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MFG., INC.
CINCINNATI, OHIO

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DATE
3-18-02

SUPERCEDES
-

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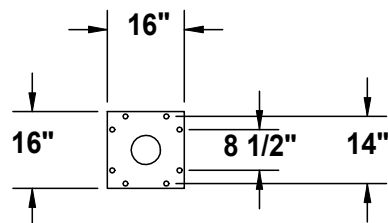
20512

SECTION 100

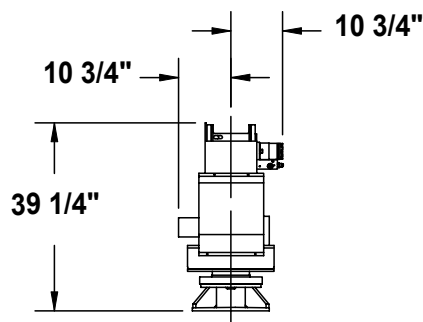
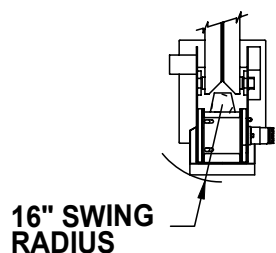
DESCRIPTION

&

SPECIFICATIONS



**BASE MOUNTING
DIMENSIONS**



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**

C.G. (APPROX)



MANUFACTURING, INC.
CINCINNATI, OHIO

**TITLE
INSTALLATION DWG**

HT40KX, HT50KX

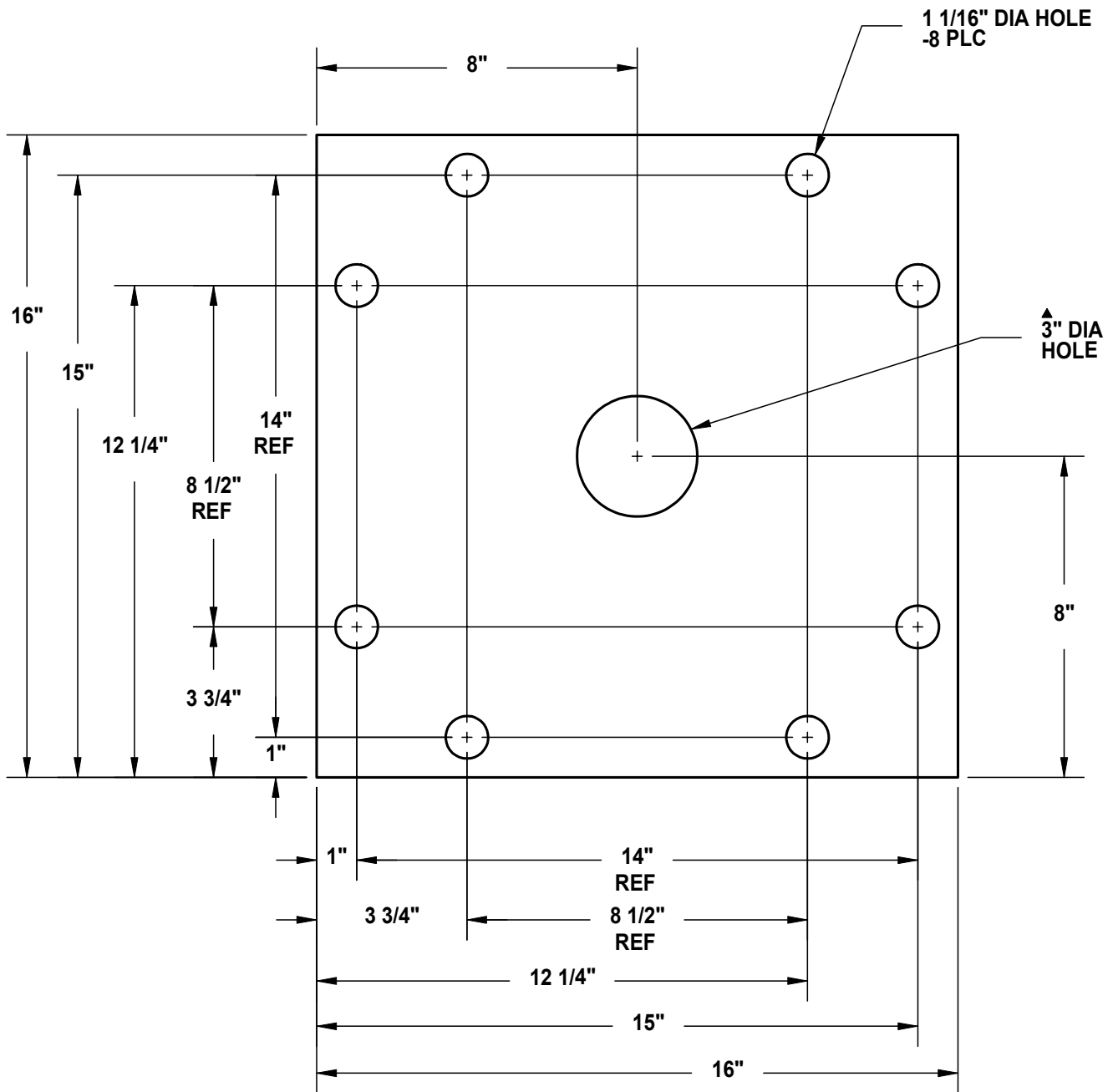
**DATE
10-21-97A**

**SUPERSEDES
5-14-97**

**SECTION
C100**

22343

22040 CRANE (QUILL) BASE PLATE



MFG., INC.
CINCINNATI, OHIO

TITLE
22040 BASE MTG DIM

HT40/50KX ▲

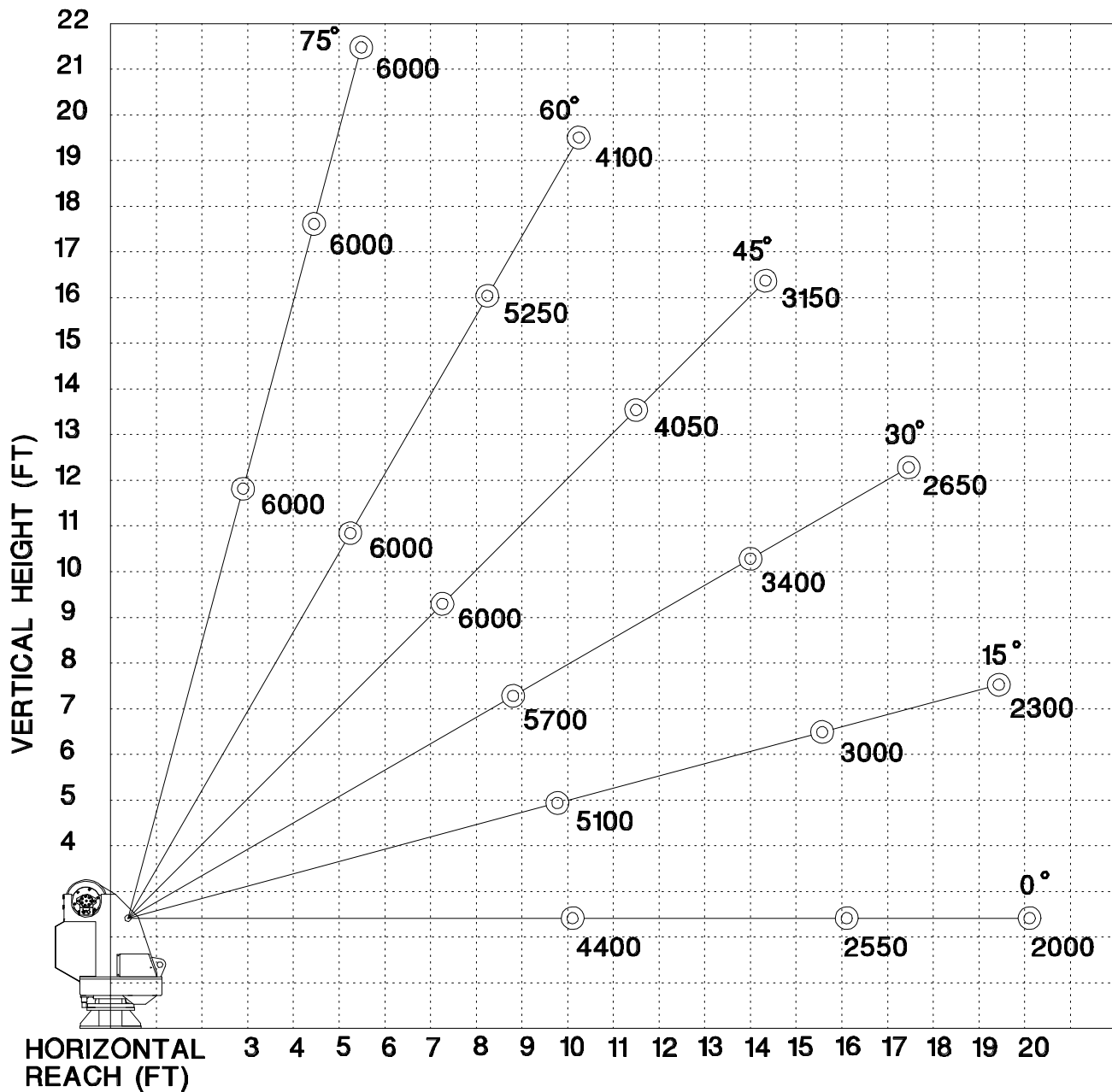
DATE
10-11-02D

SUPERSEDES
7-22-99C

SECTION
C100

18353

HT40KX - 10-16-20 BOOM MAXIMUM CAPACITY CHART



**MUST USE SNATCH BLOCK
FOR LOADS OF 3000 LBS.
AND GREATER**



MFG., INC.
CINCINNATI, OHIO

TITLE
CAPACITY CHART

HT40KX - 10-16-20

DATE
1-29-98B

SUPERSEDES
2-17-97A

SECTION
C100

22341

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.



