

VENTURO
TRUCK MOUNTED CRANES

HT25KX

INSTALLATION & OWNER'S MANUAL

TABLE OF CONTENTS

HT25KX INSTRUCTION MANUAL

SECTION 100 DESCRIPTION & SPECIFICATIONS

I19230	INSTALLATION DIMENSIONS - HT25KX
I19233	CAPACITY CHART - ET/HT25K(X) 10-16-20 FT
I19288	TYPICAL SERVICE BODY REINFORCEMENT
19411	INSTALLATION DRAWING - 17350 MOUNTING PEDESTAL
14510	INSTALLATION DRAWING - 17350 MOUNTING PEDESTAL
I23960	INSTALLATION DIMENSIONS - 23960 MANUAL OUTRIGGER FOLD AWAY TYPE
I23961	INSTALLATION DIMENSIONS - 23961 MANUAL OUTRIGGER SIDE BRACKET
I23962	INSTALLATION DRAWING - 23962 OUTRIGGER SERIES
22458	INSTALLATION DIMENSIONS - 23962-P-II & 23962-PM-II MANUAL OUTRIGGER
22459	INSTALLATION DIMENSIONS - 23962-CD-II CRANKDOWN OUTRIGGERS
22429	INSTALLATION DIMENSIONS - 23962-PH-II HYDRAULIC OUTRIGGERS
22573	INSTALLATION DIMENSIONS - 23962-PHX-II HYDRAULIC OUTRIGGERS

SECTION 150 SAFETY

15394	VEHICLE & CRANE ELECTRICAL HAZARD INFORMATION
920612	SAFETY & HAZARDS - GENERAL
I19217	WINCH SAFETY WARNINGS
19471	HT25KX DECAL PLACEMENT

SECTION 200 INSTALLATION

I19212a	HT25KX CRANE INSTALLATION
I19212b	HT25KX CRANE INSTALLATION
I19205a	HT25K(X) OPERATION & MAINTENANCE INSTRUCTIONS
I19205b	HT25K(X) OPERATION & MAINTENANCE INSTRUCTIONS
I19205c	HT25K(X) OPERATION & MAINTENANCE INSTRUCTIONS
22328	EXPLANATION OF HYDRAULIC VALVE SYSTEM
I19232	PTO SYSTEM INSTALLATION
I19213	HT25KX HOSE INSTALLATION
22447	HOSE BRACKET LOCATIONS - 23962-PH-II HYDRAULIC OUTRIGGERS
22574	HOSE BRACKET LOCATIONS - 23962-PHX-II HYDRAULIC OUTRIGGERS
22336	HYDRAULIC SYSTEM CONFIGURATION - 23962-PH-II / 23962-PHX-II HYD OUTRIGGERS
22575	BULKHEAD FITTINGS LAYOUT - 23962-PHX-II HYDRAULIC OUTRIGGERS
I19218	CABLE INSTALLATION
I25618	INSTALLATION DRAWING - PENDANT CORD SUPPORT
20420	INSTALLATION DRAWING - 20381 ADJUSTABLE BOOM REST - ET/HT25 HT40/50

SECTION 300 MAINTENANCE & SERVICE

14544	ADJUSTMENT OF WORM HEIGHT AND BACKLASH
14553	ADJUSTMENT OF ROTATION WORM END PLAY



MFG., INC.
CINCINNATI, OHIO

TITLE	TABLE OF CONTENTS
	HT25KX

DATE	7-17-01
SUPERCEDES	-

SECTION	PAGE 1 OF 2
	19909A

TABLE OF CONTENTS

HT25KX INSTRUCTION MANUAL

SECTION 400 REPLACEMENT PARTS

I19239	HT25KX REPLACEMENT PARTS DRAWING
I19240	HT25KX REPLACEMENT PARTS LIST
19931	19893 - 10-20 FT BOOM ASSEMBLY
20197-2	19197-2 ANTI-TWO-BLOCK SYSTEM REPLACEMENT PARTS
19498	ELECTRICAL SCHEMATIC - STANDARD (NON-PROPORTIONAL)
19508	ELECTRICAL SCHEMATIC - STANDARD (NON-PROP) W/ ENGINE CONTROLS
20173	ELECTRICAL SCHEMATIC - PROPORTIONAL WITHOUT ENGINE CONTROLS
19499	ELECTRICAL SCHEMATIC - PROPORTIONAL W/ ENGINE CONTROLS
20350	ELECTRICAL SCHEMATIC - NON-PROP W/ IN-COMP CONTROLS ▲
20351	ELECTRICAL SCHEMATIC - NON-PROP W/ IN-COMP & ENGINE CONTROLS ▲
▲ 20353	ELECTRICAL SCHEMATIC - PROP W/ IN-COMP CONTROLS (NO ENGINE CONTROLS)
20352	ELECTRICAL SCHEMATIC - PROP W/ IN-COMP & ENG CONTROLS ▲
19501	HYDRAULIC SYSTEM COMPONENTS REPLACEMENT PARTS DRAWING
19502	HYDRAULIC SYSTEM COMPONENTS REPLACEMENT PARTS LIST
19496	HYDRAULIC SYSTEM SCHEMATIC - STANDARD (NON-PROP) HT25KX
19497	HYDRAULIC SYSTEM SCHEMATIC - PROPORTIONAL CONTROL HT25KX
19485	REPLACEMENT PARTS - 4 FUNCTION PENDANT CONTROL
22582	STANDARD (NON-PROP) W/ ENGINE START / STOP / THROTTLE CONTROL
22655	PROPORTIONAL PENDANT CONTROL REPLACEMENT PARTS
22584	PROPORTIONAL PENDANT CONTROL W/ ENGINE START / STOP / THROTTLE CNTRL
I19249	18930-1 ELEVATION CYLINDER
19908	19886-1 EXTENSION CYLINDER
22434	REPLACEMENT PARTS - 23962-P-II MANUAL OUTRIGGER
22441	REPLACEMENT PARTS - 23962-CD-II CRANKDOWN OUTRIGGER
22428	23962-PH-II HD HYDRAULIC OUTRIGGERS
22576	23962-PHX-II HD HYDRAULIC OUTRIGGERS
23962-2	INSTALLATION & REPLACEMENT PARTS - STUB OUTRIGGER
22448	19294 PTO PACKAGE
22615	ENGINE START/STOP & THROTTLE CONTROL



MFG., INC.
CINCINNATI, OHIO

TITLE

TABLE OF CONTENTS

HT25KX

DATE

12-27-01C

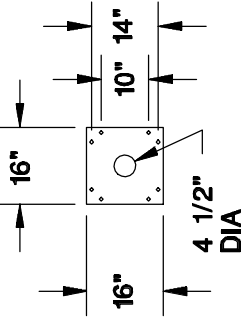
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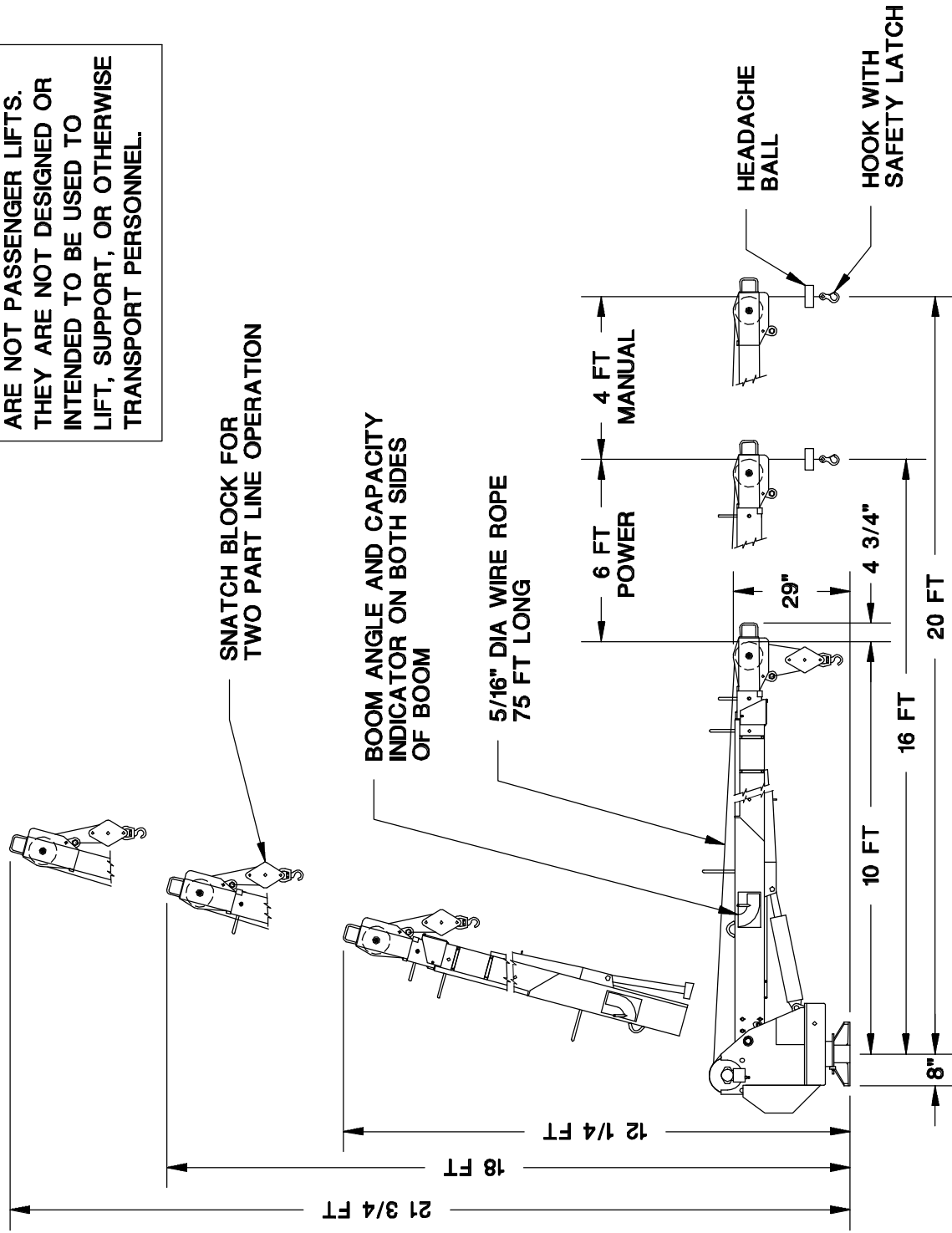
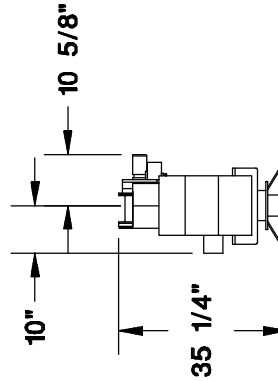
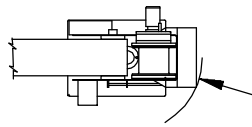
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PAGE 2 OF 2

19909B



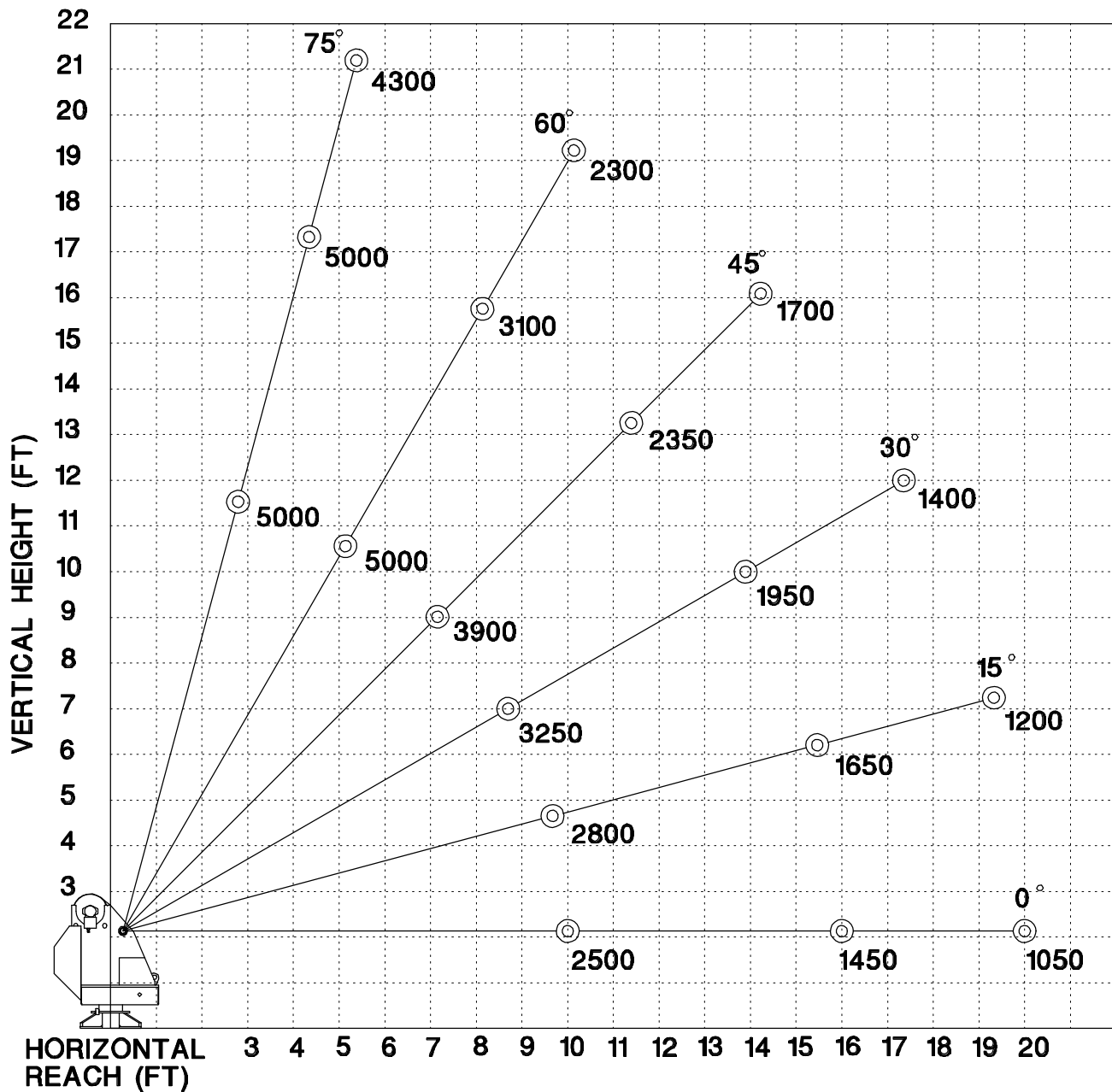
BASE MOUNTING DIMENSIONS



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

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE INSTALLATION DRAWING		DATE 10-16-97A	SECTION C100
	HT25KX - 10/16/20 BOOM		SUPERSEDES 7-31-96	I19230

ET/HT25K(X) - 10-16-20 BOOM MAXIMUM CAPACITY CHART



**MUST USE SNATCH BLOCK
FOR LOADS OF 2500 LBS.
AND GREATER**



MFG., INC.
CINCINNATI, OHIO

TITLE
CAPACITY CHART

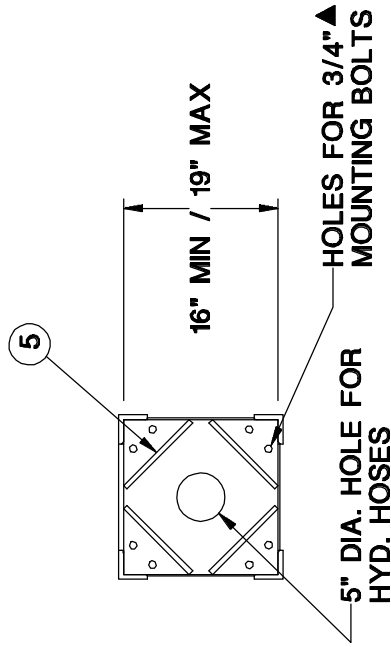
DATE
10-16-97A

SECTION
C100

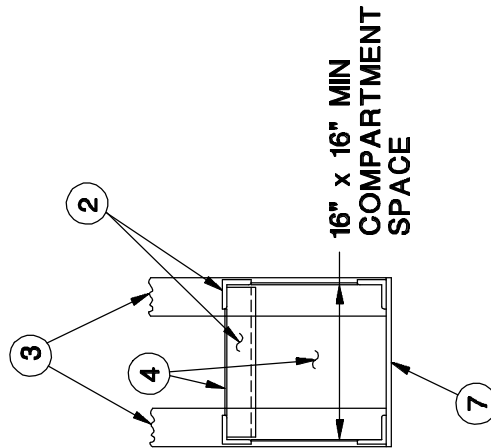
ET/HT25K(X) - 10-16-20

SUPERSEDES
8-17-96

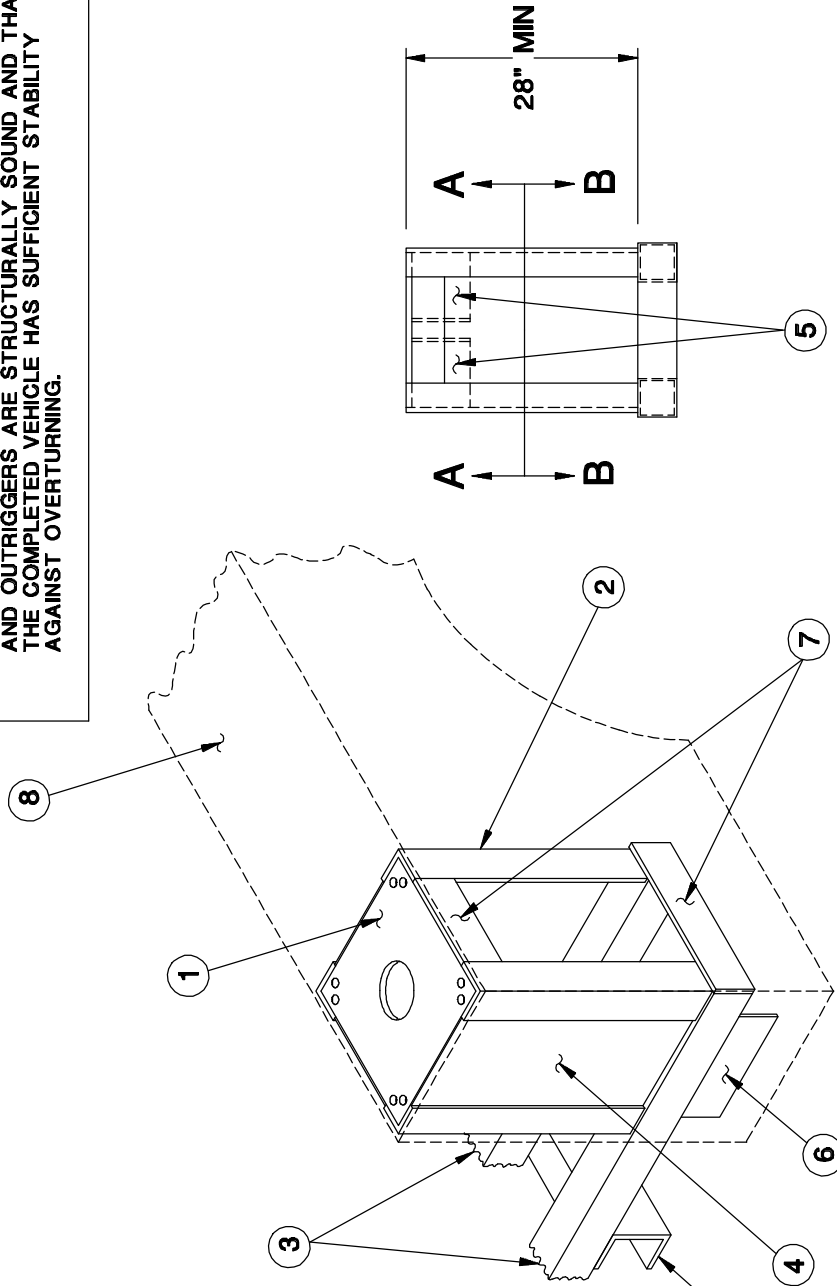
119233



SECTION A-A



SECTION B-B



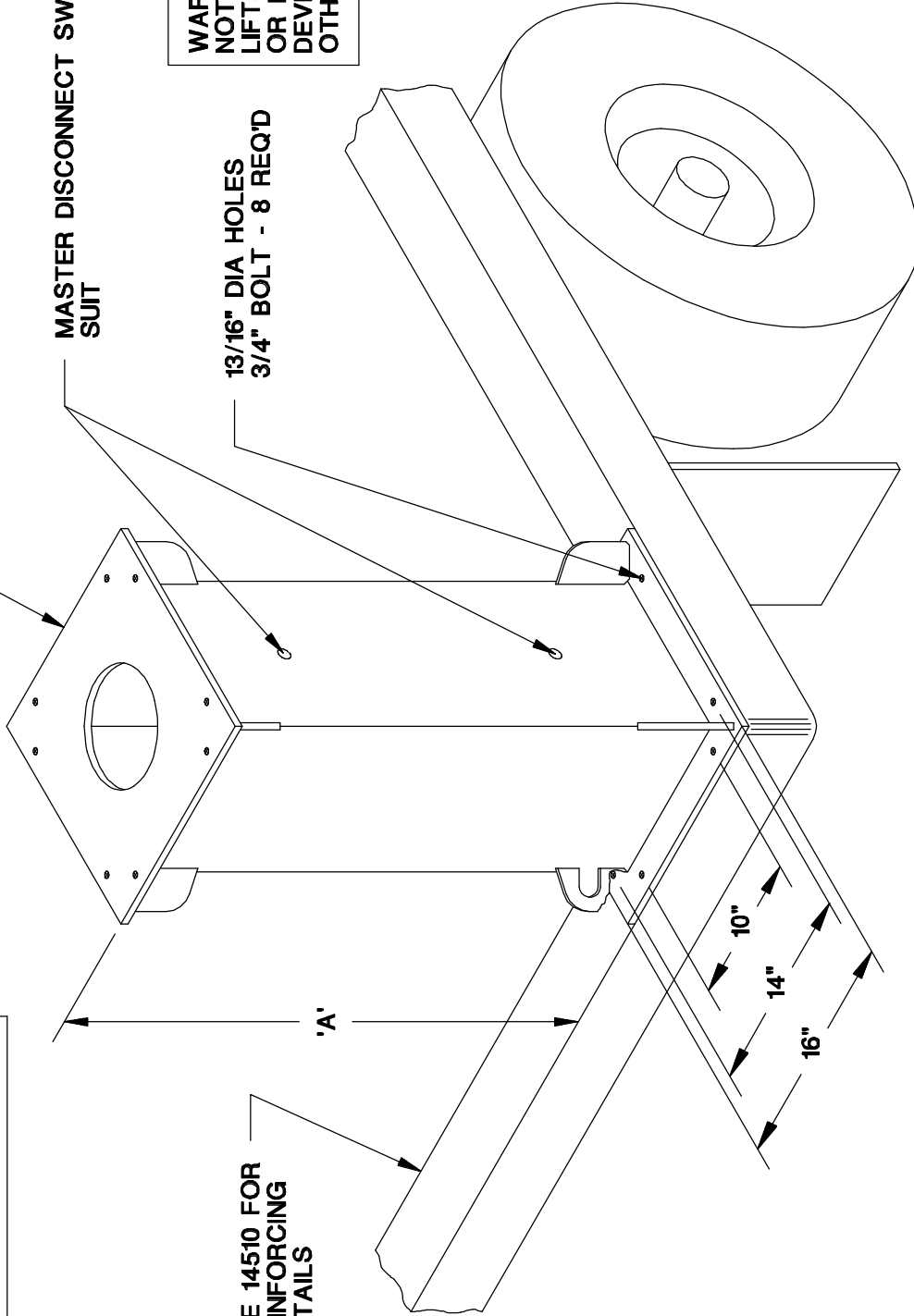
TYPICAL SERVICE BODY REINFORCEMENT

PART	DESCRIPTION	MINIMUM RECOMMENDED MATERIAL SIZE
1	TOP PLATE	1/2" STEEL ▲
2	CORNER POST	3" x 3" x 1/2" STEEL ANGLE
3	CROSS FRAME	4" x 4" x 5/16" SQUARE TUBING
4	SHEAR WEB	3/16" STEEL PLATE
5	TOP PLATE REINFORCEMENT	1/2" x 8" OR 3/4" x 5" STEEL BAR
6	OUTRIGGER REINFORCEMENT PLATE	1/4" THICK STEEL PLATE
7	GUSSET	1/2" x 4" H.R. STEEL
8	BODY TOP REINFORCEMENT	10 GA SMOOTH OR DIAMOND PLATE WITH 1" LIP OVER SIDE OF BODY

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.

'A'	17350
DIM	DASH NO.
36"	-36
CONSULT VENTURO FOR OTHER (OPTIONAL) HEIGHTS	

17350 PEDESTAL SHOWN MOUNTED ON RIGHT REAR
CORNER OF FLAT BED AS TYPICAL OF POSSIBLE
MOUNTING POSITIONS; MAY ALSO BE MOUNTED
BEHIND CAB.



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.

17350
MOUNTING PEDESTAL

TITLE INSTALLATION DRAWING	DATE 11-5-97	SECTION C100
	SUPERSEDES -	19411
VENTURO MANUFACTURING, INC. CINCINNATI, OHIO		

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.

