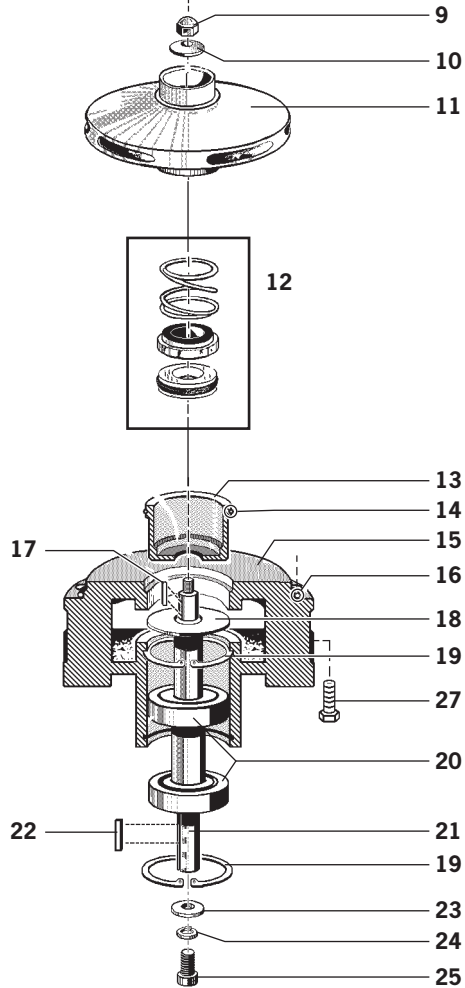
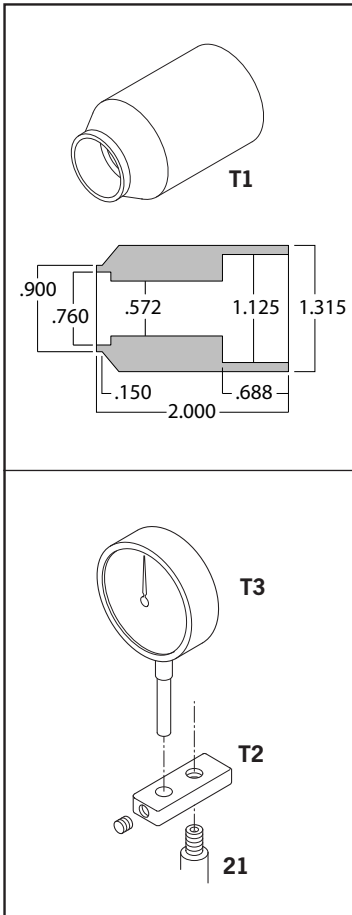
If you have Hu-valve electric controls, check the spool rotation (see appropriate parts page for HVC block assembly illustration). If the spool rotates easily by hand but not by the motor, check the wiring.

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.

34 Pul-Blast RPA pump system



installation tools



Centrifugal Pump Parts

No.	Part #	Description	Qty
	RPA	complete centrifugal pump <i>not self priming</i>	
	PBSP800	complete self priming centrifugal pump	
1R	RPA-VT	volute <i>not for self priming pump, includes 6</i>	1
1S	PBSP802	volute <i>for self priming pump, includes 6</i>	
2	0310112CH2	5/16"-18 x 1"1/8 gr.2	4
3	11-328	o-ring	1
4	11-230	o-ring	1
5	PBSP801	reservoir <i>includes 34</i>	1
6	RP5	wear ring	1
7	2-266	o-ring	1
8	PBSP803	back plate	1
9	RPA-NUT	3/8-24 acorn nut, stainless steel	1
10	RPA-WA	washer, special	1
11	RPA-IM	impeller	1
12	1R309	complete seal	1
13	RPA-SE	seal cavity	1
14	11-137	o-ring	1
15	RPA-PD	pedestal	1
16	11-160	o-ring	1
17	SPK2-8	square key	1
18	RPA-WD	water deflector	1

No.	Part #	Description	Qty
19	N5000-187	inner snap ring	2
20	6204-2RS	bearing (204p)	2
21	RPA-SH	drive shaft	1
22	SPK3-20	square key	1
23	SPSW-F4	washer, special	1
24	025WS	1/4" lock washer	1
25	0260075CH5	1/4"-28 x 3/4" gr.5 bolt	1
26	0310137CH8	5/16"-18 x 1-3/8" gr.8 bolt	8
27	0310087CH8	5/16"-18 x 7/8" gr.8 bolt	8
28	BSH125100	bushing 1-1/4" x 1"	1
29		bleed line	1
30	1/4TT	adapter 1/4"MPT x TeeJet	1
31	SSSTL025	street elbow 1/4" stainless steel	1
32	B025MF	1/4" ball valve	1
33	ETC100FAL	1" male cam-lock fitting	1
34	ETC125FAL	1-1/4" male cam-lock fitting	
35	V20M	1/4" ball valve	1
T1		seal installation tool	
T2		dial indicator	
T3		dial indicator mount block	

Replace Seal & Pedestal Bearings

NOTICE: If seal 12 or either bearing 20 should fail, replace seal and both bearings at the same time.

Removing seal and bearings:

1. Pull the pump assembly and remove to a clean area. Remove bolts **27**, volute/reservoir, and o-ring **16**.
2. Remove acorn nut **9** and washer **10**. With careful and even pressure, use two flat-head screwdrivers to pry the impeller **11** from the pump shaft.
3. Clean all impeller orifices thoroughly.
4. Remove rear snap ring **19** from pedestal and press the pump shaft and bearings out of the pedestal housing.
5. Press bearings off of the shaft and discard. Examine the shaft for damage or wear. Discard the shaft if corroded or bearing seat wear is evident. Clean shaft of all burrs. Buff scratches with emery cloth. Press new bearings **20** onto prepared smooth shaft.

6. Remove the seal **12** from the seal cavity **13** and discard. Clean the cavity thoroughly.
7. If the seal cavity must be removed for cleaning, press from bottom side to remove. The o-ring **14** may be damaged when extracting the seal cavity: replace if necessary.

When re-installing the seal cavity we recommend using a press and not a mallet.

Install the o-ring in the groove on the seal cavity.

Press the seal cavity completely into the pedestal **15** for proper seal alignment.

Instructions for repair continue on following page.

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

Replace Seal & Pedestal Bearings, continued

Install seal and bearings:

1. Press prepared pump shaft, with bearings installed, into the pedestal housing **15**. Be certain the water deflector **18** is in place. Install rear snap ring **19**. Tap bearing housing lightly with a hammer to relieve bearing tension.
2. Using a vise equipped with soft jaws or pads, clamp the non-threaded end of the pump shaft: orient the shaft vertically. **Excessive force will damage the shaft.** The pedestal **15** should spin freely.
3. The seal cavity **13** must be clean and dry.
4. The pump seal **12** has three components: a seal seat, a seal ring, and a spring.

There are two seat designs- the installation instructions are the same for both styles.



Viton O-ring seat



Viton boot seat

5. Lubricate the outer diameter of the seal seat with a suitable lubricant, see lubrication instructions, *below*.

The top and bottom faces of the seal seat should be clean and dry.

SEAL ASSEMBLY LUBRICANT:

Water is a suitable lubricant: where lubricated assembly is required, apply firm pressure to overcome surface friction.

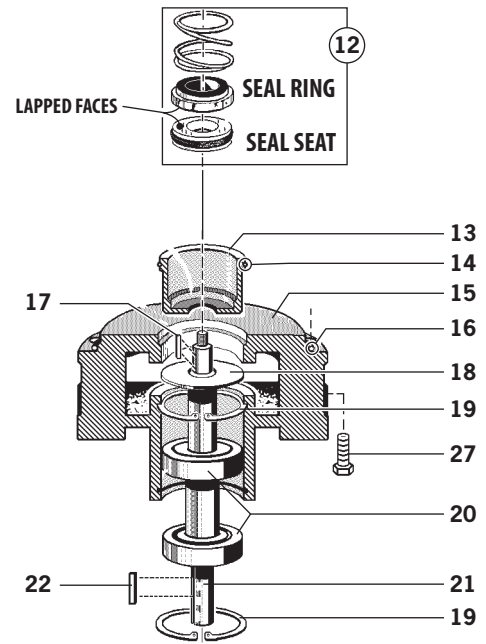
6. Install the seat in the seal cavity **13**.

O-ring seat: orient with the ungrooved face up.

Boot seat: install with viton boot down, into seal cavity.

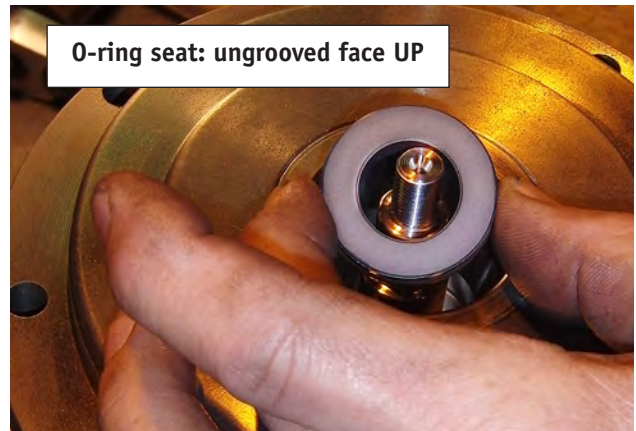
If you have an installation tool from Rears, proceed to **step 7**.

For installation without this tool, proceed to **step 8**.



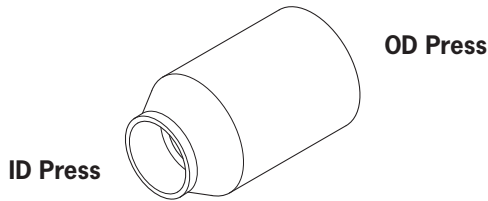
IMPORTANT!

THE PRECISION CARBON/CERAMIC FACES ON THE MECHANICAL SEAL ARE EASILY DAMAGED. HANDLE YOUR REPAIR SEAL CAREFULLY. DO NOT TOUCH THE SEAL FACES.



Replace Seal & Pedestal Bearings, continued

7. A seal installation tool is available from Rears: made from polyvinyl to prevent seal damage. The tool has



two applications: one end is an OD Press, the other end is an ID Press.

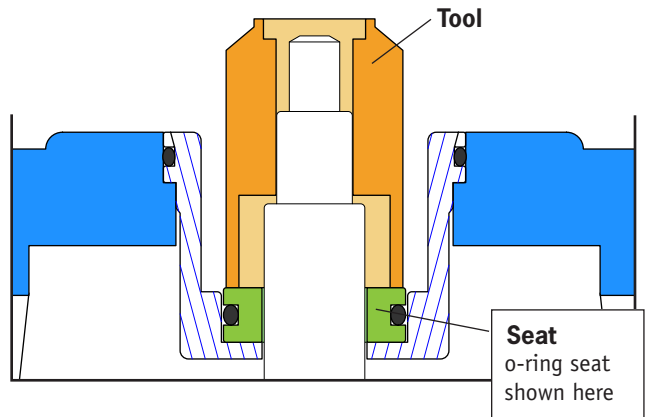
Make sure the installation tool is clean.

Center the **OD Press** end of the tool, as illustrated, on the face of the seat. Apply even pressure to press the seat into the seal cavity.

Proceed to **step 9**.

8. **Installing without an installation tool:** While wearing clean gloves or using a clean light rag, press seal seat squarely into seal cavity.

Proceed to **step 9**.



9. Check that the seat is properly installed:

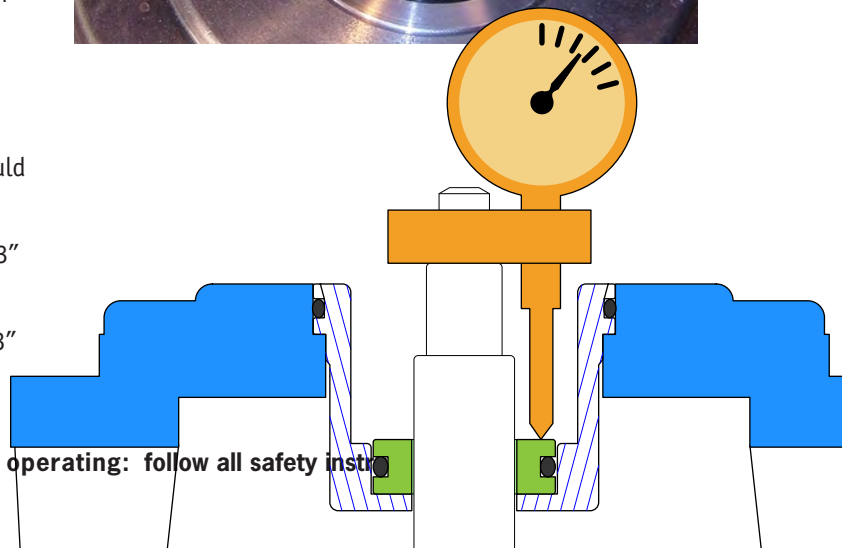
Mount a dial indicator on the pump shaft with the sensor against the face of the seat.

This photo shows a dial indicator set-up on Rears test bench. To order these parts, contact Rears.

