

JAN. 1981

DIRECTIONS

FOR

OPERATING AND MAINTAINING

THE

R O T T L E R

H-P HONING MACHINE

MACHINE SERIAL NUMBER _____

MANUFACTURED BY:

ROTTLER BORING BAR COMPANY
8029 SOUTH 200TH STREET
KENT, WASHINGTON 98031

NOTE: WHEN ORDERING REPLACEMENT PARTS, PLEASE GIVE
THE MODEL AND SERIAL NUMBER OF THE MACHINE,
ORDER BY PART NUMBER

(MINIMUM ORDER CHARGE OF \$25.00)

D E S C R I P T I O N

THE MODEL H-P HONING MACHINE IS A WET OR DRY COMPLETE CYLINDER BLOCK AND GENERAL PURPOSE HONING MACHINE. HONE ROTATING POWER IS SUPPLIED BY A TOTALLY ENCLOSED AC MOTOR DRIVING A BELT AND GEAR REDUCTION DRIVE MOUNTED WITHIN A ROCKER ARM ARRANGEMENT. THE HONING HEAD IS DRIVEN THROUGH A UNIVERSAL JOINT.

AN AIR CYLINDER WITH A HYDRAULIC CHECK SYSTEM PROVIDES STROKING POWER. STROKING MAY ALSO BE MANUALLY OPERATED.

THE SUPPORT CARRIAGE IS AIR FLOATED AND AIR CLAMPED TO PROVIDE SIMPLE AND EASY HOLE-TO-HOLE SETUP.

CONVENIENT DEVICES ARE PROVIDED TO PROPERLY CONTROL HONING OPERATIONS AND PROVIDE EASY HANDLING.

A V-8 FIXTURE IS PROVIDED TO EFFICIENTLY HOLD V-6 AND V-8 BLOCKS FOR HONING. CLAMPS ARE PROVIDED TO HOLD MOST ANY KIND OF IN-LINE BLOCK OR SIMILAR WORK PIECE.

A SPLASH TANK IS LOCATED WITHIN THE MAIN FRAME AND A SUMP PUMP TANK IS LOCATED UNDER THE BACK OF THE MACHINE. A SWITCH IS PROVIDED WITHIN THE CONTROL PANEL TO OPERATE THIS COOLANT SYSTEM OR A DUST COLLECTOR SYSTEM.

LIMITED GUARANTEE

ROTTLER BORING BAR COMPANY MODEL H-P HONE PARTS AND EQUIPMENT ARE GUARANTEED AS TO WORKMANSHIP AND MATERIAL. THIS LIMITED GUARANTEE REMAINS IN EFFECT FOR ONE YEAR FROM THE DATE OF DELIVERY, PROVIDED THE MACHINE IS OWNED AND OPERATED BY THE ORIGINAL PURCHASER AND IS OPERATED AND MAINTAINED AS PER INSTRUCTION IN THIS MANUAL.

STANDARD AIR AND ELECTRIC COMPONENTS ARE WARRANTED BY THEIR RESPECTIVE MANUFACTURERS.

WE ACCEPT NO RESPONSIBILITY FOR DEFECTS CAUSED BY EXTERNAL DAMAGE, WEAR ABUSE, OR MISUSE. NEITHER DO WE ACCEPT ANY OBLIGATION TO PROVIDE COMPENSATION FOR OTHER DIRECT OR INDIRECT COSTS IN CONNECTION WITH CASES COVERED BY THE WARRANTY.

GUARANTEE DOES NOT COVER SHIPPING OR FREIGHT CHARGES.

I M P O R T A N T

OPERATING SAFETY AND EMERGENCY PROCEDURES

ELECTRICAL POWER - MAKE SURE ALL ELECTRICAL EQUIPMENT HAS THE PROPER ELECTRICAL OVERLOAD PROTECTION.

MACHINE OPERATOR - OPERATOR OF THIS H-P HONING MACHINE SHOULD BE A SKILLED MACHINIST CRAFTSMAN; THAT IS, WELL VERSED IN THE CAUTION, CARE, AND KNOWLEDGE REQUIRED TO SAFELY OPERATE A METAL CUTTING TOOL.

IF THE OPERATOR IS NOT A SKILLED MACHINIST, THE OPERATOR MUST PAY STRICT ATTENTION TO THE OPERATING PROCEDURE OUTLINED IN THIS MANUAL, AND MUST GET INSTRUCTION FROM A QUALIFIED MACHINIST IN BOTH THE PRODUCTIVE AND SAFE OPERATION OF THIS H-P HONING MACHINE.

ROTTLER H-P HONING EQUIPMENT HAS THE FOLLOWING AREAS OF EXPOSED MOVING PARTS THAT YOU MUST TRAIN YOURSELF TO RESPECT AND STAY AWAY FROM WHEN THEY ARE IN MOTION:

1. WORK CLAMPING - BE SURE WORK IS CLAMPED SECURELY IN ACCORDANCE WITH THE INSTRUCTIONS.
2. LOWER STOP - SET LOWER LIMIT CAREFULLY SO THAT WEBS OR OTHER OBSTRUCTION BELOW THE CYLINDER SURFACE IN THE BORE DO NOT INTERFERE WITH THE GUIDES OR STONES OF THE HONE.
3. KEEP HANDS COMPLETELY AWAY FROM THE ROTATING HONING HEAD AT ALL TIMES.
4. DO NOT OPERATE POWER STROKING WITHOUT UPPER TRAVEL LIMIT LEVER LOCKED.
5. FAMILIARIZE YOURSELF WITH THE EXACT LOCATION OF THE STOP PUSHBUTTON SO YOU CAN IMMEDIATELY REACT TO AN EMERGENCY.
6. DO NOT ENGAGE ROTATION POWER WHEN HONE HEAD IS OUT OF A CYLINDER.

REMEMBER

METAL CUTTING TOOLS HAVE THE SPEED AND TORQUE TO SEVERELY INJURE ANY PART OF THE HUMAN BODY EXPOSED TO THEM.

POWER SOURCES REQUIRED

HONE DRIVE MOTOR - 3 Ø, 220 VOLT, AC CURRENT.

AIR SUPPLY - 3.5 CUBIC FEET PER MINUTE AT
100 PSI COMPRESSED AIR (A
MINIMUM 1 HP AIR COMPRESSOR
OUTPUT)

COOLANT PUMP - 3 Ø, 220 VOLT, AC CURRENT

WARNING

MODEL H-P HONING MACHINE WILL HAVE 2 ELECTRICAL POWER
SOURCES. ONE FOR THE HONE DRIVE MOTOR AND ONE FOR
COOLANT PUMP OR DUST COLLECTOR
DISCONNECT ALL POWER BEFORE SERVICING THIS HONE.

ELECTRICAL HOOK UP- MAKE SURE THE ELECTRICAL
INSTALLATION IS IN ACCORDANCE WITH THE NATIONAL
ELECTRICAL CODE AND YOUR LOCAL ELECTRICAL CODES
AND THAT THE PANEL IS PROPERLY PLACARDED FOR
THE SECOND POWER SOURCE.

MACHINE LOCATION

THE HONE MUST BE LOCATED UNDER A HOIST, PREFERABLY POWERED FOR EFFICIENT BLOCK HANDLING.

UNPACKING

CAREFULLY UNCRATE THE H-P MACHINE. REMOVE ALL EQUIPMENT IN SPLASH TANK EXCEPT THE V8 FIXTURE FRAME. REMOVE BOTH CLAMP ARMS FROM TABLE.

COMPLETELY CLEAN THESE ARTICLES AS WELL AS THE MACHINE BASE UPPER TABLE WITH SOLVENT, ALSO CLEAN THE CYLINDER BLOCK CLAMP ARM ASSEMBLIES AND THE UPPER AND LOWER TRAVEL LIMIT STOP RODS. RUST INHIBITOR IS APPLIED TO THE MACHINE AT THE THE TIME OF SHIPMENT AND MUST BE REMOVED BEFORE OPERATING THIS MACHINE.

THE HONE CARRIAGE IS GENERALLY SHIPPED WITH THE HOLD-DOWN SYSTEM LOCKED SEE PAGE 7 FOR MACHINE SET UP.

LEVELING

FOUR SQUARE HEAD SET SCREWS, JAM NUTS, AND CHAMFERED WASHERS ARE PROVIDED WITH THE MACHINE FOR LEVELING. INSERT THE SCREWS WITH NUTS INTO THE BOTTOM OF THE BASE. PLACE THE WASHER CHAMFERED SIDE UP UNDER THE BASE AT THESE POINTS.

USING A PRECISION LEVEL, LEVEL THE UPPER TABLE WITHIN .005" PER FOOT IN BOTH DIRECTIONS. (EXCEPT FAVOR THE HIGH SETTING TO THE FRONT FOR BEST COOLANT RETURN.)

MACHINE SET UP

FIRST TURN FLOAT CLAMP SWITCH TO NEUTRAL. ATTACH AIR SUPPLY TO FILTER-REGULATOR ON THE BACK OF THE MAIN BASE.

SET REGULATOR ON MAIN BASE TO 100 PSI. (PUSH DOWN TO SET, PULL UP TO LOCK.)

REMOVE COVER PLATE ON TOP OF CARRIAGE. PULL OUT COTTER PIN IN SLOTTED NUT. HAND TIGHTEN SLOTTED NUT. BACK OFF NUT APPROXIMATELY 1/4 TURN. INSERT COTTER PIN.

CAUTION:

THIS HONE CANNOT BE RUN ON 440 VOLTS.
IF NECESSARY, A TRANSFORMER MUST BE
ADDED TO SUPPLY THE CORRECT VOLTAGE.

ATTACH 3 PHASE WIRING TO THE L1, L2, AND L3 TERMINAL ON TOP OF THE HONE MOTOR STARTER; LEFT STARTER, SEE ILLUSTRATION ON PAGE 26.

TURN TOGGLE SWITCH ON TOP OF CONTROL STATION TO 'OFF'.

PULL THE HONE ROCKER ARM DOWN INTO ITS OPERATING RANGE TO TEST RUN.

PUSH STARTER BUTTON, CHECK HONE HEAD ROTATION. THE HONE HEAD SHOULD TURN CLOCKWISE LOOKING FROM THE TOP. EXCHANGE 2 WIRES ON THE L1, L2, L3, TERMINAL TO CHANGE ROTATION.

ATTACH HONE HEAD MANDREL ASSEMBLY, FEED HANDWHEEL AND UNIVERSAL JOINT TO DRIVE SHAFT OF GEAR BOX. SECURELY LOCK 6 SET SCREWS OF UNIVERSAL JOINT.

COOLANT PUMP SYSTEM

ATTACH 230 VOLT 3 PHASE WIRING TO THE L1, L2, AND L3 TERMINAL ON TOP OF THE COOLANT PUMP'S MOTOR STARTER.

TURN COOLANT PUMP'S TOGGLE SWITCH TO 'ON' AND CHECK PUMPS ROTATION AS INDICATED ON SIDE ON MOTOR, EXCHANGE 2 WIRES ON L1, L2, AND L3, TERMINAL TO CHANGE ROTATION.

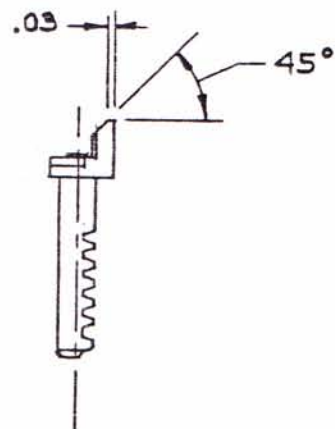
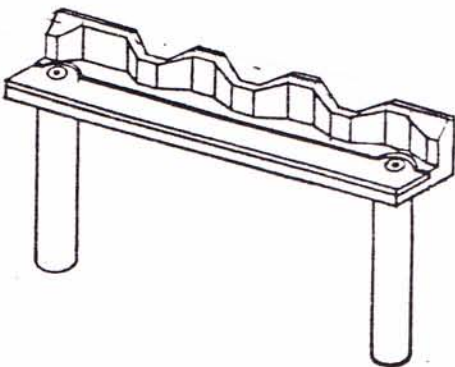
POUR 15 GALLONS OF HONING OIL INTO SPLASH TANK - (MOBIL MET 33 OR UPSILON OR ANY EQUIVALENT LIGHT HONING OIL.)
RUN COOLANT PUMP TO FILL FILTER, THEN ADD 5 MORE GALLONS.

IMPORTANT GENERAL FACTS ON HONING YOU MUST KNOW
TO GET PRECISION TROUBLE-FREE RESULTS

D R Y H O N I N G

(*APPLIES TO WET HONING AS WELL)

1. DRY HONING CREATES A SEVERE DUST PROBLEM THAT CAN BE RELIEVED BY USING THE DUST COLLECTOR SYSTEM. FREQUENT ATTENTION MUST BE PAID TO CLEANING AND REPLACING THE DUST COLLECTOR BAG.
2. DRY HONING IS LIMITED TO STONES NO FINER THAN 180 GRIT.
3. STONES CANNOT BE USED DRY AGAIN, ONCE THEY HAVE BEEN USED WET OR EVEN EXPOSED TO MOISTURE.
- *4. HONE HEAD WILL TEND TO CHATTER OR SQUEAL WHEN STONES WEAR DOWN. THIS PROBLEM IS CAUSED BY TOO MUCH PRESSURE ON THE GUIDES. TO CORRECT THIS PROBLEM, TAKE GUIDE OUT OF HEAD AND DRESS THEM DOWN AS SHOWN IN THE SKETCH BELOW.
5. STONES MUST BE CLEANED, PREFERABLY WITH A FILE BRUSH, AFTER EACH BORE TO EXPOSE A CLEAN CUTTING ABRASIVE TO THE NEXT BORE.
- *6. THE HEAT GENERATED IN HONING WILL EXPAND THE BORE DIAMETER BEYOND ITS ROOM TEMPERATURE SIZE WITH MORE EXPANSION IN THE THIN WALL MID-SECTION. EXPECT APPROXIMATELY A .0005" REDUCTION IN SIZE AFTER COOLING TO ROOM TEMPERATURE.



W E T H O N I N G

SQUIRT WET HONING WILL ALSO BUILD UP A SLUDGE THAT SHOULD BE REMOVED FROM THE STONES. EMERGE THE HONE HEAD IN A CAN OF CLEANER TO COMPLETELY CLEAN THE HEAD.

H O N I N G I N G E N E R A L

ROTTLER HONING EQUIPMENT IS DESIGNED TO REMOVE A NOMINAL .0012'' OF STOCK FROM THE DIAMETER OF A BORED CYLINDER WITH ONE SET OF STONES UNLESS YOU REQUIRE A BETTER THAN 20 MICRO INCH FINISH WITH FINE STONES. 120/150 GRIT STONES GENERALLY WILL REMOVE THE .0012 STOCK IN ABOUT 30 SECONDS IN A 4'' DIAMETER X 6'' LONG BORE.

60 GRIT STONES SHOULD BE USED WHEN YOU REQUIRE MORE STOCK REMOVAL. THEY WILL GENERALLY REMOVE STOCK AT ABOUT .004 DIAMETER PER MINUTE IN A 4'' DIAMETER X 6'' LONG CAST IRON BORE.

MANY AUTOMOTIVE CYLINDER BORES PRESENT A THROUGH STROKE LIMITATION AT THE BOTTOM. YOU MUST BE CAREFUL TO HAVE AT LEAST A 1/2'' THROUGH STONE EXTENSION AT THE BOTTOM AND BE SURE THE AREA IS COMPLETELY RELIEVED OF WEBS OR OTHER OBSTRUCTIONS. GRIND THEM AWAY IF NECESSARY.

YOU CAN FAVOR LOWER BORE INACCURACY (SMALL AT BOTTOM) BY DWELLING AT THE BOTTOM.

REMEMBER, ONCE YOU TAPER THE STONES AND GUIDES BY THE WRONG TREATMENT AT THE BOTTOM, THEY MUST BE TRUED UP AGAIN IN A HOLE WITH ADEQUATE THROUGH STROKE.

IN GENERAL, ALLOW 3/4 TO 1'' OF STONE THROUGH TRAVEL AT THE TOP OF BORE.

CORRECT STONE BOND HARDNESS ALLOW STONES TO BREAK DOWN, WHICH IN TURN PROVIDE NEW CUTTING EDGES ON STONES, PROVIDED PROPER ATTENTION IS ALSO GIVEN TO THE GUIDES. MAKE SURE THE BOND IS NOT TOO HARD SO THERE IS NO BREAK DOWN, WHICH WILL CAUSE CYLINDER GLAZING, WHICH IN TURN WILL CAUSE A RING SEAT IN PROBLEM.

RAPID DETERIORATION OF THE STONES WILL INDICATE A TOO-SOFT BOND CONDITION.

CONTROL YOUR POWER STROKING WITH DWELLING TO STABILIZE THE LOAD METER. YOU WILL FIND THE METER PROVIDES EXCELLENT INFORMATION ON SIZING THE BORE.

IF LIMITED OVER STROKE (THROUGH STONE EXTENSION) IS POSSIBLE ON A NUMBER OF BLOCKS, YOU WILL FIND 3" LENGTH STONES & GUIDES WILL REQUIRE LESS ATTENTION TO ACHIEVE AN ACCURATE BORE.

A BARREL SHAPE PATTERN CAN BE ELIMATED BY REDUCING STONE LENGTH. 1" OF THE TOP OF STONES AND GUIDES CAN EASILY BE TRIMMED OFF WITH THE AID OF A BENCH GRINDER.

