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HT50KX / Prop Ctrl / No Eng Ctrls (HSAAAA-P0**)

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MFG., INC.
CINCINNATI, OHIO

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HT50KX (HSAAAA-P0)**

DATE
1-19-04

SUPERCEDES
-

SECTION
-

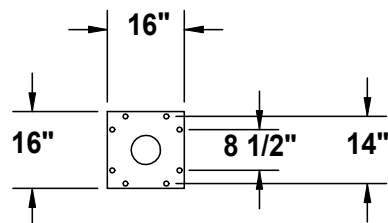
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SECTION 100

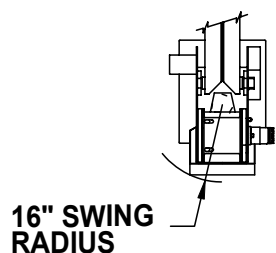
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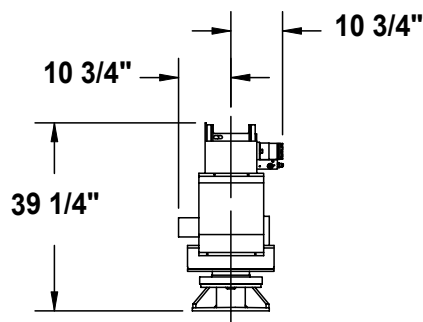
SPECIFICATIONS



**BASE MOUNTING
DIMENSIONS**



**16" SWING
RADIUS**



22 FT

18 FT

12 FT

23"

31"

10 FT

16 FT

20 FT

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

**SNATCH BLOCK FOR SINGLE AND
TWO-PART LINE OPERATION**

**3/8" DIA. WIRE ROPE
100 FT LONG**

**BOOM ANGLE AND CAPACITY
INDICATOR ON BOTH SIDES
OF BOOM**

**6 FT
POWER**

**4 FT
MANUAL /▲
POWER**

C.G. (APPROX)



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CINCINNATI, OHIO**

**TITLE
INSTALLATION DWG**

HT40KX, HT50KX

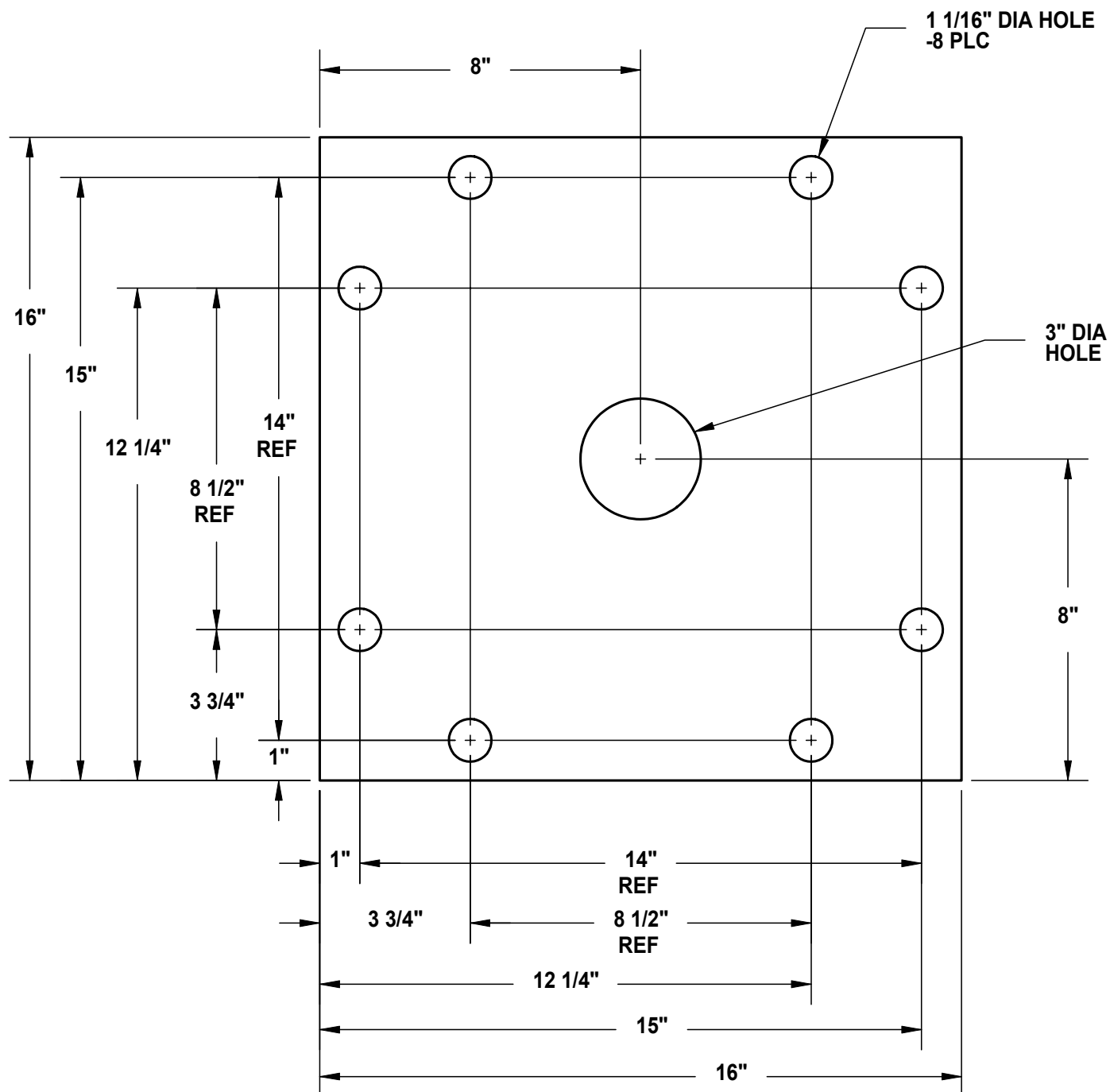
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10-21-97A**

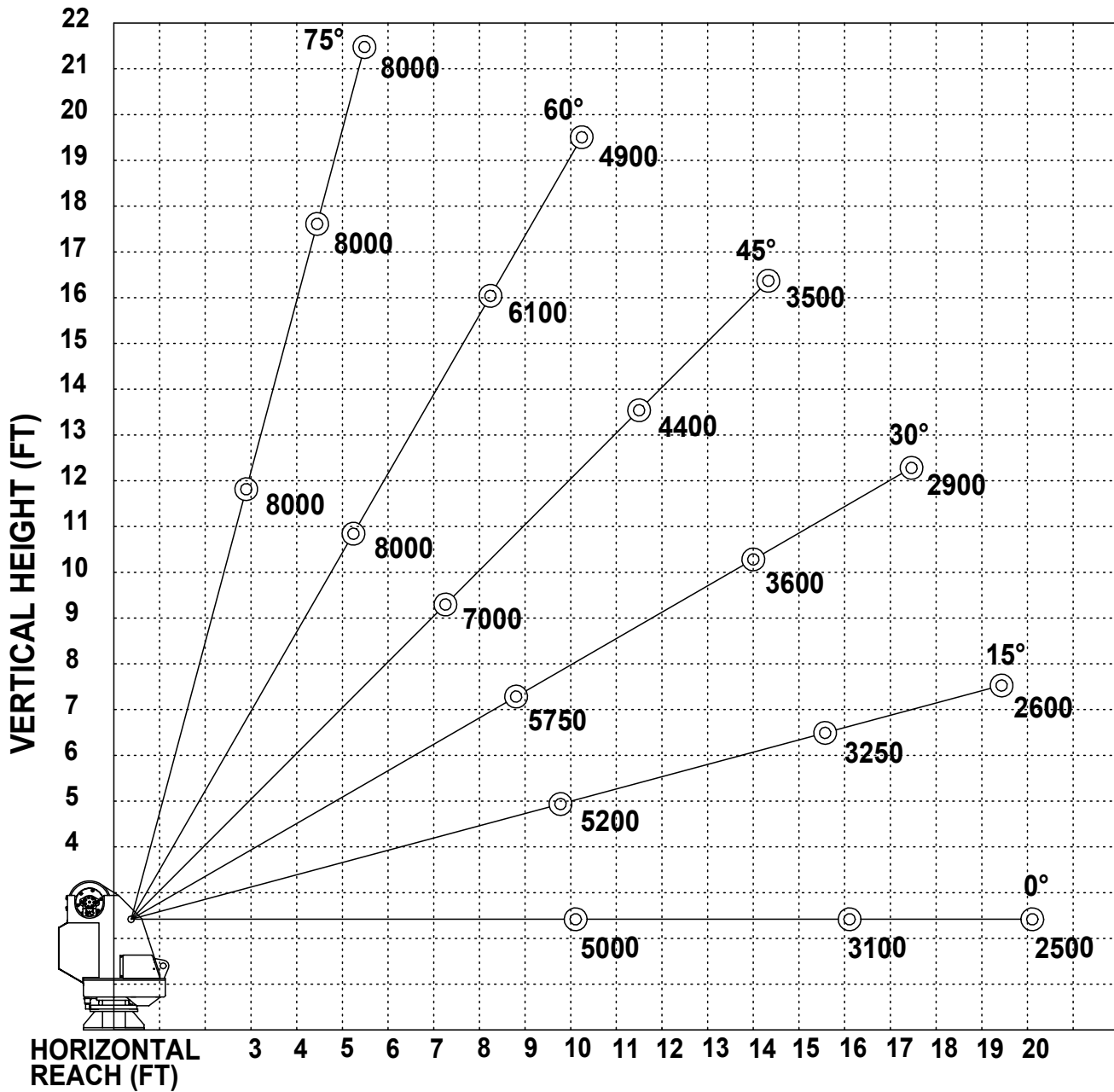
**SECTION
C100**

22343

HT40/50KX BASE MOUNTING DIMENSIONS



HT50KX - 10-16-20 BOOM MAXIMUM CAPACITY CHART



**MUST USE SNATCH BLOCK
FOR LOADS OF 4000 LBS.
AND GREATER**



MFG., INC.
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TITLE
CAPACITY CHART

HT50KX - 10-16-20

DATE
1-29-98B

SUPERSEDES
2-17-97A

SECTION
C100

22351

SECTION 150

SAFETY

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



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TITLE
INSTALLATION DWG

ET & HT CRANE SERIES

DATE
5-15-02H

SUPERCEDES
5-13-97G

SECTION
C150

15394

CRANE SAFETY AND HAZARDS

HT25KX, HT40KX, HT50KX

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 DISENGAGE PTO SYSTEM 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.



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TITLE
INSTALLATION DWG

HYDRAULIC CRANES

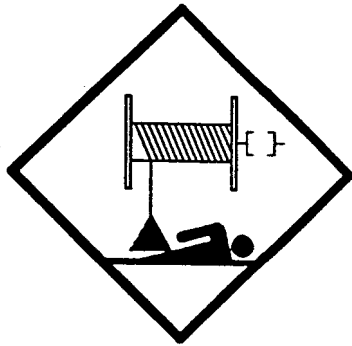
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5-13-97A

SUPERCEDES
6-12-92

SECTION
C150

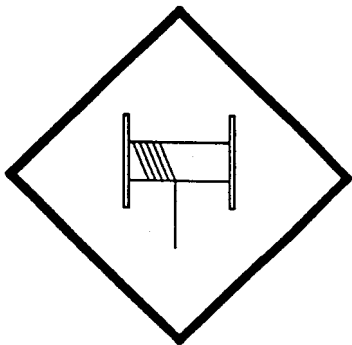
920612

WINCH SAFETY WARNINGS



DANGER

**DO NOT DISENGAGE
WINCH UNDER LOAD**



DANGER

**THE LAST FIVE
WRAPS OF WIRE ROPE
MUST BE LEFT ON
THE DRUM TO ASSIST
THE WIRE ROPE CLAMP IN
HOLDING THE LOAD**



WARNING

**WINCHES ARE NOT
TO BE USED FOR
THE LIFTING OR
MOVING OF
PERSONS**

VENTURO

MFG., INC.
CINCINNATI, OHIO

TITLE

INSTALLATION DWG

DATE

10-17-97A

SECTION

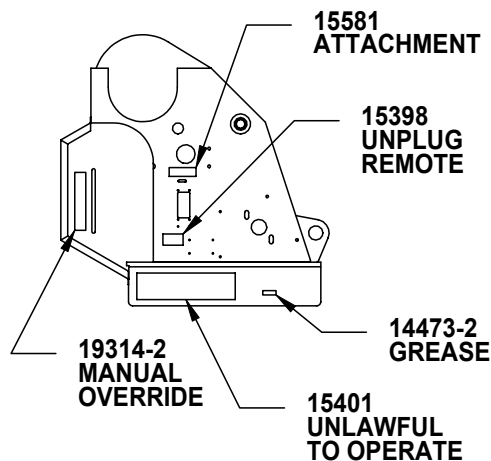
C150

HT CRANES

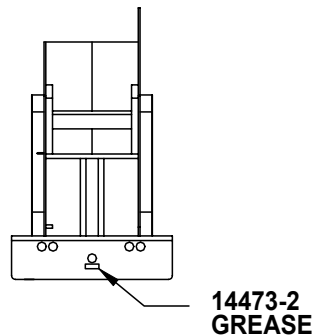
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7-30-96