MFG., INC.
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TITLE

INSTALLATION DWG

DATE

5-13-97A

SECTION

C150

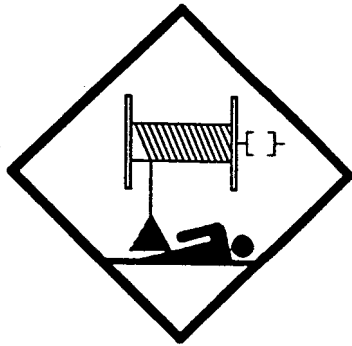
HYDRAULIC CRANES

SUPERCEDES

6-12-92

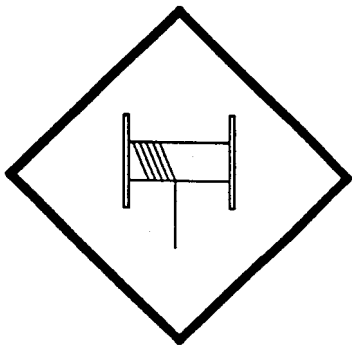
920612

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

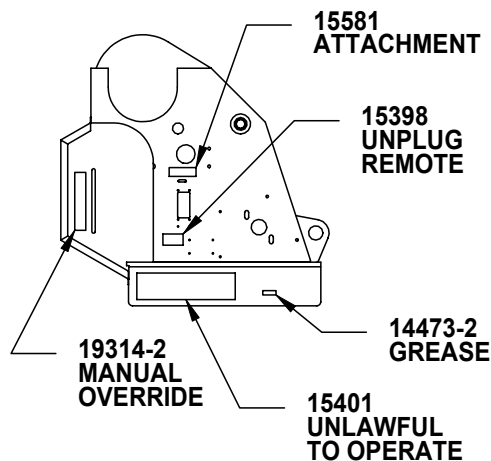
C150

HT CRANES

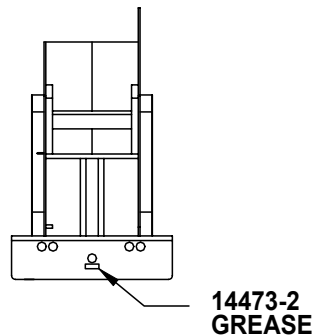
SUPERCEDES

7-30-96

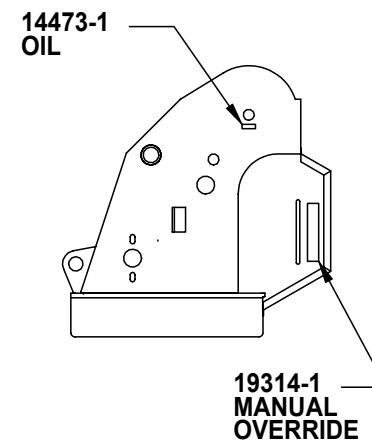
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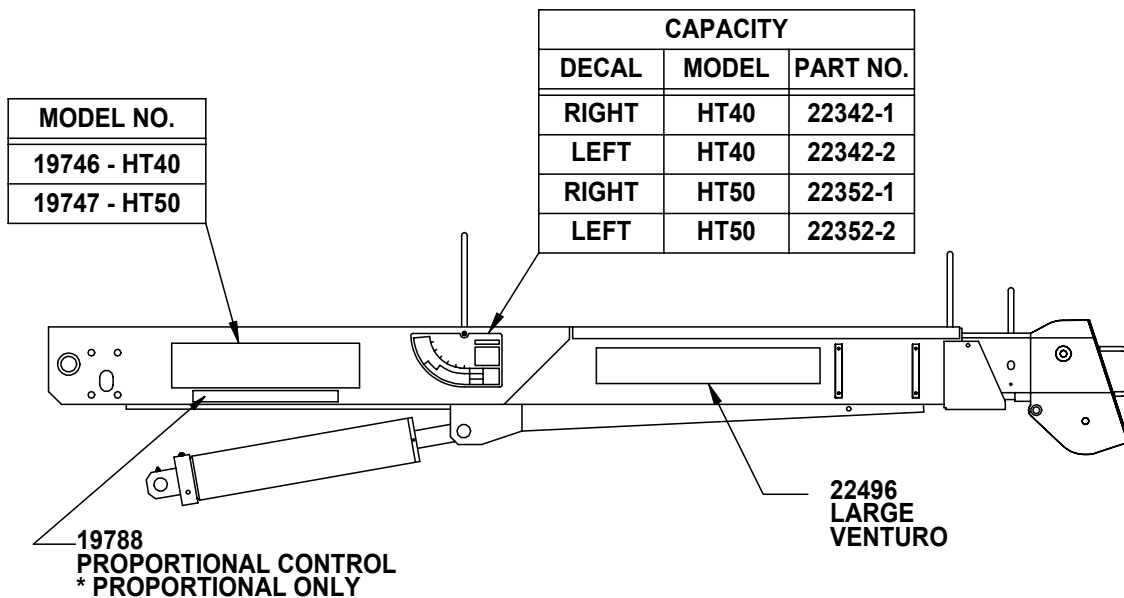
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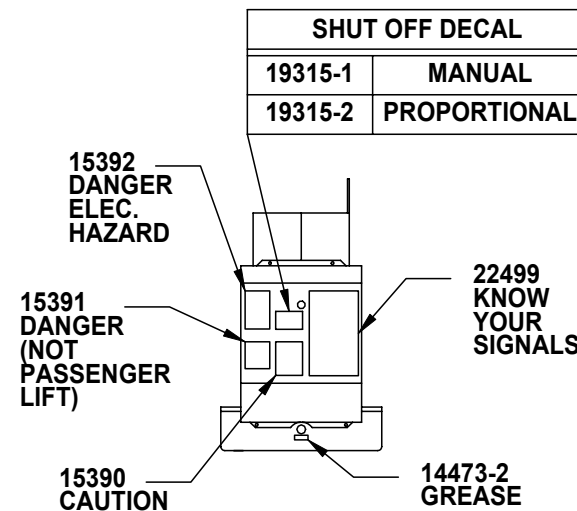
FRONT



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. These hoses are to be arranged in the compartment or pedestal below the crane as shown on drawing 22247.

These hoses are to be connected in a relaxed position as shown on 22247, 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
7-22-02B

SUPERCEDES
8-12-99A

SECTION
C200

22344a

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.

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" if it is an automatic.
4. Deploy the outriggers to help stabilize the vehicle against rocking or overturning when lifting with the crane.