IN GENERAL, THE FOLLOWING APPROXIMATE MICRO INCH FINISH IN CYLINDER BLOCK CAST IRON WILL RESULT FROM THE FOLLOWING STONE GRITS:

60 - 80 GRIT	-	40-70
120 "	-	28-35 RMS
150 "	-	24-32
180 "	-	20-25
220 "	-	15-21
280 "	-	10-16
320 "	-	8 -15

STONE AND GUIDE INSTALLATION

TO INSTALL NEW STONES, FIRST LIFT INNER ADJUSTING SHAFT ON HONE HEAD SO THAT HEAD CAN BE PIVOTED 90° SO THAT CENTERING PINION CAN BE WITHDRAWN.

NOTE:

STONES AND GUIDES WILL FALL OUT WHEN CENTERING PINION IS REMOVED AND HEAD IS PIVOTED 90°.

INSERT STONES AND GUIDES WITH RACK TEETH FACING CENTER OF HONE HEAD INTO HOLE MARKED WITH 'X'.

HOLD STONES AND GUIDES IN, THEN PIVOT HONE HEAD 90° AND INSERT CENTER PINION INTO HEAD.

LIFT INNER ADJUSTING SHAFT AND RETURN HEAD TO HONING POSITION. CHECK FOR FREE EXPANSION AND RETRACTION OF STONES.

NOTE:

USED STONES AND GUIDES THAT ARE TO BE REUSED MUST BE KEPT IN SETS.

H O N I N G P R O C E D U R E S

WITH IN-LINE BLOCKS

BLOCK POSITIONING & CLAMPING

PLACE THE 514-4-37 PARALLELS ON THE LOWER V-8 FRAME.

LOCATE BLOCK ON PARALLELS ON CENTER LINE OF HONE HEAD.

SWING CLAMPS INTO POSITION AT END OF BLOCK. LOCK CLAMP ARMS. LOWER CLAMP LEGS AND LOCK. LOCK BLOCK DOWN.

NOTE:

MAKE SURE ONE END OF BLOCK DOES NOT LIFT UP IF THE BLOCK CLAMPS ARE OUT-BOARD OF SUPPORT AREA.

HONE HEAD POSITIONING

TURN FLOAT CLAMP SWITCH TO FLOAT AND POSITION HONE HEAD OVER FIRST HOLE. TURN SWITCH TO CLAMP.

LOWER TRAVEL LIMIT SETTING

EXPAND OR CONTRACT THE STONE TO THE APPROXIMATE BORE SIZE.

EXPANDING - TURN TOP HAND WHEEL COUNTER-CLOCKWISE.
CONTRACTING - TURN TOP HAND WHEEL CLOCKWISE.

CHECK FOR OBSTRUCTION IN LOWER PART OF ALL CYLINDER. RELEASE BOTH UPPER AND LOWER TRAVEL LIMIT STOP LEVERS. LOWER HONE HEAD INTO CYLINDER AND POSITION AT LOWEST POINT OF STROKE.

NOTE:

STONES AND GUIDES MUST HAVE ADEQUATE OVER TRAVEL (APPROXIMATELY 3/4"). IF THERE IS INTERFERENCE WITH MAIN BEARING, WEBS, OR OTHER OBSTRUCTION, THE OVER TRAVEL CAN BE REDUCED.

AT THIS POSITION EXPAND STONES LIGHTLY AGAINST CYLINDER WALLS TO HOLD ROCKER ARM. UNCLAMP LOWER TRAVEL LIMIT STOP LEVER AND SET TO STOP ROCKER ARM AT THIS POSITION.

NOTE:

LOWER TRAVEL LIMIT SETTING WILL NOT HAVE TO BE CHANGED IN THIS BLOCK UNLESS THERE IS AN OBSTRUCTION IN ONE OF THE OTHER CYLINDER.

HONING PROCEDURES CONT'D

UPPER TRAVEL LIMIT SETTING

RELEASE STONE PRESSURE BY TURNING UPPER HANDWHEEL CLOCKWISE. RAISE HONE HEAD UNTIL STONES EXTEND ABOUT 3/4" OUT OF BLOCK LOCK UPPER STROKE LIMIT.

TIMER LIGHT

SET TIMER LIGHT TO THE TIME REQUIRED TO REMOVE THE STOCK LEFT AFTER BORING.
30 SECONDS WILL REMOVE APPROXIMATELY .001 ON A 4" DIAMETER BY 6" LONG CYLINDER WITH 180 GRIT STONES.

HONE CYCLE

TURN STROKE SWITCH ON TOP OF CONTROL PANEL TO 'ON' POSITION. TURN TOGGLE SWITCH ON FRONT OF CONTROL PANEL TO 'ON', IF MACHINE IS EQUIPPED WITH AN OPTIONAL COOLANT PUMP OR OPTIONAL DUST COLLECTOR.

LIGHTLY HOLD UPPER HAND WHEEL WITH RIGHT HAND.

PRESS START BUTTON WITH LEFT HAND.

REMEMBER: A LIMIT SWITCH IN THE ROCKER ARM WILL NOT ALLOW THE MOTOR TO OPERATE WHEN THE HONE HEAD IS IN PARK POSITION.

BRING LOAD UP TO 90 TO 100% ON METER. IF YOU GO OVER 100%, YOU CAN RELEASE PRESSURE BY LIGHTLY HOLDING LOWER HAND WHEEL.

NOTE: LOAD ON LOAD METER. A LARGE SWING OF NEEDLE INDICATES A SMALL AREA IN CYLINDER. THE SMALL AREA BEING THE HIGHEST READING, USUALLY AT THE BOTTOM OF THE CYLINDER. DWELL IN THIS AREA TO OPEN IT UP.

DWELL BUTTON

PUSH YELLOW DWELL BUTTON ON DOWN STROKE. HONE WILL STOP AT BOTTOM OF STROKE. PUSH BUTTON ON UP STROKE, HONE WILL STOP WHEN BUTTON IS PUSHED.

A LIGHT PRESSURE ON UPPER HAND WHEEL IS USUALLY REQUIRED TO HOLD LOAD, AS STONES WEAR DOWN.

HONING PROCEDURES CONT'D

SIZE CHECKING

TO CHECK BORE SIZE, FIRST REDUCE STONE PRESS. PRESS STOP BUTTON. PLACE LEFT HAND ON ROCKER ARM HANDLE. RELEASE UPPER TRAVEL LIMIT LEVER. MOVE HONE HEAD OUT OF WAY. AFTER CHECKING SIZE, RESET UPPER TRAVEL LIMIT LEVER.

AFTER TIMING LIGHT COMES ON REDUCE PRESSURE BY APPROXIMATELY 20% TO GET PLATEAU. ALLOW HONE TO STROKE FOR 6 TO 10 TIMES AT THIS PRESSURE.

RELEASE STONE PRESS. PRESS STOP BUTTON. PLACE LEFT HAND ON ROCKER ARM HANDLE, RELEASE UPPER TRAVEL LIMIT LEVER. TURN FLOAT/CLAMP SWITCH TO FLOAT AND MOVE TO NEXT CYLINDER.

CAUTION: DO NOT OPERATE POWER STROKING WITHOUT UPPER TRAVEL LIMIT LEVER LOCKED. IF YOU INADVERTENTLY START MACHINE WITH POWER STROKING ON AND LEVER UNLOCKED, THE AIR CYLINDER WILL GO TO THE BOTTOM OF STROKE AND REMAIN THERE.

TO RETURN IT, PRESS STOP BUTTON. CHECK TO MAKE SURE UPPER TRAVEL LIMIT LEVER IS COMPLETELY UNLOCKED. KEEP YOUR HANDS WELL CLEAR OF ALL MECHANISMS. MANUALLY BRING THE ROCKER ARM DOWN TO THE LOWER STOP OR USE A PENCIL OR SCREWDRIVER TO DEPRESS THE LOWER LIMIT VALVE AND THE CYLINDER WILL RETURN TO THE TOP.

MANUAL STROKING

TO HAND PUMP ROCKER ARM, TURN TOGGLE SWITCH ON TOP OF CONTROL PANEL TO 'OFF' POSITION. RELEASE UPPER TRAVEL LIMIT LEVER. ALL FUNCTIONS WILL OPERATE WITH EXCEPTION OF THE POWER STROKING. USE STOP BUTTON ON ROCKER ARM TO STOP HONE.

V-8 F I X T U R E S Y S T E M

CLAMPING SLING ASSEMBLY TO BLOCK

NOTE: BEARING CAPS MAY BE ON OR OFF. ON V-TYPE BLOCK, PAN RAILS MUST BE RAISED OFF FLOOR, WHEN CAPS ARE OFF, TO ALLOW INSERTION OF MAIN BEARING LOCATOR TUBE.

PLACE LIFT/INDEX CHANNEL OVER TOP OF BLOCK WITH LEFT EYE CENTERED AT MID-POINT; BETWEEN #2 & 3 CYLINDERS OF BOTH BANKS. ADJUST BOTH CLAMP ARMS TO ALLOW MAIN BEARING LOCATOR TO PASS THROUGH ARMS AND MAIN BEARINGS. INSERT LOCATOR BAR. ALIGN END OF TUBE WITH ALIGNMENT LINE ON LIFT/INDEX CHANNEL. PLACE ARMS NEXT TO BLOCK AND POSITION CONE INTO THE CAM BORE. ROTATE TUBE TO ALIGN LINE ON TUBE WITH MARK ON ARM. LIGHTLY LOCK BOTH ARM CLAMP HANDLES.

LOADING BLOCK AND SLING ASSEMBLY

POSITION BLOCK CLAMPS OUT-BOARD, OUT OF WAY.

SET V-8 FIXTURE INDEX INTO MIDDLE POSITION.
HOIST BLOCK INTO MACHINE WITH SLING ASSEMBLY.
INDEX BLOCK TO PROPER 30° OR 45° POSITION FOR HONING.

NOTE: UPPER BLOCK CLAMPS ARE NOT REQUIRED WHEN USING HONE V-8 FIXTURE.

RETURN INDEX TO MIDDLE POSITION TO REMOVE BLOCK.

V-8 FIXTURE REMOVAL

LARGE BLOCKS OR WORK PIECES MAY OCCASIONALLY REQUIRE REMOVAL OF THE V-8 FIXTURE FRAME. TO REMOVE FIXTURE, REMOVE 2 SCREWS HOLDING THE FIXTURE DOWN AND LIFT FIXTURE OUT OF TANK. SLING ASSEMBLY MAY BE USED TO LIFT FIXTURE IF A V-BLOCK IS IN FIXTURE. ROTATE MAIN BEARING LOCATOR TUBE 90° BEFORE LIFTING FIXTURE.

IMPORTANT

MAINTENANCE

1. LIGHTLY GREASE THE TWO GREASE FITTINGS ON THE ROCKER ARM PIVOT, GREASE FITTINGS ON EACH CLAMP ARM AND THE TWO FITTINGS ON THE V-8 FIXTURE. LUBRICATE WITH UNOBA OR F2 LUBRICANT, OR LUBRIPLATE #930AA, OR ANY EQUIVALENT LITHUIM BARIUM GREASE EVERY MONTH .
2. CHECK OIL LEVEL IN THE GEAR BOX ON ROCKER ARM EVERY 6 MONTHS. CHECK BY REMOVING PLUG ON LEFT SIDE OF GEAR BOX. CHECK WITH ROCKER ARM IN HORIZONTAL POSITION. OIL LEVEL SHOULD BE UP TO THIS HOLE. IF OIL IS NEEDED REMOVE FRONT PULLEY COVER ON TOP OF ROCKER ARM AND ADD OIL IN BREATHER CUP.

CAUTION: DO NOT OVER FILL. IF OVER FILLED, OIL WILL COME OUT BREATHER CAP. DRAIN OIL BY REMOVING PLUG ON BOTTOM OF GEAR HOUSING.

USE S.A.E. 90 MULTIPURPOSE GEAR LUBRICANT OR ANY EQUIVALENT S.A.E. 90 GEAR LUBRICANT.

3. REMOVE ADJUSTING PINION OF HONE HEAD AND CLEAN GEARS IN PINION. (LIGHTLY GREASE) MONTHLY.
4. LUBRICATE DAILY THE UNIVERSAL JOINT THAT DRIVE THE HONE HEAD ACTUATOR/DRIVE SHAFT ASSEMBLY WITH MOBILUBE HD-140 OIL OR EQUIVALENT OIL.

LUBRICATION - PNEUMATIC STROKING CIRCUIT

ADD WHEN NEEDED, SHELL OIL 'TELLUS #32' OR 'MOBILE DTE LIGHT' TO THE LUBRICATOR ON THE BACK OF THE MAIN BASE, OR AN EQUIVALENT HIGHLY REFINED, TURBINE, OR HYDRAULIC S.A.E. #10 OR LIGHTER PETROLEUM OIL (NONDETERGENT) WITH A MEDIUM ANILINE POINT (ASTM OIL #2).

CAUTION: USE ONLY AN OIL THAT IS COMPATIBLE WITH NITRILE SEALS AND WILL NOT CAUSE SWELLING OF SEALS.

DO NOT USE COMPOUNDED OILS CONTAINING GRAPHITE, SILICONES, SOAPS, FILLERS, HYDRAULIC FLUIDS CONTAINING PHOSPHATE ESTERS (SKYDROL, FYROUEL, PYDRAUL, ETC.) AND FIRE RESISTANT OILS CONTAINING PHOSPHATE ESTERS.

SET LUBRICATOR AT ONE DROP PER MINUTE.

MAINTENANCE CONT'D

FILTER/REGULATOR (AIR)

TO MAINTAIN MAXIMUM FILTERING EFFICIENCY AND TO AVOID EXCESSIVE PRESSURE DROP, THE FILTER/REGULATOR MUST BE KEPT CLEAN. IF THE AIR SUPPLY IS KEPT CLEAN THE REGULATOR SHOULD PROVIDE LONG PERIODS OF UNINTERRUPTED SERVICE. ERRATIC REGULATOR OPERATION OR LOSS OF REGULATION IS MOST ALWAYS DUE TO DIRT IN THE DISC AREA.

TO CLEAN, DEPRESSURIZE AND DISASSEMBLE THE FILTER/REGULATOR (REMOVE THE BOWL*, FILTER AND DISC ASSEMBLY). CLEAN PARTS WITH DENATURED ALCOHOL AND BLOW OUT BODY WITH COMPRESSED AIR. WHEN REASSEMBLING, MAKE SURE THE DISC STEM FITS INTO CENTER HOLE OF DIAPHRAGM ASSEMBLY. IF DIAPHRAGM ASSEMBLY IS REPLACED, MAKE SURE DISC STEM FITS INTO ITS CENTER HOLE. TIGHTEN BONNET SLIGHTLY MORE THAN HAND TIGHT (TO 45 INCH POUNDS TOQUE).

WASH POROUS FILTER ELEMENTS WITH DENATURED ALCOHOL.

* CLEAN PLASTIC BOWL ONLY WITH HOUSEHOLD SOAP.

COOLANT PUMP HONING OIL

CHANGE FILTER ELEMENT WHEN FLOW AT NOZZLE IS REDUCED. CHANGE HONING OIL WHEN IT GETS DIRTY. COMPLETELY CLEAN THE SUMP TANK AND FILTER SCREEN WHEN REFILLING, USE 15 GALLONS OF MOBIL MET 33 OR UPSILON OR ANY EQUIVALENT LIGHT HONING OIL.

HYDRAULIC CHECK SYSTEM

MONTHLY CHECK THE HYDRAULIC LIQUID LEVEL IN THE RESERVOIR IN BACK OF THE CARRIAGE UNDER THE PIVOT ARM. IF LIQUID IS NEEDED, ADD TWO PARTS WATER TO ONE PART ETHYLENE GLYCOL (PRESTONE) TO PLUG HOLE ON TOP OF RESERVOIR. REMOVE AIR FROM MACHINE WHILE FILLING; FILL TO MARK ON RESERVOIR.

BLEEDING AIR OUT OF HYDRAULIC SYSTEM

TURN OFF POWER STROKING TOGGLE SWITCH. CHECK HYDRAULIC LIQUID LEVEL. REMOVE COVER ON CARRIAGE. OPEN NEEDLE VALVE UNDER COVER. ATTACH A HOSE TO BLEED FIXTURE ON BACK SIDE OF LOWER CYLINDER. PLACE OTHER END OF HOSE IN A JAR OF WATER AND GLYCOL. LOOSEN BLEED FIXTURE. PUMP ROCKER ARM SLOWLY UP AND DOWN, WITH UPPER TRAVEL LIMIT LEVER CLAMPED. PUMP UNTIL NO BUBBLE APPEARS IN LIQUID IN JAR. CLOSE BLEED FIXTURE. DO THE SAME TO THE BLEED FIXTURE ON THE RIGHT SIDE OF THE UPPER CYLINDER. THEN CLOSE NEEDLE VALVE AND UNCLAMP UPPER TRAVEL LIMIT LEVER.

V - BELT

ADJUSTMENT - REMOVAL

ADJUSTMENT

REMOVE REAR COVER ON TOP OF ROCKER ARM. LOOSEN 4 MOTOR CAPSCREWS. PUSH MOTOR BACK UNTIL YOU HAVE APPROXIMATELY 1/2" PLAY IN V-BELT.