Rotate the pump housing: variation in seal attitude should be no more than .003".

If the dial indicator measures variation greater than .003" repeat steps 6-8, pressing firmly.

Repeat step 9. If the variation remains greater than .003" go to the following section, **seal seat troubleshooting**.



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

Replace Seal & Pedestal Bearings, continued

10. Following the lubrication instructions on the previous page, lubricate the internal rubber boot of the seal ring.

Take care that the lapped, or contact, faces of the seal ring and seal seat are clean and dry.

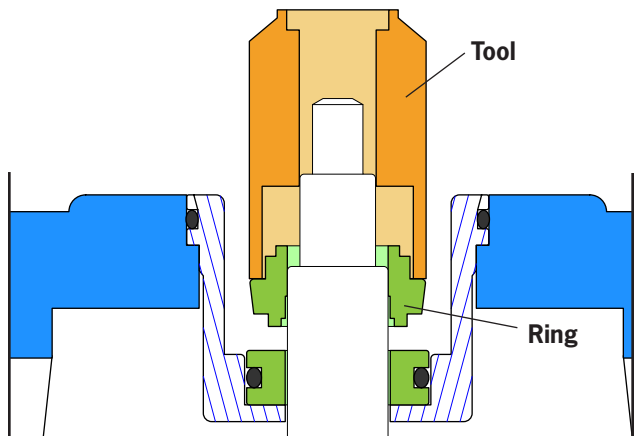
As illustrated, right, place the seal ring on the pump shaft.



11. Pressing the seal ring onto the pump shaft:

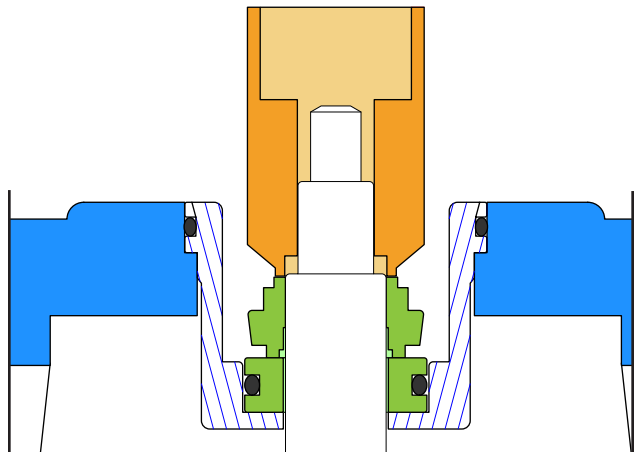
If you have Rears Seal Installation Tool:

Center the **OD Press** end of the tool on the seal ring and apply pressure to push the seal ring onto the shaft shoulder. Do not press completely onto shaft.



Use the **ID Press** end of the seal installation tool to press the seal ring completely onto the shaft. Apply even, steady pressure and drive the seal ring against the seal seat.

Stop pressing for a moment, then apply firm pressure again. The seal ring should be set firmly against the seal seat: the contact should feel solid.



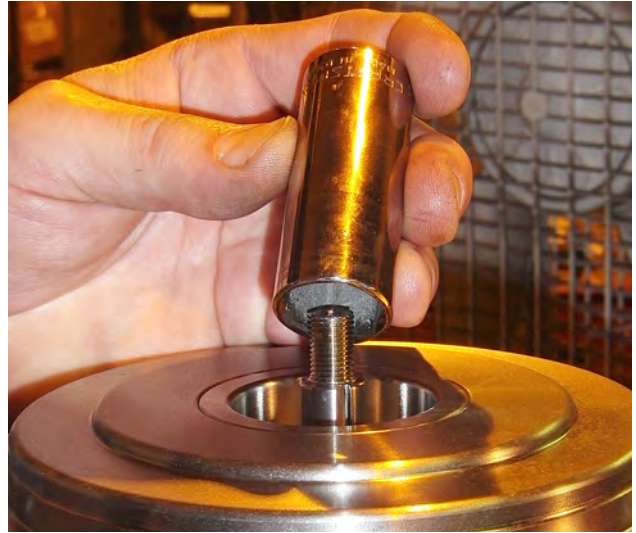
Replace Seal & Pedestal Bearings, continued**11. continued- seal ring installation****If you do not have Rears Seal Installation Tool:**

A 3/4" deep socket is helpful when pressing the seal ring onto the pump shaft.

Using your fingers press the seal ring onto the pump shaft.

Center the 3/4" deep-socket on the face of the seal ring. Do not rock the socket from side to side when pressing. Apply even, steady pressure to the socket and drive the seal ring against the seal seat.

Stop pressing for a moment, then apply even pressure again. The seal ring should be set firmly against the seal seat: the contact should feel solid.



- 12.** Inspect the exposed rubber face of the seal ring. The pump shaft shoulder should be visible above the face. The face must be even and flat with no surface irregularities.

Any surface bulges indicate that the internal boot did not install properly. If necessary remove the seal ring and repeat steps **10-12**.



- 13.** Seat the new seal spring **12** on the shoulder of the seal ring and install key **17**. Be certain the spring remains properly seated as you install the cleaned impeller **11** and washer **10**. Secure the impeller with acorn nut **9**.

- 14.** Re-install o-ring on pedestal **16** and bolt pump assembly back together.



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

Seal Seat Troubleshooting

This section is for pump seal seat installation failure.

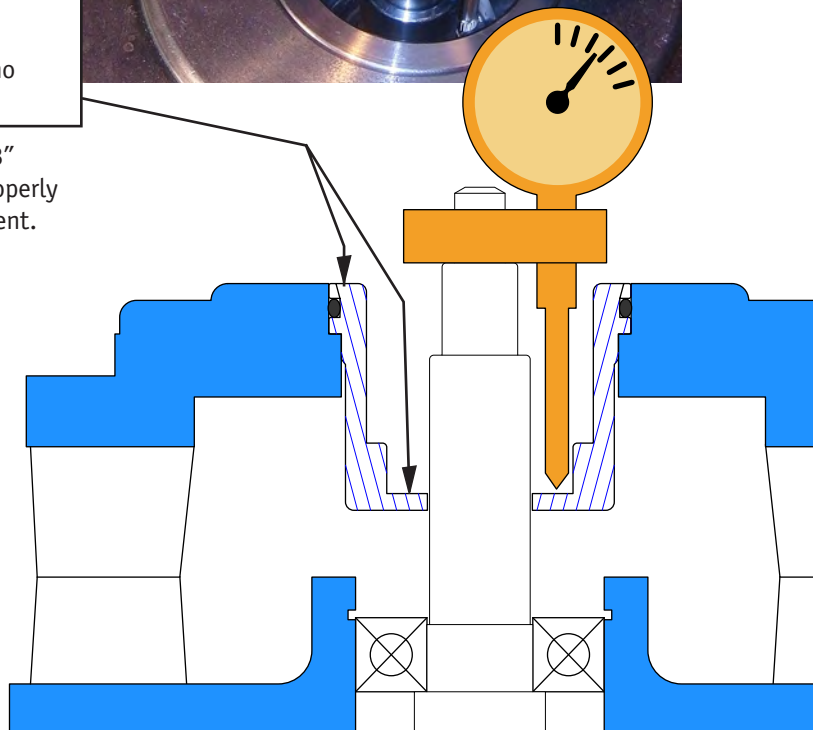
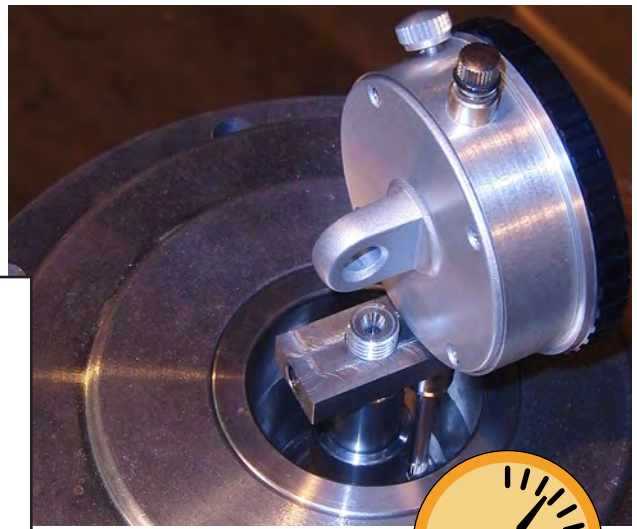
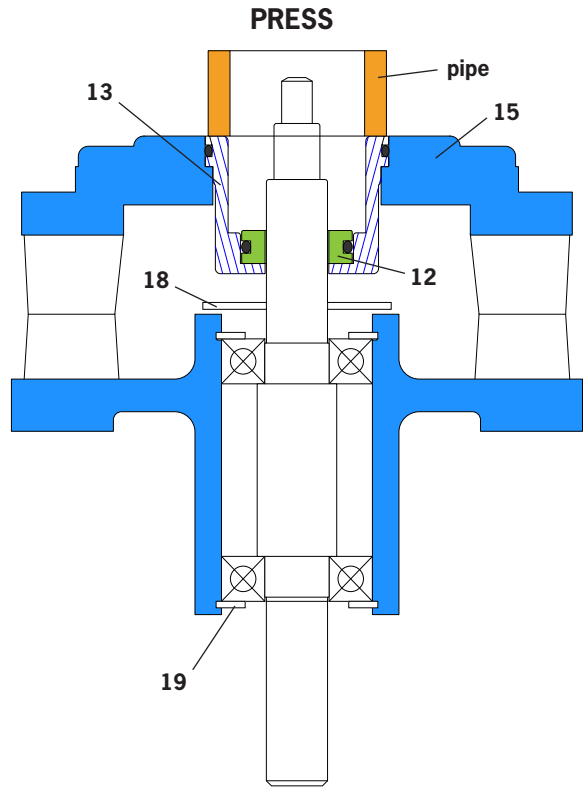
1. Use a press to be sure the seal cavity is seated properly: center a short section of pipe on the face of the seal cavity **13** and press the seal cavity into the pedestal housing.
2. Repeat steps **8 & 9** of the previous *Seal Replacement* section.
If the seal seat still fails to install properly, continue with this section.
3. Remove rear snap ring **19** from pedestal and press the pump shaft/bearing assembly out of the pedestal housing. Set aside these parts and the water deflector **18**.
4. Pull the seal seat from the seal cavity **13**.
5. Inspect the seal cavity for contaminants that would prevent proper seat installation. Clean the cavity.
6. Use a micrometer to gauge the thickness of the seal seat. Measure at several points: variation in thickness should be less than .003". If seat thickness variation exceeds this amount contact your dealer to exchange seal.
7. Press the shaft/bearing into the pedestal housing **15**. Be certain the water deflector **18** is in place. Install rear snap ring **19**. Tap bearing housing lightly with a hammer to relieve bearing tension.
8. Using a vise equipped with soft jaws or pads, clamp the non-threaded end of the pump shaft: orient the shaft vertically. **Excessive force will damage the shaft.** The pedestal **15** should spin freely.

9. Mount a dial indicator on the pump shaft with the sensor against the top face of the seal cavity or the base, as illustrated.

This photo shows a dial indicator set-up on Rears test bench. To order these parts, contact Rears.

Rotate the pump housing: measured variation should be no more than .003".

10. If the dial indicator measures variation greater than .003" repeat step **1** and step **9**. If the seal cavity fails to sit properly within the pedestal housing call your dealer for replacement.



Winterizing Rears Centrifugal Pump

Flush pump and plumbing fully with clean water. Flush again with an RV Antifreeze solution and recirculate. Shut down the pump and leave the solution in the tank and plumbing system.

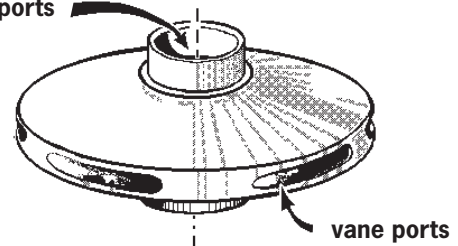
Pump Operation Troubleshooting

Seal Failure- running the pump dry will result in seal failure: excessive foam in tank, an empty tank, clogged suction strainer or closed suction valve will overheat pump seal. The dump valve in spray position during priming cycle will damage the pump seal.

Loose Pump Shaft- worn bearing, replace.

