

WBOSD

SUPER DUTY

Operator's Manual & Parts Breakdown



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INTRODUCTION

The primary purpose of this manual is to assist the operator and maintenance personnel to better understand, operate and maintain the TRAILER MOUNTED W30 CONCRETE PUMP in a safe and proficient manner. This manual has been produced as a VALUABLE tool for our CUSTOMERS. It consists of an Operation Section, General Maintenance, Repair Procedures and Illustrated Parts Section. It is in the BEST INTEREST of everyone involved with the operation, maintenance, and repair of the machine to READ and thoroughly UNDERSTAND all sections of this manual.

In general, this manual covers the servicing of the machine and ASSOCIATED STANDARD EQUIPMENT. In some cases these machines are supplied with various options and specialized equipment. If service information is not found in this manual and information is required, it is suggested that the PRODUCT SUPPORT DEPARTMENT be contacted. The proper information will then be forwarded if available at time of request. All product descriptions, illustrations and specifications were in effect at the time the manual was release for printing.

Western Equipment Manufacturing, Inc. RESERVES THE RIGHT TO MAKE CHANGES IN DESIGN OR TO MAKE ADDITIONS TO OR IMPROVEMENTS IN ITS PRODUCTS WITHOUT IMPOSING ANY OBLIGATIONS UPON ITSELF TO INSTALL THEM ON ITS PRODUCTS PREVIOUSLY MANUFACTURED.

DESCRIPTION OF THE W30SD

The W30 is a trailer-mounted concrete and grout pump of the mechanical ball valve design. It is used to pump wet concrete through a delivery system of pipes and hoses. It is of rugged construction and durable design enabling the unit to pump even the harshest mixes within its published ratings/specifications. Operation of the pump can be controlled at the panel located on the engine or by the remote control unit.

The W30 Series pump can be powered by a 30HP Wisconsin VH4D gasoline engine or a 37HP Hatz 2M41Z diesel engine. Both operate at about 2,500 RPM. The design of the pump utilizes a 2 cylinder pumping system. One cylinder powered by the crank pumps the material. The other cylinder referred to as the compensating system is used to level out or eliminate the excess pulsations of the material to be pumped thus providing for a steady smooth rate of material flow. Steel balls are used to seal off the material on suction and discharge. A 6 cubic foot (170L) capacity hopper is an integral part of the machine. The pump is mounted on a tow able trailer.



OPERATOR QUALIFICATIONS

Each W30 has undergone a thorough Quality Control inspection at the factory. The design incorporates built-in safety features. An average skilled person can readily become proficient in the safe operation of the W30. It is a pressurized efficient concrete pump and can be potentially dangerous in the hands of UNTRAINED or CARELESS OPERATORS. Knowing the characteristics of the machine and function of the controls are important to SAFE, PROPER OPERATION and USE. Becoming familiar with the controls and practices will result in efficient smooth pumping. It is the responsibility of all users to read and comply with the following rules and information designed to promote SAFETY and UNDERSTANDING of the W30.

- A thorough understanding of the operating characteristics and limitations of the W30 is always the first requirement for any user, regardless of his prior experience with similar type of equipment.
- Only QUALIFIED/AUTHORIZED and TRAINED personnel must be ALLOWED to operate the W30. A QUALIFIED/TRAINED operator is one who has READ and UNDERSTOOD the instructions in this manual and is thoroughly familiar with the operating characteristics and limitations of the machine.
- The W30 concrete pump must not be operated by individuals who cannot READ and UNDERSTAND the signs, warning, notices and operating instructions that are a part of the job, in the language in which it is printed.
- KNOW and FOLLOW all cautions, warnings and operating instructions on the machine.
- REPAIR and ADJUSTMENTS must only be made by QUALIFIED/TRAINED personnel. No MODIFICATION is to be made to the machine without prior written consent of the WESTERN EQUIPMENT MANUFACTURING Product Support Department.
- The W30 must have a SIGN-OFF sheet attached to the unit where operators can REPORT ANY DAMAGE, DEFECTS, PROBLEMS or ACCIDENTS to the work supervisor.
- UNDERSTAND and OBEY all applicable Local and Government statutes and regulations applying to safe operation and use of concrete pumping machines.

YOUR SAFETY IS OUR UTMOST CONCERN AND YOUR RESPONSIBILITY

W30SD SPECIFICATIONS

PERFORMANCE	U.S.	METRIC
Maximum Output (Theoretical)	25 cu yards/hr	19 cu meter/hr
Maximum Concrete Pressure	425 PSI	29 BAR
Maximum Aggregate	1/2 in.	12mm
Horizontal Pumping Distance (Note 1)	400ft.	125m
Vertical Pumping Distance (Note 1)	100ft.	30 m
TECHNICAL DATA		
Concrete Cylinders (Diameter X Length)	6 in. X 12 in.	152 X 305 mm
Maximum Strokes per Minute	135	135
Hopper Capacity	6 cubic ft.	170 L
Hopper Height	50 in.	1.27 m
Outlet Diameter	3 in.	76 mm
Steel Ball Diameter - Hopper	4.5 in.	114 mm
Steel Ball Diameter – Discharge	4 in.	101 mm
ENGINE - GASOLINE		
Model	Wisconsin VH4D	
Horsepower	30 HP	
Fuel Tank Capacity	18 Gal/68 L	
ENGINE - DIESEL		
Model	HATZ 2M41	
Horsepower	37 HP	
Fuel Tank Capacity	18 Gal/68 L	
DIMENSIONS		
Length	145 in.	3.68 m
Height	63 in.	1.60 m
Width	60 in.	1.52 m
Weight (Gas)	2586 lbs	1173 kg
Weight (Diesel)	2758 lbs.	1263 kg
Tire Size	14 in.	356 mm

Note - Pumping distances are to be used as a guideline only and can be exceeded on specific projects. Maximum attainable distances depend on concrete mix design, pipeline diameter and job site conditions. Maximum output and pressure cannot be achieved simultaneously.

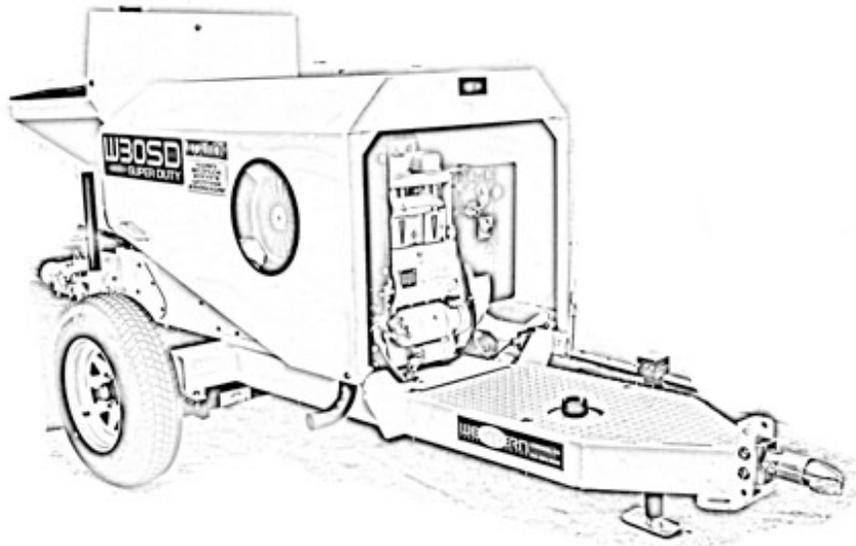
TOWING THE W30SD SERIES

The W30 pump although small in stature compared to larger type construction equipment still requires the same care and attention in TRANSPORTING as does the larger heavier type equipment. At no time should this be OVERLOOKED. The W30 is designed to be towed by a truck at a highway speed up to 55 mph (88 km/h) maximum, depending on road conditions. DO NOT EXCEED.

Because of the narrow width and small gross weight most highway regulations do not require traffic lighting and brakes. CHECK THE REGULATIONS IN YOUR AREA PRIOR TO TOWING THE W30 ON THE HIGHWAY.

Prior to towing the W30 the following SAFETY PRECAUTIONS must be observed:

- Secure hitch to towing vehicle using a 2" ball hitch.
- Attach safety chain to the towing truck.
- Raise and pin the stabilizer legs in retracted position.
- Turn tail light on if required.
- Do not tow the unit with concrete in the hopper.
- Remove all concrete delivery lines from the pump.
- Check the tires for proper inflation pressure. Inspect tires for cuts and excessive wear.



PRE-OPERATION INSPECTION

The CONDITION of the unit prior to start up is a very IMPORTANT factor as it directly affects the operators' SAFETY as well as the others around him. It should be a common practice that the operator performs a general inspection before each day's operation of the W30 pump.

The purpose of the operators' inspection is to keep the W30 in PROPER working condition and to DETECT any sign of malfunction during normal operations between scheduled maintenance checks.

DOWNTIME is COSTLY and can be prevented by taking a few minutes prior to startup. A thorough walk around inspection must be performed each day before the unit is operated. Report any damage or faulty operation immediately. Attach a sign at the control panel stating DO NOT OPERATE. Repair any discrepancies before use. Some major items to check are:

1. OVERALL MACHINE CONDITION

- External structural damage
- Hood latches, hinges missing or damaged
- Wheel lug nuts missing or loose
- Condition of tires-pits, tears, cracks or cuts, inflation
- Decals, placards, warning sign need replaced.

2. ENGINE

- Fuel level in tank
- Proper oil level
- Mounting-bolts, wiring, hoses
- Check for fuel leaks, oil leaks
- Control panel instruments, switches, controls

3. PUMP MECHANISM

- Check condition of drive belt, drive chain
- Missing or loose mounting bolts
- Condition of manifold, hinge pins, wedges and retainers
- Belt and chain guards in place, not damaged

4. BATTERY

- Condition - undamaged
- Cables and connections - ground connection
- Battery hold down condition

5. HOPPER

- Grate in place, not damaged
- Outlet cleanliness

CAUTION: Defective components, structural damage, missing parts or equipment malfunctions, jeopardize the SAFETY of the operator and other personnel and can cause extensive damage to the machine. A POORLY MAINTAINED machine could become the greatest OPERATIONAL HAZARD you may encounter.

PRE-OPERATION INSPECTION

GENERAL SAFETY PRECAUTIONS

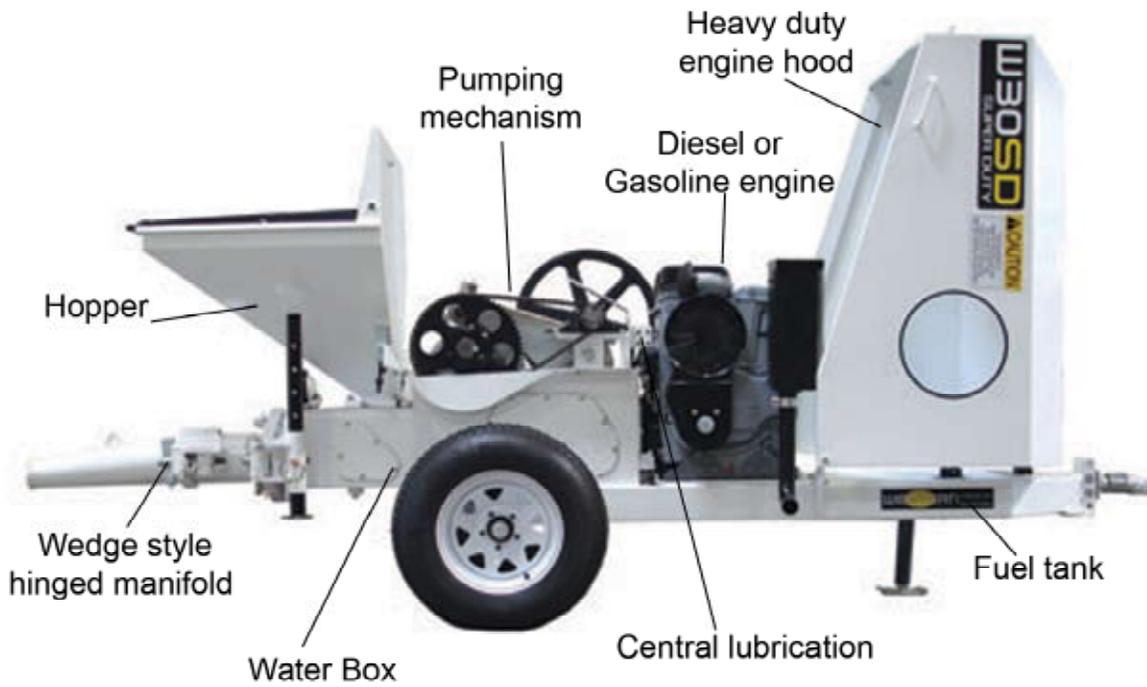
All personnel assigned to operate, repair or troubleshoot the W30 must be thoroughly familiar with the operation/service manual. To WORK SAFELY you must understand and know the JOB you DO. If in doubt, use EXTREME CAUTION and obtain assistance from other trained/qualified personnel. During operation, repair or troubleshooting, problems may arise that seem singular but may be due to several causes. The information in this manual must be used to assist in the safest and best manner of operating and repairing the W30. Areas of CONCERN and requiring the ATTENTION of the operator and those around him:

- No unauthorized persons shall be permitted to assist or remain in the vicinity of the unit while it is in operation or during the performance, inspection, cleaning, or repair of the machine.
- Before start-up check the hopper and remove any obstructions.
- Never enter the hopper with any parts of your body. It is a DANGER area and physical INJURY can occur.
- Do not remove guards or any other safety devices.
- Do not operate the pump with hood open.
- The engine must be turned OFF before performing any maintenance or service functions.
- Do not use worn out hoses or couplings.
- Do not disconnect hose couplings or nozzle while under pressure.
- Do not pour material into hopper without grate in place. Operator must monitor material being dumped in hopper, keeping a watchful eye out for unmixed or dry concrete, sticks, pieces of metal and other foreign objects.

CAUTION: At all times, personal protective equipment required by Federal, State, local and job site regulations should be worn (safety goggles, hard hats, etc.) while operating the W30. If machine is to be left unattended on a job site, secure it from unauthorized use or movements. It is important from a SAFE operational standpoint that you, the OPERATOR, know your machine, the function of each control and its limitations. A GOOD UNDERSTANDING of the controls, limitations and capabilities will enhance operation and assure maximum operating efficiency and SAFETY.

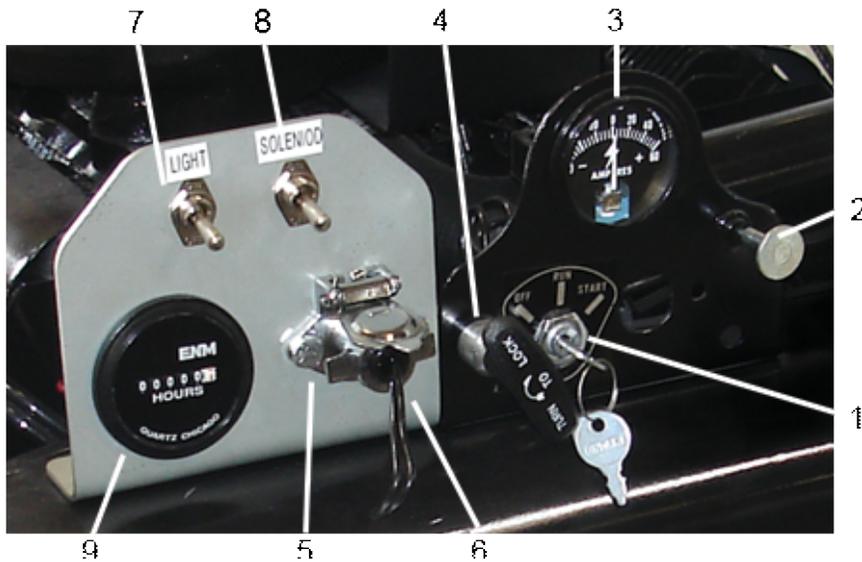
UNIT FAMILIARIZATION

A. MAJOR COMPONENT IDENTIFICATION



B. CONTROL FAMILIARIZATION

GASOLINE POWERED UNITS



1. **KEY SWITCH** – A 3 position key switch used to start and stop engine. Turning key to the right starts engine, release key for run position and turn to OFF to stop engine.
2. **CHOKE** - Push-pull switch used to assist in starting a cold engine. CLOSE choke by PULLING control to extreme out position. Once engine is running push choke control all the way in.
3. **AMMETER**- Used to denote the operation of the battery charge circuit.
4. **THROTTLE** - Push-pull control used to control the engine RPM. It is a variable speed type control. Turning handle to the LEFT unlocks the control allowing it to be pulled out to INCREASE the engine speed. Once desired speed is obtained turn handle to the RIGHT to LOCK IN speed.

NOTE:

Always unlock the throttle lever before pushing in to decrease speed to avoid damage to control.

5. **REMOTE CABLE PLUG** – Used to plug in the remote control cable.
6. **REMOTE BYPASS PLUG** – Used to operate pump without the remote cable.
7. **TAIL LIGHT SWITCH** - Switch used to turn on-off tail light.
8. **REMOTE SOLENOID SWITCH** - Toggle switch used to control the pump. DOWN position is OFF. Move switch UP to engage the solenoid and start pumping at pre-selected throttle speed.

NOTE:

Solenoid will ONLY engage if remote cable is plugged in and switch at end of cable is pulled to the ON position, or if supplied bypass plug is inserted.

9. **HOURLMETER** – Used to keep track of engine hours of operation.

DIESEL POWERED UNITS



1. **IGNITION BOX** – A 3 position key switch used to start and stop engine. Turning key to the right starts engine, release key for run position and turn to LEFT to stop engine. Box includes light indicators for charging system, oil level, temperature and fan belt. (see engine manual for more details)
2. **THROTTLE CONTROL** - Used to adjust the engine RPM. Turning knob COUNTERCLOCKWISE will INCREASE engine speed; CLOCKWISE will DECREASE engine speed.

NOTE:

The control is equipped with a “HOLD-RELEASE” feature. After the desired engine speed is found turn knob located against the bracket clockwise to HOLD speed. This prevents accidental release. To release control lock, turn same knob to RELEASE position and press center button on control. This releases the throttle back to IDLE.

3. **REMOTE CABLE PLUG** – Used to plug in the remote control cable.
4. **REMOTE BYPASS PLUG** – Used to operate pump without the remote cable.

5. **REMOTE SOLENOID SWITCH** - Toggle switch used to control the pump. DOWN position is OFF. Move switch UP to engage the solenoid and start pumping at pre-selected throttle speed.

NOTE:

Solenoid will ONLY engage if remote cable is plugged in and switch at end of cable is pulled to the ON position, or if supplied bypass plug is inserted.

6. **TAIL LIGHT SWITCH** - Switch used to turn on-off tail light.
7. **HOURLMETER** – Used to keep track of engine hours of operation.
8. **WIRELESS REMOTE SWITCH** – (Optional) – 3 Way toggle switch to enable optional wireless remote control. Left position turns remote system ON, center is OFF, and right position turns system into MANUAL. The manual position enables the CABLE remote. See REMTRON manual for more details on wireless remote control.

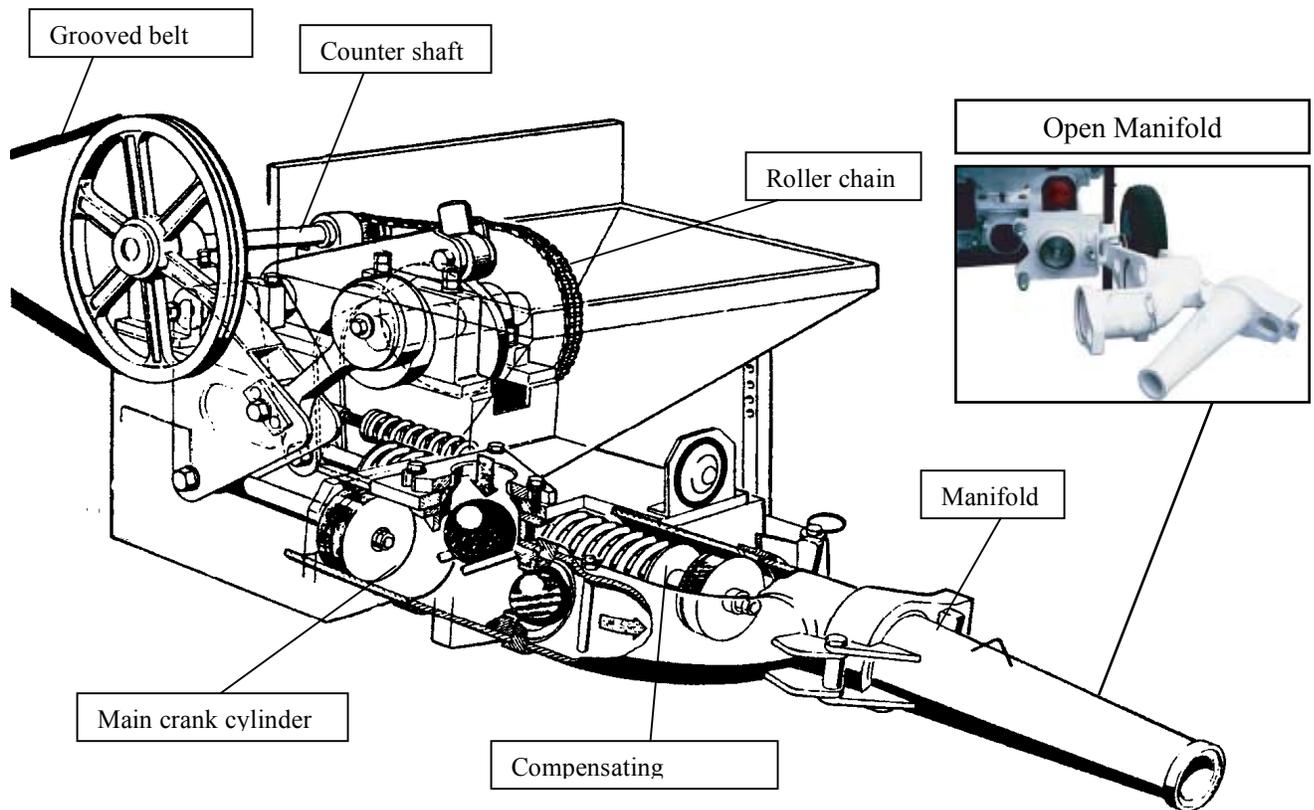
NOTE:

In order to run the wireless remote, SOLENOID SWITCH needs to be on the ON position.

