

JAMES BRINKLEY COMPANY, INC.

GUILLOTINE ROLL SPLITTER
OPERATION INSTRUCTIONS
MANUAL TYPE

The guillotine has been completely assembled, tested and operated in our shop in Seattle, using Unocal UNAX-AW-32-WR-RIB hydraulic fluid. Check the fluid level in the tank prior to starting the electric motor.

CAUTION: DO NOT OPERATE THE MOTOR ROTATING INCORRECTLY FOR LONGER THAN NECESSARY TO JOG FOR ROTATION. THE PUMP IS LUBRICATED BY THE HYDRAULIC FLUID AND REVERSE ROTATION OPERATES THE PUMP DRY, WHICH WILL DAMAGE THE PUMP.

Jog the pump motor for rotation. The correct rotation is stamped on the top of the pump. After checking for rotation, immediately operate the valve and the knife should move up or down. If it does not immediately operate, it indicates that the pump is not primed with oil. Should this happen, the discharge connection to the pump should be broken so there is no back pressure, after which, the pump will quickly prime itself.

The main relief is set for 3000 PSI. The maximum recommended operating pressure is 3000 PSI. Do not set the relief valve higher than this pressure.

CAUTION: HYDRAULIC SYSTEM OPERATES AT 3000 PSI. DO NOT BREAK THE HYDRAULIC LINES WITH THE POWER UNIT CONNECTED TO POWER.

When the valve is in the "down" or cutting position, oil pressure is introduced to the top of the cylinder, giving maximum downward force at low speed. In the "up" position, oil is introduced to both the upper and lower port of the cylinder so that displacement of the rod only causes the upward motion which is very rapid. When the valve is in the neutral position, there is not back pressure on the pump and the gauge will show no appreciable pressure until the cylinders are operated.

In order to comply with OSHA standards, the momentary run button for the hydraulic pump motor starter is a momentary contact pushbutton and must be wired in such a manner that the button must be held to run the power unit. Therefore, to operate the unit, one hand must be on the button and one hand on the hydraulic valve to operate the knife.

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Upper cylinder attachment bolts are intentionally too long so that the upper cylinder mounting pad is not pulled down to its base, but is free to move. This avoids misalignment stresses on the piston rod. DO NOT TRY TO FIRMLY BOLT FLUSH THIS TOP ATTACHMENT. KEEP THE CYLINDER RODS CLEAN IN DIRTY ENVIRONMENTS TO AVOID ROD SEAL FAILURE.

Included in the book are instruction sheets from the manufacturer on the various items of equipment which give complete maintenance and operating information.

For best operation, the knife should be as sharp as possible and it is very desirable to immediately order a spare set of knives which can be kept sharp and ready for operation. Knives are through hardened and can be resharpened indefinitely if the proper equipment is used. A shop with special grinding equipment should be used as the knife material is very hard.

CAUTION: THE KNIVES USED IN THE GUILLLOTINE ARE VERY SHARP. CARE MUST BE TAKEN IN HANDLING THEM AND THEIR EDGES GUARDED WHILE THEY ARE BEING HANDLED.

CAUTION: THE KNIFE GUIDING MECHANISM IS DESIGNED TO WITHSTAND A CERTAIN AMOUNT OF OFF-CENTER LOADING BUT IT IS VERY DESIRABLE TO PUT THE PAPER ROLL AS CLOSE TO THE CENTER AS POSSIBLE AS THIS PUTS THE MINIMUM OF STRAIN ON THE FRAMEWORK.

The brass guides may be lubricated occasionally with grease to avoid galling or sticking. A #2 grease is satisfactory for this purpose. In dirty environments, this greased area should be cleaned frequently or greasing avoided to avoid abrasion.

CAUTION: THE BRASS GUIDES ARE DESIGNED TO RESTRAIN OFF-CENTER LOADING BUT WEAR WILL OCCUR IN THE GUIDES OVER TIME. EXCESSIVE GUIDE WEAR IS UNDESIRABLE AND MAY RESULT IN EXCESS STRAIN ON THE FRAMEWORK. DO NOT OPERATE THE GUILLLOTINE WITHOUT GUIDES IN PLACE. REPLACE WORN GUIDES PROMPTLY.

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JAMES BRINKLEY COMPANY, INC.

GUILLLOTINE ROLL SPLITTER
OPERATION INSTRUCTIONS
MANUAL TYPE WITH BELT CONVEYOR

CAUTION: THIS SECTION SHOULD BE READ IN ADDITION TO THE INSTRUCTIONS FOR A MANUAL TYPE SPLITTER.