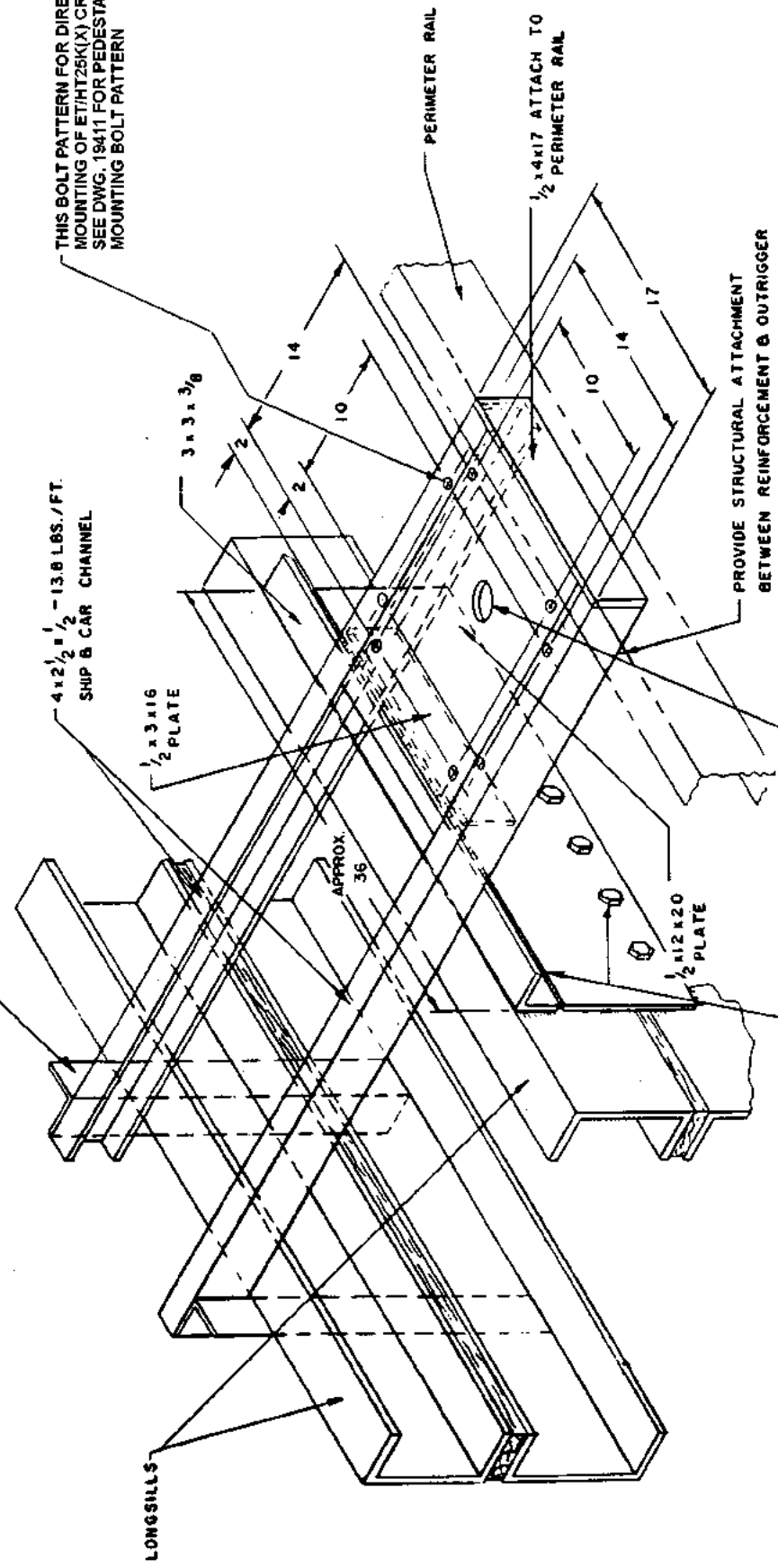
ANGLES BOLTED INTO FRAME & LONGSILLS 2 PLACES

3 x 3 x 3/8

4 x 2 1/2 x 1/2 - 13.0 LBS./FT. SHIP & CAR CHANNEL

1 x 3 x 1/2 PLATE

THIS BOLT PATTERN FOR DIRECT MOUNTING OF ET/HT25K(X) CRANE SEE DWG. 19411 FOR PEDESTAL MOUNTING BOLT PATTERN

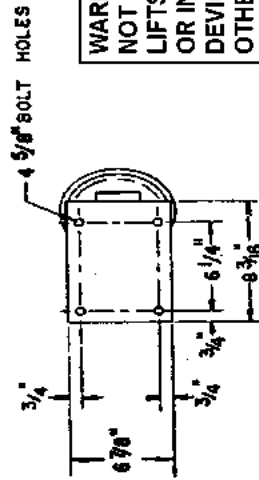


TYPICAL REINFORCEMENT FOR MOUNTING ET/HT25 CRANE ON EDGE OF FLAT BED BODY

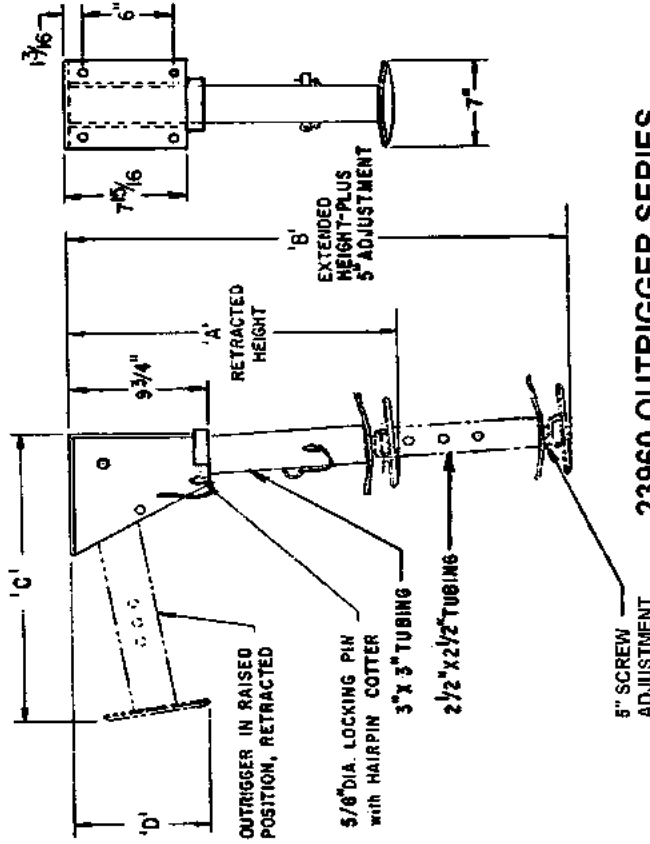
1/4\" PLATE WELDED TO LONGSILLS & BOLTED TO FRAME.
1\" HOLE FOR BATTERY CABLE - ET25K(X) OR 5\" HOLE FOR HYDRAULIC HOSES - HT25K(X)

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE		INSTALLATION DRAWING	SECTION
	DATE	4-8-99K	C100	
	SUPERCEDES	11-2-98J	14510	
	ET25K(X), HT25K(X)			

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"



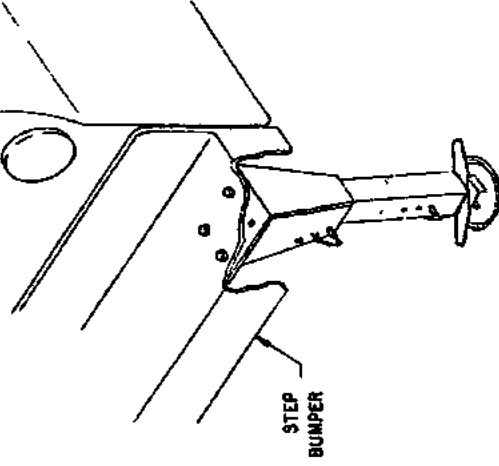
WARNING: THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL



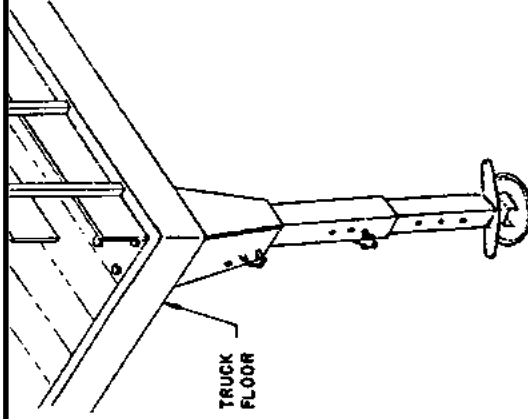
23960 OUTRIGGER SERIES ET/HT25 SERIES CRANES

VENTURO

MANUFACTURING, INC.
CINCINNATI, OHIO



TYPICAL SHORT
OUTRIGGER INSTALLATION



TYPICAL LONG
OUTRIGGER INSTALLATION

TITLE
INSTALLATION DRAWING

DATE
4-29-98C

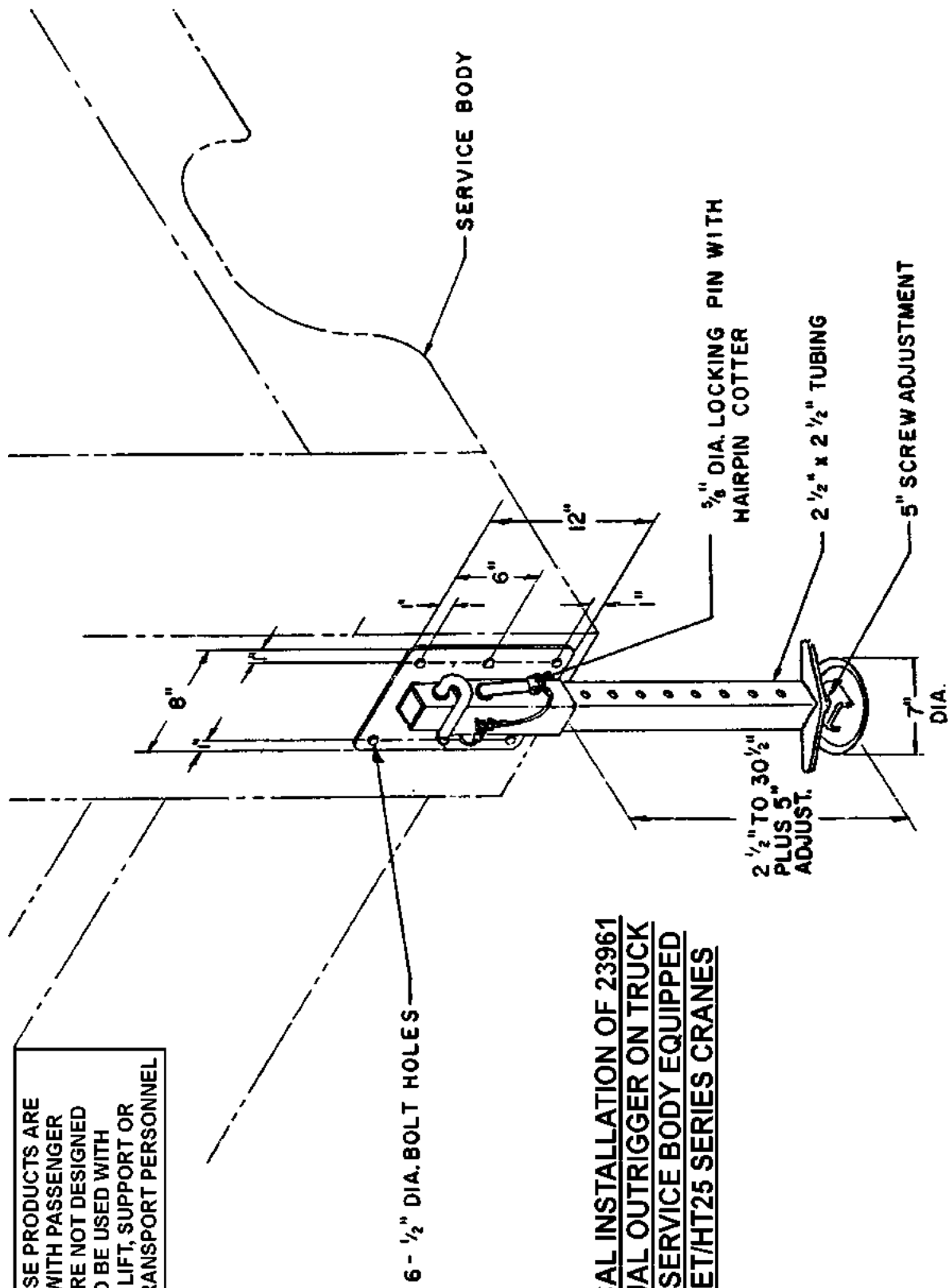
SECTION
C100

ET10K(X), ET25K(X), HT25KX

SUPERCEDES
7-27-83B

I23960

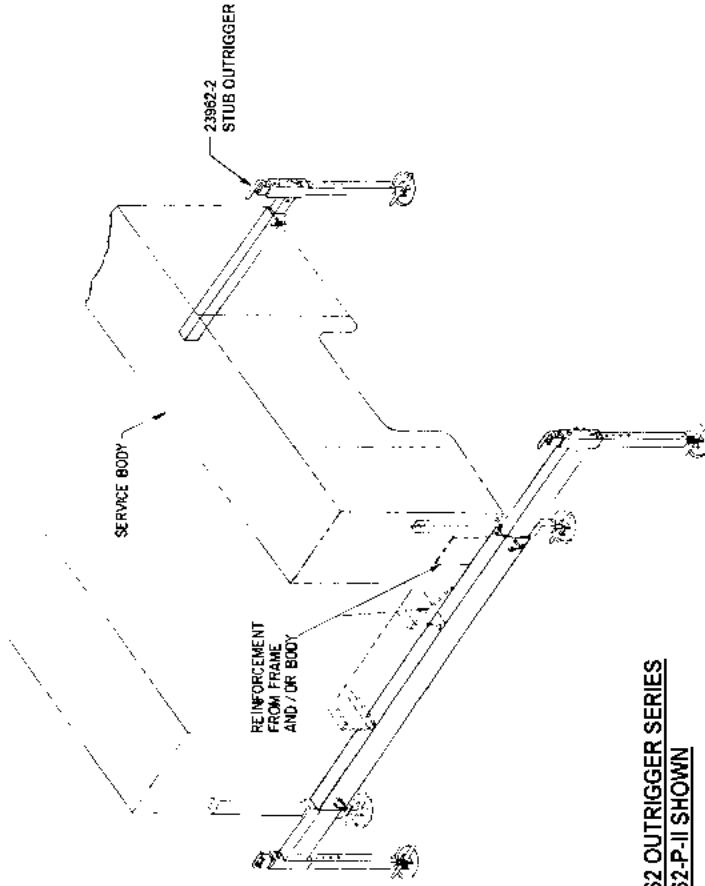
WARNING: THESE PRODUCTS ARE NOT FOR USE WITH PASSENGER LIFTS. THEY ARE NOT DESIGNED OR INTENDED TO BE USED WITH DEVICES THAT LIFT, SUPPORT OR OTHERWISE TRANSPORT PERSONNEL



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

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE	INSTALLATION DRAWING	DATE	4-29-98D	SECTION	C100
		ET10K(X), ET25K(X), HT25KX	SUPERCEDES	7-27-83C		I23961

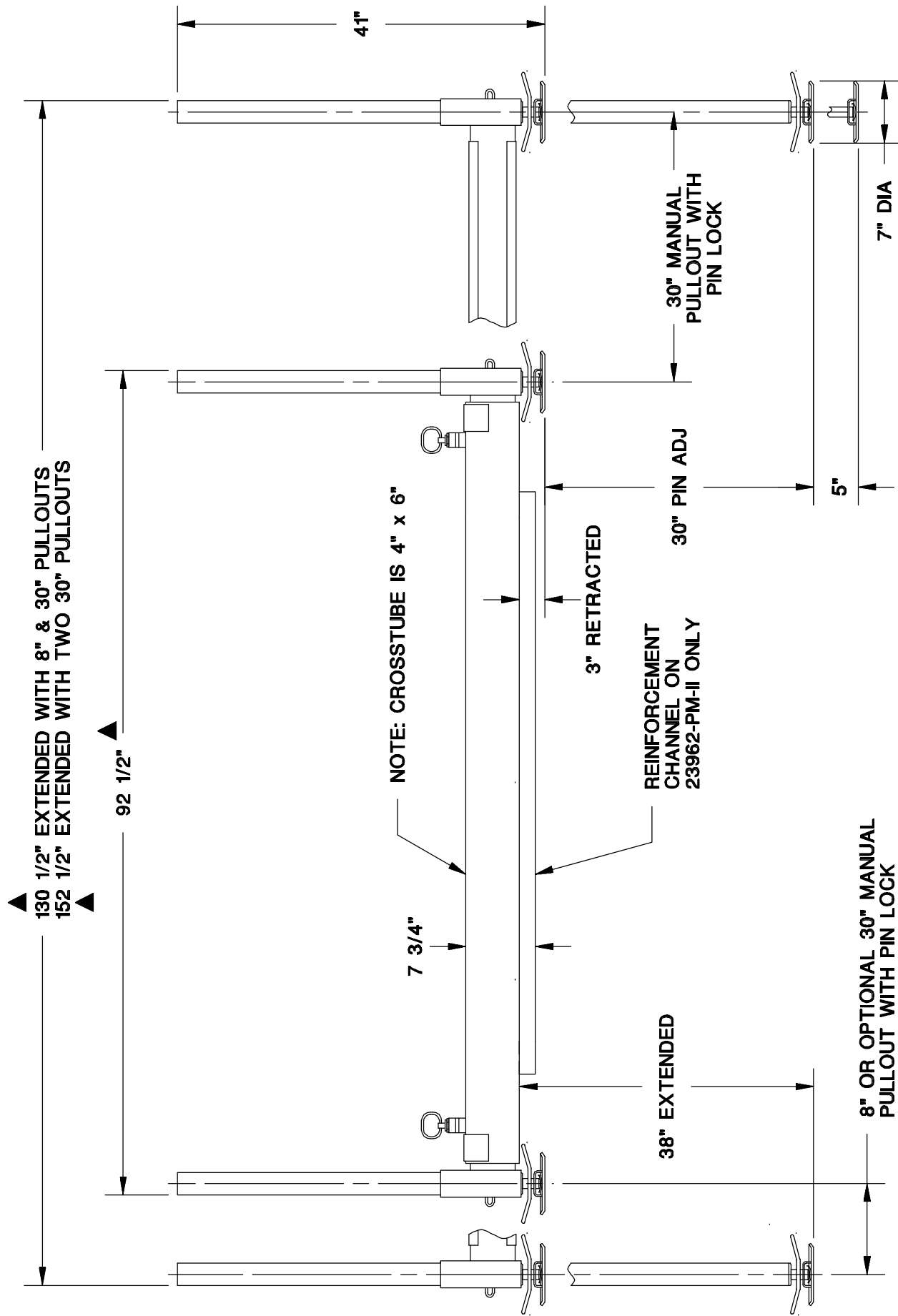
WARNING: THESE PRODUCTS ARE NOT FOR
USE WITH PASSENGER LIFTS. THEY ARE
NOT DESIGNED OR INTENDED TO BE USED
WITH DEVICES THAT LIFT, SUPPORT OR
OTHERWISE TRANSPORT PERSONNEL.

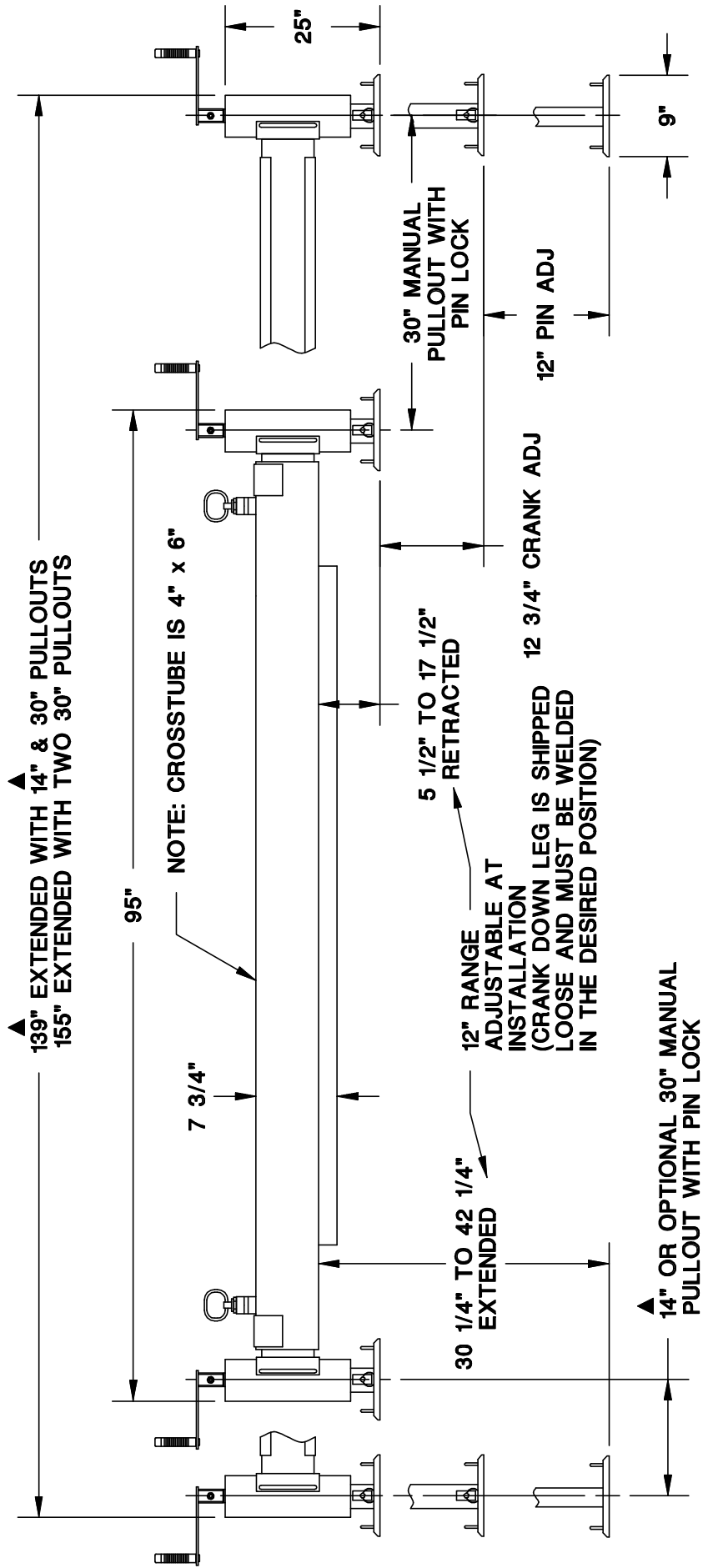


23962 OUTRIGGER SERIES
23962-P-II SHOWN

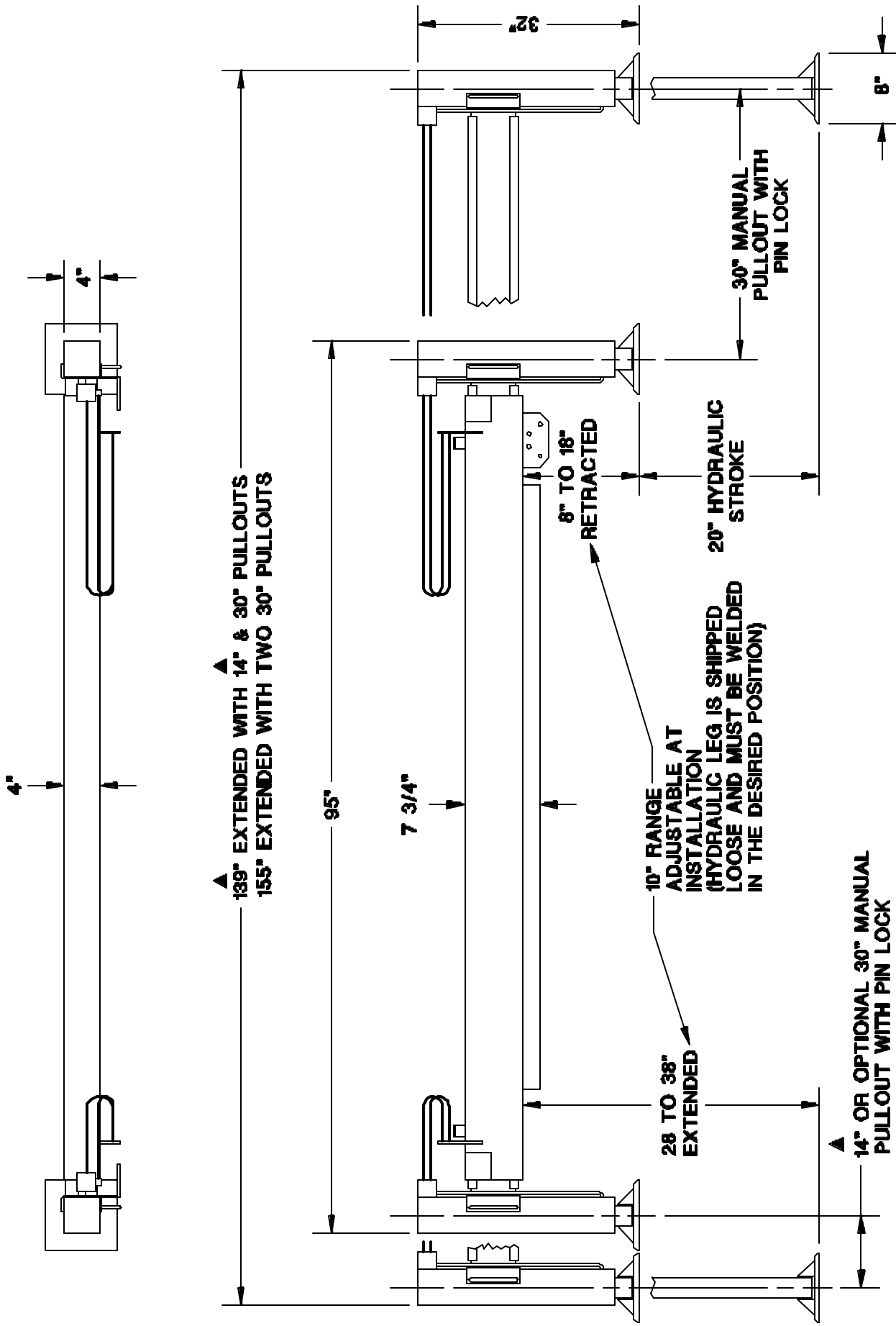
OUTRIGGER	IN/OUT	UP/DOWN	DUTY	USED ON
23962-P	MANUAL	MANUAL	STANDARD	ET/HT25K(X)
23962-PM	MANUAL	MANUAL	HEAVY	HT40/50KX
23962-CD	MANUAL	CRANK-DOWN	HEAVY	ET/HT25K(X), HT40/50KX
23962-PH	MANUAL	HYDRAULIC	HEAVY	HT25K(X), HT40/50KX
23962-PHX	HYDRAULIC	HYDRAULIC	HEAVY	HT25K(X), HT40/50KX
23962-PHE	MANUAL	ELECTRIC/HYDRAULIC	HEAVY	ET25K(X)
23962-PHXE	ELECTRIC/HYDRAULIC	ELECTRIC/HYDRAULIC	HEAVY	ET25K(X)

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE	DATE	SECTION
	INSTALLATION DRAWING	4-12-99E	C120
	ET25K(X), HT25K(X), HT40/50KX	SUPERCEDES 4-27-92D	I23962





 MANUFACTURING, INC. CINCINNATI, OHIO	TITLE		DATE	SECTION
	INSTALLATION DWG		7-30-99D	C100
	23962-CD-II CRANKDOWN OUTRIGGERS		SUPERSEDES	22459
			1-19-99C	