CAUTION: DO NOT OVER TIGHTEN BELT.

RETIGHTEN CAPSCREWS.

REMOVAL

REMOVE BOTH FRONT AND REAR COVER ON TOP OF ROCKER ARM. LOOSEN THE 4 MOTOR CAPSCREWS. PULL MOTOR FORWARD. SLIP V-BELT OFF PULLEYS. REMOVE V-BELT THROUGH STOP ROD SLOT OF ROCKER ARM.

GEAR BOX

REMOVAL - DISASSEMBLY

REMOVAL

REMOVE HONE HEAD AT TOP UNIVERSAL JOINT. REMOVE BY LOOSENING 3 SET-SCREWS AT U-JOINT.

REMOVE BOTH FRONT AND REAR COVERS ON TOP OF ROCKER ARM.

REMOVE V-BELT FROM FRONT PULLEY. REMOVE FRONT PULLEY. REMOVE TWO SCREWS IN FRONT COVER. REMOVE FOUR OF THE 3/8" SOCKET HEAD CAP SCREWS ON GEAR BOX INSIDE ROCKER ARM. REMOVE GEAR BOX.

REMOVE SIX SOCKET HEAD CAP SCREWS, TWO PINS, AND THE SCREW IN THE MIDDLE OF THE TOP GEAR POT.

TAP LIGHTLY ON HONE HEAD DRIVE SHAFT THROUGH CENTER SCREW HOLE AND HOUSING WILL COME APART.

TO REMOVE DRIVER GEAR 514-2-5A, REMOVE (3) 1/4" SOCKET HEAD CAP SCREWS IN BEARING RETAINER 514-2-3C, REMOVE BY INSERTING ALLEN WRENCH THROUGH ACCESS HOLES IN GEAR.

PRESS SHAFT AND GEAR OUT OF HOUSING.

BEND LOCKWASHER, THEN REMOVE NUT AND LOCKWASHER.

FIRST PRESS GEAR OFF SHAFT, THEN PRESS BEARING OFF SHAFT.

TO REMOVE PINION GEAR, REMOVE RETAINER 514-2-2C BY REMOVING ITS 3 SOCKET HEAD CAP SCREWS.

PRESS PINION OUT OF HOUSING.

BACK OUT SOCKET SET SCREW IN NUT, THEN REMOVE NUT.

PRESS GEAR OFF SHAFT.

CAUTION:

WHEN REASSEMBLING SHAFTS INTO GEAR POTS, EXTREME CARE MUST BE TAKEN NOT TO DAMAGE THE SEALS.

CONTROL FUNCTIONS

TO PROVIDE A CONVENIENT TROUBLE SHOOTING GUIDE IN THE EVENT OF A CONTROL FAILURE TO YOUR H-P HONE, THE FOLLOWING INFORMATION DESCRIBES THE SEQUENCE OF CONTROL ACTIONS.

THE CONTROL FUNCTIONS ARE DESCRIBED IN CAPITAL TYPE AND THE RESULTING POWER FUNCTIONS IN LOWER CASE, SO A DIFFICULTY MAY EASILY BE ISOLATED.

PARK POSITION LIMIT SWITCH

AN ELECTRICAL LIMIT SWITCH IS LOCATED ON THE CARRIAGE UNDER THE ROCKER ARM PIVOT. THIS NORMALLY OPEN SWITCH IS CLOSED BY A CAM WHEN THE ROCKER ARM IS LOWERED INTO ITS WORKING RANGE. WHEN CLOSED IT ALLOWS THE AIR CONTROL SOLENOID VALVE AND THE MOTOR STARTER TO BE ENERGIZED. WHEN OPEN IT DROPS OUT THE ELECTRICAL CONTROL CIRCUIT.

START PUSH BUTTON

PRESS START BUTTON TO CLOSE CONTACTS ON MOTOR STARTER, WHICH ENERGIZES THE MOTOR, WHICH IN TURN PROVIDES ROTATIONAL POWER TO THE HONE HEAD, THROUGH A V-BELT AND A GEAR REDUCTION. IT ALSO ENERGIZES A SOLENOID VALVE, WHICH OPENS TO PROVIDE AIR PRESSURE TO THE UPPER LIMIT VALVE LOCATED ON TOP OF THE STOP ROD. THIS VALVE IS MECHANICALLY HELD OPEN BY A PLUNGER ON THE END OF THE PISTON ROD. AIR FLOWS THROUGH THIS LIMIT VALVE AND INTO THE AIR PILOT PORT OF THE RECIPROCATING VALVE CAUSING ITS SPOOL TO SHIFT, WHICH ALLOWS AIR PRESSURE TO FLOW TO THE UPPER PORT OF THE LOWER CYLINDER DRIVING ITS PISTON AND THE ROCKER ARM DOWN. AS PISTON ROD MOVES AWAY FROM THE UPPER LIMIT VALVE, IT CLOSES AND EXHAUSTS THE AIR FROM THE AIR PILOT.

THE UPPER PIVOT OF THE ROCKER ARM CONTINUES DOWN UNTIL ITS ACTUATING SCREW STRIKES THE LOWER LIMIT VALVE, WHICH OPENS AND ALLOWS AIR TO FLOW TO THE OPPOSITE AIR PILOT PORT OF THE RECIPROCATING VALVE. THIS AIR PILOT SHIFT THE SPOOL OF THE RECIPROCATING VALVE, WHICH EXHAUST THE AIR FROM THE UPPER PORT OF THE LOWER CYLINDER AND ALLOW AIR PRESSURE TO FLOW TO THE BOTTOM PORT OF THE LOWER CYLINDER, DRIVING THE PISTON AND ROCKER ARM UP. AS THE ACTUATING SCREW MOVES AWAY FROM THE LOWER LIMIT VALVE, IT CLOSES AND EXHAUST AIR FROM THE AIR PILOT.

CONTROL FUNCTIONS CONT'D

STOP PUSH BUTTON

PRESS STOP BUTTON TO OPEN CONTACTS OF THE MOTOR STARTER TO STOP ROTATION OF THE MOTOR. IT ALSO OPENS THE ELECTRICAL CIRCUIT TO THE SOLENOID VALVE CAUSING IT TO CLOSE AND EXHAUST THE AIR FROM ITS TUBE TO THE UPPER LIMIT VALVE. STROKING WILL STOP AT THE TOP OF THE UP STROKE AND THE SPOOL OF THE RECIPROCATING VALVE WILL REMAIN IN THIS POSITION WITH AIR PRESSURE IN THE BOTTOM OF THE LOWER CYLINDER UNTIL START BUTTON IS PRESSED. THE HONE HAS TWO STOP BUTTONS, ONE ON THE CONTROL PANEL AND ONE ON ROCKER ARM.

STROKING TOGGLE SWITCH

THE STROKING TOGGLE SWITCH IS LOCATED ON THE TOP OF THE CONTROL PANEL HOUSING. WHEN THIS SWITCH IS TURNED OFF IT OPENS THE CIRCUIT TO THE SOLENOID VALVE, WHICH STOP THE POWER STROKING.

STROKING SPEED CONTROL

THE UPPER CYLINDER OF THE ARM PROVIDES SMOOTH CONTROL OF THE STROKING MOTION AND STROKING SPEED CONTROL. THIS HYDRAULIC CYLINDER PUMPS LIQUID BACK AND FORTH THROUGH A NEEDLE VALVE, WHICH IS LOCATED ON THE RIGHT SIDE OF THE CARRIAGE. BY OPENING AND CLOSING THIS VALVE, STROKING SPEED CAN BE CHANGED. A PRESSURIZED RESERVOIR IS LOCATED ON THE CARRIAGE UNDER THE ROCKER ARM PIVOT. THIS RESERVOIR COMPENSATE FOR VOLUME CHANGE DUE TO TEMPERATURE VARIATIONS. THE RESERVOIRS LIQUID IS FED THROUGH A FLOW CONTROL VALVE WHICH IS LOCATED ON TOP OF THE NEEDLE VALVE. THIS VALVE CAN BE OPENED FOR BLEEDING AND REFILLING. A REGULATOR IS LOCATED ON A MANIFOLD IN BACK OF THE CARRIAGE TO REGULATE THE AIR PRESSURE (15 PSI) TO THE RESERVOIR.

DWELL CONTROL

A DWELL VALVE IS ATTACHED TO THE UP PORT OF THE RECIPROCATING VALVE. THIS DWELL VALVE IS SPRING LOADED IN THE OPEN POSITION AND IS AIR PILOTED IN THE CLOSED POSITION. A PUSH BUTTON CONTROL VALVE IS LOCATED ON THE RIGHT SIDE OF THE CARRIAGE. IT CLOSES THE DWELL VALVE WHEN PRESSED. IF PRESSED IN DOWN STROKE RAM WILL STOP AT BOTTOM OF STROKE. IF PRESSED IN THE UP STROKE, RAM WILL STOP IMMEDIATELY.

CONTROL FUNCTIONS CONT'D

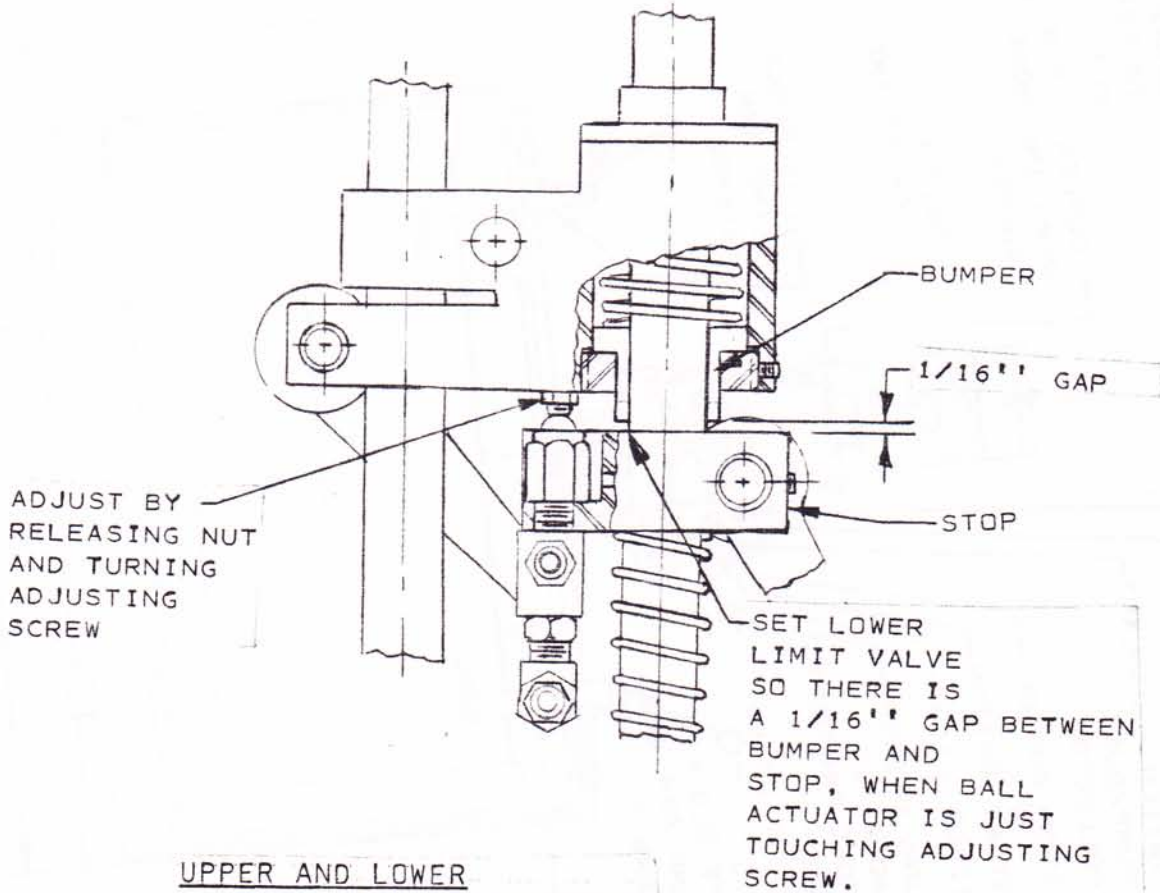
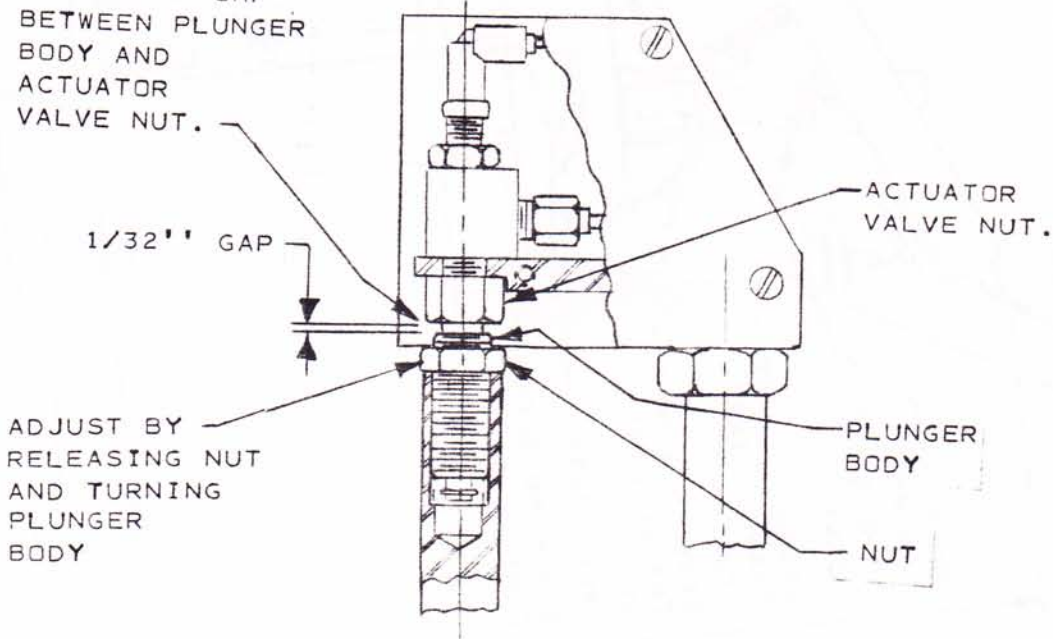
CLAMP/FLOAT SWITCH

TURN CLAMP/FLOAT SWITCH TO LEFT, WHICH ALLOWS AIR TO FLOW THROUGH VALVE TO REGULATOR, THEN OUT TWO PORTS OF THE REGULATOR. AIR FROM ONE PORT FLOWS THROUGH THE RIGHT ORIFICE ON THE BOTTOM OF THE FLOAT PLATE. AIR FROM THE OTHER PORT FLOWS THROUGH A FLOW CONTROL VALVE THEN TO THE LEFT SIDE OF THE FLOAT PLATE AND OUT THE ORIFICE ON THE BOTTOM OF THE FLOAT PLATE.

