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| VENCO VENTURO INDUSTRIES LLC CINCINNATI, OHIO | TABLE OF CONTENTS | $\begin{aligned} & \text { DATE } \\ & 02-18-15 \mathrm{H} \end{aligned}$ | sEcton |
| :---: | :---: | :---: | :---: |
|  |  | SUPERSEDES |  |
|  | HT25KX(X) (HL*AAC-00**) | $02-16-15 \mathrm{G}$ |  |

# SECTION 100 

## DESCRIPTION

\&

## SPECIFICATIONS

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


| TOTAL INSTALLED |
| :--- |
| WEIGHT 1620 LBS. |

## ET/HT25/30/36KX BASE MOUNTING DIMENSIONS



* Rotation limits typically apply to HT cranes only. ET cranes generally have continuous rotation.

| BASE MOUNTING | $\begin{aligned} & \text { DaxE } \\ & \text { 02-13-12E } \end{aligned}$ | $\begin{gathered} \text { secronen } \\ \text { C100 } \end{gathered}$ |
| :---: | :---: | :---: |
| ET/HT25/30/36 | 12-14-11D | 21080 |

ET/HT25KX, 10'-16'-20' BOOM
$\triangle$ CRANE SERIAL NUMBER:

## MAXIMUM LOAD CAPACITY CHART



WEIGHT OF LOAD HANDLING DEVICES ARE PART OF THE LOAD AND MUST BE DEDUCTED FROM THE GROSS CAPACITY.
LOAD BLOCK USAGE
1 PART LINE FOR LOADS LESS THAN 2500 LBS
2 PART LINE FOR LOADS OF 2500 LBS AND GREATER
WEIGHT OF LOAD BLOCK $=34$ LBS
ENTUR

| TTILE |
| :--- | :--- | :--- |
| MAXIMUM LOAD CAPACITY |

# SECTION 150 

SAFETY

## VEHICLE \& CRANE MOUNTED ELECTRICAL HAZARD SIGN APPLICATION \& INFORMATION

## A DANGER

ELECTROCUTION HAZARD KEEP CLEAR OF TRUCK AND LOAD DEATH OR SERIOUS INJURY CAN RESULT FROM CONTACT WITH THE LOAD, THE CRANE, OR THE VEHICLE IF BOOM OR LOAD LINE SHOULD BECOME ELECTRICALLY CHARGED.

SIGN NO. 15393 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.

## ADANGER

UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 20 FEET OF HIGH-VOLTAGE LINES OF 350,000 VOLTS OR LESS.
FOR MINIMUM CLEARANCES OF HIGH-VOLTAGE LINES IN EXCESS OF 350,000 VOLTS, REFERENCE OSHA 1926. 1408 ,
CRANE'S SAFETY MANUAL, AND CAL-OSHA ARTICLE 37, TITLE B, HIGH-VOLTAGE ELECTRICAL SAFETY CRANE'S SAFETY MANUAL, AND CAL-OSHA ARTICLE 37, TITLE 8, HIGH-VOLTAGE ELECTRICAL SAFETY ORDERS

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.

Table A - Minimum Clearance Distances

## Voltage <br> (nominal, kV, alternating current)

Minimum clearance distance (feet) *

| Up to 50. | 10 |
| :---: | :---: |
| over 50-200. | 15 |
| over 200-350. | 20 |
| over 350-500. | 25 |
| over 500-750.. | 35 |
| over 750-1000.. | 45 |
| Over 1000............................................................................... | (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution). |

Table T - Minimum Clearance Distances While Traveling With No Load
Voltage
(nominal, kV, alternating current)

0-0.75.
over 0.75-50.
over 50-345.
over 345-750.
over 750-1000.
Over 1000..

While traveling - minimum clearance distance (feet) *
$\square$
6
10
16
20
(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).


## CRANE SAFETY AND HAZARDS <br> HT SERIES CRANES

## 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 20 FEET BETWEEN ANY PART OF THE CRANE, LOADLINE, OR LOAD, AND ANY ELECTRICAL LINE OR APPARATUS CARRYING UP TO 350 kV (SEE NEW CHART). ADDITIONAL CLEARANCES ARE 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.


## WINCH SAFETY WARNINGS



## 1 <br> DANGER

- DO NOT DISENGAGE WINCH UNDER LOAD


## A DANGER

- THE LAST [5] (DEAD) WRAPS OF WIRE ROPE MUST BE LEFT ON TO ASSIST WIRE ROPE CLAMP IN HOLDING LOAD



## 4. WARNING

- Winches are not to be used to lift, support, or otherwise transport personnel

| TTILE <br> WINCH SAFETY | DATE <br> 02-21-14D | section <br> C150 |
| :--- | :--- | :--- |
| HT CRANES | supersedes <br> 04-04-12C | $\mathbf{1 9 2 1 7}$ |

DECAL \#:
15390

DESCRIPTION:
PURPOSE:
AUTION, INSPECT VEHICLE \& CRANE...
TO INFORM THE OPERATOR OF KEY OPERATING REQUIREMENTS.
QUANTITY:
1
PLACEMENT: REAR COVER OR SIDE OF CRANE

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

DECAL \#: 15391
DESCRIPTION: DANGER, NOT A PASSENGER LIFT
PURPOSE: TO INFORM OPERATOR NOT TO LIFT, SUPPORT, OR TRANSPORT PERSONNEL, AND TO ENSURE OPERATOR IS ADEQUATELY TRAINED.

