

PREDATOR PUMPS

Operator's Manual & Parts Breakdown

Used for the Predator Pump,
Predator V-600 & Predator
Tag-Pump



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LIMITED WARRANTY

Western Equipment Manufacturing, Inc. warrants manufactured products to be free from defects in material and workmanship under normal and proper use for 180 days from the date of purchase to the original purchaser. Warranty with respect to engines, components and accessories not manufactured by Western Equipment Manufacturing is limited to the warranty extended by the manufacturer of those items. Western Equipment Manufacturing, Inc.'s sole obligation under this warranty is limited to the repair or replacement at its Corona, California facility, of only such part or parts thereof as shall appear to Western Equipment Manufacturing, Inc. upon inspection at such facility, to have been defective in material and or workmanship. Warranty excludes those parts that are subject to normal operational wear and breakage. This warranty does not obligate Western Equipment Manufacturing, Inc. to bear the cost of labor or freight for replacement or defective parts. In order to obtain service under this warranty, the warranty claim form should be completely filled in and received at Western Equipment Manufacturing, Inc. within 10 days from the day the defect becomes apparent.

THIS WARRANTY, AND THE OBLIGATION OF WESTERN EQUIPMENT MANUFACTURING, INC. ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, and all other obligations or liabilities, including special, incidental or consequential damages, lost profits, lost sales, lost time, lost use, or contingent liabilities arising out of the failure of any equipment or part, to operate properly. No person is authorized to give any other warranty or to assume any additional obligation on behalf of Western Equipment Manufacturing, Inc.

INTRODUCTION

This Instruction Manual will provide you and your pump crew with a complete working knowledge of your PREDATOR PUMP. The information in this Manual has been compiled from extensive research at the factory, and from actual on-the-job experience in residential and commercial construction.

You, and the people that work with your PREDATOR pump should understand the information in this Manual. With full understanding of the machine and it's operation, your Predator pump is an excellent tool that makes it possible for you to effectively compete for conventional stucco, plastering, fireproofing, and swimming pool plastering jobs including exposed aggregate (pebble) jobs. Correct use of this machine will produce excellent results.

SAFETY

BEFORE TOWING

- All stabilizer legs should be fully retracted and locked into position
- Trailer spindle bearings should be checked for proper maintenance.
- Tires must be properly inflated. Tires should be inflated to approximately 75% of the rated maximum tire pressure on the sidewall of the tire.
- Inspect the tread on the tires. Look for cuts and excessive or un-even wear. Remove any stones caught in the tire treads.
- Secure safety chains to the towing vehicle leaving enough slack so that the breakaway device (if so equipped) will be activated should the hitch coupling become disconnected while towing.
- Lights are required if towing over the roads and highways. Check you local DMV requirements before towing.
- Make certain the weight rating of both the towing vehicle and the hitch assembly complies with the weight ratings of your particular model.

PUMP OPERATION SAFETY

- Obey all OSHA, liability insurance carrier, and site-specific rules for the site they will be working at.
- Equipment shall be operated only by experienced operators, or trainees under the direct supervision of an experienced operator, and no unauthorized person shall be permitted to assist or remain in the immediate vicinity of the unit while it is in operation or during maintenance, inspection, cleaning, repair, or make-ready operation.
- Individuals who cannot read and understand the signs, notices and operating instructions shall not operate equipment.
- Equipment shall only be operated by individuals who are familiar with the operating instructions, have received supervised on the job training, and are familiar with the environment they will be working in.
- Only individuals of legal age shall operate equipment.
- Equipment shall not be operated by anyone with serious eyesight, hearing, and physical or mental impairment.
- Equipment shall not be operated without an operator within 12 feet from the controls of the pump.
- An operator who has asked to be relieved because he feels physically or mentally unfit to perform the job shall not operate equipment.
- Equipment shall not be operated at any new site, or at the start of a new shift, until a visual inspection is made of the condition of the equipment.
- Equipment shall not be operated by anyone who is under the influence of alcohol, or drugs whether it is prescribed or not prescribed.

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- Observe all hazardous materials warnings for the product(s) being used in the pumping operation.
- Never add fuel when the engine is running.
- Never operate the unit in an enclosed area due to the exhaust gases.
- Keep hands and tools out of the mixer and pump hopper at all times while the machine is running.
- Operator must monitor the batch of material being pumped looking out for unmixed or dry material, sticks, pieces of metal and other foreign objects.
- Never stand on the side of the machine where the hose leaves the pump while it is in operation.
- Operator must wear safety goggles at all times when operating the unit.
- Hoods and safety gaurds shall be in their proper position before operating the machine.

HOW THE PREDATOR PUMP OPERATES

Your Predator Pump was designed to pump and spray cementitious stucco materials such as scratch and brown coats as well as color/texture coats (special setup is required for color/texture coats in order to reduce material volume); pool plastering materials including exposed pebble finishes; fireproofing materials (additional equipment required if using a fireproofing material with an injected accelerator); and gypsum based plasters for interior plastering jobs. The maximum nominal aggregate size is 1/8".

Pumping is achieved with two reciprocating pistons inside of a cylinder. While the primary cylinder (closest to the hopper) is in its forward-stroke, it is pushing material into the compensating cylinder chamber and into the hose. Since the primary cylinder has a stroke that yields twice as much volume as the compensating cylinder, material is pushed from the primary cylinder into the compensating cylinder as well as into the hose. In other words, half of the primary cylinder's stroke goes to the hose and the other half goes to charging the compensating cylinder. While the primary cylinder is in its back-stroke, drawing material in from the hopper, the compensating cylinder is on its forward stroke, pushing the material it got from the primary cylinder forward into the hose in order to maintain flow and pressure to the hose while the primary cylinder is getting another charge of material on its back stroke. In this way the material is supplied at an even pace so that the spray pattern remains constant throughout the pumping cycle.

The flow of material is controlled by two one-way check valves (ball and seat) inside the material delivery manifold. The check balls will allow material to flow in only one direction. The check ball between the hopper and the primary cylinder is referred to as the center section ball-and-seat and will only allow material to flow from the hopper into the primary cylinder. The check ball between the primary cylinder and the compensating chamber is referred to as the crossover ball-and-seat and will only allow material to flow from the primary cylinder to the compensating chamber. It does not matter which direction the pulleys are driven and the pump is not reversible.

The center section check ball is pulled off of its seat when the primary piston is in its back stroke pulling material from the hopper into the primary cylinder. As the primary piston completes its back-stroke and begins a forward stroke, the center section check ball is forced back onto its seat by forces of both gravity and material pressure being built by the primary piston's forward stroke. This causes the center section ball to become seated, sealing off the passage to the hopper, and the crossover section ball to be forced off of its seat, thereby causing the material to now flow from the primary cylinder to the compensating cylinder chamber where the compensating piston is on its back stroke. As the primary piston completes the forward stroke and starts its backstroke, the compensating piston is completing its backstroke and starting its forward stroke. The pressure in the compensating chamber from both residual hose pressure and pressure being built by the compensating piston now moving in its forward stroke, forces the crossover check ball onto its seat just as the primary piston begins on its back stroke thus completing a pumping cycle.

The Predator pump draws in material from the pumps hopper and pushes the material through the hose with strokes of material from the pistons. The on-board air compressor supplies compressed air flow to the nozzle air stem inside the spray nozzle. The material and airflow mix at the nozzle to create a spray pattern.

The Predator's pump engine has a two-speed electro-mechanical solenoid (air controlled solenoid also available) that controls the engines governor (throttle position). With the two-speed solenoid deactivated, the engine will remain at low speed (idle). The throttle will begin to open when the two-speed solenoid is activated causing the engine to accelerate to its high-speed setting made with an adjustable throttle position stop to limit how far the throttle will open. The engine will maintain it's high-speed setting until the solenoid is de-activated.

Pumping activity starts and stops by the engagement and disengagement of a centrifugal clutch. At engine low speed, the centrifugal clutch is disengaged. When the engine high-speed is activated, the engine accelerates to the RPM set with the throttle position stop device. The centrifugal clutch will begin to engage at approximately 1100 engine RPM on conventional units, and 1500 engine RPM on single engine mobile units such as the Mobile Predator model that is equipped with a POWERDUMP mixer. It is important to note that even though the clutch will begin to engage at these RPM ratings, the pump will not properly operate until the clutch is completely engaged allowing enough power to be transmitted to the pumping operation. The table below gives guidance to engine RPM and pulley ratios, as indicated by pumping strokes per minute (SPM) so that a range of speed settings can be realized. Failure to run at an appropriate speed can damage components of the pump.

Min/Max **Strokes per Minute** (SPM) for Low, Medium, High, and Maximum Speed Pulley Position

<i>Material</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Maximum</i>
Scratch/ Brown	NR	70/105	100/140	135/190
Color/Texture Coats*	30/50	NR	NR	NR
Pool Plasters	NR	65/105	90/140	125/190
Fireproofing Material	45/70	65/105	90/140	125/190
Gypsum Plasters	45/70	65/105	90/140	NR

* = 30 to 40 SPM can only be achieved with a special pulley setup

NR = This range is not recommended for this material due to power requirements, air consumption, material volume typically required and other factors

Minimum production RPM on conventional units is 1800 RPM

Minimum production RPM on single engine units is 2100 RPM

Maximum RPM is 2800 to 3000 depending on engine selection and engine load.

PRIMING / STARTING PROCEDURE

Connect the material hose to the pump manifold outlet. The nozzle at the end of the hose should not be attached and the end of the hose should be elevated higher than the pump so the water will not drain out on it's own.

The engine high-speed switch should be turned off at the pump and turned on at the nozzle. Since both switches have to be turned on in order for the engine to go into high speed, the pump will not start until the switch at the pump is activated.

The pump operator and the nozzle operator should be in clear eyesight of each other at all times during the priming/starting procedure.

Fill the hopper with enough water to completely fill the hose with water (hopper about ½ full for typical hose packages) but do not begin pumping the water until the priming material mentioned in the next step is ready. Mix a batch of priming material.

There are products specifically designed for priming a material pump such as PRIME TIME II available from Western Equipment Manufacturing. Follow the manufacturer's directions for mixing the priming material in a bucket. It is not recommended to use the procedure of mixing the priming material in the hopper for this type of machine.

You may use a slurry in place of a priming material product. Slurry is the material being pumped without it's aggregate (aggregates such as sand, vermiculite, perlite, etc.) thoroughly mixed with water to a creamy consistency.

- The priming procedure requires 10 gallons of priming material.
- Start pumping the water that is in the hopper into the hose after the slurry is ready.
- Prime the pump at 45-60 SPM on lightweight materials such as fireproofing.
- Prime the pump at 70-100 SPM for all other materials.

See the section under [How the Predator Pump Operates](#) regarding engine RPM and pulley ratios to get setup on an appropriate SPM for the material being pumped.

Pump all the water from the hopper leaving only enough water to keep the manifold intake from sucking air, stop the pump and dump the priming material into the hopper. Momentarily activate the pump so the pump strokes only enough times (15-30 strokes) to pull as much of the priming material into the manifold intake as possible, but without sucking air into the manifold intake. It will not be a problem if some of the priming material is still left in the hopper.

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The slurry will act as a barrier between the water and the mixed material. Failure to use slurry between the water and the material with aggregate may cause the material with aggregate to wash apart. When this happens, the aggregate that separated from the mixed product will not carry through the hose and “pack” (jam up) in the hose.

Attempting to push past a hose pack is rarely successful and is very dangerous!

It is a good idea to make the first batch of material with the least amount of aggregate that is suitable for the application and dump it into the hopper. This is only possible with field mixed materials such as mixes for scratch or brown coats on stucco systems. Mix a second batch of material with the desired amount of aggregate.

Once the second batch is ready in the mixer, begin pumping your first batch of material. Still pumping at a rate suitable for priming the pump while observing the end of the hose.

Observe the water flowing out the end of the hose. If flow out the end of the hose is not observed, yet material appears to be pulled from the hopper with each stroke of the machine, then a pack is the likely cause. STOP if the pump moves several strokes without flow out the end of the hose. The Predator pump can build dangerously high pressure very quickly as it is a positive displacement pump.

Continue pumping until the slurry passes out the end of the hose and some of the first batch begins flowing. Stop the pump with the switch at the nozzle, leaving the switch at the pump in the activated position. Again, since both switches must be on in order for the pump to activate, turning the switch off at the nozzle and leaving it on at the pump essentially give control to the nozzle operator whereas in the first stage of priming the pump operator had control of activating the pump.

The pump operator now uses the switch at the pump to stop the pump in the event of a problem at the pump that the nozzle operator may not be aware of.

The pump operator ensures the second batch and subsequent batches are added to the hopper as soon as it will fit into the hopper keeping the hopper at least $\frac{1}{4}$ full so that air cannot be pulled into the manifold intake.

The nozzle operator connects the spray nozzle to the end of the hose.

The nozzle operator starts pumping again by activating the engine high speed at the nozzle.

At this time, the nozzle operator sets the nozzle air stem distance from the orifice, airflow rate and pump engine speed to achieve the desired spray pattern.

You are now ready run production of spraying material.

CLEAN – OUT PROCEDURE

Pump all of the material from the hopper without sucking air into the manifold intake. A flat shovel may be required to move all the material to the manifold intake.

Care should be taken to not allow clumps of material or separated aggregate to enter the manifold intake. Pour enough water in the hopper to pump all of the material through the hose. The hopper at about 2/3 full will clear a 300' hose package. This is best accomplished by filling the mixer with water and dumping it into the hopper all at once.

Operate the pump at the same speed that was being used to run production as the material ahead of the water can still be used for production. As the water begins working it's way into the hose, the pressure required to overcome friction in the hose is reduced. Because of this it may be necessary to gradually slow the pumping speed.

Remove the spray nozzle from the end of the hose once the usable material is cleared from the hose. Disconnect the hose from pump manifold outlet and stuff a cleaning sponge ball of appropriate size for the hose diameters being used (or equivalent size piece of cellulose sponge) into the hose where it connects to the pump.

Reconnect hose to the hopper. Fill hopper approximately 2/3 full of clean water and pump the sponge through the hose. The clean water forces the sponge through the hose removing residual material from the interior of the hose.

The clean water circulating through the pump will clean it and it is not necessary to dismantle pumping unit.

NOTE: Backpressure created by water may not be sufficient to completely activate the compensating piston. This is normal and is not an indication of malfunction.

HOW THE PREDATOR PUMP NOZZLE OPERATES

Since the operator feels no pulsation when running the PREDATOR pump, it would appear that plaster comes from the nozzle in a steady stream. In actuality, plaster and air comes from the nozzle in alternating cycles. A pocket of plaster, followed by a pocket of air represents a spraying cycle that repeats many times per second. The quantity of spraying cycles per second is referred to as the spraying frequency.

The spraying frequency is a function of orifice size relative to material flow rates, distance that the air stem is away from the orifice, and airflow/pressure delivered to the air stem. The frequency is audible and can be described in two ways. A high pitch “scream” emitted from the nozzle would indicate a high frequency. A low pitch “gurgle” would indicate a low frequency.

A nozzle set to a high frequency is emitting a spraying cycle several hundred times per second. What this means is that each pocket of material, followed by a pocket of air is very small thereby producing a fine, or smooth, spraying pattern. On the other hand, a nozzle set to a low frequency has larger pockets of material followed by larger pockets of air producing a coarse, or lumpy, spraying pattern.

There is simply no feasible way to define how many spraying cycles is correct for each spraying application. We discuss the theory of what you are hearing relative to the adjustments that can be made so that the sound you hear will give you an indication of the adjustments in order for you to achieve your desired result.

Spraying frequency is affected first by the choice of components and then more finely affected with adjustments. Common examples are given for starting points for popular applications.

Scratch and Brown for Stucco Systems

A common set-up for these mixes are to run with medium to high pulley ratios, a 1-1/4” Browning nozzle equipped with a 5/8” orifice, and a medium length spray shield.

Set the nozzle air stem at about 1/2” behind the 5/8” orifice with the airflow about half way open. Begin spraying and observe the spray pattern. The following adjustments can be made to affect the spraying performance.

Air flow – Increases and decreases the velocity at which the material hits the sprayed surface. Too little air will create a lazy and narrow spray pattern that does not have enough velocity to spray at a distance of 18” to 24” away from the spraying surface. Too much airflow will create too much velocity and the material will hit the wall and rebound off of it.

