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WARNING

ANY MACHINE CAN BE DANGEROUS IF IT IS MISUSED. THOROUGH OPERATING INSTRUCTIONS FOR ALL OPERATORS BY THE MACHINE OWNER AND/OR THE OPERATOR(S) EMPLOYER BEFORE THE OPERATOR PLACES THE MACHINE IN SERVICE IS A MUST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE MACHINE AND THE EMPLOYER OF THE OPERATOR(S) TO PROVIDE AND INSURE THE USAGE OF EITHER A POINT OF OPERATION GUARD OR A PROPERLY APPLIED AND ADJUSTED POINT OF OPERATION DEVICE FOR EVERY OPERATION PERFORMED ON THIS MACHINE CONSISTENT WITH THE REQUIREMENTS OF THE TOOLING, DIES AND MOLDS BEING USED, WITH THE FEEDING METHODS BEING USED, WITH THE MODE OF OPERATION BEING USED, OR OTHER FEATURES UNIQUE TO THE OPERATION, SO AS TO PROVIDE MAXIMUM PROTECTION TO THE OPERATOR. FOR CONTINUAL SAFE AND TROUBLE-FREE OPERATION, AN INSPECTION AND MAINTENANCE PROGRAM SHOULD BE ESTABLISHED. THIS SHOULD INCLUDE VISUAL INSPECTION OF OPERATIONS, SAFEGUARDS AND AUXILIARY EQUIPMENT AS OFTEN AS OPERATION CONDITIONS REQUIRE BUT AT LEAST ONCE A SHIFT.

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INSTALLATION:

1. BEFORE ASSEMBLING, REMOVE ALL PRESERVATIVES FROM THE FINISHED SURFACES AND ANY FOREIGN MATERIAL FROM THE INSIDE OF THE PIPES AND OIL TANK.

2. LOWER THE BOTTOM HYDRAULIC TIE ROD NUTS INTO THE PIT AND SET THEM ON THE FLOOR. **NOTE**: EACH NUT IS MATCH MARKED TO A TIE ROD.

3. PLACE THE BASE ON THE FOUNDATION, LEVEL, GROUT AND BOLT SECURELY IN PLACE. USE GENERAL ARRANGEMENT AND PIT DRAWING AS REFERENCE. USE LEVELING PLATES (FURNISHED BY CUSTOMER) UNDER THE LEVELING SCREWS.

4. PLACE THE SLIDE ON THE BASE USING AT LEAST 57" MIN. PARALLELS BETWEEN THE WORKING SURFACES, ALIGN THE SLIDE AS CLOSE AS POSSIBLE TO ITS CORRECT RUNNING POSITION. THIS WILL ALLOW THE GIBS LATER TO BE ASSEMBLED WITH EASE. REMOVE THE GIBS LEAVING THE SHIMS IN THEIR CORRECT POSITION.

5. PLACE THE BOTTOM HOUSING LOCATING RINGS IN THEIR RESPECTIVE COUNTERBORES. REMOVE THE BOTTOM TIE ROD SHIPPING PLATES. PLACE THE HOUSINGS AND TIE ROD ASSEMBLIES ON THE BASE OVER THE LOCATING RINGS. REPLACE THE BOTTOM NUTS THAT WERE SET IN THE PIT, THEN REMOVE THE TOP TIE ROD SHIPPING PLATES AND ALLOW THE TIE RODS TO REST IN THE BOTTOM OF THE PIT OR JUST BELOW THE TOP HOUSING LOCATING RING COUNTERBORES. REPLACE THE TOP HOUSING LOCATING RINGS.

6. REPLACE THE GIBS ON THE SLIDE TO THEIR ORIGINAL POSITION, BUT LEAVE THEM A LITTLE LOOSE UNTIL THE PRESS CAN BE STARTED AND RUN A FEW CYCLES. (REFERENCE GIB AND LINER ASSEMBLY.)

7. WITH THE PISTONS BLOCK IN THE UP POSITION, PLACE THE CYLINDER ASSEMBLIES ON THE SLIDE IN THEIR CORRECT POSITION AS MARKED AT DISASSEMBLY, AND BOLT SECURELY IN PLACE WITH THEIR PISTON CONNECTOR RINGS.

NOTE: CARE MUST BE TAKEN TO INSURE THAT THE CYLINDERS ARE NOT BUMPED WHILE IN THIS POSITION.

8. LIFT THE HEAD OVER THE CYLINDERS AND SET IT ON THE HOUSINGS. ALIGN THE HEAD WITH THE LOCATING RINGS ON THE TOP OF THE HOUSINGS.

9. LIFT THE TIE RODS UP THROUGH THE TOP HEAD AND BLOCK THEM UP FROM THE BOTTOM. REPLACE THE TOP NUTS AND THEN REMOVE THE BLOCKING AT THE BOTTOM. INSERT THE .200" SET-UP SHIM BETWEEN THE BASE AND THE HYDRAULIC NUTS. MAKE SURE THEY ARE NOT UNDER THE PISTON IN THE NUTS. TIGHTEN THE NUTS AS TIGHT AS POSSIBLE AT THIS TIME WITHOUT THE USE OF THE HYDRAULIC PUMP. SEE DRAWING B-661-M.

10. BOLT THE SUPPORT BRACKET TO THE TOP PLATEN THAT SUPPORTS THE OIL TANK. PLACE THE OIL TANK ASSEMBLY ON THE BRACKETS. (DON'T LIFT THE OIL TANK WITH THE EYE BOLTS IN THE PUMP AND MOTOR.) DON'T BOLT THE OIL TANK DOWN UNTIL THE PRE-FILL VALVE ARE BOLTED IN PLACE AND TO THE TANK.

11. UNBLOCK THE PISTON FROM THE CYLINDERS (DON'T REMOVE THE PISTON CONNECTORS). PULL THE CYLINDERS UP THRU THE HOLES IN THE HEAD & OIL TANK, LINE UP THE MATCH MARKS AND BOLT SECURELY IN PLACE TO THE HEAD. BE SURE TO INSTALL THE SCREW IN THE CYLINDER EARS - 2 PER CYLINDER.

NOTE: CARE MUST BE TAKEN TO INSURE NO FOREIGN MATERIAL ENTERS THE CYLINDERS AT ANY TIME.

12. PLACE THE OILGEAR PRE-FILL VALVES ON THE MAIN CYLINDERS. MAKE SURE THE FOLLOWING PARTS ARE PROPERLY INSTALLED IN PORT 1 OF THE VALVE, SEAL LOWER PLUNGER, RING SPACER, "O" RING, SEAL RETAINER, AND SECOND "O" RING. MAKE SURE ALL ITEMS ARE IN THEIR PROPER POSITION AND THE "O" RINGS ARE NOT PINCHED OR CUT AT ASSEMBLY. INSTALL SHROUD OVER VALVE BODY. CONNECT THE PRE-FILL PIPES TO THE SHROUD OF THE PRE-FILL VALVES AND CHECK THE "O" RING BETWEEN THE VALVES AND THE PIPES TO BE SURE THEY ARE IN THEIR CORRECT POSITION.

13. BOLT OIL TANK DOWN TO THE SUPPORT BRACKETS.

14. BOLT THE SUPPORT BRACKETS TO THE TOP PLATEN THAT SUPPORTS THE CATWALK ASSEMBLY. INSTALL THE SUPPORT BEAMS ON THE REAR OF THE BRACKETS (4" CHANNEL). PLACE THE CATWALK ASSEMBLY ON THE BRACKETS AND BOLT THE CATWALK ASSEMBLY TO THE BRACKETS. INSTALL THE LADDER IN ITS PROPER POSITION.

15. INSTALL THE VALVE MANIFOLD ON THE KICKER CYLINDER (MIDDLE CYLINDER) AT THIS TIME.

16. REPLACE ALL THE REST OF THE PIPING THAT WAS REMOVED FOR SHIPPING, MAKING SURE ALL PIPES ARE CLEAN AND "O" RINGS ARE IN THEIR PROPER POSITION AND NOT PINCHED OR CUT AT ASSEMBLY. ALL PIPE CONNECTIONS ARE MARKED AT MATING POINTS AT DISASSEMBLY. (REFERENCE PIPING DIAGRAM.)

17. ASSEMBLE TEMPOSONICS UNIT.

18. LOCATE ELECTRICAL CABINETS AS SHOWN ON GENERAL ARRANGEMENT

AND PIT PLAN DRAWINGS. CONNECT ALL CONDUIT AND CONNECT EACH WIRE TO ITS RESPECTIVE TERMINAL. ALL WIRES ARE TERMINATED AT A TERMINAL STRIP. ALL WIRES AND TERMINAL BLOCKS ARE MARKED AND NUMBERED. THEY MUST BE ASSEMBLED IN THEIR RESPECTIVE ORDER TO INSURE PROPER FUNCTIONING. (REFERENCE ELECTRICAL SCHEMATIC AND WIRING DIAGRAMS.)

19. CONNECT POWER SOURCE TO MASTER DISCONNECT SWITCH IN THE ELECTRICAL CABINET 460 VOLT, 60 HERTZ, 3 PHASE.

20. CLEAN AND LUBRICATE ALL MOVING SURFACES.

21. CONNECT THE PROPER VALVING AND COOLANT SUPPLY TO THE HEAT EXCHANGER LOCATED ON THE OIL TANK. THERE IS A SOLENOID CONTROL VALVE FURNISHED WITH THE HEAT EXCHANGER FOR PROPER FUNCTIONING.

22. FILL THE OIL TANK APPROXIMATELY HALF FULL WITH OIL. THE TOTAL OIL CAPACITY OF THE MACHINE IS APPROXIMATELY 4709 GAL. DO NOT FILL THE TANK TO THE FULL MARK ON THE GAGE UNTIL THE SLIDE IS IN THE FULL UP POSITION.

23. FILL THE AIR FILTERS ON THE OIL TANK WITH THE SAME OIL USED IN THE HYDRAULIC SYSTEM. FILL TO THE FULL MARK ON THE SIDE OF THE CANISTER.

24. DO NOT INSTALL THE SAFETY LOCK BARS. THE PRESS IS TO BE TEST RUN BEFORE THE LOCKS ARE INSTALLED.

25. CONNECT THE PROPER AIR SUPPLY TO THE PRESS.

MOTOR CONTROL CENTER

OVERVIEW

THE MOTOR CONTROL CENTER HOUSES THE MAIN DISCONNECT AND DISCONNECTS, STARTERS AND FEEDER DISCONNECTS FOR THE PRESS MOTOR CONTROL AND CONTROL CABINET.

