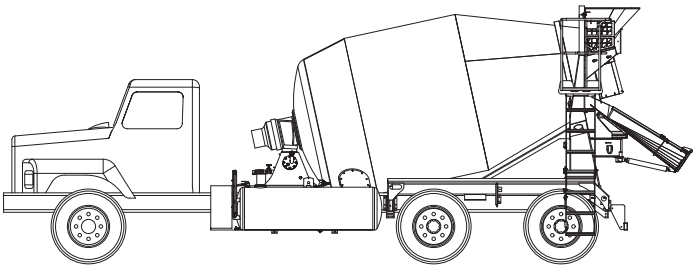
Concrete Mixer
Installation/Service Manual

1496120
(20151222)

Disclaimer:

All information, illustrations, and specifications in this manual are based on the latest information available at the time of publishing. The illustrations used in this manual are intended as representative reference views only. Moreover, because of our continuous product improvement policy, we may modify information, illustrations and/or specifications to explain and/or exemplify a product, service, or maintenance improvement. We reserve the right to make any change at any time without notice.



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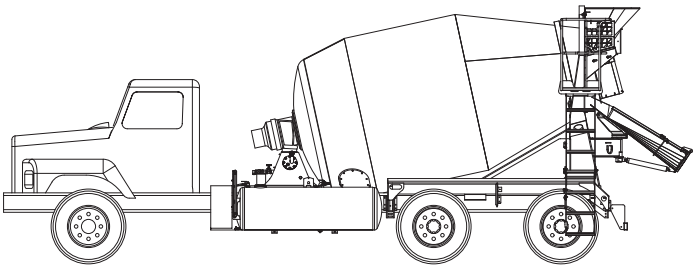

Thank You

Thank you for placing your confidence in our product. With proper maintenance, you will have a product that will serve your company for a number of years.

This manual is your guide for service and maintenance information. For parts information, manuals can be purchased through your London Machinery Parts and Service branch location. Please keep this manual in a safe place.

Protect your investment in London Machinery equipment. Do not jeopardize your warranty. Use only genuine London Machinery replacement parts. Original London Machinery parts ensure the finest quality, the longest life and proper, reliable operation.

We encourage you to call anytime you have questions or require assistance with our product. We also welcome your suggestions and ideas. Always have your model and serial number ready when calling for information and parts.

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1.0 Parts

London is committed to providing customers top quality OEM replacement parts, as well as aftermarket parts for other brands. Whatever you need, we can get you the right part at the right price at the right time. London. The name you trust for the parts you need to keep your fleet operating at peak performance.

Parts Phone: 519-963-2505
Toll Free: 800-265-1098
Parts Fax: 519-453-8916

2.0 Service

At London, we think you'll find the strongest commitment to service and support you've encountered anywhere. Why? Because we know it's so important to your success. Contact us anytime for unsurpassed knowledge and experience from customer service professionals who understand what you need to keep your fleet on the road.

Service Phone: 519-963-2531
Toll Free: 800-265-1098
Service Fax: 519-659-2306

3.0 Corporate Headquarters Information

Contact London Machinery Inc. directly at our corporate headquarters at the following address, phone numbers, and website address:

London Machinery Inc.
15790 Robin's Hill Road
London, Ontario
Canada
N5V 0A4

Phone: 519-963-2500
Toll Free: 800-265-1098
Fax: 519-659-2306

Corporate Website: www.lmi.ca

4.0 Warranty Information

We want you to be satisfied with our product and our warranty. The London Machinery warranty manual outlines the warranty procedures. Please refer to it for answers to any questions you have regarding the policy or its procedures.

If you require a warranty manual, want to submit a warranty claim, have a dispute or any other comments regarding warranty, we request that you contact your local London Machinery Parts and Service branch locations.

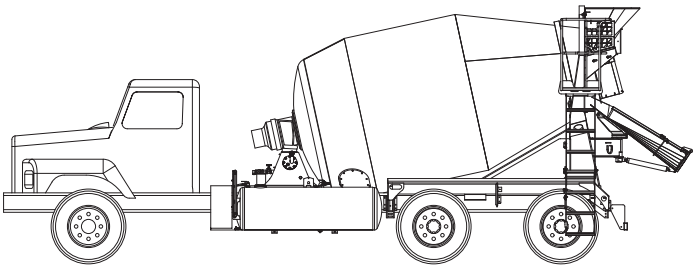
5.0 Purpose of This Manual

The purpose of this manual is to provide you with concise service and maintenance information for your London Machinery Inc. Mixer.

6.0 How to Use This Manual

Within this manual you will find that the service and maintenance procedures are divided into eight major sections. The following explains the sections in this manual:

- General Information - This section provides general information about the service manual.
- Safety - This section provides safety information applicable for the mixer.
- Installation - This section provides mixer installation information.
- Scheduled Maintenance - This section provides maintenance schedules and information.
- Hydraulic Components - This section provides service information specific to hydraulic components.
- Electrical Components - This section provides service information specific to electrical components.
- Emergency Procedures - This section provides emergency unloading procedures.
- Bulletins - This section provides bulletins specific to the mixer.



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Safety

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1.0 Product Safety Information

Safety notices are one of the primary ways to call your attention to potential hazards.

THIS SAFETY SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL.

WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS.

BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

The following safety notices are used throughout this manual.

⚠ DANGER

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Danger is used in the most extreme situations.

⚠ WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION

Caution indicates a situation that might result in property damage.

SAFETY NOTICE

Failure to follow Safety Notice instructions could cause damage to the equipment or cause it to operate improperly.

OPERATOR'S INSTRUCTION

The signal words of DANGER, WARNING, and CAUTION have specific meanings to alert you to the relative level of hazard.

Take the safety warnings seriously. If you do not understand them or have questions about them, contact London Machinery Inc.

1.1 Use Proper Safety Equipment

Always wear proper safety equipment/clothing while operating the Mixer.

Proper safety equipment includes:

- Hard Hat
- Safety Glasses or Goggles
- Snug-Fitting, Full-Covering Clothes
- Shirt with Tight-Fitting Long Sleeves (always keep shirt tails tucked in)
- Long Pants without Cuffs (Cuffs can be tripped over. Cuffs may also catch concrete)
- Steel-Toed Shoes or Boots
- Rubber Boots (if standing in concrete is required)
- Lime-Resistant Gloves
- Rubber Gloves (during clean-out)
- Hearing Protection
- Breathing Mask (if working in an area where cement dust is present)
- Breathing Apparatus and Ventilation Fan (if working in a Confined Space - see CZA

Z1006)

Follow these guidelines to reduce risks of injury:

- Avoid wearing clothing that has long strings, fringes, or ties that can become caught in equipment
- Never wear jewelry (rings, necklaces, bracelets, wrist watches, etc.). These can become snagged on equipment or, if they come in contact with electrical circuits, can present a shock or burn hazard.
- Tie up long hair to prevent it from becoming caught in moving parts
- In cold weather, avoid wearing loose-fitting clothing. It is better to wear layers of clothing under a pair of snug-coveralls than a large, loose-fitting jacket or parka
- Keep work clothing clean and in good repair
- Keep the soles of your work boots clean and in good condition for traction when climbing on and off the vehicle/mixer system.

2.0 Safety Information

Read, understand, and follow the safety guidelines and heed dangers and warnings listed below and contained in this manual as well as on the Mixer itself to promote reliable operation and prevent serious personal injury.

Contact London Machinery Inc. if you require assistance or have questions.

2.1 Safety

⚠ WARNING

Anytime you are working on this equipment or its related systems, you must do the following:

1. **Inform the truck driver that the equipment is going to be repaired and locked out and that he must not attempt to start the truck.**
2. **Follow all CSA and Mixer lockout procedures. Remove the keys from the truck's ignition.**
3. **Place magnetic signs on both doors of the truck which read "CAUTION - MAN WORKING ON MIXER - DO NOT START ENGINE."**
4. **Lockout supplies are available from London Machinery Inc.**

READ, UNDERSTAND, AND FOLLOW THE SAFETY GUIDELINES, DANGERS, AND WARNINGS LISTED BELOW AND CONTAINED IN THIS MANUAL TO PROMOTE RELIABLE OPERATION AND PREVENT SERIOUS PERSONAL INJURY.

SAFETY NOTICE

If chassis is equipped with a battery shut-off switch, it must be turned off anytime the equipment is parked overnight, in a shop, or out of service for any extended period of time. Failure to do so may result in a fire and personal injury of property damage.

SAFETY NOTICE

Immediately replace safety decals if damaged, unreadable, or missing. Contact London Machinery Inc. at 800-265-1098 for no-charge replacement decals when required. Failure to replace decals may result in serious personal injury or death.

2.2 Cab Operation

⚠ DANGER

If the Mixer comes into contact or close proximity with a power line or there is any arcing, stay in the truck cab and keep away from the metal parts of the unit. Do not let anyone come in close to the truck. Stay in the cab. The power company must disconnect the power before you can safely leave the cab.

Minimum clearance from power lines:

50,000 Volts or Less	4 Feet
50,000 + Volts	10 Feet
345,000 - 750,000 Volts	16 Feet

Know the clearance of overhead obstructions. Never drive the Mixer under any overhead obstruction without knowing the clearance height. If unit has a flip-up hopper, be sure hopper is in the lowered position. Failure to do so may result in damage to the Mixer body or truck, and may result in serious personal injury of death.

⚠ DANGER

Never back up without taking every precaution to be sure the rear is clear. Check behind truck before backing up. Watch mirrors for activity. Never back up the Mixer unless and until you are completely sure it is safe. Use a spotter/observer and/or get out and check yourself to ensure it is safe to do so.

⚠ WARNING

The operator and anyone working in the area of the Mixer should understand the meaning of all audible alarms and warning lights.

Failure to comply may result in serious injury or death.

⚠ WARNING

Thoroughly understand the controls before operating the Mixer. Be sure everyone is clear of the area around the truck before operating the Mixer. Remain attentive at all times when operating the controls.

⚠ WARNING

No passenger is allowed in the cab unless a manufacturer's approved passenger seat and seat belt are provided. Serious injury or death can result.

⚠ WARNING

The Mixer and the chassis must not be overloaded. Gross Vehicle Weights must not exceed the Manufacturer's gross vehicle weight of this vehicle. Gross Vehicle Weights must meet Federal, State, and Local laws.

⚠ WARNING

Never drive the truck with the water tank pressurized.

Serious personal injury or death may occur.

⚠ WARNING

Use slower speeds when going around curves or corners. You are carrying a high center of gravity load.

⚠ WARNING

At the job site, use the lowest transmission gear and proceed at low speed, 3 mph (4.8 km/h) maximum, to the discharge area.

⚠ WARNING

Optional air chute lock is intended for use only on the job site. The manual chute lock should always be engaged during transport. Excessive wear or injury may result due to improper useage.

2.3 Outside Operation

⚠ WARNING

IMPORTANT ALUMINUM AND STEEL WATER TANK INFORMATION.

1. Inspect water tank on a daily basis for any damage including, but not limited to, dents, gouges in metal, or leaks.
2. Do not weld on or repair water tank. Instead, replace water tank with a new OEM water tank.
3. Never pressure test an empty water tank. Only pressure test a full water tank.
4. Never remove pressure regulator or pressure safety valve from tank.

• If regulator or safety valve is defective, it must be replaced before Mixer is put into service.

5. Do not pressurize water tank beyond its working pressure.

• If pressure exceeds the working pressure, immediately depressurize water tank and replace pressure regulator and pressure safety valve.

6. Never drive the truck with the water tank pressurized.

   Depressurize water tank prior to transit to or from work site.

   Water tank should be pressurized only when being used.
7. Never modify water tank in any way.
8. Immediately replace safety decals with London Machinery, Inc. decals if decals are missing or difficult to read.
9. Refer to the London Machinery, Inc. Operator's Manual or contact London Machinery, Inc. at 800-265-1098 if you have questions or require assistance.

⚠ WARNING

NEVER drink the water from the water tank. The water tank may contain residue from chemicals used to modify concrete proporties. Drinking the water from a tank may cause serious internal injury or death.

⚠ WARNING

Never pressurize water tank in excess of 55 psi (380 kPa). If pressure exceeds 55 psi (380 kPa), depressurize the water tank immediately and adjust or replace the air regulator valve.

Serious personal injury or death may occur.

⚠ WARNING

Never pressurize an empty water tank.

Serious personal injury or death may occur.

⚠ WARNING

The tank must be operated at no more than 55 psi (380 kPa).

⚠ WARNING

Use the three-point contact method (either two hands and one foot, or two feet and one hand on the ladder at all times) when climbing the ladder. Always face the ladder when climbing up or down. Serious personal injury may result due to a fall.

⚠ WARNING

Do not climb on ladders or ride on platforms while the truck is in motion or when ladders or platforms are wet and slippery. Serious personal injury may result due to a fall.

⚠ WARNING

Do not cross or stand behind vehicle while it is backing up.

Failure to heed these instructions/warnings may result in serious personal injury or death.

⚠ WARNING

Do not wear watches, rings, and jewelry while working with electrical and mechanical equipment. These items can be hazardous and can cause serious and painful injuries if they come into contact with electrical wires, moving parts, or hydraulic equipment.

⚠ WARNING

Always keep hands and feet clear of the Mixer drum, revolving parts, and moving parts while checking load and washing down the Mixer.

⚠ WARNING

Always keep clear of pinch and crush points.

Failure to heed these instructions/warnings may result in serious personal injury or death.

⚠ WARNING

The Mixer must not be overloaded. Load pressures must match the load to be transported.

⚠ WARNING

All personnel must stand clear of the chutes during raising and lowering, and when chutes are loaded with concrete. Position chutes while they are not loaded. A loaded chute falling on a person may cause serious injury. All chutes must be handled with great care to avoid injury. Do not stand on the chutes.

⚠ WARNING

Do not let persons, other than the driver, handle the chutes, unfold the foldover, and/or remove extension, or stow and secure the extensions for transit. Keep hands away from chute hardware where the chutes connect. Never stand in the path of the chute as it is being unfolded or while in use. Failure to follow the warnings concerning chute safety may result in serious injury.

⚠ WARNING

Wear proper protective equipment when operating or maintaining the Mixer. Hard hats, safety glasses, gloves, and safety shoes should be worn.

Reflective clothing is recommended for drivers and employees.

Failure to wear proper protective equipment can result in serious personal injury or death.

⚠ CAUTION

Do not use the water tank as a step.

Using the water tank as a step may result in personal injury or damage to equipment.

⚠ CAUTION

Do not use more chute extensions than are specified for your Mixer. Never exceed three chute extensions.

Do not use any other type or style of chute extension, other than ones designed for use with your Mixer.

Using additional chute extensions, or the improper type of chute extension, may result in personal injury or damage to equipment.

2.4 Maintennce

DANGER

LOCKOUT/TAGOUT procedures must be followed when working on this equipment including, but not limited to, cylinders being changed or maintained. Failure to heed these instructions/warnings can result in serious personal injury or death.

DANGER

Do not attempt to use extraneous sources of power or extraneous machines to overcome a malfunctioning system. Contact London Machinery, Inc. if you are unsure how to proceed.

Do not override with overhead cranes, forklifts, jacks, etc., or jury-rig systems or equipment that may be malfunctioning.

Failure to heed the foregoing instructions/ warnings can result in serious personal injury or death.

DANGER

Auxiliary pusher or tag axles must be supported with jack stands, blocks, or similar devices while being serviced or maintained to prevent serious personal injury or death if auxiliary axle drops unexpectedly. Failure to do so may result in serious personal injury or death.

WARNING

Never enter under the chassis unless the Mixer is in the LOCKOUT mode. Remember to follow the LOCKOUT procedures when working under the truck.

Failure to heed may result in serious personal injury or death.

WARNING

When working on the Mixer, the wheels must be blocked, the parking brake on, LOCKOUT procedure in effect, and the keys out of the truck's ignition.

Failure to heed may result in serious personal injury or death.

WARNING

Daily inspection should be performed on the Mixer. This includes proper operation of the controls, hydraulics, lock-out systems, electrical systems, and lighting system, including turn signals, back-up alarm, brake lights, clearance lights, head lamps, tail lamps, safety equipment, and work lights. The truck's air system must operate properly and have no leaks. Water and moisture should be drained from the truck's air system daily.

Failure to heed may result in serious personal injury or death.

⚠ WARNING

The Mixer must not be modified in any way without authorization from London Machinery, Inc. Modifications may not comply with safety standards, including ANSI safety standards, and may result in serious personal injury.

⚠ WARNING

Exceeding axle gross weight will result in premature brake wear and reduced brake performance. Inspect and adjust chassis brake as per the chassis manufacturer's recommendations. Failure to inspect and adjust brakes may result in serious personal injury or death.

⚠ WARNING

Main, foldover, and extension chutes must be inspected on a daily basis for damage, excessive wear, proper hardware fit, twist, and overall condition to determine that they are safe to use. Unsafe chutes must be replaced with new chutes.

⚠ WARNING

Always check indicator lights in the cab or at the control panel for chute position. Replace lights or bulbs when required. NOTE: All models may not have indicator lights. Physically check position when indicator lights are absent.

Failure to heed may result in serious personal injury or death.

⚠ WARNING

Do not repair or weld on steel or aluminum water tanks. Inspect the water tank for rust and corrosion every 30 days. Inspect the water tank under the straps, on the exterior and interior by removing the flopper. If any rust or corrosion is found, replace the water tank with an OEM water tank from London Machinery, Inc. Contact London Machinery, Inc. with questions. Failure to maintain water tanks may result in serious personal injury or death.

2.5 Hydraulics

⚠ WARNING

Hydraulic hoses and tubing must be inspected on a daily basis for leaks, cuts, abrasions, damage, aging, improper clearance, and along the frame for hidden damage. If you find hoses with any such adverse conditions or damage, they must be replaced before the Mixer is returned to service! All hydraulic hoses must be replaced every five years. Failure to properly inspect and maintain your Mixer may result in serious personal injury or death.

⚠ WARNING

Inspect the hydraulic reservoir on a daily basis for leaks, cracks, damage, or improper clearance. If you find any such adverse conditions or damage, it must be repaired before the Mixer is returned to service! Failure to properly inspect and maintain your Mixer may result in serious personal injury or death.

⚠ WARNING

Never operate the hydraulic system if a leak is present. Operating the Mixer with a hydraulic system leak may result in serious personal injury or death.

⚠ WARNING

Hydraulic systems are hot. DO NOT TOUCH! Serious personal injury or death may result from hot oil. When you have completed working on the hydraulic systems, thoroughly clean any spilled oil from the equipment. Do not spill any hydraulic fluid on the ground. Clean any hydraulic fluid from your skin as soon as you have completed your maintenance and repairs. Dispose of used oil and filters as required by law.

⚠ WARNING

Hydraulic systems operate under high pressure. Only qualified, experienced people properly trained in hydraulic system maintenance should attempt repairs or troubleshoot hydraulic systems. Use the proper tools and equipment when servicing the hydraulic system. Failure to comply can cause serious injury. Please contact London Machinery, Inc. at 800-265-1098 if you require assistance.

⚠ WARNING

Correct hoses, fittings, and adapters with the correct SAE rating must be used when replacing hoses to prevent possible serious injury. Always replace hoses, fittings, and adapters with replacements that have a proper, suitable working pressure rating. Replacement hoses must be of correct length and must comply with the hose manufacturer's installation guidelines and recommendations. Hydraulic hoses have the SAE ratings marked on the hose to assist you in selecting the correct hose. Any replacement hydraulic hoses and fittings assemblies must be supplied by the same manufacturer. As an example: Brand "A" hose and brand "B" fitting will not normally be compatible. No "twist" is allowed in the hydraulic hoses. "Twist" may result in premature hose failure.

⚠ WARNING

Any hydraulic tubing which is replaced must conform to SAE J1065 specifications. If incorrect hydraulic tubing is installed, the hydraulic system may fail, causing serious injury. Damaged or leaking tubing must be replaced before the Mixer is returned to service. For best results, always use genuine London Machinery, Inc. replacement parts.

⚠ WARNING

Do not heat hydraulic tubing. The carbon content of this steel tube is such that if heated for bending, and either water or air is quenched, the tubing may lose its ductility and thereby be subject to failure under high pressure or hydraulic shock conditions. Serious injury can result. Damaged or leaking tubing must be replaced before the Mixer is returned to service. Please contact London Machinery, Inc. (800) 265-1098 if you require assistance or have questions.

⚠ WARNING

Hydraulic components can be heavy. Use caution while lifting these components. Serious personal injury can be avoided with proper handling of the components.

⚠ WARNING

Use the proper tools and equipment when servicing the hydraulic system. Use only the London Machinery, Inc. charging kit when recharging the accumulator.

⚠ WARNING

Never remove hydraulic pipes/tubing, fittings, and adapters until all pressure has been relieved from the hydraulic system.

⚠ WARNING

All hydraulic pressures must be relieved from the hydraulic system prior to removing any components from the system to prevent oil from spraying or functions and systems from failing.

⚠ WARNING

When performing hydraulic test procedures, use the proper hydraulic gauges. Installing an incorrect test gauge could result in serious injury or death if the gauge fails. Use properly rated hydraulic hoses with adequate length to allow the test gauge to be used far enough away from moving parts and functions.

⚠ WARNING

Increasing hydraulic pressure beyond the recommendations may result in serious damage to the Mixer or serious personal injury. If you have questions concerning hydraulic pressures or testing procedures, please contact London Machinery, Inc. at (800) 265-1098 before attempting the test procedures or making adjustments.

⚠ WARNING

When using the emergency jumper procedure to rotate the drum on a disabled Mixer, the following must be observed: Before removing the hydraulic motor or hoses from the Mixer drive on both the operating and disabled Mixer, be sure the drum has been allowed to turn freely so that it is balanced with no forces transmitted to the hydraulic motor.

2.6 Electrical

⚠ WARNING

Electrical wiring, battery wiring, and electrical cable must be inspected on a daily basis for cuts, abrasions, damage, aging, improper clearance, and along the frame for hidden damage.
If you find electrical wiring or electrical cable with any such adverse conditions or damage, it must be replaced with electrical wiring or cable of equivalent specifications before the Mixer is returned to service! Failure to properly inspect and maintain your Mixer may result in a serious personal injury. Contact London Machinery, Inc. if in need of further information.

2.7 Revolution® Drum

⚠ CAUTION

Do not rotate the Revolution® drum with dry aggregate for more than 15 minutes.

⚠ CAUTION

Do not expose any part of the Revolution® drum to open flame or temperatures exceeding 220° F (104° C).

2.8 Chute Extensions

⚠ DANGER

Do not repair metal or composite chute extensions.
Serious personal injury or death could occur.

⚠ DANGER

Do not over-load chute extensions.
Maximum load capacity of 400 lbs. (181 kg) per chute extension.

⚠ DANGER

Composite chute extensions are flammable.
Do not expose to an open flame or a temperature exceeding 220ºF (104ºC).
Burning chute extensions produce toxic smoke/fumes during combustion.
Serious personal injury or death could occur.

⚠ DANGER

Inspect chute extensions prior to each use.
Never use a damaged chute extension or a chute extension that has been driven over.
Replace damaged chute extensions immediately.

⚠ DANGER

Never stand on a chute or chute extensions.
Do not use the chute as a crane to pull or transport objects.

⚠ CAUTION

Do not use more than three chute extensions.
Do not combine the use of metal and composite chute extensions during operational use.
Failure to comply could cause damage to the equipment.

⚠ CAUTION

Never clean chute extensions by striking or chiseling. Failure to comply could cause damage to the equipment.

⚠ CAUTION

Chute extensions must be secured on the truck before leaving the job site. Failure to comply may result in damage to the equipment.

3.0 Safety Decals

The following safety decals are found on your concrete Mixer. They warn of hazards related to the use of this equipment. Read and understand all safety decals before operating this equipment. All safety decals should be present and clearly readable at all times. If any safety decals on the equipment are not clearly readable, contact London Machinery, Inc. parts and service at 800-265-1098 for replacements at no charge. Use only London Machinery, Inc. replacement decals.

NOTE

Depending on the Mixer configuration and optional equipment, the actual location of decals and/or placards may vary slightly from the examples shown.

See the Figures in this section for decal identification of each safety decal.

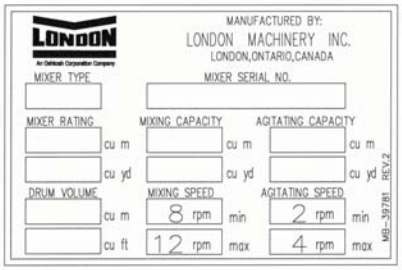
NOTE

Specifications, appearance, and part numbers for safety decals are subject to change without notice.

3.1 Product Safety Information

Mixer Serial Number Plate

The mixer serial number plate lists the serial number of the mixer unit and other pertinent details of type and size. It includes mixing and agitating capacities and speeds. If it becomes necessary to communicate with London Machinery Inc. about your unit, always specify the serial number. The serial number plate is located on the front pedestal on the driver's side of the vehicle.



TMMB Rating Plate

As a member of the National Ready Mixed Concrete Association (NRMCA) and the Truck Mixer Manufacturers Bureau (TMMB), we affix to our units the TMMB Mixer Rating Plate displaying that your unit complies with the Truck Mixers standards, for Type and Size, of the concrete mixing industry. The unit is registered as complying to these standards with the NRMCA and the plate shows that registration number. The plate is displayed with the Mixer Serial Plate on the front pedestal.

Paver Name Plate

The paver name plate is affixed only to those units designed and designated as a Paver type mixing unit. It is displayed to conform to regulations in various states that stipulate Paver units must have a name plate designating that fact. The paver name plate can be located with the serial plate and the TMMB ratings plate.

Motor Vehicle Safety Standard Plate

Vehicle running gear safety standard rating for axle weights, tire and rim sizes with applicable pressure tables. These are adhesive backed labels affixed to the corner panel inside the cab.

U.S Federal Motor Vehicle Safety Standard Type.

MANUFACTURED BY: LONDON MACHINERY INC DATE:
INC. VEH. MFD. BY: DATE:
GVWR LB.
GAWR 1ST LB. TIRES: RIM: CIP: PSI.
GAWR 2ND LB. TIRES: RIM: CIP: PSI.
GAWR 3RD LB. TIRES: RIM: CIP: PSI.
GAWR 4TH LB. TIRES: RIM: CIP: PSI.
GAWR 5TH LB. TIRES: RIM: CIP: PSI.
GAWR 6TH LB. TIRES: RIM: CIP: PSI.
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
VIN TYPE VEHICLE: TRUCK

Canada Motor Vehicle Safety Standards Type

MANUFACTURED BY: / FABRIQUE PAR: LONDON MACHINERY INC.
TYPE:TRU / CAM V.I.N. / N.I.V.: 3ALPG3DV2DDFJ6981
GVWR / PNBV: 34015 KG. DATE: MAR 2013

GAWR/PNBE KG	TIRES / PNEU	RIM / JANTE	COLD INFL. PRESS PRESS DE GONFL.A FROID PSI / LPC KPA
FR/AV 8500	385/65R22.5(J)	22.5X12.2	827 KPA. 120 PSI.
INT 8505	11R22.5(H)	22.5X8.25	827 KPA. 120 PSI.
INT 8505	11R22.5(H)	22.5X8.25	827 KPA. 120 PSI.
INT			KPA. PSI.
INT			KPA. PSI.
RR/AR 8505	11R22.5(H)	22.5X8.25	827 KPA. 120 PSI.

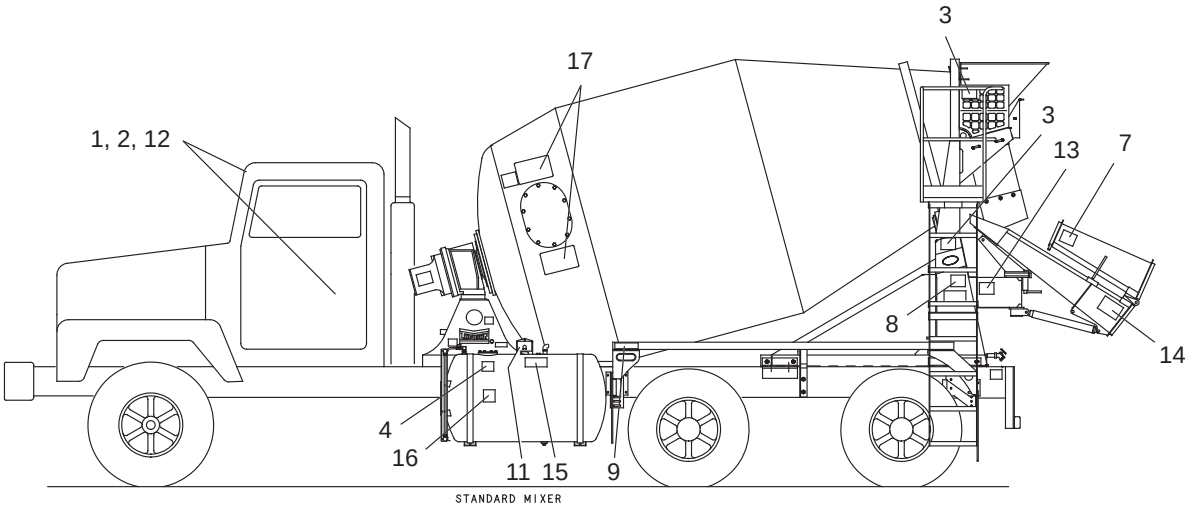
CANADA 748 CMVSS TRANSPORT

MA-38568

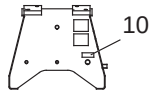
3.2 Safety Decals

As stated earlier in this manual the TRANSIT MIXER has been specially designed to be as safe a functioning concrete mixer as was possible. In addition to designing safety into the machine itself we have also designed safety signs, in the form of adhesive-backed decals, to caution the operator to be aware of areas and/or situations where he might encounter possible hazards to his person and/or the vehicle.

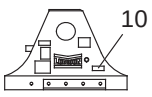
The following pages illustrate and describe the various decals attached to the vehicle.



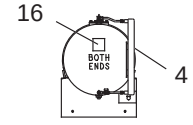
STANDARD MIXER



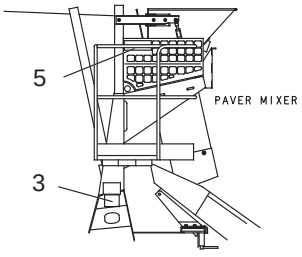
VIEWED FROM FRONT OF PEDESTAL



VIEWED FROM DR.SIDE



WATER TANK DECAL LOCATION FOR CROSS FRAME TANKS ONLY



1

DANGER

Avoid turnover. You are hauling a high center of gravity fluid load. Failure to do so can result in serious personal injury or death.

2

WARNING

A warning against loading mixer to exceed the GVWR or GAWR as listed on the Motor Vehicle Safety Standards plate. Such overloading could result in serious personal injury to the operator as well as serious damage to the equipment due to a possible roll-over of the vehicle.

3

WARNING

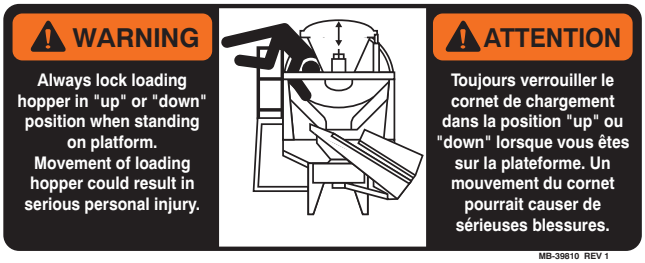
A warning to never place any part of the body, clothing or tools within the mixer body, or any part of the mixer, while it is in motion. Such actions could result in serious personal injury such as the loss of limb or limbs or even loss of life.

4

WARNING

A warning against drinking the water carried by the vehicle for cleaning the vehicle and flushing out the mixer. The accumulation of substances onto the equipment and into the water may result in serious internal injuries if warning is not heeded.

5



⚠ WARNING

A warning to always lock loading hopper in UP or DOWN position when standing on platform. Movement of loading hopper could result in serious personal injury.

6

⚠ WARNING

Keep hands away from cylinders and other moving parts. Failure to comply could injure or kill.

7

⚠ CAUTION

To exceed the design capacity of the unit by adding more chutes than three, or attempting to affix styles of chutes different than those supplied by London Machinery could result in serious personal injury and may also cause damage to the machine.

8

⚠ CAUTION

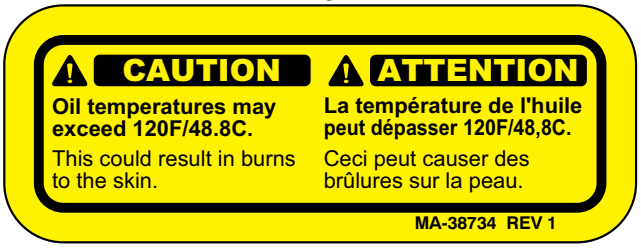
Falls and personal injuries could result if care is not exercised when using the ladder or the platform. Many situations can cause the ladder and platform to become slippery.

9

⚠ CAUTION

Loose clothing, body parts and tools near a rotating drum can become a personal injury hazard. Keep clear of a rotating drum.

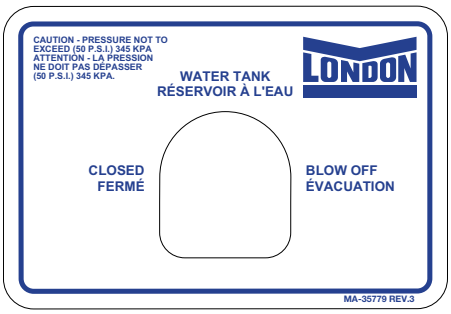
10



⚠ CAUTION

Hydraulic oil at operating temperature could exceed 120° F (48.8° C). Serious burns to the operator could result unless care is exercised.

11



⚠ CAUTION

Water tank operating pressure is 50 PSI (345 KPA). Never exceed 55 PSI (380 KPA).

12

SAFETY NOTICE

Emphasis to the operator of the importance of knowing his equipment through study of the Operator's Manual.

13

SAFETY NOTICE

FRESH CONCRETE
Can cause burns and eye injury!
- **Avoid skin contact**
- **Wear protective clothing**
- **Wash exposed skin with water**

If concrete gets into eyes, rinse immediately with water and obtain prompt medical attention.
KEEP CHILDREN AWAY FROM FRESH CONCRETE.

AVIS DE SÉCURITÉ

BÉTON FRAIS
Peut causer des brûlures ou des lésions aux yeux!
- **Éviter tout contact avec la peau.**
- **Porter des vêtements de protection.**
- **Laver à l'eau la peau exposée au béton.**

Si le béton entre en contact avec les yeux, rincer à l'eau et immédiatement recourir à des soins médicaux.
ÉLOIGNER LES ENFANTS DU BÉTON FRAIS.

MA-38730 REV 1

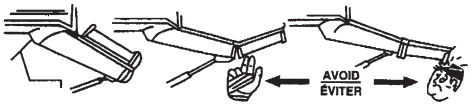
SAFETY NOTICE

Emphasis on the dangers associated with fresh concrete and advising of preventative measures.

14

CAUTION

KEEP HANDS AND BODY AWAY FROM PIVOT POINTS



ATTENTION

ÉLOIGNER LES MAINS ET LE CORPS DES POINTS DE PIVOT

15

WARNING

Burst hazard.

Regulator maintains proper pressure.

Never tamper with or remove pressure regulator or relief valve.

Never pressure test without tank full of water.

Bursting tank may injure or kill.

AVERTISSEMENT

Risque d'éclatement.

Le régulateur maintient le pression correcte.

Ne jamais altérer ou retirer le régulateur de pression ou la soupape de décharge.

Ne jamais tester la pression à moins que le réservoir ne soit rempli d'eau.

L'éclatement du réservoir peut blesser ou tuer.

Do not paint over this label. Replace if damaged or lost.
Ne pas peindre sur cette étiquette. Remplacer si endommagé ou égaré.

1459867

16

WARNING

Burst hazard.

Inspect tank daily for damage or leaks.

Replace (do not repair) damaged or leaking tank.

Drain pressure before driving.

Do not weld or repair tank.

Never exceed 55 psi (379 kPa) in tank.

Bursting tank may injure or kill.

AVERTISSEMENT

Risque d'éclatement.

Inspecter le réservoir quotidiennement pour décleler les dommages ou les fuites.

Remplacer (ne pas réparer) un réservoir endommagé ou qui fuit.

Ne pas souder ou réparer le réservoir.

Ne jamais excéder 379 kPa (55 psi) à l'intérieur du réservoir.

L'éclatement du réservoir peut blesser ou tuer.

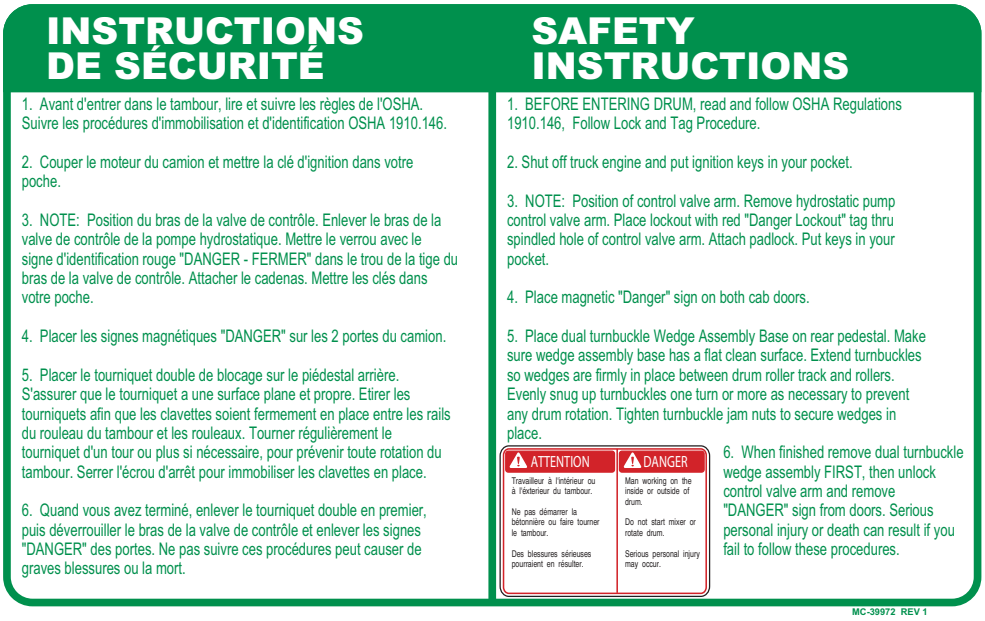
Do not paint over this label. Replace if damaged or lost.
Ne pas peindre sur cette étiquette. Remplacer si endommagé ou égaré.

1459871

Additional Safety Decals

Safety Instructions - Drum Entry through Hatch.
Two decals at each drum hatch.

17



INSTRUCTIONS DE SÉCURITÉ

1. Avant d'entrer dans le tambour, lire et suivre les règles de l'OSHA. Suivre les procédures d'immobilisation et d'identification OSHA 1910.146.

2. Couper le moteur du camion et mettre la clé d'ignition dans votre poche.

3. NOTE: Position du bras de la valve de contrôle. Enlever le bras de la valve de contrôle de la pompe hydrostatique. Mettre le verrou avec le signe d'identification rouge "DANGER - FERMER" dans le trou de la tige du bras de la valve de contrôle. Attacher le cadenas. Mettre les clés dans votre poche.

4. Placer les signes magnétiques "DANGER" sur les 2 portes du camion.

5. Placer le tourniquet double de blocage sur le piédestal arrière. S'assurer que le tourniquet a une surface plane et propre. Etirer les tourniquets afin que les clavettes soient fermement en place entre les rails du rouleau du tambour et les rouleaux. Tourner régulièrement le tourniquet d'un tour ou plus si nécessaire, pour prévenir toute rotation du tambour. Serrer l'écrou d'arrêt pour immobiliser les clavettes en place.

6. Quand vous avez terminé, enlever le tourniquet double en premier, puis déverrouiller le bras de la valve de contrôle et enlever les signes "DANGER" des portes. Ne pas suivre ces procédures peut causer de graves blessures ou la mort.

SAFETY INSTRUCTIONS

1. BEFORE ENTERING DRUM, read and follow OSHA Regulations 1910.146, Follow Lock and Tag Procedure.

2. Shut off truck engine and put ignition keys in your pocket.

3. NOTE: Position of control valve arm. Remove hydrostatic pump control valve arm. Place lockout with red "Danger Lockout" tag thru spindled hole of control valve arm. Attach padlock. Put keys in your pocket.

4. Place magnetic "Danger" sign on both cab doors.

5. Place dual turnbuckle Wedge Assembly Base on rear pedestal. Make sure wedge assembly base has a flat clean surface. Extend turnbuckles so wedges are firmly in place between drum roller track and rollers. Evenly snug up turnbuckles one turn or more as necessary to prevent any drum rotation. Tighten turnbuckle jam nuts to secure wedges in place.

6. When finished remove dual turnbuckle wedge assembly FIRST, then unlock control valve arm and remove "DANGER" sign from doors. Serious personal injury or death can result if you fail to follow these procedures.

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3.3 General Safety Instructions

1. Read these rules and instructions carefully. Failure to follow them could cause serious bodily injury and/or damage to the equipment.
2. Be aware the hydraulic oil, gearbox, hoses, and the pump system may become hot enough to burn and cause physical injury.
3. Always test the temperature of the oil and system components by momentarily touching a hose or the gearbox mounting before doing any work or adjustment on the machine. NEVER unscrew a fitting or open a hydraulic line while the oil system is hot. A spray of hot oil can cause serious injury.
4. Relieve hydraulic oil pressure within the system slowly and with great care as a spray of hot oil may cause a severe burn or blindness.
5. Before releasing hydraulic pressure within the system, make sure the drum is not in an unbalanced condition due to concrete buildup. Such a condition might cause the drum to rotate when pressure is released or the hydraulic motor is disengaged thereby causing serious injury.
6. Make sure the drum and gearbox are properly supported and immobilized against movement before loosening or removing the attaching bolts. Serious injury may occur.

3.2.1 Mixer Drum Lockout Procedure

1. Before entering drum, read and follow OSHA regulations concerning entry and working in confined space, OSHA 1910.146. Also refer to the regulations of your employer and/or the authority having jurisdiction in your locality regarding this subject.
2. Notify your supervisor and other affected person(s) that the mixer is going to be locked out and that no attempt should be made to restart it.
3. Park the truck in an appropriate area and set the brakes. Position the drum hatch where convenient for service and maintenance. Set the drum control in the neutral position so the drum remains stationary.
4. Shut off the truck engine and remove ignition key. Roll up cab windows, lock the cab doors and place the truck keys in your pocket. Chock the truck wheels.
5. Place a Danger sign on both cab doors. “Man working on the inside or outside of drum. Do not start mixer or rotate drum. Serious personal injury may occur.” See Figure 1.
6. Note position of the mixer pump control valve arm. See Figure 2. Remove the nut and lockwasher on the control valve arm. Remove the control valve arm and place a Safety Lockout through the splined hole. Lock the Safety Lockout with a padlock along with a “Danger Lockout Procedure in Affect” tag. Place the padlock key in your pocket. Each person who is working on or in the drum must place their own lock on the Safety Lockout and pocket their own key.
7. Place “Lock-Out Bracket” around drum roller and drum track. Refer to Figure 3. Tighten threaded rods so wedges are firmly in place between drum roller track and roller. Evenly, snug up threaded rod one turn or more as necessary to prevent possible drum rotation.
8. Open the hatch and place a suitable ventilating fan at the charge hopper end of the drum. Assemble personal protective equipment; hard-hat, respirator, goggles, hearing protection, safety shoes, coveralls, gloves and other safety equipment as necessary.
9. Assembly tools, equipment and supplies as necessary to complete the job.
10. If drum must be repositioned, and lockout condition interrupted, check for other employees and clear the area, energize the vehicle, rotate the drum and go back to Step 4.

11. At completion of job inspect the drum, remove tools and supplies and check for other employees.
12. Remove the Lock-out Bracket securing the drum.
13. Remove padlocks and Safety Lockout and reconnect the mixer pump control valve arm. Remove the cab door danger signs.
14. Notify your supervisor and other affected person(s) that the job is completed and the vehicle is returned to normal status.

3.2.2 Use and Control of Padlocks

1. Locks made by a reputable manufacturer should be used to preclude the possibility of having inferior locks which may be tampered with or opened by other keys.
2. Combination type locks or locks with a master key or duplicate keys are not recommended. If duplicate keys are obtained they must be kept in a locked repository away from the normal “Safety Lock Control” center. They must be under the direct control of a responsible person and used only by him in an emergency. At least two people should be responsible for using a duplicate key.
3. Locks should be checked when purchased to ensure that no two or more locks can be opened by the same key.
4. Each workman should have a personal lock with his name or clock number stamped on it. If this is not practical, a simple and economical method of control for the issue of locks is suggested as follows:

a. The locks should be serially numbered by stamping and kept on a “Safety Lock Control Board” against a matching set of serial numbers. control lever on the control valve is moved to the opposite side of neutral.

b. The locks should be under the control of a responsible person, e.g. safety officer, tool room attendant, etc. who has the facilities to maintain a log or register of locks used, dates of issue and return and name of workman, foreman or person in charge to whom the locks have been issued. Locks should not be loaned or transferred between workmen. They must be returned and re-issued from the “Safety Lock Control” center.

c. The workmen should carry their own supply of durable tags bearing their name and department. These tags should be attached to their lock for identification.