9. **WIRELESS REMOTE RECEIVER** – (Machines with optional wireless control only).

C. PRINCIPLE OF OPERATION

The Western Equipment Manufacturing, Inc. W30 is a Mechanical Ball Valve Pump and is used to pump concrete and/or similar mixes. It is powered by a gasoline or diesel engine.



The engine operating at an operator adjusted speed up to a maximum of about 2,800 RPM is equipped with a centrifugal clutch. The clutch is used to engage or disengage the pumping mechanism based on the engine speed. Although the operator adjusts and presets the engine RPM, a 12 volt solenoid is used to control the speed from idle to preset during the pumping operation.

When the pump switch is placed to "ON" position whether it is from the engine panel or remote, the solenoid opens the throttle bringing the engine RPM to preset speed. When switch is OFF, engine returns to idle. Once the engine reaches 1,100 RPM the centrifugal clutch engages and through a double groove v-belt, drives a sheave attached to one end of the countershaft. The countershaft, supported by pillow block bearings transmits the engine power to a double roller chain sprocket drive which then powers the crankshaft. The crankshaft is equipped with two (2) eccentrics one used for the connecting rod which in turn drives the main cylinder piston and one eccentric is used for the compensating cylinder.

The unit is equipped with two (2) cylinders, a main pumping cylinder and one called a compensating cylinder. The main cylinder does the pumping while the compensator cylinder is used to smooth out the pulsations to

provide for a smooth delivery flow. Installed in the main cylinder are steel balls used to seal off the suction inlet and discharge outlet dependent on the piston stroke. The main cylinder piston rod is connected to a rocker arm which in turn is attached to the crankshaft connecting rod. In operation the rocker arm moves the piston back and forth in the cylinder. As the piston is retracted it unseats the inlet ball allowing or sucking in the concrete material from the hopper. At the same time the suction created by the piston draws the outlet ball against the discharge seat, sealing off the discharge. On the forward stroke of the piston the opposite condition takes place. The outlet ball is pushed open allowing the material to flow out around it and the inlet ball is pushed closed preventing material from entering from the hopper. This reciprocating action is continual and the speed of the piston movement is regulated by the engine speed. The higher the speed the faster the piston action.

Because of the reciprocating action of the main piston the material is pushed out the discharge in spurts, which causes pulsations. To eliminate this pulsation, a cylinder is installed to compensate for this, thus it is termed the compensating cylinder.

The compensating piston is exactly like the main cylinder piston and is installed on a piston rod which has its other end attached to the cam follower arm. The cam follower arm is designed to pivot and the other end of the arm is equipped with a roller which rides on the eccentric cam installed on the crankshaft. The roller is held against the eccentric cam by a return spring rod assembly. This has one end attached to lower part of the cam follower arm so that as the roller rides on the high side of the eccentric the cam follower arm compresses the return spring which then pushes against the arm keeping the roller on the eccentric at the low side area.

As the eccentric cam rotates on the crankshaft the cam arm pivots and as a result it in turn moves the compensator piston back and forth. However, this piston movement is insufficient to do the compensating job, thus added movement of the piston is required. This is accomplished by the installation of large spring over the piston rod behind the piston.

In operation, as the main piston pumps the material out the discharge, back pressure begins to build up in the way (y) manifold and delivery line. This pressure then pushes on the compensating piston and compresses the compensator spring.

As the main piston retracts the outlet ball seals the discharge of the main cylinder and as this takes place the compensating cylinder extends pushing the material further out the delivery line, eliminating any pulsation. It should be noted that the compensator piston does not pump until sufficient back pressure exists to compress compensator spring. The pumping action and compensating action is continual and the operating speed is based on the engine speed.

The outlet or material discharge is equipped with a wedge style hinged manifold and hinged reducer cone. The fixed stop pins allows the outlet system to swing open for clean out and servicing.

OPERATION INSTRUCTIONS

Prior to operation of the W30 for your own SAFETY, it is your RESPONSIBILITY to insure the unit is in proper working condition and the PRE-OPERATION INSPECTION has been performed.

WARNING:

Observe all safety precautions while operating the machine.

A. SETTING UP AT JOB SITE

The W30 should be located on as level ground as possible. Check the condition of the soil or flooring where the machine will be positioned. Keep sufficient distance from excavations and slopes that could breakaway due to support loads. Place chocks behind wheels on inclines and slopes. Every attempt should be made to locate the machine as near as possible to placement site. When location has been determined proceed to level the unit as follows:

- Lower front leveling stand so that pad rests firmly on the ground.
- Lower rear stand so that pad rests firmly on ground.
- Adjust the levelness of the machine using the front or rear stands as necessary. It may be necessary to place wooden blocking under jack pads.

NOTE:

During the pumping operation check periodically the levelness of the unit and any blocking placed under pads.

B. DELIVERY SYSTEM

The delivery system of the W30 is meant to be those components used from the pump discharge to the placement site. This could consist of material hose, steel piping, clamps couplers and reducers. In setting up the delivery systems the following suggestions and recommendations are made. Use the most direct line as is feasible from the W30 to the placement site. Place the hoses or pipe to the farthest point of the placement site from the machine and work back to the unit. It is easier to remove hose sections then to add.

NOTE:

Avoid laying hoses or pipe that requires sharp bends or elbows. This requires more pressure and provides for a good chance of blockage. If the delivery line crosses the rebar, supports must be considered for the hose so that it does not continually come in contact with the rebar.

The steel pipe, elbows, reducers and hoses should be equipped with heavy duty ends. These type ends have higher pressure capability then the standard ends. Western Equipment Manufacturing, Inc. has available a full stock of hoses, pipe, clamps, couplers and reducers to fit your needs.

If the delivery system has not been furnished by Western Equipment Manufacturing, Inc. then it will be necessary to contact the manufacturer for the maximum pressure capability of the delivery components to be used. Only connect together couplings or clamps which are clean and seals the joint retaining the slurry in the delivery line.

WARNING:

Dirty couplings LEAK and when pressurized leak water which inevitably causes blockage.

NOTE:

DO NOT USE any worn or damaged hoses, pipes or couplings. If your pumping job requires a vertical concrete delivery system the vertical pipe line should be anchored to the building every 10 feet (3m) of height.

NOTE:

Vertical and downhill pumping are more difficult than horizontal pumping. Vertical pumping requires higher pumping pressure while down hill pumping causes separation of the concrete which may result in a blockage in the delivery line. Accordingly, back pressure in the delivery line must be kept at all times during downhill pumping.

C. STARTING THE PUMP

Prior to START-UP of the W30, for your own SAFETY, it is your RESPONSIBILITY to insure that the unit is in proper working condition. OBSERVE ALL SAFETY PRECAUTIONS WHILE OPERATING THE W30.

Check the following before starting engine:

- Engine oil level
- Fuel tank level
- Oil reservoir for lubrication system is full
- Cam roller oiler
- That hood over engine and pump mechanism is closed.
- While at the control panel located on engine start engine and allow engine to warm up. (approximately 5 minutes depending on ambient temperature)
- Adjust throttle control to desired engine speed. Lock throttle in position.
- Connect remote cable to receptacle at machine.

NOTE:

Before proceeding to cycle the pump it will be necessary to prime the pump and delivery system. This is accomplished by pumping a coating of lubricating slurry through the pumping system and delivery lines. This will enable the regular concrete mix to flow smoothly.

D. PRIMING THE PUMP AND DELIVERY

One of the most CRITICAL operations of concrete placement is getting the concrete to flow through the hose at the start of the pumping cycle. To accomplish this you MUST prime the pump and hoses before introducing the regular concrete mix.

Products like Prime Time II or a slurry can be used to prime the equipment. The slurry used for priming and lubrication should consist of ½ bag of cement to 5 gallons of water. Place several gallons (3-4) of water in the hopper and pour in approximately 5 gallons of grout slurry. The amount of grout needed for lubrication will depend on the length of the delivery line. Experience will eventually indicate the amount to be required.

Turn PUMP-ON at machine control panel and proceed to pump the grout slurry. As the slurry is pumped out of the hopper the regular concrete mix can be poured into the hopper. Continue pumping, do not STOP unless a blockage occurs until all the slurry has been pumped out and the concrete begins to flow out the end of the hose. After you have lubricated the system and are pumping concrete the REMOTE may be used if desired.

E. OPERATIONAL TIPS AND PRECAUTIONS

Your SAFETY is our utmost CONCERN and it is your RESPONSIBILITY. The following is offered as TIPS AND PRECAUTIONS to be OBSERVED during the concrete placement phase.

CAUTION:

It is IMPORTANT that during the pumping operations, the hopper contain sufficient material. If allowed to empty out air will be sucked into the main pumping cylinder and the continuous smooth flow may be interrupted. Always have the hopper grate mounted firmly in place and never stand on the grate. NEVER place any body part into the hopper while the machine is in operation. Prevent KINKING of the hose during concrete placement. Kinks can stop the material flow allowing excess pressure to build up in the system.

During concrete placement it may be necessary to STOP PUMPING for a period of time possibly due to lack of concrete or other job site problems. During these periods the concrete in the delivery system should be moved every 5-10 minutes. This can be accomplished by starting pump and pump 5-6 strokes then turn off pump. If problem continues for too long, it may be necessary to clean out the delivery system and concrete pump. Determine this from your experience in the material being pumped. If shut down periods exceed 2-3 minutes with material in hopper, it is recommended that the engine be SHUT-DOWN to prevent separating of mix in the hopper due to vibration from the engine.

Hose size is very important and has an immediate effect on the pumping operation. When using harsh mixes, vertical pushes, stiff concrete, shot Crete, or long pushes it is recommended that the use of a 2½" (63.5mm) line be used. This will assist in improved pump ability, less pumping pressure and be better for the machine.

F. TROUBLESHOOTING TIPS - PUMPING & BLOCKAGE

When pumping long distances or stiff mixes you can expect a drop in volume compared to shorter lines and wetter mixes. Water leaking from the hose coupling gaskets can cause separation of the mix in the delivery line and subsequent blockage at that point. Damaged hoses with material restrictions can cause blockages. When using snap joint coupling with gaskets to join hoses, wash and clean after each job. Dip both the couplings and gaskets into water prior to use for easier installation.

A slight pulsation of the delivery hose near the pump will always be noticeable.

Excessive pulsation near the pump is normally due to higher than average line pressure caused by stiff, harsh mixes or extremely long pumping distances. The use of hoses having larger internal diameters will reduce the line pressure.

The line pressure can be reduced by adding a small amount of water to the mix. The use of certain admixtures may also help. Be alert to the fact that if the delivery system is blocked or the line is kinked at the start-up or during the pump operation, the pump could straighten out the kink or force out the blockage. The rapid surge of material could cause the line to whip or move in such a manner that it may cause INJURY to PERSONNEL.

NOTE:

If a blockage in the hose occurs, walk along the hose until you find the point of trouble. The hose will be soft immediately past the blockage. Shake or hammer along the blockage until it loosens and concrete begins to flow freely again.

If volume at end of hose starts to decrease gradually and eventually nears stopping, it is quite likely that the valve seats and/or balls need replaced. The cam roller must ride on the eccentric cam smoothly. If it starts bouncing it's an indication that there is insufficient back pressure being created. This could be the result of a too wet of mix with a short hose or cavitations caused by over-sized aggregates passing through the valve causing it not to seat properly.

CAUTION:

Downhill pumping can be difficult on some jobs. When the pump is stopped the material can flow slowly down in the delivery line causing the hose to collapse. As a result when pumping is resumed a blockage may occur at the point of the hose collapse. NEVER move the pump with the hopper full of concrete. This can cause severe damage or breakage of the axle springs as well as imposing excess strain and loads on the hub and bearing assembly.

G. CLEARING A PACK OR BLOCKAGE

When a pack or blockage occurs in the delivery system manifold the volume at the discharge end of the hose stops and the hose is soft. The drive belts will also start to slip and the engine may bog down.

NOTE:

Exercise extreme care when clearing a pack in the manifold as a DANGEROUS CONDITION exists due to pressure build up inside the manifold. Stop the pump and turn off engine. DO NOT OPEN any of the delivery system hose or pipe clamps.

The operator must warn all others around the machine to stand at least 20 feet away from the machine and turn their heads away from the manifold. EYE PROTECTION is required while opening a clamping device to release pressure.

Set the safety chain attached to the reducer cone so that the cone can only be slightly opened. The operator shall safely position himself and proceed to remove the wedge holding the cone. Carefully pull the cone open and allow the pressure to release.

After the pressure has been released, carefully swing the discharge cone open. Carefully proceed to remove the blockage in the manifold by prodding or digging out the concrete.

BE ATTENTIVE TO THE FACT THAT SOME PRESSURE MAY STILL EXIST IN THE MANIFOLD AREA.

After blockage has been cleared and pump manifolds and reducer cone have been thoroughly flushed with water, the manifold and cone can be locked in place. Shake out about 2 feet of concrete from hose before reconnecting hose to pump. Connect hose and resume pumping operation.

CAUTION:

Never attempt to clear a pack or blockage in the delivery system using the power of the pump. This is a dangerous and expensive method causing damage to pump and personnel.

H. CLEANING THE SYSTEM

The cleaning of the W30 is a VERY IMPORTANT operation as it will set the stage as to how it will perform the next time it is used. When the pumping operation has been concluded it will be necessary to remove all of the remaining concrete from the hopper, manifold, and delivery system.

NOTE:

To avoid the possibility of material separation, leave about 4 inches of concrete material in the hopper above the inlet ball.

Proceed as follows for best results:

- Turn the pump engine OFF. Scrape and wash down the hopper with water while filling the hopper.
- Start engine and proceed to pump the water through the system at half throttle. Continue to pump water until clear water comes out of the end of hose.

- Open up reducer cone and manifolds and thoroughly clean, washing out any remaining concrete, sand and rock.
- Close the manifold and cone and lock in place.
- Take the end of the hose which connects to the cone insert a 2" x 4" x 6" sponge into the end of the hose. Reconnect the hose to the pump.
- Fill the hopper with water and start pumping, with low RPM (Half Throttle). Continue until sponge is discharged at the end of the line followed by clear water.

At this point, the pump and lines will be completely clean and ready for the next job.

PUMP MIX GUIDELINES

Mix design of the concrete is very important to achieve a good optimum of pump ability. This pump ability is significantly influenced by the variety and gradation of the aggregates used. The term “AGGREGATES” describes all of the solid materials from the largest rock to the smallest grain of sand contained in the concrete mix. The model W30 is designed to pump a wide variety of materials but certain basic principals need to be followed to assure successful pumping. Some of these principals are:

- The washed concrete sand and #4 aggregate (pea gravel) should conform to A.S.T.M. standards in regards to sieve analysis.
- In pumping, the FINES contained in sand help lubricate the delivery system. In some areas the #100 and #200 mesh fines are washed out of the sand whether it washed intentionally or due to rain. When sand of this nature is used it usually results in separation in the manifold and leads to possible blockage. If this condition develops check with your concrete suppliers engineer and get their recommendations for supplementing the lack of fines. The use of locally accepted AD-MIX may be required.
- As a general rule, the use of approximately seven (7) sacks of cement, 70% concrete sand and 30% #4 pea gravel per yard of concrete will result in a pump able mix. The ideal nature of sand and rock in certain areas may permit you to increase the percentage of rock or adjust the mix to meet your job requirements.
- Uniform gradation of the concrete sand and the ½” minus aggregate along with sufficient cement content and water are important to successful pump operations.
- In some areas where the gradation of sand and rock is ideal and sufficient cement is used along with admixtures, the W30 concrete pump can handle up to a 50-50 ratio of sand and rock.
- When the mix is designed for wet gunning applications it is normal to increase the cement up to 7.5 to 8 sacks and change the sand to rock ratio to 85% sand and 15% rock.

The result of years of experience by many concrete pump users and aggregate suppliers has proven the importance of certain requirements necessary to successful concrete pumping. The strength and quality of the concrete is relative to the cement/water ratio and the type of gradation of the aggregates used.

Keep in mind that concrete is produced out of locally available rock and sand mixed with cement and water. Consequently there are significant differences in the characteristics of concrete mix designs from one region to another. It is impossible to define a specific mix for each region that your pump might be operating.

GENERAL PREVENTATIVE MAINTENANCE

Preventive The finest equipment manufactured is only as good as it is maintained. COSTLY REPAIR and loss of revenue can often be avoided by planning ahead, setting a regular schedule and exercising preventative maintenance techniques. You can do preventative maintenance NOW or costly repairs LATER. A good preventative maintenance will enhance a properly operating machine and the SAFETY of those operating and using the equipment.

This section is devoted to the preventative maintenance program of the W30 and is broken into INSPECTION and LUBRICATION.

The maintenance and checks noted herein are not intended to replace any local or regional regulations which may pertain to this type of equipment, nor should the list and schedule be considered all inclusive. Interval times may vary due to climate and/or conditions, depending on the location and use of machine.

NOTE:

Always ensure that applicable safety precautions are strictly observed when performing the maintenance, inspections and checks. Make sure components in need of adjustment, repair or replacement are corrected before operation.

INSPECTION

The inspection list contains items which need to be inspected on a DAILY BASIS. The items listed to be inspected or checked daily will basically ensure a good, safe unit performance prior to start up operations. By accomplishing these inspections on a daily basis, any potential malfunction will be identified and detected before it expands into a major problem.

Some of the major items to check are:

1. OVERALL MACHINE CONDITION

- | | |
|----------------|--|
| Visual Damage | - Inspect frame and all supporting structures for weld cracks, dents, and bends.
- Inspect condition of support legs, lock pins, covers and missing bolts.
- Inspect condition of hood, hatch and locking hasps.
- Manifold wedges, safety chains and pins. |
| Trailer axle | - Check condition of missing bolts and brackets. |
| Tires & Wheels | - Check for wear and cuts, missing lug nuts and inflation pressure. |

2. ENGINE

- | | |
|---------------|--|
| Visual Damage | - Inspect mounting bolts, brackets, condition of engine and muffler. |
| Oil Level | - Check for leaks, proper level. |
| Fuel System | - Inspect tank mounting, fuel level, filter condition, leaks, and damaged lines. |
| Throttle | - Check linkage, moves easily and solenoid. |
| Control Panel | - Check condition of instruments, switches and controls. |

3. BATTERY

- | | |
|----------------|-----------------------------------|
| Visual | - Check condition and corrosion. |
| Battery Cables | - Check condition and tightness. |
| Hold Down | - Check mounting bolts, and nuts. |

4. PUMP MECHANISM

- | | |
|--------------------|---|
| Visual | - Condition of clutch, pulleys, sprockets, bearings and missing bolts and nuts. |
| Drive V-Belt | - Check condition, no tears, cracks or wear. |
| Drive Chain Guards | - Check condition, connecting links secure, lubrication, belt & chain guard condition |
| Tube System | - Check condition of manifold gaskets, level of lubricant and cam roller oilier. |
| Water Box | - Check level of water and water soluble oil mix. |

LUBRICATION

Economical service and long life will be achieved if day to day care, lubrication and adjustment instructions are followed rapid wear and probable component breakdown will result if the unit is operated with inadequate lubrication. Do not attempt to start the equipment until lubrication points have been checked and/or serviced.

Pre-use lubrication does not eliminate the requirement for the next scheduled periodic lubrication. The W30 is equipped with several lubrication points. Recommended lubrication intervals are based on normal use in normal environmental conditions. User is CAUTIONED to adjust the lubrication interval accordingly, to meet each individual condition and usage.

Equipment which has been stored or exposed to environmental conditions of extreme low humidity and high dust level, elevated temperatures or heavy rainfall, lubrication of components may be required more frequently than under normal conditions. External non bearing surfaces shall be wiped clean of extruded or spilled surplus grease and oil with a clean but lint free cloth to prevent damaging dust and abrasive accumulation on lubricant wet surfaces.