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
5-15-02H

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.
CINCINNATI, OHIO

TITLE

INSTALLATION DWG

DATE

5-13-97A

SECTION

C150

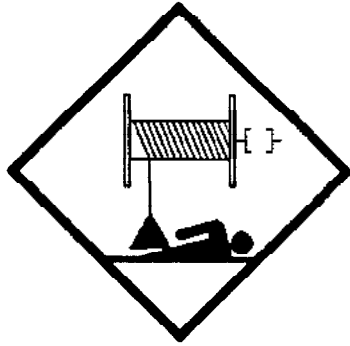
HYDRAULIC CRANES

SUPERCEDES

6-12-92

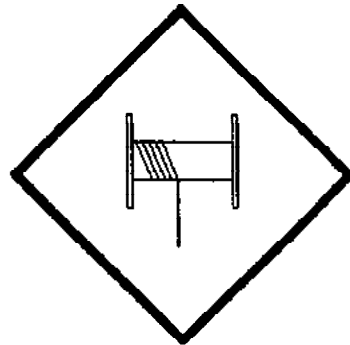
920612

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**



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

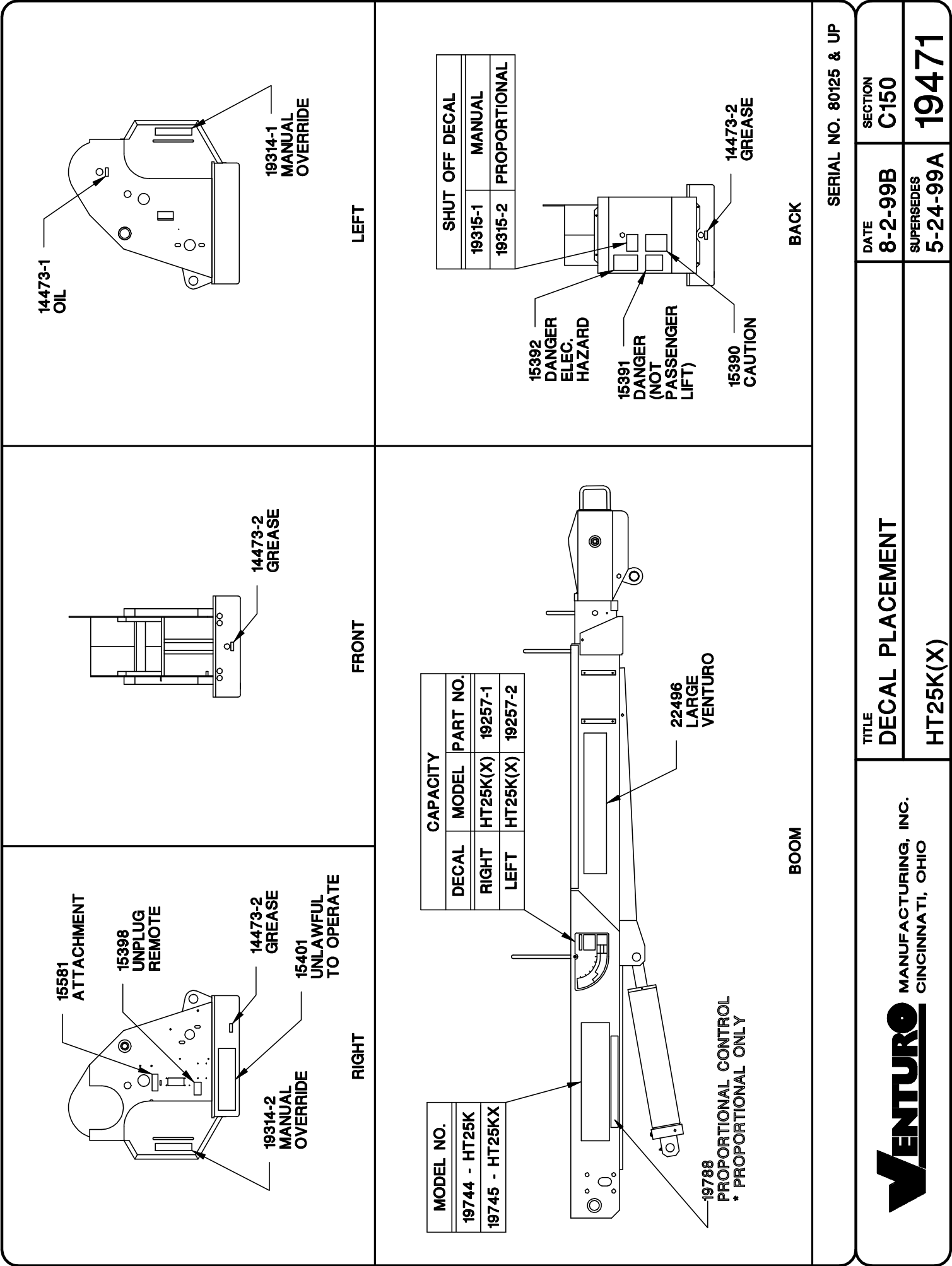
HT CRANES

DATE
5-26-98B

SUPERCEDES
10-17-97A

SECTION
C150

I19217



CRANE INSTALLATION

HT25KX

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 HT25KX is 27,000 ft. lbs.

The maximum vertical load is 6500 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 3/4" dia. with either coarse or fine threads. A 4.5" 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 users 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 housing. These hoses are to be arranged in the compartment or pedestal below the crane as shown on drawing I19213 using the angle bulkhead fittings furnished in the installation kit.

These hoses are to be connected in a relaxed position as shown on I19213, 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. The larger swivel is on the return hose which has a 1/2 flare.



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

HT25KX

DATE
6-17-02D

SUPERCEDES
8-12-99C

SECTION
C200

I19212a

ELECTRICAL CONNECTIONS

- A 25 ft. electrical power lead - intended for 12V DC only - also comes down through the center
▲ of the housing 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

<u>Average Climate</u>	<u>Type of Oil</u>
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	1/4"
RETURN	3/8"
SUCTION	3/4"

RESERVOIR

The PTO reservoir should have a capacity of 8 gallons fitted with 100 mesh suction screen, 10 micron return line filter, and filler/breather cap.

PTO PUMP

For standard (non-proportional) cranes, the PTO pump should be sized to provide 2.0 gpm (or 1.5 gpm for more delicate control of loads) at 3000 psi when engine is at desired idle speed.

For proportional cranes, the PTO pump should be sized to provide 4.0 gpm at 3000 psi when engine is at desired idle speed.

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 16 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.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

HT25KX

DATE
6-17-02E

SUPERCEDES
4-24-02D

SECTION
C200

119212b

CRANE OPERATION AND MAINTENANCE INSTRUCTIONS

HT25KX

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 2500 lbs. or 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 half-link located just above the socket.

PTO SYSTEM

Check the hydraulic fluid level in the PTO system reservoir. Engage PTO and set the engine idle speed to provide a 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



MFG., INC.
CINCINNATI, OHIO

TITLE

INSTALLATION DWG

HT25KX

DATE

10-17-97B

SUPERCEDES

9-25-97A

SECTION

C200

119205a

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 SN: 80125 & UP) - Energizes safety shutoff valve. See page 22328 for detailed operating 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.

The Overload Sensing 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.

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 19050 for parts breakdown 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.



MFG., INC.
CINCINNATI, OHIO

TITLE

INSTALLATION DWG

HT25KX

DATE

4-14-98D

SUPERCEDES

10-17-97C

SECTION

C200

119205b

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.

Temp Range (F)	Winch Hydraulic Oil
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

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.



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG
HT25KX

DATE
4-17-98C
SUPERCEDES
10-17-97B

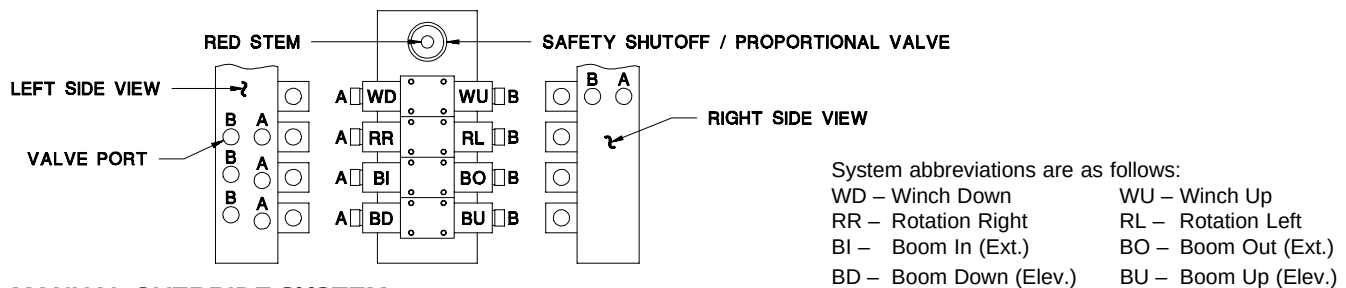
SECTION
C200
119205c

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

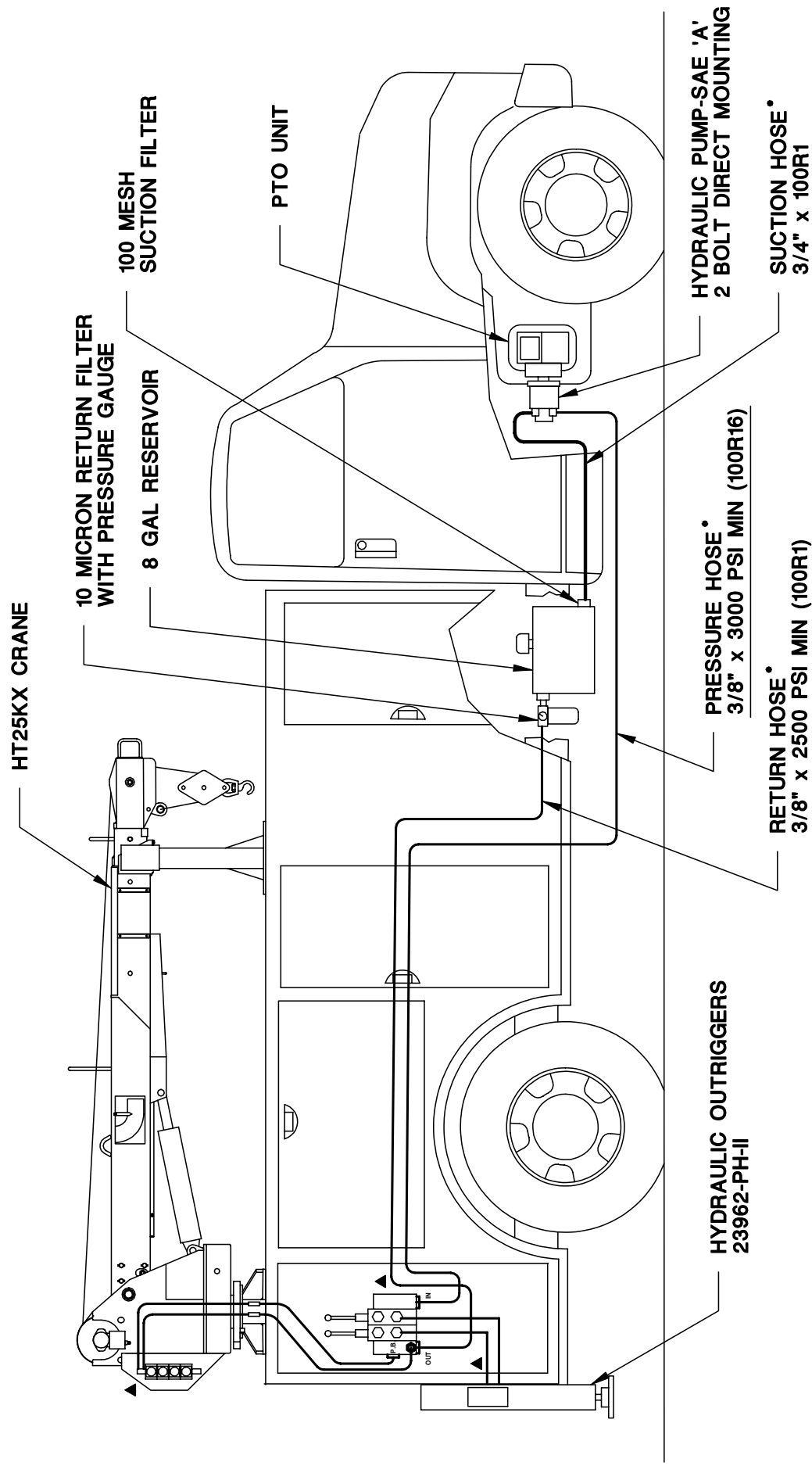
HT25, HT40/50

DATE
5-1-98A

SUPERCEDES
2-24-98

SECTION
C200

22328



HYDRAULIC REQUIREMENTS:

HT25KX STANDARD - 2.0 GPM @ 3000 PSI (19294-2.64 PTO PACKAGE)

HT25KX PROPORTIONAL - 4.0 GPM @ 3000 PSI (19294-5.00 PTO PACKAGE)

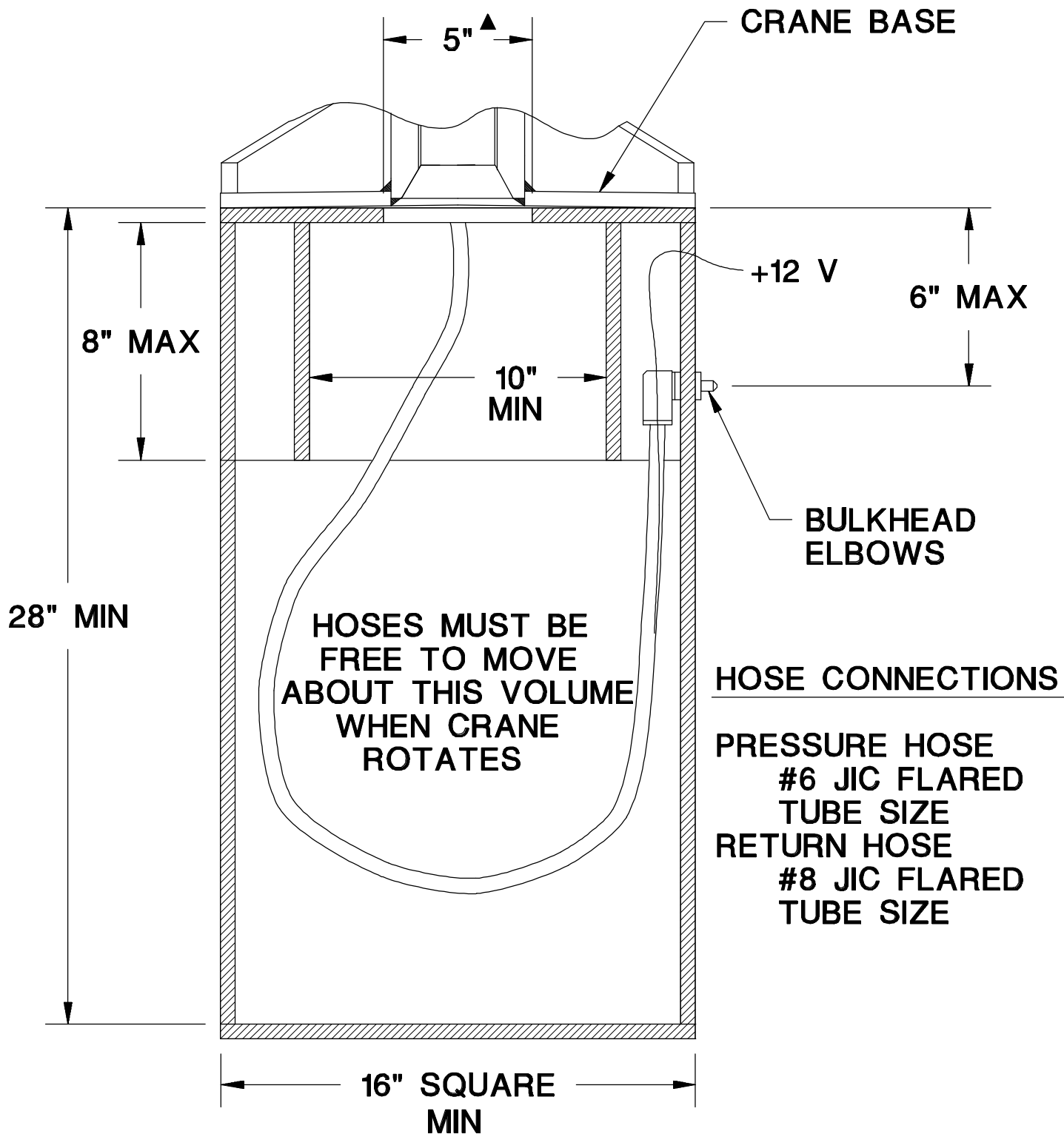
SEE INSTALLATION INSTRUCTIONS I19212 (2 PAGES).

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

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE INSTALLATION DWG		SECTION C200
	PTO INST - HT25		DATE 11-6-02B SUPERSEDES 9-26-97A

I19232

CRANE AND HOSE INSTALLATION HT25K(X)



MFG., INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

HT25K(X)

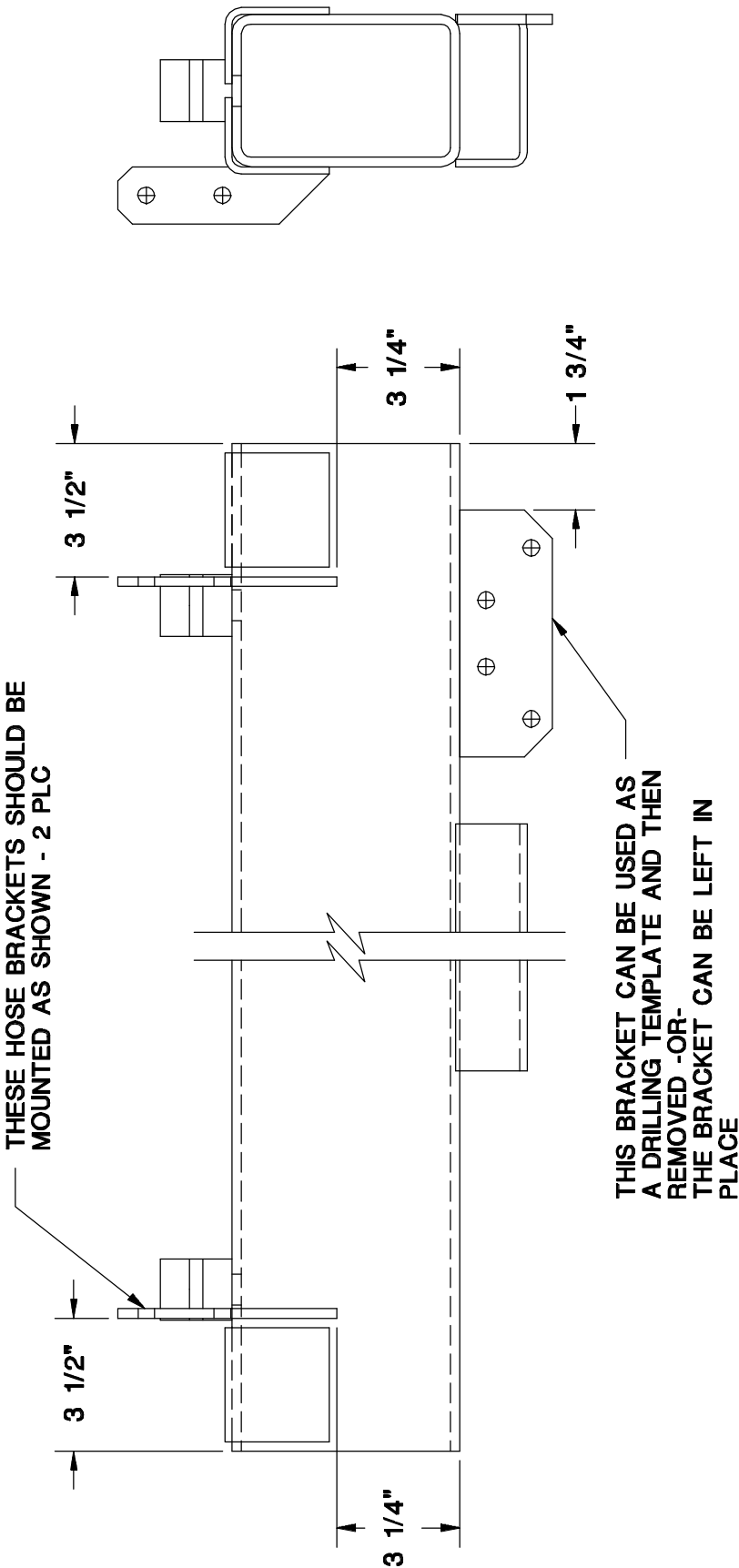
DATE
10-12-98D

SUPERSEDES
10-16-97C

SECTION
C200

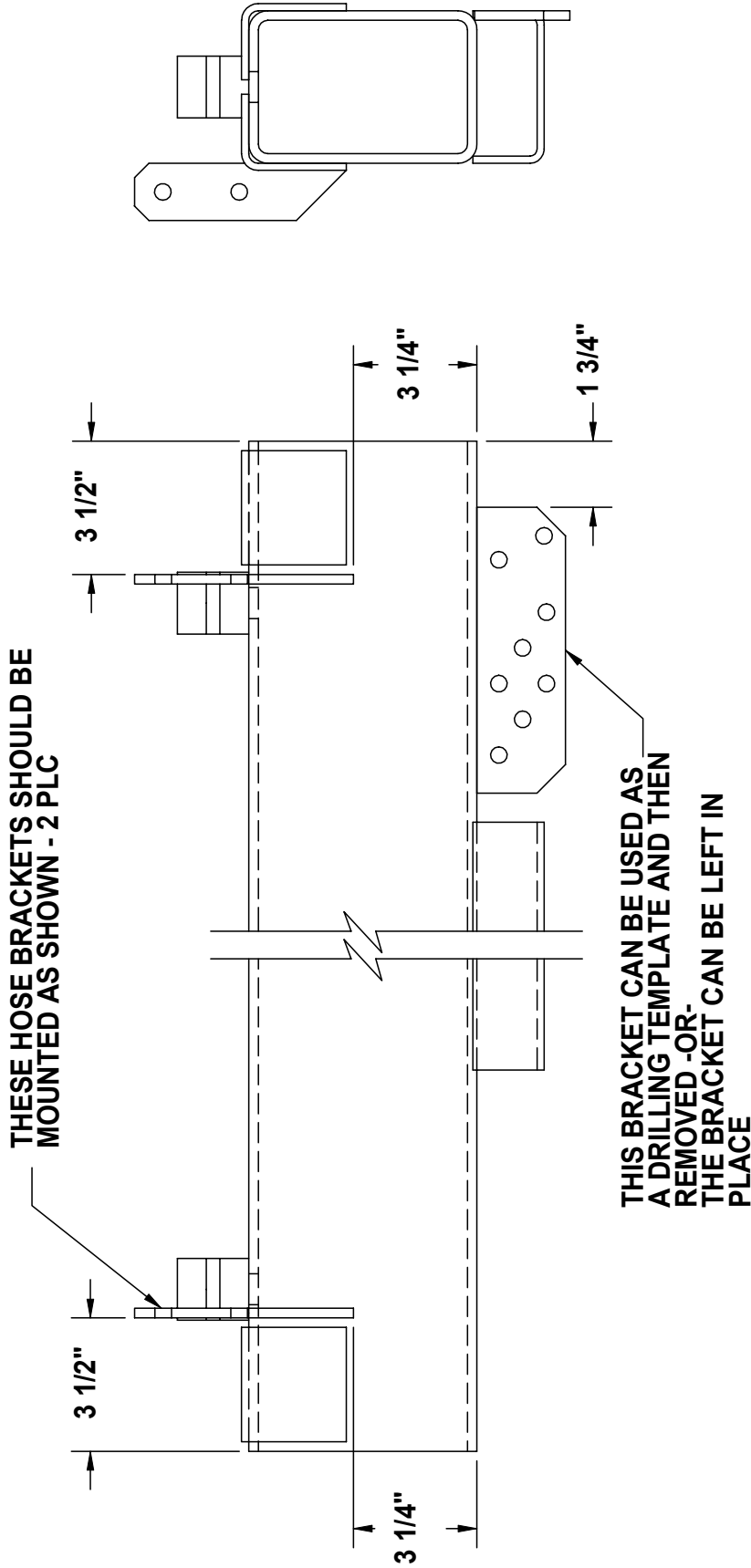
119213

HOSE BRACKET LOCATIONS - 23962-PH-II



 MANUFACTURING, INC. CINCINNATI, OHIO	TITLE INSTALLATION DRAWING		DATE 7-5-97	SECTION C200
	23962-PH-II HYD. OUTRIGGER		SUPERSEDES -	22447

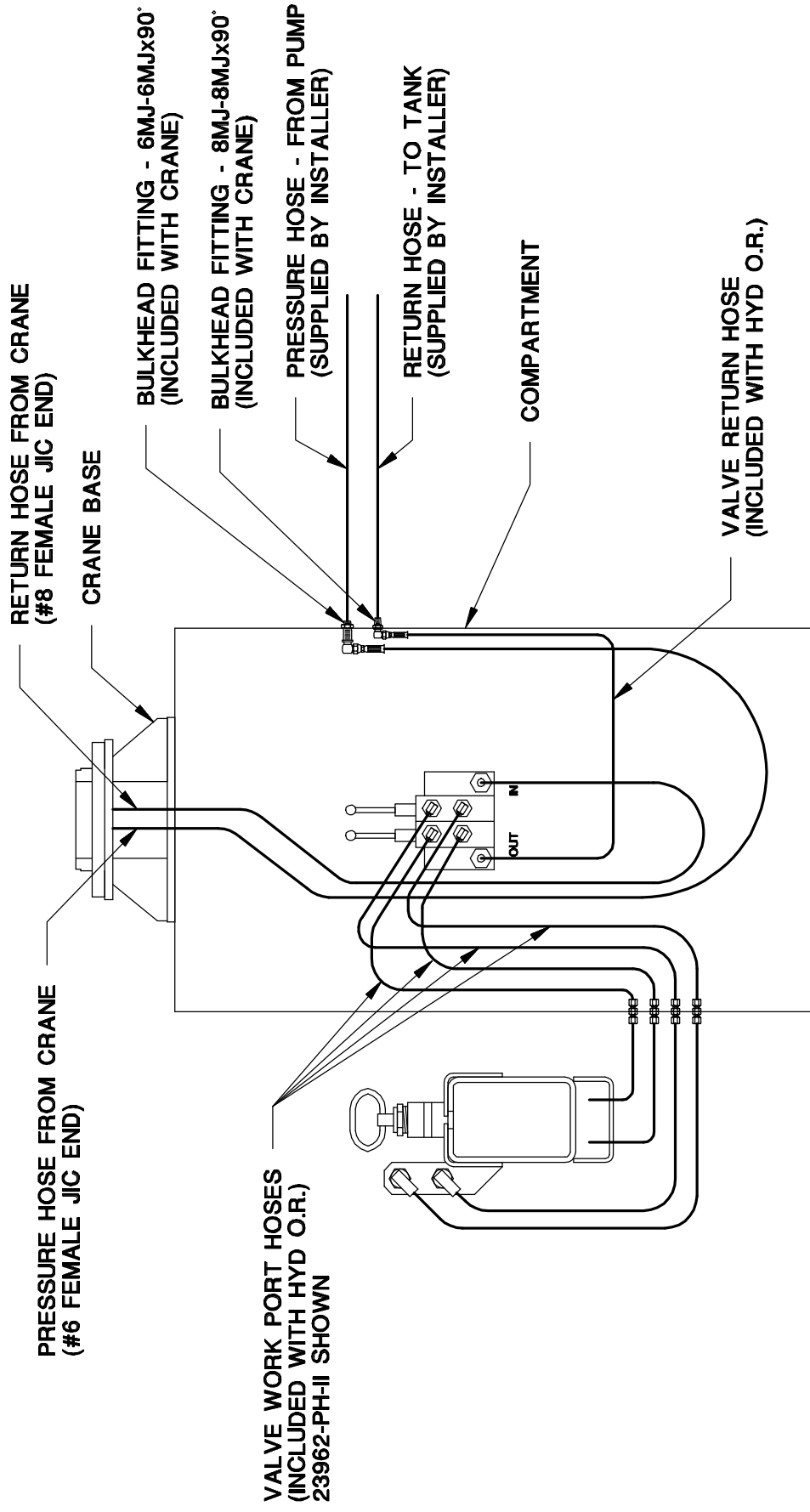
HOSE BRACKET LOCATIONS - 24962-PHX & 23962-PHX-II