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TITLE

INSTALLATION DWG

DATE

11-3-00D

SECTION

C200

HT40KX, HT50KX

SUPERCEDES

10-26-00C

22345b

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
8-12-99B

SUPERCEDES
7-17-97

SECTION
C200

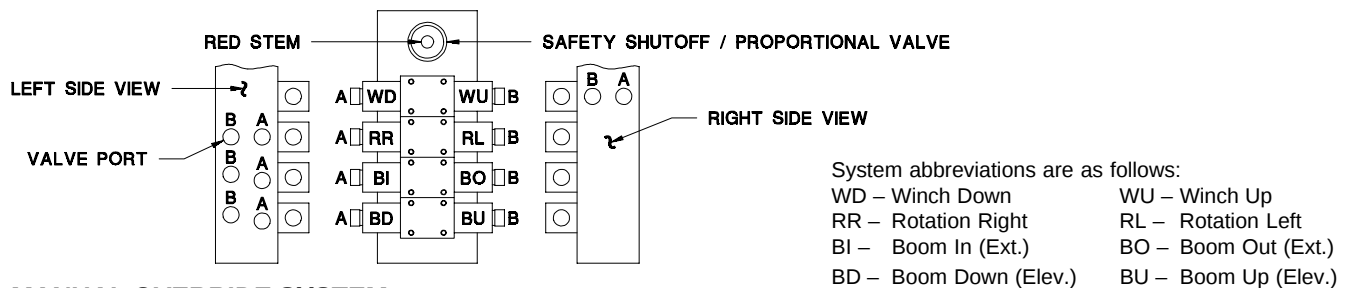
22345c

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

HT25, HT40/50

DATE
5-1-98A

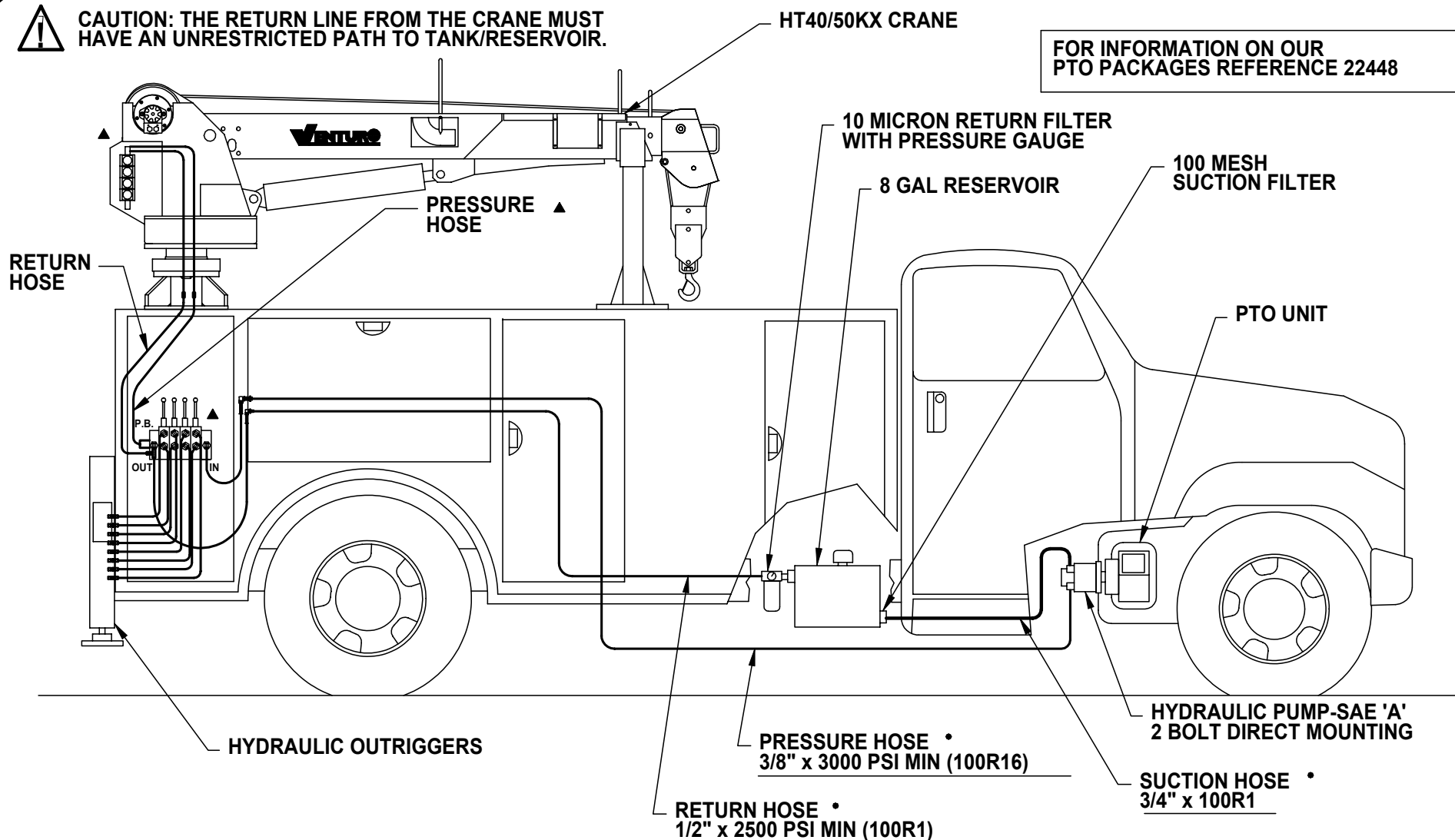
SUPERCEDES
2-24-98

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

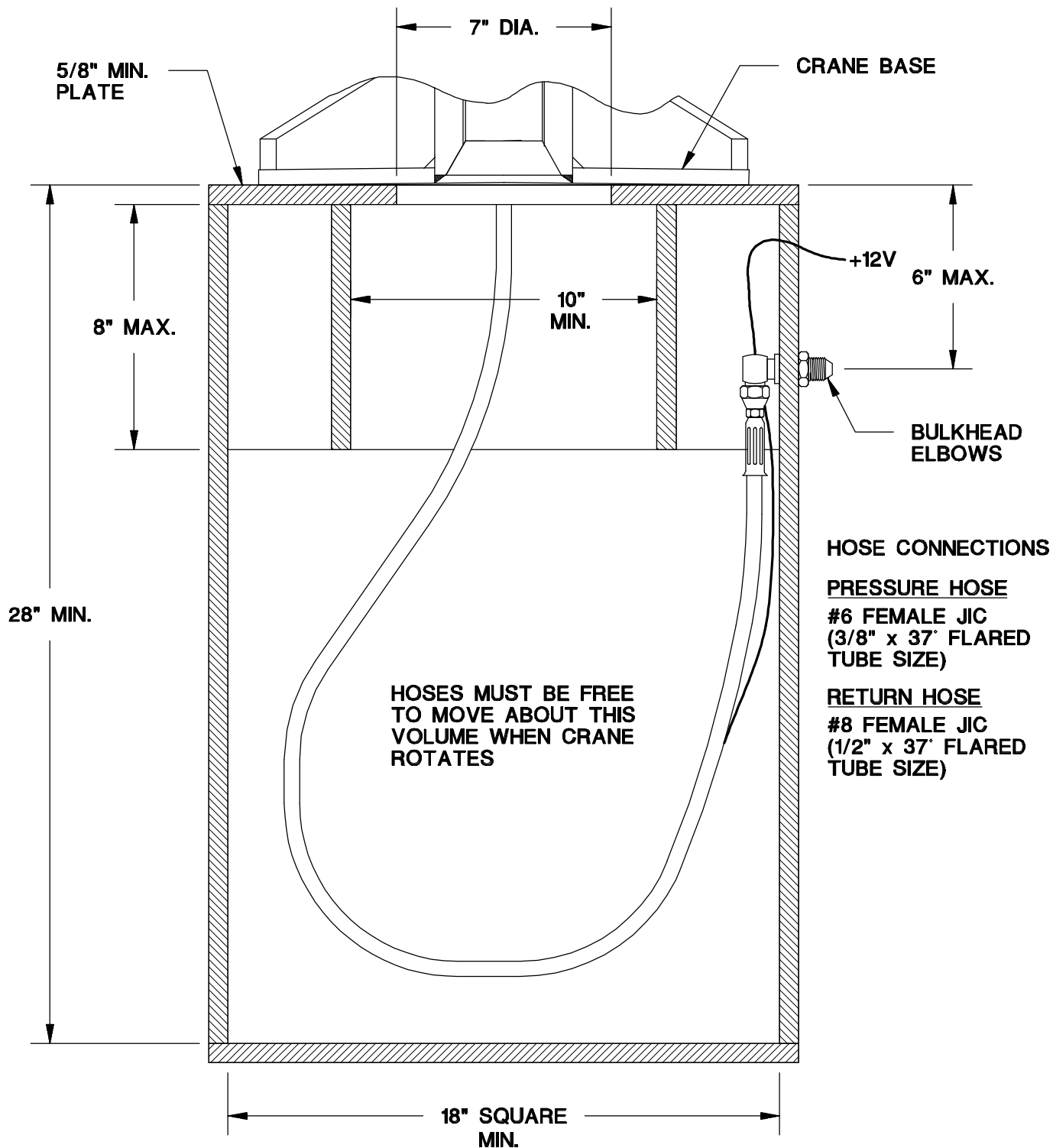
PTO INST - HT40/50

DATE
11-22-02B

SUPERSEDES
5-15-02A

SECTION
C200

22335



MFG., INC.
CINCINNATI, OHIO

TITLE
CRANE & HOSE INST.

HT40KX, HT50KX

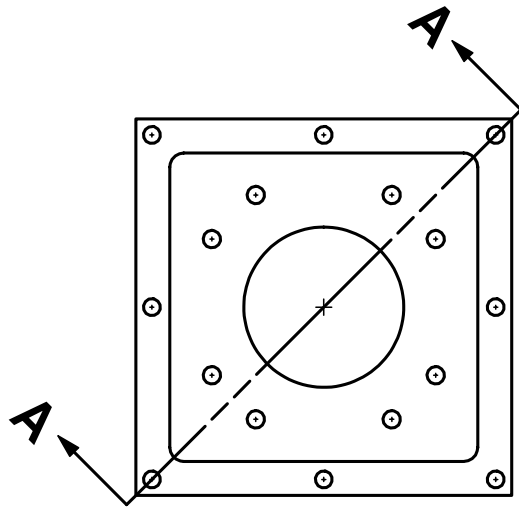
DATE
8-25-97

SUPERSEDES
-

SECTION
C200

22247

17830-XX PEDESTAL

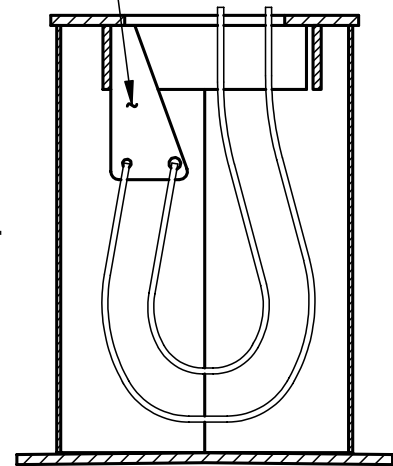


INSERT BULKHEAD
FITTINGS (FURNISHED
WITH HT40/50 CRANE)
INTO THIS BRACKET
AND ATTACH HOSES

19 1/4" (SQUARE)

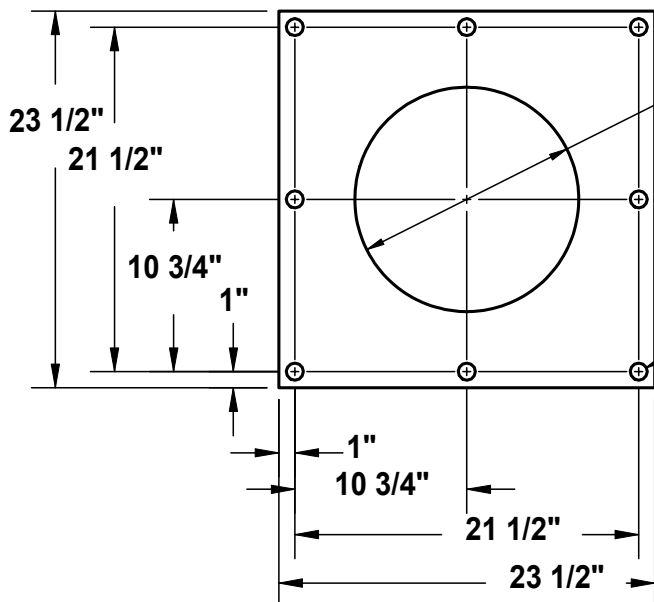
18 3/8" (SQUARE)

DASH NUMBER
SPECIFIES HEIGHT



SECTION A-A

23 1/2"



