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Installation Instructions

Model 1640 Series

P/N 22429

! ATTENTION !

KEEP THIS MANUAL WITH THE CRANE. OPERATION INSTRUCTIONS ARE CONTAINED IN A SEPARATE MANUAL. NEW OPERATORS SHOULD READ AND BE FAMILIAR WITH THE OPERATING INSTRUCTIONS BEFORE OPERATING THIS CRANE.

ORDER PARTS USING PART NUMBER, CRANE MODEL NUMBER AND CRANE SERIAL NUMBER TO ASSURE ACCURACY OF ORDERS.

MODEL 1640 INSTALLATION INSTRUCTIONS

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MODEL 1640 INSTALLATION INSTRUCTIONS

Read and understand these instructions before starting the work.

Before installing make sure you have all necessary parts. Please refer to the Owner's manual Section 4-1 for the list of parts required for installation. Report any shortages to Liftmoore, Inc. immediately.

1. The mounting surface for the crane must be capable of supporting the rated moment (16,000 Ft.-Lbs.) and maximum load (4,000 Lbs.) of the crane.
2. Layout the mounting holes for the crane as shown in the Drawing No. 50273. This crane has limited rotation. Locate the rotation stop opposite the point where the boom will be restricted. Mount the crane with four 3/4" bolts of at least Grade 8 quality. Tighten the bolts to 420 Ft.-Lbs.
3. Run the 10 Ga. battery cable along the inside of the chassis frame to the positive battery terminal. It connects to the battery through the 10 Amp. in-line fuse. Install the fuse as close as possible to the battery. See that the cable is protected avoiding sharp edges and heat sources such as the muffler or catalytic converter. Use loom for protection whenever the cable passes through the body. Mount the supplied toggle switch in a convenient location. This switch should be turned off when the crane is not in use. Connect the switch to the 10 gage wire located at the center of the crane's base. The crane electric wire needs to have enough slack to permit rotation as the crane swings. Leave extra wire to accomplish this.
4. Be certain that the crane and the battery are grounded to the truck chassis. A good ground must exist for the crane to work.

HYDRAULIC COMPONENT INSTALLATION FOR 1640 CRANES

The following description applies to Liftmoore's Hydraulic Installation Drawing No. 50026.

These cranes require a pump driven by the vehicle's engine. Pumps can be either Power Take Off or Fan Belt drive. For best, smoothest operation the pump needs to supply 6 GPM at 2750 PSI with the engine at 1000 RPM. An example of this pump is Muncie's PK6. At 600 RPM it delivers 3.5 GPM and at 1000 RPM it delivers 6 GPM.

Do not use pumps that will deliver more than 6 GPM at engine idle speed. 10 GPM is the maximum flow acceptable to the valves in the crane. If a larger pump is installed on the vehicle for other functions, use a pressure compensated flow control valve to restrict the flow to the crane as required above.

A wire control or solenoid throttle advance can be used to increase the engine speed. Liftmoore can supply a solenoid throttle advance kit (Part No. 32592) that includes a control switch to be mounted near the crane. Engine control can be included in the pendant control box. NOTE: On engines with electronic throttles, the throttle advance must be purchased from the vehicle manufacturer.

A reservoir of at least 10 gallon capacity is recommended. A larger reservoir will be needed for increased running time. For run times of 20 minutes or less the 10 gallon capacity is adequate.

The reservoir should be equipped with a suction line strainer, return line diffuser, and filler/breather cap. A sight gage for displaying fluid level is also advisable. Locate the reservoir as close to the pump as possible and as high as possible above the pump.

A relief valve should be installed at the pump's output to protect the pump from pressure surges. The crane incorporates a relief valve to protect its valves and hoses.



MODEL 1640 INSTALLATION INSTRUCTIONS, Cont.