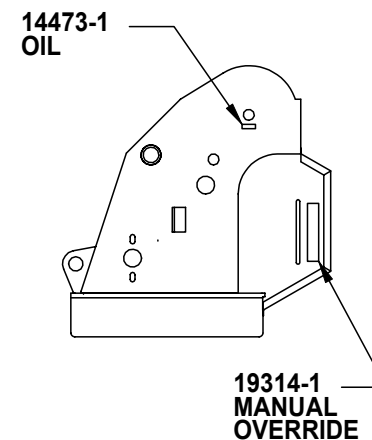
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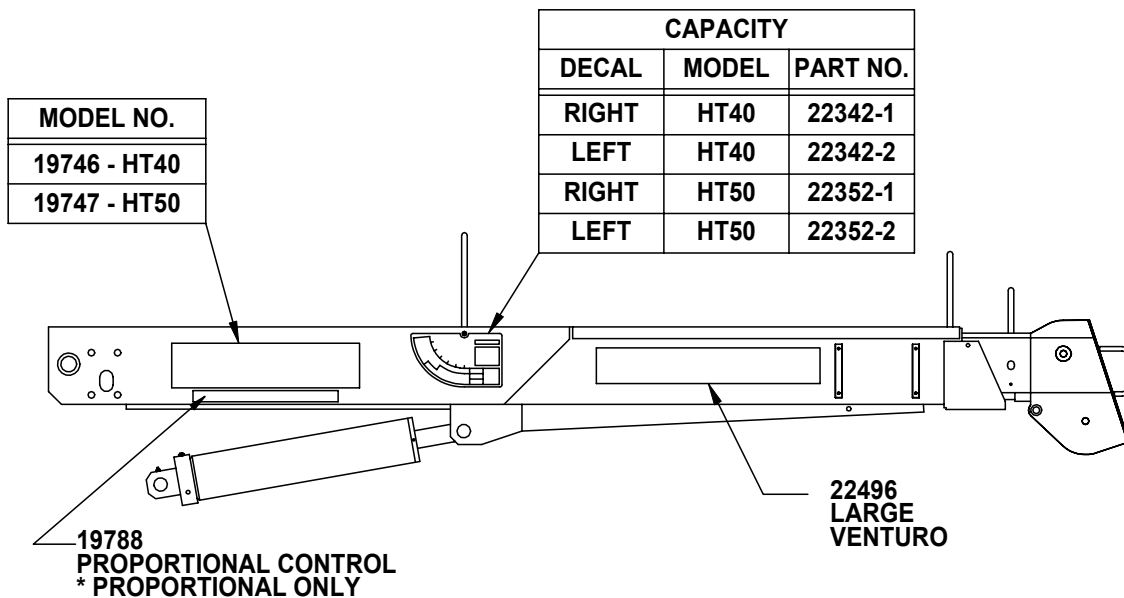
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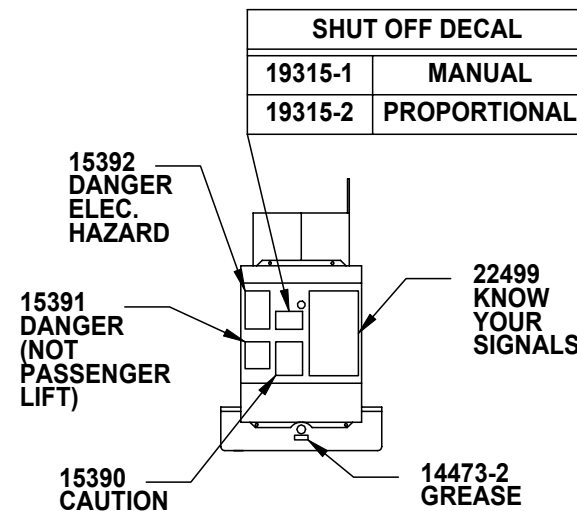
FRONT



LEFT



BOOM



BACK

SERIAL NO. 84030 & UP
SERIAL NO. 85030 & UP

SECTION 200

INSTALLATION

CRANE INSTALLATION

HT40KX, HT50KX

BODY REINFORCEMENT

The truck body must be reinforced and outriggers provided to withstand the combined loads resulting from lifting and the weight of the crane and boom.

The maximum combined overturning moment for the HT40KX is 45,000 ft. lbs. and for the HT50KX is 55,000 ft. lbs.

The maximum vertical load for the HT40KX is 7900 lbs. and for the HT50KX is 9900 lbs.

CRANE MOUNTING

The crane base plate or mounting pedestal must be bolted to the body reinforcing plate with eight (8) grade five (5) bolts of 1" dia. with either coarse or fine threads. A 7" dia. hose clearance hole must be cut in this plate to allow the hoses to swing and coil freely.

ROTATION POSITIONING

The HT cranes are shipped with the boom rotated to the middle of the 400 degree rotation travel limit. The location of this middle position relative to the center line of the truck must be decided prior to mounting. It can be in any position that pleases the user since the boom can always reach the storage and travel position by rotating one way or the other.

HYDRAULIC CONNECTIONS

The crane is furnished with a pressure and a return hose that come down through the center of the quill. Included in the installation kit are two hydraulic swivels and two more hoses. These hoses and swivels are to be arranged in the compartment or pedestal below the crane as shown on drawing 20698 using the angle bulhead fittings also furnished in the installation kit.

These hoses are to be connected in a relaxed position as shown on 20698, while the crane is at the midpoint of the 400 degree rotation range as received -- regardless of the final position of the boom during storage/travel.

The bulkhead fittings may be located on any side of the compartment relative to the middle of rotation position.

The crane pressure and return hoses have different sizes of SAE 37 degree flare swivel fittings. The smaller swivel is on the pressure hose which has a 3/8" flare (#6 JIC). The larger swivel is on the return hose which has a 1/2" flare (#8 JIC).



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TITLE
INSTALLATION DWG

HT40KX, HT50KX

DATE
10-9-02

SUPERCEDES
-

SECTION
C200

20697

ELECTRICAL CONNECTIONS

A 25 ft. electrical power lead - intended for 12V DC only - also comes down through the center of the quill with the hoses. This lead should be looped in the compartment so that it remains relaxed throughout the 400 degree rotation of the crane.

A 15amp circuit breaker is mounted on the crane and protects the crane's internal wiring and solenoid coils. The 15amp circuit breaker does not protect the 25 foot electrical power lead. For added protection, the 25 ft. lead can be connected to a 15-20 amp protected circuit that, if possible, is powered only when the vehicle engine is running

HYDRAULIC FLUID

Average Climate	Type of Oil
Cold to Moderate	ISO Grade AW 46
Warm to Hot	ISO Grade AW 68

The fluid should have the highest anti-wear characteristics and treated to inhibit rust and oxidation.

HYDRAULIC HOSES & LINES

The minimum sizes for lines and hoses are as follows:

PRESSURE	3/8"
RETURN	1/2"
SUCTION	3/4"

RESERVOIR

The PTO reservoir should have a capacity of 10 gallons fitted with 100 mesh suction screen, 10 micron return line filter, and filler/breather cap.

PTO PUMP

The PTO pump should be sized to allow an engine idle speed range that will deliver approximately 2.5 GPM for the HT40KX standard (non-proportional), 5.0 GPM for the HT40KX proportional, 3.0 GPM for the HT50KX standard or 6.0 GPM for the HT50KX proportional. The crane's relief pressure is set at 3000 psi. ▲

PTO START-UP

Before connecting the PTO system to the crane pressure and return hoses, connect the PTO pressure and return lines together at the bulkhead. Operate the PTO system for about two (2) minutes per gallon of reservoir capacity (in this case 20 minutes) to flush out the lines and filter all the fluid several times.

ENGINE START/STOP & THROTTLE CONTROL

If your crane was purchased with optional engine start/stop and throttle control, refer to drawing 22615 in the replacement parts section for further information.



MFG., INC.
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TITLE
INSTALLATION DWG

HT40KX, HT50KX

DATE
7-22-02B

SUPERCEDES
8-12-99A

SECTION
C200

22344b

CRANE OPERATION AND MAINTENANCE INSTRUCTIONS

HT40KX, HT50KX

SAFETY

Before operating this crane, read and understand these instructions, the 920612 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 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 3000 lbs.-HT40KX or 4000 lbs.-HT50KX 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.

CONTROLS

This crane is operated by a remote control pendant. The pendant should be unplugged and stored in a compartment 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.

PTO SYSTEM

Check the hydraulic fluid level in the PTO system reservoir. Engage PTO and set the engine idle speed to provide the desired hydraulic flow rate per the PTO system instructions. A lower idle setting may be used for more delicate spotting of loads if required.

CRANE OPERATION

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

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

Avoid repeated rapid reversals of the control switches. This can cause the load to swing.

Check all control functions to see that they are working as described in the following section.



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TITLE
INSTALLATION DWG

HT40KX, HT50KX

DATE
8-12-99B

SUPERCEDES
7-17-97

SECTION
C200

22345a

CONTROL FUNCTIONS

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

BOOM "UP" and "DOWN" - Raises and lowers the boom elevation angle. The boom elevates from 8 degrees below horizontal to 75 degrees above horizontal.

BOOM "OUT" and "IN" - Extends and retracts the boom. The boom hydraulic extension stroke is 6 ft.

ROTATION "L" and "R" - Controls the left and right direction of the crane rotation. The crane rotation is limited to 400 degrees.

POWER - (Non Proportional Systems) Energizes safety shutoff valve. See page 22328 for detailed operations instructions and warnings.

TRIGGER (Proportional Systems Only) - Varies the flow rate delivered to the crane valve. The farther the trigger is pulled, the faster the selected crane function operates.

OVERLOAD SENSING SYSTEM

This crane is equipped with an Overload Sensing System. If the capacity of the crane is exceeded, the "Winch Up", "Boom Down", and "Boom Out" functions will be shut down. The "Winch Down", "Boom Up", and "Boom In" functions will continue to operate and can be used to relieve the overload condition. The "Rotation" function also will continue to operate.

For crane models HT25 serial numbers 80157, HT40 serial numbers 84092 and HT50 serial numbers 85086 and below, the Overload system is inoperative if the boom elevation is at the bottom or top limit of travel. To relieve this condition, raise or lower the boom slightly before lifting the load. Cranes with serial numbers above the aforementioned have been modified to allow the Overload system to remain active at the top of boom travel.

TWO-BLOCK SENSING SYSTEM

This crane is equipped with an anti two-block device that is mounted at the tip of the boom. If the snatch block/overhaul weight contacts the device the "Winch Up", "Boom Down", and "Boom Out" functions are disabled. The "Winch Down", "Boom Up", and "Boom In" functions will continue to operate and can be used to relieve the two-block condition. Refer to Drawing 22449 for replacement parts and configuration information.

MANUAL TELESCOPIC BOOM

The 10 to 20 ft. boom has a 4 ft. manual telescoping section in addition to the 6 ft. power extension. A pin locks the manual extension into either the extended or retracted position.

▲ POWER TELESCOPIC BOOM

The 10 to 20 ft. boom has a 4 ft. power telescoping section in addition to the 6 ft. power extension.

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.



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TITLE
INSTALLATION DWG

HT40KX, HT50KX

DATE
3-4-03E

SUPERCEDES
11-3-00D

SECTION
C200

22345b

- ▲ 3. Set the vehicle parking brake and put the vehicle transmission in "park" if it is an automatic.
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. Disengage the PTO pump and idle speed control.
5. Unplug the control pendant and store in a body compartment or the cab.

MAINTENANCE

The crane requires only periodic lubrication. As a standard procedure, this can be done at the time the vehicle is serviced.

The winch planetary gearbox lube should be maintained at the level plug.

To ensure optimal winch performance, the following lube schedule and lube specifications should be followed:

Initial Change - after 6 weeks or 10 hours of operation.

Periodic Change - on an annual basis or every 50 hours of operation.

<u>Temp Range (°F)</u>	<u>Winch Hydraulic Oil</u>
120 to 10	SAE 50
40 to -25	75W90
30 to -50	Conoco DN600 or equivalent

Service grease fittings and rotation gear with molybdenum-disulfide graphite-filled lithium-based extreme pressure grease.

Grease fitting locations:

- Boom pivot at rear of boom (two grease fittings)
- Upper quill bearing
- Elevation cylinder tail clevis
- Rotation worm shaft - each side of lower part of crane housing
- Rotation shaft bearing - near elevation cylinder lower pivot

The rotation drive chain should be oiled lightly (DO NOT GREASE).

The lower quill bearing is self lubricating.

Remove rear cover and check all hydraulic tube and hose fittings for tightness.

Check electrical connections for looseness and corrosion.



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TITLE

INSTALLATION DWG

HT40KX, HT50KX

DATE

3-12-03C

SUPERCEDES

8-12-99B

SECTION

C200

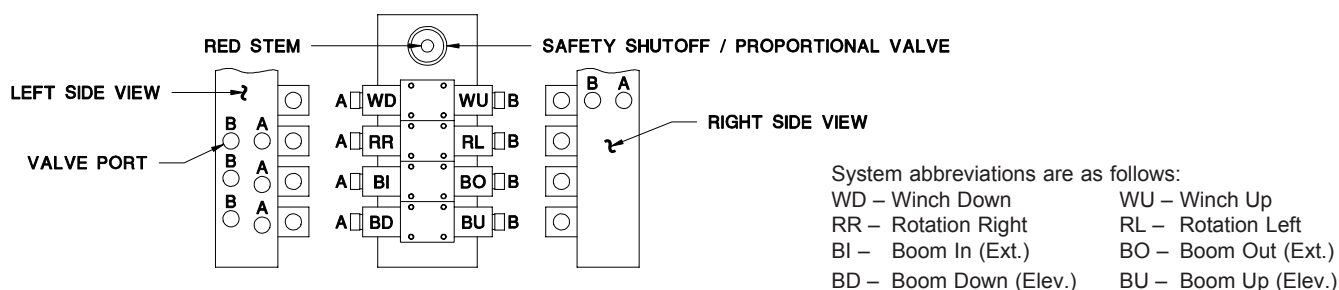
22345c

EXPLANATION OF HYDRAULIC VALVE SYSTEM

OVERVIEW

Venturo's hydraulic cranes are available in two general configurations: Proportional and Non-proportional. The **Non-proportional** configuration utilizes a safety shutoff valve which, when **not** actuated, allows hydraulic fluid to bypass the valve bank and return to tank; the crane will not function when the safety shutoff valve is not actuated. When the safety shutoff valve is actuated (control pendant energizes the coil or the coil is manually overridden), hydraulic fluid cycles through the valve bank and allows the crane to function. The **Proportional** configuration utilizes a proportional valve which in its fully closed and fully opened positions functions similarly to the safety shutoff valve, but adds the ability to operate the crane at any speed in between these two extremes.

