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MFG., INC.
CINCINNATI, OHIO

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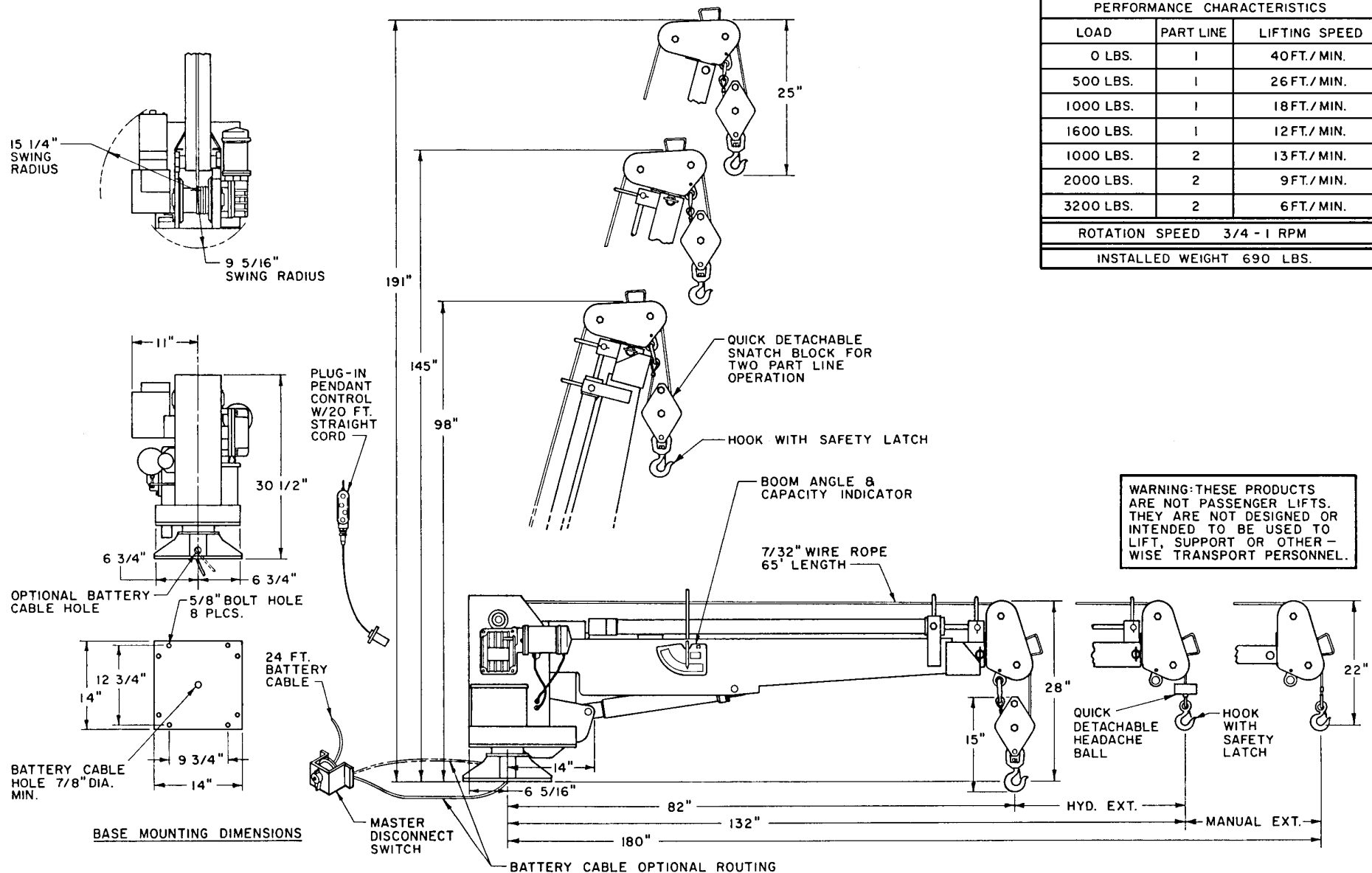
ET10KX

DATE
5-10-01F

SUPERCEDES
1-21-00E

SECTION
-

19522



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DRAWING

ET10K(X), W/ 7 - 15 FT BOOM

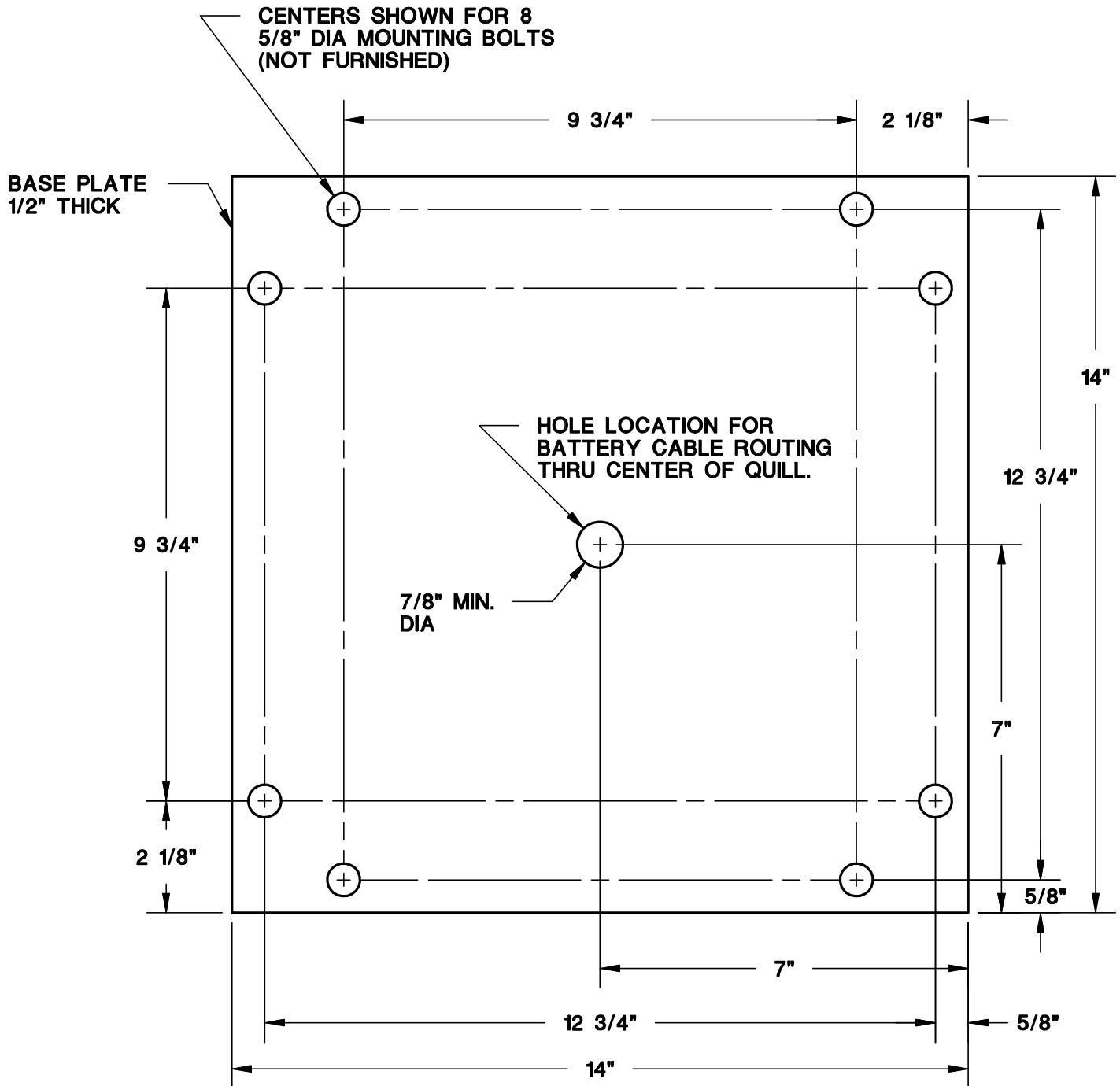
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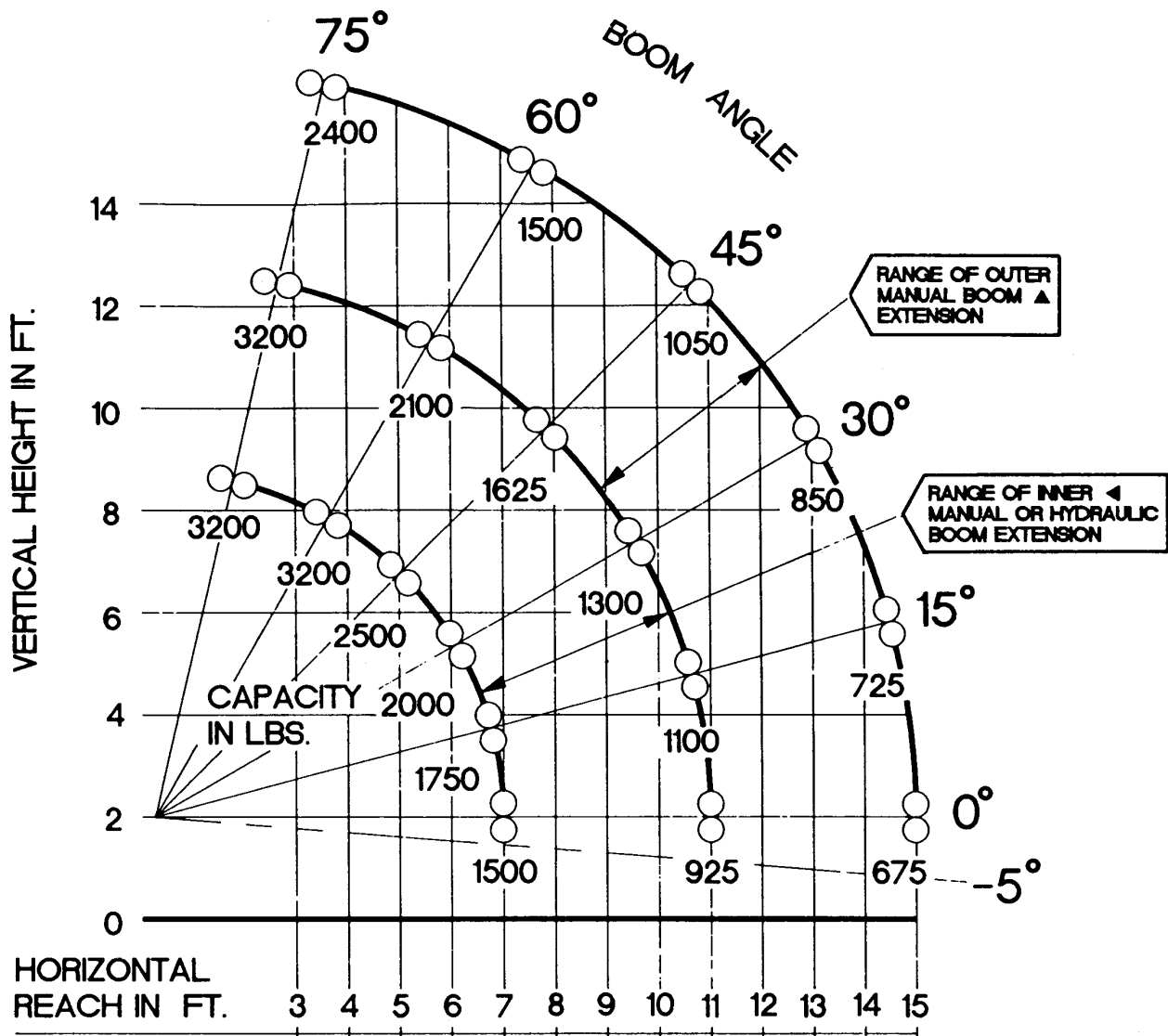
SECTION
C100

17450

MOUNTING HOLE TEMPLATE



ET10K(X) MAXIMUM CAPACITY CHART

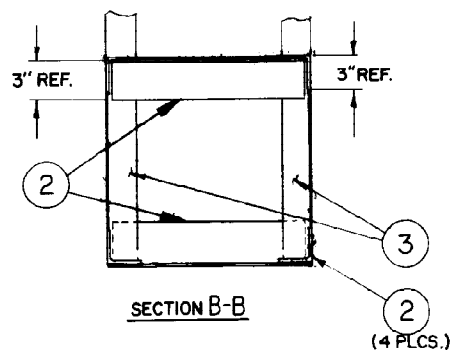


MFG., INC.
CINCINNATI, OHIO

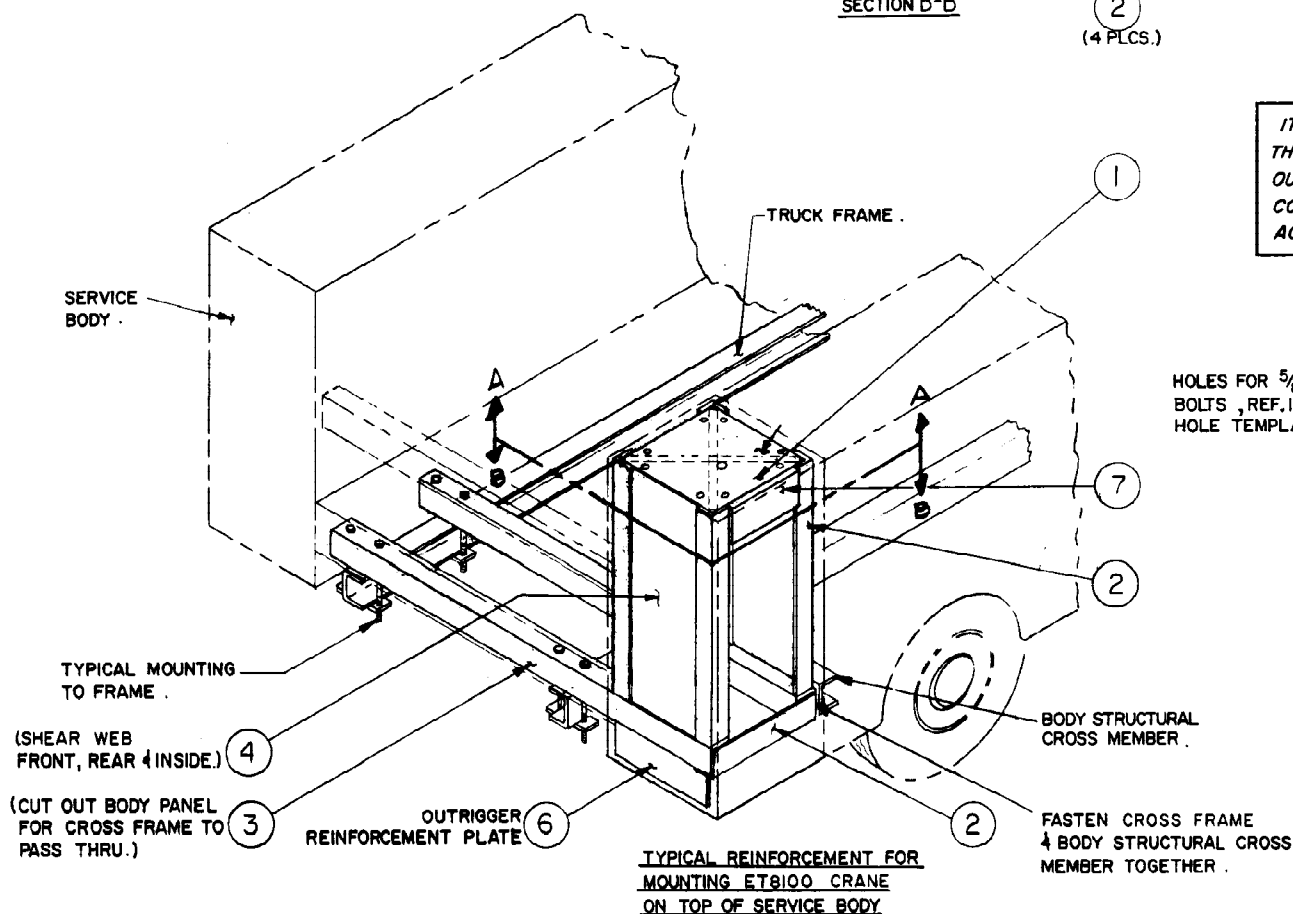
TITLE
MAX CAPACITY CHART
ET10K(X)

DATE
7-1-98
SUPERCEDES
-

SECTION
C100
19529

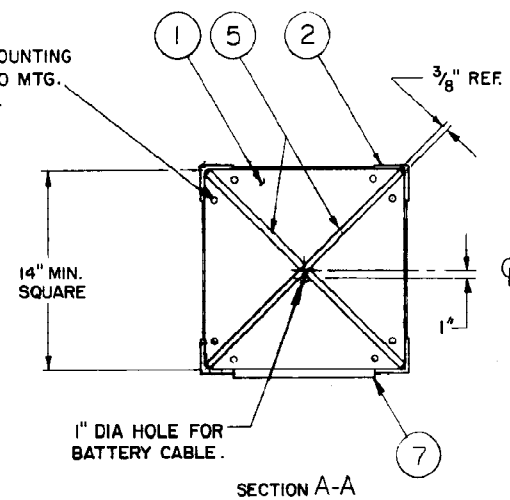


PART	DESCRIPTION	MINIMUM RECOMMENDED MATERIAL SIZE
1	TOP PLATE	$\frac{3}{8}$ " STEEL
2	CORNER POST	3" x 3" x $\frac{1}{4}$ " STEEL ANGLE
3	CROSS FRAME	2" x 4" x $\frac{1}{4}$ " W STRUCTURAL TUBING or 4" x 7.25 LB STANDARD STEEL CHANNEL
4	SHEAR WEB	12 Ga.
5	TOP PLATE REINFORCEMENT	$\frac{3}{8}$ " x 4" STEEL BAR
6	OUTRIGGER REINFORCEMENT PLATE	$\frac{3}{16}$ " THICK STEEL PLATE
7	GUSSET	$\frac{1}{4}$ " x 4" H.R. STEEL



IT IS THE SOLE RESPONSIBILITY OF THE INSTALLER TO INSURE THAT THE TOTAL STRUCTURE OF CRANE, TRUCK, AND OUTRIGGERS ARE STRUCTURALLY SOUND AND THAT THE COMPLETED VEHICLE HAS SUFFICIENT STABILITY AGAINST OVERTURNING.

HOLES FOR $\frac{5}{8}$ " MOUNTING BOLTS, REF. I7390 MTG. HOLE TEMPLATE.



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CINCINNATI, OHIO

TITLE INSTALLATION DRAWING

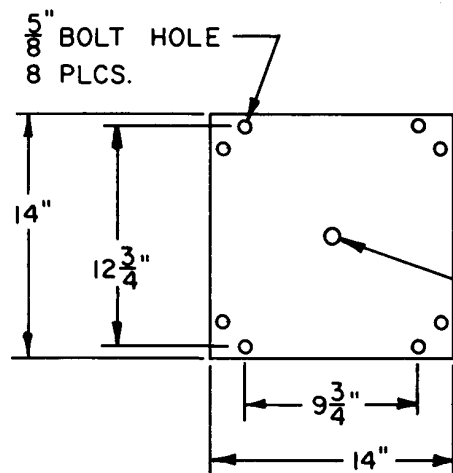
▲ ET6KR, ET10K(X) CRANES

DATE
12-21-99B

SUPERCEDES
6-19-98A

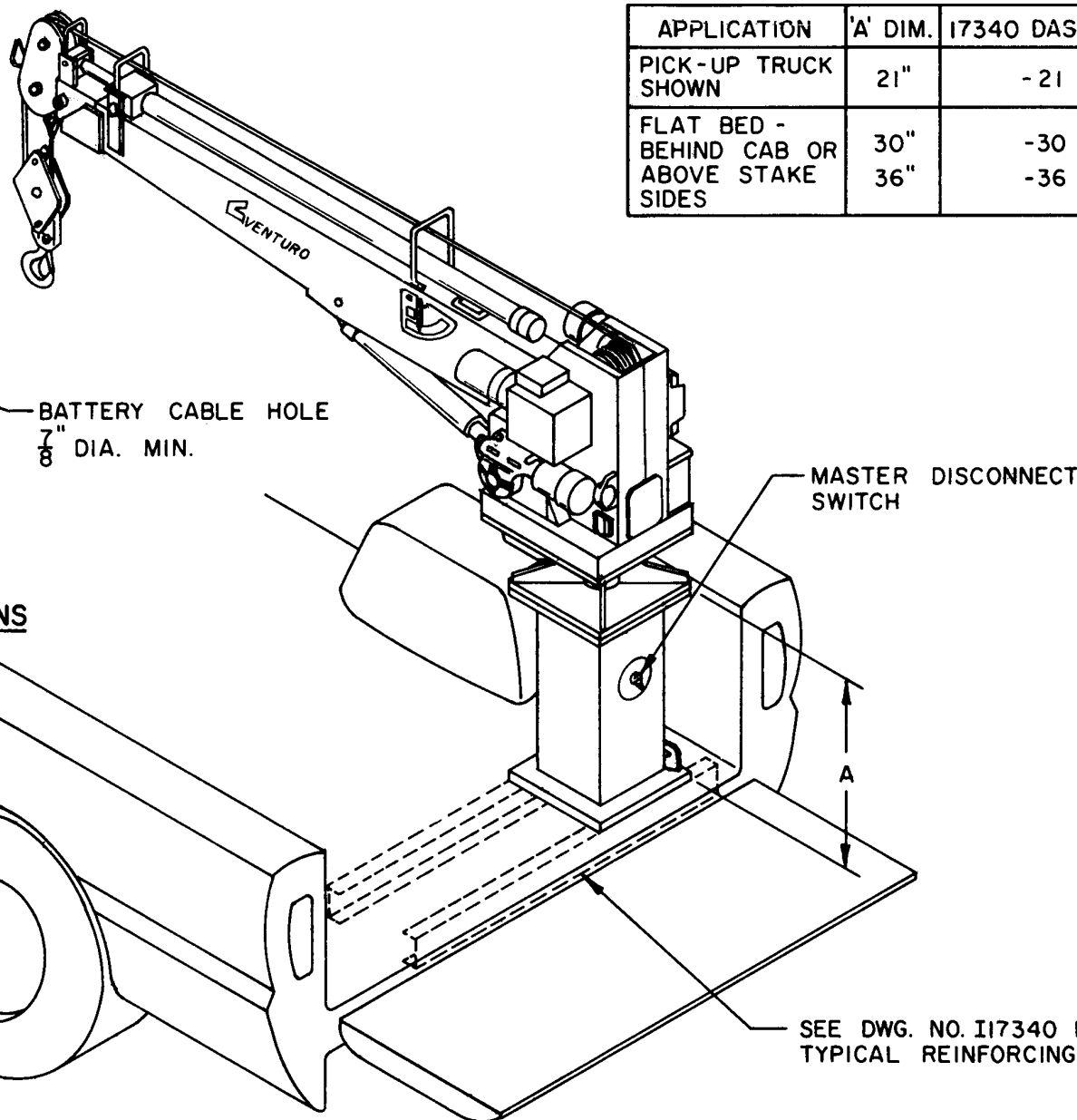
SECTION
C100

16938



BASE MOUNTING DIMENSIONS

APPLICATION	'A' DIM.	17340 DASH NO.
PICK-UP TRUCK SHOWN	21"	- 21
FLAT BED - BEHIND CAB OR ABOVE STAKE SIDES	30" 36"	-30 -36



WARNING: THESE PRODUCTS ARE NOT PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED TO LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL.



