



# TRUCK - MOUNTED CONCRETE BOOM PUMP MODEL: *XXT 32* PARTS MANUAL



**REED**, provides this manual for the guidance of all owners, operators and servicing personnel in order to obtain the longest possible trouble-free service. It contains data, specifications, warranty, schematics, operating instructions, lubrication procedures, maintenance procedures, illustrated parts breakdown, vendor information, service bulletins, and safety rules.

Serial No.: \_\_\_\_\_

Date Delivered: \_\_\_\_\_

Customer: \_\_\_\_\_

**NOTE:** Additional copies of this manual (P/N: 801118) may be obtained through the **REED** Parts Department.

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# XXT 32 TRUCK - MOUNTED CONCRETE BOOM PUMP

## TABLE OF CONTENTS

<b>GENERAL</b>	<b>GEN'L</b>
TABLE OF CONTENTS .....	00
INTRODUCTION .....	01
SPECIFIC ITEMS PERTINENT .....	02
PRODUCT DESCRIPTION .....	03
TECHNICAL SPECIFICATIONS .....	05
BOOM OPERATION ENVELOPE .....	07
ADVISORY LABEL LOCATION .....	08
SAFETY AWARENESS AND PRECAUTIONS .....	09
SAFETY ALERT DECALS .....	12
OPERATOR QUALIFICATION .....	19
<b>OPERATION</b>	<b>OPER.</b>
PRE-OPERATION INSPECTION .....	00
GETTING ACQUAINTED .....	02
OUTRIGGER - JACK CONTROL .....	03
BOOM FUNCTION CONTROLS .....	07
BOOM ARTICULATION DIAGRAM .....	12
CONCRETE PUMP CONTROL FAMILIARIZATION .....	13
REMOTE CONTROL FAMILIARIZATION .....	19
RADIO CONTROL FAMILIARIZATION .....	22
OPERATION INSTRUCTIONS .....	32
A.C.P.A. HAND SIGNAL .....	41
OPERATING OF THE BOOM .....	42
OPERATING OF THE CONCRETE PUMP .....	45
<b>MAINTENANCE</b>	<b>MAINT</b>
PREVENTATIVE MAINTENANCE .....	00
SCHEDULED INSPECTION .....	01
LUBRICATIONS .....	07
LUBRICATIONS POINT .....	08
HYDRAULIC SYSTEM MAINTENANCE .....	13
HYDRAULIC SYSTEM FAMILIARIZATION .....	18
ELECTRIC SYSTEM .....	29
ADJUSTMENT PROCEDURE .....	30
<b>SCHEMATICS</b>	<b>SCMTC</b>
HYDRAULIC SCHEMATIC (BOOM AREA) .....	00
HYDRAULIC SCHEMATIC (OUTRIGGER AREA) .....	02
HYDRAULIC SCHEMATIC (EXTEND SWING SAFETY CIRCUIT) .....	04
ELECTRIC SCHEMATIC (RIGHT SIDE CONTROL) .....	05
ELECTRIC SCHEMATIC (LEFT SIDE CONTROL) .....	06
<b>PARTS</b>	
<b>VENDOR</b>	
<b>SERVICE BULLETINS</b>	
SB001 REED WARRANTY PROGRAM	
<b>A.C.P.A. BOOM INSPECTION BOOK</b>	
<b>A.C.P.A. SAFETY MANUAL</b>	

## INTRODUCTION

A major factor in the minds of the operators and maintenance personnel should be use of the machine in a **SAFE** and **PROFICIENT** manner. This can only be accomplished by having a better understanding of the operation and maintenance of the **XXT 32 TRUCK MOUNTED CONCRETE BOOM PUMP**.

This manual (Part Number: 801118) is provided to assist in accomplishing this goal. It is considered to be a **VALUABLE** tool for our **CUSTOMERS**. It includes an Operation Section, General Maintenance/Repair Procedures and Illustrated Parts Section. Everyone involved with the operation, maintenance and repair of the machine should be given and should take the opportunity to **READ** and thoroughly **UNDERSTAND** all sections of this manual. It is in their **BEST INTEREST** to do so.

The manual covers and is applicable to a **STANDARD EQUIPPED MACHINE**. Depending on the circumstances, it is possible some machines are supplied with various options and specialized equipment. **REED** has tried to incorporate in the manual the appropriate data for these machines. If by chance, service information is not found, it is suggested you contact the **REED SERVICE DEPARTMENT**, which will forward the proper information if available.

All product descriptions, illustrations and specifications found throughout this manual were in effect at the time the manual was released for printing. It should be noted **REED RESERVES THE RIGHT TO MAKE CHANGES IN DESIGN OR TO MAKE ADDITIONS TO OR IMPROVEMENTS IN THE PRODUCT WITHOUT IMPOSING ANY OBLIGATIONS UPON ITSELF TO INSTALL THEM ON PRODUCTS PREVIOUSLY MANUFACTURED**.

### NOTE

*If you have not yet done so, please record the SERIAL NUMBER of your XXT 32 on the cover page of this manual. Throughout this manual, reference may be made to the serial number. When talking to our SERVICE DEPARTMENT or ORDERING PARTS, use of the serial number will assist us in giving prompt and accurate response and service.*



**XXT 32 TRUCK - MOUNTED  
CONCRETE BOOM PUMP**

GEN'L

PAGE 02

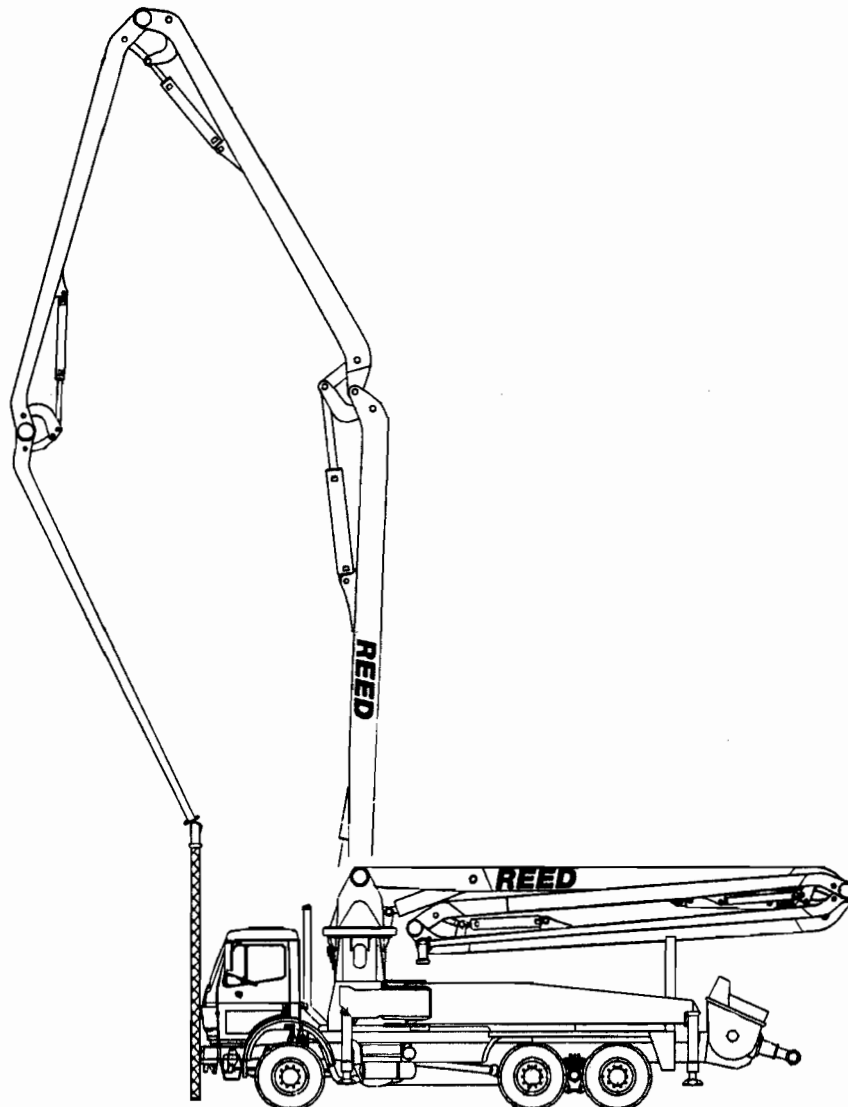
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REVISION:

## PRODUCT DESCRIPTION

The **MODEL XXT 32** is a 32 meter (105 ft.) **TRUCK MOUNTED CONCRETE BOOM PUMP**. Its operation encompasses the use of hydraulic and electrical systems. The machine is designed to pump wet concrete through a delivery system of pipes and hoses attached to a 4 section roll-and-fold boom. It is of rugged construction and durable design enabling the unit to pump even the harshest mixes within its published ratings and specifications.

The **XXT 32** super structure is mounted on a heavy duty truck chassis, which provides mobility for on-off highway use. The chassis is a three (3) axle type having a GVW rating of 64,000 lbs (29,025 kg). The front axle is rated for 20,000 lbs (9,070 kg) while the rear axle is rated for 44,000 lbs (19,955 kg). Stability of the unit during operation of the boom is provided by two (2) sets of outriggers, one set at the front swings out then leg telescopes out while the set at the rear swing out.



The power for operation of the boom and concrete pump is provided by the chassis engine, which drives the hydraulic pumps through a power take-off (PTO). One pump is used to supply the required hydraulics for operation of the boom functions and the other pumps are used for operation of the concrete pump.

The **MODEL XXT 32** employs the S-tube design delivery system. This system incorporates two (2) material cylinders, powered by two hydraulic cylinders that operate alternately. With concrete material in the hopper and pump operating, one material cylinder retracts sucking or drawing the material back inside the cylinder. At full retraction of the cylinder, a signal is sent to the S-tube swing cylinders causing the S-tube to shift over to the fully loaded material cylinder. The piston of the loaded cylinder then moves forward, pushing the material out through the S-tube and into the delivery lines. The shifting from one cylinder to the other cylinder continuously takes place providing a continuous flow of material through the delivery piping system. The hopper has a capacity of 23 cu. ft (650 L) and the material cylinders are 9 inches (230 mm) in diameter.

The boom assembly is a four (4) section articulated type having a maximum vertical reach, ground level to tip, of 104 feet (31.7 m). The pedestal structure is mounted directly behind the chassis cab and is equipped with a rotational mechanism incorporating a low friction double row rotational bearing. The mechanism allows for 370° non-continuous rotation with a minimum of boom backlash or whip. Each boom section can be operated independently through the pre-established design articulation parameters of each section movement. A 5 inch (125 mm) steel pipe delivery line is installed from the hopper discharge outlet, up through the pedestal and attached along side of the boom sections. A 5" x 13 foot (125 mm x 4m) heavy duty end hose is provided to facilitate concrete placement.

Stability of the unit during boom operation is obtained by use of two (2) sets of hydraulic powered outriggers, each with a vertical leveling jack. The front outriggers, located at the pedestal, swing out then telescope out while the rear outriggers, having their pivot located just ahead of the rear axle, swing out from the side of the structure.

Controls for operation of the outriggers are located on the curb (right) side of the chassis, near the rear outrigger pivot. A second set of controls for the outriggers only is located on the street side (left) of chassis. These controls are manual directional type. The boom functions controls are located on top of the curb side deck, near outrigger pivot. These can also be operated from the remote control console.

The pump can be operated at the pump control station on the chassis bed or can be operated from the remote control console. The remote console is easily portable and contains a carrying strap to facilitate using both hands when required.

## TECHNICAL DATA - SPECIFICATIONS

### MOBILITY DATA

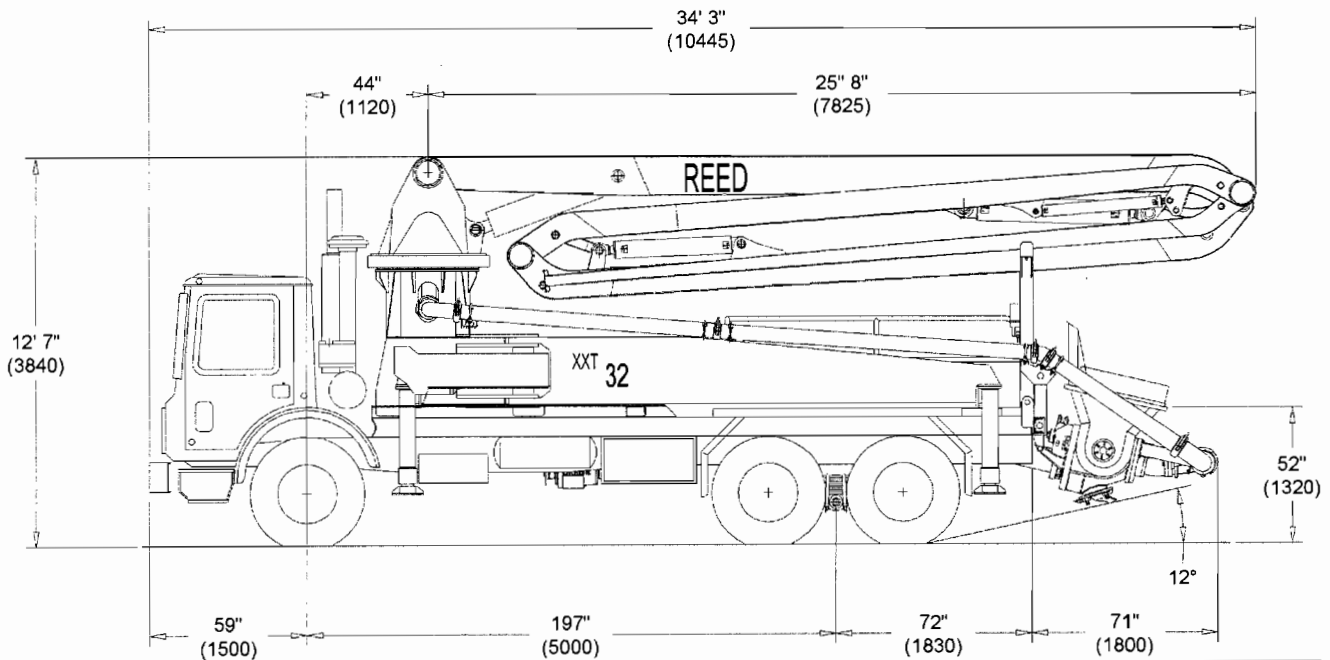
### U.S.

### METRIC

• Overall Travel Length	34 ft - 3 in	10.44 m
• Overall Travel Height	12 ft - 7 in	3.84 m
• Overall Travel Width	8 ft - 2 in	2.49 m
• Chassis Wheel base	197 in	5.00 m
• Departure Angle	12°	12°
• Gross Vehicle Weight (GVW)	54100 lbs (approx.)	24590 kg (approx.)
• Front Axle Weight	17700 lbs (approx.)	8045 kg (approx.)
• Rear Axle Weight	36400 lbs (approx.)	16545 kg (approx.)

## NOTE

Above data is based on using a Mack Model MR690S chassis.



**BOOM SPECIFICATIONS****U.S.****METRIC**

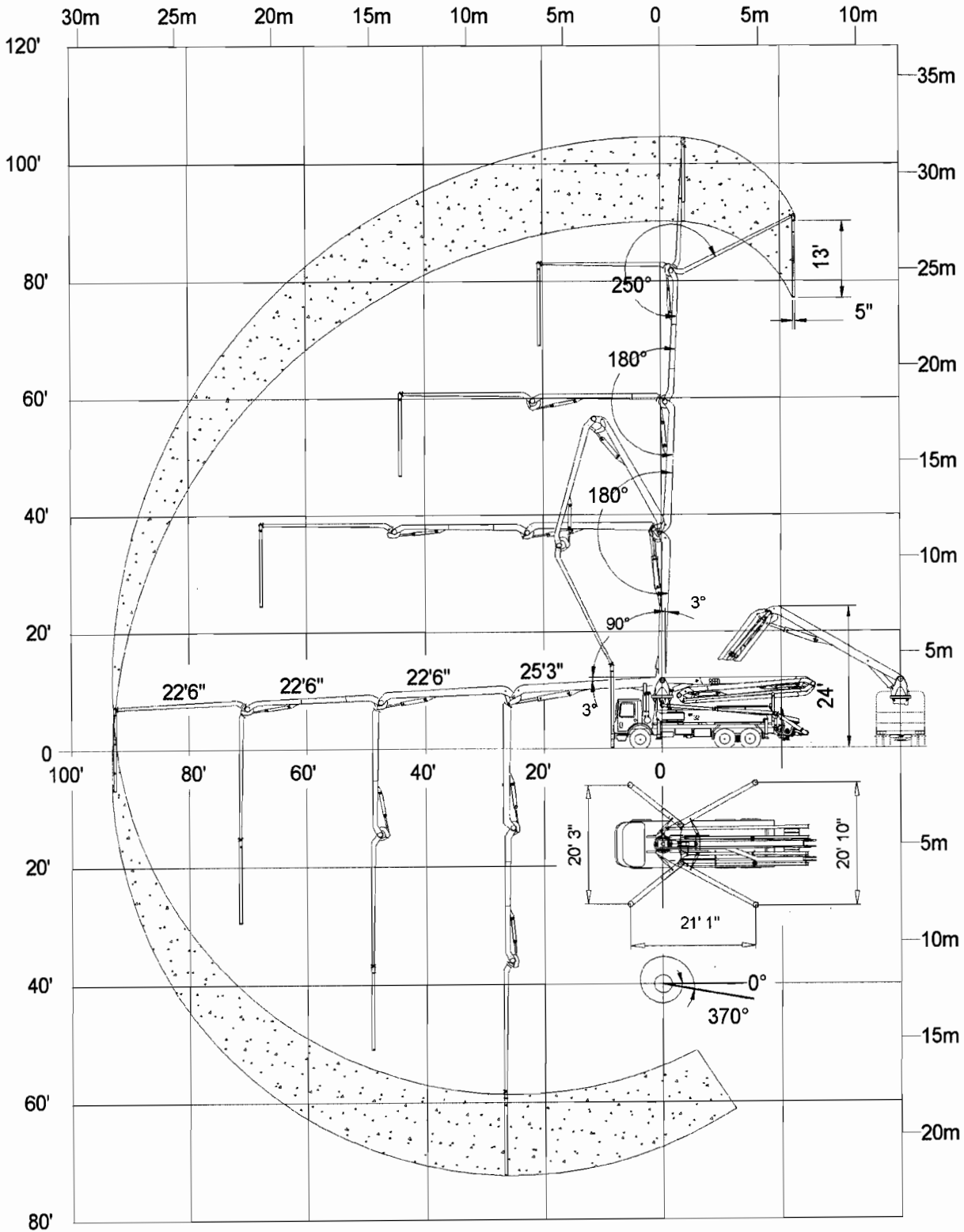
• Type	Four (4) Section Articulated	
• Vertical Reach, Height	104'	31.70 m
• Horizontal Reach from C Rotation	92' - 8"	28.25 m
• Net Reach from Front of Truck	83'	25.29 m
• Below Ground Reach	58' - 5"	17.20 m
• Unfolding Height	24' - 0"	7.35 m
• Rotation (Non-Continuous)	370°	370°
• Section #1 Articulation	96°	96°
• Section #2 Articulation	180°	180°
• Section #3 Articulation	180°	180°
• Section #4 Articulation	250°	250°
• Section #1 Length	25' - 3"	7.70 m
• Section #2 Length	22' - 6"	6.85 m
• Section #3 Length	22' - 6"	6.85 m
• Section #4 Length	22' - 6"	6.85 m
• Delivery Pipe Diameter	5"	125 mm
• End Hose - Diameter & Length	5" x 13'	125 mm x 4 m
• Front Outrigger Spread	20' - 3"	6.20 m
• Rear Outrigger Spread	20' - 10"	6.40 m

**PUMP SPECIFICATIONS****U.S.****METRIC**

• Max. Output - Rod Side	200 yd <sup>3</sup> /hr	154 m <sup>3</sup> /hr
- Piston Side	131 yd <sup>3</sup> /hr	101 m <sup>3</sup> /hr
• Max. Pressure - Rod Side	1300 psi	90 bar
- Piston Side	1853 psi	129 bar
• Max. Strokes P/Min - Rod Side	31	31
- Piston Side	18	18
• Stroke Length	79 "	2000 mm
• Concrete Cylinder Diameter	9"	230 mm
• Variable Volume Control	0 to Full	0 to Full
• Hopper Capacity	23 ft <sup>3</sup>	650 L
• Maximum Aggregate Size	2.5"	63 mm
• Hydraulic System Type	Closed Loop	Closed Loop
• Hydraulic System Pressure	5000 psi	345 bar
• Hydraulic Tank Capacity (Pump)	170 gal	640 L
• Hydraulic Drive Cylinders - Rod Dia.	3.15"	80 mm
- Piston Dia.	5.51"	140 mm
• Water Tank Capacity	150 gal	540 L



## BOOM OPERATIONAL ENVELOPE (CONFIGURATION)



## ADVISORY LABEL LOCATION

Cautionary signal word (Warning-Caution) may appear in various locations throughout this manual. Information accented by one of these signal words must be observed to minimize the risk of personal injury to service personnel, or the possibility of improper service methods which may damage the pump or render it unsafe. Additional Notes are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the uses of these use of these advisory labels as they appear throughout the manual:

### **⚠ CAUTION**

**Directs attention to unsafe practices, which could result in damage to equipment and possible subsequent personnel injury or death if proper precautions are not taken.**

### **⚠ WARNING**

**Direct Attention to unsafe practices, which could result in personnel injury or death if proper precautions are not taken.**

### **NOTE**

**An operating procedure, practice, condition, etc., which is essential to emphasize.**



## SAFETY AWARENESS AND PRECAUTIONS

The **MODEL XXT 32** concrete placing boom is only to be used for the purpose for which it was manufactured. This purpose is the placing of concrete or other material of a plastic consistency having a specific weight of not more than  $2.4 \text{ kg/dm}^3$ . The diameter of the delivery pipeline and the length of the end placing hose as noted on the **CODE PLATE** are the maximum **PERMISSIBLE** sizes and are not to be **EXCEEDED**.

All personnel assigned to operate, repair or troubleshoot the **MODEL XXT 32** must be thoroughly familiar with this Technical Manual (P/N: 801118). For the protection of yourself and others around you, it is of utmost importance that the **WORK** be done **SAFELY**. One of the best ways to accomplish this is to fully **UNDERSTAND** and **KNOW** the job you do. If there is any doubt about that what you are doing is **UNSAFE**, even marginally, obtain assistance from other trained/qualified personnel.

During operation, troubleshooting or repair, problems may arise or be encountered that seem singular but may in fact be due to several causes. These need to be sorted out and identified before proceeding with the task at hand. The information contained in this technical manual can be used to assist in the safest and best manner of operating and repairing the **MODEL XXT 32**. However **YOU** and **ONLY YOU**, must take the initiative to make yourself thoroughly familiar with the contents of this manual.

Because your job is to operate the equipment does not prevent you from focusing some attention on the maintenance and troubleshooting aspect of the unit. Just being aware of some tell-tell signs, unusual noises or a tweak here or there may enable you to complete the pumping job instead of shutting down and losing all that concrete.

### **▲ WARNING**

***DISENGAGE POWER TAKE OFF (PTO) BEFORE  
TURNING OFF ENGINE.***

### **▲ CAUTION**

***THE CONCRETE PLACING BOOM MUST NEVER  
BE USED AS A CRANE. During operation of the  
unit NO PROTECTIVE DEVICES are to be  
REMOVED and NO SAFETY LOCKOUTS are to be  
DISCONNECTED.***

**-----T H I N K S A F E T Y -----T H I N K S A F E T Y -----**

No matter how often it is said or pointed out, there are people who have a tendency to **IGNORE** safe operation until it becomes too **LATE**. Don't be this type of person. Keep **SAFETY** utmost in your mind.

The following points out some pretty **COMMON** conditions and situations, which you might encounter at one time or another. **BE ALERTED** to these and try to **PREVENT** the inevitable. They may seem simple but are often the **MOST OVERLOOKED**.

- Use only qualified operators who know the machine
- Use only qualified maintenance personnel who understand the systems
- Wear protective equipment and helmets
- Keep work area clear of unauthorized personnel
- Before leaving chassis cab, set parking brake
- Chock all wheels
- Extend and set outriggers and jacks
- Level truck on uneven terrain or slopes
- Avoid operation near electrical power lines. Keep at least 17 ft. (5.1m) away from electrical lines
- Observe boom when raising or lowering that no obstructions are in its path.
- Do not operate pump or boom in traffic lanes. Always place cones and barricades around truck
- Do not use the boom as a crane
- Don't increase the boom capacity by increasing the size of the delivery line
- Don't increase the diameter size or length of tip hose
- Make sure boom and outriggers are properly stored before moving truck
- Always keep walkways and deck areas clean and neat.

- Don't clean, lubricate or make adjustments while boom is in operation.
- Keep safety decals and operation instructions legible
- Do not alter or disconnect safety devices
- Maintain specified tire pressure
- Report items that need attention or require service
- Disengage PTO before making any adjustment or repairs to unit

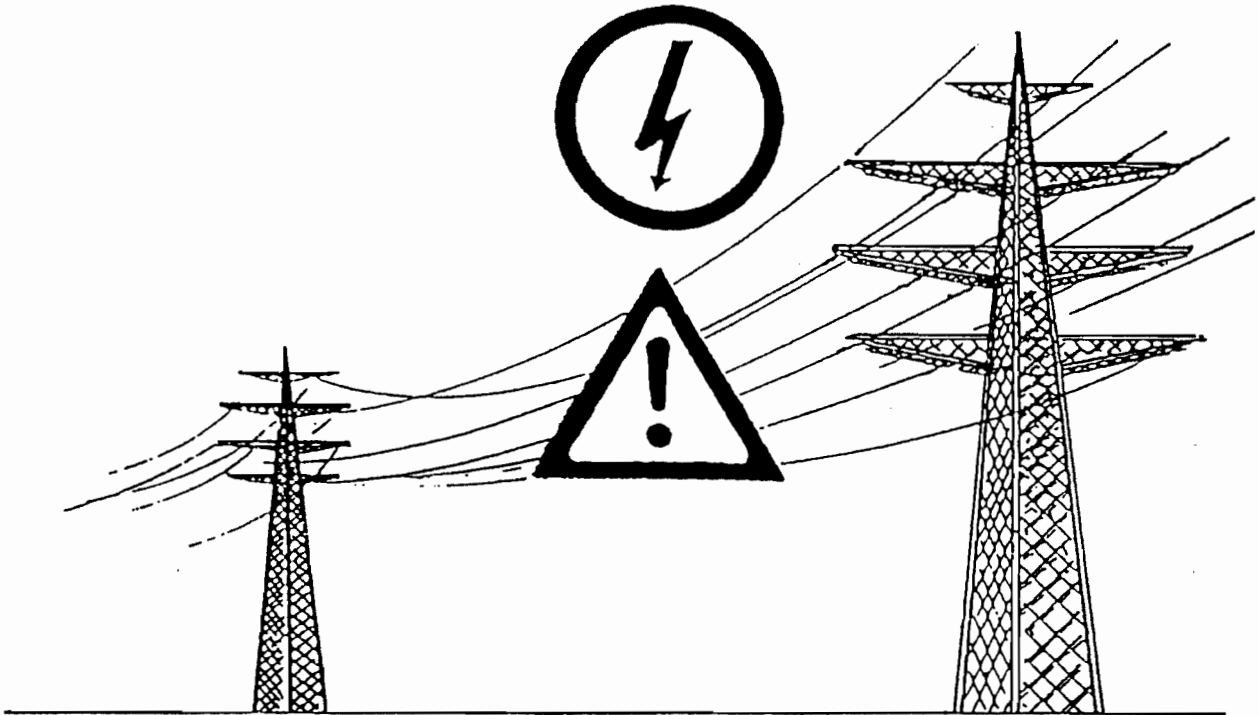
**▲ WARNING**

***BETTER SAFE THAN SORRY - DON'T TAKE CHANCES  
THAT COULD CAUSE INJURY TO YOU AND/OR OTHERS***

- Never **REMOVE** the hopper grill cover when the pump is in **OPERATION**. It protects against accidental contact with the agitator and other moving parts inside the hopper
- Never enter the hopper with any parts of your body. It is a **DANGER** area and physical **INJURY** can occur even if the engine is shut-down.
- The concrete delivery system should not be **OPENED** without relieving the pressure. This can be done by reversing the pump and pumping backwards.
- Hydraulic oil systems can be dangerous. Know the circuit you are repairing, it may contain high pressure and injury could occur. If in doubt, stop the machine and allow sufficient time for the oil pressure to zero. Check system pressure gauge.
- Do not pour material into the hopper without having the grate in place. Operator must monitor material being dumped into the hopper, keeping a watchful eye out for unmixed or dry concrete, sticks, pieces of metal and other foreign objects.

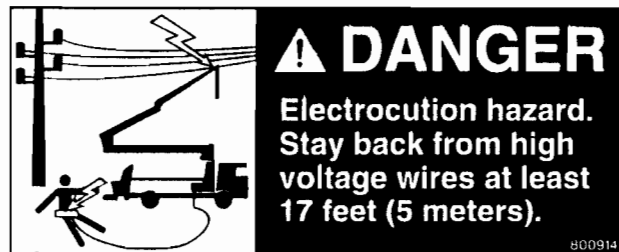
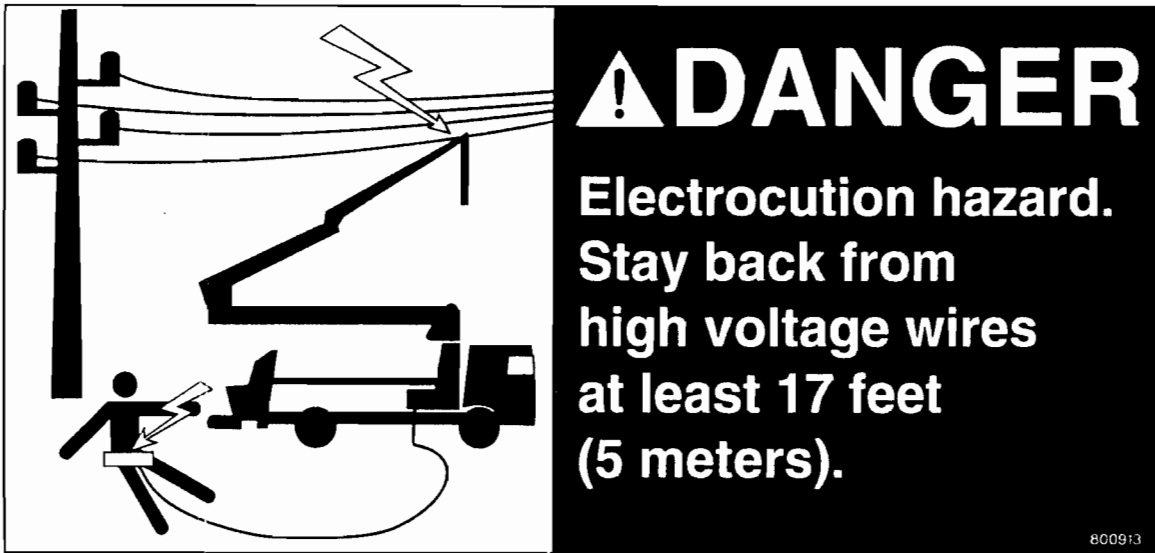
**YOUR SAFETY IS OUR UTMOST CONCERN  
AND YOUR RESPONSIBILITY**

**UNLAWFUL TO OPERATE  
THIS EQUIPMENT  
WITHIN 17 FEET OF  
HIGH VOLTAGE LINES**



### SAFETY ALERT DECALS

**DANGER ----- CAUTION ----- WARNING**  
decals are designed for your protection. They are placed at appropriate areas on the machine to be constant reminders of the ever-present dangers. Know and adhere to the information they provide.





### **! DANGER**

Stay clear.  
Contact will result in  
death or serious injury  
if the unit becomes  
electrically charged.

800915

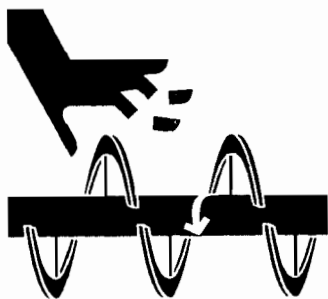


### **! WARNING**

Keep hands out of  
waterbox.  
Stop engine/motor if  
access is required.  
Keep guards in place.

800916

### **! WARNING**



Keep hands out  
of hopper and  
valve assembly.  
See operation  
manual if access  
is required.

800917

### **! WARNING**

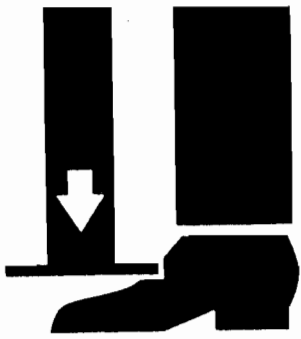


Do not stand on  
hopper grates.

800918



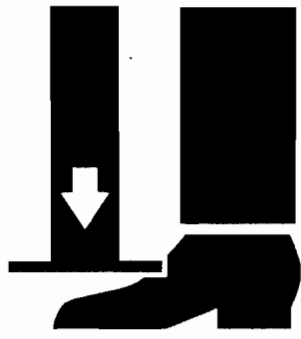
**▲WARNING**



Stand clear of outriggers when activating.


800919

**▲WARNING**



Clear area before activating outriggers


800920



**▲WARNING**

Do not operate at pressures exceeding the rating of the entire material delivery system.

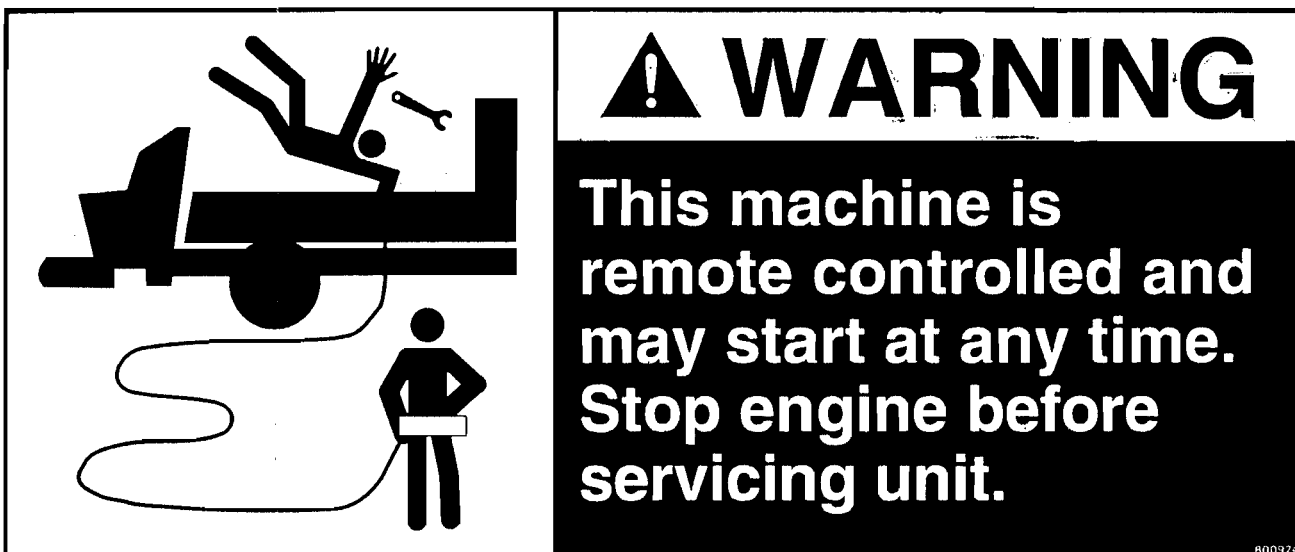
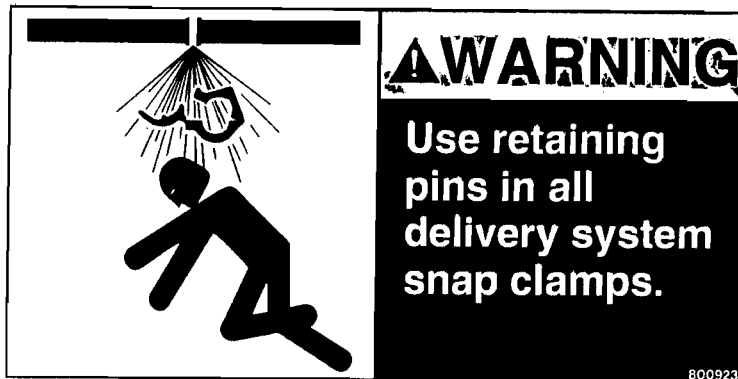
800921



**▲WARNING**

Before opening a blocked pipeline, relieve pressure by reversing pump. See manual.

800922



**▲ WARNING**



Do not operate this machine without training. Understand the warnings in safety manuals and on decals.

800925

**▲ WARNING**



Do not operate this machine without training. Understand the warnings in safety manuals and on decals.

800926


**▲ WARNING**



Do not use the boom as a crane or hoist.

800927

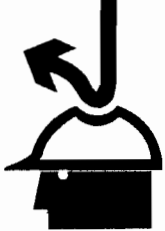
**▲ WARNING**

















Total weight of all hanging hoses, reducers and clamps must NOT exceed 376 pounds including concrete.

800928

## CUIDADO ⚠ WARNING

		
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800929

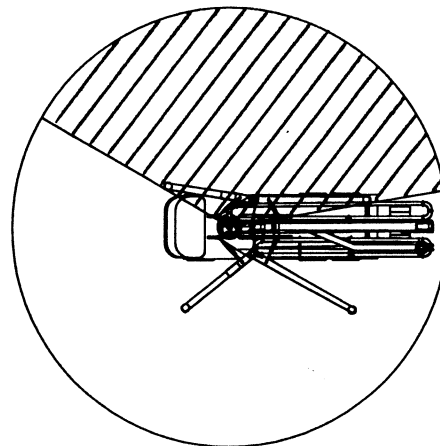
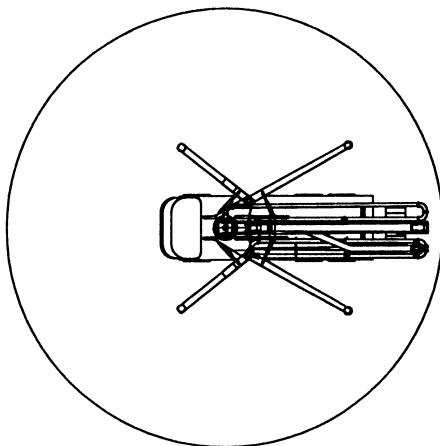
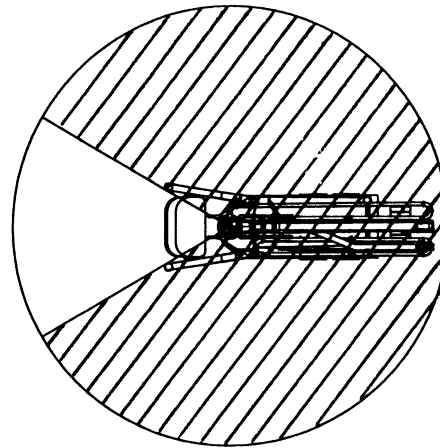
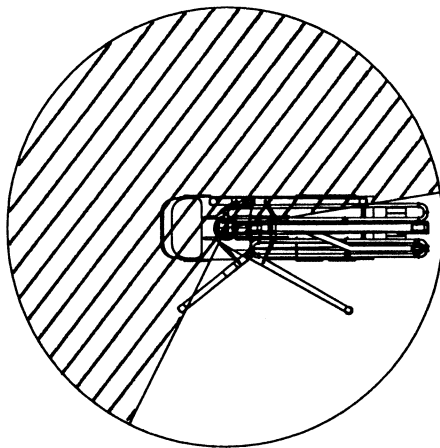
	 1. BOOM UP	 2. BOOM DOWN	 3. BOOM LEFT	 4. BOOM RIGHT	 5. OPEN OR EXTEND BOOM	 6. CLOSE OR RETRACT BOOM	
	 7. STOP BOOM	 8. START PUMP SPEED UP	 9. SLOW PUMP DOWN	 10. STOP PUMP	 11. LITTLE BIT	 12. ADD WATER 4-GALLONS	 13. ALL DONE CLEAN UP



# **WARNING**

## **REED MODEL XXT32 DRAGONFLY**

### *TYPICAL OPERATING CONFIGURATIONS*



 NON-OPERATING AREA

Do not operate boom in this area due to danger of tipover.  
Boom must be folded and vertical when rotating to operating area.

 OPERATING AREA

Outriggers must be fully extended and opened as shown.  
All four outrigger jacks must be set on firm level ground.  
Chassis must be level side to side and front to rear.

PN 801441

## OPERATOR QUALIFICATIONS

Making the choice for an operator is a vital decision as it affects safety and productivity. The **MODEL XXT 32** has been thoroughly inspected and tested by the **REED** Quality Control Department prior to shipment. The design of the unit incorporates several built-in safety features and also allows for an average skilled person to readily become proficient in the safe operation of the **MODEL XXT 32**. The unit is a pressurized concrete boom pump and can be potentially **DANGEROUS** in the hands of **UNTRAINED OR CARELESS OPERATORS**.

Knowing the characteristics of the machine and function of the controls are important to **SAFE, PROPER OPERATION** and **USE**.

It is the responsibility of all users to read and comply with the following rules and information designed to promote **SAFETY** and **UNDERSTANDING** of the **MODEL XXT 32** boom pump.

- The first requirement for any user/operator is to obtain a thorough understanding of the operating characteristics and limitations of the machine. This should not be overlooked regardless of their prior experience with similar type equipment.
- Only **QUALIFIED TRAINED** personnel who have been authorized must be allowed to operate the **MODEL XXT 32**. A Qualified Trained Operator is one who has **READ** and **UNDERSTOOD** the instructions in this manual and is thoroughly familiar with the operating characteristics and limitations of the machine.
- Individuals who cannot **READ** and **UNDERSTAND** the signs, warnings, notices and operating instructions that are part of the job, in the language in which it is printed **MUST NOT BE ALLOWED** to operate the **MODEL XXT 32**.
- Know and follow all cautions, warnings and operating instructions on the machine.
- Repair and adjustments must only be made by **QUALIFIED TRAINED** personnel.
- No modification is to be made to the machine without prior written consent of the **REED** Customer Service Department.
- Attach a **SIGN-OFF** sheet on the unit to enable the operator to report any damage, defects, problems or accidents to his work supervisor.
- Understand and **OBEY** all applicable Local and Government statutes and regulations applying to safe operation and use of concrete pumping machines.

**AN UNKNOWING OPERATOR IS AN UNSAFE OPERATOR  
AND A SORRY OPERATOR**

## PRE-OPERATION INSPECTION

The **CONDITION** of the unit prior to start-up is a very **IMPORTANT** factor as it directly affects the operator's safety as well as those around him. It should be a common practice that the operator perform a general inspection of the **MODEL XXT 32** before each days' operation.

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

**DOWNTIME** is **COSTLY** and can possibly be prevented by taking a few minutes prior to start-up to do a thorough walk-around inspection. This inspection must be performed each day before the unit is operated. Report any damage or faulty operation immediately. Attach a sign, if need be, at the control panel which states ----- **DO NOT OPERATE** ----- . Repair any discrepancies before use.

Some major items to be considered for your inspection include the following:

### 1. CHASSIS

- Engine oil level
- Fuel tank level
- Battery condition and cable connections
- Tire condition and inflation
- Fuel, oil, transmission leaks
- Wheel lug nuts missing or loose
- Overall condition of chassis

### 2. HYDRAULIC SYSTEM

- Loose or damaged hoses, tubing, fittings
- Hydraulic leaks
- Hydraulic fluid level
- Cleanliness of fluid, filter condition indicators
- Hydraulic valves and control levers
- Hydraulic cylinders

**3. HOPPER**

- Grate in place not damaged
- S-tube connection
- Agitator condition, drive motor
- Outlet connection, cleanliness
- Lubrication, loose, broken lines

**4. ELECTRICAL**

- Frayed or broken wires or loose connections
- Condition of switches, lights, connections
- Instruments and gauges - condition

**5. BOOM STRUCTURE**

- Visually check condition of outriggers, pedestal
- Visually check boom sections, signs of damage, cracked welds
- Check condition of pivot pins, retainers, lubrication
- Check delivery pipe, clamps, mountings
- Check end hose condition, clamps

**▲ CAUTION**

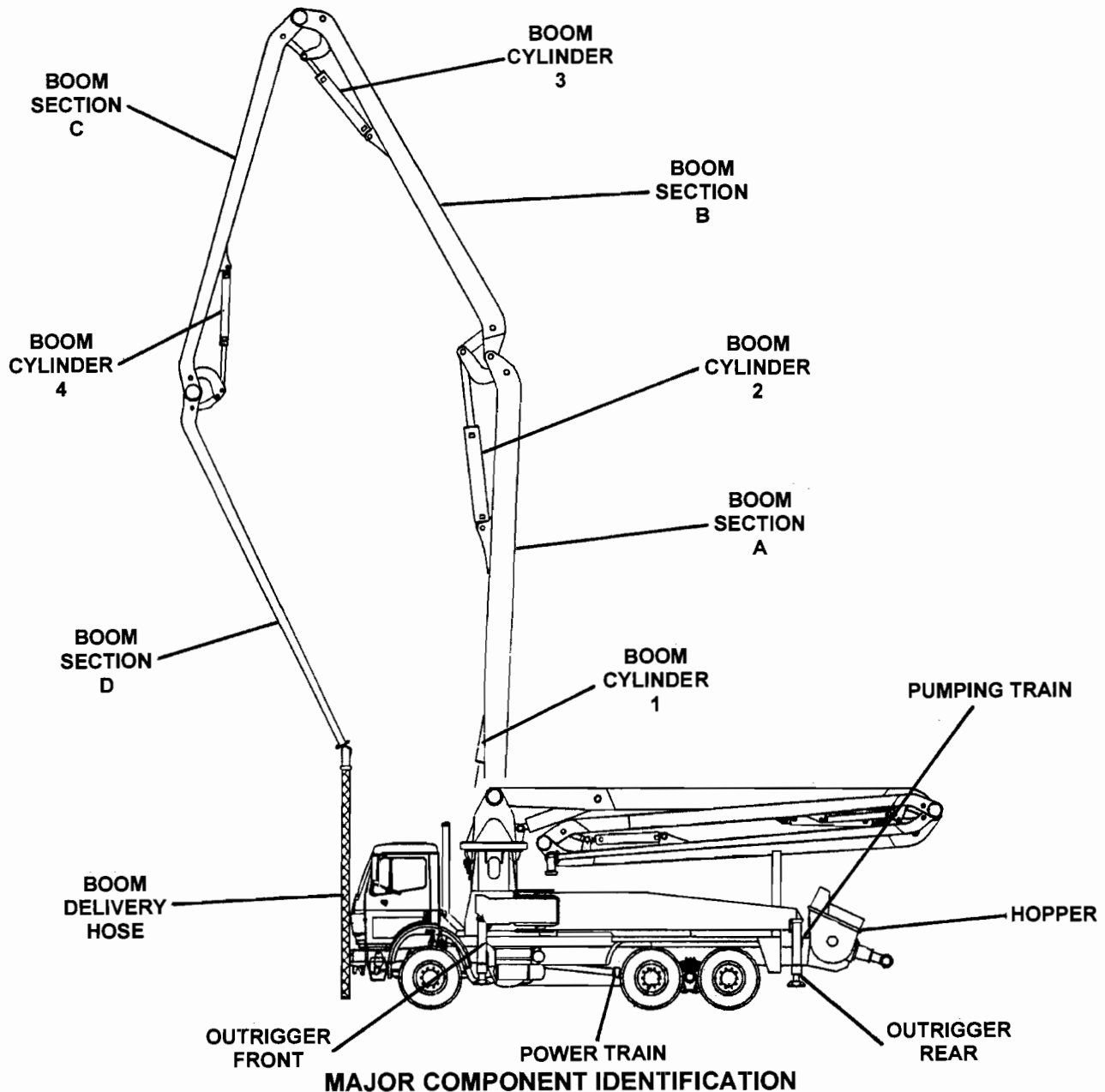
***Defective components, structural damage, missing parts or equipment malfunctions, jeopardize the SAFETY of the operator and other personnel and can cause extensive damage to the machine. A poorly MAINTAINED machine can become the greatest OPERATIONAL HAZARD you may encounter.***



## GETTING ACQUAINTED (UNIT FAMILIARIZATION)

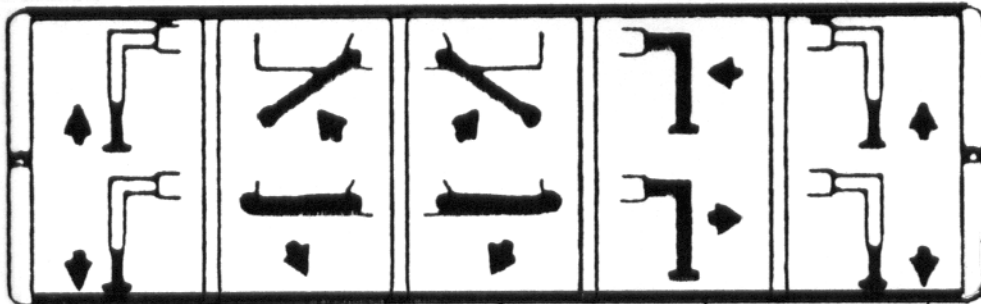
As previously indicated, it is important from a **SAFE** operational standpoint that you, the **OPERATOR**, know your machine. This means the function of each control as to what happens when it is activated, how it might interact with other functions and any limitations, which might exist. A **GOOD UNDERSTANDING** of the controls and capabilities will enhance operation and assure maximum operating and efficiency and **SAFETY**.

These next few pages will assist you in **GETTING ACQUAINTED** with the **MODEL XXT 32**. Carefully study these.



### OUTRIGGER - JACK CONTROL

The **MODEL XXT 32** is equipped with two (2) sets of outriggers. One set, referred to as **FRONT**, is located adjacent to the pedestal. This set consists of a swing out leg equipped with a telescopic leg that extends on a diagonal direction out toward the cab.



RIGHT REAR  
OUTRIGGER JACK

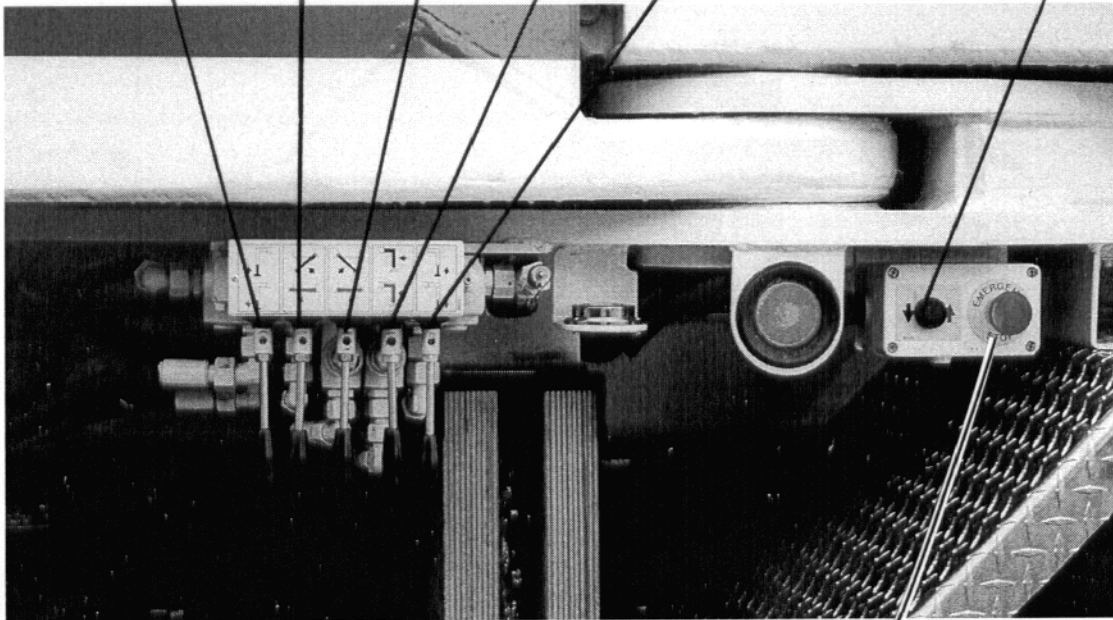
RIGHT REAR  
SWING LEG

RIGHT FRONT  
SWING LEG

RIGHT FRONT  
TELESCOPIC LEG

RIGHT FRONT  
OUTRIGGER JACK

SAFETY  
INTERLOCK/CONTROL



EMERGENCY  
STOP SWITCH

R. H. (PASSENGER) SIDE CONTROL



# XXT 32 TRUCK – MOUNTED CONCRETE BOOM PUMP

OPER.

PAGE 04

The telescopic leg is equipped with a hydraulic leveling vertical jack. The other set, referred to as **REAR**, has its pivot near the pedestal. It is a single beam that hydraulically swings out away from the chassis to a diagonal position. It too, is equipped with a leveling jack.

For operation of these outriggers, two (2) sets of controls are provided and are located one each side in the vicinity of the swing out pivot. The right side (curb side) controls operate the right side legs and jacks, front and rear. The left side (street side) controls operate the left side legs and jacks, front and rear. These valves are of the hydraulic directional type and are activated by an electric signal. The levers are returned to center type. The outrigger controls are energized or de-energized by the toggle switch located on the main control panel installed on chassis deck.

## **▲ WARNING**

*Stability during operation of boom is based on outrigger legs being fully extended. Overturning will occur if extension is less than maximum spread.*

- **EMERGENCY STOP SWITCH** - Located in the box on both the right and left side outrigger controls is an **EMERGENCY STOP** switch. Its purpose is to shut down the complete operation in an emergency. **PUSH** red knob to **STOP** operation. **PULL** knob to **RELEASE** or re-activate system.
- **SAFETY INTERLOCK/CONTROL** - This is a spring return to off push button switch. It is used as a **SAFETY INTERLOCK**, meaning the switch must be held in appropriate position while a particular outrigger control is actuated. If the switch is released even if outrigger control lever is **ON**, operation will cease to function.
- **RIGHT FRONT SWING LEG** - This control is used to swing out front leg. Actuate **SAFETY INTERLOCK** switch and hold while moving lever **TOWARD** you to swing out leg. To swing in leg, depress **SAFETY INTERLOCK** and move control lever **AWAY**.

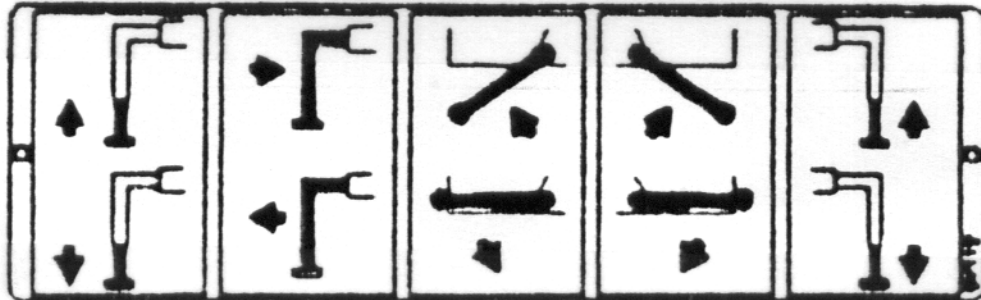
**NOTE**

*To prevent damage to cab an interlock is incorporated to prevent the leg from swinging in completely until telescopic leg is fully retracted. Likewise, the swing out leg must be swung out approximately 9° before telescopic leg can be extended.*

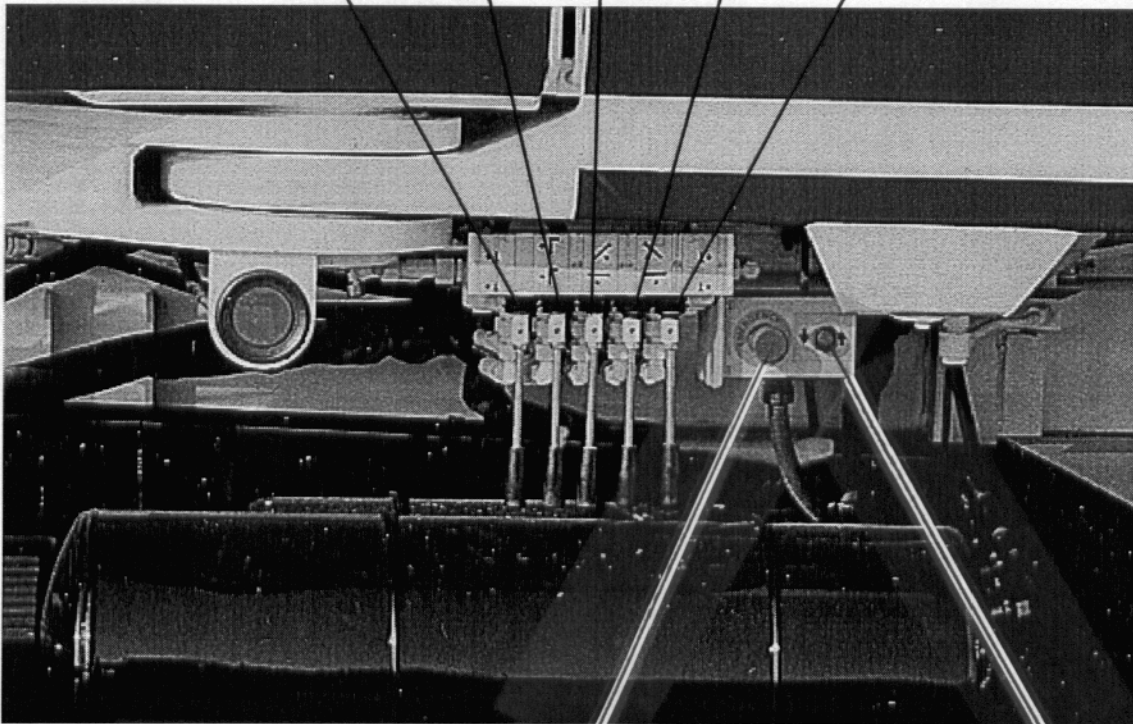
- **RIGHT FRONT TELESCOPIC LEG** – This control is used to extend or retract the telescopic beam of the swing out leg. Depress **SAFETY INTERLOCK** switch and move control **TOWARD** you to **EXTEND** leg. Move lever **AWAY** to **RETRACT** leg.
- **RIGHT FRONT OUTRIGGER JACK** - The outrigger vertical jack is used to assist in leveling the unit for boom operation. The jack is controlled by actuating **SAFETY INTERLOCK** and holding while moving **JACK** control lever **TOWARD** you to **EXTEND** jack. **RETRACT** moving lever **AWAY** from you.
- **RIGHT REAR OUTRIGGER LEG** - This leg is of the swing out type however unlike the front there is no telescopic section. To swing out leg actuate **SAFETY INTERLOCK** switch and hold while moving appropriate control lever **TOWARD** you. To swing-in leg depress **SAFETY INTERLOCK** switch and move control lever **AWAY**.
- **RIGHT REAR OUTRIGGER JACK** - To operate jack depress **SAFETY INTERLOCK** switch and move **JACK** control lever **TOWARD** you to **EXTEND** jack. **RETRACT** by depressing **SAFETY INTERLOCK** switch and moving jack leg lever **AWAY** from you.

**NOTE**

*The LEFT side FRONT and REAR outrigger legs and jacks controls operate in the same manner as the right side except for controlling the left side.*



LEFT FRONT TELESCOPIC LEG  
LEFT FRONT OUTRIGGER JACK  
LEFT FRONT SWING LEG  
LEFT REAR SWING LEG  
LEFT REAR OUTRIGGER JACK



EMERGENCY STOP SWITCH

SAFETY INTERLOCK/CONTROL

L. H. (DRIVER) SIDE CONTROL

## BOOM FUNCTION CONTROLS

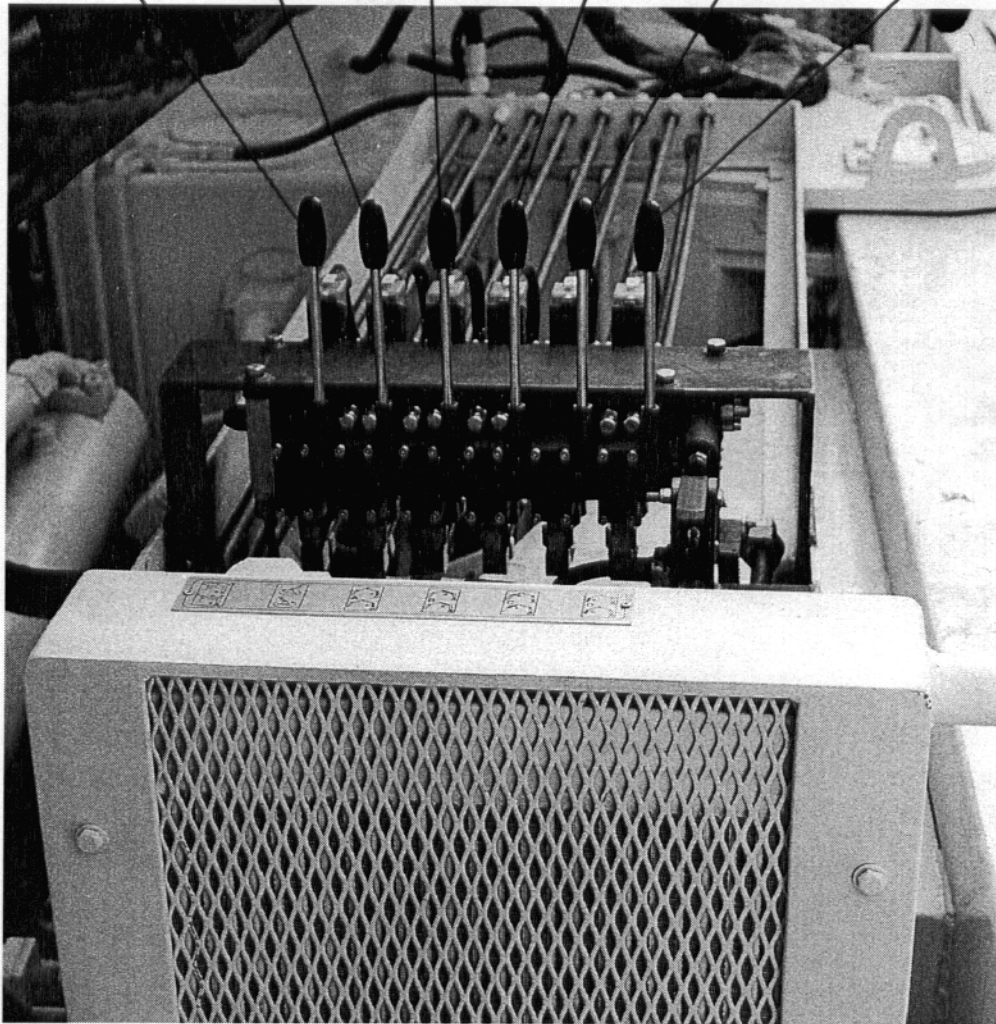
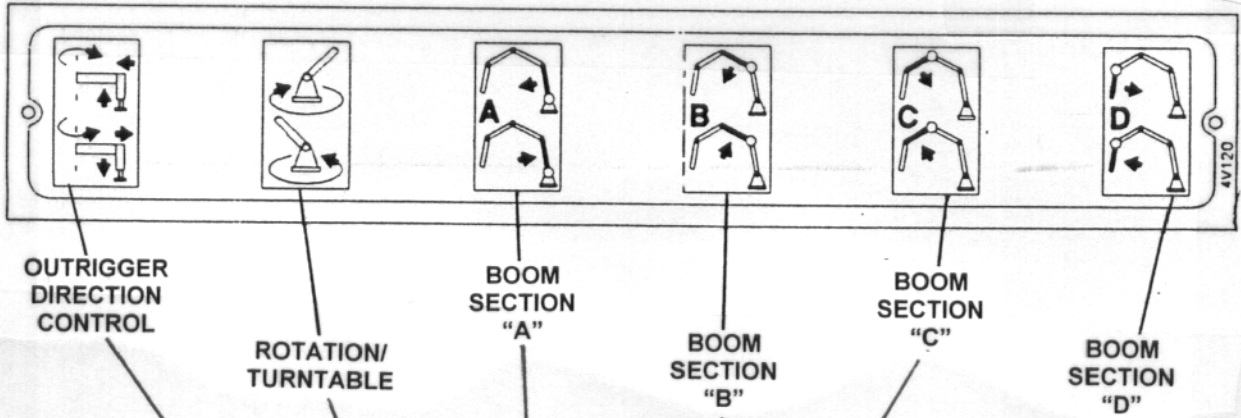
The boom functions can be controlled either by using the manual levers on the valve bank located on right side of unit on the deck near the turntable; or at the remote control console or using the radio control remote. Regardless of which control panel is used the controls are all labeled the same and the functions are alike.

The unit consists of four (4) booms and each of its movements are independently controlled. A control is also provided for the rotation of the complete structure. The boom sections are identified by letters, which appear on both sides of the boom and are labeled accordingly on the control panel decals. In addition the panel decal indicates the specific boom section by a solid red color.

- **LETTER "A"** - This is used to denote the main or first boom section which has one end attached to the turntable.
- **LETTER "B"** - Denotes the second boom section which has one end attached to the first section.
- **LETTER "C"** - Denotes the third boom section which has one end attached to the second boom section.
- **LETTER "D"** - This is the last section and has one end attached to the third section.

### A) **MANUAL BOOM CONTROL FAMILIARIZATION**

Located on the right deck side (curb side) of the unit near the turntable is a bank of valves with levered knobs. These valves are used to control the function of each boom when remote controls are not used. The control valves are 3 position hydraulic directional type valves, which can be operated manually or electrically when using the remote control. The levers are a spring return to center, meaning they must be held in the actuated position.



The function of each control is as follows:

## 1. OUTRIGGER DIRECTION CONTROL

The function of this control is a duplication of the Safety Interlock control previously explained in the Outrigger Control Familiarization paragraph. It is basically used only in an emergency situation when there is a failure in the electrical circuit or switch of the Safety Interlock.

Whenever it becomes necessary to use the control, moving control lever **DOWN** will direct the flow of oil to **EXTEND** outriggers and jacks. Pull lever **UP** to direct oil for **RETRACTION** of outriggers and jacks. Keep in mind lever must be held in position or it will return to neutral.

## 2. ROTATION - TURNTABLE

Manual lever used to control the rotation of the boom structure. The boom structure can be rotated 370° non-continuously. This means that with the boom in normal stowed position, extending out over the rear of truck, the boom once raised to 60° can be rotated left (clockwise) or right (counterclockwise) toward front of cab.

### **▲ CAUTION**

*Left and right rotation is determined with operator standing at the hopper and facing front of unit. This may also be determined that in rotating over street side of chassis toward cab is left; over curb side of chassis is right. LEFT rotation is CLOCKWISE; RIGHT rotation is COUNTERCLOCKWISE.*

### **NOTE**

*The working range of the placement boom is out over the chassis cab. If boom is first rotated toward right side, (CLOCKWISE), the left side can only be reached by continuing to rotate out over the cab. The left side cannot be reached by rotating back over the rear of the truck.*

Moving **ROTATION** lever **DOWN** will cause the boom to rotate **COUNTER-CLOCKWISE**. Moving lever **UP** will cause boom to rotate **CLOCKWISE**. When lever is in **CENTER** position, the rotation circuit is **OFF**.



### 3. BOOM SECTION "A"

This section is the main or first section of the boom assembly and it is directly attached to the pedestal turret. It has an articulation travel range of 96° total. This is based on having the ability to travel 3° below horizontal through 90° to vertical then 3° beyond vertical.

Move lever **DOWN** to **RAISE** boom section. Move lever **UP** to **LOWER** boom.

### 4. BOOM SECTION "B"

This section is the second section of the boom assembly and is attached to the end of the main boom and folds down to the underside of the main boom. It has an articulation travel range of 180° total. This is based on having the ability to travel from the folded position under main boom to a full open position, which allows this section to be in a straight line with the main boom.

#### NOTE

*Before SECTION B can be unfolded the main boom SECTION A must be raised to a height of 24 feet (7.31m)*

Move **SECTION B** control lever **DOWN** to **UNFOLD** or **RAISE** boom. Move lever **UP** to **FOLD** or **LOWER** boom section.

### 5. BOOM SECTION "C"

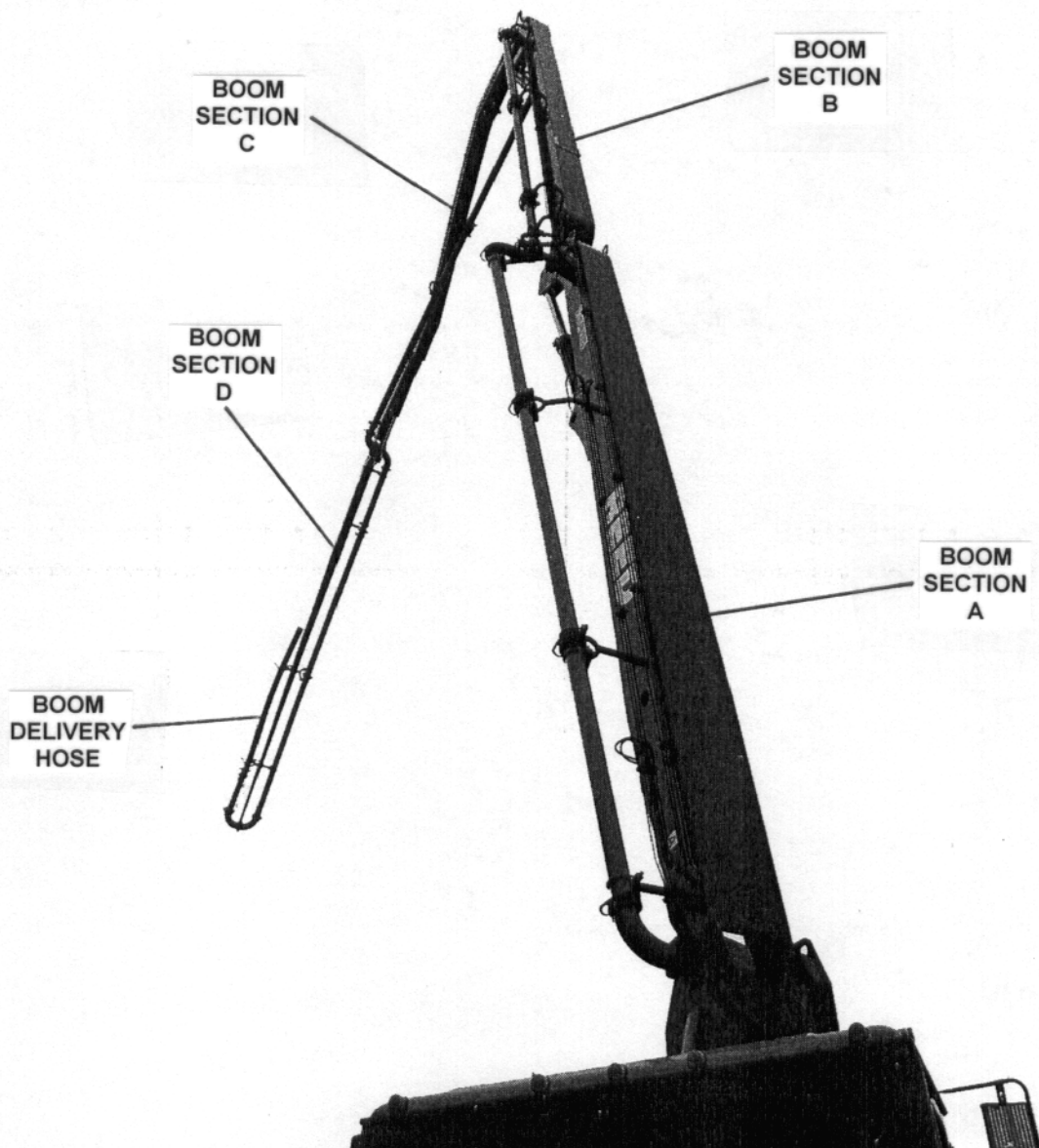
This section is the third section of the boom assembly and is attached to the end of the second section and folds along side the second section. It has an articulation range of 180° total. This is based on having the ability to travel from the folded position along side of the second section to a full open position, which allows this section to be in a straight line with the second and main boom.

**MOVE SECTION C** control lever **DOWN** to **RAISE** boom. Move lever **UP** to **LOWER** boom section.

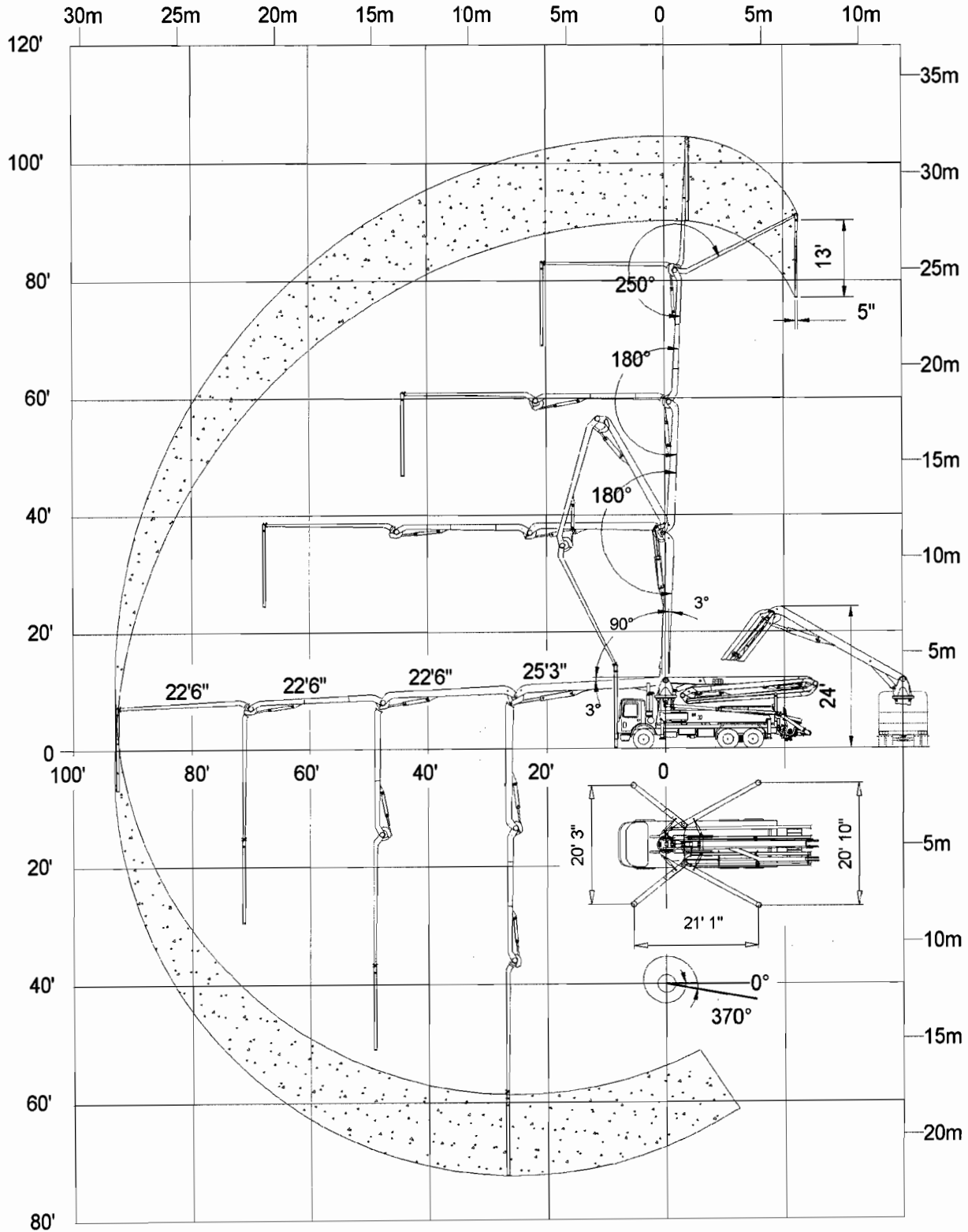
## 6. BOOM SECTION "D"

This section is the end or fly section of the boom assembly. It is attached to the third section and folds down to the underside of the third section. It has an articulation travel range of 250° total. This is based on having the ability to travel from the folded position under the third boom to vertical with the other booms then 70° beyond vertical or over center.

Move **SECTION D** control lever **DOWN** to **RAISE** boom. Move lever **UP** to lower boom section.



## BOOM ARTICULATION DIAGRAM

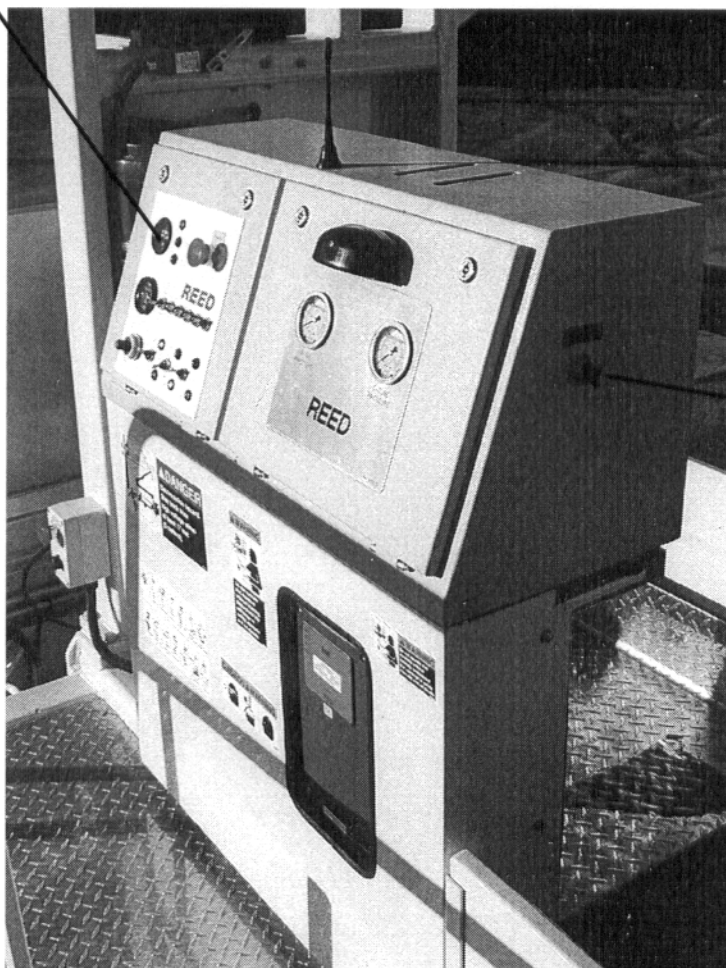


## CONCRETE PUMP CONTROL FAMILIARIZATION

In the previous pages you were introduced and familiarized with the outrigger and boom controls. Now we would like to acquaint you with the concrete pump controls. The boom and pump circuits are separate systems. One can be operated without the other.

Like the boom functions, the concrete pump can be controlled at a stationary panel on the chassis or from the remote control console or by the radio control unit. The next few pages are offered to familiarize you with these controls, their purpose, function and what happens.

SEE NEXT PAGE  
FOR MORE DETAILS

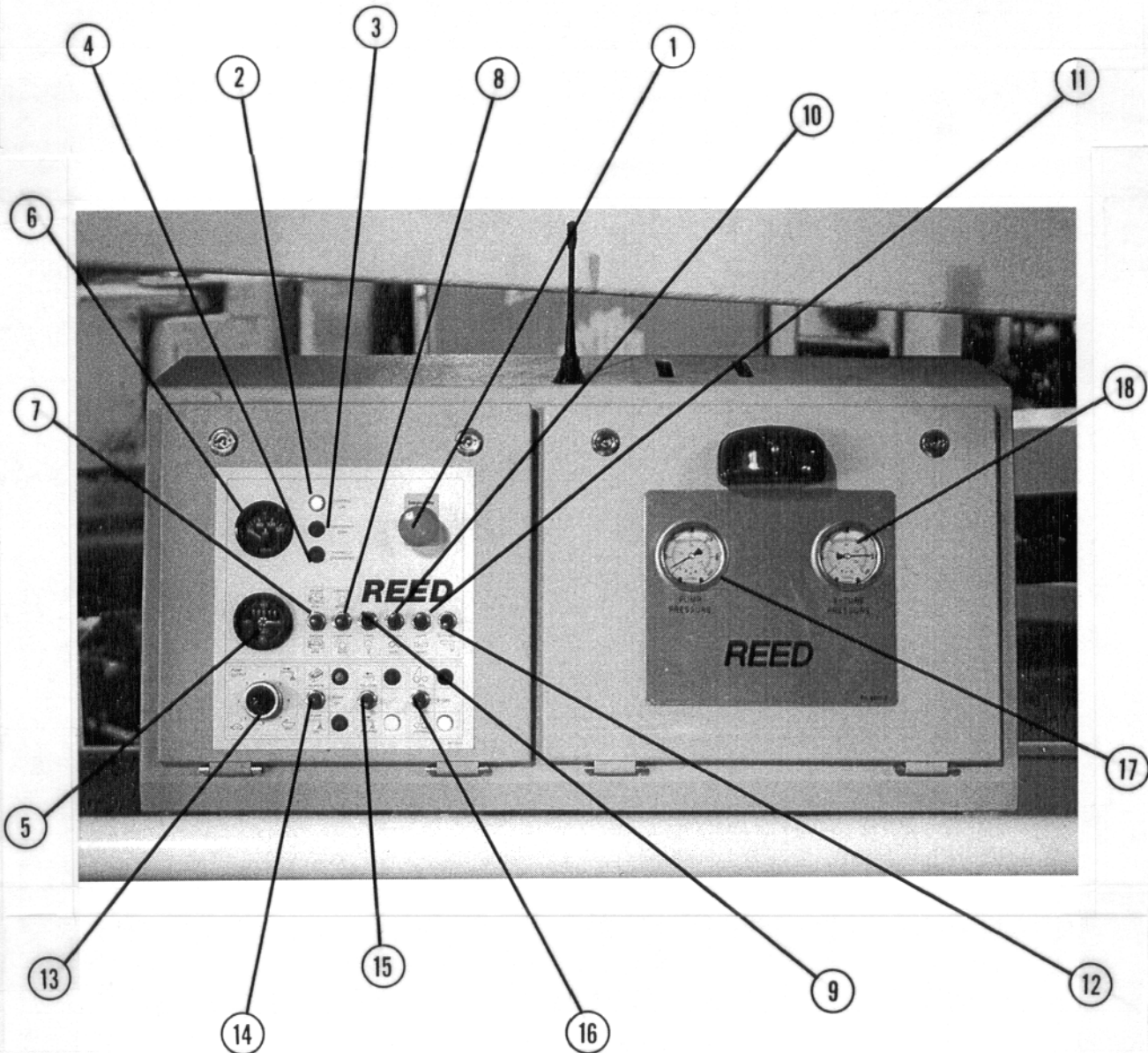


### STATIONARY PUMP CONTROL PANEL

This control panel is located on the right (curb) side of the chassis, up on the chassis deck near the rear. This panel enables complete operational control of the concrete pump as well as having the abilities to monitor the system.

## 1. EMERGENCY STOP SWITCH

This switch is used to shut down the complete operation of the concrete pump and boom in an emergency. **PUSH** red knob to **STOP** operation. **PULL** knob out to **RELEASE** or re-activate system. The **STOP** switch is equipped with a light which flashes when switch knob is depressed.



## 2. GREEN LIGHT - READY

An indicator light used to denote that the PTO (Power Take-Off) is properly engaged and concrete pump system is **READY** for operation.

### 3. E-STOP INDICATOR

This light when lit, is used to denote that one of the **E-STOP** switches has been depressed.

### 4. HYDRAULIC OVERHEAT LIGHT

This indicator light when lit, denotes the hydraulic fluid is overheated.

### 5. HOURMETER

This instrument is used to record the number of hours the concrete pump has cycled. It is only operable when the pump is cycling.

### 6. OIL TEMPERATURE

This instrument is used to indicate the hydraulic oil temperature.

### 7. ENGINE RPM SWITCH

This is a 3 position momentary return to center position toggle switch. It is used to control and set the **THROTTLE** or **ENGINE** speed. Activate the toggle switch **UP (+)** and hold to **INCREASE** RPM; move toggle to **DOWN (-)** position and hold to **DECREASE** RPM. Speed of engine will be retained as set until reset. Center position of switch is neutral.

### 8. VIBRATOR SWITCH

This is a two position toggle switch used to control the hopper grate vibrator unit. Place toggle in **UP-MANUAL** position for continuous operation of vibrator. With toggle in **DOWN-AUTO** position, vibrator will operate intermittently on a timing cycle.

### 9. LIGHT SWITCH

This is a 2 position toggle switch used to turn on or off the work light located above hopper as well as the panel light. Switch in **DOWN** position light is **ON**. Place in **UP** position to turn light **OFF**.

**10. GREASE SWITCH**

This is a 2 position momentary toggle switch used to interrupt the preset timing cycle of the lubrication system. The lubrication cycle is preset and will automatically start and stop as set. However, by moving toggle to **GREASE** position this will activate the system to pump when in between preset cycle.

**11. HORN SWITCH**

This is a 2 position momentary toggle switch used to activate the chassis horn for reactivation of system after **E-STOP** switch has been depressed.

**12. OUTRIGGER POWER CONTROL SWITCH**

This is a 2 position momentary toggle switch control with the purpose of energizing or de-energizing (lockout) the outrigger circuit.

**13. PUMP VOLUME SWITCH**

This is a potentiometer type control and is used to adjust and set the **OUTPUT** discharge volume of the concrete pump or the **SPEED** in which the pump is cycling. Note there are eight (8) position ranges indicated on the control decal. Position 1 is **LOW** speed; position 8 is **HIGH** speed.

**14. PUMP SWITCH**

This is 3 position toggle switch use to turn the concrete pump on-off or energizing the remote. With toggle in **CENTER** position, pump is **OFF** or not cycling. Place toggle in **DOWN** position to turn pump **ON** – cycling, which will be indicated by the **LIT** light. Place toggle in **UP** position –**REMOTE** to activate the remote system. In so doing, it will be indicated by a **LIT** light.

**15. PUMP DIRECTION SWITCH**

This is a 2 position toggle switch used to control the cycle direction of the concrete pump. With toggle in **DOWN** position, the pump will operate in a **FORWARD** cycle. This will be indicated by a **LIT** light. Place toggle in **UP** position to operate pump in a **REVERSE** cycle. This will be indicated by **LIT** light.

**16. S-TUBE SWITCH**

This is a 2 position toggle switch with a momentary position. The purpose of this switch is to manually shift the S-Tube from one cylinder to the other. In normal operation of the concrete pump, the S-tube is always shifted to the material cylinder which has been fully retracted. This action allows, on the pistons forward stroke, to push the material out through the discharge. However, in certain pumping situations, you may choose to change over from one cylinder to the other for maintenance and/or clean out purposes to expose the cylinder piston. When released, switch will return to **NORMAL** position causing S-tube to shift back.

**17. PRESSURE GAUGE – CYLINDER “A” OR CYLINDER “B”**

This is a 6000 PSI hydraulic gauge and is used to indicate the pressure being applied to the hydraulic cylinder piston of **CYL A** or **CYL B** on the forward stroke.

**18. PRESSURE GAUGE – S-TUBE**

This hydraulic pressure gauge is a 3000 PSI gauge and is used to indicate the hydraulic operating pressure of the S-tube shifting circuit.

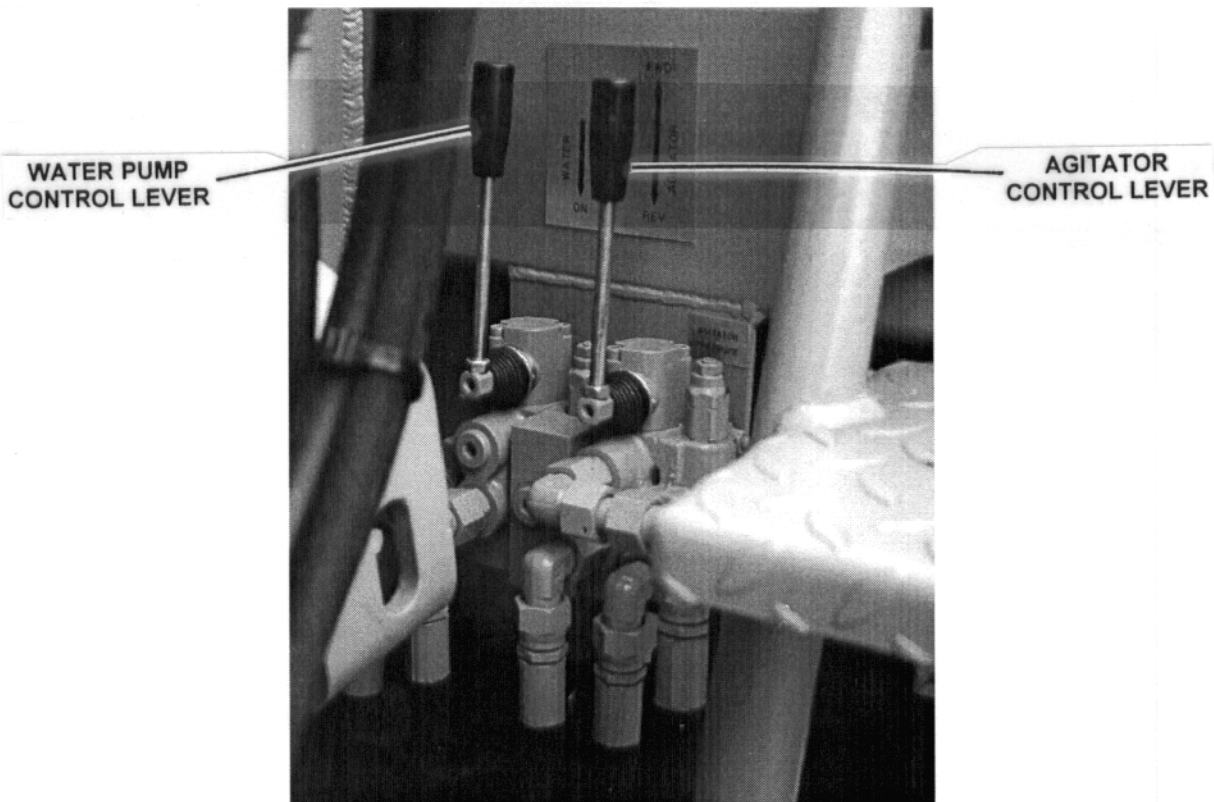
**19. TEST SWITCH**

This switch is a three (3) position momentary switch used to test the operation of the material hydraulic cylinder labeled **A** or **B**. Turn switch to “**A**” position and hold. Cylinder will bottom out enabling pressure to be read on **CYL** gauge. The switch can also be used to **JOG** cylinders a little at a time for maintenance/repair operation.

**NOTE**

*The following controls are located on the right (curb) side of the chassis at the end right before the hopper.*





## 20. AGITATOR & WATER PUMP

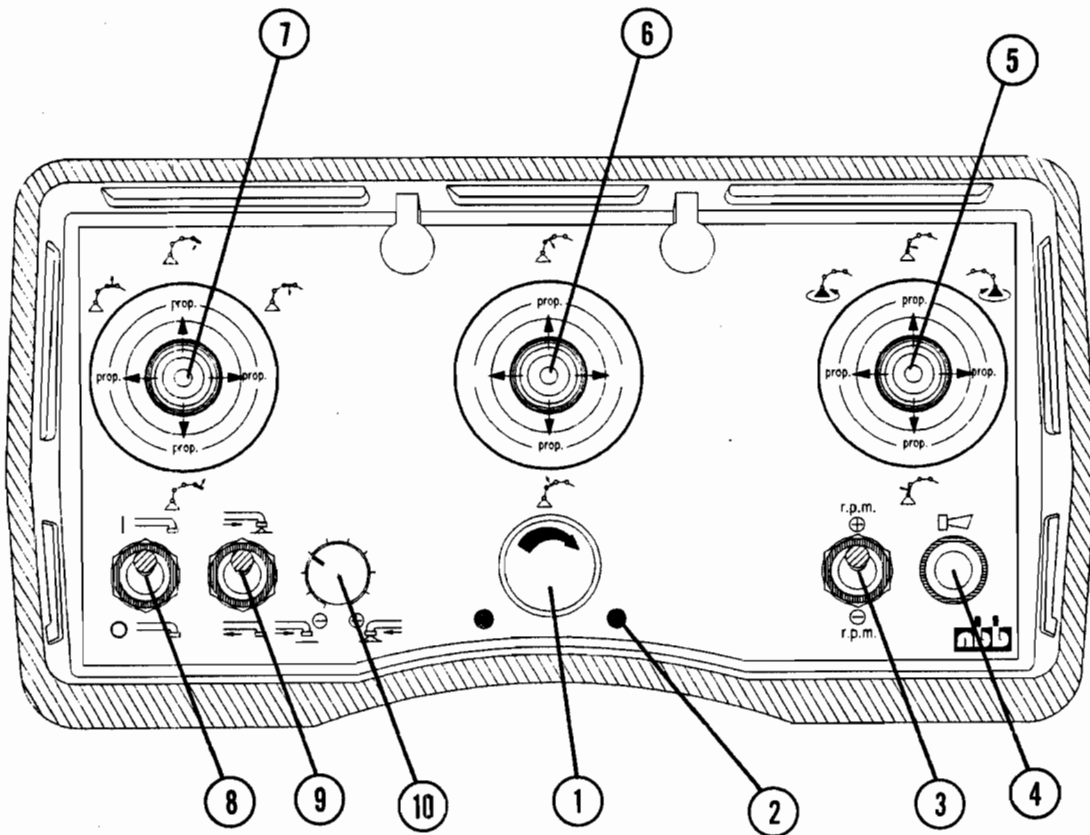
These are controlled by a manually operated 2 spool hydraulic directional control valve. One section of the valve bank is used to control the agitator/remixer and the other is used to control the water pump.

- **AGITATOR** - This lever controls the rotation direction of the hydraulic drive motors used on the agitator, sometimes called remixer. With lever in the **VERTICAL** position valve is **OFF**. **PUSH** lever in direction of chassis bed to rotate agitator in a **CLOCKWISE** direction. **PULL** lever toward hopper to rotate agitator **COUNTERCLOCKWISE**.
- **WATER PUMP** - This lever is used to control the operation of the water pump, which draws water from water tank to hose. With lever in the **VERTICAL** position the water pump is **OFF**. Push lever in direction of chassis bed to **START** pump.

## REMOTE CONTROL FAMILIARIZATION (CABLE TYPE)

A remote control console is provided and used to enable the operation of the boom functions and concrete pump operation away from the immediate vicinity of the chassis. The remote unit is easily portable in a lightweight console. A behind the neck carry strap is provided to facilitate the use of the remote control console with both hands.

The console is connected to the chassis by a 25M (82 ft) umbilical electric cord with connector plugs at each end. A portable reel is provided to enable the cable to be stored during or after use.



### 1. KEYED - EMERGENCY STOP SWITCH

This is a red colored knob switch and serves two (2) purposes. The primary purpose is to shut down the machine in an emergency situation. Depressing **PUSH** knob in will **STOP** operation of the unit. The switch is also keyed, with the key being part of the removable red knob. Once emergency switch has been depressed, it can only be released by **PUSHING IN** on knob and turning knob with key **CLOCKWISE**.

## 2. INDICATOR LIGHTS

Two (2) small lights, one each side of emergency stop switch, are installed and used to indicate status of control. The **RED** light indicates **NON-OPERATIONAL** and **GREEN** light indicates **OPERATIONAL**.

## 3. ENGINE RPM SWITCH

This is a three (3) position momentary return to center position toggle switch. It is used to control and set the **THROTTLE** or **ENGINE RPM**. Activate the toggle to **UP(+)** and hold to **INCREASE RPM**; move toggle **DOWN** to **DECREASE RPM**. Engine RPM will remain as set until once again reset. Center position of switch is neutral.

## 4. HORN

This is a momentary push button switch and is used to activate and sound the chassis horn for signaling purposes. **DEPRESS** button to sound horn, **RELEASE** to silence horn.

### NOTE

*The following three (3) controls are used for operation of the boom functions. They are of the five (5) position momentary joystick type switch, meaning the lever must be held in position to keep the particular function activated and operational. Lever will automatically return to CENTER position when released and function will CEASE to operate.*

## 5. BOOM "A" AND ROTATION

This lever is used to control the **MAIN (A) BOOM** and **ROTATION** of turret or turntable. The "A" boom lever movement is in a vertical up-down direction. Move lever back, **TOWARD** operator, to **RAISE** boom and forward, **AWAY** from operator, to **LOWER** boom.

The **ROTATION** lever movement is a side to side direction. Move lever to the **LEFT** for **COUNTERCLOCKWISE** rotation. Move lever to the **RIGHT** for **CLOCKWISE**.

**6. BOOM "B"**

This lever is used to control the function of the "B" or second boom. The direction of lever movement is vertical up-down. Move lever **FORWARD, AWAY** from operator, to **LOWER**, fold boom and **BACK, TOWARD** operator, to **RAISE** boom.

**7. BOOM "C" AND BOOM "D"**

This lever is used to control the operational functions of the "C" or third boom and "D" or fourth boom. The "C" boom lever is in a side to side direction. Move lever to the **LEFT** to **RAISE** boom and move to the **RIGHT** to **LOWER** boom.

The "D" boom lever movement is in a vertical direction. Move lever **FORWARD, AWAY** from operator, to **LOWER** boom and **BACK, TOWARD** operator, to **RAISE** boom.

**8. PUMP SWITCH**

This is a two (2) position toggle switch used to activate the concrete pump circuit. Move the toggle to **UP** position to **START-UP** pump and place toggle in **DOWN** position to **SHUT-OFF** pump.

**9. PUMP DIRECTION SWITCH**

This is a two (2) position toggle switch used to select the pumping direction of the concrete pump. Move toggle to **UP** position pump **FORWARD**, out of hopper and into delivery line. Move toggle in **DOWN** position to pump in **REVERSE**, drawing material in from the delivery line.

**10. PUMP VOLUME CONTROL**

This is a rotary type control and is used to adjust and set the **OUTPUT** discharge volume of the concrete pump or the speed in which the pump is cycling. Rotate knob **CLOCKWISE** to **INCREASE** output.

## RADIO CONTROL FAMILIARIZATION

A radio control system is provided and used to enable the operation of the boom functions and concrete pump operation away from the immediate vicinity of the truck. The radio control system consists of a:

- Portable transmitter complete with halter, waist straps and two (2) rechargeable/replaceable batteries
- A receiver with multi-pole connecting cable
- Automatic battery charger

### PRODUCT DESCRIPTION

The transmitter of the radio control contains the individual controls for operation of the boom movements and concrete pump operation. As a specific control is energized, a radio signal is generated and sent on a preset frequency to the receiver. The receiver is cable connected to the main junction box. This junction box contains the connections for the boom and pump operational functions.

The power for operation of the transmitter is provided by a 7.2-volt rechargeable battery that is stored in a compartment located on the transmitter. A full charged battery is of sufficient capacity to enable the transmitter to operate continuously for a period of approximately eight (8) hours. Indicator lights are provided to alert the operator that the battery is nearing exhaustion. The battery charger is mounted in the chassis cab and operates on the 12-volt chassis system.

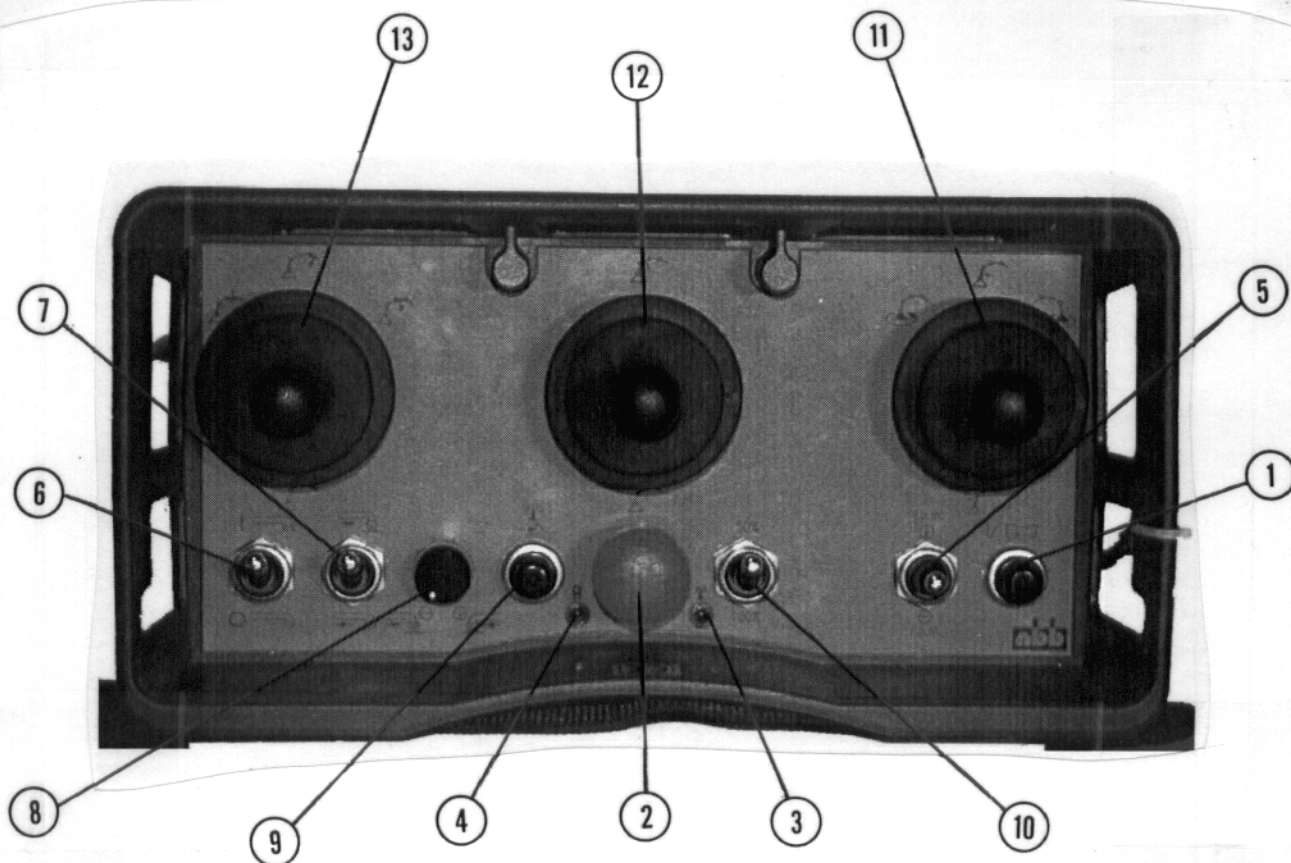
The receiver unit is located on the chassis deck in a protected area under the pump control console. Its purpose is to receive the radio signal from the transmitter and turn this signal, using its electronics, into the means to operate the controlling valves and components of the boom and concrete pump.

One of the features of the **NBB-REED** radio remote is the ability to program the output signals of the analog channels. This in turn presets the maximum operating speed of those functions that are based on speed. This is accomplished by using the "TEACH" battery and the 50%/100% switch.

Your transmitter and receiver are a matched set and should not be mixed with other components without first consulting **REED**.

## CONTROL FUNCTIONS

It is important that you, the operator, know your machine and have a good understanding of the controls and the capabilities. The following will assist you in **GETTING ACQUAINTED** with the radio remote:



### 1. ON/HORN (MASTER SWITCH)

This is a push button switch and is used to turn "ON" the units main power system. After this function has taken place, then the button is used to activate the chassis horn as required for safety at work regulations.

### 2. KEYED EMERGENCY STOP SWITCH

This is a red colored knob switch and serves two (2) purposes. The primary purpose is to shut down the machine in an emergency situation as well as de-energizing the radio control transmitter. Depressing **PUSH** knob **IN** will stop operation of the unit.



# XXT 32 TRUCK - MOUNTED CONCRETE BOOM PUMP

OPER.

PAGE 24

The switch is also keyed, with the key being part of the removable red knob. Once emergency switch has been depressed, it can only be released by **PUSHING IN** on knob and turning knob with key **CLOCKWISE**. This also will activate the radio transmitter.

## 3. FREQUENCY INDICATOR

This green light is used to indicate, when lit, that the control is **ON** and is operational on the proper frequency. It will flash regularly. Commands or usage of controls can now be made.

## 4. BATTERY INDICATOR

This red light is used to indicate, when lit, that the battery is nearing exhaustion. Under most situations, the transmitter can be operated for approximately 15 minutes more after light is lit.

## 5. ENGINE RPM SWITCH

This is a three (3) position momentary return to center position toggle switch. It is used to control and set the **THROTTLE** or the **ENGINE RPM**. Activate the toggle to **UP(+)** and hold to **INCREASE RPM**; move toggle **DOWN (-)** to **DECREASE RPM**. Center position of switch is neutral.

## 6. PUMP SWITCH

This is a two (2) position toggle switch used to activate the concrete pump circuit. Move the toggle to **UP** position to **START-UP** pump. Place toggle in **DOWN** position to **SHUT-OFF** pump.

## 7. PUMP DIRECTION SWITCH

This is a two (2) position toggle switch used to select the pumping direction of the concrete pump. With toggle in **UP** position, the material is pumped out of the delivery line. With toggle in **DOWN** position, the material is being drawn **IN** from the delivery line in reverse.

## 8. PUMP VOLUME SWITCH

This is a potentiometer type control that is used to control the volume output of the pump. With knob rotated to **(-)** position, volume **OUTPUT** is **MINIMAL**. Turn knob **CLOCKWISE** toward **(+)** to **INCREASE** volume output.

**9. FREQUENCY CHANGE**

This is a two (2) position momentary push button switch which is used to change the frequency. This is used in conjunction with the **ON/HORN** button while operating the **FREQUENCY** button until horn sounds.

**10. SWITCH 50%-100%**

This is a two (2) position toggle switch which is used to control the maximum speed of the boom and concrete pump functions. The 100% position is full speed; the 50% position sets the maximum speed of the function at one-half full speed. Refer to **OPERATION** of radio to set the speed.

**NOTE**

*The following three (3) controls are used for operation of the boom functions. They are of the five (5) position momentary joystick type switch, meaning the lever must be held in position to keep the particular function activated and operational. Lever will automatically return to CENTER position when released and function will CEASE to operate.*

**11. BOOM "A" AND ROTATION**

This lever is used to control the **MAIN (A) BOOM** and **ROTATION** of turret or turntable. The "A" boom lever movement is in a vertical up-down direction. Move lever back, **TOWARD** operator, to **RAISE** boom and forward, **AWAY** from operator, to **LOWER** boom.

The **ROTATION** lever movement is a side to side direction. Move lever to the **LEFT** for **COUNTERCLOCKWISE** rotation. Move lever to the **RIGHT** for **CLOCKWISE**.

**12. BOOM "B"**

This lever is used to control the function of the "B" or second boom. The direction of lever movement is vertical up-down. Move lever **FORWARD, AWAY** from operator, to **LOWER**, fold boom and **BACK, TOWARD** operator, to **RAISE** boom.



### 13. BOOM "C" AND BOOM "D"

This lever is used to control the operational functions of the "C" or third boom and "D" or fourth boom. The "C" boom lever is in a side to side direction. Move lever to the **LEFT** to **RAISE** boom and move to the **RIGHT** to **LOWER** boom.

The "D" boom lever movement is in a vertical direction. Move lever **FORWARD, AWAY** from operator, to **LOWER** boom and **BACK, TOWARD** operator, to **RAISE** boom.

## SAFETY PRECAUTIONS

Safety can't be overstated. We have and will continue to make you **AWARE of SAFETY** on the job. Below we have pointed out some safety points, which are important and need to be followed when operating the radio remote.

- Even if you are accustomed to working with a radio control system, familiarize yourself thoroughly on the **REED** system.
- In some areas, an operating permit and registration may be required.
- Observe all applicable work safety and accident prevention regulations without fail.
- Only fully trained, authorized personnel may use the radio control equipment.
- When the radio control unit develops a fault, it must be shut-down immediately using the **EMERGENCY OFF** switch.
- A charged battery is a concentrated energy source. Never store a charged battery in a tool box or similar area where it could be short circuited by metal components. Even a key in your pocket can cause a short circuit if next to the battery.
- Never expose the transmitter or receiver to a high pressure cleaning jet.

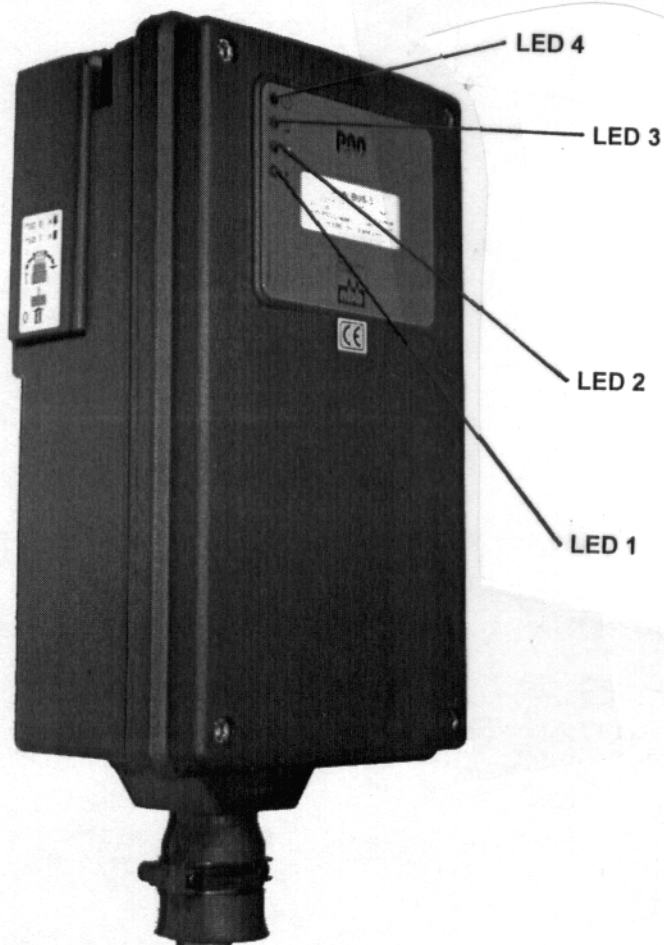
### **⚠ WARNING**

**NEVER WELD ON ANY PART OF THE MACHINE WITHOUT DISCONNECTING THE RADIO RECEIVER, BATTERY SWITCH AND TRUCK COMPUTER. FAILURE TO COMPLY WITH THIS WARNING WILL BE A COSTLY OVERSIGHT.**

## OPERATION INSTRUCTIONS

Having **READ** and **UNDERSTOOD** the previous pages on **SAFETY** and **CONTROL FAMILIARIZATION**, you are now in a position to learn how to operate the unit using the radio remote.

- Set up the unit outriggers, etc. using the manual controls as previously outlined in the **OPERATION SECTION** of this manual.
- Make the Radio Control ready for use
  - Insert a charged battery into the battery compartment of the transmitter. Note – to remove the battery, depress the pin and slide out the battery.
  - Check the connections for the receiver that they are secure.
  - Switch **ON** the transmitter by turning or releasing the **EMERGENCY OFF** button on transmitter.



- **MAKING FUNCTION CHECKS**

Regular function checks of the radio remote control are essential to insure that operating safety is maintained. It is recommended that the checks be done at least once a week. With transmitter **POWER-ON** check the following:

- **LED** of the receiver, located on receiver face.
  - **LED 1: POWER ON** – Indicator should be lit. If not check:
    - Emergency E-Stops on chassis
    - Outrigger switch is in **BOOM** position
    - Switch on main panel is in **REMOTE**
  - **LED 2: HF AVAILABLE** – This indicator should remain lit continuously when transmitter is switched on the E-Stop.
  - **LED 3:** This indicator flashes at regular intervals during fault-free operation. Irregular flashing means the HF channel is probably disrupted. This can be remedied by switching to an alternate channel.
  - **LED 4:** If this indicator flashes the HF channel has been disrupted.

- **COMMAND FUNCTION – TEST**

It is a good habit to run this check-out procedure at the beginning of each day and before the actual pumping of concrete. This will assist in ensuring the unit is functioning properly.

- Test the command functions of the boom, starting with the operation of **BOOM "A"** and proceed with the operation of the other booms and turntable rotation. Observe that movement of the functions correspond with the movement of the control.
- Push **EMERGENCY – OFF** switch. Operation of transmitter should cease. Verify by activating a control. Function should not operate.
- Release **EMERGENCY** switch. Activate a control, function should not operate.
- Remove battery, transmitter should cease to function. Replace battery, activate a control, function should not operate.
- Depress **ON/HORN** switch to activate function.

## CHANGING THE FREQUENCY

The transmitter sends its signal to the receiver on a preset radio frequency. Often some interference may be encountered during operations resulting in a need to change the frequency. This is accomplished as follows:

- Depress the **FREQUENCY CHANGE** button and hold and simultaneously depress **ON-HORN** button until the horn sounds. When horn sounds, a new frequency is established.

## SETTING ANALOG CHANNELS

The **REED** radio remote system is equipped with a means to individually set the analog channels basic settings. The output signals can be individually programmed by use of the transmitter. The setting of the functions is in reality the setting of the operational speed, at full 100% maximum speed. To program the functions, the following is offered:

### 1. ACTIVATE THE PROGRAMMING MODE

- Check that all joy stick controls are in center position.
- Insert the **TEACH** battery into the transmitter battery compartment.
- Release **EMERGENCY OFF** switch and press the **ON/HORN** switch.
- The program mode is now activated.

### 2. SELECT ANALOG FUNCTION

- Select the function to be programmed by moving the control lever in desired direction.
- Place the 50% - 100% switch to 50% position.
- To **TEACH** threshold, move function lever until function just begins to move then back off a little.
- At this point, to save this value, depress the **ON/HORN** button.
- Now place the 50% - 100% switch to 100% position.

- To **TEACH** maximum move function lever until desired fast maximum speed is obtained. Watch movement of manual control valve handles.
- Save this value by depressing the **ON/HORN** switch.
- Press the **FREQUENCY CHANGE** button.

The opposite direction of this function and other functions can be programmed in the same manner and immediately afterward.

- The concrete pump speed can be programmed in the same way as the boom functions except the knob is used instead of the handles. We recommend to teach the maximum speed just below where the cylinders spike.

### NOTE

*The programmed value or speed can be checked after the setting by depressing the **FREQUENCY CHANGE** button and holding while operating the function control. As soon as the button is released, the program mode can be continued.*

### 3. CLOSING THE PROGRAM MODE

- Depress the **EMERGENCY-OFF** switch
- Remove the **TEACH** battery from the transmitter battery compartment and insert normal work battery.
- Release the **EMERGENCY-OFF** switch.
- Press the **ON/HORN** switch to energize the transmitter.

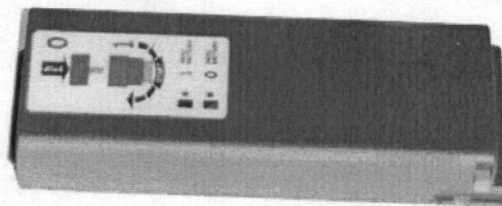
### NOTE

*In the programming mode, all functions are inoperable except **ON/HORN** and the functions selected to be programmed.*

## BATTERY CHARGER

The battery charger is located in the chassis cab and operates utilizing the chassis electrical system. To charge a battery the following is offered:

- Turn chassis ignition key **ON**. Green indicator light on charger should be lit.
- Insert dead battery into charger. Both green and red light should be lit.
- Battery will continue to charge as long as ignition switch is **ON**. An exhausted battery will take about 3½ hours to fully charge.
- When battery is fully charged, both the green and red light will flash.
- The battery can be left in the charger without doing harm to the battery itself.



BATTERY

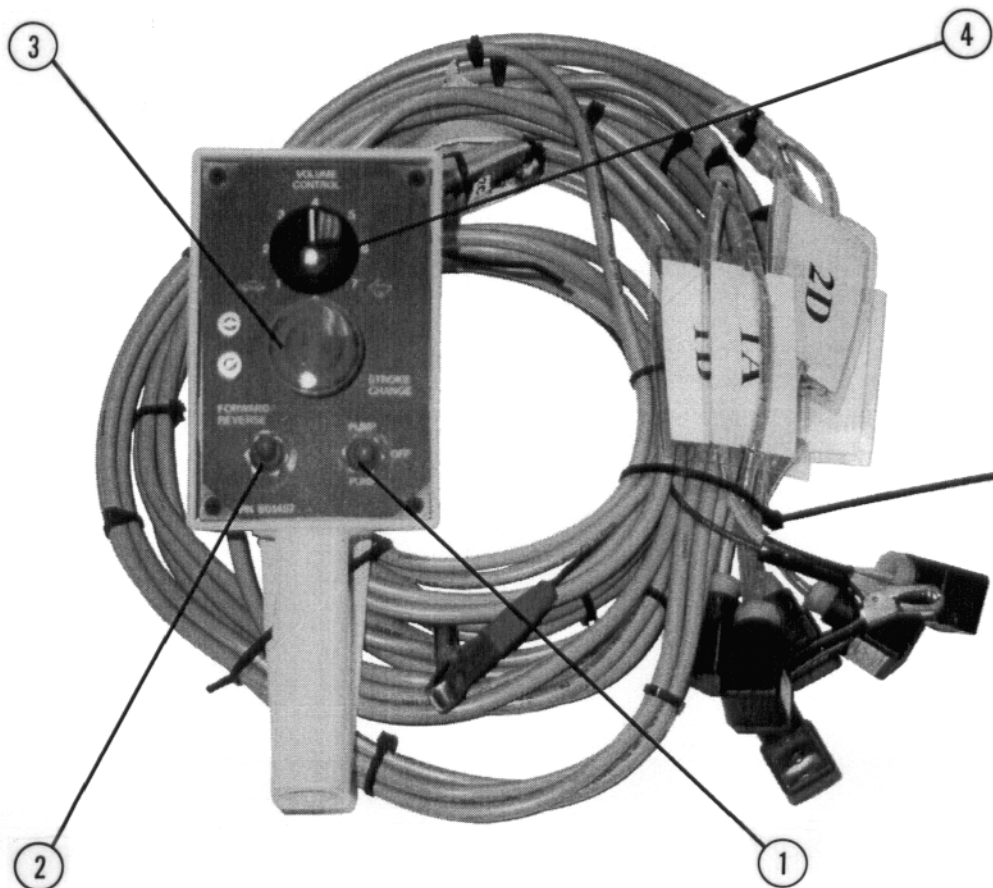
## EMERGENCY STROKE/REVERSE CONTROL

The purpose of this **EMERGENCY STROKE/REVERSE CONTROL** is to enable the concrete pump to be operated in an emergency situation, which might involve a faulty proximity switch or a loss of electrical power to a major component and/or main control system. This control when properly connected will enable continued operation for completion of pumping job.

The control consists of a hand held console equipped as follows:

### 1. STROKE CHANGE SWITCH

This is a three (3) position momentary toggle switch and is used to change the stroke of the material and hydraulic cylinders to pump from one side to the other. **CENTER** position of switch is **OFF** (non-cycling). Move switch **UP** and **HOLD** to cycle pump. When piston has bottomed out (completed stroke), move switch **DOWN** and **HOLD** to cycle other cylinder.



## 2. FORWARD/REVERSE

This is a two (2) position toggle switch and is used to change the pumping direction of the material cylinders. With switch in **DOWN** position, pump is cycling in **FORWARD** position, discharging material out from hopper. Move toggle to **UP** position, pump will cycle in **REVERSE**.

## 3. EMERGENCY STOP

This is an emergency switch and is used to shut down the pump in an emergency situation. It is of the push-pull type. Depress **PUSH** knob to **STOP** operation. **PULL** knob out to **REACTIVATE** system.

## 4. VOLUME CONTROL

This is a potentiometer type control and is used to adjust and set the **OUTPUT** discharge volume of the concrete pump or the **SPEED** in which the pump is cycling. Position #1 is **LOW** speed; position #8 is **HIGH** speed.

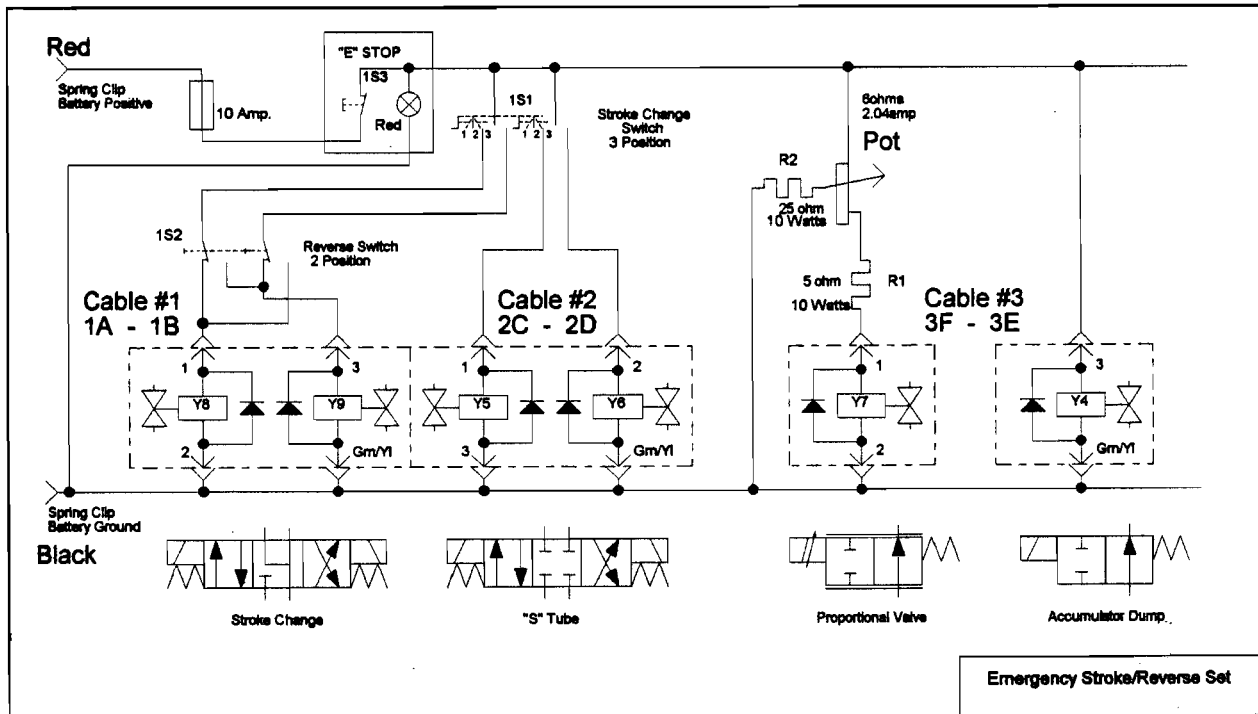
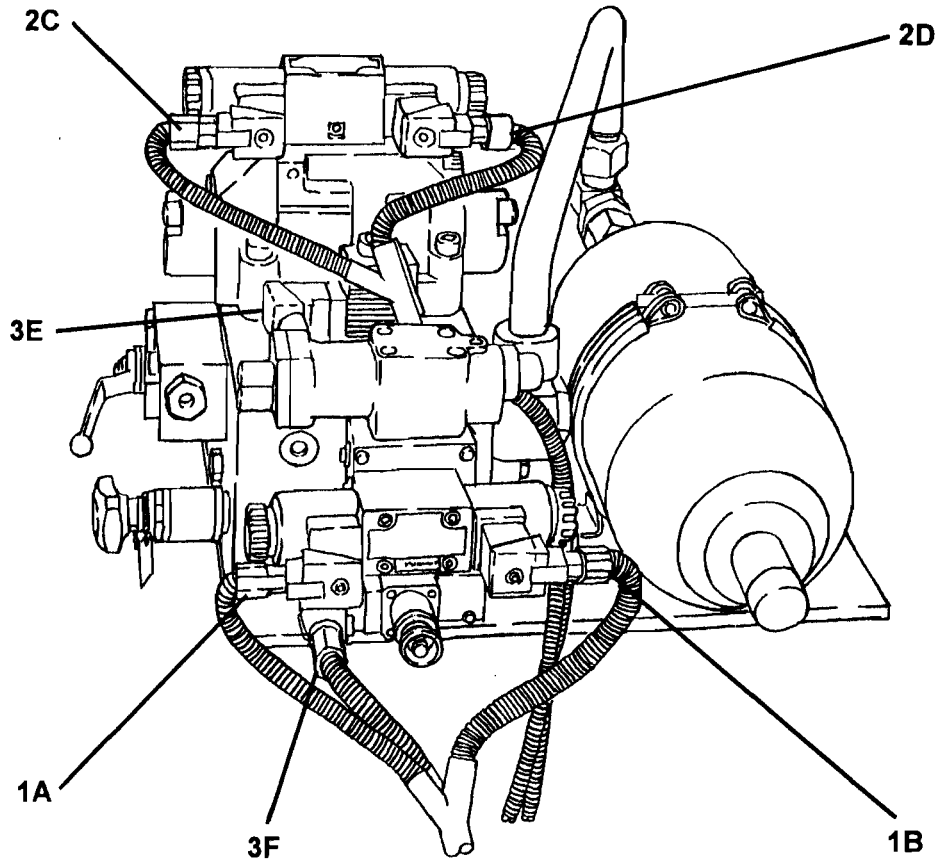
## OPERATION CONNECTION

When the situation calls for the use of the Emergency Stroke/Reverse Control, it will be necessary to make certain connections for it to be operational. The control unit is equipped with three (3) cables, each having two (2) connectors. These are to be connected to the main systems hydraulics which are mounted on top of the hydraulic drive cylinders.

Make the connections as follows:

1. On the stroke change valve, remove the existing connectors marked "Y8 – Y9" and connect cable #1 – "1A" to "Y8" and "1B" to "Y9".
2. On the S-tube valve, remove the connections "Y5" – "Y6" and connect cable #2 – "2C" to Y5 and "2D" to Y6".
3. On proportional valve, remove connector "Y7" and on accumulator dump, remove "Y4". Replace with cable #3 – "3F" on "Y7" and "3E" on "Y4".
4. On the end of the battery supply cable there are two alligator clips, red and black. Connect the red clip to the positive terminal of the battery and the black clip to ground terminal of battery. Any 12 VDC battery will work (ie pick up truck / Car).
5. Check operation and connections; push in on **EMERGENCY STOP**, knob should not be lit up. This will indicate that the control is not receiving power. Pull up on knob to activate system. System should now function. Knob will light up **RED**.





## OPERATION INSTRUCTIONS

Having **READ** and **UNDERSTOOD** the previous pages on **SAFETY** and **CONTROL FAMILIARIZATION** you are now in a position to learn how to operate the unit. If you have not **READ** the **PREVIOUS** pages we **SUGGEST** you do so **BEFORE PROCEEDING**.

### **▲ CAUTION**

*For your own **SAFETY** and others around you it is your **RESPONSIBILITY** to insure the unit is in proper working condition. Check out the unit by using the **PRE-OPERATION INSPECTION** notes previously identified.*

### **▲ WARNING**

**OBSERVE ALL SAFETY PRECAUTIONS WHILE OPERATING THIS MACHINE.**

## OPERATING INSTRUCTIONS SAFETY TIPS

**SAFETY** can't be **OVERSTATED**. We have and will continue to make you **AWARE** of **SAFETY** on the job. Below we have pointed out some safety tips, which are important and need to be followed during operation.

1. All those that are involved in the operation, maintenance and repair of the **XXT 32** must read and be familiar with this operator's manual prior to operation of the equipment.
2. Always wear an approved safety helmet while working around the concrete pump and construction site. Protective safety goggles to eliminate eye burns and damage as well as hearing protection may be found helpful.
3. Make sure only authorized personnel are in the vicinity of the unit or on the unit.



# XXT 32 TRUCK – MOUNTED CONCRETE BOOM PUMP

OPER.

PAGE 33

4. Be sure those other than the operator are aware the unit is remote controlled and could start up at anytime.
5. Never allow anyone to stand on hopper grate.
6. If failure or malfunctions occur, stop the operation and have repaired immediately.
7. Safety devices **MUST NEVER** be disconnected, altered or removed.
8. Clear area of personnel and obstructions before extending outriggers.
9. Outriggers and jacks must be fully extended before boom is operated, unless precautions are taken as noted in **WARNING – OPERATING CONFIGURATION** decal.
10. Ensure stability of unit. When in doubt of the ground condition use extra blocking under jack legs.
11. Maintain a safe distance from excavations when setting up operation.
12. Do not drive with boom unfolded or outriggers extended.
13. Boom should not be used where wind speed exceeds 48 MPH. In a storm condition lower boom and place in stored position on chassis.
14. The main boom must be raised to 28 feet to release transport hook before boom section B can be opened.
15. Safety chain, whip check or other suitable securing devices must be used to secure the tip hose to the boom.
16. No structural extension or additional hose should be added to the boom tip section. Only one (1) tip hose 13 feet long is allowed, unsupported.
17. Do not use boom structure as a crane, hoist or any other form of lifting. This is strictly **PROHIBITED**.
18. **DANGER OF ELECTROCUTION** - Keep a minimum of 17 feet away from any electrical wires. Even though you are away from the chassis and using the remote control the umbilical control cable is still conductive. **BEWARE**. Climatic conditions (wet, fog, and rain) are more conductive. Keep at least 35 feet or more away depending on voltage.
19. Engage outrigger transport lock device before traveling, if so equipped.

## SELECTION OF SET-UP AREA

Your first and primary concern when arriving at the job site is to insure the machine can be safely set up and safely operated. Don't jeopardize a safe operation for moving a few feet closer to the placement site.

Remember the **MODEL XXT 32** weighs over 50,000 lbs. (22,700 kgs) and should receive special care and attention around the job site.

Choose an area as near as possible to the placement site. When selecting the set up area, look and determine if the operator will have a perfect view over the whole area. If the operator does not have a total clear view, a second person must be available as a guide to marginal viewed areas

Get out of the truck, look and walk around the entire area of the proposed set-up. The machine should be located on as level ground as is possible. It should be set up in such a manner that its stability is ensured. Keep a sufficient distance away from slopes, pits, trenches and excavations. These areas may collapse under the pressure of the outrigger legs. Refer to **OPER. PAGE 36** for pressure fact. Never set up on dumped dirt or ground.

What about the overhead area? Is the area clear of any obstructions such as electrical wires, trees etc., that may hinder the operation of the boom? Don't take chances. The boom can be maneuvered into various articulated configurations, which, if working in a tight area could be an unsafe operation.

### **▲ WARNING**

*The operator is responsible for the complete working area when using the machine. He must determine if the area will provide the required stability, overhead clearance and unobstructed view. If the planned location does not meet the requirements of safe set-up he must REFUSE to set-up and look and propose alternate areas even if it means relocating and reset-up during the job.*

## STABILIZING THE MACHINE AND SAFE OPERATING AREA

Position the **MODEL XXT 32** so that safe stability is guaranteed for the entire operating range of the boom. To accomplish this, it is necessary that all outriggers must be fully extended and vertical jacks must be properly set.

This is the **RECOMMENDED – SAFE** manner in which to operate the boom pump. However, situations may be encountered that prevent the setup of total or full outrigger extension. In these conditions, the following guidelines must be observed and it is the responsibility of the operator to be **ALERT** to the **OPERATING CONFIGURATIONS**.

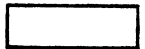
The chart below indicates areas of operation and non-operation when all outriggers are not extended. Extreme care must be exercised when operating under these conditions.

### ⚠ WARNING



#### **NON-OPERATING AREA**

**DO NOT OPERATE OR ROTATE ANY PORTION OF BOOM IN THIS AREA. DUE TO DANGER OF TIPOVER.**

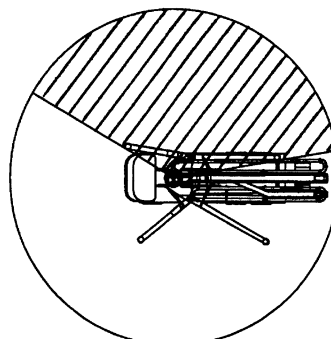
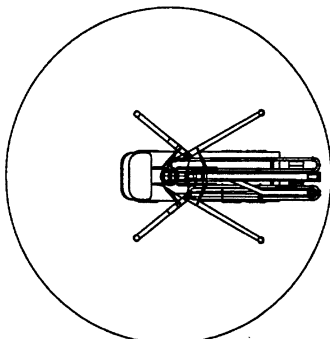
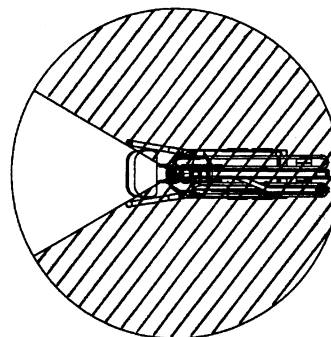
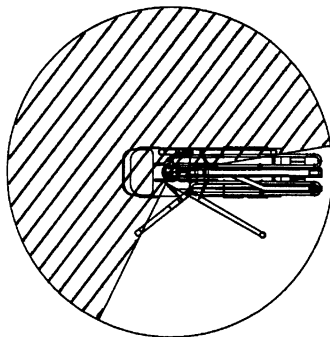


#### **OPERATING AREA**

**THIS AREA REQUIRES OUTRIGGER TO BE FULLY EXTENDED AND OPENED AS SHOWN. ALL FOUR (4) VERTICAL JACKS MUST BE SET PROPERLY ON FIRM LEVEL GROUND. CHASSIS MUST BE LEVEL SIDE TO SIDE AND FRONT TO REAR.**

#### **REED MODEL XXT32 DRAGONFLY**

#### *TYPICAL OPERATING CONFIGURATIONS*





# XXT 32 TRUCK – MOUNTED CONCRETE BOOM PUMP

## PRECAUTION AWARENESS (OUTRIGGER NOT FULLY EXTENDED)

**BE ALERTED** to these and try to **PREVENT** the inevitable of **TIPOVER**.

- Telescopic front leg(s) must be fully extended and rear leg(s) must be fully swung out.
- Boom must be folded and in vertical position before rotating to operating area.
- Tip, boom and hose must always remain on the same side and between two fully extended outriggers.

## SUPPORT OF OUTRIGGER JACKS

When stabilizing the machine, keep in mind that when the outriggers and jacks are positioned, the entire weight of the chassis and boom is supported by the jacks. At some positions, the load may be equally distributed on the jacks and depending on the position of the boom, the load on one or two jacks may be substantially increased.

Each jack leg is equipped with a circular pad, however when unit is set up it is **REQUIRED** that the furnished outrigger pads be placed beneath the jacks. This aids in spreading out the force over a large area. There may be times when it will be necessary to place additional larger pads or blocking under the jack pads to keep from sinking.

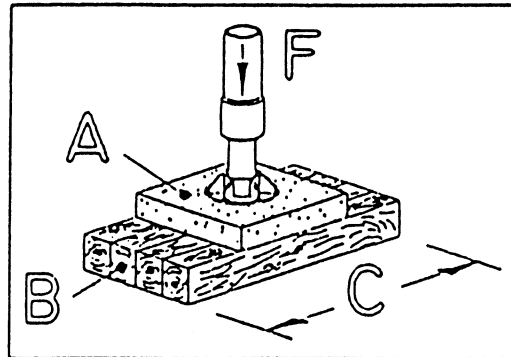
There is no fool proof method that can be used to ensure positive and absolute stability as there are too many factors involved. We have inserted the following data to assist you in determining the condition, however, it will all depend on how well you know your equipment, your experience and how alert you are to the ground conditions as you operate the unit.

**TABLE 1**

<b>PERMITTED SURFACED PRESSURES (Ps)</b>	
<b>Type of Surface</b>	<b>KN/m<sup>2</sup></b>
Normal Ground	<b>150</b>
Asphalt with 7.8”(20 Cm) minimum thickness	<b>200</b>
Tamped crushed stone	<b>250</b>
Clayish and slimy ground	<b>300</b>
Different degree of granulated ground	<b>350</b>
Gravel	<b>400/500</b>
Suitable compressed gravel	<b>750</b>
Crumbly weathered rock	<b>1000</b>

## NOTE

*The load bearing capacity on the subsurface is express in PSI. The table above depicts a few indicative values by which the resistance of the support surface can be determined.*



	PERMITTED SURFACE PRESSURES ( $P_s$ ) from the table above, expressed in $KN/m^2$														
	STABILIZER LOADS ( $F$ ) from the jack plates, expressed in KN														
	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400
150		84	112	138	166	194									
200			84	104	126	147	166	187							
250				84	89	117	132	150	166	184					
300	surfaces				84	96	112	126	138	154	166	180			
350	suitable for					84	96	106	120	132	144	153	166	180	190
400	stabilizing operations using						84	94	104	115	126	135	147	156	166
500	only the 60x60 cm. support plate (A)							74	84	91	98	109	117	126	132
750	without using wooden joists (B)											73	77	84	89
1000															↑

MINIMUM LENGTH (C) OF THE JOISTS (B) expressed in cm.

**TABLE 2**

Table 2 is arranged according to the resistance values of the ground and the stabilizing load of the machine depicting the minimum length of wooden blocks/joists that are to be positioned under the auxiliary plate of the jack. It also indicates whether the ground surface is unsuitable or unreliable for the stabilizing operation.

### EXAMPLE IN TABLE USE

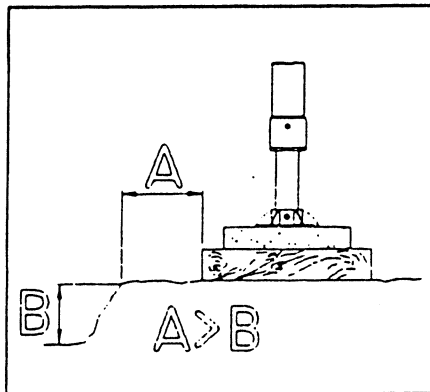
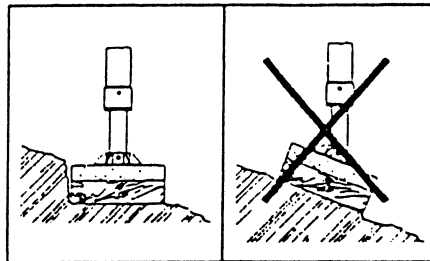
You are going to set up on an asphalt surface that has minimum thickness of (20 Cm). Look at Table 1, it shows the resistance value for asphalt is 200  $KN/m^2$ . Take note of the plate fastened to each vertical jack. This indicates vertical jack/stabilizer load expressed in KN. Check maximum loads on both front and rear stabilizers as the values may differ.

Now look at Table 2, the left side vertical column denotes the values of permitted surface pressure found in TABLE 1 (Asphalt = 200 KN/m<sup>2</sup>). The stabilizer loads (identified on jack plates) are noted across the top of the table. Assume the stabilizer load was 150 KN/m<sup>2</sup>, find that column and read down to where it reads across for the 200 KN/m<sup>2</sup> value in left column. The intersecting figure is 126 Cm (49.6 in). This means that the minimum length of the joist/blocks to be placed under pad is 126 Cm (49.6 in).

**⚠ WARNING**

*The positioning of the machine on slopes or embankments may cause instability as a result of the support surface sliding.*

The ground surface should be level. If the support plates are positioned on upward projecting hills, bumps or hollows they will break. On sloping ground condition position the plates on a level as shown below.



Always remain at a safe distance from slopes, foundation excavations and the like. Follow the simple guideline noted above: the distance between the stabilizer jack and the trench should always be equal to or greater than the depth of the trench itself.



**OPERATING THE OUTRIGGERS**

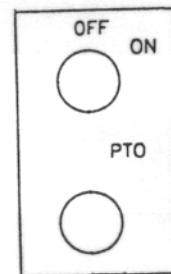
- While in the chassis cab, depress clutch pedal and place transmission in **NEUTRAL**.
- Start truck engine and deactivate Jake Brake (if engaged) by placing switch on dash to **OFF** position.
- Depress clutch pedal and engage power take off by turning **PTO KEY SWITCH** on dash to **ON** position. Indicator light adjacent to switch will light when **PTO** engaged.
- Shift transmission to **SEVENTH (7<sup>TH</sup>)** gear.

**TO OPERATE PUMP AND BOOM**

1. POSITION TRUCK AND SET PARKING BRAKE.
2. DEPRESS CLUTCH AND SHIFT TO 7TH GEAR HIGH.
3. TURN PTO ON.
4. RELEASE CLUTCH TO ENGAGE PUMPS.
5. SET THROTTLE AT 1600 RPM MAXIMUM.

**TO RETURN TO DRIVING MODE**

1. RETURN THROTTLE TO IDLE.
2. DEPRESS CLUTCH AND TURN PTO OFF.
3. SHIFT TO NEUTRAL AND RELEASE CLUTCH.

**NOTE**

*The PTO KEY SWITCH is interlocked with the clutch pedal. Before switch can be turned the clutch pedal needs to be depressed and held while making switch.*

- Check that the chassis brake is applied.
- Outside the chassis cab **INCREASE** the engine **RPM** to 1600. This can be accomplished by using the **RPM** toggle switch at rear control panel.
- Place chocks under the chassis wheels.

**▲ CAUTION**

*Before proceeding, walk around the unit and make sure the area where outriggers will extend is clear of obstructions. Also once again check the ground condition.*

- Lock pins are provided as a safety item to retain the telescopic leg in the retracted or extended position. Before operating the outrigger controls, release the lock pin located on the underside of the rear swing out leg just forward of the rear wheels.
- At **RIGHT** (curb) **SIDE** outriggers controls insert the **KEY** into the **POWER CONTROL** switch and turn key to **ON** position. The outrigger controls are now operable.
- Depress and hold **SAFETY INTERLOCK** button and actuate **FRONT SWING LEG** to **SWING OUT** position. Continue to activate until leg is fully swung out.
- Actuate **FRONT TELESCOPIC LEG** control lever to **EXTEND** leg out toward cab. Hold **SAFETY INTERLOCK** button and **TELESCOPIC LEG** control until beam is fully extended. Lock telescopic leg in position using lock pin on underside of front swing out leg.
- Actuate **RIGHT FRONT JACK** lever **TOWARD** you and lower jack pad to approximately 12 inches (304mm) from ground.
- Move **RIGHT REAR OUTRIGGER LEG** control lever **TOWARD** you causing leg to swing out. Hold until leg is fully extended.
- Actuate **RIGHT REAR JACK** control lever and lower pad to about 12 inches (304mm) from ground.
- Proceed to **LEFT** (street) **SIDE** outrigger control panel and operate the appropriate controls to position the left side outriggers, front and rear, following same procedure as that for right side.

- **NOTE** - Each jack leg is equipped with an extension to which the foot plate is mounted. The purpose of the extension is to provide additional jack stroke for better leveling on uneven terrain.

To use, remove retaining clip on lock pin, then remove lock pin. Keep clear of extension as it will fall down. Line up top hole of the extension with jack cylinder hole and reinsert lock pin and retaining clip.

- If jack leg is resting on ground, use jack controls to raise leg. Place the **AUXILIARY PADS** and any required **BLOCKING/JOISTS** under jack legs.
- Do this for all four (4) jack legs, then using controls **LOWER** jack **DOWN** until chassis tires are raised approximately 5-6 inches (127 - 152mm) off the ground.

**⚠ WARNING**

**OVERTURNING OF MACHINE CAN OCCUR IF  
OUTRIGGER LEGS ARE NOT FULLY EXTENDED.**

**NOTE**

*The unit shall be set up as level as possible in both directions, latitudinal (side to side) and longitudinal (front to rear).*

- To level unit, actuate the jack control in appropriate direction while holding **SAFETY INTERLOCK** switch. Monitor the **LEVEL SIGHT** gauge located near control panel. When bubble is lined up in center the chassis is level.

**⚠ CAUTION**

**THE MAXIMUM ADMISSIBLE INCLINATION IS 3  
DEGREES**

- With unit now stabilized to your satisfaction **DE-ACTIVATE** outrigger controls by turning **KEY** of **MASTER** switch to **OFF**.

**NOTE**

*Removal of key from master switch prevents accidental or unintentional actuation of the outrigger controls.*

## AMERICAN CONCRETE PUMPING ASSOCIATION HAND SIGNALS



1. **BOOM UP**



2. **BOOM DOWN**



3. **BOOM LEFT**



4. **BOOM RIGHT**



5. **OPEN OR  
EXTEND BOOM**



6. **CLOSE OR  
RETRACT BOOM**



7. **STOP  
BOOM**



8. **START PUMP  
SPEED UP**



9. **SLOW PUMP  
DOWN**



10. **STOP  
PUMP**



11. **LITTLE  
BIT**



12. **ADD WATER  
4-GALLONS**



13. **ALL DONE  
CLEAN UP**

## OPERATION OF THE BOOM

Prior to operation of the boom it is suggested that a **REVIEW** be made of the **GETTING ACQUAINTED (UNIT FAMILIARIZATION)** section, in particular the area pertaining to the **BOOM CONTROLS**. This will reinforce your understanding of the functions of each control and the corresponding reactions or movement of the boom.

### NOTE

*The boom functions can be operated at the ground panel on the right side of the chassis or from the remote control console. It is **RECOMMENDED** that the **REMOTE CONTROL** be used as it permits more operator movement and better visual contact of the operation.*

With a good understanding of the control and boom movement the operation is relatively simple. However, certain points need to be noted for efficient safe operation.

- Boom "A" - main boom needs to be raised to a height of 24' – 0" (7.35 m) before unfolding boom.
- Rotate the pedestal turret in a **RIGHT** or **LEFT** direction until the boom can be unfolded out over the cab.

### ⚠ CAUTION

*Before operating or unfolding **BOOM "B"**, visually check if catch hook has released. If hook has not released, operate **BOOM "B"** control to **DOWN** position.*

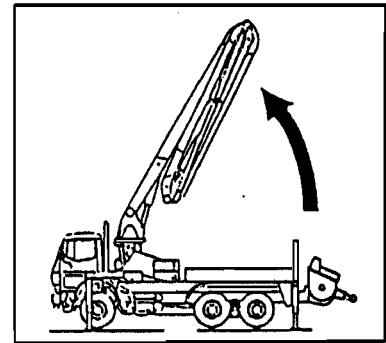
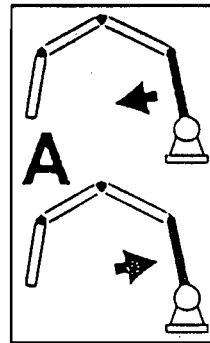
- Check that **EMERGENCY STOP** switch for boom remote control is **RELEASED**.

## ⚠ CAUTION

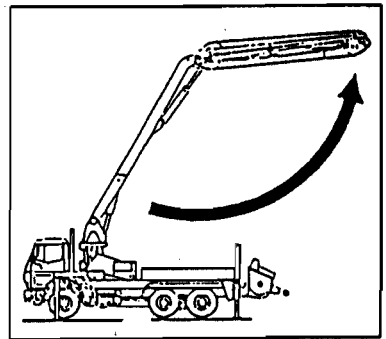
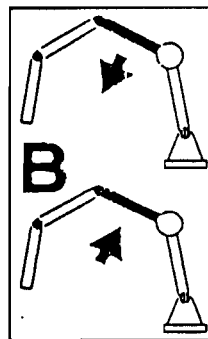
*Keep in mind that when an emergency or danger condition is imminent the boom operation can be stopped by **DEPRESSING** the STOP switch.*

With remote control console connected to panel on chassis bed or using the radio remote and engine started, PTO engaged and RPM set, proceed to operate boom controls as follows:

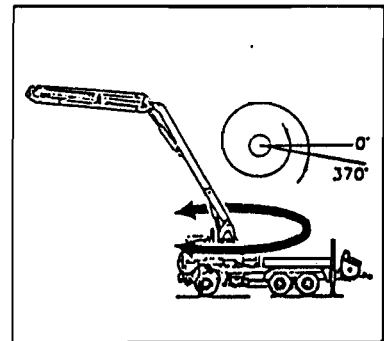
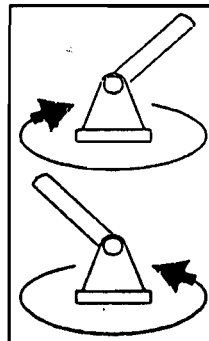
1. Actuate control lever "A" so that the entire structure is raised to approximately 60°.



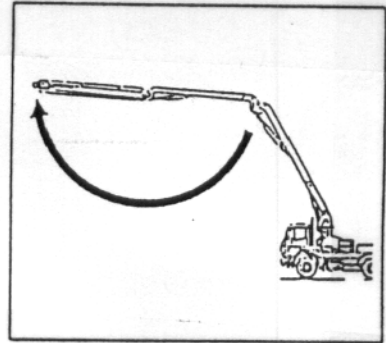
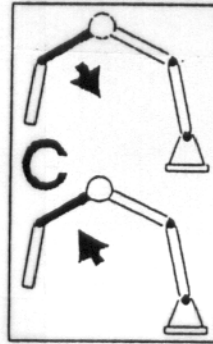
2. Actuate control lever "B" to raise boom "B" opening to at least 120°.



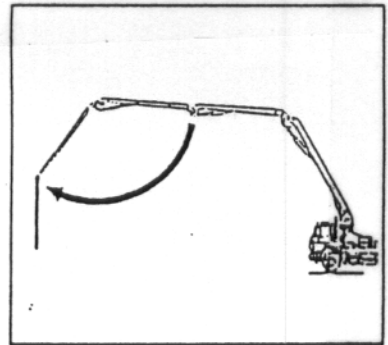
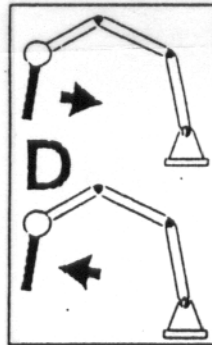
3. Actuate the **ROTATION** control moving the unit **RIGHT** or **LEFT** until structure is over front of cab.



4. Open BOOM "C" with appropriate control to approximately 180°.



5. Open BOOM "D" to desired position.



### ⚠ WARNING

*The working position shown in the previous illustrated diagram must not be exceeded during the pump operation. DO NOT WORK THE BOOM OUTSIDE THESE POSITIONS.*

### CLOSING AND BOOM STORAGE

At the conclusion of the pumping job it will be necessary to fold boom and prepare it for transport. Fold boom in **REVERSE** manner from that depicted to unfold boom.

## OPERATION OF THE CONCRETE PUMP

Prior to operation of the concrete pump it is suggested that a **REVIEW** be made of the "GETTING ACQUAINTED" (UNIT FAMILIARIZATION) section, in particular the area pertaining to the **PUMP CONTROLS**. This will reinforce your understanding of the functions of each control and the corresponding reactions or movements.

Observe all safety precautions while operating the unit. Remember it is your **RESPONSIBILITY** to insure that the unit is in proper working condition. If you have as yet not done so, please run your pre-operation inspection now prior to **START-UP**.

Take a moment to visually inspect that all delivery piping from the hopper to boom tip is in good condition. Check all the piping, fittings and clamps that they are secure. With this accomplished, start up chassis engine, engage **PTO** and allow hydraulic system to warm up.

### NOTE

*Before proceeding to cycle the concrete pump, it will be necessary to prime the pump and delivery system. A coating of lubricating grout will need to be pumped through the S-tube and delivery lines. This enables the regular concrete mix to flow smoothly.*

## PRIMING THE PUMP AND DELIVERY

The grout used for priming and lubrication should consist of two (2) parts sand and one(1) part cement and mixed to a consistency of thick soup. This will coat the delivery line ahead of the actual concrete mix to lessen the possibility of packing when the line is filled with concrete.

The amount of grout needed to lubricate the system depends on the harshness of the material to be actually pumped. The boom itself is over 105 feet (35.8m). Experience will eventually indicate the amount to be required.

- At outlet end of hopper, open clamp connecting discharge elbow to transfer tube. Remove elbow lock bar and swing elbow open.
- Insert two (2) wet sponge balls into the delivery line transfer tube. Close discharge elbow, lock in place and reinstall clamp.



- With agitator operating, controlled by lever just behind hopper, pour slurry into the hopper.

**NOTE**

*The operation of the concrete pump can be controlled at the CHASSIS control panel or using the REMOTE control.*

**CHASSIS PANEL OPERATION**

- Check that **PUMP** switch is **OFF** and the **DIRECTION** switch is in **FORWARD** position.
- Adjust **THROTTLE / ENGINE SPEED** moving switch to **INCREASE** and holding until speed reaches 1600 RPM.
- Turn **VOLUME** control to **LOW** position. **DO NOT OPERATE** at full volume while priming and lubricating the system.
- Start the pump by placing **PUMP** switch to **ON**.

**REMOTE CONTROL OPERATION**

- Connect remote control umbilical cord to the fitting at chassis panel, or set up the radio remote transmitter.
- Place **PANEL** switch to **REMOTE**.
- On remote panel, check **EMERGENCY STOP** switch that it is released to energize control panel.
- Check that **PUMP** switch is **OFF** and **DIRECTION** switch is in **FORWARD** position.
- Adjust **ENGINE SPEED**, moving switch to **INCREASE**.
- Turn **VOLUME** control to **LOW**. **DO NO OPERATE** at full volume while priming and lubricating the system.
- Start pump by placing **PUMP** switch to **ON**.

**NOTE**

*Regardless of which control panel is being used make it a practice during priming operation to pump **VERY SLOW** until a full steady flow of concrete slurry is discharged from end of tip hose. **RETRIEVE** the **SPONGE BALLS**.*

Fill the hopper with a uniform concrete mix that is required to do the job and continue to pump the concrete. After the actual mix starts coming out the tip hose, the pump **VOLUME** can be **INCREASED** if so desired.

**⚠ CAUTION**

*When operating the pump, the **MAXIMUM** conveying **PRESSURE** must not be **HIGHER** than that which has been stamped on the **DATA PLATE**.*

**PUMPING TIPS AND PRECAUTIONS**

Your **SAFETY** is our utmost **CONCERN** and it is your **RESPONSIBILITY** to operate the equipment in a **SAFE** manner. The following **TIPS** and **PRECAUTIONS** are offered as **AWARENESS** facts and should be **OBSERVED** for proper safe operation.

- Always maintain the material level in the hopper to no less than the height of the remixer shaft height or 1/2 full. This is **IMPORTANT** otherwise air will be sucked into the material cylinders and the continuous smooth flow may be interrupted.
- The concrete output is influenced and related to the quality and consistency of the concrete mix. Mix consistency is a decisive factor when it comes to the filling rate of the material cylinders.

With stiffer consistency and unfavorable grading curve of the aggregate, (smaller portion of sand, crushed materials) the rate of filling the material cylinders becomes less efficient resulting in a lesser concrete output. When you encounter this condition it is suggested that pumping at a slower speed can positively increase the output by allowing more time to fill the material cylinders.

- When it is necessary to pump unfavorable mixes such as extremely stiff, under sanded, lightweight concrete, the best procedure is to keep the remixer/agitator shaft visible all the time. In so doing, the hopper will only be filled to the lower edge of the remixer shaft making the concrete easier to pump.

This method is called the **AIR-PLUG** method, which allows air to be sucked into the material cylinders along with the unfavorable concrete mix.

- When it is necessary to pump concrete that is very liquid and has a high percentage of rough aggregate that tends to separate, keep the concrete level in the hopper as low as possible in case you encounter a work stoppage.
- Concrete that has separated or has begun to set and become lumpy should never be pumped.
- It is common that at sometime during the concrete placement you will be required to stop pumping for a period of time. This could be job site problems or possibly lack of concrete. Regardless of the reason, it is **IMPORTANT** to **MOVE** the concrete in the line during these periods. This can be accomplished by operating the pump in **REVERSE** for 2-3 strokes and then after another 10-15 minutes operate the pump **FORWARD** for 2-3 strokes.

Downtime between forward and reverse movements will depend on the consistency and type of mix. Also if shut-down is for too long a period it may be necessary to clean out the delivery system and concrete pump. Determine this from your experience in the material being pumped.

- Avoid having the material in the hopper separate during shut down. Vibration caused by chassis engine could have an effect on the material separating. We suggest the **PTO** be disengaged and engine be turned off if shut down exceeds 4-5 minutes.
- Air pockets in the delivery line can be dangerous as the air compresses within the delivery line and when it is released abruptly at the end of the line, the concrete being pumped is discharged in an explosive manner. Avoid air pockets. Keep sufficient material in hopper to prevent the induction of air into the material cylinders.
- Never bend or kink the concrete flexible end hose during the pumping operation. A kink is an obstruction, which can stop the material flow, allowing pressure to build up in the system creating a dangerous condition.

When this occurs the pumping direction must be **REVERSED** for 3-4 strokes to relieve the pressure in the line. Stop the pump and straighten out the kink, then resume pumping.

- There is a risk of accident should the tip hose be immersed in concrete. Should this occur for any period of time, operate pump as noted above, then fill hose. When pumping operations begin after cleaning an obstruction, allow end hose to hang free and keep personnel from entering the area.

**⚠ WARNING**

*Never extract an immersed tip hose from the concrete by lifting with the boom.*

- Do not allow the tip boom to be guided or maneuvered by hand especially during the initial phase of the pumping operation. Insist that the person assigned to guide the hose use a special tool.

**CLEARING A PACK OR BLOCKAGE**

Blockage in the delivery line during pumping operation will no doubt happen at one time or another. An observant alert operator, who can recognize the symptoms is of great value. A blockage can create excessive pressure in the system, which is a dangerous condition. When this occurs **IMMEDIATELY STOP** the pump.

- Place the pump direction switch to **REVERSE**. Then turn the pump switch to **ON** allowing the pump to stroke 2-3 times in reverse to assist in relieving the pressure from the delivery line blockage back to the pump outlet
- Switch the pump **OFF**

**⚠ WARNING**

**NEVER ATTEMPT TO CLEAR A PACK OR BLOCKAGE IN THE DELIVERY SYSTEM USING THE PUMP PRESSURE.**

- Warn all personnel in the immediate area of the imminent **DANGER** and to stay clear of the area.
- Make sure those assigned to clear the blockage are fitted with **EYE PROTECTION** before they open the clamping devise.

**⚠ WARNING**

*Extreme caution must be exercised when opening the clamping devices on any part of the delivery system. The possibility may still exist that there is still some pressure trapped in the line.*

- Open the clamp in the area of the blockage and clear the pack.
- When blockage has been cleared **START** pump, placing **DIRECTION** switch to **FORWARD**. Pump the material at a **LOW VOLUME** until material flows steadily out the end hose.

**CLEANING THE SYSTEM**

This sometimes may seem tedious, tiresome and a distasteful task, more so because the pump job is finished and cleaning the system is the last operation of the day. However, the cleaning up of the **MODEL XXT 32** is a **VERY IMPORTANT** operation. This function will set the stage as to how well the unit will perform the next time it is used. The clean-up involves the removal of unpumped concrete remaining in the hopper, swing tube, material cylinders and delivery system piping.

Two (2) different methods can be used and each in its own way will produce a satisfactory job if done correctly. The two methods to be used are the **SUCTION** method and **WATER UNDER PRESSURE** method. The following is offered to describe the procedure for accomplishing this operation.

**NOTE**

*The flushing and cleaning operation should only be done at **LOW RPM** and at **LOW VOLUME** position.*

**SUCTION CLEANING**

- All the concrete material is to be pumped from hopper down to the level of the top of the material cylinders.
- Stop the **FORWARD** direction of pumping and switch direction to **REVERSE**. Pump in this manner for about 3-4 strokes. Turn the pump **OFF**.
- Position the boom, operating the controls, so that each section is raised to produce a relatively straight in line configuration and the entire structure has a gradual ascending position.
- Insert into the end of the tip hose a **WATER SOAKED** sponge ball. Make sure it is firmly pressed into hose.
- With pump **DIRECTION** switch in **REVERSE** position, **START** pump. This will cause the sponge to be sucked back through the delivery piping toward the hopper. **REMEMBER LOW SPEED - LOW VOLUME.**
- With a hammer lightly tap on the delivery transfer line just ahead of the elbow at hopper (toward boom). Continue to tap until a hollow sound is heard. This indicates that the sponge ball has passed the area being tapped.
- Wait a minute or so to allow the material and sponge ball to be sucked back into the hopper. Using manual switch, shift swing tube to opposite direction. Place **DIRECTION** switch to **FORWARD** position and pump until sponge ball can be retrieved from cylinder.

**NOTE**

*If once is GOOD.....twice is BETTER. Running a second sponge ball through the delivery line will ensure a thorough cleaning.*

- If a second cleaning is to be made, do so as previously described and outlined.
- Remove any remaining concrete by opening hopper drain and washing the inside of the hopper using the water hose.