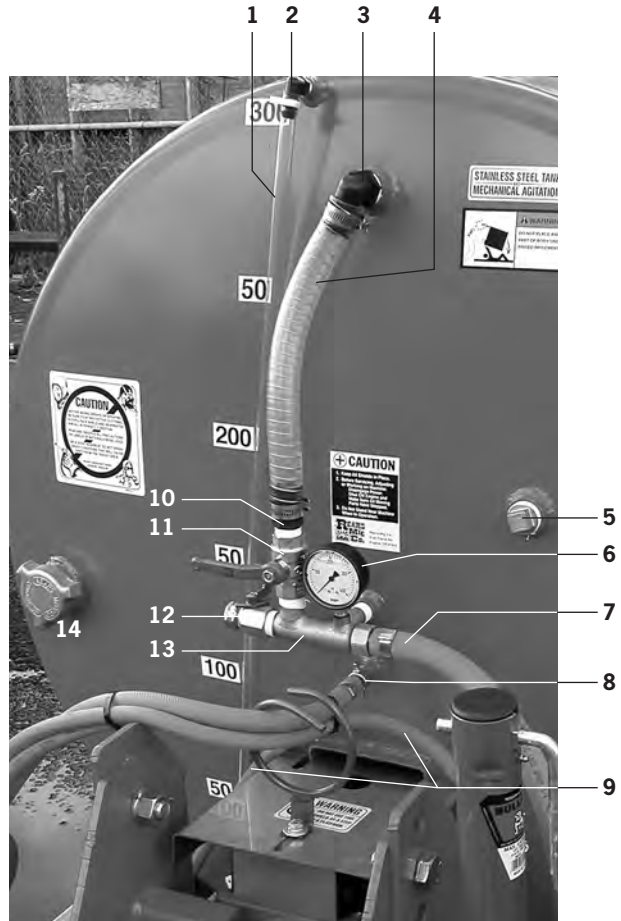
Noisy/Unbalanced Impeller- clogged impeller vane ports will unbalance the impeller. Clean impeller and clear ports with a hooked wire. Take care when cleaning: the machined brass impeller can be gouged easily.

pressure equalizing ports



tank head plumbing & fittings

No.	Part #	Description	Qty
1	SITE025	1/4" clear vinyl tube, give length	1
2	NYEL012025HB	elbow, 1/8"MPT x 1/4"HB nylon	2
	SNP-10	1/4" hose clamp	2
3	NYEL100100HB	elbow, 1"MPT x 1"HB nylon	1
4	HNP100	1" armorvin hose, give length	1
5	SSPLG100	1" plug, stainless steel	1
6	LFG600	600psi liquid filled gauge	1
7	5PVC075	3/4" pvc hose, give length	1
	HFB075075	3/4"FGHT x 3/4"HB fitting	2
8	manual controls return line, see manual controls		1
9	manual controls right/left spray control, see manual controls		1
10	NYHFC075100	3/4"MPT x 1"HB hose fitting	1
11	B075FP	brass ball valve 3/4"FPT	1
12	V75	brass ball valve 3/4"MGHT x 3/4"FPT	1
	GH075CAPBR	brass cap	1
13	MB720	pressure/return manifold	1
14	PLDC2B	2" brass cap	1



Spray and dump valve operation

When spraying always have the dump valve **11** closed.

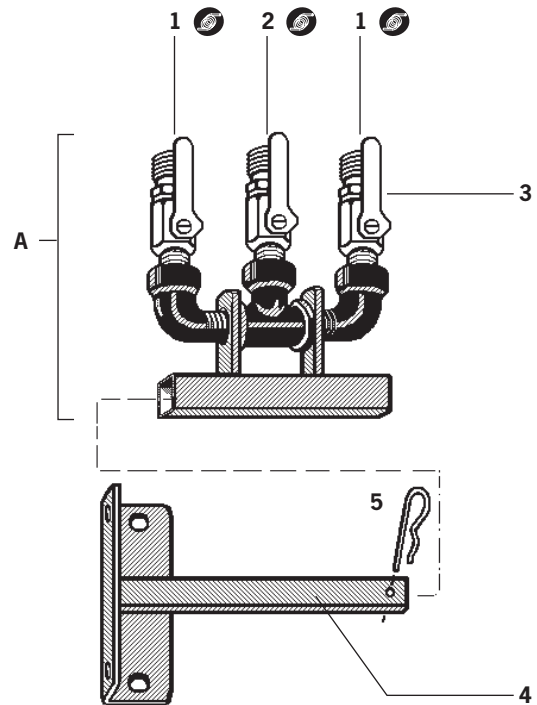
Open the dump valve when starting the pump and when refilling the tank: the system recirculates at zero pressure, easing load on pump.

Manual controls: operation & parts list

The center valve **2** is the system return line. For proper independent control of the left and right manifold, the center control valve should remain open.

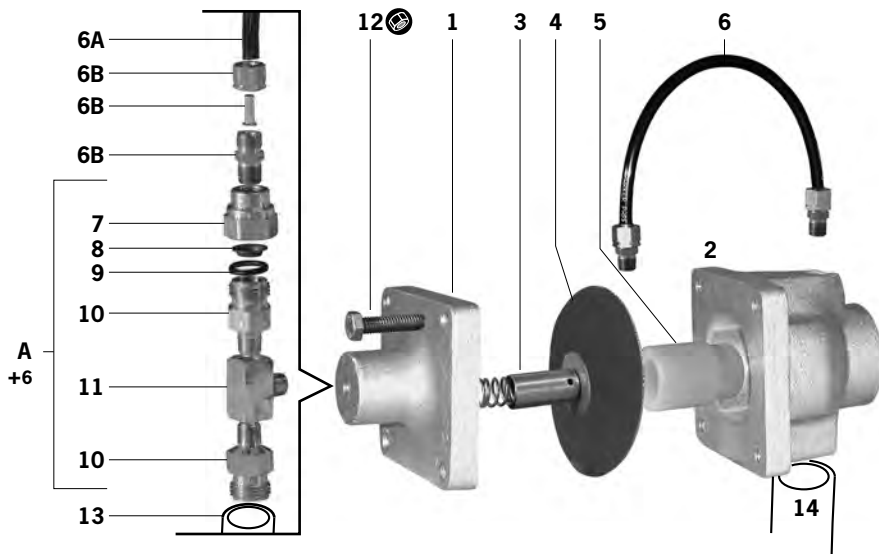
The outside valves **1** control the left and right spray manifolds. If the outside valve is closed, the corresponding spray manifold will be ON; if open, spray is OFF.

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



No.	Part #	Description	Qty
1	5PVC050	control line: 1/2" pvc hose, give length	2
	1325	11/16"-16UN cap, brass	4
	4251-375	3/8" hosebarb for 1325 cap	4
2	5PVC050	return line: 1/2" pvc hose, give length	1
	1325	11/16"-16UN cap, brass	2
	4251-375	3/8" hosebarb for 1325 cap	2
3	V19M	flow control valve	1
4	MB1282	fender mount bracket	1
5	CHP3	cotter pin	1
A	V19MASSY	manual control assembly, less hoses	

44 Pul-Blast RPA pump system

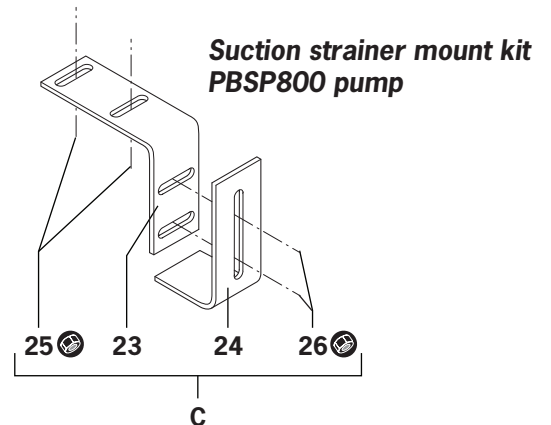
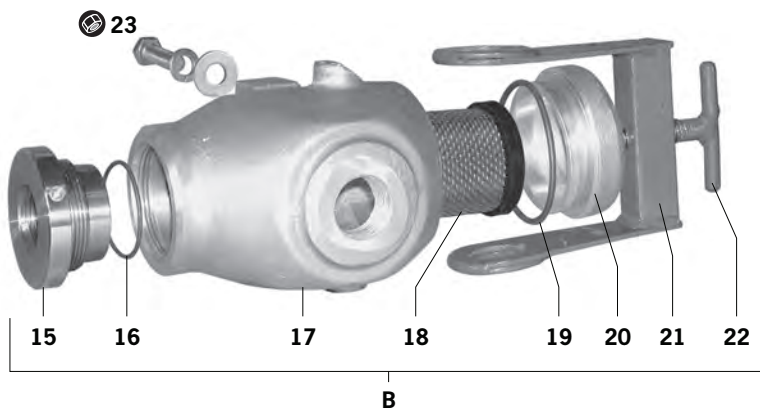


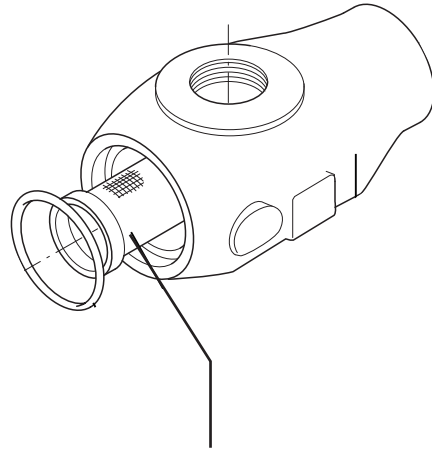
Hu-Valve Parts, qty listed for one assembly

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
	0370125CP	3/8"-16 x 1-1/4" carriage bolt	2
26	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 #23-25	

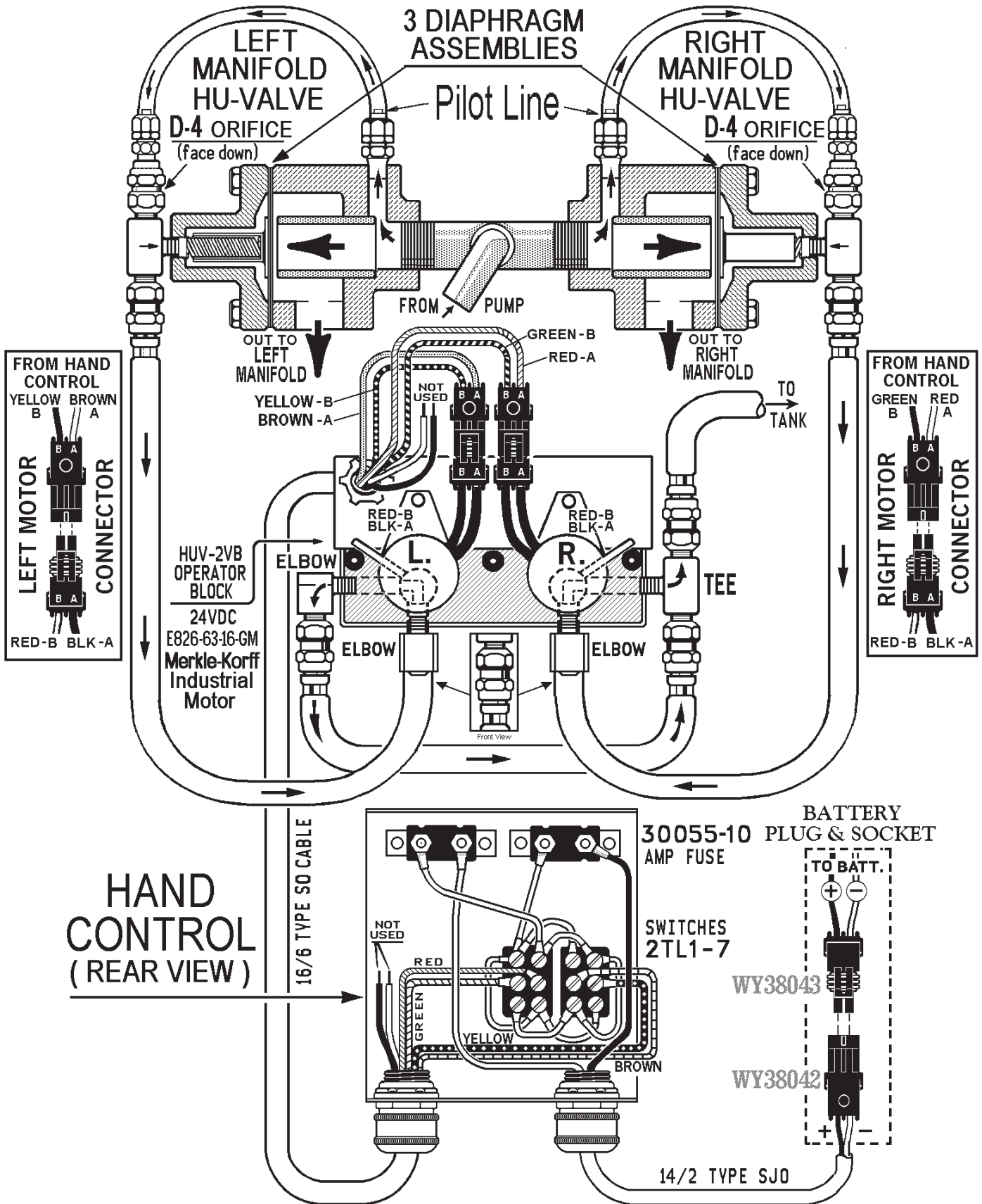




Strainer screen options, SPST7 strainers

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

electric hu-valve control- wiring



electric hu-valve control- daily maintenance

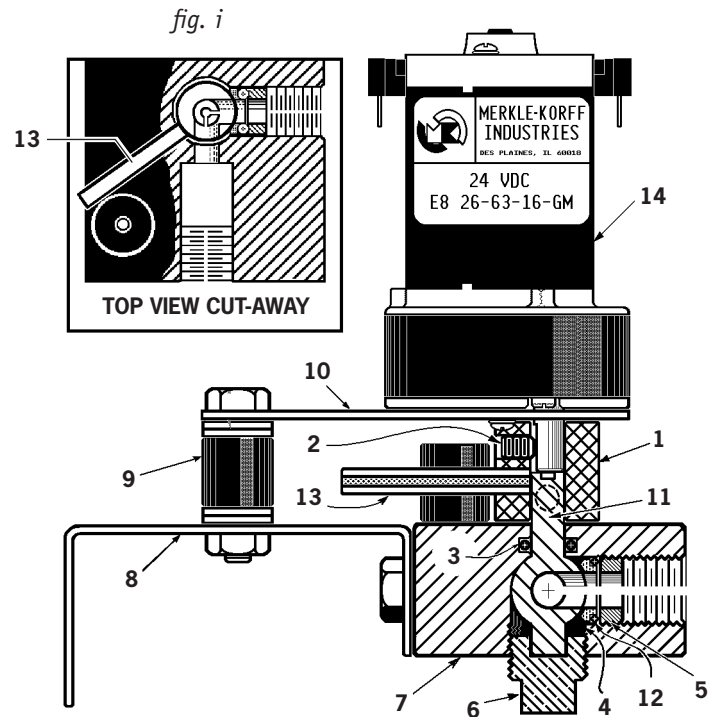
When flushing the plumbing at day's end, cycle fresh water through the spray lines, turning the spray ON and OFF several times.