QUANTITY:
1
PLACEMENT: REAR COVER OR SIDE OF CRANE

DECAL \#: 15392
DESCRIPTION: DANGER, ELECTROCUTION HAZARD, MACHINE (CRANE)
PURPOSE: TO INFORM OPERATOR THAT MACHINE (CRANE) REPRESENTS AN ELECTROCUTION HAZARD SHOULD IT COME CLOSE TO OR IN CONTACT WITH AN ELECTRICAL VOLTAGE SOURCE.

QUANTITY:
PLACEMENT: REAR COVER OR SIDE OF CRANE

DECAL \#: 15401
DESCRIPTION:
PURPOSE:
DANGER, UNLAWFUL TO OPERATE
TO INFORM OPERATOR OF PROPER OPERATION IN VICINITY OF ELECTRICAL LINES.

QUANTITY: 1
PLACEMENT: RING COVER OR SIDE OF CRANE

DECAL \#: 15393
DANGER, ELECTROCUTION HAZARD, VEHICLE (TRUCK)
PURPOSE: WARNS OF DANGER FROM ELECTRICALLY CHARGED VEHICLE, CRANE, OR LOAD.

QUANTITY: 4
PLACEMENT: EACH SIDE \& EACH END OF VEHICLE


UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 20 FEET OF HIGH-VOLTAGE LINES OF 350,000 VOLTS OR LESS.



PART ND: 14473-2
DECAL: GREASE
FUNCTIDN: To show the operator where to apply grease.

QUANTITY: Varies
PLACEMENT: Near grease fittings.

PART NQ:: 19314-1
DECAL: MANUAL $\quad$ QVERRIDE
FUNCTIDN: To inform the operator of manual overide locations.

QUANTITY: 1
PLACEMENT: Left side of rear cover.


## $\stackrel{\text { WINCH }}{\text { DOWN }}$ <br> $\underset{\substack{\text { Valve } \\ \text { MANUAL }}}{ }$ <br> Rotation RIGHT

 BOOM| me | one |
| :---: | :---: |
| SHUT OFF \& OVERRIDE DECALS | 3-9-11A |
| HT CRANES | $\begin{gathered} \text { supergeres } \\ 9-6-05 \end{gathered}$ |

PART Na: 19315-1
DECAL
FUNCTIDN: To show the operator how to override master shut off valve.

QUANTITY: 1
PLACEMENT: Rear cover.

WARNING!
KEEP VALVE IN NORMAL POSITION OVERRIDE POSITION IS INTENDED FOR EMERGENCY USE ONLY.



|  | MFG., INC. CINCINNATI, OHIO | SHUT OFF \& OVERRIDE DECALS | $\begin{aligned} & \text { DATE } \\ & 9-6-05 \end{aligned}$ | section <br> C150 |
| :---: | :---: | :---: | :---: | :---: |
|  |  | HT CRANES | SUPERSEDES | $21$ |

PART NO.: 23132-1 \& 23132-2 (OPPOSITE) $\quad$ -
DECAL: CRANE CAPACITY
FUNCTION: To show the operator the operating capacities of crane.

QUANTITY: 1 each


PLACEMENT: One on each side of boom.

PART NO.: 19745
DECAL: MODEL NUMBER
FUNCTION: To show the model of the crane.

## QUANTITY: 2 <br> 2

PLACEMENT: One on each side of boom.

| TTLE <br> MODEL \& CPCTY DECALS | date <br> 02-13-14A | secton <br> C150 |
| :--- | :--- | :--- |
| HT25KX | supeasebes <br> $09-07-05$ | $\mathbf{2 1 9 5 3}$ |

PART NO.: 20927
DECAL: CRANE STABILITY
FUNCTION: To inform the operator of the crane's lifting capacity throughout the entire rotation.

QUANTITY: 1
PLACEMENT: In prominent location, so it is easily seen and readily $\triangle \quad$ identifiable.


# SECTION 200 

## INSTALLATION

## CRANE INSTALLATION

HT25/HT30

## 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 28,000 and for the HT30KX is $33,000 \mathrm{ft}$. lbs.

The maximum vertical load for the HT25KX and the HT30KX is 6500 lbs .