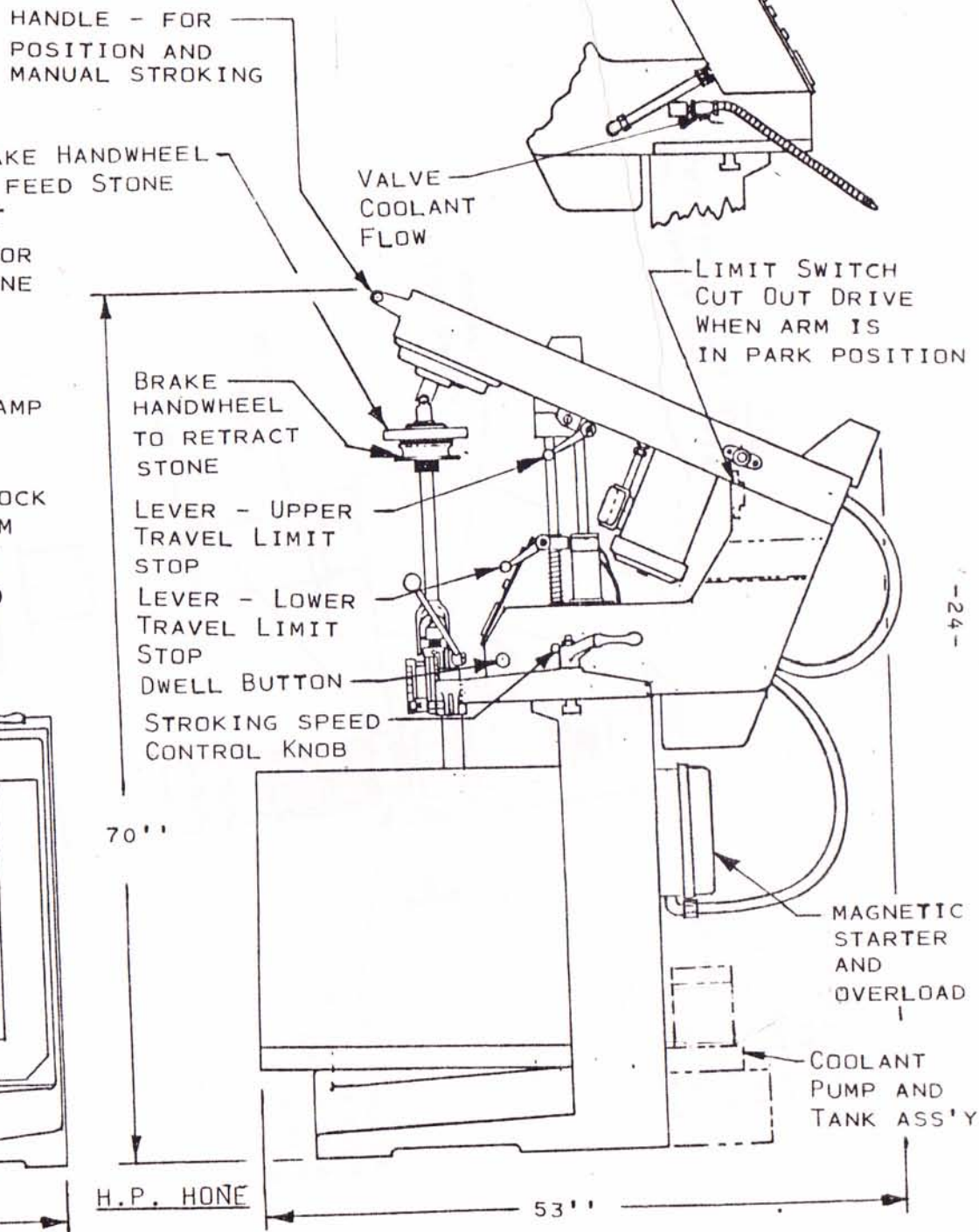
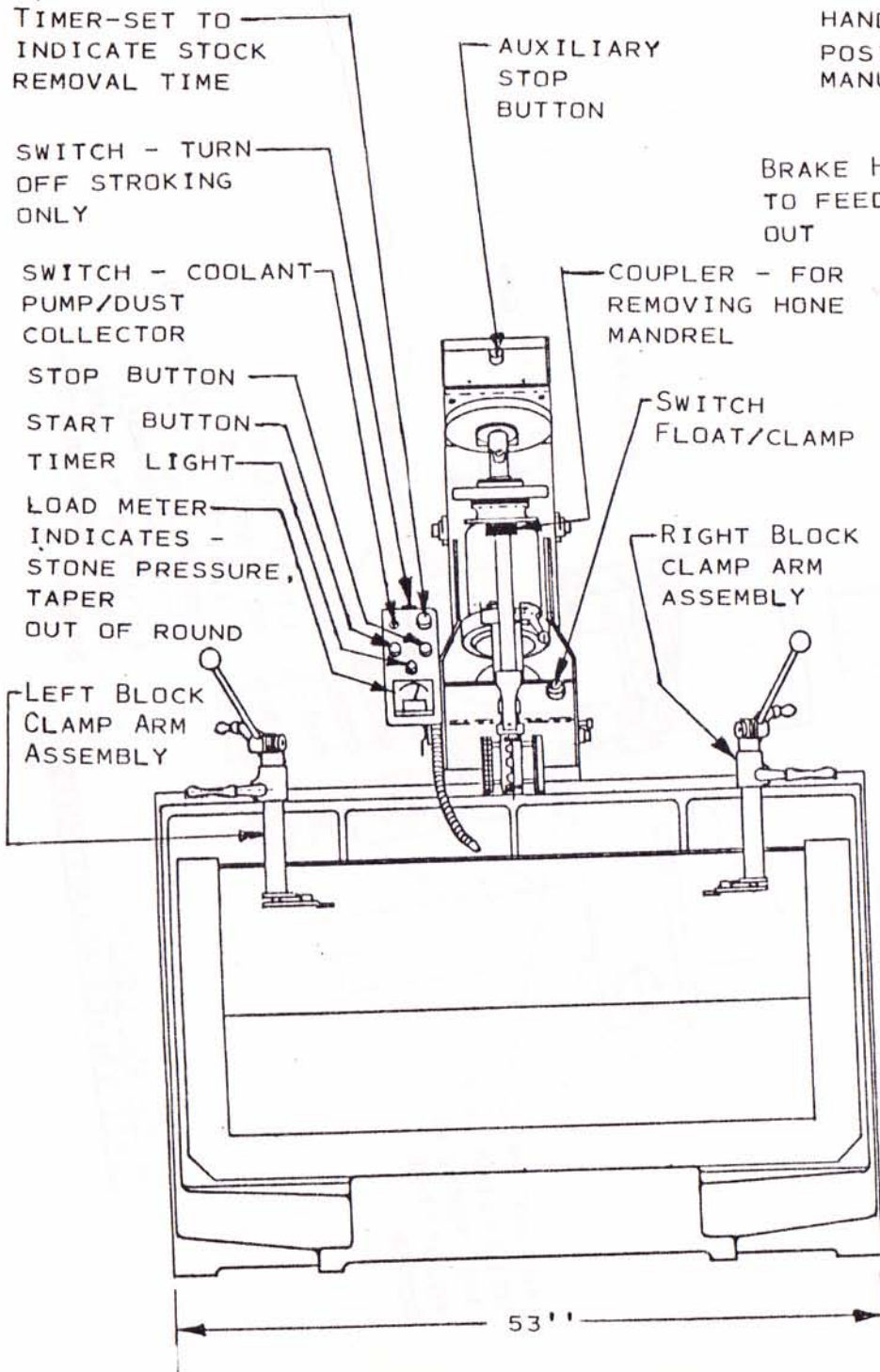
TURN CLAMP SWITCH TO RIGHT, WHICH ALLOWS AIR TO FLOW THROUGH VALVE TO TWO CLAMPING CYLINDERS. THE CYLINDERS LIFT TWO LEVER ARMS AND A CLAMP BAR WHICH PULL UP ON KEY IN T-SLOT.

SET UPPER
LIMIT VALVE
SO THERE IS
AN $1/32''$ GAP
BETWEEN PLUNGER
BODY AND
ACTUATOR
VALVE NUT.

NOTE:
MAKE ALL ADJUSTMENTS
WITH HONE TURNED OFF.



UPPER AND LOWER
LIMIT VALVES ADJUSTMENTS



ELECTRICAL
230 VOLTS
3 PHASE
60 HERTZ
IMPORTANT
ELECTRICALLY
CONNECT IN-
ACCORDANCE
WITH NATIONAL
ELECTRICAL
CODE AND
LOCAL CODES

ELECTRICAL
230 VOLTS
3 PHASE
60 HERTZ
IMPORTANT
ELECTRICALLY
CONNECT IN-
ACCORDANCE
WITH NATIONAL
ELECTRICAL
CODE AND
LOCAL CODES

502-27-33A
FUSE HOLDER
502-27-32B
FUSE
FNM 8/10 AMP

502-11-3X
MOTOR
STARTER

502-11-3U
ENCLOSURE

514-4-34
CARRIAGE

514-1-56
LIMIT
SWITCH

514-2-70
SOLENOID

502-2-16
STOP
BUTTON
RED

514-2-95A
ENCLOSURE
(STOP
BUTTON)

CAUTION
DISCONNECT
ALL POWER
SOURCES
BEFORE
SERVICING

507-6
MOTOR
(HONE)

'H-P' - HONE
WIRING DIAGRAM

502-11-3X
MOTOR
STARTER
502-11-3W
ENCLOSURE

514-4-10A
MOTOR -
(COOLANT
PUMP)

500-86
TOGGLE
SWITCH

502-2-25
TOGGLE
SWITCH

514-3-45
POTENTIOMETER

514-3-43
TIME
DELAY

502-2-16
START
BUTTON
GREEN

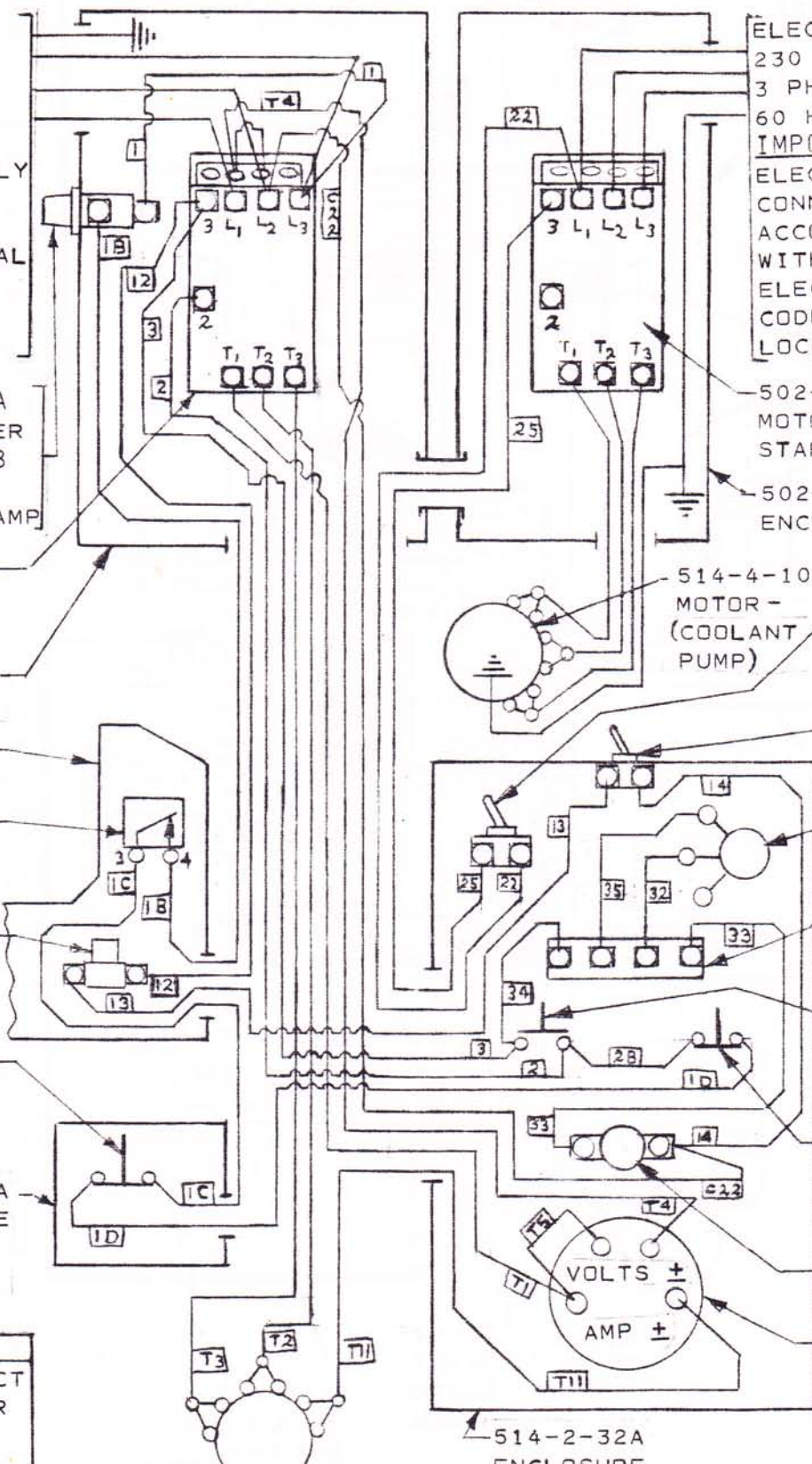
502-2-16
STOP
BUTTON
RED

514-3-44
LIGHT

514-4-42
LOAD
METER
(WATTS)

514-2-32A
ENCLOSURE
(CONTROL
PANEL)

NOTE:
FOR ELECTRICAL
CIRCUIT PRIOR
TO SER.#15036
SEE PAGE 2-6



ELECTRICAL
230 V. 3 PHASE
IMPORTANT
ELECTRICALLY
CONNECT IN-
ACCORDANCE
WITH N.E.C.
AND YOUR
LOCAL CODES

COOLANT/
BLOWER
POWER
SUPPLY
110 V
1 PHASE

400-7-1
CORD

502-27-33A
FUSE HOLDER
502-27-32A
FUSE (COOLANT
PUMP MOTOR)
FNN 3 2/10 AMP
OR
502-27-32C
FUSE (AIR
BLOWER MOTOR)
FNM 7 AMP

502-27-33A
FUSE HOLDER
502-27-32B
FUSE
FNM 8/10 AMP

514-1-56
LIMIT
SWITCH

514-4-40
MOTOR
STARTER
WITH
502-11-3T
ENCLOSURE

502-27-30
OUTLET

514-2-70
SOLENOID
VALVE

514-4-34
CARRIAGE

514-2-95A
ENCLOSURE
(STOP
BUTTON)

502-2-16
STOP
BUTTON
RED

502-2-25
TOGGLE
SWITCH

500-86
TOGGLE
SWITCH

514-3-45
POTENTIOMETER

514-3-43
TIME
DELAY

502-2-16
STOP
BUTTON
RED

514-3-44
LIGHT

514-1-55
LOAD
METER

CAUTION
DISCONNECT
ALL POWER
SOURCES
BEFORE
SERVICING

507-6
MOTOR

502-2-16
START
BUTTON
GREEN

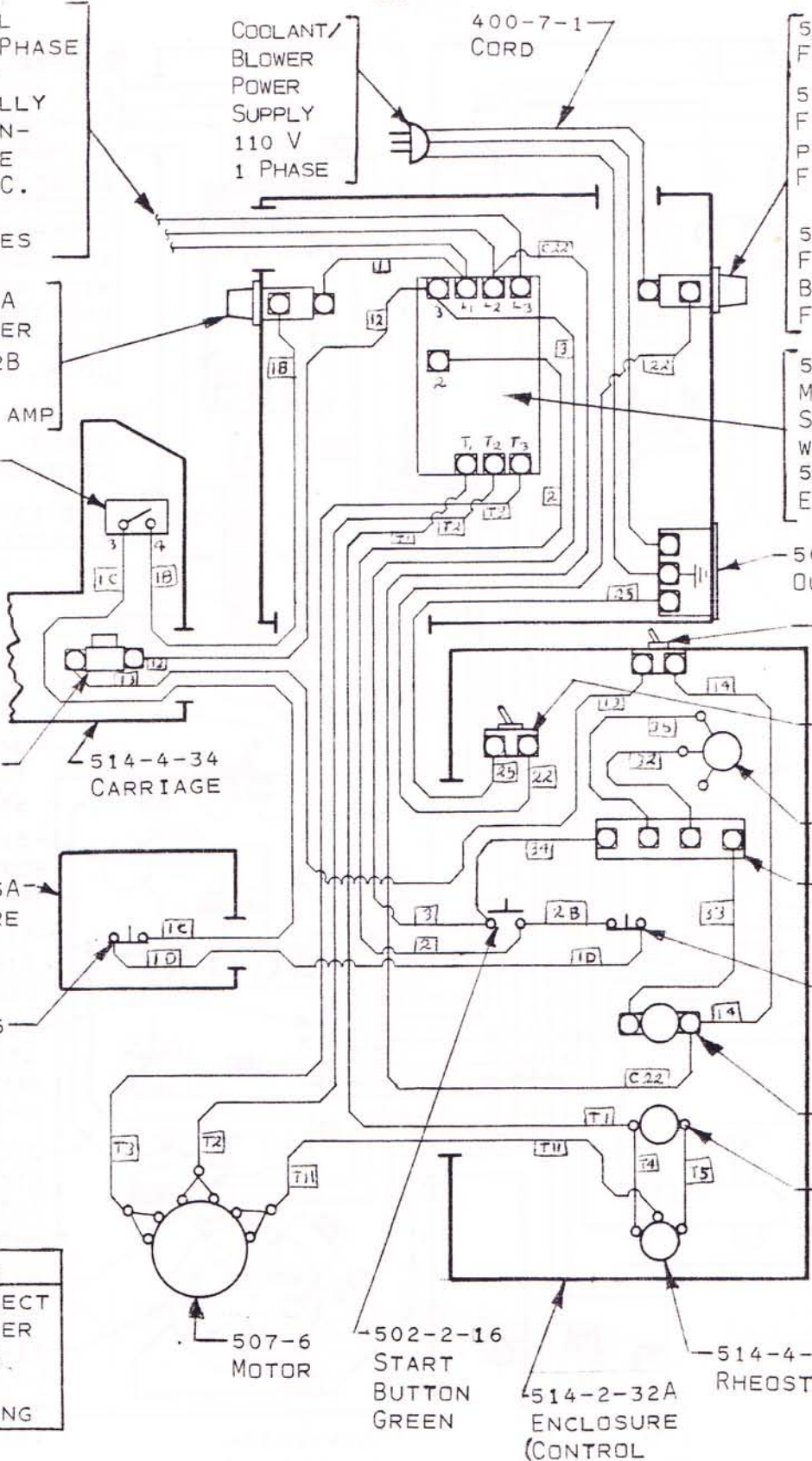
514-2-32A
ENCLOSURE
(CONTROL
PANEL)

