

VERSION~LCM # 7500-HD-60-60-MB HYDRAULIC COLD / WARM FORGING PRESS

APPLICATION: COLD & WARM FORGING OF VARIOUS COMPONENTS UP TO 850° F

TECHNICAL PROPOSAL # 8674503 ~ ISSUE # 8

DATE: MARCH

CONTRACT TECHNICAL SPECIFICATION, SCOPE OF SUPPLY, PRESS DATA, MANUFACTURING STANDARDS

	VERSION~LCM # 7500-HD-60-60-MB HYDRAULIC COLD / WARM FORGING PRESS	PAGE 1 OF 6
	<p><u>MAIN PRESS UNIT:</u></p> <ul style="list-style-type: none">• PRESS FRAME TYPE = STEEL FABRICATED, HEAVY SECTION, PORTAL FRAME TYPE• PRESS CAPACITY = 750 >> 7500 US TONS ~ FULLY ADJUSTABLE & PROGRAMMABLE• PRESS OPEN HEIGHT / DAYLIGHT = 60 INCHES• PRESS SHUT HEIGHT = 24 INCHES• PRESS STROKE = 0 >> 36 INCHES ~ FULLY ADJUSTABLE & PROGRAMMABLE• PRESS SLIDE PLATE AREA (L > R x F > B) = 60 INCHES x 60 INCHES• PRESS SLIDE LIFT CAPACITY = 100 US TONS• PRESS SLIDE DWELL CAPABILITY = 0 >> 30 SECONDS ~ FULLY ADJUSTABLE & PROGRAMMABLE• SLIDE CONFIGURATION = EXTRA HIGH DEPTH > WIDTH PROFILE FOR FORGING / OFF-CENTER LOADS• SLIDE GUIDING = EIGHT (8) UNITS, EXTRA LONG, INVERTED 45°, HEAT COMPENSATING GIBS• PRESS SLIDE PLATE T-SLOTS ~ QUANTITY & SIZE = PER DRG # SN053-0003-R2• OPENINGS IN PRESS FRAME (L > R x F > B) = 100 INCHES x 49 INCHES	

VERSION~LCM # 7500-HD-60-60-MB HYDRAULIC COLD / WARM FORGING PRESS (CONTD)

PAGE 2 OF 6

ONE (1) UNIT: # 1 MOVING BOLSTER

- MOVING BOLSTER DIRECTION OF MOVEMENT = CENTER > FRONT OF PRESS
- MOVING BOLSTER AREA (L > R x F > B) = 60 INCHES x 60 INCHES
- MOVING BOLSTER HEIGHT = 24 INCHES
- MOVING BOLSTER SPEED = 190 INCHES / MIN
- MOVING BOLSTER CAPACITY (TOTAL TOOL WEIGHT) = 20 US TONS
- MOVING BOLSTER TRAVEL ~ C/L OF PRESS TO OUTER EDGE OF BOLSTER = 194 INCHES
- MOVING BOLSTER STROKE = 164 INCHES
- MOVING BOLSTER CLEARANCE ~ REAR OF BOLSTER TO FRONT OF CROWN PLATFORM = 24 INCHES
- MOVING BOLSTER T-SLOTS & MACHINING = PER DRG # SN053-0002-R2
- MOVING BOLSTER LIFT / LOWER CYLINDERS = FOUR (4) INCLUDED IN PRESS BED
- MOVING BOLSTER WEDGE TYPE CLAMP / UNCLAMP UNITS = FOUR (4) x 25 US TON UNITS ON PRESS BED
- MOVING BOLSTER ACCURATE POSITION / LOCATION PINS = TWO (2) INCLUDED IN PRESS BED
- MOVING BOLSTER DRIVE UNIT = ONE (1) TECO-WESTINGHOUSE H-E MOTOR
- MOVING BOLSTER LIFT / LOWER CYLINDERS PUMP = REXROTH or PARKER-DENISON
- MOVING BOLSTER CLAMP / UNCLAMP CYLINDERS PUMP MOTOR = TECO-WESTINGHOUSE H-E MOTOR
- MOVING BOLSTER TRACK LENGTHS & SUPPORT BEAMS = INCLUDED