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Air Stem Distance from the Orifice- Closer to the orifice increases the frequency, while father away from the orifice decreases the frequency. The air stem set too close to the orifice can cause the material to be restricted as it tries to flow through the nozzle. If this condition occurs, you could experience problems with the orifice blowing through the rubber cap. Back the air stem off the orifice and use either more airflow, or a smaller orifice in order to increase spraying frequency if this occurs.

Orifice Size – Orifice size determines the rate that material is sprayed while maintaining a frequency range / spray pattern desired.

HOW TO MIX MATERIALS FOR THE PREDATOR PUMP

Your PREDATOR pump has the power to move materials at a consistency normally associated with hand application. However, for best results material should be mixed and dumped with a slightly wetter consistency than for hand application. Material tends to “dry up” some when sprayed and the reason why we suggest starting with a slightly wetter mix than that which is mixed for a hand application.

Always evaluate the consistency of your mix at the end of the hose without the nozzle attached. It is the stiffness of the mix in the hose that affects pump pressure.

MIXING GUIDELINES

Follow the manufacturer’s mixing specification for the material you are using should they conflict with this procedure.

Add all but about 10% of the total water required. Hold back this amount of water to prevent too soft of a mix, as materials will have different water absorption qualities from one batch to another.

Add binder materials (cement, gypsum, etc.) and mix to form creamy, lump free slurry. (Disregard this step if using pre-blended materials where the binder and aggregates are already blended together)

Gradually add the aggregate or premixed material at the rate of about one cubic foot every 15 seconds.

Check the consistency of the mix and add the remaining water to get the consistency required.

Dump the mix into the pump hopper only after it is sufficiently mixed.

AUXILIARY EQUIPMENT

Mixers – Mobile pumps are equipped with a paddle mixer that is suitable for the types of material the pump is designed pump. Tag, and Skid pumps require a separate mixer of similar design and operation. The mixer chosen should be a paddle mixer as opposed to a rotating drum style because they mix small aggregate materials more aggressively and uniformly than do rotating drum mixers.

Mixers should have a material screening function unless the material screening function is carried out on the hopper of the pump. Screening the material on the hopper is becoming less popular as it requires more effort from the mixer operator and can slow the pace of production. Both methods of screening the material produce an appropriate result of feeding the pump with pumpable material.

Water Meters - Some materials require accurate water content for the product to perform correctly. Fireproofing materials are the most critical of water content. Western offers water-metering systems that integrate with the mixer on your pump (available only on mobile pumps) as an optional system. There are companies that make water-metering equipment as stand alone units. These are fine in most applications but require a separate 110v or 220v power supply.

Injection Equipment for accelerators – Some fireproofing materials utilize an accelerator that is injected into the materials at or near the spray nozzle. These are stand-alone units that require separate power an operation.

HOSES AND HOSE PRESSURES

Hose set-ups are critical to successful pump operation, safety, and productivity. Talk to your equipment dealer, or ask Western to help specify a hose package configuration for your specific needs. We will discuss some of the criteria that you will have to consider before specifying a hose package and what some of the cause and effects are when making your decisions.

The material sprayed through a Predator pump is thick and as a result the hose and their fittings need to be “full flow”. Meaning that transitions from hose connections need to be the same interior diameter as the hose and where hose diameters change, a smooth transition needs to take place. This is very important to consider when choosing hoses and fittings and the rate at which the interior diameters change. A qualified dealer and/or Western Equipment Manufacturing, Inc representative should be consulted in order for you to obtain the best results in a safe manner.

In general, a shorter has package is easier to manage than is a longer hose package. This is because longer hose packages require more pressure to overcome friction as the material travels through the hose. Elevation requires more pressure as well in order to overcome gravity.

Hose pressure ratings and the choice of fittings must be matched to the anticipated pressure requirements to overcome both friction and gravity. The pressure relief valve (PRV) located on the discharge of the manifold needs to be matched to the hose pressure requirements that the risk of over-pressurizing the hose is eliminated. Too high a PRV rating can cause the hose or it's fittings to blow up causing serious injury or death, and too low a PRV setting can cause the PRV to unload unexpectedly leaving an inability to perform the spraying task at hand.

Other considerations are to choose a hose long enough to match the kind of job being performed. Consider how far horizontally and how far vertically you will take the hose for the application(s) you will be spraying. In residential home building, you need a hose length long enough to go at least halfway around the perimeter of the house plus any vertical distance. Remember to consider not only the house footprint but also some stand off from the house to accommodate scaffolding and any other obstructions that may be encountered. In residential track homes, you may want a hose long enough to reach to two or three houses from a central point where the sand pile and sacks of cement will be located.

Commercial jobs have the same basic considerations plus additional ones as they relate to hose pressure capabilities due to vertical distances.

Pumping through steel pipe, known as slick-line, can reduce pressure caused by friction. Much greater distances can be achieved through slick line set-ups and are especially useful on vertical climbs. Some fireproofing materials require the use of an injected accelerating agent for the material to achieve proper yield and set time. An auxiliary low volume, high-pressure pump carries the accelerator through a separate hose and is injected into the fireproofing material into the last 15' of the hose. The pressure capabilities of the hoses and their fittings need to be considered in such an application as injector pumps can generate high pressures, albeit relatively slower than the material pump.

Since so many factors and considerations need to be made when selecting a hose package, it is best to consult with a qualified dealer and/or Western Equipment Manufacturing, Inc. when making hose setup selections. You will need to be prepared with information regarding the type of material you intend to pump, an understanding of the environment you'll be pumping in, and the distances you need to pump (both horizontal and vertical) so that a proper consultation can occur.

PRESSURE RELIEF VALVE (PRV)

The PRV is designed to protect the hose assembly from extreme pressures.

An opening in the side of the PRV is sealed off with a rubber ball that is held in place with a brass cap that has an orifice for the ball to push through. The ball will stay in place until enough pressure occurs that will cause the ball to blow out through the opening in the brass cap and release the pressure. Always face the opening in the brass cap downward as the ball will release at high velocity.

MAINTENANCE

The maintenance section of this manual is only intended for routine maintenance that is commonly performed by the operator. Diagnosis, technical repairs, warranty work and rebuilding shall be done by authorized and accomplished service personnel that are qualified for the repair work being done.

The pump is shipped the operators manuals for the engine the machine was powered with. Refer to the engine manufacturers manual for maintenance and care for the specific engine(s) that your pump is powered with.

The engine should be off with the key removed before any service or maintenance id performed. Verify that the pump does not have material under pressure before attempting any service or maintenance work.

AIR COMPRESSOR

Check oil level daily by with the dipstick on the air compressor. Add **NON-DETERGENT** motor oil to air compressors consistent with the compressor manufacturers recommendations.

Belt adjustment is important for air compressor performance. The belt should be adjusted to $\frac{1}{4}$ - $\frac{1}{2}$ " of deflection under force with your fingers.

AIR HOSE AND COUPLINGS

Do not kink the air hoses and check for air leaks around fittings and hose punctures. Correct any kinks or air leaks prior to operating.

PUMP DRIVE GEARBOX

Change the oil after an initial period of 250 hours of operation or three months, whichever occurs first. Thereafter, the recommended oil interval is 2500 hours or 1 year, whichever occurs first.

The gearbox uses 85w90 gear oil

Oil level in the gearbox is checked by turning the gearbox vertical and filling to the lower plug of the gearbox cover.

GREASE FITTINGS

There are grease fittings for each bearings and bushing on the pumping mechanisms. These fittings need to be greased everyday

PISTON OIL

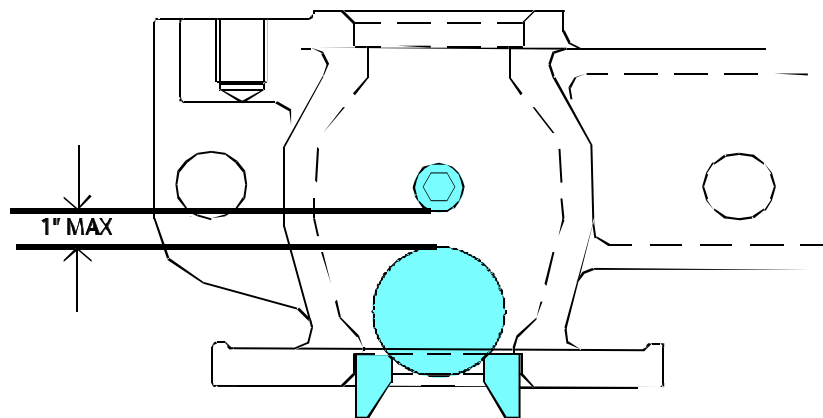
The piston oil lines supply oil to a felt pad behind the piston cup. This lubrication is essential for proper pump performance. It not only reduces friction and wear, but also keeps the piston “wetted”. This helps to maintain a good seal between the piston and the cylinder. Western recommends any motor oil or transmission/hydraulic fluid in areas where the oil does not properly flow to the pistons due to cold weather. Crack open the oiler valves just enough to notice that the oil is flowing. The flow is proper when oil will flow through 6” of the clear oil line in 10 minutes. More oil will not hurt anything but will make a mess and will consume more oil than necessary. Open the piston oilers before you begin the priming procedure and close them when you are finished with the clean-out procedure. Change the felt pad every time the leathers are changed.

MATERIAL DELIVERY MANIFOLD MAINTENANCE

The material delivery manifold requires attention and wear management, as this is the section of the machine that is in contact with the abrasive materials that you are pumping. Become familiar with all the components in the material delivery manifold by reviewing the parts breakdown. We have provided some methods to use as indications for maximum allowable wear.

To check a ball and seat combination and determine if wear is excessive, measure the height of the ball and the seat together. The stacked dimension should be no less than 2-1/4". This is not to say that the pump will not run, but that it will not perform properly and may begin to cause rapid wear on the cast steel manifold pieces.

To check the ball and seat without dismantling the manifold, you can use a reference of the gap between the center section ball stop pin and the top of the ball. This dimension is 1/2" when all components are new and is assembled correctly. Maximum wear indicated by this gap should not exceed 1".



PISTON

A piston cup should last at least 100 hours, provided packs, excessive pressure, and proper oil wetting is maintained.

Indication of a damaged or worn out piston cup is evidenced by the water mixed with cement (slurry), seeping out the backside of cylinder. A small amount (a tablespoon or two per hour) can be tolerated in order to continue for the day, but if excessive slurry (a cup or more) or if material with it's aggregate (sand) is seen, the piston cup is too damaged to continue safely and should be changed immediately.

Steps for changing the piston cup:

Run the piston toward the manifold to the most forward extent of its stroke

Remove the material delivery manifold assembly

Loosen the piston nut until it is loose by hand but do not remove

Move the piston assembly back and forth by moving the pump drive pulley. This will free up the piston seal against the cylinder enough to slip the cylinder out of the pump box

Remove piston rod nut from the exposed piston assembly.

Slide piston assembly off piston rod stud maintaining their order of assembly

Check all piston cup parts for wear and damage.

Replace any part that shows signs of wear or damage

Check piston cup for gouges or uneven wear. Replace if necessary

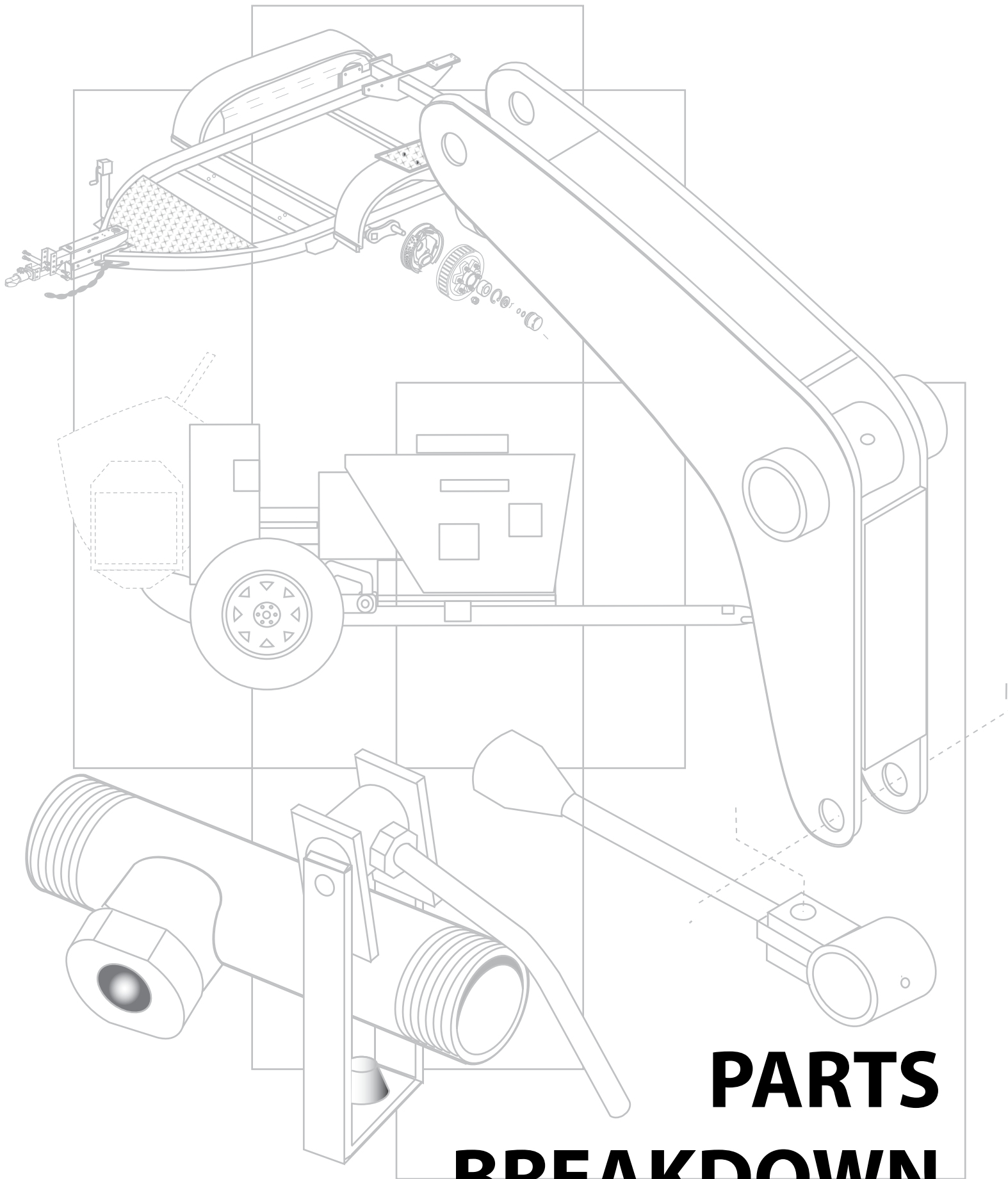
Leather cups should be saturated with oil before installing. A leather cup is very flexible and soft when fully saturated. It is a good idea to keep a set of leathers soaking in oil for at least 8 hours before installing them for operation

Check felt, if hard because of plaster material, replace with new felt saturated with oil.

Replace piston parts in their proper order (**see parts breakdown**) making sure that the piston oiler hose is at the top of the piston and remains there while the piston rod nut is being tightened. Lubrication of the piston depends on gravity flow from the oil cup to the felt oil wick.