The belt conveyor table is shipped disassembled because of its size. It has been shop assembled. The conveyor belt is shipped loose and must be assembled by field vulcanizing the belt. Make sure the fabric (red) side is down on the deck. A screw type takeup is provided. Take the belt up evenly. Do not overtighten the belt.

The belt conveyor is powered by a separate electric motor, driving a reducer which in turn drives the drive pulley. The reducer must be lubricated in accordance with the manufacturer's instructions enclosed. Conveyor pulley bearings are grease lubricated and must be lubricated in accordance with the manufacturer's instructions enclosed. Check the belt training mechanism to make sure the rollers turn freely and the mechanism itself turns freely.

Belt conveyor controls are momentary contact pushbuttons operating the conveyor job forward and jog reverse, so that cut rolls may be further cut into sections and then fed into the pulper.

CAUTION: DO NOT OPERATE THE BELT CONVEYOR UNLESS THE GUILLLOTINE KNIFE IS RAISED TO CLEAR PAPER ON THE BELT. DO NOT WALK ON THE BELT UNLESS THE GUILLLOTINE AND BELT CONVEYOR ARE DISABLED.

The belt conveyor pull cord switches should be wired in series with the belt conveyor and hydraulic power unit drive motors to stop them if pulled.

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GUILLOTINE SAFETY PROCEDURES

CAUTION: Before performing any maintenance on the guillotine:

1. Lower the knife to the stops or place 6 x 6 timbers on each side of the anvil or deck to stop the knife holder, or crosshead, at the edges beyond the knife.
2. Lower the crosshead to engage these timbers or the stops
3. Lower the roll lift or table to the floor (if present)
4. Lower the adjustable roll stop to its stops and close the air valve (if present)
5. Stop all motors and make sure all motors are locked out and tagged

HYDRAULIC SAFETY LOCKS

CAUTION: Before working on the hydraulic system:

The knife holder, or crosshead, and lift or tilt tables are held in place by:

1. The lever operated valve, or solenoid valve, ports for the knife or crosshead are plugged in the neutral (non operating) position. The knife will not move with power off if the valve is operated.
2. The crosshead is held up by Sun counterbalance valves piped at the lower port of each cylinder. The valves are closed and hold the cylinder in place unless hydraulic pressure is applied to their pilot. These valves remain closed when the power is off or a hose is broken. Do not remove these valves until the crosshead is blocked up.
3. Lift and tilt table cylinders are provided with flow fuses on their lower tilt ports which prevent free fall if a hose breaks. The lift or table lever operated valve will lower the table if power is off.

GUILLOTINE SAFETY PROCEDURES & HYDRAULIC SAFETY LOCKS
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4. Operate the lever operated valves up and down to relieve line pressure.

Disconnecting hydraulic components may defeat these safety locks. Check the Hydraulic Schematic or call James Brinkley if you have questions.

DANGER: THE HYDRAULIC SYSTEM WILL RETAIN SOME TRAPPED PRESSURE IN THE LINES AT SOME POINTS. ESPECIALLY FROM THE VALVE TO THE RETURN CHECK. EXERCISE CARE IN DISASSEMBLY.

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KNIFE CHANGE PROCEDURE

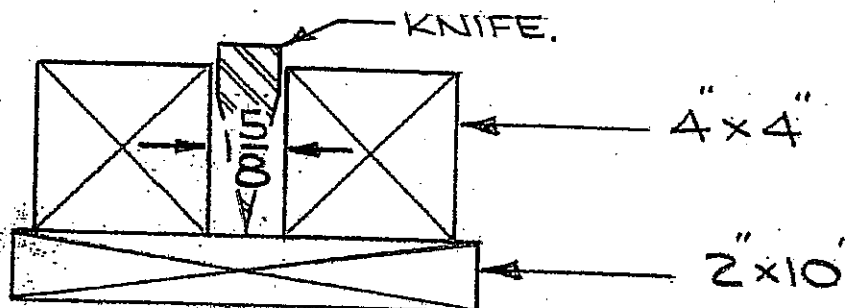
WARNING: GUILLOTINE KNIVES ARE EXTREMELY SHARP. MAKE SURE EDGES ARE GUARDED WHILE HANDLING. BAND HEAVY CARDBOARD OVER THE EDGE PRIOR TO HANDLING OR REMOVAL.