14" DIA

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



MFG., INC.
CINCINNATI, OHIO

TITLE
MOUNTING DIMENSIONS

HT40/50KX CRANES

DATE
1-30-98B

SUPERSEDES
12-18-97A

SECTION
C200

17831

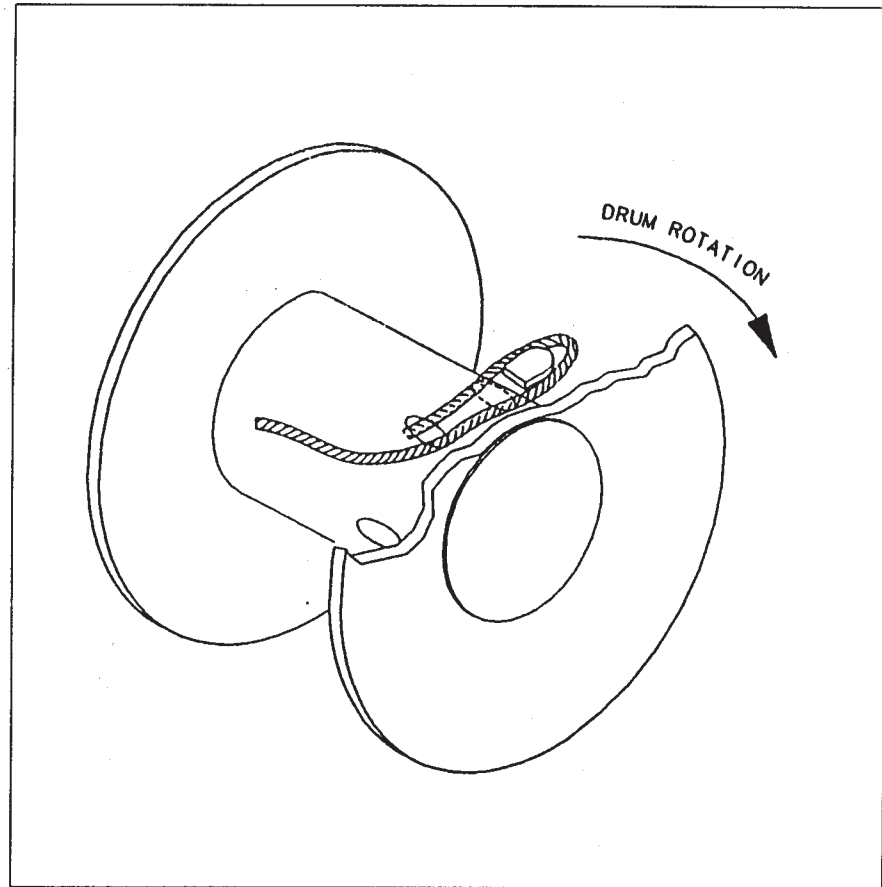
WIRE ROPE INSTALLATION

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

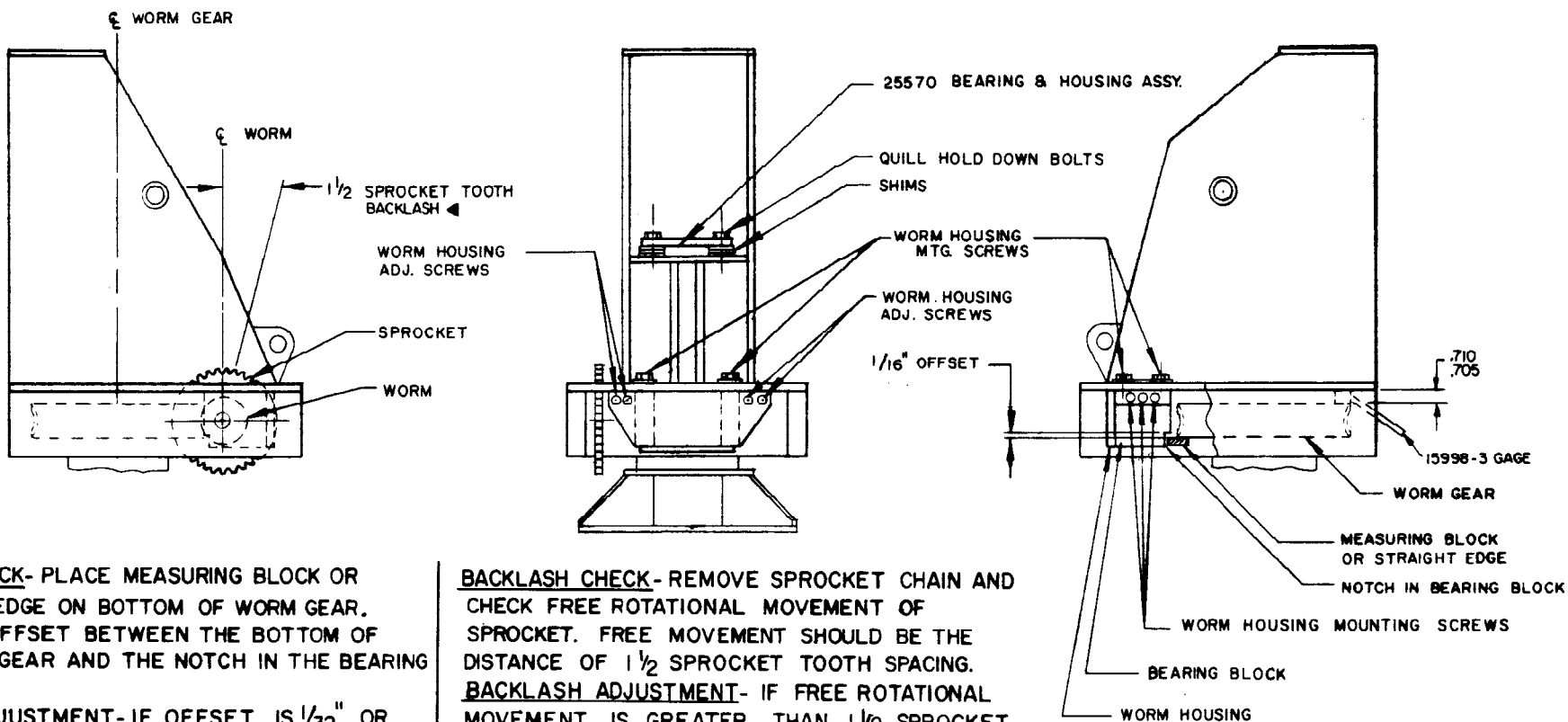
22245

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

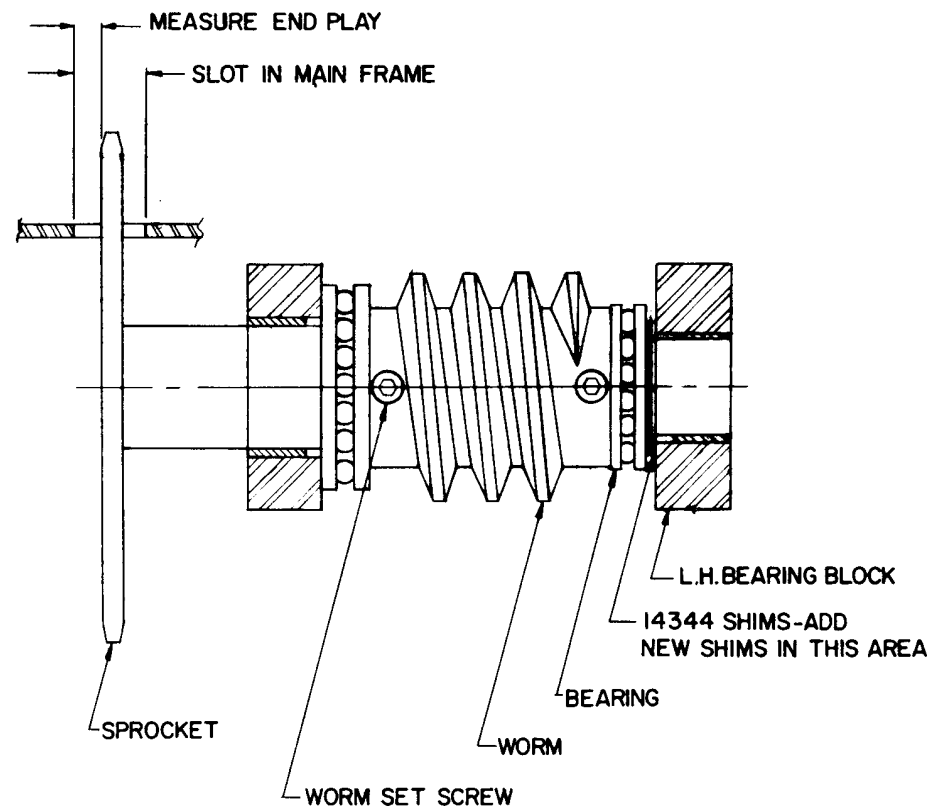
SUPERCEDES
8-10-98C

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

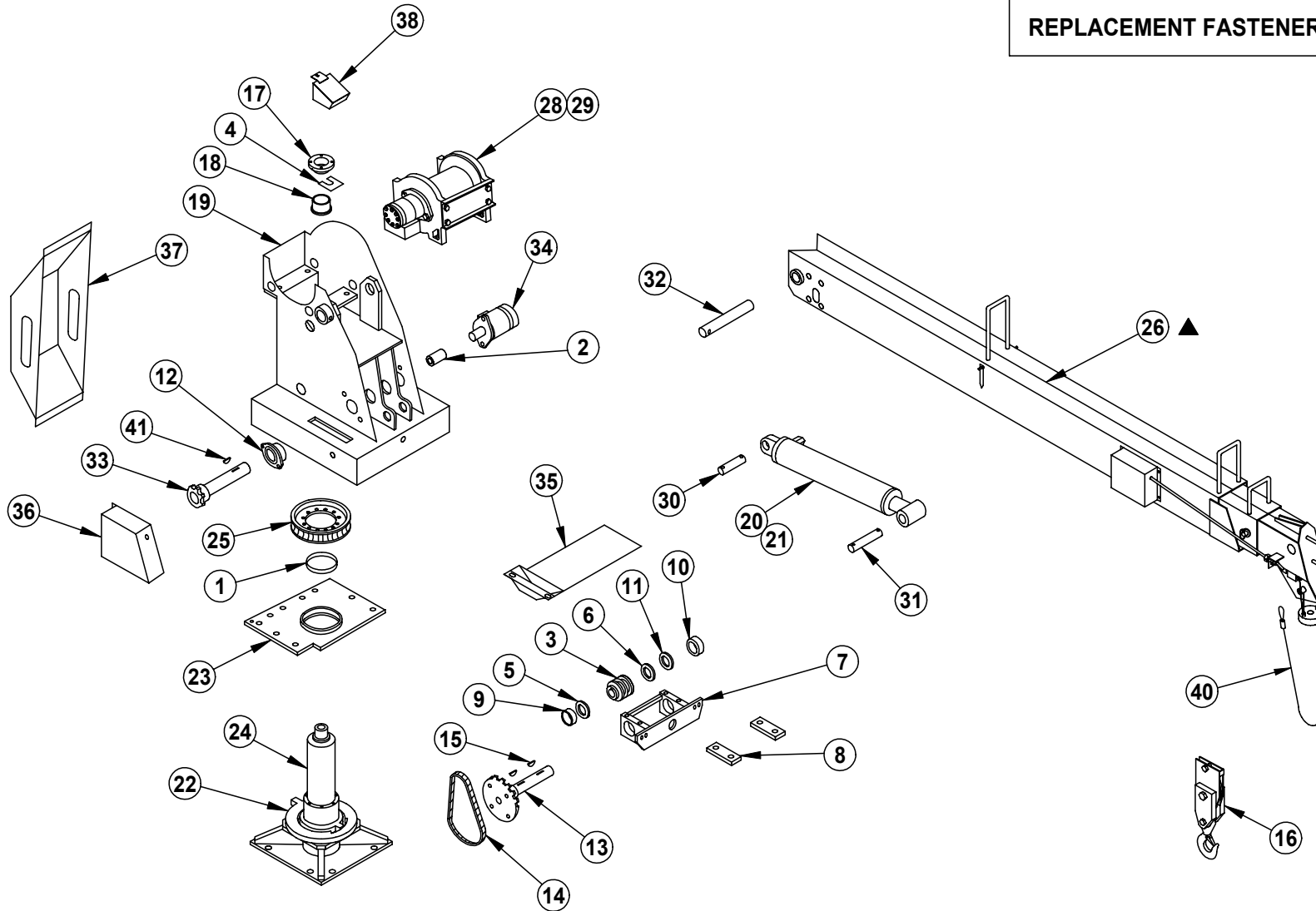
14553

SECTION 400

PARTS



REPLACEMENT PARTS LIST REF 22517 ▲
 REPLACEMENT FASTENERS LIST REF 22338



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	▲ -	-	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

10-29-01B

SUPERCEDES

5-25-99A

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	CAP SCREW - 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	WORM HOUSING
!LWSH-063	LOCK WASHER - 5/8"	4	WORM HOUSING
!SHCS05020125	SHCS - 1/2"-20 x 1-1/4"	2	WORM HOUSING
25593	SET SCREW - FLAT FACE 1/2"-20 x 1"	5	WORM HOUSING
!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

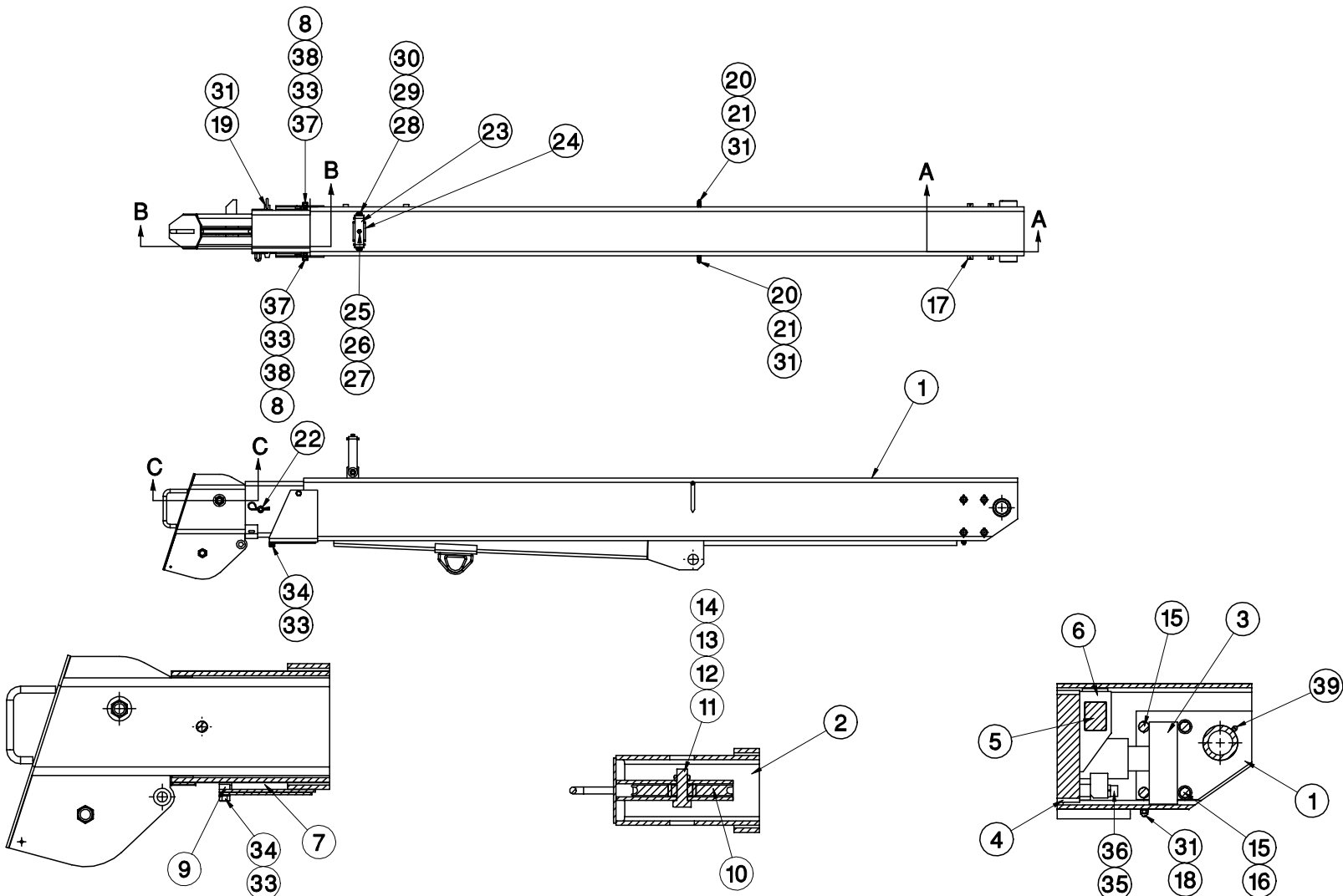
DATE
7-17-00B

SUPERCEDES
6-8-98A

SECTION
C400

22518

▲ 24524 BOOM PARTS DRAWING



SECTION B-B

SECTION C-C

SECTION A-A

REF. REPLACEMENT PARTS LIST 24526

**TITLE**

24524 BOOM PARTS DRAWING

HT40/50KX

DATE _____

11-21-01B

SUPERSEDES

11-1-01A

SECTION

—

24525

22	1	22234-1-PHAN	TOGGLE PIN ASSEMBLY	▲ -	-	-	-
21	2	13459-2	BOOM ARROW - 4-7/16" LONG	*43	2	ILWSH-#10	LOCK WASHER #10