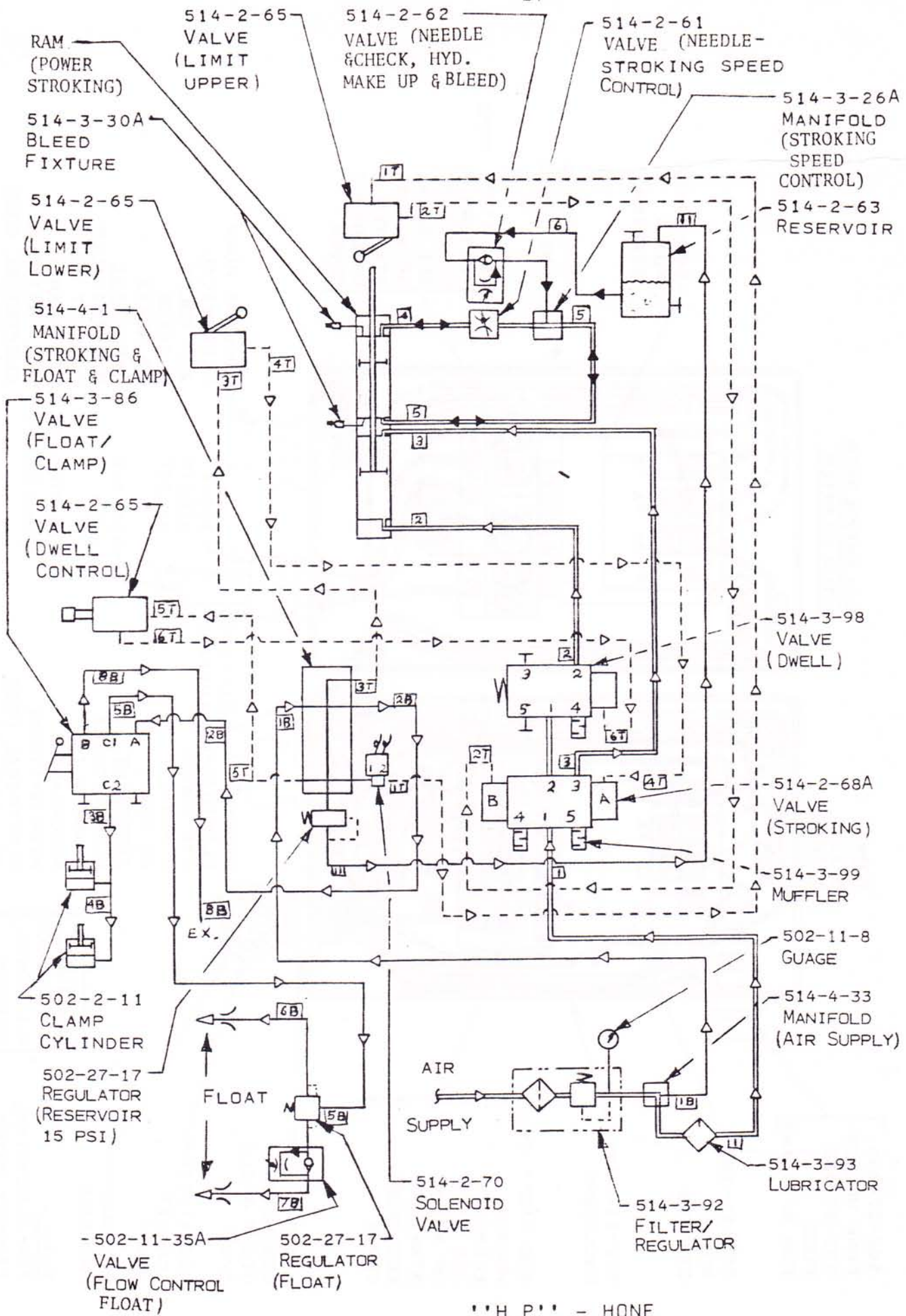
514-4-32
RHEOSTAT

“H P” - HONE
WIRING DIAGRAM

OLD STYLE

NOTE:
THIS ELECTRICAL
CIRCUIT USED
PRIOR TO
SERIAL #15036





RAM
(POWER
STROKING)

514-3-30A
BLEED
FIXTURE

514-2-65
VALVE
(LIMIT
LOWER)

514-4-1
MANIFOLD
(STROKING &
FLOAT & CLAMP)

514-3-86
VALVE
(FLOAT/
CLAMP)

514-2-65
VALVE
(DWELL
CONTROL)

502-2-11
CLAMP
CYLINDER

502-27-17
REGULATOR
(RESERVOIR
15 PSI)

502-11-35A
VALVE
(FLOW CONTROL
FLOAT)

502-27-17
REGULATOR
(FLOAT)

514-2-65
VALVE
(LIMIT
UPPER)

514-2-62
VALVE (NEEDLE
& CHECK, HYD.
MAKE UP & BLEED)

514-2-61
VALVE (NEEDLE-
STROKING SPEED
CONTROL)

514-3-26A
MANIFOLD
(STROKING
SPEED
CONTROL)

514-2-63
RESERVOIR

514-3-98
VALVE
(DWELL)

514-2-68A
VALVE
(STROKING)

514-3-99
MUFFLER

502-11-8
GAUGE

514-4-33
MANIFOLD
(AIR SUPPLY)

514-3-93
LUBRICATOR

AIR
SUPPLY

514-2-70
SOLENOID
VALVE

514-3-92
FILTER/
REGULATOR

H P - HONE
PNEUMATIC CIRCUIT

502-27-33A
FUSE HOLDER
502-27-32B
FUSE
FNM 8/10 AMP

HONE
MOTOR
STARTER

COOLANT/BLOWER
MOTOR STARTER

502-11-3X
MOTOR
STARTER

502-11-3U
ENCLOSURE

FOR "H" TYPE
HEATER
ELEMENTS
SEE BACK
OF MOTOR
STARTER
ENCLOSURE
COVER

502-11-3X
MOTOR
STARTER

502-11-3W
ENCLOSURE

FOR "H" TYPE
HEATERS
ELEMENTS
SEE BACK
OF MOTOR
STARTER
ENCLOSURE
COVER

502-6-8
CONNECTOR
RIGHT ANGLE
3/4"

502-11-11A
CONDUIT
3/4"

TO HONE
CARRIAGE

HONE
ELECTRICAL
230 VOLTS
3 PHASE
60 HERTZ
IMPORTANT
ELECTRICALLY
CONNECT IN-
ACCORDANCE
WITH NATIONAL
ELECTRICAL CODE
AND YOUR LOCAL
CODES.

514-4-91
FITTING

COOLANT PUMP
ELECTRICAL
230 VOLTS
3 PHASE
60 HERTZ
IMPORTANT
ELECTRICALLY
CONNECT IN-
ACCORDANCE
WITH NATIONAL
ELECTRICAL CODE
AND YOUR LOCAL
CODES