Replacement knives are shipped in wooden boxes. The edges are guarded with heavy cardboard banded around the knife, as shipped from the factory. Leave the guarding on the knife during installation. Knives are heavy and must be carefully handled. Dropping knives, or otherwise impacting the edge, may chip or break the knives as the material is very hard.

Knives are made of through hardened chipper steel so they may be resharpened. This must be done with the proper grinding equipment to provide a uniform, sharp edge.

To change knives, we suggest the fixture shown in figure 1 be built for each individual knife.

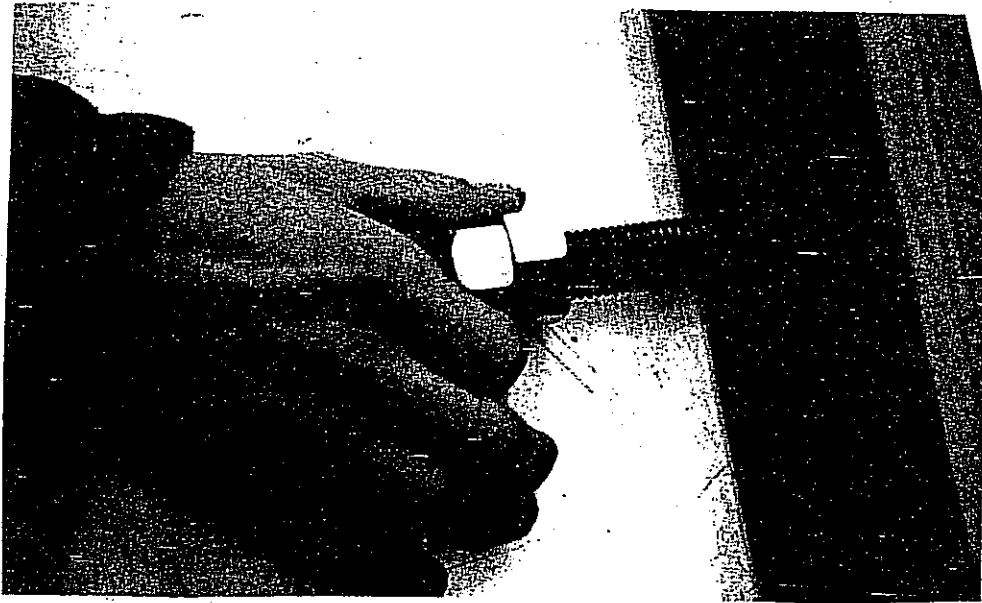
FIGURE 1: KNIFE CHANGE FIXTURE - provide one (1) fixture for each knife. Length is that of each knife.



Set these fixtures under the crosshead. To remove the knife, lock the guillotine motor out, guard the sharp edge with heavy cardboard taped to the knife. Undo the nuts in the crosshead 1/8" and band the cardboard in place.

To remove the dull knife, align the fixtures under each knife. Lower the crosshead to a convenient height, setting knives in the fixtures, then remove the nuts holding the knife studs to the crosshead. The fixtures holding the knives can be removed to change the knives.

FIGURE 2: STUD WITH DOUBLE NUT



Secure the fixtures to a working surface. The studs can be removed by double nutting. Carefully note the stud extension prior to removal so that the studs can be reinstalled to the same length. This is normally a 2" extension. Take care not to damage the threads during removal. If they are damaged, run a die over them.

Open the boxes containing the replacement knives and remove the replacement knife. Return the used knives to the boxes and set the guarded replacement knives in fixtures.

CAUTION: DO NOT HANDLE OR SHIP KNIVES OUTSIDE THE WOODEN BOXES PROVIDED.

Double nut the studs and tighten them into the knives to the correct length. Check to make sure the studs are true and properly spaced. If not, call Brinkley.

Set the fixtures on the anvils under the crosshead, carefully aligning the studs with the holes. Stud diameter is $7/8$ " and hole diameter is $15/16$ ". Lower the crosshead over the studs and make sure the knives are aligned and have no gaps. Tighten the nuts firmly. Carefully remove the cardboard guarding the edge.