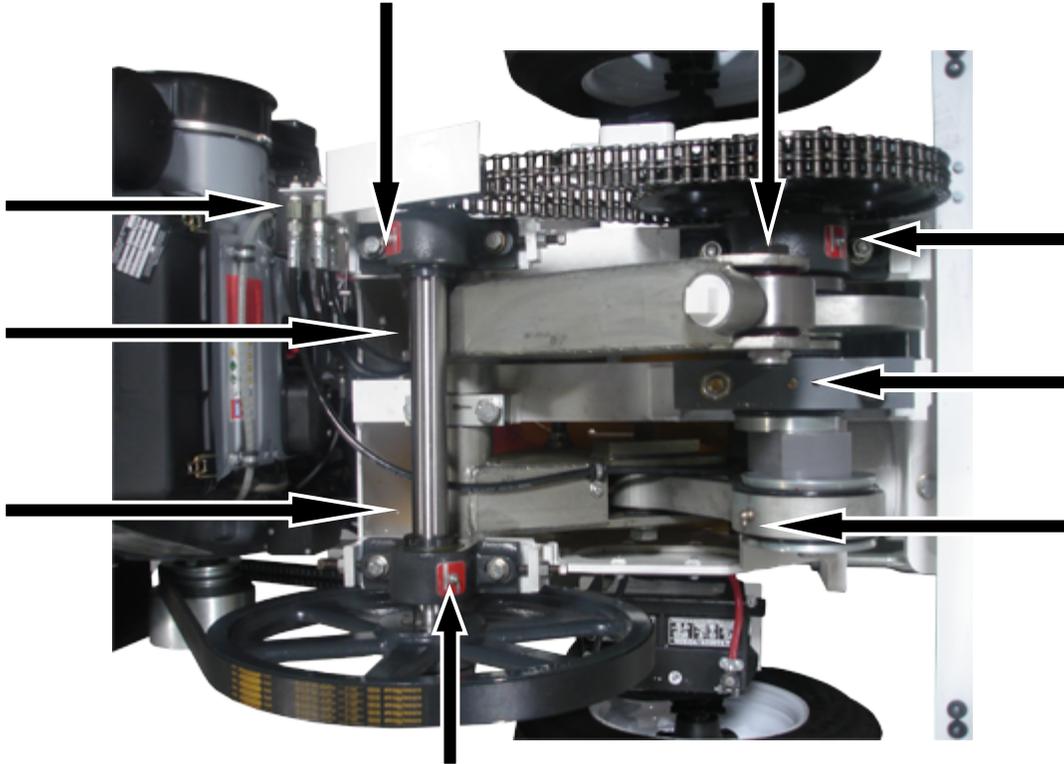
NOTE:

Specific lubricants recommended are generally the best choice. Should these lubricants be unavailable in your area, consult your local supplier for an equivalent.

LUBRICATION CHART

DETAIL PICTURE:

Recommended grease GENERAL PURPOSE No.2 greasing points



WHEEL BEARINGS:

The W30 is equipped with grease lubricated wheel bearings and they should be replaced every 12,000 miles or 12 months (For more information see Dexter's Hub/Bearings insert).

Recommended: WHEEL BEARING GREASE Lithium Complex NLGI No. 2

Approved Sources: Mobil Oil..... Mobilgrease HP

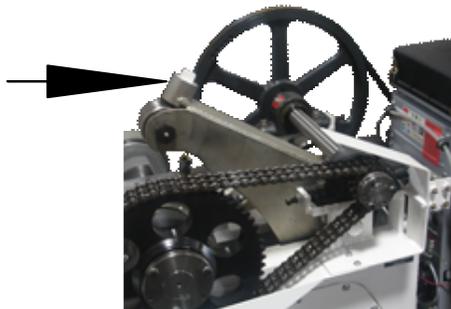
Exxon.....Ronex MP

Kendall..... Kendall L-427

Penzoil.....Premium Wheel Bearing Grease 707L

CAM FOLLOWER BEARING:

Soak Felt with motor oil.



WATER BOX:

Fill with a water and water-soluble oil mix to about half the pumping cylinder diameter height (See soluble oil mixing instructions for ratios).

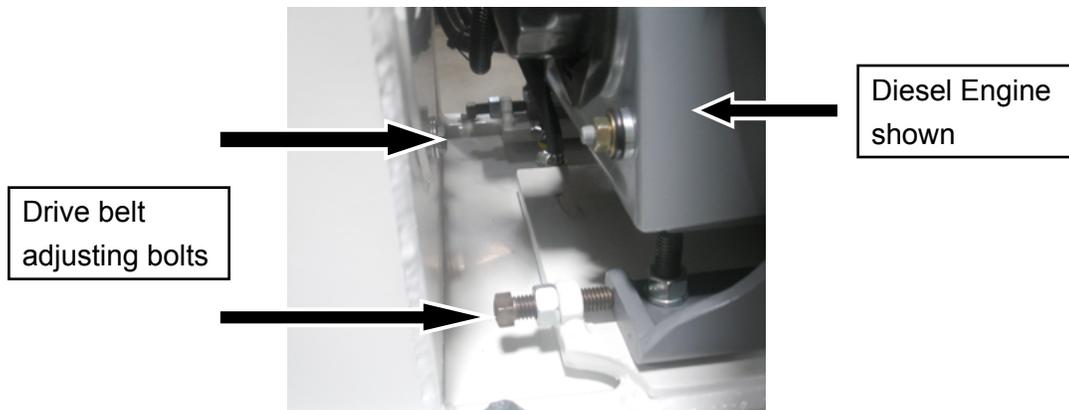
ADJUSTMENT PROCEDURES

Periodically due to usage, repair or replacement of parts the W30 may require adjustments to certain operational and system functions. This adjustment section is provided to assist you in making the necessary adjustments.

A. DRIVE BELT ADJUSTMENT

A double groove v-belt is used to transmit the engine power from the centrifugal clutch to the countershaft. The tension of the belt must be maintained and frequent inspections are necessary. The following procedure is offered to accomplish the check and adjustment:

- The belt tension can be checked by placing a measuring tape on the edge of the belt approximately halfway between the pulleys.
- At this point hold the tape measure steady and with your finger push inward on the belt and read the amount of deflection on the tape measure.
- This deflection should be approximately $\frac{1}{2}$ " – $\frac{3}{4}$ " (12-19mm). A TOO LOOSE of a belt may have a tendency to SLIP while a TOO TIGHT of a belt imposes higher stress on clutch and engine shaft.
- If an adjustment needs to be made on the drive belt it is suggested that the drive chain tension be checked before proceeding. Any adjustment made to drive chain may require adjustment to the drive belt. Make adjustment to drive chain first.



Adjustment drive belt tension as follows:

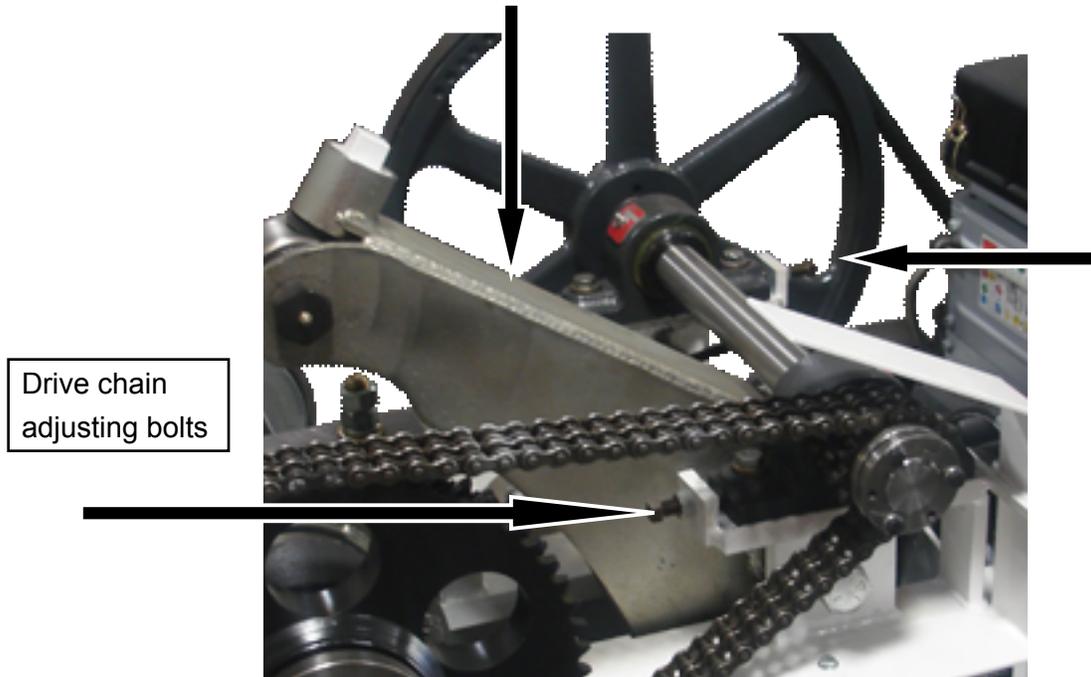
- Loosen engine mounting bolts sufficiently to enable engine to be moved. DO NOT REMOVE BOLTS.
- Located on engine mounting plate are two (2) adjusting bolts, one each side.
- To make adjustment easier because both bolts need to be adjusted evenly it is suggested that a mark be made on the bolt heads in IDENTICAL spots.
- This can be made with a felt tip pen or marking pencil. Loosen locknut on adjusting bolts.
- Adjust bolts evenly using marks as a guide.

NOTE:

Turn CLOCKWISE to TIGHTEN belt; COUNTERCLOCKWISE to LOOSEN belt. To loosen belt the engine will need to be pushed against adjusting bolts after they are backed-off. After adjustment is made tighten locknuts on adjusting bolts and then tighten engine mounting bolts.

B. DRIVE CHAIN ADJUSTMENT

A double roller chain is used to transmit power from the countershaft to the crankshaft which in turn powers the material cylinder. Through usage the chain will have a tendency to wear and stretch. As a result the tension of the chain must be maintained and frequent inspections are necessary.



CAUTION:

A chain that is TOO TIGHT will increase the stress on the chain resulting in fatigue and breakage. A TOO LOOSE or slack chain on the crank drive creates backlash and shock loads on the shafts and bearings resulting in shorter wear life of the drive components.

The following procedure is offered to accomplish the check and adjustment:

- The chain tension can be checked by placing a measuring tape on the edge of the chain approximately half way between the sprockets.
- At this point hold the tape measure steady and with your fingers push inward on the chain and read the amount of deflection of the tape measure. This deflection should be approximately ½ inch (12mm). For adjusting the chain, loosen the countershaft mounting bolts so that they are still snug.
- Located on each of the countershaft pillow blocks are adjusting bolts. The drive belt side has two (2) adjusting bolts.

ADJUSTMENT PROCEDURES

- Loosen the locknuts on the adjusting bolts. Turn the bolts CLOCKWISE to TIGHTEN chain and COUNTERCLOCKWISE to LOOSEN chain.
- Each bolt must be turned and adjusted an equal amount.

NOTE:

It is CRITICAL that the pillow block adjustment on the belt side be within 1/16 inch of an equal distance to the pillow block adjustment on chain side. This distance can be checked by measuring the distance from the inside of the adjusting bolt bracket to the face of the pillow block bearing. After adjustment is made tighten locknuts on adjusting bolts and then retighten pillow block mounting bolts.

As chain adjustment will affect the drive belt its tension needs to be rechecked and adjusted if required.

C. PISTON CUP REPLACEMENT

The W30 is equipped with two (2) material cylinders, a main pumping cylinder and one called a compensating cylinder. Both cylinders contain identical pistons which consist of housing, a “U” cup and a guide ring. The purpose of the piston is to push the material through the material cylinder as well as to act as a seal keeping the material from escaping to the rod side of the cylinder. On each stroke of the piston a wiping action takes place due to the close fit of U-cup to the inner cylinder wall. This and the abrasiveness of the concrete material will eventually wear the U-cup making it necessary to have it replaced.

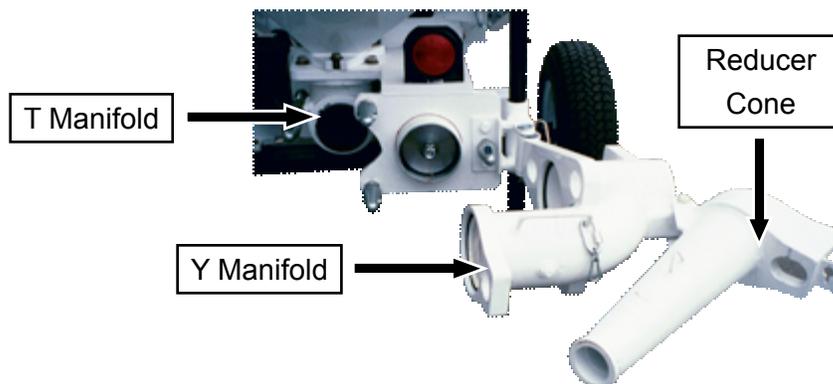
Some identifying symptoms of worn parts:

- Slurry of the material being pump starts to appear in the water box
- The water or lubricating liquid in box begins to rapidly lower its level
- Operation of the piston is rough and erratic.
-

The following step by step procedure is offered to replace the U-cup and guide ring:

1. Main Cylinder

- Drain the lubricating liquid from the water box.
- Remove the wedges and unlock the way manifold and swing open out of the way.
- Remove the long wedge rod at “T” manifold.

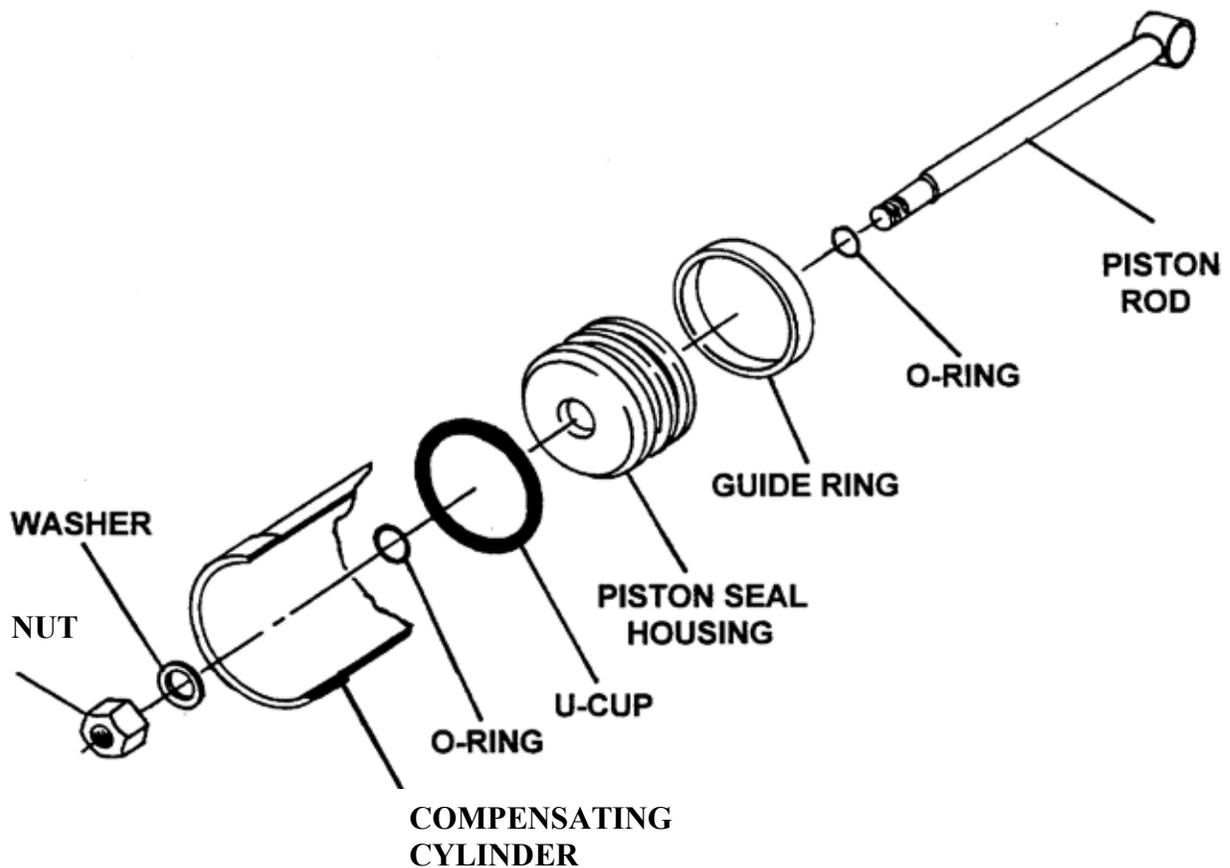


Although it is not necessary it is recommended the hopper be removed. This will enable the area to be cleaned and an inspection made of the o-ring and ball seat.

NOTE:

The "T-manifold is quite heavy thus it is suggested that something be placed to support it while mounting bolts are removed.

- Removal of the "T-manifold will expose the main pump cylinder and piston. If piston is not at its maximum out stroke, turn large belt pulley by hand until piston is totally extended.
- Proceed to remove $\frac{3}{4}$ hex nut and washer from piston rod. Turn belt pulley by hand to retract piston rod sufficiently to enable piston to be removed.
- With piston removed carefully clean the inside of the cylinder with a soft



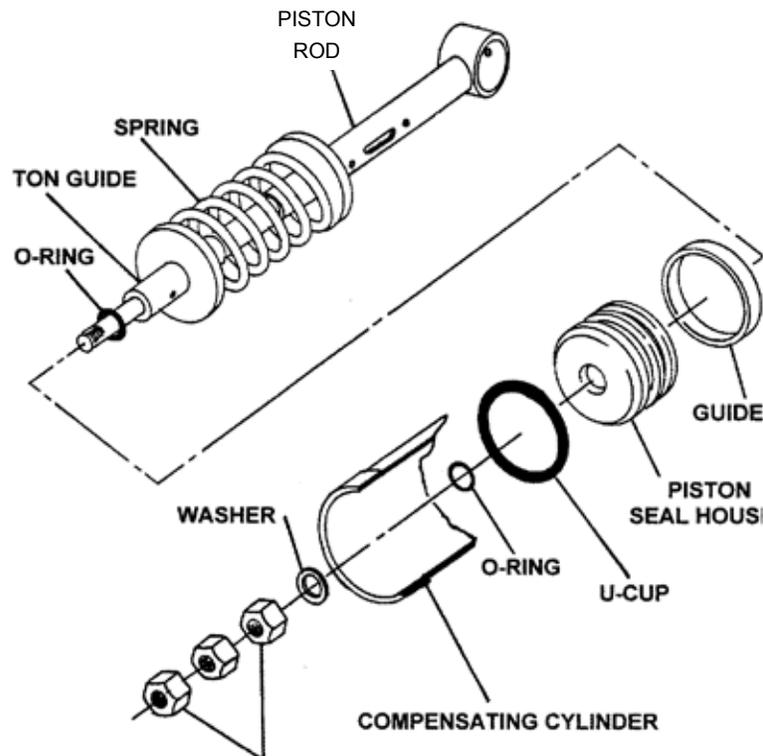
- Carefully place a new o-ring over threads on the shaft and slide to shaft step up.
- Lubricate outside diameter of U-cup and guide ring and insert into cylinder and slide onto piston rod.
- Because of the tight seal created by the new parts it may be difficult to install.
- Once piston is started into cylinder and onto rod, and using a rubber or plastic hammer gently tap on piston until sufficient threads appear on rod which would allow the installation of nut.
- Before installing nut, install new o-ring and washer. Tighten nut until back of piston is seated against step on piston rod.

2. Compensating Cylinder

- With “Y” manifold swung open the compensating cylinder and piston is exposed. If piston is not at its maximum out stroke turn large belt pulley by hand until piston is totally extended.
- Proceed to remove the three 3/4 hex nut and washer from the piston rod. If necessary turn belt pulley by hand to retract piston rod sufficiently to enable the piston to be removed.
- It may be necessary to remove access cover and with a bar placed against back or piston hit bar to dislodge piston.
- With piston removed carefully clean the inside of the cylinder with a soft cloth. Check the inside for any scratches, gauges, and notches. Remove the old U-cup and guide ring from the piston housing.
- Wipe clean the housing.

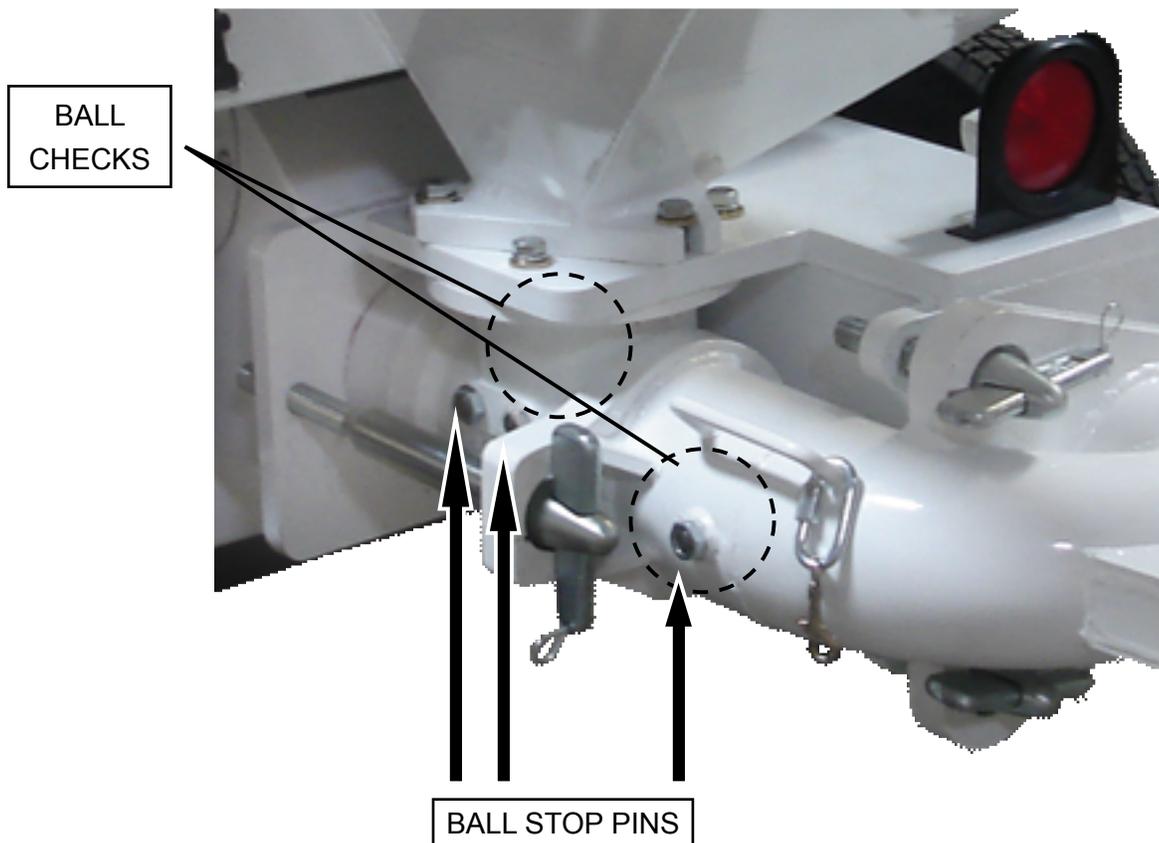
3. Reassembly of Compensating Cylinder

- Lubricate the inside of the U-cup with a small amount of oil.
- Start to install the cup with lip facing smooth side of housing on the housing.
- Install guide ring.
- When piston was removed from rod, the rod fell off center. Reach inside water box and raise piston rod with guide piston up from bottom of cylinder and while holding rod turn belt pulley until rod is fully extended.
- Carefully place a new o-ring over threads on shaft end and slide to step-up.
- Lubricate outside diameter of U-cup and guide ring and insert into cylinder and slide onto piston.
- Once piston is started into cylinder and onto the rod, if necessary gently tap on piston using a rubber or plastic hammer until sufficient threads appear on the rod which will allow the installation of the nut.
- Before installing nut, install new o-ring and washer.
- Tighten nut until back of piston is seated against step on piston rod and install the remaining 2 nuts.