4. It is recommended that a supply of “Personal Safety Padlock Instructions” be kept at the “Safety Control Board” and issued to each workman that does not already have one, each time a lock is issued.

3.2.3 Personal Safety Padlock Instructions

1. Your safety padlock is for your PERSONAL SAFETY and is to be used ONLY for locking-out mixer controls. If loaned from your employer it must be returned to the Safety Lock Control Board at the end of the job.
2. When starting to work on mixer drum, read and follow the “Mixer Drum Lockout Procedure”. This procedure explains how to apply your safety padlock before entering the drum.
3. There is no master key and only one regular key for your lock. It is therefore impossible for any other workman to unlock your padlock.
4. When more than one individual is working on a mixer drum each man shall use his own personal padlock to lock the mixer pump control lever. Therefore, the mixer cannot be restarted until the last man has completed his work.
5. The breaking of a padlock on a Safety Lockout without authority might very easily be an act responsible for the death or serious injury of one or more workmen.

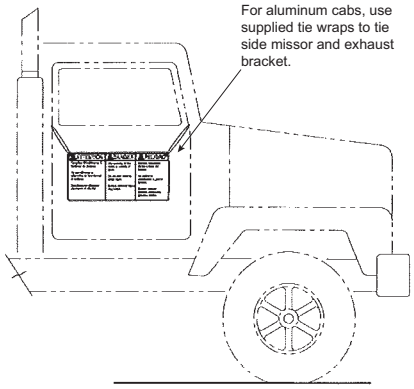


Figure 1

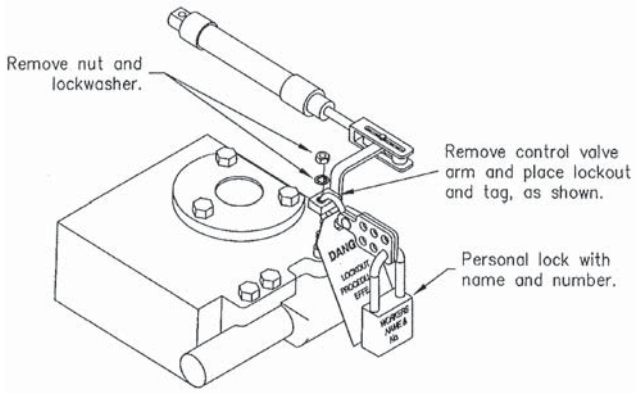
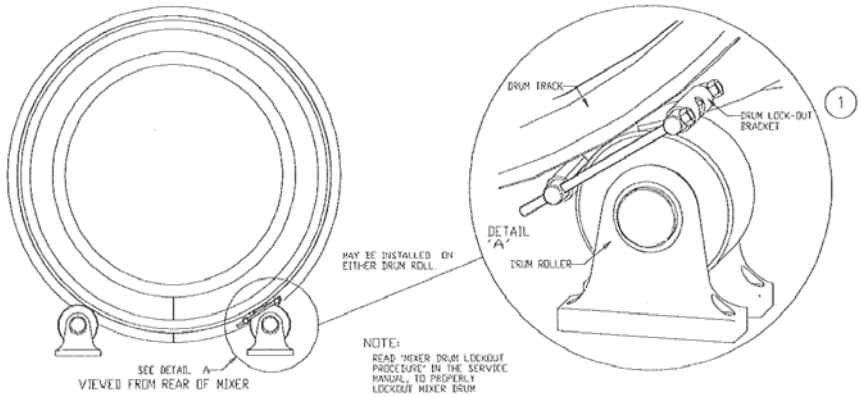
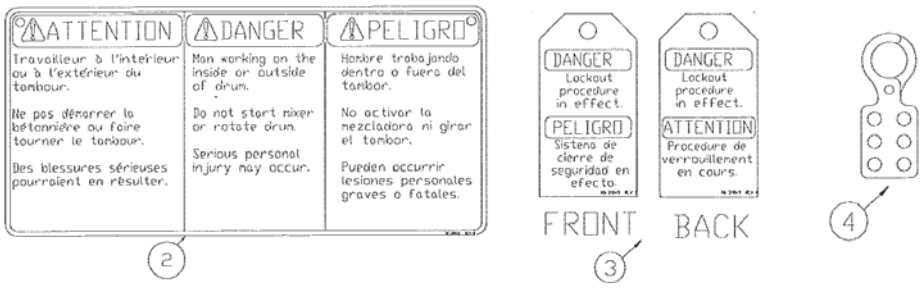


Figure 2





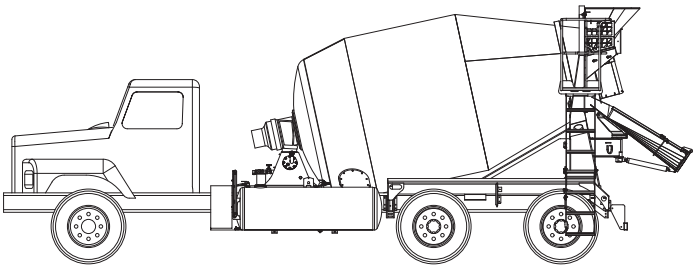
ITEM	DESCRIPTION	QTY	PART No.
1	LOCK-OUT BRACKET	1	MB-40690
2	LABEL, MAGNETIC, DANGER	1	MC-39848
3	TAG, LOCK-OUT	1	MB-39849
4	LOCK-OUT HASP	1	HH-01267-000

Figure 3

4.0 Restoring Equipment to Normal Production Operations

1. After the servicing and/or maintenance is complete and the vehicle is ready for normal operations, check the area around the vehicle to ensure that no one is exposed.
2. After all tools have been removed from the vehicle, guards have been reinstalled and employees are in the clear, the employee who applied the LOCKOUT/TAGOUT device(s) will remove it.
3. Notify all affected employees that the vehicle is being put in operation. Operate the energy-isolating devices to restore energy to the vehicle.

If you have questions on Lockout or Tagout procedures or Confined Space procedures, please contact London Machinery Inc. at (800) 265-1098.



Installation

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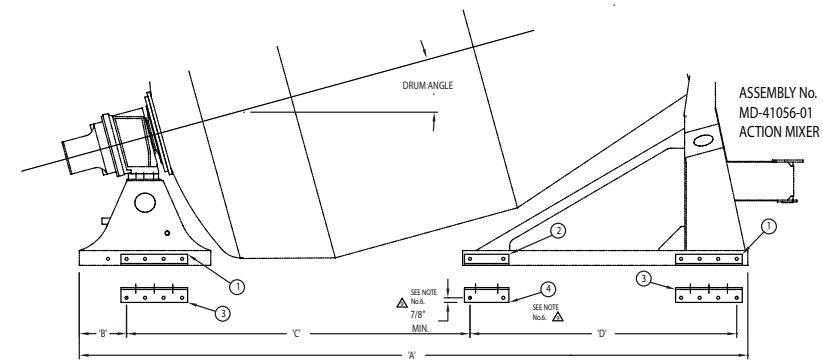
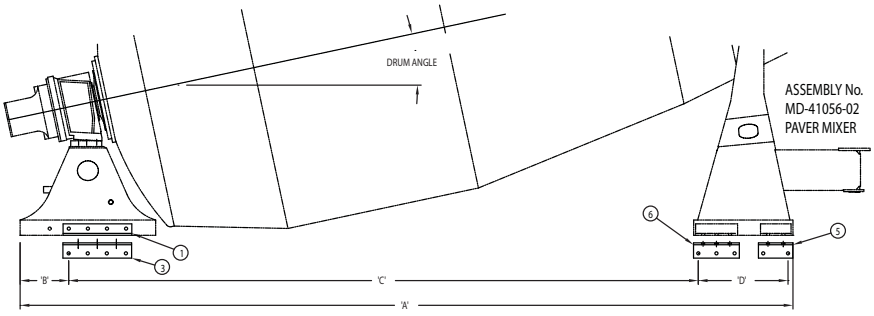
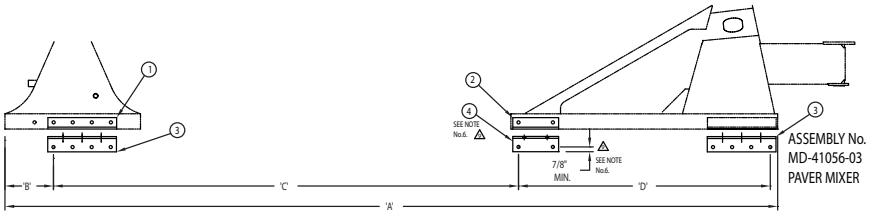
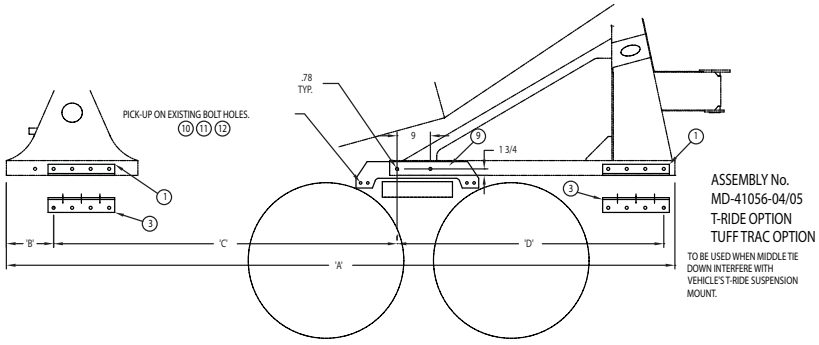
1.0 Mixer Mounting

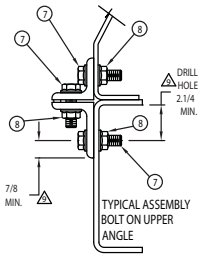
MD-41056

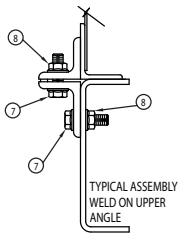


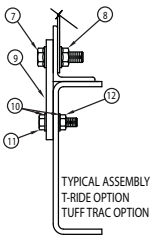












FRAME DRILLING SPECIFICATIONS

-Use existing holes whenever possible.
-Do not drill holes in frame rail flange.
-Drill holes only in frame rail web. A minimum distance of 2-1/4" from inside of frame rail flange to hole center.
-Space new holes in frame rail web section at 2" minimum apart center to center.
-No more than 4 holes should exist on the same vertical line of the frame rail web.
-Hardened flat washer or flanged head nuts and bolts must be used on both sides.
-Holes should be drilled or reamed out and diameter should not be more than 1/32" oversized.
-No fasteners to exceed 3/4" in diameter.

NOTE:

1. LOCATE LOWER MOUNTING ANGLE ON TRUCK FRAME AND DRILL TO SUIT. PICK-UP ON ANY EXISTING BOLT HOLES WHERE POSSIBLE.

2. USE 3/4 UNF GRADE 8 PLATED FLANGE HEAD BOLTS ONLY. UNLESS OTHERWISE SPECIFIED.

3. TORQUE: 3/4 BOLTS TO 430 FT-LBS.
5/8 BOLTS TO 240 FT-LBS.

4. HIGH OV.HEAD. WATER TANK INSTALLATION, MC-41456, SUPPORTED TIE DOWN, MUST BE USED.

5. TIE DOWN ANGLES THAT DO NOT MEET MINIMUM INSIDE RADIUS SPEC. MUST HAVE GUSSETS WELDED ON. SEE TIE DOWN DRAWINGS FOR DETAIL.

6. OPTIONAL TIE DOWN TO BE USED WHEN MIN. ALLOWABLE DIM. CAN NOT BE ACHIEVED.

7. ALL INTERNATIONAL TRUCKS, MUST USE OPTIONAL BASE MOUNTED TIE DOWN.

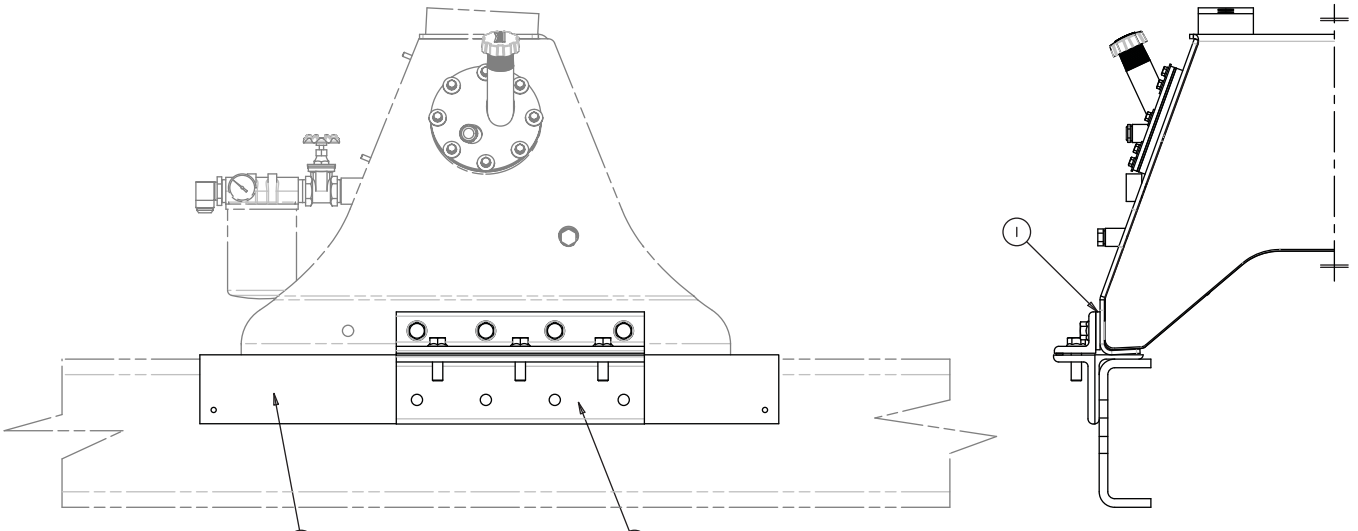
ASSEMBLY NUMBER	MODEL	MIXER CAPACITY CU.YD.	MIXER CAPACITY CU.M.	DRIVE	DRUM ANGLE	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'	QTY. ITEM1	QTY. ITEM2	QTY. ITEM3	QTY. ITEM4	QTY. ITEM5	QTY. ITEM6	QTY. ITEM7	QTY. ITEM8	QTY. ITEM9	QTY. ITEM10	QTY. ITEM11	QTY. ITEM12
MD-41056-01	ACTION		4.0	ZF	15 DEG.					4	2	4	2	-	-	56	56	-	-	-	-
		8.5	6.0	ZF	15 DEG.	167.5/8	12.3/4	80.1/4	71.1/2△	4	2	4	2	-	-	56	56	-	-	-	-
		9.0	6.5	ZF	15 DEG.	173.7/8	12.3/4	86.1/2	71.1/2△	4	2	4	2	-	-	56	56	-	-	-	-
		9.5	7.0	ZF	15 DEG.	181	12.3/4	92.3/4	71.1/2△	4	2	4	2	-	-	56	56	-	-	-	-
		10.5	8.0	ZF	15 DEG.	193.5/8	12.3/4	105.3/8	71.1/2△	4	2	4	2	-	-	56	56	-	-	-	-
		11.5	8.5	ZF	15 DEG.	207.1/4	12.3/4	117.7/8	74.5/8	4	2	4	2	-	-	56	56	-	-	-	-
		12.0	9.0	ZF	15 DEG.	213	12.3/4	123.5/8	74.5/8	4	2	4	2	-	-	56	56	-	-	-	-
	△16	12.5	9.5	ZF	14.5 deg.	220	12.3/4	130.5/8	74.5/8	4	2	4	2	-	-	56	56	-	-	-	-
		13.0	10.0	ZF	14 DEG.	229	12.3/4	139.5/8	74.5/8	4	2	4	2	-	-	56	56	-	-	-	-
	△	10.5LP	8.0LP	ZF	13.5 DEG.	193.7/16	12.3/4	106.1/16	71.1/2	4	2	4	2	-	-	56	56	-	-	-	-
	△	12.0LP	9.0LP	ZF	13.5 DEG.	212.5/8	12.3/4	124.3/8	71.1/2	4	2	4	2	-	-	56	56	-	-	-	-
		11.5PAV	8.5PAV	ZF	15 DEG.	207.1/4	12.3/4	117.7/8	74.5/8	4	2	4	2	-	-	56	56	-	-	-	-
	COMPOSITE △	11.0HP	8.5HP	ZF	13 DEG.	199.13/16	12.3/4	110.375	72.125	4	2	4	2	-	-	56	56	-	-	-	-
MD-41056-02	PAVER	9.5	7.0	ZF	13 DEG.	189	12.3/4	151.5	23.1/2	2	-	2	-	2	2	42	42	-	-	-	-
		10.5	8.0	ZF	12 DEG.	202.1/2	12.3/4	165	23.1/2	2	-	2	-	2	2	42	42	-	-	-	-
		11.0	8.5	ZF	11.5 DEG.	208.7/8	12.3/4	171.3/8	23.1/2	2	-	2	-	2	2	42	42	-	-	-	-
MD-41056-03	PAVER	10.5 H.P.	8.0 H.P.	ZF	13.5 DEG.	203	12.3/4	△ 120.5/16	68	2	2	4	2	-	-	48	48	-	-	-	-
		12.0	9.0	ZF	12 DEG.	223.5/16	12.3/4	△ 140.5/8	68	2	2	4	2	-	-	48	48	-	-	-	-
		13.0	10.0	ZF	11 DEG.	237.5/8	12.3/4	△ 155	68	2	2	4	2	-	-	48	48	-	-	-	-
	COMPOSITE △	11.0	8.5	ZF	12 DEG.	199	12.3/4	△ 116.5/16	68	2	2	4	2	-	-	48	48	-	-	-	-
MD-41056-04 T-RIDE TUFF TRAC	ACTION		4.0	ZF	15 DEG.					4	-	4	-	-	-	48	48	2	16	8	8
		8.5	6.0	ZF	15 DEG.	167.5/8	12.3/4	80.1/4	71.1/2	4	-	4	-	-	-	48	48	2	16	8	8
		9.0	6.5	ZF	15 DEG.	173.7/8	12.3/4	86.1/2	71.1/2	4	-	4	-	-	-	48	48	2	16	8	8
		9.5	7.0	ZF	15 DEG.	181	12.3/4	92.3/4	71.1/2	4	-	4	-	-	-	48	48	2	16	8	8
		10.5	8.0	ZF	15 DEG.	193.5/8	12.3/4	105.3/8	71.1/2	4	-	4	-	-	-	48	48	2	16	8	8
		11.5	8.5	ZF	15 DEG.	207.1/4	12.3/4	117.7/8	74.5/8	4	-	4	-	-	-	48	48	2	16	8	8
		12.0	9.0	ZF	15 DEG.	213	12.3/4	123.5/8	74.5/8	4	-	4	-	-	-	48	48	2	16	8	8
	△16	12.5	9.5	ZF	14.5 DEG.	220	12.3/4	130.5/8	74.5/8	4	-	4	-	-	-	48	48	2	16	8	8
		13.0	10.0	ZF	14 DEG.	229	12.3/4	139.5/8	74.5/8	4	-	4	-	-	-	48	48	2	16	8	8
	△	10.5LP	8.0LP	ZF	13.5 DEG.	193.7/16	12.3/4	106.1/16	71.1/2	4	-	4	-	-	-	48	48	2	16	8	8
	△	12.0LP	9.0LP	ZF	13.5 DEG.	212.5/8	12.3/4	124.3/8	71.1/2	4	-	4	-	-	-	48	48	2	16	8	8
		11.5PAV	8.5PAV	ZF	15 DEG.	207.1/4	12.3/4	117.7/8	74.5/8	4	-	4	-	-	-	48	48	2	16	8	8
	COMPOSITE △	11.0HP	8.5HP	ZF	13 DEG.	199.13/16	12.3/4	110.375	72.125	4	-	4	-	-	-	48	48	2	16	8	8
MD-41056-05 T-RIDE TUFF TRAC	PAVER	10.5 H.P.	8.0 H.P.	ZF	13.5 DEG.	203	12.3/4	△ 120.5/16	68	2	-	4	-	-	-	40	40	2	16	8	8
		12.0	9.0	ZF	12 DEG.	223.5/16	12.3/4	△ 140.5/8	68	2	-	4	-	-	-	40	40	2	16	8	8
		13.0	10.0	ZF	11 DEG.	237.5/8	12.3/4	△ 155	68	2	-	4	-	-	-	40	40	2	16	8	8
	COMPOSITE △	11.0	8.5	ZF	12 DEG.	199	12.3/4	△ 116.5/16	68	2	-	4	-	-	-	40	40	2	16	8	8

OPTIONAL FRONT TIE DOWN SYSTEMS:		
△6	MC-41450	BASE MOUNTED TIE DOWN.
	MC-41456	SUPPORTED TIE DOWN
△17	MB-42074	SUPPORTED BASE MOUNTED TIE DOWN
△10	OPTIONAL COMPONENTS:	
△15	MB-42040	TIE DOWN SPACER INSTALLATION

ITEM	PART No.	DESCRIPTION	QTY.
12	HH-01050-007	5/8 UNF UNI-TORQUE NUT GR.8	SEE CHART
11	HH-01169-134	5/8 UNF x 3 BOLT GR8	SEE CHART
10	HH-00613-006	5/8 HARDEN WASHER	SEE CHART
9	MB-41365	SWAY BRACE TIE DOWN	SEE CHART
8	HH-01278-001	3/4 UNF UNI-TORQUE FLGE. NUT	SEE CHART
7	HH-01279-007	FLGE. HD BOLT GR8 3/4UNFx2.1/2"LG	SEE CHART
6	MB-40457	LOWER REAR ANGLE	SEE CHART
5	MB-39178	LOWER REAR ANGLE	SEE CHART
△9	MB-41555	LOWER MID ANGLE	OPT. NOTE 6
4	MB-38671	LOWER MID ANGLE	SEE CHART
3	MB-38395	LOWER FRONT/REAR ANGLE	SEE CHART
2	MB-36293	UPPER MID ANGLE	SEE CHART
1	MB-36292	UPPER FRONT/REAR ANGLE	SEE CHART

2.0 Mounting Base Tie Down

MC-41450



NOTE:
FOR COMPLETE MIXER MOUNTING INSTALLATION, SEE DRAWING MD-41056.
SOME COMPONENTS ON THIS DRAWING MAY REPLACE COMPONENTS ON 'MIXER MOUNTING', DRAWING MD-41056.

TIE DOWNS THAT DO NOT MEET INSIDE RADIUS SPEC. MUST HAVE GUSSETS WELDED ON. SEE TIE DOWN DRAWING FOR DETAIL.

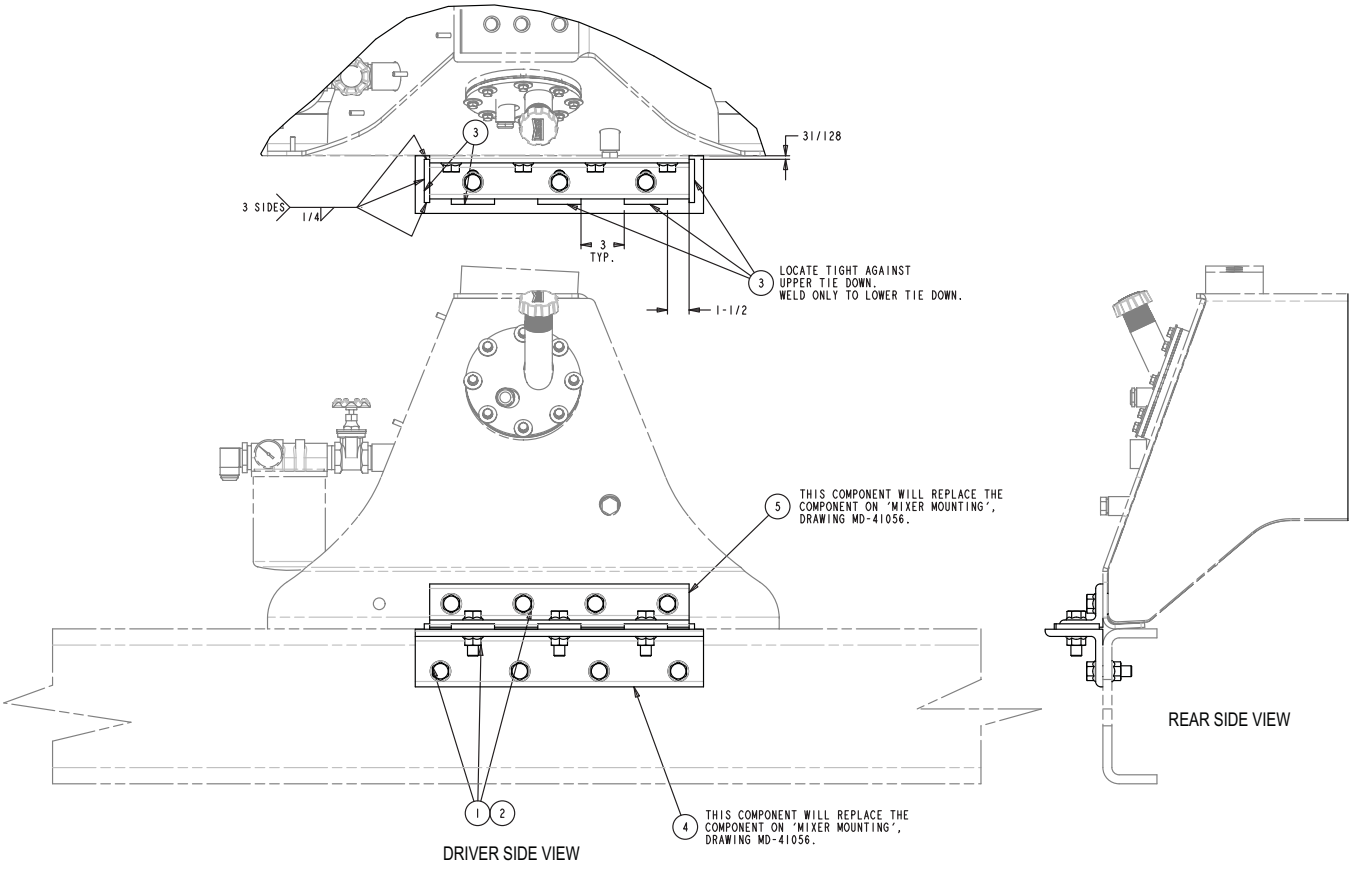
△1

△3 ALL INTERNATIONAL TRUCKS MUST USE THIS OPTION.

△4 ITEM	PART NUMBER	DESCRIPTION	QTY.
3	MB-42071	SLEEPER ANGLE	1
2	MB-41452	LOWER TIE DOWN WELD'T	1
1	MA-41448	TIE DOWN SPACER	1

3.0 Supported Tie Down

MC-41456



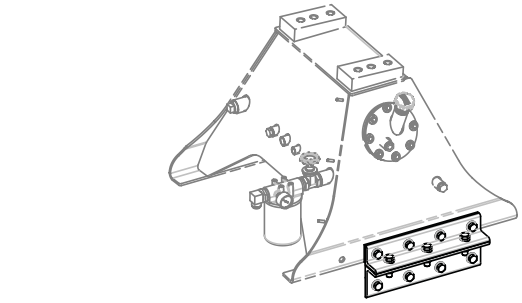
ITEM	PART NUMBER	DESCRIPTION	QTY.
5	MB-41453	UPPER TIE DOWN WELD'T.	2
4	MB-41455	LOWER TIE DOWN WELD'T.	2
3	MA-41457	SQUARE BAR	10
2	HH-01279-007	3/4 UNF FLGE HD. BOLT -2.1/2"	REF.
1	HH-01278-001	3/4 UNF FLGE HEX NUT	REF.

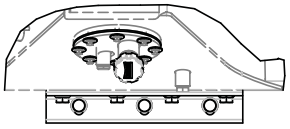
NOTE:
FOR A COMPLETE MIXER MOUNTING INSTALLATION,
SEE DRAWING MD-41056.
SOME COMPONENTS ON THIS DRAWING MAY
REPLACE COMPONENTS ON 'MIXER MOUNTING',
DRAWING MD-41056.

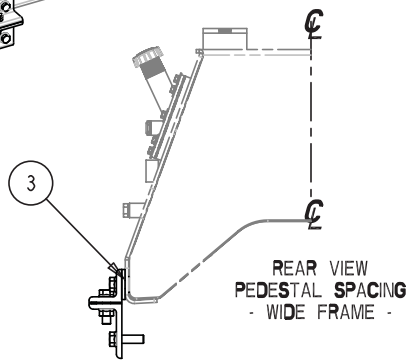
TIE DOWN ANGLES THAT DO NOT MEET MINIMUM INSIDE RADIUS
SPEC. MUST HAVE GUSSETS WELDED ON. SEE TIE DOWN
DRAWING FOR DETAIL.

4.0 Tie Down Spacer Installation

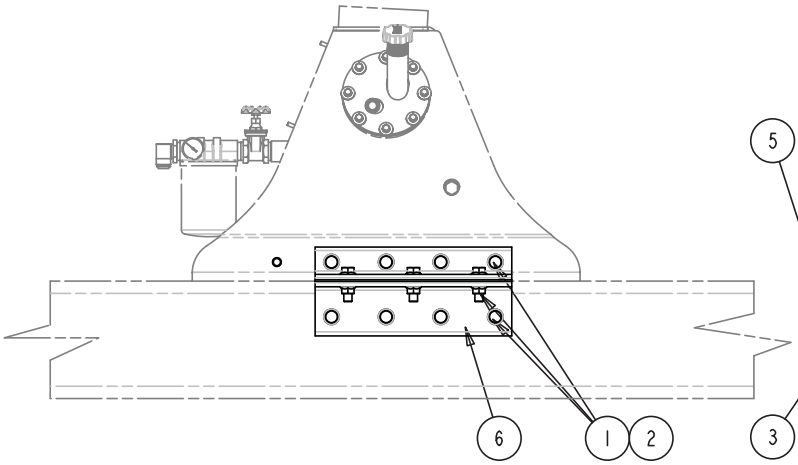
MB-42040

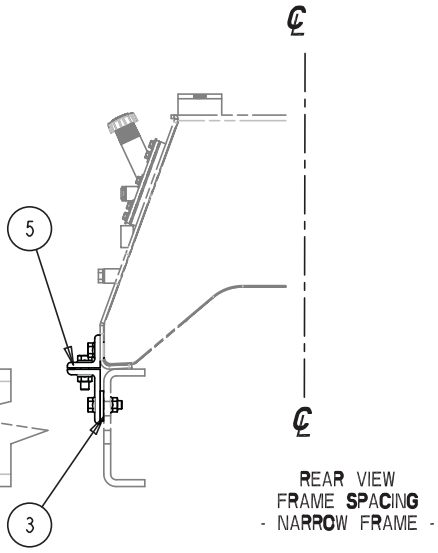






DRIVER SIDE VIEW





ITEM	PART NUMBER	DESCRIPTION	QTY.
6	MB-41452	LOWER TIE DOWN WELD'T	REF.
5	MB-36292-01	UPPER FRONT/REAR ANGLE	REF.
4	MB-41597	TIE DOWN SPACER - SWAY BRACE	2
3	MA-41448	TIE DOWN SPACER - FRT./REAR	4
2	HH-01279-007	3/4 UNF FLGE HD. BOLT -2.1/2"	REF.
1	HH-01278-001	3/4 UNF FLGE HEX NUT	REF.

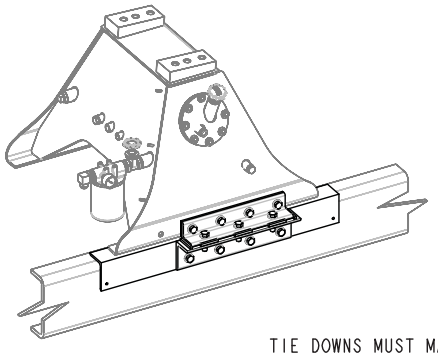
NOTE:
FRONT PEDESTAL TIE DOWN SHOWN AS REF.
SPACERS ARE ALSO REQUIRED ON SWAY BRACE
AND REAR PEDESTAL TIE DOWNS,
TYPICALLY AS SHOWN.

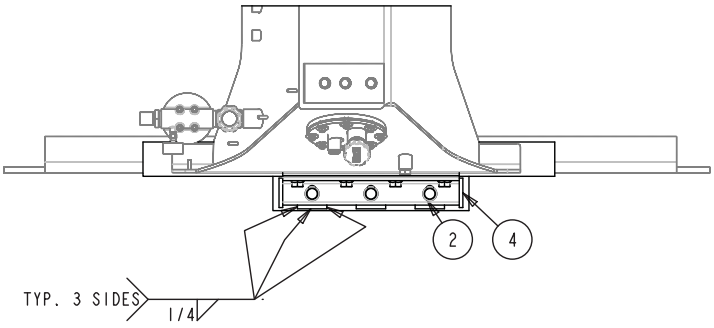
NOTE:
FOR COMPLETE MIXER MOUNTING INSTALLATION,
SEE DRAWING MD-41056.
SOME COMPONENTS ON THIS DRAWING MAY
REPLACE COMPONENTS ON 'MIXER MOUNTING',
DRAWING MD-41056.

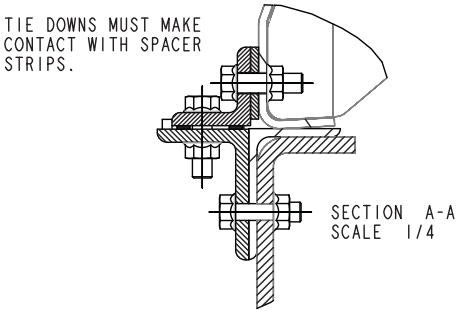
TIE DOWNS THAT DO NOT MEET INSIDE RADIUS SPEC.
MUST HAVE GUSSETS WELDED ON. SEE TIE DOWN
DRAWING FOR DETAIL.

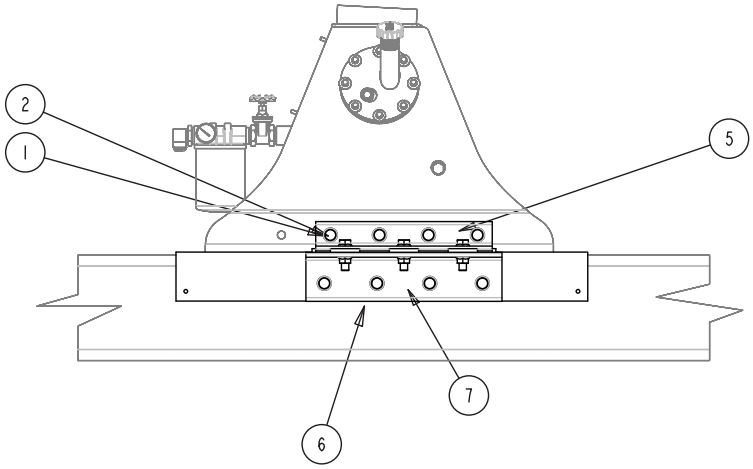
5.0 Supported Mounting Base Tie Down

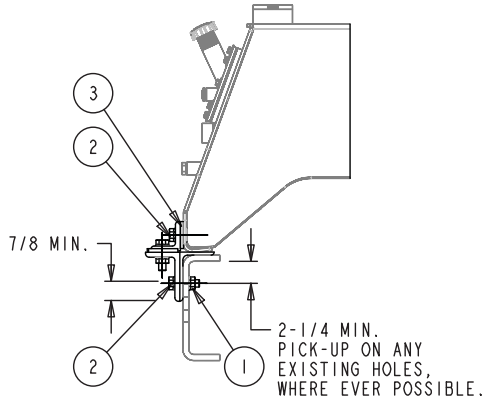
MB-42074











ITEM	PART NUMBER	DESCRIPTION	QTY
7	MB-42073	LOWER TIE DOWN WELD'T.	1
6	MB-42071	SLEEPER ANGLE	1
5	MB-41453	UPPER TIE DOWN WELD'T.	1
4	MA-41457	SQUARE BAR	5
3	MA-41448	TIE DOWN SPACER	1
2	HH-01279-000	SCR, FLG, HEX, FINE, G8, JS500	11
1	HH-01278-001	3/4 UNF FLGE HEX NUT	11

NOTE:

- QUANTITIES SHOWN ARE PER SIDE.
- FOR COMPLETE MIXER MOUNTING INSTALLATION, SEE DRAWING MD-41056.
- OPTIONAL MOUNTING FOR INTERNATIONAL TRUCKS. SEE DRAWING MD-41056 FOR DETAIL.
- SOME COMPONENTS ON THIS DRAWING MAY REPLACE COMPONENTS ON MD-41056.
- TIE DOWNS THAT DO NOT MEET INSIDE RADIUS SPEC. MUST HAVE GUSSETS WELDED ON. SEE TIE DOWN DRAWING FOR DETAIL.

6.0 Hydrostatic Drive Installation

6.1 General Description of the System

The closed-loop circuit consists of an axial piston variable displacement pump, a gerotor type “make-up” or charge pump integrally mounted to the main pump, an axial piston fixed displacement motor, reservoir, filter, heat exchanger, and all hose and fittings required to create the complete circuit.

A mounting framework, designed for the specific make of truck, bolts to suitable pads on the front end of the truck frame, ahead of the radiator. This mount provides for the pump and heat exchanger. A universal joint driveline connects between the drive flange on the truck engine crankshaft and the input shaft of the pump. The oil reservoir and filter are mounted on the mixer frame as part of the front pedestal. The splined shaft of the motor fits into the input gear of a spur gear type final reduction transmission. The latter is pivotally mounted to the mixer front stand. Thus, the motor bolts onto the transmission housing, and the motor torque is transferred through the transmission gearing to the output shaft to the mixer drum head.

Control of the volume of oil delivery from the pump is provided by means of electro-hydraulic control signal connecting the pump control lever and a push button station conveniently located adjacent to the drivers seat in the truck cab. A second cable runs to a rear station at rear left of mixer and incorporates a push button station w/25 ft extension cord. An air valve to control the air throttle, is mounted at rear left of mixer to control truck engine speed.

6.1.1 Explanation of Circuit Schematic

- 6.1.1.1 Charge Pump Circuit

The charge pump is a gerotor type pump mounted on the rear of the main pump. It is driven by means of a tang drive directly off the main pump shaft. The charge pump performs these functions:

1. Provides for internal priming of system.
2. Provides sufficient oil under pressure for control of the main pump.
3. Supplies oil under pressure to maintain a positive pressure on the low pressure side of the main circuit between pump and motor.
4. Provides a flow of oil through the transmission for cooling purposes.

The charge pump receives oil from the reservoir through a filter and delivers the oil to the low pressure side on the main circuit through one or two check valves located in the rear of the main pump housing. (In “charge or discharge” the second check valve is held closed by the high pressure on the other side of the main circuit.) The charge pump charge relief valve normally set at 220 psi controls the maximum pressure from the charge pump. This relief valve is located in the housing of the charge pump.

- 6.1.1.2 Main Circuit

Oil flows between the axial piston pump and motor in a “race track,” or continuous closed loop. The flow of oil in the circuit at any time is determined by both pump speed and displacement. The pump is an over-center swashplate type. On one side of center, the pump drives the motor in a clockwise direction. On the other side of center, the motor is driven in a counterclockwise direction. As the pump swashplate is moved away from center or neutral position, in either direction, the volume of oil pumped increases, and the motor speed increases.

Attached to the back of the motor housing is a valve assembly which connects across the main circuit. This assembly contains two pilot operated high pressure relief valves. The valves function to prevent sustained excessively high pressure surges in either direction of the two main lines by dumping oil from the high pressure line to the low pressure line during rapid acceleration, abrupt braking, and sudden application of load.

In addition to the main relief valves, the valve assembly contains a shuttle valve. The shuttle valve establishes a circuit between the low pressure side of the main circuit. Spring centering of the shuttle valve allows access to the motor charge relief valve for cooling and prevents loss of high pressure oil from the main circuit as the pump passes through neutral.

- 6.1.1.3 Cooling Circuit

Any excess cooling oil from the motor charge pressure relief valve flows through the motor case. Thus, the cooling oil circulates through the motor and pump in series to aid in cooling. From the pump case, cooling oil passes through a heat exchanger and returns to reservoir.

When the main pump is running and its swashplate is at neutral the shuttle valve in the manifold valve assembly (motor) is closed. In this situation, excess oil from the charge pump is directed to the cooling circuit by the charge relief valve in the housing of the charge or make-up pump. Also, with the main pump in neutral no cooling oil is admitted to the motor because it is not running.

- 6.1.1.4 Main Pump Control

Control of speed and direction is accomplished by the movement of a single control lever from a neutral position. The pump swashplate is spring loaded to neutral position to insure positive neutral. The swashplate is provided with two opposed, single acting servo cylinders to move the swashplate and thus vary pump displacement. Pressurizing one of the cylinders while exhausting the other will move the swashplate from its neutral position. To obtain the reverse direction from neutral, the opposite cylinder is pressurized and the other is exhausted. Oil is directed to the desired servo cylinder by the control valve which is activated by a signal from the operator through the control lever or from the swashplate and its feed-back linkage system. If the circuit pressures tend to overcome the swashplate servo piston preset position, the feed-back linkage connecting the swashplate to the control valve will activate the control valve and supply adequate pressure to the servo piston and maintain the swashplate in its position determined by the operator. The control valve is spring centered and contains sufficient underlap to open both servo cylinders to drain when the control lever is in neutral. This permits the servo cylinder centering springs to move the swashplate to the zero stroke position, ensuring a positive neutral.

Reverse in the circuit is the same as forward with the following changes:

a. The control lever on the control valve is moved to the opposite side of neutral. This moves the valve spool opposite from forward position and permits control flow and pressure to the opposite servo piston. This powers the variable swashplate in the opposite direction. This reverses the flow from the pump that is under high pressure conditions.

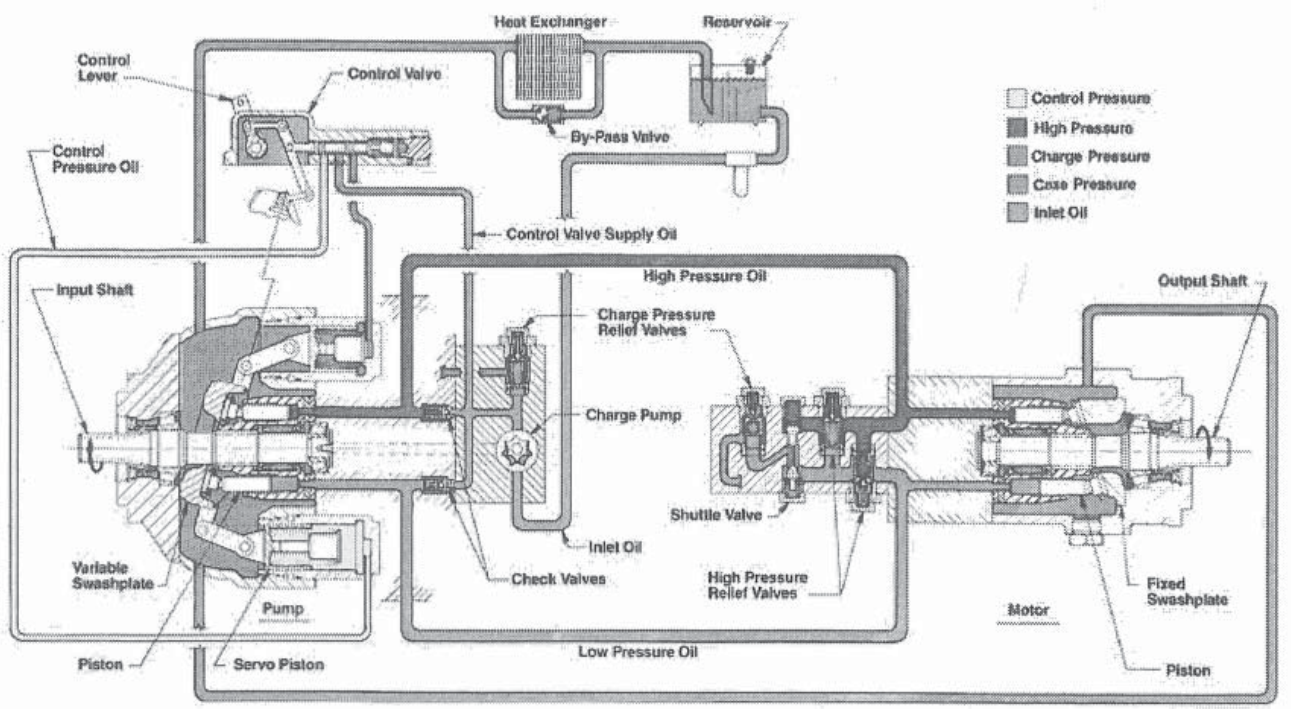
b. Flow under high pressure enters the opposite side of the motor cylinder barrel assembly causing motor to rotate in the opposite direction.

c. The opposite high pressure relief valve monitors system pressure.