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Safety Guide for Selecting and Using Hose, Fittings, and Related Accessories

Parker Publication No. 4400-B.1
Revised: June, 1994



DANGER: Failure or improper selection or improper use of hose, fittings, or related accessories can cause death, personal injury and property damage. Possible consequences of failure or improper selection of improper use of hose, fittings, or related accessories include but are not limited to:

- * Fittings thrown off at high speed.
- * High velocity fluid discharge.
- * Explosion or burning of the conveyed fluid.
- * Electrocution from high voltage electric power lines or other sources of electricity.
- * Contact with suddenly moving or falling objects that are to be held in position or moved by the conveyed fluid.
- * Dangerously whipping hose.
- * Contact with conveyed fluids that may be hot, cold, toxic or otherwise injurious.
- * Sparking or explosion caused by static electricity buildup.
- * Sparking or explosion while paint or flammable liquid spraying.

Before selecting or using any Parker hose or fittings or related accessories, it is important that you read and follow the following instructions:

1.0 GENERAL INSTRUCTIONS

- 1.1 **Scope:** This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) hose (including all rubber and/or plastic products commonly called "hose" or "tubing"), fittings (including all products commonly called "fittings" or "couplings" for attachment to hose), and related accessories (including crimping and swaging machines and tooling). This safety guide is a supplement to and is to be used with the specific Parker publications for the specific hose, fittings and related accessories that are being considered for use.
 - 1.2 **Fall-Safe:** Hose and hose assemblies can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the hose or hose assembly will not endanger persons or property.
 - 1.3 **Distribution:** Provide a copy of this safety guide to each person that is responsible for selecting or using hose and fitting products. Do not select or use hose and fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
 - 1.4 **User Responsibility:** Due to the wide variety of operating conditions and uses for hose and fittings, Parker and its distributors do not represent or warrant that any particular hose or fitting is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
 - Making the final selection of the hose and fitting.
 - Assuring that the user's requirements are met and that the use presents no health or safety hazards.
 - Providing all appropriate health and safety warnings on the equipment on which the hose and fittings are used.
 - 1.5 **Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, for telephone numbers of the appropriate technical service department.
- ## 2.0 HOSE AND FITTING SELECTION INSTRUCTIONS
- 2.1 **Electrical Conductivity:** Certain applications require that a hose be nonconductive to prevent electrical current flow. Other applications require the hose to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting hose and fittings for these or any other applications in which electrical conductivity or nonconductivity is a factor.

For applications that require hose to be electrically nonconductive, including but not limited to applications near high voltage electric lines, only special nonconductive hose can be used. The manufacturer of the equipment in which the non-conductive hose is to be used must be consulted to be certain that the hose and fittings that are selected are proper for the application. Do not use any Parker hose or fitting for any such application requiring nonconductive hose, including but not limited to applications near high voltage electric lines, unless (i) the application is expressly approved in the Parker technical publication for the product, (ii) the hose is both orange color and marked "nonconductive," and (iii) the manufacturer of the equipment on which the hose is to be used specifically approves the particular Parker hose and fitting for such use.

The electrical conductivity or nonconductivity of hose and fittings is dependent upon many factors and may be susceptible to change. These factors include but are not limited to the various materials used to make the hose and the fittings, manufacturing methods (including moisture control), how the fittings contact the hose, age and amount of deterioration of damage or other changes, moisture content of the hose at any particular time, and other factors.

Parker manufactures a special hose for conveying paint in airless paint spraying applications. This hose is labeled "Electrically Conductive Airless Paint Spray Hose" on its layline and on its packaging. This hose must be properly connected to Parker fittings and properly grounded in order to dissipate dangerous static charge buildup which occurs in all airless paint spraying. Do not use any other hose, even if electrically conductive, for airless paint spraying. Use of any other hose or failure to properly connect the hose can cause a fire or an explosion resulting in death, personal injury, and property damage.
 - 2.2 **Pressure:** Hose selection must be made so that the published maximum recommended working pressure of the hose is equal to or greater than the maximum system pressure. Surge pressures in the system higher than the published maximum recommended working pressure will cause failure or shorten hose life. Do not confuse burst pressure or other pressure values with working pressure and do not use burst pressure or other pressure values for this purpose.
 - 2.3 **Suction:** Hoses used for suction applications must be selected to insure that the hose will withstand the vacuum and pressure of the system. Improperly selected hose may collapse in suction application.
 - 2.4 **Temperature:** Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the hose. Temperatures below and above the recommended limit can degrade hose to a point where a failure may occur and release fluid. Care must be taken when routing hose near hot objects (e.g. manifolds) to properly insulate and protect the hose.
 - 2.5 **Fluid Compatibility:** Hose selection must assure compatibility of the hose tube, cover, reinforcement, and fittings with the fluid media used. See the fluid compatibility chart in the Parker publication for the product being considered or used. This information is offered only as a guide. Actual service life can only be determined by the end user by testing under all extreme conditions and other analysis.
 - 2.6 **Permeation:** Permeation (that is, seepage through the hose) will occur from inside the hose to outside when hose is used with gases, liquid and gas fuels, and refrigerants (including but not limited to such materials as helium, fuel oil, natural gas, or R-134a). This permeation may result in high concentrations of vapors which are potentially flammable, explosive, or toxic, and in loss of fluid. Dangerous explosions, fires, and other hazards can result when using the wrong hose for such applications. The system designer must take into account the fact that this permeation will take place and must not use hose if this permeation could be hazardous. The system designer must take into account all legal, government, insurance, or any other special regulations which govern the use of fuels and refrigerants. Never use a hose even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the hose assembly.