D. BALL AND SEAT CHECKS

Ball checks are used to seal off the material on the suction side and on the discharge side of the main pumping cylinder. These checks consist of a steel ball that is drawn against a cast seat to provide a seal. This sealing is important to the operation of the pump. Worn seats or damaged balls can be the cause of a decrease in pump output volume. It is recommended that when the opportunity arises these seats and balls be inspected and replaced if necessary.



1. Suction Seat

Located at the base of the hopper, sandwiched in between the hopper and "T"- manifold is the suction ball check. The cast seat and steel ball is exposed by the removal of the hopper. If seat is not loose, turn hopper on its side and inspect condition of seat for any cracks, pits, chips, or rough edges.

Replace if any sign of wear is apparent. To remove pull out on seat until it is free. Remove o-ring as well. It is recommended that any time the seat is removed and replaced that the o-ring also be replaced.

Inspect the steel ball for nicks, scratches and wear. Drop the ball on concrete if it bounces it is unusually heavy then it may be full of water. Replace ball and o-ring. Check the ball stop pins in "T"-manifold. If these show sign of excessive wear they should be replaced. When replacing pins also replace o-rings.

2. Discharge Seat

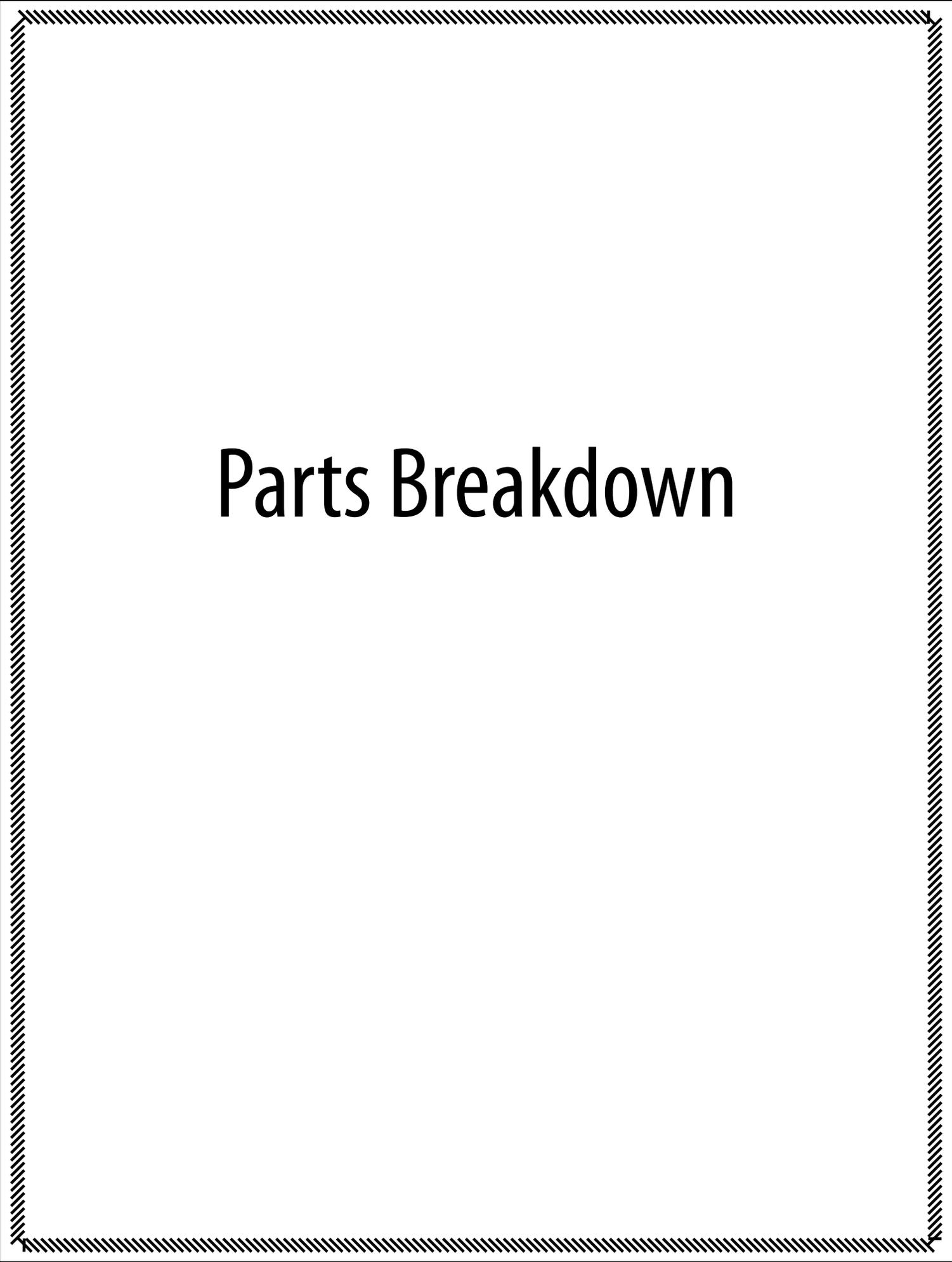
Located at the main cylinder end of the way manifold is the discharge ball check. The seat needs to be removed to inspect. Pull seat out of manifold and inspect condition for any cracks, pits, chips, or rough edges. Replace if any sign of wear is apparent. With seat removed inspect condition of ball and ball stop pin. Replace if necessary.

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.

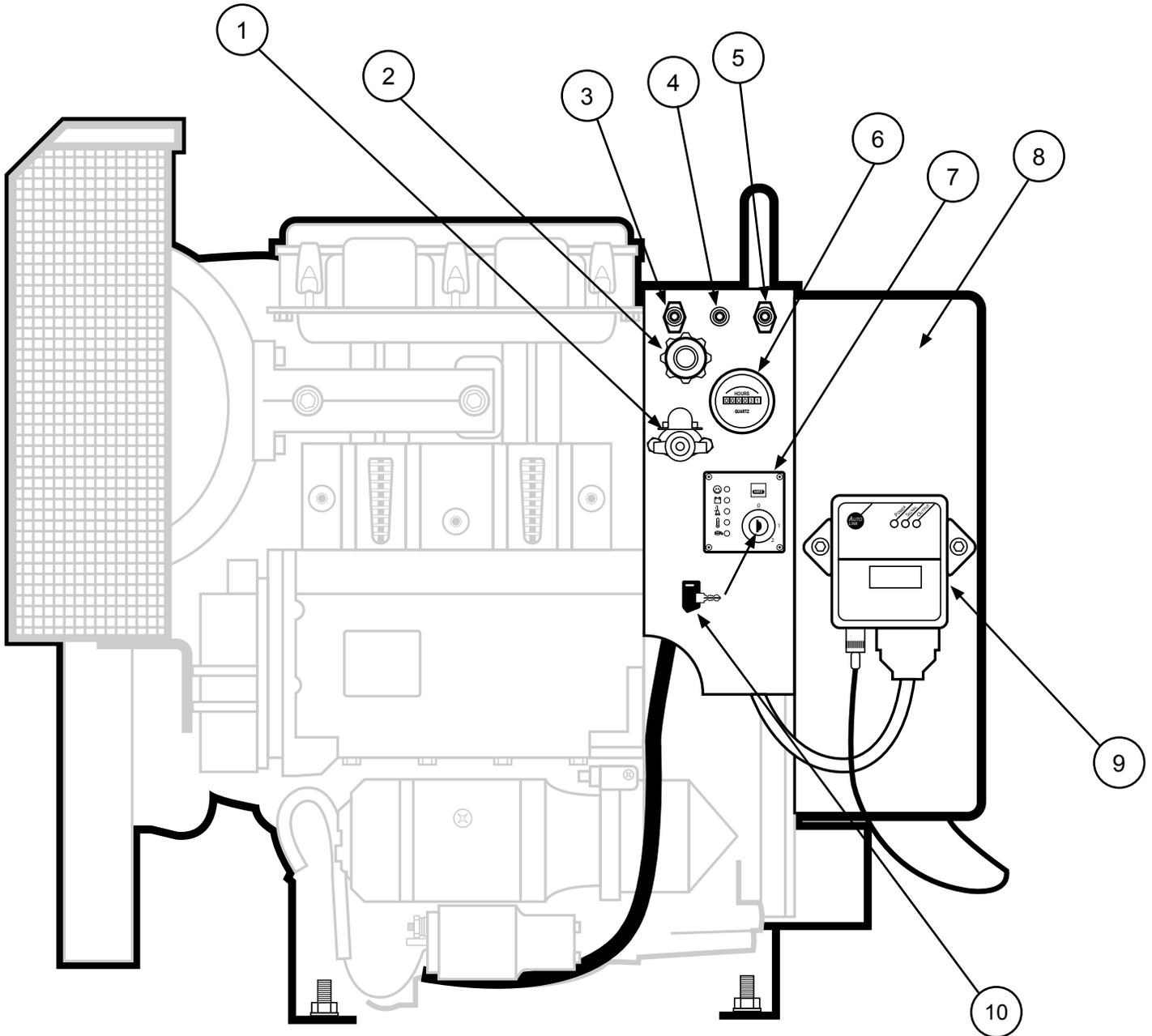
Warranty with respect to engines, components and accessories not manufactured by Western Equipment Manufacturing, Inc. is limited to the warranty extended by the manufacturer of those items. Western Equipment Manufacturing, Inc.'s sole obligation under this warranty is limited to the repair or replacement 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.



Parts Breakdown

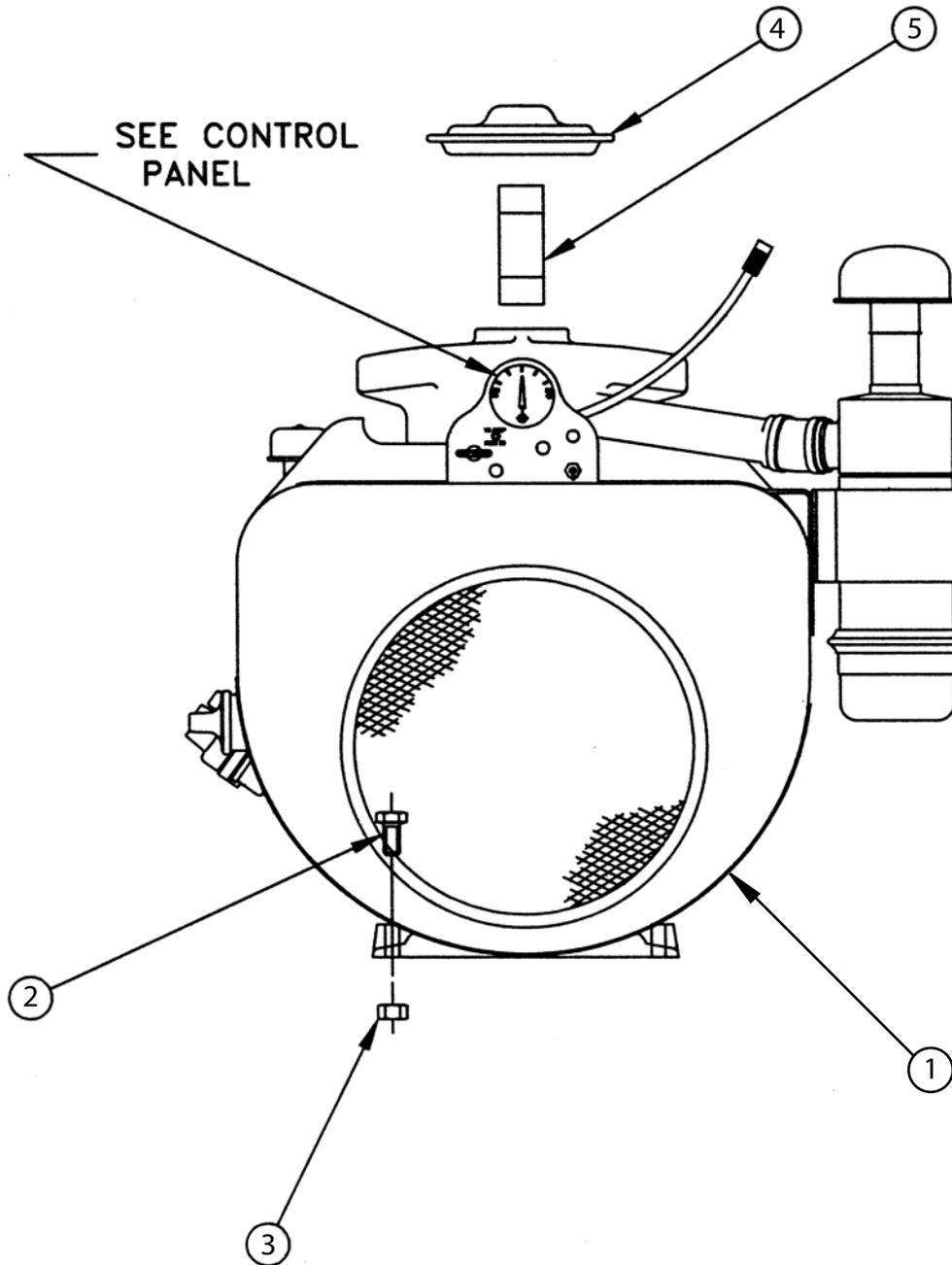
ENGINE GROUP HATZ 2M41Z



REF	DESCRIPTION	PART #
1	CONNECTOR 4 WAY	3040 000 004
2	THROTTLE CABLE ASSY.	9920 000 002
3	TOGGLE SWITCH 2P.	500 000 45
4	TOGGLE SWITCH 3P.	500 000 41
5	TOGGLE SWITCH 2P.	500 000 45
6	HOUR METER	3099 000 011
7	CONTROL PANEL	5030 0161 0500
8	W30 2M41Z CONTROL	1430 240 010
9	RADIO REMOTE PB (OPTIONAL)	3098 000 001
10	KEY 2M41Z	5030 5040 4900

LIMITED WARRANTY

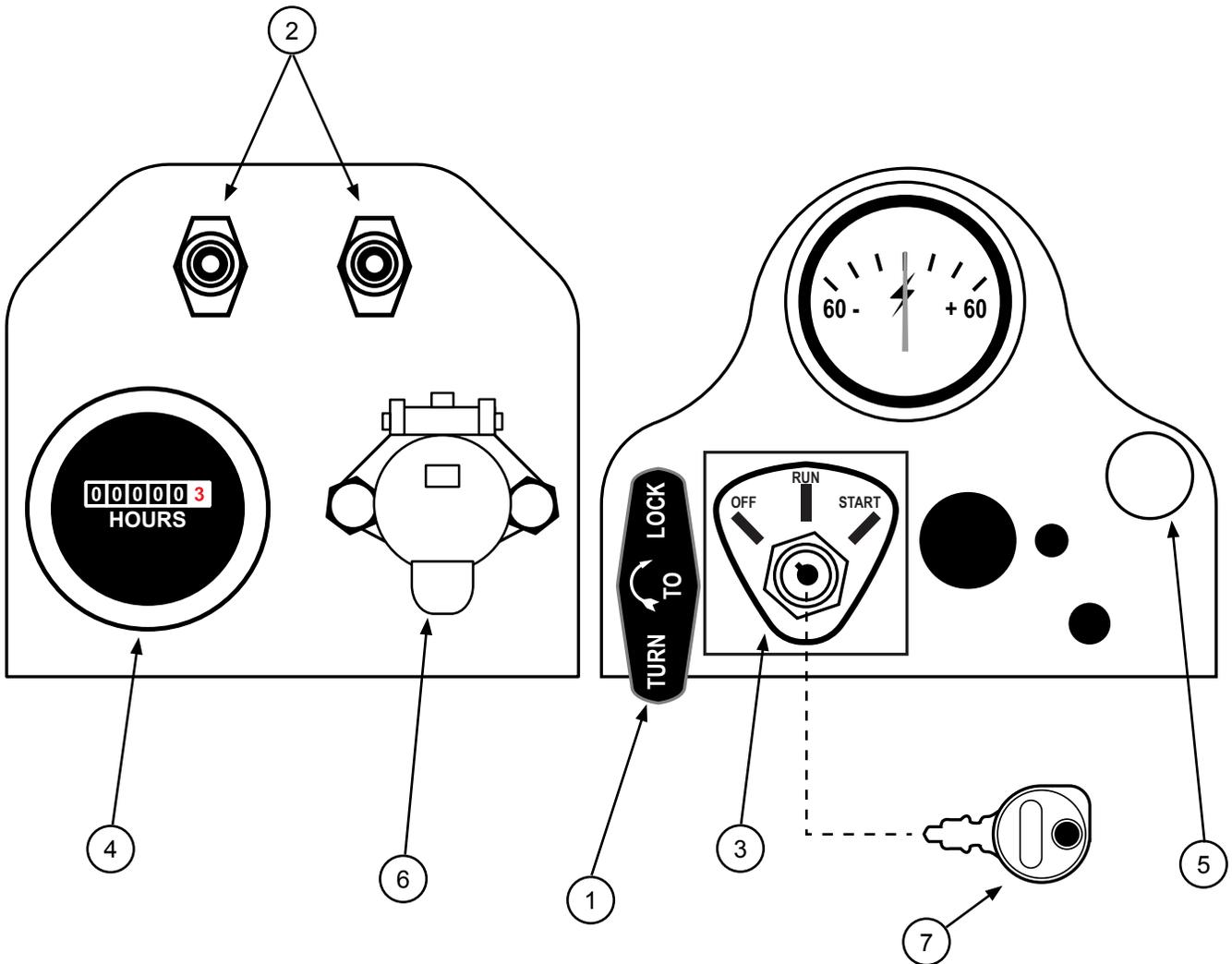
ENGINE GROUP WISCONSIN VH4D



REF	DESCRIPTION	PART #
1	WISCONSIN VH4D 466483	0040 1001
2	BOLT HEX	1010 000 014
3	NUT LOCK	1020 000 001
4	PANCAKE MUFFLER	5010MWD98
5	NIPPLE STF	3510 000 006

PARTS BREAKDOWN

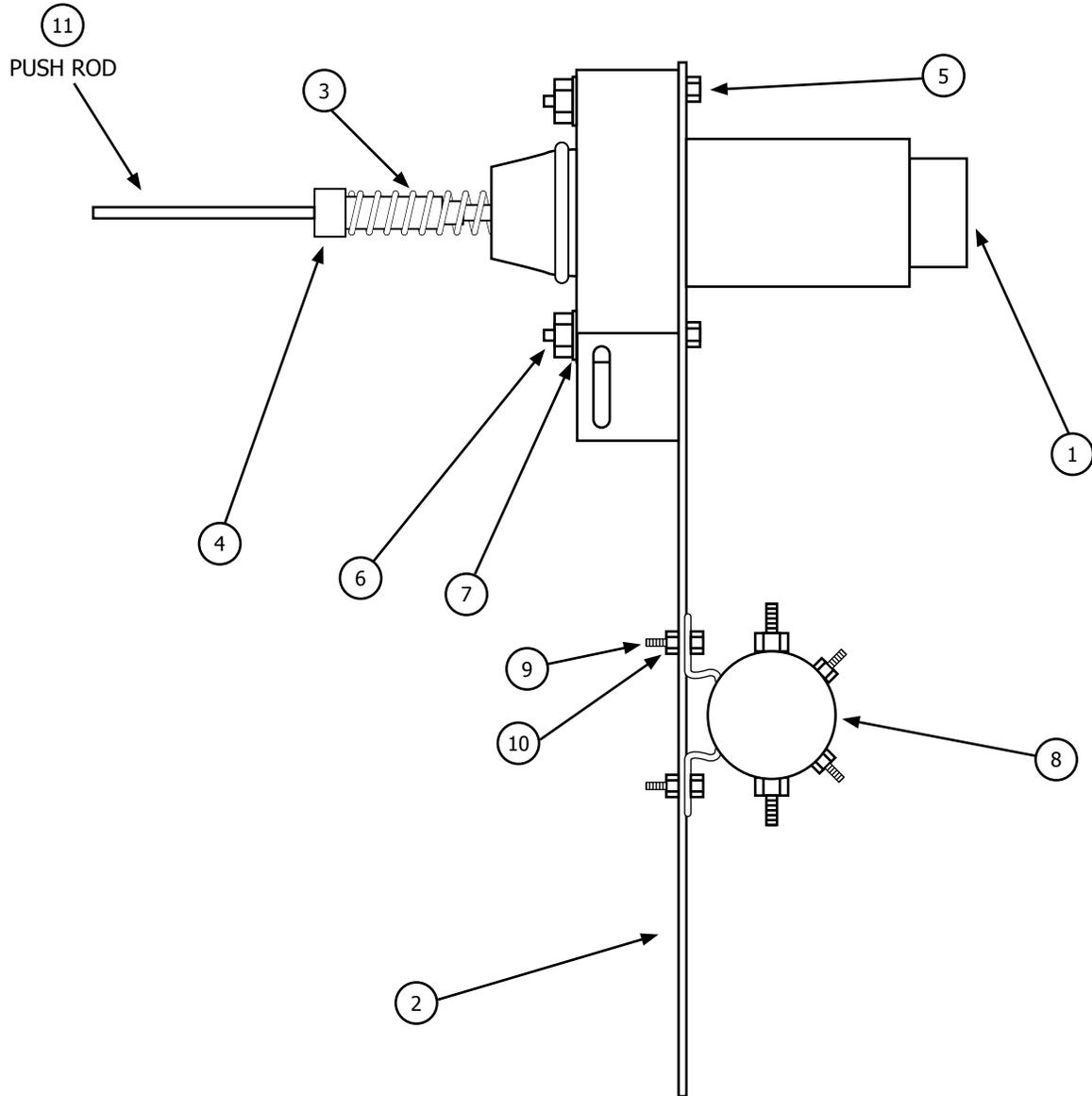
CONTROL PANEL



REF	DESCRIPTION	PART #
1	T-HANDLE LOCK-PUSH PULL	9920 000 003
2	SWITCH	3030 000 001
3	VH4D KEY SWITCH	5010YC78D
4	HOUR METER	3099 000 011
5	CHOKE WIRE	5010VE693
6	CONNECTOR 4 WAY	3040 000 003
7	KEY	00404834001-S1

