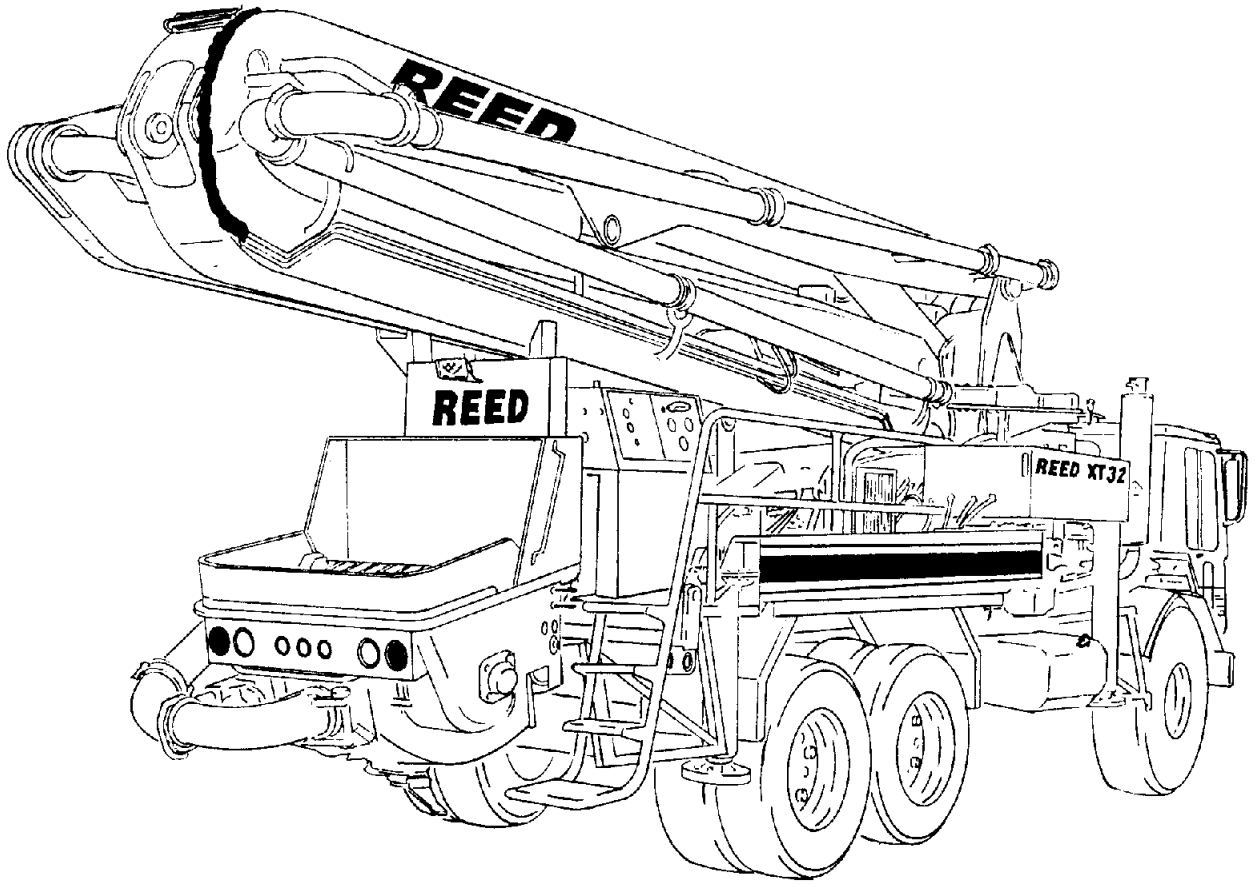
REED
CONCRETE PLACING EQUIPMENT

OPERATION, MAINTENANCE AND PARTS MANUAL

TRUCK - MOUNTED CONCRETE BOOM PUMP MODEL: *XT 32*



REED **MANUFACTURING,** 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: 800046) maybe obtained through the ***REED*** Parts Department.

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XT32

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32-Meter Truck Mounted Concrete Boom Pump

- **105 ft (32m) Vertical Reach**
- **195 yd³/hr (150m³/hr) Maximum Output**
- **1475 Psi (101 bar) Maximum Pressure**
- **4-Section Boom with 5" (125mm) Delivery Line**
- **Integrated Outrigger and Boom Pedestal**
- **Efficient, Closed Loop Hydraulic System**

Boom Versatile, compact, fully articulating 4-section roll-and-fold boom represents the latest in boom technology. Low unfolding height of 24 ft. (7.35m).

Delivery Line 5" (125mm) delivery line with straight pipe sections and 90° elbows. Components are all readily available and bracket mounted for basic delivery line replacement.

Pedestal Integrated outrigger and boom pedestal with small outrigger footprint. Uni-structure design for reduced stress or twist in truck frame. Low friction, double-row ball bearing rotates the 4-section boom assembly through a 370° slewing range without boom backlash or whip. Hydraulic oil tanks as well as water tank located in pedestal area for improved weight distribution. Two spacious 11'6" (3.5m) long decks for convenient storage of pipes and hoses.

Outriggers Front and rear, fully hydraulic X-type outriggers only 20'4" (6.2m) in width for quick setup even on confined job sites. Front outriggers diagonally telescope while rear ones swing out. Convenient, responsive, independently operated manual controls located at the truck boom base. Unsurpassed stability while pumping.

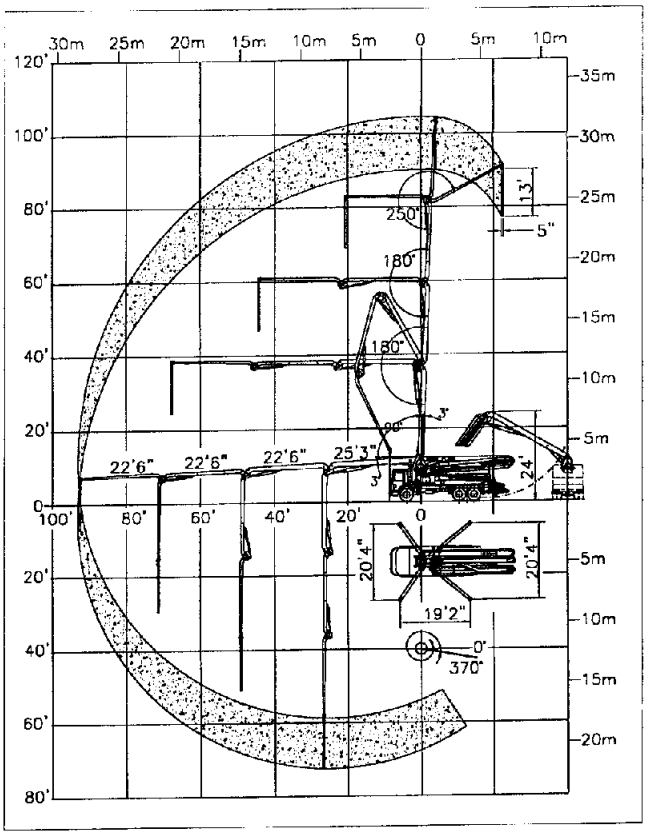
Remote Controls User friendly, lightweight remote control box with 100 ft. (31m) cable for safe, steady operation of all boom and pump functions. Emergency stop button will immediately halt all functions. Optional fully proportional radio remote controls.

Clean Out Hydraulically driven, high pressure 290 psi (20 bar) water pump with 130 gal. (500 L) watertank and hose.

Concrete Pump Field proven, full-torque P.T.O. (Power Take Off) with outstanding reliability. Efficient, closed-loop hydraulic system for smooth, controllable pumping. Reduced boom bounce even when pumping at maximum output. Hard chromed concrete cylinders and hard-faced wear parts precision machined for long life and tight sealing. Variable volume control with maximum speed capability for simultaneous pumping and boom operation. ***REED*** Solid State Black Box technology for control circuit eliminates conventional relays. Hinged clean-out door and swing away discharge pipe for quick, effective wash out. All major system components located for good operator accessibility and ease of service. Harsh mix hopper combines field proven boom pump experience with the most advanced technology available. Hopper screen and splash guards are standard.

Specifications

XT32 Truck Mounted Concrete Boom Pump



BOOM SPECIFICATIONS

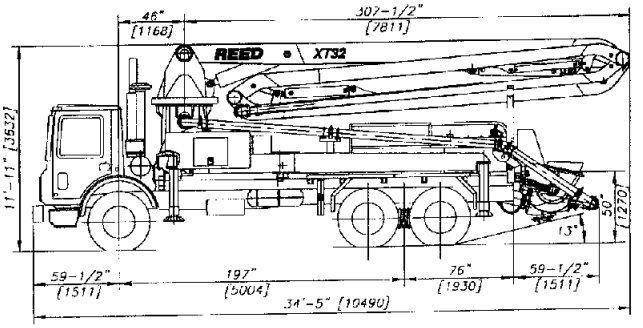
Height & Reach		
Vertical reach	105'0"	32.00m
Horizontal reach	92'8"	28.25m
Reach from front of truck	83'0"	25.29m
Reach depth	58'5"	17.80m
Unfolding height	24'0"	7.35m
4-Section Boom		
1st section articulation	96°	96°
2nd section articulation	180°	180°
3rd section articulation	180°	180°
4th section articulation	250°	250°
1st section length	25'3"	7.70m
2nd section length	22'6"	6.85m
3rd section length	22'6"	6.85m
4th section length	22'6"	6.85m
General Specs		
Pipeline size (ID) metric ends	5.0"	125mm
with couplings	5.5"	140mm
Rotation	370°	370°
End hose - length (heavy duty)	13'0"	4m
End hose - diameter	5.0"	125mm
Outrigger spread L-R-Front swing-out and telescope	20'4"	6.2m
Outrigger spread L-R-Rear swing-out	20'4"	6.2m

PUMP SPECIFICATIONS

Output	rod side	195 yd^3/hr	150 m^3/hr
	piston side	115 yd^3/hr	88 m^3/hr
Pressure	rod side	870 psi	60 bar
	piston side	1475 psi	101 bar
Hard chromed concrete cylinders		Standard	Standard
Concrete cylinder diameter		9.0"	230mm
Stroke length		79.0"	2000mm
Maximum strokes per minute			
	rod side	30	30
	piston side	18	18
Hopper capacity		23 ft^3	650 L
Volume control		Zero to full	Zero to full
Hopper grate vibrator		Standard	Standard
Hydraulic system		Closed loop	Closed loop
Hydraulic system pressure		5000 psi	345 bar
Hydraulic tank capacity (pump system)		100 gal	378 L
Hydraulic drive cylinders			
	rod diameter	3.15"	80mm
	piston diameter	4.92"	125mm
Water tank capacity		130 gal	500 L
Maximum aggregate size		2.5"	63mm

TRUCK MOUNTED SPECIFICATIONS Mack MR 690S

Length	34' 5"	(10.5m)
Width	8' 2"	(2.49m)
Height	11' 11"	(3.63m)
Wheelbase	197"	(5.0m)
Front axle weight	16,500 lbs	(7484 Kg)
Rear axle weight	35,700 lbs	(16193 Kg)
Approximate total weight	52,200 lbs	(23677 Kg)



Maximum attainable volumes and pressures are subject to aggregate size, mix design and pipeline diameter. Maximum output and pressure cannot be reached simultaneously. Specifications subject to change without prior notice.

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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 ***XT 32* TRUCK MOUNTED CONCRETE BOOM PUMP**.

This manual (Part Number: 8000046) 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.**

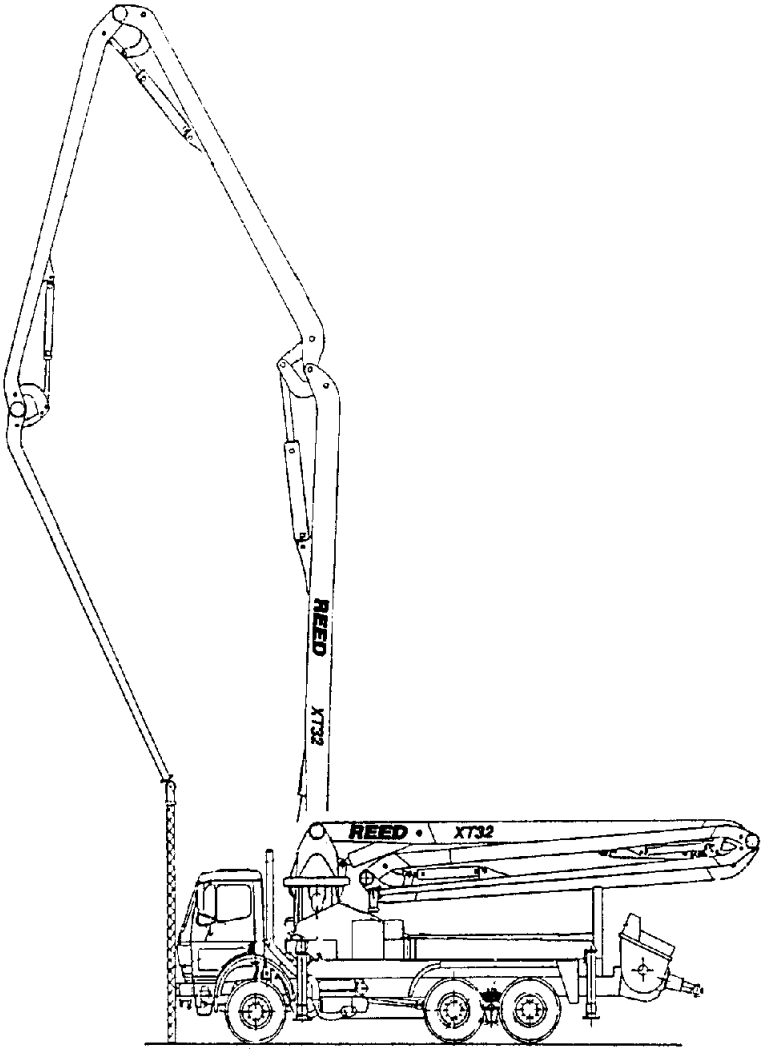
NOTE

If you have not yet done so, please record the SERIAL NUMBER of your XT 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.

PRODUCT DESCRIPTION

The **MODEL *XT 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 with the harshest mixes within its published ratings and specifications.

The ***XT 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 diagonally telescope 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 *XT 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 fully loaded material cylinder. The piston of 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 (650L) and the material cylinders are 9 inches (230mm) in diameter.

The boom assembly is a four (4) section articulated type having a maximum vertical reach, ground level to tip, of 105 feet (32m). 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 (125mm) 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 (125mm 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 x-type outriggers, each with a vertical leveling jack. The front outriggers, located at the pedestal, telescope out diagonally while the rear outriggers, having their pivot located just ahead of the rear axle, swing out from the side of the structure.

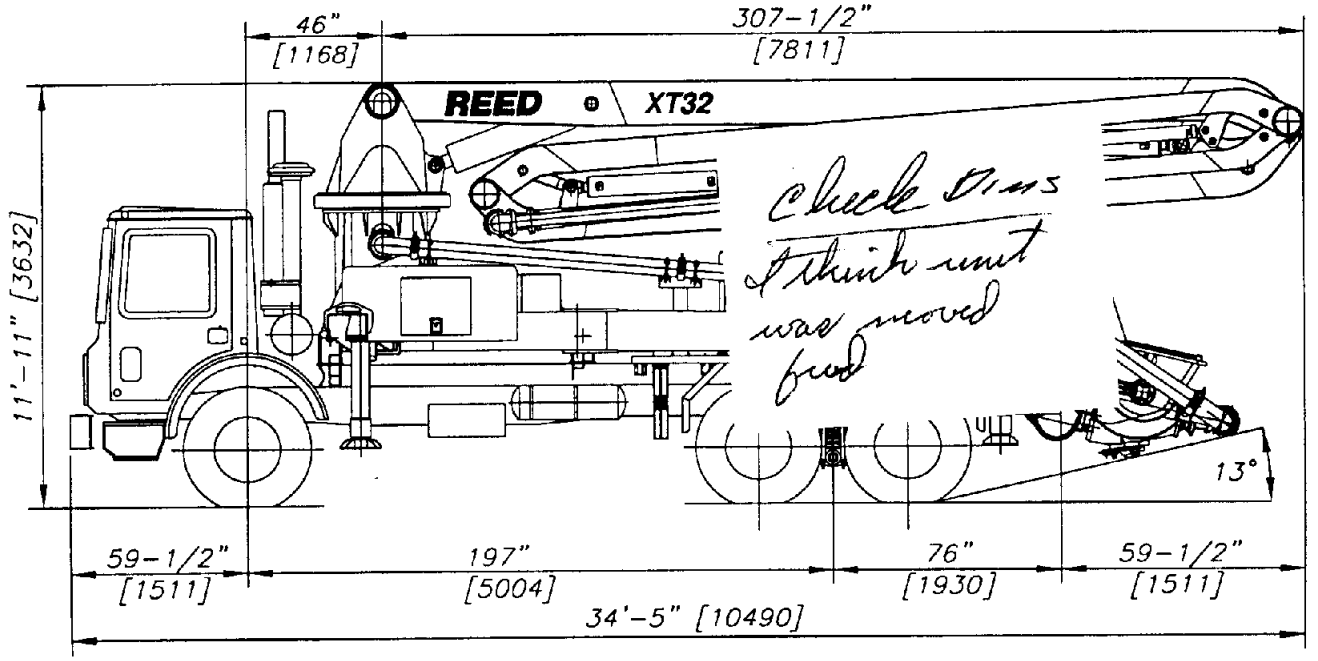
Controls for operation of the outriggers and boom functions are located on the curb (right) side of the chassis, near the rear outrigger pivot. A second set of controls for the outriggers only is located on the street side (left) of chassis. These controls are manual directional type. The boom functions can also be operated from the main 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. Some units may be equipped with a radio control type console.

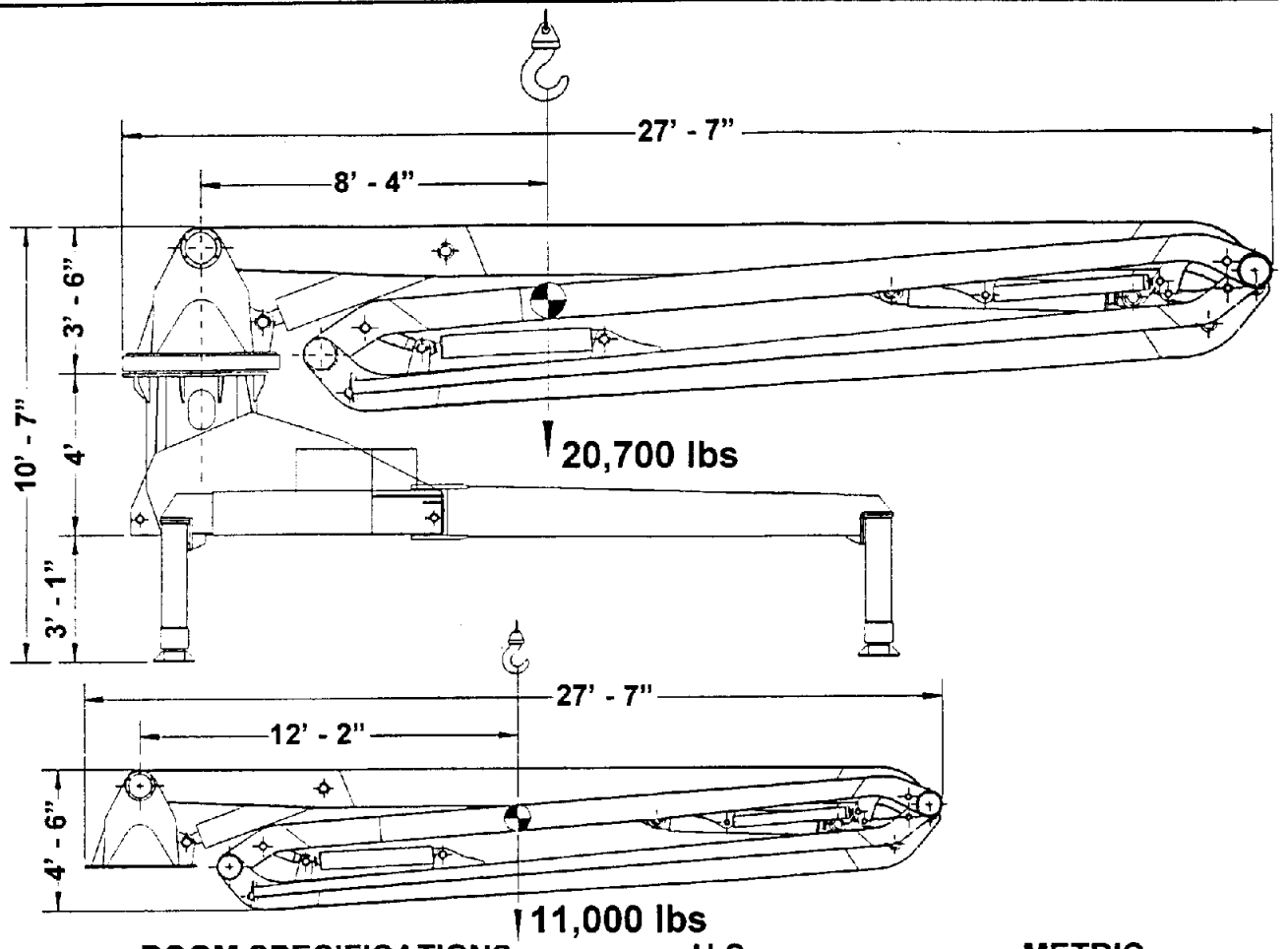
TECHNICAL DATA - SPECIFICATIONS

MOBILITY DATA	U.S.	METRIC
• Overall Travel Length	34ft - 5in	10.5m
• Overall Travel Height	11ft - 11in	3.63m
• Overall Travel Width	8ft - 2in	2.49m
• Chassis Wheelbase	197in	5.0m
• Departure Angle	13°	13°
• Gross Vehicle Weight (GVW)	52200 lbs (approx.)	23677 kg (approx.)
• Front Axle Weight	16500 lbs (approx.)	7484 kg (approx.)
• Rear Axle Weight	35700 lbs (approx.)	16208 kg (approx.)

