

# PARTS AND OPERATION MANUAL



## Concrete Pump Model C-30HD

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Revision #4 (03/06/01)



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# WARNING



## **CALIFORNIA — Proposition 65 Warning**

Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: **ALWAYS** work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

## **HERE'S HOW TO GET HELP**

*PLEASE HAVE THE MODEL AND SERIAL NUMBER  
ON-HAND WHEN CALLING*

### ***PARTS DEPARTMENT***

*800-427-1244 or 310-537-3700*

*FAX: 800-672-7877 or 310-637-3284*

### ***SERVICE DEPARTMENT/TECHNICAL ASSISTANCE***

*800-478-1244 or 310-537-3700*

*FAX: 310- 537-4259*

### ***WARRANTY DEPARTMENT***

*888-661-4279, or 310-661-4279*

*FAX: 310- 537-1173*

### ***MAIN***

*800-421-1244 or 310-537-3700*

*FAX: 310-537-3927*

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*NOTE: Specification and part number  
are subject to change without notice.*

## PARTS ORDERING PROCEDURES

- Dealer account number
- Dealer name and address
- Shipping address (if different than billing address)
- Return fax number
- Applicable model number
- Quantity, part number and description of each part
- Specify preferred method of shipment:
  - UPS Ground
  - UPS Second Day or Third Day\*
  - UPS Next Day\*
  - Federal Express Priority One (please provide us with your Federal Express account number)\*
  - Airborne Express\*
  - Truck or parcel post

*\*Normally shipped the same day the order is received, if prior to 2PM west coast time.*

## Earn Extra Discounts when you order by FAX!

All parts orders which include complete part numbers and are received by fax qualify for the following extra discounts:

<u>Number of line items ordered</u>	<u>Additional Discount</u>
1-9 items	3%
10+ items**	5%

### Get special freight allowances when you order 10 or more line items via FAX! \*\*

- UPS Ground Service at no charge for freight
- PS Third Day Service at one-half of actual freight cost

No other allowances on freight shipped by any other carrier.

\*\*Common nuts, bolts and washers (all items under \$1.00 list price) do not count towards the 10+ line items.

\*DISCOUNTS ARE SUBJECT TO CHANGE\*

Fax order discount and UPS special programs revised June 1, 1995

**Extra Fax Discount  
for Domestic USA  
Dealers Only**

**Up to 5%  
extra savings!**

**UPS  
Special**  
For faxed orders only

**Now! Direct TOLL-FREE access  
to our Parts Department!**

Toll-free nationwide:

**800-421-1244**

Toll-free FAX:

**800/6-PARTS-7 • 800-672-7877**

## PERFORMANCE

Pumping Rate .....	25 cu. yds. per hour
Maximum Aggregate Size .....	1/2" minus (35mm)
Verticle Pumping Height .....	Excess of 100 ft. (60 m)
Horizontal Pumping Distance .....	400 to 500 ft. (300 m)
Engine — Gas .....	30 HP Wisconsin VH4D
Engine — Diesel .....	30 HP Hatz Z790
Pump .....	Reciprocating piston
Remote Control .....	Standard
Hopper Capacity .....	6 cu. ft.
Material Hose .....	2" or 2 1/2"

## DIMENSIONS

L x W x H .....	10 ft. x 4 1/2 ft. x 4 1/2 ft.
Weight .....	2,200 lbs.
Tire Size .....	7.35 - 14

## Mechanical Drive Models

MAYCO PUMP, hereinafter referred to as “Manufacturer”, warrants each new Mayco Pump sold by the manufacturer to be free from defects in material and workmanship, under normal use and service, for a period of one year after the date of delivery to the original retail purchaser. Manufacturer will, at its option, replace or repair at a point designated by the Manufacturer any part or parts which shall appear to the satisfaction of the Manufacturer upon inspection at such point to have been defective in material or workmanship. This warranty does not obligate the Manufacturer to bear any transportation charges or labor charges in connection with the replacement or repair of the defective parts.

This warranty does not apply to any pump if attempts have been made to pump concrete materials which have separated, to any pump which has been repaired with other than Genuine Mayco Parts, nor to any pump which has been altered, repaired or used in such manner as to adversely affect its performance, nor to normal service or maintenance or where blockages have developed within the pump manifold or placing line or which has been operated in any other manner not recommended by the Manufacturer. Due to the abrasive nature of concrete, Mayco does not cover natural component wear.

THIS WARRANTY AND MANUFACTURER’S OBLIGATION HEREUNDER, IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY AND ALL OTHER OBLIGATIONS OR LIABILITIES INCLUDING SPECIAL OR CONSEQUENTIAL DAMAGES OR CONTINGENT LIABILITIES ARISING OUT OF THE FAILURE OF ANY PUMP OR PART TO OPERATE PROPERLY, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

## Hydraulic Drive Models

MAYCO PUMP, hereinafter referred to as “Manufacturer”, warrants each new Mayco Pump sold by the manufacturer to be free from defects in material and workmanship, under normal use and service, for a period of one year or 2000 hours after the date of delivery to the original retail purchaser. The Manufacturer will, at its option, replace or repair at a point designated by Manufacturer any part or parts which shall appear to the satisfaction of Manufacturer upon inspection at such point to have been defective in material or workmanship. This warranty does not obligate Manufacturer to bear any transportation charges or labor charges in connection with the replacement or repair of the defective parts.

This warranty does not apply to any pump if attempts have been made to pump concrete materials which have separated, to any pump which has been repaired with other than Genuine Mayco Parts, nor to any pump which has been altered, repaired or used in such manner as to adversely affect its performance, nor to normal service or maintenance or where blockages have developed within the pump manifold or placing line or which has been operated in any other manner not recommended by the Manufacturer. Due to the abrasive nature of concrete, Mayco does not cover natural component wear.

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## SAFETY INSTRUCTIONS



1. Read the Mayco Owners Manual before moving or operating the unit.
2. Do not attempt to operate this pump without a thorough understanding of this technical manual.
3. To prevent damage to equipment or injury to personnel, these instructions must be followed carefully.
4. A copy of this manual shall accompany the pump at all times.
5. This equipment shall be operated only by experienced operators or students under the direct supervision of an experienced operator.
6. 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 or make-ready operation.
7. This equipment shall not be towed or operated by individuals who cannot read and understand the signs, decals, or operating instructions.
8. This equipment shall not be operated by individuals under the influence of alcohol or drugs.
9. Before towing, check the hitch and secure the safety chain to the towing vehicle. Also check for proper tire pressure.
10. Tow only with a vehicle and hitch rated to pull a 2200 lb. load.
11. If pump is equipped with ball hitch coupler, use only a 2" all steel ball rated for a minimum of 5000 lbs. Use a 1" hardened steel pull pin, if the pump is equipped with a pin hitch.
12. Before start-up, check the hopper and remove all obstructions.
13. Keep all hands out of the hopper when the engine is running.
14. The engine must be turned off before performing any service operations.
15. Do not operate the pump with the hood open.
16. Replace any worn or damaged pump components immediately.

17. Do not use worn out hoses or couplings; inspect daily.
18. Do not disconnect the hose couplings or nozzle while they are under pressure. Relieve the pressure by manually swinging the clamp arm latch handle to the first open position at the exhaust cone outlet.
19. Never fill the fuel tank while the engine is running or hot; avoid the possibility of spilled fuel causing a fire.
20. Always carry a fire extinguisher of adequate size and a first aid kit.
21. Always wear safety glasses when spraying material.
22. The unit should not be towed in excess of 45 MPH (or less depending on road conditions).
23. Pull the tail light switch "ON" for night towing.
24. Do not tow the pump with the hopper full of material.
25. Do not tow the pump with the hoses attached.



### CAUTION

If hoses or lines are blocked for any reason, or if the lines are kinked when starting up or during the pumping cycle, the pump pressure could straighten out the kink or force out the blockage. This rapid surge of material could cause the lines to whip or move in a manner that could cause injury to personnel.

**Inspect the lines at all times to prevent the above conditions.**



## IMPORTANT HAND SIGNALS



**Chute Up**



**Chute Down**



**Stop**



**Start Pump  
Speed Up**



**Slow Pump  
Down**



**Stop Pump**



**Little Bit**



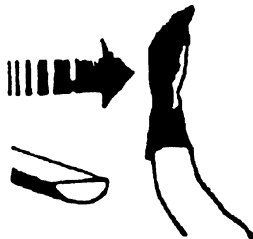
**Add Water — 4  
Gallons**



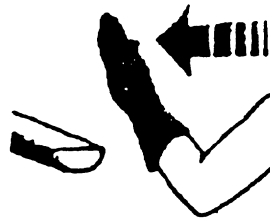
**All Done Clean  
Up**



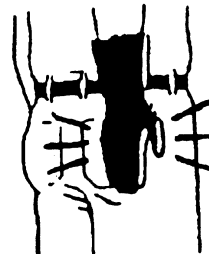
**Drive In**



**Back Up**



**Pull Forward**



**Back In**

The following operating principles and operating suggestions should prove helpful in the successful operation of your concrete pump. Your new "small line" concrete pump has been designed to give you many years of service when operated properly. A study of the following paragraphs is important to the successful operation of your new Direct-flo Concrete Placer.

All concrete pumps require a high level of operator skill and more frequent service than most of the other construction equipment. The highly abrasive nature of concrete under pressure makes it extremely important that expendable wear components be inspected at regular intervals between jobs to prevent having to replace these items during a pour. Experience has proved that inconsistency of batched concrete mixes and frequent moving of the line requires the operator to be readily available at all times during pumping to stop the pump and prevent abuse to the unit which may occur if unexpected blockages develop.

### PUMP MIX GUIDELINES

When ordering concrete, be certain to advise the concrete supplier that you require a "pump mix". The Direct-flo manifold will pump a wide variety of materials, but certain basic principles must be followed to assure successful pumping, as follows:

1. Generally speaking, the washed concrete sand and #4 aggregate (pea gravel) should conform to A.S.T.M. standards in regard to sieve analysis. Sands in some areas are washed clean of the #100 and #200 mesh fines, which results in separation and jamming in the manifold while pumping under pressure. If this condition develops, check with your concrete suppliers engineers and get their recommendations for supplementing the lack of the fines. The use of locally accepted ad-mixes may be required. (For example, Pozzoloth, Bentonite Clay, Plastiments, etc.) When properly prescribed, additives form the plastic paste sometimes necessary to hold the cement and aggregate together. NOTE: If jamming conditions in the pump or hose occur for any reason at all, do not attempt to use more power to correct the condition. Determine the cause of jamming, correct it and resume pumping. Trying to force material through under jammed conditions may result in damage to the drive system, thus voiding any warranty services.

2. As a general rule, the use of approximately six sacks of cement, 70% washed concrete sand and 30% #4 pea gravel per yard of concrete will result in a pumpable mix. The ideal nature of sand and rock in certain areas may permit you to increase the percentage of rock or adjust the mix considerably to meet the job requirements. When possible, you may experiment with various mixes in your area to determine the degree of versatility of the Direct-flo Pump.

3. Uniform gradation of the washed concrete sand and the 1/2" minus aggregate along with sufficient cement content and water are important to a successful pump operation.

4. A recommended pumpable mix design would be 70% sand and 30% aggregate-cement content to be a minimum of 6 sacks. (564 lbs.)

NOTE; Your local sand and rock engineers will give you the s.s.d. weights of sand and rock required in your local area which will yield one cubic yard per the above recommendation.

### SAMPLE DESIGN MIX

6 1/2 sacks cement (611 lbs.)

1800 lbs. washed concrete sand

1000 lbs. pea gravel

230 lbs. water

5. Test laboratory data has proven in many areas that the above mix guidelines have produced concrete rated at 3000 psi (28 day test) and upwards of 5000 psi with an increase in cement.

6. In some areas where the gradation of sand and rock is ideal and sufficient cement is used along with admixtures, the Mayco small line concrete pump will handle up to a 50-50 ratio of sand and rock.

7. When the mix is designed for wet gunning applications, it is normal to increase the cement (up to 7.5 or 8 sacks) and change the sand to rock ratio to 85% sand and 15% rock.

8. The Mayco concrete pump will valve efficiently when using cellular-foam concrete mixes upwards of 70 lbs. per cubic foot wet density. (Below 70 lbs. materials (roof decks) the valving becomes inefficient.)

[illegible]

The Mayco concrete pump has one main pumping piston which is valved by means of two ball checks. (A inlet, and B outlet.)

The secondary piston is used as a compensator piston to smooth out the pulsations of a single piston action. Note: The compensator will not start operating until material is pumped into the line and back pressure develops.

The compensator spring, which is installed on the compensator piston rod, deflects with each piston stroke. This "spring cushion", in conjunction with the cam profile, produces and uninterrupted smooth flow of material under average pumping conditions.

An automatic, centrifugal clutch is installed to engage and disengage the pumping action without stopping or starting the engine. The centrifugal clutch is set at 1100 R.P.M. release. The engine idle speed is approximately 750 R.P.M.; therefore, the clutch is completely disengaged at idle. The throttle settings while pumping should always maintain an engine R.P.M. high enough to prevent the clutch from slipping and burning the clutch lining.

The return spring which is installed on the rocker arm, is installed to eliminate shock and stress between the cam roller and the cam weldment when the pump is in operation. If the return spring is removed or replaced for any reason, maintain the backing plate dimension of 3" as shown on Figure 3, to produce the proper pre-loading of the spring for a smooth performance.

Figure 1- The pumping cylinder retracts drawing the material past the ball (A) and filling the cylinder. The compensator piston is pumping the material out to the nozzle and causing ball (B) to seat preventing the material from returning to the pumping cylinder intake.

Figure 2- The pumping piston is forcing the material past ball (B) and out to the nozzle, also seating ball A so that the material will not flow back to the hopper. This action also fills the compensating piston for the next stroke.

Figure 3- Shows the relationship between the return spring, the compensator spring and the rocker arm to maintain a smooth performance. Do not tighten the bolt (Item 1) completely, the rod end must be able to move.

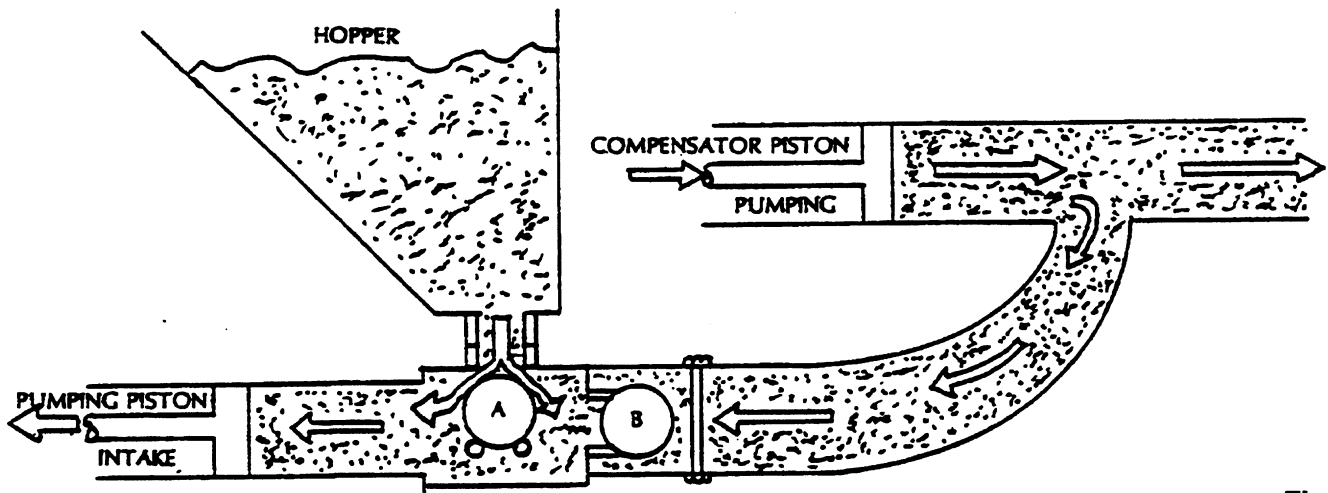


Figure 1

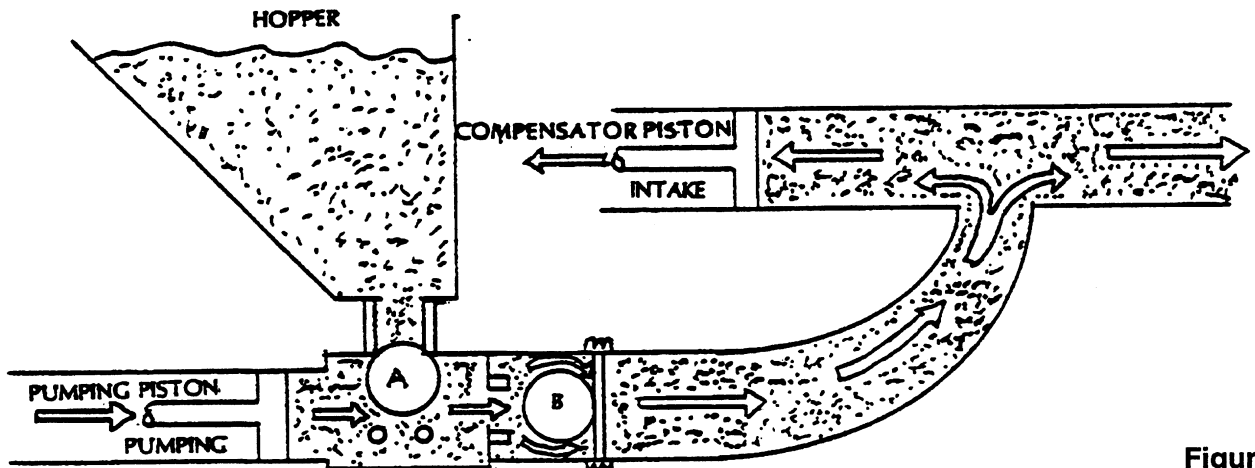


Figure 2

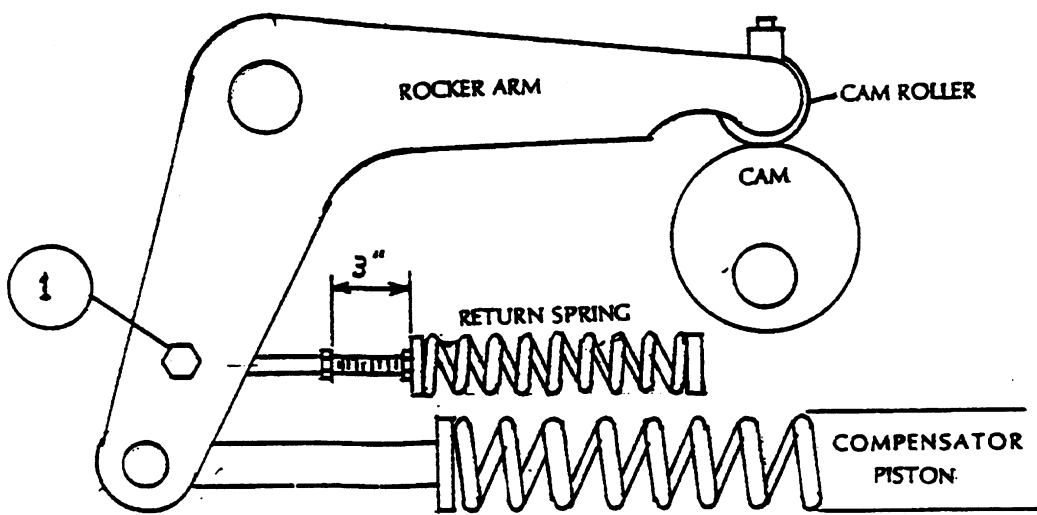


Figure 3

### OPERATING SUGGESTIONS

1. A well-planned location of the pump and routing of the hose before starting a pour may save subsequent moves throughout the job.

2. Before concrete is discharged into the hopper, it is suggested that 3 to 4 gallons of water be sprayed into the hopper, followed by approximately 5 gallons of a creamy cement and water slurry (1/2 bag of cement to 5 gallons of water). This procedure lubricates the hose and prevents separation and blockages in the hose. Note: Getting the concrete to flow through the hose at the start of the pumping cycle can be one of the most critical operations of the pour. (Manually operate the throttle - when starting. NOT REMOTELY)

3. It is important that once the slurry procedure is completed, and you have started concrete flowing through the hose, do not stop the pour until all the slurry is pumped out and the concrete has reached the end of the hose. The only time to stop the pump at the start is if a blockage occurs.

4. When the pump is stopped for any reason during a pour; e.g., moving hose, waiting for redi-mix truck, the following suggestions are offered:

A. Leave the hopper full of concrete at the time of shutdown. It is important not to let the redi-mix driver wash too much water into the hopper, as this could cause separation of the concrete in the hopper.

B. If the shutdown period exceeds 2 to 3 minutes, turn off the engine so the vibration does not separate the mix in the hopper which can cause a blockage in the manifold when the pump is started.

C. If it is necessary to wait 10 minutes or more for another load of concrete, it is wise to start the pump and pump 6 or 8 strokes every 5 minutes to prevent setting of the mix in the system. If waiting time is excessive, it would be wise to wash out the pump and hoses and start over when the new truck arrives.

D. When pumping stiff mixes and there is waiting time between redi-mix trucks, it is advisable to add some water to the last hopper of material and "hand mix" to ensure an easier start with the following load.

E. When the pumping job requires a stiffer mix, the following method is suggested for starting: Take a water hose with a nozzle on it and apply water with a fine spray to the concrete as it comes down the redi-mix chute into the pump hopper after the slurry procedure is completed and you are ready to start pumping. Using this procedure will make it easier to pump through the clean hose. Note: Once the concrete has reached the end of the hose, do not apply any more water in this manner as this procedure is used on the start only.

F. Hose sizing is very important: We strongly recommend on harsh mixes, vertical pushes, stiff concrete, shotcrete, long pushes, that a 2 1/2" line be used as far as possible. The advantages of using the 2 1/2" line are improved pumpability, less pumping pressure and less wear on the pump.

5. Following the pump operation, proper wash out of all materials or "build-up" within the pump manifold and hoses will prevent problems when starting the next job.

6. A thorough inspection of the drive components and greasing of all bearings after each job will ensure adequate lubrication and service to the pump which is normally operating in wet, gritty conditions. Note: Over-greasing any bearing on your Mayco pump will not damage the bearing.



**7. Warning:** Common sense tells us that if you drive a truck into a brick wall, something is going to be damaged. The same holds true with your concrete pump. If you repeatedly pull the throttle all the way out and try to force your pump to push through blockages due to separation of material in the hose or manifold, you will soon have breakdowns and costly repairs which are not covered under warranty. If a blockage occurs, find where it is and clear it before further pumping. Do not use horse-power; it will only make it worse.



**8. Warning:** It will be necessary at times to move your pump from one job site location to another. Before moving the pump, make sure to pump the remaining concrete out of the hopper. Moving the pump with a full hopper of concrete can cause severe damage or breakage of the axle and axle springs, excess strain and pressure on the hub and bearing assembly.

### PUMPING TIPS AND TROUBLE SHOOTING

1. **The effects of heat and excessive time on concrete:** Hot concrete, commonly referred to as a hot load, is concrete that has been in the redi-mix truck in excess of 2 to 3 hours. On a hot day, this amount of time is even less. A brief explanation of why heat and time affect concrete: Concrete starts setting by drying up through a chemical reaction. The catalyst to this reaction is heat. When pumping a hot load, it is important to remember that when you have to stop pumping for any reason, add water to the concrete in the hopper and hand mix and move concrete in the hose every 5 minutes. If the shut down time becomes too long, wash out immediately.

2. **ADMIXTURES:** A remixtures that are designed into the concrete mix by the redi-mix company or an architectural engineering company. This section lists common admixtures and a brief explanation of their function.

A. **POZZOLITH 300 R** or the equivalent acts as a water retarder and a lubricant. On a lean mix, long pushes, stiff mixes, and vertical pushes, Pozzoloth 300 R helps pumpability.

B. **MBVR**, air entraining, acts as a lubricant.

C. **CALCIUM CHLORIDE**, commonly referred to as C.C., is used as an accelerator. When pumping a load with calcium chloride, it is recommended that you wash out if the waiting time between delivery trucks becomes too long.

D. **SUPER PLASTICIZERS**, acts as an accelerator. The concrete will look very wet after the super plasticizer is added, but will begin to set up very fast. Wash out immediately if you do not have a truck waiting. Super plasticizers are used mainly on commercial jobs.

E. **RED LABEL**, acts as a water retarder and an accelerator. Red label will be used mainly on commercial jobs.

F. **FLY ASH**, is used to help increase the strength of the concrete and decrease the cement content per yard. This is one of the most common admixtures used.

**NOTE:** All admixtures will be shown on the redi-mix concrete ticket. Before starting the pumping job, ask the driver of the redi-mix truck to see the concrete ticket and note the admixtures that exist and take the proper action.

3. When pumping long distance or pumping stiff mixes, you can expect a drop in volume compared to shorter lines and wetter mixes due to the change in valve efficiency or cavitation.

4. Leaking manifold seals or hose coupling gaskets which leak water can cause separation and subsequent jamming at that point.

5. Damaged hoses with internal restrictions can cause blockages.

6. If a blockage occurs in a hose, "walk the hose" until you find the point of trouble. The hose will be soft immediately past the blockage. If this happens at the start, disconnect the hose at the first coupling past the blockage. Elevate the hose at that point with the blockage area hanging down. **Note: Use extreme care! The hose line is under pressure and can cause serious injury.** Using a hammer, you can pound the down-stream edge of the packed area until it is free to flow. Shake all of the sand and gravel out to the end of the hose. Before reconnecting the hose, start the pump and run a small amount of concrete out to the end of the hose. This will assure that all of the separation is out of the hose.

7. The manifold is plugged if the volume at the discharge end of the hose stops, and the hose is soft. The drive belts will start to slip and the engine will lugdown.

To clear a plugged manifold, *great care must be taken as a dangerous condition will exist due to pressure build-up inside the manifold.*

#### Follow these instructions carefully:

7.1 Stop the pump. Switch off the engine.

7.2 **DO NOT** open any of the delivery system joint clamps.

7.3 The senior experienced operator must warn all others to stand at least 20 feet away from the machine and turn their heads away from the manifold.

7.4 The operator must position himself/herself away from the hinged side of the manifold.

7.5 Wearing safety glasses, grasp the clamp arm weldment and carefully pull it open to the primary (safety) position. **STOP** count to 20. This will allow the pressure to release.

7.6 After the pressure has been released, open the clamp arm weldment and swing the hinged discharge cone open.

7.7 Remove blockage with around a 2-foot length of reinforcing steel rod. Flush the manifolds with water. Make sure the (3" x 2") reducer is clear of any blockage before closing the discharge cone.

7.8 After the blockage has been cleared and the pump manifold has been thoroughly flushed with water, close the hinged discharged cone and lock into place.

7.9 Before reconnecting hose to the reducer, start the engine and pump two or three shovels of concrete through the reducer. This will insure that all the blockage has been cleared.

7.10 Shake out around 2 feet of concrete before reconnecting hose to pump. After this is done, connect hose to pump and resume the pumping operation.

8. If it is necessary to wait 1/2 hour or more for another load of concrete, it is advisable to consider the factors affecting the concrete that is already in the pump and system. To prevent setting of the mix in the system: 1) how old is the concrete ? 2) is there an accelerator, calcium chloride, red label, etc., in the concrete ? 3) the temperature of the day, 80, 90, degrees? 4) how much system you have out and how stiff was the mix you were pumping? If, for any reason, the mix should set up in the system, the following procedure is suggested:

**Note: Use extreme care! The hose is under pressure!**

Disconnect the hose from the pump and wash the pump out immediately. Reconnect the hose and fill the hopper with water. DO NOT try to push all the concrete out of all of the hose line at one time. For example: If you had 200 ft. of system out, you would disconnect each hose. Clean it out by pushing water through the first hose off the pump, then continue progressing through all the hoses, until all the system is clean. If waiting time is excessive, it would be wise to wash out the pump and hoses and start over when the new truck arrives. This can be avoided by being attentive to the pump and system, also taking into consideration the above 4 factors affecting the mix.

9. "Down-hill pumping" can be difficult on some jobs. The slurry procedure would be the same as explained on the pages titled Operating Suggestions. It is suggested that a sponge 2"x 4"x 6" be placed in the hose before the start of pumping. Wet the sponge before placing it in the hose. The reason for using the wet sponge is to keep the slurry from running too far ahead of the concrete and so reducing the possibility of separation. When the pump is stopped, the material can flow slowly down, due to gravity, and cause the hose to collapse. When pumping is resumed, you can expect a blockage at the point of hose collapse. To prevent this from happening, the hose can be "kinked off" at the discharge end when the pump is stopped to prevent the gravity flow of the material in the hose. The use of stiffer mixes when pumping down-hill will decrease gravity flow of the material in the hose and will assure a smoother operation between the cam roller bearing and cam plate. As with any job, make sure that the hose and the couplings are in good workable shape.

10. When pumping vertically:

A. When pumping vertically up the side of a building, above 40 feet, we would recommend the installation of steel pipe securely fastened at intervals as necessary to support the pipe. Ninety degree, long radius pipe sweeps should be installed at the top and bottom of the steel line. Use a 25 ft. hose, or short section, off the pump; and for the balance of the horizontal distance to the vertical line, use steel pipe. This type of installation has been satisfactory on many jobs being pumped in excess of 100 feet high. Line pressures are always less using steel pipe as compared to hose.

B. When pumping vertically, using all hose, it is recommended not to go higher than 50 feet with hose. The hose should be tied off at intervals of 10 feet, if possible. Special attention should be given when tying the hose off at the top as the hose will have a tendency to stretch when filled with concrete. This will increase the possibility of a blockage at the point where the hose is tied off. To avoid this, a long radius of 90 degree elbow is recommended. The suggested place to tie off is on the hose, under the clamp. **Note: It is strongly recommended that pipe be used on all vertical pumping for safety and convenience.**

If it is absolutely necessary to use hose, then use this section as a guide.

11. If the volume at the end of hose starts to decrease gradually and eventually almost stops, it is quite likely that the valve seats have had excessive wear and need replacement. Once they have reached a certain wear point, they may "channel out" rapidly and material will reciprocate past the ball on each stroke. The hollow steel ball should be replaced when it starts to show dents or appears to be badly worn. Sand and aggregate materials in some areas are extremely sharp and hard and therefore highly abrasive. Under these conditions when pumping stiff mixes, or to high elevations which cause line pressures, it will be noted that valve components may have short wear life. If this condition exists, it is advisable to remove the manifold only, and inspect the lower seat at the end of each day. If it appears that the seat is beginning to "channel out, replace before starting the next day's pour. The upper valve seat can be inspected after each washout by running your finger around lower edge of seat where the ball makes contact. You can reach this from the inside of the hopper. Be sure that the engine is turned off.