In both the Non-proportional and Proportional configurations, the four crane functions (winch, rotation, boom elevation, and boom extension) are controlled by four separate valve sections. Each valve section has two solenoid coils (and two manual overrides) which control the direction that the function operates (e.g. winch up vs. winch down). For a given crane function and direction (e.g. winch up) the solenoid coil and the associated manual override lie on the same side of the valve bank (both "push").



MANUAL OVERRIDE SYSTEM

Should an electrical failure occur, your Venturo crane can be operated manually. **The manual overrides are intended for emergency use only and should not be used for normal operation.**

To operate in manual override mode:

- (1) Override the safety shutoff or proportional valve by turning the red stem on the valve as stated below.

Non-proportional system:

For override operation, press stem in and rotate counterclockwise until it stops.

To return to normal operation, press stem in and rotate clockwise until it stops.

Proportional system:

For override operation, rotate stem clockwise (the farther the stem is turned the faster the crane will operate).

To return to normal operation, rotate the stem counterclockwise until it stops.

- (2) Determine the coil/override associated with the function you wish to operate, then insert a small diameter object (an allen wrench works well) into the detent on the end of the valve stem and press firmly inward. For example, pushing the stem labeled A on the first bank (refer to the illustration) will actuate winch down.

WARNING! For normal crane operation, the safety shutoff or proportional valve must be in the "normal" position (as described above). Test the crane before each use by placing the power toggle switch or trigger in the "OFF" position and testing each crane function *using the manual overrides*. If any crane function operates, verify that the red stem on the safety shutoff or proportional valve is in the normal position then retest.

EMERGENCY STOP

In the unlikely event that a function of the crane does not stop once the function's toggle switch is released, the **Non-proportional** crane can be stopped by simply toggling the power switch to the off (emergency stop) position and the **Proportional** crane can be stopped by releasing the trigger.



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TITLE
HYDRAULIC SYSTEM

▲HT18, HT25, HT40/50

DATE
9-24-03B

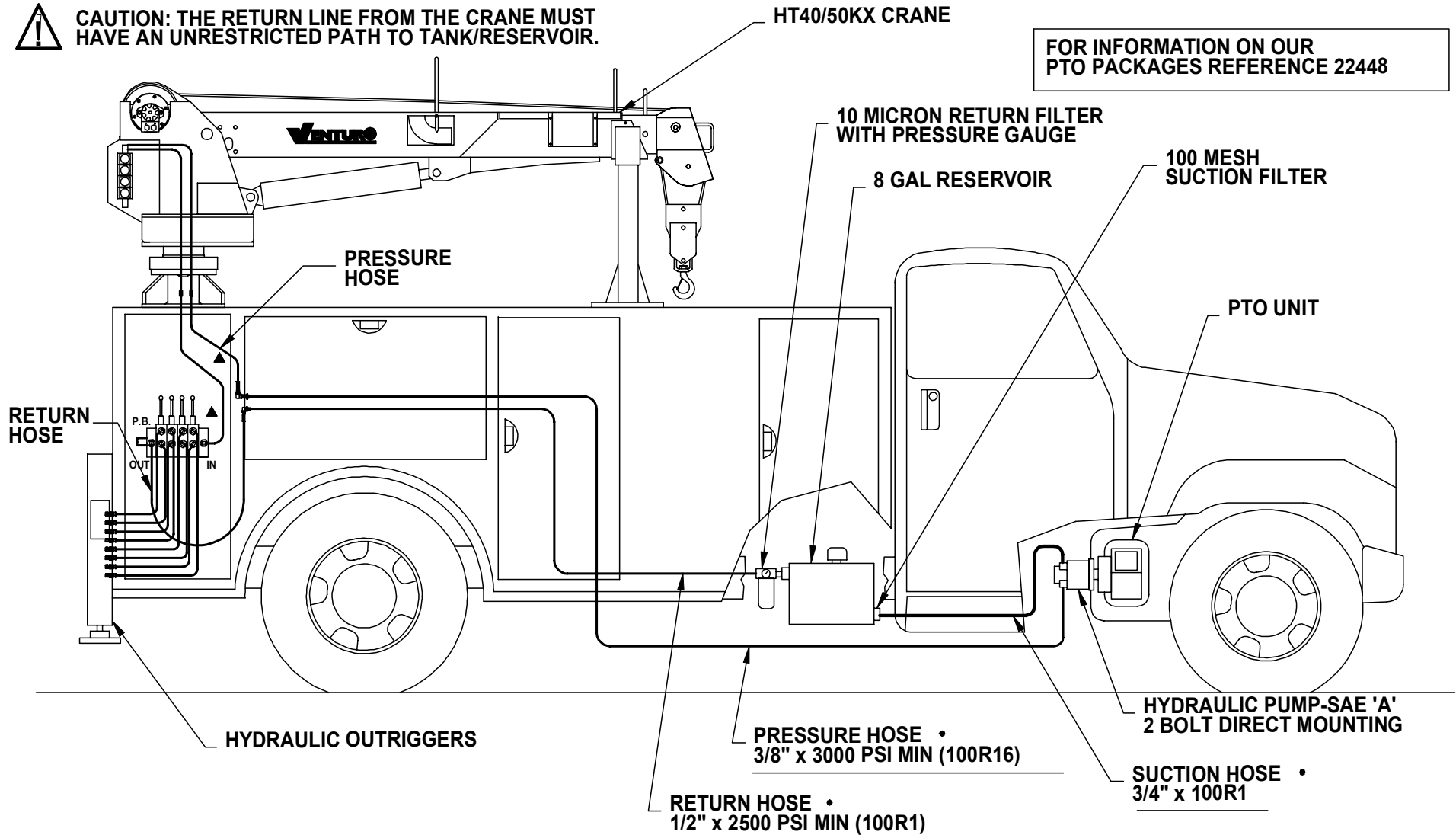
SUPERCEDES
5-1-98A

SECTION
C200

22328



CAUTION: THE RETURN LINE FROM THE CRANE MUST HAVE AN UNRESTRICTED PATH TO TANK/RESERVOIR.



HYDRAULIC REQUIREMENTS :

- HT40KX STANDARD - 2.6 GPM @ 3000 PSI (19294-2.64 PTO PACKAGE)
- HT50KX STANDARD - 3.0 GPM @ 3000 PSI (19294-2.64 PTO PACKAGE)
- HT40KX PROPORTIONAL - 5.0 GPM @ 3000 PSI (19294-5.00 PTO PACKAGE)
- HT50KX PROPORTIONAL - 6.0 GPM @ 3000 PSI (19294-5.00 PTO PACKAGE)

SEE INSTALLATION INSTRUCTIONS 22344 (2 PAGES).

*HOSES OR FITTINGS BETWEEN PUMP, RESERVOIR, AND CRANE NOT INCLUDED.



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TITLE
INSTALLATION DWG

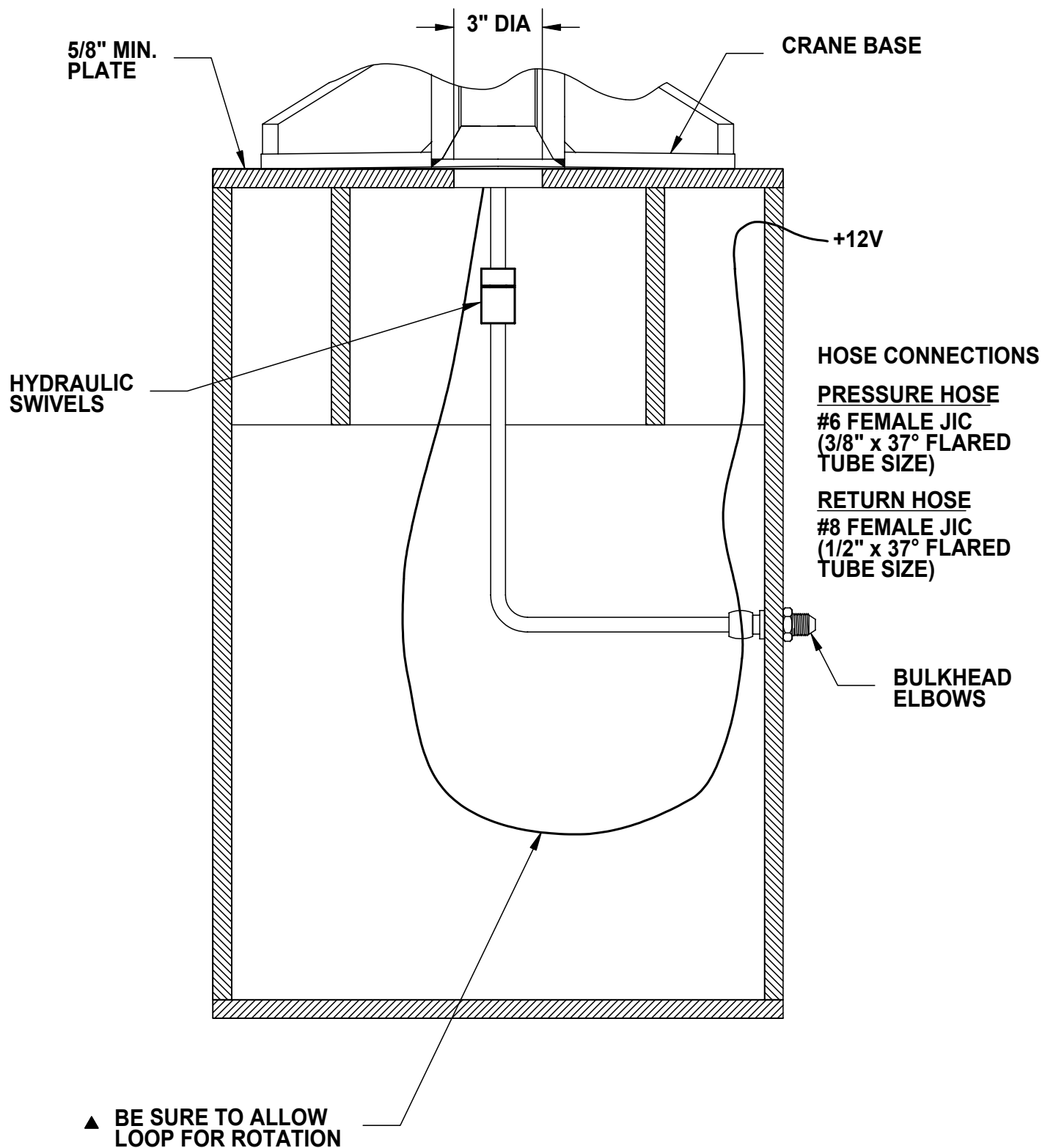
PTO INST - HT40/50

DATE
4-23-04C

SUPERSEDES
11-22-02B

SECTION
C200

22335



A diagram of a square lattice. A central circle is surrounded by a square frame. Inside the square frame, there are eight small circles arranged in a ring. A dashed diagonal line passes through the center of the central circle. Two arrows, both labeled 'A', point away from the center along the diagonal line, one towards the top-right and one towards the bottom-left.

→ **19 1/4" (SQUARE)** ←

18 3/8" (SQUARE)

SECTION A-A

14" DIA

**1 1/16" DIA HOLES
FOR 1" GRADE 5 BOLTS
-8 PLC**



TITLE

MOUNTING DIMENSIONS

DATE
1-30-98B

SUPERSEDES
12-18-97A

SECTION C200

17831

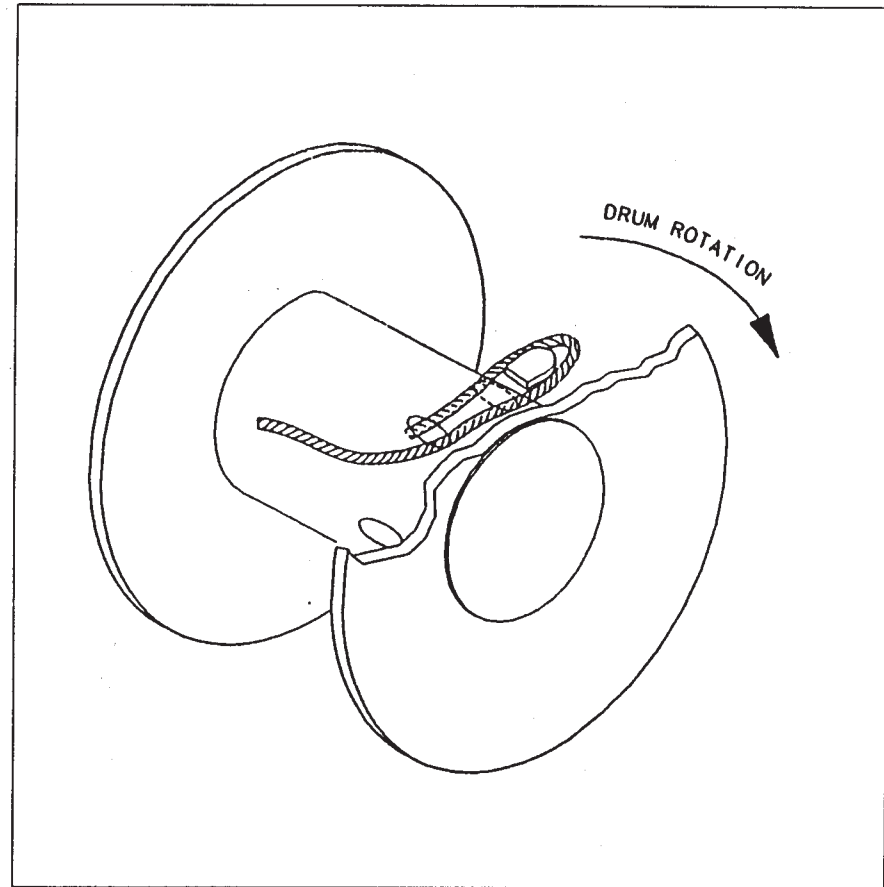
WIRE ROPE INSTALLATION

STEP 1: INSERT WIRE ROPE END THROUGH ANTI-TWO-BLOCKWEIGHT.