## CRANE MOUNTING

The crane base plate or mounting pedestal must be bolted to the body reinforcing plate with four (4) Grade 5 bolts of $3 / 4$ " dia. A larger than 3 " 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 as shown on drawing 20051. 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 housing. Included in the installation kit are two hydraulic swivels.

The hoses are to be connected in a relaxed position while the crane is at the midpoint of the 400 degree rotation range -- 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.

NOTE: If you purchased one of Venturo's hydraulic packages (19294 series), you will have received our pressure gauge kit. This kit includes a gauge, hose and bulkhead "T" fitting and should be installed on the pressure hose.

## ELECTRICAL CONNECTIONS

A 25 ft . electrical power lead - intended for 12 V 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

Average Climate
Cold to Moderate
Warm to Hot

Type of Oil
ISO Grade AW 46
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:

|  | NON-PROP | PROP |
| :---: | :---: | :---: |
| PRESSURE | $1 / 4^{\prime \prime}$ | $3 / 8^{\prime \prime}$ |
| RETURN | $3 / 8^{\prime \prime}$ | $1 / 2^{\prime \prime}$ |
| SUCTION | $1 / 2^{\prime \prime}$ | $3 / 4^{\prime \prime}$ |

## 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.
=n' CINCINNATI, OHIO

| ${ }^{\text {TrIE }}$ INSTALLATION DWG | $\begin{aligned} & \text { Dant } \\ & 12-14-09 G \end{aligned}$ | $\stackrel{\text { secion }}{\text { C200 }}$ |
| :---: | :---: | :---: |
| HT25 / HT30 ${ }^{\text {- }}$ |  | \|19212b |

## CRANE OPERATION AND MAINTENANCE INSTRUCTIONS

HT25 / HT30

## 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.

## 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

## 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 for single-stage is 6 ft . and for dual-stage is 10 ft .

ENTURO меє. .nc. CINCINNATI, OHIO

| INSTALLATION DWG | $\begin{aligned} & \text { DATE } \\ & 12-14-09 A \end{aligned}$ | C200 |
| :---: | :---: | :---: |
| HT25 / HT30 | ${ }^{\text {Superceis }}$ 6-17-02 | 20435A |

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.

## 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 load 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 Drawings 20904 in this manual for replacement parts and configuration information.

## TELESCOPIC HEXAGONAL BOOM

© The dual-stage $10-20 \mathrm{ft}$. boom has a 10 ft . hydraulic power extension (REF. DWG. 21098). The single-stage $10-20 \mathrm{ft}$. boom has a 6 ft . hydraulic power extension and a 4 ft . manual extension (REF. DWG. 21198).

## TRUCK SETUP \& STABILIZERS

1. The truck should be parked on firm level surface, $+/-5^{\circ}$.
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 stabilizers to help stabilize the vehicle against rocking or overturning when lifting with the crane.

## PREPARATION FOR TRAVEL

1. Return the stabilizers to the stowed position. Install and secure all pins.
2. Stow the crane's boom in the boom support.
3. Hook the winch line to the tie down point on the boom and apply light tension.
4. Disengage PTO pump and idle speed control.
5. Unplug the control pendant and store in a body compartment or the cab.

| TENTUR ${ }^{\circ}$ |  | Installation dwa | $\int_{04+16-138}^{\text {anem }}$ | ${ }_{\text {cemom }}^{\text {ceom }}$ |
| :---: | :---: | :---: | :---: | :---: |
|  |  | нт25/30КX | 120, | 21955 |

## EXPLANATION OF HYDRAULIC VALVE SYSTEMS

## OVERVIEW

Venturo's hydraulic cranes are available in two [2] general configurations: Proportional and Non-Proportional. The Non-Proportional configuration (see fig. 1) utilizes a safety shut-off 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 shut-off valve is not actuated. When the safety shut-off 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 shut-off 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 [4] crane functions (winch, rotation, boom elevation, and boom extension) are controlled by four [4] separate valve sections. Each valve section has two [2] solenoid coils (and two [2] 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').


| RIGHT SIDE |
| :--- |
| VIEW |

SYSTEM ABBREVIATIONS ARE AS FOLLOWS:
WD - Winch Down
RR - Rotation Right
BI - Boom In - Winch Up
BD - Boom Down

## 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 shut-off 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 counter-clockwise 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 turns, the faster the crane operates).
To return to normal operation, roate stem counter-clockwise 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. For example, pushing the stem labeled ' $A$ ' on the first bank (refer to illustration in Fig. 1) will actuate winch down.


- For normal crane operation, the safety shut-off 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 shut-off 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.