12. Slight pulsation of the hose will always be noticeable near the pump. Excessive pulsation of the hose near the pump is normally due to higher than average line pressures caused by stiff, harsh mixes, or extremely long pumping distances. The use of 2 1/2" I.D. hose in these extreme cases reduces line pressures or the addition of slight amounts of water to the mix, if permissible, will permit easier pumping. The use of certain pumping admixtures may help.

If excessive pulsation exists in the hose, it is advisable to use burlap or some means of wear protection under the hose at points where the hose may wear through the outer cover; e.g. over forms, steel or sharp curbs.

13. If the cam roller does not ride on the cam profile smoothly, it may be caused by insufficient line back-pressure; e.g., a wet mix with only 50 feet of hose. Add more hose as necessary. It can also be caused by cavitation or the passing of oversized aggregates through the valving, causing it to skip.

14. When using Snap-Joint couplings with gaskets to join hose, see that they are washed clean after each job. Keeping the hose ends clean (heavy duty) is very important for the best job setup. A thin coat of grease on the rubber gasket or dipping both coupling and gasket in water before coupling the hose will make for easier installation.

15. All new pumps are "water pressure tested" at the factory before shipment. This procedure permits a thorough inspection of entire drive system and valving under simulated full load conditions. The pump owner can do the same by attaching an adaptor to couple to the end of the discharge cone; e.g., the use of a standard 2" pipe cap with a 3/8" hole drilled in the center, screwed on to the end of the hinged cone or reducer at the pump. Fill the hopper with water after making sure that all sand and rock have been removed from the manifold. Operate the pump at full throttle and the 3/8" diameter hole restriction will create sufficient back-pressure to make a thorough inspection of all moving parts.

16. Before starting the pumping operation, the following check list procedure should be followed:

1. Check the engine oil.
2. Check the oil reservoir of the lubrication system to make sure that it is full.
3. Inspect the chain and belt adjustment.
4. Check the cam oiler.
5. Start and run the engine a minimum of five minutes before starting the pumping operation.

Note: When the redi-mix truck arrives, it is always a good idea to check the concrete ticket and make sure you have the proper mix design.

### CLEAN UP PROCEDURE

#### PART A

1. Ensure that there is no blockage in the hose and line (See Page 15, Para. 6) or in the manifold (See Page 15, Para. 7). If a blockage exists, clear it as it dictates how the machine will pump the next time it is used. At the end of every pour, or because of long delays during a pour, the pump and delivery system must be thoroughly cleaned by removing all concrete material.

2. Proper wash out of all materials or build up within the pump manifold and hoses following the pumping operation will prevent problems when starting the next job. After completion of the pour, pump the remaining concrete in the hopper through the discharge line.

3. Note: To avoid the possibility of separation during clean-up, do not pump the concrete below the inlet ball in the hopper. It is best to leave approximately 3 to 4 inches of concrete above the inlet ball.

4. Turn the pump engine off before filling the hopper with water. Engine vibration at idle may "separate" material in the hopper, causing jamming in manifold when pumping is resumed.

5. Fill hopper with water and resume pumping. The water will push the concrete through the line. When the water runs clear at the end of the hose, disconnect lines and shake out all the sand and sediment so the lines will be clean for the next pour.

6. It is important that the hinged discharge cone on the pump manifold be opened and all remaining concrete (rock and sand) be thoroughly washed out. This must be done after each job to prevent concrete build up in the discharge manifolds and 3" discharge elbow.

## PART B

This section will explain the recommended procedure for using a sponge to clean out the lines. After completion of the pour, pump the remaining concrete in the hopper through the discharge line. Using a shovel, clean the sides of the hopper. (Note: The pump engine should be turned off, as explained in Part A of the Clean Up Procedure.) After the sides of the hopper have been cleaned, add a small amount of water to the remaining concrete in the hopper and hand mix.

Start the pump engine and pump the hopper all the way down. Disconnect the hose from the pump. Fill the hopper with water and pump the remaining concrete out of the pump. Open the hinged discharge cone and thoroughly wash out all remaining concrete (sand-sediment) from the cone and pump manifolds. Close the discharge cone and lock in place. Take a sponge (2"x 4"x 6") and soak it with water. Take the hose that is disconnected from the pump and shake out the concrete so that about 2 feet of it is clear. Insert the sponge into the hose. Reconnect the hose to the pump. Fill the hopper with water and resume pumping. Run the pump approximately half throttle. The sponge will be 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.

## WARNINGS



1. Never put your hands, or any other parts of your body, in the hopper when the engine is running.
2. Never use muriatic acid to clear the pump. Acid will dissolve the chrome finish on the pumping cylinder.

3. When using a clean-out hook to clean out back into the redi-mix truck, use a safety chain to secure the clean-out hook to some solid part of the redi-mix truck to prevent the hook from jumping off the redi-mix truck's hopper. Run the pump at half throttle.

4. Never use air to clean out the lines.

**Always think safety first!**

## CONCRETE MIX DESIGNS-SCREEN ANALYSIS-TERMINOLOGY

The following information has been prepared to assist in the selection of concrete mix designs in certain areas where the use of concrete pumps is a new industry.

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.

Special emphasis is given to the gradation of the fine aggregates, coarse aggregates sand and used in all pump mixes. Generally speaking, if the screen analysis of the local sand and rock conform to the A.S.T.M. specifications shown on Pages 11 and 13 and the proper ratio of sand and rock are used in the mix, you can expect a pumpable mix.

If difficulty is experienced in pumping the mixes shown on Pages 11 and 12, consult your local aggregate supplier with this information and make the necessary adjustments.

## DEFINITIONS

**ONE SACK CEMENT** (U.S.)-94lbs. (42.58 KG)

**S.S.D.**-Saturated Surface Dry: Meaning sand particles may be saturated with moisture but there is no free water on the surface.

**OVEN DRY**-meaning all the moisture is removed from the sand particle.

**SLUMP**-a measure of moisture consistency.

**W/C SAND**-washed concrete sand.

**#4 GRAVEL or ROCK**-3/8" PEA GRAVEL (1/2" MINUS)

**#3 GRAVEL or ROCK**-3/4" rock (1" minus)

**POZZOLITH**-Master Builders Admixture -(Pozz)

**P.S.I.**-compressive strength (Pounds per Square Inch)

## DEFICIENCIES IN SIEVE ANALYSIS of AGGREGATES

The uniform gradation of sand and aggregate in the concrete mix is extremely important in all pumping operations. It is highly possible that the lack of certain sieve sizes may prevent pumpability. In some areas it may be necessary to make up these deficiencies by the addition of "blending sands" to the local sand.

**GENERAL RULE**-supplement to improve pumpability.

**FLY ASH**-use up to 15% of cement weight.

**POZZOLIN**-use up to 13% of cement weight.

## CONCRETE MIX INFORMATION

The following information has been extracted from actual testing laboratory reports. The purpose of this printing is only to help create a better understanding of the importance of uniform gradation and proportioning of materials which affect pumpability of concrete mixes. These weights and proportions illustrate that when the sieve analysis is ideal, the sand/rock ratio can be adjusted (65% sand 35% rock) and pumpability should be excellent.

### EXAMPLE #1 (A California Test Lab. Report)

JOB: Building Foundations (Water Project)

Sacks per cu./yd. 6.5 designed for 2,500 lbs. in 28 days

Gallons per sack 7.1

Washed Sand-#200 wash 1.3

Organic matter-OK

Specific gravity (SSD) Sand-2.58; Pea Gravel-2.60

### Sieve analysis-percent passing

Material	1.5"	1"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200
W.C. Sand				100	99.7	79.1	60.4	36.5	14.3	4.0	1.1
Pea Gravel				100	3.0						
% Comb.				100	66	51	39	23	9	3	1.0

### DESIGN FOR ONE YARD OF CONCRETE (SATURATED & SURFACE DRY):













Absolute volume of aggregate in one cu. yard: 17.78 cu. ft.

Specific gravity of aggregates in one cu. yard: 2.58

Weight of aggregates in one cu. yard batch: 2850 lbs.

	<u>%</u>	<u>BATCH</u>	<u>SPEC. GRAVITY</u>	<u>ABS. VOL.</u>
W.C. Sand	65	1800	2.58	11.56
PEA GRAVEL	35	1000	2.60	6.22
WATER 46 gal.		1		
CEMENT 6.5 sk.		611		
TOTAL				27.00
ADMIXTURE:		None		
SLUMP		4"		
REMARKS		This mix designed for pumping		
NOTE:		Due to the availability of well-graded sand as shown in the above sieve analysis, this mix pumped very successfully.		

# A.S.T.M. STANDARD SPECIFICATION FOR GRADING AGGREGATE

Screen		Size of Operating U.S.	Metric	Percentage Passing (by weight)
<b>FINE AGGREGATE: Referred to as washed concrete sand.</b>				
3/8"		3/8"	9.51mm	100%
#4		4760 micron	4.76 mm	95 to 100%
#8		2380 micron	2.38 mm	80 to 100%
#16		1190 micron	1.19 mm	50 to 85%
#30		590 micron	1.19 mm	50 to 85%
#50		297 micron	297 μ	10 to 30%
#100		149 micron	149 μ	2 to 10%
<b>3/8" (9.51 mm) PEA GRAVEL AGGREGATE: Referenced to as #4 Rock or Gravel or 1/2" minus (12.7 mm) size.</b>				
1/2"		1/2"	12.7 mm	100%
3/8"		3/8"	9.51 mm	85 to 100%
#4		4760 micron	4.76 mm	10 to 30%
#8		2380 micron	2.38 mm	0 to 10%
#16		1190 micron	1.19 mm	0 to 5%

## CONCRETE MIX INFORMATION

Consolidated Rock Products Co., Division of Tests

3/8" Pea Gravel STANDARD PUMP MIXES (one-half inch minus)

NOTE: All weights shown are one cubic yard with S.S.D. aggregates.

CRP Mix Number	6004	6005	6006	6007
Design Slump (in.)	6" (15 cm)	6" (15 cm)	6" (15 cm)	6" (15 cm)
Cement, SACK.	7.0	7.0	7.0	7.0
Cement, Lbs.	658 (298 kg)	658 (298 kg)	658 (298 kg)	658 (298 kg)
w/Con Sand (1 lb.)	2031 (920 kg)	2982 (943 kg)	1879 (851 kg)	1943 (880 kg)
Gravel #4(9.51 mm)	677 (307 kg)	693 (314 kg)	806 (365 kg)	832 (377 kg)
<b>TOTAL AGGREGATE</b>	<b>2708 (1227 kg)</b>	<b>2775 (1257 kg)</b>	<b>2685 (1216 kg)</b>	<b>2775 (1257 kg)</b>

### ADMIXTURE

Pozzolight 311-1 lb.	1.4 (.63 kg)	1.4 (.63 kg)	1.4 (.63 kg)	—
Water, Design (gals.)	50.0 (189 liters)	53.0 (200 liters)	50.0 (189 liters)	53.9 (200 liters)
Mater, Max. (gals.)	50.0 (189 liters)	53.0 (200 liters)	53.0 (200 liters)	53.0 (200 liters)

NOTE: Multiply above kilograms and liters by 1.308 to obtain the proportions for one cubic meter of concrete.

Consolidated Rock Products Co., Division of Tests

3/8" Pea Gravel STANDARD PUMP MIXES (one-half inch minus)

NOTE: All weights shown are one cubic yard with S.S.D. aggregates.

CRP Mix Number	6000	6001	6002	6003
Design Slump (in.)	6" (15 cm)	6" (15 cm)	6" (15 cm)	6" (15 cm)
Cement, SACK.	6.5	6.5	6.5	6.5
Cement, Lbs.	611 (276 kg)	611 (276 kg)	611 (276 kg)	611 (276 kg)
w/Con Sand (1.1 lb.)	2062 (934 kg)	2112 (957 kg)	1924 (872 kg)	1971 (893 kg)
Gravel #4 (9.51mm)	687 (311 kg)	704 (319 kg)	825 (374 kg)	845 (383 kg)
<b>TOTAL AGGREGATE</b>	<b>2749 (1245 kg)</b>	<b>2816 (1276 kg)</b>	<b>2749 (1245 kg)</b>	<b>2816 (1276 kg)</b>

### ADMIXTURE

Pozzolight 311-1.3lb.	1.3 (.59 kg)	1.3 (.59)	—	—
Water, Design (gals.)	50.0 (189 liters)	53.0 (200 liters)	50.0 (189 liters)	53.9 (200 liters)
Mater, Max. (gals.)	50.0 (189 liters)	53.0 (200 liters)	53.0 (200 liters)	53.0 (200 liters)

NOTE: Multiply above kilograms and liters by 1.308 to obtain the proportions for one cubic meter of concrete.

## SLUMP TEST PROCEDURE

1. To obtain a representative sample, take samples at three or more regular intervals throughout the discharge of the mixer or truck. DO NOT take samples at the beginning or end of the discharge.
2. Dampen the inside of the cone and place it on a smooth, moist, nonabsorbent, level surface large enough to accommodate both the slumped concrete and the slump cone. Stand on the "foot pieces" throughout the test procedure to hold the cone firmly in place.
3. Fill the cone 1/3 full by volume and rod 25 times with a 1/2" dia x 24" lg. bullet-pointed steel rod. (This is a specific requirement which will produce non-standard results unless followed exactly.) Distribute rodding evenly over the entire cross section of the sample. (See figure A.)
4. Fill cone another 1/3 which will make the cone 2/3 full by volume. Rod this second layer 25 times with the rod penetrating into, but not through, the first layer. Distribute rodding evenly over the entire cross section of the layer. (See figure B.)
5. Fill cone to overflowing. Rod this layer 25 times with rod penetrating into but not through, the second layer. Distribute rodding evenly over the entire cross section of this layer. (See figure C.)
6. Remove the excess concrete from the top of the cone, using the tamping rod as a screed. (See figure D.)
7. Lift the cone vertically with a slow even motion. Do not jar the concrete or tilt the cone during this process. (See figure E.) Invert the withdrawn cone, and place it next to, but not touching the slumped concrete.
8. Lay a straight edge across the top of the slumped cone. Measure the amount of slump in inches from the bottom of the straight edge to the top of the slumped concrete at a point over the original center of the base (See Figure F). The slump operation must be complete in a maximum elapsed time of 1-1/2 minutes. Discard the concrete. DO NOT use it in any other tests.

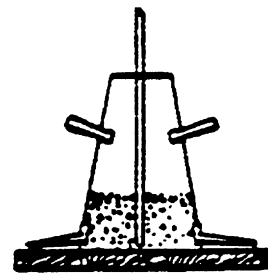


Fig. A

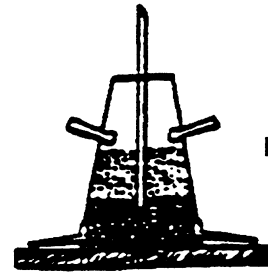


Fig. B

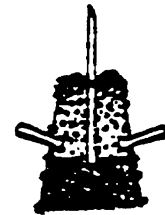


Fig. C



Fig. D

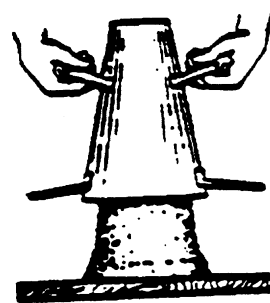


Fig. E

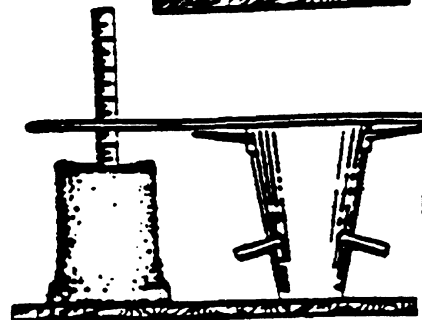


Fig. F

## EXPLANATION OF CODE IN REMARKS COLUMN

How to read the marks and remarks used in this parts book.

### Items Found In the “Remarks” Column

Serial Numbers-Where indicated, this indicates a serial number range (inclusive) where a particular part is used.

Model Number-Where indicated, this shows that the corresponding part is utilized only with this specific model number or model number variant.

### Items Found In the “Items Number” Column

All parts with same symbol in the number column, \*, #, +, %, or ■, belong to the same assembly or kit

#### NOTE

If more than one of the same reference number is listed, the last one listed indicates newest (or latest) part available.

#### NOTE

*The contents of this catalog are subject to change without notice.*



# C-30HD SUGGESTED SPARE PARTS

## C-30HD Concrete Pump 1 Units

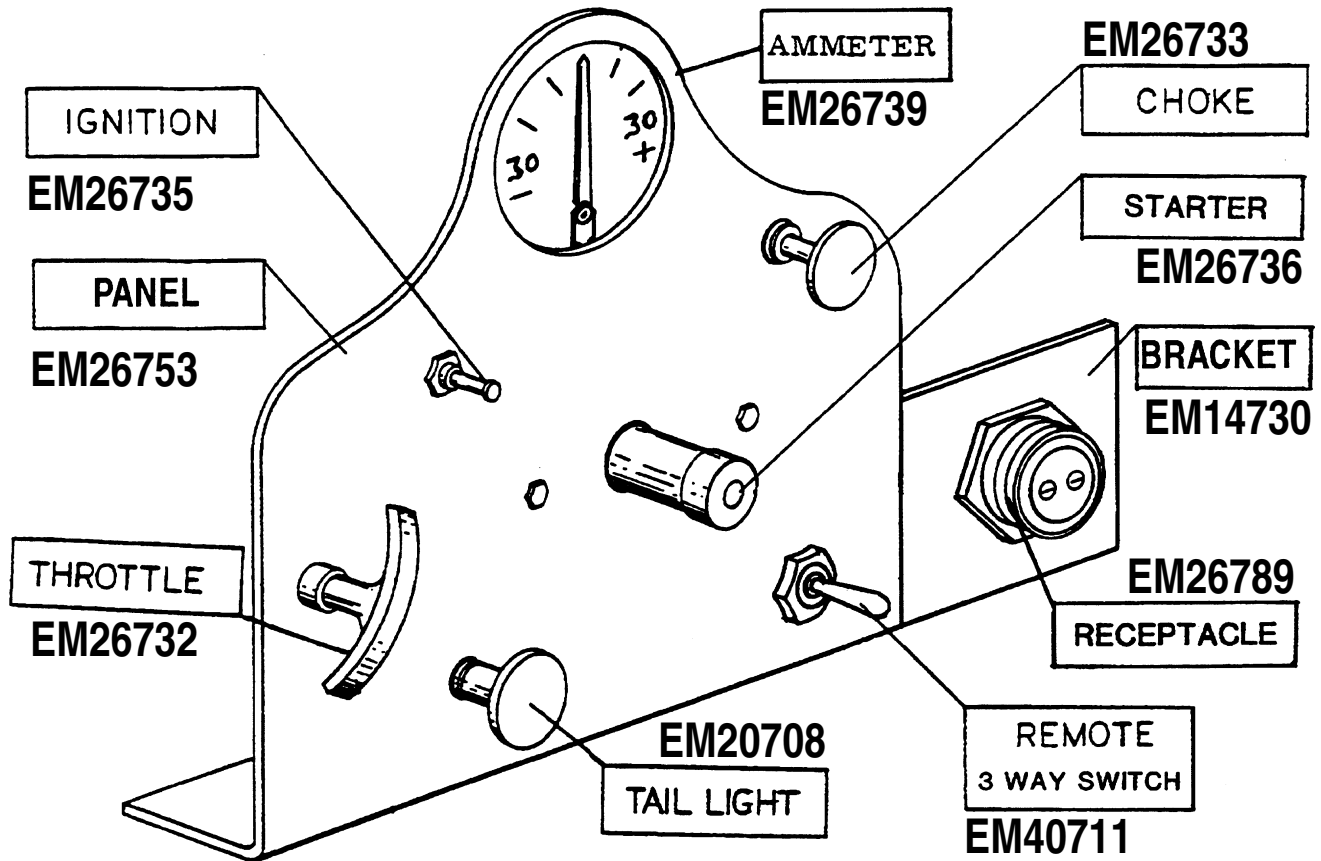
Qty.	P/N	Description
6	EM14904	PISTON CUP KITS
4	EM18804	4 1/2" STEEL BALL
4	EM14818	4" STEEL BALL
6	EM14903	BALL STOP PIN KIT
10	EM18801	O-RING MANIFOLD
1	EM14308	CHAIN
2	EM26313	HALF LINK
2	EM26314	MASTER LINK
1	EM14334	COMPENSATOR SPRING
2	EM14408	BRONZE RING
2	EM903092	CAM ROLLER BEARING
2	EM14315	V-BELT
2	EM14842	LOWER SEAT
2	EM14843	UPPER SEAT
2	EM26310	CLUTCH LINING
10	EM18409	O-RING
2	EM20763	FUEL FILTER
2	EM26746	OIL FILTER
2	EM20328TKIT	BEARING KIT
1	EM28004DD	REDUCER 3" X 2"
1	EM23946	3" ELBOW
2	EM28904	3" CLAMP
4	EM28904-1	3" GASKETS
1	EM14159	HOPPER SCREEN
1	EM14401	OIL PUMP
1	EM20709	SOLENOID
2	EM2074	THROTTLE LINKAGE

## C-30HD Concrete Pump 3 Units

Qty.	P/N	Description
10	EM14904	PISTON CUP KITS
10	EM18804	4 1/2" STEEL
10	EM14818	4" STEEL BALL
12	EM14903	BALL STOP PIN KITS
25	EM18801	MANIFOLD O-RINGS
3	EM14308	CHAINS
10	EM26313	HALF LINK
10	EM26314	MASTER LINK
2	EM14334	COMPENSATOR SPRING
4	EM14408	BRONZE RING
2	EM903092	CAM ROLLER BEARING
4	EM14315	V-BELT
6	EM14842	LOWER SEAT
6	EM14843	UPPER SEAT
3	EM26310	CLUTCH LINING
20	EM18409	O-RING
3	EM207063	FUEL FILTER
3	EM26746	OIL FILTER
2	EM20328TKIT	BEARING KIT
2	EM28004DD	REDUCER 3" x 2"
2	EM23946	3" ELBOW
4	EM28904	3" CLAMP
10	EM28904-1	3" GASKET
2	EM14159	HOPPER SCREEN
2	EM14401	OIL PUMP
2	EM20709	SOLENOID
4	EM20714	THROTTLE LINKAGE
1	EM14300	CAM
1	EM14801	T-MANIFOLD
1	EM14819	Y-MANIFOLD
2	EM14335	PISTON ROD
1	EM14205P	PLASTIC FUEL TANK
1	EM26788	REMOTE SWITCH
1	EM903176	CONN. ROD BEARING
1	EM14305	CRANKSHAFT
2	EM14807	PUMP CYLINDER
2	EM18800	COMPENSATOR CYLINDER
1	EM14320A	CLUTCH
2	EM60HB	CLUTCH DISK

### NOTE

Part number on this Suggested Spare Parts List may super cede/ replace the P/N shown in the text pages of this book.



Before starting the engine, refer to the HATZ diesel or WISCONSIN air cooled engine manual for break-in instructions.

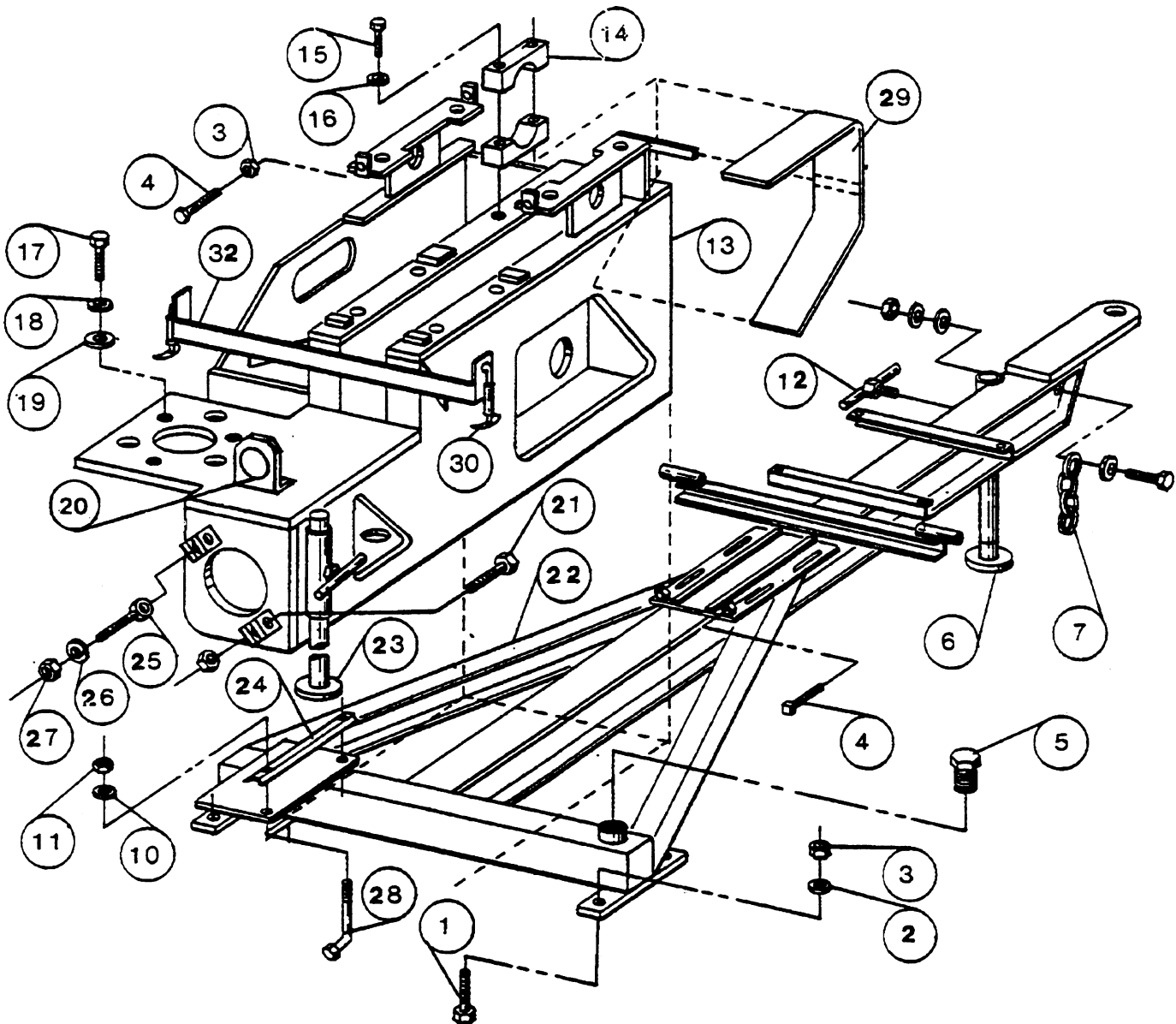
1. **IGNITION**-is a push/pull type control, to start the pump engine, the ignition control must be pulled out.
2. **CHOKE**-when starting the cold engine, close choke by pulling choke control to extreme out position. Once engine is running, push choke control all the way in.
3. **STARTER**-push in to start engine.

4. **THROTTLE**-is a variable speed type control. Turning the throttle to the left unlocks it allowing the control to be pulled out to the desired speed. Once the desired speed has been reached, turning the throttle control to the right locks it in place. Note-always unlock the throttle control before it is pushed in because if this is not done first, possible damage could result to the locking mechanism.

5. **TAIL LIGHT**-pull turns on tail light and push turns it off.

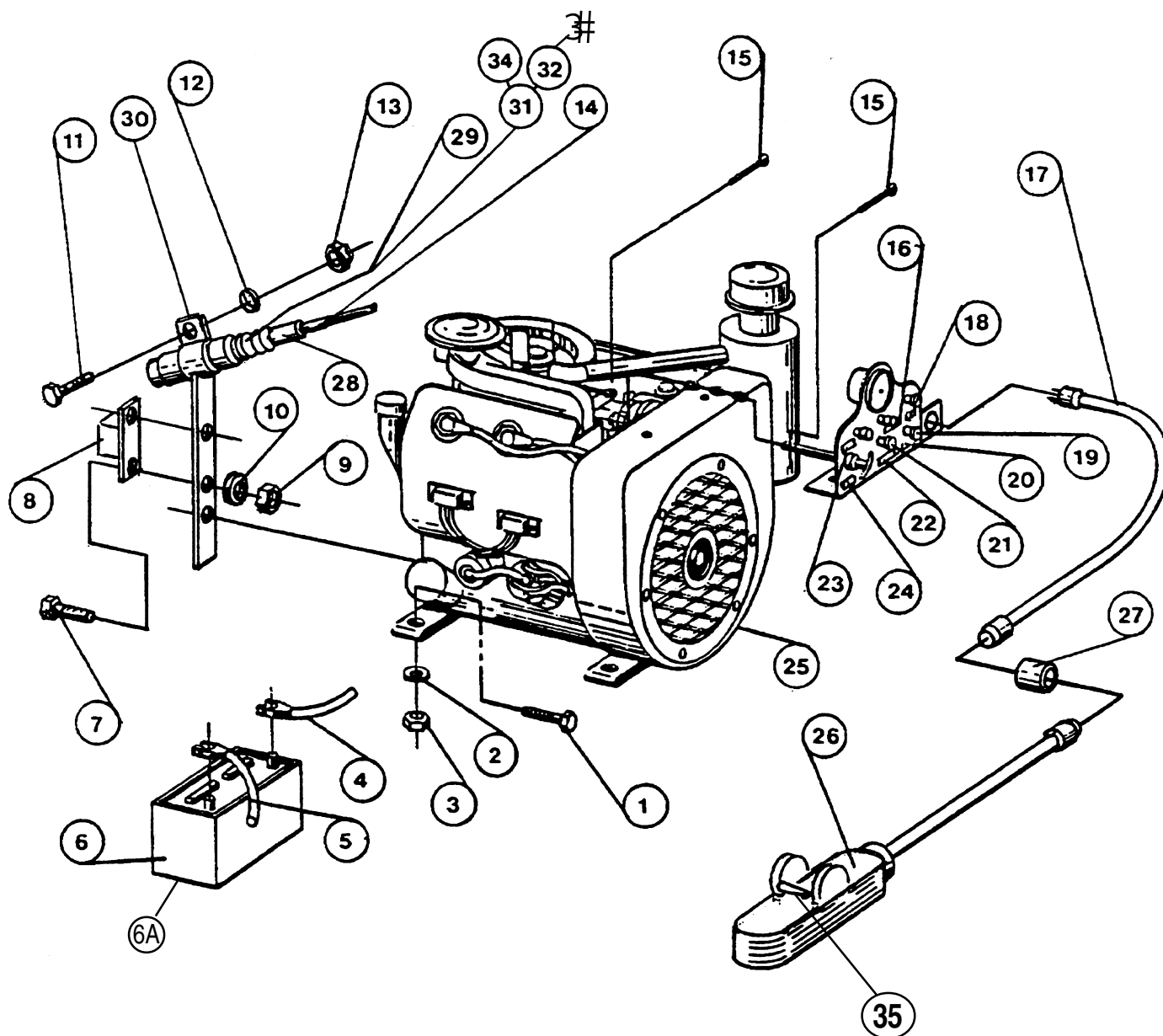
Before starting the concrete pumping procedure, let the engine warm up a minimum of five minutes. Also thoroughly read and understand the service manual for the C-30-HD concrete pump and become totally familiar with its operation before pumping.