Permeation of moisture from outside the hose to inside the hose will also occur in hose assemblies, regardless of internal pressure. If this moisture permeation would have detrimental effects (particularly but not limited to refrigeration and air conditioning systems), incorporation of sufficient drying capacity in the system or other appropriate system safeguards should be selected and used.

- 2.7 **Size:** Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep pressure losses to a minimum and avoid damage due to heat generation or excessive fluid velocity.
- 2.8 **Routing:** Attention must be given to optimum routing to minimize inherent problems (kinking or flow restriction due to hose collapse).
- 2.9 **Environment:** Care must be taken to insure that the hose and fittings are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, sunlight, heat, ozone, moisture, water, salt water, chemicals, and air pollutants can cause degradation and premature failure.

(Continued)

- 2.10 Mechanical Loads:** External forces can significantly reduce hose life or cause failure. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type fittings or adapters may be required to insure no twist is put into the hose. Unusual applications may require special testing prior to hose selection.
- 2.11 Physical Damage:** Care must be taken to protect hose from wear, snagging and cutting, which can cause premature hose failure.
- 2.12 Proper End Fitting:** See instructions 3.2 through 3.5 below. These recommendations may be substantiated by testing to industry standards such as SAE J517.
- 2.13 Length:** When establishing a proper hose length, motion absorption, hose length changes due to pressure, and hose and machine tolerances must be considered.
- 2.14 Specifications and Standards:** When selecting hose and fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.
- 2.15 Hose Cleanliness:** Hose components may vary in cleanliness levels. Care must be taken to insure that the assembly selected has an adequate level of cleanliness for the application.
- 2.16 Fire Resistant Fluids:** Some fire resistant fluids require the same hose as petroleum oil. Some use a special hose, while a few fluids will not work with any hose at all. See instructions 2.5 and 1.5. The wrong hose may fail after a very short service. In addition, all liquids but pure water may burn fiercely under certain conditions; and even pure water leakage may be hazardous.
- 2.17 Radiant Heat:** Hose can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the hose.
- 2.18 Welding and Brazing:** Heating of plated parts, including hose fittings and adapters, above 450°F (232°C) such as during welding, brazing, or soldering may emit deadly gases.
- 2.19 Atomic Radiation:** Atomic radiation affects all materials used in hose assemblies. Since the long term effects may be unknown, do not expose hose assemblies to atomic radiation.

3.0 HOSE AND FITTING ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1 Pre-Installation Inspection:** Prior to installation, a careful examination of the hose must be performed. All components must be checked for correct style, size, catalog number, and length. In addition, the hose must be examined for cleanliness, obstructions, blisters, cover looseness, or any other visible defects.
- Hose and Fitting Assembly:** Do not assemble a Parker fitting on a Parker hose that is not specifically listed by Parker for that fitting unless authorized in writing by the chief engineer of the appropriate Parker division. Do not assemble a Parker fitting on another manufacturer's hose or a Parker hose on another manufacturer's fitting unless (i) the chief engineer of the appropriate Parker division approves the assembly in writing, and (ii) the user verifies the assembly and the application through analysis and testing. See instruction 1.4 above.
- The Parker published instructions must be followed for assembling the fittings on the hose. These instructions are provided in the Parker fitting catalog for the specific Parker fitting being used.
- 3.3 Related Accessories:** Do not crimp or swage any Parker hose or fitting with anything but the proper listed Parker swage or crimp machine and dies and in accordance with Parker published instructions. Do not crimp or swage another manufacturer's hose fitting with a Parker crimp or swage die unless authorized in writing by the chief engineer of the appropriate Parker division.
- 3.4 Parts:** Do not use any Parker hose fitting part (including but not limited to socket, shell, nipple, or insert) except with the correct Parker mating parts, in accordance with Parker published instructions, unless authorized in writing by the chief engineer of the appropriate Parker division.
- 3.5 Reusable/Permanent:** Do not reuse any reusable hose product that has blown or pulled off a hose. Do not reuse a Parker permanent (that is, crimped or swaged) hose fitting or any part thereof.
- 3.6 Minimum Bend Radius:** Installation of a hose at less than the minimum listed bend radius may significantly reduce the hose life. Particular attention must be given to preclude sharp bending at the hose/fitting juncture.
- 3.7 Twist Angle and Orientation:** Hose installations must be such that relative motion of machine components does not produce twisting.
- 3.8 Securement:** In many applications, it may be necessary to restrain, protect, or guide the hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to insure such restraint does not introduce additional stress or wear points.