PARTS BREAKDOWN

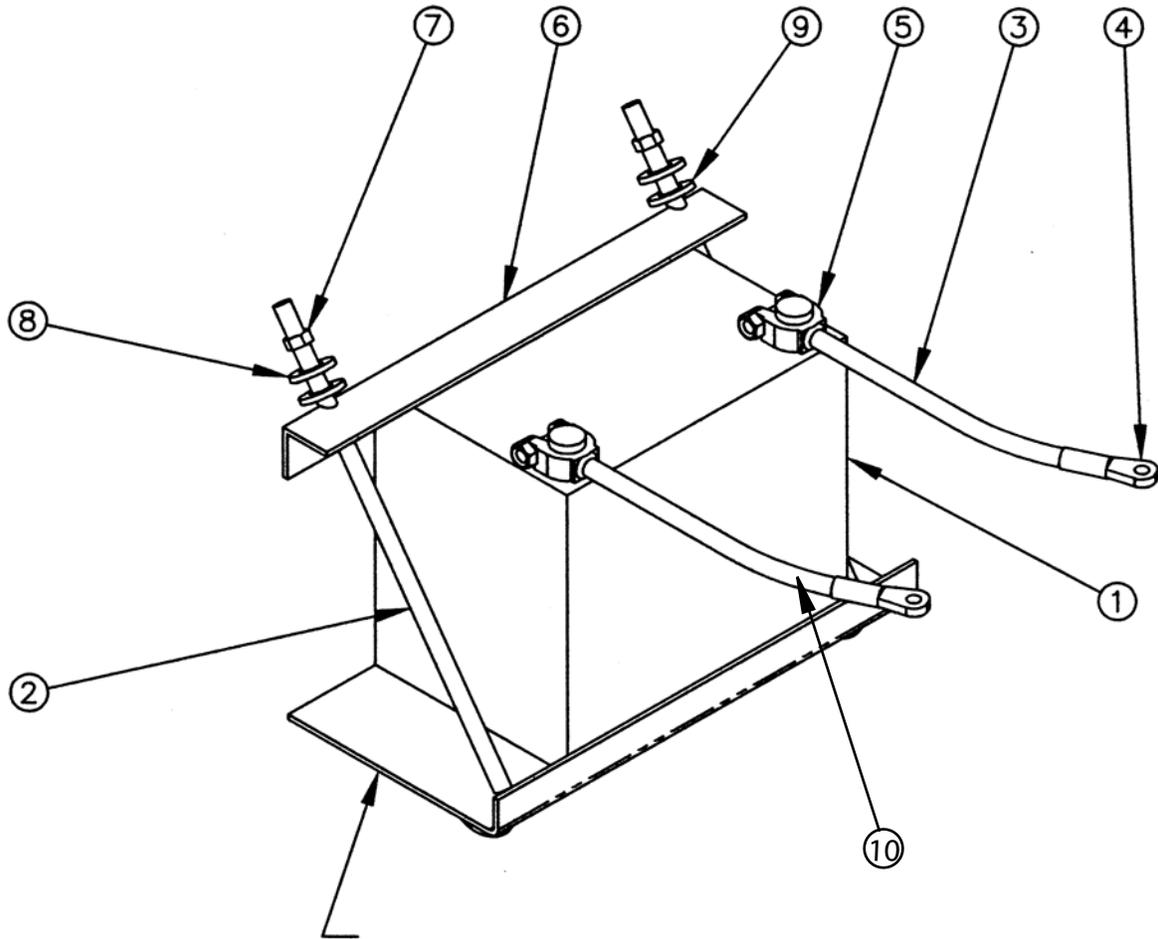
SOLENOID ASSY.



REF	DESCRIPTION	PART #
1	SOLENOID SLG WITH PAD AND PLUN	3020 000 001
2	SOLENOID BRACKET FOR WISCON.	6130 17
3	SPRING FOR SOLENOID	9920 000 001
4	SOLENOID ROD BRONZE	1598 000 001
5	BOLT HEX	1010 000 046
6	NUT LOCK	1020 000 005
7	WASHER LOCK	1030 000 025
8	RELAY	3030 000 002
9	BOLT HEX	1010 000 002
10	NUT LOCK	1020 000 002
11	PUSH ROD	1400 120 011

PARTS BREAKDOWN

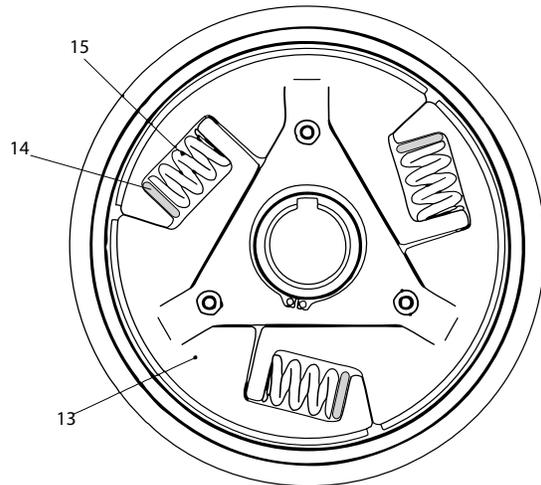
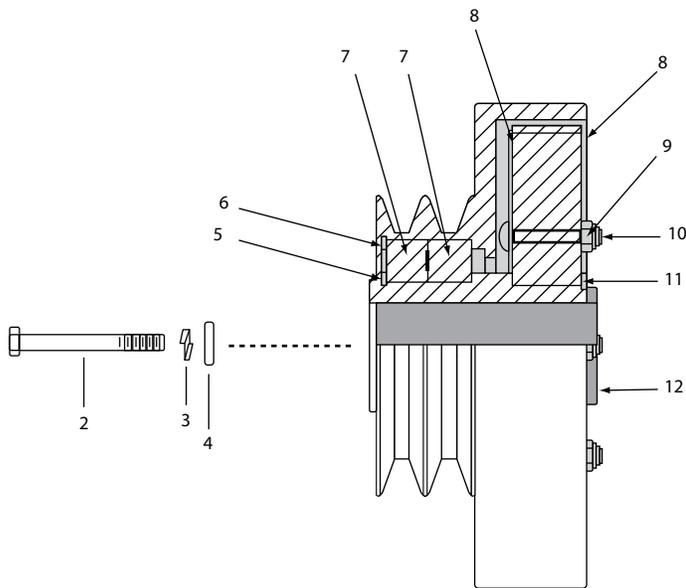
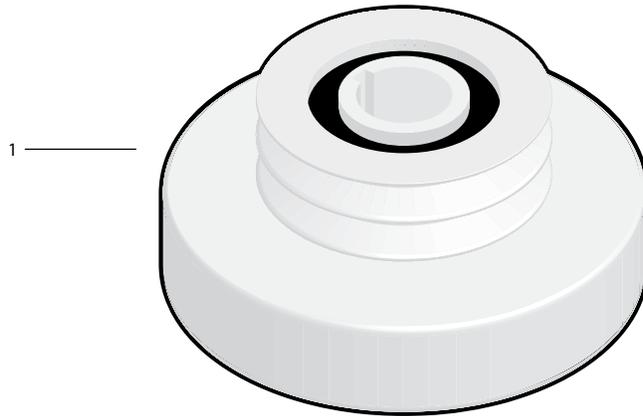
BATTERY



REF	DESCRIPTION	PART #
1	BATTERY "M"	3099 000 001
2	BOLT "J" FOR BATTERY HOLD DOWN	1010 000 064
3	BATTERY CABLE- RED	3010 000 001
4	BATTERY CABLE LUG	3099 000 002
5	BATTERY TERMINAL	3099 000 003
6	BATTERY HOLD DOWN BRACKET	4510 000 002
7	NUT LOCK	1020 000 005
8	WASHER LOCK	1030 000 025
9	WASHER FLAT	1030 000 014
10	BATTERY CABLE BELDEN- BLACK	3010 000 002

PARTS BREAKDOWN

CLUTCH ASSY.

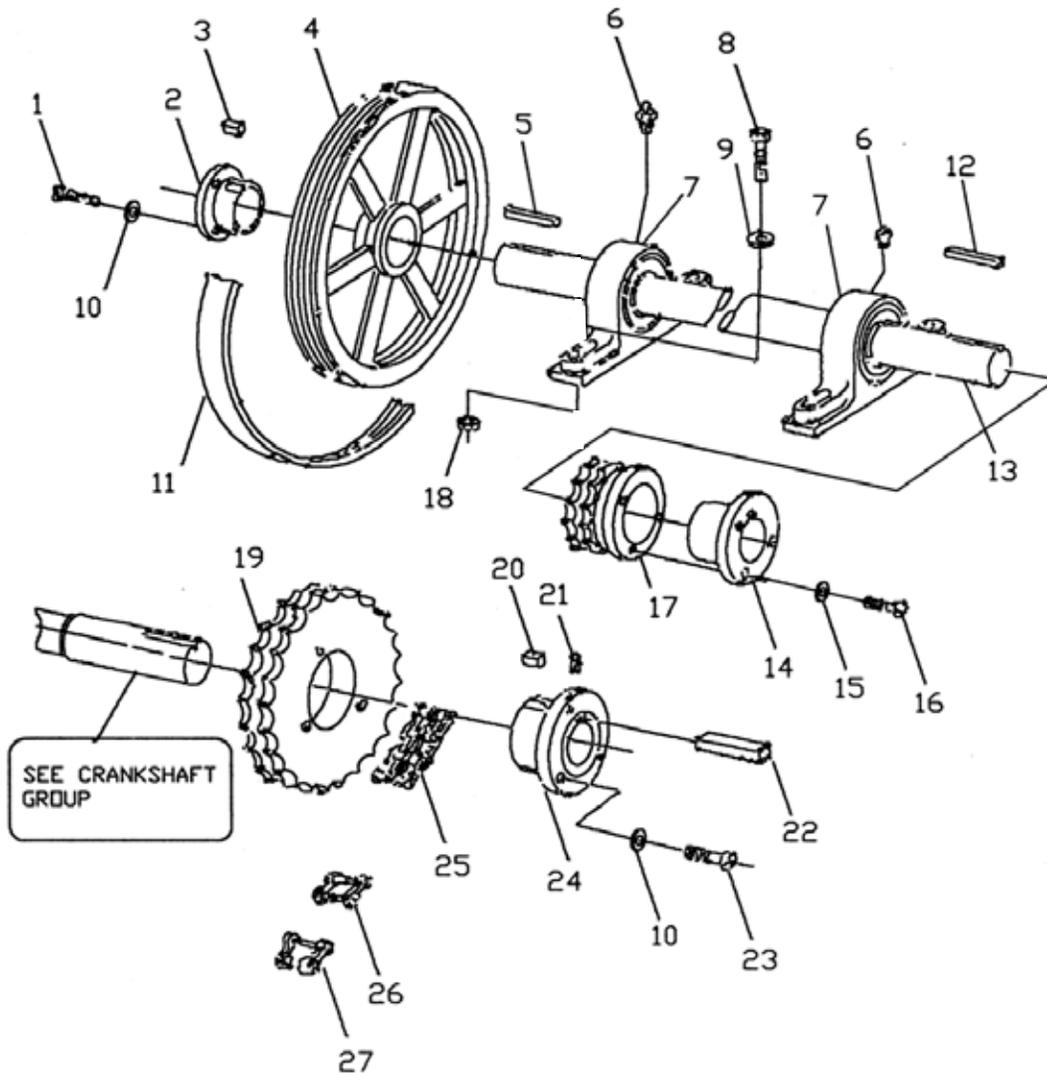


VIEW SHOWN THROUGH COVER PLATE

REF	DESCRIPTION	PART #
1	CLUTCH	1430 010 012
2	BOLT HEX	1010 000 014
3	WASHER LOCK	1030 000 038
4	WASHER	1030 000 036
5	RETAINING RING	1400 300 100
6	RETAINING RING	
7	BEARING	1400 300 040
8	PLATE	1400 300 223
9	BOLT	
10	NUT	
11	RETAINING RING	1400 300 100
12	HUB ASSY	
13	SHOE	1400 300 220
14	WASHER	1030 000 014
15	SPRING	1400 300 221

PARTS BREAKDOWN

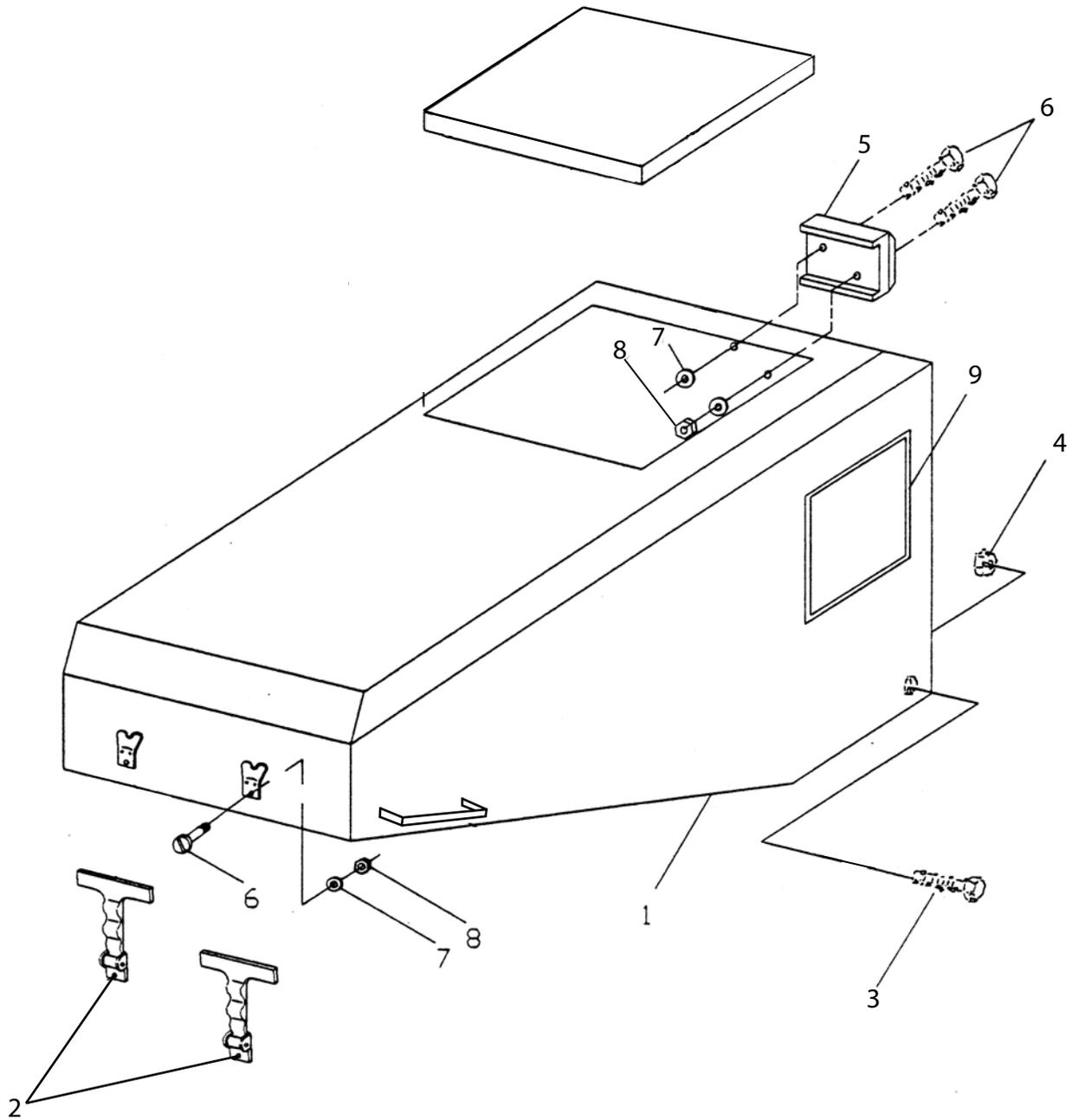
DRIVE GROUP



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	BOLT	1010 000 031	15	WASHER LOCK	1030 000 025
2	BUSHING	2530 000 001	16	BOLT HEX	1010 000 047
3	KEY STOCK	1040 000 008	17	SPROCKET	2520 000 002
4	SHEAVE	2520 000 001	18	NUT LOCK	1020 000 001
5	KEY STOCK	1040 000 009	19	SPROCKET	2520 000 003
6	GREASE FITTING	3598 000 001	20	KEY STOCK	1040 000 011
7	BEARING PILLOW BLOCK	1510 000 001	21	SET SCREW	1040 000 012
8	BOLT HEX	1010 000 015	22	KEY STOCK	1040 000 013
9	WASHER	1030 000 036	23	BOLT HEX	1010 000 035
10	WASHER LOCK	1030 000 025	24	BUSHING	2530 000 003
11A	V-BELT DOUBLE (DIESEL)	2510 000 004	25	CHAIN ROLLER DOUBLE	2599 000 001
11B	V-BELT DOUBLE (GAS)	2510 000 001	26	CHAIN OFFSET	2599 000 002
12	KEY STOCK	1040 000 010	27	CHAIN SNAP CLIP	2599 000 003
13	COUNTER SHAFT	2530 000 002			
14	BUSHING	2530 000 002			

PARTS BREAKDOWN

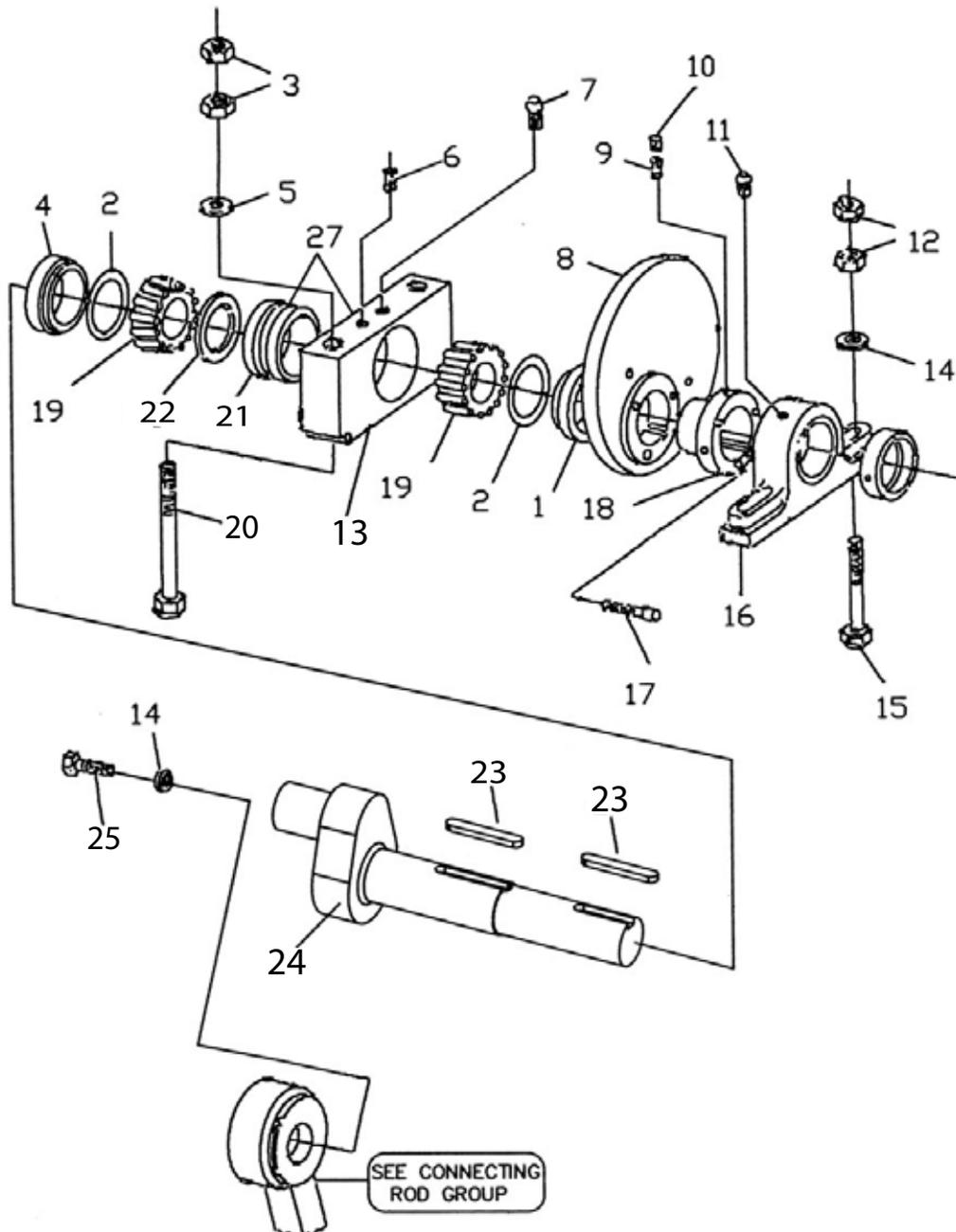
HOOD GROUP



REF	DESCRIPTION	PART #
1	HOOD W30 SUPERDUTY	1430 070 010
2	LATCH KIT RUBBER	9999 000 001
3	BOLT HEX	1010 000 017
4	NUT LOCK	1020 000 001
5	HOOD REST RUBBER BUFFER	9999 000 002
6	BOLT	1010 000 003
7	WASHER	1030 000 008
8	LOCK NUT	1020 000 002
9	TRIM FLEXIBLE	9999 000 003