[illegible]



## C-30HD CONCRETE PUMP FRAME

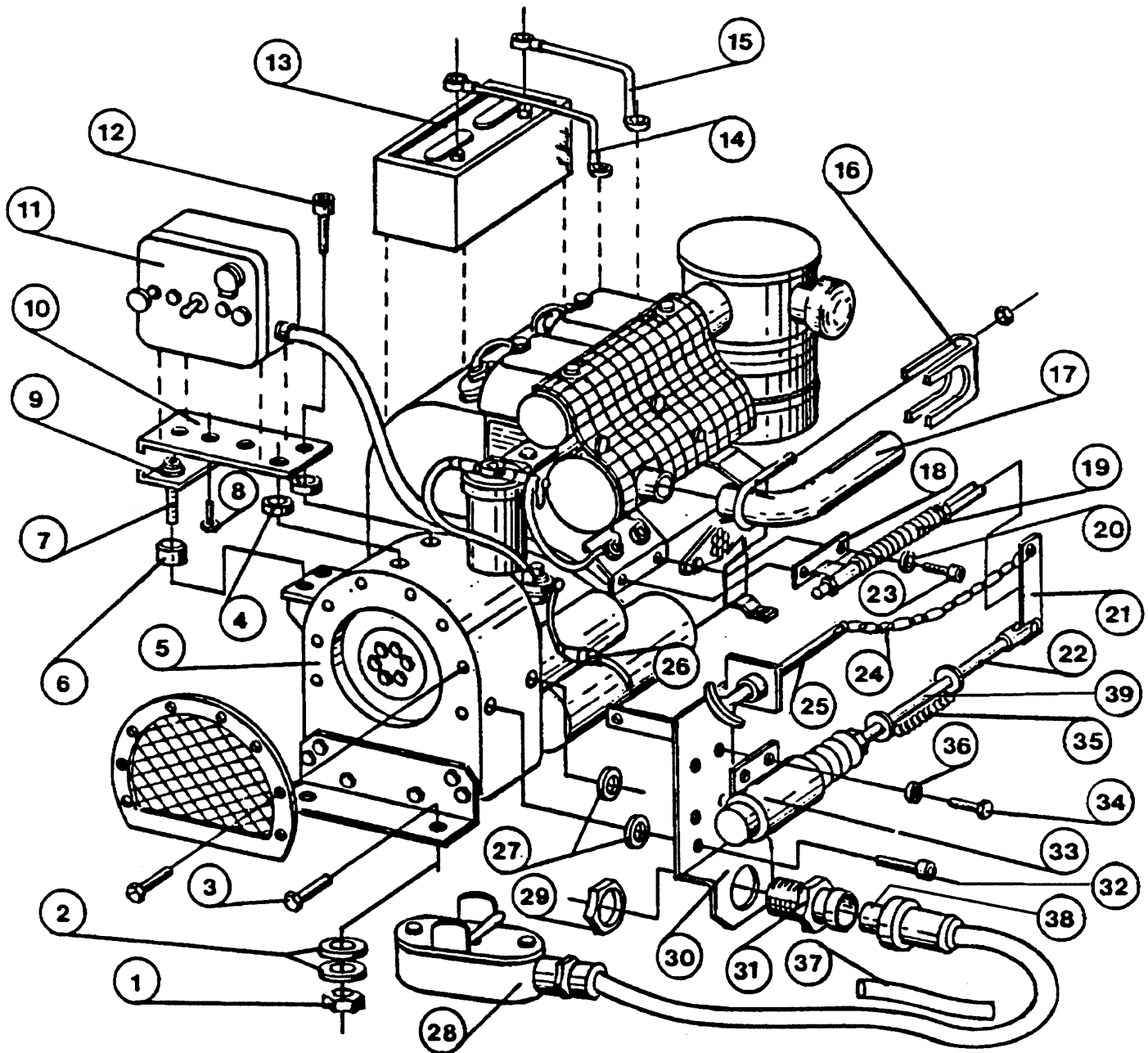
<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	EM117	BOLT, HEX 1/2-13X2	4	
2	EM923346	WASHER, LOCK 1/2" .....	4	REPLACES EM606
3	EM406	NUT, HEX 1/2-13	4	
4	EM130	BOLT, SQ. HEAD 1/2-13X2 1/2"	5	
5	EM20349	OILER PLUG	1	
6	EM14137	FRONT STAND ASSY (OLD STYLE) .....	1	PRIOR TO: 12-31-96
6	EM25610	SWIVEL JACK STAND .....	1	S/N 970101 & ABOVE
6A	EM508530	SUPPORT SWIVEL JACK .....	1	S/N 970101 & ABOVE
7	EM20135	SAFETY CHAIN	1	
12	EM14138	TEE HANDLE ASSY	2	
13	EM14100	PUMP BOX ASSY	1	
14	EM14116	JOURNAL BLOCK	4	
15	EM963180	BOLT, HEX 3/4-10X5 .....	4	REPLACES EM131
16	EM923350	WASHER, LOCK 3/4"	4	
17	EM104	BOLT, HEX 5/8-11X2	3	
18	EM602	WASHER, LOCK 5/8	3	
19	EM620	WASHER, WILLIAM 5/8	3	
20	EM26536	TAIL LIGHT	1	
21	EM963614	BOLT, HEX 3/4-10X3	2	
22	EM14142	FRAME ASSEMBLY	1	
23	EM14136	REAR STAND ASSY	1	
24	EM14711	BATTERY HOLD DOWN	1	
25	EM14165	WILLIAMS RE9B, 3/4X4	2	
26	EM619	WASHER, WILLIAM 3/4"	2	
27	EM968446	NUT, HEX 3/4-10	4	
28	EM145	BOLT, HEX 1/4-20X11	2	
29	EM14119	CHAIN GUARD	1	
30	EM929028	HOOD LATCH .....	2	REPLACES EM20107-1
32	EM14120	HOOD REST ASSY	1	
	EM26117	LUBE PLATE KIT .....	1	NOTE: THIS KIT IS USED TO ENCLOSE THE FRAME TO CREATE A SPLASH TYPE LUBRICATION SYSTEM. (CONTACT FACTORY FOR DETAILS)



# C-30HD — GASOLINE ENGINE CONTROL

## C-30HD CONCRETE PUMP GASOLINE ENGINE

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	EM147	BOLT, 1/2-13X2.1/2"	4	
2	EM923346	WASHER, LOCK 1/2" .....	4	REPLACES EM606
3	EM406	NUT, HEX 1/2-13"	4	
4	EM14705	POSITIVE CABLE	1	
5	EM20720	NEGATIVE CABLE	1	
6	EM14710	BATTERY 12V	1	
6A	EM509755	BATTERY BOX	1	S/N ABOVE 980401
7	EM140	BOLT, 1/4-20X5/8"	2	
8	EM20705	RELAY	1	
9	EM968435	HEX NUT, 1/4-20" .....	2	REPLACES EM400
10	EM600	WASHER, LOCK 1/4"	2	
11	EM123	BOLT, 3/8-16X1.1/4"	1	
12	EM612	WASHER, LOCK 3/8"	1	
13	EM968009	NUT, HEX 3/8-16	1	
14	EM20714	LINKAGE	1	
15	EM924028	PIN, COTTER 3/32X7/8" .....	2	REPLACES EM707
16	EM979	DECAL, STARTER	1	
17	EM26792	100 FT. EXTENSION	1	
18	EM977	DECAL, CHOKE	1	
19	EM40711	3 WAY SWITCH	1	
20	EM946	DECAL, REMOTE CONTROL	1	
21	EM26736	STARTER	1	
22	EM978	DECAL, TAIL LIGHT	1	
23	EM980	DECAL, THROTTLE	1	
24	EM976	DECAL, IGNITION	1	
25	EM20701	ENGINE 30 HP WISE VH4D	1	
26	EM26788	REMOTE CORD ASSY	1	
27	EM26793	ADAPTER	1	
28	EM20713	EXTENSION	1	
29*	EM20709	SOLENOID	1	
30	EM20704	CLAMP BRACKET ASSY	1	
	EM14728	SOLENOID ASSY COMPLETE .....	1	INCLS. ITEMS W/*
31*	EM20711	SOLENOID SPRING	1	
32*	EM20710	SOLENOID PLUNGER	1	
33*	EM20709-2	RUBBER BOOT	1	
34*	EM456	NUT, NYLOCK 5-40	1	
35	EM16754	SWITCH	1	





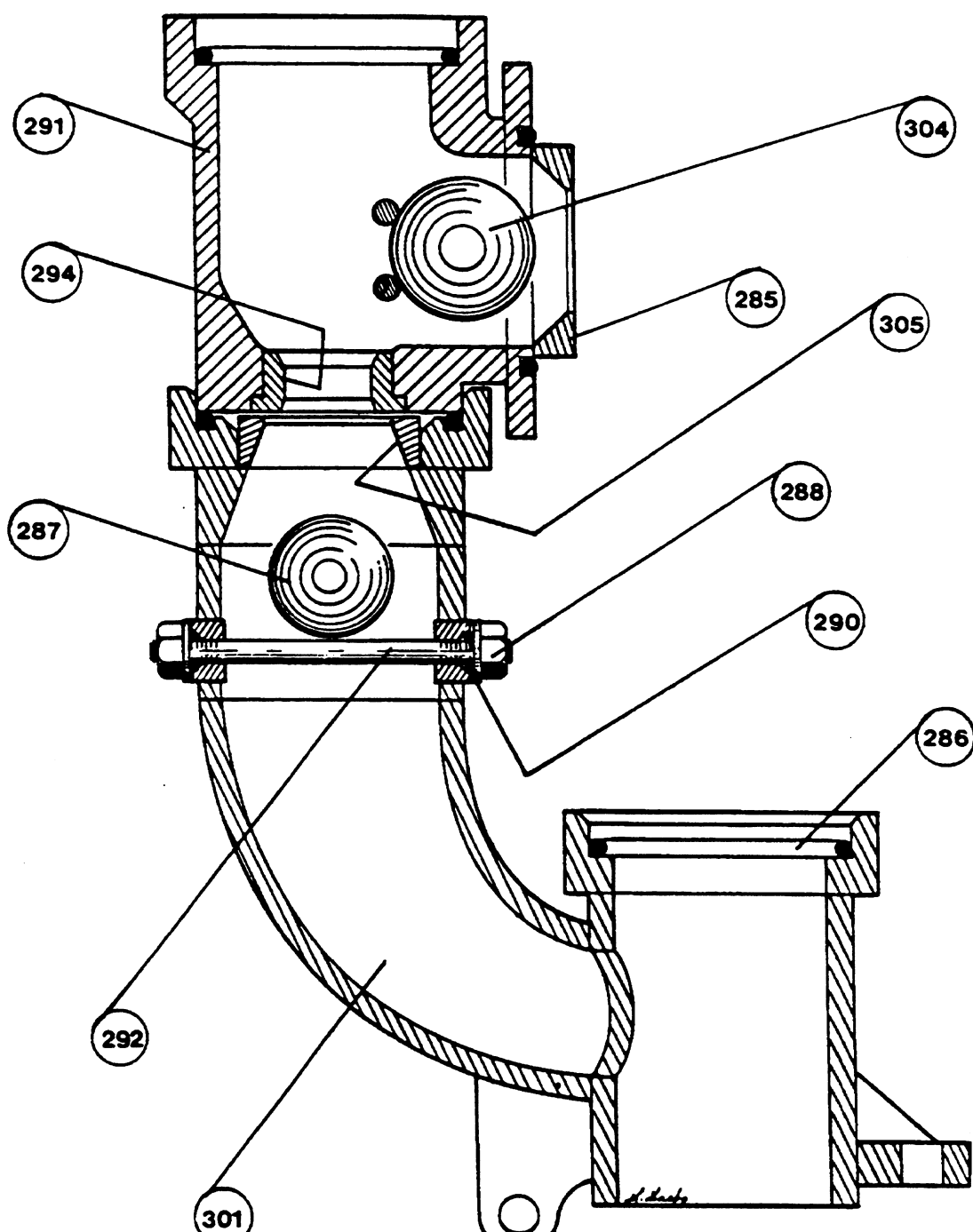
# C-30HD — DIESEL ENGINE CONTROL

C-30HD CONCRETE PUMP  
DIESEL ENGINE CONTROL-C-30HD

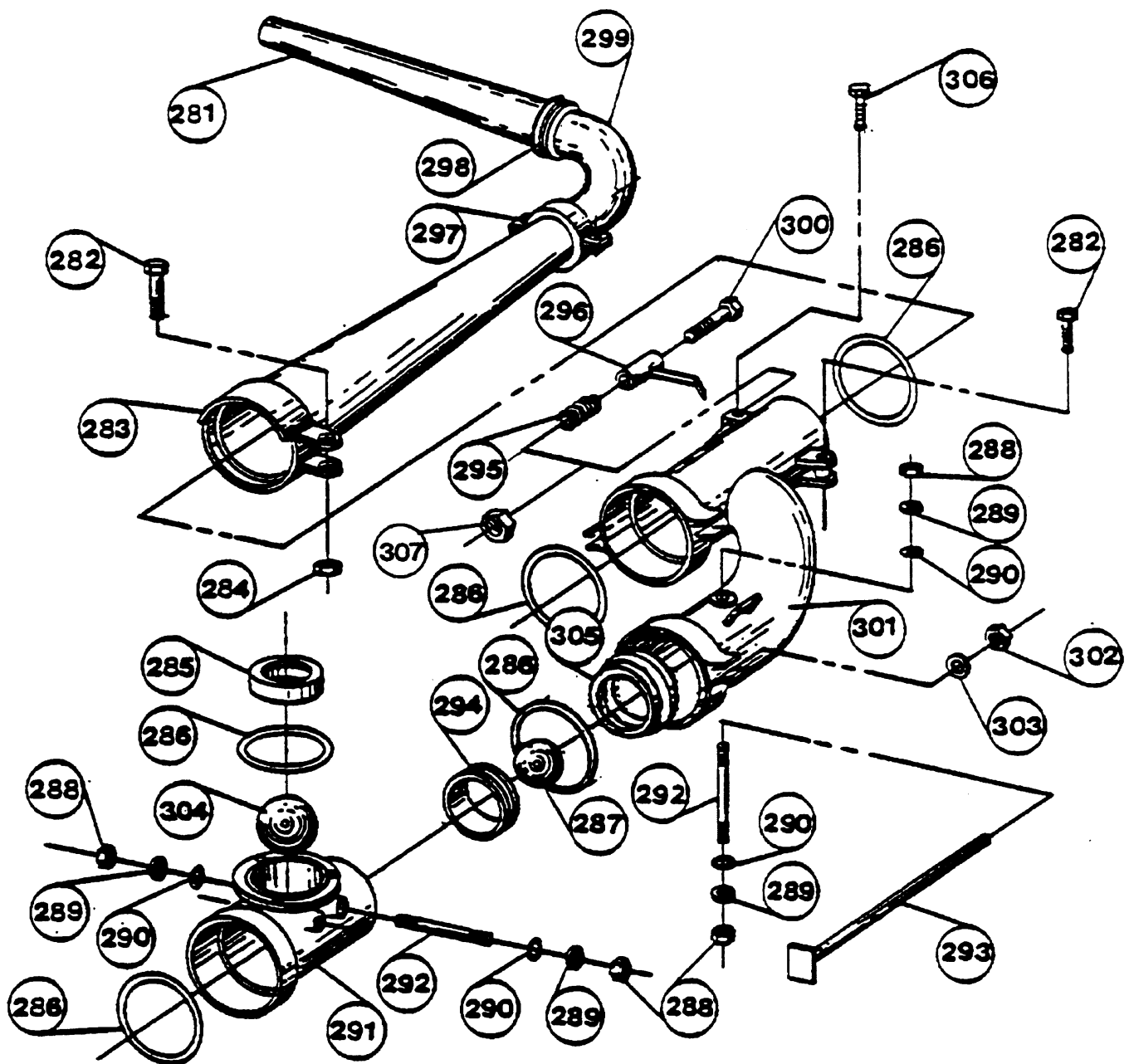
NO.	PART NO.	PART NAME	QTY.	REMARKS
1	EM968011	NUT, LOCK 1/2-13 .....	4 .....	REPLACES EM404
2	EM923035	WASHER, FLAT 1/2" .....	4 .....	REPLACES EM609
3	EM963692	BOLT, 1/2-13X1.1/2" .....	4 .....	REPLACES EM110
4	EM621	WASHER, WILLIAM 1/2"	2	
5	EM20733	DIESEL ENGINE, HATZ Z790	1	
6	EM620	WASHER, PLAIN 5/8 .....	4 .....	REPLACES EM14347
7	EM176	BOLT SOCKET HD, 3/8-16X1.1/4"	2	
8	EM138	BOLT, HEX 3/8-16X1	3	
9	EM612	WASHER, LOCK 3/8"	2	
10	EM14602	BRACKET ASSY	1	
11	EM20791	CONTROL BOX	1	
12	EM175	BOLT SOCKET HD, 3/8-16X1.1/4	2	
13	EM20719	BATTERY 12V	1	
14	EM16707	GROUND CABLE	1	
15	EM20721	POSITIVE CABLE	1	
16	EM20735	EXHAUST CLAMP	1	REPLACES EM176847
17	EM20734	EXHAUST ELBOW	1	
18	EM20790	LINKAGE ASSY	1	
19	EM20790-5	SPRING	1	
20	EM601	LOCK WASHER	2	
21	EM20761	YOKE BAR	1	
22	EM20758-1	YOKE SUPPORT	1	
23	EM272	BOLT, ALLEN HEAD 8X30MM	2	
24	EM20731	CONTROL CHAIN		
25	EM26732	ENGINE CONTROL .....	1 .....	REPLACES EM20730
26	EM20763	INLINE FILTER	1	
27	EM923035	WASHER, FLAT 1/2" .....	2 .....	REPLACES EM609
28	EM26788	REMOTE CONTROL	1	
29	EM940062	NUT, LOCK 1/2-14 .....	1 .....	REPLACES EM26789-3
30	EM20727	CONTROL BRKT.	1	
31	EM26789	RECEPTACLE	1	
32	EM146	BOLT, ALLEN HEAD 12X25MM S.H.	2	
33	EM20709	SOLENOID	1	
34	EM963550	BOLT, 1/4-20X3/4 .....	4 .....	REPLACES EM112
35	EM16730	RETURN SPRING .....	1 .....	REPLACES EM20728
36	EM600	WASHER, LOCK 1/4	4	
37	EM26792	CORD ASSY, 100 FT.	1	
38	EM26793	ADAPTER FOR CORD	1	
39	EM20760	ROD	1	

**NOTE:** EffectiveS/N971001  
The throttle control has been updated  
— Consult factory for part numbers.

[illegible]



Note: EXPLODED VIEW OF  
PAGES 34 & 35



# C-30HD — CONCRETE DELIVERY

## C-30HD CONCRETE PUMP CONCRETE DELIVERY

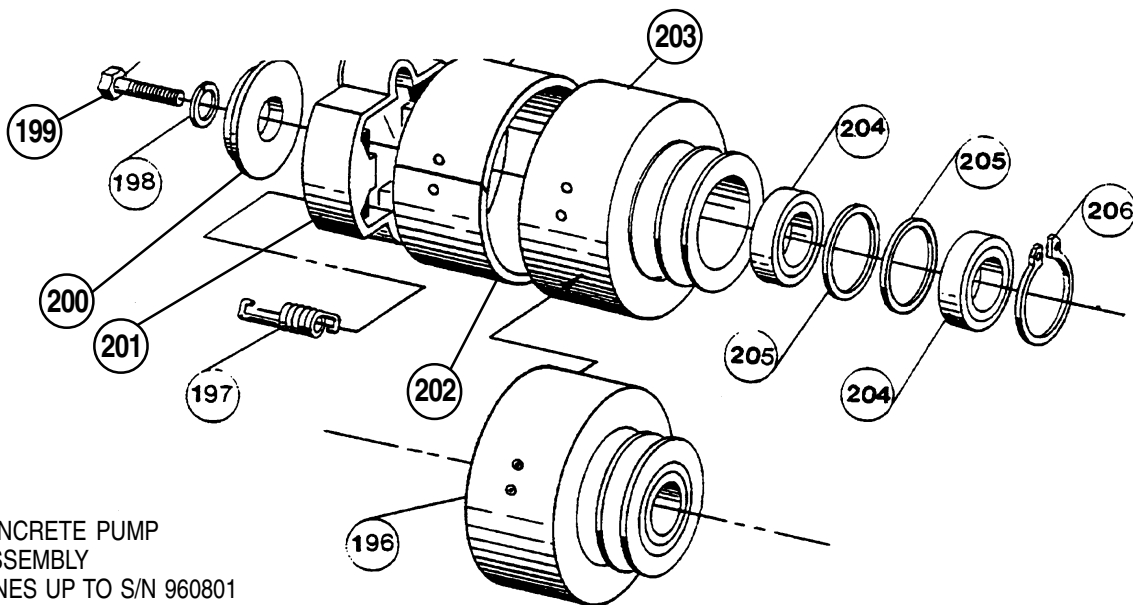
NO.	PART NO.	PART NAME	QTY.	REMARKS
281	EM23837	REDUCER, 3X2 .....	1 .....	PRIOR TO JULY 1, 1990
281	EM28004-DD	REDUCER, 3X2 .....	1 .....	AFTER JULY 1, 1990
282	EM963180	BOLT, 3/4-10X5 .....	2 .....	REPLACES EM131
283	EM14809	EXHAUST GATE .....	1 .....	PRIOR TO JULY 1, 1990
283	EM14850	EXHAUST GATE .....	1 .....	AFTER JULY 1, 1990
284	EM968446	NUT, HEX 3/4-10 .....	2 .....	REPLACES EM407
285		BALL INSERT .....	1 .....	SEE NOTE
286	EM18801	"O" RING	5	
287	EM14818	STEEL BALL, 4"	1	
288	EM968266	NUT, JAM 3/4-16 .....	6 .....	REPLACES EM421
289	EM618	WASHER, SPECIAL 3/4	6	
290	EM18409	"O" RING	6	
291	EM14801	PRIMARY VALVE	1	
292	EM136	STUD, 3/4-16X8	3	
293	EM137	T-BOLT, 3/4-10X14	2	
294	EM14817	VALVE SEAT	1	
295	EM14810	JOLTER SPRING	1	
296	EM14845	CLAMP ARM	1	
297	EM23839	3" COUPLING "B" VIC .....	1 .....	PRIOR TO JULY 1, 1990
297	EM28904	3" COUPLING "B" HD .....	1 .....	AFTER JULY 1, 1990
298	EM23840	3" COUPLING S/J VIC .....	1 .....	PRIOR TO JULY 1, 1990
298	EM28904	3" COUPLING "B" HD .....	1 .....	AFTER JULY 1, 1990
299	EM23838	ELBOW, 3"-90° .....	1 .....	PRIOR TO JULY 1, 1990
299	EM23946	ELBOW, 3"-90° .....	1 .....	AFTER JULY 1, 1990
300	EM135	BOLT, 1-1/4-12X6	1	
301	EM14819A	MANIFOLD ASSY	1	
302	EM968446	NUT, HEX 3/4-10 .....	2 .....	REPLACES EM407
303	EM619	WASHER, WILLIAM 3/4	2	
304	EM18804	STEEL BALL, 4 1/2"	1	
305		BALL INSERT .....	1 .....	SEE NOTES
306	EM160	BOLT, 3/8-16X3/4	1	
307	EM451	NUT, LOCK 1-1/4-12	1	

Not Shown in diagram: 4" Urethane Ball (P/N EM26817); 4" Seat (P/N EM26816)

**Notes on item #285 — Machines prior to July 1, 1990 use P/N 18803 Ball Insert; On machines after July 1, 1990, P/N 18803 was replaced by the Duraseat P/N 14843. This new seat is more durable and can be used on older units.**

**Notes on item #305 — Machines prior to July 1, 1990 use P/N 18806 insert (used in conjunction with 14817 seat); On machines after July 1, 1990, these parts are replaced by 14842 Duraseat.**

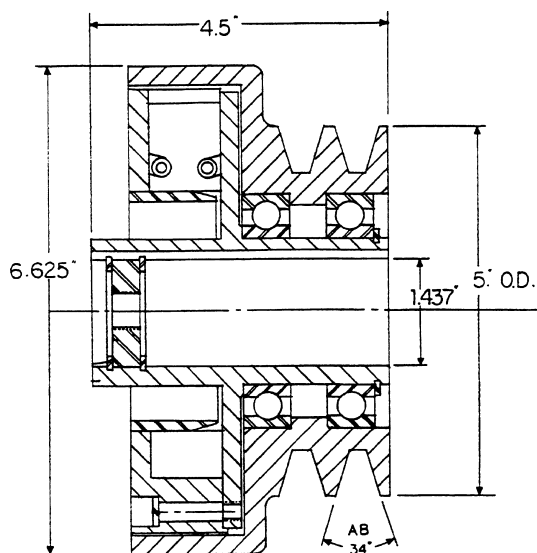
## C-30HD — CLUTCH ASSEMBLY — ALL MACHINES PRIOR TO S/N 960801 (August 1996)



C-30HD CONCRETE PUMP  
CLUTCH ASSEMBLY  
ALL MACHINES UP TO S/N 960801

NO.	PART NO.	PART NAME	QTY.	REMARKS
196	EM14320	CLUTCH ASSEMBLY (8" DIA) .....	1 .....	INCLS. ALL ITEMS W/*
197*	EM918050	CLUTCH SPRING .....	2 .....	REPLACES EM26309
198*	EM923346	1/2 LOCK WASHER .....	1 .....	REPLACES EM606
199*	EM963564	1/2-13X1 1/4 HEX BOLT .....	1 .....	REPLACES EM139
200*	EM628	SPECIAL WASHER .....	1 .....	
201*	EM26321	ROTOR ASSEMBLY .....	1 .....	
202*	EM26310	CLUTCH LINING .....	1 .....	
203*	EM26322	CLUTCH HOUSING .....	1 .....	
204*	EM902204	CLUTCH BEARING .....	2 .....	REPLACES EM26311
205*	EM926066	RETAINING RING .....	2 .....	REPLACES EM801
206*	EM926053	RETAINING RING .....	1 .....	REPLACES EM800

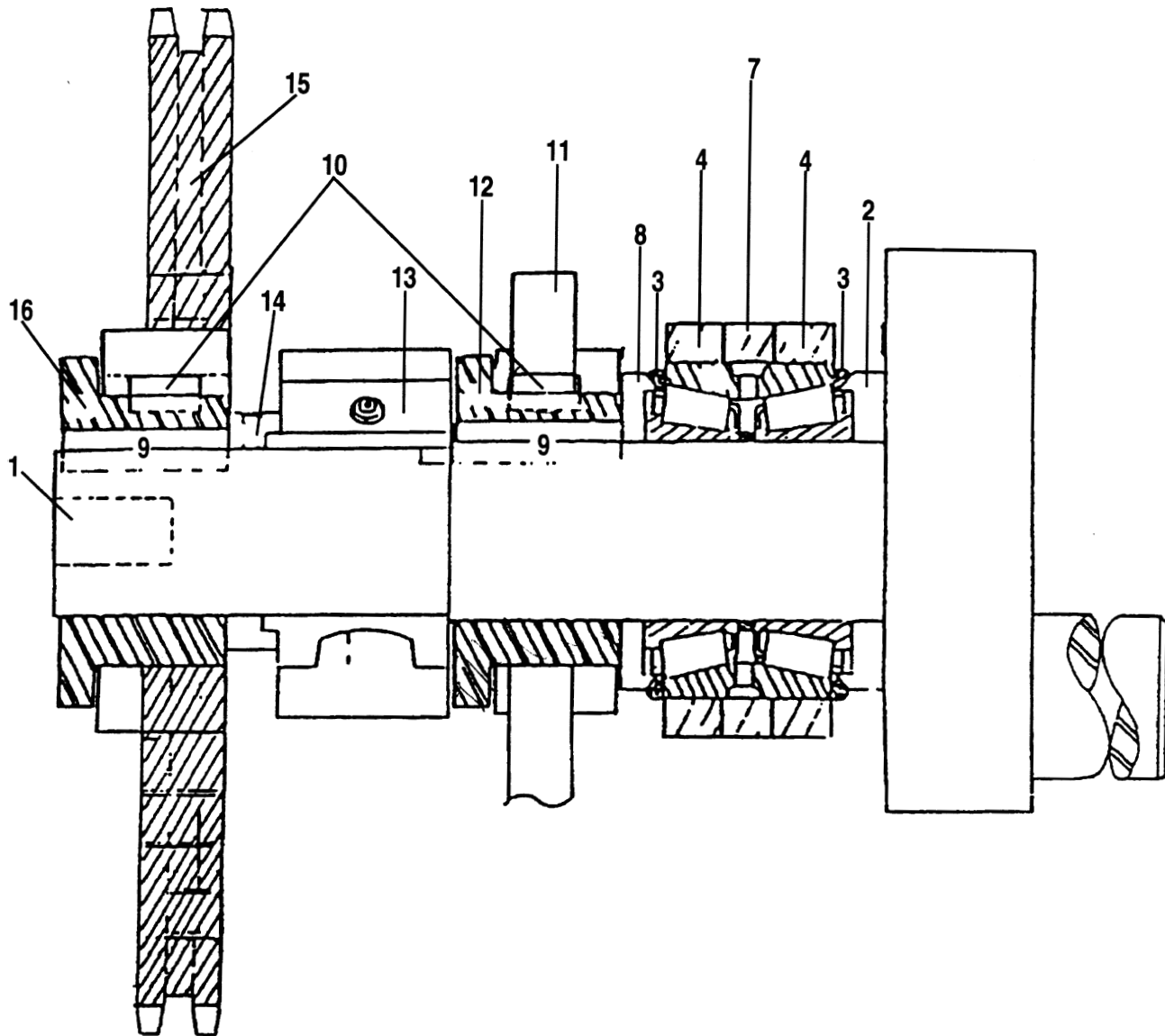
## C-30HD — CLUTCH ASSEMBLY — ALL MACHINES S/N 960801 THRU 980400 (August 1996)