 MANUFACTURING, INC. CINCINNATI, OHIO	TITLE		DATE	SECTION
	INSTALLATION DRAWING		3-28-02A	C200
	24962-PHX & 23962-PHX-II HYD. OUTRIGGER		SUPERSEDES 4-7-99	22574

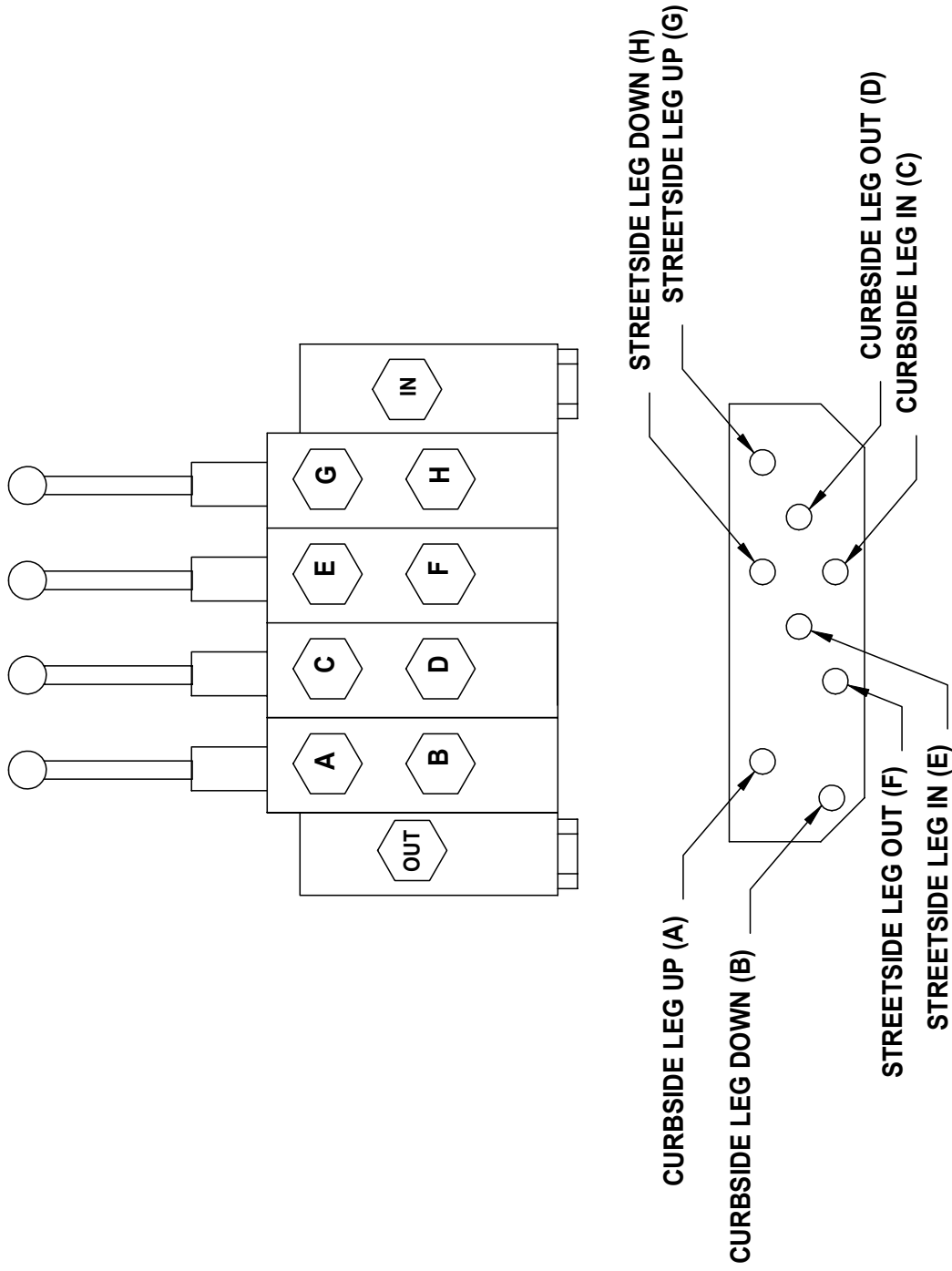
TYPICAL HYDRAULIC OUTRIGGER INSTALLATION

SEE 22428/22576 REPLACEMENT PARTS DRAWING FOR ADDITIONAL INFORMATION



VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE INSTALLATION DRAWING		DATE 4-7-99A	SECTION C200
	23962-PH-II/23962-PHX-II OUTRIGGERS		SUPERSEDES 6-25-97	22336

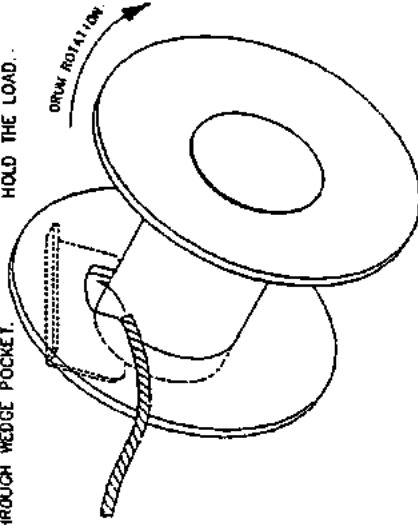
BULKHEAD FITTINGS LAYOUT



VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE BULKHEAD FITTINGS LAYOUT		DATE 4-7-99	SECTION C200
	23962-PHX-II		SUPERSEDES -	22575

STEP 1

INSERT CABLE END INTO
POCKET OPENING AND
THROUGH WEDGE POCKET.

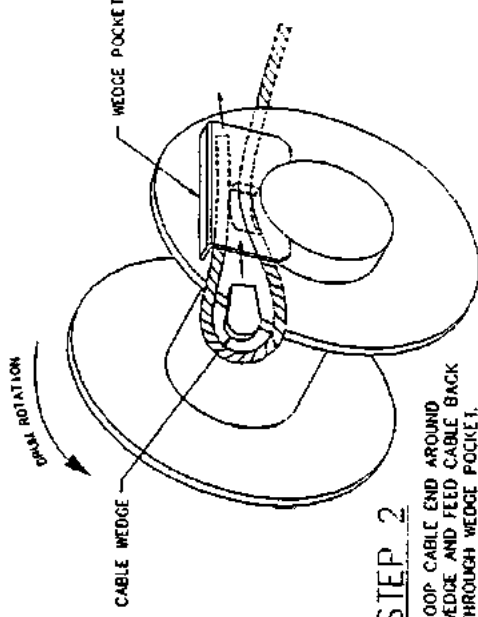


CAUTION:

IF WINCH CABLE IS NOT INSTALLED
FOR THE CORRECT DRUM ROTATION,
THE WINCH BRAKE VALVE WILL NOT
HOLD THE LOAD.

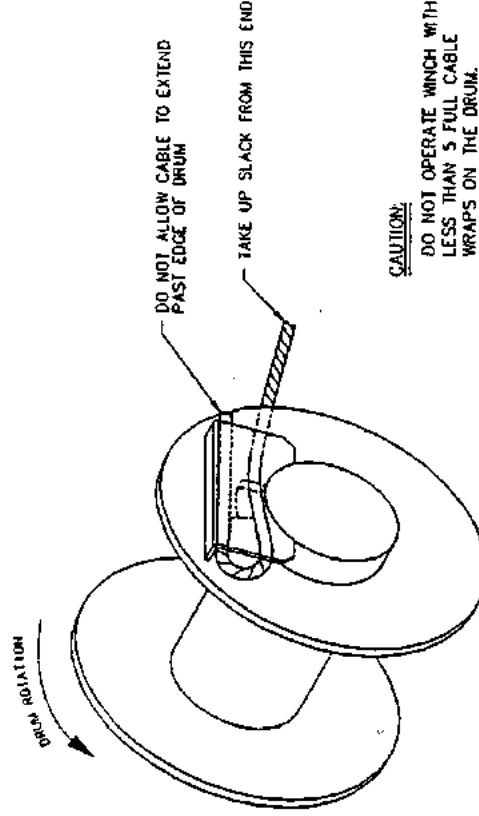
STEP 2

LOOP CABLE END AROUND
WEDGE AND FEED CABLE BACK
THROUGH WEDGE POCKET.



STEP 3

ONCE SLACK IS TAKEN UP,
THE CABLE IS PROPERLY
INSTALLED.



DO NOT ALLOW CABLE TO EXTEND
PAST EDGE OF DRUM

TAKE UP SLACK FROM THIS END

CAUTION:

DO NOT OPERATE WINCH WITH
LESS THAN 5 FULL CABLE
WRAPS ON THE DRUM.

CABLE INSTALLATION



MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
INSTALLATION DWG

HT25KX

SECTION

C200

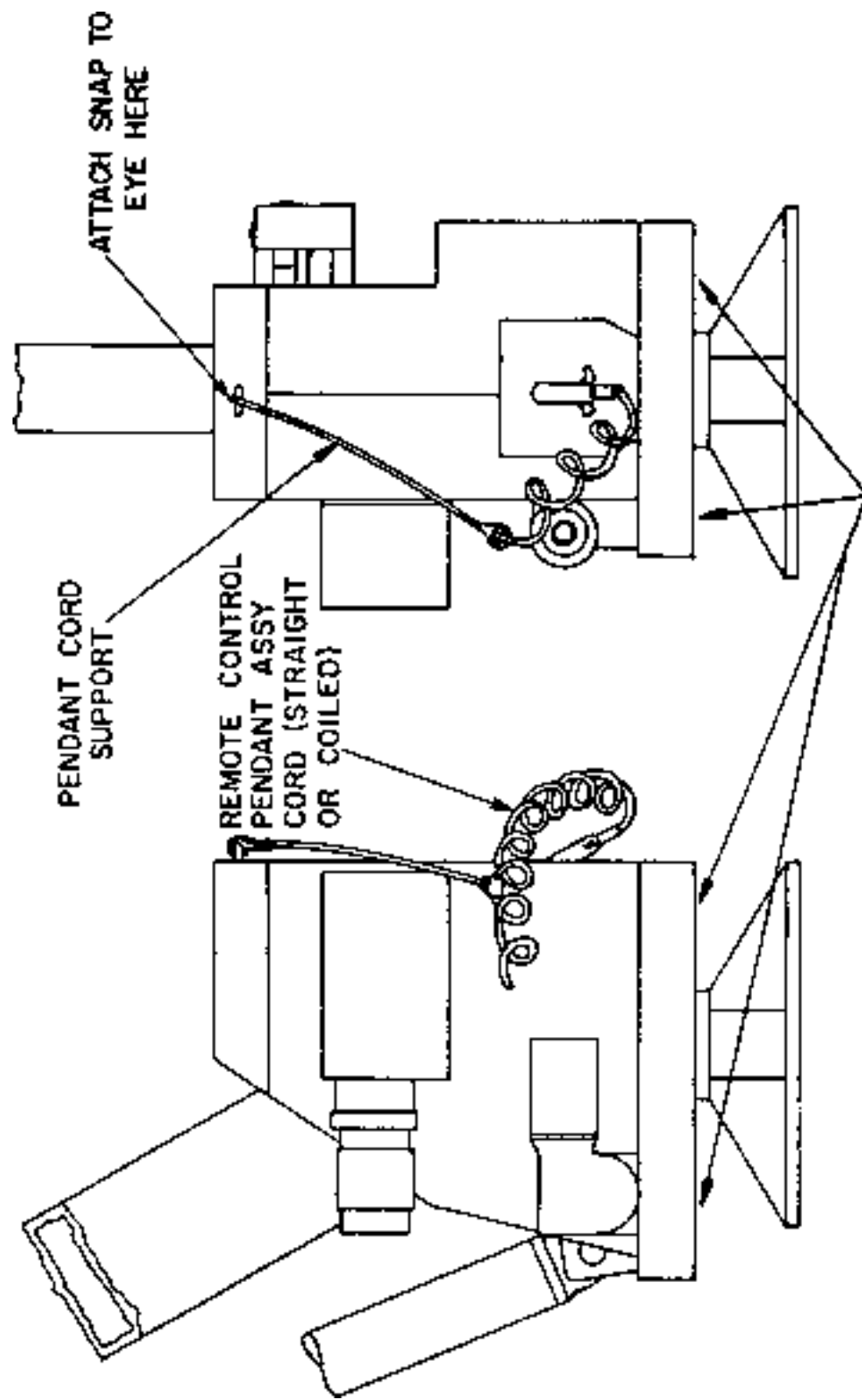
DATE

10-17-97A

SUPERCEDES

7-29-96

I19218



CAUTION: KEEP PENDANT CORD AWAY FROM THIS AREA

PENDANT CORD SUPPORT REDUCES STRAIN ON PLUG & HELPS KEEP THE CORD AWAY FROM THE AREA BETWEEN CRANE LOWER HOUSING & BASE

MANUFACTURING, INC.
CINCINNATI, OHIO



TITLE
PENDANT CORD SUPPORT

DATE
5-26-98C

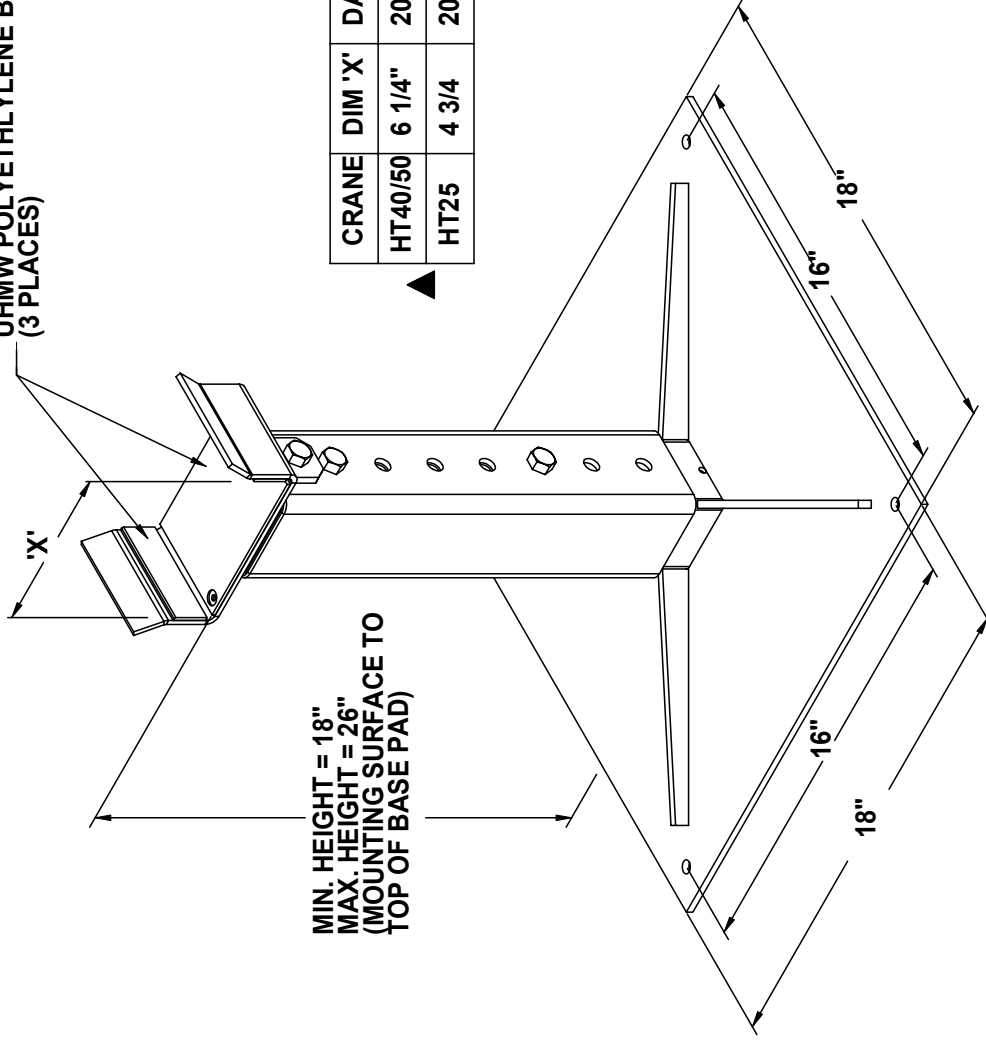
SECTION
C200

ET & HT CRANE SERIES

SUPPERCEDES
7-13-92B

I25618

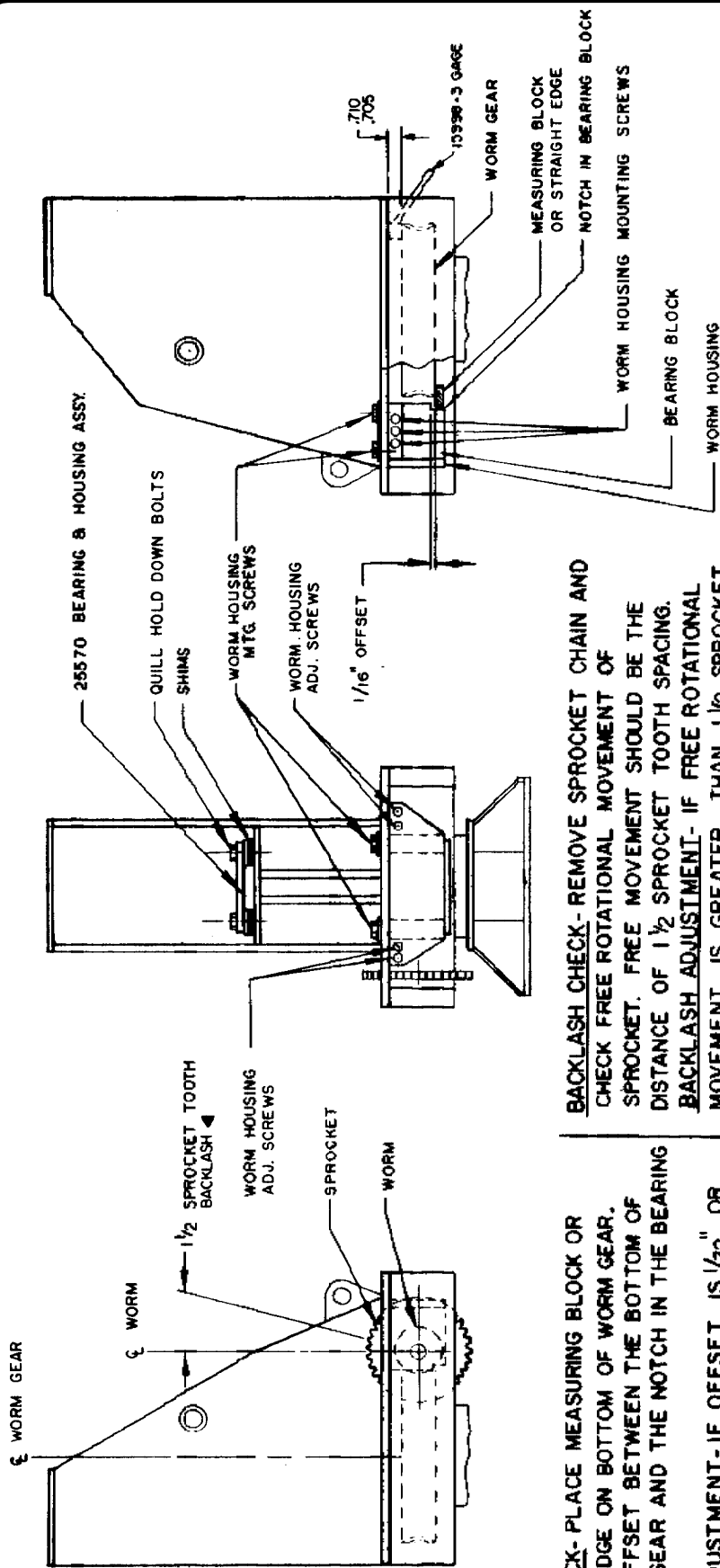
UHMW POLYETHYLENE BOOM PADS
(3 PLACES)



MIN. HEIGHT = 18"
MAX. HEIGHT = 26"
(MOUNTING SURFACE TO
TOP OF BASE PAD)

CRANE	DIM 'X'	DASH No.
HT40/50	6 1/4"	20381-1
HT25	4 3/4"	20381-2

WITH SINGLE ACTING
ELEVATION CYLINDER
MECHANICAL DEVICE IS
NEEDED TO SECURE
BOOM



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 1998-3 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.

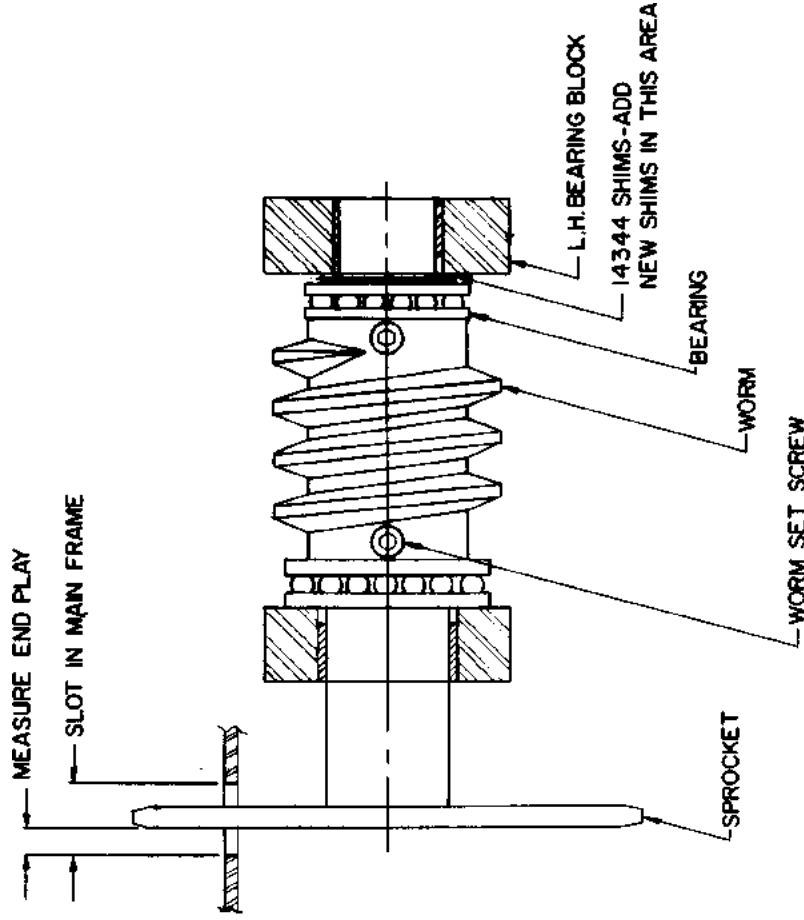
BACKLASH CHECK- REMOVE SPROCKET CHAIN AND CHECK FREE ROTATIONAL MOVEMENT OF SPROCKET. FREE MOVEMENT SHOULD BE THE DISTANCE OF $1\frac{1}{2}$ SPROCKET TOOTH SPACING. BACKLASH ADJUSTMENT- IF FREE ROTATIONAL MOVEMENT IS GREATER THAN $1\frac{1}{2}$ SPROCKET TOOTH, THEN THE DISTANCE BETWEEN THE CENTERLINES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

ADJUSTMENT OF WORM HEIGHT AND BACKLASH

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE ASSEMBLY & SERVICE INST.		DATE 1-19-00D	SECTION C320
	ET 20,000, ET20K(X), ET25K(X), HT25K(X), HT40/50KX ▲		SUPERCEDES 8-10-98C	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

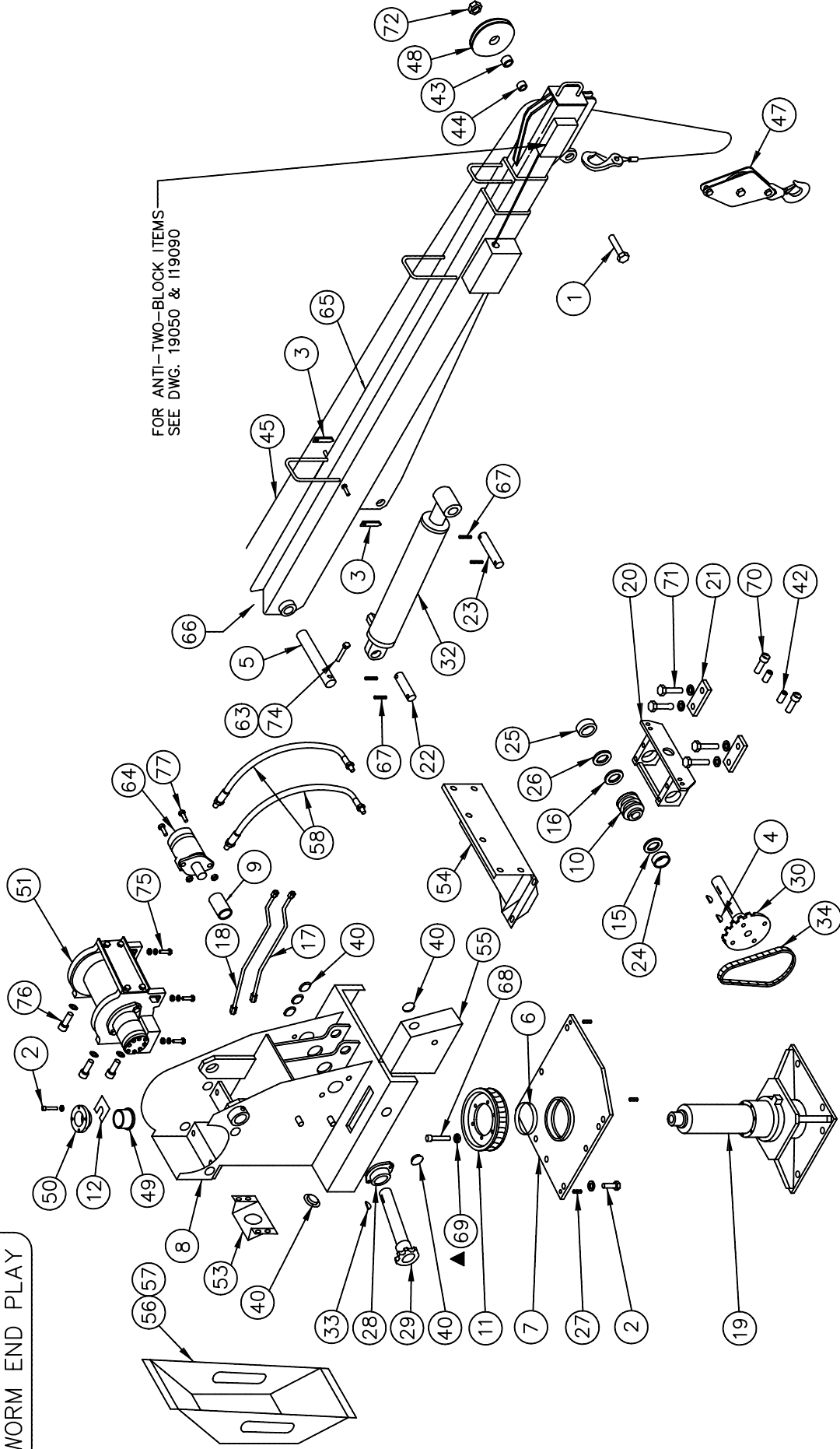
VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE ASSEMBLY & SERVICE INST.		DATE 8-10-98B	SECTION C320
	ET 20,000 CRANE		SUPERCEDES 3-10-82A	14553