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
17340 MOUNTING PEDESTAL

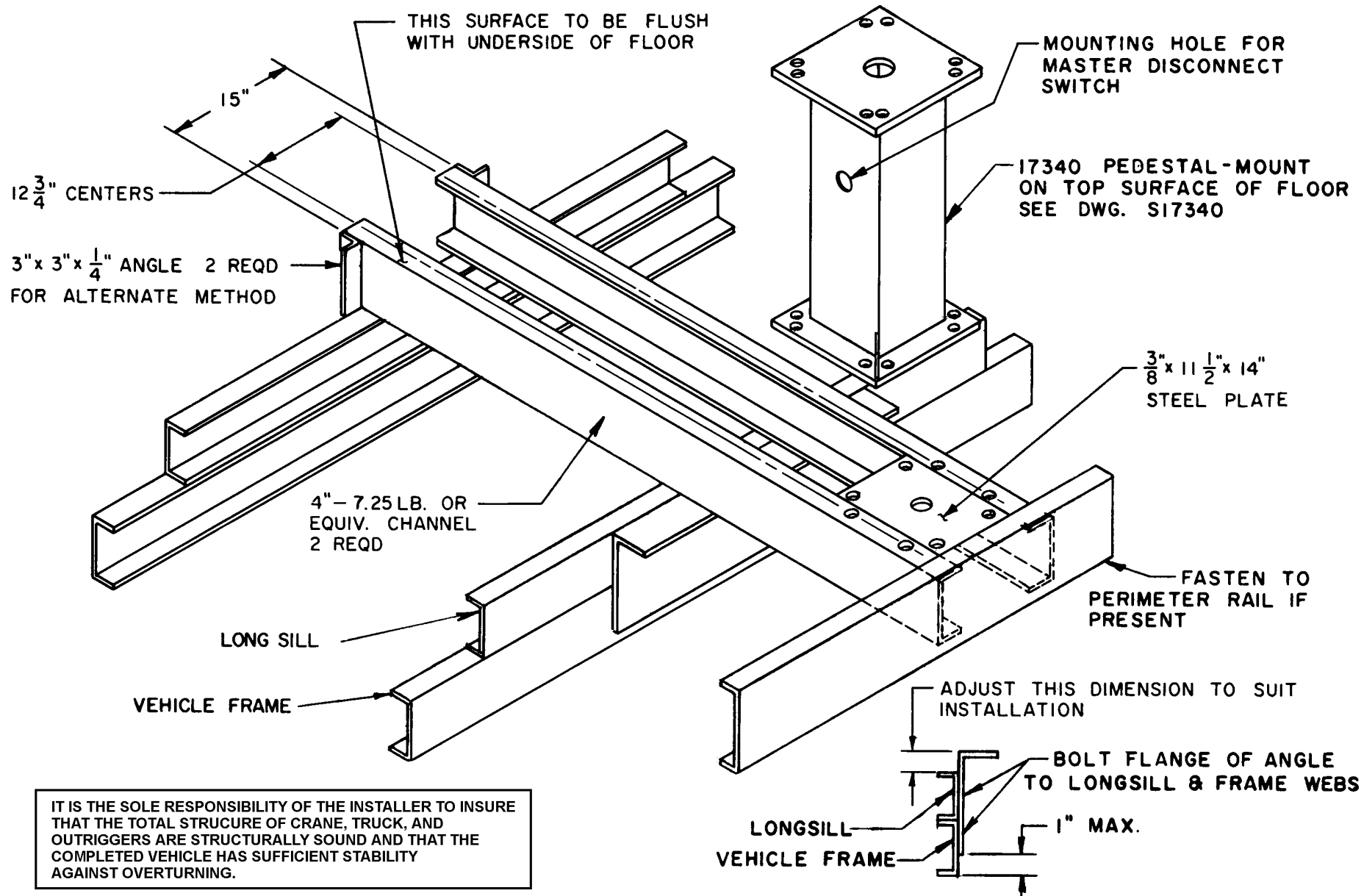
ET8100, ET10K(X) CRANES

DATE
6-19-98B

SUPERCEDES
11-17-92A

SECTION
C100

S17340



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DRAWING

ET8100, ET10K(X) CRANES

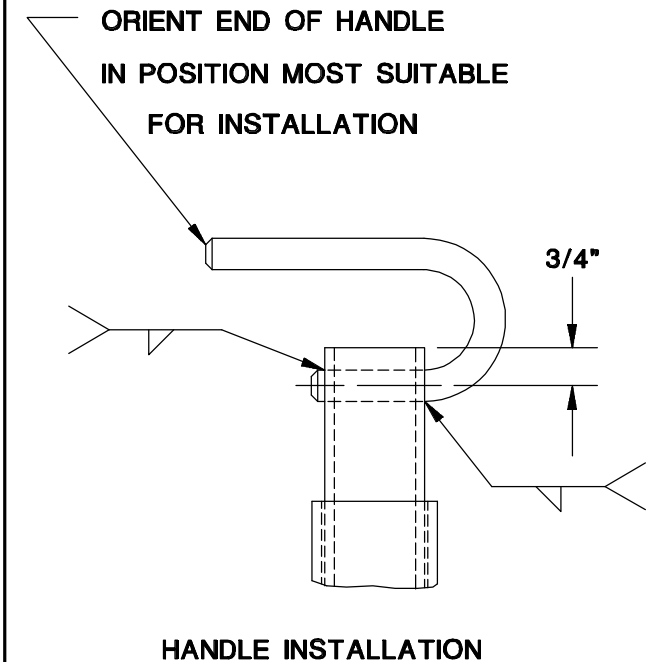
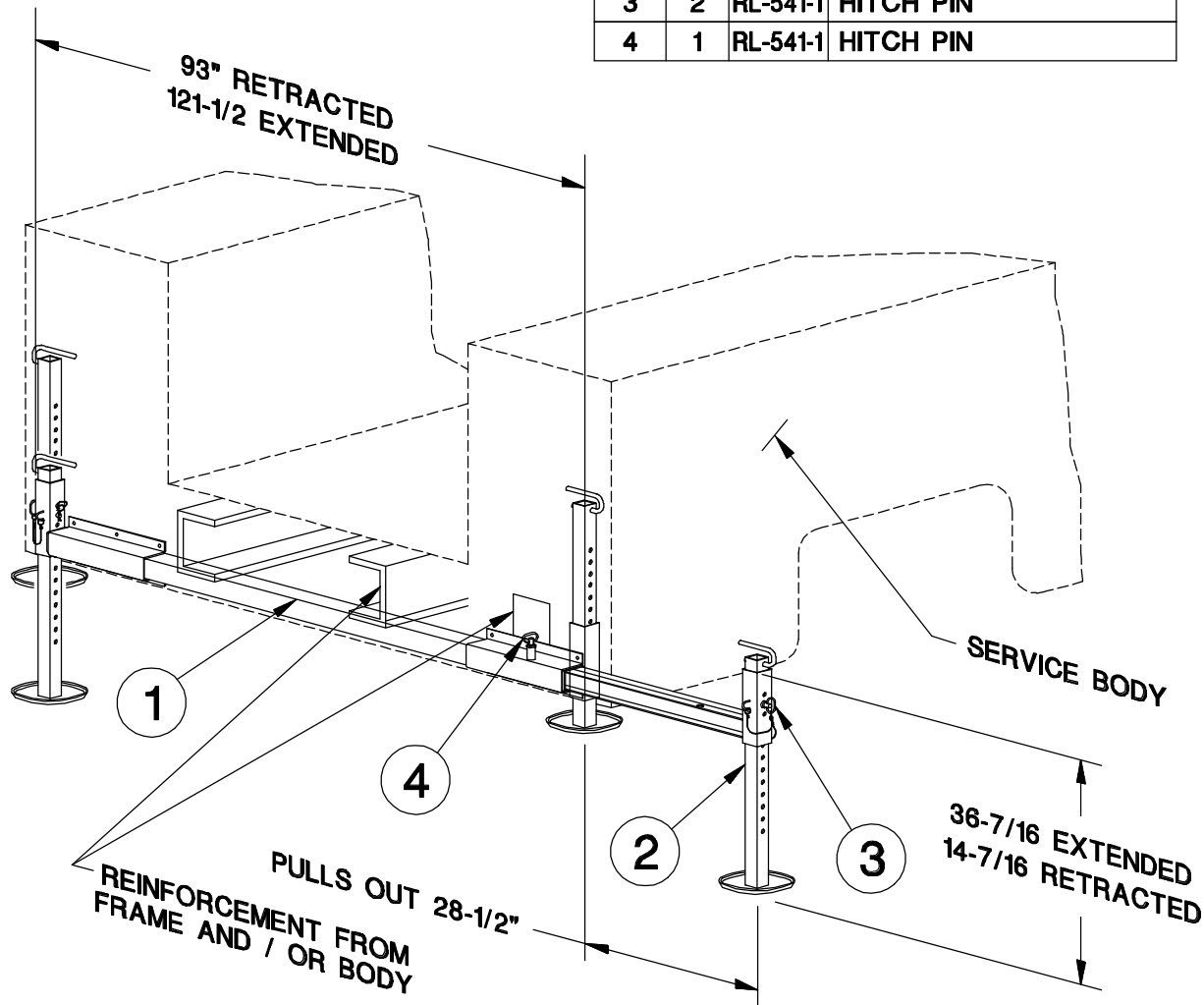
DATE
6-19-98B

SUPERCEDES
11-17-92A

SECTION
C100

117340

ITEM	QTY	PART NO.	DESCRIPTION
1	1	18507	MOUNTING TUBE ASSY
2	1	18508	OUTRIGGER ASSY
3	2	RL-541-1	HITCH PIN
4	1	RL-541-1	HITCH PIN



WARNING - THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL

WARNING: THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL.

6 - $\frac{3}{8}$ " DIA. BOLT HOLES

SERVICE BODY

TYPICAL INSTALLATION OF
13500 MANUAL OUTRIGGER
ON TRUCK WITH SERVICE BODY

$\frac{1}{2}$ " TO 24"

$\frac{1}{2}$ " DIA. LOCKING PIN WITH HAIRPIN COTTER

OUTRIGGER EXTENDS AND RETRACTS IN INCREMENTS OF $\frac{11}{16}$ ".

$6\frac{5}{16}$ "
DIA.



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DRAWING

ET5500MPB, ET6KM/R

DATE
6-17-98C

SUPERCEDES
8-1-83B

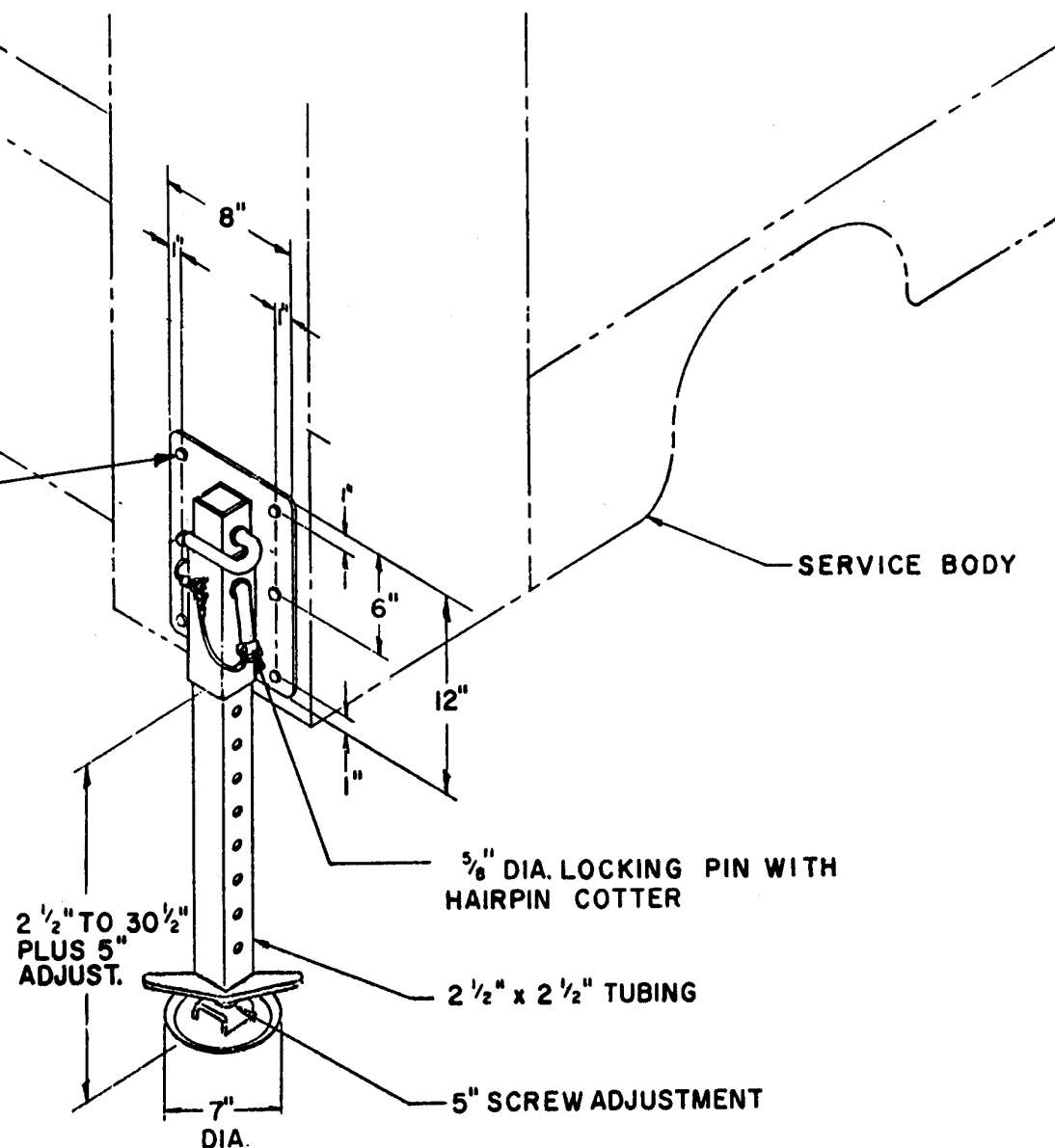
SECTION
C100

13509

WARNING: THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL

**TYPICAL INSTALLATION OF 23961
MANUAL OUTRIGGER ON TRUCK
WITH SERVICE BODY EQUIPPED
WITH ET/HT25 SERIES CRANES**

6 - 1/2" DIA. BOLT HOLES



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DRAWING

ET10K(X), ET25K(X), HT25KX

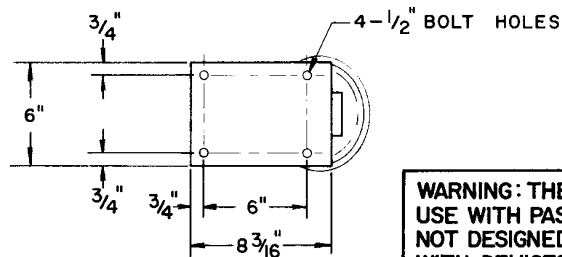
DATE
4-29-98D

SUPERCEDES
7-27-83C

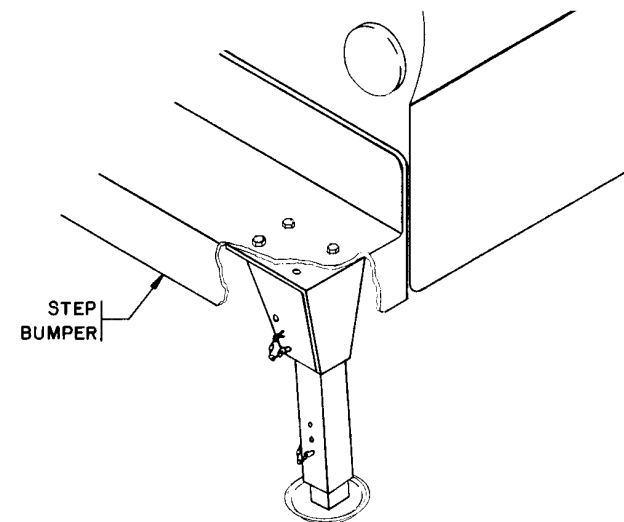
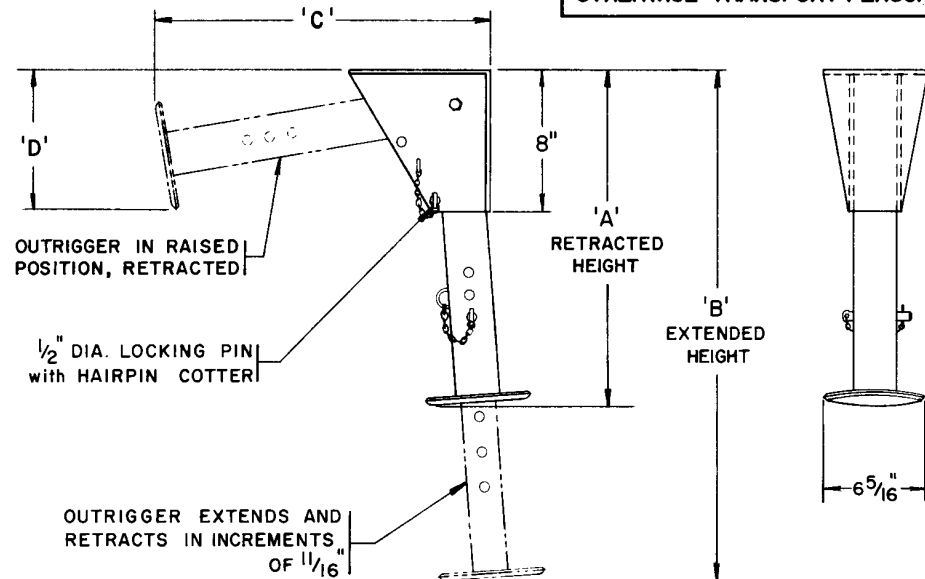
SECTION
C100

I23961

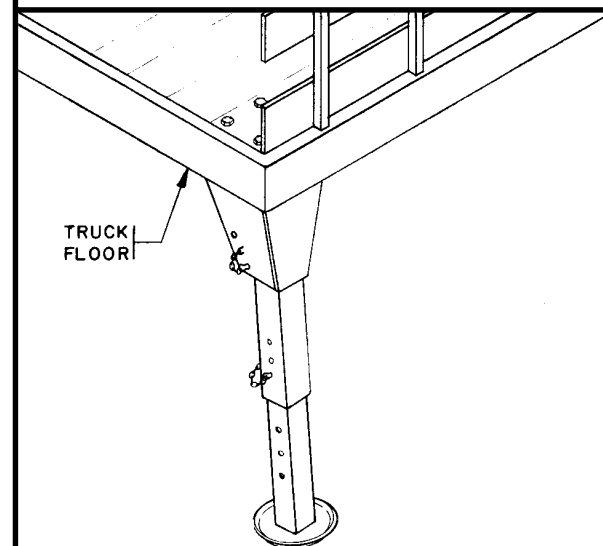
PART No.	DESCRIPTION	'A'	'B'	'C'	'D'
11822-1	SHORT OUTRIGGER	19"	29"	19 $\frac{3}{4}$ "	6 $\frac{1}{2}$ "
11822-2	LONG OUTRIGGER	27"	45"	27 $\frac{3}{4}$ "	9 $\frac{3}{4}$ "



WARNING: THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL.