This Venturo crane is shipped with the rotation orientation as shown above. To change the orientation rotate crane base prior to mounting to suit your application.

|  | Rotation stop Locti |  |  |
| :---: | :---: | :---: | :---: |
|  | $400^{\circ}$ Rotation cranes | c | 20051 |

## STABILITY TEST - ET/HT25-20' SERIES

## Overview

Venturo follows the guidelines of ANSI B30.5 in defining stability. Generally speaking, a truck is considered stable as long as it is not on the verge of tipping - i.e. with the truck level, at least one tire on each corner of the truck must remain in contact with the ground.

It is important to note that nearly every installation is unique and will, therefore, typically require stability testing.
The procedure outlined below follows ANSI's (B30.5-5-1.1.1) specified "maximum load rating" of $85 \%$ of truck stability.

## Testing Procedure

1. Locate the truck on firm, level ground and set parking brake.
2. Fully deploy stabilizers, making sure they are firmly in contact with supportive ground; use stabilizer pads as required. The tires of the truck should remain in full contact with the ground.
3. Inspect wire rope and other key components of crane (consult owners manual for more information).
4. Conduct an operational check of all crane functions.

5. Position the boom level and fully retracted.
6. Referring to the Stability Chart (drawing 20907) rotate the crane to a position between 1 and 2 o'clock (truck cab is facing 12 o'clock) to begin testing.
7. Use the winch to lift the Test Weight; DO NOT allow the weight to be more than 6 " off the ground at any time during testing (for safety).
8. Extend the boom slowly, until one of two conditions occur: 1) the boom reaches full extension or 2) the vehicle begins to be unstable, whichever occurs first. Note: If the boom reaches full extension (without an overload or unstable condition) the $\%$ of Rated Capacity is $100 \%$ for the given ZONE.
9. Use the formula below to determine the \% of Rated Capacity for each ZONE on the Stability Chart (ref. page 20907).
10. Note: The "Max Stable Reach in inches" is measured from the center of rotation of the crane housing to the lifting load hook.
$\%$ Rated Capacity $=\frac{\text { "Max Stable Reach" in inches" }}{248} \quad \times 100$

Example 1) Max Stable Reach $=248$ (inches, full extension) $\div 248 \times 100=100$ or $100 \%$ of Rated Capacity for the given ZONE

Example 2) Max Stable Reach $=241$ (inches) $\div 248 \times 100=97.17$ or $97 \%$ (rounded) of Rated Capacity for the given ZONE
12. Record the \% of Rated Capacity in the appropriate blank (region) on the Crane Stability page (ref. 20907) and decal.
13. Repeat Steps 7 through 12 for each ZONE on the stability page.

| $\sqrt{\text { a }}{ }^{\text {® }}$ VENCO VENTURO Industries LIC | TITLE STABILITY TEST | $\begin{array}{\|l\|} \hline \text { DATE } \\ 02-26-21 C \end{array}$ | $\begin{aligned} & \text { section } \\ & \mathrm{C} 200 \end{aligned}$ |
| :---: | :---: | :---: | :---: |
| CICLINCINNAT, OHIO | ET/HT25-20' SERIES | SUPERSEDES 04-23-20B | 20906-25 |

## CRANE STABILITY


\% of Rated Capacity for each of the 10 regions are provided above.
CONDITIONS:

- STABILIZERS FULLY EXTENDED \& DOWN, ON FIRM LEVEL GROUND.


REFER TO SECTION 200 FOR MORE INFORMATION ON INSTALLING HYDRAULIC COMPONENTS.





HYDRAULIC CIRCUIT CONNECTION GUIDE - TWO-STAGE PUMP W/ COMPRESSOR

(1) CAUTION

- SELECTOR VALVE MUST BE 'NON-CLOSED CENTER TRANSITION' TYPE.

REFER TO SECTION 200 FOR MORE INFORMATION, INCLUDING HOSE SPECIFICATIONS

## 4. CAUTION

- THE CASE DRAIN LINE FROM THE WINCH MUST HAVE AN UNRESTRICTED PATH TO TANK/ RESERVOIR.

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| :--- | :--- | :--- |
| CNNCTN GDE, PAGE 2/2 | date | section |
| 02-21-14B | C200 |  |
| HT CRANES | supersedes | $04-19-12 A$ |

## WIRE ROPE INSTALLATION



STEP 1: UNWIND COIL OF WIRE ROPE BY 'ROLLING' ALONG THE FLOOR. THIS WILL PREVENT 'KINKING'.

STEP 2: INSERT WIRE ROPE END UP THROUGH ANTI-2-BLOCK (A2B) CAGE ASSEMBLY, BETWEEN CHEEK PLATES, OVER THE TOP SHEAVE, AND THROUGH WIRE ROPE GUIDE.

STEP 3: INSERT WIRE ROPE END INTO POCKET OPENING ON WINCH, WRAP AROUND WEDGE, AND BACK THROUGH POCKET OPENING AS SHOWN IN FIGURE 1.