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.



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

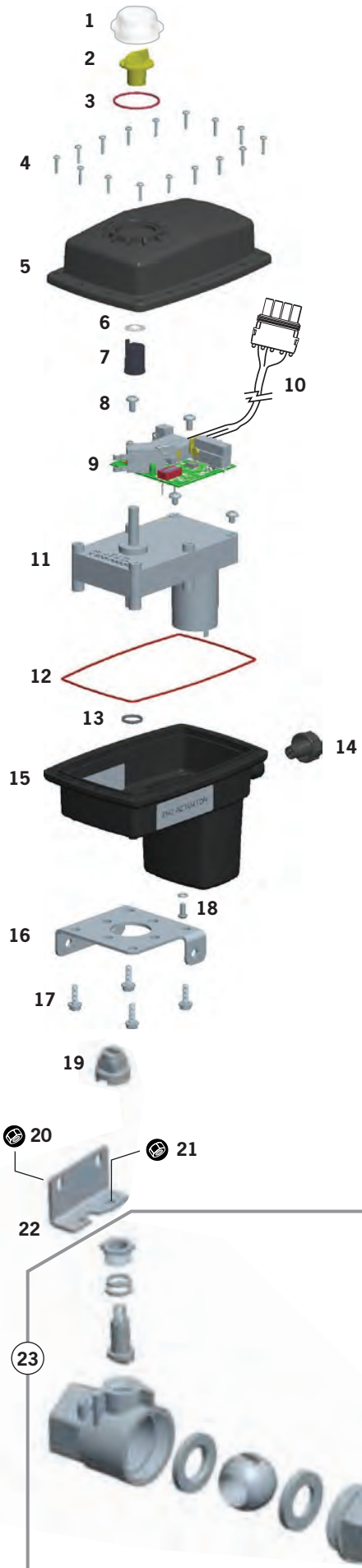
No.	Part #	Description	Qty
	HUV510	complete operator block, does not include motor or mount brackets	-
1	HUV5116	coupler	2
2	HUV5119	set screw	8
3	HUV5112	• o-ring	2
4	HUV5113	• teflon seat	2
5	HUV5115	• keeper	2
6	HUV5118	bushing	2
7	HUV512	HVC operator block	1
8	HUV525	block mount bracket	1
9	HUV515	• 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	

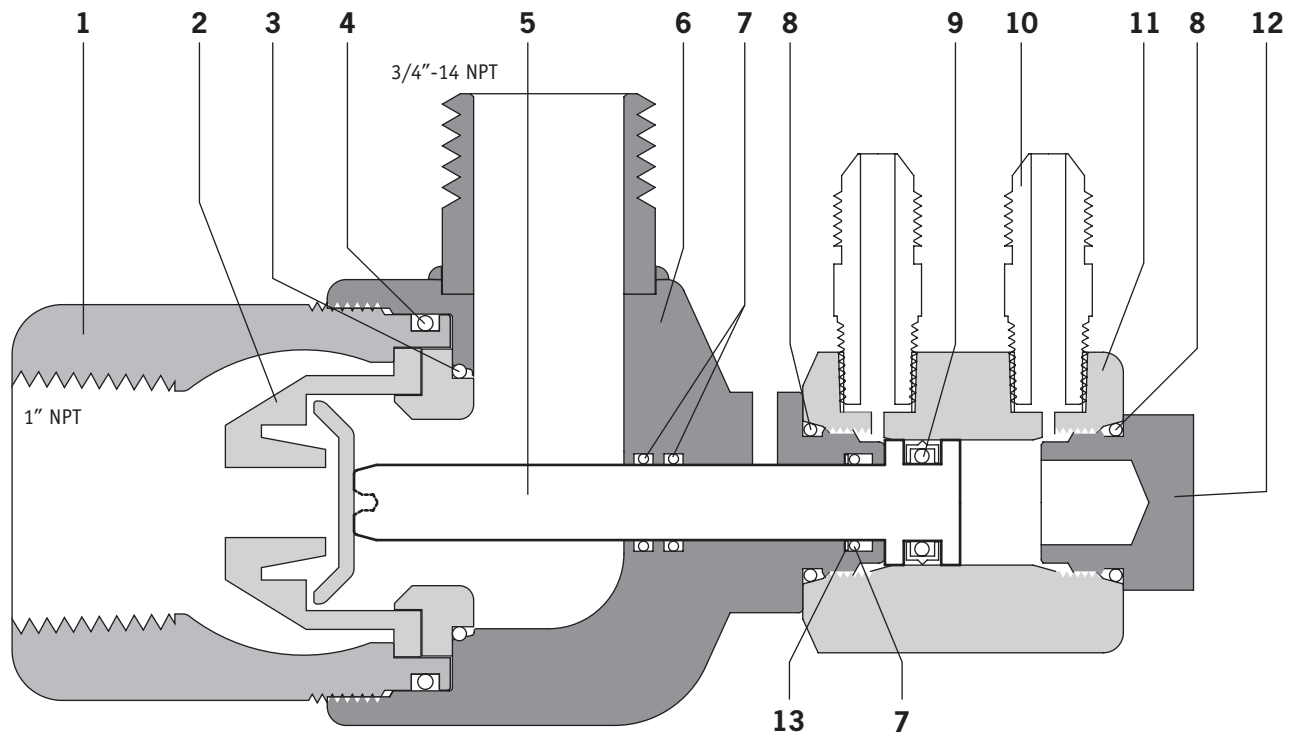
KZ electric ball valve DC 12 volt, 1.5A

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 valve 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.





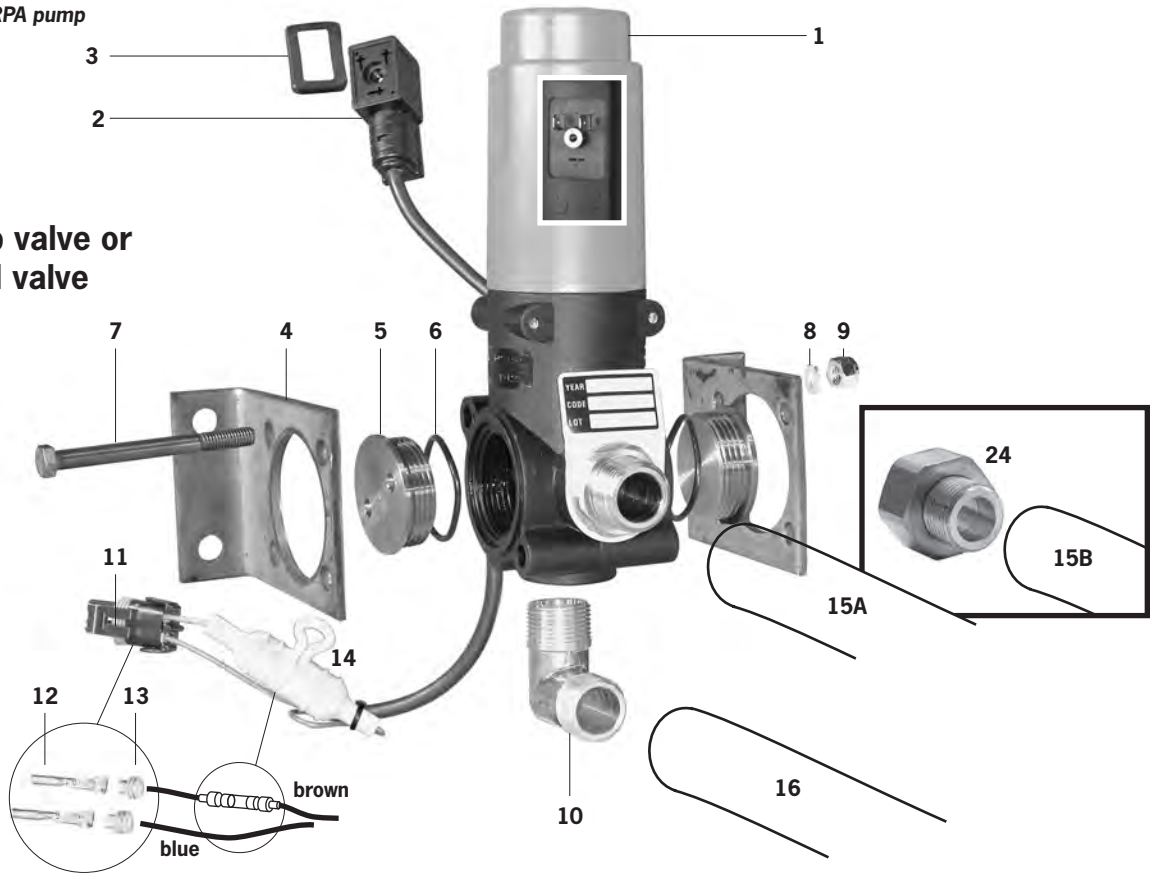
R7 hydraulic spray valve

No.	Part #	Description	Qty
	DAH2W075	R7 hydraulic actuated valve, complete	
	DAHV2WKIT	repair kit <i>includes all • items</i>	
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

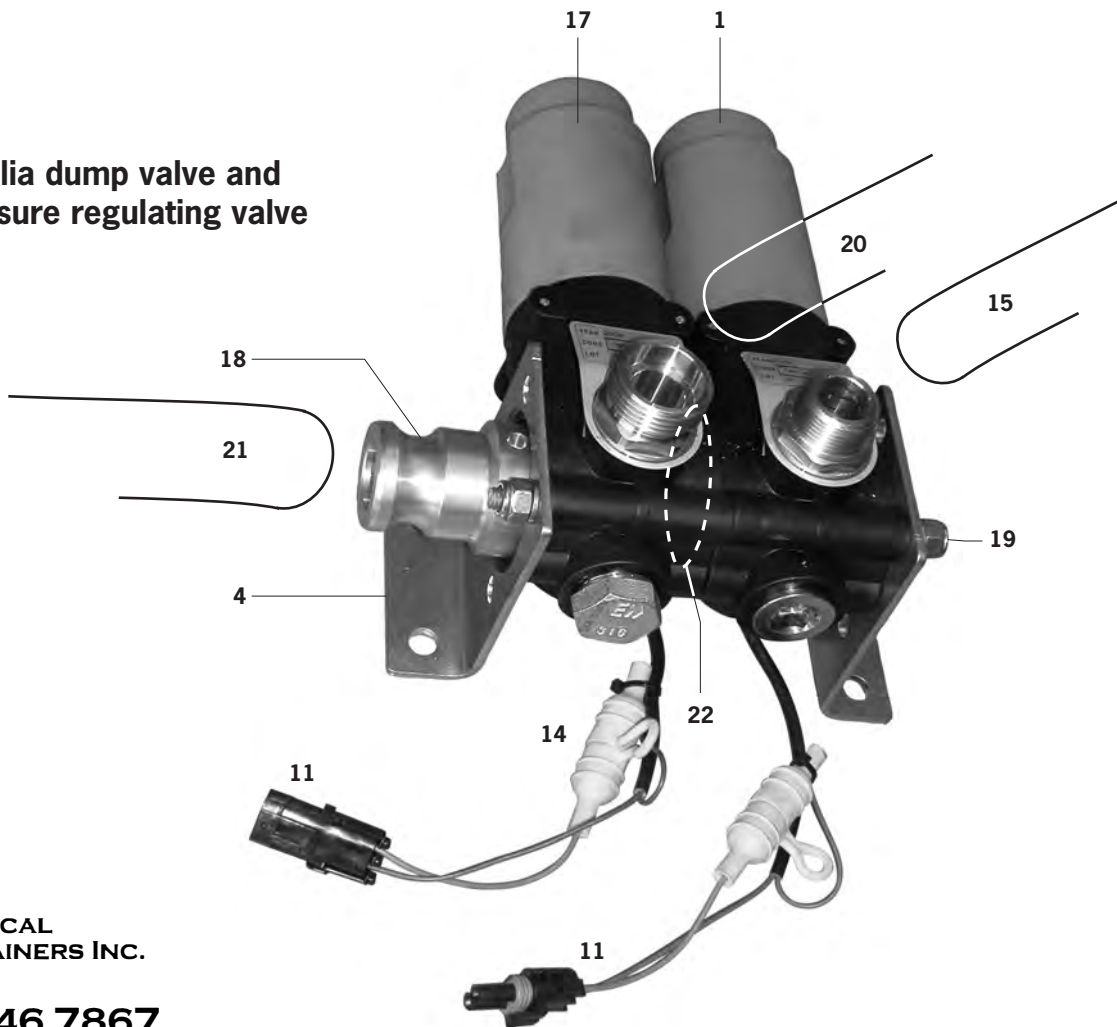
Read this manual completely before operating: follow all safety instructions.