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



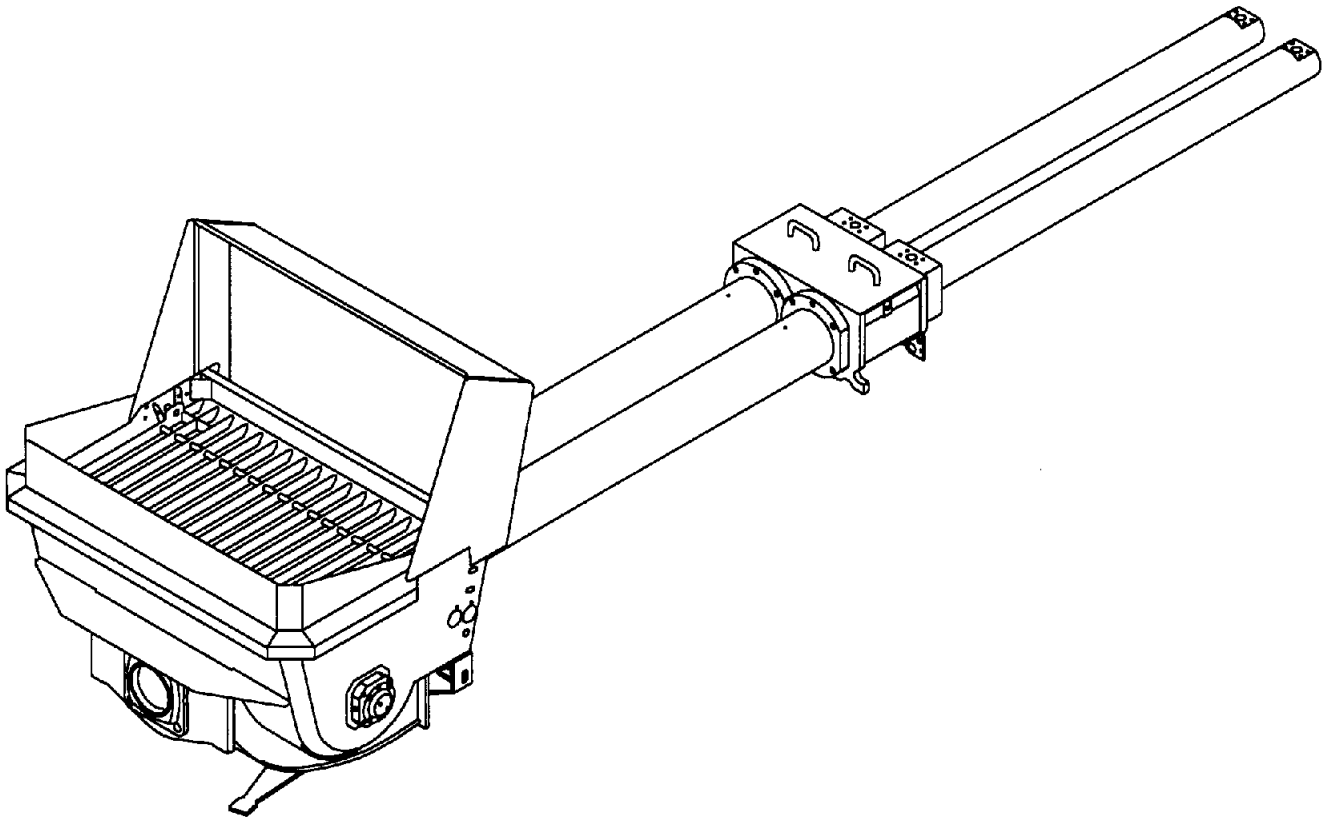
XT 32 TRUCK - MOUNTED CONCRETE BOOM PUMP



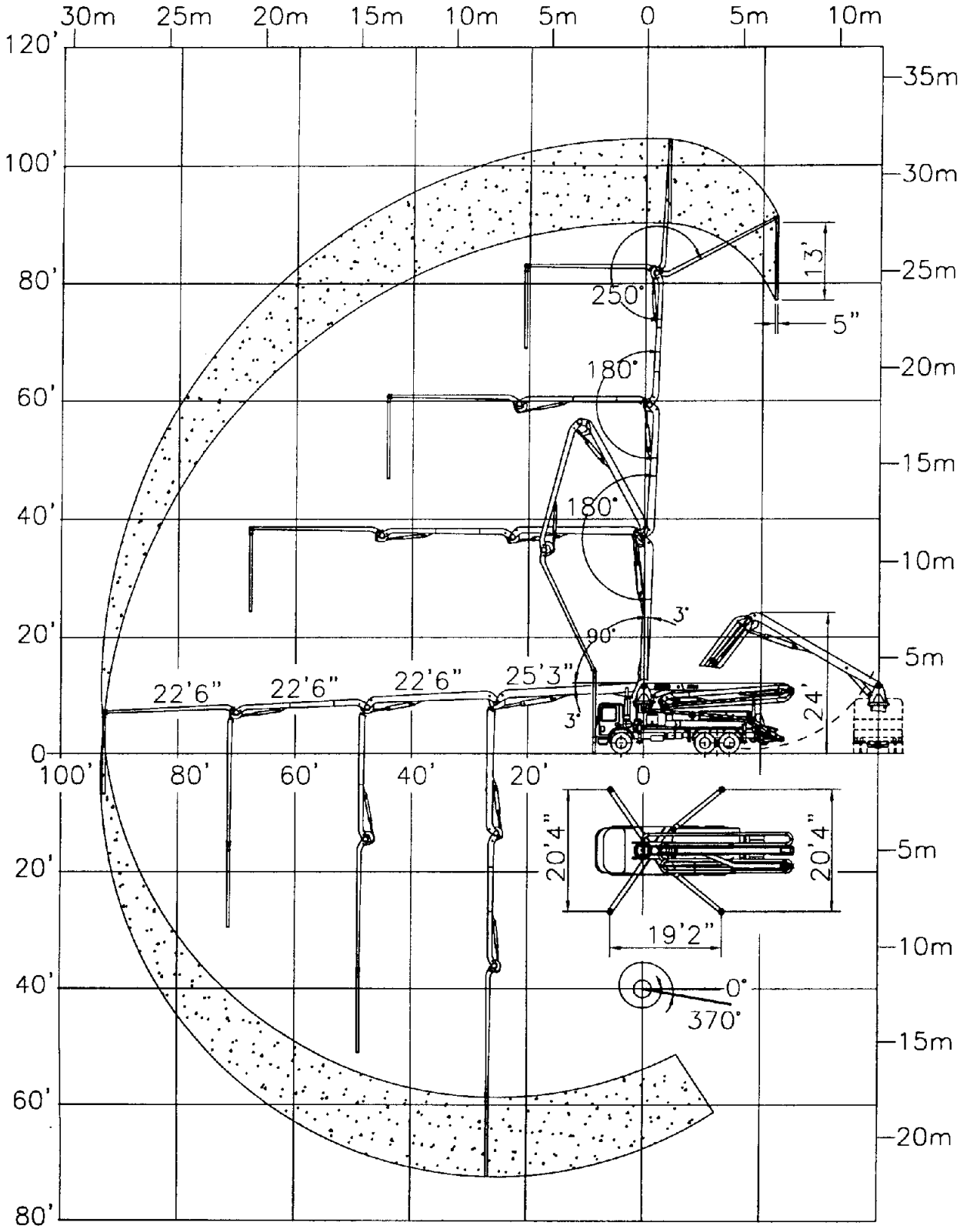
BOOM SPECIFICATIONS	U.S.	METRIC
• Type	Four (4) Section Articulated	
• Vertical Reach, Height	105'	32m
• Horizontal Reach from C Rotation	92' - 8"	28.25m
• Net Reach from Front of Truck	83'	25.29m
• Below Ground Reach	58' - 5"	17.8m
• Unfolding Height	24'	7.35m
• Rotation (Non-Continuous)	370°	370°
• 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"	7.7m
• Section #2 Length	22' - 6"	6.85m
• Section #3 Length	22' - 6"	6.85m
• Section #4 Length	22' - 6"	6.85m
• Delivery Pipe Diameter	5"	125mm
• End Hose - Diameter & Length	5" x 13'	125mmx4m
• Front Outrigger Spread	20' - 4"	6.2m
• Rear Outrigger Spread	20' - 4"	6.2m

XT 32 TRUCK - MOUNTED CONCRETE BOOM PUMP

PUMP SPECIFICATIONS	U.S.	METRIC
• Max. Output - Rod Side	195 yd^3/hr	150m^3/hr
- Piston Side	115 yd^3/hr	88m^3/hr
• Max. Pressure - Rod Side	870 psi	30 bar
- Piston Side	1475 psi	101 bar
• Max. Strokes P/Min - Rod Side	30	50
- Piston Side	18	18
• Stroke Length	79 "	2000mm
• Concrete Cylinder Diameter	9"	230mm
• Variable Volume Control	0 to Full	
• Hopper Capacity	23ft^3	650L
• Maximum Aggregate Size	2.5"	63mm
• Hydraulic System Type	Closed Loop	Closed Loop
• Hydraulic System Pressure	5000 psi	345 bar
• Hydraulic Tank Capacity (Pump)	100 gal	378L
• Hydraulic Drive Cylinders - Rod Dia.	3.15"	80mm
- Piston Dia.	4.92"	125mm
• Water Tank Capacity	130 gal	500L



BOOM OPERATIONAL ENVELOPE
(CONFIGURATION)



SAFETY AWARENESS AND PRECAUTIONS

The **MODEL *XT 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 2.4kg/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 *XT 32*** must be thoroughly familiar with this Technical Manual (P/N: 800046). 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 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 *XT 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.

⚠ 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.

THINK SAFETY-THINK SAFETY-THINK SAFETY

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

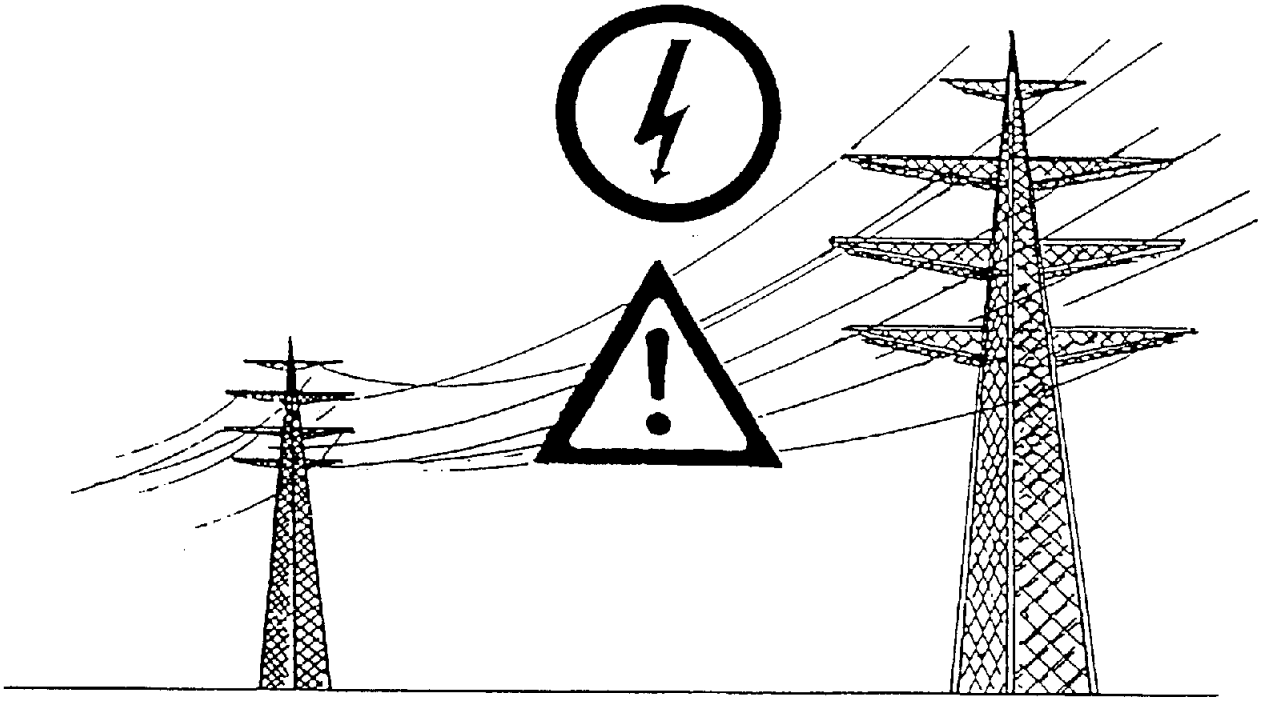
⚠ WARNING

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 remixer shaft 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

D A N G E R ----------C A U T I O N----------W A R N I N G 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.

SAFETY INSTRUCTIONS

1. Pump and boom operators must read and be familiar with the operator's manual before operating this equipment
2. Authorized personnel only are allowed on or near concrete pump and truck unit
3. Safety devices MUST NOT be altered or removed
4. If failures or malfunctions occur, stop operation and repair immediately
5. Electrical and manual controls must always be in good condition
6. NEVER stand on hopper grate
7. Keep hands, feet or human body away from hopper/concrete valve area during operation or in motion
8. This machinery is remote controlled and may start at any time! Stand clear
9. If vision is obscured, an assistant is required
10. If something happens to hinder the safe operation of this machine, HALT USE until corrected
11. Insure stability of unit, when in doubt of ground condition, use extra blocking under outrigger legs. Operate unit on level ground
12. Clear area before extending outriggers or swinging boom
13. Outriggers must be fully extended before boom is opened, extended or operated
14. Engage outrigger transport locking device before entering public road
15. Maintain safe distance from excavations. Slopes could break away
16. Do not drive with an unfolded placing boom or unretracted outriggers
17. Safety chain, whipcheck or other suitable securing device must be used to secure tip hose to boom tip section
18. No structural extension or additional hose should be added to the boom-tip section. One tip hose, 10-15 feet, is allowed unsupported. Additional hose and/or line systems require proper support of boom structure
19. Do not use boom structure as a crane hoist for lifting work. Use of the placing boom as a hoist is STRICTLY PROHIBITED
20. Do not move truck pump assembly with boom extended or unfolded
21. DANGER OF ELECTROCUTION. Keep all personnel clear of truck, pump and outriggers. If structure comes near to or makes contact with live high voltage lines, anyone on or near this unit may be electrocuted
22. KEEP MINIMUM 10 FEET from any electrical wires. Remote control cable and box is conductive - Operator BEWARE
23. Boom should be folded/retracted upon completion of work and during high wind conditions (where wind speeds exceed 48 mph). In storm conditions, put boom in folded travel position
24. Support additional pipe line properly for vertical and horizontal movement. Use proper pipeline couplings to handle concrete pressure
25. Before opening any area of concrete pipeline, depressurize system by reverse pumping. Then be cautious when operating couplings
26. Only trained personnel should clean conveying pipeline with compressed air and water. A ball catcher or trap basket must be used at the discharge end
27. Always wear approved safety helmet when working around concrete pump unit. Full protective safety goggles to eliminate eye burns and damage are helpful
28. Whenever remote control box is left unattended, master kill button (red) on side MUST BE DEPRESSED
29. Opening/unfolding boom requires main section arm 1 raised to vertical to release transport hook. Hook must be engaged while folding to transport position

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SAFETY INSTRUCTIONS

MEMBER AMERICAN CONCRETE PUMPING ASSOCIATION

HAND SIGNALS

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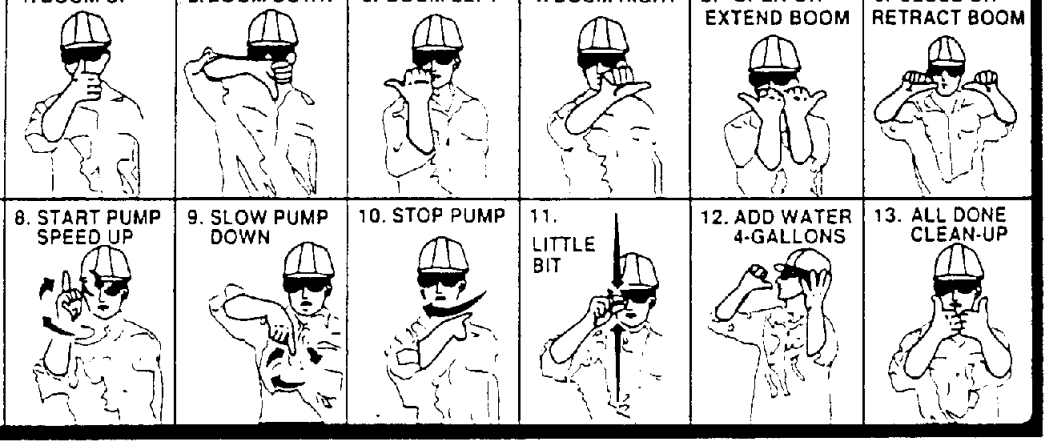
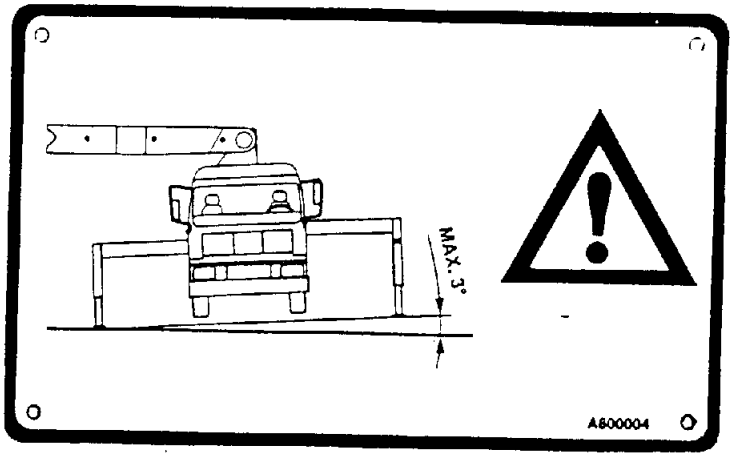
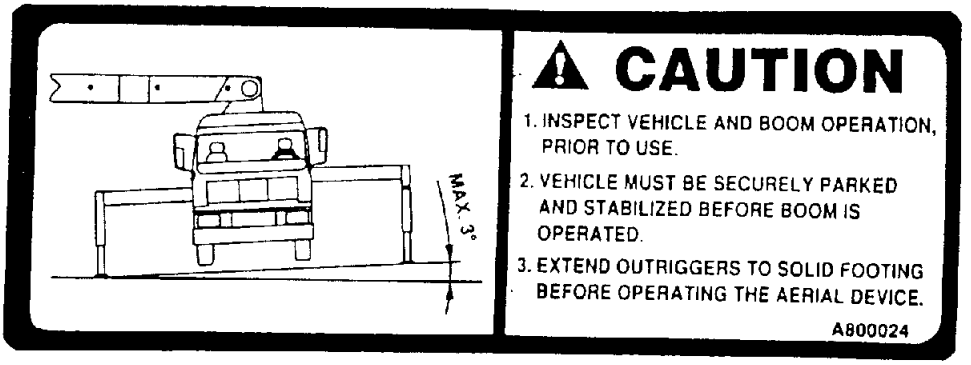
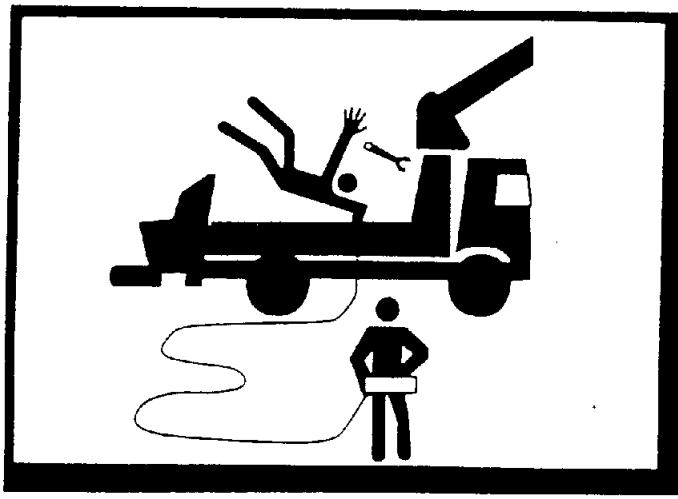



MAX. 3°
A800004


MAX. 3°
CAUTION
1. INSPECT VEHICLE AND BOOM OPERATION, PRIOR TO USE.
2. VEHICLE MUST BE SECURELY PARKED AND STABILIZED BEFORE BOOM IS OPERATED.
3. EXTEND OUTRIGGERS TO SOLID FOOTING BEFORE OPERATING THE AERIAL DEVICE.
A800024


CAUTION
STAND CLEAR OF JACK SUPPORT LEG PAD WHEN OPERATING OUTRIGGER CONTROL
A800014



⚠ WARNING

THIS MACHINE IS REMOTE CONTROLLED AND MAY START AT ANY TIME

STOP ENGINE BEFORE SERVICING UNIT

A800023

A800054

⚠ WARNING

PRESSURIZED PIPELINE SYSTEM
STAY CLEAR DURING USE

1. Never open a pressurized coupling or pipe. If access is required, consult operator's manual
2. Use genuine and correct couplings and seals
3. Regularly inspect wall thickness of pipe
4. Bursting pressure point of pipes decreases with increased wear

NOMINAL DIAMETER 125 mm MAXIMUM PRESSURE 65 bar

⚠ WARNING

KEEP HANDS OUT OF WATERBOX.
STOP ENGINE/MOTOR IF ACCESS IS REQUIRED.
KEEP COVER CLOSED.

A800027

⚠ WARNING

Do not stand on hopper grates.

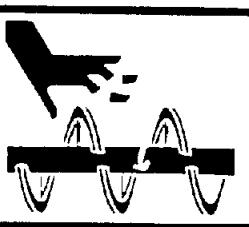
SAFETY INSTRUCTIONS

BEFORE REMOVING HOPPER GRATE OR PERFORMING ANY SERVICE ON GASOLINE OR DIESEL ENGINES:

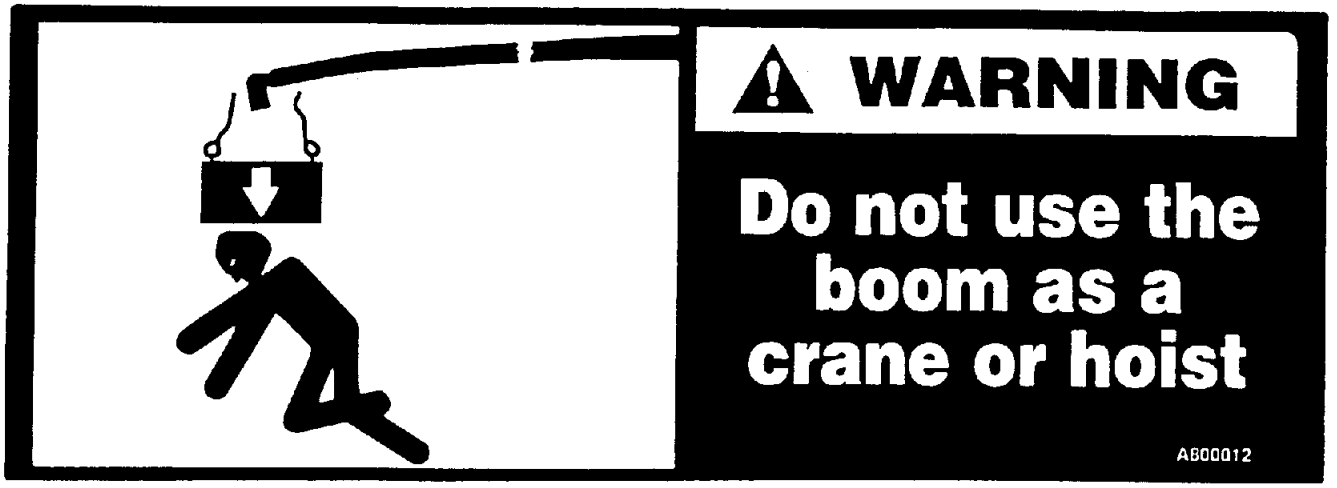
1. Stop the engine.
2. Remove the key, place it in your pocket, and put a "DO NOT OPERATE" tag on the PTO switch.
3. Release pressure from accumulator and check gauge for zero system pressure.

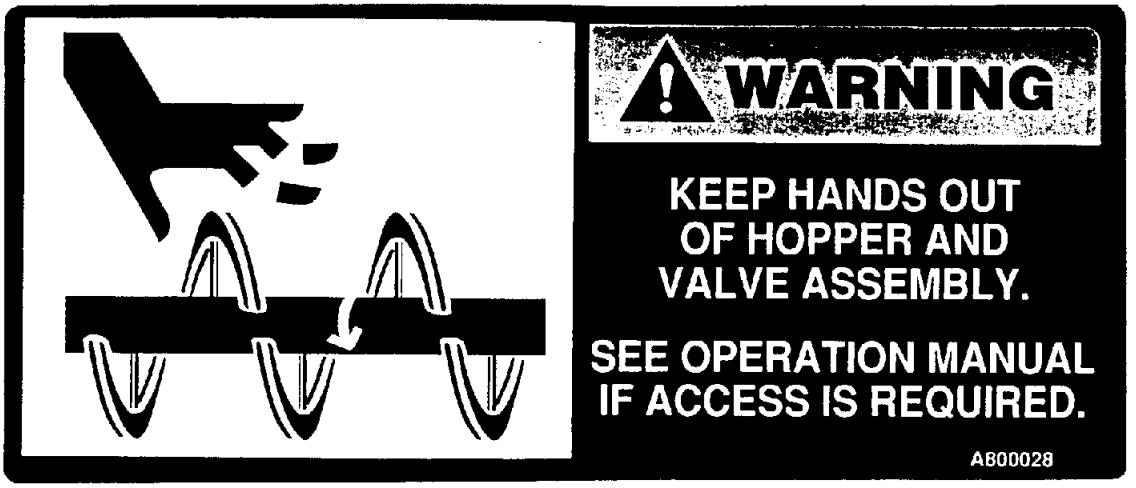
A800143

⚠ WARNING



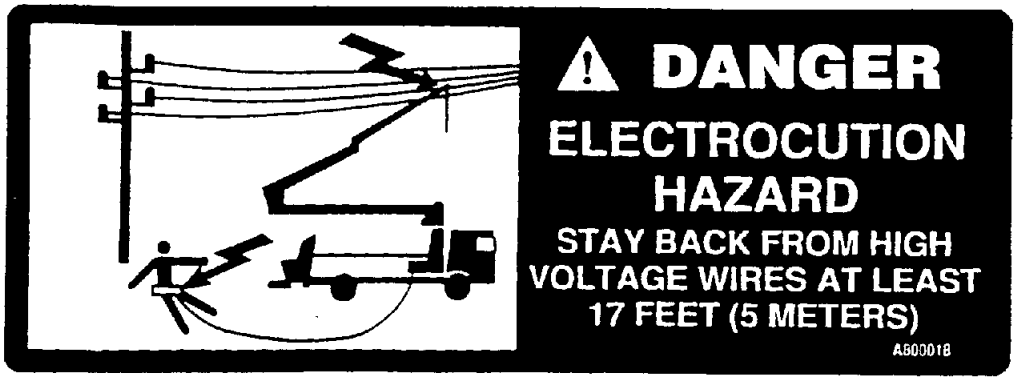
Keep hands out of hopper and valve assembly. See operation manual if access is required.