20	2	22490	SPACER, BOOM ARROW 1/2" O.D.	*42	2	IHHCS#1032050	HEX HEAD CAP SCREW #10-32 X 1/2" LONG
19	1	RL-639	CABLE CLAMP - 5/16"	*41	4	IHHCS03118050	HEX HEAD CAP SCREW 5/16-18 X 1/2" LONG
18	1	19269	CABLE CLAMP - 1/4"	*40	1	22450	ANTI TWO BLOCK SYSTEM
17	8	IRPIN-019125	ROLL PIN 3/16" DIA. X 1-1/4" LONG	39	1	IZERK02528	ZERK FITTING - 1/4-28
16	2	24523	THRUST ROLLER	38	2	IHNUT-03816	HEX NUT 3/8-16
15	4	22239	THRUST PIN	37	2	IHHCS03816050	HEX HEAD CAP SCREW 3/8-16 X 1/2" LG - GR 5
14	2	IJNUT-06311N	NYLON LOCK/JAMNUT - 5/8-11	36	2	ISHCS05013200	SOCKET HEAD CAP SCREW 1/2-13 X 2" LONG
13	2	17059-1	SHEAVE AXLE	35	2	ILWSH-050-HC	LOCK WASHER 1/2" HI COLLAR
12	2	22233	BEARING SPACER	34	2	IHHCS03816075	HEX HEAD CAP SCREW 3/8-16 X 3/4" LONG
11	2	22232	OILITE BEARING	33	8	ILWSH-038	LOCK WASHER 3/8"
10	2	22231	CABLE SHEAVE	*32	2	ICACS03816100	CNTRSNG ALLEN HEAD CAP SCREW 1/8-16 X 1" LG
9	1	24522	LOWER FRONT NUT BAR	31	4	IANUT-02520S	ACORN NUT 1/4-20 STAINLESS
8	2	22236	BEARING - SIDE - FRONT	30	2	IJNUT-05013N	1/2-13 NYLON INSERT JAM NUT
7	1	24521	LOWER - FRONT BEARING	29	2	IFWSH-050	FLAT WASHER - 1/2"
6	1	24520	UPPER REAR BEARING	28	2	IHHCS05013100	HEX HEAD CAP SCREW 1/2-13 X 1" LONG GRADE 5
5	2	24519	SIDE - REAR BEARING	27	1	IHNUT-02520	HEX NUT 1/4-20
4	1	24518	LOWER REAR BEARING	26	1	ILWSH-025	LOCK WASHER - 1/4"
3	1	22032-2	EXTENSION CYLINDER	25	1	IHHCS02520075	HEX HEAD CAP SCREW - 1/4-20 X 3/4" LONG
2	1	24501	SECONDARY / TERTIARY BOOM ASSEMBLY	24	1	19881	CABLE GUIDE WEAR STRIP
1	1	24500	PRIMARY BOOM FINAL ASSEMBLY	23	1	19880	CABLE GUIDE STRUCTURE
ITEM	QTY	PART NO.	DESCRIPTION	ITEM	QTY	PART NO.	DESCRIPTION