### NOTE

*The control for operation of the water pump is located on the curb side behind the hopper adjacent to the AGITATOR control.*

- Open the discharge elbow and place water hose with spray nozzle attached, set to create some water pressure, inside the outlet. Feed the hose down into the S-tube being careful not to go all the way through the S-tube.
- Remove hose and close discharge elbow and put some water inside hopper. Turn pump **ON** and pump in **REVERSE** for a few strokes to enable the flushing of the material cylinders.
- Turn pump **OFF**. Drain hopper and water box and wash and clean up outside of machine.

### WATER PRESSURE CLEANING

- Pump all the remaining material from the hopper. Place **DIRECTION** switch in **REVERSE** and pump 2-3 strokes to relieve any pressure in the delivery line.
- With pump turned **OFF** open the hopper drain and remove any remaining concrete.
- Using spray hose thoroughly wash down the inside of the hopper and the inside of the material cylinders.
- Close the hopper drain and fill the hopper with water. Leave hose run inside hopper
- Open discharge elbow and insert two (2) or three (3) **WATER SOAKED** sponge balls into transfer tube. Replace elbow and lock in place.
- Place **DIRECTION** switch to **FORWARD** and start pumping. This will push the water and sponge balls up through the delivery line cleaning out any remaining material. Keep **SUFFICIENT** water in the hopper.

- When the sponge balls come out the tip hose the pump can be stopped.
- Increase the slant of the boom structure slightly. Place **DIRECTION** switch to **REVERSE** and pump for several strokes to allow the cleaning water to flow out of boom.
- Turn pump **OFF**. Open hopper drain to remove any remaining water and concrete. Clean the rest of the machine. Drain the water box.

### PREPARE UNIT FOR TRAVEL

Having done the distasteful job of clean-up, you can now ready the unit for the trip home.

- Using the appropriate controls, proceed to fold or lower each boom section, starting with section "D". Do not lower main "A" boom unless it is already over rear of chassis.
- Rotate boom structure so that boom is positioned over rear of chassis. Align so that boom will be centered on chassis and proceed to lower boom down onto travel rest.
- Disengage lock pin on telescoping leg and using the controls at the outrigger panel either right or left side **RETRACT** outrigger jacks, and legs. Front telescopic leg must be fully retracted to enable swing out leg to be completely swung in.
- Pick up auxiliary jack pads and any cribbing joist that were used and place in proper storage area. Engage lock pin at underside of rear swing out leg.
- De-energize the remote control panel turning key **OFF**. Disconnect the remote cord from the connection on the chassis panel and place remote control in a secure location.
- Pick up and store any wheel chocks, cones and other equipment
- In chassis cab, engage clutch pedal, shift transmission to **NEUTRAL** then place **PTO** switch in **OFF** position.

**D R I V E   S A F E L Y**





# XXT 32 TRUCK - MOUNTED CONCRETE BOOM PUMP

MAINT

PAGE 00

## PREVENTATIVE MAINTENANCE

How good is any of the equipment you own? It is only as good as it is **MAINTAINED**. Even the finest equipment manufactured requires attention and care. The **MODEL XXT 32** is no different. A good well planned and carried out preventative maintenance program will enhance a properly operating unit as well as the safety of those operating and using the equipment.

It is very important to establish a good maintenance program. Costly repairs and loss of revenue can often be avoided by planning ahead, setting a regular schedule and exercising good preventative maintenance techniques.

The following section is offered as a guide and depicts a start for developing your own preventative maintenance program for the **MODEL XXT 32** concrete boom pump. It does not cover any part of the chassis. The program is depicted and broken into sections of **INSPECTION** and **LUBRICATION**.

### NOTE

*All points noted herein regarding the maintenance and checks are not intended to replace any local or regional regulations which may pertain to this type of equipment. It should also be noted that the list and schedule is not considered to be inclusive. Interval times may vary due to the climate and/or conditions associated with the location area in which the equipment will be used.*

### ⚠ CAUTION

*It is your responsibility to always insure that the applicable safety precautions are strictly observed when performing the inspections and maintenance checks. Make certain any components that are found to be defective are replaced or those in need of adjustments or repair are corrected before operating the machine.*

## **SCHEDULED INSPECTION**

The main purpose of accomplishing scheduled inspections is to identify and detect any potential malfunction before it can expand into a major problem. The list presented herein should be inspected and checked on a regular basis. In so doing it will help ensure a good, safe unit performance.

### **1. CHASSIS**

- The overall condition of cab, inside and out, dents, missing or loose parts
- Engine oil level
- Fuel tank level
- Battery condition and cable connections
- Tire condition and inflation pressure
- Check for fuel, oil, transmission leaks
- Check chassis lighting, brake, signal, running

### **2. SUB-FRAME AND DECKING**

- Inspect sub-frame, supporting structure for weld cracks, missing bolts
- Integrity of decking, steps, walkways
- Body side panels secure, condition
- Tool compartments and doors secure

### **3. UNDERCARRIAGE DRIVE COMPONENTS**

- Power take-off mounting secure, oil level
- Visually check drive lines, no interference
- All hydraulic pumps in good condition, secure
- Check for loose, dangling electrical cables, wires, hoses, and tubing
- Look for hydraulic leaks

- All points properly lubed.

#### **4. OUTRIGGER LEGS AND STABILIZER JACKS**

- Check for damage, missing parts, rollers, pins, wear pads, bolts and nuts
- Inspect hydraulic cylinders, secure
- Foot pads installed
- Condition of hydraulic hoses, tubing. Securely installed properly clamped
- Control valves securely mounted
- Control levers move freely, protective boots in good condition
- Control toggle switches undamaged, emergency stop switch-push/pulls
- Level sight gauge in good condition
- All points properly lubed.

#### **5. BOOM PEDESTAL AND TURRET**

- Visually check pedestal and turret for structural damage, cracked welds
- Insure all rotation gear mounting bolts are secure
- Drive pinion and gear teeth in good condition
- Reduction unit securely mounted
- Rotation limit stops in good condition
- Delivery line piping, swivels, clamps secure
- Hydraulic hoses, tubing secure, properly clamped no leaks
- All oil levels full and points properly lubed

**6. BOOM ASSEMBLY-ALL SECTIONS  
(REPEAT FOR EACH SECTION WHERE APPLICABLE)**

- Visually check for structural damage, cracked welds
- Ensure all bushings, pins and retainers are in place
- Hydraulic cylinder in good condition, securely mounted
- Hydraulic hoses, tubing secure, properly clamped no leaks
- Delivery line not damaged, no dents, secured properly to boom
- All clamps secure, retaining pin in place
- All delivery line swivels secure
- All points properly lubed

**7. BOOM END DELIVERY HOSE**

- Check for damage, condition, free of cuts internal and external
- Mounted securely to boom, support brackets in tact
- Locking levers, lever springs in place, good condition
- Hose clamps secure, retaining chain in good condition, shackles and pins tight

**8. BOOM CONTROL**

- Hydraulic control valve bank securely mounted
- Each control lever moves freely, returns when released
- Protective rubber boots in good condition
- Control identification decal in good condition
- Hydraulic tubing, hoses and electrical wiring secure and clamped
- No hydraulic leaks

**9. CONCRETE PUMP  
(PUMP CELL)**

- Visually check for structural damage, cracked welds of pump cell, secured to sub-frame
- Hydraulic drive cylinders in good condition, secure no leakage
- Material cylinder secure
- Water box structurally sound, clean, cover in place, drain functional
- S-tube shift mechanism structurally sound, all pins and retainers in place
- Hydraulic shift cylinders in good condition
- Bearing housing, seals etc. in good condition
- Hydraulic hoses secure no leaks
- All lube points greased

**10. HOPPER ASSEMBLY**

- Visually check for structural damage, dents, cracked welds
- S-tube secure, in good condition
- Check condition of spectacle plate, wear ring, seals
- Check connection of S-tube to outlet seals, bearing
- Hopper grating is structurally sound, opens and closes
- Vibrator securely mounted, wiring connections secure
- Hopper drain is functional
- Transfer delivery line undamaged, secured all clamps tight with pin retainers
- Outlet elbow secure, clamp tight

**11. AGITATOR**

- Visually check agitator worms for damage, cracked welds
- Drive motor secure, bearings, seals housing in good condition
- Control valve securely mounted, lever moves freely
- Hydraulic hoses and tubing secure, clamped

**12. LUBE SYSTEM**

- Lube pump securely mounted, all parts reservoir gaskets, lid in place
- Lube line connections tight, clamped
- Ample grease in reservoir

**13. PUMP CONTROL PANEL  
(STATIONARY)**

- All toggles in good condition, stay in position or momentary return to center
- Instruments and gauges in good condition, lights operate
- Control identification in good condition

**14. REMOTE CONTROL PANEL  
(CABLED)**

- All toggles in good condition, stay in position or momentary return to center
- Boom control levers move freely, return to center, protective rubber boots in good condition
- Umbilical cord in good condition, not damaged or cut and securely connected

**15. HYDRAULIC SYSTEM**

- Boom tank securely mounted, filler cap in place, level sight gauge in good condition
- Pump hydraulic tank securely mounted, filler cap in place level sight gauge in good condition
- Check hydraulic filter condition gauges, not damaged
- Hydraulic oil cooler securely mounted, fan motor in good condition
- All hydraulic fluid levels to proper level
- All hoses and tubing's secure, no leaks

**16. WATER SYSTEM**

- Water tank securely mounted, filler cap in place, level sight gauge in good condition
- Water pump securely mounted, all connections made
- Control valve at hopper secure, lever functions easily all connections tight

**17. REMOTE CONTROL PANEL  
(RADIO)**

- All toggles in good condition, stay in position or momentary return to center
- Boom control levers move freely, return to center, protective boots in good condition
- Check receiver and connections, battery charger and batteries in good condition

## LUBRICATION

The **REED MODEL XXT 32** is equipped with several critical areas that require lubrication. These areas involve various points on the outriggers, pedestal, turret and boom structure, S-tube shifting mechanism, S-tube swing components, shift and outlet, and the agitator components.

To insure economical service and long life of the components, the unit has been equipped with an automatic central distribution system for the S-tube shifting, swing components and agitator. This system consists of a six (6) port distribution block located at the hopper. The block is fed by the auto lube pump and reservoir unit, then distributed to the areas by plastic tubing. The interval of lubrication can be adjusted to meet the conditions.

The lube points on the boom structure and other areas have individual grease fittings for direct manual lubrication.

### **▲ WARNING**

*Rapid wear and probable component breakdown will result if the unit is operated with inadequate lubrication. Follow the recommended interval and if need be increase the interval when above normal usage takes place.*

## LUBRICANT AND INTERVAL

The recommended lubricant is generally the best choice, however, should this lubricant be unavailable in your area, consult your local supplier for an equivalent.

On the same basis, recommended lubrication intervals are based on normal use in normal environmental conditions. User is **CAUTIONED** to adjust the lubrication interval accordingly to meet each individual condition and usage. Look for tell-tell signs while machine is in operation. If the S-tube swing point components become extremely hot or lubricant becomes a liquid and oozes out around the bearing or seal, the area should be relubricated.

Make it a practice to wipe clean the grease fitting before and after lubricating. Also external non-bearing surfaces are to be cleaned of any extended grease with a clean cloth to prevent damaging dust and abrasive accumulation on lubricated wet surface.

If the **MODEL XXT 32** has been stored or exposed to environmental conditions of extreme low humidity, high dust level, elevated temperatures or heavy rainfall, lubrication of components may be required more frequently than under normal conditions.





# XXT 32 TRUCK - MOUNTED CONCRETE BOOM PUMP

## LUBRICATION POINTS

### A. BOOM AND OUTRIGGER AREA

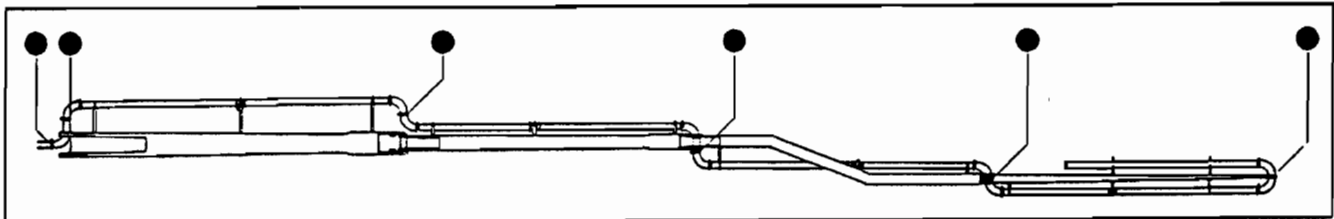
There are several points on the boom structure that requires lubrication. These points are noted in the diagrams below and involve all the articulated joints on the boom, the swivels and rotating joints of the concrete delivery piping and the pivot points of the swing out outriggers.

### ▲ CAUTION

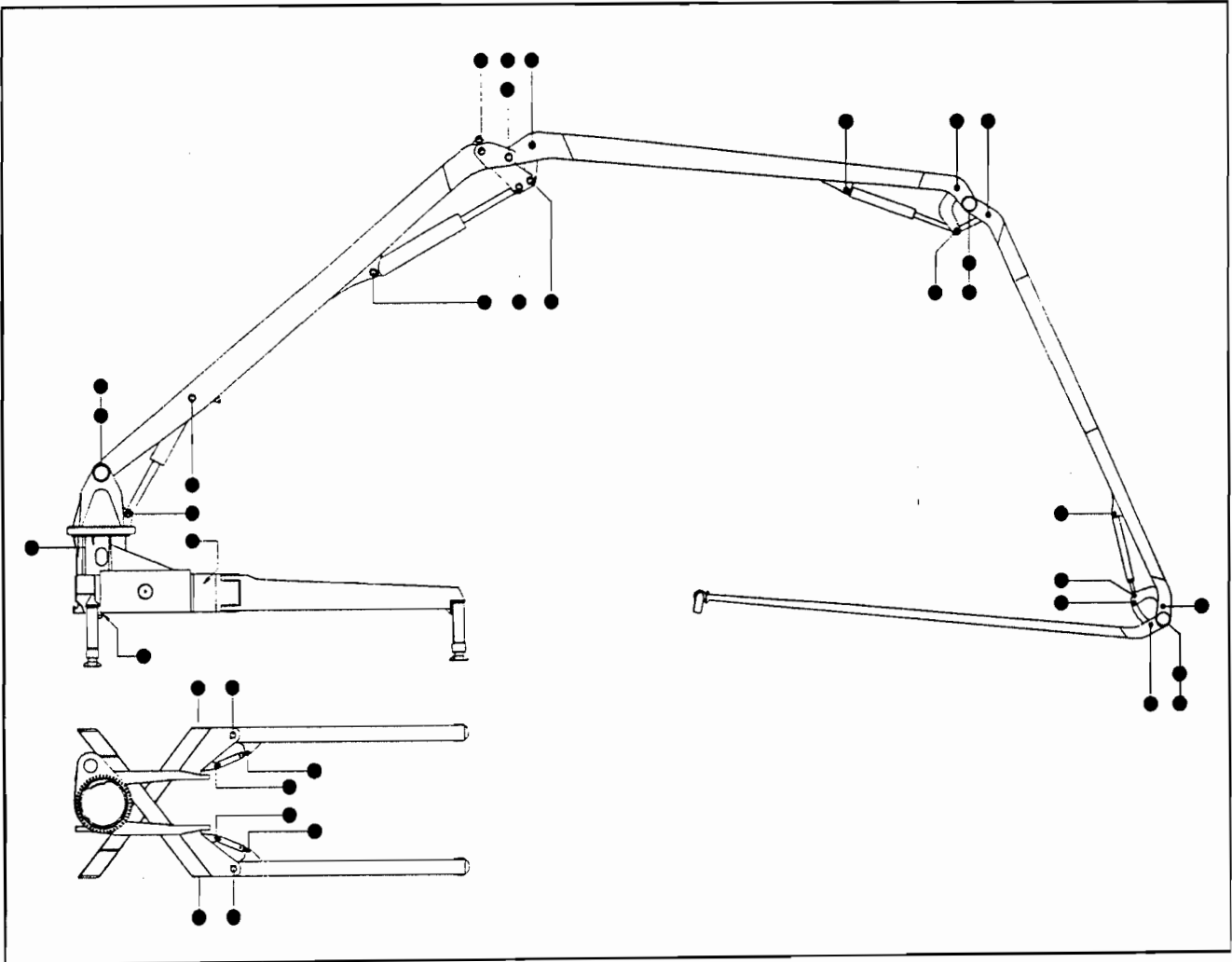
*Before making the connection of the lube pump to grease fitting be sure to WIPE CLEAN the fitting to prevent contaminates from entering the lube point. Wipe off any excess lubricant after greasing fitting.*

Recommended lubricant: **GENERAL PURPOSE GREASE SHELL ALVANIA EPLFH2  
OR EQUAL**

Recommended interval: **EVERY 60 HOURS OF OPERATION UNDER NORMAL  
USAGE. MORE FREQUENT AS REQUIRED**



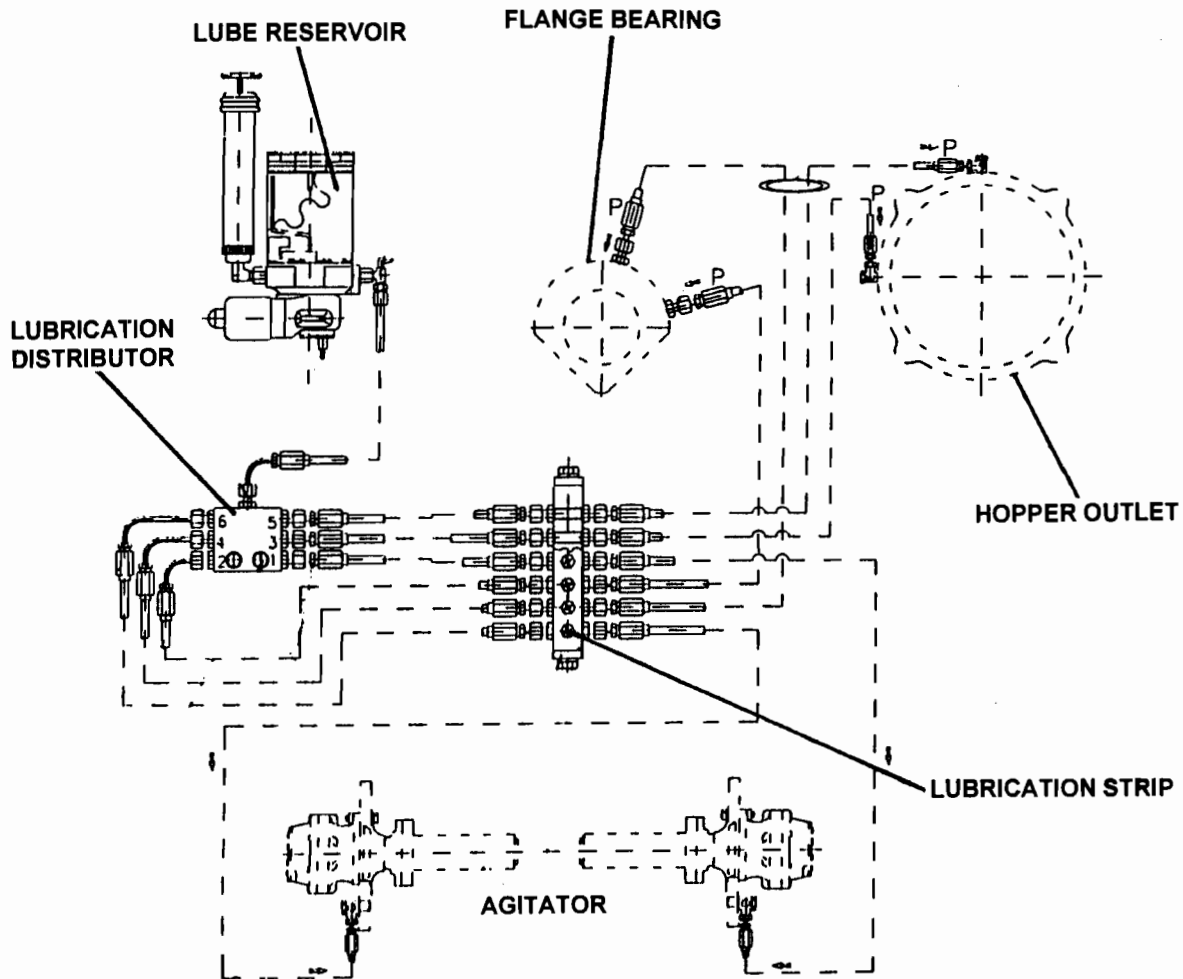
**DELIVERY LINE ROTATING LUBE POINT**



## B. CONCRETE PUMP AREA

This area's critical lube points except for the material cylinders are connected to the central lubrication distribution block and fed by the automatic lube pump. The main lube pump and reservoir is located at rear of unit near hopper. This system will automatically feed the central distribution block at the present interval. However the reservoir must be checked and lubricant replenished if necessary on a daily basis. For areas not connected to the auto lube system, use a manual lube pump and pump a sufficient number of strokes to ensure thorough lubrication of each point. **VISUALLY CHECK EACH POINT.** Wipe off any excess lubricant. The material cylinders are equipped with a grease fitting at the flush box end of tube.

Recommended lubricant: **GENERAL PURPOSE GREASE SHELL ALVANIA EPLFH2 OR EQUAL**  
Recommended interval: **DAILY BEFORE START-UP AND AS REQUIRED DURING OPERATION**

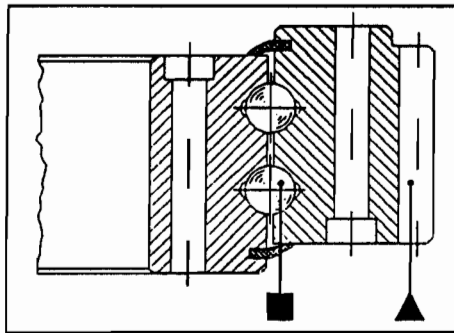


## C. BOOM ROTATION UNIT

This lubrication attention area involves the turret rotation gear reduction unit, rotation bearing and pinion.

### 1. ROTATION BEARING

Greasing serves to reduce the ball friction and maintains the bearing seal as well as offering protection against the entry of contaminants. Inject the grease until it is made to exit from the gasket.



For lubrication of gear teeth on bearing and pinion smear or brush recommended oil on all areas of teeth.

Bearing lubricant: **GENERAL PURPOSE GREASE, SHELL ALVANIA ELPFH2 OR EQUAL**

Gear teeth lubricant: **SHELL MALLEUS FLUID "C" OR EQUAL**

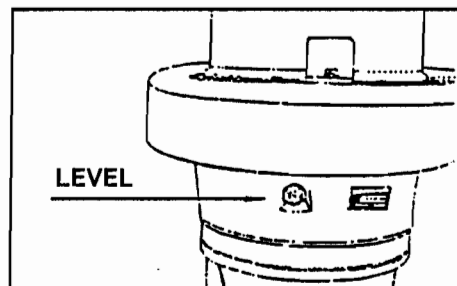
Recommended interval: **EVERY 100 HOURS OF OPERATION**

### 2. GEAR REDUCTION UNIT

This unit is located on the outside of the turret pedestal and requires attention on a daily basis. An oil level plug is located on side of reduction unit. The breather and fill extends from reduction unit opposite oil level plug and is readily accessible. Remove the cap to add oil if necessary.

Lubricant: **SHELL OMALA OIL 150**

Interval: **CHECK DAILY FILL AS REQUIRED (TOTAL CAPACITY OF OIL = 5.6 LITERS)**



**D. POWER TAKE-OFF (P.T.O.)**

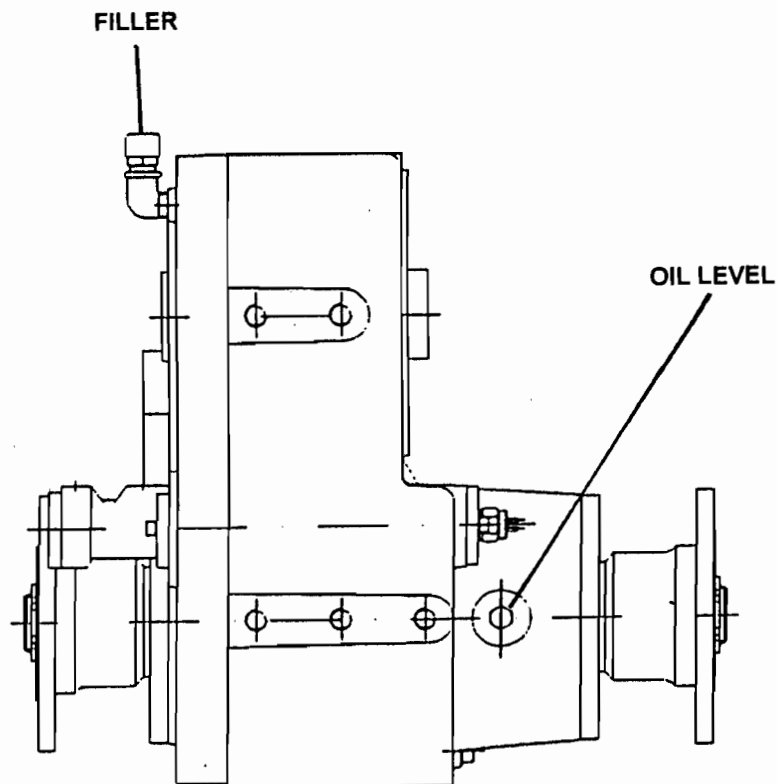
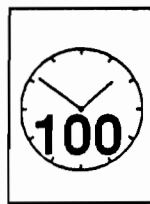
The power take-off unit contains two (2) areas requiring lubrication attention. One area is the main gear box and the other is the pump shaft cavity.

The oil level plug for the main section is located on side of the casing. Remove plug to check level. When required add oil through breather fill fitting.

The oil level plug for the pump shaft cavity is located on side of flange ring. Remove plug to check level. When required add oil through cavity breather fill unit.

Recommended lubricant: **SHELL 80 WT. GEAR OIL OR EQUAL**

Recommended interval: **CHECK LEVEL EVERY 100 HOURS OF OPERATION**



## HYDRAULIC SYSTEM MAINTENANCE

The **REED MODEL XXT 32** concrete boom pump is equipped with two (2) separate complete hydraulic systems. One system is used to meet the hydraulic requirements for operation of the boom structure and the other hydraulic system is used for the operation of the concrete pump functions. Both systems are critical to their own particular operation and it is for this reason that it is important they receive extra care and good maintenance.

### **▲ CAUTION**

***CONTAMINATION is the downfall of most hydraulic systems and a major contributor leading to system malfunctions. Extreme care must be exercised to prevent dirt from entering the system. Make it a habit to ALWAYS cap or plug open ports and hydraulic lines.***

## HYDRAULIC TANK

### • **BOOM HYDRAULICS**

The hydraulic tank having a capacity of 55 gals (208 L) is located inside the boom pedestal and is an integral part of the machine superstructure. The tank is equipped with a filler breather cap located outside the pedestal and facing chassis cab. A 25 micron return filter assembly is located on top of tank. A high pressure filter is located on the curb side of unit near outriggers controls. A sight gauge is located on outside of the tank facing cab of unit and used to visually determine the fluid level inside tank.

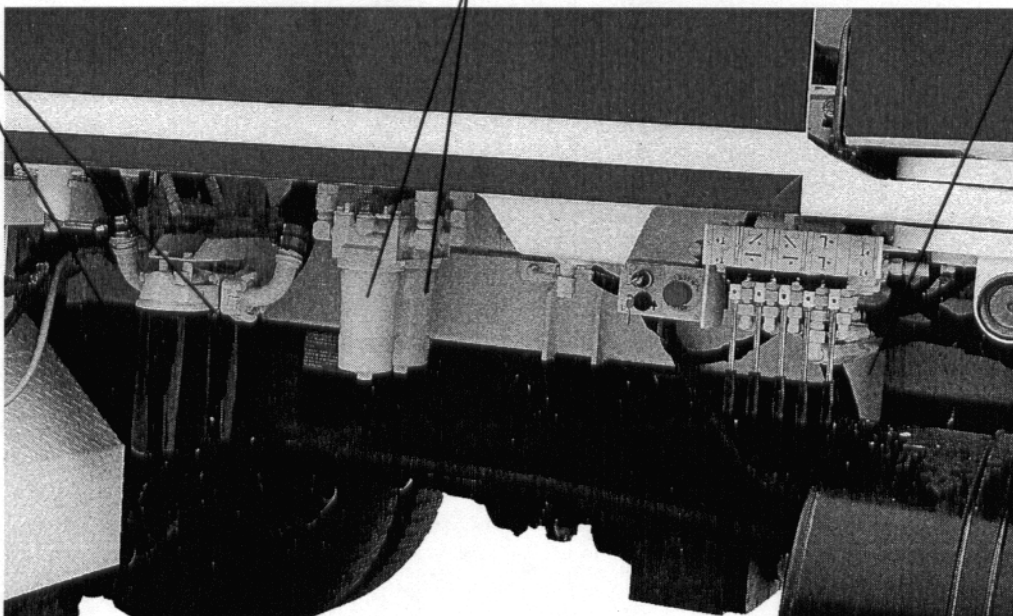
### • **CONCRETE PUMP HYDRAULICS**

This hydraulic tank has a capacity of 100 gals (378 L) and is located on the right and to the rear of the boom pedestal.. The tank is equipped with a filler breather cap located on top of the tank and access covers on both the outer side and top side of the tank. Suction strainers for pre-filtering of fluid are located inside the tank. A sight gauge is installed on the outside of the tank to determine the fluid level inside the tank. A twin element return line filter and two (2) high pressure filters are located on the curb side of the unit under the chassis deck, just forward of the rear wheels.

**SYSTEM MAINTENANCE ITEMS**

The following are specific items for care and maintenance of the hydraulic system.

- **FLUID LEVEL-** It is **IMPORTANT** that the fluid level be checked **DAILY**.  
Maintain fluid to proper level at all times.
- **TANK BREATHER-** Clean every 50 hours of operation. Remove from tank and clean with solvent and air blow dry.
- **RETURN FILTERS-** For the concrete pump these are 10 micron filters with disposable elements. Change element when filter condition gauges indicates to do so. For the boom system the element is a 25 micron type.

RETURN  
FILTERSPUMP  
PRESSURE FILTERSBOOM  
PRESSURE FILTER

- **PRESSURE FILTERS** - These filters are 10 micron filters with disposable element. **(Concrete Pump)** Change when condition indicator depicts to do so. The boom also is a 10 micron with condition indicator.
- **HYDRAULIC TANK-** Change oil in tank every 1500 hours of operation or yearly whichever comes first.

**NOTE**

*After fluid loss for any reason, filter replacement, component removal etc. sufficient fluid must be added to properly maintain required level in tank.*

## HYDRAULIC FLUID

The **MODEL XXT 32** utilizes in its hydraulic system a fluid manufactured by the SHELL OIL CO. and is designated as TELLUS #46. It is to be used in ambient temperatures of 39-90° F (4-32° C). The normal fluid temperature will range from 100-167° F (38-75° C).

For ambient temperatures of 90° F (32° C) and above use fluid designated as a ISO rating of 68. Use ISO 32 for ambient temperatures of 32° F (4° C) and below.

### **▲ WARNING**

***USE ONLY SHELL TELLUS 46 or equal hydraulic fluid and NEVER MIX with other type fluids. Always use a CLEAN fluid. Using impure or other type of fluids not specified will contaminate the hydraulic system and can lead to eventual system malfunction or damage and possibly deteriorate the hydraulic seals.***

## ADDING HYDRAULIC FLUID

As previously indicated, a hydraulic systems worst enemy is **CONTAMINATION**. Exercise extreme care when adding fluid to the hydraulic tank.

- To prevent any dirt or water from entering the hydraulic tank, thoroughly clean area around filler opening.
- Use fresh clean hydraulic fluid. If a hand pump is used to transfer fluid, check that pump filter is clean. If pouring of fluid, pour it through a fine wire mesh screen, 200 mesh or finer.
- Replace filler cap immediately after filling tank to proper level.

### **▲ WARNING**

***Do not use a cloth for straining fluid as lint is harmful to the hydraulic system.***



## **FILTER SERVICING**

The purpose of installing hydraulic filters in the system is to provide a means of continuous hydraulic fluid filtration in an effort to prevent recirculation of abrasive solids which will cause rapid wear of component breakdown.

The filter assemblies on the pump circuit are equipped with condition indicators. These need to be checked periodically and the element changed when so indicated. The return filter is equipped with a by-pass which allows some fluid to go around filter element when a restriction exists.

The filter for the boom hydraulics is a pressure filter. It is not equipped with a condition indicator thus a log needs to be kept and element changed every 250 hours of operation.

To service/change the filter elements the following is offered:

- Shut off machine. On pump circuit allow accumulator system to depressurize
- Place a drain pan underneath the filter housing to catch any fluid drainage
- Wipe clean any dirt and grime from around filter housing
- On the return filters carefully unscrew filter element, remove and discard. For the high pressure filters loosen bolt on bottom of filter housing until free then remove element
- If element has a gasket lightly smear a small amount of oil on the element gasket
- Replace the element in the filter
- Start up machine and observe for any leakage

### **▲ CAUTION**

***DO NOT ATTEMPT TO WASH OUT FILTER ELEMENT.  
These are disposable types and more harm can be done  
than its worth.***

## **CLEANING THE HYDRAULIC TANK**

The hydraulic tanks should be drained and cleaned after 1500 hours of operation or yearly whichever comes first. This will assist in keeping the systems clean and in proper condition. To accomplish this the following is offered and generally will apply to both hydraulic tanks.

- Shut off machine. On pump circuit allow accumulator system to depressurize

Place a suitable size container under the hydraulic tank sump drain. **NOTE:** The boom tank has a capacity of 55 gals (208 L) and the concrete pump hydraulic tank has a capacity of 100 gals (378 L). Make sure your drain container is large enough. Open drain valve.

- Remove the access cover(s) on the hydraulic tank being careful not to damage the gasket
- On the pump hydraulic tank remove the two (2) suction strainers

After tank has drained, flush the inside of the hydraulic tank with clean solvent and wipe clean with lint free cloths. **DO NOT USE PAPER TOWELS.** Remove any particles from tank bottom and sump

- Clean the suction strainers by soaking them in fresh solvent and then air blow dry
- Close the tank drain valve. Reinstall the suction strainers, access covers with gasket
- Clean the filler breather with solvent and air blow dry
- Change the hydraulic system filter elements both pressure and return
- Refill the hydraulic tank with new **CLEAN** hydraulic fluid, **SHELL TELLUS 46**
- Start machine and check for leaks

## HYDRAULIC SYSTEM FAMILIARIZATION

The **REED MODEL XXT 32** Concrete Boom Pump is dependent on hydraulics for operation of its many functions. Two (2) separate independent hydraulic systems are employed on the unit. One system is used for operation of the boom and outriggers and the other system is used for operation of the concrete pump and related components.

For the purpose of making it easier to understand the hydraulic systems, we have chosen to describe and familiarize you with each system separately.

### BOOM HYDRAULIC SYSTEM

#### SPECIFICS - PRESSURES

- |                                     |   |                    |
|-------------------------------------|---|--------------------|
| • Maximum System Pressure & Relief  | = | 4500 PSI (320 Bar) |
| • Boom Section "A" - Relief         | = | 4000 PSI (280 Bar) |
| • Cylinder Relief - Extend, Retract | = | 3500 PSI (250 Bar) |
| • Boom Section "B" - Relief         | = | 4000 PSI (280 Bar) |
| • Cylinder Relief - Extend, Retract | = | 3500 PSI (250 Bar) |
| • Boom Section "C" - Relief         | = | 4500 PSI (320 Bar) |
| • Cylinder Relief - Extend          | = | 3500 PSI (250 Bar) |
| • Cylinder Retract                  | = | 4500 PSI (320 Bar) |
| • Boom Section "D" - Relief         | = | 4000 PSI (280 Bar) |
| • Cylinder Relief - Extended        | = | 2850 PSI (200 Bar) |
| • Cylinder Relief - Retract         | = | 4500 PSI (320 Bar) |
| • Rotation Relief Pressure          | = | 2000 PSI (140 Bar) |
| • Outrigger Circuit Relief          | = | 2850 PSI (200 Bar) |

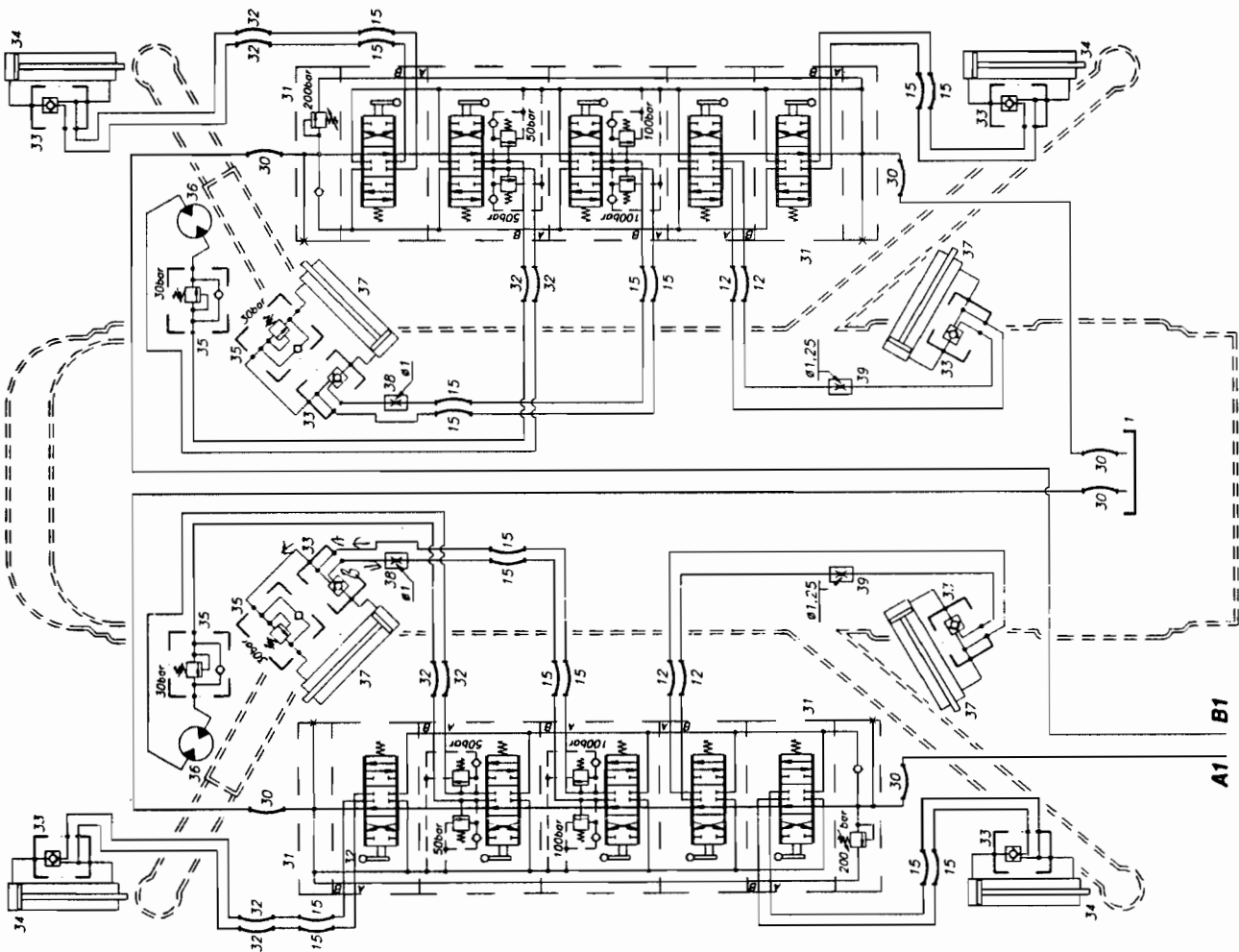
#### BOOM HYDRAULIC CIRCUIT DESCRIPTION (Refer to Hydraulic Schematic)

With chassis engine started and having engaged PTO the boom hydraulic pump becomes operational. The pump is of the piston type design of constant displacement and produces the preset flow and pressure when the engine speed is at the maximum preset RPM. When no control is actuated, the hydraulic fluid passes through the master section of the distribution block and is returned to the hydraulic tank.

The distribution block is located on the curb up on the deck and just to the rear of the swing outrigger pivot. It is a control valve bank which consists of six (6) manual operated directional control valves of a spring return to neutral type. In addition to manually controlling the valves, a means is provided to enable the valves to be controlled remotely using an electric power source to actuate the valve spool.

## OUTRIGGER HYDRAULIC CIRCUIT

Control of the swing out beams, telescopic legs and the vertical jack operation is accomplished by the use of two (2) groups of control valves located one each side of the chassis. The **RIGHT SIDE** controls the right side swing out beam telescopic, leg and jacks. The **LEFT SIDE** controls the left side swing out beam telescopic, leg and jacks. These control valve groups consist of a bank of 4 directional control valves. The valves are manually actuated with lever movement in either direction for the specific function and will return to center when released. They are used to extend or retract the outrigger cylinders. These valves are inoperable until the **MASTER** outrigger valve has been actuated.



The **MASTER** outrigger valve is located and is part of the boom hydraulic circuit distribution block located on the deck. It is the first valve section from the left and is a manual lever controlled directional valve. The valve is used to direct the flow of oil to the outrigger circuit for the extension or retraction operation. Because of the need to control several functions, a means has been provided to electrically actuate the valve remotely.

Operation of the outrigger controls from either side, right or left, first requires energizing the circuit. This is accomplished by the **OUTRIGGER POWER CONTROL** switch. This is a keyed switch control located on the curb side only with the purpose of energizing or de-energizing the outrigger electrical circuit. It also acts as a safety precaution against accidental actuation of the outrigger circuit when the boom is elevated.

Once the **POWER CONTROL** is **ON** the **INTERLOCK** switch is used to electrically energize the coil of the **MASTER** outrigger valve. This is a momentary push button switch which must be held in **ON** position or it will return to **OFF** position. With **INTERLOCK** switch depressed and held by moving the lever of the control valve, hydraulic fluid is permitted to flow in the appropriate direction to the specific cylinder of the outrigger circuit.

The swing out – in operation of each rear beam is controlled by its own control valve and the circuit description for each is identical. The swing out cylinder is equipped with a holding valve installed on the barrel or extension side. As soon as the flow ceases, control unactuated, the holding valve closes thereby locking the fluid in the cylinder. When the control is actuated to retract the cylinder, fluid from the barrel side must be exhausted and allowed to return to tank. This is accomplished by pilot pressure obtained from the fluid going to the rod side of the cylinder. In an effort to obtain a smooth swing out-in motion in lieu of erratic operation, a throttle valve is installed in the circuit. This valve regulates the hydraulic flow going to or from the cylinder. These valves are non adjustable.

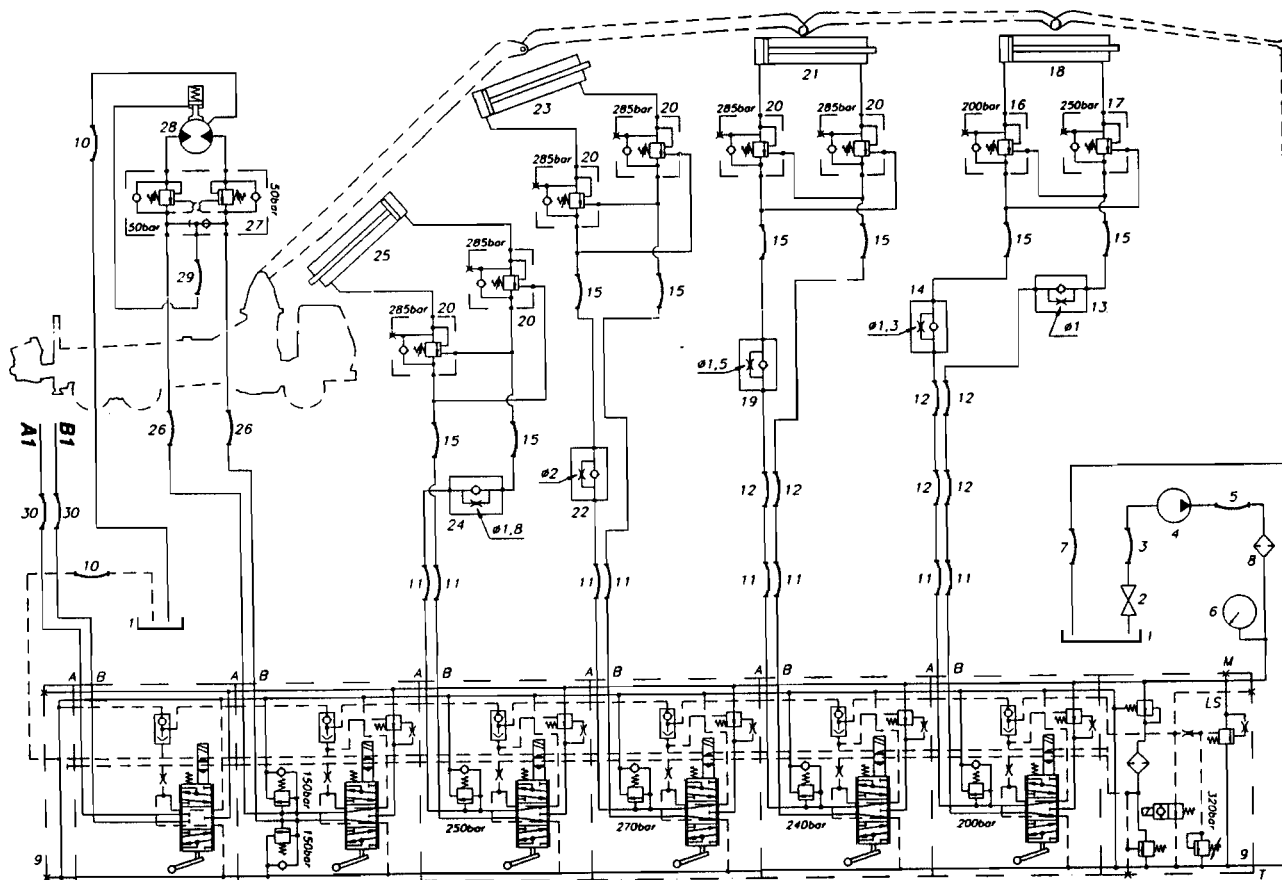
The front legs are of the swing out type and each contains a telescopic section. The swing out cylinders, like the rear are equipped with a holding valve on the barrel side of the cylinder. A relief is incorporated in the control valve and set at 1500 PSI (100 Bar). This is to protect against excessive pressure. The telescopic section is extended and retracted by use of the reversible hydraulic motor in a rack and pinion arrangement. This control valve is also equipped with a relief to prevent over extension and continuing applying pressure to a point of breakage of the chain.

The vertical jacks operate from their individual control and the cylinders are equipped with holding valves on the barrel side.

### **BOOM CONTROL HYDRAULIC CIRCUIT**

This circuit involves the operation of the four (4) boom sections and turret rotation. Basically with the exception of the pressure relief setting, the circuit is identical for all four (4) booms. Because of this, the boom circuit description will be in general terms.

Each boom section is controlled by the appropriate manual directional valve section located on the distributor block. When a control lever is actuated, it in turn shifts the valve spool of that particular function and directs the hydraulic fluid to the hydraulic cylinder for extension or retraction. Each cylinder is equipped with two holding or lock valves. One is used on the barrel side of the cylinder and the other is used on the rod side. The purpose of these valves is to retain the fluid in the cylinder when not actuated.



In operation, should the control for Boom "A" be actuated to the **EXTEND** position, hydraulic fluid will be directed to the barrel side of Boom "A" cylinder. It will pass freely through the barrel side holding valve unseating the ball check. However, a holding valve is also installed on the rod side of the cylinder to retain the fluid in that cavity. Thus, if the cylinder is to be extended, then fluid must be exhausted from the rod side. To accomplish this, pilot pressure is used from the extension circuit and applied to the ball check of the rod side holding valve, unseating the ball and allowing the fluid to be exhausted to tank. As long as pressure is applied to extension, both valves will be open.

In addition, this same valve is used as a relief valve to protect the system against excessive pressure. Any excessive pressure created would be on the cylinder itself and would no doubt be caused by an overload of the booms.

In the Boom A, B, and C hydraulic circuit, a flow control check valve is installed on the piston or barrel side of cylinder. The purpose of this valve is to slow down the flow of the fluid being exhausted from the barrel to prevent erratic motion of the boom when the rod side is pressured. In the Boom "D" circuit, a flow control check valve is installed on both sides of the cylinder. These valves are adjustable and have been set at the factory and should only be adjusted by qualified persons in a maintenance operation.

### **TURRET ROTATION CIRCUIT**

The rotation circuit of the turret or boom structure feeds off the same distribution block as the boom and is controlled by the directional control valve located second from the left on the block. A hydraulic motor is used to drive the rotation mechanism. When the directional valve is actuated, fluid is directed to the side of the motor which corresponds to the appropriate movement of the valve lever.

Like the boom circuit, the rotation circuit is also equipped with a holding valve. However, this valve is somewhat different in that it is a double pilot operated holding valve and contains a shuttle valve feature. The lock valve works or is opened and closed by pilot pressure in same manner as that on the boom circuit.

The purpose of the shuttle valve is to control the hydraulic rotation brake. The brake is spring applied and hydraulically released. When the rotation control is actuated to a specific direction, this same flow going to the rotation motor is used to apply pressure to the brake causing it to release. As soon as the flow ceases the brake is applied automatically by the spring pressure.

### **REMOTE CONTROL BOOM CIRCUIT**

The foregoing description of the boom and rotation hydraulic circuits was for manual operation utilizing the control levers of the distribution block located on the chassis.

The boom and rotation functions can also be operated remotely using the cable remote console controls or the radio remote controls. This is accomplished by electrically actuating the directional valve solenoid to shift the spool instead of direct manual actuation for a particular function. Nothing else changes in the circuit operation.

### **NOTE**

***When actuating the control valve using the remote, the valve handle on the direction valve of the function being operated will also move. This is a common occurrence and should not be cause for alarm.***

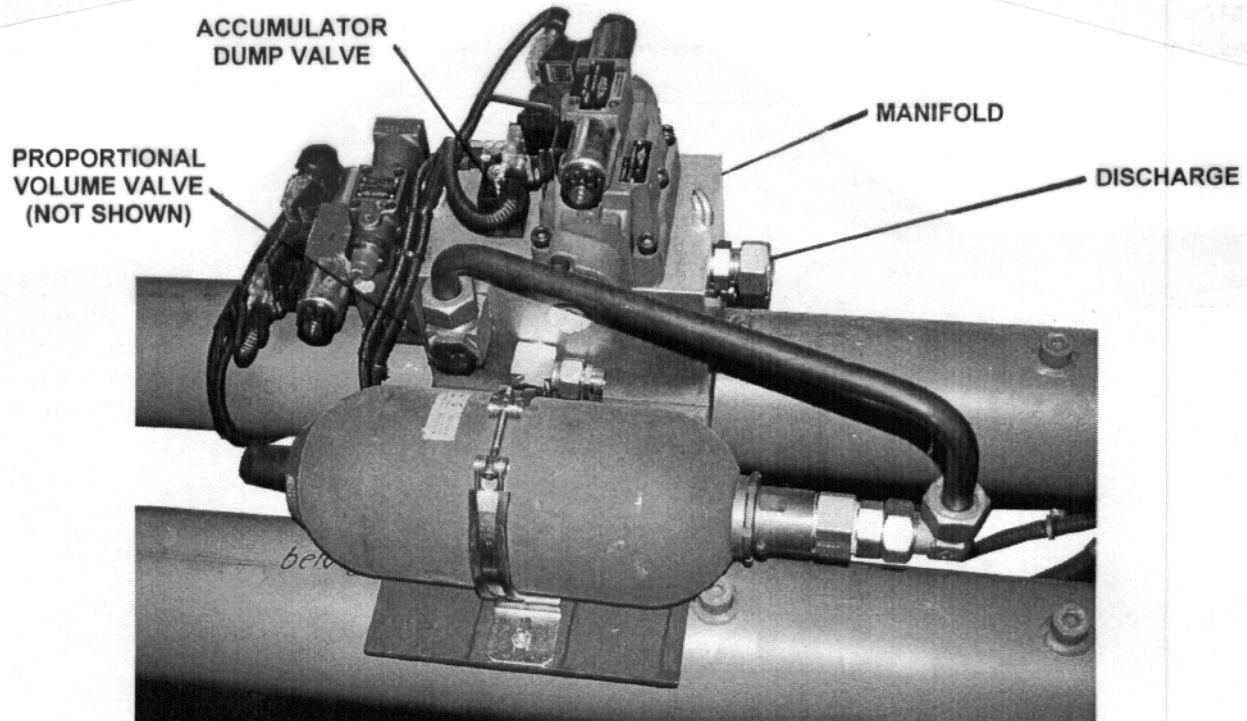
## CONCRETE PUMP HYDRAULIC SYSTEM

As previously noted the **MODEL XXT 32** is equipped with two separate independent hydraulic systems. One is designed for the operation of the boom functions and one for operation of the concrete pump. However, within the concrete pump hydraulic system, there are four separate circuits. The four circuits utilized are the **MAIN PUMP** circuit for the material cylinder, the **S-TUBE SHIFT** circuit, **OIL COOLER** circuit and the **AUXILIARY** circuit for operation of the remixer and water pump system.

For the purpose of making it easier to understand the four circuits, which are somewhat, related are presented and described separately:

### SPECIFICS – PRESSURES (TEST POINT VALUES BASED ON FULL RPM)

- Maximum System Pressure, Main Pumps = 5075 PSI ( 350 Bar)
- Main Pump Charge Pressure = 493 PSI (34 Bar)
- Low Pressure (Flush Oil) = 406 PSI (28 Bar)
- S-tube Shift System Pressure = 2755 PSI (190 Bar)
- Accumulator Pre-Charge Pressure = 1305 PSI (90 Bar)
- Oil Cooler Fan Relief Pressure = 800 PSI (56 Bar)
- Agitator System Relief Pressure = 2900 PSI (200 Bar)
- Water Pump System Relief Pressure = 2900 PSI (200 Bar)
- Flow to Oil Cooler = 24 GPM (92LPM)



SEE MAINT. PAGE 25  
FOR MORE DETAILS



**MATERIAL CYLINDER CIRCUIT** (Refer to Hydraulic Schematic)

The **MODEL XXT 32** is designed to pump concrete material from the hopper through a delivery system to the placement site. To accomplish this requires the use of two (2) material cylinders that are driven by two (2) hydraulic cylinders and the concrete material pumping action is the result of the two (2) cylinders operating or stroking on an alternate basis. In other words, when one cylinder is retracting, it is drawing, into the material cylinder tube, the concrete material from the hopper. The other cylinder, which has its material cylinder tube already full is extending. This causes the material to be pushed through the swing tube and out into the delivery line system. This reciprocating action continuously takes place while the pump is in **FORWARD**. This is the purpose of the **MAIN PUMP** circuit to provide the hydraulic power for operation of the material cylinders.

The **MAIN PUMP** circuit is of the **CLOSED LOOP** type. In the design of this closed loop circuit, the main ports of the hydraulic pump are connected by a hydraulic line to each of the hydraulic drive cylinders. By making an internal change within the pump during operation from an external control, the flow pressure output direction of the fluid can be directed to flow in either direction. As an example, the hydraulic fluid can be discharged from Port "A" to Cylinder "A" with return fluid from cylinder "B" going back to Port "B" of the pump. When this cycle is complete, then the direction is reversed.

For the **MODEL XXT 32**, two (2) hydraulic pumps are used to meet the volume and pressure requirements of the concrete pumping system. The hydraulic pumps are manufactured by Rexroth and are of the variable displacement axial piston type with a swashplate design. The pistons of the pump run against the swashplate, which is capable of being tilted. This tilting or angle varies the stroke length of the pistons which in turn varies the displacement of the fluid. The larger the angle, the greater the flow. In the case of the **MODEL XXT 32**, the angle of the swashplate is varied by use of the **VOLUME** control that works in conjunction with the **HD** (Hydraulic Displacement) control module and is held constant by a feed back lever connected to the swashplate.

The pumps are driven by the chassis engine through a power take off and are installed in the tandem on series arrangement. They are designated as Front Pump and Rear Pump. Starting the chassis engine and engaging the PTO will place the two (2) main pumps in operation. However, at this point, since no control has been actuated and with no volume demand, the hydraulic pumps are producing a minimal amount of pressure and flow to enable lubrication of the pump. The pumps are at zero position at this time. This condition exists regardless of whether the engine is at idle or maximum RPM.

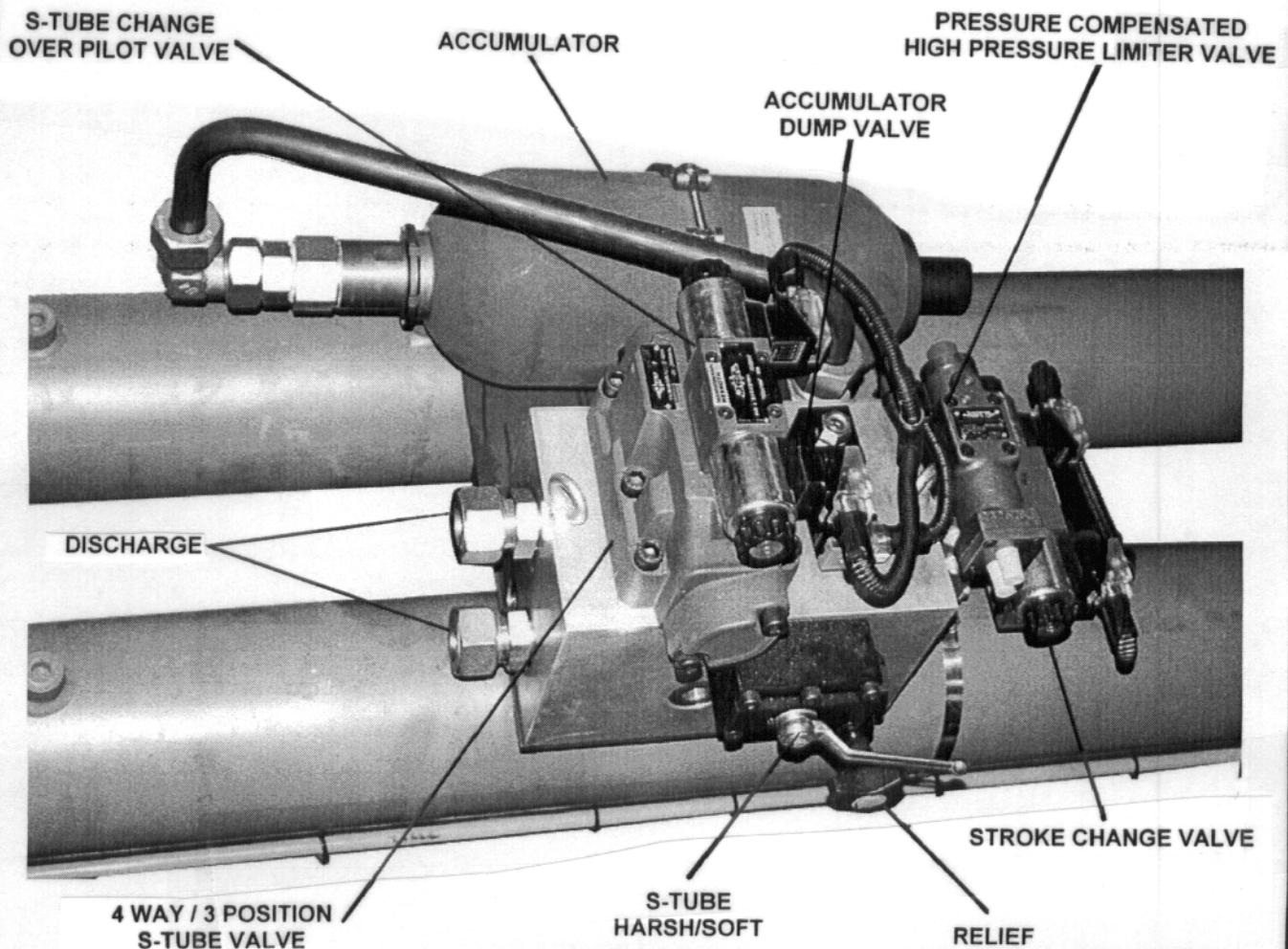
To energize the material cylinder cycling circuit, the **PUMP** switch must be **ON**. In so doing, an electrical signal is generated which engages the hydraulic pumps to start and direct the flow to the appropriate hydraulic drive cylinder.

Where, how, and why is this electrical signal generated?

It was previously noted that the concrete pumping action is the result of the two (2) material cylinders cycling on an alternate basis. This alternating cycling is controlled by an electrical signal which is generated by the extension and retraction of the hydraulic cylinder designated as **CYL "A"**. This cylinder has installed, at each end of the cylinder barrel, a sensor which is triggered by the cylinder piston head passing underneath the sensor.

The electric signal that is generated by the proximity sensor is sent to the logic controller or which is better known as the black box. The black box is a **REED** proprietary solid state device, designed to control the alternating action of the main pump and to synchronize the movement of the S-tube. The signal from the black box is then sent to the **HD** (Hydraulic Displacement) control valve of the pump circuit.

The **HD** control valve, when energized is used to change the position of the swashplate which is used to direct the flow of fluid to either **CYL "A"** or **CYL "B"** based on the signal received and which sensor was activated. The **HD** control valve is also used to vary the angle of the swashplate which changes the displacement of fluid to either a higher or lower output in proportion to the amount of volume demand placed on it by the volume control potentiometer's electric signal.



In the cycling of the cylinders, the main pressure and flow is only directed to one end of the hydraulic cylinder. In this instance for the **XXT 32**, it is directed to the rod side. In so doing, it is necessary to connect together the piston ends of both cylinders. The purpose of this is to transfer hydraulic oil from one to the other during extension/retraction stroke. As the rod of one cylinder is retracted, oil is pushed out of the barrel side and directed to the barrel side of the other cylinder forcing it to extend.

In the closed loop system, the same hydraulic fluid is continuously circulated as the loop does not allow for a direct return to tank.

### **CIRCUIT OPERATIONAL SEQUENCE**

In the operational sequence of the **MAIN PUMP CIRCUIT** with the chassis engine running and the PTO engaged, the two (2) main pumps are in operation in a standby state. This condition is due to the fact the pump switch is off and no volume demand exists. When the **PUMP** switch is placed **ON**, and throttle is at the proper **RPM**, the hydraulic cylinders begin to cycle. The stroking speed of the cylinders is dependent on the adjustment of the volume control and engine **RPM**.

### **NOTE**

*The pump is operational at engine idle, however, for concrete pump cycling, the engine RPM should be set to at least 1/2 throttle.*

The volume control is a potentiometer type control and varies the electrical current signal to the proportional pilot pressure control valve. In operation, a full 12 volt DC signal is sent to the stroke change valve and the appropriate pilot pressure is allowed to signal the **HD** control module. The pilot pressure that exists in the hydraulic circuit is directly related to the position of the potentiometer knob (1 to 8).

### **S-TUBE SHIFT CIRCUIT (Refer to Hydraulic Schematic)**

In the foregoing description of the Main Pump Circuit, we had learned that the hydraulic drive cylinders operate on an alternating basis causing the material cylinders to do the same. Since there is only one outlet for the concrete material, a means is required to transfer the concrete material from the material cylinders to the outlet and into the delivery line. To accomplish this, a component referred to as the S-Tube or swing tube is installed in the hopper. Since there are two material cylinders and one S-tube, the S-tube must be shifted from one material cylinder to the other, whichever one is loaded with the concrete material. Thus the incorporation of the **S-TUBE SHIFT CIRCUIT**.

The S-tube shift hydraulic circuit is of the pressure compensated type, meaning that when the control valves are in the neutral position hydraulic non-operational (unactuated), the internal passages of the valves are closed to all ports. To meet the flow and pressure requirements of the shift circuit, a Rexroth variable displacement axial piston pump of a swashplate design is used. The pump is equipped with a pressure compensator and load limiter device. It is driven by the chassis engine through a PTO. In addition to the hydraulic pump, the shift circuit consists of an unloader solenoid, a relief valve, an accumulator, a solenoid directional valve and two (2) hydraulic cylinders.

The shifting circuit is energized as that of the main circuit by activation of the **PUMP** switch to the **ON** position and receipt of the electrical signal from the proximity switches. As the proximity switch signal is generated, the shift circuit pump comes on stroke producing the required flow and pressure to recharge the accumulator after shifting of S-tube.

In operation the shifting of the S-tube from one material cylinder to the next cylinder requires instant pressure and volume which cannot be obtained by the system itself. To compensate for this, an accumulator is used.

An accumulator is a hydraulic reservoir that retains the hydraulic fluid under high pressure. To accomplish this, the accumulator contains a rubber bladder on the inside of the reservoir. This bladder, at time of installation, before start-up, or upon replacement, must be pre-charged to a certain pressure using nitrogen gas. This expands the bladder much like a balloon. In operation of the circuit, the hydraulic fluid is pumped inside the accumulator shell. This compresses the bladder and the fluid is contained in the reservoir under high tension until released.

### **SHIFT CIRCUIT OPERATIONAL SEQUENCE**

In the operational sequence of the shift circuit with the chassis engine running and PTO engaged when the **PUMP CYCLE** switch is placed to **ON**, an electrical signal activates the solenoid of the dump valve closing the valve. When this occurs, the hydraulic pump goes on stroke and hydraulic fluid now is directed to the accumulator.

As previously described, the proximity sensor generates an electrical signal which is sent to the black box and used to control the hydraulic cylinders and shifting of the S-tube. The electrical signal, when received, activates the solenoid coil of the directional valve shifting the spool to the appropriate side. This allows piloting oil to flow into the 4/3 directional valve on one side or the other causing the larger spool to allow the accumulator flow to pass through to the appropriate "S"-tube shift cylinder. The accumulator then releases, exhausting the fluid which is then directed to the appropriate shift cylinder of the S-tube. As soon as the shift is made, the accumulator is refilled immediately and the sequence starts all over again.

For the shifting of the S-tube, two (2) hydraulic cylinders are used, one for each swing direction. The cylinders are pressurized on the barrel side only. As the fluid is directed to the barrel side of one cylinder to extend the rod, the fluid in the cylinder with the rod already extended is forced out and directed back to tank by the shifting of the other cylinder.

When necessary, the shifting speed of the S-tube cylinders can be adjusted. This is accomplished by use of the levered manual valve installed on the shifting manifold. Closing of valve will cause cylinder to shift at a slow rate as the flow is restricted. With valve open, flow to cylinders is increased causing a faster shift.

### **AUXILIARY CIRCUIT**

The auxiliary circuit is used to operate the oil cooler fan, agitator/remixer, and water pump. Providing the flow and pressure requirements for the auxiliary circuit is a tandem gear type hydraulic pump which is mounted to the back of the shift circuit pump. This pump operates on an open center basis meaning the pump is continually producing the required flow even if no control is actuated. Fluid is directed back to the tank.

- **OIL COOLER CIRCUIT** – This is a straight forward circuit and is used to operate the oil cooler fan motor. Supplying the flow and pressure requirements is the second section of the tandem pump. The operation of the fan motor is controlled by a thermostat which when high temperature setting is reached, it activates the solenoid of the control valve, opening the circuit to allow flow to go to the fan motor. When low temperature is reached the valve closes shutting off the motor. For protection of the system against excessive pressure a relief valve is installed and is set at 800 PSI (56 Bar).
- **AGITATOR/REMIKXER CIRCUIT** – This circuit is used to operate the agitator hydraulic motors. The flow and pressure is supplied by the first section of the tandem pump. For operation, the flow from the pump is directed to a manually operated double spooled directional control valve. This is a three (3) position valve section having a detented spool. This means that when the control lever is moved to a particular direction, it will remain in that position until once again moved. A relief valve for each section is incorporated in the valve bank to protect the agitator and water system against excessive pressure.
- **WATER PUMP CIRCUIT** – This unit is equipped with a water system , complete with water tank, water pump, etc. The water pump is driven by a hydraulic motor which is controlled by the second spool section of the same directional control valve used on the agitator system. This valve section is of the two (2) position type which when actuated, directs the flow to the hydraulic motor for operation of the pump.

## ELECTRIC SYSTEM

The **MODEL XXT 32** electrical system is in most areas of the ordinary design. The system consists of various switches both momentary and positive position type, key switches, potentiometers, relays, instruments and lighting.

The **XXT 32** utilizes a 12 volt direct current system with a negative ground. All electrical components operate directly from the 12 volt source.

The 12 volt power source is provided by the chassis batteries and kept in the charged state by the chassis alternator.

Refer to the Electrical Schematics for specifics on the systems.

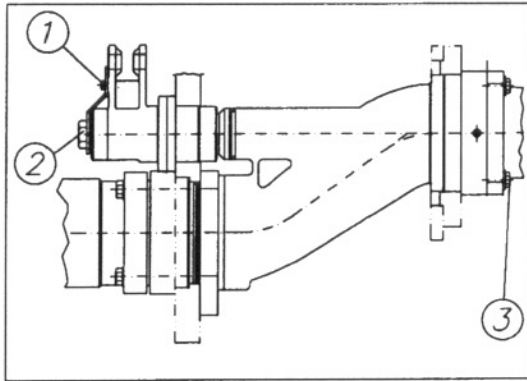


### 3.5 Conversion and replacement of wear parts

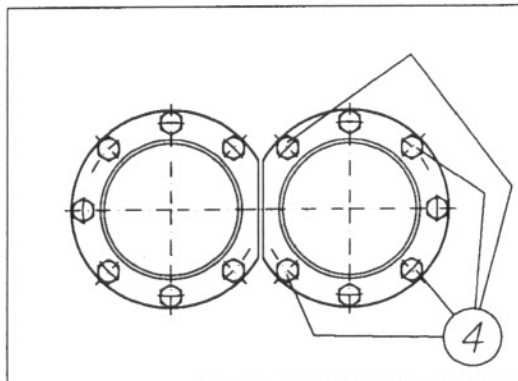
#### 3.5.1 Replacement of wear plate and wear ring

**ATTENTION:** Always stop the engine and remove the ignition key if you work inside the hopper or in the surroundings of the tilting cylinders.

1. Remove safety plate (1) at the tilting lever. Release the s-valve by opening the screws (2) und (3) for about 15 mm.



2. Exchange the released wear plate by removing the 4 screws (4) and tighten the bolts again.



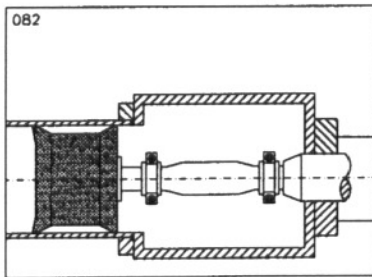
3. Swing the s-valve to the other side..

4. Take out the second wear plate by removing the 4 screws (4).
5. Swing the s-valve back and exchange the wear ring (5).
6. Swing the s-valve up to the mounted wear plate and assemble the second one.
7. Give tension to the s-valve by tighten the 4 screws (3).
8. Tighten the adjusting screw (2) by hand until there is no gap anymore. Release this screw for 1/6 at least and assemble the safety plate (1).  
**ATTENTION:** Tighten the screws (3) and (4) with tightening torque. ( See attached table for torque's).
9. Carry out a test run.

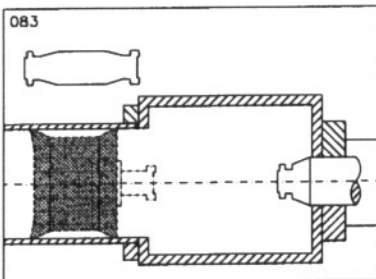
### 3.5.2 Replacement of conveyor pistons

**ATTENTION:** Always stop the engine and remove the ignition key if you work inside the water box. Do never grab inside the water box as long as the engine is running. Do the hydraulic cylinders drive always by using manual driving with the valves at the main control block. Use low r.p.m.

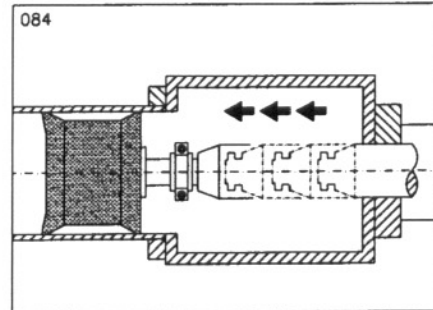
1. Drain the water box and remove the safety grid..
2. Move one drive cylinder by activating the valves Y3 and Y4 to end position.



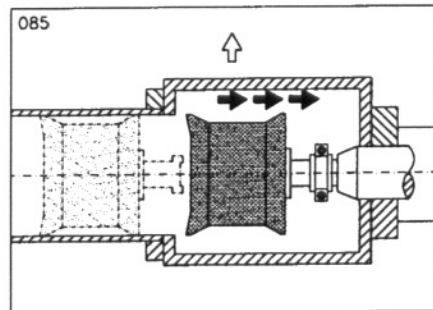
3. Open and remove the hose clamp and the clamp coupling.
4. Push the conveyor piston about 5mm in direction of conveyor cylinder and remove the spacer.



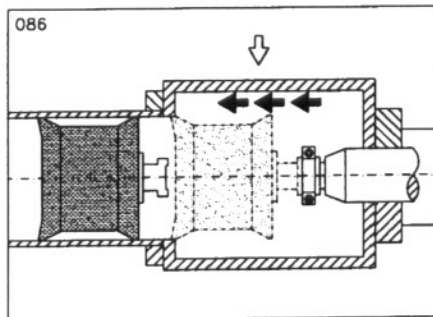
Drive the drive cylinder carefully out until the flanges touch each other and assemble a clamp coupling.



6. Bring the drive cylinder to end position and disassemble the clamp coupling and the piston.

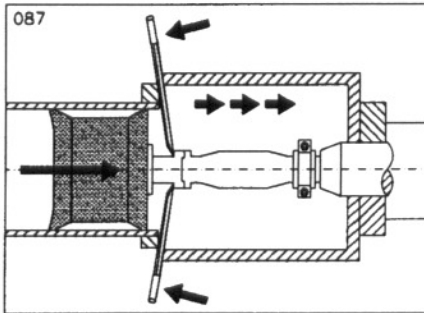


7. Lubricate the new conveyor piston well with grease and assemble it with one clamp coupling.



8. Drive the drive cylinder into the conveyor cylinder as long as there is enough space to assemble the spacer.
9. Remove the clamp coupling and drive the cylinder back to end position.
10. Assemble the spacer with the clamp coupling and the hose clamp onto the drive cylinder.

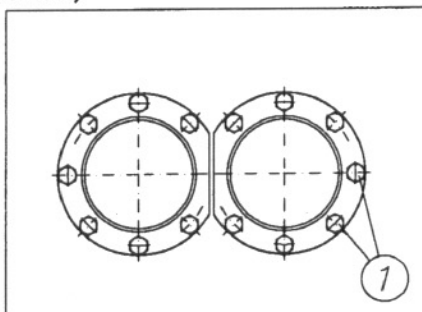




11. Push the piston in direction to the spacer and mount the second clamp coupling and clamp.

### 3.5.3 Replacement / turning of conveyor cylinders

1. Disassemble conveyor piston (see 3.5.3)
2. Bring both drive cylinders hydraulically to end position: Open the hydraulic swing hose at the driven in drive cylinder and fix a bucket at the hose.
3. Disassemble the axle and support the water box.
4. Remove the 28 screws (1) at the 4 flanges of the two conveyor cylinders and support the cylinders. (The easiest way would be with the fork lift)



Lift the hopper by crane.

**ATTENTION:** Take care that you don't squeeze hydraulic hoses or electrical cables during lifting.

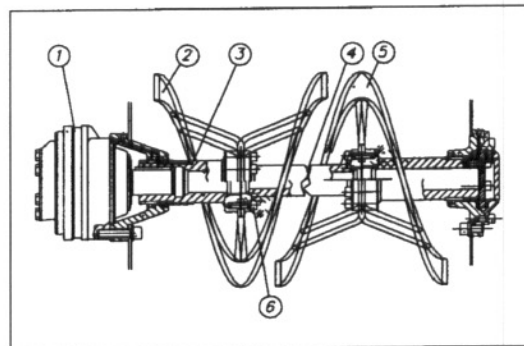
5. Disassemble or turn the conveyor cylinders.  
**Hint:** In order to increase the life time of cylinders you can turn them for 180°. It is

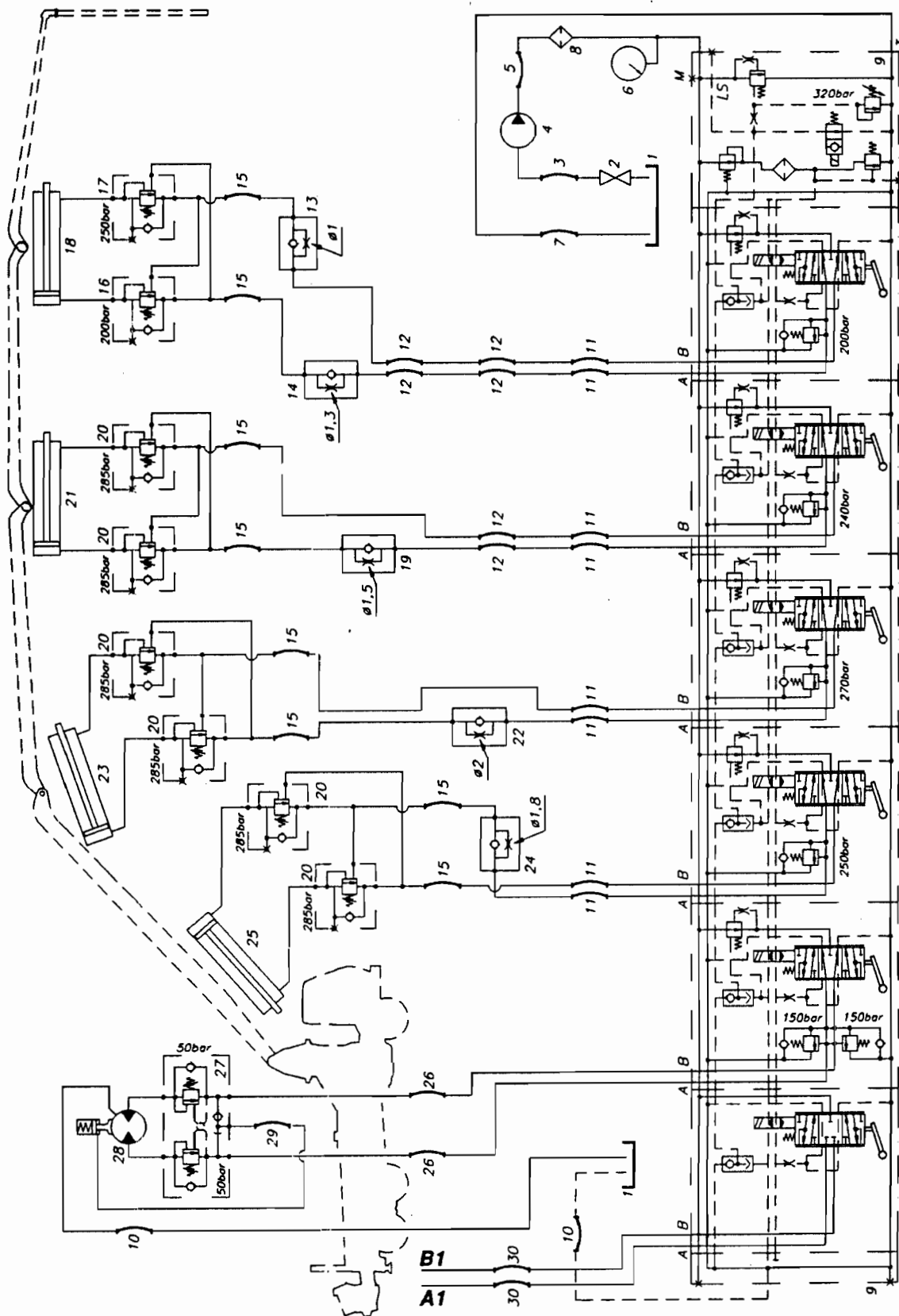
very important to turn the cylinders in time, before the wear out is too big, because than you have to exchange them completely.

6. Assemble the conveyor cylinders in opposite order.
7. Assemble the pistons (see 3.5.3) and the hydraulic swing hose again.
8. Drive the right drive cylinder out by activating the valves Y4a and Y3. (look at 3.1.4)
9. Take out the air from the swing hose. (see 3.1.4)
10. Start a test run.

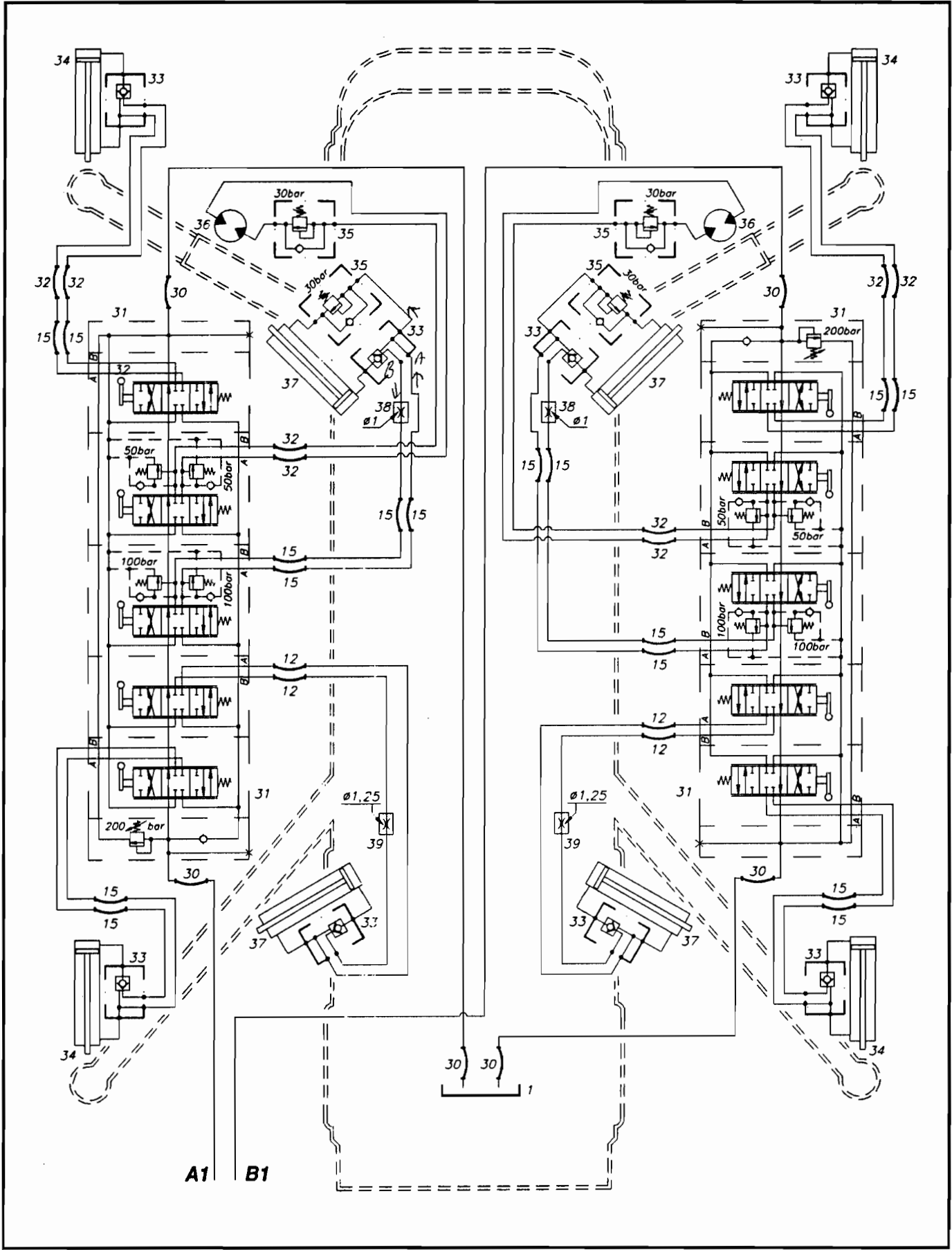
### 3.5.4 Replacement of the agitator tool

1. Remove the cylindrical screws (6).
2. Push the shaft (3) against the motor (1).
3. Exchange the agitator tools (2 and 5).
4. Assemble the screws (6) and tighten it.
5. Fill the inner hex gap of the cylindrical screws with silicon to protect against concrete.

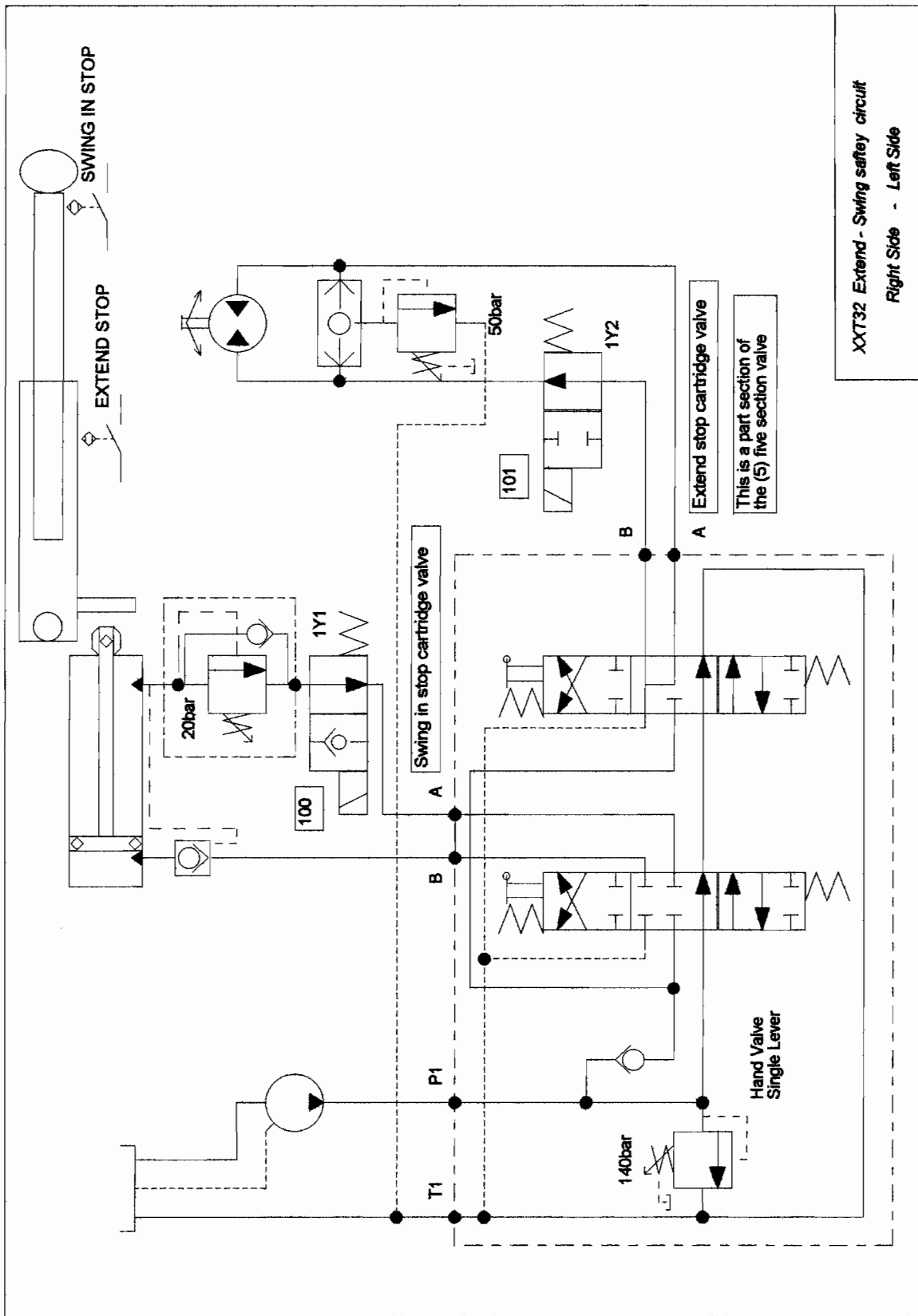


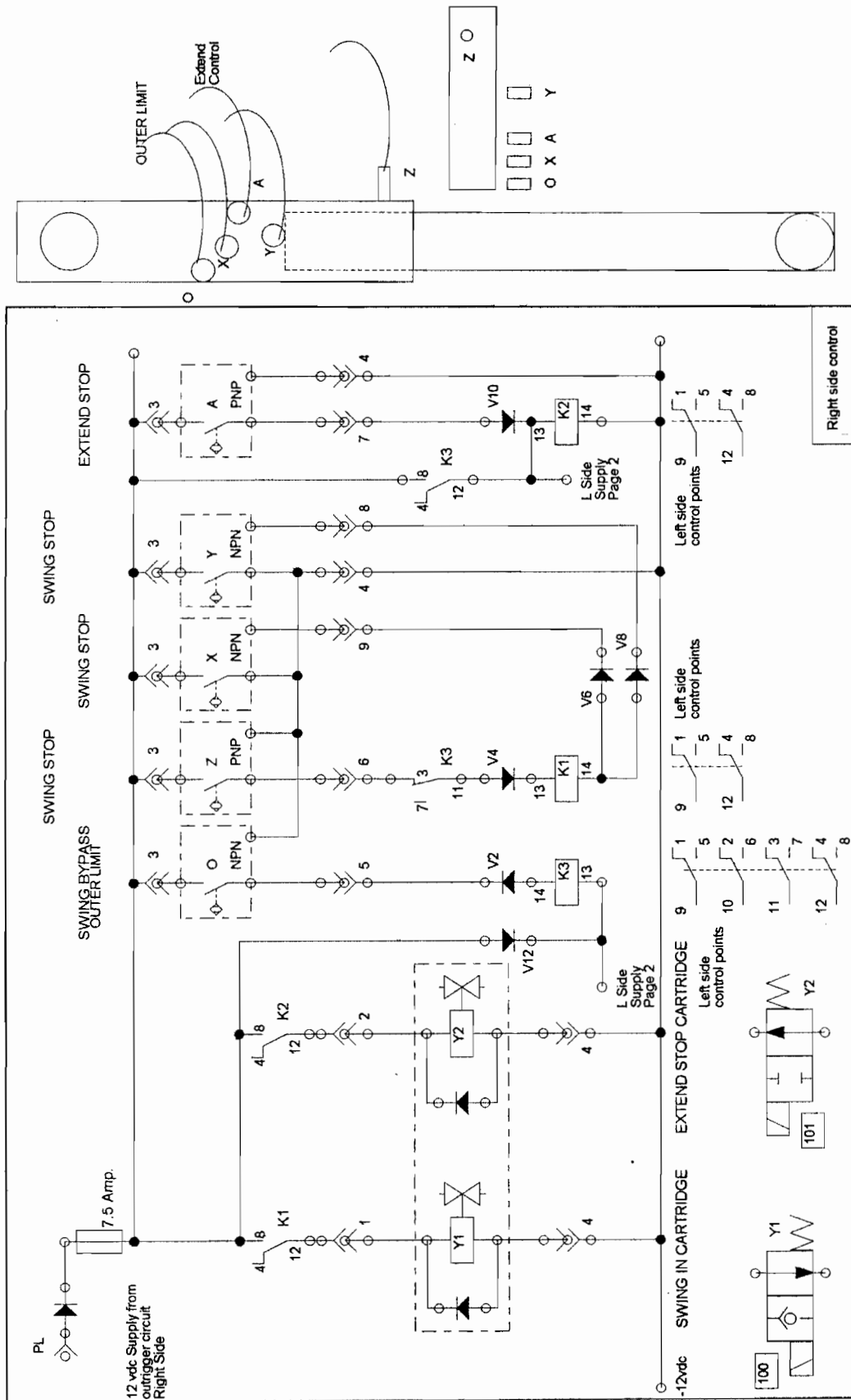


CODE NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
1	C-.SE	Tank, Hydraulic Oil					1
2	C-.WR	Valve, Inlet					1
3	C-.FF1	Hose, Flexible					1
4	C-.MP	Pump, Hydraulic					1
5	C-.FF2	Hose, Flexible					1
6	C-DM000	Gauge, Pressure					1
7	C-FF143.100	Hose, Flexible					1
8	C-DF101	Filter, Hydraulic					1
9	C-DD001/DD002	Distributor					1
10	C-FF101.080	Hose, Flexible					2
11	C-FF122.440	Hose, Flexible					8
12	C-FF122.125	Hose, Flexible					10
13	C-WL210	Valve, Flow Limiter					1
14	C-WL213	Valve, Flow Limiter					1
15	C-FF122.070	Hose, Flexible					24
16	C-WC120	Valve, Check					1
17	C-WC125	Valve, Check					1
18	C-.B4	Piston, Hydraulic					1
19	C-WL215	Valve, Flow Limiter					1
20	C-WL128	Valve, Check					6
21	C-.B3	Piston, Hydraulic					1
22	C-WL220	Valve, Flow Limiter					1
23	C-.B2	Piston, Hydraulic					1
24	C-WL218	Valve, Flow Limiter					1
25	C-.B1	Piston, Hydraulic					1
26	C-FF122.160	Hose, Flexible					2
27	C-WA105	Valve, Over Center					1
28	C-.MI	Motor, Hydraulic					1
29	C-FF101.045	Hose, Flexible					1
30	C-FF134.070	Hose, Flexible					8
31	C-DD009	Distributor					2



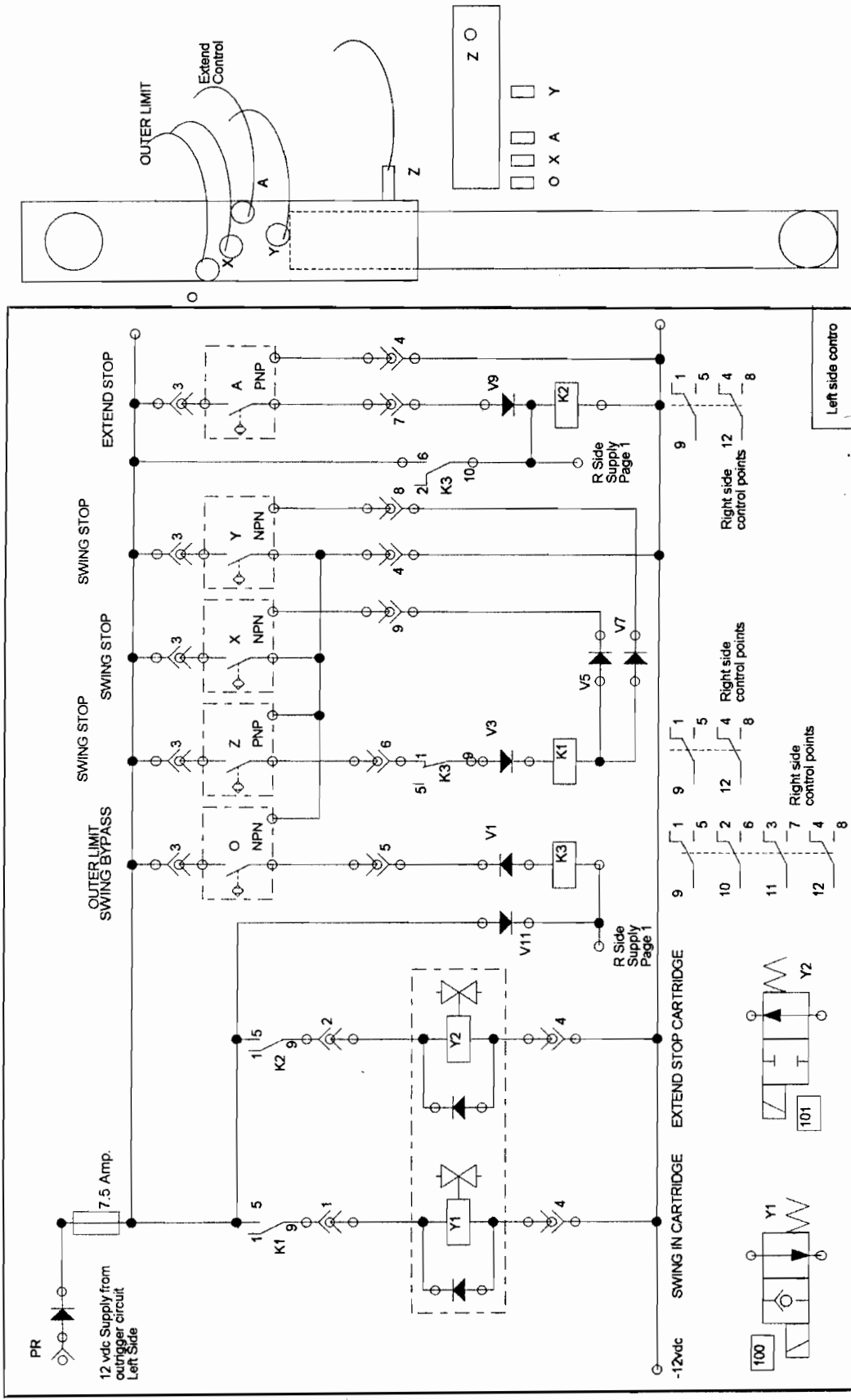
CODE NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
32	C-FF122.170	Hose, Flexible					8
33	C-WD101	Valve, Check					8
34	C-.L5	Piston, Hydraulic					4
35	C-WS103	Valve, Sequence					4
36	C-.MI1	Motor, Hydraulic					2
37	C-.M3	Piston, Hydraulic					4
38	C-WL110	Valve, 2 Direction Throttle					2
39	C-WL112	Valve, 2 Direction Throttle					2





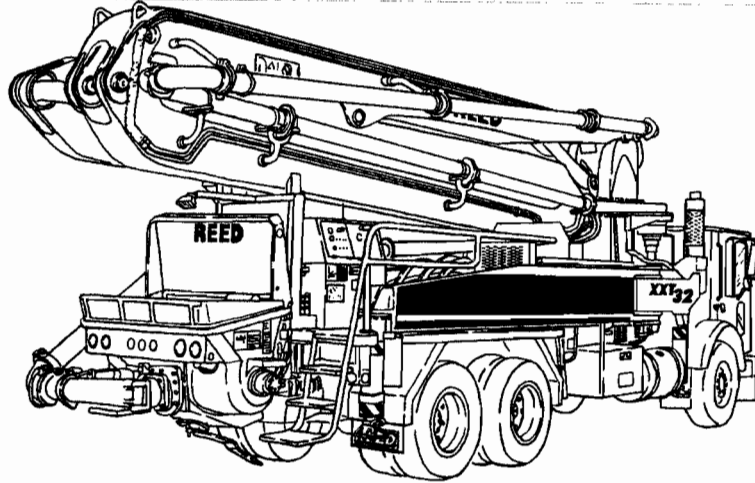


# ELECTRIC SCHEMATIC (LEFT SIDE CONTROL)



REVISION:





**REED TRUCK MOUNTED CONCRETE BOOM PUMP MODEL XXT 32 ILLUSTRATED PARTS MANUAL CONTAINS THE FOLLOWING GROUPS AND FIGURES:**

**GROUP 00 HOW TO USE PARTS MANUAL**

- FIGURE 00 TABLE OF CONTENTS
- FIGURE 01 HOW TO USE PARTS MANUAL
- FIGURE 02 HOW TO ORDER PARTS

**GROUP 10 FINAL INSTALLATION**

- FIGURE 00 TABLE OF CONTENTS
- FIGURE 01 FINAL INSTALLATION
- FIGURE 02 DECAL ASSEMBLY

**GROUP 20 HOPPER INSTALLATION**

- FIGURE 00 TABLE OF CONTENTS
- FIGURE 01 HOPPER INSTALLATION
- FIGURE 02 CENTRAL LUBRICATION SYSTEM
- FIGURE 03 LUBRICATION PUMP ASSEMBLY
- FIGURE 04 HOPPER VIBRATION ASSEMBLY
- FIGURE 05 AGITATOR ASSEMBLY
- FIGURE 06 AGITATOR DRIVE MOTOR ASSEMBLY
- FIGURE 07 HOPPER OUTLET ASSEMBLY

**GROUP 30 TANK INSTALLATION**

- FIGURE 00 TABLE OF CONTENTS
- FIGURE 01 TANK INSTALLATION
- FIGURE 02 WATER SYSTEM GROUP
- FIGURE 03 WASH WATER PUMP ASSEMBLY
- FIGURE 04 WATER PUMP MOTOR ASSEMBLY

**GROUP 40 POWER TRAIN INSTALLATION**

- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** POWER TRAIN INSTALLATION (BEF JUL 1999)
- FIGURE 02** POWER TRAIN INSTALLATION (AUG 1999 ~ MAR 2000)
- FIGURE 03** POWER TRAIN INSTALLATION (APR 2000 ~ FEB 2001)
- FIGURE 04** POWER TRAIN INSTALLATION (AFT MAR 2001)
- FIGURE 05** GEAR PUMP ASSEMBLY
- FIGURE 06** PTO GEARBOX ASSEMBLY

**GROUP 50 CONTROLS INSTALLATION**

- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** CONTROLS INSTALLATION (BEF MAY 2000)
- FIGURE 02** CONTROLS INSTALLATION (AFT JUN 2000)
- FIGURE 03** CAB CONTROLS ASSEMBLY
- FIGURE 04** MAIN CONTROLS ASSEMBLY (BEF MAY 2000)
- FIGURE 05** MAIN CONTROLS ASSEMBLY (AFT JUN 2000)
- FIGURE 06** LH SIDE OUTRIGGER CONTROLS ASSEMBLY (BEF MAY 2000)
- FIGURE 07** LH SIDE OUTRIGGER CONTROLS ASSEMBLY (AFT JUN 2000)
- FIGURE 08** RH SIDE OUTRIGGER CONTROLS ASSEMBLY (BEF MAY 2000)
- FIGURE 09** RH SIDE OUTRIGGER CONTROLS ASSEMBLY (AFT JUN 2000)
- FIGURE 10** STATIONARY BOOM CONTROLS ASSEMBLY
- FIGURE 11** CABLED REMOTE CONTROL ASSEMBLY (BEF MAY 2000)
- FIGURE 12** CABLED REMOTE CONTROL ASSEMBLY (AFT JUN 2000)
- FIGURE 13** RADIO REMOTE CONTROL ASSEMBLY (BEF MAY 2000)
- FIGURE 14** RADIO REMOTE CONTROL ASSEMBLY (AFT JUN 2000)
- FIGURE 15** SHUNT ASSEMBLY

**GROUP 60 PUMPING TRAIN INSTALLATION**

- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** PUMPING TRAIN INSTALLATION
- FIGURE 02** SWING VALVE ASSEMBLY
- FIGURE 03** TILTING DRIVE ASSEMBLY
- FIGURE 04** TILTING CYLINDER ASSEMBLY
- FIGURE 05** CONCRETE CYLINDER ASSEMBLY
- FIGURE 06** WATER BOX ASSEMBLY
- FIGURE 07** HYDRAULIC DRIVE CYLINDER ASSEMBLY
- FIGURE 08** DRIVE CYLINDER SUB-ASSEMBLY

**GROUP 70 FRAME AND SUPPORT INSTALLATION**

<b>FIGURE 00</b>	<b>TABLE OF CONTENTS</b>
<b>FIGURE 01</b>	<b>FRAME AND SUPPORT INSTALLATION</b>
<b>FIGURE 02</b>	<b>TURRET ASSEMBLY</b>
<b>FIGURE 03</b>	<b>MOTOR AND REDUCTION ASSEMBLY</b>
<b>FIGURE 04</b>	<b>ROTATION UNIT ASSEMBLY</b>
<b>FIGURE 05</b>	<b>SUPPORT FRAME STABILIZERS ASSEMBLY</b>
<b>FIGURE 06</b>	<b>FRONT LEFT STABILIZERS TELESCOPIC LEG ASSEMBLY</b>
<b>FIGURE 07</b>	<b>FRONT RIGHT STABILIZERS TELESCOPIC LEG ASSEMBLY</b>
<b>FIGURE 08</b>	<b>REAR LEFT SWING OUT LEG ASSEMBLY</b>
<b>FIGURE 09</b>	<b>REAR RIGHT SWING OUT LEG ASSEMBLY</b>
<b>FIGURE 10</b>	<b>STABILIZERS VERTICAL JACK CYLINDER ASSEMBLY</b>
<b>FIGURE 11</b>	<b>SWING OUT CYLINDER ASSEMBLY</b>

**GROUP 80 OPTIONAL INSTALLATION**

<b>FIGURE 00</b>	<b>TABLE OF CONTENTS</b>
<b>FIGURE 01</b>	<b>OPTIONAL INSTALLATION</b>
<b>FIGURE 02</b>	<b>ACCUMULATOR CHARGE KIT</b>
<b>FIGURE 03</b>	<b>OPTIONAL TOOL KIT ASSEMBLY</b>

**GROUP 90 BOOM INSTALLATION**

<b>FIGURE 00</b>	<b>TABLE OF CONTENTS</b>
<b>FIGURE 01</b>	<b>BOOM INSTALLATION</b>
<b>FIGURE 02</b>	<b>FIRST BOOM ASSEMBLY</b>
<b>FIGURE 03</b>	<b>SECOND BOOM ASSEMBLY</b>
<b>FIGURE 04</b>	<b>THIRD BOOM ASSEMBLY</b>
<b>FIGURE 05</b>	<b>FOURTH BOOM ASSEMBLY</b>
<b>FIGURE 06</b>	<b>FIRST BOOM CYLINDER ASSEMBLY</b>
<b>FIGURE 07</b>	<b>SECOND BOOM CYLINDER ASSEMBLY</b>
<b>FIGURE 08</b>	<b>THIRD BOOM CYLINDER ASSEMBLY</b>
<b>FIGURE 09</b>	<b>FOURTH BOOM CYLINDER ASSEMBLY</b>
<b>FIGURE 10</b>	<b>CONCRETE DECK PIPELINE ASSEMBLY</b>
<b>FIGURE 11</b>	<b>CONCRETE BOOM PIPELINE ASSEMBLY</b>



# MODEL **XXT 32** TRUCK MOUNTED CONCRETE BOOM PUMP HOW TO USE PARTS MANUAL

**XXT 32**  
**PARTS**  
GROUP 00  
FIGURE 01  
PAGE 01

## I. PURPOSE

This parts manual is prepared, issued and/or revised by **REED** Manufacturing, for the exclusive use of its customers and is intended for use in provisioning, requisitioning, storing and issuing replaceable **REED** truck mounted concrete boom pump model **XXT 32**. The contents are proprietary to **REED** and are subject to change without notice. The use of any part of this document by any other person or persons or for any other purpose without the written consent of **REED** is expressly prohibited. In addition, **REED** expressly disclaims any and all responsibility arising in or any way related to such **REED'S** prior written consent thereto.

The parts number content of this document, arrangement and breakdown sequence of items is compatible with Military Standard (**MS**) and Air Transport Association Specification (**ATA**).

## II. GENERAL SYSTEM OF ASSEMBLY ORDER - Detailed Parts List (Refer to Next Page)

1. This area refers to the corresponding illustration

### MODEL - GROUP - FIGURE - PAGE

A. **MODEL** shows which is **REED'S** model number.

B. **GROUP** should be divided with:

00	MODEL <b>XXT 32</b> ILLUSTRATED PARTS MANUAL
10	FINAL INSTALLATION
20	HOPPER INSTALLATION
30	TANK INSTALLATION
40	POWER TRAIN INSTALLATION
50	CONTROL INSTALLATION
60	PUMPING TRAIN INSTALLATION
70	FRAME AND SUPPORT INSTALLATION
80	OPTIONAL INSTALLATION
90	BOOM INSTALLATION

C. **FIGURE** belong to the group. Please see page of contents and each group.

D. **PAGE** numbers follow to the right of each figure number.

2. The **ITEM NUMBER** corresponds to the item number shown for the part in illustration. Parts with item number preceded by a dash (such as: -1, -5, -12 etc.) are not illustrated.

3. **PARTS NUMBERS** that carry a **REED** part number.



# MODEL XXT 32 TRUCK MOUNTED CONCRETE BOOM PUMP HOW TO USE PARTS MANUAL

**XXT 32  
PARTS  
GROUP 00  
FIGURE 01  
PAGE 02**



## HYDRAULIC PUMPING ASSEMBLY

**XXT 32  
PARTS  
GROUP 80  
FIGURE 08  
PAGE 02**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION	1 2 3 4 5				
			QTY				
-1	60-06	Assembly, Hydraulic Pumping (See Group 20, Figure 01 for NHA)	Ref				
2	78354	• Cup, Piston	2				
3	78444	• Coupler	2				
4	78352	• Coupling, Dog bone	4				
5		• Bolt 1/2 x 4 (attaching parts)	8				
6		• Nut, 1/2 (attaching parts)	8				
7	78443	• Bone, Dog	2				
8		• Bolt 5/8 x 2	6				
9	78442	• Coupler	2				
10	78438	• Assembly, Hydraulic Cylinder (See Group 60, Figure 07 for DET)	1				
11		• Nut (attaching parts)	16				
12		• Washer (attaching parts)	16				
13	77617	• Bolt (attaching parts)	16				
14		• Elbow, 90 FS6802-16-16	4				
15	79343	• Assembly, Hose	2				
16	78593	• Fitting, MiniCheck (Port)	2				
17		• Elbow, 90 FS6802-06-06	4				
18		• Fitting, STR FS6400-06-06	4				
19	79344	• Assembly, Hose	2				
20		• Elbow, 90 FS6801-06-06	4				
21		• Valve, Check	4				
22		• Elbow, 90 MBMB90-06-06	4				
23		• Clamp	3				
24	79326	• Tube, Wire	1				
25	79345	• Assembly, Tube	2				
26	78417	• Cable	2				
27	72010	• Loom, 1/2 Flex	A/R				
28		• Pin, 1/4 x 20	4				
29	79285	• Cover, Proximity Switch	2				
30	78416	• Switch, Proximity	2				
31	79327	• Plate, End	1				
32		• Washer, 1 Lock (attaching parts)	8				
33		• Bolt, 1 x 2 Course (attaching parts)	8				

DASH (-) ITEM NOT ILLUSTRATED

REVISION:



REVISION:



# MODEL XXT 32 TRUCK MOUNTED CONCRETE BOOM PUMP HOW TO USE PARTS MANUAL

**XXT 32**  
**PARTS**  
GROUP 00  
FIGURE 01  
PAGE 03



## HYDRAULIC PUMPING ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 06  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	60-06	Assembly, Hydraulic Pumping (See Group 20, Figure 01 for NHA)					Ref
2	78354	• Cup, Piston					2
3	78444	• Coupler					2
4	78352	• Coupling, Dog bone					4
5		• Bolt 1/2 x 4 (attaching parts)					8
6		• Nut, 1/2 (attaching parts)					8
7	78443	• Bone, Dog					2
8		• Bolt 5/8 x 2					6
9	78442	• Coupler					2
10	78438	• Assembly, Hydraulic Cylinder (See Group 60, Figure 07 for DET)					1
11		• Nut (attaching parts)					16
12		• Washer (attaching parts)					16
13	77617	• Bolt (attaching parts)					16
14		• Elbow, 90 FS6802-16-16					4
15	79343	• Assembly, Hose					2
16	78593	• Fitting, MiniCheck (Port)					2
17		• Elbow, 90 FS6802-06-06					4
18		• Fitting, STR FS6400-06-06					4
19	79344	• Assembly, Hose					2
20		• Elbow, 90 FS6801-06-06					4
21		• Valve, Check					4
22		• Elbow, 90 MBMB90-06-06					4
23		• Clamp					3
24	79326	• Tube, Wire					1
25	79345	• Assembly, Tube					2
26	78417	• Cable					2
27	72010	• Loom, 1/2 Flex					A/R
28		• Pin, 1/4 x 20					4
29	79285	• Cover, Proximity Switch					2
30	78416	• Switch, Proximity					2
31	79327	• Plate, End					1
32		• Washer, 1 Lock (attaching parts)					8
33		• Bolt, 1 x 2 Course (attaching parts)					8

DASH (-) ITEM NOT ILLUSTRATED

REVISION:



REVISION:



# MODEL XXT 32 TRUCK MOUNTED CONCRETE BOOM PUMP HOW TO USE PARTS MANUAL

**XXT 32**  
**PARTS**  
GROUP 00  
FIGURE 01  
PAGE 04

## 4. DESCRIPTION

A. The **INDENTURE SYSTEM** used in the parts list shows the relationship of one part to another. For a given item, the number of indentures depicts the relationship of the item to the components of the item as follows:

1 2 3 4 5

Assembly (or Installation)

- Detail part of assembly
- Sub-assembly
- Attaching parts for sub-assembly
- ● Detail part of sub-assembly
- ● Sub-sub-assembly
- ● Attaching parts for sub-sub-assembly
- ● ● Detail part of sub-sub-assembly
- ● ● Sub-sub-sub-assembly
- ● ● Attaching parts of sub-sub-sub-assembly
- ● ● ● Detail part of sub-sub-sub-assembly

B. "See Group 20, Figure 01 For **NHA**"

Identifies the illustrated parts chapter location; indicates where the Next Higher Assembly (**NHA**) of the item shown.

C. "See Group 60, Figure 07 For **DET**"

Identifies the illustrated parts chapter location; indicates where the item and its Detailed Breakdown (**DET**) is shown.

D. "See Group 30, Figure 05 for **REF**" or "See Vendor Chapter For **REF**"

Identifies the illustrated parts chapter where the part is, and if listed and illustrated in Vendor Chapter. It is used as a cross-reference (**REF**).

## 5. QUANTITY

A. Reference (**REF**) indicates the items that is listed previously in the Next Higher Assembly (**NHA**) and then again in this figure.

B. As Required (**A/R**) indicates the parts that is used in a quantity as required.

C. A number entry indicates the quantity of the part used in its next higher application.

6. Functionally related assemblies are illustrated in phantom ( \_\_\_\_\_ ) but not listed on the detail parts list page.



# MODEL XXT 32 TRUCK MOUNTED CONCRETE BOOM PUMP HOW TO ORDER PARTS

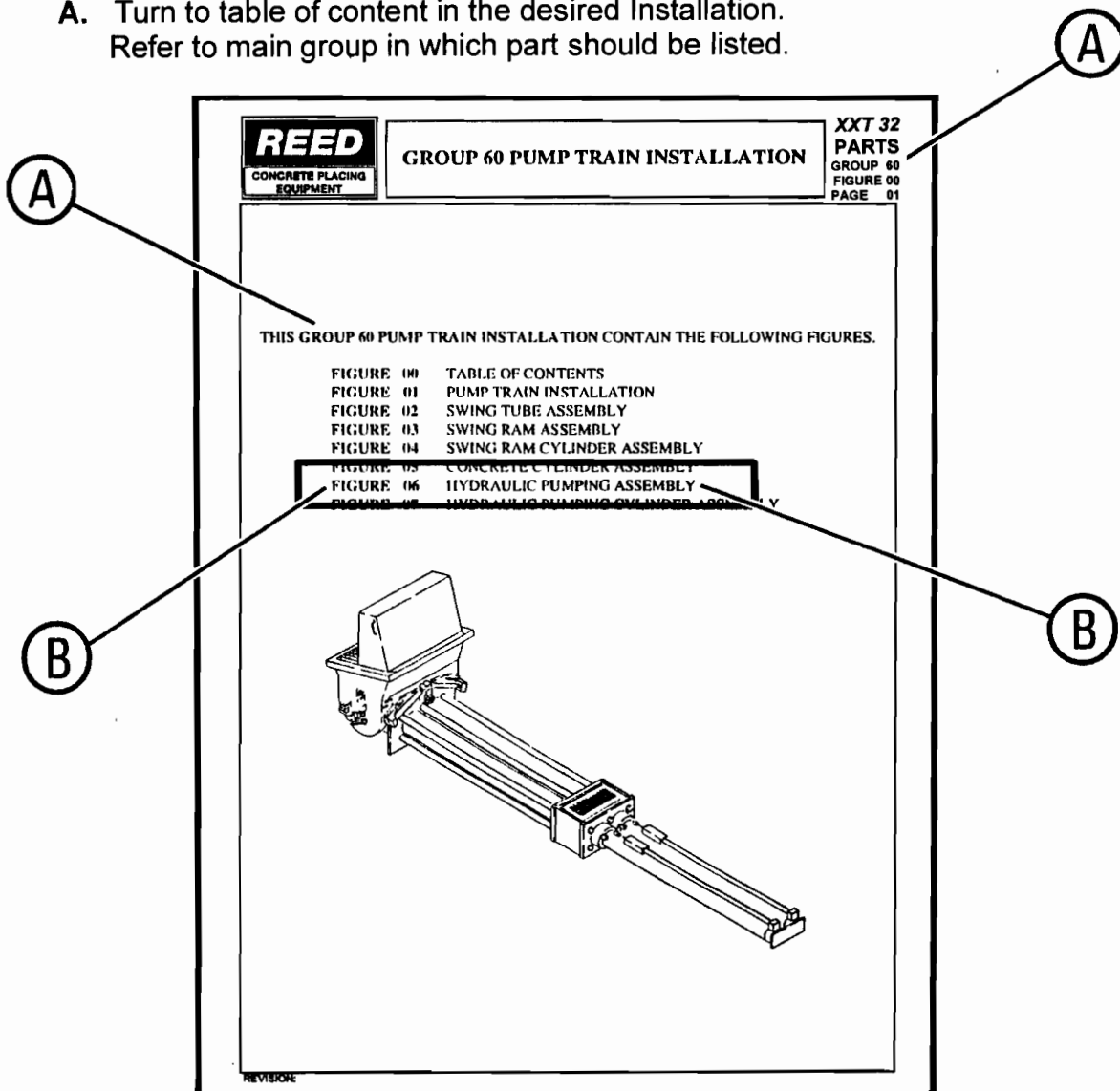
**XXT 32  
PARTS**  
GROUP 00  
FIGURE 02  
PAGE 01

- Always give serial number and model of **REED** truck mounted concrete boom pump model: **XXT 32**. (Refer to each unit name plate shown below). NOTE: This manual is being released to cover unit starting with serial number **99 - 181 - XXT 32** to current production. Some components used on earlier units differ from current productions. Where this occurs, the part is identified by a serial number.

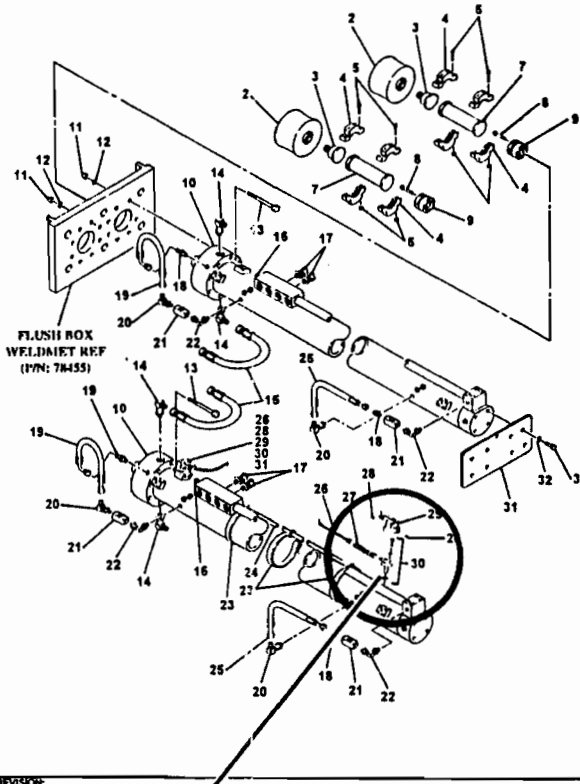
<b>REED</b> 13822 OAKS AVENUE CHINO, CA 90710 USA		PHONE (909) 384-2100 FAX (909) 384-2140	CE
MODEL	<input type="text"/>	SERIAL NO.	<input type="text"/>
HYD. PRESSURE	<input type="text"/>	PSI	<input type="text"/>
		BAR	<input type="text"/>
ELECTRIC MOTOR/ ENGINE SPEED	<input type="text"/>	RPM	<input type="text"/>
		VOLTS	<input type="text"/>
VEHICLE WEIGHT (APPROX.)	<input type="text"/>	LBS	<input type="text"/>
		KG	<input type="text"/>

75009A

- Always specify part number and complete name of parts ordered.
  - Turn to table of content in the desired Installation. Refer to main group in which part should be listed.







REVISION:

ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	60-06	Assembly, Hydraulic Pump (See Group 20, Figure 1 for NHA)	Ref
2	78354	* Cup, Piston	2
3	78434	* Coupler	2
4	78352	* Coupling, Drag by	4
5		* Bolt 1/2 x 4 (attaching parts)	8
6		* Nut, 1/2 (attaching parts)	8
7	78441	* Hose, Drag	2
8		* Bolt 5/8 x 2	6
9	78442	* Coupler	2
10	78438	* Assembly, Hydraulic Cylinder (See Group 00, Figure 07 for DET)	1
11		* Nut (attaching parts)	16
12		* Washer (attaching parts)	16
13	77617	* Bolt (attaching parts)	16
14		* Elbow, 90 FSA002-16-16	4
15	79343	* Assembly, Hose	2
16	78593	* Fitting, Minicheck (Port)	2
17		* Elbow, 90 FSA002-06-06	4
18		* Fitting, STD FSA0010-06	4
19	79344	* Assembly, Hose	2
20		* Elbow, 90 FSA001-06-06	4
21		* Elbow, Check	4
22		* Elbow, 90 MBM100-06-06	4
23		* Clamp	3
24	79326	* Tube, Wire	1
25	79345	* Assembly, Tube	2
26	78417	* Cable	2
27	72010	* Lawn, 1/2 Flat	A/R
28		* Pin, 1/4 x 20	4
29	79385	* Cover, Proximity Switch	2
30	78416	* Switch, Proximity	2
31	78455	* Flush Box	1
32		* Washer, 1 Lock (attaching parts)	8
33		* Bolt, 1 x 2 Course (attaching parts)	8

DASH (-) ITEM NOT ILLUSTRATED

REVISION:

- B. Find title of figure in which the part should be shown. Note figure number.
- C. Turn to corresponding page, find the group and figure.
- D. Check your required part and its attaching parts and match with illustration page.
- E. Refer to corresponding item number in the part list page. Part numbers are located in the part number column.
- F. When ordering variable or optional miscellaneous parts which are not found this in parts chapter, follow the above outlined procedure of how to order parts.
  - 1). When applicable, give model and serial number of the component for which parts are desired.
  - 2). In a specific, difficult to describe situation, a marked-up photograph or detailed sketch would be helpful.

3. Do not designate quantity by "set". State specifically how many parts are wanted.
4. Always give complete address and full shipping instructions. Specify shipping instructions, truck freight, air freight. United Parcel Service (UPS), or Air Borne Express and DHL are available in designated areas.

**5. TO ORDER****A. BY MAIL**

Attention: Parts Department  
**REED**  
13822 Oaks Avenue  
Chino, CA. 91710

**B. BY FAX**

(909) 287 - 2141

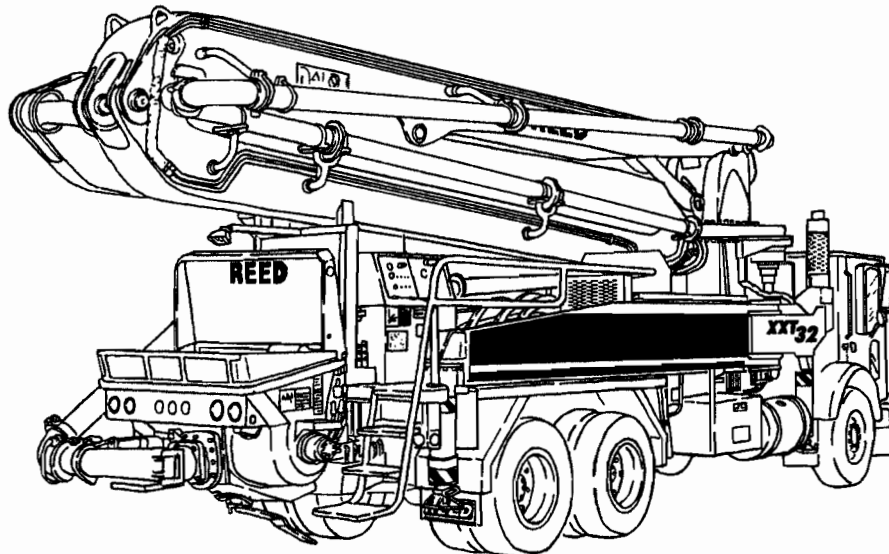
**C. BY PHONE**

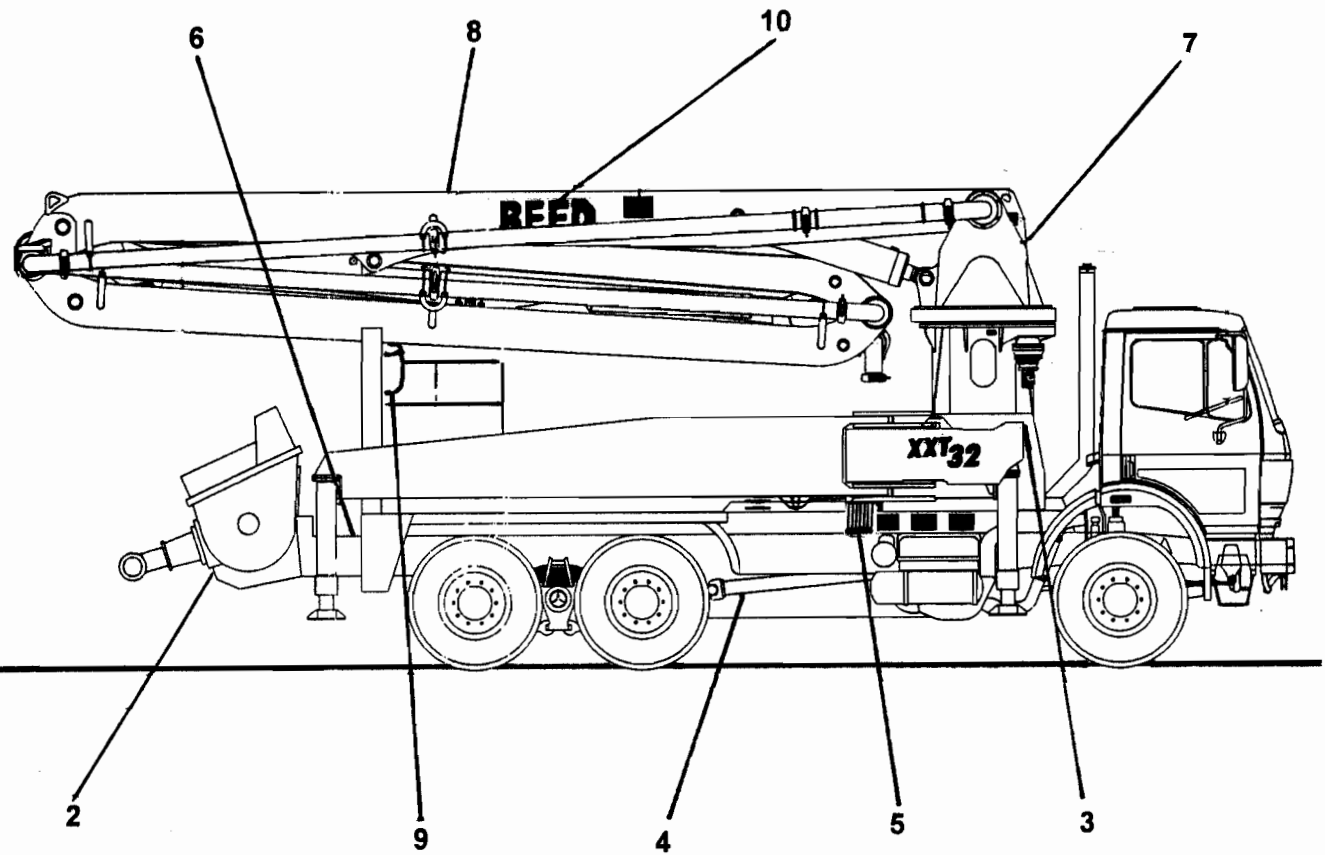
(909) 287 - 2100

6. Parts return without authorization will not be accepted. If it is necessary to return parts for any reason, written authorization may be obtained from **REED** Parts Department, Chino, CA. 91710-7008. A Parts Return Authorization form is provided when **REED** deems its necessary to have the part returned for evaluation. The form is issued by the Warranty of Parts Department of **REED**.
  - A. The form will be filled by **REED** unless requesting necessary information and you will receive a copy as well as shipping tag.
  - B. Attach shipping tag to part insert return original invoice.
  - C. Ship part to **REED PREPAID**.
  - D. Part must be returned to **REED** within 30 days from date of authorization.

**REED** TRUCK MOUNTED CONCRETE BOOM PUMP MODEL **XXT 32** ILLUSTRATED PARTS MANUAL GROUP 10 FINAL INSTALLATION CONTAINS THE FOLLOWING FIGURES:

- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** FINAL INSTALLATION
- FIGURE 02** DECAL ASSEMBLY





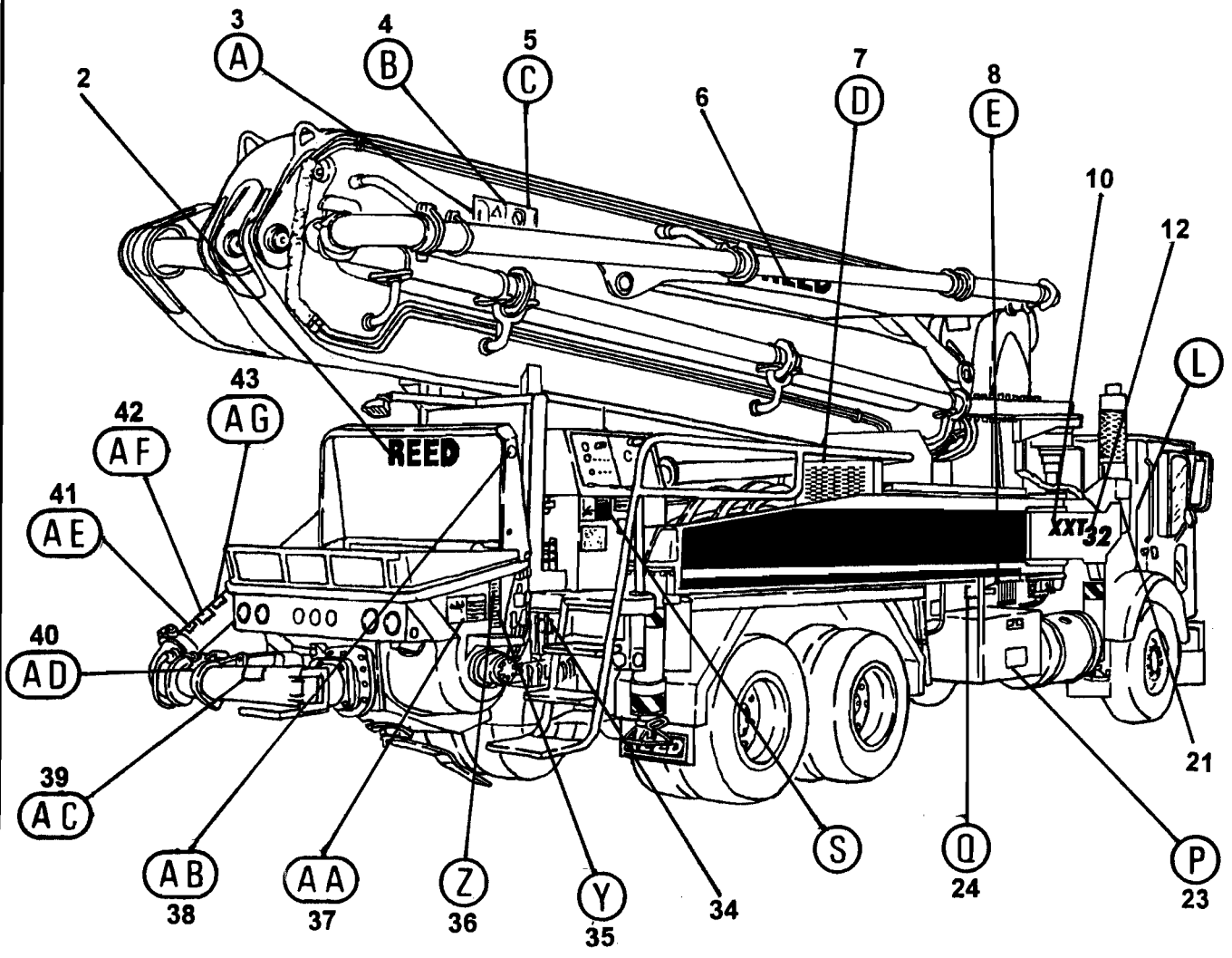
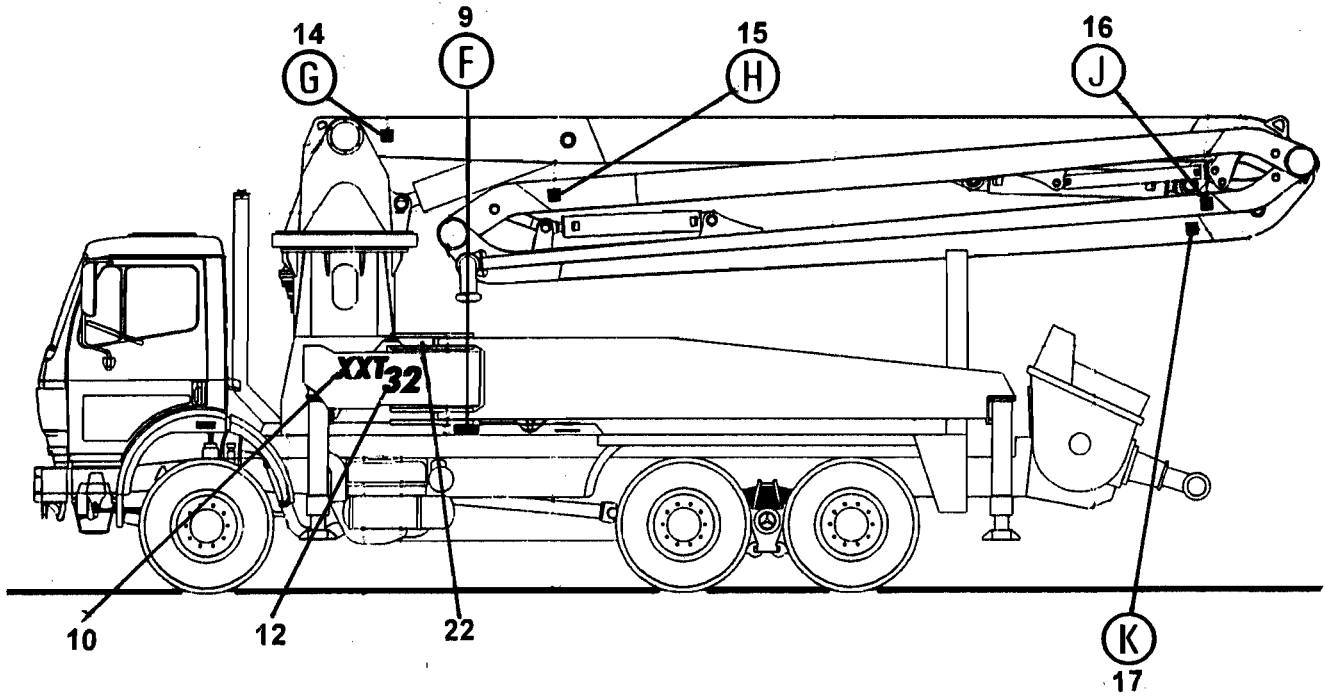
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	800519	Installation, <b>XXT 32</b> Final					Ref
2	20-01	• Installation, Hopper (See Group 20, Figure 01 for DET)					1
3	30-01	• Installation, Tank (See Group 30, Figure 01 for DET)					1
4	40-01	• Installation, Power Train (Bef Jul 1999) (See Group 40, Figure 01 for DET)					1
	40-02	• Installation, Power Train (Aug 1999 ~ Mar 2000) (See Group 40, Figure 01 for DET)					1
	40-03	• Installation, Power Train (Apr 200 ~ Feb 2001) (See Group 40, Figure 01 for DET)					1
	40-04	• Installation, Power Train (Aft Mar 2001) (See Group 40, Figure 01 for DET)					1
5	50-01	• Installation, Control (Bef May 2000) (See Group 50, Figure 01 for DET)					1
	50-02	• Installation, Control (Aft Jun 2000) (See Group 50, Figure 01 for DET)					1
6	60-01	• Installation, Pumping Train (See Group 60, Figure 01 for DET)					1
7	70-01	• Installation, Frame and Support (See Group 70, Figure 01 for DET)					1
8	80-01	• Installation, Optional (See Group 80, Figure 01 for DET)					1
9	90-01	• Installation, Boom (See Group 90, Figure 01 for DET)					1
10	10-02	• Assembly, Decal (See Group 10, Figure 02 for DET)					1

DASH (-) ITEM NOT ILLUSTRATED

# REED

## DECAL ASSEMBLY

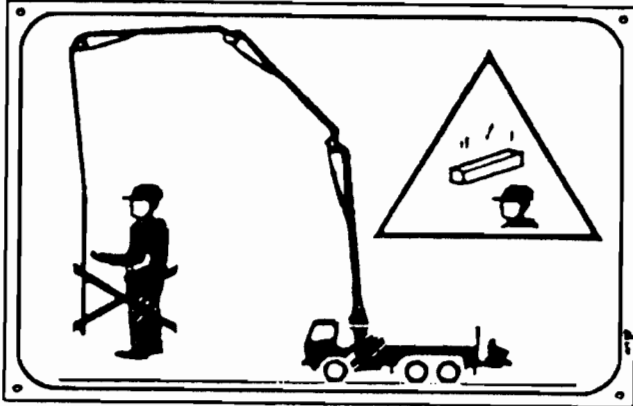
**XXT 32**  
**PARTS**  
GROUP 10  
FIGURE 02  
PAGE 01



REVISION:

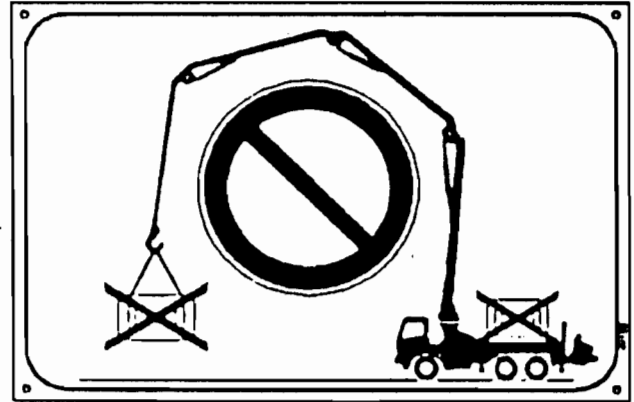
ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	10-02	Assembly, Decal (See Group 10, Figure 01 for NHA)	Ref
2	800442	• Decal, <b>REED</b> , 6 Inch Black	1
3	C-4V107	• Plate, Danger Of Falling Object	1
4	C-4V106	• Plate, Never Use As Crane	1
5	C-4V105	• Plate, Death Hazard	1
6	801069	• Decal, <b>REED</b> , 12 Inch White	2
7	C-4V120	• Plate, Hydraulic Distributor	1
8	C-9V111	• Decal, Right Side Stabilizers	1
9	C-9V112	• Decal, Left Side Stabilizers	1
10	801068	• Decal, <b>XXT</b> , 5 Inch White	2
-11		• Decal, <b>XXT</b> , 5 Inch Optional Color	2
12	801070	• Decal, <b>32</b> , 8 Inch White	2
-13		• Decal, <b>32</b> , 8 Inch Optional Color	2
14	C-4V113	• Decal, <b>A</b> Letter Adhesive	1
15	C-4V115	• Decal, <b>C</b> Letter Adhesive	1
16	C-4V116	• Decal, <b>D</b> Letter Adhesive	1
17	C-4V114	• Decal, <b>B</b> Letter Adhesive	1
-18	800766	• Kit, <b>XXT 32</b> Decal	1
19	800051	•• Nameplate, PTO	1
20	800059	•• Plate, PTO Operation	1
21	800034	•• Decal, Oil Level	2
22	800033	•• Decal, Water	1
23	800915	•• Decal, Danger, Stay Clear	1
24	800919	•• Decal, Warning, Stand Clear of Outriggers when activating	4
-25	800920	•• Decal, Warning, Clear Area Before Activating Outriggers	2
26	800439	•• Decal, Control Box Panel	1
27	801113	•• Decal, Gauge	1
28		•• Decal, A B	1
29	800926	•• Decal, Warning, Do Not Operate This Machine without	1
30	800929	•• Decal, Warning	1
31	800925	•• Decal, Warning, Do Not Operate This Machine without	1
32	800930	•• Decal, <b>ACPA</b> Hand Signals	1
33	800913	•• Decal, Danger, Electrocution Hazard	1
34	800875	•• Nameplate, Agitator / Water	1
35	800918	•• Decal, Warning, Do Not Stand on Hopper Grate	2
36	800917	•• Decal, Warning, Keep Hand Out of Hopper and Valve	2
37	800924	•• Decal, Warning, This Machine is Remote Controlled and	1
38	800931	•• Decal, <b>ACPA</b> Member	1
39	800922	•• Decal, Warning, Before Opening a Blocked Pipeline,	1
40	800923	•• Decal, Warning, Use Retaining Pins in all Delivery	1
41	800928	•• Decal, Warning, Total Weight of all Hanging Hoses,	1
42	800927	•• Decal, Warning, Do Not Use the Boom as a Crane	1
43	800921	•• Decal, Warning, Do Not Operate at Pressures Exceeding	1
-44	800914	•• Decal, Danger, Electrocution Hazard	1
-45	800916	•• Decal, Warning, Keep Hand Out of Water Box	1
46	75009	•• Nameplate, <b>REED</b> , Serial No.	1

DASH (-) ITEM NOT ILLUSTRATED



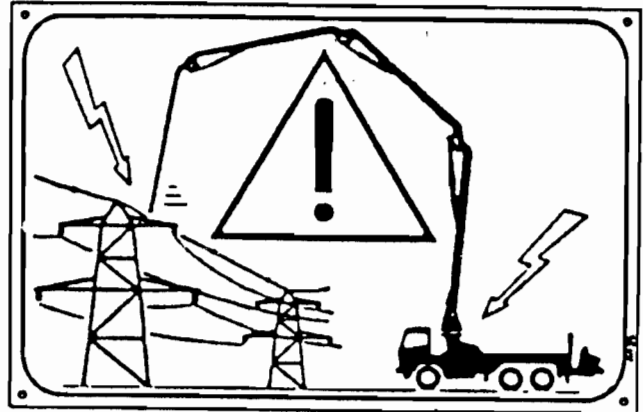
(A)

3



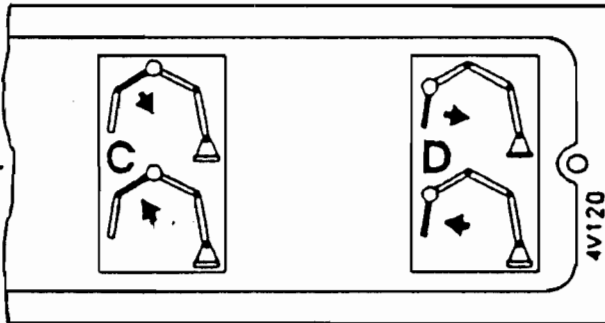
(B)

4



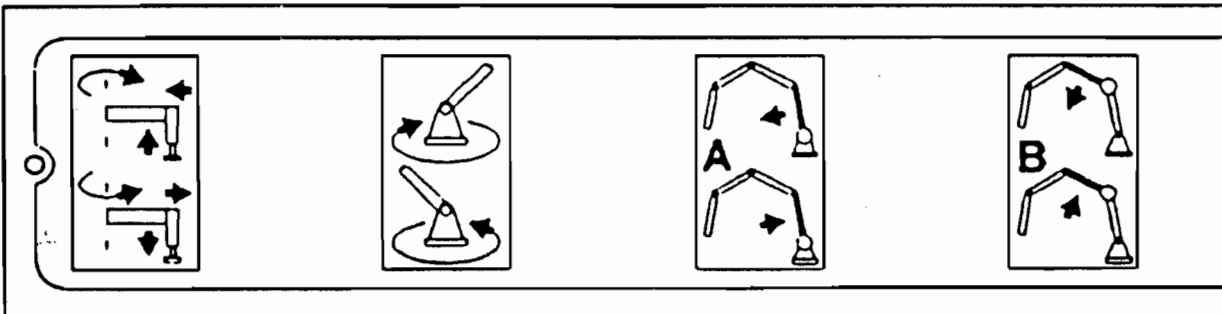
(C)

5

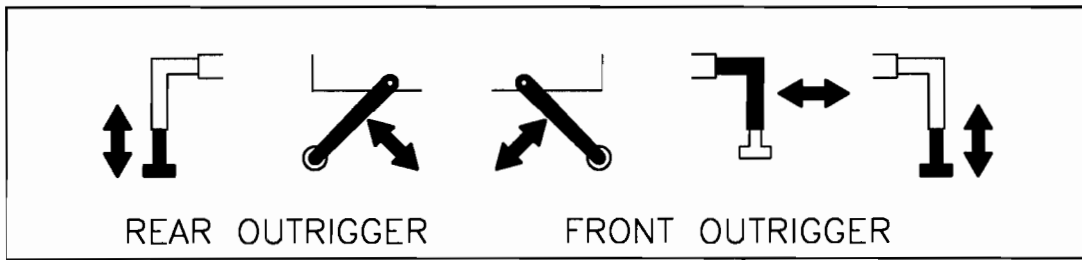


(D)

7

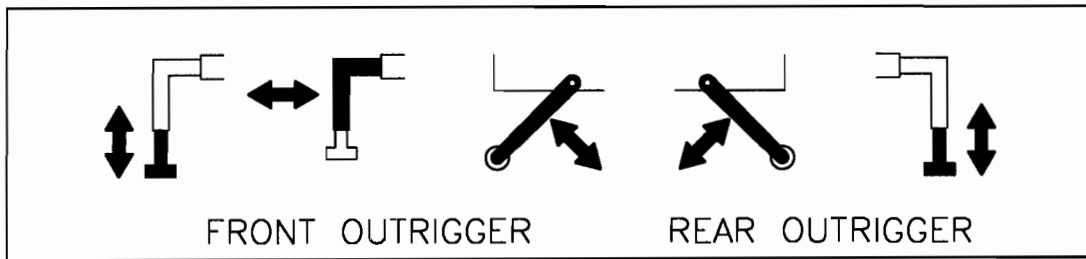






(E)

8



9

(F)

**B**

17

(K)

**A**

14

(G)

**D**

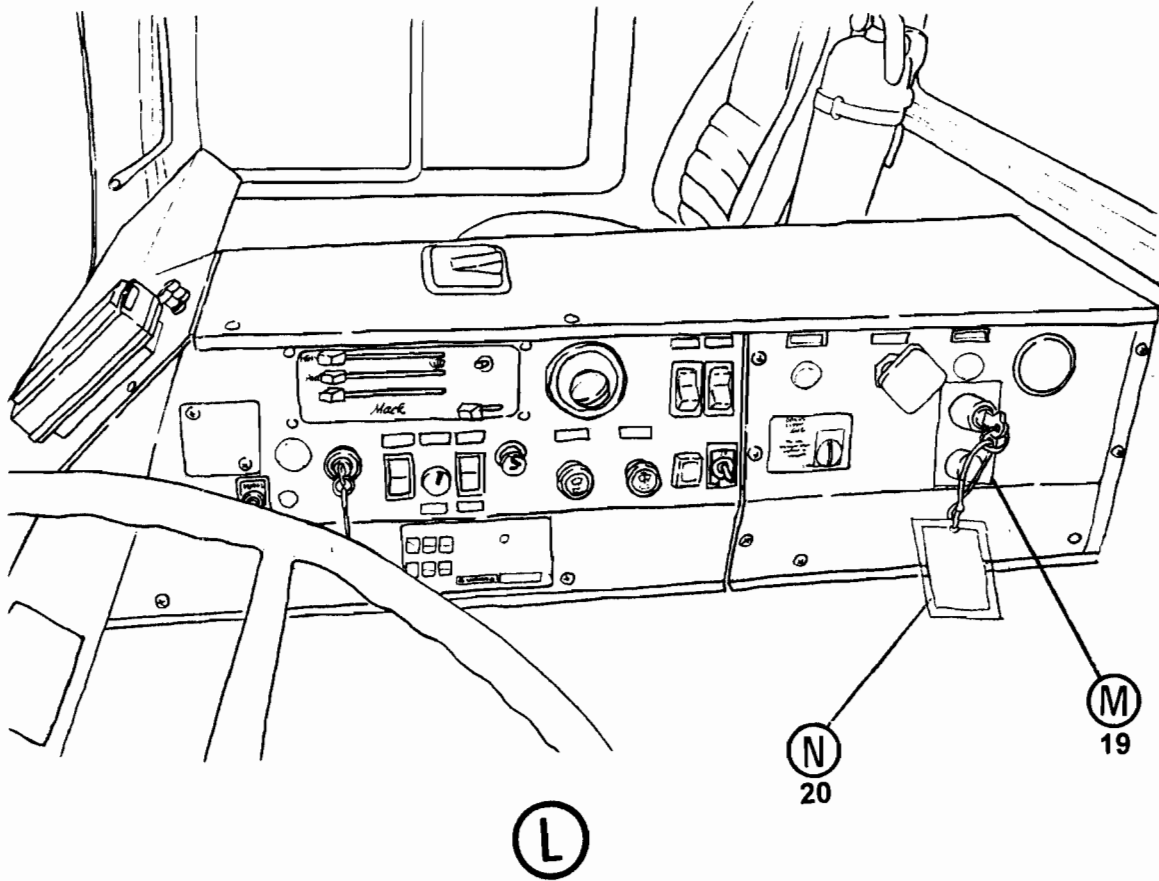
16

(J)

**C**

15

(H)

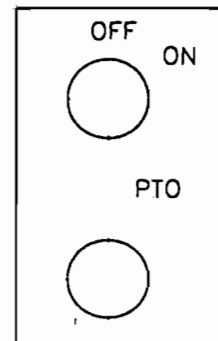


### TO OPERATE PUMP AND BOOM

1. POSITION TRUCK AND SET PARKING BRAKE.
2. DEPRESS CLUTCH AND SHIFT TO 7TH GEAR HIGH.
3. TURN PTO ON.
4. RELEASE CLUTCH TO ENGAGE PUMPS.
5. SET THROTTLE AT 1600 RPM MAXIMUM.

### TO RETURN TO DRIVING MODE

1. RETURN THROTTLE TO IDLE.
2. DEPRESS CLUTCH AND TURN PTO OFF.
3. SHIFT TO NUETRAL AND RELEASE CLUTCH.



19

20

(N)

(M)

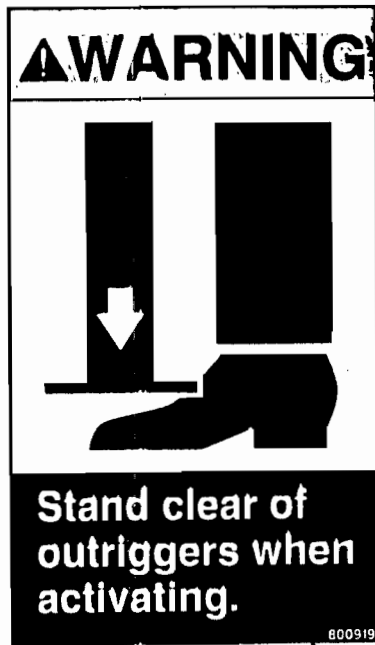


# ⚠ DANGER

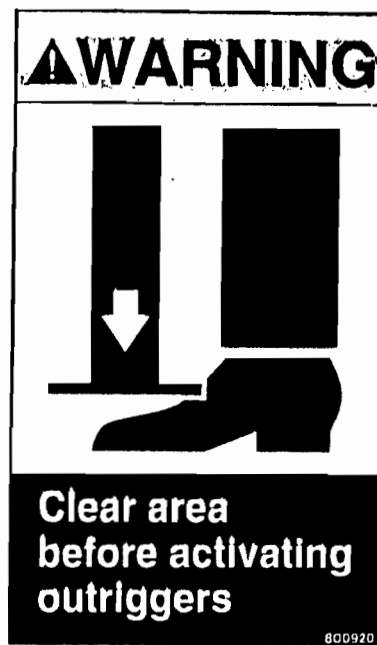
Stay clear.  
Contact will result in  
death or serious injury  
if the unit becomes  
electrically charged.

800915

23

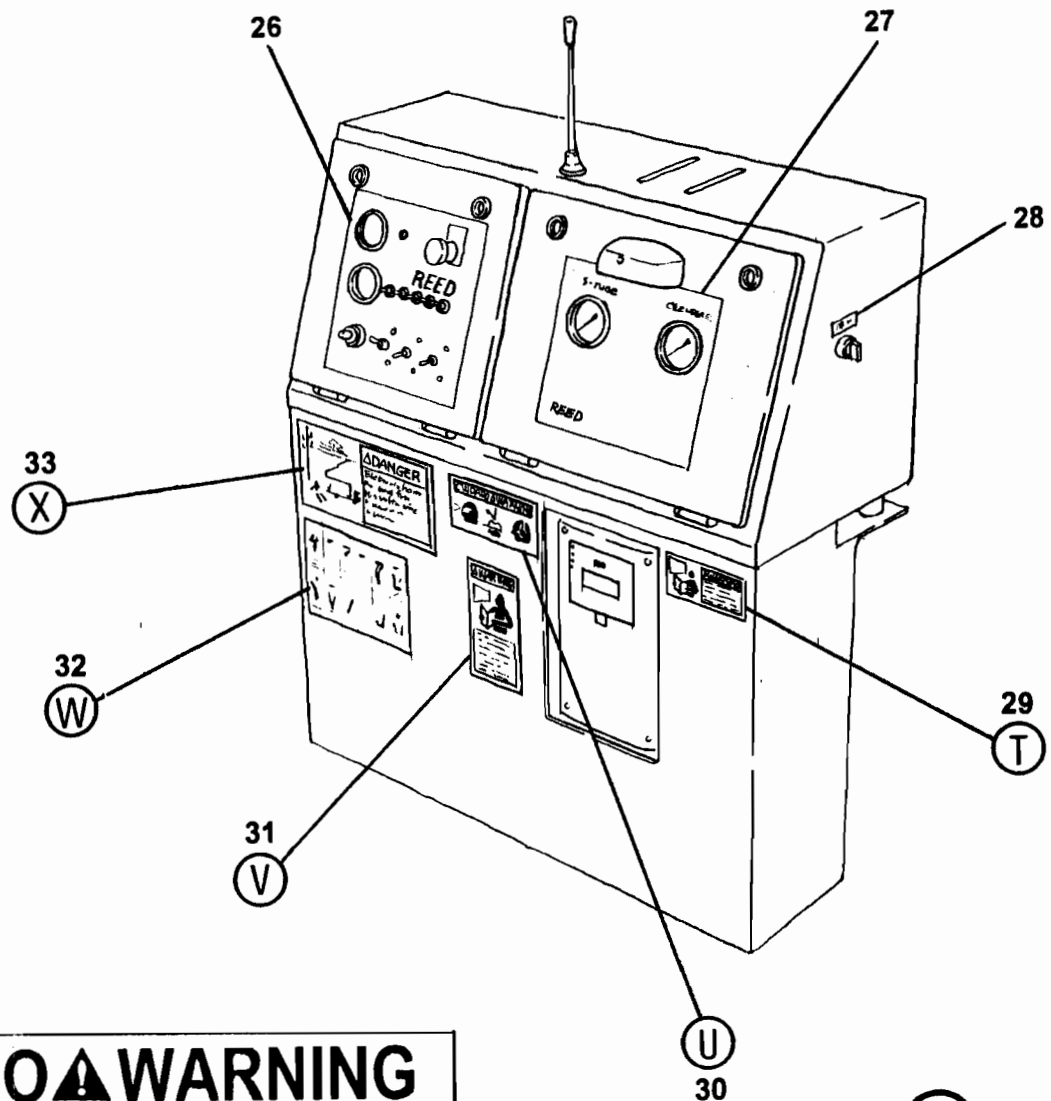


25



24





**CUIDADO ⚠ WARNING**

--	--	--

800929

U

30

T

**⚠ WARNING**

Do not operate this machine without training. Understand the warnings in safety manuals and on decals.

800920

**⚠ WARNING**



**Do not operate this machine without training. Understand the warnings in safety manuals and on decals.**

800925

31



32



1. BOOM UP



2. BOOM DOWN



3. BOOM LEFT



4. BOOM RIGHT



5. OPEN OR EXTEND BOOM



6. CLOSE OR RETRACT BOOM



7. STOP BOOM



8. START PUMP SPEED UP



9. SLOW PUMP DOWN



10. STOP PUMP



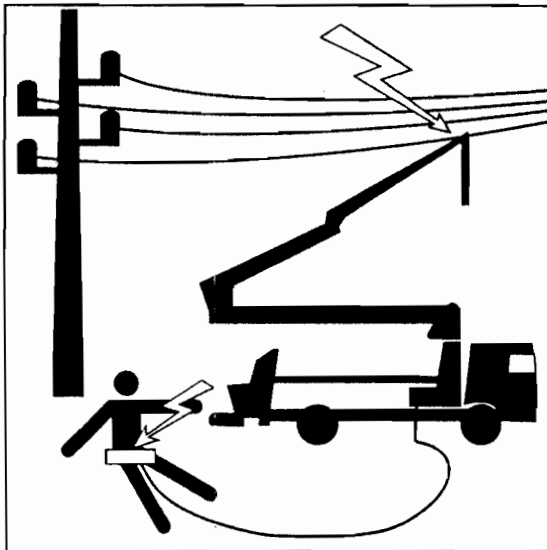
11. LITTLE BIT



12. ADD WATER 4-GALLONS



13. ALL DONE CLEAN UP



# ! DANGER

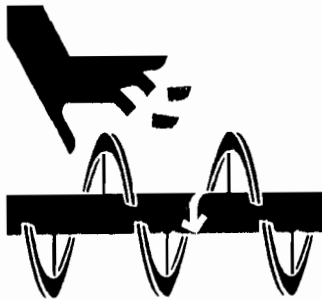
Electrocution hazard.  
Stay back from  
high voltage wires  
at least 17 feet  
(5 meters).

800913

(X)

33

# ! WARNING



Keep hands out  
of hopper and  
valve assembly.  
See operation  
manual if access  
is required.

800917

(Z)

36

# ! WARNING

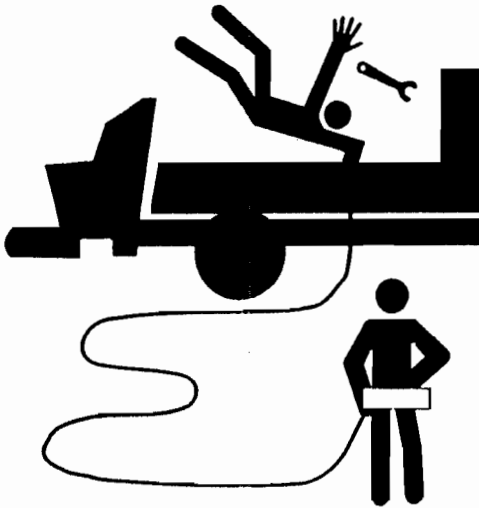


Do not stand on  
hopper grates.