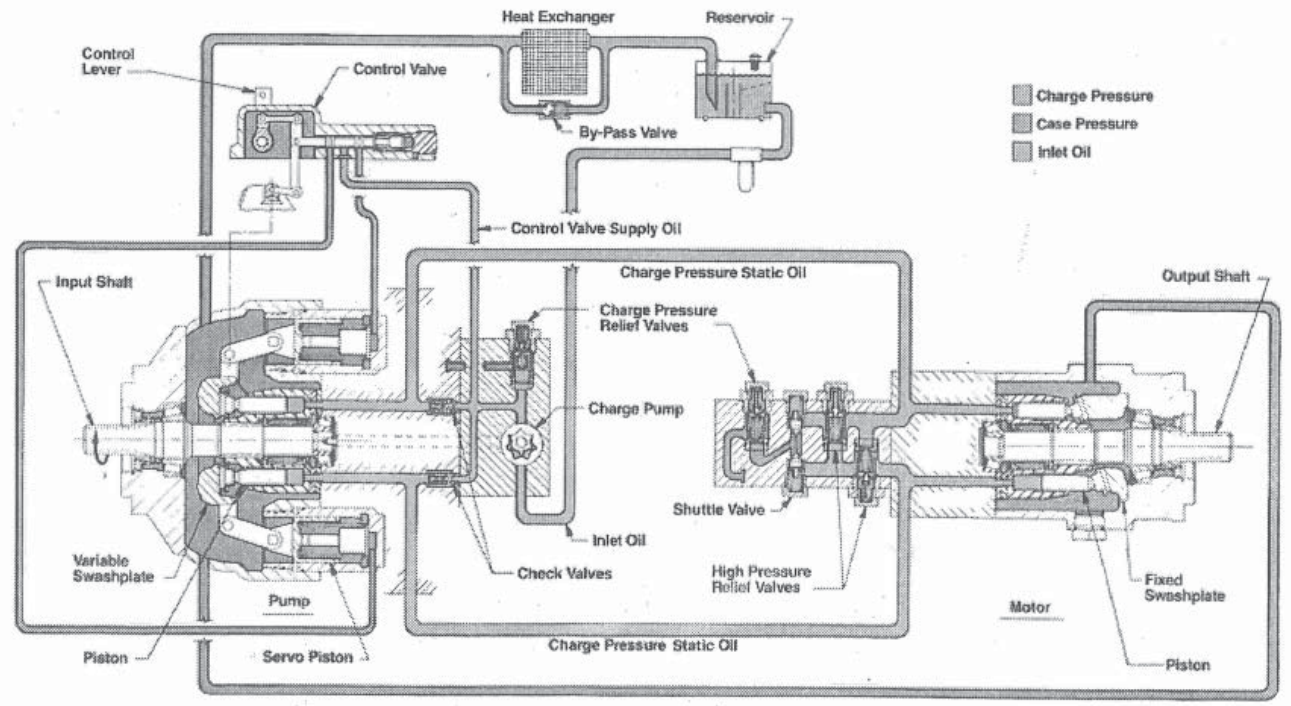
d. High pressure seats shuttle valve to the other end of its cavity to permit access to low pressure relief valve for motor cooling purposes.

e. Flow returns to pump in opposite low pressure oil line.

f. Charge pump flow enters circuit by way of check valve on this low pressure side.



Axial Piston Variable Displacement Pump
& Fixed Displacement Motor Schematic



Axial Piston Variable Displacement Pump
& Fixed Displacement Motor Schematic

6.2 Hydraulic Component Mounting

After the mixer has been mounted on the truck as outlined in Section 3 of this manual, proceed to mount the hydraulic components as outline below.

If the mixer is shipped unmounted, the mounting of the hydraulic pump must be accomplished so that the pump shaft and the engine crankshaft or R.E.P.T.O. shaft, as the case may be, are parallel. The shafts may be offset but it is extremely important that they be parallel. IF THE SHAFTS ARE NOT PARALLEL, SERIOUS PUMP DAMAGE IS LIKELY TO OCCUR. A prefabricated structure is provided for front of engine mount which provides a mounting plate for the pump. It is to be positioned so that the pump shaft and the engine crankshaft are parallel and then bolted into the structure. The pump is supplied with a Dana (Spicer) 1310 series driveline or the optional 1350 series driveline. This driveline is supplied in the unwelded state and needs to be cut to length, assembled, straightened, welded and balanced prior to installation. The pump must be mounted with the control lever up, and operable in a horizontal plane.

After the pump has been mounted the next step is to mount the heat exchanger. The heat exchanger assembly is normally mounted on top of the front structure and positioned in front of the truck radiator so that the air being pulled in by the fan will also be pulled through the cooling fins of the exchanger.

Care should be taken when positioning the exchanger so that it does not cut off or restrict the air flow to the truck radiator. On some models of truck cabs, which have the flip hood type of construction, it may be necessary to mount the heat exchanger behind the truck grill.

When all the components have been mounted, the next step is to complete the hosing of the circuit. A hose kit is supplied with each mixer and the location and connecting points for each hose is shown in the hydraulic drive section. Three hoses are required to connect the pump and motor and two are required to connect the case drain to the heat exchanger and tank and one is required to connect the tank/filter-to-charge pump inlet. See hydraulic circuit for correct hose and fitting installations. NOTE: While assembling the various hoses, care should be taken to keep the bore of the hose clean. It is a good practice to cap the ends of the completed hose assembly until the hose is installed. It is very important that whenever the hose comes in contact with something (such as frame, cables, other hoses, etc.) that it be clamped or by some other method, to prevent rubbing at that point. If this is not done, the outer covering of the hose may be worn through, causing premature hose failure.

NOTE: The hydraulic oil is not supplied with the mixer when field mounted. Approximately 10 gallons will be required to fill the system. A list of various oils that are recommended for use in the transmission is included. See Scheduled Maintenance Section.

6.3 PTO Driveline Installations

Improper driveline installations are the source of many PTO and PTO related problems. Universal joints wear out rapidly, PTO and pump seals and bearings take unnecessary abuse, high noise and vibration levels contribute to operator and vehicle fatigue, always causing premature failure.

The most likely causes of U-joint failure are LACK OF LUBRICATION, installation and improper application. Lack of lubrication can be avoided by remembering a re-lube cycle of 50 hours of operation, depending upon the severity of the application. Severity is increased by high angles, high speeds, high temperature, high torque, and environmental conditions such as dust, salt spray or extreme cold. The primary cause of pto driveline installation failure is the misalignment of the input (PTO) and output (pump) elements of a universal joint or drive shaft.

The shafts of the driving and the driven units should be parallel and the yokes of the drive shaft assembly should be in line and in the same plane.

To review U-joint problems, most failures will be a result of one or more of the following:

Too much torque or HP requirement

Lack of lubrication or dirty grease

High degree of angularity

2-joints not in phase

2-joint angles not equal

Drive line not allowed to slip

Drive line out of balance

In addition to shorter life cycles the driveline will experience unpleasant noises, high vibration levels and bearing failures if, “Universal Joints Are Not In Phase.”

Proper drive shaft angles and correct phasing of the universal joints are very important in maintaining long life and quiet running shafts. When in phase, the slip yoke lugs (ears) and the tube yoke lugs (ears) are in line. Normally, this is the ideal condition and gives the smoothest running shaft. There should be an alignment arrow stamped on the slip yoke and on the tube shaft to assure proper phasing when assembling the components. If there are no alignment marks, they should be added before disassembly of the shaft to assure proper reassembly.

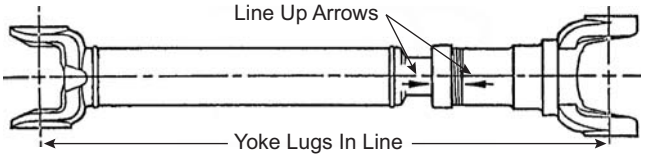


Figure 1

6.4 Pump and Driveshaft Alignment

The taper bore yoke will usually come assembled to the pump shaft. If it is shipped loose or must be removed and reassembled follow these instructions:

1. Clean pump shaft and yoke bore and coat with grease.
2. Slip the yoke onto pump shaft as far as possible making sure the woodruff key stays in place.
3. Lubricate nut face and shaft threads before hand tightening the nut.
4. Torque nut to 320 ft lbs plus the torque required to align the slotted nut to the shaft cross hole but not to exceed 415 ft lbs.
5. Install the cotter pin.

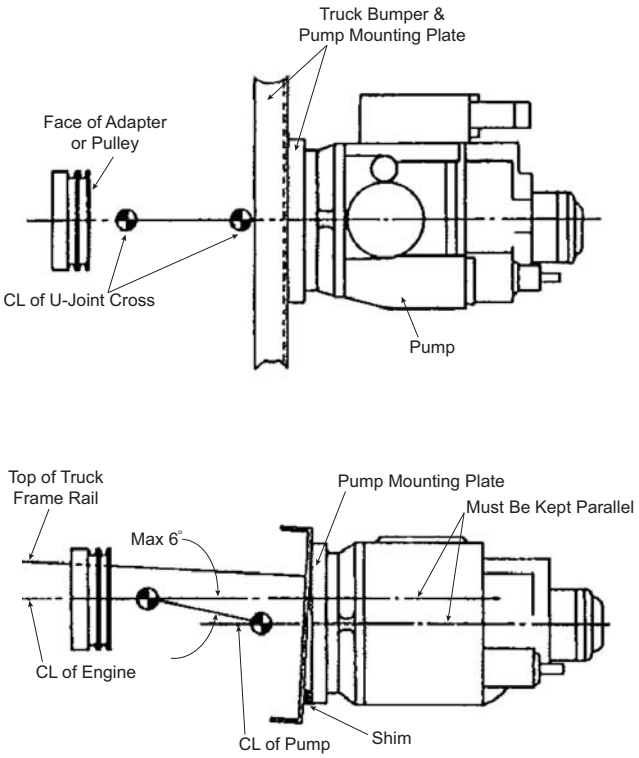


Figure 2

6.5 Hydrostatic Transmission Start-Up Procedure

The initial start-up of a hydrostatic transmission follows any easy, logical step by step procedure based on past knowledge of starting hydraulic pumping and motoring devices. The start-up begins with filling the system, proceeds through the priming of the charge pump, and ends with supplying fluid from the transmission pump to the motor as outline below. Care must be taken during the installation of the system to clean, or keep clean, all transmission components. This applies to the reservoir, valves, filter, hydraulic conduits, and heat exchanger. A thorough job of cleaning, flushing, and blowing dry must be done on the above components prior to beginning the installation.

After the system has been installed:

1. Install a 600 psi gauge and hose assembly at the charge pressure gauge port on the side of the variable pump housing for reading charge pressure.
2. Install a 30 psi to 30 inches of mercury compound gauge and hose assembly at the charge pump inlet to read charge pump inlet pressure. Also install a 30 psi gauge to the reservoir if sealed.
3. Check all lines and fittings and be sure they are installed and tightened correctly.
4. Fill the reservoir with a fluid selected from the guidelines described in scheduled maintenance section. This fluid should be pre-filtered through a 10 micron filter and be free of any water.
5. Proceed as outlined below depending on the position of the reservoir with respect to the charge pump inlet.
   a. Reservoir Below Charge Pump Inlet: Disconnect the charge pump inlet and hand fill the line with pre-filtered fluid (from step 4 above). If a pressurized reservoir is used, loosen the inlet hose and apply up to 10 psi air pressure to the reservoir to force fluid through the suction line and filter. If bubble free fluid does not appear at the charge pump inlet with 10 psi at the reservoir, check to see if the line is obstructed. Be sure the shut-off valve at the reservoir is open.
   b. Reservoir Above Charge Pump Inlet: Loosen the charge pump inlet hose at the charge pump and wait for gravity to force the fluid through the suction line and filter to the charge pump. If a pressurized reservoir is used, loosen or remove the filler cap so that the reservoir can breathe. If gravity will not force the fluid through the suction line and filter, apply air pressure to the reservoir. Do not apply more than 10 psi air pressure to the reservoir. If fluid does not appear at the charge pump with 10 psi air pressure applied to the reservoir, check the line for any obstructions. Be sure the shut-off valve at the reservoir is open.

6. Fill the pump and motor case with pre-filtered fluid (from step 4 above) through their uppermost case drain port. If air pressure can be applied to the reservoir, the pump and cases can be filled by loosening the uppermost case drain fitting at the motor case. Fluid from the reservoir will flow through the reservoir return line, the heat exchanger (if used), the pump case drain line, the pump case, the motor case drain line, and into the motor case. When bubble free fluid begins to escape around the loosened fitting at the motor case, the pump and motor case are full. Retighten the fitting at the motor case. Be sure the return line shut-off valve (if used) is open.
7. Refill the reservoir to make up for the fluid used to fill the pump and motor cases plus the suction line and filter.
8. Check to see that the control mechanism is in neutral. More importantly, check to see that the pump control valve lever is at neutral by disconnecting the control mechanism at the pump control valve.
9. Start the prime mover and set the hand throttle for idling speed. DO NOT RACE THE ENGINE. Charge pressure should reach a minimum of 190 psi above pump case pressure within 30 to 40 seconds. Run in neutral at idling speed for approximately five minutes to properly fill the system.

   If a charge pressure of 190 psi is not apparent after 30 or 40 seconds, stop the engine, wait 5 minutes, and try again. If this fails, troubleshoot.

   If an electric motor is used, do not run for more than 15 seconds without a charge pressure build-up.
10. Set the throttle for 50% to 75% of full throttle setting. The charge pressure should be 200 to 220 psi above pump case pressure.
11. Stop the prime mover and check the level of fluid in the reservoir. Fluid may be needed to bring the reservoir to the proper fill level due to charging the system.
12. Restart the prime mover and set the throttle for 50% to 75% of full throttle setting. Slowly move the control mechanism forward. Charge pressure should drop approximately 40 psi (this is normal). Return to neutral and slowly move the control mechanism to reverse. Again, charge pressure will drop 40 psi. Repeat the above three or four times.
13. Advance the throttle to maximum and observe the inlet pressure at the charge pump. If a sealed reservoir is used, the total pressure drop between the reservoir and the inlet to the charge pump must not exceed 3 psi at normal operating temperatures with a new filter. If this pressure drop is exceeded, the suction line system must be replumbed.

    If a vented reservoir is used, the minimum charge pump inlet pressure must not be less than 11.7 PSIA (6 in Hg at sea level). If the inlet pressure is less than 11.7 PSIA, the suction line must be replumbed.

NOTE

Atmospheric pressure is reduced by 1/2 PSI (1 in Hg) for each 1,000 feet of altitude. Normal atmospheric pressure at sea level is 14.7 PSIA and 12.2 PSI at an altitude of 5,000 feet above sea level.

14. Stop the prime mover, remove all gauges, replace fittings and plugs, and recheck the reservoir level (add fluid if needed). The system is now operational.
15. Next, reconnect the remote control assembly to the end of the pump control lever. The controls have a total throw of 3 inches. Thus 1.1/2 inches stroke, each side of neutral, provides almost full volume from the pump. Clevis take-up adjustment can be made at the pump.
16. DO NOT ALLOW THE PUMP CONTROL LEVER TO BOTTOM INTERNALLY INSIDE THE PUMP. THE LEVER MUST BOTTOM AGAINST THE EXTERNAL MECHANICAL STOPS. After stops have been carefully set, tighten all nuts on stop assembly securely.

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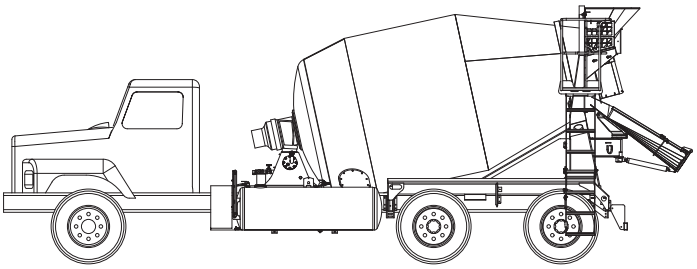


Scheduled Maintenance

Table of Contents

Scheduled Maintenance

1.0 Introduction

The following pages outline checks, adjustments and lubrication instructions that should be incorporated into a regular service/maintenance schedule.

It is recommended also that a Service/ Maintenance Log be maintained and kept by the driver/operator in the vehicle cab.

2.0 General Information

1. Any gearboxes not installed by LMI are shipped without oil. To fill refer to Page 4-5 for specifications and the amounts of oil required.
2. Extreme care must be exercised to ensure that no dirt or foreign matter be allowed in or around the hydraulic pump and motor if fittings or plugs are removed, and when fittings are re-installed.
3. Any replacement hoses not supplied by LMI must be thoroughly washed out before installing on the equipment. New hydraulic kits and assemblies supplied by LMI are washed and capped before shipping.
4. Ensure always that the main shut-off valve from the front pedestal/reservoir to the suction line of the pump is open before starting truck engine.
5. Drum rollers should be checked for alignment with drum track after one or two working days and adjusted if necessary. To align rollers, loosen the 4 bolts and tap casting with hammer towards the front or rear of the vehicle as required. Tighten bolts. Misalignment could be the result of heavy loads causing varying amounts of flexing and settling in different truck frames.
6. Check all hold-down bolts before start-up and at weekly intervals thereafter. Bolts must be tight at all times to maintain proper alignment of drum, drum rolls, and loading hopper.

⚠ CAUTION

Do not start a fully loaded drum at full throttle and/or with the pump control at a maximum speed.

⚠ CAUTION

When reversing the rotation of the drum, throttle back on truck engine and make sure that the drum comes to a complete stop before changing direction.

7. Check oil regularly for the presence of water. If water is present in the system the oil will have a milky appearance. If present in the system determine the source and correct the problem. Drain the system and replace the oil.
8. Check often for any oil and/or air leaks and correct immediately. Such leaks can usually be traced to hydraulic hose and pneumatic tubing. Check for any cuts, abrasions and possible chafing points.
9. Check pump drive-shaft end connections for proper tightness of capscrews.
10. Check extension chute storage assemblies. Make certain that chutes are secure when not in use, and when vehicle is away from loading and unloading sites. Examine all rubber tie downs for cuts, abrasions and any deterioration.
11. Keep drum interior clear of any concrete build-up often.
12. Maintain mixer and truck lighting systems: replace any defective light bulbs and reflectors when required. Check especially for those lights within the mixer electrical system that signal Active and/or Non-active functions and replace immediately if defective.
13. Check drum speed. Drum speeds should be constant if hydraulic system is working correctly. Check RPM of drum while loading with concrete and with engine running at top governed RPM. If drum speed is 2 RPM less than the previously checked speed a problem has developed. Check the Eaton literature PROBLEMS IN THE HYDRAULIC SYSTEM and/ or TROUBLESHOOTING supplied with this manual.

3.0 Inspections

3.1 Daily

1. Keep the mixer clean by hosing down the drum, rear frame assembly and discharge chute after each load. You will be rewarded with longer service life, better performance and eliminate the added weight of accumulated concrete.

⚠ DANGER

Do not repair metal or composite chute extensions.
Serious personal injury or death could occur.

⚠ DANGER

Composite chute extensions are flammable. Do not expose to an open flame or a temperature exceeding 220 F (104 C). Burning chute extensions produce toxic smoke/fumes during combustion.
Serious personal injury or death could occur.

⚠ CAUTION

Never clean chute extensions by striking or chiseling. Failure to comply may result in damage to the equipment.

2. Check the chute extensions. Inspect the chute extensions for cracks, breaks, or structural damage. Replace chute(s) if any damage is noted.

3.2 Weekly

1. Check pump drive shaft capscrews for proper tightness.
2. Lubricate complete mixer per lube chart.
3. Check oil for presence of water. If water is present, the oil will be milky in appearance. Milky oil should be drained from the system and replaced and the source of the water entry found and corrected.
4. Check fill cap and neck on oil reservoir for leaks. Make any necessary repairs immediately.
5. Check for and correct any external oil or air leaks. Check hydraulic hoses and tubes for cuts, abrasions and clearance. NOTE: Do not tighten or loosen any connections while system is under pressure. Check oil level in hydraulic reservoir and add oil if oil is below gauge level. See Figure 4 above for sight gauge location.
6. Check drum RPM while loading mixer with concrete and with truck engine running at top governed RPM. If drum revolution is 2 RPM less than previous check, see manual for component checkout.
7. Extension chutes and bracket assembly. Check tension of chute latch-hook to ensure chute is held securely in cradle. Check rubber tie-down for cuts and/or deterioration.
8. Check inside of drum for concrete build-up and clean as required.
9. Check mounting bolts for proper tightness.
10. Check mixer lighting system. Replace defective light bulbs and reflectors when needed.

3.3 Three Months

Change oil and oil filter if needed, see lubrication chart for oil specifications and filter replacement cartridge number.

IMPORTANT: Check cartridge paper element for presence of metal particles.

The presence of minute particles of brass may indicate excessive wear or possible malfunction in one of the hydraulic components. Do not use any other oil or lubricants than what is recommended in lubrication chart.

3.4 Six Months

Change hydraulic oil and oil filter cartridge. Check used filter cartridge for foreign material as outlined in three months inspection. NOTE: For alternate hydraulic oil recommendations, check with factory.

4.0 Grease Points

EP#2 lithium base grease

4.1 Chute Swivel and Chute Positioner

Service frequency = weekly

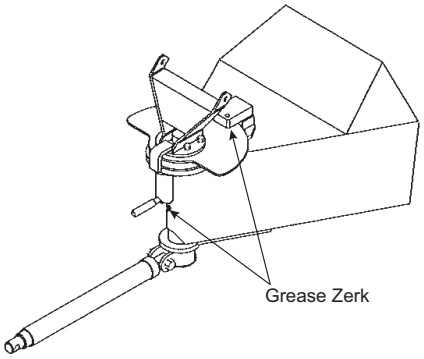


Figure 1

4.2 Drum Rollers

Service frequency = weekly

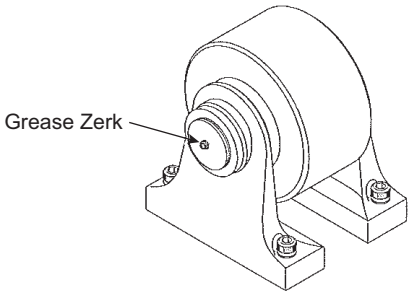


Figure 2

4.3 Pump Drive Line

Service frequency = weekly

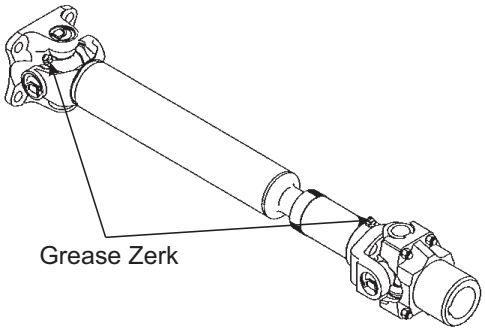


Figure 3

4.4 Hydraulic Water Pump

Service frequency = weekly

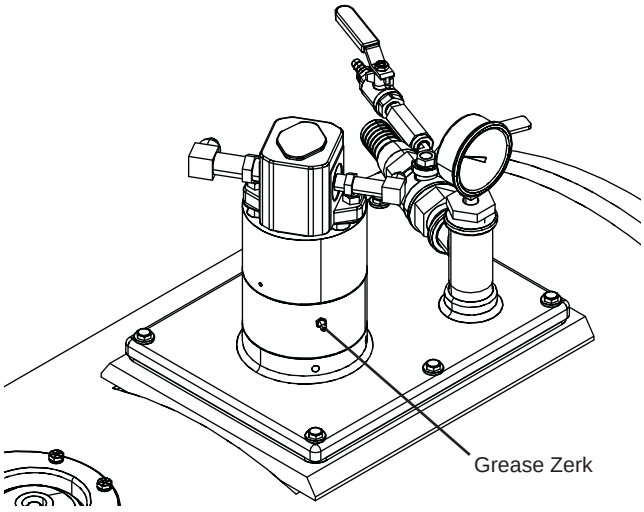


Figure 4

5.0 Front Pedestal/Reservoir

Lubrication type: Esso Rando HD32

Alternate type: Shell Tellus 32; SAE15W30 API CC: CD: SE: SF

Approximate capacity: 56 Litres

Service frequency: Change oil after 50 operational hours. Second change after 500 hours. Subsequent changes every 1000 hours, at least once a year. Change filter with every oil change.

The oil level should be visible in the sight gauge located near the top of the reservoir. If not, add enough oil to bring to level. Do not over-fill. The tank area above the gauge is provided as “foaming space.”

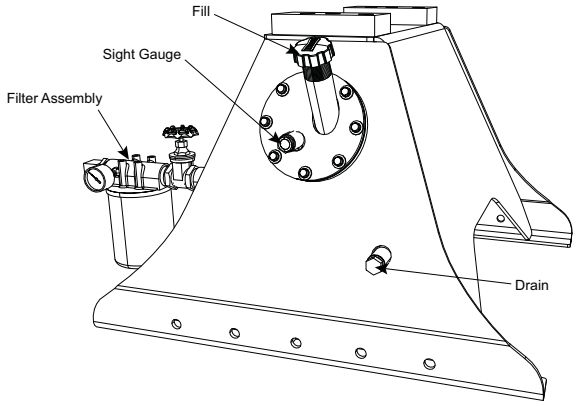


Figure 5

6.0 Water Tank Inspection and Maintenance

⚠ WARNING

IMPORTANT ALUMINUM AND STEEL WATER TANK INFORMATION.

1. Inspect water tank on a daily basis for any damage including, but not limited to, dents, gouges in metal, or leaks.

2. Do not weld on or repair water tank. Instead, replace water tank with a new OEM water tank.

3. Never pressure test an empty water tank. Only pressure test a full water tank.

4. Never remove pressure regulator or pressure safety valve from tank.

- **If regulator or safety valve is defective, it must be replaced before Packer is put into service.**

5. Do not pressurize water tank beyond its working pressure.

- **If pressure exceeds the working pressure, immediately depressurize water tank and replace pressure regulator and pressure safety valve.**

6. Never drive the truck with the water tank pressurized.

- **Depressurize water tank prior to transit to or from landfill site.**
- **Water tank should be pressurized only when being used.**

7. Never modify water tank in any way.

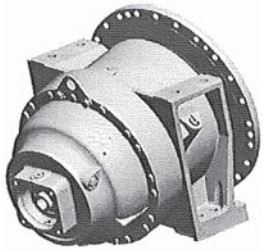
8. Immediately replace safety decals with London decals if decals are missing or difficult to read.

9. Refer to the London Operator's Manual or contact London Service at 1-800-265-1098 if you have questions or require assistance.

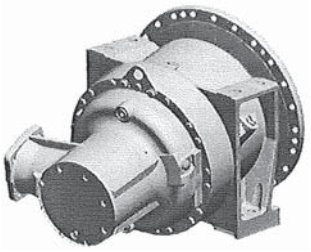
On a weekly basis;

1. Inspect the water tank for visible signs of external damage. Dented tanks should be replaced.
2. Inspect the water tank for signs of leakage. If there is leakage from a weld seam or anywhere on the tank shell or heads the tank should be replaced immediately. Correct any leakage from pipe and tube connections. Fill the water tank completely full of water before pressure testing.
3. Check that the water tank pressure gauge is correctly registering both 0 and 50 psig conditions. If in doubt test with an independent pressure gauge. The operating pressure must NOT exceed 50 psig.
4. Check that the pressure relief valve is functioning by pulling on the stem ring. Pressurized air should escape.
5. Check the pressure setting of the relief valve by gradually increasing the pressure regulator setting. Air should escape from the relief valve at 55 psig. Return the regulator to its 50 psig setting and briefly lower the tank pressure by opening the pressure release valve. Upon closing this valve the tank pressure should return to 50 psig and the relief valve should not be leaking.
6. Ensure that all valves, drains and the filler are functioning correctly.
7. Ensure that the water tank is sitting correctly in its rubber lined cradles and the straps are snug. The cradles must be securely mounted.

7.0 Reducers



P7300	
Mixing Capacity	12 cubic meters
Maximum Output Torque	72,000 Nm
Ratio	144.3
Maximum Output Speed	18 RPM
Oil Quantity	11.5 liters
Dry Weight	770 lbs



PK7500	
Mixing Capacity	12 cubic meters
Maximum Output Torque	72,000 Nm
Ratio	138.8
Maximum Output Speed	18 RPM
Oil Quantity	16.5 liters
Dry Weight	814 lbs

7.1 Lubrication

Lubrication type: Multigear EP SAE 80-90

PK7500 capacity: 16.5L

P7300 capacity: 11.5L

Service frequency: Change oil after 100 operating hours. Subsequent changes every 1000 hours, at least once a year. Fill to level mark on sight gauge. Check gauges after a few minutes, and top up as necessary. Check levels at least once a month. Ensure that all oil entry and exit openings are clean when servicing.

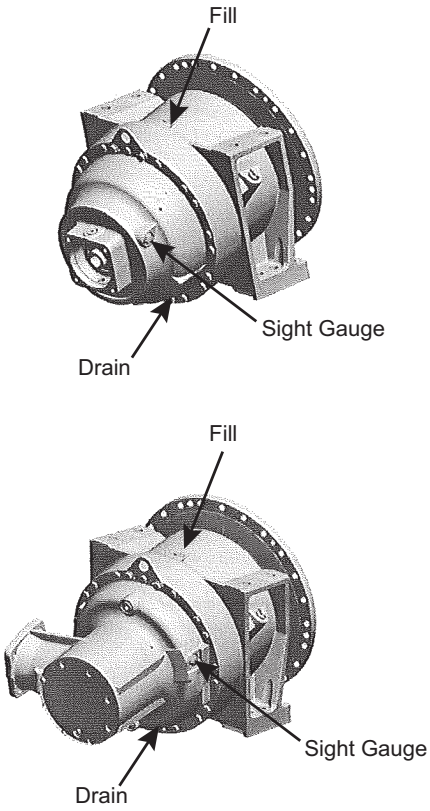
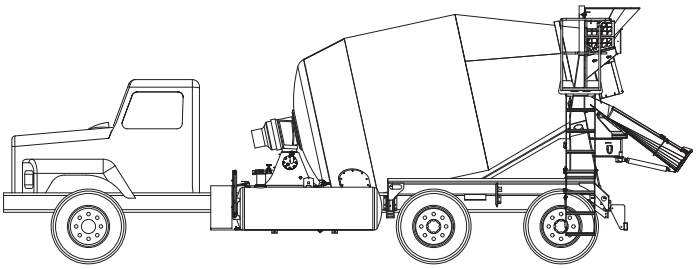


Figure 6



Hydraulic Components

Table of Contents

1.0 Adjusting the Eaton Standard Manual Control Valve

Used on Eaton Hydrostatic Variable Displacement Pump

1.1 Principles of Operation

The Eaton Standard Manual Pump Control Valve is a three-position, four-way, infinitely variable, closed center valve. Movement of the control lever rotates the control shaft, which by linkage, repositions the control spool to permit pressurized fluid to flow to the servo piston system. When the pump displacement has reached the position commanded by the control lever, the control spool (through feedback linkage) is returned to a closed position holding the commanded pump displacement. Any change in pump displacement is accomplished by repositioning the control lever, which again creates the above cycle.

1.2 On Unit Adjustment

With the system completely shut down, disconnect the control linkage and remove the two O-ring plugs in the side of the control. Loosen the set screw in the bottom of the control snout. Using pliers, back-out the spring box adjustment screw two turns. While looking in the two open ports in the side of the control, move the control lever lightly in both directions.

NOTE

Do not apply enough force on the control lever that would compress the control spool spring.

The control spool end play can be seen. Turn the spring box adjustment screw in slowly while moving the control lever in both directions. When no end play is seen in the spool, adjustment is made.

The control spool end play can be seen on the exposed control spool end. Turn the spring box adjustment screw in slowly while moving the spool back and forth. When no end play is seen in the control spool, the adjustment is made.

NOTE

Turning the spring box adjustment screw in too far, will cause end play of the control spool. It will feel the same as if the spring box adjustment screw was not screwed in far enough.

Tighten the set screw and recheck spool end play, 0.000 to 0.001 end play is required.

1.3 Off Unit Adjustment

With the system completely shut down, drain the unit housing. Disconnect the control linkage and remove the manual control valve from the unit.

NOTE

Care must be used not to drop the retainer clip and pin into the unit housing.

Mount the manual control valve, with the mounting surface up, in a vice. Loosen the set screw in the control snout. Using pliers, back-out the spring box adjustment screw two turns. Holding the exposed end of the control spool at the linkage end, move it lightly back and forth.

NOTE

Do not apply enough force on the spool to compress the control spool spring.

The control spool end play can be seen on the exposed control spool end. Turn the spring box adjustment screw in slowly while moving the spool back and forth. When no end play is seen in the control spool, the adjustment is made.

NOTE
Turning the spring box adjustment screw in too far, will cause end play on the control spool. It will feel the same if the spring box adjustment screw was not screwed in far enough.

Tighten the set screw and recheck spool end play, 0.000 to 0.001 end play is required.

2.0 Front Pedestal Oil Reservoir Inspection

The oil level should be visible in the sight gauge located near the top of the reservoir. If not, add enough oil to bring to level. Do not over-fill. The tank area above the gauge is provided as “foaming space.”

3.0 Hydraulic System Temperature

We do not furnish a temperature gauge as part of the system. Operating temperature of the circuit depends on a number of factors such as type of oil used, slump concrete, ambient temperature, etc. A temperature gauge is not a reliable indication of circuit condition, if taken as a single indicator. In general, maximum operation temperature can be expected in the range of 155 deg F to 170 deg F. The oil temperature must not exceed 200 deg F. (A reservoir which is “hot” to the touch may be only 140 deg F).

If the system is considered to be hot due to oil fumes escaping from the reservoir breather, or due to any other reason, shut unit down. Remove the hose from the pump case, drain port and check oil temperature with a thermometer. If temperature is over 200 deg F reduce truck engine speed to 800-1000 RPM, and set pump control lever for 1 or 2 RPM of the drum. Operate in this manner until the circuit cools down. Then shut down. Troubleshoot for cause of excessive heat as detailed in the Troubleshooting Procedure in Eaton bulletin #7-404 provided in Appendix A of this manual.

4.0 Hydraulic Water Pump

4.1 Performance

The hydraulic water pump is powered by hydraulic pressure from the A Pad pump and shares a hydraulic circuit and control valve with the chute up/down circuit.

Pump performance is based on engine RPM. At engine idle only one function can be used at a time, either the chute controls or the hydraulic water pump.

The water pump at engine idle pressurizes the water lines between the range of 30-40 psi. Depending on the throttle capabilities of the engine, the pressure can be increased to 60-80 psi and the chute controls can be used at the same time.

4.2 Troubleshooting

If the hydraulic water pump is activated but the water lines are not pressurized there may be air in the hydraulic lines, or debris in the impeller.

Perform the following procedure with the pump turned OFF to determine the cause of the low pressure.

1. Remove the hydraulic motor (Figure 1, Item 1) from the upper bearing carrier (Figure 1, Item 3).
2. Rotate the pump shaft (Figure 1, Item 2) by hand in both directions.

   If the pump shaft rotates freely a full 360 degrees the issue is air in the hydraulic lines. Bleed the hydraulic lines of air.

   If the pump shaft turns and gets stuck at a particular degree of rotation there is debris in the impeller. Continuing to rotate the pump shaft back-and-forth may dislodge the debris in the impeller. If rotating the pump shaft back-and-forth does not free the shaft the pump assembly must be removed from the tank and the impeller cleaned.

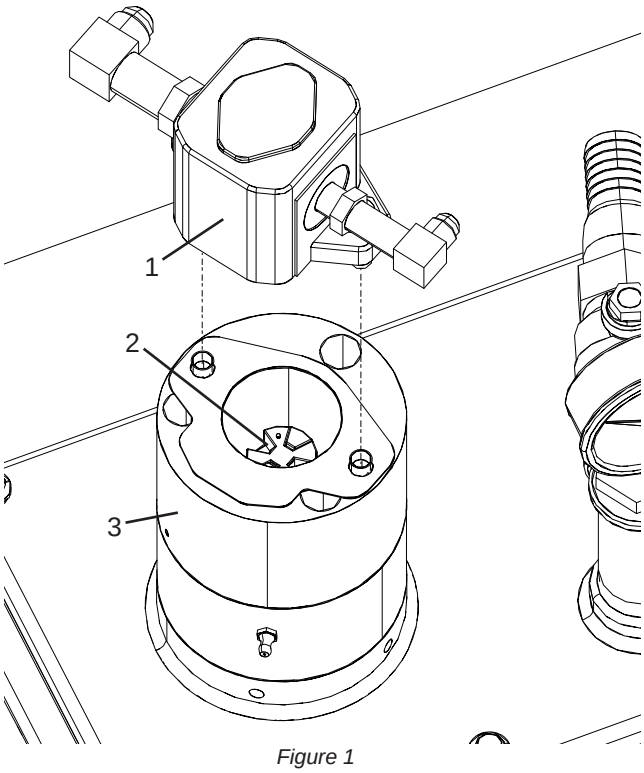


Figure 1

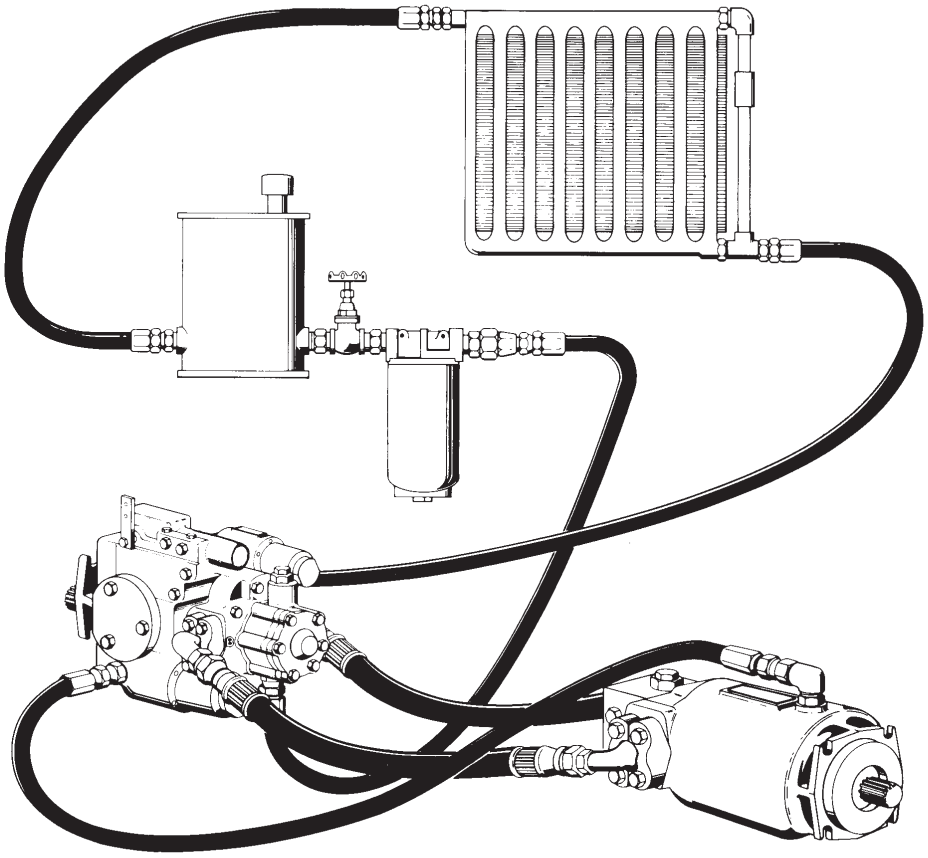
5.0 Eaton Hydrostatic Service Bulletins

5.1 Start-Up Procedure #2-402

Eaton
Hydraulics
Division

Start-up Procedure

Eaton Hydrostatic Transmissions Models 33 thru 76



EATON

System Records

Type of Hydraulic Fluid Used: _____

Amount of Fluid Used: _____

Models Used: **A** Pumps: 1 _____
2 _____
3 _____
B Motors: 1 _____
2 _____
3 _____

Inlet Vacuum: At Start-Up: _____
At Temperature: _____

Case Pressure: At Start-Up: _____
At Temperature: _____

Charge Pressures: A Pump: 1 _____
2 _____
3 _____
B Motor: 1 _____
2 _____
3 _____

Notes: _____
_____
_____
_____
_____
_____
_____

Cleanliness is extremely important when you repair or replace a hydrostatic transmission. Clean the reservoir and all hoses and connecting lines before installing the unit. The filter and hydraulic fluid must also be replaced at this time.

The hydraulic fluid must meet ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2500 particles per milliliter greater than 5 µm and a maximum of 80 particles per milliliter greater than 15 µm. See the back page for fluid recommendations.

Initial Start-up Procedures

The initial start-up of the Eaton hydrostatic transmission is an easy, logical, step-by-step procedure and when followed will ensure satisfactory transmission life on both new or repaired units.

The following publications are also available for use with the start-up manual for complete servicing of the Eaton heavy duty hydrostatic transmissions.

Eaton Heavy Duty Hydrostatic Troubleshooting Info. . . . . No. 7-404
Eaton Hydrostatic Variable Pump Repair Manual . . . . . No. 7-603
Eaton Hydrostatic Fixed Motor Repair Manual . . . . . No. 7-122
Eaton Hydrostatic Variable Motor Repair Manual . . . . . No. 7-121

Pressure Readings

The pressures given in this manual are gauge pressures or delta pressures. A pressure gauge reads zero when connected to atmospheric pressure. Any reading above or below this zero point is referred to as gauge pressure (PSI). Delta pressure is the difference of two gauge pressures in a hydraulic circuit. For example:

Charge Pressure of 240 PSI
minus Case Pressure of 20 PSI

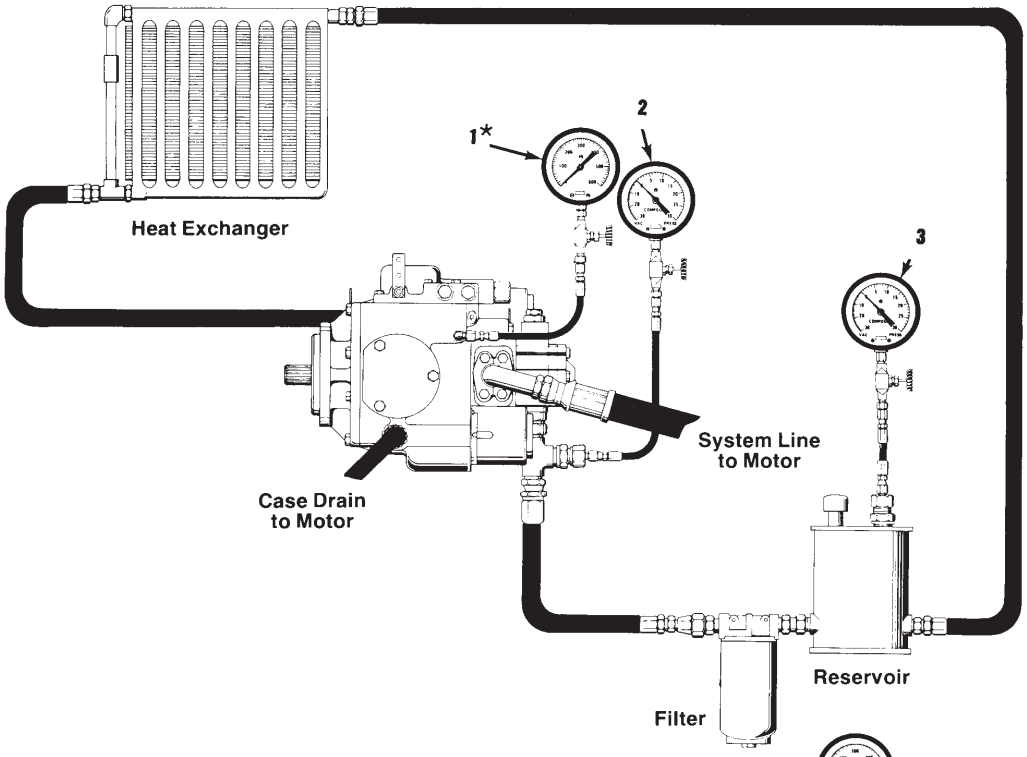
equals Differential Pressure of 220 △ PSI

Hydrostatic circuits typically include high pressure, low or charge pressure, case pressure and inlet pressure. These pressures will vary per application and operating conditions.

Nominal Operating Pressures (At Normal Operating Temperature)

Inlet Vacuum	Should not exceed 10 in.Hg (inches mercury) for an extended period of time	
Case Pressure	Should not exceed 40 PSI for an extended period of time	
Charge Pressure*	Neutral	220 PSI
	Forward or Reverse	160 PSI

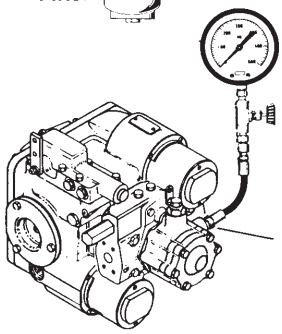
*Charge pressure relief valves are factory preset to their nominal setting with a 2 GPM flow rate. The original valve pressure setting will increase approximately 6.5 PSI per 1 GPM additional flow over the valve. The charge pressures given above are typical. Higher charge pressures may be set at the factory for your particular application.