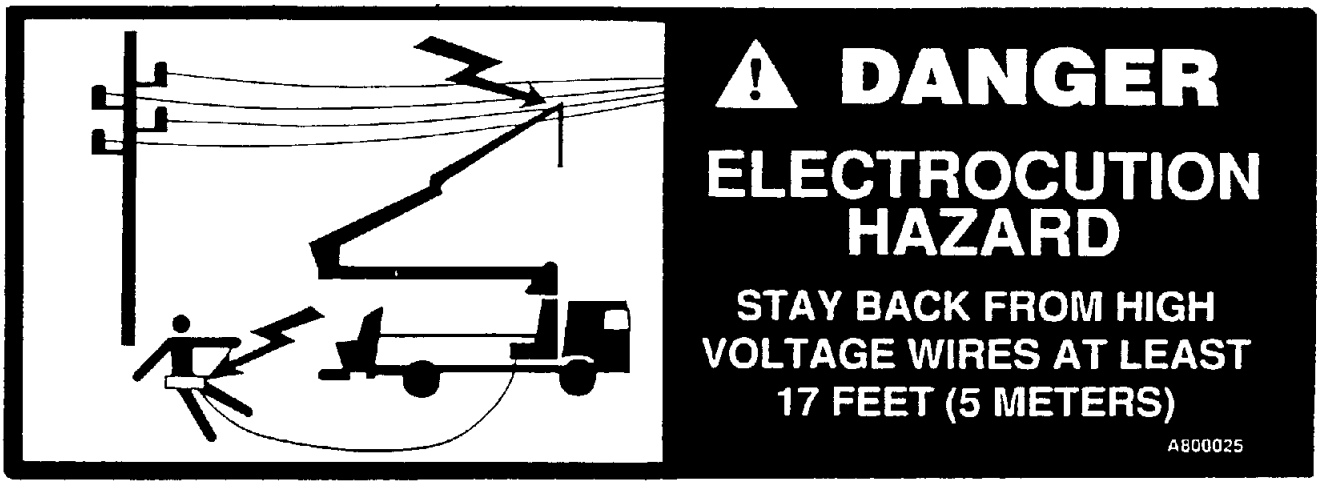

WARNING
Do not use the boom as a crane or hoist
A800012


WARNING
KEEP HANDS OUT OF HOPPER AND VALVE ASSEMBLY.
SEE OPERATION MANUAL IF ACCESS IS REQUIRED.
A800028


DANGER
YOU MUST NOT OPERATE THIS MACHINE
UNLESS YOU ARE QUALIFIED BY TRAINING AND EXPERIENCE IN THE SAFE OPERATION OF THIS MACHINE
TRAINING INCLUDES COMPLETE KNOWLEDGE OF YOUR EMPLOYER'S WORK RULES, ALL GOVERNMENTAL REGULATIONS, AND MANUFACTURER'S OPERATOR AND SAFETY MANUALS RELATIVE TO THIS MACHINE'S SAFE USE.
ANY UNTRAINED OPERATOR SUBJECTS HIMSELF AND OTHERS TO DEATH OR SERIOUS INJURY.
A800017


DANGER
DO NOT STAND UNDER BOOM
USE EXTREME CAUTION WHEN NEAR THE BOOM OR SERIOUS INJURY MAY RESULT
A800013


DANGER
ELECTROCUTION HAZARD
STAY BACK FROM HIGH VOLTAGE WIRES AT LEAST 17 FEET (5 METERS)
A800018


DANGER
ELECTROCUTION HAZARD
STAY BACK FROM HIGH VOLTAGE WIRES AT LEAST 17 FEET (5 METERS)
A800025

OPERATOR QUALIFICATIONS

Making the choice for an operator is a vital decision as it affects safety and productivity. The **MODEL *XT 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 *XT 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 *XT 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 *XT 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 *XT 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 *XT 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
- Cleaniiness of fluid, filter condition indicators
- Hydraulic valves and control levers
- Hydraulic cylinders

3. HOPPER

- Grate in place not damaged
- S-tube connection
- Remixer 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

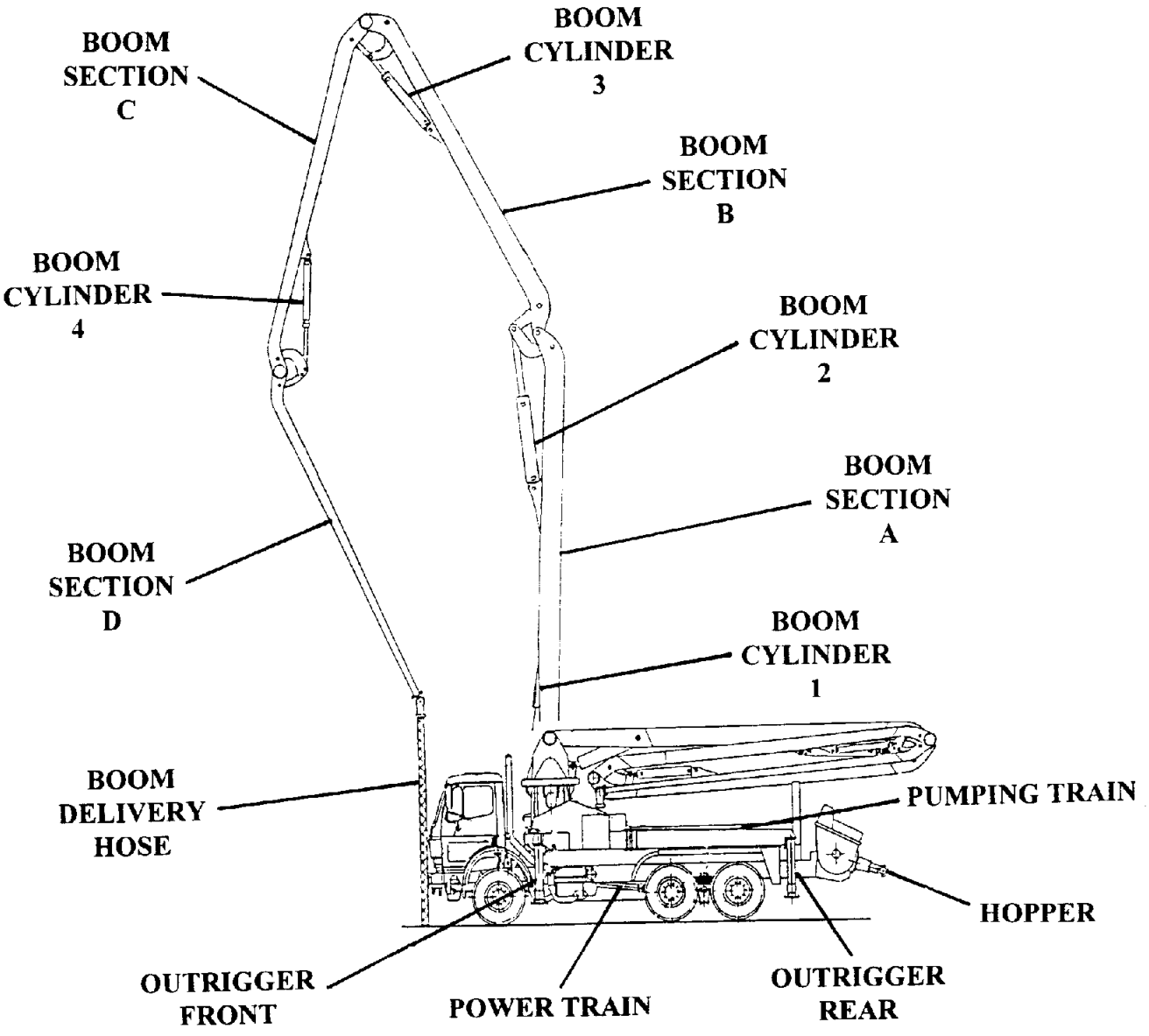
Defective components, structural damage, missing parts or equipment malfunctions, jeopardize the SAFETY of the operator and other personnel and can cause extensive damage to the machine. A poorly MAINTAINED machine can become the greatest OPERATIONAL HAZARD you may encounter.

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 *XT 32***. Carefully study these.

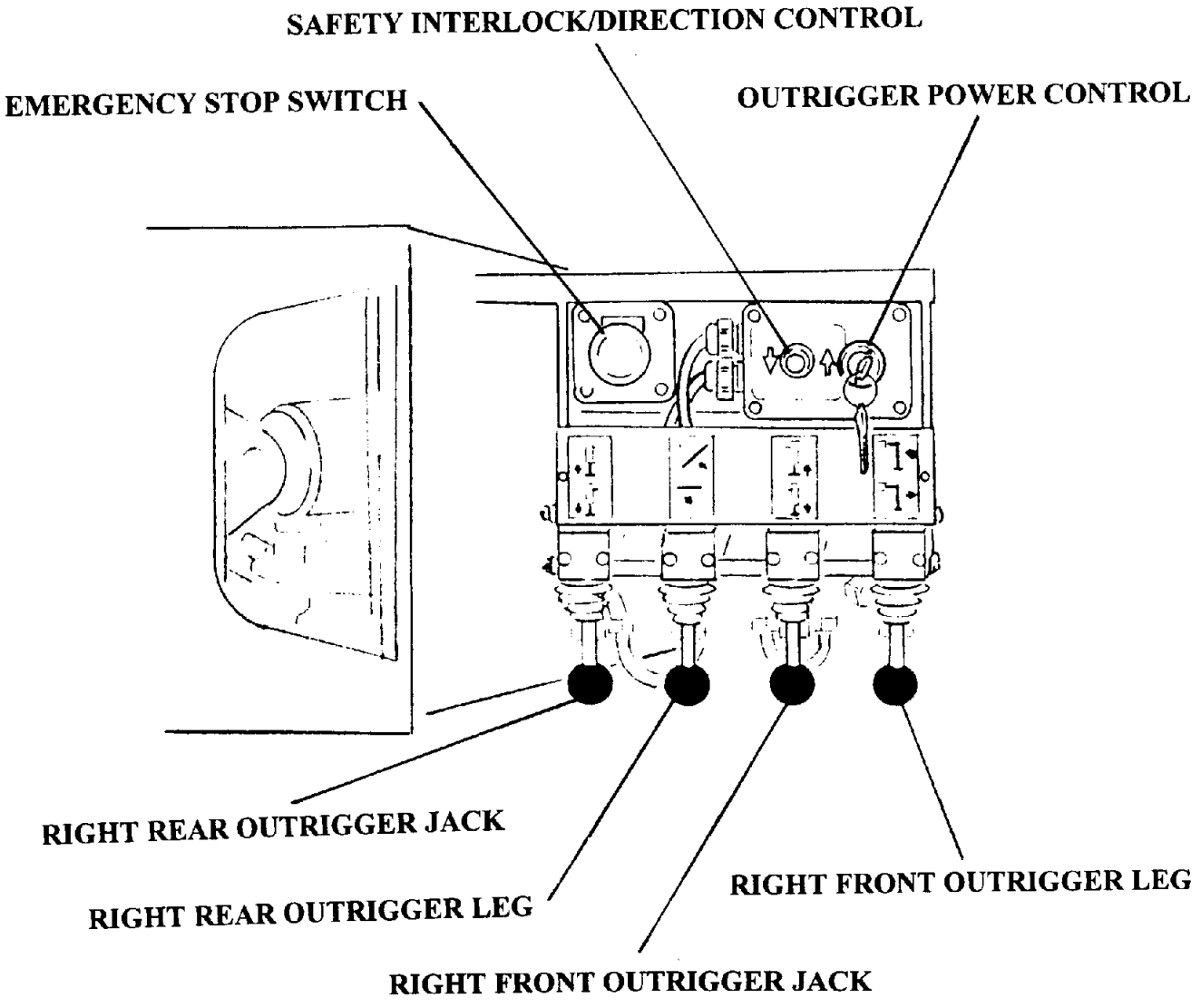
A. MAJOR COMPONENT IDENTIFICATION



OUTRIGGER - JACK CONTROL

The **MODEL *XT 32*** is equipped with two (2) sets of outriggers. One set, referred to as **FRONT**, is located adjacent to the pedestal and the other set, referred to as **REAR** has its pivot, just ahead of the rear axle. The front set consists of a hydraulic telescopic leg that extends on a diagonal direction out toward the chassis cab. The leg is equipped with a hydraulic leveling jack. The rear set consists of a single beam that hydraulically swings out away from the chassis to a diagonal position. It, too, is equipped with a leveling jack. Both sets are used to stabilize the unit before operation of the boom.

For operation of these outriggers, two (2) sets of controls are provided and are located one each side just ahead of the rear axle. 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 activated by an electric signal. The levers are returned to center position.



- **OUTRIGGER POWER CONTROL** - This control is only located on the **RIGHT SIDE** outrigger control panel. This is a keyed switch control with the purpose of energizing or de-energizing (lockout) the outrigger circuit. With key in **VERTICAL** the circuit is **OFF**. Turn key to **RIGHT (CLOCKWISE)** to activate circuit to ON.

- **EMERGENCY STOP SWITCH** - Located on the panel of both the right and left side outrigger controls is an **EMERGENCY STOP** switch. This switch has no effect on the outrigger control circuit. Its purpose is to shut down the **PUMP CYCLING** operation in an emergency. **PUSH** red knob to **STOP** operation. **PULL** know to **RELEASE**.

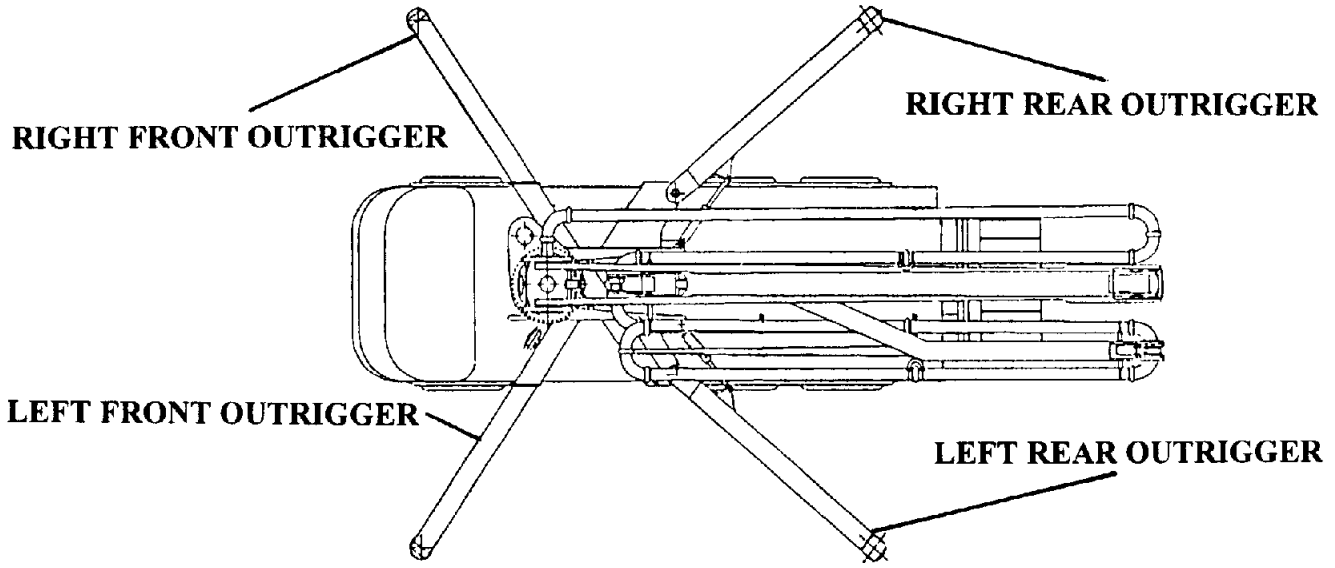
- **SAFETY INTERLOCK/DIRECTION CONTROL** - This is a 3-position, spring return to off toggle switch. It is used as a **SAFETY INTERLOCK**, meaning the switch must be held in appropriate position while a particular outrigger control is actuated. If toggle switch is released even if outrigger control lever is **ON**, operation will cease to function. The switch is also used to direct the flow of hydraulic oil to have the outrigger leg and jack either **EXTEND** or **RETRACT** when the specific control lever is moved.

- **RIGHT FRONT OUTRIGGER LEG** - This is the control nearest the chassis front and is used to extend or retract the right front telescopic leg. With **SAFETY INTERLOCK** toggle in **DOWN** position (**RED**) move control lever **AWAY** to **EXTEND** leg. For **RETRACT** actuate **SAFETY INTERLOCK - UP (BLACK)** and move control lever again **AWAY**.

- **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 the second lever on the valve bank. Move **SAFETY INTERLOCK** switch **DOWN** and hold while moving **JACK** control lever **AWAY** to **EXTEND** jack. **RETRACT** by actuating **SAFETY INTERLOCK** switch up.

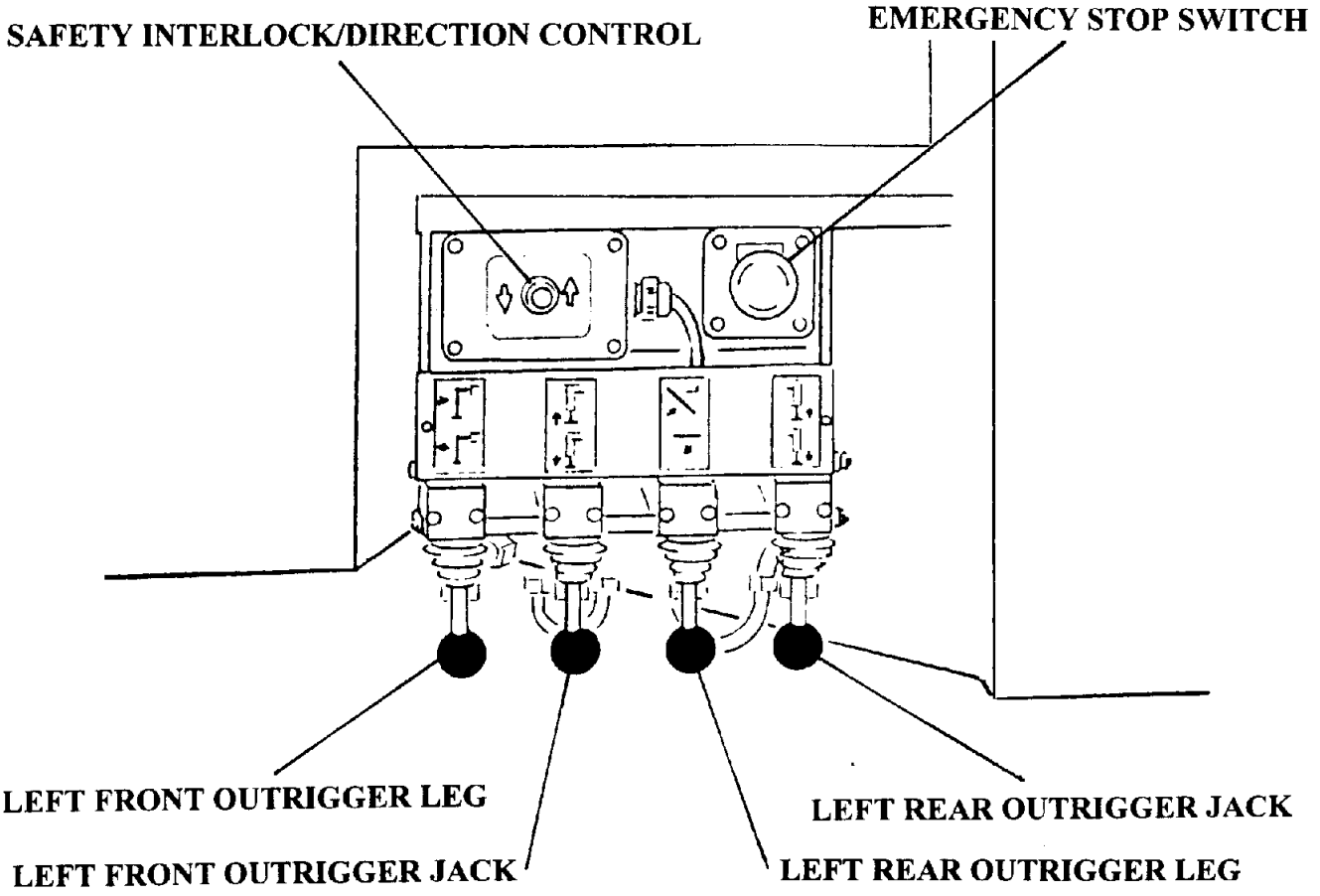
- **RIGHT REAR OUTRIGGER LEG** - This leg is of the swing out type. To swing out leg actuate the **SAFETY INTERLOCK** switch to **DOWN** position and hold while moving **RIGHT REAR OUTRIGGER** lever **AWAY**. To swing in leg place **SAFETY INTERLOCK** switch to **UP** position.

- **RIGHT REAR OUTRIGGER JACK** - The rear jack is controlled by the lever nearest the rear of chassis. Move **SAFETY INTERLOCK** switch **DOWN** and hold while moving **JACK** control lever **AWAY** to **EXTEND** jack. **RETRACT** by moving **SAFETY INTERLOCK** switch **UP**.



⚠ CAUTION

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.



BOOM FUNCTION CONTROLS

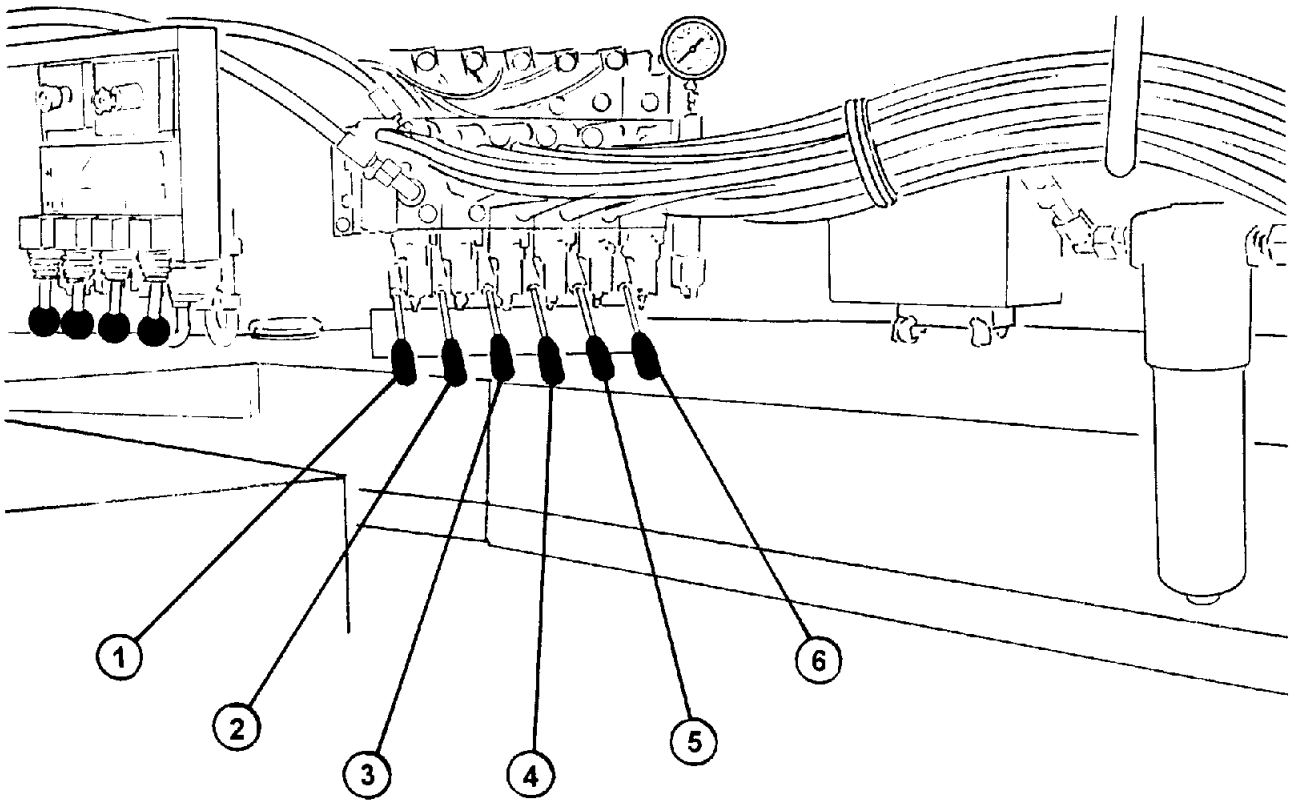
The boom functions can be controlled either by using the manual levers on the valve bank located on right side of unit just behind the pedestal; or at the remote control console or/and if so equipped, using the radio control remote. Regardless of which control panel is used the controls are all labeled the same and the functions are alike.

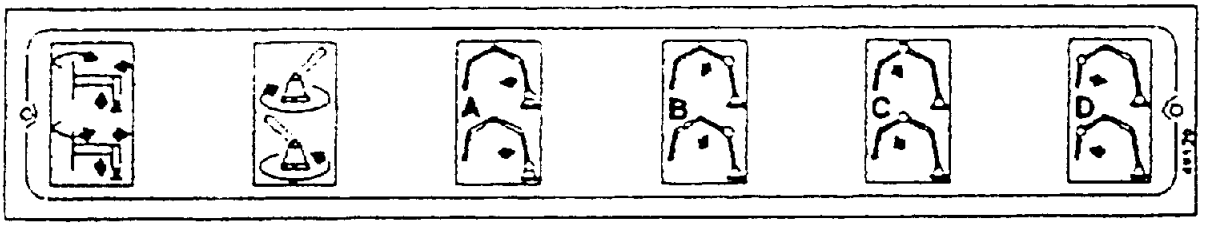
The unit consists of four (4) booms and each of its movements are independently controlled. A control is also provided for the rotation of the complete structure. The boom sections are identified by letters which appear on both sides of the boom and are labeled accordingly on the control panel decals. In addition the panel decal indicates the specific boom section by a solid black 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 side (curb side) of the unit on the forward side of the outrigger controls 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 the control is a duplication of the Safety Interlock / Direction 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 / Direction control.

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 right (clockwise) or left (counterclockwise) toward front of cab.

⚠ CAUTION

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

⚠ CAUTION

Before SECTION B can be unfolded the main boom SECTION A must be raised to a height of 24 feet (7.35m)

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 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.