TYPICAL SHORT
OUTRIGGER INSTALLATION



TYPICAL LONG
OUTRIGGER INSTALLATION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DRAWING

ET5500MPB, ET6KM/R

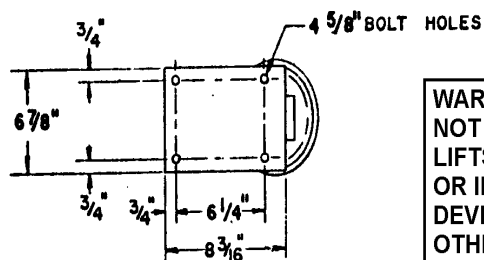
DATE
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SUPERCEDES
10-12-83B

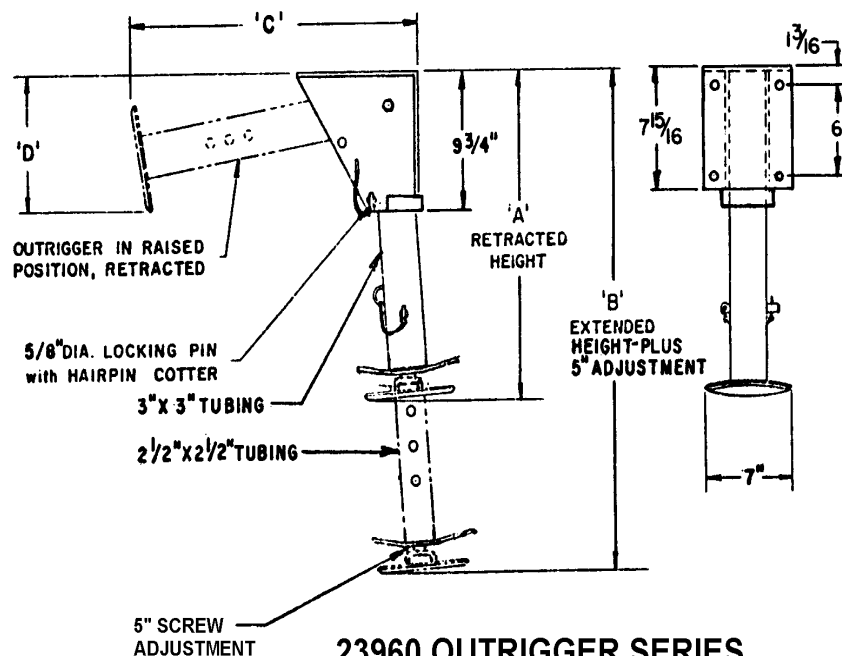
SECTION
C100

13510

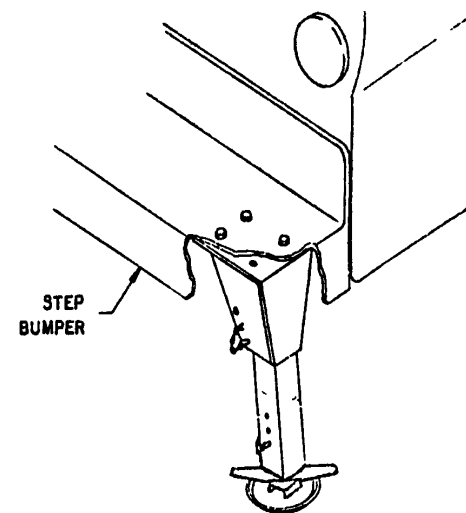
PART NO.	DESCRIPTION	'A'	'B'	'C'	'D'
23960-1	SHORT OUTRIGGER	20 1/2"	28 1/2"	21"	7 1/4"
23960-2	LONG OUTRIGGER	28 1/2"	44 1/2"	29"	10 1/2"



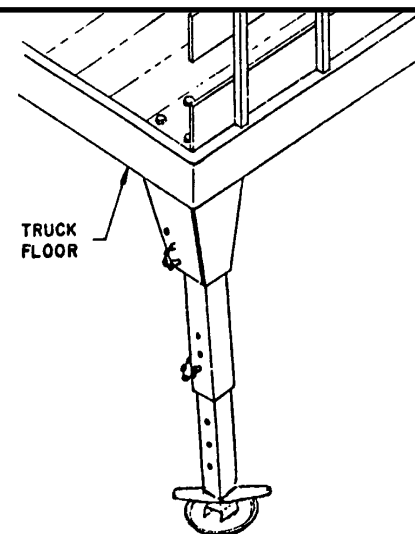
WARNING: THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL.



23960 OUTRIGGER SERIES ET/HT25 SERIES CRANES



**TYPICAL SHORT
OUTRIGGER INSTALLATION**



**TYPICAL LONG
OUTRIGGER INSTALLATION**



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DRAWING

ET10K(X), ET25K(X), HT25KX

DATE
4-29-98C

SUPERCEDES
7-27-83B

SECTION
C100

I23960

CRANE SAFETY AND HAZARDS

ET5500MPB/R, ET6KMPB/R, ET8100R, ET10K(X), ET25K(X)

CAUTIONS

1. INSPECT VEHICLE AND CRANE, INCLUDING OPERATION, PRIOR TO USE DAILY.
2. DO NOT USE THIS EQUIPMENT EXCEPT ON SOLID, LEVEL SURFACE WITH CRANE MOUNTED ON FACTORY-RECOMMENDED TRUCK.
3. BEFORE OPERATING THE CRANE, REFER TO MAXIMUM LOAD (CAPACITY) CHART ON CRANE FOR OPERATING (LOAD) LIMITATIONS.
4. DO NOT OPERATE, WALK, OR STAND BENEATH BOOM OR A SUSPENDED LOAD.
5. ATTACH PENDANT CORD SUPPORT SNAP TO ATTACHMENT POINT BEFORE PLUGGING IN PENDANT.
6. UNPLUG PENDANT AND SHUT OFF MASTER DISCONNECT SWITCH WHEN CRANE NOT IN USE.
7. FOR TRAVEL, BOOM MUST BE IN STOWED POSITION.

DANGER

- THIS CRANE IS NOT A PASSENGER LIFT
- IT IS NOT DESIGNED OR INTENDED TO BE USED TO LIFT, SUPPORT, OR OTHERWISE TRANSPORT PERSONNEL.

YOU MUST NOT OPERATE THIS CRANE UNLESS

1. YOU HAVE BEEN TRAINED IN THE SAFE OPERATION OF THIS CRANE
AND
2. YOU KNOW AND FOLLOW THE SAFETY AND OPERATING RECOMMENDATIONS CONTAINED IN THE MANUFACTURER'S MANUALS, YOUR EMPLOYER'S WORK RULES, AND APPLICABLE GOVERNMENT REGULATIONS. AN UNTRAINED OPERATOR SUBJECTS HIMSELF AND OTHERS TO DEATH OR SERIOUS INJURY.

ELECTROCUTION HAZARD

- THIS MACHINE IS NOT INSULATED.
- MAINTAIN SAFE CLEARANCES FROM ELECTRICAL LINES AND APPARATUS.
- YOU MUST ALLOW FOR BOOM SWAY, ROCK OR SAG, AND ELECTRICAL LINE AND LOADLINE SWAYING.
- THIS LIFTING DEVICE DOES NOT PROVIDE PROTECTION FROM CONTACT WITH OR PROXIMITY TO AN ELECTRICALLY CHARGED CONDUCTOR.
- YOU MUST MAINTAIN A CLEARANCE OF AT LEAST 10 FEET BETWEEN ANY PART OF THE CRANE, LOADLINE, OR LOAD, AND ANY ELECTRICAL LINE OR APPARATUS CARRYING UP TO 50,000 VOLTS. ADDITIONAL CLEARANCE IS REQUIRED FOR VOLTAGES IN EXCESS OF 50,000 VOLTS. REFER TO DRAWING 15394 FOR ADDITIONAL INFORMATION.
- **DEATH OR SERIOUS INJURY** WILL RESULT FROM CONTACT OR INADEQUATE CLEARANCE.



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

ET5500MPB-ET25KX

DATE
10-14-97F

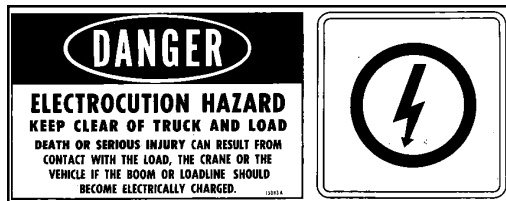
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5-13-97E

SECTION
C150

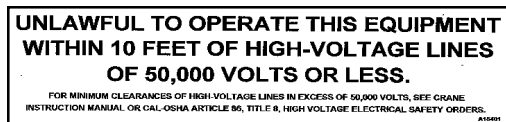
850711

VEHICLE & CRANE MOUNTED ELECTRICAL HAZARD SIGN APPLICATION & INFORMATION

ET & HT CRANE SERIES



SIGN NO. 15393A DISPLAYS THE INTERNATIONAL SYMBOL FOR ELECTRICITY AND WARNS OF DANGER FROM AN ELECTRICALLY CHARGED VEHICLE, CRANE, OR LOAD. FOUR ARE RECOMMENDED (ONE FOR EACH SIDE AND ONE FOR EACH END OF VEHICLE) TO BE APPLIED IN LOCATIONS WHICH ARE READILY VISIBLE TO GROUND PERSONNEL.



SIGN NO. 15401 PROVIDES ADDITIONAL WARNING OF LEGAL REQUIREMENTS WHEN OPERATING NEAR HIGH VOLTAGE LINES. THIS SIGN IS PLACED ON THE CONTROL PENDANT SIDE OF BOOM.

REQUIRED MINIMUM CLEARANCES REFERRED TO ON SIGN NO. 15401

REQUIRED CLEARANCES FROM OVERHEAD HIGH-VOLTAGE LINES

NOMINAL VOLTAGE (kV) (PHASE TO PHASE)	MINIMUM REQUIRED CLEARANCE (FEET) *
0 - 50	10
over 50 - 200	15
over 200 - 350	20
over 350 - 500	25
over 500 - 750	35
over 750 - 1000	45

REQUIRED CLEARANCES FROM ENERGIZED HIGH-VOLTAGE CONDUCTORS
(WHILE IN TRANSIT)

NOMINAL VOLTAGE (kV) (PHASE TO PHASE)	MINIMUM REQUIRED CLEARANCE (FEET) *
0 - 0.75	4
over 0.75 - 50	6
over 50 - 345	10
over 345 - 750	16
over 750 - 1000	20

* NOTE: ENVIRONMENTAL CONDITIONS SUCH AS FOG, SMOKE, OR PRECIPITATION MAY REQUIRE INCREASED CLEARANCES



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

ET & HT CRANE SERIES

DATE
5-13-97G

SUPERCEDES
7-15-96F

SECTION
C150

15394

IMPORTANT

ADEQUATE WIRING IMPERATIVE FOR PROPER OPERATION

1. PROPER GROUND PATH - SEE DWG 15660

2. CURRENT DRAW IS SEVERAL HUNDRED AMPERES -
ADEQUATE WIRE SIZE AND BATTERY CAPACITY IS ABSOLUTELY
ESSENTIAL (SEE CHART BELOW.)

MINIMUM WIRE GAUGE AND BATTERY SIZE

MODEL	TOTAL LENGTH OF CABLE (FT)*								12 VOLT BATTERY REQUIREMENTS	
	0-20	21-25	26-30	31-40	41-50	51-60	61-70	71-80	CCA (A)**	RC (MIN)***
CE6K CT2000 CT2003/4/5 DT7K	#4	#4	#2	#2	#1	#0	#0	#00	350	100
ET5500MPB ET5500R ET6KMPB ET6KR ET10K	#2	#2	#1	#0	#00	NOTRECOMMENDED			450	100
ET10KX	#2	#2	#1	#0	#00	NOTRECOMMENDED			550	150
ET25K ET25KX	SEE DRAWING I24600 FOR CABLE AND BATTERY REQUIREMENTS									

* INCLUDES GROUND CABLE

** CCA=COLD CRANKING AMPS AT 0° F.
THE CCA RATING IS A MEASURE OF THE ABILITY OF THE BATTERY TO DELIVER A HIGH CURRENT FOR A SHORT PERIOD OF TIME.

*** RC=RESERVE CAPACITY IN MINUTES AT 25 AMPS AND 80° F.
THE RC RATING IS A MEASURE OF THE PERIOD OF TIME THE BATTERY CAN SUPPLY A GIVEN CURRENT WITHOUT RECHARGING.



MFG., INC.
CINCINNATI, OHIO

TITLE

CABLE & BATTERY

CE, CT, DT, & ET

DATE

8-10-00R

SUPERCEDES

3-3-99Q

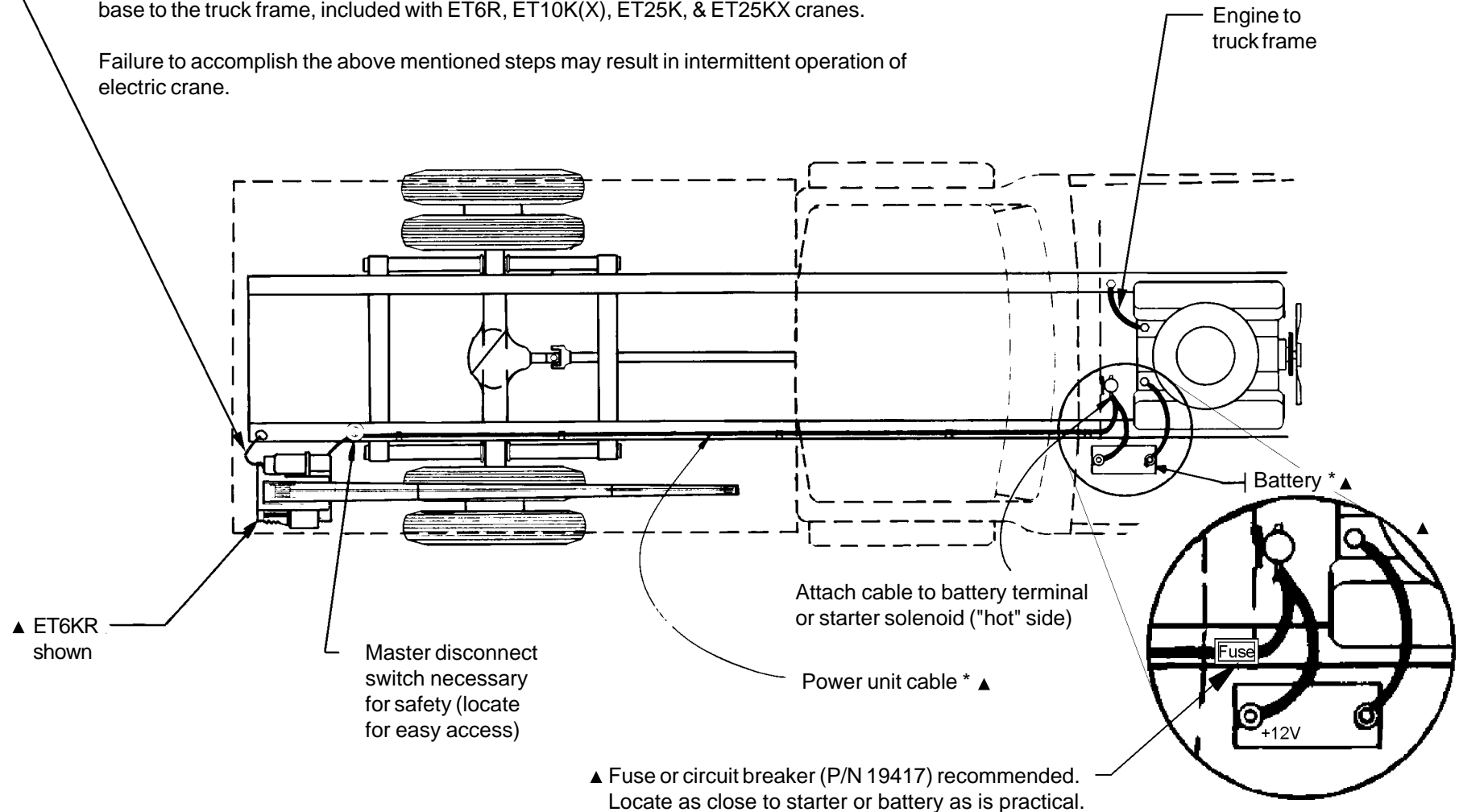
SECTION

C200

711105

Important: The crane must make connection with the negative of the battery. To insure this, install a #2 gauge grounding strap from the engine to the truck frame (required if negative from battery is connected to the engine.) Also, install a #2 gauge grounding strap from the crane base to the truck frame, included with ET6R, ET10K(X), ET25K, & ET25KX cranes.

Failure to accomplish the above mentioned steps may result in intermittent operation of electric crane.



▲ * Note: See Dwg 711105 for recommended battery and cable specifications



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION - BATTERY CABLE

WINCH & CRANE

DATE
1-15-02E

SUPERCEDES
11-7-01D

SECTION
C200

15660

CRANE OPERATION AND MAINTENANCE INSTRUCTIONS

ET10KX

SAFETY

Before operating this crane, read and understand these instructions, the 850711 Crane Safety and Hazards Information Sheet, and review all safety & instruction labels on the crane.

CRANE INSPECTION

Before operating this crane, inspect for wear, damage, or oil leakage. After the wire rope has been run out, check for wear, kinks, and broken strands. Check the hook and safety latch for damage. Correct any problems before using the crane.

CAPACITY

Before operating this crane, review the capacity diagrams on the 891014 Capacity Information Sheet as well as the capacity charts on the sides of the boom to relate the load to be lifted to the boom length and angle. The boom angle is shown by a gravity arrow.

SNATCH BLOCK

If the load exceeds 1600 lbs. or if reduced winching speed for better control of smaller loads is required, use the snatch block to rig the crane for two part line operation. Refer to drawing 17450 or 17470 for this.

CONTROLS

This crane is operated by a remote control pendant. The pendant should be unplugged and stored in a compartment or the cab when the crane is not in use.

Before plugging the pendant in, inspect the plug, socket, cord, pendant head, and switches for damage. Actuate all four switches both ways to verify that they all have the same feel and sound and that they return to the center position.

Plug the pendant into the socket on the right side of the crane and snap the strain relief tether to the crane housing.

Turn on the Master Disconnect Switch. Use "Winch Down" to release tension on the wire rope to unhook it from storage tie down position.

Use "Boom Up" to elevate the boom from the boom rest position.

Check all control functions to see that they are working correctly.



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

ET10KX

DATE
10-23-97A

SUPERCEDES
5-30-90

SECTION
C200

900530a

CONTROL FUNCTIONS

WINCH "UP" and "DOWN" - Raises and lowers the load with the wire rope.

POWER ELEVATION - "Up" raises the boom elevation by operating the valves and the electric hydraulic power unit. "Down" operates a solenoid release valve mounted on the cylinder to lower the load and/or boom by gravity at a controlled rate. A check valve on the cylinder prevents the boom from coming down if a hose breaks. A flow control valve controls lowering rate.

POWER EXTENSION - "Out" and "In" extend and retract boom 4 ft. under power. A pilot operated check valve on the boom prevents the boom retracting without hydraulic power or if a hose should break. A flow control valve controls retract rate under load.

POWER ROTATION - "L" & "R" control direction of rotation. The ET10KX can be rotated continuously thru 360 degrees or more. There are no internal restrictions on the number of rotations in any direction.

CONTROL PRIORITY SYSTEM - As a built in safety feature, the operator can perform only one major and one minor function at any one time. Major functions are rotation, winching up of a load, and elevating, extending and retracting the boom. Minor functions are winching down, and lowering the boom.

- a. "Winch Up" has priority over "Boom Up", "Boom Out & In", and "Rotation"
- b. "Boom Up" has priority over "Boom Out & In", and "Rotation".
- c. "Boom Out & In" have priority over "Rotation".
- d. "Boom Down" and "Winch Down" can be operated with any function.

CRANE OPERATION

Avoid rapid reversal of the Winch and Rotation Control Switches. The high inrush current to the motors during reversal can reduce the life of the contactors and the motor brushes and commutators.

When operating "Winch Up", "Boom Down" or "Boom Out" always maintain clearance between the boom head and the snatch block or hook.