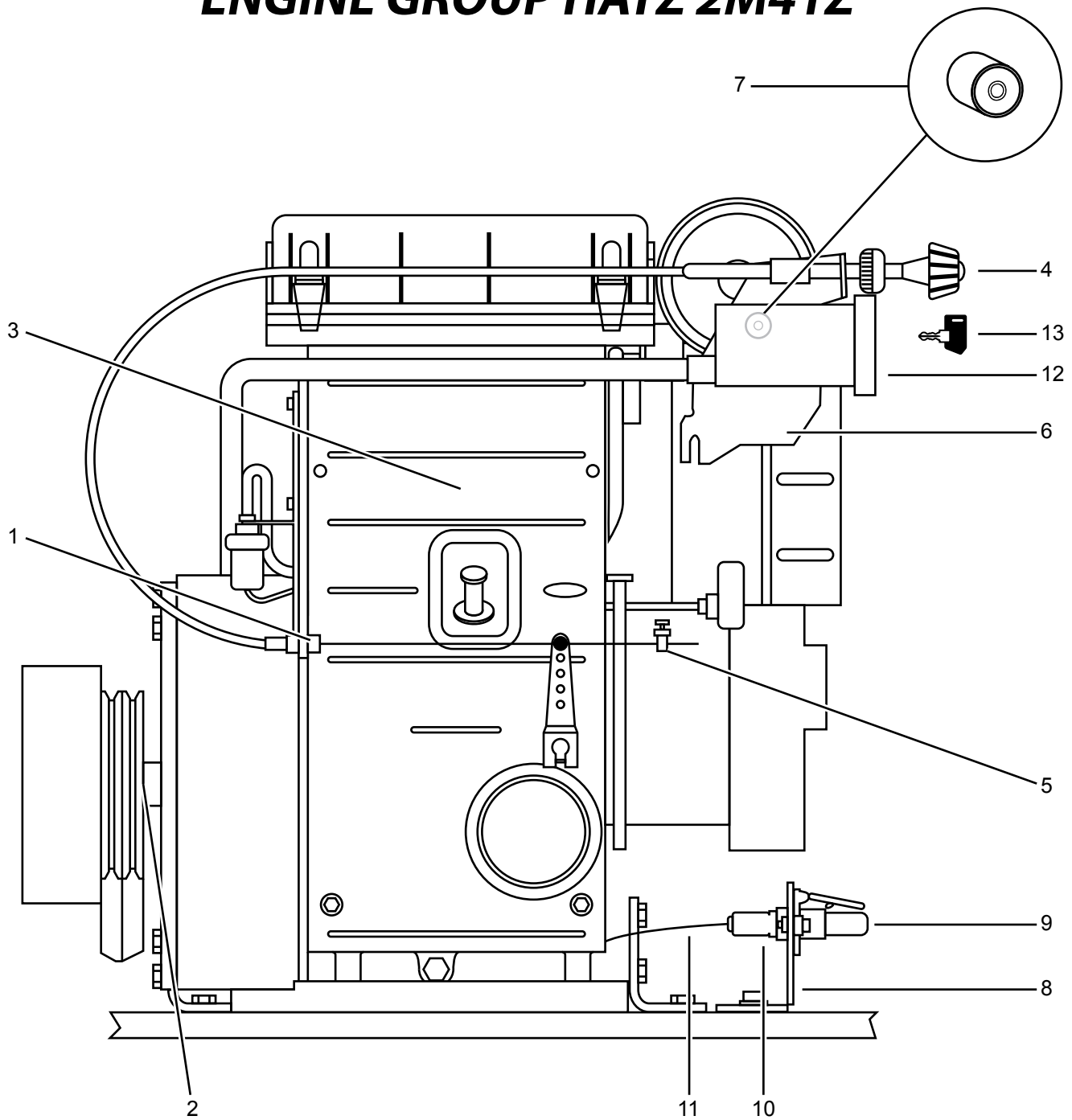
CYLINDERS

The cylinder walls wear very slowly under normal operation. However, they can be damaged by improper installation of piston components and/or damaged piston components. Care should be taken not to damage the surface on the ends of the cylinders as this will cause an air leak between the end of the cylinder and the manifold center section. An insufficient seal in the material delivery manifold will cause leaks. Remember that the seals are working with up to 1000 PSI.



PARTS BREAKDOWN

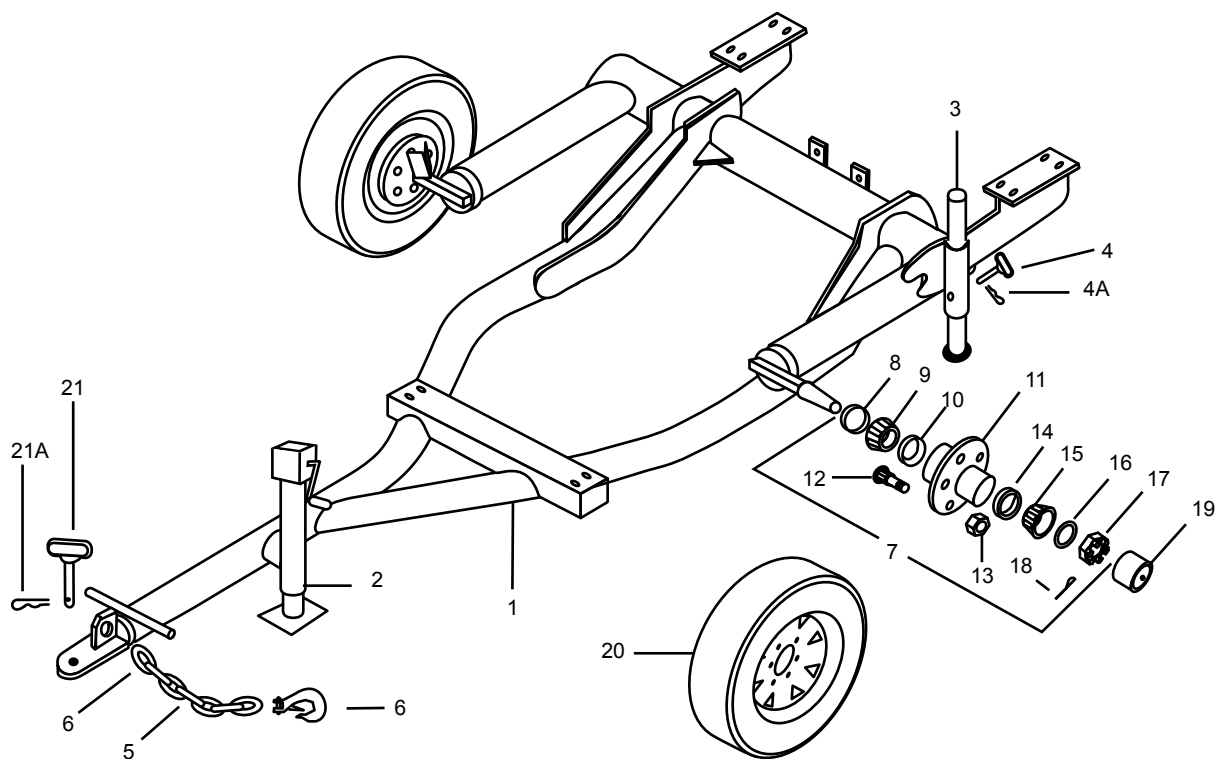
ENGINE GROUP HATZ 2M41Z



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	THROTTLE CABLE BRACKET	618015	8	PLUG MOUNT BRACKET	610032
2	STUB SHAFT	503001062100	9	6 WAY ZINC PLUG	60165705
3	HATZ 2M41Z	00401380	10	6 WAY SOCKET	60165706
4	THROTTLE CABLE ASSY.	9920000002	11	GRAY CABLE	3010000009
5	CABLE STOP	1040000007	12	CONTROL PANEL 2M41Z	503001610500
6	CONTROL BOX BRACKET	9999000005	13	KEY 2M41Z	503050404900
7	CONTROL RUBBER MOUNT	9999000004			

PARTS BREAKDOWN

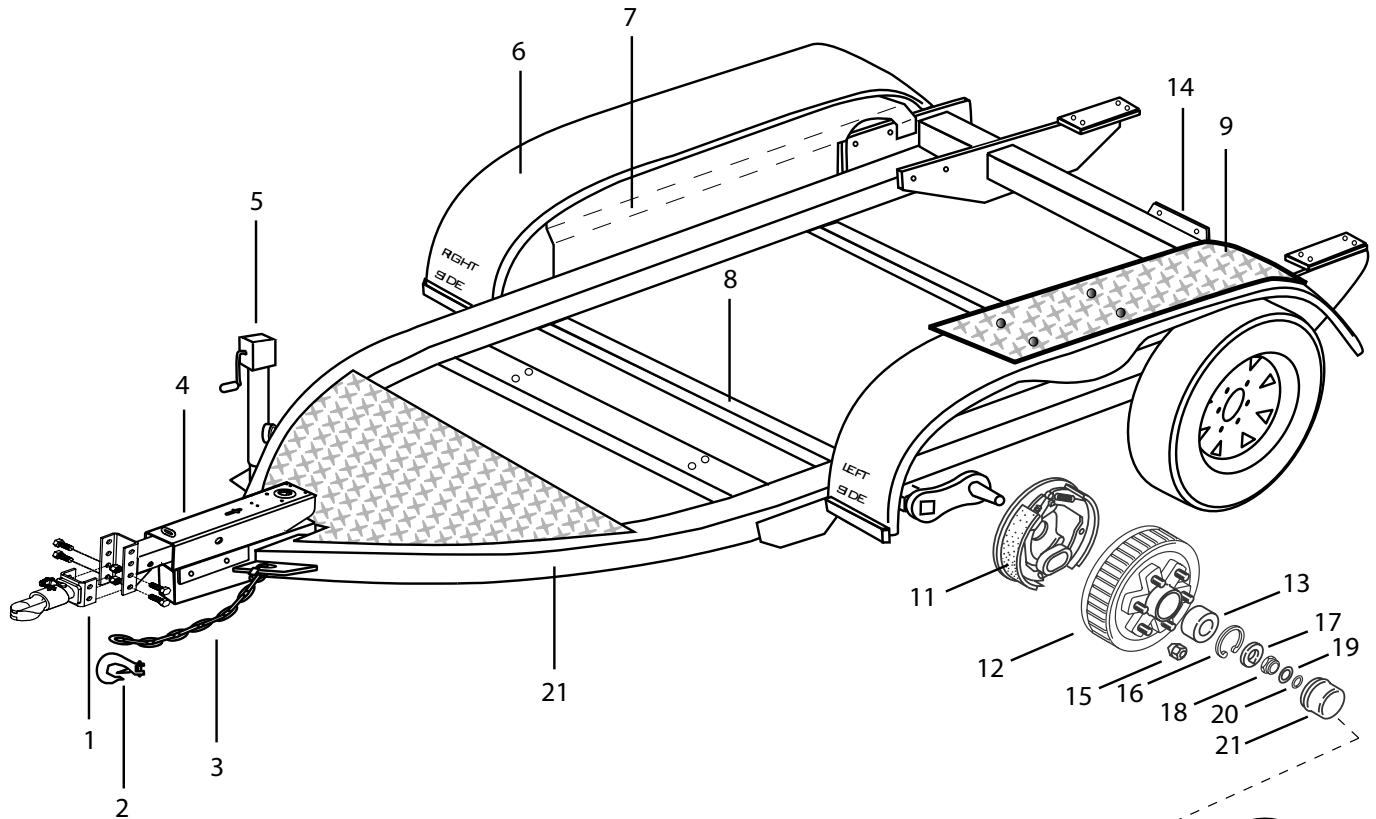
TRAILER



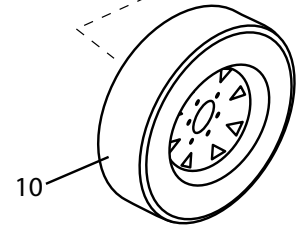
REF	DESCRIPTION	PART #
1	MOBILE TRAILER	1400 010 010
	MOBILE TRAILER COMPLETE ASSY	1400 010 001
2	JACK STAND PREDATOR CUSTOM	9910 000 005
3	STABILIZER	4510 000 003
4	LINK PIN 1/2 X 4	1040 000 006
4A	HAIRPIN CLIP	1040 000 004
5	SAFETY CHAIN (PER FOOT)	1400 010 060
6	SAFETY CHAIN HOOK	1400 010 075
7	HUB ASSY-PREDATOR	1400 010 080
8	INNER WHEEL BEARING SEAL	1400 010 090
9	INNER WHEEL BEARING	1400 010 100
10	BEARING RACE INNER	1400 010 110
11	WHEEL HUB-PREDATOR	1400 010 120
13	LUG NUT	1020 000 029
14	BEARING RACE OUTER	1400 010 150
15	OUTER WHEEL BEARING	1400 010 160
16	THRUST WASHER-PREDATOR	1400 010 170
17	SPINDLE NUT	1400 010 180
18	COTTER PIN	1040 000 004
19	SPRING LOADED DUST CAP	1400 010 200
20	TIRE / WHEEL ASSY.	1400 010 210
21	LINK PIN 1 X 6	1400 010 021
21A	HAIRPIN CLIP	1400 010 022

PARTS BREAKDOWN

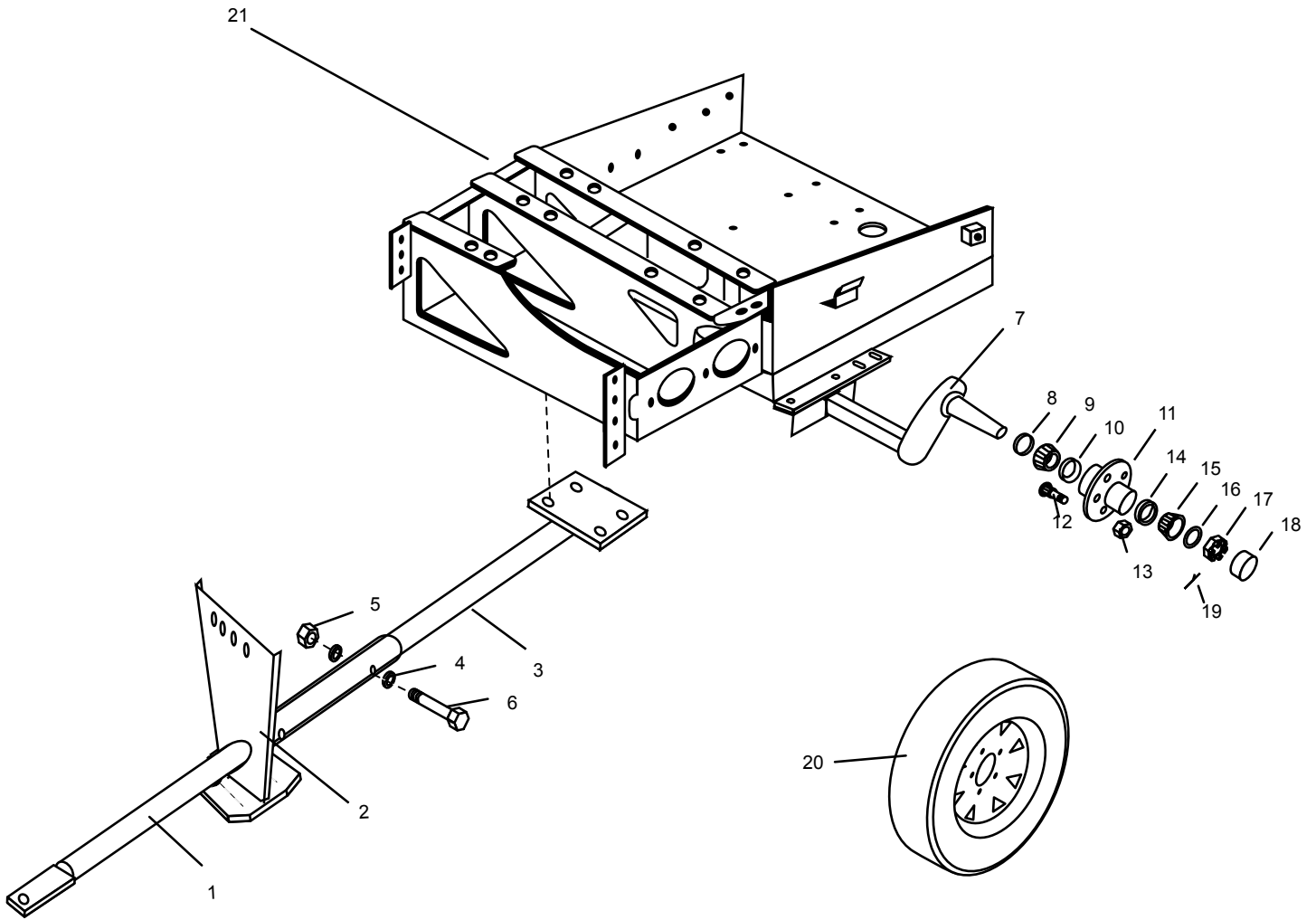
TANDEM TRAILER



REF	DESCRIPTION	PART #
1	HITCH 2 - 5/16"	1400 020 062
2	SAFETY CHAIN HOOK	1400 010 075
3	SAFETY CHAIN (PER FOOT)	1400 010 060
4	BRAKE ACTUATOR ASSY	1400 020 050
5	JACKSTAND	9910 000 005
6 R	FENDER RIGHT SIDE	1400 020 030-1
6 L	FENDER LEFT SIDE	1400 020 030-2
7 R	FENDER LINER RIGHT SIDE	1400 020 001-4
7 L	FENDER LINER LEFT SIDE	1400 020 001-5
8	AXLE ASSY W/ BRAKES	1400 020 020
9	FENDER PLATFORM TREAD	1400 020 001-14
10	TIRE / WHEEL ASSY. 15" 6 LUG	1400 020 040
11	BRAKE LINER KIT R	1400 020 100R
11	BRAKE LINER KIT L	1400 020 100L
12	NEV R LUBE HUB	1400 020 110
13	CARTRIDGE BEARING	003303107303
14	LIGHT KIT	1400 020 001-6
21	TRAILER ASSY FOR V600	1400 020 002
21A	TRAILER ASSY FOR G450/D500	1400 020 010
ITEMS 15 THROUGH 21 - SEE MANUFACTURERS PARTS LIST		