**Note:** CLUTCH ASSY (BLM 6") P/N  
EM14320A HAS BEEN REPLACED  
BY CLUTCH ASSY P/N EM14320  
(8" CLUTCH)

THE CLUTCH PACK FOR 6"  
CLUTCH IS STILL AVAILABLE  
UNDER P/N EM60HB

[illegible]



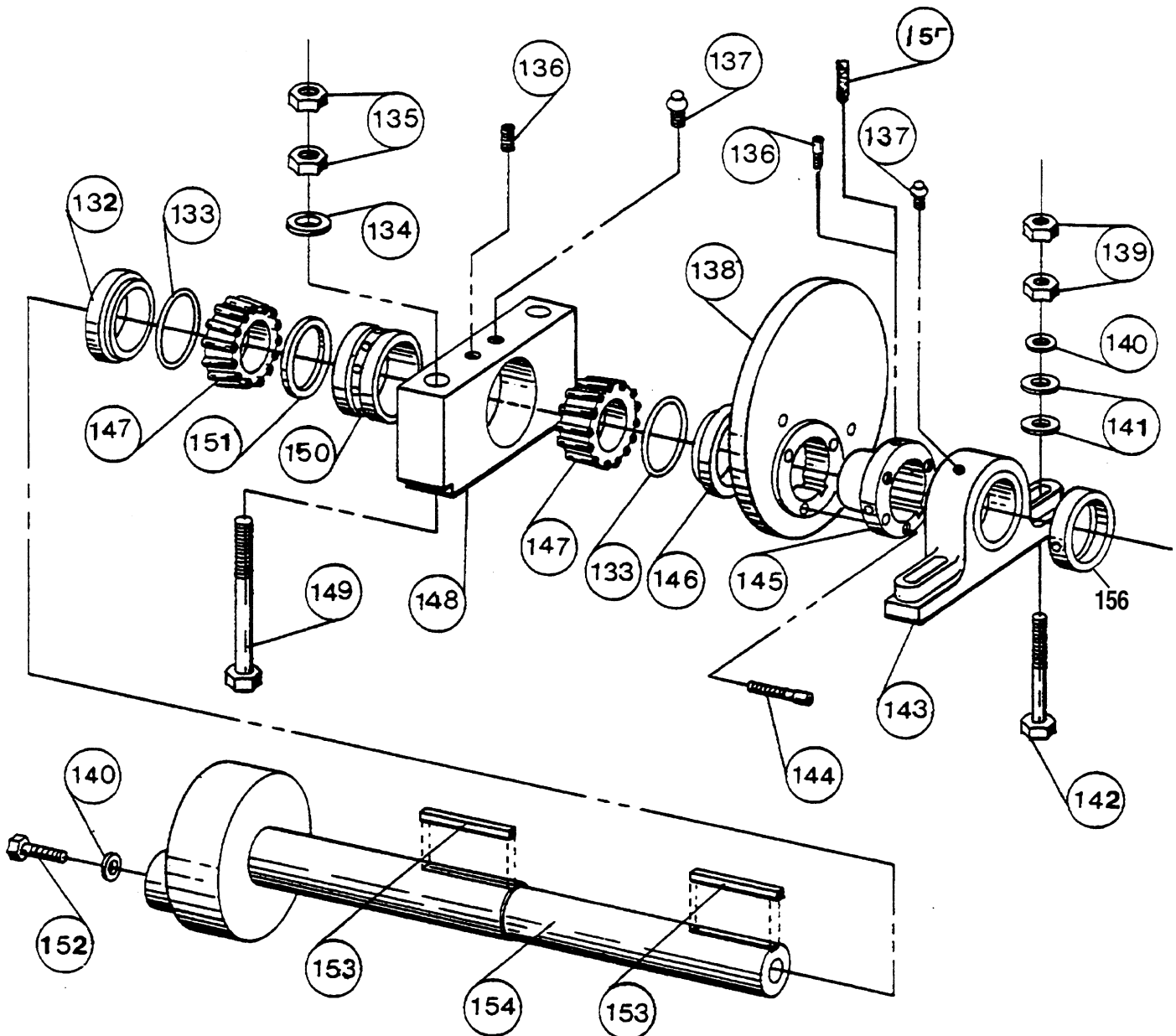


## C-30HD — CRANKSHAFT ASSEMBLY

### C-30HD CONCRETE PUMP CRANKSHAFT ASSEMBLY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	EM14305	CRANKSHAFT	1	
2	EM14322	SPACER	1	
3	EM14326	"O" RING	2	
4	EM14325	BEARING CONE	2	
5	EM14323	BEARING CONE SPACER	1	
6	EM14324	BEARING CUP	1	
7	EM14303	BEARING BLOCK	1	
8	EM14302	CAM BUSHING SPACER	1	
9	EM14306	CRANKSHAFT KEY	2	
10		KEY .....	1	INCLUDED W/ ITEMS 12 +16
11	EM14300	CAM WELDMENT	1	
12	EM14301	CAM BUSHING	1	
13	EM14304	CAM BEARING	1	
14	EM30190	SET COLLAR	1	
15	EM14307	SPROCKET, 60 TOOTH	1	
16	EM14309	BUSHING	1	

## C-30HD — CRANKSHAFT ASSEMBLY

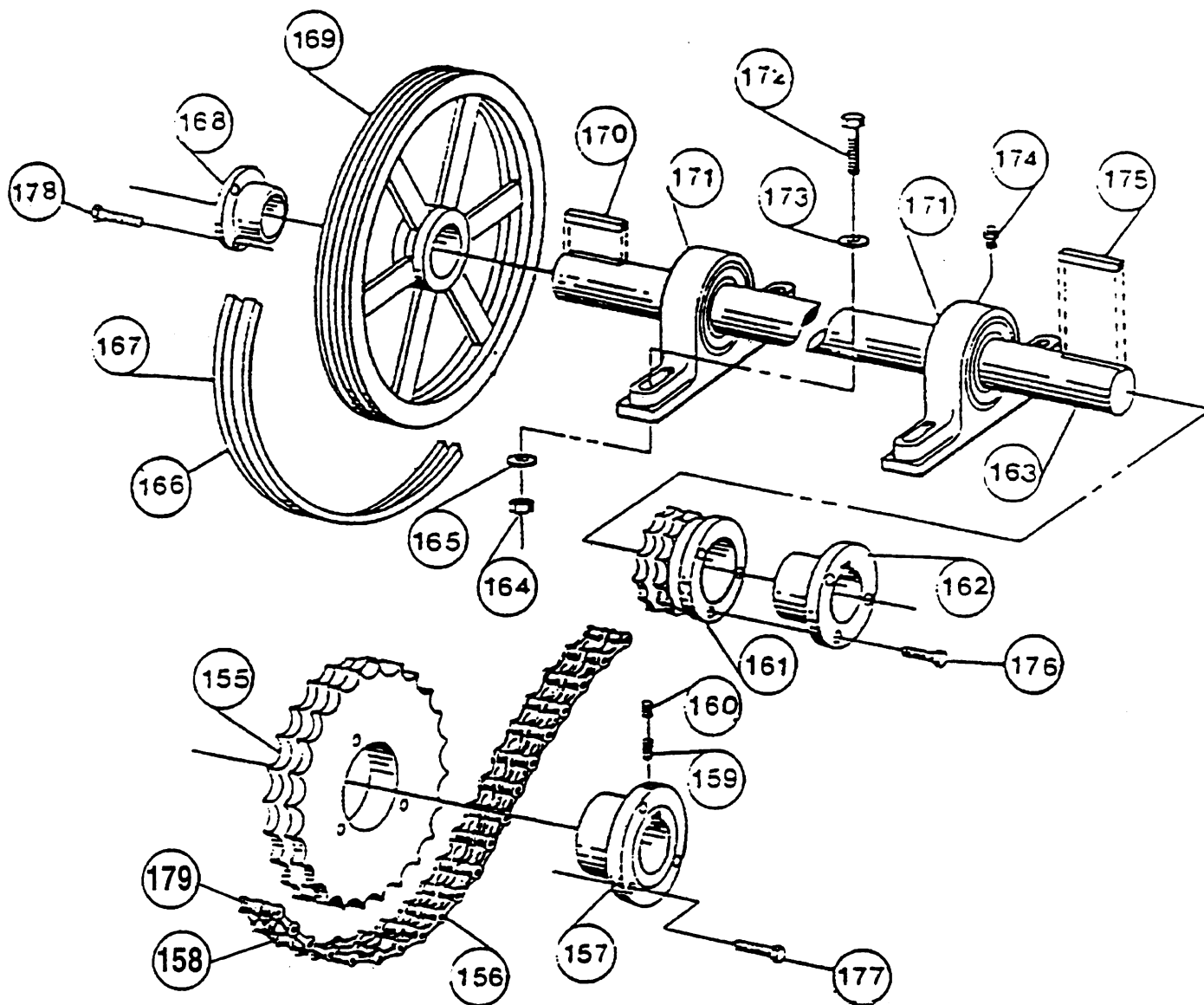


# C-30HD — CRANKSHAFT ASSEMBLY

## C-30HD CONCRETE PUMP CRANKSHAFT ASSEMBLY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
132	EM14322	SPACER	1	
133	EM14326	"O" RING	2	
134	EM923350	LOCK WASHER .....	2	REPLACES EM610
135	EM968446	NUT, HEX 3/4-10 .....	4	REPLACES EM407
136	EM702	SCREW, SET HALF DOG POINT 3/8-16X3/4	2	
137	EM916001	LUBE FITTING, 1/8-27 NPT .....	2	REPLACES EM16179
138	EM14300	CAM WELDMENT	1	
139	EM968013	NUT, HEX 5/8-11 .....	4	REPLACES EM419
140	EM923348	WASHER, LOCK 5/8 .....	3	REPLACES EM602
141	EM620	WASHER, WILLIAMS 5/8	4	
142	EM128	BOLT, HEX 5/8-11X4	2	
143	EM14304	CAM BEARING	1	
144	EM175	BOLT, SOC HD 3/8-16X1 1/4	1	
145	EM14301	CAM BUSHING	1	
146	EM14302	CAM BUSHING SPACER	1	
147	EM14325	BEARING CONE	2	
148	EM14303	BEARING BLOCK	1	
149	EM129	BOLT, HEX 3/4-10X8 1/2	2	
150	EM14324	BEARING CUP	1	
151	EM14323	BEARING CONE SPACER	1	
152	EM104	BOLT, HEX 5/8-11X2	1	
153	EM14306	CRANKSHAFT KEY	2	
154	EM14305	CRANKSHAFT	1	
155	EM703	SCREW, SET 3/8-16X3/8	2	
156	EM30139	SET COLLAR	1	

## C-30HD — COUNTER SHAFT ASSEMBLY

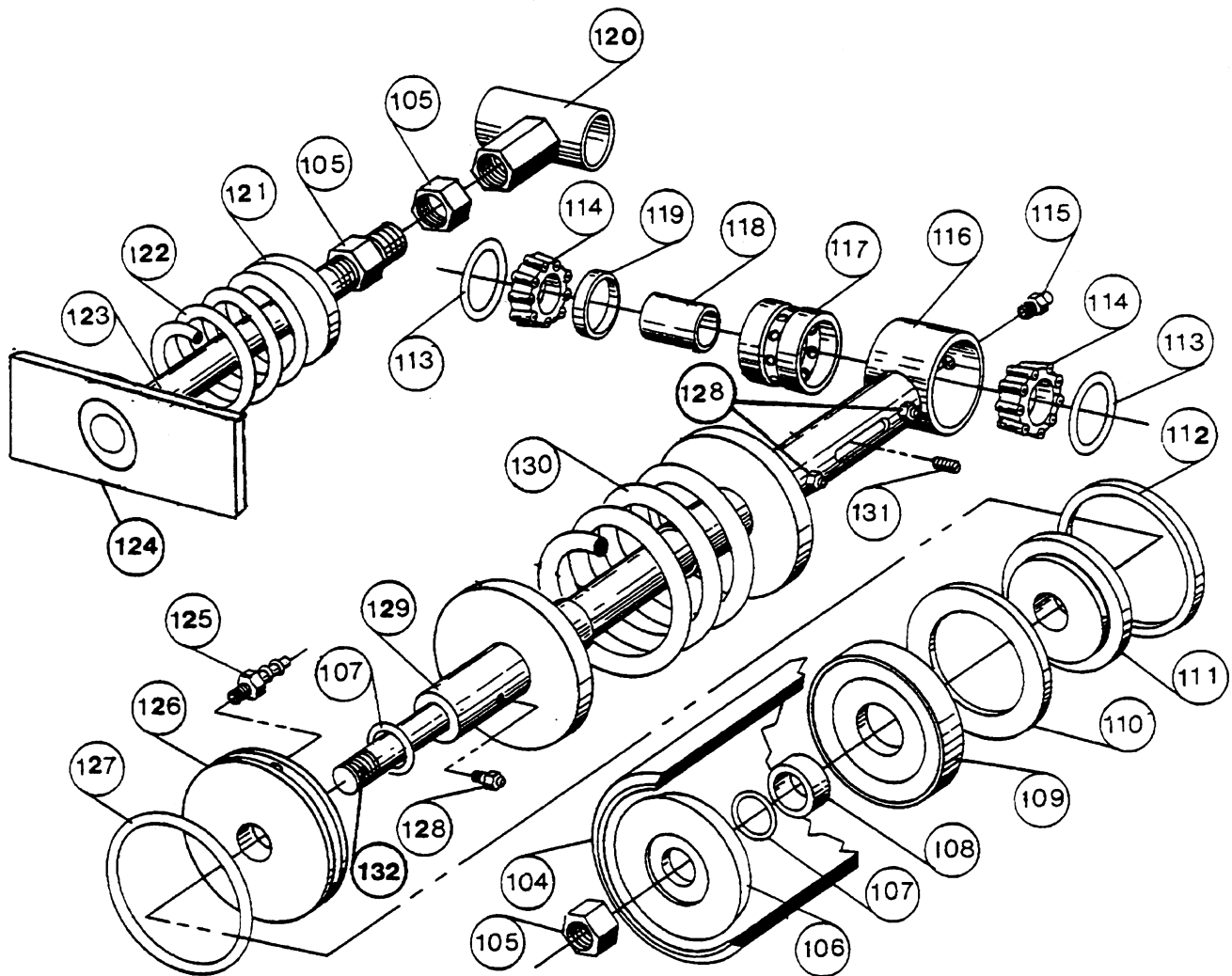


## C-30HD — COUNTER SHAFT ASSEMBLY

### C-30HD CONCRETE PUMP COUNTER SHAFT ASSEMBLY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
155	EM14307	SPROCKET, 60 TOOTH	1	
156	EM14308	CHAIN	1	
157	EM14309	BUSHING	1	
158	EM26313	OFFSET LINK	1	
159	EM702	SCREW, SET 3/8-16X3/4	1	
160	EM703	SCREW, SET 3/8-16X3/8	1	
161	EM14318	SPROCKET, 13 TOOTH	1	
161	EM14319	BUSHING	1	
163	EM14312	COUNTER SHAFT	1	
164	EM968011	NUT, HEX 1/2-13 .....	4	REPLACES EM404
165	EM923346	WASHER, LOCK 1/2 .....	4	REPLACES EM606
166	EM14315	BELT, BP90 (GASOLINE)	1	
167	EM900127	BELT, B87 (DIESEL) .....	2	REPLACES EM14321
168	EM14314	BUSHING	1	
169	EM14313	PULLEY	1	
170	EM14316	KEY	1	
171	EM14311	CAM BEARING	2	
172	EM124	BOLT, HEX 1/2-13X4	4	
173	EM621	WASHER, WILLIAM 1/2	4	
174	EM916001	LUBE FITTING .....	2	REPLACES EM16179
175	EM14317	KEY	1	
176	EM161	BOLT, HEX 5/16-18X1	3	
177	EM492378	BOLT, HEX 3/8-16X1 3/4 .....	3	REPLACES EM177
178	EM123	BOLT, HEX 3/8-16X1 1/4	3	
179	EM26314	CONNECTING LINK	1	

## C-30HD — COMPENSATOR PISTON ROD

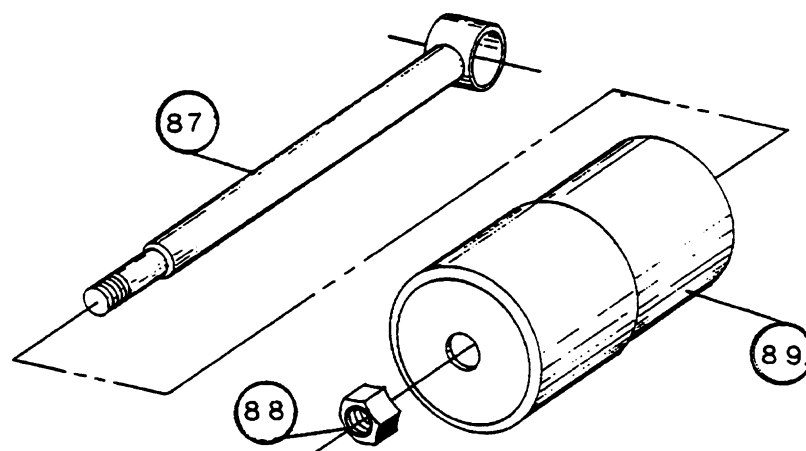
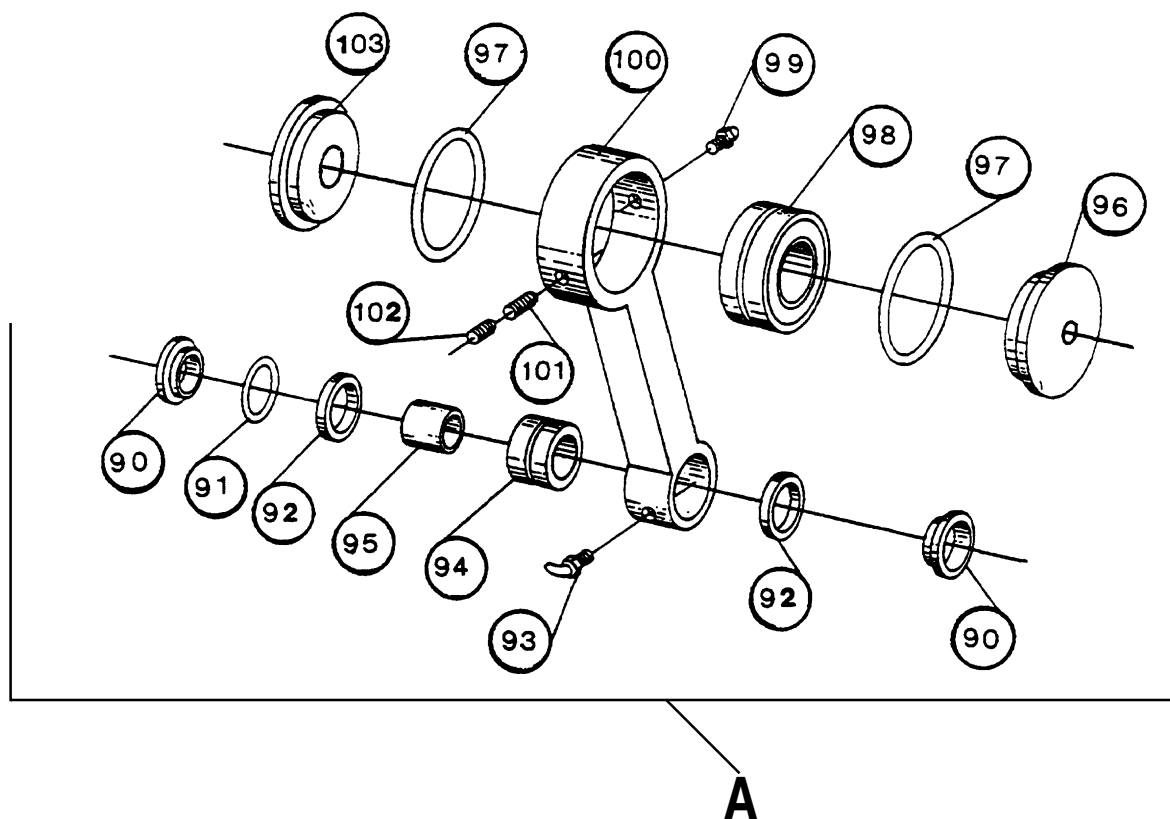


## C-30HD — COMPENSATOR PISTON ROD

### C-30HD CONCRETE PUMP COMPENSATOR PISTON ROD

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
104	EM18800	PUMPING CYLINDER	1	
105	EM968446	NUT, HEX 3/4-10 .....	4	REPLACES EM407
106	EM14413	FACE PLATE	2	
107	EM18409	"O" RING	4	
108	EM14412	BUSHING	2	
109	EM14411	PISTON CUP	2	
110	EM14408	BRONZE RING	2	
111	EM14410	RING & FELT HOLDER	2	
112	EM16493	FELT RING	2	
113	EM20816	"O" RING	2	
114	EM903162	BEARING CONE .....	4	REPLACES EM20815
115	EM916001	LUBE FITTING .....	2	REPLACES EM16179
116	EM14806	PISTON GUIDE	1	
117	EM903163	BEARING CUP .....	2	REPLACES EM20812
118	EM20814	BUSHING	2	
119	EM20813	SPACER	2	
120	EM14805	ROD END	1	
121	EM14331	BACKING PLATE	1	
122	EM14333	RETURN SPRING	1	
123	EM14332	GUIDE ROD	1	
124	EM14105	ANCHOR PLATE	1	
125	EM20412	OILER FITTING MINI-BARB	2	
126	EM14409	OILER PLATE	2	
127	EM14407	"O" RING	2	
128	EM916001	LUBE FITTING .....	3	REPLACES EM16179
129	EM14336	PISTON GUIDE	1	
130	EM14334	COMPENSATOR SPRING	1	
131	EM704	PIN, LG SPIRAL 1/2X2	1	
132	EM14335	PISTON ROD	1	

## C-30HD — CONNECTING ROD ASSEMBLY 20328 (OLD STYLE)



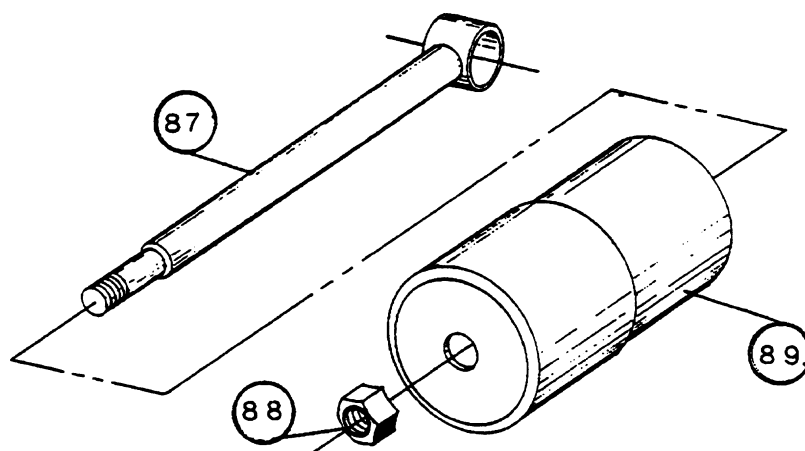
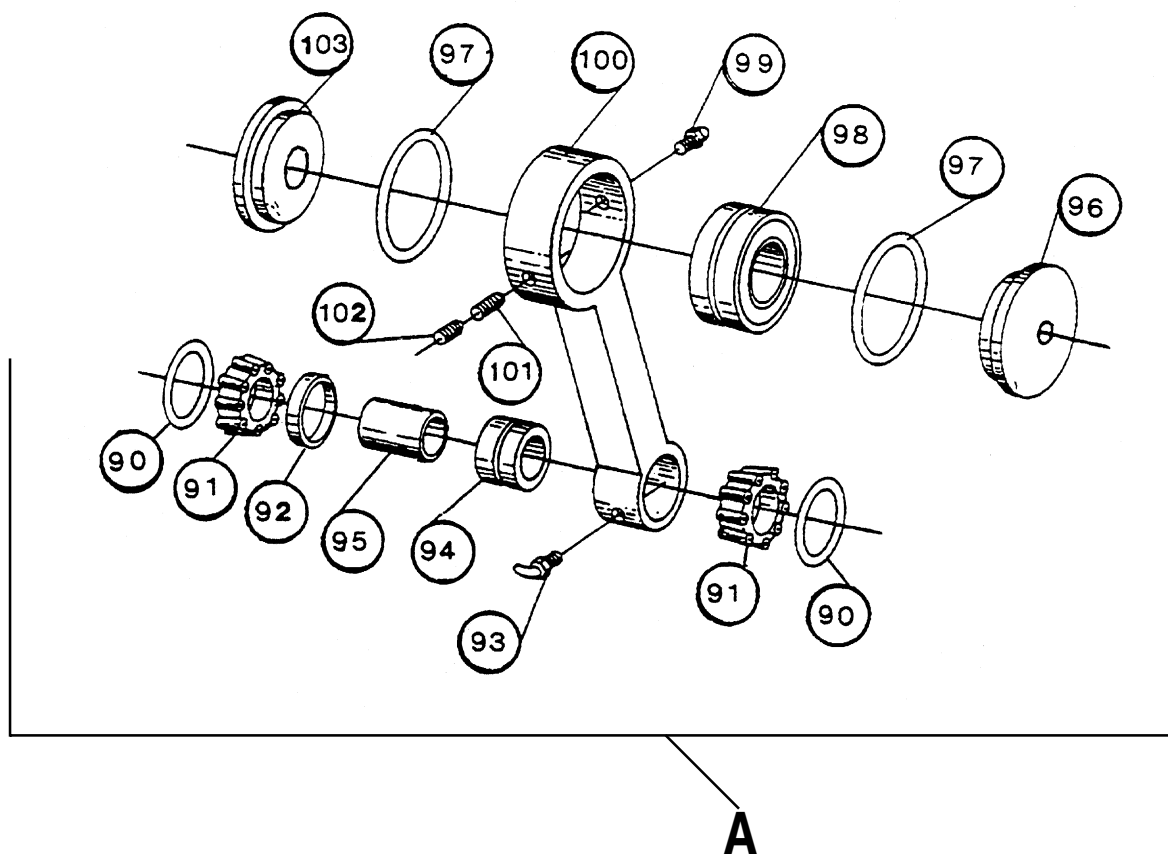


## C-30HD — CONNECTING ROD ASSEMBLY 20328 (OLD STYLE)

C-30HD CONCRETE PUMP  
CONNECTING ROD ASSEMBLY EM20328 (OLD STYLE)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	EM20328	CONNECTING ROD ASSY .....	1 .....	INCLS. ALL ITEMS W/★
87	EM14808	PISTON ROD WELDMENT	1	
88	EM968446	3/4-10 HEX NUT .....	1 .....	REPLACES EM407
89	EM14807	PUMPING CYLINDER	1	
90★	EM402150	SPACER .....	2 .....	REPLACES EM20329
91★	EM2330	O-RING	2	
92★	EM402999	SPACER .....	2 .....	REPLACES EM20331
93★	EM916004	LUBE FITTING .....	1 .....	REPLACES EM16153
94★	EM903175	BEARING .....	1 .....	REPLACES EM20333
95★	EM402149	BUSHING .....	1 .....	REPLACES EM20332
96★	EM402996	SPACER .....	1 .....	REPLACES EM20335
97★	EM20336	"O" RING	2	
98★	EM903176	BEARING .....	1 .....	REPLACES EM20337
99★	EM916001	LUBE FITTING .....	1 .....	REPLACES EM16179
100★	EM20328-1	CONNECTING ROD	1	
101	EM703	SCREW, SET LG CUP 3/8-16X3/8	2	
103	EM20338	SPACER	1	

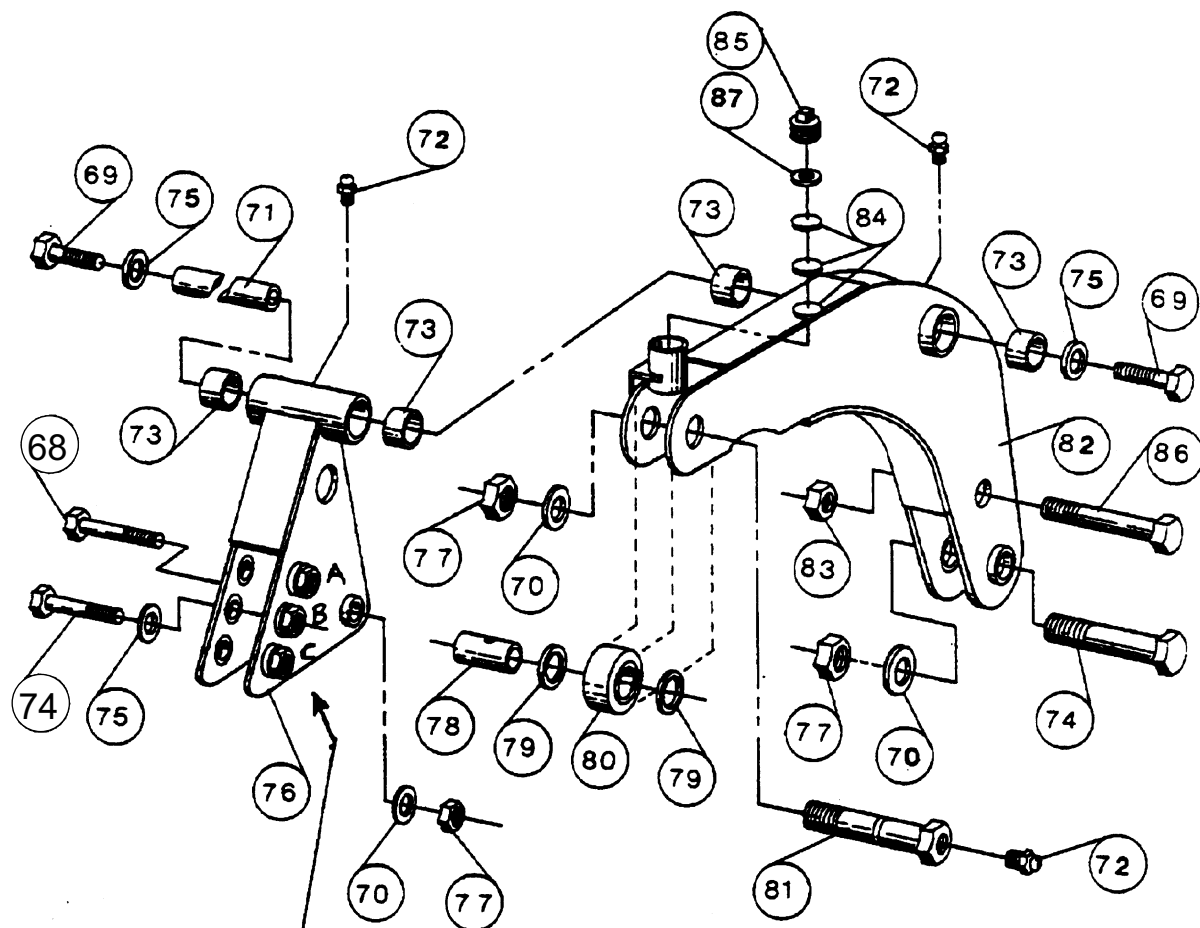
## C-30HD — CONNECTING ROD ASSEMBLY 20328T (NEW STYLE)