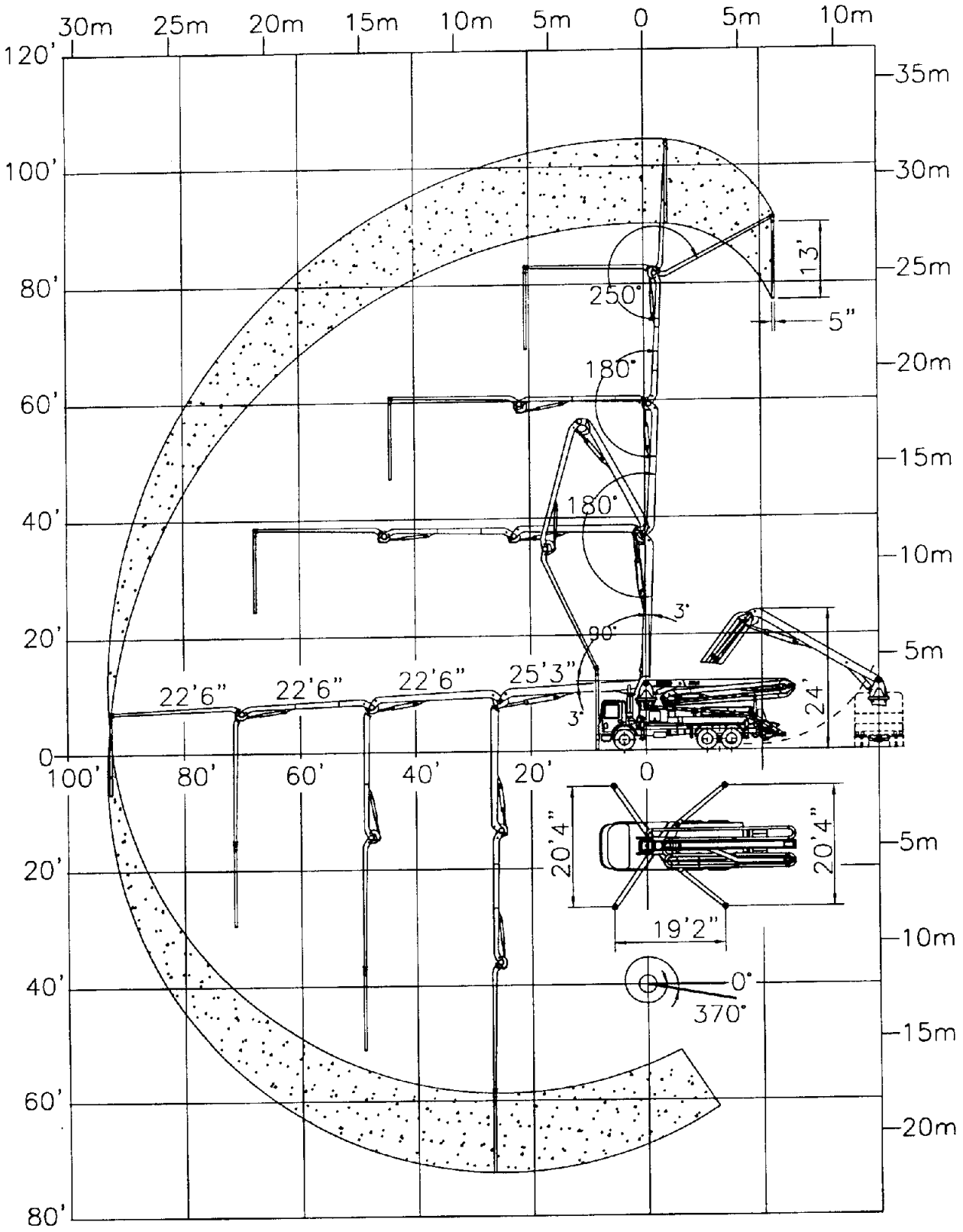
SPACE

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.

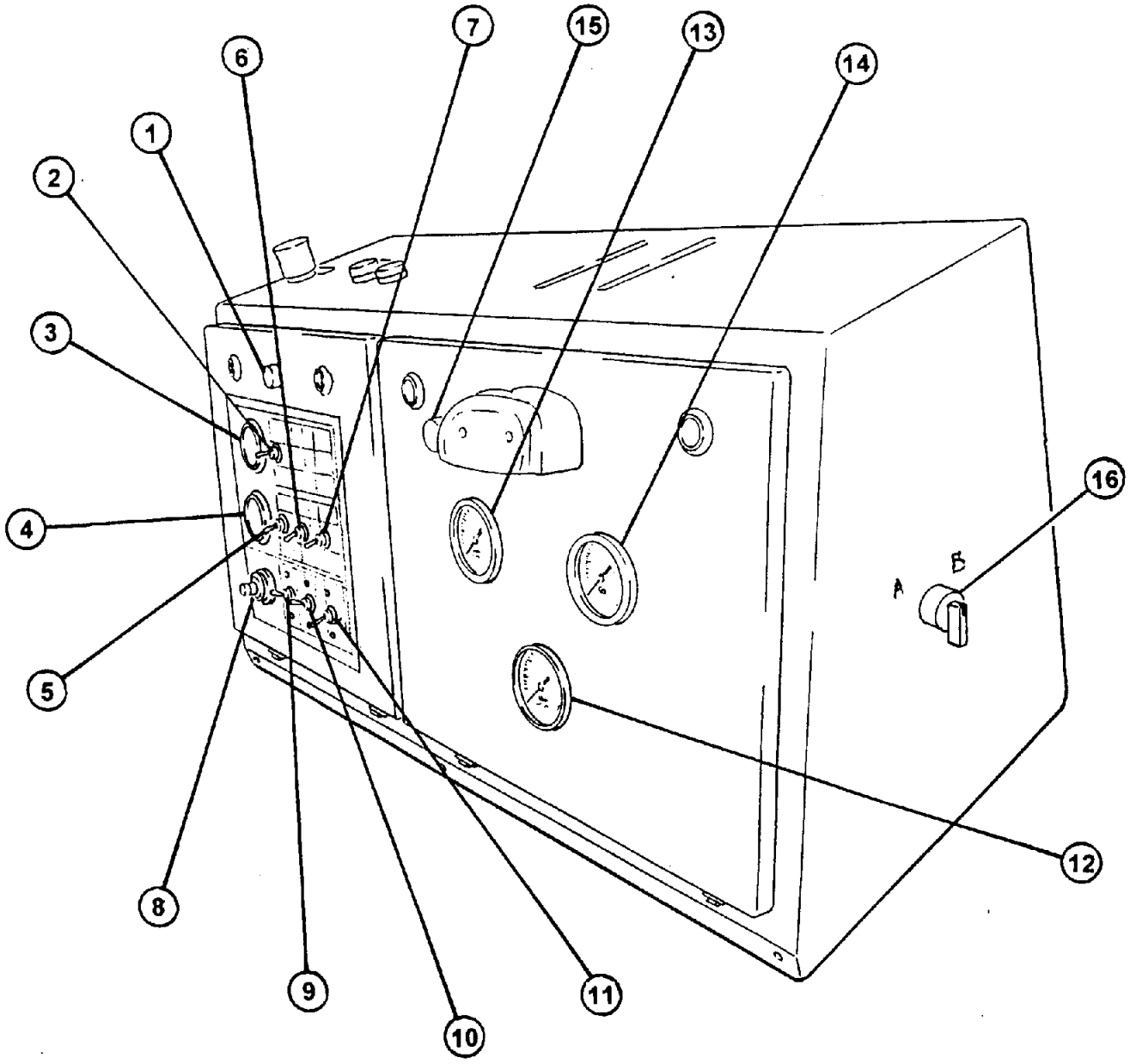
BOOM ARTICULATION DIAGRAM



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 if so equipped. The next few pages are offered to familiarize you with these controls, their purpose, function and what happens.



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. 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.

2. ENGINE RPM SWITCH

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

3 TACHOMETER

This instrument is used to indicate the operational speed (RPM) of the engine.

4 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.

5 VIBRATOR SWITCH

This is a 2 position toggle switch used to control the hopper grate vibrator unit. With the switch toggle in **DOWN** position vibrator unit is **INOPERABLE**. Move toggle to **UP** position to **ENERGIZE** vibrator.

6 LOCAL - REMOTE SWITCH

A 2 position toggle switch used to energize the chassis mounted pump control panel or the remote circuit. Place switch **DOWN** for **CHASSIS** panel and in **UP** position for **REMOTE** panel.

7 WORK LIGHT SWITCH

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

8. PUMP VOLUME CONTROL

This control 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. The slowest speed is in the #1 position, fastest speed is #8 position.

9. PUMP SWITCH

This is a 2 position toggle switch used to turn the concrete pump on or off. With toggle in **UP** position the pump is **OFF** or not cycling. This will be noted by the **LIT** indicator light in upper position. Placing toggle **DOWN** pump will cycle **ON** and this will be indicted by the **LIT** light.

10. PUMP DIRECTION SWITCH

A 2 position toggle switch used to control the cycle direction of the pump. With toggle in **UP** position the pump will operate in a **FORWARD** cycle, and will be indicated by the lit light. Placing toggle in **DOWN** position the pump will **REVERSE** the cycle and the indicator light will be lit.

11. SWING (S-TUBE) SWITCH

This is 2 position toggle switch. The purpose of the 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 pumping from one cylinder to the other or for maintenance and/or clean out purposes to expose the cylinder piston. Actuation of the switch to the appropriate position will cause the S-tube to shift.

NOTE

The following instruments and controls are located on the console to the right and adjacent to the pump control panel.

12. PRESSURE GAUGE - S-TUBE

This hydraulic pressure gauge is used to indicate the hydraulic operating pressure of the S-Tube shift accumulator circuit.

13. PRESSURE GAUGE - CYLINDER "A"

This hydraulic pressure gauge is used to indicate the main system hydraulic pressure being applied to the hydraulic cylinder piston of **CYL "A"** on the forward stroke.

14. PRESSURE GAUGE - CYLINDER "B"

This hydraulic pressure gauge is used to indicate the main system hydraulic pressure being applied to the hydraulic cylinder piston of **CYL "B"** on the forward stroke.

⚠ CAUTION

The identification of the cylinder can be determined by standing at rear of unit facing front. Cylinder "A" is on RIGHT (CURB) side; Cylinder "B" is on LEFT (STREET) side.

15. PANEL LIGHT SWITCH

This is a 2 position switch used to turn panel light **ON** or **OFF.**

16. 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.** The switch can also be used to **JOG** cylinders a little at a time for maintenance / repair operation. Switch must be held in position.

NOTE

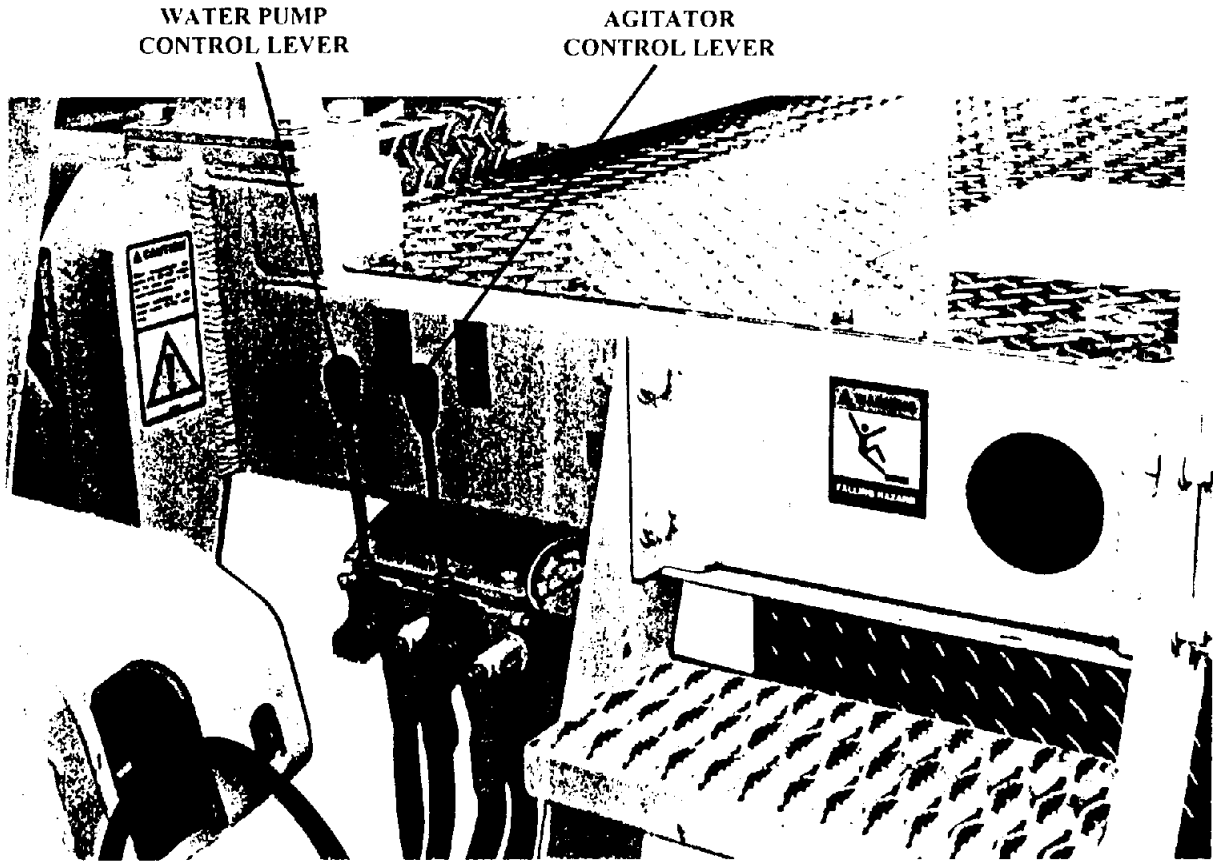
The following controls are located on the right (curb) side of the chassis at the end right before the hopper.

17. 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.

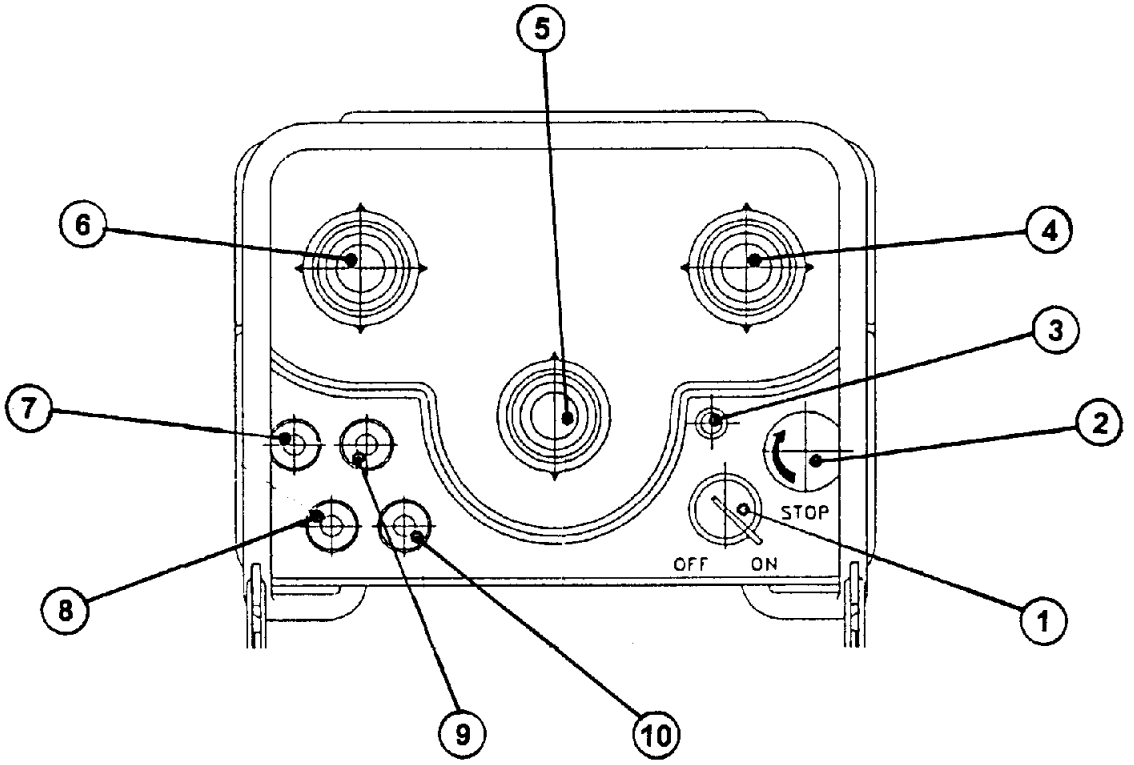
- **AGITATOR -** This lever controls the rotation direction of the hydraulic drive motors used on the agitator, sometimes called remixer. With lever in the **VERTICAL** position valve is **OFF**. **PUSH** lever in direction of chassis bed to rotate agitator in a **CLOCKWISE** direction. **PULL** lever 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

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 equipped with 82 feet (25m) umbilical cord that plugs into the main control at chassis. A behind the neck carry strap is provided to facilitate the use of the remote control console.



1. KEYED SWITCH

This is a keyed type 2 position switch which is used to energize or de-energize the remote control console. The **VERTICAL** position of key the system is **OFF**, de-energized. Turn key **RIGHT** to turn **ON**, energize the system.

2. EMERGENCY STOP SWITCH

This red colored knob is used to shut down the pump cycle in emergency situations. Depressing **PUSH** knob in to **STOP** operation of pump cycling. To release knob, **TWIST** knob **CLOCKWISE.**

3. INDICATOR

This light is used to indicate that the remote control is operable.

4. BOOM "A" AND ROTATION

This lever or control is a five position momentary joy stick type switch, meaning it must be held in position to keep the particular function activated. Both the **MAIN (A) BOOM** and **ROTATION** of turret can be controlled with this lever.

The "**A**" boom lever movement is in a vertical direction. Move lever **FORWARD (AWAY)** to **LOWER** boom, move lever **BACK (TOWARD)** operator to **RAISE** boom.

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

5. BOOM "B"

This lever is also a five position momentary joy stick type switch, however only 3 positions are connected. These are used to control the function of the "**B**" - boom. The direction of lever movement is vertical. Move lever **FORWARD - (AWAY)** from operator to **LOWER** boom and **BACK (TOWARD)** operator to **RAISE** boom.

6. BOOM "C" AND BOOM "D"

This lever is a five position momentary joystick type switch and is used to control the operational functions of both the "**C**" boom and "**D**" boom.

The "**C**" boom lever is in a side to side direction. Mover lever to the **LEFT** to **RAISE** boom and move to the **RIGHT** to **LOWER** boom.

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

7. PUMP SWITCH

This is a 2 position toggle switch used to activate the pump circuit. Move toggle **DOWN** to **SHUT-OFF** pump. Place toggle in **UP** position to **START** pump. Prior to the pump actually starting the switch will for a short period activate the chassis horn. This is used as a signal that the concrete pump is starting up.

8. ENGINE RPM SWITCH

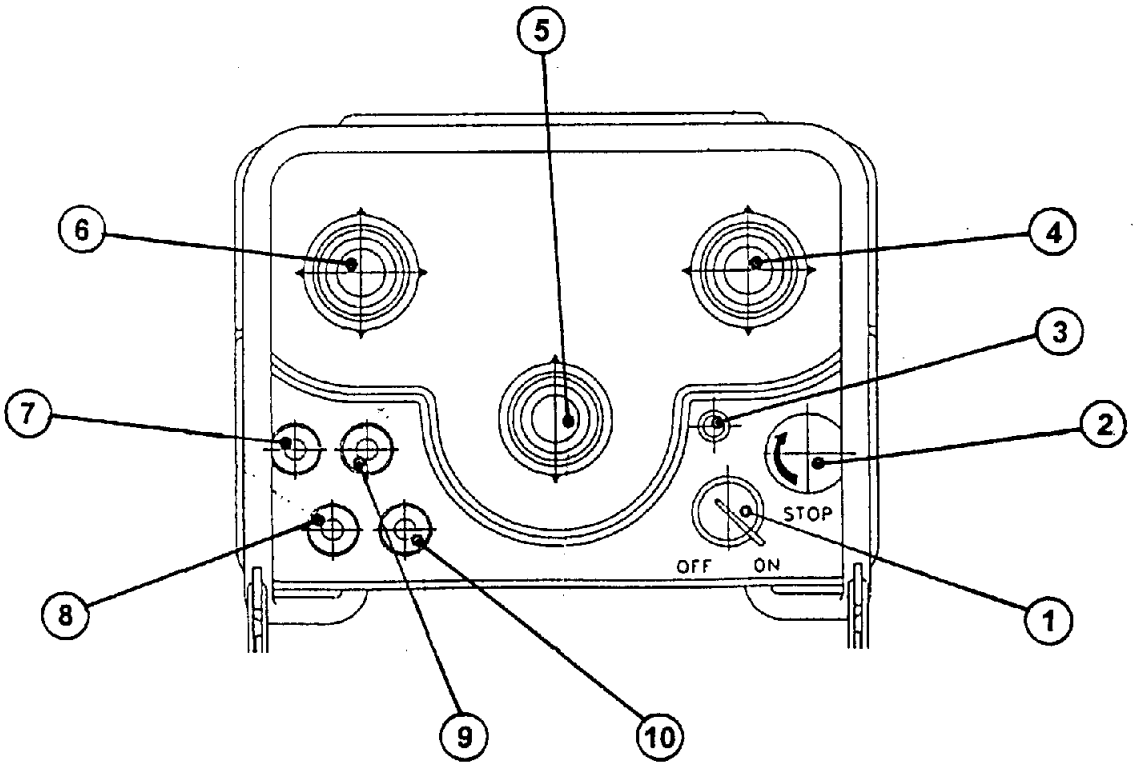
This is a 3 position momentary return to center position toggle switch. It is used to control the **THROTTLE** or **ENGINE RPM**. Actuate the toggle switch **UP** (+) and hold to **INCREASE RPM** and move toggle **DOWN** to **DECREASE RPM**. Center position of switch is neutral.

9. PUMP VOLUME SWITCH

This is a 3 position momentary return to center position toggle switch. It is used to control the pump output. Move the toggle to **UP** position and hold to **INCREASE** volume and to the **DOWN** position to **DECREASE** volume. Center position of switch is neutral.

10. PUMP DIRECTION SWITCH

This is a 2 position toggle switch used to change the pumping direction of the concrete pump. With toggle in **UP** position the material is being pumped **OUT** the delivery line. With switch toggle in **DOWN** position material is being drawn **IN** from the delivery line.



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 ***XT 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.

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.

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 48MPH. In a storm condition lower boom and place in stored position on chassis.

14. The main boom must be raised to 24 feet to release transport hook before boom section B can be opened.

15. Safety chain, whip check or other suitable securing device 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**.

19. Engage outrigger transport lock device before traveling.

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 *XT 32*** weighs over 50,000 lbs. (22,680 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 will a second person 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. 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

Position the **MODEL *XT 32*** so that safe stability is guaranteed for the entire operating range of the boom. 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 which depending on the ground surface may be of sufficient size. However to be on the safe side we suggest using the auxiliary pads. This aids in spreading out the force over a larger area. In fact there may be times when it may be necessary to place some 4 x 4 or 4 x 6 wood joists under the pads to keep from sinking.

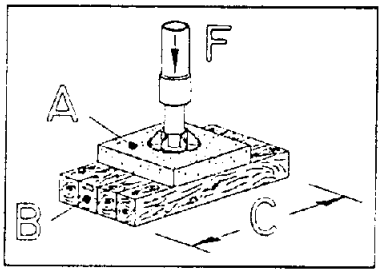
There is no fool proof method that can be used to ensure positive and absolute stability as there are too many factors involved. We have inserted the following data to assist you in determining the condition, however, it will all depend on how well you know your equipment, your experience and how alert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

TABLE 1

PERMITTED SURFACE PRESSURES (P_s)	
type of surface	KN/m^2
Normal ground	150
Asphalt with 20cm.minimum thickness	200
Tamped crushed stone	250
Clayish and slimy ground	300
Different degrees of granulated ground	350
Gravel	400/500
Suitably compressed gravel	750
Crumbly weathered rock	1000

NOTE

The load bearing capacity on the subsurface is express in KN/m^2. 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/m²														
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.															

surfaces unsuitable for stabilizing operations

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

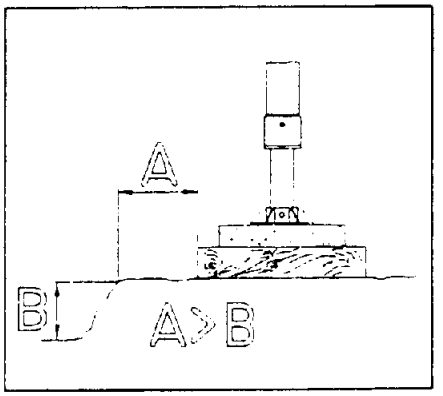
You are going to set up on an asphalt surface that has minimum thickness of (20cm). Look at Table 1, it shows the resistance value for asphalt is 200KN/m². Take note of the plate fastened to each vertical jack. This indicator vertical jack/stabilizer load expressed in KN. Check maximum loads on both front and rear stabilizers as the values may differ.

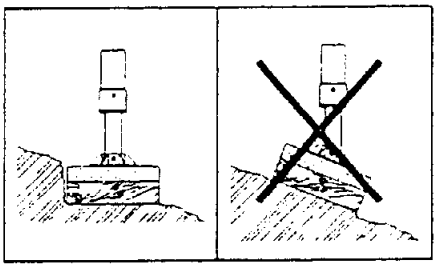
Now look at Table 2, the left side vertical column denotes the values of permitted surface pressure found in TABLE 1 (Asphalt = 200KN/m^2). The stabilizer loads (identified on jack plates) are noted across the top of the table. Assume the stabilizer load was 150KN/m^2, find that column and read down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

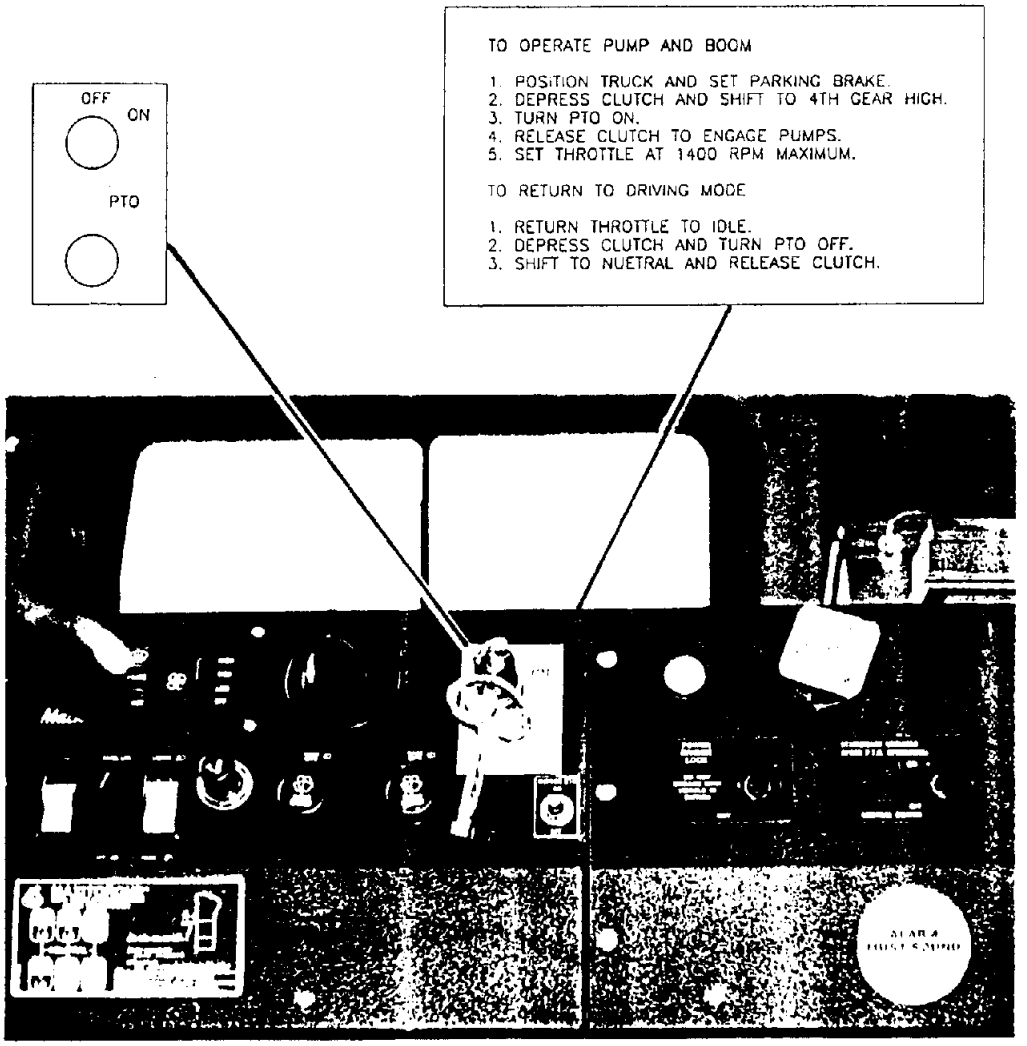




Always remain at a safe distance from slopes, foundation excavations and the like. Follow the simple guideline noted above: the distance between the stabilizer jack and the trench should always be equal to or greater than the depth of the trench itself.