## A. CAUTION

- IF THE WIRE ROPE IS NOT INSTALLED FOR THE CORRECT DRUM ROTATION, THE WINCH BRAKE VALVE WILL NOT HOLD THE LOAD.
(1) CAUTION
- THERE MUST ALWAYS BE AT LEAST [5] DEAD WRAPS OF WIRE ROPE ON THE WINCH DRUM WHILE UNDER LOAD.

NOTE: SOME WINCHES MAY BE SUPPLIED WITH A HEX NUT IN LIEU OF A WEDGE FOR INSTALLING THE WIRE ROPE.


## IN-COMPARTMENT CONTROLS INSTALLATION HT25 / $30 \wedge$



|  | INSTALLATION DWG |  | secron |
| :---: | :---: | :---: | :---: |
|  | HT25/30 ${ }^{\text {s }}$ |  | 20453 |

# SECTION 300 

 MAINTENANCE \& SERVICETRUEK MOUNTED CRAMES


## MAINTENANCE OVERVIEW INFORMATION

## MAINTENANCE

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

## GENERAL

Inspect wire rope for any evidence of kinks or fraying. Ensure that lifting hook of wire rope shows no evidence of damage and is functioning normally.

Inspect headache ball ("load block") for any signs of damage or excessive wear.

Service all grease fitting locations.

Inspect hydraulic hoses and hydraulic fittings for hydraulic leaks.

Inspect electrical connections for any looseness or corrosion.

Inspect bolts and verify all are tight, paying particular attention to winch, rotation system, and mounting base bolts.

Inspect all pins and snap rings for proper fit and function.

Inspect sheaves for excessive wear or play.

## WINCH

Perform a basic inspection of the winch with each use, monitoring for unusual noise or hydraulic leaks.

The winch planetary gearbox lube (SAE 90) should be maintained at the level plug (final base relief valve port) which is approximately half-full point.

To ensure optimal winch performance, the following oil change schedule should be followed:

Initial Change - after the initial 100 hours of operation or two months.
Periodic Change - after every 1000 hours of operation or two years .

| TTLE | DATE | secton |
| :---: | :---: | :---: |
| MAINTENANCE INFO | 02-21-14C | C300 |
| HT25/30/40/50/66K(X) | $\begin{array}{\|l\|} \hline \text { SUPPRSSEDES } \\ 04-12-12 B \end{array}$ |  |



# SECTION 400 

 PARTS

| $\boldsymbol{4} \quad 27$  <br> $\boldsymbol{4}$  | 50 | !LWSH-050 | LOCK WASHER, 1/2" |
| :---: | :---: | :---: | :---: |
| $\boldsymbol{A}$ 26 | 26 | !HHCSM12175090-8.8 | HHCS; 12MM-1.75MM X 90MM LG, GR. 8.8 |
| - 25 | 24 | !HHCSM12175080-8.8 | HHCS; 12MM-1.75MM X 80MM LG, GR. 8.8 |
| 24 | 1 | 27668-5/16-80 | WIRE ROPE ASS'Y. |
| 23 | 1 | 27198 | BOOM FINAL ASS'Y. (KX - SINGLE STAGE) |
| 22 | 1 | 27738 | ANTI-2-BLOCK ASS'Y. |
| 21 | 1 | 27667 | LOAD BLOACK ASS'Y. - 6000 LBS. |
| 20 | 1 | 17460-2400-21 | OVERLOAD PRESSURE SWITCH |
| 19 | 1 | 19904 | BOOM SHUT-OFF SWITCH ASS'Y. |
| 18 | 1 | !SRNG-150 | RETAINING RING; 1 1/2" SHAFT DIA. |
| 17 | 1 | 18762 | PIVOT PIN; ELEVATION CYLINDER |
| 16 | 4 | !SRNG-125 | RETAINING RING; 1 1/4" SHAFT DIA. |
| 15 | 1 | 18761 | PIVOT PIN; ELEVATION CYLINDER |
| 14 | 1 | 21012 | PIVOT PIN; MAIN BOOM PIVOT |
| 13 | 1 | 27186 | GUARD; ROTATION GEAR |
| 12 | 1 | 27557 | LIMITING RING; ROTATION |
| 11 | 1 | 27520 H | SPACER |
| 10 | 1 | 23156 | PLATE, COVER |
| 9 | 1 | 21752 | ELEVATION CYLINDER |
| 8 | 1 | 27000 | SIDE COVER; HOUSING |
| 7 | 1 | 21470 | BOOM FINAL ASS'Y. (KXX - DUAL STAGE) |
| 6 | 1 | 27315 | REAR COVER; CRANE |
| 5 | 1 | 19814 | HYDRAULIC WINCH; HT25KX |
| 4 | 1 | 22501 | VALVE MANIFOLD |
| 3 | 1 | 27520m-1 | WELDED ASS'Y.; BASE |
| - 2 | 1 | 21418 | SLEWING RING |
| 1 | 1 | 27521 | WELDED ASS'Y.; UPPER HOUSING |
| ITEM NO. | QTY. | PART NO. | DESCRIPTION |