## C-30HD — CONNECTING ROD ASSEMBLY 20328T (NEW STYLE)

C-30HD CONCRETE PUMP  
CONNECTING ROD ASSEMBLY EM20328T (NEW STYLE)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	EM20328T	CONNECTING ROD ASSY .....	1 .....	INCLS. ALL ITEMS W/★
87	EM14808	PISTON ROD WELDMENT	1	
88	EM968446	NUT, HEX 3/4-10 .....	1 .....	REPLACES EM407
89	EM14807	PUMPING CYLINDER	1	
90★	EM20816	O-RING	2	
91★	EM903162	BEARING CONE .....	2 .....	REPLACES EM20815
92★	EM20813	SPACER	1	
93★	EM916004	LUBE FITTING .....	1 .....	REPLACES EM16153
94★	EM903175	BEARING CUP .....	1 .....	REPLACES EM20333
95★	EM20814	BUSHING	1	
96★	EM402996	SPACER .....	1 .....	REPLACES EM20335
97★	EM20336	"O" RING	2	
98★	EM903176	BEARING .....	1 .....	REPLACES EM20337
99★	EM916001	LUBE FITTING .....	1 .....	REPLACES EM16179
100★	EM20364	CONNECTING ROD	1	
101	EM703	SCREW, SET, LG CUP 3/8-16X3/8	1	
102	EM702	SCREW, SET, POG POINT 3/8-16X3/8	1	
103	EM20338	SPACER	1	



Note:

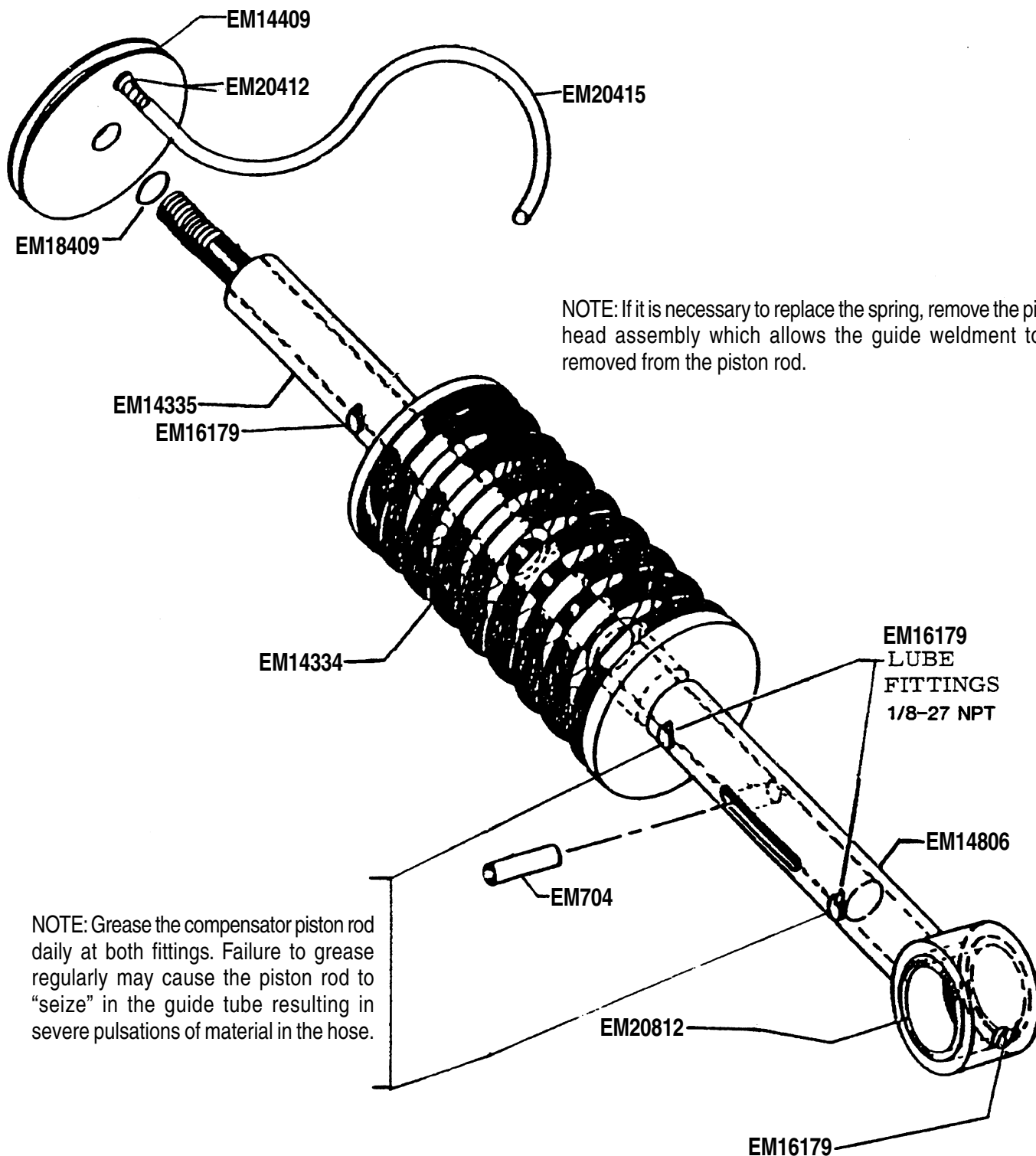
- A. Long stroke setting
- B. Standard setting
- C. Short stroke setting

# C-30HD — ROCKER ASSEMBLY

## C-30HD CONCRETE PUMP ROCKER ASSEMBLIES

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
68	EM105	BOLT, HEX 1-14X6 LG	2	
69	EM133	BOLT, HEX 1-14X2 LG	2	
70	EM627	WASHER, STAR 1"	3	
71	EM14329	ROCKER ARM SHAFT	1	
72	EM916001	LUBE FITTING, 1/8-27 NPT .....	3	REPLACES EM16179
73	EM20326-2	BUSHING	4	
74	EM202	BOLT, HEX 1-8X6 LG	1	
75	EM603	WASHER, LOCK 1"	3	
76	EM14328	ROCKER ARM ASSEMBLY	1	
77	EM417	NUT, LOCK 1-14	3	
78	EM402434	BUSHING .....	1	REPLACES EM20346
79	EM20347	SPACER	3	
80	EM903092	CAM ROLLER .....	1	REPLACES EM20345
81	EM23044	GREASE BOLT	1	
82	EM14846	CAM ROCKER ARM	1	
83	EM405	NUT, LOCK 3/4-10	1	
84	EM402456	OILER PLUG	1	
86	EM963180	BOLT, HEX 3/4-10X5 LG .....	1	REPLACES EM131
87	EM923157	CAM OILER SEAL SPACER .....	1	REPLACES EM607

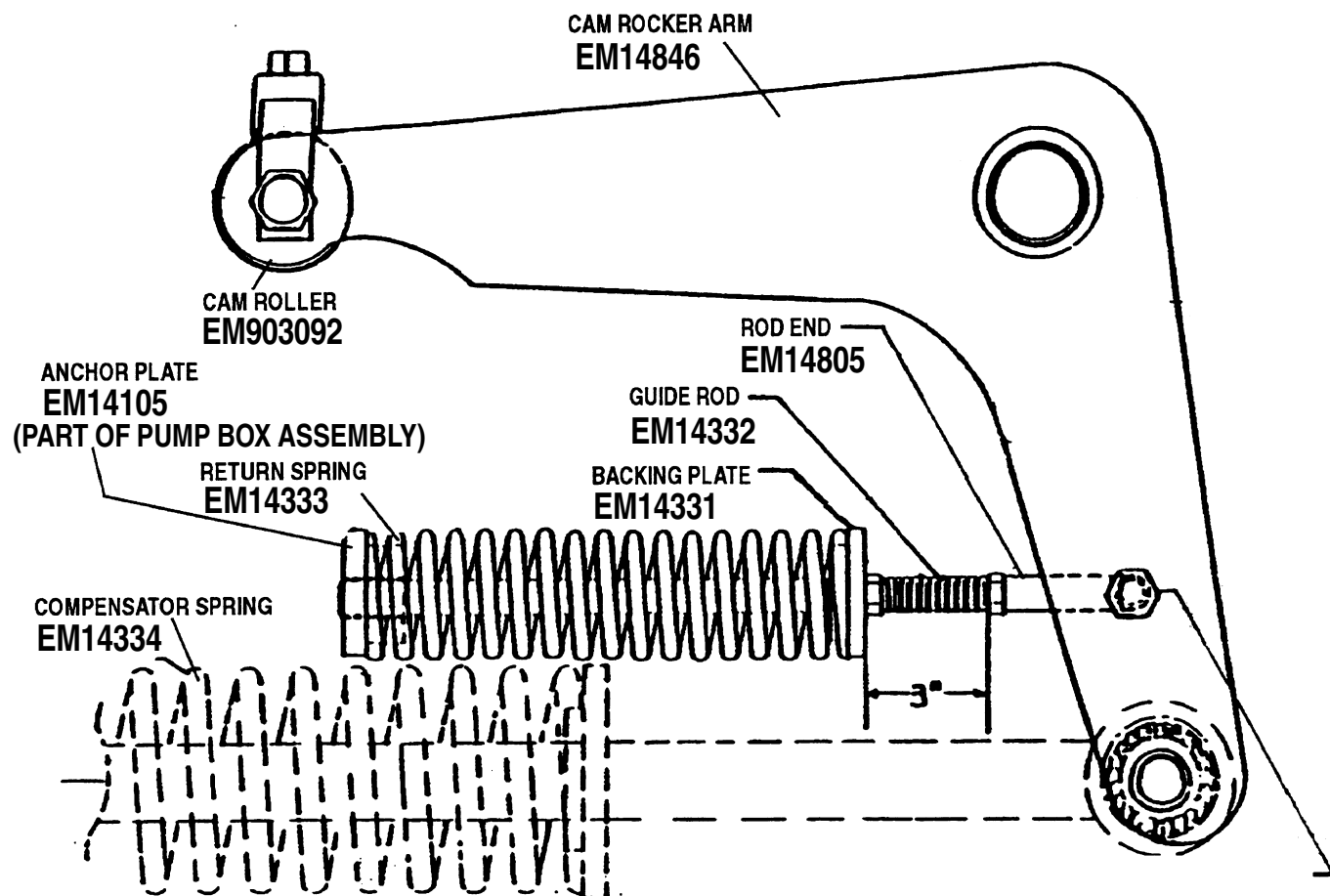
## C-30HD — COMPENSATING SPRING ASSEMBLY

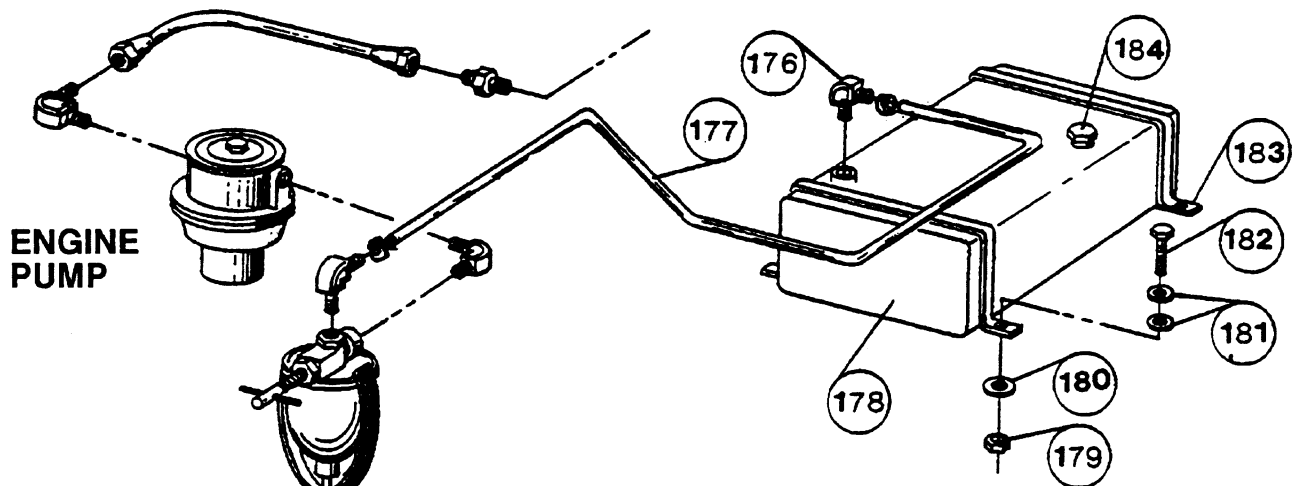
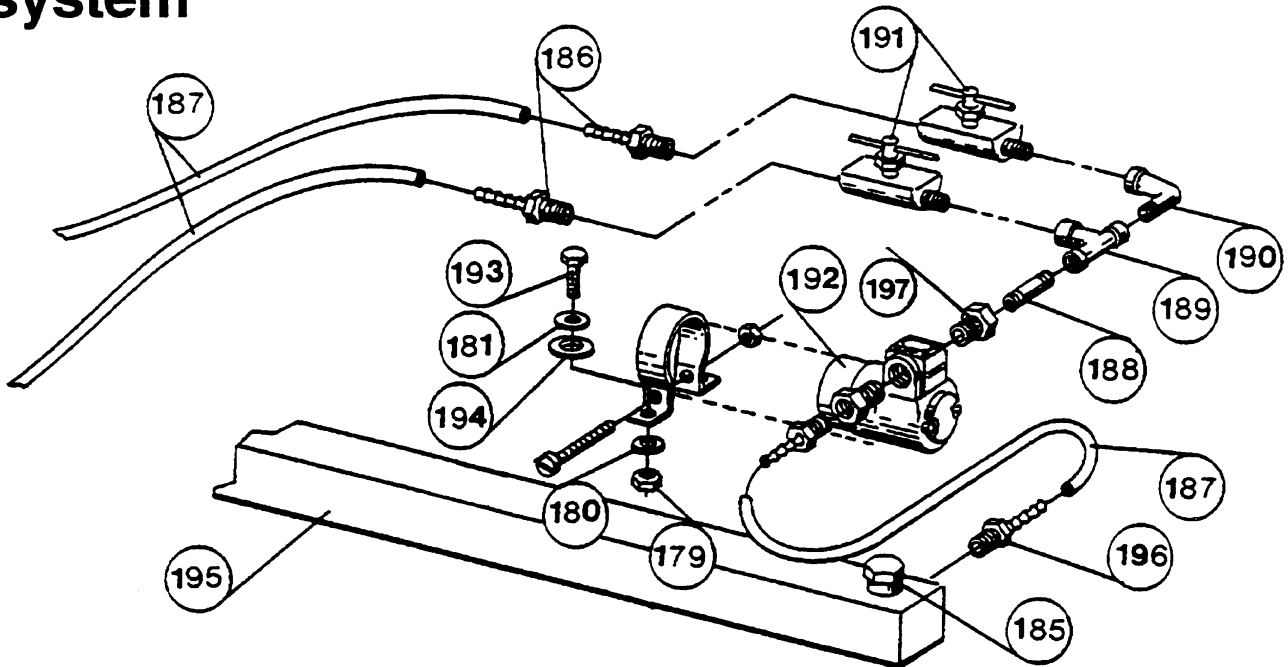


NOTE: If it is necessary to replace the spring, remove the piston head assembly which allows the guide weldment to be removed from the piston rod.

NOTE: Grease the compensator piston rod daily at both fittings. Failure to grease regularly may cause the piston rod to "seize" in the guide tube resulting in severe pulsations of material in the hose.

## C-30HD — RETURN SPRING ASSEMBLY





## Fuel system



# C-30HD — OIL SYSTEM AND FUEL SYSTEM

## C-30HD CONCRETE PUMP OIL SYSTEM AND FUEL SYSTEM

NO.	PART NO.	PART NAME	QTY.	REMARKS
176	EM20426	MINI BARB ELBOW	2	
177	EM20427	FUEL LINE	A/R	
178		FUEL TANK .....	1 .....	SEE NOTE
179	EM401	NUT, HEX 5/16-18	6	
180	EM968354	WASHER, LOCK 5/16 .....	6 .....	REPLACES EM601
181	EM923023	WASHER, FLAT 5/16 .....	10 .....	REPLACES EM614
182	EM101	BOLT, HEX 5/16-18X1 1/2	4	
183		FUEL TANK STRAP .....	2 .....	SEE NOTE
184	EM20787	FUEL TANK CAP .....	1 .....	SEE NOTE FOR PLASTIC FUEL TANK
185	EM20349	OIL PLUG	1	
186	EM20412	MINI BARB FITTING	3	
187	EM20415	CLEAR PLASTIC TUBE	A/R	
188	EM20417	NIPPLE	1	
189	EM20418	TEE FITTING	1	
190	EM911004	STREET ELBOW .....	1 .....	REPLACES EM20416
191	EM20421	METERING VALVE	2	
192	EM14401	ELECTRIC OIL PUMP	1	
193	EM963030	BOLT, HEX 5/16-18X1 .....	2 .....	REPLACES EM163
194	EM923027	WASHER, FLAT 3/8 .....	2 .....	REPLACES EM611
195	EM14198	OIL RESERVOIR	1	
196	EM1440	INSERT FITTING	1	

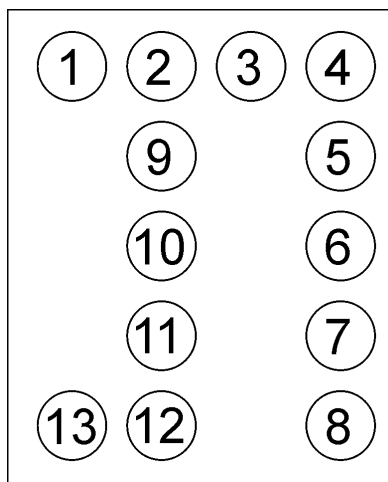
**Notes:** Item #178 and 183 (A) — Machines prior to 1993 use P/N 14701 Fuel Tank (8 gal. capacity) and #14703 Fuel Tank Straps (two required). (B) — Machines after 1993 use P/N 14205 Fuel Tank (18 gal. capacity) and #16185 Fuel Tank Straps (two required). (C) — Machines after 2/1/95 use P/N 14205P Plastic Fuel Tank (18 gal. capacity); P/N 2108 Gas Cap. Fuel tank straps not required. Note: interchangeable with P/N 14205.

## FITTING LOCATION AND PLASTIC HOSE LENGTH

EM509306 PANEL ASSY COMPLETE

EM505489 HOSE GREASE ZERK-12 REQUIRED

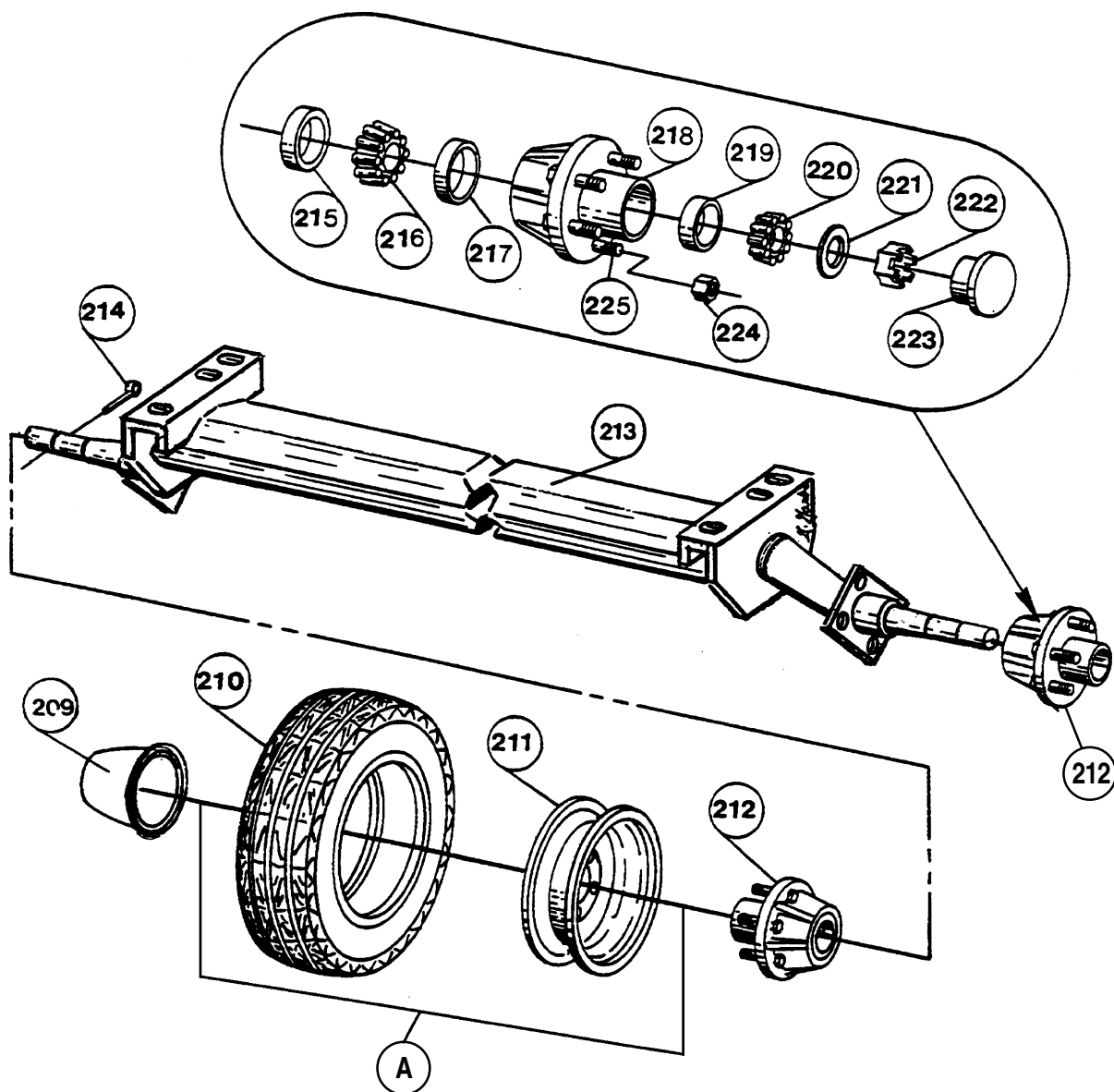
EM505490 45° GREASE ZERK-1 REQUIRED



**NOTE: P/N  
EM16495  
GREASE LINE  
(sold per foot)**

<u>POSITION</u>	<u>LOCATION</u>	<u>LENGTH OF LINES</u>
1 .....	FLANGE BEARING (CRANKSHAFT) .....	28"
2 .....	CONNECTING ROD .....	31"
3 .....	CAM BEARING .....	28"
4 .....	STEEL BEARING BLOCK (SQUARE) .....	34"
5 .....	ROCKER ARM UPPER (CRANKSHAFT SIDE) .....	10"
6 .....	PILLOW BLOCK BEARINGS (COUNTERSHAFT) .....	15"
7 .....	LOWER ROCKER ARM .....	28"
8 .....	ROCKER ARM LOWER (CHAIN SIDE) .....	26"
9 .....	PILLOW BLOCK BEARINGS (COUNTERSHAFT) .....	20"
10 .....	ROCKER ARM UPPER (PULLEY SIDE) .....	20"
11 .....	CONNECTING ROD LOWER .....	40"
12 .....	PISTON GUIDE .....	42"
13 .....	PISTON ROD .....	42"
	TOTAL LENGTH OF LINES REQUIRED .....	364"

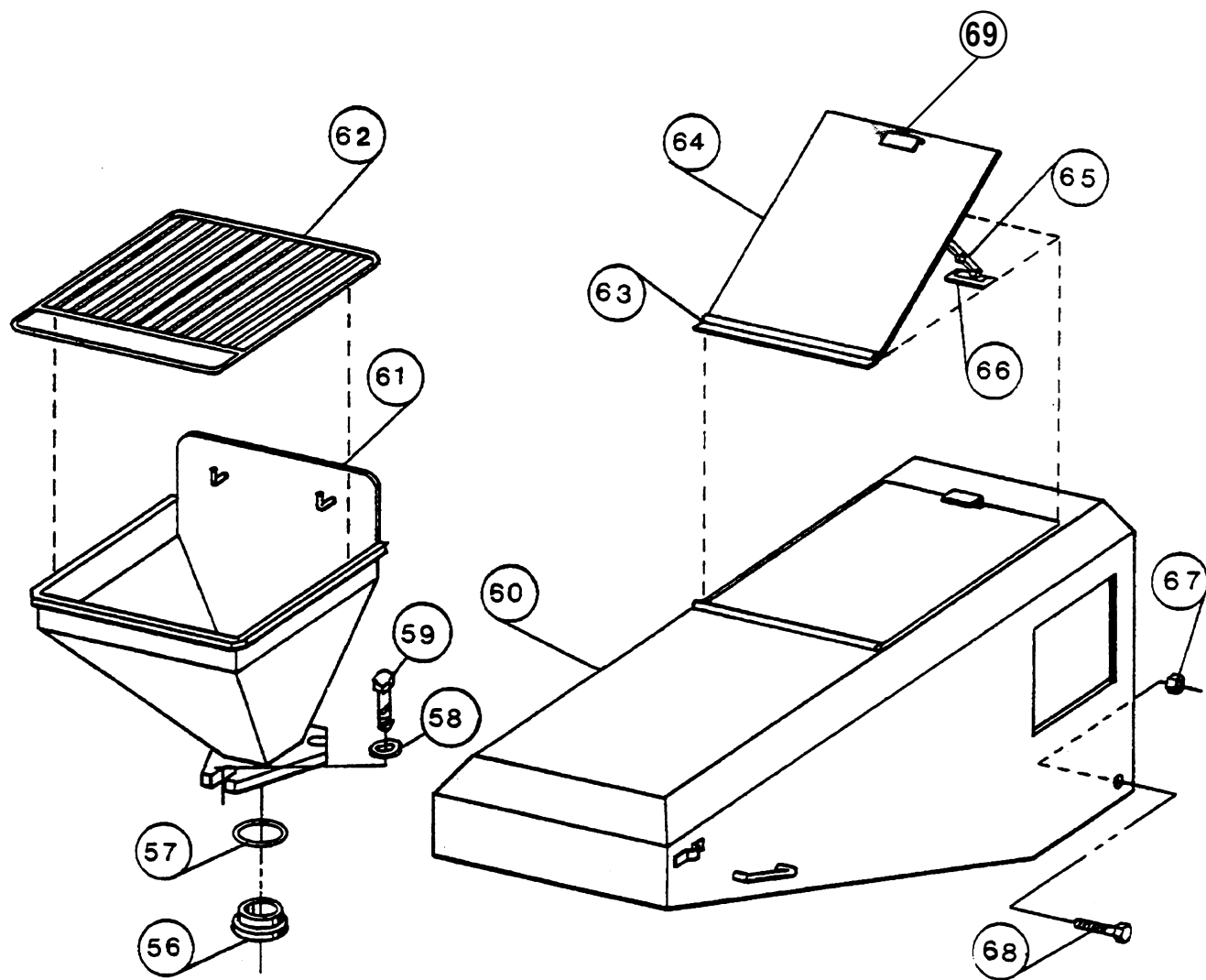
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## C-30HD — AXLE INSTALLATION

### C-30HD CONCRETE PUMP AXLE INSTALLATION

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	EM26615A	TIRE ASSY .....	2 .....	INCLS. ALL ITEMS W/*
209	EM26518	HUB CAP	2	
210*	EM20603	TIRE	2	
211*	EM20602	WHEEL	2	
212	EM20601	HUB ASSEMBLY .....	2 .....	INCLS. ALL ITEMS W/#
213	EM14600	AXLE	1	
214	EM705	PIN, COTTER 3/16X1 1/2	2	
215#	EM26305	GREASE SEAL	2	
216#	EM903168	INNER BEARING .....	2 .....	REPLACES EM26301
217#	EM903169	INNER CUP .....	2 .....	REPLACES EM26303
218#	EM26300	HUB	2	
219#	EM903012	OUTER CUP .....	2 .....	REPLACES EM26304
220#	EM903113	OUTER BEARING .....	2 .....	REPLACES EM26302
221#	EM26329	WASHER	2	
222#	EM968481	CASTLE NUT .....	2 .....	REPLACES EM420
223#	EM26306	DUST COVER	2	
224#	EM26519	NUT	12	
225#	EM20612	STUD	12	



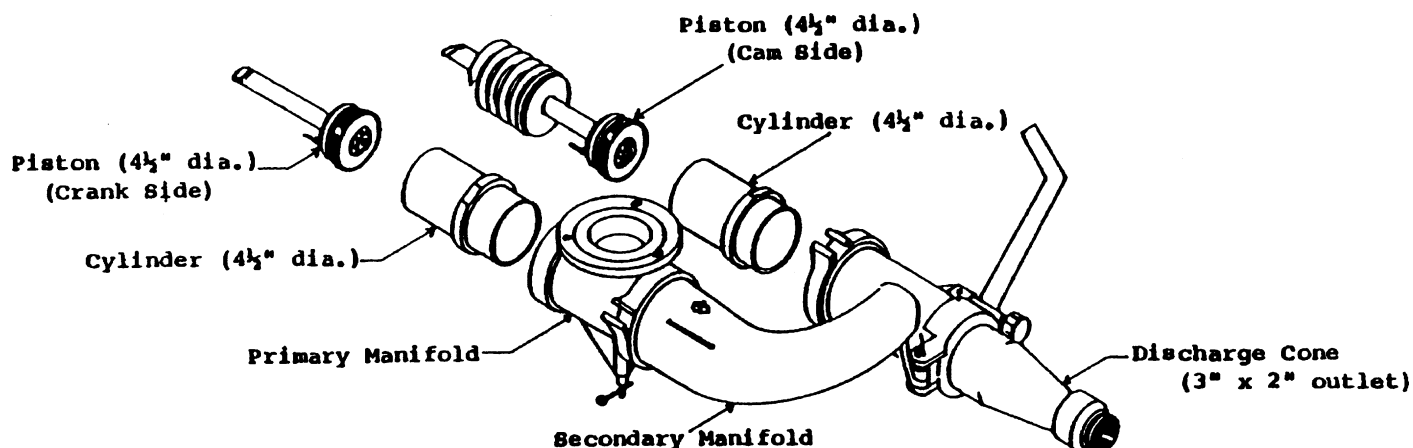
## C-30HD — HOPPER AND HOOD

### C-30HD CONCRETE PUMP HOPPER AND HOOD

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
56		DURASEAT .....	1 .....	SEE NOTE BELOW
57	EM18801	"O" RING	1	
58	EM923348	5/8" LOCK WASHER .....	3 .....	REPLACES EM602
59	EM104	5/8-11X2 LG HEX BOLT	3	
60	EM14140	HOOD	1	
61	EM14141	HOPPER	1	
62	EM14159	HOPPER SCREEN	1	
63	EM14140-17	DOOR HINGE	1	
64	EM14140-16	HOOD DOOR	1	
65	EM14140-4	HOOD DOOR SUPPORT	2	
66	EM14140-5	HOOD SUPPORT BRKT	2	
67	EM406	1/2-13 HEX NUT	2	
68	EM124	1/2-13X4 LG HEX BOLT	2	
69	508659	LATCH	1	
	EM14164	KIT, DECAL SAFETY .....	1 .....	COMPONENTS NOT SHOWN