PARTS BREAKDOWN

CRANKSHAFT GROUP

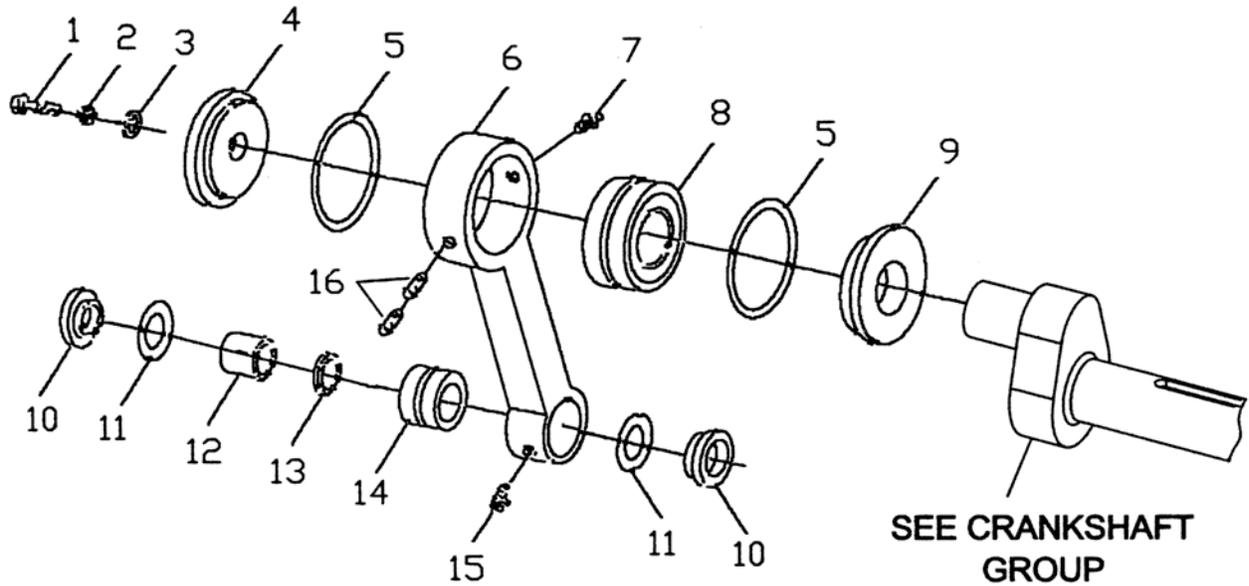


REF	DESCRIPTION	PART #
1	SPACER INBOARD	1430 080 010
2	O-RING	2020 000 001
3	NUT LOCK	1020 000 003
4	SPACER OUTBOARD	1430 080 020
5	WASHER	1030 000 039
6	SET SCREW	1040 000 014
7	FITTING GREASE	3598 000 001
8	CAM WELDMENT	1430 080 030
9	SET CREW	1040 000 015
10	SET SCREW	1040 000 012
11	FITTING GREASE	3598 000 002
12	NUT HEX	1020 000 020
13	BEARING BLOCK	1430 080 040

REF	DESCRIPTION	PART #
14	WASHER	1030 000 037
15	BOLT HEX	1010 000 057
16	PILLOW BLOCK MACHINED	1430 080 050
17	BOLT SOCKET CAP	1010 000 034
18	BUSHING CAM RI	2530 000 004
19	BEARING	1520 000 001
20	BOLT HEX	1010 000 069
21	BEARING CUP	1530 000 001
22	SPACER BEARING	1430 000 060
23	KEY STOCK	1040 000 013
24	CRANK SHAFT BILLET	1430 080 070
25	BOLT HEX	1010 000 055

PARTS BREAKDOWN

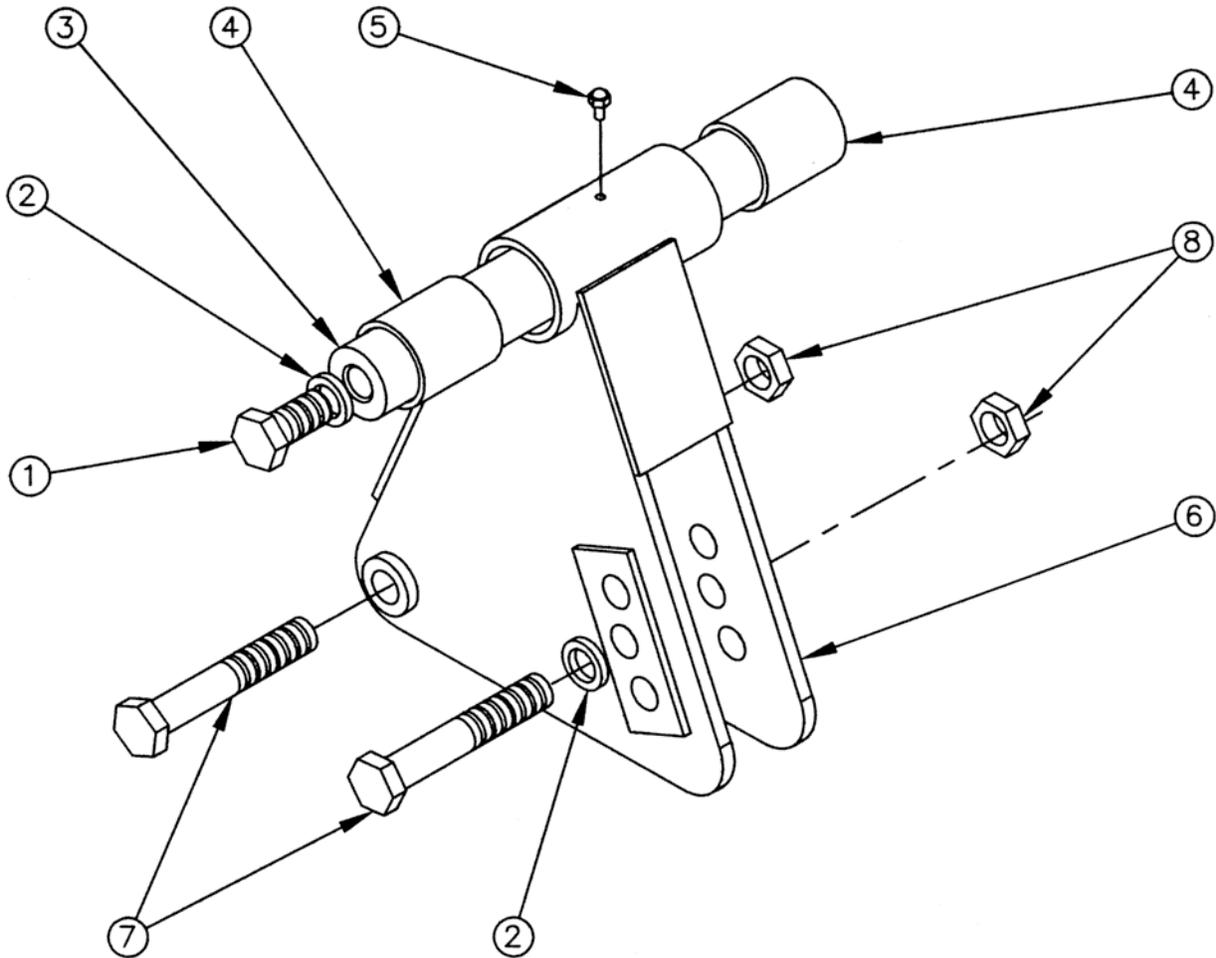
CONNECTING ROD GROUP



REF	DESCRIPTION	PART #
1	BOLT HEX	1010 000 055
2	WASHER LOCK	1030 000 026
3	WASHER	1030 000 015
4	SPACER OUTBOARD CONNECTING ROD	1430 090 010
5	O-RING	2020 000 002
6	CONNECTING ROD	1430 090 020
7	FITTING GREASE	3598 000 002
8	BEARING	1510 000 002
9	SPACER INBOARD CONNECTING ROD	1430 090 030
10	BEARING TAPERED	1520 000 002
11	O-RING	2020 000 003
12	BUSHING	1540 000 001
13	SPACER	1098 000 001
14	RACE BEARING	1530 000 002
15	FITTING GREASE	3598 000 003
16	SET SCREW	1040 000 012

PARTS BREAKDOWN

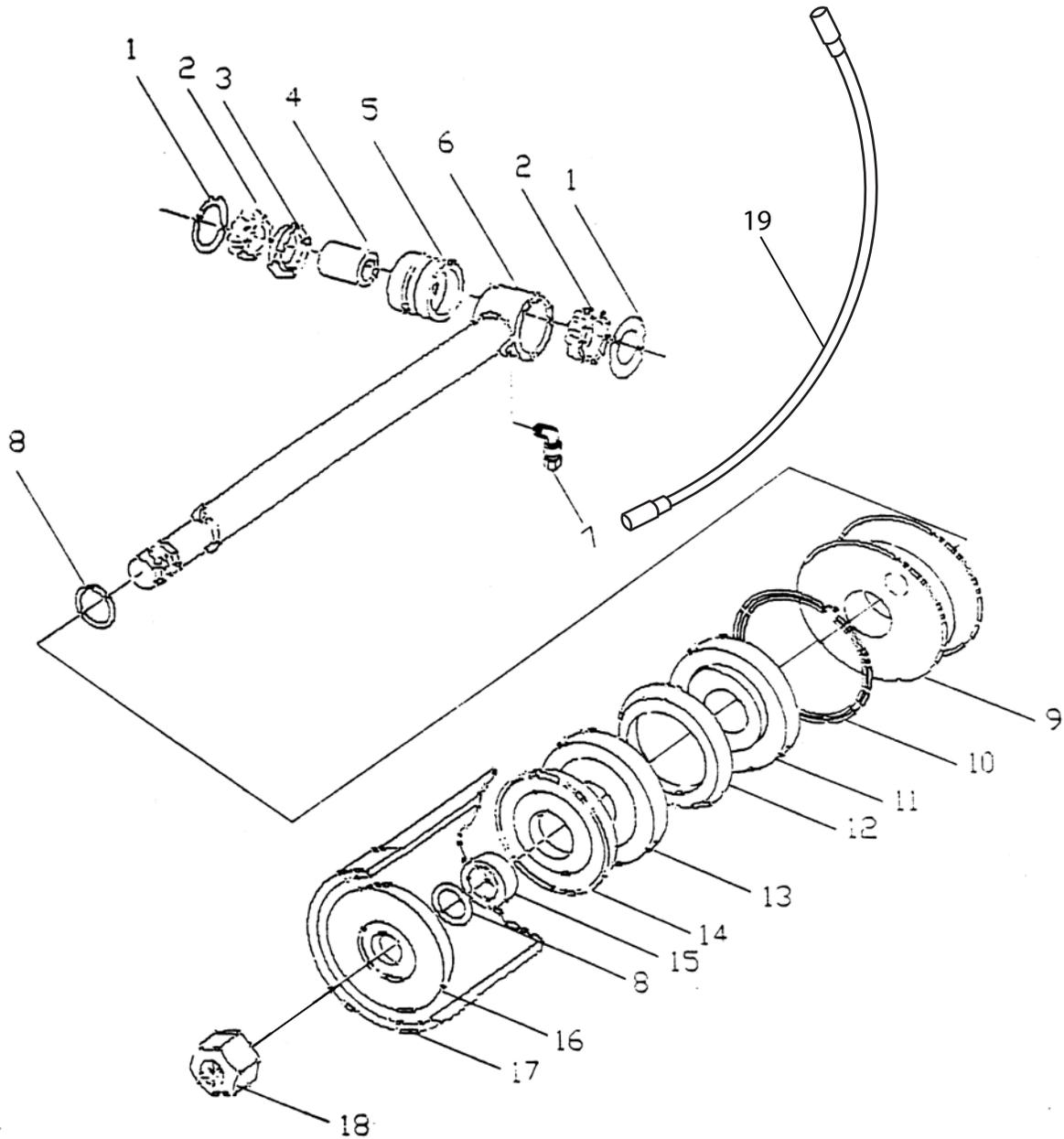
ROCKER/CONNECTING ROD GROUP



REF	DESCRIPTION	PART #
1	BOLT HEX	1010 000 070
2	WASHER LOCK	1030 000 038
3	SHAFT ROCKER ARM	1430 100 010
4	BUSHING BRONZE ROCKER	1540 000 002
5	GREASE FITTING	3598 000 001
6	ROCKER ARM WELDMENT	1430 100 020
7	BOLT HEX	1010 000 006
8	NUT LOCK	1020 000 021

PARTS BREAKDOWN

MAIN PISTON ROD

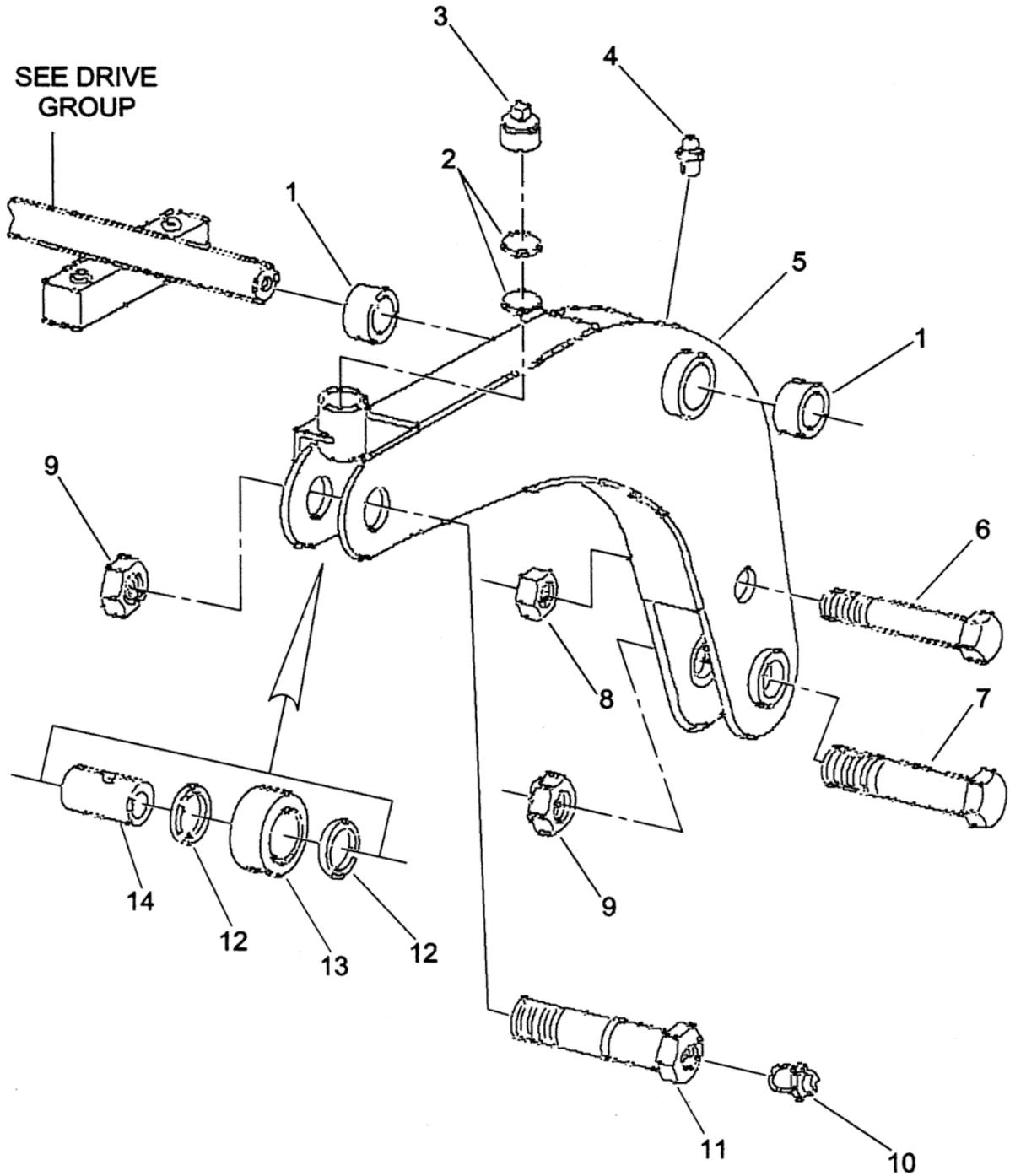


REF	DESCRIPTION	PART #
1	O-RING	2020 000 003
2	BEARING TAPERED	1520 000 002
3	SPACER	1098 000 001
4	BUSHING	1540 000 001
5	RACE BEARING	1530 000 002
6	PISTON ROD	1430 110 010
7	FITTING	1040 000 001
8	O-RING	2020 000 004
9	OILER PLATE	1430 110 020
10	O-RING	2020 000 002

REF	DESCRIPTION	PART #
11	FELT RING PLATE	1430 110 030
12	FELT OILER W30	2010 000 001
13	BRONZE WASHER	1430 110 040
14	PISTON CUP 6" URETHANE	1430 110 050
15	BUSHING PISTON CUP	1430 110 060
16	FACE PLATE	1430 110 070
17	CYLINDER CRANK	1430 110 080
18	NUT	1020 000 013
19	HOSE GREASE 43" TO ROCKER PIST	1430 110 090

PARTS BREAKDOWN

CAM FOLLOWER ARM

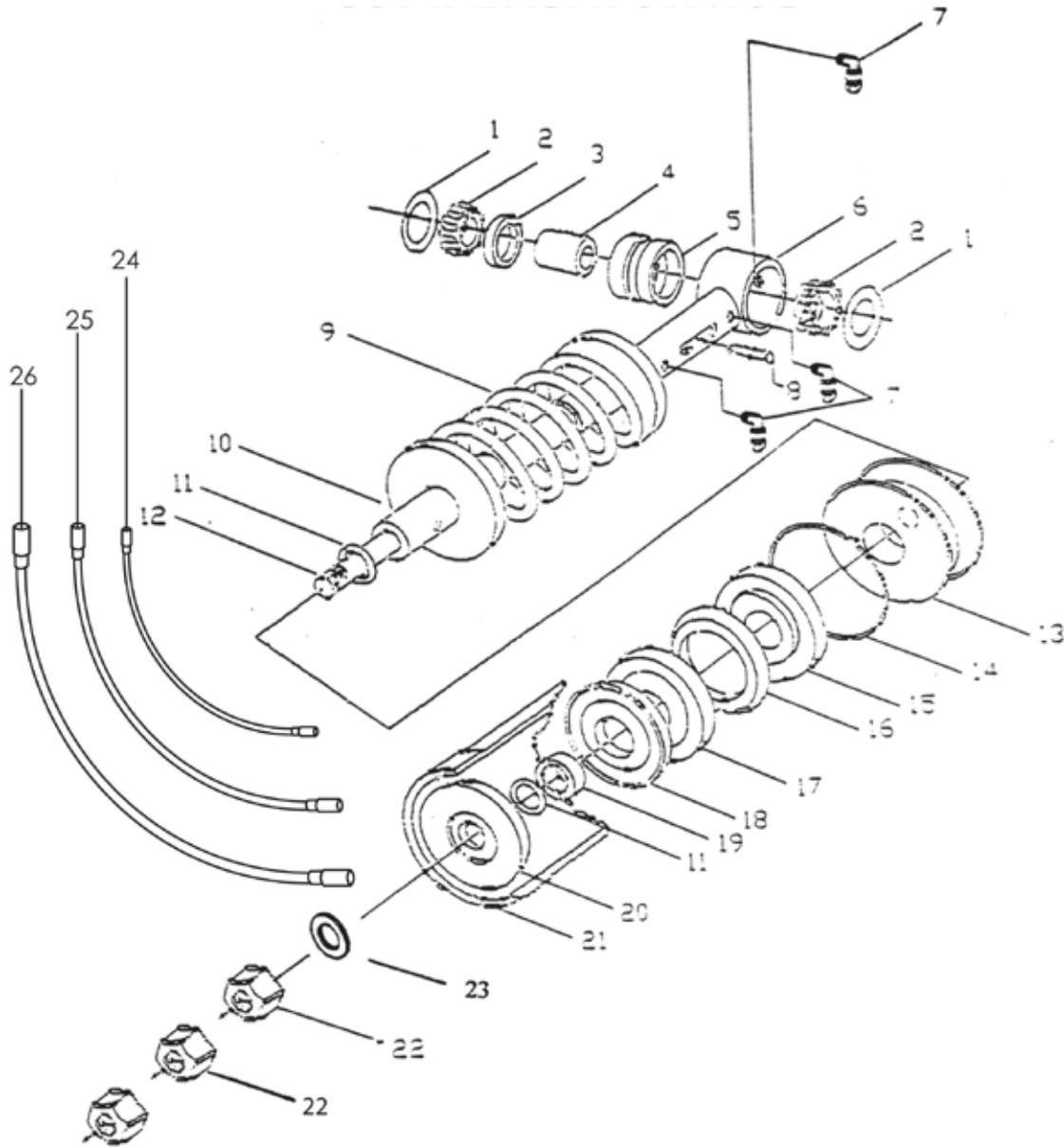


REF	DESCRIPTION	PART #
1	BUSHING BRONZE ROCKER	1540 000 002
2	FELT CAM OILER	2010 000 002
3	PLUG CAM OILER	1040 000 002
4	FITTING GREASE	3598 000 001
5	CAM FOLLOWER ARM	1430 120 010
6	BOLT HEX	1010 000 073
7	BOLT HEX	1010 000 006