BED KNOCKOUT UNIT:

- BED KNOCKOUT CAPACITY = 75 US TONS
- BED KNOCKOUT STROKE = 6 INCHES ~ FIXED
- BED KNOCKOUT ROD DIAMETER = 6 INCHES DIAMETER

MAIN CYLINDER & RETURN CYLINDERS:

- MAIN CYLINDER ~ SINGLE ACTING = ONE (1) UNIT @ 71 INCHES DIA
- RETURN CYLINDERS ~ SINGLE ACTING = TWO (2) UNITS

PRESS SPEEDS:

- FAST APPROACH = 1000 IPM
- PRESSING @ 7500 US TONS = 0 IPM >> 25.0 IPM ~ FULLY ADJUSTABLE & PROGRAMMABLE
- PRESSING @ 7000 US TONS = 0 IPM >> 28.6 IPM ~ FULLY ADJUSTABLE & PROGRAMMABLE
- STRIPPING / PULL-OUT / FAST RETURN = 735 IPM

VERSON~LCM # 7500-HD-60-60-MB HYDRAULIC COLD / WARM FORGING PRESS (CONTD)	PAGE 3 OF 6
<u>MAIN HYDRAULIC PUMPS & MOTORS:</u>	
<ul style="list-style-type: none"> • MAIN HYDRAULIC PUMPS = THREE (3) REXROTH # A2V-500 PUMPS • PILOT PUMP = ONE (1) REXROTH or PARKER-DENISON PUMP • OIL COOLING & FILTRATION PUMP = ONE (1) REXROTH or PARKER-DENISON PUMP • MAIN HYDRAULIC PUMP MOTORS = THREE (3) TECO-WESTINGHOUSE 360 HP HI-EFFICIENCY MOTORS • PILOT PUMP MOTOR = ONE (1) TECO-WESTINGHOUSE 20 HP HI-EFFICIENCY MOTOR • OIL COOLING & FILTRATION PUMP MOTOR = ONE (1) TECO-WESTINGHOUSE 40 HP HI-EFFICIENCY MOTOR 	
<u>HYDRAULIC CONTROL SYSTEM:</u>	
<ul style="list-style-type: none"> • PRESS CROWN PLATFORM = SIZED TO ACCOMMODATE A TOTAL OF THREE (3) MAIN PUMPS & MOTORS • HYDRAULIC PUMPS, MOTORS, MANIFOLDS, VALVES etc = MOUNTED ON PRESS CROWN PLATFORM • MAIN OIL TANK, PIPING etc = MOUNTED ON PRESS CROWN PLATFORM • HYDRAULIC OIL TANK VOLUME = 2380 US GALLONS • HYDRAULIC OIL ~ TYPE / GRADE = MOBIL DTE 25 or SHELL TELLUS 46 or EQUIVALENT • HYDRAULIC SYSTEM OPERATING PRESSURE = 3,810 PSI • HYDRAULIC CIRCUIT = FITTED WITH AMPLE PRESSURE TEST POINTS FOR TROUBLESHOOTING • HYDRAULIC OIL OPERATING TEMPERATURE RANGE = 40° F >> 130° F • HYDRAULIC OIL COOLING & FILTRATION UNIT = MOUNTED ON PRESS CROWN PLATFORM • HYDRAULIC OIL COOLING & FILTRATION UNIT COOLING WATER INLET TEMPERATURE = BELOW 85° F • HYDRAULIC OIL COOLING & FILTRATION UNIT COOLING WATER FLOW RATE = 26 GPM) • HYDRAULIC OIL COOLING & FILTRATION UNIT COOLING WATER PRESSURE = 15 PSI >> 30 PSI • HYDRAULIC VALVES ~ DIRECTIONAL, RELIEF, THROTTLE / CHECK, PROPORTIONAL = REXROTH BRAND • HYDRAULIC PRE-FILL VALVES = VERNON~LCM BRAND • HYDRAULIC MANIFOLD BLOCKS = VERNON~LCM BRAND • HYDRAULIC OVERLOAD PROTECTION SYSTEM = REXROTH BRAND • HYDRAULIC FLUID FILTRATION SYSTEM UNITS & FILTERS = HYDAC BRAND 	