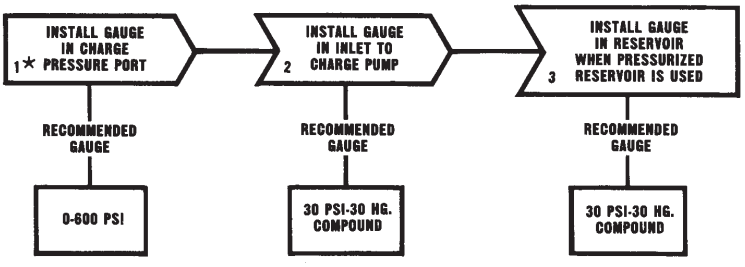


For easy gauging and start-up procedures, follow the simple action steps shown in the following box diagrams.

Following the logical box diagrams (page7) are comments corresponding with the number shown in the box diagrams.

When installing gauges for start-up, care must be taken to keep the system clean. Cleanliness will ensure continuous and satisfactory transmission life by preventing contamination of the system.





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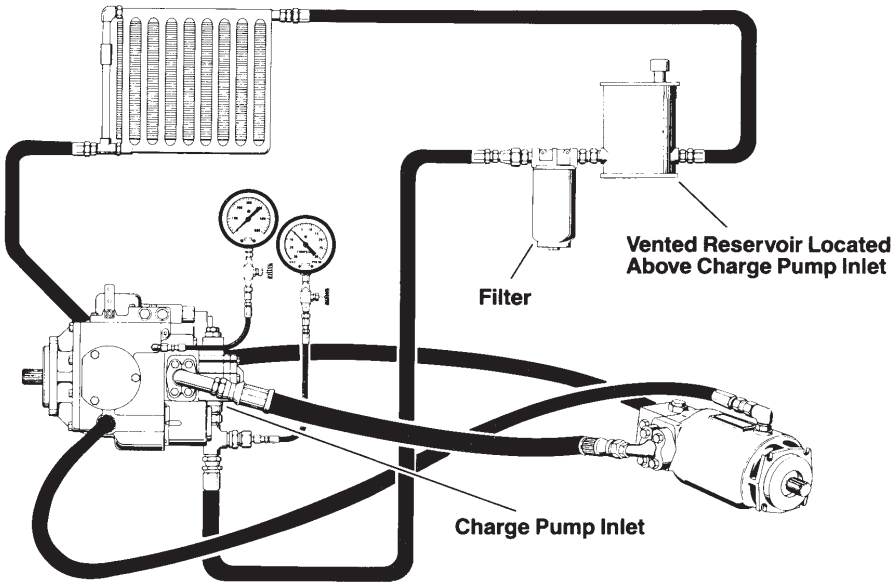

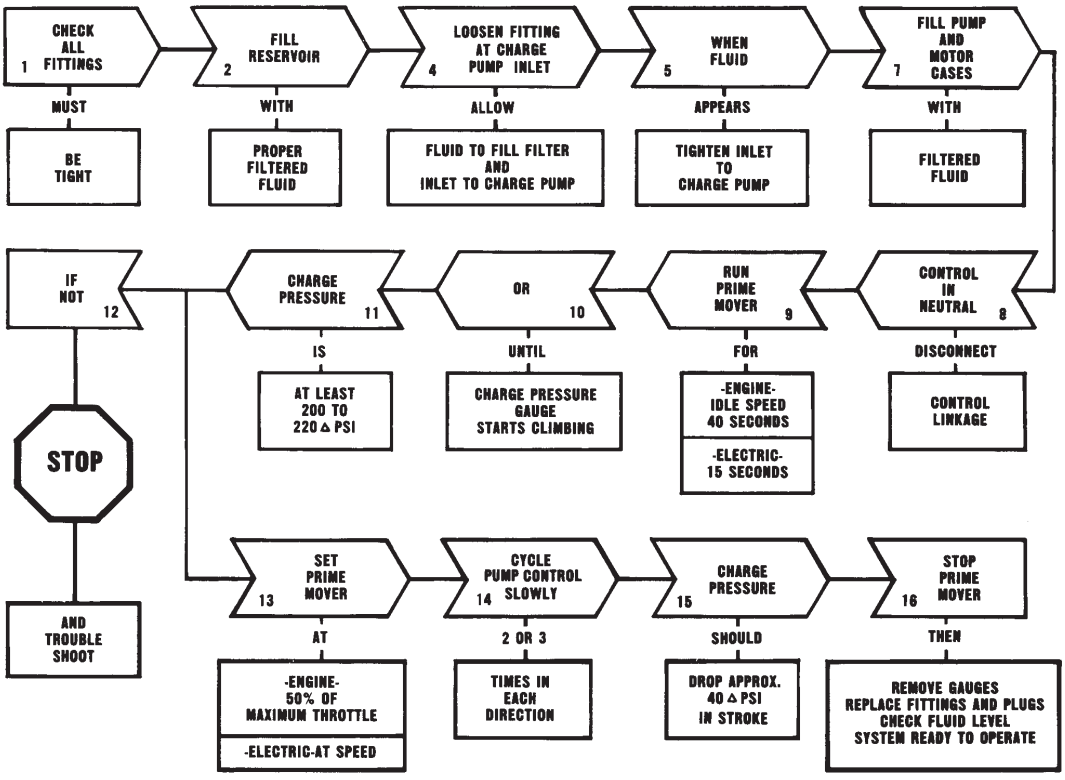

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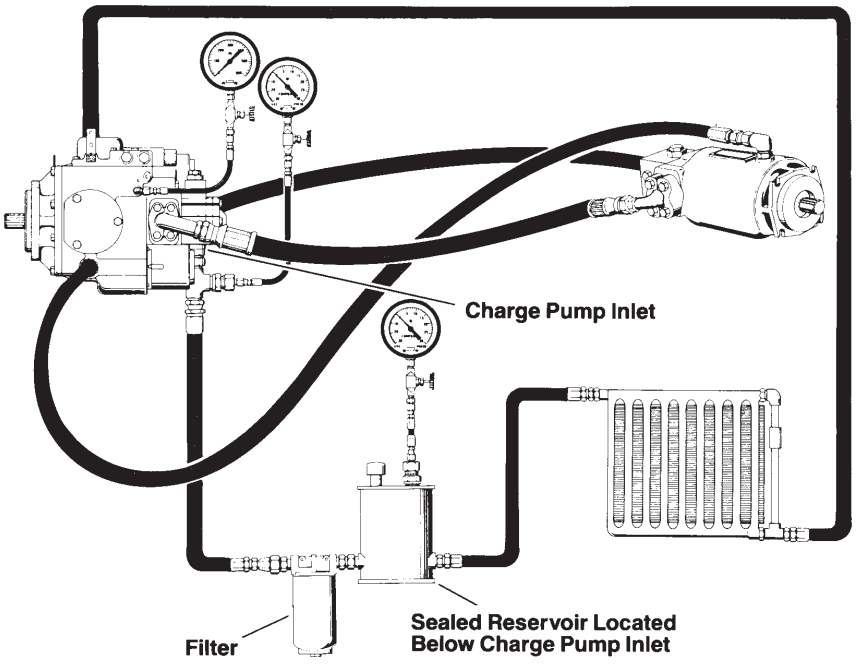

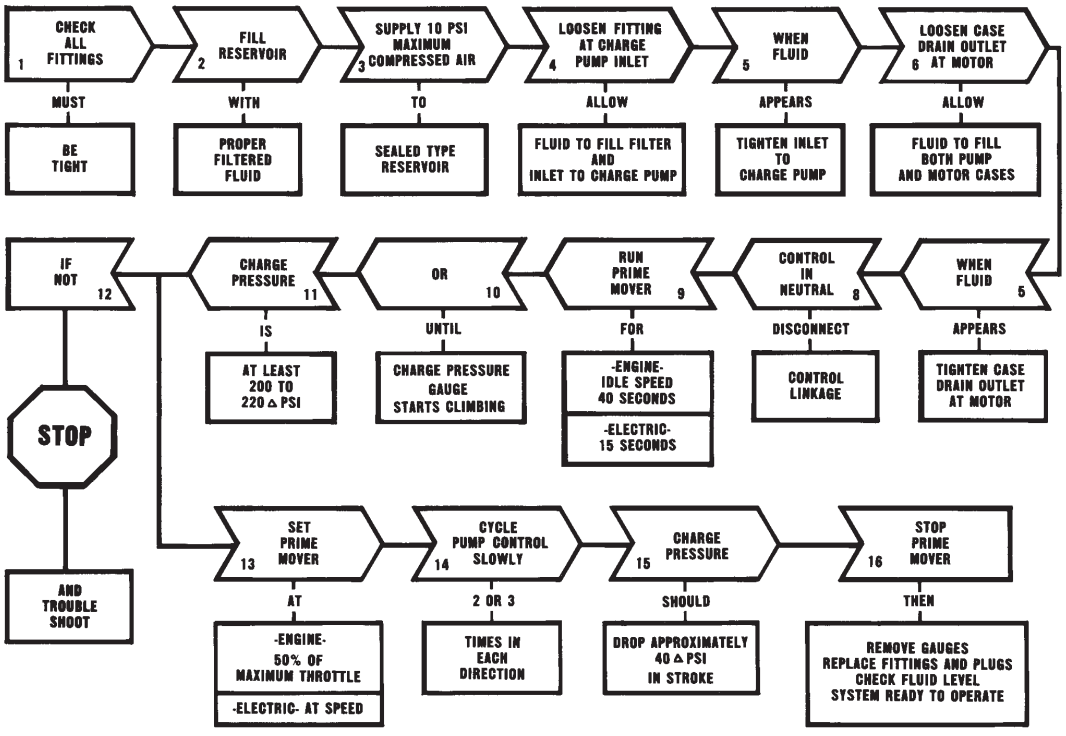

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Diagram Action Step Comments

1 **Check All Fittings** on hose and tube connections. Make sure they are tight to prevent fluid leakage and keep air from entering the system.

2 **Fill Reservoir** with the proper fluid. Consult Owner/Operator's Manual for proper fluid type and level. For alternate fluids, see back page of this manual for fluid recommendations. When a sealed reservoir is located above the charge pump inlet, it is recommended that you leave the filter cap off during start-up. This allows any entrapped air to exit the system.

3 **Supply 10 PSI Maximum Compressed Air** to a reservoir that is located below the charge pump inlet. This will push or force the hydraulic fluid into the system.

4 **Loosen fitting at Charge Pump Inlet,** using gravity or air pressure to force fluid into filter inlet and charge pump inlet.

5 **When Fluid** appears at the charge pump inlet and motor case drain outlet, tighten the connection.

6 **Loosen Case Drain Connection at Motor** to bleed the system of any entrapped air. This allows the pump and motor cases to fill with fluid for instant lubrication at start-up.

7 **Fill Pump and Motor Cases** through the uppermost case drain ports. This gives both units instant lubrication at start-up.

8 Placing the Pump **Control in Neutral** at start-up is essential to prevent any unexpected machine movement. The recommended method is to disconnect the external control linkage.

9 **Run Prime Mover** (engine) for a short period of time using the starter. This allows the charge pump to start filling the system. Start the engine and run at *idle* speed. Shut the engine down within 40 seconds if the charge pressure does not increase steadily to approximately 200 to 220 PSI.

When the prime mover is electric, jog the start-stop switch for a short period of time, allowing the charge pump to start filling the system. Start the electric motor. Shut the motor off within 15 seconds if the charge pressure does not increase steadily to approximately 200 to 220 PSI.

10 **Or** run the prime mover until the charge pressure gauge starts climbing steadily, showing the system is filling. If the charge pressure gauge does not move, stop the prime mover and recheck installation.

11 **Charge Pressure** should be steady at approximately 200 to 220 PSI. This indicates the system is full.

12 **If Not** at this pressure, stop the prime mover and troubleshoot the installation and system. For further assistance in troubleshooting, consult the Heavy Duty Hydrostatic Transmission Troubleshooting Information 7-404.

13 **Set Prime Mover** at approximately 50 percent of maximum throttle for a few minutes (when an engine is used as the prime mover). This will purge any remaining trapped air from the system. When an electric motor is used as the prime mover, run at speed for a few minutes to purge trapped air from the system.

14 **Cycle Pump Control Slowly** by hand with or without the control linkage. When reconnecting the control linkage, stop the prime mover to adjust the control linkage to the control handle. Restart the prime mover and actuate the pump stroke control two or three times in each direction to purge any trapped air from the system.

Caution: When cycling the pump control, motor output rotation will occur.

15 **Charge Pressure** should drop approximately 40 to 80 PSI when the pump control is actuated. This occurs because the shuttle valve, located in the motor valve block, has shifted and activated the motor charge pressure relief valve. The motor charge pressure relief valve has a lower pressure relief setting. The result is diversion of excess charge pump flow to the motor case where it is used for system cooling.

16 **Stop Prime Mover** and remove all gauges used at start-up. Replace the fittings and plugs. Recheck the reservoir fluid level and add fluid if necessary. Replace the reservoir cap. Replace the control linkage if not previously done.

System is now ready to operate.

7

Hydrostatic Fluid Recommendations

A reputable supplier can help you make the best selection of hydraulic fluid for use in Eaton hydrostatic products.

For satisfactory operation, the following recommendations apply:

1. The filter system used in the hydraulic circuit should be capable of cleaning and maintaining the hydraulic fluid to meet ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2500 particles per milliliter greater than 5 μm and a maximum of 80 particles per milliliter greater than 15 μm.
2. At normal operating temperatures, optimum viscosity ranges are from 80-180 SUS (16-39 cSt). Viscosity should never fall below 60 SUS (10 cSt) and, at the lowest expected start-up temperature, should not exceed 10,000 SUS (2158 cSt).
3. The fluid should be chemically stable, incorporating rust and oxidation inhibitors.

   Specific types of fluid meeting these requirements are:

   - Premium hydraulic oil
   - Engine crankcase oil–SAE 10w, SAE 20w-20, SAE 30
   - Automatic transmission oil
   - Hydraulic transmission oil
   - Synthetic fire resistant fluid–

     Quintolubric 822-220, -300 or -450
     Quaker Chemical Co.
     Conshohocken, PA 19428

     Cosmolubric HF-122, -130, -144 or -1530
     E.F. Houghton & Co.
     Valley Forge, PA

     Milisafe Code 1274 (280 Series) 280-150, -300 or -500
     Future Trend Industries
     Cottage Grove, MN 55016

Note: If the natural color of the fluid has become black or milky, it is possible that an overheating or water contaminant problem exists.

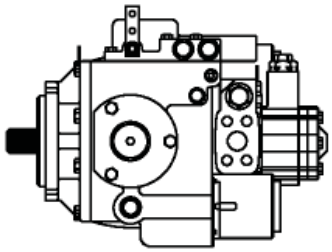
For accurate level readings, take readings when the fluid is cold.

5.2 Troubleshooting Information
#7-404

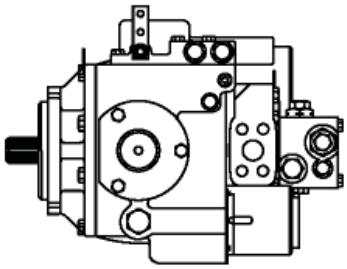
Eaton®
Heavy Duty Hydrostatic Transmissions

No. 7-404
July, 1995

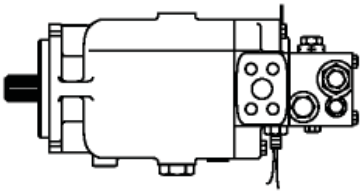
Variable Displacement Pump



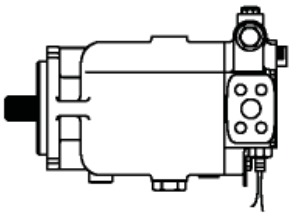
Variable Displacement Motor



Fixed Displacement Motor



Fixed Displacement Motor
(With Integral Shuttle)



Troubleshooting Guide for Eaton Hydrostatic Transmissions

Contents

Introduction

This manual provides troubleshooting information for a typical hydrostatic system. It will help you to diagnose minor problems that may occur with Eaton Heavy Duty Hydrostatic Transmissions.

The following publications are also available for Eaton Heavy Duty Hydrostatic Transmissions:

Technical Data for Hydrostatic Closed-Circuit Schematics ..... No. 3-403

Eaton Heavy Duty Hydrostatic Start-Up Procedure ..... No. 2-402

Eaton Hydrostatic Variable Pump Repair Manual (Series 0) ..... No. 7-603

Eaton Hydrostatic Variable Pump Repair Manual (Series 1) ..... No. 7-606

Eaton Hydrostatic Fixed Pump Repair Manual (Series 0) ..... No. 7-122

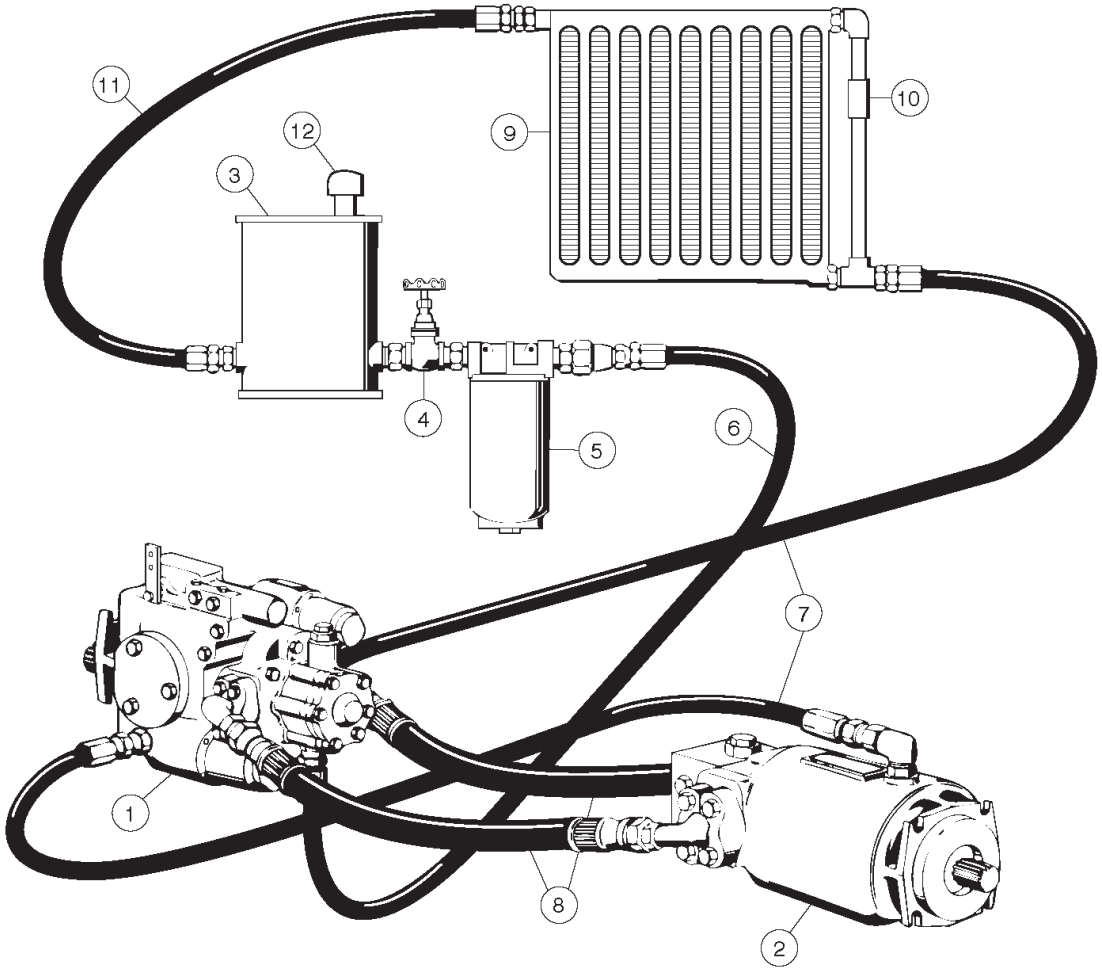
Eaton Hydrostatic Fixed Pump Repair Manual (Series 1) ..... No. 7-127

Eaton Hydrostatic Variable Motor Repair Manual (Series 0) ..... No. 7-121

Eaton Hydrostatic Variable Motor Repair Manual (Series 1) ..... No. 7-140

Typical Hydrostatic System

Variable Pump-Fixed Motor

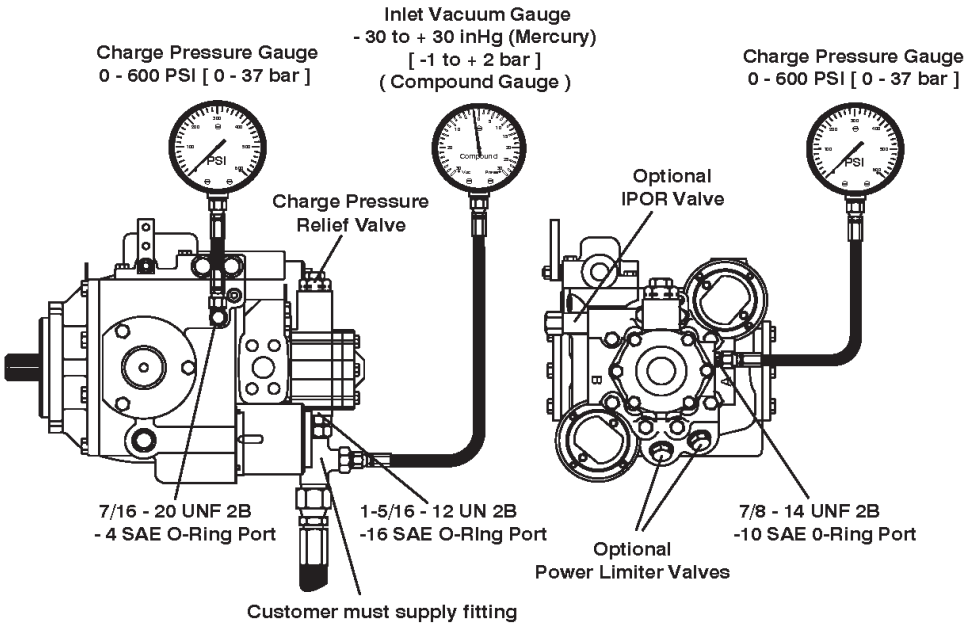


1 Variable Displacement Pump
2 Fixed or Variable Displacement Motor
3 Reservoir
4 Shut-off Valve (Optional)
5 Filter
6 Charge Pump Inlet Line
7 Pump and Motor Case Drain Lines
8 High Pressure Lines
9 Heat Exchanger
10 Heat Exchanger By-pass Valve
11 Reservoir Return Line
12 Reservoir fill Cap and Breather

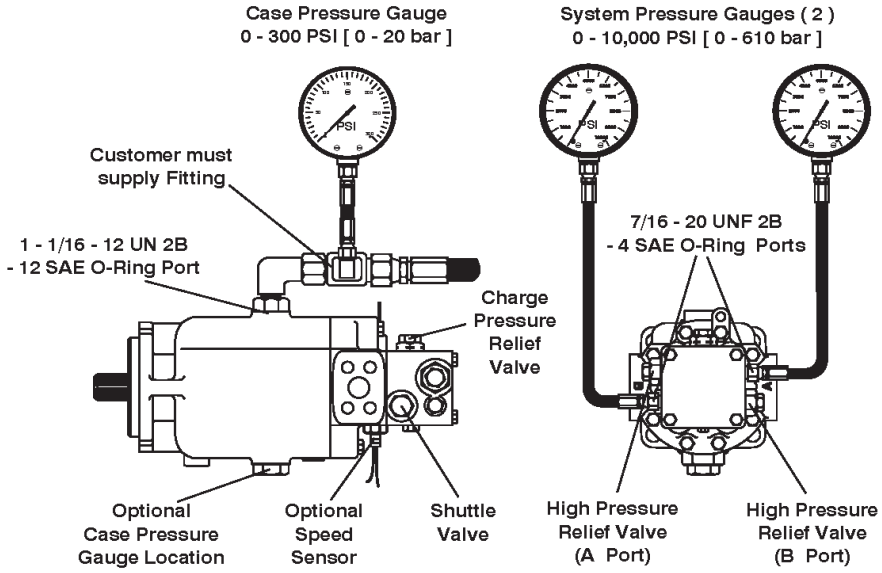
3

Gauge Requirements, Gauge Port Size and Locations

Variable Displacement Pumps



Fixed Displacement Motors



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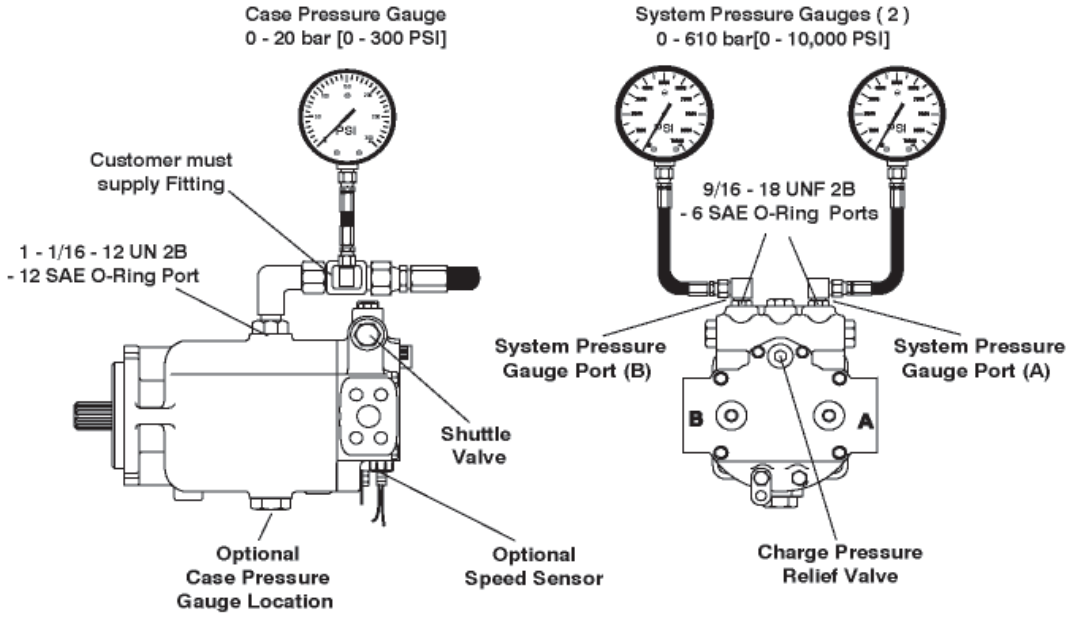
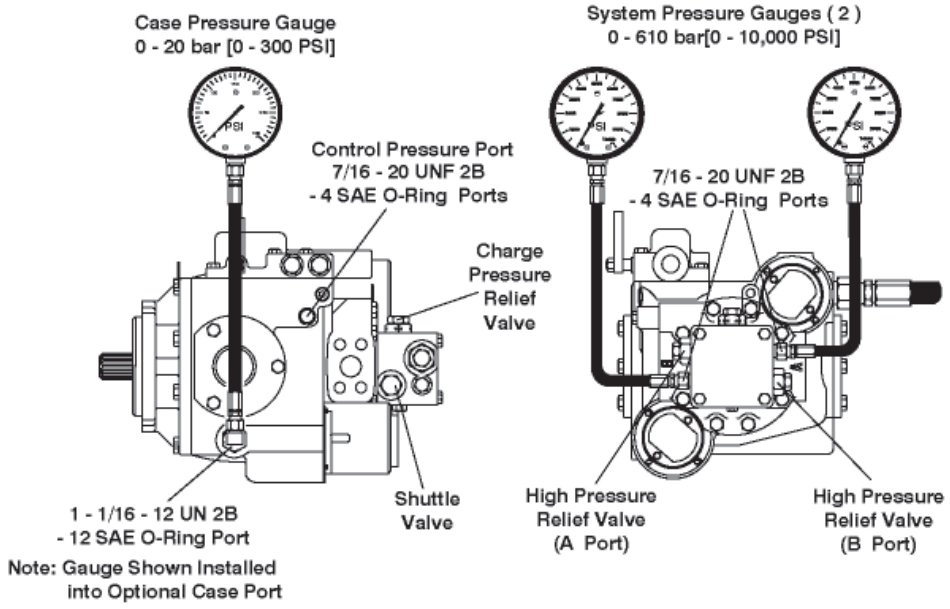
EATON

Gauge Requirements, Gauge Port Size and Locations

Fixed Displacement Motors
(with Integral Shuttle)



Variable Displacement Motors



Note: To protect your instrumentation, all gauges should be dampened (or snubbed) and mounted with flexible lines.

5

5

Pressure Readings

The pressures given in this manual are gauge pressures or delta pressures. A pressure gauge reads zero when connected to atmospheric pressure. Any reading above or below this zero point is referred to as gauge pressure (bar [PSI]). Delta pressure is the difference of two gauge pressures in a hydraulic circuit.

Example:

Charge pressure reading of 16,5 bar [240 PSI]
- Case pressure reading of 1,5 bar [20 PSI]
Differential pressure of 15,0 D bar [220 D PSI]

Typical hydrostatic circuits usually include a inlet pressure, case pressure, low or charge pressure and system or high pressure. These pressures will vary per each individual application and operating conditions.

Nominal Operating Pressures

(At Normal Operating Temperature)

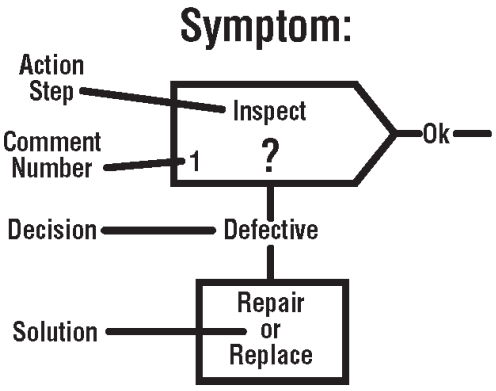
Inlet Vacuum:	Should not exceed 254 mm [10 in.] mercury (Hg.) for an extended period of time	
Case pressure:	Should not exceed 2,8 bar [40 PSI] for an extended period of time	
Charge Pressure:*	Neutral	15,2 bar [220 PSI]
	Forward or Reverse	11,0 bar [160 PSI]

*Charge Pressure Relief valves are factory preset to their nominal setting with a 7,6 l/min [2 GPM] flow rate. The original valve pressure will increase approximately ,45 bar per 3,8 l/min [6.5 PSI per 1 GPM] additional flow over the valve. The charge pressures given above are typical. Higher charge pressures may be set at the factory for your particular application.

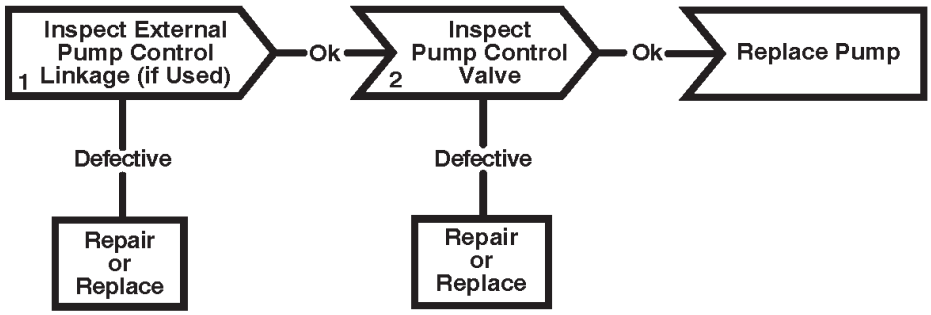
Fault-Logic Troubleshooting

This guide is designed as a diagnostic aid for the user to locate possible transmission problems. Match the transmission symptoms with the problem statements and follow the action steps shown in the box diagrams. This will help in correcting minor problems, eliminating unnecessary mixer down time.

Following the fault-logic diagrams are diagram action comments to further help explain the action steps shown in the diagrams. Where applicable, the action comment number of the statement appears in the action block of the diagram.



Neutral Difficult or Impossible to Find



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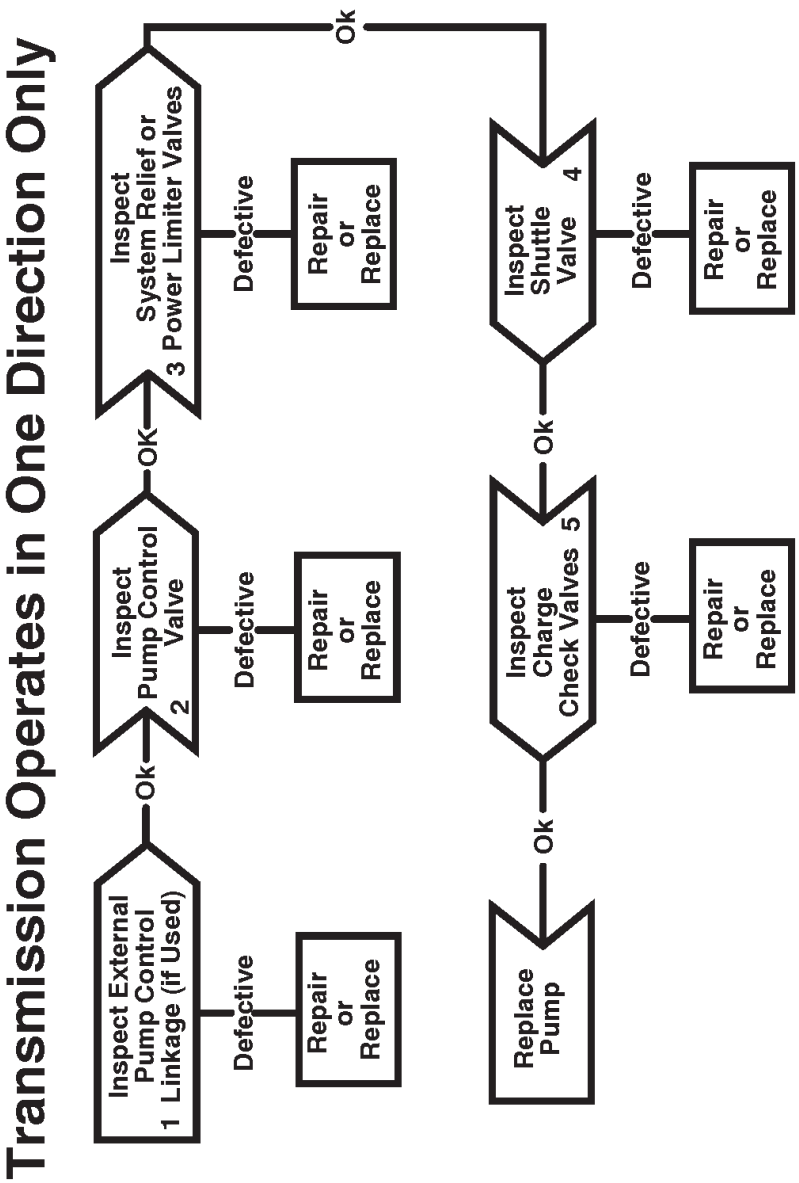

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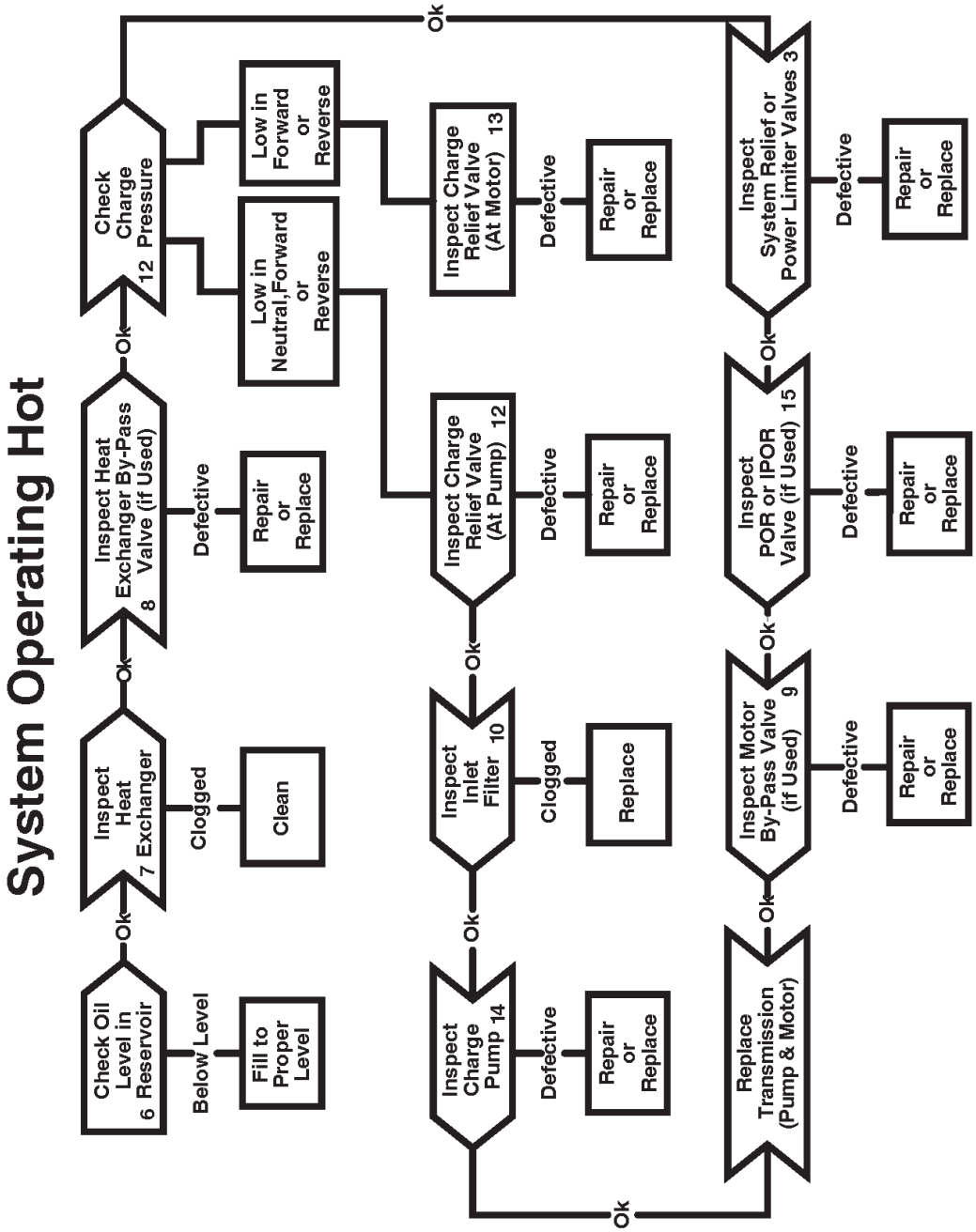

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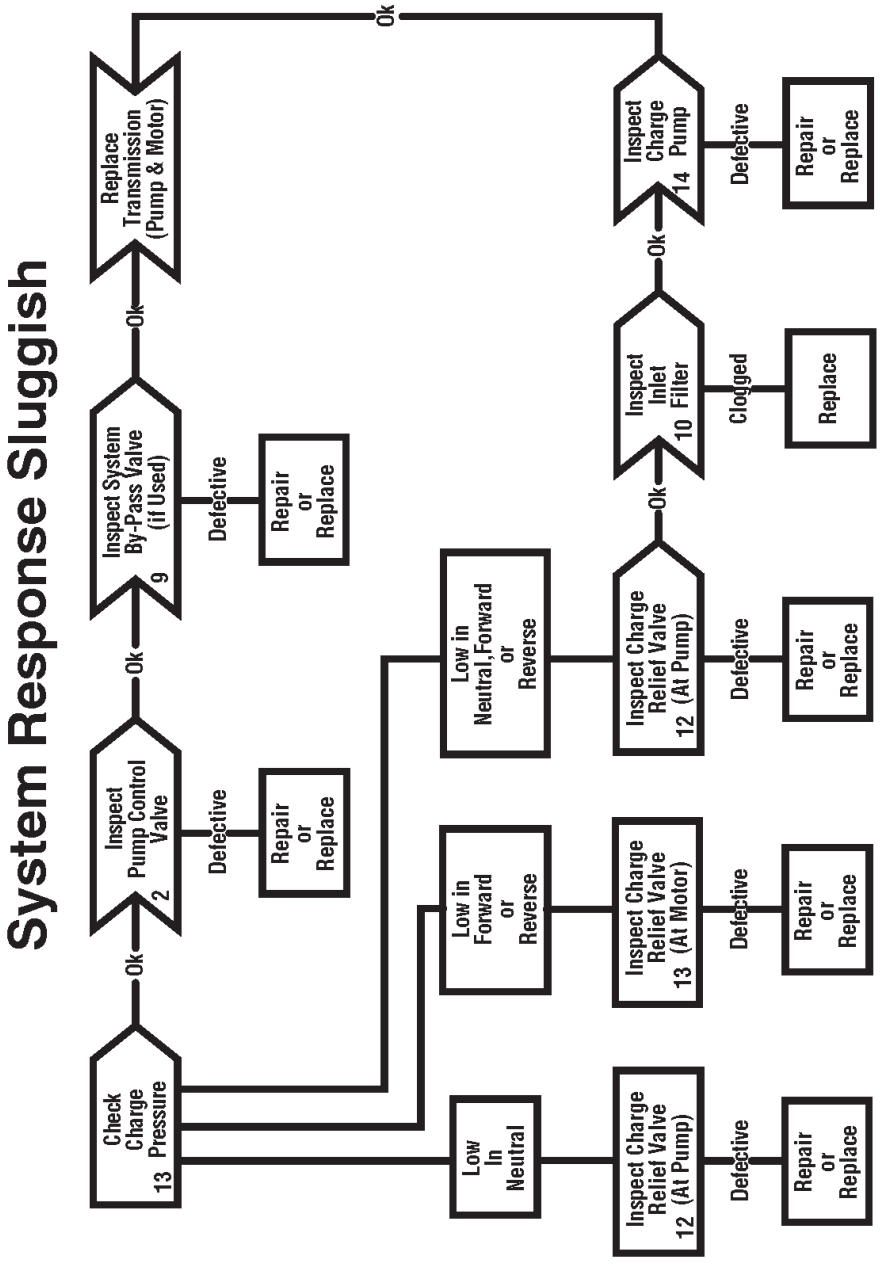

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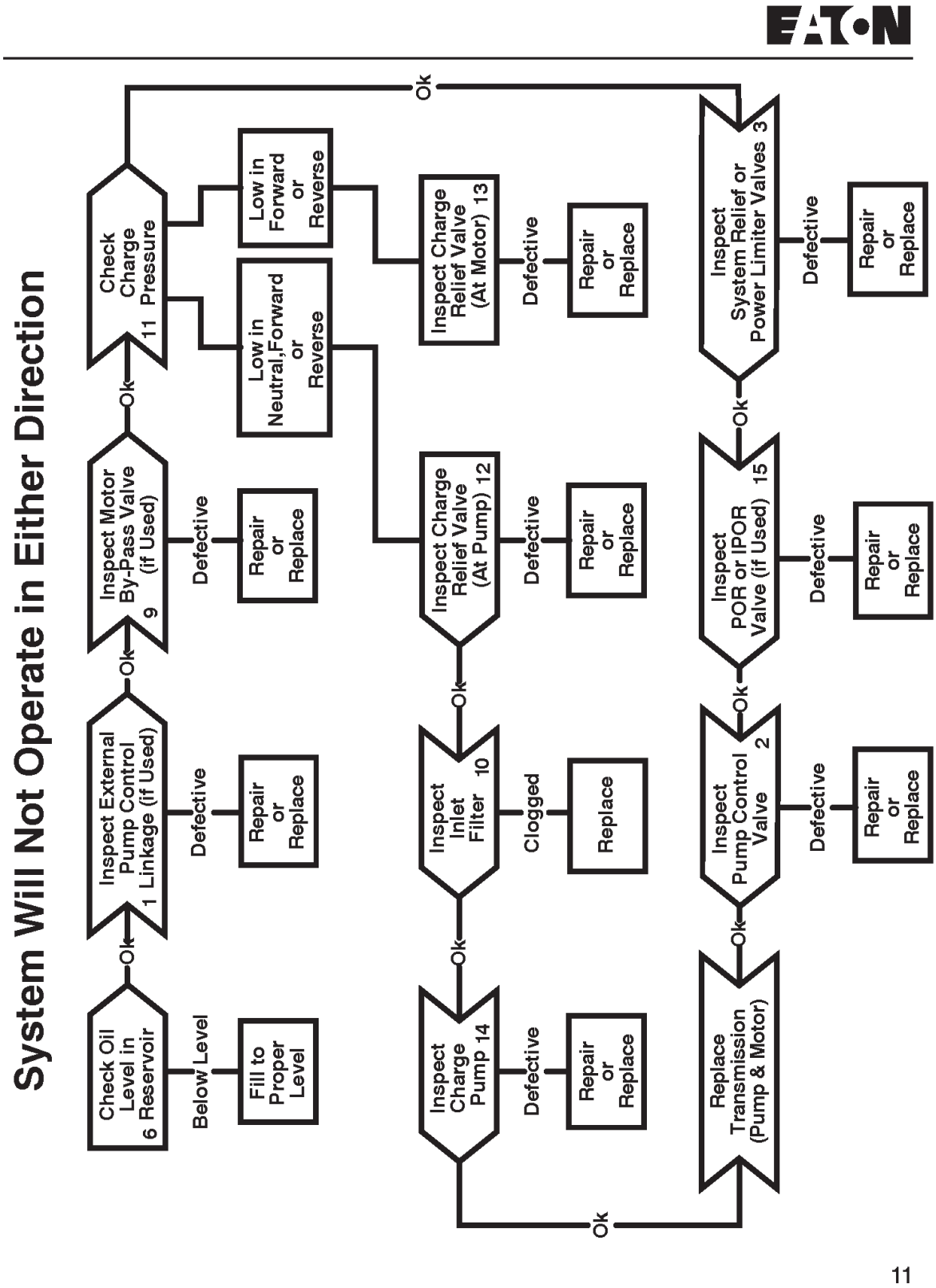

Diagram Action Step Comments

1. Inspect External Pump Control Linkage for:
   (Manual Operated Controls)
   A. Misadjusted or disconnected
   B. Binding, bent or broken

   (Hydraulic Remote Controls)
   A. Improper pilot pressure
   B. Defective proportional valve
   (See proportional valve manual for repairs.)