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 fourth gear.



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 1400. This can be accomplished by using the **RPM** toggle switch at rear control panel.
- Place chocks under the chassis wheels.

⚠ CAUTION

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

- Unlock the telescopic leg of the front outriggers by removing the lock pin. Also unlock the rear swing out legs.
- At **RIGHT** (curb) **SIDE** control panel insert **KEY** into **MASTER** switch and turn key to **ON** position. The outrigger control panel is now operable.
- At the right control panel with one hand actuate the **DIRECTION** switch **DOWN - RED** position and **HOLD**.
- Proceed with the other hand to actuate the **FRONT LEG** control lever moving it **TOWARD YOU** to extend telescopic leg. Hold both controls until leg is **FULLY** EXTENDED and **RED ARROWS** on leg and beam **MATCH UP** or are in line.
- Actuate **RIGHT FRONT JACK** control lever **TOWARD** you and lower jack pad to approximately 12 inches (304 mm) from ground.
- Actuate **RIGHT REAR** control lever **TOWARD you to SWING-OUT** leg. Hold until leg is fully extended, no further movement of leg with lever actuated.

- Actuate **RIGHT REAR JACK** control lever and again lower pad to about 12 inches (304mm) from ground.
- Proceed to **LEFT (STREET)** side control panel and operate appropriate controls to position left side outriggers, front and rear.
- At this point place the **AUXILIARY PADS** and any required **BLOCKING/JOISTS** under jack legs.
- Proceed then, using **JACK** controls to **LOWER** jack pads **DOWN** on either right or left side until chassis tires are raised approximately 5-6 inches (127 - 152mm) off the ground.
- Move to opposite side and set the side stabilizer jacks.

⚠ CAUTION

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 **TOWARD** you and move **DIRECTION** switch toggle **UP** or **DOWN** for appropriate movement. Monitor the **LEVEL SIGHT** gauge located near control panel. When bubble is lined up in center the chassis is level.

⚠ WARNING

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**.

⚠ CAUTION

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 feet (2.35m) 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.

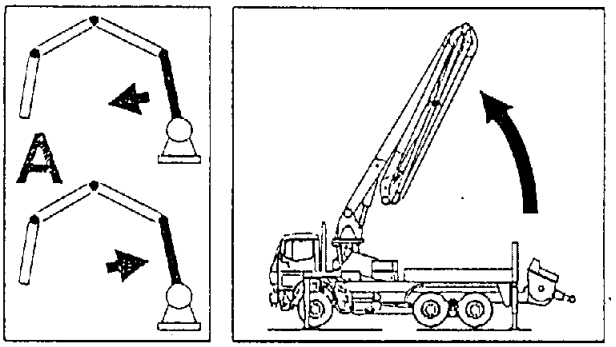
- Check that **EMERGENCY STOP** switch for boom control is **RELEASED**.

⚠ CAUTION

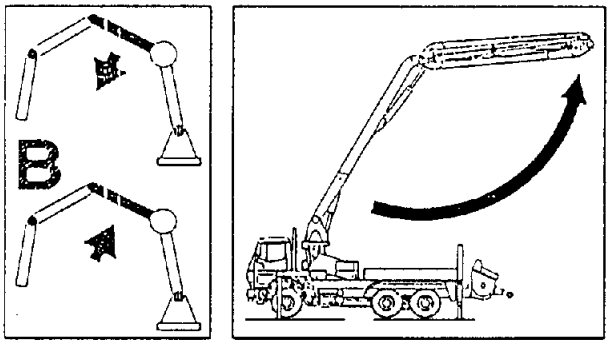
Keep in mind that when an emergency or danger condition is imminent the boom operation can be stopped by DEPRESSING the STOP switch.

With remote control console connected to panel on chassis bed and engine started and RPM set proceed to operate boom controls as follows:

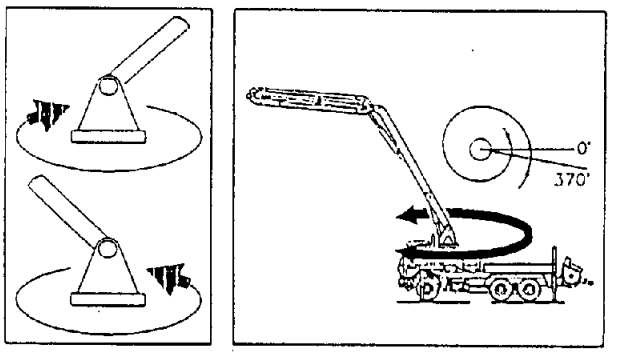
1. Actuate control lever "**A**" so that the entire structure is raised to approximately 60°.



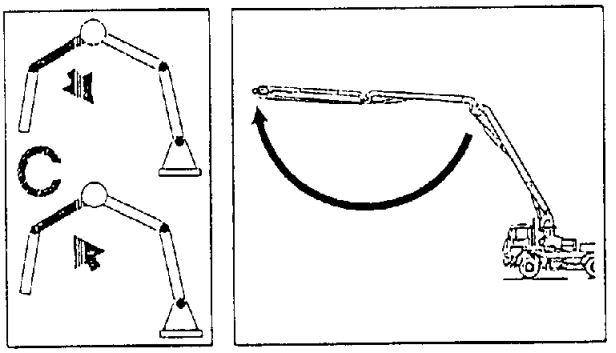
2. Actuate control lever "**B**" to raise boom "B" opening to at least 120°.



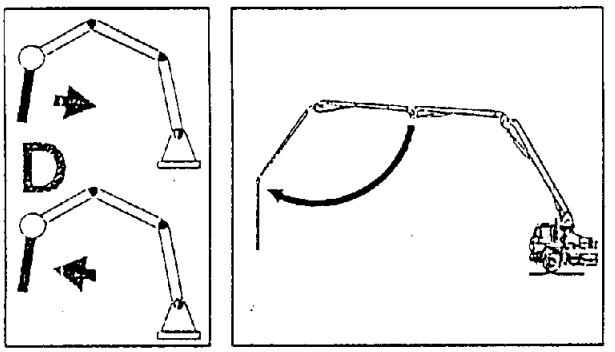
3. Actuate the **ROTATION** control moving the unit **RIGHT** or **LEFT** until structure is over front of cab.



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.

⚠ CAUTION

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 117 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

- Place panel **SELECTOR** switch to **LOCAL**.
- 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 1400 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.
- Place **PANEL** switch to **REMOTE**.
- On remote panel, insert **KEY** and turn to **ON** position to energize control panel.
- Check that **PUMP** switch is **OFF** and **DIRECTION** switch is in **FORWARD** position.
- Adjust **ENGINE SPEED**, moving switch to **INCREASE**.
- Actuate **VOLUME** switch 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 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 in finished and cleaning the system is the last operation of the day. However, the cleaning up of the **MODEL *XT 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 switch 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 5" 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 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.
- Using the controls at the outrigger panel either right or left side **RETRACT** outrigger jacks, and legs.
- Pick up auxiliary jack pads and any cribbing joist that were used and place in proper storage area.
- 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

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 *XT 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 *XT 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. SUBFRAME AND DECKING

- Inspect subframe, 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, wearpads, 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. PUMP CELL (FLAT PACK)

- Visually check for structural damage, cracked welds of flat pack, secured to subframe
- Hydraulic drive cylinders in good condition, secure no leakage
- Material cylinder secure, tie rods tight
- 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
- Clean-out cap installed

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

LUBRICATION

The ***REED*** **MODEL *XT 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 a manual 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 a manual lube pump and reservoir unit, then distributed to the areas by plastic tubing. As an option the unit may be equipped with an automatic lube system for the swing components.

The lube points on the boom structure 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 *XT 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.

LUBRICATION POINTS

A. BOOM AND OUTRIGGER AREA

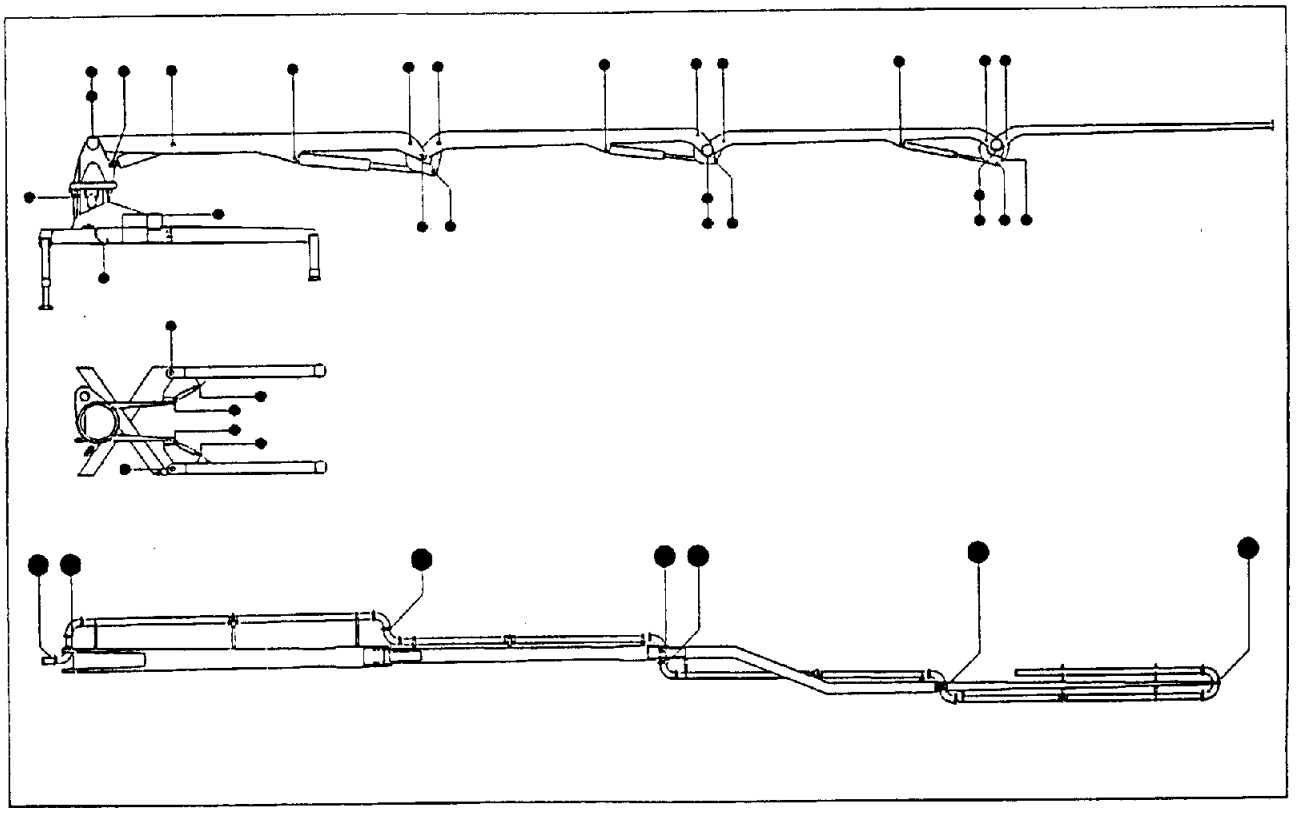
There are several points on the boom structure that requires lubrication. These points are noted in the diagrams below and involve all the articulated joints on the boom, the swivels and rotating joints of the concrete delivery piping and the pivot points of the swing out outriggers.

⚠ 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**



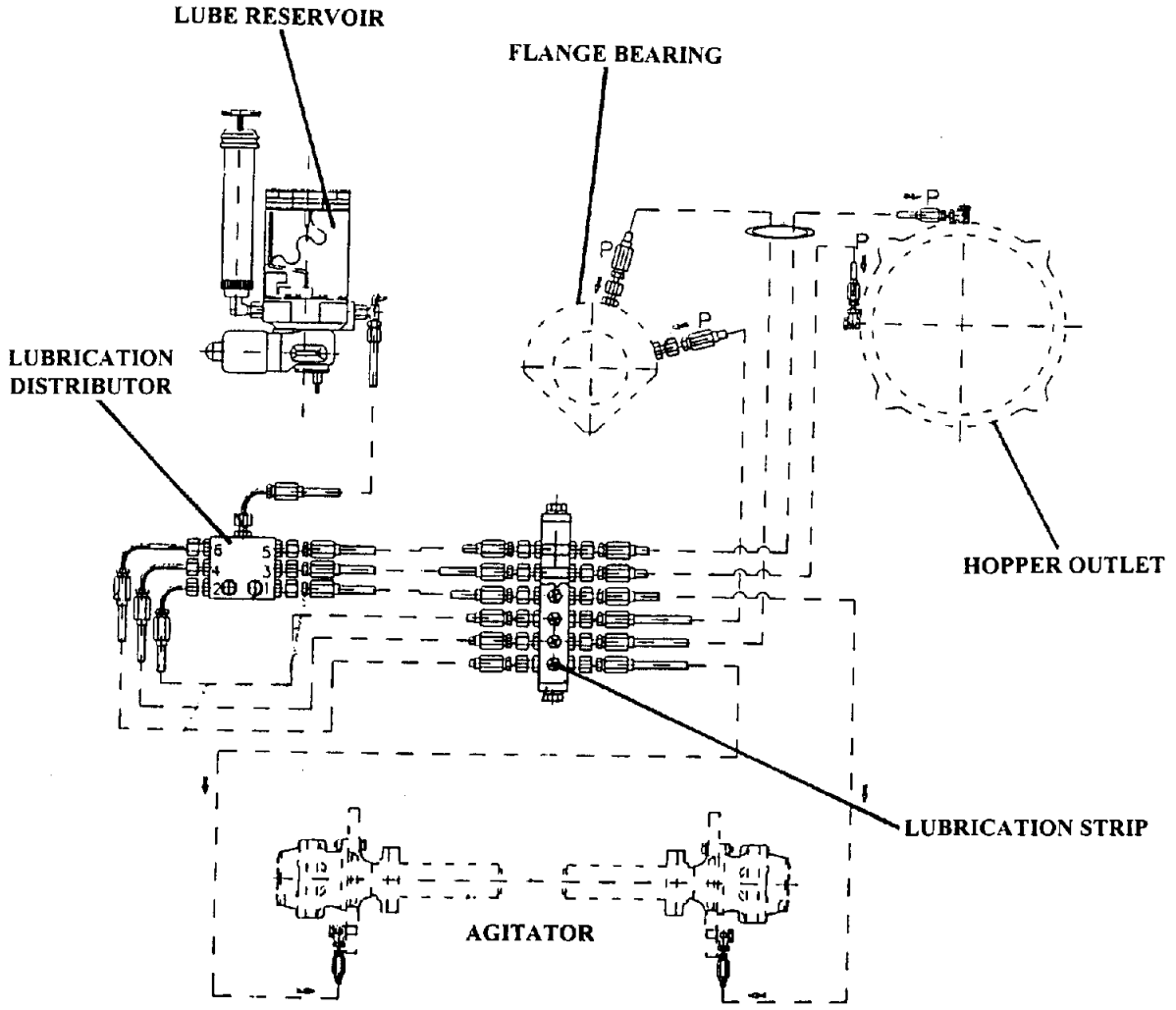
B. CONCRETE PUMP AREA

This area's critical lube points are connected to the central lubrication distribution block and fed by the manual lube pumps. Pump a sufficient number of strokes to ensure thorough lubrication of each point. **VISUALLY CHECK EACH POINT**. Wipe off any excess lubricant.

For units equipped with an Auto Lube System, the main lube pump and reservoir is located at rear of unit near hopper. This system will automatically feed the central distribution block at a preset interval. However the reservoir must be checked and lubricant replenished if necessary on a daily basis.

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

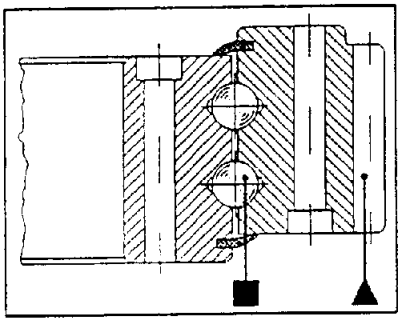
Recommended interval: **DAILY BEFORE START-UP AND AS REQUIRED DURING OPERATION**



C. BOOM ROTATION UNIT

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

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

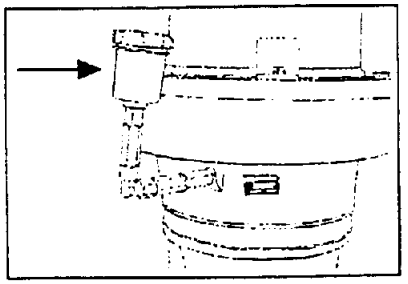


For lubrication of gear teeth on bearing and pinion smear or brush recommended oil on all areas of teeth.

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**

- **GEAR REDUCTION UNIT-**This unit is located in the turret pedestal and requires attention on a daily basis. An oil level cup extends from reduction unit and is readily accessible. Remove the cap and visually check level in cup. Add oil if necessary.

Lubricant: **SHELL OMALA OIL 150**
Interval: **CHECK DAILY FILL AS REQUIRED**



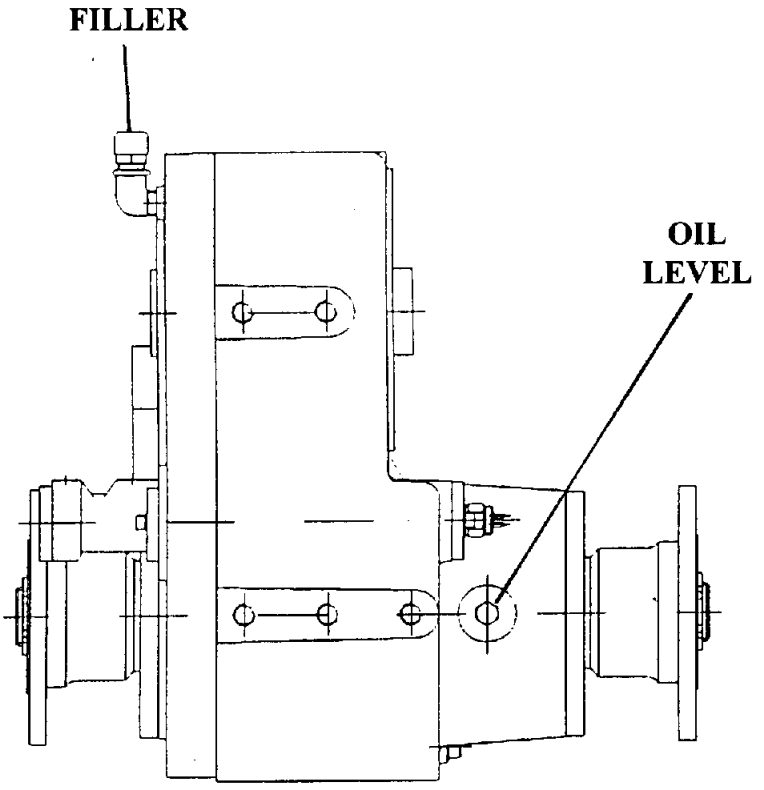
D. POWER TAKE-OFF (P.T.O.)

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** ***XT 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 75 gals (290L) is located inside the boom pedestal. It is equipped with a filler breather cap, and a pressure filter outside the tank along the frame. A sight gauge is located on outside of pedestal and is used to visually determine the fluid level inside tank.

- **CONCRETE PUMP HYDRAULICS-**This hydraulic tank has a capacity of 100 gals (378L) and is located on the chassis deck. It is equipped with a filler breather unit, access covers, and four (4) suction strainers inside the tank. A sight gauge is installed on side of tank to determine the fluid level inside the tank. In close proximity of tank is a twin element return line filter assembly and two high pressure filter assembly.

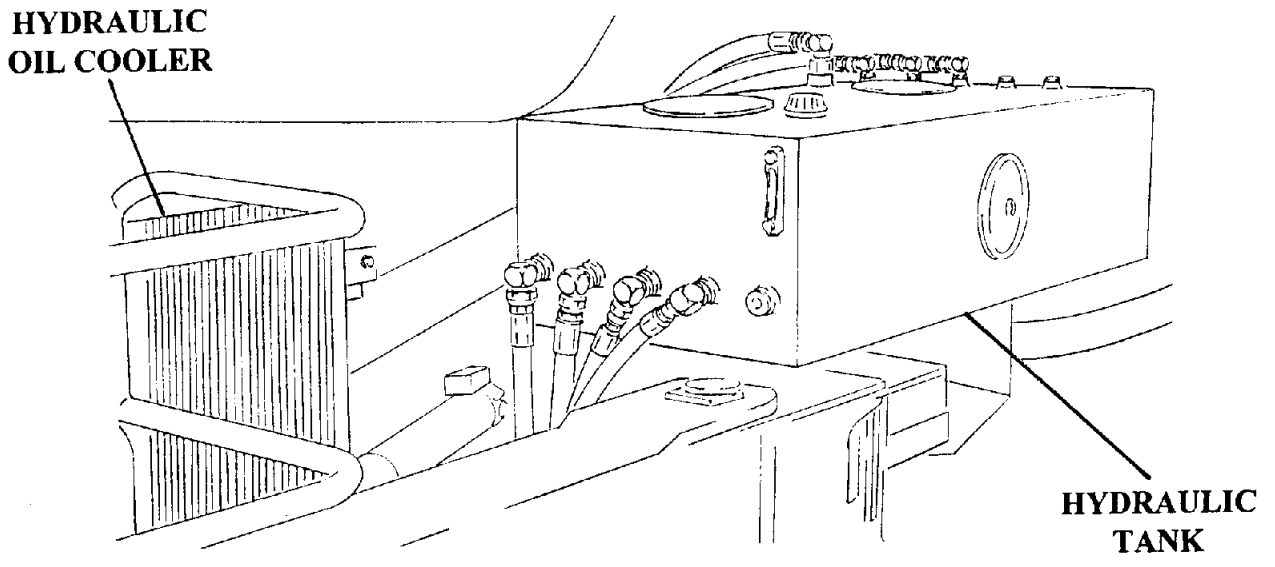
SYSTEM MAINTENANCE ITEMS

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-** These are 10 micron filters with disposable elements. Change element when filter condition gauges indicates to do so.
- **PRESSURE FILTERS (Concrete Pump)-** These filters are 10 micron filters with disposable element. Change when condition indicator depicts to do so.
- **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 *XT 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 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 75 gals (290L) and the concrete pump hydraulic tank has a capacity of 100 gals (378L). 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 four (4) 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
- Refill the hydraulic tank with new **CLEAN** hydraulic fluid, **SHELL TELLUS 46**
- Start machine and check for leaks

HYDRAULIC SYSTEM FAMILIARIZATION

The ***REED*** **MODEL *XT 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	=	3400 PSI (240 Bar)
• Cylinder Relief - Extend, Retract	=	4000 PSI (285 Bar)
• Boom Section "B" - Relief	=	3700 PSI (260 Bar)
• Cylinder Relief - Extend, Retract	=	4000 PSI (285 Bar)
• Boom Section "C" - Relief	=	3400 PSI (240 Bar)
• Cylinder Relief - Extend, Retract	=	4000 PSI (285 Bar)
• Boom Section "D" - Relief	=	2850 PSI (200 Bar)
• Cylinder Relief - Extended	=	2850 PSI (200 Bar)
• Cylinder Relief - Retract	=	3600 PSI (250 Bar)
• Rotation Relief Pressure	=	2000 PSI (140 Bar)
• Outrigger Circuit Relief	=	2850 PSI (200 Bar)

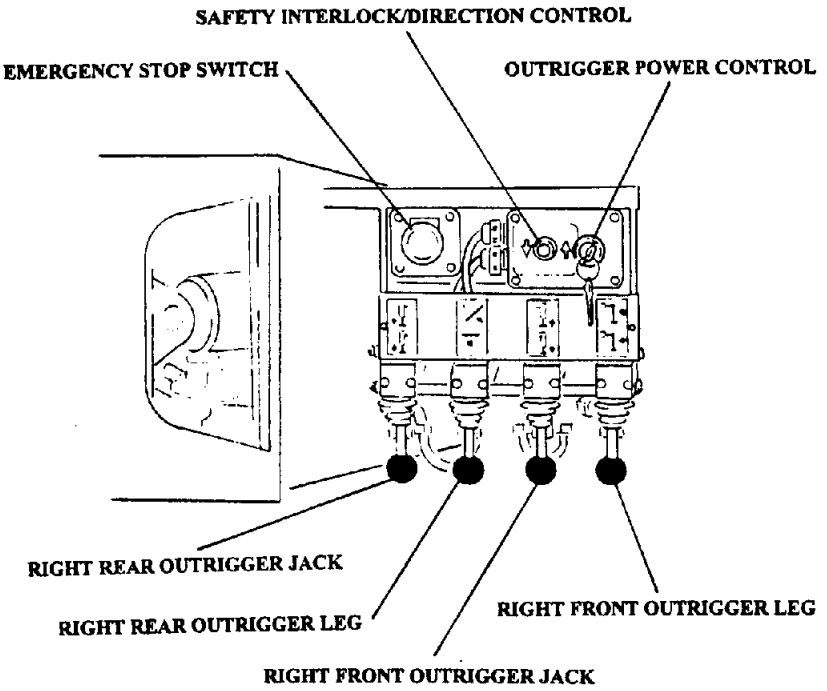
BOOM HYDRAULIC CIRCUIT DESCRIPTION (Refer to Hydraulic Schematic)

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 side of unit near the outrigger controls. 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 outrigger and jack operation is accomplished by two (2) banks of control valves located one each on side of the chassis. The right side controls the right side outrigger and jacks. The left side controls the left side outriggers and jacks. These control valve banks consist of four (4) flow diverter valves, manually actuated and used to extend or retract the cylinders of the outriggers. These valves are inoperable until the master outrigger valve has been actuated.