800918

(Y)

35



### **! WARNING**

**This machine is remote controlled and may start at any time. Stop engine before servicing unit.**

800924

AA

37



### **! WARNING**

**Use retaining pins in all delivery system snap clamps.**

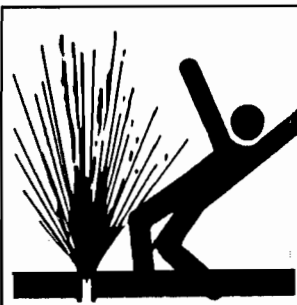
800923

AD

40



38



### **! WARNING**

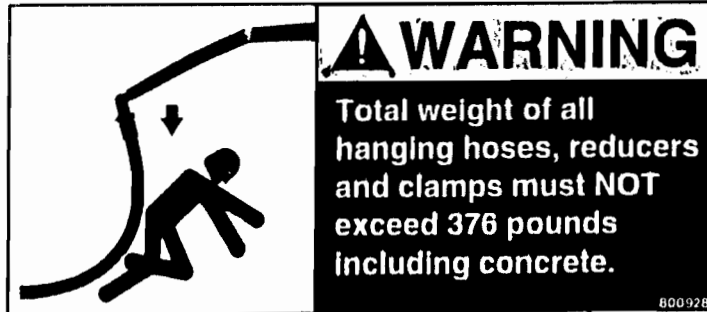
**Before opening a blocked pipeline, relieve pressure by reversing pump. See manual.**

800922

39

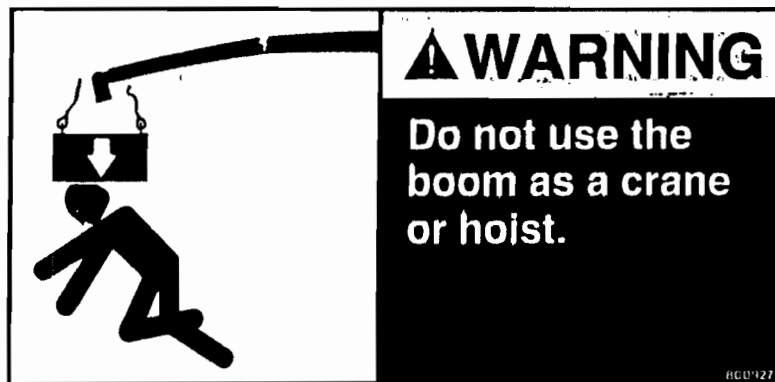
AC

AB



AE

41



AF

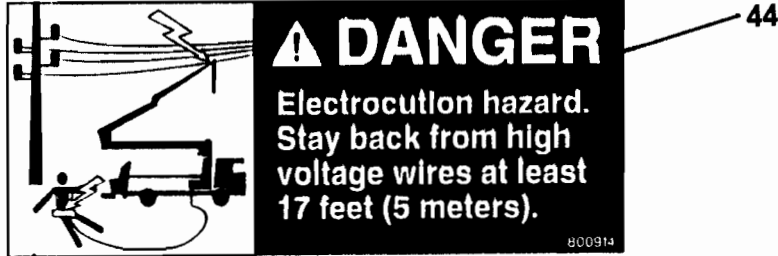
42



AG

43

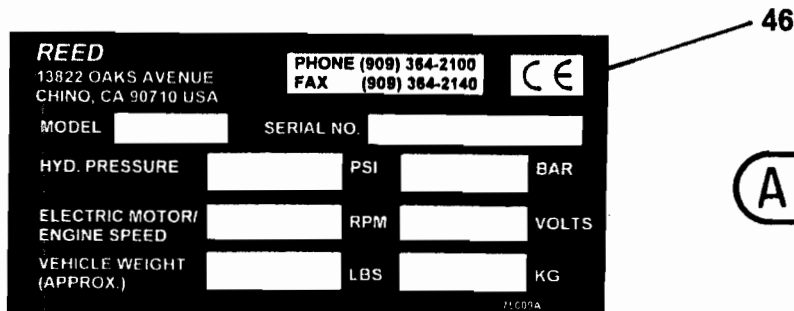




AH



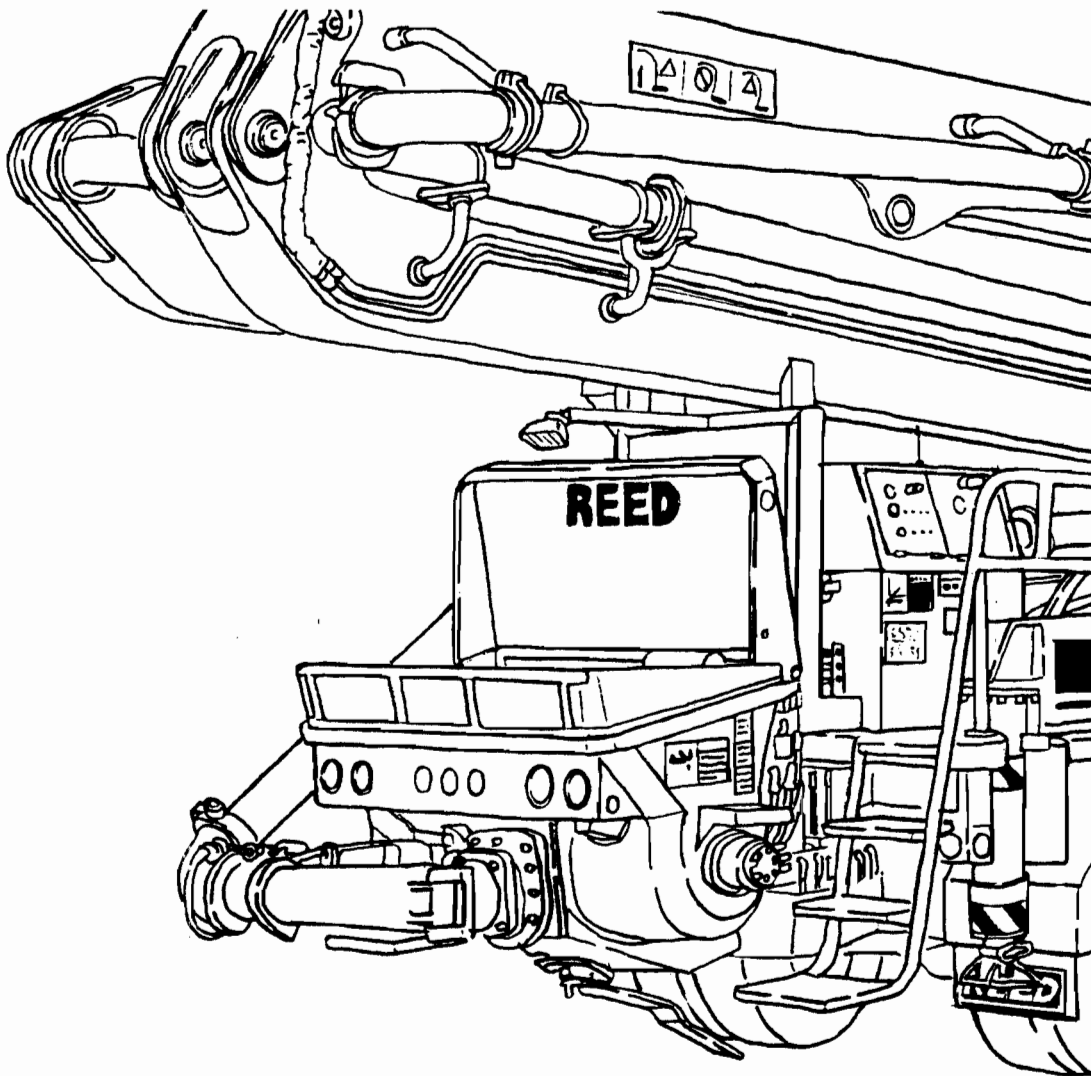
AJ



AK

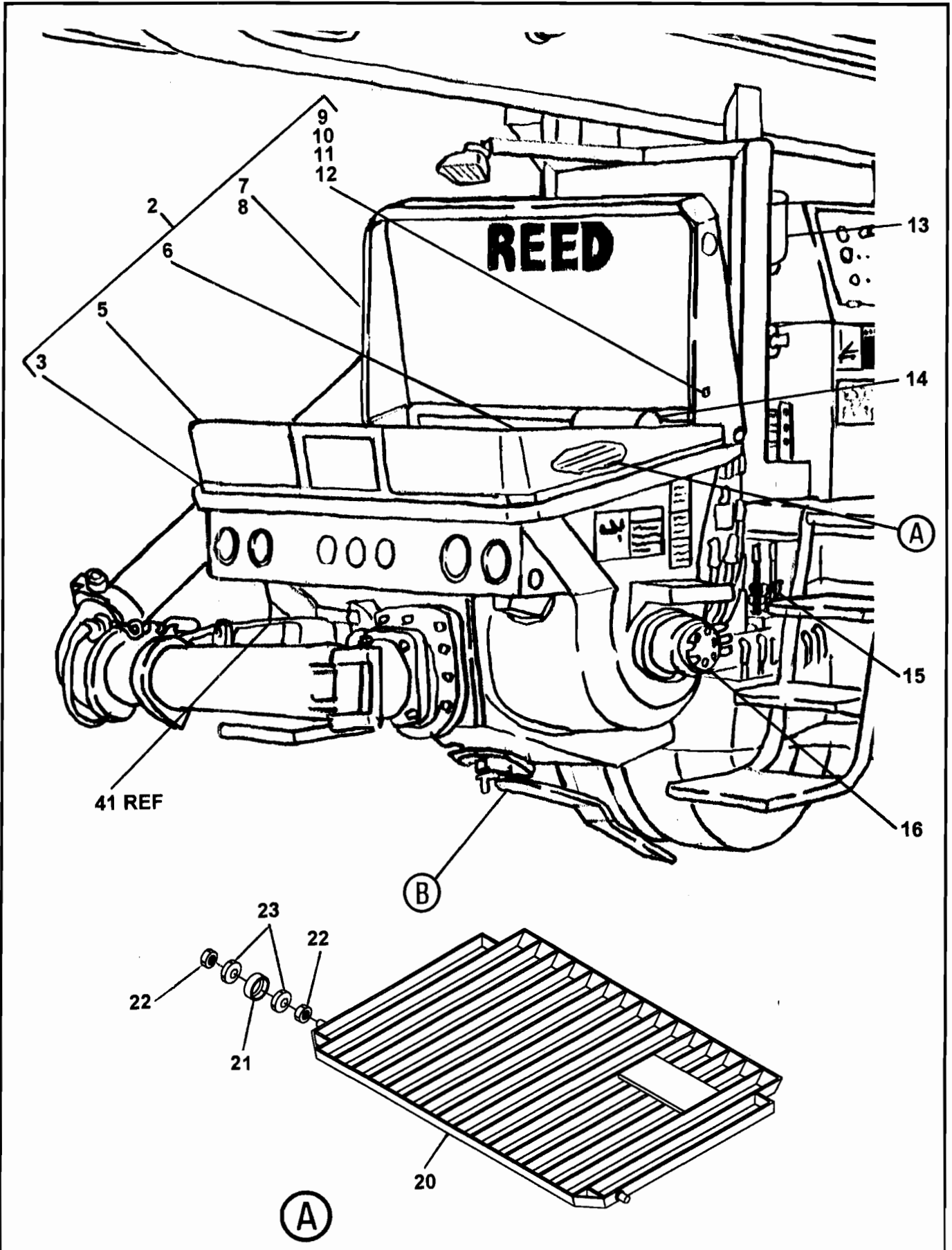
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	10-02	Assembly, Decal (See Group 10, Figure 01 for NHA)					Ref
2	800442	• Decal, <b>REED</b> , 6 Inch Black					1
3	C-4V107	• Plate, Danger Of Falling Object					1
4	C-4V106	• Plate, Never Use As Crane					1
5	C-4V105	• Plate, Death Hazard					1
6	801069	• Decal, <b>REED</b> , 12 Inch White					2
7	C-4V120	• Plate, Hydraulic Distributor					1
8	C-9V111	• Decal, Right Side Stabilizers					1
9	C-9V112	• Decal, Left Side Stabilizers					1
10	801068	• Decal, <b>XXT</b> , 5 Inch White					2
-11		• Decal, <b>XXT</b> , 5 Inch Optional Color					2
12	801070	• Decal, <b>32</b> , 8 Inch White					2
-13		• Decal, <b>32</b> , 8 Inch Optional Color					2
14	C-4V113	• Decal, <b>A</b> Letter Adhesive					1
15	C-4V115	• Decal, <b>C</b> Letter Adhesive					1
16	C-4V116	• Decal, <b>D</b> Letter Adhesive					1
17	C-4V114	• Decal, <b>B</b> Letter Adhesive					1
-18	800766	• Kit, <b>XXT 32</b> Decal					1
19	800051	•• Nameplate, PTO					1
20	800059	•• Plate, PTO Operation					1
21	800034	•• Decal, Oil Level					2
22	800033	•• Decal, Water					1
23	800915	•• Decal, Danger, Stay Clear					1
24	800919	•• Decal, Warning, Stand Clear of Outriggers when activating					4
-25	800920	•• Decal, Warning, Clear Area Before Activating Outriggers					2
26	800439	•• Decal, Control Box Panel					1
27	801113	•• Decal, Gauge					1
28		•• Decal, A B					1
29	800926	•• Decal, Warning, Do Not Operate This Machine without					1
30	800929	•• Decal, Warning					1
31	800925	•• Decal, Warning, Do Not Operate This Machine without					1
32	800930	•• Decal, <b>ACPA</b> Hand Signals					1
33	800913	•• Decal, Danger, Electrocutation Hazard					1
34	800875	•• Nameplate, Agitator / Water					1
35	800918	•• Decal, Warning, Do Not Stand on Hopper Grate					2
36	800917	•• Decal, Warning, Keep Hand Out of Hopper and Valve					2
37	800924	•• Decal, Warning, This Machine is Remote Controlled and					1
38	800931	•• Decal, <b>ACPA</b> Member					1
39	800922	•• Decal, Warning, Before Opening a Blocked Pipeline,					1
40	800923	•• Decal, Warning, Use Retaining Pins in all Delivery					1
41	800928	•• Decal, Warning, Total Weight of all Hanging Hoses,					1
42	800927	•• Decal, Warning, Do Not Use the Boom as a Crane					1
43	800921	•• Decal, Warning, Do Not Operate at Pressures Exceeding					1
-44	800914	•• Decal, Danger, Electrocutation Hazard					1
-45	800916	•• Decal, Warning, Keep Hand Out of Water Box					1
46	75009	•• Nameplate, <b>REED</b> , Serial No.					1

DASH (-) ITEM NOT ILLUSTRATED



**REED TRUCK MOUNTED CONCRETE BOOM PUMP MODEL XXT 32 ILLUSTRATED PARTS MANUAL GROUP 20 HOPPER INSTALLATION CONTAINS THE FOLLOWING FIGURES:**

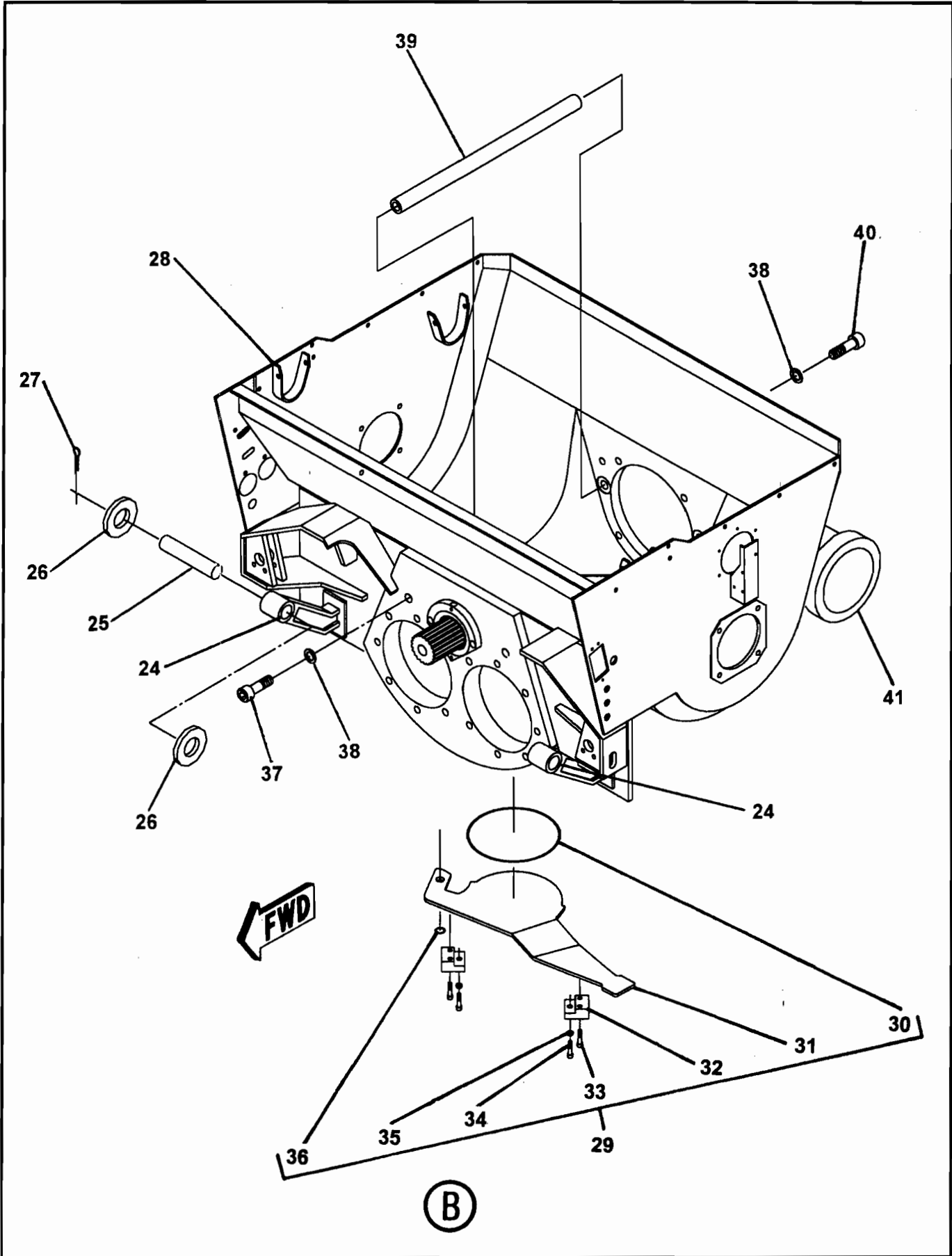
- |                  |                                      |
|------------------|--------------------------------------|
| <b>FIGURE 00</b> | <b>TABLE OF CONTENTS</b>             |
| <b>FIGURE 01</b> | <b>HOPPER INSTALLATION</b>           |
| <b>FIGURE 02</b> | <b>LUBRICATION PUMP ASSEMBLY</b>     |
| <b>FIGURE 03</b> | <b>CENTRAL LUBRICATION SYSTEM</b>    |
| <b>FIGURE 04</b> | <b>HOPPER VIBRATION ASSEMBLY</b>     |
| <b>FIGURE 05</b> | <b>AGITATOR ASSEMBLY</b>             |
| <b>FIGURE 06</b> | <b>AGITATOR DRIVE MOTOR ASSEMBLY</b> |
| <b>FIGURE 07</b> | <b>HOPPER OUTLET ASSEMBLY</b>        |



ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	20-01	Installation, Hopper (See Group 10, Figure 01 for NHA)	Ref
2	800419	• Group, Splash Guard	1
3	800398	• • Bar, Splash Guard	1
-4	800402	• • Strip, Silicon 0.53	1
5	800399	• • Rubber Flap, Splash Guard	1
6	800416	• • Rubber, Splash Guard 10 FT	1
7	79056	• • Handle, Splash Guard	1
8	800395	• • Weldment, Splash Guard	1
9	800400	• • Pivot plate, Splash Guard	2
10	800401	• • Plunger, Spring	2
11	800417	• • Pin	1
12	800418	• • Lanyard	1
13	B-183000	• Assembly, Central Lubrication System (See Group 20, Figure 02 for DET)	1
14	71429	• Assembly, Hopper Vibration (See Group 20, Figure 04 for DET)	1
15	W-100124	• Assembly, Agitator/Wash Control Valve	1
-16	B-254120	• Assembly, Agitator (See Group 20, Figure 05 for DET)	1
-17	W-104067	• Buffer, Grid Rubber	4
-18	W-101559	• Washer (attaching parts)	4
19	W-101847	• Nut, Cap (attaching parts)	8
20	B-224035	• Grid	1
21	W101849	• Buffer, Rubber	2
22	W-101559	• Washer	4
23	B-223011	• Nut, Cap	4

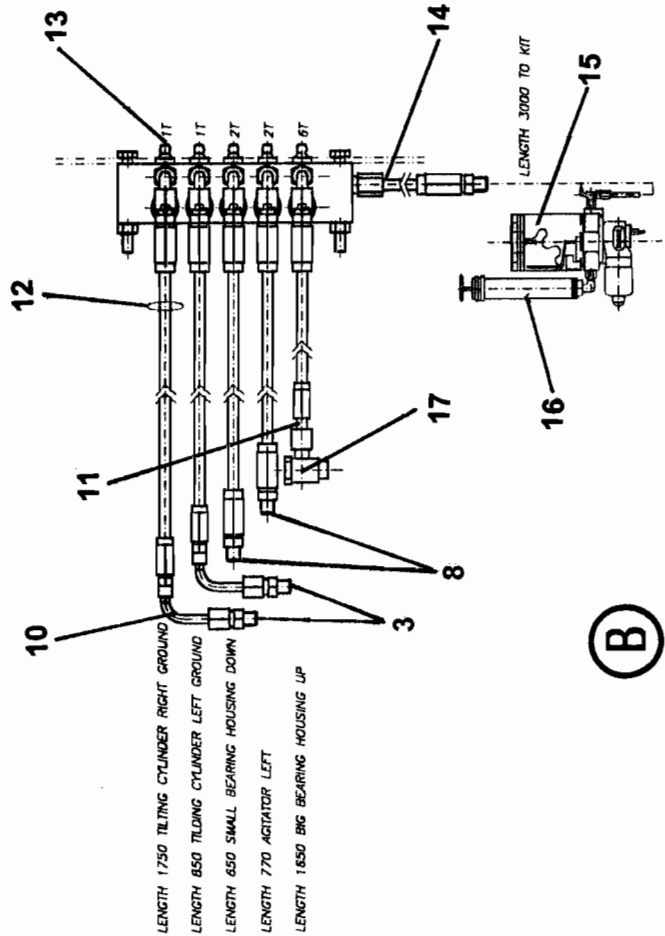
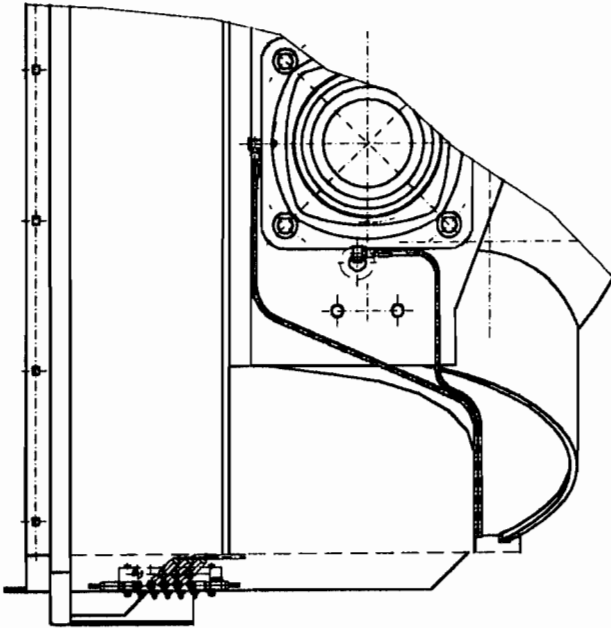
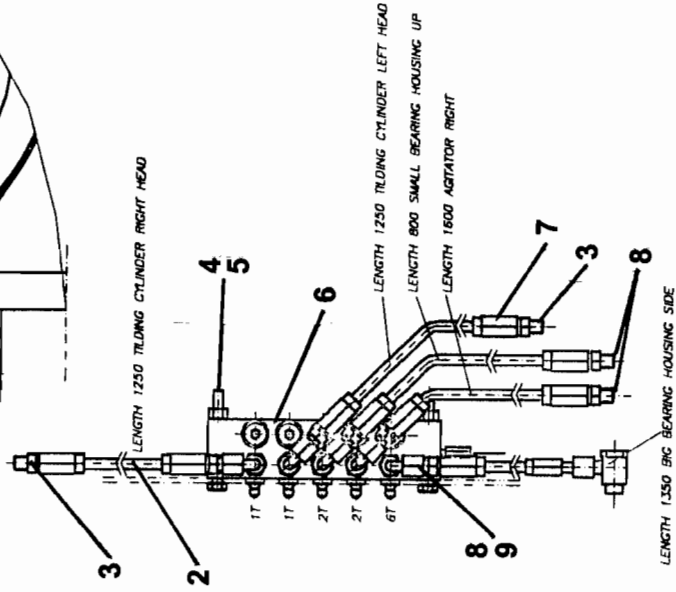
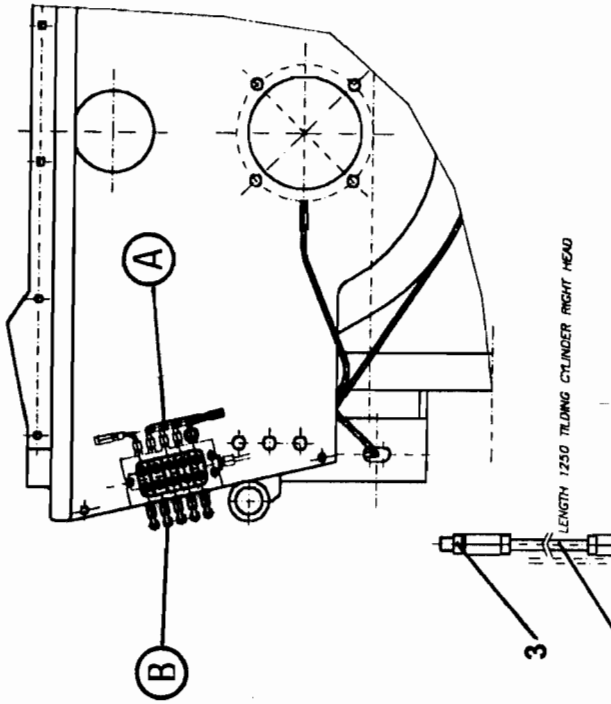
DASH (-) ITEM NOT ILLUSTRATED

## HOPPER INSTALLATION



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
24	W-102489	• Buffer, Rubber					2
25	W-100940	• Pin					2
26	W-103411	• Washer					4
27		• Pin, Cotter					4
28	B-173021	• Weldment, Hopper					1
29	B-173085	• Assembly, Cleaning Cover					1
30	W-102908	• • O-Ring, Round Cord					1
31	B-172130	• • Cover, Cleaning					1
32	B-172126	• • Block, Clamping					2
33	W-102855	• • Screw, M20 (attaching parts)					4
34	B-172218	• • Screw, M20 (attaching parts)					2
35	W-102891	• • Nut, Hex M20 (attaching parts)					2
36	W-102864	• • Ring, Lock					1
37	W-103074	• Screw, Hex					2
38	W-102331	• Washer					4
39	B-174075	• Rod, Tie					2
40	W-103073	• Screw, Hex M24					2
41	20-07	• Assembly, Hopper Outlet (See Group 20, Figure 07 for DET)					1

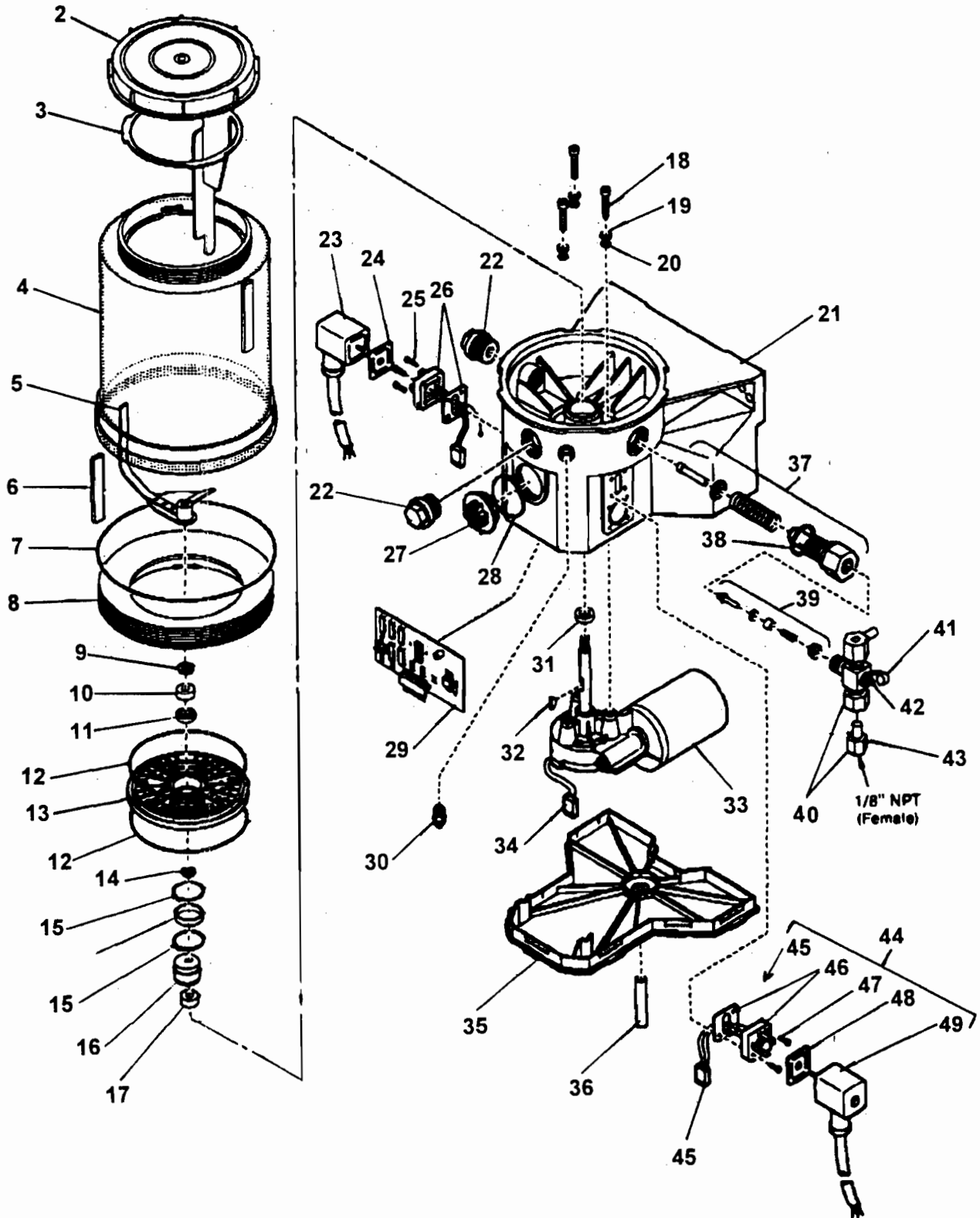
DASH (-) ITEM NOT ILLUSTRATED





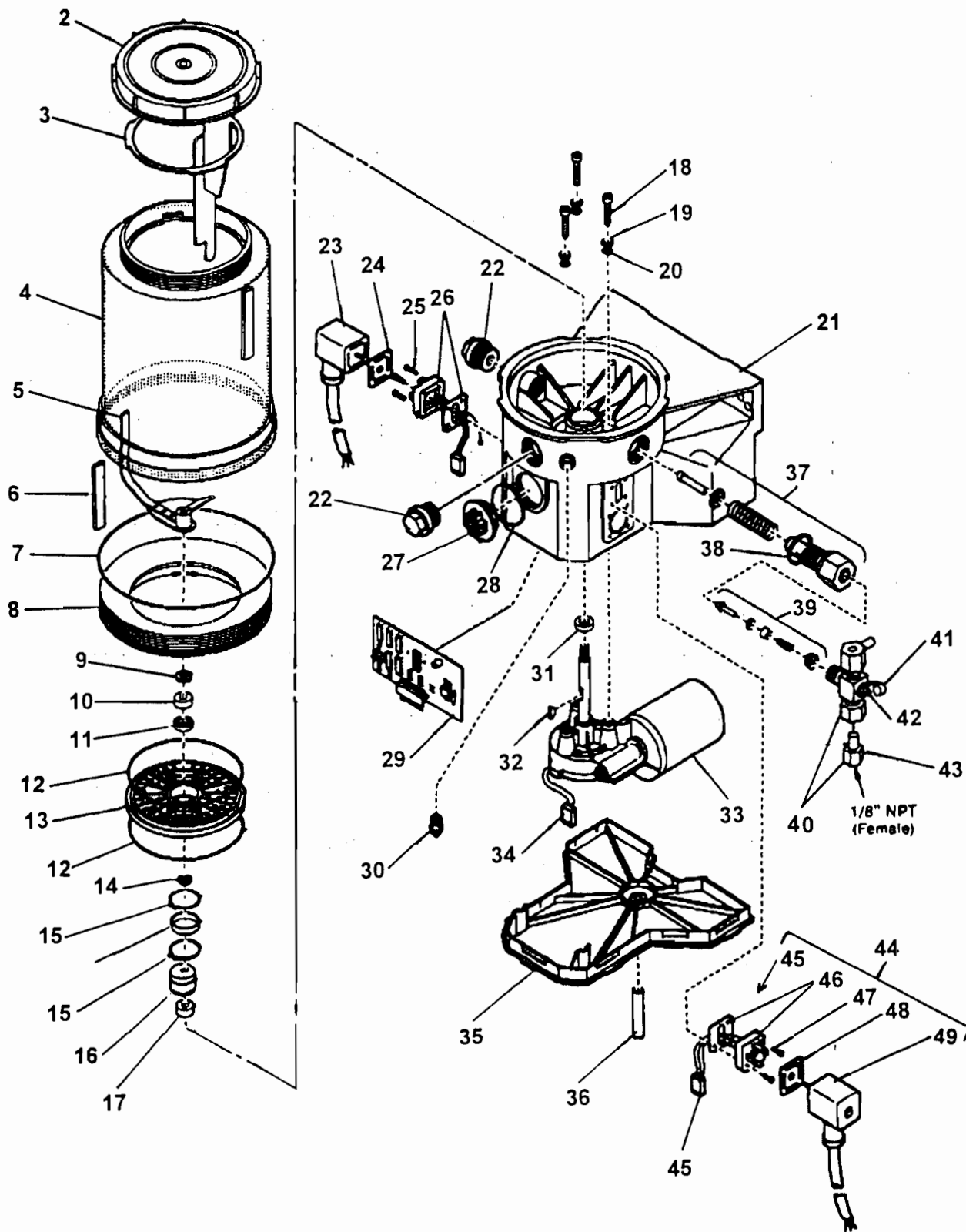
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	B-183000	System, Central Lubrication (See Group 20, Figure 01 for NHA)					Ref
2	W-100255	• Pipe, Plastic					1
3	W-102603	• Coupling, Straight Male Stud					4
4	W-103512	• Screw, Hex					3
5	W-102131	• Nut, Lock					3
6	W-102602	• Distributor, Lubrication					1
7	W-100254	• Sleeve, Threaded					22
8	W-100548	• Coupling, Straight Male Stud					5
9	W-102664	• Elbow, Adjustable					10
10	W-100643	• Sleeve, Threaded					2
11	W-100253	• Piece, Hose Connection					20
12	W-103137	• Tie, Cable					30
13	W-100303	• Nipple, Grease					10
14	W-102665	• Coupling, Straight Male Stud					1
15	800065	• Assembly, Lubrication Pump (See Group 20, Figure 03 for DET)					1
16	78532	• Gun, Grease					1
17	W-102884	• Elbow, Throttle Free benjo					2

DASH (-) ITEM NOT ILLUSTRATED



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	800065	Assembly, Lubrication Pump (See Group 20, Figure 02 for NHA)					Ref
2		• Lid					1
3		• Paddle, Fixed					1
4		• Reservoir					1
5		• Paddle, Stirring					1
6		• Hose					1
7		• O-Ring					1
8		• Adapter					1
9		• Washer					1
10		• Ring, Bearing					2
11		• Bearing					1
12		• O-Ring					2
13		• Plate, Intermediate					1
14		• Shim					1
15		• Ring, Snap					2
16		• Ring, Inner					1
17		• Cam, Eccentric					1
18		• Screw					3
19		• Washer					3
20		• O-Ring					3
21		• Housing, Pump					1
22		• Plug, Closure					2
23		• Socket with Cord					1
24		• Packing, Flat					1
25		• Screw					4
26		• Plug					1
27		• Plug, Sealing					1
28		• O-Ring					1
29		• Board, Printed Circuit					1
30		• Fitting, Grease					1
31		• Seal, Radial					1
32		• Key, Wood Ruff					1
33		• Motor, 12 VDC					1
34		• Plug, Motor					1
35		• Cover, Housing					1

DASH (-) ITEM NOT ILLUSTRATED



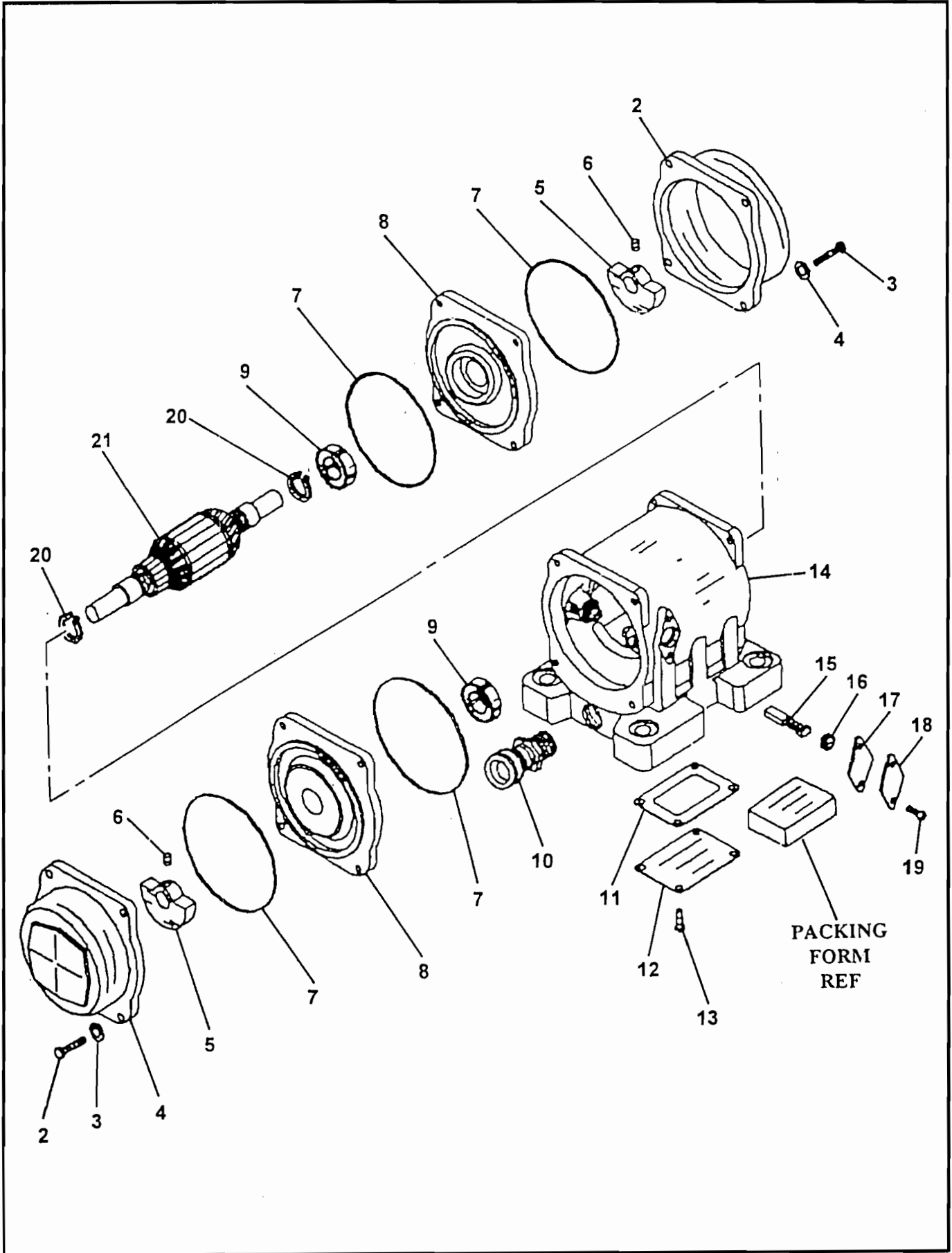


# LUBRICATION PUMP ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 20  
FIGURE 03  
PAGE 04

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
36		•	Hose				1
37		•	Element, Pump				1
38		•	Gasket				1
39		•	Valve, Check				1
40		•	Assembly, Pressure Release				1
41		•	Cap, Grease				1
42		•	Fitting, Grease				1
43		•	Adapter for Relief				1
44		•	Assembly, Optional Pressure Relief Valve				1
45		• •	Cord, Optional Power				1
46		• •	Plug, Optional				1
47		• •	Screw, Optional				4
48		• •	Packing, Optional Flat				1
49		• •	Socket, Optional				1

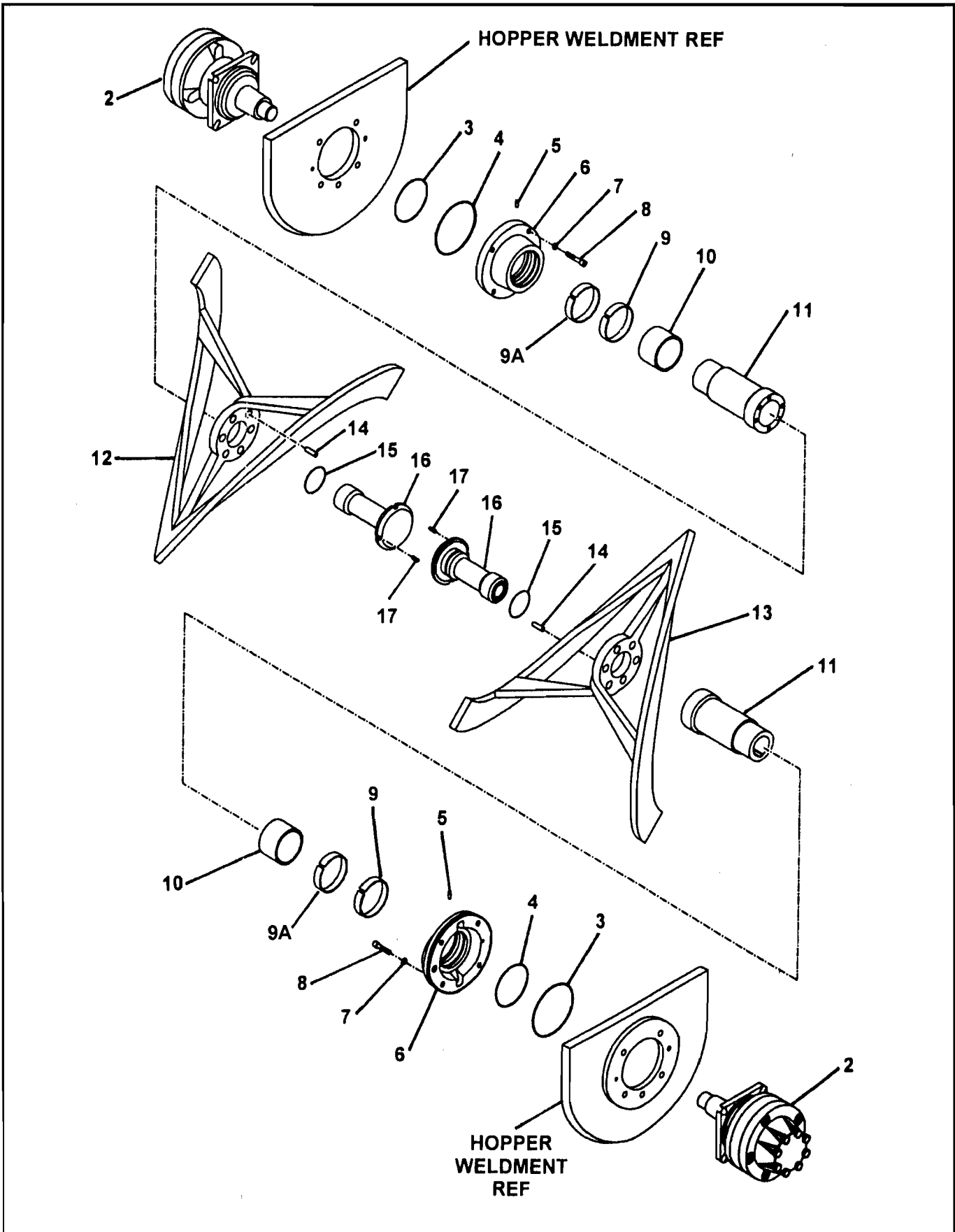
DASH (-) ITEM NOT ILLUSTRATED



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	71429	Assembly, Hopper Vibrator (See Group 20, Figure 01 for NHA)					Ref
2		• Cap, End					2
3		• Bolt (attaching parts)					8
4		• Washer, Lock (attaching parts)					8
5		• Weight					2
6		• Screw, Set (attaching parts)					2
7		• O-Ring					4
8		• Bell, End					2
9		• Bearing					2
10		• Holder, Cord					1
11		• Gasket					1
12		• Cover, Box					1
13		• Screw (attaching parts)					4
14		• Sub-Assembly, Housing					1
15		• Brush					1
16		• Cap, Brush					2
17		• Gasket					2
18		• Cover, Brush					2
19		• Screw (attaching parts)					4
20		• Ring, Snap					2
21		• Assembly, Armature					1

DASH (-) ITEM NOT ILLUSTRATED

## AGITATOR ASSEMBLY





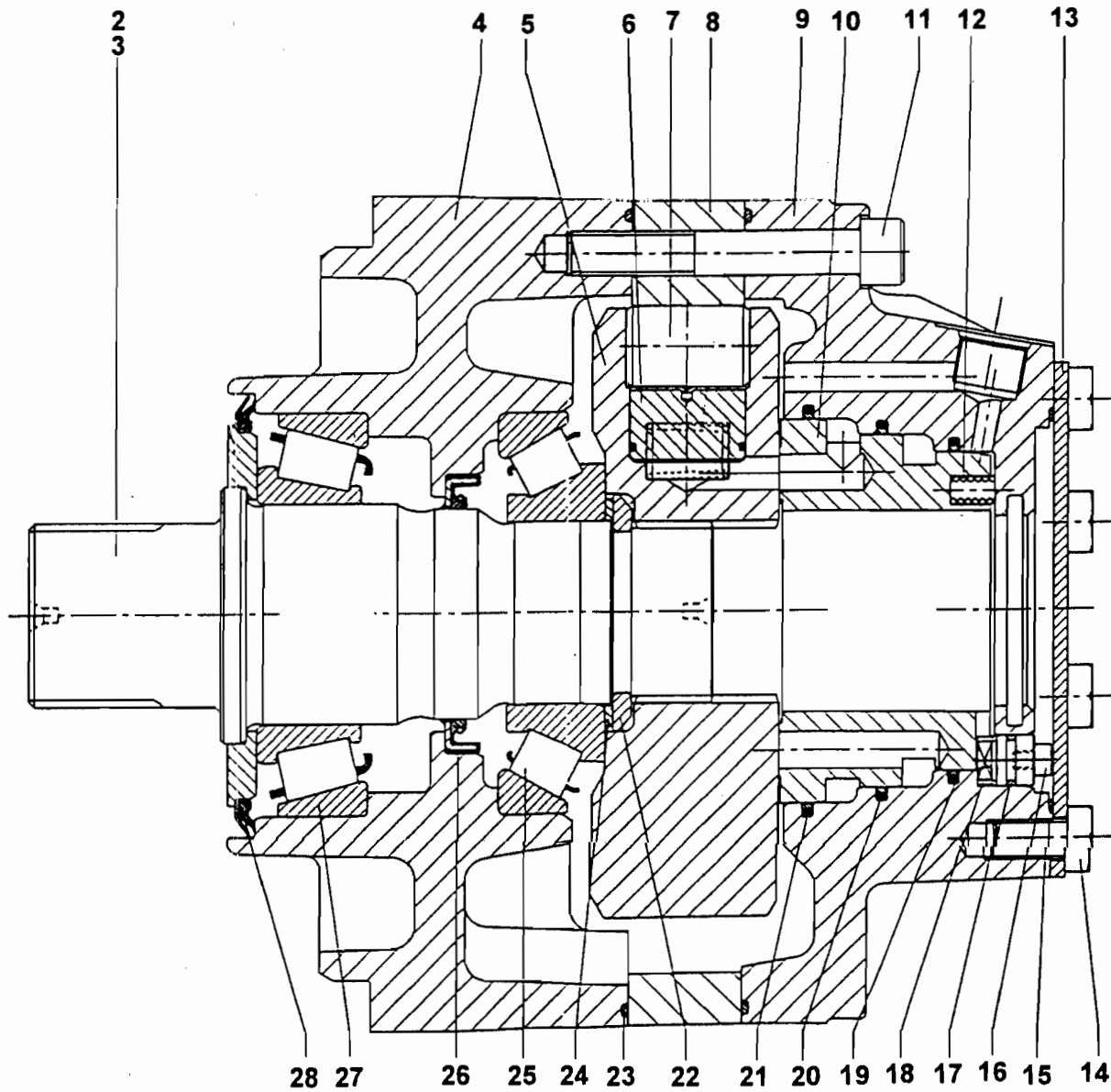
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	B-254120	Assembly, Agitator (See Group 20, Figure 01 for NHA)					Ref
2	W-101240	• Assembly, Agitator Drive Motor (See Group 20, Figure 08 for DET)					1
3	W-103064	• O-Ring					2
4	W-103063	• O-Ring					2
5	W-1004909	• Screw, M5 Set					2
6	B-254101	• Assembly, Flange					2
7	W-102962	• Washer					8
8	W-103062	• Screw, M12 Hex					8
9	W-102544	• Ring, Groove-Outer					2
9A	B-253029	• Ring, Groove-Inner					2
10	B-254104	• Sleeve, Wear					2
11	B-254102	• Shaft					2
12	B-254105	• Agitator, Left					1
13	B-254106	• Agitator, Right					1
14	W-103065	• Pin 10m					12
15	W-103249	• O-Ring					2
16	B-254103	• Nut					2
17	W-103106	• Sleeve, Clamping					4

DASH (-) ITEM NOT ILLUSTRATED



# AGITATOR DRIVE MOTOR ASSEMBLY

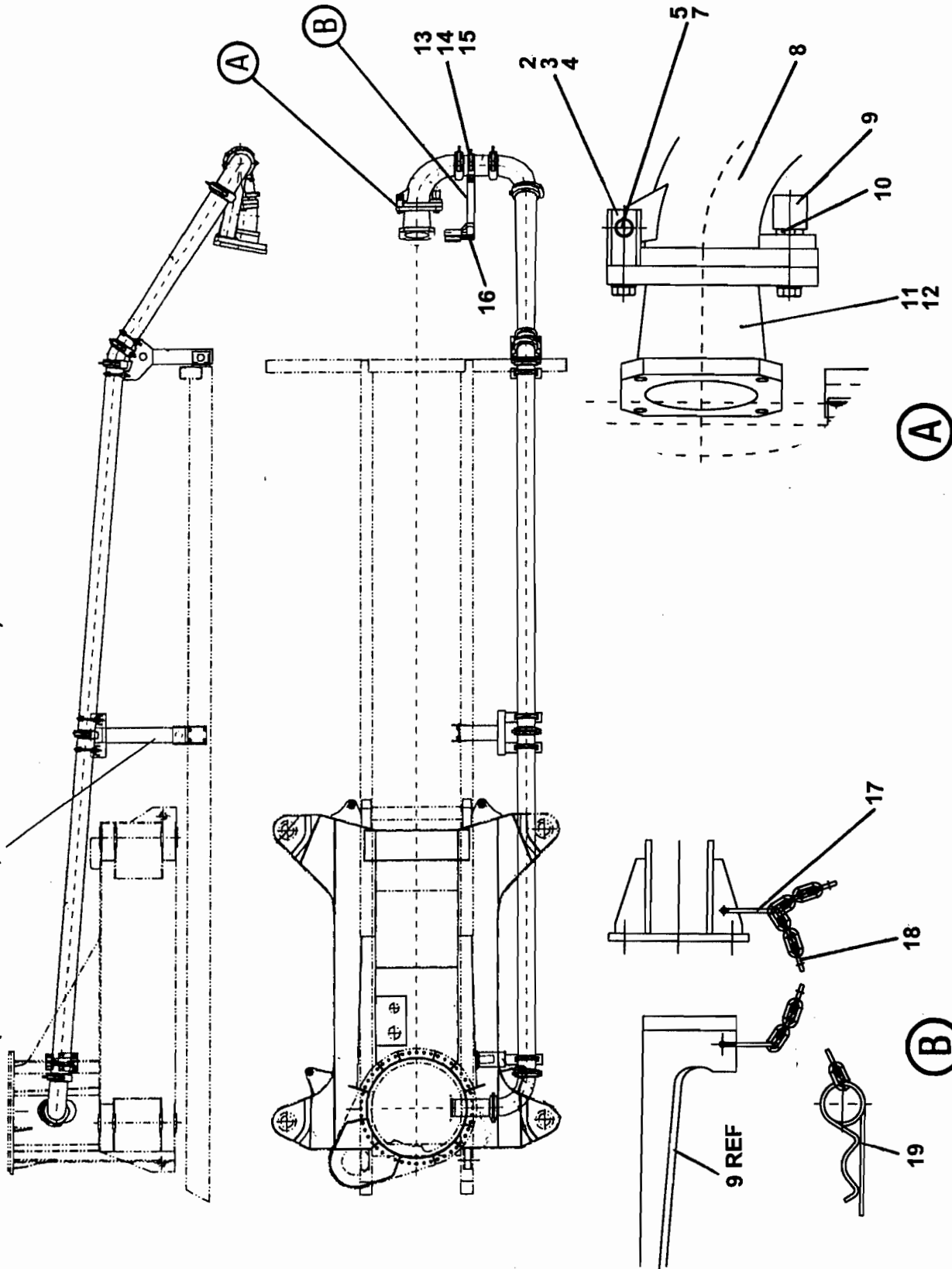
XXT 32  
PARTS  
GROUP 20  
FIGURE 06  
PAGE 01



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-101240	Assembly, Agitator Drive Motor (See Group 20, Figure 05 for NHA)					Ref
2		• Assembly, Auger Drive Motor					1
3		• Shaft					1
4		• Case, Front					1
5		• Block, Cylinder					1
6		• Piston					8
7		• Roller					8
8		• Cam					1
9		• Case, Rear					1
10		• Ring, Distributor					1
11		• Screw, Cap M12					12
12		• Spring					6
13		• Plate, Cover					1
14		• Screw, Hex M10					8
15		• O-Ring					1
16		• Screw, Cap M5					1
17		• O-Ring					1
18		• Pin, Stop					1
19		• Seal, Rod					1
20		• Seal, Rod					1
21		• Seal, Rod					1
22		• Ring, Split					1
23		• O-Ring					2
24		• Washer					1
25		• Bearing					1
26		• Seal, Shaft					1
27		• Bearing					1
28		• Seal, Face					1

DASH (-) ITEM NOT ILLUSTRATED

CONCRETE DECK PIPE LINE ASSEMBLY  
(SEE GROUP 90, FIGURE 10 FOR REF)



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	20-07	Assembly, Hopper Outlet (See Group 20, Figure 01 for NHA)					Ref
2	B-194049	• Hinge					2
3	W-102848	• Screw, M24 Hex Head					3
4	W-102331	• Washer					3
5	W-100694	• Ring, Snap					2
-6	B-194065	• Sub- Assembly, Hopper Outlet					1
7	B-194050	• • Bolt					1
8	B-191015	• • Elbow, Reducer					1
9	B-194046	• • Wedge, Locking					1
10	B-194045	• • Bolt, Locking					1
11	B-191010	• • Reducer					1
12	W-104025	• • O-Ring, Hopper Elbow					1
13	W-101779	• • Coupling, 6 Inch Clamp					3
14	W-100690	• • Elbow, 6 Inch					1
15	W-101545	• • O-Ring					3
16	B-194053	• • Coupling, Delivery Line Snap					1
17	W-103731	• S-Hook					2
18	W-103732	• Chain					1
19	W-103733	• Pin, Spring					1

DASH (-) ITEM NOT ILLUSTRATED

**REED**

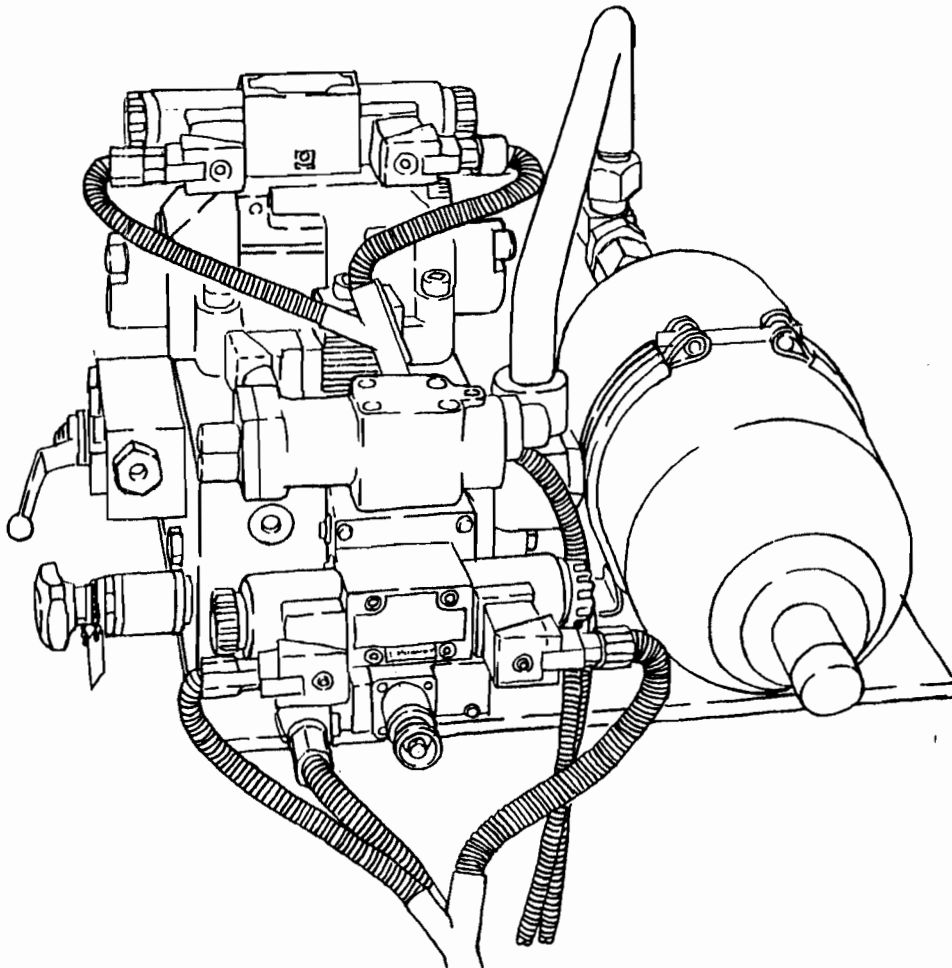
**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

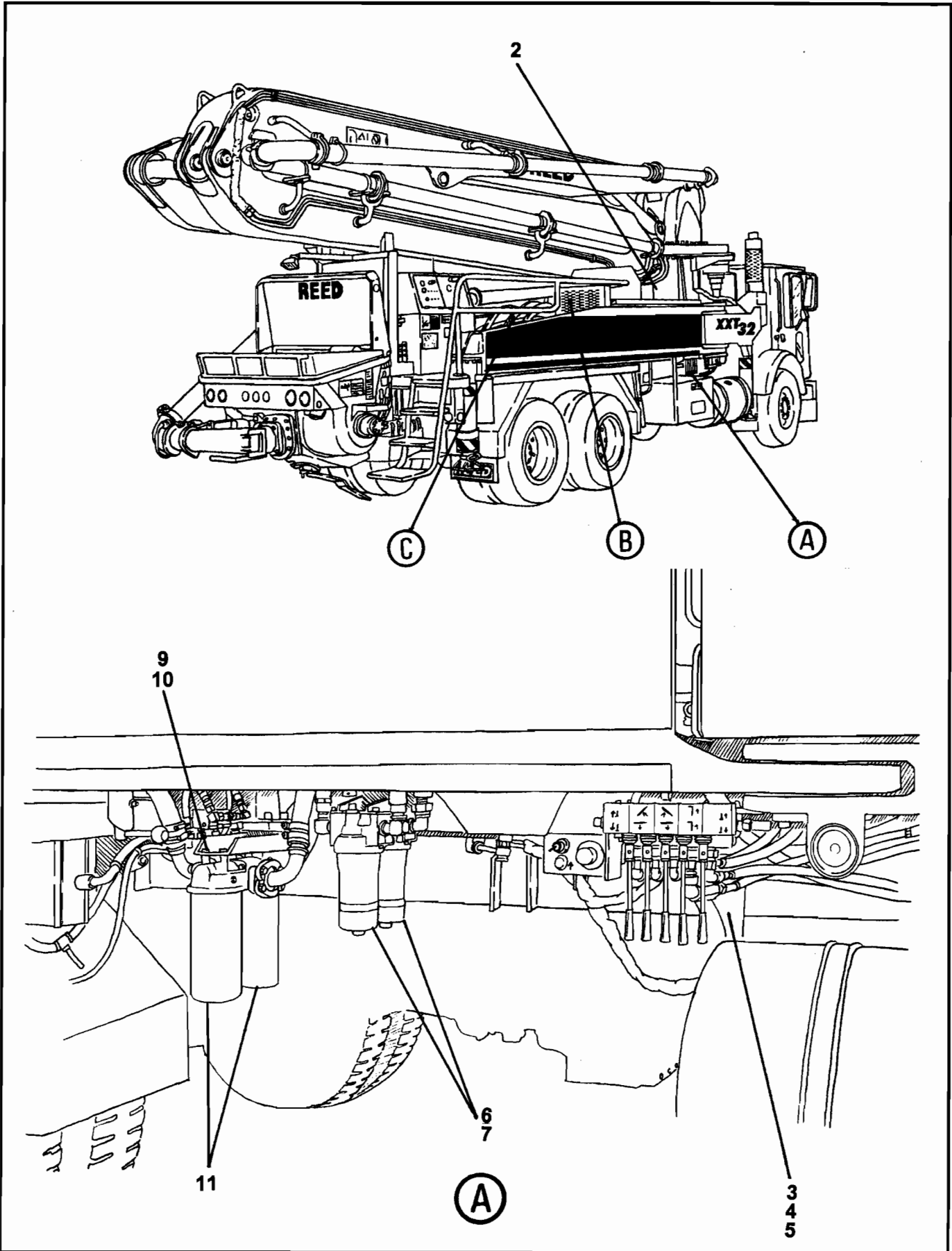
**XXT 32  
PARTS  
GROUP 20  
FIGURE 08  
PAGE 01**

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**REED** TRUCK MOUNTED CONCRETE BOOM PUMP MODEL **XXT 32** ILLUSTRATED PARTS MANUAL GROUP 30 HYDRAULIC TANK INSTALLATION CONTAINS THE FOLLOWING FIGURES:

- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** TANK INSTALLATION
- FIGURE 02** WATER SYSTEM GROUP
- FIGURE 03** WASH WATER PUMP ASSEMBLY
- FIGURE 04** WATER PUMP MOTOR ASSEMBLY

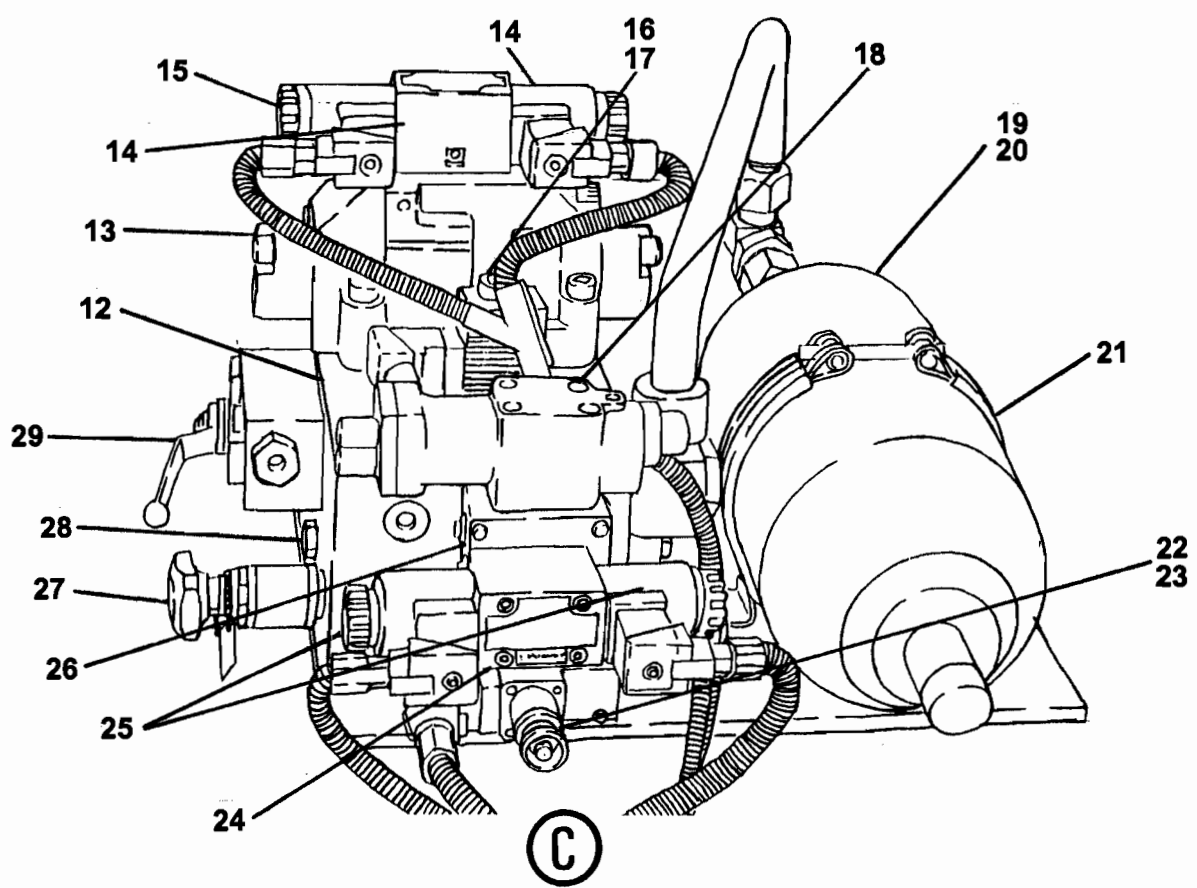
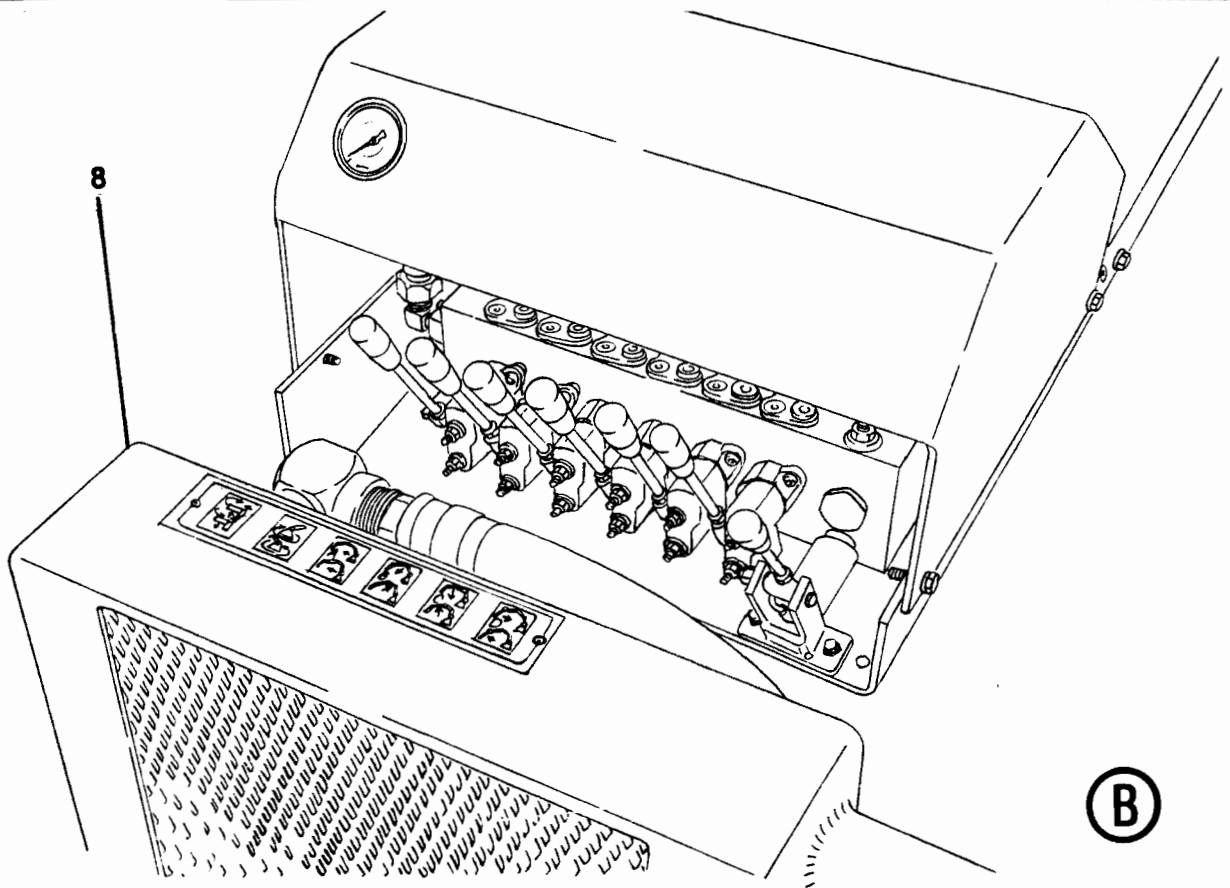






ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	30-01	Installation, Tank (See Group 10, Figure 01 for NHA)					Ref
-2	800750	• Group, Water System (See Group 30, Figure 02 for DET)					1
3	W-105526	• Assembly, Boom High Pressure Filter					1
4	W-105527	• • Element, Boom High Pressure Filter					1
5	W-105556	• Indicator, Boom High Pressure Filter Visual Clogging					1
6	73300	• Assembly, Hydraulic Filter					2
7	73303	• • Element, Hydraulic Filter					1
8	800651	• Assembly, Hydraulic Oil Cooler					1
9	79276	• Gauge, Return Filter Indicator					2
10	79245	• Assembly, Return Filter					1
11	79269	• • Element, Return Filter					2
12	W-104847	• Assembly, Swing Tube Manifold					1
13	W-105573	• Assembly, Swing Tube Circuit Solenoid Valve					1
14	W-105581	• • Pilot, Solenoid Valve					1
15	W-105576	• • • Coil, Swing Tube Circuit Solenoid Valve					2
16	W-105572	• Cartridge, Solenoid Valve					1
17	W-105605	• • Coil					1
18	W-105579	• Valve, HP Limiter					1
19	W-103616	• Accumulator					1
20	71460	• Kit, Accumulator Charge (Optional Item) (See Group 80, Figure 02 for REF)					1
21	73171	• Bracket, Accumulator					A/R
22	W-105582	• Valve, Proportional Pilot					1
23	W-105606	• • Coil					1
24	W-105581	• Assembly, Pump Control Solenoid Valve					1
25	W-105576	• • Coil, Pump Control Solenoid Valve					2
26	W-104846	• Assembly, Pump Control Manifold					1
27	W-105570	• Cartridge, Relief Valve					1
28	W-105577	• Cartridge, Check Valve					1
29	W-105578	• Valve, Ball					1

DASH (-) ITEM NOT ILLUSTRATED



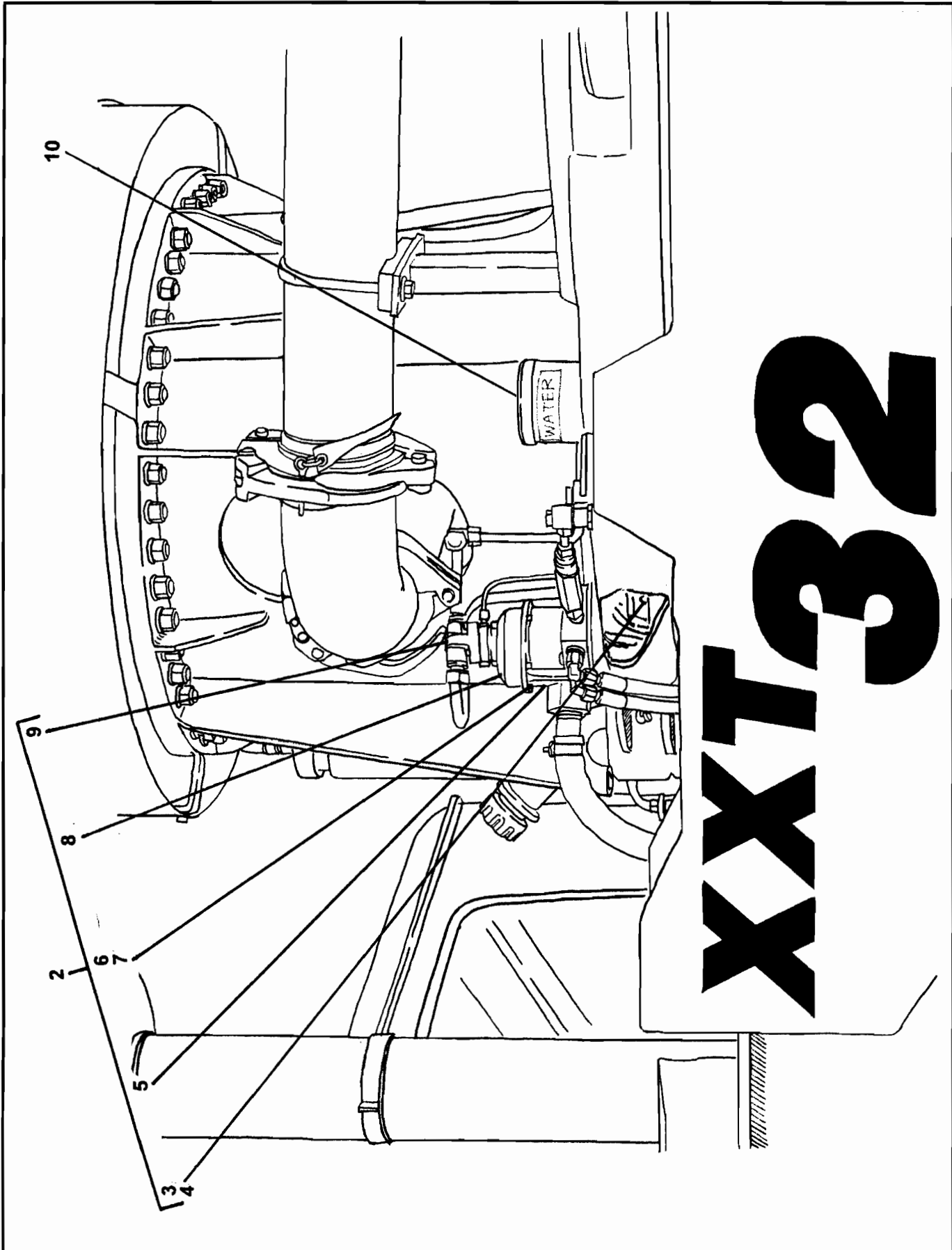
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	30-01	Installation, Tank (See Group 10, Figure 01 for NHA)					Ref
-2	800750	• Group, Water System (See Group 30, Figure 02 for DET)					1
3	W-105526	• Assembly, Boom High Pressure Filter					1
4	W-105527	• • Element, Boom High Pressure Filter					1
5	W-105556	• Indicator, Boom High Pressure Filter Visual Clogging					1
6	73300	• Assembly, Hydraulic Filter					2
7	73303	• • Element, Hydraulic Filter					1
8	800651	• Assembly, Hydraulic Oil Cooler					1
9	79276	• Gauge, Return Filter Indicator					2
10	79245	• Assembly, Return Filter					1
11	79269	• • Element, Return Filter					2
12	W-104847	• Assembly, Swing Tube Manifold					1
13	W-105573	• Assembly, Swing Tube Circuit Solenoid Valve					1
14	W-105581	• • Pilot, Solenoid Valve					1
15	W-105576	• • • Coil, Swing Tube Circuit Solenoid Valve					2
16	W-105572	• Cartridge, Solenoid Valve					1
17	W-105605	• • Coil					1
18	W-105579	• Valve, HP Limiter					1
19	W-103616	• Accumulator					1
20	71460	• Kit, Accumulator Charge (Optional Item) (See Group 80, Figure 02 for REF)					1
21	73171	• Bracket, Accumulator					A/R
22	W-105582	• Valve, Proportional Pilot					1
23	W-105606	• • Coil					1
24	W-105581	• Assembly, Pump Control Solenoid Valve					1
25	W-105576	• • Coil, Pump Control Solenoid Valve					2
26	W-104846	• Assembly, Pump Control Manifold					1
27	W-105570	• Cartridge, Relief Valve					1
28	W-105577	• Cartridge, Check Valve					1
29	W-105578	• Valve, Ball					1

DASH (-) ITEM NOT ILLUSTRATED



WATER SYSTEM GROUP

XXT 32  
PARTS  
GROUP 30  
FIGURE 02  
PAGE 01



**XXT 32**

REVISION:

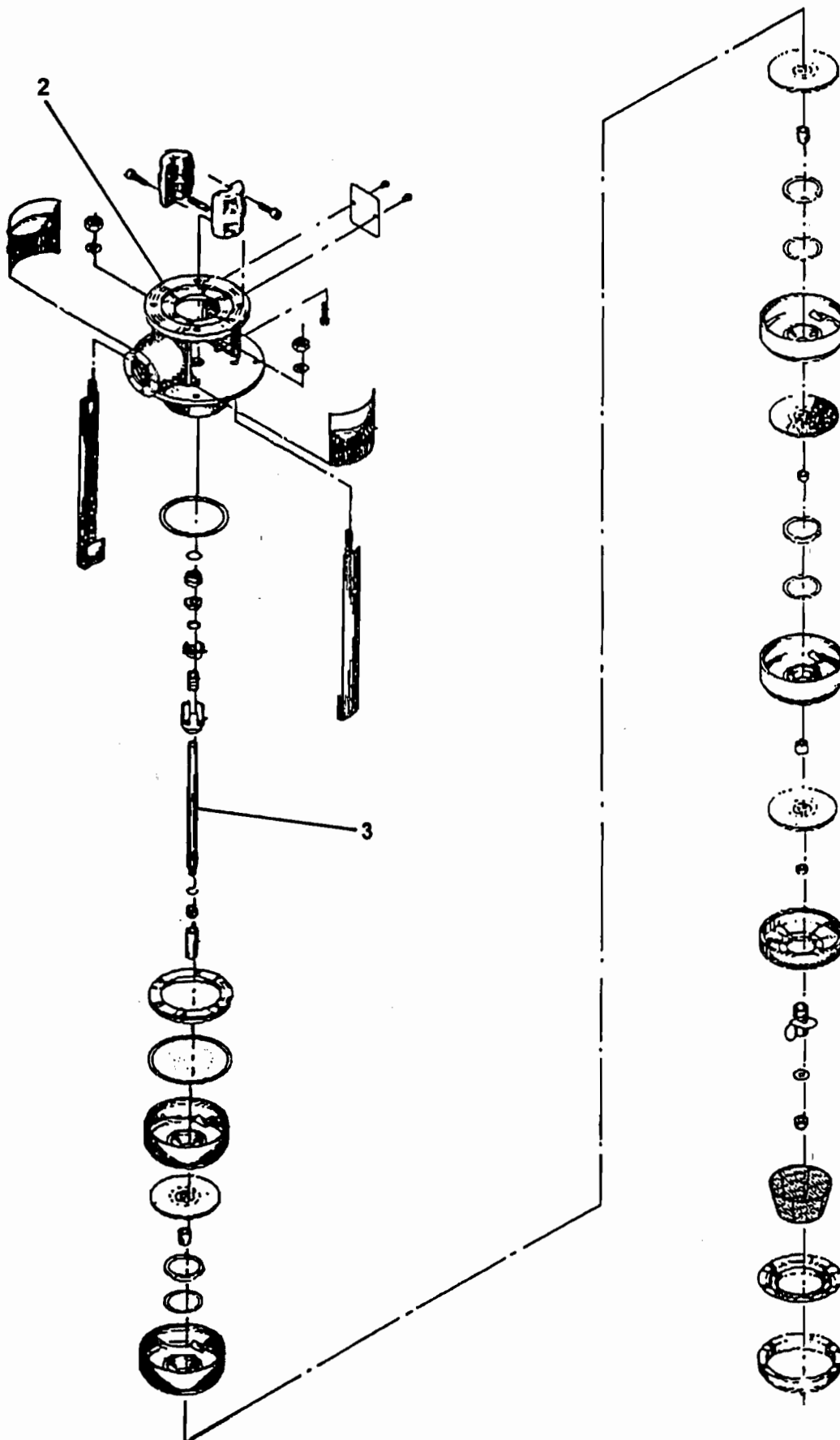
<b>ITEM NO.</b>	<b>REED'S PARTS NO.</b>	<b>1 2 3 4 5</b>	<b>DESCRIPTION</b>	<b>QTY</b>
-1	800750		Group, Water System (See Group 30, Figure 01 for NHA)	Ref
2	W-104176	•	Assembly, Water Pump And Drive	1
3	B-321502	• •	Coupling	1
4	W-103646	• •	Screw, M6	2
5	W-100122	• •	Assembly, Wash Water Pump (See Group 30, Figure 03 for DET)	1
6	W-101838	• •	Screw, M6	8
7	W-103674	• •	Washer, Spring	8
8	B-321505	• •	Flange	1
9	W-100121	• •	Assembly, Water Pump Motor (See Group 30, Figure 04 for DET)	1
10	W-103102	•	Cap, Fill	1

DASH (-) ITEM NOT ILLUSTRATED

# REED

## WASH WATER PUMP ASSEMBLY

XXT 32  
PARTS  
GROUP 30  
FIGURE 03  
PAGE 01



REVISION:

**REED****WASH WATER PUMP ASSEMBLY****XXT 32****PARTS**

GROUP 30

FIGURE 03

PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-100122	Assembly, Wash Water Pump (See Group 30, Figure 02 for NHA)					Ref
2	W-105221	• Housing, Pump					1
3	W-105222	• Shaft, Pump					1

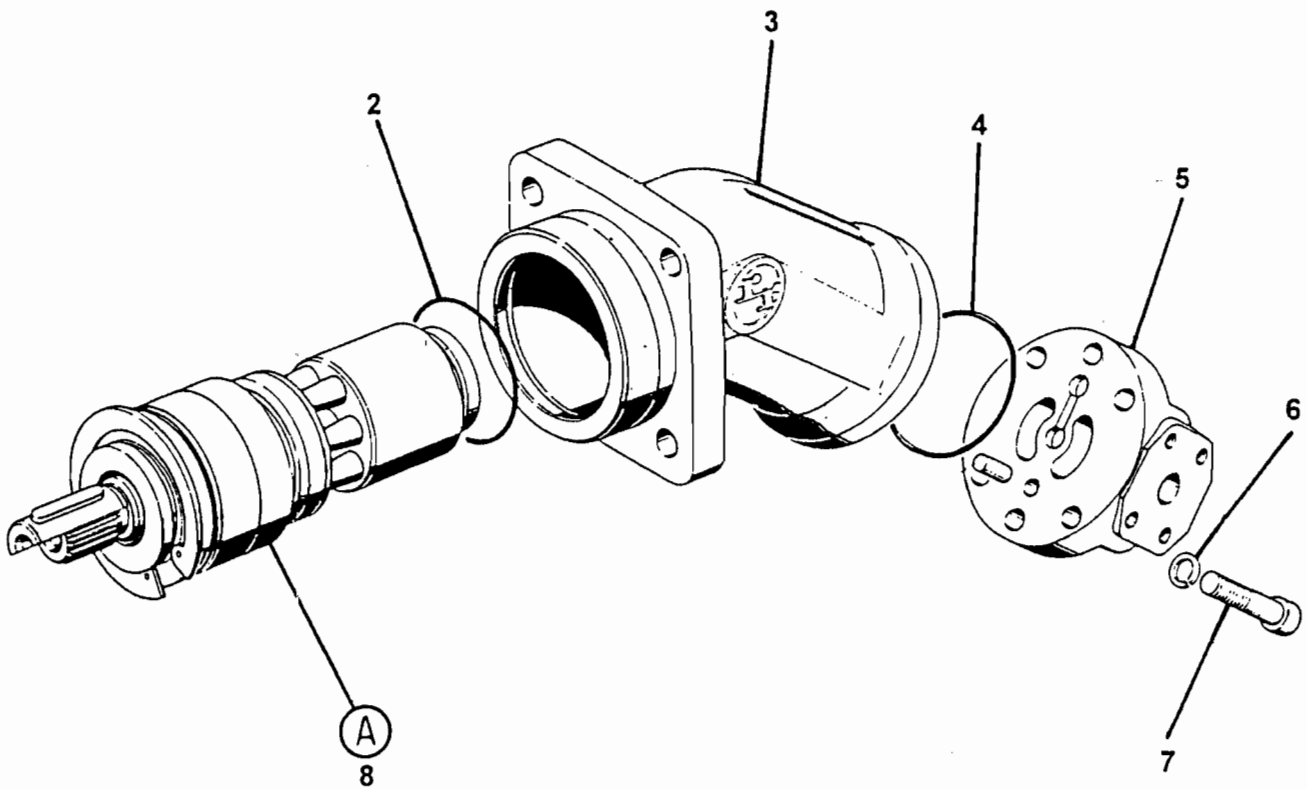
DASH (-) ITEM NOT ILLUSTRATED

REVISION:



# WATER PUMP MOTOR ASSEMBLY

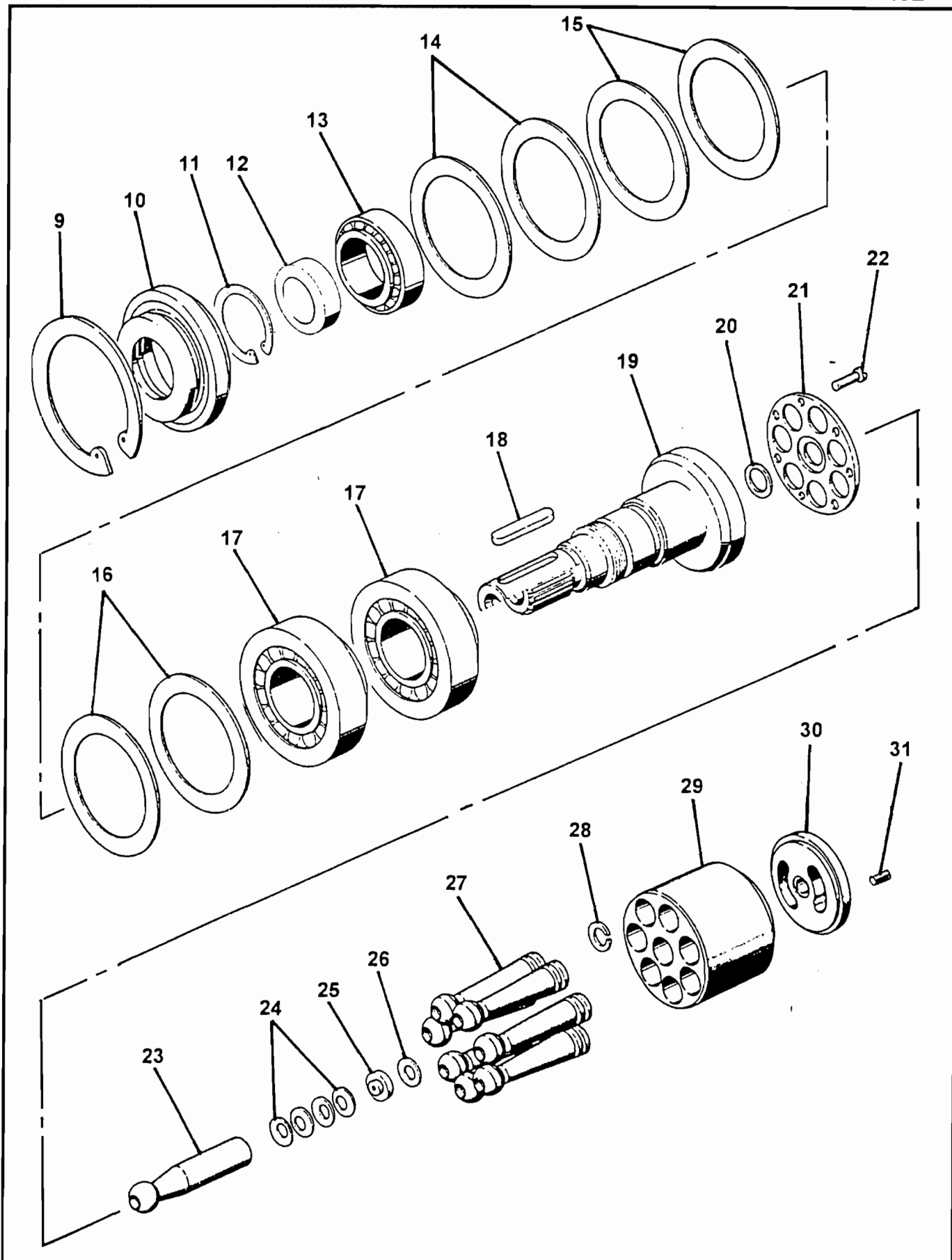
XXT 32  
PARTS  
GROUP 30  
FIGURE 04  
PAGE 01





ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-100121	Assembly, Water Pump Motor (See Group 30, Figure 02 for NHA)					Ref
2		• O-Ring					1
3		• Housing					1
4		• O-Ring					1
5		• Plate, Port					1
6		• Washer, Lock					4
7		• Screw, M6					4
8		• Sub-Assembly, Rotary					1
9		• • Ring Retaining					1
10		• • Cover					1
11		• • Ring, Shaft Seal					1
12		• • Ring Retaining					1
13		• • Bearing, Tapered Roller					1
14		• • Shim					2
15		• • Shim					2
16		• • Shim					2
17		• • Bearing, Angular Contact Ball					2
18		• • Key, Shaft					1
19		• + Shaft, Drive					1
20		• • Disc					1
21		• • Plate, Retaining					1
22		• • Rivet					7
23		• • Pin, Center					1
24		• • Cup, Spring					4
25		• • Collar, Spring					1
26		• • Shim					1
27		• • Piston					7
28		• • Ring, Steel Sealing					7
29		• • Cylinder					1
30		• • Plate, Control					1
31		• Pin					1

DASH (-) ITEM NOT ILLUSTRATED



REVISION:

ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	W-100121	Assembly, Water Pump Motor (See Group 30, Figure 02 for NHA)	Ref
2		• O-Ring	1
3		• Housing	1
4		• O-Ring	1
5		• Plate, Port	1
6		• Washer, Lock	4
7		• Screw, M6	4
8		• Sub-Assembly, Rotary	1
9		•• Ring Retaining	1
10		•• Cover	1
11		•• Ring, Shaft Seal	1
12		•• Ring Retaining	1
13		•• Bearing, Tapered Roller	1
14		•• Shim	2
15		•• Shim	2
16		•• Shim	2
17		•• Bearing, Angular Contact Ball	2
18		•• Key, Shaft	1
19		•• Shaft, Drive	1
20		•• Disc	1
21		•• Plate, Retaining	1
22		•• Rivet	7
23		•• Pin, Center	1
24		•• Cup, Spring	4
25		•• Collar, Spring	1
26		•• Shim	1
27		•• Piston	7
28		•• Ring, Steel Sealing	7
29		•• Cylinder	1
30		•• Plate, Control	1
31		•• Pin	1

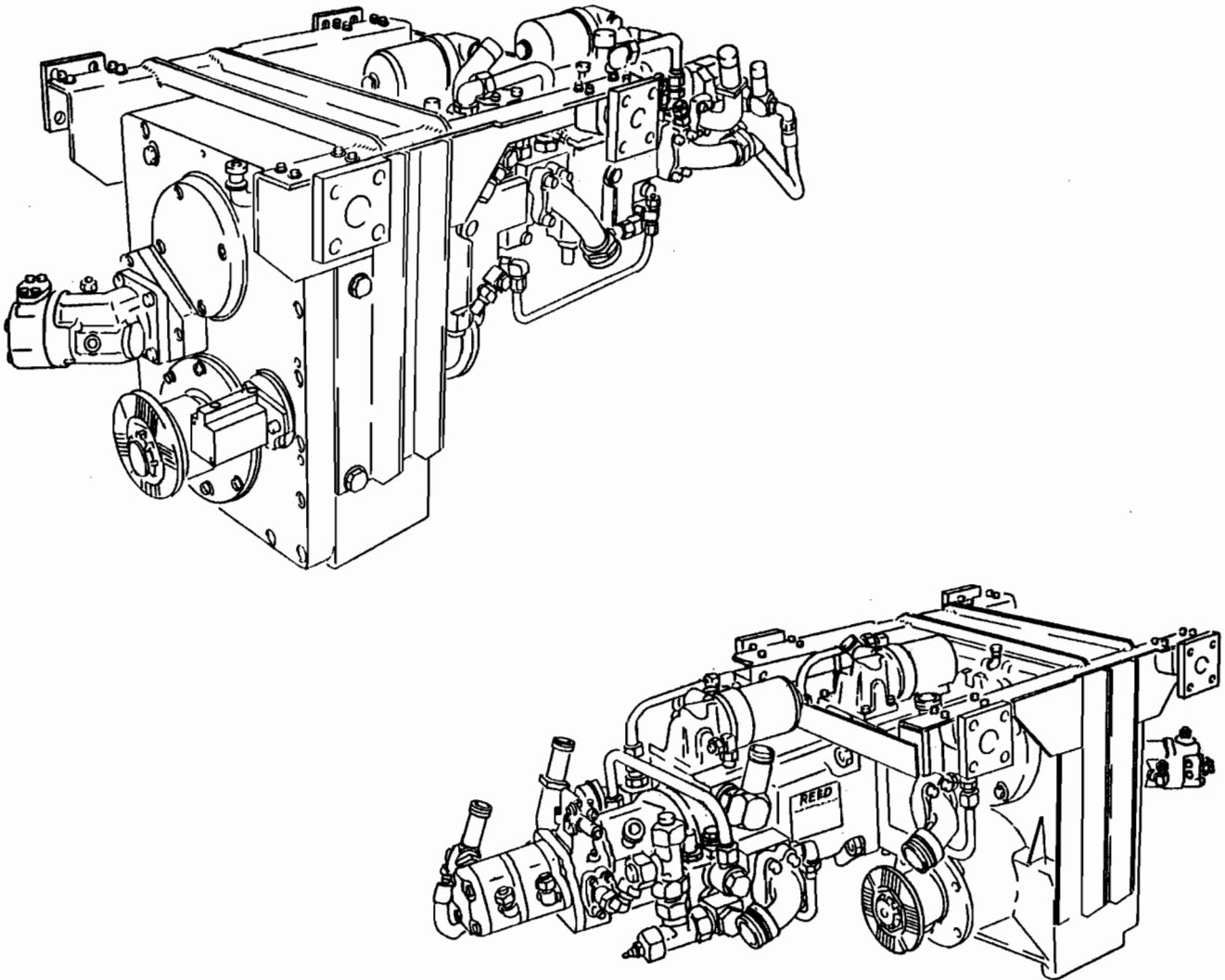
DASH (-) ITEM NOT ILLUSTRATED

**REED**

**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

**XXT 32  
PARTS  
GROUP 30  
FIGURE 05  
PAGE 01**

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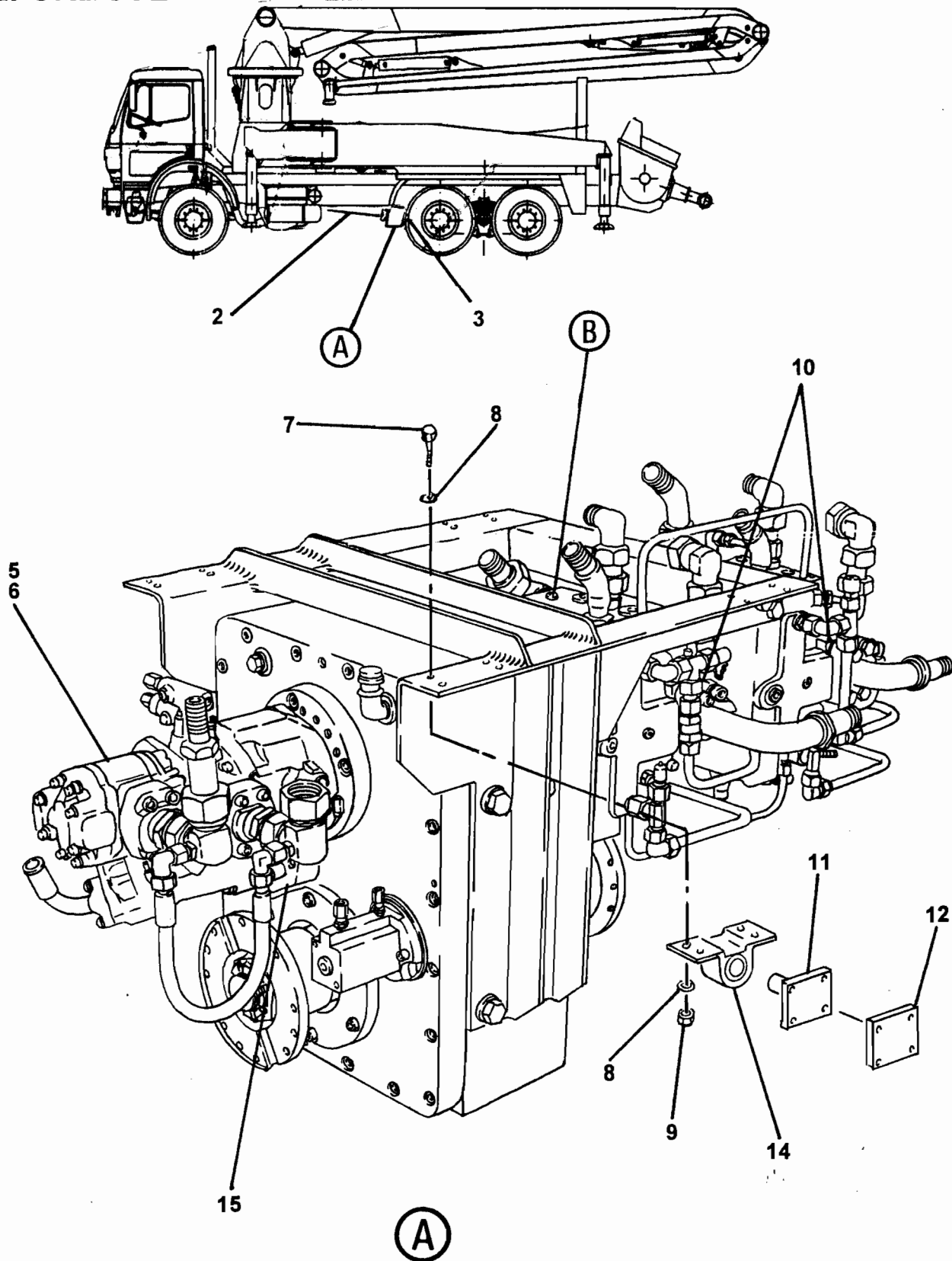


**SHOWN MODEL: AFTER MARCH 2001**

**REED TRUCK MOUNTED CONCRETE BOOM PUMP MODEL XXT 32 ILLUSTRATED PARTS MANUAL GROUP 40 POWER TRAIN INSTALLATION CONTAINS THE FOLLOWING FIGURES:**

<b>FIGURE 00</b>	<b>TABLE OF CONTENTS</b>
<b>FIGURE 01</b>	<b>POWER TRAIN INSTALLATION (BEF JUL 1999)</b>
<b>FIGURE 02</b>	<b>POWER TRAIN INSTALLATION (AUG 1999 ~ MAR 2000)</b>
<b>FIGURE 03</b>	<b>POWER TRAIN INSTALLATION (APR 2000 ~ FEB 2001)</b>
<b>FIGURE 04</b>	<b>POWER TRAIN INSTALLATION (AFT MAR 2001)</b>
<b>FIGURE 05</b>	<b>GEAR PUMP ASSEMBLY</b>
<b>FIGURE 06</b>	<b>PTO GEARBOX ASSEMBLY</b>

BEFORE JULY 1999

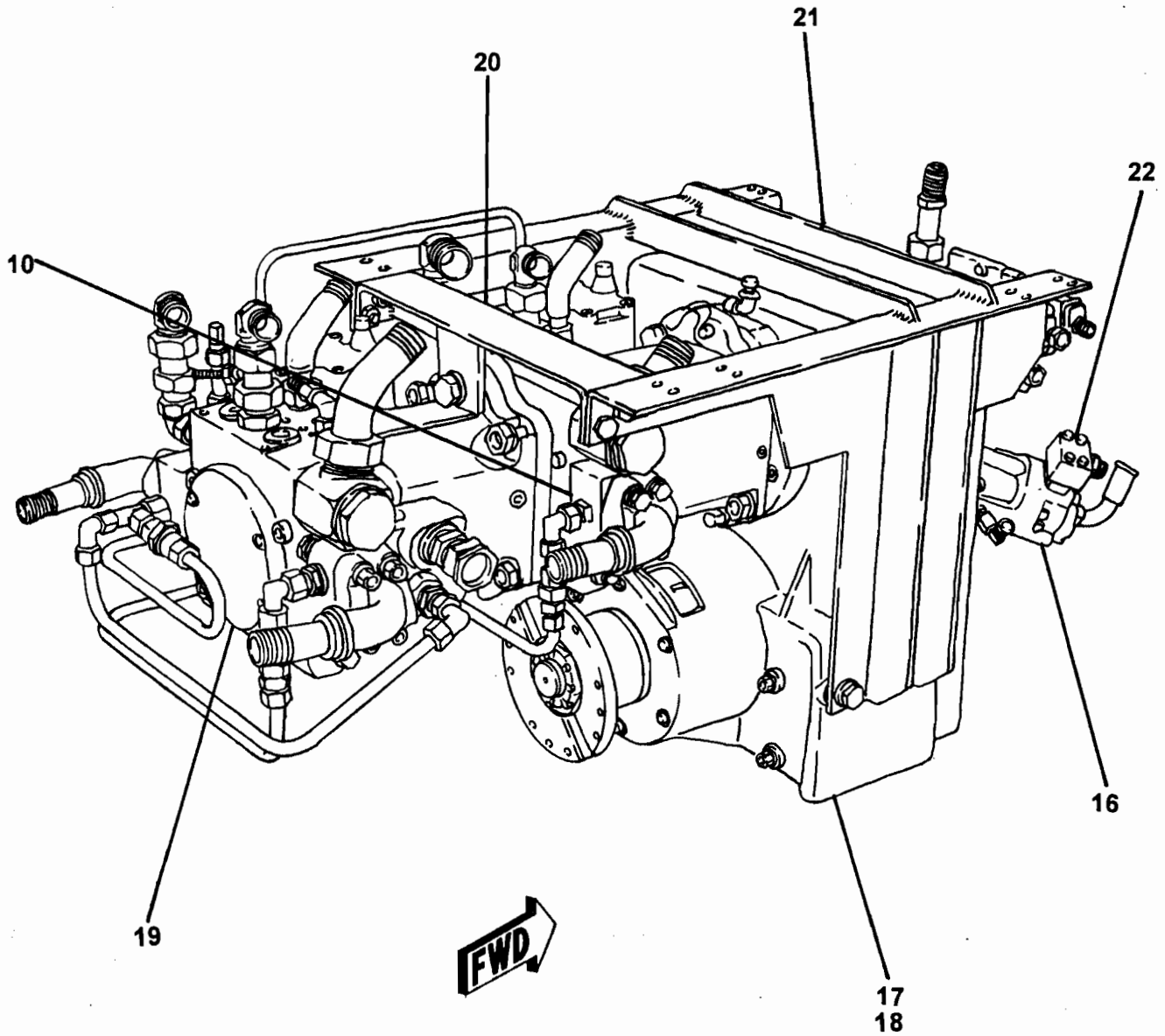


**BEFORE JULY 1999**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	40-01	Installation, Power Train (Before Jul 1999) (See Group 10, Figure 01 for NHA)					Ref
2	801059	• Shaft, Front Drive					1
3	801289	• Shaft, Rear Drive					1
4	800607	• Group, <b>XXT 32</b> Gearbox					1
5	801022	• Assembly, Gear Pump					1
6	800061	• • O-Ring					1
7		• • Bolt, Hex					16
8		• • Washer					32
9		• • Nut, Lock					16
10	801057	• • Manifold, Pump					3
11	800125	• • Axle, PTO Mount					4
12	800128	• • Plate, PTO Axle Mount					4
13	W-105055	• • Assembly, PTO Gearbox with Rexroth					1
14	W-103414	• • • Buffer, Rubber					4
15	W-104703	• • • Assembly, S-Tube Circuit Pump					1
16	W-103511	• • • Assembly, Boom Pump					1
17	W-104527	• • • Assembly, PTO Gearbox					1
18	W-105513	• • • • Switch, PTO Gearbox					1
19	W-104704	• • • Assembly, Rexroth Pump					2
20	W-104949	• • • Valve, Main Pump Flushing					1
21	801087	• • Mount, PTO Gearbox with Rexroth					1
22	801058	• • Manifold, Boom Pump					1
23	801088	• • Brace, PTO Mount					1
-24	800063	• • Valve, Air					1
-25	800064	• • Muffler, Air Valve					1

DASH (-) ITEM NOT ILLUSTRATED

BEFORE JULY 1999



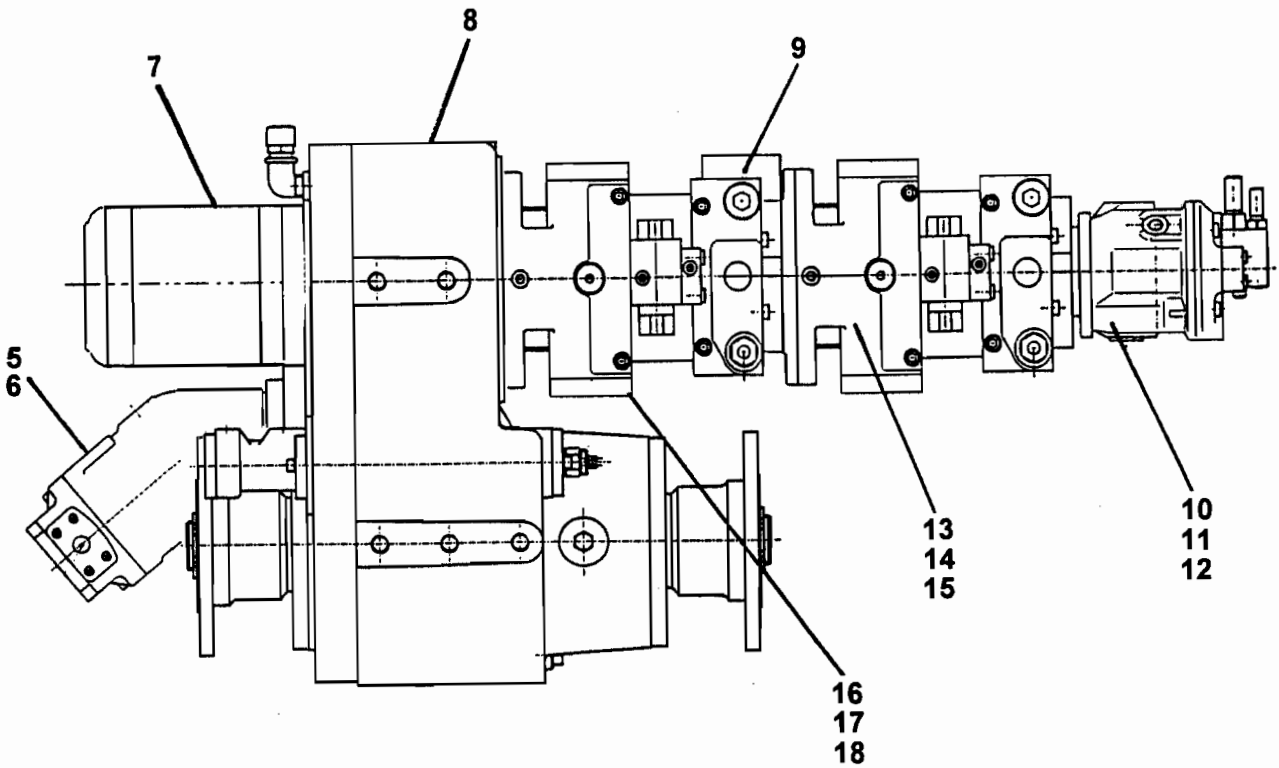
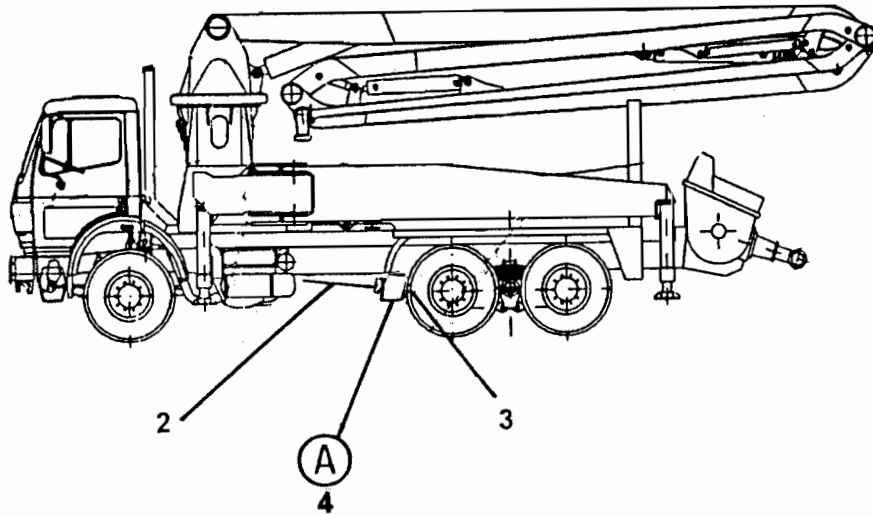


**BEFORE JULY 1999**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	40-01	Installation, Power Train (Before Jul 1999) (See Group 10, Figure 01 for NHA)					Ref
2	801059	• Shaft, Front Drive					1
3	801289	• Shaft, Rear Drive					1
4	800607	• Group, <b>XXT 32</b> Gearbox					1
5	801022	• Assembly, Gear Pump					1
6	800061	•• O-Ring					1
7		•• Bolt, Hex					16
8		•• Washer					32
9		•• Nut, Lock					16
10	801057	•• Manifold, Pump					3
11	800125	•• Axle, PTO Mount					4
12	800128	•• Plate, PTO Axle Mount					4
13	W-105055	•• Assembly, PTO Gearbox with Rexroth					1
14	W-103414	••• Buffer, Rubber					4
15	W-104703	••• Assembly, S-Tube Circuit Pump					1
16	W-103511	••• Assembly, Boom Pump					1
17	W-104527	••• Assembly, PTO Gearbox					1
18	W-105513	•••• Switch, PTO Gearbox					1
19	W-104704	••• Assembly, Rexroth Pump					2
20	W-104949	••• Valve, Main Pump Flushing					1
21	801087	•• Mount, PTO Gearbox with Rexroth					1
22	801058	•• Manifold, Boom Pump					1
23	801088	•• Brace, PTO Mount					1
-24	800063	•• Valve, Air					1
-25	800064	•• Muffler, Air Valve					1

DASH (-) ITEM NOT ILLUSTRATED

AUGUST 1999 ~ MARCH 2000



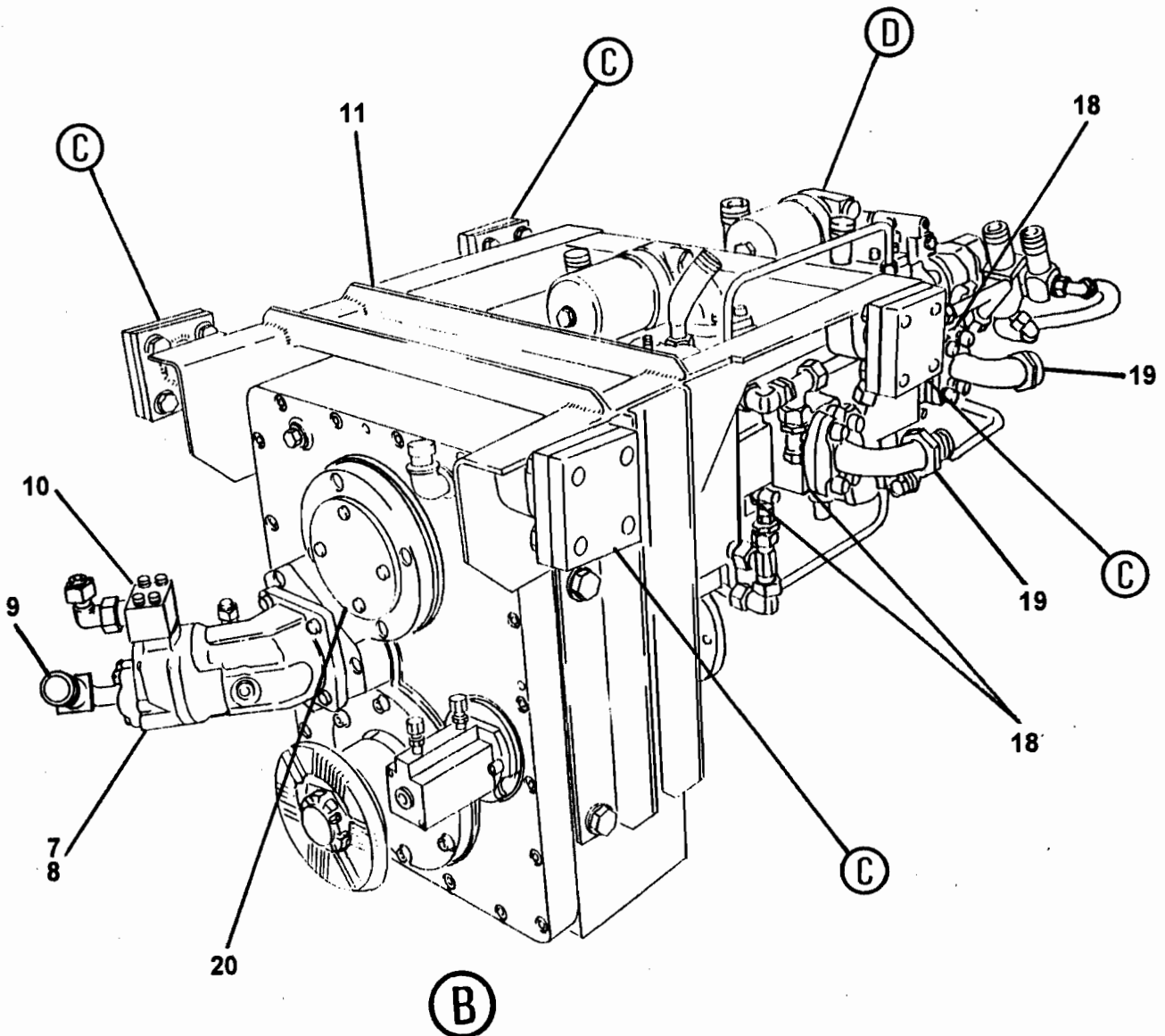
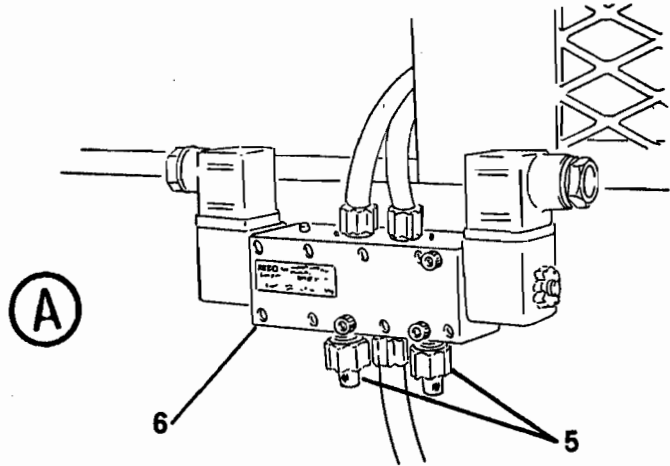
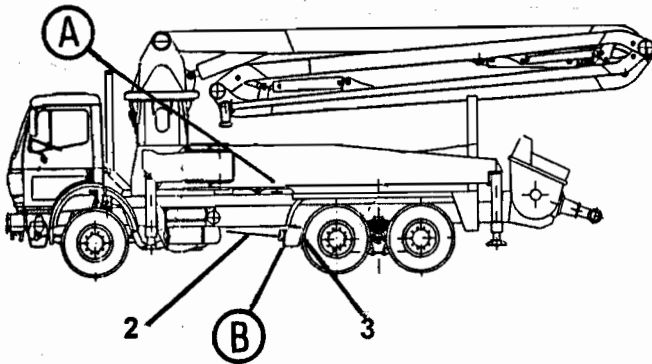
(A)

**AUGUST 1999 ~ MARCH 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	40-02	Installation, Power Train (Aug 1999 ~ Mar 2000) (See Group 10, Figure 01 for NHA)					Ref
2	801480	• Shaft, Front Drive					1
3	801481	• Shaft, Rear Drive					1
4	W-105340	• Group, <b>XXT 32</b> Gearbox (Aug 1999 ~ Mar 2000)					1
5	W-103623	• • Assembly, Boom Pump					1
6	801058	• • Manifold, Boom Pump					1
7	801397	• • Assembly, 4/4CC Gear Pump					1
8	W-104870	• • Assembly, PTO Gearbox					1
9	W-104949	• • Valve, Flushing					1
10	W-105594	• • Assembly, A10VO28 Gear Pump					1
11	W-105789	• • • Kit, A10VO28 Gear Pump Seal					1
12	W-105001	• • • Seal, Shaft					1
13	W-105592	• • Assembly, A4VG125 Gear Pump					1
14	W-105787	• • • Kit, A4VG125Gear Pump Seal					1
15	W-105788	• • • Seal, Shaft					1
16	W-105591	• • Assembly, A4VG125 Gear Pump					1
17	W-105785	• • • Kit, A4VG125Gear Pump Seal					1
18	W-105786	• • • Seal, Shaft					1

DASH (-) ITEM NOT ILLUSTRATED

APRIL 2000 ~ FEBRUARY 2001

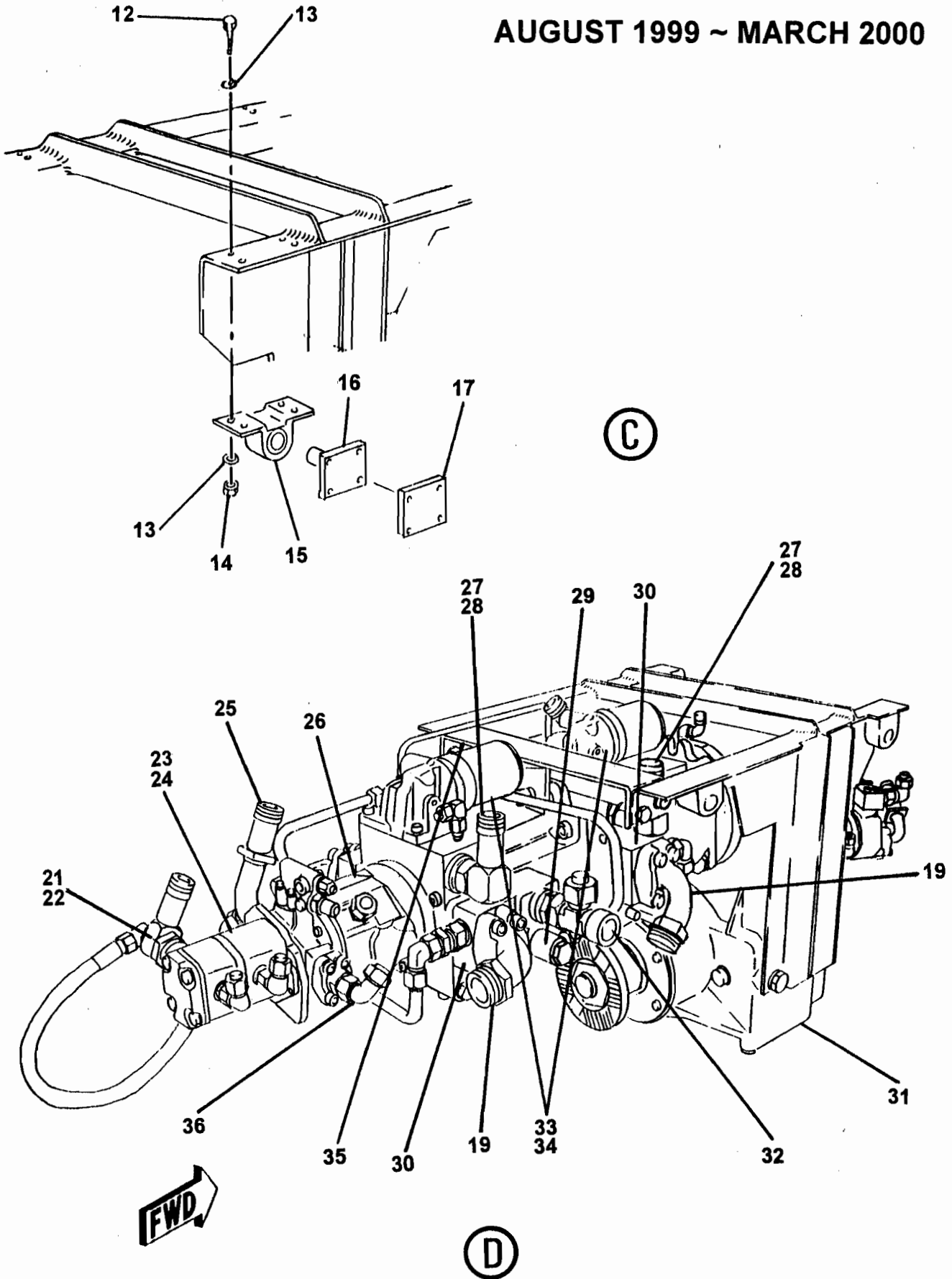


**APRIL 2000 ~ FEBRUARY 2001**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	40-03	Installation, Power Train (Apr 2000 ~ Feb 2001) (See Group 10, Figure 01 for NHA)					Ref
2	801973	• Shaft, Front Drive					1
3	801974	• Shaft, Rear Drive					1
-4	800610	• Group, <b>XXT 36</b> Gearbox					1
5	800064	• • Muffler, Air Valve					2
6	800063	• • Valve, Air					1
7	W-103623	• • Assembly, Boom Pump					1
8	W-105629	• • • Seal, Boom Pump Shaft					1
9	801511	• • Adapter, 90L					1
10	801058	• • Manifold, Boom Pump					1
11	801087	• • Mount, PTO Gearbox with Rexroth					1
12		• • Bolt, Hex					16
13		• • Washer					32
14		• • Nut, Lock					16
15	W-103414	• • Buffer, Rubber					4
16	800125	• • Axle, PTO Mount					4
17	800128	• • Plate, PTO Axle Mount					4
18	801778	• • Manifold, Pump					2
19	801503	• • Adapter, 90L					4
20	75861	• • Cover, Bolt Housing					1
21	801510	• • Adapter, 90L					1
22	801516	• • Adapter, STR					1
23	801684	• • Assembly, 4/4CC Gear Pump					1
24	800061	• • • O-Ring, Gear Pump					1
25	801512	• • Adapter, 90L					1
26	W-105650	• • Assembly, Gear Pump (See Group 40, Figure 05 for DET)					1
27	801506	• • Adapter, 90L					2
28	801526	• • Adapter, STR					2
29	801527	• • Adapter, STR					1
30	801057	• • Manifold, Pump					2
31	W-105539	• • Assembly, PTO Gearbox (See Group 40, Figure 06 for DET)					1
32	W-105513	• • • Switch, PTO Gearbox					1
33	801499	• • Filter, Charge Pump					2
34	801500	• • • Element, Charge Pump Filter					2
35	801088	• • Brace, PTO Mount					1
36	W-105075	• • Adapter, 90L					1

DASH (-) ITEM NOT ILLUSTRATED

**AUGUST 1999 ~ MARCH 2000**

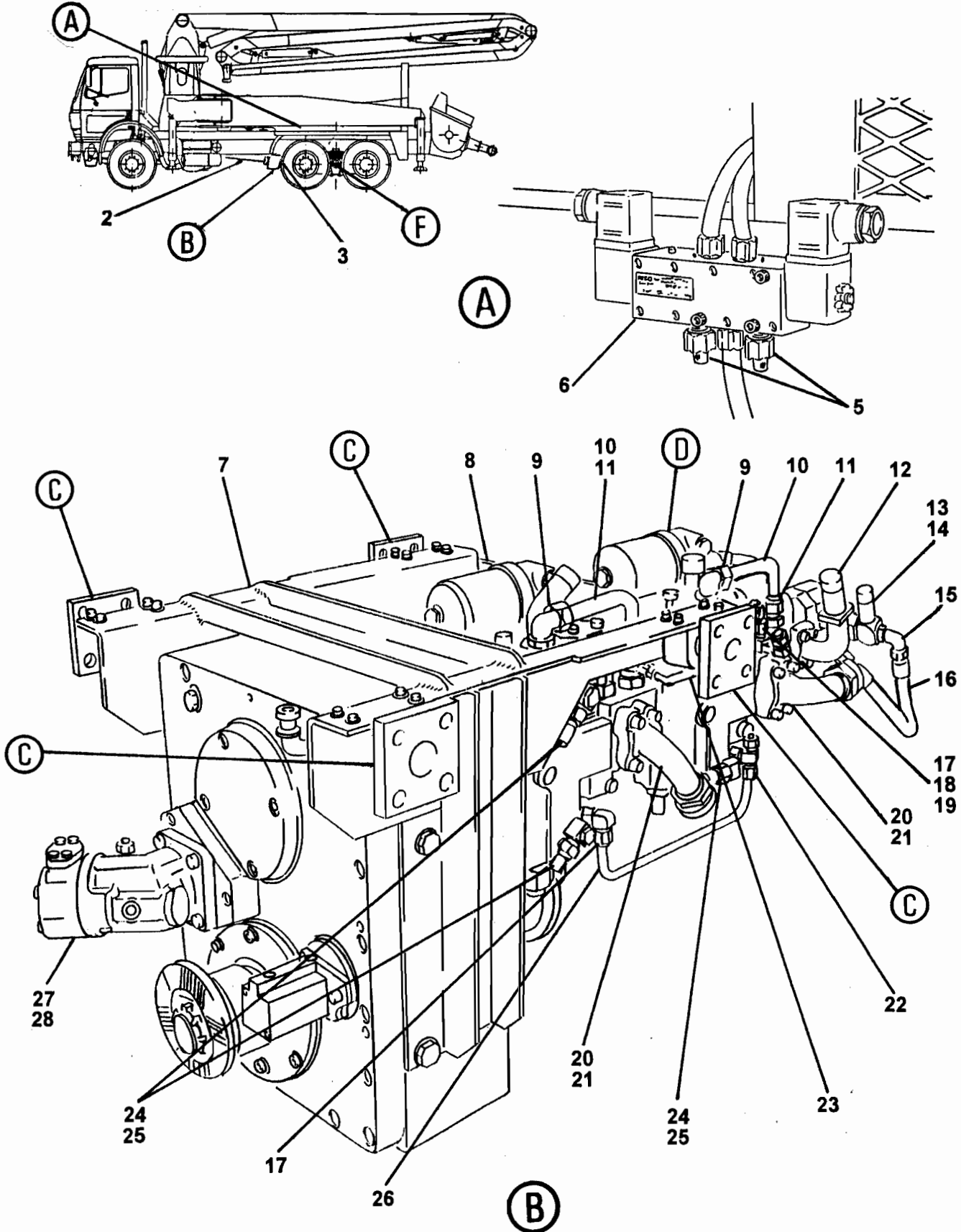


**APRIL 2000 ~ FEBRUARY 2001**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	40-03	Installation, Power Train (Apr 2000 ~ Feb 2001) (See Group 10, Figure 01 for NHA)	Ref
2	801973	• Shaft, Front Drive	1
3	801974	• Shaft, Rear Drive	1
-4	800610	• Group, <b>XXT 36</b> Gearbox	1
5	800064	• • Muffler, Air Valve	2
6	800063	• • Valve, Air	1
7	W-103623	• • Assembly, Boom Pump	1
8	W-105629	• • • Seal, Boom Pump Shaft	1
9	801511	• • Adapter, 90L	1
10	801058	• • Manifold, Boom Pump	1
11	801087	• • Mount, PTO Gearbox with Rexroth	1
12		• • Bolt, Hex	16
13		• • Washer	32
14		• • Nut, Lock	16
15	W-103414	• • Buffer, Rubber	4
16	800125	• • Axle, PTO Mount	4
17	800128	• • Plate, PTO Axle Mount	4
18	801778	• • Manifold, Pump	2
19	801503	• • Adapter, 90L	4
20	75861	• • Cover, Bolt Housing	1
21	801510	• • Adapter, 90L	1
22	801516	• • Adapter, STR	1
23	801684	• • Assembly, 4/4CC Gear Pump	1
24	800061	• • • O-Ring, Gear Pump	1
25	801512	• • Adapter, 90L	1
26	W-105650	• • Assembly, Gear Pump (See Group 40, Figure 05 for DET)	1
27	801506	• • Adapter, 90L	2
28	801526	• • Adapter, STR	2
29	801527	• • Adapter, STR	1
30	801057	• • Manifold, Pump	2
31	W-105539	• • Assembly, PTO Gearbox (See Group 40, Figure 06 for DET)	1
32	W-105513	• • • Switch, PTO Gearbox	1
33	801499	• • Filter, Charge Pump	2
34	801500	• • • Element, Charge Pump Filter	2
35	801088	• • Brace, PTO Mount	1
36	W-105075	• • Adapter, 90L	1

DASH (-) ITEM NOT ILLUSTRATED

**AFTER MARCH 2001**







**POWER TRAIN INSTALLATION  
(AFTER MARCH 2001)**

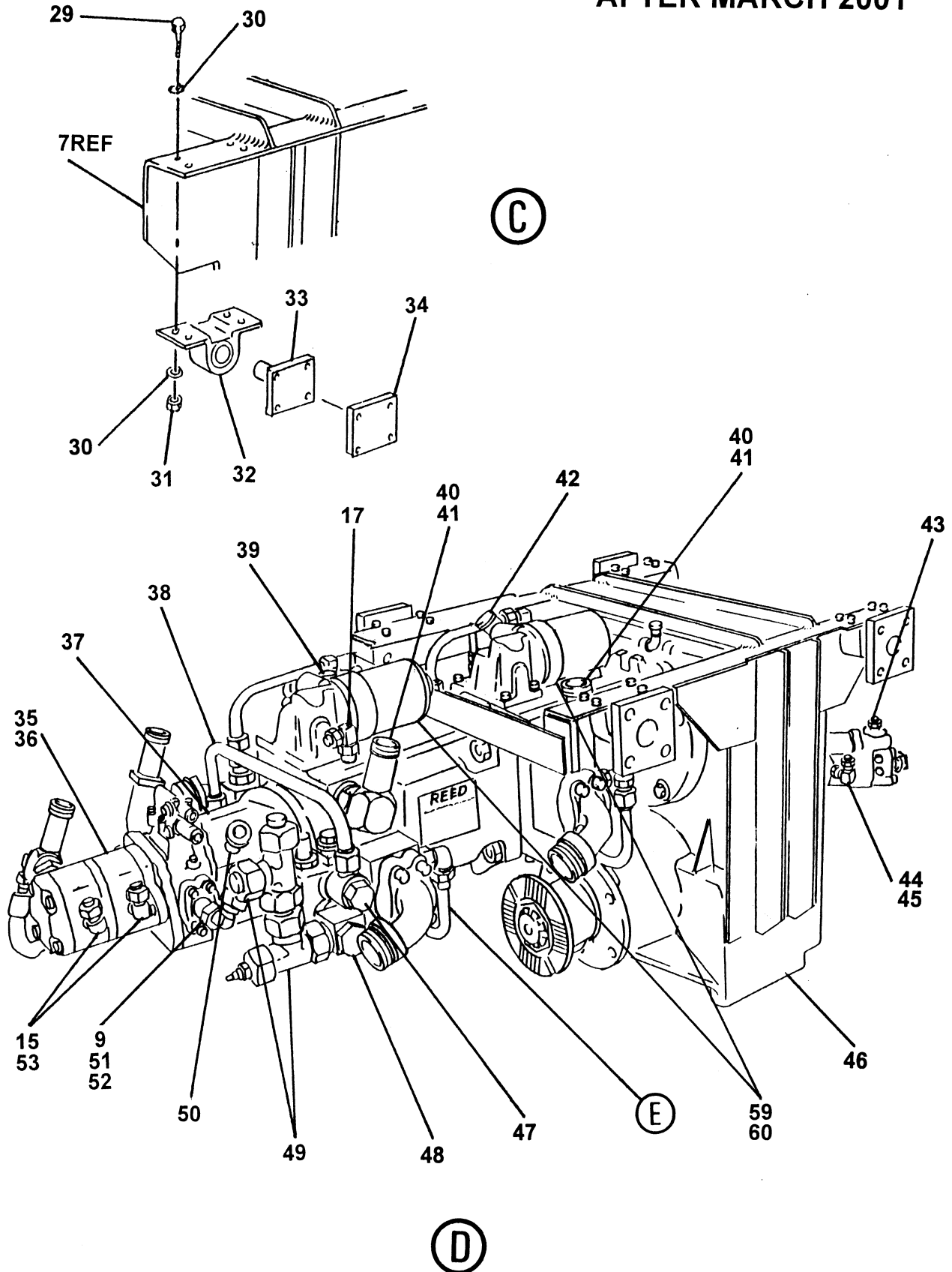
**XXT 32  
PARTS  
GROUP 40  
FIGURE 04  
PAGE 02**

**AFTER MARCH 2001**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	40-01	Installation, Power Train (Aft Mar 2001) (See Group 10, Figure 01 for NHA)					Ref
2	801973	• Shaft, Front Drive					1
3	801974	• Shaft, Rear Drive					1
-4	800610	• Installation, <b>XXT 32</b> PTO Gearbox					1
5	800064	• • Muffler, Air Valve					2
6	800063	• • Valve, Air					1
7	801788	• • Mount, PTO Gearbox with Rexroth					1
8	801792	• • Brace, PTO Mount					1
9	801888-005	• • Swivel, Elbow					7
10	801793	• • Assembly, Tube					2
11		• • Adapter, STR					2
12	801512	• • Adapter, 90L					1
13	801510	• • Adapter, 90L					1
14	801516	• • Adapter, STR					1
15	801888-014	• • Swivel, Elbow					3
16	801486-005	• • Assembly, Hose					1
17	801888-003	• • Swivel, Elbow					3
18	801890-003	• • Swivel, Tee					1
19	W-105076	• • Port, Pressure Test					3
20	801778	• • Manifold, Pump					2
21	801503	• • Adapter, 90L					4
22	801889-003	• • Swivel, Tee					1
23	802339	• • Assembly, Tube					1
24	801874-003	• • Banjo					4
25	W-104831	• • Port, Pressure Test					4
26	801797	• • Assembly, Tube					1
27	W-103623	• • Assembly, Boom Pump					1
28	W-105925	• • • Seal, Boom Pump Shaft					1

DASH (-) ITEM NOT ILLUSTRATED

AFTER MARCH 2001





**POWER TRAIN INSTALLATION  
(AFTER MARCH 2001)**

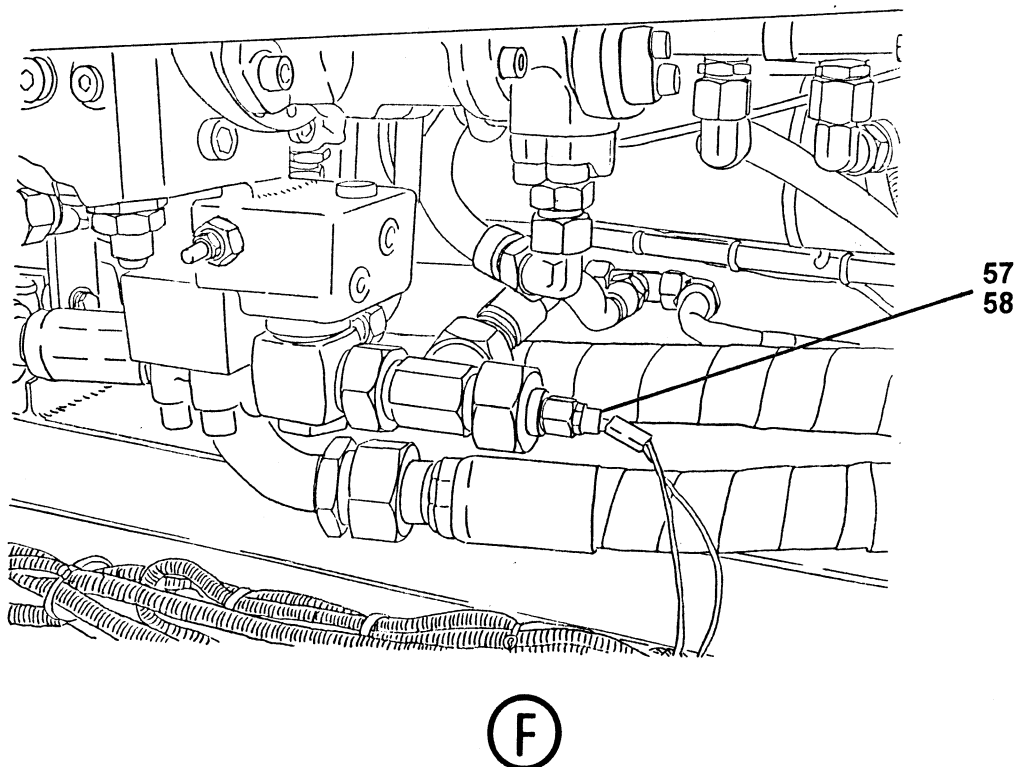
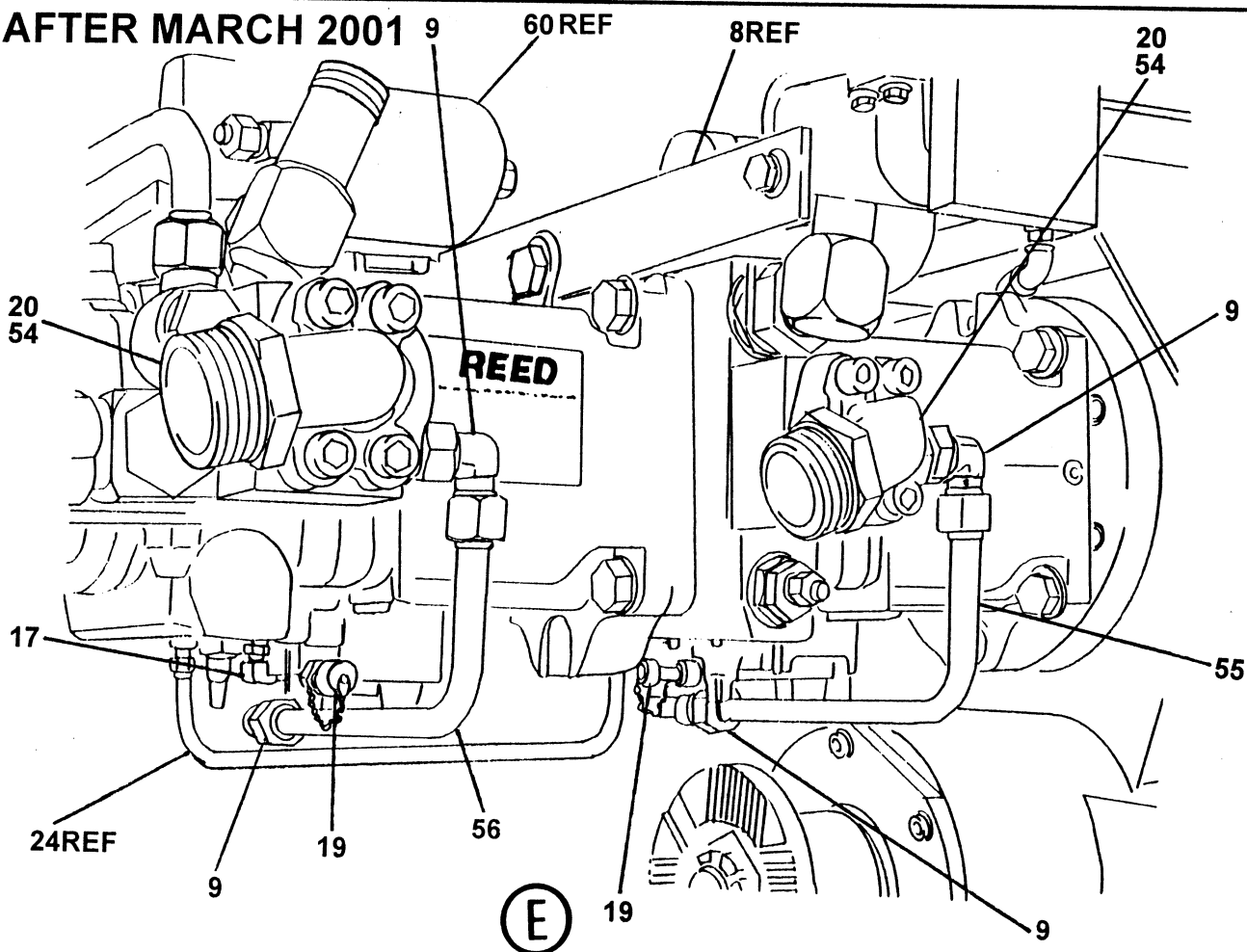
**XXT 32  
PARTS  
GROUP 40  
FIGURE 04  
PAGE 04**

**AFTER MARCH 2001**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
29		• • Bolt, Hex					16
30		• • Washer					32
31		• • Nut, Lock					16
32	W-103414	• • Buffer, Rubber					4
33	800125	• • Axle, PTO Mount					4
34	800128	• • Plate, PTO Axle Mount					4
35	801684	• • Assembly, 4/4CC Pump					1
36	800061	• • • O-Ring, 4/4CC Pump					1
37	W-105650	• • Assembly, Gear Pump (See Group 40, Figure 02 for DET)					1
38	801796	• • Assembly, Tube					1
39	W-105170	• • Adapter, STR					1
40	801506	• • Adapter, 90L					2
41	801526	• • Adapter, STR					2
42	W-105169	• • Adapter, 45					1
43	801873-011	• • Adapter					1
44	801524	• • Adapter, STR					1
45	801509	• • Adapter, 90L					1
46	802242	• • Assembly, PTO Gear Box (See Group 40, Figure 03 for DET)					1
47	801527	• • Adapter, STR					1
48		• • Banjo					1
49	801890-006	• • Swivel, Tee					2
50	801876-005	• • Adapter, STR					1
51	86264-002	• • Flange, Split					1
52	W-105075	• • Adapter, STR					1
53	801876-003	• • Adapter					2
54	801057	• • Manifold, Pump					2
55	801794	• • Assembly, Tube					1
56	801795	• • Assembly, Tube					1
57	W-105567	• • Sensor, Thermal					1
58	801927	• • Adapter, Thermal Sensor					1
59	801499	• • Filter, A4VG125 Charge Pump					2
60	801500	• • • Element, A4VG125 Charge Pump Filter					2

DASH (-) ITEM NOT ILLUSTRATED

**AFTER MARCH 2001**



**AFTER MARCH 2001**

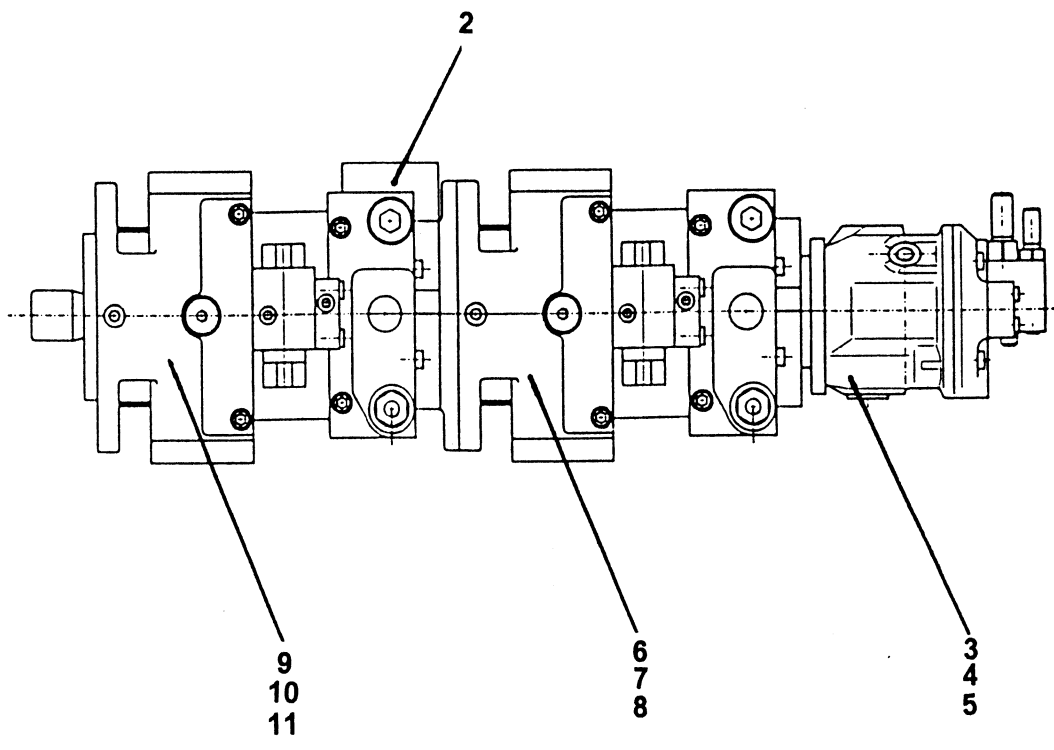
ITEM NO.	REED'S PARTS NO.	1 2 3 4 5	DESCRIPTION	QTY
29		• •	Bolt, Hex	16
30		• •	Washer	32
31		• •	Nut, Lock	16
32	W-103414	• •	Buffer, Rubber	4
33	800125	• •	Axle, PTO Mount	4
34	800128	• •	Plate, PTO Axle Mount	4
35	801684	• •	Assembly, 4/4CC Gear Pump	1
36	800061	• • •	O-Ring, Gear Pump	1
37	W-105650	• •	Assembly, Gear Pump (See Group 40, Figure 02 for DET)	1
38	801796	• •	Assembly, Tube	1
39	W-105170	• •	Adapter, STR	1
40	801506	• •	Adapter, 90L	2
41	801526	• •	Adapter, STR	2
42	W-105169	• •	Adapter, 45	1
43	801873-011	• •	Adapter	1
44	801524	• •	Adapter, STR	1
45	801509	• •	Adapter, 90L	1
46	802242	• •	Assembly, PTO Gear Box (See Group 40, Figure 03 for DET)	1
47	801527	• •	Adapter, STR	1
48		• •	Banjo	1
49	801890-006	• •	Swivel, Tee	2
50	801876-005	• •	Adapter, STR	1
51	86264-002	• •	Flange, Split	1
52	W-105075	• •	Adapter, STR	1
53	801876-003	• •	Adapter	2
54	801057	• •	Manifold, Pump	2
55	801794	• •	Assembly, Tube	1
56	801795	• •	Assembly, Tube	1
57	W-105567	• •	Sensor, Thermal	1
58	801927	• •	Adapter, Thermal Sensor	1
59	801499	• •	Filter, A4VG125 Charge Pump	2
60	801500	• • •	Element, A4VG125 Charge Pump Filter	2

DASH (-) ITEM NOT ILLUSTRATED



# GEAR PUMP ASSEMBLY

XXT 32  
PARTS  
GROUP 40  
FIGURE 05  
PAGE 01





# GEAR PUMP ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 40  
FIGURE 05  
PAGE 02

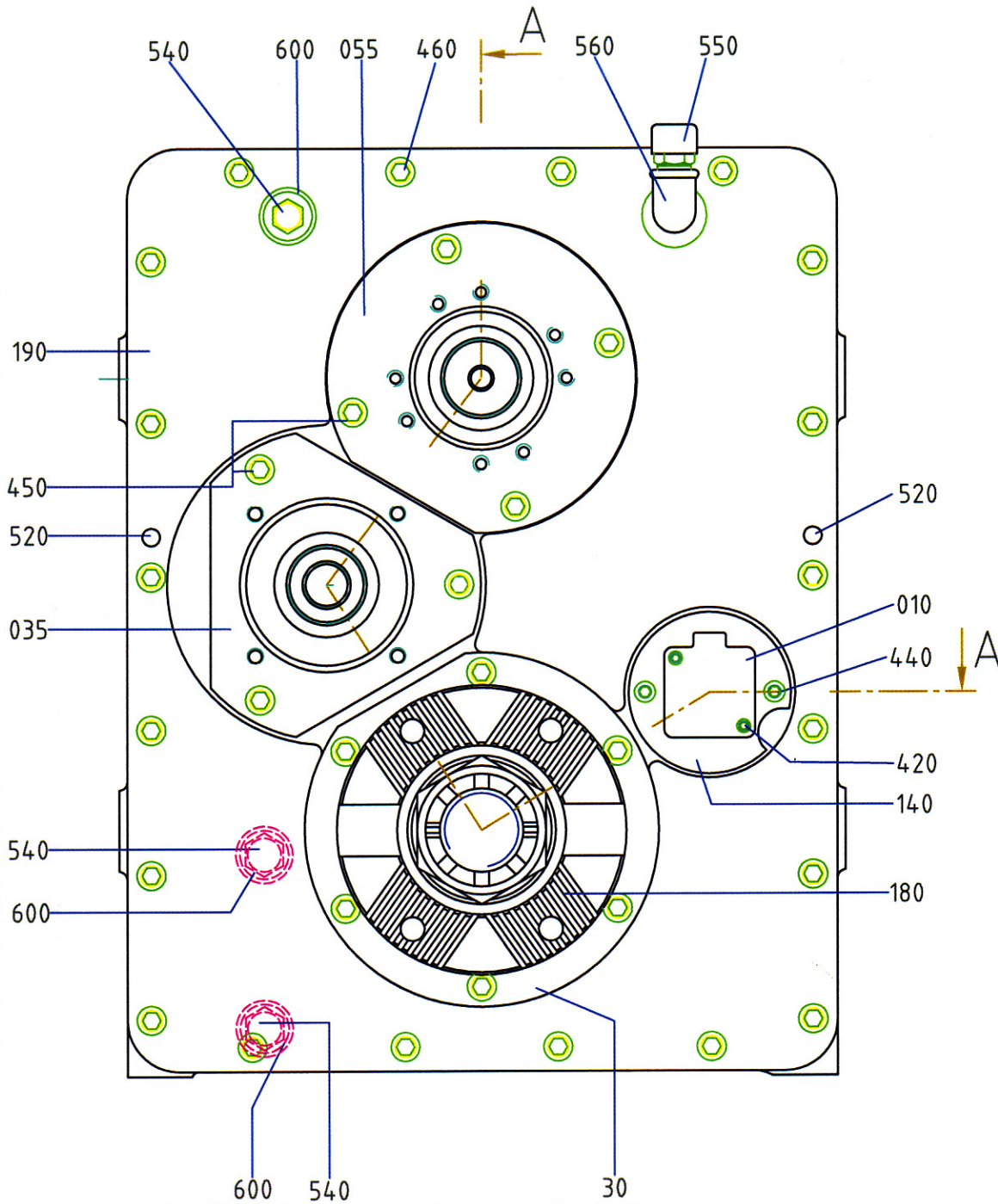
ITEM NO.	REED 'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-105650	Assembly, Gear Pump (See Group 40, Figure 03 and 04 for NHA)					1
2	W-104949	• Valve, Flushing					1
3	W-105651	• Assembly, A10VO28 Gear Pump					1
4	W-105789	• • Kit, A10VO28 Gear Pump Seal					1
5	W-105001	• • Seal, Shaft					1
6	W-105592	• Assembly, A4VG125 Gear Pump					1
7	W-105787	• • Kit, A4VG125Gear Pump Seal					1
8	W-105788	• • Seal, Shaft					1
9	W-105591	• Assembly, A4VG125 Gear Pump					1
10	W-105785	• • Kit, A4VG125Gear Pump Seal					1
11	W-105786	• • Seal, Shaft					1

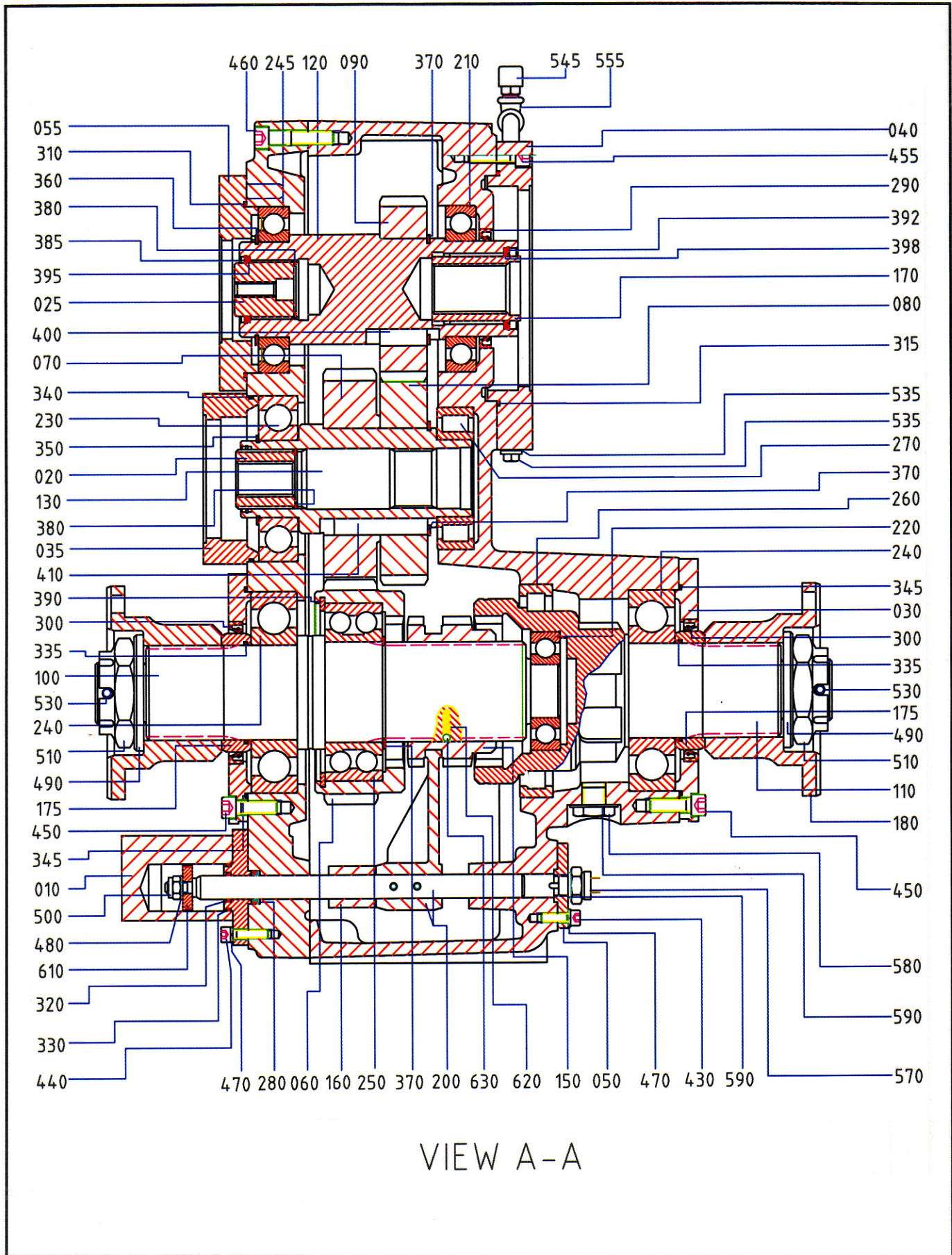
DASH (-) ITEM NOT ILLUSTRATED

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	802242	Assembly, PTO Gear Box (See Group 40, Figure 03 and 04 for NHA)					1
10	802160	• Cylinder, PTO Shift					1
20	802161	• Adapter, Shaft					1
25	802162	• Adapter, Shaft					1
30	802163	• Cap, Packing Ring					2
35	802164	• Flange, Mounting					1
40	802165	• Flange, Mounting					1
50	802166	• Cover					1
55	802167	• Flange, Mounting					1
60	802168	• Gear, Coupling					1
70	802169	• Gear					1
80	802170	• Gear					1
90	802171	• Gear					1
100	802172	• Shaft, Toothed					1
110	802173	• Shaft, Coupling					1
120	802174	• Shaft, Toothed					1
130	802175	• Shaft, Splined Hollow					1
140	802176	• Flange, Mounting					1
150	802177	• Coupling					1
160	802178	• Spacer					1
170	802179	• Adapter, Shaft					1
175	802180	• Ring, Running					2
180	802181	• Flange					2
190	802182	• Housing, Gearbox					1
200	802183	• Fork, Gear					10
210	802184	• Bearing, Ball					1
220	802185	• Bearing, Ball					1
230	802186	• Bearing, Ball					1
240	802187	• Bearing, Ball					2
245	802188	• Bearing, Ball					1
250	802189	• Bearing					1
260	802190	• Bearing, Roller					1
270	802191	• Bearing, Roller					1
280	802192	• Seal, Radial Oil					1
290	802193	• Seal, Radial Oil					1
300	802194	• Seal, Radial Oil					2
310	802195	• O-Ring					1
315	802196	• O-Ring					1
320	802197	• O-Ring					1
330	802198	• O-Ring					1
335	802199	• O-Ring					2

DASH (-) ITEM NOT ILLUSTRATED







ITEM NO.	REED'S PARTS NO.	1 2 3 4 5	DESCRIPTION	QTY
340	802200		• O-Ring	1
345	802201		• O-Ring	2
350	802202		• Ring, Retaining	1
360	802203		• Ring, Retaining	1
370	802204		• Ring, Retaining	3
380	802205		• Ring, Retaining	2
385	802206		• Ring, Retaining	1
390	802207		• Ring, Retaining	1
392	802208		• Ring, Retaining	1
395	802209		• Disk, Support	1
398	802210		• Disk, Support	1
400	802211		• Key	2
410	802212		• Key	2
420	802213		• Screw, Socket Head Cap	2
430	802214		• Screw, Socket Head Cap	2
440	802215		• Screw, Socket Head Cap	2
450	802216		• Screw, Socket Head Cap	19
455	802217		• Screw, Socket Head Cap	8
460	802218		• Screw, Socket Head Cap	18
470	802219		• Washer, Lock	4
480	802220		• Disk	1
490	802221		• Disk	2
500	802222		• Nut, Hex	1
510	802223		• Nut, Castle	2
520	802224		• Pin	2
530	802225		• Pin, Spring	2
535	802226		• Plug, Hex Head	1
540	802227		• Plug, Hex Head	3
545	802228		• Filter, Vent	1
550	802229		• Filter, Vent	1
555	802230		• Elbow	2
560	802231		• Elbow	1
570	802232		• Switch, Limit	1
580	802233		• Plug, Hex Head	1
-585	802234		• Ring, Sealing	1
590	802235		• Ring, Sealing	2
600	802236		• Ring, Sealing	3
-605	802237		• Plug, Screw	2
610	802238		• Assembly, Piston	1
-615	802239		• Plug, Screw	1
620	802240		• Spring	1
630	802241		• Ball, 1/4 IN	1

DASH (-) ITEM NOT ILLUSTRATED

**REED**

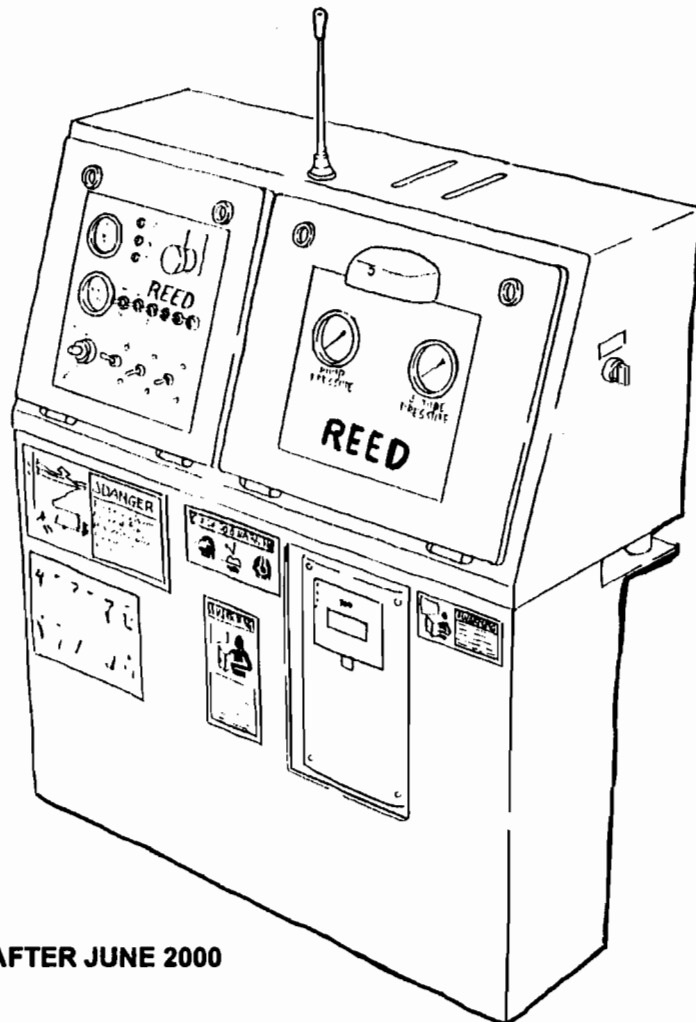
**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