   (Electrical Operated Controls)
   A. Disconnected electrical signal connection

2. Inspect Pump Control Valve for:
   (Manual Operated Controls)
   A. Plugged control orifice
   B. Damaged mounting gasket
   C. Misadjusted, damaged or broken neutral return spring
   D. Broken control connector pin
   E. Broken or missing control linkage pin(s)
   F. Galled, stuck or bent control spool

   (Hydraulic Remote Controls)
   A. Plugged control orifice
   B. Damaged mounting gasket
   C. Misadjusted, damaged or broken neutral return spring (2)
   D. Broken control connector pin
   E. Broken or missing control linkage pin(s)
   F. Galled, stuck or bent control spool

   (Electrical Operated Controls)
   A. Plugged control orifice
   B. Damaged mounting gasket
   C. Galled, stuck or bent control spool
   D. Stuck solenoid valve(s)
   E. Defective solenoid coil(s)
   F. Misadjusted speed sensor (when used)
   G. Defective speed sensor (when used)
   H. Defective electronics module
   NOTE: When the electronic transit mixer control is used, follow the control box fault dector instructions.

3. Inspect System Relief or Power Limiter Valves for:
   (System Relief Valves)
   A. Improper pressure relief setting
   (Consult owners/operator manual for system relief valve settings)
   B. Damaged or missing O-ring and/or back-up ring(s)
   C. Plugged orifice
   D. Piston galled or stuck
   E. Valve poppet held off seat

   (Power Limiter Valves)
   A. Improper pressure relief setting
   (Consult owners/operator manual for power limiter valve setting.)
   B. Broken spring
   C. Valve held off seat

4. Inspect Shuttle Valve for:
   A. Bent or broken return centering spring
   B. Galled or stuck shuttle spool
   C. Bent or broken shuttle spool

5. Inspect Charge Check Valves for:
   A. Damaged or missing O-ring and/or back-up ring(s)
   B. Damaged check ball seat
   C. Stuck check ball

6. Check Oil Level in Reservoir:
   A. Consult owner/operators manual for the proper type fluid and level.

7. Inspect Heat Exchanger for:
   A. Obstructed air flow (air cooled)
   B. Obstructed water flow (water cooled)
   C. Improper Plumbing (inlet to outlet)
   D. Obstructed or insufficient fluid flow
   E. Cooling fan failure (if used)

8. Inspect Heat Exchanger By-Pass Valve for:
   A. Improper pressure setting
   B. Stuck or broken valve

9. Inspect Motor By-Pass Valve for:
   A. Valve held in partial and/or open position

10. Inspect Inlet Filter for:
    A. Plugged or clogged filter
    B. Obstructed inlet or outlet
    C. Collapsed inlet line to charge pump
C. Open inlet to charge pump

11. *Check Charge Pressure:
    A. Consult page 4 in this manual for charge pressure gauge installation location.
    B. Consult owner/operators manual for charge relief valve settings.

12. *Inspect Charge Relief Valve for:
    (at Pump)
    A. Improper charge relief pressure setting
    B. Plugged Orifice
    C. Piston galled or stuck open and/or closed
    D. Damaged or missing O-ring
    E. Valve poppet held off seat

13. *Inspect Charge Relief Valve for:
    (at Motor)
    A. Improper charge relief pressure setting
    B. Plugged Orifice
    C. Piston galled or stuck open and/or closed
    D. Damaged or missing O-ring
    E. Valve poppet held off seat

14. Inspect Charge Pump for:
    (Standard and A-Pad Pumps)
    A. Broken drive tang
    B. Damaged or missing o-ring(s)
    C. Broken drive key
    D. Galled or broken gerotor set

    (B-Pad Pumps)
    A. Stripped or broken drive coupling
    B. Stripped or broken drive spline
    C. Damaged or missing o-ring(s)
    D. Broken drive key
    E. Galled or broken gerotor set

15. Inspect POR or IPOR for:
    (POR, Pressure Override)
    A. Plugged orifice
    B. Misadjustment of maximum pressure setting
    C. Stuck or missing check ball
    D. Stuck or broken sensing pin
    E. Stuck or broken control spool
    F. Obstructed or broken sensing line

    (IPOR, Internal Pressure Override)
    A. Plugged orifice
    B. Misadjustment of maximum pressure setting
    C. Load sensing pins reversed
    D. Stuck or broken sensing pin
    E. Stuck or broken control spool

Diagram Action Step Comments

*System / Charge Relief Valve Pressure Setting Identification

The system and charge pressure relief valves are all factory preset. For identification, a pressure code is stamped on the hex plug located on the end of the system and charge pressure valve cartridges.

This same code is also used on the power limiter valves. The code number is stamped on the end of the valve cartridge. (Power limiter valves must be removed to view pressure code.) To determine the pressure setting of each valve, add a zero to the right of the stamped coded number.

Charge Pressure Valve Examples

016 = 11,0 bar [160 PSI] Setting
022 = 15,2 bar [220 PSI] Setting

System and Power Limiter Valve Pressure Examples

400 = 275 bar [4000 PSI] Setting
500 = 345 bar [5000 PSI] Setting

Hydraulic Fluid Recommendations

Introduction

The ability of Eaton hydraulic components to provide desired performance and life expectancy depends largely on the fluid used. The purpose of this document is to provide readers with the knowledge required to select the appropriate fluids for use in systems that employ Eaton hydraulic components.

One of the most important characteristic to consider when choosing a fluid to be used in a hydraulic system is **viscosity.** Viscosity choice is always a compromise; the fluid must be thin enough to flow easily but thick enough to seal and maintain a lubricating film between bearing and sealing surfaces. Viscosity requirements for each of Eaton's product lines are given on the back of this document.

Viscosity and Temperature

Fluid temperature affects viscosity. In general, as the fluid warms it gets thinner and its viscosity decreases. The opposite is true when fluid cools. When choosing a fluid, it is important to consider the start-up and operating temperatures of the hydraulic system . Generally, the fluid is thick when the hydraulic system is started. With movement, the fluid warms to a point where a cooling system begins to operate. From then on, the fluid is maintained at the temperature for which the hydraulic system was designed. In actual applications this sequence varies; hydraulic systems are used in many environments from very cold to very hot. Cooling systems also vary from very elaborate to very simple, so ambient temperature may affect operating temperature. Equipment manufacturers who use Eaton hydraulic components in their products should anticipate temperature in their designs and make the appropriate fluid recommendations to their customers.

Cleanliness

Cleanliness of the fluid in a hydraulic system is extremely important. Eaton recommends that the fluid used in its hydraulic components be maintained at ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2500 particles per milliliter greater than 5 µm and a maximum of 80 particles per milliliter greater than 15 µm. When components with different cleanliness requirements are used in the same system, the cleanest standard should be applied. OEM's and distributors who use Eaton hydraulic components in their products should provide for these requirements in their designs. A reputable filter supplier can supply filter information.

Fluid Maintenance

Maintaining correct fluid viscosity and cleanliness level is essential for all hydraulic systems. Since Eaton hydraulic components are used in a wide variety of applications it is impossible for Eaton to publish a fluid maintenance schedule that would cover every situation. Field testing and monitoring are the only ways to get accurate measurements of system cleanliness. OEM's and distributors who use Eaton hydraulic components should test and establish fluid maintenance schedules for their products. These maintenance schedules should be designed to meet the viscosity and cleanliness requirements laid out in this document.

Fluid Selection

Premium grade petroleum based hydraulic fluids will provide the best performance in Eaton hydraulic components. These fluids typically contain additives that are beneficial to hydraulic systems. Eaton recommends fluids that contain anti-wear agents, rust inhibitors, anti-foaming agents, and oxidation inhibitors. Premium grade petroleum based hydraulic fluids carry an ISO VG rating.

SAE grade crankcase oils may be used in systems that employ Eaton hydraulic components, but it should be noted that these oils may not contain all of the recommended additives. This means using crankcase oils may increase fluid maintenance requirements.

Hydraulic fluids that contain V.I. (viscosity index) improvers, sometimes called multi-viscosity oils, may be used in systems that employ Eaton hydraulic components. These V.I. improved fluids are known to "shear-down" with use. This means that their actual viscosity drops below the rated value. Fluid maintenance must be increased if V.I. improved fluids are used. Automotive automatic transmission fluids contain V.I. improvers.

Synthetic fluids may be used in Eaton hydraulic components. A reputable fluid supplier can provide information on synthetic fluids. Review applications that require the use of synthetic fluids with your Eaton representative.

Viscosity Requirements

Product Line	Minimum	Optimum Range	Maximum	ISO Cleanliness Requirements	Comments
Heavy Duty Piston Pumps and Motors	60 SUS [10 cSt]	80 - 180 SUS [16 - 39 cSt]	10,000 SUS [2158 cSt]	18/13	

Additional Notes:

- Fluids too thick to flow in cold weather start-ups will cause pump cavitation and possible damage. Motor cavitation is not a problem during cold start-ups, except for two speed motors. Thick oil can cause high case pressures which in turn can blow motor shaft seals.
- When choosing a hydraulic fluid, all the components in the system must be considered and the optimum viscosity range adjusted accordingly. For example, when a medium duty piston pump is combined with a Geroler motor the optimum viscosity range becomes 100 - 150 SUS [20 - 32 cSt] and viscosity should never fall below 70 SUS [13 cSt].
- If the natural color of the fluid has become black it is possible that an overheating problem exists.
- If the fluid becomes milky, water contamination may be a problem.
- Take fluid level reading when the system is cold.
- Contact your Eaton representative if you have specific questions about the fluid requirements of Eaton hydraulic components.

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Eden Prairie, MN 55344
Telephone 612/937-9800
Fax 612/937-7130

Eaton Ltd.
Hydraulics Division
Glenrothes, File
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Telephone 44/1-592-771-771
Fax 44/1-592-773-184

Quality System Certified
Products in this catalog are manufactured in an ISO-9001-certified site.

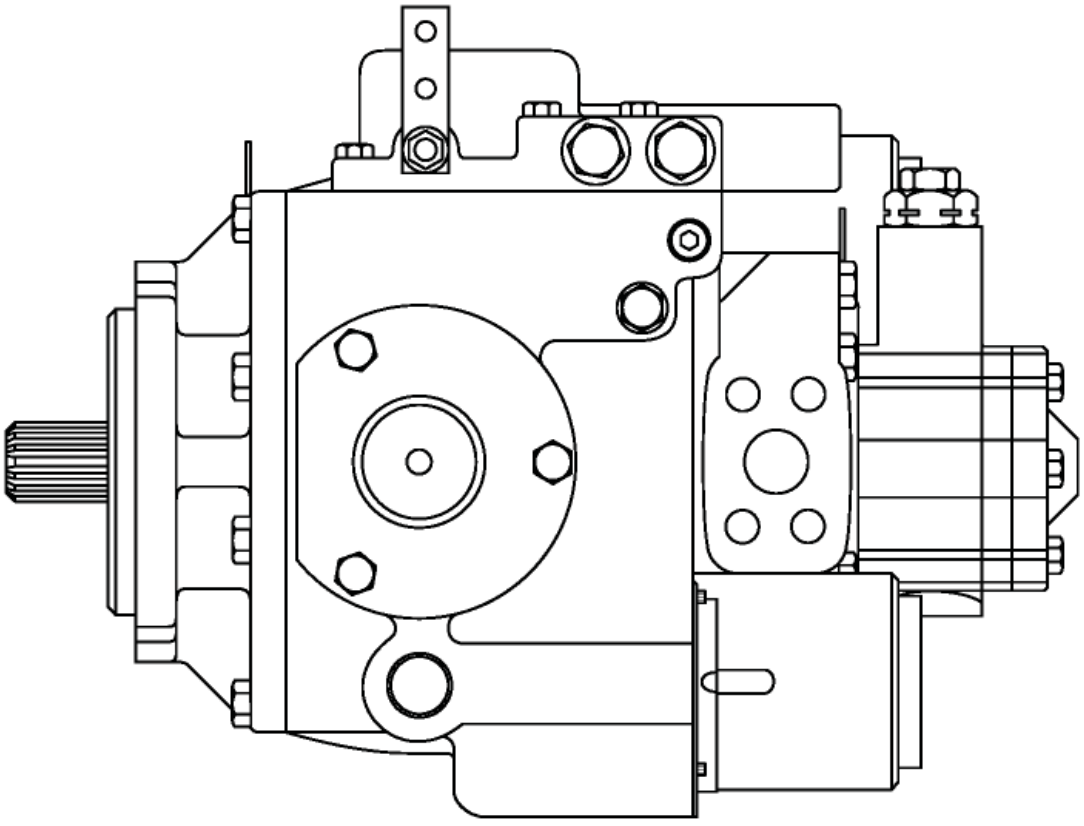
Form No. 7-404

5.3 Repair Information Series 1 Pumps #7-606

Eaton®
Hydrostatic Pumps

No. 7-606
March, 1995

Repair Information



Series 1 Models 33-64
Hydrostatic Variable Pumps

Table of Contents

Introduction

This manual provides service information for Eaton Models 33 thru 64 Variable Pumps. Step by step instructions for the complete disassembly, inspection and reassembly of the pump are given. The following recommendations should be followed to insure successful repairs:

- Most repairs require the removal of the pump from the vehicle.
- Cleanliness is extremely important.
- Clean the port areas thoroughly before disconnecting the hydraulic lines.
- Plug the pump ports and cover the open hydraulic lines immediately after they're disconnected.
- Drain the oil and clean the exterior of the pump before making repairs.
- Wash all metal parts in clean solvent.
- Use compressed air to dry the parts. Do not wipe them dry with paper towels or cloth; Lint in a hydraulic system will cause damage.
- The compressed air should be filtered and moisture free.
- Always use new seals when reassembling hydraulic pumps.
- For replacement parts and ordering information refer to parts list 6-608.
- Lubricate the new rubber seals with a petroleum jelly like Vaseline before installation.
- Torque all bolts over gasketed joints, then repeat the torquing sequence to make-up for gasket compression.
- **Verifying the accuracy of pump repairs on an authorized test stand is essential.**

ID Tag

A - Displacement (cu.in./rev.)
0033 = 3.3
0039 = 3.9
0046 = 4.6
0054 = 5.4
0064 = 6.4
0076 = 7.6

B - Identifies Type of Product
21 = Variable Displacement Pump
31 = Fixed Displacement Motor
41 = Variable Displacement Motor
61 = Tandem Variable Displacement Pumps

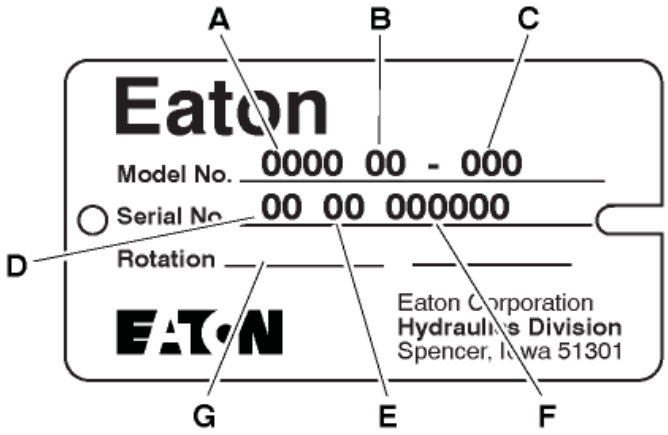
C - Identifies Specific Unit Configuration

D - Month of Manufacture

E - Year of Manufacture

F - Specific Serial Number of Unit

G - Identifies Direction of Input Shaft (Pumps Only) Rotation
Observed from Shaft End of Unit
CW = Clockwise
CCW = Counterclockwise



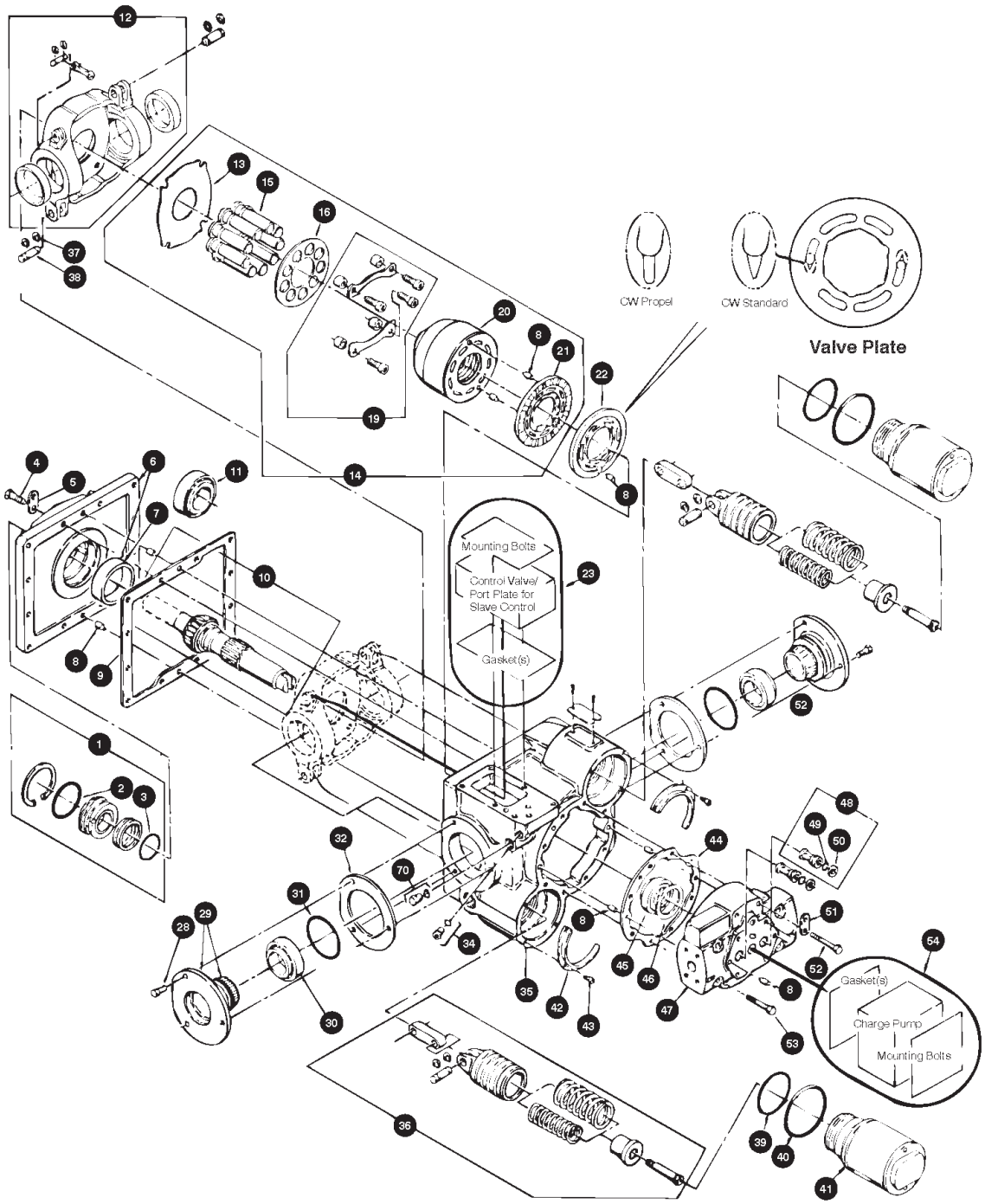
Required Tools

- 9/64 in. Hex Key
- 1/4 in. Hex Key
- 1/2 in. Socket
- 9/16 in. Socket
- 5/8 in. Socket
- 3/4 in. Socket
- 7/8 in. Socket
- 1 in. Socket
- 1-3/8 in. Socket
- Dial Indicator with Magnetic Base
- Spring Compression Scale (0-10 lbs)
- No. 5 or 7 Retaining Ring Pliers
- Small Pair of External Retaining Ring Pliers (45° or 90°)
- Adjustable joint Pliers
- 3 in.X 1/4-20 Bolt
- Breaker Bar or Ratchet Wrench
- Torque Wrench (200 lb-ft capacity)
- 18 to 20 in. Adjustable Wrench
- Shaft End Spacer (Special)
- Hammer (steel and Plastic)
- Depth Micrometer with Extensions
- Parallel Bars
- Slide Hammer
- Split Blade Bearing Puller
- Prick Punch
- Scribe
- Punch
- Arbor Press
- Clean, Lint Free Cloths
- Loctite
- Light Petroleum Jelly
- Suitable Solvents and Cleaners
- Rotating Seal Puller (Special)
- Low Clearance Bearing Puller (Special)
- Bearing Cone Driver (Special)
- Check Valve Puller (Special)

Special Tools are shown on pages 25 and 26.

3

Exploded View Drawing



4

Models 33 thru 64 Variable Pump Parts

Item No.	Description	Qty.
1	Shaft Seal Kit	1
2	O-ring	1
3	O-ring	1
4	Mounting Flange Bolt	12
5	Shipping Strap	2
6	Mounting Flange S/A	1
7	Bearing Cup	1
8	Dowel Pin	9
9	Mounting Flange Gasket	1
10	Drive Shaft S/A	1
11	Replacement Bearing Kit	♦
12	Swashplate S/A	1
13	Thrust Plate	1
14	Rotating Group	1
15	Piston and Slipper S/A	9
16	Slipper Retainer Plate	1
19	Retaining Strap and Bolts	2
20	Cylinder Barrel	1
21	Bearing Plate	1
22	Valve Plate	1
23	Control Valve Option	1
28	Trunnion Bolt	6
29	Trunnion S/A	2
30	Replacement Bearing Kit	♦

Item No.	Description	Qty.
31	O-ring	2
32	Trunnion Shims	♦
34	Plug and O-ring	1
35	Pump Housing	1
36	Servo Piston S/A	2
37	Retaining Ring	8
38	Pin	4
39	O-ring	2
40	O-ring	2
41	Servo Sleeve	2
42	Servo Sleeve Retainer	2
43	Cap Screw	6
44	End Cover Gasket	1
45	End Cover Bearing	1
46	Shaft Shims	♦
47	End Cover	1
48	Check Valve S/A	2
49	O-ring	2
50	Back-up Ring	2
52	End Cover Bolt	6
53	End Cover Bolt	2
54	Charge Pump	1
70	Plug and O-ring	1

♦ Parts used as required.

Hydrostatic Variable Pump Repairs

Disassembly

Due to the complexity of the heavy duty pump certain subassemblies are disassembled, inspected, and reassembled upon removal from the pump. This procedure insures repair accuracy and helps avoid the loss of small parts.

1 Clean the exterior of the pump and drain the oil.

2 Position the pump so the shaft seal is accessible.

Important: Cleanliness is extremely important; be sure that no contaminates get into the pump.

3 Using a retaining ring pliers remove the retaining ring.

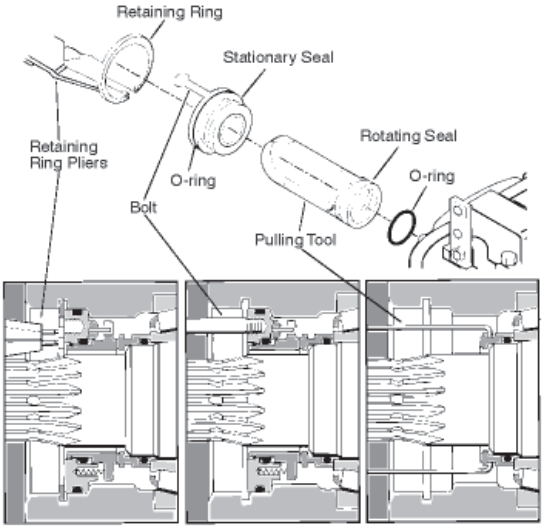


Figure 1

4 Screw a 3 in. X 1/4-20 bolt into the threaded hole in the stationary seal. Pull on the bolt to remove the seal.

5 Use the special pulling tool, Owatonna Tool Co. P/N CAS 1844, to remove the rotating seal, see figure 1. If the special tool is not available pull out the rotating seal with a wire bent to the shape of the puller.

Note: Detailed drawings of all special tools are given in Appendix E, in the back of this manual.

6 Remove the o-ring; it will either be in the rotating seal or on the shaft.

Note: If you are just replacing the shaft seal jump ahead to step 105 on page 20.

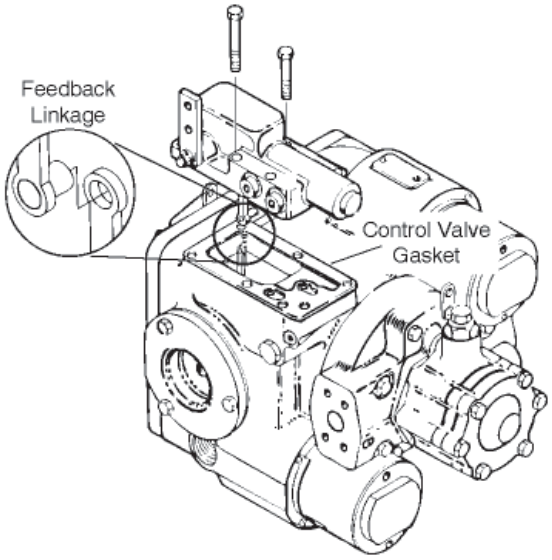


Figure 2

7 Remove the six hex head bolts that hold the control valve to the pump.

8 Lift the control valve away from the pump and disengage the feedback linkage, see figure 2.

9 Remove the control valve gasket.

10 Inspect the control valve: Start by thoroughly flushing the control valve with clean solvent. Then blow it dry with compressed air. Be sure to blow through all of the control valve's internal passages.

Inspect the control valve linkage. Move the control lever back and forth; it should move freely without binding. There should be no free play in the feedback link or control lever.

Check the control valve orifice; if it is plugged after flushing clean or replace it. Appendix C gives information on orifice replacement.

> **Important:** The control orifice may be installed in different locations depending on which pump control is used. If it is removed a new orifice must be installed in the same location.

6

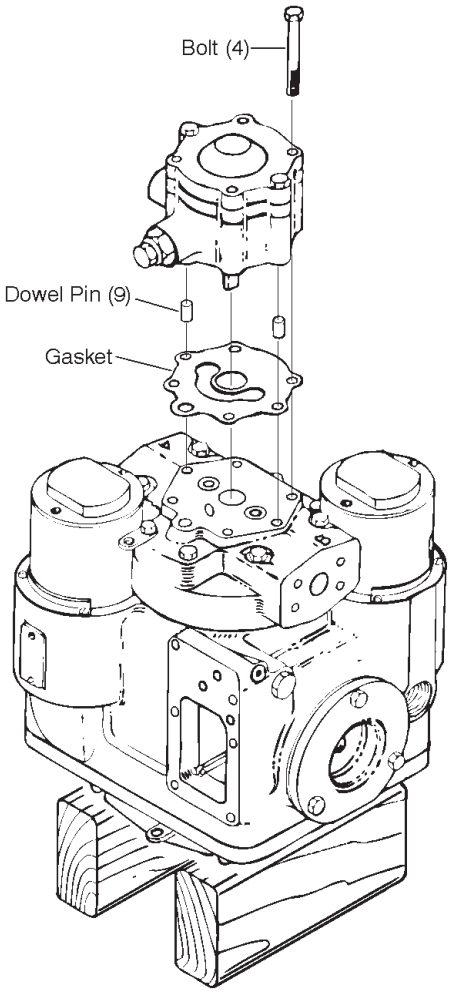


Figure 3

11 Reposition the pump so the shaft is vertical and the charge pump is on top. Stand the pump on two blocks of wood as shown in figure 3.

12 Remove the four bolts that hold the charge pump to the end cover, see figure 3. The two remaining bolts hold the charge pump together.

Note: Information on charge pump repair is given in Appendix D.

13 Lift the charge pump from the end cover. Remove the gasket and two dowel pins.

Note: Keep track of the dowel pins, see figures 3, 5, and 8. There is a total of nine dowel pins in the pump. It is a good idea to put them in a small box so they don't get lost.

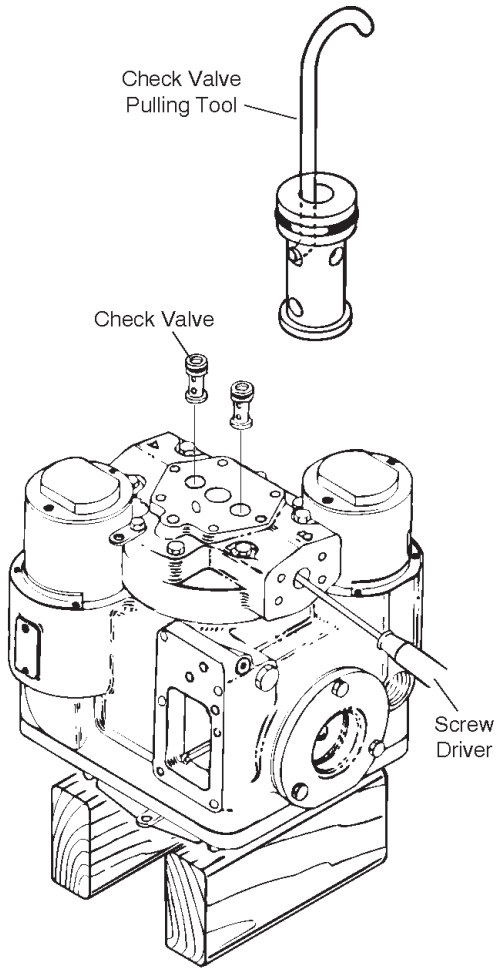


Figure 4

14 Pull the two check valves from the end cover; Hook the short end of the pulling tool in one of the check valve cross holes, see figure 4.

If the pulling tool is unavailable remove each check valve by inserting a screw driver into the output port and prying up on the bottom of the check valve.

Note: A detailed drawing of the check valve pulling tool in given in Appendix E.

15 Remove the o-rings and back-up rings from the check valves.

7

Hydrostatic Variable Pump Repairs

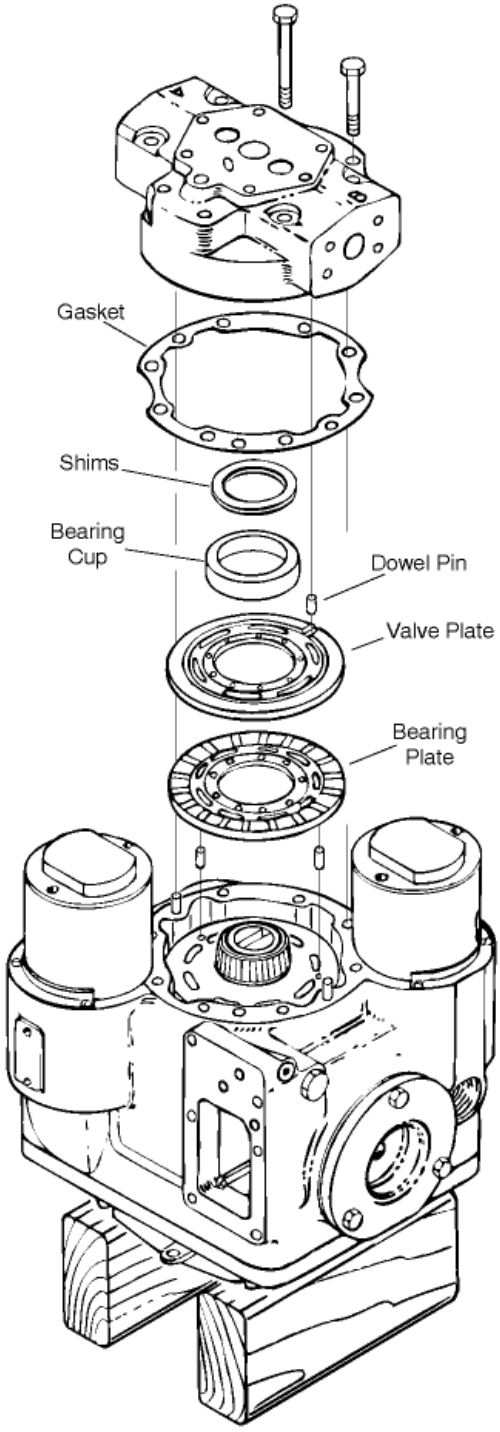


Figure 5

16 Remove the end cover.

Caution: The cylinder barrel spring pre-load will damage the pump's internal parts if the end cover is removed incorrectly.

Start by removing six of the eight bolts that hold the end cover to the pump. Leave two bolts that are directly across from each other tight.

Next, loosen the two remaining bolts one or two turns. The end cover should rise as the bolts are loosened. If it doesn't tap it with a plastic hammer to break the gasket seal.

After the gasket seal is broken loosen the bolts gradually and evenly until the cylinder barrel spring pre-load is relieved.

Remove the bolts and lift the end cover from the pump. Be careful; do not drop the valve plate, it may lift away with the end cover.

Important: Use care when handling the pump's internal parts. They are machined to extremely close tolerances.

17 Turn the end cover over and set it on a clean cloth.

Important: Always protect machined surfaces.

Note: The standard end cover is shown in figure 5. Two optional end covers are available. Use the same removal procedure for the optional end covers. Breakdowns of the optional end covers are shown in the appendices:

Optional End Cover	Appendix	Page
IPOR	A	21
Power Limiter Valve	B	22

18 Remove the valve plate and dowel pin; they will either be on the end cover or bearing plate.

Note: Pump valve plates are unidirectional and must be matched to the input direction of the pump. The metering slots indicate the valve plate's direction, see figure 6. Also be aware that there are different shaped metering slots; 'V' shaped metering slots are standard, and kidney shaped metering slots are on propel valve plates.

19 The bearing cup is slip-fit into the end cover. The shims under the bearing cup adjust the shaft end play. It is not necessary to remove these parts at this time.

20 Remove the bearing plate.

21 Remove the end cover gasket.

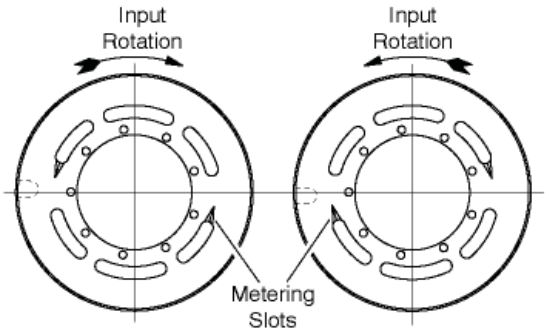


Figure 6

22 Remove the two dowel pins from cylinder barrel face, see figure 5.

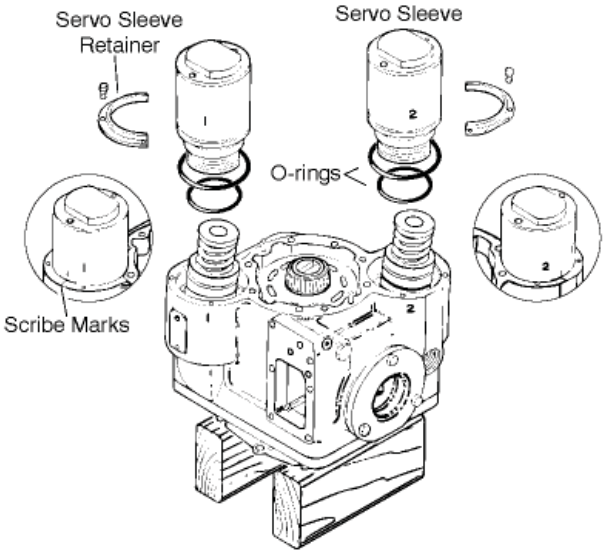


Figure 7

23 Mark the pump housing and servo sleeves so they can reinstalled in the same locations.

24 Remove the servo sleeve retainers.

25 Scribe position marks on each servo sleeve; Make a horizontal line where the servo sleeve and pump housing meet. Then make a vertical line that starts on the servo sleeve and ends on the housing, see figure 7. These marks will indicate how far to screw the servo sleeves in during reassembly.

26 Remove the servo sleeves.

27 Remove two o-rings from each servo sleeve.

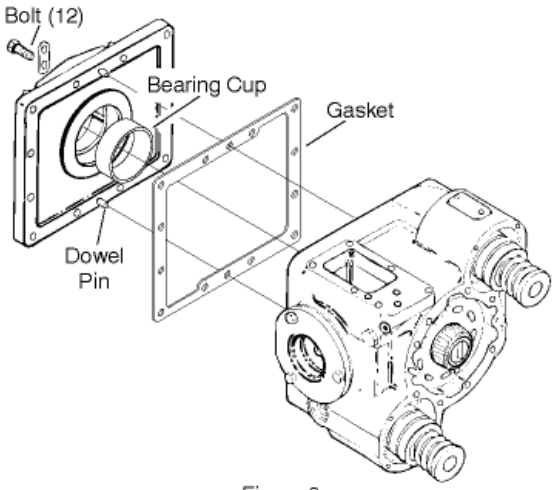


Figure 8

28 Reposition the pump so the control valve mount is on top.

29 Remove the twelve hex head bolts that hold the mounting flange to the pump.

30 Remove the mounting flange, tapping it with a plastic hammer will help to break it loose.

31 Remove the mounting flange gasket.

Note: Do not remove the bearing cup from the mounting flange unless it is damaged. Go to step 34 if the bearing cup is undamaged.

32 Use an internal bearing puller or a long punch to remove the old bearing cup. Be careful; do not damage the mounting flange.

33 Press the new bearing cup into the mounting flange. Be sure that it is pressed all the way to the bottom of the recess.

9

5

Hydrostatic Variable Pump Repairs

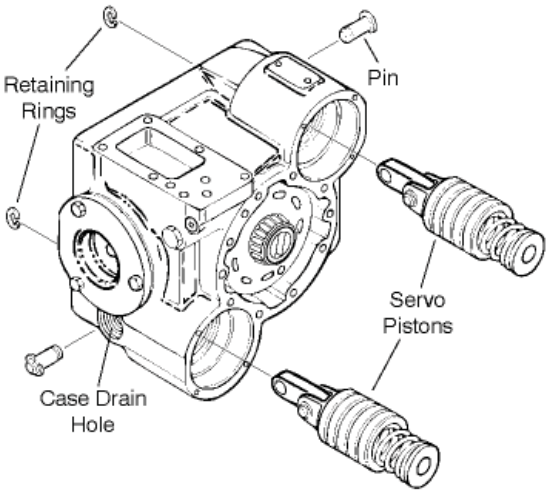


Figure 9

34 Remove the inside retaining ring from each of the pins that connect the servo piston links to the swashplate. Slide the pins out through the case drain holes and remove the servo pistons, see figure 9.

Note: Disassembly of the servo pistons is not required unless they are damaged.

35 Mark the pump housing and the trunnions so they can be reinstalled in the same locations.

36 Repeat the following steps to remove each trunnion:

Remove the three hex head bolts that hold the trunnion to the pump

The trunnion fits into the pump tightly; use a slide hammer to loosen it. Screw the slide hammer into the threaded hole in the trunnion. The sizes of the threaded trunnion holes are listed below:

Model Number	Screw Size
33, 39, 46	3/8-16
54, 64	7/16-14

Remove the trunnions and shims.

Important: Keep the shims with each trunnion; they must be reinstalled on the same trunnion during reassembly. The shims pre-load the trunnion bearings.

Remove the o-ring from the trunnion, see figure 10.

37 If the trunnion bearings are damaged replace them. A split blade bearing puller will be needed to remove the bearing cone from the trunnion. Use a press to install the new bearing cone.

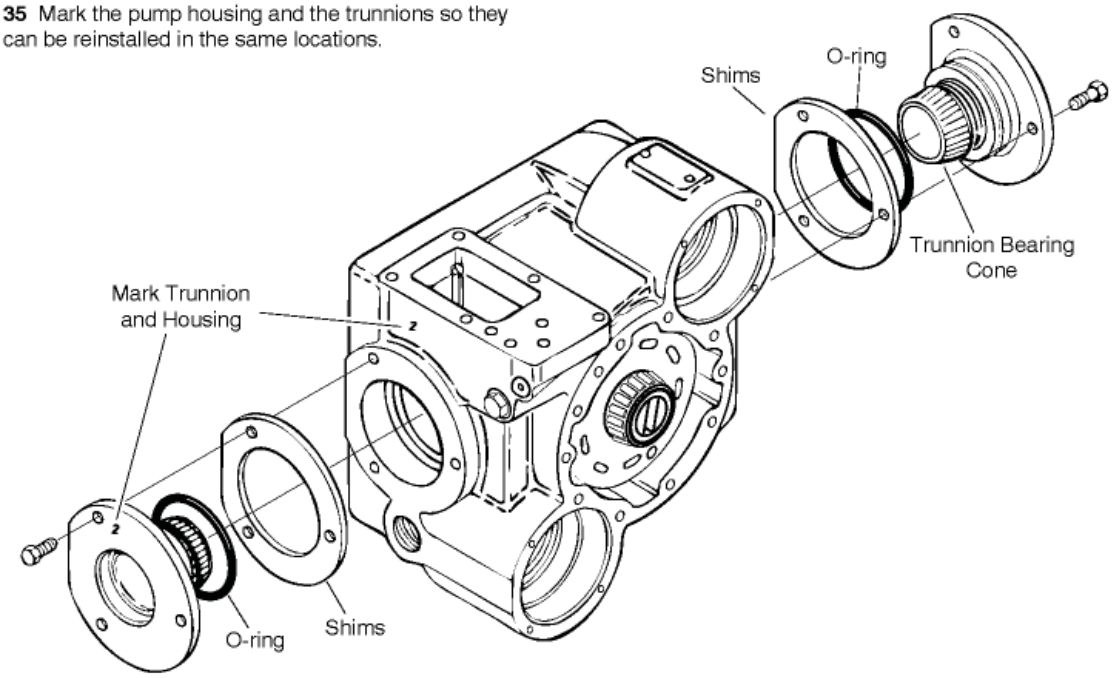


Figure 10

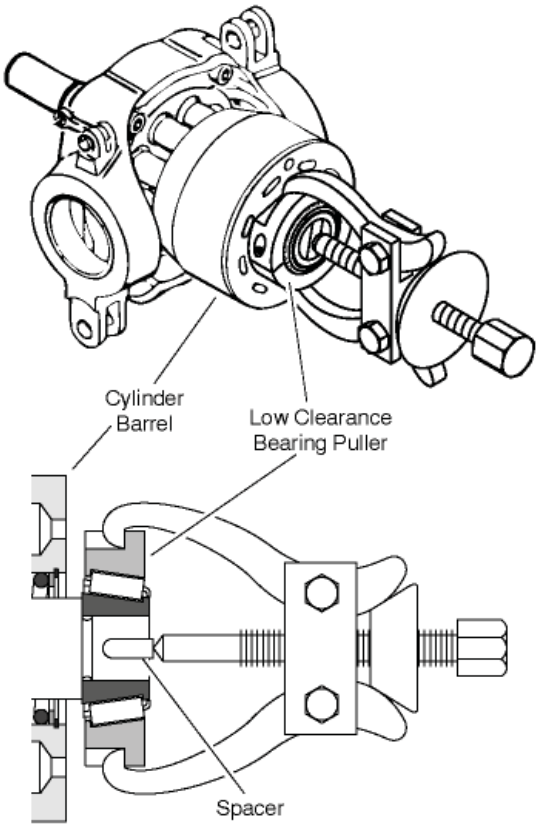


Figure 11

38 Carefully remove the swashplate, cylinder barrel and shaft through the mounting flange end of the housing.

39 Pull the end cover bearing cone from the shaft. Use a special low clearance bearing puller and place a spacer in the slot in the shaft.

Note: Detailed drawings of the low clearance bearing puller and spacer are given in Appendix E. The low clearance bearing puller was designed to protect the cylinder barrel face, see cut-away in figure 11. The spacer will prevent the slotted end of the shaft from spreading.