50 Pul-Blast RPA pump

**braglia dump valve or
spray control valve**



**braglia dump valve and
pressure regulating valve**

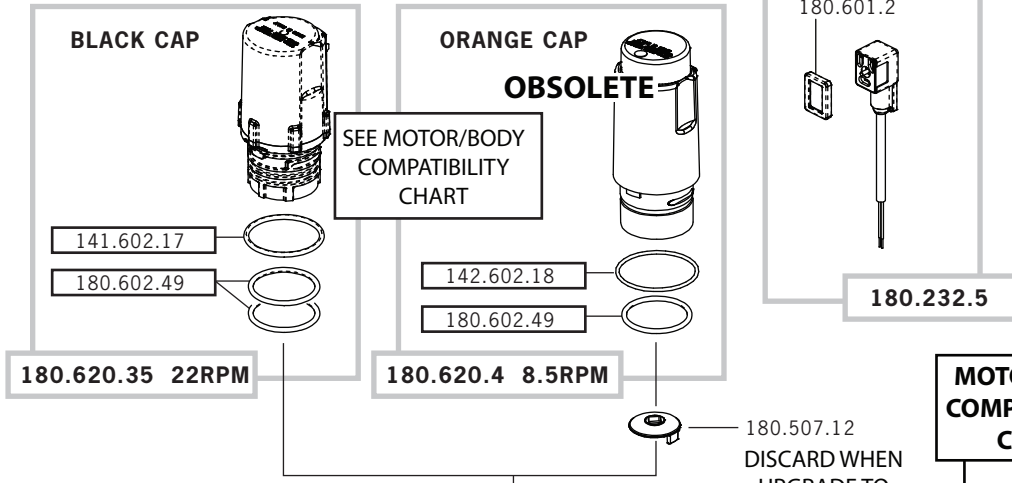


Braglia valve assemblies

No.	Part #	Description	Qty		
1*	180.1910.9HS	Dump valve, 1" port, <i>black cap</i>	1		
	180.1910.9	Dump valve, 1" port, <i>orange cap, obsolete</i>			
	180.1910.19HS	Dump valve, 3/4" port, <i>black cap</i>			
	180.1910.19	Dump valve, 3/4" port, <i>orange cap, obsolete</i>			
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
		FBSP100100HB			
		HFC075100			
	3/4"	call	3/4" pvc hose, give length		
		FBSP0750750HB	3/4"FBSP hose fitting	1	
	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		
	FBS0750750HB	3/4"FBSP hose fitting	1		
	HFD075075	3/4"FPT hose fitting	1		
17	180.1910.10	Braglia pressure regulator, <i>green cap</i>	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		RPA PUMP ONLY
	ETC100CAL	1" camlock hose fitting	2		
	ETC100CAL	1" camlock hose fitting	1		
	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	SELF PRIMING PUMP ONLY	

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

52 Pul-Blast RPA pump system

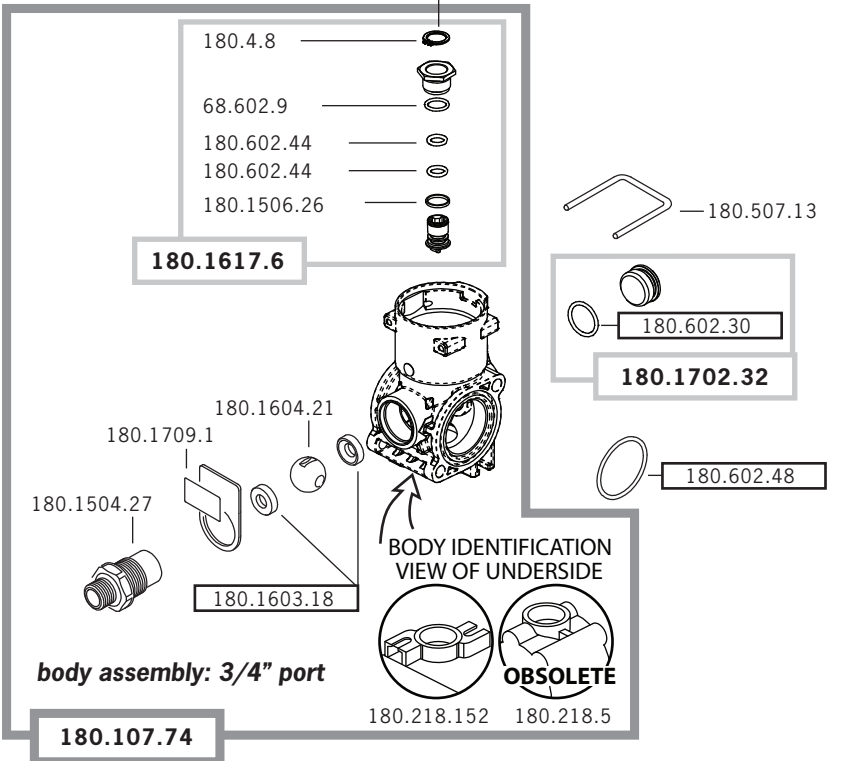
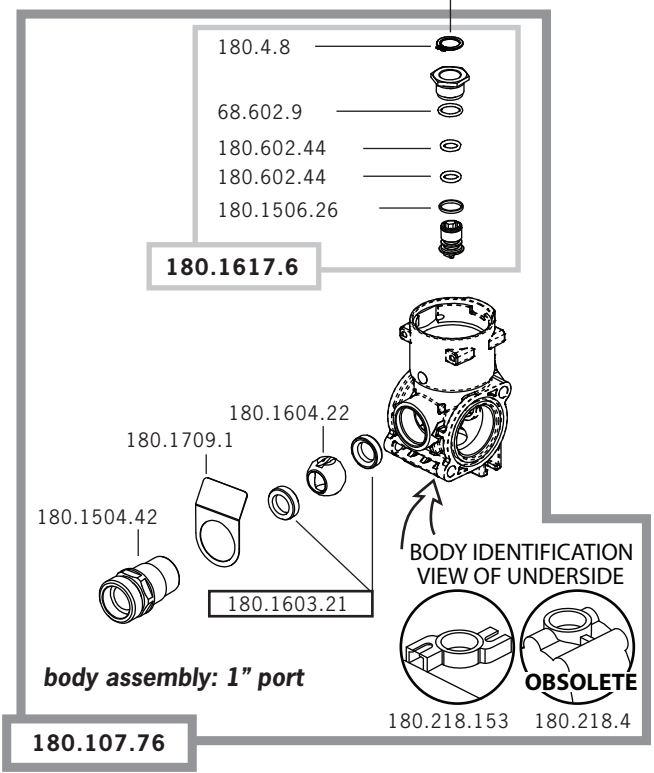


180.1910.9HS
 1" port valve parts

180.1910.19HS
 3/4" port valve parts

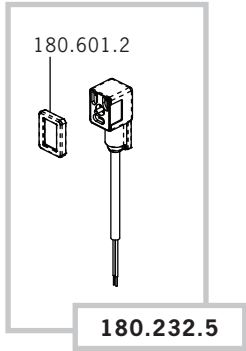
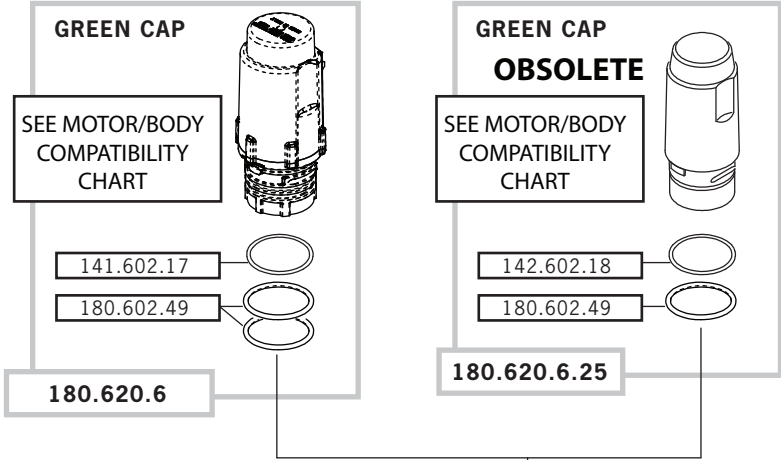
MOTOR/BODY COMPATIBILITY CHART		MOTOR	
		180.620.35 BLACK CAP	180.620.6* ORANGE CAP
BODY	180.218.153	YES	NO
	180.218.4*	YES	YES
	180.218.152	YES	YES
	180.218.5*	YES	YES

*OBSOLETE PART, LIMITED AVAILABILITY



PART NUMBER	individual components	AVAILABLE SPARE PARTS KITS
PART NUMBER	subassembly order number	
PART NUMBER	basic assembly order number	
PART NUMBER	component included in a spare parts kit kits listed, right	

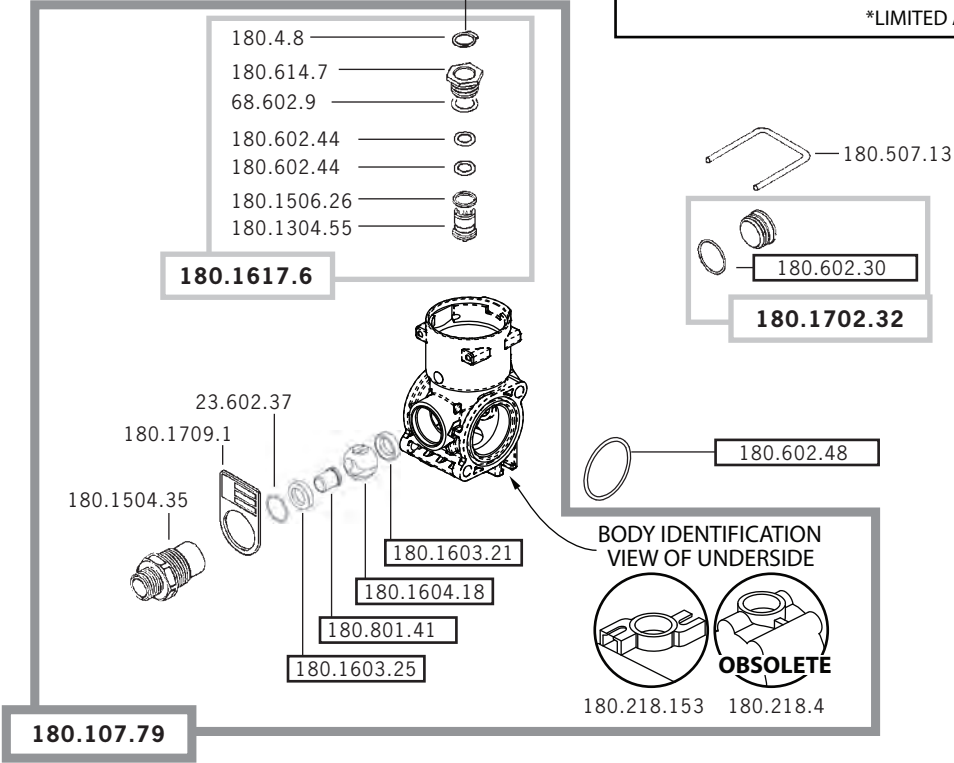
180.302.31 spare parts kit



180.1910.10
pressure regulating valve parts

MOTOR/BODY COMPATIBILITY CHART		MOTOR	
		180.620.6	180.620.6.25* OBSOLETE
BODY	180.218.153	YES	NO
	180.218.4* OBSOLETE	YES	YES

*LIMITED AVAILABILITY



PART NUMBER	individual components	AVAILABLE SPARE PARTS KITS	
PART NUMBER	subassembly order number		180.302.33 spare parts kit
PART NUMBER	basic assembly order number		
PART NUMBER	component included in a spare parts kit kits listed, right		

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.