SERVICE INSTRUCTIONS

14544 ADJUSTMENT OF
WORM HEIGHT
AND BACKLASH

14553 ADJUSTMENT OF
WORM END PLAY

REFER TO REPLACEMENT PARTS LIST I19240 FOR HT25KX CRANE



ITEM #	PART #	DESCRIPTION	ITEM #	PART #	DESCRIPTION
1	18994	SHEAVE AXLE - MODIFIED HEX HEAD CAP SCREW - 3/4"-10	40	RL-644	SNAP IN PLUG - 1" DIA HOLE
2	IHHCS05013125-5	HEX HEAD CAP SCREW - 1/2"-13 x 1 1/4" GRADE 5	41	15253	WASHER PLATE
3	13459-2	ARROW	42	25593	SET SCREW - 1/2"-20 x 1"
4*	15245	WOODRUFF KEY - 5/16" x 1 1/8" (MODIFIED)	43	15808	BEARING - 1 1/4" ID x 1 5/8" OD x 11/16" LONG
5	13918	PIVOT PIN, BOOM - 1 1/2" OD x 11 3/4"	44	15809	SPACER - 3/4" ID x 1 1/4" OD x 21/32" LONG
6	13978	LOWER BEARING	45	25810-5/16-75	WIRE ROPE ASSY - 5/16" x 75 FT
7	18891	BEARING PLATE	46	-----	-----
8	18914	WELDED HOUSING ASSY	47	23169	SWIVEL SNATCH BLOCK ASSEMBLY
9	14084	COUPLING	48	23911	SHEAVE (INCLUDES ITEMS 1, 43, 44, 71 & 72)
10	14142-4	WORM - SINGLE THREAD RH	49	18069	FLANGED BEARING - 2" BORE x 3" OD FLANGE
11	14143-4	WORM GEAR - 48T, 4 PITCH	50	18068	BEARING HOUSING - 1 1/8" LONG
12*	14159	SHIM - 1 1/2" SQ x .015", .042", .105"	51	19180	HYDRAULIC WINCH
13*	15675	SHIM - 1 1/4" ID x .015", .031"	52	18067	BEARING AND HOUSING ASSY (ITEMS 49, 50)
14	17356	OVERLOAD ALARM	53	19185	BRACKET - PENDANT SOCKET
15	14191-1	BALL THRUST BEARING - 2" ID x 3 11/32" OD	54	26272-2/-3	FRONT COVER (-2) AND LOWER COVER (-3)
16	14191-2	BALL THRUST BEARING - 1 1/2" ID x 2 19/32" OD	55	19198	CHAIN COVER
17	19178	HYD TUBE ASSEMBLY - ROTATION BOTTOM	56	19227	REAR COVER - SERIAL NO. 80110 - 80127 ONLY
18	19179	HYD TUBE ASSEMBLY - ROTATION TOP	57	22325	REAR COVER - SERIAL NO. 80128 & UP
19	18880	QUILL ASSEMBLY (DOES NOT INCLUDE 18888 STOPRING)	58	19237	HYDRAULIC HOSE - ELEV CYL - SN: 80110 - 80127
20	14242	HOUSING, WORM GEAR	59	19503	HYDRAULIC HOSE - ELEV CYL - SN: 80128 & UP
21	14245	WASHER PLATE	60^	19238	HYDRAULIC HOSE - EXT CYL - SN: 80110 - 80127
22	18727	PIVOT PIN, CYL TAIL - 1 1/4" OD x 3 3/16" LONG	61	19504	HYDRAULIC HOSE - EXT CYL - SN: 80128 & UP
23	18728	PIVOT PIN, CYL ROD - 1 1/4" OD x 5 3/16" LONG	62	-----	-----
24	14341-1	BUSHING - 2" ID x 2 1/4" OD x 1" LONG	63	ILNUT-03816 ▲	LOCK NUT - 3/8"-16 ▲
25	14341-2	BUSHING - 1 1/2" ID x 1 3/4" OD x 1" LONG	64	19177	HYDRAULIC MOTOR - ROTATION
26*	14344	SHIM WASHER - 1 1/2" ID x 2 1/8" OD x .005", .015", .031" THK	65	18971	BOOM ASSY - 10/20 FT (COMPLETE ASSY)
27*	14353	COIL PIN - 1/2" OD x 1 1/2" LONG	66	18969-1	EXTENSION CYLINDER
28	14356	FLANGE MOUNTED BALL BEARING - 1" BORE	67	IRPIN-025175	ROLL PIN - 1/4" DIA x 1 3/4"
29	14377	SPROCKET AND SHAFT ASSEMBLY (10T SPROCKET)	68	18927	SOCKET HEAD CAP SCREW - 1/2"-13 x 3" LONG
30	14384	SPROCKET AND SHAFT ASSEMBLY (40T SPROCKET)	69	IHW5H-050-LOCK	HI-COLLAR LOCK WASHER - 1/2"
31^	14426	HEADACHE BALL ASSEMBLY - 9 LBS; NOT REQ. WITH 29 LBS	70	ISHCS05020125	SOCKET HEAD CAP SCREW - 1/2"-20 x 1 1/4" LONG
32	18930-1	SNATCH BLOCK	71	IHHCS06311175	HEX HEAD CAP SCREW - 5/8"-11 x 1 3/4"
33	26404	ELEVATION CYLINDER	72	ILNUT-075010	LOCK NUT - 3/4"-10
34	14481	WOODRUFF KEY - 1/4 X 1 (MODIFIED)	73	HELB4MP-4FX-90	SWIVEL ADAPTER - 90 DEG ELBOW - 1/4 NPT
35	14776	ROTATION DRIVE CHAIN	74	IHHCS03816275 ▲	HEX HEAD CAP SCREW - 3/8"-16 x 2 3/4" ▲
36^	19176	GROMMET - 5/8" ID x 7/8" OD x 3/16" GROOVE	75	IHHCS03816150	3/8-16 x 1-1/2 HEX HD CAP SCREW W/ NUT & L.W.
37^	19182	HYDRAULIC HOSE ASSY - WINCH UP	76	IHHCS03816100	3/8-16 x 1 HEX HD CAP SCREW W/ LOCK WASHER
38^	19170	HYDRAULIC TUBE ASSY - WINCH DOWN	77	IHHCS05013175	1/2-13 x 1-3/4 HEX HD CAP SCREW & NUT, L.W., F.W.
39	-----	VALVE BANK ASSY.	*	16476	SHIM, PIN, & KEY KIT (INCLUDES *ITEMS)
		-----		22493^	FIELD SERVICE LABEL KIT - HT25KX NON-PROP.
				22493-1^	FIELD SERVICE LABEL KIT - HT25KX PROPORTIONAL
				22493-2^	FIELD SERVICE LABEL KIT - HT25K NON-PROP.
				22493-3^	FIELD SERVICE LABEL KIT - HT25K PROPORTIONAL

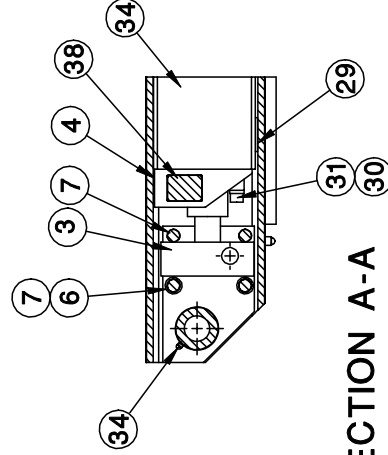
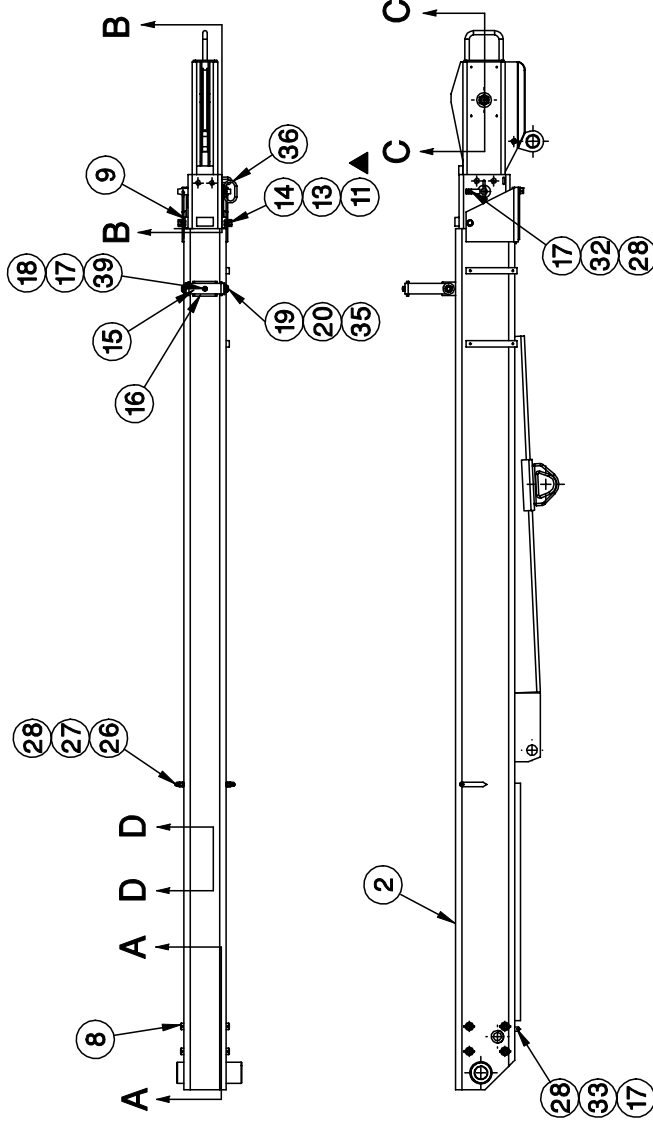
^ - ITEMS NOT SHOWN ON DRAWING I19239

FOR ANTI-TWO-BLOCK ITEMS SEE DWG. 19050 (SN: 80110 - 80127) & 19197-2 (SN: 80128 - UP)

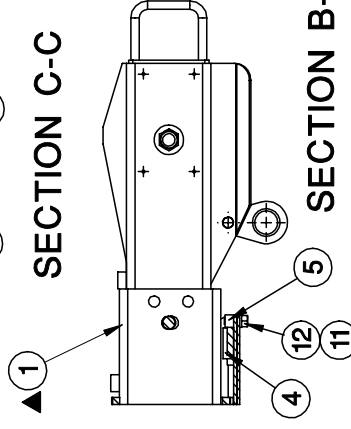
SERIAL NO. 80110 & UP

 MANUFACTURING, INC. CINCINNATI, OHIO	TITLE		REPLACEMENT PARTS	DATE	SECTION
	HT25KX			5-1-01G	C420
				SUPERCEDES 3-21-01F	I19240

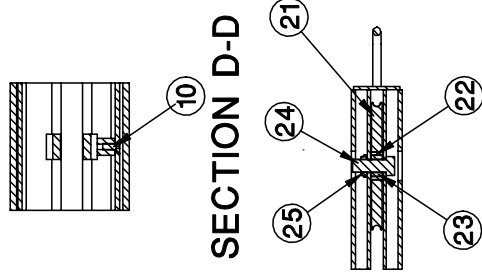
19893 BOOM PARTS DRAWING



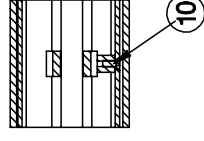
SECTION A-A



SECTION B-B



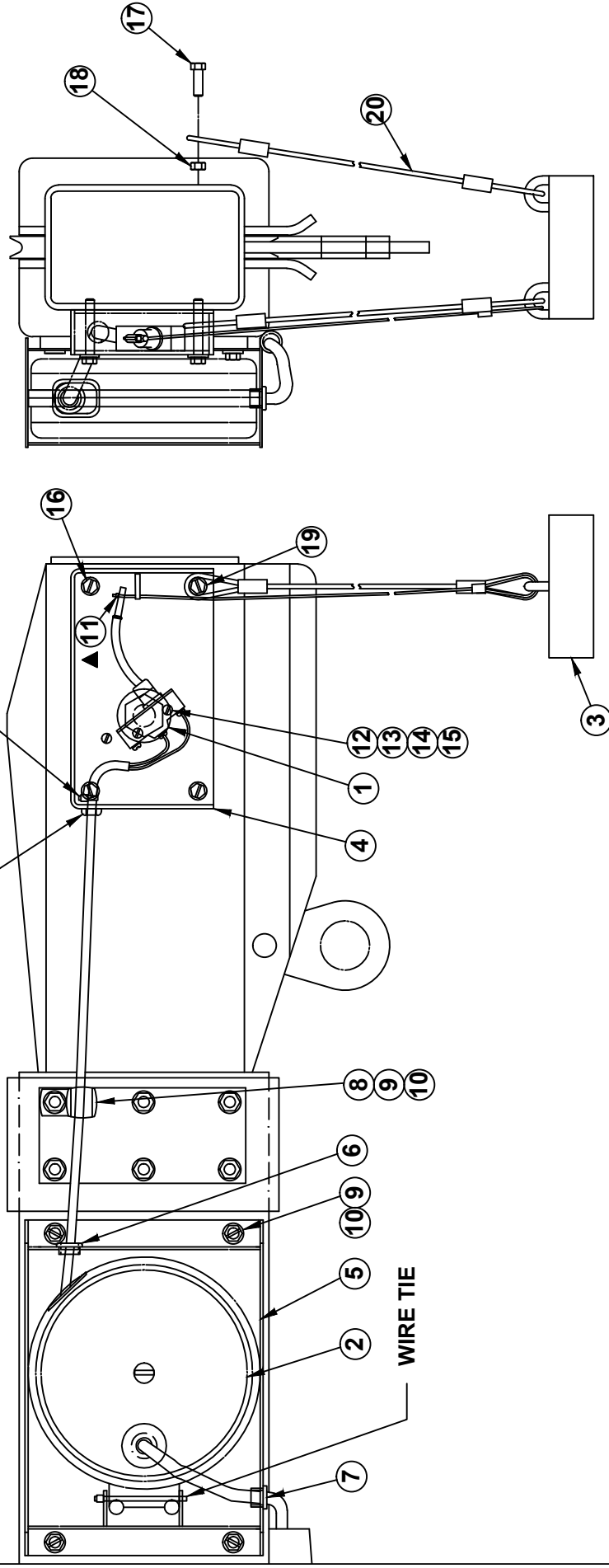
SECTION C-C



SECTION D-D

ITEM	QTY	PART NO.	DESCRIPTION	ITEM	QTY	PART NO.	DESCRIPTION
20	2	IFWSH-050	FLAT WASHER 1/2"	-	-	-	-
19	2	IHCOS05013100	HEX HEAD CAP SCREW 1/2-13 X 1" LG GR 5	39	1	IHCOS02520075	HEX HEAD CAP SCREW - 1/4-20 X 3/4" LG. GR 5
18	1	ILNUT-02520	HEX NUT 1/4-20	38	2	19888	SIDE BEARING PAD
17	3	ILWSH-025	LOCK WASHER 1/4"	37	1	19197-2	ANTI-TWO BLOCK SYSTEM
16	1	19881	CABLE GUIDE WEAR STRIP	36	1	19258-1	BOOM PIN 19/5/7-3/4
15	1	19880	CABLE GUIDE STRUCTURE	35	2	ILNUT-05013N	1/2-13 NYLON INSERT JAM NUT
14	2	IHCOS03816050	HEX HEAD CAP SCREW 3/8-16 X 1/2" LG GR 5	34	1	IZERK-02528	ZERK FITTING - 1/4-28
13	2	ILNUT-03816	JAM NUT - 3/8-16 GRADE 5	33	1	19269	CABLE CLAMP - 1/4"
12	2	IHCOS03816100	HEX HEAD CAP SCREW - 3/8-16 X 1" LG GR. 5	32	1	19275	CABLE CLAMP - 3/4"
11	4	ILWSH-038	LOCK WASHER 3/8"	31	2	IHCOS05013200	SOCKET HEAD CAP SCREW 1/2-13 X 2" LONG
10	2	ICACS03816100	CONTRSK ALLEN HEAD CAP SCREW 3/8-16 X 1" LG	30	2	ILWSH-050-HC	LOCK WASHER 1/2" HIGH COLLAR
9	2	18957	BEARING PAD - SIDE FRONT	29	1	26216-3	BEARING PAD 2 X 3/8" LOWER REAR
8	8	IRPIN-019125	ROLL PIN 3/16"DIA. X 1-1/4" LONG	28	4	IANUT-02520S	ACORN NUT 1/4-20 STAINLESS
7	4	19884	EXTENSION CYLINDER THRUST PIN	27	2	22490	SPACER, BOOM ARROW 1/2" O.D.
6	2	19885	EXTENSION CYLINDER ROLLER	26	2	13459-1	BOOM ARROW 3-3/16 LONG
5	1	18955	BEARING RETAINING BAR	25	1	ILNUT-07510	LOCKNUT 3/4-10
4	2	19865	UPPER REAR BEARING PAD	24	1	17059-6	SHEAVE AXLE 3/4 X 2 W/ 1" SHANK
3	1	19886-1	EXTENSION CYLINDER - HOLLOW ROD	23	1	15809	SPACER 1.25 O.D. X 2 1/32 LONG
2	1	19889	PRIMARY BOOM ASSEMBLY	22	1	15808	BRONZE BEARING 1.63 O.D.
1	1	19892	TERTIARY & SECONDARY BOOM ASSEMBLY	21	1	23911	SHEAVE - BOOM

WIRE TIE
CABLE & CUT
OFF STEM



11	1	19302	SET COLLAR - 3/32"
10	5	ILWSH-031	LOCK WASHER - 5/16"
9	5	IHHCS03118050	HEX HEAD CAP SCREW - 5/16-18 x 1/2"
8	1	19275	CABLE CLAMP - 3/4" x 13/32" HOLE
7	2	19270	SNAP BUSHING - 3/8" I.D.
6	1	19063	SNAP BUSHING - 1/2" I.D.
5	1	19058	COVER - CORD REEL
4	1	20839	ANTI TWO-BLOCK HOUSING ASSEMBLY
3	1	19377-2	CABLE WEIGHT ASSY
2	1	22388-1	CORD REEL ASSY
1	1	19376	LIMIT SWITCH
			DESCRIPTION
20	2	▲ 20951-2	HANGER CABLE
19	1	IHHCS02520150	HEX HEAD CAP SCREW - 1/4-20 x 1 1/2"
18	1	IHNUT-02520	HEX NUT - 1/4-20
17	1	IHHCS02520075	HEX HEAD CAP SCREW - 1/4-20 x 3/4"
16	3	IHHCS02520175	HEX HEAD CAP SCREW - 1/4-20 x 1 3/4"
15	2	ILWSH-#06	LOCK WASHER - #6
14	2	IFWSH-#06	FLAT WASHER - #6
13	2	IHNUT-#0632	HEX NUT - #6-32
12	2	IPHMS#632125	PAN HEAD MACHINE SCREW - #6-32 x 1 1/4"
ITEM	QTY	PART NO.	