700-4
STRAIN
RELIEF

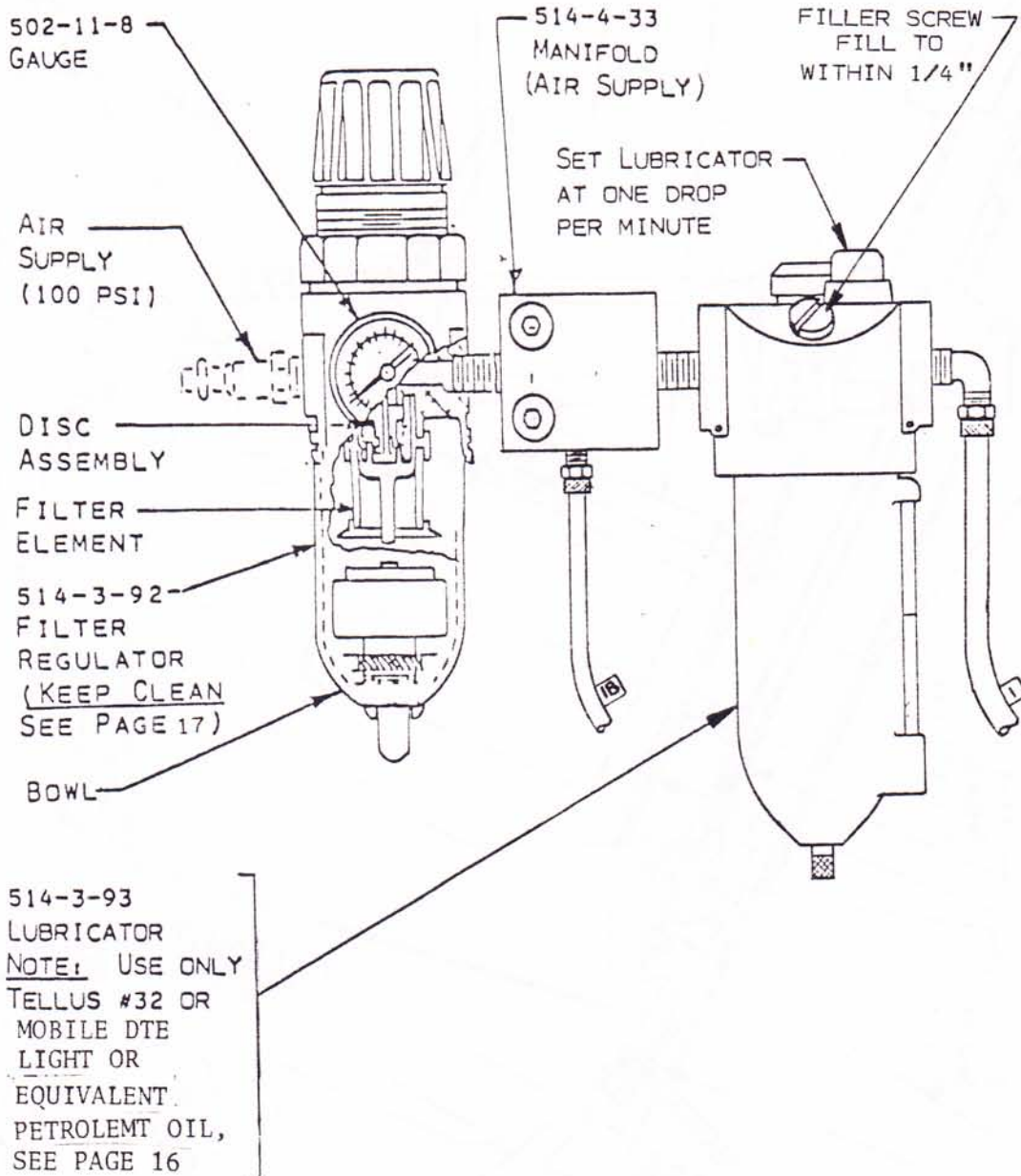
400-7-8
CORD

TO COOLANT
PUMP MOTOR

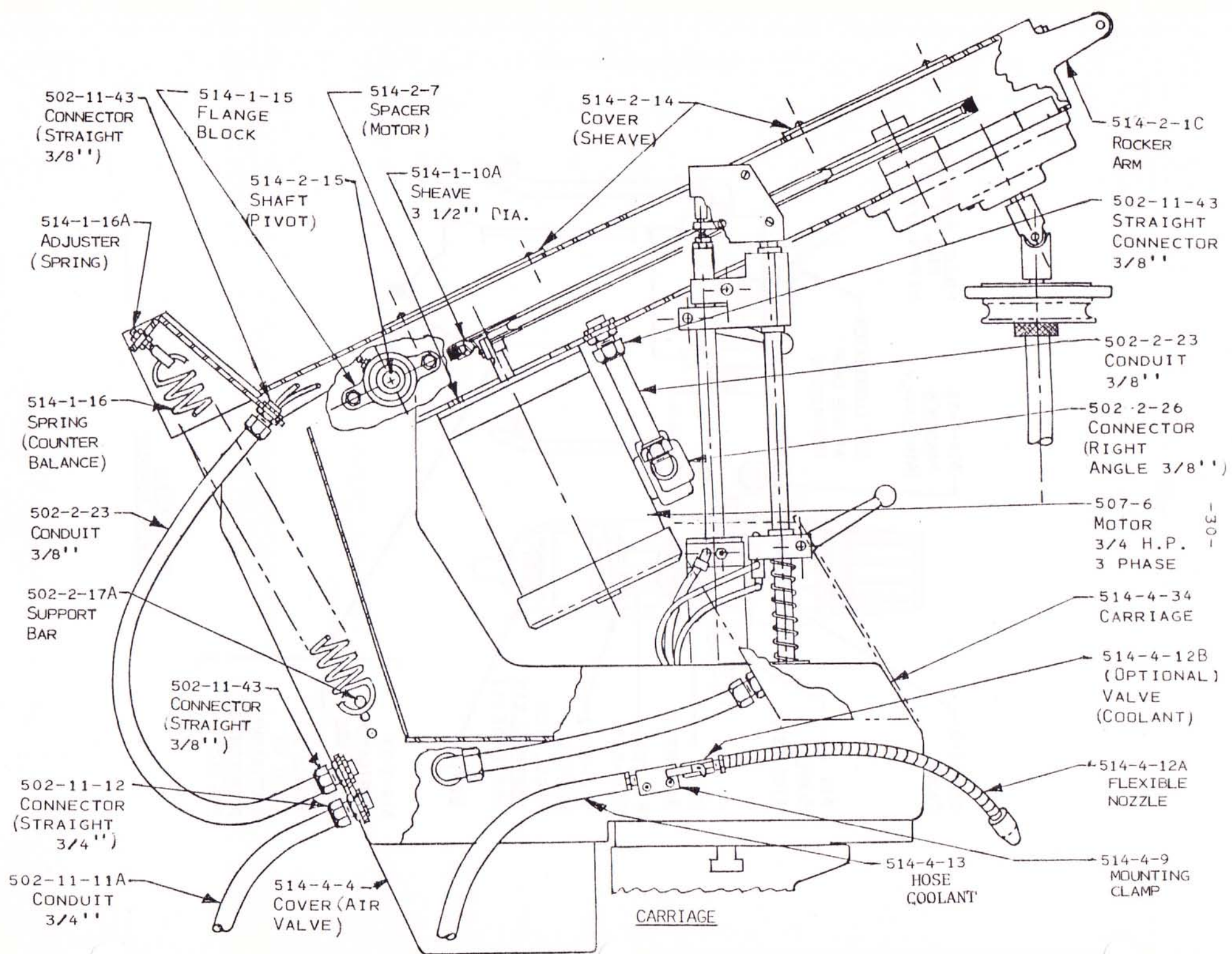
ELECTRICAL
POWER SUPPLY
PANELS

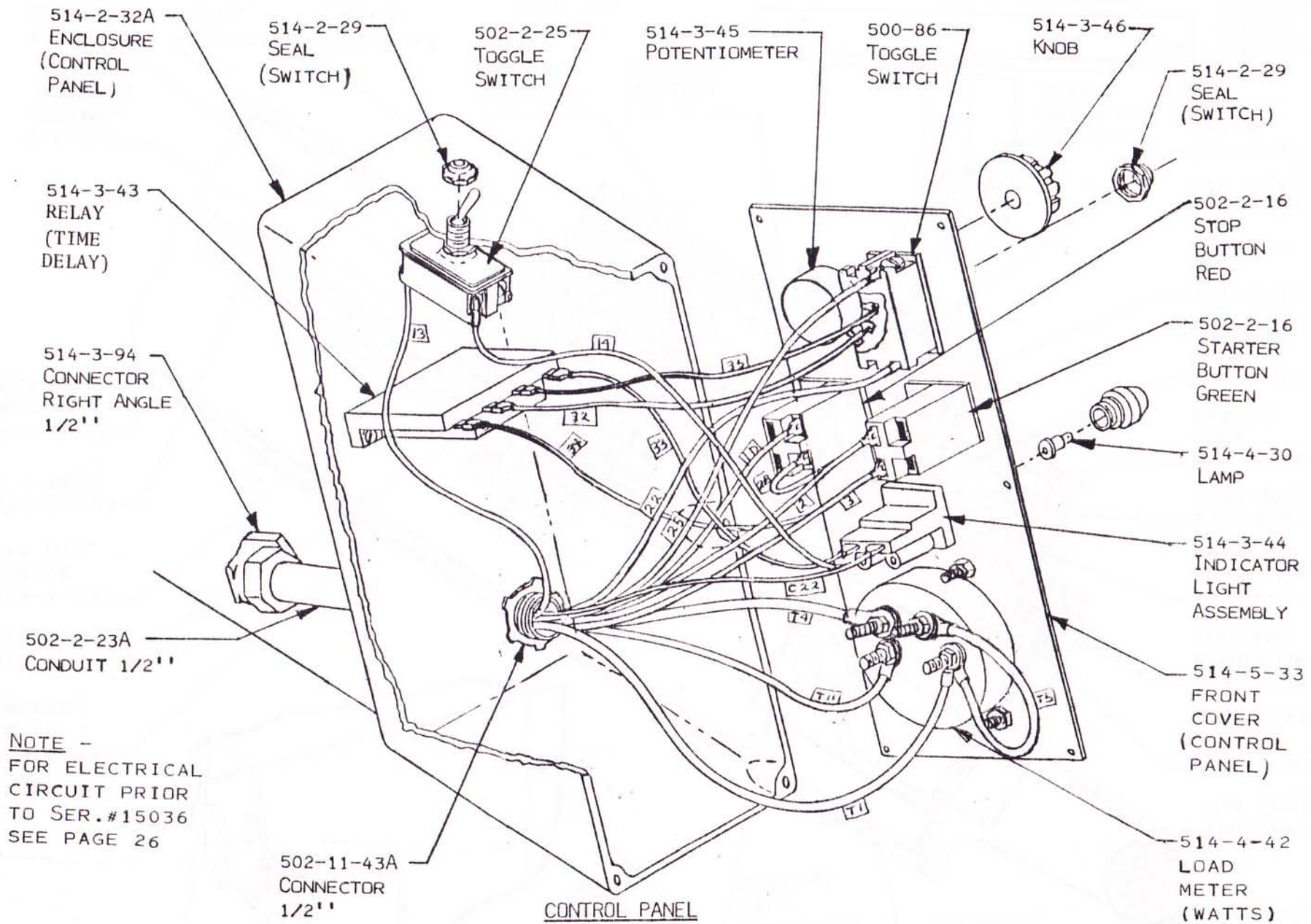
NOTE -
FOR ELECTRICAL
CIRCUIT PRIOR
TO SER.#15036
SEE PAGE 26

CAUTION
DISCONNECT
ALL POWER
SOURCES
BEFORE
SERVICING

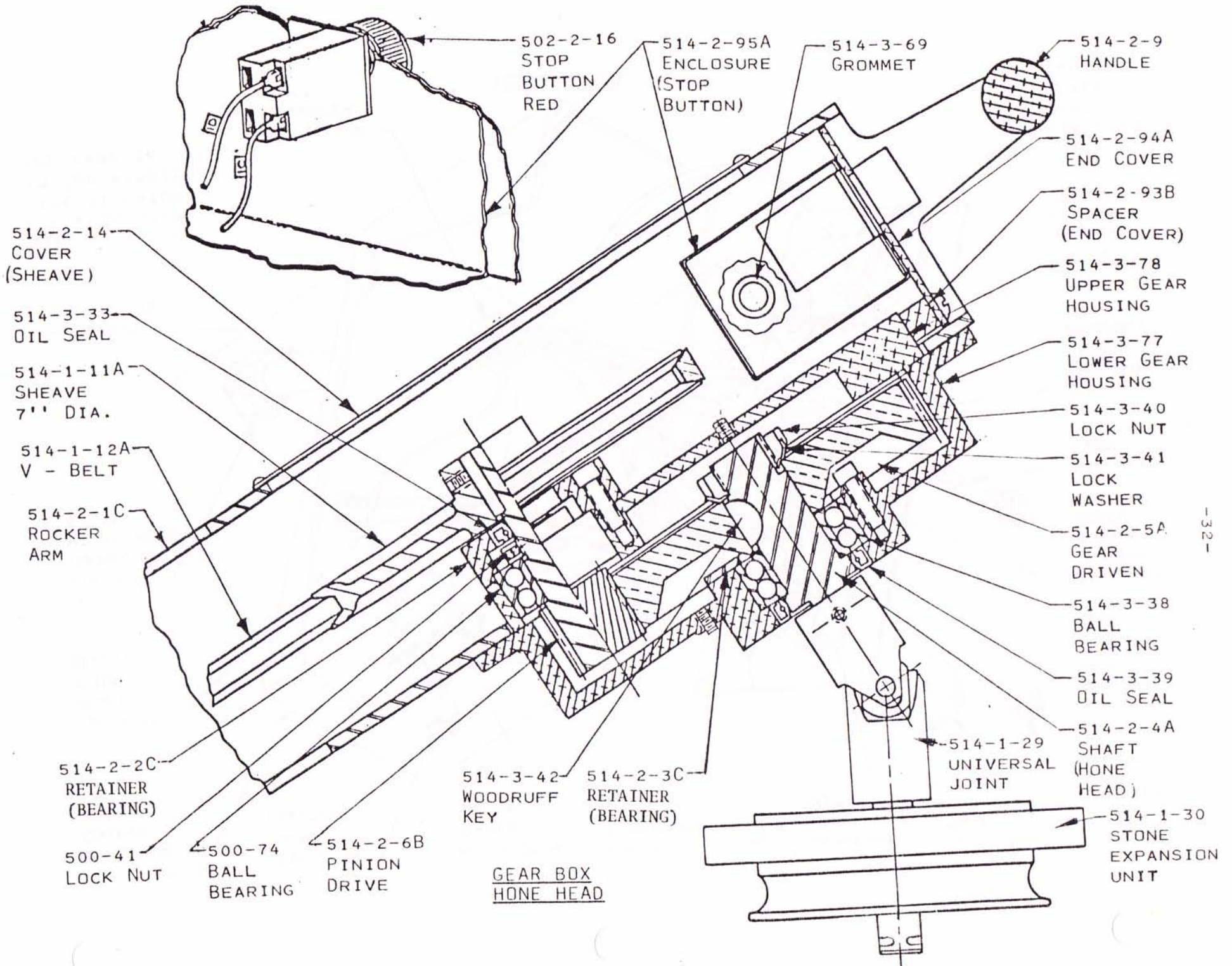


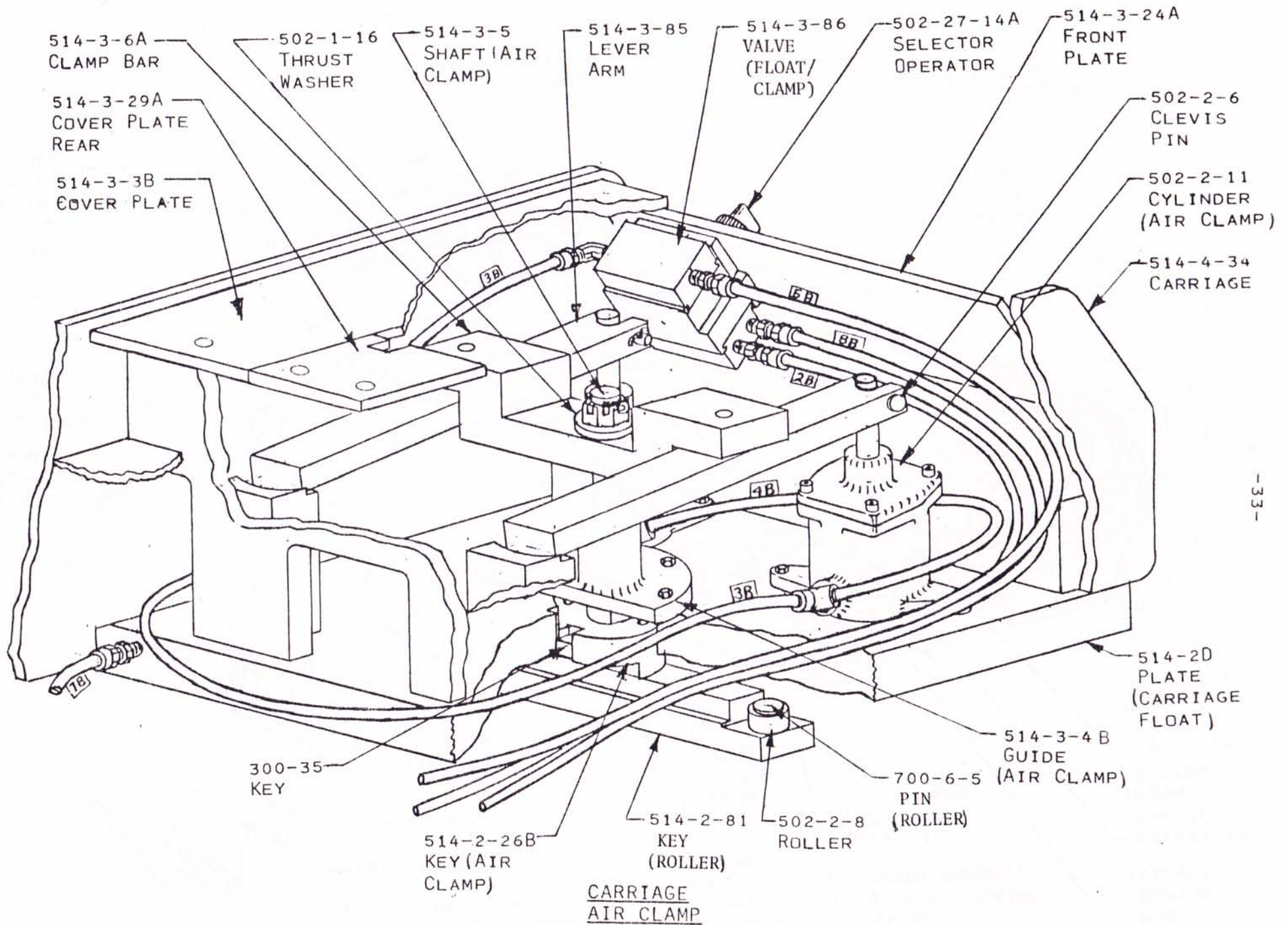
PNEUMATIC
POWER SUPPLY

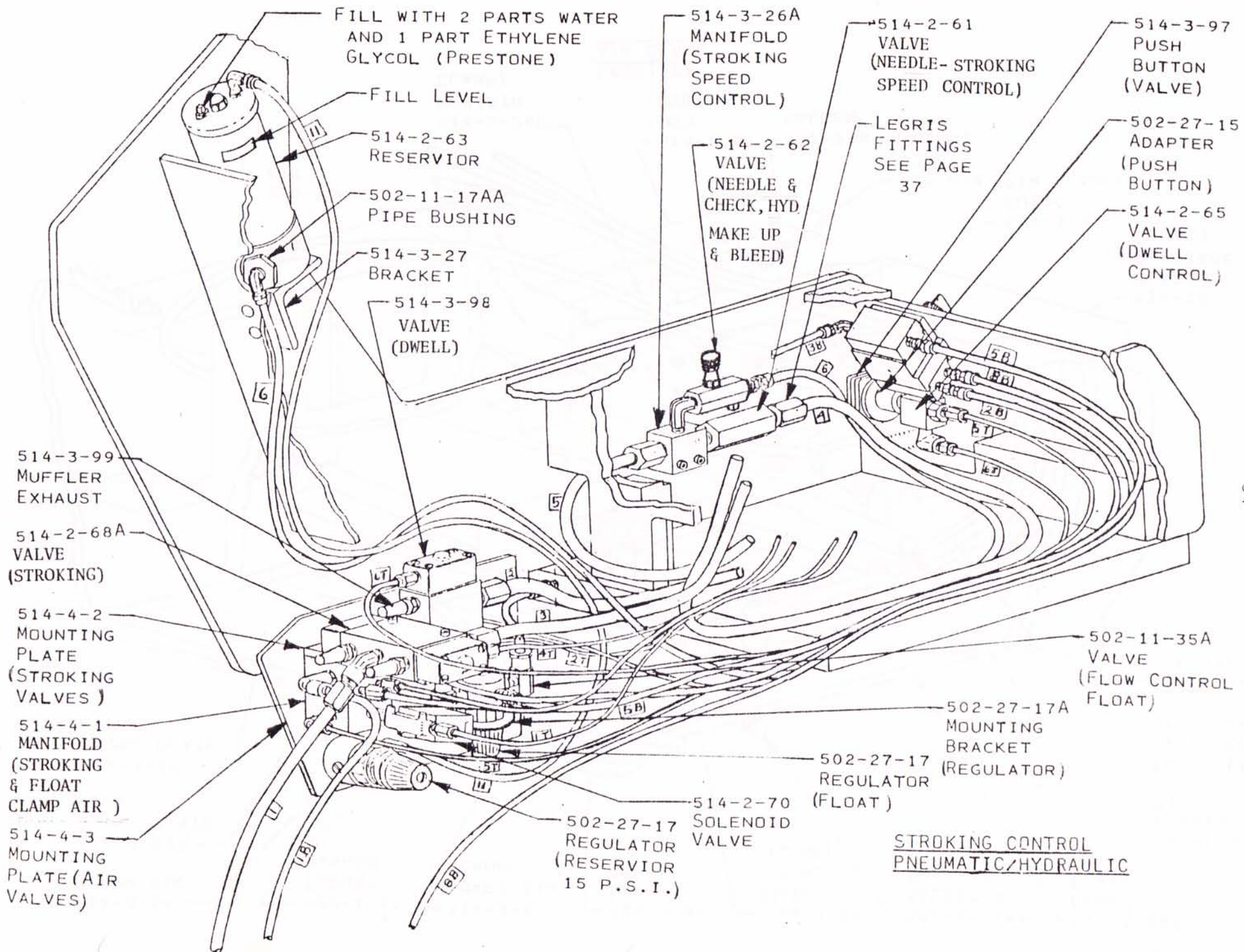


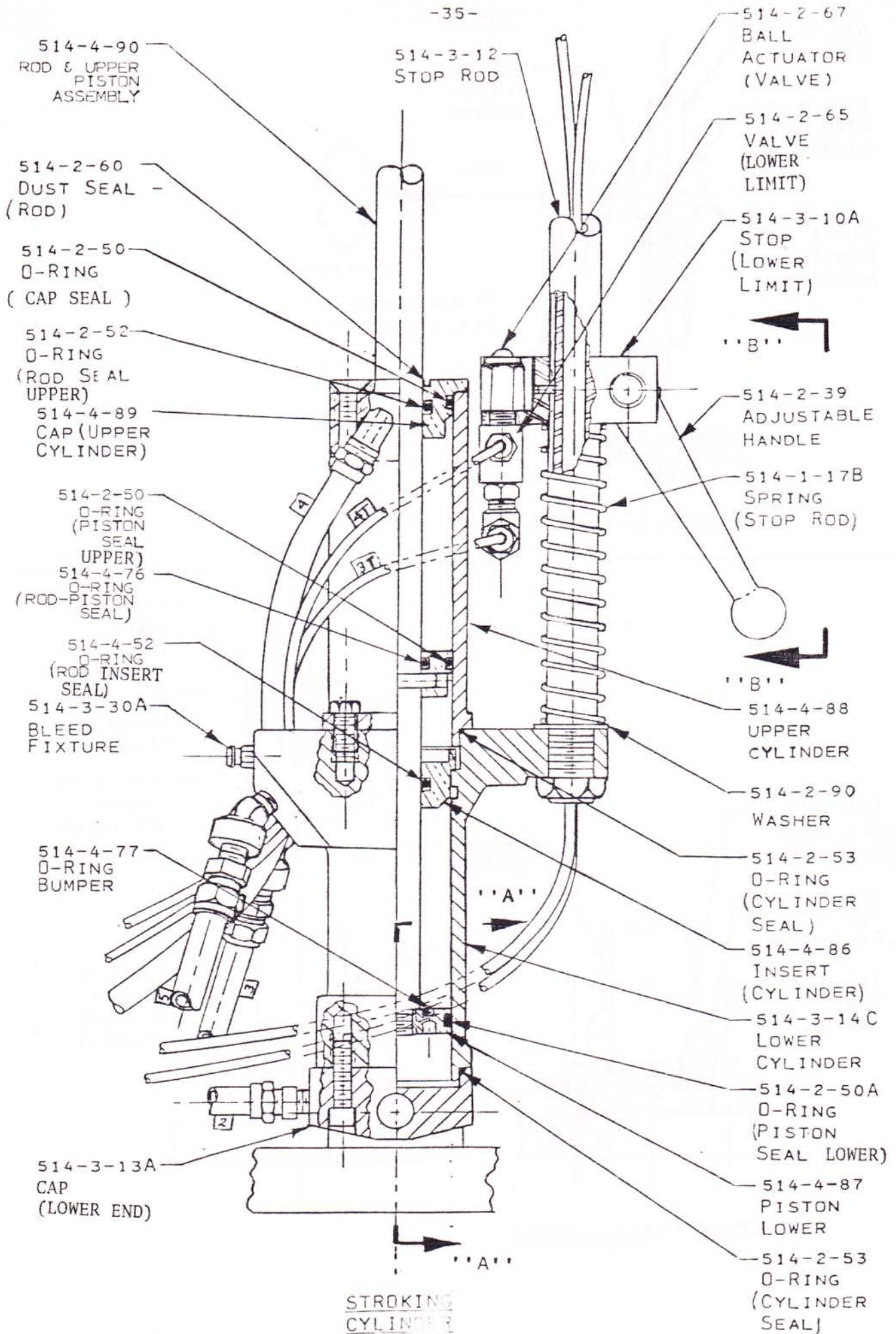


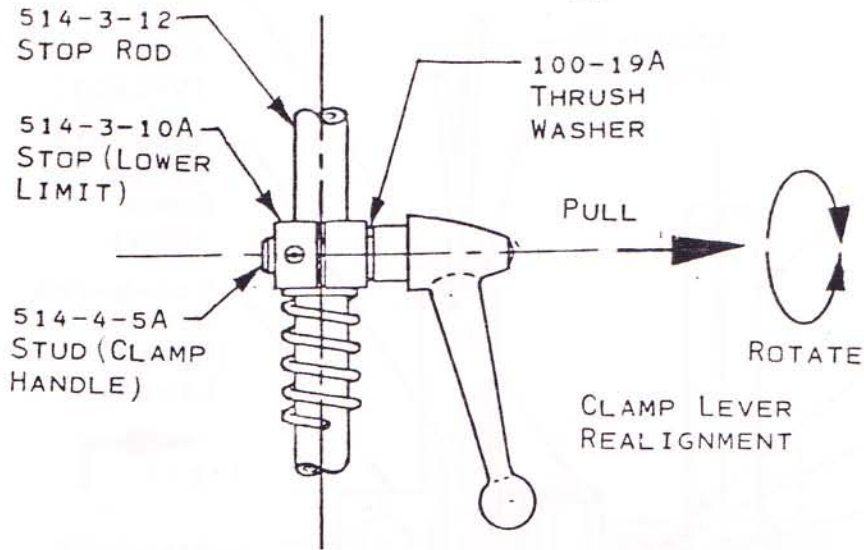
NOTE -
FOR ELECTRICAL
CIRCUIT PRIOR
TO SER.#15036
SEE PAGE 26





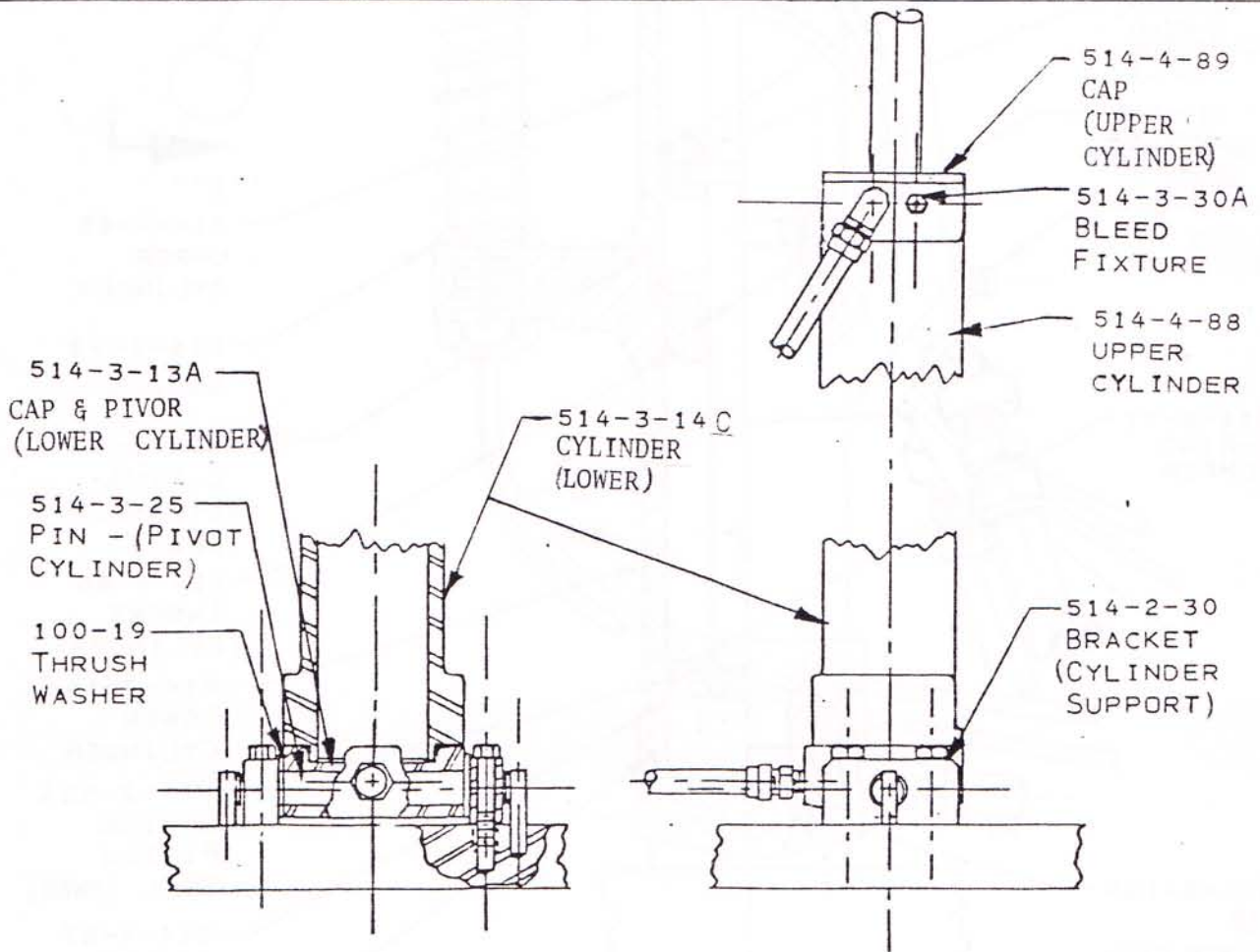






LOWER TRAVEL
LIMIT STOP
LEVER

VIEW 'B' - 'B'



SECTION 'A' - 'A'

▽ USE ON "H-P"
HONE AFTER
SER. #15024-
FOR HONE
PARTS PRIOR
TO SER#15024
SEE PAGE 38

▽ 514-4-66
SIDE COVER
(UPPER LIMIT
VALVE)

514-2-65
VALVE
(UPPER
LIMIT)

▽ 514-4-65
ENCLOSURE
(LIMIT VALVE)

▽ 514-4-70
NUT
ACTUATOR
(VALVE)

▽ 514-4-69
PLUNGER

▽ 1/2-20UNF
JAM NUT

▽ 514-4-68
PLUNGER
BODY

▽ 500-48
SPRING

▽ 514-4-84
SNAP RING

▽ 514-4-90
ROD & UPPER
PISTON ASS'Y.

* 514-3-7C
PIN -(UPPER
PIVOT)

LOCK
NUT

ADJUSTING
SCREW
(LOWER
LIMIT
VALVE)

514-4-5
STUD

* 514-4-64
PIVOT
SUPPORT

PULL

ROTATE

514-2-43
SPACER
(ADJUSTABLE
HANDLE)

514-2-39
ADJUSTABLE
HANDLE