MAIN DISCONNECT

THE MAIN DISCONNECT SWITCH IS LOCATED ON THE LEFT MOST SECTION OF THE MOTOR CONTROL CENTER. THIS DISCONNECT SWITCH WILL REMOVE ALL ELECTRICAL POWER TO THE PRESS WHEN IN THE "OFF" POSITION.

CONTROL CABINET FEEDER DISCONNECT

THE CONTROL CABINET FEEDER DISCONNECT WILL REMOVE ALL ELECTRICAL POWER TO THE CONTROL CABINET WHEN IN THE "OFF" POSITION.

MOTOR CONTROL DISCONNECTS

THE EIGHT MOTOR CONTROL DISCONNECTS WILL REMOVE ALL ELECTRICAL POWER TO THE MOTOR STARTERS WHEN IN THE "OFF" POSITION. THE AUXILIARY CONTACTS ON THE DISCONNECTS WILL REMOVE CONTROL POWER TO THE TERMINAL STRIP BUT WILL BE LIVE TO THE TOP OF THE AUXILIARY CONTACT.

CONTROLS

CONTROL CABINET DISCONNECT

THE CONTROL CABINET DISCONNECT WILL REMOVE ALL ELECTRICAL POWER TO THE CONTROL CABINET WHEN IN THE "OFF" POSITION.

DIE BLOCK INTERLOCK

THERE ARE TWO DIE BLOCK INTERLOCK RECEPTACLES AND PLUGS ON THE PRESS. WHEN EITHER OF THESE PLUGS ARE REMOVED FROM THEIR RECEPTACLES IT DISABLES ALL OF THE PRESS CONTROL INCLUDING THE MOTORS. THESE PLUGS SHOULD BE REMOVED WHENEVER PEOPLE ARE WORKING ON THE PRESS OR TOOL.

GROUND CONNECTED LIGHT

THIS LIGHT MONITORS THE GROUND CONNECTION ON ONE SIDE OF THE CONTROL CIRCUIT. A BRIGHT LIGHT INDICATES A SAFE CONDITION. IF THE LIGHT GOES OUT OR IS DIM, IT INDICATES A LOSS OF THE CONTROL CIRCUIT GROUND. A POTENTIAL SHOCK HAZARD EXISTS AND SHOULD BE CHECKED BEFORE THE PRESS IS OPERATED.

LOW OIL WARNING LIGHT

THIS LIGHT MONITORS THE HYDRAULIC OIL IN THE TANK. WHEN THE LIGHT COMES ON IT SIGNALS A LOW OIL CONDITION AND IMMEDIATE ACTION SHOULD BE TAKEN.

FILTER BYPASS WARNING LIGHT

THIS LIGHT MONITORS THE OIL FILTERING. WHEN THIS LIGHT COMES ON IT SIGNALS THAT A FILTER IS DIRTY AT EITHER FILTER SET #1 OR FILTER SET #2.

FAULT/RESET PUSHBUTTON LIGHT

THIS PUSHBUTTON LIGHT IS USED TO RESET THE FAULT AND INDICATES A FAULT CONDITION. IF THE FAULT LIGHT DOES NOT GO OFF WHEN THE RESET BUTTON IS DEPRESSED, THE FAULT CONDITION STILL EXISTS. THE SPECIFIC FAULT CONDITION WILL BE DISPLAYED ON THE SPECTER.

CONTROL ON PUSHBUTTON LIGHT

THIS PUSHBUTTON LIGHT IS USED TO TURN THE PRESS CONTROL ON. THE

CONTROL MUST BE ON BEFORE THE MOTORS CAN BE STARTED. THIS PUSHBUTTON MUST BE PUSHED TO RE-ACTIVATE THE PRESS CONTROL AFTER ANY "CYCLE STOP" PUSHBUTTON HAS BEEN PUSHED. THE "CONTROL ON" PUSHBUTTON WILL ILLUMINATE IF THE CONTROL IS ACTIVATED.

MASTER STOP PUSHBUTTON

THE MASTER STOP PUSHBUTTON TURNS OFF THE PRESS CONTROL AND WILL STOP ALL MOTORS.

CYCLE STOP PUSHBUTTON

WHEN THIS PUSHBUTTON IS DEPRESSED, THE PRESS MOTION WILL STOP, THE PRESS MOTION CONTROLS WILL BE DISABLED, AND THE ACTIVE MODE WILL BE CANCELLED BUT THE MOTORS WILL CONTINUE TO RUN. THE "CONTROL ON" PUSHBUTTON MUST BE DEPRESSED TO RE-ACTIVATE THE PRESS CONTROL AFTER THIS PUSHBUTTON HAS BEEN PUSHED.

NOTE: PUSHING THE CYCLE STOP PUSHBUTTON DOES NOT STOP THE PUMP MOTOR(S). USE THE MASTER STOP PUSHBUTTON TO STOP ALL PRESS FUNCTIONS AND STOP ALL MOTORS.

PILOT PRESSURE MOTOR START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE PILOT PRESSURE HYDRAULIC PUMP MOTOR. THE CONTROL MUST BE ON BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING. THIS MOTOR MUST BE RUNNING BEFORE ANY OTHER MOTOR MAY BE STARTED.

PILOT PRESSURE MOTOR STOP PUSH BUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE PILOT PRESSURE MOTOR AND WILL ALSO STOP ALL THE OTHER MOTORS.

MAIN DRIVE MOTOR START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE MAIN DRIVE PUMP MOTOR. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

MAIN DRIVE MOTOR STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE MAIN DRIVE PUMP MOTOR.

ASSIST PUMP MOTOR #1 START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE ASSIST PUMP MOTOR #1. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

ASSIST PUMP MOTOR #1 STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE ASSIST PUMP MOTOR #1.

ASSIST PUMP MOTOR #2 START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE ASSIST PUMP MOTOR #2. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

ASSIST PUMP MOTOR #2 STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE ASSIST PUMP MOTOR #2.

ASSIST PUMP MOTOR #3 START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE ASSIST PUMP MOTOR #3. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

ASSIST PUMP MOTOR #3 STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE ASSIST PUMP MOTOR #3.

ASSIST PUMP MOTOR #4 START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE ASSIST PUMP MOTOR #4. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

ASSIST PUMP MOTOR #4 STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE ASSIST PUMP MOTOR #4.

HIGH PRESSURE AUXILIARY MOTOR #1 START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE HIGH PRESSURE AUXILIARY MOTOR #1. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

HIGH PRESSURE AUXILIARY MOTOR #1 STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE HIGH PRESSURE AUXILIARY MOTOR #1.

HIGH PRESSURE AUXILIARY MOTOR #2 START PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO START THE HIGH PRESSURE AUXILIARY MOTOR #2. THE CONTROL MUST BE ON AND PILOT PRESSURE MOTOR RUNNING BEFORE THE MOTOR CAN BE STARTED. THE PUSHBUTTON WILL ILLUMINATE WHEN THE MOTOR IS RUNNING.

HIGH PRESSURE AUXILIARY MOTOR #2 STOP PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL STOP THE HIGH PRESSURE AUXILIARY MOTOR #2.

MODE LIMIT SELECTOR SWITCH

OFF/INCH/SINGLE - THIS SELECTOR SWITCH IS USED TO LIMIT THE SELECTION OF THE PRESS MODE. WHEN IN THE OFF POSITION, A MODE CAN NOT BE ACTIVATED. WHEN IN THE INCH POSITION, ONLY THE INCH MODE CAN BE ACTIVATED. WHEN IN THE SINGLE POSITION, THE INCH OR SINGLE MODE CAN BE ACTIVATED.

INCH MODE PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO ACTIVATE THE INCH MODE OF CONTROL. IT WILL BE ILLUMINATED WHEN THE CONTROL IS IN THE INCH MODE.

SINGLE MODE PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO ACTIVATE THE SINGLE MODE OF CONTROL. IT WILL BE ILLUMINATED WHEN THE CONTROL IS IN THE SINGLE MODE.

DISTANCE REVERSE SELECTOR SWITCH OFF/ON

TURNING THIS SELECTOR SWITCH ON WILL ALLOW THE PRESS TO REVERSE WHEN THE SLIDE REACHES THE "REVERSE POSITION" DURING A SINGLE CYCLE.

LAMP TEST PUSHBUTTON

DEPRESSING THIS PUSHBUTTON WILL CAUSE ALL PILOT LIGHTS, EXCEPT THE "GROUND CONNECTED", TO ILLUMINATE FOR 5 SECONDS. THIS IS USED TO CHECK FOR BAD LAMPS.

MANUAL LUBE PUSHBUTTON

REFERENCE AUTO LUBRICATION SYSTEM

RUN STATION

DUAL RUN PUSHBUTTONS

WHILE IN THE SINGLE MODE, CONCURRENTLY DEPRESSING BOTH RUN PUSHBUTTONS ON THE RUN STATION WILL INITIATE A SINGLE CYCLE. BOTH RUN PUSHBUTTONS MUST BE HELD UNTIL THE SLIDE DISTANCE REVERSES OR PRESSURE REVERSES, AT WHICH TIME THEY MAY BE RELEASED. THE PRESS CYCLE WILL CONTINUE UNTIL THE PRESS SLIDE HAS RETURNED TO THE STOP OPEN POSITION. IF ANY OF THE ACTIVE RUN PUSHBUTTONS ARE RELEASED BEFORE THE SLIDE PRESSURE REVERSES OR DISTANCE REVERSES THE CYCLE WILL BE ABORTED. THE RUN BUTTONS WILL HAVE TO BE RELEASED AND THE SLIDE OPENED TO STOP OPEN BEFORE A NEW CYCLE CAN BE STARTED.

CYCLE STOP PUSHBUTTON

THIS PUSHBUTTON IS FUNCTIONALLY THE SAME AS THE CYCLE STOP PUSHBUTTON LOCATED ON THE MAIN CONTROL PANEL. PUSHING ANY CYCLE STOP PUSHBUTTON DISABLES THE PRESS CONTROL, RESETS THE MODE AND STOPS ALL SLIDE MOVEMENT.

NOTE: PUSHING THE CYCLE STOP PUSHBUTTON DOES NOT STOP THE PUMP MOTOR(S). USE THE MASTER STOP PUSHBUTTON TO STOP ALL PRESS FUNCTIONS AND STOP ALL MOTORS.