Do not lift or drag a load sideways using any of the crane functions. The boom has much lower bending strength sideways than in the vertical direction.



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900530b

OVERLOAD ALARM SYSTEMS (OPTIONAL)

This crane may be equipped with an optional overload alarm system.

1. Overload alarm horn sounds if rated load is exceeded at any reach.
2. If alarm sounds, RAISE Boom or LOWER Winch to remove overload.
3. Always RAISE Boom slightly before lifting load - Warning system INOPERATIVE when cylinder is completely bottomed.
4. Alarm can be tested by raising Boom against UP limit stop.

MANUAL TELESCOPIC BOOM

The 7' to 15' boom has a 4' manual telescoping section in addition to the 4' power extension. A toggle pin locks the boom into either the extended or retracted position.

TRUCK SETUP & OUTRIGGERS

1. The truck should be parked on ground that is as level and as firm as possible when using the crane.
2. The center of the crane should be positioned close enough to the job so that it can be operated at a reach that puts the load within the rated capacity of the crane.
3. Set the vehicle parking brake and put the vehicle transmission in "park" or a low gear unless the engine is to be left running.
4. Deploy the outriggers to help stabilize the vehicle against rocking or overturning when lifting with the crane.

PREPARATION FOR TRAVEL

1. Return the outriggers to the stowed position. Install and secure all pins.
2. Stow the crane boom in the boom support.
3. Hook the winch line to a tie down point on the body or pedestal and apply tension.
4. TURN OFF THE MASTER DISCONNECT SWITCH.
5. Unplug the control pendant and store in a body compartment or the cab.



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MAINTENANCE

Crane requires only periodic lubrication. As a standard procedure this can be done at the time the vehicle is serviced. Rotation bearings are self - lubricating. Fill Winch & Rotation Gear Boxes to level of the side plug with S.A.E. 85W/140 Hypoid Lubricant.

Chains should be oiled lightly (DO NOT GREASE). Excess oil or grease will collect road grit and cause excessive chain wear. Moly filled chassis grease should be applied by pressure grease gun to fittings on each end of rotation worm shaft and on rotation gear teeth thru port at rear of crane.

Fill electric hydraulic boom elevation, power unit reservoir to oil level line with boom down. Use Automatic Transmission Fluid Type "A" or Type "B" (Dexron). Below 20 degrees F. add 3/4 pt. Kerosene. Drain and refill with Dexron ATF when weather warms up. Check periodically or when boom action slows down.



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SELECTION

The chart below shows the maximum working load and breaking strength of 7 X 19 Galvanized AIRCRAFT Grade Wire Rope in various diameters. The breaking strength is 3-1/2 times the maximum working load. Do not use wire rope with a Maximum Working Load rating less than the single line capacity of the crane. Use of wire rope diameter larger than the size furnished with the crane will reduce the fatigue life of the wire rope.

<u>WIRE ROPE DIAMETER</u>	<u>MAXIMUM WORKING LOAD</u>	<u>BREAKING STRENGTH</u>
1/8"	570 lbs	2000 lbs
5/32"	800 lbs	2800 lbs
3/16"	1200 lbs	4200 lbs
7/32"	1600 lbs	5600 lbs
1/4"	2000 lbs	7000 lbs
5/16"	2800 lbs	9800 lbs
3/8"	4114 lbs	14400 lbs

INSTALLATION

1. Unwind coil of rope by rolling it along floor. This will prevent kinking.
2. Most VENTURO Cranes are provided with a slot in the winch drum side plate for attaching the end of the wire rope with a stop collar. A hole in the housing allows access for the end of the wire rope when inserted thru the slot.

The ET20K(X) & ET25K(X) Cranes have a clamp built into the winch drum and do not use a stop collar.

3. THERE MUST ALWAYS BE AT LEAST (3) TURNS OF WIRE ROPE ON THE DRUM WHEN UNDER LOAD.



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TITLE
WIRE ROPE SPECS

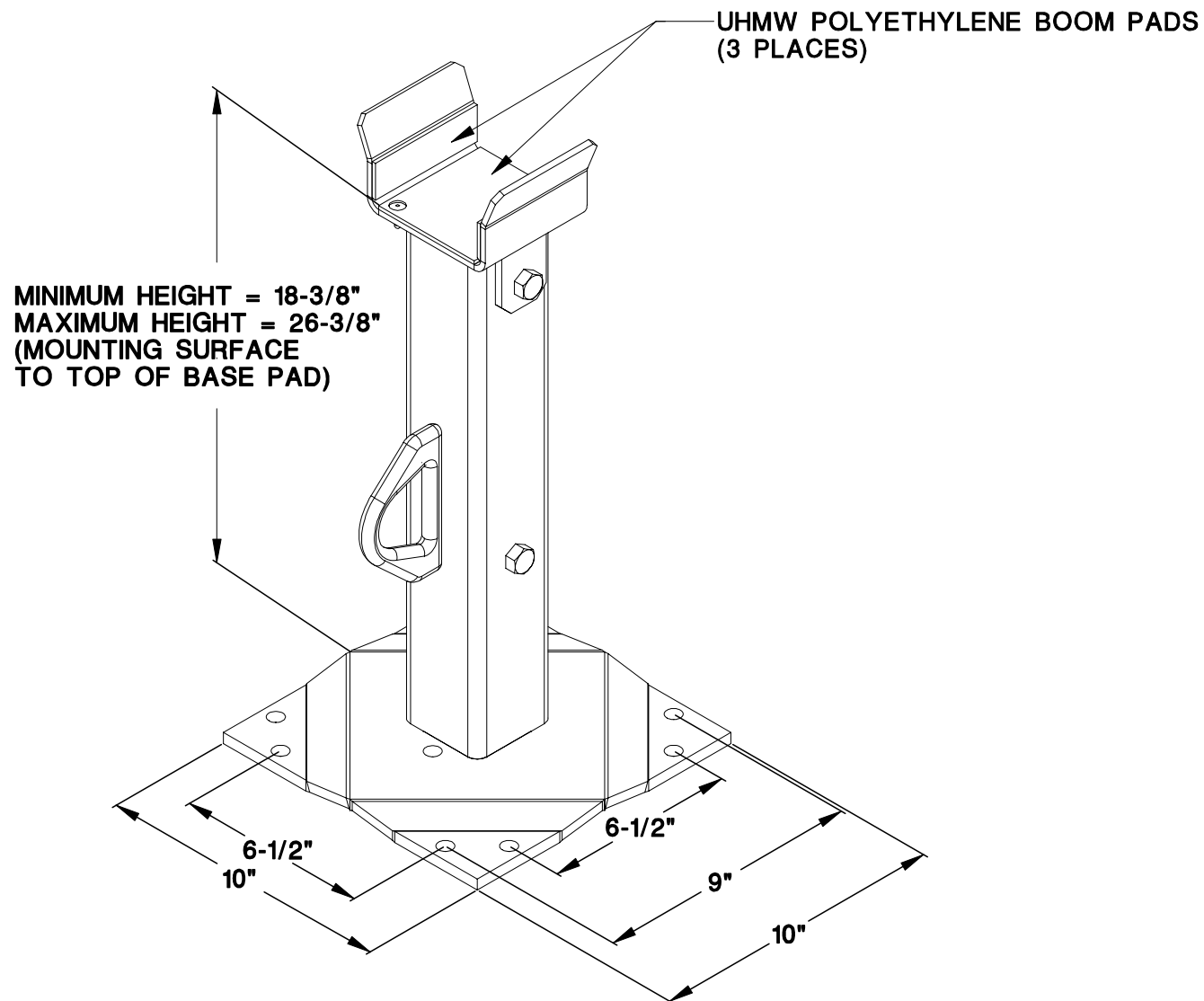
VENTURO WINCH & CRANE

DATE
10-23-97G

SUPERCEDES
4-27-92F

SECTION
WC 200

711006



TROUBLESHOOTING GUIDE ET10KX



**FOR FURTHER ASSISTANCE
CALL 800-226-2238 AND ASK
FOR TECHNICAL SUPPORT.**

INITIAL TROUBLESHOOTING STEPS (ANY INOPERATIVE FUNCTION)

IF YOU ARE EXPERIENCING AN ELECTRICAL PROBLEM (OR ARE UNSURE WHAT THE PROBLEM IS) CHECK THE FOLLOWING BEFORE PROCEEDING:

CHECK THE MAIN POWER SUPPLY - MAKE SURE THAT THE MASTER DISCONNECT SWITCH IS **ON**.

CHECK THE PENDANT CORD PLUG - MAKE SURE IT IS SECURELY PLUGGED IN.

THE MOST COMMON ELECTRICAL PROBLEM IS INSUFFICIENT VOLTAGE. YOU CAN VERIFY SUFFICIENT SOURCE VOLTAGE BY REFERRING TO SERVICE BULLETIN **800306 "MINIMUM VOLTAGE TEST"** IN THIS INSTALLATION MANUAL. IF YOU ARE UNABLE TO PERFORM THIS TEST (i.e. THE POWER UNIT WILL NOT FUNCTION) SKIP TO THE NEXT STEP.

CHECKING FOR SUFFICIENT CONTROL VOLTAGE AT THE PENDANT SOCKET:

REMOVE THE PENDANT CONTROL FROM THE CRANE AND PROP OPEN THE PENDANT SOCKET LID.

TURN **ON** THE MASTER DISCONNECT SWITCH.

LOCATE THE POWER SUPPLY PIN ("HOT PIN") FOR THE SOCKET - SEE FIGURE 1 BELOW.

WITH A MULTIMETER/VOLTMETER MEASURE THE VOLTAGE AT THE "HOT PIN". THIS SHOULD BE SOURCE VOLTAGE MEASURING 12 VOLTS DC.

PENDANT CONTROL BYPASS PROCEDURE

IF THE PENDANT CORD IS SUSPECT, YOU CAN JUMPER THE "HOT PIN" TO ANY OF THE FUNCTION PINS (i.e. WU = WINCH UP, BD = BOOM DOWN, ETC.) TO VERIFY WHETHER THE PROBLEM IS IN THE PENDANT CONTROL OR THE CRANE WIRING.

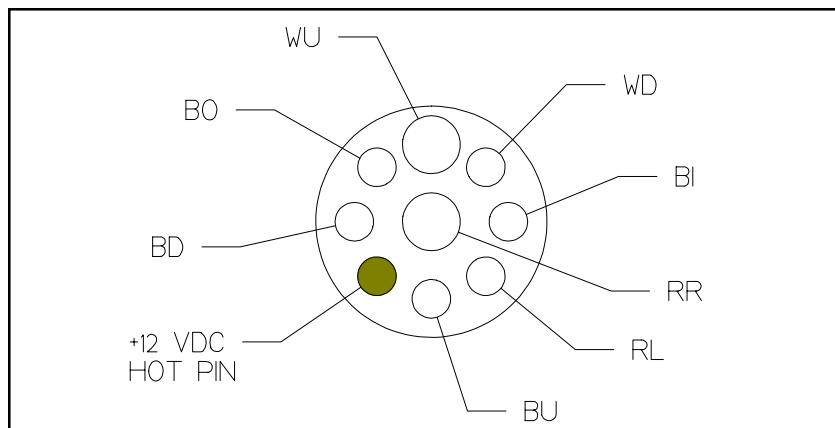


FIGURE 1 - PENDANT SOCKET "HOT PIN"



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19477a

LOSS OF SPECIFIC FUNCTIONS - THE FOLLOWING PROVIDES TROUBLESHOOTING STEPS FOR THE MOST COMMONLY ENCOUNTERED PROBLEMS.

LOSS OF ALL THREE OF THE FOLLOWING FUNCTIONS SIMULTANEOUSLY - WINCH UP (WU), BOOM DOWN (BD), AND BOOM OUT (BO)

VERIFY THAT THE CRANE IS NOT OVERLOADED (CHECK CAPACITY DECAL ON BOOM).

▲ IF CRANE IS OVERLOADED - UNLOAD CRANE COMPLETELY BY **WINCHING DOWN**.

IF FULL FUNCTION IS RESTORED, REDUCE LOAD AND RESUME OPERATION.

▲ IF NOT, REMOVE THE SIDE ELECTRICAL BOX COVER. LOCATE THE 15690 [OVERLOAD SHUTOFF] RELAY-REFER TO 17793 ELECTRICAL SCHEMATIC IN THIS INSTALLATION MANUAL OR THE DIAGRAM ON THE INSIDE OF THE SIDE ELECTRICAL BOX COVER. 17799 RESISTOR ASSY, IS ATTACHED TO TERMINAL #4 OF THE OVERLOAD SHUTOFF RELAY-CAREFULLY DETERMINE IF RESISTOR IS HOT/WARM.

IF SO, REMOVE THE BLACK WIRE FROM TERMINAL #5 ON THE OVERLOAD SHUTOFF RELAY.

IF THIS RESTORES FUNCTIONS, IT INDICATES THAT THE OVERLOAD SHUTOFF PRESSURE SWITCH (LOCATED ON THE ELEVATION CYLINDER) HAS MALFUNCTIONED.

IF THIS DOES NOT RESTORE FUNCTIONS, IT MAY INDICATE THAT THE OVERLOAD SHUTOFF RELAY IS DEFECTIVE.

RECONNECT THE BLACK WIRE TO THE OVERLOAD RELAY - DO NOT CONTINUE TO OPERATE THE CRANE WITH THIS WIRE DETACHED.

WARNING: THE FOLLOWING PROCEDURE IS INTENDED FOR UNLOADED CRANE STOWAGE ONLY. A LOADED CRANE SHOULD NEVER BE OPERATED IN THIS MANNER. TO STOW AN UNLOADED CRANE WHICH HAS LOST WU, BD AND BO PERFORM THE FOLLOWING:

▲ LOCATE 15690 [OVERLOAD SHUTOFF] RELAY. RELOCATE THE 14" PURPLE WIRE FROM TERMINAL #2 TO TERMINAL #1 **NEXT** TO THE 3" BLACK WIRE IN THE CENTER OF THE RELAY.

THIS ACTION PROVIDES A SURE GROUND FOR THE 14" PURPLE WIRE AND SHOULD RESTORE THE THREE FUNCTIONS (WINCH UP, BOOM DOWN, AND BOOM OUT).

NOTE: DO NOT CONTINUE TO OPERATE THE CRANE IN THIS CONFIGURATION. EXPEDITE PERMANENT REPAIRS BY VISITING AN AUTHORIZED DEALER OR CALLING OUR TECHNICAL SUPPORT LINE @ 1-800-226-2238 X 124.



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OPERATING A LOADED CRANE USING THIS PROCEDURE WILL VOID THE WARRANTY.

LOSS OF BOOM DOWN (BD) ONLY:

CHECK FOR WINCH UP AND BOOM OUT. IF THESE TWO FUNCTIONS ARE WORKING PROCEED TO NEXT STEP. IF THESE TWO FUNCTIONS ARE ALSO INOPERATIVE SEE THE PREVIOUS SECTION ("LOSS OF WINCH UP, BOOM DOWN, AND BOOM OUT").

WARNING: THE FOLLOWING PROCEDURE IS INTENDED FOR UNLOADED CRANE STOWAGE ONLY - A LOADED CRANE SHOULD NEVER BE OPERATED IN THIS MANNER. TO STOW AN UNLOADED CRANE WHICH HAS LOST THE BOOM DOWN FUNCTION PERFORM THE FOLLOWING:

CAUTION: KEEP HANDS AWAY FROM ALL PINCH POINTS BY APPROACHING THE "BOOM TOP POSITION SWITCH" FROM THE TOP OF THE MECHANISM - IN FRONT OF THE WINCH AND JUST BEHIND THE BOOM. LOCATE THE BOOM TOP POSITION SWITCH (SILVER BUTTON) AND DEPRESS USING A LONG SCREWDRIVER. AT THE SAME TIME, ACTIVATE THE BOOM DOWN SWITCH ON THE PENDANT CONTROL.

IF BOOM DOWN IS NOW FUNCTIONAL THIS WOULD INDICATE THAT THE OVERLOAD PRESSURE SWITCH IS NOT PROPERLY GROUNDED OR IS ITSELF MALFUNCTIONING (NOT PROVIDING THE PRIMARY GROUND TO THE BOOM DOWN RELEASE COIL).

LOSS OF HYDRAULIC FUNCTIONS

IF (ANY ONE OF THESE THREE FUNCTIONS) BOOM UP, BOOM OUT, OR BOOM IN IS FUNCTIONING PROPERLY, THE HYDRAULIC POWER UNIT AND ITS ASSOCIATED CONTACTOR ARE WORKING PROPERLY AND THIS SECTION DOES NOT APPLY.

IF THE HYDRAULIC POWER UNIT DOES NOT WORK LISTEN FOR THE CLICK OF THE HYDRAULIC POWER UNIT CONTACTOR (LOCATED IN THE SIDE ELECTRICAL BOX).

IF NO CLICK (OF THE CONTACTOR) IS HEARD WHEN ACTUATING ANY ONE OF THE THREE FUNCTIONS THE PROBLEM IS ELECTRICAL, NOT HYDRAULIC, AND THE "INITIAL TROUBLESHOOTING" SECTION SHOULD BE CONSULTED.

IF THE HYDRAULIC POWER UNIT OPERATES (YOU CAN HEAR THE MOTOR RUNNING), BUT THE HYDRAULIC FUNCTION(S) (BOOM UP, BOOM OUT, BOOM IN) DO NOT, PERFORM THE FOLLOWING STEPS:

ACTUATE A HYDRAULIC FUNCTION WHILE TESTING THE MAGNETIC FIELD OF THE "SURGE BYPASS" COIL (REFER TO THE WIRING DIAGRAM) WITH A SMALL SCREW DRIVER - THE COIL SHOULD MAGNETICALLY ATTRACT THE SCREW DRIVER BLADE WHEN ANY OF THE HYDRAULIC FUNCTIONS ARE OPERATED.

IF NO MAGNETIC ATTRACTION IS EVIDENT, THE COIL IS NOT RECEIVING POWER, NOT RECEIVING A GROUND, OR THE COIL ITSELF HAS FAILED.

IF THE COIL IS PRODUCING A MAGNETIC FIELD REMOVE THE COIL AND BACK OFF THE VALVE STEM FROM THE VALVE BLOCK - IT IS NOT NECESSARY TO COMPLETELY REMOVE THIS VALVE. CAREFULLY TURN THE VALVE "IN" UNTIL IT IS SEATED - **NO TORQUE IS REQUIRED ("FINGER-TIGHT" IS SUFFICIENT)**. OVER-TORQUING THE VALVE MAY RESULT IN DAMAGE OR MALFUNCTION.