REF	DESCRIPTION	PART #
8	NUT LOCK	1020 000 003
9	NUT LOCK	1020 000 021
10	GREASE FITTING	3598 000 007
11	BOLT CAM ROLLER	1098 000 002
12	SPACER CAM ROLLER	1098 000 003
13	BEARING CAM ROLLER	1510 000 003
14	BEARING CAM ROLLER	1540 000 003

PARTS BREAKDOWN

CAM FOLLOWER ARM COMPENSATOR ROD

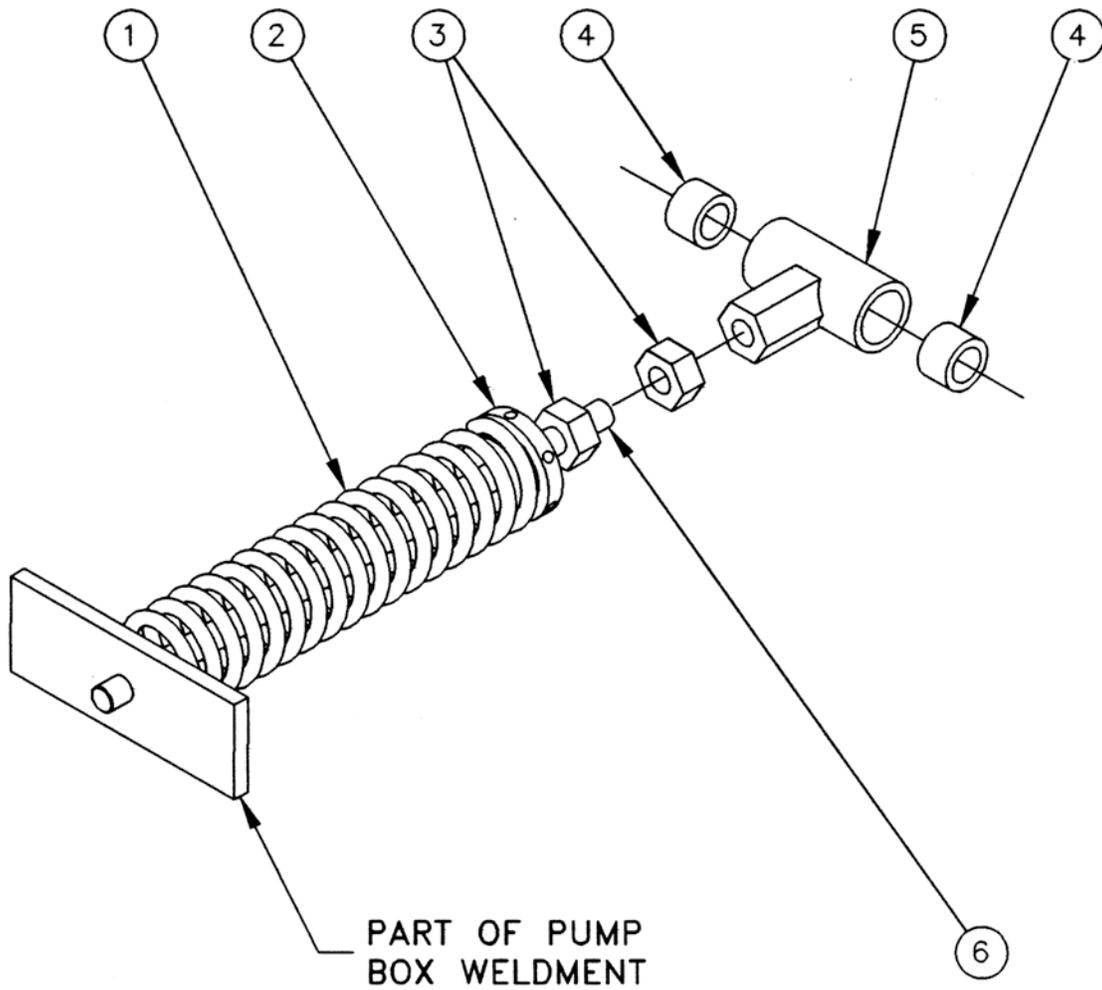


REF	DESCRIPTION	PART #
1	O-RING	2020 000 003
2	BEARING TAPERED	1520 000 002
3	SPACER	1098 000 001
4	BUSHING	1540 000 001
5	RACE BEARING	1530 000 002
6	PISTON GUIDE	1430 130 010
7	FITTING	1040 000 001
8	PIN COILED	1040 000 003
9	SPRING COMPENSATING	1430 130 020
10	PISTON ROD	1430 130 030
11	O-RING	2020 000 04
12	PISTON GUIDE	1430 130 040
13	OILER PLATE	1430 110 020

REF	DESCRIPTION	PART #
14	O-RING	2020 000 005
15	FELT RING PLATE	1430 110 030
16	FELT OILER W30	2010 000 001
17	BRONZE WASHER	1430 110 040
18	PISTON CUP 6" URENTHANE	1430 110 050
19	BUSHING PISTON CUP	1430 110 060
20	FACE PLATE	1430 110 070
21	CYLINDER COMPENASTING	1430 130 050
22	NUT	1020 000 013
23	WASHER FLAT	1030 000 011
24	HOSE GREASE 20" TO COMPENSATER	1430 130 060
25	HOSE GREASE 32" TO COMPENSATER	1430 130 070
26	HOSE GREASE 37" TO COMPENSATER	1430 130 080

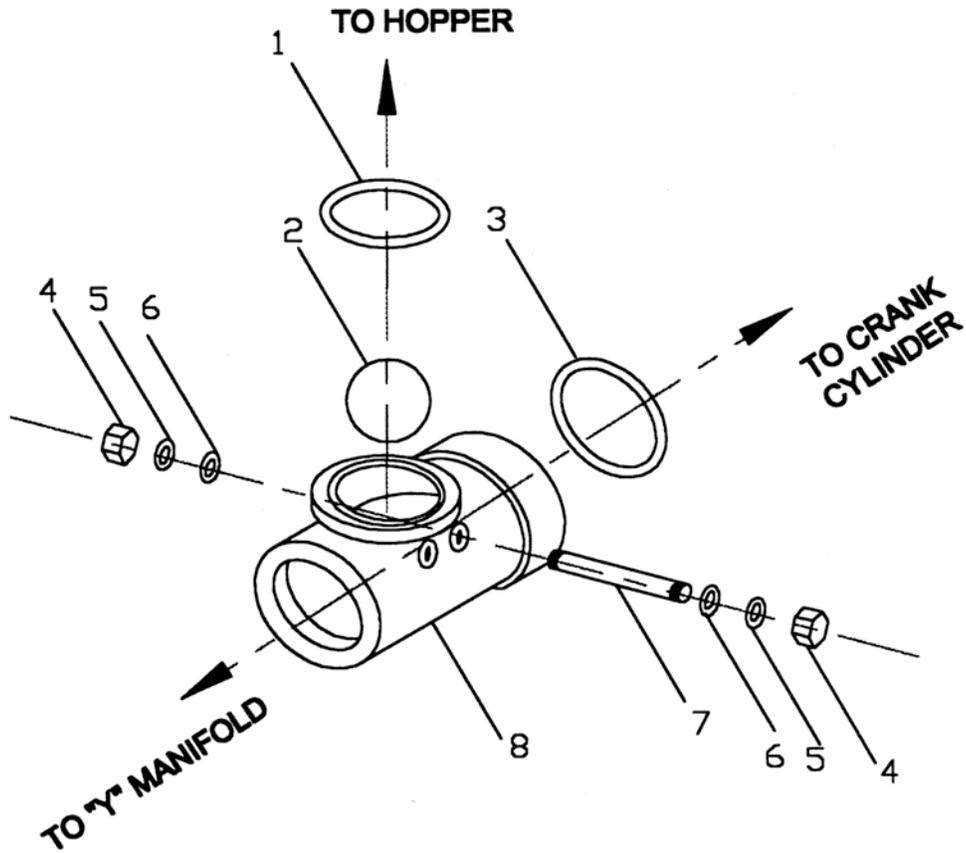
PARTS BREAKDOWN

RETURN SPRING



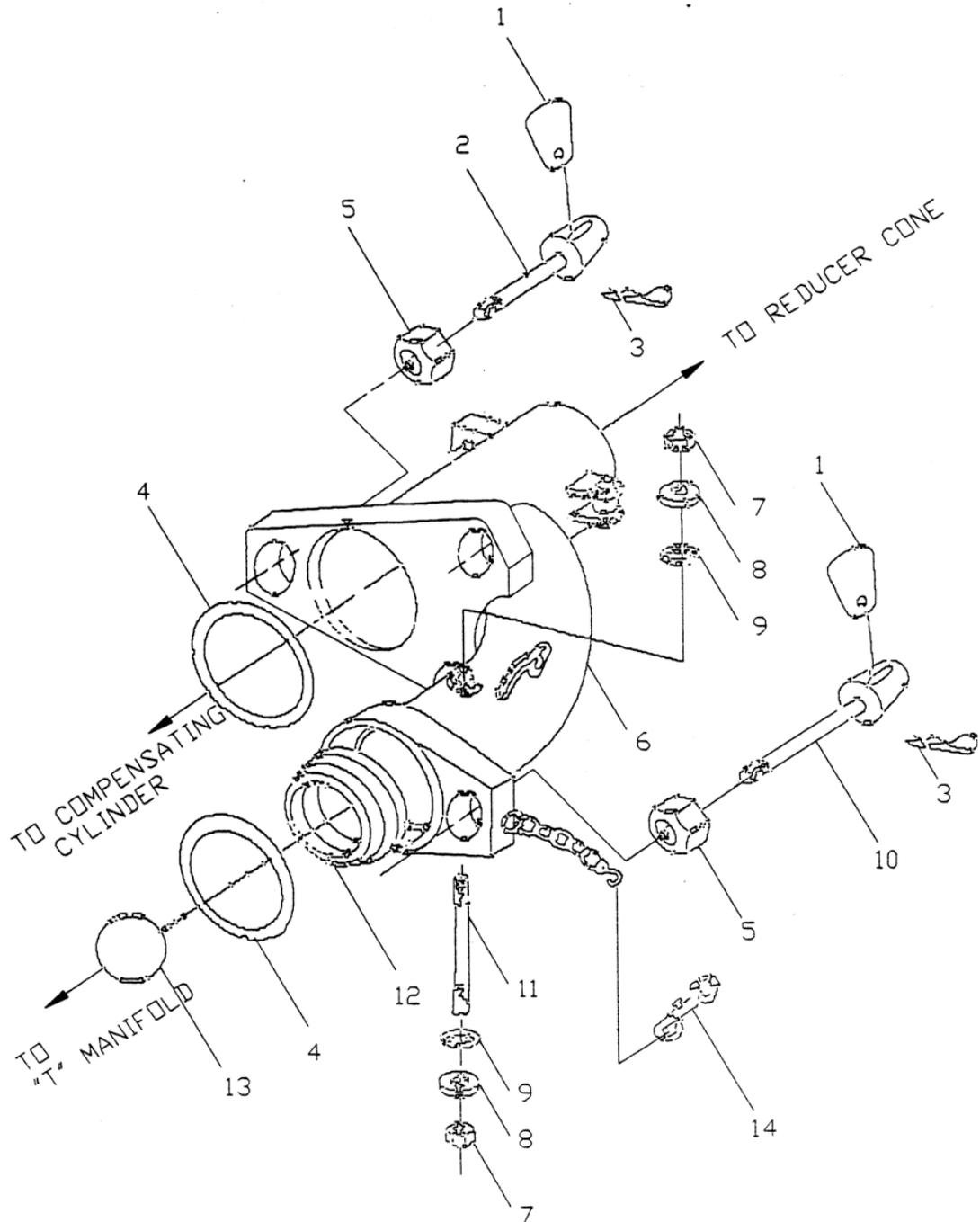
REF	DESCRIPTION	PART #
1	SPRING RETURN	1430 140 010
2	BACKING PLATE	1430 140 020
3	NUT	1020 000 013
4	BUSHING SLEEVE	1540 000 001
5	ROD END WELDMENT	1430 140 030
6	ROD PISTON GUIDE	1430 140 040

T MANIFOLD



REF	DESCRIPTION	PART #
1	O-RING	2020 000 006
2	BALL STEEL	1430 150 010
3	O-RING	2020 000 007
4	NUT JAM	1020 000 018
5	WASHER	1030 000 035
6	O-RING	2020 000 004
7	STUD	1430 150 020
8	MANIFOLD T	1430 150 030

Y MANIFOLD

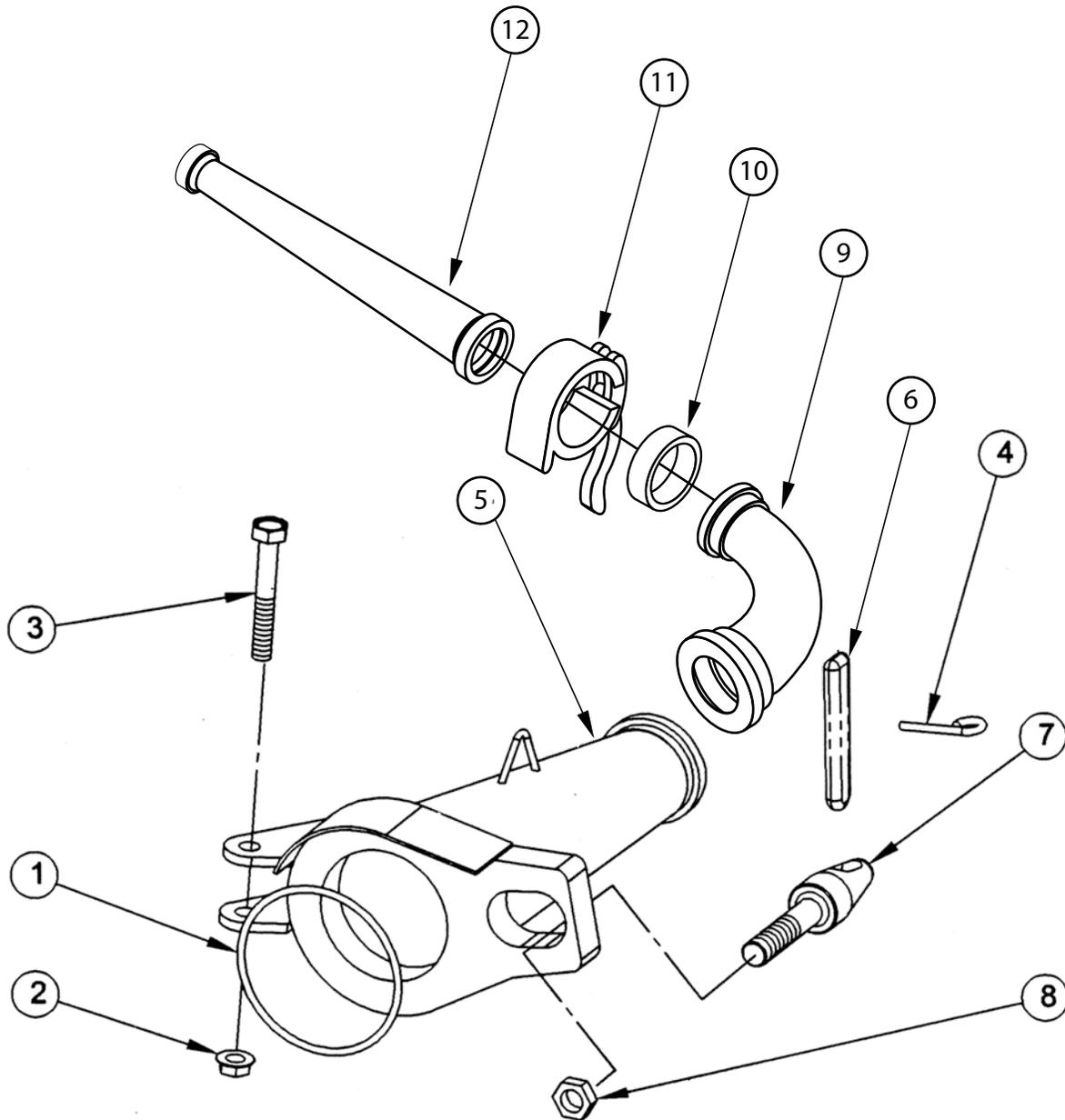


REF	DESCRIPTION	PART #
1	WEDGE CAST	1430 160 010
2	WEDGE ROD SHORT	1430 160 020
3	HAIR PIN COTTER	1040 000 004
4	O-RING	2020 000 007
5	NUT JAM	1020 000 019
6	MANIFOLD Y	1430 160 030
7	NUT JAM	1020 000 018

REF	DESCRIPTION	PART #
8	WASHER	1030 000 035
9	O-RING	2020 000 004
10	WEDGE ROD LONG	1430 160 040
11	STUD	1430 150 020
12	BALL SEAT	1430 160 050
13	BALL STEEL	1430 160 060
14	BOLT SNAP ROUND EYE	1040 000 005

PARTS BREAKDOWN

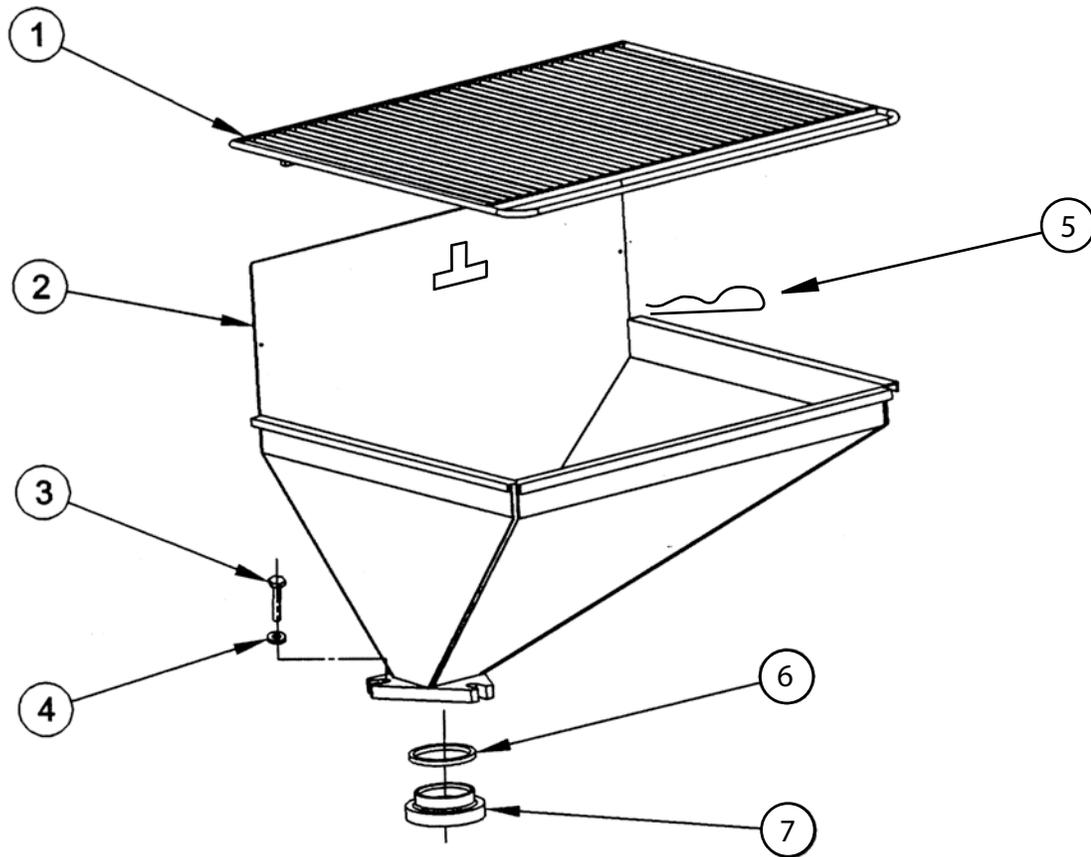
REDUCER CONE



REF	DESCRIPTION	PART #
1	O-RING	2020 000 007
2	NUT LOCK	1020 000 003
3	BOLT HEX	1010 000 073
4	HAIR PIN COTTER	1040 000 004
5	REDUCER CONE	1430 170 010
6	WEDGE CAST	1430 160 010
7	WEDGE ROD SHORT	1430 160 020
8	NUT JAM	1020 000 019
9	ELBOW 3" HEAVY DUTY	0021 PB3 09007D
10	GASKET 3" HEAVY DUTY	0021 CG3 0D
11	CLAMP 3" HEAVY DUTY	0021 C30 SD
12	REDUCER 3" HEAVY DUTY	0021 R30 2028D