OPEN PUSHBUTTON

IN THE SINGLE MODE MOMENTARILY PUSHING THE OPEN PUSHBUTTON WILL CAUSE THE PRESS TO DECOMPRESS, (IF IT IS UNDER PRESSURE) AND OPEN TO THE STOP OPEN POSITION. HOLDING THE OPEN PUSHBUTTON DEPRESSED WILL KEEP THE PRESS OPENING AT THE SELECTED STRIP SPEED EVEN IF THE SLIDE IS ABOVE THE FAST OPEN POSITION. WHILE IN THE SINGLE MODE WITH THE PRESS SLIDE ABOVE THE STOP OPEN POSITION, PUSHING THE OPEN PUSHBUTTON WILL CAUSE THE PRESS TO OPEN AT THE STRIPPING SPEED UNTIL THE BUTTON IS RELEASED OR THE MAXIMUM OPEN LIMIT IS REACHED. IF THE PRESS SLIDE HAS DRIFTED ONTO THE SLIDE LOCKS, THIS PUSHBUTTON CAN BE USED TO RAISE THE PRESS SLIDE OFF OF THE SLIDE LOCKS WITHOUT SWITCHING TO THE INCH MODE.

FAULT/RESET PUSHBUTTON LIGHT

THIS PUSHBUTTON LIGHT IS USED TO RESET THE FAULT AND INDICATE A FAULT CONDITION. IF THE FAULT LIGHT DOES NOT GO OFF WHEN THE RESET BUTTON IS DEPRESSED, THE FAULT CONDITION STILL EXISTS. THE

SPECIFIC FAULT CONDITION WILL BE DISPLAYED ON THE SPECTER.

INCH STATION

ZERO REFERENCE PUSHBUTTON LIGHT

THIS PUSHBUTTON IS USED TO ACTIVATE THE REFERENCING OF THE SLIDE POSITION TO 00.00 INCHES WITH THE TOOL FULLY CLOSED. DEPRESSING THIS BUTTON WHILE IN INCH MODE WILL CAUSE THE LIGHT TO ILLUMINATE. WHILE THE LIGHT IS ON, INCHING THE SLIDE DOWN AND ATTAINING PRESSING TONNAGE WILL CAUSE THE SLIDE POSITION TO BECOME 00.00 INCHES. WHEN REFERENCING IS COMPLETE THE LIGHT WILL GO OFF.

CYCLE STOP PUSHBUTTON

WHEN THIS PUSHBUTTON IS DEPRESSED, THE PRESS MOTION WILL STOP, THE PRESS MOTION CONTROLS WILL BE DISABLED, AND THE ACTIVE MODE WILL BE CANCELLED BUT THE MOTORS WILL CONTINUE TO RUN. THE "CONTROL ON" PUSHBUTTON MUST BE DEPRESSED TO RE-ACTIVATE THE PRESS CONTROL AFTER THIS PUSHBUTTON HAS BEEN PUSHED.

NOTE: PUSHING THE CYCLE STOP PUSHBUTTON DOES NOT STOP THE PUMP MOTOR(S). USE THE MASTER STOP PUSHBUTTON TO STOP ALL PRESS FUNCTIONS AND STOP ALL MOTORS.

SET-UP CLOSE PUSHBUTTON

THIS PUSHBUTTON IS USED IN CONJUNCTION WITH THE INCH CLOSE PUSHBUTTON. WITH INCH MODE SELECTED, DEPRESSING THE TWO PUSHBUTTONS WILL RETRACT THE SLIDE LOCKS AND METER THE OIL OUT OF ROD END OF THE MAIN AND THE TWO KICKER RAMS. THIS FUNCTION IS USED TO LOWER THE SLIDE ONTO THE TOOL WITHOUT THE RISK OF EXERTING MORE PRESSURE THAN THE DEAD WEIGHT OF THE SLIDE.

INCH CLOSE PUSHBUTTON

THIS PUSHBUTTON IS USED IN CONJUNCTION WITH THE INCH HANDLEVER TO CONTROL THE DOWNWARD MOVEMENT OF THE SLIDE IN INCH MODE. DEPRESSING THE "INCH CLOSE" PUSHBUTTON WHILE DEFLECTING THE INCH HANDLEVER DOWNWARD WILL MOVE THE SLIDE CLOSED. RELEASING THIS PUSHBUTTON OR RELEASING THE INCH HANDLEVER WILL STOP ALL SLIDE MOVEMENT.

INCH HANDLEVER

THIS HANDLEVER IS USED TO CONTROL THE SLIDE MOVEMENT IN INCH MODE. THE CLOSING MOVEMENT OF THE SLIDE IS CONTROLLED BY DEFLECTING THE HANDLEVER DOWN WHILE PUSHING THE INCH CLOSE PUSHBUTTON. THE OPENING MOVEMENT IS CONTROLLED BY DEFLECTING THE HANDLEVER UPWARD. SLIDE SPEED IS PROPORTIONAL TO HANDLEVER DEFLECTION. SLIDE CLOSURE IS AT PRESSING SPEED RANGE (WITH ONE PUMP) AND TONNAGE WITH OPENING IS AT STRIP SPEED RANGE AND TONNAGE.

DUMMY PLUG

A DUMMY PLUG WILL HAVE TO BE INSERTED IN ANY UNUSED INCH STATION RECEPTACLE BEFORE THE PRESS CAN BE OPERATED.

SENSORS

HYDRAULIC OIL TEMPERATURE

LOCATED IN THE OIL TANK ON TOP OF THE PRESS IS A TYPE "J" THERMOCOUPLE USED TO SENSE OIL TEMPERATURE. THIS THERMOCOUPLE IS CONNECTED TO A THERMOCOUPLE TRANSMITTER MOUNTED IN THE ELECTRICAL JUNCTION BOX ON THE OIL TANK. THE TRANSMITTER IS CALIBRATED TO OUTPUT AN ANALOG VOLTAGE WHICH IS PROPORTIONAL TO OIL TEMPERATURE. THE VOLTAGE SCALING EQUALS 1 VOLT PER 100 DEGREES FAHRENHEIT. THE OUTPUT OF THE TRANSMITTER IS CONNECTED TO AN ANALOG INPUT OF THE PROGRAMMABLE CONTROLLER. THE PROGRAMMABLE CONTROLLER WILL MONITOR THIS INPUT. WHEN THE OIL REACHES 75 DEGREES THE HOT WATER WILL TURN ON AND WARM UP THE OIL UNTIL IT REACHES 80 DEGREES, AT THIS TIME THE HOT WATER WILL SHUT OFF. WHEN THE OIL REACHES 120 DEGREES THE COLD WATER WILL TURN ON COOL THE OIL UNTIL IT REACHES 115 DEGREES, AT THIS TIME THE COLD WATER WILL SHUT OFF. IF THE OIL TEMPERATURE EXCEEDS THE 135 DEGREE LIMIT, THE PRESS CONTROL WILL SHUT DOWN. THE HYDRAULIC PUMPS WILL CONTINUE TO RUN, PUMPING OIL THROUGH THE HEAT EXCHANGER.

SYSTEM PRESSURE

THE HYDRAULIC PRESSURE GENERATED BY THE MAIN PUMP IS MONITORED BY A ELECTRONIC PRESSURE TRANSDUCER. THIS TRANSDUCER OUTPUTS A ANALOG SIGNAL PROPORTIONAL TO PRESSURE. 10 VOLTS OUTPUT EQUALS 4567 PSI. THIS SIGNAL IS READ BY A ANALOG INPUT OF THE PROGRAMMABLE CONTROLLER. IT IS USED TO SENSE WHEN THE HYDRAULIC PRESSURE EQUALS THE COMMANDED REVERSE TONNAGE. IT IS ALSO USED TO DETERMINE WHEN THE SYSTEM PRESSURE HAS DECOMPRESSED TO A LEVEL WHERE IT IS SAFE TO OPEN THE PRESS.

PILOT PRESSURE

THE PILOT PRESSURE GENERATED BY THE PILOT PRESSURE PUMP IS MONITORED BY A ELECTRONIC PRESSURE TRANSDUCER. THIS TRANSDUCER OUTPUTS A ANALOG SIGNAL PROPORTIONAL TO PRESSURE. 10 VOLTS OUTPUT EQUALS 1450 PSI. THIS SIGNAL IS READ BY A ANALOG INPUT OF THE PROGRAMMABLE CONTROLLER. IT IS USED TO SENSE WHEN THE PILOT PRESSURE IS ABOVE A PREDETERMINED OPERATING PRESSURE. WHEN THIS PRESSURE FALLS TOO LOW, A FAULT CONDITION IS MET AND THE PRESS CYCLE WILL BE STOPPED.

SLIDE POSITION

THE SLIDE POSITION SIGNAL IS GENERATED BY A ABSOLUTE DIGITAL TRANSDUCER SYSTEM. IT CONSISTS OF THREE PARTS: THE NON-CONTACT LINEAR TRANSDUCER (LOCATED ON THE HOUSING), THE DIGITAL INTERFACE BOX, LOCATED NEAR THE TRANSDUCER AND A COUNTER CARD, LOCATED IN THE MAIN CONTROL CABINET. THE POSITION SIGNAL IS THE OUTPUT OF THE COUNTER CARD. IT IS A 16 BIT BINARY SIGNAL WITH THE LEAST SIGNIFICANT BIT BEING 0.001 INCHES. THIS SIGNAL IS CONNECTED TO THE PROGRAMMABLE CONTROLLERS TTL INPUT MODULE. IN THE PROGRAMMABLE CONTROLLER THE SIGNAL IS SCALED TO 0.01". IT IS USED FOR POSITION PRESET COMPARISONS.

HYDRAULIC OIL LEVEL

LOCATED IN THE OIL TANK ON TOP OF THE PRESS ARE TWO LEVEL SWITCH ASSEMBLY. THEY CONSIST OF A MAGNETICALLY OPERATED FLOAT SWITCH WHICH IS CONNECTED TO ONE OF THE PROGRAMMABLE CONTROLLERS AC INPUTS. THE SWITCHES ARE MOUNTED AT A LEVEL AT WHICH ONE WOULD INITIATE A WARNING WHICH WOULD SIGNAL THE OPERATOR OF THE CONDITION AND THE OTHER INITIATE A FAULT, AT THIS TIME IT WOULD BE NECESSARY TO ADD OIL TO THE TANK BEFORE PRESS OPERATION COULD CONTINUE. THE CONTROL IS PROGRAMMED TO FINISH THE CURRENT CYCLE, IF THE SWITCH TRIPS BEFORE COMPLETION, THEN DROP OUT THE MODE AND DISPLAY A " LOW HYD. OIL FAULT" MESSAGE.