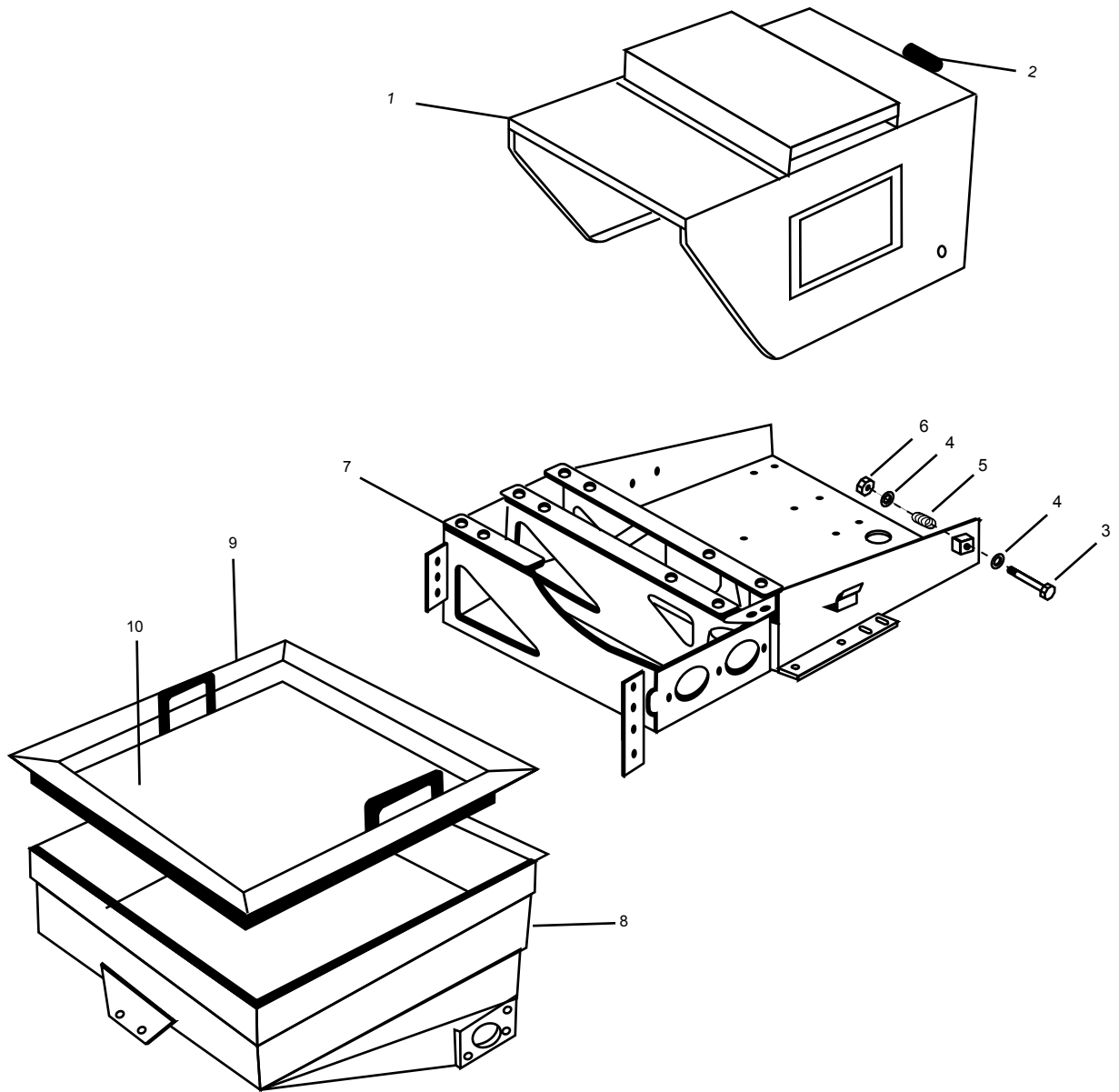
TAG-A-LONG ASSY.



REF	DESCRIPTION	PART #
1	TOW BAR PIN HITCH	1200 030 010
2	TAG FRONT SUPPORT	1400 030 020
3	TAG TOW BAR RECEIVER	1400 030 030
4	WASHER	1030 000 034
5	LOCK NUT	1020 000 001
6	HEX BOLT	1010 000 016
7	TAG AXLE ASSY.	1400 030 081
8	GREASE SEAL	1400 030 110
9	INNER WHEEL BEARING	1400 030 120
10	BEARING RACE INNER	1400 030 310
11	WHEEL HUB-TAG A LONG	1400 030 140
12	LUG STUD	1400 010 130
13	LUG NUT	1400 010 140
14	BEARING RACE OUTER	1400 030 170
15	OUTER WHEEL BEARING	1400 030 180
16	THRUST WASHER	1400 030 190
17	SPINDLE NUT	1400 030 200
18	DUST CAP	1400 030 210
19	COTTER PIN	1400 010 190
20	TIRE / WHEEL ASSY.	1430 230 040
21	TAG PUMP BOX	1400 050 080

PARTS BREAKDOWN

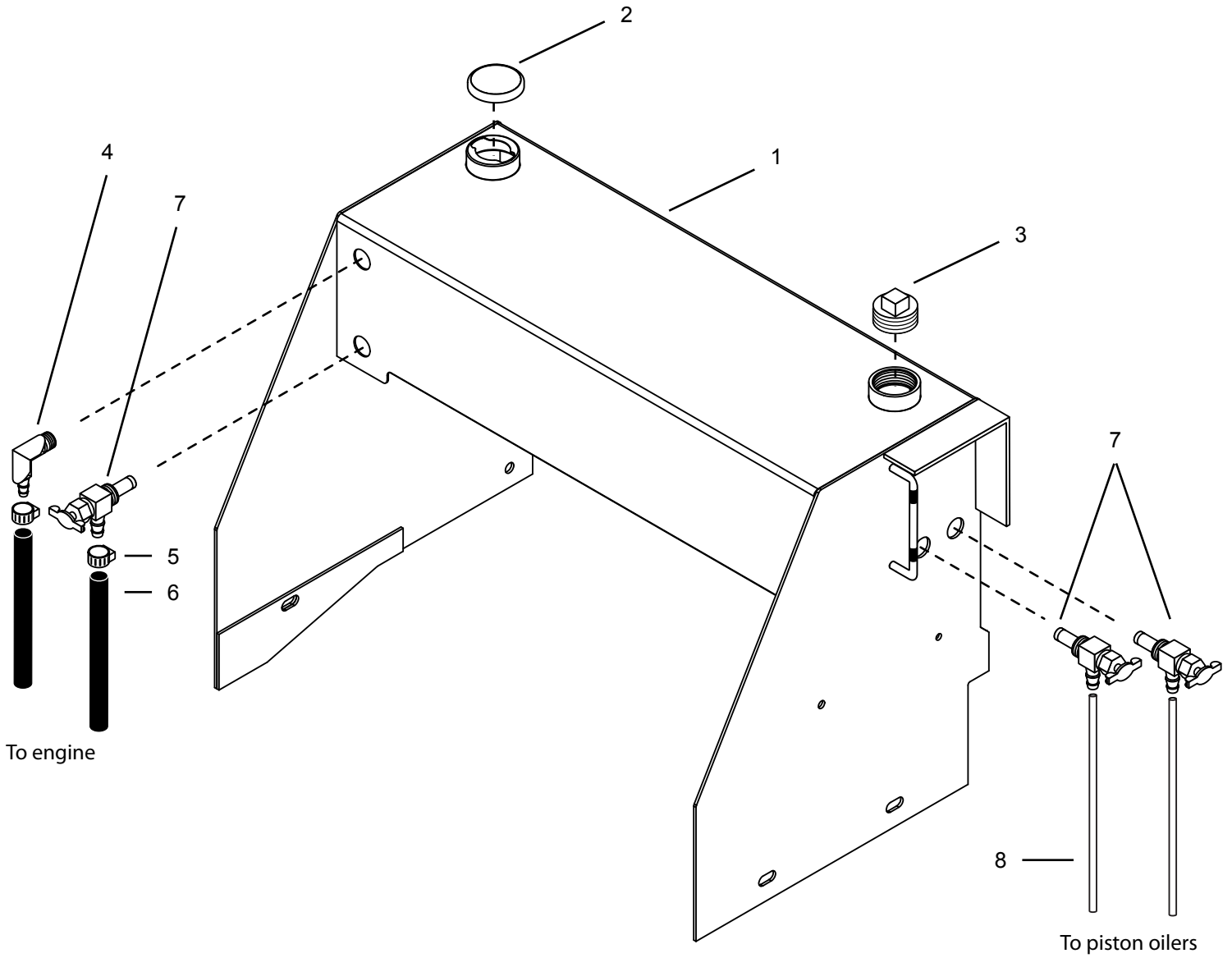
PUMPBOX/HOPPER



REF	DESCRIPTION	PART #
1	PUMP HOOD	1400 050 010
2	RUBBER HOOD REST	9999 000 002
3	HEX BOLT	1010 000 091
4	WASHER	1030 000 012
5	SPRING	1098 000 007
6	LOCK NUT	1020 000 004
7	PUMP BOX-PREDATOR	1400 050 080
8 A	HOPPER	1400 050 120
8 B	HOPPER NO EXTENSION	1400 050 122
8 C	HOPPER V600	1400 050 121
8 D	HOPPER SKID	1400 050 123
9	HOPPER SCREEN FRAME	1400 050 130
10	HOPPER SCREEN	1400 050 140

PARTS BREAKDOWN

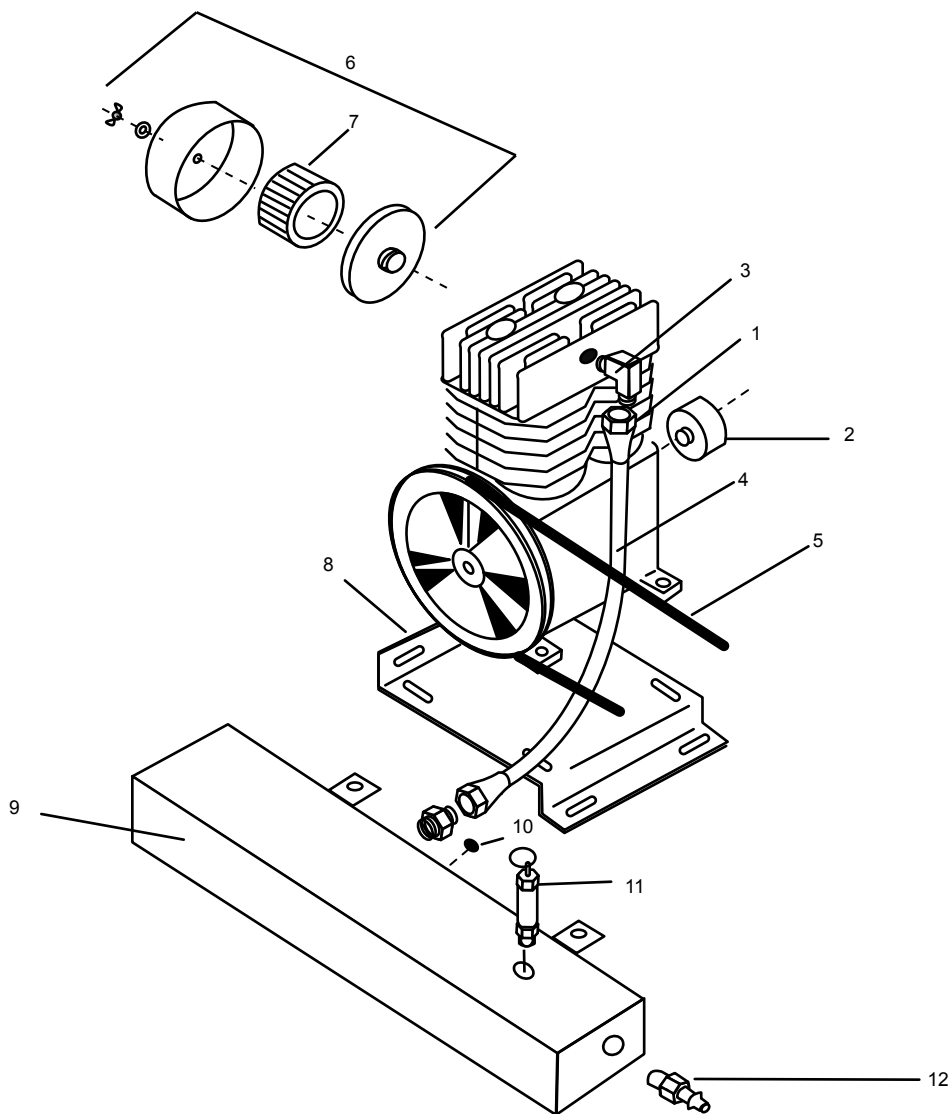
FUEL/OIL RESERVOIR



REF	DESCRIPTION	PART #
1	FUEL / OIL TANK	1400 100 010
2	TANK CAP FUEL / OIL	1400 100 020
3	OIL TANK PLUG	1040 000 002
4	BARB FITTING	3510 000 005
5	HOSE CLAMP	1400 100 090
6	HOSE-FUEL	1400 100 100
7	OILER VALVE	5010RG41
8	OIL LINE PER FT	1400 100 160

PARTS BREAKDOWN

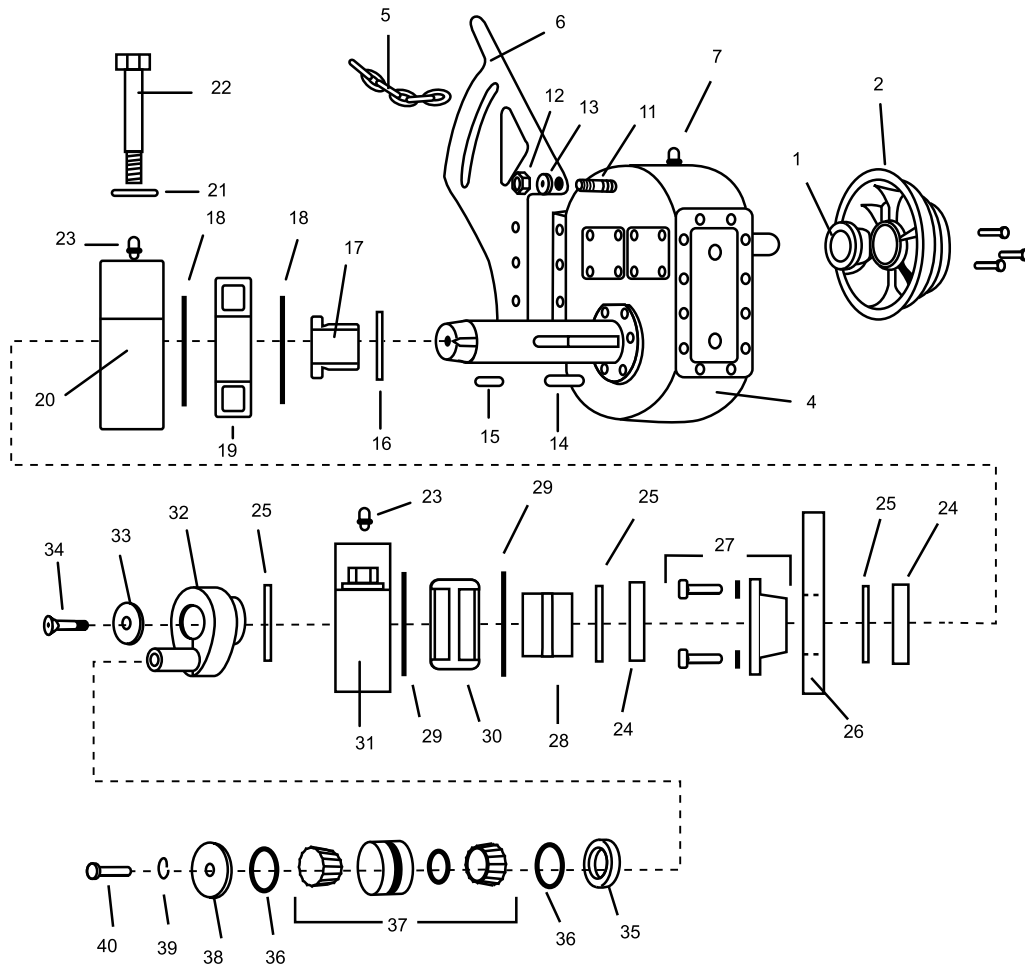
COMPRESSOR



REF	DESCRIPTION	PART #
1	COMPRESSOR QUINCY PLS2.5 REPLACES QUINCY 210 AND 214	1400 150 012
2	OIL PRESSURE GAUGE	5050110162
3	AIR FITTING ELBOW	1400 150 080
4	AIR LINE SS BRAID	1400 150 090
5	V-BELT	1400 150 100
6	AIR FILTER ASSY (SPECIFY MODEL)	
7	AIR FILTER ELEMENT (PLS2.5 & 214)	5050112845-06
8	COMPRESSOR BRACKET	1400 150 140
9	AIR TANK	1400 150 180
10	PLUG 1/8" NPT	
11	PRESSURE RELIEF VALVE	1400 150 200
12	PLUG MALE	00222302