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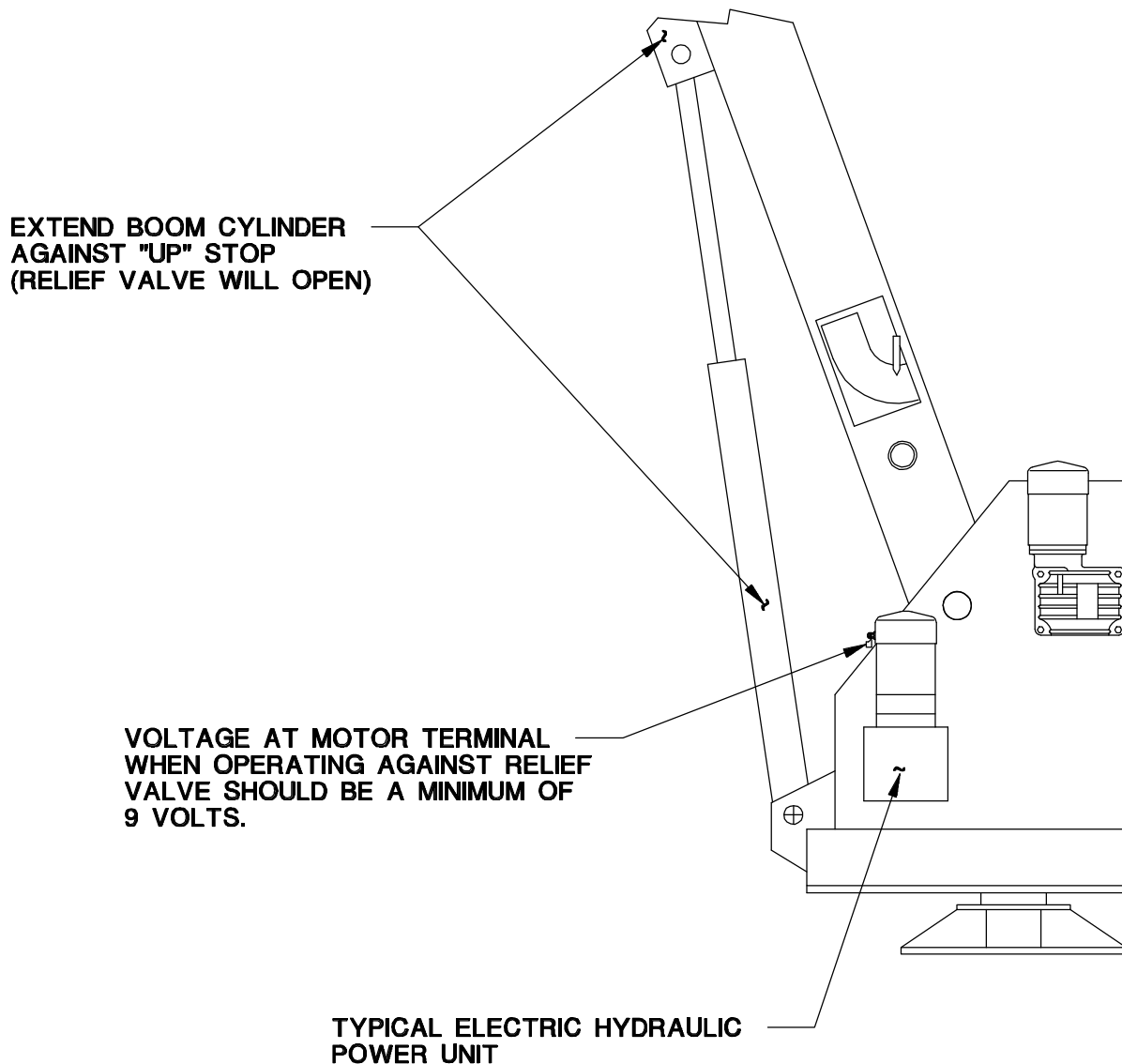
C300

19477c

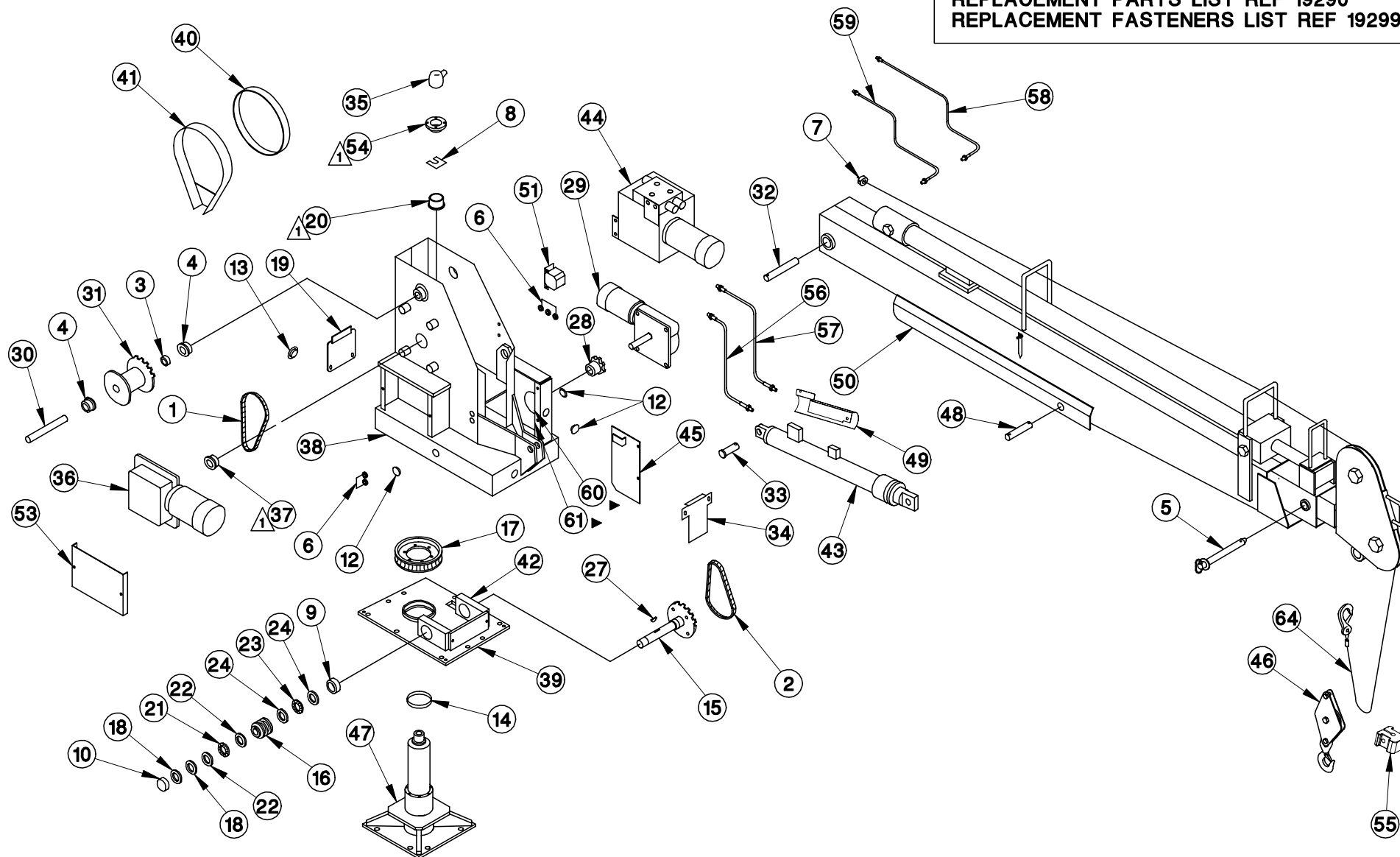
MINIMUM VOTAGE TEST
ET5500, ET6K(M/R), ET8100, ET10K(X)

ONE OF THE MOST COMMON ELECRICAL PROBLEMS ENCOUNTERED ON ELECTRICAL CRANES IS INSUFFICIENT VOLTAGE AT THE MOTOR WHEN DRAWING THE LARGE CURRENT THAT EXISTS AT FULL LOAD.

TO ISOLATE THIS PROBLEM PERFORM THE MINIMUM VOLTAGE TEST BELOW:



REPLACEMENT PARTS LIST REF 19290
REPLACEMENT FASTENERS LIST REF 19299



▲ INSTALL WITH LOCKTITE
GRADE 242 (BLUE) OR EQUIV.

FOR ELECTRICAL COMPONENTS
SEE DWG 17382 FOR S/N 65001 THRU 65117
SEE DWG 17793 FOR S/N 65118 & UP



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS

ET10KX

DATE
1-14-02D

SUPERSEDES
10-31-01C

SECTION
C400

19369

ITEM #	PART #	DESCRIPTION	ITEM #	PART #	DESCRIPTION
1	00867-3	DRIVE CHAIN - WINCH (#40 x 56 LINKS)	41	18455	WINCH DRUM GUARD - RH
2	00867-4	DRIVE CHAIN - ROTATION (#40 x 52 LINKS)	42	18846	WORM HOUSING
3	01158	SHAFT COLLAR - 1"	43	17255-3	ELEVATION CYLINDER (ONLY)
4	01299	BALL BEARING - 2" OD x 1" ID	44	17261	HYDRAULIC POWER UNIT & CONTROL VALVE
5	19258-3	BOOM PIN ASSEMBLY	45	17287	ROTATION CHAIN COVER
6*	14883	GROMMET - 3/8" ID 5/8" OD W/ 3/16" GROOVE	46	17290	SWIVEL SNATCH BLOCK ASSEMBLY
7	13463-1	SHAFT COLLAR - 1/4"	47	17295	QUILL ASSEMBLY
8*	14159	SHIM - 1 1/2" SQ x .015", .042", .105" THK	48	17318	PIVOT PIN, CYL ROD
9	14341-3	BUSHING - 1 3/4" OD x 1 1/2" ID x 1" LONG	49	19164	COVER - ELEVATION CYLINDER
10	14341-5	BUSHING - 1 3/4" OD x 1 1/4" ID x 1" LONG	50	17330	BOOM ASSEMBLY (COMPLETE ASSY)
11	-	-	51	17356	OVERLOAD ALARM (OPTIONAL)
12	RL-644	HOLE PLUG - 1"	52	17360-20	PENDANT ASSEMBLY - 4 SWITCH x 20 FOOT CORD
13	RL-644	HOLE PLUG - 1"	53	17367	SIDE COVER
14	20189	LOWER BEARING - 5" OD x 1" LONG	54	17372	UPPER BEARING HOUSING
15	18860	SPROCKET & SHAFT ASSY	55	16735	HEADACHE BALL ASSY (INCLUDES HARDWARE)
16	15650	WORM	56	19693	HOSE, ELEVATION CYL RETURN - 36" LONG
17	15651	WORM GEAR	57	17395	HOSE, ELEVATION CYL PRESSURE - 34" LONG
18*	15675	SHIM - 1 1/4" ID x .015", .031" THK	58	17397	HOSE, EXTENSION CYL - 30" LONG
19	15676	REAR COVER	59	17397	HOSE, EXTENSION CYL - 30" LONG
20	15681	UPPER BEARING	60	▲ 20083	NUT BAR ROTATION P.U. - GROUNDING
21	15696	NEEDLE THRUST BEARING	61	▲ 15664	NUT BAR - ROTATION P.U.
22	15697	THRUST RACE	62	-	-
23	15698	NEEDLE THRUST BEARING	63	-	-
24	15699	THRUST RACE	64	15810-7/32-65	WIRE ROPE ASSY - 7/32" x 65 FT
25	-	-	65	-	-
26	-	-	66	-	-
27*	15929	WOODRUFF KEY - 1/4" x 1 1/4"	67	-	-
28	15999	SPROCKET - #40 x 10 TOOTH	68	-	-
29	16107	ROTATION POWER UNIT	69	-	-
30	16614	WINCH DRUM SHAFT	70	-	-
31	16822	WINCH DRUM	71	17442	FIELD SERVICE LABEL KIT - ET10KX W/ 7 - 15 FT BOOM
32	16825	PIVOT PIN, BOOM	72	-	-
33	16828	PIVOT PIN, CYL TAIL - 1" DIA x 2 3/4" LONG	73	-	-
34	16829	FRONT COVER	74	-	-
35*	17011	BOOT, SWIVEL TERMINAL	75	-	-
36	17211	WINCH POWER UNIT	76	-	-
37	17218	SPROCKET - #40 x 12 TOOTH	77	-	-
38	18870	WELDED HOUSING ASSY	78	-	-
39	18856	LOWER BEARING PLATE	79	-	-
40	18459	WINCH DRUM GUARD - LH	80	-	-
		REPLACEMENT PARTS DWG REF 19369	*	15828	SMALL PARTS KIT (INCLUDES * ITEMS) SN: 65367 & UP



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS

ET10KX-7/15

DATE
1-14-02G

SUPERCEDES
10-31-01F

SECTION
C400

19290

FASTENER LIST FOR INSTALLATION DRAWING ET10KX-7/15

PART NUMBER	DESCRIPTION	QTY	LOCATION/FUNCTION
!HHCS05013150	HEX HEAD CAP SCREW - 1/2"-13 x 1-1/2"	10	BASE PLATE
!LWSH-050	LOCK WASHER - 1/2"	10	BASE PLATE
18873	CAPSCREW-MODIFIED	6	WORMGEAR/QUILL HUB
!LWSH-038-HC	LOCK WASHER - 3/8" HI COLLAR	6	BULL GEAR 15651
!HHCS03816200TB	HEX HEAD CAP SCREW - 3/8"-16 x 2" TB	1	ADJ FOR ROTATION MOTOR
!HNUT-03816	HEX NUT - 3/8"-16, PLATED	1	ADJ FOR ROTATION MOTOR
!HHCS03118250	HEX HEAD CAP SCREW - 5/16"-18 x 2-1/2"	1	BOOMPIN
▲ -	- ▲	- ▲	- ▲
▲ !LNUT-03118	LOCKNUT - 5/16"-18 ▲	1	BOOMPIN
!HHCS03816150	HEX HEAD CAP SCREW - 3/8"-16 x 1-1/2"	3	WINCHDRUM MOTOR
!HHCS03816300	HEX HEAD CAP SCREW - 3/8"-16 x 3"	1	WINCHDRUM MOTOR
!LWSH-038	LOCK WASHER - 3/8"	4	WINCHDRUM MOTOR
!HHCS03816125	HEX HEAD CAP SCREW - 3/8"-16 x 1-1/4"	1	ROTATION MOTOR
!HHCS03816150	HEX HEAD CAP SCREW - 3/8"-16 x 1-1/2"	2	ROTATION MOTOR
!HHCS03816300	HEX HEAD CAP SCREW - 3/8"-16 x 3"	1	ROTATION MOTOR
!LWSH-038	LOCK WASHER - 3/8"	4	ROTATION MOTOR
!LWSH-031	LOCK WASHER - 5/16"	2	HYDRAULIC MOTOR
!HHCS03816225-5	HEX HEAD CAP SCREW - 3/8"-16 x 2-1/4"	2	HYDRAULIC MOTOR
!HHCS03118075	HEX HEAD CAP SCREW - 5/16"-18 x 3/4"	2	HYDRAULIC MOTOR
!LWSH-038	LOCK WASHER - 3/8"	2	HYDRAULIC MOTOR
!HHCS03118063	HEX HEAD CAP SCREW - 5/16"-18 x 5/8"	2	VALVE BLOCK
!LWSH-031	LOCK WASHER - 5/16"	2	VALVE BLOCK
!HHCS03816125	HEX HEAD CAP SCREW - 3/8"-16 x 1-1/4"	4	UPPER BEARING HOUSING
!LWSH-038	LOCK WASHER - 3/8"	4	UPPER BEARING HOUSING
!HHCS02520063-5	HEX HEAD CAP SCREW - 1/4"-20 x 5/8"	8	CHAIN GUARD - WINCHDRUM
!LWSH-025	LOCK WASHER - 1/4"	8	CHAIN GUARD - WINCHDRUM
!HNUT-02520	HEX NUT - 1/4"-20	6	CHAIN GUARD
!HWHS02520063-F	HEX WASHER HEAD - 1/4"-20 x 5/8"	18	COVERS & WIRING
!PHCS02520075	PAN HEAD CAP SCREW - 1/4"-20 x 3/4"	8	WIRING - CONTACTORS
!LWSH-025	LOCK WASHER - 1/4"	8	WIRING - CONTACTORS
!HNUT-02520	HEX NUT - 1/4"-20	8	WIRING - CONTACTORS
!PHCS-#1024050	PAN HEAD CAP SCREW - 10-24 x 1/2"	2	CIRCUIT BREAKER
!UNUT15195-1420	U-NUT - 1/4"-20	2	VOLTAGE STABILIZER
!UNUT-#1024	U-NUT - #10-24 x 3/8"	2	CIRCUIT BREAKER
!CHCS3118400	CARRIAGE BOLT - 5/16"-18 x 4"	4	CRATING
!FWSH-038	FLAT WASHER - 3/8"	4	CRATING
!HNUT-03118	HEX NUT - 5/16"-18	4	CRATING
!LWSH-#10	LOCK WASHER - #10	2	CIRCUIT BREAKER
!HNUT-#1032	HEX NUT - #10-32	2	CIRCUIT BREAKER
!RPIN-025100	ROLL PIN - 1/4" x 1"	1	CYLINDER PIN
!RPIN-025175	ROLL PIN - 1/4" x 1-3/4"	1	CYLINDER PIN
!RPIN-038100	ROLL PIN - 3/8" x 1"	4	BASE PLATE
!SHCS05013125	SCKT HD CAP SCREW - 1/2"-13 x 1-1/4"	4	WORM BLOCK BOLTS
!LWSH-050	LOCK WASHER - 1/2"	4	WORM BLOCK BOLTS
!SHCS03824150	SCKT HD CAP SCREW - 3/8"-24UNF x 1-1/2"	2	FORE/AFT WORM BLOCK ADJ
!SHCS03824100KC	SET SCREW - 3/8"-24 x 1"	2	FORE/AFT WORM BLOCK ADJ
25593	SET SCREW - FLAT FACE - 1/2"-20 x 1"	1	WORM BLOCK LEFT/RIGHT SECURE
!SHCS03816050KC	SET SCREW - 3/8"-16 x 1/2"	2	WORM-ROTATION
!HWHS02520038-F	HEX WASHER HEAD - 1/4"-20 x 3/8"	4	-
!ZERK02528	ZERKLUBE FITTING - 1/4"-28	2	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

REPLACEMENT PARTS DWG REF 19369

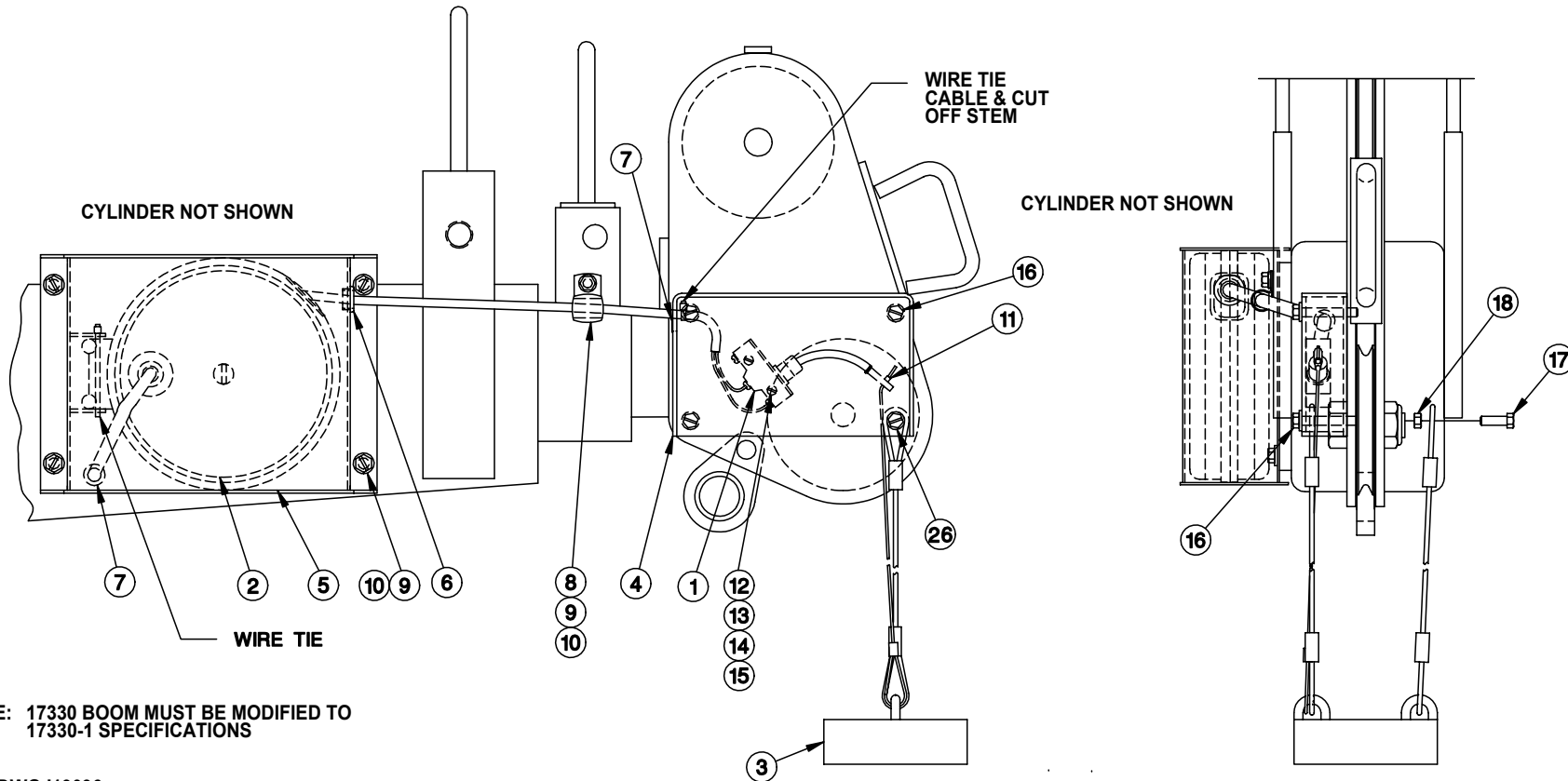


MFG., INC.
CINCINNATI, OHIO

TITLE
REPL. FASTENERS LIST
ET10KX-7/15

DATE
5-1-01C
SUPERCEDES
8-16-00B

SECTION
C400
19299



▲	26	1	!HHCS02520150	HEX HEAD CAP SCREW - 1/4-20 x 1 1/2"	13	2	!HNUT-#0632	HEX NUT - #6-32
	25	1	-	ENGINEERING DRAWING 17331	12	2	!PHMS#632125	PAN HEAD MACHINE SCREW - #6-32 x 1 1/4"
	24	1	-	ENGINEERING DRAWING 17347	11	1	19302	SET COLLAR
	23	1	-	ENGINEERING DRAWING 17327	10	5	!LWSH-031	LOCK WASHER - 5/16"
	22	1	14883	GROMMET - FRONT COVER	9	5	!HHCS03118050-5	HEX HEAD CAP SCREW - 5/16-18 x 1/2"
*	21	2	19099	'Y' CONNECTOR	8	1	19275	CABLE CLAMP - 3/4" x 13/32" HOLE
*	20	1	19097	WIRE HARNESS	7	2	19270	SNAP BUSHING - 3/8" I.D.
*	19	1	19098	WIRE HARNESS	6	1	19063	SNAP BUSHING - 1/2" I.D.
	18	1	!HNUT-02520	HEX NUT - 1/4-20	5	1	19058	COVER - CORD REEL
	17	1	!HHCS02520075-5	HEX HEAD CAP SCREW - 1/4-20 x 3/4" GR. 5	4	1	19855	SWITCH BRACKET
	16	3▲	!HHCS02520175	HEX HEAD CAP SCREW - 1/4-20 x 1 3/4"	3	1	19377-1	CABLE WEIGHT ASSY
	15	2	!LWSH-#06	LOCK WASHER - #6	2	1	22388-1	CORD REEL ASSY
	14	2	!FWSH-#06	FLAT WASHER - #6	1	1	19376	LIMIT SWITCH
					ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DWG