FILTER PRE-BYPASS AND BYPASS PRESSURE SWITCHES

ALL OIL THAT PASSES THROUGH THE HEAT EXCHANGERS ALSO PASSES THROUGH THE SYSTEM FILTERS. THESE FILTERS CONTAINS REPLACEABLE FILTER ELEMENTS WITH A 3 MICRON RATING. IN PARALLEL WITH THE ELEMENTS IS A 25 PSI BYPASS CHECK VALVE. AS THE ELEMENTS GET DIRTY THE PRESSURE IT TAKES TO MOVE THE OIL THROUGH THE FILTER WILL INCREASE. WHEN IT REACHES 20 PSI, A PRESSURE SWITCH WILL TRIP SIGNALING THE OPERATOR OF A PRE-BYPASS CONDITION. WHEN IT REACHES 25 PSI THE CHECK VALVE WILL OPEN AND ALSO TRIP A SWITCH WHICH SENDS A SIGNAL TO THE PROGRAMMABLE CONTROLLER. THE CONTROL IS PROGRAMMED TO FINISH THE CURRENT CYCLE, IF THE SWITCH TRIPS BEFORE COMPLETION, THEN DROP OUT THE MODE AND SIGNAL THE OPERATOR OF THE FAULT CONDITION.

LOW COOLANT PRESSURE SWITCH

THIS PRESSURE SWITCH SENSES WATER PRESSURE AT THE HEAT EXCHANGER.

PREFILL OPEN PROXIMITY SWITCH

AFTER THE PRESS GETS DECOMPRESSED WE CHECK THESE SWITCHES TO SEE THAT THE PREFILLS ARE OPEN BEFORE WE START THE OPENING PART OF THE CYCLE.

SLIDE MAX OPEN SWITCH

WHEN THE SLIDE MOVES OFF THIS LIMIT SWITCH ALL OPENING PRESS MOTION WILL STOP. THIS MECHANICAL SWITCH IS PRESET AT THE FACTORY AND SHOULD NOT BE ALTERED.

SLIDE MAX CLOSE SWITCH

WHEN THE SLIDE MOVES OFF THIS LIMIT SWITCH ALL CLOSING PRESS MOTION WILL STOP. THIS MECHANICAL SWITCH IS PRESET AT THE FACTORY AND SHOULD NOT BE ALTERED.

SLIDE LOCK RETRACTED SWITCH

EACH SLIDE LOCK ASSEMBLY CONTAINS TWO LIMIT SWITCHES THAT MONITORS THE POSITION OF THE LOCK. BEFORE THE PRESS CAN CLOSE OR FAST OPEN THE SLIDE LOCKS MUST BE RETRACTED. THE CONTROL SYSTEM MONITORS THESE SWITCHES AND WILL NOT ALLOW THE PRESS TO CLOSE OR FAST OPEN UNLESS THEY ARE ALL TRIPPED. AFTER A PRESS CYCLE IS COMPLETE THE SLIDE LOCKS ARE EXTENDED, ALL SLIDE LOCK RETRACTED SWITCHES MUST BE UNTRIPPED BEFORE ANOTHER CYCLE CAN BE INITIATED.

DIE SET-UP CLOSE CHECK SWITCH

THIS SWITCH IS PART OF THE DIE SETUP CLOSE VALVE. IT MONITORS THE SHIFTING OF THE VALVE SPOOL. IF THE VALVE FAILS TO SHIFT WHEN ENERGIZED OR IS SHIFTED WHEN DE-ENERGIZED IT WILL BE DETECTED BY THE CONTROL.

LOW LUBE LEVEL SWITCH

REFERENCE AUTO LUBRICATION SYSTEM

LUBE CYCLE SWITCH

REFERENCE AUTO LUBRICATION SYSTEM

OUTPUT DEVICES

SOLENOIDS

THE HYDRAULIC CONTROL SYSTEM CONTAINS AC OPERATED SOLENOIDS WHICH CONTROL VALVES THAT CONTROL HYDRAULIC SEQUENCING OF THE PRESS AND ITS AUXILIARY EQUIPMENT. THESE SOLENOIDS ARE AN ON/OFF DEVICE CONNECTED TO THE PROGRAMMABLE CONTROLLERS AC OUTPUTS. THERE ARE ALSO AC SOLENOIDS TO CONTROL THE FLOW OF COOLING AND HOT WATER THROUGH THE HEAT EXCHANGER AND AC SOLENOID TO CONTROL LUBRICATION.

ELECTRONIC RELIEF VALVES

THE HYDRAULIC CONTROL SYSTEM CONTAINS A ELECTRONIC CONTROLLED PROPORTIONAL RELIEF VALVE. IT IS USED TO CONTROL PRESSURE IN THE HYDRAULIC SYSTEM. THE VALVE IS CONNECTED TO AN ANALOG OUTPUT OF THE PROGRAMMABLE CONTROLLER. A 0 TO 10 VOLT DC SIGNAL WILL PRODUCE A 0 PSI(MINIMUM) TO 3000 PSI(MAXIMUM) PRESSURE COMMAND. THE VALVE HAS TWO INTERNAL ADJUSTMENTS, THEY ARE "P CORR" AND "P MAX". THE "P CORR" ADJUSTMENT SETS THE MINIMUM PRESSURE WHILE THE "P MAX" SETS THE MAXIMUM PRESSURE. THESE ADJUSTMENTS ARE SET AT THE TIME OF SHIPMENT. THEY NEED TO BE CHECKED AND RECALIBRATED PERIODICALLY.

PUMP PROPORTIONAL CONTROL

THERE IS A PROPORTIONAL VALVE TO UNLOAD THE MAIN DRIVE FIXED VOLUME PUMP. THE VALVE IS CONTROLLED BY ITS AMPLIFIER. VALVE POSITION IS DETERMINED BY A DC COMMAND FROM 0 TO 10 VOLTS. VALVE POSITION IS PROPORTIONAL TO THE COMMAND, 0 VOLTS EQUALS FULLY CLOSED AND 10 VOLTS EQUALS FULLY OPEN. AN ANALOG OUTPUT FROM THE PROGRAMMABLE CONTROLLER DRIVES THE AMPLIFIER. THE FUNCTION OF THE PROPORTIONAL VALVE IS TO UNLOAD THE MAIN DRIVE PUMP AT STOP OPEN.

OPERATOR INTERFACE

OVERVIEW

THE OPERATOR INTERFACE HAS A FOUR LINE ALPHA-NUMERIC LED READOUT THAT IS USED TO DISPLAY VARIOUS SCREENS OF INFORMATION. THIS INFORMATION CAN TAKE THE FORM OF OPERATING PARAMETERS, SETUP PARAMETERS, OPERATOR MESSAGES OR FAULT MESSAGES. THE UNIT ALSO CONTAINS A NUMERIC KEY PAD THAT CAN BE USED TO ENTER DATA INTO SETUP SCREENS OR CAN BE USED TO ACCESS OR ACKNOWLEDGE VARIOUS SCREENS. THE DIFFERENT SCREENS CAN BE ACCESSED BY SCROLLING THROUGH EACH ONE BY PRESSING THE "NEXT" OR "PREVIOUS" KEYS. A PARTICULAR SCREEN CAN BE ACCESSED DIRECTLY BY TYPING IN THE SCREEN NUMBER AND PRESSING THE ENTER KEY.

PARAMETER ENTRY SCREENS OVERVIEW

THE PARAMETER ENTRY SCREENS ARE FOR THE ENTRY AND DISPLAY OF PRESS CYCLE PARAMETERS. WITH THE KEY SWITCH IN THE "RUN" POSITION THE CURRENT PRESET PARAMETER VALUE WILL BE DISPLAYED. TO CHANGE A PRESET TURN THE KEY SWITCH TO "CHANGE", THE CURRENT VALUE WILL FLASH. PRESS THE NUMBER KEYS OF THE DESIRED VALUE THEN PRESS THE ENTER KEY. THE NEW PRESET VALUE WILL NOW BE FLASHING IN THE CURRENT DISPLAY. TURN THE KEY SWITCH BACK TO "RUN" TO RETAIN THE ENTERED VALUE.

PRESSING POSITION - SCREEN 10

THIS SCREEN DISPLAYS THE PRESET FOR PRESSING POSITION AS WELL AS THE ACTUAL (CURRENT) SLIDE POSITION. WHEN THE PRESS IS IN SINGLE MODE THE SLIDE WILL CHANGE FROM FAST CLOSE SPEED TO PRESSING SPEED AT THIS POSITION. THE PRESET RANGE IS FROM 0.00" TO 72.00".

PRESSING TONNAGE - SCREEN 20

THIS SCREEN DISPLAYS THE PRESET FOR MAXIMUM PRESSING TONNAGE. THE PRESET RANGE IS FROM 200 TO 2000 TONS.

DISTANCE REVERSE POSITION - SCREEN 30

THIS SCREEN DISPLAYS THE PRESET FOR SLIDE REVERSE POSITION. REVERSE POSITION IS ACTIVE IN SINGLE MODE, DISTANCE REVERSE "ON" AND THE PRESSING SEGMENT OF THE CYCLE. WHEN THE SLIDE REACHES THIS POSITION IT WILL STOP, DECOMPRESS AND OPEN TO STOP OPEN POSITION. THE PRESET RANGE IS FROM 0.00" TO 72.00".

LOWER REVERSE LIMIT - SCREEN 40

THIS SCREEN DISPLAYS THE PRESET FOR LOWER REVERSE LIMIT POSITION AS WELL AS THE ACTUAL (CURRENT) SLIDE POSITION. WHEN THE PRESS IS IN SINGLE MODE IT IS THE MAXIMUM POSITION THE SLIDE SHOULD REACH DURING THE CYCLE. THE PRESET RANGE IS FROM 0.00" TO 72.00". IF THIS POSITION IS EXCEEDED A FAULT CONDITION WILL BE DISPLAYED "LOWER REVERSE LIMIT EXCEEDED".

STRIP TONNAGE - SCREEN 50

THIS SCREEN DISPLAYS THE PRESET FOR MAXIMUM STRIP TONNAGE. THE PRESET RANGE IS 0 TO 300 TONS.

FAST OPEN POSITION - SCREEN 60

THIS SCREEN DISPLAYS THE PRESET FOR FAST OPEN POSITION AS WELL AS THE ACTUAL (CURRENT) SLIDE POSITION. IN SINGLE MODE, AS THE PRESS IS OPENING, WHEN THE SLIDE REACHES THIS POSITION IT WILL SWITCH TO THE FAST OPEN SEGMENT OF THE CYCLE. IN INCH MODE THIS POSITION PRESET IS IGNORED BY THE CONTROL. THE PRESET RANGE IS 0.00" TO 72.00".

STOP OPEN POSITION - SCREEN 70

THIS SCREEN DISPLAYS THE PRESET FOR STOP OPEN POSITION AS WELL AS THE ACTUAL (CURRENT) SLIDE POSITION. IN SINGLE MODE, AS THE PRESS IS OPENING, WHEN THE SLIDE REACHES THIS POSITION IT WILL STOP. IN INCH MODE THIS POSITION PRESET IS IGNORED BY THE CONTROL. THE PRESET RANGE IS 0.00" TO 72.00".