ELECTRICAL CONTROL SYSTEM:

- ELECTRICAL CONTROL SYSTEM, MOTOR STARTERS, COMPONENTS ETC = ALLEN BRADLEY (MAINLY)
- PLC CONTROL SYSTEM = ALLEN BRADLEY COMPACTLOGIX
- PLC OPERATOR INTERFACE SCREEN (HMI) = ALLEN BRADLEY PANELVIEW 1000
- HMI SCREENS INCLUDE:
 - > PRESS START-UP SCREEN
 - > PRESS SHUT-DOWN SCREEN
 - > PRESS MAINTENANCE / DIAGNOSTIC SCREEN(S)
 - > PRESS CURRENT ALARM(S) SCREEN
 - > PRESS ALARM HISTORY SCREEN
 - > PRESS OPERATION & SYSTEMS DISPLAY SCREEN
 - > PRESS TO AUTOMATION (ROBOT ETC) INTERFACE STATUS SCREEN
- REMOTE DIAGNOSTIC SUPPORT VIA ETHERNET LINK = INCLUDED WITH COMPACTLOGIX
- PRESS OPERATIONAL PARAMETERS / TOOL CODE MEMORY STORAGE = CAPACITY FOR 100 PROGRAMS
- PRESS OPERATIONAL MODES ~ FOUR (4) = OFF / DIE CHANGE / MANUAL / AUTO
- PRESS OPERATING CONTROL CONSOLE = NEMA 12, PENDANT TYPE, SITED ON RHF PRESS COLUMN
- REMOTE OPERATOR INTERFACE SCREEN (HMI) FOR MONITORING = MOUNTED ON LHR PRESS COLUMN
- PUSH BUTTONS FOR SET-UP, MANUAL OR AUTOMATIC OPERATION = INCLUDED ON PENDANT
- MAIN ELECTRICAL CONTROL CABINET = NEMA 12, CROWN PLATFORM MOUNTED
- MAIN ELECTRICAL CONTROL CABINET = CONTAINS 10% EXTRA, VACANT, USEABLE PANEL SPACE
- MAIN DISCONNECT SWITCH = FITTED ON PRESS COLUMN AT EASILY ACCESSIBLE HEIGHT
- SLIDE POSITION CONTROL = LINEAR DISPLACEMENT TRANSDUCER (BALLUFF BRAND)
- AIR CONDITIONING UNIT FOR MAIN ELECTRICAL CONTROL CABINET = INCLUDED
- ELECTRIC LIGHT CURTAIN UNITS FOR FRONT & REAR OF PRESS = TWO (2) SETS INCLUDED
- REMOTE OPERATOR PRESS CONTROL T-STAND = ONE (1) ~ WITH TWO (2) RUN & ONE (1) E-STOP
- RECEPTACLE FOR REMOTE PRESS CONTROL T-STAND = TWO (2) UNITS ~ ON LHF & RHR PRESS COLUMN
- EMERGENCY STOP BUTTONS ~ FIVE (5) LOCATIONS = ON LHF / LHR / RHF / RHR COLUMNS + PENDANT
- DUPLEX ELECTRICAL RECEPTACLE (110V-1PH-60HZ) = TWO (2) UNITS ~ ON LHF & RHR PRESS COLUMN

ELECTRICAL POWER REQUIREMENTS:

- MAIN ELECTRICAL SUPPLY = 440~480 VOLT ~ 3 PHASE ~ 60 HZ (AC)
- MAIN CONTROL VOLTAGE = 110~120 VOLT ~ 1 PHASE ~ 60 HZ (AC)
- PLC, OUT-PUT DEVICES, PUSH BUTTONS = 24 VOLT (DC)
- TOTAL ELECTRICAL POWER REQUIREMENT = 1068 KVA