**XXT 32  
PARTS  
GROUP 40  
FIGURE 07  
PAGE 01**

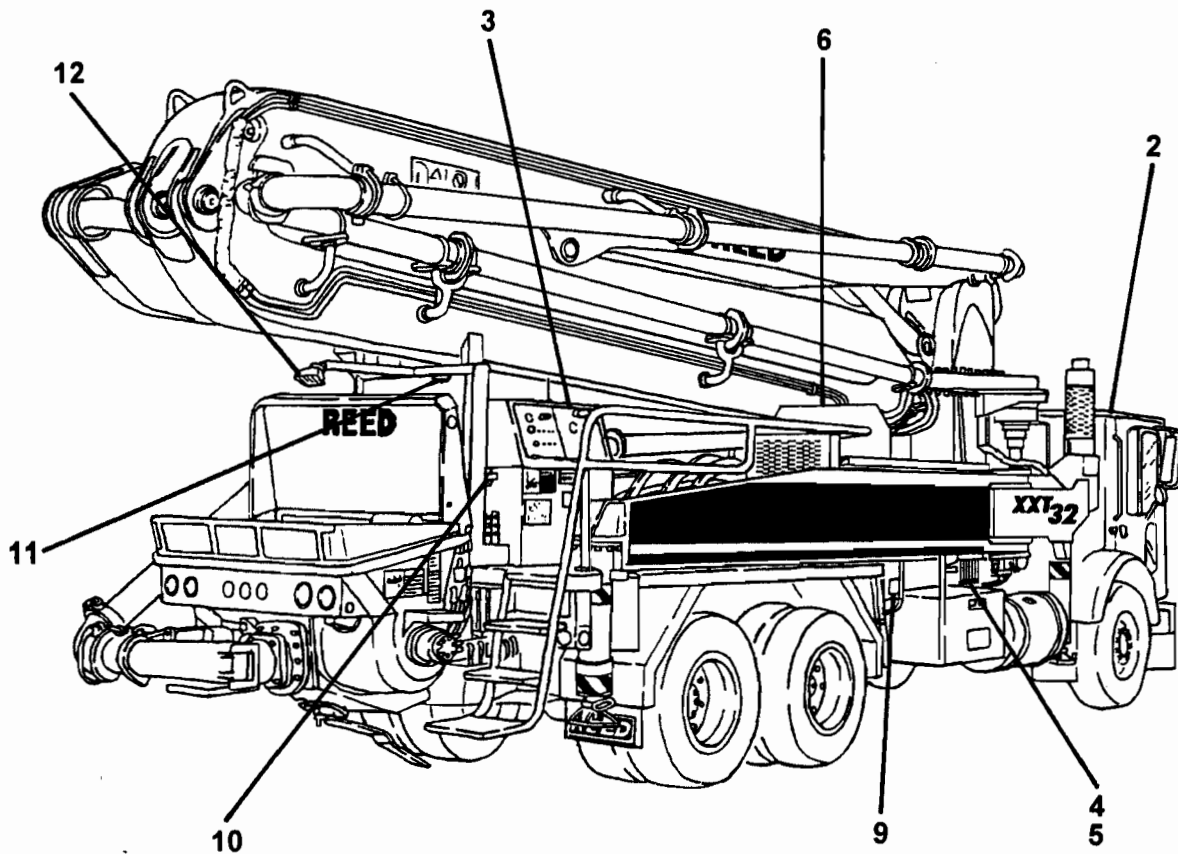
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**REED** TRUCK MOUNTED CONCRETE BOOM PUMP MODEL **XXT 32** ILLUSTRATED PARTS MANUAL GROUP 50 CONTROLS INSTALLATION CONTAINS THE FOLLOWING FIGURES:

- FIGURE 00 TABLE OF CONTENTS
- FIGURE 01 CONTROLS INSTALLATION (BEF MAY 2000)
- FIGURE 02 CONTROLS INSTALLATION (AFT JUN 2000)
- FIGURE 03 CAB CONTROLS ASSEMBLY
- FIGURE 04 MAIN CONTROLS ASSEMBLY (BEF MAY 2000)
- FIGURE 05 MAIN CONTROLS ASSEMBLY (AFT JUN 2000)
- FIGURE 06 LH SIDE OUTRIGGER CONTROLS ASSEMBLY (BEF MAY 2000)
- FIGURE 07 LH SIDE OUTRIGGER CONTROLS ASSEMBLY (AFT JUN 2000)
- FIGURE 08 RH SIDE OUTRIGGER CONTROLS ASSEMBLY (BEF MAY 2000)
- FIGURE 09 RH SIDE OUTRIGGER CONTROLS ASSEMBLY (AFT JUN 2000)
- FIGURE 10 STATIONARY BOOM CONTROLS ASSEMBLY
- FIGURE 11 CABLED REMOTE CONTROL ASSEMBLY (BEF MAY 2000)
- FIGURE 12 CABLED REMOTE CONTROL ASSEMBLY (AFT JUN 2000)
- FIGURE 13 RADIO REMOTE CONTROL ASSEMBLY (BEF MAY 2000)
- FIGURE 14 RADIO REMOTE CONTROL ASSEMBLY (AFT JUN 2000)
- FIGURE 15 SHUNT ASSEMBLY



**SHOWN MODEL: AFTER JUNE 2000**



**BEFORE MAY 2000**

**BEFORE MAY 2000**

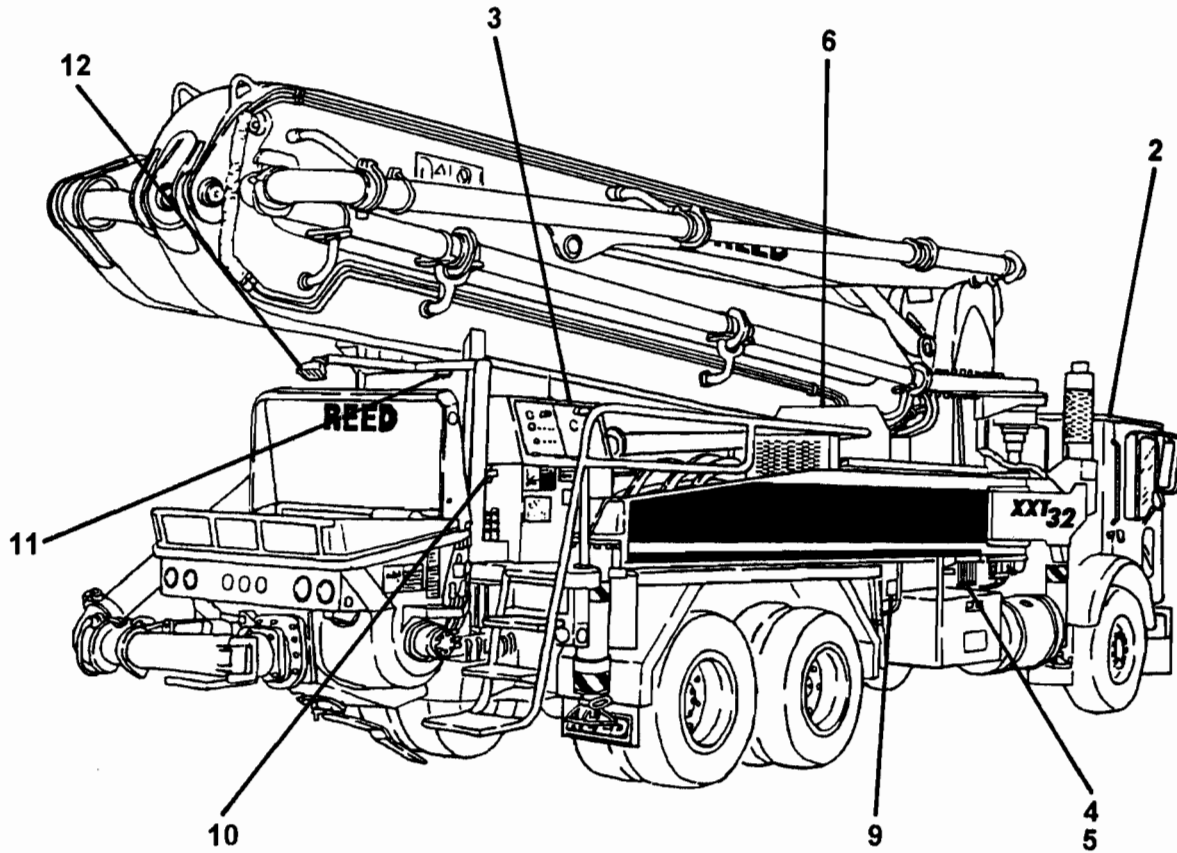
ITEM NO.	REED 'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-01	Installation, <b>XXT 32</b> Controls (Bef May 2000) (See Group 10, Figure 01 for NHA)					Ref
2	800710	• Assembly, Cab Controls (See Group 50, Figure 03 for DET)					1
3	50-04	• Assembly, Main Controls (Bef May 2000) (See Group 50, Figure 04 for DET)					1
4	50-06	• Assembly, Driver (L. H.) Side Outrigger Controls (Bef May 2000) (See Group 50, Figure 06 for DET)					1
5	50-08	• Assembly, Passenger (R. H.) Side Outrigger Controls (Bef May 2000) (See Group 50, Figure 08 for DET)					1
6	50-10	• Assembly, Stationary Boom Controls (See Group 50, Figure 10 for DET)					1
-7	50-11	• Assembly, Cabled Remote Control (Bef May 2000) (See Group 50, Figure 11 for DET)					1
-8	W-104428	• Assembly, Radio Remote Control (Bef May 2000) (See Group 50, Figure 13 for DET)					1
9	C-VW00587	• Assembly, Shunt (See Group 50, Figure 15 for DET)					1
10	800347	• Horn, 12V					1
11	800072	• Switch, Limit					1
12	800095	• Light, Floor Work					1

DASH (-) ITEM NOT ILLUSTRATED



# CONTROLS INSTALLATION (AFTER JUNE 2000)

**XXT 32**  
**PARTS**  
GROUP 50  
FIGURE 02  
PAGE 01



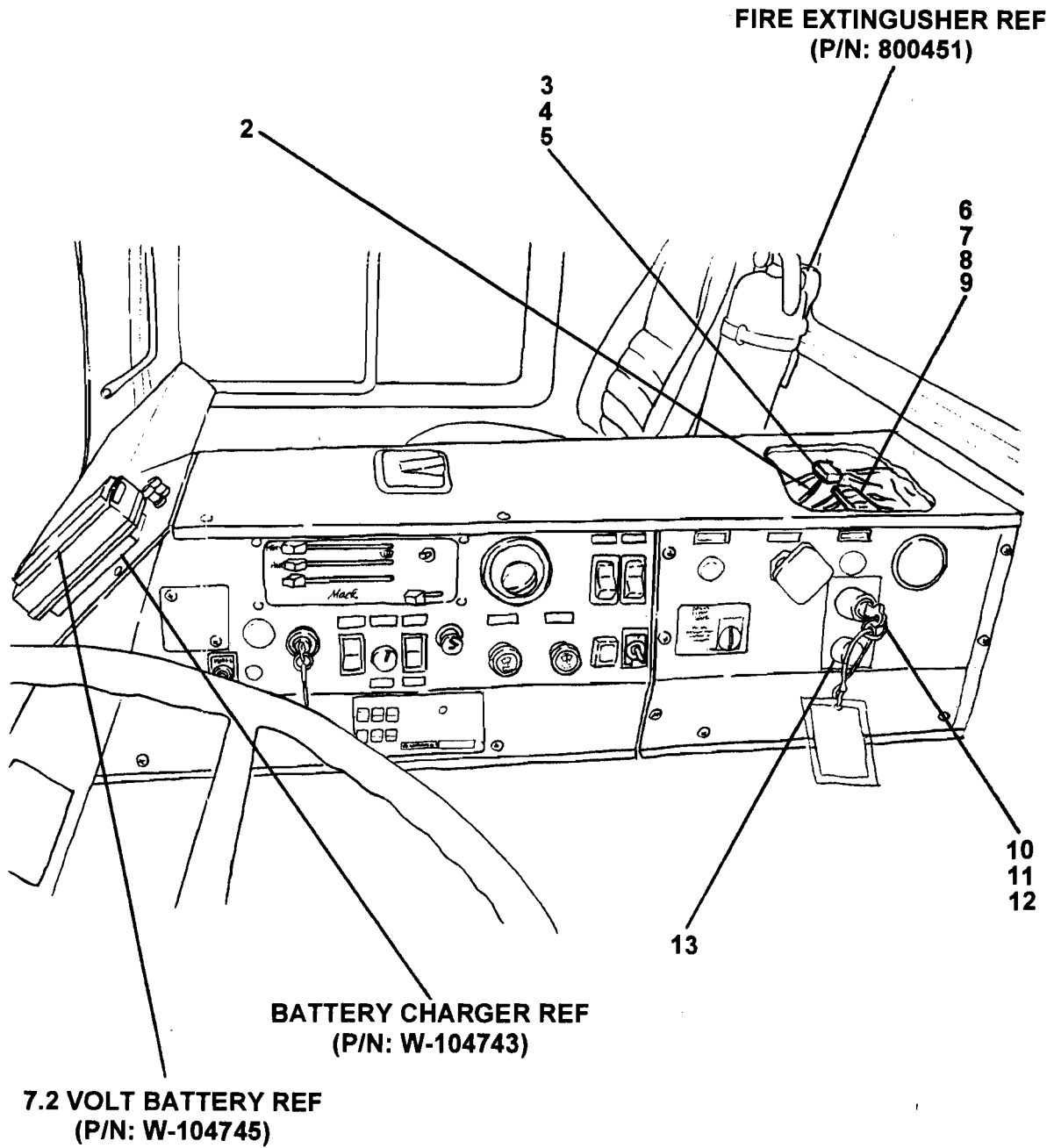
**AFTER JUNE 2000**



**AFTER JUNE 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-01	Installation, <b>XXT 32</b> Controls (Aft Jun 2000) (See Group 10, Figure 01 for NHA)					Ref
2	800710	• Assembly, Cab Controls (See Group 50, Figure 02 for DET)					1
3	50-05	• Assembly, Main Controls (Aft Jun 2000) (See Group 50, Figure 05 for DET)					1
4	50-07	• Assembly, Driver (L. H.) Side Outrigger Controls (Aft Jun 2000) (See Group 50, Figure 07 for DET)					1
5	50-09	• Assembly, Passenger (R. H.) Side Outrigger Controls (Aft Jun 2000) (See Group 50, Figure 09 for DET)					1
6	C-DD103	• Assembly, Stationary Boom Controls (See Group 50, Figure 10 for DET)					1
-7	W-105565	• Assembly, Cabled Remote Control (Aft Jun 2000) (See Group 50, Figure 12 for DET)					1
-8	W-105566	• Assembly, Radio Remote Control (Aft Jun 2000) (See Group 50, Figure 14 for DET)					1
9	C-VW00587	• Assembly, Shunt (See Group 50, Figure 15 for DET)					1
10	800347	• Horn, 12V					1
11	800072	• Switch, Limit					1
12	800095	• Light, Floor Work					1

DASH (-) ITEM NOT ILLUSTRATED



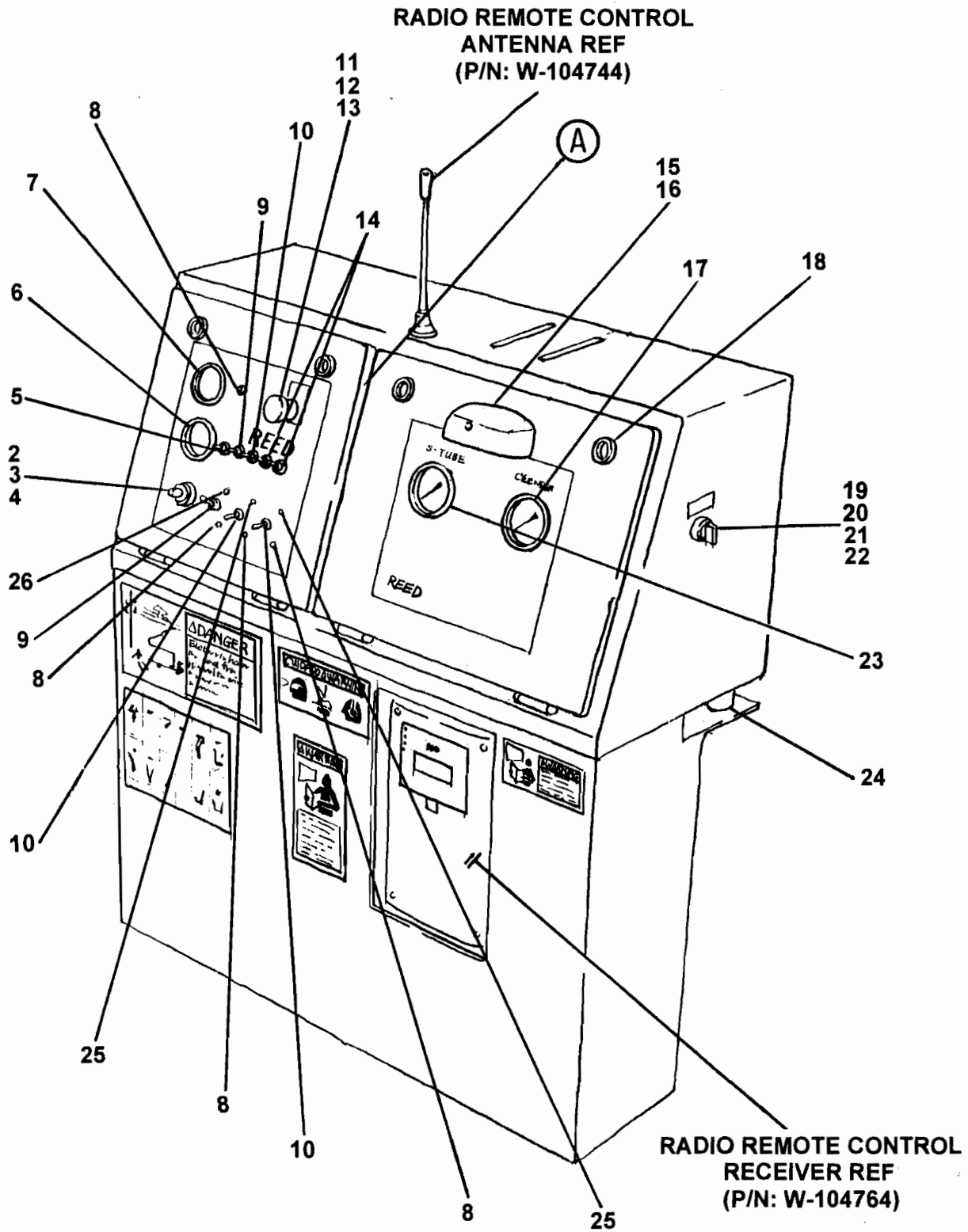
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	800710	Assembly, Cab Controls (See Group 50, Figure 01 and 02 for NHA)					1
2	10194	• Cable, 50 FT					1
3	800433	• Block, Fuse					1
4	800448	• Fuse, ATO 20					2
5	90392	• Fuse, ATO 5					1
6	72820	• Terminal					13
7	75654	• End, Barrier					1
8	72821	• Rail, Terminal					1
9	72824	• Jumper					3
10	800369	• Operator, Key					1
11	800370	• Block, Contact					1
12	800864	• Block, Contact					2
13	800414	• Light, Green Pilot					1
-14	800965	• Switch, Pressure (Located Near Engine)					1
-15	800909	• Switch, Clutch Limit (Located under Clutch Pedal)					1

DASH (-) ITEM NOT ILLUSTRATED



# MAIN CONTROLS ASSEMBLY (BEFORE MAY 2000)

XXT 32  
PARTS  
GROUP 50  
FIGURE 04  
PAGE 01



BEFORE MAY 2000

**BEFORE MAY 2000**

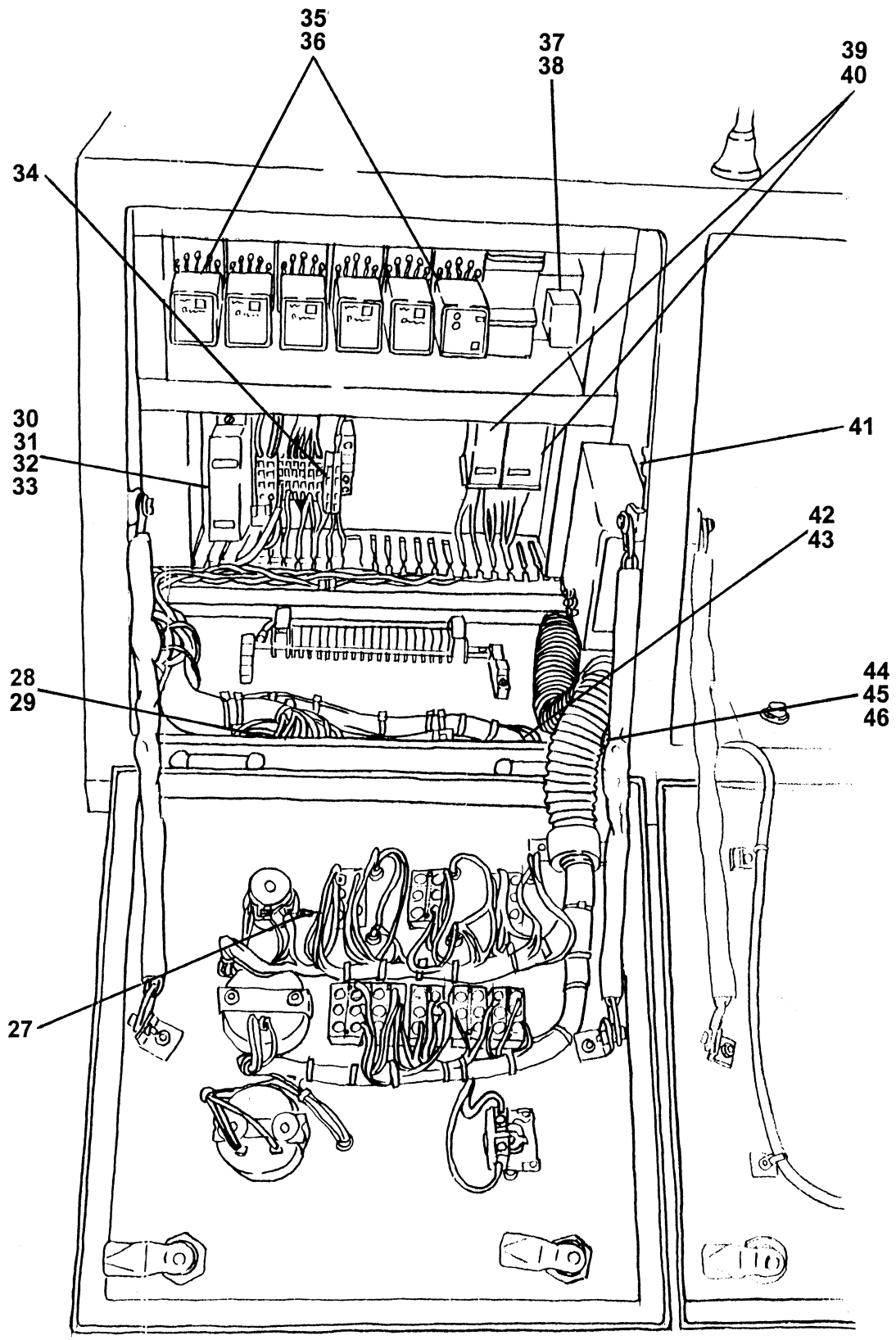
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-04	Assembly, Main Controls (Bef May 2000) (See Group 50, Figure 01 for NHA)					Ref
2		• Assembly, Volume Control					1
3	W-104103	• • Potentiometer					1
4	W-104104	• • Body, Mounting					1
5	W-103976	• Switch, RPM Toggle					1
6	W-104761	• Tachometer, 0-4000 RPM					1
7	W-101732	• Meter, Hour					1
8	W-104086	• Light, Green Indicator					4
9	W-104090	• Switch, Vibrator / Pump Rev Toggle					2
10	W-104089	• Switch, Light / S-Tube / Pump Rev Toggle					3
11	W-104079	• Button, Emergency Stop					1
12	W-101712	• Element, Emergency Stop Contact					1
13	W-102278	• Nameplate, Emergency Stop					1
14	W-104091	• Switch, Lube / Horn Toggle					1
15	W-101033	• Assembly, Light					1
16	W-104101	• • Bulb, Replacement					1
17	79831	• Gauge, 6000 PSI Pressure					1
18		• Lock, Twist					4
19	W-100968	• Switch, A & B Momentary Rotary					1
20	W-100969	• Contact, A & B Switch					3
21	W-103735	• Bridge, A & B Switch					1
22	W-100287	• Base, A & B Switch					1
23	70366	• Gauge, 3000 PSI Pressure					1
24		• Mount, Rubber					A/R
25	W-104088	• Light, Red Indicator					2
26	W-104087	• Light, Green Indicator					1

DASH (-) ITEM NOT ILLUSTRATED



# MAIN CONTROLS ASSEMBLY (BEFORE MAY 2000)

XXT 32  
PARTS  
GROUP 50  
FIGURE 04  
PAGE 03



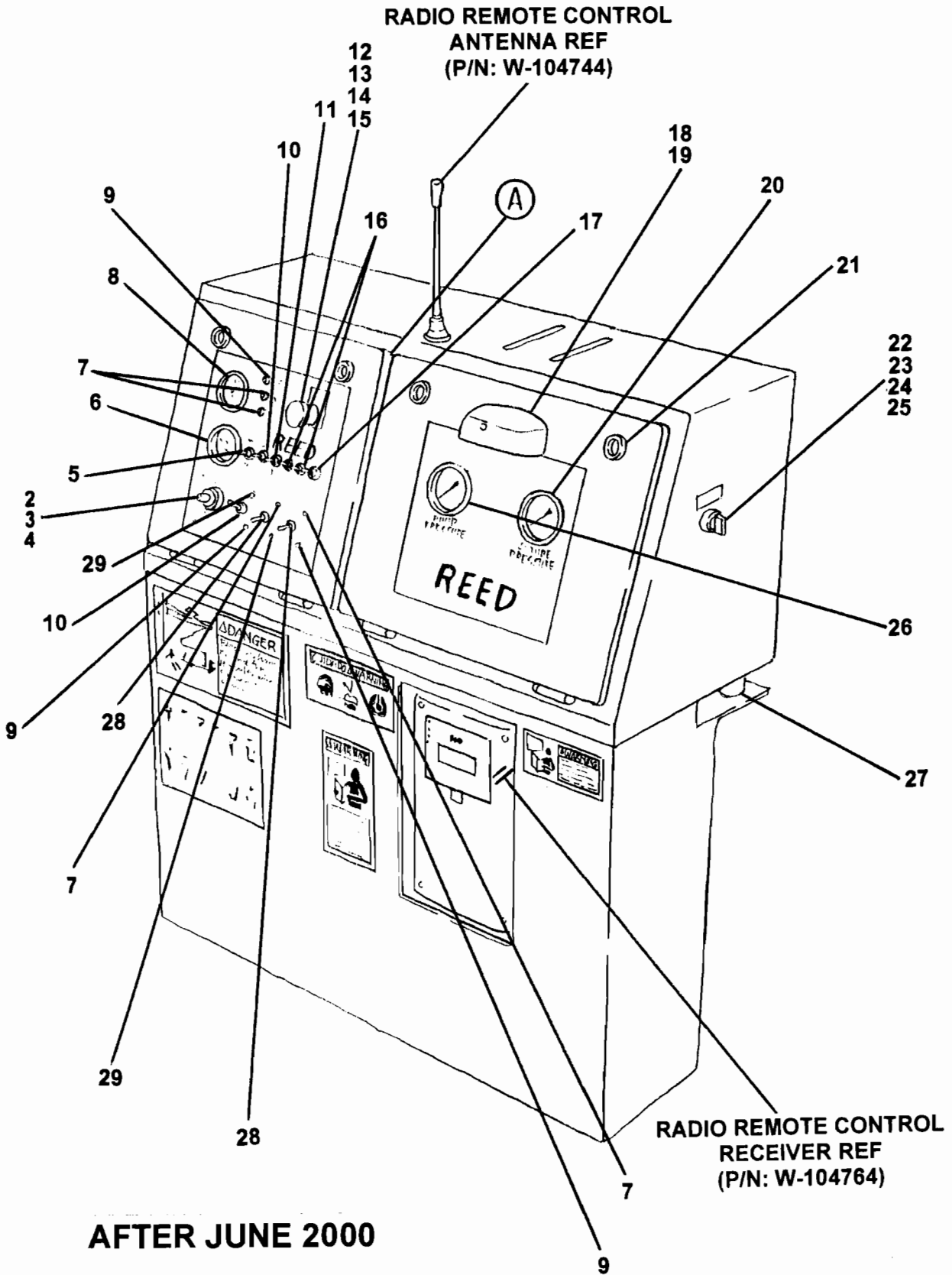
(A)

BEFORE MAY 2000

**BEFORE MAY 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
27	W-104118	• Resistor, 100 OHM					1
28	W-100710	• Contact, 24 Pin Female (A)					1
29	W-101553	• Contact, 24 Pin Housing (A)					1
30	W-101577	• Holder, 8 Type Fuse					1
31	W-101922	• Fuse, 5 AMP					5
32	W-101921	• Fuse, 10 AMP					2
33	W-104096	• Fuse, 20 AMP					1
34	W-104185	• Diode					3
35	W-100178	• Base, Relay					6
36	W-104093	• Relay, Type 60.13					6
37	W-103974	• Base, Relay					1
38	W-105046	• Relay, Type 55.34					1
39	W-100986	• Base, Relay Bosch					2
40	W-104117	• Relay, Bosch					2
41	800461	• Box, Black					1
42	W-104022	• Contact, 16 Pin Female (B)					1
43	W-104097	• Contact, 16 Pin Housing (B)					1
44		• Contact, 8 Pin Female (C)					1
45		• Contact, 8 Pin Housing (C)					1
46	W-104773	• Contact, 8 Pin Male (C)					1

DASH (-) ITEM NOT ILLUSTRATED







# MAIN CONTROLS ASSEMBLY (AFTER JUNE 2000)

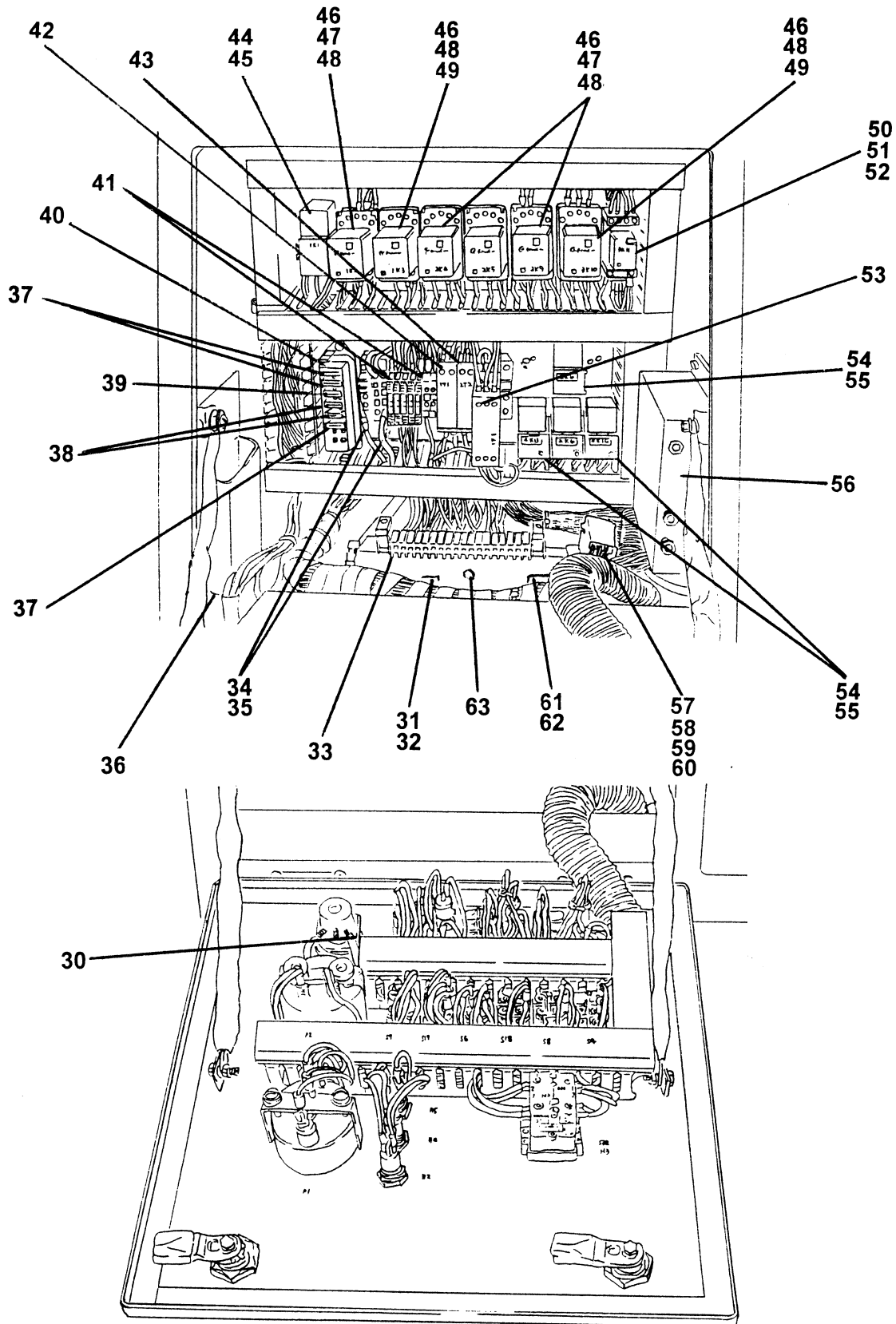
**XXT 32**  
**PARTS**  
GROUP 50  
FIGURE 05  
PAGE 02

## AFTER JUNE 2000

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-05	Assembly, Main Controls (Aft Jun 2000) (See Group 50, Figure 02 for NHA)					Ref
2		• Assembly, Volume Control					1
3	W-104103	• • Potentiometer					1
4	W-104104	• • Body, Mounting					1
5	W-103976	• Switch, RPM Toggle					1
6	W-100900	• Meter, Hour					1
7	W-105811	• Light, Red Indicator					4
8	W-105823	• Thermometer					1
9	W-105813	• Light, Green Indicator					3
10	W-104090	• Switch, Vibrator / Pump Rev Toggle					2
11	W-104089	• Switch, Light / S-Tube / Pump Rev Toggle					3
12	W-105094	• Button, Emergency Stop					1
13	W-105095	• Element, Emergency Stop Contact					1
14	W-102278	• Nameplate, Emergency Stop					1
15	W-104083	• Light, Emergency					1
16	W-104091	• Switch, Lube / Horn Toggle					1
17	W-104089	• Switch, Lever					1
18	W-101033	• Assembly, Light					1
19	W-104101	• • Bulb, Replacement					1
20	70366	• Gauge, 3000 PSI Pressure					1
21		• Lock, Twist					4
22	W-100968	• Switch, A & B Momentary Rotary					1
23	W-100969	• Contact, A & B Switch					3
24	W-103735	• Bridge, A & B Switch					1
25	W-100287	• Base, A & B Switch					1
26	79831	• Gauge, 6000 PSI Pressure					1
27		• Mount, Rubber					A/R
28	72826	• Switch, On - On					1
29	W-105812	• Light, Yellow Indicator					2

DASH (-) ITEM NOT ILLUSTRATED

## MAIN CONTROLS ASSEMBLY (AFTER JUNE 2000)



**AFTER JUNE 2000**

**AFTER JUNE 2000**

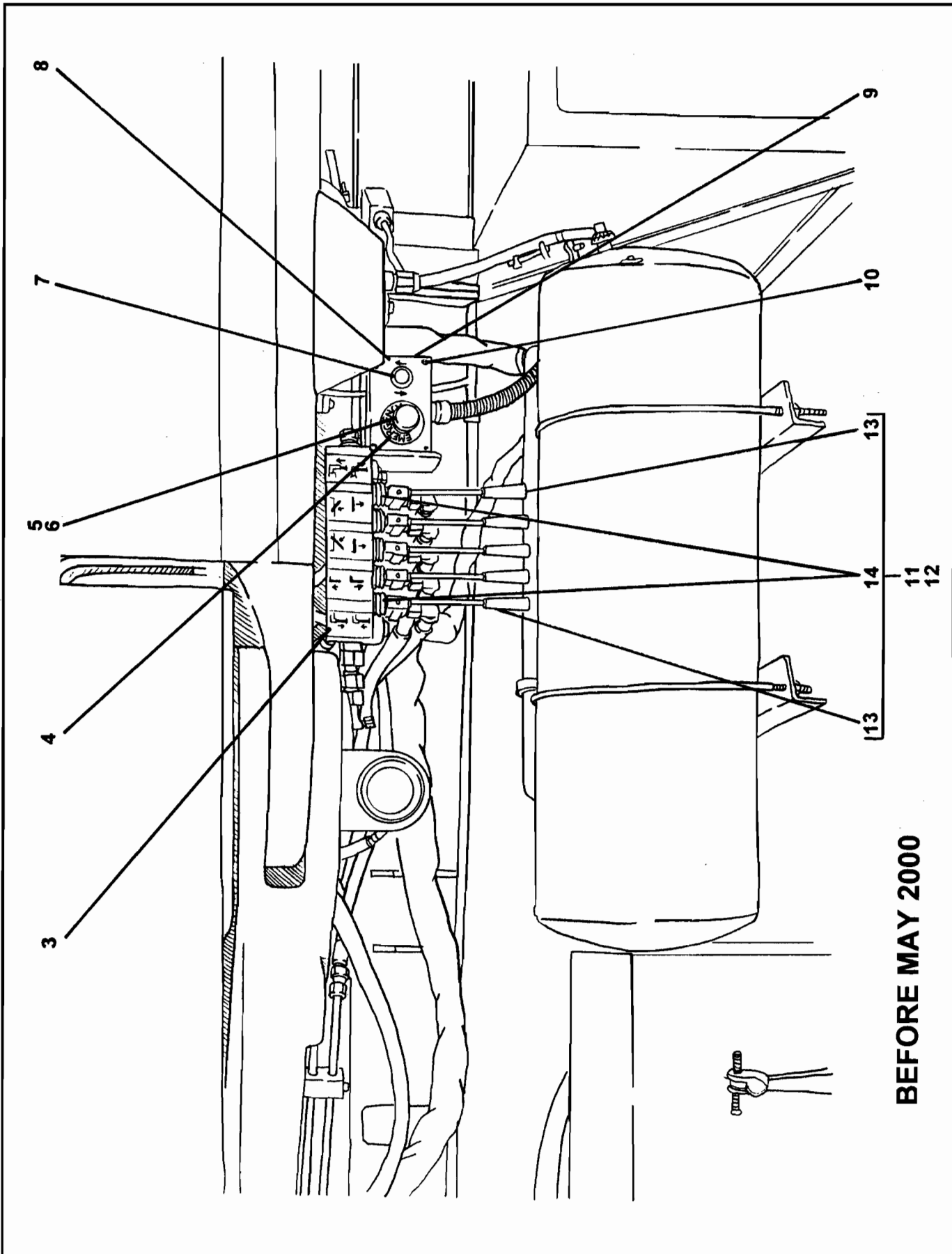
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
30	W-104118	• Resistor, 100 OHM					1
31	W-100710	• Contact, 24 Pin Female (A)					1
32	W-101553	• Contact, 24 Pin Housing (A)					1
33	W-102577	• Block, Terminal					1
34	W-105817	• Clamp					2
35	W-105818	• Plate, End					2
36	W-104099	• Bag, Circuit Diagram					1
37	W-101921	• Fuse, 10 AMP					3
38	W-104096	• Fuse, 20 AMP					2
39	W-101922	• Fuse, 5 AMP					1
40	W-101577	• Holder, 8 Type Fuse					1
41	W-104185	• Diode					4
42	W-105331	• Relay, Time					1
43	W-105815	• Relay					1
44	W-105619	• Socket, Relay					1
45	W-104122	• Relay					1
46	W-104094	• Clip					6
47	W-100178	• Clip					4
48	W-104093	• Relay					6
49	W-104895	• Clip					2
50	W-103974	• Socket, Relay					1
51	W-105046	• Relay, Type 55.34					1
52	W-104860	• Clip					1
53	W-105814	• Element, Emergency Stop					1
54	W-100986	• Socket, Relay Bosch					4
55	W-104117	• Relay, Bosch					4
56	800461	• Box, Black					1
57	W-103693	• Contact, 8 Pin Female (C)					1
58	W-105816	• Contact, 8 Pin Housing (C)					1
59	W-103695	• Contact, Crimp (C)					1
60	W-103697	• Contact, Crimp (C)					1
61	W-104022	• Contact, 16 Pin Female (B)					1
62	W-104097	• Contact, 16 Pin Housing (B)					1
63	W-104669	• Condenser					1

DASH (-) ITEM NOT ILLUSTRATED

**REED**

**DRIVER SIDE (LEFT HAND)  
OUTRIGGER CONTROLS ASSEMBLY  
(BEFORE MAY 2000)**

**XXT 32  
PARTS  
GROUP 50  
FIGURE 06  
PAGE 01**



**BEFORE MAY 2000**

**BEFORE MAY 2000**

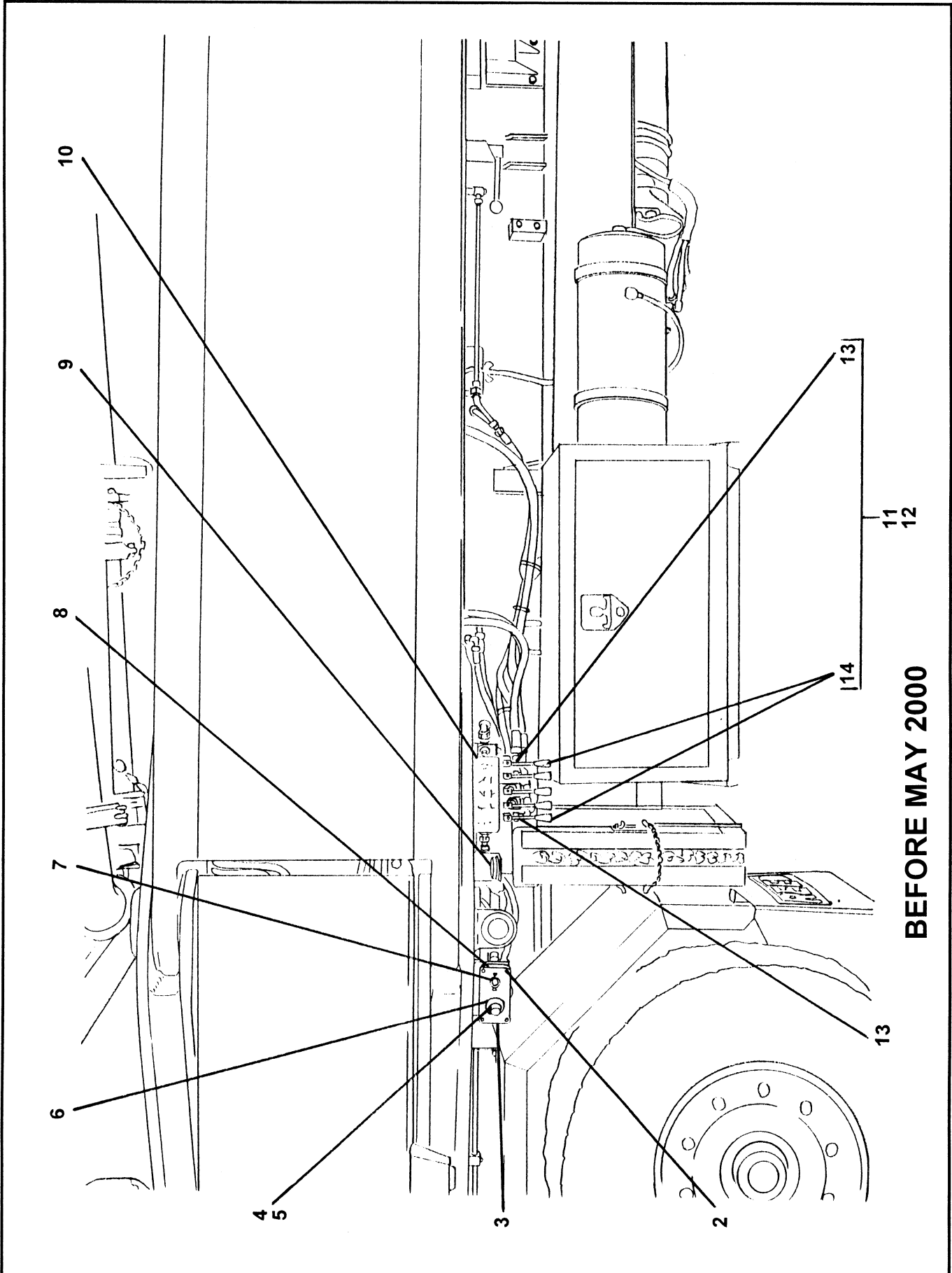
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-06	Assembly, Driver (L. H.) Side Outrigger Controls (Bef May 2000) (See Group 50, Figure 01 for NHA)					Ref
-2	800099	• Level, Bubble					1
3	C-9V112	• Decal, Left Side Stabilizers					1
4	W-102278	• Nameplate, Emergency					1
5	W-104079	• Button, Emergency Stop					1
6	W-101712	• Contact, Emergency Stop Element					1
7	W-103530	• Switch, Toggle					1
8		• Box, Non-Keyed Junction					1
9		• Decal, Non-Keyed Junction Box					1
10	W-103735	• Screw, Twist Lock Spring (attaching parts)					4
11	C-DD009	• Bank, Left Side Directional Valve					1
12		•• Lever					5
13		••• Lever, Knob					1
14		••• Boot, Rubber					1

DASH (-) ITEM NOT ILLUSTRATED



DRIVER SIDE (LEFT HAND)  
OUTRIGGER CONTROLS ASSEMBLY  
(AFTER JUNE 2000)

XXT 32  
PARTS  
GROUP 50  
FIGURE 07  
PAGE 01



**AFTER JUNE 2000**

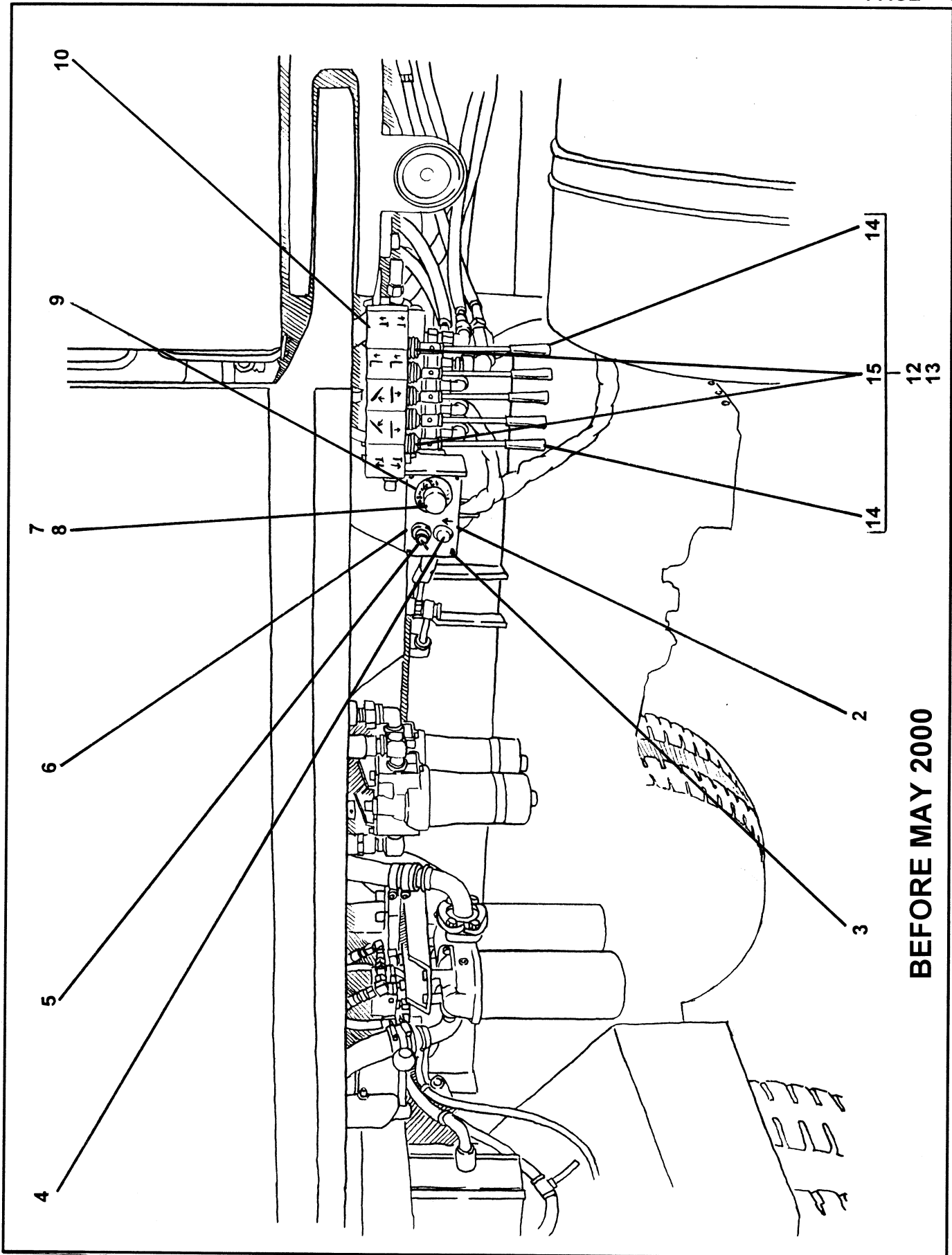
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-07	Assembly, Driver (L. H.) Side Outrigger Controls (Aft Jun 2000) (See Group 50, Figure 02 for NHA)					Ref
2	W-103735	• Screw, Twist Lock Spring (attaching parts)					4
3		• Box, Non-Keyed Junction					1
4	W-104079	• Button, Emergency Stop					1
5	W-101712	• Contact, Emergency Stop Element					1
6	W-102278	• Nameplate, Emergency					1
7	W-100569	• Button, Push Operation					1
8		• Decal, Non-Keyed Junction Box					1
9	800099	• Level, Bubble					1
10	C-9V112	• Decal, Left Side Stabilizers					1
11	C-DD009	• Bank, Left Side Directional Valve					1
12		• • Lever					5
13		• • • Lever, Knob					1
14		• • • Boot, Rubber					1

DASH (-) ITEM NOT ILLUSTRATED



PASSENGER SIDE (RIGHT HAND)  
OUTRIGGER CONTROLS ASSEMBLY  
(BEFORE MAY 2000)

XXT 32  
PARTS  
GROUP 50  
FIGURE 08  
PAGE 01



BEFORE MAY 2000





**PASSENGER SIDE (RIGHT HAND)  
OUTRIGGER CONTROLS ASSEMBLY  
(BEFORE MAY 2000)**

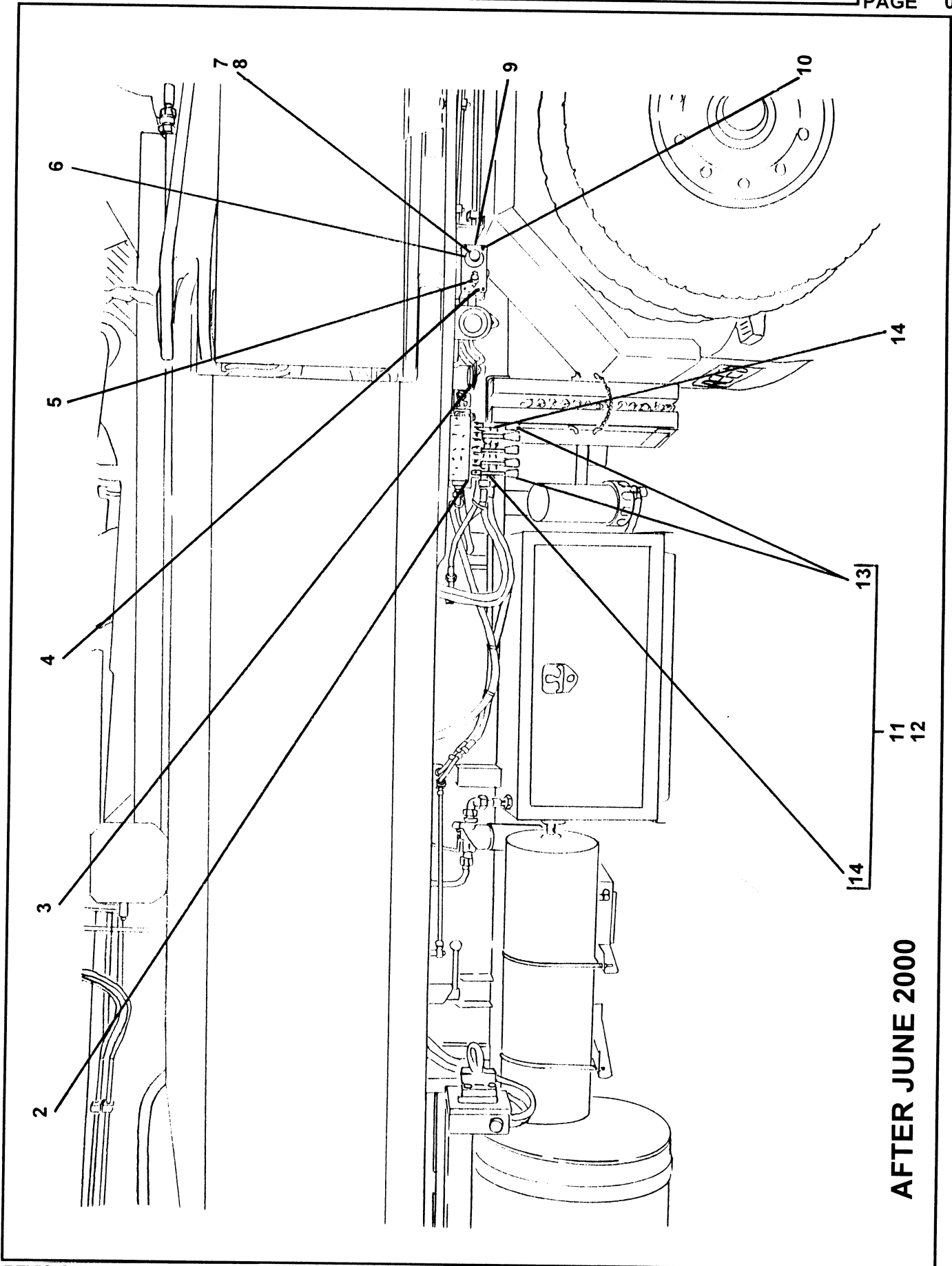
**XXT 32**  
**PARTS**  
GROUP 50  
FIGURE 08  
PAGE 02

**BEFORE MAY 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-08	Assembly, Passenger (R. H.) Side Outrigger Controls (Bef May 2000) (See Group 50, Figure 01 for NHA)					Ref
2		• Box, Keyed Junction					1
3	W-103735	• Screw, Twist Lock Spring (attaching parts)					4
4	W-103530	• Switch, Toggle					1
5	C-WW00190	• Switch, Key					1
6		• Decal, Keyed Junction Box					1
7	W-104079	• Button, Emergency Stop					1
8	W-101712	• Contact, Emergency Stop Element					1
9	W-102278	• Nameplate, Emergency					1
10	C-9V111	• Decal, Right Side Stabilizers					1
-11	800099	• Level, Bubble					1
12	C-DD009	• Bank, Right Side Directional Valve					1
13		•• Lever					5
14		••• Lever, Knob					1
15		••• Boot, Rubber					1

DASH (-) ITEM NOT ILLUSTRATED

## PASSENGER SIDE (RIGHT HAND) OUTRIGGER CONTROLS ASSEMBLY (AFTER JUNE 2000)



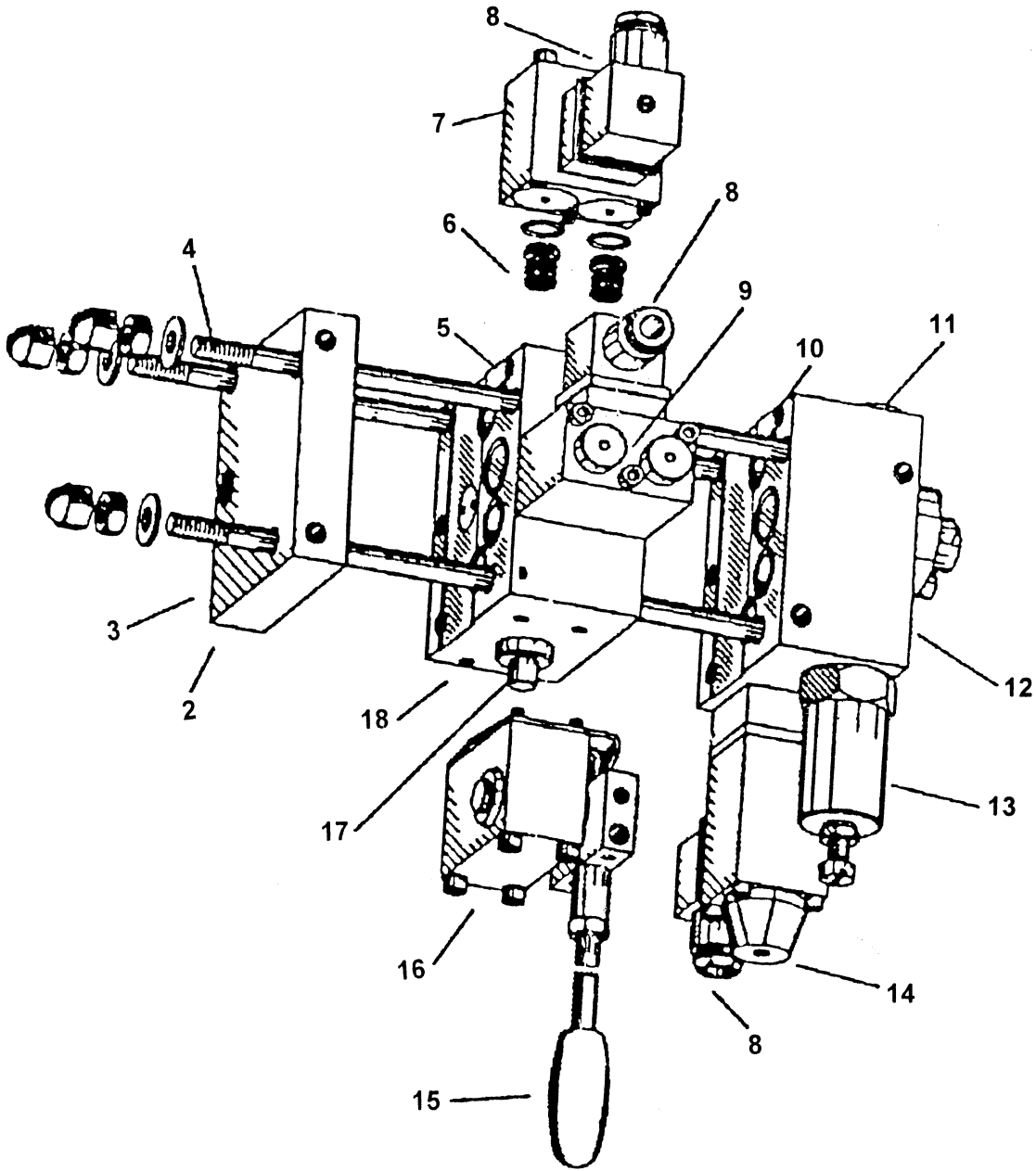
**AFTER JUNE 2000**

**AFTER JUNE 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-05	Assembly, Passenger (R. H.) Side Outrigger Controls (See Group 50, Figure 01 for NHA)					Ref
2	C-9V111	• Decal, Right Side Stabilizers					1
3	800099	• Level, Bubble					1
4		• Decal, Keyed Junction Box					1
5	W-100569	• Button, Push Operation					1
6	W-102278	• Nameplate, Emergency					1
7	W-104079	• Button, Emergency Stop					1
8	W-101712	• Contact, Emergency Stop Element					1
9		• Box, Keyed Junction					1
10	W-103735	• Screw, Twist Lock Spring (attaching parts)					4
11	C-DD009	• Bank, Right Side Directional Valve					1
12		• • Lever					5
13		• • • Lever, Knob					1
14		• • • Boot, Rubber					1

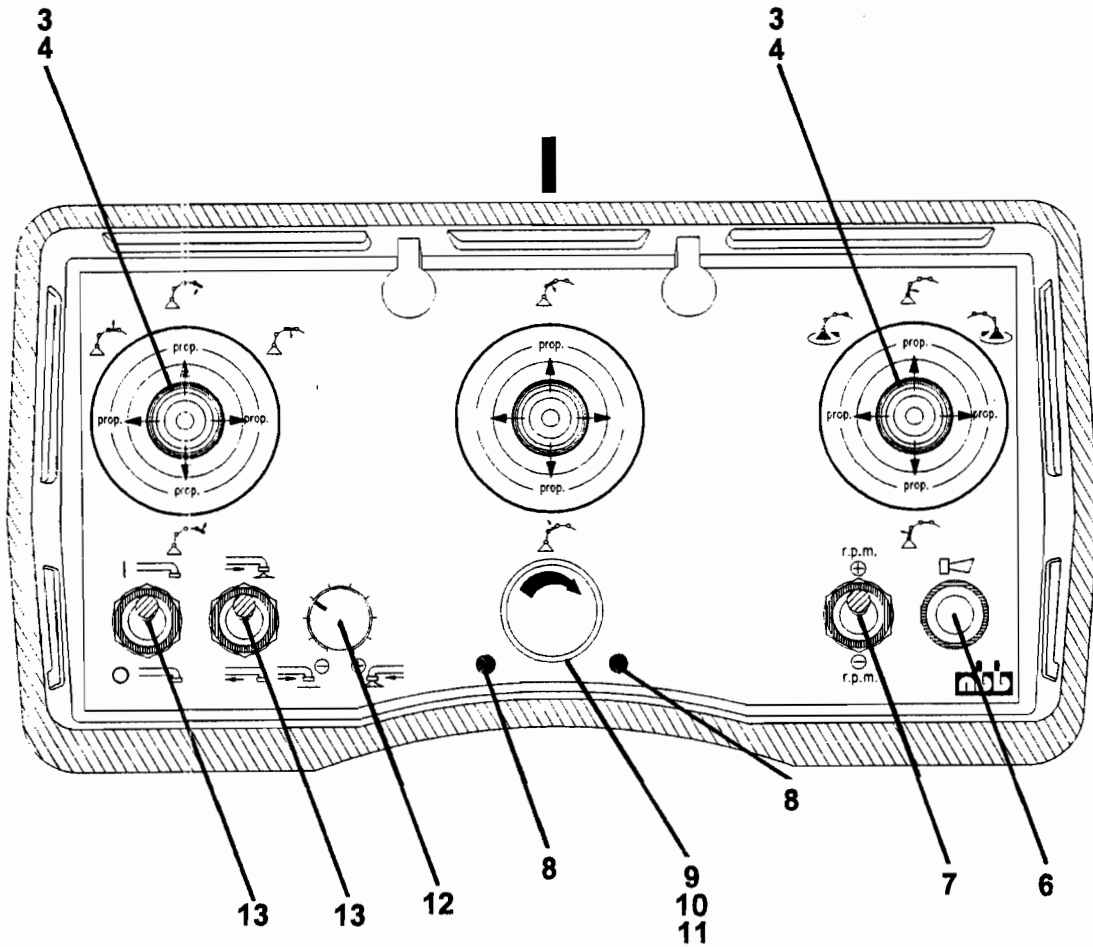
DASH (-) ITEM NOT ILLUSTRATED

## STATIONARY BOOM CONTROLS ASSEMBLY



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-DD103	Assembly, Stationary Boom Controls (See Group 50, Figure 01 and 02 for NHA)					Ref
2					• Plate, End	1	
3					• Valve, Check	1	
4					• Set, Tension Rod	1	
5					• Kit, Valve Section Seal	6	
6					• Valve, Press Reducing	6	
7					• Solenoid, Actuation	6	
8					• Plug, Solenoid	13	
9					• Solenoid, Function	6	
10					• Kit, Connection Block Seal	1	
11					• Valve, Pilot Press Reducing	1	
12					• Block, Connection	1	
13					• Valve, Pressure Limiting	1	
14					• Valve, Directional Seated	1	
15					• Lever, Hand	6	
16					• Housing, Actuation	6	
17					• Spool	6	
18					• Valve, Section	6	
-19	C-4V120				• Decal, Control	1	

DASH (-) ITEM NOT ILLUSTRATED

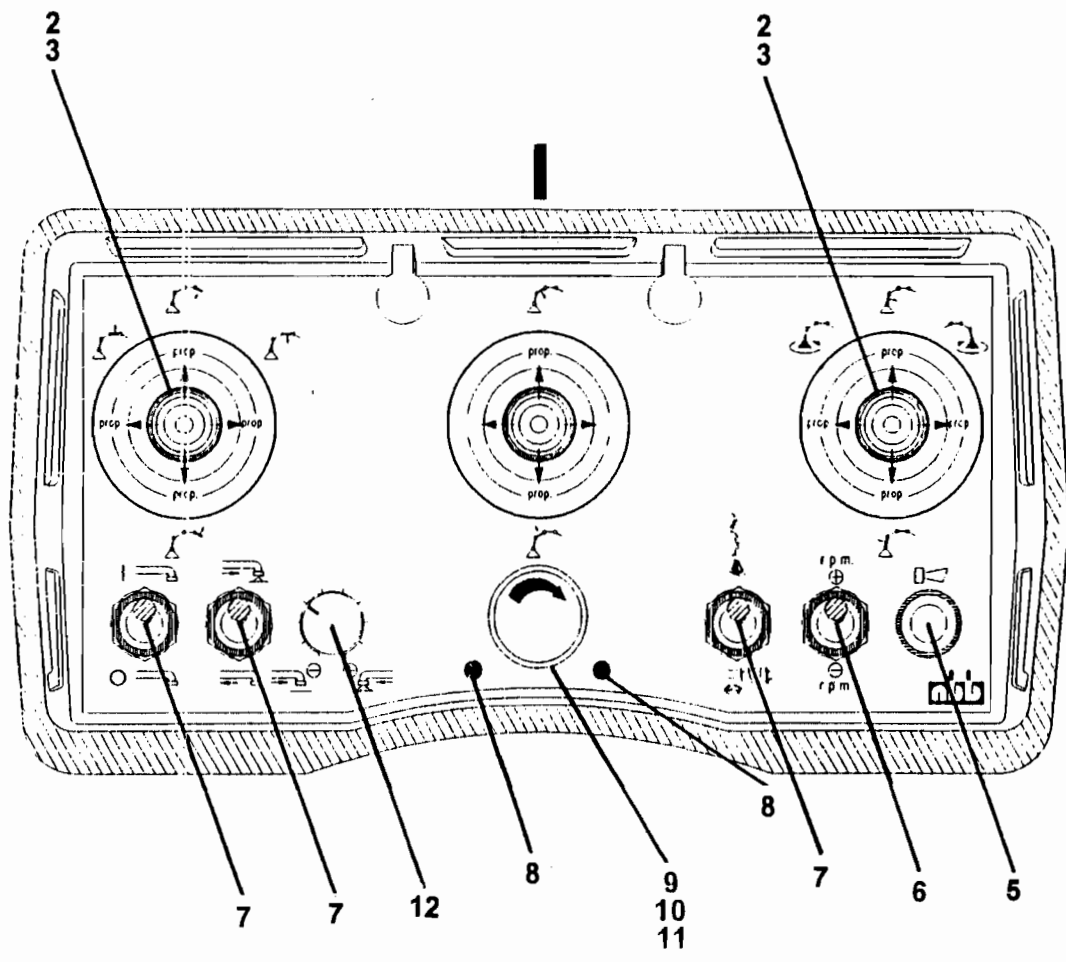


**BEFORE MAY 2000**

**BEFORE MAY 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	50-07	Assembly, Cabled Remote Control (Bef May 2000) (See Group 50, Figure 01 for NHA)					Ref
2	W-104429	• Sub-Assembly, Cabled Remote Control					1
3		• • Switch, Joy Stick Control					3
4		• • • Boot, Rubber					1
-5		• • Strap, Shoulder					1
6	3.740.1020	• • Switch, O – Mom Push Button					1
7	3.740.1017	• • Switch, O – Mom Toggle					1
8		• • Indicator, Light					2
9		• • Switch, Emergency Stop					1
10		• • • Knob, with Key					1
11		• • • Switch, Contact					1
12	3.980.1156	• • Potentiometer, with Knob					1
13	3.740.1018	• • Switch, On – O - On Toggle					2
14	W-104413	• Assembly, Cabled Remote Control Drum with 35m Cable					1
15	W-104477	• Assembly, Cabled					1
16		• • Plug, 16 Pin Male					1
17		• • Receptacle, 16 Pin Female					1

DASH (-) ITEM NOT ILLUSTRATED



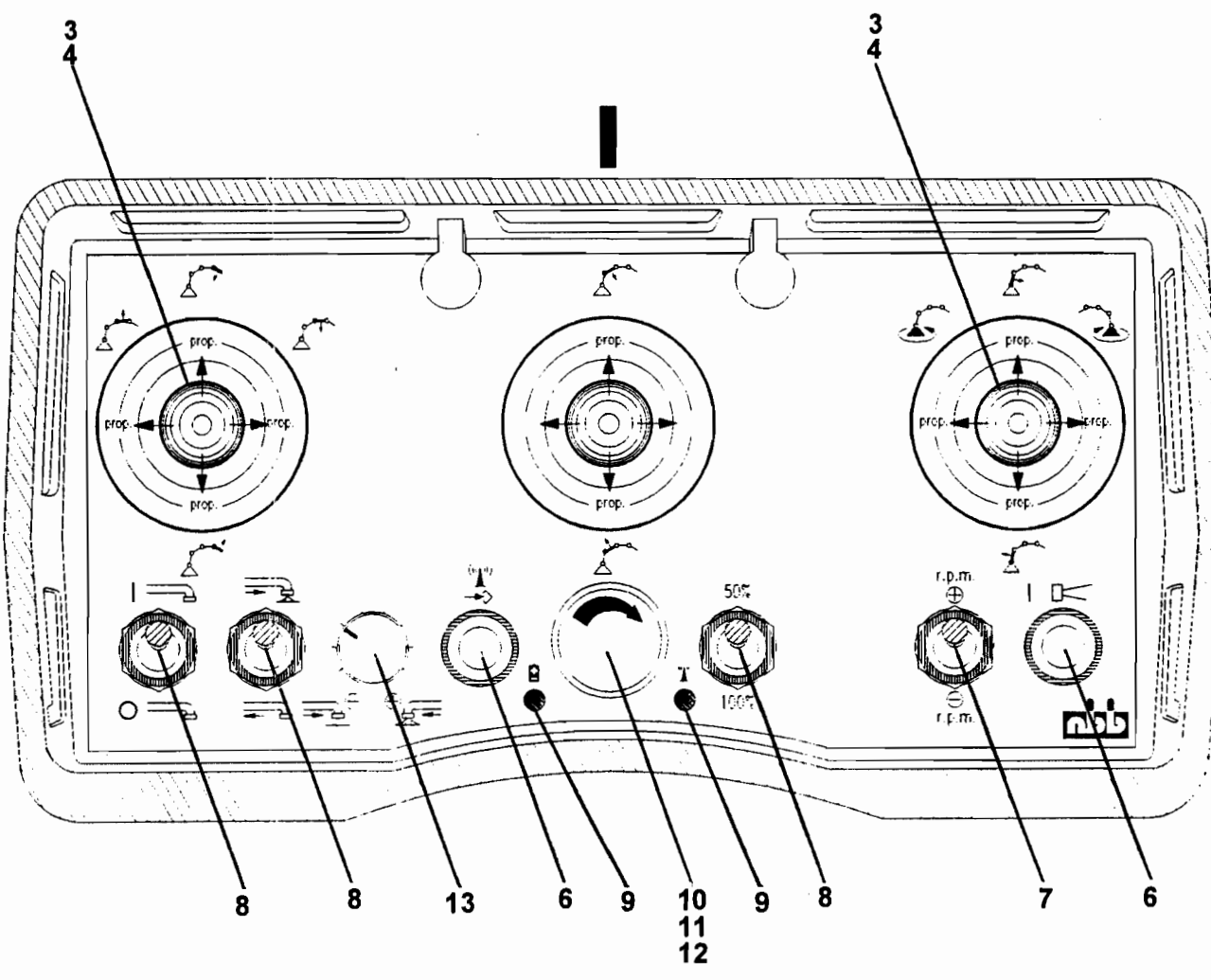
**AFTER JUNE 2000**



**AFTER JUNE 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-105565	Assembly, Cabled Remote Control (Aft Jun 2000) (See Group 50, Figure 02 for NHA)					Ref
2		• Switch, Joy Stick Control					3
3		• • Boot, Rubber					3
-4		• Strap, Shoulder					1
5	3.740.1020	• Switch, O - Mom Push Button					1
6	3.740.1017	• Switch, Mom - O - Mom Toggle					1
7	3.740.1018	• Switch, On - O - On Toggle					3
8		• • Indicator, Light					2
9		• • Switch, Emergency Stop					1
10		• • • Knob, with Key					1
11		• • • Switch, Contact					1
12	3.980.1156	• • Potentiometer, with Knob					1

DASH (-) ITEM NOT ILLUSTRATED

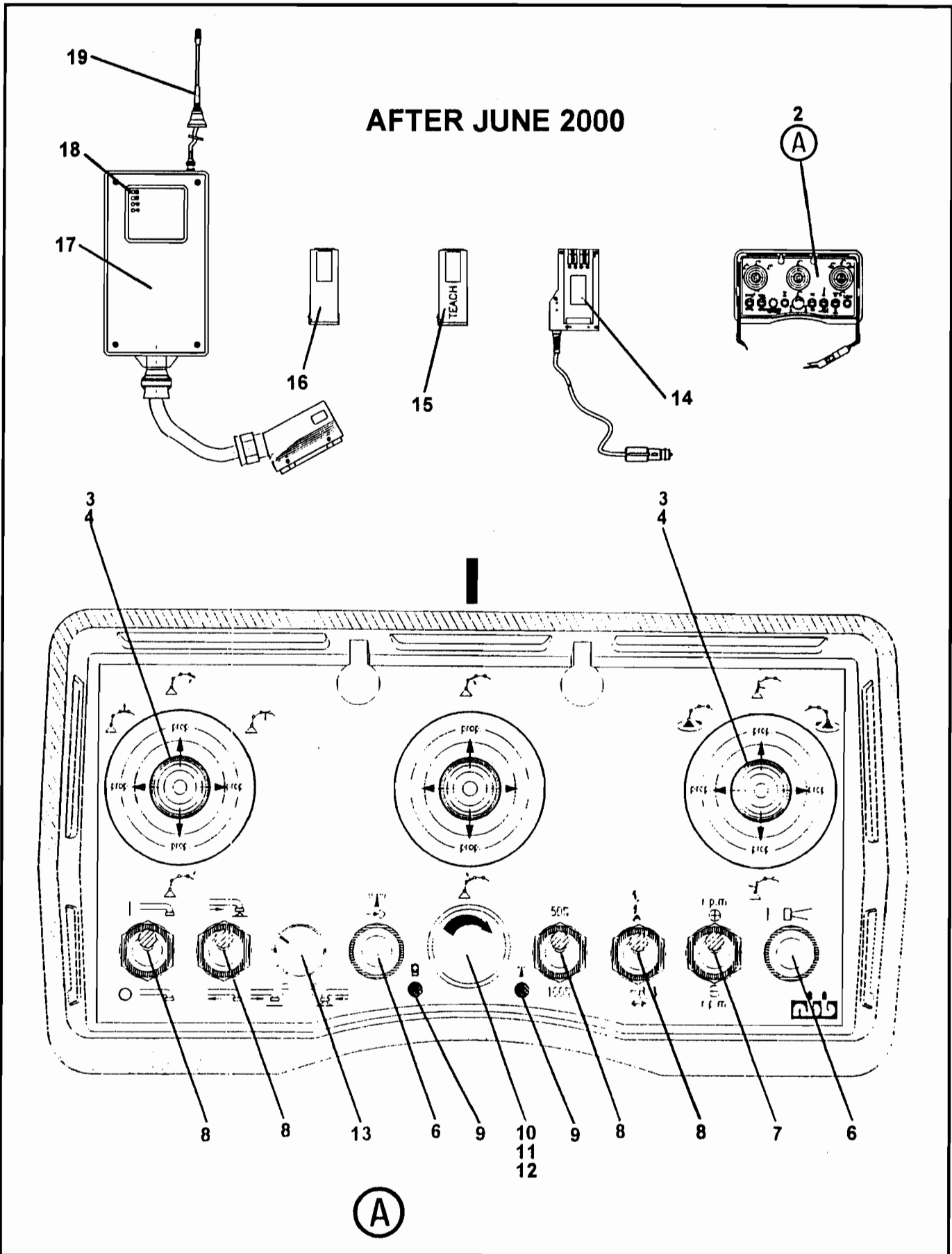


**BEFORE MAY 2000**

**BEFORE MAY 2000**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-104428	Assembly, Radio Remote Control (Bef May 2000) (See Group 50, Figure 01 for NHA)					Ref
-2	W-104763	• Transmitter, Radio Remote Control					1
3		• • Switch, Joy Stick Control					3
4		• • • Boot, Rubber					1
-5		• • Strap, Shoulder					1
6	3.740.1020	• • Switch, O – Mom Push Button					1
7	3.740.1017	• • Switch, O – Mom Toggle					1
8	3.740.1018	• • Switch, On – O - On Toggle					3
9		• • Indicator, Light					2
10		• • Switch, Emergency Stop					1
11		• • • Knob, with Key					1
12		• • • Switch, Contact					1
13	3.980.1156	• • Potentiometer, with Knob					1
-14	W-104745	• Battery, 7.2V (See Group 50, Figure 03 for REF)					1
-15	W-104430	• Battery, Teach					1
-16	W-104764	• Receiver, Radio Remote Control (See Group 50, Figure 04 for REF)					1
-17		• • Indicator, Light					5
-18	W-104774	• Antenna, Radio Remote Control (See Group 50, Figure 04 for REF)					1
-19	W-104743	• Charger, Battery (See Group 50, Figure 03 for REF)					1

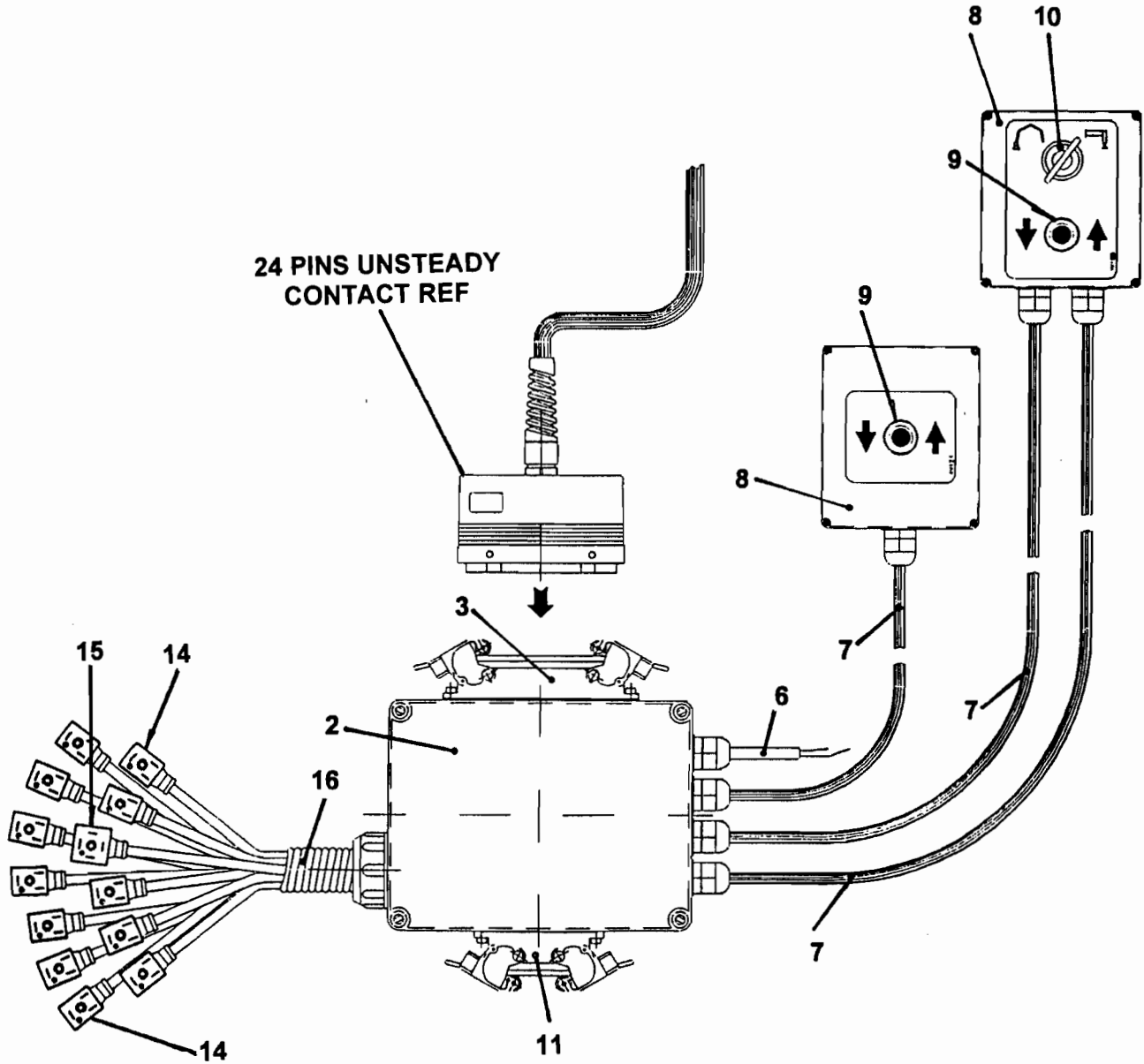
DASH (-) ITEM NOT ILLUSTRATED



**AFTER JUNE 2000**

<b>ITEM NO.</b>	<b>REED'S PARTS NO.</b>	<b>DESCRIPTION</b>	<b>QTY</b>
-1	W-105566	Assembly, Radio Remote Control (Aft Jun 2000) (See Group 50, Figure 02 for NHA)	Ref
2	W-104763	• Transmitter, Radio Remote Control	1
3		• • Switch, Joy Stick Control	3
4		• • • Boot, Rubber	1
-5		• • Strap, Shoulder	1
6	3.740.1020	• • Switch, O – Mom Push Button	1
7	3.740.1017	• • Switch, O – Mom Toggle	1
8	3.740.1018	• • Switch, On – O - On Toggle	4
9		• • Indicator, Light	2
10		• • Switch, Emergency Stop	1
11		• • • Knob, with Key	1
12		• • • Switch, Contact	1
13	3.980.1156	• • Potentiometer, with Knob	1
14	W-104743	• Charger, Battery (See Group 50, Figure 03 for REF)	1
15	W-104430	• Battery, Teach	1
16	W-104745	• Battery, 7.2V (See Group 50, Figure 03 for REF)	1
17	W-104764	• Receiver, Radio Remote Control (See Group 50, Figure 05 for REF)	1
18		• • Indicator, Light	5
19	W-104774	• Antenna, Radio Remote Control (See Group 50, Figure 05 for REF)	1

DASH (-) ITEM NOT ILLUSTRATED



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-VW00587	Assembly, Shunt (See Group 50, Figure 01 and 02 for NHA)					Ref
2	C-WW00230	••	Box, Connector	214 X 162 X 92		1	
3		••	Plug, 24 Points Contact			1	
-4	C-WW00154	•••	Plug			1	
-5	C-WW00167	•••	Case, Plug			1	
6	C-WW00116	••	Cable, Electric	1.6 m		1	
7	C-WW00265	••	Cable, Electric	4 m		3	
8	C-ESC01	••	Box, Junction			2	
9	C-EI031	••	Switch			2	
10	C-WW00190	••	Switch, 2 Position Key			1	
11		••	Plug, 10 Points Auxiliary Contact			1	
-12	C-WW00011	•••	Plug			1	
-13	C-WW00037	•••	Case, Plug			1	
14	C-WW00065	••	Plug, Rectangular with Cable			12	
15	C-WW00175	••	Plug, Square with Electric Cable			1	
16	C-WW00100	••	Cable, 1.5 m Sheath			1	

DASH (-) ITEM NOT ILLUSTRATED

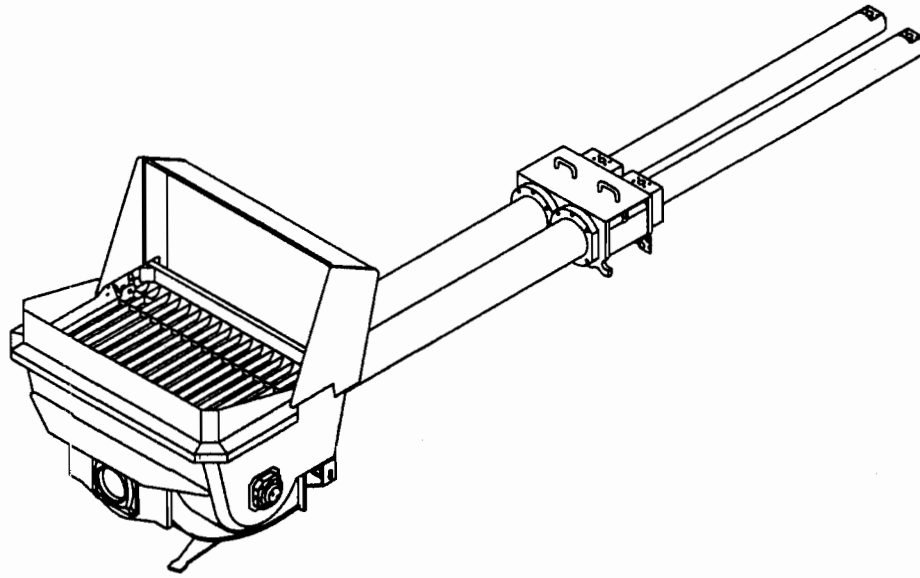


**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

**XXT 32  
PARTS  
GROUP 50  
FIGURE 16  
PAGE 01**

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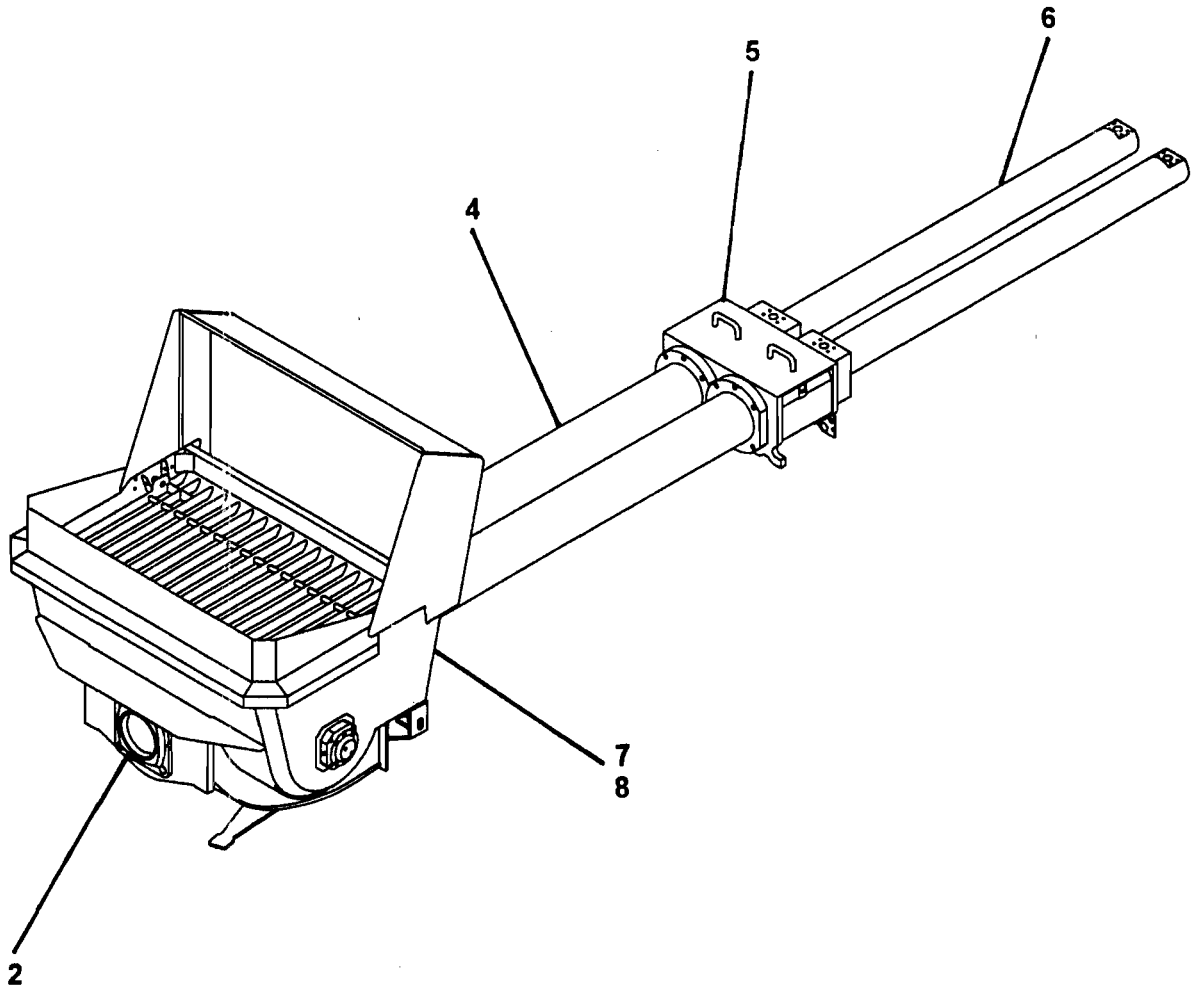
**REED TRUCK MOUNTED CONCRETE BOOM PUMP MODEL XXT 32  
ILLUSTRATED PARTS MANUAL GROUP 60 PUMPING TRAIN INSTALLATION  
CONTAINS THE FOLLOWING FIGURES:**

<b>FIGURE 00</b>	<b>TABLE OF CONTENTS</b>
<b>FIGURE 01</b>	<b>PUMPING TRAIN INSTALLATION</b>
<b>FIGURE 02</b>	<b>SWING VALVE ASSEMBLY</b>
<b>FIGURE 03</b>	<b>TILTING DRIVE ASSEMBLY</b>
<b>FIGURE 04</b>	<b>TILTING CYLINDER ASSEMBLY</b>
<b>FIGURE 05</b>	<b>CONCRETE CYLINDER ASSEMBLY</b>
<b>FIGURE 06</b>	<b>WATER BOX ASSEMBLY</b>
<b>FIGURE 07</b>	<b>HYDRAULIC DRIVE CYLINDER ASSEMBLY</b>
<b>FIGURE 08</b>	<b>DRIVE CYLINDER SUB-ASSEMBLY</b>



# PUMPING TRAIN INSTALLATION

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 01  
PAGE 01



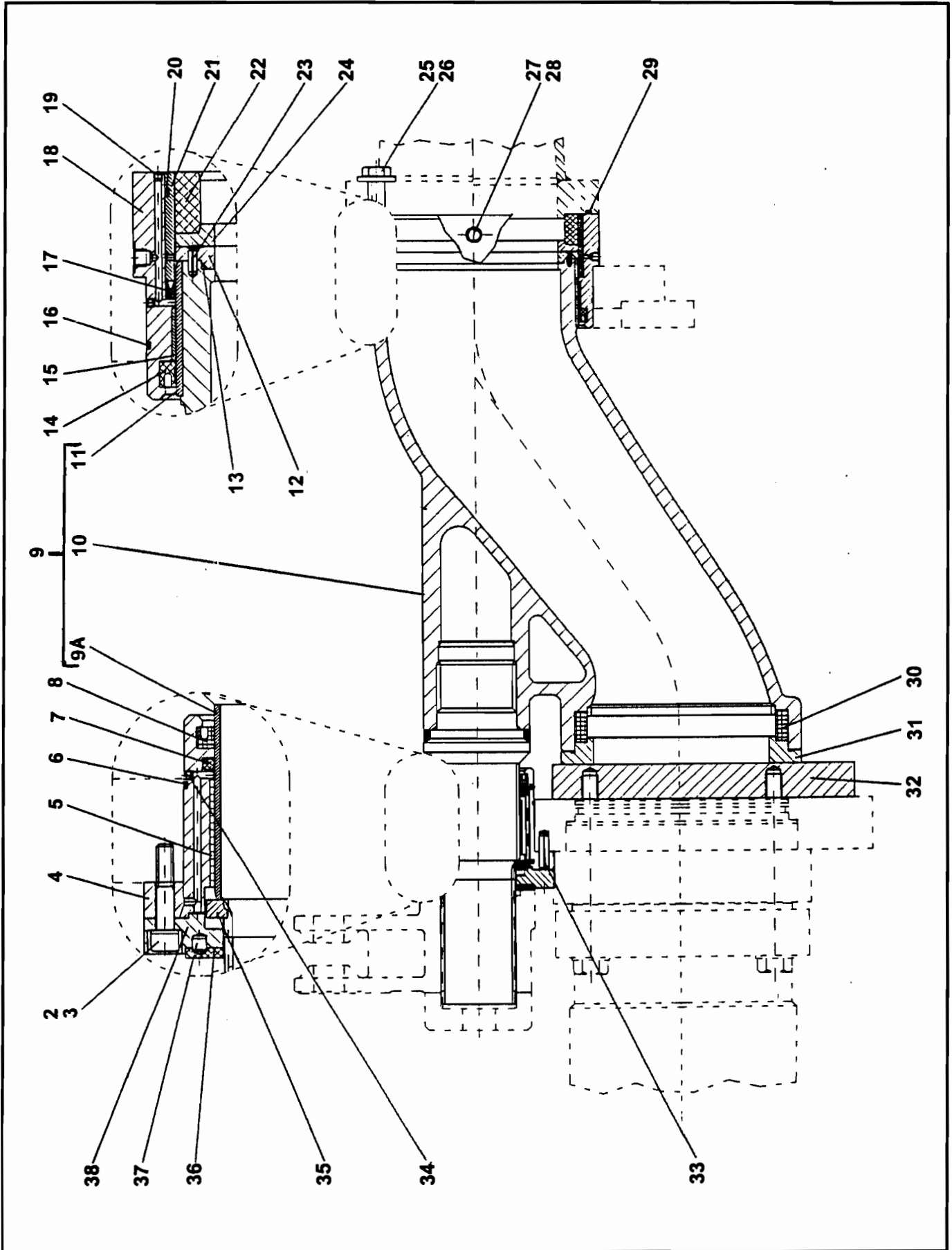
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	60-01	Installation, Pumping Train (See Group 10, Figure 01 for NHA)					Ref
2	B-174020	• Assembly, Swing Valve (See Group 60, Figure 02 for DET)					1
-3	B-174030	• Assembly, Tilting Drive (See Group 60, Figure 03 for DET)					1
4	B-124013	• Assembly, Concrete Cylinder (See Group 60, Figure 05 for DET)					1
5	B-143000	• Assembly, Water Box (See Group 60, Figure 06 for DET)					1
6	60-06	• Assembly, Hydraulic Drive Cylinder (See Group 60, Figure 07 for DET)					1
7	20-01	• Installation, Hopper (See Group 20, Figure 01 for REF)					Ref
-8	B-183000	• System, Central Lubrication (See Group 20, Figure 02 for REF)					Ref

DASH (-) ITEM NOT ILLUSTRATED



# SWING VALVE ASSEMBLY

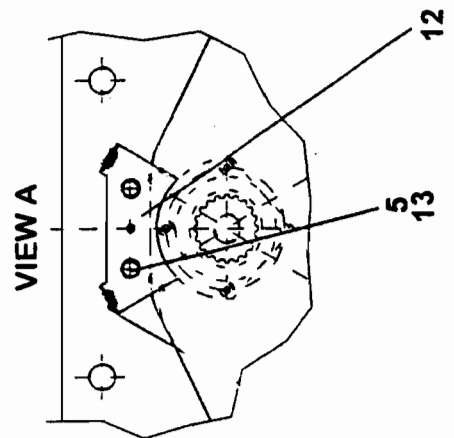
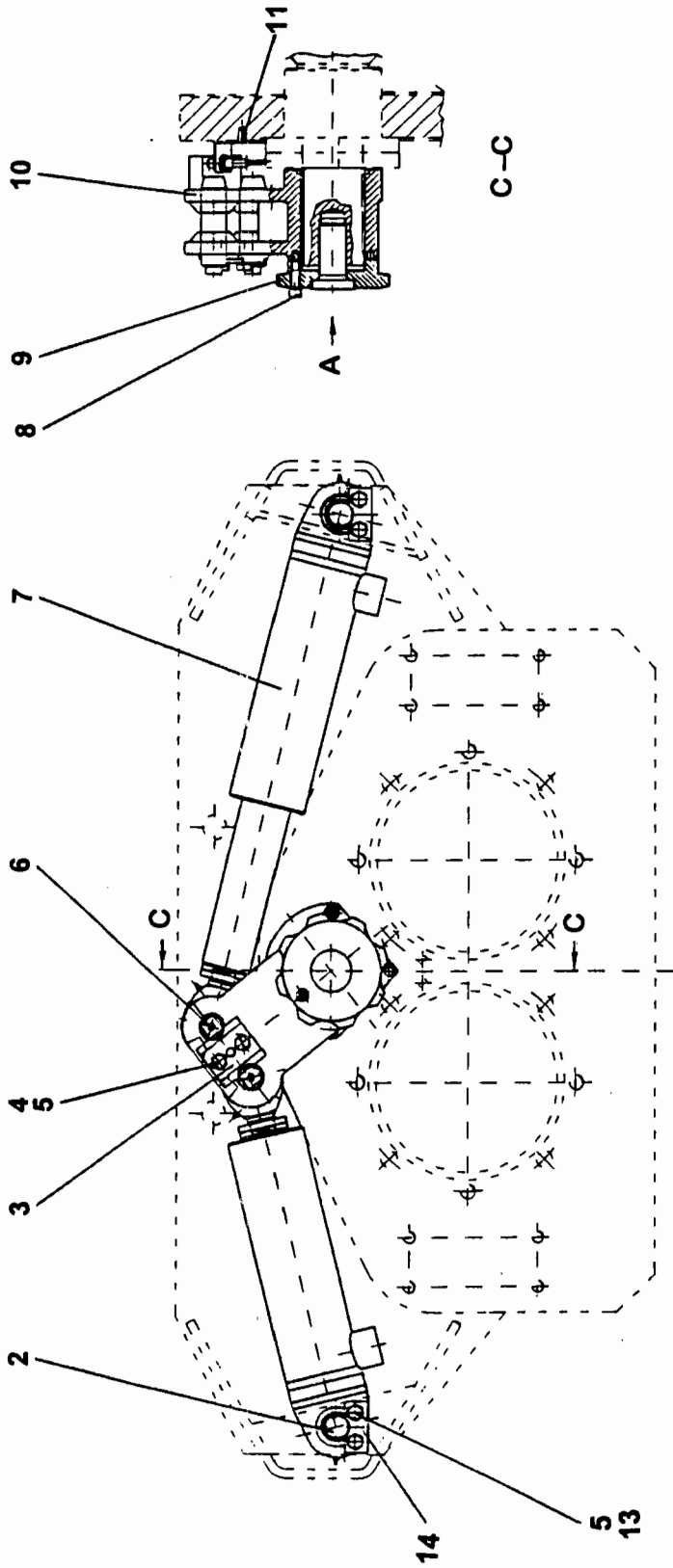
XXT 32  
PARTS  
GROUP 60  
FIGURE 02  
PAGE 01



REVISION:

	<b>REED'S PARTS NO.</b>	<b>DESCRIPTION</b>	<b>QTY</b>
-1	B-174020	Assembly, Swing Valve (See Group 60, Figure 01 for NHA)	Ref
2	W-103151	• Screw, M12	3
3	W-103113	• Washer, Spring A12	3
4	B-174024	• Housing, Small Bearing	1
5	W-100237	• Bushing	1
6	W-100486	• O-Ring	2
7	W-100485	• O-Ring	2
8	W-100484	• Ring, Groove	1
9	W-105223	• Assembly, Swing Tube	1
9A	B-172105	• • Bushing, Small	1
10	B-174089	• • Valve, Swing DN 200	1
11	B-172107	• • Bushing, Big	1
12	B-174027	• Ring, Sliding	1
13	B-100625	• O-Ring	1
14	W-100479	• Ring, Groove	1
15	W-100236	• Ring, Outlet Wear	1
16	W-100481	• O-Ring	1
17	W-103078	• Foreseal	1
18	B-174022	• Housing, Big Bearing	1
19	W-100499	• Screw, M5 Set	2
20	W-103365	• O-Ring	1
21	B-174023	• Ring, Spacer	1
22	W-100262	• Ring, Outlet Wear	1
23	W-103077	• Pin, Spring Type Straight	2
24	B-174028	• Ring, Sliding	1
25	W-101589	• Screw, M20 Hex	4
26	W-102110	• Washer, A20	4
27	W-101621	• Screw, M8 Hex	1
28	W-101269	• Ring	1
29	W-101588	• O-Ring	1
30	W-103378	• Ring, Wear Ring Tension	1
31	B-174087	• Ring, Wear	1
32	B-172112	• Plate, Spectacle (2 Halves)	1
33	W-103076	• Pin, Spring Type Straight	1
34	W-102710	• Screw, M4 Set	4
35	B-174026	• Profile	1
36	B-173012	• Washer, Phenolic Axial Bearing	1
37	W-103080	• Pin, Cylindrical	1
38	B-174025	• Flange	1

DASH (-) ITEM NOT ILLUSTRATED



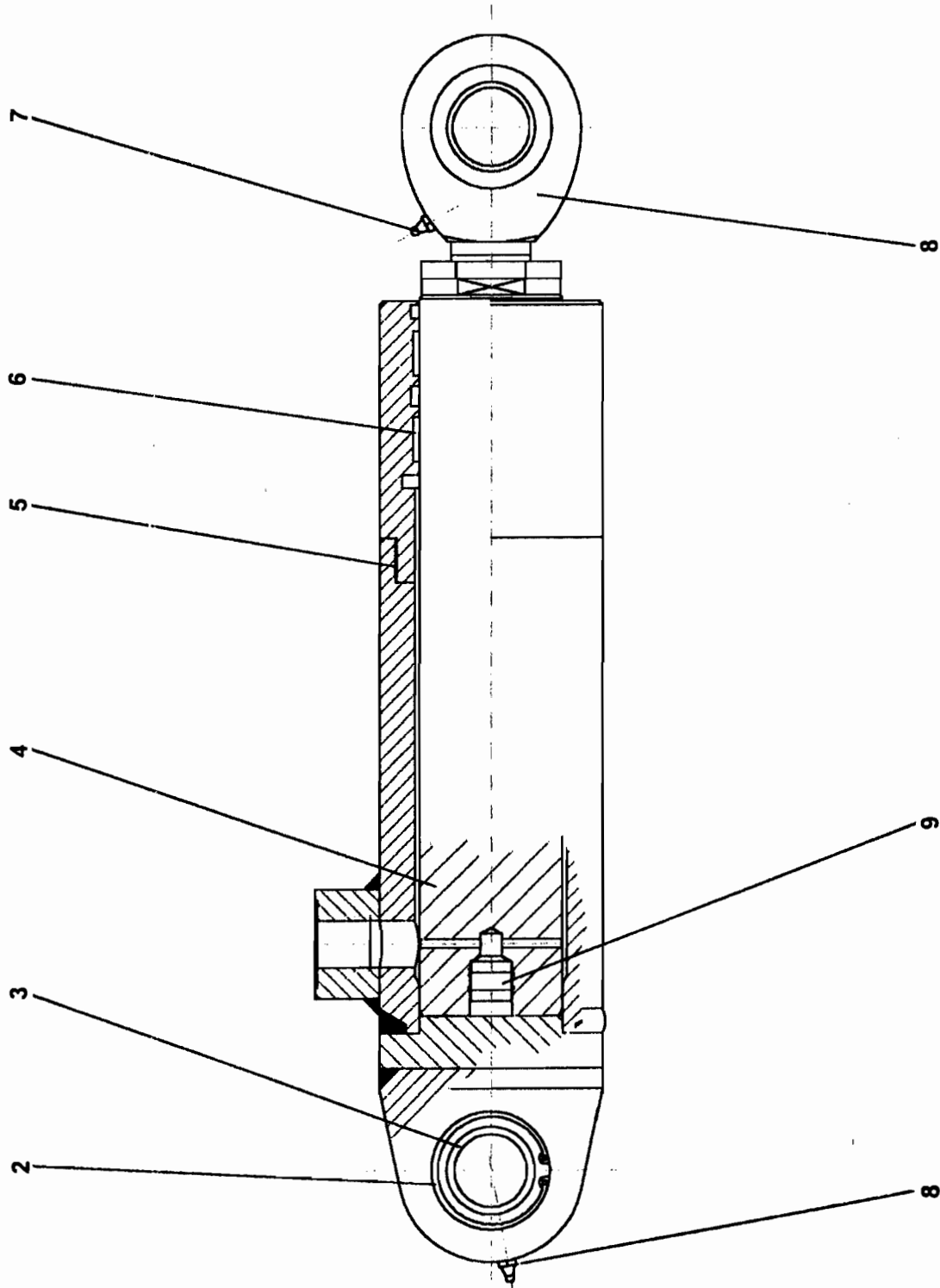
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	B-174030	Assembly, Tilting Drive (See Group 60, Figure 01 for NHA)					Ref
2	B-173066	• Pin, Safety					2
3	B-174083	• Plate, Key					1
4	W-102107	• Screw, M12 Hex					2
5	W-102877	• Washer, A12					8
6	B-173019	• Pin					2
7	W-103363	• Assembly, Tilting Cylinder (See Group 60, Figure 04 for DET)					2
8	B-174035	• Screw, M10 Hex (attaching parts)					1
9	B-174032	• Plate, Tension					1
10	B-174031	• Lever, Tilting					1
11	W-102881	• Pin, Spring Type Straight					1
12	B-174084	• Bracket, Sensor					1
13	W-101001	• Bolt, M12					6
14	B-173067	• Plate, Safety Pin					2

DASH (-) ITEM NOT ILLUSTRATED



# TILTING CYLINDER ASSEMBLY

XXT 32  
PARTS  
GROUP 60  
FIGURE 04  
PAGE 01



REVISION:



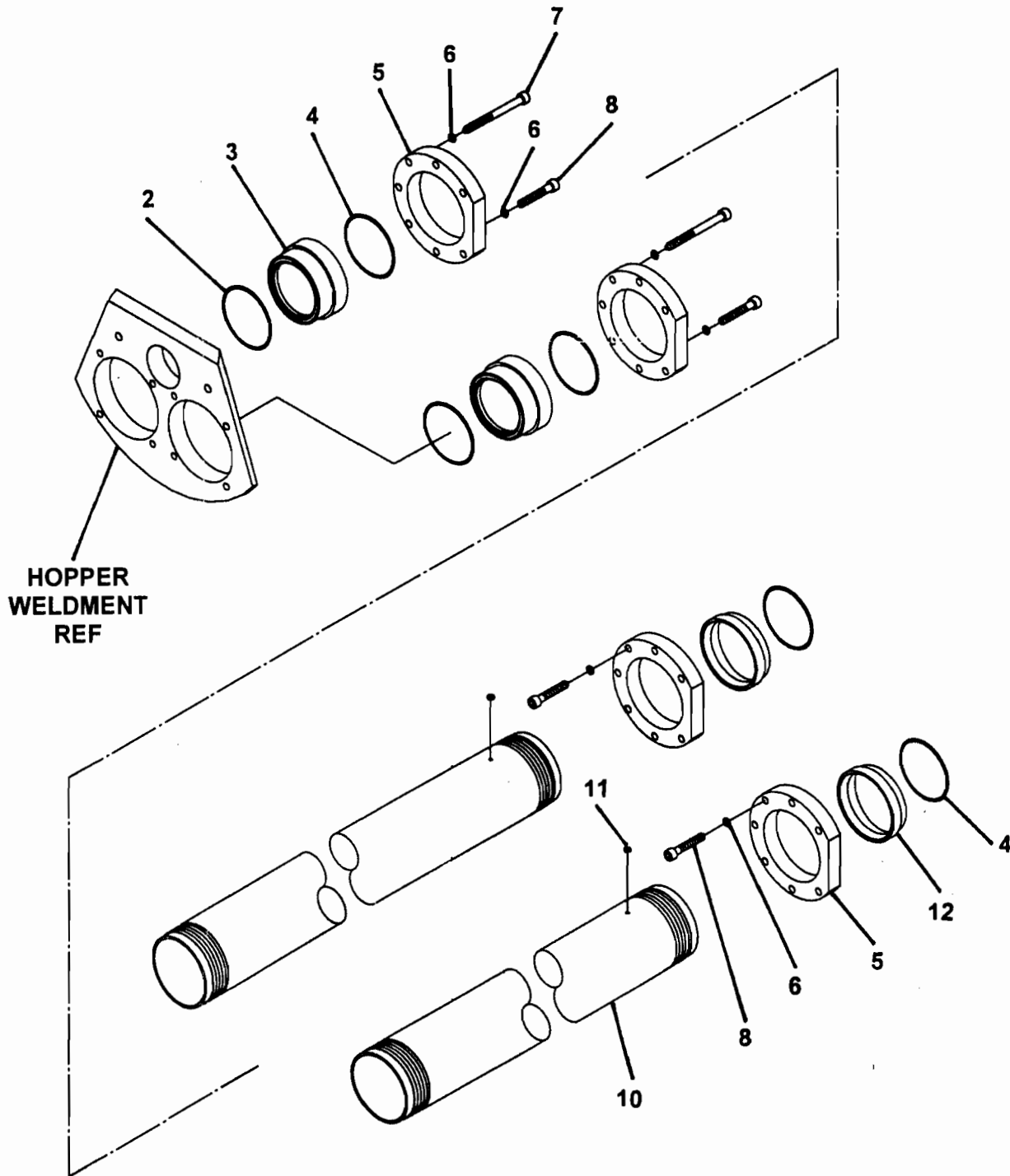


# TILTING CYLINDER ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 04  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	W-103363	Assembly, Tilting Cylinder (See Group 60, Figure 03 for NHA)					Ref
2	W-103626	• Bearing					1
3	W-101973	• Ring, Retaining					1
4	W-104438	• Rod, Piston					1
5	W-104440	• Pipe, Cylinder					1
6	W-103364	• Kit, Seal					1
7	W-100805	• Nipple, Grease					2
8	W-104437	• Valve, Check					1
9	W-104439	• Head, Rod					1

DASH (-) ITEM NOT ILLUSTRATED



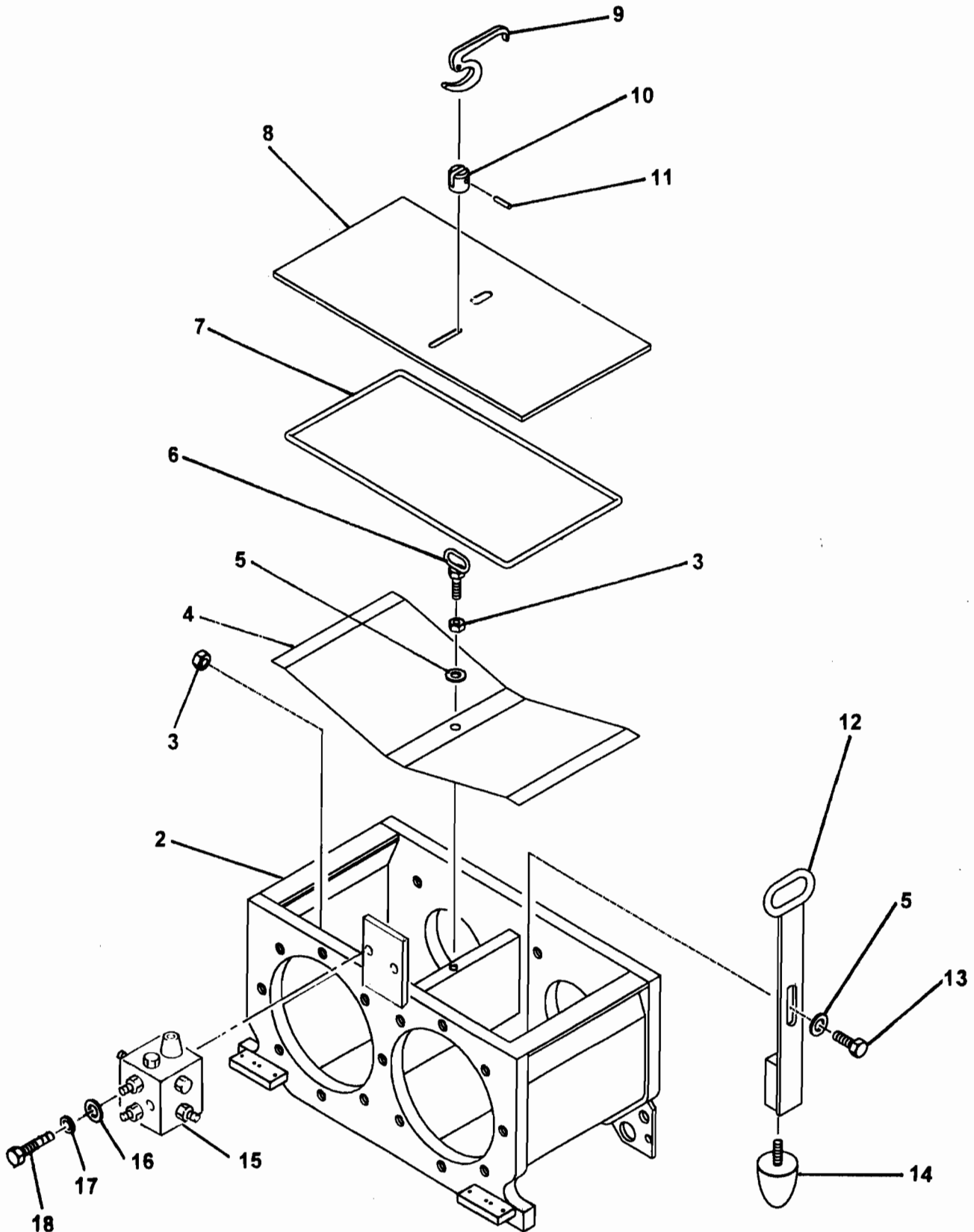


# CONCRETE CYLINDER ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 05  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	B-124017	Assembly, Concrete Cylinder (See Group 60, Figure 01 for NHA)					Ref
2	W-101090	• O-Ring					2
3	B-124015	• Ring, Fitting					2
4	W-102868	• O-Ring					4
5	B-123007	• Flange					4
6	W-100691	• Washer					28
7	W-102885	• Bolt, M20					6
8	W-103970	• Screw, M20					14
-9	W-102845	• Bolt, M20					8
10	B-123011	• Cylinder, Concrete					2
11		• Fitting, Grease					2
12	B-123012	• Ring, Fitting					2

DASH (-) ITEM NOT ILLUSTRATED



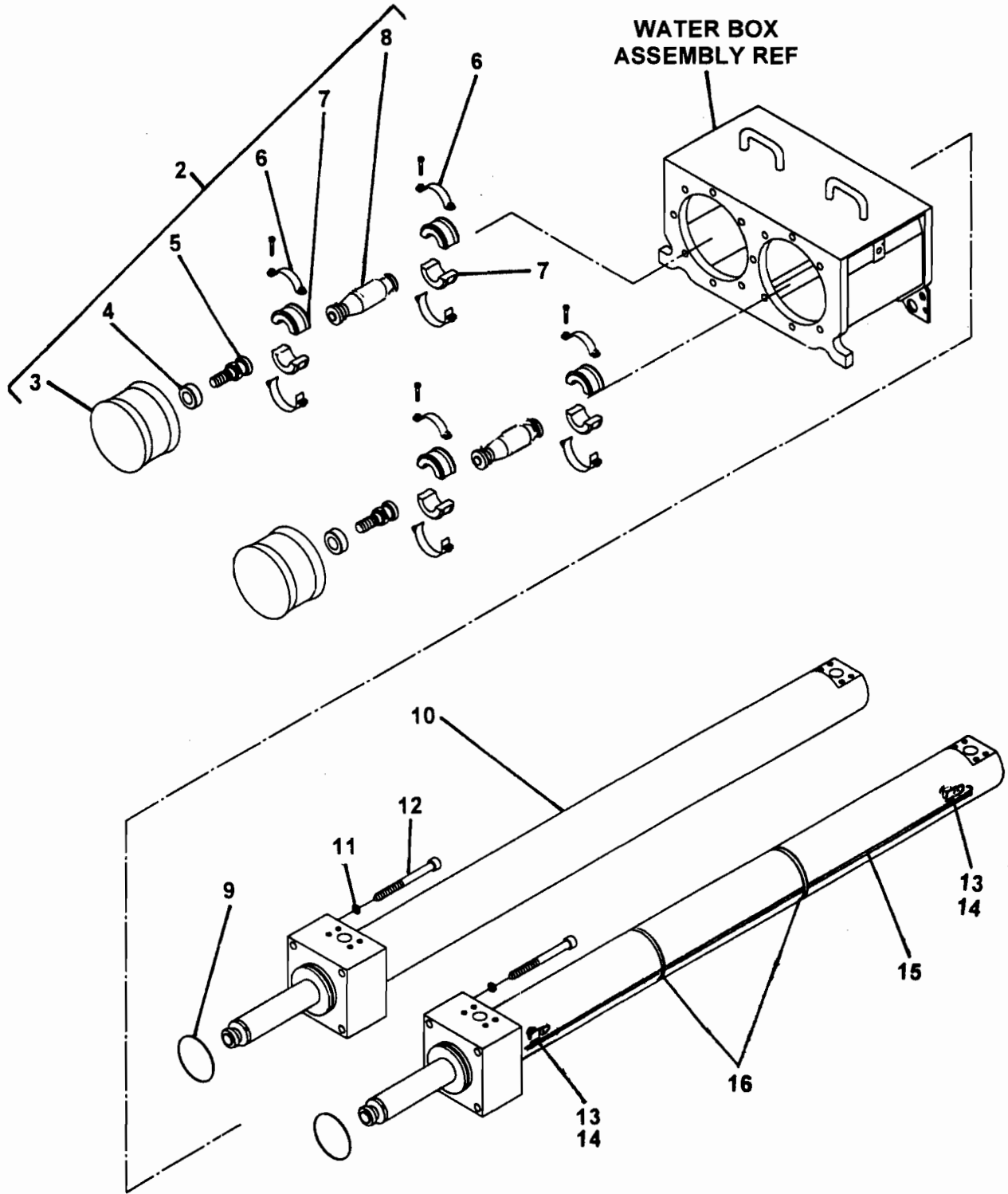


# WATER BOX ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 06  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	B-143030	Assembly, Water Box (See Group 60, Figure 01 for NHA)					Ref
2	B-143031	• Weldment, Water Box					1
3	W-101557	• Nut, M12 Hex					2
4	B-143020	• Cover, Safety					1
5	W-100504	• Washer					2
6	B-143009	• Bolt, M12 Eye					1
7	W-101831	• Seal, Round Cord					1
8	B-143015	• Cover, Water Box					1
9	B-143007	• Lever					1
10		• Head, Eye Bolt					1
11	W-103387	• Pin, Grooved					1
12	B-143011	• Handle					1
13	W-103688	• Bolt, M12 Hex					1
14	W-102712	• Buffer, Rubber					1
15	W-104402	• Block, Lube					1
16		• Washer, Flat (attaching parts)					2
17		• Washer, Lock (attaching parts)					2
18		• Bolt, Hex (attaching parts)					2

DASH (-) ITEM NOT ILLUSTRATED





# HYDRAULIC DRIVE CYLINDER ASSEMBLY

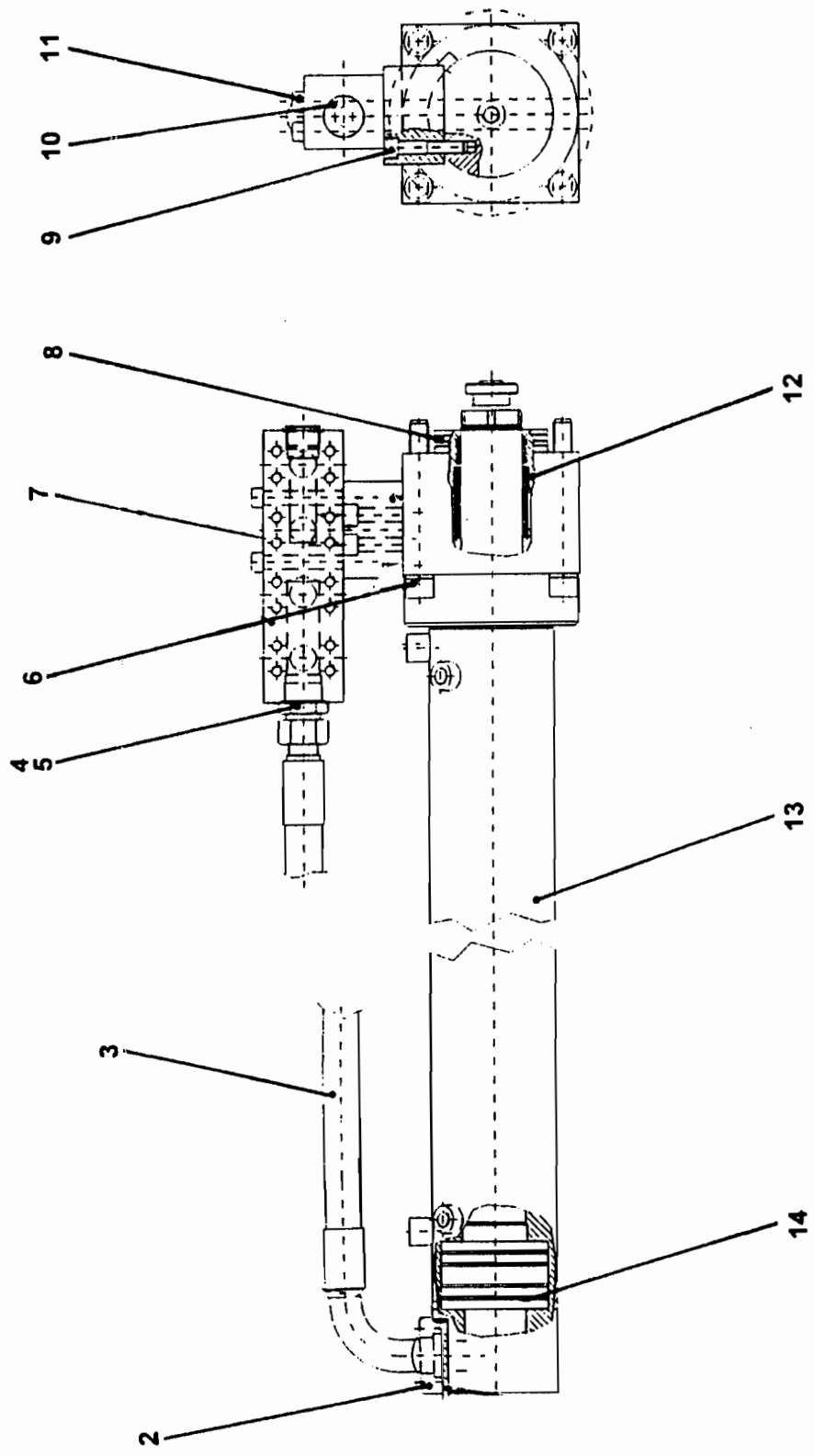
**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 07  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	60-06	Assembly, Hydraulic Drive Cylinder (See Group 60, Figure 01 for NHA)					Ref
2	B-133012	• Assembly, Piston Ram					1
3	W-100175	• • Ram, Piston					2
4	W-100934	• • Ring, Fitting					2
5	B-131003	• • Pin, Coupling					2
6	W-101381	• • Clamp, Hose					4
7	B-131004	• • Coupling, Clamp					4
8	B-133003	• • Adapter, Dog Bone					2
9	W-100190	• O-Ring					2
10	B-154030	• Sub-Assembly, Hydraulic Drive Cylinder (See Group 60, Figure 08 for DET)					2
11	W-103070	• Washer (attaching parts)					6
12	W-102846	• Bolt (attaching parts)					6
13	79285	• Guard, Prox Switch					2
14	78416	• Switch, Prox					2
15	78417	• Cable, Prox Switch					2
16		• Tie-Down (attaching parts)					2

DASH (-) ITEM NOT ILLUSTRATED

## HYDRAULIC DRIVE CYLINDER SUB-ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 08  
PAGE 01







# HYDRAULIC DRIVE CYLINDER SUB-ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 60  
FIGURE 08  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	B-154030	Sub-Assembly, Hydraulic Drive Cylinder (See Group 60, Figure 07 for NHA)					Ref
2	W-102305	• Flange (set)					1
3		• Assembly, High Pressure Hose					1
4	W-102846	• Screw, M24					4
5	W-103070	• Washer, Spring					4
6	W-102184	• Coupling, Straight Male Stud					1
7	B-153002	• Box, Hydraulic					1
8	W-100190	• O-Ring					1
9		• Screw, M16					4
10	W-103347	• Screw, Locking					1
11		• Screw, M16					4
12	W-102393	• Set, Seal					1
13	W-102504	• Cylinder, Drive					1
14	W-105049	• Ring, Piston					4
-15	B-153003	• Block, Hydraulic					1
-16	78416	• Sensor, Proximity					2
-17	78417	• Cable, Proximity Sensor					2
-18	79285	• Guard, Proximity Sensor					2
-19		• Valve, Check					2

DASH (-) ITEM NOT ILLUSTRATED

**REED**

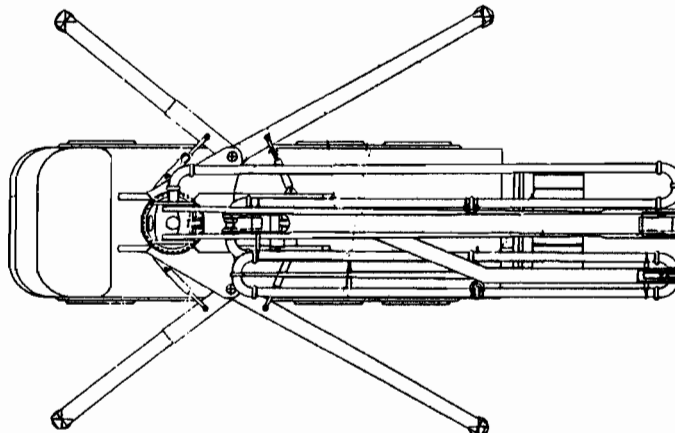
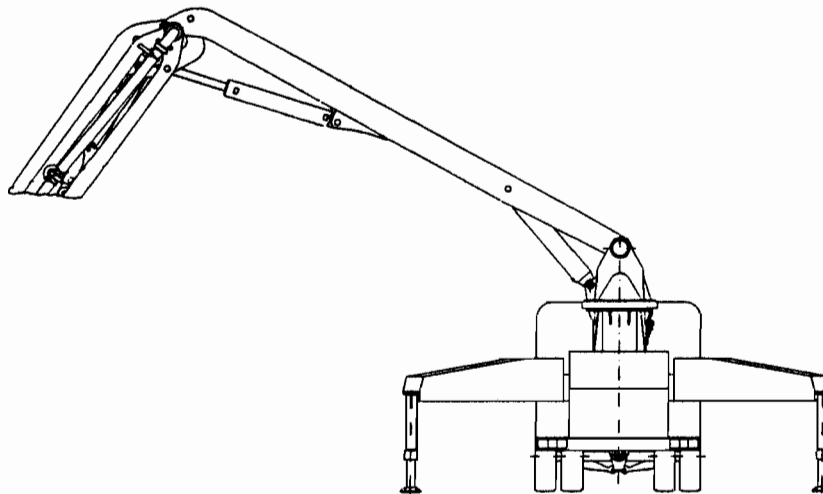
**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

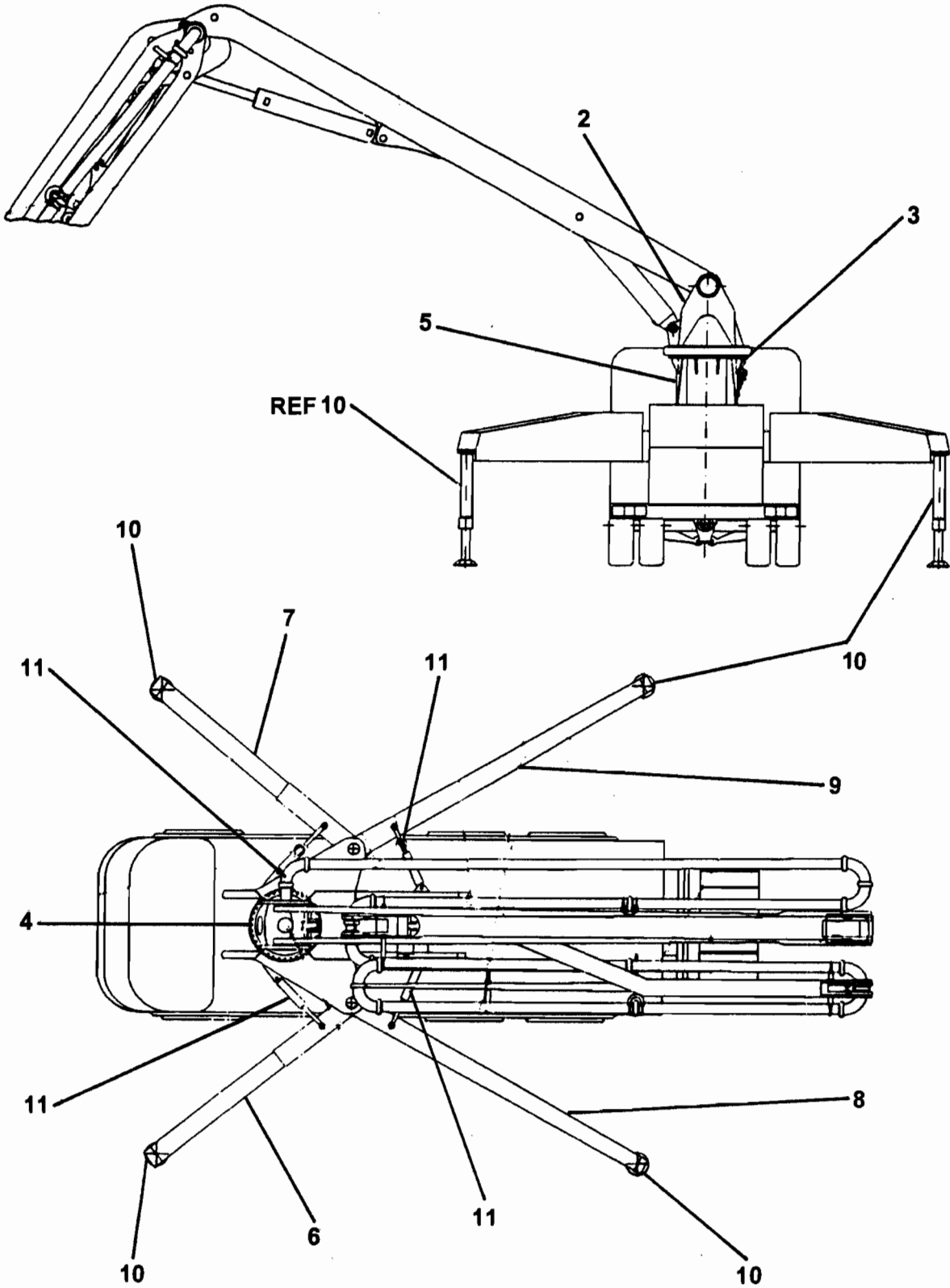
**XXT 32  
PARTS  
GROUP 60  
FIGURE 09  
PAGE 01**

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**REED** TRUCK MOUNTED CONCRETE BOOM PUMP MODEL **XXT 32** ILLUSTRATED PARTS MANUAL GROUP 70 FRAME AND SUPPORT INSTALLATION CONTAINS THE FOLLOWING FIGURES:

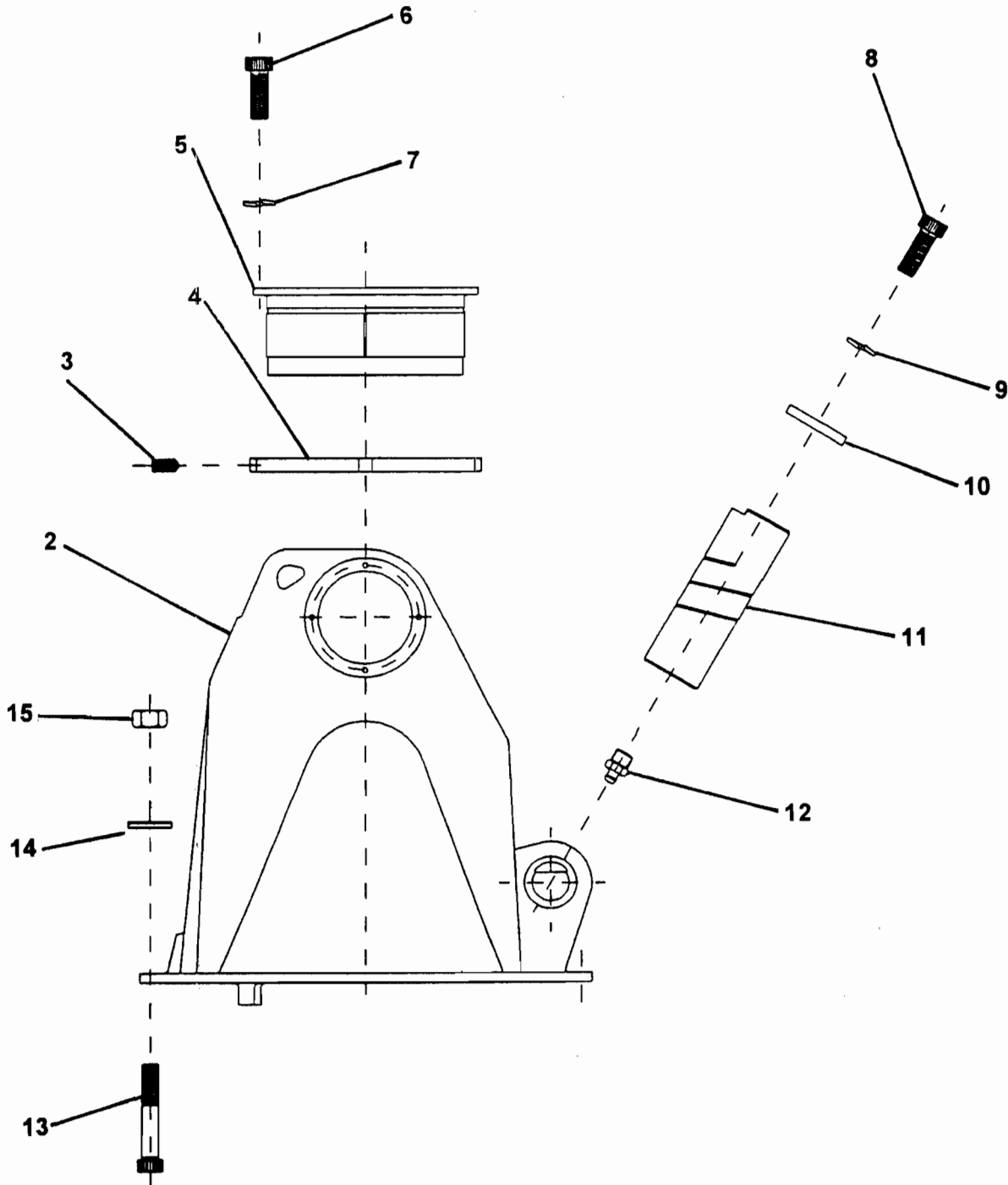
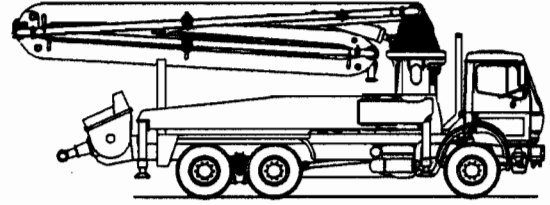
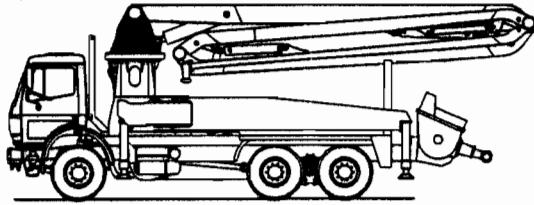
- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** FRAME AND SUPPORT INSTALLATION
- FIGURE 02** TURRET ASSEMBLY
- FIGURE 03** MOTOR AND REDUCTION ASSEMBLY
- FIGURE 04** ROTATION UNIT ASSEMBLY
- FIGURE 05** SUPPORT FRAME STABILIZERS ASSEMBLY
- FIGURE 06** FRONT LEFT STABILIZERS TELESCOPIC LEG ASSEMBLY
- FIGURE 07** FRONT RIGHT STABILIZERS TELESCOPIC LEG ASSEMBLY
- FIGURE 08** REAR LEFT SWING OUT LEG ASSEMBLY
- FIGURE 09** REAR RIGHT SWING OUT LEG ASSEMBLY
- FIGURE 10** STABILIZERS VERTICAL JACK CYLINDER ASSEMBLY
- FIGURE 11** SWING OUT CYLINDER ASSEMBLY





ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	70-01	Installation, Frame And Support (See Group 10, Figure 01 for NHA)					Ref
2	C-3F1	• Assembly, Turret (See Group 70, Figure 02 for DET)					1
3	C-3G1	• Assembly, Motor And Reduction (See Group 70, Figure 03 for DET)					1
4	C-3G2	• Assembly, Rotation Unit (See Group 70, Figure 04 for DET)					1
5	C-9H1	• Assembly, Support Frame Stabilizers (See Group 70, Figure 05 for DET)					1
6	C-9K1-L	• Assembly, Front Left Side Stabilizers Telescopic Leg (See Group 70, Figure 06 for DET)					1
7	C-9K1-R	• Assembly, Front Right Side Stabilizers Telescopic Leg (See Group 70, Figure 07 for DET)					1
8	C-9M1-L	• Assembly, Rear Left Side Swing Out Leg (See Group 70, Figure 08 for DET)					1
9	C-9M1-R	• Assembly, Rear Right Side Swing Out Leg (See Group 70, Figure 09 for DET)					1
10	C-6L5	• Assembly, Stabilizer Vertical Jack Cylinder (See Group 70, Figure 10 for DET)					4
11	C-8M3	• Assembly, Swing Out Cylinder (See Group 70, Figure 11 for DET)					4

DASH (-) ITEM NOT ILLUSTRATED





# TURRET ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 70  
FIGURE 02  
PAGE 02

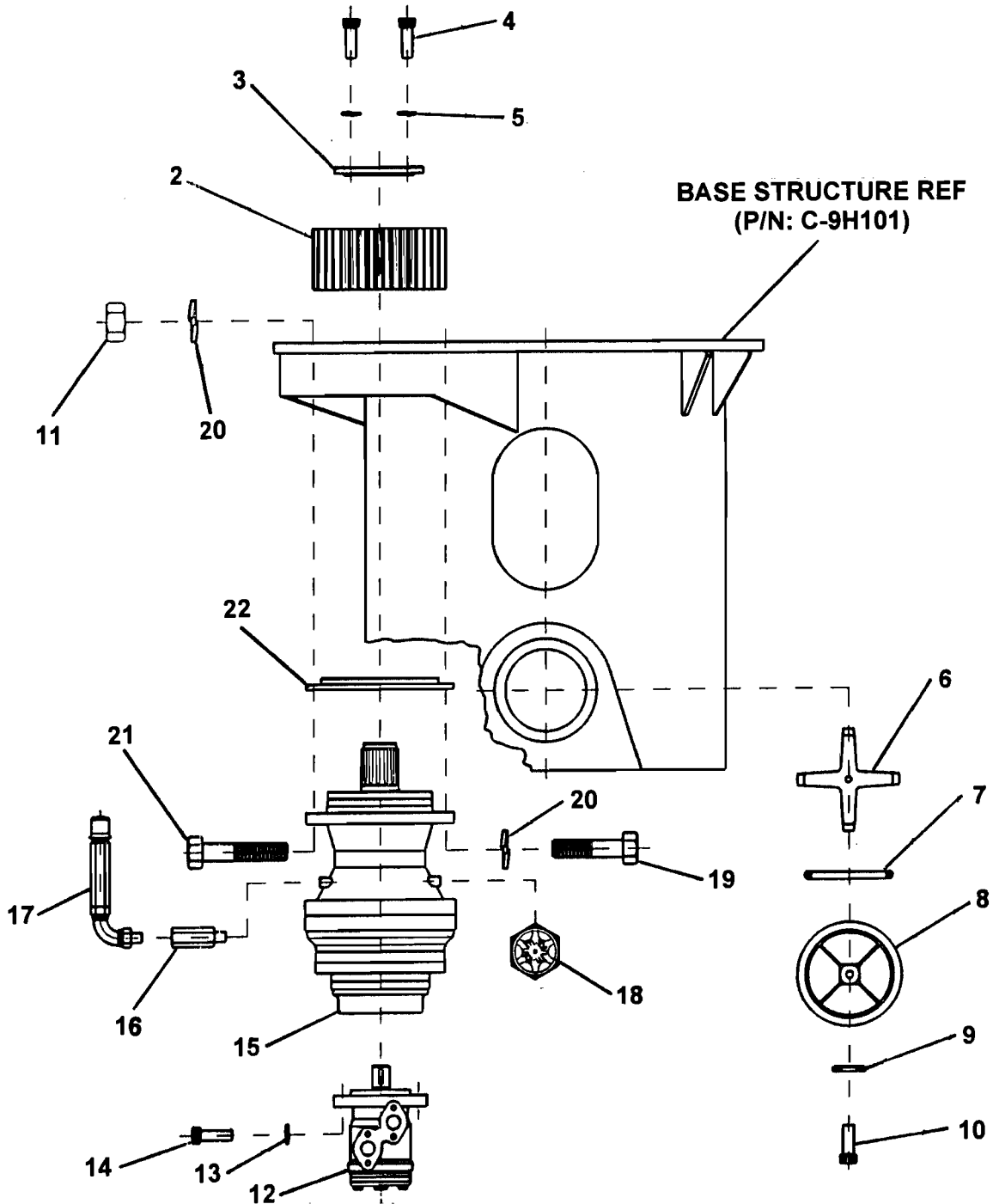
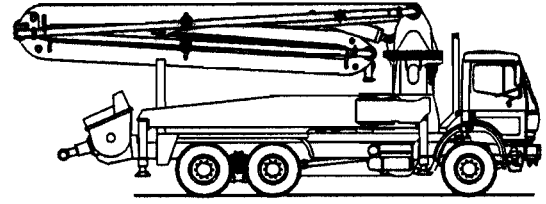
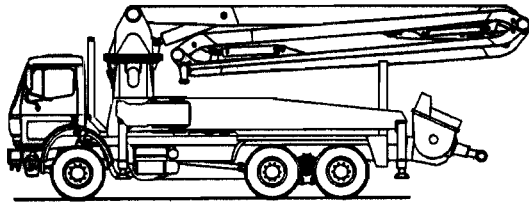
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3F1	Assembly, Turret (See Group 70, Figure 01 for NHA)					Ref
2	C-3F101	• Head, Rotating					1
3	C-VG122.061010	• Screw					4
4	C-GV228.2015	• Ring, Threaded					2
5	C-4P118	• Pin					2
6	C-VC110.142040	• Screw					8
7	C-UE110.14	• Washer, Elastic					8
8	C-VC110.101525	• Screw					1
9	C-UE110.10	• Washer, Elastic					1
10	C-UD080.1106	• Washer, Pin Locking					1
11	C-3P116A	• Pin					1
12	C-VI131.1010	• Nipple, Grease					1
13	C-VC130.2225C6	• Screw					48
14	C-UP110.22	• Washer					48
15	C-VD113.2225	• Nut					48

DASH (-) ITEM NOT ILLUSTRATED



# MOTOR AND REDUCTION ASSEMBLY

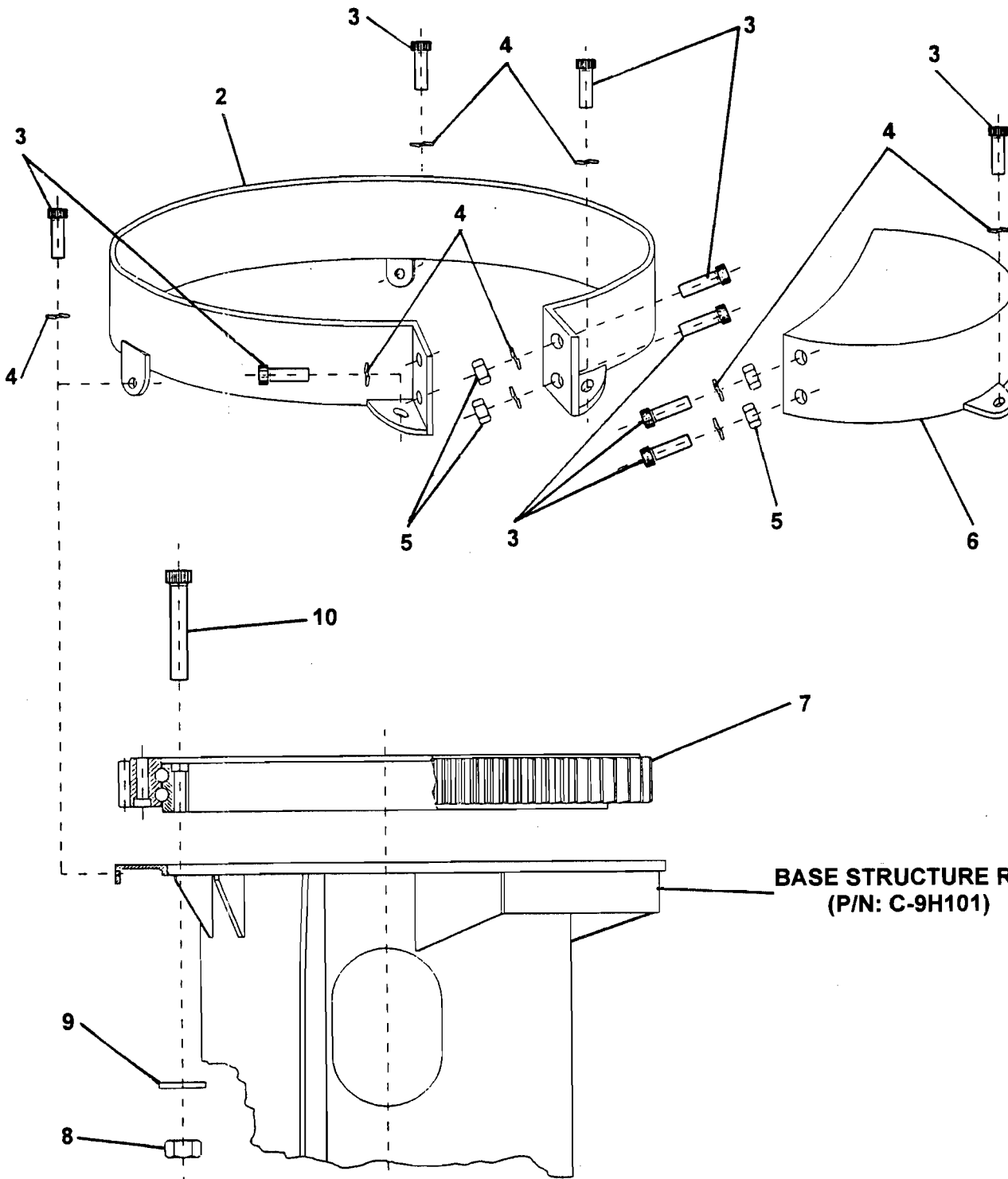
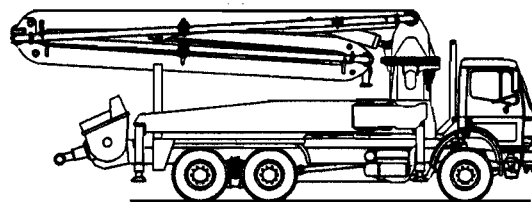
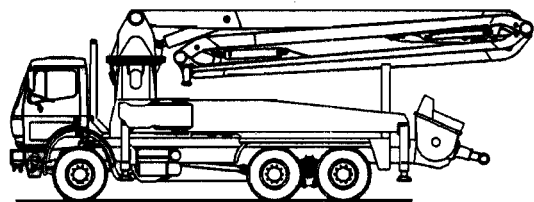
XXT 32  
PARTS  
GROUP 70  
FIGURE 03  
PAGE 01





ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3G1	Assembly, Motor And Reduction (See Group 70, Figure 01 for NHA)					Ref
2	C-RP114.120	• Pinion					1
3	C-RP100	• Washer, Pinion					1
4	C-VC110.101530	• Screw					3
5	C-UE110.10	• Washer, Elastic					3
6	C-DT301	• Support, Cover					1
7	C-A0120.371	• Gasket, Seal					1
8	C-DT300	• Cover					1
9	C-AB110.016	• Ring-Bonded					1
10	C-VC110.162040	• Screw					1
11	C-VD111.1620	• Nut					7
12	C-MI110.300	• Assembly, Hydraulic Motor					1
13	C-UE110	• Washer, Elastic					4
14	C-VC110	• Screw					4
15	C-RE040.11201	• Unit, Reduction					1
16	C-NP020.040MF	• Fitting					1
17	C-FS020	• Filter, Air Hole					1
18	C-LL301	• Level, Oil					1
19	C-VE110.162055	• Screw					3
20	C-UE110.16	• Washer, Elastic					10
21	C-VE110.162075	• Screw					3
22	C-3G102	• Flange, Adjusting Coupling					1

DASH (-) ITEM NOT ILLUSTRATED



BASE STRUCTURE REF  
(P/N: C-9H101)



# ROTATION UNIT ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 70  
FIGURE 04  
PAGE 02

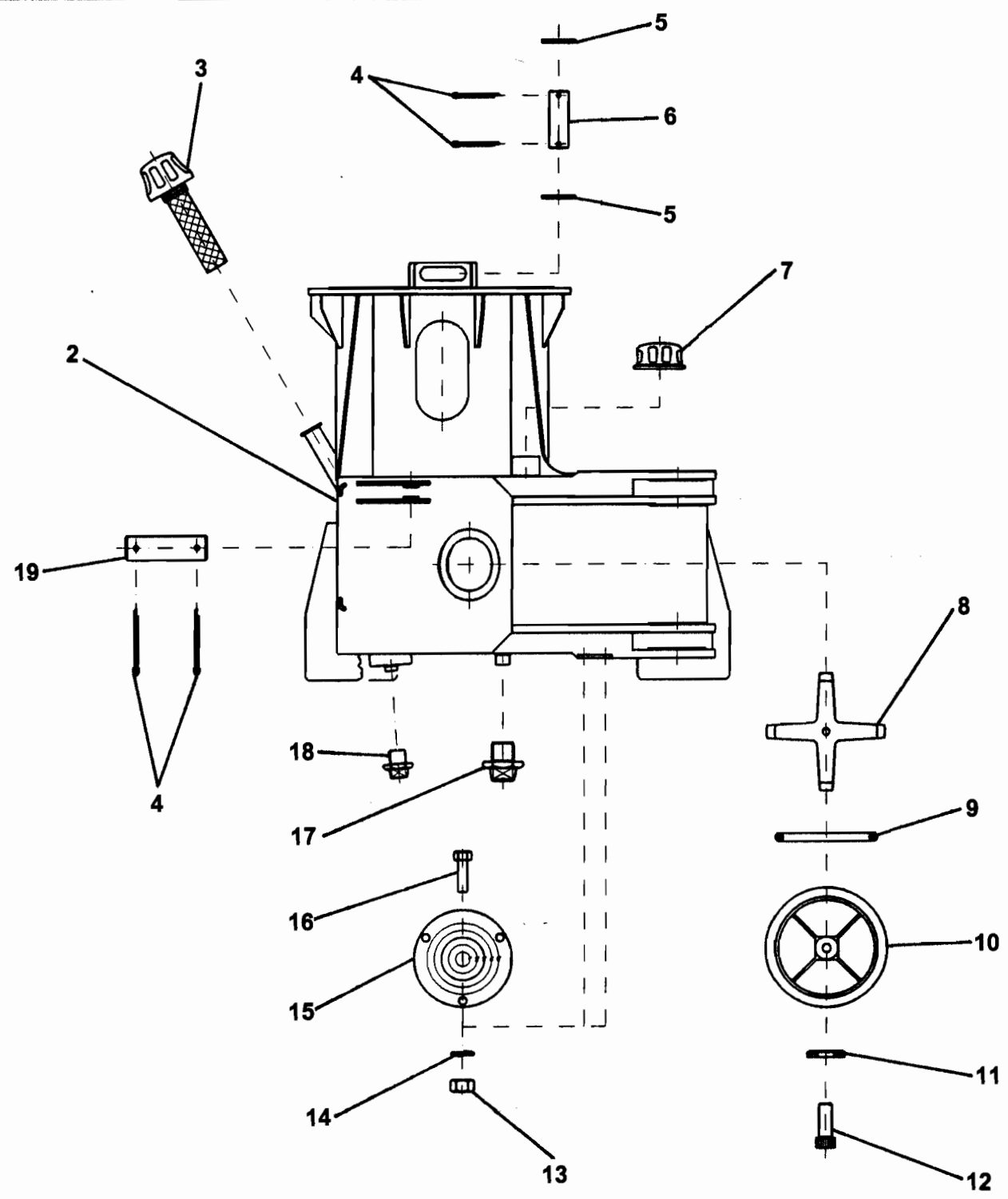
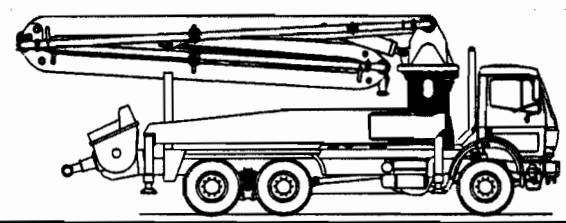
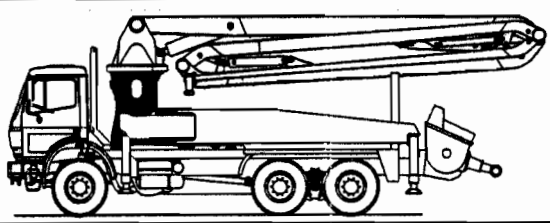
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3G2	Assembly, Rotation Unit (See Group 70, Figure 01 for NHA)					Ref
2	C-3G204	• Protection, Rotating					1
3	C-VC110.081225	• Screw					9
4	C-UE110.08	• Washer, Elastic (attaching parts)					9
5	C-VD111.0815	• Nut					4
6	C-3G203	• Protection, Pinion					1
7	C-B112.1164	• Bearing, Rotation					1
8	C-VD113.2225	• Nut (attaching parts)					48
9	C-UP110.22	• Washer (attaching parts)					48
10	C-VC130.2225C6	• Screw (attaching parts)					48

DASH (-) ITEM NOT ILLUSTRATED



# SUPPORT FRAME STABILIZERS ASSEMBLY

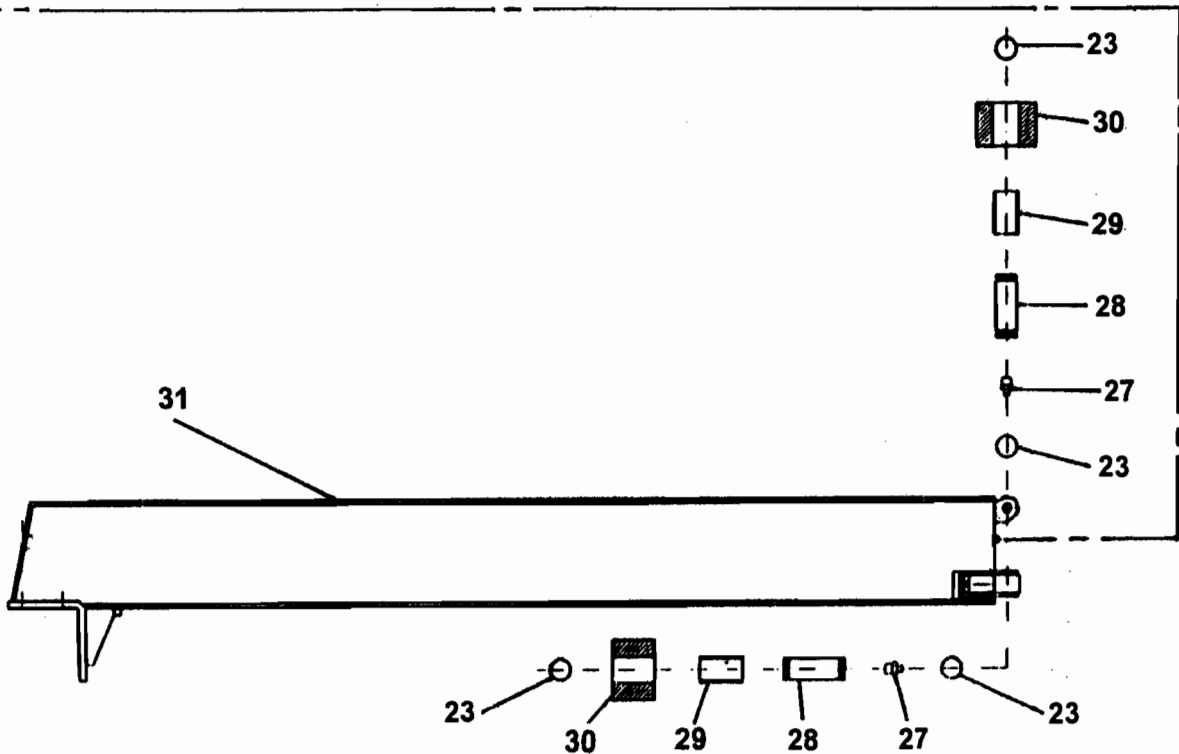
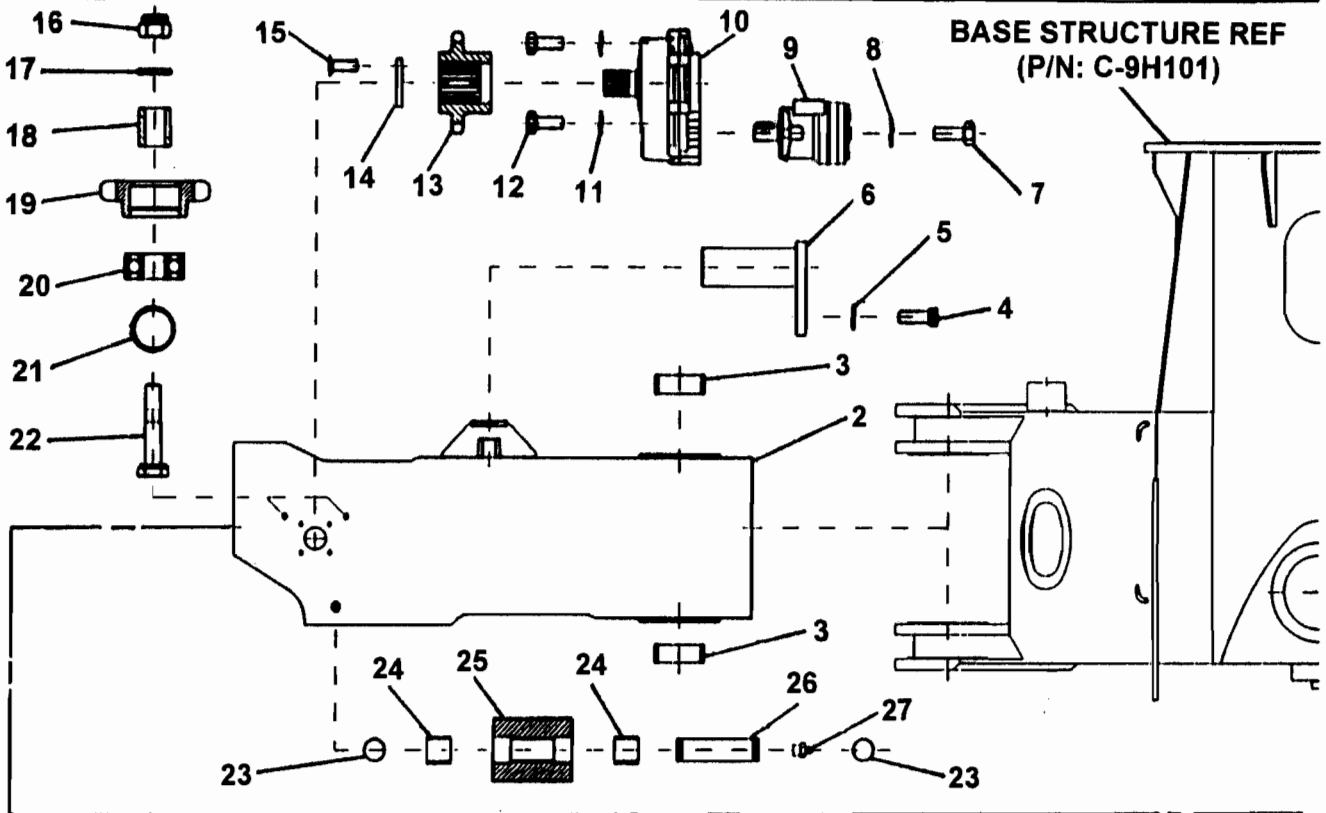
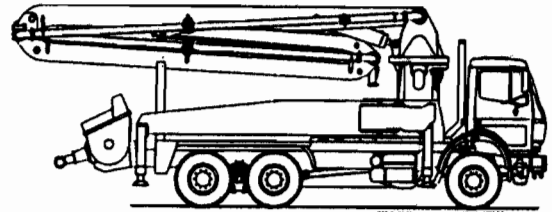
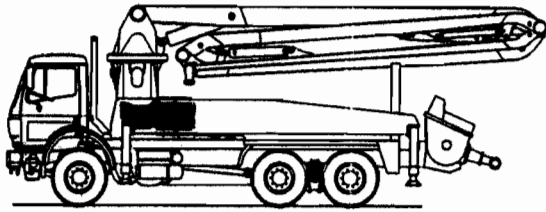
XXT 32  
PARTS  
GROUP 70  
FIGURE 05  
PAGE 01