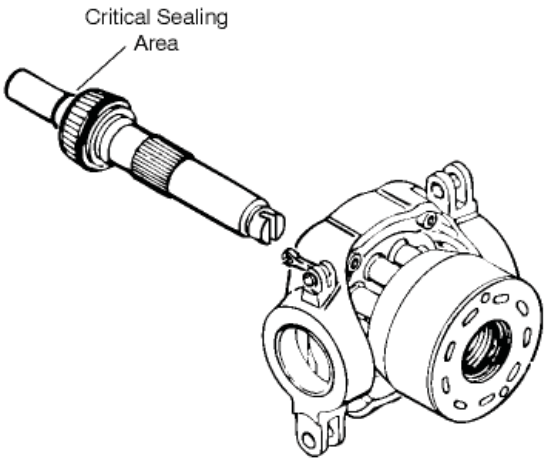


Figure 12

40 Remove the shaft and bearing assembly from the swashplate and cylinder barrel. Keep the cylinder barrel and pistons together.

Note: Do not remove the bearing cone from the shaft unless it is damaged. Go to step 43 if the bearing cone is undamaged.

41 Press the old bearing cone from the shaft.

Caution: Do not damage the sealing area of the shaft, see figure 12. The shaft sealing area is between the bearing journal and the keyway or splined end of the shaft. This area is extremely critical.

42 Press the new bearing cone onto the shaft. Use the special stop limit tool shown in Appendix E of this manual. The position of the bearing cone on the shaft is important.

Hydrostatic Variable Pump Repairs

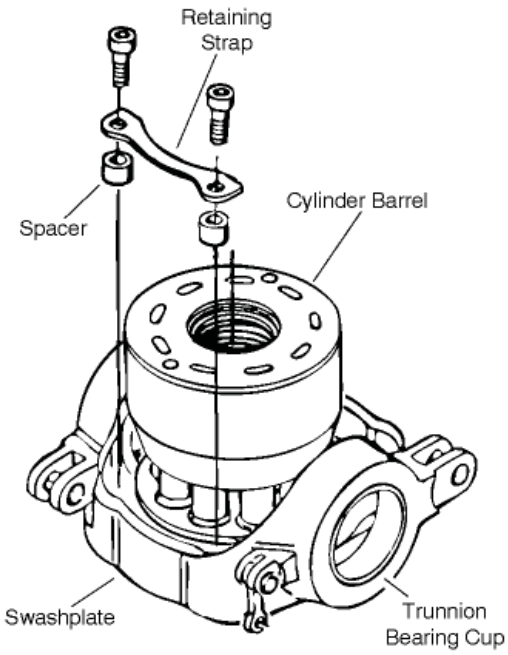


Figure 13

43 Set the swashplate and cylinder barrel assembly on one of the trunnions; in this position it will be easier to break the retaining strap bolts loose. Remove one of the retaining straps and loosen the other.

Important: keep the cylinder barrel and pistons together.

44 Reposition the swashplate and cylinder barrel assembly so the cylinder barrel is on the bottom. Remove the swashplate by lifting it slightly and sliding it over to disengage the retaining strap.

45 Remove the retaining strap and thrust plate from the swashplate.

46 Replace the trunnion bearing cups if they are damaged. Use a long punch to remove the old bearing cups, then carefully press the new bearing cups into the swashplate.

Reassembly

Inspect the cylinder barrel, pistons, piston slippers, and thrust plate. Replace any worn or damaged parts. Check all mating surfaces; replace any parts with scratches or burrs that could cause leakage. Inspect parts for excessive wear and replace as necessary. Wash all metal parts in clean solvent and blow them dry with compressed air. Do not wipe parts dry with paper towels or cloth. Lint in a hydraulic system will cause damage.

Always use new seals when reassembling hydraulic pumps. Refer to parts list 6-608 for seal part numbers, replacement parts, and ordering information.

Important: During reassembly lubricate the new rubber seals with a petroleum jelly like Vaseline. Also lubricate all machined surfaces and bearings with clean hydraulic fluid.

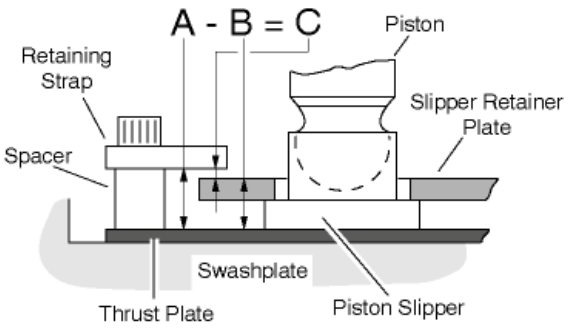


Figure 14

47 Before beginning reassembly check the piston slipper clearance:

First, use a vernier calipers to measure the spacer height, height "A" in figure 14.

Next, measure the thickness of the slipper retainer plate and piston slippers, Thickness "B" in the figure.

Finally, calculate the piston slipper clearance "C" by subtracting thickness "B" from height "A".

Clearance "C" must not exceed .008 in. [,20 mm].

12

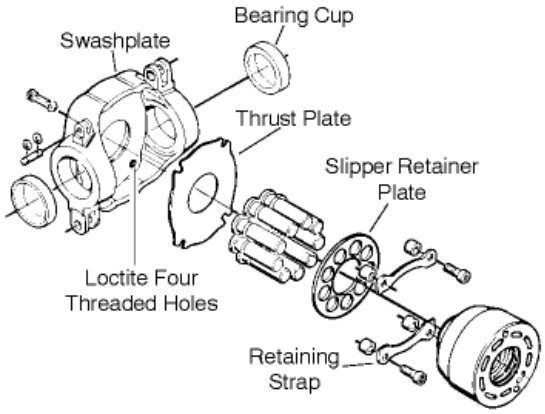


Figure 15

48 Position the cylinder barrel, pistons, and slipper retainer so the piston slippers are on top.

49 Apply two drops of Loctite 271 in each of the four retaining strap holes in the swashplate. Apply the Loctite no closer than two threads from the running surface. Do not apply Loctitie to the retaining strap bolts.

Caution: Remove all excess Loctite, it will contaminate the pump if not removed.

50 Place the thrust plate in the swashplate.

51 Install one of the retaining straps, and leave the bolts loose.

52 Apply a light coating of clean hydraulic fluid to the thrust plate.

53 Fit the swashplate onto the cylinder barrel assembly. Be sure the slipper retainer plate is between the swashplate and retaining strap.

54 Turn the swashplate and cylinder barrel over so the swashplate is on the bottom.

55 Install the second retaining strap and tighten all four retaining strap bolts to 18 lb-ft [25 Nm]. Remove all excess Loctite.

56 Liberally lubricate the pistons slippers, thrust plate, retainer plate, pistons, and cylinders. These parts must have sufficient start-up lubrication.

57 Slide the shaft and bearing assembly through the swashplate into the cylinder barrel.

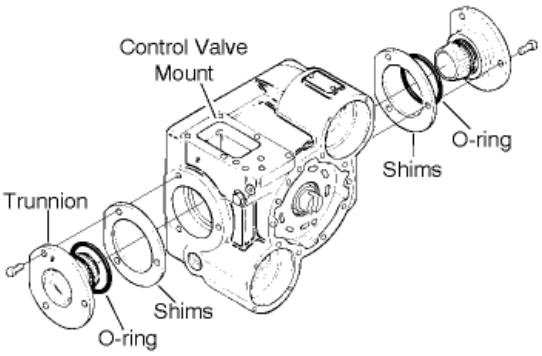


Figure 16

58 Carefully, put the swashplate, cylinder barrel, and shaft into the pump housing. Be sure the feedback linkage is by the control valve mount.

59 Lubricate and install a new o-ring on each trunnion.

60 Install the trunnions and shims in their original locations.

61 Install the trunnion bolts and tighten them to the specified torque given below:

Model Number	Trunnion Bolt Torque
33, 39, 46	28 lb-ft [38 Nm]
54, 64	44 lb-ft [60 Nm]

13

Hydrostatic Variable Pump Repairs

62 After the bolts are torqued strike one of the trunnions to free up the swashplate's movement.

63 Measure the swashplate breakaway force with a spring compression scale. Attach the scale to the feedback linkage as shown in figure 17. A swashplate breakaway force of 2 to 5 lb [,9 to 2,3 Kg] is required. Add or subtract trunnion shims as needed.

Important: The trunnion shims on each side of the pump should be equal thickness. The maximum allowable difference between the sides is .010 in. [,3 mm].

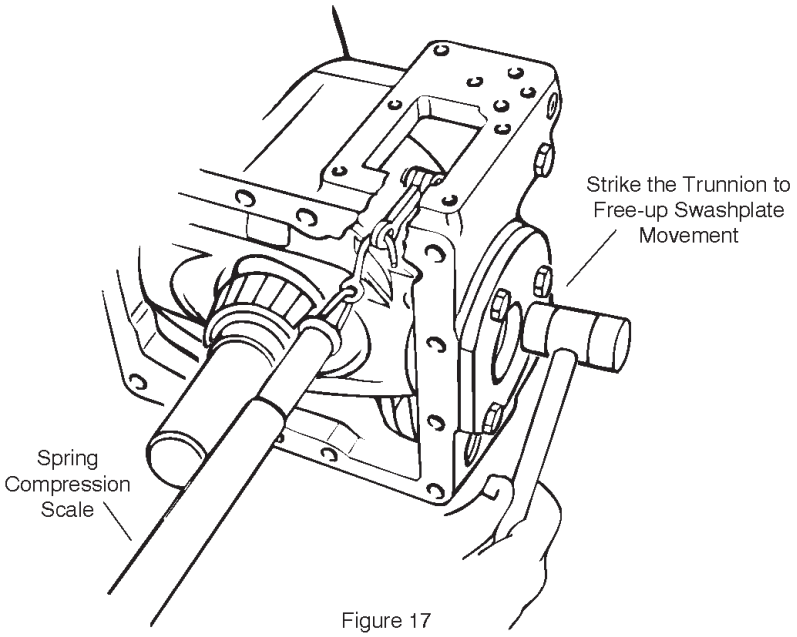


Figure 17

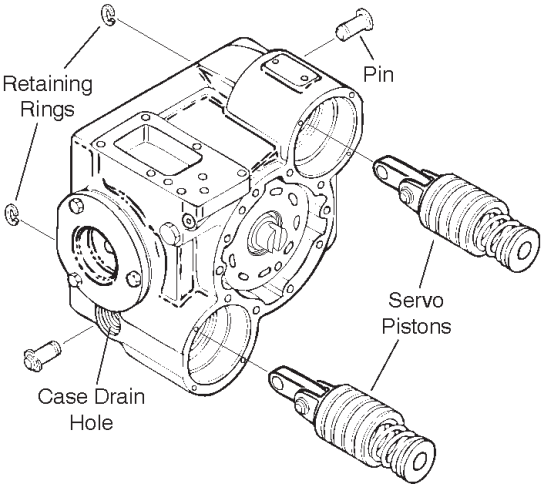


Figure 18

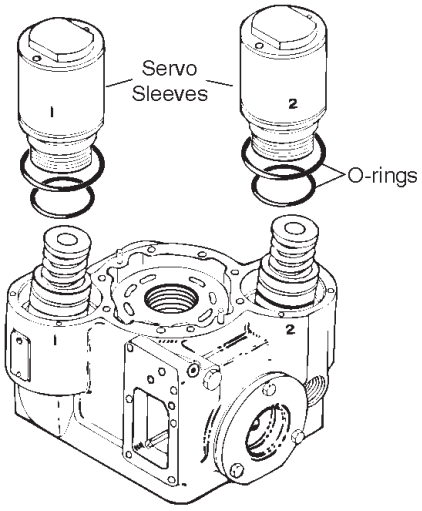


Figure 19

64 Install the servo pistons. Line up the servo piston links and install the pins through the case drain holes as shown in figure 18.

65 Carefully remove the shaft and bearing assembly. Reposition the pump so it is sitting on the mounting flange gasket surface.

Note: Do not let the cylinder barrel slide off of the pistons.

66 Lubricate and install new o-rings on the servo sleeves.

67 Install each servo sleeve in its original location. Start by lifting one of the servo pistons, tilting the swashplate to its maximum angle, then carefully fit the servo sleeve over the piston. Next, lower the servo sleeve and piston into the pump housing until the threads meet. Finally, screw the servo sleeve in until the scribe marks line up. Repeat this procedure for the second servo sleeve.

14

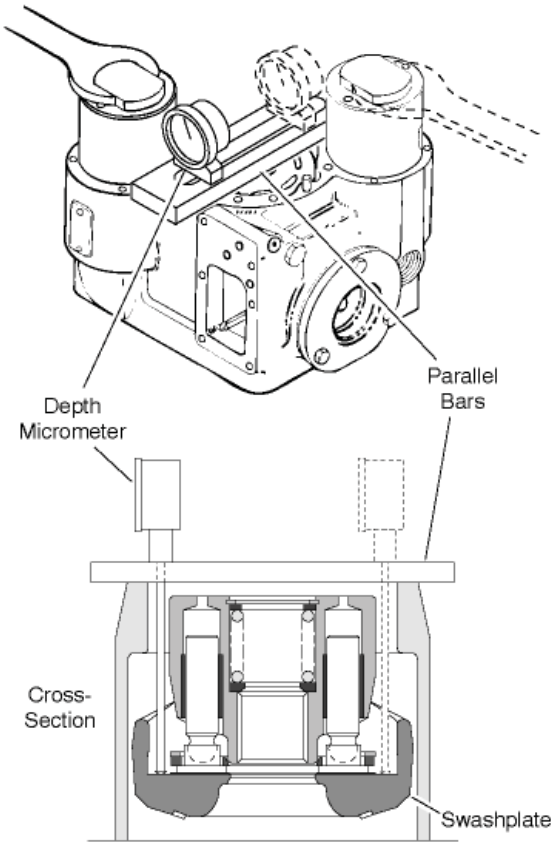


Figure 20

68 Check the zero angle of the swashplate.

Important: Zeroing the swashplate insures that the springs on the servo pistons will return the swashplate to neutral when the control lever is centered.

69 Place parallel bars across the end cover gasket surface and measure the depth to the swashplate on each side of the cylinder barrel, as shown in figure 20.

The maximum allowable difference in the measurements is .0005 inch [,012 mm].

The springs on the servo pistons must hold the swashplate tight; The maximum allowable swashplate rock is .001 inch [,03 mm].

Screw the servo sleeves in or out to adjust the zero angle of the swashplate.

70 Install the servo sleeve retainers and re-stake if necessary.

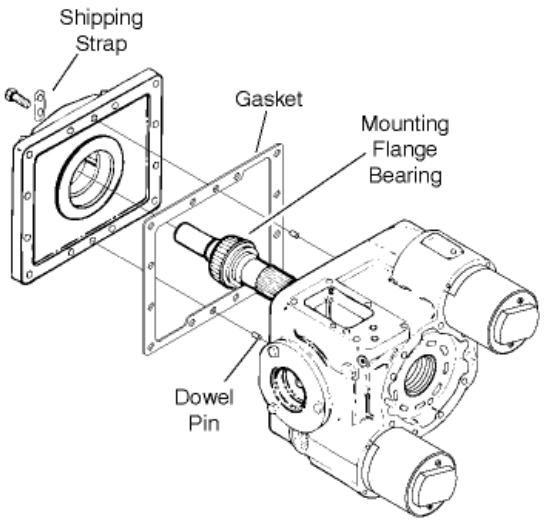


Figure 21

71 Reposition the pump so the control valve mount is on top. Be careful do not let the cylinder barrel slide out off the pump.

72 Carefully slide the shaft and bearing assembly into the pump.

73 Install two dowel pins in the holes in the mounting flange surface of the pump housing.

74 Place a new mounting flange gasket on the pump housing. Hold it in place with petroleum jelly.

75 Lubricate the mounting flange bearing with clean hydraulic fluid

76 Install the mounting flange on the pump.

77 Install the twelve mounting flange bolts. Remember to install the shipping strap. Tighten the bolts to the torque specified in the table below:

Model Number	Mounting Flange Bolt Torque
33, 39, 46	28 lb-ft [38 Nm]
54, 64	44 lb-ft [60 Nm]

15

5

Hydrostatic Variable Pump Repairs

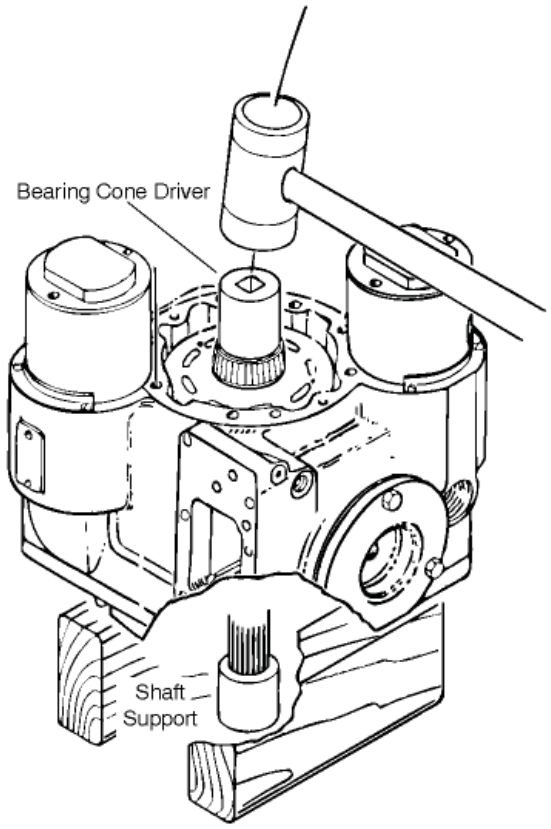


Figure 22

78 Turn the pump over so the shaft is vertical and the mounting flange is down.

79 Support the pump's shaft and use a bearing driver to install the end cover bearing cone, see figure 22. Be sure the bearing cone is seated against the shoulder of the shaft.

Note: A detailed drawing of the bearing cone driver is shown in Appendix E of this manual.

80 Remove the shaft support.

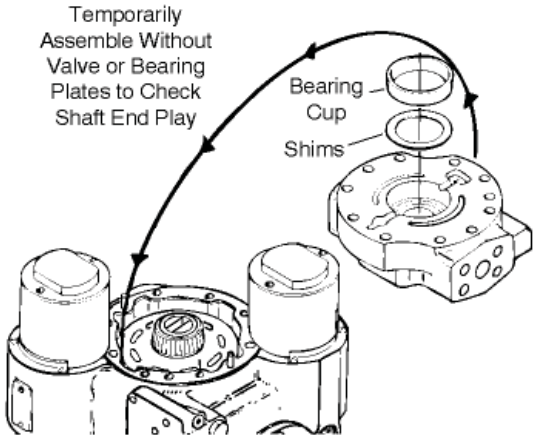


Figure 23

81 Install two dowel pins in the holes in the end cover surface of the pump housing.

82 Install a new end cover gasket.

83 Check the pump shaft end play before installing the bearing and valve plates.

Be sure the bearing cup and shims are in the end cover and place it on the pump.

Install the eight end cover bolts and tighten them alternately to the torque specified in the table below:

Model Number	End Cover Bolt Torque
33, 39, 46	39 lb-ft [53 Nm]
54, 64	63 lb-ft [85 Nm]

Turn the pump over so the mounting flange and shaft are on top. Place a block of wood under the end cover so the weight of the pump is not on the servo sleeves.

16

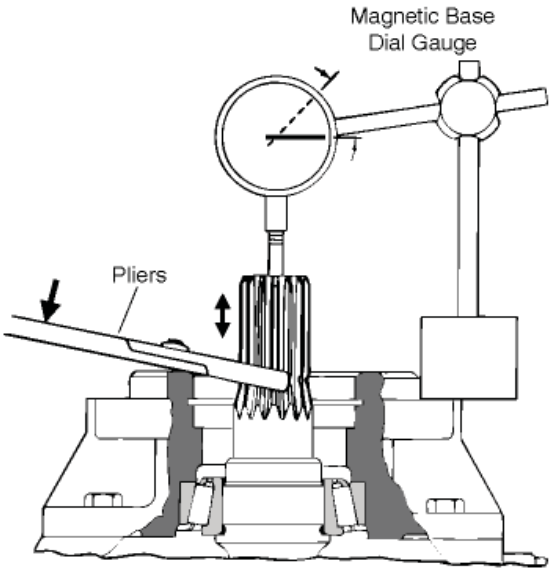


Figure 24

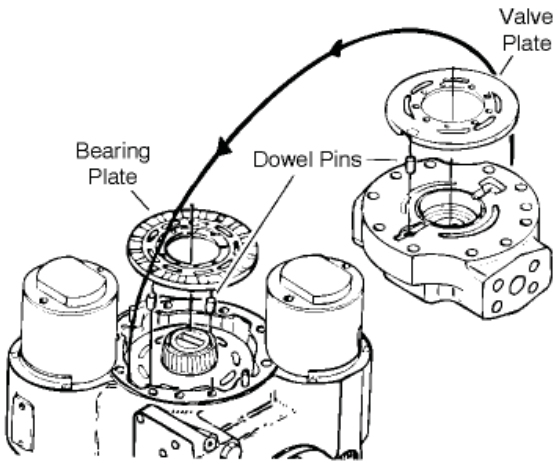


Figure 25

Gently tap the shaft into the pump with a plastic hammer to seat the bearings.

Place a dial gauge, with a magnetic base over the shaft as shown in figure 24. Grasp the shaft low with a pliers and pry it up to get the end play reading.

The pump shaft end play must be from .002 in. to .007 in. [,05 mm to ,17 mm].

Adjust the end play by adding or subtracting shims from under the end cover bearing cup.

84 Turn the pump over and remove the end cover.

85 Install two dowel pins in the holes in the cylinder barrel face.

86 Place the bearing plate on the cylinder barrel and engage it with the dowel pins.

87 Liberally lubricate the bronze surface of the bearing plate with clean hydraulic fluid.

88 Install a dowel pin in the hole in the end cover.

89 Place the valve plate on the end cover. Be sure it engages with the dowel pin.

17

Hydrostatic Variable Pump Repairs

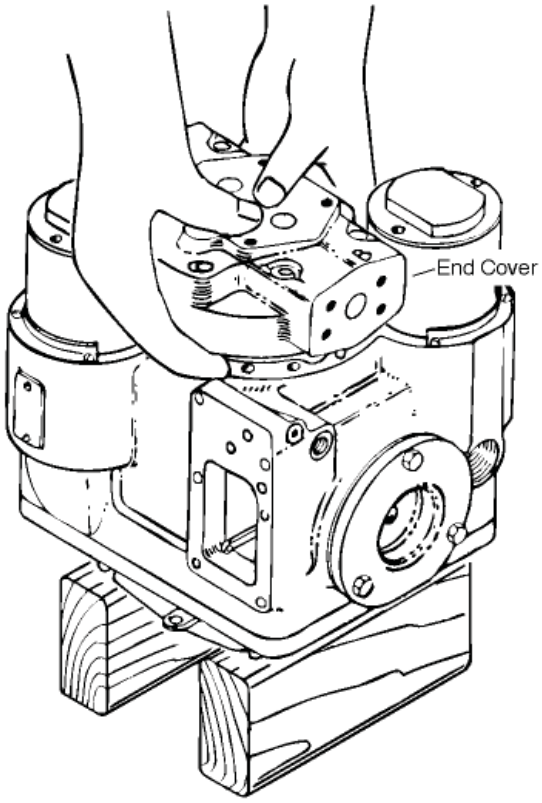


Figure 26

90 Holding the valve plate in place carefully install the end cover.

Note: Use petroleum jelly to help hold the valve plate to the end cover.

91 Install the eight end cover bolts, remember the shipping strap.

92 Tighten the end cover bolts evenly so the cylinder barrel spring pre-load is taken-up gradually. Torque them alternately to the specifications given in the table below:

Model Number	End Cover Bolt Torque
33, 39, 46	39 lb-ft [53 Nm]
54, 64	63 lb-ft [85 Nm]

93 Lubricate and install new o-rings and back-up rings on the check valves. The back-up ring must be installed on the charge pump side of the o-ring, see figure 27.

94 Install the check valves in the pump end cover. Push them down until their tops are flush with the surface of the end cover.

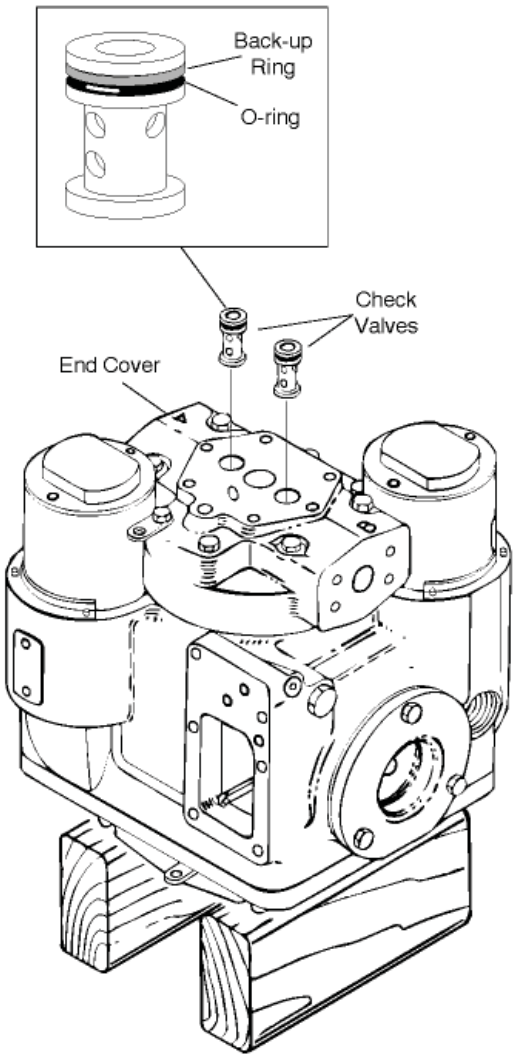


Figure 27

18

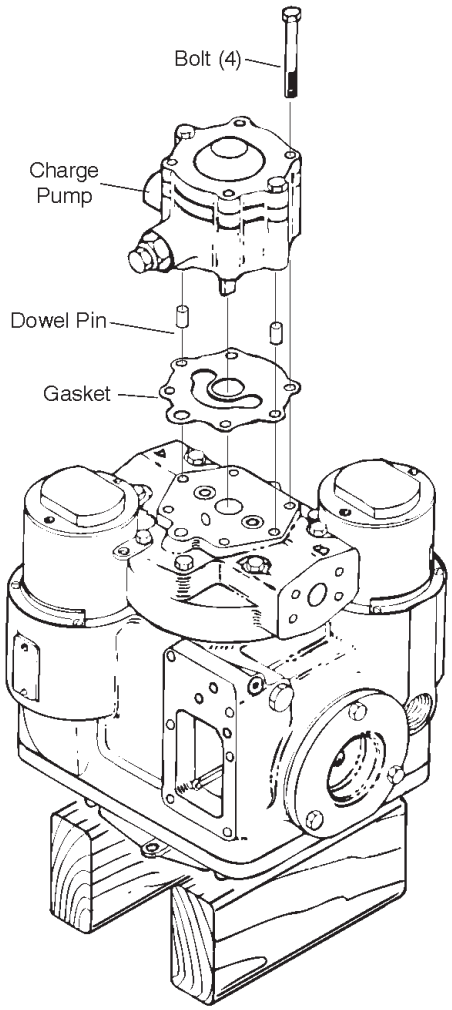


Figure 28

95 Install the two remaining dowel pins in the holes in the end cover, see figure 28.

96 Place a new charge pump gasket on the end cover.

97 Rotate the charge pump shaft so the tang and the dowel pin holes line-up correctly with the pump. Then carefully install the charge pump.

Note: Some charge pumps have splined drives.

98 Install the four hex head bolts that hold the charge pump to the pump end cover. Torque them alternately to 25 lb-ft [34Nm]. Charge pumps that have 'A' or 'B' pads require a torque of 22 lb-ft [30 Nm].

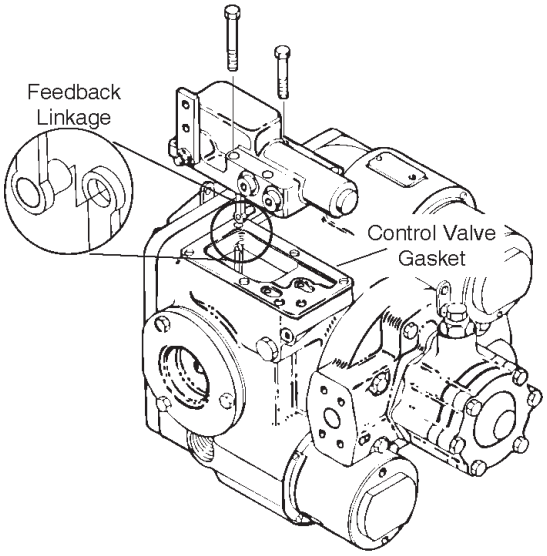


Figure 29

99 Reposition the pump so the control valve mount is on top.

100 Place a new control valve gasket on the pump.

101 Connect the feedback linkage and position the control valve on the pump.

Important: When the control valve is positioned on the pump make sure the feedback linkage points towards the end cover.

102 Install the six hex head bolts and tighten them finger tight.

103 Move the control lever back and forth; it should move freely in both directions and self-center. If it doesn't recheck the feedback linkage.

104 Tighten the six hex head bolts to 16 lb-ft [22 Nm].

Hydrostatic Variable Pump Repairs

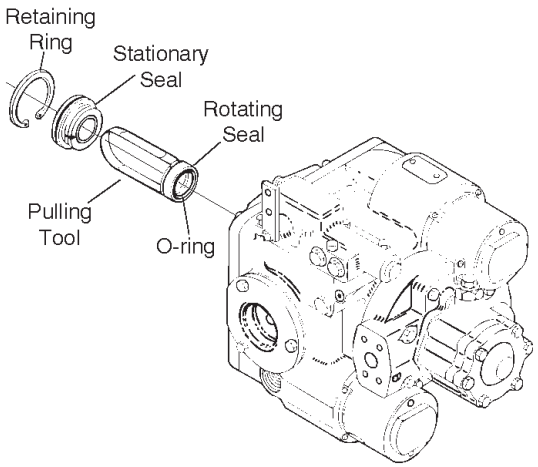


Figure 30

105 Reposition the pump so the shaft seal can be installed.

Note: Eaton recommends replacing the entire shaft seal. Use Shaft Seal Kit P/N 990231.

Important: The metal-to-metal sealing surfaces are critical. Clean the areas of contact with a suitable solvent then blow them dry. The solvent must evaporate without leaving a residue. Do not touch the sealing surfaces after cleaning.

106 Apply petroleum jelly to the o-ring and install it in the rotating seal

107 Apply a light coating of clean hydraulic oil to the cleaned metal sealing surface of the rotating seal.

108 Install the rotating seal using the special pulling tool (CAS 1844).

109 Screw a 3 in. X 1/4-20 bolt into the threaded hole in the new stationary seal. The bolt provides a convenient means for holding the seal.

110 Apply petroleum jelly to the o-ring that is around the largest part of the stationary seal.

111 Apply a light coating of clean hydraulic oil to the cleaned metal sealing surface of the stationary seal.

112 Install the stationary seal.

113 Using the retaining ring pliers install the retaining ring with the beveled side out, be sure that it is seated properly.

Caution: Verifying the accuracy of repairs on an authorized test stand is essential.

Appendix A: IPOR End Cover

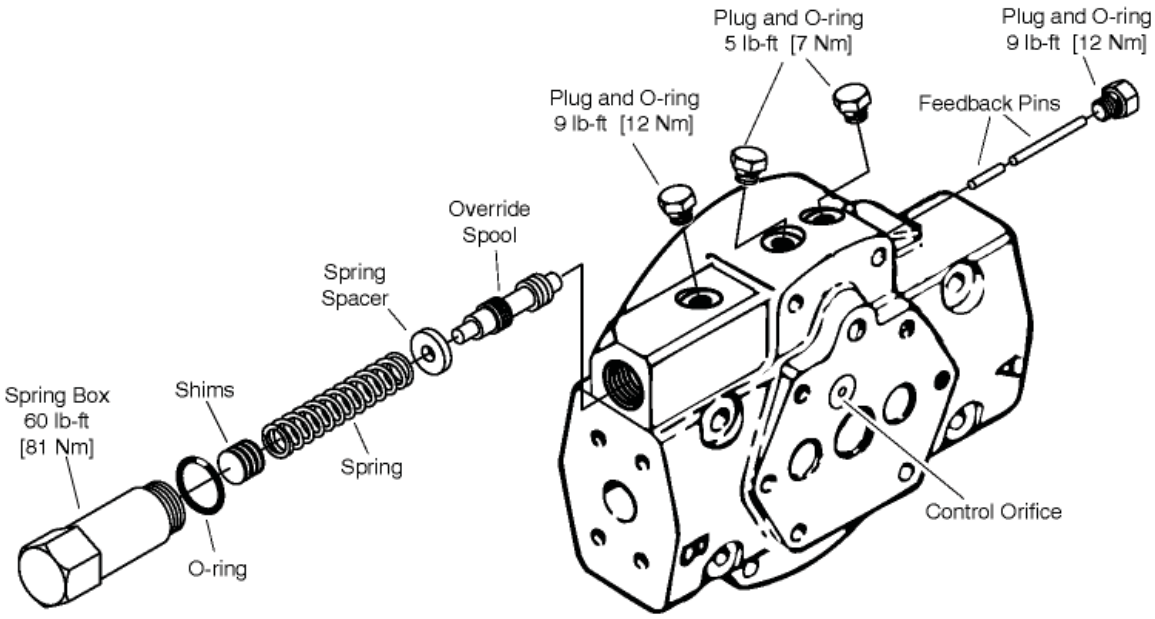


Figure 31

After the end cover has been removed from the pump, disassemble it as shown in figure 31.

Flush the end cover's internal passages and wash the IPOR parts with clean solvent. Blow the parts dry with compressed air.

Inspect the parts and replace any that are worn or damaged.

Inspect the control orifice, see figure 31, if it is plugged after flushing replace it.

To remove the plugged orifice, strike it in the center with a center punch. This will curl the orifice so it can be removed.

Install a new orifice of the same size. The orifice size is stamped on the orifice in thousandths of an inch, example: 57 = .057 in.

Place the orifice in the orifice pocket so the size is visible.

Stake the orifice in six places with a center punch.

Insure that the orifice is properly seated after staking.

Important: Do not flatten and reuse orifices.

Reassemble the end cover. Install new o-rings and torque the plugs and spring box to the specifications given in figure 31.

IPOR Pressure Setting

The IPOR pressure setting is adjusted by adding or removing shims. An .018 inch shim changes the pressure override setting by 500 psi. Shims totaling .125 inch will provide an override setting of approximately 5000 psi. Because of tolerances the actual pressure override must be measured with a gauge while the pump is operating.

Appendix B: Power Limiter Valve End Cover

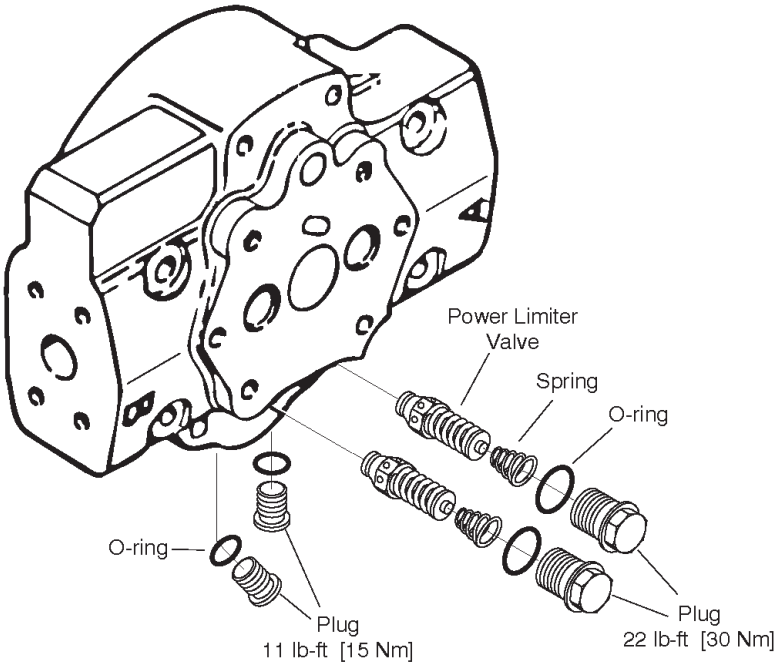


Figure 32

After the end cover has been removed from the pump, disassemble it as shown in figure 32.

Flush the end cover's internal passages and wash the power limiter parts with clean solvent. Blow the parts dry with compressed air.

Inspect the parts and replace any that are worn or damaged.

Reassemble the end cover. Install new o-rings and torque the plugs to the specifications given in figure 32.

Power Limiter Valve Pressure Setting

The pressure setting is stamped on the power limiter valve. If there is a two digit code find the pressure setting in the table. If the power limiter valve has a three digit number, multiply the number by 10 to get the pressure setting, example: 550 = 5500 psi.

Power Limiter Valve Settings	
2 Digit Code	Pressure Setting (psi)
54	4000
59	4500
56	5000
63	5500
21	5800
57	6000

Appendix C: Control Orifice Installtion and Removal

There are two types of control valve orifices: the plate orifice and the plug orifice.

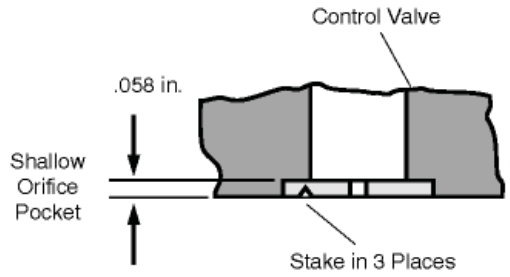


Plate Orifice

The plate orifice is used in control valves that have shallow orifice pockets.

The orifice size is stamped on the orifice in thousandths of an inch, example: 57 = .057 in.

Installation:

Place the orifice in the orifice pocket so the size is visible.

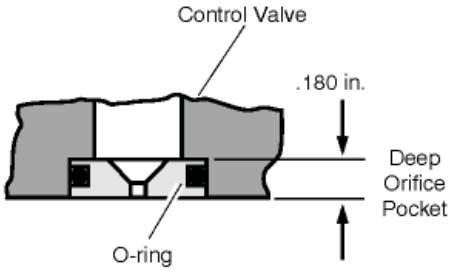
Stake the orifice in three places with a center punch.

Insure that the orifice is properly seated after staking.

Removal:

To remove the plate orifice, strike it in the center with a center punch. This will curl the orifice so it can be removed.

Important: Do not flatten and reuse orifices.



Plug Orifice

The plug orifice is used in control valves that have deep orifice pockets. The plug orifice replaces the hat orifice.

Installation:

Before installing the plug orifice be sure that the o-ring is in place. Apply petroleum jelly to the edge of plug orifice and o-ring.

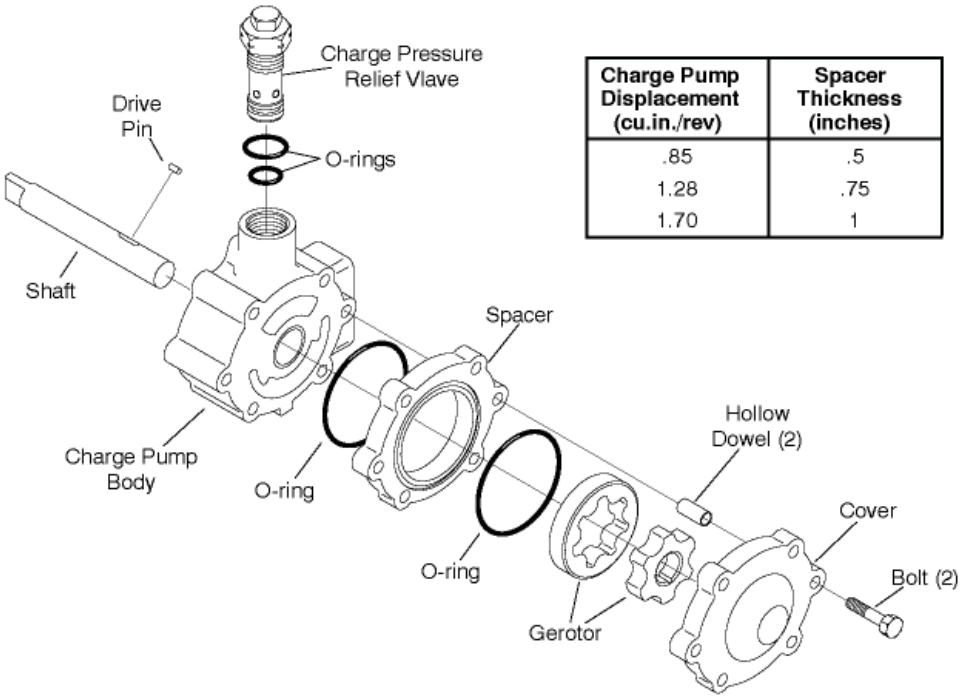
Carefully insert the plug orifice into the orifice pocket. The large opening in the plug must go into the control valve.

Removal:

To remove the plug orifice, insert a stiff wire, that has been bent to form a hook, through the orifice hole. Hook the inside of the plug orifice and pull it out of the pocket.

Important: Removing the orifice may damage it, so do not reuse orifices.

Appendix D: Charge Pump Repair



Charge Pump Displacement (cu.in./rev)	Spacer Thickness (inches)
.85	.5
1.28	.75
1.70	1

Figure 33

Disassemble the charge pump by removing the two bolts that hold it together, as shown in figure 33.

Note: Figures 33 and 34 show a standard charge pump. The repair procedures given here apply to optional charge pumps too.

Wash the parts in clean solvent and blow them dry with compressed air.

Inspect the parts and replace any that are worn or damaged.

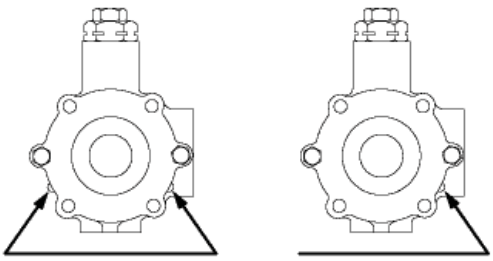
The three digit number stamped on the charge pressure relief valve indicates its pressure setting. Multiply this number by ten to get the pressure setting in PSI. Example: 022 = 220 PSI.

Assemble the charge pump using new o-rings. Lubricate the o-rings with petroleum jelly before assembly. Apply a coating of clean hydraulic fluid to the gerotor to provide start up lubrication.

Tighten the two bolts that hold the charge pump together to 17 lb-ft [23 Nm]. Tighten the charge pressure relief valve to 80 lb-ft [108 Nm].

Important: The charge pump's rotation direction must match the rotation direction of the pump.

The charge pump's rotation direction can be identified by checking the alignment of the beads on the pump body and spacer. Figure 34 summarizes charge pump rotation identification.



Clockwise rotation: bead on spacer and bead on pump body not aligned.

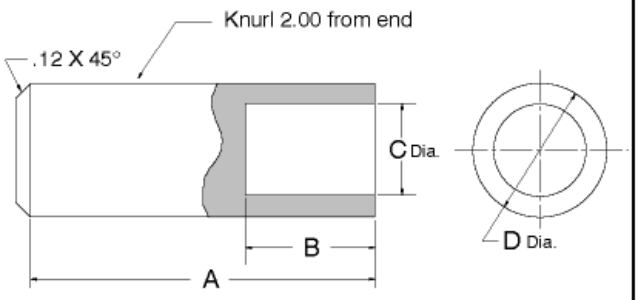
Counterclockwise rotation: bead on spacer and bead on pump body aligned.

Figure 34

Appendix E: Special Tools

(All dimensions are given in inches.)