The master outrigger valve is the first valve section from the left of the distributor block. This valve is used to direct the flow to the outrigger circuit for extension or retraction operation. This valve is basically a manual lever controlled valve, however, for convenience in operation a means has been provided to electrically actuate the valve remotely.

This is accomplished by the installation of a momentary 3 position toggle switch. Momentary means toggle returns to **OFF** position unless held in actuated position. This toggle switch is used to electrically energize the coil of the master outrigger valve, shifting the spool to the appropriate direction for extension or retraction. With switch activated and held, the flow diverter valve will allow the hydraulic fluid to flow in the appropriate direction to the appropriate cylinder of the outrigger circuit.

The four (4) vertical jacks are equipped with pilot operated holding valves on the barrel or extension side of the cylinder. When the direction valve is in the extended position, the fluid flows freely to the barrel side of the cylinder, extending the rod. However, as soon as this operation ceases the holding valve closes, thereby locking the fluid in the cylinder.

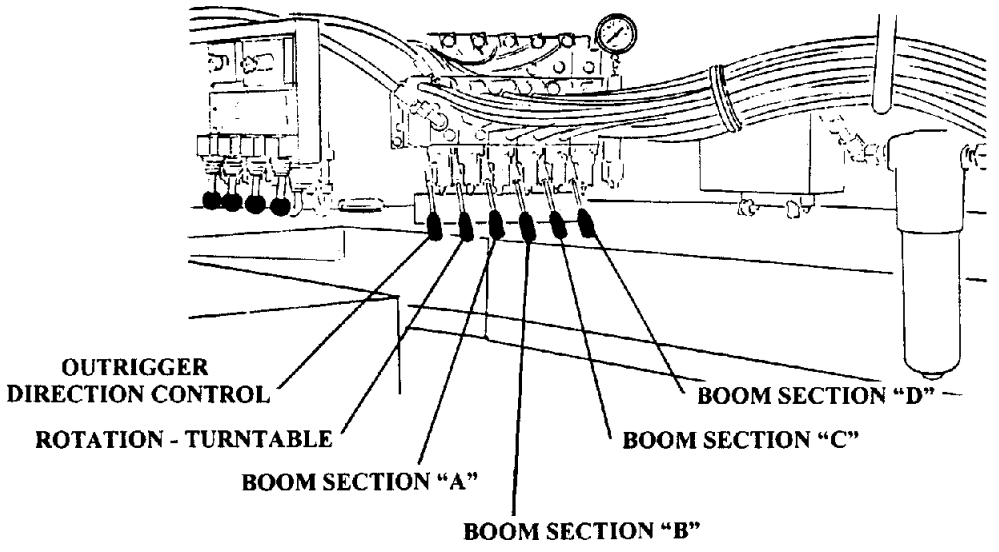
To release the holding valve the direction valve must be in the retract position. In so doing, pilot pressure from the flow going to rod side of the cylinder for retraction, unseats the holding valve, allowing the fluid in the barrel side to return to tank.

No holding valves are installed on the rod side of any of the outrigger cylinders, thus to prevent the rods from unactuated extension and leaking out, a master holding valve has been installed. This has been placed in the main retraction line feeding all the outrigger cylinders. When no pressure is applied, the fluid is locked in the circuit. This does not prevent leakage of rod due to a hydraulic line malfunction.

On each of the swing out leg hydraulics a flow limiter valve is installed on the rod side line of the swing cylinder. The purpose of this valve is to enable the speed (flow) of the swing out-swing in operation to be controlled preventing erratic motions. These valves are adjustable and have been set at the factory to provide safe operation.

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 "D" hydraulic circuit a flow control check valve is installed on the rod side circuit. The purpose of this valve is to slow down the flow of the fluid being exhausted to prevent erratic motion of the boom and end hose. This is an adjustable valve which has 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.

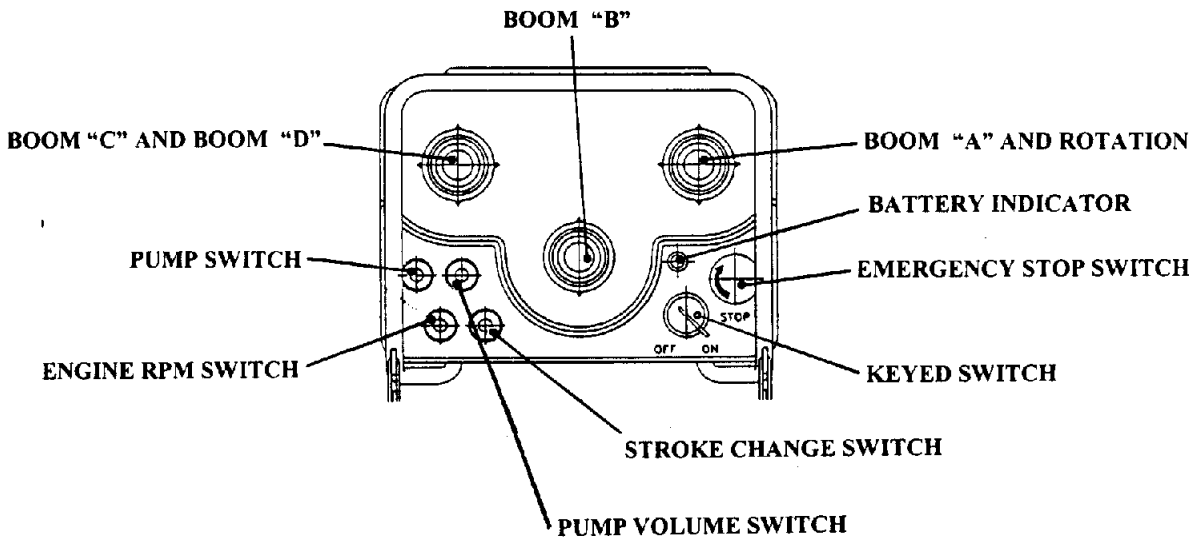
REMOTE CONTROL BOOM CIRCUIT

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 remote console 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.



REMOTE CONTROL ASSEMBLY

CONCRETE PUMP HYDRAULIC SYSTEM

As previously noted the **MODEL *XT 32*** is equipped with two separate independent hydraulic systems. One for 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 shifting circuit, oil cooler circuit and the auxiliary circuit for operation of the agitator and water system.

For the purpose of making it easier to understand the four circuits which are somewhat related are being described separately.

SPECIFICS - PRESSURES

• Main Pump Standby Pressure	=	350 - 400 PSI (24-28 Bar)
• Maximum System Pressure, Main Pumps	=	5500 PSI (385 Bar)
• Main System Relief Pressure	=	5000 PSI (350 Bar)
• S-tube Shift System Pressure	=	2500 PSI (175 Bar)
• S-tube Shift System Relief Pressure	=	2500 PSI (175 Bar)
• Accumulator Pre-Charge Pressure	=	1250 PSI (87 Bar)
• Hot Oil Shuttle Pressure	=	200 PSI (14 Bar)
• Thermal By Pass Pressure	=	65 PSI (4.5 Bar)
• Oil Cooler Relief Pressure	=	800 PSI (56 Bar)
• Auxiliary System Pressure	=	3000 PSI (210 Bar)
• Auxiliary System Relief Pressure	=	3000 PSI (210 Bar)

MATERIAL CYLINDER CIRCUIT (Refer to Hydraulic Schematic)

The concrete pump circuit is used to support the operational functions of the material cylinders. Two (2) material cylinders are used and are driven by two (2) hydraulic cylinders. The circuit for these cylinders is designed so that each cylinder is stroked on an alternate basis. In other words, when one cylinder is retracting causing the concrete material to be drawn into the material cylinder tube, the other cylinder which has its material cylinder full is extending. This causes the concrete material to be pushed through the S-tube and out into the delivery line.

To meet the volume and pressure requirements of the material hydraulic cylinders two (2) main hydraulic pumps are used. These pumps are installed on the power take off unit in a tandem or series arrangement. They are designated as Front Pump and Rear Pump. They are Sundstrand variable displacement axial piston pumps of a swash plate design. The swash plate angle is adjustable and is used to vary the stroke length of the piston which in turn varies the flow,

For operation of the material cylinder circuit, with chassis engine running and PTO engaged, the two main hydraulic pumps are in operation. At this point since no control has been actuated and with no volume demand, the charge pump built into the Sundstrand pump is circulating the oil and lubricating the inside of the pump.

It was previously noted that the concrete output pumping operation is the result of the two material cylinders which cycle on an alternate basis. This alternate cycling is controlled by an electrical signal which is generated as each cylinder completes its full retracted stroke. To accomplish the signaling, a proximity switch or sensor is installed in the water box and is triggered by the passing of the material cylinders piston adapter underneath the sensor.

For the purpose of adjusting the volume of the hydraulic pumps, a volume control is located on the control panel. This is a potentiometer type control and varies the electrical current signal to the pressure control pilot (PCP). This PCP valve converts the electrical signal to a hydraulic signal which in turn adjusts the swash place, placing the pump in a higher pumping mode in proportion to the amount of volume demand placed on it by the electrical signal.

When the volume control is opened and the **PUMP** switch is in the **ON** position, the cycling circuit is energized. The electric signal generated by the proximity sensor is sent to the logic controller (black box). This is a proprietary solid state device designed to control the alternating action of the pump and synchronize the movement of the S-tube. The signal is then sent to the PCP valve which shifts the 4-way servo valve thereby reversing the hydraulic pump flow allowing the fluid to go to either cylinder **A** or **B** whichever is to be extended.

The main pressure and flow is only directed to one side of the hydraulic material cylinder. In this instance for the ***XT 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 is to transfer hydraulic oil from one to the other during the 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.

For protection of the hydraulic system, two pressure relief valves have been installed on each of the main pressure lines.

A loop flushing block is incorporated in the system to remove oil from the main hydraulic circuit for fluid cooling and filtration. This prevents heat and contamination build up in the material hydraulic cylinder circuit loop. The hot oil shuttle is designed to remove oil from the low pressure side of the Sundstrand pump.

S-TUBE SHIFT CIRCUIT (Refer to Hydraulic Schematic)

The S-tube is located inside the hopper and its purpose is to transfer the concrete material from the material cylinder to the outlet and into the delivery line. Because of the alternating cycling of the material cylinders, the S-tube must shift alternately from one cylinder to the other in a synchronized operation.

For operation of the S-tube shift circuit, the flow and pressure requirements are met by use of one section of a tandem pump. This pump is installed on the power take off and is of the gear pump design having a fixed displacement. In addition to the pump, the S-tube shift circuit consists of an unloader manifold, an accumulator, a shift solenoid valve and two (2) hydraulic shift cylinders.

The unloader manifold contains four (4) cartridge valves which are designed into the system to perform several functions. The relief cartridge is used to protect the system from excessive pressure and opens when the accumulator reaches the relief setting. When the relief opens, it in turn actuates the DPS valve (differential pressure sensing). The DPS is used to divert the flow of oil from the pump back to the tank once the accumulator has reached its working pressure. The third cartridge of the manifold is the accumulator solenoid cartridge. It is used as a dump valve to automatically relieve the pressure in the accumulator preventing unintentional shifting of the S-tube when the pump cycling switch is turned **OFF**. A check valve is incorporated in the manifold to prevent the accumulator flow from going back into the pump.

The shifting of the S-tube requires instant pressure and volume that 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. This expands the bladder much like a balloon. In operation of the circuit, the hydraulic fluid is pumped into the accumulator at a higher pressure than that inside the bladder. This compresses the bladder and the fluid is contained in the reservoir until released.

Two (2) hydraulic cylinders are used to shift the S-tube from one material cylinder to the other, one for each direction. The cylinders are pressurized on the barrel side only. As one cylinder is pressurized the fluid in the barrel of the other is forced out back to tank by the shifting of the other.

To direct the flow from the accumulator to one or the other shift cylinder, a solenoid operated directional valve is used. This valve is controlled and actuated by the proximity sensor signal via the black box. When the appropriate signal is received, it activates the solenoid coil shifting the valve spool to the appropriate side. The accumulator then releases, exhausting the fluid which is then directed to the appropriate cylinder. As soon as the shift is made the accumulator is refilled immediately.

OIL COOLER CIRCUIT

This is a straight forward circuit and is used to operate the oil cooler fan. Supplying the flow and pressure requirements for the circuit is the second section of the tandem pump. When pump is running, the oil is automatically directed to the fan hydraulic motor. A relief valve is incorporated in the circuit for protection against excessive pressures.

AUXILIARY CIRCUIT

The auxiliary circuit is used in the operation of the agitator and water pump system. The flow and pressure requirements are provided by a gear type hydraulic pump mounted to the power take-off. A relief valve is installed in the system to protect against excessive pressures.

- **AGITATOR/REMIXER CIRCUIT**

  For operation of this system the flow from the pump is directed to a manually operated double spooled directional control valve. The agitator uses a 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.

  With the manual lever actuated in a particular direction, the flow is directed to the appropriate side of both motors for rotation of both agitators.

- **WATER PUMP CIRCUIT**

  For control of the water pump operation, it uses the second section of the directional control valve. When control is actuated flow is directed to the water pump hydraulic motor.

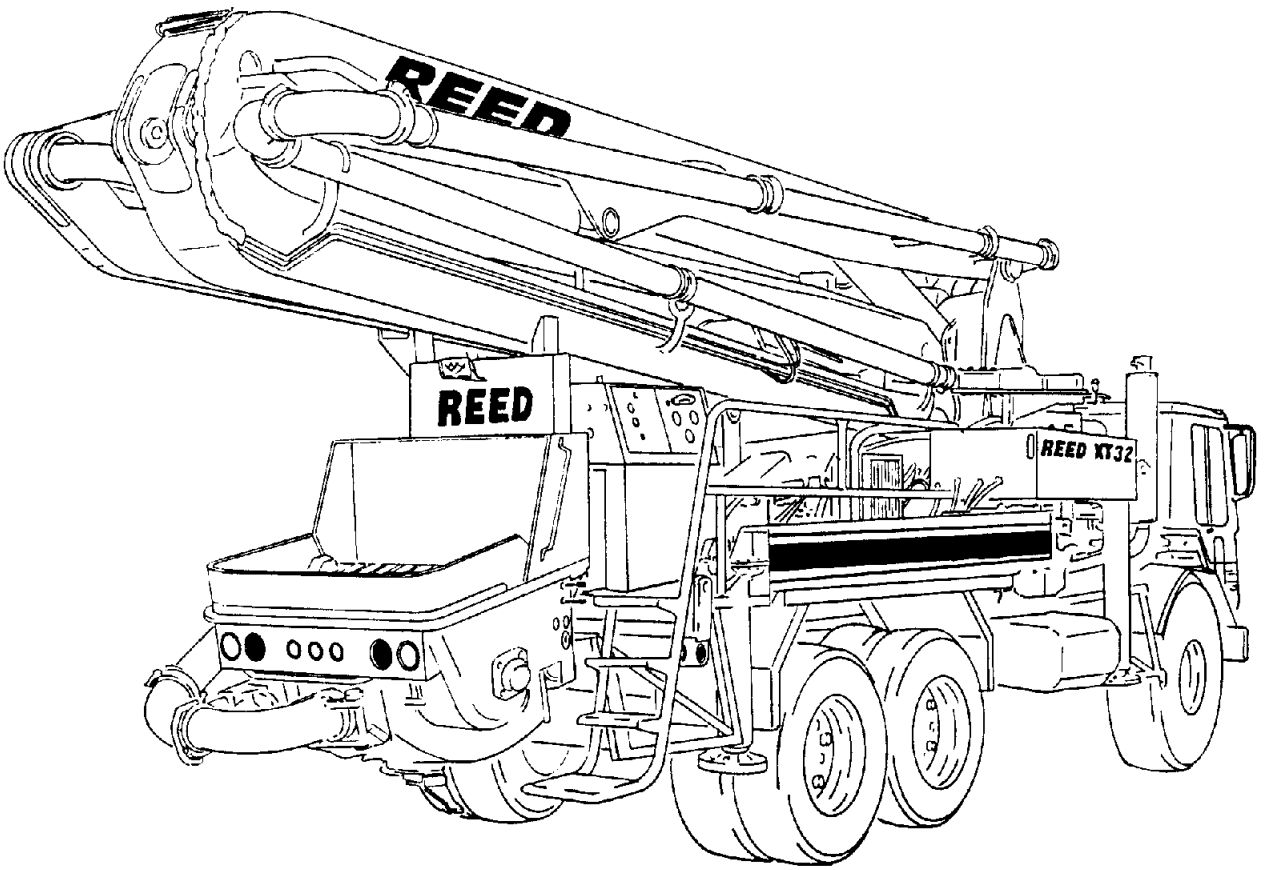
ELECTRIC SYSTEM

The **MODEL *XT 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 ***XT 32*** utilizes a 24 volt direct current system with a negative ground. All electrical components operate directly from the 24 volt source.

The 24 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.



ADJUSTMENT PROCEDURES

It is not unusual that over a period of time due to usage, repair or replacement of parts that periodically adjustments may be required to certain components, operational and system functions. This section of the manual is offered to assist you in making these adjustments.

HYDRAULIC PRESSURE SETTINGS

The machine has undergone extensive quality control testing and prior to leaving the factory, the operational hydraulic pressures have been checked and set to provide efficient safe operation. The pressures should not be altered. However, it may be necessary through the course of using the machine or replacement of parts to check and reset the pressure to the established guidelines. This can be accomplished as follows:

⚠ CAUTION

Power take off (PTO) must be DISENGAGED when any component adjustments, repairs, replacement or maintenance is to be performed. Do not SHUT DOWN ENGINE before DISENGAGING PTO.

- **PRESSURE LIMITER RELIEF VALVE - Set @ 5000 PSI (350 BAR)**

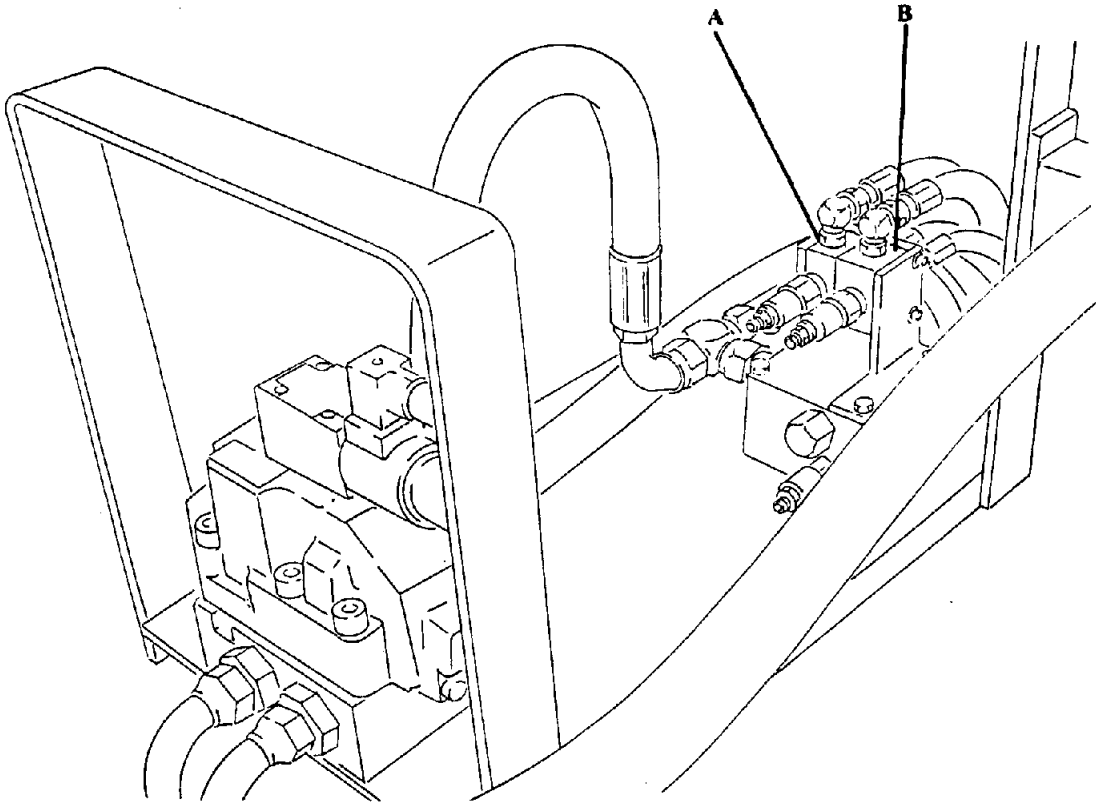
  Two (2) Limiter Relief Valves have been installed in the system. The purpose of these valves is to protect the main system from excess pressure. The valves are located on the structure used for mounting of the shift unloader and manifolds in the vicinity of the hydraulic drive cylinders. To check or adjust to proper setting proceed as follows:

  CHECK PRESSURE

  - Start engine and engage **PTO**. Adjust **THROTTLE CONTROL** to maximum RPM.
  - Place **PUMP DIRECTION** switch to **FORWARD.**
  - Turn **VOLUME CONTROL** to full on.
  - Actuate **PUMP** switch to **ON** then simultaneously actuate and hold **TEST** switch and **CYL "A"** switch.
  - Now in doing this, observe pressure gauge for **CYL "A".** Gauge should register 5000 PSI (350 BAR).
  - Actuate simultaneously the **TEST** switch and **CYL "B"** switch and observe **CYL "B"** pressure gauge. It too should register 5000 PSI (350 BAR).

- Turn **PUMP** switch to **OFF.**
- If pressure on either gauge does not read 5000 PSI (350 BAR) then an adjustment is necessary.

PRESSURE LIMITER RELIEF VALVE



ADJUST PRESSURE

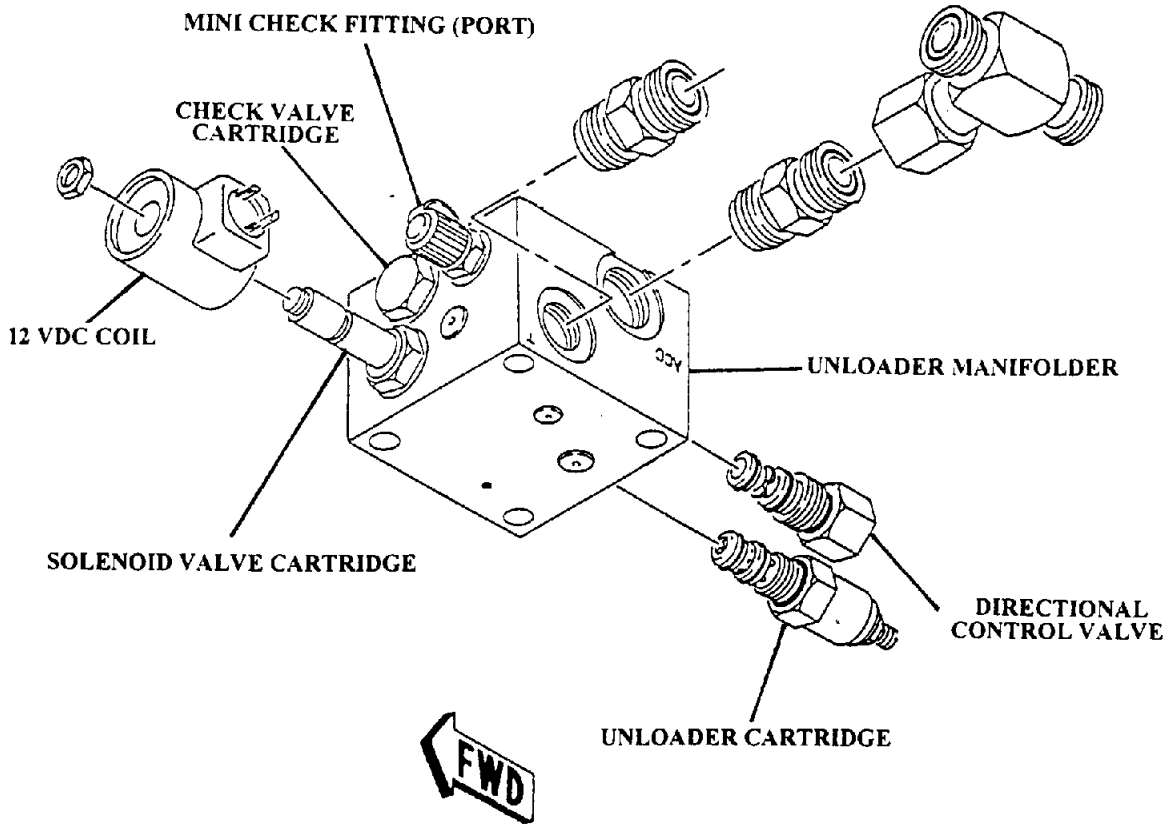
- To make the adjustment loosen the locknut on the limiter valve which is to be adjusted.
- Turn **PUMP** switch **ON** and simultaneously actuate **TEST** switch and appropriate cylinder switch..
- Using an allen wrench, turn adjustment screw **IN** to **RAISE** pressure and **OUT** to **LOWER** pressure. Observe pressure gauge while making adjustment.
- When adjustment has been made retighten locknut.
- Proceed to repeat procedure to the other cylinder if adjustment is required.