TITLE

REPLACEMENT PARTS DRAWING

DATE

08-01-16G

SECTION

C400

MANUFACTURING, INC.
CINCINNATI, OHIO



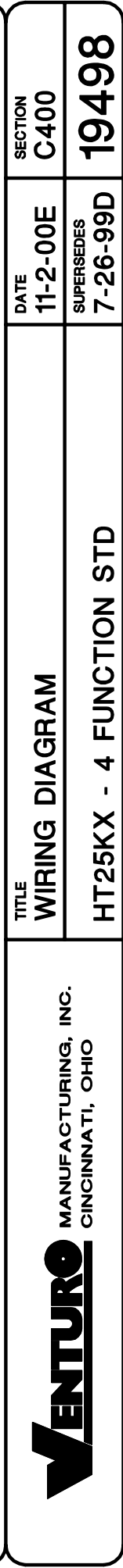
19197-2 ANTI-TWO-BLOCK SYSTEM

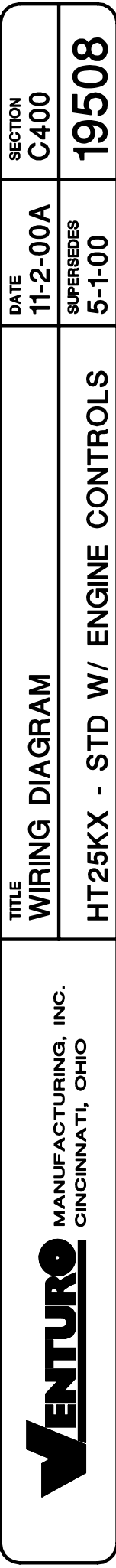
SUPERSEDES

06-03-08F

SECTION

20197-2

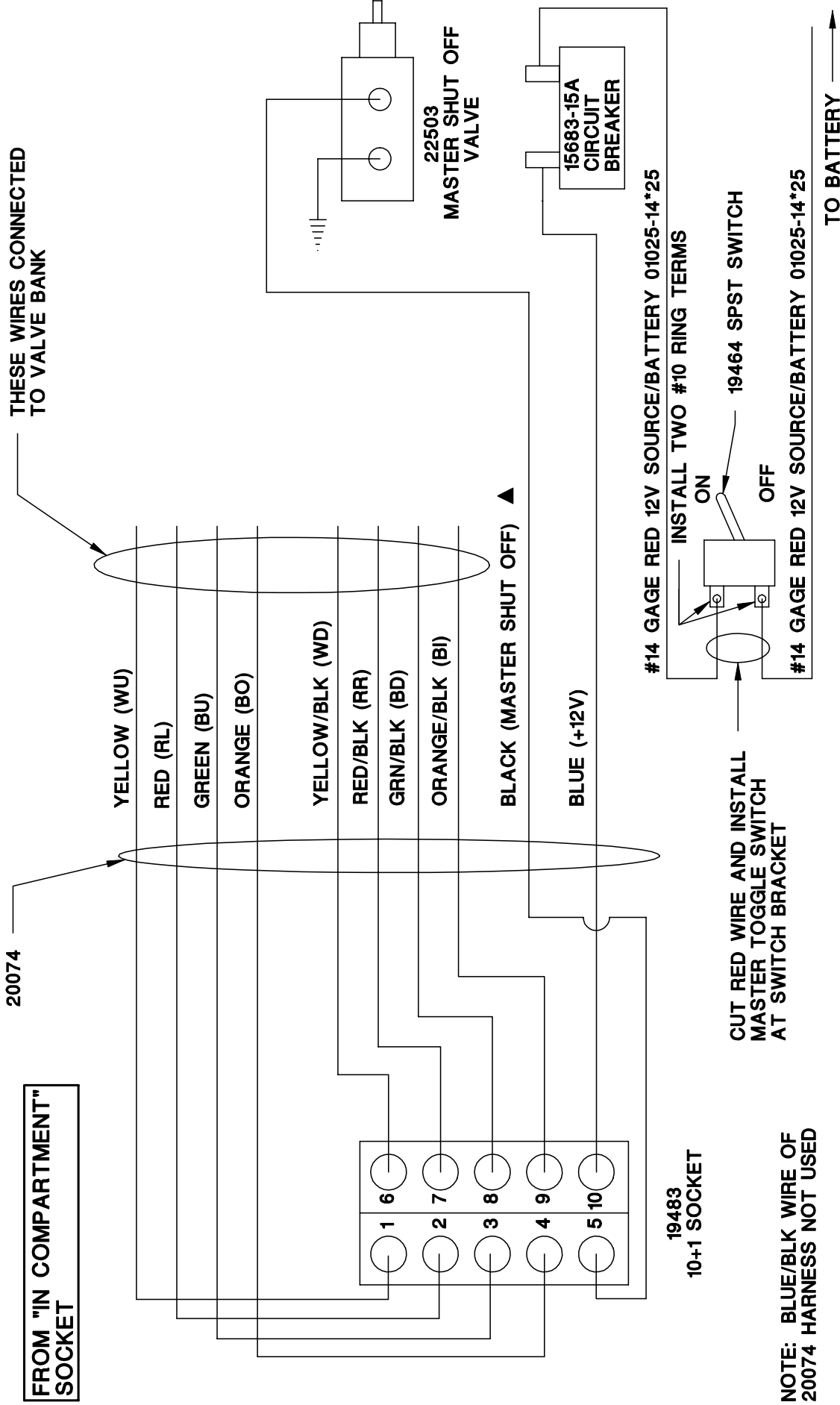






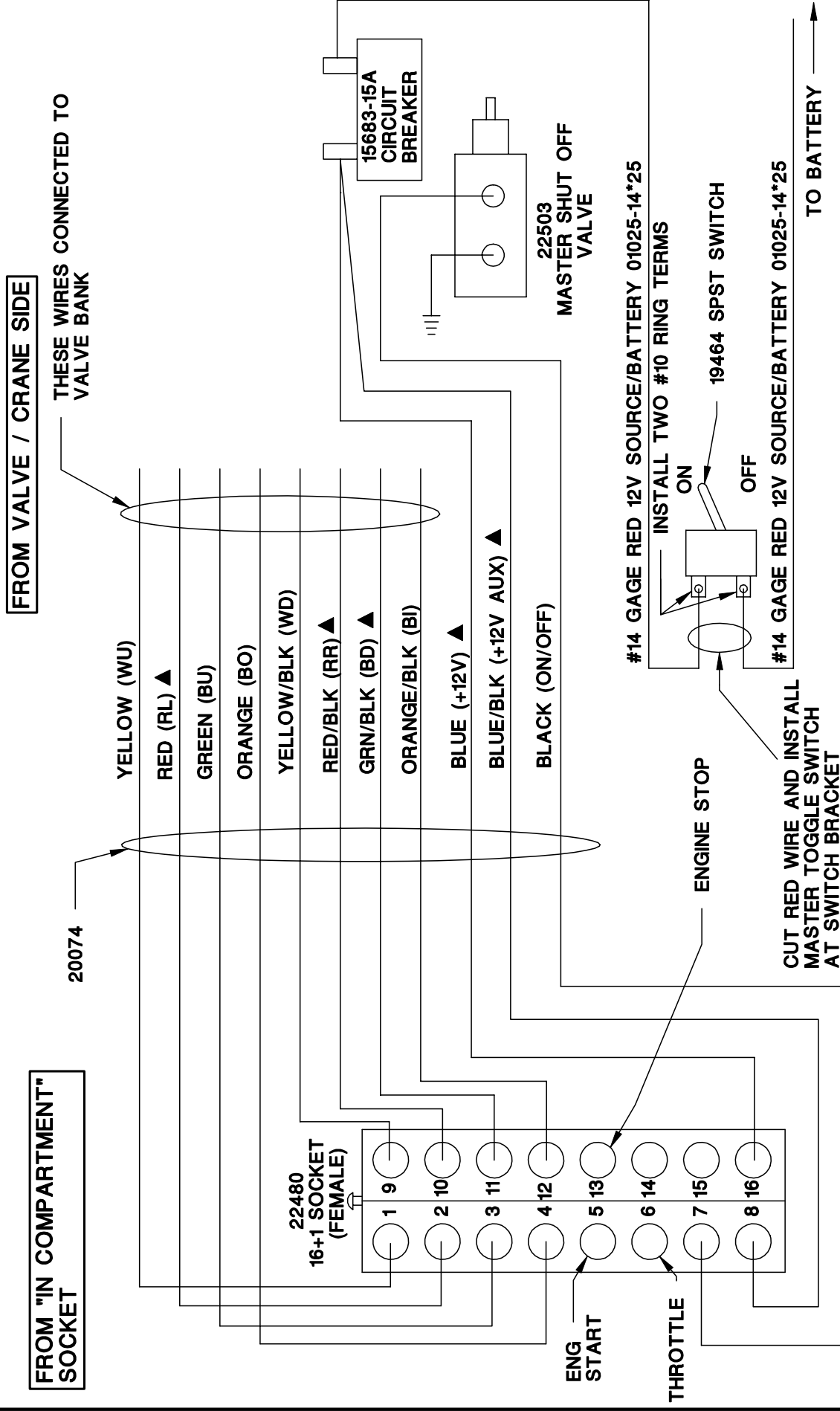


NON-PROPORTIONAL IN-COMPARTMENT CONTROLS

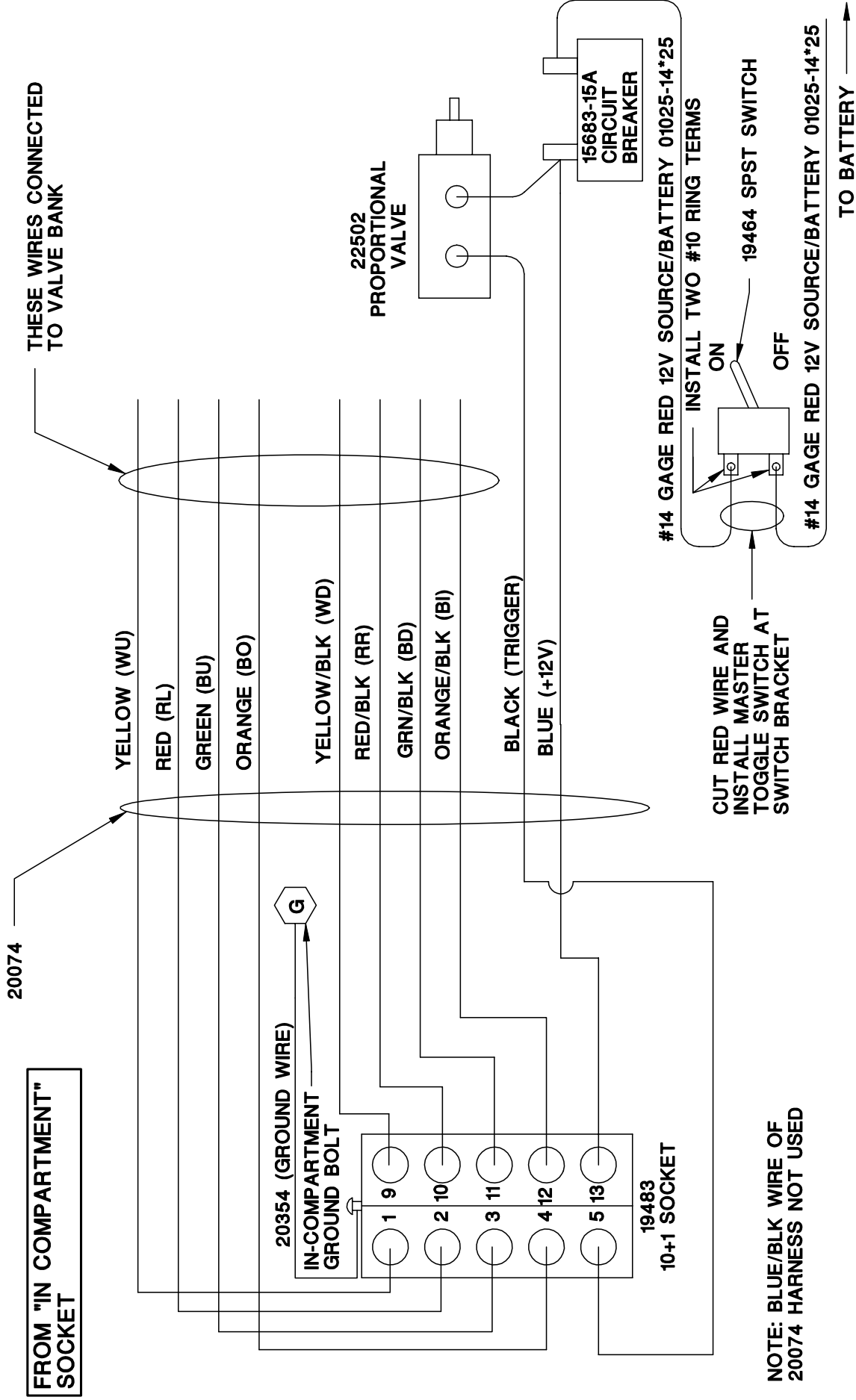


 VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE	DATE	SECTION
	NON-PROP W/ IN-COMPARTMENT CTRLS	3-8-02C	-
	HT25/40/50 CRANES	SUPERSEDES 12-18-01B	20350

NON-PROPORTIONAL IN-COMPARTMENT CONTROLS W/ ENG START/STOP AND/OR THROTTLE CONTROL



PROPORTIONAL IN-COMPARTMENT CONTROLS (NO ENGINE CONTROLS)

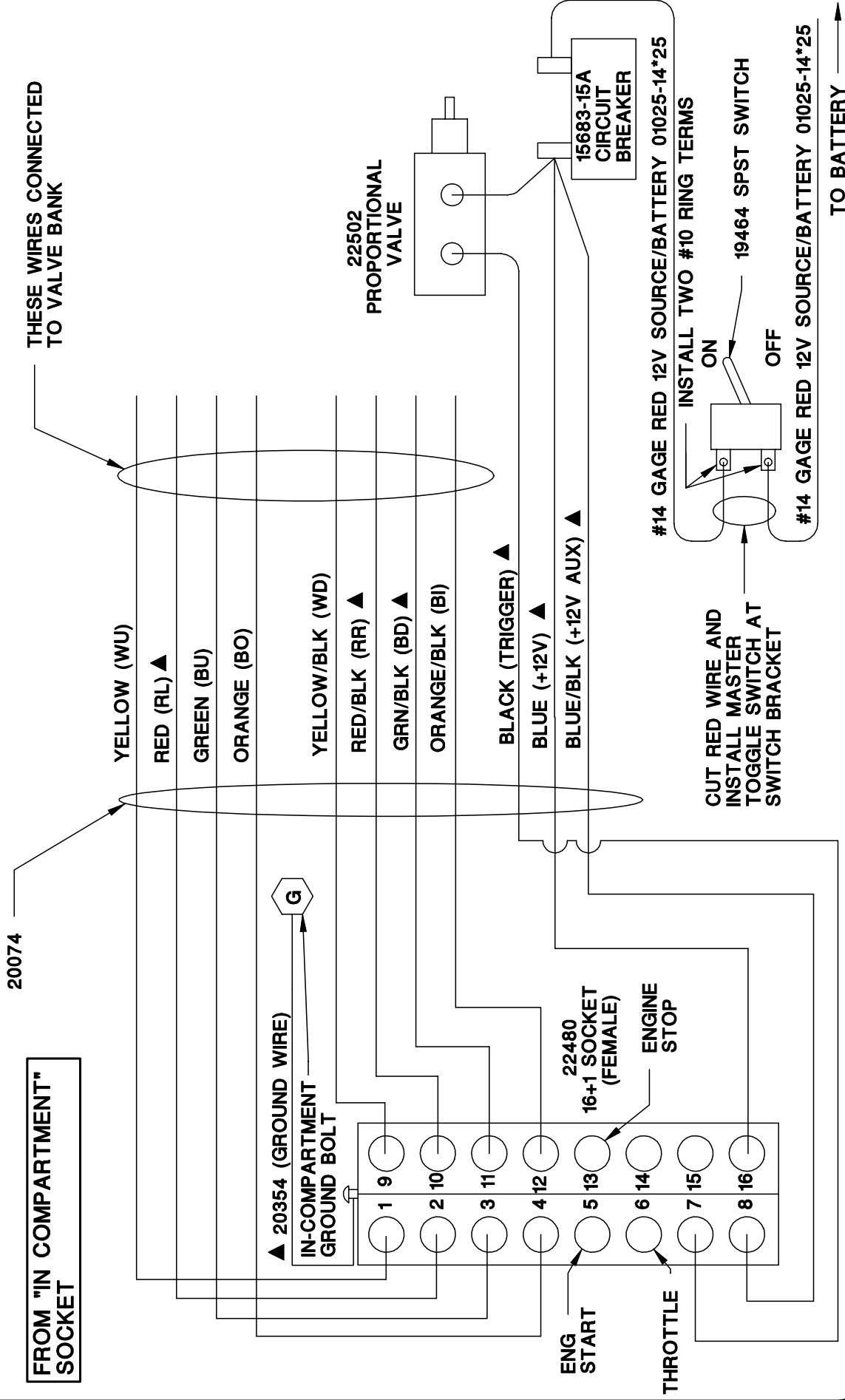


TITLE PROP W/ IN-COMP CTRLS (NO ENG CTRL)	DATE 12-18-01	SECTION -
HT25/40/50 CRANES	SUPERSEDES -	20353

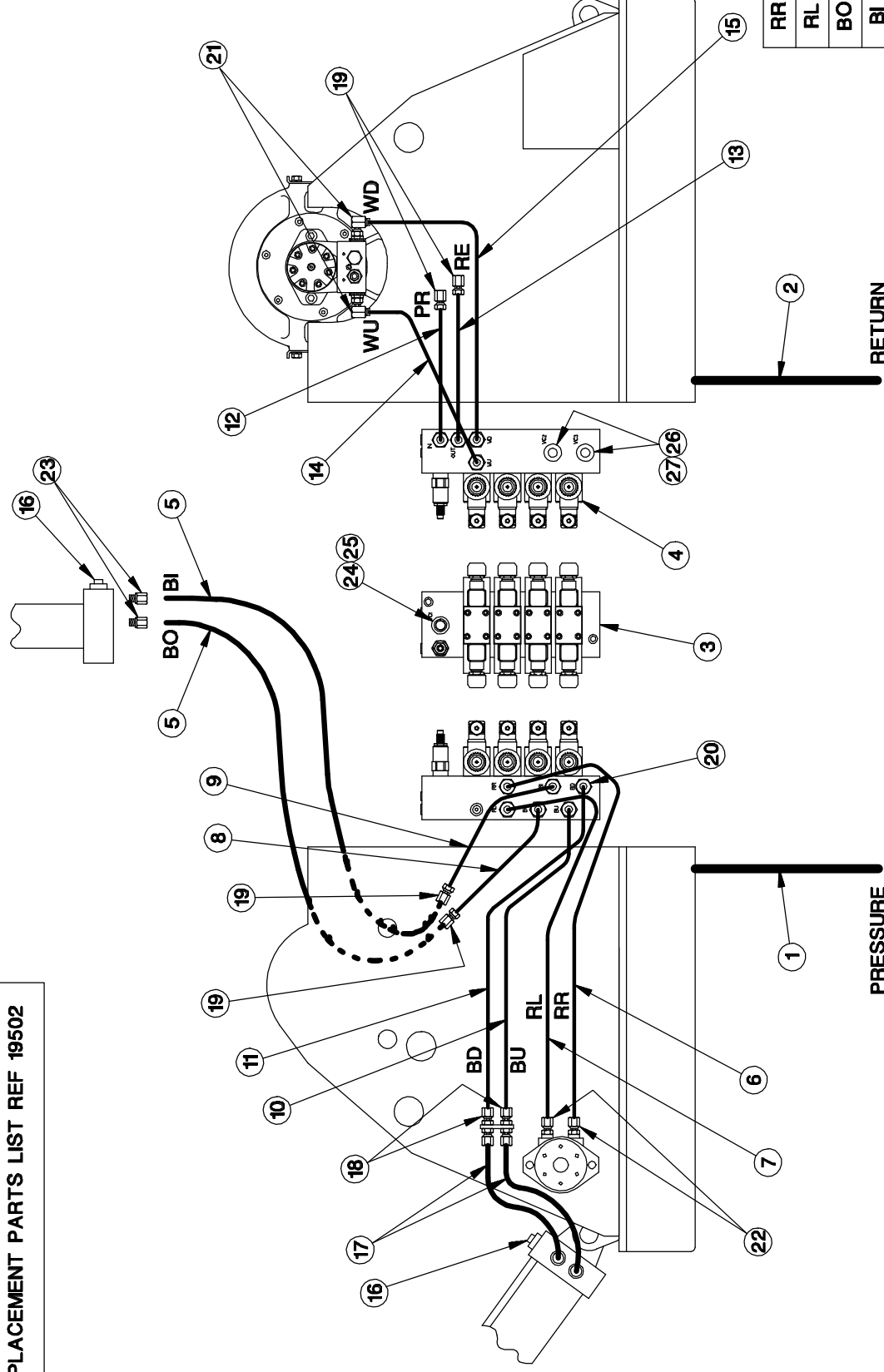


MANUFACTURING, INC.
CINCINNATI, OHIO

PROPORTIONAL IN-COMPARTMENT CONTROLS W/ ENG START/STOP AND/OR THROTTLE CONTROL



VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE	DATE	SECTION
	PROP W/ IN-COMP CTRLS & ENG CTRL HT25/40/50 CRANES	12-18-01B SUPERSEDES 8-14-01A	- 20352



LEFT SIDE VIEW

REAR VIEW

RIGHT SIDE VIEW

SERIAL NO. 80125 & UP

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

 VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE	DATE	SECTION
	REPLACEMENT PARTS DRAWING	4-13-98	C400
	HT25KX HYDRAULIC COMPONENTS	SUPERSEDES	19501

HYDRAULIC SYSTEM COMPONENTS - HT25KX CRANES

REPLACEMENT PARTS LIST

ITEM	PART NUMBER	DESCRIPTION
1	19214	PRESSURE HOSE
2	19215	RETURN HOSE
3	22501	VALVE BANK - HT40KX, HT50KX
4	22362	VALVE COIL
5	19504	EXTENSION CYLINDER HOSE
6	19486	HYD TUBING - ROTATION RIGHT
7	19487	HYD TUBING - ROTATION LEFT
8	19488	HYD TUBING - BOOM OUT
9	19489	HYD TUBING - BOOM IN
10	19490	HYD TUBING - BOOM UP
11	19491	HYD TUBING - BOOM DOWN
12	19492	HYD TUBING - PRESSURE
13	19493	HYD TUBING - RETURN
14	19494	HYD TUBING - WINCH UP
15	19495	HYD TUBING - WINCH DOWN
16	19247	COUNTERBALANCE VALVE (ELEVATION & EXTENSION CYLINDERS)
17	19503	ELEV CYLINDER HOSE - 4MPX-6FJ
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	HRDB4MO-4FP	HYDRAULIC BUSHING - 4MO-4FP
24	22502	PROPORTIONAL VALVE
25	22503	MASTER BYPASS (SAFETY SHUT-OFF) VALVE AND COIL
26	22312-1.00	PRIORITY FLOW CART - 1.00 GPM - NON-PROP. CRANE ELEV. & EXT.
27	22312-2.25	PRIORITY FLOW CART - 2.25 GPM - PROPORTIONAL CRANE ELEV. & EXT.
28	-	-
29	-	-
30	-	-

REPLACEMENT PARTS DWG REF 19501

SERIAL NO. 80125 & UP



MFG., INC.
CINCINNATI, OHIO

TITLE
REPL. PARTS LIST

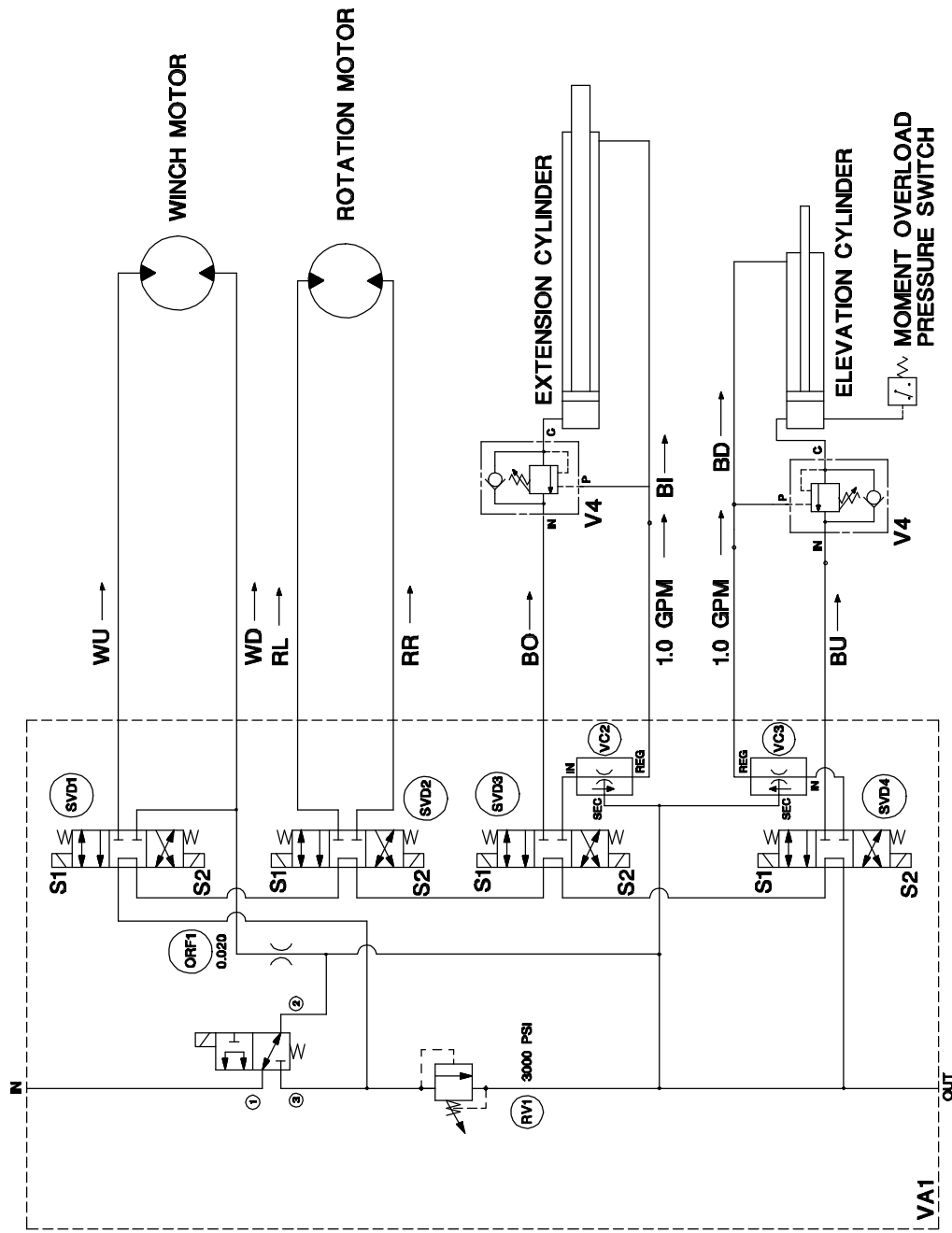
HT25KX

DATE
4-13-98

SUPERCEDES
-

SECTION
C400

19502



SERIAL NO. 80125 & UP

- 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

VENTURO
 MANUFACTURING, INC.
 CINCINNATI, OHIO

TITLE
 HYDRAULIC SYSTEM DIAGRAM

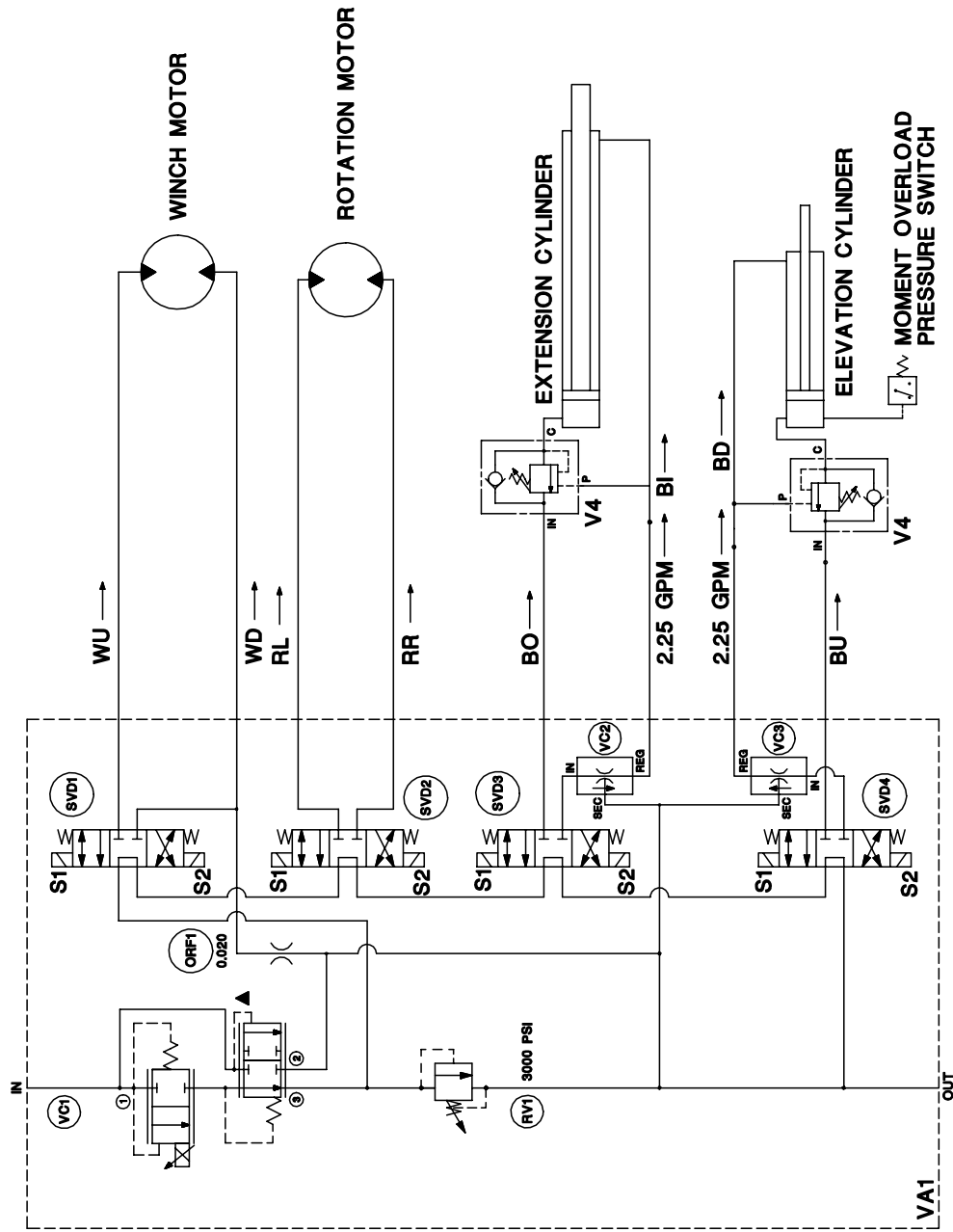
DATE
 3-27-98

SECTION
 C400

HT25KX WITH SAFETY SHUTOFF VALVE

SUPERSEDES
 -

19496



- 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. 80125 & UP

VENTURO
 MANUFACTURING, INC.
 CINCINNATI, OHIO

TITLE
HYDRAULIC SYSTEM DIAGRAM

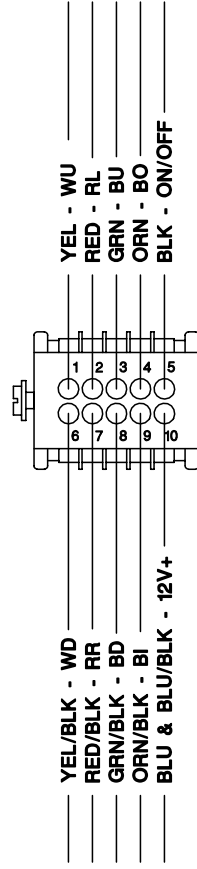
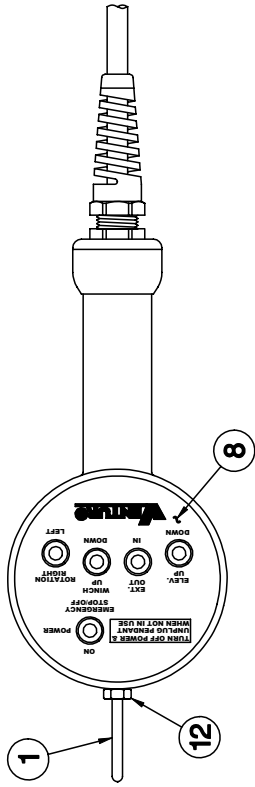
DATE
1-12-01A