STEP 2: INSERT WIRE ROPE END INTO POCKET OPENING AND THROUGH WEDGE POCKET.

CAUTION: IF THE WIRE ROPE IS NOT INSTALLED FOR THE CORRECT DRUM ROTATION, THE WINCH BRAKE VALVE WILL NOT HOLD THE LOAD.

▲ NOTE: ON THE ET25K(X) A 7/16" HEX NUT WILL BE USED IN LIEU OF A WEDGE.



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
WIRE ROPE INSTALLATION DRAWING

ET/HT25K(X), HT40KX, HT50KX

DATE
11-22-02D

SUPERCEDES
4-19-02C

SECTION
C200

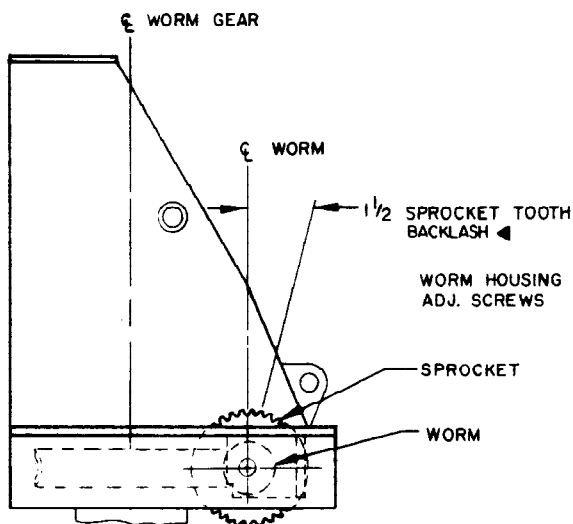
22245

SECTION 300

MAINTENANCE

&

SERVICE



HEIGHT CHECK- PLACE MEASURING BLOCK OR STRAIGHT EDGE ON BOTTOM OF WORM GEAR. MEASURE OFFSET BETWEEN THE BOTTOM OF THE WORM GEAR AND THE NOTCH IN THE BEARING BLOCK.

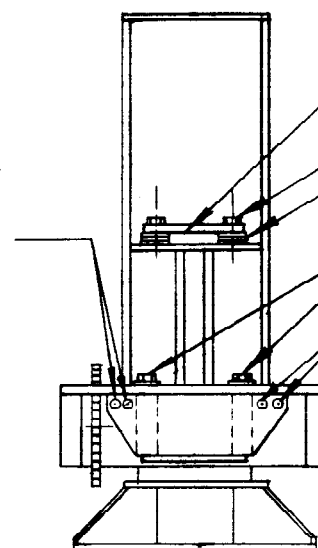
HEIGHT ADJUSTMENT- IF OFFSET IS $\frac{1}{32}$ " OR LESS, THEN HEIGHT ADJUSTMENT IS REQUIRED.

ADJUSTMENT METHOD- LOOSEN QUILL HOLD DOWN BOLTS (2 PLACES). REMOVE SHIMS TO INCREASE OFFSET TO $\frac{1}{16}$ ".

ALTERNATE HEIGHT ADJUSTMENT METHOD

USE 15998-3 GAGE TO SET DISTANCE BETWEEN GEAR & HOUSING TO .710/.705.

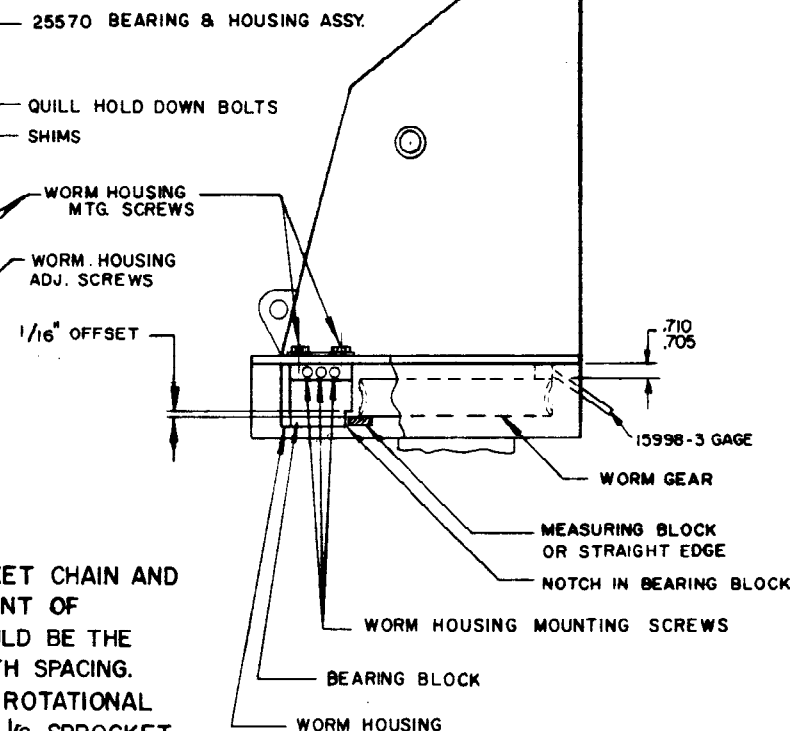
NOTE: BEFORE CHECKING BACKLASH, CHECK WORM END PLAY AS DESCRIBED ON DRAWING 14553 AND ADJUST END PLAY IF NECESSARY.



BACKLASH CHECK- REMOVE SPROCKET CHAIN AND CHECK FREE ROTATIONAL MOVEMENT OF SPROCKET. FREE MOVEMENT SHOULD BE THE DISTANCE OF $\frac{1}{2}$ SPROCKET TOOTH SPACING.

BACKLASH ADJUSTMENT- IF FREE ROTATIONAL MOVEMENT IS GREATER THAN $\frac{1}{2}$ SPROCKET TOOTH, THEN THE DISTANCE BETWEEN THE CENTERLINES OF THE WORM GEAR AND THE WORM SHOULD BE DECREASED. IF THE FREE MOVEMENT IS LESS THAN $\frac{1}{2}$ TOOTH, THEN CENTERLINE DISTANCE SHOULD BE INCREASED.

ADJUSTMENT METHOD- LOOSEN WORM HOUSING MOUNTING SCREWS (7 PLACES). MOVE WORM HOUSING TOWARDS, OR AWAY FROM CENTERLINE OF WORM GEAR WITH THE WORM HOUSING ADJUSTMENT SCREWS. TIGHTEN WORM HOUSING, AND RECHECK BACKLASH. THE FREE MOVEMENT SHOULD BE EQUAL TO $\frac{1}{2}$ SPROCKET TOOTH SPACING.



ADJUSTMENT OF WORM HEIGHT AND BACKLASH



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
ASSEMBLY & SERVICE INST.

ET 20,000, ET20K(X), ET25K(X), HT25K(X), HT40/50KX ▲

DATE
1-19-00D

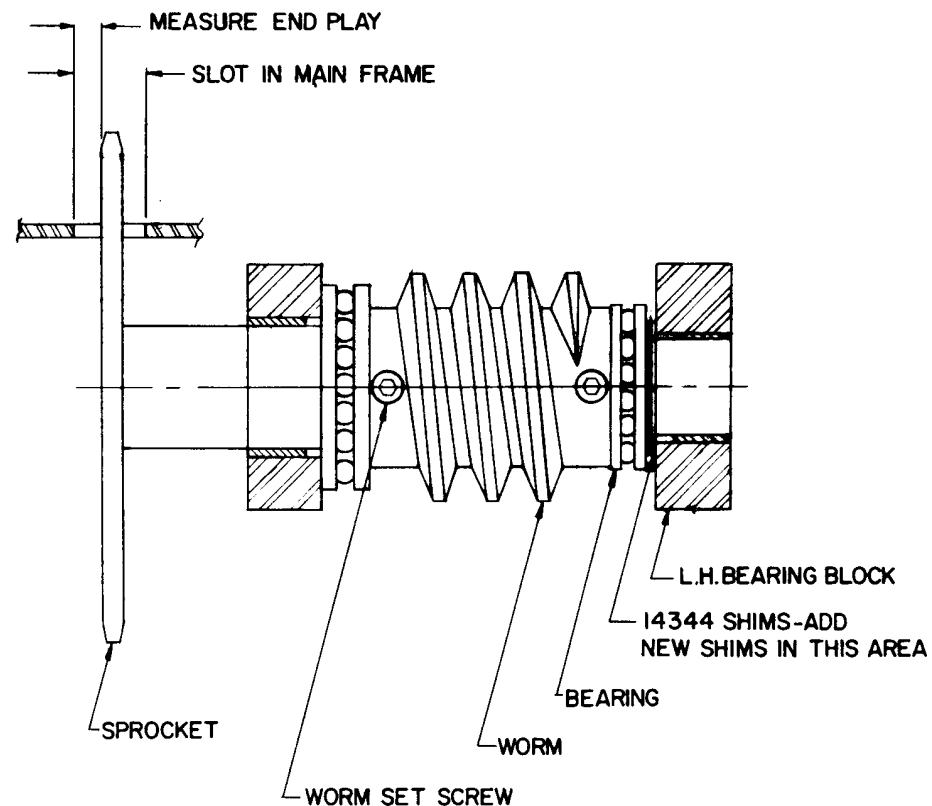
SUPERCEDES
8-10-98C

SECTION
C320

14544

END PLAY CHECK - REMOVE LOWER COVER & SIDE COVER. TO CHECK WORM END PLAY, APPLY TORQUE TO CRANE BY PUSHING IN OPPOSITE DIRECTIONS ON BOOM. IF END PLAY IS MORE THAN .005" THEN ADJUSTMENT IS REQUIRED. MEASURE END PLAY WITH CALIPERS BETWEEN OUTSIDE FACE OF SPROCKET & SPROCKET SLOT IN MAIN FRAME.

END PLAY ADJUSTMENT - REMOVE DRIVE CHAIN, THEN REMOVE WORM & WORM HOUSING AS ONE UNIT. LOOSEN WORM SET SCREWS & PUSH WORM SHAFT OUT OF L.H. BEARING BLOCK. PLACE ADDITIONAL SHIMS (P/N 14344) AS DETERMINED BY END PLAY CHECK. (NOTE: THE SHIM ARE .005" THK.) PUSH WORM SHAFT BACK IN L.H. BEARING BLOCK & TIGHTEN WORM SET SCREWS. INSTALL WORM HOUSING ASSEMBLY TO MAIN FRAME. ADJUST BACKLASH PER DWG. 14544. REPLACE DRIVE CHAIN & COVERS.



ADJUSTMENT OF ROTATION WORM END PLAY



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
ASSEMBLY & SERVICE INST.

ET 20,000 CRANE

DATE
8-10-98B

SUPERCEDES
3-10-82A

SECTION
C320

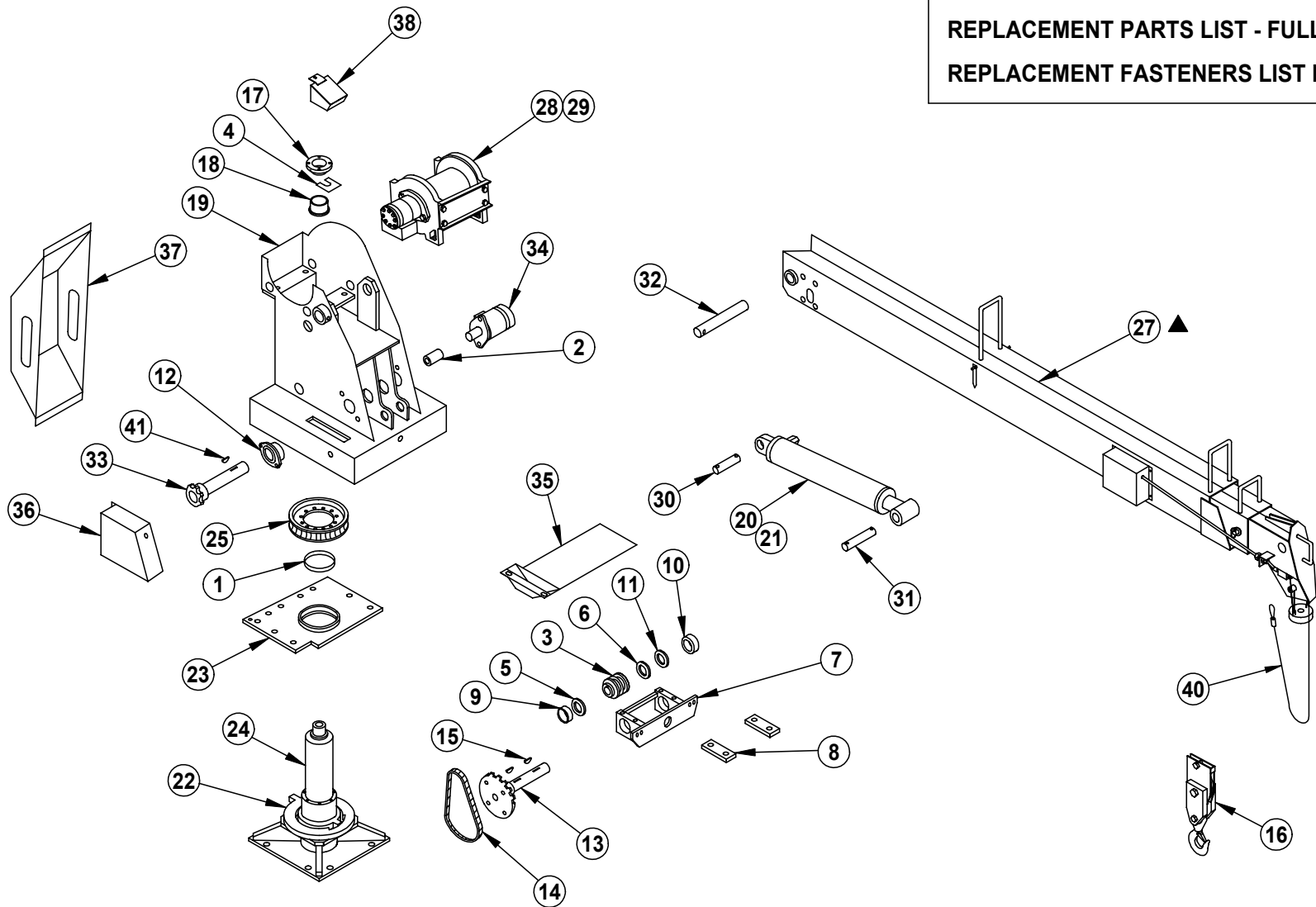
14553


SECTION 400

PARTS



REPLACEMENT PARTS LIST - REF 22517 ▲
 REPLACEMENT PARTS LIST - FULL POWER BOOM 22572
 REPLACEMENT FASTENERS LIST REF 22518 ▲