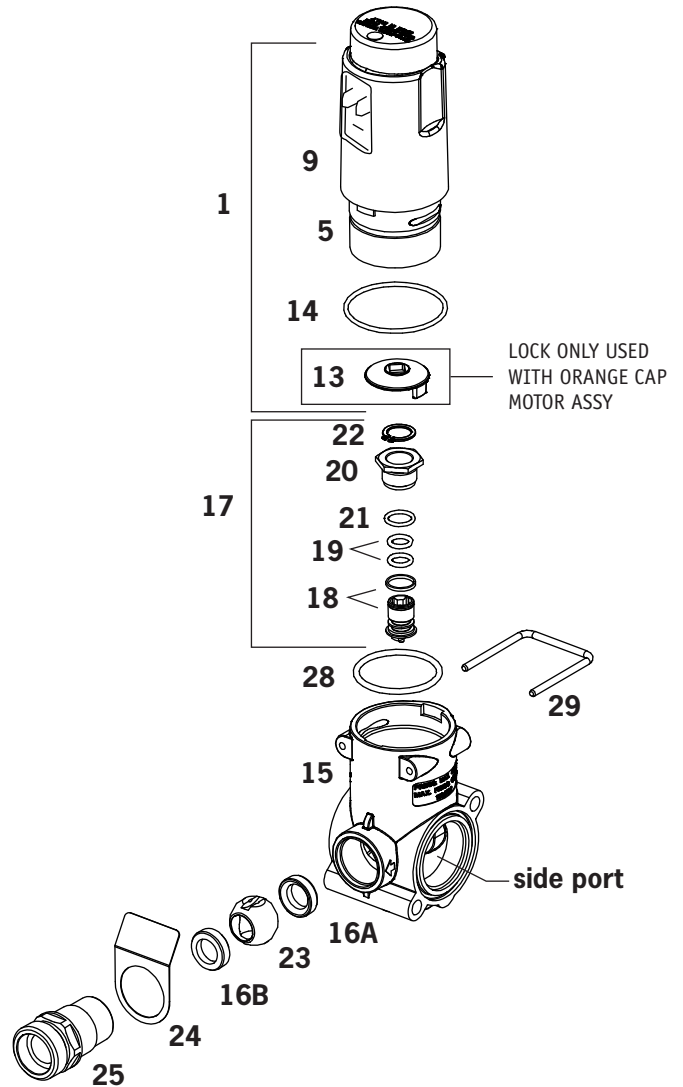


fig. i

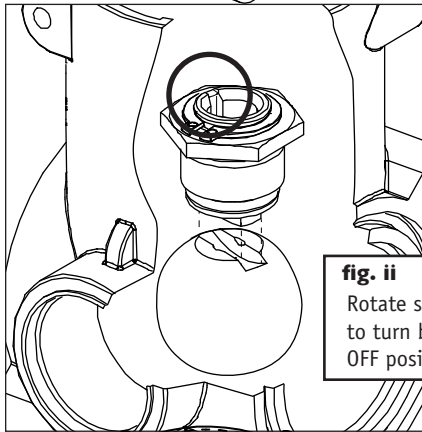
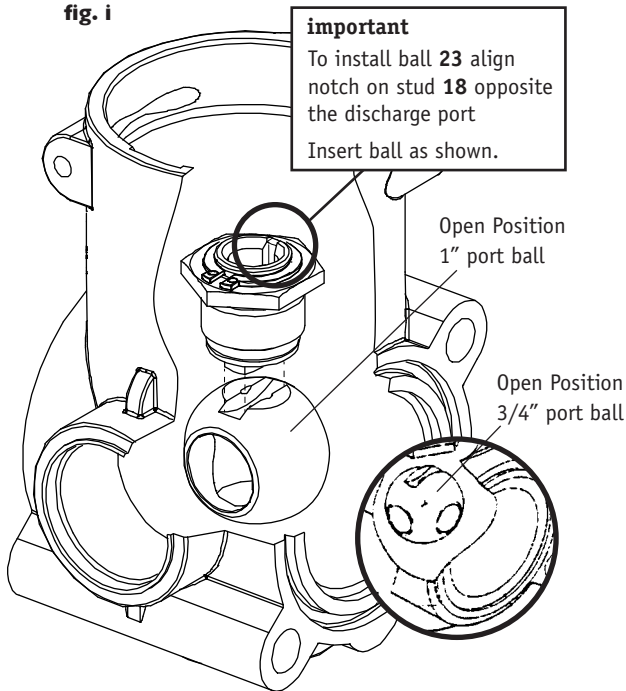


fig. ii
Rotate stud 18 90° to turn ball 23 to OFF position.

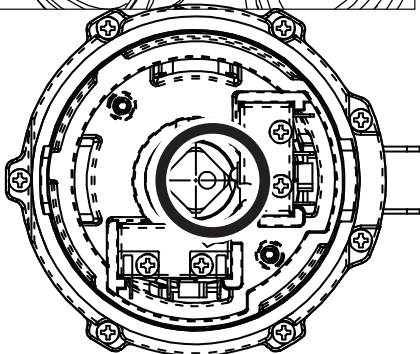


fig. iii BLACK CAP MOTOR

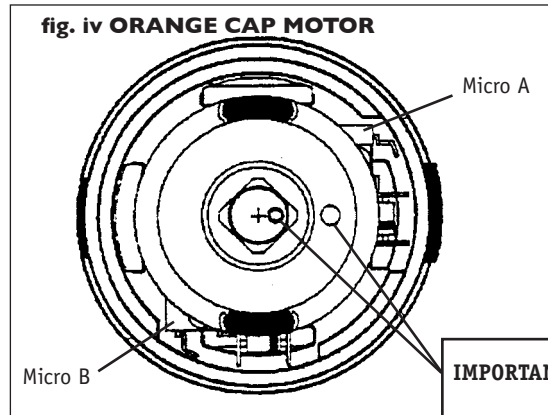


fig. iv ORANGE CAP MOTOR

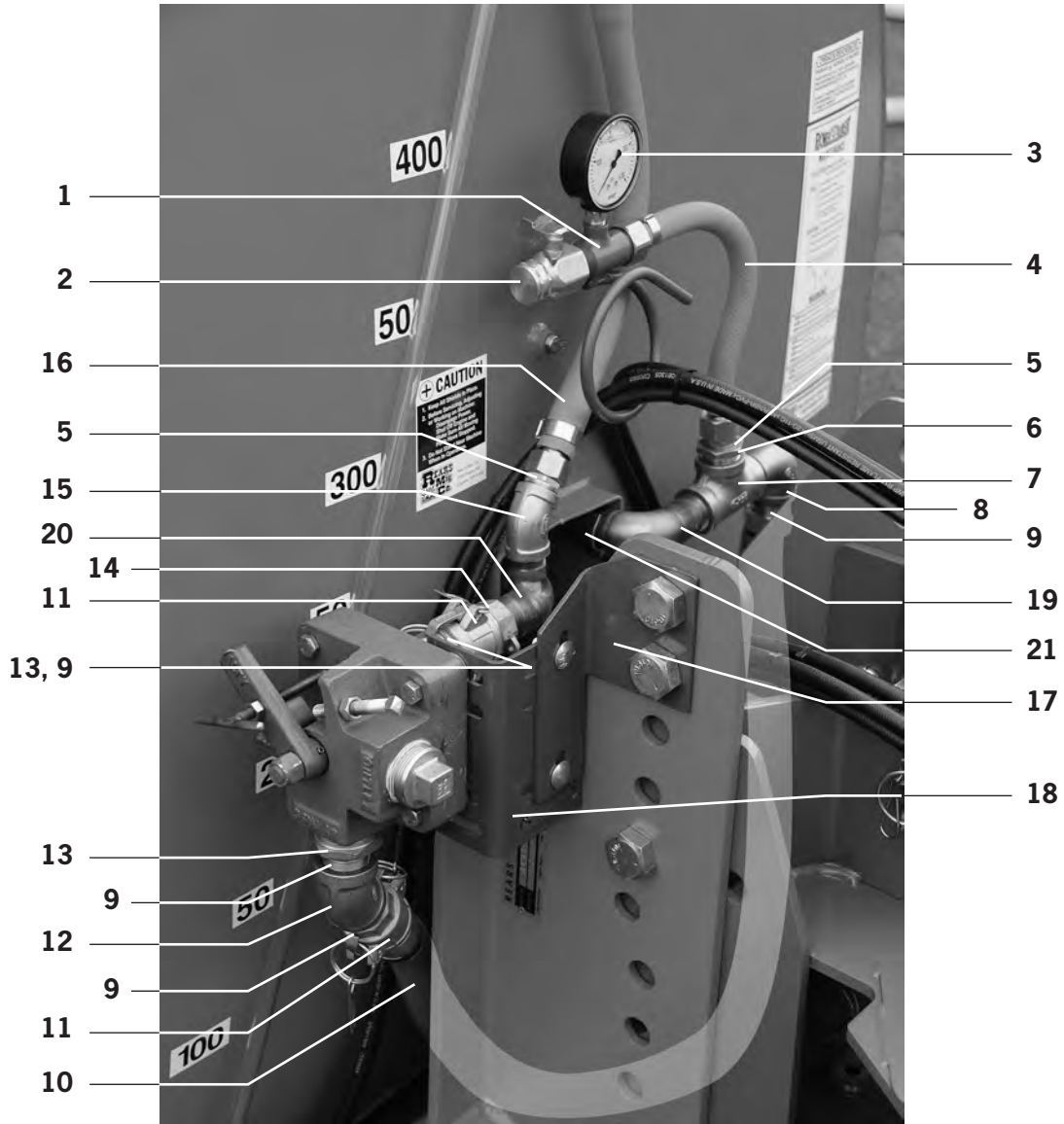
IMPORTANT Align notches on lock 13 and gearmotor cam for installation.

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

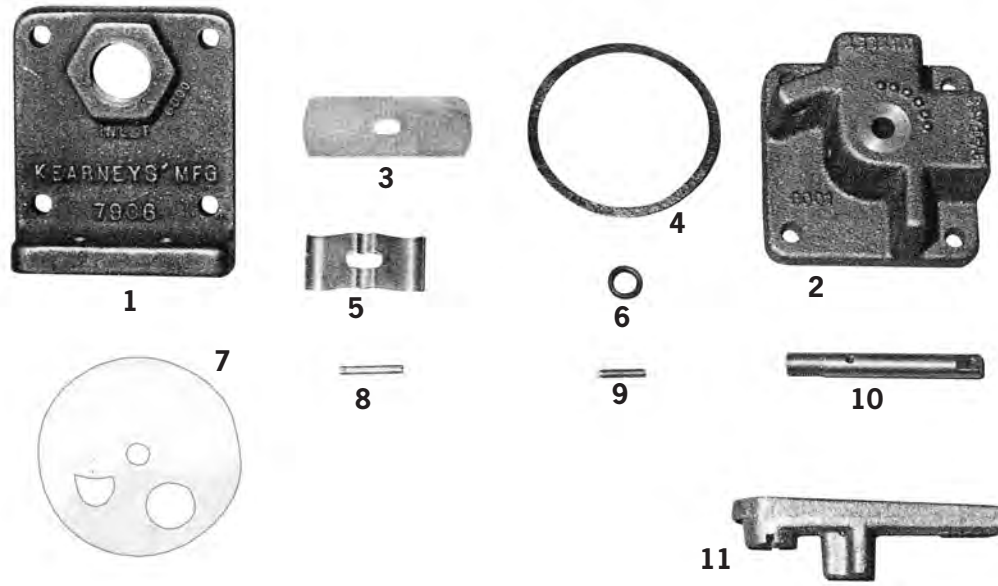
Before beginning assembly all parts should be clean and dry- *no residual sealants*. Lubricate all O-rings and sliding surfaces. Subassemblies should be ready before valve assembly: Nipple/seal 25/16B; Drive subassembly 17.
 Assemble and lubricate seal 16A in valve body. Do not damage seal surface.
 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.