SUPERSEDES
3-27-98

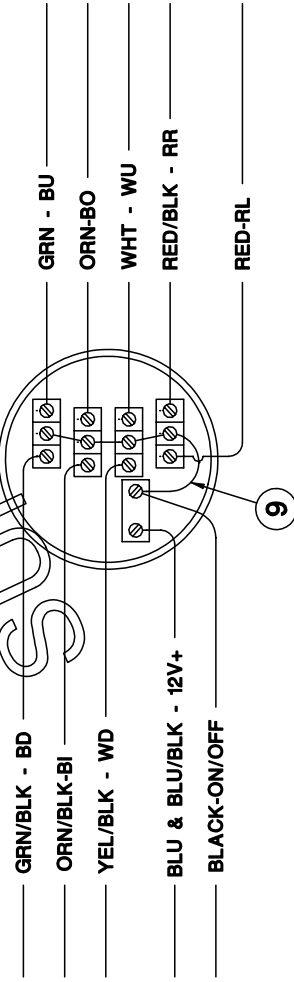
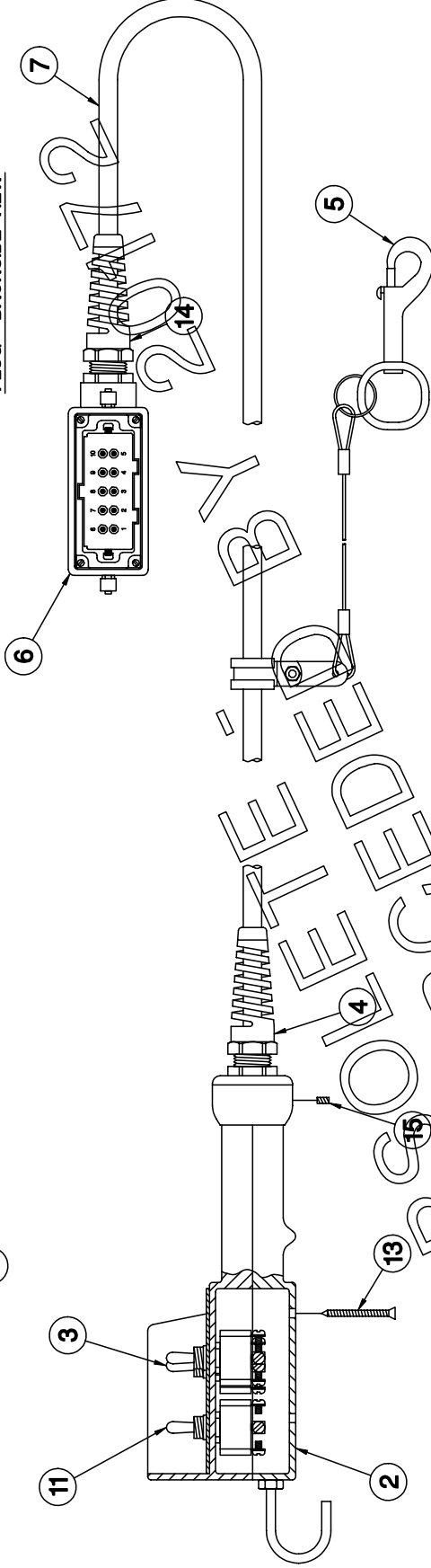
HT25KX W/ PROPORTIONAL CONTROL

SECTION
C400

19497



PLUG - BACKSIDE VIEW



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

ITEM	QTY	PART NO.	DESCRIPTION
15	1	ISHCS#832038SS	SET SCREW - #8-32 x 3/8"
14	1	19313	STRAIN RELIEF - PG16 METRIC
13	4	IFHPS#10150A	FLAT HEAD PHILLIPS SCREW - #10 x 1 1/2" LG
12	1	IHNUT-02520	HEX NUT - 1/4-20
11	1	19484	ON/OFF SWITCH
10	1	-	-
9	1	19312	5SW PENDANT CORD JUMPER
8	1	22250	LOGO PLATE, PENDANT CONTROL
7	1	19505-xx	CORD ASSEMBLY (xx = LENGTH IN FT.)
6	1	19482	PLUG ASSEMBLY - 10 + 1 POLE
5	1	15913-2	PHAN, CLAMP AND TETHER ASSEMBLY
4	1	25534	3/4" STRAIN RELIEF
3	4	13763	TOGGLE SWITCH
2	1	19374	PENDANT HOUSING
1	1	11557	PENDANT HOOK

TITLE

REPLACEMENT PARTS DRAWING

DATE

10-25-02C

SECTION

C400

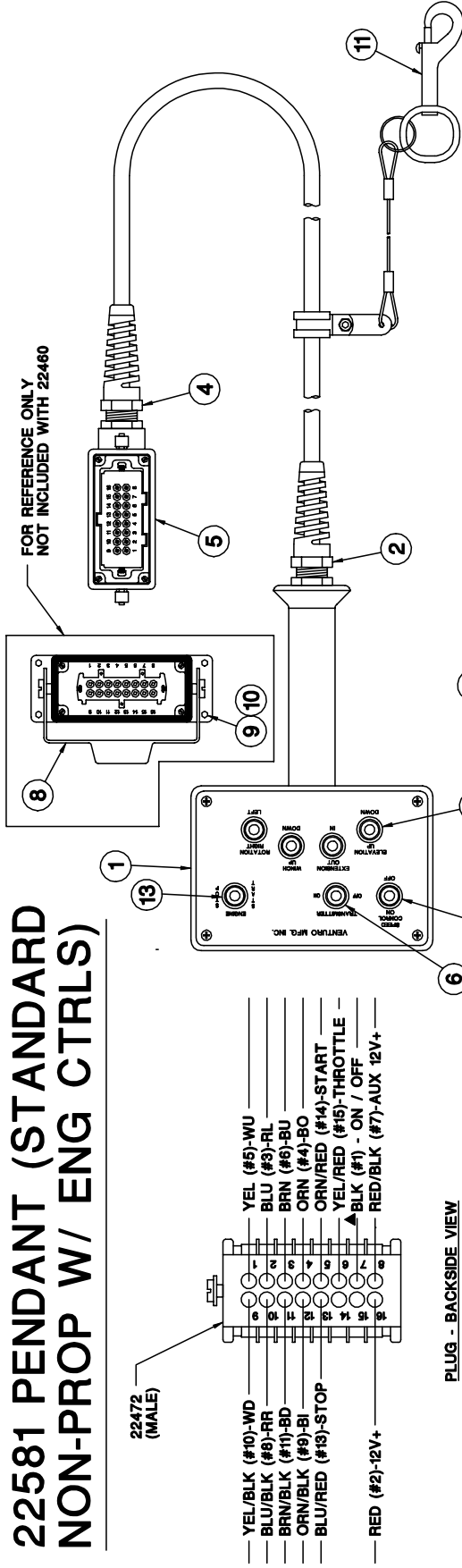
4 FUNCTION CRANES

SUPERSEDES

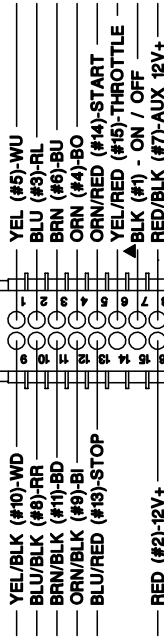
7-17-01B

19485

22581 PENDANT (STANDARD NON-PROP W/ ENG CTRLS)



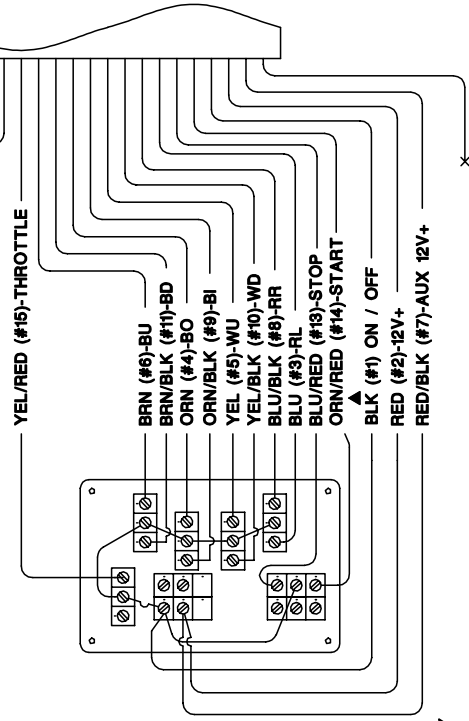
22472
(MALE)



PLUG - BACKSIDE VIEW

DOUBLE BACK &
BUNDLE WITH
PULL TIE

PENDANT HEAD - BACKSIDE VIEW



NOTE:
EXAMPLE OF COLOR CODES:

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

- ① ENGINE THROTTLE CONTROL ONLY
- ② ENGINE START/STOP CONTROL ONLY
- ③ ENGINE THROTTLE & START/STOP CONTROL

DASH NO.

	-1	-2	-3	
13	-	1	1	22477
12	1	-	1	22476
11	1	1	1	15913-1
10	-	-	-	ILWSH-08
9	-	-	-	IPHCS#0832050
8	-	-	-	22480
7	4	4	4	13763
6	1	1	1	22478
5	1	1	1	22470
4	1	1	1	22313
3	1	1	1	22462-1
2	1	1	1	25634
1	1	1	1	22311-1

ITEM	QTY	QTY	QTY	PART NO.	DESCRIPTION
13	-	1	1	22477	ENGINE START TOGGLE SWITCH - DPDT
12	1	-	1	22476	SPEED CONTROL TOGGLE SWITCH - SPDT
11	1	1	1	15913-1	CLAMP AND TETHER ASSEMBLY
10	-	-	-	ILWSH-08	LOCK WASHER - #8
9	-	-	-	IPHCS#0832050	PAN HEAD CAP SCREW - 8-32 x 1/2"
8	-	-	-	22480	SOCKET ASSEMBLY
7	4	4	4	13763	TOGGLE SWITCH
6	1	1	1	22478	POWER SWITCH - DOUBLE POLE SINGLE THROW
5	1	1	1	22470	PLUG ASSY - 16+1 POLE
4	1	1	1	22313	STRAIN RELIEF - METRIC
3	1	1	1	22462-1	CORD ASSY - 25 FT
2	1	1	1	25634	STRAIN RELIEF - 3/4"
1	1	1	1	22311-1	PROPORTIONAL CONTROL PENDANT HEAD

TITLE

REPLACEMENT PARTS DRAWING

SECTION

C400

DATE

12-21-01A

MANUFACTURING, INC.
CINCINNATI, OHIO

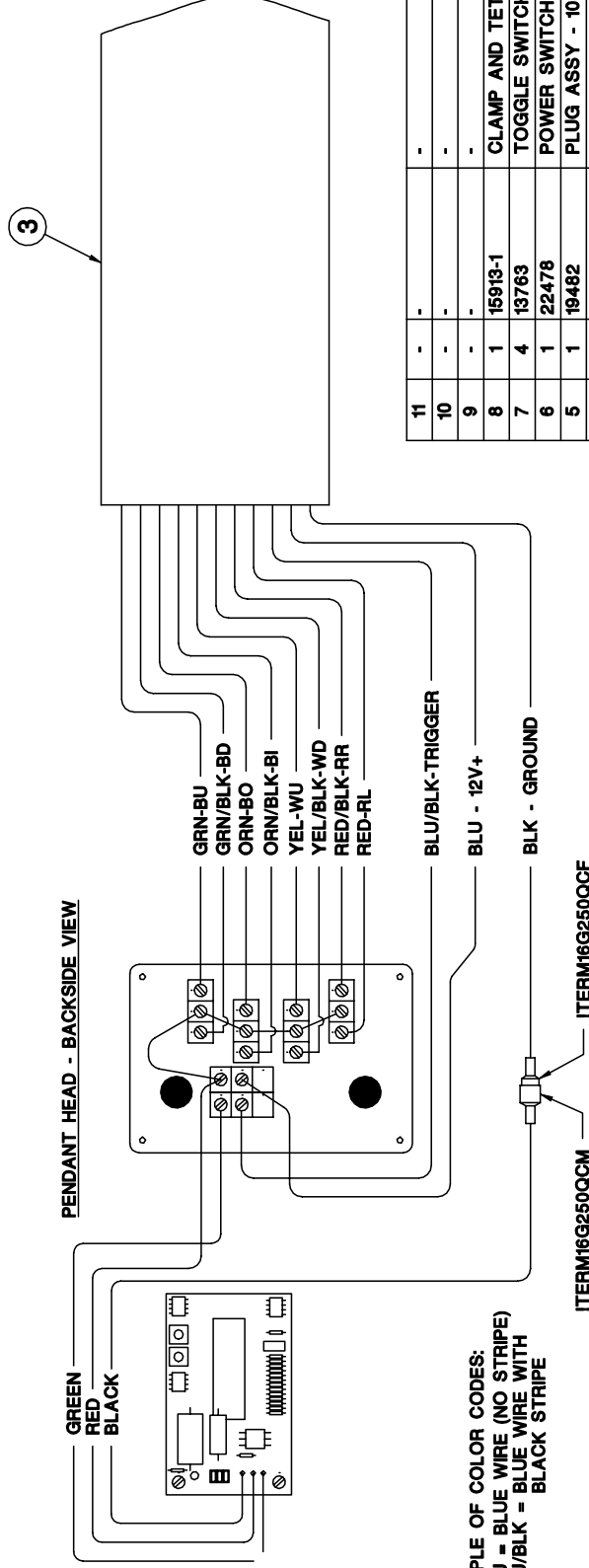
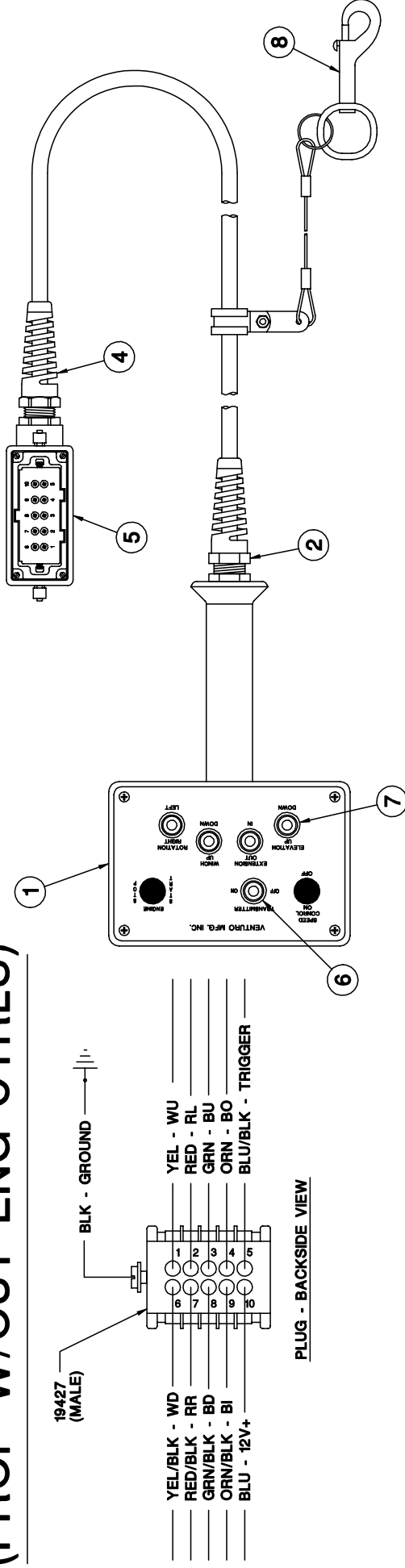
22581 PENDANT (NON-PROP W/ ENG CTRLS)

SUPERSEDES

5-23-00

22582

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

TITLE
REPLACEMENT PARTS DRAWING

DATE
2-28-02A

SECTION
C400

22460 PENDANT (PROPORTIONAL CTRL)

SUPERSEDES
10-18-01

22655

22583 PENDANT (PROP W/ ENG CTRLS)

The diagram illustrates the wiring for the 22583 Pendant (Prop W/ Eng Ctrls). It includes a detailed view of the pendant's backside with 13 numbered callouts and a corresponding exploded view of the components.

Wiring Connections:

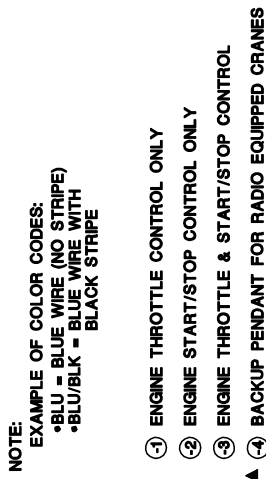
- 22472 (MALE):** Connects to the BLK (#17) or BLK/BLU wire.
- GROUND:** Connects to the BLK (#17) or BLK/BLU wire.
- RED (#2)-12V+:** Connects to the RED (#2)-12V+ terminal.
- RED/BLK (#7)-AUX 12V+:** Connects to the RED/BLK (#7)-AUX 12V+ terminal.
- YEL/BLK (#10)-WD:** Connects to the YEL/BLK (#10)-WD terminal.
- BLU/BLK (#6)-RR:** Connects to the BLU/BLK (#6)-RR terminal.
- BRN/BLK (#11)-BD:** Connects to the BRN/BLK (#11)-BD terminal.
- ORN/BLK (#9)-BI:** Connects to the ORN/BLK (#9)-BI terminal.
- BLU/RED (#13)-STOP:** Connects to the BLU/RED (#13)-STOP terminal.
- YEL/BLK (#5)-WU:** Connects to the YEL/BLK (#5)-WU terminal.
- BLU (#3)-RL:** Connects to the BLU (#3)-RL terminal.
- BRN (#6)-BU:** Connects to the BRN (#6)-BU terminal.
- ORN (#4)-BO:** Connects to the ORN (#4)-BO terminal.
- ORN/RED (#14)-START:** Connects to the ORN/RED (#14)-START terminal.
- YEL/RED (#15)-THROTTLE:** Connects to the YEL/RED (#15)-THROTTLE terminal.
- BLK-TRIGGER:** Connects to the BLK-TRIGGER terminal.
- #1 (ON INNER PERIMETER):** Connects to the #1 (ON INNER PERIMETER) terminal.

Components and Callouts:

- 1:** Main pendant housing.
- 2:** Cable connector.
- 3:** Cable.
- 4:** Cable connector.
- 5:** Cable connector.
- 6:** Cable connector.
- 7:** Cable connector.
- 8:** Cable connector.
- 9:** Cable connector.
- 10:** Cable connector.
- 11:** Cable connector.
- 12:** Cable connector.
- 13:** Cable connector.

Additional Labels:

- DOUBLE BACK & BUNDLE WITH PULL TIE**
- FOR REFERENCE ONLY NOT INCLUDED WITH 22460**
- PLUG - BACKSIDE VIEW**



ITEM	QTY	DASH NO.				DESCRIPTION
		-1	-2	-3	-4 ▲	
14	-	-	-	1	N/A	JUMPER BETWEEN PLUG POLES #15 & #16
13	-	1	1	1	22477	ENGINE START TOGGLE SWITCH - DPDT
12	-	1	1	1	22476	SPEED CONTROL TOGGLE SWITCH - SPDT
11	1	1	1	1	15913-1	CLAMP AND TETHER ASSEMBLY
10	-	-	-	-	ILWSH-#08	LOCK WASHER - #8
9	-	-	-	-	IPHCS#0832050	PAN HEAD CAP SCREW - 8-32 x 1/2"
8	-	-	-	-	22480	SOCKET ASSEMBLY
7	4	4	4	4	13763	TOGGLE SWITCH
6	1	1	1	1	22478	POWER SWITCH - DOUBLE POLE SINGLE THROW
5	1	1	1	1	22470	PLUG ASSY - 18+1 POLE
4	1	1	1	1	22313	STRAIN RELIEF - METRIC
3	1	1	1	1	22462-1	CORD ASSY - 25 FT
2	1	1	1	1	25534	STRAIN RELIEF - 3/4"
1	1	1	1	1	22311	PROPORTIONAL CONTROL PENDANT HEAD
ITEM	QTY	QTY	QTY	QTY	PART NO.	DESCRIPTION

VENTURO
MANUFACTURING, INC.
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DRAWING

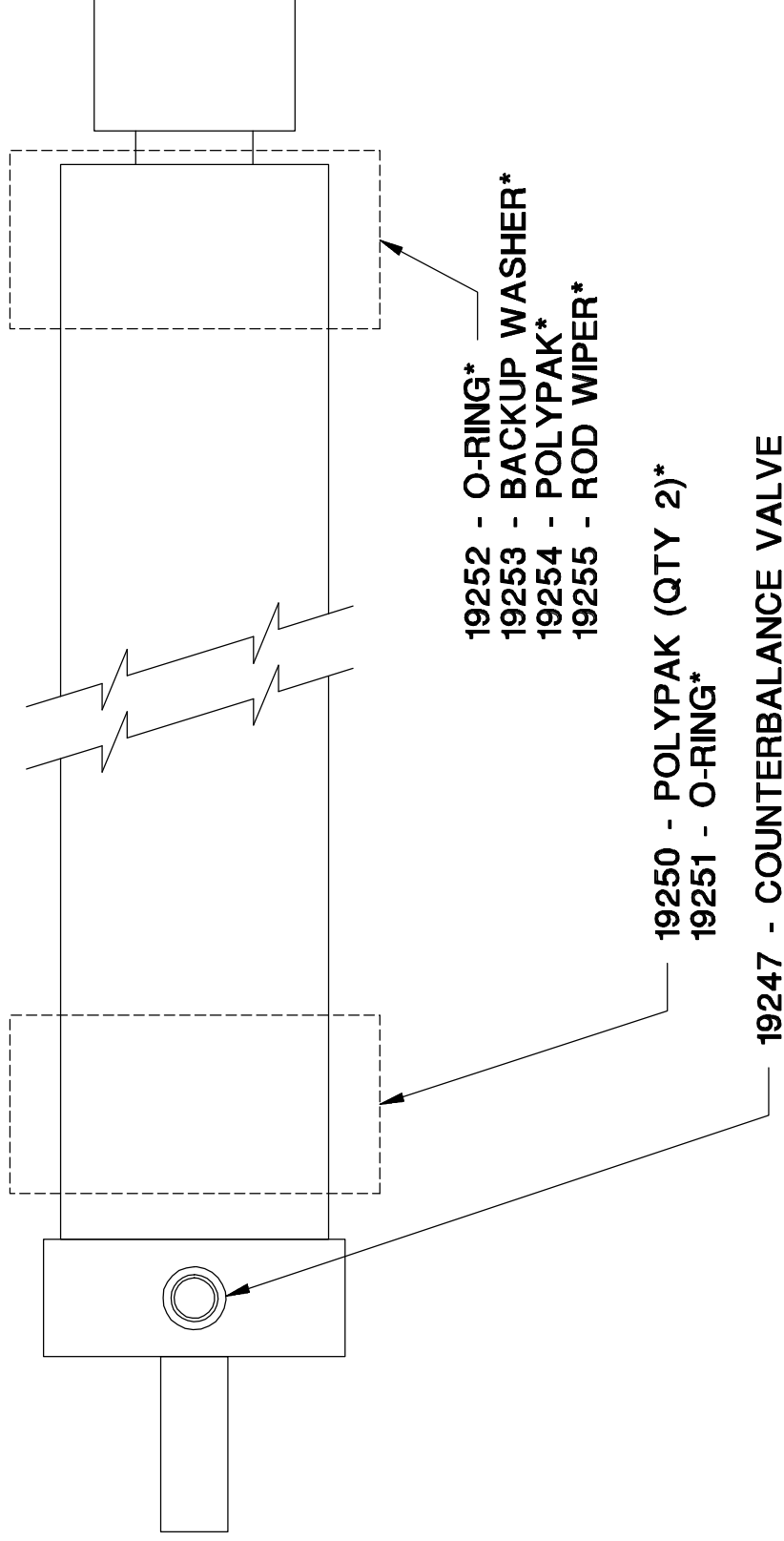
TITLE
REPLACEMENT PARTS DRAWING
22583 PENDANT (PROP W/ ENG CTRLS)

DATE	SECTION
4-30-02C	C400

SUPERSEDES

22584

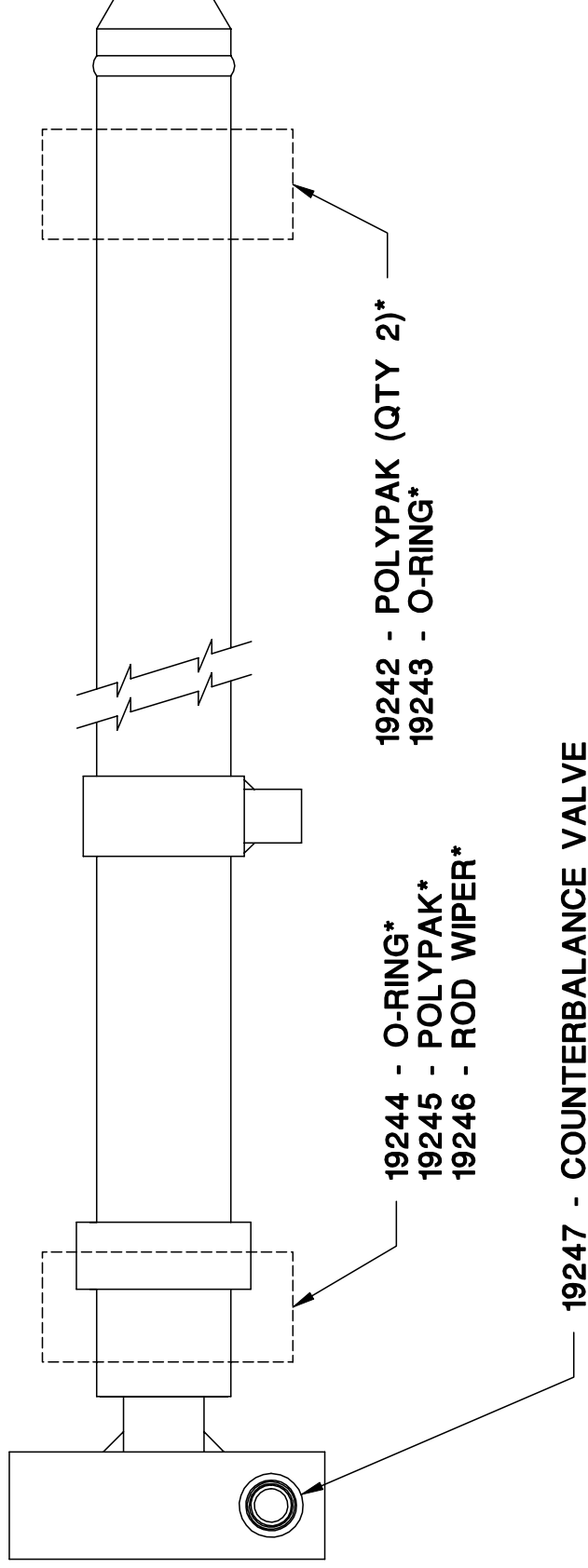
18930-1 ELEVATION CYLINDER



* ITEMS INCLUDED IN 18930-1-SK SEAL KIT

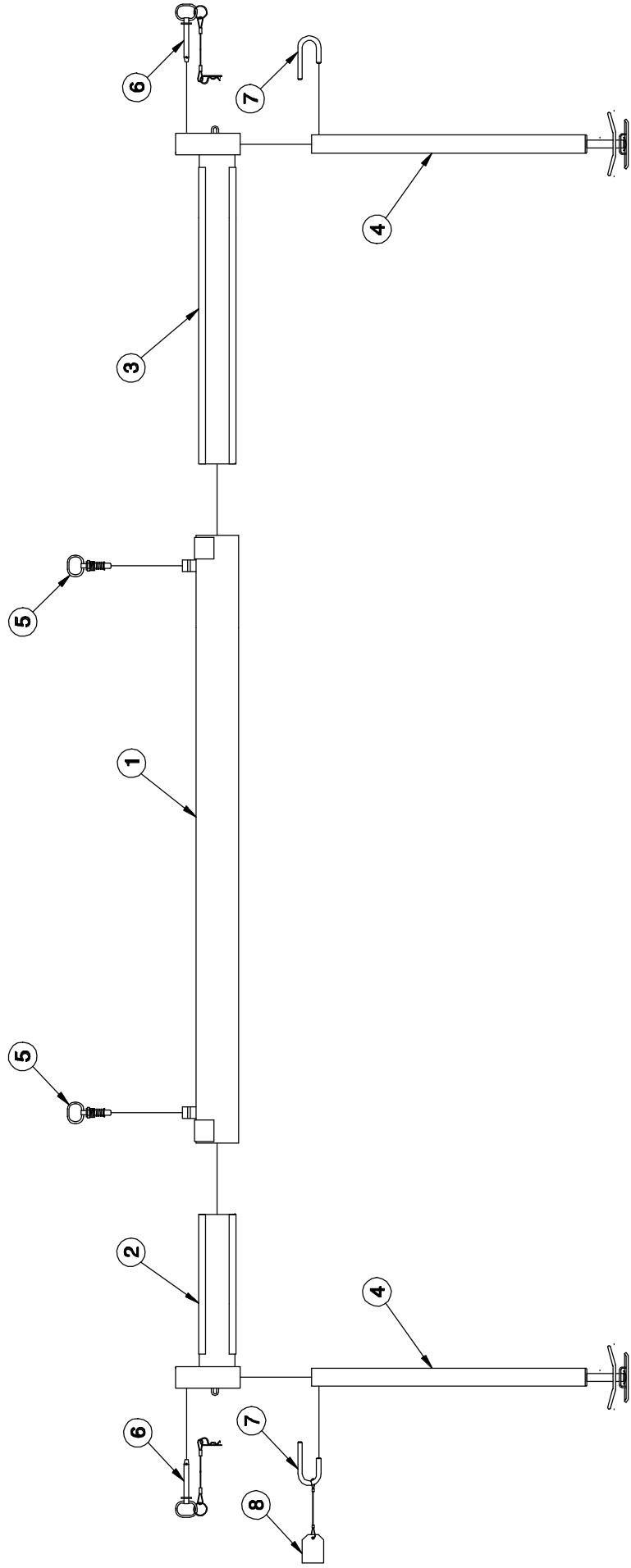
VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE ELEVATION CYLINDER		DATE 10-15-97A	SECTION C400
	ET/HT25KX		SUPERSEDES 9-21-96	119249