ITEM #	PART #	DESCRIPTION	ITEM #	PART #	DESCRIPTION
1	22017	LOWER BEARING - 8" OD x 1.5" LONG	41	26404	WOODRUFF KEY - 1/4" x 1" (MODIFIED)
2	14084	COUPLING	42	-	-
3	14142-4	WORM - SINGLE THREAD RH	43	-	-
4	14159	SHIM - 1-1/2" SQ x .015", .042", .105"	44	-	-
5	14191-1	BALL THRUST BEARING - 2" ID x 3-11/32" OD	45	-	-
6	14191-2	BALL THRUST BEARING - 1-1/2" ID x 2-19/32" OD	46	-	-
7	14242	HOUSING, WORM GEAR	47	-	-
8	14245	WASHER PLATE	48	-	-
9	14341-1	BUSHING - 2.003" ID x 2.252" OD x 15/16" LONG	49	-	-
10	14341-2	BUSHING - 1.503" ID x 1.752" OD x 1" LONG	50	-	-
11	14344	SHIM WASHER - 1-1/2" ID x 2-1/8" OD x .005", .015", .031" THK	51	22494	FIELD SERVICE LABEL KIT - HT40KX NON-PROP.
12	22468	HD STEEL FLANGE MOUNTED BALL BEARING - 1" BORE	52	22494-1	FIELD SERVICE LABEL KIT - HT40KX PROPORTIONAL
13	14384	SPROCKET AND SHAFT ASSEMBLY (40T SPROCKET)	53	22495	FIELD SERVICE LABEL KIT - HT50KX NON-PROP.
14	14481	ROTATION DRIVE CHAIN	54	22495-1	FIELD SERVICE LABEL KIT - HT50KX PROPORTIONAL
15	15245	WOODRUFF KEY - 5/16" x 1-1/8" (MODIFIED)	55	-	-
16	17770	HEADACHE BALL ASSEMBLY	56	-	-
17	18068	BEARING HOUSING - 1-1/8" LONG	57	-	-
18	18069	FLANGED BEARING - 2" BORE x 3" OD FLANGE	58	-	-
19	22006	WELDED HOUSING ASSEMBLY	59	-	-
20	22021-1	ELEV. CYL. 4.5" BORE x 2" ROD x 19.63" STROKE	60	-	-
21	22022-1	ELEV. CYL. 5" BORE x 2" ROD x 19.63" STROKE	61	-	-
22	22024	STOP RING - ROTATION	62	-	-
23	22026	LOWER BEARING PLATE ASSEMBLY	63	-	-
24	22030	QUILL ASSEMBLY	64	-	-
25	22041	WORM GEAR - ROTATION	65	-	-
26	24524	BOOM ASSEMBLY - HT40/50KX	66	-	-
27	▲ 24550	FULL POWER BOOM ASSEMBLY - HT40/50KXX	67	-	-
28	22266	WINCH - 3000 LB (SINGLE LINE) - HT40KX	68	-	-
29	22268	WINCH - 4000 LB (SINGLE LINE) - HT50KX	69	-	-
30	22274	PIVOT PIN, CYL TAIL - 1-1/2" OD x 2-13/16" LONG	70	-	-
31	22275	PIVOT PIN, CYL ROD - 1-1/2" OD x 6-7/8" LONG	71	-	-
32	22290	PIVOT PIN, BOOM - 1-3/4" OD x 12-1/2" LONG	72	-	-
33	22291	SPROCKET AND SHAFT ASSEMBLY (10T SPROCKET)	73	-	-
34	22294	HYDRAULIC MOTOR - ROTATION	74	-	-
35	22298	LOWER COVER	75	-	-
36	22303	CHAIN COVER	76	-	-
37	22322	VALVE COVER ASSEMBLY	77	-	-
38	22387	RAIN COVER - QUILL	78	-	-
39	-	-	79	-	-
40	17094-3/8-100	WIRE ROPE ASSEMBLY - 3/8" x 100 FT	80	-	-
 ITEM NOT SHOWN ON REPLACEMENT PARTS DRAWING REPLACEMENT PARTS DWG REF 22346					



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS

HT40KX, HT50KX

DATE
3-4-03C

SUPERCEDES
10-29-01B

SECTION
C400

22517

FASTENER LIST FOR HT40/50KX

PART NUMBER	DESCRIPTION	QTY	LOCATION/FUNCTION
14353 ▲	COIL PIN - 1/2" x 1-1/2"	10	BASE PLATE
!HHCS05013150	HHCS - 1/2"-13 x 1-1/2"	10	BASE PLATE
!LWSH-050	LOCK WASHER - 1/2"	10	BASE PLATE
18927	CAPSCREW - MODIFIED	12	BULL GEAR
!LWSH-050-HC	LOCK WASHER - 1/2" HI COLLAR	12	BULL GEAR
!HHCS06311175	HHCS - 5/8"-11 x 1-3/4"	4	WORMHOUSING
!LWSH-063	LOCK WASHER - 5/8"	4	WORMHOUSING
!SHCS05020125	SHCS - 1/2"-20 x 1-1/4"	2	WORMHOUSING
25593	SET SCREW - FLAT FACE 1/2"-20 x 1"	5	WORMHOUSING
!HHCS02520063-5	HHCS 1/4"-20 x 5/8"	7	LOWER CHAIN COVER
!LWSH-025	LOCK WASHER - 1/4"	7	LOWER CHAIN COVER
!UNUT15195-1420	FASTENER, U-NUT, 1/4"-20	7	LOWER CHAIN COVER
!HHCS02520063-5	HHCS 1/4"-20 x 5/8"	2	SIDE CHAIN COVER
!HHCS02520375	HHCS - 1/4"-20 x 3-3/4"	1	SIDE CHAIN COVER
!HNUT-02520	HEX NUT - 1/4"-20	1	SIDE CHAIN COVER
!LWSH-025	LOCK WASHER - 1/4"	3	SIDE CHAIN COVER
!HHCS02520063-5	HHCS - 1/4"-20 x 5/8"	4	VALVE BACK COVER
!LWSH-025	LOCK WASHER - 1/4"	4	VALVE BACK COVER
!SHCS03816350	SHCS - 3/8"-16 x 3-1/2"	2	VALVE BANK
!HNUT-03816	HEX NUT - 3/8"-16	2	VALVE BANK
!LWSH-038-HC	LOCK WASHER - 3/8" HI COLLAR	2	VALVE BANK
12534-4	BUSHING - 1/2" I.D. x 7/8" O.D. x 14 GA	4	VALVE BANK
!RPIN-025200	ROLL PIN - 1/4" DIA x 2" LONG	4	ELEVATION CYLINDER PINS
!HHCS03816125	HHCS - 3/8"-16 x 1-1/4"	2	ROTATION SHAFT BEARING
!HWSH-038SAE	HEX WASHER - SAE 3/8"	2	ROTATION SHAFT BEARING
!LWSH-038	LOCK WASHER - 3/8"	2	ROTATION SHAFT BEARING
!HNUT-03816	HEX NUT - 3/8"-16	2	ROTATION SHAFT BEARING
!HHCS03118100-5	HHCS - 5/16"-18 x 1-1/2"	1	SUPPORT-ROTATION BEARING
!HNUT-03118	HEX NUT - 5/16"-18	1	SUPPORT-ROTATION BEARING
!HHCS05013175	HHCS - 1/2"-13 x 1-3/4"	2	ROTATION MOTOR
!LWSH-050-STAR	LOCK WASHER - 1/2" STAR	2	ROTATION MOTOR
!LWSH-050	LOCK WASHER - 1/2"	2	ROTATION MOTOR
!HNUT-05013	HEX NUT - 1/2"-13	2	ROTATION MOTOR
!HHCS05013225	HHCS - 1/2"-13 x 2-1/4"	4	WINCH
!LWSH-050	LOCK WASHER - 1/2"	4	WINCH
!FWSH-050	FLAT WASHER - 1/2"	4	WINCH
!HNUT-05013	HEX NUT - 1/2"-13	4	WINCH
19269	CLAMP, CABLE - 1/4"	1	PRESSURE SWITCH HARNESS
!HHCS02520063-5	HHCS - 1/4"-20 x 5/8"	1	PRESSURE SWITCH HARNESS
!LWSH-025	LOCK WASHER - 1/4"	1	PRESSURE SWITCH HARNESS
!HHCS05013125-5	HHCS - 1/2"-13 x 1-1/4"	4	UPPER BEARING
!LWSH-050	LOCK WASHER - 1/2"	4	UPPER BEARING
!HHCS03816100	HHCS - 3/8"-16 x 1"	4	WINCH (BACK SIDE)
!FWSH-038	FLAT WASHER - 3/8"	4	WINCH (BACK SIDE)
!LWSH-038	LOCK WASHER - 3/8"	4	WINCH (BACK SIDE)
19271-2	PLASTIC PLUG - 2-1/8" DIA	2	WINCH ACCESS HOLES
!HHCS05013300	HHCS - 1/2"-13 x 3"	1	BOOM PIVOT PIN
RL-644	INSULATING PLUG - 1"	4	LOWER HOUSING
!LNUT-05013	LOCK NUT - 1/2"-13 NYLON INSERT	1	BOOM PIVOT PIN
!HHCS02520075-5	HHCS - 1/4"-20 x 3/4"	1	GROUND SCREW
!PHCS#1024050	PHCS - #10-24 x 1/2"	2	CIRCUIT BREAKER
!LWSH-#10	LOCK WASHER - #10	2	CIRCUIT BREAKER
!PHCS#0632100	PHCS - 6-32 x 1"	2	TERMINAL BLOCK
!PHCS03816050	PHCS - 3/8"-16 x 1/2"	1	COUPLING FOR MASTER BYPASS VALVE
-	-	-	-

REPLACEMENT PARTS DWG REF 22346

SERIAL NO. 84030 & UP
SERIAL NO. 85030 & UP



MFG., INC.
CINCINNATI, OHIO

TITLE
REPL. FASTENERS LIST

HT40KX, HT50KX

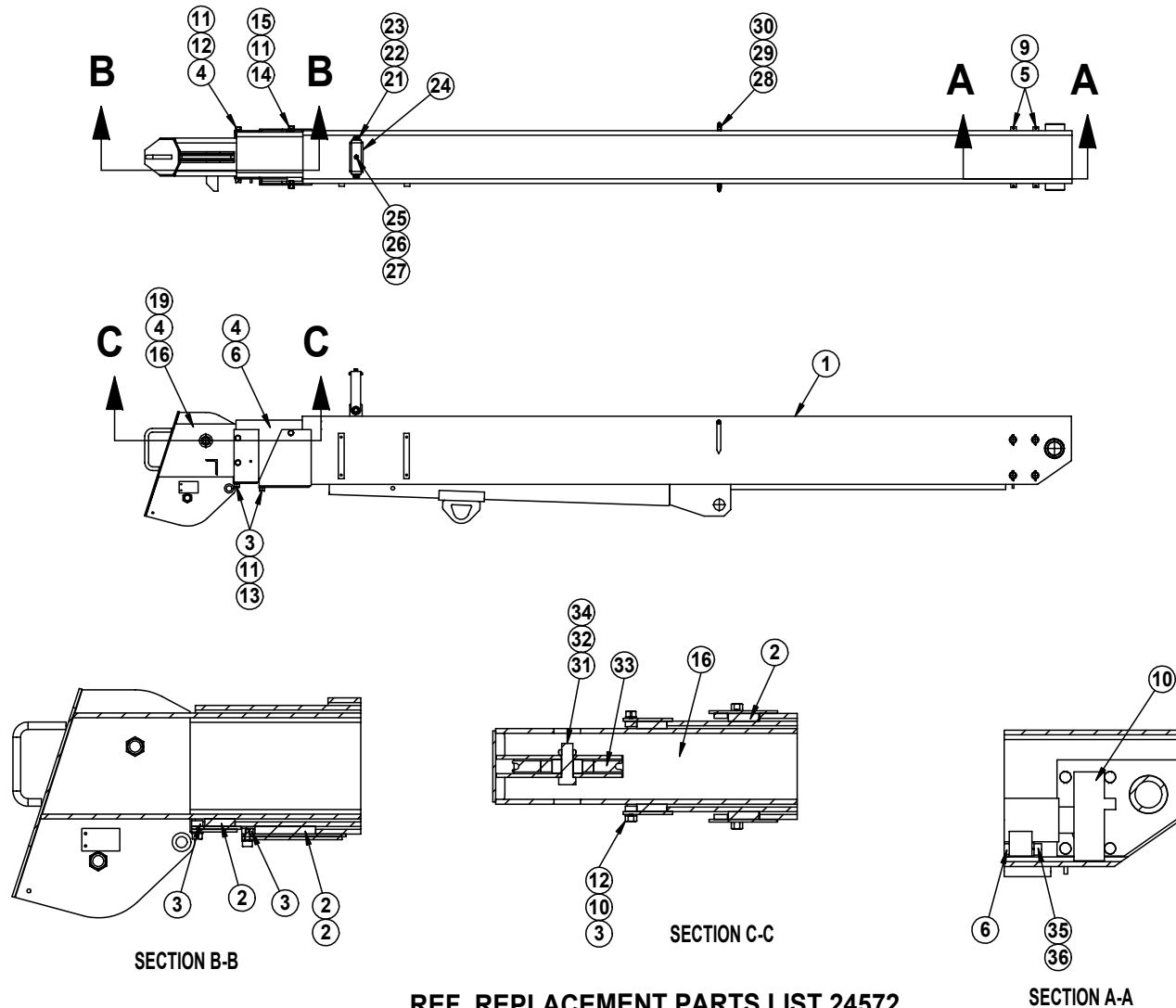
DATE
7-17-00B

SUPERCEDES
6-8-98A

SECTION
C400

22518

24550 BOOM PARTS DRAWING



REF. REPLACEMENT PARTS LIST 24572

VENTURO MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
24550 BOOM PARTS DRAWING