MONITOR SCREENS OVERVIEW

THE MONITOR SCREENS ARE FOR DISPLAY ONLY. IF THE KEY SWITCH IS TURNED TO CHANGE WHILE ON A MONITOR SCREEN THE FOURTH LINE OF THE DISPLAY WILL STATE "NO CHANGE". ON EACH DISPLAY SCREEN THE FIRST THREE LINES ARE USED FOR DESCRIPTION AND THE LAST LINE DISPLAYS THE CURRENT VALUE.

CURRENT POSITION - SCREEN 80

DISPLAYS THE CURRENT POSITION OF THE SLIDE. THE SLIDE POSITION IS REFERENCED TO DIE CLOSED POSITION. DIE CLOSED POSITION BEING 0.00". THE SLIDE STROKE IS A MAXIMUM OF 72.00".

SYSTEM TONNAGE - SCREEN 90

DISPLAYS THE ACTUAL TONNAGE DURING THE PRESSING AND STRIPPING PHASES OF THE CYCLE. THE TONNAGE DISPLAYED IS 0 TO 2000 TONS.

SYSTEM PRESSURE - SCREEN 100

DISPLAYS THE ACTUAL SYSTEM PRESSURE OF THE PRESS. THE PRESSURE DISPLAYED IS FROM 0 TO 4567 PSI.

PILOT PRESSURE - SCREEN 110

DISPLAYS THE ACTUAL PILOT PRESSURE. THE PRESSURE DISPLAYED FROM 0 TO 1450 PSI.

HYDRAULIC OIL TEMPERATURE - SCREEN 120

DISPLAYS THE CURRENT OIL TEMPERATURE. MAXIMUM OPERATING TEMPERATURE IS 135 DEGREES FAHRENHEIT. IF THIS TEMPERATURE IS EXCEEDED THE MACHINE WILL NOT BE ALLOWED TO START ANOTHER CYCLE. OPTIMUM OPERATING TEMPERATURE IS 115 DEGREES FAHRENHEIT.

CYCLE COUNTER - SCREEN 130

DISPLAYS THE CURRENT SINGLE CYCLE COUNT. THIS COUNTER INCREMENTS WHENEVER THE PRESS STARTS THE OPENING PORTION OF A SINGLE CYCLE. THE COUNTER CAN BE RESET ON SCREEN 140. MAXIMUM COUNT IS 9999 BEFORE IT RESETS TO 0.

CYCLE COUNTER RESET - SCREEN 140

THIS IS AN ENTRY SCREEN TO RESET THE CYCLE COUNTER. ENTERING A 1 IN THE PRESET WILL RESET THE CYCLE COUNTER.

PIERCE CYCLE TIME - SCREEN 150

DISPLAYS THE CYCLE TIME OF THE PIERCE (PRESSING) PHASE OF THE LAST CYCLE. THIS VALUE WILL BE DISPLAYED AT THE END OF THE CYCLE AND WILL BE RESET WHENEVER A NEW CYCLE IS INITIATED. THIS IS ONLY ACTIVE DURING SINGLE MODE.

CYCLE TIME - SCREEN 160

DISPLAYS THE CYCLE TIME OF THE LAST CYCLE. IT STARTS AT FAST CLOSE AND CONTINUES UNTIL THE PRESS REACHES STOP OPEN. THIS VALUE WILL BE DISPLAYED AT THE END OF THE CYCLE AND WILL BE RESET WHENEVER A NEW CYCLE IS INITIATED. THIS IS ONLY ACTIVE DURING SINGLE MODE.

MAXIMUM TONNAGE - SCREEN 170

DISPLAYS THE MAXIMUM TONNAGE DURING THE PRESS CYCLE. IT WILL BE DISPLAYED AT THE END OF CYCLE AND RESET WHENEVER A NEW CYCLE IS INITIATED. THIS IS ONLY ACTIVE DURING SINGLE MODE.

POSITION OF MAXIMUM TONNAGE - SCREEN 171

DISPLAYS THE POSITION AT WHICH THE MAXIMUM TONNAGE WAS REACHED. IT WILL BE DISPLAYED AT THE END OF THE CYCLE AND RESET WHENEVER A NEW CYCLE IS INITIATED. THIS IS ONLY ACTIVE DURING SINGLE MODE.

LOWEST SLIDE POSITION - SCREEN 172

DISPLAYS THE LOWEST SLIDE POSITION REACHED DURING THE CYCLE. IT WILL BE DISPLAYED AT THE END OF THE CYCLE AND RESET WHENEVER A NEW CYCLE IS INITIATED.

FAULT/MESSAGE SCREENS

IF THE PRESS CONTROL DETECTS A FAULT, A FLASHING MESSAGE WILL APPEAR ON THE OPERATOR INTERFACE. BELOW IS A LISTING OF ALL THE FAULTS AND MESSAGES.

FAULT/MESSAGE RESET

AFTER THE FAULT CONDITION HAS BEEN CORRECTED THE CONTROL CIRCUIT MUST BE RESET. PUSHING THE FAULT/RESET PUSHBUTTON ON THE CONTROL CABINET OR RUN STATION WILL RESET THE CONTROL CIRCUIT. AFTER A FAULT HAS BEEN ACKNOWLEDGED THE DISPLAY WILL STOP FLASHING. IF IT CONTINUES TO FLASH THE FAULT CONDITION STILL EXISTS. AFTER A FAULT CONDITION IS CLEARED FROM THE CONTROL A SCREEN CAN BE SELECTED AS DESCRIBED UNDER THE HEADING "OPERATOR INTERFACE".

SLIDE AT MAX CLOSE

THIS FAULT WILL BE DISPLAYED IF THE PRESS IS CLOSED TO ITS MAXIMUM CLOSED POSITION.

SLIDE AT MAX OPEN

THIS FAULT WILL BE DISPLAYED IF THE PRESS IS OPENED TO ITS MAXIMUM OPEN POSITION.

DIE NOT REFERENCED

THIS MESSAGE WILL BE DISPLAYED WHEN THE ZERO REFERENCE PUSHBUTTON IS DEPRESSED AND THE SLIDE HAS NOT BEEN REFERENCED. THE PRESS CAN ONLY BE REFERENCED IN INCH MODE. THE MESSAGE WILL BE RESET AFTER ZERO REFERENCING IS COMPLETE.

REVERSE POSITION NOT ACHIEVED

THIS FAULT WILL BE DISPLAYED WHENEVER DISTANCE REVERSE IS SELECTED ON AND THE SLIDE HAS REACHED MAXIMUM TONNAGE BEFORE REACHING THE DISTANCE REVERSE POSITION.

LOWER REVERSE LIMIT EXCEEDED

THIS FAULT WILL BE DISPLAYED IF THE SLIDE EXCEEDS THE LOWER REVERSE LIMIT PRESET VALUE DURING A SINGLE CYCLE.

LOW PLC BATTERY

THIS FAULT MESSAGE WILL BE DISPLAYED WHEN THE BATTERY, WHICH BACKS UP THE PLC MEMORY, NEEDS TO BE REPLACED. WHEN REPLACING THE BATTERY, LEAVE POWER ON THE PLC, OTHERWISE THE PROGRAM WILL BE LOST.

SLIDE BELOW STOP OPEN

THIS FAULT MESSAGE WILL BE DISPLAYED WHEN THE RUN PUSHBUTTONS ARE DEPRESSED TO START A SINGLE CYCLE AND THE SLIDE IS BELOW STOP OPEN. THE OPEN BUTTON WILL NEED TO BE DEPRESSED TO RAISE THE PRESS TO ITS STOP OPEN POSITION.

SLIDE LOX DID NOT RETRACT

THIS FAULT WILL BE DISPLAYED ANYTIME THE OPERATOR TRIES TO CLOSE THE PRESS AND THE SLIDE LOCKS FAIL TO RETRACT AND MAKE THERE LIMIT SWITCHES.

LOW COOLANT PRESSURE

THIS FAULT WILL BE DISPLAYED WHEN THE HYDRAULIC OIL HAS MET A CONDITION TO BE HEATED OR COOLED BUT THE WATER PRESSURE IS TO LOW.

PRE-BYPASS FILTER #1 OR #2 WARNING

THIS FAULT MESSAGE WILL BE DISPLAYED AND THE AMBER LIGHT WILL BE ON WHEN THE FILTER IS STARTING TO GET DIRTY AND NEEDS TO BE CHANGED BEFORE IT STARTS BYPASSING THE FILTER. THIS PRESSURE SWITCH IS SET TO TRIP AT APPROXIMATELY 20 PSI.

LOW HYDRAULIC OIL WARNING (RESERVED)

THIS FAULT MESSAGE WILL BE DISPLAYED AND THE AMBER LIGHT WILL BE ON WHEN THE OIL LEVEL HAS DROPPED BELOW THE DETERMINED TANK LEVEL. WHEN THIS MESSAGE APPEARS OIL SHOULD BE ADDED TO PREVENT A LOW HYDRAULIC OIL FAULT.

SET-UP DIE CLOSE VALVE FAULT

THIS FAULT WILL BE DISPLAYED WHENEVER A SETUP CLOSE VALVE MALFUNCTION IS DETECTED. THIS IS CAUSED BY THE VALVE BEING ENERGIZED AND THE DIE SET-UP CLOSE VALVE CHECK SWITCH

DOES NOT PICK UP OR IF THE MONITOR SWITCH IS PICKED UP AND THE VALVE IS DE-ENERGIZED.

CYCLE STOP INITIATED

THIS FAULT WILL BE DISPLAYED WHEN A SINGLE CYCLE HAS BEEN INITIATED AND A CYCLE STOP BUTTON IS DEPRESSED.

LUBE FAULT

THIS FAULT WILL BE DISPLAYED WHEN THE LUBRICATION SYSTEM, ONCE ENABLED, FAILS TO COMPLETE ITS CYCLE IN 90 SECONDS OR IF THE LUBE LEVEL IS LOW.

COLD HYDRAULIC OIL FAULT

THIS FAULT WILL BE DISPLAYED WHENEVER THE OIL TEMPERATURE FALLS BELOW 70 DEGREES.

HOT HYDRAULIC OIL FAULT

THIS FAULT WILL BE DISPLAYED WHENEVER THE OIL TEMPERATURE EXCEEDS 135 DEGREES FAHRENHEIT.

BYPASS FILTER #1 OR #2 FAULT

THIS FAULT WILL BE DISPLAYED WHEN THE FILTER IS DIRTY AND THE OIL IS BYPASSING. THE FILTER ELEMENTS WILL HAVE TO BE REPLACED. THE PRESSURE SWITCH IS SET TO TRIP AT APPROXIMATELY 25 PSI.