19886-1 EXTENSION CYLINDER



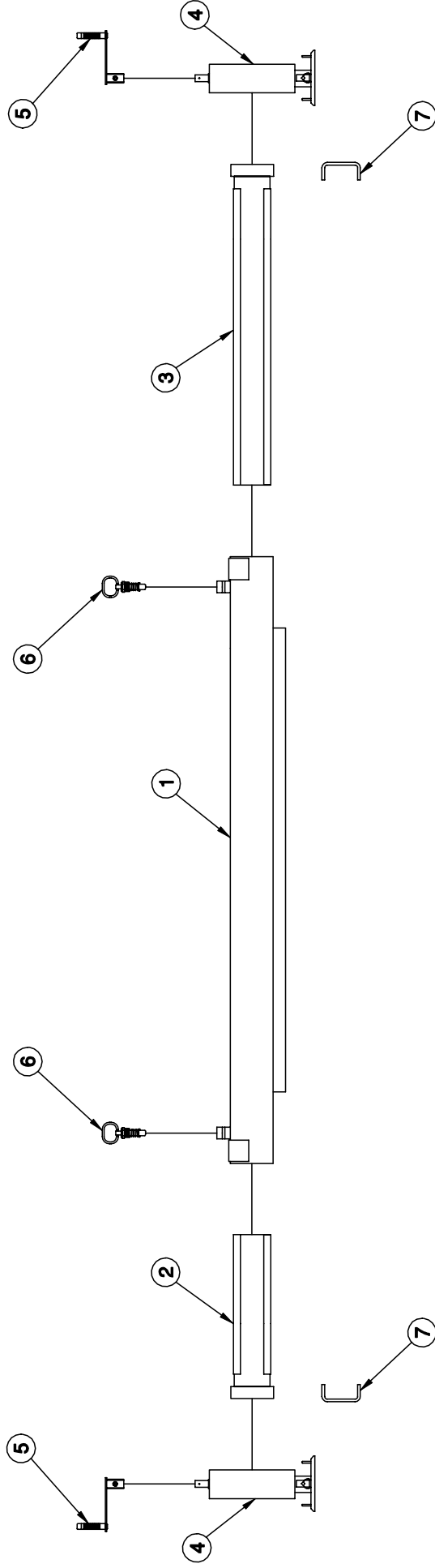
* ITEMS INCLUDED IN 19887 SEAL KIT

VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE EXTENSION CYLINDER		DATE 7-6-01	SECTION C400
	ET/HT25KX		SUPERSEDES -	19908



ITEM	QTY	PART NO	DESCRIPTION
8	1	14517	TAG - HANDLE INSTALLATION
7	2	23980	OUTRIGER LEG HANDLE
6	2	23976	HITCH PIN WITH LANYARD
5	2	22433	SPRING LOADED PIN ASSY
4	2	24073-4	MANUAL DROP LEG
3	1	22420-2	PULLOUT - LONG
2	1	22420-1	PULLOUT - SHORT
1	1	22425	CROSS TUBE WELDED ASSY

TITLE	DATE	SECTION
REPLACEMENT PARTS DWG & LIST	10-14-97A	C400
23962-P-II MANUAL OUTRIGGERS	SUPERSEDES 7-8-97	22434



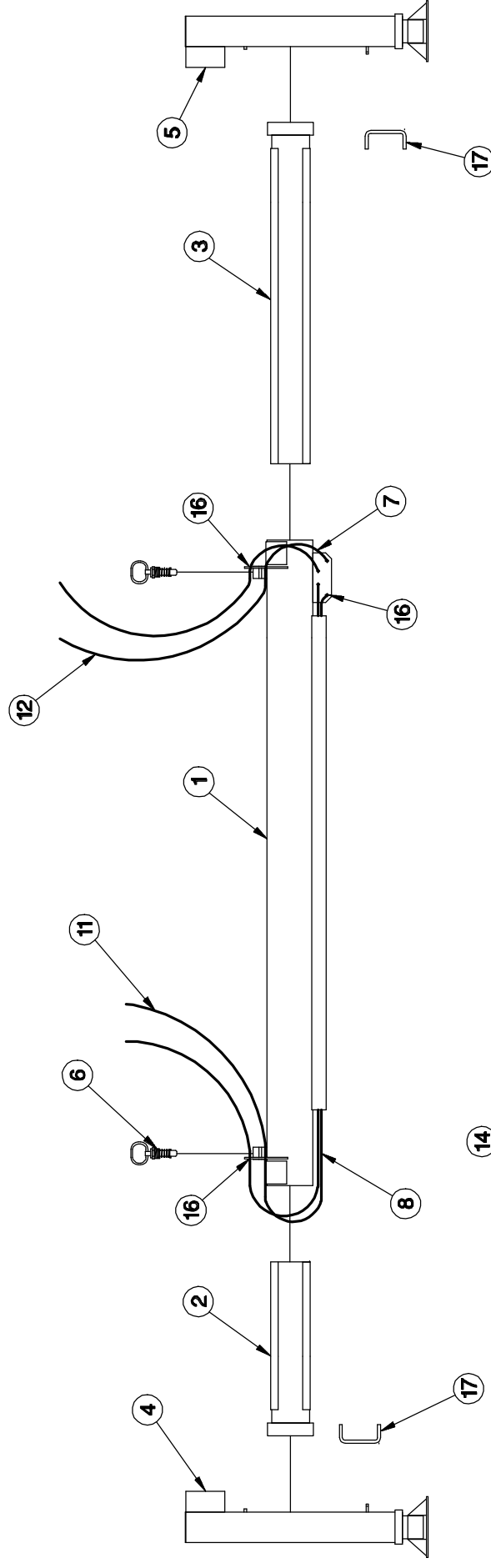
NOTE: CUSTOMER TO WELD (3/16" BEAD) ITEM 4 (CRANK DOWN LEG) IN PLACE AFTER ADJUSTING FOR PROPER GROUND CLEARANCE AND TRAVEL
CUSTOMER TO WELD (3/16" BEAD) ITEM 7 (HANDLE) IN PLACE IN A SUITABLE LOCATION

▲ IF USING CRANKDOWN OUTRIGGER LEGS (ITEM 4) WITH 4" X 4" TUBING YOU WILL NEED TO SPECIFY 22422 FOR ITEM 2 AND 22423 FOR ITEM 3.

7	2	19344	HANDLE
6	2	22433	SPRING LOADED PIN ASSY
5	2	19008	CRANK ASSY - OUTRIGGER
4	2	22440	CRANK DOWN LEG
3	1	▲ 22569	PULLOUT - LONG
2	1	▲ 22568	PULLOUT - SHORT
1	1	22426	CROSS TUBE WELDED ASSY

ITEM	QTY	PART NO	DESCRIPTION
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TITLE	DATE	SECTION
REPLACEMENT PARTS DWG & LIST	11-7-01B	C400
23962-CD-II HD CRANKDOWN O.R.	SUPERSEDES 7-30-99A	22441



NOTE: CUSTOMER TO WELD (3/16" BEAD) ITEM 17
(HANDLE) IN PLACE IN A SUITABLE LOCATION

ITEM	QTY	PART NUMBER	DESCRIPTION
17	2	19344	HANDLE
16	8	HLK4MJ-4MJ-90	HYD BULKHEAD ELBOW - 4MJ-4MJ x 90°
15	1	HTAD8MJ-8MO	HYD TUBE ADAPTER - 8MJ-8MO
14	4	HTAD4MJ-6MO	HYD TUBE ADAPTER - 4MJ-6MO
13	1	22444	TWO FUNCTION VALVE - 2000 PSI RELIEF
12	2	22443	HOSE - 1/4" x 46" x 4FJ-4FJ
11	2	22442	HOSE - 1/4" x 30" x 4FJ-4FJ ▲
10	1	22438	HOSE - 3/8" x 60" x 8MO-8FJ
9	4	22437	HOSE - 1/4" x 48" x 4FJ-4FJx90°
8	2	22436	HOSE - 1/4" x 84" x 4FJ-4FJx90°
7	2	22435	HOSE - 1/4" x 13 1/4" x 4FJ-4FJ
6	2	22433	SPRING LOADED PIN ASSY
5	1	22465-2	HYD LEG ASSY - RIGHT
4	1	22465-1	HYD LEG ASSY - LEFT
3	1	22423	PULLOUT - LONG
2	1	22422	PULLOUT - SHORT
1	1	22427	CROSS TUBE WELDED ASSY
ITEM	QTY	PART NUMBER	DESCRIPTION

MANUFACTURING, INC.
CINCINNATI, OHIO

REPLACEMENT PARTS DWG & LIST

23962-PH-II HYD. OUTRIGGERS (22403)

DATE
3-3-00C

SECTION
C400

SUPERSEDES
9-16-99B

22428

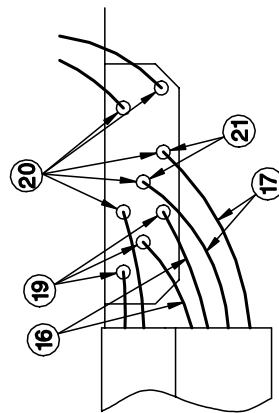
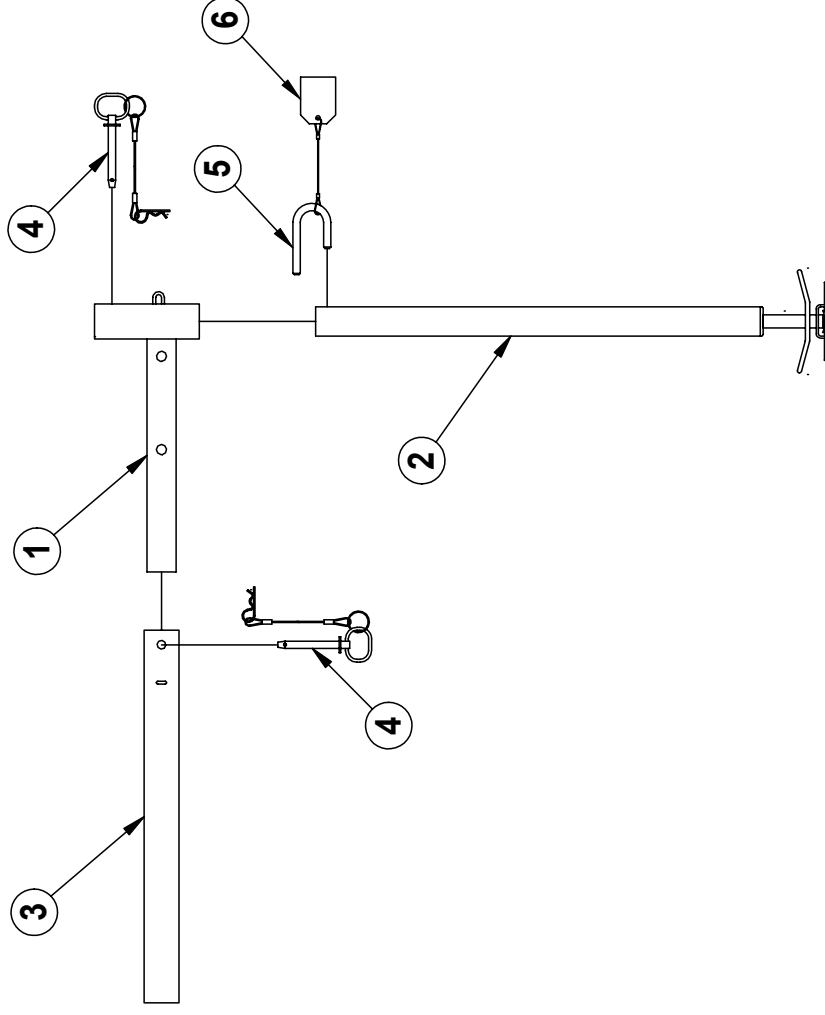
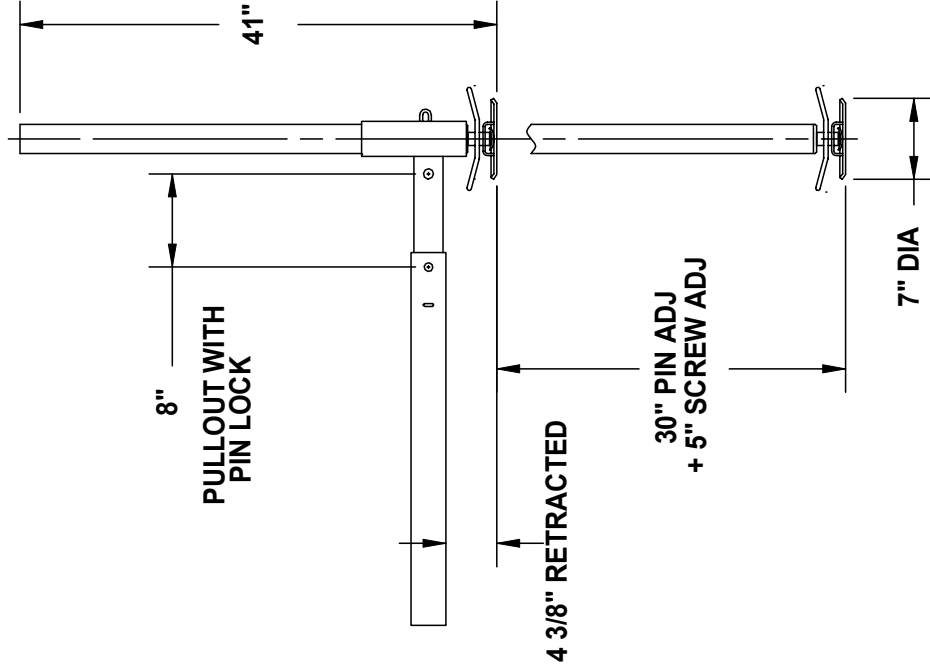


Diagram illustrating a cable assembly 18. The assembly includes a multi-pin connector 11 with five pins. A cable 22 is connected to the connector 11. The cable 22 has a connector 23 at one end and a connector 24 at the other end. The cable 22 is shown in a curved configuration.

TITLE	DATE	SECTION
REPLACEMENT PARTS DWG & LIST	5-4-01D	C400
23962-PHX-II HYD. OUTRIGGERS (22550)	SUPERSEDES 9-16-99C	22576

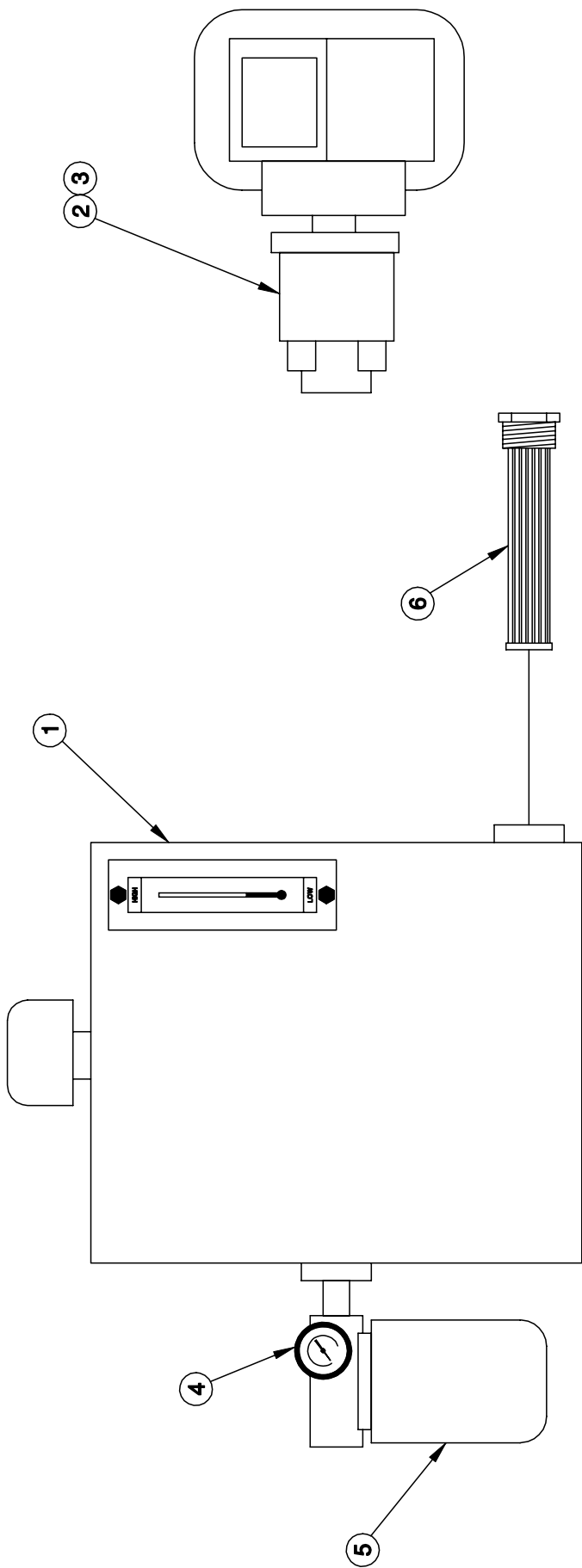


6	1	14517	TAG - HANDLE INSTALLATION
5	1	23980	OUTRIGGER LEG HANDLE
4	2	23976	HITCH PIN WITH LANYARDS
3	1	23962-4	STUB MOUNTING TUBE
2	1	24073-4	SECONDARY LEG ASSEMBLY
1	1	23979	STUB OUTRIGGER

ITEM	QTY	PART NO.	DESCRIPTION
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TITLE		DATE	SECTION
INSTALLATION DRAWING		4-14-98D	C100
STUB OUTRIGGER		SUPERSEDES	23962-2
		1-18-90C	

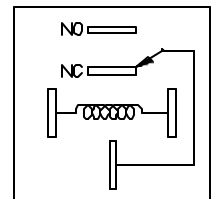
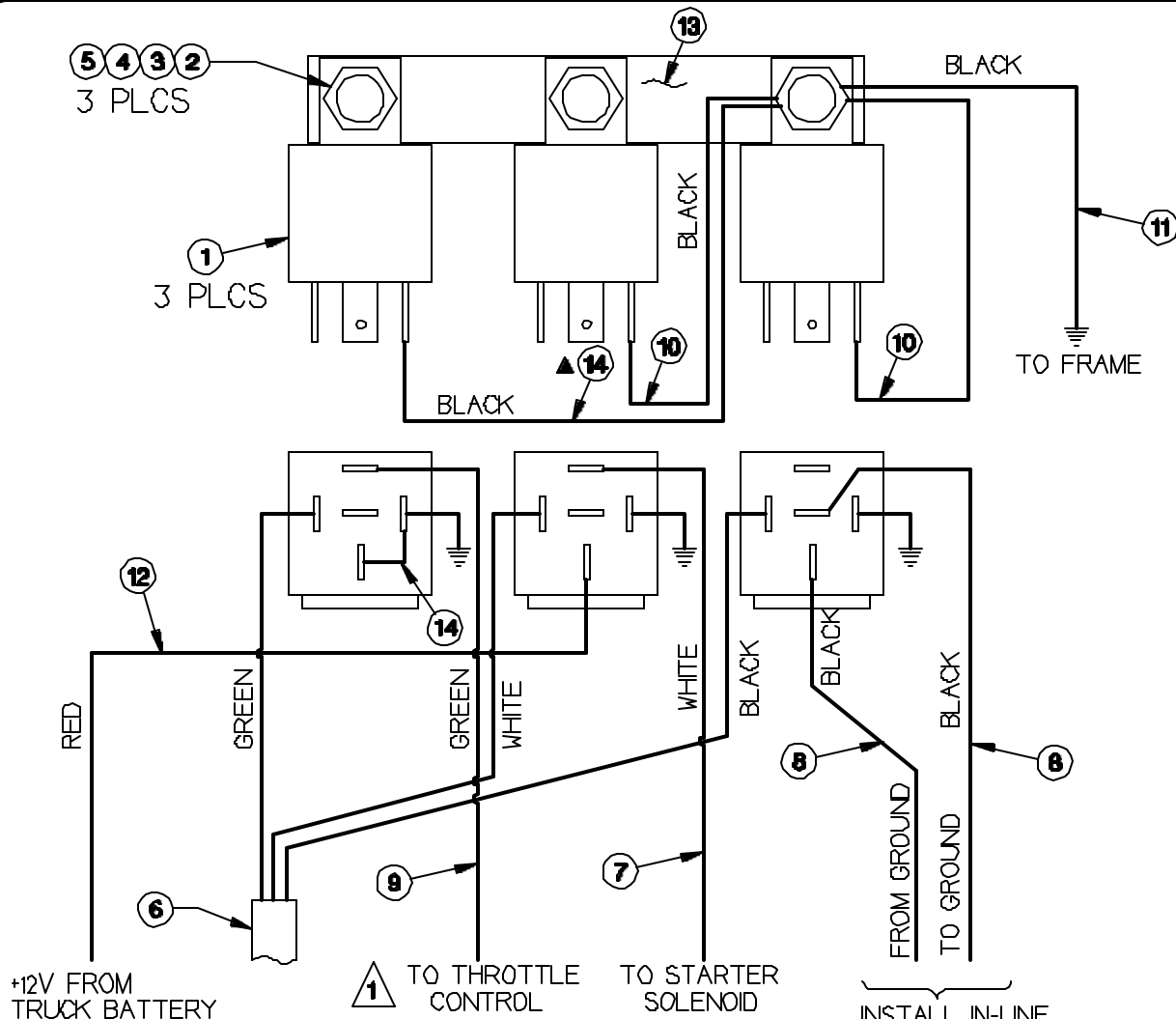
19294 PTO PACKAGES



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)
		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

 VENTURO MANUFACTURING, INC. CINCINNATI, OHIO	TITLE		SECTION
	REPLACEMENT PARTS DWG		C400
	PTO KIT - HT25/40/50KX		22448
		DATE	SUPERSEDES
		7-2-01C	7-21-00B



RELAY SCHEMATIC

ITEM	QTY	PART#	DESCRIPTION
1	3	22606	RELAY
2	3	IPHCS#1024075	#10-24 X 3/4 PHIL PAN HD BOLT
3	3	ILWSH-#10	#10 LOCKWASHER
4	3	IFWSH-025	#10 WASHER
5	3	IHNUT-#1024	#10 NUT
6	1	22607	WIRE HARNESS - 12/3 SJO
7	1	22609	WHITE - 16 GAGE ELECTRICAL WIRE - 15 FEET LONG
8	2	22610	BLACK - 16 GAGE ELECTRICAL WIRE - 15 FEET LONG
9	1	22611	GREEN - 16 GAGE ELECTRICAL WIRE - 15 FEET LONG
10	▲ 2	22612	BLACK - 16 GAGE ELECTRICAL WIRE - 6 INCHES LONG
11	1	22613	BLACK - 16 GAGE ELECTRICAL WIRE - 8 FEET LONG
12	1	22614	RED - 14 GAGE ELECTRICAL WIRE - 15 FEET LONG
13	1	01181	BUSS BAR
▲ 14	1	22619	BLACK - 16GA WIRE ASSY - 6" LONG W/ 3 INCH PIGTAIL



MFG., INC.
CINCINNATI, OHIO

**ENGINE START/STOP
THROTTLE CONTROL**

HT25/40/50

DATE
5-24-00B

REVISION
2-18-00A

SECTION
C400

22615



LIMITED WARRANTY POLICY

This limited policy warrants new products of Venturo be free from defects in material and workmanship for a period of one (1) year from date of original installation. This warranty covers:

- ◆ ***Repair or replacement of product***
- ◆ ***Labor to repair or replace product***
- ◆ ***Freight to return and/or replace product***

We shall not be liable for any contingent liabilities arising out of the improper function of any products. Warranty shall become void if the product is improperly installed, modified, damaged, abused or used for application other than intended use.

WARRANTY CLAIMS

Venturo Manufacturing, Inc. will make a good faith effort for prompt correction or other adjustment with respect to any product, which proves to be defective after our inspection and within the warranty period. Before any repairs are attempted or before returning any product, your Venturo Distributor is required to obtain a warranty claim number. This number is necessary for any claim to be considered. To obtain a warranty claim number, Venturo requires the model and serial number. Only authorized Venturo Distributors can perform warranty. For the name and address of your local Venturo Distributor call the **Warranty Claim Department – 513-772-8448**.

WARNING – It is the responsibility of the installer to insure the installation is completed according to the manufacturer's recommendations, insure the ultimate user understands how to operate product in a safe manner and understands the need for regular service and maintenance by an authorized Venturo Distributor. No modifications or alterations may be made to any Venturo products without the expressed written consent of the manufacturer. Reinstallation of any Venturo product must be done by an authorized Venturo Distributor, to the standards of the industry including maintenance, service and affixing of all instruction, safety and warning decals. Users should again be instructed as to the safe operation at time of delivery. Maintenance, service, operation and safety warning decals are available on request from Venturo Manufacturing, Inc.

VENTURO MANUFACTURING, INC

DIVISION OF COLLINS ASSOCIATES, INC
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