HT40/50KXX

DATE
3-4-03

SUPERSEDES
-

SECTION
C400

24571

		MANUAL EXTENSION				FULL POWER EXTENSION				MANUAL EXTENSION		FULL POWER EXTENSION			
19	2	+	+	18957	BEARING PAD - SIDE FRONT	-	-								
18	1		+	24568	PIN - CYLINDER	38	1		+	24566	* EXTENSION CYLINDER				
17	2		+	24558	PIN BLOCK	38	1	+		22032-2	* EXTENSION CYLINDER				
16	1		+	24556-2	TERTIARY BOOM TUBE ASSEMBLY	37	8	+	+	!CACS06318100	COUNTERSUNK ALLEN HEAD CAP SCREW 5/8-18 X 1" LONG				
16	1	+		24556-1	TERTIARY BOOM TUBE ASSEMBLY	36	2	+	+	!LOWSH-050	LOCK WASHER - 1/2-13				
15	2	+	+	!HNUT-03816	HEX NUT - 3/8-16	35	2	+	+	!SHCS05013250	SOCKET HEAD CAP SCREW - 1/2-13 X 2-1/2" LONG				
14	2	+	+	!HHCS03816038	NEX HEAD CAP SCREW - 3/8-16 X 3/8" LONG	34	2	+	+	!JNUT-07510N	NYLON LOCK - JAMNUT - 3/4-10				
13	4	+	+	!HHCS03816075	HEX HEAD CAP SCREW - 3/8-16 X 3/4" LONG	33	2	+	+	23928	BOOM SHEAVE WITH BUSHING				
12	4	+	+	!HHCS03816063	HEX HEAD CAP SCREW - 3/8-16 X 5/8" LONG	32	2	+	+	17059-1	SHEAVE AXLE				
11	10	+	+	!LWSH-038	LOCK WASHER - 3/8"	31	1	+	+	23929	SPACER - 23927 & 23928 POLY SHEAVES				
10	1	+	+	24566	EXTENSION CYLINDER	30	2	+	+	!ANUT-02520S	ACORN NUT - 1/4-20 STAINLESS				
9	8	+	+	!RPIN-019125	ROLL PIN 3/16" DIA X 1-1/4" LONG	29	2	+	+	13459-2	BOOM ARROW 4-7/16" LONG				
8	4	+	+	24519	SIDE, REAR BEARING	28	2	+	+	22490	SPACER, BOOM ARROW 1/2" O.D.				
7	1	+	+	24559	NUT BAR	27	1	+	+	!HNUT-02520	HEX NUT 1/4-20				
6	1		+	24554-2	SECONDARY BOOM TUBE ASSEMBLY	26	1	+	+	!LWSH-025	LOCK WASHER - 1/4"				
6	1	+		24554-1	SECONDARY BOOM TUBE ASSEMBLY	25	1	+	+	!HHCS02520075	HEX HEAD CAP SCREW - 1/4-20 X 3/4" LONG				
5	4	+	+	22239	THRUST PIN - 3/4 X 8	24	1	+	+	19881	CABLE GUIDE WEAR STRIP				
4	-	+	+	-	-	23	2	+	+	!JNUT-05013N	1/2-13 NYLON INSERT JAM NUT				
3	4	+	+	24522	LOWER FRONT NUTBAR	22	1	+	+	!FWSH-050	FLAT WASHER - 1/2"				
2	9	+	+	24562	BEARING	21	2	+	+	!HHCS05013100	HEX HEAD CAP SCREW - 1/2-13NC X 1" LONG				
1	1	+	+	24552	PRIMARY BOOM FINAL ASSEMBLY	20	1	+	+	19880	CABLE GUIDE STRUCTURE				
ITEM	QTY			PART NO.	DESCRIPTION	ITEM	QTY			PART NO.	DESCRIPTION				

* ITEMS NOT SHOWN ON DWG. 24571

**TITLE**

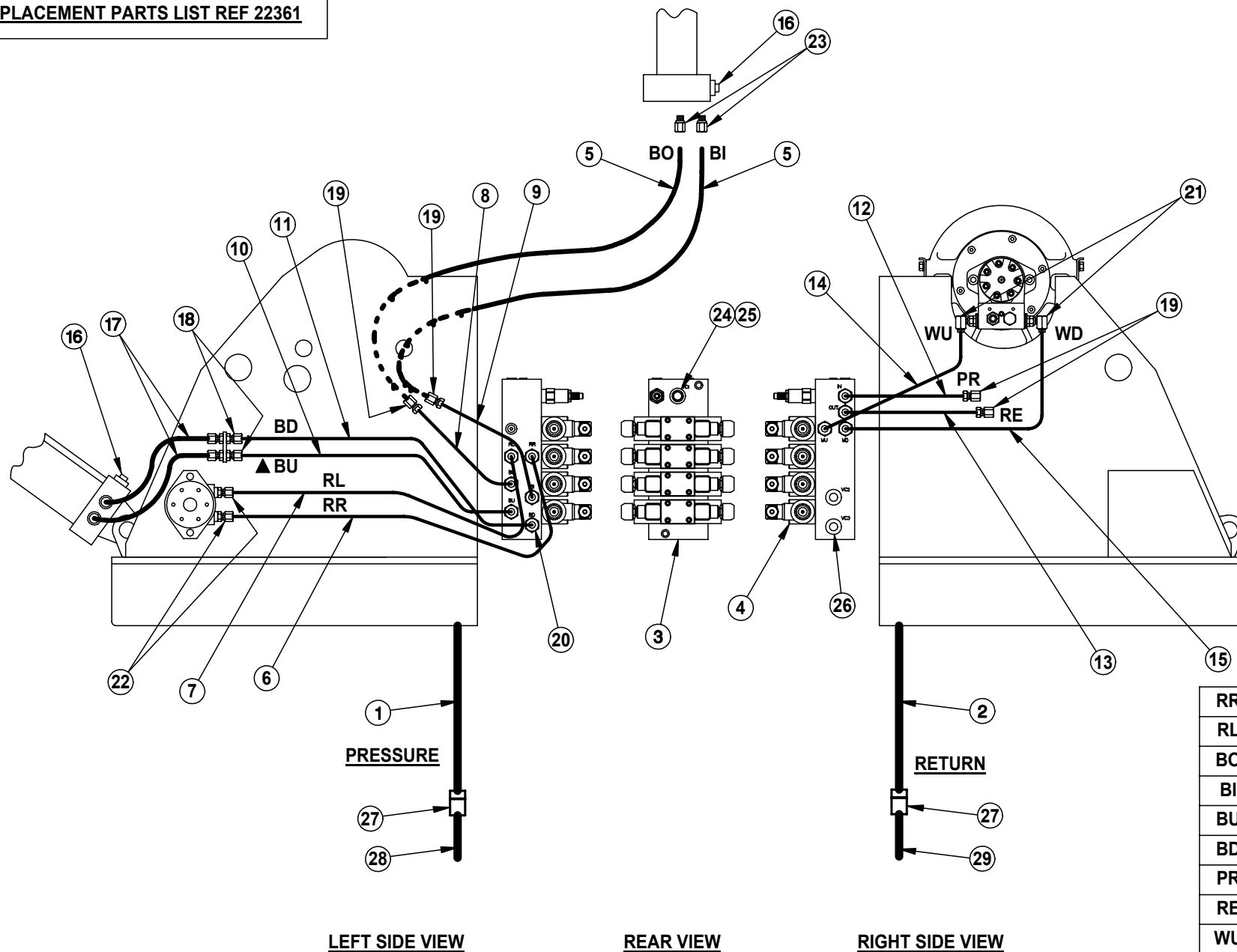
HT40/50KXX

SECTION

SUPERSEDES

24572

REPLACEMENT PARTS LIST REF 22361



RR	ROTATION RIGHT
RL	ROTATION LEFT
BO	BOOM OUT
BI	BOOM IN
BU	BOOM UP
BD	BOOM DOWN
PR	PRESSURE
RE	RETURN
WU	WINCH UP
WD	WINCH DOWN



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DRAWING

HT40/50KX HYDRAULIC COMPONENTS

DATE
10-10-02

SUPERSEDES
-

SECTION
C400

20699

HYDRAULIC SYSTEM COMPONENTS - HT40/50KX CRANES

REPLACEMENT PARTS LIST

ITEM	PART NUMBER	DESCRIPTION
1	20685	PRESSURE HOSE - HOUSING SIDE
2	20686	RETURN HOSE - HOUSING SIDE
3	22501	VALVE BANK - HT40KX, HT50KX
4	22523	VALVE ASSEMBLY (VALVE BLOCK, VALVE, COIL, & HARDWARE)
	22362	COIL ONLY
5	22363	EXTENSION CYLINDER HOSE
6	22505	HYD TUBING - ROTATION RIGHT
7	22506	HYD TUBING - ROTATION LEFT
8	22507	HYD TUBING - BOOM OUT
9	22508	HYD TUBING - BOOM IN
10	22509	HYD TUBING - BOOM UP
11	22510	HYD TUBING - BOOM DOWN
12	22511	HYD TUBING - PRESSURE
13	22512	HYD TUBING - RETURN
14	22513	HYD TUBING - WINCH UP
15	22514	HYD TUBING - WINCH DOWN
16	19247	COUNTERBALANCE VALVE (ELEVATION & EXTENSION CYLINDERS)
17	22382	ELEV CYLINDER HOSE - 22" x 6MBX x 6FJX
18	HBLK6MJ-6MJ	HYD BULKHEAD
19	HBLK6MJ-6MJ-90	HYD BULKHEAD UNION ELBOW WITH LOCK NUT - 6MJ x 90°
20	HNPL6MJ-6MO	HYD NIPPLE
21	HELB8MO-6MJ-90	HYD ELBOW
22	HNPL10MO-6MJ	HYD NIPPLE
23	HRDB6MO-4FP	HYDRAULIC BUSHING - 6MO-4FP
24	22502	PROPORTIONAL VALVE
25	22503	MASTER BYPASS VALVE AND COIL
26	22312-X.XX	PRIORITY FLOW CART (X.XX REFER TO CHART BELOW)
27	20684	LIVE CONTINUOUS HYDRAULIC SWIVEL
28	20687	PRESSURE HOSE - COMPARTMENT SIDE
30	20688	RETURN HOSE - COMPARTMENT SIDE

REPLACEMENT PARTS DWG REF 20699

STANDARD (NON-PROP)	PROPORTIONAL
------------------------	--------------

HT40	EXTENSION	1.25	2.25
	ELEVATION	1.75	4.00
HT50	EXTENSION	1.25	2.25
	ELEVATION	2.25	4.00

SERIAL NO. 84030 & UP
SERIAL NO. 85030 & UP



MFG., INC.
CINCINNATI, OHIO

TITLE
REPL. PARTS LIST

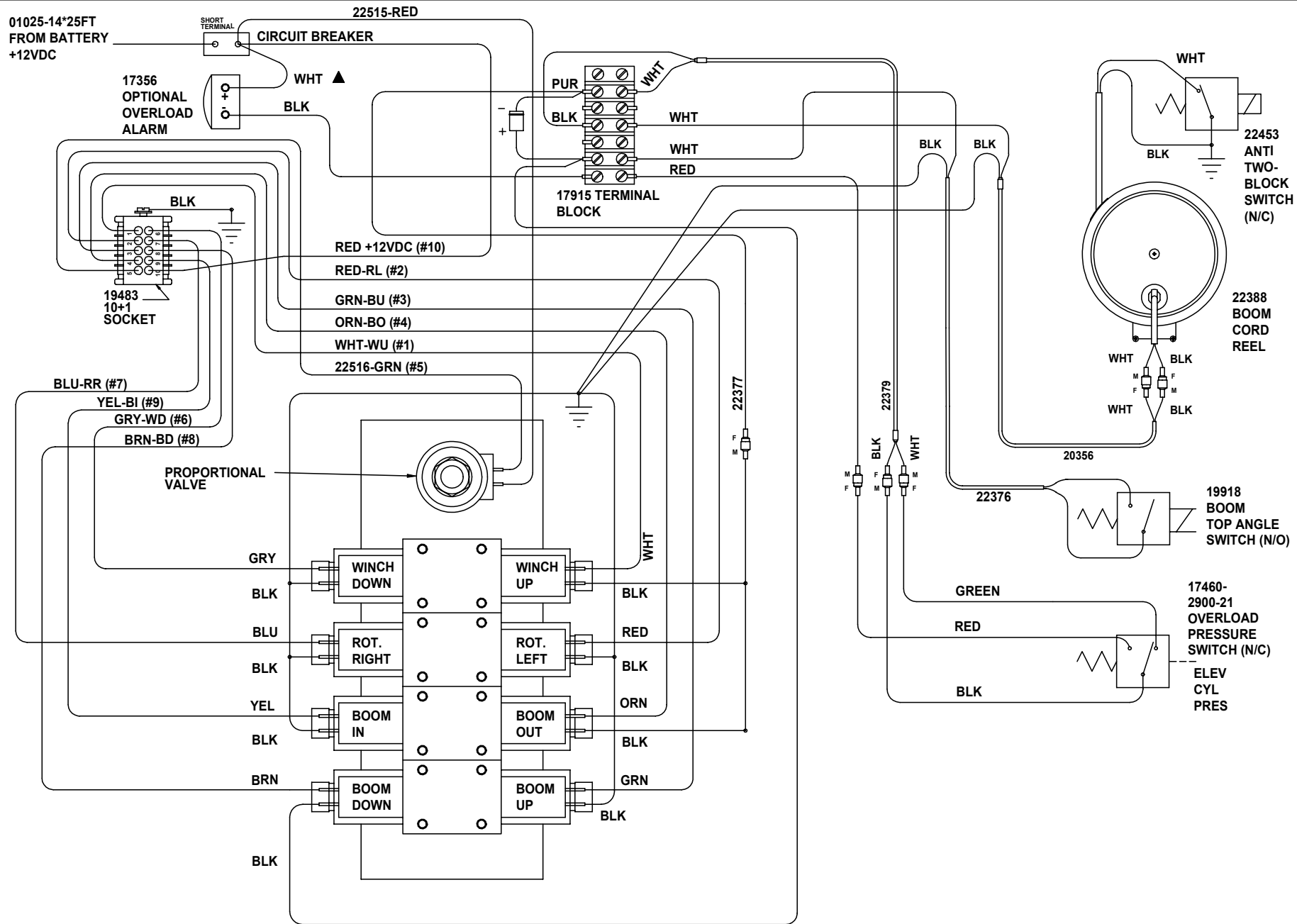
HT40/50KX

DATE
10-10-02

SUPERCEDES
-

SECTION
C400

20930



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
WIRING DIAGRAM

HT40/50KX - PROP (NO ENGINE CONTROLS)