PARTS BREAKDOWN

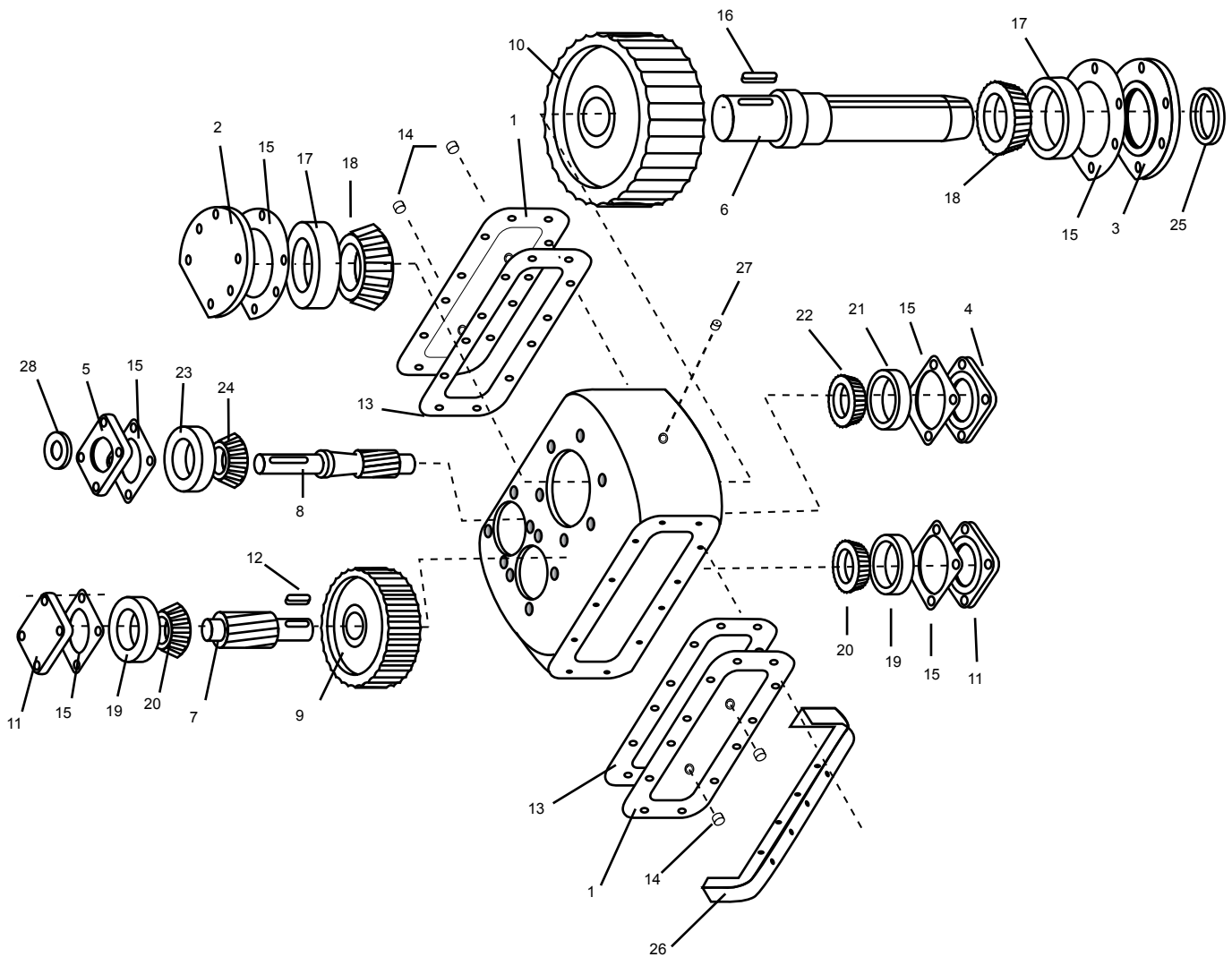
PUMP DRIVE ASSY.



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	BUSHING	1400 200 010	23	GREASE FITTING	3598 000 007
2	STEP PULLEY	1400 200 020	24	SPACER	1400 200 240
4	GEARBOX	1400 200 040	25	SPACER	1400 200 250
5	SAFETY CHAIN	1400 010 060	26	CAM-PREDATOR	1400 200 260
6	ADJUSTING BRACKET GEARBOX	1400 200 060	27	TAPER-LOCK BUSHING	1400 200 270
7	BREATHER	1400 250 380	28	RACE	1400 200 280
11	STUD	1400 200 110	29	RETAINING RING	1400 200 290
12	LOCK NUT	1020 000 028	30	BEARING	1400 200 300
13	WASHER HEAVY	1030 000 037	31	BEARING HOUSING	1400 200 310
14	CAM KEY	1400 200 140	32	CRANK PREDATOR	1400 200 320
15	CRANK KEY	1400 200 150	33	WASHER CRANK	1400 200 330
16	RETAINING RING	1400 200 160	34	FH ALLEN BOLT	1400 200 340
17	ADAPTER	1400 200 170	35	INNER PLATE	1400 200 350
18	RETAINING RING	1400 200 180	36	O RING	1400 200 360
19	BEARING	1400 200 190	37	BEARING ASSY	1400 200 370
20	BEARING HOUSING	1400 200 220	38	WASHER SPCL CON ROD FLAT	1400 200 380
21	WASHER	1030 000 042	39	LOCK WASHER	1030 000 026
22	HEX BOLT	1010 000 079	40	HEX BOLT	1010 000 052

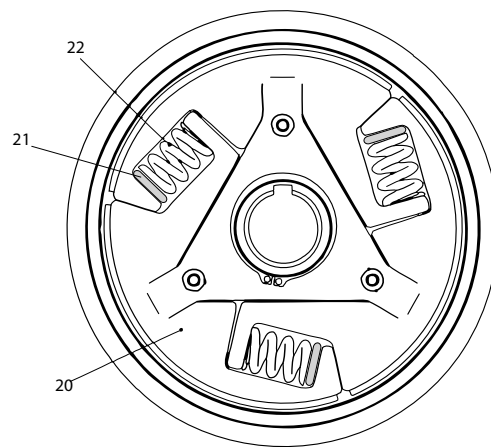
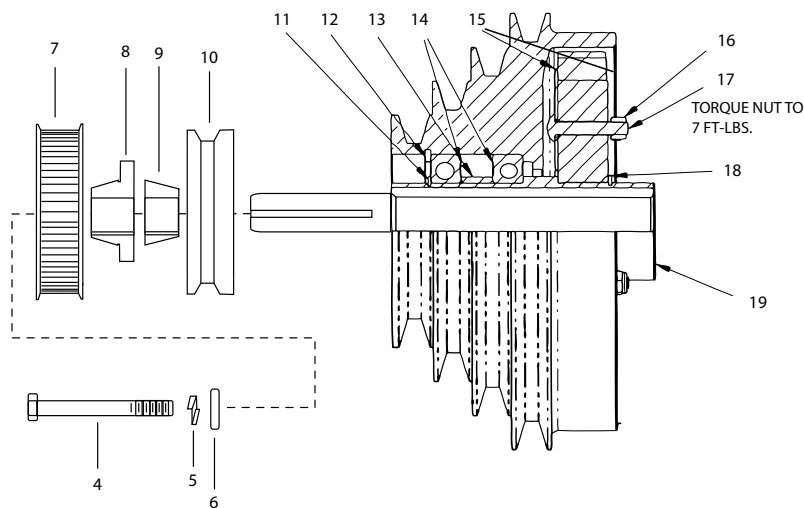
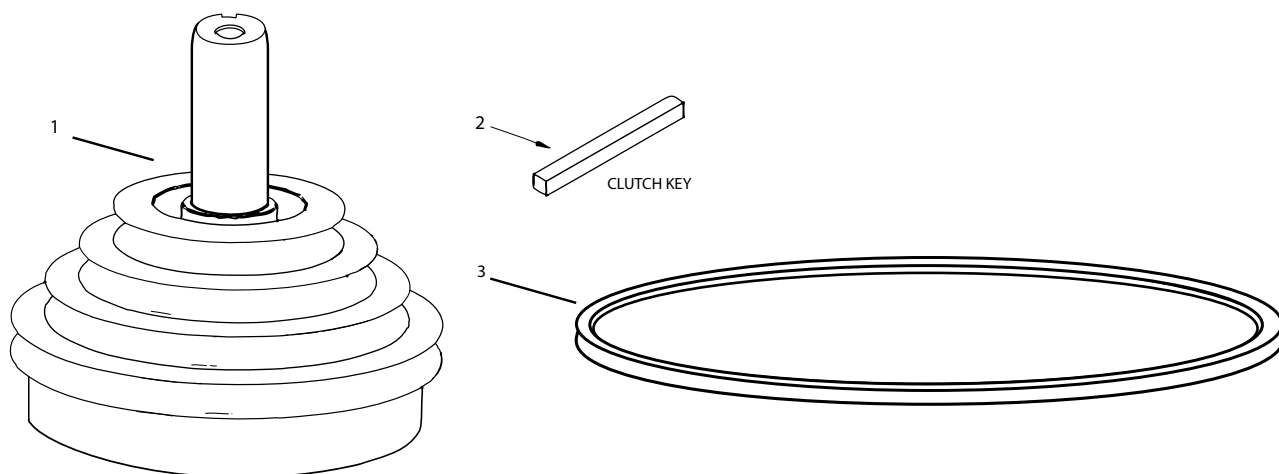
PARTS BREAKDOWN

PUMP DRIVE INTERNALS



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	COVER PLATE	1400 250 020	15	SHIM SET	1400 250 220
2	OUTPUT CLOSED CAP	1400 250 030	16	OUTPUT GEAR KEY	1400 250 230
3	OUTPUT OPEN CAP	1400 250 040	17	RACE	1400 250 260
4	INPUT CLOSED CAP	1400 250 050	18	TAPERED BEARING	1400 250 270
5	INPUT OPEN CAP	1400 250 060	19	RACE	1400 010 110
6	OUTPUT SHAFT	1400 250 070	20	TAPERED BEARING	1400 010 100
7	INTERMEDIATE PINION	1400 250 080	21	RACE	1400 250 300
8	INPUT SHAFT	1400 250 090	22	TAPERED BEARING	1400 250 310
9	INTERMEDIATE GEAR	1400 250 100	23	RACE	1400 250 320
10	OUTPUT GEAR	1400 250 110	24	BEARING	1400 250 330
11	INTERMEDIATE CLOSED CAP	1400 250 120	25	OUTPUT OIL SEAL	1400 250 340
12	INTERMEDIATE KEY	1400 250 190	26	MOUNTING BRACKET	1400 250 350
13	COVER GASKET	1400 250 200	27	PLUG	1400 250 360
14	BREATHER	1400 250 380	28	INPUT OIL SEAL	1400 250 370

CLUTCH

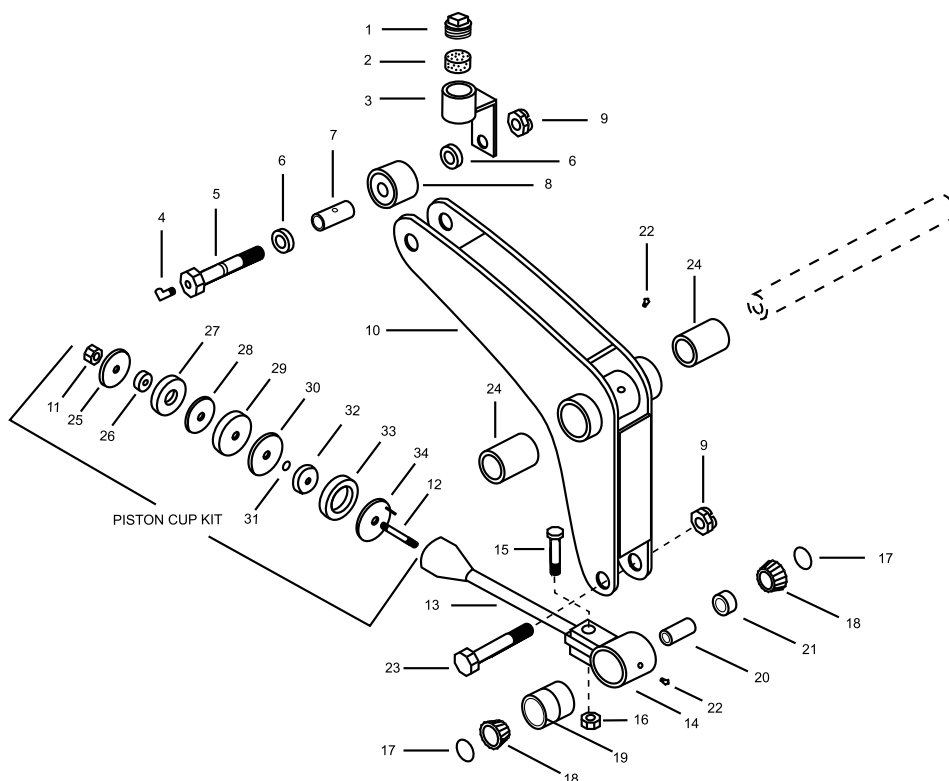


VIEW SHOWN THROUGH COVER PLATE

REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	CLUTCH ASSEMBLY W/ SHAFT (Standard)	1400 300 180	11	RETAINING RING	1400 300 100
1	CLUTCH ASSEMBLY W/SHAFT (Pumps w/hyd mixer)	1400 300 181	12	RETAINING RING	
2	CLUTCH KEY	1400 300 150	13	SPACER	1400 300 120
3	V-BELT (Pumps w/ Wisconsin VH4D)	1400 300 190	14	BEARING	00336010ZZE
3	V-BELT (Pumps w/ Hatz 2M41)	1400 300 191	15	PLATE	1400 300 223
4	BOLT (Pumps w/ Wisconsin VH4D)	1010 000 019	16	BOLT	
4	BOLT (Pumps w/ Hatz 2M41)	1010 000 095	17	NUT	
5	LOCK WASHER	1030 000 021	18	RETAINING RING	1400 300 100
6	WASHER	1030 000 034	19	HUB ASSY	1400 300 222
7	SPROCKET (V600 model only)	0040P448M20QD	20	SHOE	1400 300 220
8	BUSHING	00400051	21	WASHER (Pumps W/ hydraulic mixer only)	1030 000 014
9	BUSHING	0040161017/16	22	SPRING	1400 300 221
10	PULLEY (Compressor)	1400 300 062			