- 3.9 Proper Connection of Ports:** Proper physical installation of the hose requires a correctly installed port connection insuring that no twist or torque is transferred to the hose.
- 3.10 External Damage:** Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage, or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.
- 3.11 System Checkout:** All air entrapment must be eliminated and the system pressurized to the maximum system pressure and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using the system.
- 3.12 Routing:** Hose should be routed in such a manner so if a failure does occur, oil mist will not come into contact with hot surfaces, open flame, or sparks, and the chance of personal injury is minimized.

4.0 HOSE AND FITTING MAINTENANCE INSTRUCTIONS

- 4.1** Even with proper selection and installation, hose life may be significantly reduced without a continuing maintenance program. Frequency should be determined by the severity of the application and risk potential. A maintenance program must be established and followed by the user and, at a minimum, must include instructions 4.2 through 4.7, listed below.
- 4.2 Visual Inspection Hose/Fitting:** Any of the following conditions require immediate shut down and replacement of the hose assembly:
- Fitting slippage on hose;
 - Damaged, cut or abraded cover (any reinforcement exposed);
 - Hard, stiff, heat cracked, or charred hose;
 - Cracked, damaged, or badly corroded fittings;
 - Leaks at fitting or in hose;
 - Kinked, crushed, flattened or twisted hose; and
 - Blistered, soft, degraded, or loose cover.
- 4.3 Visual Inspection All Other:** The following items must be tightened, repaired or replaced as required:
- Leaking port conditions;
 - Remove excess dirt buildup;
 - Clamps, guards, shields; and
 - System fluid level, fluid type and any air entrapment.
- 4.4 Functional Test:** Operate the system at maximum operating pressure and check for possible malfunctions and freedom from leaks. Personnel must avoid potential hazardous areas while testing and using the system.
- 4.5 Replacement Intervals:** Specific replacement intervals must be considered based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See instructions 1.2 above.
- 4.6 Inspecting a Pressurized System:** Hydraulic power is accomplished by utilizing high-pressure fluids to do work. Hoses, fittings, and hose assemblies all contribute to doing work by transmitting fluids at high pressures. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the hoses transporting the fluids. From time to time, hose assemblies will fail. Usually these failures are the result of some form of misapplication, abuse, or simply wear. When hoses fail, generally the high-pressure fluids inside escape in some sort of stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body. High-pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly loss of limb. Even seemingly minor hydraulic fluid injection injuries must be treated by a physician with knowledge of the tissue damaging properties of hydraulic fluid.
- If a hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the hose assembly. Simply shutting down the hydraulic pump may or may not eliminate the pressure in the hose assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a hose assembly even when pumps or equipment are not operating. Tiny holes in the hose, commonly known as "pinholes", can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the hose assembly may be examined safely.
- Once the pressure has been reduced to zero, the hose assembly may be taken off the equipment and examined. It must always be replaced if a failure has occurred. Never attempt to patch or repair a hose assembly that has failed. Consult the nearest Parker distributor or the appropriate Parker division for hose assembly replacement information.
- Never touch or examine a failed hose assembly unless it is obvious that the hose no longer contains fluid under pressure. The high-pressure fluid is extremely dangerous and can cause serious and potentially fatal injury.
- 4.7 Refrigerant gases:** Special care should be taken when working with refrigeration systems. Sudden escape of refrigerant gases can cause blindness if the escaping gases contact the eye and can cause freezing or other severe injuries if it contacts any other portion of the body.

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