VIEW 'D'-'D'

JAM NUT

514-3-12
STOP ROD

* 514-4-63
BUMPER

* 514-4-62
CAP

* 514-4-61
UPPER PIVOT
ASSEMBLY

514-3-95
SPRING
(BUMPER)

514-3-8
NUT (UPPER
PIVOT)

* 514-4-63
BUMPER

* USE ON "H-P"
HONE AFTER
SER. #15021
FOR HONE
PARTS PRIOR
TO SER# 15021
SEE PAGE 38

UPPER LIMIT VALVE &
UPPER PIVOT
STROKING CYLINDER

▽ 514-3-23
SIDE COVER
L.H. (UPPER
LIMIT VALVE)

▽ 514-3-22
SIDE COVER
R.H. (UPPER
LIMIT VALVE)

▽ 514-3-21A
ENCLOSURE
(LIMIT VALVE)

▽ 514-2-67
BALL
ACTUATOR
(VALVE)

▽ 514-3-19
PLUNGER
ACTUATOR
(UPPER
VALVE)

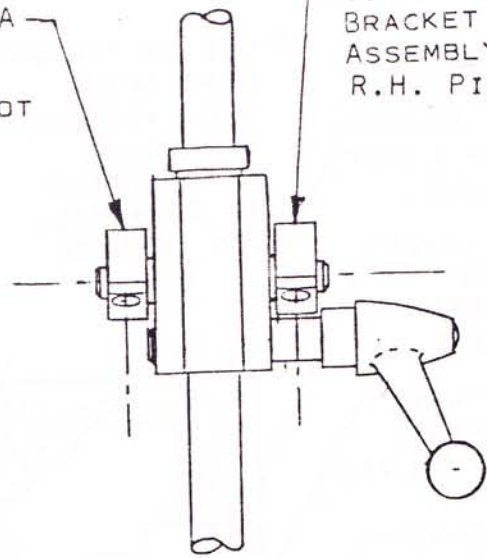
▽ 514-3-20
RETAINER
(PLUNGER)

▽ 514-3-96
SPRING
(PLUNGER)

▽ 514-2-44B
ROD & UPPER
PISTON ASS'Y.

* 514-2-18A
BRACKET
ASSEMBLY
L.H. PIVOT

* 514-2-18B
BRACKET
ASSEMBLY
R.H. PIVOT



VIEW 'D'-'D'

* 514-2-35
CUSHION

* 514-3-7
UPPER
PIVOT
ASSEMBLY

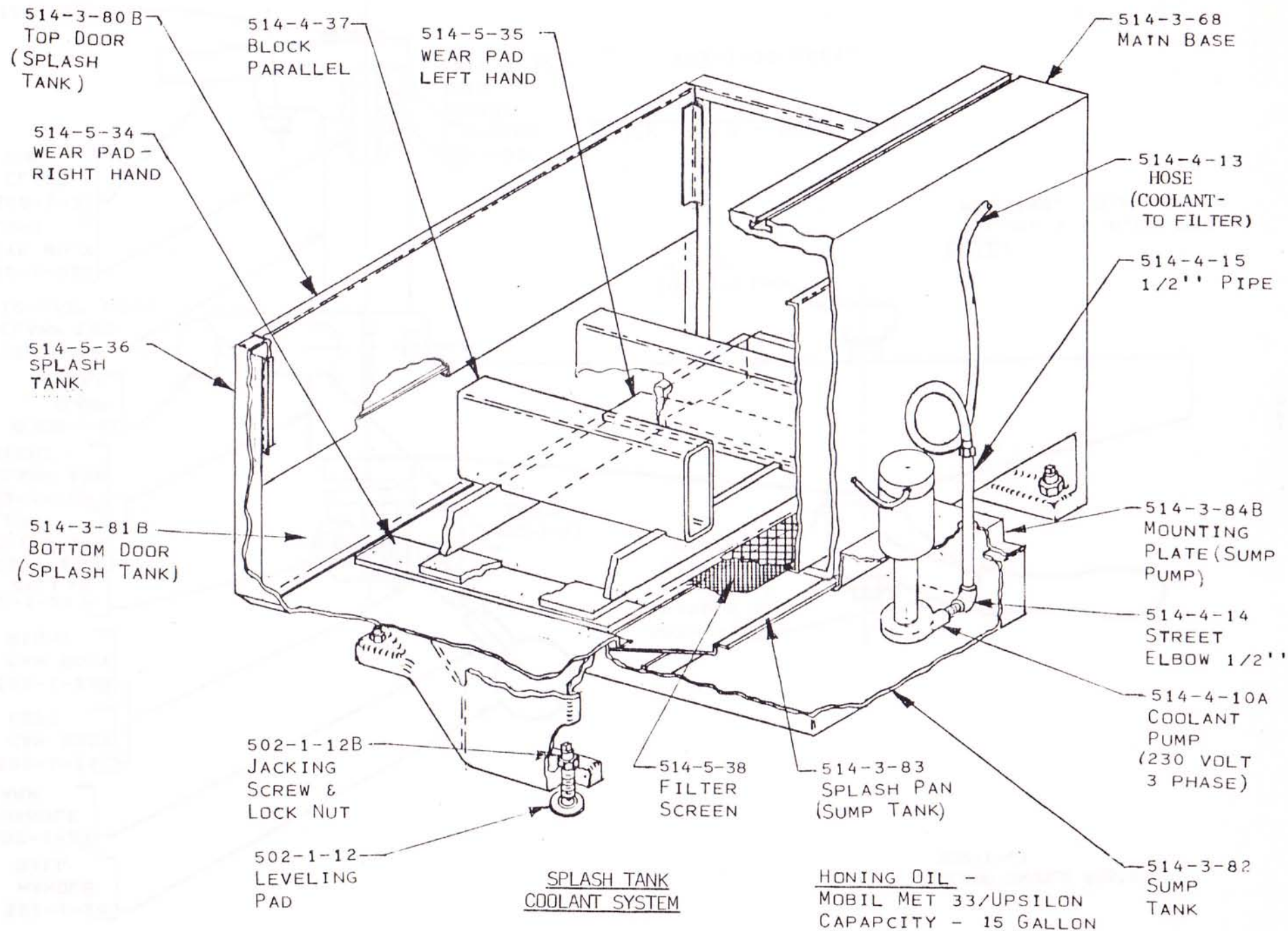
* 514-3-9
BUMPER

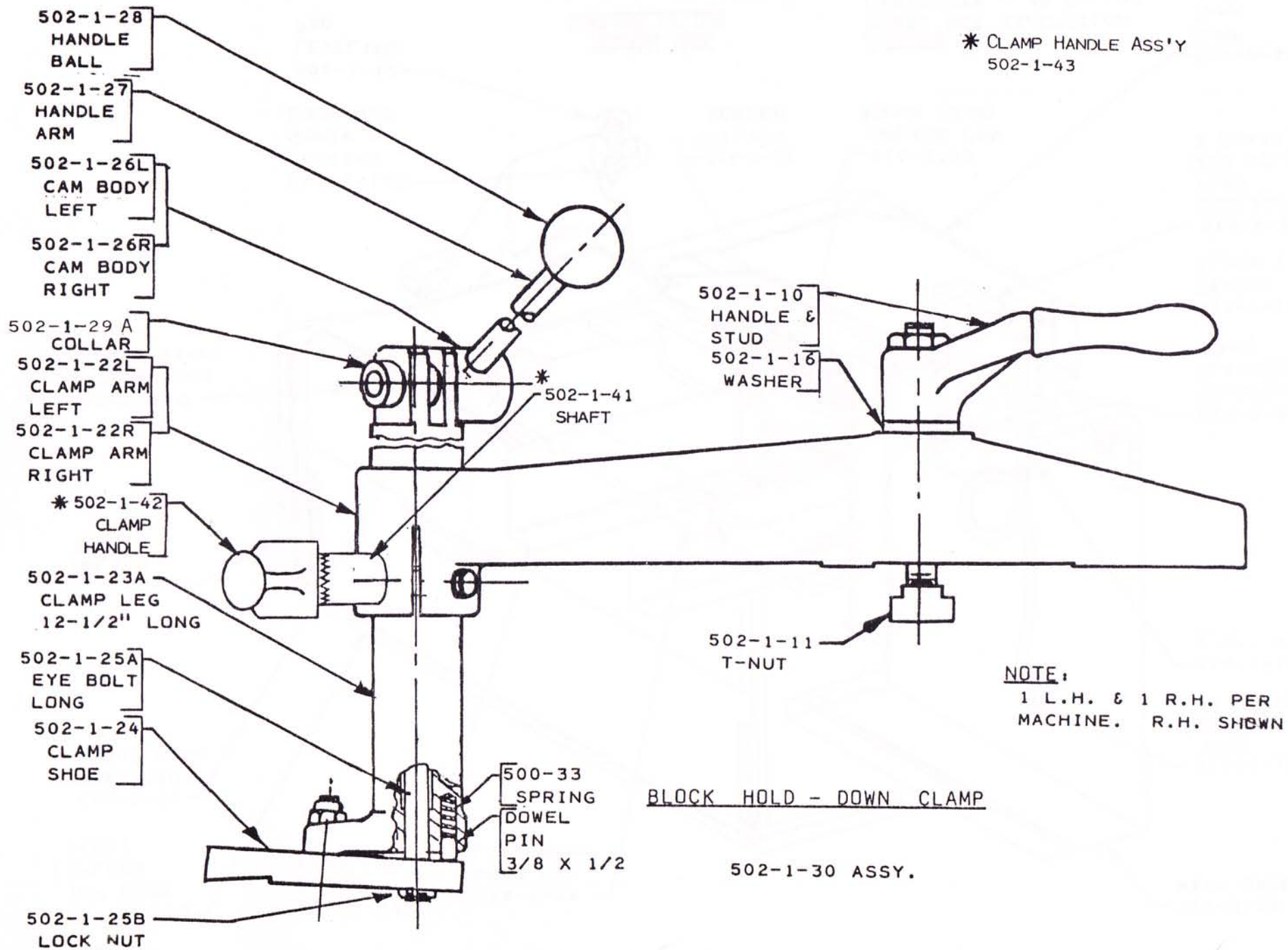
▽ USE ON 'H-P'
HONE PRIOR
TO SER.#15024

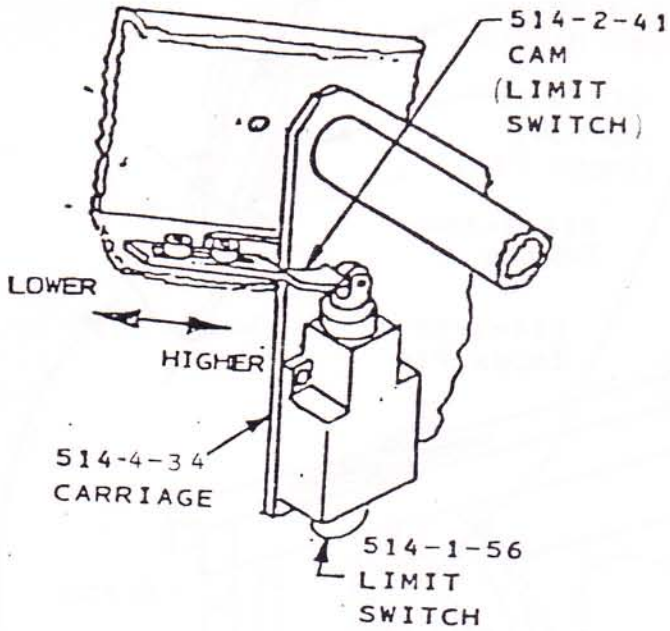
*USE ON 'H-P'
HONE PRIOR
TO SER# 15021

OLD STYLE

UPPER LIMIT VALVE &
UPPER PIVOT
STROKING CYLINDER



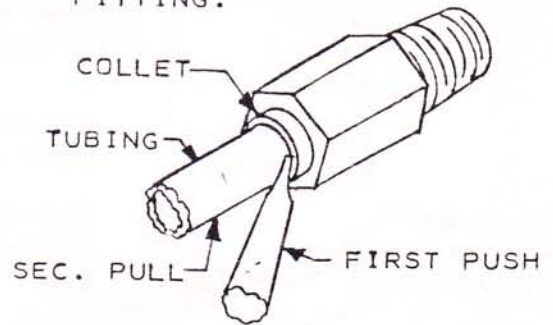




SET SO BOTTOM OF HONE HEAD IS 5" LOWER THAN FLOAT TABLE, WHEN MOTOR CUTS OFF.

MOTOR CUT OUT SAFETY SWITCH ADJUSTMENT

USE A NYLON 11 TUBING WITH LEGRIS FITTING.