PARTS BREAKDOWN

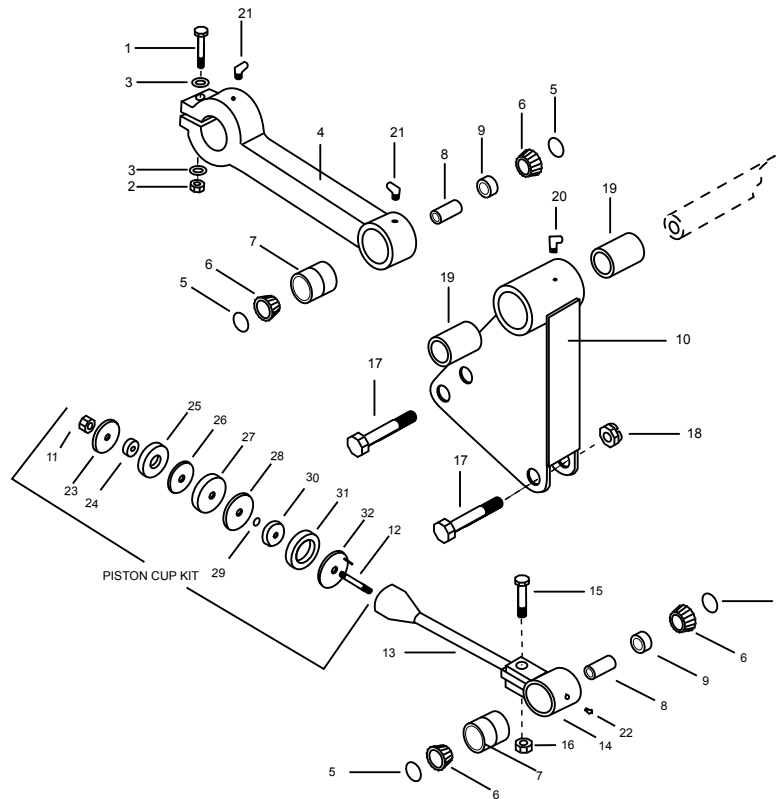
ROCKER ARM CAM



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	CAM OIL PLUG	1040 000 002	26	EXPANDER SPACER	1400 350 260
2	CAM OILER FELT	2010 000 002	26	EXPANDER SPACER 2-3/4"	1400 350 261
3	CAM OILER BRACKET	1400 350 030	27	EXPANDER 3-3/4"	1400 350 270
4	GREASE FITTING	1400 350 040	27	EXPANDER 3-1/2"	1400 350 271
5	CAM ROLLER BOLT	1098 000 002	27	EXPANDER 2-3/4"	1400 350 272
6	SPACER-CAM ROLLER	1098 000 003	28	EXPANDER WASHER 3-3/4"	1400 350 280
7	BUSHING CAM ROLLER	1540 000 003	28	EXPANDER WASHER 3-1/2"	1400 350 281
8	CAM ROLLER BEARING	1510 000 003	28	EXPANDER WASHER 2-3/4"	1400 350 282
	CAM ROLLER BEARING KIT (REF# 4-9)	1400 350 080K	29	PISTON CUP 3-3/4"	1400 350 290
9	FLEX NUT	1020 000 021		PISTON CUP KIT 3-3/4"	1400 350 290K
10	ROCKER ARM -CAM	1400 350 100		INCLUDES 11, 12, 25-34	
11	NUT	1400 350 110	29	PISTON CUP 3-1/2"	1400 350 291
12	STUD-PISTON ROD	1400 350 120		PISTON CUP KIT 3-1/2"	1400 350 291K
13	PISTON ROD	1400 350 130		INCLUDES 11, 12, 25-34	
14	PISTON ROD BEARING HOUSING	1400 350 140	29	PISTON CUP 2-3/4"	1400 350 292
15	HEX BOLT	1010 000 080		PISTON CUP KIT 2-3/4"	1400 350 292K
16	LOCK NUT	1020 000 018		INCLUDES 11, 12, 25-34	
17	O RING	2020 000 003	30	BACK UP WASHER 3-3/4"	1400 350 300
18	TAPERED BEARING	1520 000 002	30	BACK UP WASHER 3-1/2"	1400 350 301
	TAPERED BEARING KIT (REF# 17-21)	1400 350 180K	30	BACK UP WASHER 2-3/4"	1400 350 302
19	DOUBLE RACE	1530 000 002	31	O-RING SEAL	1400 350 310
20	BUSHING	1540 000 001	32	FELT SPACER	1400 350 320
21	CRUSH RING	1098 000 001	32	FELT SPACER 2-3/4"	1400 350 321
22	GREASE FITTING	3598 000 002	33	OILER FELT 3-3/4"	1400 350 330
23	HEX BOLT	1400 350 230	33	OILER FELT 3-1/2"	1400 350 331
24	BRONZE BUSHING	1540 000 002	33	OILER FELT 2-3/4"	1400 350 332
25	COMPRESSION WASHER 3-3/4"	1400 350 250	34	OILER PLATE 3-3/4" OR 3-1/2"	1400 350 340
25	COMPRESSION WASHER 3-1/2"	1400 350 251	34	OILER PLATE 2-3/4"	1400 350 341
25	COMPRESSION WASHER 2-3/4"	1400 350 252			

PARTS BREAKDOWN

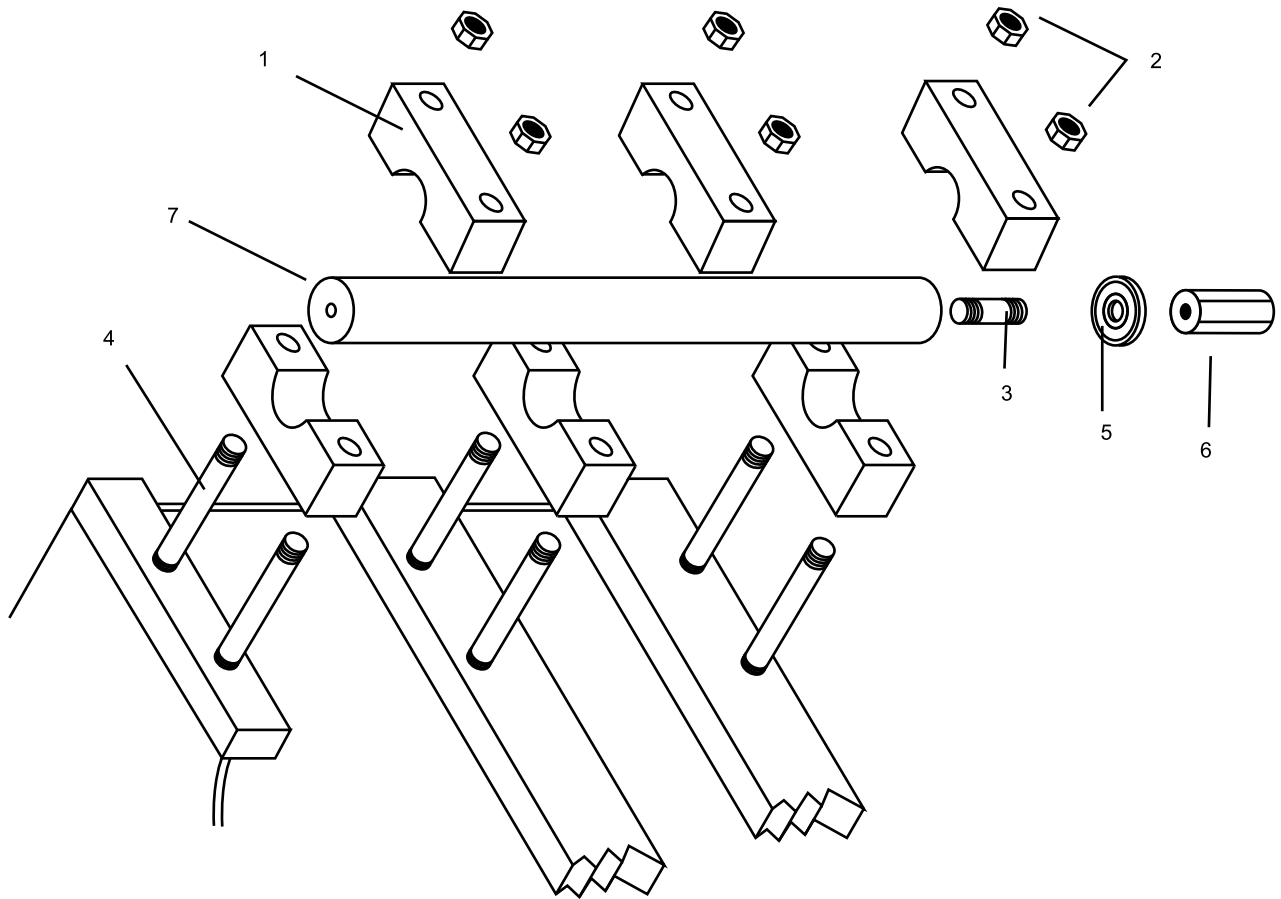
ROCKER ARM CRANK



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	HEX BOLT	1010 000 097	24	EXPANDER SPACER 2-3/4"	1400 350 261
2	LOCK NUT	1020 000 003	25	EXPANDER 3-3/4"	1400 350 270
3	WASHER	1030 000 011	25	EXPANDER 3-1/2"	1400 350 271
4	CONNECTING ROD	1400 400 040	25	EXPANDER 2-3/4"	1400 350 272
5	SEAL	2020 000 003	26	EXPANDER WASHER 3-3/4"	1400 350 280
6	TAPERED BEARING	1520 000 002	26	EXPANDER WASHER 3-1/2"	1400 350 281
	TAPERED BEARING KIT (REF# 5-9)	1400 350 180K	26	EXPANDER WASHER 2-3/4"	1400 350 282
7	DOUBLE RACE	1530 000 002	27	PISTON CUP 3-3/4"	1400 350 290
8	BUSHING	1540 000 001		PISTON CUP KIT 3-3/4" INCLUDES	1400 350 290K
9	SPACER	1098 000 001		#'s 11, 12, 25 THRU 34	
10	ROCKER ARM -CRANK	1400 400 100	27	PISTON CUP 3-1/2"	1400 350 291
11	LOCK NUT	1400 350 110		PISTON CUP KIT 3-1/2" INCLUDES	1400 350 291K
12	STUD-PISTON ROD	1400 350 120		#'s 11, 12, 25 THRU 34	
13	PISTON ROD	1400 350 130	27	PISTON CUP 2-3/4"	1400 350 292
14	PISTON ROD BEARING HOUSING	1400 350 140		PISTON CUP KIT 2-3/4" INCLUDES	1400 350 292K
15	HEX BOLT	1010 000 080		#'s 11, 12, 25 THRU 34	
16	LOCK NUT	1020 000 018	28	BACK UP WASHER 3-3/4"	1400 350 300
17	HEX BOLT	1400 350 230	28	BACK UP WASHER 3-1/2"	1400 350 301
18	FLEX NUT	1020 000 021	28	BACK UP WASHER 2-3/4"	1400 350 302
19	BRONZE BUSHING	1540 000 002	29	O-RING SEAL	1400 350 310
20	GREASE FITTING	3598 000 002	30	FELT SPACER	1400 350 320
21	GREASE FITTING	3598 000 007	30	FELT SPACER 2 3/4"	1400 350 321
22	GREASE FITTING	3598 000 004	31	OILER FELT 3-3/4"	1400 350 330
23	COMPRESSION WASHER 3-3/4"	1400 350 250	31	OILER FELT 3-1/2"	1400 350 331
23	COMPRESSION WASHER 3-1/2"	1400 350 251	31	OILER FELT 2-3/4"	1400 350 332
23	COMPRESSION WASHER 2-3/4"	1400 350 252	32	OILER PLATE 3-3/4" OR 3-1/2"	1400 350 340
24	EXPANDER SPACER	1400 350 260	32	OILER PLATE 2-3/4"	1400 350 341

PARTS BREAKDOWN

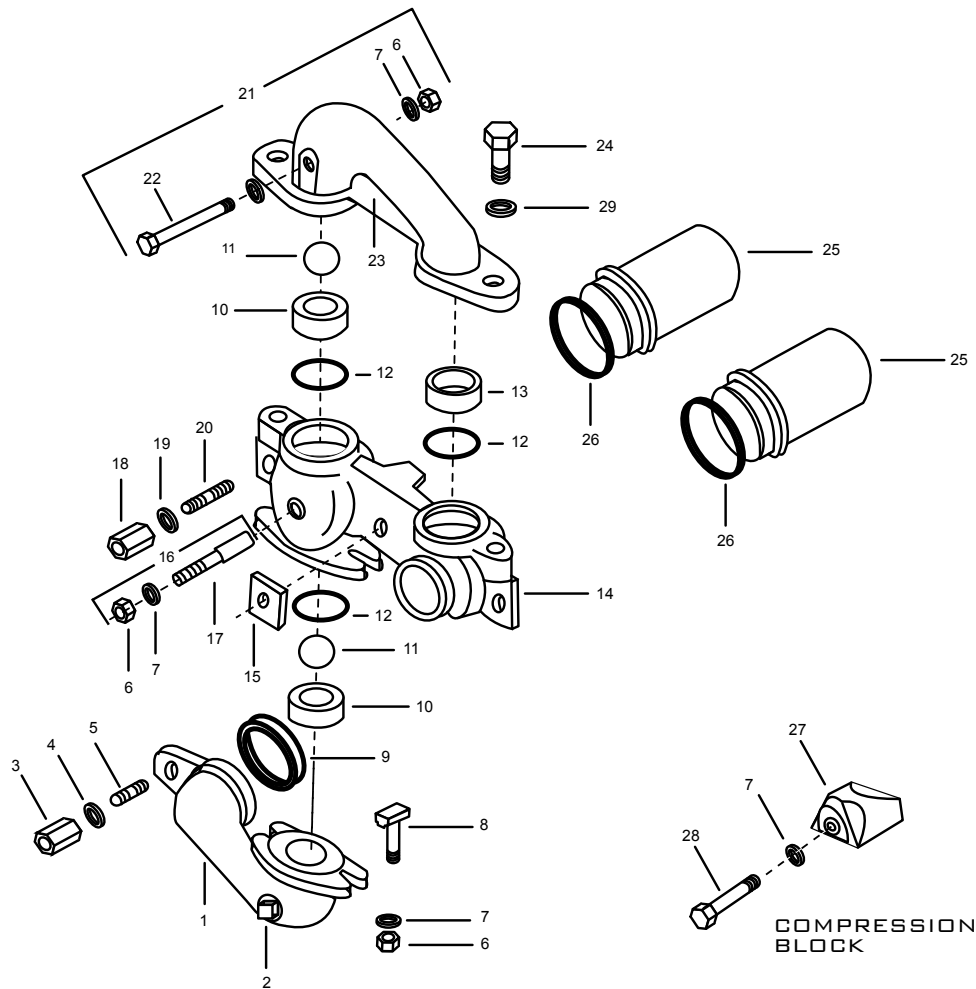
ROCKER ARM SHAFT



REF	DESCRIPTION	PART #
1	ROCKER SHAFT CLAMP	1598 000 002
2	LOCK NUT	1020 000 003
3	STUD	1400 450 030
4	STUD	1400 450 040
5	GROOVED WASHER	1400 450 050
6	NUT ADJUSTING GEARBOX	1400 450 060
7	ROCKER SHAFT	1400 450 070