REVISION:

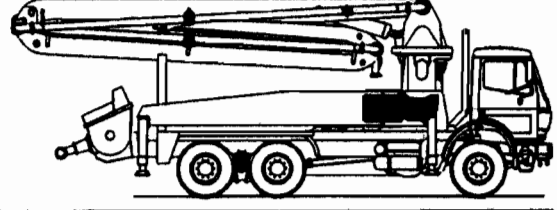
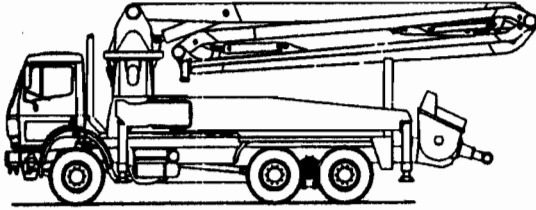
<b>ITEM NO.</b>	<b>REED'S PARTS NO.</b>	<b>DESCRIPTION</b>	<b>QTY</b>
-1	C-9H1	Assembly, Support Frame Stabilizers (See Group 70, Figure 01 for NHA)	Ref
2	C-9H101	• Structure, Base	1
3	C-DT200	• Plug, Screw for Hydraulic Oil Tank	1
4	C-VS110.08070	• Pin, Split	6
5	C-3G205	• Washer	2
6	C-3P202	• Pin	1
7	C-DT121	• Plug, Screw for Water Tank	1
8	C-DT301	• Support, Cover	2
9	C-A0120.371	• Gasket, Seal	2
10	C-DT300	• Cover	2
11	C-AB110.016	• Ring-Bonded	2
12	C-VC110.162040	• Screw	2
13	C-VD111.0407	• Nut	3
14	C-UE110.04	• Washer, Elastic	3
15	C-LL401	• Level	1
16	C-VE110.040715	• Screw	3
17	C-DT109	• Plug, Screw	2
18	C-DT105	• Plug, Screw	3
19	C-1P201	• Pin	2

DASH (-) ITEM NOT ILLUSTRATED

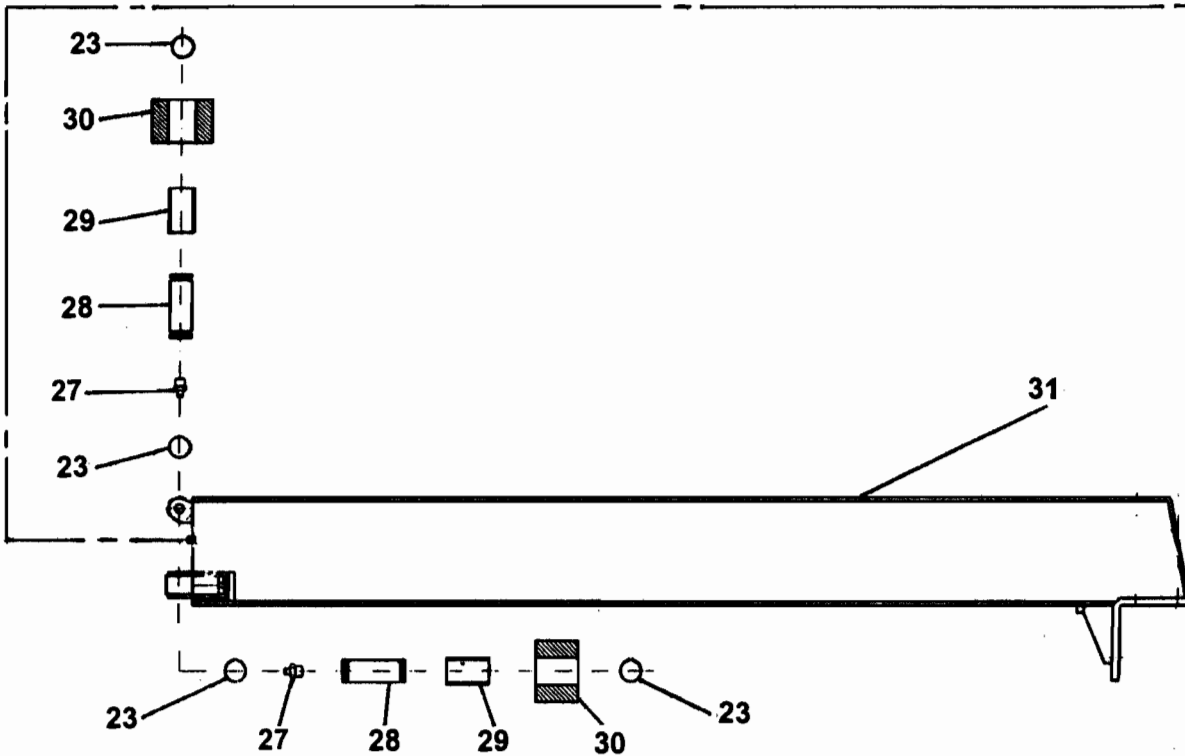
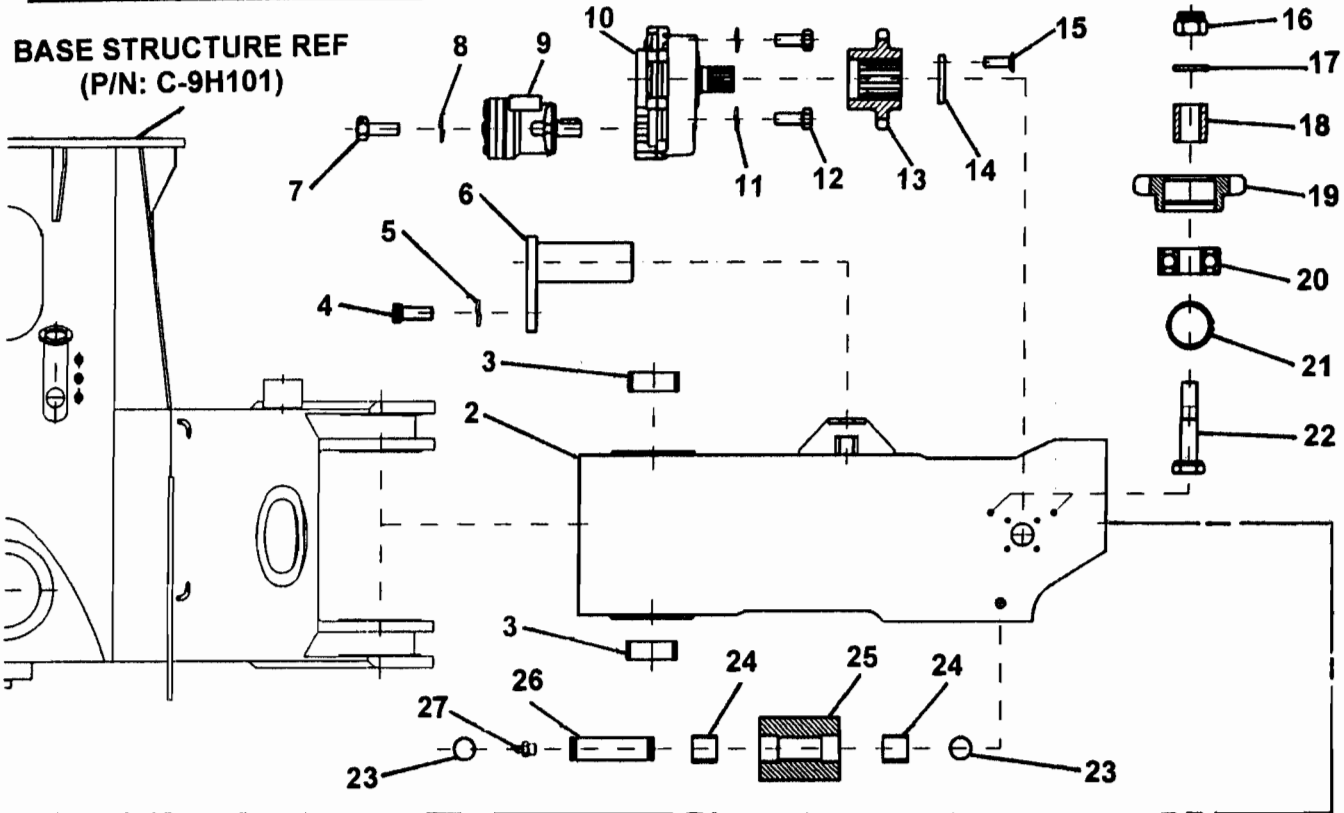


ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-9K1-L	Assembly, Front Stabilizers Left Side Telescopic Leg (See Group 70, Figure 01 for NHA)					Ref
2	C-9K102	• Weldment, Front Left Side Stabilizers					1
3	C-CD180.185060	• Bearing, Anti-friction					2
4	C-VE110.081220	• Screw					1
5	C-UE100.08	• Washer, Elastic					1
6	C-9P206	• Pin					1
7	C-VE110.121725	• Screw					2
8	C-UE110.12	• Washer, Elastic					2
9	C-MI300.250	• Assembly, Hydraulic Motor					1
10	C-RE003.00075	• Reducer					1
11	C-UE110.10	• Washer, Elastic					4
12	C-VE110.101535	• Screw					4
13	C-9K108	• Pinion					1
14	C-9K112	• Washer					1
15	C-VT110.031025	• Screw					3
16	C-VD221.1420	• Nut, Self Locking					2
17	C-UE110.14	• Washer					2
18	C-9K111	• Piece, Distance					2
19	C-9K109	• Pinion, Free					2
20	C-CC63002.2RS	• Bearing, Ball					2
21	C-AA120.032	• Ring, Clamping					2
22	C-9K110	• Pin					2
23	C-AA110.025	• Ring, Clamping					6
24	C-CD025.02825	• Bearing, Anti-friction					2
25	C-5H105	• Roller					1
26	C-3P206	• Pin					1
27	C-VI131.0608	• Nipple, Grease					3
28	C-4P201	• Pin					2
29	C-CD025.02850	• Bearing, Anti-friction					2
30	C-4H102	• Roller					2
31	C-9K202	• Weldment, Front Left Side Telescopic Leg					1

DASH (-) ITEM NOT ILLUSTRATED



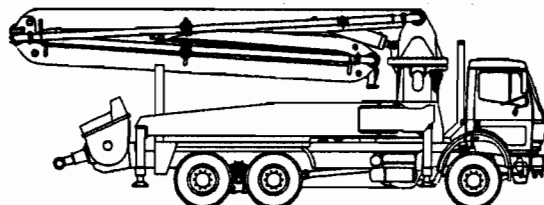
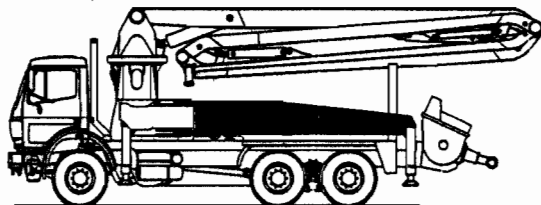
BASE STRUCTURE REF  
(P/N: C-9H101)



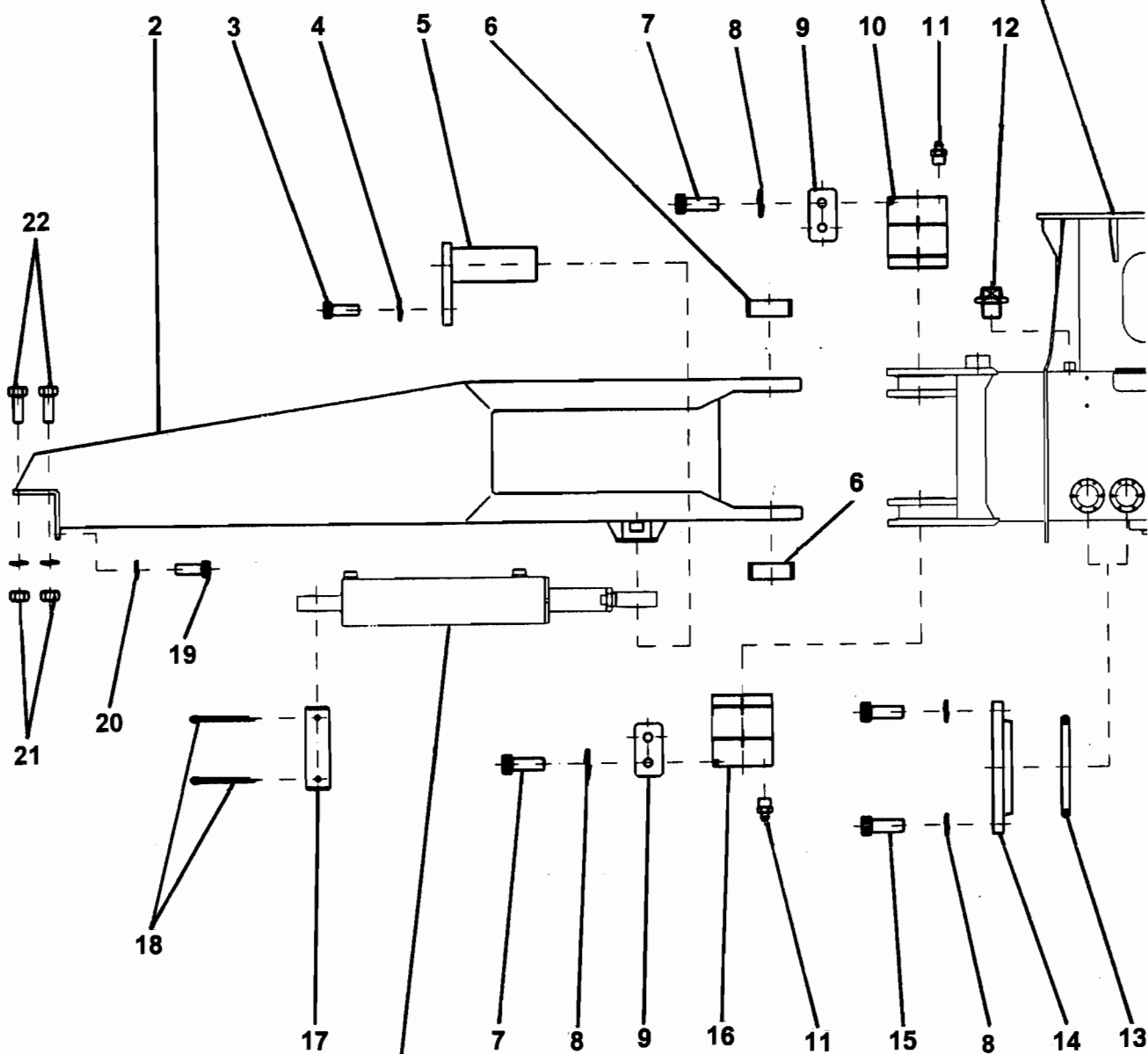


ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	C-9K1-R	Assembly, Front Stabilizers Right Side Telescopic Leg (See Group 70, Figure 01 for NHA)	Ref
2	C-9K101	• Weldment, Front Right Side Stabilizers	1
3	C-CD180.185060	• Bearing, Anti-friction	2
4	C-VE110.081220	• Screw	1
5	C-UE100.08	• Washer, Elastic	1
6	C-9P206	• Pin	1
7	C-VE110.121725	• Screw	2
8	C-UE110.12	• Washer, Elastic	2
9	C-MI300.250	• Assembly, Hydraulic Motor	1
10	C-RE003.00075	• Reducer	1
11	C-UE110.10	• Washer, Elastic	4
12	C-VE110.101535	• Screw	4
13	C-9K108	• Pinion	1
14	C-9K112	• Washer	1
15	C-VT110.031025	• Screw	3
16	C-VD221.1420	• Nut, Self Locking	2
17	C-UE110.14	• Washer	2
18	C-9K111	• Piece, Distance	2
19	C-9K109	• Pinion, Free	2
20	C-CC63002.2RS	• Bearing, Ball	2
21	C-AA120.032	• Ring, Clamping	2
22	C-9K110	• Pin	2
23	C-AA110.025	• Ring, Clamping	6
24	C-CD025.02825	• Bearing, Anti-friction	2
25	C-5H105	• Roller	1
26	C-3P206	• Pin	1
27	C-VI131.0608	• Nipple, Grease	3
28	C-4P201	• Pin	2
29	C-CD025.02850	• Bearing, Anti-friction	2
30	C-4H102	• Roller	2
31	C-9K201	• Weldment, Front Right Side Telescopic Leg	1

DASH (-) ITEM NOT ILLUSTRATED



BASE STRUCTURE REF  
(P/N: C-9H101)



REAR SWING OUT  
CYLINDER REF  
(P/N: C-8M3)

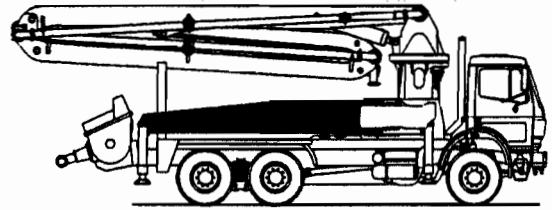
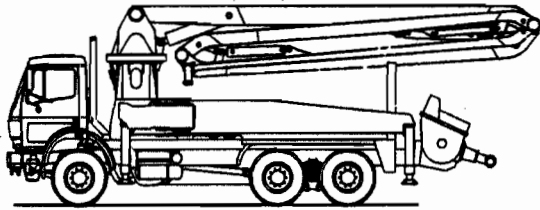


# REAR LEFT SIDE SWING OUT LEG ASSEMBLY

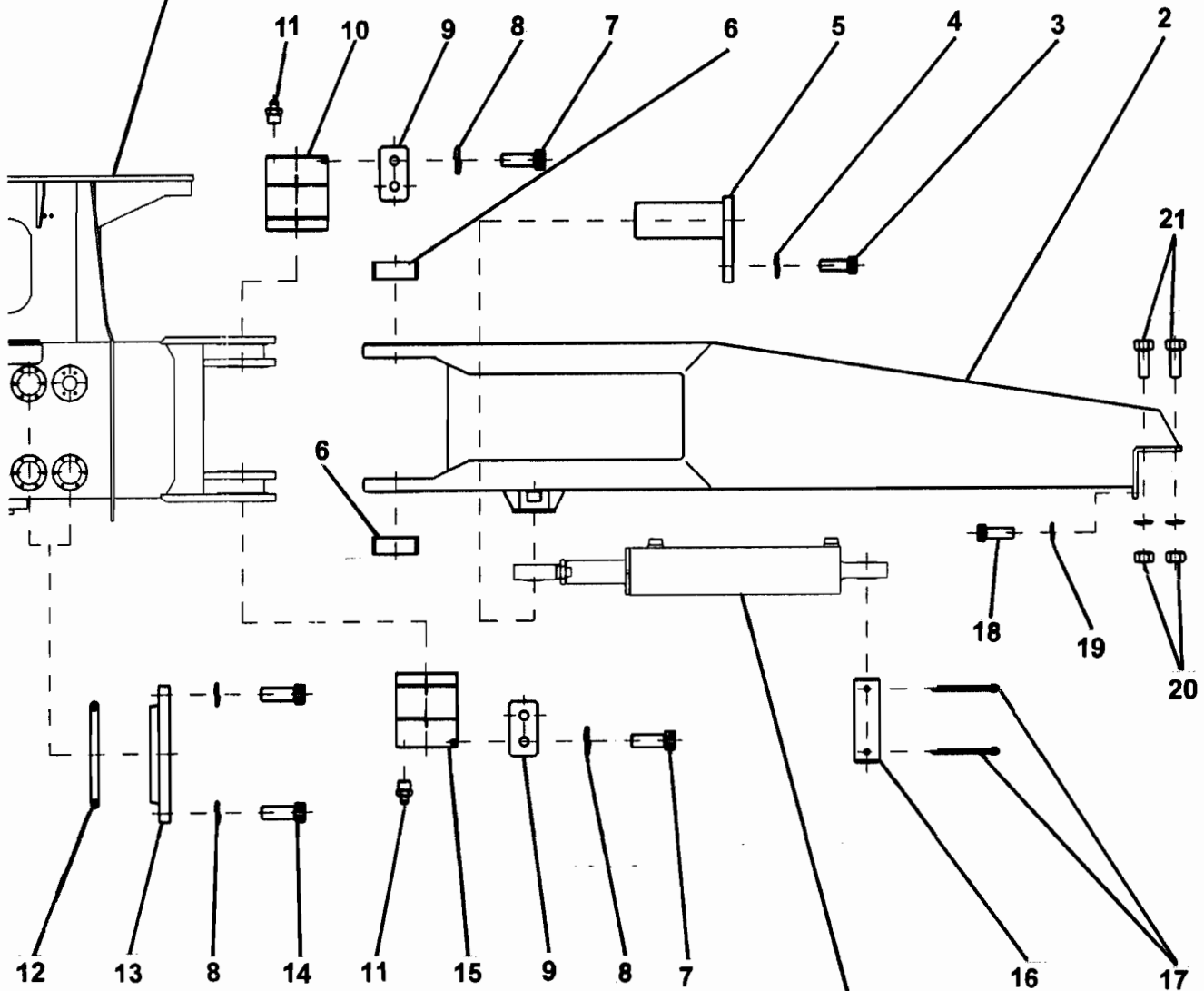
**XXT 32**  
**PARTS**  
GROUP 70  
FIGURE 08  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-9M1-L	Assembly, Rear Left Side Swing Out Leg (See Group 70, Figure 01 for NHA)					Ref
2	C-9M1021	• Stabilizer, Rear Left Side					1
3	C-VE110.081220	• Screw					1
4	C-UE110.08	• Washer, Elastic					1
5	C-9P206	• Pin					1
6	C-CD180.185060	• Bearing, Anti Friction					2
7	C-VC110.121730	• Screw					4
8	C-UE110.12	• Washer, Elastic					19
9	C-3M105	• Plate, Embed					2
10	C-9P202	• Pin, Left Side Top					1
11	C-VI131.1010	• Nipple, Grease					4
12	C-DT105	• Plug, Screw					1
13	C-AO420.4412	• Seal, Gasket					A/R
14	C-1H102.53	• Cover					A/R
15	C-VE110.121725	• Screw					15
16	C-9P205	• Pin, Left Side Bottom					1
17	C-1P201	• Pin					1
18	C-VS110.08070	• Pin, Split					2
19	C-VC110.222550	• Screw					2
20	C-UE110.22	• Washer, Elastic					6
21	C-VD111.2225	• Nut					4
22	C-EC110.222580	• Screw					4

DASH (-) ITEM NOT ILLUSTRATED



**BASE STRUCTURE REF**  
(P/N: C-9H101)



**REAR SWING OUT  
CYLINDER REF**  
(P/N: C-8M3)

**REAR RIGHT SIDE  
SWING OUT LEG ASSEMBLY**

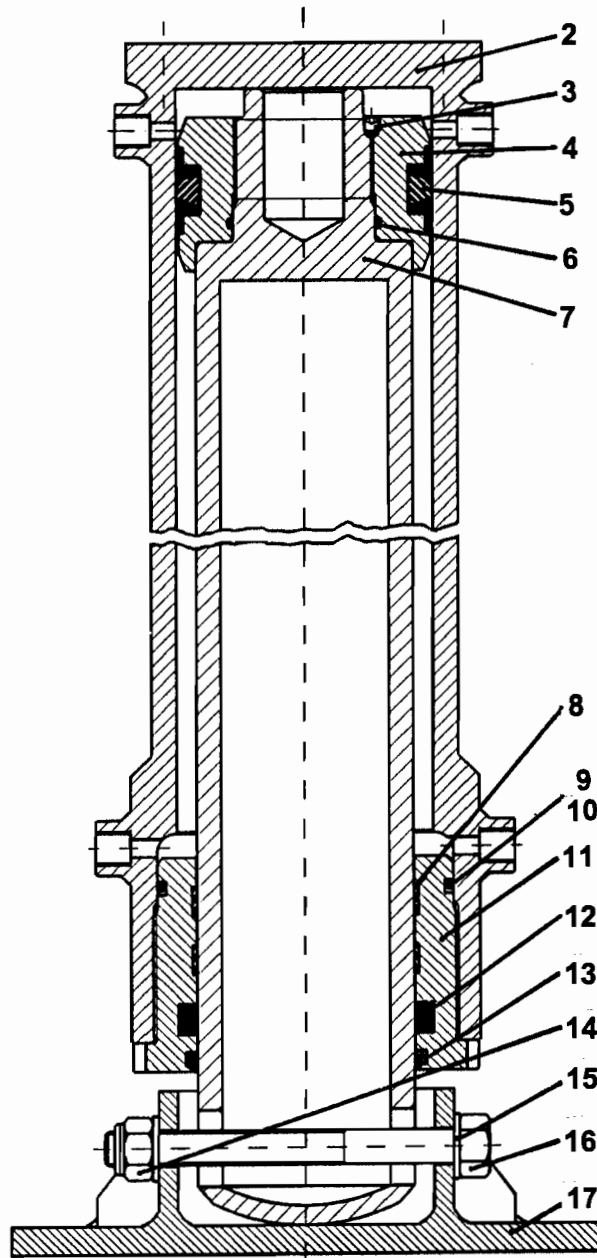
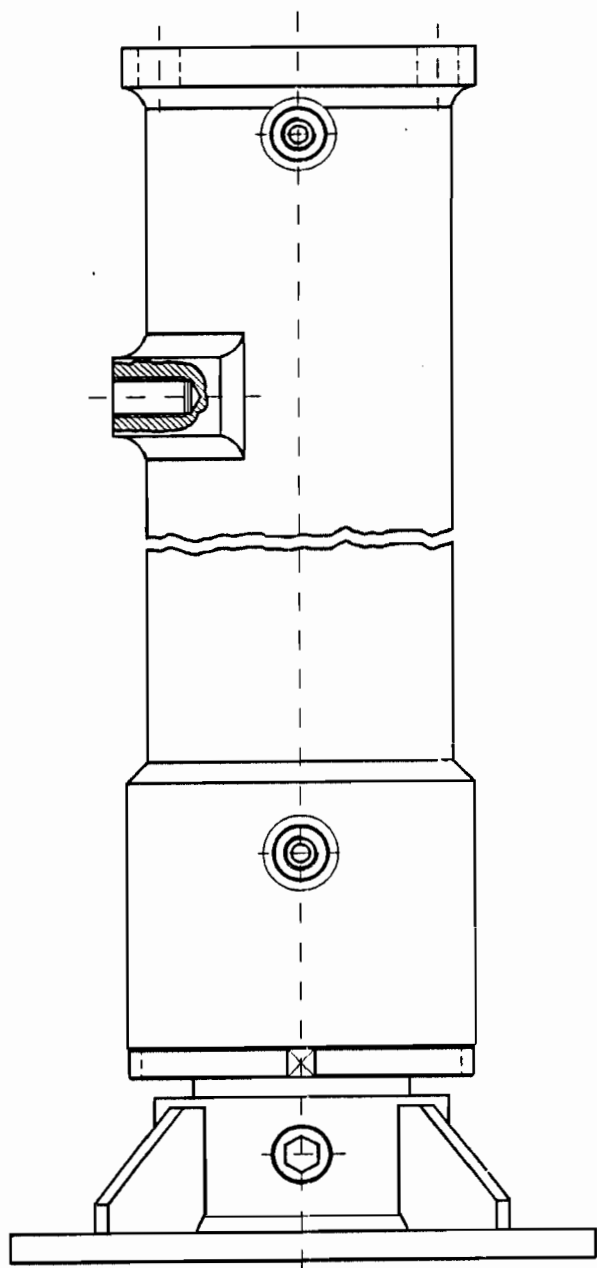
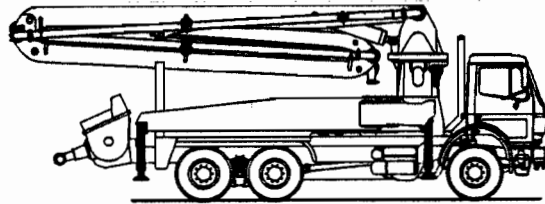
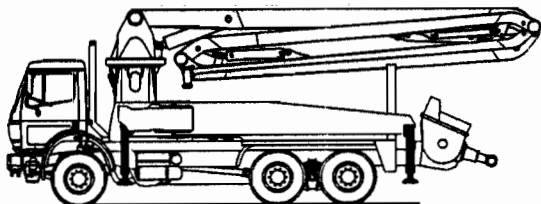
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-9M1-R	Assembly, Rear Right Side Swing Out Leg (See Group 70, Figure 01 for NHA)					Ref
2	C-9M1021	• Stabilizer, Rear Right Side					1
3	C-VE110.081220	• Screw					1
4	C-UE110.08	• Washer, Elastic					1
5	C-9P206	• Pin					1
6	C-CD180.185060	• Bearing, Anti Friction					2
7	C-VC110.121730	• Screw					4
8	C-UE110.12	• Washer, Elastic					19
9	C-3M105	• Plate, Embed					2
10	C-9P203	• Pin, Right Side Top					1
11	C-VI131.1010	• Nipple, Grease					4
12	C-AO420.4412	• Seal, Gasket					A/R
13	C-1H102.53	• Cover					A/R
14	C-VE110.121725	• Screw					15
15	C-9P204	• Pin, Right Side Bottom					1
16	C-1P201	• Pin					1
17	C-VS110.08070	• Pin, Split					2
18	C-VC110.222550	• Screw					2
19	C-UE110.22	• Washer, Elastic					6
20	C-VD111.2225	• Nut					4
21	C-EC110.222580	• Screw					4

DASH (-) ITEM NOT ILLUSTRATED

# REED

## STABILIZER VERTICAL JACK CYLINDER ASSEMBLY

XXT 32  
PARTS  
GROUP 70  
FIGURE 10  
PAGE 01



REVISION:

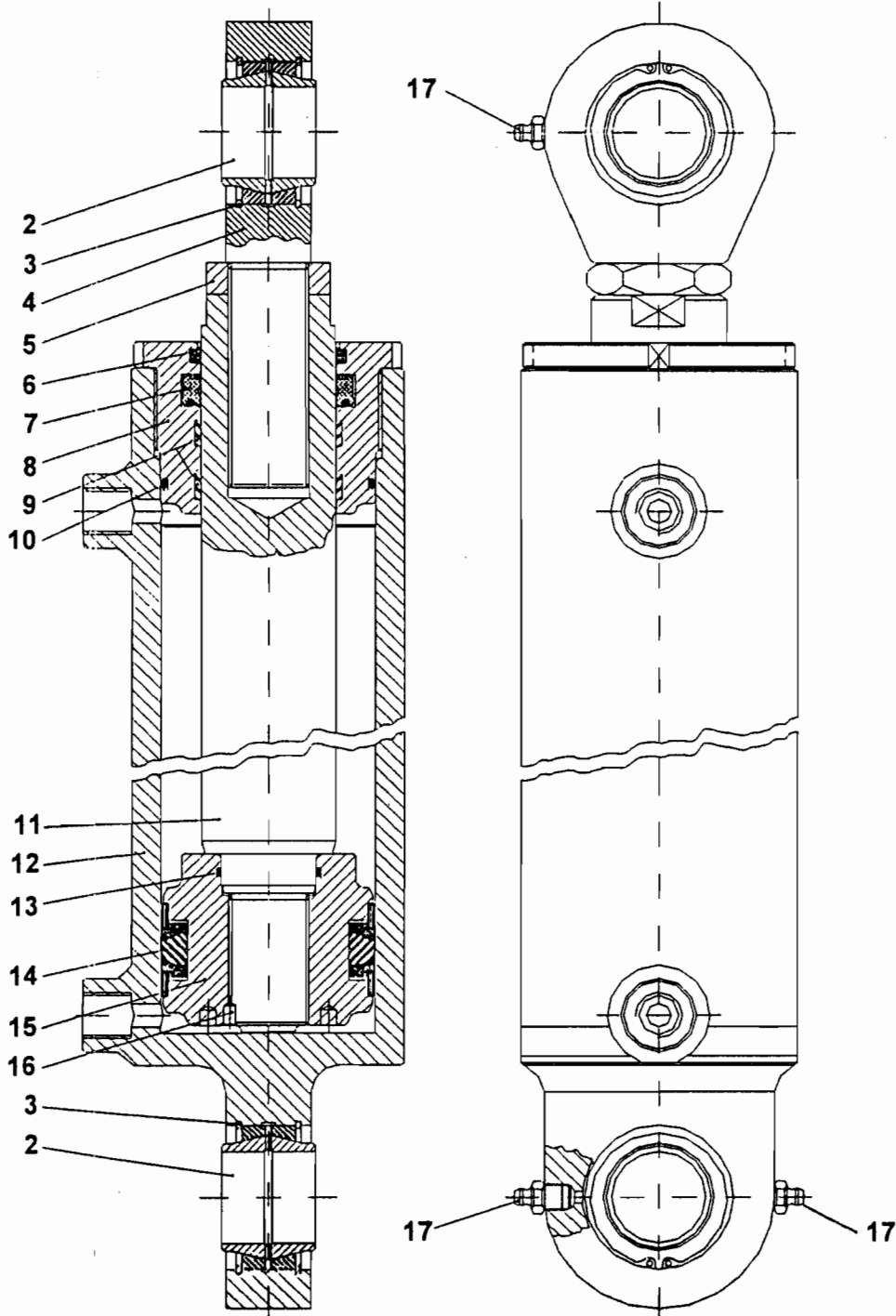
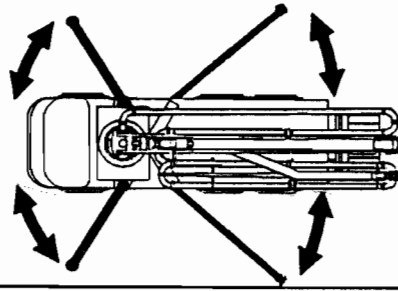
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-6L5	Assembly, Stabilizers Jack Cylinder (See Group 70, Figure 01 for NHA)					Ref
2	C-6L502	• Cylinder					1
3	C-VG122.081010	• Screw					1
4	C-4K512	• Piston					1
5	C-BS23511413	• Gasket, Seal					1
6	C-AO420.174	• Gasket, Seal					1
7	C-6L507	• Rod					1
8	C-AG123.110	• Ring, Slide Rod					2
9	C-AO120.357	• Gasket, Seal					1
10	C-AP110.357	• Gasket, Seal					1
11	C-4K501	• Head, Slide Rod					1
12	C-BT110.110	• Gasket, Seal					1
13	C-BR310.110	• Gasket, Seal					1
14	C-VD112.1825	• Nut, Self Locking					1
15	C-UP110.18	• Washer, Elastic					2
16	C-VE112.1825C8	• Screw, Foot					1
17	C-6K519	• Foot					1

DASH (-) ITEM NOT ILLUSTRATED



# SWING OUT CYLINDER ASSEMBLY

XXT 32  
PARTS  
GROUP 70  
FIGURE 11  
PAGE 01



REVISION:





# SWING OUT CYLINDER ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 70  
FIGURE 11  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-8M3	Assembly, Rear Swing Out Cylinder (See Group 70, Figure 01 for NHA)					Ref
2	C-CT223.035	• Joint, Ball					2
3	C-AA120.055	• Ring, Clamping					4
4	C-8M308	• Cap, Rod					1
5	C-3M325	• Nut					1
6	C-BR210.196228	• Gasket, Seal					1
7	C-BT110.050	• Gasket, Seal					1
8	C-3M301	• Head, Slide Rod					1
9	C-AG122.050	• Ring, Slide Rod					2
10	C-AO420.4287	• Ring, Sealing					1
11	C-8M307	• Rod					1
12	C-8M302	• Cylinder					1
13	C-AO120.126	• Ring, Sealing					1
14	C-BS23314236	• Gasket, Seal					1
15	C-1K312	• Piston					1
16	C-VG122.061008	• Screw					1
17	C-VI131.1010	• Nipple, Grease					3

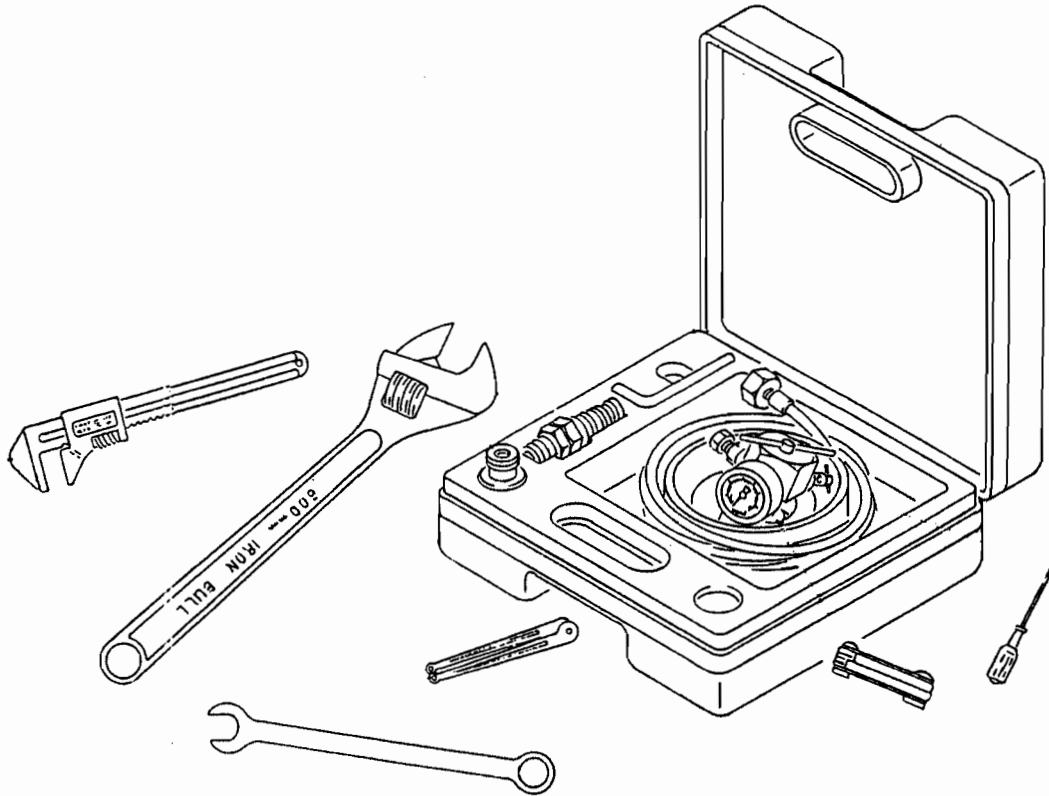
DASH (-) ITEM NOT ILLUSTRATED



**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

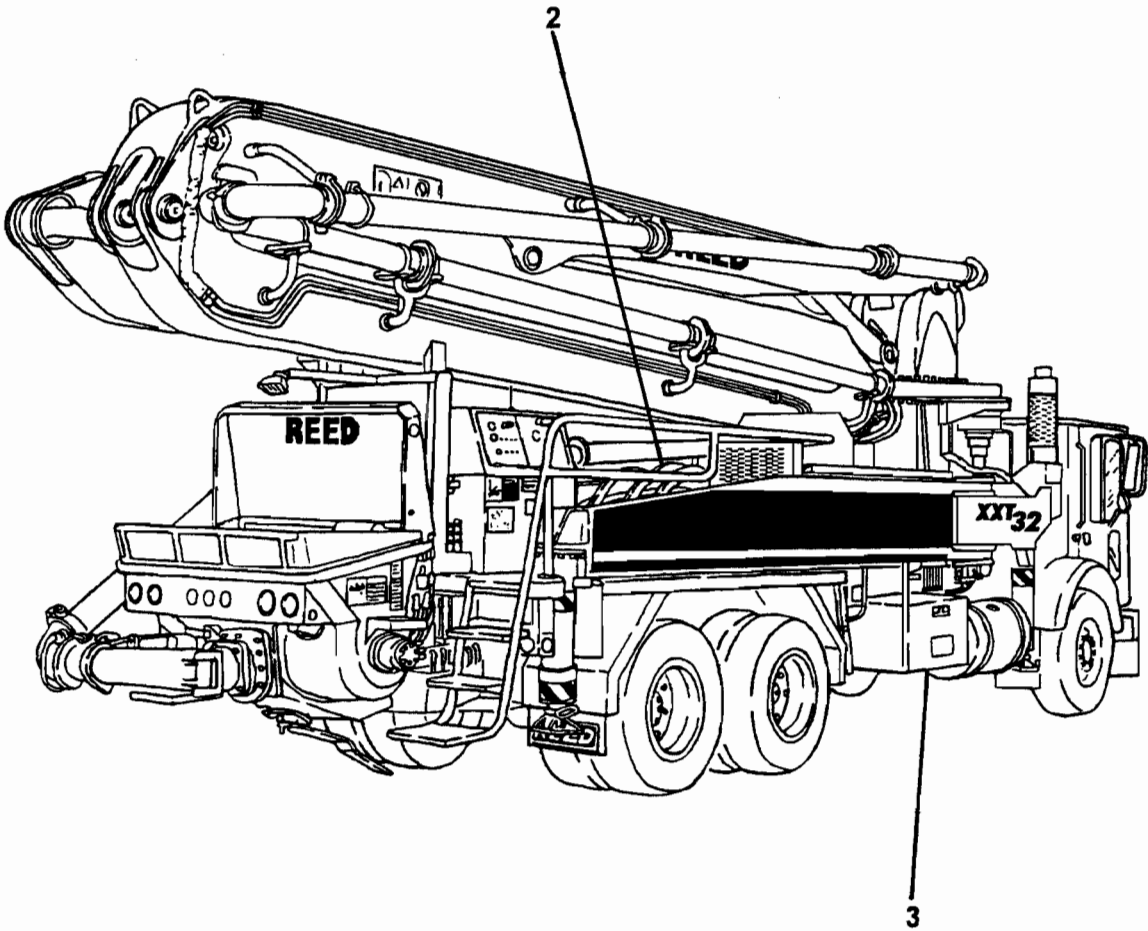
**XXT 32  
PARTS  
GROUP 70  
FIGURE 12  
PAGE 01**

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**REED TRUCK MOUNTED CONCRETE BOOM PUMP MODEL XXT 32 ILLUSTRATED PARTS MANUAL GROUP 80 OPTIONAL INSTALLATION CONTAINS THE FOLLOWING FIGURES:**

- |                  |                                   |
|------------------|-----------------------------------|
| <b>FIGURE 00</b> | <b>TABLE OF CONTENTS</b>          |
| <b>FIGURE 01</b> | <b>OPTIONAL INSTALLATION</b>      |
| <b>FIGURE 02</b> | <b>ACCUMULATOR CHARGE KIT</b>     |
| <b>FIGURE 03</b> | <b>OPTIONAL TOOL KIT ASSEMBLY</b> |





# OPTIONAL INSTALLATION

**XXT 32**  
**PARTS**  
GROUP 80  
FIGURE 01  
PAGE 02

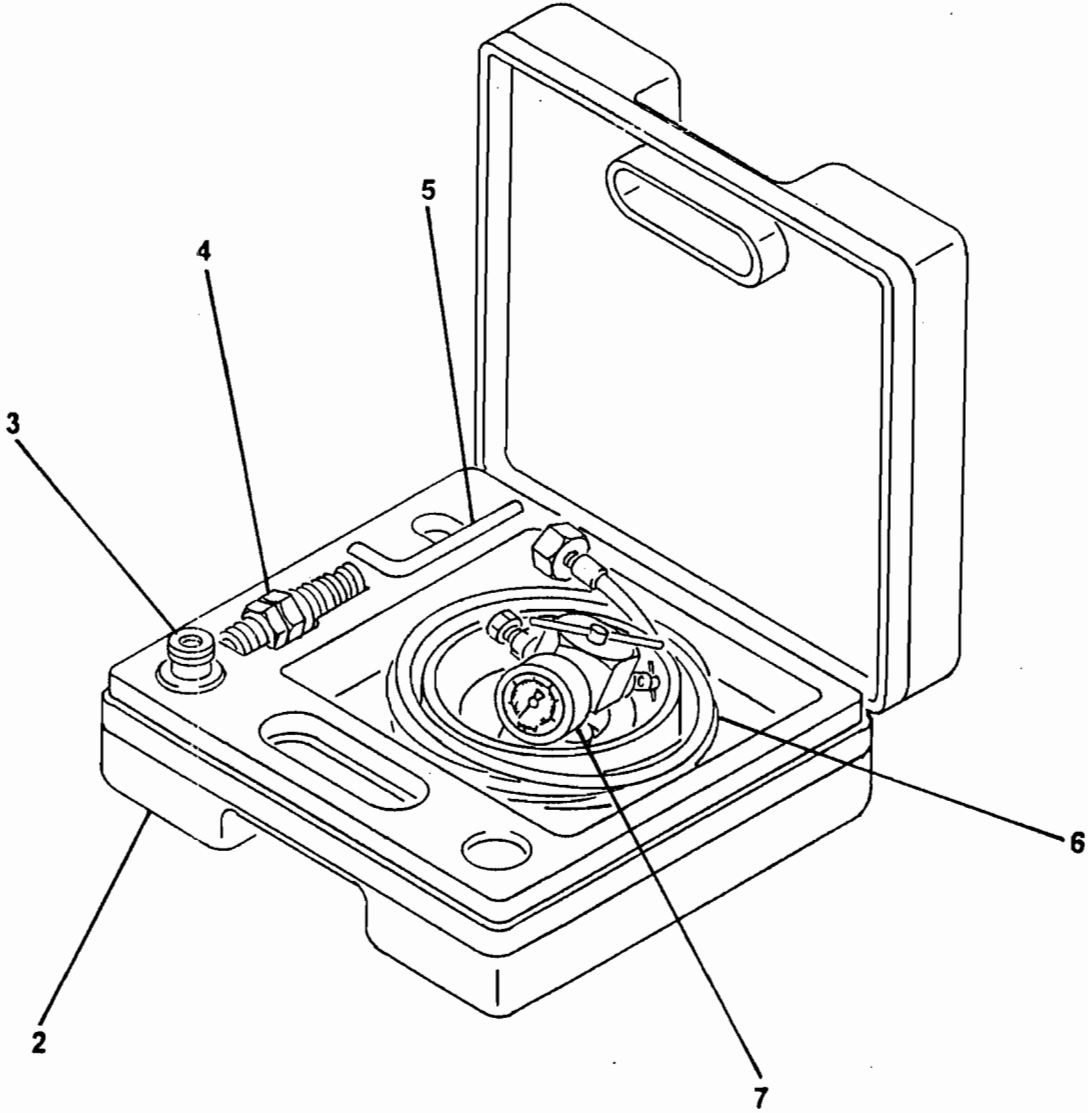
ITEM NO.	REED'S PARTS NO.	DESCRIPTION	QTY
-1	80-01	Installation, Optional (See Group 10, Figure 01 for NHA)	Ref
2	71460	• Kit, Accumulator Charge (See Group 80, Figure 04 for DET)	1
3	79020	• Assembly, Optional Tool Kit (See Group 80, Figure 06 for DET)	1

DASH (-) ITEM NOT ILLUSTRATED



# ACCUMULATOR CHARGE KIT

XXT 32  
PARTS  
GROUP 80  
FIGURE 02  
PAGE 01



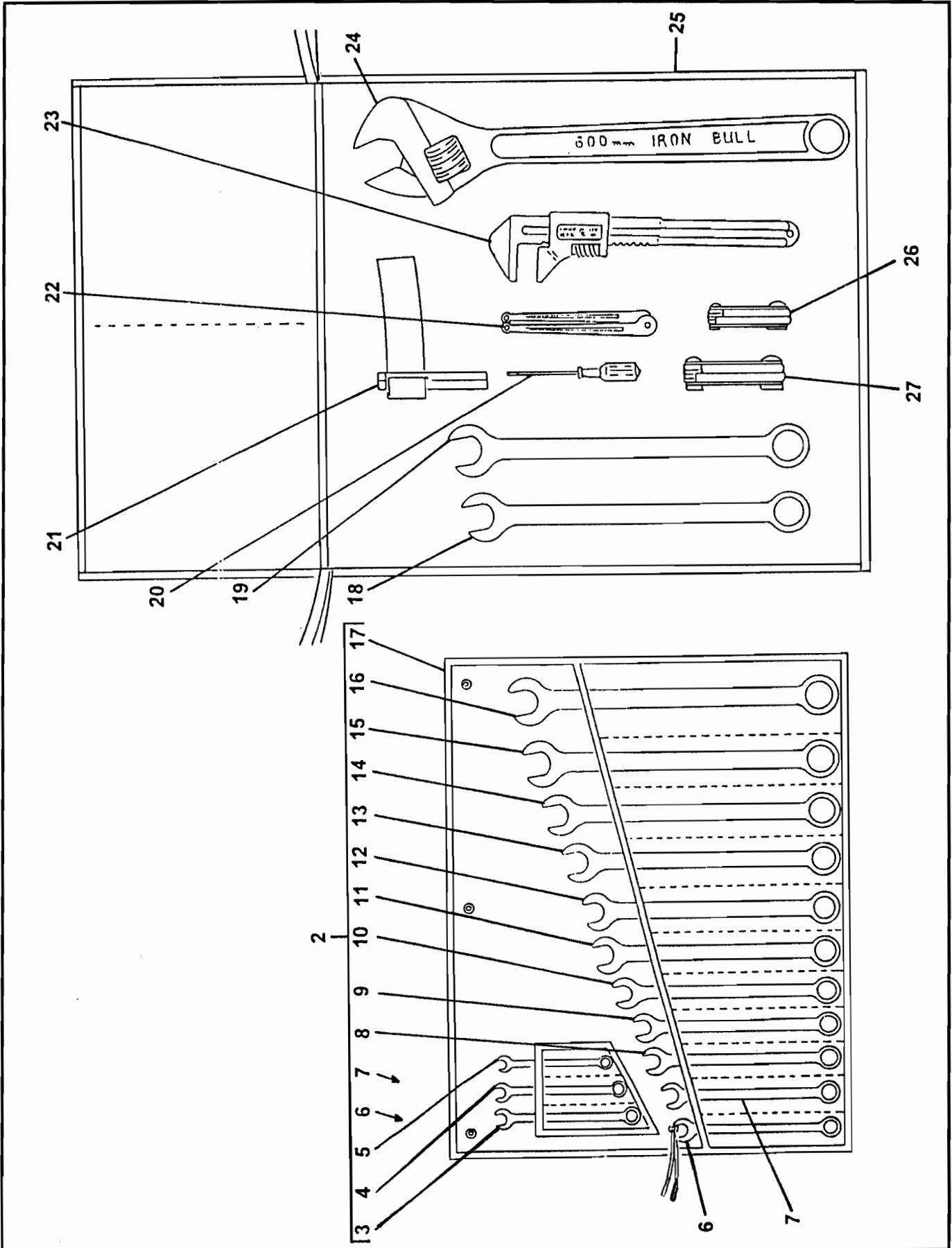


# ACCUMULATOR CHARGE KIT

XXT 32  
PARTS  
GROUP 80  
FIGURE 02  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	71460	Kit, Accumulator Charge (See Group 80, Figure 01 for NHA)					Ref
2		• Case, Charge Kit					1
3		• Adapter, FPK / SB					1
4		• Adapter, G4					1
5		• Wrench, Allen					1
6		• Hose, Charging					1
7		• Unit, FPK Charging and Gagging					1

DASH (-) ITEM NOT ILLUSTRATED







# OPTIONAL TOOL KIT ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 80  
FIGURE 03  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	79020	Assembly, Optional Tool Kit (See Group 80, Figure 01 for NHA)					Ref
2	79037	• Kit, Wrench					1
3		• • Wrench, 1/2 Inch					1
4		• • Wrench, 7/16 Inch					1
5		• • Wrench, 3/8 Inch					1
6		• • Wrench, 9/16 Inch					1
7		• • Wrench, 5/8 Inch					1
8		• • Wrench, 11/16 Inch					1
9		• • Wrench, 3/4 Inch					1
10		• • Wrench, 13/16 Inch					1
11		• • Wrench, 7/8 Inch					1
12		• • Wrench, 15/16 Inch					1
13		• • Wrench, 1 Inch					1
14		• • Wrench, 1-1/16 Inch					1
15		• • Wrench, 1-1/8 Inch					1
16		• • Wrench, 1-1/4 Inch					1
17		• • Wrap, Plastic					1
18	79036	• Wrench, 1-3/8 Inch					1
19	79028	• Wrench, 1-1/2 Inch					1
20	79038	• Screwdriver					1
21	79814	• Wrench, Strap (for Filter)					1
22	79325	• Wrench, Spanner					1
23	79031	• Wrench, Monkey					1
24	79032	• Wrench, Adjustable 24 Inch					1
25	77502	• Bag, Tool					1
26	79030	• Set, Metric Allen Key (2-8 mm)					1
27	79029	• Set, Standard Allen Key (3/16-3/8 Inch)					1

DASH (-) ITEM NOT ILLUSTRATED



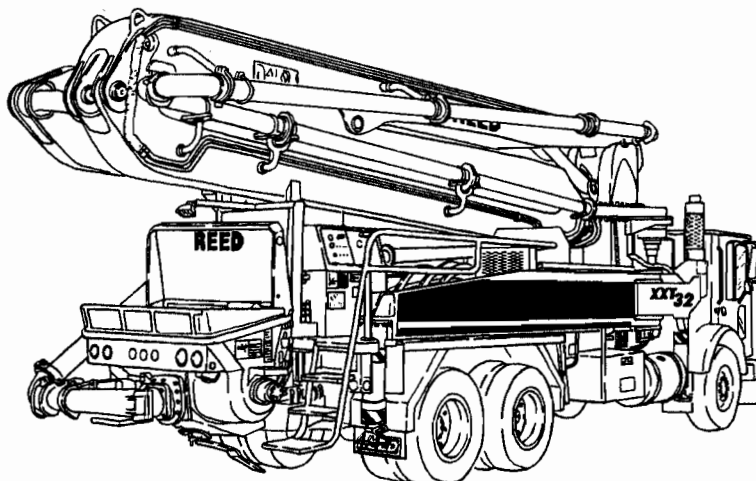
**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

**XXT 32  
PARTS  
GROUP 80  
FIGURE 04  
PAGE 01**

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**REED** TRUCK MOUNTED CONCRETE BOOM PUMP MODEL **XXT 32**  
ILLUSTRATED PARTS MANUAL GROUP 90 BOOM INSTALLATION CONTAINS  
THE FOLLOWING FIGURES:

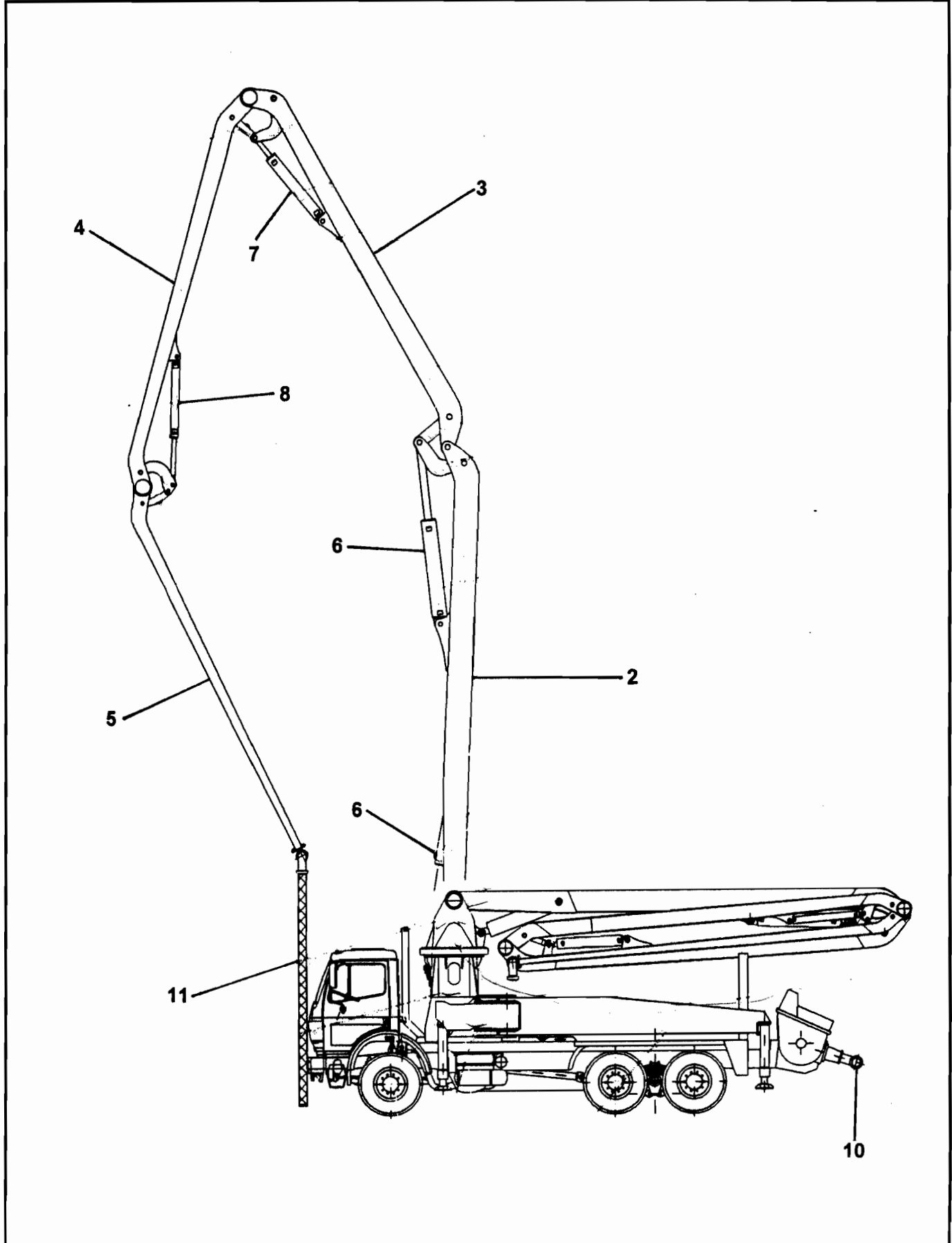
- FIGURE 00** TABLE OF CONTENTS
- FIGURE 01** BOOM INSTALLATION
- FIGURE 02** FIRST BOOM ASSEMBLY
- FIGURE 03** SECOND BOOM ASSEMBLY
- FIGURE 04** THIRD BOOM ASSEMBLY
- FIGURE 05** FOURTH BOOM ASSEMBLY
- FIGURE 06** FIRST BOOM CYLINDER ASSEMBLY
- FIGURE 07** SECOND BOOM CYLINDER ASSEMBLY
- FIGURE 08** THIRD BOOM CYLINDER ASSEMBLY
- FIGURE 09** FOURTH BOOM CYLINDER ASSEMBLY
- FIGURE 10** CONCRETE PIPELINE ASSEMBLY (DECK AREA)
- FIGURE 11** CONCRETE PIPELINE ASSEMBLY (BOOM AREA)





# BOOM INSTALLATION

XXT 32  
PARTS  
GROUP 90  
FIGURE 01  
PAGE 01



REVISION:

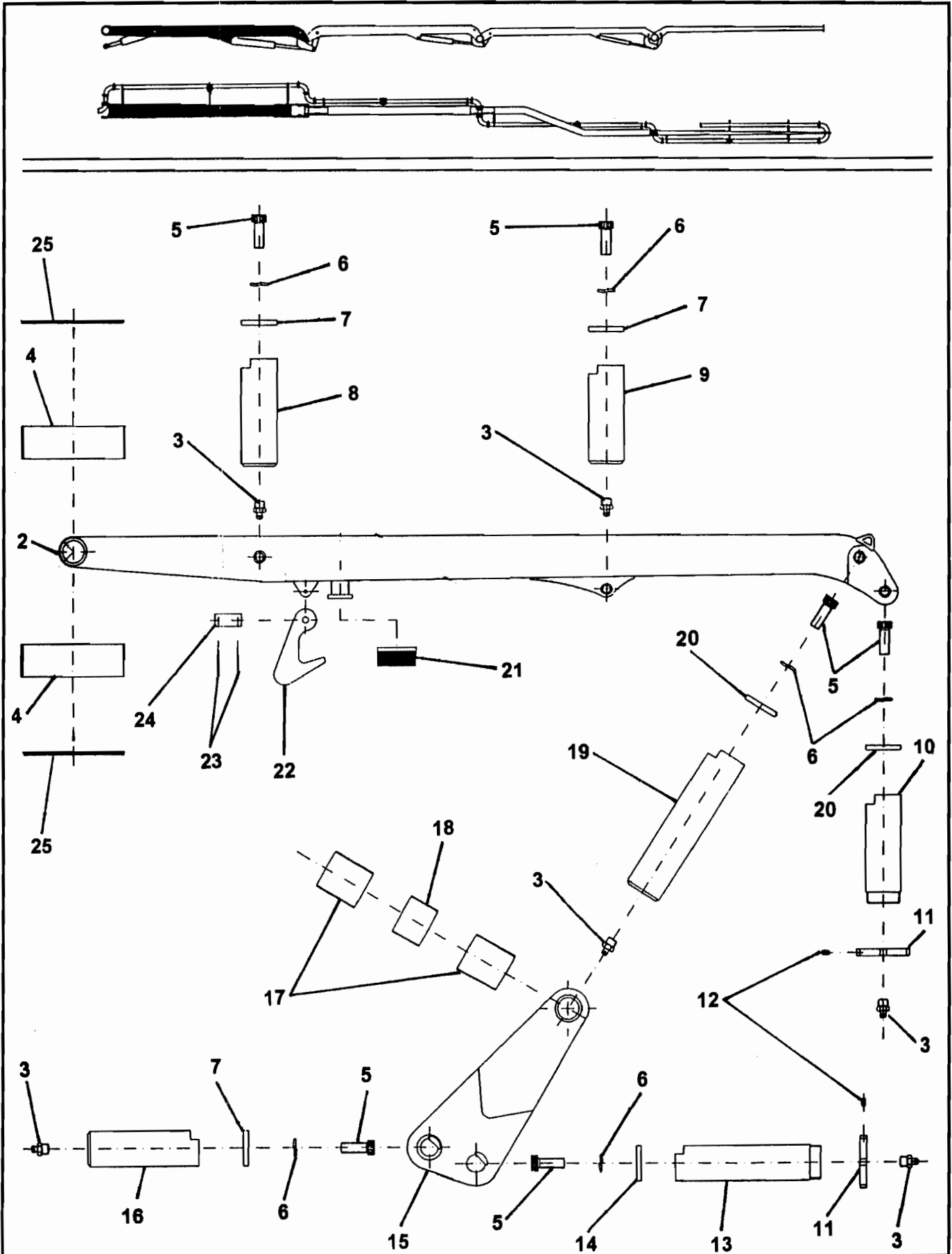


# BOOM INSTALLATION

**XXT 32**  
**PARTS**  
GROUP 90  
FIGURE 01  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	90-01	Installation, Boom (See Group 10, Figure 01 for NHA)					Ref
2	C-3A1	• Assembly, First Boom (See Group 90, Figure 02 for DET)					1
3	C-3A2	• Assembly, Second Boom (See Group 90, Figure 03 for DET)					1
4	C-3A3	• Assembly, Third Boom (See Group 90, Figure 04 for DET)					1
5	C-3A4	• Assembly, Fourth Boom (See Group 90, Figure 05 for DET)					1
6	C-3B1A	• Assembly, First Boom Cylinder (See Group 90, Figure 06 for DET)					1
7	C-3B2A	• Assembly, Second Boom Cylinder (See Group 90, Figure 07 for DET)					1
8	C-5B3C	• Assembly, Third Boom Cylinder (See Group 90, Figure 08 for DET)					1
9	C-3B4C	• Assembly, Fourth Boom Cylinder (See Group 90, Figure 09 for DET)					1
10	90-10	• Assembly, Concrete Pipe Line (Deck Area) (See Group 90, Figure 10 for DET)					1
11	C-3T	• Assembly, Concrete Pipe Line (Boom Area) (See Group 90, Figure 11 for DET)					1

DASH (-) ITEM NOT ILLUSTRATED



REVISION:

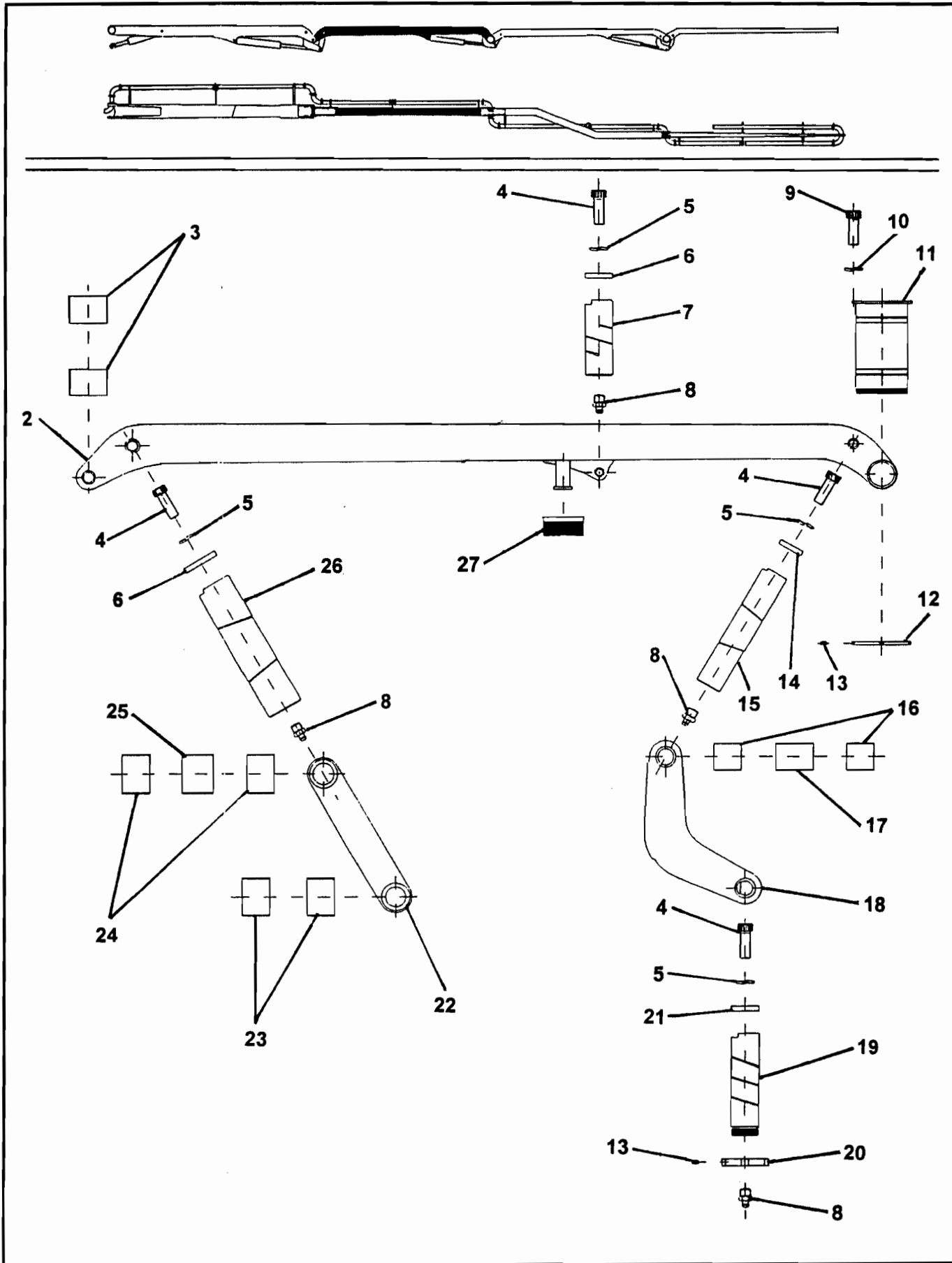
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3A1	Assembly, First Boom (See Group 90, Figure 01 for NHA)					Ref
2	C-3A101	• Structure, Base					1
3	C-VI131.1010	• Nipple, Grease					7
4	C-CD230.235070	• Bearing, Anti-friction					2
5	C-VC110.101525	• Screw					7
6	C-UE110.10	• Washer, Elastic					7
7	C-UD080.1106	• Washer, Pin Locking					3
8	C-3P115	• Pin					1
9	C-3P114	• Pin					1
10	C-3P113	• Pin					2
11	C-GV075.2015	• Ring, Thread					3
12	C-VG120.061010	• Screw					4
13	C-3P110	• Pin					1
14	C-UD080.1106	• Washer, Pin Locking					1
15	C-3C101	• Beam					1
16	C-3P112	• Pin					1
17	C-CD090.095060	• Bearing, Anti-friction					2
18	C-3C102	• Piece, Distance					1
19	C-3P111	• Pin					1
20	C-UD090.1106	• Washer, Pin Locking					3
21	C-UG220.10012	• Pad, Rubber					1
22	C-4A103	• Hook					1
23	C-VS110.04050	• Pin, Split					2
24	C-4P120	• Pin					1
25	C-CR230.02	• Ring, Wear					2

DASH (-) ITEM NOT ILLUSTRATED



# SECOND BOOM ASSEMBLY

XXT 32  
PARTS  
GROUP 90  
FIGURE 03  
PAGE 01

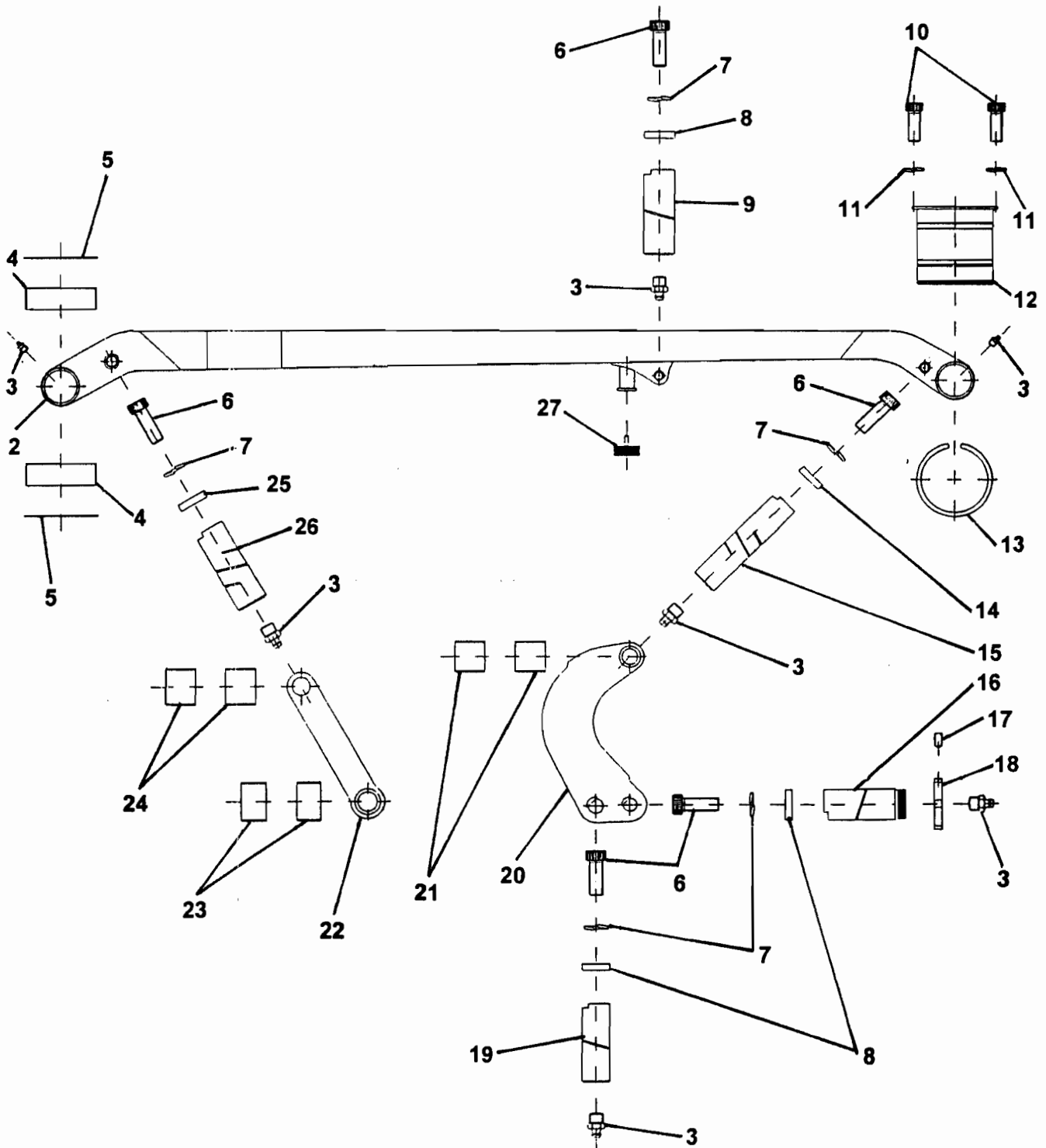
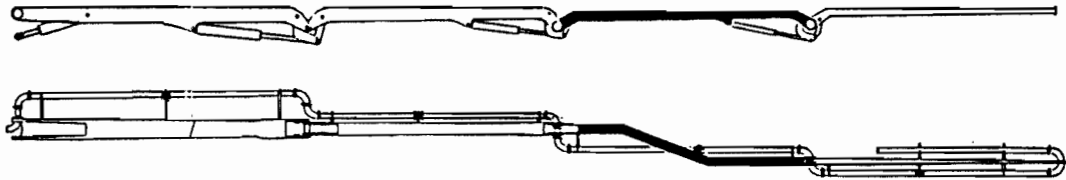


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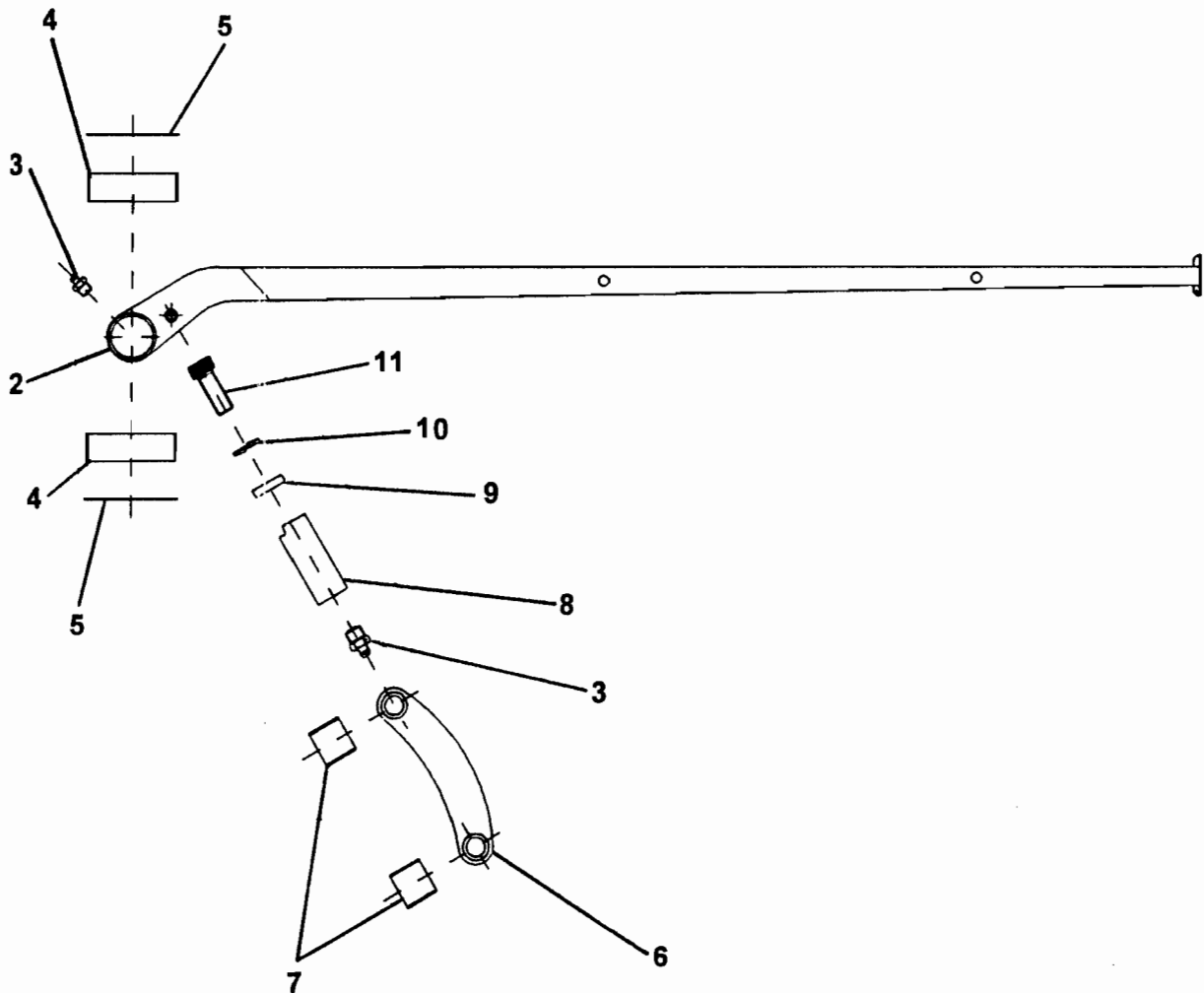
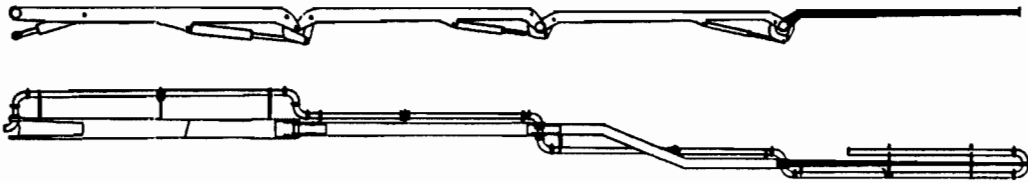
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3A2	Assembly, Second Boom (See Group 90, Figure 01 for NHA)					Ref
2	C-3A201A	• Structure, Base					1
3	C-CD090.095060	• Bearing, Anti-friction					2
4	C-VC110.101525	• Screw					4
5	C-UE110.10	• Washer, Elastic					4
6	C-UD080.1106	• Washer, Pin Locking					2
7	C-3P108	• Pin					1
8	C-VI131.1010	• Nipple, Grease					4
9	C-VC110.081220	• Screw					4
10	C-UE110.08	• Washer, Elastic					4
11	C-3P107C	• Pin					1
12	C-GV218.2015	• Ring, Thread					1
13	C-VG122.061010	• Screw					4
14	C-UD065.1105	• Washer, Pin Locking					1
15	C-3P106	• Pin					1
16	C-CD070.075050	• Bearing, Anti-friction					2
17	C-3C202	• Piece, Distance					1
18	C-3C201	• Beam					1
19	C-3P105	• Pin					1
20	C-GV055.1515	• Ring, Thread					1
21	C-UD060.1105	• Washer, Pin Locking					1
22	C-3D101	• Rod, Connecting					1
23	C-CD080.085060	• Bearing, Anti-friction					2
24	C-CD085.090060	• Bearing, Anti-friction					2
25	C-3D102	• Piece, Distance					1
26	C-3P109	• Pin					1
27	C-UG220.10012	• Pad, Rubber					1

DASH (-) ITEM NOT ILLUSTRATED



ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3A3	Assembly, Third Boom (See Group 90, Figure 01 for NHA)					Ref
2	C-3A301A	• Structure, Base					1
3	C-VI131.1010	• Nipple, Grease					9
4	C-CD220.225035	• Bearing, Anti-friction					2
5	C-CR220.02	• Ring, Wear					2
6	C-VC110.101525	• Screw					5
7	C-UE110.10	• Washer, Elastic					5
8	C-UD050.1105	• Washer, Pin Locking					3
9	C-4P106	• Pin					1
10	C-VC110.081220	• Screw					8
11	C-UE110.08	• Washer, Elastic					8
12	C-4P105B	• Pin					2
13	C-AA210.220	• Ring, Clamping					2
14	C-UD055.1105	• Washer, Pin Locking					1
15	C-4P107	• Pin					1
16	C-3P103	• Pin					1
17	C-VG122.061010	• Screw					2
18	C-GV045.1512	• Ring, Threaded					1
19	C-3P102	• Pin					1
20	C-6C301A	• Beam					1
21	C-CD055.060060	• Bearing, Anti-friction					2
22	C-3D201	• Rod, Connecting					1
23	C-CD060.065040	• Bearing, Anti-friction					2
24	C-CD065.075050	• Bearing, Anti-friction					1
25	C-UD065.1105	• Washer, Pin Locking					1
26	C-3P104	• Pin					1
27	UG220.10012	• Pad, Rubber					1

DASH (-) ITEM NOT ILLUSTRATED





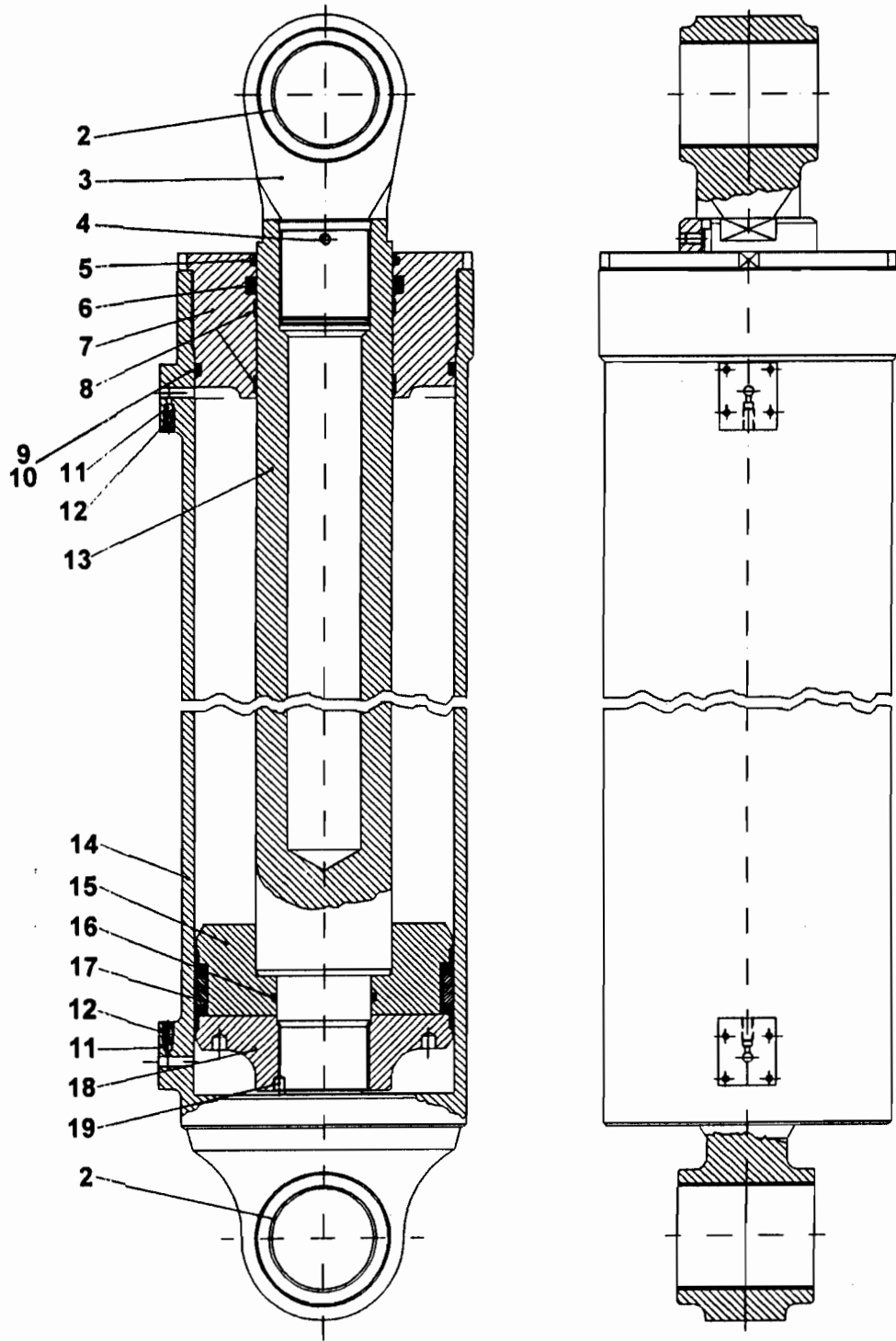
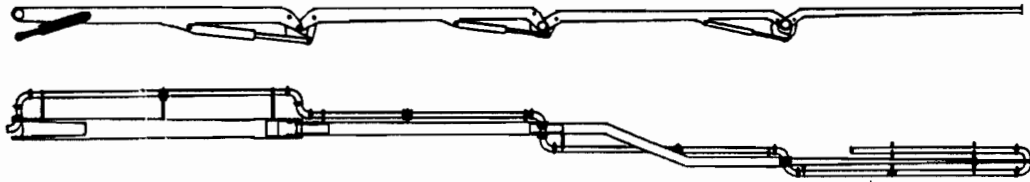
# FOURTH BOOM ASSEMBLY

**XXT 32**  
**PARTS**  
GROUP 90  
FIGURE 05  
PAGE 02

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3A4	Assembly, Fourth Boom (See Group 90, Figure 01 for NHA)					Ref
2	C-3A401A	• Structure, Base					1
3	C-VI131.1010	• Nipple, Grease					3
4	C-CD220.225030	• Bearing, Anti-friction					2
5	C-CR220.02	• Ring, Wear					2
6	C-3D301A	• Rod, Connection					1
7	C-CD050.055050	• Bearing, Anti-friction					2
8	C-3P101	• Pin					1
9	C-UD050.1105	• Washer, Pin Locking					1
10	C-UE110.10	• Washer, Elastic					1
11	C-VC110.101525	• Screw					1

DASH (-) ITEM NOT ILLUSTRATED

## FIRST BOOM CYLINDER ASSEMBLY



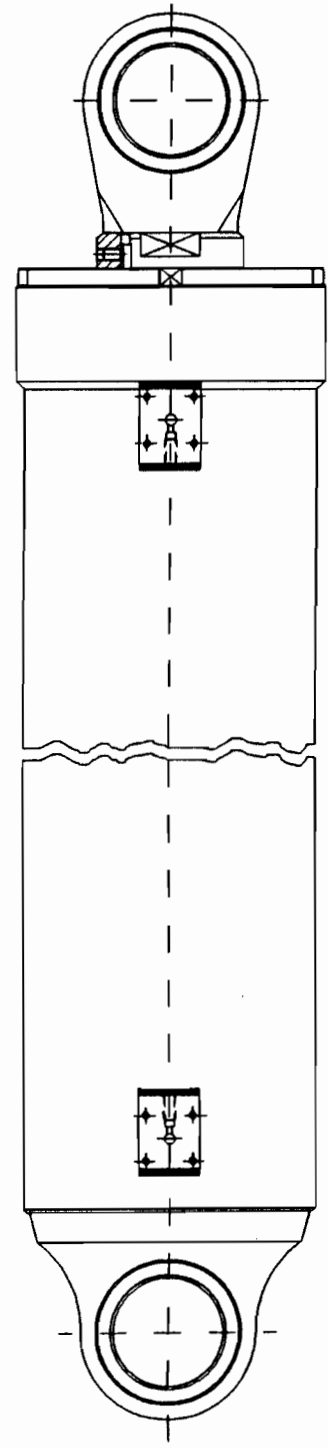
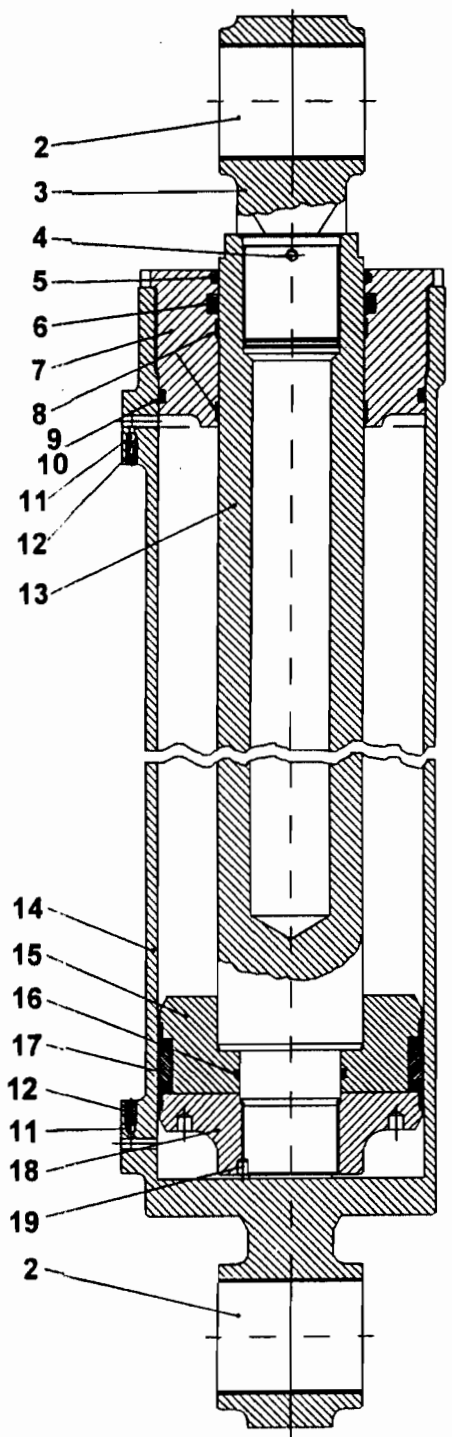
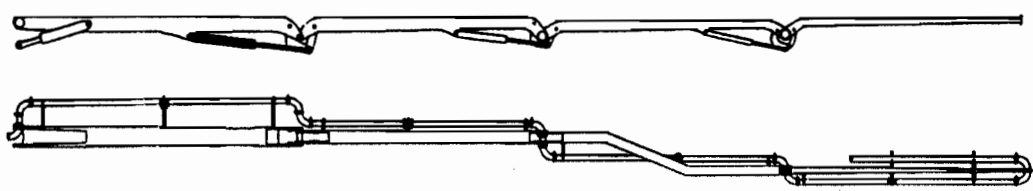
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3B1A	Assembly, First Boom Cylinder (See Group 90, Figure 01 for NHA)					Ref
2	C-CD080.085060	• Bearing, Anti Friction					4
3	C-3B108A	• Cap, Rod					1
4	C-VG122.101515	• Screw					1
5	C-BR310.120	• Gasket, Seal					1
6	C-BT110.120	• Gasket, Seal					1
7	C-3B101	• Head, Slide Rod					1
8	C-AG123.120	• Ring, Slide Rod					2
9	C-AO120.371	• Ring, Sealing					1
10	C-AP110.372	• Seal, Gasket					1
11	C-CS100.007	• Ball, Still					2
12	C-WPVS1	• Valve, Air Hole					2
13	C-3B107	• Rod					1
14	C-3B102A	• Cylinder					1
15	C-3B112	• Piston					1
16	C-AO420.6325	• Ring, Sealing					1
17	C-BS229058071A	• Gasket, Seal					1
18	C-3B109A	• Nut, Rod					1
19	C-VG121.101512	• Screw					1

DASH (-) ITEM NOT ILLUSTRATED



# SECOND BOOM CYLINDER ASSEMBLY

XXT 32  
PARTS  
GROUP 90  
FIGURE 07  
PAGE 01



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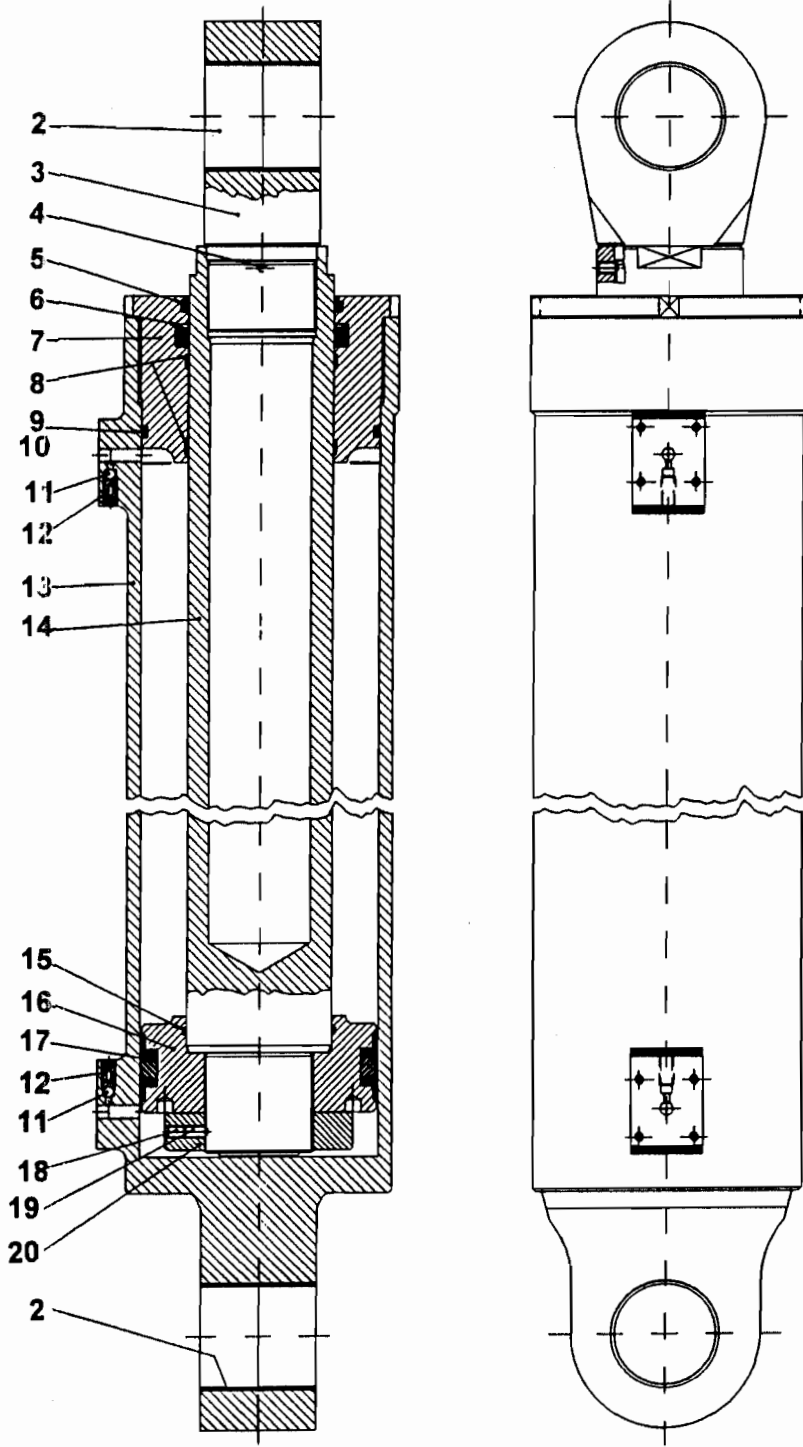
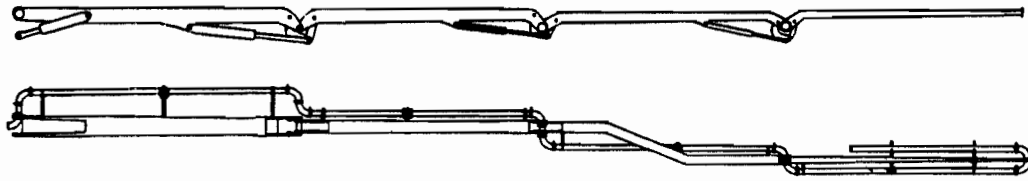
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3B2A	Assembly, Second Boom Cylinder (See Group 90, Figure 01 for NHA)					Ref
2	C-CD080.085060	• Bearing, Anti Friction					4
3	C-3B208A	• Cap, Rod					1
4	C-VG122.101515	• Screw					1
5	C-BR310.120	• Gasket, Seal					1
6	C-BT110.120	• Gasket, Seal					1
7	C-3B201	• Head, Slide Rod					1
8	C-AG123.120	• Ring, Slide Rod					2
9	C-AO120.368	• Ring, Sealing					1
10	C-AP110.368	• Seal, Gasket					1
11	C-CS100.007	• Ball, Steel					2
12	C-WPVS1	• Valve, Air Hole					2
13	C-3B207	• Rod					1
14	C-3B202A	• Cylinder					1
15	C-3B212	• Piston					1
16	C-AO420.6325	• Ring, Sealing					1
17	C-BS228267281A	• Ring, Sealing					1
18	C-3B209A	• Nut, Rod					1
19	C-VG121.101512	• Screw					1

DASH (-) ITEM NOT ILLUSTRATED



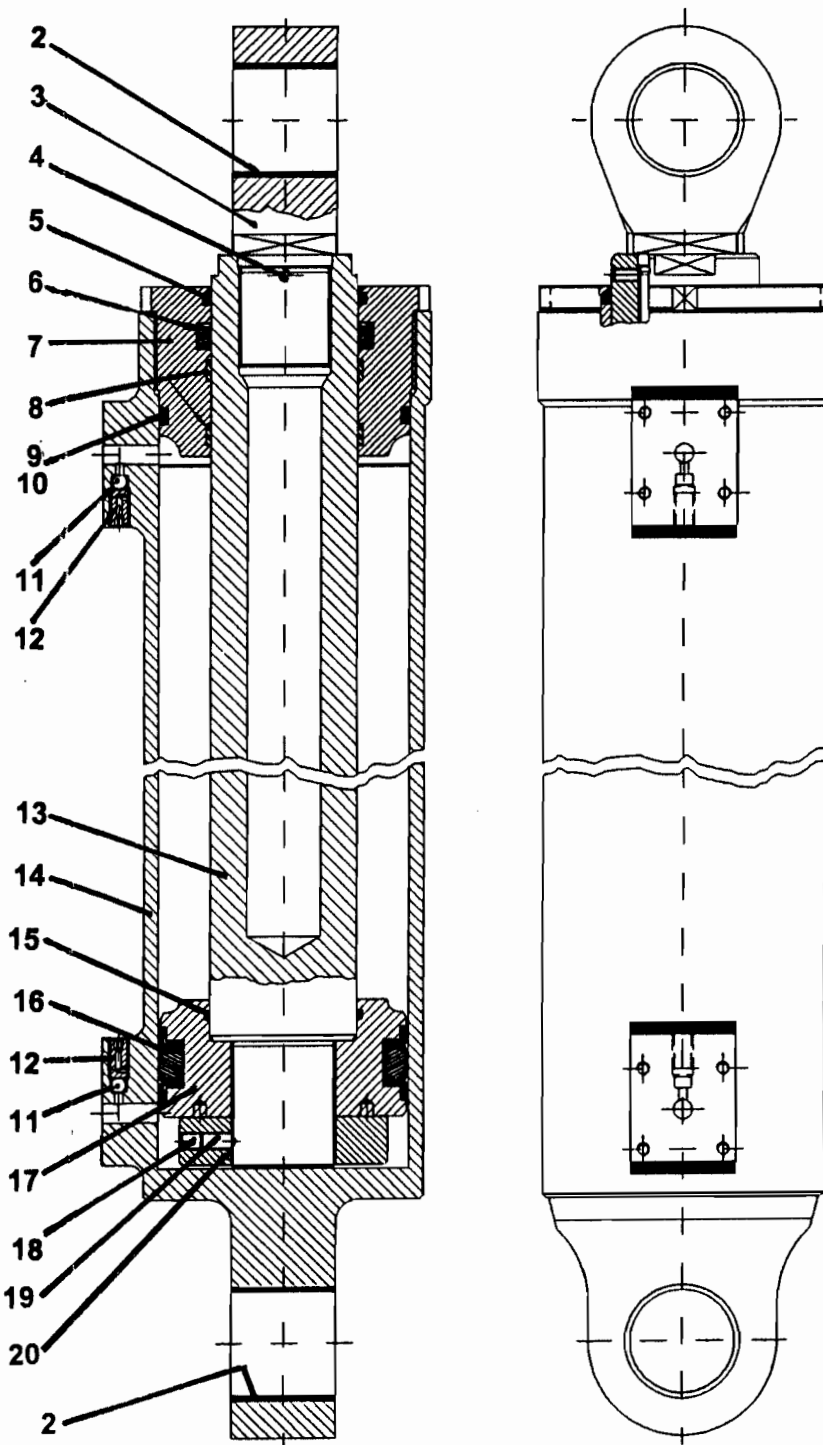
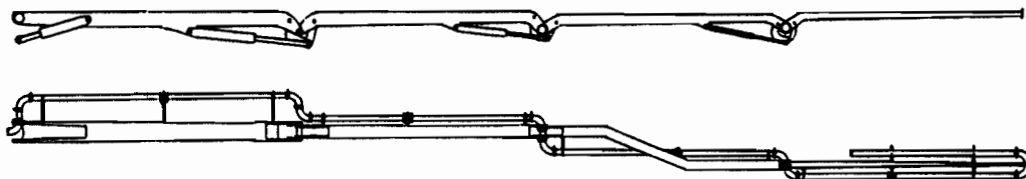
# THIRD BOOM CYLINDER ASSEMBLY

XXT 32  
PARTS  
GROUP 90  
FIGURE 08  
PAGE 01



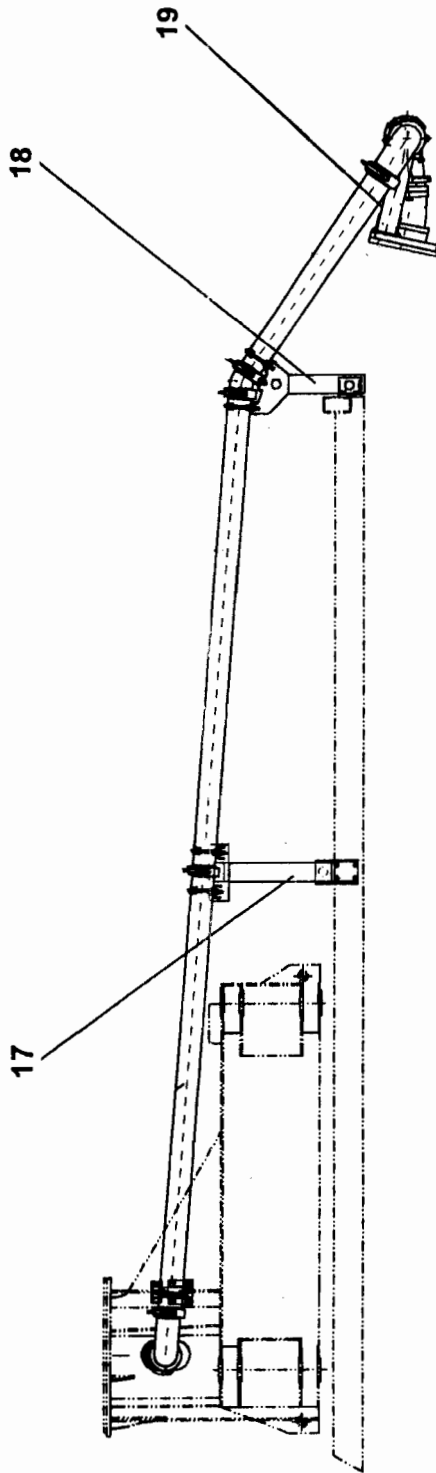
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-5B3C	Assembly, Third Boom Cylinder (See Group 90, Figure 01 for NHA)					Ref
2	C-CD065.070060	• Bearing, Anti Friction					4
3	C-5B308	• Cap, Rod					1
4	C-VG122.081215	• Screw					1
5	C-BR310.080	• Gasket, Seal					1
6	C-BT110.080	• Gasket, Seal					1
7	C-3B301	• Head, Slide Rod					1
8	C-AG122.080	• Ring, Slide Rod					2
9	C-AP110.361	• Seal, Gasket					1
10	C-AO120.361	• Ring, Sealing					1
11	C-CS100.007	• Ball, Steel					2
12	C-WPVS1	• Valve, Air Hole					2
13	C-5B302B	• Cylinder					1
14	C-3B307A	• Rod					1
15	C-AO420.4312	• Ring, Seal					1
16	C-3B312C	• Piston					1
17	C-BS23649551	• Gasket, Seal					1
18	C-VG122.081212	• Screw					1
19	C-VG122.081215	• Screw					1
20	C-3B309	• Nut, Rod					1

DASH (-) ITEM NOT ILLUSTRATED

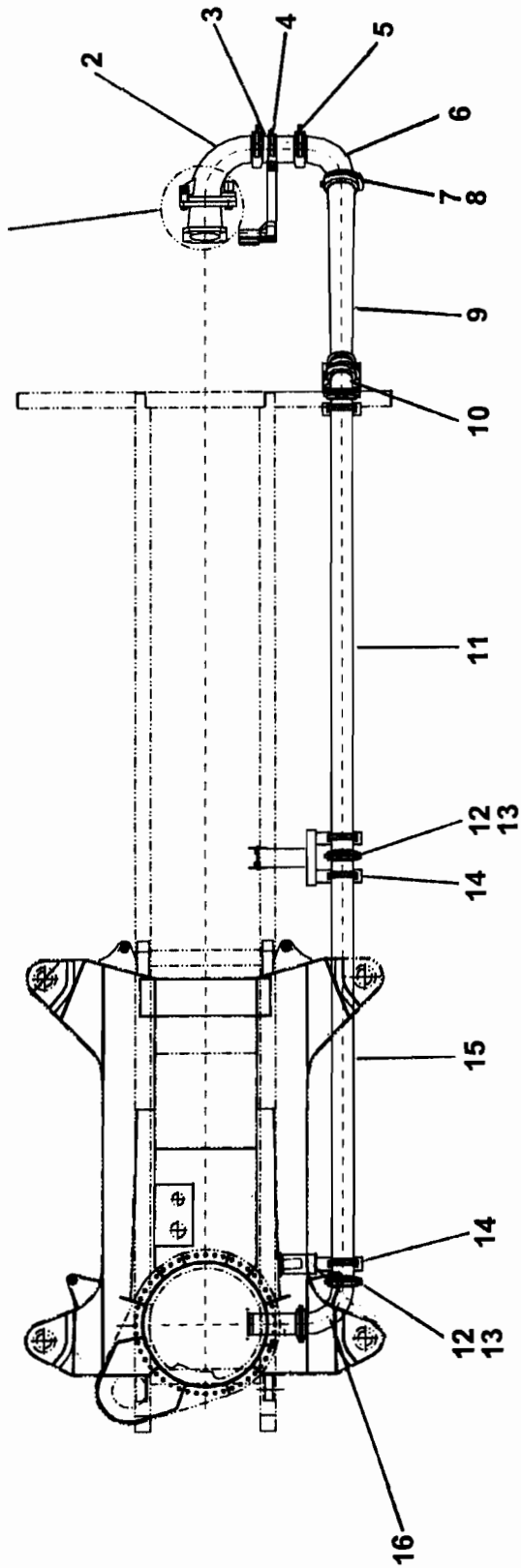


ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3B4C	Assembly, Fourth Boom Cylinder (See Group 90, Figure 01 for NHA)					Ref
2	C-CD050.055050	• Bearing, Anti Friction					4
3	C-3B408A	• Cap, Rod					4
4	C-VG122.061012	• Screw					1
5	C-BR310.070	• Gasket, Seal					1
6	C-BT110.070	• Gasket, Seal					1
7	C-3B401	• Head, Slide Rod					1
8	C-AG122.070	• Ring, Slide Rod					2
9	C-AP110.348	• Seal, Gasket					1
10	C-AO120.348	• Ring, Sealing					1
11	C-CS100.007	• Ball, Steel					2
12	C-WPVS1	• Valve, Air Hole					2
13	C-3B407B	• Rod					1
14	C-3B402B	• Cylinder					1
15	C-AO420.4275	• Ring, Sealing					1
16	C-BS23472374	• Gasket, Seal					1
17	C-3B412B	• Piston					1
18	C-VG121.081210	• Screw					1
19	C-VG121.081215	• Screw					1
20	C-3B409	• Nut, Rod					1

DASH (-) ITEM NOT ILLUSTRATED



HOPPER OUTLET ASSEMBLY  
(SEE GROUP 20, FIGURE 07 FOR REF)



**CONCRETE PIPE LINE ASSEMBLY  
(DECK AREA)**

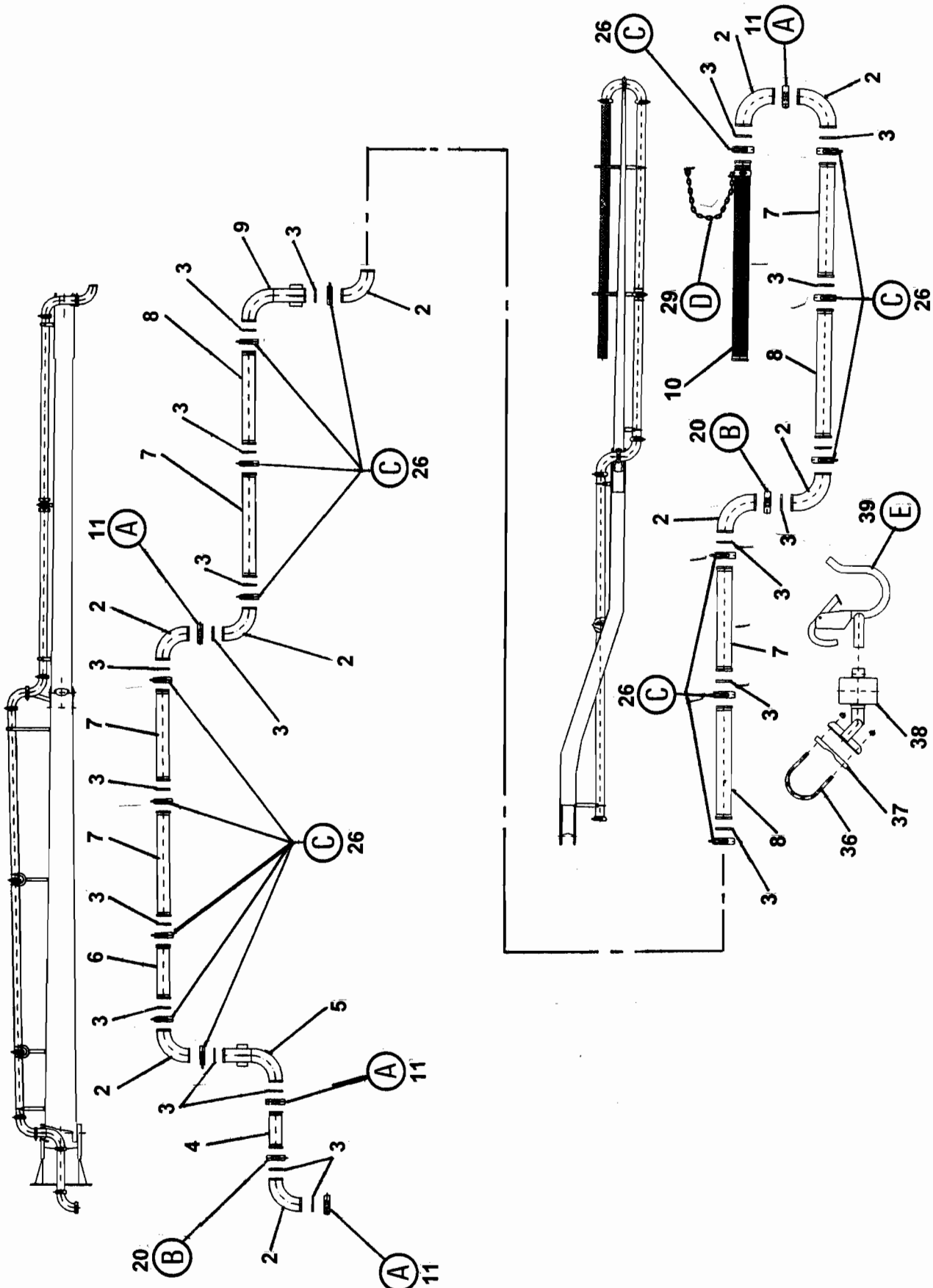
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	90-10	Assembly, Deck Area Concrete Pipe Line (See Group 90, Figure 01 for NHA)					Ref
2	B-191015	• Elbow, Swing Away					1
3	801076	• Adapter, 6 Inch Special					1
4	B-194053	• Adapter, Snap Coupling					1
5	W-105165	• Adapter, Hopper Snap Coupling					1
6	800336	• Elbow, 6 Inch 90					1
7	W-101779	• Coupling, 6 Inch Clamp					2
8	72241	• Gasket, 6 Inch Clamp					2
9	800326	• Reducer, 6 Inch to 5 Inch					1
10	800328	• Elbow, 5 Inch 30					1
11	800323	• Pipe, 5 Inch Deck					1
12	800070	• Coupling, 5 Inch Snap					5
13	800337	• Gasket, Metric Coupling					5
14	800341	• U-Clamp, 5 Inch Pipe					1
15		• Pipe, 5 Inch Deck					1
16	800327	• Elbow, 5 Inch 90					1
17	B-194027	• Bracket					1
18	B-194013	• Bracket					1
19	B-194033	• Bracket					1

DASH (-) ITEM NOT ILLUSTRATED

# REED

## CONCRETE PIPE LINE ASSEMBLY (BOOM AREA)

XXT 32  
PARTS  
GROUP 90  
FIGURE 11  
PAGE 01



REVISION:

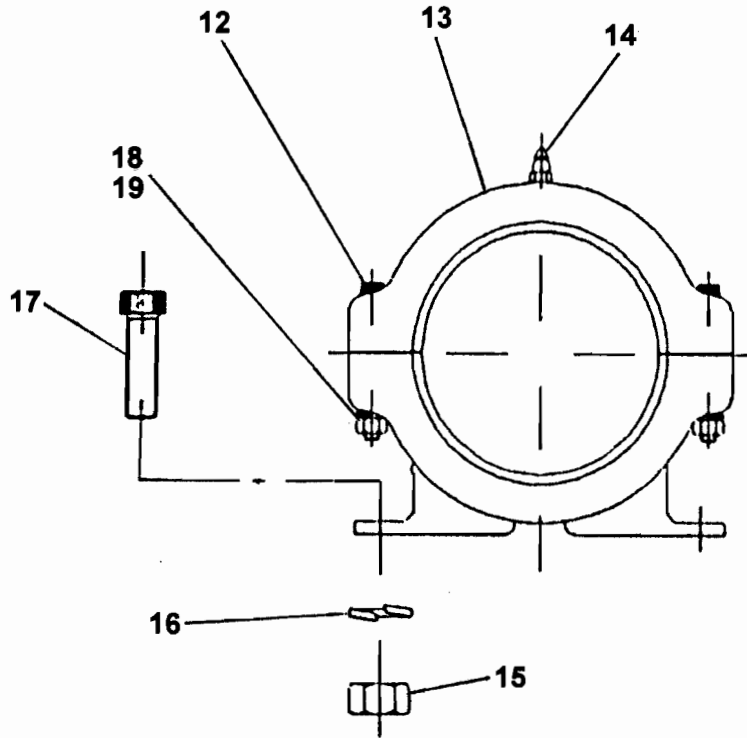


**REED****CONCRETE PIPE LINE ASSEMBLY  
(BOOM AREA)****XXT 32  
PARTS  
GROUP 90  
FIGURE 11  
PAGE 02**

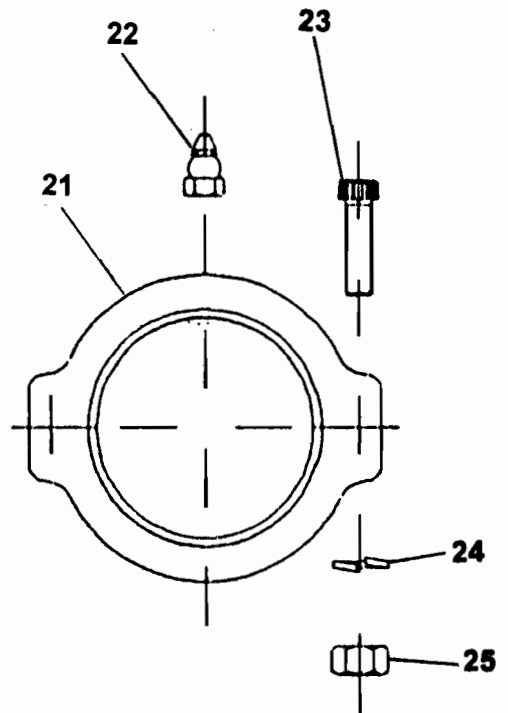
ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
-1	C-3T	Assembly, Boom Area Concrete Pipeline (See Group 90, Figure 01 for NHA)					Ref
2	801100	• Elbow, 90					9
3	C-TB125	• Gasket, Seal					22
4	801105-*	• Pipe					1
5	801102	• Pipe with Bend					1
6	801105-*	• Pipe					1
7	801105-3000	• Pipe					5
8	801105-*	• Pipe					3
9	801103	• Pipe with Bend					1
10	C-TT2.FLEX	• Hose, Flexible Max 4m					1
11	C-TG222	• Coupling, Bracket 2 Bolts					4
20	C-TG221	• Coupling, 2 Bolts					2
26	C-TG211	• Coupling, Lever					16
29	C-TS24	• Kit, Safety Collar					1
36	C-TS212	• Collar					24
37	C-TS001	• Plate, Plastic					24
38	C-VD221.1420	• Nut, Self Locking					48
39	C-TS23	• Kit, Flexible Hose Support					2

\* REFER TO SPECIFIC SHEET FOR YOUR MODEL AND SERIAL NUMBER OF UNIT

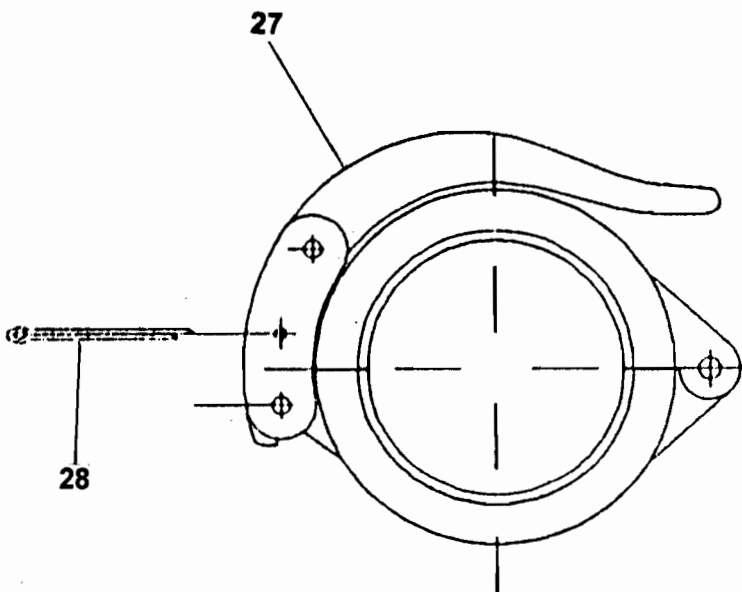
DASH (-) ITEM NOT ILLUSTRATED



(A)



(B)



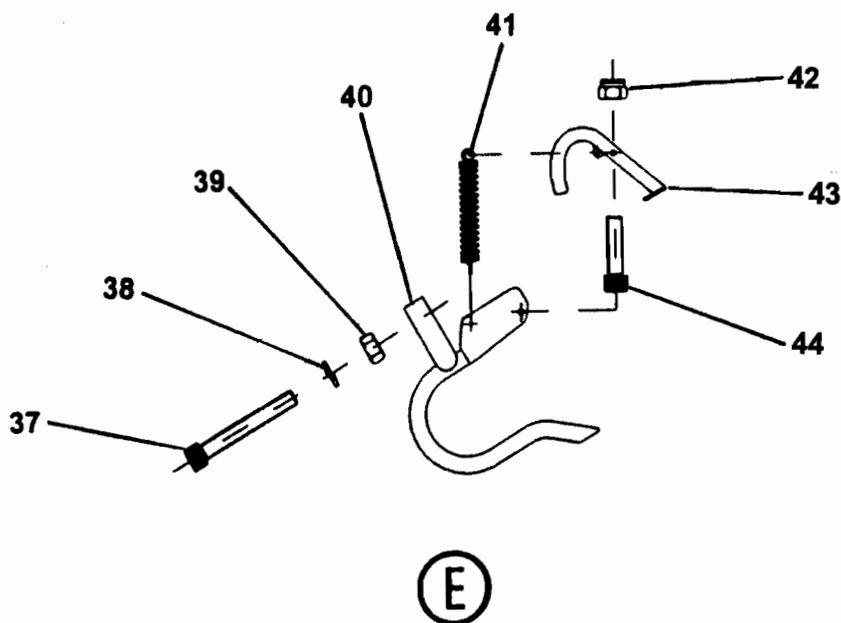
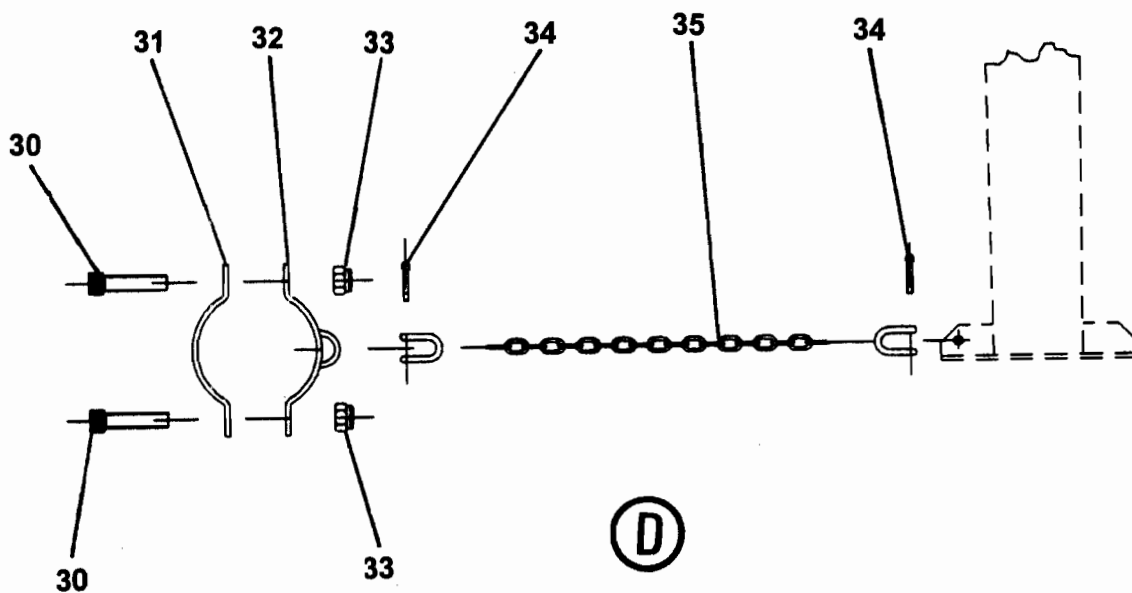
(C)

**REED****CONCRETE PIPE LINE ASSEMBLY  
(BOOM AREA)****XXT 32  
PARTS  
GROUP 90  
FIGURE 11  
PAGE 04**

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
11	C-TG222	• Coupling, Bracket 2 Bolts					4
12	C-VC112.121755	•• Screw					2
13	C-TG222.01	•• Coupling, Bracket					1
14	C-VI131.1010	•• Nipple, Grease					1
15	C-VD111.1420	•• Nut					2
16	C-UE110.14	•• Washer, Elastic					2
17	C-VC110.142035	•• Screw					2
18	C-UE110.12	•• Washer, Elastic					2
19	C-VD111.1217	•• Nut					2
20	C-TG221	• Coupling, 2 Bolts					2
21	C-TG221.01	•• Coupling					1
22	C-VI131.1010	•• Nipple, Grease					1
23	C-VC110.121755	•• Screw					2
24	C-UE110.12	•• Washer, Elastic					2
25	C-VD111.1217	•• Nut					2
26	C-TG211	• Coupling, Lever					17
27	C-TG211.01	•• Coupling					1
28	C-VS210.08040	•• Pin, Split					1

DASH (-) ITEM NOT ILLUSTRATED

REVISION:





# CONCRETE PIPE LINE ASSEMBLY (BOOM AREA)

**XXT 32**  
**PARTS**  
GROUP 90  
FIGURE 11  
PAGE 06

ITEM NO.	REED'S PARTS NO.	DESCRIPTION					QTY
		1	2	3	4	5	
29	C-TS24	• Kit, Safety Collar					1
30	C-VC110.101560	• • Screw					2
31	C-TS241	• • Collar, Safety					1
32	C-TS242	• • Connecting, Safety Collar					1
33	C-VD221.1015	• • Nut					2
34	C-AC910.1	• • Plate, Shackles Die					2
35	C-TG221	• • Chain Safety					1
36	C-TS23	• Kit, Flexible Hose Support					2
37	C-VC110.081270	• • Screw					1
38	C-UE110.08	• • Washer, Elastic					1
39	C-VD211.0812	• • Nut					1
40	C-TS231	• • Support, Flexible Hose					1
41	C-LT020.015096	• • Spring					1
42	C-VD221.0812	• • Nut, Self Locking					1
43	C-TS232	• • Lever, Locking					1
44	C-VC110.081260	• • Screw					1

DASH (-) ITEM NOT ILLUSTRATED



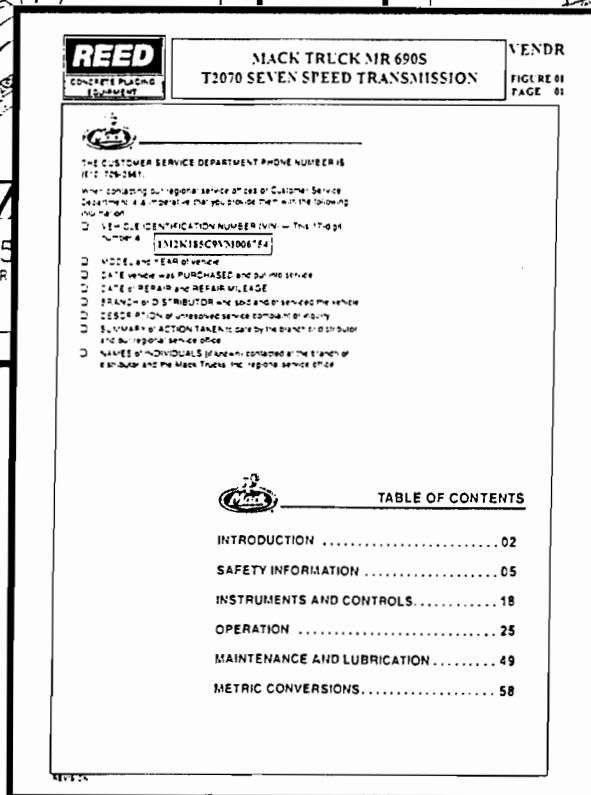
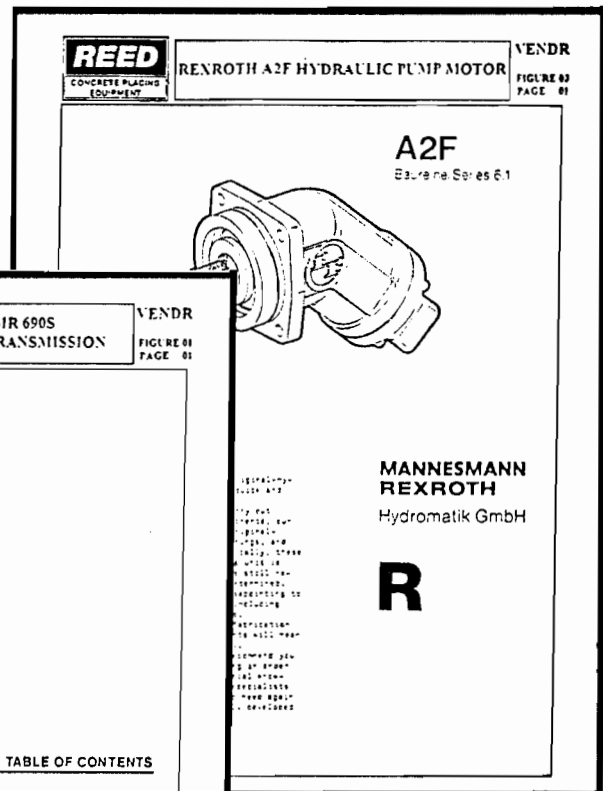
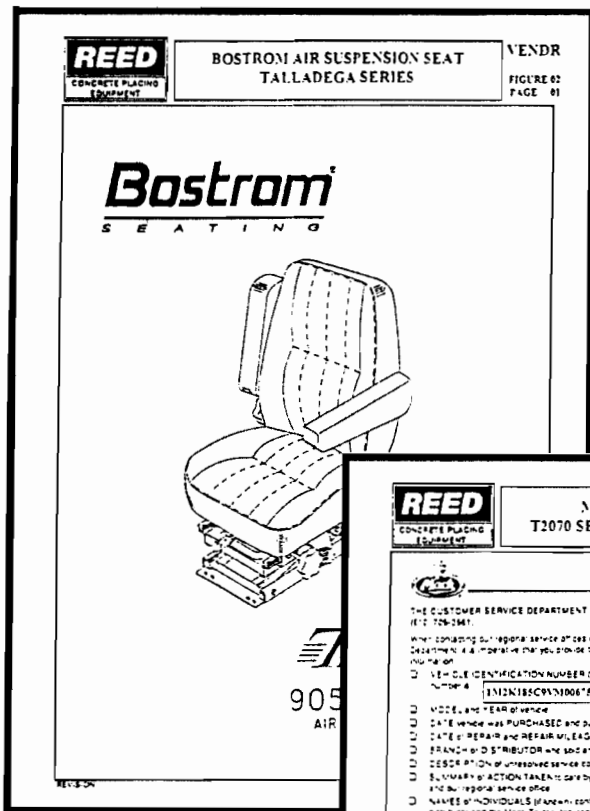
**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
ILLUSTRATED PARTS MANUAL**

**XXT 32  
PARTS  
GROUP 90  
FIGURE 12  
PAGE 01**

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**REED TRUCK MOUNTED CONCRETE BOOM PUMP MODEL XXT 32 VENDOR SECTION CONTAINS THE FOLLOWING FIGURES:**

- FIGURE 00 TABLE OF CONTENTS
- FIGURE 01 MACK TRUCK MR690S T2070 7 SPEED TRANSMISSION
- FIGURE 02 BOSTROM AIR SUSPENSION SEAT TALLADEGA SERIES
- FIGURE 03 REXROTH A2F HYDRAULIC PUMP MOTOR
- FIGURE 04 PNN SYSTEM RADIO REMOTE CONTROL
- FIGURE 05 REXROTH A4VG 71-180 HYDRAULIC PUMP SERIES 32
- FIGURE 06 STIEBEL POWER TAKE-OFF GEAR
- FIGURE 07 CRK WASH WATER PUMP
- FIGURE 08 PNN SYSTEM CABLE REMOTE CONTROL





THE CUSTOMER SERVICE DEPARTMENT PHONE NUMBER IS  
(610) 709-3961.

When contacting our regional service offices or Customer Service Department, it is imperative that you provide them with the following information:

- VEHICLE IDENTIFICATION NUMBER (VIN) — This 17-digit number is
  
- MODEL and YEAR of vehicle
- DATE vehicle was PURCHASED and put into service
- DATE of REPAIR and REPAIR MILEAGE
- BRANCH or DISTRIBUTOR who sold and/or serviced the vehicle
- DESCRIPTION of unresolved service complaint or inquiry
- SUMMARY of ACTION TAKEN to date by the branch or distributor and our regional service office
- NAMES of INDIVIDUALS (if known) contacted at the branch or distributor and the Mack Trucks, Inc. regional service office



**TABLE OF CONTENTS**

**INTRODUCTION ..... 02**

**SAFETY INFORMATION ..... 05**

**INSTRUMENTS AND CONTROLS..... 18**

**OPERATION ..... 25**

**MAINTENANCE AND LUBRICATION ..... 49**

**METRIC CONVERSIONS..... 58**



**REED**

CONCRETE PLACING  
EQUIPMENT

# MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 02



## INTRODUCTION

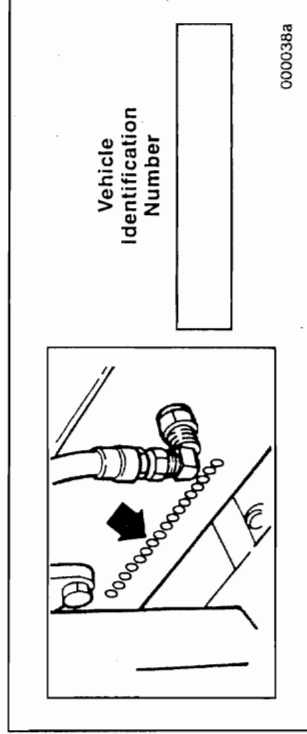
### UNIT IDENTIFICATION

Locate the following serial numbers and write them in the boxes provided next to each illustration.

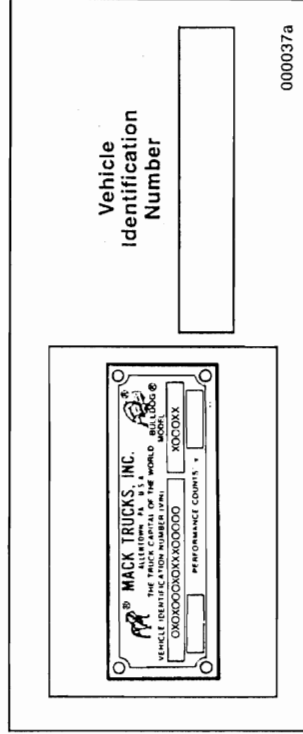
### VIN Locations

The Vehicle Identification Number (VIN) in the two locations shown here must be the same.

The VIN frame stamping is located on the right front frame rail.



The VIN plate is located on the driver side, mounted on the seat riser.



## INTRODUCTION



### THE VEHICLE

#### Basic Configuration

The MR has a low-entry, cab-forward-style operator's compartment. The low profile and excellent visibility are features that make this model popular throughout the refuse-hauling, construction and fire-fighting industries.

#### Vehicle Management and Control System (V-MAC)

The Vehicle Management and Control System, referred to as V-MAC, is an electronic engine control system with the ability to control and manage certain functions of the vehicle as well as monitor and store information.

Your vehicle may or may not be equipped with V-MAC. Vehicles equipped with V-MAC may have switches or controls located in slightly different locations than vehicles without V-MAC.

A complete description of the system components, their functions and locations on the vehicle is contained in the V-MAC Operator's Guide, TS725 (V-MAC) or TS780 (V-MAC II). If your vehicle has V-MAC, refer to TS725/TS780 for specific V-MAC information not found in this handbook.



Never cut into the V-MAC system harness to power additional equipment.

# REED

CONCRETE PLACING  
EQUIPMENT

## MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 03

### INTRODUCTION



#### WARRANTY

#### Injection Pump and Governor Settings

### CAUTION

*Any unauthorized adjustments of the injection pump and governor settings, other than as specified, can cause serious damage to the engine.*

Please be aware of the hazards of attempting to increase the power of the diesel engine in your chassis by adjusting injection pump and governor settings. Standard specifications for injection pump and governor settings permit the maximum allowable engine output. Adjustments of the injection pump and governor settings, other than as specified, can cause serious damage to the engine. In some engines, improper adjustments generally produce visual evidence of over-fueling, excessive fuel consumption and smoke. The turbocharged diesel engine usually does not produce visual evidence. The possibility of damage from improper adjustments is greater in the turbocharged diesel engine because the usual warning signs may not be present.

In the event that damage results from such unauthorized adjustments, as evidenced by improper settings in the injection pump and governor assembly or broken fastener seals of the same, the cost of repairing such damage will NOT be covered under the MACK Standard Vehicle Warranty.

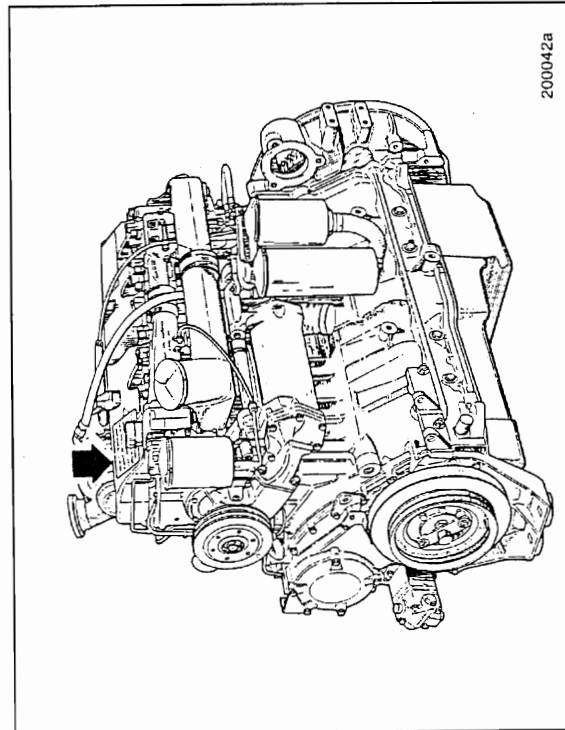
### INTRODUCTION



#### Engine Information Plate

In compliance with the emissions standards requirements, an engine exhaust emissions control plate is affixed to one of the engine cylinder head covers for all MACK E7 and E9 (if equipped) diesel engines. This plate gives basic engine identification information and specifications for injection pump-to-engine timing and valve clearances.

The MACK E7 engine is shown for example purposes, where the information plate is found on the forward cylinder head cover.



**REED**CONCRETE PLACING  
EQUIPMENT**MR SERIES MACK TRUCK****VENDR****FIGURE 01  
PAGE 04****INTRODUCTION****CUSTOMER SERVICE****Questions and Complaints**

Your satisfaction with the vehicle or service parts you purchase, and the service you receive at a Mack Trucks, Inc. subsidiary, distributor or service dealer, are our most important concerns.

If questions or complaints arise, we suggest that you first discuss the matter with the service manager at the MACK facility involved. If you are not satisfied with the service manager's response, contact the branch manager, principal or general manager of the distributorship, explain the situation and request assistance. Those requiring assistance at a service dealer should speak with the owner of the establishment.

If, for any reason, you need further assistance after dealing with the personnel at a MACK subsidiary or distributor, contact the nearest MACK regional service office and address your problem or request to our regional service manager. The regional service manager has the responsibility and the authority to recommend action in most cases and (with the aid of relevant district service personnel) will make every effort to conduct a fair review of your situation.

**Addresses**

The addresses and telephone and fax numbers of the Mack Trucks, Inc. regional offices are:

**United States**

**Northeast Region** — 2166 S. 12th St., P.O. Box M, Allentown, PA 18105-5000, TEL: (610) 709-3419, FAX: (610) 709-2220

**Southeast Region** — 6768 Southlake Parkway, Morrow, GA 30260, TEL: (770) 960-0511, FAX: (770) 960-0593

**Central Region** — 900 S. Frontage Rd., Suite 100, Woodridge, IL 60517, TEL: (708) 910-3330, FAX: (708) 910-3331

**Southwest Region** — 5605 N. MacArthur Blvd. #550, P.O. Box 165408, Irving, TX 75016-5408, TEL: (214) 518-1614, FAX: (214) 550-0389

**Western Region** — 20201 Mack St., P.O. Box 56658, Hayward, CA 94545-6658, TEL: (510) 732-0680, FAX: (510) 785-3803

**INTRODUCTION****Air Brake System**

The MACK Standard Vehicle Warranty applies to the air brake system, as set forth in the Warranty, but only if the air brake system has not been subjected to unauthorized additions, deletions or modifications. If any such unauthorized additions, deletions or modifications are performed to the air brake system, Mack Trucks, Inc. disclaims any and all liability for any loss or damage arising out of a malfunction of the air brake system.

The air brake system was designed and built to conform to all applicable federal motor vehicle safety standards in effect at the time of manufacture. Tractor air systems are designed for operation as a tractor only, and truck air systems are designed to be operated as a truck only. If a tractor is going to be converted for operation as a truck, the air brake system must be reconfigured to that of a truck. Conversely, if a truck is going to be converted for operation as a tractor, the air system must be reconfigured to that of a tractor. Consult your MACK trucks distributor for additional information.

If any unauthorized additions, deletions or modifications are made to any portion of the air brake system which is required by Federal Motor Vehicle Safety Standards, Mack Trucks, Inc. makes no representation as to conformity with the Standards.

For complete warranty information, refer to Pedigreed Protection Plan (TS468) or Standard Vehicle Warranty (Form F034) furnished with your truck.



**SAFETY INFORMATION**

**CERTIFICATION LABELS**

**Safety Certification Label**

National Highway Traffic Safety Administration (NHTSA) regulations require affixing a certification label to all vehicles.

NHTSA regulations also require that the certification label be affixed to either the hinge pillar, door latch post or the door edge that meets the door latch post next to the driver seat. If none of these locations are practical, it may be attached to the left side of the instrument panel or to an inward facing surface of the driver-side door.

In compliance with NHTSA regulations, your MR has a safety certification label affixed in one of the NHTSA locations listed above. This label may be either an Incomplete Vehicle and/or Completed Vehicle label. Both labels are described below.

**Incomplete Vehicles**

CHASSIS-CAB MANUFACTURED BY MACK TRUCKS, INC. DATE: 03/1996

THIS CHASSIS-CAB CONFORMS TO FEDERAL MOTOR VEHICLE SAFETY STANDARDS NOS. 101, 102, 103, 104, 106, 107, 111, 113, 115, 116, 124, 205, 206, 207, 208, 209, 210, AND 302.

THIS VEHICLE WILL CONFORM TO STANDARDS NOS. 108, 120, AND 123 IF IT IS COMPLETED IN ACCORDANCE WITH THE INSTRUCTIONS ON THIS LABEL. THIS VEHICLE IS NOT CONSIDERED TO BE IN COMPLIANCE WITH FEDERAL MOTOR VEHICLE SAFETY STANDARDS APPLICABLE TO THIS VEHICLE WHEN COMPLETED IS NOT SUBSTANTIALLY AFFECTED BY THE DESIGN OF THE CHASSIS-CAB.

VEHICLE IDENTIFICATION NUMBER (VIN): 1M2AA10YX1W0086Z 4MR3256

000249a

A chassis-cab is an incomplete vehicle with a completed occupant compartment that requires the addition of cargo-carrying, work-performing or load-bearing components to perform its intended functions.

The chassis-cab manufacturer must affix a label to the incomplete vehicle in one of the NHTSA locations listed above. This label provides the chassis-cab date of manufacture, VIN and vehicle certification information.



**SAFETY INFORMATION**

**SAFETY STATEMENT**

Mack Trucks, Inc. cannot anticipate every possible occurrence which may involve a potential hazard. An accident can be avoided by recognizing potentially hazardous situations before an accident occurs. Correctly performed service procedures are critical for technician safety and safe, reliable operation of the vehicle.



*Driver attitude is the most important part of any effective vehicle safety system. Mack Trucks, Inc. strongly encourages all drivers and passengers to use their seat belts, drive defensively, remain alert and respect the speed limits. Many accidents can also be avoided through regular vehicle maintenance.*

Certain everyday procedures like washing your truck and cleaning the windshield can also be hazardous because of the vehicle's height. Mack Trucks, Inc. does NOT recommend climbing up on your truck to perform these operations! Instead, stand on the ground and use brushes and squeegees mounted on extension poles. When better access is necessary (for instance, when washing the cab roof), use sturdy ladders held in place by someone on the ground.

# REED

CONCRETE PLACING  
EQUIPMENT

## MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 06

### SAFETY INFORMATION



#### ADVISORY LABELS

Throughout this book you will find paragraphs labeled *Service Hint*, *Note*, *Caution*, *Warning* and *Danger*. *Caution* and *Warning* labels are also found in various locations on the vehicle to alert drivers, operators and service technicians to situations which can cause personal injury or equipment damage. The labels shown are applicable to the MR model chassis at the time of publication and they are representative of what can be typically found on an MR. (Your vehicle may not contain all of the labels illustrated in this handbook.) These labels are for your benefit. Please look through this section and make a mental note of the labels, their locations and what they explain. Be sure to replace any label that is damaged.

### SAFETY INFORMATION



#### Completed Vehicles

In addition to the label supplied by Mack Trucks, Inc. as the chassis-cab manufacturer, a Completed Vehicle certification label, supplied by the body manufacturer, is affixed in the same general location. This label provides information pertaining to Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating (GAWR), tire and rim information, etc.

On **MACK-completed vehicles**, this label contains the date of manufacture, VIN, GVWR, GAWR, and tire and rim data. It is found in one of the NHTSA locations listed above.

MACK VEHICLES BY MACK TRUCKS, INC. IN 03/1998		GVWR		MS. I.		SERIES		LBI	
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE		VEHICLE IDENTIFICATION NUMBER		1M1AA1370T0689202		VEHICLE IDENTIFICATION NUMBER		1M1AA1370T0689202	
GAWR		TIRES		RIMS		TIRES		RIMS	
FRONT	5443 KG (12000 LBS) WITH (0.6) WITH	11R24.5 G	24.5 X 8.25	.AT	724 KPA (105 PSI) COLD	11R24.5 G	24.5 X 8.25	.AT	724 KPA (105 PSI) COLD
2ND INT	8818 KG (19400 LBS) WITH (0.6) WITH	11R24.5 G	24.5 X 8.25	.AT	724 KPA (105 PSI) COLD	11R24.5 G	24.5 X 8.25	.AT	724 KPA (105 PSI) COLD
REAR MOST	8818 KG (19400 LBS) WITH (0.6) WITH	11R24.5 G	24.5 X 8.25	.AT	724 KPA (105 PSI) COLD	11R24.5 G	24.5 X 8.25	.AT	724 KPA (105 PSI) COLD
VEHICLE TYPE: TRUCK-TRACTOR		VEHICLE TYPE: TRUCK-TRACTOR		VEHICLE TYPE: TRUCK-TRACTOR		VEHICLE TYPE: TRUCK-TRACTOR		VEHICLE TYPE: TRUCK-TRACTOR	

THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE. VEHICULE EST CONFORME A TOUTES LES REGLEMENTS EN VIGUEUR AU CANADA EN LA DATE DE SA FABRICATION.

MANUFACTURED IN 03/1998 BY MACK TRUCKS, INC. VEHICLE IDENTIFICATION NUMBER: 1M1AA1370T0689202

GAWR: FRONT 5443 KG (12000 LBS) WITH (0.6) WITH, 2ND INT 8818 KG (19400 LBS) WITH (0.6) WITH, REAR MOST 8818 KG (19400 LBS) WITH (0.6) WITH

TIRES: FRONT 11R24.5 G, 2ND INT 11R24.5 G, REAR MOST 11R24.5 G

RIMS: FRONT .AT 724 KPA (105 PSI) COLD, 2ND INT .AT 724 KPA (105 PSI) COLD, REAR MOST .AT 724 KPA (105 PSI) COLD

VEHICLE TYPE: TRUCK-TRACTOR

4MR3311

000250a

#### U.S. VEHICLES

#### CANADIAN VEHICLES



## SAFETY INFORMATION

### Advisory Label Location (In Handbook)

Cautionary signal words (Danger-Warning-Caution) may appear in various locations throughout this manual. Information accented by one of these signal words must be observed to minimize the risk of personal injury to service personnel, or the possibility of improper service methods which may damage the vehicle or render it unsafe. Additional Notes and Service Hints are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the use of these advisory labels as they appear throughout the manual:

### CAUTION

*Directs attention to unsafe practices which could result in damage to equipment and possible subsequent personal injury or death if proper precautions are not taken.*

### WARNING

*Directs attention to unsafe practices which could result in personal injury or death if proper precautions are not taken.*

### DANGER

*Directs attention to unsafe practices and/or existing hazards which will result in personal injury or death if proper precautions are not taken.*

### NOTE

An operating procedure, practice, condition, etc., which is essential to emphasize.

### SERVICE HINT

A helpful suggestion which will make it quicker and/or easier to perform a certain procedure, while possibly reducing overhaul cost.

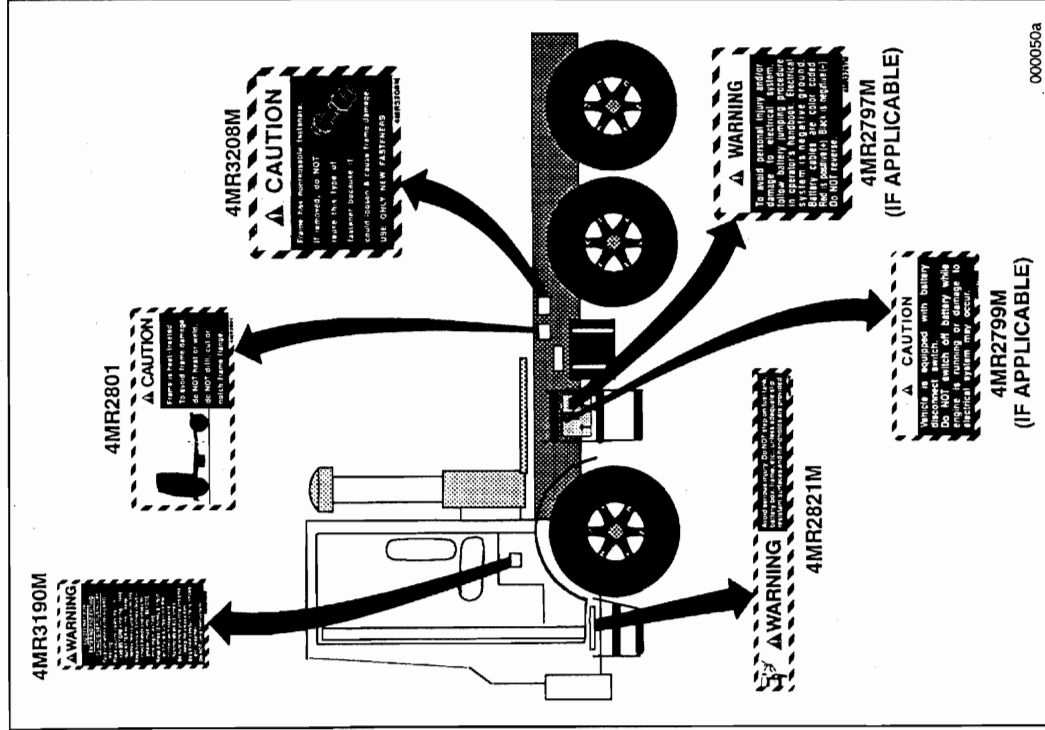
000084a



## SAFETY INFORMATION

### Advisory Label Location (On Truck)

Labels Found on Chassis



**REED**

CONCRETE PLACING  
EQUIPMENT

MR SERIES MACK TRUCK

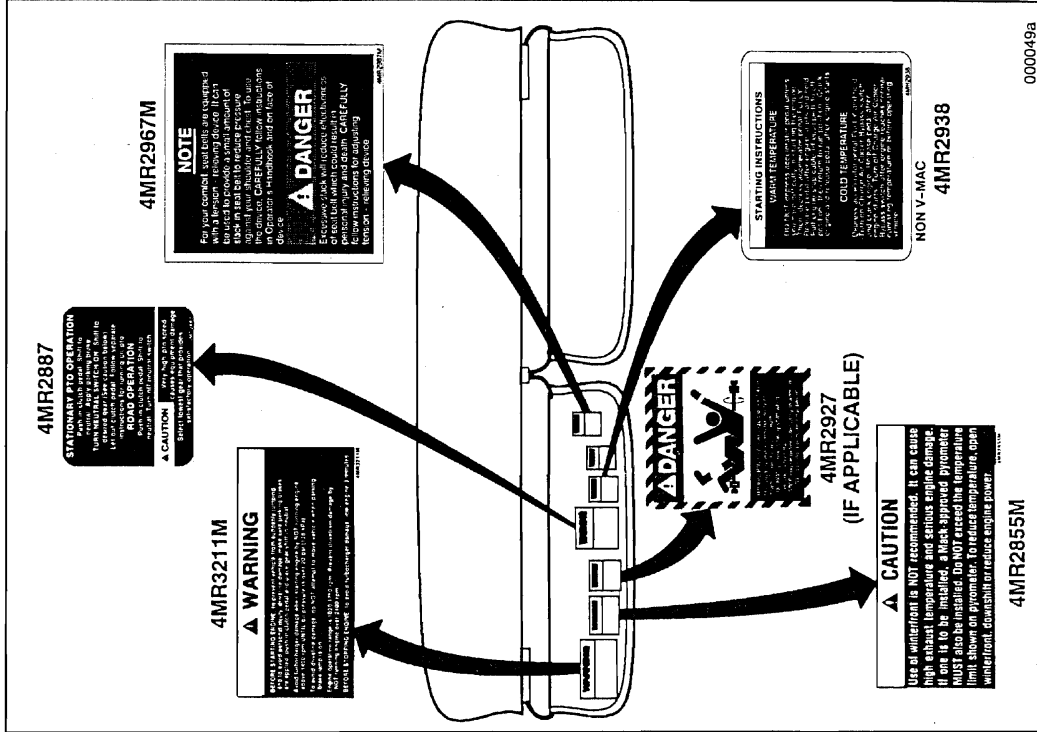
VENDR

FIGURE 01  
PAGE 08

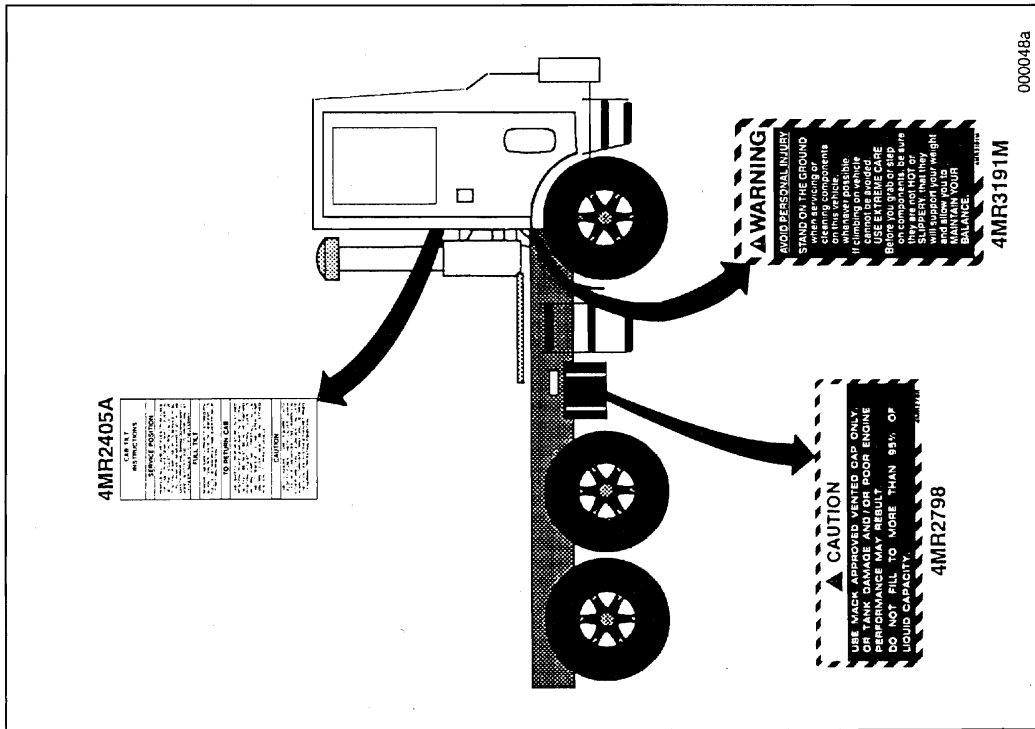
**SAFETY INFORMATION**



Labels Found on Driver-Side Sun Visor



**SAFETY INFORMATION**



**REED**

CONCRETE PLACING  
EQUIPMENT

# MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 09

## SAFETY INFORMATION



### CAB ENTRY/EXIT

#### Three-Limb Contact

When entering or exiting a cab, the driver and/or passenger must have at least three limbs in contact with the vehicle or ground at all times. This means that a minimum of two hands and one foot, or one hand and two feet must be in FIRM contact with the vehicle or ground to avoid accidents due to carelessness.

### WARNING

When entering or exiting the cab, be aware of the condition of steps and handrails, especially in cold weather. During cold weather operations, ice and snow may accumulate and should be cleaned off to prevent slipping.

During cold, wet conditions when ice, slush, or snow may accumulate on the cab doorstep and other external surfaces, extra caution must be observed when entering or exiting the cab.

## SAFETY INFORMATION



### Labels Found on Windshield

#### CAUTION

This tractor has an air brake system designed for TRACTOR OPERATION ONLY. If this tractor is converted for operation as a TRUCK, the air brake system MUST be changed to provide SAFE OPERATION as a TRUCK. Contact your MACK Dealer for instructions.

DO NOT remove until delivered to the ultimate consumer.

44071037

#### CAUTION

This truck has an air brake system designed for TRUCK OPERATION ONLY. If this truck is converted for operation as a TRACTOR the air brake system MUST be changed to provide SAFE OPERATION as a TRACTOR. Contact your MACK Dealer for instructions.

DO NOT remove until delivered to the ultimate consumer.

44071031

000247a

### NOTE

Label to be removed upon delivery to the end user.  
Refer to page 11 for additional information.



**SAFETY INFORMATION****SAFETY INFORMATION****WARNING**

To avoid injury, use the following guidelines when entering and exiting the cab:

- Face the cab when entering and exiting.
- Keep hands free to grip handholds. Place papers, coats, etc., in the cab before entering, and remove after exiting.
- Keep hands and shoes clean. Check hands and shoes for grease, mud, etc., before entering and exiting to avoid slipping.
- Do NOT jump from the vehicle.
- Do NOT step on the fuel tank, battery box, frame, etc., unless adequate slip-resistant surfaces and handholds are provided.
- Be aware of the condition of steps and handholds, especially in rainy or snowy weather. Clean grease, oil, mud, snow, ice, etc., from steps and handholds before entering and exiting to avoid slipping.

**NOTE**

The illustrations on the following pages are typical for purposes of emphasizing a safe method for hand/foot placement and movement during cab entry/exit. Your truck may not look exactly like the one pictured.

**NOTE**

The arrows in the illustrations are intended to show movement. Notice that three-limb contact is maintained even when one foot, or one hand, is moving.

### SAFETY INFORMATION



### SAFETY INFORMATION



#### Left Side

The following cab entry and exit procedures, along with the safety guidelines outlined in Three-Limb Contact earlier in this section, can be used with your MACK truck.