REPLACEMENT PARTS DRAWING - REFERENCE 23206


> REPLACEMENT PARTS DRAWING - REF 21198
21470 BOOM REPLACEMENT PARTS DRAWING


| 23924 | SPACER - SHEA VE |
| :---: | :---: |
| ! C A CSO2520063-N | CNTR SNK ALLEN HEAD CAP SCREW 1/4-20 X 5/8 LG W / PATCH |
| 23217-10 | UHM W GUIDE PAD |
| 23116 | PIN BLOCK REINFORCING |
| 21428 | BUSHING |
| 21941 | EXTENSION CYLINDER PIN |
| 23217-7 | UHM W GUIDE PAD |
| 23217-6 | UHM W GUIDE PAD |
| !LW SH-038 | LOCK W ASHER 3/8" |
| ! HHCS03816075 | HEX HEAD CAP SCREW -3/8-16X3/4 LONG |
| 23217-3 | UHM W GUIDE PAD |
| 23217-9 | UHM W GUIDE PAD |
| 23217-8 | UHM W GUIDE PAD |
| !ANUT-02520S | ACORN NUT 1/4-20 STAINLESS |
| 13459-2 | BOOM ARROW 4-7/16 LONG |
| 22490 | SPACER, BOOM ARROW 1/2" O.D. |
| !SRNG-075 | RETAINING RING - 3/4" SHAFT DIA. |
| ! HHCSO4414550 | HEX HEAD CAP SCREW - 7/16-14 X 5-1/2 LG |
| !LNUT-04414 | NYLON INSERT LOCK NUT - 7/16-14 |
| 21560 | ROLLER,UHM W GUIDE |
| 21936 | FLAT,M OUNT;W IRE ROPE GUIDE |
| 21935 | W IRE-ROPE GUIDE W ELDED |
| !LNUT-07510 | LOCKNUT 3/4-10 |
| 17059-6 | SHEAVE AXLE 3/4 X $2 \mathrm{~W} / 1$ ' SHANK |
| 27001 | SHEAVE - BOOM |
| 23119 | BEARING RETAINING BLOCK |
| 23183 | V-BLOCK SLIDER |
| 21498 | EXTENSION CYLINDER ROLLER |
| 21497 | THRUST PIN - EXTENSION CYLINDER |
| 21472 | PRIM ARY BOOM W ELDED ASSEM BLY |
| 21753 | EXTENSION CYLINDER |
| 21476 | TERTIARY BOOM ASSEM BLY |
| 21474 | SECONDARY BOOM W ELDED ASSEM BLY |
| PART NUMBER | DESCRIPTION |



REPLACEMENT PARTS 19814 WINCH

NOT SHOW ON DRAWING:
21381 - WINCH SEAL KIT
21382 - MOTOR SEAL KIT

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| :---: | :---: | :---: | :---: |
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STEP 1
ANTI-TWO BLOCK (A2B) SWITCH WIRING
Connect the Black wire to the 'COM' (Common) terminal and the White wire to the 'NC' (Normally Closed) terminal. The center terminal is not used.


CUT-AWAY VIEW

STEP 2

## ANTI-TWO BLOCK (A2B) SWITCH ADJUSTMENT

The A2B switch is adjusted by loosing the Pivot \& Adjustment Fasteners of the A2B switch housing.
Once loosened the A2B switch and housing move freely piviting on the 'Pivot Fastener' allowing the 'Switch Wand' to be adjusted to the 'Cage Actuating Tube'.

With the A2B Switch Wand inserted into the Cage Actuating Tube rotate the A2B switch housing Counter-Clockwise until you hear the 'click' of the A2B switch then rotate Clockwise 'just until' the A2B switch 'UN-CLICKS' and then tighten the Pivot \& Adjustment Fasteners of the Switch Housing


ADJUSTMENT FASTENER
PIVOT FASTENER


## TESTING ADJUSTMENT

Lift up on the A2B Cage Assy. until the A2B switch 'clicks' and note the distance under the spring hanger nut; the distance should be approximately $1 / 2$ of an inch.

Note: If the distance under the nut is greater than $3 / 4$ of an inch repeat STEP 2 above.