PARTS BREAKDOWN

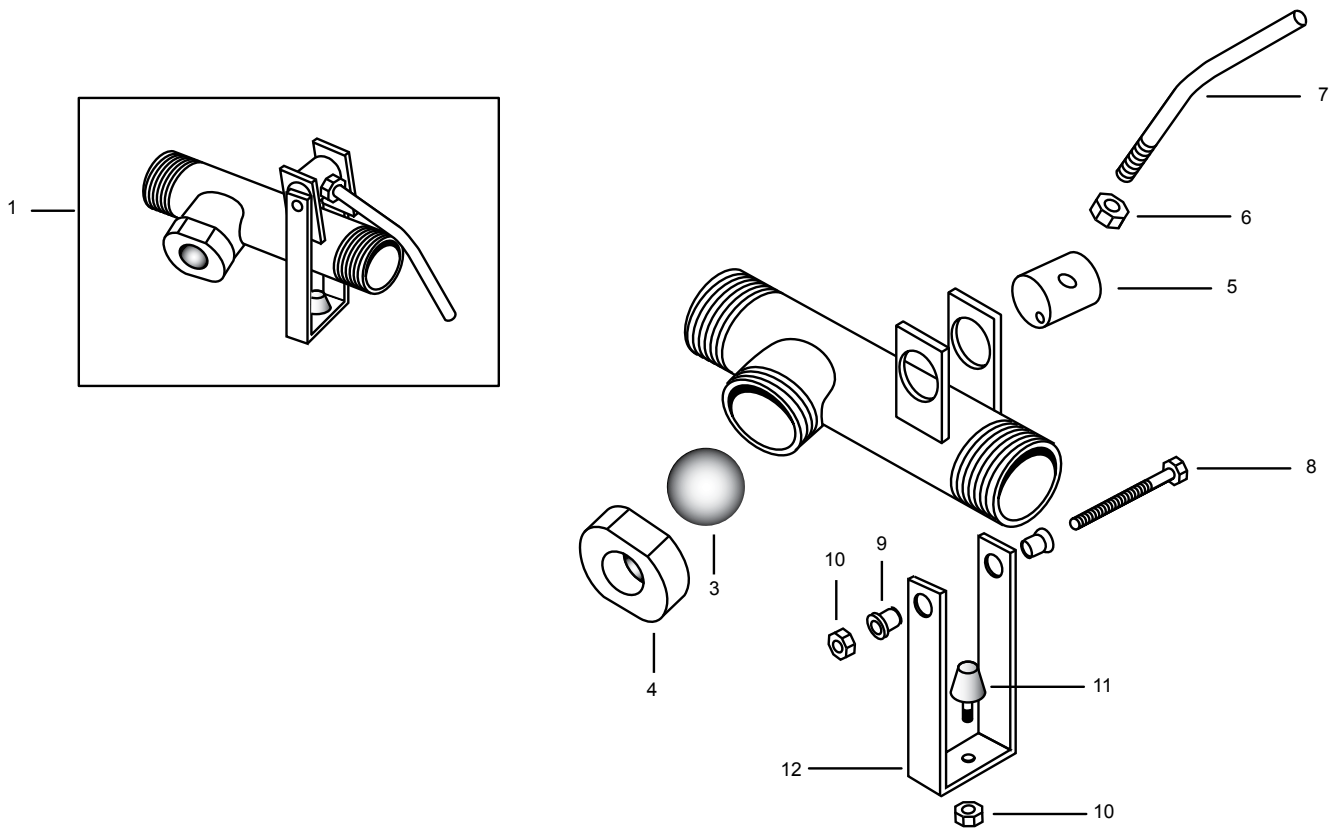
MANIFOLD



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	MANIFOLD ELBOW	1400 500 010	14	MANIFOLD CENTER SECTION HD 3"	1400 500 144
2	HEX PLUG-MANIFOLD	1400 500 020	15	WASHER-SQUARE MANIFOLD	1400 500 150
3	COUPLER NUT	1400 500 030	16	BALL STOP PIN ASSY (REF# 6, 7, 17)	1400 500 160
4	MANIFOLD WASHER	1030 000 039	17	BALL STOP PIN -CENTER SECTION	1010 000 078
5	STUD	1400 500 050	18	COUPLER NUT	1400 500 190
6	NUT	1020 000 022	19	MANIFOLD WASHER	1400 500 200
7	WASHER	1030 000 034	20	STUD	1400 500 210
8	T-SLOT BOLT	1010 000 065	21	CROSS OVER STOP PIN ASSY	1400 500 220
9	HOPPER SEAL OUTLET	1400 500 091	22	CROSS OVER STOP PIN	1400 500 230
10	SEAT-TUNGSTEN CARBIDE HIGH VOLUME	1400 500 100	23	MANIFOLD CROSS OVER	1400 500 240
10	SEAT -TUNGSTEN CARBIDE STD	1400 500 101	24	HEX BOLT	1010 000 081
11	STEEL CHECK BALL 2"	1400 500 110	25	CYLINDERS 3 3/4	1400 500 260
11	STEEL CHECK BALL 2-1/8	1400 500 111	25	CYLINDERS 3 1/2	1400 500 261
11	URETHANE CHECK BALL	1400 500 112	25	CYLINDERS 2 3/4	1400 500 262
12	SEAT O-RING	2020 000 003	26	CYLINDER SEAL	1400 500 270
13	CONNECTING RING	1400 500 130	27	COMPRESSION BLOCK	1400 500 280
14	MANIFOLD CENTER SECTION 2"	1400 500 140		COMPRESSION BLOCK KIT REF 7,28,29	1400 500 280K
14	MANIFOLD CENTER SECTION 3"	1400 500 141	28	HEX BOLT	1010 000 015
14	MANIFOLD CENTER SECTION TAG 2"	1400 500 142	29	WASHER	1030 000 009
14	MANIFOLD CENTER SECTION TAG 3"	1400 500 143			

PARTS BREAKDOWN

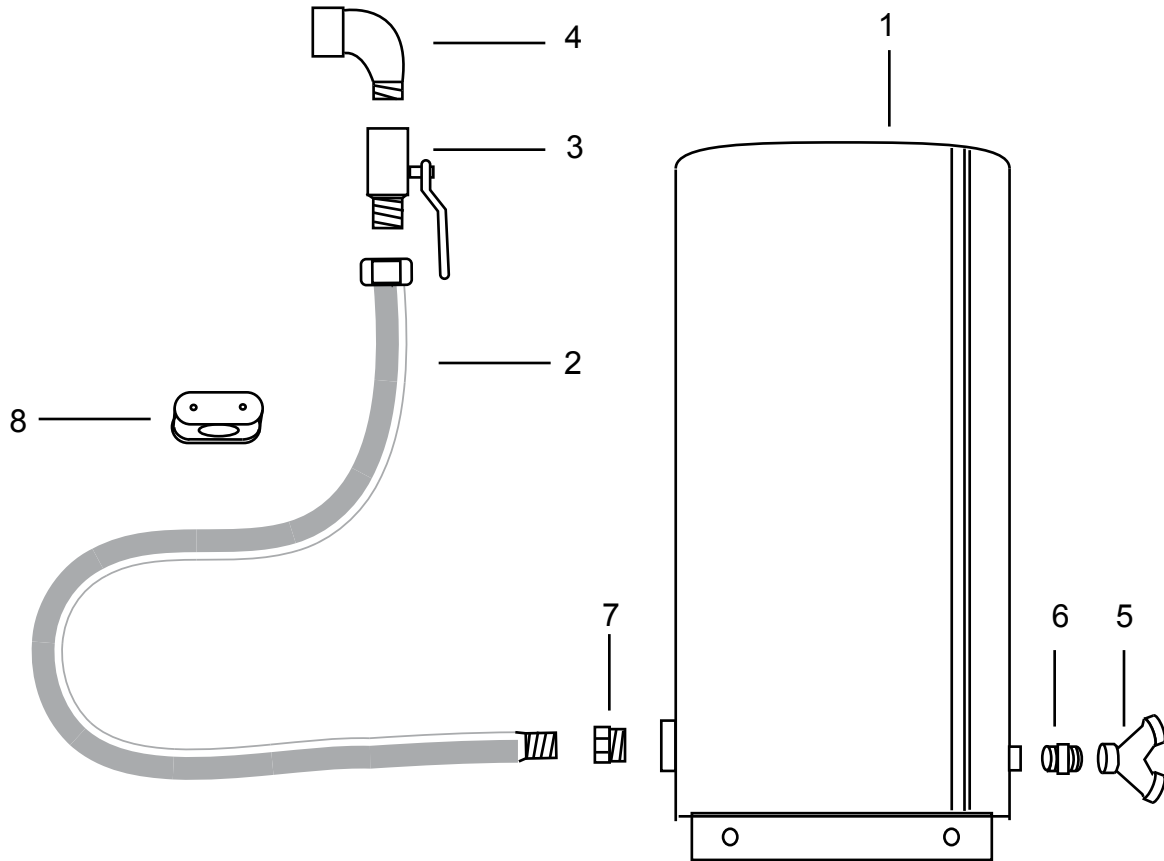
PRESSURE RELIEF VALVE



REF	2" NPT PRESSURE RELIEF VALVE DESCRIPTION	PART #	REF	3" NPT PRESSURE RELIEF VALVE DESCRIPTION	PART #
1	PRESSURE RELIEF VALVE ASSY 2" NPT	1400 550 010	1	PRESSURE RELIEF VALVE ASSY 3" NPT	1400 550 014
3	PRV BALL 1000 PSI	1400 550 031	3	PRV BALL 1000 PSI	1400 550 031
3	PRV BALL 700 PSI	1400 550 032	3	PRV BALL 700 PSI	1400 550 032
4	PRESSURE RELIEF CAP	1400 550 040	4	PRESSURE RELIEF CAP	1400 550 040
5	ECCENTRIC 2"	1400 550 050	5	ECCENTRIC 3"	1400 550 051
6	NUT	1020 000 022	6	NUT	1020 000 022
7	HANDLE PRV	1400 550 070	7	HANDLE PRV	1400 550 070
8	HEX BOLT	1010 000 021	8	HEX BOLT	1010 000 105
9	BUSHING	1400 550 090	9	BUSHING	1400 550 090
10	LOCK NUT	1020 000 002	10	LOCK NUT	1020 000 002
11	PRV RELIEF PLUG	1400 550 110	11	PRV RELIEF PLUG	1400 550 110
12	YOKE 2"	1400 550 140	12	YOKE 3"	1400 550 141

PARTS BREAKDOWN

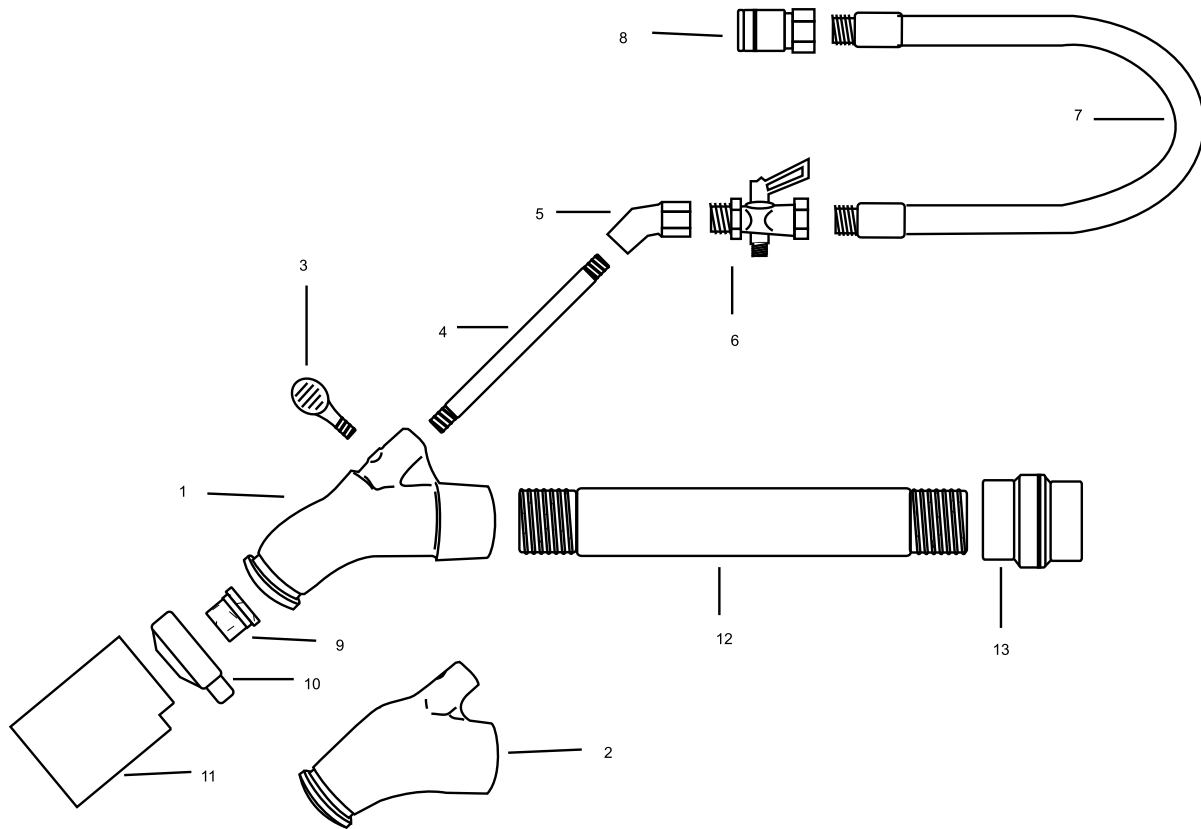
WATER TANK SYSTEM



REF	DESCRIPTION	PART #
1	WATER TANK	1400 600 010
2	WATER TANK HOSE 1"	1400 600 032
3	BALL VALVE-WATER TANK 1"	1400 600 051
4	ELBOW 90 DEGREE 1" MXF	1400 600 061
5	BRASS HOSE BIBB Y	1400 600 080
6	ADAPTER NPT X GHT	1400 600 150
7	REDUCING BUSHING	00220517
8	HOSE MOUNT	1400 020 083

PARTS BREAKDOWN

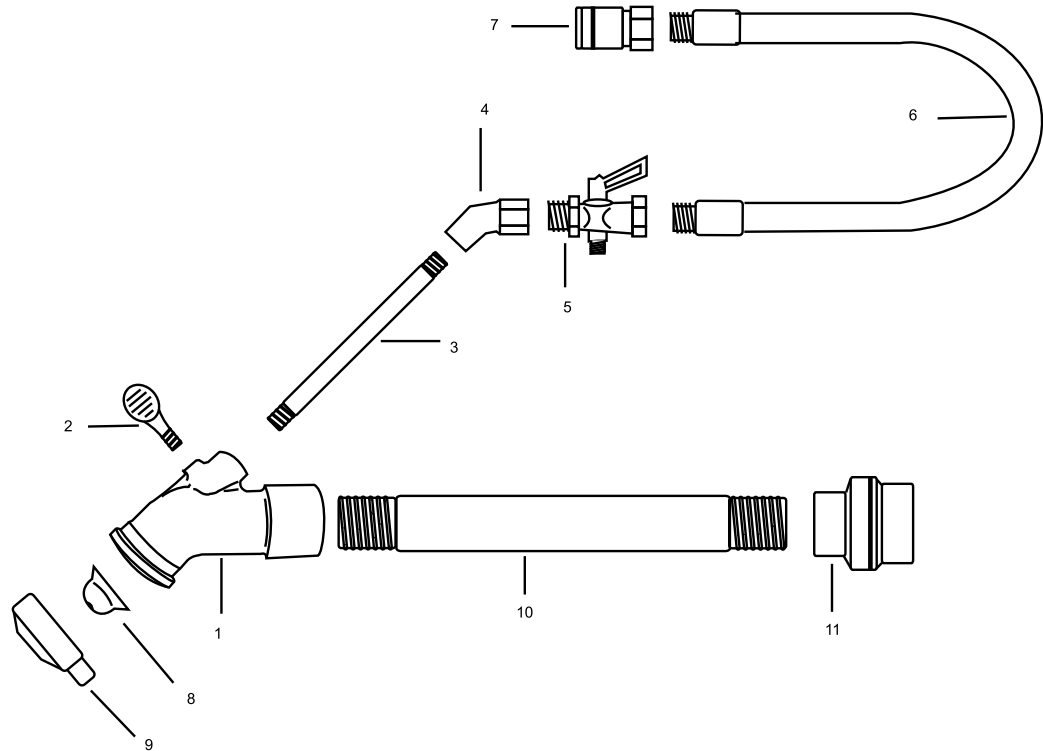
BROWNING NOZZLE



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
	BROWNING NOZZLE LONG COMPLETE	1400 650 010K	9	ORIFICE TUFF-BOY 9/16"	1400 650 090
1	BROWNING NOZZLE LONG	1400 650 010	9	ORIFICE TUFF-BOY 5/8"	1400 650 091
2	BROWNING NOZZLE SHORT	1400 650 020	9	ORIFICE TUFF-BOY 11/16"	1400 650 092
3	THUMB SCREW	1400 650 030	9	ORIFICE TUFF-BOY 3/4"	1400 650 093
4	AIR STEM STEEL L. HOLE SHORT	1400 650 040	10	RUBBER NOZZLE CAP	1400 650 102
4	AIR STEM STEEL S. HOLE SHORT	1400 650 041	10	RUBBER NOZZLE CAP SOFT	5210EM400668
4	AIR STEM STEEL L. HOLE LONG	1400 650 042	11	NOZZLE SHIELD 3-3/4"	1400 650 110
4	AIR STEM STEEL S.HOLE LONG	1400 650 043	11	NOZZLE SHIELD 3-1/2"	1400 650 111
5	AIR STEM ELBOW	1400 650 050	11	NOZZLE SHIELD 3"	1400 650 112
6	DRAIN COCK	1400 100 070	12	EXTENSION ALUM 1-1/4" X 9"	1400 650 120
7	AIR HOSE ASSEMBLY 12"	1400 650 070	12	EXTENSION ALUM 1-1/4" X 6"	1400 650 121
7	AIR HOSE ASSEMBLY 15"	1400 650 071	12	EXTENSION ALUM 1-1/4" X 3	1400 650 122
7	AIR HOSE ASSEMBLY 24"	1400 650 072	13	SWIVEL STEEL 1-1/4" X 1-1/4"	1400 650 130
8	COUPLER	1400 650 080			