#### Entry

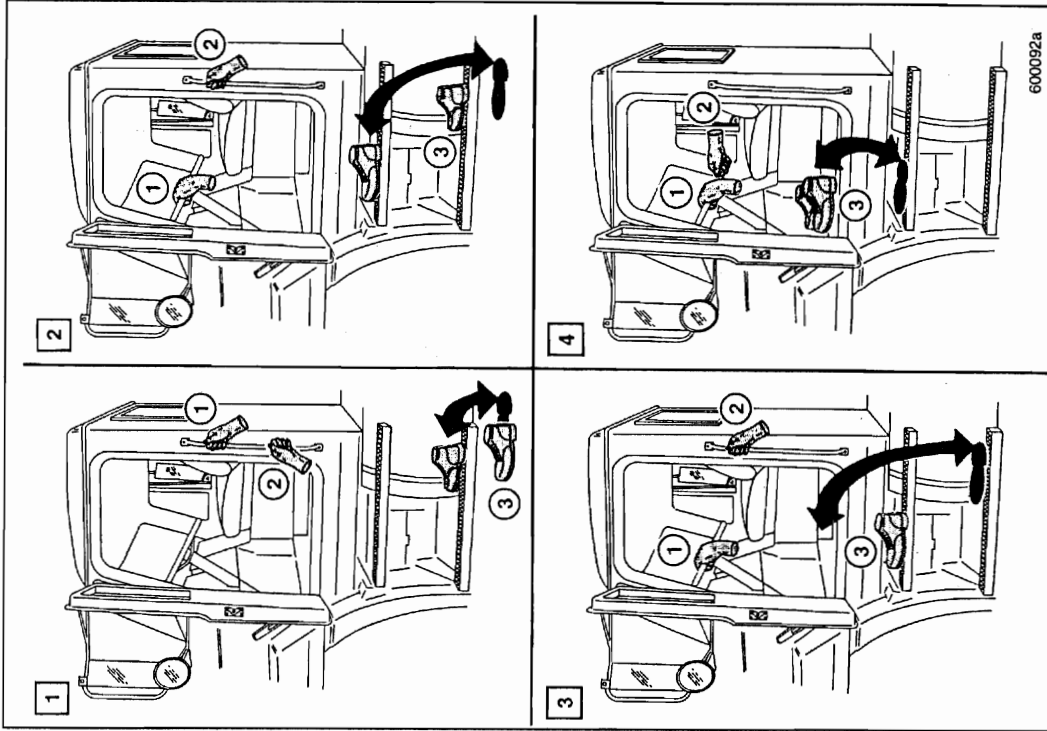
These entry procedures are illustrated on the following page:

1. With both feet firmly on the ground, grab the outside handhold with both hands or grab the outside handhold with one hand and grab the steering wheel or inside handhold (if equipped) with the other hand. Then raise one foot to the bottom step. (See figure 1.)
2. Maintain a firm grip on the handholds and/or steering wheel and raise your other foot to the top step. If the truck has only one step, go on to step 3. (See figure 2.)
3. While still gripping the handholds and/or steering wheel, raise one foot to the cab floor. (See figure 3.)
4. Move one hand at a time to the steering wheel, inside handhold (if equipped) or cab interior. Bring the other foot inside the cab and sit down. (See figure 4.)

#### Exit

To exit, follow the illustrations in reverse order:

1. With both hands gripping the steering wheel, inside handhold (if equipped) or cab interior, stand up and face the inside of the cab. Move one foot to the top step. (See figure 4.)
2. Move one hand to the outside handhold and grip the steering wheel, inside handhold (if equipped), or cab interior with the other hand. With one foot firmly on the top step, lower the other foot to the bottom step. If the truck has only one step, lower the other foot to the ground and go on to step 4. (See figure 3.)
3. Maintain a firm grip on the handholds and/or steering wheel, and keep one foot firmly on the bottom step. Then lower the other foot to the ground. (See figure 2.)
4. With both hands firmly gripping the handholds and/or steering wheel, lower the other foot to the ground. (See figure 1.)



600092a

### SAFETY INFORMATION



### SAFETY INFORMATION



#### Right Side

The following cab entry and exit procedures, along with the safety guidelines outlined in the Three-Limb Contact section, can be used with any MACK truck. If any of the following entry/exit procedures seem unclear, or if you have any questions, please contact your MACK distributor for assistance.

#### Entry

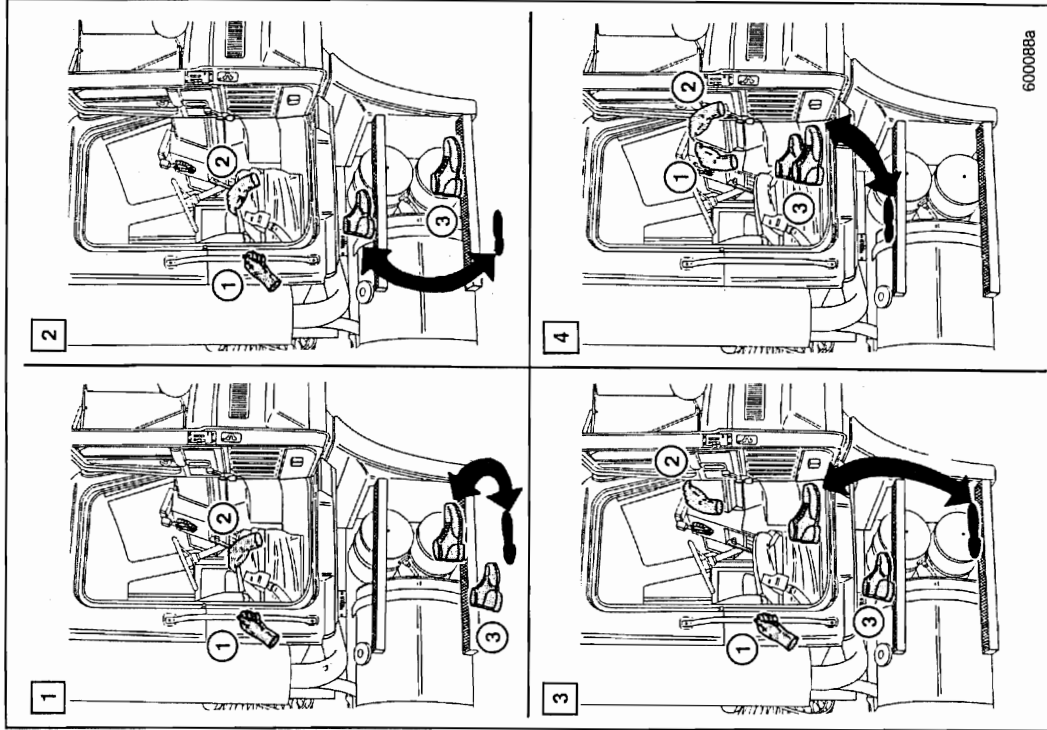
These entry procedures are illustrated on the following page:

1. With both feet firmly on the ground, grab the outside handhold with both hands, or grab the outside handhold with one hand and grab the inside handhold (if equipped) or cab interior with the other hand. Then raise one foot to the bottom step. (See figure 1.)
2. Maintain a firm grip on the handholds and/or cab interior and raise your other foot to the top step. If the truck has only one step, go on to step 3. (See figure 2.)
3. While still gripping the handholds and/or cab interior, raise one foot to the cab floor. (See figure 3.)
4. Move one hand at a time to the cab interior for support, bring the other foot inside the cab and sit down. (See figure 4.)

#### Exit

To exit, follow the illustrations in reverse order:

1. With both hands gripping the cab interior or inside handhold (if equipped), stand up and face the inside of the cab. Move one foot to the top step. (See figure 4.)
2. Move one hand to the outside handhold and grip the inside handhold (if equipped) or cab interior with the other hand. With one foot firmly on the top step, lower the other foot to the bottom step. If the truck has only one step, lower the other foot to the ground and go on to step 4. (See figure 3.)
3. Maintain a firm grip on the handholds and/or cab interior, and keep one foot firmly on the bottom step. Then lower the other foot to the ground. (See figure 2.)
4. With both hands firmly gripping the handholds and/or cab interior, lower the other foot to the ground. (See figure 1.)



### SAFETY INFORMATION



### SAFETY INFORMATION

#### Cab Door Seals and Key Locks

Hollow-core rubber weather seals around some cab doors may lose their resilience in extremely cold temperatures (i.e., -40°F/ -40°C and below). Under these conditions, it may be necessary to drill holes to penetrate the hollow core. This allows entrapped air to escape, thereby easing the opening/closing of cab door(s).

Be sure to keep the key locks clean and dry to prevent occasional winter freeze-up. Use of antifreeze lubricants is neither required nor recommended.

#### Deck Plate Access

There may be a time when you will need to climb up behind the cab. If your vehicle is equipped with a deck access package, steps and a handhold are provided so you can get to this area safely. Review the rules in the Three-Limb Contact section before climbing behind the cab.

#### Climbing Up

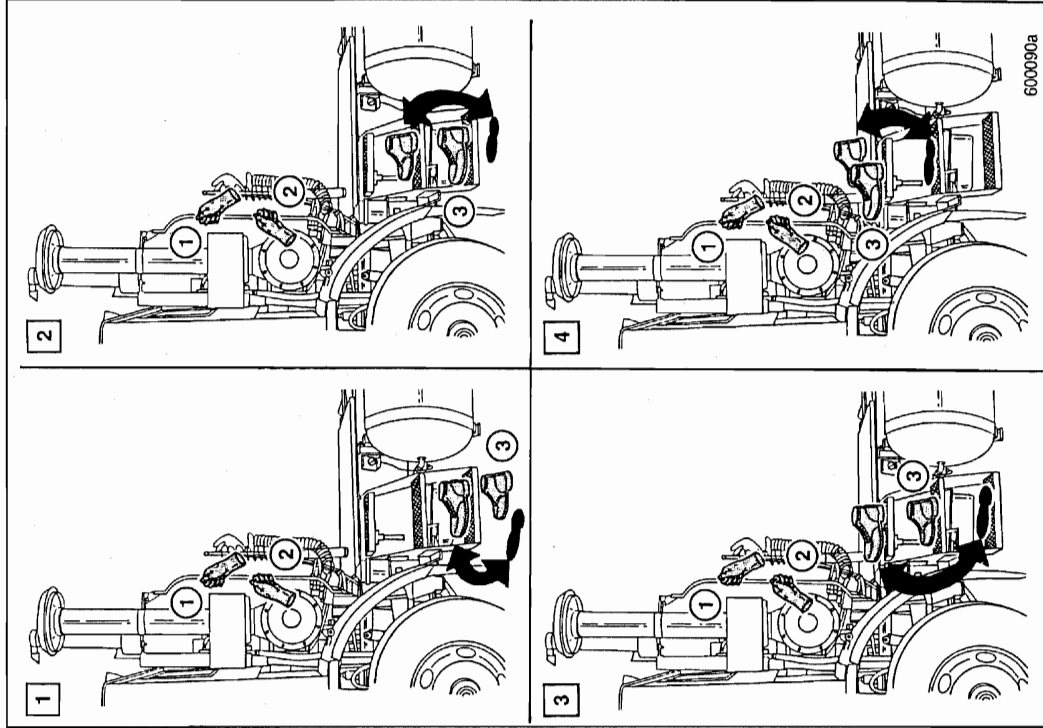
These procedures are illustrated on the following page:

1. Grab the handhold with both hands. Then move one foot to the bottom step. (See figure 1.)
2. While still gripping the handhold, and with one foot planted firmly on the bottom step, move your other foot to the middle step. (See figure 2.)
3. Then with one foot planted firmly on the middle step, move your left foot to the top step. (See figure 3.)
4. Finally, move your other foot from the middle step onto the deck plate. (See figure 4.)

#### Climbing Down

To climb down from behind the cab, follow the illustrations in reverse order:

1. Grab the handhold with both hands and move one foot to the top step. (See figure 4.)
2. While firmly gripping the handhold, and with one foot on the top step, move your other foot to the middle step. (See figure 4.)
3. Then with one foot planted firmly on the middle step, place the other foot on the bottom step. (See figure 3.)
4. With both hands still gripping the handhold, move your other foot from the middle step to the ground. (See figure 2.)
5. Finally, move foot from bottom step to the ground. (See figure 1.)



**SAFETY INFORMATION****SEAT BELTS****⚠ DANGER**

*The use of seat belts is required in some states and is strongly recommended at all times, especially during adverse road conditions associated with winter weather. Failure to use seat belts can result in SEVERE bodily injury.*

**Operation**

MACK vehicles manufactured on or after September 1, 1990 must have locking retractable seat belts. For all seating positions on your MACK vehicle, this type of seat belt is a combination lap and shoulder belt.

This type of belt is designed to lock (that is, prevent belt travel out of the retractor) only during sudden stops or impacts. This feature allows the operator to move freely under normal conditions. The seat belts cannot be locked by jerking on the belt, except during sudden stops or harsh bumps.

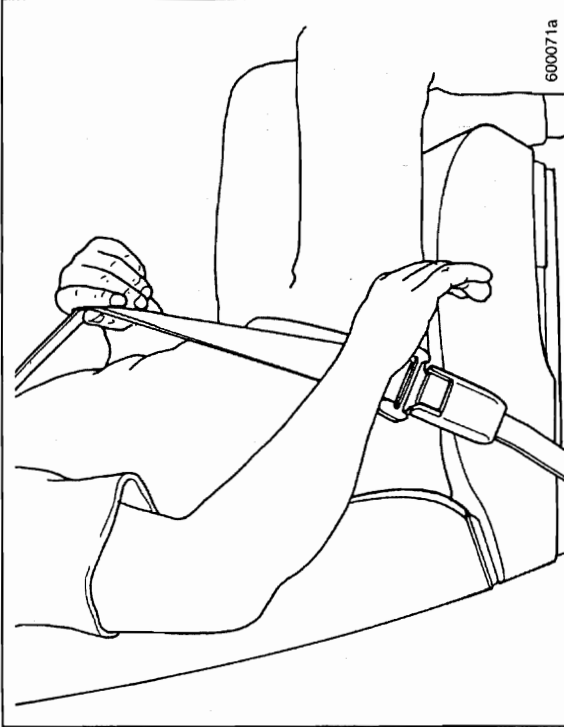
**Fastening**

1. Pull clip so the belt crosses your shoulder and lap and insert it into the buckle until an audible snap is heard.

**⚠ WARNING**

Use the shoulder belt only on the shoulder that is closest to the vehicle door. Never wear the shoulder portion of the belt under your arm or behind your back. Improper use will increase your chances of injury during a collision.

2. Make sure the clip is securely fastened into the buckle.



3. To tighten the lap portion of the combination belt, pull upward on the shoulder portion until the lap portion fits you snugly. The belt should rest as low on your hips as possible.

**Unfastening**

Push down on the button to release the belt.

**⚠ WARNING**

Do NOT wear seat belt loosely. Do NOT use one belt for more than one person. Do NOT wear retractor belt with webbing wound on retractor drum. Do NOT bleach or dye belt, as this may cause severe loss of strength. Do NOT install belt in a truck with weakened floor until the floor has been replaced or reinforced.

**SAFETY INFORMATION****Komfort Latch Feature**

If the constant tension of the buckled seat belt causes any discomfort, engage the Komfort Latch as follows:

**WARNING**

**Do NOT attempt to engage the Komfort Latch feature while the truck is in motion.**

**Engagement** — Pull the webbing of the shoulder belt away from the upper torso, pulling only as much slack as needed while still allowing the belt to exert slight pressure against your chest and shoulder. (Maximum amount of slack should not exceed one inch when measured from the chest to the belt.) While holding the slack, lift the lever located on top of the Komfort Latch mechanism upward to clamp the webbing in place.

**Normal Release** — To unfasten the seat belt, simply release the buckle and give the shoulder belt a quick tug to release the Komfort Latch mechanism. Allow the belt to retract into the retractor.

**Emergency Release** — In the event of an emergency, release the seat belt buckle. It is not necessary to release the Komfort Latch in an emergency situation.

**SAFETY INFORMATION****Maintenance**

- Keep belt clean and dry.
- Clean with mild soap solution and lukewarm water.
- Periodically inspect belt, retractor, and mounting points for damage or corrosion that could materially lessen effectiveness of belt installation. Replace all inadequate parts.

**NOTE**

Seat belt assemblies must be replaced after an accident if they have been subjected to loading by occupants (even if no damage is obvious), or if they have been damaged by an accident (bent retractor, torn webbing, etc.). If there is any question regarding belt or retractor condition, replace the appropriate part.

**The Komfort® Latch System****Track III Three-Point Seat Belt Assembly**

The Track III three-point seat belts installed in this chassis are designed to provide the highest degree of operator safety, comfort and convenience. Additional comfort is provided by the Komfort Latch mechanism which is incorporated into the seat belt assembly, and may be used to relieve any discomfort caused by the constant pressure of engaged seat belts.

**Seat Belt Operation**

To buckle the seat belt, grasp the latch portion of the buckle, bring it across your lap (from outboard to inboard) and insert it into the fixed buckle which is mounted to the floor or seat (depending on seat type). With the belt properly latched, the pelvic and upper torso restraints will be in place and automatically adjusted to provide a snug fit.

**SAFETY INFORMATION****SAFETY TIPS FOR COLD WEATHER OPERATION****Driver Visibility**

Poor driver visibility is not only annoying, but extremely unsafe under any circumstances. Without proper maintenance of visibility-related components, adverse weather conditions such as rain, snow and frost can seriously reduce visibility. Take time before winter arrives to check the following:

- Windshield Wipers
  - Check windshield wiper operation and speeds.
  - Inspect condition and travel of blades. Install new refills for any blades that are cracked, brittle, torn, or coated with road oil along their wiping edge.
- Windshield Washers
  - Check operation of windshield washer.
  - Inspect system hoses and replace if brittle or worn.
  - Inspect washer reservoir. Drain and flush if dirt particles are evident in washer solution.
  - Fill reservoir with commercially available non-freezing type washer fluid.

**CAUTION**

*Do NOT fill reservoir with water only. Even though non-freezing type washer fluid is recommended, do not attempt to clear the windshield of ice by activating the windshield washer and wipers. Ice accumulations should be removed manually by using a scraper.*

**SAFETY INFORMATION****NOTE**

If forward movement is required while the Komfort Latch mechanism is latched, the latch automatically releases when you lean against the shoulder portion of the belt. Repeat the above steps to reset the Komfort Latch, if desired, after forward movement is no longer required.

**! DANGER**

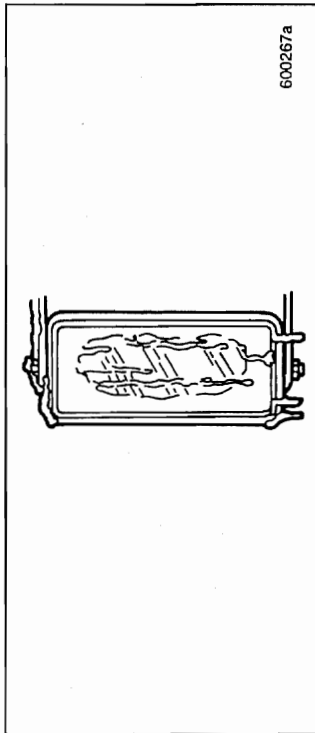
*Excessive slack will reduce effectiveness of the seat belt, which could result in personal injury and death. CAREFULLY follow the instructions for adjusting the tension-relieving device.*

**SAFETY INFORMATION**



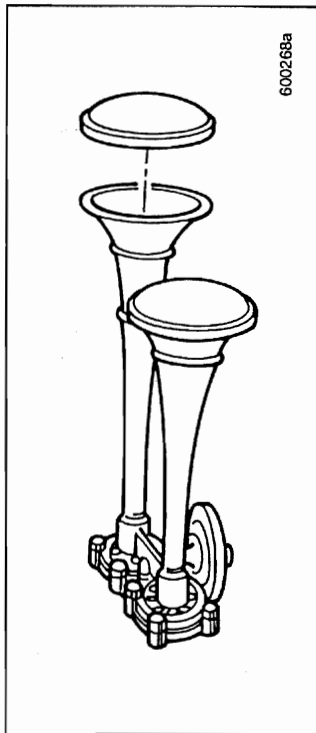
**Outside Mirror Heater**

In areas of frequent snowfall and ice, it may be beneficial to install heated mirrors which will defrost and de-ice cab mirrors. Heated mirrors eliminate the need to pull off the highway and stand on the roadside to scrape ice and snow from the mirrors during winter driving conditions.



**Air Horn Snow Shield**

To prevent snow from clogging the air horn bell, thereby maintaining maximum sound output in snowy conditions, installation of an air horn snow shield is recommended.



**SAFETY INFORMATION**

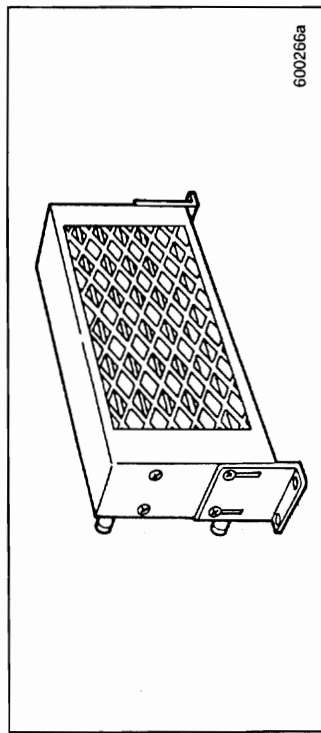


• **Heater/Defroster**

- Check operation and blowers for speed control, noise and temperature.
- Inspect heater core for signs of corrosion and/or leakage.
- Check that the defroster blend door is operating correctly and that all ducting is connected properly.
- Be sure that vents are not obstructed by debris or other objects.

**Auxiliary Cab Heater**

Ensure maximum in-cab comfort even under severe cold weather conditions. See your nearest MACK subsidiary or distributor for a wide range of auxiliary in-cab heaters to fit your chassis (see figure below).





**INSTRUMENTS AND CONTROLS****Panel Arrangement**

Your view from the driver seat should look something like the illustrations shown. The layout has been designed to provide the operator with a good view of the gauges and controls (which are placed so they are within easy reach). The instrument panel, as shown in the following drawing, is broken down into four or five main sections. For easy identification we will refer to them, from left to right, as Panels A, B, C, D and E (where necessary).

**NOTE**

This section is intended to show all the possible instruments and controls available for your truck. However, depending on the options you chose, your truck may not have all of the instruments and controls shown here, and they may not be in exactly the same position.

**INSTRUMENTS AND CONTROLS****INSTRUMENT PANEL****Tell-Tales**

A tell-tale, by definition, is a display that indicates, by means of a light-emitting signal, the actuation of a device, a correct or defective functioning or condition, or a failure to function.

The operator should become familiar with these symbols to recognize and react, if necessary, to the indicated condition.

**Colors**

To promote visual recognition internationally, specific colors for tell-tales have been established. Unless governmental regulations in the area where the vehicle is to be used, or engineering directives specify otherwise, the standard colors are:

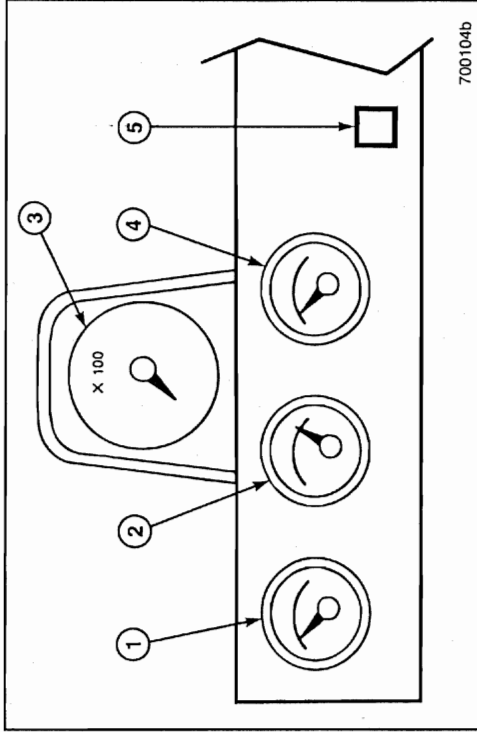
- **Blue** — high-beam headlights
- **Flashing Green** — turn signals
- **Flashing Red** — hazard condition involving the safety of personnel
- **Steady Green** — system in operation
- **Steady Red** — warning, immediate action required
- **Amber** — early warning, such as low fuel or anti-lock malfunction

Tell-tale symbols are shown in the instrument panel illustrations on the following pages.

### INSTRUMENTS AND CONTROLS

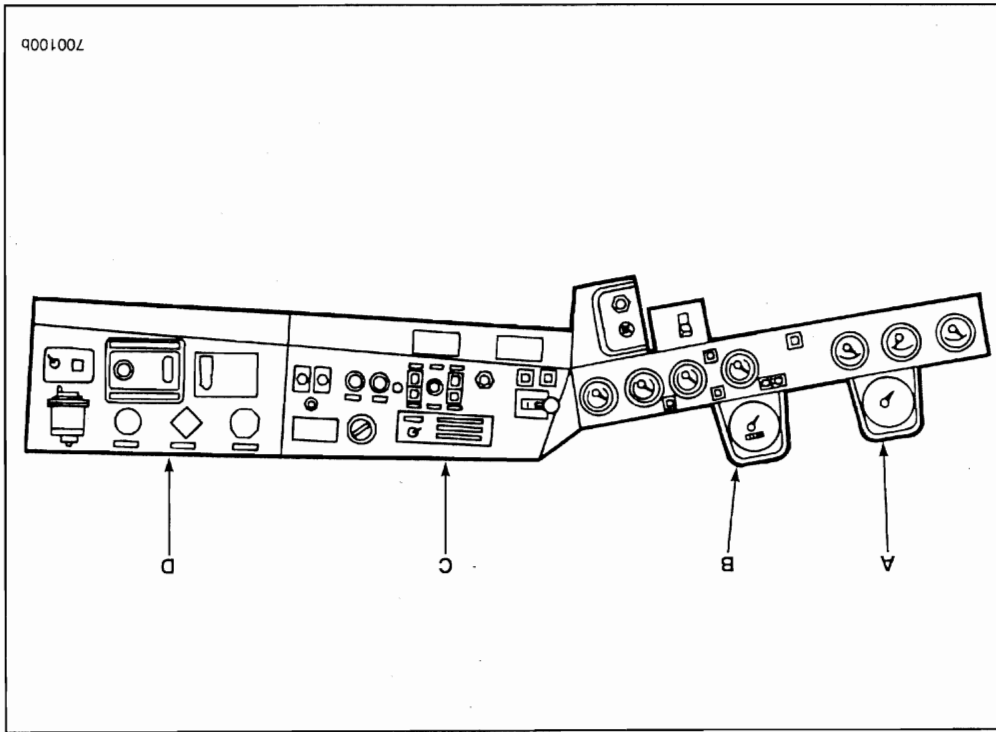


Panel A



- 1. Voltmeter
- 2. Coolant Temperature Gauge
- 3. Tachometer
- 4. Oil Pressure Gauge
- 5. Engine Shutdown Indicator (Red)

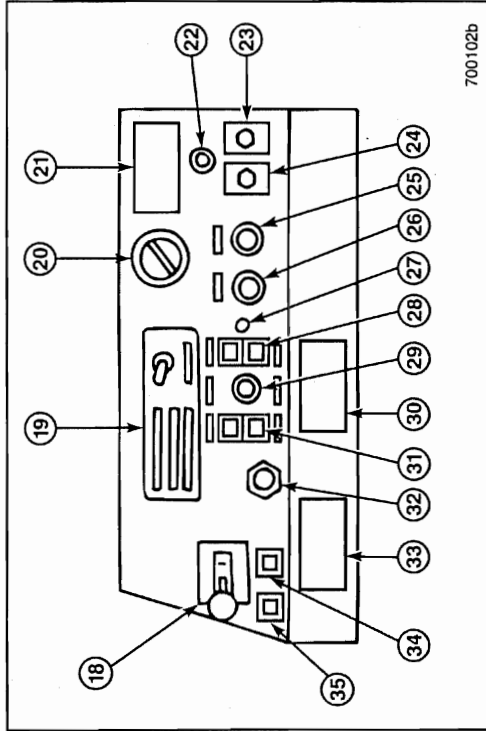
### INSTRUMENTS AND CONTROLS



### INSTRUMENTS AND CONTROLS



Panel C

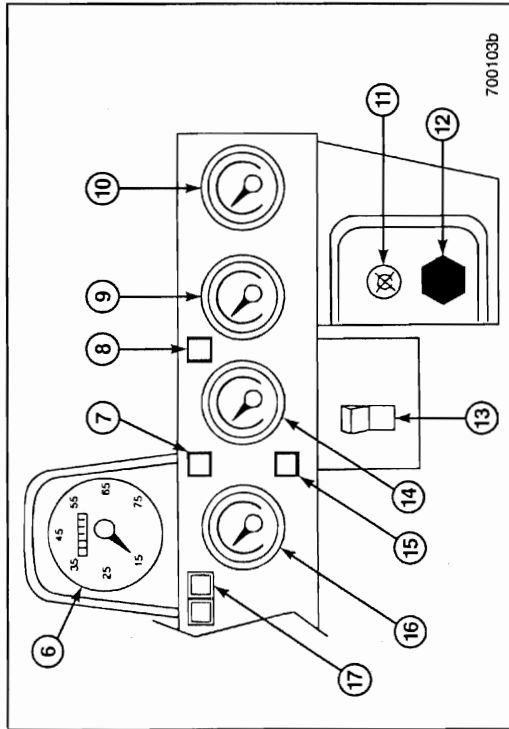


- |  |   |
|--|---|
| 18. Trailer Brake Lever                                | 27. Cigar Lighter   |
| 19. Climate Control Panel                              | 28. Light Switch  |
| 20. Air Vent   | 29. Panel Lights Rheostat                                   |
| 21. Battery Disconnect Switch<br>Caution Label 4MR2799 | 30. Transmission Shifter Neutral<br>Inhibitor Label 4MR2860 |
| 22. Engine Shutdown Override                           | 31. Clearance Light Switch                                  |
| 23. Mirror Defroster Switch                            | 32. Combination Starter and<br>Electrical Switch            |
| 24. Mirror Adjustment Switch                           | 33. PTO Overspeed Label<br>4MR2856                          |
| 25. Right Windshield Wiper/<br>Washer Control          | 34. Power Take-Off Overspeed<br>Warning Indicator (Amber)   |
| 26. Left Windshield Wiper/<br>Washer Control           | 35. Engine Brake Switch                                     |

### INSTRUMENTS AND CONTROLS



Panel B



- |                                     |   |
|-------------------------------------|---|
| 6. Speedometer/Odometer             | 12. Throttle (If Equipped)                      |
| 7. Parking Brake Indicator<br>(Red) | 13. Power Take-Off Switch                       |
| 8. High Beam Indicator (Blue)       | 14. Fuel Gauge                                  |
| 9. Hour Meter                       | 15. Low Air Pressure Warning<br>Indicator (Red) |
| 10. Engine Oil Temperature<br>Gauge | 16. Air Pressure Gauge                          |
| 11. Engine Stop Control             | 17. Turn Signal Indicators                      |

**INSTRUMENTS AND CONTROLS**



- ① **Voltmeter** — This gauge indicates the surface charge of the battery with the ignition switch ON and the engine NOT running. With engine running, gauge indicates condition of charging system.  
The voltmeter will provide useful information. When the reading is observed during cranking, the reading normally should not drop below 10 volts. Lower readings indicate corroded connections at the cranking motor or at the battery terminals of defective or discharged batteries.
- ② **Coolant Temperature Gauge** — The normal operating range of a MACK engine, as indicated by the coolant, is between 170°F and 225°F (77°C and 107°C).  
Consult the appropriate vendor engine manual if your vehicle is not equipped with a MACK engine.

**CAUTION**

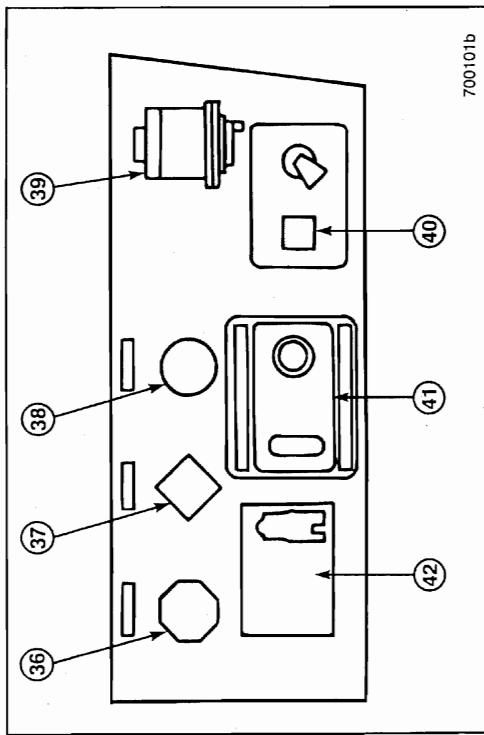
*Coolant temperature must NOT exceed 225°F (107°C).*

- ③ **Tachometer** — Engine speed is indicated in revolutions per minute (RPM). The tachometer readings should be used as a guide for shifting and to prevent engine damage due to overspeed.
- ④ **Oil Pressure Gauge** — Under normal operating conditions, the engine oil pressure will be between 30 and 84 psi (207 and 579 kPa) at governed speed on a MACK six-cylinder engine, depending on engine type speed and oil viscosity. Oil pressure should be between 10 and 35 psi (69 and 241 kPa) on E7 engines at idling speed.  
E9 engines (if equipped) should be between 25 and 46 psi (172 and 317 kPa) at 600 RPM. At governed speed, a hot oil reading should be between 50 and 100 psi (345 and 690 kPa).  
Should pressure at operating speeds drop suddenly from normal reading, stop engine immediately and determine cause. Other manufacturers' engines may have different requirements and specs. Consult the appropriate manufacturers' engine manuals for their respective pressures.

**INSTRUMENTS AND CONTROLS**



Panel D



700.101b

- 36. Trailer Air Supply Valve
- 37. Parking Brake Valve
- 38. Tractor Parking Brake
- 39. Air Filter Restriction Indicator
- 40. Charge Air Cooler Bypass Switch (if Equipped)
- 41. Power Divider Switch
- 42. Power Take-Off Switch

**INSTRUMENTS AND CONTROLS**

- ⑬ **Power Take-Off Switch** — Push top in to turn on; push bottom in to turn off.
- ⑭ **Fuel Gauge** — Registers fuel level in supply tank(s).
- ⑮ **Low Air Pressure Warning Indicator (Red)**
- ⑯ **Air Pressure Gauge** — Normal operating air pressure is between 105 psi (724 kPa) and 135 psi (931 kPa) in both air brake systems. If pressure drops below 75 psi ( $\pm 5$  psi) in either system, the warning buzzer and warning light will go on. Determine the cause of failure before proceeding. Primary air pressure is supplied to the rear brakes and is indicated by the green pointer on the gauge. Secondary air pressure is supplied to the steering axle brakes and indicated by the orange pointer.
- ⑰ **Turn Signal Indicators** — Flash green when the turn signals are activated.
- ⑱ **Trailer Brake Lever** — Pull down to activate the trailer brakes.

**WARNING**

The trailer braking system must NOT be used for parking.

- ⑲ **Climate Control Panel** — See the CLIMATE CONTROL section for more information.
- ⑳ **Air Vent** — Rotate knob to open or close the air vent.
- ㉑ **Battery Disconnect Switch Caution Label 4MR2799** — This label states that "Vehicle is equipped with battery disconnect switch. Do NOT switch off battery while engine is running or damage to electrical system may occur."
- ㉒ **Engine Shutdown Override** — Allows the operator to temporarily override the engine shutdown system for the purpose of moving the vehicle to safety.
- ㉓ **Mirror Defroster Switch** — This is a two-position rocker switch. Push the top to activate outside rearview mirror defrosters. Push the bottom in to turn the mirror defrosters off.

**INSTRUMENTS AND CONTROLS**

- ⑤ **Engine Shutdown Indicator (Red)** — If low water level, low oil pressure or high water temperature occurs, the light will go on. If the vehicle is equipped with the shutdown feature, the driver has about 15 seconds to pull to the side of the road before the engine shuts off.
- ⑥ **Speedometer/Odometer** — Indicates road speed in miles and/or kilometers per hour and total distance vehicle has traveled.
- ⑦ **Parking Brake Indicator (Red)**
- ⑧ **High Beam Indicator (Blue)**
- ⑨ **Hour Meter** — Indicates hours of engine operation. Hours of operation should be used as a guide for certain engine or PTO maintenance operations.
- ⑩ **Engine Oil Temperature Gauge** — Indicates the temperature of the engine oil.

**CAUTION**

*Maximum safe oil temperature is 235° F (113° C). Continued operation with oil above this temperature will cause rapid deterioration of the oil's lubricating properties and is NOT recommended.*

- ⑪ **Engine Stop Control** — Pull out to stop the engine (not used on electronically controlled engines, or chassis having a key switch shut-off feature).
- ⑫ **Throttle (If Equipped)** — Pull out to increase idling speed. Turn clockwise to lock in position.

**WARNING**

The throttle was designed to allow the operator to increase the idle speed of the engine. Uses other than what the throttle was designed for are strictly prohibited. Misuse may cause damage to equipment or even fatal injuries.

### INSTRUMENTS AND CONTROLS



- ②4 **Mirror Adjustment Switch** — This two-position switch allows the operator to adjust the passenger-side rearview mirror.
- ②5 and ②6 **Windshield Wiper/Washer Control** — Push knob in to activate the washers. The 12 o'clock position is OFF. The area between OFF and LOW is intermittent wiper control. Four o'clock position is LOW speed. Five o'clock position is HIGH speed.
- ②7 **Cigar Lighter**
- ②8 **Light Switch** — This is a three-position switch allowing the operator to choose between parking lights (push bottom in), headlights (push top in), or OFF (middle position).
- ②9 **Panel Lights Rheostat** — Clockwise rotation decreases dash light intensity.

### NOTE

Panel lights will not go on unless Light Switch is ON.

- ③0 **Transmission Shifter Neutral Inhibitor Label 4MR2860** — This label states, "This vehicle is equipped with a transmission shifter neutral inhibitor system. Neutral to Drive range shifts are automatically prevented at high engine speeds. After completing neutral PTO operation, reduce engine speed to below 900 RPM to allow neutral to range shift."
- ③1 **Clearance Light Switch** — This is a two-position switch. Push the top to activate the clearance lights on the tractor and the trailer. Push the bottom to turn the switch OFF.
- ③2 **Combination Starter and Electrical Switch** — When key is straight up and down, the switch is OFF. Turn counterclockwise to activate accessories. To start the engine, turn key clockwise. As soon as the engine starts, release the key (which will automatically return to running position). When switch is turned to ON in either direction, a warning buzzer will sound if air pressure is below  $65 \pm 5$  psi ( $448 \pm 34$  kPa). Buzzer shuts off as soon as sufficient air pressure is restored.
- V-MAC** — For information on the engine protection/shutdown system as it relates to V-MAC, consult TS725 (V-MAC I) or TS780 (V-MAC II).

- ③3 **PTO Overspeed Label 4MR2856** — This label states, "Yellow light indicates PTO overspeed. PTO system is automatically disengaged. To reset, reduce engine speed to idle." This label applies to chassis equipped with a Power-Pro system only.
- ③4 **Power Take-Off Overspeed Warning Indicator (Amber)** — Indicates PTO has automatically disengaged. To reset, reduce engine speed.
- ③5 **Engine Brake Switch** — E7 engines use the Jacobs compression release engine brake, or the Jacobs Stealth Retarding System™. With either system, the best braking performance is achieved in the 1800 to 2100 RPM range. For optimum retarding power, keep engine RPM as close to 2100 RPM as possible. For additional information, refer to the Jacobs driver's manual supplied with the vehicle.

### CAUTION

Do NOT activate the engine brake until the engine has reached normal operating temperatures.

- ③6 **Trailer Air Supply Valve** — This valve is NOT to be used for parking. Pull to apply trailer emergency brakes. Push to pressurize trailer air reservoir, releasing the trailer emergency brakes.
- ③7 **Parking Brake Valve** — Pull to apply. Push to release. Applies tractor parking brakes and trailer brakes, if attached.
- ③8 **Tractor Parking Brake** — Pull to apply. Push to release.
- ③9 **Air Filter Restriction Indicator** — Indicator shows when the element needs servicing or replacement. When the red flag locks into position, service as soon as possible to prevent engine damage. Then reset the indicator after the filter change. Check the air filter indicator daily.
- ④0 **Charge Air Cooler Bypass Switch (If Equipped)**
- ④1 **Power Divider Switch** — See Inter-Axle Power Divider in the OPERATION section.
- ④2 **Power Take-Off Switch** — Push top in to turn on; push bottom in to turn off.

### INSTRUMENTS AND CONTROLS

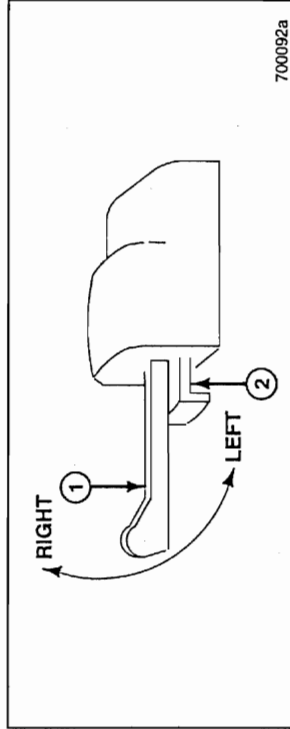


#### STEERING COLUMN

##### Turn Signal Lever

#### NOTE

The turn signals are not self-cancelling and must be returned to the middle position manually.



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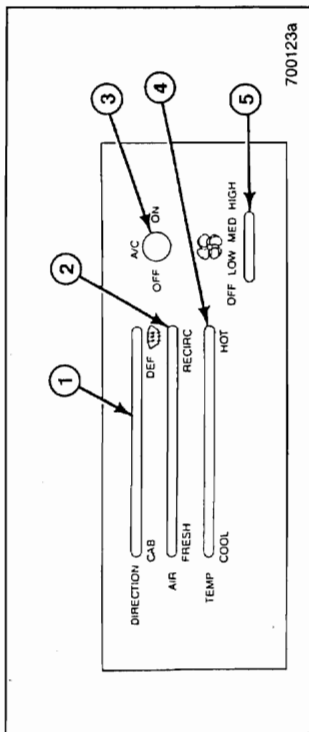
The turn signal lever is located on the steering column. It incorporates a hazard switch.

- ① **Turn Signal Lever** — Push lever clockwise to activate right turn signal and counterclockwise to activate left turn signal.
- ② **Hazard Switch** — Pull out to activate the four-way flasher when required. Flip-turn signal lever forward or back to release.

### INSTRUMENTS AND CONTROLS



#### CLIMATE CONTROL



700123a

- 1. Mode Selection Lever
- 2. Air Selection Lever
- 3. A/C On-Off Switch
- 4. Temperature Control Lever
- 5. Fan Control Switch

- ① **Mode Selection Lever** — This lever lets you choose the air direction. The CAB position delivers air to the floor outlets, while the DEF position delivers air to the defrost louvers. Sliding the lever in between positions provides a blend of the two.
- ② **Air Selection Lever** — This lever lets operator choose between fresh air (from the outside) and recirculated air (within the cab).
- ③ **A/C On-Off Switch** — This switch turns the air conditioner on or off.
- ④ **Temperature Control Lever** — This sliding lever controls the temperature of air from COOL (far left) to WARM (far right).
- ⑤ **Fan Control Switch** — This is a four-position switch to control the amount of air delivered through the vents. Down is OFF and up is HIGH speed. The middle positions are LOW and MEDIUM speeds.

**OPERATION****Check Fasteners**

- Steering linkage
- Seat belts
- Doors and windows
- Battery box covers
- Fuel tank straps
- Hood or engine compartment covers

**Air Reservoir**

- Drain to remove moisture

**Lights/Reflectors**

- Replace bulbs that aren't working
- Replace broken lenses and reflectors

**Gauges and Instruments**

- Air pressure gauge
- Oil pressure gauge
- Temperature gauge
- Voltmeter

**Check Operation**

- Brakes (service and parking)
- Horn
- Heater and defroster
- Signaling devices
- Windshield wipers/washers
- Foot pedals
- Back-up alarms (if equipped)

**Check Adjustment**

- Rearview mirrors
- Seats

**OPERATION****BEFORE OPERATING YOUR VEHICLE****Daily Walk-Around Inspection**

With the proper care, your MR will work hard and give you years of efficiency and performance — and it is the operator's job to provide the proper care. Good operating habits formed early will make you and your truck a great team.

The driver for each shift should inspect safety equipment, oil and fluid levels and conditions of the following:

**WARNING**

To avoid serious injury, do NOT step on fuel tank, battery box, frame, etc., unless adequate slip-resistant surfaces and handholds are provided.

**Check/Add Fluid**

- Engine oil
- Engine coolant
- Fuel

**Check for Leaks**

- Air, coolant, oil, fuel

**Wheels and Tires**

- Tire air pressure
- Tire/wheel condition
- Wheel stud nuts
- Front wheel bearings (oil)



**MR SERIES MACK TRUCK****OPERATION**

- Report all leaks, loose fasteners, unusual noises, etc., to the service representative at your nearest branch or distributor, so they can be checked and corrected.
- Check spring clip torque (U-bolts). (On Reyco suspensions, also check equalizer nut torque.)
- Check the U-bolt torque on the MACK air suspension at the end of the first 1000 miles (1600 km).

**After the First 3000 Miles (5000 Kilometers) or Before 4000 Miles (6400 Kilometers) or Before 3 to 4 Months**

- Retorque spring clip (U-bolts). (On Reyco suspensions, also retorque equalizer nut.)

**NOTE**

Lubricate the chassis and change the following lubricants and filters according to the Mack preventive maintenance schedules outlined in the MAINTENANCE AND LUBRICATION MANUAL, TS494:

- Gear oils — transmission, rear axle carrier(s), front drive axle carrier, transfer case, flywheel PTO.
- Engine oil, oil filters, fuel filters and coolant conditioner.

**At the First A Inspection Interval**

- Check front and rear axle alignment and adjust if out of specifications.

**OPERATION****New Vehicle Break-In**

Your new MR has been quality built, inspected, lubricated and final adjustments performed at the Mack Trucks Assembly Plant. A proper break-in, along with the following suggestions, can help ensure the long life of your truck.

- As moving parts "wear in," or as gaskets "take a set," an occasional oil, air or coolant leak may develop. Quick action to adjust and correct these minor mechanical items will prevent major repair later, saving you inconvenience and unnecessary expense. So, please stop at your nearest MACK service center as soon as any abnormal condition becomes evident.

**NOTE**

It is important to fill components with lubricants meeting the specifications listed in the Lubricants and Capacities section of the MAINTENANCE AND LUBRICATION manual, TS494.

**NOTE**

All checks and adjustments referred to in this vehicle break-in section can be found in the MAINTENANCE AND LUBRICATION manual, TS494.

**During the First 3000 Miles (5000 Kilometers)**

- After the first 125 miles (200 km), retorque the wheel nuts using an accurately calibrated torque wrench. Recheck this torque again after 500 miles (800 km).
- Check the oil and coolant levels frequently.
- Check brake and clutch adjustments per recommended maintenance schedule, and adjust as needed.
- Observe the instruments often, and shut down at the first sign of any abnormal readings.

### OPERATION



Cab Tilt

#### **⚠ DANGER**

*Before attempting to tilt the cab, be certain to take the following steps:*

- Park on a level surface.
- Shut off engine.
- Secure all loose items within the cab.
- Apply parking brake.
- Place gearshift lever in NEUTRAL position.
- Close cab doors.

The MR cab is mounted on the chassis frame by two front hinges and two rear cab locks. This arrangement allows the cab to tilt forward to a maximum of 60 degrees, exposing the engine compartment for easy accessibility.

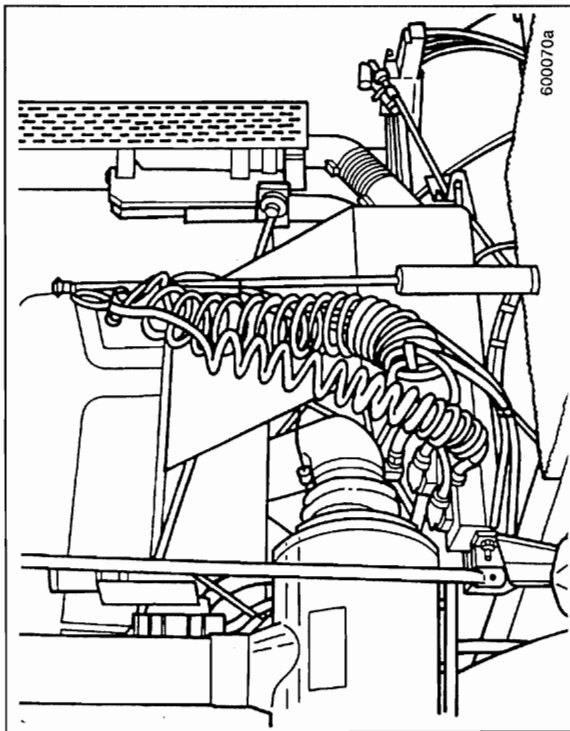
The cab tilt system uses one hydraulic cylinder. It incorporates internal safety valves which lock up automatically if the cab moves too rapidly in either direction.

The hydraulic fluid pressure imbalance forces the check valves to seat, holding the cab in a hydraulically locked position. If this situation occurs, operate the pump in the opposite direction to open the check valves. The system will then be returned to normal operation.

### OPERATION



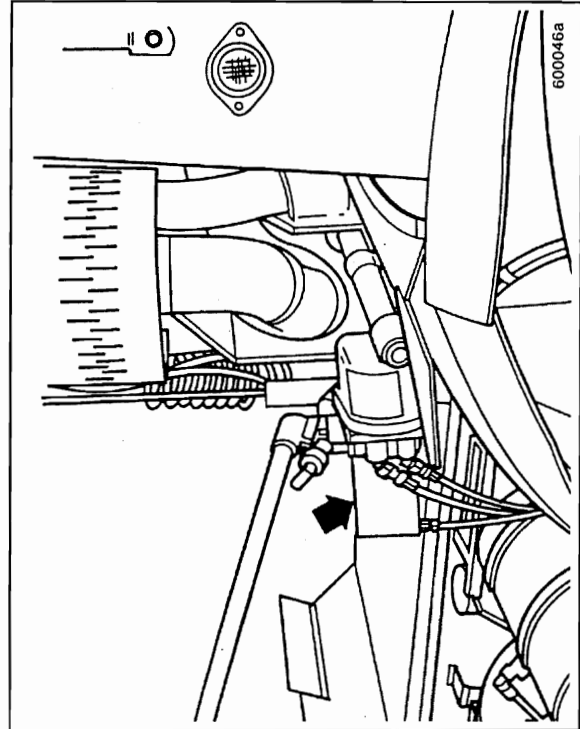
Hose Tenders



#### **⚠ CAUTION**

*AVOID LOOSE HOSES. Air lines and tractor-to-trailer electrical connections must be secured to the tractor hose tenders (hose hanger, towel bar, pogo stick, etc.) to prevent them from tangling in the driveline.*

**OPERATION**



4. To raise to the service position, pump cab up to SERVICE HEIGHT.

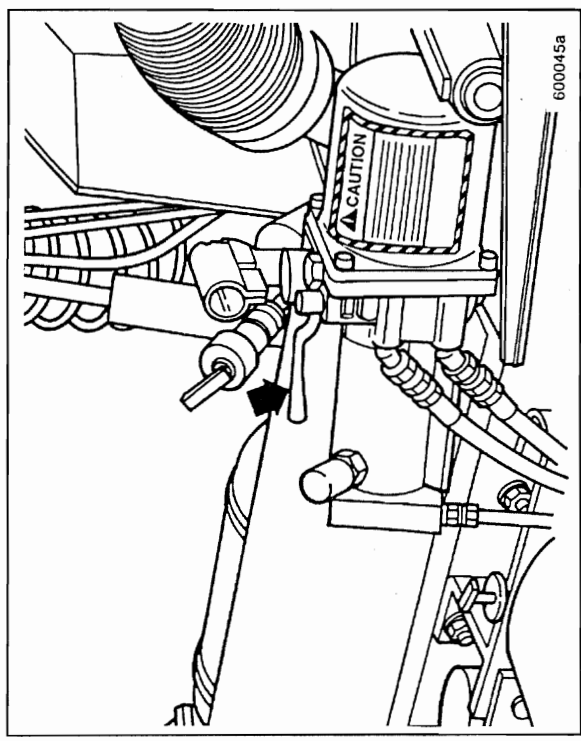
**OPERATION**



**Tilting Cab**

Use the following instructions to tilt the cab:

1. Be sure the engine is shut off, and secure all loose items in the cab.
2. Take the cab tilt pump handle from its stored position.



3. Insert the pump handle into the pump and move the pump control lever to the RAISE position.



### OPERATION

5. In the service position, the cab must be secured with the safety prop. Loosen the thumbscrew and swing the safety prop down onto the safety prop stud so the slot in the safety prop settles securely around the stud.

### WARNING

Be certain that there are no people, tools or unsecured vehicle parts in the path of the descending cab before shifting pump control lever.

6. You may have to manipulate the control lever to get the cab to descend so the safety prop settles on the stud (see arrow).
7. To raise the cab to the full tilt position, pump the cab up past the balance point. The cab will descend by itself. The rate of descent may be controlled by manipulating the pump control lever from the RAISE to LOWER position.

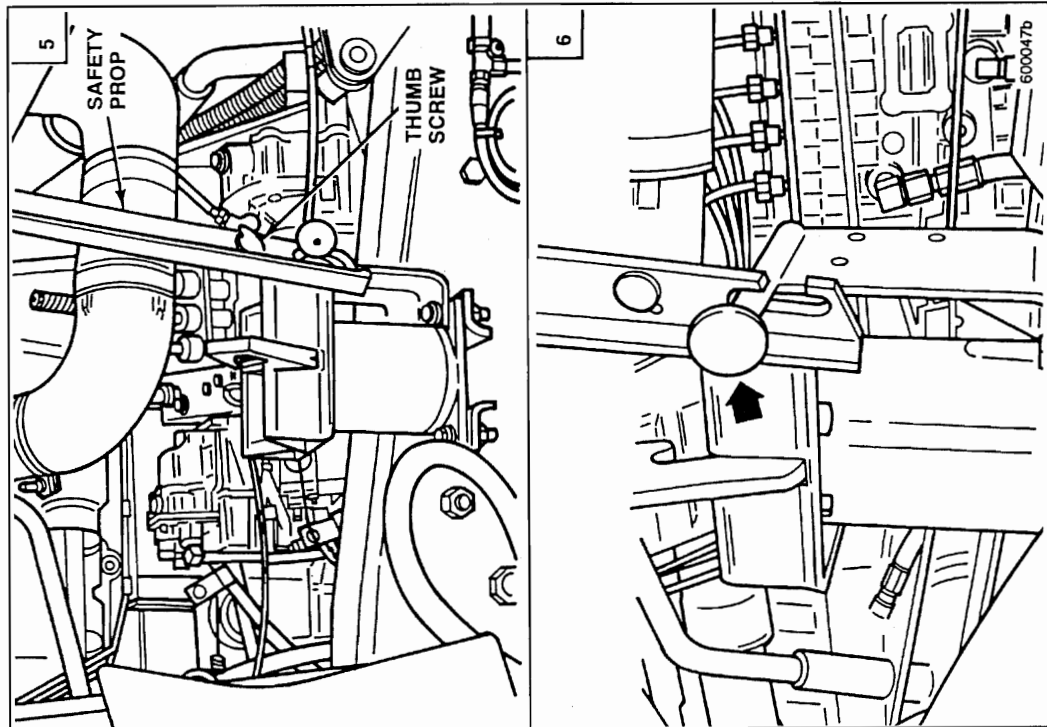
### Lowering Cab

### NOTE

The cab safety prop must be in stored position and the transmission in NEUTRAL.

1. Move the pump control lever to the LOWER position.
2. Pump until the cab is past the balance point and allow the cab to descend and latch.
3. Leave the pump control lever in the LOWER position to operate the vehicle.

### OPERATION





### OPERATION

5. Shift pump control lever to RAISE position. Repeat the procedure in step 4 for the RAISE lines. Bleed latch cylinders first and tighten connections. Repeat for push port of the tilt cylinder.
6. After the entire system is bled, shift pump control lever to LOWER position. Check and refill reservoir, if necessary.

#### SERVICE HINT

The recommended type of fluid for the cab tilt system is CF-A (MIL-H-5606B), capacity 3 pints (1.4 liters).

#### WARNING

The pump control lever must be in the LOWER position before operating the vehicle.



### OPERATION

#### System Bleed Procedure

#### NOTE

The cab must be in the lowered position.

#### NOTE

All steps must be performed in the following order ONLY.

1. Connect all hydraulic lines.
2. Tighten all connections (except two) at the tilt cylinder and one at each latch cylinder.
3. Fill pump reservoir to top with specified oil. Close and tighten fill plug.

#### CAUTION

Do not refill the reservoir with the cab in the RAISE position.

4. Shift pump control lever to LOWER position. Pump until LOWER lines are bled. Tighten corresponding connections.

### OPERATION



#### Power Take-Off

If the vehicle you are operating is equipped with a Power Take-Off (PTO) unit, be sure you read and understand the following section.

#### **⚠ DANGER**

Power Take-Off (PTO) units and their related equipment can be very dangerous. Any PTO installation, repair or replacement should include a warning indicator light which indicates PTO engagement. The light must be located close to the PTO control and clearly visible to the operator.

#### **⚠ DANGER**

PTO units are driven by the engine or drivetrain components (flywheel, crankshaft, transmission). Do not attempt any work or service on the PTO and related units unless the engine is shut down.

#### **⚠ DANGER**

Always keep body parts and loose-fitting clothing out of the range of drivetrain components or personal injury may result.

#### **⚠ DANGER**

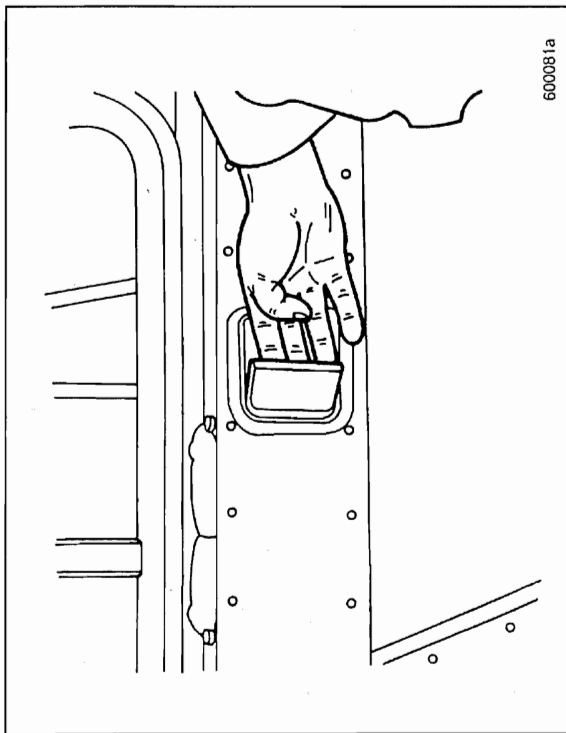
Be sure you are aware of the PTO's engagement or non-engagement status and the position of the truck's body (dump body controlled by PTO, etc.). Be sure PTO is disengaged when not in use.

### OPERATION



#### Doors

##### Opening



The inside door handles are of flush-mounted, paddle-type design. To open, put your fingers behind the handle and pull out while exerting some force on the door to open it.

##### Locking

To lock (with door open), press the door handle inward and shut the door.



**OPERATION**

**PTO Operating Procedures**

The following procedures apply to transmissions with a neutral switch and a transmission rear-case-mounted PTO only.

When engaging PTO:

1. Select LO-split using the splitter switch and select LO range using the range selector. The transmission **MUST** be in LO range and LO-split at all times during PTO operation.
2. Depress the clutch pedal to disengage the clutch.
3. Set parking brakes.
4. Move the main box gearshift lever to the **NEUTRAL** position.
5. Move the dash-mounted compound neutral control valve to the **ON** position, which moves the synchro clutch to a neutral position.
6. Engage the PTO.
7. Move the main box gearshift lever to the desired ratio.
8. Release the clutch pedal to engage the clutch.
9. Operate the PTO-driven load.

When disengaging the PTO:

1. Depress the clutch pedal to disengage the clutch.
2. Move the main box gearshift lever to **NEUTRAL**.
3. Disengage the PTO.
4. Move the dash-mounted compound neutral control valve to the **OFF** position, which moves the synchro clutch back to LO range.
5. Move the gearshift lever to the desired main gear box ratio.
6. Release the parking brakes.
7. Release the clutch pedal to engage the clutch.



**OPERATION**

MACK transmission rear-mounted PTO units fall into one of two categories (depending on how they operate).

**Intermittent Service** — The PTO unit is operated, under load, for less than seven minutes and then allowed to cool before it is operated again.

**Continuous Service** — The PTO unit is operated, under load, for seven minutes or more. Also, units operated for less than seven minutes and not allowed to cool down before operating again, should be considered in continuous service.

Rear-mounted PTO units operating under the continuous service guideline must not be run at more than 70% of the PTO output-rated torque/horsepower.

**V-MAC** — PTO operations controlled through V-MAC differ from vehicles not equipped with V-MAC. See TS725 (V-MAC) or TS780 (V-MAC II) for information regarding the programming of PTO.

**OPERATION****OPERATION****Engine****CAUTION**

Use a Mack-approved winterfront designed for the specific chassis only. The use of winterfronts or shutters for normal operating conditions above freezing requires caution to avoid high intake/exhaust temperatures. The restriction in air flow can cause higher exhaust temperature, power loss, excessive fan usage and a reduction in fuel economy.

**CAUTION**

A Mack-approved exhaust pyrometer must be installed and closely monitored while the engine is in operation when a winterfront is used. DO NOT exceed the maximum temperature listed on the decal. To reduce exhaust temperature, downshift or reduce engine power and open the winterfront.

**CAUTION**

Do not permit load to drive engine above governed speed. Operate in a gear low enough to allow engine to accelerate to (or maintain) governed RPM when applying throttle.

**WARNING**

Misuse or modification of a turbocharger can result in serious injury and property damage. In addition, extreme care must be taken to avoid foreign material induction, excessive exhaust temperatures and lack of lubrication.

**Model Designation**

The MACK engine unit symbol designation system is designed to provide total unit description identification through a combination of prefix letters, numbers, digits and suffix letters, as applicable.

**Prefix Letters and Numbers:**

- E = MACK turbocharged diesel engine
- M = Maxidyne engine (high torque rise)
- 7 = 728 cubic inch displacement
- 9 = 998 cubic inch displacement
- Digits: peak gross horsepower (BHP)

**NOTE**

E7 engines use the Jacobs compression release brake, or the Jacobs Stealth Retarding System™. With either system, the best braking performance is achieved in the 1800 to 2100 RPM range. For optimum retarding power, keep engine RPM as close to 2100 RPM as possible. For additional information, refer to the Jacobs driver's manual supplied with your chassis.



**OPERATION**

When slowing for a stop, leave clutch engaged as long as possible to use the braking effect of the engine. When forward speed has dropped to a little above idling speed, push clutch pedal in and brake to a complete stop.

**Parking Brake**

Spring-type parking brakes are standard on rear axles and bogies. The basic unit of a spring brake system is an air cylinder with heavy springs integrated with the service brake chamber. The spring brake chamber operates so that when there is no pressure in the spring brake section of the air chamber, the spring expands, causing a brake application. When air pressure is applied to the spring section of the air chamber, the heavy spring is compressed, releasing the brakes.

The spring brakes can be applied and released from the cab by using the hand-operated control valve. In the event of an air loss in both the primary and secondary air systems, pressure is automatically exhausted from the spring brake chambers, applying the brakes. The spring brakes will remain applied until enough pressure is available in the system to compress the heavy application springs.

**CAUTION**

*NEVER use the trailer parking brake system alone.  
Use the tractor-trailer parking brake system only.*

**OPERATION****Brakes****Air Brake System**

This truck has been built to meet or exceed all applicable federal standards and regulations.

**Brake Operation** — The air brake system consists of three main elements:

- The compressor, governor and reservoirs supply and store the air pressure.
- The brake application valve controls the brake application pressures.
- The brake chambers perform the work on the brake mechanism.

MACK vehicle design has incorporated into this chassis a dual braking system. It has two complete air circuits: a primary circuit for rear brakes and a secondary circuit for front brakes. Each circuit receives air from separate reservoirs. Although there are two air circuits, they operate as one brake system through the dual-circuit treadle valve. This provides the driver with easy, graduated control when applying and releasing the brakes.

The air pressure in the two air brake circuits is monitored by air pressure gauges on the instrument panel. (See the INSTRUMENT PANEL section for more information.) When air pressure drops below 65 ± 5 psi (448 ± 34 kPa) in either the primary or secondary air system at any time other than vehicle startup, pull to the side of the road and determine problem. If air pressure continues to drop below 40 ± 5 psi in BOTH systems, spring brakes will automatically apply. The Low Air Pressure warning indicator or buzzer will be activated if low air pressure occurs in either circuit.

**CAUTION**

*Avoid sudden stops. Constant, sudden stops may negatively affect the performance of braking and driving parts.*

**OPERATION****Good Driving Habits****Gross Vehicle Weight (GVW) Rating**

Do not overload your chassis. The gross vehicle weight ratings for a given model truck vary with operating conditions, tire size, wheel base, type of wheels, axles, suspension, frame length and overhang. For economy and safety, it is important to observe the GVW rating for your particular truck, which can be found on the Safety Certification Label.

**Observe Instruments**

Glance at instruments frequently. When problems develop, take prompt steps to correct them.

**Stopping the Engine**

After a hard run, allow engine to idle three minutes before shutdown in order to stabilize the temperature of all engine parts. Quick shutdowns can cause engine damage and prevent the turbocharger from being properly lubricated.

**Parking**

Use only the parking brake for parking. Do NOT use the hand control for rear service brakes or trailer brakes (if equipped) for parking. Check brake adjustment frequently to be sure the brakes will lock and hold vehicle when parked. Do NOT use the parking brake for braking vehicle when in motion, except in an emergency. When parking on a grade, use wheel chocks under the rear wheels or turn front wheels to the curb. Do NOT leave diesel engine vehicles in gear; if vehicle should move, the engine may start by heat of compression.

**General Observation**

Make it a habit at stops to walk around your truck looking for fuel, oil and coolant leaks. Also check condition of tires, wheel nuts, springs and lights. Stop trouble before it stops you!

**OPERATION****Anti-Lock Brakes (If Equipped)****Installation of Electrical Equipment on Vehicles Equipped with Anti-Lock Brake System (ABS)**

Connecting electrically powered or electrically controlled equipment to the vehicle may cause interference with the proper operation of other vehicle components. This interference may depend on the operating frequency and the degree to which transient signals are coupled into the vehicle system.

Every user and installer of electrical equipment has the obligation to ensure the proper operation of all electrical systems on the vehicle with respect to conducted or radiated signals by his installation.

Specific attention is directed to the anti-lock brake control system. A vehicle checkout procedure should include operating any added circuitry under the following test conditions:

- Engine running and brake air system pressure in operating range
- Vehicle stationary
- Depress and hold brake pedal in full application pressure mode
- Operate added equipment in all starting, running and shutdown conditions. Listen for any air exhausting from anti-wheel-lock controllers. This indicates an interference condition which must be corrected before the vehicle is released for highway use.

**Operating an ABS-Equipped Vehicle**

- Apply the brakes as normal. If the anti-lock brake system begins to function, maintain brake pressure. DO NOT release the brakes.
- Avoid rapidly pumping the brakes. The anti-lock brake system automatically applies and releases the brakes up to five times per second.
- When towing a trailer(s), especially if only the tractor is equipped with anti-lock brakes, watch the trailer(s) through the mirrors. Adjust brake application pressure as necessary to keep the combination in a straight line. Make sure the trailer(s) follows the tractor properly.

### OPERATION



#### Cold Weather Starting Tips

#### NOTE

Before attempting to start the engine during cold weather, actuate the Engine Stop Control (if so equipped) several times to ensure that the injection pump control rack is free. Condensation in the fuel could cause the control rack to freeze up after extended shutdown in cold weather.

- Save your batteries. Do not overtax batteries and starting motor by cranking for more than 30 seconds without interruption. Allow about two minutes between attempts at starting the truck. This permits starter to cool and batteries to re-energize.
- Use the correct grade of oil in your crankcase for the prevailing winter temperature.
- Water/moisture can accumulate in the fuel system. Water accumulation can freeze in fuel tank, fuel lines and filter. This can be avoided by regularly draining the tanks and filters.

#### WARNING

**Under NO circumstances should gasoline, alcohol, used oil or additives with metallic particles be added to the fuel.**

- Diesel fuel has some bad habits in cold weather. It can gel and clog filters and small passages. When gelling occurs, mix a small percentage of No. 1D fuel (kerosene) with No. 2D (diesel) fuel. Adding kerosene is NOT recommended for general use since there will be a sacrifice in both performance and fuel economy. Refer to the MAINTENANCE AND LUBRICATION manual, TS494, for additional cold weather operating information.

### OPERATION



#### STARTING YOUR VEHICLE

##### General Information

Before you put the key in the ignition switch, set the parking (spring) brake, disengage the clutch (if equipped) and put the transmission in NEUTRAL. Push the Engine Stop Control all the way in (if equipped).

#### CAUTION

*Do not engage the starting motor too soon after an incomplete start of the engine, or the starter may be damaged. Wait at least five seconds before attempting to restart the engine.*

#### CAUTION

*Do not rev the engine at start-up. Turbocharger damage may result. Lubricants need time to establish a film between moving parts.*

#### CAUTION

*If the engine does not start immediately, limit cranking periods to 30 seconds to avoid overheating and damaging the starter.*



### OPERATION

#### Air Starter or Push Button (If Equipped)

#### NOTE

Build up air pressure to a maximum (120 lbs/827 kPa) before shutting down and parking for the night.

#### CAUTION

*Idling engine unnecessarily for long periods of time wastes fuel and fouls injection nozzles. Unburned fuel causes carbon formation and oil dilution. NEVER race an engine during warm-up.*

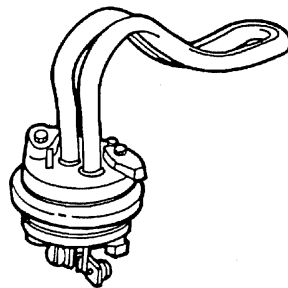
Put the key in the ignition switch. Turn the key clockwise to the first "click" (about two o'clock position) to activate the instruments. Push starter button in and release as soon as engine starts. Keep clutch (if equipped) disengaged until engine runs smoothly. When oil pressure and air pressure approach normal operating ranges, you may put the vehicle into operation.



### OPERATION

#### Engine Block Heater

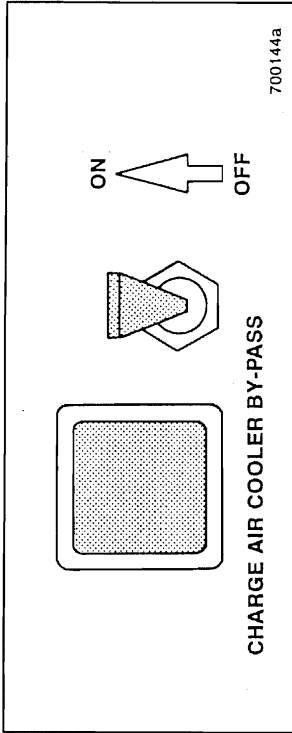
An engine block heater works by heating the coolant surrounding the combustion chambers. Engine heaters are recommended to help combat the extreme demands of cold weather operating conditions. The engine heater can be plugged in overnight when the temperature drops. Location of the engine heater power receptacle varies according to vehicle design.



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#### Engine Heater Benefits

- Eliminates cold weather starting problems.
- Increases engine life significantly by keeping the engine warm and avoiding costly, excessive idling.
- Prevents external water leaks caused by excessive cold.
- Allows the cab to heat more quickly.
- Reduces the temperature at which ether is required.
- Engine heaters may be activated as soon as the engine is stopped.

**OPERATION****OPERATION****E7 Non V-MAC Engines**

If your chassis is equipped with a mechanically governed E7 (non V-MAC) engine, use the following procedure:

**Normal Temperatures**

1. Do NOT depress the accelerator.
2. Crank the engine.
3. After the engine has started, set the hand throttle to maintain an engine speed of 1200 RPM.
4. Allow the engine to idle at 1200 RPM and reach normal operating temperature BEFORE moving the vehicle.

If the engine is difficult to start, use the following procedure:

1. With the key switch in the OFF position, fully depress and hold the accelerator pedal to the floor.
2. If equipped with an Engine Stop Control, pull to the OFF position, then return to the run position.
3. Crank the engine.
4. Release the accelerator pedal as soon as the engine starts.

**Cold Temperatures**

1. Fully depress and hold the accelerator pedal to the floor.
2. Push the Charge Air Cooler Bypass switch (if equipped) to the ON position. A dash light will illuminate when the bypass is activated.

3. Crank the engine.
4. Release the accelerator pedal as soon as the engine starts.
5. Set the hand throttle to maintain an engine speed of 1200 RPM.
6. Allow the engine to idle at 1200 RPM and reach normal operating temperature BEFORE moving the vehicle.
7. Move the Charge Air Cooler Bypass switch (if equipped) to the OFF position when the coolant temperature has reached 125°F (52°C).

**CAUTION**

Operating the chassis with the Charge Air Cooler Bypass switch (if equipped) in the ON position may cause severe engine damage.

**CAUTION**

Do NOT use the Charge Air Cooler Bypass switch (if equipped) during warm temperatures or if the engine is already warm.

**OPERATION****Engine Warm-Up**

Engine damage can occur if the engine is not warmed up to a minimum operating temperature of 170°F (77°C) before putting the chassis into full operation.

Heavy-duty diesel engines are designed to operate at optimum efficiency when they are running loaded at (or very near) normal operating temperature where efficient combustion takes place. When the engine is operated unloaded, lightly loaded (stop and go operations, PTO operations, or periods of extended engine idling) or in cold weather conditions, normal operating temperature may not be achieved or maintained. As a result, carbon and/or varnish build-up will occur and lubricating oil will become contaminated with combustion byproducts.

Cold weather operations place added demands on a diesel engine. When operating in cold climates, particularly in stop-and-go operations, PTO operations or periods of extended engine idling, minimum operating temperature must be maintained to prevent engine damage resulting from valve varnishing and carbon build-up. Many accessories, from winterfronts to belly tarps, are available to best equip your truck for cold weather operations. Refer to the **MAINTENANCE AND LUBRICATION** manual, TS494, supplied with your truck for additional information concerning cold weather accessories.

**Engine Idling**

Idling the engine unnecessarily for long periods of time wastes fuel, fouls injector nozzles and can lead to valve carbon and varnish deposits. Unburned fuel causes carbon formation and oil dilution. Shut engine down when prolonged loading or unloading of cargo is required. When starting a cold engine, or if the vehicle has been parked and the engine coolant has fallen well below normal operating temperature, a fast idle speed of approximately 1200 RPM should be maintained to help the engine warm up more quickly.

**OPERATION****E7 V-MAC Engines**

If your chassis is equipped with an electronically governed E7 (V-MAC) engine, use the following procedure:

**Normal Temperatures**

1. Do NOT depress the accelerator. The pedal must be left in the idle position.
2. Crank the engine.
3. After the engine has started, set the hand throttle to maintain an engine speed of 1200 RPM.
4. Allow the engine to idle at 1200 RPM and reach normal operating temperature **BEFORE** moving the vehicle.

**Cold Temperatures**

1. Fully depress and hold the accelerator pedal to the floor.
2. Crank the engine.
3. Release the accelerator pedal as soon as the engine starts.
4. Set the Variable Speed Control (VSC) (if equipped) to maintain an engine speed of 1200 RPM.
5. Allow the engine to idle at 1200 RPM and reach normal operating temperature **BEFORE** moving the vehicle.

**OPERATION****Engine Shutdown System (If Equipped)**

The engine may be protected by a shutdown system that prevents engine failure when a condition such as loss of oil pressure, loss of coolant or engine overheating occurs. If the system detects a condition that will initiate engine shutdown, a warning indicator light will illuminate to alert the driver before the engine actually shuts down. Should shutdown occur, the system can be overridden so the vehicle can be moved to a location where it will not pose a hazard.

**Check Engine Warning Indicator** — During normal operating conditions, the Check Engine warning indicator should illuminate as soon as the key switch is turned on. After the engine is started, it will remain illuminated until engine oil pressure reaches normal idling range. During shutdown, if the system detects a condition that could lead to engine failure, the Check Engine warning indicator illuminates 30 to 45 seconds prior to engine shutdown.

**Lengard Shutdown System**

**Shutdown Override Button (If Equipped)** — During normal operation, to ensure adequate fuel delivery when starting the engine (whether starting a hot or a cold engine), the following starting procedures are recommended (Lengard system only):

1. Depress and hold the Shutdown Override button.
2. Crank the engine.
3. Continue depressing the Shutdown Override button after the engine is started and the Check Engine warning indicator is still illuminated.
4. Release the Shutdown Override button when the Check Engine warning indicator deactivates.

Refer to the **STARTING YOUR VEHICLE** section for complete engine starting procedures.

**OPERATION****Engine Shutdown**

After a hard run, allow the engine to idle approximately three minutes before shutdown. This provides the temperature stabilization of all engine parts and allows the turbocharger RPM to slow gradually. Quick shutdowns can result in mechanical problems for the engine and/or turbocharger.

**CAUTION**

*Operating the engine below normal operating temperature for extended periods of time will allow varnish/carbon deposits to build on the valve stems and guides. Varnish deposits will cause the valves to stick in the guides after the engine has been shut down, and could result in push rod damage when the engine is restarted. If the engine has been operated below normal operating temperature for an extended period of time, and the odor of raw diesel fuel can be detected or unburned fuel can be seen at the exhaust stack, it is recommended that the engine be operated under load until normal operating temperature is achieved before shutting down.*

On chassis equipped with an air starter, make sure that the air pressure gauge reads a maximum of 120 psi before shutting down and parking for the night. This will ensure sufficient air pressure for restarting the engine.



### OPERATION

#### MOVING YOUR VEHICLE

##### General Information

##### Braking

Avoid sudden stops. Constantly making such stops may have a negative effect on the performance of braking and driving parts. When slowing, leave clutch (if equipped) engaged as long as possible to use the braking effect of the engine.

#### CAUTION

*When using the braking effect of the engine, final gear selection is critical. If gear selection is too high the vehicle will buck, which could cause loss of control.*

E7 engines use the Jacobs compression release engine brake, or the Jacobs Stealth Retarding System™. With either system, the best braking performance is achieved in the 1800 to 2100 RPM range. For optimum retarding power, keep engine RPM as close to 2100 RPM as possible. For additional information, refer to the Jacobs driver's manual supplied with your chassis.

##### Shifting

Operate in a gear low enough to allow engine to accelerate to, or maintain, governed RPM when applying full throttle. Allowing the engine to lug causes excessive strain on engine which could damage pistons, rings, cylinder walls, or bearings. However, you should not overspeed the engine either.

#### CAUTION

*Do not permit a load to drive the engine above governed speed. Use lower gears when descending steep grades, and watch the tachometer. Over-speeding will cause severe drivetrain damage and eventually destroy the engine.*



### OPERATION

**During Shutdown** — If the shutdown system activates, use the following procedures to move the vehicle to a location where it can be parked safely:

1. Push and hold the Shutdown Override button (if equipped).
2. Start the engine.
3. Continue depressing the Shutdown Override button while moving the vehicle to the nearest area where the vehicle can be parked safely.

##### Kysor Shutdown Systems

There are no special starting instructions for the Kysor shutdown system. To override the engine shutdown system so the vehicle can be moved to safety, simply restart the engine in the normal manner. The engine will run for 30 seconds and then shut down again.

#### CAUTION

*Continuously overriding the shutdown system for an extended period will cause severe engine damage.*



# REED

CONCRETE PLACING  
EQUIPMENT

## MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 42



### OPERATION

#### Clutch (If Equipped)

To avoid shock damage, release the clutch pedal smoothly without shock-loading the driveline, especially on grades while carrying heavy loads. Do not ride the clutch pedal. Premature wear of clutch facing and release bearing may result.

#### CAUTION

*Always use the lowest drive gear combination to start vehicle moving to avoid premature clutch failure.*

#### General Instructions

1. To move the vehicle, begin by starting the engine and waiting until it reaches its operating range.
2. Disengage the clutch (if equipped) by pushing the pedal to the floor.
3. Shift transmission into first or LO gear (see Transmission Shifting Instructions for how to shift your particular transmission and in what gear to start).
4. Release the parking brake.

#### CAUTION

*If the Spring Brake Warning indicator is on, do NOT attempt to move the vehicle because driveline damage may result.*



### OPERATION

#### ⚠ DANGER

*Select the proper gear ratio BEFORE descending a grade to avoid a runaway vehicle and to stay within safe and legal speed limits. Do NOT coast down hills. Gear ratios should be selected to allow engine operation between peak torque and rated speed.*

#### CAUTION

*Running the engine at an RPM that is too low for the load or grade of the road can cause damage to the drivetrain.*

Shifting at the proper time will save both fuel and unnecessary repair bills, but remember that once your engine falls below the peak torque, both the torque and horsepower drop off very rapidly. Before this happens, downshift to the next lower gear.

On vehicles with transmissions having extreme reduction gearing coupled with high rear-axle loads, a torque-limiting device will be used. This device limits the amount of fuel that can be delivered to the engine by the injection pump and prevents overloading of the drivetrain components while in extreme reduction gears.

Use the same gear going downhill as you would going uphill. This will save your brakes and prevent damage to the engine from over-speeding.

#### Engine Temperature

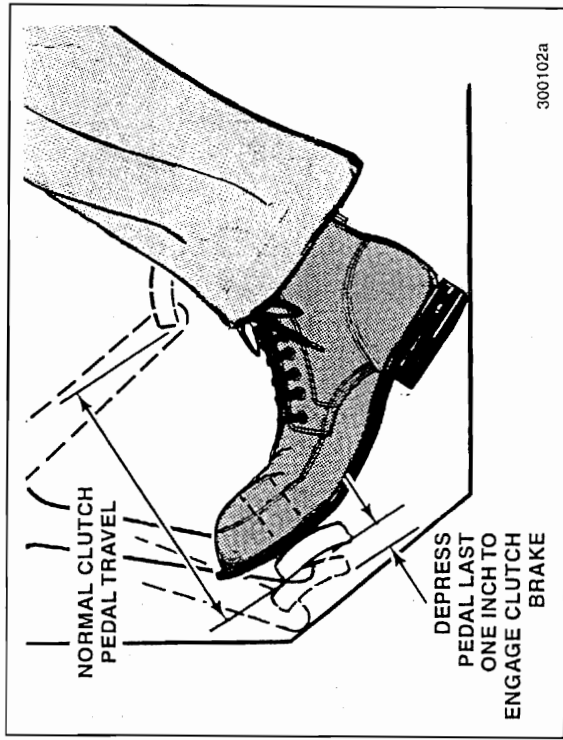
Before entering high-speed traffic conditions, allow the engine to reach normal operating temperature. Normal operating range may be between 170°F and 225°F (77°C and 107°C) depending on weather and road conditions.



**OPERATION**

**Clutch Brake Operation (If Equipped)**

The clutch brake is designed to stop the rotation of the transmission input shaft while the truck is standing still, to make shifting into first or reverse gears easier.



With the vehicle standing still, push in the clutch pedal. Apply the clutch brake by pushing the clutch pedal all the way to the floor (the clutch brake is applied when the clutch pedal is fully depressed, the last one inch of travel past normal pedal travel).

**NOTE**

When the clutch is engaged, a slight but definite resistance to clutch pedal downward travel will be felt in the last one inch.



**OPERATION**

5. Engage clutch (if equipped) smoothly by releasing the clutch pedal. At the same time, apply the accelerator enough for the engine to move the load.

**CAUTION**

*Never allow your foot to ride the clutch pedal when clutch is engaged. This will cause premature failure and short clutch facing life.*

6. As vehicle gains speed, continue shifting until transmission is in the highest gear possible with engine in operating range.

**NOTE**

Engine must be warmed up to operating temperature before attempting to move in either REVERSE or LO-LO range when the vehicle is equipped with a torque-limiting device.

### OPERATION



#### Transmission Shifting Instructions

#### CAUTION

Maximum safe oil temperature is 235°F (113°C) for manual transmissions. Continued operation with oil above this temperature will cause rapid deterioration of the oil's lubricating properties and is NOT recommended.

#### CAUTION

The vehicle must be completely stopped before attempting to shift from REVERSE to any forward speed, or vice versa, to avoid transmission damage.

#### T2070-T2070C-T2070F TRANSMISSION RATIOS

Gear (Main Box)	Ratios	
	LO	HI
1	14.16	5.24
2	8.25	3.05
3	(4.67)	1.73
4	(2.70)	1.00
5	(1.62)	0.60
5 (T2070C)	(1.81)	0.67
Reverse	14.53	5.38

( ) The ratios in parentheses are not practical to use.

300161a

### OPERATION



Shift the transmission into first or reverse gear, engage the clutch and accelerate. The clutch brake is only to be used when the vehicle is stopped and being shifted into first or reverse gears. It is not designed to be used as an upshifting aid.

#### CAUTION

Clutch brake damage may result if used while the vehicle is in motion. The clutch brake must NOT be used when making a downshift or an upshift.

#### Double-Clutching

As with all nonsynchronized transmissions, double-clutching is necessary on downshifts as well as upshifts. It is advisable to use the torque-limiting clutch brake to engage first and REVERSE gears and to double-clutch for gear ratio changes.

Double-clutching is a way to bring the speed of transmission gears into synchronization so that the shift can be made without clash. The engine is used to speed up the countershaft for a downshift and to slow it down for an upshift.

1. Depress clutch pedal and shift to NEUTRAL.
2. Let up clutch pedal and accelerate engine (when making downshift) or allow engine to slow down (upshift) until engine speed approximately corresponds to road speed of gear to be selected.
3. Depress clutch pedal and complete shift to desired gear. Release the clutch pedal.

**OPERATION**



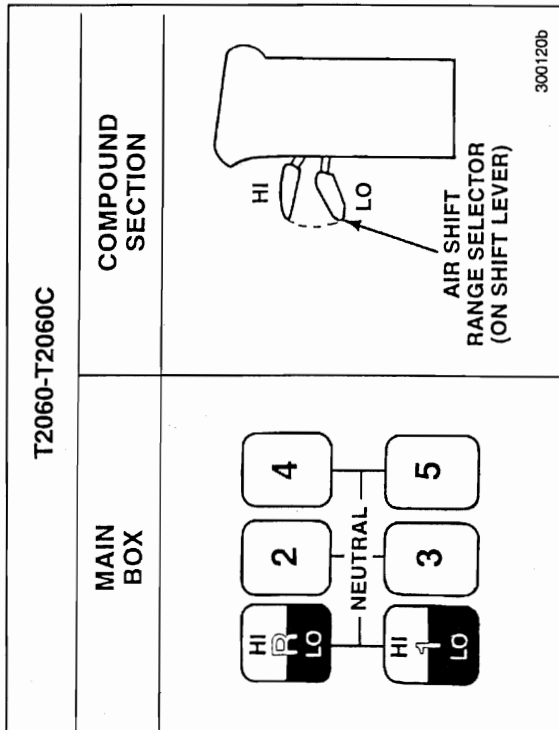
**MACK T2070-T2070C-T2070F**

The T2070-T2070C-T2070F are nonsynchronized transmissions. These transmissions feature a LO and HI auxiliary compound section controlled by an air-shift range selector located on the shift lever. The LO range provides two low ratios. In HI range there are five forward gears that can be shifted in the standard manner, but remember to double-clutch whether moving up or down through the gears. For normal highway usage, start in HI range, first gear and shift through second, third, fourth, and fifth. The two gears in LO range are designed for off-highway use and in slow-moving applications (curb pouring, material spreading, heavy load/steep grade operation). REVERSE can be used in LO or HI range.

**Upshift** — Begin in first gear, LO range (commonly called LO-LO as shown on the shift pattern diagram). Double-clutch and upshift to second gear, LO range (called LO) in the normal manner. When ready to upshift again, depress the clutch pedal and release the accelerator pedal. Move the shift lever to NEUTRAL, then flip the air-shift range selector to HI range, double-clutch and move the shift lever back to first gear. This is first gear HI range, which provides the next higher ratio. Release the clutch pedal and apply the accelerator to reach the top of the operating range. Shift through second, third, fourth, and fifth (HI range), being sure to double-clutch from one gear to the next.

**Downshift** — Downshift in reverse order from fifth through first gear (HI range), double-clutching through each gear. The next downshift will be to second gear, LO range (called LO). Proceed to depress the clutch pedal and release the accelerator pedal. Move the shift lever to NEUTRAL, then flip the air-shift range selector to LO range, double-clutch and move the shift lever to second gear. This is second gear, LO range, which provides the next lower ratio. When ready for the lowest ratio available (called LO-LO), double-clutch and downshift to first gear, LO range.

**OPERATION**



**T2060-T2060C TRANSMISSION RATIOS**

Gear (Main Box)	Ratios	
	LO	HI
1	9.02	5.24
2	(5.25)	3.05
3	(2.98)	1.73
4	(1.72)	1.00
5 (T2060)	(1.03)	0.60
5 (T2060C)	(1.16)	0.67
Reverse	9.25	5.38

( ) The ratios in parentheses are not practical to use.

300121b

# REED

CONCRETE PLACING  
EQUIPMENT

## MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 46

### OPERATION



#### Axles

#### Rear Axle

Mack Trucks, Inc. provides axle housings in three capacity classifications. They are medium duty, heavy duty and extra-heavy duty. To deliver the appropriate amount of torque to the driving wheels, Mack Trucks, Inc. offers single-reduction and dual-reduction carriers in a large variety of ratios for single axle applications. When required, a large variety of four-wheel-drive, two-axle bogies are also available with top-mounted, dual-reduction carriers for straight line through drive. The bogie carriers are also available in a large number of ratios.

All four-wheel-drive bogie tandem carriers are available with the MACK inter-axle power divider third differential, with or without a driver-controlled lockout.

MACK rear axles are designed so the entire load is carried by the axle housing through the wheel bearings mounted on the housing spindle. The rear axle shafts can be either free-splined, both ends, or integral flange type. Both types of axle shafts may be removed without removing or disturbing the rear wheels.

To avoid excessive tire wear, good maintenance must be practiced in the matching of tires on bogies without a compensating inter-axle power divider.

### CAUTION

Maximum safe oil temperature is 235° F (113° C).  
Continued operation with oil above this temperature will cause rapid deterioration of the oil's lubricating properties and is NOT recommended.

### OPERATION

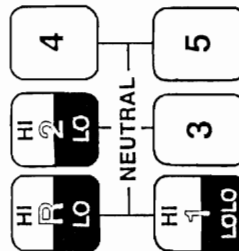


### CAUTION

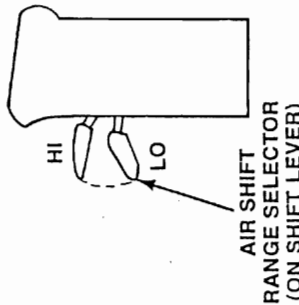
Do not overspeed the engine when downshifting the transmission. Damage to the drivetrain components can result. Do NOT preselect the air-shift range selector. Shift the auxiliary compound section only with the clutch pedal depressed and/or the shift lever in NEUTRAL. To avoid transmission damage, do NOT change range while moving in reverse gear.

#### T2070-T2070C-T2070F

#### MAIN BOX



#### COMPOUND SECTION



300162b

### OPERATION



### OPERATION



#### Two-Speed Rear Axle

The dual-reduction rear axle carrier employs selective fast and slow gear reductions. Electric shift (button on the transmission shifter lever) provides either fast or slow ratio by selecting these gearsets. The transmission is shifted in the usual manner and the two-speed axle is shifted in the usual manner. The two-speed axle is shifted as follows:

**Split Shifting** — To shift to higher transmission gear and LO axle speed at the same time:

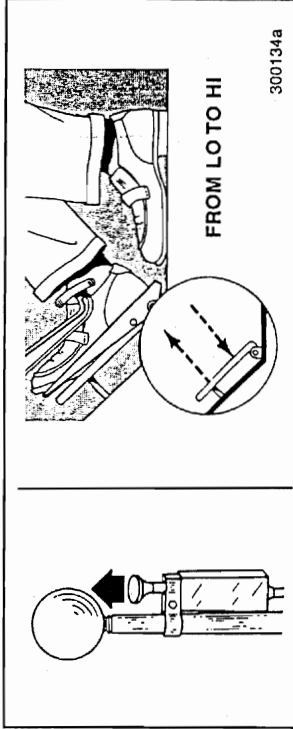
1. Shift transmission to higher gear in the usual way.
2. Push the axle shifter button down just before re-engaging the clutch.
3. Re-engage clutch and depress the accelerator to maintain road speed.

To shift to lower transmission gear and HI axle speed at the same time:

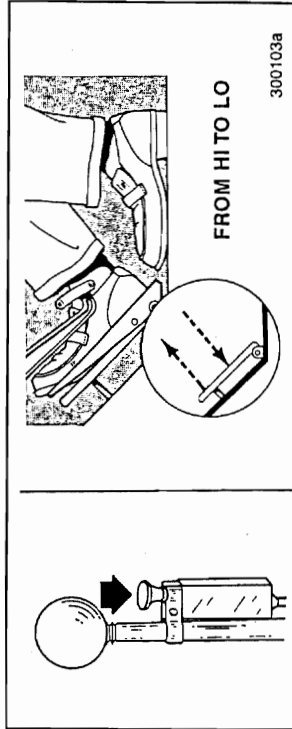
1. Hold accelerator down and pull axle shifter up.
2. Shift transmission to lower gear in the usual way, then depress accelerator to maintain road speed.

### CAUTION

Always keep accelerator down when shifter button is moved, except when split shifting to LO axle speed. Vehicle must be brought to a full stop before shifting from forward to REVERSE, and vice versa.



**To shift from LO to HI speed** — Hold accelerator down and pull axle shifter button up. Ride with accelerator down until you want to complete shift. Release accelerator, pause until shift is completed, then depress accelerator to maintain road speed.



**To shift from HI to LO speed** — Push axle shifter button down and hold accelerator down until you want to shift. Disengage and re-engage clutch as quickly as possible while holding accelerator down, or release and depress accelerator as quickly as possible without declutching.



### OPERATION

Decouple the engine (if equipped with an automatic transmission, shift to NEUTRAL) and move the lockout switch to the engaged position. Re-engage clutch and drive through the slippery area.

#### NOTE

An electric buzzer in the cab sounds continuously as long as the lockout is engaged. This is to remind the driver to release the lock as soon as normal traction is regained.

When driving conditions permit returning to normal, unlock power-divider drive, move the lockout switch back to the OUT (disengaged) position, and let up momentarily on the accelerator pedal to powershift out of locked position. Then drive as usual.

#### CAUTION

To avoid clash at the lockout sliding clutch and outer cam, under NO circumstances should the air-shift mechanism be activated while the drive wheels are actually slipping or spinning.

### OPERATION



#### Inter-Axle Power Divider (If Equipped)

A driver-controlled, air-shifted lockout is available so the MACK power divider can be rendered inoperative for short periods of poor traction, and then unlocked when normal traction returns. When the MACK sliding clutch lockout is engaged with mating teeth of the outer cam, both axles are locked together in positive through-drive for maximum traction with no differential action taking place between axles.

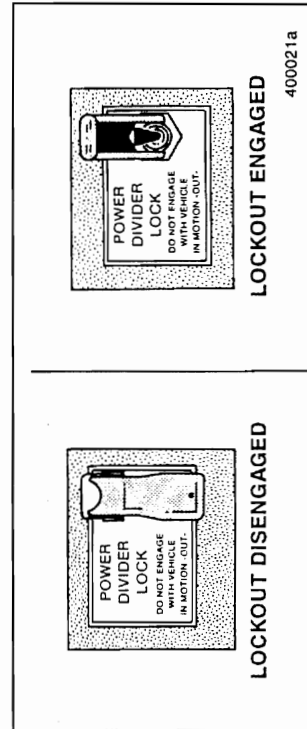
Normally, the driver-controlled, inter-axle power divider lockout control switch is in the OUT or unlocked position. On rare occasions, it is necessary to provide positive through-drive to both bogie axles for poor traction situations.

#### CAUTION

Stop the vehicle before actuating the air-shift range selector.

#### NOTE

The lockout should NOT be used on dry, hard surfaces.



# REED

CONCRETE PLACING  
EQUIPMENT

## MR SERIES MACK TRUCK

VENDR

FIGURE 01  
PAGE 49



### MAINTENANCE AND LUBRICATION

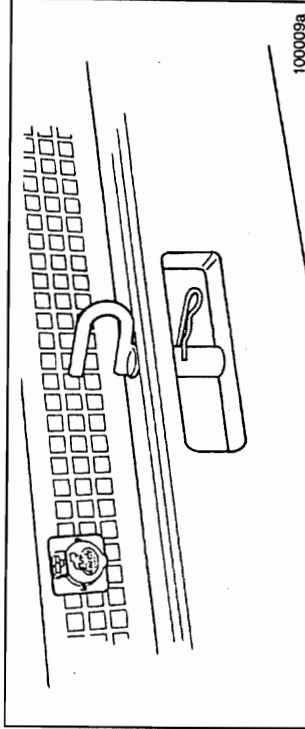
#### TOWING

There is one center-mounted tow pin located in the front bumper. The device meets the requirements set forth by The Maintenance Council (TMC) of the American Trucking Association. The tow pin may be used for towing a disabled vehicle from the immediate location.

If it is necessary to remove the tow pin, remove the retainer clip first. Once the retainer clip is pulled, the tow pin can be lifted out of the bumper hole.

#### CAUTION

*Do NOT lift and tow vehicle by tow pins, hooks, eyes, etc. If mired in heavy mud, snow, etc., use a suitable sling-type towing arrangement to move the truck.*



### MAINTENANCE AND LUBRICATION

#### MAINTENANCE INTRODUCTION

Preventive maintenance is vital to the life of your new MR. This section of the Operator's Handbook covers items of importance concerning the proper care of your new truck. A well-run maintenance and lubrication program is the best way of ensuring a long and productive life for your truck, as well as increased profitability and reduced maintenance costs for your business.

The operator plays an important role in the proper care of this equipment. By performing daily checks and observing the equipment while it is in operation, minor defects can be caught and corrected before they become major problems. Make sure any problems are corrected before putting the equipment into operation.

The service manager at your Mack Sales, Parts and Service Center knows your truck the best. Your satisfaction is his main concern. If you have any questions concerning the proper care, maintenance and lubrication of your MR, or if you need help in developing a preventive maintenance program, he will be glad to help.

#### NOTE

This handbook contains some maintenance information. Refer to TS494 for complete maintenance and lubrication procedures.

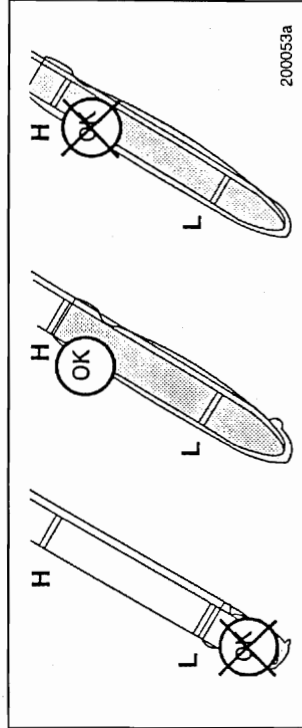


**MAINTENANCE AND LUBRICATION****ENGINE****Oil Level Check**

As the operator of this vehicle, it is important for you to perform the daily inspections necessary to keep your truck in good shape. Maintaining the proper oil level in your engine crankcase cannot be overemphasized.

Before checking the oil, remember these important points:

- Measurement of the oil level must be taken on level ground.
- If the engine has been running, allow about 15 minutes after shutdown for oil to drain down to the oil pan.
- The level must be close to the FULL line (at least between the ADD and FULL lines) on the dipstick, but must NOT exceed the FULL line (refer to illustration below).

**MAINTENANCE AND LUBRICATION****NOTE**

Use of tow pins, hooks, eyes, etc., is NOT intended for long-term wrecker pull of disabled vehicles.

**CAUTION**

*Failure to disconnect the driveline before towing or pushing the vehicle can cause serious transmission damage.*

Before towing or pushing the vehicle, the driveline should be disconnected or the drive wheels should be lifted off the ground.



**MAINTENANCE AND LUBRICATION**

When a winterfront is installed, a MACK-approved exhaust pyrometer must also be installed and closely monitored while the engine is in operation.

**CAUTION**

DO NOT exceed the maximum exhaust temperature listed on the pyrometer decal. To reduce exhaust temperature, open the winterfront, downshift or reduce engine power.

Maximum Ambient Air Temperature			
	Above 60°F (15.5° C)	60°F (15.5°C)	40°F (4.40°C)
MACK-Approved Winterfront	Not Recommended	Available*	Recommended
MACK-Approved Belly Tarp	Not Recommended	Not Recommended	Available*

\* Make sure that engine oil, coolant, transmission and pyrometer temperatures remain in normal operating range.

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**CAUTION**

Winter treatments are NOT RECOMMENDED for vehicles which only operate intermittently in cold climates.

**CAUTION**

Never operate a viscous fan with a closed or partially closed winterfront.



**MAINTENANCE AND LUBRICATION**

**COOLING SYSTEM**

The cooling system is a pressurized system. The coolant is circulated by a centrifugal pump. It is a typical system in most respects, but there are a few things to keep in mind when checking or working on the cooling system.

**WARNING**

Avoid injury when checking coolant in a hot engine. Wait for the engine to cool prior to checking the level, whenever possible.

**Winterfronts**

A MACK-approved winterfront, although not recommended for normal operation, may be used during cold weather to aid the engine in reaching and maintaining engine coolant temperatures within the normal operating range.

**CAUTION**

Use only a MACK-approved winterfront designed for the specific chassis. Restricted air flow through the charge air cooler can cause higher exhaust temperatures, power loss, excessive fan usage, reduced fuel economy and possible engine damage. The use of any other type of device, such as a radiator cover, cardboard or similar material, is not approved by Mack Trucks, Inc.

**NOTE**

The minimum operating temperature is 170°F (77°C).



### MAINTENANCE AND LUBRICATION

#### Draining

Whenever repairs are to be made which would require disconnection of coolant hoses, etc., the cooling system should be completely drained. Carefully remove the filler cap and open all coolant drain cocks.

#### Protecting Coolant System

#### CAUTION

*The concentration of ethylene glycol or propylene glycol in the cooling system must be checked with a refractometer prior to traveling or operating in areas where subfreezing temperatures may be encountered. When adding antifreeze to the system, run the engine for 20 minutes before checking with a hydrometer.*

#### NOTE

Your chassis is currently supplied from the factory with engine coolant protection to  $-10^{\circ}\text{F}$  ( $-23^{\circ}\text{C}$ ). Optional coolant protection to  $-40^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ) is also available.

Ethylene glycol or propylene glycol-based antifreezes are both approved for all MACK engines. All ethylene glycol and propylene glycol coolants must be low-silicate antifreezes which meet ASTM4985 test (GM6038M SPEC) criteria. These antifreezes are sometimes referred to as heavy-duty diesel coolants. Passenger car coolants do NOT meet this specification.

Be sure to maintain the required level of antifreeze protection for anticipated winter temperatures in your area of operation. A 40% to 60% concentration of antifreeze is required for E7 and E9 engines, regardless of application, geographic location or ambient air temperature.



### MAINTENANCE AND LUBRICATION

#### ON/OFF FAN CLUTCH

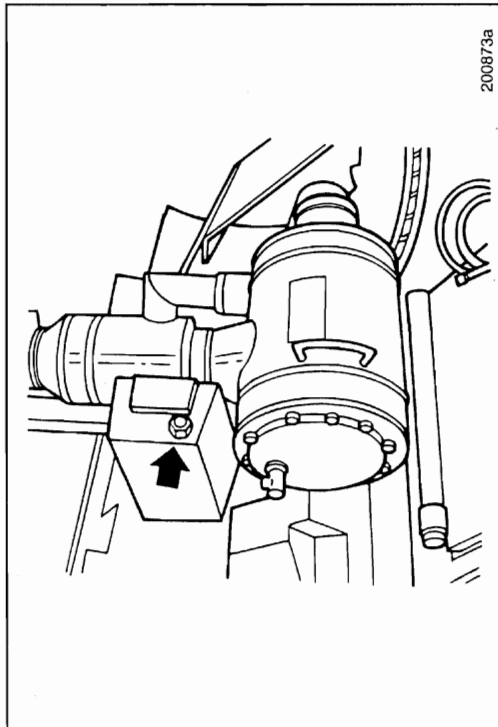
An ON/OFF fan clutch can help prevent excessive cooling during extremely cold weather operations. Whereas viscous fans often rotate continuously during cold weather, an ON/OFF fan clutch keeps the fan in the OFF position, thus reducing unnecessary air movement and helping to maintain adequate engine operating temperatures.

#### COOLANT LEVEL CHECK

#### WARNING

Turn the radiator cap counterclockwise to the first stop but do NOT depress. After the pressure has completely dissipated, press the cap downward and continue turning to remove.

The MR model chassis has an expansion tank located on the left-hand side of the chassis, mounted on the air cleaner assembly support bracket. Coolant should be visible in the sight glass located on the side of the tank.



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**MR SERIES MACK TRUCK****MAINTENANCE AND LUBRICATION****CAUTION**

Do NOT exceed a 60% concentration of antifreeze to water. A higher percentage of antifreeze will not increase protection. Concentrations over 60% adversely affect freeze protection and heat transfer rates.

**NOTE**

Propylene glycol should be checked with a refractometer.

**NOTE**

ALWAYS mix the water/antifreeze solution before pouring it into the cooling system.

**NOTE**

Piping arrangement may cause capacity variation depending on the type of cooling system and optional external cooling devices which may be attached. Therefore, it is difficult to tell exactly how much coolant it will take to fill any one particular system. As a general rule, fill to one inch below the bottom of the radiator filler neck.

**CAUTION**

Do NOT use coolant solutions which contain anti-leak additives in trucks equipped with coolant filters or conditioners.

**CAUTION**

Do NOT use soluble oil-type coolants in any MACK cooling system.

**Refilling**

Close all drain cocks and fill with the proper coolant mixture. Run engine with the radiator cap off until operating temperature is reached and the thermostat opens. Recheck level and add coolant, if required. Run the engine long enough to be sure the system is free of air and has the correct amount of coolant.

**Cooling System Maintenance**

The cooling system must be maintained by performing regularly scheduled maintenance as outlined in the MAINTENANCE AND LUBRICATION manual, TS494. Cold weather operations, however, place added demands on the cooling system. Prevent potential cold weather problems by performing a quick check of the cooling system as outlined below:

- Make a general check for cooling system leaks.
- Inspect hoses and clamps for leaks and condition. Tighten hose clamps to specifications (as required).
- Check coolant level. Add fresh coolant (in specified concentration) as necessary.
- Check and record degree of antifreeze concentration. Add antifreeze as necessary to obtain required protection level.



### MAINTENANCE AND LUBRICATION

#### Tires

#### **⚠ DANGER**

*Tires used on multipiece rims must be assembled and inflated only by experienced, qualified personnel. Tires must be inflated in a safety cage whenever possible. If, however, a safety cage is not available, use a portable lock-ring guard. The tire must be deflated prior to removal of the tire-and-rim assembly from the vehicle. Remove the valve core to ensure complete deflation.*

#### **⚠ DANGER**

*NEVER position your body in front of the rim during inflation.*

#### Inflation Pressure

In order to ensure maximum mileage and overall performance from your tires, it is essential that they operate at the correct inflation pressure for the load carried. Inflation pressure should be checked daily while the tires are cold. Always use an accurate tire pressure gauge. NEVER bleed air from a hot tire, as it will then be underinflated. Refer to the MAINTENANCE AND LUBRICATION manual, TS494 for a complete listing of tire inflation pressures, and for additional information concerning tire care.

#### **⚠ WARNING**

**UNDER NO CIRCUMSTANCES should you drive on underinflated or overloaded tires. A tire in this condition builds up excessive heat which can result in sudden tire destruction, property damage and personal injury.**

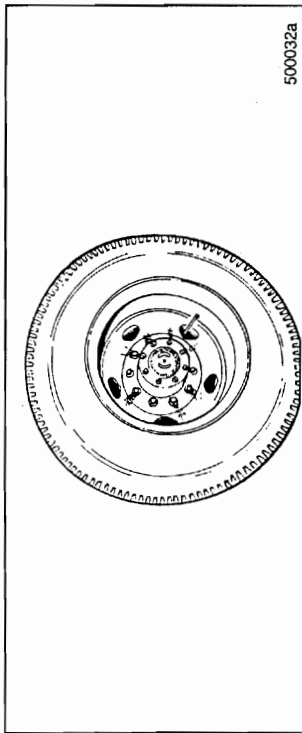


### MAINTENANCE AND LUBRICATION

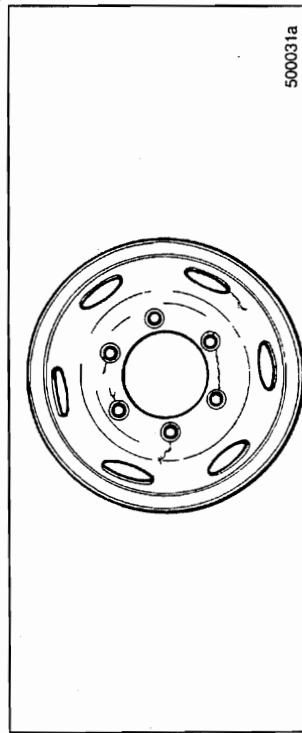
#### WHEELS

#### Wheel Inspection

Look at wheels and cap nuts. Inspect them for evidence of cap nut looseness. Rust streaks from the cap nut ball seat are an indication of looseness.



Look for cracks around the hand hole, stud hole and wheel. Look for broken studs, wheel damage or improperly seated lock rings.



**MAINTENANCE AND LUBRICATION****Oil Contamination of Tires**

Lubricating oils, fuel oil, gasoline and other petroleum derivatives, if allowed to contact tires, will soften the rubber and destroy the tire. Preventive maintenance is necessary to ensure that oil leakage does not occur. The following areas should be inspected on a regular basis:

- Axle end seals
- Engine seals
- Transmission seals
- Drive axle seals
- Oil filters
- Oil and hydraulic lines (if equipped)

**MAINTENANCE AND LUBRICATION****CAUTION**

*Never bleed air from your tires in an attempt to gain traction for a vehicle stuck in snow, ice or mud. This practice provides no additional traction and typically results in underinflated tires. Never bleed air from a hot tire since that tire will then be underinflated.*

To adjust for pressure fluctuations induced by temperature changes associated with winter weather, it is recommended that tire inflation pressure be checked daily when the tires are cold (i.e., before the vehicle is driven). Always use an accurate tire pressure gauge.

**Inspection**

Inspect your tires daily. Look for bulges, cracks, cuts, penetrations and/or oil contamination. If any such damage is found, the tire must be thoroughly inspected by a qualified tire inspector and repaired or discarded immediately, at his discretion. Also, check for uneven wear. If found, a thorough inspection of front end parts and alignment should be made by a qualified mechanic.

**Tire Manufacturer's Data Book**

Specific and more detailed information can be obtained by referring to the technical data books provided by each tire manufacturer.

Subjects of interest are:

- High-speed or low-speed operation
- Repair, retreading and regrooving
- Use of tire chains
- Mixing radial and bias tires on the same vehicle
- Use of dynamometers
- Tire mounting/dismounting

**MAINTENANCE AND LUBRICATION****ELECTRICAL****Circuit Protection**

The circuit protection panel is located to the left of the passenger seat (on the engine tunnel). Remove the fasteners and the circuit board will be exposed.

Fuses are standard equipment for all circuits except the headlamps and windshield wipers. Circuit breakers are available as optional equipment.

**CAUTION**

*For proper installation of electrical accessories, all wiring should meet SAE requirements and be routed through the circuit protection panel with proper amperage fuses or Type II circuit breakers. (Headlights and wipers will be on Type I, cycling-type circuit breakers.)*

Some vehicles may be equipped with daytime running lights. For the daytime running lights to be operational, a DRL module must be installed in the relay socket marked either "DRL MOD" or "Running Lamps" on the electrical equipment panel. Do NOT install a standard relay into the daytime running light relay socket (marked either "DRL MOD" or "Running Lamps") or a short circuit in the headlight high beam circuit will result.

The headlight circuits are protected by SAE Type I (automatic reset-cycling) circuit breakers that automatically interrupt then restore the flow of current through the circuit in the event of an overload. This cycling will continue until the cause of the overload is repaired.

SAE Type II (automatic reset, non-cycling) circuit breakers (if equipped) provide a complete circuit disconnect until the overload is corrected. The power to the affected circuit breaker must be shut off before the circuit breaker will reset itself.

The circuit protection panel also provides access to battery, ignition and ground terminals for non-factory installed electronic equipment. (On V-MAC chassis, there are two serial link terminals for easy local connection of a trip recording device.)

**MAINTENANCE AND LUBRICATION****BATTERY****Jump-Starting Engine**

If you encounter a situation in which it is necessary to jump-start an engine, use the following procedures.

**WARNING**

Batteries which are to be linked together must be of the same voltage (12 to 12, 24 to 24). Batteries produce explosive gasses. Keep sparks, flames, cigarettes, etc., away from batteries at all times. Protect your eyes by wearing safety goggles. Be sure vehicles are NOT touching each other.

1. Connect positive (+) cable to positive (+) post of discharged battery.
2. Connect the other end of the same cable to the positive (+) post of the booster battery.
3. Connect the second cable, negative (-) side, to the other post of the booster battery.
4. Make the final connection on the engine block of the stalled vehicle AWAY FROM THE BATTERY, and stand back.
5. Start the vehicle with the booster batteries and then start the stalled vehicle. Shut down the vehicle with the booster batteries and remove the cables in the reverse order of connection.

**WARNING**

Do NOT connect the final negative (-) connection to the frame of the stalled vehicle. This would cause all current to flow through the master ground circuit breaker resulting in overload.

### MAINTENANCE AND LUBRICATION



#### Bulb Chart

Light (Some lights may not be available on certain models)	Quantity (Varies with model)	CP/Watt	Trade No.
ABC Gauge Panel Cluster Lights	26	1.0CP	#161
Gauge Panel D	2	1.0CP	#161
Dome and Door Courtesy Light	2/3	12.0CP	#561
Map Light	1	3.0CP	#1816
Heater and Air Conditioner	1	1.0CP	#184
Clearance & Cab ID Marker (Standard)	5/7	3.0CP	#168
Clearance & Cab ID Marker (Premium)	5	4.0CP	#904
Side Turn Indicator	2	32.0CP	#570
Hook-Up Light	1	35W/600CP	#4406
Fog Light	2	55W	#H3
Headlight, Incandescent (Round)	2	60W/50W	#6015
Headlight, Halogen (Round)	2	65W/35W	#H6024
Headlight, Halogen (Rectangular)	2	65W/45W	#9004
Rear Tail Light Backup	2	32.0CP	#1156
Rear Stop, Tail and Turn Light	2	32.0/3.0CP	#1157
Front Turn Light	2	32.0/3.0CP	#3057

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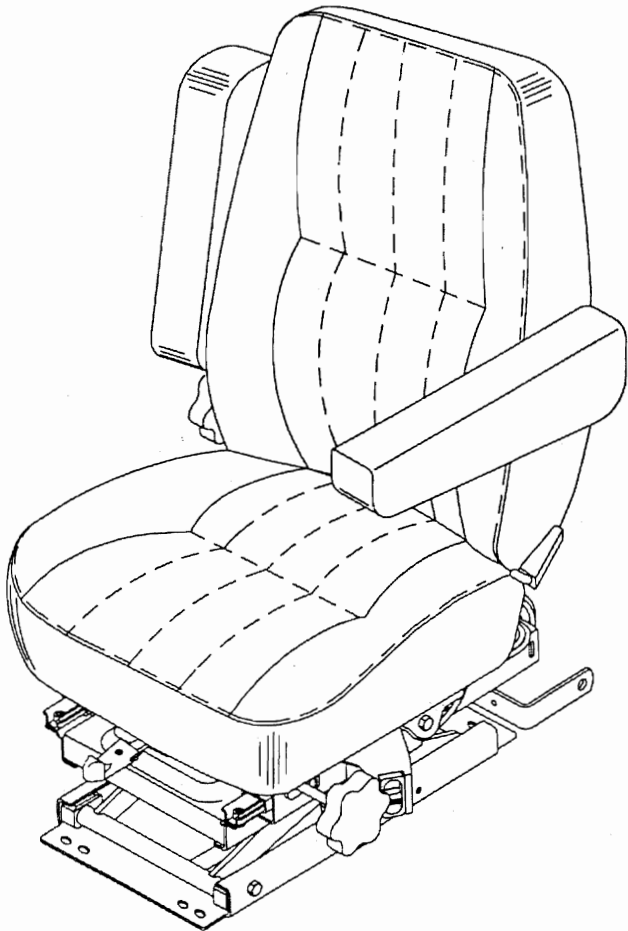
To prevent corrosion of the lamp socket terminals, particularly with the clearance and marker lamps, apply a coating of electrical sealing grease, such as Lubriplate DS-EX, to the socket and terminal assemblies.

**CAUTION**

Do not use electrical grease on any V-MAC connectors.



**Bostrom**<sup>®</sup>  
S E A T I N G



**TALLADEGA**<sup>TM</sup>  
SERIES  
905L/905/910  
AIR SUSPENSION SEATS

# REED

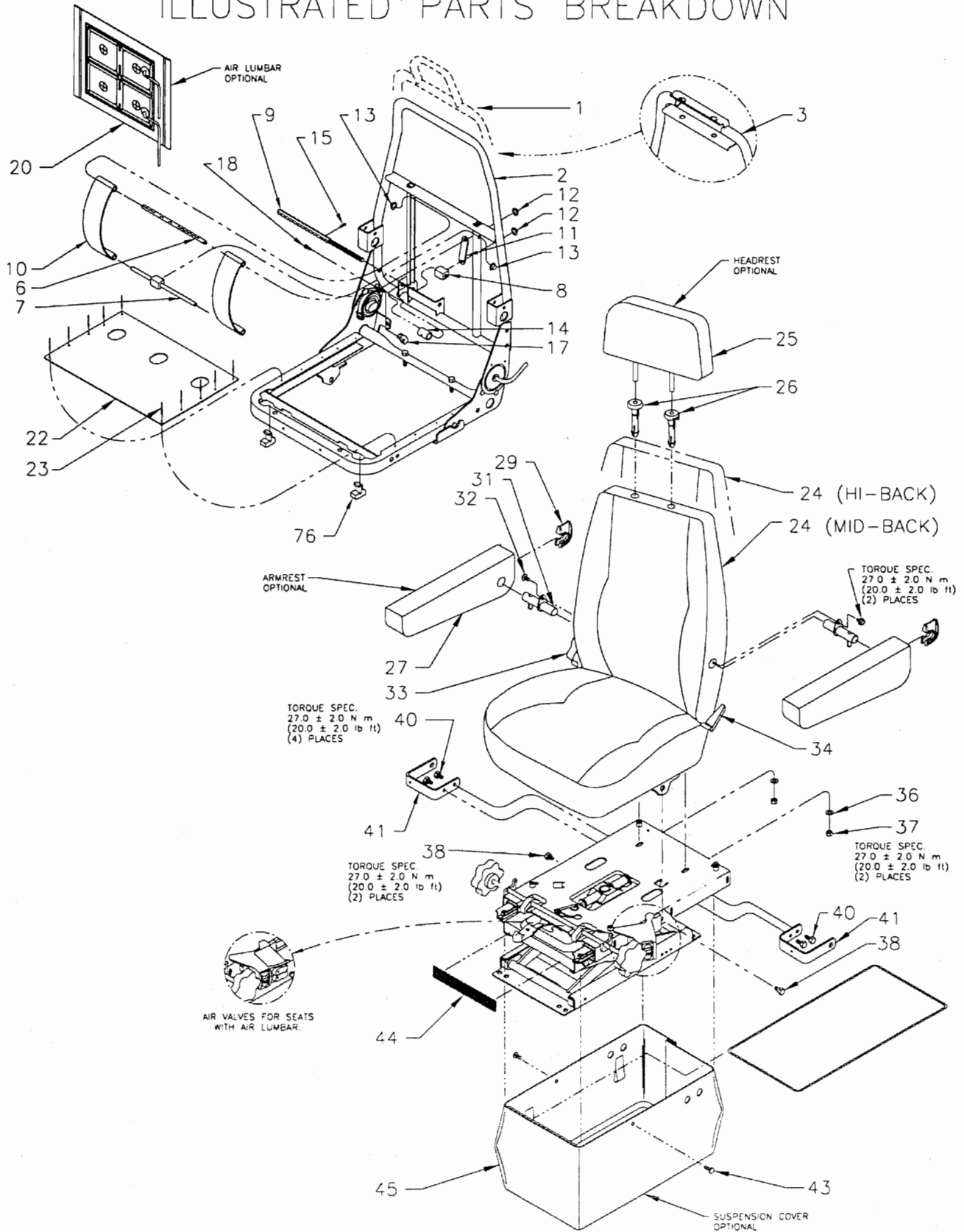
CONCRETE PLACING  
EQUIPMENT

## BOSTROM AIR SUSPENSION SEAT TALLADEGA SERIES

VENDR

FIGURE 02  
PAGE 02

### ILLUSTRATED PARTS BREAKDOWN



REVISION:



# BOSTROM AIR SUSPENSION SEAT TALLADEGA SERIES

VENDR

FIGURE 02  
PAGE 03

## PARTS REPLACEMENT LIST LOW PROFILE SUSPENSION SEAT

**ORDERING INSTRUCTIONS:** Order by Part Number, NOT Reference Number.

**HOW TO USE:** Find the corresponding part that you wish to replace on the exploded view illustration and note its reference number. Refer to list below and record part number, quantity required and description. Order cover pad kits or armrests by color and material.

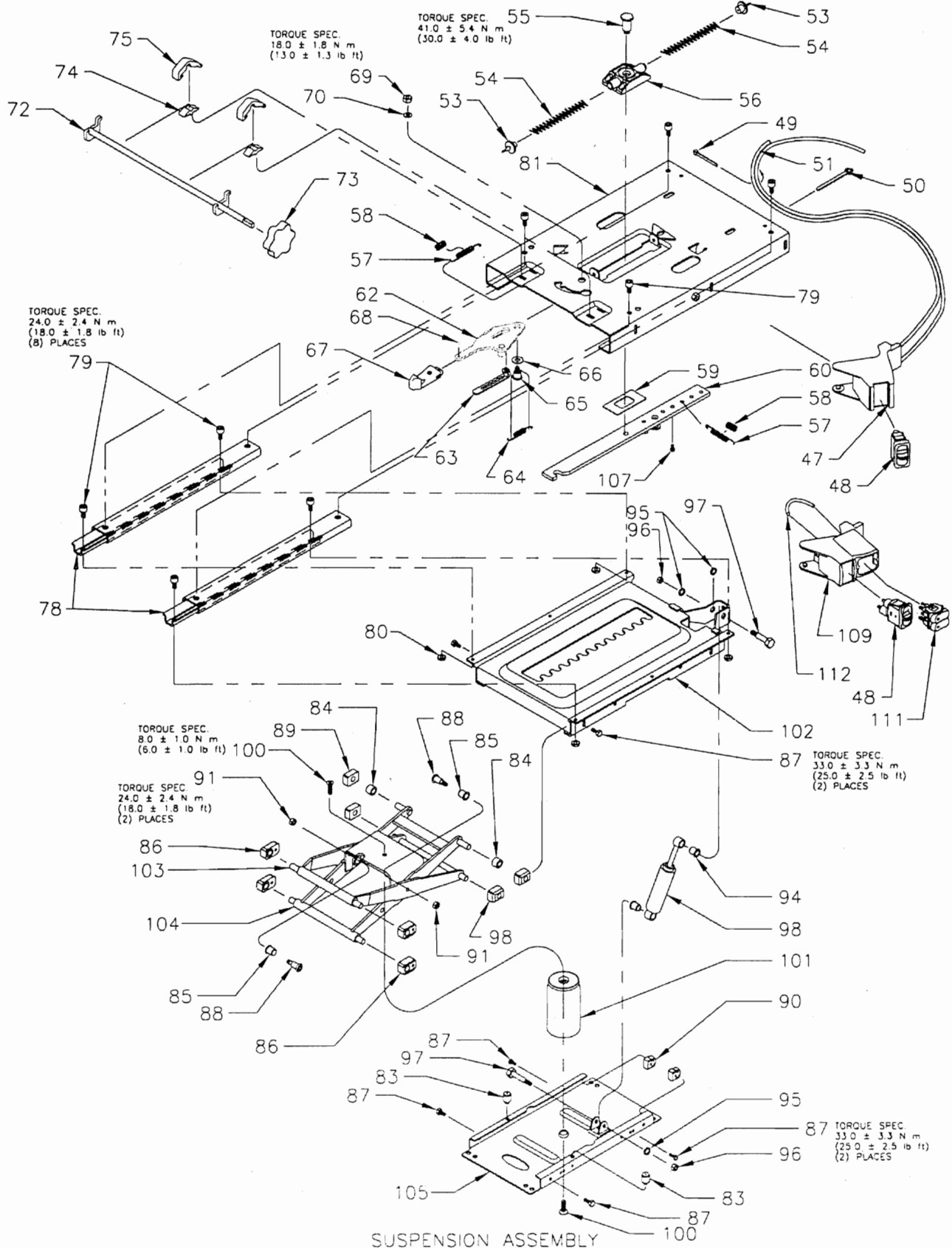
**ORDER FROM:** Your truck dealer or Bostrom Authorized Distributor for your area.

REF NO	PART NO	DESCRIPTION	QTY	REF NO	PART NO	DESCRIPTION	QTY
1	6200906-001	Frame Assy. - High Back		35	6222007-001	Kit Fastener Mounting	
2	6200908-001	Frame Assy. - Mid Back		36	*	Washer Flat	2
3	6201118-001	Frame w/Headrest		37	*	Nut M8 x 1.25	2
4	6201316-001	Frame w/Air Lumbar		38	*	Shoulder Bolt M8	2
5	6222137-001	Lumbar Kit		39	6222005-001	ICP Bracket Kit	
6	*	Lumbar Support Shaft	1	40	*	Bolts	4
7	*	Lumbar Slide Shaft	1	41	*	ICP Bracket	2
8	*	Lumbar Adj. Block	1	42	**	Suspension Cover Kit	
9	*	Lumbar Adj. Shaft	1	43	*	Fastener	2
10	*	Lumbar Spring	2	44	*	Velcro	1
11	*	Lumbar Linkage	1	45	*	Suspension Cover	1
12	*	Push Nut 5/16"	2	46	6222155-001	Air Valve Kit	
13	*	Push Nut 3/8"	2	47	*	Valve Mounting Pod	1
14	*	Spacer	1	48	*	Air Valve	1
15	*	Roll Pin	1	49	*	Wire Tie 3"	3
16	6107030-001	Back Restriction Kit		50	*	Wire Tie 6"	1
17	*	Stop Block	1	51	*	Air Line	
18	*	Screw 10-32	1	52	6222133-001	Isolator Spring Kit	
19	6222141-001	Lumbar Kit (Air)		53	*	Rubber Bumper	2
20	*	Lumbar Bladder	1	54	*	Isolator Spring	2
21	6222157-001	Pan - Support Kit		55	*	Shoulder Bolt M10 x 1.50	1
22	*	Pan	1	56	*	Pivot Block Assy.	1
23	*	Rivets	10	57	*	Latch Spring	2
24	**	Upper or Cover Pad Kit		58	*	Split Poly Loom	2
25	**	Headrest		59	*	Spacer	1
26	6201133-001	Grommet	2	60	*	Latch Bar	1
27	**	Armrest Assy.		61	6222134-001	Control Handle Kit	
28	6222159-001	Kit Armrest Insert		62	*	Control Handle Assy.	1
29	*	Insert	1	63	*	Detent Pin Assy.	1
30	6222160-001	Kit Armrest Bracket		64	*	Spring Lockout	1
31	*	Screw 5/16 x 1/2 Hex Tap	1	65	*	Hex Head - Shoulder	1
32	*	Armrest Shaft	1	66	*	Washer	1
33	6200413-002	Lumbar Knob	1	67	*	Isolator Knob	1
34	6103653-003	Recliner Handle	1	68	*	Pop Rivet	1

REVISION:

## BOSTROM AIR SUSPENSION SEAT TALLADEGA SERIES

### ILLUSTRATED PARTS BREAKDOWN



SUSPENSION ASSEMBLY

**BOSTROM AIR SUSPENSION SEAT  
TALLADEGA SERIES****PARTS REPLACEMENT LIST  
LOW PROFILE SUSPENSION SEAT  
CONTINUED**

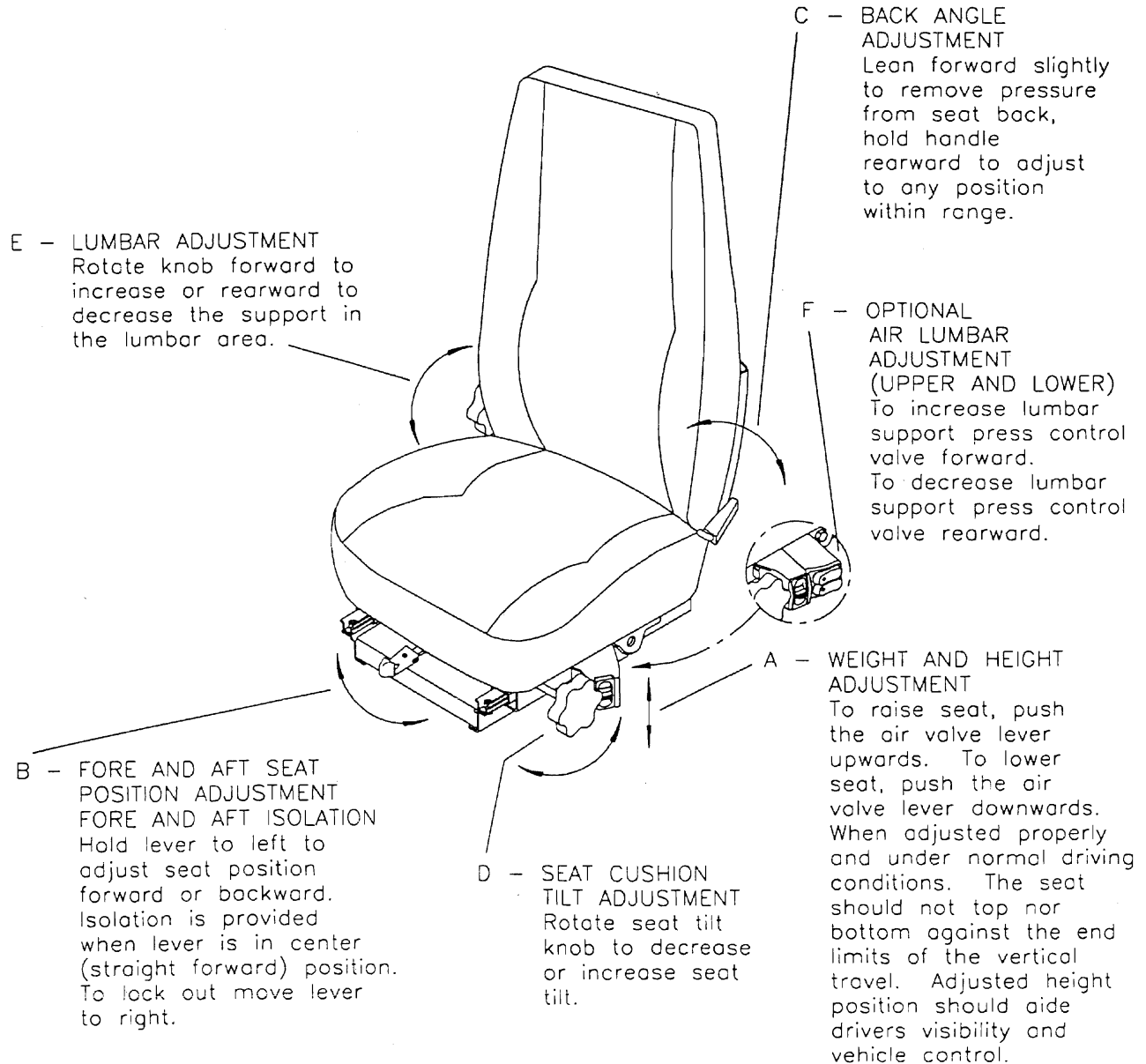
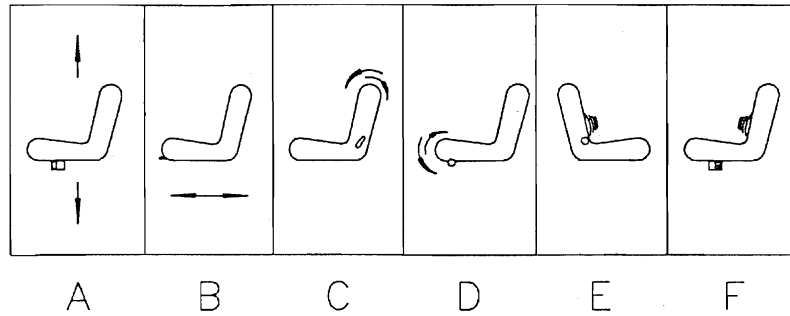
REF NO	PART NO	DESCRIPTION	QTY	REF NO	PART NO	DESCRIPTION	QTY
69	*	Hex Nut M8 x 1.25 LK	1	92	6222078-001	Low Profile Damper Kit	
70	*	Washer	1	93	6222079-001	Heavy Duty Damper Kit	
71	6222135-001	Seat Tilt Replacement		94	*	Bearing Multilube	2
72	*	Tilt Rod Weldment	1	95	*	Washer Flat	2
73	*	Tilt Knob	1	96	*	Hex Nut	2
74	*	Bracket Tilt Rod	2	97	*	Bolt	2
75	*	Bracket Tilt Rod	2	98	*	Standard Damper	1
76	*	Slide Block Seat Tilt	2	99	6222084-001	Air Spring Kit	
77	6222165-001	Slide Rail Kit		100	*	Screw	2
78	*	Slide Rail	2	101	*	Air Spring Assy.	1
79	*	Screws	8	102	6201571-001	Upper Plate Weldment	1
80	*	Nuts	4	103	6065662-002	Outer Lever Assy.	1
81	6200641-004	Isolator Assy.		104	6106528-002	Inner Lever Assy.	1
82	6222076-001	Susp. Hardware Kit		105	6111111-001	Base Assy.	1
83	*	Rubber Bumper	2	106	6222138-001	Fore/Aft Restriction	
84	*	Spacer Roller	2	107	*	Restrictor Screw	1
85	*	Bearing Multilube	2	108	6222163-001	Air Valve Kit Assy.	
86	*	Bearing Block	4	109	*	Pod	1
87	*	Screw Cap M8 x 20mm	6	110	*	Air Lumbar Valve	1
88	*	Bolt Shoulder M8 x 1.25	2	111	*	Air Valve	1
89	*	Block Slide	4	112	*	Jumper Loop	1
90	*	Stop Block Assy.	2				
91	*	Nut Hex M8 x 1.25 LK	2				

\* EXCEPT AS NOTED, KITS CONTAIN ALL ITEMS DENOTED BY ASTERISK LISTED BELOW EACH KIT PART NUMBER.

\*\* SEE YOUR DEALER OR BOSTROM AUTHORIZED DISTRIBUTOR FOR UPPER, ARMREST, SUSPENSION COVER OR COVER PAD KIT PART NUMBERS APPROPRIATE FOR YOUR SEAT.

**COMFORT ADJUSTMENTS**

After installation the following comfort adjustments can be made to ensure the best performance.



**REMOVAL / REASSEMBLY****Air Spring Assembly (101)  
Removal/Reassembly**

Remove complete seat assembly from vehicle.

1. Fill air spring assembly (101) so that seat is at maximum height (see comfort adjustments).
2. Block suspension up with a spacer placed between the base riser (105) and the upper frame (102).
3. Release air pressure from air spring so that seat is supported by spacer (see comfort adjustments).
4. Disconnect air line (51) from air spring assembly (101) by loosening air fitting and pulling air line out of fitting.
5. Remove top and bottom screw from air spring (101) and remove air spring assembly from suspension assembly.
6. Position air spring so that fitting at bottom of air spring (101) is toward the front of the seat. Install screw (100) into bottom of air spring (101).
7. Torque screw (100) at bottom of air spring assembly (101) to 10.0 +/- 1.0 ft.-lbs.
8. Install screw (100) at top of air spring assembly (101) and torque to 6.0 +/- 1.0 ft.-lbs.
9. Reconnect air line (51) to fitting in air spring assembly (101) by pushing air line into fitting and tightening fitting.
10. Fill air spring assembly (101) (see comfort adjustment) and remove spacer block.

**Damper Replacement (98)**

Seat need not be removed from truck.

1. Be sure suspension is at maximum height. Add air if needed (see comfort adjustment).
2. Move channel assembly (81) to full frontward position to gain working room.
3. Remove shoulder bolts (97) and hex nuts (96).
4. Remove damper assembly.
5. Install new damper with flanges of bearings to the outside of the suspension. Add thrust washers (95) and install shoulder bolts (97) and hex nuts (96).

**Slide Rail (77) Replacement**

1. Remove seat/back assembly (24). NOTE: See Seat/Back Assembly Removal/Reassembly procedure.
2. Once seat/back is removed, slide channel assembly (81) to the rear. Remove front screws (79) and nuts (80). Carefully, move channel assembly (81) to the front. Remove screws (79) and nuts (80).
3. Remove top screws (79).
4. Remove and install one slide rail (78) at a time.
5. Install new screws (79) and nuts (80).
6. Reassemble seat/back assembly (24).

**REMOVAL / REASSEMBLY****Suspension Rebuild Bearing/Slide Block Replacement**

1. Bleed all air from supply line. Disconnect air supply line to seat. Using air valve, exhaust all air from air spring. Remove complete seat assembly from vehicle.
2. Remove seat/back assembly (24) from suspension per procedures shown.
3. If seat assembly has a suspension cover (45), remove along with fasteners (43), after removing ICP bracket (41) and cap screws (40).
4. Block suspension up with a spacer placed between the base riser (105) and the upper frame (102).
5. Disconnect air line (51) from air spring assembly (101) by loosening air fitting and pulling air line (51) out of fitting.
6. Remove top and bottom screw from air spring (101) and remove air spring assembly from suspension assembly.
7. Remove damper assembly (98) by removing shoulder bolts (97) nuts (96) and washers (95) (see procedure for damper replacement).
8. Remove cap screws (87) from upper front bearing blocks (86) and lower rear stop block assemblies (90).
9. Remove upper plate weldment (102) by lifting and sliding it forward until bearing blocks (86) can be removed from cutouts in channels on upper frame (102). Then slide channel rearward until slide blocks (89) can be removed. Be careful not to pinch fingers in lever assembly.
10. Remove cap screws (87) from lower front bearing blocks (86) and slide lever assemblies (103 and 104) forward until bearing blocks (87) are removed from channel on base (105). Then slide lever assemblies rearward until slide blocks (89) are removed from channel. Be careful not to pinch fingers in lever assemblies.
11. Remove shoulder bolts (88) and nuts (91) from pivots of lever assemblies (103 and 104) and inspect. Replace if worn.
12. Replace bearings (85) at pivots on lever assembly (104) by pushing the old out and pressing in new. Flange of bearings (85) should be on outside of lever assembly (104).
13. Reassemble reverse order. Torque pivot shoulder bolts (88) to 20.0 +/- 2 ft.-lbs.
14. Put new bearing blocks (86) and slide blocks (89) on levers with beveled surfaces outward and slide levers with blocks into channel on base riser (105). Torque screws (87) to 30.0 +/- 3.0 ft.-lbs.
15. After putting bearing blocks (86), spacers (85) and slide blocks (89) on levers, slide upper frame assembly (102) over blocks. Line up screws (88) with bearing blocks (86) and torque screws (87) to 30.0 +/- 3.0 ft.-lbs.
16. Manually move suspension up and down to make sure there are no clearance problems. Be careful not to pinch fingers in linkage.
17. Block up suspension and reinstall air spring assembly (101). Torque upper screw (100) to 6.0 +/- 1.0 ft.-lbs. and lower screw (100) to 10.0 +/- 1.0 ft.-lbs. (see procedure shown for air spring reassembly).
18. Reinstall damper assembly (98) with washer (95) and nuts (96) (see procedure for damper replacement).
19. Reinstall suspension cover (45) and ICP brackets (41) if removed (see step #3).
20. Install assembly (24).

**Seat/Back Assembly (24)  
Removal/Reassembly**

1. Adjust the seat upper to most rearward position and remove two nuts (37) and flat washers (36) from underside of channel assembly (81).
2. Remove two shoulder bolts (38) from channel assembly (81).
3. Reverse procedure to reassemble.

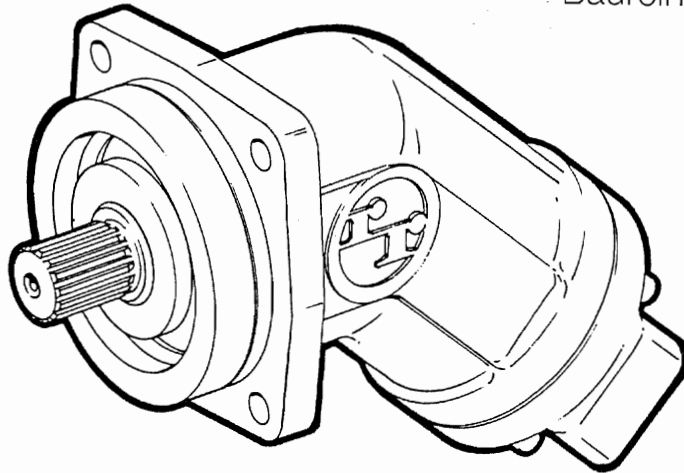


**REED**CONCRETE PLACING  
EQUIPMENT**REXROTH A2F HYDRAULIC PUMP MOTOR**

VENDR

FIGURE 03  
PAGE 01**A2F**

Baureihe/Series 6.1

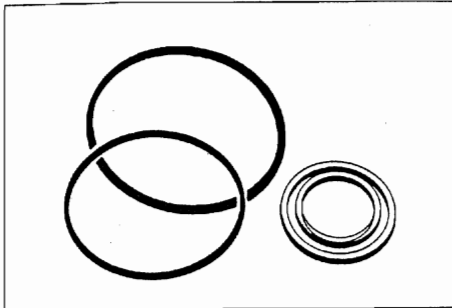
**NOTE**

Pretested and preassembled Original-Hydrumatik-subassemblies make quick and successful repairs possible. Should it be necessary to carry out repairs with individual components, our experience shows that only Original-Hydrumatik-seals, retaining rings, and bearings should be used. Basically, these should be changed when ever a unit is stripped down, as useful life still remaining cannot be visually determined. In addition, it would be dissapointing to spoil a well done repair by including marginally cheaper components. Giving us the unit type and fabrication number when ordering components will mean that you receive them quickly. Repairs are simple, but we recommend you take advantage of our training in order to acquire the necessary special knowledge. This applies also to specialists whom we ale always pleased to meed again to explain the repair of newly developed products.

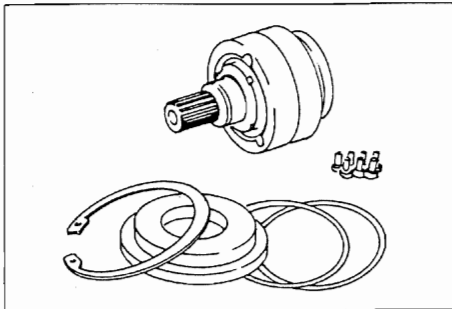
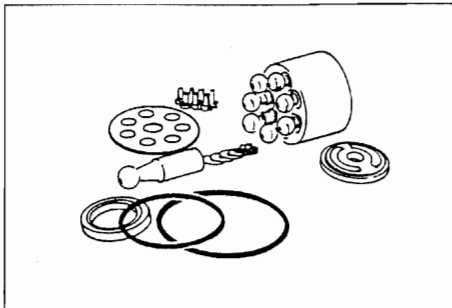
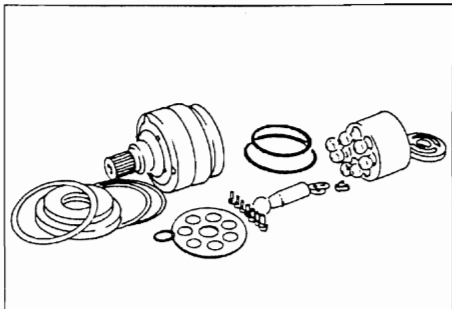
**MANNESMANN  
REXROTH**

Hydrumatik GmbH

**R**



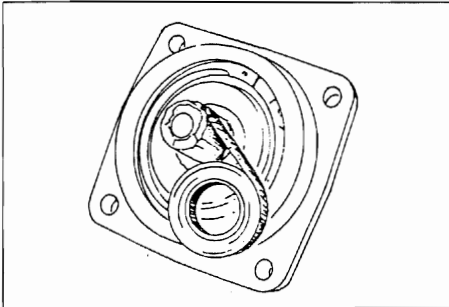
External seals

Rotary group, mechanical part; with sealkit,  
completely adjusted.Rotary group, hydraulic part; with sealkit,  
completely adjusted.Rotary group, complete; with sealkit, completely  
adjusted.

## C O N T E N T S

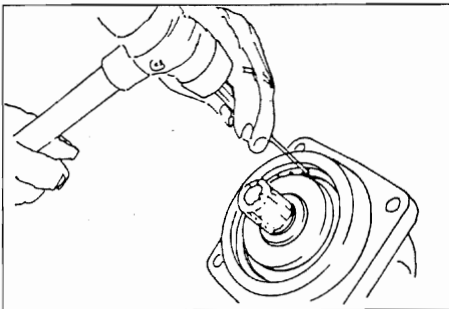
Seal sets/Sub-assemblies  
Notes/Section  
Drive Shaft/Seal  
Cover Plate/Seals  
Removal of rotary group  
Examination (notes)  
Installing rotary group  
Special equipment/Torques

## Shaft seals



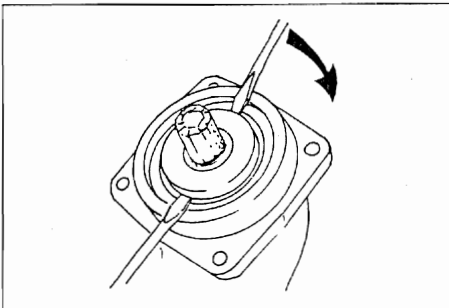
1

Remove protective cover. If keyed shaft, remove key.



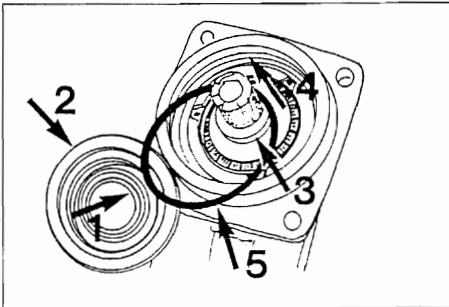
2

Free circlip and remove.



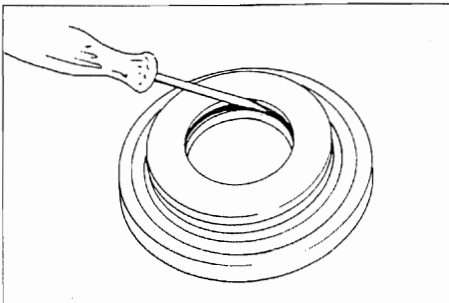
3

Pry off front cover.



4

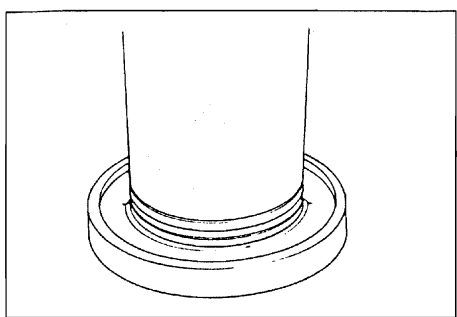
Visual check  
Shaft seal (1), Cover (2), drive shaft (3),  
housing (4), O-ring (5).



5

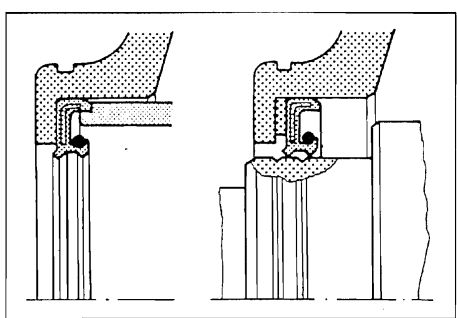
Remove old shaft seal.

Shaft seals



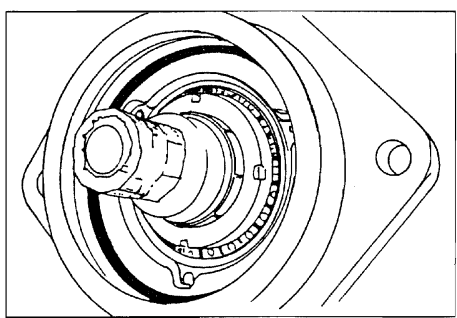
6

Press in the shaft seal ring to the correct position with a suitable sleeve.



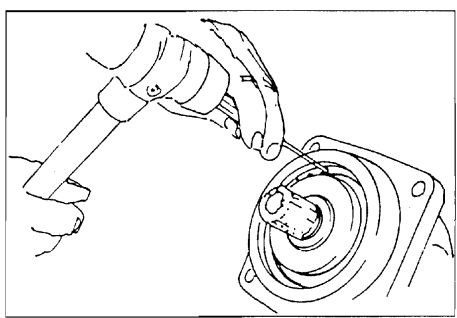
7

If the shaft is deeply grooved, insert shim behind seal.



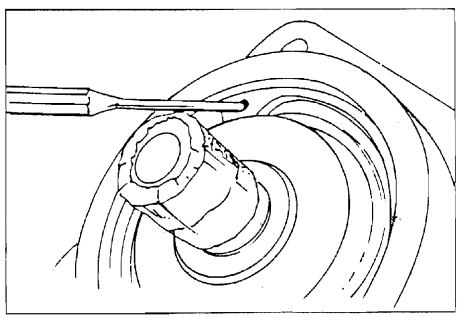
8

Fit new O-ring, ensure it is a snug fit. Grease O-ring and lips of shaft seal.



9

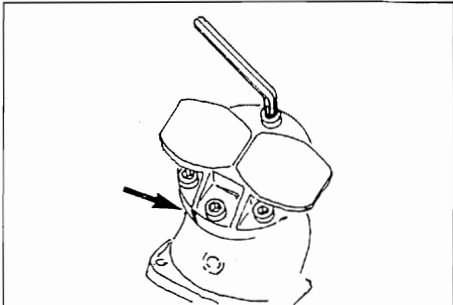
Fit circlip using a punch.



10

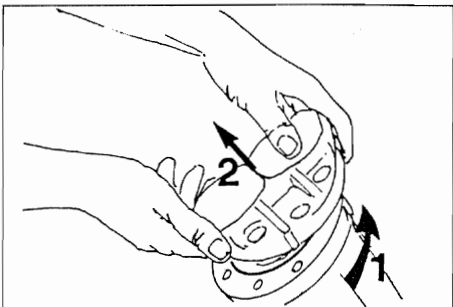
Check that circlip is well seated.

Cover plate/seals



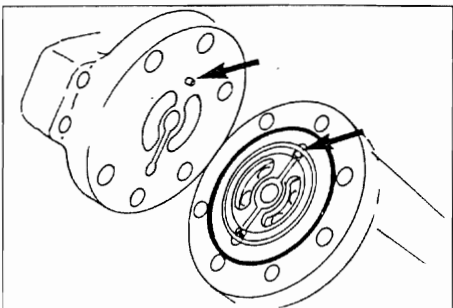
11

Mark position of cover plate (arrowed). Remove screws.



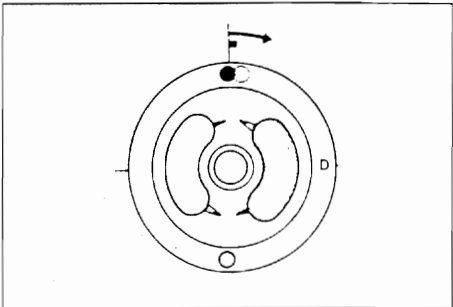
12

Swivel port plate on locating pin and lift off.



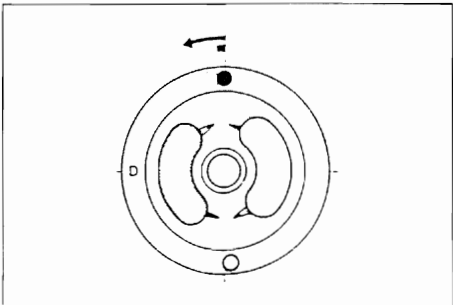
13

Note position of locating pin. (arrow).



14

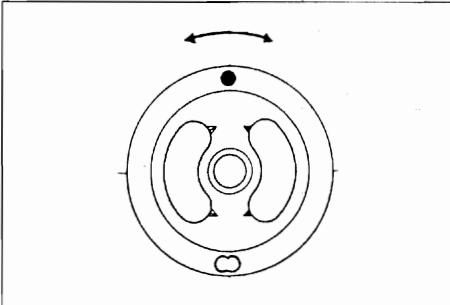
Pump, clockwise rotation. (Viewed on spherical surface.)



15

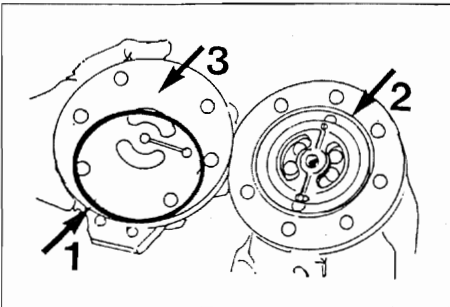
Pump, anti-clockwise rotation. (Viewed on spherical surface.)

## Cover plate/seals



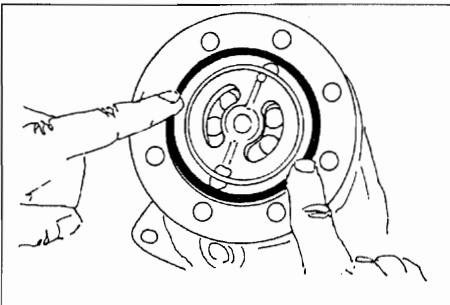
16

Motor, bi-directional. (Viewed on spherical surface.)



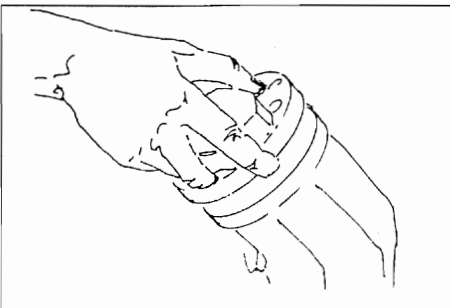
17

Visual check  
O-ring (1), Groove (2), Plate (3).



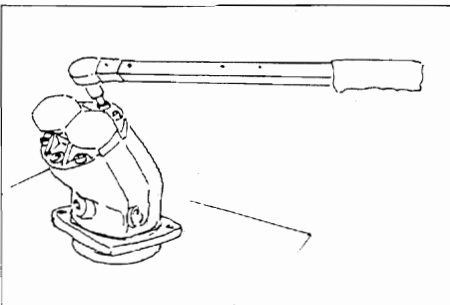
18

Lightly grease and fit O-ring.



19

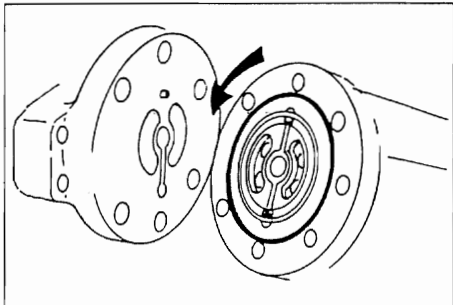
Assemble port plate to original mark (11), noting position of port plate (14-16). See notes fitting control plate.



20

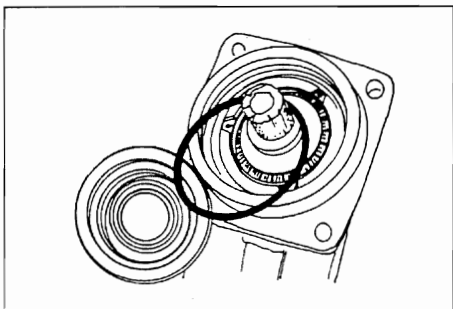
Tighten screws using torque wrench. See p. 14 for setting.

Removal of rotary group



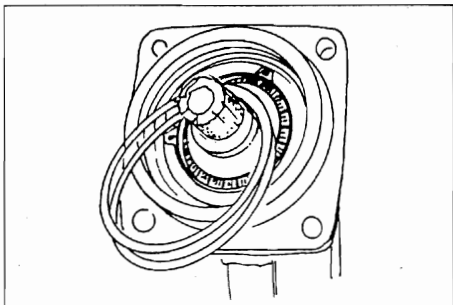
21

Remove cover plate (page 6). Rotate control plate to remove.



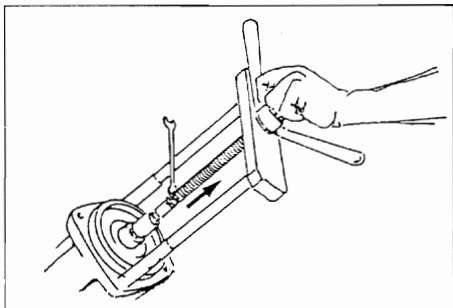
22

Remove front cover (page 4).



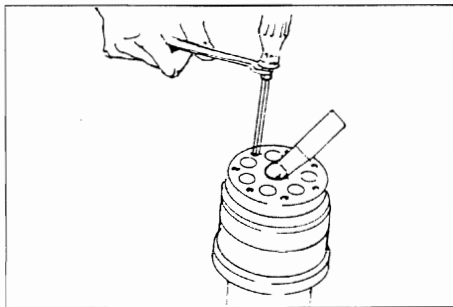
23

Remove shim(s).



24

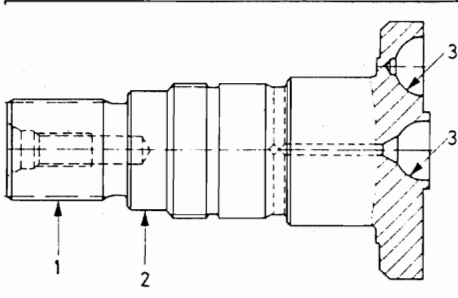
Remove rotary group with extractor. (See fig. 50).



25

Remove retaining plate. The screws are held by loctite.

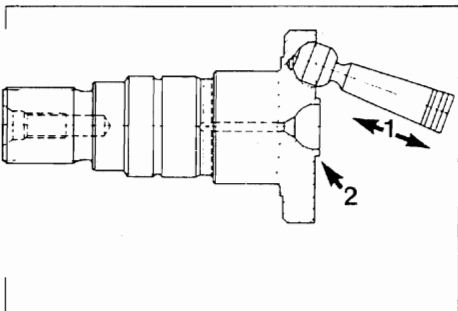
## Examination notes



26

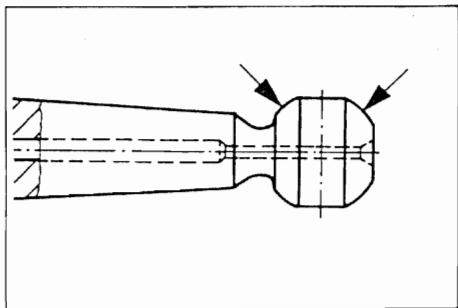
## Drive shaft

- 1.) Free of corrosion or erosion, no damage to splines or keyway.
- 2.) No trace of wear, free of scratches (p. 7).
- 3.) Cups free of scratches and no pitting.



27

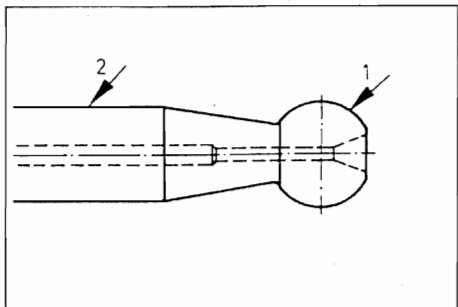
- 1.) Axial play of piston.
- 2.) Spigot.



28

## Piston

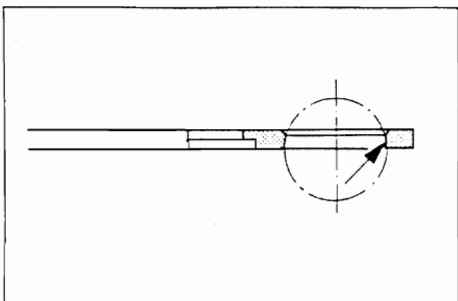
- Free of scratches, no pitting (do not dismantle - tilt).



29

## Centre pin

- 1.) Free of scratches, no pitting (do not dismantle - tilt).
- 2.) Free of scratches.