SWING TUBE SHIFT RELIEF VALVE - Set @ 2500 PSI (175 BAR)

Located in the shift circuit unloader manifold is a relief valve or unloader cartridge. This valve is used to protect the system from excessive pressure and also to limit the pressure being applied to the accumulators. To check or adjust to proper setting proceed as follows:

CHECK PRESSURE

This can be done during normal operation by observing S-tube shift pressure gauge. Because of quickness in the operation of loading and unloading the accumulator the pressure gauge needle will reach the set pressure then quickly fall back. This makes it difficult to read and it is suggested the gauge be observed for several shifts before determining any required adjustment. Also by slowing down the cycling of the material cylinder, lower volume, the gauge will reach pre-set pressure and stay longer before dropping back.



ADJUST PRESSURE

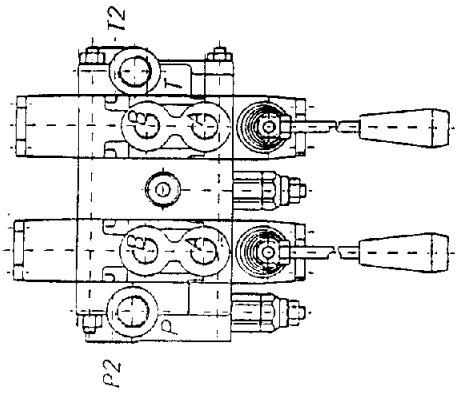
- Start engine and engage **PTO**. Adjust **THROTTLE CONTROL** to maximum **RPM.**
- Place **PUMP DIRECTION** switch to **FORWARD.**
- Turn **VOLUME CONTROL** to one-half on.
- Loosen locknut on relief valve adjustment screw.
- Turn **PUMP** switch **ON.**
- Using an allen wrench turn adjustment screw **IN** to **RAISE** pressure and **OUT** to **LOWER** pressure.
- Make adjustment in small increments because gauge will not register new pressure until next shift of swing tube. Observe swing tube pressure gauge.
- After adjustment has been made tighten locknut on adjustment screw.

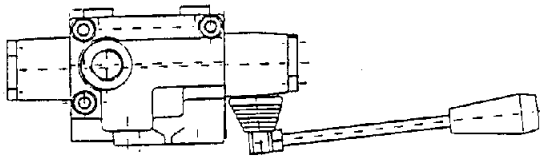
AGITATOR & WATER PUMP RELIEF VALVE - Set @ 3600 PSI (252 BAR)

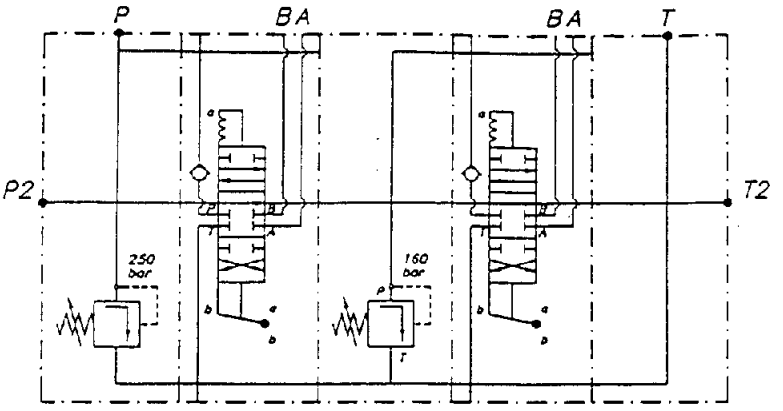
Located behind the hopper and mounted to the chassis is a 2 spool manual directional control valve. One valve spool section is used to control the operation of the agitator and one spool section is used for operation of the water pump. This directional control valve is equipped with 2 relief valves, one for each valve section. The relief valve at the water pump section has been set at a high pressure so that it has no effect on the system pressure. The agitator relief valve is used to protect both the agitator and water pump. Based on this the checking and pressure adjustment is directed only to the agitator relief.

CHECK PRESSURE

- Start engine and engage **PTO** and adjust **THROTTLE CONTROL** to maximum **RPM.**
- Actuate the **AGITATOR** control lever to either rotation direction.
- Read the pressure on the pressure gauge. It should read 3600 PSI (252 BAR).
- If pressure is different then an adjustment will be necessary.







ADJUST PRESSURE

- On directional control valve loosen locknut on relief valve adjusting screw.
- Start engine, engage **PTO** and adjust **THROTTLE CONTROL** to maximum **RPM**.
- Actuate the **AGITATOR** control lever.
- Turn relief adjusting screw **IN** to **INCREASE** pressure and then **OUT** to **DECREASE** pressure. Proper setting is 3600 PSI (252 BAR). Monitor gauge while adjusting pressure.
- After adjustment has been made, **TIGHTEN** locknut.

SWING (S-TUBE) ADJUSTMENTS

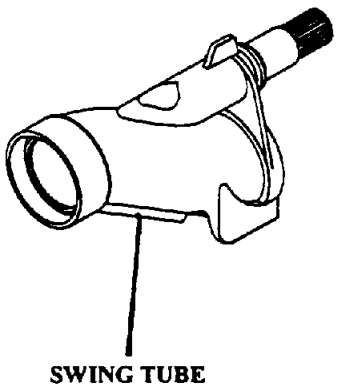
It is important from an operational standpoint that the swing tube be properly adjusted. On a properly adjusted swing tube the shifting motion from one cylinder to the other shall be smooth providing a very light scraping noise. The gap between the swing tube and wearplate installed on the hopper should be almost non-existent.

The scraping noise being heard is the result of the wear ring located inside the swing tube rubbing against the wearplate. This is the sealing action required for efficient operation.

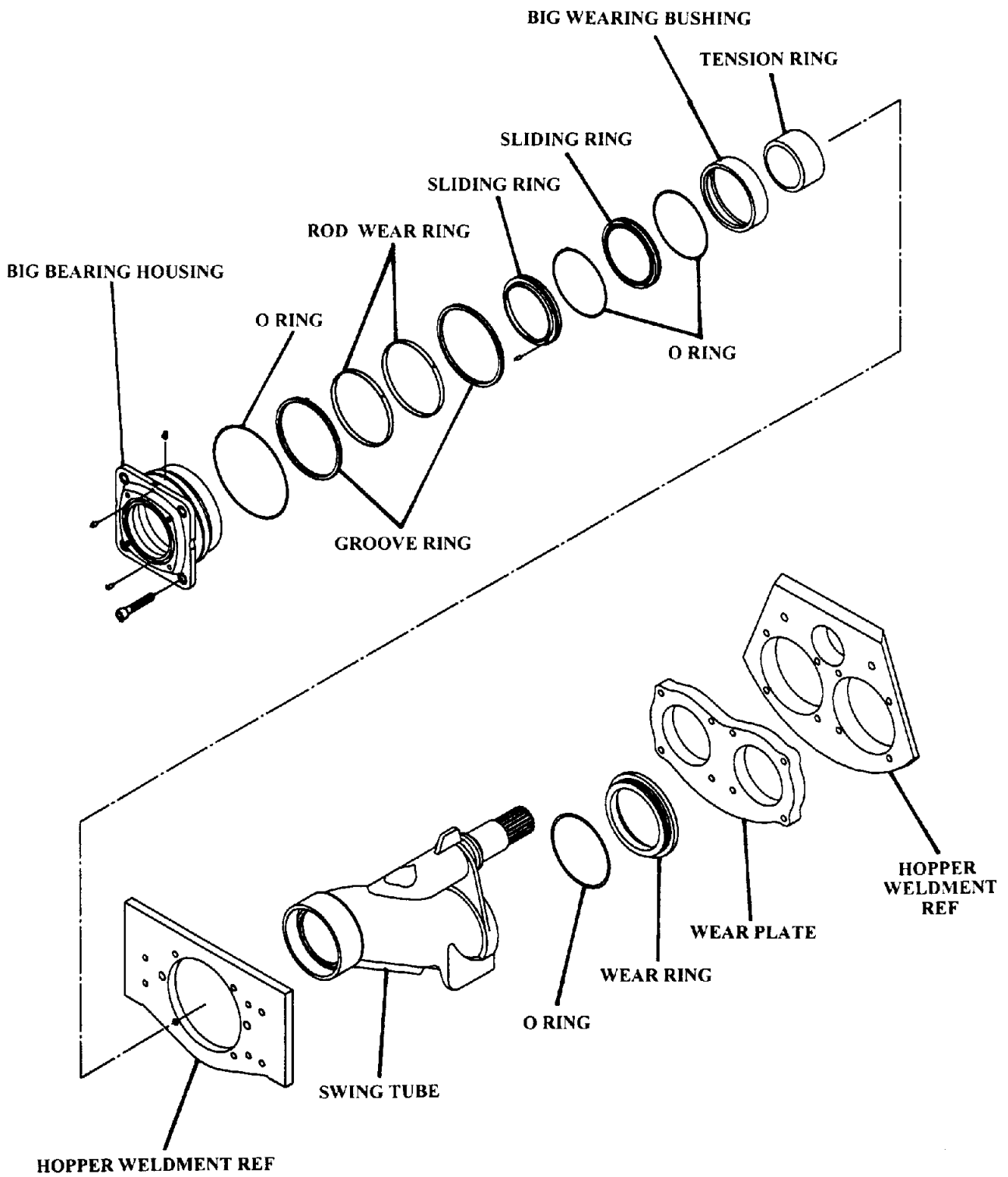
If there is a lack of the scraping noise or the swing tube shifts too freely this is usually the first indication that an adjustment is required.

To adjust the swing tube clearance:

- Turn off engine and release the accumulator pressure.
- Unfasten the retaining plate securing the lock bolt in place.
- Tighten the lock bolt approximately one-half turn.
- Start chassis engine and using the SWING switch located on chassis control panel, shift swing tube from side to side. If the scraping noise of swing tube is slight and tube shifts briskly from side to side the adjustment is correct.
- If further adjustment is necessary do so a little at a time. Do not over tighten or swing tube may bind while pumping concrete at high line pressure.
- If the swing tube hesitates or stutters during the changeover, the adjustment is too tight. Loosen lock bolt a little at a time.
- With adjustment finalized, replace retaining plate to secure lock bolt.



SWING TUBE



SWING TUBE ASSEMBLY

PROXIMITY SENSOR SETTING

As previously noted in the concrete pump hydraulic description the proximity sensor is used to send an electrical signal for the synchronizing movement of the swing tube shift.

The sensor is installed in the water box and is triggered by the passing of the material cylinder piston adapter underneath it. If the sensors are not properly adjusted erratic cycling and shifting could occur. The sensors are set at the factory to provide the maximum cylinder stroke. If for some reason it is necessary to remove the sensors or alter the setting it is recommended that the factory setting be marked or recorded for future reference before disturbing the setting.

If necessary the sensors can be adjusted as follows:

⚠ WARNING

Never make adjustments to sensors or place your hands inside water box with PTO engaged.

- The proximity sensor is mounted on a bracket on the inside of the water box. The bracket is equipped with slots enabling it to be slid forward or backward. For adjustment, loosen bolts on bracket and slide until bolts are approximately half way on the slot.
- Install outlet test piping and fill hopper with water and put water in water box.
- Start up engine and engage **PTO** and place pump direction switch to **FORWARD**. Adjust throttle control until tachometer reads approximately 1350 RPM. Adjust volume control to about 1/2 open.
- Place **PUMP** switch **ON** and listen for the material cylinder piston to reach the end of the stroke on its forward motion. If it hits hard, turn off pump and disengage **PTO**.
- Slide both sensor brackets equally back toward the hydraulic cylinder end of the water box, approximately half way between center of slot and end of slot.
- Engage **PTO** and turn pump on and recheck. If movement of piston is smooth then open volume control full on. Observe **CYL A** or **B** pressure gauge and when piston bottoms out read gauge. It should spike out to 5000 PSI (350 BAR).
- Should pressure spike differ from the above reading then the sensor needs further adjustment.

- Turn off pump and disengage **PTO**.
- If pressure spike reads:
  - HIGHER - Move bracket TOWARD the hydraulic drive cylinders.
  - LOWER - Move bracket AWAY from the hydraulic drive cylinders.
- With adjustments made retest machine as previously noted. Tighten bracket bolts when adjustment is satisfactorily made.
- When a weak signal is being sent, it is probably due to an improper gap setting.
- To check the gap between the sensor and piston adapter, start engine and engage **PTO** and with volume low, place pump on and simultaneously jog either A or B cylinder until piston adapter is under sensor. Shut off pump immediately and disengage **PTO**.
- Check gap using the spacer gauge originally provided with the machine. If gap needs adjustment loosen locknuts and adjust sensor accordingly. Retighten locknuts.
- Jog the other cylinder and check gap. Adjust as necessary.

NOTE

Due to the variances of one machine to another, it is difficult to specify how much movement or adjustment will be required. Trial and error is the best means.

MAJOR COMPONENT REPLACEMENT

It is a given fact that due to usage, improper maintenance and environmental conditions that certain parts will wear out over a period of time and will need to be replaced to continue efficient operation. When tell-tell signs indicate that a part is worn do not delay in the replacement. Continued usage with worn parts may lead to the damaging of other parts.

This section of the manual is provided to assist you in replacing the worn part. A step by step procedure is offered. Please be aware that the possibility exists your machine may be slightly different. If you find this to be the case, contact the ***REED*** Service Department. They will be pleased to assist you.

SWING TUBE & COMPONENTS

The sealing characteristics of the swing tube depends on metal to metal friction of the wear ring, located inside the swing tube, to the wear plate installed on the inside of the hopper at the material cylinders. This friction and the abrasiveness of the concrete mixes will cause wear and a breakdown of the sealing action. As this breakdown occurs, periodic adjustments to the swing tube can be made as described in the **ADJUSTMENT SECTION**. This will help to improve the sealing quality however, eventually the components will need to be replaced.

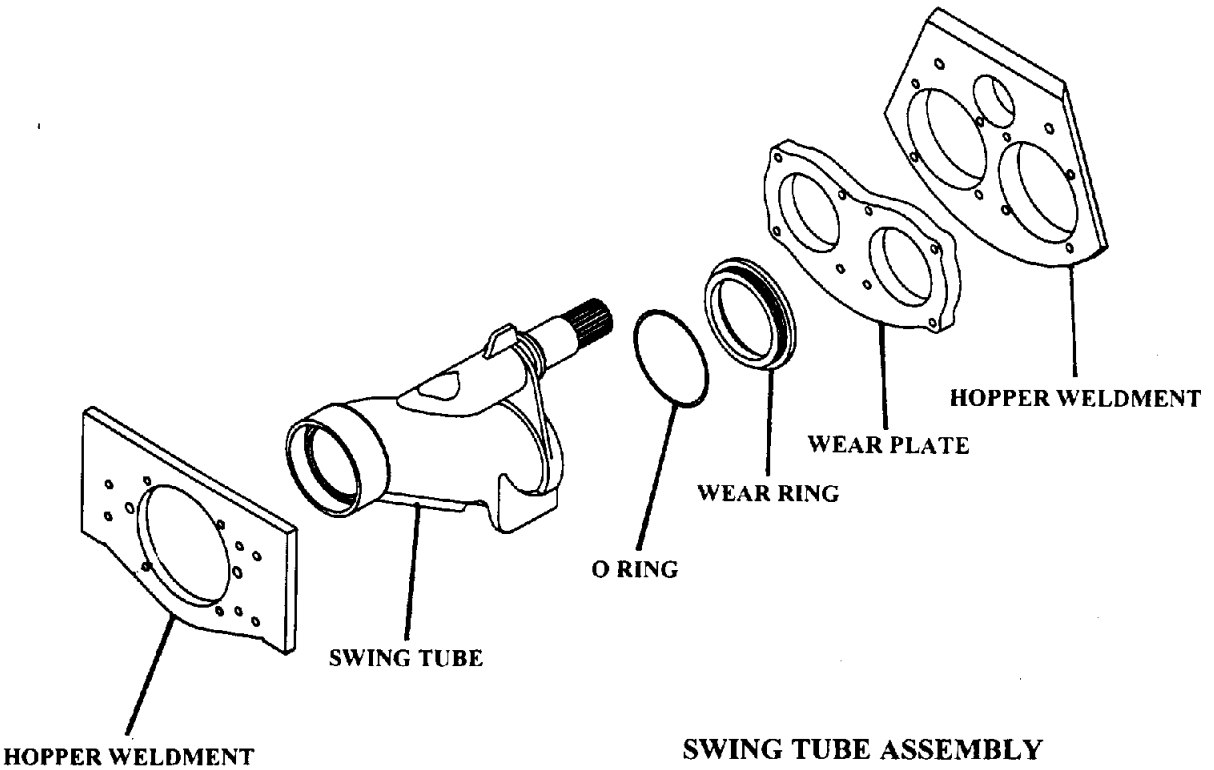
Some tell-tell signs or identifying symptoms that adjustment is needed or parts are worn might be:

- When deep grooves have developed on the face of the wear plate and/or on the wear ring.
- When the output volume at the end of the delivery line noticeably decreases or eventually stops for no apparent reason.
- When the material being pumped is being forced back into the hopper under pressure.

REPLACEMENT OF WEAR RING AND WEAR PLATE REMOVAL

- Disengage **PTO** and turn off engine to shut down the system. **BE SURE ACCUMULATOR PRESSURE IS RELEASED.**
- Remove hopper grate and disconnect vibrator.
- At shift cylinder end remove the lock bolt securing the adjusting nut. Remove adjusting nut.

- Place a sling from an overhead hoist around discharge end of swing tube to help support the tube.
- Unfasten discharge elbow clamp and remove discharge elbow.
- Unbolt outlet flange from hopper and remove being careful not to damage any of the seals and o-rings.
- Work swing tube back toward the outlet. It may be necessary to nudge it with a pry bar. **EXERCISE CARE**. Swing tube only needs to be moved toward outlet a sufficient distance to enable wear ring to be replaced.
- Remove wear ring from inside of swing tube. The wear ring is equipped with an O-ring. Make sure this is removed.
- If it is necessary to replace the wear plate this can be accomplished by backing out the mounting bolts located on outside back material cylinder end of hopper (Back out only a sufficient distance to enable wear plate to be removed). Maneuver the wear plate up through the gap between swing tube and hopper.
- Clean out the end of the swing tube where wear ring will sit. Also clean the surface of the hopper where new wear plate will be installed.



SWING TUBE ASSEMBLY

RE-ASSEMBLY

- Install O-ring onto the wear ring being careful not to stretch or nick the O-ring.
- Apply a small amount of general purpose grease on the outside area of the wear ring including the O-ring.
- Carefully install the wear ring inside the swing tube.
- Slide the new wear plate down between the swing tube and hopper. Reinstall and tighten the bolts.
- Slide swing tube forward until wear ring is set against wear plate.
- Install outlet flange assembly being careful not to damage any of the seals. Tighten bolts.
- Reinstall adjusting nut lock bolt at splined end of swing tube. Remove sling.
- Adjust the swing tube. Refer to procedure outlined in **ADJUSTMENT SECTION**.
- Once swing tube has been properly adjusted proceed to re-install hopper grill and discharge elbow.

REPLACEMENT OF SWING TUBE

REMOVAL

- Disengage **PTO** and turn off engine to shut down the system. **BE SURE ACCUMULATOR PRESSURE IS RELEASED**.
- Remove hopper grate and disconnect vibrator if equipped.
- At shift cylinder end, remove lock bolt and adjusting nut.
- Disconnect the shift cylinders from shift lever and remove shift lever from swing tube spline.
- Remove allen head screws that secure small bearing housing to hopper. Disconnect lube lines and carefully remove housing assembly.
- Disconnect discharge elbow clamp and discharge elbow.
- Unbolt outlet flange from hopper and remove being careful not to damage the seals.

- Place a sling from an overhead hoist around the swing tube to assist in removal.
- Maneuver and work the swing tube back toward the outlet as far as it will go or until the splined end of the shaft is inside the hopper.
- Using the hoist and sling, lift swing tube out of hopper with splined shaft end first.

NOTE

If after having spline shaft inside hopper and not enough room is available to lift out swing tube the following method is offered:

- Once shaft is inside hopper, rotate swing tube 180° so that splined shaft is now at the bottom of the hopper.
- Insert splined shaft into the material cylinder that has the piston in the retracted position. Exercise EXTREME CARE not to damage inside of material cylinder.
- Outlet end of swing tube should now be inside hopper and by hoisting out the outlet end first, sufficient clearance should exist to remove swing tube.

RE-ASSEMBLY

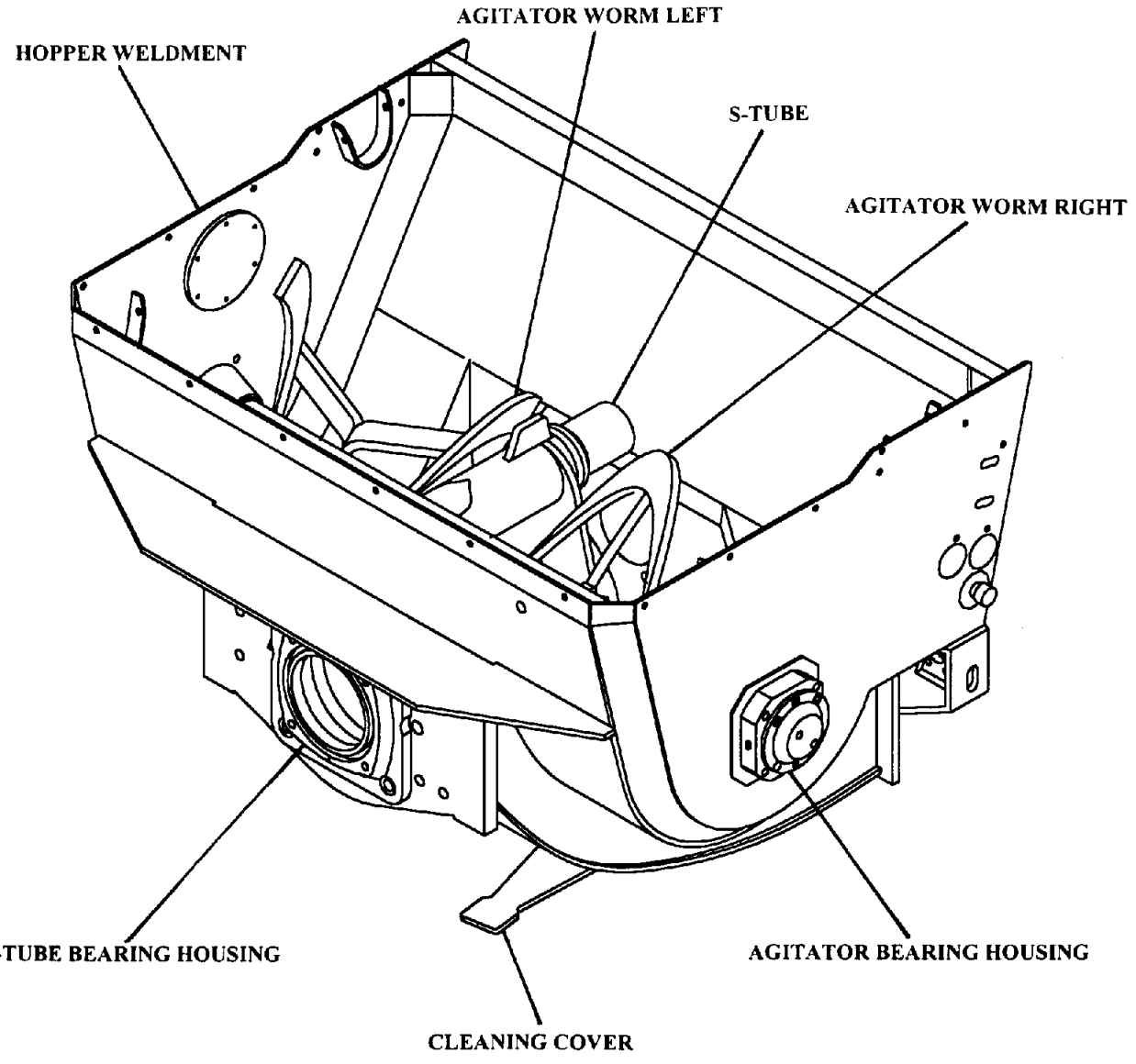
Before reassembly of the swing tube this is a good opportunity to clean out hopper of cured concrete, replace wear plate or do any maintenance on the material cylinders.

It is recommended that when the swing tube is replaced that all seals on the outlet and small bearing housing be replaced as well as any other wear items. This is a good preventative maintenance.

- Reassemble the swing tube and components in basically the reverse order used in disassembly. Some important items to be noted are:
  - Make sure all components that are to be reused are cleaned from any residual concrete or grease.
  - Inspect all parts for damage such as nicks, scratches etc.
  - Smear a small amount of clean grease on all seals, polypacks and O-rings before installing.
  - Note position and direction of seals when installing.
  - Make sure all bolts and nuts are tight.