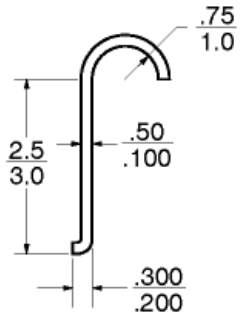
Bearing Cone Drive



Model	A	B	C	D
33, 39, 46	4.0	1.5	1.01	1.25
54, 64	4.0	1.5	1.25	1.48

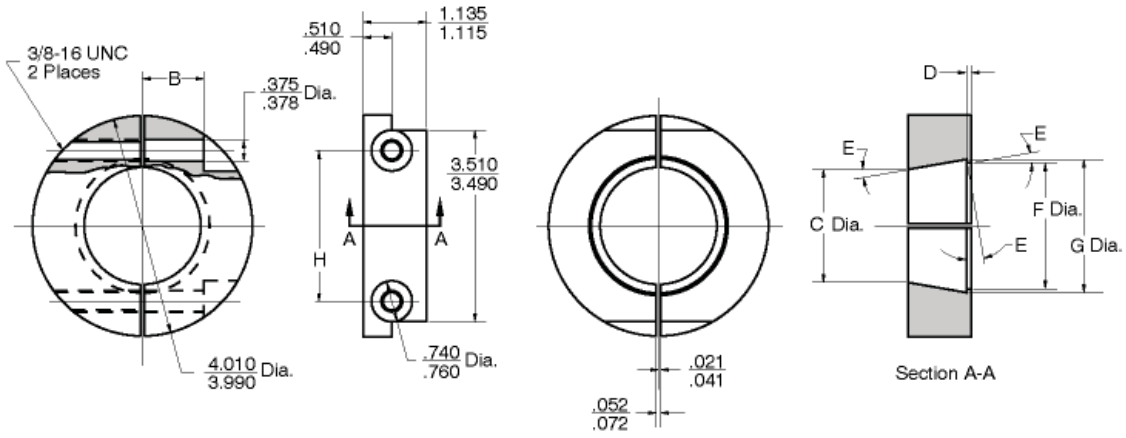
Material / Heat Treatment; C.R.S. / 50-55 Rc

Check Valve Puller



Material - Steel

Low Clearance Bearing Puller



Model	B	C	D	E	F	G	H
33, 39, 46	1.050 / 1.070	1.565 Ref.	1.35 / 1.29	13°	1.907 / 1.913	2.020 / 2.026	2.622 / 2.628
54, 64	1.115 / 1.135	1.603 Ref.	.141 / .135	20°	2.223 / 2.229	2.318 / 2.324	2.747 / 2.753

Material / Heat Treatment; Stentor / 45-55 Rc

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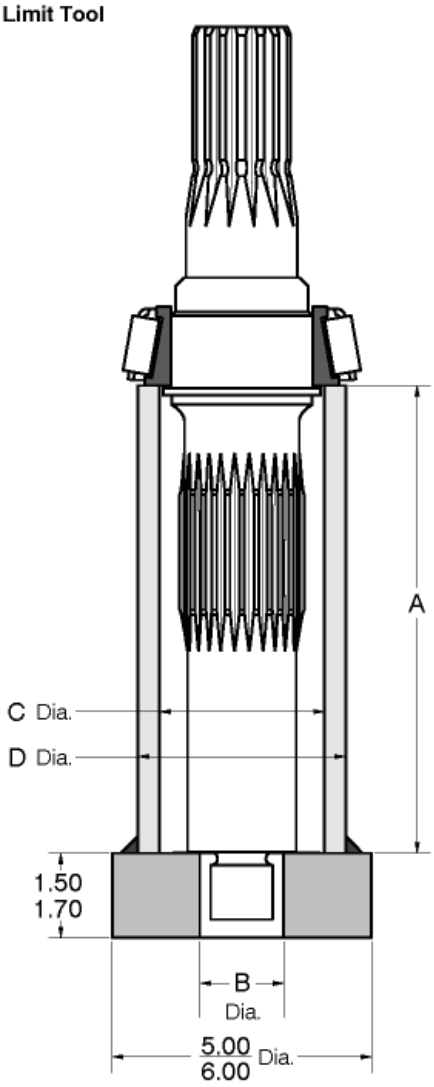
Hydrostatic Variable Pump Repairs

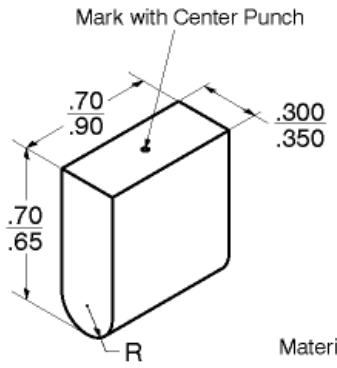
Stop Limit Tool



	Model	
	33, 39, 46,	54, 64
A ±.001	5.803	6.682
B	1.00 / 1.20	1.30 / 1.32
C	2.20 / 2.30	2.20 / 2.30
D	3.00 min.	3.00 min.

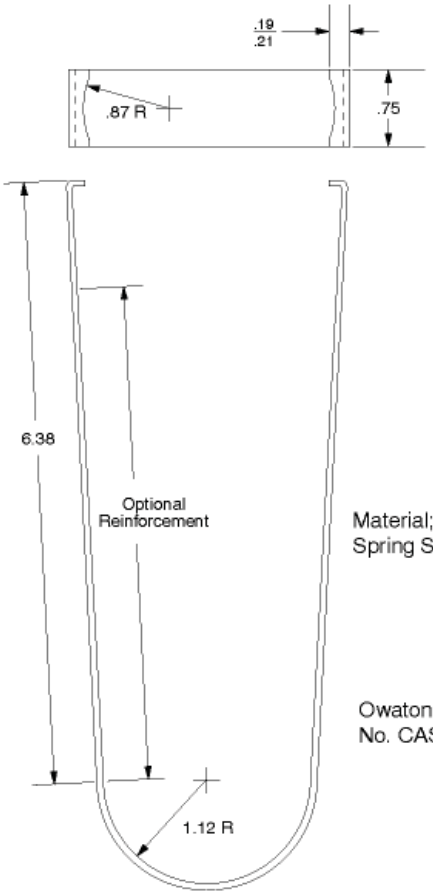
Material - Steel

Shaft End Spacer



Material - Steel

Rotating Seal Puller



Material; SAE 1074
Spring Steel 16 Ga.

Owatonna Tool Co.
No. CAS 1844

26

Hydraulic Fluid Recommendations

A reputable supplier can help you make the best selection of hydraulic fluid for use in Eaton hydrostatic products.

For satisfactory operation the following recommendations apply:

1. The filter system used in the hydraulic circuit should be capable of cleaning and maintaining the hydraulic fluid to meet ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2500 particles per milliliter greater than 5 µm and a maximum of 80 particles per milliliter greater than 15 µm.
2. At normal operating temperatures optimum viscosity ranges from 80-180 SUS (16-39 cSt). Viscosity should never fall below 60 SUS (10 cSt) and, at the lowest expected start-up temperature, should not exceed 10,000 SUS (2158 cSt).
3. The fluid should be chemically stable, incorporating rust and oxidation inhibitors.

Specific types of fluid that meet these requirements are:

- Premium quality, industrial anti-wear type hydraulic fluid
- Engine crankcase oil — SAE 10w, SAE 20w-20, SAE 30
- Automatic transmission oil
- Hydraulic transmission oil
- Synthetic fire resistant fluid — Quintolubric, Cosmolubric, or equivalent

Note: If the natural color of the fluid has become black or milky it is possible that an overheating or water contamination problem exists.

Take level readings when fluid is cold.

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Form No. 7-606
March, 1995

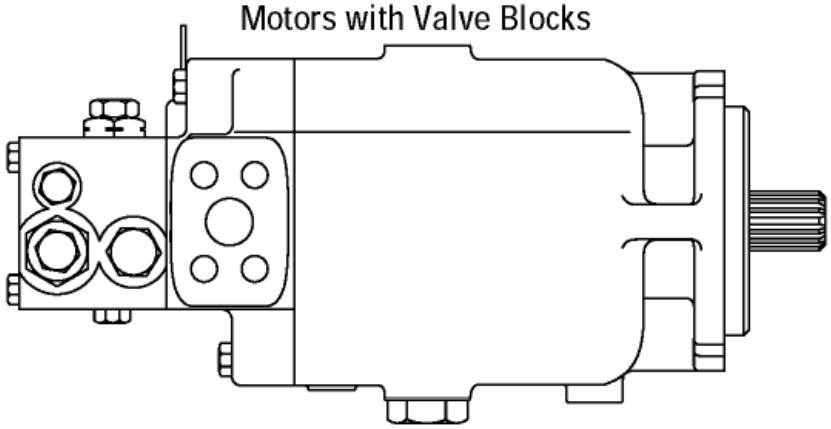
5.4 Repair Information Series 1 Motors #7-127

Eaton®
Hydrostatic Fixed Motors

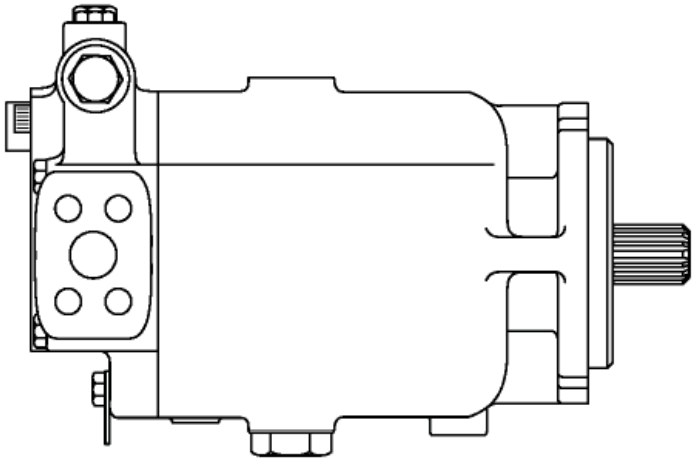
No. 7-127
September, 1997

Repair Information

Motors with Valve Blocks



Motors with Integral Shuttle and Low Pressure Relief Valves



Series 1 Models 33-64
Hydrostatic Fixed Motors

Table of Contents

Introduction

The purpose of this manual is to provide you with service information and procedures for disassembly and reassembly of Eaton Hydrostatic Fixed Displacement Motors (Series 1; Models 33, 39, 46, 54, and 64). Motors with valve blocks and motors with integral shuttle and low pressure relief valves are covered. We feel the procedures outlined in this manual will allow you to better service your motors and obtain the best results possible. To ensure accuracy of repair, and prevent part loss or damage, certain components or subassemblies are disassembled, inspected, and reassembled upon removal from the motor.

Note: All requests or inquiries must be accompanied by the complete model and serial number.

Refer to specific part listings covering your Eaton motor when ordering replacement parts. Listings are available from the Hydraulics Division in Eden Prairie, MN. See example tag below for motor identification.

When ordering replacement parts, you must include the following information:

ID Tag

A - Displacement (cu.in./rev.)
- 0033 = 3.3
- 0039 = 3.9
- 0046 = 4.6
- 0054 = 5.4
- 0064 = 6.4

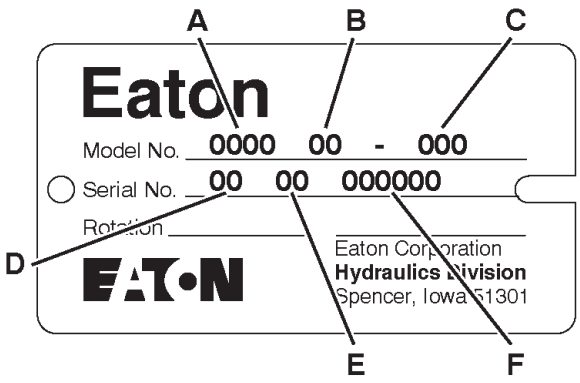
B - Identifies Type of Product
- 21 =Variable Displacement Pump
- 31 =Fixed Displacement Motor
- 41 =Variable Displacement Motor
- 61 =Tandem Variable Displacement Pumps

C - Identifies Specific Unit Configuration

D - Month of Manufacture

E - Year of Manufacture

F - Specific Serial Number of Unit



Tools Required

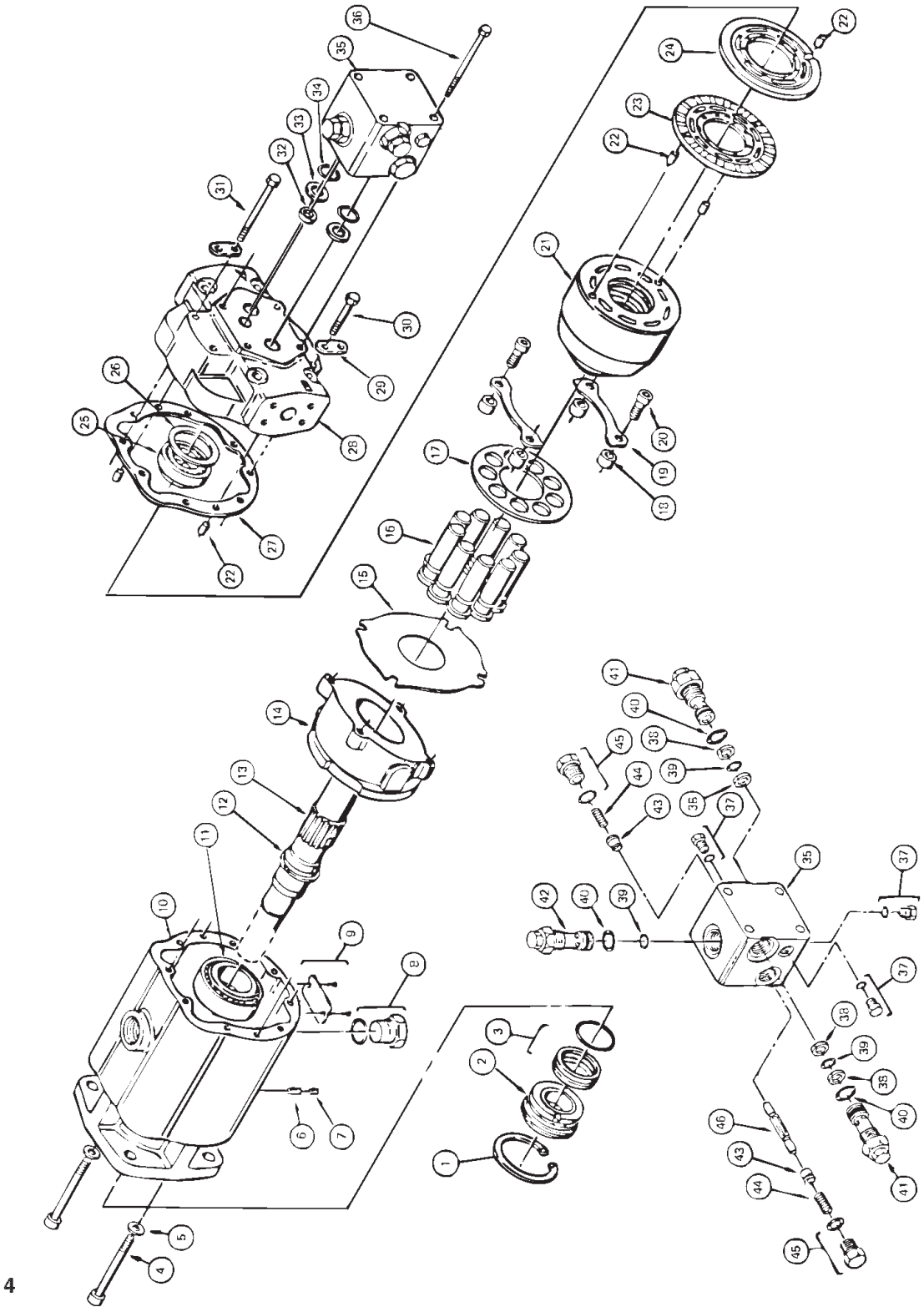
- Stationary Seal Puller (1/4 in. x 20 UNC Cap Screw, 3 to 4 in. Long)
- Rotating Seal Puller (Special)
- Retaining Ring Pliers, No. 5 or 7
- Breaker Bar or Ratchet Wrench
- 1-3/8 in. Hex Wrench
- 1 in. Hex Wrench
- 9/16 in. Socket
- Torque Wrench (200 lb-ft Capacity)
- 1/4 in. Hex Bit Socket
- 1/4 in. Hex Key
- Loctite No. 271
- Pliers
- Punch
- Magnetic Base Indicator
- Hammer
- Bearing Press or Driver
- Light Petroleum Jelly (like Vaseline)
- Cleaning Solvent
- Two Headless 5/16 in. Cap Screws, 5 to 6 in. Long (Special)
- Micrometer or Vernier Calipers
- Small Screwdriver (1/8 in. Blade)
- Low Clearance Bearing Puller (Special)
- Clean Lint Free Rags

Seal all open ports. Thoroughly clean exterior of motor before disassembly.

Whenever a unit is disassembled, it is a good service policy to replace all seals. Lubricate the seals with petroleum jelly (Vaseline®). Use only clean, recommended oil when assembling the unit. See Hydrostatic Fluid Recommendations on page 20 or Form No. 3-401 for recommended fluids.

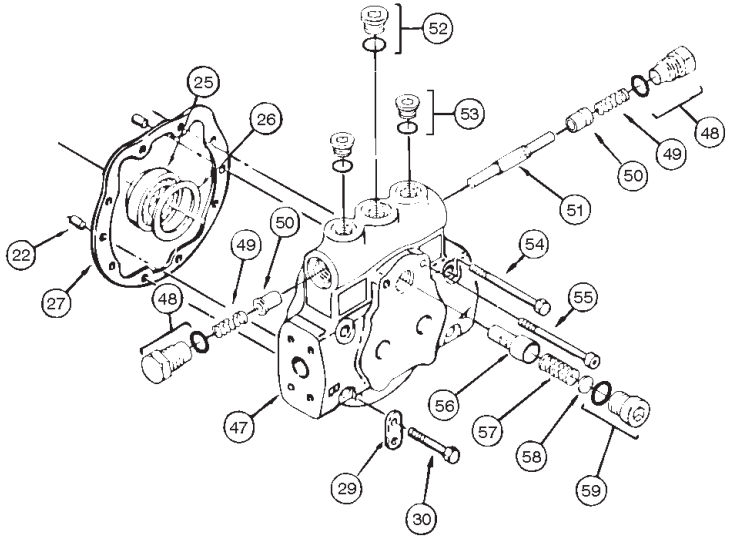
Cleanliness is extremely important when repairing a hydrostatic pump or motor. Work in a clean area. Clean all metal parts in clean solvent and blow dry the parts with filtered, moisture free air.

Special Tools are shown on pages 17-19.



4

End Cover with Integral Shuttle and Low Pressure Relief Valve



Item No.	Description	Qty.
1	Retaining Ring	1
2	Stationary Seal	1
3	Rotating Seal and O-ring	1
4	Cap Screw	2
5	Washer	2
6	Dowel Pin	1
7	Socket Pipe Plug (1/8-27)	1
8	Case Drain Plug/O-ring	1
9	I.D. Tag and Screws	1
10	Fixed Motor Housing	1
11	Output Shaft Bearing Cup and Cone	1
12	Retaining Ring	1
13	Motor Drive Shaft	1
14	Swashplate	1
15	Thrust plate	1
16	Piston and Slipper Assembly	9
17	Slipper Retainer Plate	1
18	Spacer	4
19	Retaining Strap	2
20	Cap Screw	4
21	Cylinder Barrel Assembly	1
22	Dowel Pin (5/16 x 5/8 long)	5
23	Bearing Plate	1
24	Valve Plate	1
25	End Cover Bearing Cup and Cone	1
26	End Cover Bearing Shims	A/R
27	End Cover Gasket	1
28	Standard Motor End Cover	1
29	Lifting Strap	2
30	Hex Head Bolt	2
31	Hex Head Bolt	6
32	Square Cut Seal	1
33	Back-up Washer	2
34	O-ring	2
35	Valve Block Assembly	1
36	Hex Head Bolt	4
37	Gauge Port Plug/O-ring	3
38	Back-up Ring	4
39	O-ring	3
40	O-ring	3
41	High Pressure Relief Cartridge	2
42	Low Pressure Relief Cartridge	1
43	Shuttle Valve	2
44	Shuttle Spring	2
45	Shuttle Valve Plug/O-ring	2
46	Shuttle Spool	1
47	Motor End Cover with Integral Shuttle and Low Pressure Relief Valve	1
48	Shuttle Valve Plug/O-ring	2
49	Shuttle Spring	2
50	Shuttle Valve	2
51	Shuttle Spool	1
52	Gauge Port Plug/O-ring	1
53	Gauge Port Plug/O-ring	2
54	Hex Head Bolt	4
55	Cap Screw, Socket Head	2
56	Plunger	1
57	Spring	1
58	Low Pressure Relief Valve Shims	A/R
59	Low Pressure Relief Valve Plug/O-ring	1

A/R – As Required

Important: Cleanliness is extremely important when repairing a hydrostatic pump or motor. Before disconnecting the lines , clean foreign material from exterior of unit. Work in a clean area. Clean all metal parts in clean solvent. Blow parts dry with air. Don't wipe parts with cloth or paper towel, because lint or other matter could cause damage. Check all mating surfaces. Replace any parts that have scratches or burrs that could cause leakage. Don't use coarse grit paper, piles or grinders on parts.

Note: All torque specifications are for lubricated threads. Bolts for gasketed surfaces should be retorqued a second time.

A good service policy is to replace all old seals with new seals whenever unit is disassembled. Lubricate seals (except metal sealing surfaces of shaft seal assembly) with petroleum jelly. Use only clean, recommended oil when assembling unit. See Fluid Recommendation Form 3-401.

See page 16 for shaft seal reassembly instructions.

Disassembly Shaft Seal

Important: Clean surface area around stationary seal assembly.

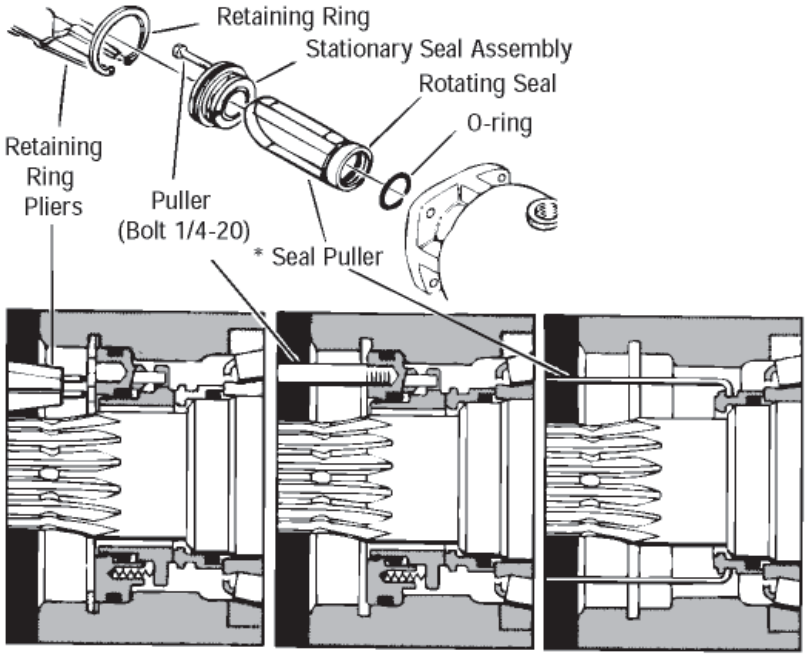


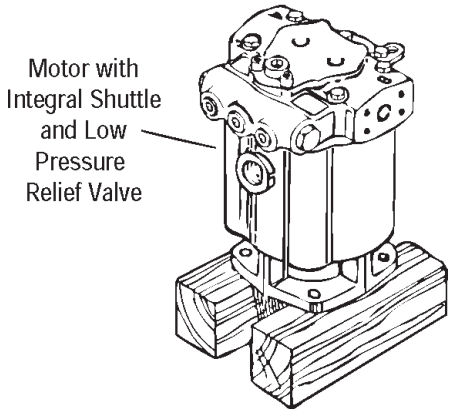
Figure 1

1. Use a pair of retaining ring pliers to remove retaining ring.
2. Insert stationary seal puller into threaded hold of station seal assembly to pull seal assembly from mounting flange.
3. Use rotating seal puller* (Figure 1) to grip outside diameter of bronze rotating seal. Remove seal from output shaft.
4. O-ring may remain in rotating seal recess. If not found in recess, remove O-ring from main motor shaft.

* Owatonna Tool Company No CAS 1844

6

Disassembly



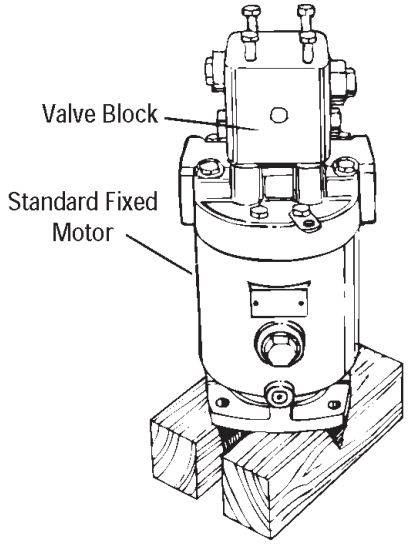


Figure 2

5. Position the motor on its mounting flange as shown in Figure 2. If your motor has an integral shuttle and low pressure relief, go to the box on page 9. Otherwise loosen all of the relief valves and plugs in the valve block. Remove the four bolts that hold the valve block to the motor. Then remove the valve block.

6. Remove O-rings and back-up rings from mounting face of valve block.

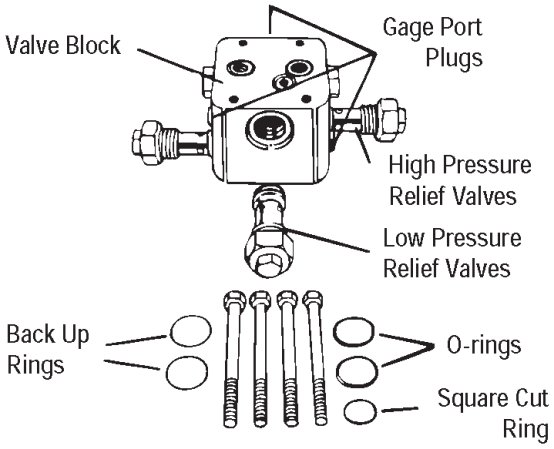


Figure 3

7. Use a 1-3/8 in hex wrench to remove valve block low pressure relief valve cartridge.

Note: The low pressure relief valve doesn't have back-up rings. It has only one O-ring in lower groove. Also, low and high pressure relief settings are preset at the factory. Stamping on cartridge identifies setting.

Example:

0	0	0
Thousands	Hundreds	Tens

Low pressure example:	016= 160 PSI [11 Bar]
	022= 220 PSI [15 Bar]
High pressure example:	500= 5000 PSI [344 Bar]
	400= 4000 PSI [275 Bar]

8. Using a 1-3/8 in hex wrench to remove two high pressure relief valve from valve block.

Note: High pressure relief valves have two white back-up rings and one O-ring in the lower groove. See Note above (Step 7) for pressure settings.

7

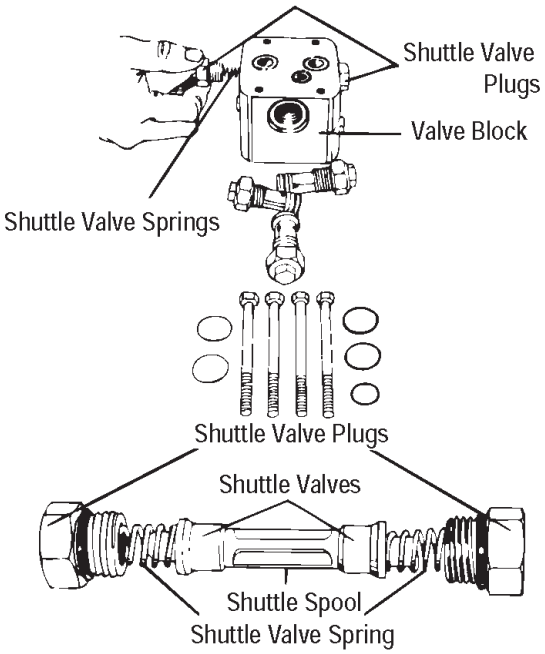


Figure 4

8. Use a 1 in. hex wrench to remove two shuttle valve plugs. Then remove shuttle valve springs.

10. Remove shuttle valves and shuttle spool.

11. Remove three gage port plugs assemblies.

Reassembly Valve Block

12. Install three gage port plug assemblies. Torque plugs 16 lb-ft [22Nm].

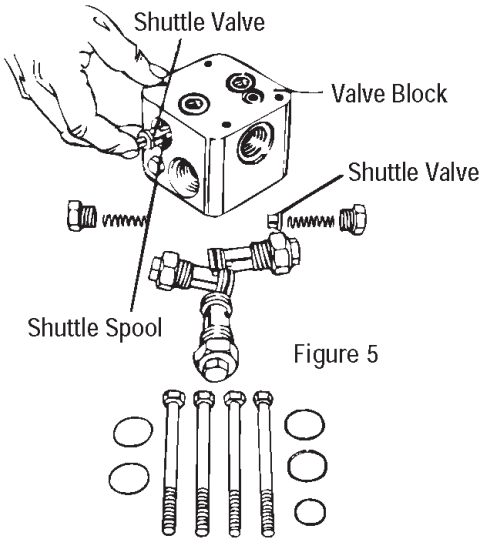


Figure 5

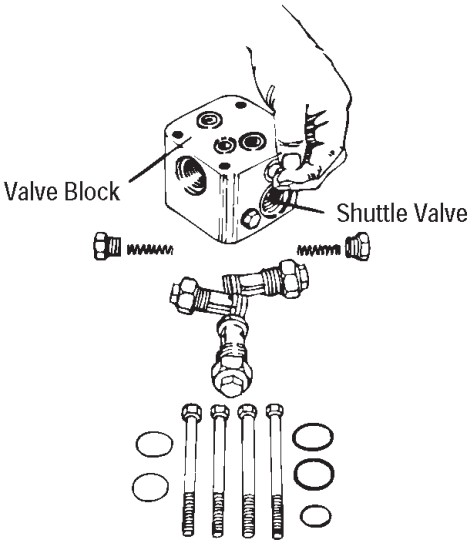


Figure 6

13. Install shuttle spool and shuttle valves in valve block.

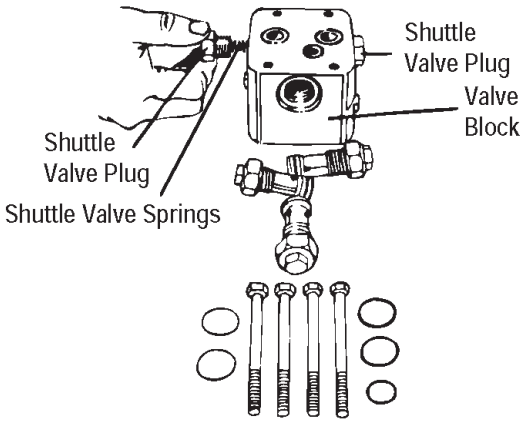


Figure 7

14. Install shuttle valve plugs and shuttle valve springs. Torque valve plugs to 68 lb-ft [92Nm].

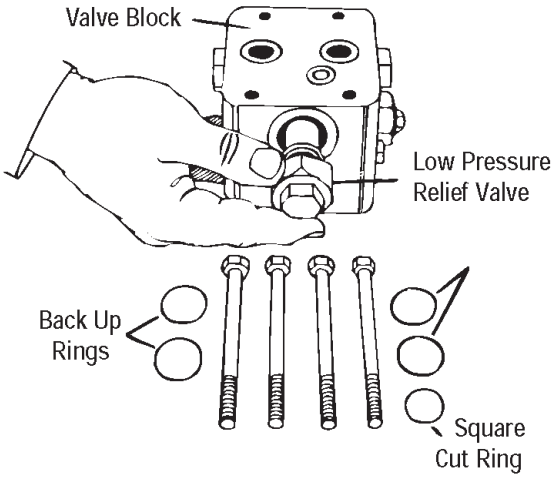


Figure 7

15. Install two high pressure relief valves – as shown in Fig 5. Torque valve to 25 lb-ft [Nm].

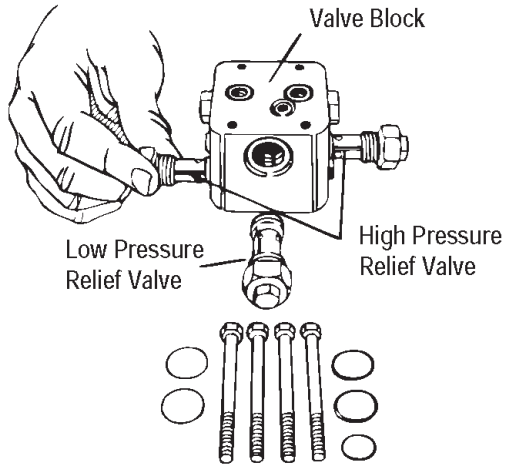
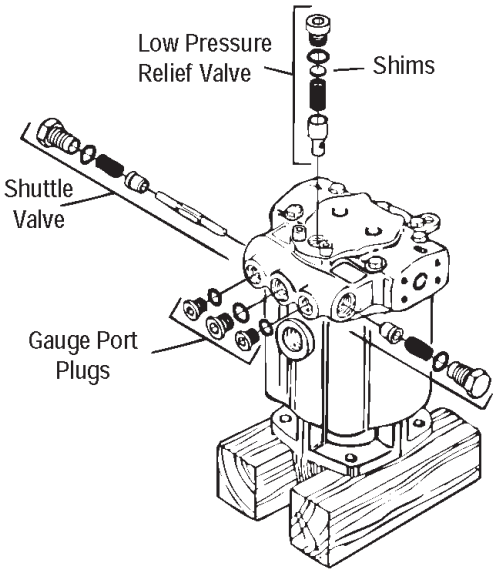


Figure 9

16. Install low pressure relief valve. Torque valve to 75 lb-ft [100 Nm].

Disassembly End Cover with Integral Shuttle and Low Pressure Relief Valve

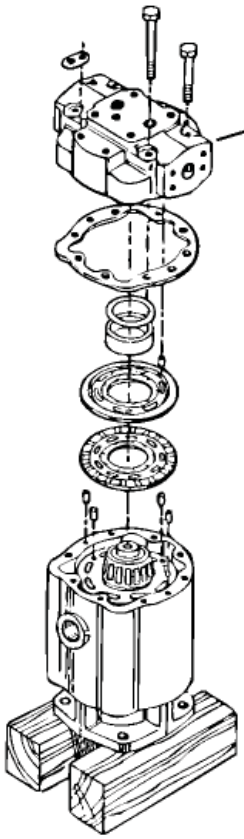


Remove the low pressure relief valve. Keep track of the shims, they are used to adjust the relief setting.

Remove the shutlle valve and gauge port plugs.

9

5



Standard End Cover

Note: Use the same procedure to remove the end cover from the motor with integral shuttle and low pressure relief valve.

Figure 10

Disassembly of End Cover

17. Remove eight hex bolts from end cover. See caution below.

Caution: Internal parts are spring loaded. To avoid internal part damage, remove six bolts leaving tow bolts opposite each other tight. Then, gradually and evenly remove two remaining bolts.

18. Carefully remove end cover, gasket and two end cover dowel pins. Don't drop any parts (valve plate, bearing cup, or shims) which may (may not) stick to end cover.

Disassembly of Rotating Group

Note: Use extreme care when handling all close tolerance internal parts of motor.

Keep Parts Clean

10

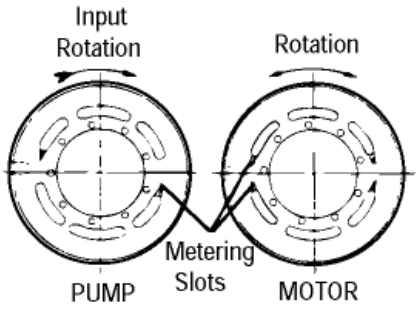


Figure 11

18. Pump valve plates are all unidirectional and motor valve plates are bidirectional. Shown on left is clockwise pump valve plate, which is identified by two metering slots. On right is the bidirectional motor valve plate, which is identified by four metering slots. Pump and motor valve plates are <u>not</u> interchangeable.

20. Remove rear bearing race from end cover. Use slight twisting motion to remove bearing race. It is slip-fit into end cover.

21. Remove rear bearing shims from end cover. Make sure you do not misplace shims as they are used to adjust shaft bearing end play of motor output shaft.

22. Remove end cover gasket and dowel pins from motor housing. Gasket may have remained on end cover during removal.

23. Remove bearing plate and pins from cylinder barrel. If small screwdriver is used to pry bearing plate from cylinder barrel, make sure bearing plate and barrel surfaces are not scratched or damaged.

Important: Handle the bearing and valve plates with extreme care. Both plates are lapped to extremely close tolerances for flatness.

Bearing Puller and Special Tool – Low Clearance Bearing Puller (see page 19)

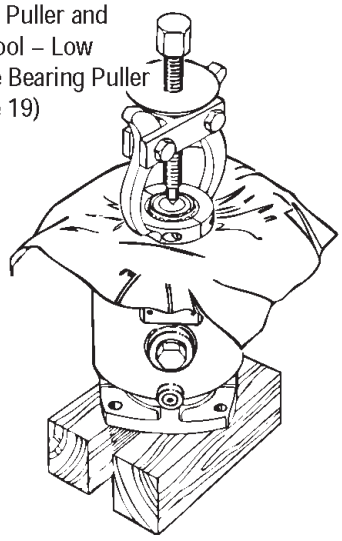


Figure 12

24. Use of low clearance bearing puller is recommended from removal of end cover bearing cone (see Figure 12).

This bearing puller pulls against bearing rollers, not against inner race. It is designed to prevent bearing cone and cylinder barrel face from being damaged when bearing is removed. Close clearance between end cover bearing and cylinder barrel makes it difficult to use any other type of bearing puller.

25. Install bearing puller and remove bearing from output shaft.

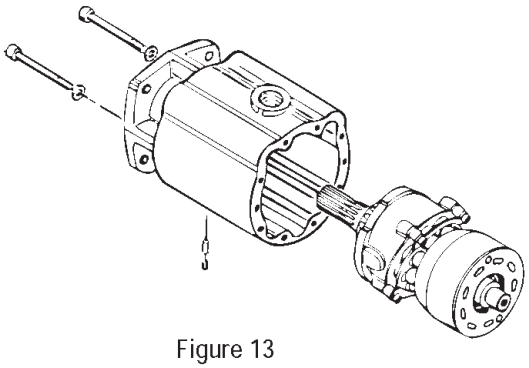


Figure 13

26. Carefully reposition motor on its side. Using 1/4 inch hex bit socket, remove two cap screws that retain swashplate in housing.

27. Remove washers from cap screws and discard. Replace with new washers.

28. Push output shaft assembly inward to dislodge swashplate from its pocket in housing.

29. Carefully remove cylinder barrel assembly and output shaft from housing.

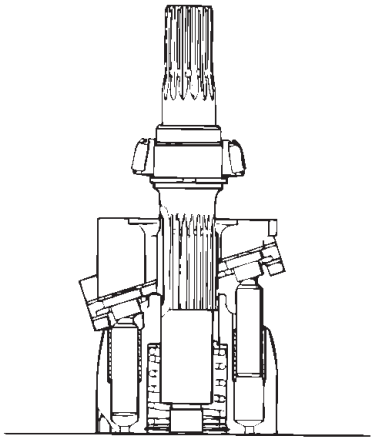


Figure 14

30. Reposition cylinder barrel and output shaft assembly in the up position. Remove output shaft assembly.

31. When output shaft bearing cone must be replaced, use a press to remove cone from shaft assembly.

You must use special stop limit tool (page 18) when installing new cone on shaft.

11

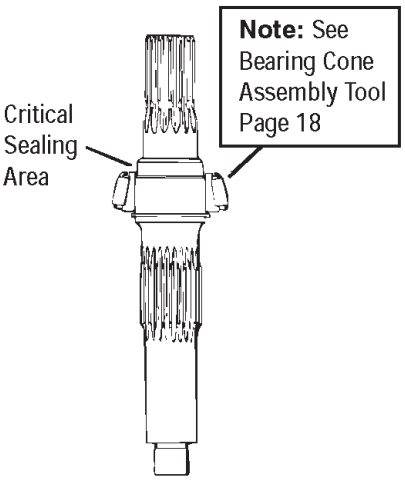


Figure 15

Important: When removing or installing bearing cone, do not damage output shaft sealing area (stepped area between bearing journal and output shaft splines). This area is critical for sealing output shaft seal.

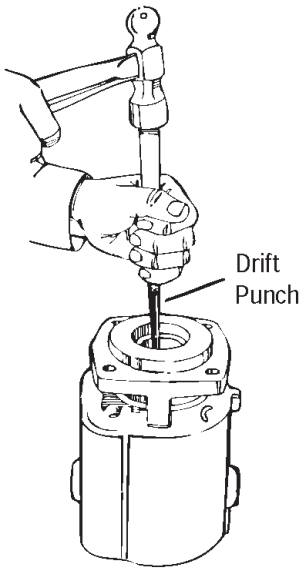


Figure 16

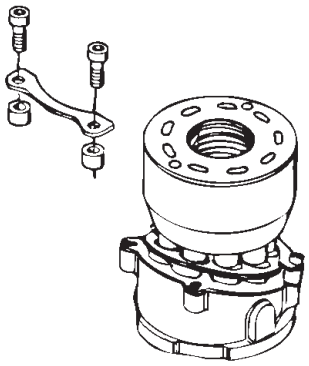


Figure 17

33. Reposition cylinder barrel and swashplate so that the swashplate is in the down position. Using a 1/4 inch hex key to remove the cap screws from the retaining strap on one side of the swashplate. Loosen the cap screws on the other retaining strap as this makes it easier to remove cylinder barrel from swashplate.

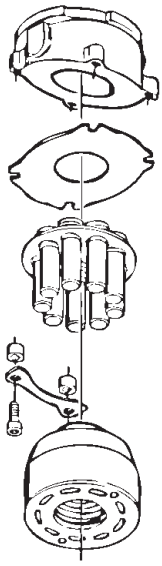


Figure 18

34. Carefully reposition cylinder barrel and swashplate with swashplate in the up position. Remove swashplate by lifting slightly and sliding it over to disengage from retaining strap.

35. Remove cap screws, retaining strap, spacers and thrust plate from swashplate.

36. Disassemble cylinder barrel assembly. Place it on a clean protective surface for inspection and cleaning.

Reassembly

37. Before reassembly of fixed displacement (fixed clearance) motor, clean all parts and assemblies in clean solvent and blow them dry with compressed air. Inspect and replace all scratched or damaged parts. When reworking parts. Do not use coarse grit paper, files or grinders on any finished surfaces. Replace all gaskets and O-rings.

    Lubricate O-rings with petroleum jelly for retention during reassembly. Freely lubricate all bearings and finished part surfaces with clean hydraulic fluid. This will provide required start-up lubrication for moving parts.

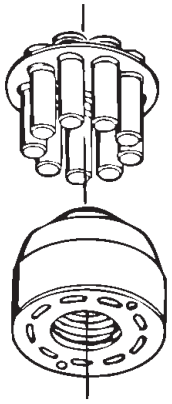


Figure 19

38. Lubricate and install slipper retainer plate and piston slippers in cylinder barrel assembly. After installation, freely lubricate brass slipper faces with clean hydraulic fluid.

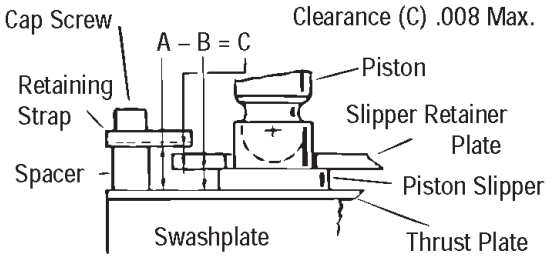


Figure 20

39. Before assembling motor any further, you must check fixed clearance of unit. Do this by first measuring height of retaining strap spacer with a micrometer or vernier calipers. There are two spacer heights – one for the 33, 39, 46 units and one for the 54, 64 units. Spacers are critical to the unit design and may not be adjusted.

    Next, measure thickness of both piston slipper flange and slipper retainer plate. Subtracting this measurement from spacer measurement gives fixed clearance of unit. Fixed clearance must not exceed .008 [,20 mm]. If fixed clearance exceeds .009 in [,02 mm], replace worn parts, (i.e., piston slipper assemblies thrust plate, retaining strap and slipper retainer plate).

    Fixed Clearance =
    Spacer Height – [Slipper Flange + Retainer Plate]

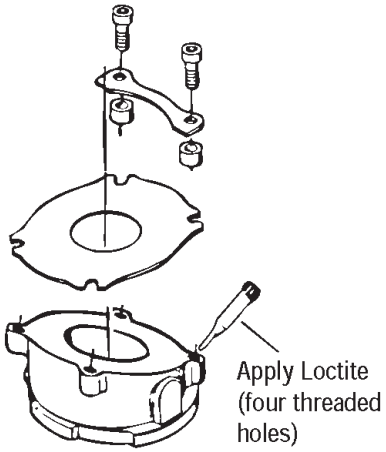


Figure 21

40. After checking fixed clearance, continue with assembly of cylinder barrel and swashplate. Apply one or two drops of Loctite No. 271 in first or second thread down in each of four hole in swashplate.

Caution: Loctite parts must contact only those surfaces intended for assembly. Wipe excess Loctite from swashplate with non-petroleum base solvent applied to cloth. Do not apply Loctite to threads more that 15 minutes before installing cap screws. If Loctite stands for more that 15 minutes, repeat application. If repeating application is not necessary to remove previously applied Loctite.

41. Lightly lubricate and then install thrust plate, aligning cap screw holes. Install spacers, retaining strap and cap screws on one side of the swashplate. Do not tighten cap screws at this time.

42. Place cylinder barrel assembly on clean, flat surface with piston slippers pointing upward. Carefully install swashplate on cylinder barrel by slightly lifting side without retaining strap. Slide swashplate over to engage installed retaining strap around piston retainer.

13

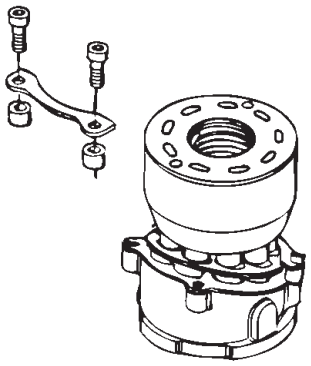


Figure 22

43. Carefully reposition cylinder barrel and swashplate with the swashplate in the down position. Install the remaining spacers, strap and cap screws in the swashplate. Tighten all four cap screws 16-19 lb-ft [22 to 26 Nm].