VERSION~LCM # 7500-HD-60-60-MB HYDRAULIC COLD / WARM FORGING PRESS (CONTD)

PAGE 5 OF 6

STANDARD FEATURES & EQUIPMENT:

- SAFETY PLATFORM & SOLID WALL PANEL ENCLOSURE AROUND PRESS CROWN = INCLUDED
- PRESS CROWN ACCESS WALK-UP TYPE STAIRCASE WITH LANDINGS = DRAWINGS ONLY / CEC SUPPLY
- SLIDE OUT-OF-LEVEL MONITORING SYSTEM = LDT's ON ALL FOUR (4) CORNERS OF PRESS SLIDE
- MULTI-POSITION SAFETY SLIDE LOCK UNIT = ONE (1) UNIT ~ COVERS FULL PRESS STROKE
- MULTI-POSITION SAFETY SLIDE LOCK UNIT = SLIDE LOCKABLE IN 4 INCH INCREMENTS
- REMOVABLE STEEL MESH SAFETY PANELS = TWO (2) TO COVER OPENINGS IN PRESS SIDE COLUMNS
- AIR OUTLETS FOR AIR TOOL OPERATION = TWO (2) UNITS ~ ON LHF & RHR PRESS COLUMN
- PRESS ANCHOR BOLTS ~ SIX (6) UNITS + PRESS TOOL KIT ~ ONE (1) SET
- TWO (2) SETS: PRESS OPERATOR, SERVICE & MAINTENANCE MANUALS + ONE (1) CD

OFF-CENTER LOADING CAPABILITY ~ SEE DIAGRAM # SN006-OA29-R2 & # SN006-OA30-R3

- 7500 US TONS ~ WITHIN 5.00 INCHES RADIUS OF PRESS CENTERLINE ie: 10.00 INCHES DIAMETER
- 7000 US TONS ~ WITHIN 5.35 INCHES RADIUS OF PRESS CENTERLINE ie: 10.70 INCHES DIAMETER
- 6000 US TONS ~ WITHIN 6.25 INCHES RADIUS OF PRESS CENTERLINE ie: 12.50 INCHES DIAMETER
- 5000 US TONS ~ WITHIN 7.50 INCHES RADIUS OF PRESS CENTERLINE ie: 15.00 INCHES DIAMETER
- 4000 US TONS ~ WITHIN 9.40 INCHES RADIUS OF PRESS CENTERLINE ie: 18.80 INCHES DIAMETER
- 3000 US TONS ~ WITHIN 12.50 INCHES RADIUS OF PRESS CENTERLINE ie: 25.00 INCHES DIAMETER
- 2500 US TONS ~ WITHIN 15.00 INCHES RADIUS OF PRESS CENTERLINE ie: 30.00 INCHES DIAMETER
- 2000 US TONS ~ WITHIN 18.00 INCHES RADIUS OF PRESS CENTERLINE ie: 36.00 INCHES DIAMETER
- 1000 US TONS ~ WITHIN 30.00 INCHES RADIUS OF PRESS CENTERLINE ie: 60.00 INCHES DIAMETER

PRESS DATA (APPROX):

- FLOOR TO TOP OF BOLSTER = 24 INCHES / 2 FEET
- FLOOR TO TOP OF PRESS = 314 INCHES / 26 FEET
- FLOOR TO UNDERSIDE OF PRESS BED = 147 INCHES / 12 FEET
- PRESS WIDTH OVERALL (L > R) @ FLOOR LEVEL = 157 INCHES / 13 FEET
- PRESS WIDTH OVERALL (L > R) @ CROWN PLATFORM LEVEL = 362 INCHES / 30 FEET
- PRESS DEPTH OVERALL (F > B) @ FLOOR LEVEL = 96 INCHES / 8 FEET
- PRESS DEPTH OVERALL (F > B) @ CROWN PLATFORM LEVEL = 220 INCHES / 18 FEET
- PRESS WEIGHT ~ APPROXIMATE = 550 US TONS