- Make sure all bolts and nuts are tight.
- Lubricate the wear components.

- Test movement of swing tube and make necessary adjustments following the procedure noted in the **ADJUSTMENT SECTION**.



MATERIAL CYLINDER COMPONENTS

Two (2) material cylinders powered by two (2) hydraulic drive cylinders are arranged in the system to operate alternately. While one cylinder is drawing material into the cylinder tube from the hopper on the retraction stroke, the other cylinder is pushing the material out the swing tube and discharge on the forward stroke. Because of the abrasiveness of the concrete material it will be necessary to periodically replace the seal and/or piston cups.

Some tell-tell signs and identifying systems of worn parts might be:

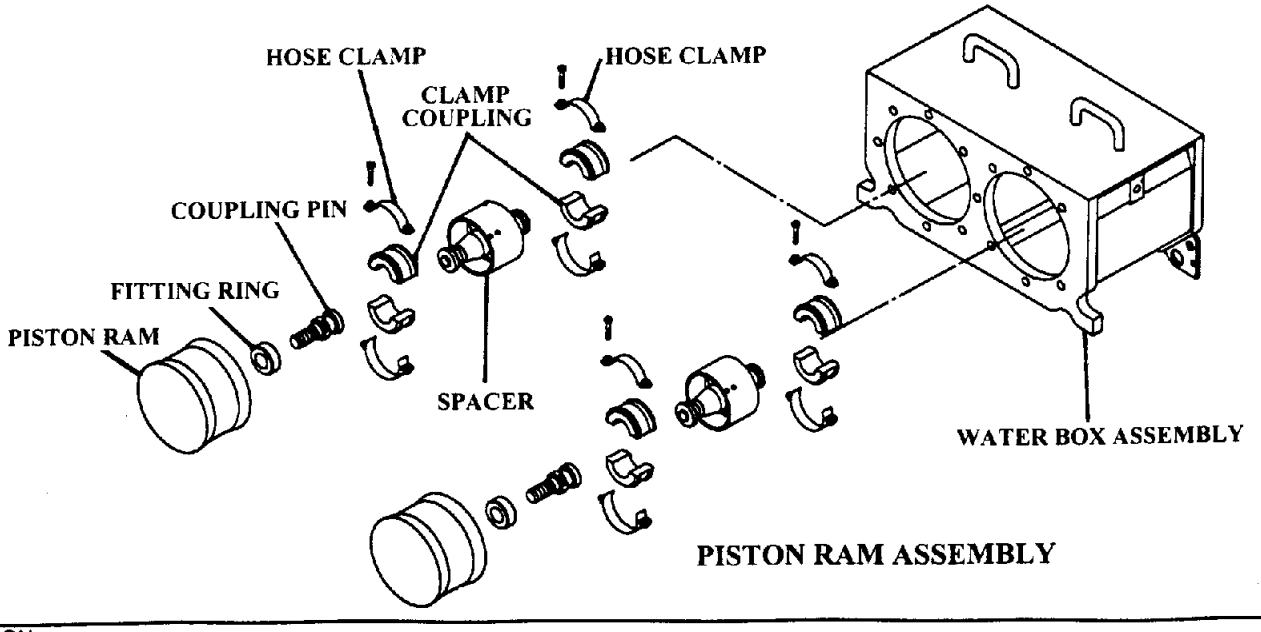
- A slurry of the material being pumped starts to appear in the water box.
- The water or lubricating oil if used begins to rapidly lower the level without any sign of leakage from the box.
- Operation of the cylinder is rough and erratic.

REPLACING THE MATERIAL CYLINDER CUPS

The following procedure involves the frequent engaging and disengagement of the **PTO** and start-up and stop of the pump. It is also advised that the **ENGINE RPM** be set at **IDLE** and that the **VOLUME CONTROL** be adjusted to a **SLOW** operation. The **"A" CYL - "B" CYL** switch located on side of chassis control panel will be used to **JOG** hydraulic drive cylinders simultaneously with **TEST** switch.

⚠ WARNING

Do not place hands in the water box or in adjacent area while PTO is engaged. Always check that the pressure in the accumulator has been released before performing any work.



REMOVAL

With water box drained, **START** engine and engage **PTO** and adjust to low RPM, set **PUMP VOLUME** at **LOW** output and place **DIRECTION** switch to **FORWARD**.

- Actuate **PUMP** switch to **ON** position until material piston of **CYL "A"** is fully retracted.
- Turn **PUMP** switch **OFF** immediately. **DISENGAGE PTO**.
- Remove the clamp and coupling that connects the spacer (dog bone) to end of hydraulic cylinder rod.
- Remove the clamp and coupling that connects the spacer - dog bone to piston coupling pin.
- Remove spacer - dog bone from the water box.
- If piston cup is badly worn it may be possible to remove the piston cup by hand by pulling it out of the cylinder tube.
- If piston cup cannot be removed by hand:
    - Engage **PTO** and actuate **PUMP** switch and simultaneously using **TEST** switch, **JOG CYL "A"** until cylinder rod touches coupling pin on piston cup.
    - Turn **PUMP** switch **OFF** immediately and **DISENGAGE PTO**.
    - Clamp cylinder rod to piston coupling pin using existing parts.
    - Place **PUMP DIRECTION** switch to **REVERSE.**
    - Engage **PTO** and actuate **PUMP** switch and simultaneously using **TEST** switch **JOG - CYL "A"** until piston cup is free of cylinder tube. Turn **PUMP** switch **OFF** immediately and **DISENGAGE PTO**.
    - Disconnect clamping and coupling pin from piston cup.

RE-ASSEMBLY

- Clean area of material cylinder tube where new piston cup will be installed.
- Apply clean general purpose grease to inside of cylinder tube.
- Install ring fitting and coupling pin to new piston cup and tighten.
- Clamp as previously noted the coupling pin and cylinder rod end.
- Place **PUMP DIRECTION** switch to **FORWARD**.
- Turning on the **PUMP** switch and using **TEST** switch and **JOG CYL "A"** switch together, carefully nudge piston cup forward until cup starts to enter cylinder tube. **STOP IMMEDIATELY**.
- Inspect fit of cup to tube to determine if properly aligned and will enter tube squarely.
- Again with pump switch **ON** and **TEST** switch, **JOG CYL "A"** until back of piston is inside and flush with cylinder tube. Stop operation.
- Remove clamp from piston cup coupling pin and cylinder rod.
- Place **PUMP DIRECTION** switch to **REVERSE**. Actuate pump switch until **CYL "A"** is fully retracted.
- Install spacer - dog bone to both piston coupling pin and cylinder rod.
- Place **PUMP DIRECTION** switch to **FORWARD** and actuate pump switch with **TEST** switch and **CYL "A" JOG** switch and observe stroke.

Repeat procedure for removal and reassembly of **CYL "B"** piston cup.

NOTE

When both piston cups have been installed and before cycling pump fill water box with water.

ACCUMULATOR

It was noted in the **S-TUBE SHIFT CIRCUIT** description that the S-tube must shift alternately from one cylinder to the other in a synchronized operation. In addition this shift must be almost simultaneously. This instant pressure and volume cannot be provided by the system itself. To compensate for this an accumulator is used.

This is made up with an outer shell or tank, a rubber bladder installed inside the shell, a gas valve with port on top of the shell and a fluid port at the bottom of the shell complete with the necessary valves and seals.

To successfully work in the system and do the job intended the accumulator must first be pre-charged. This operation involved the induction of **DRY NITROGEN GAS** into the bladder to a pressure of 1250 PSI (87.5 BAR). This pressure will vary with each machine. Check the specifications noted in **HYDRAULIC DESCRIPTION SECTION** of the appropriate manual. This gas is inserted prior to installation of the accumulator and is used to inflate the bladder much like a balloon.

In operation of the accumulator in the hydraulic system, hydraulic fluid enters the accumulator through the fluid port and fills the area at the bottom between the inner wall of the shell and bladder. The hydraulic fluid enters at a higher pressure, 2500 PSI (175 BAR) than the gas pressure inside the bladder. At the appropriate time in the pump cycle, the unloading valve of the shift circuit opens, allowing the fluid in the accumulator to be discharged and is directed to the shift cylinder. As soon as the fluid is dispersed the accumulator is refilled. This cycle is repeated time after time.

The accumulator is a critical component in the pump operation and at some point in time it will be necessary to service the accumulator which might involve recharging with nitrogen, maintenance or bladder replacement. The following is offered to assist you in accomplishing this repair.

⚠ WARNING

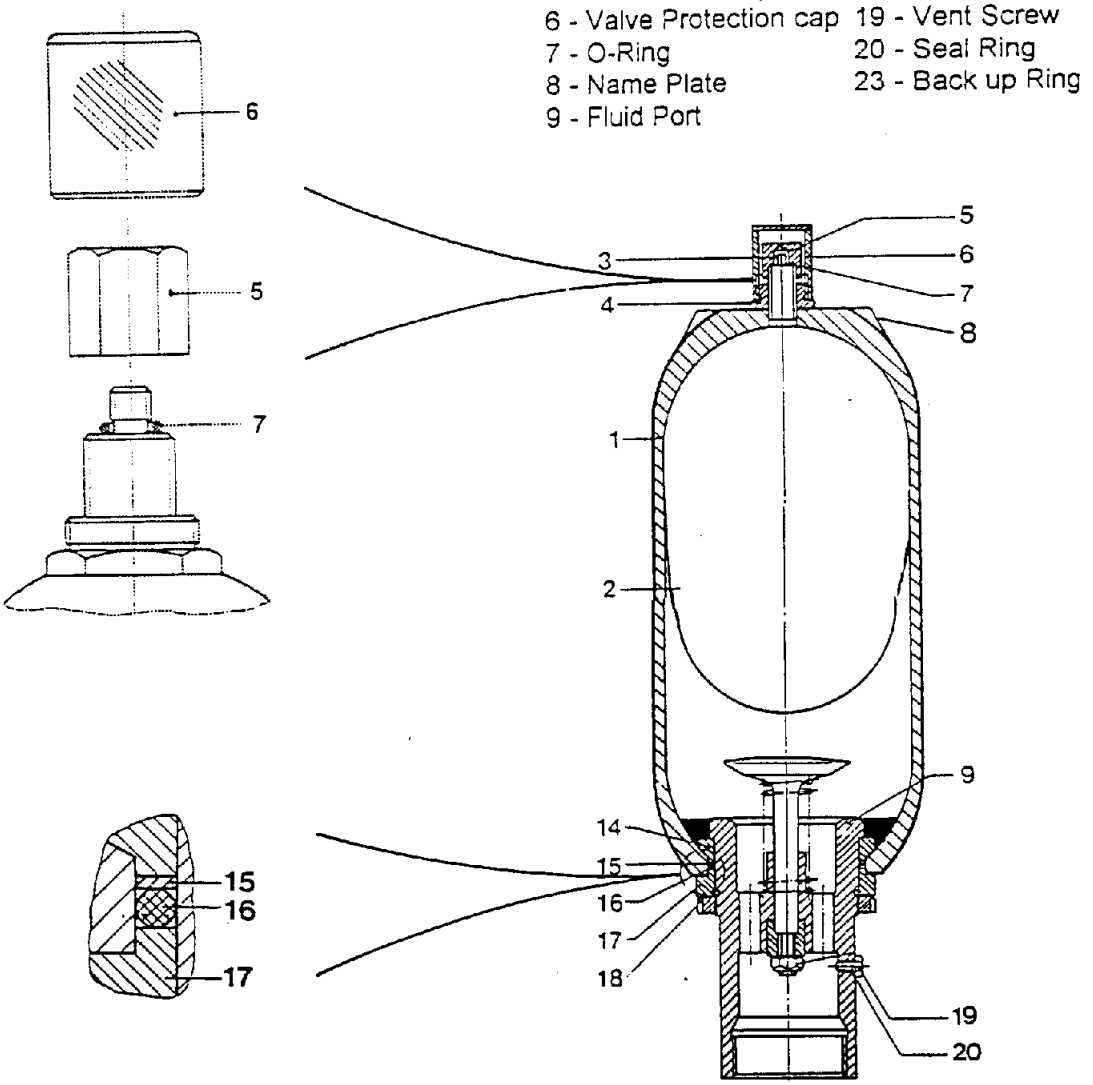
The hydraulic accumulator is PRESSURIZED VESSEL and only QUALIFIED TECHNICIANS should perform the necessary repairs. Always drain the fluid COMPLETELY from the accumulator before performing any work on the component.

We recommend the following special tools to be on hand to facilitate any work being done on the accumulator:

- Charging & Gauge Unit
- Gas Valve Core Tool
- Spanner Wrenches
- Bladder Pull Rod
- Sockets 27mm & 36mm
- Blunt Flathead Screwdriver
- Soft Faced Hammer
- Torque Wrenches

ACCUMULATOR PART FAMILIARIZATION

1 - SHELL
2 - Bladder
3 - Gas Valve Core
4 - Lock Nut
5 - Valve Seal Cap
6 - Valve Protection cap
7 - O-Ring
8 - Name Plate
9 - Fluid Port
14 - Anti ext Ring
15 - Flat Ring
16 - O-Ring
17 - Spacer Ring
18 - Locknut
19 - Vent Screw
20 - Seal Ring
23 - Back up Ring



PRE-CHARGE PRESSURE

Pre-charge pressure as it relates to the accumulator is the insertion of dry nitrogen gas into the bladder, prior to installation or use. On a new machine the accumulator is pre-charged at the factory. When a replacement is shipped from the factory it is **NOT PRE-CHARGED** unless shipped by over land or ground. A charged accumulator is a pressurized vessel thus it is against the law to ship by **AIR FREIGHT**.

Periodically due to usage or leakage the bladder may loose some of the pre-charge which does affect the operation of the accumulator. As a result it is important that the pressure be checked at least once a year or when there is a noticeable change in the operation. The following is offered to assist you in servicing the accumulator.

NOTE

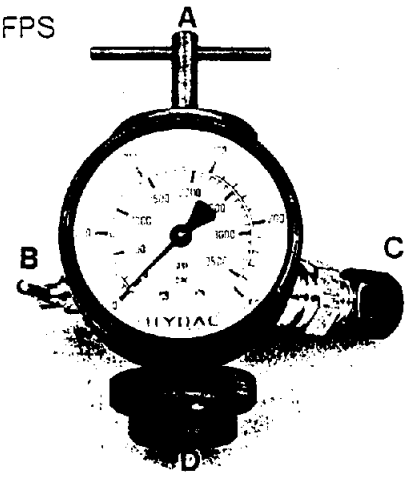
A Charging and Gauge Kit is required to perform maintenance on the accumulator. It is available from the REED Parts Department and you will find that it to be a good investment for your workshop.

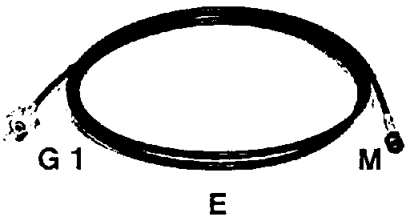
CHECKING PRESSURE

Prior to checking of the accumulator pre-charge pressure the machine must be shut-down and all hydraulic pressure and fluid in the accumulator has been relieved.

- Unscrew the valve protection cap #6 and valve seal hex cap #5. Exercise extreme care not to damage the O-ring #7 when removing the cap.

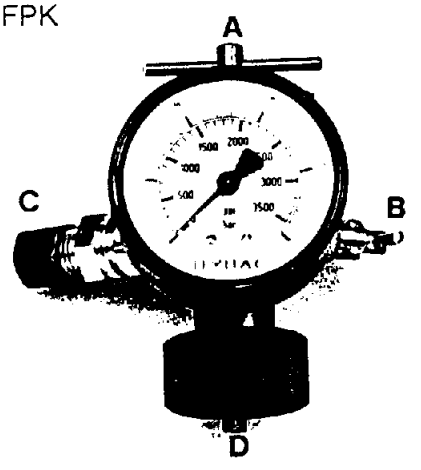
FPS





A) T-handle
B) manual bleed valve
C) check valve
D) cap nut
E) charging hose, including cap screw connections G1 and M

FPK



- Before making the installation of the gauge unit to the accumulator, turn the **"T"** handle counterclockwise until some resistance is felt. Check that the manual bleed valve is closed. It not close hand tight.

- Install gauge unit on the accumulator by screwing the cap nut onto the gas valve. Hand tighten.
- Proceed to turn T-handle clockwise a maximum of 3 full turns from the full counterclockwise position.
- The gauge should then indicate the pre-charge pressure. Refer to specifications for correct pressure:
    - If pressure reading is **TOO LOW** then accumulator will need **RECHARGED**.
    - If pressure is **TOO HIGH** then it will be necessary to **RELEASE** pressure.

RELEASE OF PRESSURE

When gauge indicates that the pre-charge pressure is too high proceed as follows to release some of the pressure within bladder.

- With gauging valve installed, carefully open the **MANUAL BLEED** valve, releasing some of the nitrogen gas.
- While doing this observe gauge until sufficient gas has been released and desired pressure has been reached.
- Close the manual bleed valve. Wait approximately 10 minutes for the pressure to stabilize, then recheck and if necessary adjust accordingly.
- To remove the gauging unit, turn T-handle until resistance is felt to close the gas valve. Open manual bleed valve.
- Disconnect the gauging unit by unscrewing the cap from the gas valve. Replace valve seal hex cap and tighten to 18 lb. ft. Screw on valve protection cap, hand tight.

INCREASE PRE-CHARGE PRESSURE

In checking the pre-charge pressure if it is found to be too low then add nitrogen gas as follows:

- Install gauging unit as previously described. Turn T-handle clockwise until needle on gauge begins to move then from this point turn it another full turn.

⚠ WARNING

USE DRY NITROGEN GAS ONLY - NEVER USE OXYGEN OR AIR. THIS COULD CAUSE AN EXPLOSION.

- Connect the charging hose to the cap screw adapter and to the nitrogen bottle discharge. It is recommended that the commercial nitrogen bottle be equipped with a regulator to adjust pressure. Full pressure may damage gauge.
- Open the shut-off on the nitrogen bottle and slowly fill the accumulator. Charging too quickly may damage the accumulator.

NOTE

The gauge on the gauging unit during pre-charge registers the incoming line pressure and not necessarily the accumulator pressure while charging.

- The accumulator pressure can be checked by first closing the shut-off valve on nitrogen bottle.
- Allow a few minutes for the temperature and pressure in the accumulator to stabilize.
- Check the accumulator pressure as previously described, then fill or release pressure as required.
- Close shut-off valve on the nitrogen bottle. Turn T-handle counterclockwise to close gas valve.
- Open bleed valve, disconnect charging hose and remove gauging unit from accumulator. Reinstall hex cap and protective cap.

REPLACING THE ACCUMULATOR BLADDER

Because of the continuous inflation-deflation of the bladder, it is not uncommon that replacement of the bladder will be required. It is not difficult but time consuming as extra care must be exercised in disassembly-reassembly so as not to damage good reusable parts. The following is offered as suggested means of accomplishing bladder replacement.

DISASSEMBLY - Refer to Parts Identification page

- Remove the hydraulic connection at the base of the accumulator or at the fluid port. Then remove the mounting brackets.
- Place the accumulator in a vice or secure it to your work bench.
- Install the gauging unit to the accumulator after turning the T-handle counterclockwise until a resistance is felt. Also close manual bleed valve, hand tight.

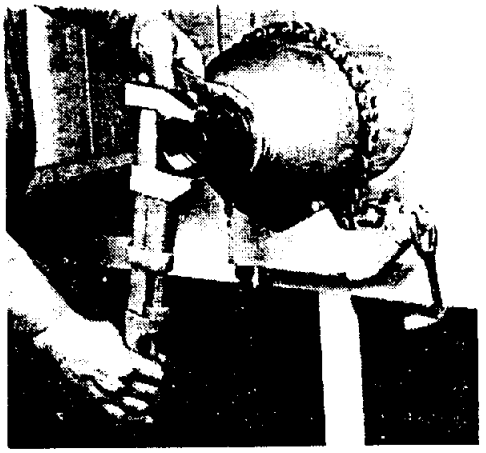


Photo A

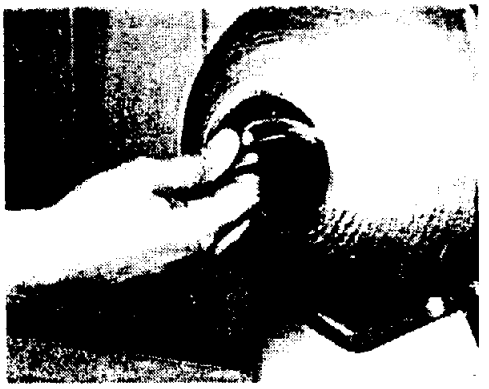


Photo C

Photo B

Photo D

Photo E

Photo F

- After gauging unit has been installed, turn T-handle clockwise a maximum of 3 full turns from the full closed position. The gauge will indicate the existing precharge pressure.
- Release the pressure by carefully opening the manual bleed valve. Remove gauging unit from accumulator.
- Using the core tool contained in the accumulator repair kit, remove the valve core #3 of the bladder.
- At the bottom of the accumulator, remove vent screw #19 and seal ring #20.
- Use a spanner wrench to remove lock nut #18 then remove the spacer ring #17.
- Loosen the fluid port #9 and push it into the shell. Remove the back-up ring #23, O-ring #16 and flat ring #15 from the fluid port.
- Pull anti-extrusion ring #14 off the fluid port and by folding the ring in half remove it through the fluid side opening.
- Remove the fluid port #9.
- At the top of the accumulator remove locknut #4.
- From the fluid side remove the bladder #2. It may be necessary to fold the bladder lengthwise to remove it.

REASSEMBLY

Before proceeding to reassemble the accumulator it is recommended that the various parts be inspected for wear and damage. Replace as required. Also make sure that all parts are clean in particular the interior of the accumulator shell. To reassemble:

- Prepare replacement bladder for installation by removing the valve seal cap #5 and gas valve core #3. Press all residual air from bladder.
- Lubricate interior of shell and exterior of bladder with clean hydraulic fluid, Shell Tellus #46.
- Take the bladder pull rod from the kit. Put locknut #4 over the pull rod. Be sure male threads on locknut face the full rod handle.
- Insert the pull rod from top of accumulator through the shell with threaded connection toward fluid side.

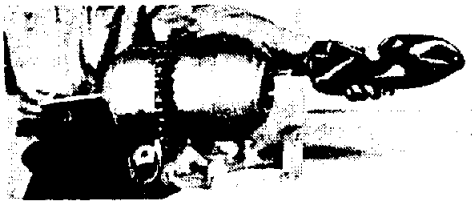


Photo G

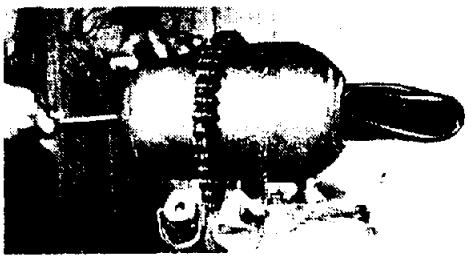


Photo H

- Thread pull rod onto bladder gas valve. Fold bladder in half lengthwise and again if necessary so that it can be easily inserted.
- Pull the rod through the top until gas valve emerges. Loosely attach locknut $4 to gas valve to prevent bladder from slipping back into shell. Remove rod from gas valve.
- Install gas valve core #3 and torque to 0.4 lb ft (0.5Nm).
- Insert fluid port #9 into shell. Exercise extreme care not to damage threads and O-ring. Make sure bladder is fully extended within shell.
- Fold anti-extrusion ring #14 in half and insert into shell with steel seat facing the fluid side opening. To do this push fluid port further into shell and then pull it back through the middle of the extension ring.

- Slightly pull on the fluid port to prevent it from falling back into the shell while inserting the seals.

- Assemble items #15 flat ring, #16 O-ring. #23 back-up ring, #17 spacer ring, #18 locknut in that order.

- Insert flat ring #15 into space between fluid port and shell. If it does not slide on properly recenter fluid port in the opening.

- Next insert O-ring #16, by pressing gently with a blunt flathead screwdriver (with rounded edges) at 90° intervals. Carefully level O-ring onto seat.

- Where applicable insert back-up ring #23 over O-ring with grooved surface towards O-ring.

- Insert spacer ring #17 with "lip" placed in the shell. Thread on locknut #18 and torque using spanner wrench. Place seal ring #20 on vent screw #19 and install in fluid port.

- On top side of accumulator, remove loosely attached locknut #4 and install nameplate. Install locknut and tighten.

- Install charging and gauging kit and pre-charge with **DRY NITROGEN GAS** as previously described.

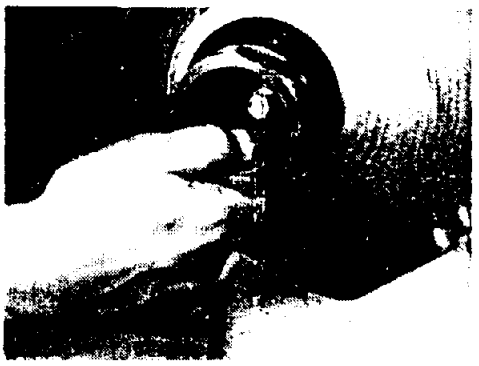


Photo I

Photo J

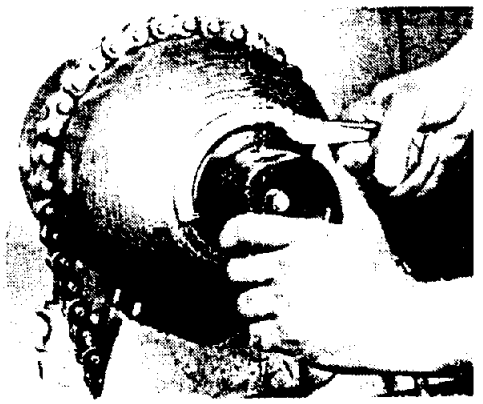


Photo K