44. An alternate method of checking fixed clearance is with the use of a feeler gauge. If using this method, make sure gauge is inserted between retaining strap and slipper retainer plate only. Piston slipper faces could be damaged if gauge is inserted between piston slipper and thrust plate.

45. Carefully reposition cylinder barrel assembly and swashplate so that cylinder barrel face is on a clean, flat surface. Lubricate and install output shaft subassembly in cylinder barrel subassembly.

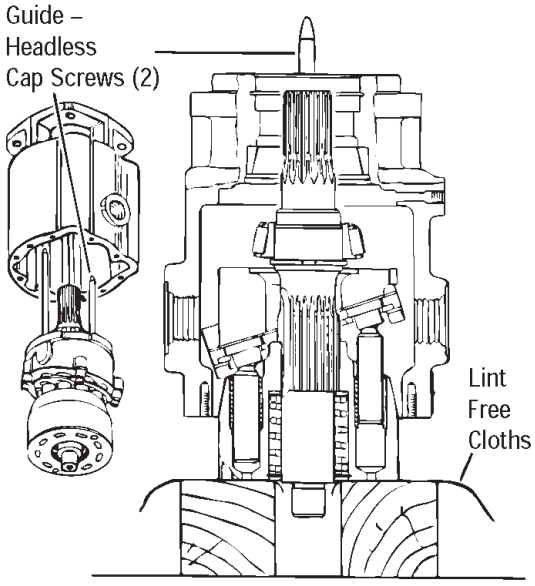


Figure 23

46. Install two headless 5/16 inch cap screws (five to six inches long) in swashplate. These cap screws will guide swashplate into pocket in housing.

47. When installing cylinder barrel and swashplate into housing, align pin in housing with notch in swashplate.

48. Carefully slide housing over output shaft subassembly, swashplate and cylinder barrel assembly.

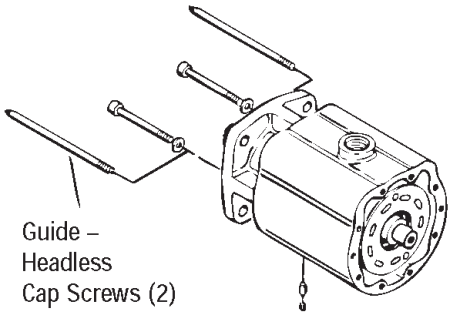


Figure 24

49. Holding cylinder barrel assembly carefully in position in housing, reposition motor on its side and remove headless cap screws.

50. Install new special washers on swashplate cap screws.

51. Install two cap screws in swashplate. Tighten them 20 to 24 lb-ft [27 to 33 Nm].

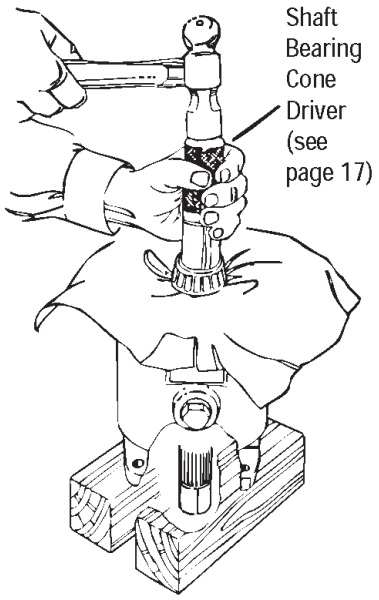


Figure 25

52. Carefully reposition and support motor on mounting flange. Support output shaft in a slightly raised position.

    Use a press or bearing driver to install end cover bearing cone on output shaft. Bearing cone must seat against shoulder of output shaft.

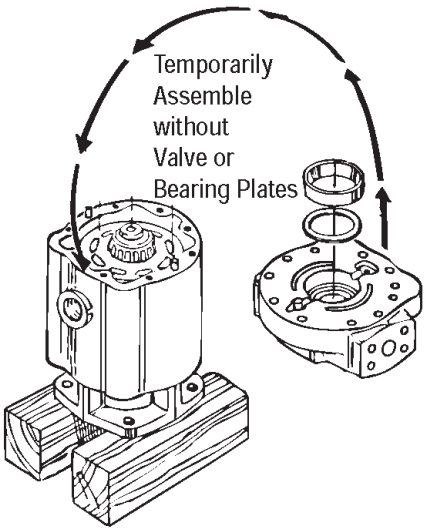


Figure 26

53. Install two dowel pins and gasket on end cover.

54. Lubricate and install bearing shims and bearing cup into end cover.

55. Check output shaft subassembly end play by installing end cover without installing either valve or bearing plates. This remove cylinder barrel's spring tension against output shaft.

56. Install cap screws in end cover and slowly and evenly tighten them. Torque cap screws as follows:
    Models 33, 39, 46 – 39 lb-ft [53 Nm]
    Models 54, 54 – 63 lb-ft [85 Nm]

57. Place and support motor assembly on end cover. Gently tap output shaft inward with hammer.

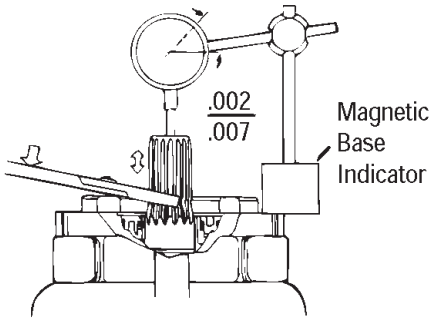


Figure 27

58. Install magnetic base indicator on mounting flange with gauge on output shaft end. Use pliers to grip output shaft as low as possible. Pry upward to determine shaft end play. Indicator must read .002 to .007 in [,05 to ,17 mm] shaft end play. If end play is incorrect, adjust by adding or removing shims under bearing cup located in end cover.

59. After adjusting end play, reposition motor on mounting flange and remove end cover.

60. Install two dowel pins in face of cylinder barrel subassembly. Freely lubricate bearing plate with dowel pins and install it on cylinder barrel assembly.

61. Install valve plate dowel pin in face of end cover. Using petroleum jelly, lightly coat side of valve plate facing end cover. This will retain valve plate during assembly. Install valve plate over bearing cup, aligning it with dowel pin. Valve parts must rest flat and be flush with end cover.

15

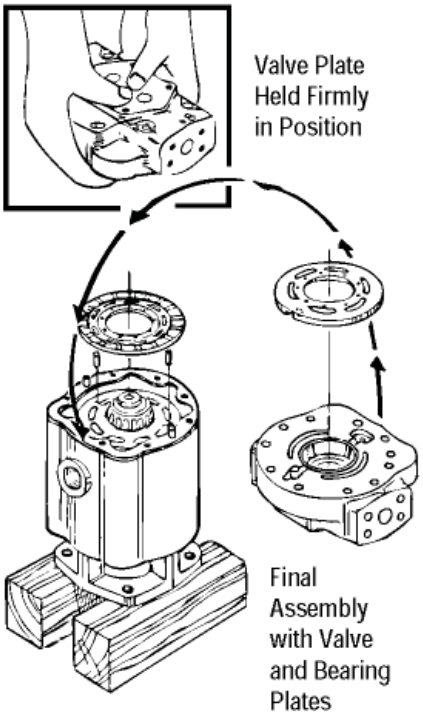


Figure 28

62. Hold vale plate firmly in position. Install end cover on housing.

63. Install cap screws in end cover. Slowly and evenly tighten them. Torque cap screws as follows:
    Models 33, 39, 46 – 39 lb-ft [53 Nm]
    Models 54, 64 – 63 lb-ft [85 Nm]

    Torque screws in star pattern. Then torque each screw a second time to compensate for gasket compression set.

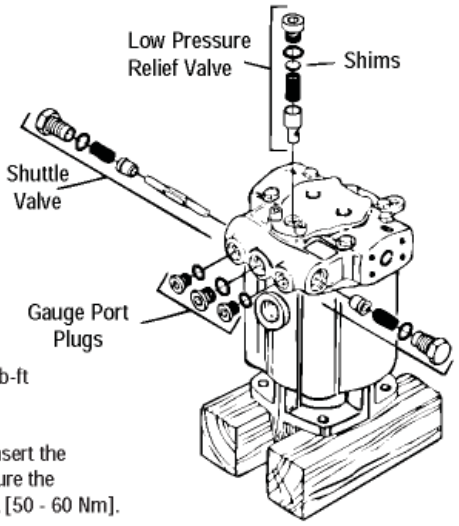
Reassembly of End Cover with Integral Shuttle and Low Pressure Relief Valve

Install the gauge port plug assemblies. The two outer ports have smaller plugs; torque them to 25 - 31 lb-ft [18 - 23 Nm]. Torque the larger plug to 40 - 48 lb-ft [30 - 35 Nm].

Lubricate and install the shuttle spool and shuttle valves in end cover. Make sure the shuttle valve are installed correctly, with the smaller ends facing the center of the spool.

Install the shuttle valve springs and plugs. Torque the plugs to 68 - 82 lb-ft [50 - 60 Nm].

Install the low pressure relief valve plunger and spring. Lubricate and insert the shims in the relief valve plug. Install the plug over the spring, making sure the shims are not dislodged. Screw the plug in and torque it to 68 - 82 lb-ft [50 - 60 Nm].



16

Reassembly of Shaft Seal

Important: For best sealing results, clean the metal-to metal seal surfaces with an aerosol cleaner such as Freon or trichlorethylene. This cleaner must evaporate and not leave any residue. It must also be compatible with Viton. Do not touch these surfaces with hands. Coat with clean, filtered oil before reassembly.

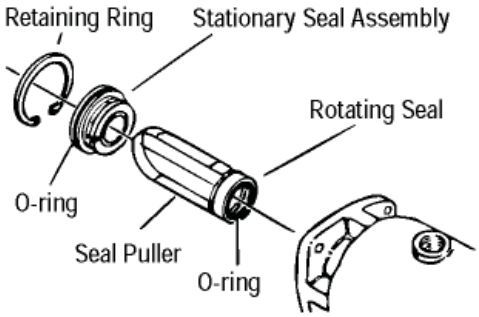


Figure 29

64. Lubricate O-ring seal of rotating seal. Then install rotating seal with seal puller (Owatonna Tool Company No., CAS-1844). Ensure that rotating seal O-ring is placed inside the rotating seal before assembly onto the drive shaft.

65. Lubricate O-ring seal of stationary seal assembly. Then install stationary seal assembly (see Fig. 29).

66. Use a No. 5 or No. 7 retaining ring pliers to install retaining ring (beveled side of ring out).

Reassembly Install Valve Block

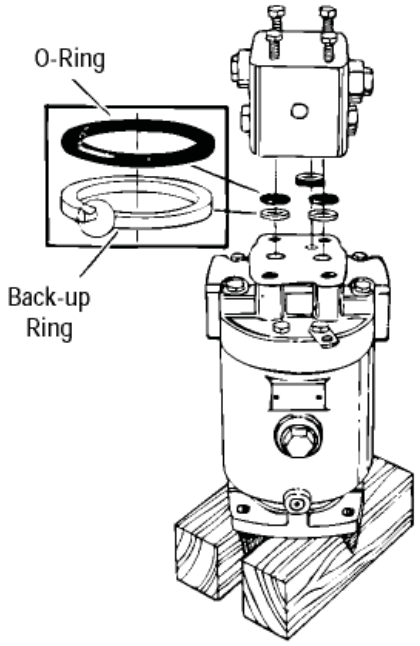


Figure 30

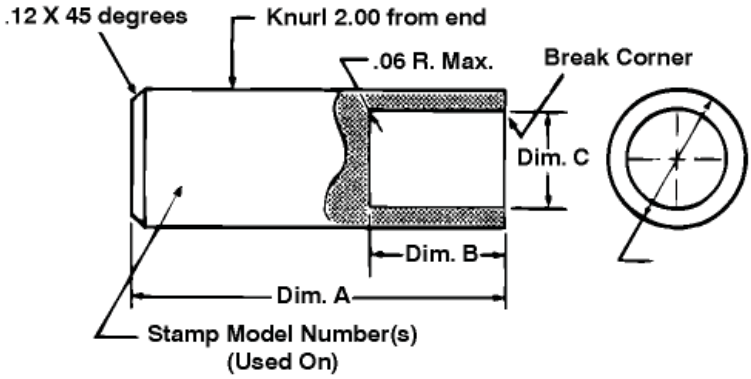
67. Install O-rings and back-up rings on valve block. The high pressure ports require an O-ring and back-up ring. The O-ring goes on first, then the back-up ring – with the rounded side of ring toward the O-ring – as shown in Fig 30. Install square-cut ring in low pressure drain port of valve block.

Note: Be careful not to damage O-rings and back-up rings. Use clean petroleum jelly to hold O-rings and back-up rings in place during block installation.

68. Install valve block on end cover. Then install four hex bolts. Torque bolts 28 lb-ft [38 Nm].

Torque Specifications for Lubricated Threads – lb-ft [Nm]		
Where Used	Model 33-39-46	Model 54-64
End Cover Bolts – Grade 8	39 [53]	63 [85]
Relief Valve (Low Press.)	75 [100]	75 [100]
Relief Valve (High Press.)	25 [34]	25 [34]
Relief Valve (Feathering)	25 [34]	25 [34]
Shuttle Cap	68 [92]	68 [92]
Socket Pipe Plug	16 [22]	16 [22]
Valve Block Mounting Bolts	28 [38]	28 [38]

Shaft Bearing Cone Driver
(End Cover end)



Material: C.R.S., Hardern to Rc 50-55

Model	Dim. A	Dim. B	Dim. C	Dim. D
33, 39,46	4.0	1.5*	1.01	1.25
54, 64	4.0	1.5*	1.30	1.48

*** 1.5 in from shaft with splined drive for B pad Charge Pump**

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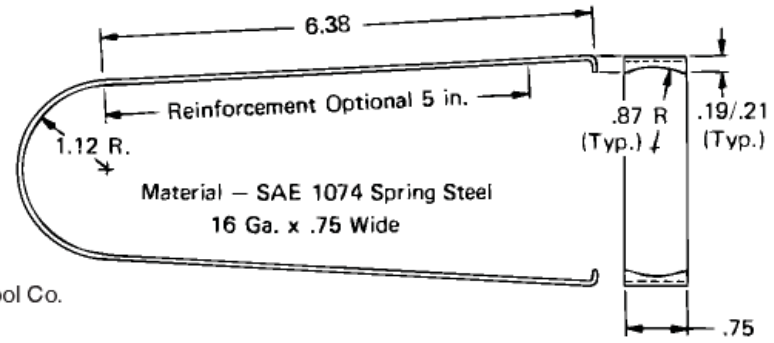
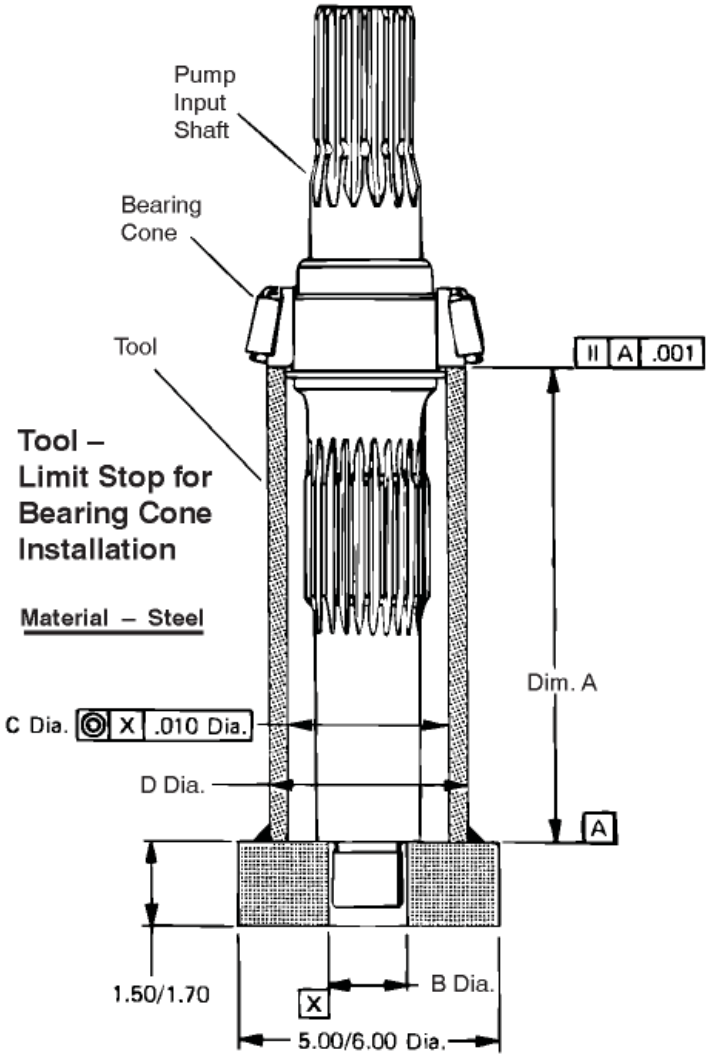
Tool – Shaft Rotating Seal Puller



Available from Owatonna Tool Co.
No. CAS - 1844

Tool – Limit Stop for Bearing Cone Installation

Material – Steel



Tool	Model	Dim. A ±.001	Dim. B	Dim. C	Dim. D
1	33,39,46	5.803	1.00/1.20	2.20/2.30	3.00 Min.
2	54,64	6.682	1.30/1.32	2.20/2.30	3.00 Min.

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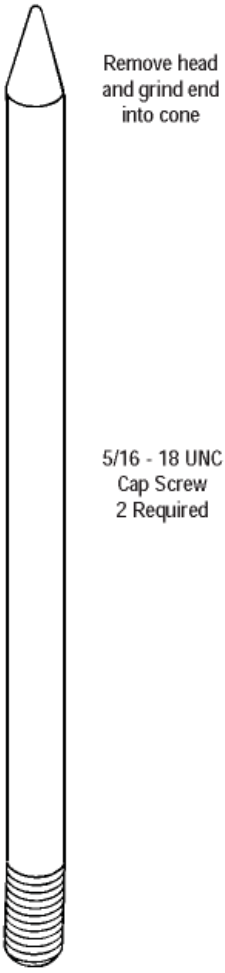
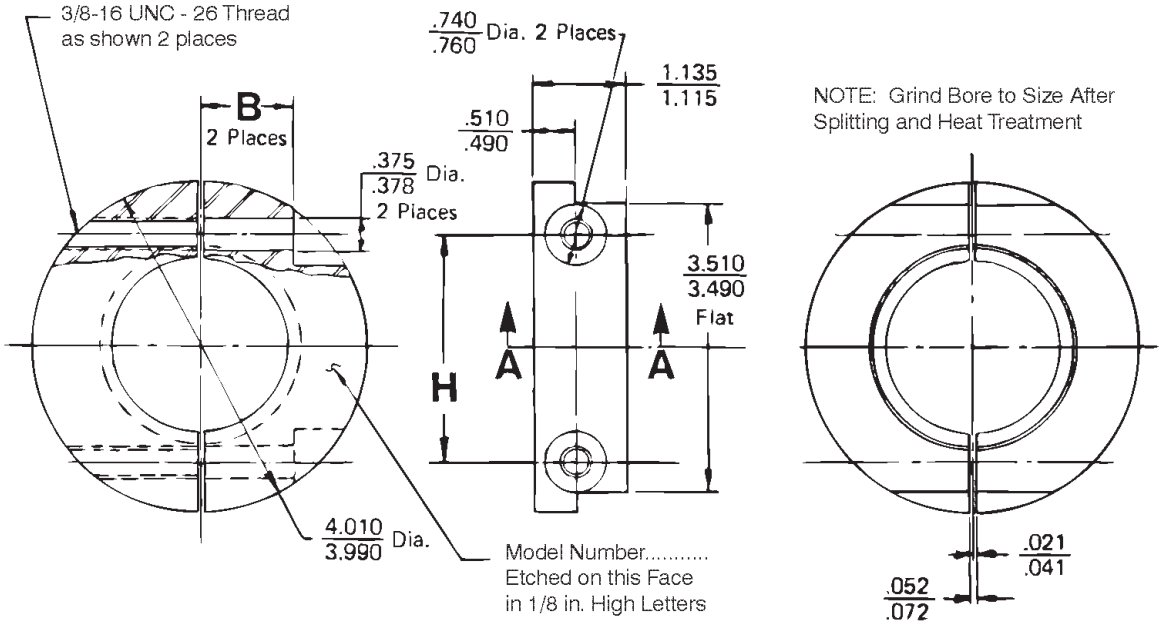
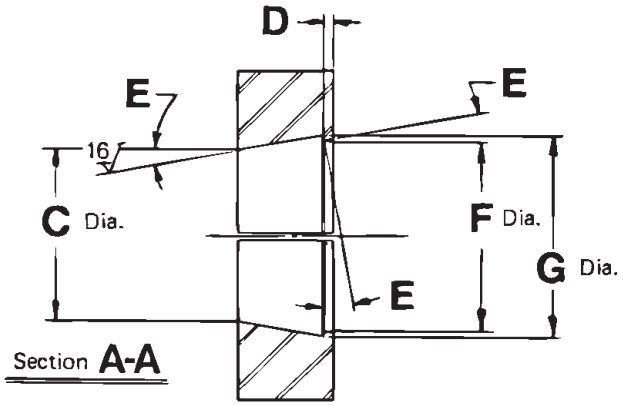
Headless Cap Screw Guide



Low Clearance Bearing Puller



Material/ Heat Treat
Stentor / 45 - 55 R_C
Title
Cone Bearing Puller



	Displacement cu. in./rev.				
	3.3	3.9	4.6	5.4	6.4
B	1.050 / 1.070			1.115 / 1.135	
C	1.565 Ref.			2.071 Ref.	
D	1.35 / 1.29			.131 / .125	
E	12° -45' / 13° -15'			10° -5' / 10° -35'	
F	1.907 / 1.913			2.310 / 2.316	
G	2.020 / 2.026			2.432 / 2.438	

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Hydrostatic Fluid Recommendations

A reputable supplier can help you make the best selection of hydraulic fluid for use in Eaton hydrostatic products.

For satisfactory operation, the following recommendations apply:

- The filter system used in the hydraulic circuit must be capable of maintaining the fluid at ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2500 particles per milliliter greater than 5µm and a maximum of 80 particles per milliliter greater than 15µm.
- At normal operating temperatures, optimum viscosity ranges are from 80–180 SUS [16–39 cSt]. Viscosity should never fall below 60 SUS [10cSt] and, at the lowest expected startup temperature, should not exceed 10,000 SUS [2158 cSt].
- The fluid should contain anti-wear agents, rust inhibitors, and anti-foaming agents.

Note: If the fluid becomes black or milky, an overheating or water contamination problem exists.

Take fluid level readings when the fluid is cold.

Eaton Corporation
Hydraulics Division
15151 Hwy. 5
Eden Prairie, MN 55344
Telephone 612/937-9800
Fax 612/937-7130

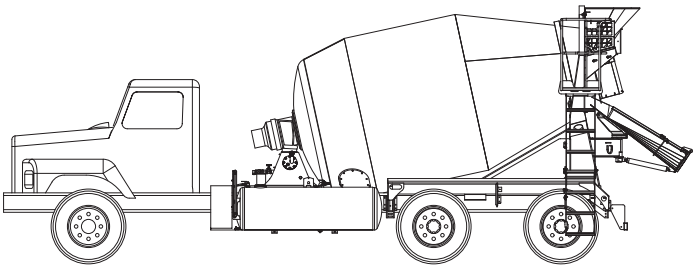
Eaton Ltd.
Hydraulics Division
Glenrothes, Fife
Scotland, KY7 4NW
Telephone 01-592-771-771
Fax 01-592-773-184

Eaton GmbH
Hydraulics Products
Am Schimmersfeld 7
40880 Ratingen, Germany
Telephone 02102-406-830
Fax 02102-406-800

ISO-9001 CERTIFICATED FIRM

Quality System Certified
Products in this catalog are manufactured in an ISO-9001-certified site.

Form No. 7-127



Electrical Components

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1.0 10-Button Transmitter/ Receiver

1.1 Quick Programming Procedure

Use the following procedure to program the 10 button Omnex transmitter and receiver.

1. Release the two tabs holding the receiver cover and pull out the receiver circuit board. See Figure 2.
2. Prepare the transmitter by pressing the transmitter buttons in the following sequence. See Figure 1.
   a. Press and hold the RED button.
   b. Press and hold the GREEN button
   c. Release the RED button.
   d. Release the GREEN button. NOTE: The YELLOW LED on the transmitter should begin to flash slowly.
   e. Press and hold the receiver SET-UP button, see Figure 2. The STATUS LED on the receiver will begin to flash approximately once per second. Release the receiver SET-UP button as soon as the STATUS LED begins to flash rapidly, this should take approximately 5 seconds.
   f. Press and release the GREEN transmitter button. Both transmitter LEDs should go solid and after approximately 10 seconds will go out. This indicates that the program has been downloaded.
   g. Press the GREEN transmitter button. The LINK LED on the receiver should begin to flash showing that a link has been established between the transmitter and receiver.

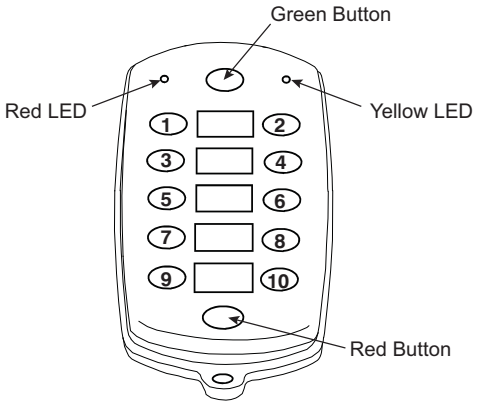

Figure 1

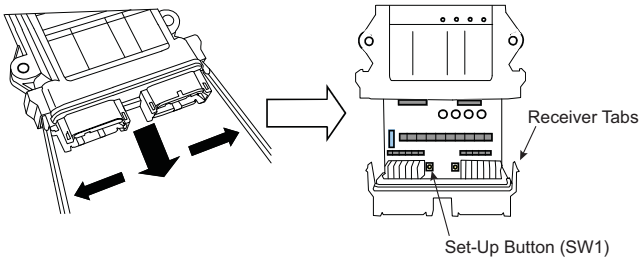

Figure 2

1.2 Transmitter Troubleshooting

Is the Transmitter Lighting Up?

- If not try new batteries and inspect the battery contacts for corrosion or broken tabs.
- Does unit have tabs for battery contacts? If yes, are there rubber spacers behind tabs to stop them from bending and not making contact with the batteries?
- Another way to tell if the batteries are making contact or not is to put the transmitter into the charging cradle. If the batteries are not making contact the upper left LED on the transmitter will flash slowly for approximately 2 times and then begin to flash rapidly. Remove the transmitter from the charger cradle.
- If you can not get the transmitter to light up after completing the above steps then call for service.

Transmitter Lights Up but the Functions Do Not Work.

- The following tests can be performed without the truck or receiver.
- Do both LEDs light up? If they flash together, that indicates one of the buttons is stuck. If you turn the unit on and the red LED flashes at its own pace then that means the batteries are low on power.
- With the transmitter on and upper right corner white LED flashing, push #1 gray button twice per second. White LED should be on solid and you should also hear and feel a distinctive “snap” when you push the button.
- Repeat this test with each of the gray buttons. The white LED should stay solid while you press each of the buttons twice per second. If not, the connection between the button and the circuit board is lost and the transmitter needs to be repaired.
- If all of the gray buttons fail to work, it is likely a major issue. There may be a break in the circuit board in which case the unit will have to be replaced.
- If the transmitter passes the above tests then continue to the next section to test the receiver.

Is the receiver lighting up?

- Key on, transmitter off. E-Stop LED - red. Function/Fault LED - green, Link LED - red, Status LED - green.
- Key on, transmitter on. E-Stop LED - green, Function/Fault LED - green, Link LED - flashing green, Status LED - green.
- If none of the receiver LEDs are lit, then there is a problem with the main circuit breaker or power wire - trace to source which will be located at the truck fuse panel.
  - The Link LED should flash the same as the transmitter, showing that they are communicating with each other.
  - Every time you push a gray button on the transmitter the Link LED on the receiver will stay on solid just for a moment to indicate that it has received the signal. Just as with the transmitter, push each of the gray buttons twice per second to see if the Link LED will stay on showing that it is receiving the signal from each button.
- If any of the LEDs are other then stated above, use the chart on the top of the receiver to identify the type of failure.
- If both transmitter and receiver pass the above tests then the radio system is operating properly and the problem is located after the radio system.
  - If only one function is not working properly then check for 12 volts at the valve that controls the function. It will have a 2 wire cable running to it with one wire being 12 volts and one being ground.
  - If there is no power or ground then follow the wiring from the valve to the source looking for a break in the wire. There will be a connector inside the cab floor cover on which the receiver sits and it will be marked for the individual function. Check to make sure there is power there and it is plugged in fully.

Normal charger operation - Key ON

- The Charge LED on the cradle will flash approximately twice per second when the transmitter is not stored.
- The Charge LED on the cradle will be on solid when the transmitter is stored and being charged.
- If the Charge LED on the cradle flashes when the transmitter is stored, the charging portion of the cradle may be faulty, or the charging portion of the transmitter may be faulty. If available, place another Yellow 10 button transmitter in the charging cradle and note if the LED operates normally. If it does, then the transmitter is faulty and needs to be replaced.
- The upper left LED on the transmitter will flash slowly until the batteries are fully charged and then it will be on solid.
- If the upper left LED flashes rapidly it's indicating a problem with the batteries. The batteries are missing, there is no contact with them, they are non-rechargeable, installed backwards or are dead.

2.0 Dash Cradle

Dash Cradle - Wiring Diagram

POWER-BATTERY: Supply 11-29VDC (fuse with 1.5 - 3 Amp)
GROUND: Negative Supply, Ground [#12]
INPUT: Vehicle in motion input—
N/C: Relay normally closed (max. current .5 Amp) -
COM: Relay common (max. current .5 Amp) -
N/O: Relay normally open (max. current .5 Amp) -
LED A: Top left LED +5 to 36V active high - [Hopper Up #10 LED]
LED B: Middle LED +5 to 36V active high - [Chute Unlock #9 LED]
LED C: Bottom left LED +5 to 36V active high - [Pause #11 LED]
SW A: Switch output - [Discharge #7]
SW B: Switch common- [Auxiliary Power #6]
SW C: Switch output – [Mix #8]

NOTE: *For SW A to C: 0-36V fuse externally if required, max current 3A*

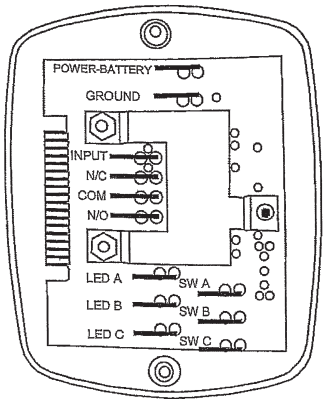

Figure 3

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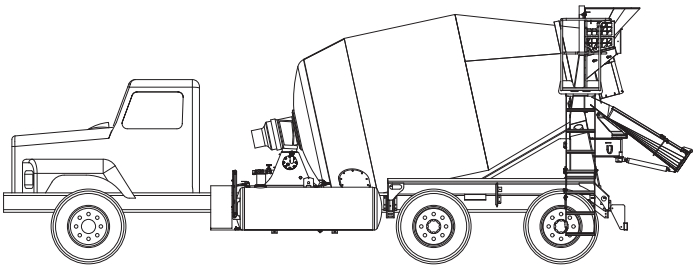

Emergency Unloading Procedures

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Emergency Unloading Procedure

1.0 Introduction

One of the worst situations, other than an accident on the site or on the road, to face a transit mixer operator is a system failure to the unit with a load still in the drum. The following pages outline procedures to be followed in the case of such an emergency.

2.0 Contingency Measures - Preparation

A contingency plan for unloading should be formulated in advance of operations, because normally action time is limited in any emergency situation.

The following are factors which should be addressed before an emergency happens.

1. Maintain a service truck complete with trained personnel and the necessary equipment needed in an emergency.
2. Train operators to familiarize themselves with the operator's manual, so they can perform the necessary actions while waiting for assistance.
3. Checking for locations between plant and site where, if necessary, it would be feasible to discharge the load.
4. The dispatcher should be able to locate and dispatch a stand-by mixer to the scene of the emergency immediately after receiving an assistance call.
5. The service truck should carry the following equipment:
   a. Emergency unloading hose kit.
   b. A new replacement filter and a supply of hydraulic oil.
   c. A complete set of mechanics hand tools.
   d. A set of necessary tools to unload the concrete from the drum, shovels, hoes, rakes, etc.
   e. Equipment for manually turning and positioning the drum for emptying via the unloading hatches. E.g. rope, chain, pry-bar, 4x4 wooden block, etc.

3.0 Failure of the Truck Engine

To discharge the load of a disabled mixer; couple the hydraulic systems of the disabled unit and a stand-by mixer. Proceed as follows;

1. Leaving approximately 5 feet of working space between the trucks, position the stand-by unit with its right hand side adjacent to the right hand side of the disabled unit. Locate the mixers so the hydraulic motor hose clusters are opposite to each other. See Figure 1.
2. Put the drum control of the stand-by mixer in STOP (pump NEUTRAL) position, then turn vehicle OFF.

⚠ WARNING

Make certain that neither hydraulic system is running hot, or that the lines are pressurized. A spray of hot oil could cause serious injury or blindness.

3. To relieve pressure remove the reservoir filler cap from both mixers.
4. Clean the hose connections of both units thoroughly, and make certain that no contamination will get into either system during the hook-up procedure.
5. On the stand-by mixer, disconnect a hose from a motor port and attach one from the emergency hose kit to this hose. From the disabled mixer, remove the corresponding hose and connect the emergency hose to same coupling.
6. Cap and plug the disconnected hoses immediately with clean plastic caps and plugs.
7. Repeat steps 5 and 6 with the remaining hose connections.
8. Start the engine of the stand-by vehicle. Use low throttle and slow drum speeds until any air-traps and/or voids are eliminated from the hydraulic system. Check the oil level in the reservoir constantly during this procedure, and top up as necessary.

9. Actuate the drum control on the stand-by unit to the discharge function and discharge the disabled units load.
10. When discharging is complete, stop the procedure and remove the emergency hose connections in the reverse sequence as installed. Check oil levels and replace the reservoir filler caps.

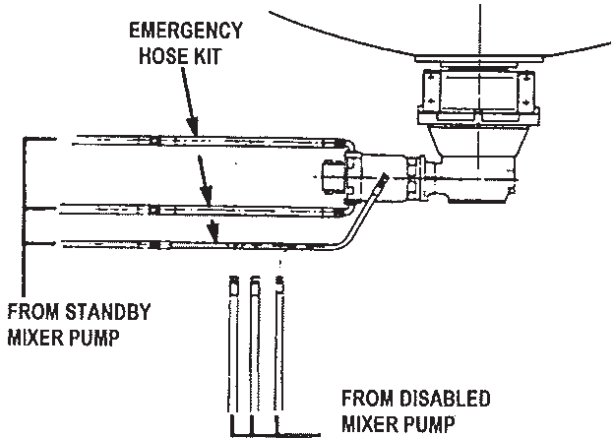


Figure 1

4.0 Problems in the Hydraulic System

⚠ CAUTION

A failure of the hydraulic system or the planetary gear train could be a signal that the oil in the system has become contaminated. If either of these conditions occur DO NOT use the procedure in Section 3 or couple to a stand-by mixer. To do so would create the risk of severely damaging the stand-by mixer's hydraulic and gear train components. Use instead, if required, the Manual Unloading procedure.

First make a quick inspection for:

a. Broken or leaking hydraulic hoses, lines or fittings.
b. Broken or loose filter canister.
c. Clogged filter cartridge.
d. Reduced fluid level in the reservoir.

5.0 Mechanical Problems other than Engine Failure

Make the following checks for an obvious cause of the failure.

1. Drum not turning. Possibly caught and held by a foreign object. Clear the drum.
2. Roller jammed on the track. Clear the roller.
3. Pump drive shaft disconnected or broken. Reconnect or replace.
   a. It may be expedient to temporarily use one from a similar mixer.
   b. If a new drive shaft is not immediately available to unload mixer; use procedure in Section 3 with a standby mixer.

6.0 Manual Unloading

One method of turning the drum to unload is shown in Figure 3.

A tow chain, strap or rope together with a 4 x 4" block placed inside an open emergency hatch. Power to rotate the drum can be provided by a standby truck, or by turning manually using a pry bar as shown.

With the emergency hatch opened and in the bottom position the load can be removed.

When the drum is hydraulically locked against turning by the hydraulic motor; attempt to bleed off sufficient fluid from the motor by loosening the high pressure hose fittings shown in Figure 4. Bleed off sufficient fluid to enable the drum to be turned manually.

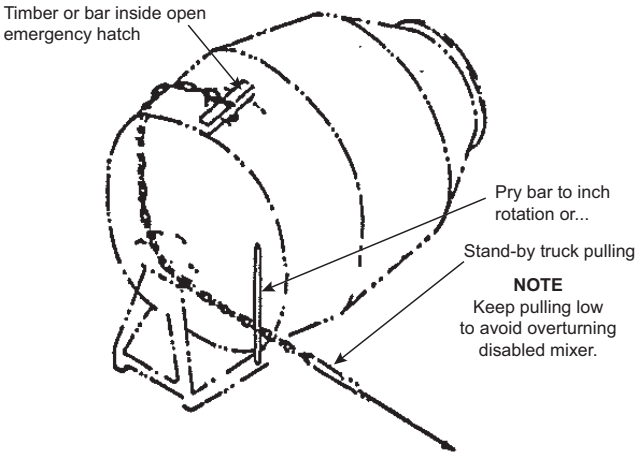


Figure 3

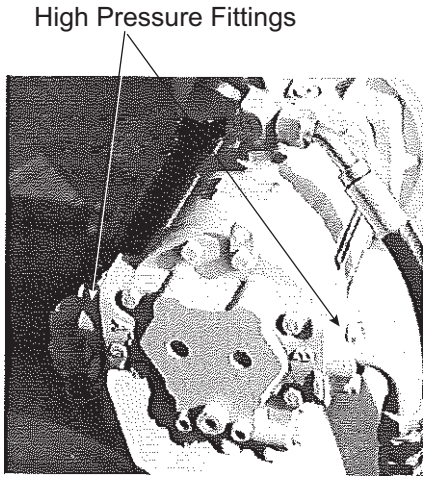
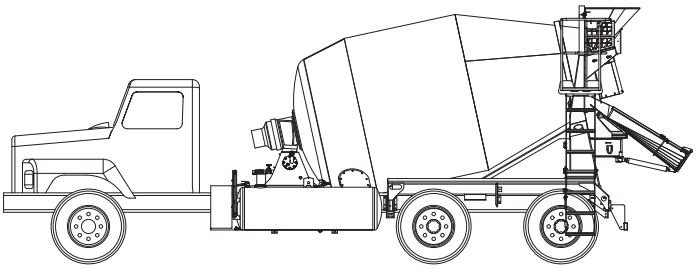


Figure 4

7.0 After Completing Emergency Unloading Procedures

1. Replace all hoses to their correct (previous) locations.
2. Return both mixers to their respective maintenance bases for service check.
3. Check hydraulic oil system of both mixers for possible contamination by draining oil through a clean lint-free cloth.
4. If contamination is detected, find the source and eliminate it.
5. Flush out entire systems of both units; clean out the reservoir, all hoses and connecting lines. Replace hydraulic oil and filter. See the Eaton Start-up Bulletin #2-402 provided in Section 5 of this manual.



Bulletins

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1.0 Revolution Drum Washout Procedure

LONDON
An Oshkosh Truck Corporation Company

Technical Service Information Bulletin

Revolution™ Drum Washout Procedure

Purpose: A key to the long and productive service life of the Revolution™ drum is to perform a routine washout schedule. London is providing a washout schedule and the procedures for standard preventive maintenance of the Revolution™ mixer drum.

Washout Schedule/Procedure:

- AFTER EACH LOAD

Wash truck paying special attention to charge hopper, water injection pipe, collection hopper and discharge end of drum and fins. Failure to do this will cause premature wear of the drip ring and discharge end of drum and fins.

- DAILY

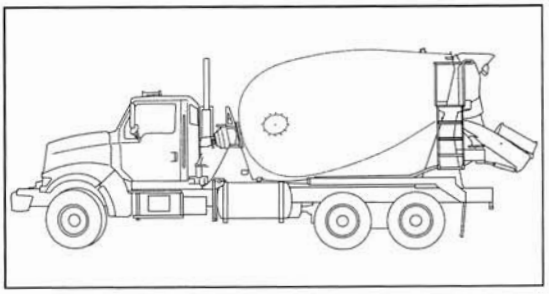
Add approximately 100 gallons water to an empty drum and agitate at 1200 engine rpm, alternating between full charge/discharge operation for a minimum of 5 minutes. It is important to cycle wash water forward and back across the entire area of the fin spiral. Repeat if time allows. In cases of high cement content or rapid setting mixes use approximately 300 gallons of water and perform this same procedure. Failure to do this can cause pre-mature concrete build-up within drum interior.

- WEEKLY

Add 2500 pounds of aggregate and 150 gallons of water to an empty drum and agitate at 1200 engine rpm for 5 minutes. Alternate between full charge/discharge operation to move the aggregate back and forth across the fins.

-BI-WEEKLY

Inspect for concrete build-up and remove with a 3 pound hand maul. Do not use any sharp edged tools as damage to the urethane skin may result. If a small air/electric power chisel is used, only blunt tipped chisel inserts may be used. Avoid striking urethane liner as damage to liner or fiberglass shell may occur. Any concrete pieces removed must be removed from the drum by hand, not discharged by the drum as these may lodge between the collector and drum and cause severe damage.



Call London Mixer Service if you have any questions concerning this procedure. Inspect for any obvious damage to the shell liner and spiral fins. Report any suspect damage to London Mixer Service to include the mixer serial number and drum serial number.

ADDITIONAL SERVICE INFORMATION

-Do not run dry aggregate in the drum for more than 15 minutes.

-Do not expose any part of the drum to open flame or temperatures above 220 degrees F.

-Maintain debouncer clearance of 1/4" to 1/2" between drum surface and debouncer.

-The Revolution™ drum utilizes shorter length drive socket fasteners than standard mixers. Only 5/8-11 UNC x 1.3/4" Grade 9 bolts with hardened washers should be used. Bolts must be torqued to 295 ft/lbs with dry Loctite or 210 ft/lbs with wet Loctite.

-When removing and re-installing the drum hatch, remove the o-ring seal, clean with a mild detergent, dry and re-install. Hatch door has an alignment arrow molded into the interior surface and must be re-aligned with arrow on hatch surround. Install hatch fasteners and torque to 17 ft/lbs. Do not exceed this torque specification. Details of torque and installation can be referenced on Technical Service Information Bulletin MXR-TSIB-007.

2.0 Revolution Drum Bolt Pattern and Torque Specs

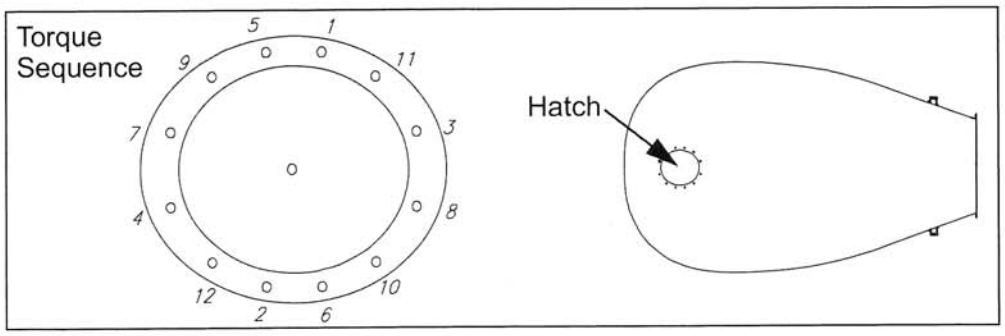
An Oshkosh Truck Corporation Company

Technical Service Information Bulletin

Revolution™ Drum Bolt Pattern and Torque Specs

Purpose:
London is providing a standard install pattern and torque specs for the Revolution™ drum inspection hatch.

Instructions:
1. Ensure all mating surfaces are free of foreign material.
2. Snug all bolts and hand-tight using 5/16" x 1/2" hex head capscrew in squence shown below.
3. Torque all bolts to 17 ft-lbs. using given torque sequence.



NOTE: Insertion of T-bolt into center hole is used to aid removal of hatch.

NOTE:
Warranty reimbursement: The information contained herein is for information purposes only and will not be considered for warranty reimbursement unless a failure occurs within the warranty period.

Warning: Safety and safe working procedures must be followed at all times. OSHA Lock Out Tag Out Procedures must be followed when maintaining, servicing and inspecting this equipment. If you are unfamiliar with OSHA Lock Out Tag Out Procedures or any safety requirements, please contact London Machinery Inc. for assistance.

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