PARTS BREAKDOWN

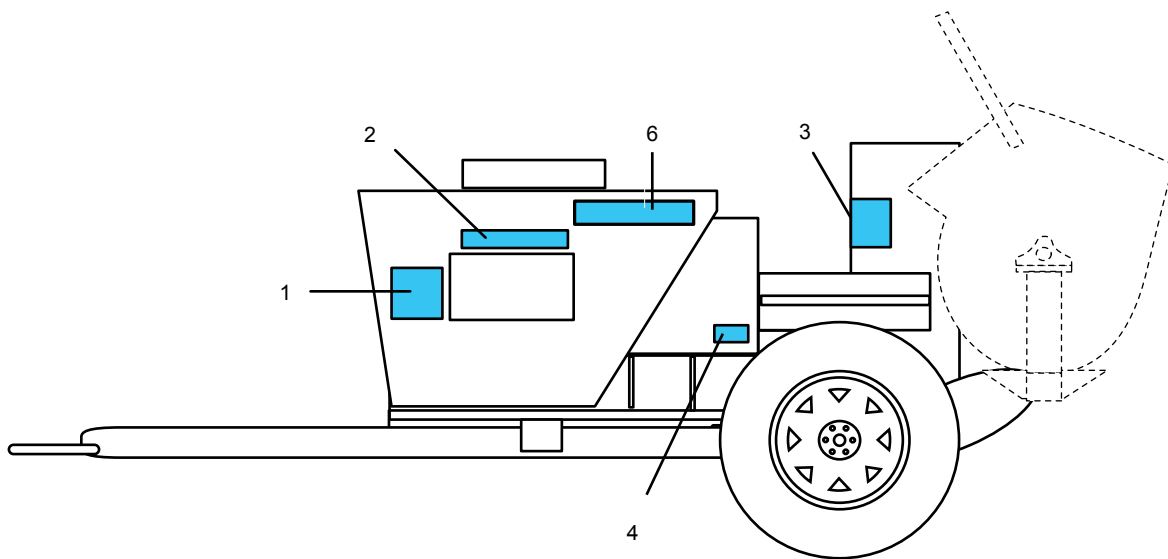
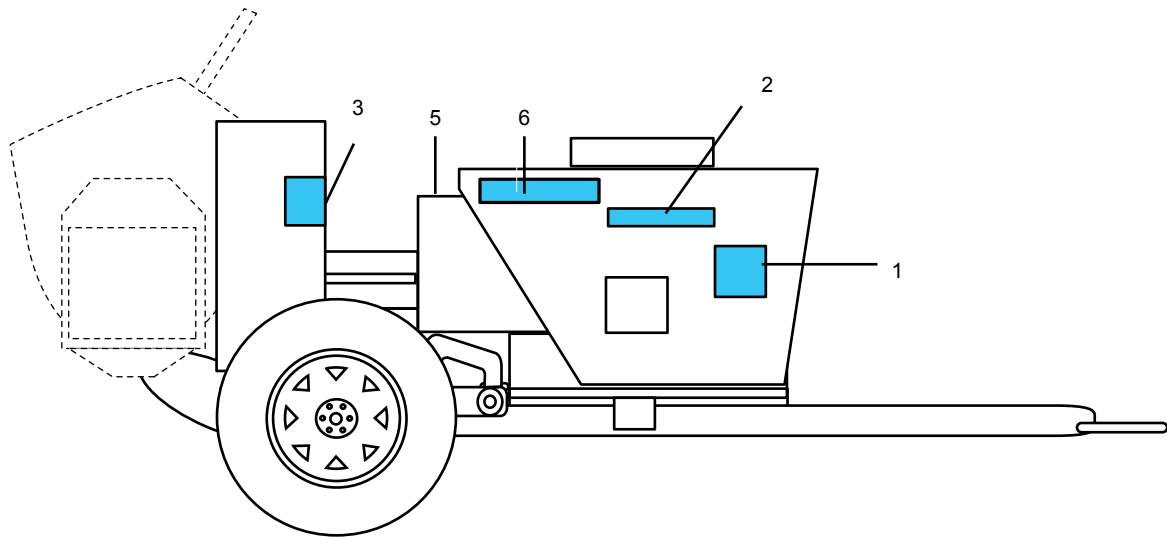
FINISH NOZZLE



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
	FINISHING NOZZLE COMPLETE	1400 700 010K	8	ORIFICE STEEL 3/8"	1400 700 082
1	FINISHING NOZZLE	1400 700 010	8	ORIFICE STEEL 1/2"	1400 700 083
2	THUMB SCREW	1400 650 030	8	ORIFICE STEEL 9/16"	1400 700 084
3	AIR STEM STEEL L. HOLE SHORT	1400 650 040	8	ORIFICE STEEL 5/8"	1400 700 085
3	AIR STEM STEEL S. HOLE SHORT	1400 650 041	8	ORIFICE STEEL 11/16"	1400 700 086
3	AIR STEM STEEL L. HOLE LONG	1400 650 042	8	ORIFICE STEEL 3/4"	1400 700 087
3	AIR STEM STEEL S.HOLE LONG	1400 650 043	9	RUBBER NOZZLE CAP	1400 650 102
4	AIR STEM ELBOW	1400 650 050	9	RUBBER NOZZLE CAP SOFT	5210EM400668
5	DRAIN COCK	1400 100 070	10	EXTENSION ALUM 1" X 9"	1400 7000 110
6	AIR HOSE ASSEMBLY 12"	1400 650 070	10	EXTENSION ALUM 1" X 6"	1400 7000 111
6	AIR HOSE ASSEMBLY 15"	1400 650 071	10	EXTENSION ALUM 1" X 3"	1400 700 112
6	AIR HOSE ASSEMBLY 24"	1400 650 072	11	SWIVEL STEEL 1" X 1-1/4"	1400 700 110
7	COUPLER	1400 650 080			
8	ORIFICE STEEL 1/4"	1400 700 080			
8	ORIFICE STEEL 5/16"	1400 700 081			

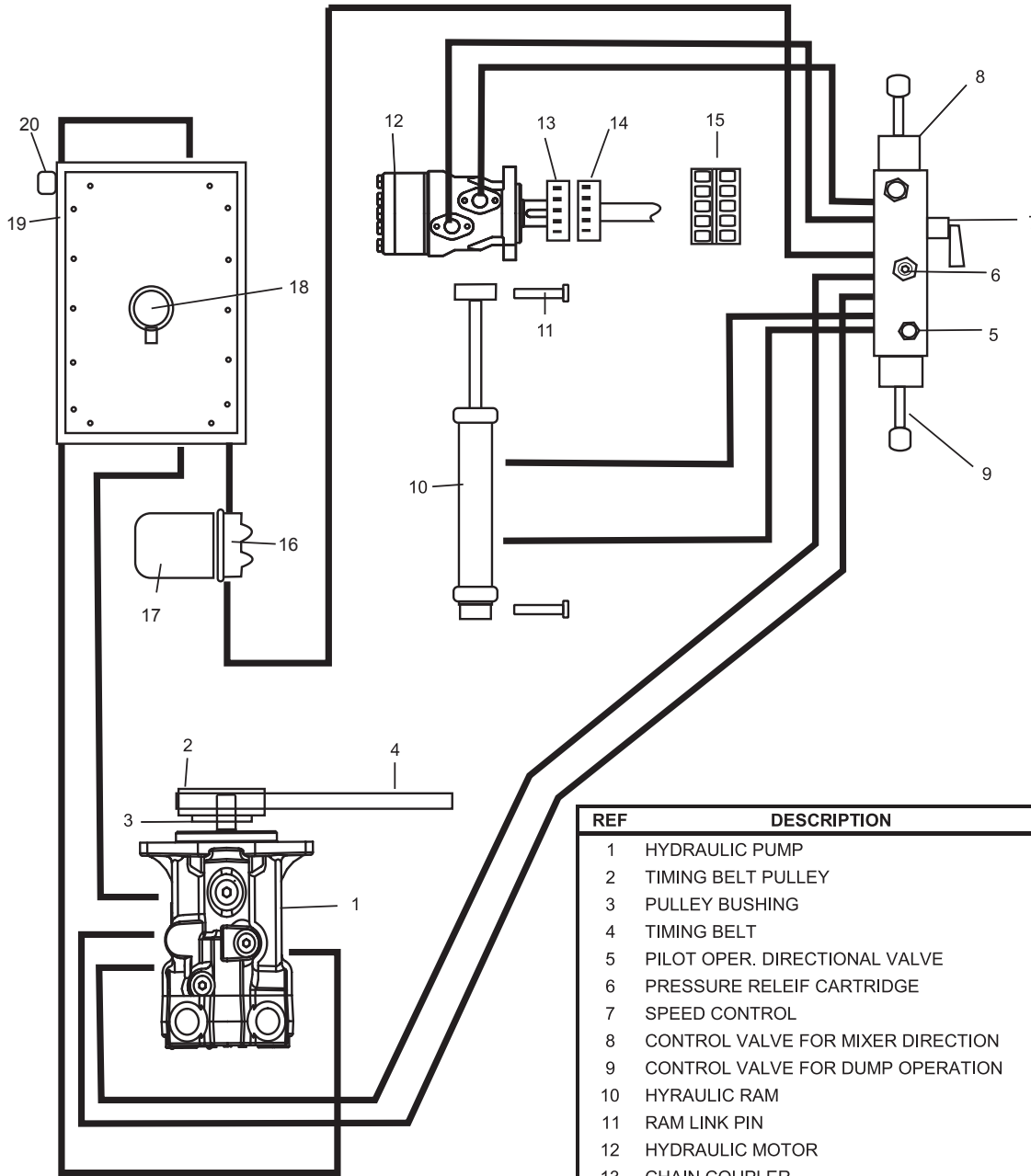
PARTS BREAKDOWN

SAFETY LABELS



REF	DESCRIPTION	PART #
1	DECAL - "CAUTION:REMOTE CONTROLLED..."	0500 000 014
2	PLATE - WESTERN MFG.-16"	0500 000 002
3	DECAL - WESTERN SUN-8"	0500 000 011
4	PLATE - SERIAL NUMBER - NOT FOR SALE	0500 000 021
5	DECAL - GASOLINE	0500 000 017
5	DECAL - DIESEL	0500 000 016
6	DECAL - V600 14"	0500 000 005

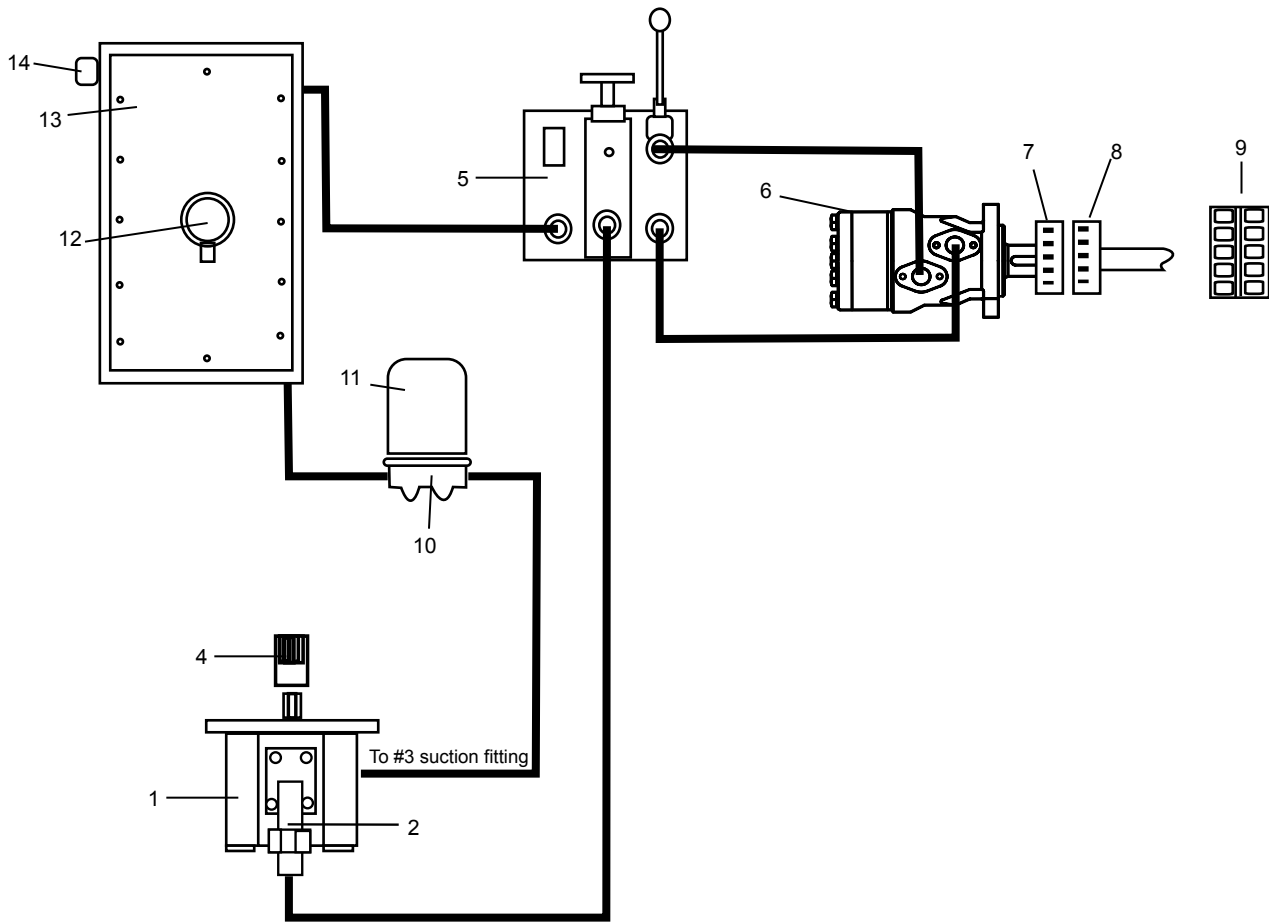
POWERDUMP HYDRAULIC CIRCUIT COMPONENTS



REF	DESCRIPTION	PART #
1	HYDRAULIC PUMP	53017005538
2	TIMING BELT PULLEY	0040P448M20QD
3	PULLEY BUSHING	0040SDS7/8QD
4	TIMING BELT	00408008M20
5	PILOT OPER. DIRECTIONAL VALVE	1200400060
6	PRESSURE RELIEF CARTRIDGE	1200400070
7	SPEED CONTROL	1200400050
8	CONTROL VALVE FOR MIXER DIRECTION	1200400010
9	CONTROL VALVE FOR DUMP OPERATION	1200400020
10	HYRAULIC RAM	5301216-703
11	RAM LINK PIN	00200036
12	HYDRAULIC MOTOR	5301151H1046
13	CHAIN COUPLER	0040501811/4
14	CHAIN COUPLER	0040501815/8
15	CHAIN FOR COUPLER	00405018
16	FILTER HOUSING	5301P563278
17	FILTER ELEMENT	5301P562198
18	TANK CAP	12HD100110
19	TANK WITH CLEANOUT LID	12HD100101
20	GAUGE	2000T-LLG-5

PARTS BREAKDOWN

H3 HYDRAULIC MIXER DIAGRAM



REF	DESCRIPTION	PART #
1	GEAR PUMP	5301SNP2/19SS
2	ELBOW FITTING (PRESSURE)	5301GF-35LK
3	GEAR PUMP FITTING (SUCTION)	5301GF-40LK
4	SPLINED COUPLING	503001062300
5	PM VALVE H3	5301650516
6	HYDRAULIC MOTOR	5301151H1046
7	CHAIN COUPLER	0040501811/4
8	CHAIN COUPLER	0040501815/8
9	CHAIN FOR COUPLER	00405018
10	FILTER HOUSING	5301P563278
11	FILTER ELEMENT	5301P562198
12	TANK CAP	12HD100110
13	TANK	12HD100101
14	GAUGE	2000T-LLG-5

PARTS BREAKDOWN

NOTES