A2B CAGE WELDED ASSY.


| tiTLE <br> WIRING \& ADJUSTMENT | DATE <br> $02-21-14 \mathrm{~A}$ | SECTON <br> C400 |
| :--- | :--- | :--- |
| A2B SYSTEM | Supersedes <br> $04-12-11 ~$ | $\mathbf{2 7 0 2 9}$ |



 불 $\square$

FROM "IN COMPARTMENT" SOCKET
20354 (GROUND WIRE)
IN-COMPARTMENT/ ON
GROUND BOLT


ENGINE CONTROLS (\#22616) SOLD AS AN OPTION (NOT INCLUDED WITH CRANE) HT CRANES
YELLOW (WU)
TO VALVE BANK


| REPLACEMENT PARTS LIST; HYDRAULIC SYSTEM COMPONENTS HT25/30 SERIES CRANES |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| ITEM | QTY | PART NUMBER | DESCRIPTION | INSTALLATION |
| 1 | 1 | 21764 | HOSE ASSY; PRESSURE SUPPLY | VALVE BANK TO COMPARTMENT |
| 2 | 1 | 21763 | HOSE ASSY; RETURN SUPPLY | VALVE BANK TO COMPARTMENT |
| 3 | 2 | 21761 | HOSE ASSY; BOOM UP / BOOM DOWN | VALVE BANK TO ELEVATION CYLINDER |
| 4 | 1 | 21765 | HOSE ASSY; BOOM IN | VALVE BANK TO EXTENSION CYLINDER |
| 5 | 1 | 21766 | HOSE ASSY; BOOM OUT | VALVE BANK TO EXTENSION CYLINDER |
| 6 | 1 | 21767 | HOSE ASSY; WINCH UP | VALVE BANK TO WINCH MOTOR |
| 7 | 1 | 21768 | HOSE ASSY; WINCH DOWN | VALVE BANK TO WINCH MOTOR |
| 8 | 2 | 21771 | HOSE ASSY; ROTATE LEFT / RIGHT | VALVE BANK TO ROTATION MOTOR |
| 9 | 1 | 22903 | HOSE ASSY; CASE DRAIN, 96" LONG | T-SHAPE FITTING TO COMPARTMENT |
| 10 | 1 | 22952 | HOSE ASSY; CASE DRAIN, 13" LONG | WINCH CASE DRAIN TO T-SHAPE FITTING |
| 11 | 1 | 22953 | HOSE ASSY; CASE DRAIN, 30" LONG | ROTATION CASE DRAIN TO T-SHAPE FITTING |
| 12 | 2 | H6410-1608 | FITTING; ADAPTER, STRAIGHT, 16MO-8FO | WINCH MOTOR PORTS |
| 13 | 2 | FF6801-0608 | FITTING; ADAPTER, $90^{\circ}$ ELBOW, 6OFS-8MO | FOR ADAPTERS IN WINCH MOTOR PORTS |
| 14 | 2 | H6801-0404 | FITTING; ADAPTER, $90^{\circ}$ ELBOW, 4MJ-4MO | WINCH \& ROTATION MOTORS CASE DRAINS |
| 15 | 1 | H2603-040404 | FITTING; T-SHAPE JUNCTION, 4MJ-4MJ-4MJ | CASE DRAIN HOSES, NEAR VALVE BANK |
| 16 | 2 | FF6400-0610 | FITTING; ADAPTER, STRAIGHT, 6OFS-10MB | ROTATION MOTOR PORTS |
| 17 | 2 | FF6802-0606 | FITTING; ADAPTER, $45^{\circ}$ ELBOW, 6OFS-6MO | EXTENSION CYLINDER PORTS |
| 18 | 12 | FF6400-0606 | FITTING; ADAPTER, STRAIGHT, 6OFS-6MB | VALVE BANK \& ELEVATION CYLINDER PORTS |
| 19 | 2 | 20684 | LIVE CONTINUOUS HYDRAULIC SWIVEL | PRESSURE \& RETURN SUPPLIES TO MAINS |
| 20 | 1 | H6805-0404 | FITTING; ADAPTER, $90^{\circ}$ ELBOW, 4MO-4FP | ELEVATION CYLINDER TO PRESSURE SWITCH |
| 21 | - | - | - | - |
| 22 | - | - | - | - |
| 23 | - | - | - | - |
| 24 | - | - | - | - |
| 25 | - | - | - | - |
| 26 | - | - | - |  |
| 27 | - | - | - | - |
| 28 | - | - | - | - |
| 29 | - | - | - | - |
| 30 | - | - | - | - |

* MUST USE ELBOW FOR PRESSURE SWITCH


## REFERENCE REPLACEMENT PARTS DWG 21251

|  | TITLE <br> RPLCMNT PARTS LIST | $\begin{array}{\|l\|} \hline \text { DATE } \\ 12-16-16 B \end{array}$ | $\begin{aligned} & \text { SECTION } \\ & \mathrm{C} 400 \end{aligned}$ |
| :---: | :---: | :---: | :---: |
| CINCINNATI, OHIO | HT25/30 SERIES CRANES | $\begin{aligned} & \text { SUPPRRSEDES } \\ & 04-19-10 A \end{aligned}$ | 21252 |

22501 HYDRAULIC VALVE MANIFOLD, REPLACEMENT PARTS


|  | Trimplacement Parts | $\left.\right\|_{10-22-158} ^{\text {ONE }}$ | C400 |
| :---: | :---: | :---: | :---: |
|  | 22501 VaLVe block, ht series cranes | 03-04-10A | 22939 |


CORD REPLACEMENT INSTRUCTIONS
NOTE 1)
WIRE TERMINALS TO BE INSTALLED 'AFTER'
ROUTING REPLACEMENT CORD ASSY THROUGH
PENDANT HEAD AND PLUG HOUSING.