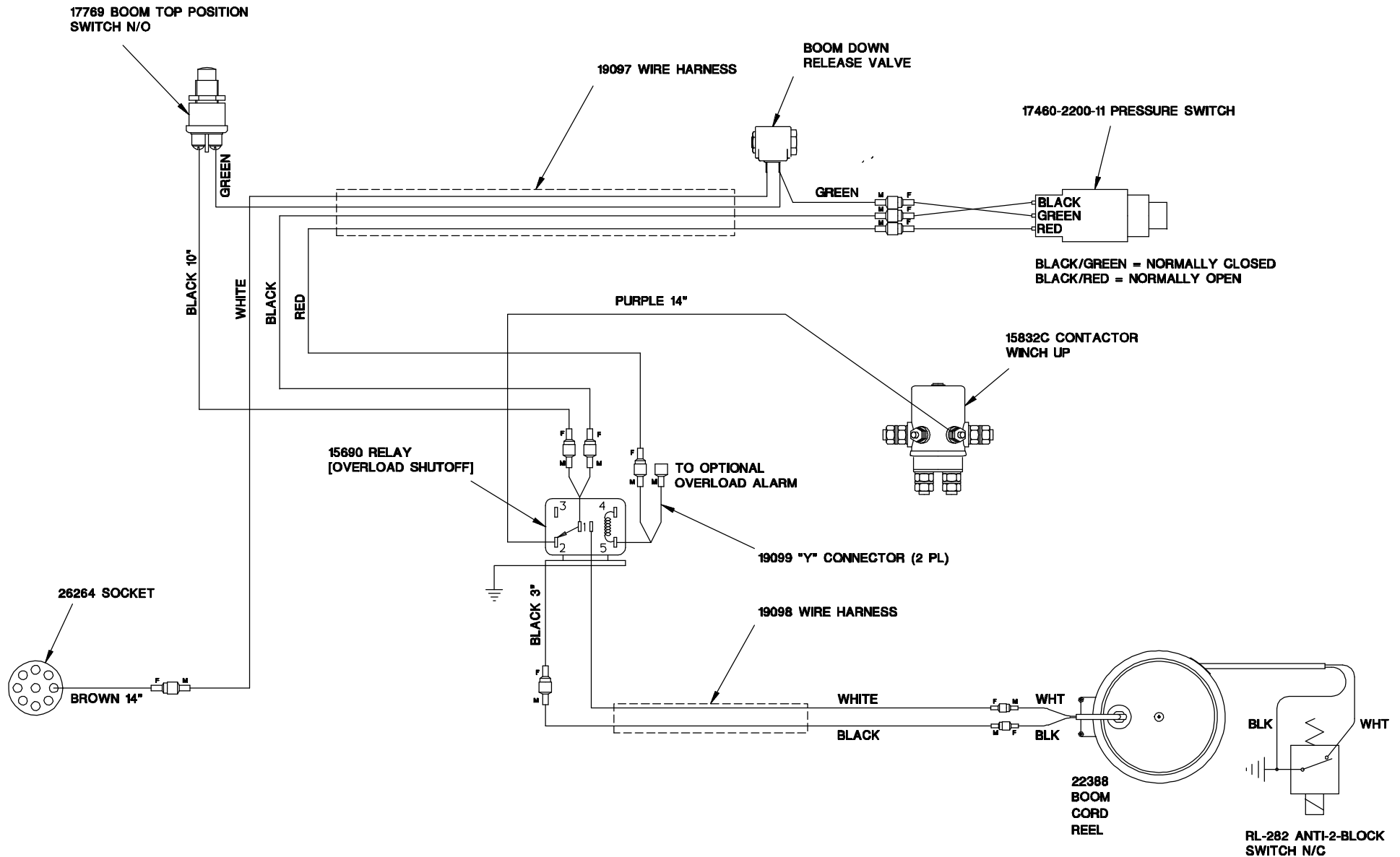
19197-1 ANTI-TWO-BLOCK SYSTEM

DATE
8-26-02C

SUPERSEDES
11-30-01B

SECTION
C400

20197-1



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
ANTI-TWO-BLOCK WIRING DIAGRAM

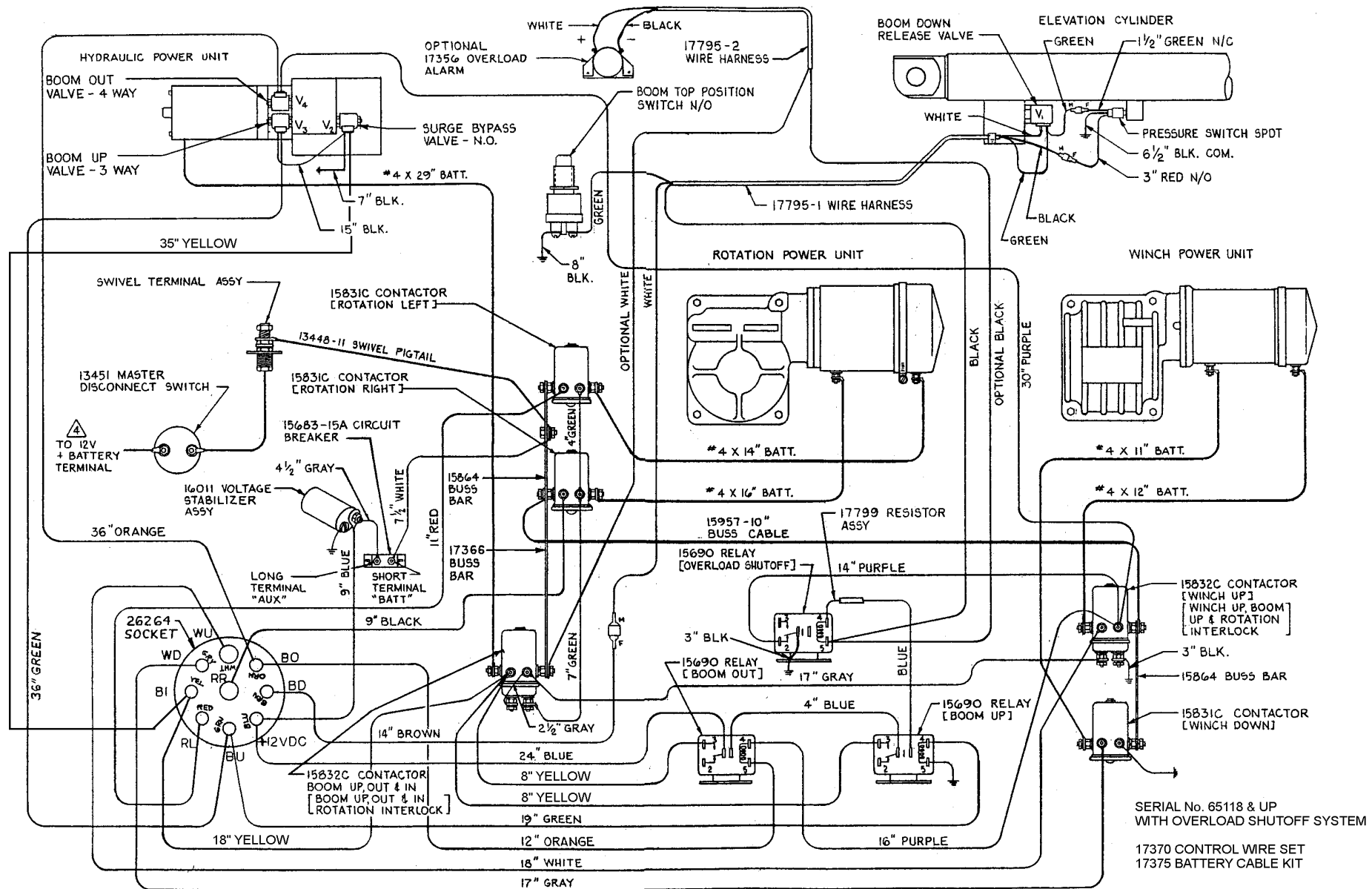
ET10KX CRANE

DATE
2-5-99B

SUPERSEDES
10-14-97A

SECTION
-

I19096



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
WIRING DIAGRAM

ET10KX

DATE
2-22-01B

SUPERCEDES
6-23-98A

SECTION
C400


17793



17794



16770 SWIVEL TERMINAL ASSY

15666  








13450-13.5 

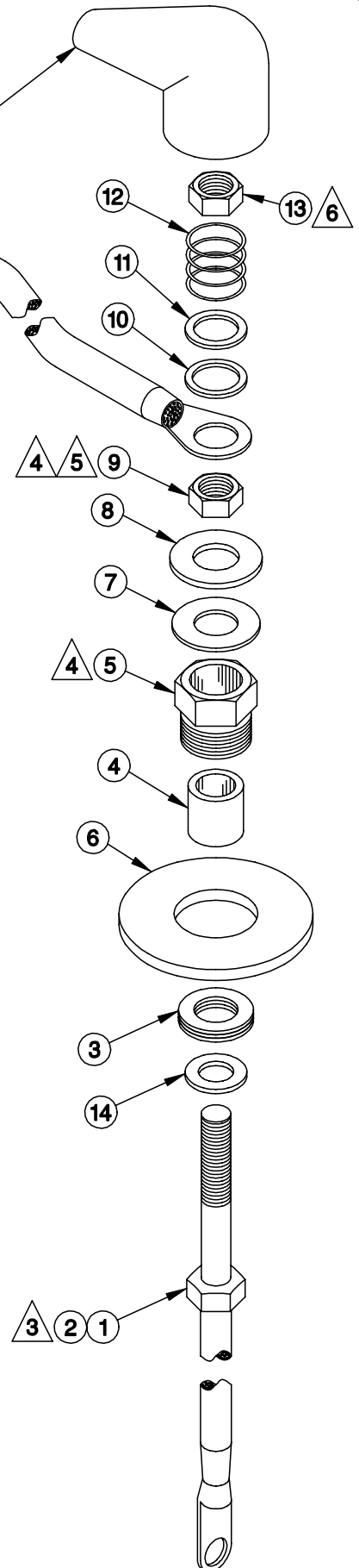
17011 RUBBER BOOT - REF

13448-XX SWIVEL PIGTAIL
(NOT INCLUDED WITH 16770)

ITEM	QTY	PART NO.	DESCRIPTION
1	1	15653-60	PIGTAIL & STUD ASSY
2	1	13447-13.5	PIGTAIL & STUD ASSY
*3	3	16771-1	FIBER WASHER 1/2" I.D. x 15/16" O.D. x 1/16" THK
*4	1	13410	INSULATING BUSHING
5	1	13467	3/4" INVERTED FLARE NUT - MODIFIED
6	1	IFWSH-100SAE	FLAT WASHER 1 1/8" I.D. x 2 1/8" O.D. x 1/8" THK
*7	1	16771-2	FIBER WASHER 1/2" I.D. x 1 1/4" O.D. x 1/16" THK
*8	1	16770*7	BRASS WASHER 1/2" I.D. x 1 1/4" O.D. x 5/64" THK
*9	1	19800 	BRASS JAM NUT - 1/2"-13NC - MODIFIED 
*10	1	16770*11	TEFLON WASHER 1/2" I.D. x 3/4" O.D. x 1/32" THK
*11	1	16770*10	BRASS WASHER 1/2" I.D. x 11/16" O.D. x 1/32" THK
*12	1	LC-063HJ-1	SPRING .66" O.D. x .63" W x 5/8" F.L.
*13	1	IJNUT-05013N	NYLON INSERT-JAMNUT - 1/2"-13
*14	1	12534-4	MACHINERY BUSHING 1/2" I.D. x 7/8" O.D. x 14 GA THK
*15	1	LOCTITE-24205	LOCTITE CAPSULE GRADE 242 BLUE
*16	1	16770	REPL. PARTS DWG (THIS PAGE)

*ITEMS ARE ONLY AVAILABLE IN A 16772 SERVICE PARTS KIT

-  16772 SERVICE PARTS KIT CONVERTS 15666 TO 16770
-  16770 REPLACES & IS INTERCHANGEABLE WITH 15666
-  13447-13.5 PIGTAIL STUD ASSY REQ'D WITH 13450-13.5 ASSY USED ON EARLY MODEL ET5500M/(PB) CRANES
-  SECURE WITH LOCTITE 242 BLUE
-  TORQUE TO 30 FT-LBS, THEN TIGHTEN SET SCREW. 
-  TIGHTEN UNTIL ONE THREAD IS VISIBLE ABOVE THE NUT & ENSURE THAT SPRING IS NOT FULLY COMPRESSED



MFG., INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS

ET5500, ET6KM/R,
ET8100, ET10K(X)

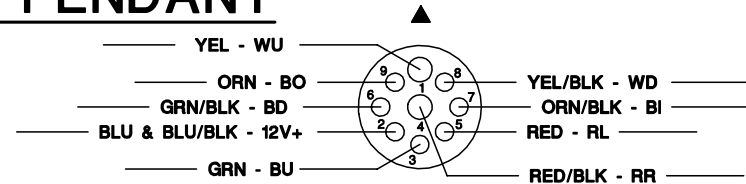
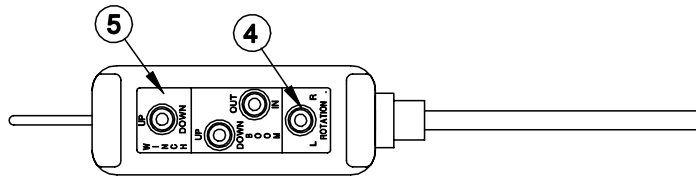
DATE
2-21-02F

SUPERSEDES
1-14-98E

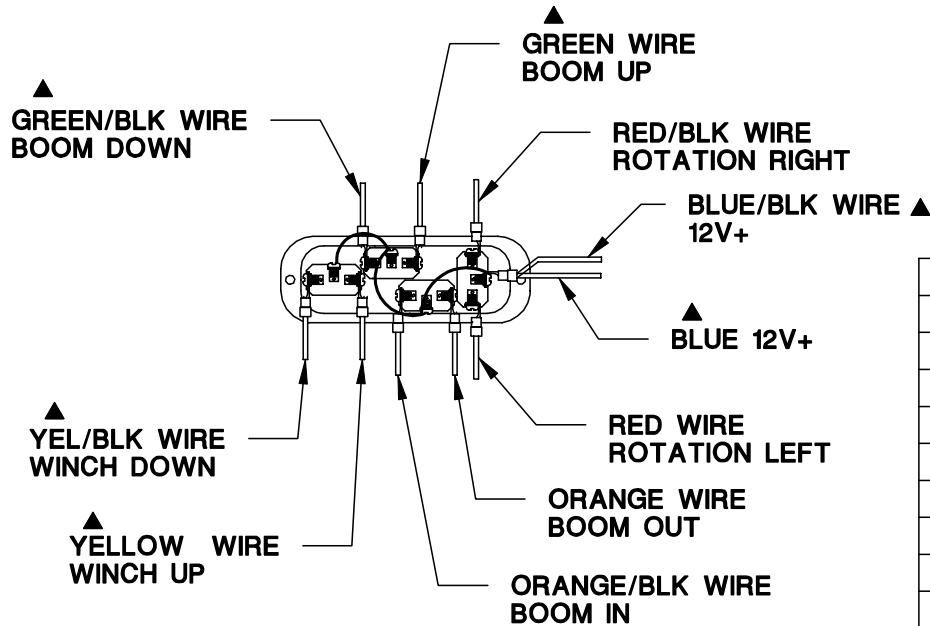
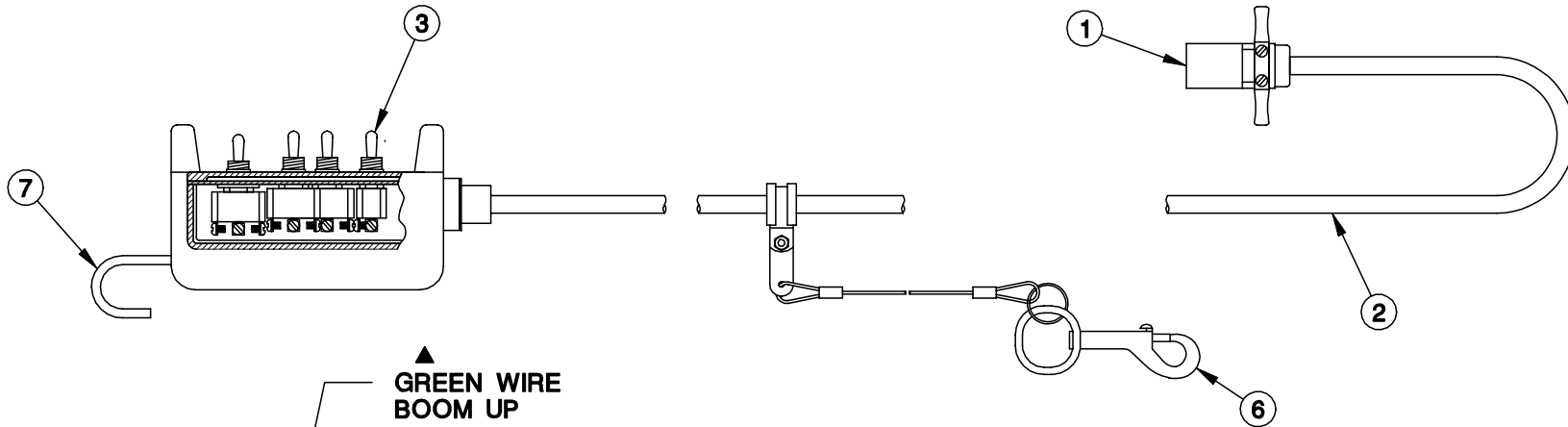
SECTION
C455

16770

20160 4-SWITCH PENDANT



PLUG - BACKSIDE VIEW



▲ NOTE: BLACK WIRE IS NOT USED

10	1	20165	GASKET / CORD RESTRAINT - PENDANT HEAD
9	1	20164	BASE - PENDANT HEAD
8	1	20163	COVER - PENDANT HEAD
7	1	11557	PENDANT HOOK
6	1	15913-2	PHAN, CLAMP AND TETHER ASSY
5	1	17363	DECAL
4	4	19793	TOGGLE BOOT
3	4	13763	TOGGLE SWITCH
2	1	26262-xx	CORD ASSY (xx = LENGTH IN FT.)
1	1	26263	PLUG - 9 POLE
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPL. PARTS DWG.