**Note on item 56: A — Machines, built after July 1, 1990 use Duraseat P/N 14843 — This new seat is more durable and can be used on older units.**

## C-30MG — SCALED DOWN MANIFOLD/CYLINDER KIT MODEL C-30MG

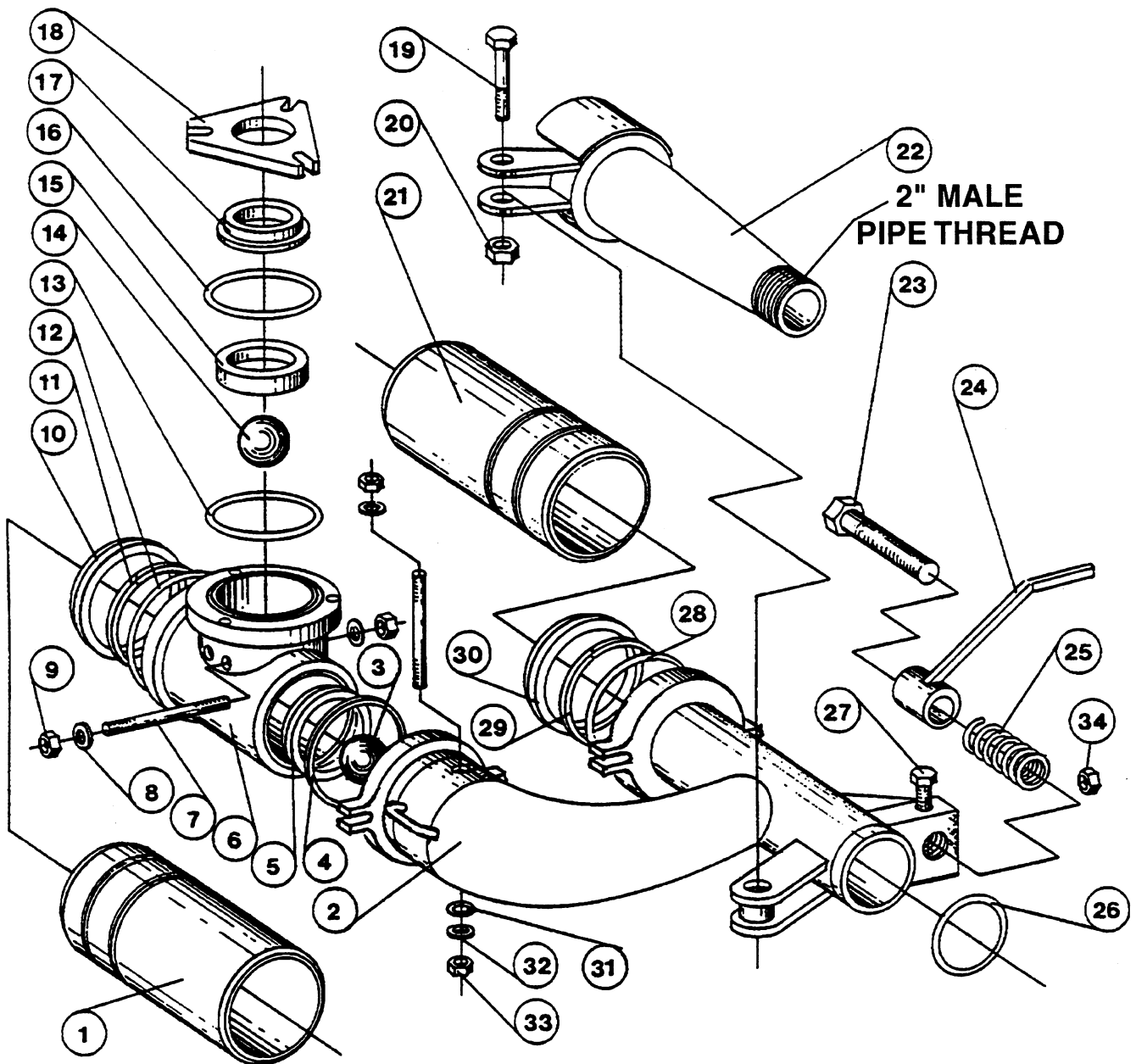


The above manifold/cylinder and piston assembly can be ordered as a kit to be installed on model C-30K, C-30SP or model C-30D pumps. This unit has a volume delivery of 4 to 13 cu. yds. per hour. When installed on a standard pump, the unit will pump brick mortar as well as 1/2" minus aggregate mixes in excess of 200 ft. vertical. It is a high pressure-low volume pump for numerous applications such as high-rise grouting-spancrete-mud jacking-capping wells-tunnel grouting-pumping pilings and shotcrete.

Note: If the above assembly is installed on model C-30D pumps it will be necessary to replace the compensator piston rod assembly with the new style used on the model C-30K, and model C-30 HD.



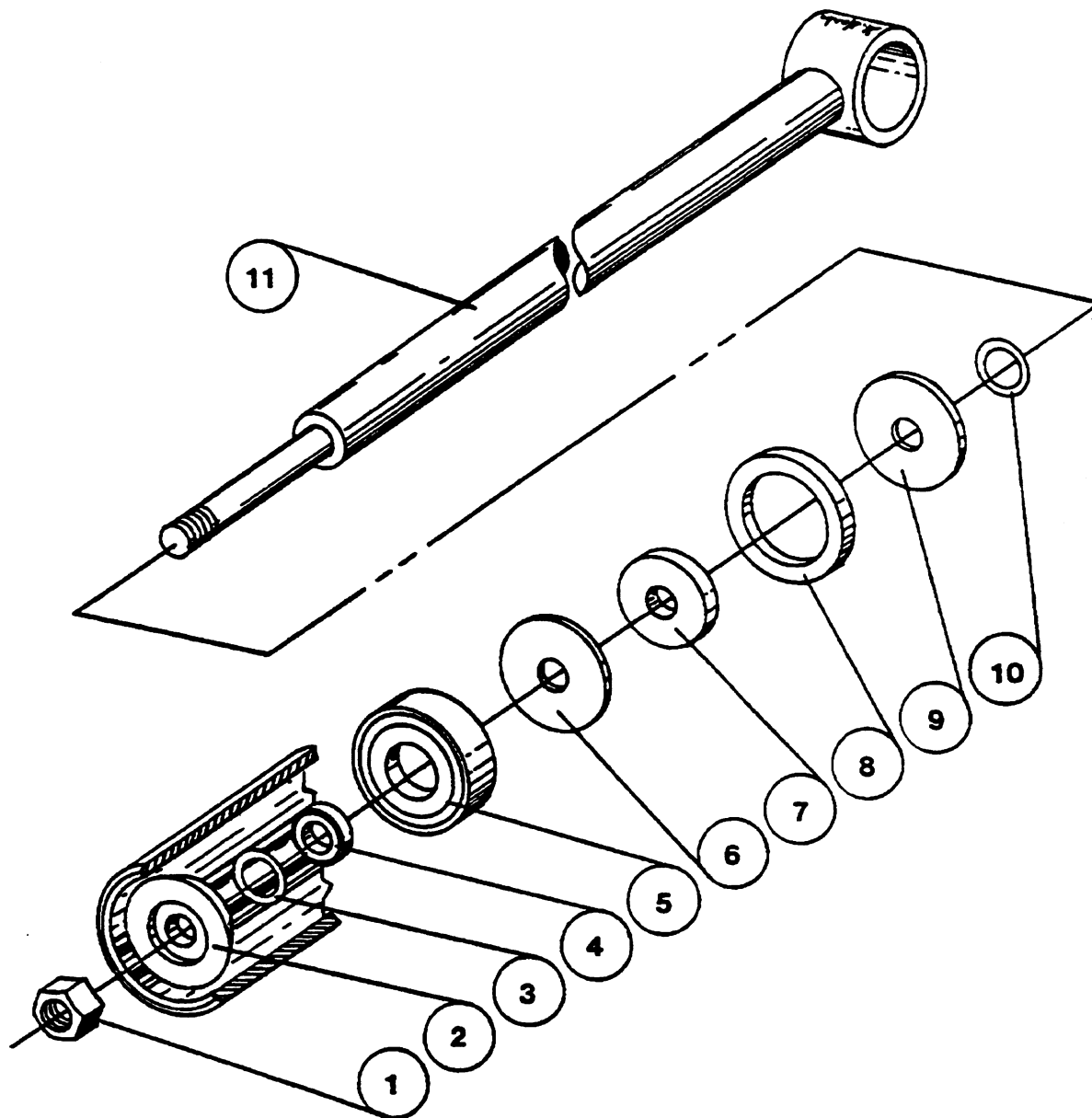
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# C-30MG — MANIFOLD ASSEMBLY C-30MG

C-30MG CONCRETE PUMP  
MANIFOLD ASSEMBLY-C30-MG

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	EM14832	PUMPING CYLINDER	1	
2	EM14827	MANIFOLD	1	
3	EM14824	STEEL BALL, 3-1/4	1	
4	EM14422	SQ. SEAL	1	
5	EM14823	VALVE SEAT	1	
6	EM14822	VALVE HOUSING	1	
7	EM803	BALL STOP STUD	3	
8	EM618	WASHER, 3/4	6	
9	EM968266	NUT, JAM 3/4-16 .....	6	REPLACES EM421
10	EM14833	ADAPTOR	1	
11	EM802	RETAINING RING	1	
12	EM14829	O-RING	1	
13	EM18801	O-RING	1	
14	EM14824	STEEL BALL, 3-1/4	1	
15	EM14826	INSERT	1	
16	EM18801	O-RING	1	
17	EM14823	VALVE SEAT	1	
18	EM14836	VALVE SEAT ADAPT.	1	
19	EM963180	BOLT, 3/4-10X5 .....	1	REPLACES EM131
20	EM968446	NUT, HEX 3/4-10 .....	1	REPLACES EM407
21	EM14832	COMP CYLINDER	1	
22	EM14828	REDUCER	1	
23	EM135	BOLT, 1/4-20X6	1	
24	EM14845	CLAMP ARM	1	
25	EM14810	SPRING	1	
26	EM14830	O-RING	1	
27	EM160	BOLT, 3/8-16X3/4	1	
28	EM14829	O-RING	1	
29	EM802	RETAINING RING	1	
30	EM14833	ADAPTOR	1	
31	EM18409	O-RING	6	
32	EM618	WASHER, 3/4	6	
33	EM968266	NUT, JAM 3/4X16 .....	6	REPLACES EM421
34	EM451	NUT, HEX 1-1/4-12	1	

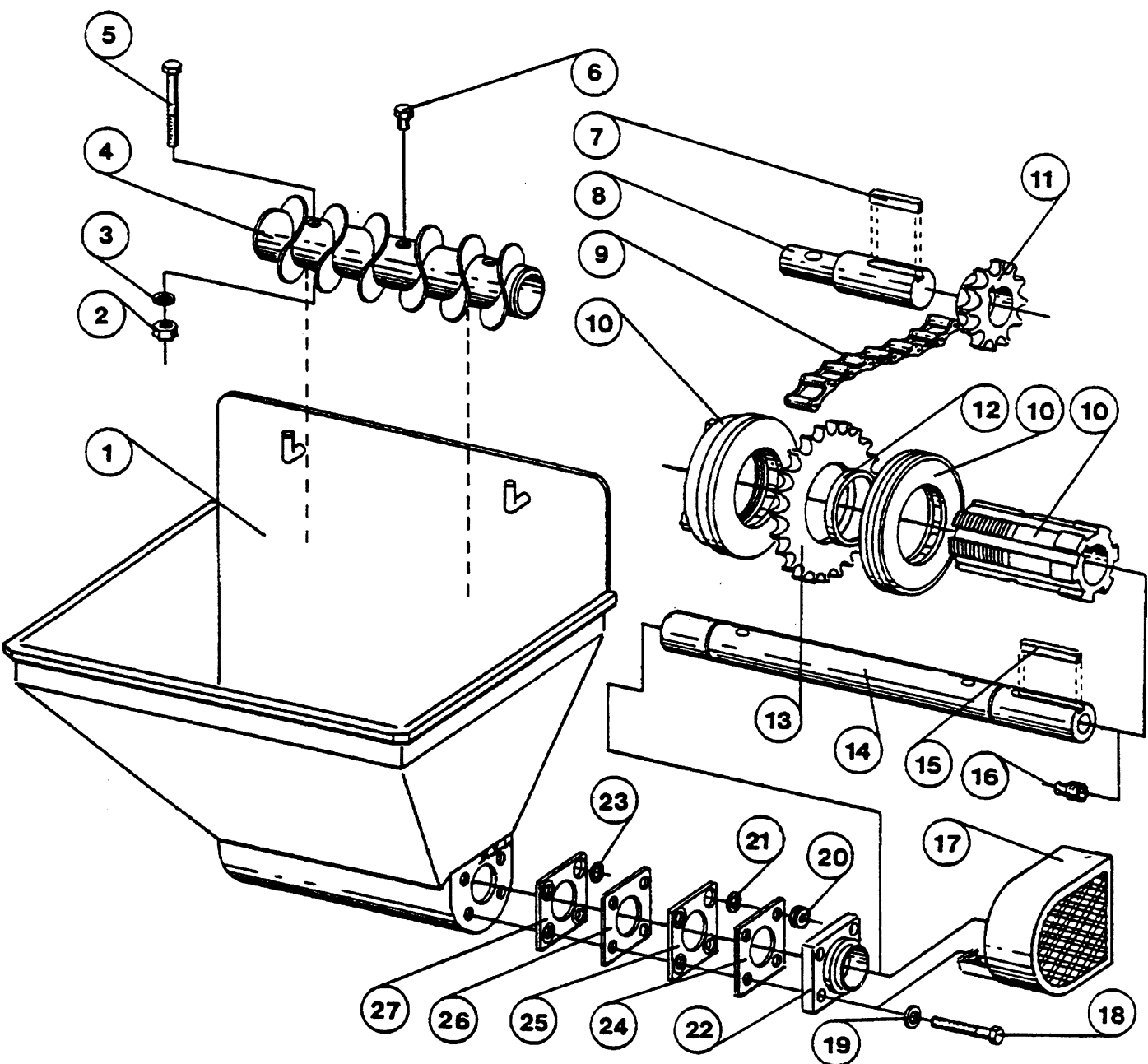


## C-30MG — PISTON HEAD COMPONENTS

C-30MG CONCRETE PUMP  
PISTON HEAD COMPONENTS C30-MG

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	EM968446	NUT, HEX 3/4-10 .....	2 .....	REPLACES EM407
2	EM14420	FACE PLATE	2	
3	EM18409	O-RING	2	
4	EM14418	SLEEVE	2	
5	EM14419	PISTON CUP	2	
6	EM14417	BACK PLATE	2	
7	EM14416	FELT SPACER	2	
8	EM14423	FELT RING	2	
9	EM14421	OILER PLATE	2	
10	EM18409	O-RING	2	
11	EM14808	PISTON ROD	2	

**C-30SP — OPTIONAL SCREW CONVEYOR AND TORQUE LIMITER MODEL C30-SP**



## C-30SP — OPTIONAL SCREW CONVEYOR AND TORQUE LIMITER MODEL C30-SP

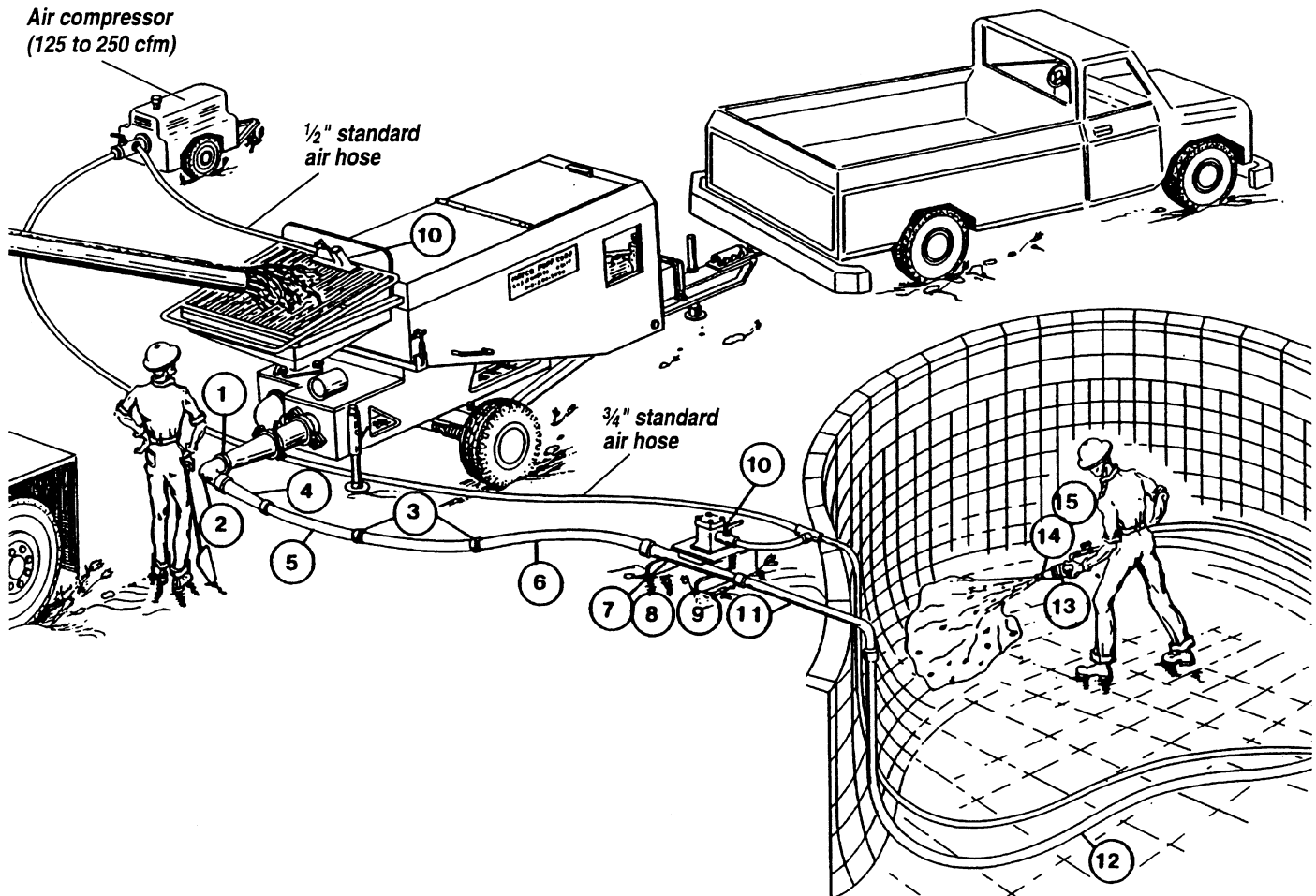
C-30SP CONCRETE PUMP

OPTIONAL SCREW CONVEYOR AND TORQUE LIMITER C30-SP

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	EM14175	HOPPER	1	
2	EM968011	NUT, HEX 1/2-13 .....	2 .....	REPLACES EM404
3	EM923346	WASHER, LOCK 1/2 .....	2 .....	REPLACES EM606
4	EM26108	SCREW FEEDER	1	
5	EM147	BOLT, HEX 1/2-13X2.1/2	2	
6	EM26108-4	PLUG	1	
7	EM721	KEY	1	
8	EM14170	EXTENSION	1	
9	EM14340	SPROCKET CHAIN	1	
10	EM14338	TORQUE LIMITER	1	
11	EM14341	SPROCKET	1	
12	EM14716	BUSHING	1	
13	EM14339	SPROCKET	1	
14	EM26359	DRIVE SHAFT	1	
15	EM720	KEY	1	
16	EM916001	OILER .....	1 .....	REPLACES EM16179
17	EM26109	CHAIN GUARD	1	
18	EM147	BOLT, HEX 1/2-13X2.1/2	8	
19	EM923346	WASHER, LOCK 1/2 .....	8 .....	REPLACES EM606
20	EM621	WASHER, WILLIAM	4	
21	EM18138	SEAL SPACER	8	
22	EM18135	FLANGE BEARING	2	
23	EM18138	SEAL SPACER	8	
24	EM18136	SPACER PLATE	2	
25	EM18137	SHAFT SEAL	2	
26	EM18136	SPACER PLATE	2	
27	EM18137	SHAFT SEAL	2	

# RECOMMENDED SHOTCRETE SYSTEM

For swimming pool construction, ditch lining, tunnel lining, slope stabilization, etc.





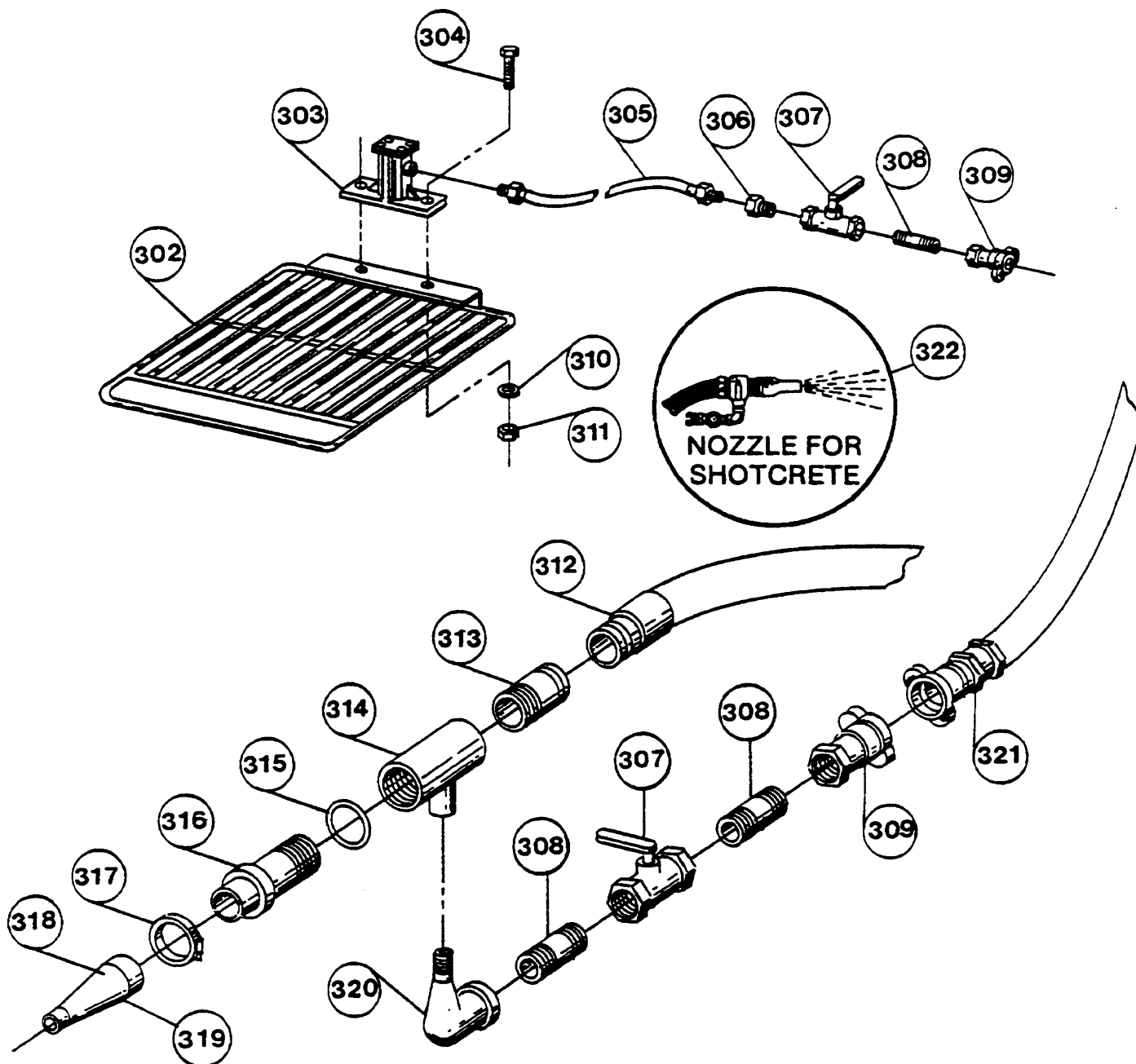
## RECOMMENDED SHOTCRETE SYSTEM

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	EM28904 .....	3" "B" COUPLING		
2	EM23946 .....	3"-90° ELBOW		
3	EM28903 .....	2 1/2" S/J COUPLING		
4	EM28005DD .....	3"X 2 1/2 REDUCER		
5	EM28061 .....	2 1/2"X 10FT. PIPE		
6	EM24849 .....	2 1/2"X 50FT. HOSE		
7	EM28001DD .....	2 1/2"X 2" REDUCER		
8	EM23815D .....	2 1/2"X 2" REDUCER W/AIR VIBRATOR		
9	EM28902 .....	2" S/J COUPLING		
10	EM23101 .....	AIR VIBRATOR		
11	EM28131 .....	2"X 2 ELBOW		
12	EM24841 .....	2"X 25 FT. HOSE		
13	EM23808D .....	NOZZLE ASSEMBLY		
14	EM23806 .....	1 3/8" NOZZLE TIP		
15	EM23807 .....	1 1/4" NOZZLE TIP		

### General recommendations

- If the site will permit, use steel pipe from the pump to the pool perimeter. It will reduce line pressures which is highly recommended.
- The vibrator on the reducer by the pool improves pumpability.
- Turn both air vibrators off whenever the pump is stopped to prevent separation of mix.
- The air vibrators are low consumption (4.2 scfm).
- Leave the air on at the nozzle when the pump is stopped to prevent clogging of air the hoses in the air insert.
- Use item #11 (steel elbow) at the edge of the pool to prevent collapse of the rubber hose, which can cause blockage.

# C-30HD SHOTCRETE ACCESSORIES



# C-30HD SHOTCRETE ACCESSORIES

## C-30HD CONCRETE PUMP SHOTCRETE ACCESSORIES

NO.	PART NO.	PART NAME	QTY.	REMARKS
302	EM26107	HOPPER SCREEN	1	
303	EM23101-1	AIR VIBRATOR	1	
304	EM132	BOLT, 1/2-13X2	2	
305	EM23407	AIR HOSE	1	
306	EM23408	BUSHING	1	
307	EM23411	VALVE	1	
308	EM912073	NIPPLE	2	
309	EM23409	COUPLING	1	
310	EM923346	WASHER, 1/2 LOCK .....	2	REPLACES EM606
311	EM406	NUT, HEX 1/2-13	2	
312	EM23818	2"X25' GROOVED HOSE		
	EM24841	2"X25' RAISED HOSE		
	EM23845	2"X50' GROOVED HOSE		
313*	EM23802	ADAPTER	1	
314*	EM23803	GUN BODY	1	
315*	EM20816	"O" RING	1	
316*	EM23804	AIR INSERT	1	
317*	EM23805	NOZZLE CLAMP	1	
318*	EM23806	NOZZLE TIP, 1 3/8"	1	
319*	EM23807	NOZZLE TIP, 1 1/4"	1	
320*	EM911076	STREET ELBOW .....	1	REPLACES EM23412
321		AIR HOSE		NOT SUPPLIED BY MAYCO
322	EM23808	NOZZLE ASSEMBLY .....	1	INCLS. ITEMS W/*

**NOTE:** Use a 1 3/8" rubber nozzle tip for a wide spray pattern. Use a 1 1/4" rubber nozzle tip for a narrow spray pattern. **DO NOT INSTALL THE NOZZLE AT THE END OF THE HOSE UNTIL THE FIRST MATERIAL HAS PASSED THROUGH THE ENTIRE HOSE LENGTH.**

**Disassemble and clean the nozzle assembly thoroughly after each job. Grease all threads before re-assembly. Do not close the air valve when pumping is stopped as a continued air flow keeps the air passages clean.**

### 1. CRANKSHAFT AND CAM ASSEMBLY PROCEDURE

A. Set bearing block (part #EM14303) into hydraulic press. Place bearing cup into bearing block and press in evenly. Bearing cup should be aligned equally on both sides of bearing block.

B. Set crankshaft into hydraulic press with the long end towards the top. Install spacer (part #EM14322), O-ring (part #EM14326) and bearing cone (part #EM14325) onto crankshaft. Place bearing block on crankshaft until the bearing cone is riding in the bearing cup. Insert bearing cone spacer (part #EM14323) onto crankshaft and inside bearing block. Install second bearing cone until it is seated inside bearing cup. Place O-ring and spacer (part #EM14302) on crankshaft. Set cam weldment on top of spacer. Install crankshaft key and cam key on cam bushing (part #EM14301). Slide cam bushing down crankshaft and align the bushing, cam and crankshaft. Install sleeve over crankshaft and align with hydraulic press. Install cam bushing bolts loosely. Press bushing down onto bearing assembly. Leaving pressure on the bushing, tighten cam bolts evenly to 40-50 foot pounds. Release pressure on the bushing, re-apply pressure to bushing and tighten bolts evenly to 40-50 foot pounds. Repeat procedure 3 to 4 times. After bushing is tight into cam, remove from hydraulic press. Remove one bolt at a time, using Loctite, install bolts and torque to 65-70 foot pounds. Counter sink set screw hole and install dog point set screw and second set screw both with Loctite.

C. Place cam bearing onto crankshaft keeping bearing loose.  
\*Note: Make sure the eccentric lock is facing toward the outside of the pumping unit.