S&R valve plumbing

No.	Part #	Description	Qty
1	PB720	handgun and pressure gauge manifold	1
2	V58	ball valve, 3/4"MGHT x 3/4"FPT	1
3	LFG400	400psi glycerine filled gauge	1
4	call	1/2" pvc hose	-
	HFB075050	3/4"FGHT hose fitting	2
5	MGXMP075	3/4"MPT x MGHT adapter	2
6	SSBSH075100	3/4"FPT X 1"MPT bushing, stainless steel	1
7	SSTEE100	1" tee, stainless steel	1
8	SSTL100	1" street elbow, stainless steel	1
9	SSN100CLOSE	1" close nipple, stainless steel	4
	call	1" rubber hose	-
	HFD100100	1"FPT hose fitting	1
10	ETC100EAL	1" male camlock hose fitting	1

No.	Part #	Description	Qty
11	ETC100DAL	1"FPT x 1" female camlock	2
12	SSEL45100	1" 45° elbow, stainless steel	1
13	SSBSH125100	1"1/4MPT x 1"FPT bushing	2
14	ETC100AAL	1"FPT x 1" male camlock	1
15	SSEL45075	3/4" 45° elbow, stainless steel	1
	call	1/2" pvc hose	-
16	HFB075050	3/4"FGHT hose fitting	2
17	PBS&R100	mast mount bracket	1
18	PBSR1025	valve mount bracket	1
19	call	tunnel line to discharge strainer	1
20	call	tunnel line from pump	1
21	MBIN2131	tunnel line clamp	4



S&R valve parts

No.	Part #	Description	Qty
	SR1-1/4	1"1/4 port S&R valve, complete	
	S&R125KIT	repair kit <i>includes all • items</i>	
1	K-80-1000	inlet housing	1
2	K-80-1001	outlet housing	1
3	K-80-1006	main adjusting gate	1
4	K-80-1009	• housing gasket	1
5	K-80-1005	• gate tension spring	1
6	K-80-1010	• o-ring, viton	1
7	K-80-1004	• teflon valve disc	1
8	K-80-1007	• spring retainer pin	1
9	K-80-1008	• stem shear pin	1
10	K-80-1003	main valve stem	1
11	SRK80-1002	valve control handle, 7" long	1
	SRK80-1002M	valve control handle, 4" long	

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

Injector hopper operation

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

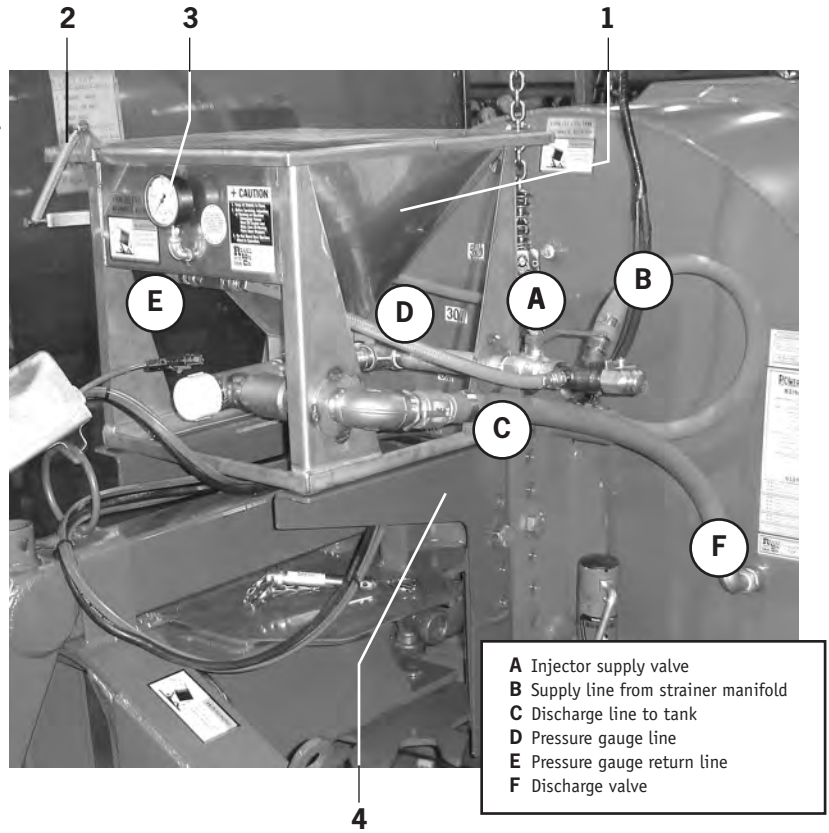
To use the injector, make certain the dump line valve at **F** is open.

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.

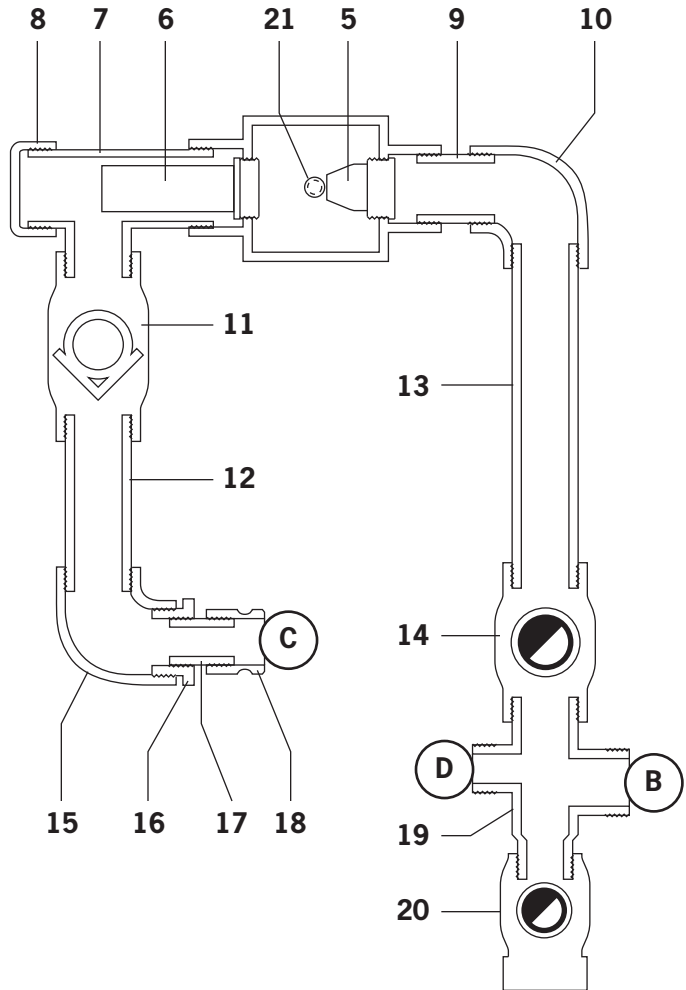
When you have completed adding materials, close the lid and shut off the supply valve **A**.

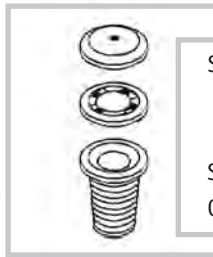
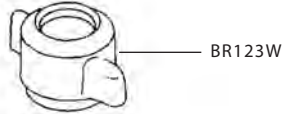


- A Injector supply valve
- B Supply line from strainer manifold
- C Discharge line to tank
- D Pressure gauge line
- E Pressure gauge return line
- F Discharge valve

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





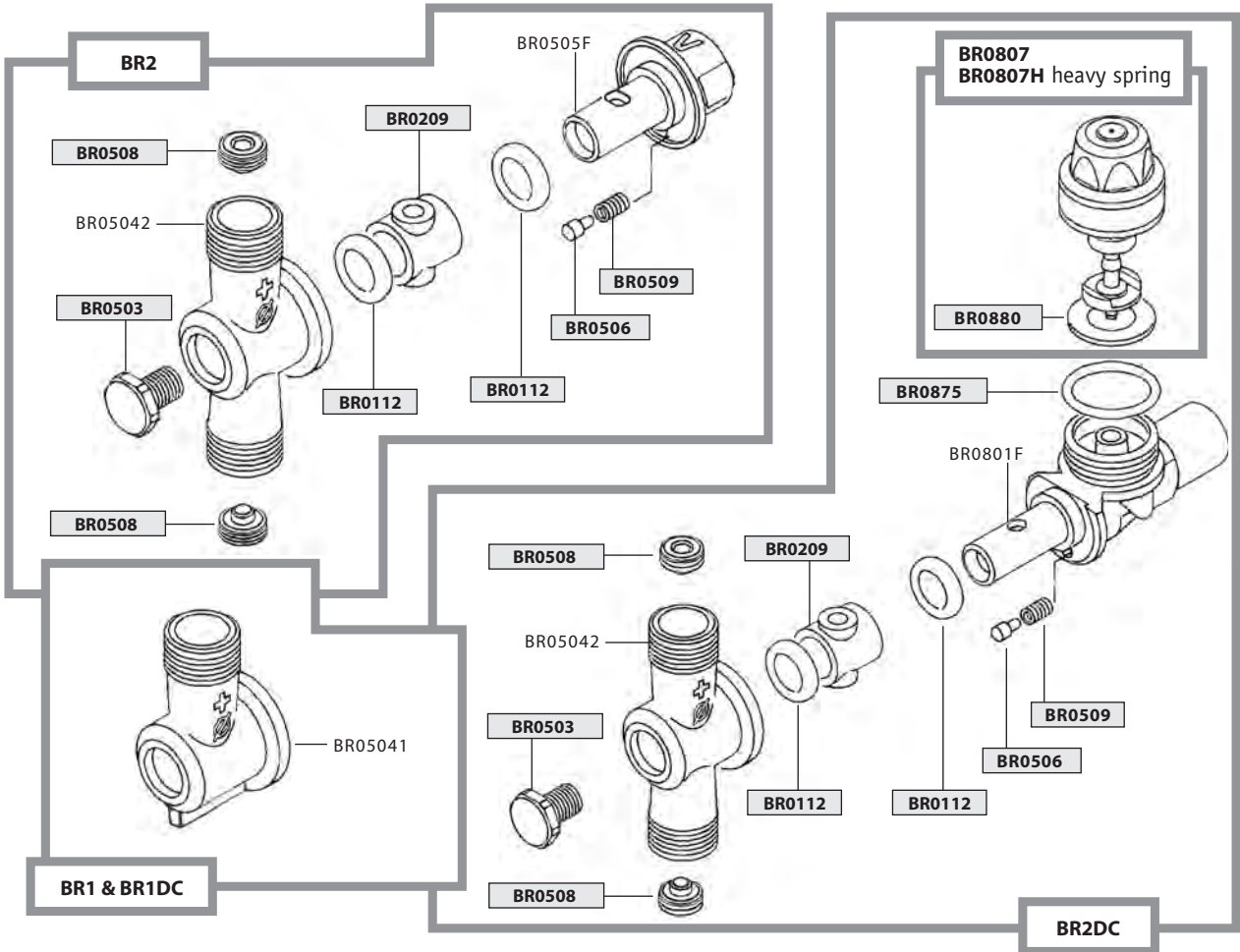
Standard **BR2/BR2DC** nozzle configuration:

A side- ceramic orifice/core, nylon strainer

B side- steel orifice, brass core, brass strainer

Specify sizes for orifice/core/strainer.

Complete Spraying Systems selection.



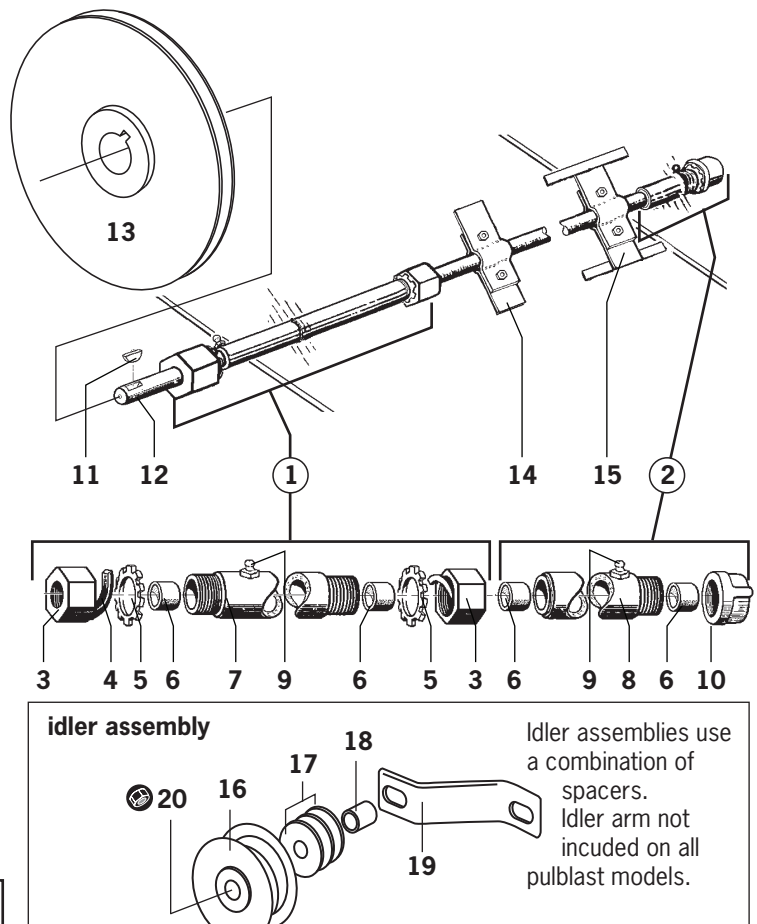
PART NUMBER	individual components	AVAILABLE SPARE PARTS KITS
PART NUMBER	subassembly order number	
PART NUMBER	basic assembly order number	PART NUMBER
PART NUMBER	component included in a spare parts kit kits listed, right	BR2DCKIT BR2KIT
		<i>parts kit for BR1DC & BR2DC</i> <i>parts kit for BR1 & BR2</i>