4 FUNCTION CRANES

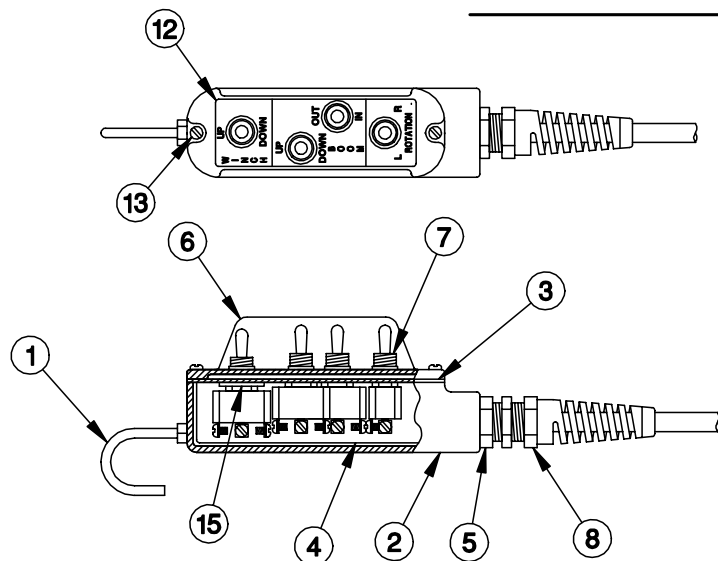
DATE
7-16-01B

SUPERSEDES
4-10-00A

SECTION
C400

20161

▲ 17360 SERIES PENDANT CORD



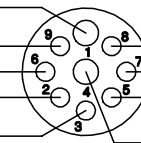
WHT OR YEL - WU

ORN - BO

GRN/BLK OR BLU/BLK - BD

BLU & BLK - 12V+

GRN OR BRN - BU



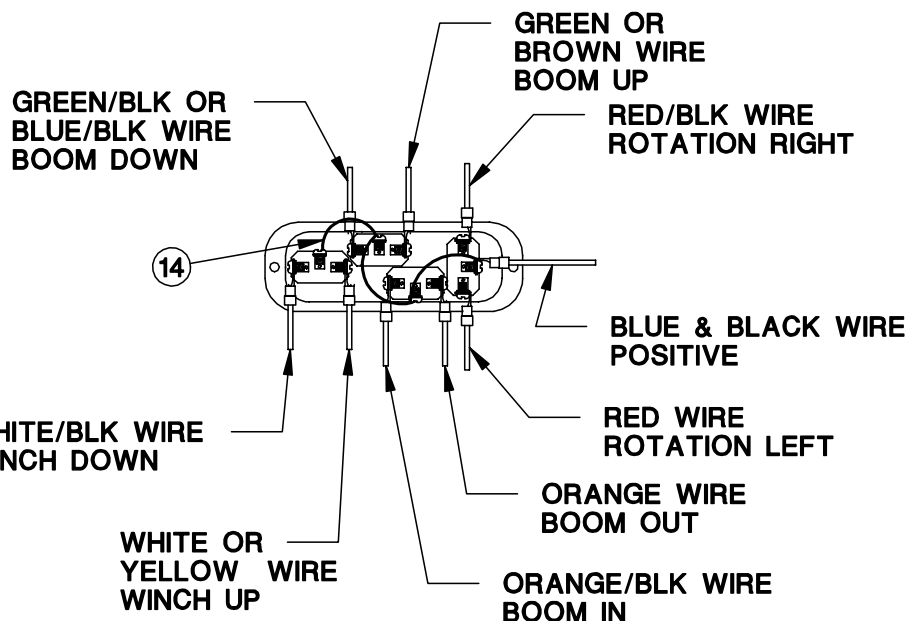
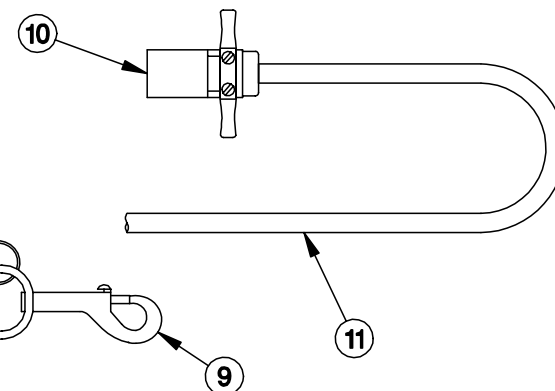
WHT/BLK OR YEL/BLK - WD

ORN/BLK - BI

RED - RL

RED/BLK - RR

PLUG - BACKSIDE VIEW



15	1	12534-4	MACHINERY BUSHING - 1/2" I.D. x 7/8" O.D. x 14 GA.
14	1	19307	4SW PENDANT CORD JUMPER
13	2	IPHCS#0832050	PHCS 8-32 x 1/2
12	1	17363	DECAL, CRANE CONTROL
11	1	26262-xx	CORD ASSY (xx = LENGTH IN FT.)
10	1	26263	PLUG - 9 POLE
9	1	15913-2	PHAN, CLAMP AND TETHER ASSY
8	1	25534	PLASTIC 3/4" STRAIN RELIEF
7	4	13763	TOGGLE SWITCH
6	1	17361	PENDANT COVER
5	1	HRDB16MP-12FP	HYD BUSHING
4	1	15629	INSULATOR FOR CONDULET
3	1	25625	GASKET 1"
2	1	25624	ENCLOSURE 1"
1	1	11557	PENDANT HOOK
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPL. PARTS DWG.

4 FUNCTION CRANES

DATE
4-10-00A

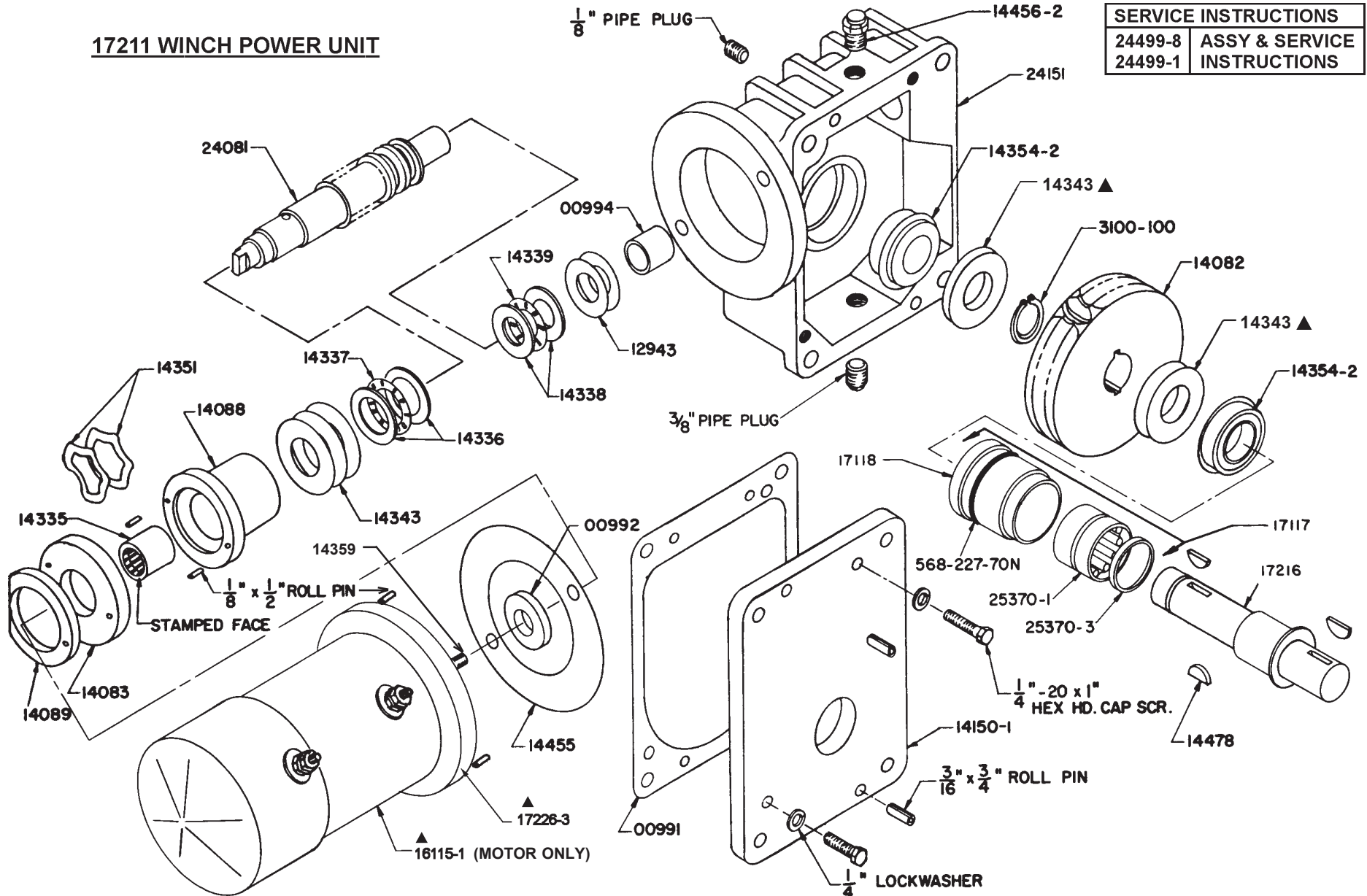
SUPERSEDES
1-21-00

SECTION
C400

17383

17211 WINCH POWER UNIT

SERVICE INSTRUCTIONS	
24499-8	ASSY & SERVICE
24499-1	INSTRUCTIONS



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS

ET10K(X)

DATE
1-30-03D


SUPERCEDES
1-4-01C

SECTION
C400

17210

REPLACEMENT PARTS LIST - 17211 WINCH POWER UNIT

MODEL: ET10K(X)

PART NO.	DESCRIPTION
* 00991 * 00992 00994 * 12943-1 * 12943-2	GASKET SEAL WORM SHAFT BUSHING SHIM WASHER - 3/4" x 1 1/2" x .005" (AS REQUIRED) SHIM WASHER - 3/4" x 1 1/2" x .015" (AS REQUIRED)
* 12943-3 14082 14083 14088 14089	SHIM WASHER - 3/4" x 1 1/2" x .030" (AS REQUIRED) WORM GEAR BRAKE MOTOR CLUTCH HOUSING (INCLUDES 1/8" x 1/2" ROLL PIN) BRAKE DISC
14150-1 14335 14336 14337 14338	COVER ROLLER CLUTCH THRUST RACE - 1" NEEDLE THRUST BEARING - 1" I.D. THRUST RACE - 3/4"
14339 * 14343-1 * 14343-2 * 14343-4 * 14345-1	NEEDLE THRUST BEARING - 3/4" I.D. SHIM WASHER - 1" x 1 1/2" x .005" (AS REQUIRED) SHIM WASHER - 1" x 1 1/2" x .015" (AS REQUIRED) SHIM WASHER - 1" x 1 1/2" x .031" (AS REQUIRED) SHIM WASHER - 1" x 2" x .005" (AS REQUIRED)
* 14345-2 * 14351 14354-2 * 14455 14456-2 * 14478	SHIM WASHER - 1" x 2" x .015" (AS REQUIRED) WAVE WASHER BALL BEARING GASKET - MOTOR BREATHER CAP ASSEMBLY #91 WOODRUFF KEY - 1/4" x 3/4"
24081 24151 16115  25370-1 * 25370-3 17117	WORM & SHAFT GEAR CASE MOTOR (INCLUDES 00992 SEAL) ROLLER BEARING (INCLUDES 25370-3 SEAL) SEAL BEARING & HOUSING ASSEMBLY (INCLUDES 25370-1, 25370-3, 17118 & 568-277-70N)
17216 17218 * 3100-100 * OR-227-7 * IRPIN-013050 * IRPIN-019075	SHAFT & RACE ASSEMBLY BEARING HOUSING RETAINING RING O-RING - 2 1/8" x 2 3/8" x 1/8" ROLL PIN - 1/8" x 1/2" ROLL PIN - 3/16" x 3/4"
16485 17468-1 17468-2 ▲ 17468-3	SHIM, KEY, PIN & SEAL KIT (INCLUDES ITEMS MARKED *) MOTOR REPAIR KIT (INCLUDES 00992 SEAL & 14455 GASKET) FOR 17221-1 MOTOR MOTOR REPAIR KIT (INCLUDES 00992 SEAL & 14455 GASKET) FOR 17221-2 MOTOR MOTOR REPAIR KIT (INCLUDES 00992 SEAL & 14455 GASKET) FOR 16115 MOTOR

 16115 MOTOR REPLACES 17221 MOTOR



MFG., INC.
CINCINNATI, OHIO

REPL. PARTS LIST

17211 WINCH PU

4-11-00D

1-18-99C

C400

900308

REPLACEMENT PARTS LIST - 16100 ELECTRIC POWER UNIT

MODEL(S): ET5500MPB, ET6KM, ET6KR

PART NO.	DESCRIPTION
16101 16102 16105 16106 16107	POWER UNIT - LONG SHAFT - ET5500R WINCH ² POWER UNIT - SHORT SHAFT - ET5500R ROTATION POWER UNIT - LONG SHAFT - CA 2000, CT 2003, WA/SL 3000 (WITH SPACERS) POWER UNIT - LONG SHAFT - ET5500 WINCH (WITHOUT SPACERS) ³ POWER UNIT - SHORT SHAFT - ET5500R ROTATION
00181-2 00977 00978 00980 * 00986	FLANGE BEARING - 3/4" BORE x 1 3/4" O.D. GEAR CASE (INCLUDES 00994 BUSHING) WORM GEAR BASE PLATE BRAKE DISC
* 00989 00990 * 00991 * 00992 * 00993 ⁴	LOCK RING OIL PLUG - 1/4" PIPE GASKET OIL SEAL KEY - #9 WOODRUFF
00994 01029 01043 ⁴ 01071 01155-1	BUSHING BRAKE PLATE BRAKE SPRING (16102 & 16107 ROTATION POWER UNIT ONLY) WORM SHAFT SPACER (16105 ONLY)
01156 * 12943-1 ⁴ * 12943-2 ⁴ * 12943-3 ⁴ 14338	WORM GEAR SHAFT - 3/4" x 5 3/16" LONG (16105 & 16106 ONLY) SHIM WASHER - .005" THICK (AS REQUIRED) SHIM WASHER - .015" THICK (AS REQUIRED) SHIM WASHER - .030" THICK (AS REQUIRED) NEEDLE THRUST RACE 3/4" I.D.
14339 15241 15242 15243 15667	NEEDLE THRUST BEARING 3/4" I.D. SPACER (INSTALL NEXT TO BRAKE PLATE) NEEDLE THRUST BEARING 5/8" I.D. NEEDLE THRUST RACE .092" x 5/8" I.D. WORM GEAR SHAFT - 3/4" x 4 3/16" LONG (16102 & 16107 ONLY)
16111 ⁴ 16145 16988 ⁴	MOTOR - 12 VOLT 4 1/2" DIAMETER SPACER BRAKE SPRING (16101, 16105 & 16106 WINCH POWER UNITS ONLY)
14889 15290	MOTOR REPAIR KIT SMALL PARTS KIT (INCLUDES ITEMS MARKED *)

¹ AVAILABLE ONLY AS PART OF 15290 SMALL PARTS KIT

² 16101 POWER UNIT REPLACED BY 16106 POWER UNIT
16102 POWER UNIT REPLACED BY 16107 POWER UNIT

³ REPLACE 30E & 16100 POWER UNITS AS FOLLOWS:
16105 REPLACES 11497
16106 REPLACES 11497NS & 16101
16107 REPLACES 16102

⁴ 16111 MOTOR REPLACES 01024 E & F & 16112 MOTORS
ON ALL 30E & 16100 SERIES POWER UNITS

⁵ 16988 BRAKE SPRING REPLACES 01043 BRAKE SPRING ON
16101, 16105 & 16106 WINCH POWER UNITS ONLY



MFG., INC.
CINCINNATI, OHIO

TITLE
REPL. PARTS LIST

16100 ELECTRIC PU

DATE
8-10-99D

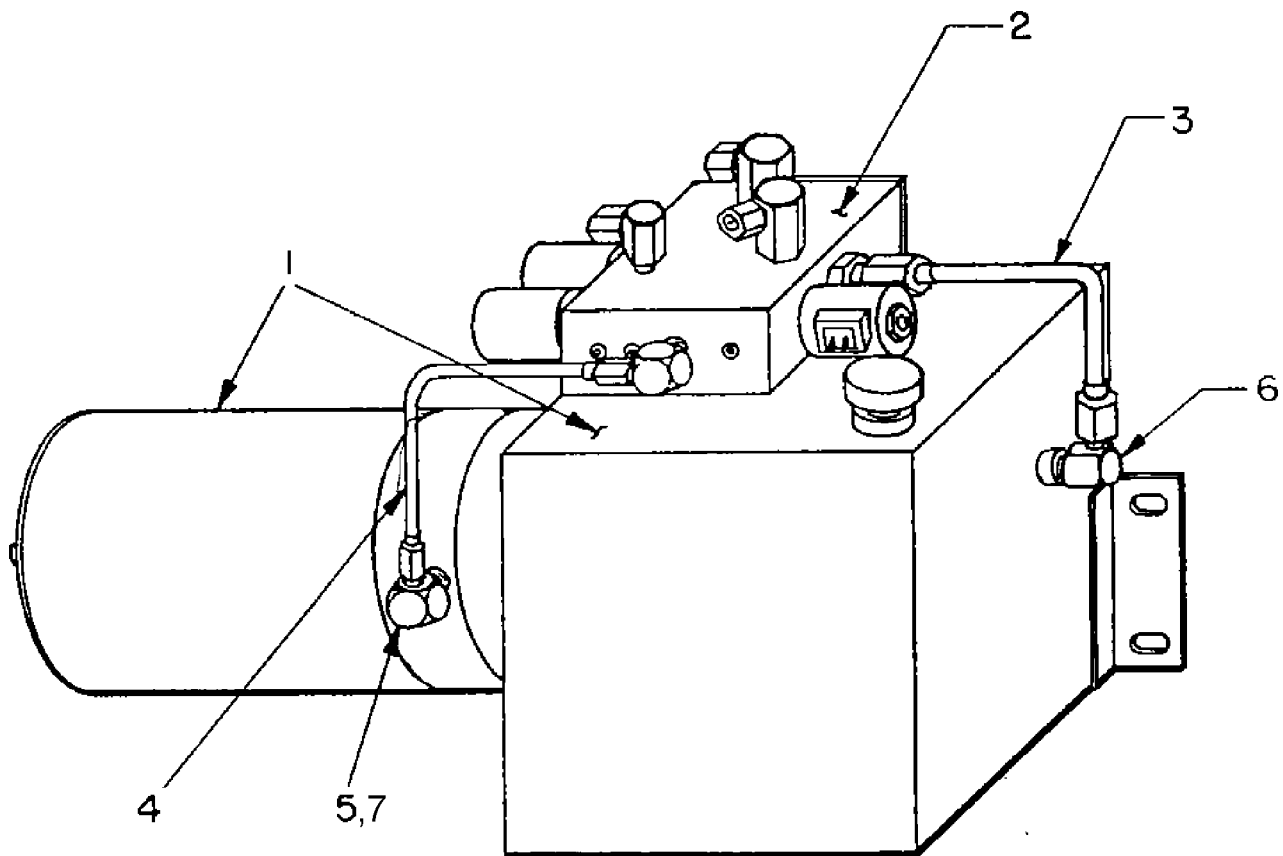
SUPERCEDES
6-17-98C

SECTION
C400

811016

17261 HYDRAULIC POWER UNIT WITH CONTROL VALVE ASSY - ET10KX REPLACEMENT PARTS LIST

ITEM	PART NO.	DESCRIPTION
	17261	HYDRAULIC POWER UNIT WITH CONTROL VALVE ASSEMBLY
1 2 3	17260-1▲ 17263 17293	HYDRAULIC POWER UNIT WITH VALVE BRACKET CONTROL VALVE ASSEMBLY (INCLUDES HYDRAULIC FITTINGS)▲ RETURN TUBE ASSEMBLY
4 5 6 7	17294 HTEL4MJ-4MP-90 HTEL6MJ-4MP-90 HRDB6MP-4FP	PRESSURE TUBE ASSEMBLY ELBOW TUBE ADAPTER ELBOW TUBE ADAPTER HYDRAULIC BUSHING
-	16940	ELECTRIC MOTOR (ONLY)



MFG., INC.
CINCINNATI, OHIO

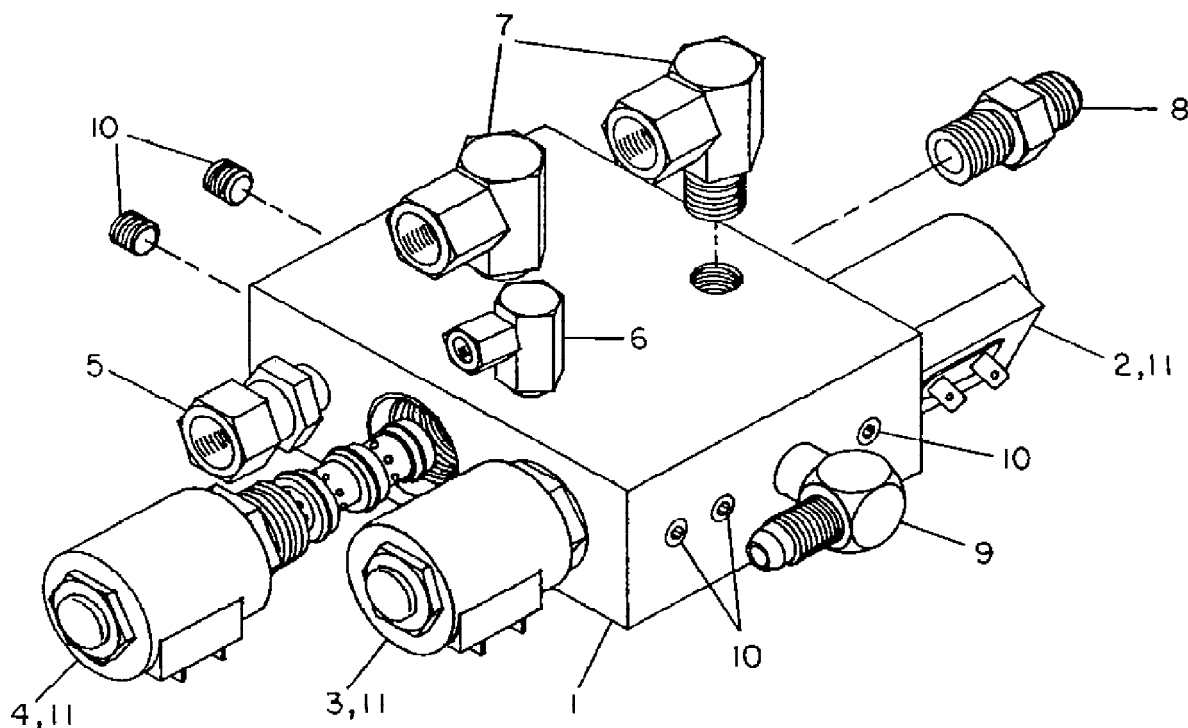
TITLE
REPLACEMENT PARTS
ET10KX

DATE
7-14-00B
SUPERCEDES
1-20-98A

SECTION
C400
17261

17263 CONTROL VALVE ASSEMBLY - ET10KX REPLACEMENT PARTS LIST

ITEM	PART NO.	DESCRIPTION
	17263	CONTROL VALVE ASSEMBLY
1	17264	VALVE BODY
2	17266	SOLENOID VALVE 2-WAY N.O. WITH 16919 COIL
3	17267	SOLENOID VALVE 3-WAY WITH 16919 COIL
4	17268	SOLENOID VALVE 4-WAY WITH 16919 COIL
5	HSWL4MP-4FX	SWIVEL ADAPTER - STRAIGHT
6	HELB2MP-2FX-90	SWIVEL ADAPTER - ELBOW
7	HELB4MP-4FX-90	SWIVEL ADAPTER - ELBOW
8	HTAD6MJ-4MP	STRAIGHT TUBE ADAPTER
9	HTEL4MJ-4MP-90	ELBOW TUBE ADAPTER
10	HPLG1MP	SOCKET HEAD PIPE PLUG - 1/16" NPT.
11	16919	SOLENOID COIL - 12 VOLT D.C. (-1 HYDRAFORCE - 1 1/4" LONG, -2 DELTA POWER - 1 9/16" LONG) ▲
-	17349	PACKING KIT