PARTS BREAKDOWN

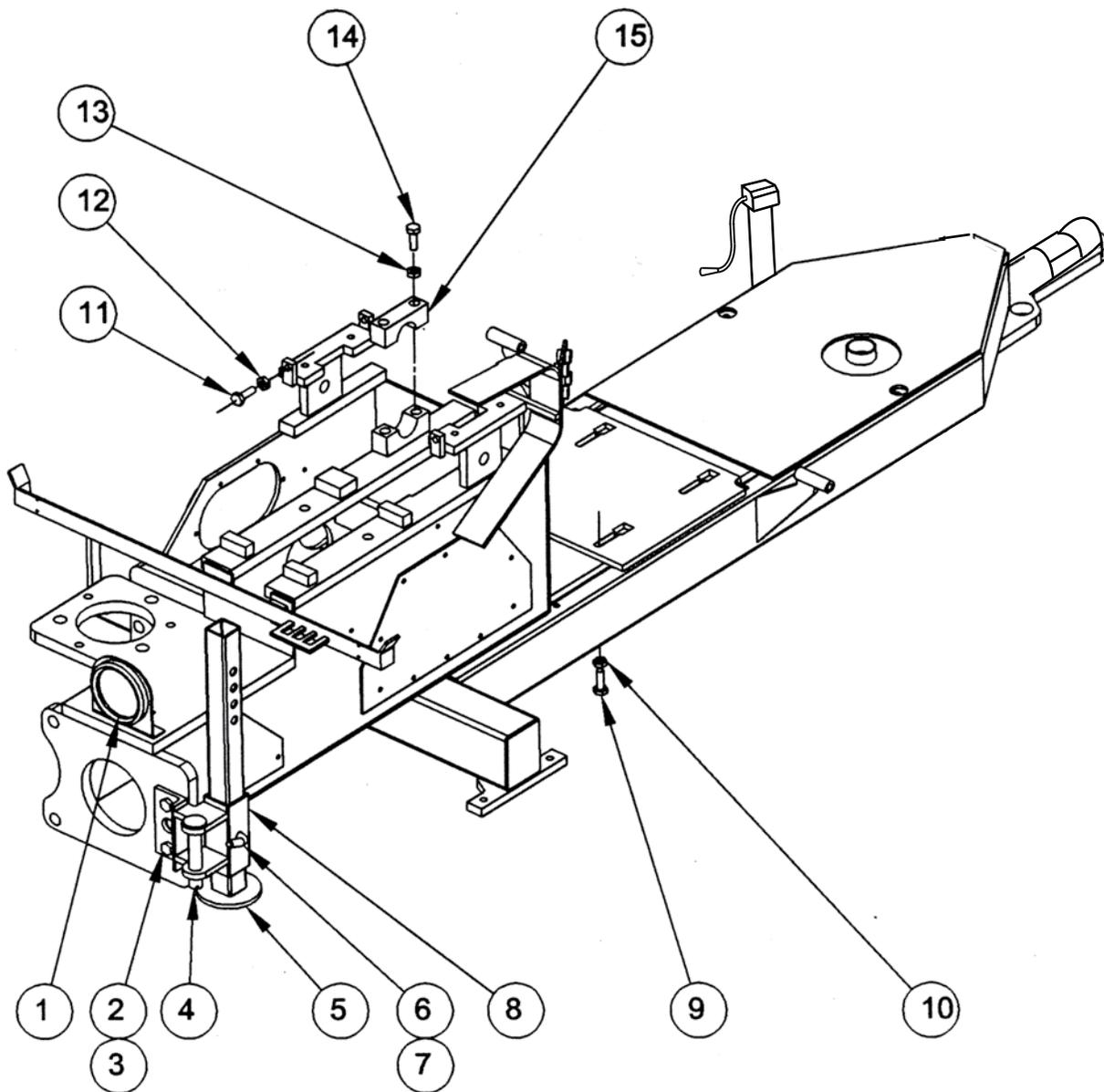
HOPPER



REF	DESCRIPTION	PART #
1	HOPPER SCREEN	1430 180 010
2	HOPPER WELDMENT	1430 180 020
3	BOLT HEX	1010 000 053
4	WASHER	1030 000 037
5	HAIR PIN COTTER	1040 000 004
6	O-RING	2020 000 006
7	BALL SEAT	1430 180 030

PARTS BREAKDOWN

FRAME

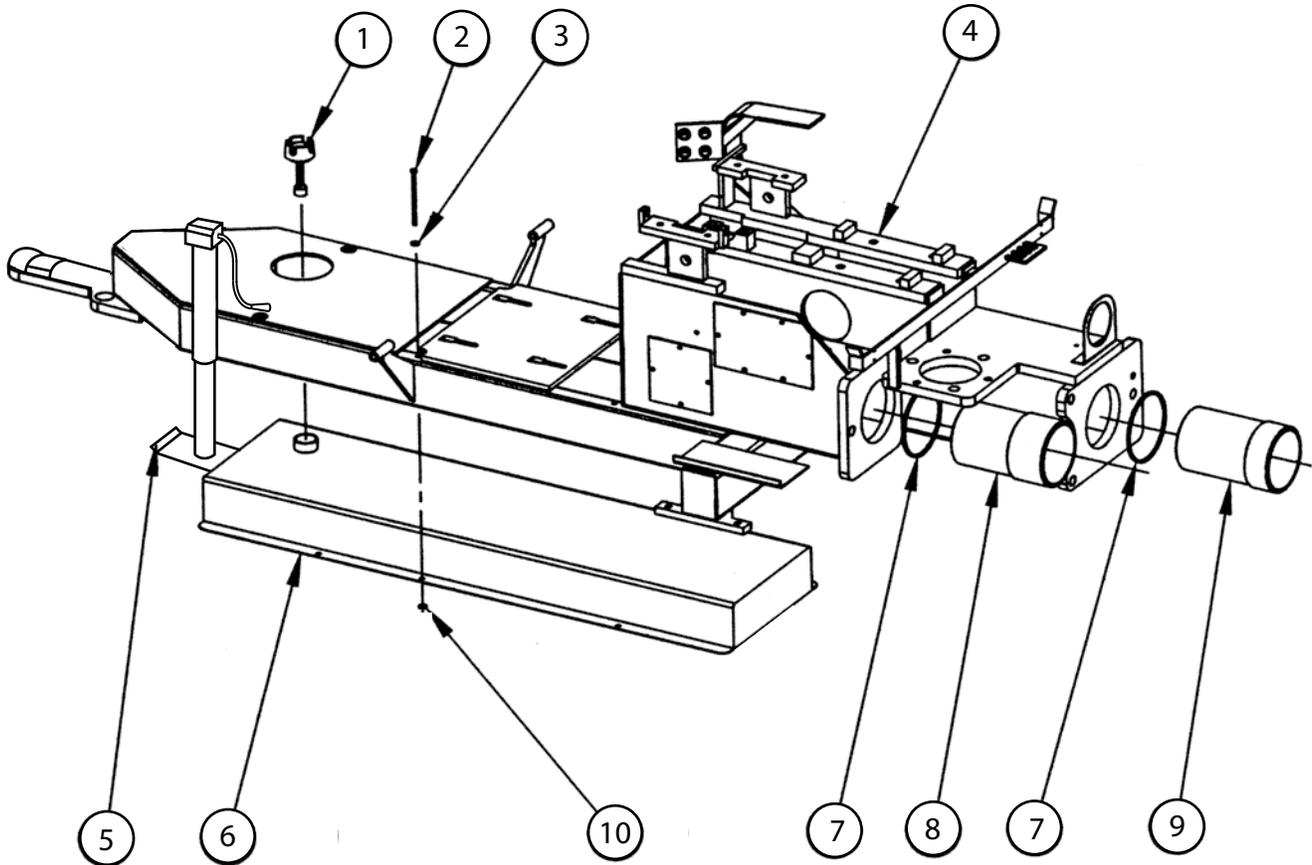


REF	DESCRIPTION	PART #
1	TAIL LIGHT KIT W30	9910 000 001
2	BOLT HEX	1010 000 053
3	WASHER LOCK	1030 000 026
4	PIN	00200041
5	STABILIZER FRONT/REAR	4510 000 003
6	LINK PINS	1040 000 006
7	HAIR PIN COTTER	1040 000 004
8	HINGE WELDMENT	4510 000 004

REF	DESCRIPTION	PART #
9	BOLT T SLOT	1010 000 065
10	NUT LOCK 1/2-13	1020 000 001
11	SET SCREW	1010 000 072
12	NUT LOCK	1020 000 001
13	WASHER LOCK	1030 000 024
14	BOLT HEX	1010 000 073
15	CLAMP ROCKER SHAFT	1598 000 002

PARTS BREAKDOWN

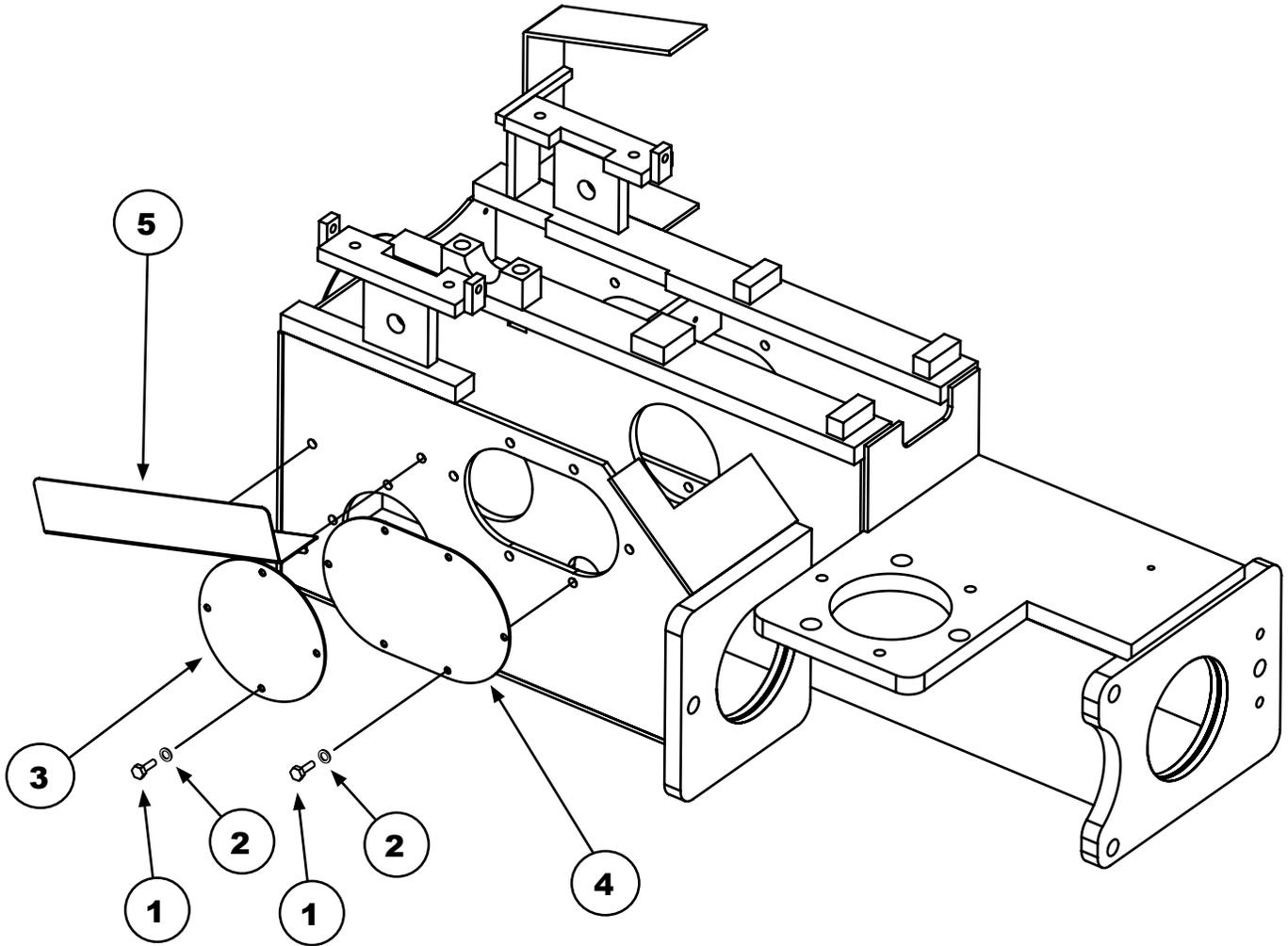
FRAME B



REF	DESCRIPTION	PART #
1	CAP GAS WITH LEVEL	1002 000 001
2	BOLT HEX	1010 000 074
3	WASHER FLAT	1030 000 012
4	PUMP BOX/TRAILER W30	1430 200 010
5	JACK STAND W30 (5000 LB.)	9910 000 006
6	FUEL TANK W30	1430 200 020
7	O-RING	2020 000 008
8	CYLINDER CRANK	1430 110 080
9	CYLINDER COMPENSATING	1430 130 050
10	NUT	1020 000 004

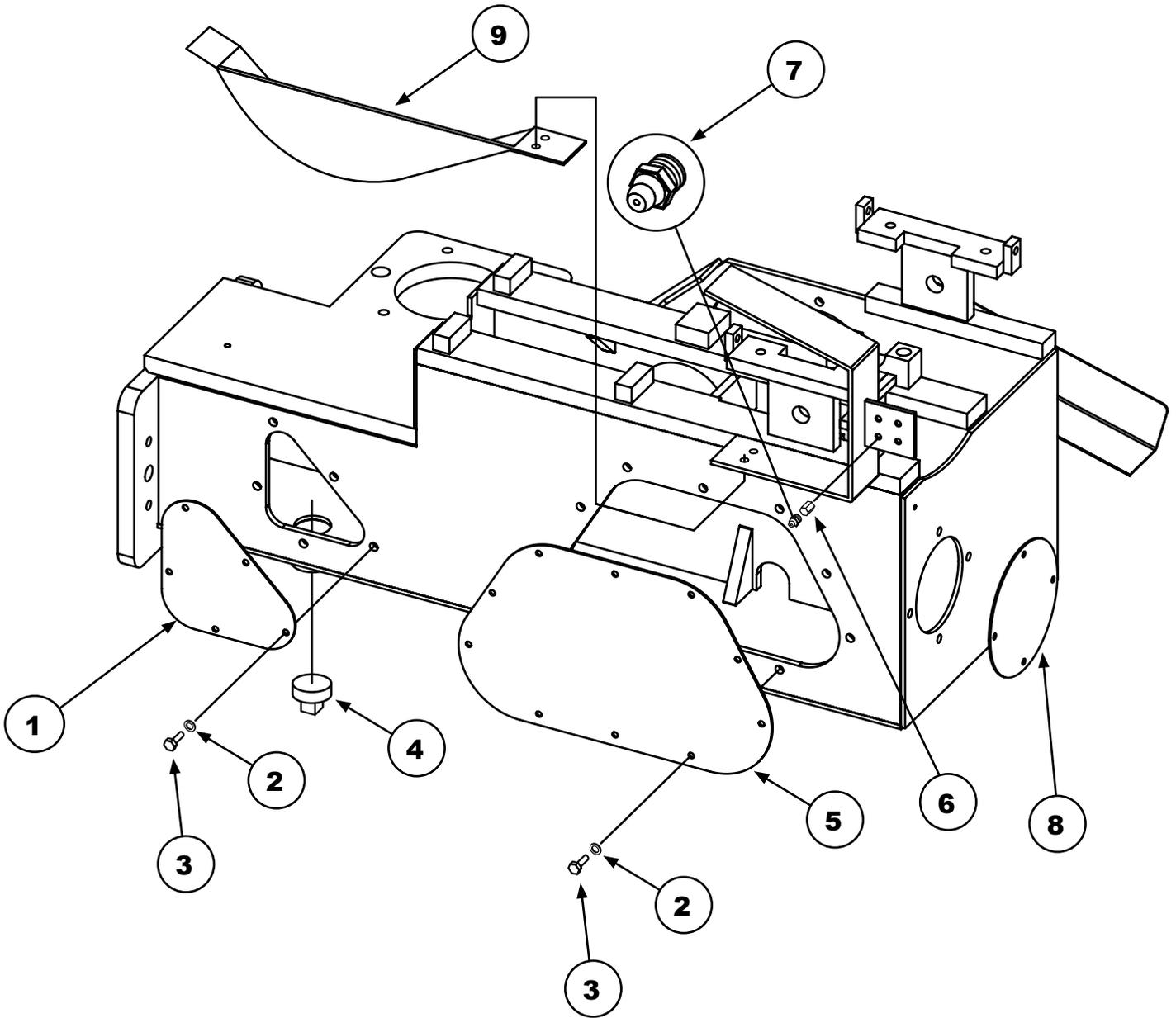
PARTS BREAKDOWN

FRAME C



REF	DESCRIPTION	PART #
1	BOLT HEX	1010 000 075
2	WASHER	1030 000 014
3	COVER STEEL	1430 210 030
4	COVER STEEL	1430 210 010
5	W30 CHAIN GUARD	1430 220 050

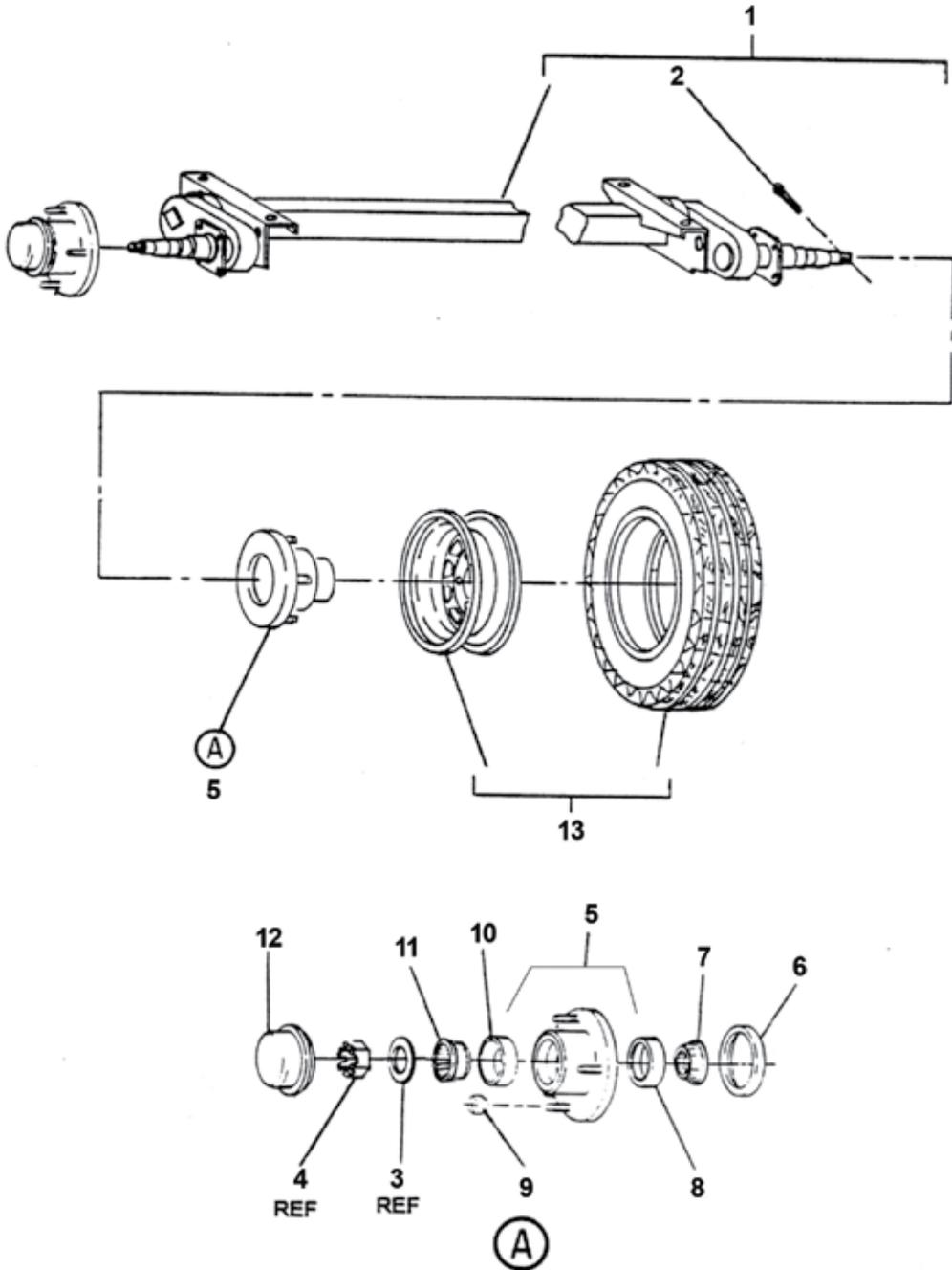
FRAME D



REF	DESCRIPTION	PART #
1	COVER STEEL	1430 220 020
2	WASHER	1030 000 014
3	BOLT HEX	1010 000 075
4	PLUG PIPE	1040 000 002
5	COVER STEEL	1430 220 030
6	COUPLING BLK	3510 000 001
7	FITTING GREASE	3598 000 001
8	COVER	1430 210 030
9	W30 BELT GUARD	1430 220 060

PARTS BREAKDOWN

AXLE ASSY.



REF	DESCRIPTION	PART #	REF	DESCRIPTION	PART #
1	AXLE SUB-ASSY WITH HUBS W30	1430 230 010	8	CUP INNER	0033 L68 111
2	COTTER PIN	1400 010 090	9	NUT WHEEL	1020 000 029
3	WASHER	1400 010 170	10	CUP OUTER	1200 030 170
4	NUT, CASTLE	1400 010 180	11	BEARING OUTER	1200 030 180
5	HUB ASSY W30	1430 230 030	12	BUDDY BEARING	0030 0026
6	SEAL GREASE	1400 030 110	13	TIRE & WHEEL ASSY W30	1430 230 040
7	BEARING INNER	1400 030 120			

PARTS BREAKDOWN

NOTES