DATE
10-7-03D

SUPERSEDES
12-17-02C

SECTION
C400

22657

PROPORTIONAL IN-COMPARTMENT CONTROLS (NO ENGINE CONTROLS)

FROM "IN COMPARTMENT"
SOCKET

20074

THESE WIRES CONNECTED
TO VALVE BANK

YELLOW (WU)

RED (RL)

GREEN (BU)

ORANGE (BO)

20354 (GROUND WIRE)
IN-COMPARTMENT
GROUND BOLT



YELLOW/BLK (WD)

RED/BLK (RR)

GRN/BLK (BD)

ORANGE/BLK (BI)

BLACK (TRIGGER)

BLUE (+12V)

22502
PROPORTIONAL
VALVE

15683-15A
CIRCUIT
BREAKER

19483
10+1 SOCKET

NOTE: BLUE/BLK WIRE OF
20074 HARNESS NOT USED

CUT RED WIRE AND
INSTALL MASTER
TOGGLE SWITCH AT
SWITCH BRACKET

#14 GAGE RED 12V SOURCE/BATTERY 01025-14*25

INSTALL TWO #10 RING TERMS

19464 SPST SWITCH

#14 GAGE RED 12V SOURCE/BATTERY 01025-14*25

TO BATTERY



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE

PROP W/ IN-COMP CTRLS (NO ENG CTRL)

▲
HT18/25/40/50 CRANES

DATE

4-5-04B

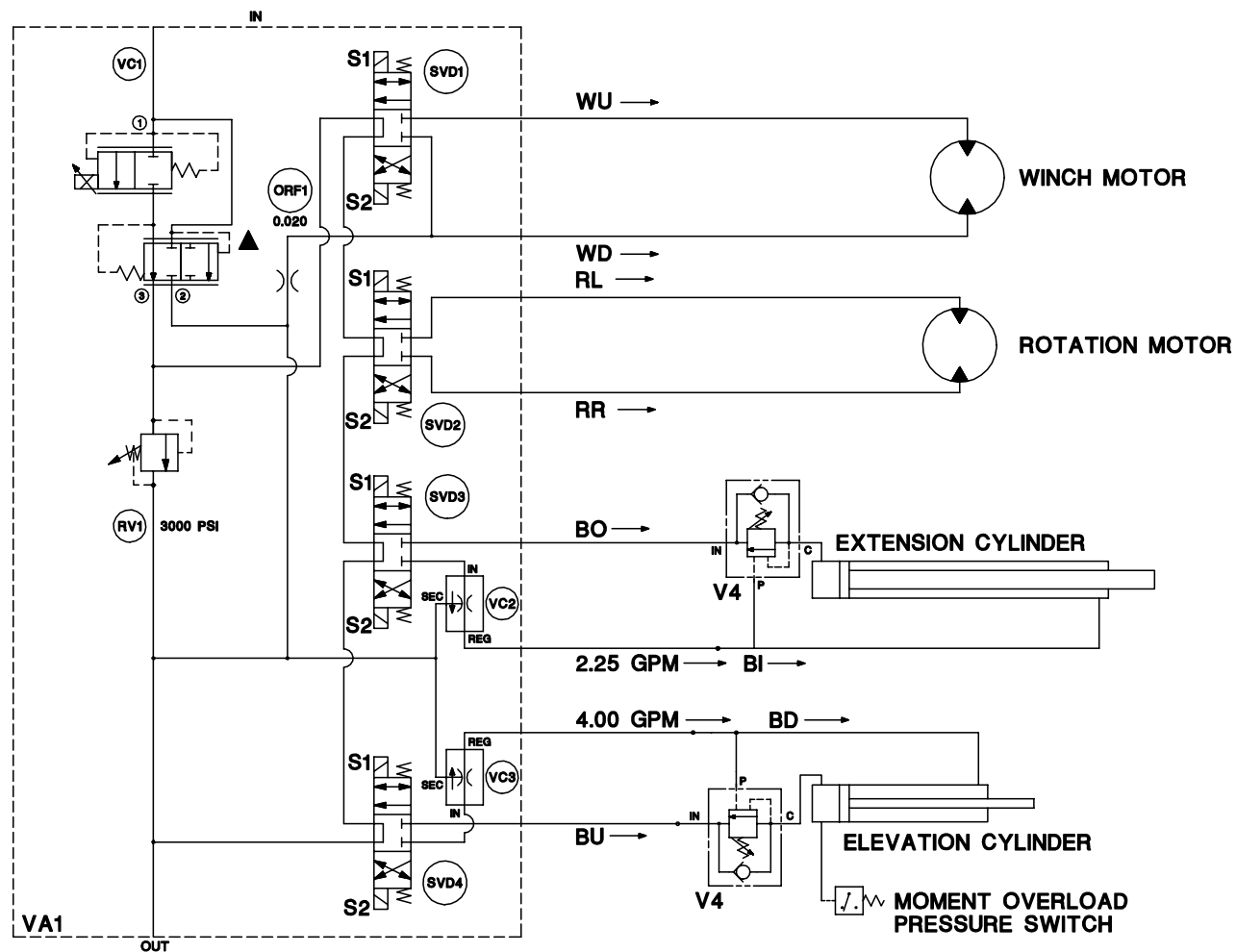
SUPERSEDES

9-26-03A

SECTION

-

20353



- | | |
|------|---|
| VA1 | CONTROL VALVE ASSY |
| RV1 | INLET RELIEF VALVE (3000 PSI) |
| SVD1 | 3 POSITION-4 WAY VALVE |
| SVD2 | 3 POSITION-4 WAY VALVE |
| SVD3 | 3 POSITION-4 WAY VALVE |
| SVD4 | 3 POSITION-4 WAY VALVE |
| V4 | COUNTERBALANCE CARTRIDGE VALVE |
| VC1 | PROPORTIONAL CONTROL VALVE (SIMPLIFIED REP) |
| VC2 | PRIORITY FLOW REGULATOR VALVE |
| VC3 | PRIORITY FLOW REGULATOR VALVE |

SERIAL NO. 84030 & UP
SERIAL NO. 85030 & UP



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
HYDRAULIC SYSTEM DIAGRAM

HT40KX & HT50KX W/ PROP. CONTROL

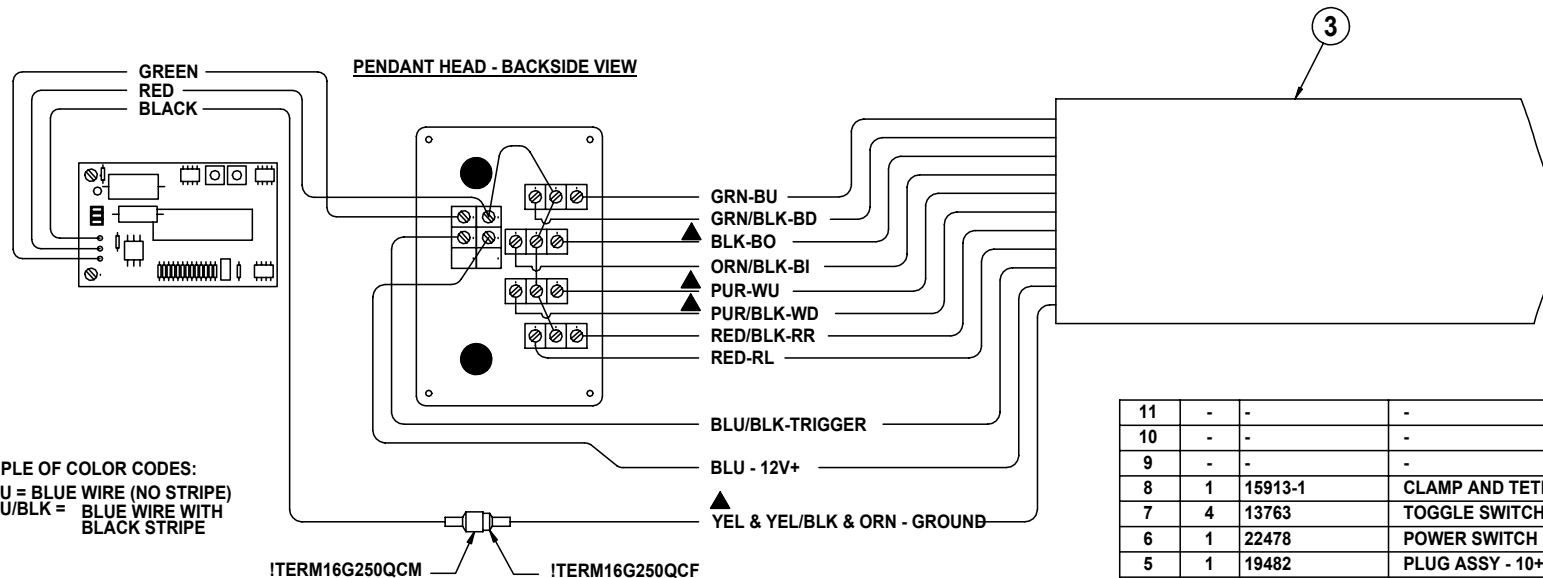
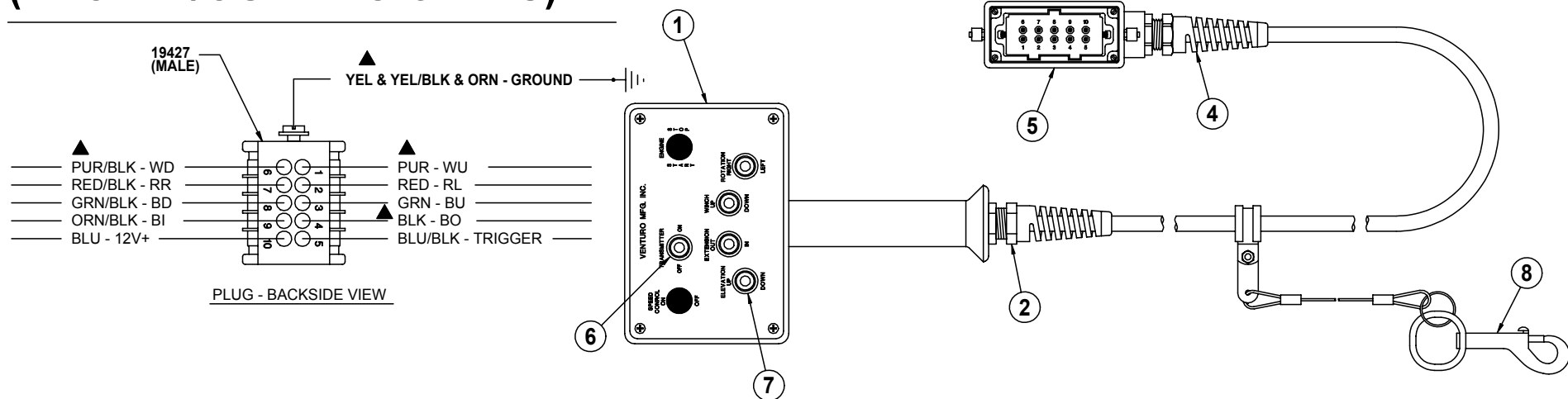
DATE
1-12-01A

SUPERSEDES
2-27-98

SECTION
C400

22488

22460 PENDANT (PROP W/OUT ENG CTRLS)



EXAMPLE OF COLOR CODES:

- BLU = BLUE WIRE (NO STRIPE)
- BLU/BLK = BLUE WIRE WITH BLACK STRIPE

11	-	-	-
10	-	-	-
9	-	-	-
8	1	15913-1	CLAMP AND TETHER ASSEMBLY
7	4	13763	TOGGLE SWITCH
6	1	22478	POWER SWITCH - DOUBLE POLE SINGLE THROW
5	1	19482	PLUG ASSY - 10+1 POLE
4	1	20975	STRAIN RELIEF - M20
3	1	22656	CORD ASSY - 25 FT
2	1	25534	STRAIN RELIEF - 3/4"
1	1	22311	PROPORTIONAL CONTROL PENDANT HEAD
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DRAWING