* ITEMS NOT SHOWN ON DWG. 24525

REF. REPLACEMENT DRAWING NO. 24525

SERIAL NO. 84120 & UP

SERIAL NO. 85108 & UP



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE

24524 BOOM REPLACEMENT PARTS LIST

HT40/50KX

DATE

11-1-01A

SUPERSEDES

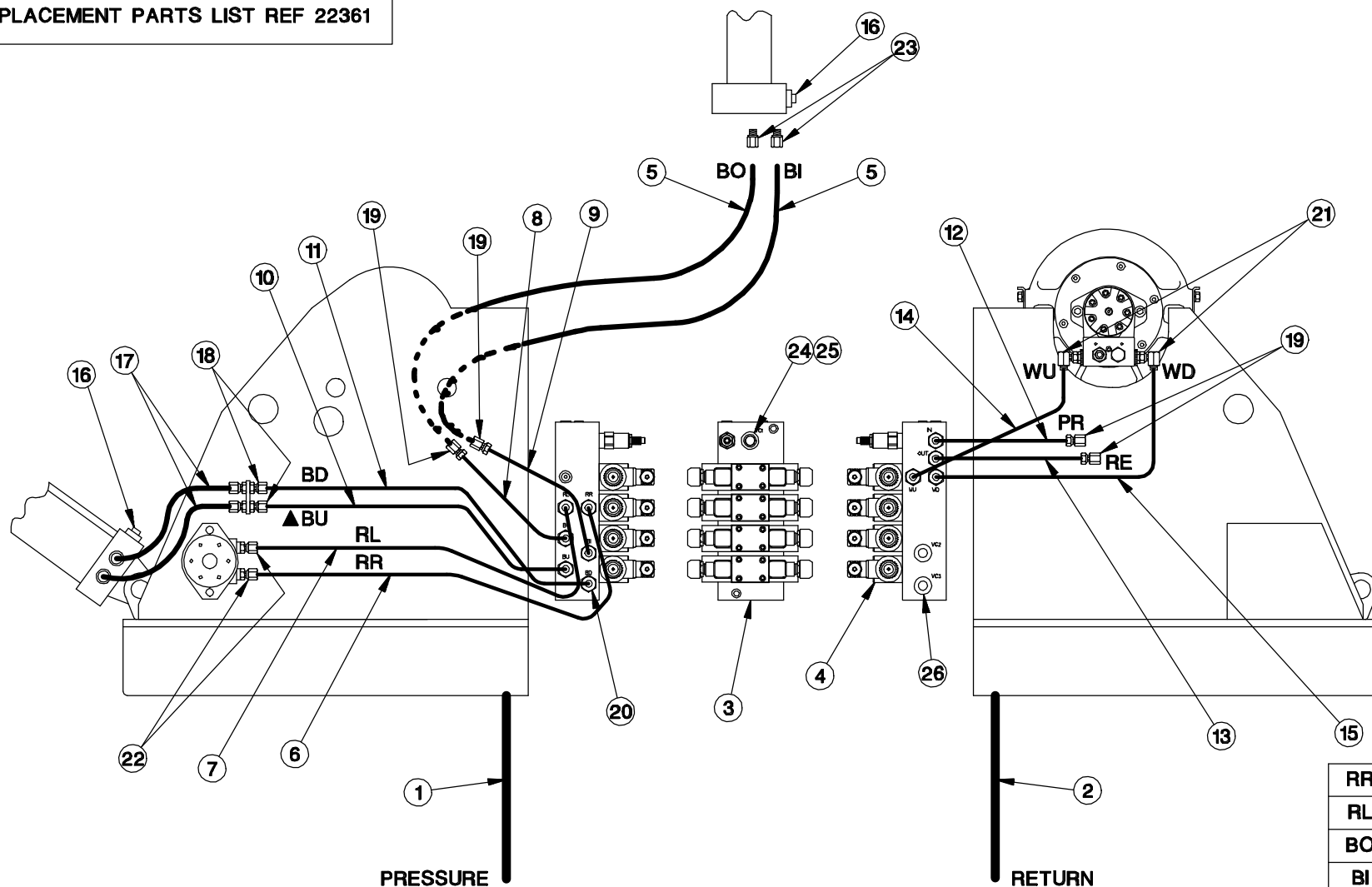
7-26-01

SECTION

-

24526

REPLACEMENT PARTS LIST REF 22361



LEFT SIDE VIEW

REAR VIEW

RIGHT SIDE VIEW

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



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE

REPLACEMENT PARTS DRAWING

HT40/50KX HYDRAULIC COMPONENTS

DATE

4-13-98A

SUPERSEDES

3-4-98

SECTION

C400

22360

HYDRAULIC SYSTEM COMPONENTS - HT40/50KX CRANES

REPLACEMENT PARTS LIST

ITEM	PART NUMBER	DESCRIPTION
1	19214	PRESSURE HOSE
2	19215	RETURN HOSE
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	-	-
28	-	-
29	-	-
30	-	-

REPLACEMENT PARTS DWG REF 22360

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

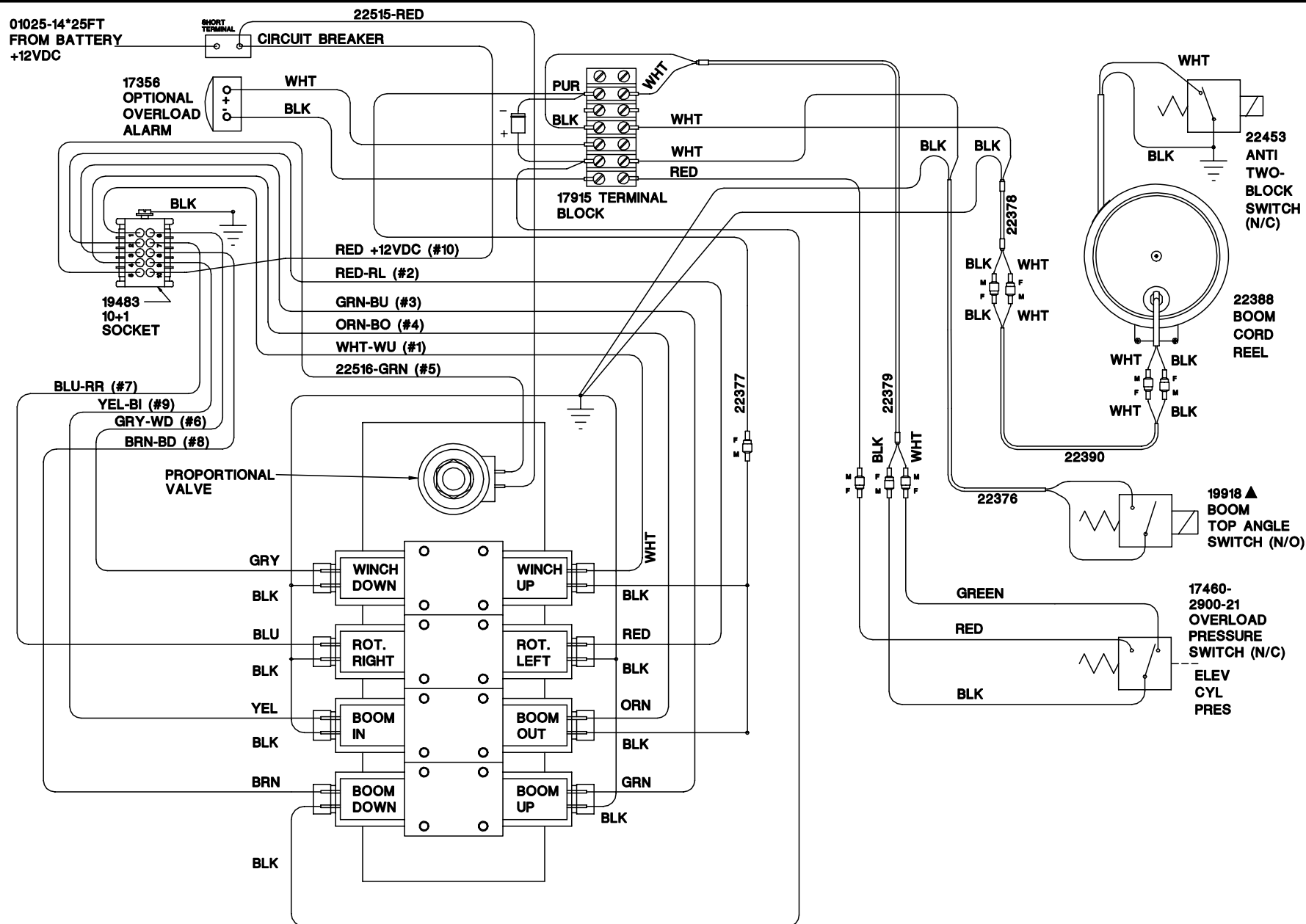
HT40/50KX

DATE
12-17-98B

SUPERCEDES
4-13-98A

SECTION
C400

22361



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE WIRING DIAGRAM

HT40/50KX - PROP (NO ENGINE CONTROLS)