D. Set crankshaft assembly into the pump box and align both bearing assemblies with the pump box mountings.

E. After crankshaft assembly is securely fastened to the pump box, place sprocket (part #EM14307) onto the cam side of the crankshaft assembly. Install bushing (part #EM14309) into sprocket. Align sprocket with sprocket on countershafts and tighten bolts.

F. Install chain part #EM14308. To adjust, loosen locknuts on pusher bolts and tighten chain to approximately 1/2" slack in the chain. Once chain is adjusted properly, tighten down locknuts.

### 2. BALL AND SEAT REPLACEMENT PROCEDURE

A. Remove 3"x 2" reducer and 3" elbow from the pump outlet. Remove exhaust gate and Y-manifold (secondary manifold). Check ball seat and ball stop pin for wear. If any wear is detected, the part should be replaced. Remove T-manifold (primary manifold). Check all parts for wear. Remove hopper and hopper seat and inspect.

B. Loosen the piston nuts and remove the piston cup assembly and cylinders. Inspect all parts for wear and replace parts with excessive wear. Check oiler pump for proper operation.

C. Clean all parts thoroughly, removing all foreign material and concrete slurry. Once parts are clean, install concrete cylinders. Place oiler plate O-ring in place and coat with oil. Install small O-ring on piston rod. Run oiler line through the cylinders and connect in the oiler fitting on the oiler plate. Push oiler plate into cylinder. Install ring and felt holder, soak felt ring in oil, then install around felt holder in cylinder. Make sure the bronze ring is flat, then push it up flush with the ring and felt holder. Coat piston cup with oil and push it into the cylinder. Install bushing into center of piston cup. Put small O-ring on rod, place face plate on rod and tighten down securely. Repeat these procedure on the opposite cylinder.

D. Thoroughly check T-manifold, ball stoppings and both steel balls for wear. Insert an O-ring in the top flange and in the leading edge of the manifold. Put the manifold onto the primary side of the pump and install bolts leaving them loose.

E. Check Y-manifold for wear, install all O-rings, ball stop pin, ball and seat. Align and install Y-manifold to T-manifold and cylinder assembly. Tighten Y-manifold bolts first before tightening T-manifold bolts. After manifolds are tight, check O-rings for slippage.

F. Insert seat into frame hole directly above the T-manifold. The seat orifice should fit inside the frame itself, then the seat sits on top of the orifice. On the dura-seat, set the big end of the seat in the frame. The seat, or the small part of the dura-seat, fits into the bottom of the hopper.

G. After tightening the manifold bolts and inserting the seats in place, set the hopper over the seat and align the bolt holes. Tighten bolts, check O-ring and seat for alignment.

H. Check exhaust gate for wear, install and align gate onto Y-manifold. Insert O-ring into exhaust gate flange and close gate. Lock down lever and adjust clamp arm.

I. Install 3" elbow and 3"x 2" reducer. Fill hopper half full and check for leaks.

### **3. CLUTCH LINING REPLACEMENT (FOR EM14320 CLUTCH ASSEMBLY ONLY)**

A. Remove worn out lining and rivets. Check clutch springs and flyweights for wear.

B. Cut 1/8" off of each end of clutch lining. Slide lining into place. Insert one rivet into clutch lining hole. (Make sure rivet goes from inside out.) Wedge a flathead screwdriver between clutch flyweight and rivet head. Adjust screwdriver so that the rivet sticks out from the clutch housing approximately 1/8 of an inch. With a flat punch, pen the ends on the rivet so that it locks in place with the clutch housing. Repeat this procedure for all remaining clutch rivets.

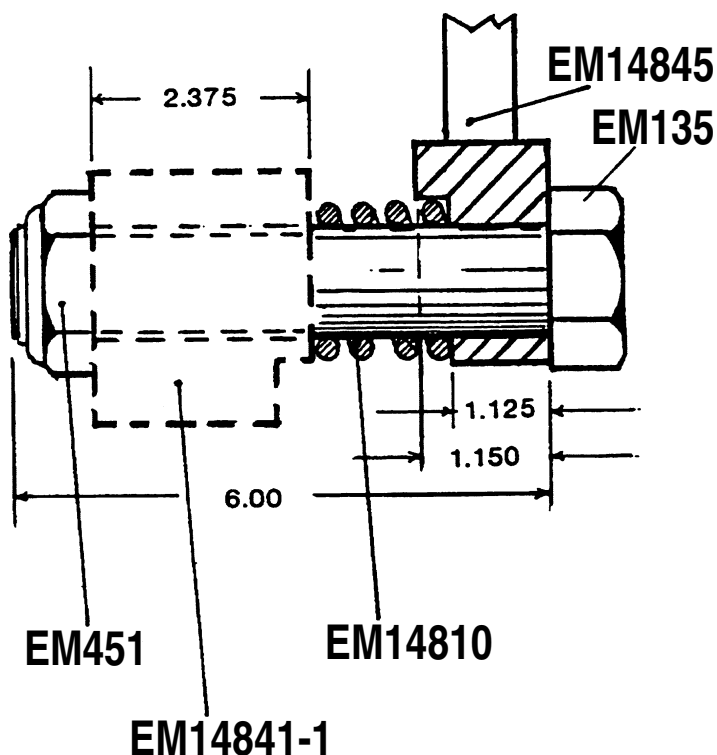
### **PREVENTIVE MAINTENANCE**

**It is extremely important to maintain this pump due to the highly abrasive nature of concrete material.**

Mayco recommends checking after every 8 hours of operation.

1. Engine; Refer to engine owner's manual.
2. Inspect all drive components for loose or worn bolts.
3. Drive belt/chain should be checked to remove all slack. Refer to adjustment procedure.
4. Always carry extra "O" rings.
5. Keep entire pump clean of concrete to prevent build-up.
6. Always grease all fittings daily. Use only premium grade grease. \*Note: Over greasing will not damage machine.

# C-30HD — SERVICE INFORMATION MANUFACTURING CHANGES



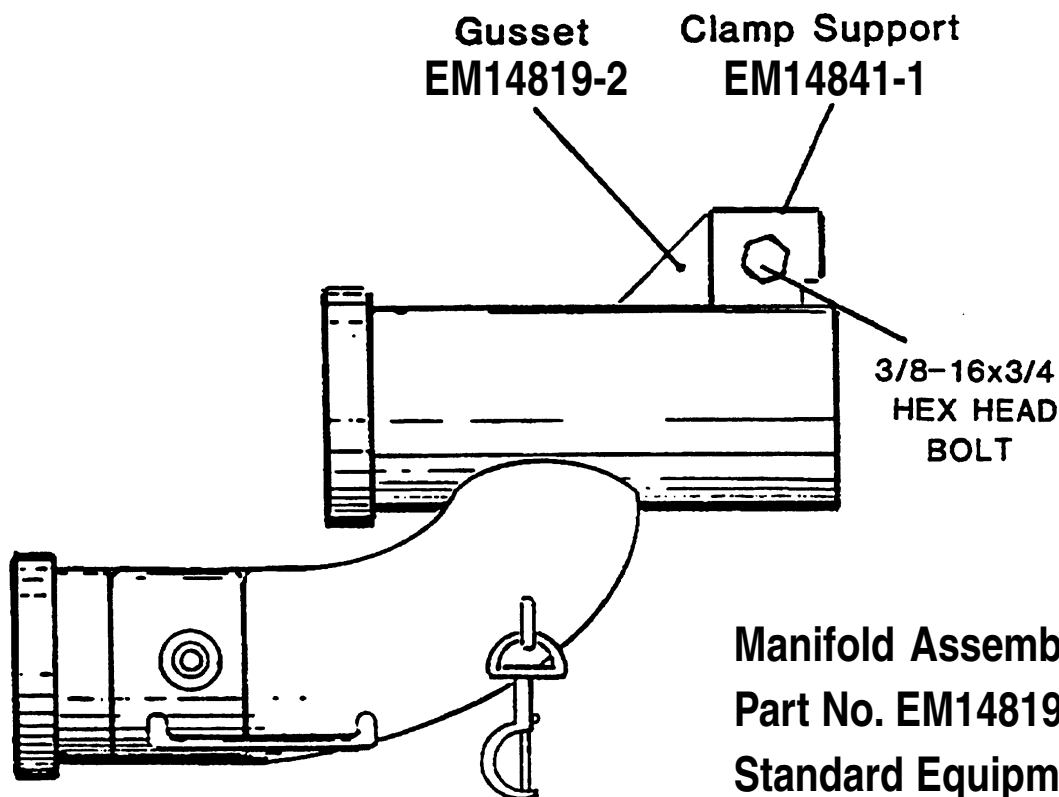
When ordering the new Manifold P/N EM14819, the following items are necessary to complete the new Clamp Arm Assembly:

EM451.....Nut, Hex 1-1/4-12

EM14810.....Jolter Spring

EM14845.....Clamp Arm

EM135.....Bolt

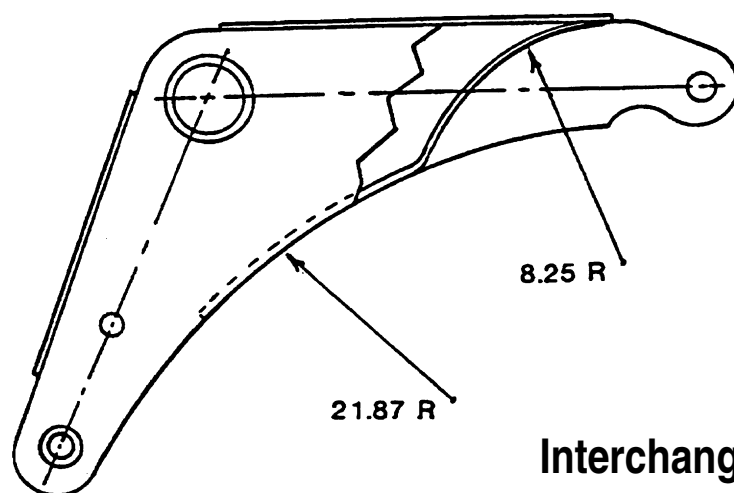


Manifold Assembly

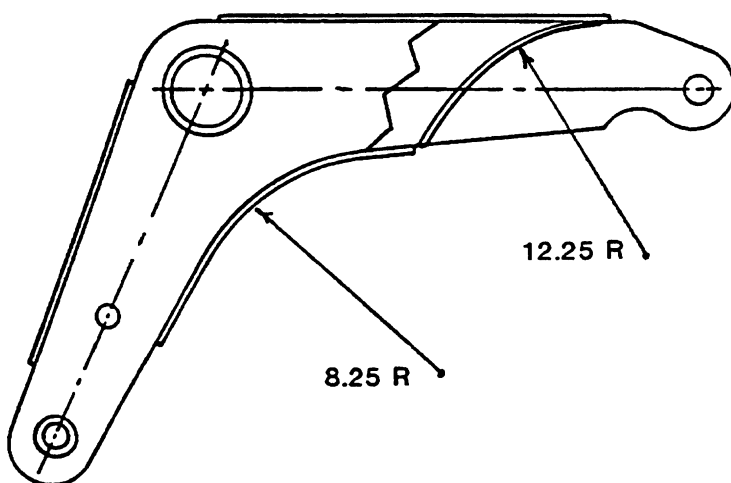
Part No. EM14819

Standard Equipment on all new C-30HD models as of March 1989.

**NEW ROCKER ARM ASSEMBLY PART NO. EM14846**

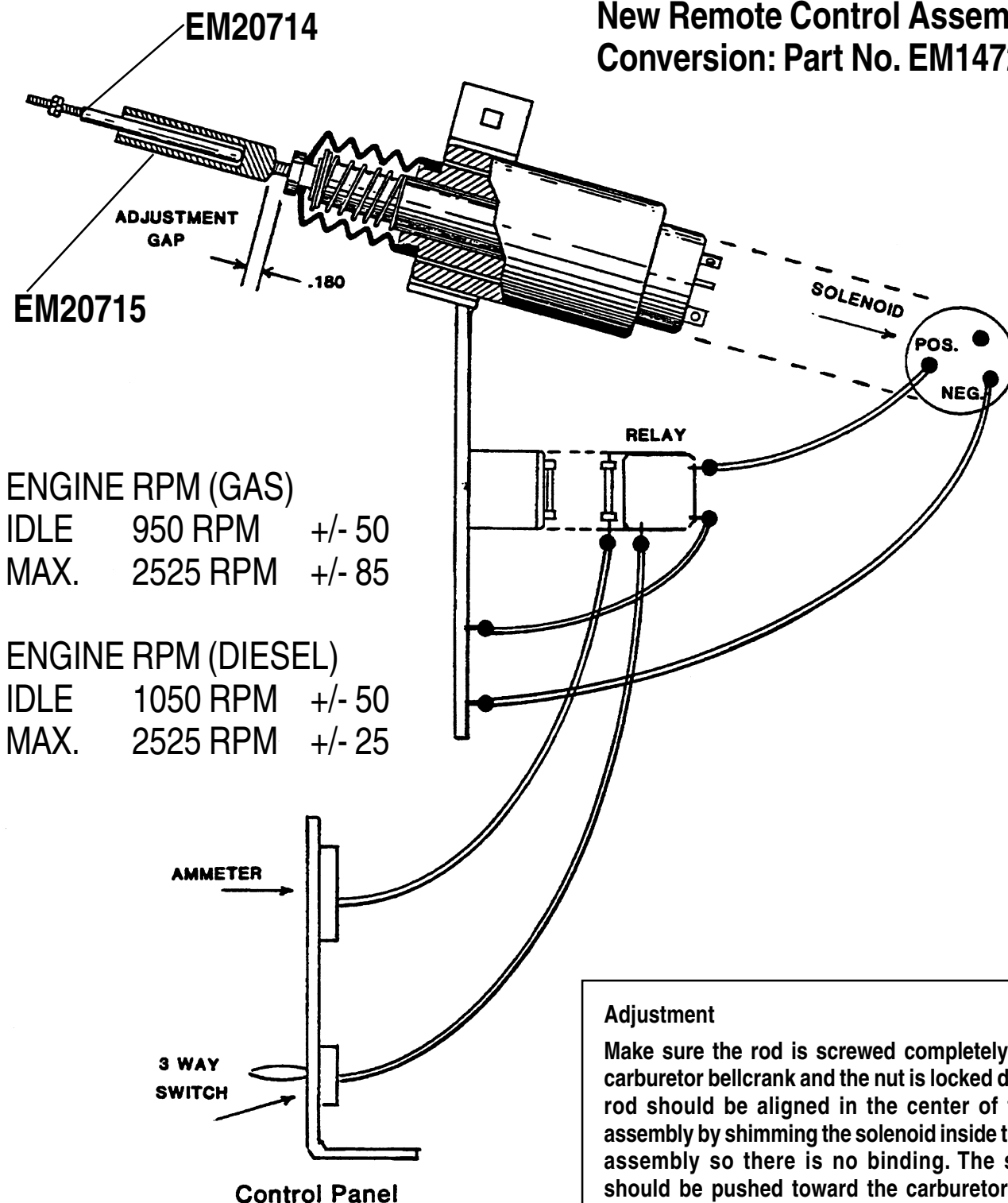


**Interchanges with Plaster Pump  
Standard Equipment on all new C-30HD  
models as of July 1, 1990**



**Part No. EM20342  
Old Rocker Arm Assembly  
Interchanges with Plaster Pump.  
NO LONGER AVAILABLE.**

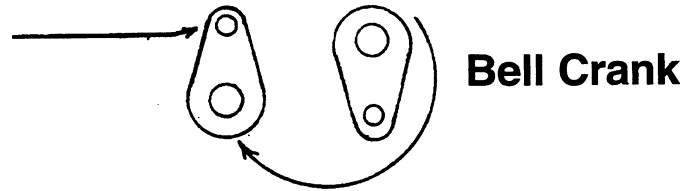
## New Remote Control Assembly Conversion: Part No. EM14728



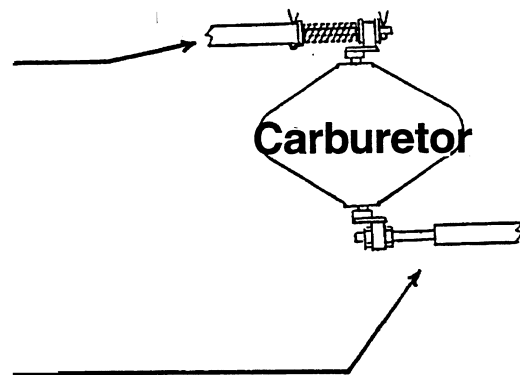


## C-30HD — SERVICE INFORMATION: REMOTE CONTROL

1. Turn Bell Crank on carburetor with Swivel End up. Bell Crank

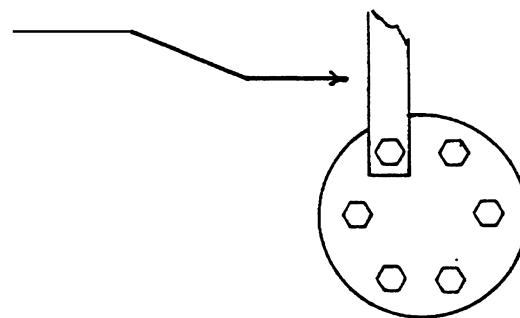


2. Drill .156 dia. hole through Bell Crank swivel on Throttle side of carburetor. Insert Rod & Spring assembly P/N EM14729 and fasten with cotter pin. Carburetor

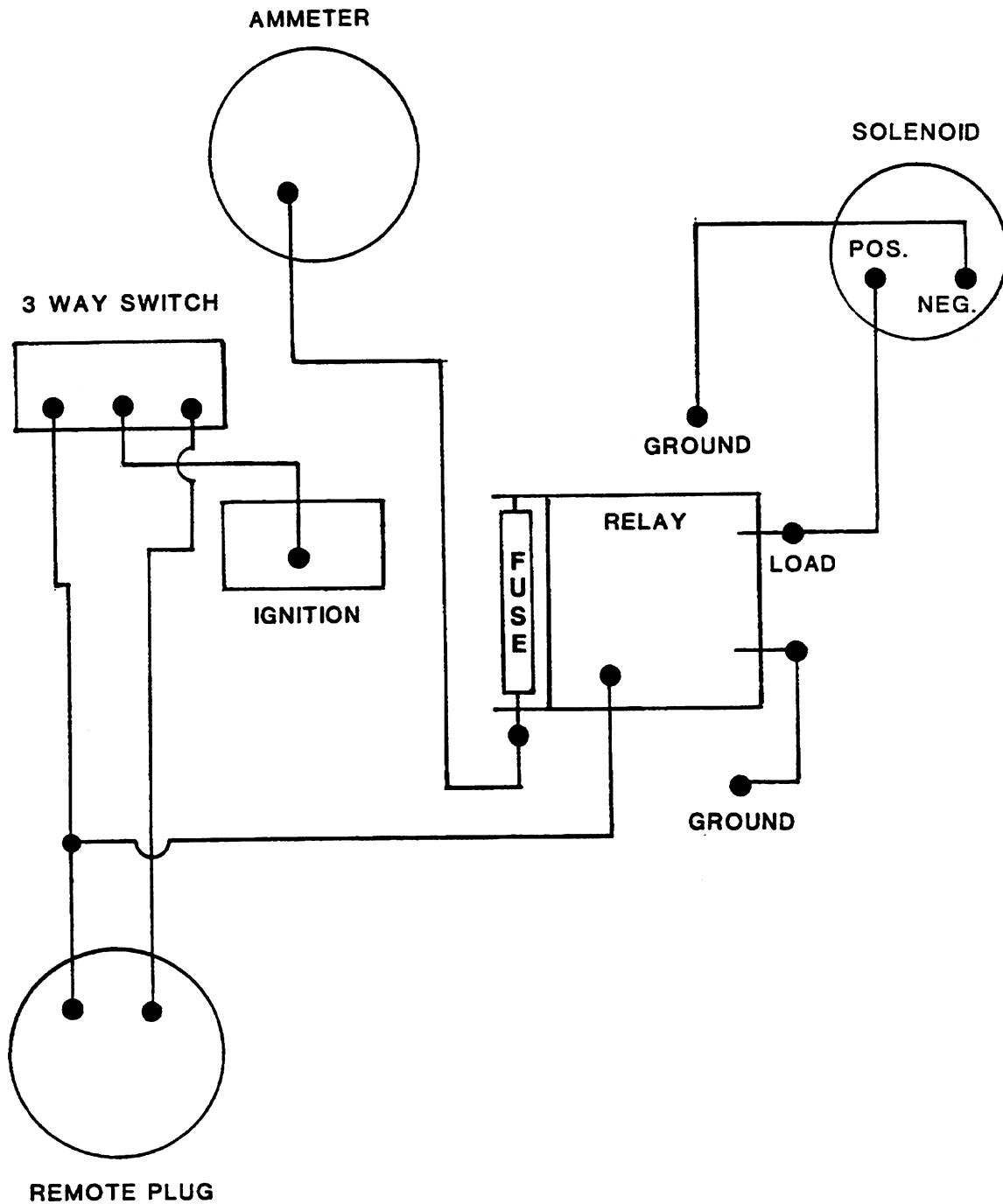


3. Insert linkage P/N EM20714 into Bell Crank on solenoid side of carburetor and fasten with nut.

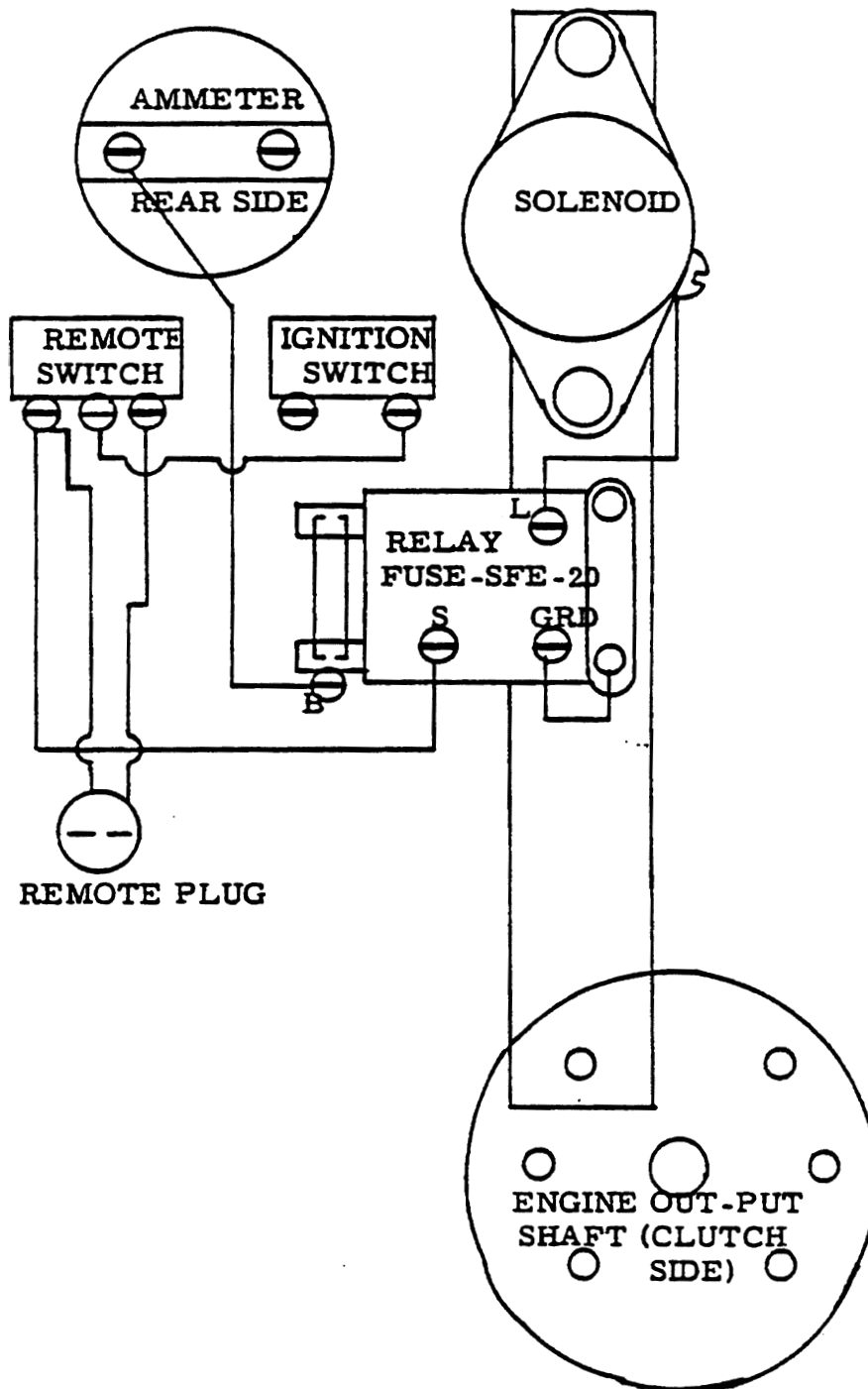
4. Insert linkage P/N EM20714 into extension on Remote Control unit and bolt bracket P/N EM20704 on clutch side of engine.



## C-30HD — REMOTE CONTROL SCHEMATIC

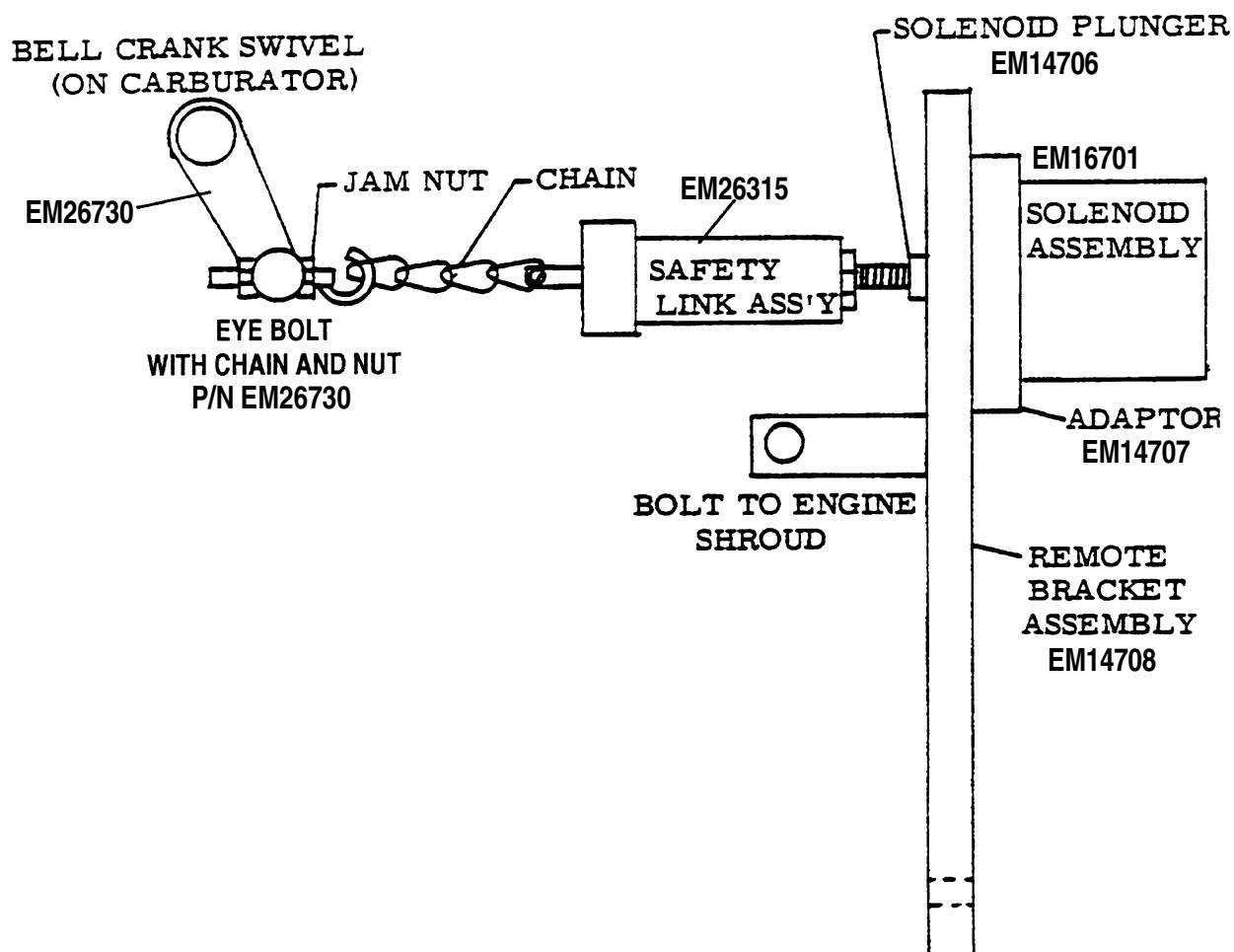


REAR VIEW FROM CLUTCH SIDE OF ENGINE



**(OBSOLETE)**

SIDE VIEW FROM STARTER SIDE OF ENGINE



**Important**

Adjust linkage as follows:

1. Energize the solenoid which will "bottom" the solenoid plunger.
2. Screw eyebolt into bell crank swivel until all slack is removed from chain, and "idle set screw" is full idle position. Note: Remove gas line to carburetor to permit easy installation of eye bolt in bell crank.
3. Tighten jam-nut to prevent eye bolt from unscrewing.

### **(Overload Safety Device Installed on Screw Conveyor Shaft)**

While pumping, if the Screw Conveyor at the bottom of the hopper is fouled or stopped because of rocks, the Torque Limit slips to prevent chain breakage.

If this condition exists, stop the pump and rotate the large pulley by hand in reverse direction to free the Screw.