FRONT OR REAR LIGHT CURTAIN INTERRUPTED

THIS FAULT WILL BE DISPLAYED ANYTIME THE LIGHT CURTAIN IS INTERRUPTED AND THE PRESS WAS COMMANDED TO MOVE DOWN.

ANALOG IN WRITE FAULT

THIS FAULT WILL BE DISPLAYED IF THE INFORMATION FROM THE ANALOG INPUT MODULE TO THE PROGRAMMABLE CONTROLLER IS NOT UPDATED WITHIN A PREDETERMINED AMOUNT OF TIME.

ANALOG IN WRITE FAULT

THIS FAULT WILL BE DISPLAYED IF THE INFORMATION FROM

THE PROGRAMMABLE CONTROLLER TO THE ANALOG INPUT MODULE IS NOT UPDATED WITHIN A PREDETERMINED AMOUNT OF TIME.

ANALOG OUT WRITE FAULT

THIS FAULT WILL BE DISPLAYED IF THE INFORMATION IN THE PROGRAMMABLE CONTROLLER HAS NOT BEEN SUCCESSFULLY TRANSFERRED TO ITS ANALOG OUTPUT MODULE WITHIN A PREDETERMINED AMOUNT OF TIME.

ANALOG OUTPUT READ FAULT

THIS FAULT WILL BE DISPLAYED IF THE INFORMATION FROM THE ANALOG OUTPUT MODULE TO THE PROGRAMMABLE CONTROLLER IS NOT UPDATED WITHIN A PREDETERMINED AMOUNT OF TIME.

LOW PILOT PRESSURE

THIS FAULT WILL BE DISPLAYED IF THE PILOT PRESSURE FALLS BELOW 200 PSI OPERATING RANGE.

LOW HYDRAULIC OIL LEVEL

THIS FAULT WILL BE DISPLAYED WHEN THE OIL LEVEL IN THE HYD. TANK HAS DROPPED BELOW THE TRIP POINT ON THE LOW LEVEL FLOAT SWITCH.

MACHINE OPERATION AND SETUP

INITIAL SETUP

TURN ON ALL THE DISCONNECTS ON THE MOTOR CONTROL CENTER. TURN ON THE CONTROL CABINET DISCONNECT AND ACTIVATE THE CONTROL BY DEPRESSING THE CONTROL ON PUSHBUTTON LIGHT. START THE PILOT PRESSURE MOTOR BY DEPRESSING THE PILOT PRESSURE START/ON PUSHBUTTON. START THE MAIN DRIVE MOTOR BY DEPRESSING THE MAIN DRIVE MOTOR START/ON PUSHBUTTON. START THE FOUR ASSIST PUMP MOTORS BY DEPRESSING THEIR ASSIST PUMP MOTOR START/ON PUSHBUTTONS. THE PRESS IS NOW READY FOR YOU TO SELECT A MODE OF OPERATION.

INCH MODE

SET THE MODE LIMIT SELECTOR SWITCH TO INCH OR INCH/SINGLE AND DEPRESS THE INCH MODE PUSHBUTTON LIGHT. IN INCH MODE THE PRESS SLIDE CAN BE MOVED CLOSED BY USING THE INCH HANDLEVER AND THE INCH CLOSE PUSHBUTTON AND OPEN BY USING THE INCH HANDLEVER ONLY. INCHING CLOSED IS ALWAYS AT PRESSING TONNAGE. INCH OPEN IS ALWAYS AT STRIP TONNAGE. SPEED IS CONTROLLED BY THE AMOUNT THE HANDLEVER IS DEFLECTED. SLIDE TRAVEL IS LIMITED BY THE MAX OPEN AND MAX CLOSE LIMIT SWITCHES. CHECK FOR ANY LEAKS.

SINGLE MODE

SET THE MODE LIMIT SELECTOR SWITCH TO INCH/SINGLE AND DEPRESS THE SINGLE MODE PUSHBUTTON LIGHT. THE SLIDE MUST BE ABOVE STOP OPEN BEFORE IT IS POSSIBLE TO INITIATE A SINGLE CYCLE. THIS CAN BE ACCOMPLISHED BY INCHING THE SLIDE UP WITH THE INCH HANDLEVER IN INCH MODE OR DEPRESSING THE OPEN PUSHBUTTON IN SINGLE MODE.

PARAMETER ENTRY

ENTER SETUP PARAMETERS FOR THE TOOL INSTALLED IN THE PRESS. THE OPERATOR INTERFACE AND PARAMETER ENTRIES ARE DESCRIBED IN DETAIL IN THE OPERATOR INTERFACE SECTION.

ZERO REFERENCE

IF A NEW TOOL HAS BEEN INSTALLED IN THE PRESS THE DIGITAL POSITION SYSTEM NEEDS TO BE REFERENCED TO THE TOOL CLOSED POSITION. THIS SHOULD BE DONE BEFORE A SINGLE CYCLE IS INITIATED OR DAMAGE TO THE TOOL AND PRESS COULD RESULT. TO ZERO

REFERENCE, CYCLE PARAMETERS MUST FIRST BE ENTERED IN THE OPERATOR INTERFACE. SELECT INCH MODE AND DEPRESS THE ZERO REFERENCE PUSHBUTTON LIGHT. THE ZERO REFERENCE PUSHBUTTON LIGHT SHOULD BE ON. INCH THE SLIDE CLOSED UNTIL THE TOOL CLOSES AND SYSTEM TONNAGE BUILDS TO THE PRESET PRESSING TONNAGE. THE DIGITAL POSITION SYSTEM WILL STORE THIS TOOL CLOSED POSITION AS 0.00" AND THE ZERO REFERENCE LIGHT WILL TURN OFF. AS THE SLIDE OPENS THE POSITION SHOULD INCREMENT UP TO A MAXIMUM OF 72.00".

SINGLE CYCLE

THE SINGLE CYCLE IS INITIATED BY DEPRESSING THE RUN PUSHBUTTONS. THE SLIDE LOCKS WILL RETRACT AND THE SLIDE WILL FAST CLOSE. WHEN THE SLIDE REACHES PRESSING POSITION THE PREFILL WILL CLOSE AND IT WILL CONTINUE MOVING AT THE FIXED PRESSING SPEED ACCORDING TO HOW MANY ASSIST PUMP MOTORS ARE ON. IF DISTANCE REVERSE IS OFF AND THE TOOL CLOSES, THE PRESSURE WILL BUILD UNTIL IT REACHES THE PRESSING TONNAGE. THIS IS CALLED PRESSURE REVERSE. IF DISTANCE REVERSE IS ON THE SLIDE WILL CLOSE AT PRESSING SPEED UNTIL IT REACHES THE DISTANCE REVERSE POSITION (NOTE: THE PRESSING TONNAGE MUST BE SET HIGH ENOUGH TO ALLOW THE SLIDE TO REACH THE REVERSE POSITION OR IT WILL REVERSE ON PRESSURE). WHEN DISTANCE OR PRESSURE REVERSE IS ATTAINED THE SLIDE WILL STOP CLOSING, DECOMPRESS, AND START THE STRIP SEGMENT OF THE CYCLE. IT WILL STRIP AT THE FIXED STRIP SPEED AND ENTERED STRIP TONNAGE UNTIL IT REACHES THE FAST OPEN POSITION AT WHICH TIME IT WILL OPEN AT FAST OPEN SPEED UNTIL IT REACHES STOP OPEN POSITION.

PROGRAMMABLE CONTROLLER

BASIC OPERATION

ALL CONTROL FUNCTIONS OF THE PRESS, EXCEPT FOR THE MASTER RELAY AND THE MOTOR STARTERS, ARE CONTROLLED BY THE PROGRAMMABLE LOGIC CONTROLLER (ABBREVIATED PLC). THE PLC SENSES AND CONTROLS THE PRESS THROUGH ITS INPUT AND OUTPUT MODULES (ABBREVIATED I/O). THE PROGRAM THAT MAKES DECISIONS AND TURNS ON THE PROPER OUTPUTS AT THE PROPER TIME IS CALLED LOGIC. THE LOGIC CAN BE VIEWED AND CHANGED WHILE THE PRESS IS RUNNING (ON LINE). THE DEVICE TO ALLOW VIEWING OF THE PROGRAM IS CALLED A PROGRAMMING TERMINAL. THE TERMINAL SHOWS THE CONDITION OF I/O BY HIGHLIGHTING POINTS THAT ARE ON OR TRUE. THROUGH THE USE OF THE TERMINAL, AND A GOOD BASIC UNDERSTANDING OF HOW THE PRESS SHOULD OPERATE, TROUBLESHOOTING OF THE PRESS IS GREATLY ENHANCED.

WARNING: REMOVE POWER FROM THE I/O POWER SUPPLY AND WIRING ARMS BEFORE REMOVING OR INSTALLING A MODULE. FAILURE TO SO COULD CAUSE INJURY TO PERSONNEL, OR DAMAGE TO EQUIPMENT OR MODULES.

PLC POWER SUPPLY

THE POWER SUPPLY CONVERTS 115VAC TO 5VDC USED TO POWER THE I/O MODULES. IT ALSO PROVIDES THE NECESSARY ENABLE SIGNALS FOR THE PROCESSOR AND INTELLIGENT I/O MODULES. THE POWER SUPPLY CONTAINS MONITORING CIRCUITRY THAT CAN DETECT UNDERVOLTAGE AND OVERCURRENT CONDITIONS. IF ANY OF THESE CONDITIONS ARE DETECTED THE POWER SUPPLY WILL SIGNAL A SYSTEM SHUTDOWN. THE POWER SUPPLY OUTPUT CURRENT CAPACITY IS SIZED FOR THE INSTALLED PROCESSOR AND I/O MODULES. WHEN ADDING NEW MODULES THE TOTAL CURRENT REQUIREMENTS SHOULD BE CHECKED.

CONFIGURATION JUMPERS AND SWITCHES

THE PLC PROCESSOR MODULE AS WELL AS MOST I/O MODULES CONTAIN JUMPERS AND/OR SWITCHES TO SET THEIR CONFIGURATION. WHEN REPLACING A MODULE, MAKE SURE ALL JUMPERS AND/OR SWITCHES ON THE REPLACEMENT MODULE ARE SET TO MATCH THE MODULE BEING REPLACED. ALL JUMPERS AND SWITCH SETTINGS ARE LISTED ON THE SCHEMATIC DRAWING ADJACENT TO EACH MODULE.