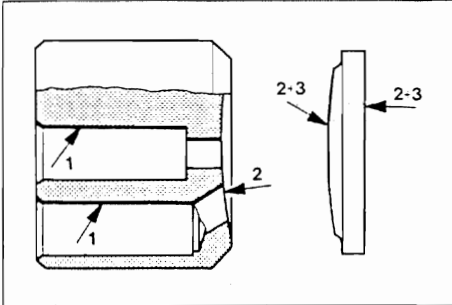
30

## Retaining plate

- Free of scratches, no wear.



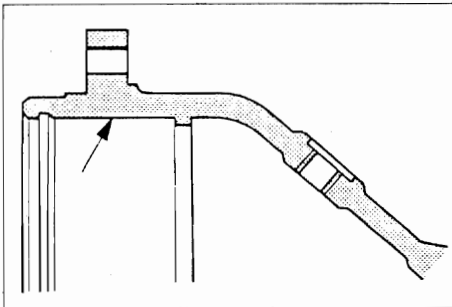
## Examination notes



31

Cylinder block/Control plate

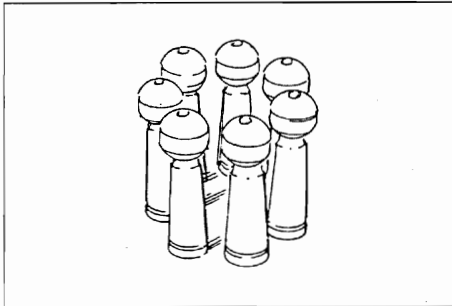
- 1.) Bores unscratched, and not worn.
- 2.) Faces, smooth and even, no cracks or scratches.
- 3.) Min. hardness 700 HV 10.



32

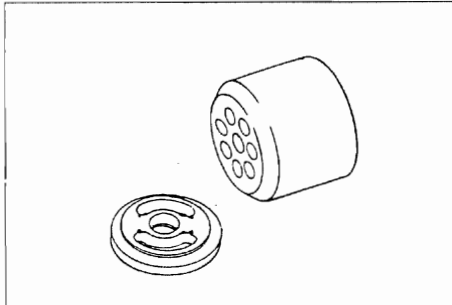
Housing

No damage or wear where bearings fit.



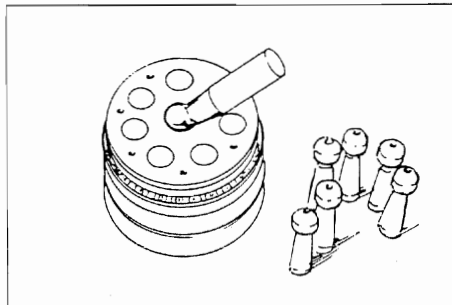
33

Only exchange piston as a complete set. When changing other components, re-calibration is required.



34

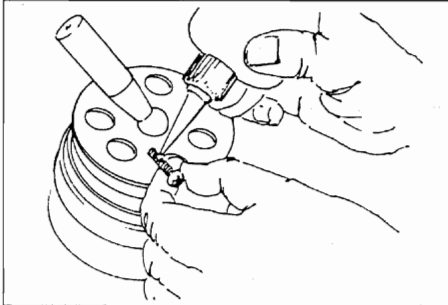
Exchange cylinder block and control plate as a pair.



35

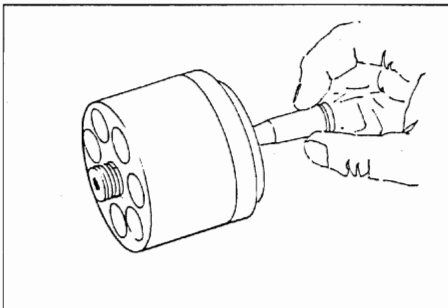
Insert centre pin with retaining ring.  
Correctly fit retaining plate.

## Installing rotary group



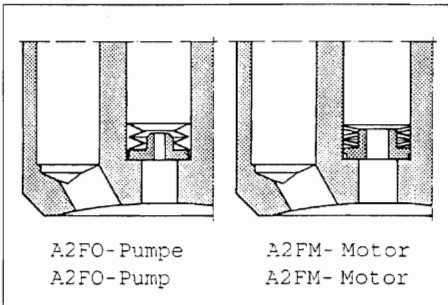
36

Apply loctite sparingly to screws only.



37

Heavily grease and fit spring pad and Belleville washers (using screwdriver).



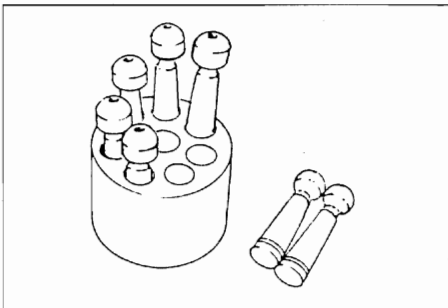
38

Make sure all parts are fitted in correctly!

Note:

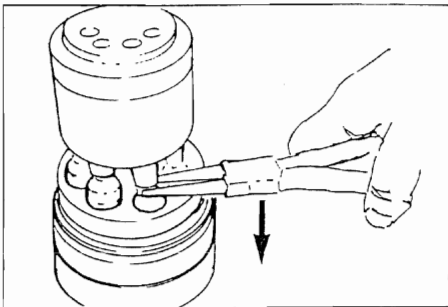
A2FO - Pump- 4 Belleville washers/ Spring pad

A2FM - Motor- 6 Belleville washers/ Spring pad



39

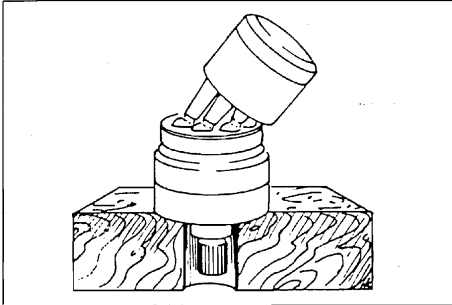
Fit pistons in bores.



40

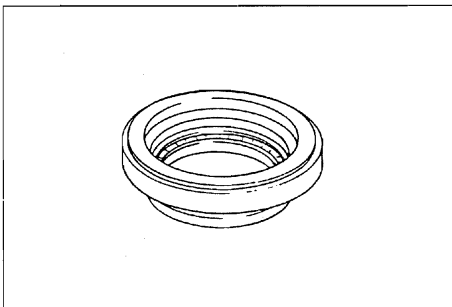
Press pistons firmly into cups with cylinder block held in central position.

Installing rotary group



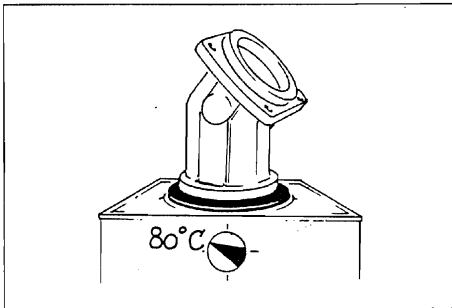
41

Swivel cylinder block to max. It fouling occurs fig. 40.



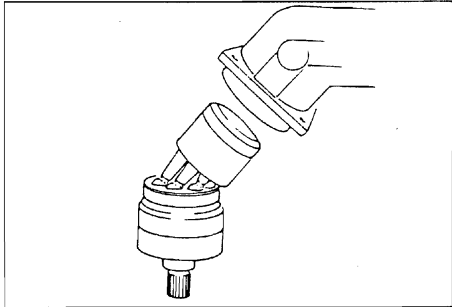
42

Is new shaft seal fitted? (comparisons fig 7).



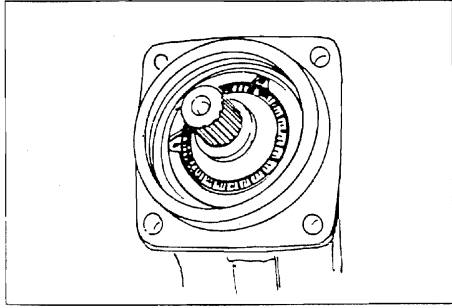
43

Heat the housing to 80°C.



44

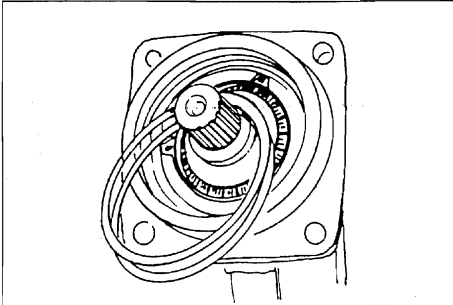
Fit pre-heated housing up to stop.



45

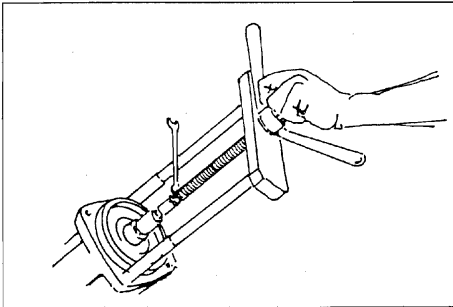
Re-position.

## Installing rotary group



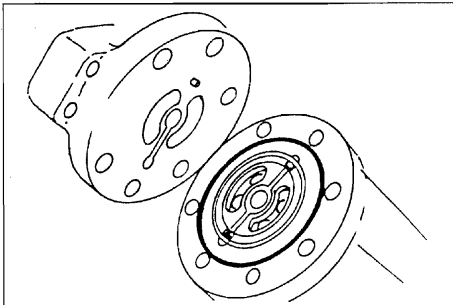
46

Insert shims and assemble to figs. 7 - 10.



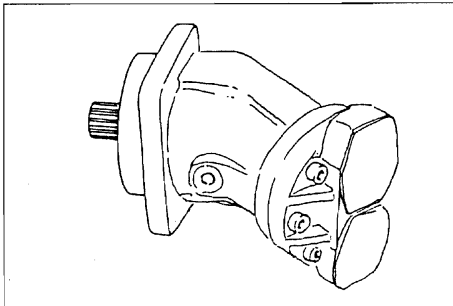
47

Pull the rotary group against the cover plate.  
Check that the cover plate cannot move!



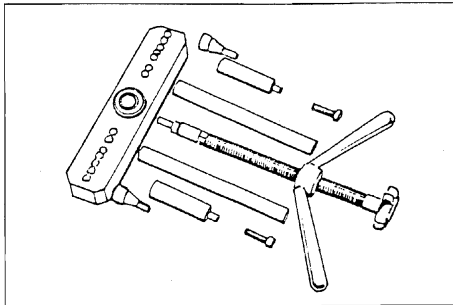
48

Completely assemble to figs. 18 - 20.



49

Seal connections to protect against dust.  
Corrosion protection (internal/external).  
Assembly complete.



50

Extractor for rotary group (fig. 24).



# REXROTH A2F HYDRAULIC PUMP MOTOR

VENDR

FIGURE 03  
PAGE 13

## Tightening torques

### Anziehdrehmomente für Schafschrauben (Metrisches ISO-Regelgewinde)

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Schafschrauben mit metrischem ISO-Regelgewinde und Kopplauflagemmaßen nach DIN 912, DIN 931 und DIN 933. Außerdem gelten diese Werte nur für leich- oder nicht geölte, unbehandelte Oberflächen, sowie nur bei Verwendung von Drehmoment- und Kräftebegrenzungsschlüsseln.	Gewindegröße	Festigkeitsklassen		
		8.8	10.9	12.9
	M 3	1.1	1.6	1.9
	M 4	2.9	4.1	4.9
	M 5	6	8.5	10
	M 6	10	14	17
	M 8	25	36	41
	M 10	49	69	83
	M 12	86	120	145
	M 14	135	190	230
	M 16	210	295	355
	M 18	290	405	485
	M 20	410	580	690
	M 22	550	780	930
	M 24	710	1000	1200
	M 27	1050	1500	1800
	M 30	1450	2000	2400

### Tightening torques for shaft bolts (Metric ISO Standard Thread)

The values for tightening torques shown in the table are valid only for shaft bolts with metric ISO-standard threads and head support surface dimensions in accordance with DIN 912, DIN 931 and DIN 933. These values are also valid only for light or unoleed, untreated surfaces as well as for use only with torque-indicating wrenches and force limiting tools.	Thread Size	Strength Classes		
		8.8	10.9	12.9
	M 3	0.8	1.2	1.4
	M 4	2.1	3.0	3.6
	M 5	4.4	6.3	7.4
	M 6	7.4	10.3	12.5
	M 8	18.4	25.8	30.2
	M 10	36.1	50.9	61.2
	M 12	63.4	88.4	106.9
	M 14	99.5	140.0	169.5
	M 16	154.8	217.4	261.6
	M 18	213.7	298.5	357.4
	M 20	302.2	427.5	508.5
	M 22	405.4	574.9	685.4
	M 24	523.5	737.0	884.4
	M 27	773.9	1105.5	1326.6
	M 30	1068.7	1474.0	1768.8

### Anziehdrehmomente für Verschlusschrauben VSTI (Metrisches Feingewinde)

Gewindegröße	Bezeichnung	Anziehdrehmoment (Nm)
M 8 x 1	VSTI 8 x 1 -ED/SA	= 5
M 10 x 1	VSTI 10 x 1 -ED	= 10
M 12 x 1.5	VSTI 12 x 1.5 -ED	= 20
M 14 x 1.5	VSTI 14 x 1.5 -ED	= 30
M 16 x 1.5	VSTI 16 x 1.5 -ED/SA	= 30
M 18 x 1.5	VSTI 18 x 1.5 -ED/SA	= 40
M 20 x 1.5	VSTI 20 x 1.5 -ED/SA	= 50
M 22 x 1.5	VSTI 22 x 1.5 -ED	= 60
M 26 x 1.5	VSTI 16 x 1.5 -ED/SA	= 70
M 27 x 2	VSTI 27 x 2 -ED	= 90
M 30 x 1.5	VSTI 30 x 1.5 -ED/SA	= 100
M 33 x 2	VSTI 33 x 2 -ED/SA	= 120
M 42 x 2	VSTI 42 x 2 -ED/SA	= 200
M 48 x 2	VSTI 48 x 2 -ED	= 300

### Tightening torques for locking screws VSTI (Metric ISO fine thread)

Thread Size	Designation	Tightening Torque (lb.ft)
M 8 x 1	VSTI 8 x 1 -ED/SA	= 4
M 10 x 1	VSTI 10 x 1 -ED	= 7
M 12 x 1.5	VSTI 12 x 1.5 -ED	= 15
M 14 x 1.5	VSTI 14 x 1.5 -ED	= 22
M 16 x 1.5	VSTI 16 x 1.5 -ED/SA	= 22
M 18 x 1.5	VSTI 18 x 1.5 -ED/SA	= 29
M 20 x 1.5	VSTI 20 x 1.5 -ED/SA	= 37
M 22 x 1.5	VSTI 22 x 1.5 -ED	= 44
M 26 x 1.5	VSTI 16 x 1.5 -ED/SA	= 51
M 27 x 2	VSTI 27 x 2 -ED	= 66
M 30 x 1.5	VSTI 30 x 1.5 -ED/SA	= 74
M 33 x 2	VSTI 33 x 2 -ED/SA	= 88
M 42 x 2	VSTI 42 x 2 -ED/SA	= 147
M 48 x 2	VSTI 48 x 2 -ED	= 220

### Anziehdrehmomente für Seal-Lock Bundmuttern (Metrisches ISO-Regelgewinde)

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Seal-Lock Bundmuttern der Festigkeitsklasse 8.8 mit metrischem ISO-Regelgewinde.	Gewindegröße	Festigkeitsklassen		
		8.8	10.9	12.9
	M 6	10	/	/
	M 8	22	/	/
	M 10	40	/	/
	M 12	69	/	/
	M 14	110	/	/
	M 16	170	/	/

### Tightening torques for seal-lock nuts (Metric ISO-Standard Thread)

The values for tightening torques shown in the table are valid only for seal-lock-nuts of the strength class 8.8 and with metric ISO-standard thread.	Thread size	Strength Classes		
		8.8	10.9	12.9
	M 6	7.4	/	/
	M 8	16.2	/	/
	M 10	29.5	/	/
	M 12	50.9	/	/
	M 14	81.1	/	/
	M 16	125.3	/	/

### Anziehdrehmomente für Linsenschrauben mit Kreuzschlitz DIN 7985 (Metrisches ISO-Regelgewinde)

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Linsenschrauben mit Kreuzschlitz DIN 7985 der Festigkeitsklasse 8.8 mit metrischem ISO-Regelgewinde.	Gewindegröße	Festigkeitsklassen		
		8.8	10.9	12.9
	M 3	1.1	/	/
	M 4	2.9	/	/
	M 5	6	/	/
	M 6	10	/	/
	M 8	25	/	/
	M 10	49	/	/

### Tightening torques for cross-slotted lens head screws DIN 7985 (Metric ISO-Standard Thread)

The values for tightening torques shown in the table are valid only for cross-slotted lens head screws DIN 7985 of the strength class 8.8 and with metric ISO-standard thread.	Thread size	Strength Classes		
		8.8	10.9	12.9
	M 3	0.8	/	/
	M 4	2.1	/	/
	M 5	4.4	/	/
	M 6	7.4	/	/
	M 8	18.4	/	/
	M 10	36.1	/	/

**General advice**

- Make yourself familiar with the equipment of the machine.
- Only operate the machine if you are completely familiar with the operating and control elements as well as the functioning of the machine.
- Use your safety equipment like helmet, safety shoes and hearing protection.
- Make yourself familiar with your working field.
- Only operate the machine for its intended purpose.

Please observe the guidelines of the Professional Association and the machine manufacturer.

**Before starting**

- Observe the operating instructions before starting.
- Check the machine for remarkable faults.
- Do not operate the machine with defective instruments, warning lights or control elements.
- All safety devices must be in a secure position.
- Do not carry with you movable objects or secure them to the machine.
- Keep oily and inflammable material away from the machine.
- Before entering the driver's cabin, check if persons or obstacles are beside or beneath the machine.
- Be careful when entering the driver's cabin, use stairs and handles.
- Adjust your seat before starting.


**Start**

- When starting all operating levers must be in "neutral position".
- Only start the machine from the driver's seat.
- Check the indicating instruments after start to assure that all functions are in order.
- Do not leave the machine unobserved when the motor is running.
- When starting with battery connection cables connect plus with plus and minus with minus. Always connect mass cable (minus) at last and cut off at first.

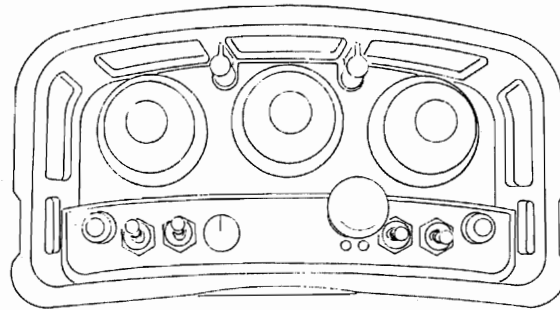
**Attention**

- Exhaust gas is dangerous. Assure sufficient fresh air when starting in closed rooms!

**Hydraulic equipment**

1. Hydraulic equipment is standing under high pressure.  
 High pressure fluids (fuel, hydraulic oil) which escape under high pressure can penetrate the skin and cause heavy injuries.  
Therefore immediately consult a doctor as otherwise heavy infections can be caused.
2. When searching leakages use appropriate auxiliary devices because of the danger of accidents.
3. Before working at the hydraulic equipment, lower pressure to zero and lower working arms of the machine.
4. When working at the hydraulic equipment, absolutely stop motor and secure tractor against rolling away (parking brake, shim)!
5. When connecting hydraulic cylinders and motor pay attention to correct connection of hydraulic flexible hoses.
6. In case of exchanging the ports, the functions are vice versa (f. ex. lift-up/lower) - danger of accidents!
7. Check hydraulic flexible hoses regularly and replace them in case of damage or wear! The new hose pipes must comply with the technical requirements of the machine manufacturer!

-  Orderly disposal or recycling of oil, fuel and filters!

NBB  
NACHRICHTEN  
TECHNIK

S/N :

## 1. STANDARD SPECIFICATION

- Portable transmitter with two replaceable 7,2 volt NiCd batteries, halter and waist straps
- Receiver with NBB adapter plate for fastening purposes (Only PNN-BUS-3)
- Receiver with 4 fastening angles (PNN-BUS-5)
- Multi-pole connecting cable for the receiver, to your specifications
- Automatic battery charger with charging adapter (rapid charging in three hours)

The actual delivery specification is as detailed on the confirmation of order or the delivery note accompanying the goods!

## 2. SAFETY PRECAUTIONS

Even if you are accustomed to working with radio control systems, read these operating instructions without fail before using this equipment. Only this document contains the latest information relating to your NBB radio control system.

Please refer to the accompanying registration documents for the explanatory notes on obtained an operating permit. Observe all applicable work-safety and accident prevention regulations without fail. Only fully trained, authorized personnel may use the NBB radio control equipment. Components, etc. built into the NBB equipment for safety purposes must be regularly inspected. (See point 6 of this instruction)

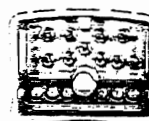
If the NBB radio control unit develops a fault, it must be shut down immediately. The transmitter should be switched off with the EMERGENCY-OFF switch. The connecting cable must be disconnected from the crane connecting socket (terminal) on the receiver. The repair of the equipment must not be carried out other than by NBB or an NBB authorized technician.

Failure to observe these recommendations will put both you yourself and others at risk. Under these circumstances, NBB rescinds the guarantee and any other form of liability. This radio control unit is designed exclusively for the control of construction machines and industrial plants. Only under these conditions are the safety systems (EMERGENCY-OFF, zero setting) fully effective. No other form of use is permitted. Any non-observance of this condition will relieve NBB of all liability.

Nano, Nano-S-A2-HC



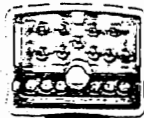
Nano-Vario



Nano, Nano-S-A2-HC

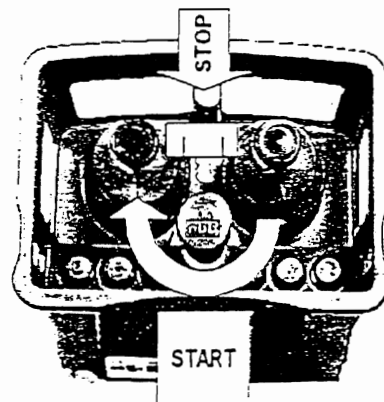
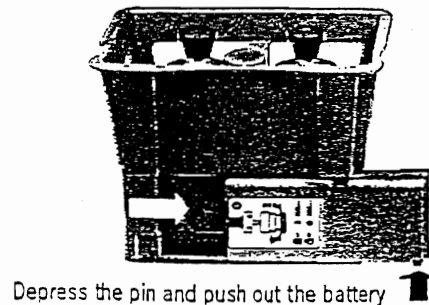


Nano-Vario



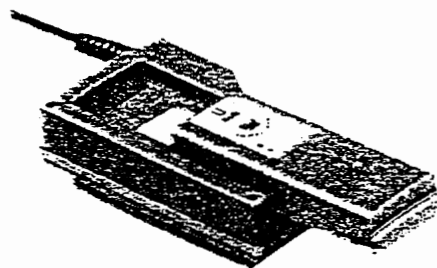
**3. TRANSMITTER**

To make the unit ready for use, insert the battery into the battery compartment. To remove the battery, depress the pin and push out the battery. The power supply to the transmitter is activated with the EMERGENCY-OFF switch (when depressed, the EMERGENCY-OFF switch can also be secured by removing the key cap). The green LED on the transmitter control panel must flash regularly. Commands can now be input by means of the controls. The operating period with a charged battery is approximately 8 hours with the transmitter in continuous use. When the red 'Battery' indicator lamp lights up, the battery is nearing exhaustion. The transmitter can be operated for approximately 15 minutes more in this condition. During this time, bring the crane to a safe position and install a new battery. Removal of the battery interrupts the radio link. As a result, the master switch for the crane must be switched on again. Charge the discharged battery with the charger supplied.



**4. BATTERY CHARGER**

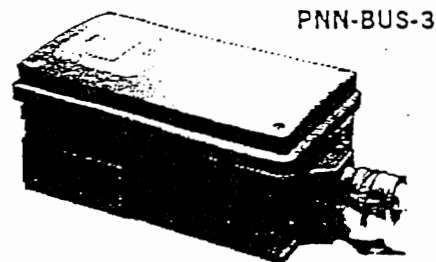
The red indicator lamp indicates that the battery charger is ready for use. Place the battery in the charging well; it will now be charged. When the red LED goes out, the charging process is concluded. No harm will come to the battery if it is left in the charger beyond the required charging time. Do not use the charger other than in dry rooms having a min-max temperature range of 0-40°C. A charged battery is a concentrated energy source. Never store a charged battery in a toolbox or similar where it could be short-circuited by metal components (even a key in your trouser pocket can cause a short circuit).



**5. RECEIVER (PNN-BUS-3 and PNN-BUS-5)**

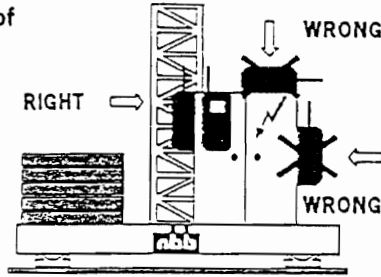
The receiver is connected to the crane with the multi-pole connecting cable supplied. Please observe the instructions issued by the crane manufacturer. The power supply to the receiver is generally effected by way of the connecting cable.

- In general, an earth lead is required in the case of cranes which have not previously been operated under radio control. Failing this, the receiver electronic circuit will not receive any power supply. Take care to ensure that the operating voltage of the receiver complies with the electrical specifications of the crane. The applicable operating voltage is specified in the supplement.





- Never expose the receiver to a high pressure cleaning jet. This also applies to the transmitter.
- The receiver should always be fixed vertical at the outside panel of the switching cabinet. The antenna should reach over the top of the panel.



**6. OPERATING THE SYSTEM**

Safety equipment in the NBB radio control system:

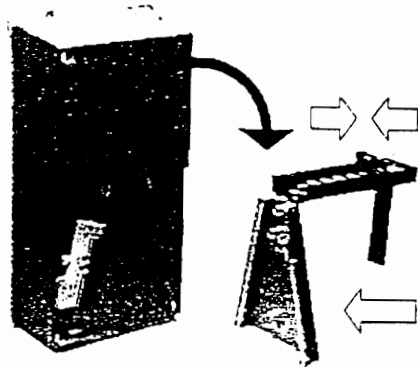
- In the transmitter:**
  - EMERGENCY-OFF switch with automatic disconnection from the power supply
  - Automatic zeroing
- In the receiver:**
  - Duplicated 2-channel evaluation of the EMERGENCY-OFF signal
  - Automatic zeroing when switched on again after radio signal interruption
  - Inhibition of radio control commands at the relay level if EMERGENCY-OFF circuit defective.

To ensure troublefree operation, observe the following operating instructions precisely. Subject to the transmitter being in operating condition, the crane's master switch can only be switched on provided no command transmitter is actuated. The necessary command for this purpose is initiated by the 'ON/HOOTER' button. This activates a warning signal on the crane. After the crane has been switched on, this button serves for the subsequent activation of the hooter as required by safety at work regulations.

If the NBB radio control unit remains unused for a prolonged period, we strongly recommend that the battery be charged from time to time (approximately every four weeks). This will prevent it from becoming discharged and will prolong its working life. If an extended period of disuse is intended, we recommend that the battery be removed from the transmitter.

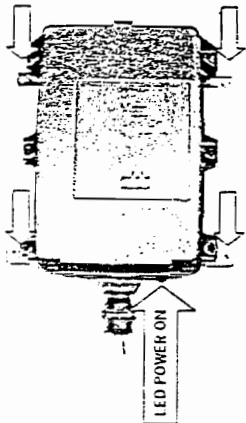
**Changing the frequency:**

To change the frequency, hold down the 'ON/HOOTER' button while simultaneously operating the 'FREQUENCY CHANGE' button until the hooter sounds. (Please observe the accompanying registration conditions, see page 5, point 9).

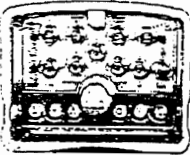


Mounting-possibilities of the PNN-BUS-3 or of the PNN-BUS-5.

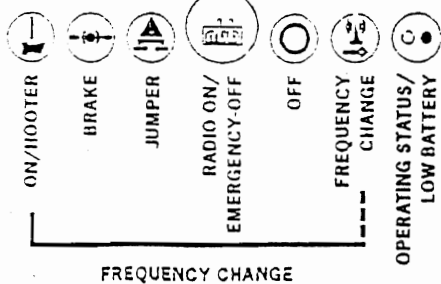
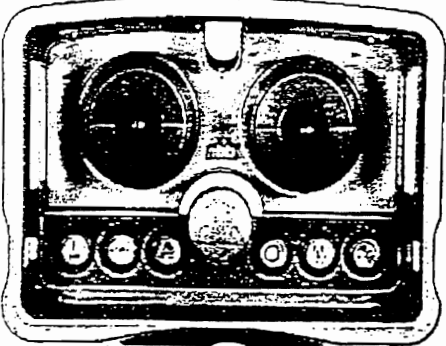
PNN-BUS-5



Nano-Vario



Nano / Nano-S-A2-HC



**NBB NANO-S-A2-HC  
RADIO REMOTE CONTROL**

**TEACH-IN: Individual Setting of Analog Channels (Basic Setting) at Nano Transmitter\*.**  
The output signals of the analog channels can be individually programmed from the transmitter.

**Activate programming mode**



**Select analog function**



**Save "contact point"**



**Save maximum speed**



**Program opposite direction?**



Yes

**End programming mode**

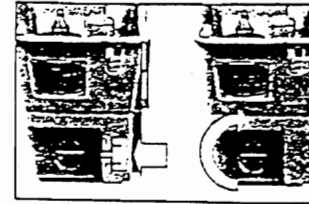


**Programming of next function?**

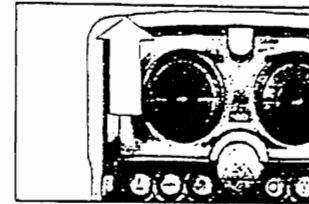


Yes

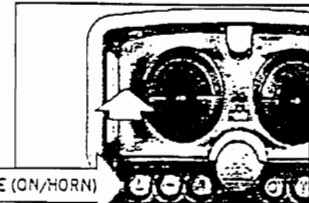
Mounting the key cap on the rotary switch opposite the battery compartment and then turning this switch activates the programming mode.



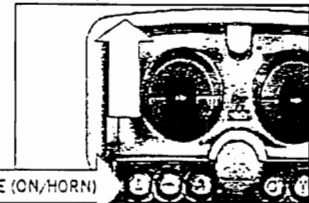
To determine which analog function is to be programmed, it is sufficient to briefly turn the appropriate master switch fully in the direction of this function.



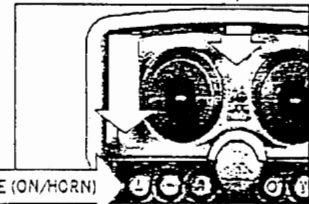
The master switch is now turned until the required "contact point" (less than 50% of the master switch turning range) is reached. To save this value, the "SAVE" ("ON/HORN") key must be pressed at this position.



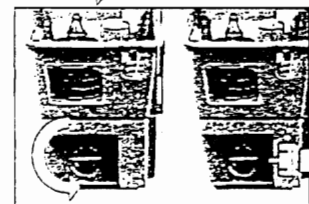
The upper initial value is saved by turning the master switch (further than 50% of the master switch turning range) until the maximum speed of the function is reached, and then pressing again the "SAVE" ("ON/HORN") key.



The opposite direction of this function can then be programmed the same way immediately afterwards.



If the rotary switch is reset, the programming mode is left and working with this function can commence. Removing the key cap secures the transmitter against inadvertent teaching.



When programming several analog channels consecutively, the programming function must be left after saving a function, in order to release the next channel for programming, after turning the programming switch back on by briefly turning the master switch to the full.

**Please note:**

The control is ready to operate.

**No frequency change is possible in the programming mode!**

\*Please refer to the scope of supply of your facility.

**TEACH-IN: Individual Setting of Analog Channels (Basic Setting) at Nano Transmitter with Potentiometer Control\***

The output signals of the analog channels can be individually programmed from the transmitter.

**Activate programming mode**



**Select analog function**



**Save "contact point"**



**Save maximum speed**



**End programming mode**

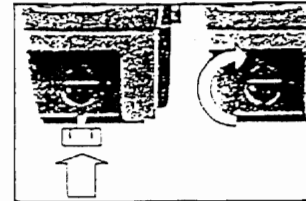


**Programming next function?**

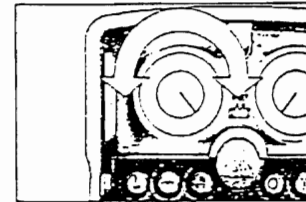


The control is ready to operate.

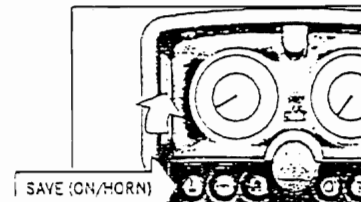
Mounting the key cap on the rotary switch opposite the battery compartment and then turning this switch activates the programming mode.



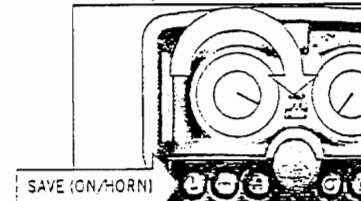
To determine which analog function is to be programmed, it is sufficient to briefly turn the appropriate potentiometer fully in the direction of this function and then back again.



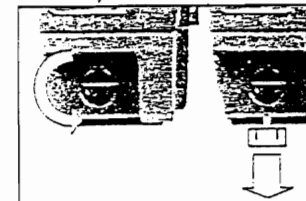
The potentiometer is now turned until the required "contact point" (less than 50% of the potentiometer turning range) is reached. To save this value, the "SAVE" ("ON/HORN") key must be pressed at this position.



The upper initial value is saved by turning the potentiometer (more than 50% of the potentiometer turning range) until the maximum speed of the function is reached, and then pressing again the "SAVE" ("ON/HORN") key.



If the rotary switch is reset, the programming mode is left and working with this function can commence. Removing the key cap secures the transmitter against inadvertent teaching.

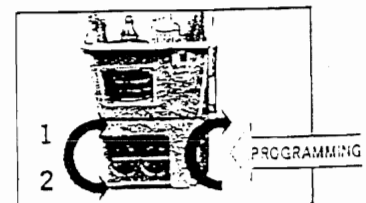


When programming several analog channels consecutively, the programming function must be left after saving a function, in order to release the next channel for programming, after turning the programming switch back on by briefly turning the master switch to the full.

**Please note:**  
No frequency change is possible in the programming mode!

**Saving two different basis settings (optional)\***

If required, the unit can be supplied with two saving options for the basic setting. These can be selected using an additional key switch or rotary switch once saved. For both settings, the individual analog functions must be programmed separately.



\*Please refer to the scope of supply of your facility.

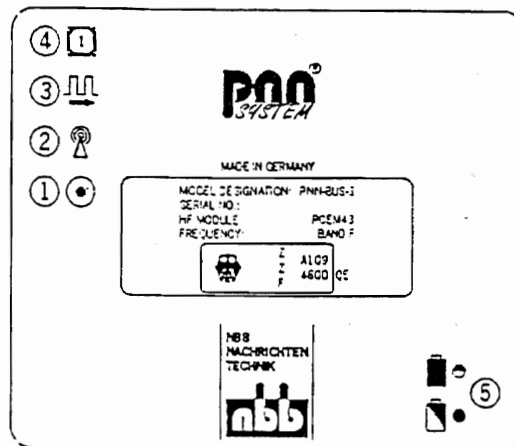
## 7. FUNCTION CHECKS

Regular function checks of the NBB radio control unit are essential to ensure that operating safety is maintained. In the case of a single-shift daily operation, we recommend that the checks be carried out once a week. They can be performed with the aid of the indicator lamps on the receiver. For this purpose, the transmitter must be in operating condition.

- First, connect only the receiver - the transmitter remains switched off.
- Switch on the transmitter by releasing the EMERGENCY-OFF button.
- Now test the command functions (always starting at the lowest stage) and check that the crane responds correctly. In particular, make sure that the danger area is clear of all personnel. **Failure to do so may result in an ACCIDENT.**
- **EMERGENCY-OFF check.** Press the EMERGENCY-OFF button on the transmitter until it locks. The crane's master contactor must drop out after a maximum of 1/2 second.

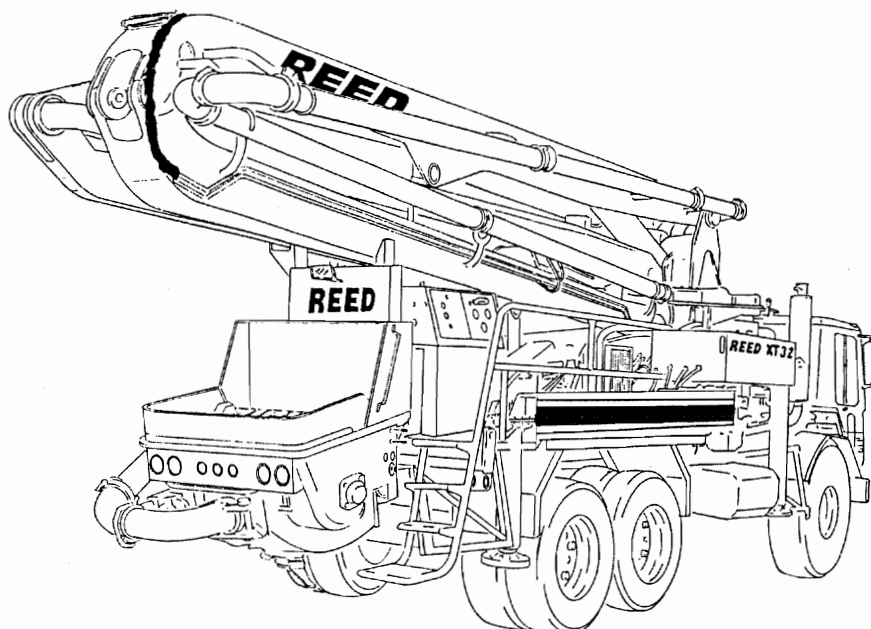
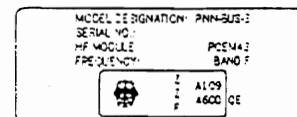
### Checking the LEDs of the receiver

- **LED1: POWER ON.** If the LED does not light up, check the power supply. If the power supply lead is in satisfactory condition, notify your service centre.
- **LED2: HF AVAILABLE.** Remains lit continuously when the transmitter is switched on.  
(not significant in the case of scanner operation).
- **LED3:** Flashes at regular intervals during fault-free operation. Irregular flashing means that the HF channel is probably disrupted. In this case, select an alternative channel.
- **LED4:** If this LED flashes, the HF channel is disrupted.
- **LED5 (Battery operation):** state of charge of the battery.



## 8. RATING PLATES

Rating plates contain the serial number, model designation, type of HF module and frequency. In the event of a query, please give the serial number without fail.



**9. REGISTRATION**

Explanatory notes on obtaining an operating permit for your NBB radio control system will be found in the accompanying registration documents.

**10. MAINTENANCE**

The NBB radio control unit is largely maintenance-free. Nevertheless, please observe the following points:

- The EMERGENCY-OFF button must operate freely.
- Keep the unit clean of any contamination from building materials.
- If any electrical welding is carried out on the crane, disconnect the control cable from the receiver, otherwise the receiver electronics may be damaged.

**11. GUARANTEE**

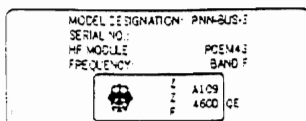
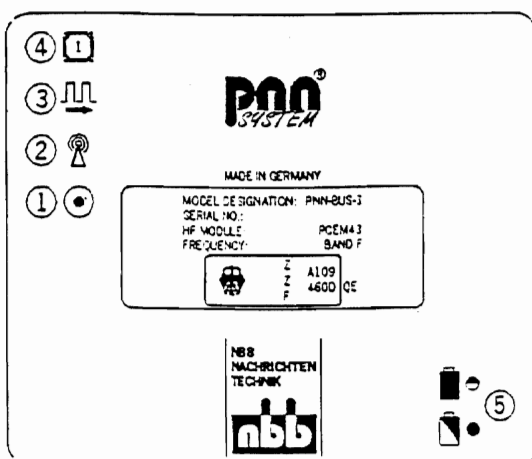
All NBB radio control units (transmitter, receiver, battery charger) are guaranteed to operate satisfactorily for a period of six months from the date of sale. The terms of the guarantee include parts and labour. Transport costs are the buyer's responsibility. The following are excluded from the guarantee: wearing parts, relays and batteries. The guarantee does not cover damage, accidental damage, negligence, improper use, non-adherence to operating conditions, the non-observance of operating, testing and servicing instructions, or repairs or modifications to the unit not authorized by NBB.

NBB will not be liable for consequential damage. It reserves the right to effect repairs or replacements at its own discretion.

**12. ACTION IN THE EVENT OF A FAULT**

Do not continue to work with a defective NBB radio control unit. Even a minor defect in the first instance may eventually lead to a major fault!

Do not try to repair the NBB radio control unit yourself. In the event of a fault, please notify your dealer or contact us!

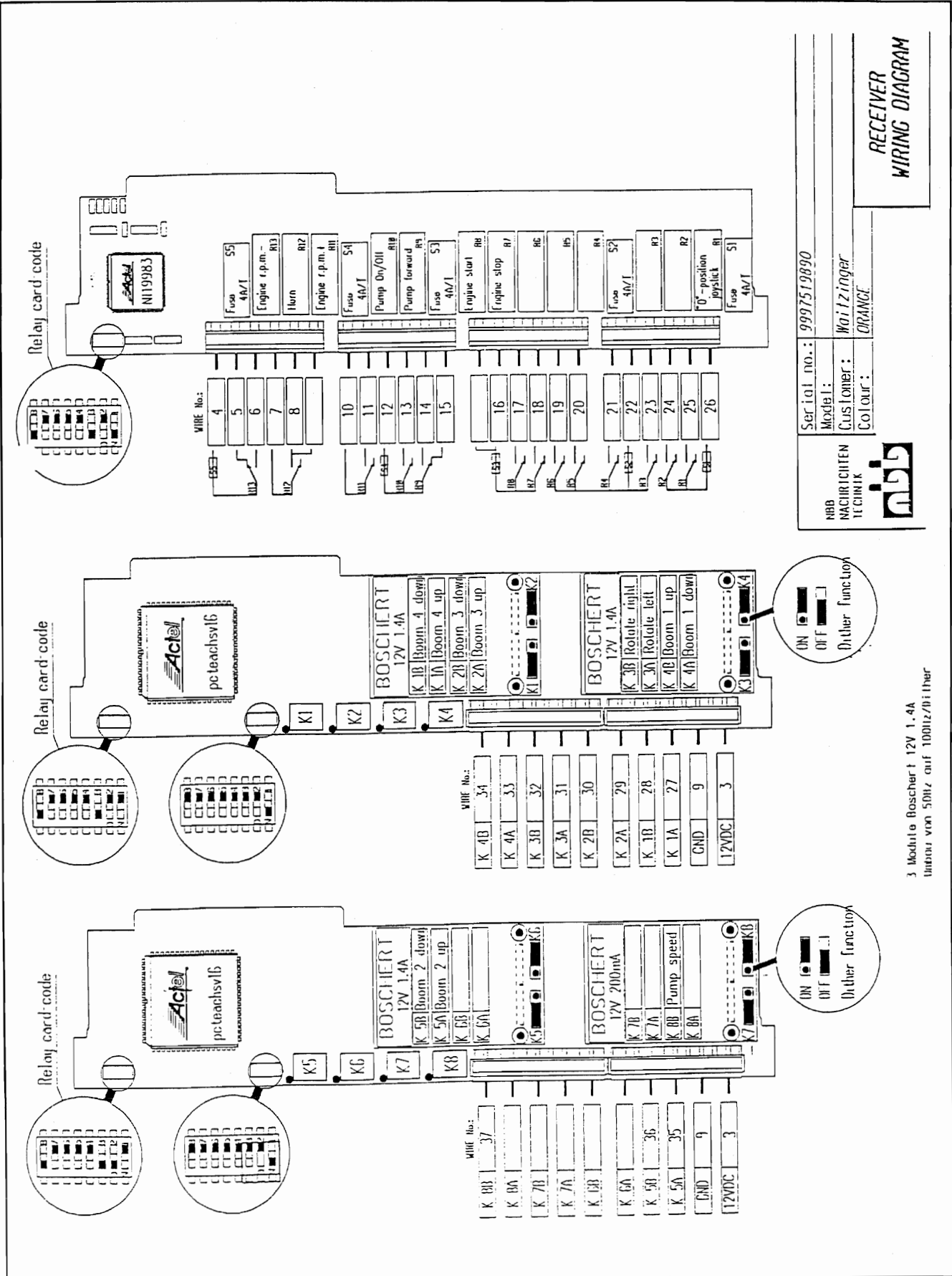


**NBB NANO-S-A2-HC  
RADIO REMOTE CONTROL**

**VENDR**

FIGURE 04  
PAGE 08

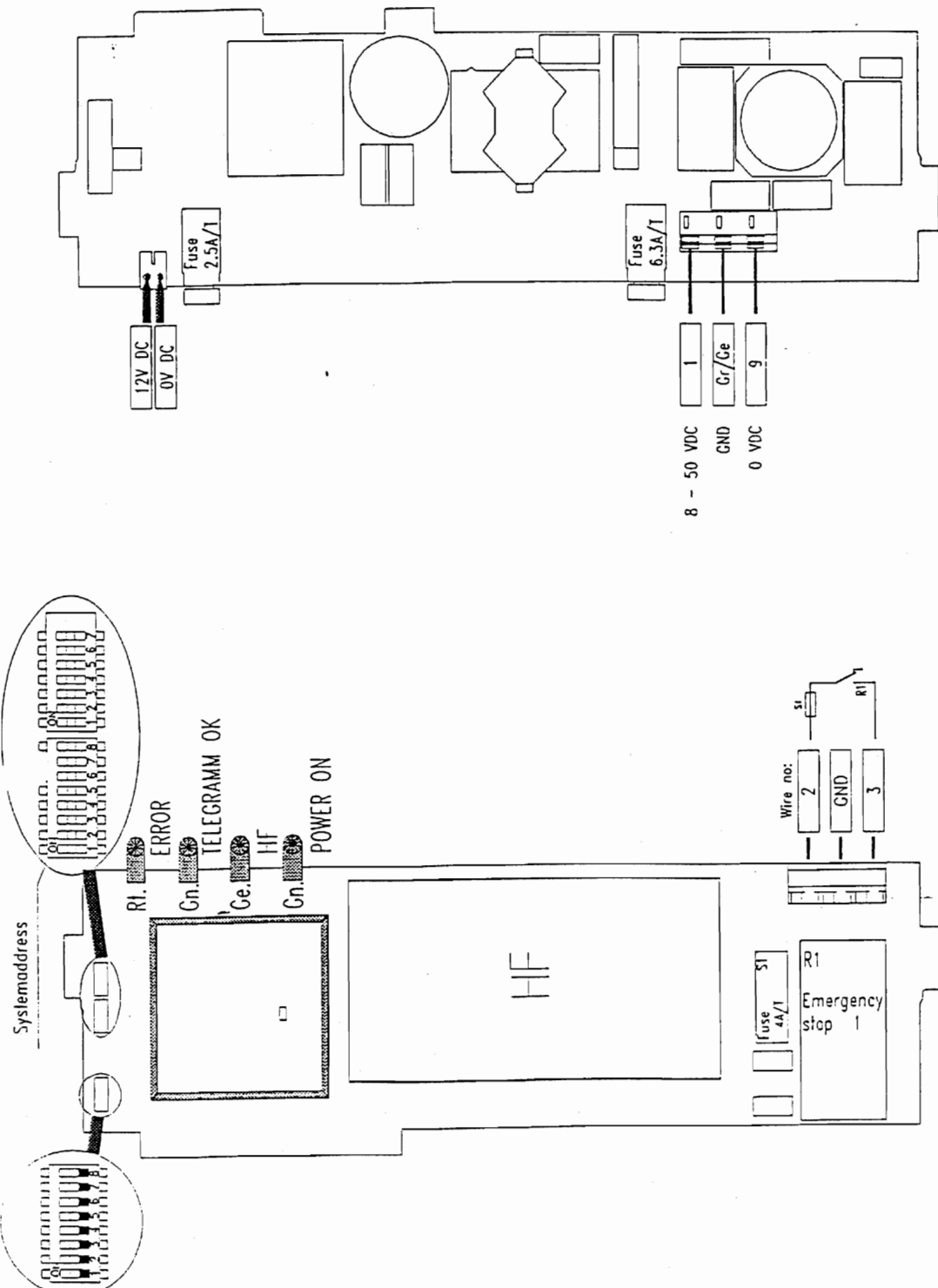
RECEIVER  
WIRING DIAGRAM




REVISION:

3 Module Boschert 12V 1.4A  
Innen von 50Hz auf 100Hz/Hiiter

**NBB NANO-S-A2-HC  
RADIO REMOTE CONTROL**



 <p>NBB NACHRICHTEN TECHNIK</p>	Serial no.:	9997519890	<p><b>RECEIVER WIRING DIAGRAM</b></p>
	Model:	Concrete-Pump	
	Customer:	Wolzinger	
	Colour:		
	Date:	7/05/1997	
	Name:		
Scale:			



# NBB NANO-S-A2-HC RADIO REMOTE CONTROL

VENDR

FIGURE 04  
PAGE 10

## CONTROL CABLE CONNECTING PLAN

Serial no. 9997519890  
Relay board code: 1. 3. 8

RECEIVER	Terminal strip no. :	CONTROL CABLE	Wire-No.:	CRANE
		Function:		Terminal strip or plug socket:
<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     8-50VDC                      12VDC                 </div>	1	Power supply 12VDC	1	> _____
	9	Power supply 0VDC GND	9	> _____
	2	Common	2	> _____
	3	Emergency stop	3	> _____
	4	Common	4	> _____
	5	Engine r.p.m. „-“	5	> _____
	6	Engine r.p.m. „-“	6	> _____
	7	Common	7	> _____
	8	Horn	8	> _____
	10	Common	10	> _____
	11	Engine r.p.m. +	11	> _____
	12	Common	12	> _____
	13	Pump on/off	13	> _____
	14	Pump for.	14	> _____
	15	Pump rev.	15	> _____
	16	Common	16	> _____
	17	Engine start	17	> _____
	18	Engine stop	18	> _____
	19		19	> _____
	20		20	> _____
	21		21	> _____
	22	Common	22	> _____
	23		23	> _____
	24		24	> _____
	25	„0“-position joystick	25	> _____
	26	Common	26	> _____

REVISION:



**REED**CONCRETE PLACING  
EQUIPMENT**NBB NANO-S-A2-HC  
RADIO REMOTE CONTROL****VENDR**FIGURE 04  
PAGE 11

Serial no.: 9997519890

Crane model:

Relay board code: 3, 8

**RECEIVER****CONTROL CABLE****CRANE**

Terminal strip no.:

Function:

Wire-No.:

Terminal strip  
or plug socket:

BOSCHERT

12V 1.4A

34 K4B: Boom 1 up 34

33 K4A: Boom 1 down 33

32 K3B: Rotate right 32

31 K3A: Rotate left 31

30 K2B: Boom 3 down 30

29 K2A: Boom 3 up 29

28 K1B: Boom 4 down 28

27 K1A: Boom 4 up 27

9 Gnd 9

3 12V DC 3

BOSCHERT

12V 1.4A

~~37~~ K8B: Pump speed (Poti) 37

— K8A: —

— K7B: —

~~36~~ K7A: —

— K6B: —

— K6A: —

36 K5B: Boom 2 down 36

35 K5A: Boom 2 up 35

9 Gnd 9

3 12V DC 3

BOSCHERT

12V 200mA

BOSCHERT

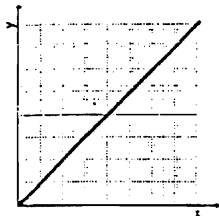
12V 1.4A

REVISION:

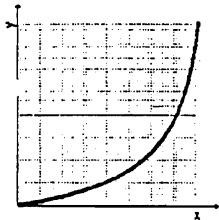
# TECHNICAL SUPPLEMENT

## NANO: Board E-AN04A2V1/1 TEACH-IN\*

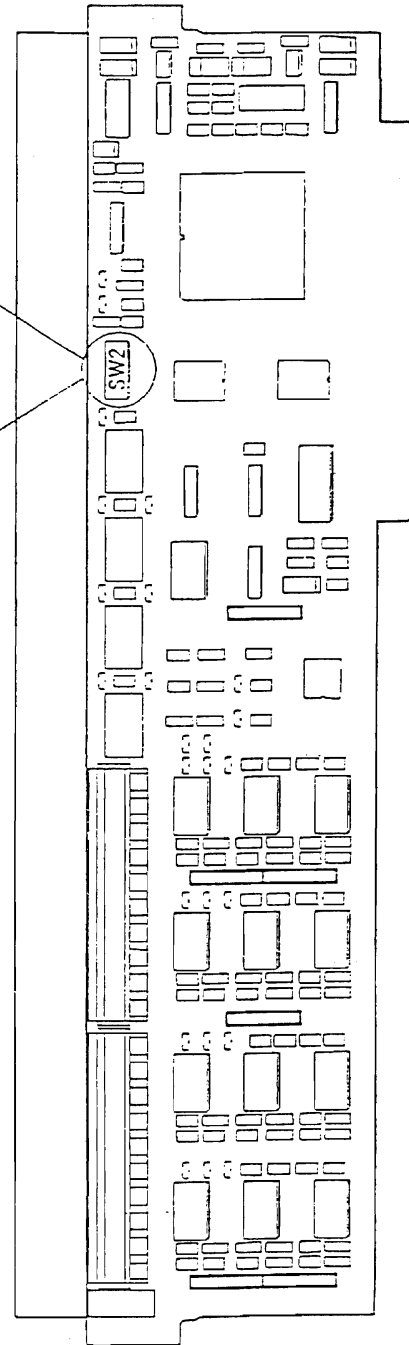
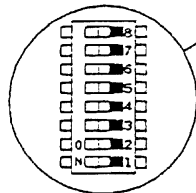
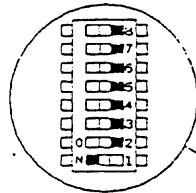
DIL switch (SW2) for setting various transmission characteristics:



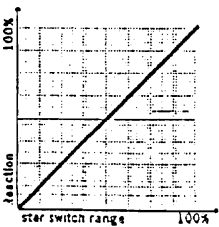
Setting for linear characteristic



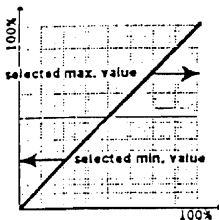
Setting for non-linear characteristic



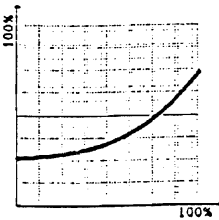
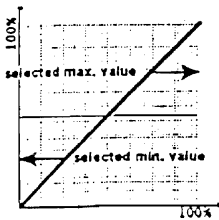
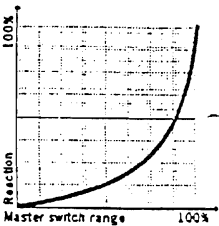
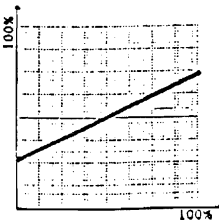
Characteristics  
linear or non-linear



Characteristics in  
Teach-In mode



Characteristics after  
Teach-In mode



\*Please refer to the scope of supply of your facility.

### Teaching of the function "PUMP SPEED":

In case of teaching the function 'PUMP SPEED' the rotary switch has to be set from minimum to maximum and back in order to release this function for programming.  
This function is to be programmed at last.

### Teaching of the additional functions:

Before the programming-mode is activated the rotary switch for the function 'PUMP SPEED' has to be set to less than 50% (best minimum or left-hand position).

Apart from that the programming is according to the advice in the operating instructions.

## TECHNICAL DATA

Operating ambient temperature	-20 to +65 °C
Insulation class - Protection	IP 65

### TRANSMITTER

*Nano, Nano-Vario, Nano-S-A2-HC*

Transmission frequency range	400 - 477 MHz, 25 mW FM
------------------------------	-------------------------

The use of synthesizer technology permits frequencies to be selected in accordance with the appropriate waveband for the country of use.

Low frequency modulation	FSK signal to CCITT V.23
Data repetition rate	about 60 ms
Baud rate	1200 baud (bits per sec.)
Range	300 up to 1000 m
Power input	about 60 mA
RF output	25 mW

	Weight (without battery)	Size (L x W x H)
Pocket	0,4 kg	8,7 x 3,5 x 18,2 cm
Nano	0,8 kg	17,5 x 12,6 x 12,2 cm
MOL	1,5 kg	28,3 x 14,4 x 16,7 cm

# TECHNICAL DATA

## RECEIVER

*PNN-BUS-3 PNN-BUS-5*

Reception frequency range 400 - 477 MHz

### Data security:

Generates a CRC code with a Hamming distance = 4. Generates a neutral position Addressing of each transmitter with its own, unique combination (32768 possible combinations). Parity - Bit parameters with addressing.

### Data reception security:

2 diversitary evaluators (1 hardware evaluator, 1 software - controlled evaluator). CRC. EMERGENCY OFF and neutral position bits. Restart inhibitor if EMERGENCY OFF relay defective.

• contact loading for EMERGENCY OFF and commands.

max. switching voltage	250 V
max. switching current	6 A
max. switching power	1000 VA

	Weight	Size (L x W x H)
PNN-BUS-3	3,0 kg	30,6 x 18,1 x 13 cm
PNN-BUS-5	4,7 kg	36,4 x 28,3 x 15,2 cm

## BATTERY

Pocket / Nano	7,2V / 0,6 Ah
MOL	9,6V / 0,6 Ah

## CHARGING UNIT

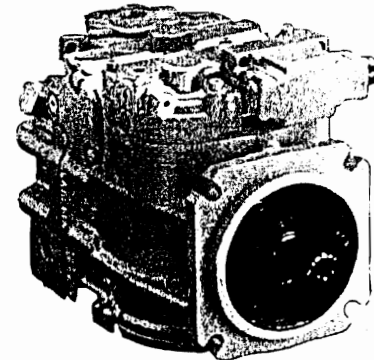
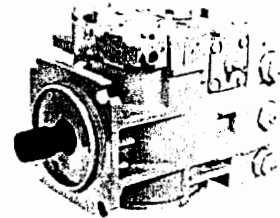
Operating voltage	80V - 270V AC
	8V - 50V DC

# SAUER SUNDSTRAND

## Series 90

### Contents

1. Introduction
  - 1.1 Use of This Manual
  - 1.2 Safety Precautions
2. Functional Description
  - 2.1 General Description and Cross Sectional Views
    - 2.1.1 Variable Displacement Pumps
  - 2.2 The System Circuit
  - 2.3 Common Features of Pumps and Motors
    - 2.3.1 End Caps and Shafts
    - 2.3.2 Speed Sensors
  - 2.4 Pump Features
    - 2.4.1 Charge Pump
    - 2.4.2 Charge Relief Valve
    - 2.4.3 Charge Check Valves
    - 2.4.4 Multi-Function Valves
    - 2.4.5 Pressure Limiter and High Pressure Relief Valves
    - 2.4.6 Bypass Valves
    - 2.4.7 Displacement Limiters
    - 2.4.8 Auxiliary Mounting Pads
    - 2.4.9 Filtration Options
    - 2.4.10 Pressure Override (POR) - 180 Frame Size Only
  - 2.5 Pump Control Options
    - 2.5.1 Manual Displacement Control (MDC)
    - 2.5.2 Hydraulic Displacement Control (HDC)
    - 2.5.3 Electric Displacement Control (EDC)
    - 2.5.4 Automotive Control (AC and AC II)
    - 2.5.5 3-Position (FNR) Electric Control
  - 2.6 Motor Features
    - 2.6.1 Motor Loop Flushing Valve and Charge Relief Valve
    - 2.6.2 Variable Motor Displacement Limiters
  - 2.7 Variable Motor Controls
    - 2.7.1 Hydraulic 2-Position Control
    - 2.7.2 Electric 2-Position Control
3. Technical Specifications
  - 3.1 General Specifications
  - 3.2 Circuit Diagrams
  - 3.3 Hydraulic Parameters
  - 3.4 Technical Data
4. Pressure Measurement
  - 4.1 Required Tools
  - 4.2 Port Locations and Pressure Gauge Installation
    - 4.2.1 Variable Pump
5. Initial Start-Up Procedure
6. Fluid and Filter Maintenance
7. Troubleshooting
  - 7.1 "Neutral" Difficult or Impossible to Find
  - 7.2 System Operating Hot
  - 7.3 Transmission Operates Normally in One Direction Only
  - 7.4 System Will Not Operate in Either Direction
  - 7.5 Low Motor Output Torque
  - 7.6 Improper Motor Output Speed
  - 7.7 Excessive Noise and/or Vibration
  - 7.8 System Response is Sluggish





Series 90 Introduction 1

## 1. Introduction

### 1.1 Use of This Manual

This manual includes information for the normal operation, maintenance, and servicing of the Series 90 family of hydrostatic pumps and motors. The manual includes the description of the units and their individual components, troubleshooting information, adjustment instructions, and minor repair procedures. Unit warranty obligations should not be affected if maintenance, adjustment, and minor repairs are performed according to the procedures described in this manual.

Many service and adjustment activities can be performed without removing the unit from the vehicle or machine. However, adequate access to the unit must

be available, and the unit must be thoroughly cleaned before beginning maintenance, adjustment, or repair activities. Since dirt and contamination are the greatest enemies of any type of hydraulic equipment, cleanliness requirements must be strictly adhered to. This is especially important when changing the system filter and during adjustment and repair activities.

A worldwide network of Sauer-Sundstrand Authorized Service Centers is available should repairs be needed. Contact any Sauer-Sundstrand Authorized Service Center for details. A list of all Service Centers can be found in bulletin BLN-2-40527, or in brochure SAW (Ident. No. 698266).

### 1.2 Safety Precautions

Observe the following safety precautions when using and servicing hydrostatic products.

#### Loss of Hydrostatic Braking Ability

**WARNING**  
When Series 90 units are used in vehicular hydrostatic drive systems, the loss of hydrostatic drive line power in any mode of operation (e.g. acceleration, deceleration or "neutral" mode) may cause a loss of hydrostatic braking capacity. A braking system which is independent of the hydrostatic transmission must, therefore, be provided which is adequate to stop and hold the system should the condition develop.

#### Disable Work Function

**WARNING**  
Certain service procedures may require the vehicle/machine to be disabled (wheels raised off the ground, work function disconnected, etc.) while performing them in order to prevent injury to the technician and bystanders.

#### Fluid Under High Pressure

**WARNING**  
Use caution when dealing with hydraulic fluid under pressure. Escaping hydraulic fluid under pressure can have sufficient force to penetrate your skin causing serious injury. This fluid may also be hot enough to burn. Serious infection or reactions can develop if proper medical treatment is not administered immediately.

#### Flammable Cleaning Solvents

**WARNING**  
Some cleaning solvents are flammable. To avoid possible fire, do not use cleaning solvents in an area where a source of ignition may be present.

**Series 90 Functional Description 2**

## 2. Functional Description

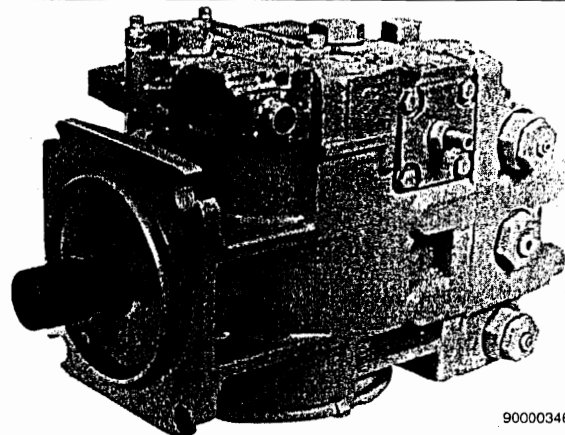
This section describes the operation of pumps, motors, and their various serviceable features. It is a useful reference for readers unfamiliar with the functioning of a specific system.

### 2.1 General Description and Cross Sectional Views

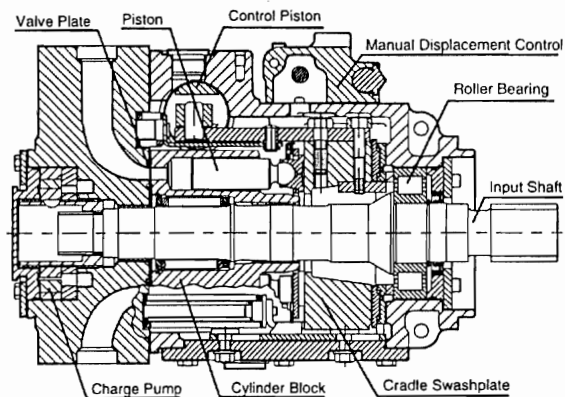
#### 2.1.1 Variable Displacement Pumps

The Variable Displacement Pump (PV) is designed to convert an input torque into hydraulic power. The input shaft turns the pump cylinder which contains a ring of pistons. The pistons run against a tilted plate, called the swashplate. This causes the pistons to compress the hydraulic fluid which imparts the input energy into the hydraulic fluid. The high pressure fluid is then ported out to provide power to a remote function.

The swashplate angle can be varied by the control piston. Altering the swashplate angle varies the displacement of fluid in a given revolution of the input shaft. A larger angle causes greater displacement which yields greater output torque for a given input. A smaller angle reduces the displacement per revolution and yields greater speed for a given input.



Series 90 Variable Displacement Pump (PV)



Series 90 PV Cross Section

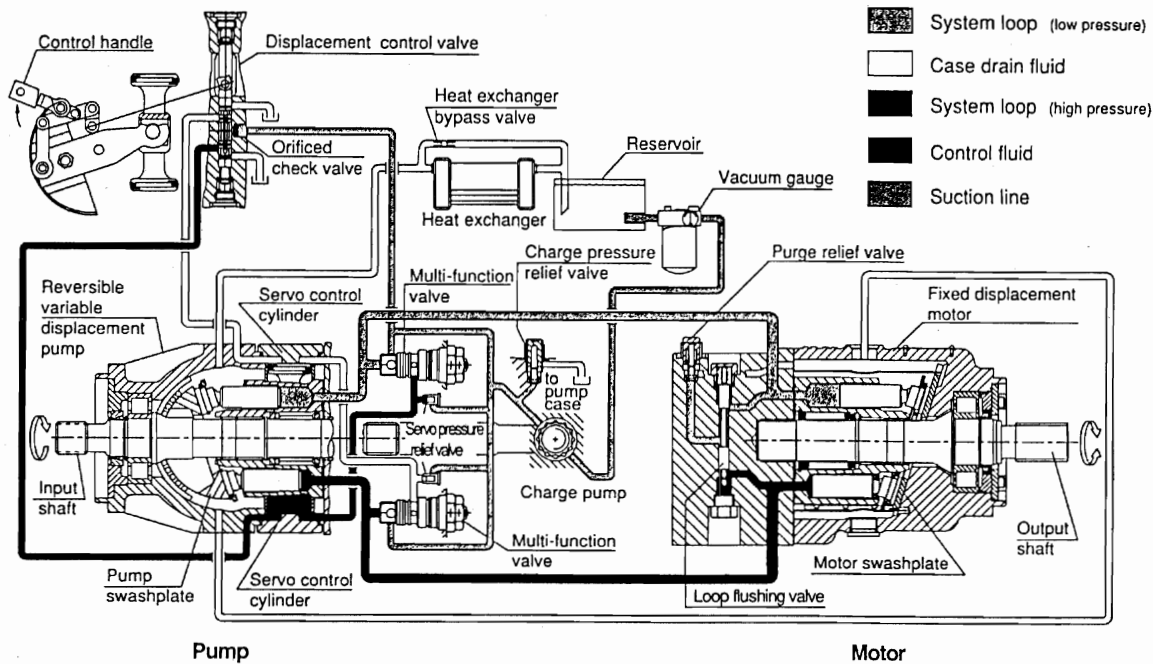
90000346

90000189



**Series 90 Functional Description 2**

**2.2 The System Circuit**



**Circuit Diagram for Series 90 PV and Series 90 MF**

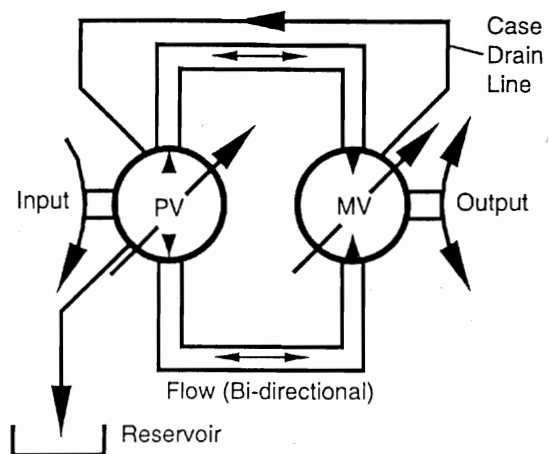
90000800

**The Basic Closed Circuit**

The main ports of the pump are connected by hydraulic lines to the main ports of the motor. Fluid flows, in either direction, from the pump to the motor then back to the pump in this closed circuit. Either of the hydraulic lines can be under high pressure. The position of the pump swashplate determines which line is high pressure as well as the direction of fluid flow.

**Case Drain and Heat Exchanger**

The pump and motor require case drain lines to remove hot fluid from the system. The motor should be drained from its topmost drain port to ensure the case remains full of fluid. The motor case drain can then be connected to the lower drain port on the pump housing and out the top most port. A heat exchanger, with a bypass valve, is required to cool the case drain fluid before it returns to the reservoir.



**Basic Closed Circuit**

90000803





**Series 90 Functional Description 2**

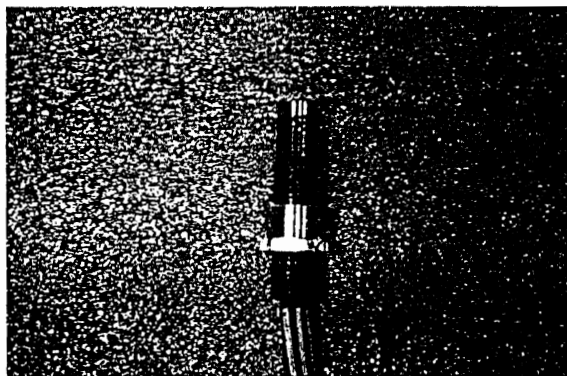
**2.3 Common Features of Pumps and Motors**

**2.3.1 End Caps and Shafts**

Series 90 pumps and motors can be supplied with a variety of end caps and shafts to allow for almost any configuration. For pumps, end caps are available with system ports on either side ("side ports") or both ports on one side ("twin ports"). Motors have end caps with ports on the face of the end cap ("axial ports") or both ports on one side ("twin ports"). See the Series 90 Technical Information manuals (BLN-10029 and BLN-10030) or the Series 90 Price Book (BLN-2-40588) for information on available options. **Removing the end cap will void the warranty on a Series 90 pump or motor.**

**2.3.2 Speed Sensors**

An optional speed sensor can be installed on Series 90 pumps and motors to provide unit speed information. The sensor reads a magnetic ring wrapped about the unit's cylinder. See Sec. 4 to locate the speed sensor port. See Sec. 8.4 and 9.6 to adjust and install the sensor.



Speed Sensor

90000810

**Series 90****Functional Description****2****2.4 Pump Features****2.4.1 Charge Pump**

The charge pump is necessary to supply cool fluid to the system, to maintain positive pressure in the main system loop, to provide pressure to operate the control system, and to make up for internal leakage. Charge pressure must be at its specified pressure under all conditions of driving and braking to prevent damage to the transmission.

The charge pump is a fixed-displacement, gerotor type pump installed in the variable displacement pump and driven off the main pump shaft. Charge pressure is limited by a relief valve (Sec. 2.4.2).

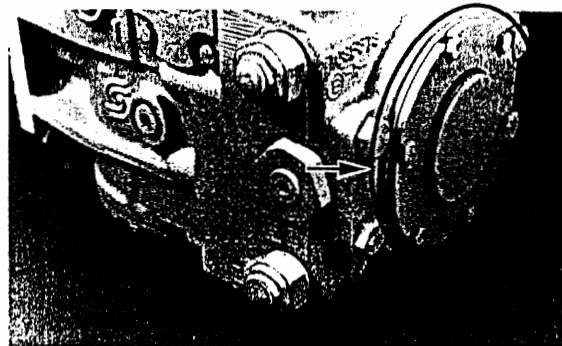
The standard charge pump will be satisfactory for most applications. However, if the charge pump sizes available for the given main pump size are not adequate, a gear pump may be mounted to the auxiliary mounting pad (Sec. 2.4.8) and supply the required additional charge flow. For repairs to the charge pump see Sec. 9.2.4.

**2.4.2 Charge Relief Valve**

The charge relief valve on the pump serves to maintain charge pressure at a designated level. A direct-acting poppet valve relieves charge pressure whenever it surpasses a certain level. This level is nominally set referencing case pressure at 1775 rpm. This nominal setting assumes the pump is in neutral (zero flow); in forward or reverse charge pressure will be lower. The charge relief valve setting is specified on the model code of the pump (Sec. 8.1.1). For repairs to the pump charge relief valve see Sec. 9.2.3.

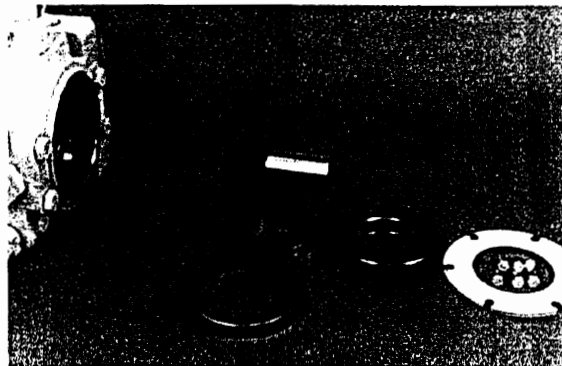
**2.4.3 System Check Valves**

The system check valves allow pressurized flow from the charge pump to enter the low pressure side of the loop whenever system pressure dips below a certain level. This is needed as the pump will generally lose system pressure due to leakage and other factors. Since the pump can operate in either direction, two system check valves are used to direct the charge supply into the low pressure lines. The system check valves are poppet valves located in the multi-function valve assembly (next section).



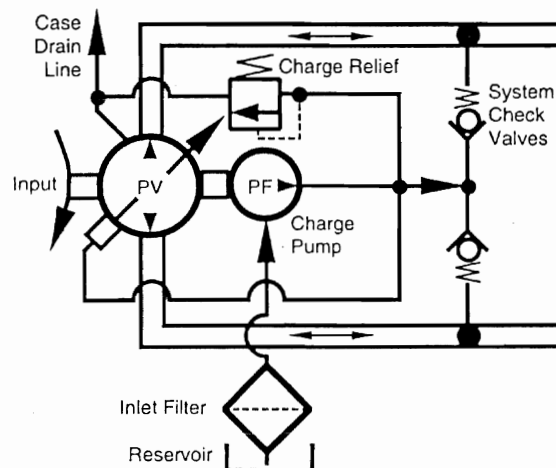
PV with Charge Pump

90000243



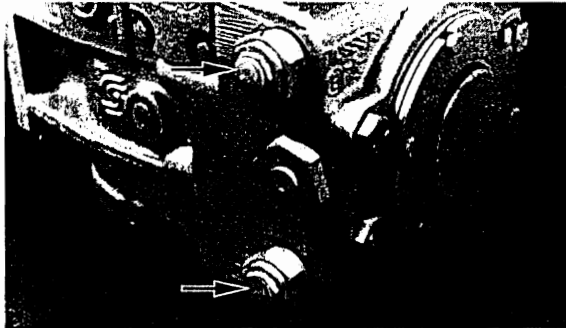
Charge Pump Components

90000349



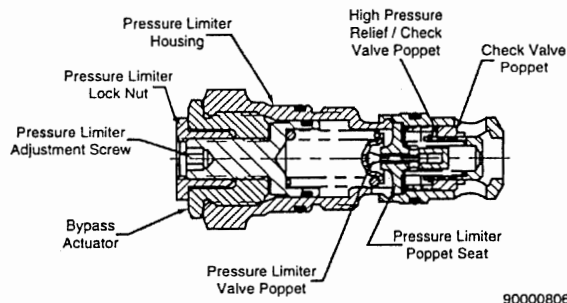
Pump Charge System

90000804

**SAUER  SUNDSTRAND****Series 90****Functional Description****2**

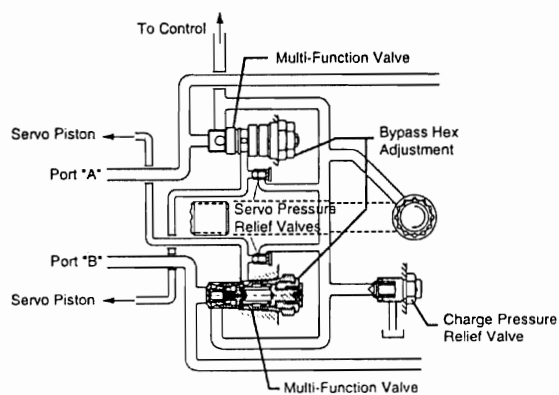
90000243

PV showing location of Multi-Function Valves



90000806

Cross Section of Multi-Function Valve



90000801

Circuit Diagram Showing Pressure Control  
Mechanisms**2.4.4 Multi-Function Valves**

All Series 90 pumps include two multi-function valves. The multi-function valve incorporates the system check valve, the pressure limiter valve, the high pressure relief valve, and the bypass valve in a replaceable cartridge. These functions are described separately. There are two multi-function valve cartridges in each Series 90 pump to handle functions in either direction. See Secs. 8.1.2 and 9.2.1 for adjustments and repairs.

*NOTE: Some multi-function valves do not include a pressure limiter valve.*

**2.4.5 Pressure Limiter and High Pressure Relief Valves**

Series 90 pumps are designed with a sequenced pressure limiting system and high pressure relief valves. When the preset pressure is reached, the pressure limiter system acts to rapidly destroke the pump so as to limit the system pressure. For unusually rapid load application, the high pressure relief valve acts to immediately limit system pressure by cross-porting system flow to the low pressure side of the loop. The pressure limiter valve acts as the pilot for the high pressure relief valve spool. The high pressure relief valve is sequenced to operate at approximately 35 bar (500 psi) above the level that initiates the pressure limiter valve.

Both the pressure limiter sensing valves and relief valves are built into the multi-function valves (see above).

*NOTE: For some applications, such as dual path vehicles, the pressure limiter function may be defeated so that only the high pressure relief valve function remains.*

**2.4.6 Bypass Valves**

The bypass valves ("tow") can be operated when it is desired to move the vehicle or mechanical function when the pump is not running. The valve is opened by manually resetting the valve position (Sec. 8.1.3).

The bypass valves are built into the multi-function valves (see above).



**Series 90 Functional Description 2**

**2.4.7 Displacement Limiters**

Series 90 pumps sizes 042 - 250 are designed for optional mechanical displacement (stroke) limiters. The maximum displacement of the pump can be limited in either direction.

The setting can be set as low as 0° in either direction.

For instructions on adjustment see Sec. 8.1.5.



PV with Displacement Limiters

**2.4.8 Auxiliary Mounting Pads**

Auxiliary mounting pads are available on all Series 90 pumps. SAE A through E and H mounts are available (availability varies by pump size). This pad is used for mounting auxiliary hydraulic pumps and for mounting additional Series 90 pumps to make tandem pumps. The pads allow for full through-torque capability.



PV with Auxiliary Mounting Pad

**2.4.9 Filtration Options**

All Series 90 pumps are available with provisions for either suction or charge pressure filtration (integral or remote mounted) to filter the fluid entering the charge circuit. (See Sec. 6 for more information.)

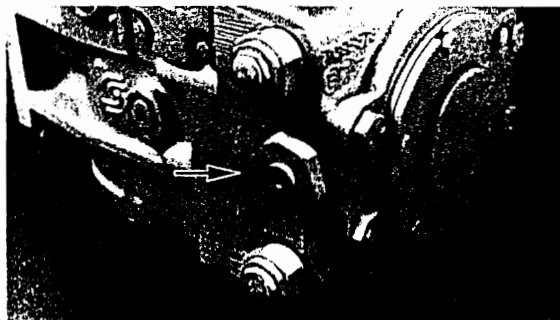
**Suction Filtration**

The suction filter is placed in the circuit between the reservoir and the inlet to the charge pump. When suction filtration is used, a reducer fitting is placed in the charge pressure gauge port (M3). Filtration devices of this type are provided by the user.

**Charge Pressure Filtration**

The pressure filter may be integrally mounted directly on the pump or a filter may be remotely mounted for ease of servicing.

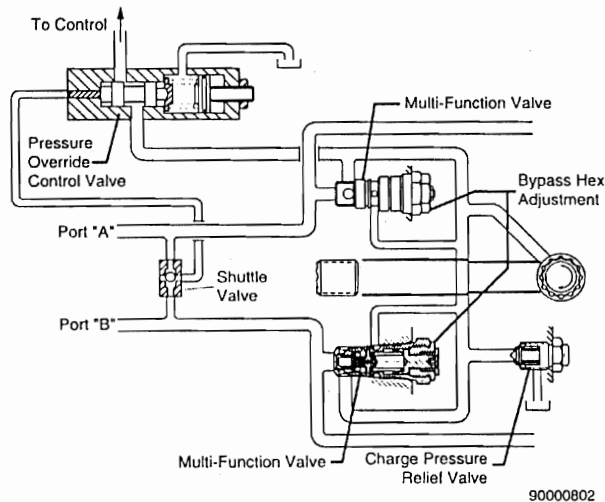
A 200 mesh screen, located in the reservoir or the charge inlet line, is recommended when using this filtration option. A non-bypass filter is preferred on all types of filtration.



PV with Suction Filtration  
(No filtration device attached)



PV with Integral Charge Pressure Filtration (left)  
PV with Remote Charge Pressure Filtration (right,  
filter attached remotely)

**SAUER SUNDSTRAND****Series 90****Functional Description****2****Pressure Override - 180 Frame Size Only****2.4.10 Pressure Override (POR) - 180  
Frame Size Only**

The pressure override valve (POR) modulates the control pressure to the displacement control to maintain a pump displacement which will produce a system pressure level less than or equal to the POR setting. For unusually rapid load application, the high pressure relief valve function of the multifunction valves is available to also limit the pressure level.

The pressure override consists of a three-way normally open valve which operates in series with the pump displacement control. Control supply pressure is normally ported through the pressure override valve to the displacement control valve for controlling the pump's displacement. If the system demands a pressure above the override setting, the POR valve will override the control by reducing the control pressure supplied to the displacement control. As the control pressure reduces, the internal forces tending to rotate the swashplate overcome the force of the servo pistons and allow the pump's displacement to decrease.

**Series 90****Functional Description****2**

## 2.5 Pump Control Options

### 2.5.1 Manual Displacement Control (MDC)

The manual displacement control converts a mechanical input signal to a hydraulic signal using a spring-centered four-way servo valve. This valve ports hydraulic pressure to either side of a dual-acting servo piston. The servo piston rotates the cradle swashplate through an angular rotation of  $\pm 17^\circ$ , thus varying the pump's displacement from full displacement in one direction to full displacement in the opposite direction. The MDC is designed so the angular position of the pump swashplate is proportional to the rotation of the control input shaft. For adjustments see 8.2.1; for repairs see 9.3.2, 9.3.8.

#### Non-Linear MDC

The non-linear manual displacement control (photo in Sec. 8.2.2) operates in the same manner as the regular MDC except that it is designed so the change in the angular position of the pump swashplate *progressively* increases as the control input shaft is rotated toward its maximum displacement position. For adjustments see Sec. 8.2.2; for repairs see 9.3.2.

#### Solenoid Override Valve

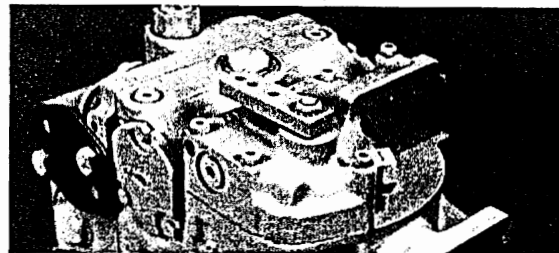
A solenoid override valve option (not shown here) is available for MDC. This safety feature will return the swashplate to zero displacement position when activated. The valve may be set in either a normally open or normally closed mode. For repairs see 9.3.3, 9.3.4.

#### Neutral Start Switch (NSS)

The neutral start switch is an optional feature available with MDC. When connected properly with the vehicle's electrical system, the neutral start switch ensures that the prime mover can be started only when the control is in a neutral position. For adjustments see Sec. 8.2.3.

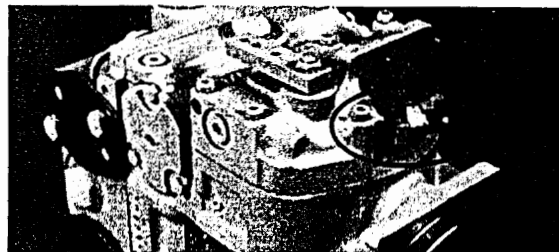
### 2.5.2 Hydraulic Displacement Control (HDC)

The hydraulic displacement control uses a hydraulic input signal to operate a spring-centered four-way servo valve. This valve ports hydraulic pressure to either side of a dual-acting servo piston. The servo piston rotates the cradle swashplate through an angular rotation of  $\pm 17^\circ$ , thus varying the pump's displacement from full displacement in one direction to full displacement in the opposite direction. The HDC is designed so the angular position of the pump swashplate is proportional to input pressure. For adjustments see 8.2.4; for repairs see 9.3.5, 9.3.8.



90000237

PV with Manual Displacement Control



90000239

PV with Manual Displacement Control and Neutral Start Switch



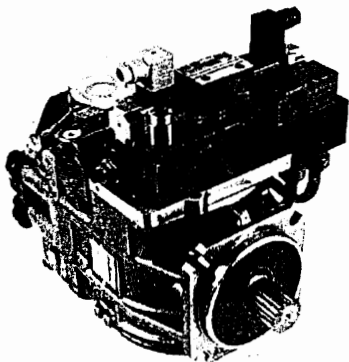
90000240

PV with Hydraulic Displacement Control

**SAUER  SUNDSTRAND****Series 90****Functional Description****2**

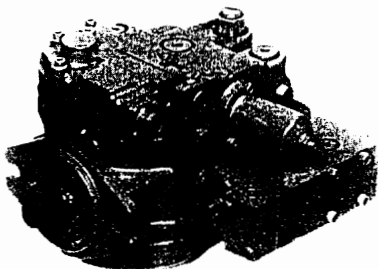
90000241

PV with Electric Displacement Control



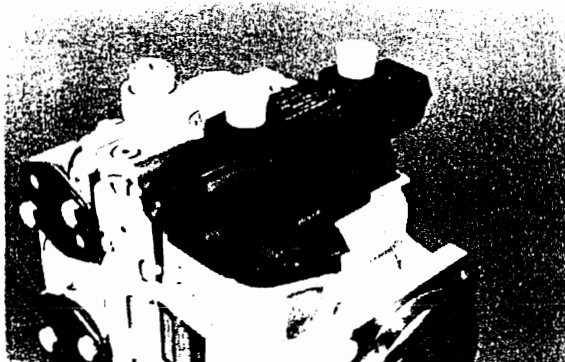
90000353

PV with Automotive Control (AC)



F000645

PV with Automotive Control Type II (AC II)



90000354

PV with 3-Position (FNR) Electric Control

**2.5.3 Electric Displacement Control (EDC)**

The electric displacement control is similar to the hydraulic displacement control with the input signal pressure controlled by a pressure control pilot (PCP) valve. The PCP valve converts a DC electrical input signal to a hydraulic signal which operates a spring-centered four-way servo valve. This valve ports hydraulic pressure to either side of a dual-acting servo piston. The servo piston rotates the cradle swashplate through an angular rotation of  $\pm 17^\circ$ , thus varying the pump's displacement from full displacement in one direction to full displacement in the opposite direction. The control is designed so the angular position of the swashplate is proportional to the EDC input. For neutral adjustment see Sec. 8.2.4; for repairs see Sec. 9.3.5, 9.3.6, and 9.3.8.

**2.5.4 Automotive Control (AC and AC II)**

Automotive Control (AC) allows a vehicle to be driven in a manner similar to an automobile with an automatic transmission.

The AC control includes a three-position electric control to provide direction control.

The AC II control can be combined with a manual, hydraulic, or electric displacement control to provide both direction control and control over maximum vehicle speed. It may also be combined with a 3-position electric control to provide direction control.

**2.5.5 3-Position (FNR) Electric Control**

This control utilizes a 12 or 24 VDC electrically operated spool valve to port pressure to either side of the pump displacement control piston. Energizing one of the solenoids will cause the pump to go to its maximum displacement in the corresponding direction.

All functions of the three-position (FNR) electric control are preset at the factory. For repairs, see Sec. 9.3.7.



### Series 90

### Functional Description

2

## 2.6 Motor Features

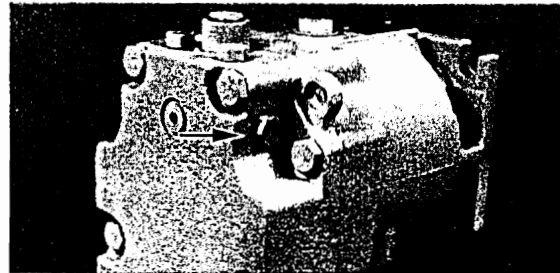
### 2.6.1 Motor Loop Flushing Valve and Charge Relief Valve

All Series 90 motors are designed to accommodate a loop flushing valve. The loop flushing valve is used in installations which require additional fluid to be removed from the main hydraulic circuit because of transmission cooling requirements, or unusual circuits requiring additional loop flushing to remove excessive contamination in the high pressure circuit.

A shuttle valve and charge relief valve are installed in the motor end cap to provide the loop flushing function. The shuttle valve provides a circuit between the low pressure side of the closed loop and the charge relief valve in the motor end cap.

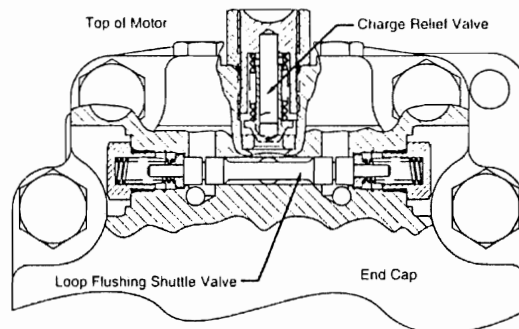
The motor charge relief valve regulates the charge pressure level only when there is a pressure differential in the main loop. The shuttle valve is spring centered to the closed position so that no high pressure fluid is lost from the circuit when reversing pressures.

For charge relief valve adjustment see Sec. 8.3.1, for repairs see Sec. 9.4.1.



90000248

MF showing location of Loop Flushing Valve



90000238

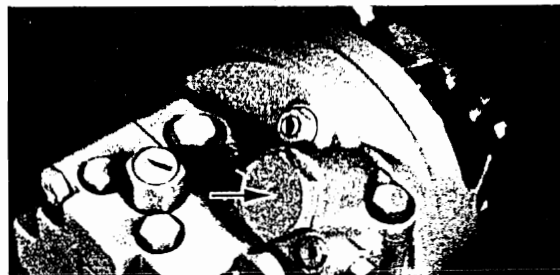
Motor Charge Relief Valve and Loop Flushing Shuttle Valve

### 2.6.2 Variable Motor Displacement Limiters

All Series 90 variable motors include mechanical displacement (stroke) limiters. Both the maximum and minimum displacement of the motor can be limited.

The range of the settings is as follows:

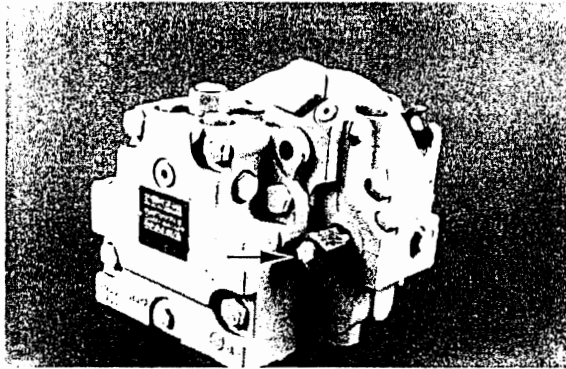
	055 MV Frame	075 MV Frame
Minimum Displacement	19 - 40 cm <sup>3</sup> 1.2 - 2.4 in <sup>3</sup>	26 - 54 cm <sup>3</sup> 1.6 - 3.3 in <sup>3</sup>
Maximum Displacement	65 - 100%	65 - 100%



90000352

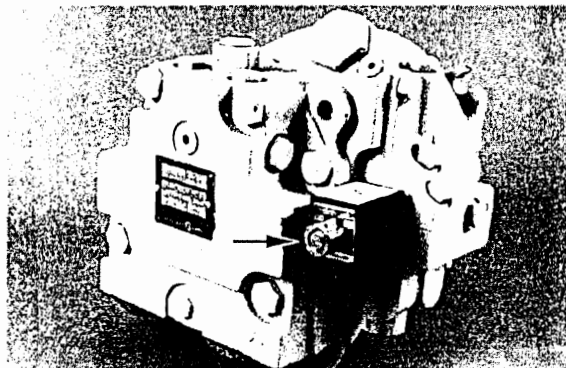
MV Maximum Displacement Limiter  
(Minimum Displacement Limiters on Opposite Side)



**SAUER SUNDSTRAND****Series 90****Functional Description****2****2.7 Variable Motor Controls**

90000350

MV with Hydraulic 2-Position Control



90000351

MV with Electric 2-Position Control

**2.7.1 Hydraulic 2-Position Control**

This control utilizes a hydraulically operated three-way hydraulic valve to port system pressure to either of the motor displacement control pistons. The motor is normally held at its maximum displacement. Supplying pilot hydraulic pressure to the valve will cause the motor to go to its minimum displacement.

All functions of the hydraulic two-position control are preset at the factory. For repairs see Sec. 9.5.2 and 9.5.4.

**2.7.2 Electric 2-Position Control**

This control utilizes an electric solenoid operated three-way hydraulic valve to port system pressure to either of the motor displacement control pistons. The motor is normally held at its maximum displacement. Energizing the solenoid will cause the motor to go to its minimum displacement.

All functions of the electric two-position control are preset at the factory. For repairs see Sec. 9.5.1 and 9.5.4.



Series 90

Technical Specifications

3

### 3. Technical Specifications

#### 3.1 General Specifications

**Design**

Variable Pumps and Motors: Axial piston pump of variable displacement, cradle swashplate design.

Fixed Motors: Axial piston motor with fixed displacement, fixed swashplate design.

**Type of Mounting** (per SAE J744)

SAE flange, Size "B" mounting pad, 2 bolts

SAE flange, Size "C" mounting pad, 4 bolts

Cartridge flange, 2 bolts (for motor only)

**Port Connections** (See Sec. 4.2 for exact specs.)

Main pressure ports: SAE flange, Code 62

Remaining ports: SAE straight thread O-ring boss

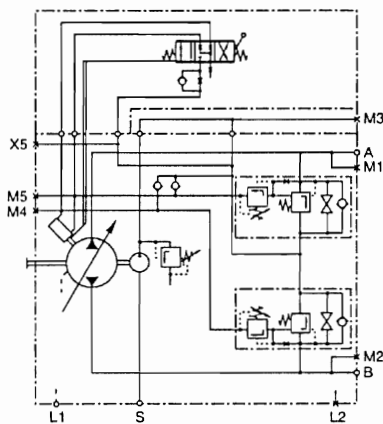
**Direction of Rotation**

Clockwise or counterclockwise (motors are bidirectional)

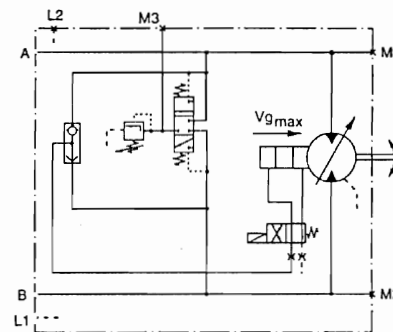
**Installation Position**

Installation position is discretionary. The housing must always be filled with hydraulic fluid, so note position of drain ports.

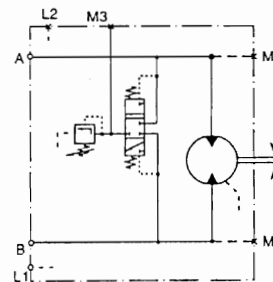
#### 3.2 Circuit Diagrams



PV with charge pump and manual displacement control



MV with electrohydraulic two-position control



MF

**Series 90 Technical Specifications 3****3.3 Hydraulic Parameters****System Pressure Range**

Maximum Pressure	480 bar	[6960 psi]
Rated Pressure	420 bar	[6000 psi]

**Charge Pump Inlet Vacuum (on pumps only)**

Maximum Vacuum, Continuous	0.7 bar abs	[10 in Hg]
Maximum Vacuum, Cold Start	0.2 bar abs	[25 in Hg]

**Case Pressure**

Maximum, Continuous	3 bar	[44 psi]
Maximum, Intermittent or Cold Start	5 bar	[73 psi]

**Hydraulic Fluid**

Refer to SAS publication BLN 9887 or Publication SDF (Id. No. 697581). Also refer to publication ATI-E 9101 for information relating to biodegradable fluids

**Temperature Range<sup>1</sup>**

Minimum, Intermittent or Cold Start	-40°C	[-40°F]
Maximum, Continuous	104°C	[220°F]
Maximum, Intermittent	115°C	[240°F]

**Fluid Viscosity Limits**

Minimum, Intermittent	5 mm <sup>2</sup> /s	[42 SUS]
Minimum, Continuous	6.4 mm <sup>2</sup> /s	[47 SUS]
Minimum, Optimum	13 mm <sup>2</sup> /s	[70 SUS]
Maximum, Continuous	110 mm <sup>2</sup> /s	[510 SUS]
Maximum, Intermittent or Cold Start	1600 mm <sup>2</sup> /s	[7400 SUS]

**Filtration**

Required cleanliness level: ISO 4406 Class 18/13 or better. Refer to SAS publications BLN 9887 or Publication SDF (Id. No. 697581) and ATI-E 9201.



## Series 90 Technical Specifications 3

### 3.4 Technical Data

**Table 1 - Variable Displacement Pumps**

	Dimension	030 PV	042 PV	055 PV	075 PV	100 PV	130 PV	180 PV	250 PV
Displacement (maximum)	cm <sup>3</sup>	30.0	42.0	55.0	75.0	100.0	130.0	180.0	250.0
	in <sup>3</sup>	1.83	2.56	3.35	4.57	6.10	7.93	10.98	15.25
Minimum speed	min <sup>-1</sup> (rpm)	500	500	500	500	500	500	500	500
Rated speed*	min <sup>-1</sup> (rpm)	4200	4200	3900	3600	3300	3100	2600	2300
Maximum speed*	min <sup>-1</sup> (rpm)	4600	4600	4250	3950	3650	3400	2850	2500
Max. attainable speed* at max. disp.	min <sup>-1</sup> (rpm)	5000	5000	4700	4300	4000	3700	3150	2750
Theoretical torque at max. disp.	Nm / bar	0.48	0.67	0.88	1.19	1.59	2.07	2.87	3.97
	lbf•in/1000 psi	290	380	530	730	970	1260	1750	2433
Weight (Base Unit)	kg	28	34	40	49	68	88	136	154
	lb	62	75	88	108	150	195	300	340

**Table 2 - Fixed and Variable Displacement Motors**

	Dimension	030 MF	042 MF	055 MF	075 MF	100 MF	130 MF	055 MV	075 MV	
Displacement (maximum)	cm <sup>3</sup>	30.0	42.0	55.0	75.0	100.0	130.0	55.0	75.0	
	in <sup>3</sup>	1.83	2.56	3.35	4.57	6.10	7.93	3.35	4.57	
Displacement (minimum)	cm <sup>3</sup>	—	—	—	—	—	—	19.0	26.0	
	in <sup>3</sup>	—	—	—	—	—	—	1.16	1.59	
Rated speed*	at max. disp.	min <sup>-1</sup> (rpm)	4200	4200	3900	3600	3300	3100	3900	3600
	at min. disp.	min <sup>-1</sup> (rpm)	—	—	—	—	—	—	4600	4250
Maximum speed*	at max. disp.	min <sup>-1</sup> (rpm)	4600	4600	4250	3950	3650	3400	4250	3950
	at min. disp.	min <sup>-1</sup> (rpm)	—	—	—	—	—	—	5100	4700
Max. attainable speed* at max. disp.	min <sup>-1</sup> (rpm)	5000	5000	4700	4300	4000	3700	4700	4300	
Theoretical torque at max. disp.	Nm / bar	0.48	0.67	0.88	1.19	1.59	2.07	0.88	1.19	
	lbf•in/1000 psi	290	380	530	730	970	1260	530	730	
Maximum flow at max. disp.	l / min	138	193	234	296	365	442	234	296	
	gal / min	36.5	51	62	78	96	117	62	78	
Max. corner power	kW	111	155	187	237	292	354	224	282	
	hp	149	208	251	318	392	475	300	378	
Weight (SAE Flange)	kg	11	15	20	26	34	45	39	44	
	lb	24	34	45	57	74	99	86	98	
Weight (Cartridge Motor)	kg	—	17	26	33	—	—	40	46	
	lb	—	37	57	72	—	—	88	101	

\* = Refer to Series 90 Technical Information manual for definitions



**Series 90 Pressure Measurement 4**

## 4. Pressure Measurement

### 4.1 Required Tools

The service procedures described in this manual for Series 90 pumps and motors can be performed using common mechanic's tools. Special tools, if required are shown.

Pressure gauges should be calibrated frequently to ensure accuracy. Snubbers are recommended to protect pressure gauges.

### 4.2 Port Locations and Pressure Gauge Installation

The following sections list the ports for each type of hydraulic unit. The recommended pressure gauge and fitting are also specified.

Outline drawings showing port locations follow the tables.

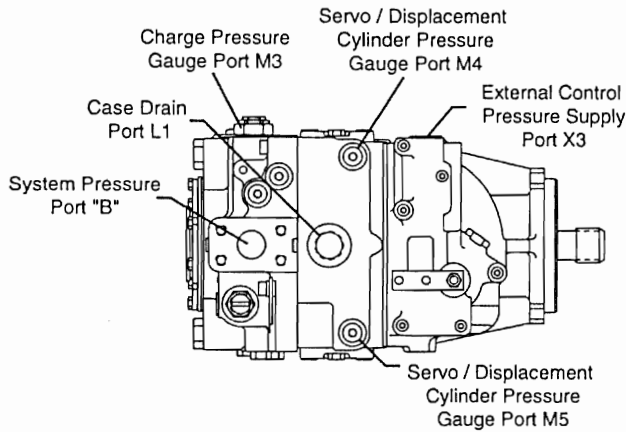
#### 4.2.1 Variable Pump

Port	Function	Recommended Gauge Size and Fitting
M1	System Pressure Port "A"	1000 bar or 10 000 psi Gauge 9/16—18 O-Ring Fitting
M2	System Pressure Port "B"	1000 bar or 10 000 psi Gauge 9/16—18 O-Ring Fitting
M3 (M6)	Charge Pressure	50 bar or 1000 psi Gauge 9/16—18 O-Ring Fitting
M4 M5	Servo Pressure	50 bar or 500 psi Gauge 9/16—18 O-Ring Fitting

Port	Function	Recommended Gauge Size and Fitting
L1 L2	Case Pressure	10 bar or 100 psi Gauge SAE O-Ring Fitting: 030, 042 7/8—14 055, 075, 100 1-1/16—12 130 1-5/16—12 180, 250 1-5/8—12
X1 X2	HDC / EDC Pressure	50 bar or 1000 psi Gauge 7/16 — 20 O-Ring Fitting or 9/16 — 18 O-Ring Fitting
X3	Ext. Control Pressure	50 bar or 1000 psi Gauge 9/16 — 18 O-Ring Fitting
S	Charge Pump Inlet	Vacuum Gauge, Tee into Inlet Line SAE O-Ring Fitting: 030, 042 1-1/16 — 12 055, 075 1-5/16 — 12 100, 130, 180 1-5/8 — 12 250 1-1/2 SAE Split Flange

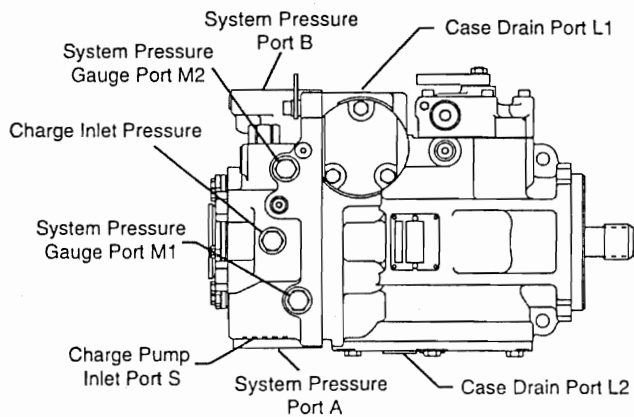


**Series 90 Pressure Measurement 4**

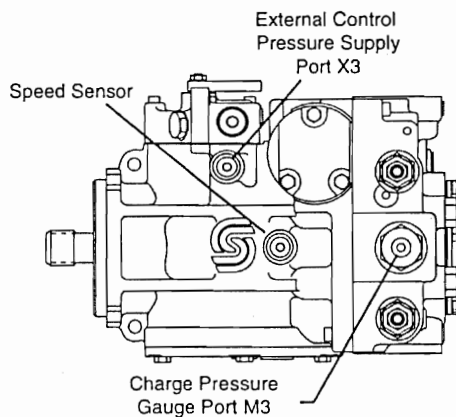


Top View

90000814



Left Side View



Right Side View

90000815  
90000816

**PV with Side Port End Cap and Manual Displacement Control**

**SAUER  SUNDSTRAND****Series 90****Start-Up****5**

## 5. Initial Start-Up Procedure

The following start-up procedure should always be followed when starting-up a new Series 90 installation or when restarting an installation in which either the pump or motor had been removed.

**WARNING**

The following procedure may require the vehicle/machine to be disabled (wheels raised off the ground, work function disconnected, etc.) while performing the procedure in order to prevent injury to the technician and bystanders. Take necessary safety precautions before moving the vehicle/machine.

Prior to installing the pump and/or motor, inspect the units for damage incurred during shipping and handling. Make certain all system components (reservoir, hoses, valves, fittings, heat exchanger, etc.) are clean prior to filling with fluid.

Fill the reservoir with recommended hydraulic fluid. This fluid should be passed through a 10 micron (nominal, no bypass) filter prior to entering the reservoir. The use of contaminated fluid will cause damage to the components, which may result in unexpected vehicle/machine movement. See the publications BLN-9887 and SDF 697581 for further related information.

The inlet line leading from the reservoir to the pump must be filled prior to start-up. Check inlet line for properly tightened fittings and make sure it is free of restrictions and air leaks.

**Be certain to fill the pump and/or motor housing with clean hydraulic fluid prior to start up.** Fill the housing by pouring filtered oil into the upper case drain port.

Install a 50 bar (or 1000 psi) pressure gauge in the charge pressure gauge port (see Sec. 4.2 for location) to monitor the charge pressure during start-up.

It is recommended that the external control input signal (linkage for MDC, hydraulic lines for HDC, or

electrical connections for EDC) be disconnected at the pump control until after initial start-up. This will ensure that the pump remains in its neutral position.

**WARNING**

Do not start prime mover unless pump is in neutral position (0° swashplate angle). Take precautions to prevent machine movement in case pump is actuated during initial start up.

“Jog” or slowly rotate prime mover until charge pressure starts to rise. Start the prime mover and run at the lowest possible RPM until charge pressure has been established. Excess air may be bled from the high pressure lines through the high pressure system gauge port.

Once charge pressure has been established, increase speed to normal operating RPM. Charge pressure should be as indicated in the pump model code (see Sec. 8.1.1). If charge pressure is inadequate, shut down and determine cause for improper pressure. Refer to Troubleshooting Sec. 7.

**WARNING**

Inadequate charge pressure will affect the operator's ability to control the machine.

Shut down the prime mover and connect the external control input signal. Also reconnect the machine function if disconnected earlier. Start the prime mover, checking to be certain the pump remains in neutral. With the prime mover at normal operating speed, slowly check for forward and reverse machine operation.

Charge pressure may slightly decrease during forward or reverse operation. Continue to cycle slowly between forward and reverse for at least five minutes.

Shut down prime mover, remove gauges, and plug ports. Check reservoir level and add filtered fluid if needed.

The transmission is now ready for operation.

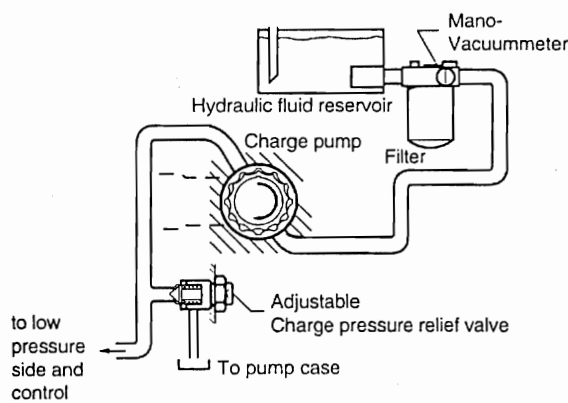


Series 90

Fluid and Filter Maintenance

6

### 6. Fluid and Filter Maintenance



P000797 E

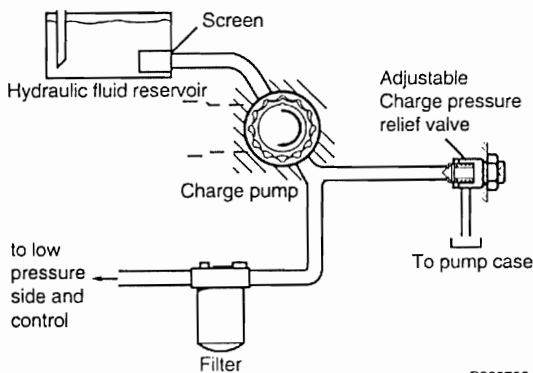
Suction Filtration Schematic

To ensure optimum service life of Series 90 products, regular maintenance of the fluid and filter must be performed. Contaminated fluid is the main cause of unit failure. Care should be taken to maintain fluid cleanliness while performing any service procedure.

Check the reservoir daily for proper fluid level, the presence of water (noted by a cloudy to milky appearance, or free water in bottom of reservoir), and rancid fluid odor (indicating excessive heat). If either of these conditions occur, change the fluid and filter immediately.

It is recommended that the fluid and filter be changed per the vehicle/machine manufacturer's recommendations or at the following intervals:

System with a sealed-type reservoir	2000 hours
System with a breathing-type reservoir	500 hours



P000798 E

Charge Pressure Filtration Schematic  
(Partial Flow)

It may be necessary to change the fluid more frequently than the above intervals if the fluid becomes contaminated with foreign matter (dirt, water, grease, etc.) or if the fluid has been subjected to temperature levels greater than the recommended maximum. Never reuse fluid.

The filter should be changed whenever the fluid is changed or whenever the filter indicator shows that it is necessary to change the filter.

Filters can be in either pressure filtration or suction filtration configurations. For suction filtration, filters should have a Beta-ratio of  $\beta_{10} > 2$ . For charge pressure filtration, filters should have a Beta-ratio of  $\beta_{10} > 10$ . See Sauer-Sundstrand publication BLN-9887 or 697581 and ATI-E 9201 for more information on filtration.



**Series 90****Troubleshooting****7**

## 7. Troubleshooting

This section provides general steps to follow if certain undesirable system conditions are observed. Follow the steps in a section until the problem is solved. Some of the items will be system specific. For areas covered in this manual, a section is referenced. **Always observe the safety precautions listed in Sec. 1.2 and related to your specific equipment.**

### 7.1 "Neutral" Difficult or Impossible to Find

Item	Description	Action
1. Check input to pump control.	Input to control module is operating improperly.	Check control input and repair or replace as necessary.
2. Check pump displacement control.	Control linkages are not secure, control orifices are blocked, etc.	Adjust, repair, or replace control module as necessary (8.2 and 9.3).
3. Repair or replace pump.		Consult a Sauer-Sundstrand Authorized Service Center.

### 7.2 System Operating Hot

Item	Description	Action
1. Check oil level in reservoir.	Insufficient hydraulic fluid will not meet cooling demands of system.	Fill reservoir to proper level.
2. Inspect heat exchanger.	Heat exchanger not sufficiently cooling the system.	Check air flow and input air temperature for heat exchanger. Clean, repair or replace heat exchanger.
3. Check charge pressure.	Low charge pressure will overwork system.	Measure charge pressure (4.2). Inspect and adjust or replace charge relief valve (8.1.1 and 9.2.3). Or repair leaky charge pump (9.2.4).
4. Check charge pump inlet vacuum.	High inlet vacuum will overwork system. A dirty filter will increase the inlet vacuum. Inadequate line size will restrict flow.	Check charge inlet vacuum (4.2). If high, inspect inlet filter and replace as necessary. Check for adequate line size, length or other restrictions.
5. Check system relief pressure settings.	If the system relief settings are too low, the relief valves will be overworked.	Verify settings of pressure limiters and high pressure relief valves and adjust or replace multi-function valves as necessary (8.1.2, 9.2.1)
6. Check for internal leakage in motor.	Leakage will reduce low side system pressure and overwork the system.	Monitor motor case flow without loop flushing in the circuit (use defeat spool 9.4.1.3). If flow is excessive, replace motor.
7. Check system pressure.	High system pressure will overheat system.	Measure system pressure (4.2). If pressure is high reduce loads.
8. Replace transmission.		Replace pump and motor.

**Series 90****Troubleshooting****7****7.3 Transmission Operates Normally in One Direction Only**

Item	Description	Action
1. Check input to pump control.	Input to control module is operating improperly.	Check control input and repair or replace as necessary.
2. Check pump displacement control.	Control linkages are not secure, control orifices are blocked, etc.	Repair or replace control module as necessary (8.2 and 9.3).
3. Interchange system pressure limiters, high pressure relief valves, and system check valves.	Interchanging the multi-function valves will show if the problem is related to the valve functions contained in the multi-function valves.	Interchange multi-function valves. If the problem changes direction, repair or replace the valve on the side that does not operate (8.1.2 and 9.2.1).
4. Check charge pressure.	If charge pressure decays in one direction the loop flushing valve may be "sticking" in one direction.	Measure charge pressure in forward and reverse (4.2). If pressure decays in one direction, inspect and repair the motor loop flushing valve (9.4.1.1).

**7.4 System Will Not Operate in Either Direction**

Item	Description	Action
1. Check oil level in reservoir.	Insufficient hydraulic fluid to supply system loop.	Fill reservoir to proper level.
2. Check input to pump control.	Input to control module is operating improperly.	Check control input and repair or replace as necessary.
3. Check pump displacement control.	Control linkages are not secure, control orifices are blocked, etc.	Repair or replace control module as necessary (8.2 and 9.3).
4. Ensure bypass valve(s) are closed.	If bypass valve(s) is open, the system loop will be depressurized.	Close bypass valves (8.1.3). Replace multi-function valve if defective (9.2.1).
5. Check charge pressure with pump in neutral.	Low charge pressure insufficient to recharge system loop.	Measure charge pressure with the pump in neutral (4.2). If pressure is low, go to step 6; otherwise continue with step 5.
6. Check charge pressure with pump in stroke.	Low charge pressure with the pump in stroke indicates a motor charge relief valve or system pressure relief valve may be improperly set.	Measure charge pressure with pump in stroke (4.2). If pressure is low, adjust or replace motor charge relief valve (8.3.1 and 9.4.1.2), otherwise go to step 9.
7. Inspect pump charge relief valve.	A pump charge relief valve that is leaky or set too low will depressurize the system.	Adjust or replace pump charge relief valve as necessary (8.1.1, 9.2.3)
8. Check charge pump inlet filter.	A clogged filter will undersupply system loop.	Inspect filter and replace if necessary.



**Series 90 Troubleshooting 7**

- |   |   |   |
|---|---|---|
| 9. Check charge pump.                   | A malfunctioning charge pump will provide insufficient charge flow.   | Repair or replace the charge pump (9.2.4). If OK go to last step. |
| 10. Check pump displacement control.    | Control linkages are not secure, control orifices are blocked, etc.   | Repair or replace control module as necessary (8.2 and 9.3).      |
| 11. Check system pressure.              | Low system pressure will not provide power necessary to move load.    | Measure system pressure (4.2). Continue with next step.           |
| 12. Check system multi-function valves. | Defective multi-function valves will cause system pressure to be low. | Repair or replace multi-function valve(s) (9.2.1).                |
| 13. Replace transmission.               |   | Replace pump and motor.   |

**7.5 Low Motor Output Torque**

Item	Description	Action
1. Check system pressure at motor.	Low system pressure at the motor will reduce torque.	Measure system pressure at motor (4.2). If pressure limiter setting is low, increase setting.
2. Variable motor stuck at minimum displacement.	Minimum motor displacement yields low output torque.	Check control supply pressure (4.2.3) or repair displacement control (9.5). Check motor control orifices (9.5.4).
3. Check for internal leakage.	Internal leakage will reduce system pressure.	Check for leakage in O-rings, gaskets, and other fittings (9.1.1 and others). Repair unit as required, or replace leaky unit.
4. Replace transmission.		Replace pump and motor.

**7.6 Improper Motor Output Speed**

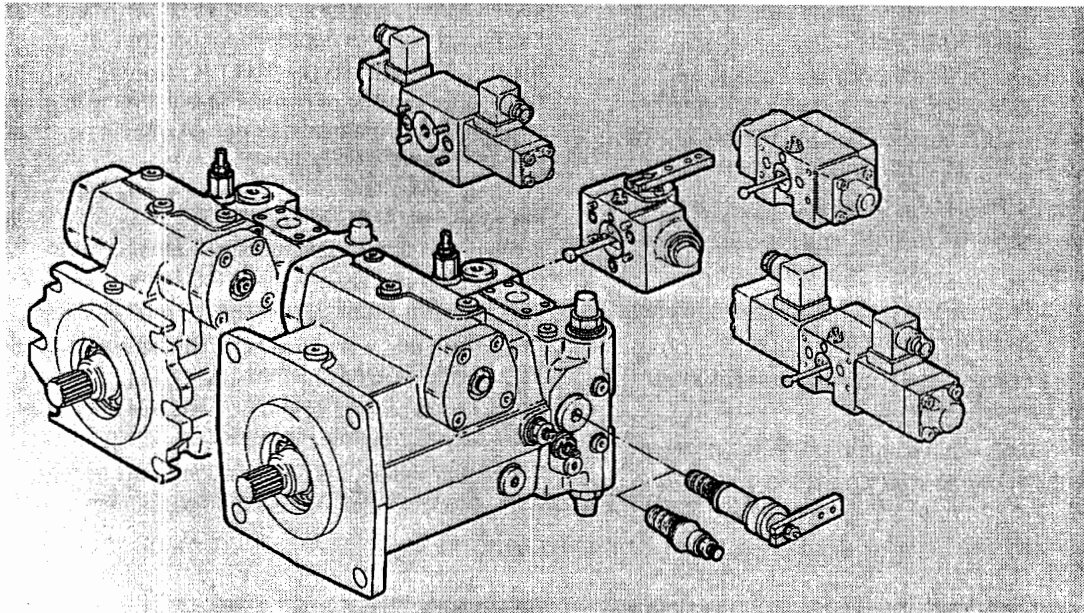
Item	Description	Action
1. Check oil level in reservoir.	Insufficient hydraulic fluid will reduce motor speed.	Fill oil to proper level.
2. Check charge pressure.	Incorrect charge pressure can result in a low speed motor.	Measure charge pressure (8.1.1), adjust charge system as necessary (9.2.3 and 9.2.4).
3. Check pump output flow.	Incorrect outflow will affect output speed. Incorrect output flow indicates the swashplate is out of position.	Measure pump output flow by teeing into outflow hose. Check for proper pump speed and see that the pump is in full stroke.
4. Check variable motor displacement control.	If variable motor displacement control is not functioning correctly, variable motor swashplate may be in wrong position.	See if variable motor displacement control is responding. If not, repair or replace control (9.5).

**Series 90****Troubleshooting****7****7.7 Excessive Noise and/or Vibration**

Item	Description	Action
1. Check oil in reservoir.	Insufficient hydraulic fluid will lead to cavitation.	Fill reservoir to proper level.
2. Air in system.	Air bubbles will lead to cavitation.	Look for foam in reservoir. Check for leaks on inlet side of system loop. Afterwards, let reservoir settle until bubbles are gone. Run system at low speed to move system fluid to reservoir. Repeat.
3. Check pump inlet vacuum.	High inlet vacuum will create noise. A dirty filter will increase the inlet vacuum.	Inspect and replace filter as necessary. Check for proper suction line size.
4. Inspect shaft couplings.	A loose shaft coupling will cause excessive noise.	Replace loose shaft coupling in charge pump (Sec. 9.2.4) or replace pump or motor.
5. Inspect shaft alignment.	Unaligned shafts will create excessive frictional noise.	Align shafts.

**7.8 System Response is Sluggish**

Item	Description	Action
1. Check oil level in reservoir.	Insufficient hydraulic fluid will reduce output pressure.	Fill reservoir to proper level.
2. Check multi-function valves' pressure settings.	Incorrect pressure settings will affect system reaction time.	Adjust or replace multi-function valves (8.1.2 and 9.2.1).
3. Check pump inlet vacuum.	High pump inlet vacuum will reduce system pressure.	Measure charge inlet vacuum (4.2). If high replace inlet filter.
4. Check prime mover speed.	Low engine speed will reduce system performance.	Adjust engine speed.
5. Check charge and control pressures.	Incorrect charge or control pressures will affect system performance.	Measure charge and control pressures and correct if necessary (4.2 and others).
6. Check system internal leakage.	Internal leakage will reduce system pressure.	Check for leakage in O-rings, gaskets, and other fittings (9.1.1 and others).
7. Replace transmission.		Replace pump and motor.

**NOTICE**

Specifications, descriptions and illustrative material shown herein were as accurate as known at the time this publication was approved for printing.

BRUENINGHAUS HYDROMATIK reserves the right to discontinue models or options at any time or to change specifications, materials, or design without notice and without incurring obligation.

Optional equipment and accessories may add cost to the basic unit, and some options are available only in combination with certain models or other options.

For the available combinations refer to the relevant data sheet for the basic unit and the desired option.

Adjustment and tests have to be carried out on the test bench under operating temperatures.

Protection of personnel and property has to be guaranteed by appropriate measures.

Expert knowledge, the precondition of any service work, can be obtained in our training courses.

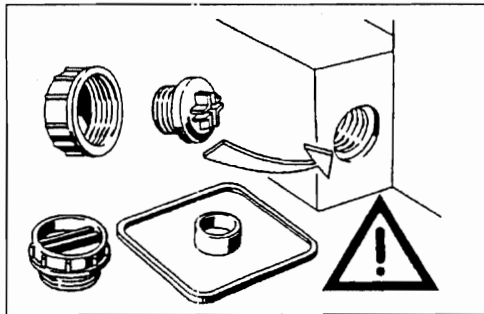
**CONTENTS**

- General repair instructions
- Seal kits and sub assembly groups
- Sealing of the drive shaft
- Sealing of the boost pump
- Sealing of the control piston cover
- Sealing of the boost pressure valve
- Sealing of the pressure relief valve HD
- Sealing of the pressure cut-off valve
- Sealing of the control device
- Control device HW
- Control device HD
- Control device EP
- Control device DA
- Sealing of the regulator valve
- Pump disassembly
- Dismantling of the control
- Dismantling of the cylinder
- Inspection notes
- Positioning piston, rotary group assembly
- Installation of the rotary group
- Assembly of the pump
- Tightening torques
- Safety regulations
- Adjustment instructions



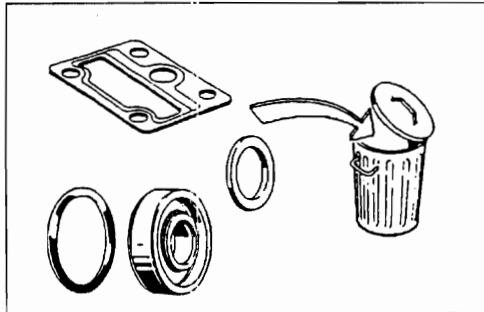
**Achtung!**  
Nachfolgend Hinweise bei allen Reparaturarbeiten  
an Hydraulikaggregaten beachten!

**Attention!**  
Observe the following notices when carrying out repair  
work at hydraulic aggregates!



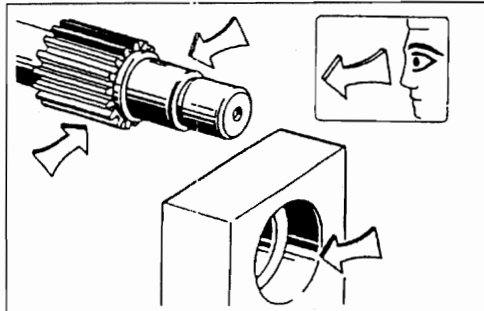
Alle Öffnungen der Hydraulikaggregate verschließen.

Close all ports of the hydraulic aggregates.



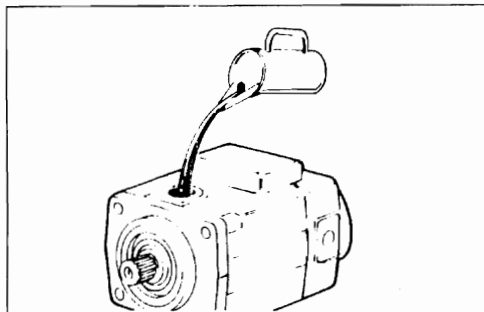
Alle Dichtungen erneuern.  
Nur original HYDROMATIK-Ersatzteile verwenden.

Replace all seals.  
Use only original HYDROMATIK spare parts.



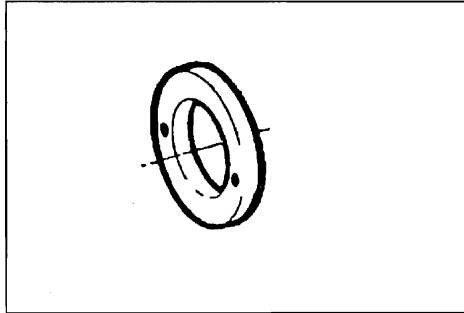
Alle Dicht- und Gleitflächen auf Verschleiß prüfen.  
Achtung: Nacharbeiten an Dichtflächen z. B. durch  
Schleifpapier kann die Oberfläche beschädigen.

Check all seal and sliding surfaces for wear.  
Attention: Rework of sealing area f. ex. with abrasive  
paper can damage surface.



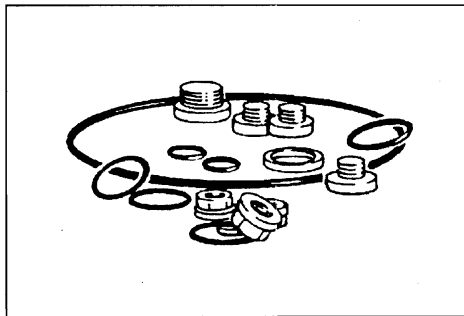
Hydraulikaggregate vor Inbetriebnahme mit  
Betriebsmedium befüllen.

Fill up hydraulic aggregates with medium  
before start- up.



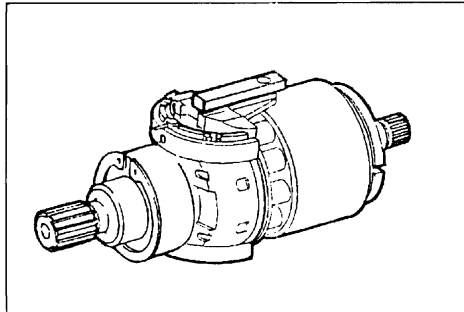
1 Dichtsatz für Triebwelle.

Seal kit for drive shaft.



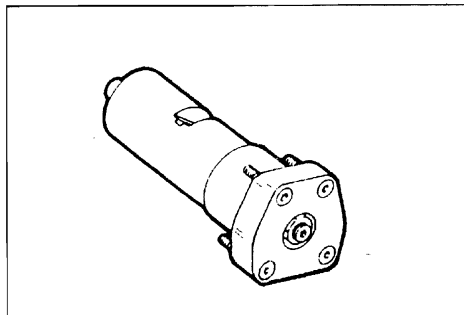
2 Äußerer Dichtsatz.

External seal kit.



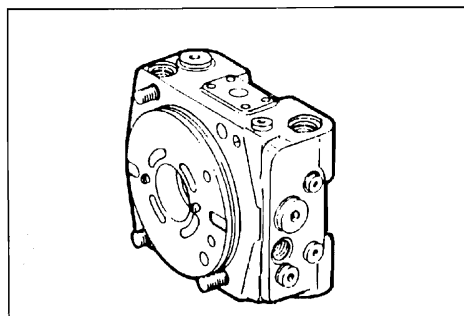
3 Triebwerk komplett.

Complete rotary group.



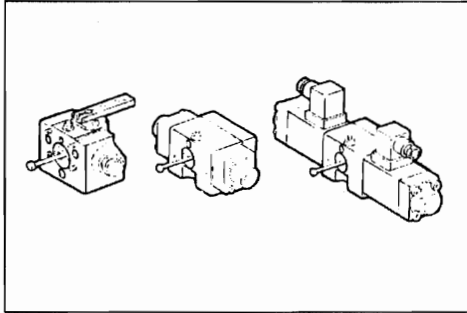
4 Stellkolben

Positioning piston

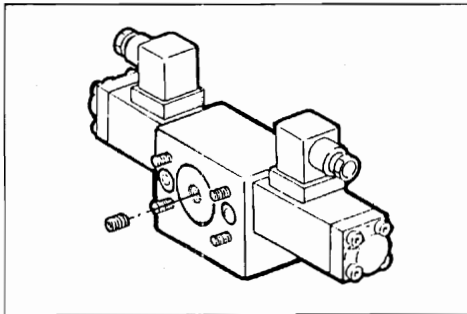


5 Anschlußplatte

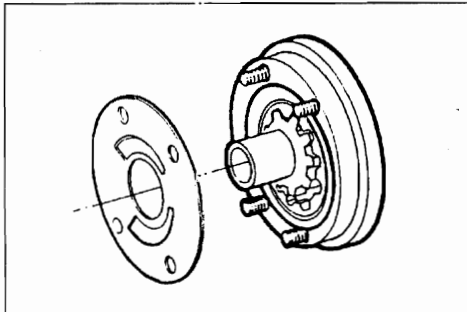
Valve plate



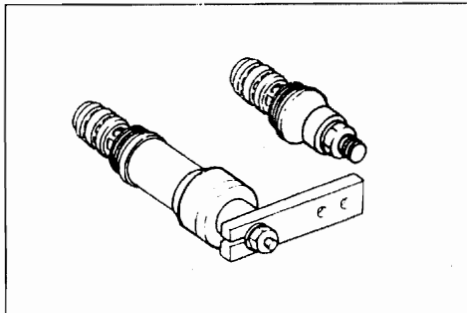
- 6 Ansteuergeräte **HW, HD, EP**  
Hinweis:  
NG 71 wie NG 40 - 56 mit Flachdichtung.  
  
Control device **HW, HD, EP**  
Note:  
Size 71 control device as size 40 - 56 with flat seal.



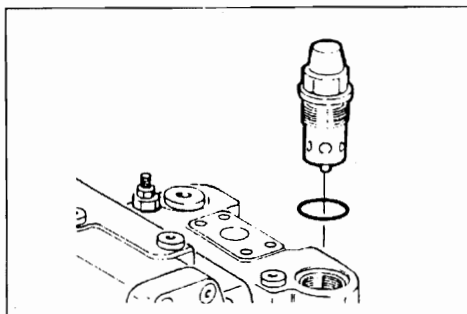
- 7 Ansteuergerät **DA**  
Hinweis:  
NG 71 wie NG 40 - 56 mit Flachdichtung.  
  
Control device **DA**  
Note:  
Size 71 control device as size 40 - 56 with flat seal.



- 8 Hilfspumpe  
  
Boost pump

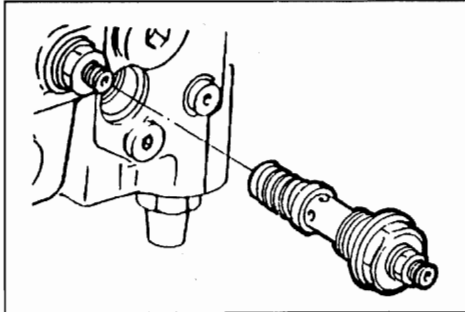


- 9 Regelventil  
  
Control valve

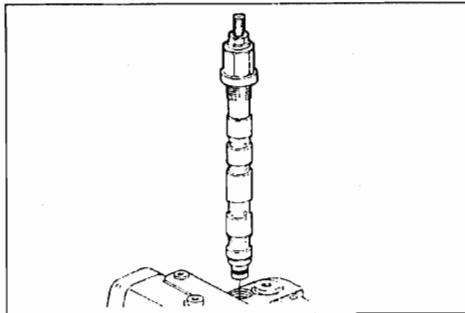


- 10 HD - Ventil  
  
High pressure valve

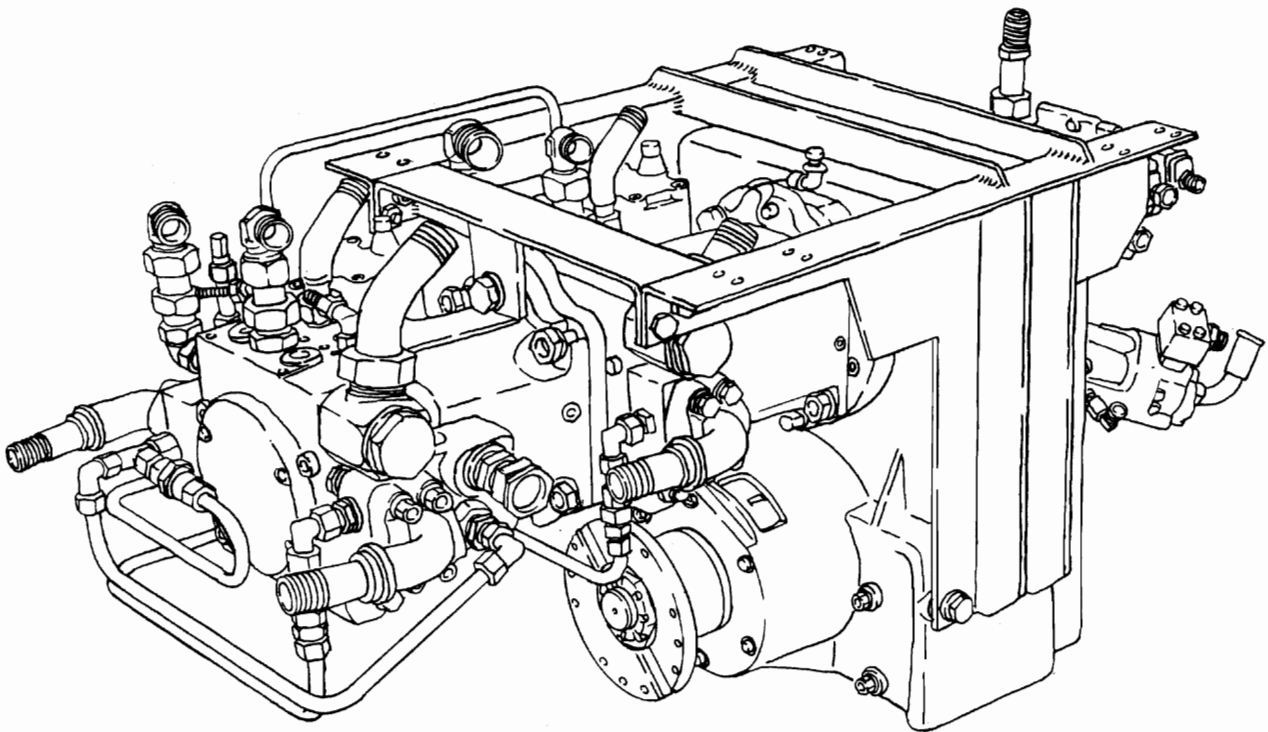


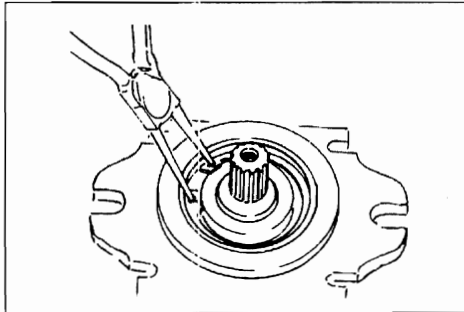
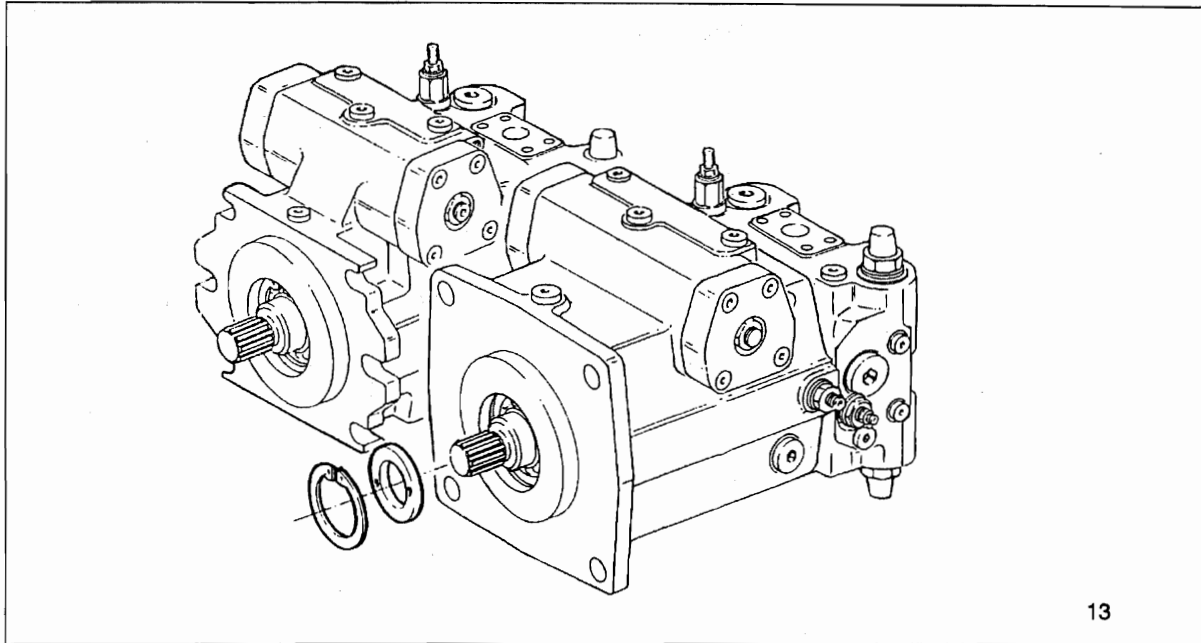


11 ND - Ventil  
Low pressure valve



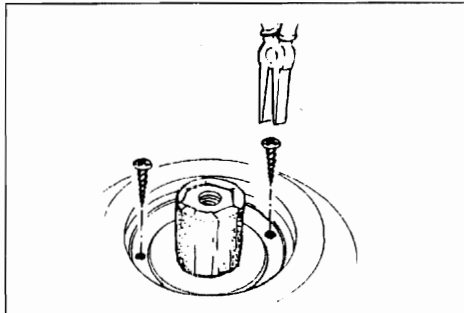
12 Druckabschneidung  
Pressure cut-off





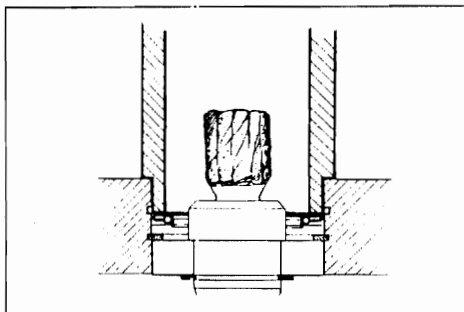
- 14 Triebwelle abkleben.  
Sicherungsring ausbauen.

Protecting the drive shaft.  
Remove retaining ring.



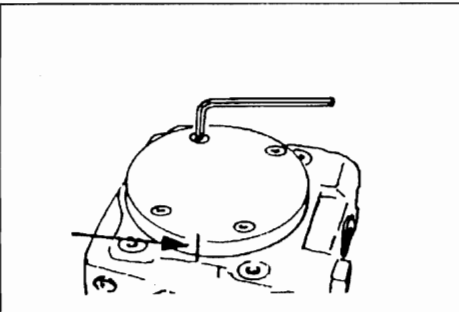
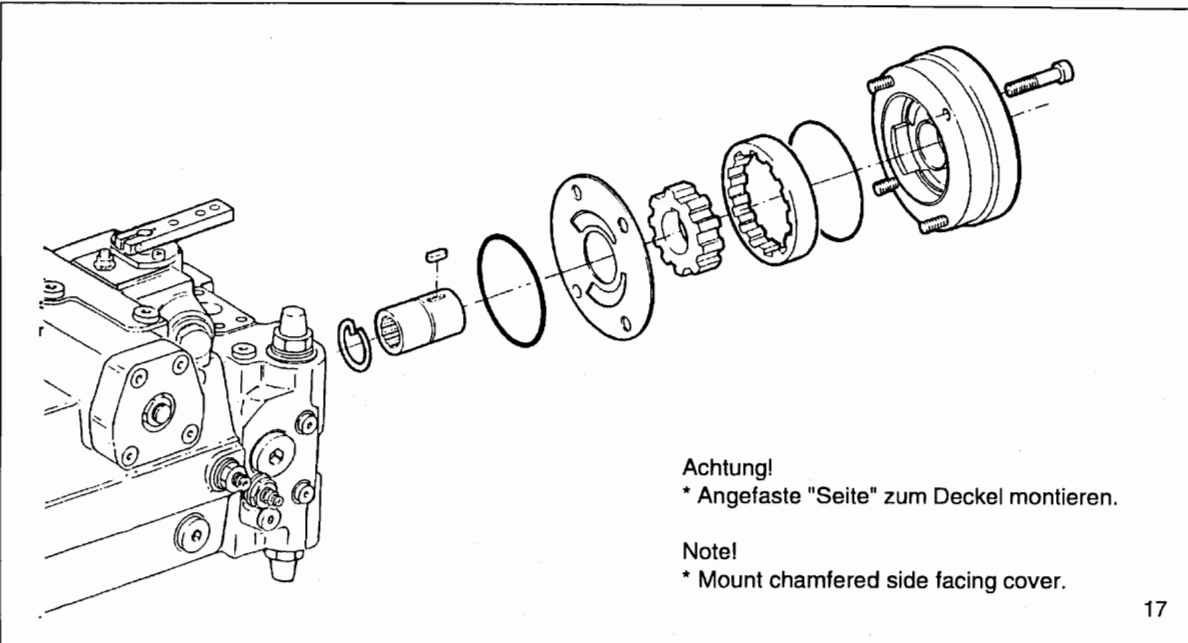
- 15 Blechschraube in die mit Gummi gefüllten  
Löcher eindrehen.  
Mit Zange WDR herausziehen.

Screw in sheet metal screw into the holes  
fitted with rubber.  
Pull out shaft seal with pliers.



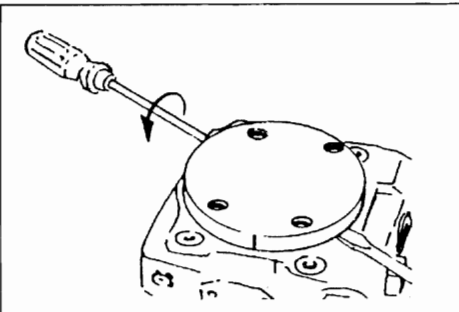
- 16 Wellendichtring mit Buchse auf  
Anschlag einpressen.  
Sicherungsring einbauen.

Press-in shaft seal with bush to stop.  
Assemble retaining ring.



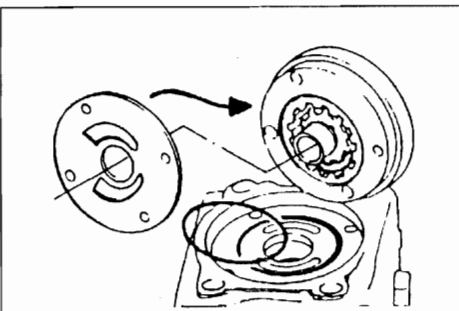
Lage kennzeichnen,  
Befestigungsschrauben ausbauen.

Mark position,  
remove fixing screws.



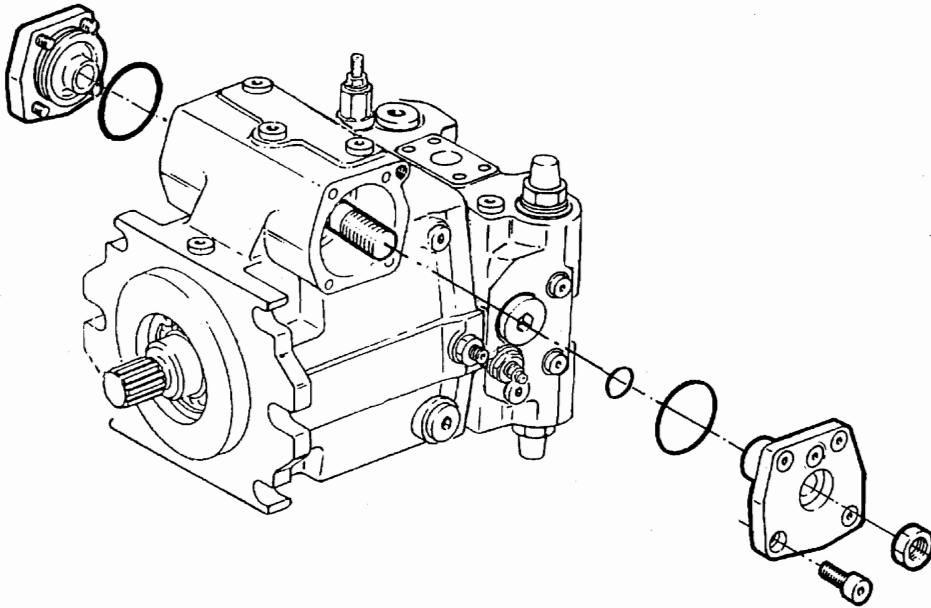
Deckel abdrücken.

Pry-off cover.



Kontrolle:  
O-Ring, Nut,  
Lauffläche, Anschlußplatte.

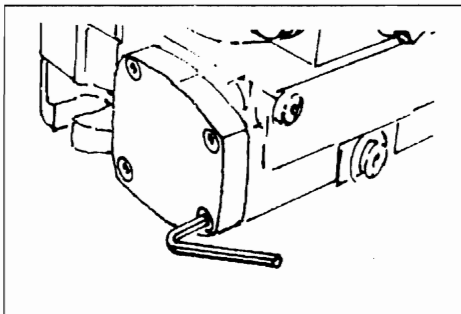
Check:  
O-ring, groove,  
gliding surface, connection plate.



Achtung!  
Korrekt mechanische 0-Lageneinstellung überprüfen

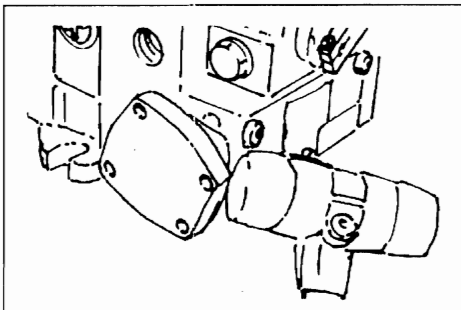
Attention!  
Check correct mechanical 0-position.

21



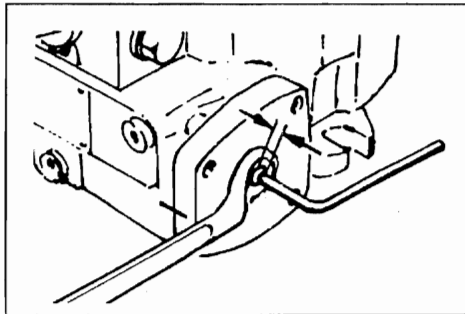
22 Lage kennzeichnen.

Mark position.



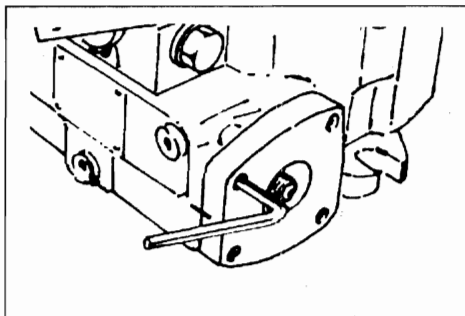
23 Deckel verdrehen und mit leichten Hammerschlägen lösen.

Rotate cover and release by tapping gently with hammer.



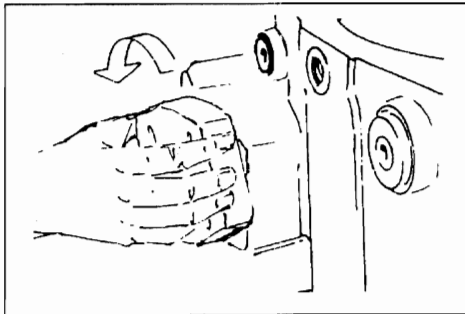
24 Deckel kennzeichnen. Maß festhalten, Kontermutter lösen, Stellschraube gegenhalten.

Mark cover. Must be fixed, loosen counter nut, hold adjustment screw.



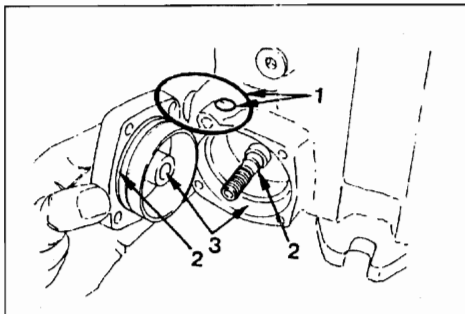
25 Deckel demontieren.

Remove cover.



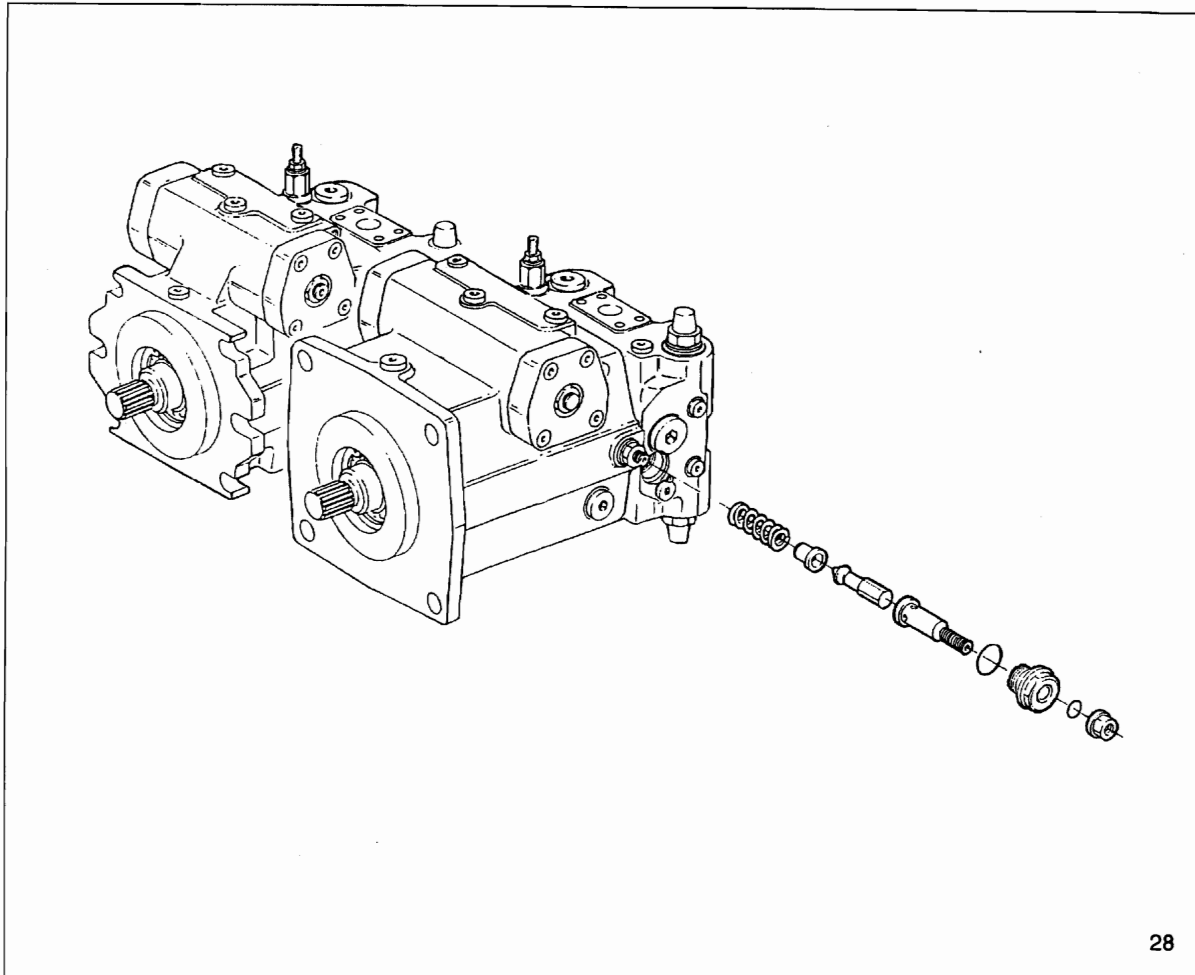
26 Deckel von Stellschraube "abschrauben".

Lift off by turning the setting screw.

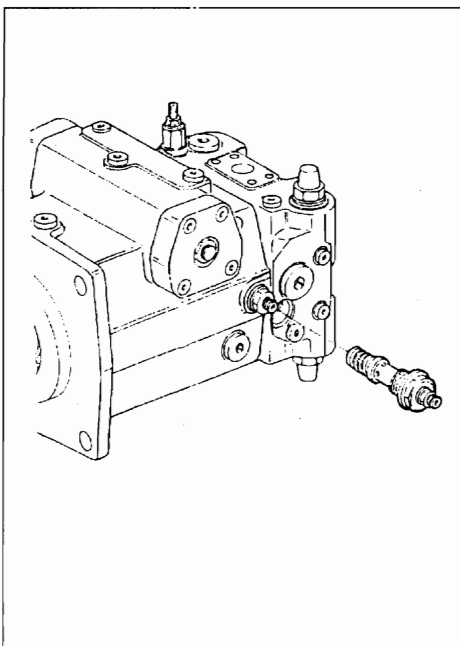


27 Kontrolle!  
O-Ring (1), Nut (2), Gehäuse (3).

Check!  
O-ring (1), groove (2), housing (3).



28



29

**Ventil komplett ausbauen.**

Hinweis:

Einstellschraube nicht verändern.

Achtung!

Nach Einbau Ventileinstellung überprüfen!

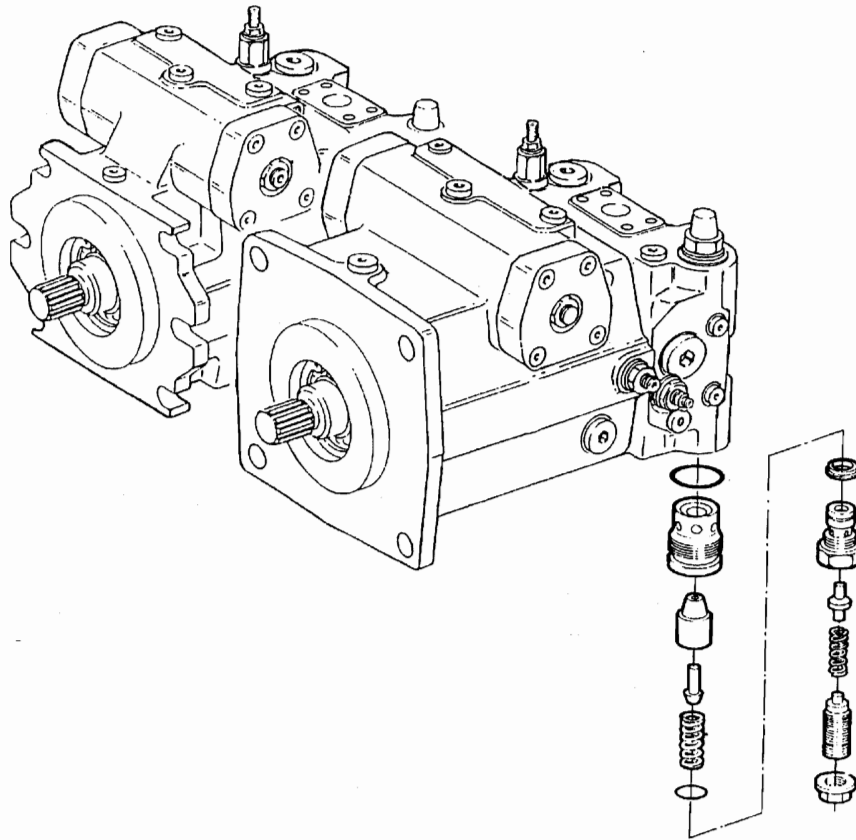
Remove valve completely:

Note:

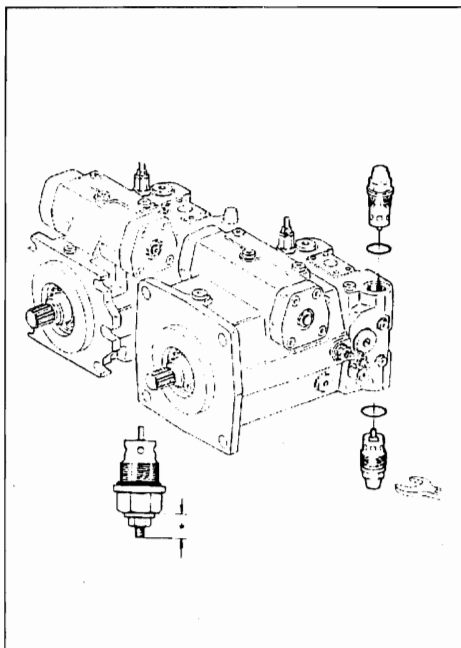
Do not change adjustment screw.

Attention!

Check valve setting after installation.



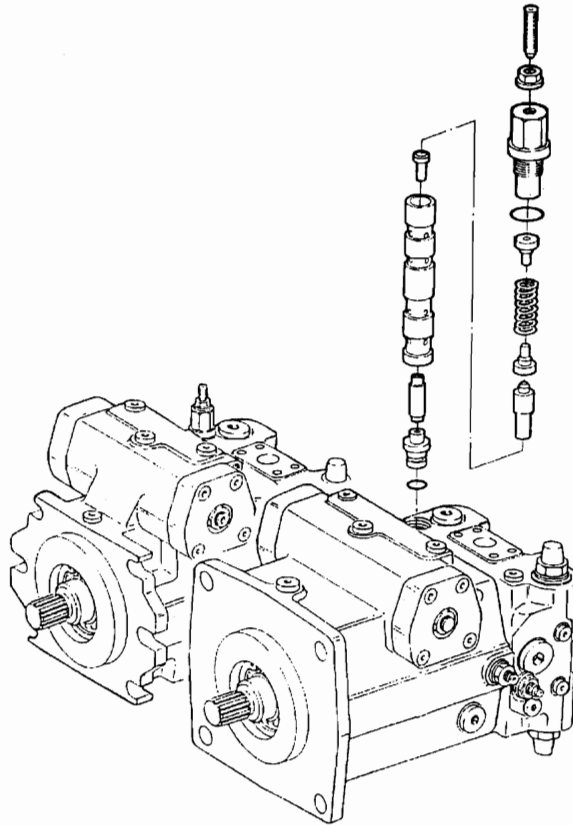
30



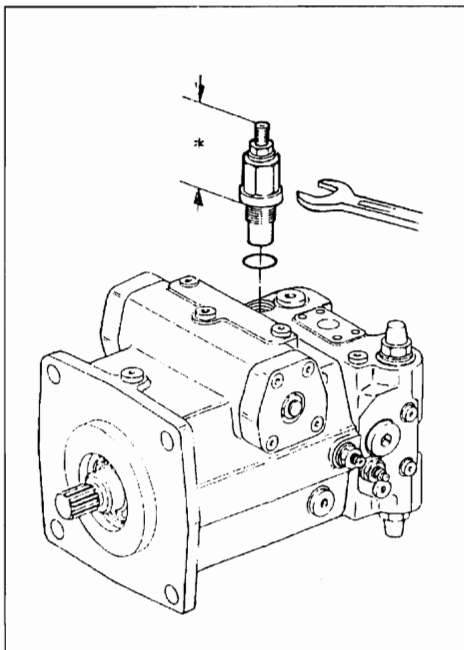
31

Ventil komplett ausbauen.  
Kontrolle: O-Ring, Gehäuse.  
Wechsel der Dichtmutter - Einstellmaß (\*) festhalten.  
Achtung!  
Nach Einbau "Ventileinstellung" überprüfen.