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

Mechanical agitation

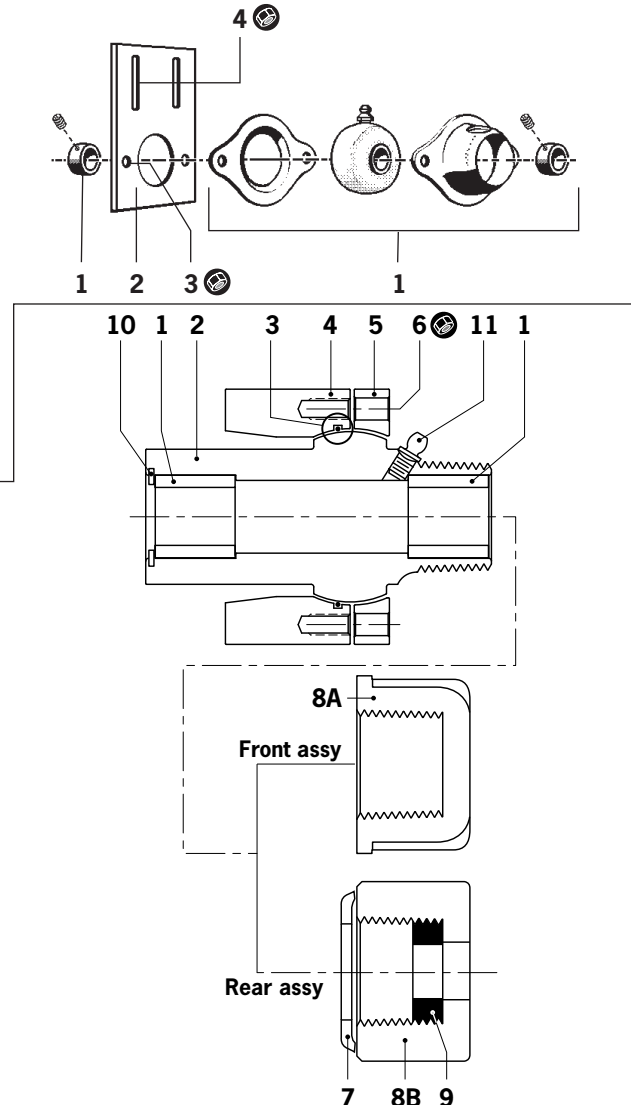
No.	Part #		Description	Qty
	5/8" shaft	3/4" shaft		
1	AG06210ASSY	AG07510ASSY	complete rear bearing	1
2	AG06203ASSY	AG07503ASSY	complete front bearing	1
3	AG062ESS	AG075ESS	packing nut w/packing	2
4	AG025 (6")	AG025 (11")	packing	-
5	AG062C	AG075C	locking ring	2
6	AGBSH062	AGBSH075112	bushing	4
7	AG06210	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, <i>provide length</i>	1
13	AGP06206	AGP07506	agitator pulley	1
14	AG23		standard paddle <i>one comple set</i>	-
15	PB50		large paddle <i>one comple set</i>	-
16	MB702		idler pulley	1
17	062WUSS		5/8" flatwasher	see inset
18	MBIN651		spacer	
19	MBIN404		6" idler arm	see inset
	PLIN5611LS		10" idler arm	
20	062	CH5	5/8"-11 Gr.5 bolt, <i>provide length</i>	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

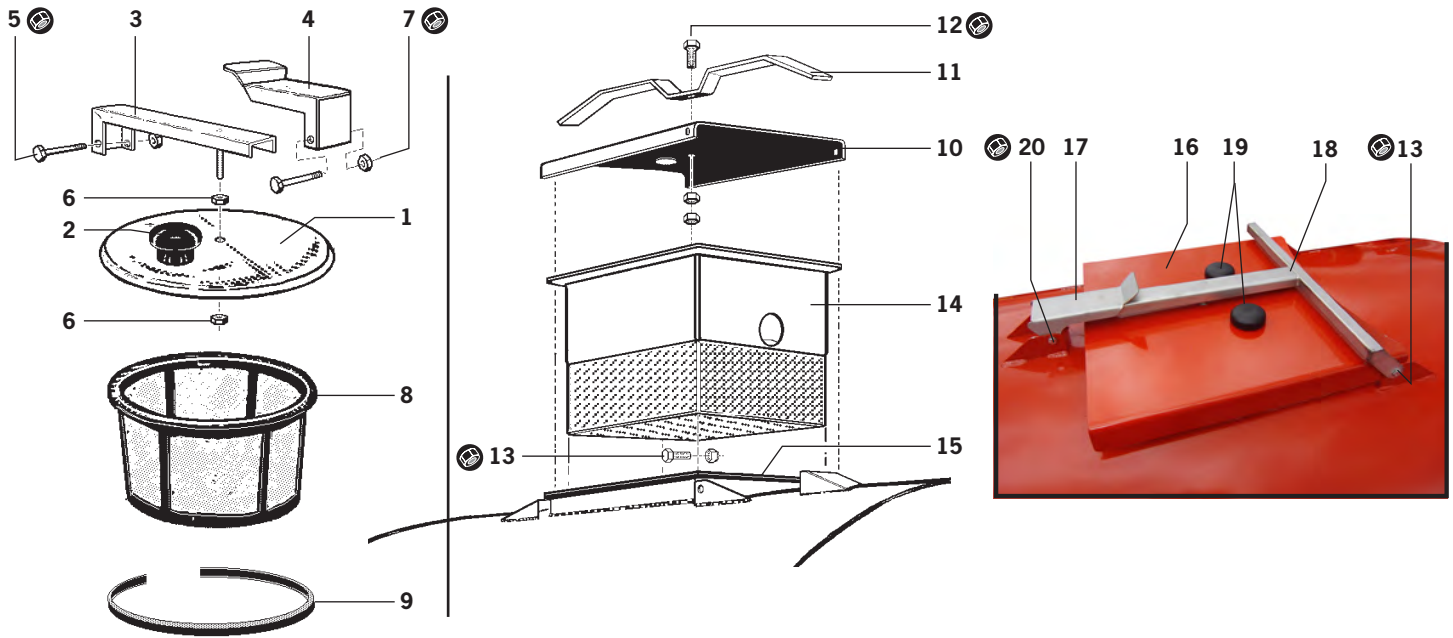
No.	Part #	Description	Qty
1	AGOB062T	outboard bearing, 5/8" shaft	1
	AGOB075T	outboard bearing, 3/4" shaft	
2	AGPL062	5/8" bearing plate <i>provide plate height</i>	1
	AGPL075	3/4" bearing plate <i>provide plate height</i>	
3	0310075CP	5/16"-18 x 3/4" carriage bolt	2
	031WS	5/16" lockwasher	2
	031NF	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 <i>welded to tank</i>	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 <i>front assembly</i>	1
8B	AG075ESS	packing nut with packing <i>rear assembly</i>	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



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
	0250275CH5	1/4"-20 x 2-3/4" bolt	
7	025NYS	1/4"-20 nylock nut	1
	LD160STR	lid basket	
9		lid gasket	1
10	PBLID	square lid for twist latch <i>includes PBLID-V</i>	1
	PBLID-V	vent disc with pop-rivet	
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	

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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.

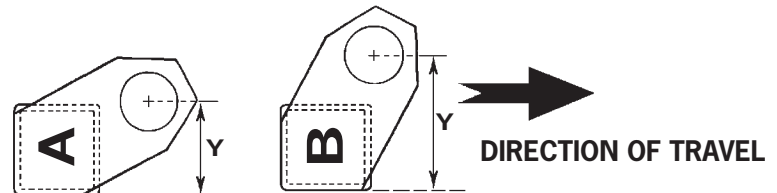
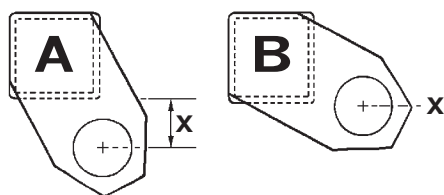
Note: DO NOT spin bearings with compressed air.

3. Hand pack each bearing individually using a premium water resistant wheel bearing grease.

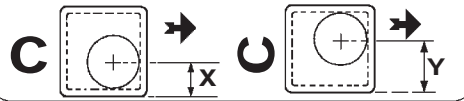
Bearing adjustment- reinstall hub

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



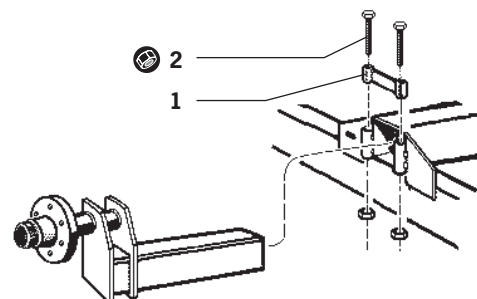
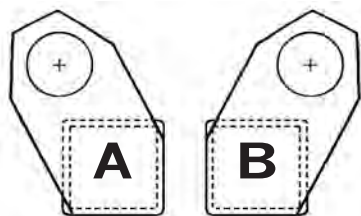
Set your desired ground clearance

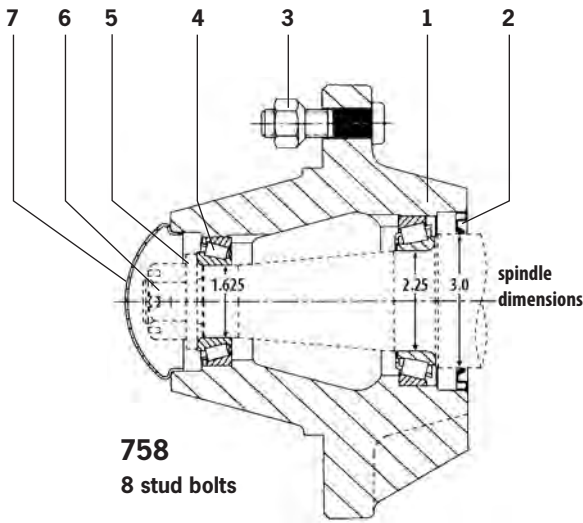
- By rotating the axle spindle assembly and/or switching the left/right spindles you can choose from 4 different ground clearance positions. Take care when positioning the axle spindle: the tire should not block the air slot.
- A variety of tires are available to accommodate your application.
- Check 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

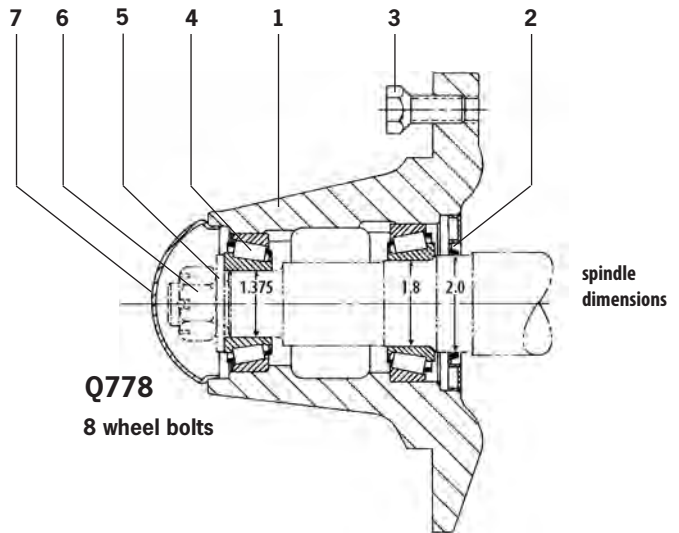
Identify A or B spindle...

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

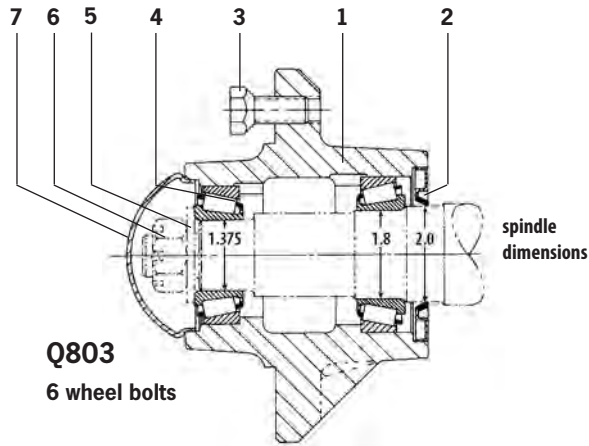




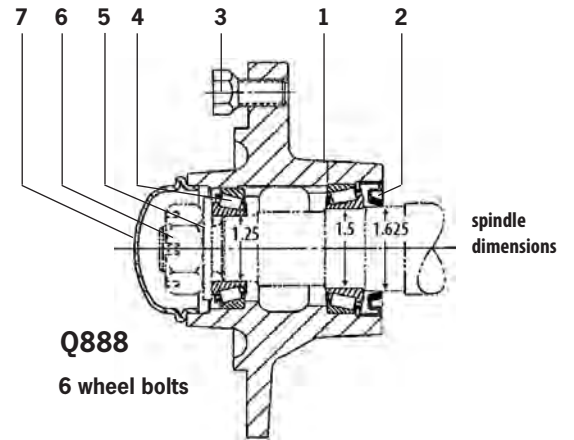
758
8 stud bolts



Q778
8 wheel bolts



Q803
6 wheel bolts



Q888
6 wheel bolts

No.	758		Q778		Q803		Q888		Description
	Part #	Qty	Part #	Qty	Part #	Qty	Part #	Qty	
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
3	CR29968	1	CR20148	1	CR20148	1	CR16289	1	seal
			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

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



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Purchaser Name		Purchase Date
Address	City	State/Zip
Model		Serial Number
Dealer Name	Sales person	Phone
Address	City	State/Zip