AC INPUTS

THE AC INPUT MODULE CONVERTS SIXTEEN 120V AC INPUTS TO LOGIC LEVEL SIGNALS COMPATIBLE WITH THE PROCESSOR. INPUT FILTERING LIMITS THE EFFECT OF VOLTAGE SPIKES AND ELECTRICAL NOISE. BY USING OPTO-ISOLATION THE PROCESSOR AND BACKPLANE ARE PROTECTED FROM SPIKES TO 1500 VAC. EACH INPUT HAS A CORRESPONDING LED INDICATOR LIGHT TO SHOW STATUS OF THE INPUT DEVICE. THE FRONT OF THE MODULE CONTAINS A GREEN ACTIVE LED. THE ACTIVE INDICATOR WILL LIGHT WHEN THE MODULE IS POWERED AND FUNCTIONING PROPERLY. INCLUDED WITH EACH MODULE IS A REMOVABLE WIRING ARM. THE ARM CAN BE EASILY DISCONNECTED TO ALLOW FOR RAPID REPLACEMENT OF MODULES. THE I/O BACKPLANE IS KEYED TO PREVENT THE INADVERTENT INSTALLATION OF THE WRONG TYPE MODULE.

AC OUTPUTS

THE AC OUTPUT MODULE CONTAINS THE OUTPUT CIRCUITRY TO CONTROL THE ON/OFF STATUS OF SIXTEEN 12-120V AC DEVICES. EACH OUTPUT IS RATED AT 2 AMP CONTINUOUS OR 25 AMP SURGE, NOT TO EXCEED 8 AMP TOTAL PER MODULE. EACH OUTPUT HAS A CORRESPONDING LED INDICATOR LIGHT TO SHOW STATUS OF THE OUTPUT. THE FRONT OF THE MODULE CONTAINS A GREEN ACTIVE LED. THE ACTIVE INDICATOR WILL LIGHT WHEN THE MODULE IS POWERED AND FUNCTIONING PROPERLY. IF A FAULT OCCURS THE MODULE WILL SHUTDOWN AND TURN OFF ALL OUTPUTS. THE RED FUSE BLOWN LED WILL TURN ON IF THE MODULE FUSE IS BLOWN. INCLUDED WITH EACH MODULE IS A REMOVABLE WIRING ARM. THE ARM CAN BE EASILY DISCONNECTED TO ALLOW FOR RAPID REPLACEMENT OF MODULES. THE I/O BACKPLANE IS KEYED TO PREVENT THE INADVERTENT INSTALLATION OF THE WRONG TYPE MODULE.

TTL INPUTS

THE TTL INPUT MODULE MONITORS THE STATUS OF ITS SIXTEEN INPUTS AND TRANSFERS THIS DATA TO THE PROCESSOR. THE MODULE PROVIDES INPUT FILTERING TO IMPROVE NOISE IMMUNITY. THE MODULE ALLOWS YOU TO SELECT HIGH = TRUE OR LOW = TRUE LOGIC. THE GREEN HIGH INDICATOR WILL BE ON IF HIGH = TRUE IS SELECTED. THERE ARE SIXTEEN INDICATORS, ONE FOR EACH INPUT, WHICH INDICATE WHETHER THEIR CORRESPONDING INPUT IS TRUE. THE FRONT OF THE MODULE CONTAINS A GREEN ACTIVE INDICATOR. THE ACTIVE INDICATOR WILL LIGHT WHEN THE MODULE IS POWERED AND FUNCTION PROPERLY. INCLUDED WITH EACH MODULE IS A REMOVABLE WIRING ARM. THE ARM CAN BE EASILY DISCONNECTED TO ALLOW FOR RAPID REPLACEMENT OF MODULES. THE I/O BACKPLANE IS KEYED TO PREVENT THE INADVERTENT INSTALLATION OF THE WRONG TYPE MODULE.

TTL OUTPUTS

THE TTL OUTPUT MODULE PROVIDES EIGHT TTL COMPATIBLE OUTPUTS FOR INTERFACING WITH TTL DEVICES, DISPLAYS AND OTHER 5 VDC DEVICES. MODULE LOGIC CIRCUITRY IS PROVIDED WITH 1500 VAC OPTO-ISOLATION FROM THE OUTPUT CIRCUITRY. THE MODULE ALLOWS YOU TO SELECT HIGH = TRUE OR LOW = TRUE LOGIC. THE MODULE HAS NINE LED STATUS INDICATORS. ONE TURNS ON IF YOU HAVE SELECTED HIGH = TRUE LOGIC. THE OTHER EIGHT INDICATE WHETHER THEIR CORRESPONDING OUTPUT IS TRUE. INCLUDED WITH EACH MODULE IS A REMOVABLE WIRING ARM. THE ARM CAN BE EASILY DISCONNECTED TO ALLOW FOR RAPID REPLACEMENT OF MODULES. THE I/O BACKPLANE IS KEYED TO PREVENT THE INADVERTENT INSTALLATION OF THE WRONG TYPE MODULE.

ANALOG INPUTS

THE ANALOG INPUT MODULE MEASURES ANALOG SIGNALS AT ITS INPUTS AND CONVERTS THIS DATA INTO A PROPORTIONAL 4 DIGIT BCD OR 12 BIT BINARY VALUE. THE MODULE PROVIDES UP TO 16 SINGLE-ENDED OR 8 DIFFERENTIAL INPUTS. IT LETS YOU SELECT FROM FIVE VOLTAGE OR THREE CURRENT INPUT RANGES. EACH INPUT IS INDIVIDUALLY SELECTABLE. THE MODULE HAS 200 VOLT OVERVOLTAGE PROTECTION AND PROVIDES 1500 VOLT OPTO-ISOLATION TO THE PROCESSOR. LINEAR CONVERSION OF RAW DATA INTO ENGINEERING UNITS IS PROVIDED BY THE MODULE. ALSO A VARIABLE DIGITAL FILTER IS INCLUDED TO HELP REDUCE THE EFFECTS OF ELECTRICAL NOISE. THERE ARE TWO LED STATUS INDICATORS ON THE FRONT OF THE MODULE. THE RED FAULT LED TURNS ON AND THE GREEN RUN LED TURNS OFF IF THE ON-BOARD SELF TEST FAILS. EXTENSIVE DIAGNOSTICS ARE AVAILABLE TO THE PROCESSOR FOR MONITORING PURPOSES. INCLUDED WITH EACH MODULE IS A REMOVABLE WIRING ARM. THE ARM CAN BE EASILY DISCONNECTED TO ALLOW FOR RAPID REPLACEMENT OF MODULES. THE I/O BACKPLANE IS KEYED TO PREVENT THE INADVERTENT INSTALLATION OF THE WRONG TYPE MODULE.

ANALOG OUTPUTS

THE ANALOG OUTPUT MODULE CONVERTS 4 DIGIT BCD OR 12 BIT BINARY VALUES INTO ANALOG SIGNALS. FOUR VOLTAGE OUTPUTS ARE PROVIDED EACH WITH THREE SELECTABLE RANGES. EACH OUTPUT IS AN INDIVIDUALLY ISOLATED DIFFERENTIAL OUTPUT WITH 1000 VOLT ISOLATION FROM THE OTHER OUTPUTS. THE MODULE HAS 1500 VOLT OPTO-ISOLATION TO PROTECT THE PROCESSOR. LINEAR CONVERSION OF SCALED ENGINEERING DATA INTO AN ANALOG SIGNAL IS PROVIDED BY THE MODULE. THERE ARE TWO LED STATUS INDICATORS ON THE FRONT OF THE MODULE. THE RED FAULT LED TURNS ON AND THE GREEN RUN LED TURNS OFF IF THE ON-BOARD SELF TEST FAILS. EXTENSIVE DIAGNOSTICS ARE AVAILABLE TO THE PROCESSOR FOR MONITORING PURPOSES. INCLUDED WITH EACH MODULE IS A REMOVABLE WIRING ARM. THE ARM CAN BE EASILY DISCONNECTED TO ALLOW FOR RAPID REPLACEMENT OF MODULES. THE I/O BACKPLANE IS KEYED TO PREVENT THE INADVERTENT INSTALLATION OF THE WRONG TYPE MODULE.

AUTO LUBRICATION SYSTEM

OVERVIEW

THE AUTO LUBRICATION SYSTEM IS COMPOSED OF AN AIR ACTUATED LUBE PUMP AND A NETWORK OF LUBE BLOCKS AND LINES. THE SYSTEM IS AUTOMATIC IN THAT IT STARTS A LUBE CYCLE DEPENDING ON THE NUMBER OF STROKES THE PRESS HAS MADE. IT WILL ONLY CYCLE AS LONG AS IT TAKES TO DELIVER OIL TO ALL THE LUBE POINTS.

LUBE LEVEL SWITCH

THE LUBE LEVEL SWITCH MONITORS THE AMOUNT OF OIL IN THE LUBE RESERVOIR. WHEN THIS SWITCH IS TRIPPED THE LUBE CYCLE WILL STOP AND A FAULT MESSAGE WILL BE DISPLAYED ON THE OPERATOR INTERFACE. THE PRESS CYCLE WILL STOP AT THE END OF THE CYCLE IN PROGRESS. TO RESET THE FAULT, FILL THE OIL RESERVOIR WITH THE PROPER OIL(LISTED BELOW) AND PRESS THE FAULT/RESET PUSHBUTTON KEY ON THE CONTROL CABINET OR RUN STATION. A NEW LUBE CYCLE WILL START.

LUBE CYCLE SWITCH

THE LUBE CYCLE SWITCH IS MOUNTED ON THE MAIN DISTRIBUTION BLOCK OF THE LUBE SYSTEM. THE DISTRIBUTION BLOCK IS COMPOSED OF A NUMBER OF SECTIONS, EACH CONTAINING A SMALL INTERNAL HYDRAULIC PISTON. AS OIL IS PUMPED INTO THE FIRST BLOCK THE PISTONS WILL SEQUENTIALLY MOVE BACK AND FORTH, PUMPING LUBE ON EACH STROKE. ONE LUBE CYCLE CONSISTS OF ALL THE PISTONS STROKING ONCE IN BOTH DIRECTIONS. ONE OF THE BLOCKS HAS AN INDICATOR PIN MOUNTED TO ITS INTERNAL PISTON. THE LUBE CYCLE SWITCH IS MOUNTED TO THIS BLOCK. WHENEVER A LUBE CYCLE IS STARTED THE CONTROL MONITORS THIS SWITCH. THE SWITCH MUST MAKE AND BREAK TO SIGNAL THE COMPLETION OF A LUBE CYCLE. IF THIS DOES NOT OCCUR WITHIN 90 SECONDS AFTER THE START OF A LUBE CYCLE, IT WILL BE STOPPED AND A LUBE FAULT MESSAGE WILL BE DISPLAYED ON THE OPERATOR INTERFACE. THE PRESS CYCLE WILL STOP AT THE END OF ITS CYCLE. TO RESET THE LUBE FAULT, PRESS THE FAULT/RESET PUSHBUTTON ON THE CONTROL CABINET OR RUN STATION. A NEW LUBE CYCLE WILL START. IF THE LUBE FAULT CONTINUES TO APPEAR CHECK FOR LOOSE FITTINGS BETWEEN THE LUBE PUMP AND THE DISTRIBUTION BLOCK. CHECK THAT THE HIGH PRESSURE BLOWOUT DISK IS NOT RUPTURED. WHEN THIS HAPPENS ALL LUBE WILL BE PUMPED OUT THE BLOWOUT PORT AND ONTO THE FLOOR.