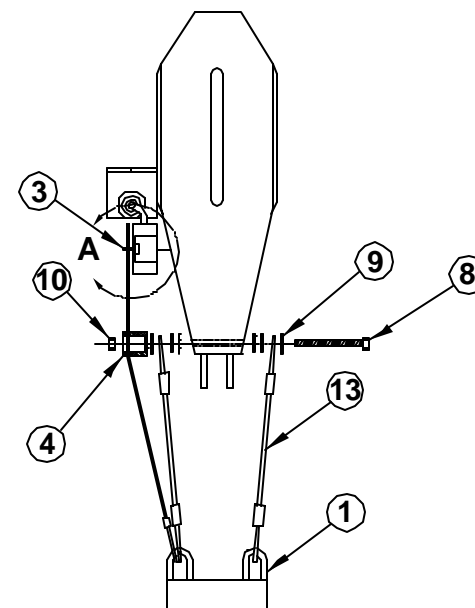
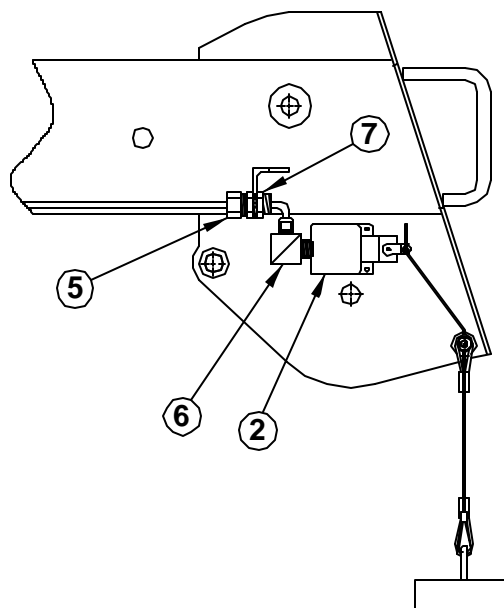
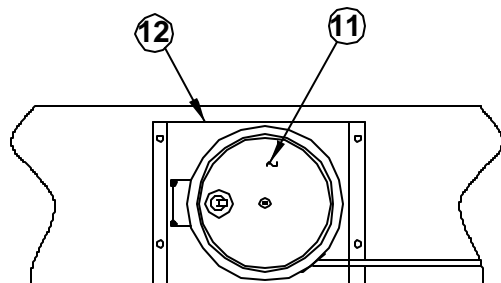
22460 PENDANT (PROPORTIONAL CTRL)

DATE
1-12-04C

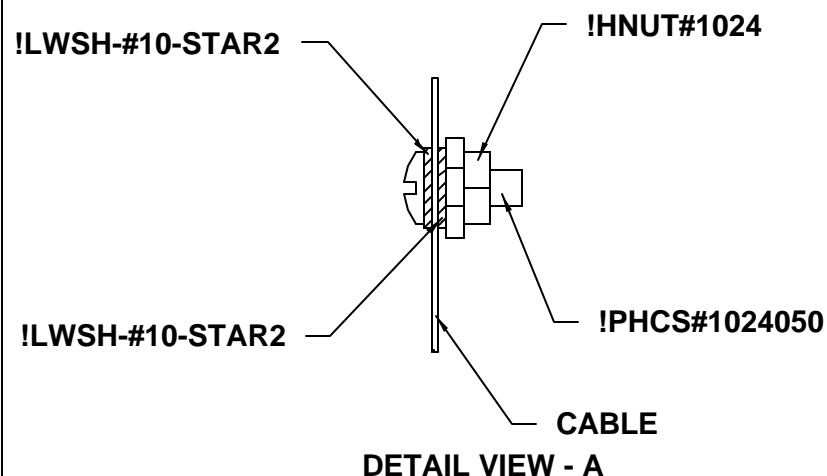
SUPERSEDES
10-8-03B

SECTION C400

22655



NOTE: FOR OPTIONAL RIGHT HAND CORD REEL.



13	2	20951-3	HANGER CABLE
12	1	19058	COVER - CORD REEL
11	1	22388	CORD REEL ASSEMBLY - RH
10	1	!LNUT-02520	LOCK NUT, NYLON 1/4-20
9	6	!FWSH-025	FLAT WASHER 1/4
8	1	!HHCS02520275-5	HHCS 1/4-20 x 2-3/4" GR. 5
7	1	PL-20-469	LOCKNUT (1/2" PIPE)
6	1	19060	STRAIN RELIEF - 90DEG
5	1	22455	STRAIN RELIEF - STRAIGHT (1/2" PIPE)
4	1	22454	CABLE GUIDE - BLACK DELRIN
3	1	22456	CONNECTOR / SET-COLLAR ASSEMBLY
2	1	22453	MICROSWITCH
1	1	19377-3	WEIGHT ASSY.
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DWG - RH CORD REEL

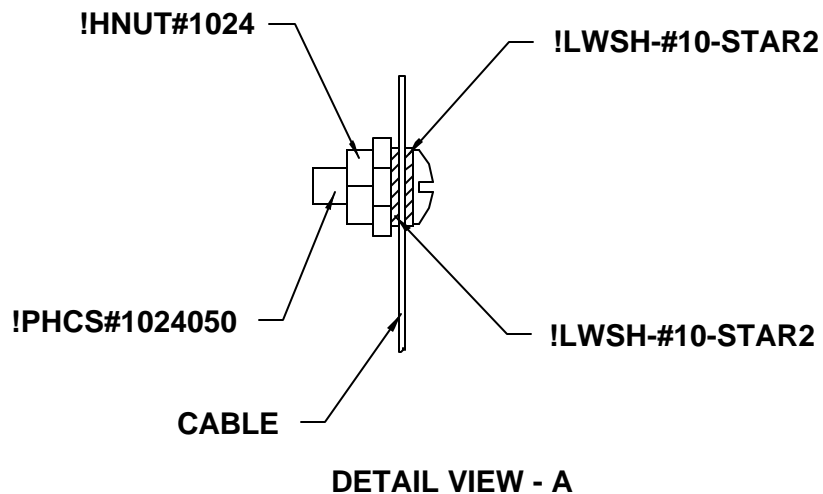
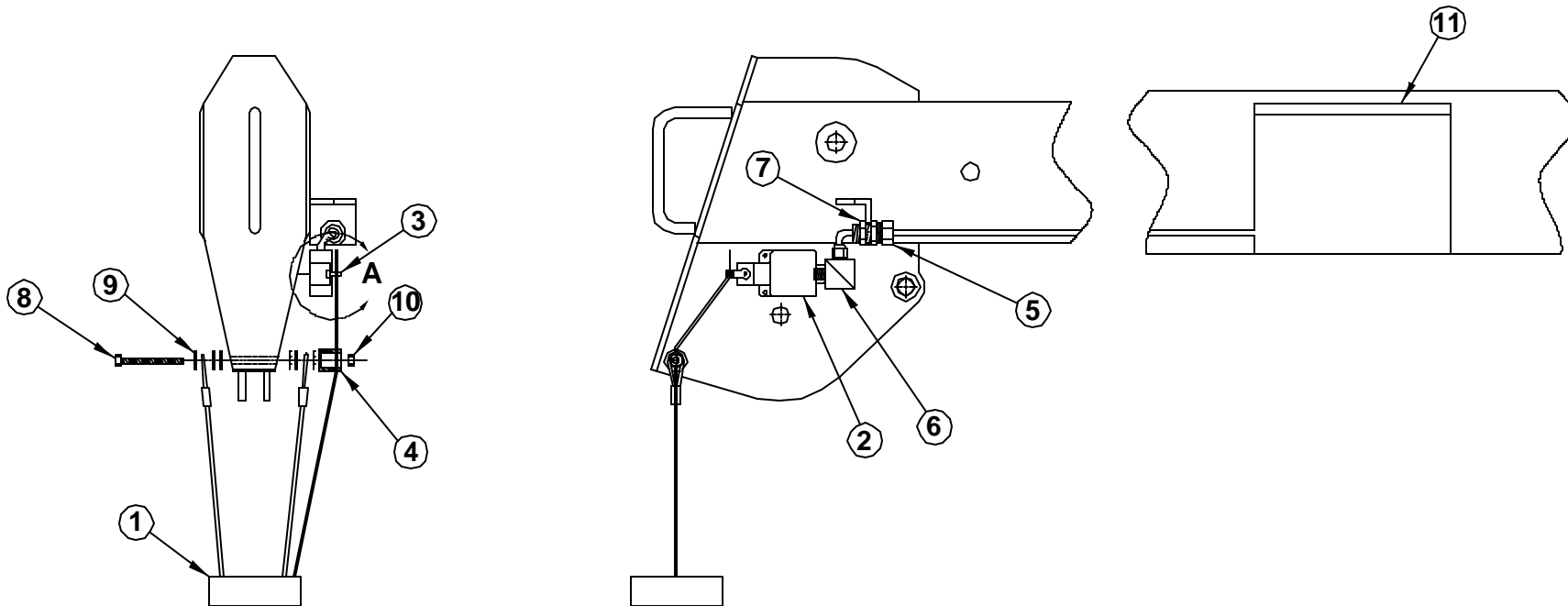
HT40KX, HT50KX

DATE
5-21-04D

SUPERSEDES
7-3-03C

SECTION
C400

22449



NOTE: FOR STANDARD LEFT HAND CORD REEL

12	1	20951-3	HANGER CABLE
11	1	22683	CORD REEL ASSEMBLY - LEFT HAND
10	1	!LNUT-02520	LOCK NUT, NYLON 1/4-20
9	6	!FWSH-025	FLAT WASHER 1/4
8	1	!HHCS02520275	HHCS 1/4-20 x 2-3/4" GR. 5
7	1	PL-20-469	LOCKNUT (1/2" PIPE)
6	1	19060	STRAIN RELIEF - 90DEG
5	1	22455	STRAIN RELIEF - STRAIGHT (1/2" PIPE)
4	1	22454	CABLE GUIDE - BLACK DELRIN
3	1	22456	CONNECTOR / SET-COLLAR ASSEMBLY
2	1	22453	MICROSWITCH
1	1	19377-3	WEIGHT ASSY.
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DWG - LH CORD REEL

22685 ANTI-TWO BLOCK SYSTEM

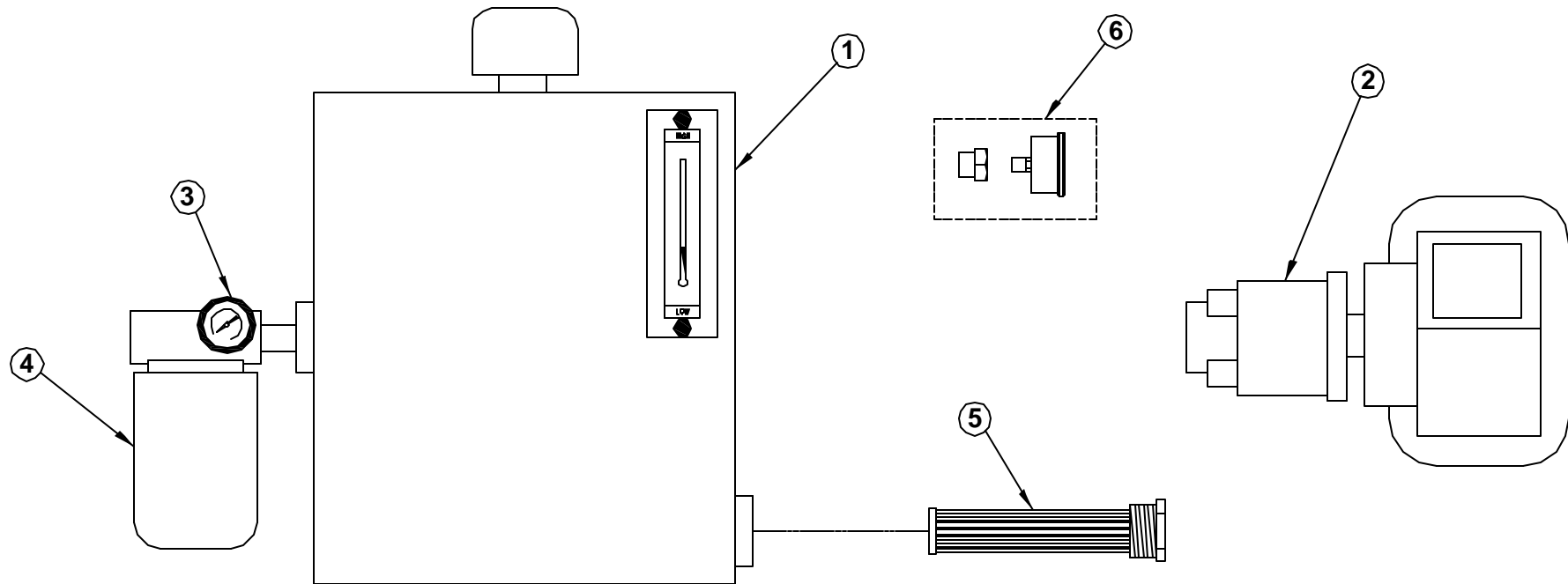
DATE
5-21-04C

SUPERSEDES
9-23-03B

SECTION
C400

22684

19294 PTO PACKAGES



PUMP	MOUNTING	RECOMMENDED GPM (RPM)
19296-1.60	SAE "A" 9 TOOTH SPLINED SHAFT	HT18 - STD. - 1.75 GPM (1110 RPM)
		HT25 - STD. - 2.00 GPM (1250 RPM)
19296-2.64		HT40 - STD. - 2.6 GPM (1000 RPM)
		HT50 - STD. - 3.0 GPM (1150 RPM)
19296-4.00		HT18 - PROP. - 3.5 GPM (875 RPM)
▲		HT25 - PROP. - 4.0 GPM (1000 RPM)
19296-5.00		HT40 - PROP. - 5.0 GPM (1000 RPM)
		HT50 - PROP. - 6.0 GPM (1200 RPM)

6	1	22263	PRESSURE GAUGE ASSEMBLY
5	1	19300	SUCTION SCREEN - 100 MESH
4	1	19298	FILTER ASSY, RETURN - 10 MICRON
3	1	19297	PRESSURE GAUGE - RETURN
2	1	SEE CHART	PTO PUMP - HT18/25/40/50KX
1	1	19295	RESERVOIR TANK - 10 GALLON
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DWG

PTO KIT - HT18/25/40/50KX

DATE
7-13-04F

SUPERSEDES
3-4-04E

SECTION
C400

22448