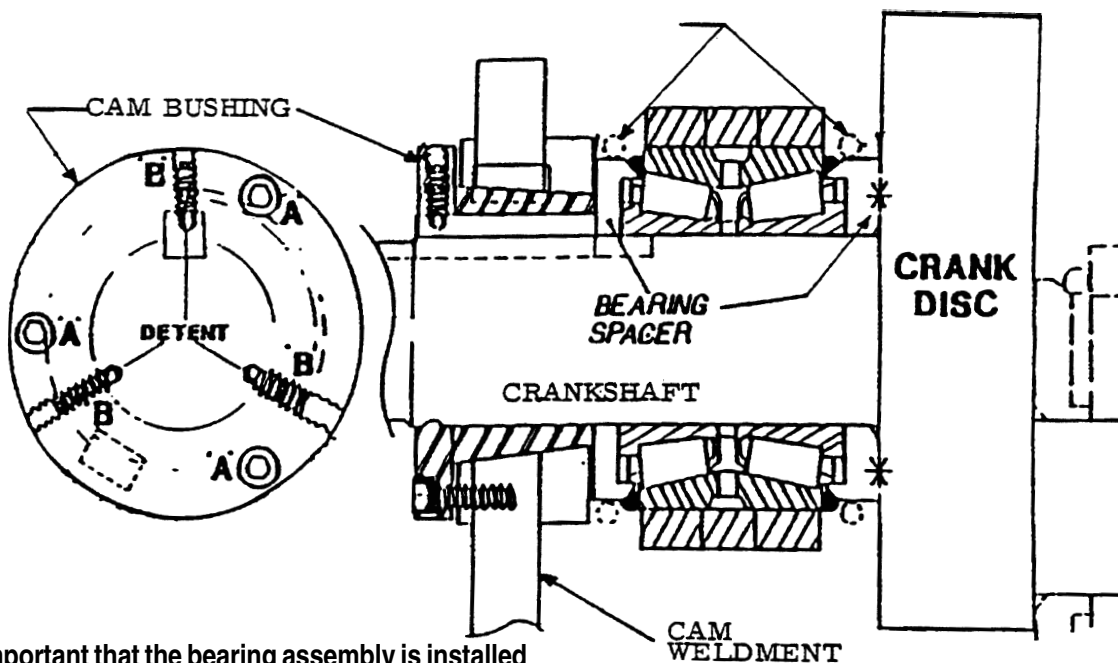
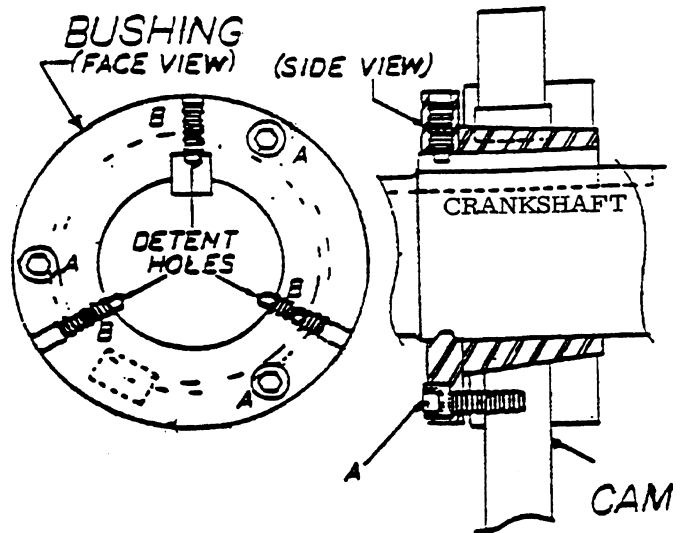
If the rock blockage is severe, it may be necessary to disconnect the Drive Chain and turn the Screw Conveyor Shaft using a wrench at the end nearest to the Jolter Cam.

Reconnect the chain and resume pumping.

## C-30HD — SERVICE INFORMATION: BEARING INSTALLATION

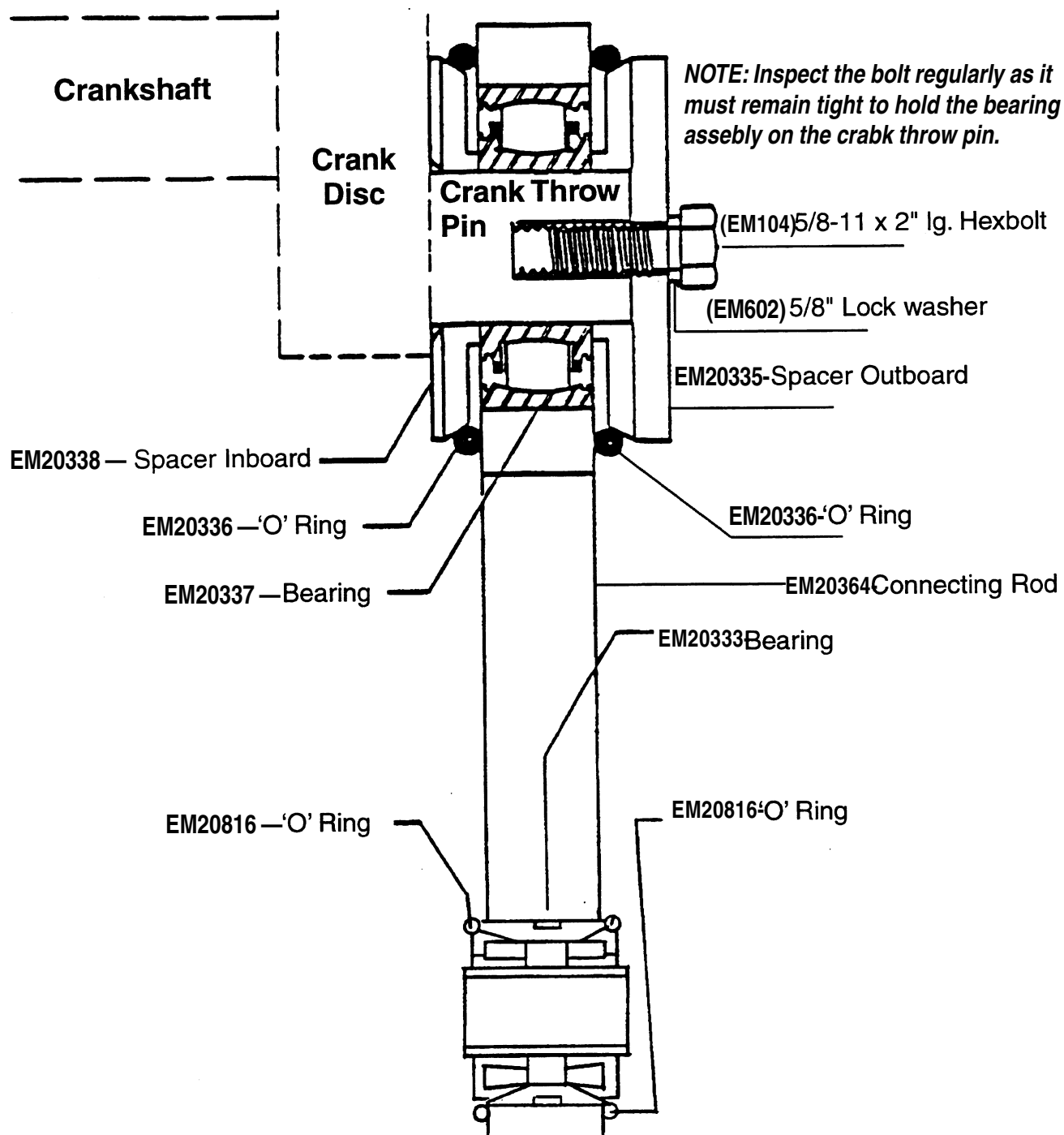
After the cam bushing is installed as per instructions below, remove the three “dog type” allen set screws (B) to allow detents to be drilled. Use a 9/32” drill to “detent” half (minimum 1/8” deep). Then “chase” the threads with a 3/8-16 bottom tap and blow out the chips after drilling, to be certain that the “dog type” allen set screws bottom in the detents to prevent the taper bushing from sliding laterally. If this procedure is not followed closely the heavy loading of the bearing during pumping operations causes the Timken cone bearings to create lateral forces which will move the taper bushing and allow the Timken cone bearings to separate from the race and subsequently fail.

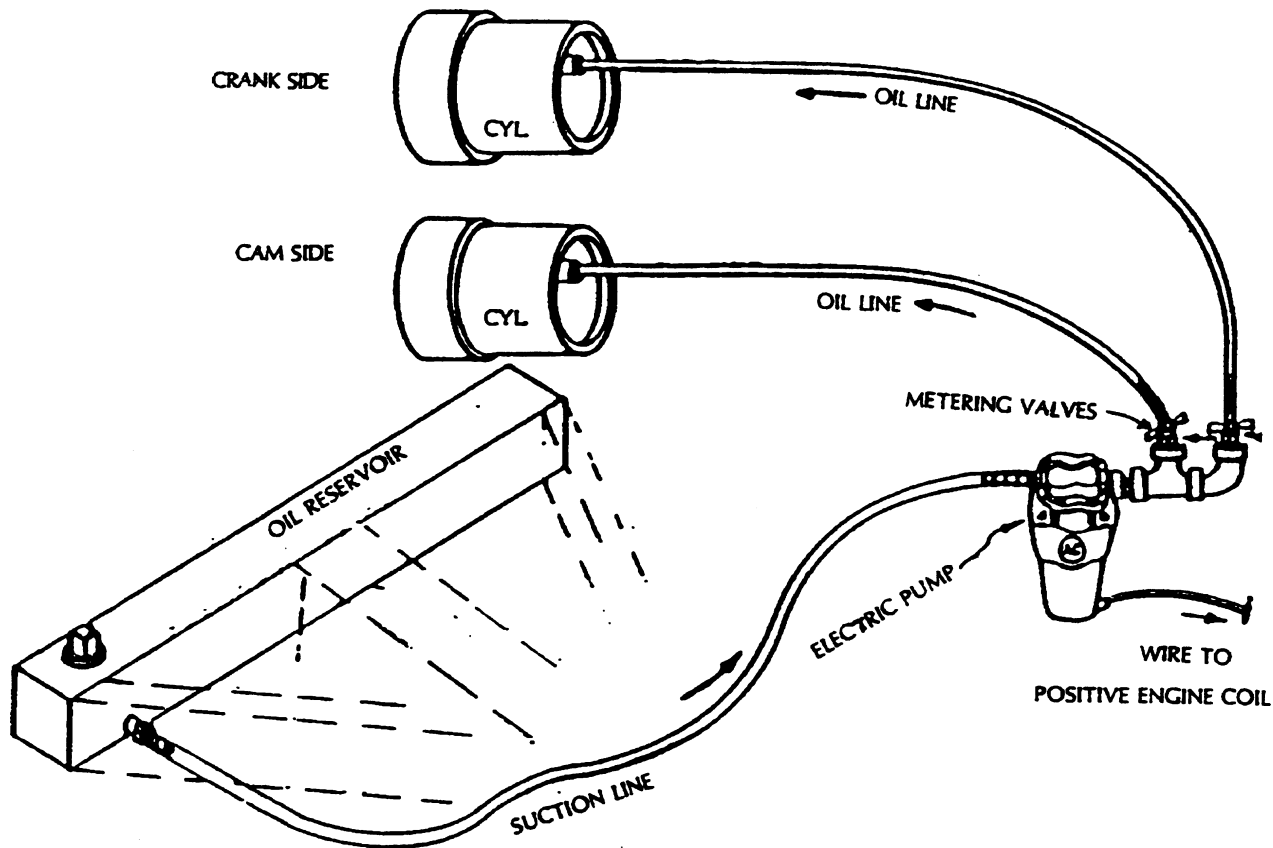
**Caution:** Position the ‘O’ ring on the O.D. of the bearing spacer during assembly to assure proper bearing adjustment.



**Note:** It is important that the bearing assembly is installed properly.

1. Install the bearing components on the crankshaft making full contact with the back side of the crank disc as indicated by the symbol\*.
2. Install the bushing in the cam weldment and slide it onto the crankshaft until contact is made with the bearing spacer.
3. Tighten the 3 allen socket head screws “A” while exerting pressure on the bushing towards the bearing spacer.
4. Drill (detent) the shaft under the allen set screws “B” to prevent the bushing from the sliding away from the bearing spacer when the pump is under a load.





**Illustration represents the oil pressurized system (oil pump)**

The Mayco model C30-HD pump is the only pump available utilizing a direct oil pressurized system (oil pump) and enclosed lubrication box. This combination will prolong the piston cup life and meet environmental standards.

1. Oil injection system — Check the reservoir every 8 hours. Use a good grade of SAE 30 oil. \*Note: Use SAE 10 wt. in cool weather. When the piston cups are new, open the metering valves to full open or approximately 15 drops of oil per minute drip from the rear of each cylinder. (For the first 25 yards)

2. Lubrication box — We recommend utilizing soluble type oil (water and oil mixture). The oil level should be periodically checked and maintained at a height of 5 inches or one-half of the cylinder height.

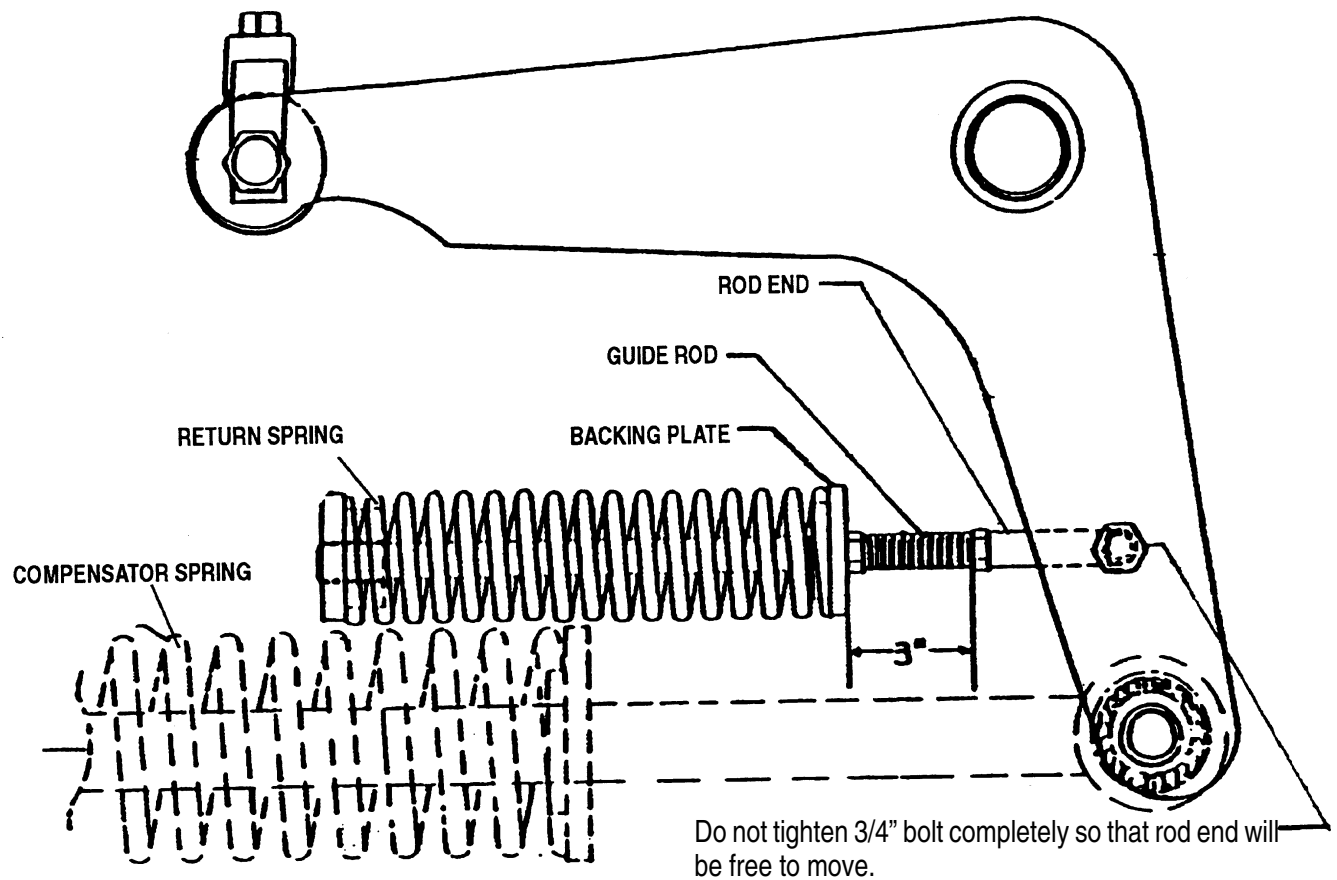
\*Note: IMPORTANT! During freezing temperatures, completely drain the water box and cover hopper.

As the piston cups naturally wear, fine cement particles will accumulate in the box. Once the concrete paste reaches a height of 3/4 inches from the bottom, the box should be drained and cleaned, and the pump should be serviced.

\*Note: If preferred, the oil pump may be disconnected. (Contact Mayco Service Department)

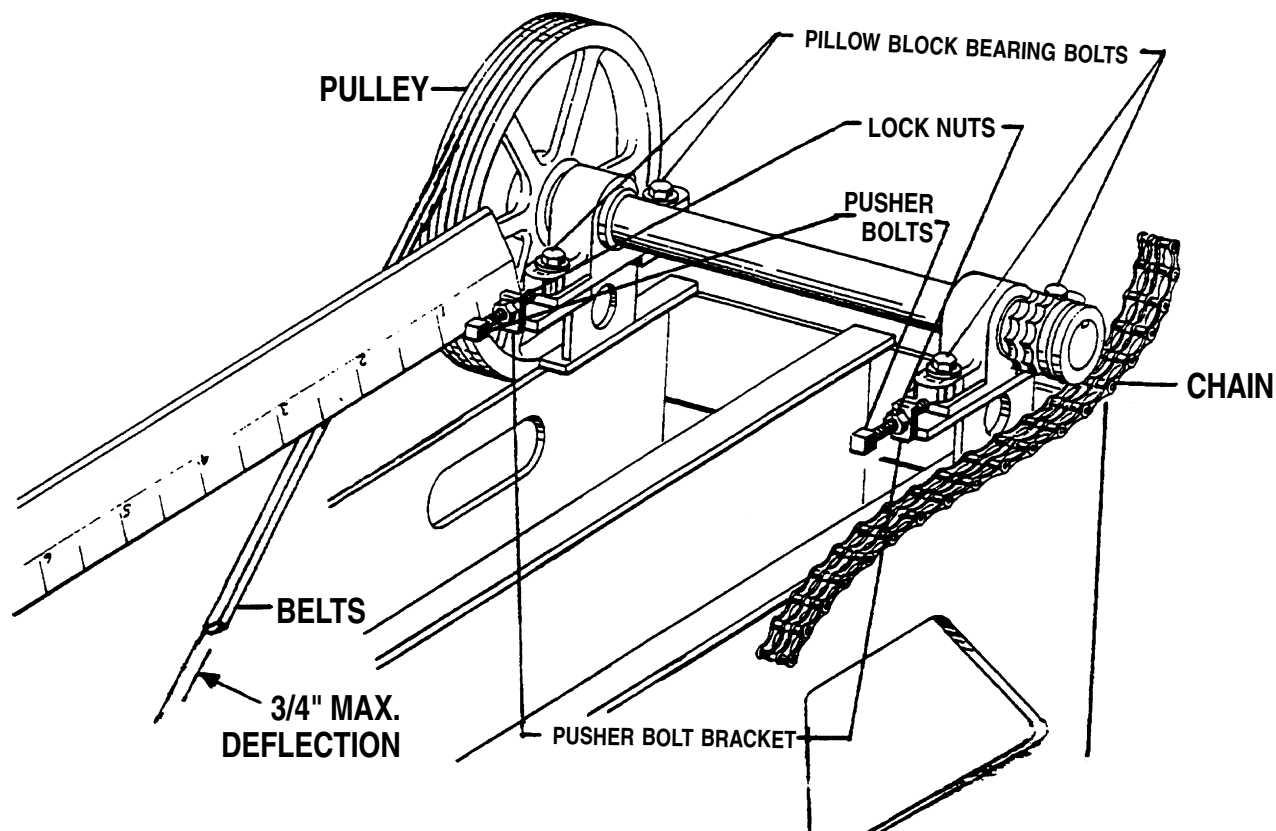


## C-30HD — SERVICE INFORMATION RETURN SPRING ADJUSTMENT PROCEDURE



The above return spring is installed to eliminate shock and stress between the cam roller and the cam weldment when the pump is in operation. If spring EM14333 is removed or replaced for any reason, maintain the backing plate dimension as shown to produce proper pre-loading of the spring for a smooth performance.

## C-30HD — SERVICE INFORMATION BELT AND CHAIN ADJUSTMENT



1. Loosen the pillow bearing bolts only to the point where the bolts will remain snug.

2. Unlock the two pusher bolt lock nuts.

3. Turn each pusher bolt clockwise an equal amount until the chain is to proper adjustment of approximately 3/8" to 1/2" slack in the chain. It is very important that the pulley side and the chain side (pillow block bearings) are within 1/16" of an equal distance.

4. This distance can be checked by using a tape measure or a straight edge ruler, measuring from the inside of the pusher bolt bracket to the face of the pillow block bearing.

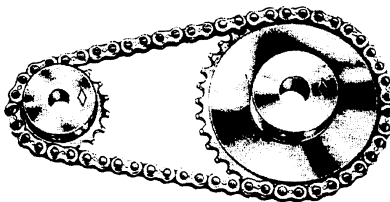
5. The drive chain should be adjusted regularly to remove all slack. Once all slack is removed, do not over-adjust, as this will overload the shaft bearings. A slack chain on the crank drive creates backlash and shock loads on the shafts and bearings which results in shorter wear/life of the drive components. Lubricate the chain regularly. Note-it is advisable to carry a spare chain and master links for replacement in the field if necessary.

6. Drive belts should be regularly adjusted to prevent slippage. To adjust the belts, loosen the engine mounting bolts and move the engine until there is a maximum 3/4" deflection in the belts, retighten the engine mounting bolts.

7. Frequent inspections should be made on all drive components to make certain that all bolts and nuts remain tight.

**NOTE:** PRIOR TO ADJUSTING CHAIN — PLACE THE LOBE OF THE CAM IN THE DOWN POSITION. THE CHAIN SHOULD HAVE 83 RIVETS INCLUDES (ONE EACH, HALF LINK AND FULL LINK)

# ROLLER CHAIN — APPLICATION INFORMATION



Roller chain properly selected, installed and maintained is an extremely versatile means of power transmission. It is possible, however, to greatly reduce a chain's life and even induce failure if the chain is abused through improper installation, operating or maintenance procedures. In certain applications, failure can lead to personal injury or property damage.

Recommendations and comments on how to get the most from your roller chain drive are given on the following pages.

## WORKING LOADS

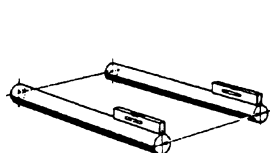
UTS-Ultimate Tensile Strength-is the one time pull required to break the chain. The Tensile Strength figures given in the Diamond catalog are not allowed working loads. For single strand chain, the load (pull) applied to the chain in service should never exceed 1/6th of the UTS for the chain being used except as noted below.

It is possible to exceed the allowable working loads for a limited number of cycles, but you should contact Diamond Chain Company before this is considered. **A roller chain should never be loaded above 50% of UTS for even one cycle. To do so will damage the chain structure and reduce its capacity.**

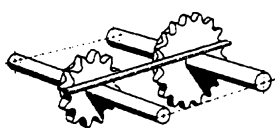
The UTS or one time breaking load of multiple strand chain is the UTS of a single strand chain times the number of strands; i.e., two strand chain is twice as strong as single.

When allowable working loads are considered, however, the capacity of each strand in a multiple strand chain is only 65% of the single strand rating; thus, three-strand chain would rate not three times single but only 1.95 times. This is because the chain load cannot be exactly distributed across all three strands of the three-strand chain.

## INSTALLATION AND DRIVE ALIGNMENT



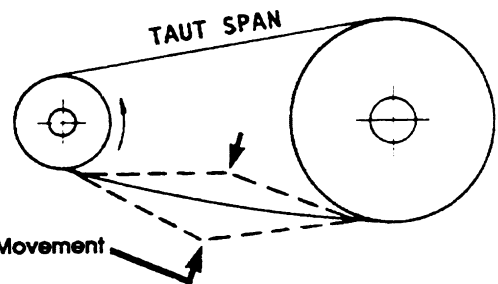
Aligning Shafts



Aligning Sprockets

Chain and sprockets must be installed correctly. Sprockets must be properly aligned and sprocket shafts must be parallel so the drive will run in a plane perpendicular to them. Axial alignment should be checked with a straight edge which will extend across the finished sides of the sprockets. They should be true-running with minimum wobble and eccentricity. The higher the drive speed, the more important these details become.

The chain should be installed so the slack span is properly tensioned. To check chain tension, turn one sprocket to tighten the upper span of the chain while holding the other sprocket fixed. The lack span should have 4-6% of span length in the mid-span movement for horizontal drives and 2-3% for vertical drives.



A roller chain's capacity can be significantly reduced if it is twisted or bent sideways in the direction of the pin axis. Exercise particular care in alignment of hoist or other applications where loads are suspended near personnel.

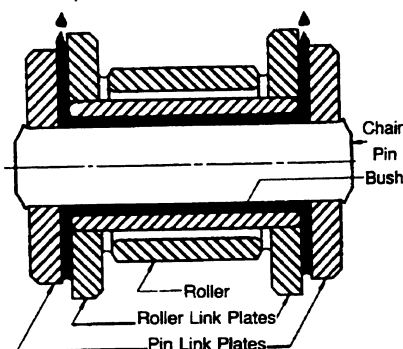
## LUBRICATION

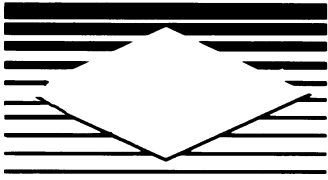
As a chain articulates in entering and leaving a sprocket, there is relative movement between pin and bushing surfaces. These surfaces wear causing chain elongation. If a lubricant film can be maintained between the pin and bushing, the wear rate is very slow and the chain wear life very long. Maintaining the oil film is relatively simple at low speeds but becomes increasingly difficult as the speed increases.

It is recognized that good lubrication is not possible in many applications, so shorter wear life must be accepted in these situations.

In general, chain wear leads to rough or unsatisfactory service prior to actual chain breakage. Good lube can help to prevent chain failure by providing protection against rust or corrosion. Rusting can allow pits to form in the surfaces of the chain parts causing stress concentration points. This can lead to chain failure at relatively low loads.

The clearance between pin and bushings is very small, on the order of .003 to .005 inches. A lubricant must be thin enough to flow into the chain. SAE 30 weight oil is about right for room temperature. Lighter oil should be used for lower ambients and heavier for higher operating temperatures. Grease should not be used as it cannot penetrate chain clearances.





# DIAMOND<sup>®</sup>

## CHAIN COMPANY

### WHEN DISASSEMBLING OR ASSEMBLING CHAINS:

**WARNING:** — The components of a chain are hardened parts. Striking these parts may cause metal chips to break off from the chain or the tools used resulting in personal injury. During all stages of chain disassembly and assembly, wear safety glasses to prevent metal parts or chips from entering your eyes and have personnel in the immediate area do likewise.

#### A. Pin Removal

- 1) If chain is of cotter pin- type construction, remove cotters.
- 2) If chain is riveted type construction, grind pin heads off so pin ends are flush with the linkplate.
- 3) Drive pins out of linkplate using a Diamond pin extractor Model #113 or 135. Some multiple strand chains or large pitch models will require a hammer and punch or a press to remove the pins.

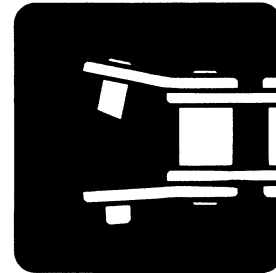
#### B. Installation of Coversides

Diamond coversides are manufactured three different ways: (1) Slip Fit, (2) Modified Press Fit, and (3) Full Press Fit. Modified and Full Press Fits require some patience and tools to assemble and/or disassemble. Use vice grips, plumbers pliers or a small hammer to drive coversides onto pins.

#### C. Installation of Spring Locks and Cotterpins

After coversides have been installed, install spring locks or cotters (depending on chain design). Avoid using bent or worn cotters or spring locks. After spring locks (or cotters) are installed, lightly tap pin ends to position these parts snug against the coverside for additional support.

## **WARNING**



**Chain will break if misused or abused.**

**Serious injury or property damage can result.**

**Select, install, guard and maintain chain in accordance with equipment manufacturer and Diamond Chain Company's recommendations.**

**Read assembly instructions with carton before installation.**

**DIAMOND<sup>®</sup>**  
CHAIN COMPANY

402 Kentucky Avenue, P.O. Box 7045, Indianapolis, Indiana 46207 • 1-800-U.S. CHAIN

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### WHEN INSTALLING CHAIN DRIVES ON EQUIPMENT:

**WARNING** — You may be seriously injured if you attempt to install chain on equipment under power. Shut off power and lock out gears and sprockets before attempting installation.

Once installed, the chain drive must be guarded to prevent personal injury or property damage in the event the chain separates during operation. If chain drive is not guarded, contact equipment manufacturer for recommendations on guarding before using equipment.

Knowing more about how the chain is constructed may help in assembly and disassembly. Further information may be obtained by calling or writing Diamond Chain Company.

**PAYMENT TERMS**

Terms of payment for parts are net 10 days.

**FREIGHT POLICY**

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

**MINIMUM ORDER**

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

**RETURNED GOODS POLICY**

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
  - a. The parts numbers and descriptions must match the current parts price list.
  - b. The list must be typed or computer generated.
  - c. The list must state the reason(s) for the return.
  - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
  - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.
5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
  - a. Obsolete parts. (If an item is listed in the parts price book as being replaced by another item, it is obsolete.)
  - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
  - c. Any line item with an extended dealer net price of less than \$5.00.
  - d. Special order items.
  - e. Electrical components.
  - f. Paint, chemicals, and lubricants.
  - g. Decals and paper products.
  - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for 5 working days from notification, pending instructions. If a reply is not received within 5 days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

**PRICING AND REBATES**

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

**SPECIAL EXPEDITING SERVICE**

A \$20.00 to \$50.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

**LIMITATIONS OF SELLER'S LIABILITY**

Multiquip shall not be liable here under for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

**LIMITATION OF WARRANTIES**

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. A part from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

# PARTS AND OPERATION MANUAL

## **HERE'S HOW TO GET HELP**

*PLEASE HAVE THE MODEL AND SERIAL NUMBER  
ON-HAND WHEN CALLING*

### ***PARTS DEPARTMENT***

*800-427-1244 or 310-537-3700*

*FAX: 800-672-7877 or 310-637-3284*

### ***SERVICE DEPARTMENT/TECHNICAL ASSISTANCE***

*800-478-1244 or 310-537-3700*

*FAX: 310- 537-4259*

### ***WARRANTY DEPARTMENT***

*888-661-4279, or 310-661-4279*

*FAX: 310- 537-1173*

### ***MAIN***

*800-421-1244 or 310-537-3700*

*FAX: 310-537-3927*



**MULTIQUIP INC.**

POST OFFICE BOX 6254

CARSON, CA 90749

310-537-3700 • 800-421-1244

FAX: 310-537-3927

E-MAIL: [mq@multiquip.com](mailto:mq@multiquip.com)

WWW: [multiquip.com](http://multiquip.com)

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Quebec, Canada • Manchester, UK • Rio De Janeiro, BR • Guadalajara, MX