BLOCKED LINE PROTECTION

BLOCKED LINE PROTECTION IS PROVIDED BY THE BLOWOUT DISK ON THE SIDE OF THE PUMP. THIS DISK IS REPLACEABLE BY UNSCREWING THE HEX HEAD CAP THAT HOLDS IT IN PLACE AND INSTALLING A NEW DISK IN THE CAP. THE DISKS USED IN THIS SYSTEM ARE ALUMINUM IN COLOR AND HAVE A PRESSURE RATING OF 2350 PSI.

LUBE SOLENOID

THE LUBE SOLENOID IS A 115VAC ON/OFF DEVICE THAT CONTROLS THE AIR SUPPLY TO THE LUBE PUMP. THE CONTROL IS SETUP TO TURN THE SOLENOID ON FOR THREE SECONDS THEN OFF FOR THREE SECONDS CONTINUOUSLY WHILE A LUBE CYCLE IS IN PROGRESS.

MANUAL LUBE PUSHBUTTON

A LUBE CYCLE CAN BE INITIATED BY PRESSING THE MANUAL LUBE PUSHBUTTON. IT WILL START AN AUTO LUBE CYCLE WITH THE SAME MONITORING AS IF IT WAS STARTED BY THE PRESS CYCLE COUNTER. IT NEED ONLY BE DEPRESSED MOMENTARILY THEN RELEASED.

OIL TYPE

THE LUBE RESERVOIR SHOULD BE FILLED WITH A TYPE S.S.U. 285/325 OIL @ 100 DEGREES F.

SCAVENGER PUMP

OVERVIEW

THE SCAVENGER PUMP AND RESERVOIR COLLECTS THE OIL THAT SEEPS PAST THE HIGH PRESSURE PACKING OF THE HYDRAULIC CYLINDERS AND PUMPS IT BACK TO THE MAIN OIL TANK.

COMBINATION PUMP AND MOTOR

THE PUMP/MOTOR COMBINATION IS MOUNTED TO THE BOTTOM OF THE SCAVENGER TANK. IT IS A 115V, SINGLE PHASE, 1/3 HP, 3450 RPM MOTOR. THE PUMP CAN DELIVER 1.4 GPM.

LEVEL SWITCHES

INSIDE THE SCAVENGER TANK ARE TWO LEVEL SWITCHES. THE HIGH LEVEL SWITCH TURNS ON THE MOTOR STARTER WHEN THE OIL LEVEL REACHES IT. THE LOW LEVEL SWITCH TURNS OFF THE MOTOR STARTER WHEN THE TANK IS NEARLY EMPTY. THE LEVEL SWITCHES ARE STAINLESS STEEL AND MAGNETICALLY OPERATED.

MOTOR STARTER

THE MOTOR STARTER IS CONTAINED IN THE SCAVENGER PUMP ASSEMBLY. IT IS AUTOMATICALLY OPERATED BY THE SCAVENGER TANK LEVEL SWITCHES. IT HAS BUILT-IN MOTOR OVERLOAD PROTECTION.

PILOT LIGHT

THE PILOT LIGHT ON THE SIDE OF THE SCAVENGER ASSEMBLY SIGNALS WHEN THE HIGH LEVEL SWITCH IS MADE. IF THIS LIGHT IS ON BUT THE MOTOR IS NOT RUNNING AND MOTOR STARTER OVERLOAD RESET SHOULD BE CHECKED.

OVER CURRENT PROTECTION

INSIDE THE SCAVENGER ASSEMBLY WITH THE MOTOR STARTER IS A OVERLOAD TRIP. THIS TRIP PROVIDES OVER CURRENT PROTECTION FOR THE MOTOR. THERE IS ALSO A FUSE LOCATED IN THE MAIN CONTROL CABINET THAT PROTECTS THE SCAVENGER PUMP UNIT AND THE WIRING TO THE UNIT.

CALIBRATION PROCEDURES

ELECTRONIC RELIEF VALVES

THE HYDRAULIC SYSTEM CONTAINS A ELECTRONIC RELIEF VALVE. WHICH NEEDS TO BE CALIBRATED PERIODICALLY.

CALIBRATION POTENTIOMETERS ARE LOCATED UNDER THE NAME PLATE OF EACH VALVE.

CAUTION: BEFORE ADJUSTING, MAKE SURE THE PARALLELS OR TOOL IN THE PRESS IS CAPABLE OF WITHSTANDING FULL TONNAGE.

THE "P CORR" (BIAS ADJUSTMENT) IS SET WITH THE VALVE COMMANDED TO 10% OF MAXIMUM TONNAGE. TURNING THE "P CORR" POT CLOCKWISE WILL INCREASE PRESSURE, COUNTER-CLOCKWISE WILL REDUCE THE PRESSURE. VERIFY THE RESULT ON THE CORRESPONDING PRESSURE GAGE.

THE " MAX" (MAXIMUM ADJUSTMENT) SHOULD BE ADJUSTED WITH THE VALVE COMMANDED TO MAXIMUM TONNAGE. TURNING THE "P MAX" POT CLOCKWISE WILL INCREASE THE PRESSURE, COUNTER-CLOCKWISE WILL REDUCE THE PRESSURE. VERIFY THE RESULT ON THE SYSTEM PRESSURE GAGE.

UNLOAD PUMP VALVE AMPLIFIER

THE MAIN DRIVE PUMP IS CONTROLLED BY A ELECTRONIC PROPORTIONAL VALVE. IT HAS A SEPARATE AMPLIFIER LOCATED IN THE CONTROL CABINET. A ANALOG COMMAND FROM THE PROGRAMMABLE CONTROL DETERMINES THE AMOUNT OF OIL WILL FLOW THRU THE VALVE. A 0 VDC EQUALS FULLY CLOSED TO +10 VDC FOR FULL OPEN. THERE ARE THREE ADJUSTMENTS ON THE AMPLIFIER; GAIN, RAMP AND DEAD BAND COMPENSATION. THE RAMP IS DISABLED AND REQUIRES NO ADJUSTMENT. ALL RAMPING IS DONE THROUGH THE PROGRAMMABLE CONTROLLER. THE GAIN ADJUSTS THE MAXIMUM FLOW FOR A GIVEN COMMAND VOLTAGE. THE DEAD BAND COMPENSATION ADJUSTS THE POINT AT WHICH THE VALVE STARTS TO OPEN WITH A MINIMUM SIGNAL.

OIL TEMPERATURE TRANSMITTER

THE OIL TEMPERATURE TRANSMITTER LOCATED IN THE OIL TANK JUNCTION BOX MAY NEED PERIODIC CALIBRATION. TO CALIBRATE REMOVE THE THERMOCOUPLE FROM THE TRANSMITTER AND REPLACE WITH A TYPE "J" THERMOCOUPLE SIMULATOR. SET THE SIMULATOR FOR ZERO DEGREES FAHRENHEIT AND ADJUST THE "ZERO" POT FOR ZERO VOLTS DC OUTPUT AT TERMINAL NUMBERS 7 AND 8. SET THE SIMULATOR FOR 150

DEGREES FAHRENHEIT AND ADJUST THE "SPAN" POT FOR 1.5 VOLTS DC OUTPUT. CHECK THE ZERO DEGREE READING AGAIN AND ADJUST IF NECESSARY. RECONNECT THE OIL TANK THERMOCOUPLE.

SYSTEM PRESSURE TRANSDUCER

THERE ARE NO ADJUSTMENTS ON THE SYSTEM PRESSURE TRANSDUCER, HOWEVER IT IS SCALED BY ENTERING VALUES IN THE PLC-5/15.

PILOT PRESSURE TRANSDUCER

THERE ARE NO ADJUSTMENTS ON THE SYSTEM PRESSURE TRANSDUCER, HOWEVER IT IS SCALED BY ENTERING VALUES IN THE PLC-5/15.

COUNTER BALANCE ADJUSTMENT

A PROPERLY ADJUSTED COUNTERBALANCE VALVE AIDS THE OPERATION OF THE FORMING CYCLE. PROPERLY SET, THE VALVE PREVENTS PRESSURE SEQUENCING, EXCESSIVE DRIFT AND IMPROPER CYCLE TIMES, AS WELL AS SYSTEM SHOCK AND LEAKING HYDRAULIC LINES.

IN ORDER TO PROPERLY SET THIS VALVE, THE MACHINE MUST BE UP WITH THE MOLD TO BE USED IN PRODUCTION. PROCEED AS FOLLOW:

WITH THE SLIDE AT REST IN THE BOTTOM OF THE STROKE AND THE MOTOR OFF, INSERT A 0 TO 5000 PSI GAGE IN THE GAGE PORT OF THE COUNTERBALANCE VALVE.

START THE MACHINE AND SELECT INCH MODE.

CYCLE THE MACHINE TO OBSERVE THE SELECTED POSITION CONTROL (THIS IS TO PREVENT DAMAGE TO THE DIE AND INJURY TO THE MACHINE OPERATOR).

SELECT THE SINGLE MODE. CYCLE THE MACHINE AND OBSERVE THE READING OF THE GAGE ON THE COUNTERBALANCE VALVE AS SOON AS THE SLIDE HAS STOPPED MOVING UPWARD FROM THE FAST OPEN. THIS METHOD PRODUCES THE MOST ACCURATE DEAD WEIGHT READING. RECORD THIS MEASUREMENT FOR USE IN THE FOLLOWING STEP.

SELECT THE INCH MODE ONCE AGAIN. INCH THE SLIDE DOWN. WHILE THE SLIDE IS MOVING DOWN, SET THE COUNTERBALANCE VALVE TO READ 350-400 PSI HIGHER THAN THE READING PRODUCED IN THE PREVIOUS STEP.

SELECT THE SINGLE MODE AND CYCLE THE MACHINE TO INSURE PROPER

OPERATION OF THE SLIDE BEFORE RETURNING THE MACHINE TO PRODUCTION.