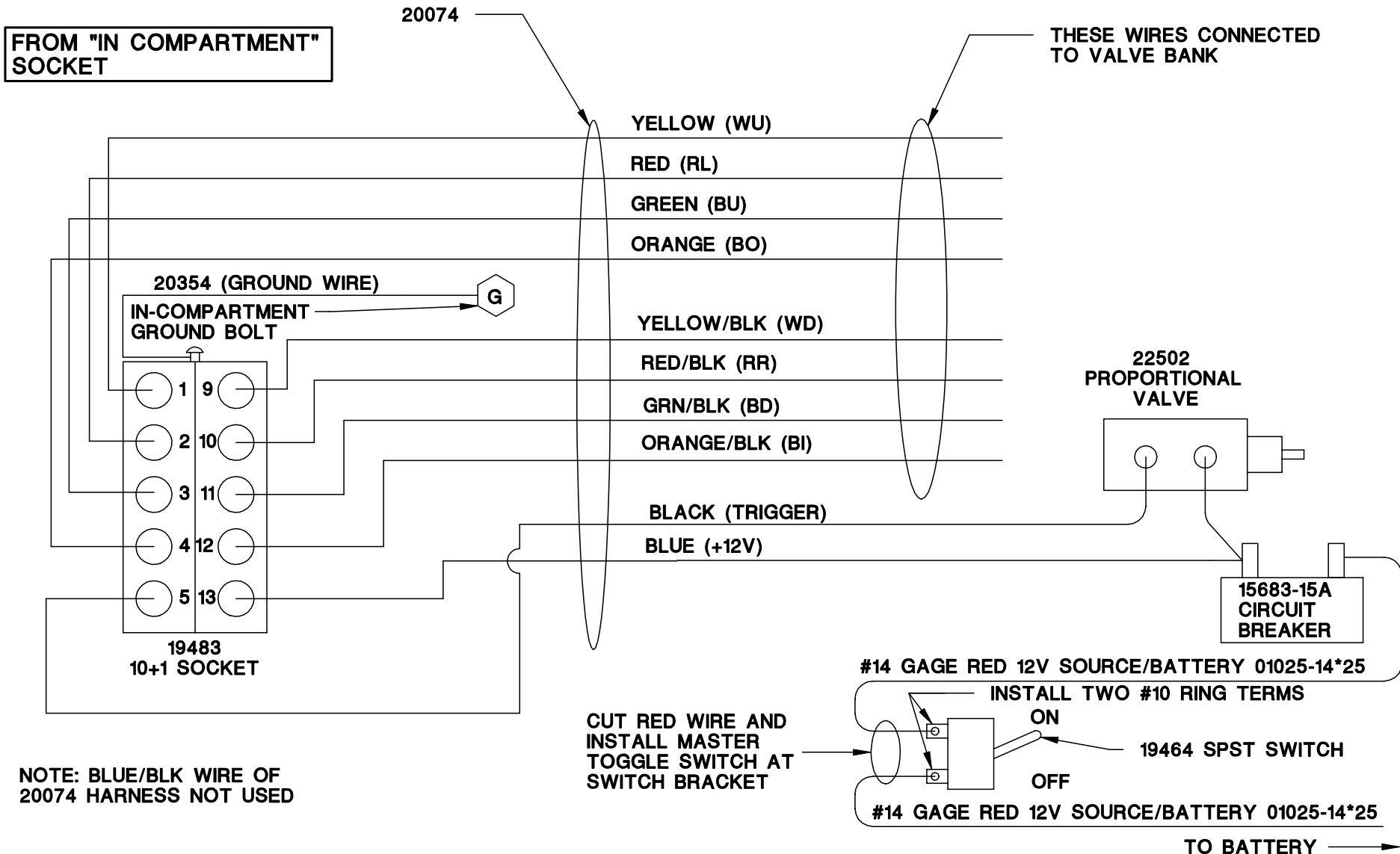
DATE
6-3-02B

SUPERSEDES
4-1-02A

SECTION
C400

22657

PROPORTIONAL IN-COMPARTMENT CONTROLS (NO ENGINE CONTROLS)



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE

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

HT25/40/50 CRANES

DATE

12-18-01

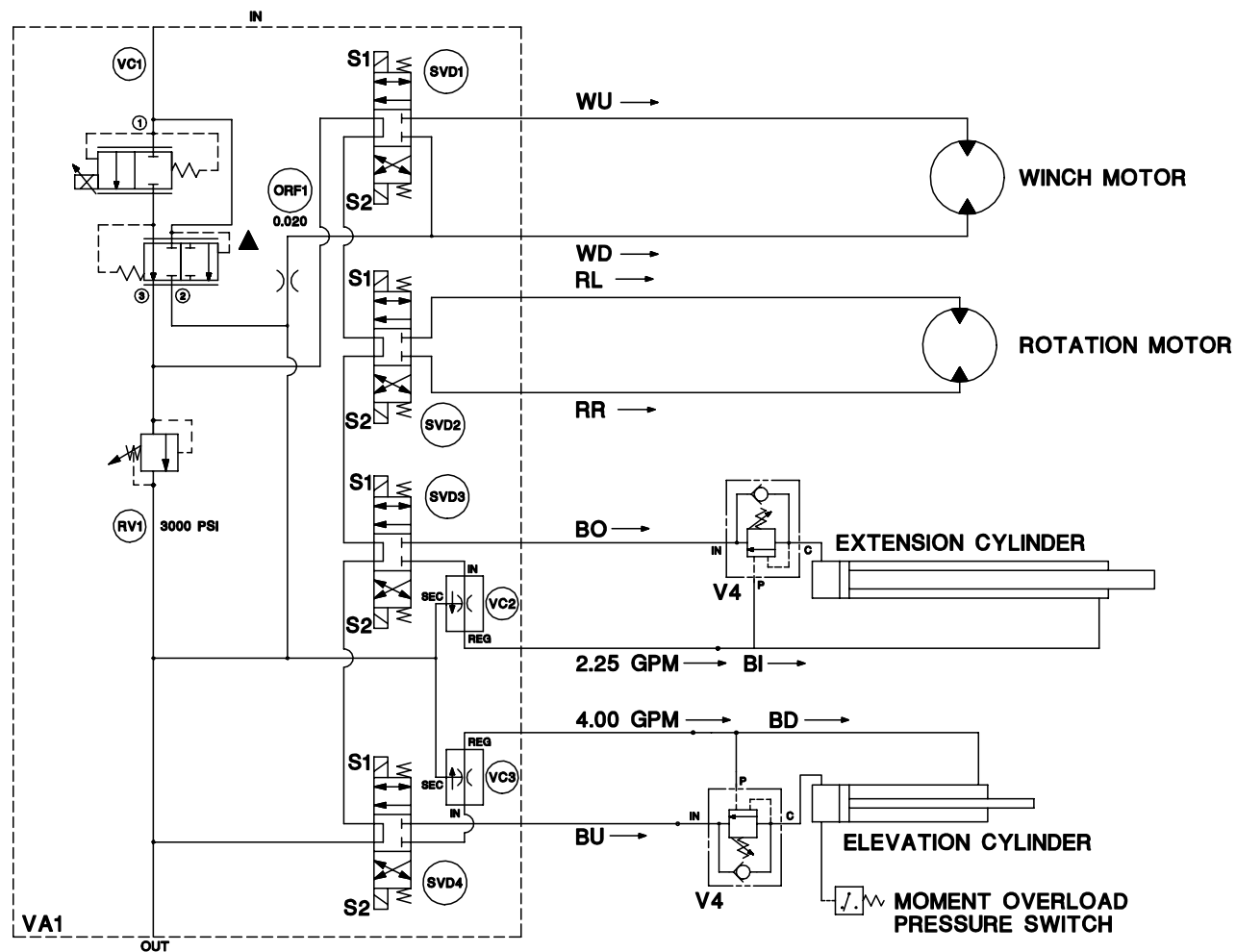
SUPERSEDES

-

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

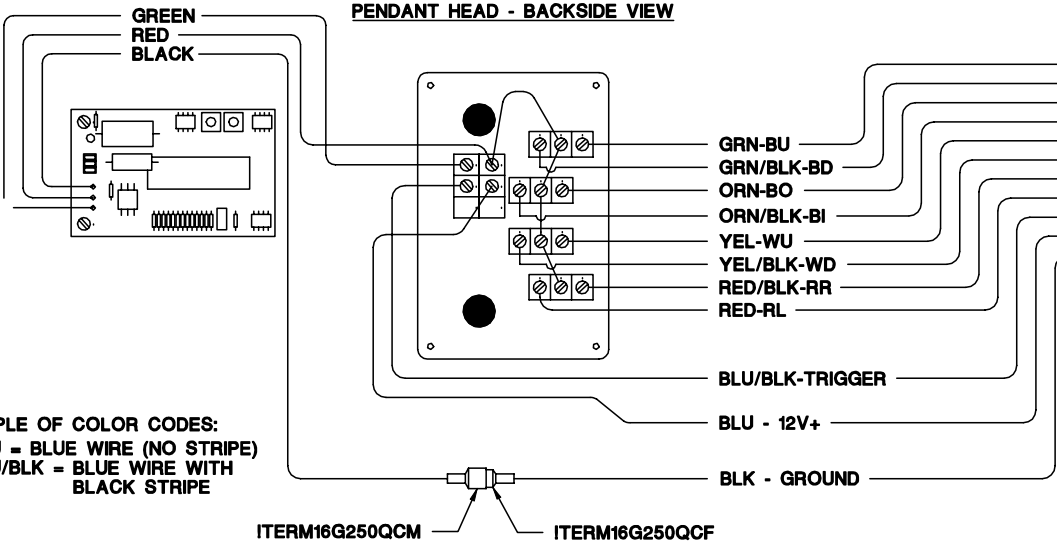
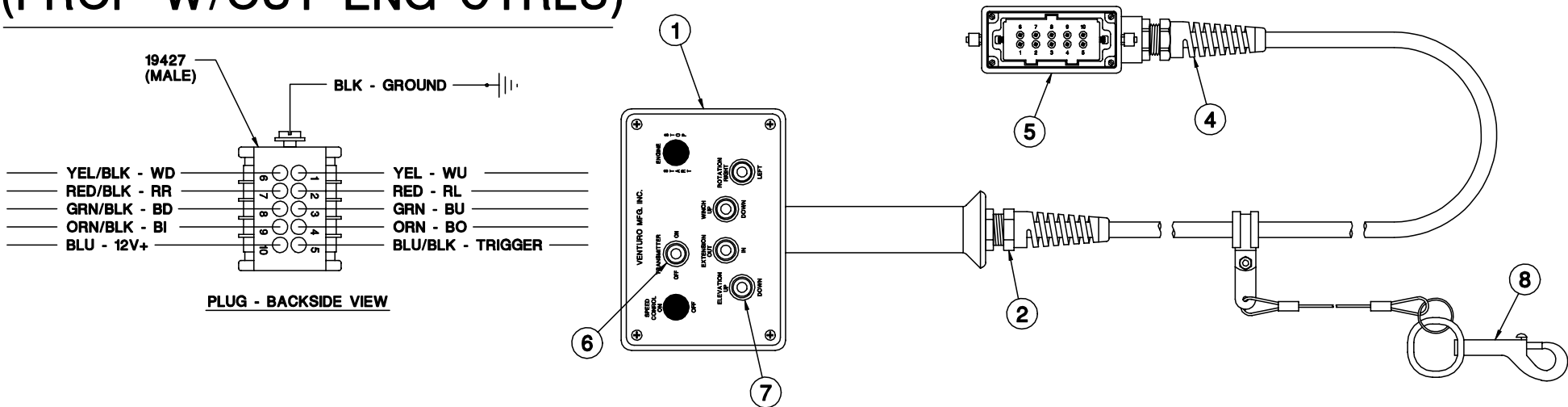
DATE
1-12-01A