Remove valve completely.  
Control: O-ring, housing.  
Replacement of the tightening nut, record measure (\*).  
Attention!  
After assembly check "valve setting".



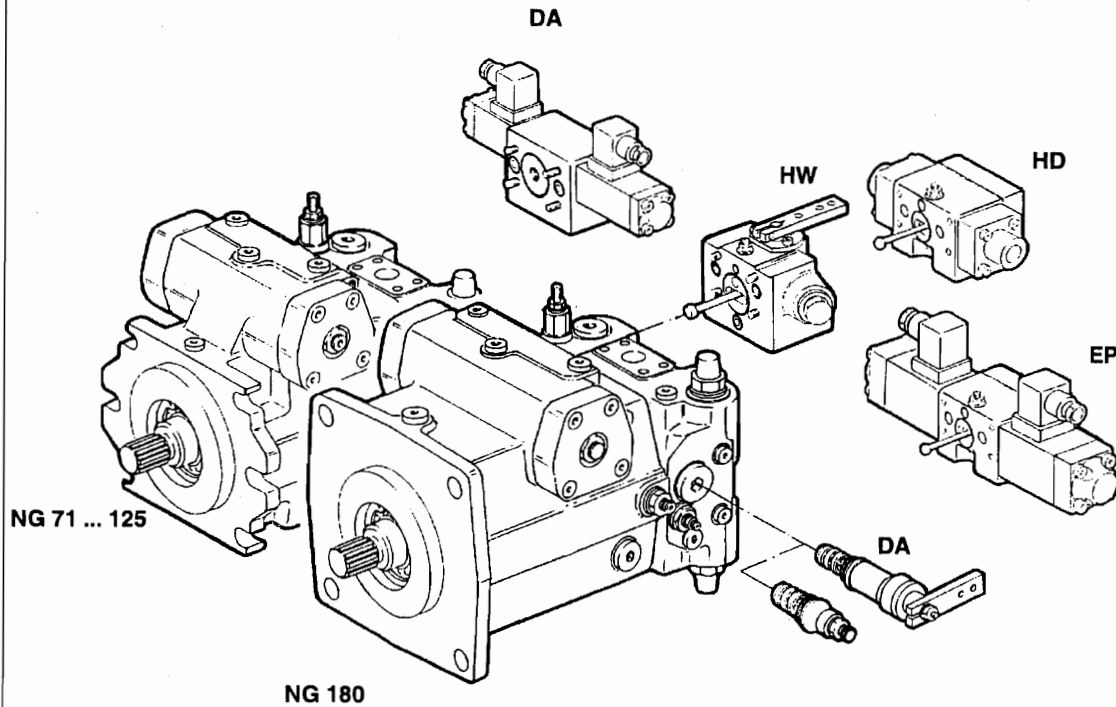
32



- 33 Einstellteil komplett ausschrauben.  
Kontrolle: O-Ring, Gehäuse.  
Wechsel der Dichtmutter - Einstellmaß (\*) festhalten.  
Achtung!  
Nach Einbau "Ventileinstellung" überprüfen.

Unscrew setting cartridge completely.  
Control: O-ring, housing.  
Replacement of the tightening nut, record measure (\*).  
Attention!  
After assembly check "valve setting".





Ansteuergerät abbauen.

Remove control device.

Hinweis:

NG 71: Abdichtung der Ansteuergeräte wie NG 40 - 56  
mit Flachdichtung.

Achtung!

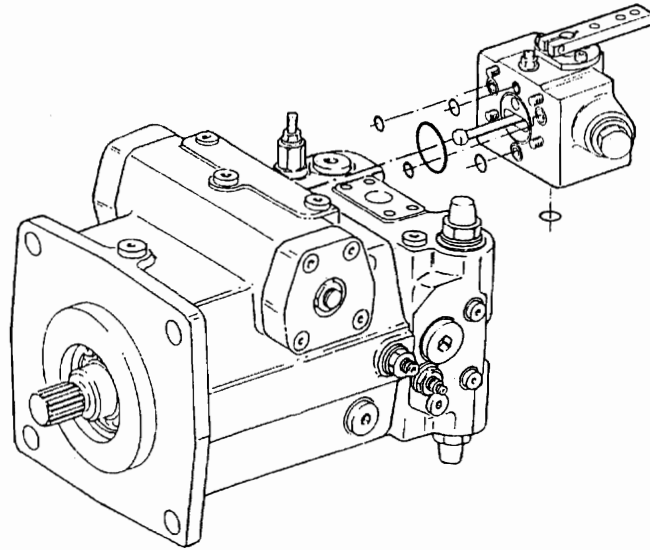
Korrekte hydraulische Nullageneinstellung überprüfen.

Note:

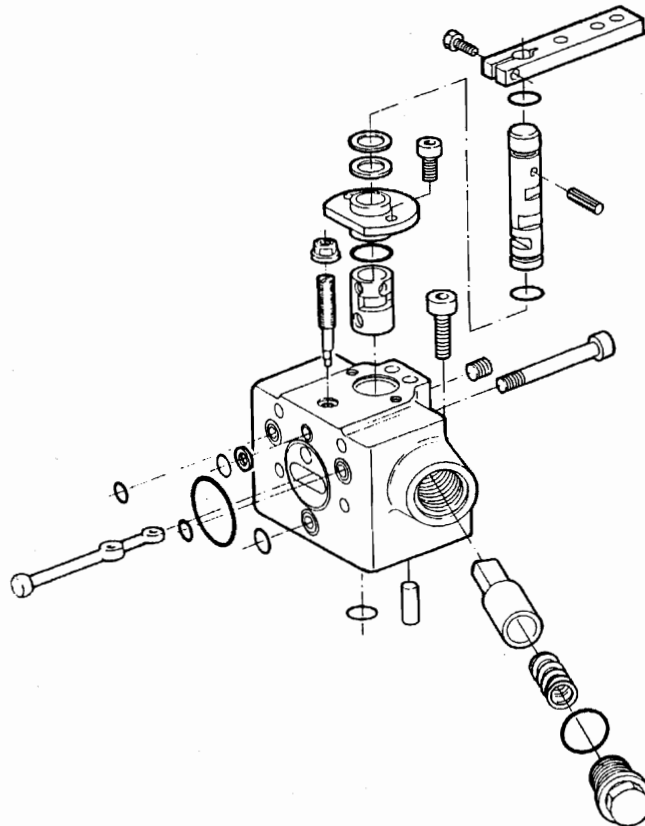
Size 71: Sealing of control device as size 40 - 56  
with flat seal.

Attention!

Check correct hydraulic 0-position.



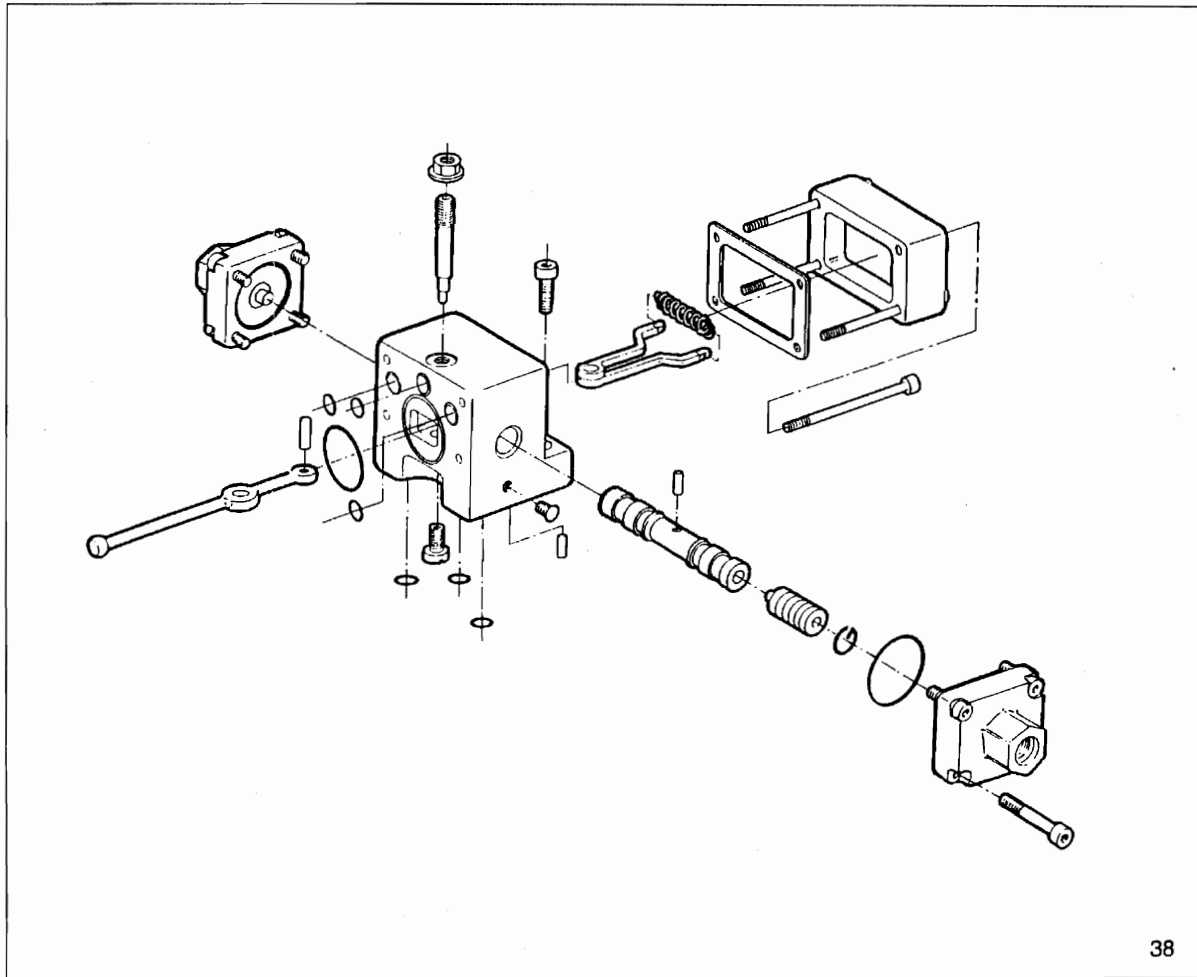
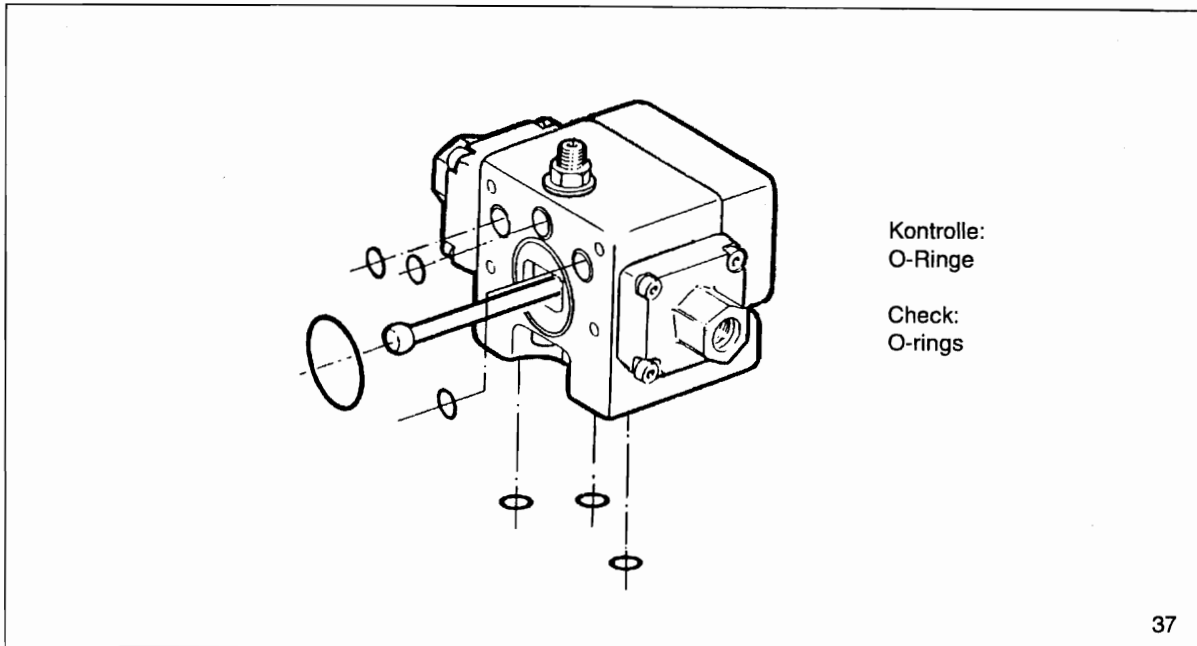
35

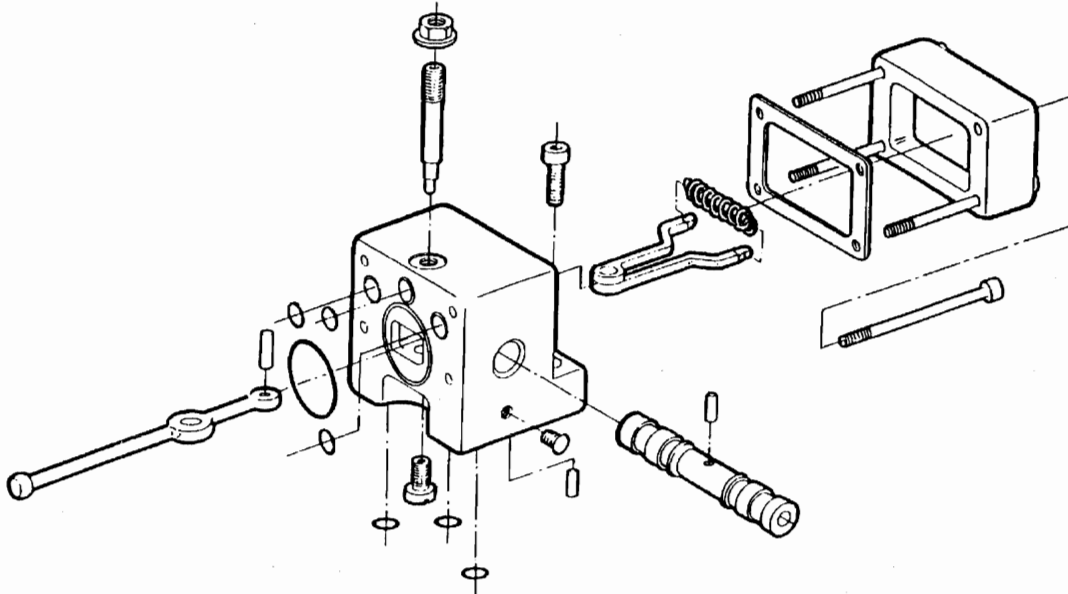
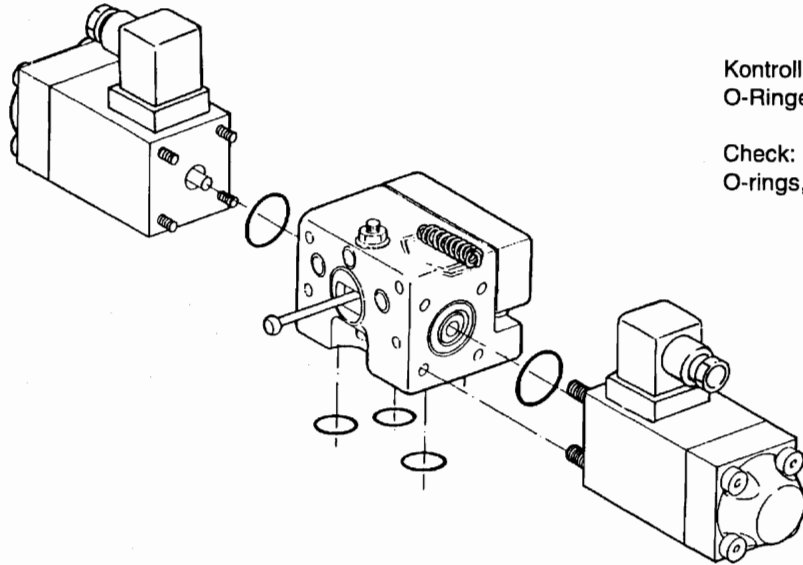


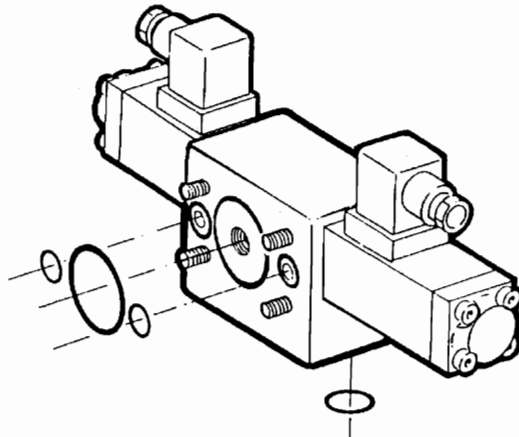
Kontrolle:  
O-Ringe und Dichtung.

Check:  
O-rings, gasket.

36



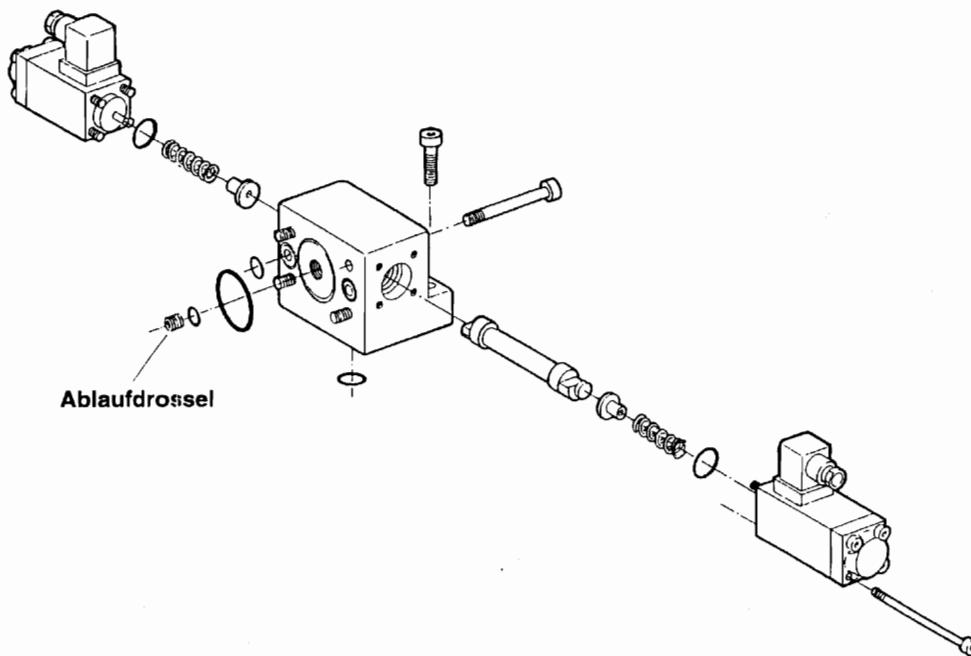




Kontrolle:  
O-Ringe

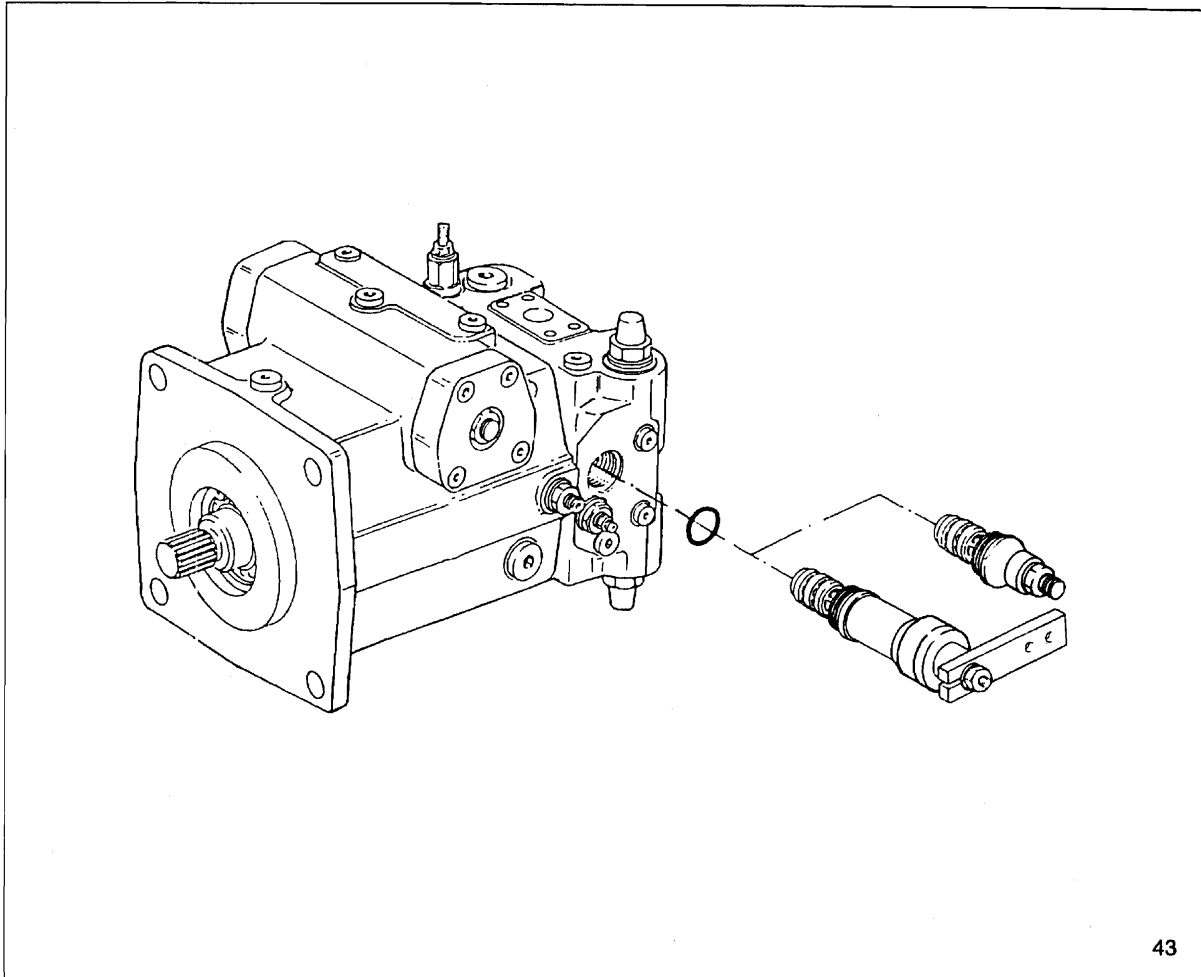
Check:  
O-rings

41

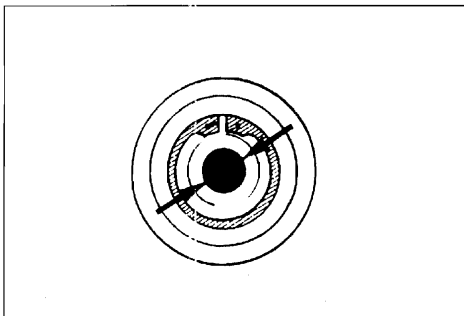


Ablaufdrossel

42

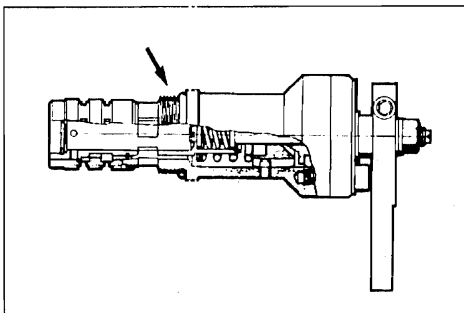


43



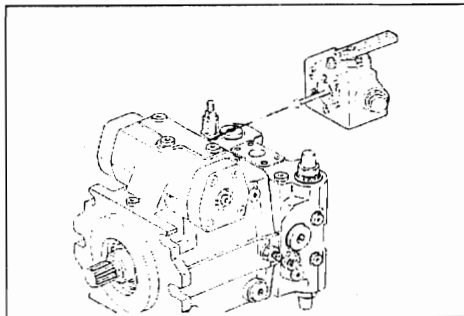
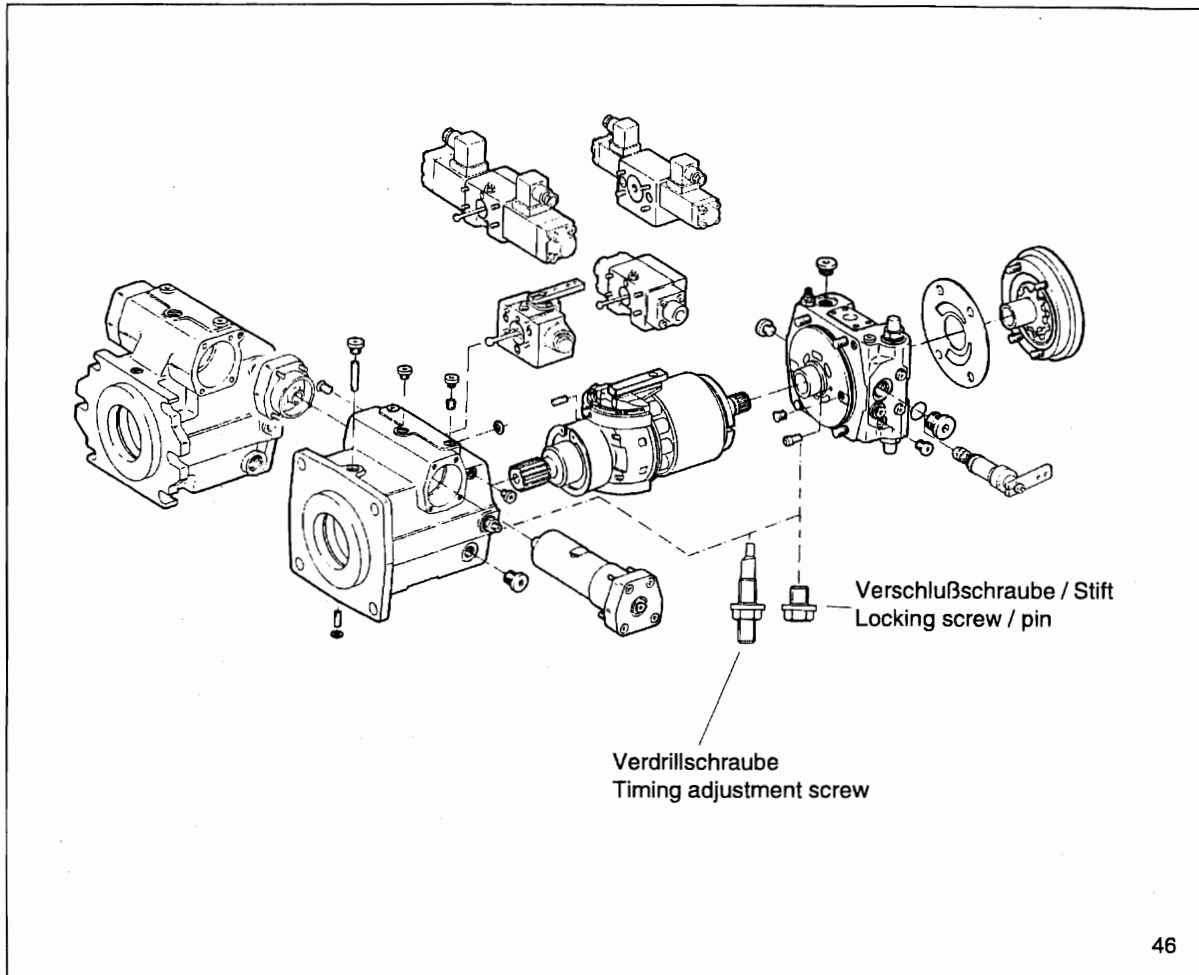
44 Blende überprüfen.  
Keine Beschädigung.

Inspect orifice.  
No damage.

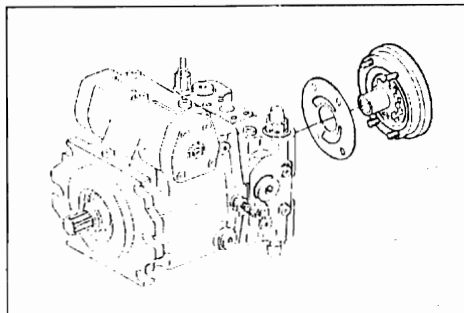


45 Gewinde abkleben.  
O-Ring einsetzen.

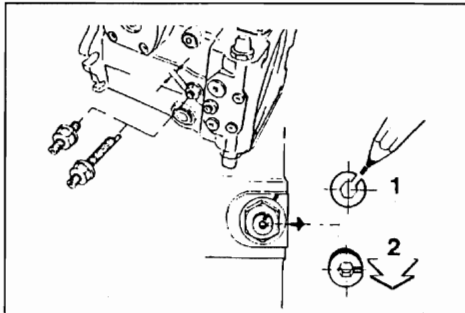
Cover threads.  
Insert O-ring.



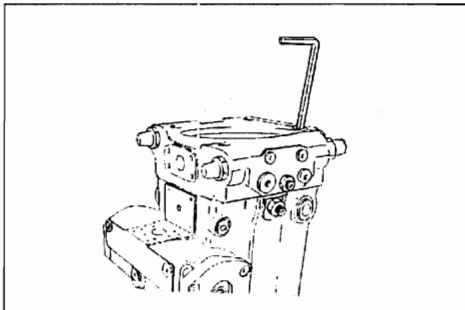
- 47 Ansteuergerät abbauen.  
Remove control device.



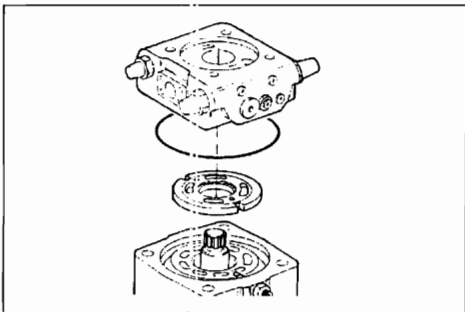
- 48 Hilfspumpe ausbauen.  
Hinweis:  
Einbaulage kennzeichnen.  
Remove auxiliary pump.  
Note:  
Mark assembly position previously.



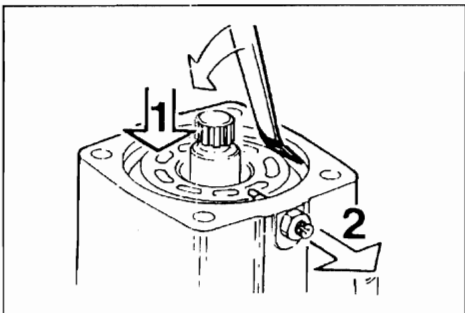
- 49 Lage der Verdrillschraube markieren (1).  
Einstellmaß festhalten.  
Verdrillschraube auf Demontageposition stellen (2).
- Mark the position of the indexing screw (1).  
Record setting measure.  
Set the indexing screw to disassembly position (2).



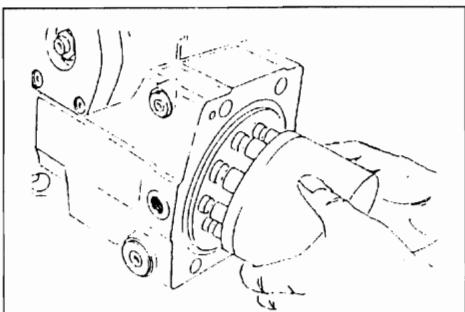
- 50 Lage der Hilfspumpe und Anschlußplatte markieren.  
Anschlußplattenbefestigung lösen.
- Mark position of the connection plate.  
Loosen connection plate fixation.



- 51 Anschlußplatte und Steuerplatte abheben.
- Lift off port plate and control plate.

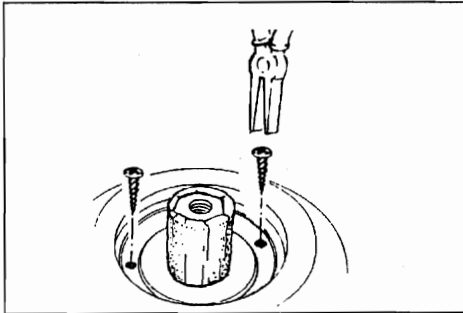


- 52 1. Zylinder nach unten drücken.  
2. Verdrillschraube herausdrehen.
1. Press the cylinder to the bottom.  
2. Remove fixing indexing screw.



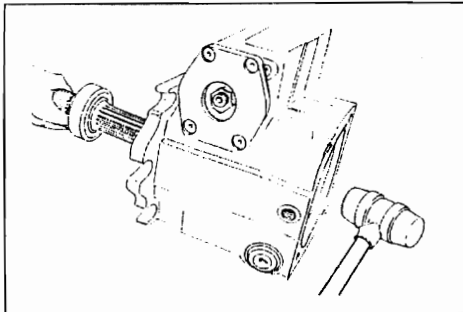
- 53 Zylinder komplett mit Kolben und  
Rückzugeinrichtung ausbauen.
- Push off hydraulic section of rotary group.





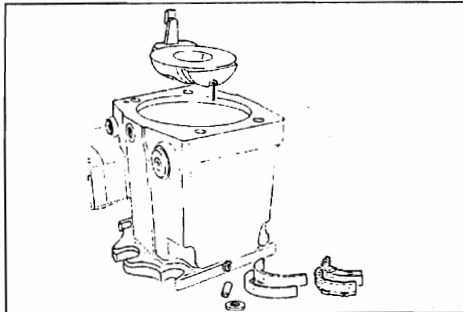
54 Seegerring / WDR ausbauen.

Remove retaining ring and radial seal ring.



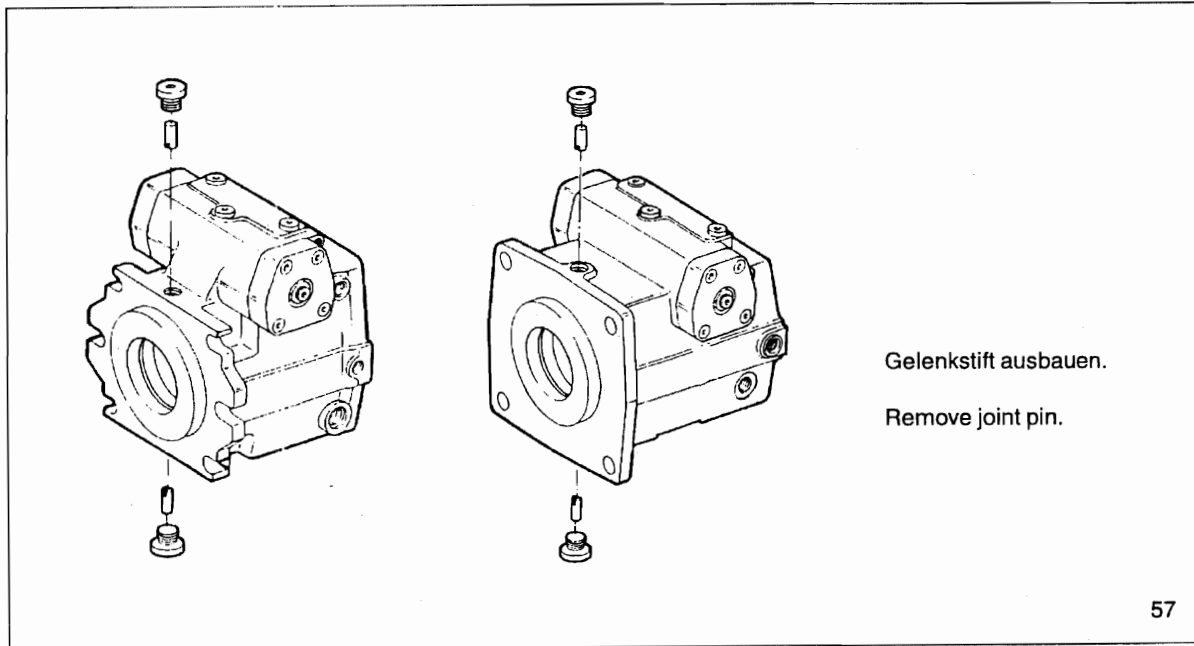
55 Triebwelle mit leichten Hammerschlägen austreiben.

Remove drive shaft with slide hammer strokes.



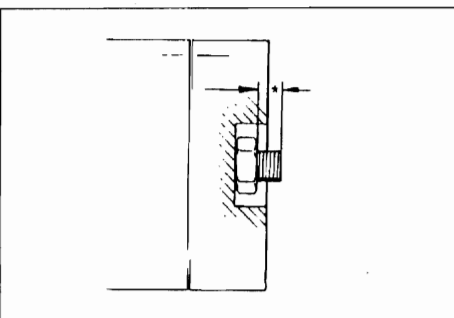
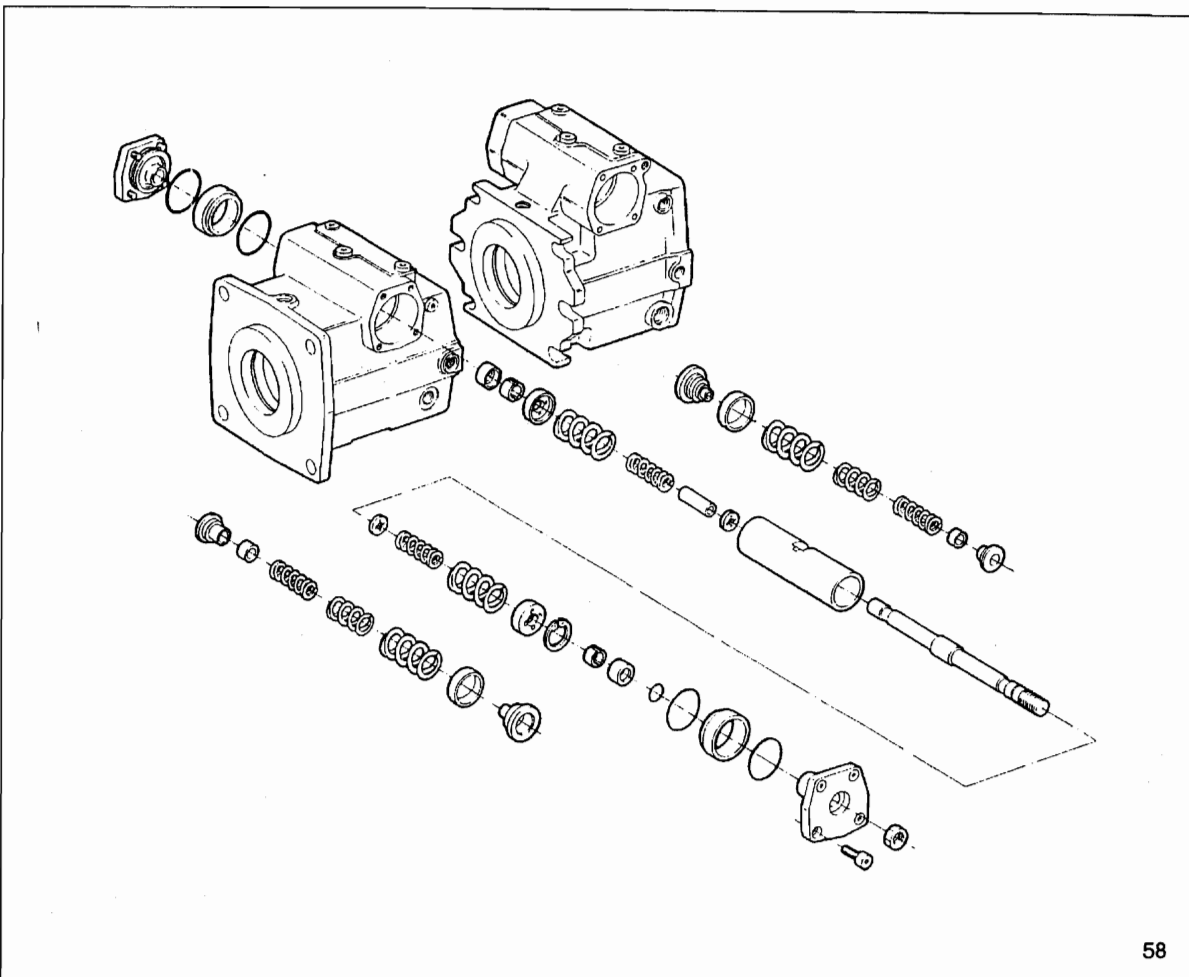
56 Schwenkplatte / Lager komplett ausbauen.

Remove swash plate / bearing cups.



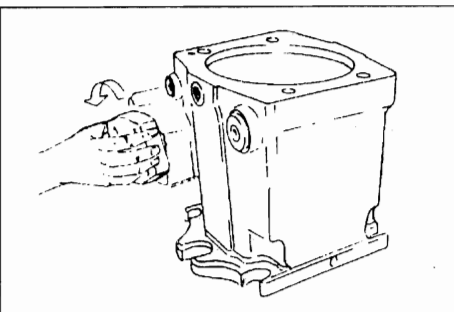
Gelenkstift ausbauen.

Remove joint pin.



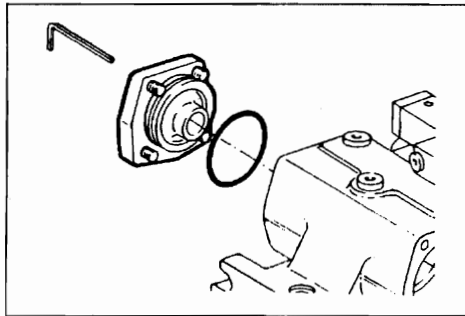
59 Lage vom Deckel markieren, Maß "Nullage" festhalten, Mutter lösen.

Mark position of the cover, note measure of "zero position".  
Loosen nut.



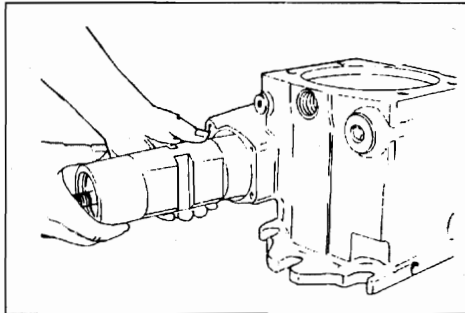
60 Deckel abdrehen.

Remove cover.

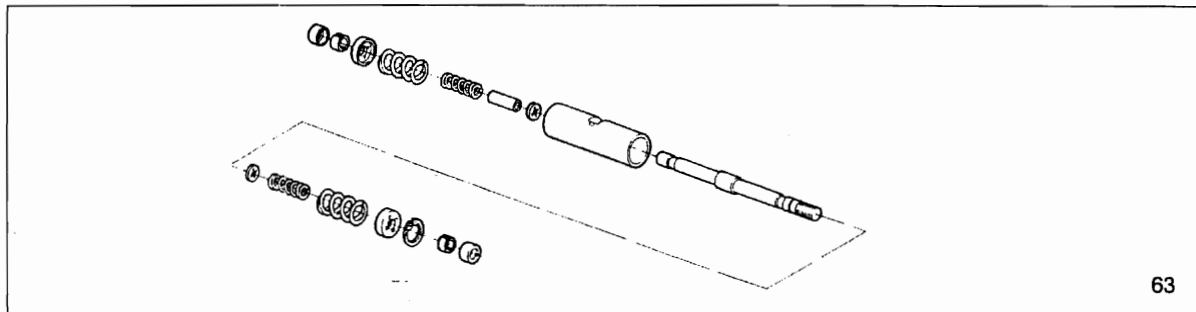


61 Lage des Deckels markieren.  
Befestigungsschrauben lösen, abbauen.

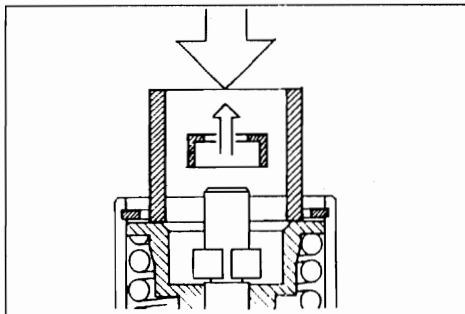
Mark position of the cover.  
Loosen locking screw, remove cover.



62 Stellzylinder ausbauen.  
Remove positioning ring.

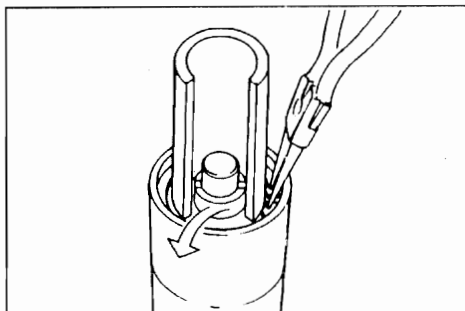


63



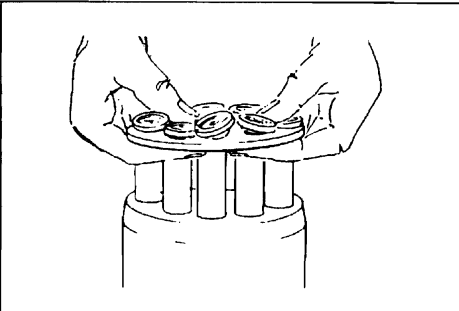
64 Vorrichtung aufsetzen und Feder vorspannen.  
Aufnahmering ausbauen.

Fit tool device and preload spring.  
Remove take-off ring.

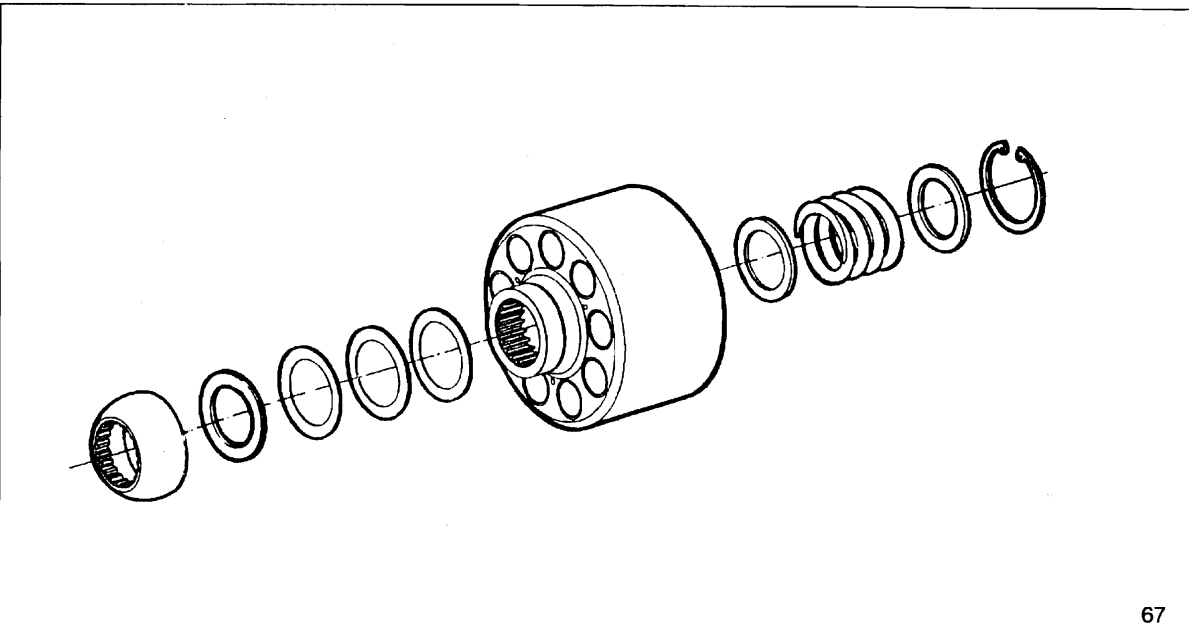


65 Ringe ausbauen.  
Sicherungsring ausbauen.  
Achtung: Teile stehen unter Federvorspannung.

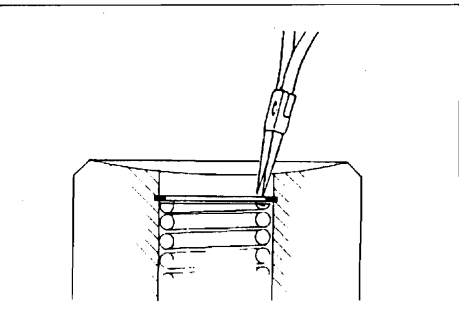
Remove rings.  
Remove safety ring.  
Attention: Parts are under spring load.



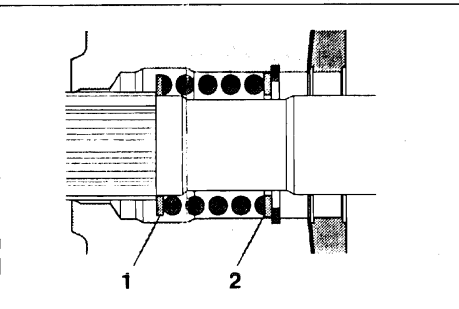
- 66 Kolben mit Rückzugeinrichtung ausbauen.  
Tragkugel mit Tellerfedersäule abheben.
- Remove piston with retaining plate.  
Remove retaining ball with spring cup assembly.



67



- 68 Sicherungsring ausbauen.
- Remove safety ring.

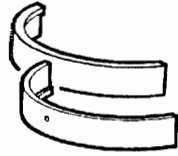


- 69 Scheibe 1, 2
- Disc 1, 2

Lager  
Bearing

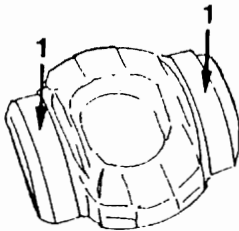


Lagerschalen  
Bearing cup



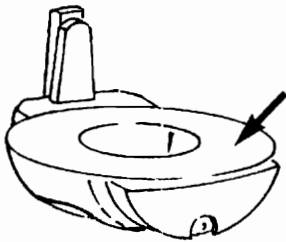
70 Kontrolle!  
Käfig-Paar (1),  
Lagerschalenpaar (2).

Check!  
Cage set (1),  
Bearing cup set (2).



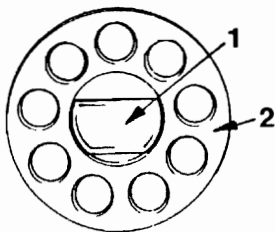
71 Kontrolle!  
Lagerbahnen (1)

Check!  
Bearing surfaces (1)



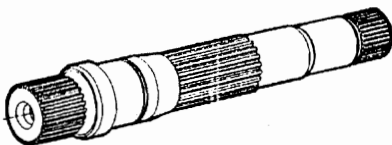
72 Kontrolle!  
Gleitfläche riefenfrei.

Check!  
Sliding surface free from scoring.



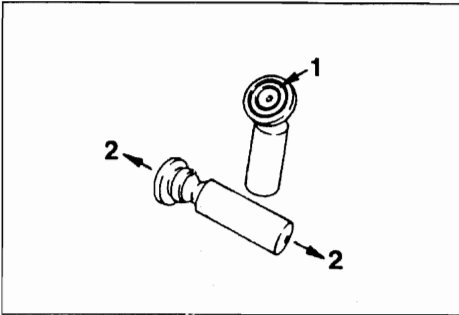
73 Kontrolle!  
Rückzugeinrichtung riefenfrei.

Check!  
Check that return device is free of scoring.



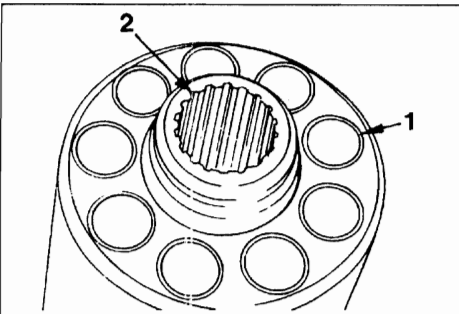
74 Kontrolle!  
1. Verzahnung "ausgeschlagen", Passungsrost.  
2. Laufflächen.  
3. Lauffläche - Wellendichtring.

Check!  
1. Splines for damage or fretting.  
2. Running surfaces.  
3. Groove cut by shaft seal.



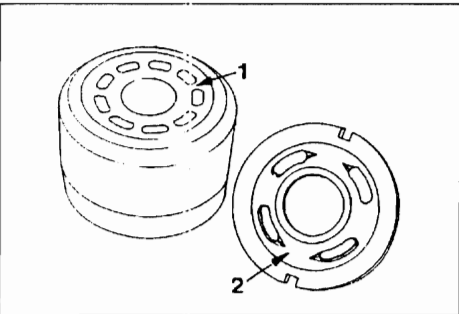
- 75 Kontrolle!  
Lauffläche (1) keine Kratzer, keine Metalleinlagerungen,  
kein Axialspiel (2), (Kolben nur satzweise tauschen).

Check!  
Check that there are no scratches or metal deposits on  
sliding surface (1), and there is no axial play (2),  
(otherwise: pistons must be replaced in sets).



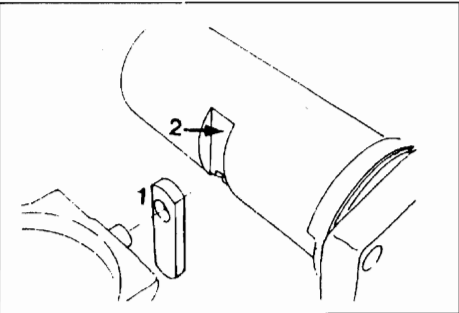
- 76 Kontrolle!  
Zylinderbohrungen (1), Verzahnungen (2).

Check!  
Cylinder bores (1), splines (2).



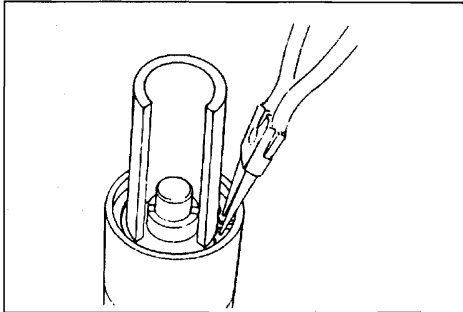
- 77 Kontrolle!  
Zylindergleitfläche (1) riefenfrei.  
Steuerplatte (2) nicht riefig.

Check!  
Cylinder surface (1) free of scoring.  
Control plate (2) without scoring.

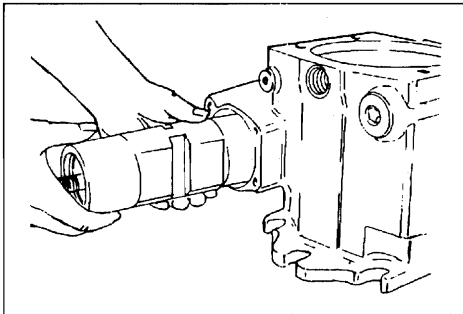


- 78 Kontrolle!  
Stellkolben - Schwenkwiegenverbindung  
Gleitstein (1), Nut im Stellkolben (2), Stellkolben.

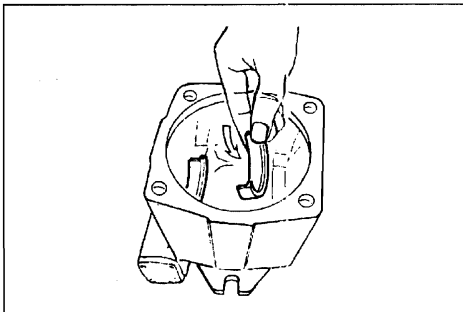
Check!  
Positioning piston - cradle linkage  
Gliding stone (1), groove at the positioning piston (2).  
Positioning piston.



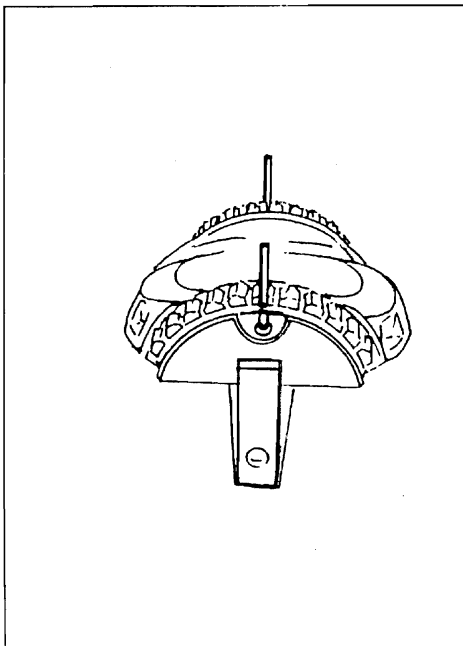
- 79 Stellkolben montieren.  
Hinweis:  
Auf korrekten Sitz der geteilten Ringe "achten".
- Assemble positioning piston.  
Instruction:  
Observe correct fit of the divided rings.



- 80 Stellkolben ins Gehäuse einsetzen.  
Hinweis:  
Stellkolben vor Einbau einölen.
- Insert positioning piston into the housing.  
Instruction:  
Oil positioning piston before assembly.

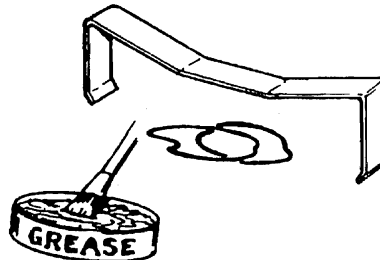


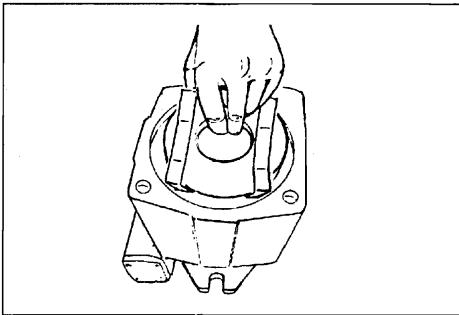
- 81 Lagerschalenpaar einsetzen.  
Insert bearing cup set.



Lager, Draht, Gleitstein und Gelenkstift  
montieren.  
Montagehilfe: z.B. - Klammer / Gummiringe / Fett

Assemble bearing, wire, gliding stone  
and articulating pin.  
Assistance: Devices e.g. - Clamp / rubber rings / grease



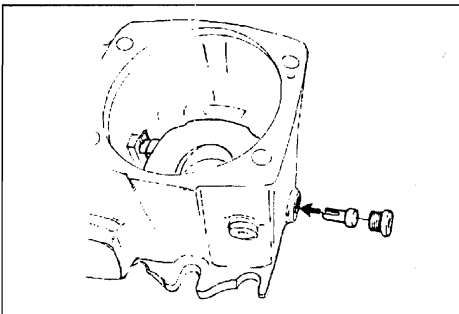


- 83 Schwenkwiège komplett ins Gehäuse einsetzen.  
Auf korrekten Sitz der Schwenklager im Gehäuse "achten".

⚠ Montagehilfe ausbauen.

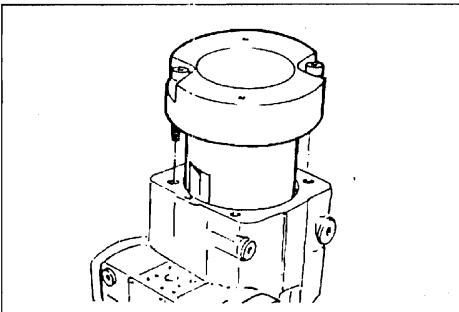
Insert completely swivel cradle into the housing.  
Pay attention for correct seat of the swivel cradle in the housing.

⚠ Remove auxiliary device.



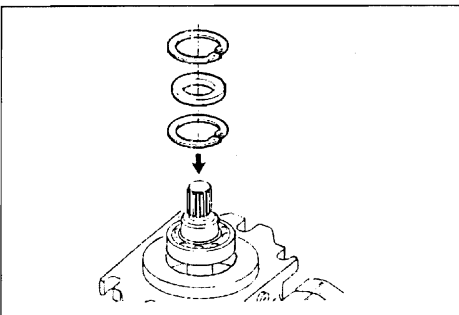
- 84 Gelenkstifte montieren.

Assemble articulating pins.



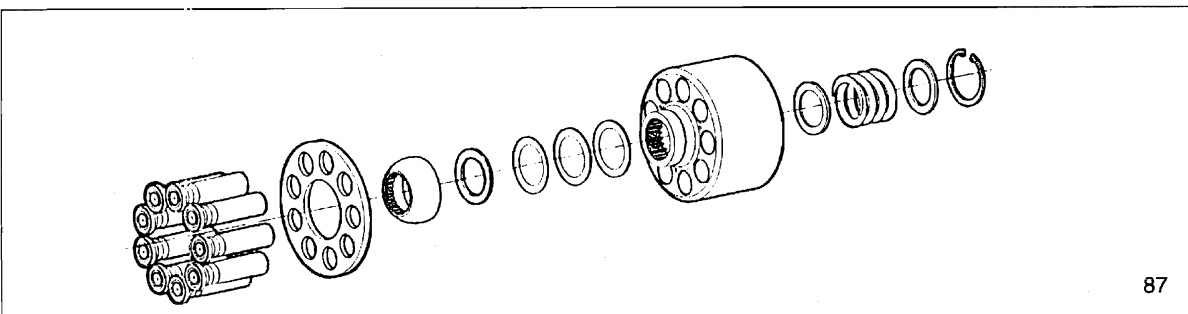
- 85 Vorrichtung zum Fixieren der Schwenkwiège montieren.

Assemble device for fixation of the swivel cradle.

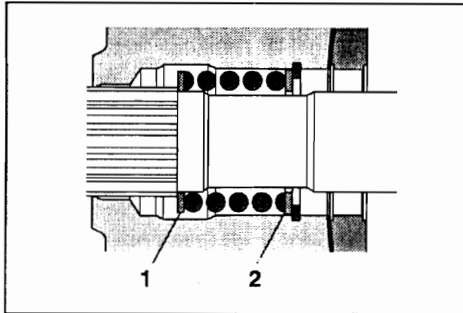


- 86 Neue Montageposition!  
Triebwelle mit Lager und Wellendichtring einbauen.

Assemble drive shaft with bearings and radial seal rings.

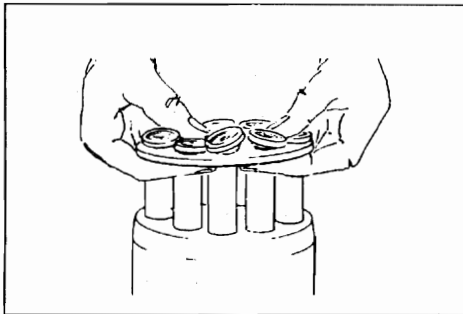






88 Scheibe 1, 2

Disc 1, 2

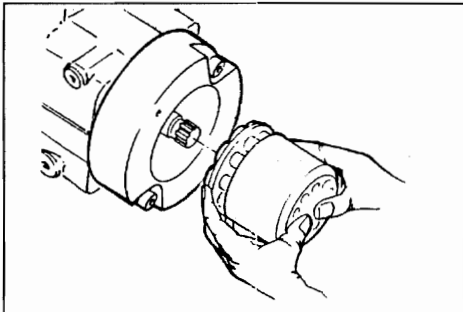


89 Kolben mit Rückzugeinrichtung montieren.

Hinweis:  
Kolben, Gleitschuhe einölen.

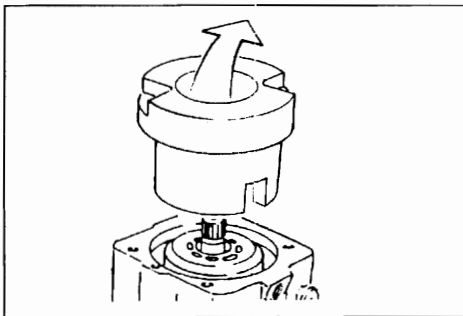
Assemble piston with retaining plate.

Note:  
Oil piston and piston pad.



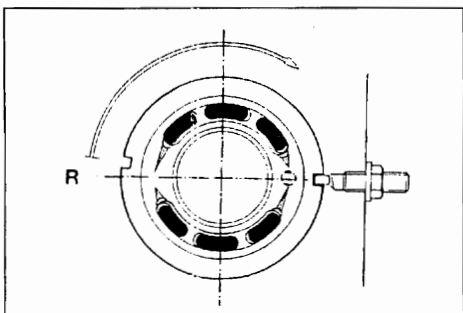
90 Zylinder komplett einbauen.

Assemble cylinder completely.



91 Vorrichtung ausbauen.

Remove assembly device.

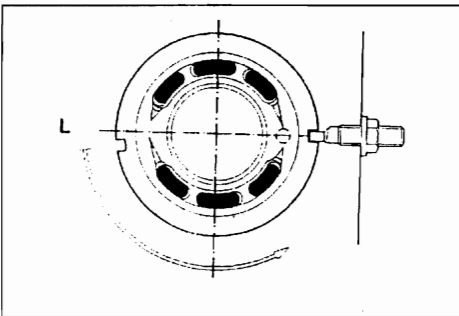


92 Steuerplatte Rechtslauf - in Drehrichtung verdreht.

Achtung!  
Geräuschkerben sind drehrichtungsbezogen eingeschliffen.

Control plate clockwise rotation - indexed in the direction  
of rotation.

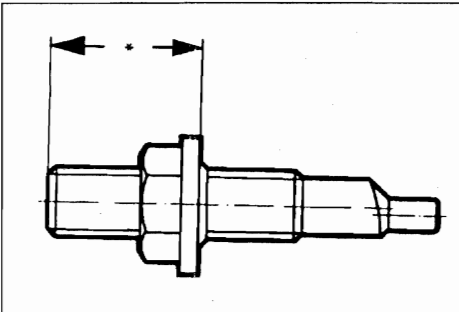
Note!  
Noise grooves are machined - in based on direction  
of rotation.



- 93 Steuerplatte Linkslauf - in Drehrichtung verdreht.  
Achtung!  
Geräuschkerben sind drehrichtungsbezogen eingeschliffen.

Control plate counter clockwise rotation - indexed in the direction of rotation.

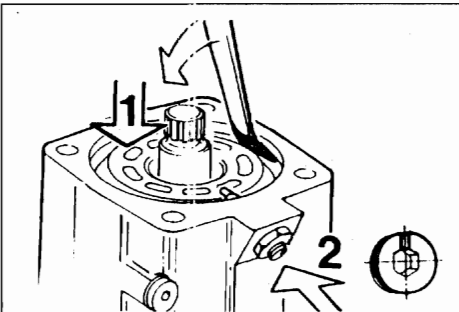
Note!  
Noise grooves are machined - in based on direction of rotation.



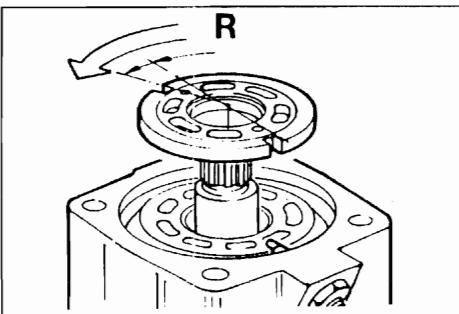
- 94 Grundeinstellung - Verdrillschraube  
A4VG...71 \* =  $28 \pm 0,75$  mm    A4VG...90 \* =  $29 \pm 0,75$  mm  
A4VG...125 \* =  $20 \pm 0,75$  mm    A4VG...180 \* =  $22 \pm 0,75$  mm.

Basic setting - indexing screw

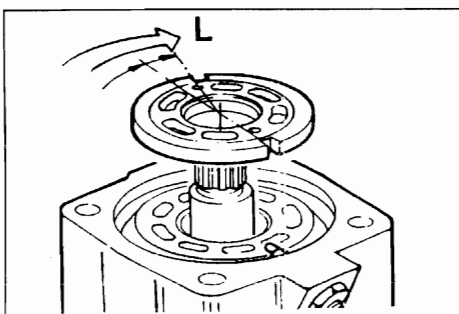
A4VG...71 \* =  $28 \pm 0,75$  mm    A4VG...90 \* =  $29 \pm 0,75$  mm  
A4VG...125 \* =  $20 \pm 0,75$  mm    A4VG...180 \* =  $22 \pm 0,75$  mm.



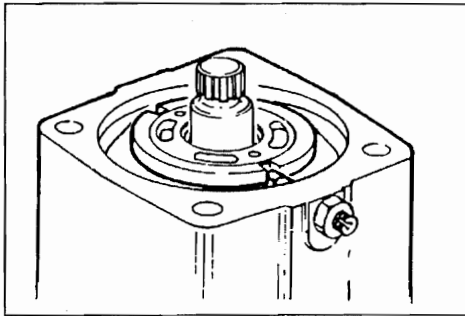
- 95 Steuerplatte einsetzen - Rechtslauf.  
Insert the control plate - clockwise rotation.



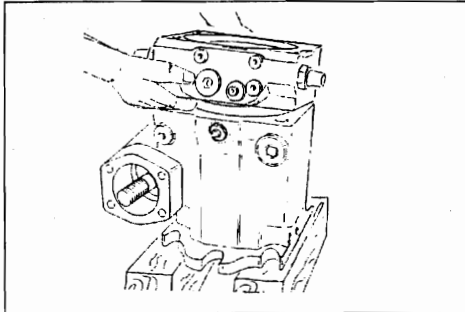
- 96 Zylinder nach unten drücken (1).  
Verdrillschraube einbauen (2).  
Kerbe in Montageposition.  
Press the cylinder to the bottom (1).  
Screw in the indexing screw (2).  
Groove in mounting position.



- 97 Steuerplatte einsetzen - Linkslauf.  
Insert the control plate - Counter- clockwise rotation.



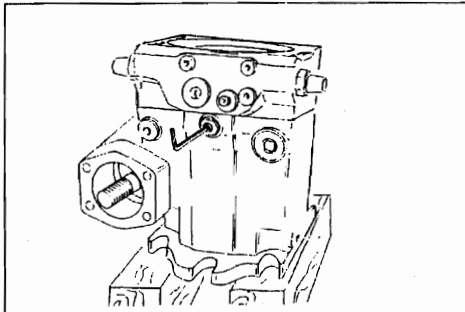
98



99

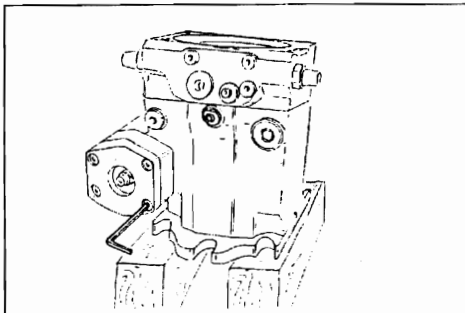
Anschlußplatte aufbauen.  
Achtung! Federvorspannung!  
Mit zwei Befestigungsschrauben überkreuz Anschlußplatte  
in Gehäuseführung einsetzen - Fertigmontage!

Assemble connection plate.  
Attention! Spring preloaded!  
Insert control plate into housing, guidance with two locking  
screws crossing over -Finish assembly!



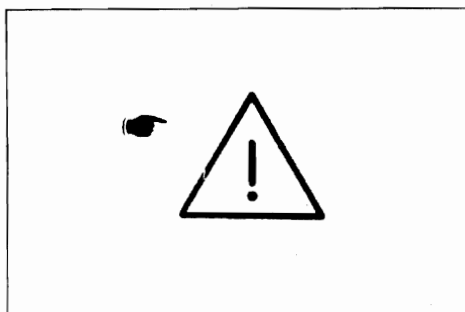
100

Verdrillschraube - Nach Markierung ausrichten.  
Locking screw - Observe adjusting measure.



101

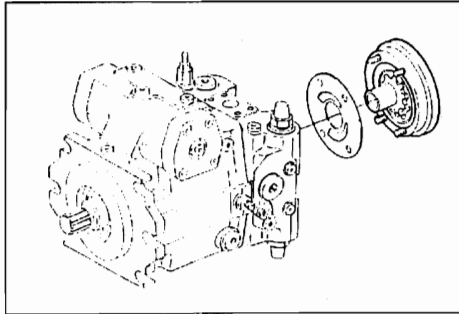
1. Deckel montieren.  
2. Nulllage nach Maß einstellen.  
1. Assemble cover  
2. Adjust zero position according to measure.



102

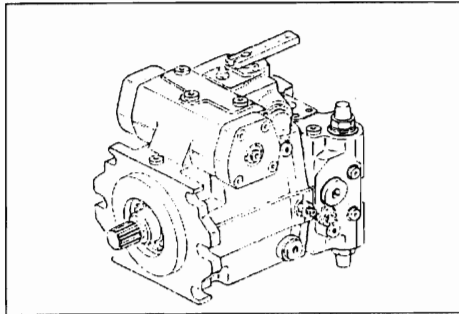
Achtung!  
Korrekte mechanische Nulllageneinstellung muß nach  
Einbau im Gerät bzw. Prüfstand erfolgen.

Attention!  
Adjustments of the correct zero position to be carried out  
after installation into the machine or on the bench test.



103 Hilfspumpe montieren.  
Hinweis: Drehrichtung beachten.

Assemble auxiliary pump.  
Note: Take care of direction of rotation.



104 Ansteuergerät montieren.

Assemble control device.

#### Tightening torques for shaft bolts (Metric ISO Standard Thread)

	Thread size	Strength Classes		
		8.8	10.9	12.9
The values for tightening torques shown in the table are valid only for shaft bolts with metric ISO- standard threads and head support surface dimensions in accordance with DIN 912, DIN 931 and DIN 933. These values are also valid only for light or uncoiled, untreated surface as well as for use only with torque-indicating wrenches and force limiting tools.				
		Tightening Torque (lb.ft)		
	M 3	0,8	1,2	1,4
	M 4	2,1	3,0	3,6
	M 5	4,4	6,3	7,4
	M 6	7,4	10,3	12,5
	M 8	18,4	25,8	30,2
	M10	36,1	50,9	61,2
	M12	63,4	88,4	106,9
	M14	99,5	140,0	169,5
	M16	154,8	217,4	261,6
	M18	213,7	298,5	357,4
	M 20	302,2	427,5	508,5
	M 22	405,4	574,9	685,4
	M 24	523,5	737,0	884,4
	M 27	773,9	1105,5	1326,6
	M 30	1068,7	1474,0	1768,8

#### Tightening torques for locking screws VSTI (Metric ISO fine thread)

Thread size	Designation	Tightening torques (lb.ft)	
M 8 x 1	VSTI 8 x 1 -ED/SA	= 4	
M 10 x 1	VSTI 10 x 1 -ED	= 7	
M 12 x 1,5	VSTI 12 x 1,5 -ED	= 15	
M 14 x 1,5	VSTI 14 x 1,5 -ED	= 22	
M 16 x 1,5	VSTI 16 x 1,5 -ED/SA	= 22	
M 18 x 1,5	VSTI 18 x 1,5 -ED/SA	= 29	
M 20 x 1,5	VSTI 20 x 1,5 -ED/SA	= 37	
M 22 x 1,5	VSTI 22 x 1,5 -ED	= 44	
M 26 x 1,5	VSTI 16 x 1,5 -ED/SA	= 51	
M 27 x 2	VSTI 27 x 2 -ED	= 66	
M 30 x 1,5	VSTI 30 x 1,5 -ED/SA	= 74	
M 33 x 2	VSTI 33 x 2 -ED/SA	= 88	
M 42 x 2	VSTI 42 x 2 -ED/SA	= 147	
M 48 x 2	VSTI 48 x 2 -ED	= 220	

#### Tightening torques for seal-lock nuts (Metric ISO-Standard Thread)

	Thread size	Strength classes		
		8.8	10.9	12.9
The values for tightening torques shown in the table are valid only for seal-lock nuts of the strength class 8.8 and with metric ISO-standard thread.				
		Tightening torque (lb.ft)		
	M 6	7,4		
	M 8	16,2		
	M 10	29,5		
	M 12	50,9		
	M 14	81,1		
	M 16	125,3		

#### Tightening torques for cross-slotted lens head screws DIN 7985 (Metric ISO- Standard Thread)

	Thread size	Strength classes		
		8.8	10.9	12.9
The values for tightening torques shown in the table are valid only for cross-slotted lens head screws DIN 7985 of the strength class 8.8 and with metric ISO-standard thread.				
		Tightening torques (lb.ft)		
	M 3	0,8		
	M 4	2,1		
	M 5	4,4		
	M 6	7,4		
	M 8	18,4		
	M10	36,1		

**General advice**

- Make yourself familiar with the equipment of the machine.
- Only operate the machine if you are completely familiar with the operating and control elements as well as the functioning of the machine.
- Use your safety equipment like helmet, safety shoes and hearing protection.
- Make yourself familiar with your working field.
- Only operate the machine for its intended purpose.

**Please observe the guidelines of the Professional Association and the machine manufacturer.**

**Before starting**

- Observe the operating instructions before starting.
- Check the machine for obvious faults.
- Do not operate the machine with defective instruments, warning lights or control elements.
- All safety devices must be in a secure position.
- Do not carry with you movable objects or secure them to the machine.
- Keep oily and inflammable material away from the machine.
- Before entering the driver's cabin, check if persons or obstacles are beside or beneath the machine.
- Be careful when entering the driver's cabin, use stairs and handles.
- Adjust your seat before starting.


**Start**


- When starting all operating levers must be in "neutral position".
- Only start the machine from the driver's seat
- Check the indicating instruments after start to assure that all functions are in order.
- Do not leave the machine unobserved when the motor is running.
- When starting with battery connection cables connect plus with plus and minus with minus. Always connect negative (-) cable last and disconnect negative cable first.

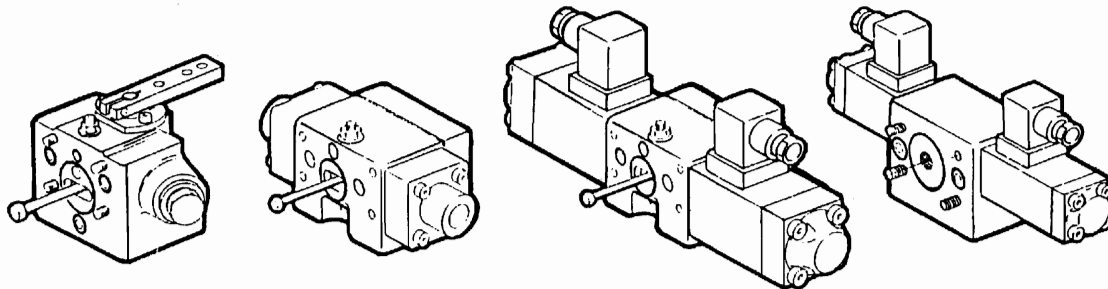
**Attention**

- Exhaust gas is dangerous. Assure sufficient fresh air when starting in closed rooms!

**Hydraulic equipment**

1. Hydraulic equipment is standing under high pressure.  
 High pressure fluids (fuel, hydraulic oil) which escape under high pressure can penetrate the skin and cause heavy injuries.  
Therefore immediately consult a doctor as otherwise heavy infections can be caused.
2. When searching leakages use appropriate auxiliary devices because of the danger of accidents.
3. Before working at the hydraulic equipment, lower pressure to zero and lower working arms of the machine.
4. When working at the hydraulic equipment, absolutely stop motor and secure machine against rolling away (parking brake, shim)!
5. When connecting hydraulic cylinders and motor pay attention to correct connection of hydraulic flexible hoses.
6. In case of exchanging the ports, the functions are vice versa (f. ex. lift-up/lower) - danger of accidents!
7. Check hydraulic flexible hoses regularly and replace them in case of damage or wear! The new hose pipes must comply with the technical requirements of the machine manufacturer!

Orderly disposal or recycling of oil, fuel and  
 filters!



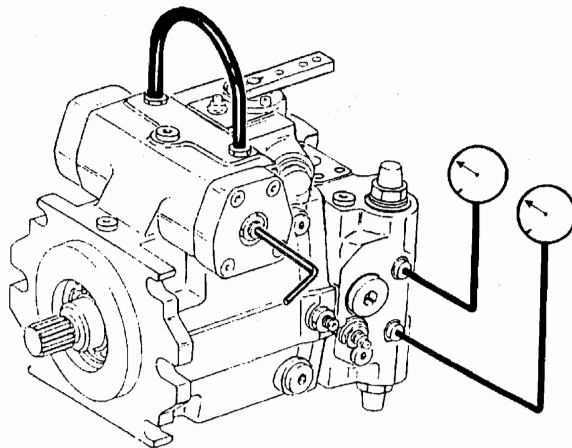
HW

HD

EP

DA

105

**Achtung!**

Sicherheitsbestimmungen beachten!  
Mit Schlauch NW6 beide Stellkammern  
verbinden. Vermeidung von Restsignal  
aus hydraulischer Nulllage.

Manometer an  $M_A$  und  $M_B$  anschließen.  
Nulllage so einstellen, daß bei blockiertem  
Antrieb beide Manometer auf gleichem  
Druckwert stehen.

**Hinweis:**

Totband der Nulllage - vermitteln.

**Attention!**

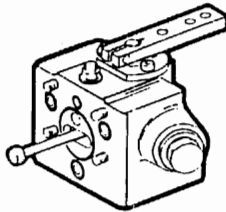
Observe safety regulations!  
Connect both control chambers with hose  
NW6. Avoidance of rest signal from hydraulic  
zero position.

Connect manometer to  $M_A$  and  $M_B$ . Adjust  
zero position so that at blocked drive both  
manometer indicate the same pressure valve.

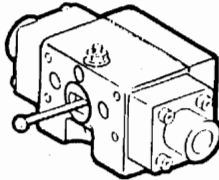
**Note:**

Adjust death line of zero position.

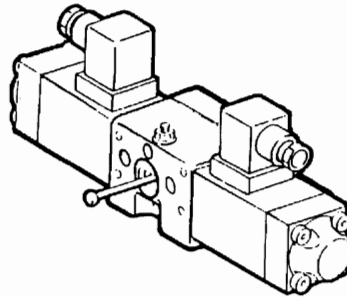
106



HW



HD

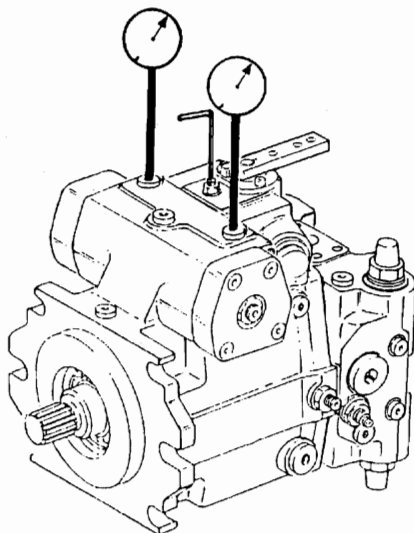


EP

Achtung!  
Sicherheitsbestimmungen beachten!

Attention!  
Observe safety regulations!

107



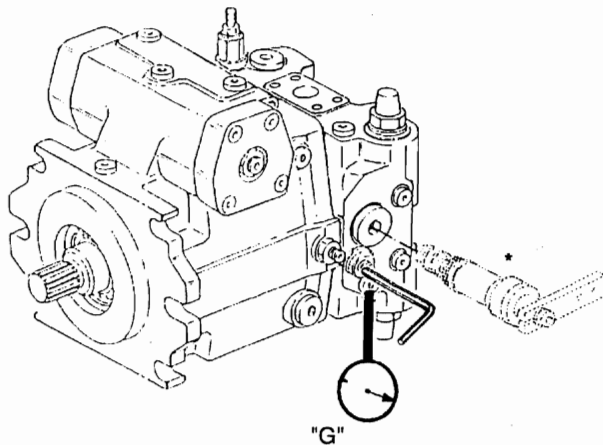
Manometer an  $X_1$  und  $X_2$  anschließen.  
Nullage so einstellen, daß bei blockiertem  
Antrieb beide Manometer auf gleichem  
Druckwert stehen.

Hinweis:  
Excenterjustierung  
- nicht über  $\pm 90^\circ$  verdrehen.

Connect manometer to  $X_1$  and  $X_2$ .  
Adjust zero position so that at blocked drive  
both manometer indicate the same pressure  
value.

Note:  
Eccentric adjusting  
- Do not turn over  $\pm 90^\circ$ .

108



Achtung!  
Sicherheitsbestimmungen beachten!

Hinweis:  
Nachjustierung nur bei Betriebstemperatur.

Manometer an "G" anschließen.

Achtung!  
\* Speisedruckeinstellung!  
Nenndruck  $p_H$  - 18 bar  
Höchstdruck  $p_H$  - 40 bar  
Bei Max.-Drehzahl.

Hinweis:  
Einstelldaten nach Werksauftrag.

\* bei DA-Ausführung

Attention!  
Observe safety regulations!

Note:  
Readjusting only at operating temperature.

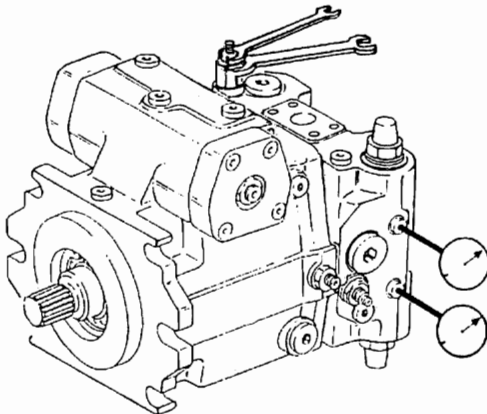
Connect manometer to "G".

Attention!  
\* Boost pressure setting!  
Nominal pressure  $p_H$  - 18 bar  
Peak pressure  $p_H$  - 40 bar  
at max. speed.

Note:  
Adjusting data according to order.



Druckabschneidung  
Pressure cut-off



110

**Achtung!**  
Sicherheitsbestimmungen beachten!

#### HD-Ventil ohne Bypass

1. HD- Ventile sind immer 10% höher eingestellt als die Druckabschneidung.  
Bei Veränderung eines Einstellwertes immer beide kontrollieren.
2. Nachjustierung nur bei Betriebstemperatur

Manometer an  $M_A$  und  $M_B$  anschließen.  
Druckabschneidung: Maß X Einstellschrauben notieren!  
Einstellschraube auf Block drehen.

HD- Ventile: Mit geringer Pumpenmenge über Ventile fahren. Einstellwert kontrollieren.  
(Nur kurzzeitig "Temperatur".)

Drucklos "Einstellwert" verändern - Kontrolle

Druckabschneidung:  
Einstellschraube auf Maß (\*) zurückdrehen.  
Druckwert kontrollieren bzw. nachjustieren.  
**Achtung!** Differenz von 10% HD- Ventile und Druckabschneidung beachten!  
Hinweis: Einstelldaten nach Werksauftrag.

**Attention!**  
Observe safety regulations.

#### HP valve without bypass-function

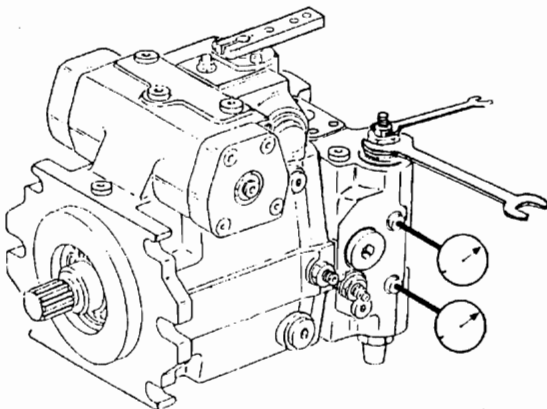
1. HP valves are always adjusted 10% higher than the pressure cut-off.  
If one setting value is changed, always check both values.
2. Readjusting only at operating temperature.

Connect manometer  $M_A$  and  $M_B$ .  
Pressure cut-off: Note measure X setting screw! Turn setting screw on block.

HP valves: Operate valves with small pump flow volume.  
Check setting value. ("temperature" only for a short time).  
Change "setting value" - check.

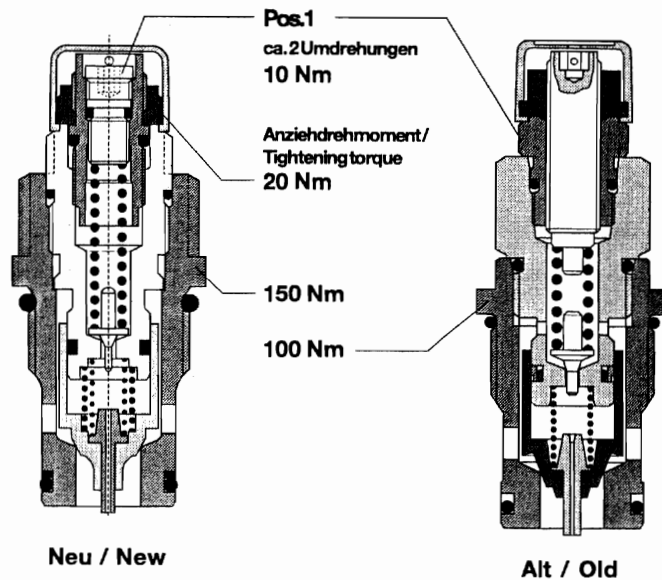
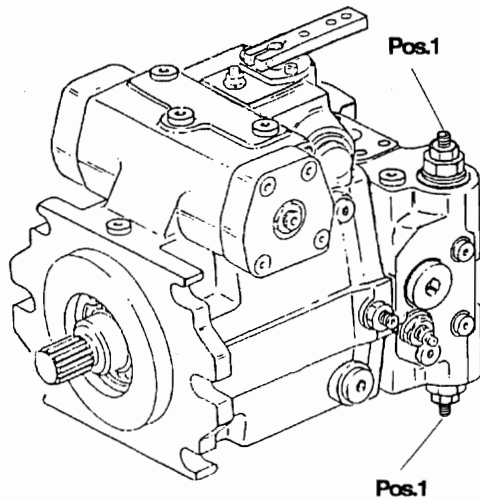
Pressure cut-off:  
Turn back setting screw to measure (\*).  
Check pressure value and readjust.  
**Attention!** Observe 10% pressure difference HP valves and pressure cut-off!

HD- Ventile  
HP- valves



111

### A4VG 71 - 90



Fahrzeuge mit rein-hydrostatischem Fahrtrieb bzw. mit hydrostatischem Fahrtrieb und Schaltgetriebe ohne Leerlaufstellung (Freilauf).

Vehicle with hydrostatic transmission and gear shift without idling setting position (free wheeling).

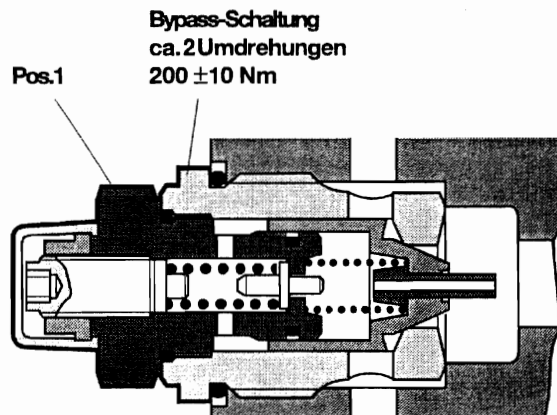
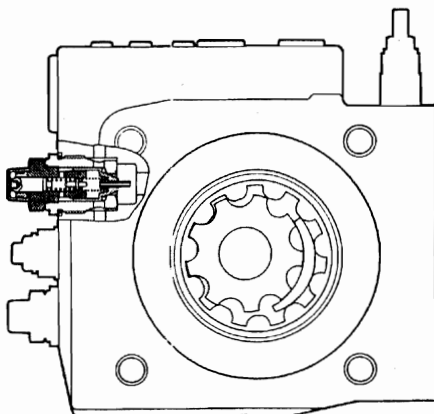
#### Hydrostatischer Antrieb / Bypass-Schaltung

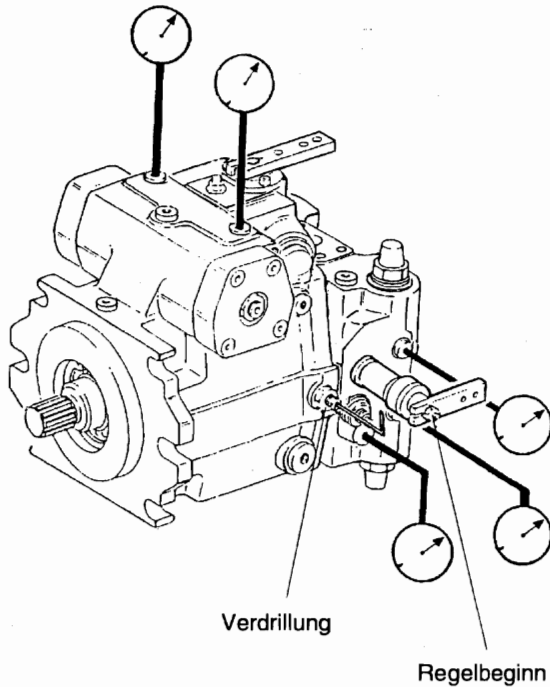
#### Hydrostatic transmission / Bypass-switching

In diesem Fall wird der Fahrtrieb auf freien Umlauf geschaltet. Zu diesem Zweck haben die in der Verstellpumpe integrierten Hochdruckbegrenzungsventile eine sogenannte Bypass-Funktion. D.h. durch Drehen der entsprechenden Schraube (Pos.1) wird der Ventil-Einsatz so entspannt, daß ein freier Öl-Umlauf möglich ist.

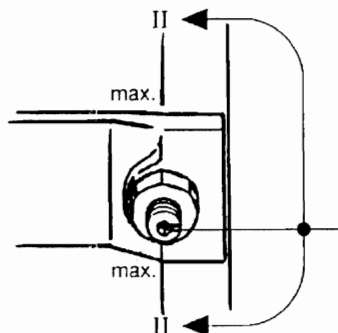
In this case the travel transmission is switched on to free wheeling. For this purpose the variable displacement pump has incorporated high pressure relief valves with bypass function. The screw (item 1) is unscrewed to such an extent, that the valve cartridge is released and free oil circulation is possible.

### A4VG 125 - 250





113



114

**Achtung!**  
Sicherheitsbestimmungen beachten!

Überprüfung der Einstelldaten  
Betriebstemperatur soll während des Überprüfungs Vorgangs weitgehend konstant gehalten werden.  
Antriebsmotor starten, Leerlaufdrehzahl

#### Blockzustand

Fahrtrichtungsschalter "0"  
Motordrehzahl langsam steigern bis zur max.  
Motordrehzahl, dabei Meßgeräte beobachten.  
Speisedruck:  
Leerlaufdrehzahl  
Psp = ca. 15-20 bar  
max. Motordrehzahl  
Psp = ..... bar\*

#### Blockzustand

Fahrtrichtungsschalter - vorwärts  
(Straßengang und Festgebremst)

Einstelldaten Pumpe A4V/DA überprüfen

#### Regelbeginn

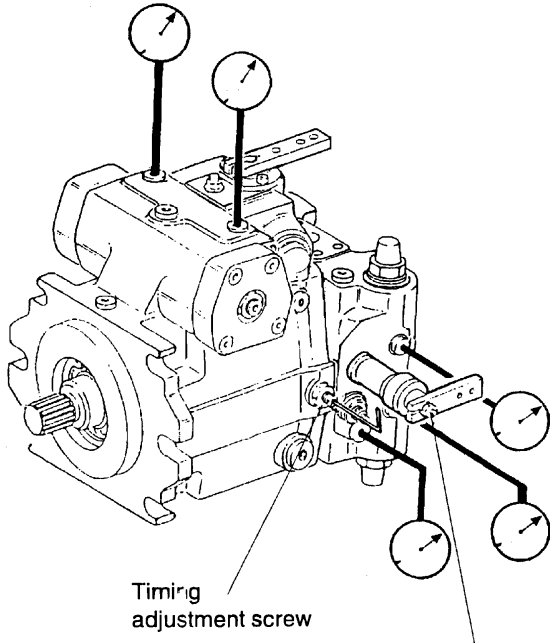
HD 40 - 50 bar  
Motordrehzahl ..... min.<sup>1</sup>\* Psp ..... bar\*  
HD ..... bar  
Nachjustierung - Regelbeginnschraube

#### Regelende

HD ..... bar\*  
Motordrehzahl ..... min.<sup>1</sup>\* Psp ..... bar\*  
Nachjustierung - Verdrillschraube

Hinweis:  
Excenterjustierung - Drehrichtung beachten

Hinweis: \* Einstelldaten nach Werksauftrag!



113

**Attention!**  
Observe safety regulations!

Check setting data.  
Operating temperature should be kept largely constant during the check procedure.  
Start prime mover, idle speed.

**Block position**

Drive direction switch - "0".  
Slowly increase motor speed up to the max. motor speed and thereby observe measuring instruments.

**Boost pressure:**

Idle speed of prime mover  
Psp = approx. 15 - 20 bar  
max. motor speed  
Psp = ..... bar\*

**Block position**

Drive direction switch - **forward**  
(Road gear and fully applied brake)

Check setting data pump A4VIDA

**Begin of control:**

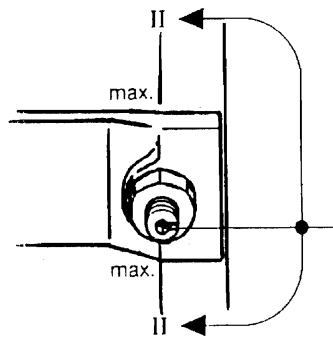
HD 40 - 50 bar  
Motor speed ..... rpm\* Psp ..... bar\*  
HD ..... bar\*  
Readjusting - control start screw

**End of control**

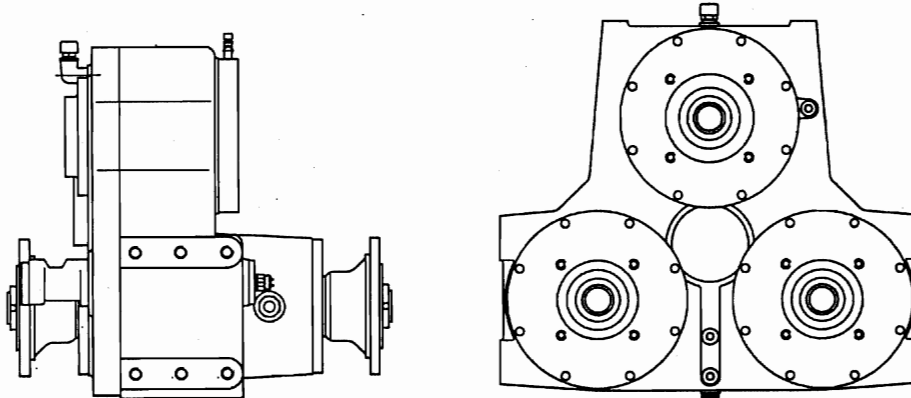
HD ..... bar  
Motor speed ..... rpm\* Psp ..... bar\*  
Readjusting timing adjustment screw

**Note:**  
Eccentric adjusting - observe direction of rotation

\* Setting data according to order!



114



## Contents

1. Technical data
2. Forward
3. Prescribed use
4. Transport and storage
5. Set-up and putting into operation
6. Conversions and modifications
7. Maintenance
8. Spare parts and repairs
9. Lubricants

## 1. Technical Data

STIEBEL D51545 WALDBROEL

Typ 4400.02.09904.97-

Nr. 459005

kW  $n_1$  min<sup>-1</sup>

T<sub>2</sub> Nm  $i = 1:1,6289$

Bj. 1997 kg


GETRIEBEOEL 8.50L

CLP220 DIN51517

## 2. Foreword

These operating instructions contain important advice on the safe, correct and economic operation of the gear and plant.

Following this advice helps to prevent hazards and damage, reduce repair costs and breakdown times and to increase the reliability and service life of the gear.

**Important:** Always read information marked with this  symbol. Such information warns of danger. Non-observance can lead to personal injury and damage to property.

**Advice:** The content of these operating instructions are protected by copyright. Illustrations, drawings and data from these operating instructions may be neither reproduced nor communicated or made available to third parties or competing companies (Para. 48 of the copyright law of 11th June 1870).

## 3. Prescribed Use

The above-mentioned product is intended for installation in a machine. It may not be commissioned until it has been ascertained that the machine in which the above-mentioned product is to be installed complies with the conditions of the EC guideline on machinery.

The product may only be used for the technically designed purpose agreed. The product may not be operated with outputs, torques or external loads which exceed the structural design (see technical data and catalogue).


Installation and commissioning may only be carried out by properly qualified personnel.

Any applicable national, local and plant-specific conditions and requirements concerning the prevention of accidents must be observed.

Qualified personnel are those persons who, on the basis of their training, experience and instruction, along with their knowledge of relevant standards, conditions, regulations for the prevention of accidents and operating conditions, have been authorized by the person responsible for the safety of the plant to carry out the necessary activities and in so doing are able to detect and prevent possible hazards.

## 4. Transport and Storage

### Transport

 For risk-free handling, the hoisting lugs and pegs or threaded bore-holes provided must be used. Hoisting lugs and similar aids attached to the gears are designed only for the weight of the gear and may not be used for raising extension components such as motors, drum shafts or similar. Only use suitable and technically faultless lifting equipment and load suspension devices (e.g. ropes, eye bolts etc.) with sufficient load-bearing capacity. See indication of weight in the technical data or on the type plate. The indications of weight must be regarded as approximate as weights can vary slightly, e.g. by different oil levels. Do not remain or work under suspended loads.

### Storage

Storage from delivery to commissioning should be in dry, dust-free and vibration-free. Enquiries should be addressed to the manufacturer in the case of differing storage conditions.

### Protection against Corrosion


The standard preservation of the shafts, hollow shafts etc. is effective for one year maximum under the above-mentioned conditions. It is not suitable for outside storage.


## 5. Set-up and putting into operation


Assembly and commissioning may only be carried out by suitably qualified personnel.


 Before commissioning and the test run it must be ensured that the moving and rotating components (e.g. shafts, couplings etc.) do not represent a hazard. This means that the necessary contact protection must be provided or measures taken to ensure a safe distance from the machine is maintained. During the test run without attached machinery,


the keys in the shaft ends are to be secured against being spun out.


 Before work on the gear unit or attached equipment is performed, the power supply must be disconnected. Action must be taken to prevent the power being inadvertently switched on again. Where necessary, mechanical devices (special equipment, supports etc.) must ensure that the machine cannot move or rotate.


 It must be ensured before commissioning that the specified amount of lubricant has been poured into the machine. For the oil quantity and oil grade, see nameplate or operating manual. Check the oil level by undoing the overflow screw or by using the oil dipstick or oil sight glass if these devices are fitted.

 Never operate without a breather filter otherwise the excess pressure resulting from the gear unit heating up will cause an oil leak.

 After prolonged operation the lubricant and gear unit surface may reach temperatures which could cause skin burns.

 Oil mist is produced in the gear units. It is therefore dangerous to work with a naked flame near the gear unit openings. There is a risk of fire or explosion.

 High-speed machines into which these gear units are installed may generate loud noises which can damage your hearing if they persist. In this case the operating staff should be provided with ear protection. In order to reduce the noise, all technical possibilities should be used to observe the statutory regulations.

 It must be ensured that the gear units are not continuously subjected to severe vibrations, e.g. from low-speed diesel engines.

#### Technical information

Housings: Torsionally rigid housings made of aluminium or grey cast iron

Gearing: casehardened, tooth flanks ground

Lubrication: Splash lubrication, pressurised circulation lubrication

#### Assembly of the gear units

Before assembly, check the surfaces, edges of the shaft end, keys and external shaft splines for damage, and remedy any damage discovered.

In the case of key and splined shaft connections apply lubricating paste (e.g. Optimol White T) to the shaft end. The paste facilitates assembly of the units and prevents corrosion which would make subsequent dismantling much more difficult. It must be ensured that the shaft seals are not dirty, damaged or coated with paint. When the units are being painted, cover the seals and running surfaces of the shafts or protect with grease. This is the only way to prevent damage and thus oil losses.

Oil baffle plates which may be installed on the pump mounting flanges must not be damaged or dismantled.

#### Assembly of input and output elements

Couplings, belt pulleys or similar elements should be mounted with the appropriate jigs (threaded spindle which is screwed into the centring bore of the shaft). Severe hammering must be avoided as antifriction bearings, retaining rings and other internals would be damaged!

Hydraulic pumps must be connected with the mounting flanges so that they are oil-tight and must not exert any axial pressure on the gear unit shafts! The coupling elements and the splines

must be adequately lubricated before assembly; we recommend Optimol White T or Staburags NBU 30 PTM. Exception: Splined hollow shafts which have their own oil filling from the gear unit lubrication system; the relevant mounting flange is then provided with screw plugs for the oil level and oil drain as well as a breather. In these cases the oil level as well as the oil quantity required to fill the gear unit flange is entered in the assembly drawing.

#### Lubricants

The gear units are as a rule supplied without oil; they are then provided with a label "Caution! Not filled with oil!". Normally gear oil CLP220 to DIN 51517 (mineral oil) or PGLP 220 to DIN 51502 (synthetic oil) is used. These grades are suitable for normal operating conditions at an ambient temperature of -5° to +35°C or -25° to +80°C with synthetic oil. Consult the manufacturer in the event of special operating and application conditions.


#### Commissioning

Before commissioning, the gear units and, if necessary, the mounting flanges must be properly filled with oil; for the oil grade and oil level, refer to the technical data or the nameplate and assembly drawing. During commissioning the plant must not be operated immediately at full capacity. Only after 3-4 hours is the load to be slowly increased so that the plant can then be run under full load. Oil and gear unit temperatures up to 80°C, or up to 100°C with synthetic oil, are not unusual and do not have any negative impact on the functioning of the gear units. The oil level is to be checked after about 15 min. running time as oil collects in the mounting flanges or is dammed there to lubricate the splined hollow shafts. If necessary, replenish oil up to the specified oil level mark. We recommend you to repeat this procedure until the oil level no longer changes. This is especially important if oil pumps, oil coolers and the like also have to be filled with oil.

#### Installation positions

Stiebel power take-off, pump power take-off and variable-speed gear units can be operated in several installation positions depending on the type. The manufacturer must always be consulted in the event of installation positions which deviate from the position ordered or shown in the assembly drawing.

#### Power take-off variable-speed gear units

 The gear units must not be switched under load; this operation may only be performed at standstill. Any contravention of this will result in damage to the geared coupling and no claims under the guarantee will be accepted.

- Pneumatic gear-shifting: The pneumatics must be designed so that the side subjected to pressure is continuously under a pressure of 6 bar. A mist oiler must be installed in the pneumatic system to ensure proper lubrication of the operating piston and to protect it against any corrosion.

- Mechanical gear-shifting: A spring element (gear-shifting aid) must be installed in the shift linkage so that, if the geared coupling in the gear unit is in an unfavourable position (tooth on tooth), the shift linkage can be locked. When the motor starts up, the coupling then engages. The tensile and compressive forces of the shift linkage in the engaged condition must not exceed 500 N.

## 6. Conversions and modifications




Do not make any changes, provide attachments or perform conversion work on the gear unit or components which could reduce safety without the manufacturer's permission! In par-

ticular any protective facilities provided (e.g. covers, overload protection) must not be removed or changed.

## 7. Notes on maintenance





Change oil regularly in accordance with the operating manual. Refer to lubrication chart, pump power take-off gear units. If the mounting flanges have their own oil filling, it is designed as long-life lubrication and no oil change is necessary. For the oil quantity and oil grade, see nameplate or operating manual; the oil quantities are to be regarded as approximations. The oil level indicated in the assembly drawing is always decisive. Check the oil level by undoing the overflow screw or by using the oil dipstick provided these devices are part of the fittings. At each oil change check all the seals and screw fittings for any leaks and, if necessary, retighten the screws. If possible, a visual leak check should be made every day. A rise in the oil level in the gear unit or mounting flanges with their own oil filling is a sign of defective seals in the hydraulic units.

Premature gear unit failure may occur as a result of running dry caused by oil loss, the ingress of water into the gear unit housing or the presence of foreign matter in the lubricant.

-  When changing, replenishing or draining the oil or when taking oil samples, it must be guaranteed that no oil can escape onto the ground, penetrate the ground or surface water or enter the sewage system.
-  Prolonged contact with lubricants can cause injury to your skin. Use a protective skin ointment.
-  After prolonged operation the lubricant and surface of the gear unit may reach temperatures which can cause skin

burns. When working on hot components, wear protective clothing, e.g. protective gloves.



The lubricant is best drained while still warm from operation so that a complete change of the old lubricant is ensured. If the oil is highly contaminated, the gear unit should be rinsed with the same lubricant.

-  Under no circumstances may different types of lubricant, such as mineral oil, synthetic oil or grease, be mixed with each other.
-  The applicable national, local and plant-specific regulations and requirements concerning accident prevention and environmental protection are to be observed.
-  To prevent faults, it is necessary to carry out the regular maintenance and inspection work prescribed. Any changes compared with normal operation (higher power input, temperatures or vibrations, unusual noises or smells, response of monitoring devices etc.) are an indication that the unit is not functioning properly. To avoid faults which could result in injury to people or damage to property, the maintenance staff responsible must be notified immediately. In case of doubt switch off the relevant item of equipment and ensure it cannot be switched on again.
-  To prevent damage from overheating, dirt and dust deposits should be regularly removed from the gear unit surface.

## 8. Spare parts and repairs

Spare parts must satisfy the technical requirements specified by the manufacturer. This is always guaranteed with original spare parts. When ordering spare parts, the type number and serial number (to be found on the nameplate or in the technical data) in addition to the spare part number must be indicated. Spare parts drawings and spare parts lists can be requested from the manufacturer.

Repairs and overhauls are carried out by the manufacturer at short notice. When carrying out your own repairs, make sure that the expendables and auxiliary materials and parts which have been replaced are disposed of safely and without polluting the environment.

-  The applicable national, local and plant-specific regulations and requirements concerning accident prevention and environmental protection are to be observed. The manufacturer does not assume any liability for damage caused by improper repair work or the use of non-original spare parts.
-  Prolonged contact with lubricants can cause skin damage. Use a protective skin ointment. After prolonged operation the lubricant and the surface of the gear unit may reach temperatures which can cause skin burns. Before starting repairs, let the gear unit cool down.





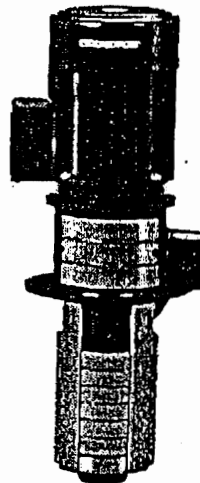
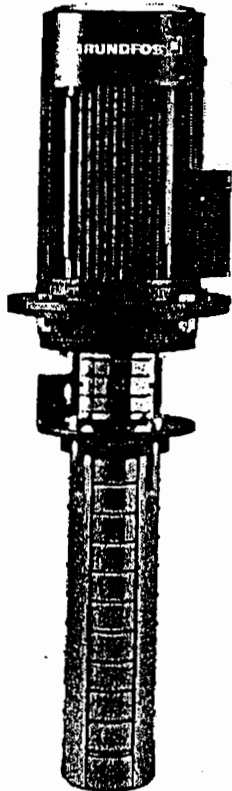
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**REED**CONCRETE PLACING  
EQUIPMENT**CRK WASH WATER PUMP**

VENDR

FIGURE 07

PAGE 01



- Ⓒ GB Installation and Operating Instructions
- Ⓒ D Montage- und Betriebsanleitung
- Ⓒ F Notice d'Installation et d'entretien
- Ⓒ DK Monterings- og driftsinstruktion

**CRK****CONTENTS**

1. Applications
2. Type Designation
3. Operating Conditions
4. Installation
  - 4.1 Pump Location
  - 4.2 Suction Conditions
5. Electrical Connections
6. Start-Up
7. Operation and Maintenance
  - 7.1 Lubrication and Maintenance
  - 7.2 Filters
  - 7.3 Periodic Checks
8. Fault Finding Chart

# CRK WASH WATER PUMP

## 1. Applications

The GRUNDFOS CRK pumps are multistage centrifugal pumps designed for the pumping of cooling and cutting liquids for machine tools, condensate transfer, liquid transfer in industrial washing machines and similar applications.

CRK pumps are designed for the pumping of liquids with a density and viscosity corresponding to those of water. The pumped liquid must not contain abrasive particles or fibres.



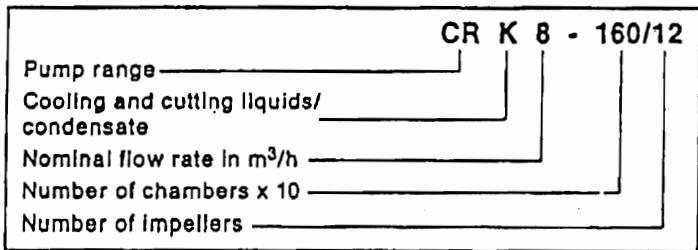
When pumping liquids with a density or viscosity higher than that of water, motors with correspondingly higher outputs must be used, if required.

## 2. Type Designation

The standard range of CRK pumps encompasses complete impeller in chamber combinations. On request, other lengths, against duty combinations, can be supplied by fitting empty intermediate chambers instead of standard chambers with impellers.

The pump key on the pump nameplate indicates the number of chambers and impellers fitted to the pump.

Example:



## 3. Operating Conditions

- Liquid Temperature: - 15°C to + 90°C.
- Ambient Temperature: - 30°C to + 40°C.
- Enclosure Class: IP 55.
- Relative Air Humidity: Maximum 90%.
- Operating Pressure: Maximum 25 bar.

## 4. Installation

### 4.1 Pump Location

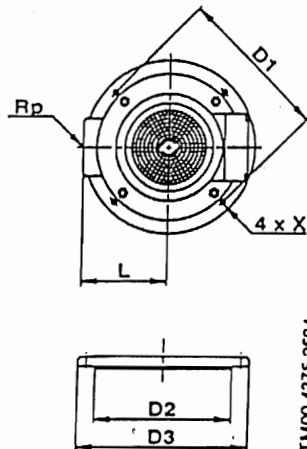
The pump is designed for tank mounting in a vertical position. The pump is positioned in a hole cut into the cover of the tank (upper side) and is secured to the tank by four set screws through the holes in the mounting flange. It is recommended to fit a sealing gasket between the pump flange and tank.

**GB**

Fig. 1

Pump Mounting Flange Dimensions

	CRK 2 and 4	CRK 8 and 16
D1	160	225
D2	140	200
D3	180	250
L	100	125
Rp	1¼	2
X	ø7	ø9



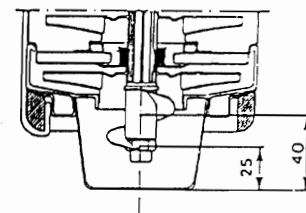
### 4.2 Suction Conditions

The CRK pumps are designed to provide full performance down to a liquid level of 40 mm (CRK 2/4) or 50 mm (CRK 8/16) above the bottom of the pump strainer.

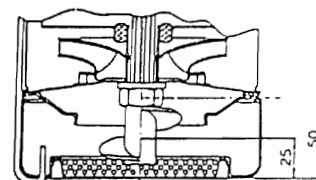
At a liquid level between 25 and 40/50 mm above the bottom of the strainer, the built-in priming screw will protect the pump against dry-running, see fig. 2.

Fig. 2

CRK 2 and CRK 4



CRK 8 and CRK 16



## 5. Electrical Connections

The electrical connections should be carried out in accordance with local regulations.

The operating voltage and frequency are marked on the pump nameplate. Please make sure that the motor is suitable for the electricity supply on which it will be used.

Single-phase GRUNDFOS motors incorporate a thermal switch and require no additional motor protection.

Three-phase motors must be connected to a motor starter.

To ensure easy access to the electrical connections, the terminal box can be turned to the positions shown in fig. 3.

Remove the coupling guards which are kept in position by spring tension.

To change the position of the terminal box, remove the four screws securing the motor to the motor stool. Turn the motor to the required position, replace and tighten the four screws.

Replace the coupling guards.

Do not start the pump until it has been submerged in the pumped liquid. ...

The electrical connection should be carried out as shown in the diagram inside the terminal box cover.

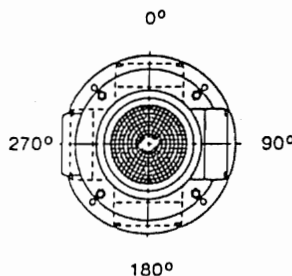
In the case of **frequency converter** operation, the motor should not be loaded by more than 90% of the power stated on the motor nameplate, unless otherwise stated by the frequency converter manufacturer.

## 6. Start-Up

The pump can be started against an open or a closed discharge side.

- If the discharge side is open and the pump body is partly filled with liquid when the pump is started, the air will escape through the discharge pipe.
- If the discharge side is closed and the pump body is partly filled with liquid when the pump is started, the air will be pressed down through the pump body and out into the tank, and the pump will very quickly reach its maximum operating pressure.

Fig. 3



TM00 4257 2294

GB

Before starting the pump, make sure:

1. that the direction of rotation of the pump is correct.

When seen from the top, the pump should rotate counter-clockwise.

(Start the pump for a short period and check the direction of rotation at the motor cooling fan).



2. that all pipe connections are tight.
3. that the pump body is partly filled with liquid (partly submerged).
4. that the strainer is not blocked by impurities.

## 7. Operation and Maintenance

### 7.1 Lubrication and Maintenance

Pumps installed in accordance with these instructions require very little maintenance.

The mechanical shaft seal is self-adjusting and has wear-resistant seal rings which are lubricated and cooled by the pumped liquid.

The pump bearings are also lubricated by the pumped liquid. Motor bearings are grease packed and sealed for life. No further lubrication is necessary.

### 7.2 Filters

Chip trays, filters, etc. should be cleaned at regular intervals to ensure a correct flow of liquid.

### 7.3 Periodic Checks

At regular intervals, depending on the conditions and time of operation, the following checks should be made:

- Check the quantity of liquid and operating pressure.
- Check that there are no leaks.
- Check that the motor is not overheating.
- Check the tripping of the motor starter.
- Check that all controls are operating satisfactorily.

If the above checks do not reveal any abnormal operating details, no further checks are necessary. Should any faults be found, check the symptoms with section 8. "Fault Finding Chart".

**8. Fault Finding Chart**

Before removing the terminal box cover and before any removal/dismantling of the pump, make sure that the electricity supply has been switched off.

Fault	Cause
1. Motor does not run when started.	a) Supply failure. b) Fuses blown. c) Motor starter overload has tripped out. d) Main contacts in starter are not making contact or the coil is faulty. e) Control circuit fuses are defective.
2. Motor starter overload trips out immediately when supply is switched on.	a) One fuse is blown. b) Contacts in motor starter overload are faulty. c) Cable connection is loose or faulty. d) Motor winding is defective. e) Pump mechanically blocked.
3. Motor starter overload trips out occasionally.	a) Overload setting too low. b) Periodic supply failure. c) Low voltage at peak times.
4. Motor starter has not tripped out but the pump does not run.	a) Check 1 a), b), d) and e).
5. Pump capacity not constant.	a) Pump strainer partly blocked by impurities. b) Liquid level in tank too low. See 4.2 "Suction Conditions".
6. Pump runs but gives no liquid.	a) Pump strainer blocked by impurities. b) Liquid level in tank too low. See 4.2 "Suction Conditions". c) Pump rotates in the wrong direction.





**OPERATING INSTRUCTIONS**



**1. STANDARD SPECIFICATION**

- Portable transmitter with two replaceable 7,2 volt NiCd batteries, halter and waist straps
- Receiver with NBB adapter plate for fastening purposes (Only PNN-BUS-3)
- Receiver with 4 fastening angles (PNN-BUS-5)
- Multi-pole connecting cable for the receiver, to your specifications
- Automatic battery charger with charging adapter (rapid charging in three hours)

**The actual delivery specification is as detailed on the confirmation of order or the delivery note accompanying the goods!**

## 2. SAFETY PRECAUTIONS

Even if you are accustomed to working with radio control systems, read these operating instructions without fail before using this equipment. Only this document contains the latest information relating to your NBB radio control system.

Please refer to the accompanying registration documents for the explanatory notes on obtained an operating permit. Observe all applicable work-safety and accident prevention regulations without fail. Only fully trained, authorized personnel may use the NBB radio control equipment. Components, etc. built into the NBB equipment for safety purposes must be regularly inspected. (See point 6 of this instruction)

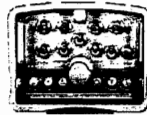
**If the NBB radio control unit develops a fault, it must be shut down immediately. The transmitter should be switched off with the EMERGENCY-OFF switch. The connecting cable must be disconnected from the crane connecting socket (terminal) on the receiver. The repair of the equipment must not be carried out other than by NBB or an NBB authorized technician.**

Failure to observe these recommendations will put both you yourself and others at risk. Under these circumstances, NBB rescinds the guarantee and any other form of liability. This radio control unit is designed exclusively for the control of construction machines and industrial plants. Only under these conditions are the safety systems (EMERGENCY-OFF, zero setting) fully effective. No other form of use is permitted. Any non-observance of this condition will relieve NBB of all liability.

Nano, Nano-S-A2-HC



Nano-Vario



## 3. TRANSMITTER

To make the unit ready for use, insert the battery into the battery compartment. To remove the battery, depress the pin and push out the battery. The power supply to the transmitter is activated with the EMERGENCY-OFF switch (when depressed, the EMERGENCY-OFF switch can also be secured by removing the key cap). The green LED on the transmitter control panel must flash regularly. Commands can now be input by means of the controls. The operating period with a charged battery is approximately 8 hours with the transmitter in continuous use. When the red "Battery" indicator lamp lights up, the battery is nearing exhaustion. The transmitter can be operated for approximately 15 minutes more in this condition. During this time, bring the crane to a safe position and install a new battery.

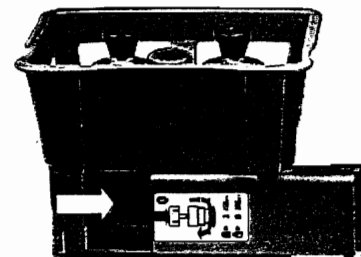
Removal of the battery interrupts the radio link. As a result, the master switch for the crane must be switched on again.

Charge the discharged battery with the charger supplied.

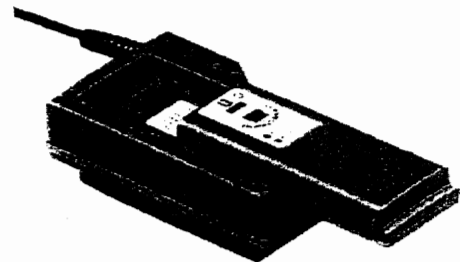
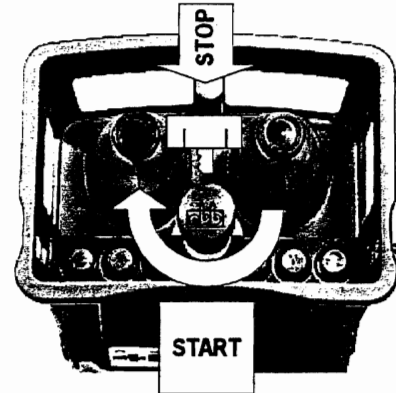
## 4. BATTERY CHARGER

The red indicator lamp indicates that the battery charger is ready for use. Place the battery in the charging well; it will now be charged. When the red LED goes out, the charging process is concluded. No harm will come to the battery if it is left in the charger beyond the required charging time.

**Do not use the charger other than in dry rooms having a min-max temperature range of 0-40°C. A charged battery is a concentrated energy source. Never store a charged battery in a toolbox or similar where it could be short-circuited by metal components (even a key in your trouser pocket can cause a short circuit).**



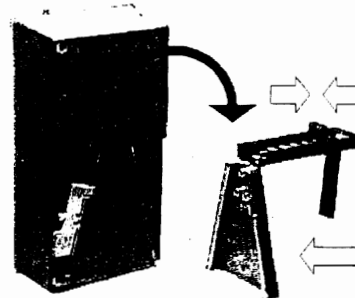
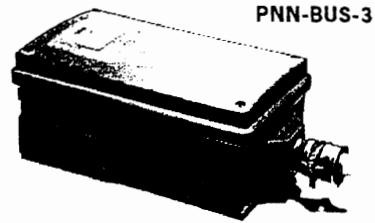
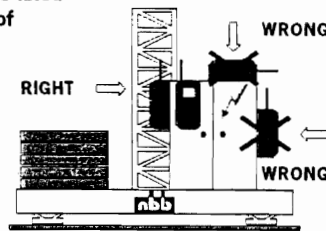
Depress the pin and push out the battery



### 5. RECEIVER (PNN-BUS-3 and PNN-BUS-5)

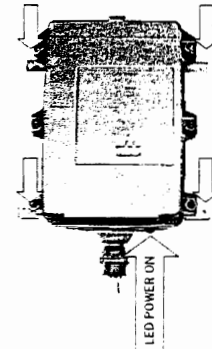
The receiver is connected to the crane with the multi-pole connecting cable supplied. Please observe the instructions issued by the crane manufacturer. The power supply to the receiver is generally effected by way of the connecting cable.

- In general, an earth lead is required in the case of cranes which have not previously been operated under radio control. Failing this, the receiver electronic circuit will not receive any power supply.  
Take care to ensure that the operating voltage of the receiver complies with the electrical specifications of the crane.  
The applicable operating voltage is specified in the supplement.
- Never expose the receiver to a high pressure cleaning jet. This also applies to the transmitter.
- The receiver should always be fixed vertical at the outside panel of the switching cabinet. The antenna should reach over the top of the panel.

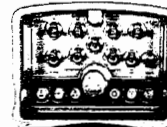


Mounting-possibilities of the PNN-BUS-3 or of the PNN-BUS-5.

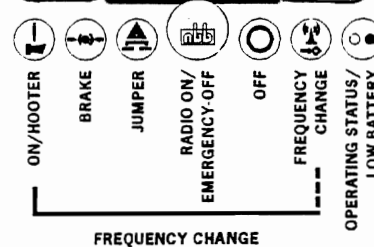
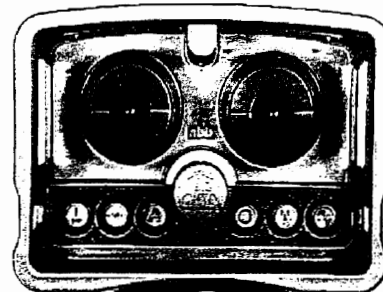
PNN-BUS-5



Nano-Vario



Nano / Nano-S-A2-HC



### 6. OPERATING THE SYSTEM

Safety equipment in the NBB radio control system:

- In the transmitter:**
  - EMERGENCY-OFF switch with automatic disconnection from the power supply
  - Automatic zeroing
- In the receiver:**
  - Duplicated 2-channel evaluation of the EMERGENCY-OFF signal
  - Automatic zeroing when switched on again after radio signal interruption
  - Inhibition of radio control commands at the relay level if EMERGENCY-OFF circuit defective.

To ensure troublefree operation, observe the following operating instructions precisely. Subject to the transmitter being in operating condition, the crane's master switch can only be switched on provided no command transmitter is actuated. The necessary command for this purpose is initiated by the 'ON/HOOTER' button. This activates a warning signal on the crane. After the crane has been switched on, this button serves for the subsequent activation of the hooter as required by safety at work regulations.

If the NBB radio control unit remains unused for a prolonged period, we strongly recommend that the battery be charged from time to time (approximately every four weeks). This will prevent it from becoming discharged and will prolong its working life. If an extended period of disuse is intended, we recommend that the battery be removed from the transmitter.

#### Changing the frequency:

To change the frequency, hold down the 'ON/HOOTER' button while simultaneously operating the 'FREQUENCY CHANGE' button until the hooter sounds. (Please observe the accompanying registration conditions, see page 5, point 9).

**TEACH-IN: Individual Setting of Analog Channels (Basic Setting) at Nano Transmitter\*.**  
The output signals of the analog channels can be individually programmed by the transmitter.

**Activate programming mode**



**Select analog function**



**Save "contact point"**



**Save maximum speed**



**Program opposite direction ?**



**Programming of next function ?**

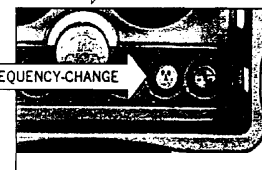
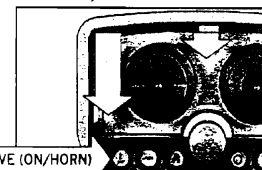
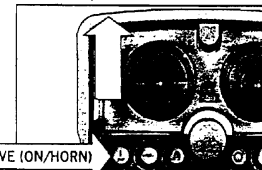
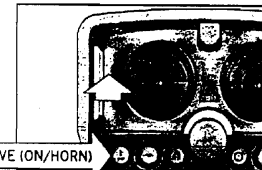
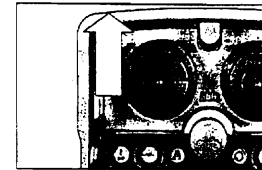
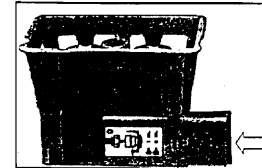


**Check the programmed values**

**Close the programming mode**

The control is ready to operate.

- 1** Set all analog channels to zero position. (potentiometer without automatic release) Insert the TEACH-battery into the battery compartment, release the EMERGENCY-OFF switch and press the "ON/HORN" key. Now the programming mode is activated.
- 2** To determine which analog function is to be programmed, it is sufficient to turn briefly the appropriate master switch fully in the direction of this function.
- 3** Now the "50%/100%" switch has to be turned into the "50%" position. The master switch is now turned until the required "contact point" is reached. To save this value, the "SAVE" ("ON/HORN") key must be pressed at this position.
- 4** The "50%/100%" switch has to be turned into the "100%" position. The upper initial value is saved by turning the master switch until the maximum speed of the function is reached then pressing again the "SAVE" ("ON/HORN") key.
- 5** The opposite direction of this function can then be programmed the same way immediately afterwards. See point **3** and **4**.
- 6** When programming several analog channels consecutively, the "FREQUENCY-CHANGE" key must be pressed once after saving a function. Continue point **2**.



- 7** By pressing and holding the "FREQUENCY-CHANGE" key it is possible to change to the working mode to check the programmed values. As soon as the key is released, the programming mode can be commenced, as described above. (Point **2** to **5**.)
- 8** Press the EMERGENCY-OFF switch, push out the TEACH battery of the battery compartment, insert the normal working battery, release the EMERGENCY-OFF switch again and prepare the control to operate by pressing the "ON/HORN" key.

**Please note:**  
In the programming mode all functions are locked, except "ON/HORN" and each selected function.

\* Please refer to the scope of supply of your facility.

**TEACH-IN: Individual Setting of Analog Channels (Basic Setting) at Nano Transmitter with Potentiometer Control\*.**

The output signals of the analog channels can be individually programmed by the transmitter.

**Activate programming mode**



**Select analog function**



**Save "contact point"**



**Save maximum speed**



**Programming of next function ?**

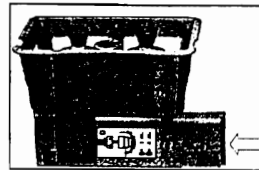


**Check the programmed values**

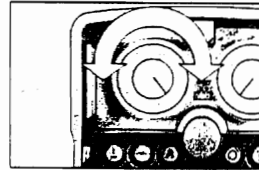
**Close the programming mode**

The control is ready to operate.

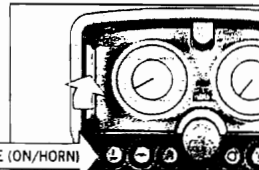
**1** Set all analog channels to zero position. (potentiometer without automatic release) Insert the TEACH-battery into the battery compartment, release the EMERGENCY-OFF switch and press the 'ON/HORN' key. Now the programming mode is activated.



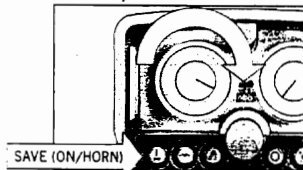
**2** To determine which analog function is to be programmed, it is sufficient to turn briefly the appropriate potentiometer fully in the direction of this function.



**3** Now the '50%/100%' switch has to be turned into the '50%' position. The potentiometer is now turned until the required 'contact point' is reached. To save this value, the 'SAVE' ('ON/HORN') key must be pressed at this position.

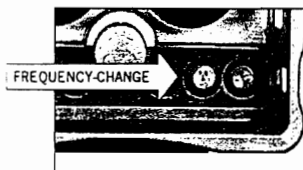


**4** The '50%/100%' switch has to be turned into the '100%' position. The upper initial value is saved by turning the potentiometer until the maximum speed of the function is reached then pressing again the 'SAVE' ('ON/HORN') key.



**5** No opposite direction.

**6** When programming several analog channels consecutively, the 'FREQUENCY-CHANGE' key must be pressed once after saving a function. Continue point **2**.



**7** By pressing and holding the 'FREQUENCY-CHANGE' key it is possible to change to the working mode to check the programmed values. As soon as the key is released, the programming mode can be commenced, as described above. (Point **2** to **5**.)

**8** Press the EMERGENCY-OFF switch, push out the TEACH battery of the battery compartment, insert the normal working battery, release the EMERGENCY-OFF switch again and prepare the control to operate by pressing the 'ON/HORN' key.

**Please note:**  
In the programming mode all functions are locked, except "ON/HORN" and each selected function.

\* Please refer to the scope of supply of your facility.

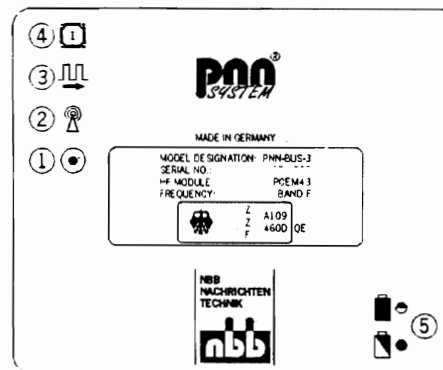
## 7. FUNCTION CHECKS

Regular function checks of the NBB radio control unit are essential to ensure that operating safety is maintained. In the case of a single-shift daily operation, we recommend that the checks be carried out once a week. They can be performed with the aid of the indicator lamps on the receiver. For this purpose, the transmitter must be in operating condition.

- First, connect only the receiver - the transmitter remains switched off.
- Switch on the transmitter by releasing the EMERGENCY-OFF button.
- Now test the command functions (always starting at the lowest stage) and check that the crane responds correctly. In particular, make sure that the danger area is clear of all personnel. **Failure to do so may result in an ACCIDENT.**
- **EMERGENCY-OFF check.** Press the EMERGENCY-OFF button on the transmitter until it locks. The crane's master contactor must drop out after a maximum of 1/2 second.

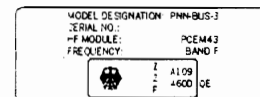
### Checking the LEDs of the receiver

- **LED1: POWER ON.** If the LED does not light up, check the power supply. If the power supply lead is in satisfactory condition, notify your service centre.
- **LED2: HF AVAILABLE.** Remains lit continuously when the transmitter is switched on.  
(not significant in the case of scanner operation).
- **LED3:** Flashes at regular intervals during fault-free operation. Irregular flashing means that the HF channel is probably disrupted. In this case, select an alternative channel.
- **LED4:** If this LED flashes, the HF channel is disrupted.
- **LED5 (Battery operation):** state of charge of the battery.



## 8. RATING PLATES

Rating plates contain the serial number, model designation, type of HF module and frequency. In the event of a query, please give the serial number without fail.



## 9. REGISTRATION

Explanatory notes on obtaining an operating permit for your NBB radio control system will be found in the accompanying registration documents.

## 10. MAINTENANCE

The NBB radio control unit is largely maintenance-free. Nevertheless, please observe the following points:

- The EMERGENCY-OFF button must operate freely.
- Keep the unit clean of any contamination from building materials.
- If any electrical welding is carried out on the crane, disconnect the control cable from the receiver, otherwise the receiver electronics may be damaged.

## 11. GUARANTEE

All NBB radio control units (transmitter, receiver, battery charger) are guaranteed to operate satisfactorily for a period of six months from the date of sale. The terms of the guarantee include parts and labour. Transport costs are the buyer's responsibility. The following are excluded from the guarantee: wearing parts, relays and batteries. The guarantee does not cover damage, accidental damage, negligence, improper use, non-adherence to operating conditions, the non-observance of operating, testing and servicing instructions, or repairs or modifications to the unit not authorized by NBB. NBB will not be liable for consequential damage. It reserves the right to effect repairs or replacements at its own discretion.

## 12. ACTION IN THE EVENT OF A FAULT

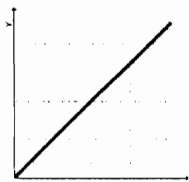
Do not continue to work with a defective NBB radio control unit. Even a minor defect in the first instance may eventually lead to a major fault!

Do not try to repair the NBB radio control unit yourself. In the event of a fault, please notify your dealer or contact us!

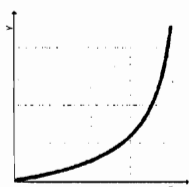
# TECHNICAL SUPPLEMENT

## NANO: Board E-AN04A2V1/1 TEACH-IN\*

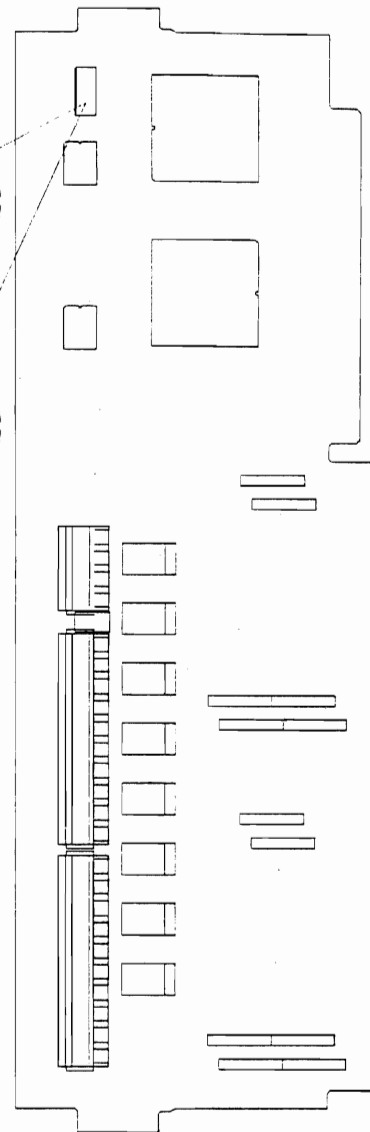
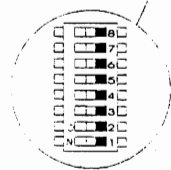
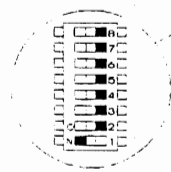
DIL switch (SW2) for setting various transmission characteristics:



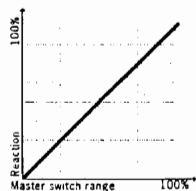
Setting for linear characteristic



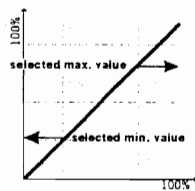
Setting for non-linear characteristic



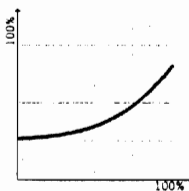
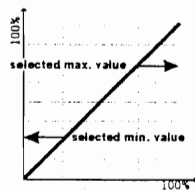
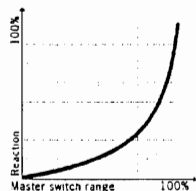
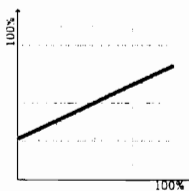
Characteristics  
linear or non-linear



Characteristics in  
Teach-In mode



Characteristics after  
Teach-In mode



DIL switch no. 8 : OFF : 50% switching variable  
ON : 50% switching fixed

\*Please refer to the scope of supply of your facility.

# TECHNICAL DATA



Operating ambient temperature -20 to +65 °C  
Insulation class - Protection IP 65

**TRANSMITTER** *Pocket-S Nano Nano-L Nano-M*

Transmission frequency range 400 - 477 MHz, 25 mW FM  
The use of synthesizer technology permits frequencies to be selected in accordance with the appropriate waveband for the country of use.  
Low frequency modulation FSK signal to CCITT V.23  
Data repetition rate about 60 ms  
Baud rate 1200 baud (bits per sec.)  
Range 300 up to 1000 m  
Power input about 60 mA  
RF output 10 mW

	Weight (without battery)	Size (L x W x H)
Pocket	0,2 kg	8,7 x 3,5 x 14 cm
Nano	0,7 kg	17,5 x 12,6 x 12,2 cm
Nano-L	1,0 kg	24,7 x 13,9 x 11,7 cm
Nano-M	1,5 kg	28,3 x 14,4 x 16,7 cm

**RECEIVER** *PNN-BUS-3, PNN-BUS-5*

Reception frequency range 400 - 477 MHz  
Data security:  
Generates a CRC code with a Hamming distance = 4. Generates a neutral position Addressing of each transmitter with its own, unique combination (32768 possible combinations). Parity - Bit parameters with addressing.  
Data reception security:  
2 diversitary evaluators (1 hardware evaluator, 1 software - controlled evaluator). CRC. EMERGENCY OFF and neutral position bits. Restart inhibitor if EMERGENCY OFF relay defective.  
Contact loading for EMERGENCY OFF and commands.  
max. switching voltage 250 V  
max. switching current 6 A  
max. switching power 1000 VA

	Weight	Size (L x W x H)
PNN-BUS-3	3,0 kg	30,6 x 18,1 x 13 cm
PNN-BUS-5	4,7 kg	36,4 x 28,3 x 15,2 cm

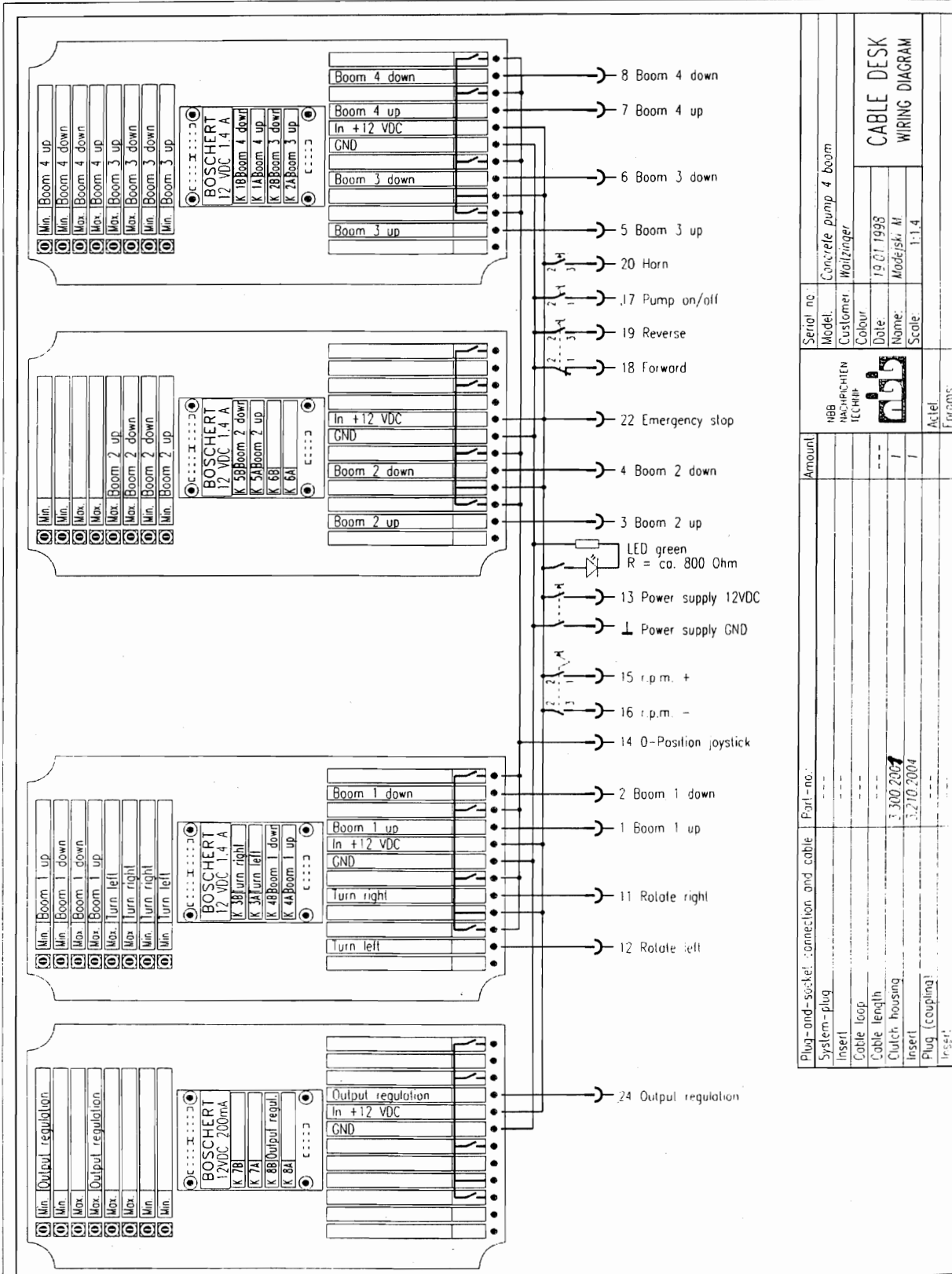
**BATTERY** 7,2V / 0,6 Ah

**CHARGING UNIT**

Operating voltage external charging unit 12V/24V DC  
110V/230V AC  
Operating voltage /PNN-BUS-3/PNN-BUS-5 90V - 270V AC  
40V - 270V AC  
40V - 130V AC  
8V - 50V DC  
24V DC



## PNN SYSTEM CABLE REMOTE CONTROL



# REED

CONCRETE PLACING  
EQUIPMENT

## PNN SYSTEM CABLE REMOTE CONTROL

VENDR

FIGURE 08  
PAGE 09

Anlage 1 zur Zulassungsurkunde  
Nr. G120913F vom 05.10.1995  
Vorgangs-Nr.: 49202  
Seite 1 (2)

### SYSTEMBESCHREIBUNG

Objektbestandteil: Empfangsmodul: E-EM43 AO

Objektmerkmale:

Frequenzbereich: 433,05 MHz bis 434,79 MHz  
Betriebsfrequenzbereich: 433,100 MHz bis 434,750 MHz  
Sendeart: F 1 D  
Betriebsart: Simplex  
Spannungsversorgung des Empfängers: 12V, DC  
Antenne des Empfängers: Antennenbuchse  
Anzahl der schaltbaren HF-Kanäle: 67

### BUNDESAMT FÜR ZULASSUNGEN IN DER TELEKOMMUNIKATION



### ZULASSUNGSURKUNDE

Zulassungsnummer: G120913F

Zus. Kennzeichen: LED-D

Objektbezeichnung: E-EM43 AO

Zulassungsinhaber: RRB  
Hochrichtertechnik GmbH  
Otto-Wahl-Str. 3  
D-75248 Ölbrunn-Byrrn

Zulassungsort: Allgemeinzulassung

Objektart: Funkanlagen für gewerbliche und industrielle Fernsteuerungs-  
und Fernmeßzwecke

Das Zulassungsobjekt erfüllt die Zulassungsvorschrift BAPT 222 ZV 125, Ausgabe  
Dezember 1954 auf der Grundlage der angewandten technischen Vorschrift T-ETS  
300 220, Ausgabe August 1993

Saarbrücken, den 05.10.1995



Im Auftrag

*Hans Werner Bies*

Hans Werner Bies

1 Anlage

Bundesamt für Zulassungen in der Telekommunikation, Telegrafstr. 42, D-60119 Frankfurt am Main, (069 81) 94-5, fax (069) 9 84-18 00



MODEL *XXT* 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
VENDOR SECTION

VENDR

FIGURE 00  
PAGE 02

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MODEL *XXT 32* TRUCK MOUNTED  
CONCRETE BOOM PUMP  
SERVICE BULLETIN

SRVBT

PAGE 01

AS WE MAKE IMPROVEMENTS TO THE *REED*  
TRUCK MOUNTED CONCRETE BOOM PUMP MODEL *XXT 32*,  
WE LIKE TO SUPPLY YOU, THE CUSTOMER, WITH  
UPDATED INFORMATION WHICH APPLIES TO YOUR PUMP.

THIS SECTION IS PROVIDED AS A PLACE TO STORE  
SERVICE BULLETINS AS YOU RECEIVE THEM  
FROM *REED MANUFACTURING*.



**MODEL XXT 32 TRUCK MOUNTED  
CONCRETE BOOM PUMP  
SERVICE BULLETIN**

**SRVBT**

**PAGE 02**

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BULLETIN NO: SB001  
DATE: FEBRUARY 5, 1998  
TO: ALL **REED** DEALERS  
SUBJECT: **REED** WARRANTY PROGRAM

Each **REED** Concrete Placing Trailer Pump, Truck Mounted Boom Pump and Dry-mix Spraying Gun, undergoes before delivery a thorough Quality Assurance inspection, a performance check and final testing. However, even with these precautions the possibility exists that after delivery, for some reason, a component may fail.

This is the reason for warranty. If this should happen to one of your machines during the first 12 months or 1000 pumping hours after delivery, there is a good chance the failed component could be replaced under warranty.

**REED** has updated and formalized its **WARRANTY PROGRAM** and this bulletin is issued to make all dealers aware of the program.

Enclosed is a supply of our new **WARRANTY CLAIM** forms. From this point on, all warranty claims must be submitted on these forms. Also, please find a description of the program, coverage and how to make a claim and its submission. We suggest you give this some careful attention. Briefly some noteworthy items are:

- Do not return any failed part unless requested by **REED**
- Purchase the replacement part through normal channels from **REED**. Submit your claim noting the invoice number of the replacement part. Upon approval of the claim, a credit will be issued.
- Every effort will be made to process claim within 2 weeks from receipt except for those occasions where the part is to be returned.

Should questions arise during your review, please do not hesitate to contact us.

We appreciate the opportunity to be of service.

Sincerely,



Mike Wickstrom  
Service Manager

## WARRANTY PROGRAM POLICY

**REED** Concrete Placing Equipment is designed and engineered to perform as stated on published specifications. Only quality materials and workmanship are used in the manufacture of these products. As a back up for the product manufactured by **REED**, a guarantee against defects in design and workmanship of components is provided for each machine.

The **REED** guarantee/warranty states, in general, that **REED** will replace free of charge any components found to be defective within the time frame of the warranty period. There are exceptions to some components which are not the responsibility of **REED**. These are noted elsewhere.

A formal printed policy is available and depicts in more detail the warranty and description. However, for your ready reference the following is offered:

### A. WARRANTY PERIOD

- ALL CONCRETE PLACING MACHINES

The warranty period is for twelve (12) months from date of delivery to initial user or 1000 pumping hours whichever comes first.

- NEW PARTS WARRANTY

For parts sold through the **REED** Parts Department the warranty is ninety (90) days from invoice ship date.

- REPLACEMENT WARRANTY PARTS

Replacement parts provided under the terms of the machine warranty are for the warranty period applicable to the unit in which they were installed as if such parts were original components of the machine.

### B. WARRANTY COVERAGE

- DEFECTIVE PARTS

Unless otherwise authorized the replacement part **MUST** be **PURCHASED** from **REED**. Once warranty claim is received and approved, **REED** will provide credit to the dealer/user for their cost of the replacement part as invoiced by **REED**.

- LABOR

No labor time and related compensation will be provided by **REED** to dealers/users or others to perform work under this warranty policy.

- TRAVEL TIME

No travel time, mileage or other expenses will be compensated by **REED** to dealers/users or others to perform work under this warranty policy.

- FREIGHT, IMPORT DOCUMENTATION, CUSTOM DUTY

Any expense incurred for freight, import duty and documentation will not be reimbursed by **REED** in association with this warranty policy.

### C. EXCLUSIONS

- CHASSIS AND RELATED COMPONENTS (TRUCK MOUNTED UNITS)

The warranty for the chassis is handled by the chassis manufacturer and their dealer network. Prior to putting the truck in service it is suggested you contact the nearest manufacturer dealership.

- ENGINE - TRAILER UNITS

The engine warranty is handled by the engine manufacturer and their dealer network. The terms and conditions of their warranty will apply. Contact the local engine dealer for specifics on warranty of the engine.

- NORMAL WEAR

This pertains to items that have failed as a result of normal wear and tear to the product including but not limited to material cylinder and hydraulic cylinder piston components, delivery systems, pins, chains, bushings, seals, concrete pump wear parts, brakes, filter elements, fluids and tires.

- DAMAGES

Caused by transport of equipment or parts, improper set-up or installation, operator error, improper operation or storage, environmental conditions, accidents, improper mechanical techniques employed by anyone or any other cause other than a structural defect in materials or workmanship.



- MAINTENANCE

Caused by failure to perform any scheduled maintenance or routine maintenance as specified in technical manual on any structural or mechanical component.

- MODIFICATIONS

Any non-authorized changes or modifications of any kind to the product. Any modification must be authorized and approved in writing by **REED** Engineering Department.

- ABUSE

Any accidental or intentional abuse of product including but not limited to neglect, loading beyond capacity or any operation of the equipment beyond the limits set forth by **REED** documentation and as depicted in the appropriate technical manual.

#### **D. SUBMISSION OF CLAIM BY DEALER/USER**

Should a component failure be encountered during the warranty period and should it fall within the guidelines of the **REED WARRANTY POLICY** the following procedure is to be followed to claim warranty:

1. REPLACEMENT PART

- Obtain the replacement part by ordering it from the **REED PARTS DEPT.** through normal channels. You will be **INVOICED** for the part.
- If the part has been previously ordered from **REED** and is in your replacement stock inventory you may choose to use that part.

2. COMPLETE THE CLAIM FORM

**REED** has supplied you with a pre-numbered Warranty Claim Form which consists of four (4) parts. This and only this form is **ACCEPTABLE**. **DUPLICATE** copies of the form are **NOT ACCEPTABLE**. If you do not have the proper form, contact the **REED** Service Department. They will send you a supply.



# SERVICE BULLERTIN WARRANTY PROGRAM

SERV C

SB 001  
PAGE 05

<b>REED</b> CONCRETE PLACING EQUIPMENT	<b>WARRANTY CLAIM</b> 13822 OAKS AVENUE CHINO, CA. 91710 909-364-2100	<b>NO.</b> Date: _____ (1)
--	---	-------------------------------

Distributor Account Number: _____ Distributor: _____ (2) Address: _____ City: _____ State: _____ Zip Code: _____ Phone: ( ) _____	End User Account Number: _____ End User: _____ (3) Address: _____ City: _____ State: _____ Zip Code: _____ Phone: ( ) _____
--	--

**MACHINE PUMP DATA**

Model \_\_\_\_\_ (4) Serial No. \_\_\_\_\_ (5) In Service Date \_\_\_\_\_ (6)  
 Hours of Operation \_\_\_\_\_ (7) Failure Date \_\_\_\_\_ (8) Repair Date \_\_\_\_\_ (9)

NOTE - Hold deficient part(s) until requested by **REED** or until claim is approved. All parts requested to be returned must have a return authorization number provided by **REED**, shipped freight prepaid. Parts must ship within 30 days from **REED** request.

RETURN AUTHORIZATION NO. \_\_\_\_\_ (10) SHIP DATE \_\_\_\_\_ (11)

PART NUMBER	DESCRIPTION (12)	QTY.	NET PRICE	TOTAL PRICE	REED REPLACEMENT PART INVOICE NO. (13)

Describe Failure and How it Occurred \_\_\_\_\_ (14)

REED comments _____	Claim Approved for \$ _____
---------------------	--------------------------------

REED Use - Claim Approved <input type="checkbox"/> Denied <input type="checkbox"/>	Dealer Signature _____ (15)
Signed _____ Date _____	Date _____

The following instructions are offered for completing the **WARRANTY CLAIM FORM**. Refer to sample of form. Circled numbers on form correspond to items below. **FILL IN:**

1. Date your claim is written
2. Distributor name and address
3. End user name and address
4. Model number of unit affected
5. Serial number of unit affected
6. Date unit was first placed in service
7. Hours (from hourmeter) of operation at time of failure
8. Date when failure occurred
9. Date when unit was repaired
10. Return Authorization number as received from **REED** Service Department. This will only apply when failed component is requested to be returned by **REED**.
11. Date when failed part is shipped back to **REED**
12. List **REED** part number, description of part, quantity and price of part.
13. List **REED** invoice number sent you when replacement part was purchased
14. Briefly describe failure and how it occurred
15. Dealers signature and date

The claim form **MUST BE COMPLETELY FILLED OUT**. Claims lacking specific, accurate information will be returned **UNPROCESSED**. If additional room is needed to describe the failure or to list the parts used, attach a separate sheet and identify those sheets with the **SAME WARRANTY CLAIM NUMBER**.

**3. SUBMITTING TO REED**

When all appropriate data has been entered on the claim and signed, proceed as follows:

- Remove copies of form marked “**DEALER**” (yellow) and “**RETURN AUTHORIZATION**” (green). The Dealer copy is for your records and the Return Authorization copy is to be retained in the event **REED** requests the return of the part.
- Mail the “**REED**” copy (white) and “**ACCOUNTING**” copy (pink) along with any back-up data such as a copy of the replacement part **INVOICE** to **REED**. **DO NOT FAX COMPLETED FORM** and send only **FORM ORIGINALS**.

**E. RETURN OF FAILED COMPONENT**

Depending on the type of part and circumstance surrounding the component failure, the possibility exists that **REED** may request that the failed part be returned to them for investigation and evaluation purposes or to apply for warranty from the manufacturer of the part.

- Upon receipt of your warranty claim and before claim is approved, **REED** will inform you in writing if the part is to be returned. On this correspondence a **RETURN AUTHORIZATION** number will be given to you.
- This number is to be written in the appropriate area on the **RETURN AUTHORIZATION** copy (green) of the warranty form. Include this copy as part of your packing slip. Also write the number on a tag and attach to the part.
- Parts requested to be returned must be shipped back to **REED** within 30 days from issuing of the **RA** number. Failure to do so will cause warranty claim to be **DENIED**.
- Returned parts are to be properly packaged and shipped freight **PREPAID**.
- Any parts received by **REED** without the **PROPER RA** number will be shipped back at **DEALER/USER EXPENSE**.
- If claim is approved and no request to return parts from **REED** has been made, then parts can be discarded.



# SERVICE BULLERTIN WARRANTY PROGRAM

## F. APPROVAL/DENIAL OF CLAIM

Every effort will be made to process the warranty claim within 2 weeks from receipt.

- APPROVAL

Once your claim has been approved by **REED**, the pink copy will be forwarded to our Accounting Dept. They in turn will issue a credit against the invoice for the replacement purchased part.

In the meantime a fax or notification will be sent you indicating the claim and the amount approved.

- DENIAL

If your warranty claim is denied for any reason, a fax or notification will be sent to you indicating reasons for denial. Should you have any dispute with the decision, you have the right to have the decision reconsidered. You must present your arguments in **WRITING** within 15 days of your receipt of the claim denial.

<b>REED</b> CONCRETE PLACING EQUIPMENT		<b>WARRANTY CLAIM</b> 13822 OAKS AVENUE CHINO, CA. 91710 909.364.2100		<b>NO.</b> Date: ① _____	
Distributor Account Number _____ Distributor: ② _____ Address: _____ City: _____ State: _____ Zip Code: _____ Phone: ( ) _____		End User Account Number _____ End User: ③ _____ Address: _____ City: _____ State: _____ Zip Code: _____ Phone: ( ) _____			
<b>MACHINE PUMP DATA</b>					
Model ④ _____		Serial No. ⑤ _____		In Service Date ⑥ _____	
Hours of Operation ⑦ _____		Failure Date ⑧ _____		Repair Date ⑨ _____	
NOTE - Hold deficient part(s) until requested by REED or until claim is approved. All parts requested to be returned must have a return authorization number provided by REED, shipped freight prepaid. Parts must ship within 30 days from REED request.					
RETURN AUTHORIZATION NO. ⑩ _____		SHIP DATE ⑪ _____			
<b>PART NUMBER</b>	<b>DESCRIPTION</b> ⑫	<b>QTY.</b>	<b>NET PRICE</b>	<b>TOTAL PRICE</b>	<b>REED REPLACEMENT PART INVOICE NO.</b> ⑬
Describe Failure and How it Occurred ⑭ _____					
REED comments _____					Claim Approved for \$ _____
REED Use - Claim Approved <input type="checkbox"/> Denied <input type="checkbox"/>				Dealer Signature ⑮ _____	
Signed _____ Date _____				Date _____	