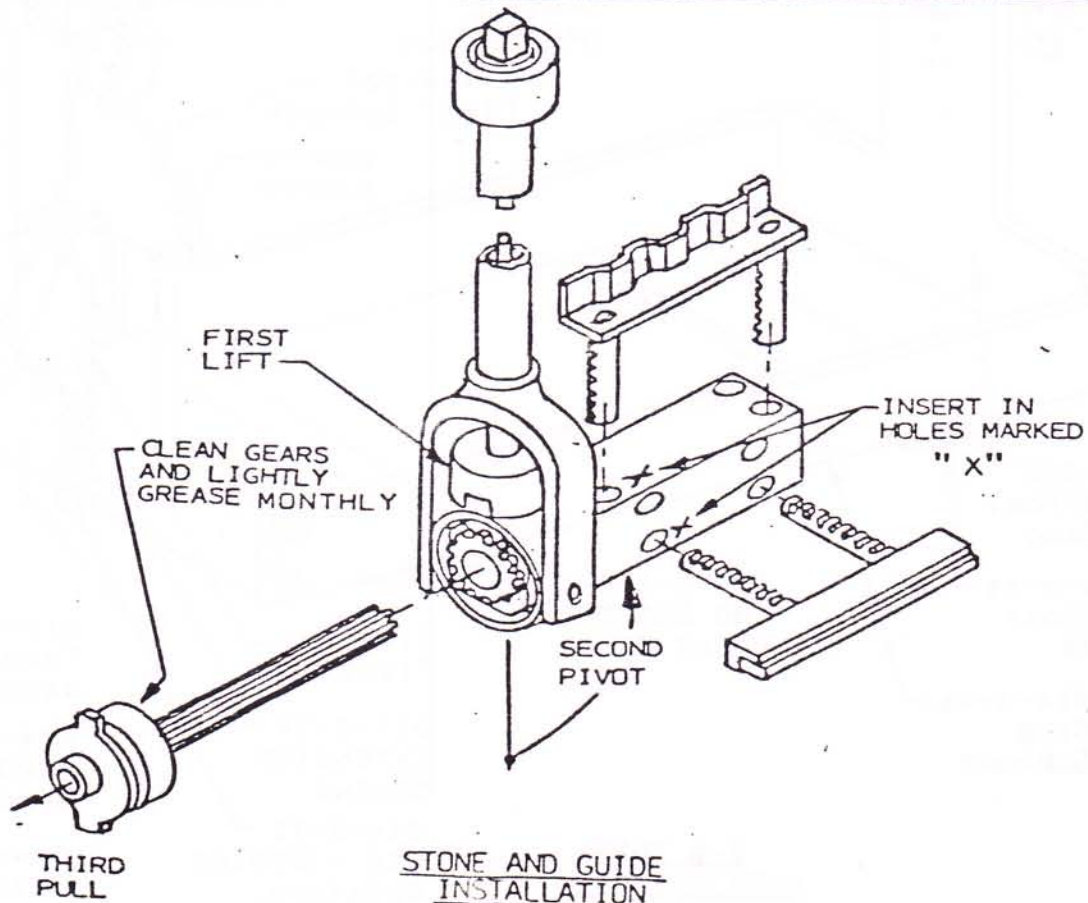


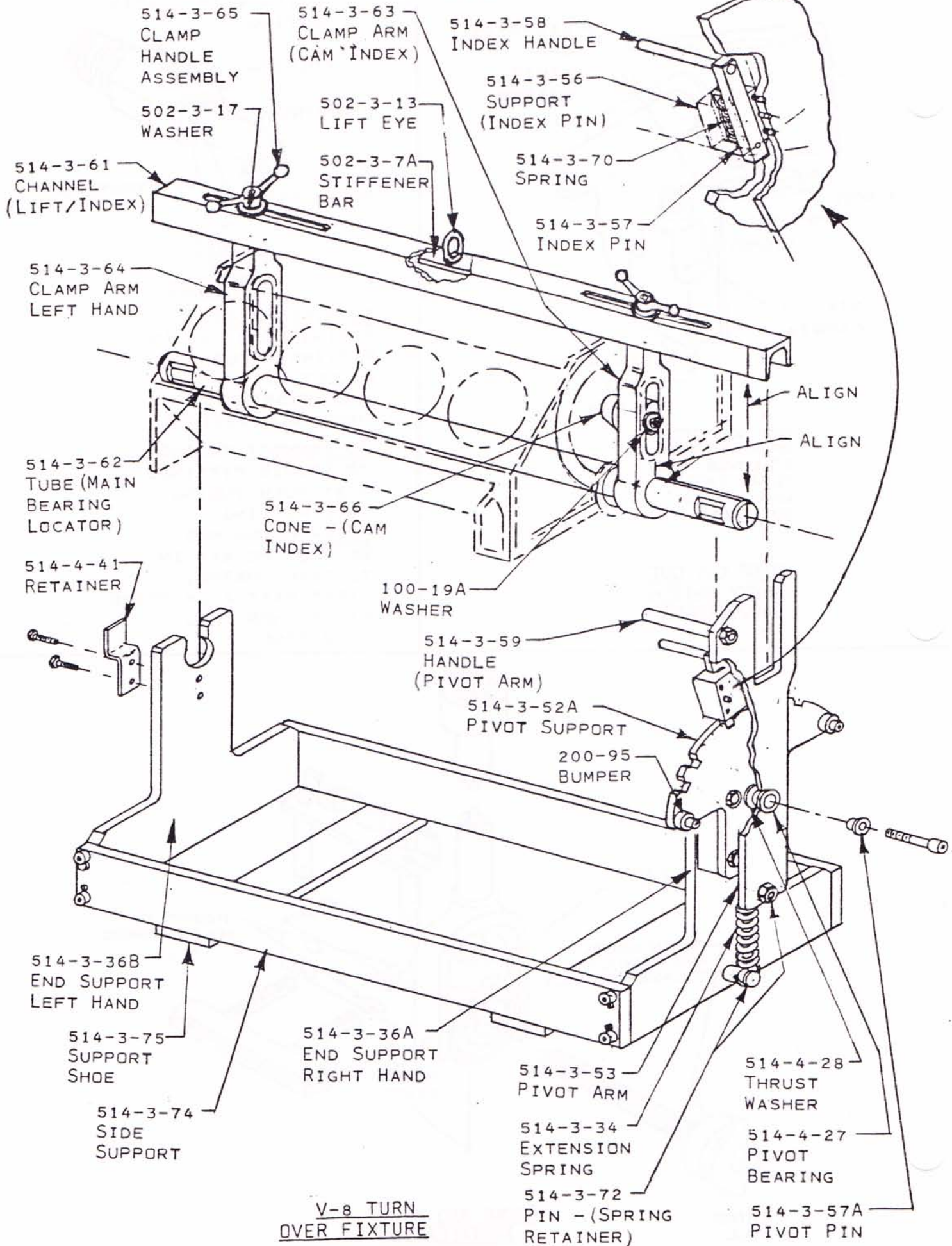
LEGRIS TUBE FITTINGS

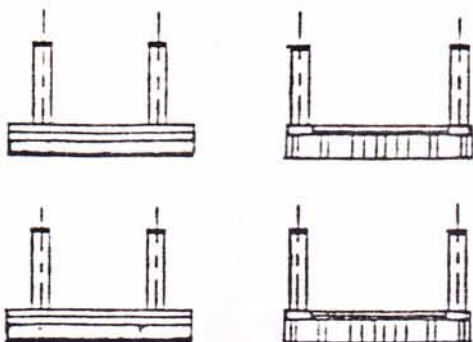
TO DISCONNECT TUBING FROM LEGRIS FITTING - PUSH COLLET WITH A SCREWDRIVER THEN PULL TUBING.

TO CONNECT TUBING TO LEGRIS FITTINGS JUST PUSH TUBING INTO FITTING.

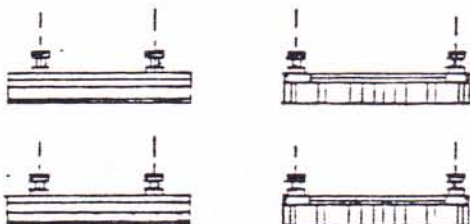
NOTE-TUBING MUST BE ALL THE WAY IN TO SEAL TUBING. FIRST PAST A GRIPPING RIDGE THEN THRU AN O-RING.



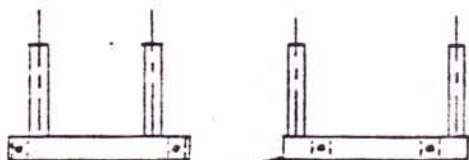




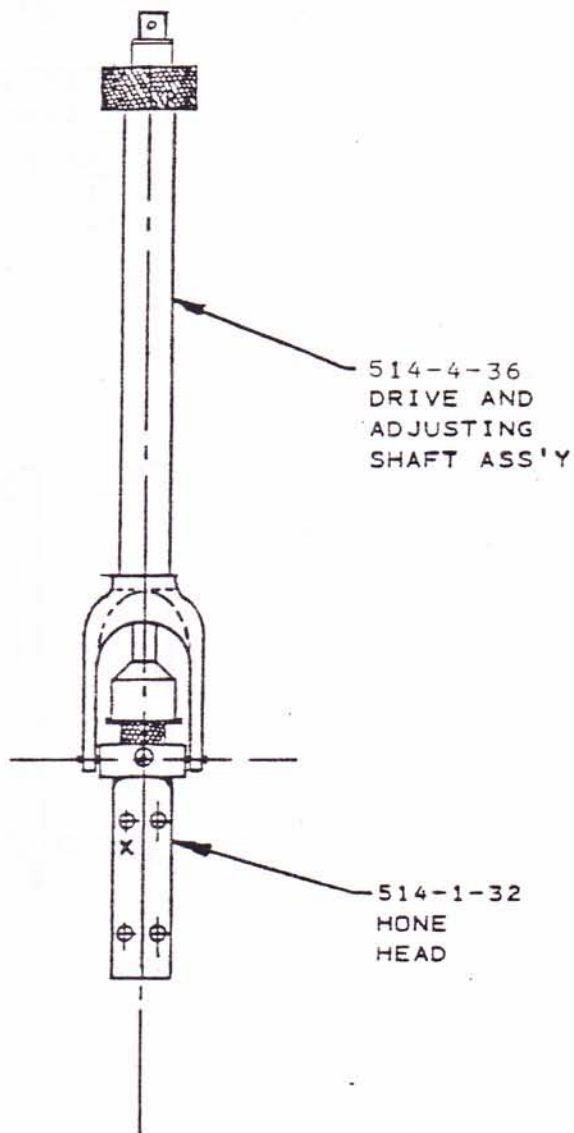
STONE SET	
2.88 TO 4.25 DIA.	
GRIT	PART NO.
120 M2F2F	514-1-33
180 M2F3F	514-1-34



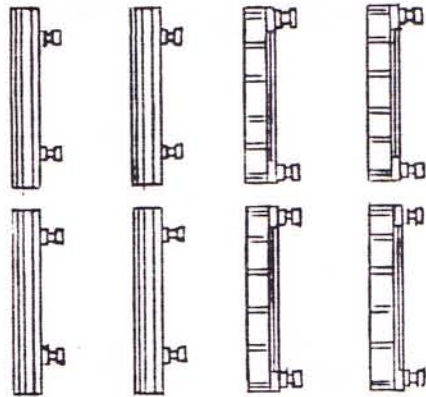
STONE SET FOR CARRIER 514-1-37	
GRIT	PART NO.
120 PT2F2F	514-1-35
180 PT2F3F	514-1-36



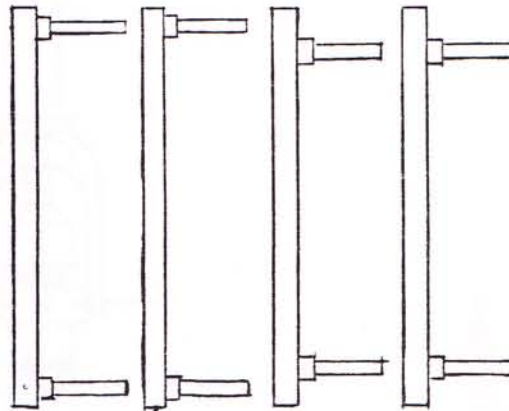
514-1-37
CARRIER
FOR STONE
PTN 3.75
TO 5.00 DIA.



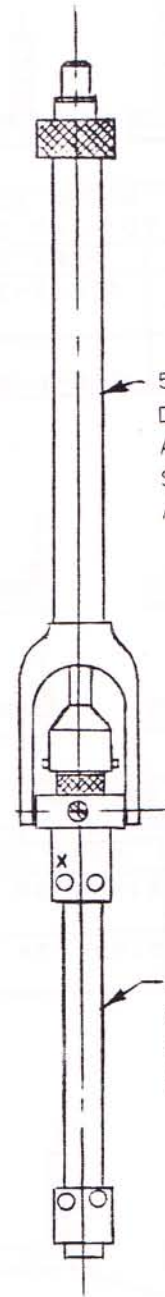
STANDARD
HP - HONE
HEAD ASSEMBLY
2.68 TO 5.00 DIA.
514-1-39



STONE SET FOR CARRIER 514-5-2	
GRIT	PART NO.
120 PT4/4/F2F	514-5-4
180 PT4/4/F3F	514-5-5



514-5-2
CARRIER
FOR STONE
PT4/4



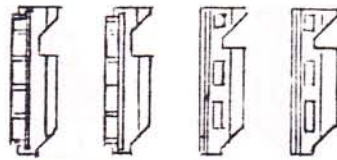
514-5-3
DRIVE &
ADJUSTING
SHAFT
ASSEMBLY

514-5-1
MAJOR
HONE
HEAD

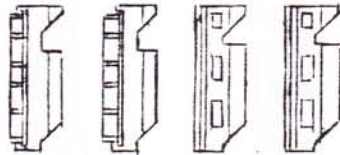
(Optional)

MAJOR
"H-P" HONE HEAD ASS'Y.
4.62 TO 7.00 DIA.

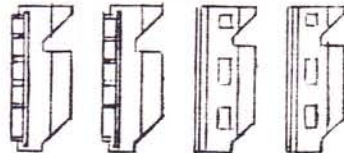
514-5



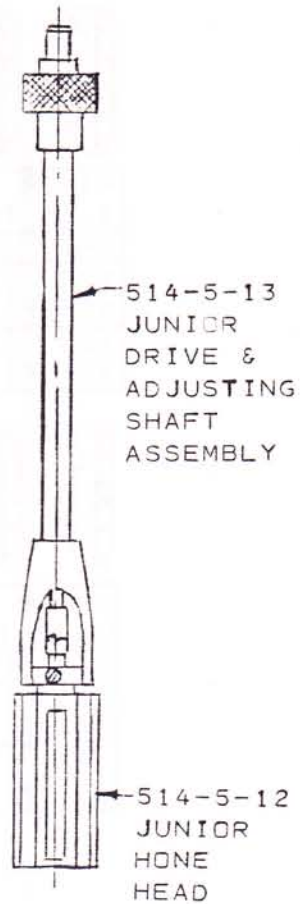
JUNIOR STONE SET 2.00 TO 2.20 DIA.	
GRIT	PART NO.
120 TF2F	514-5-14
180 TF3F	514-5-17



JUNIOR STONE SET 2.20 TO 2.40 DIA.	
GRIT	PART NO.
120 UF2F	514-5-15
180 UF3F	514-5-18

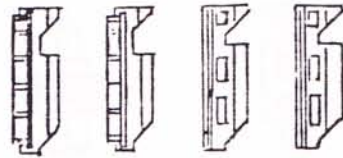


JUNIOR STONE SET 2.40 TO 2.68 DIA.	
GRIT	PART NO.
120 VF2F	514-5-16
180 VF3F	514-5-19

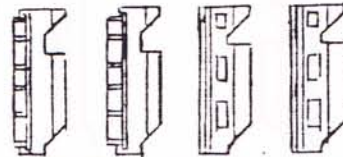


(Optional)

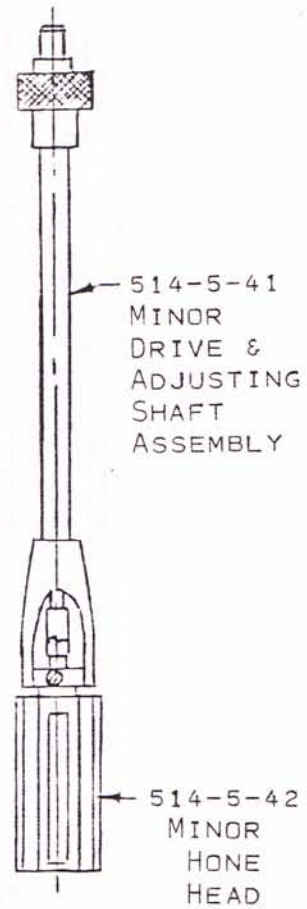
JUNIOR
"H-P" HONE
HEAD ASSEMBLY
2.00 TO 2.68 DIA.
514-5-11



MINOR STONE SET 1.50 TO 1.75 DIA.	
GRIT	PART NO.
120	514-5-43
28F2F	
180	514-5-44
28F3F	



MINOR STONE SET 1.75 TO 2.00 DIA.	
GRIT	PART NO.
120	514-5-45
29F2F	
180	514-5-46
29F3F	



(Optional)

MINOR
HONE HEAD ASSEMBLY
1.50 TO 2.00 DIA.
514-5-40