SUPERSEDES
2-27-98

SECTION
C400

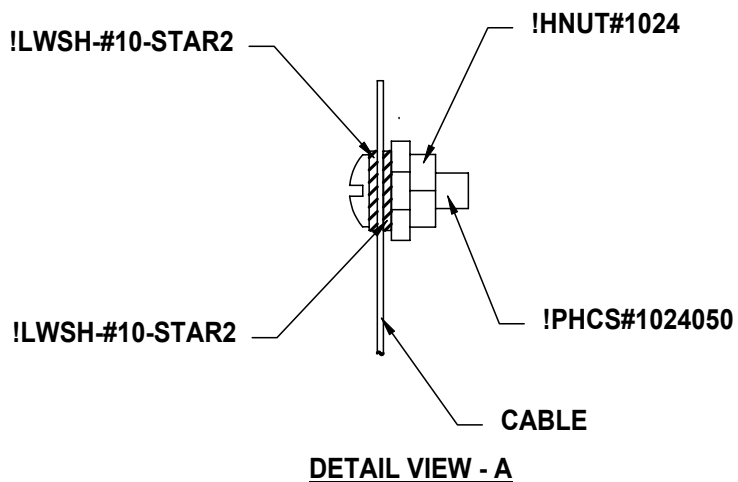
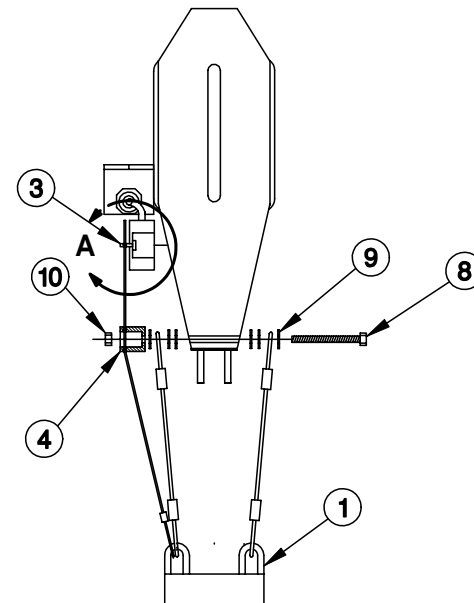
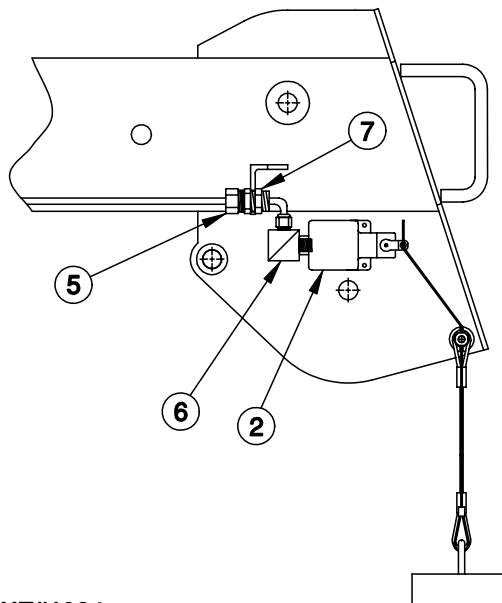
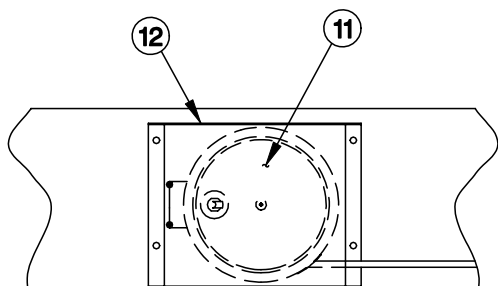
22488

22460 PENDANT (PROP W/OUT ENG CTRLS)



NOTE:
EXAMPLE OF COLOR CODES:
•BLU = BLUE WIRE (NO STRIPE)
•BLU/BLK = BLUE WIRE WITH BLACK STRIPE

ITEM	QTY	PART NO.	DESCRIPTION
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	19313	STRAIN RELIEF - METRIC
3	1	22656	CORD ASSY - 25 FT
2	1	25534	STRAIN RELIEF - 3/4"
1	1	22311	PROPORTIONAL CONTROL PENDANT HEAD



12	1	19058	COVER - CORD REEL
11	1	22388	CORD REEL ASSEMBLY
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	22452	WEIGHT ASSY.
ITEM	QTY	PART NO.	DESCRIPTION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DWG

HT40KX, HT50KX

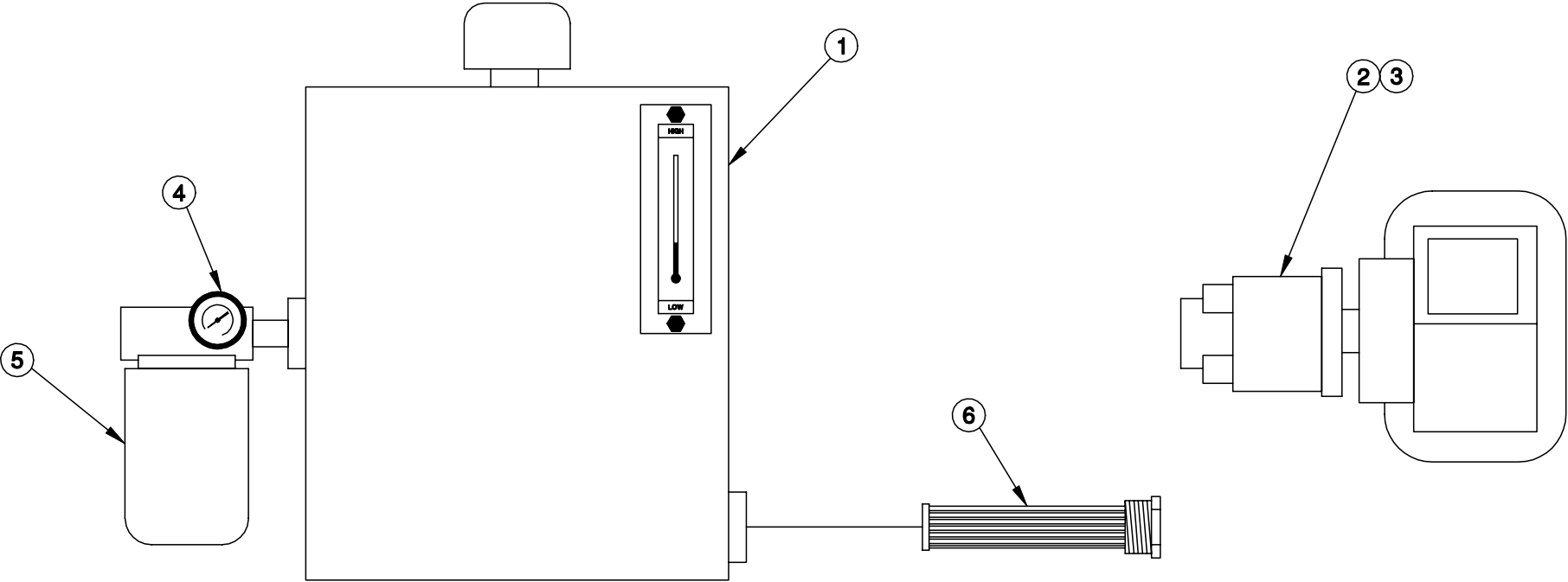
DATE
9-12-02A

SUPERSEDES
6-24-97

SECTION
C400

22449

19294 PTO PACKAGES



PUMP	MOUNTING	RECOMMENDED GPM (RPM)
19296-2.64	SAE "A" 9 TOOTH SPLINED SHAFT	STANDARD (NON-PROP) ▲
		HT25 - 2.0 GPM (800 RPM)
		HT40 - 2.6 GPM (1000 RPM)
		HT50 - 3.0 GPM (1150 RPM)
19296-5.00	SAE "A" 9 TOOTH SPLINED SHAFT	PROPORTIONAL ▲
		HT25 - 4.0 GPM (800 RPM)
		HT40 - 5.0 GPM (1000 RPM)
		HT50 - 6.0 GPM (1200 RPM)

6	1	19300	SUCTION SCREEN - 100 MESH
5	1	19298	FILTER ASSY, RETURN - 10 MICRON
4	1	19297	PRESSURE GAUGE - RETURN
3	1	19296-5.00	PTO PUMP - HT25/40/50KX PROPORTIONAL
2	1	19296-2.64	PTO PUMP - HT25/40/50KX NON-PROP
1	1	19295	RESERVOIR TANK - 10 GALLON
ITEM	QTY	PART NO.	DESCRIPTION