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## 21874-25-0 FIELD SERVICE LABEL KIT

| QTY. | PART NO. | DESCRIPTION |
| :---: | :---: | :--- |
| 1 | $14473-1$ | DECAL; OIL |
| 9 | $14473-2$ | DECAL; GREASE |
| 1 | $19314-1$ | DECAL; MANUAL OVERRIDE, VALVE BANK, LEFT |
| 1 | $19314-2$ | DECAL; MANUAL OVERRIDE, VALVE BANK, RIGHT |
| 2 | 17389 | DECAL; VENTURO LOGO, MEDIUM |
| 1 | $17389-4$ | DECAL; VENTURO LOGO, SMALL |
| 1 | $23132-1$ | DECAL; BOOM CAPACITY, RIGHT |
| 1 | $23132-2$ | DECAL; BOOM CAPACITY, LEFT |
| 2 | 19745 | DECAL; MODEL NAME, HT25KX |
| 1 | $19315-1$ | DECAL; SAFETY SHUT-OFF OVERRIDE |
| 1 | 22499 | DECAL; KNOW YOUR SIGNALS |
| 1 | 20834 | DECAL; OVERRIDE INSTRUCTIONS |
| 1 | 17813 | DECAL; OVERLOAD SENSING SYSTEM |
| 1 | 23208 | IDWG; FIELD SERVICE LABEL KIT LIST |
| 1 | 21884 | IDWG; DECAL PLACEMENT |
| 1 | INST-23233 | SAFETY MANUAL, VENTURO CRANES |
| 1 | 15397 | KIT; ACCIDENT PREVENTION SIGNS |

## NOTE:

APPLICABLE SERIAL NUMBERS $=120000$ TO CURRENT

| 15397 ACCIDENT PREVENTION SIGNS |  |  |
| :---: | :---: | :--- |
| PART NO. | QTY. | DESCRIPTION |
| 15390 | 1 | DECAL; CAUTION, OPERATIONS |
| 15391 | 1 | DECAL; DANGER, NOT PASSENGER LIFT |
| 15392 | 1 | DECAL; DANGER, ELECTRICAL HAZARD SIGN |
| 15393 | 4 | DECAL; DANGER, ELECTRICAL HAZARD |
| 15394 | 1 | APPLICATION INSTRUCTIONS |
| 15398 | 1 | DECAL; UNPLUG PENDANT |
| 15401 | 1 | DECAL; UNLAWFUL TO OPERATE |
| 15513 | 1 | DECAL; MASTER DISCONNECT |
| 22317 | 1 | DECAL SHEET; VENTURO, COMPLEMENTARY |
| 20927 | 1 | DECAL; CRANE STABILITY |


| VENCO VENTURO INDUSTRIES LLC CINCINNATI, OHIO | TITLE <br> FIELD SERVICE LABEL KIT | $\begin{aligned} & \text { DATE } \\ & 02-12-15 \mathrm{C} \end{aligned}$ | $\begin{aligned} & \text { SECTION } \\ & \text { C400 } \end{aligned}$ |
| :---: | :---: | :---: | :---: |
|  |  | SUPERSEDES |  |
|  | HT25KX(X)-20' NON-PROPORTIONAL | 05-13-13B | -3208 |

## VENTURO CRANES LIMITED WARRANTY POLICY

Venturo products are built to last...we guarantee them.

As a purchaser of any new Venturo product covered by warranty, you will receive 1 year of the most complete coverage available...and, at no added cost to you.

## 1-Year Limited Warranty Policy

This limited policy warrants new products of Venturo to be free from defects in material and workmanship for a period of one (1) year from date of original installation. OEM products or accessories purchased by Venturo as part of or offered with our product will carry the OEM manufacturer's respective warranty. Our 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. There is no warranty of merchantability, fitness for a particular purpose, warranty arising from course of dealing or usage of trade, or any other implied or expressed warranty, except as made specifically herein. This warranty supersedes all previous warranties, written or implied.

## Warranty Claims

Venco Venturo Industries LLC 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 ensure the installation is completed according to the manufacturer's recommendations, ensure 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 product without the expressed written consent of Venco Venturo Industries LLC. Installation 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 be instructed as to the safe operation at time of delivery. Maintenance, service, operation and safety warning decals are available on request from Venco Venturo Industries LLC.

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> www.venturo.com