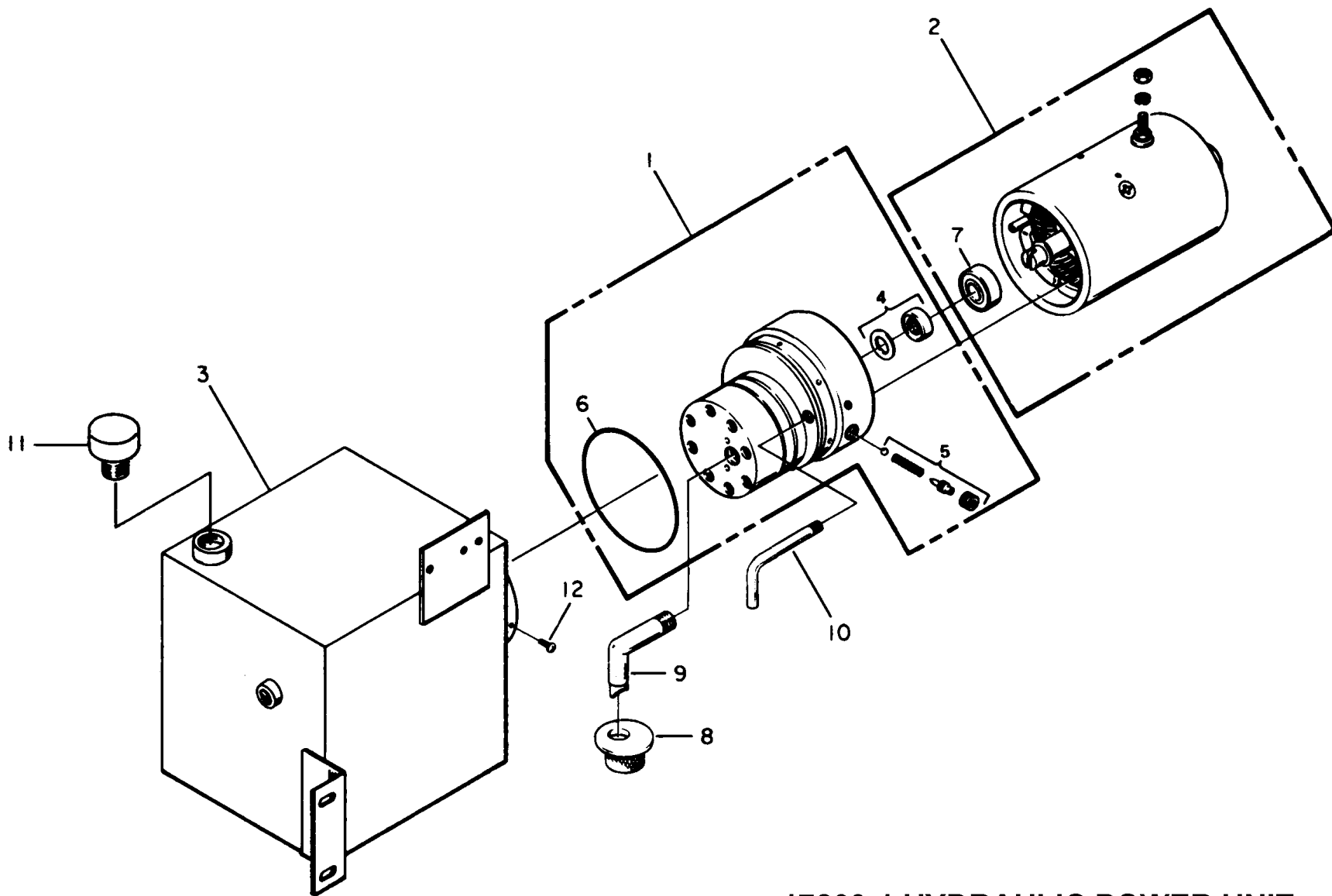


MFG., INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS
ET10KX

DATE
10-26-99B
SUPERCEDES
1-20-98A

SECTION
C400
I17263



17260-1 HYDRAULIC POWER UNIT



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS

ET10K(X)

DATE
6-19-98A

SUPERCEDES
2-20-90

SECTION
C400

17451

REPLACEMENT PARTS LIST - 17260-1 HYDRAULIC POWER UNIT

MODEL: ET10K(X)

ITEM	PART NO.	DESCRIPTION
	17260-1-2400*	HYDRAULIC POWER UNIT
1	16943	PUMP ASSEMBLY
2	16940	MOTOR - 12V DC
3	17283	RESERVOIR ASSEMBLY
4	02330	SEAL & GASKET KIT
5	02220	RELIEF VALVE KIT
6	OR-239-7	O-RING (3 5/8" x 3 7/8" x 1/8")
7	02318	BALL BEARING
8	01134	SUCTION FILTER SCREEN
9	-	SUCTION TUBE
10	-	RETURN TUBE
11	19276	VENT PLUG (3/8" NPT)
12	07703	SCREW (10-24NC x 3/8")
-	17282	PACKING KIT

*STANDARD RELIEF VALVE SETTING - P.S.I.



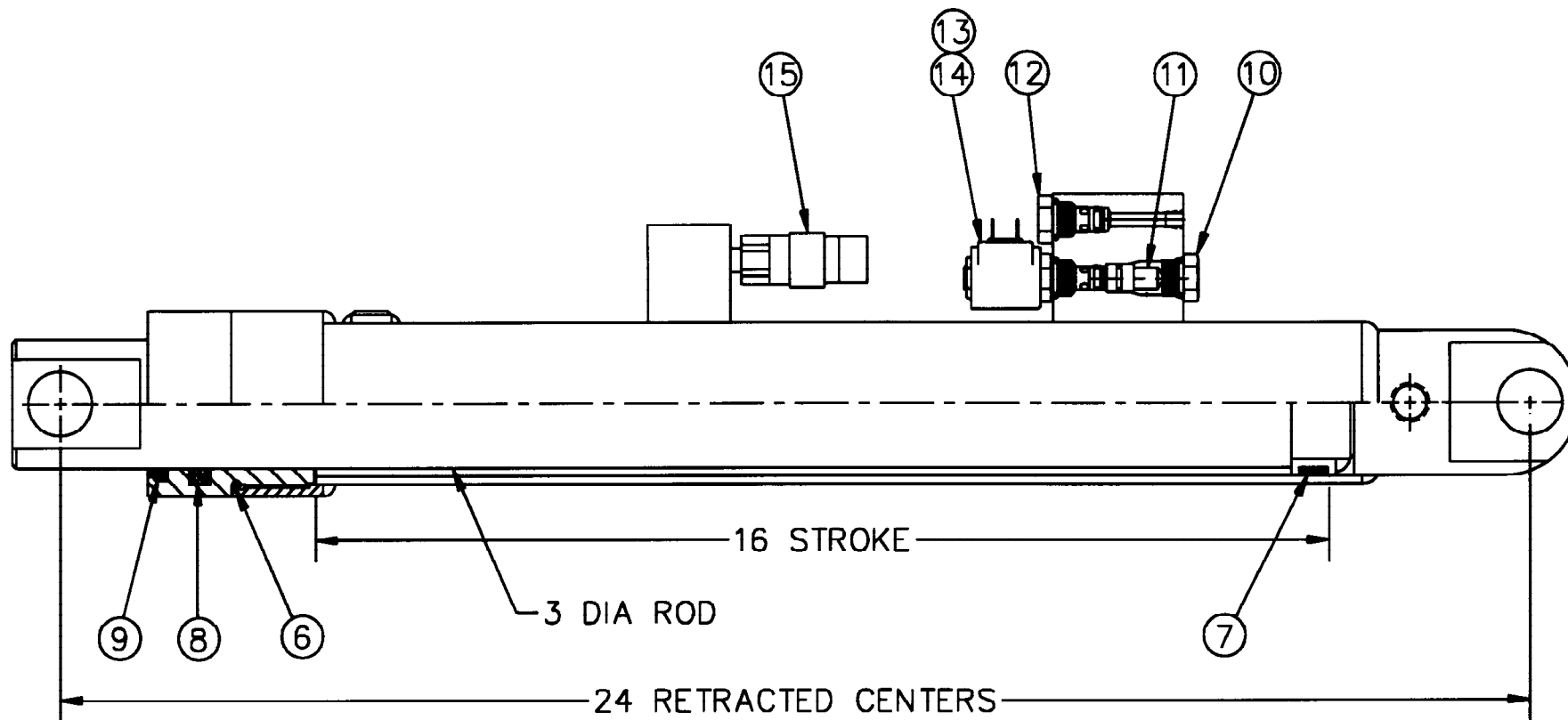
MFG., INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS
ET10K(X)

DATE
6-22-98A
SUPERCEDES
2-20-90

SECTION
C400
900220

17256-3 ELEVATION CYLINDER



REPLACEMENT PARTS LIST REF 931130



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
ELEVATING CYL & VALVE ASSY PARTS

DATE
7-7-99D

SECTION
C400

ET10K(X)


SUPERCEDES
4-29-99C

17257-3

REPLACEMENT PARTS LIST

17256-3 ELEVATION CYLINDER & VALVE ASSEMBLY

MODEL: ET10K(X)

ITEM	PART NUMBER	DESCRIPTION
1	17255-3	ELEVATING CYLINDER ASSEMBLY W/OUT VALVES & PRESSURE SWITCH
2	17256-3	ELEVATING CYLINDER ASSEMBLY WITH VALVES & PRESSURE SWITCH
3	-	-
4	-	-
5	-	-
6	*	O-RING
7	*	WEAR RING
8	*	POLYURETHANE PACKING (POLYPAK TYPE "B")
9	*	ROD WIPER
10	14416 	CAP
11	14450M-085	FLOW CONTROL VALVE
12	16917	CHECK VALVE
13	16918	SOLENOID VALVE (INCLUDES COIL)
14	16919	SOLENOID COIL ONLY
15	17460-2200-11	PRESSURE SWITCH
16	-	-
17	-	-
18	-	-
19	-	-
20	-	-
21	17376-3	PACKING KIT (INCLUDES ITEMS MARKED *)
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-



ON CURRENT PRODUCTION CRANES, CAP HAS BEEN INCORPORATED INTO RETURN HOSE



MFG., INC.
CINCINNATI, OHIO

TITLE

REPL. PARTS LIST

ET10K(X)

DATE

10-5-99D

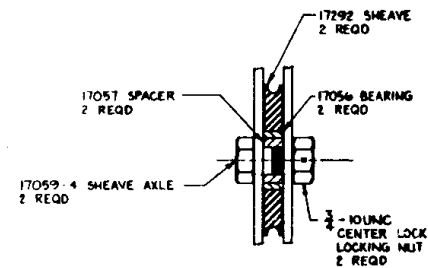
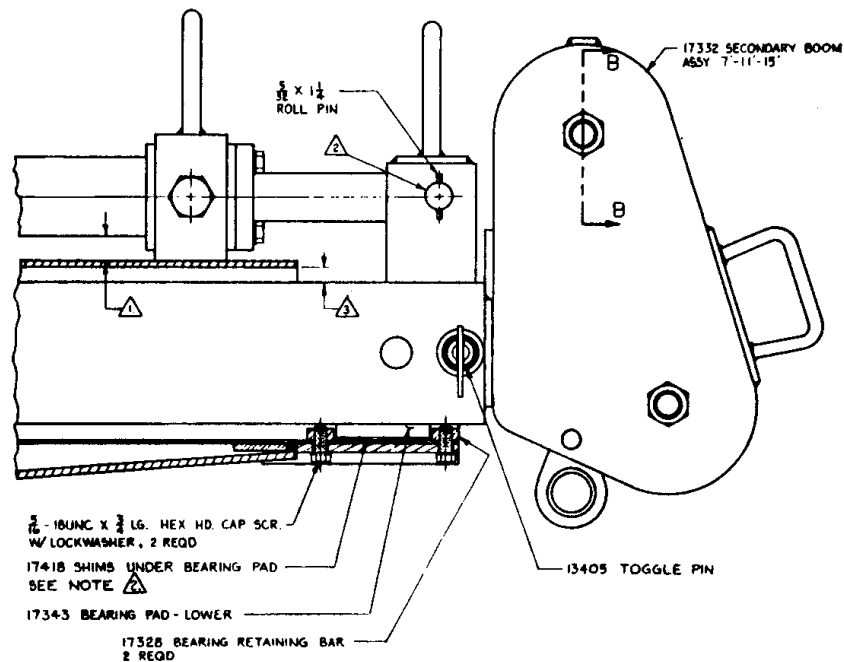
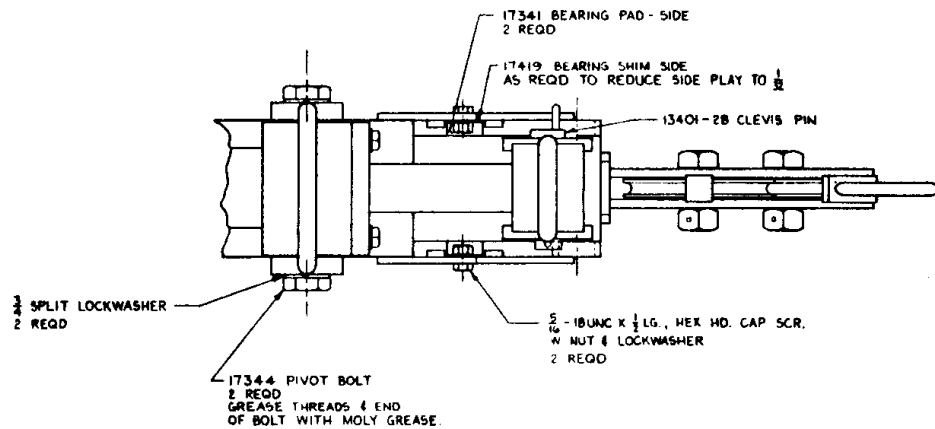
SUPERCEDES

5-3-99C

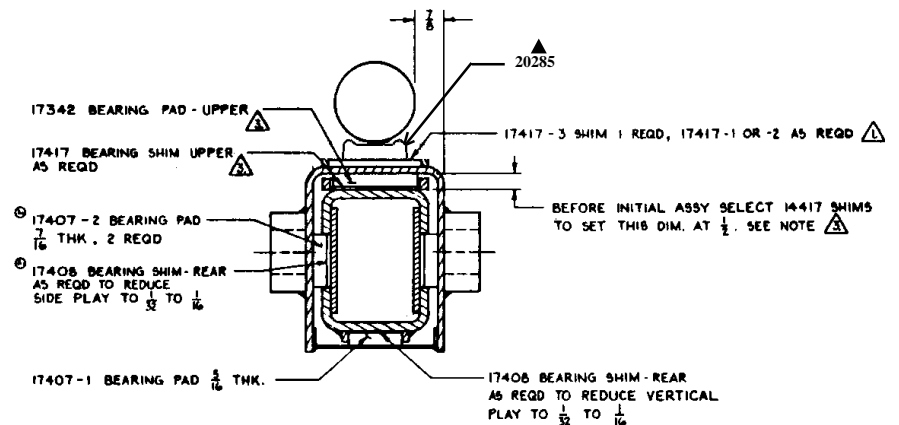
SECTION

C400

931130



SECT B-B



SECTION VIEW OF
SECONDARY BOOM REAR

- Δ IF THE SPACE BETWEEN THE TOP OF THE SECONDARY BOOM & THE INSIDE OF THE PRIMARY BOOM IS NOT $7\frac{1}{16}$ " ADJUST SHIMS UNDER THE 17342 BEARING PAD AT THE REAR OF THE BOOM SO THE HEIGHT OF THE 17342 BEARING IS $1\frac{1}{16}$ " MORE THAN THIS SPACE.
- Δ SELECT 17418 SHIMS SO THAT HOLES IN ROD END PIVOT PLATES ARE $1\frac{1}{32}$ " ABOVE HOLE IN ROD END.
- Δ SELECT 17417 SHIMS TO SET CYLINDER PARALLEL TO TOP OF BOOM WITHIN $1\frac{1}{32}$ " NORMAL SPACING SHOULD BE $13\frac{1}{16}$ ".



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
17330 REPLACEMENT PARTS

ET10KX

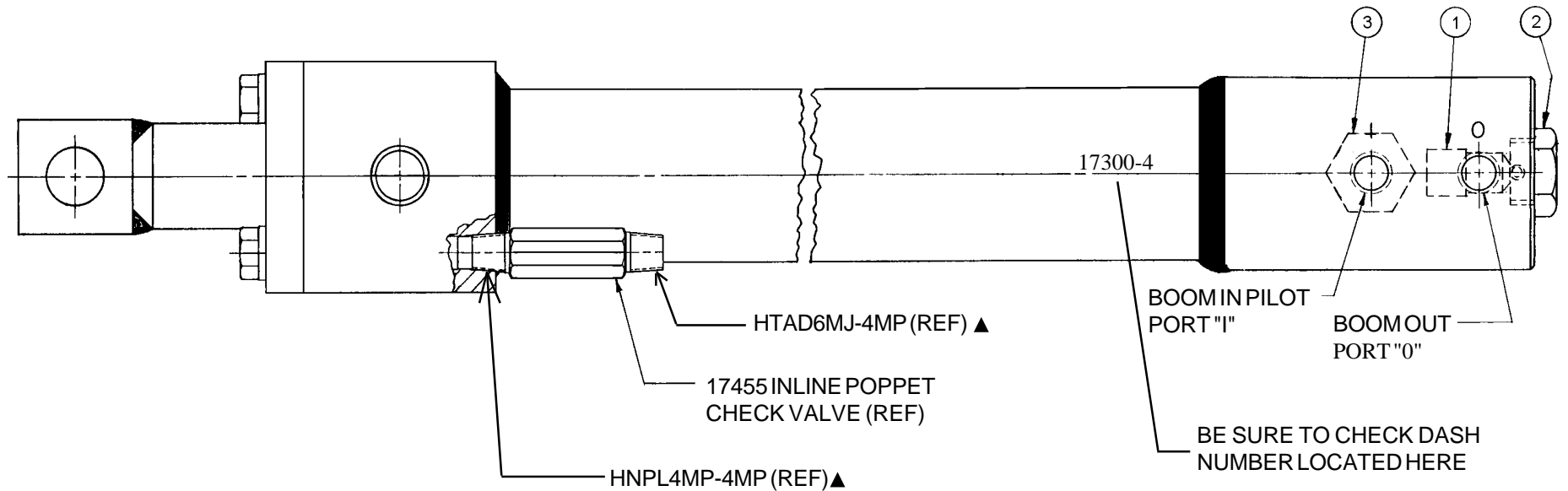
DATE
11-2-01A

SUPERCEDES
6-23-98

SECTION
C400

19533

17300-4 EXTENSION CYLINDER



ITEM	QTY	PART NO.	DESCRIPTION
1	1	14450M-100	FLOW CONTROL VALVE
2	1	26279	VALVE RETAINING PLUG
3	1	17265	PILOT OPERATED CHECK VALVE
REF		19001	HYDRAULIC TUBE - APPROX.48" LONG
REF		17357-4	PACKING KIT



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
17300-4 REPLACEMENT PARTS

ET10KX

DATE
7-13-01A

SUPERCEDES
8-2-99

SECTION
C400

19719