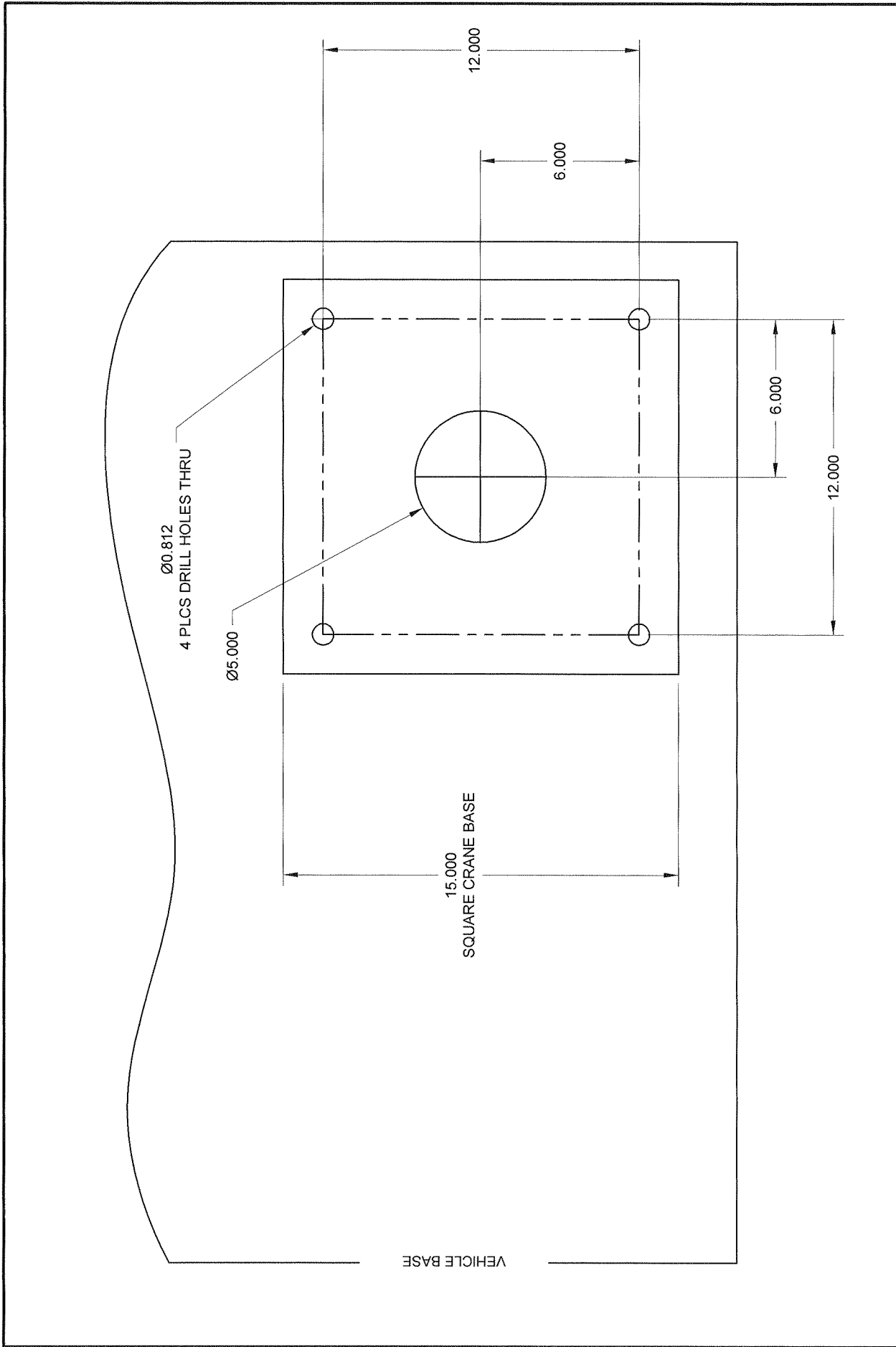
For up to 9 GPM flow, the minimum suction line hose size is 1" ID. For the pressure line a 5/8" ID hose is needed. For the return line between the crane and reservoir a 3/4" ID is advised. Hose sizes can be reduced for lower flows. The hoses must be left long enough to twist together as the crane rotates. Hydraulic swivels are supplied for connecting between the crane tubing and the hose. These allow the hose to move relative to the crane and help prevent loosening of the connection.

A 10 Micron return line filter should be installed in a location that allows convenient access to the replaceable cartridge.

5. DO NOT RUN OIL THROUGH THE CRANE UNTIL THE OIL HAS BEEN FILTERED. A nipple matching the crane fittings is included. Connect the supply and return lines together using this nipple, circulate the oil through the filter to insure a clean supply. After the pump has filtered 1.5 times the reservoir capacity, hook the hoses to the crane. If the oil is not circulated, air can be introduced into the manifold block. This may produce a cavitation type noise. It can only be corrected by running the crane.
6. Connect the hydraulic hoses to the nipples projecting below the crane. The pressure hose must be connected using the smaller adapter on the longer nipple. The return line to the tank must be connected using the larger adapter on the shorter nipple.
7. NOTE: THE LONGER PIPE IS THE PRESSURE LINE.
8. A boom support is required for this crane. On boom rests supplied by Liftmoore the boom is held down by tension on the hoist wire rope.
9. An outrigger must be installed to keep the crane as level as possible under all expected working conditions. Keeping the crane level reduces the loads on the rotation gear. This will also protect the truck's springs, axle and wheels when heavy loads are suspended from the crane. If jackstands or an outrigger package were supplied by Liftmoore, instructions for the package are included with the packet of instructions.

OSHA standards require that a stability test be performed on this installation whether or not outriggers are installed. See Form 691/692 for an explanation of this procedure.
10. Extra rear spring leaves or heavy coil springs may be needed to keep the truck level when the crane is mounted on corner or off center locations.
11. If equipped with an anti two-block device, verify that the anti two-block will stop extension out, boom down and winch up when the weight on the device is lifted by either function. Make sure that the weight is on the live or running wire rope. The Crane Assembly drawing in the owner's manual Section 4-2 illustrates how the weight should be installed on the line.
12. READ AND UNDERSTAND OPERATORS MANUAL BEFORE OPERATING CRANE. Operate the crane through all of its functions. Check that each switch operates the correct function.
13. Place the Installation Instructions Manual and the Owner's Manual in a convenient place for the user to find and use before operating the crane.
14. Load Chart Decal # 22378 is to be placed on the truck body for easy visibility by the user.





DRAWING NO.

50273-B

MOUNTING PATTERN FOR

1640/4000

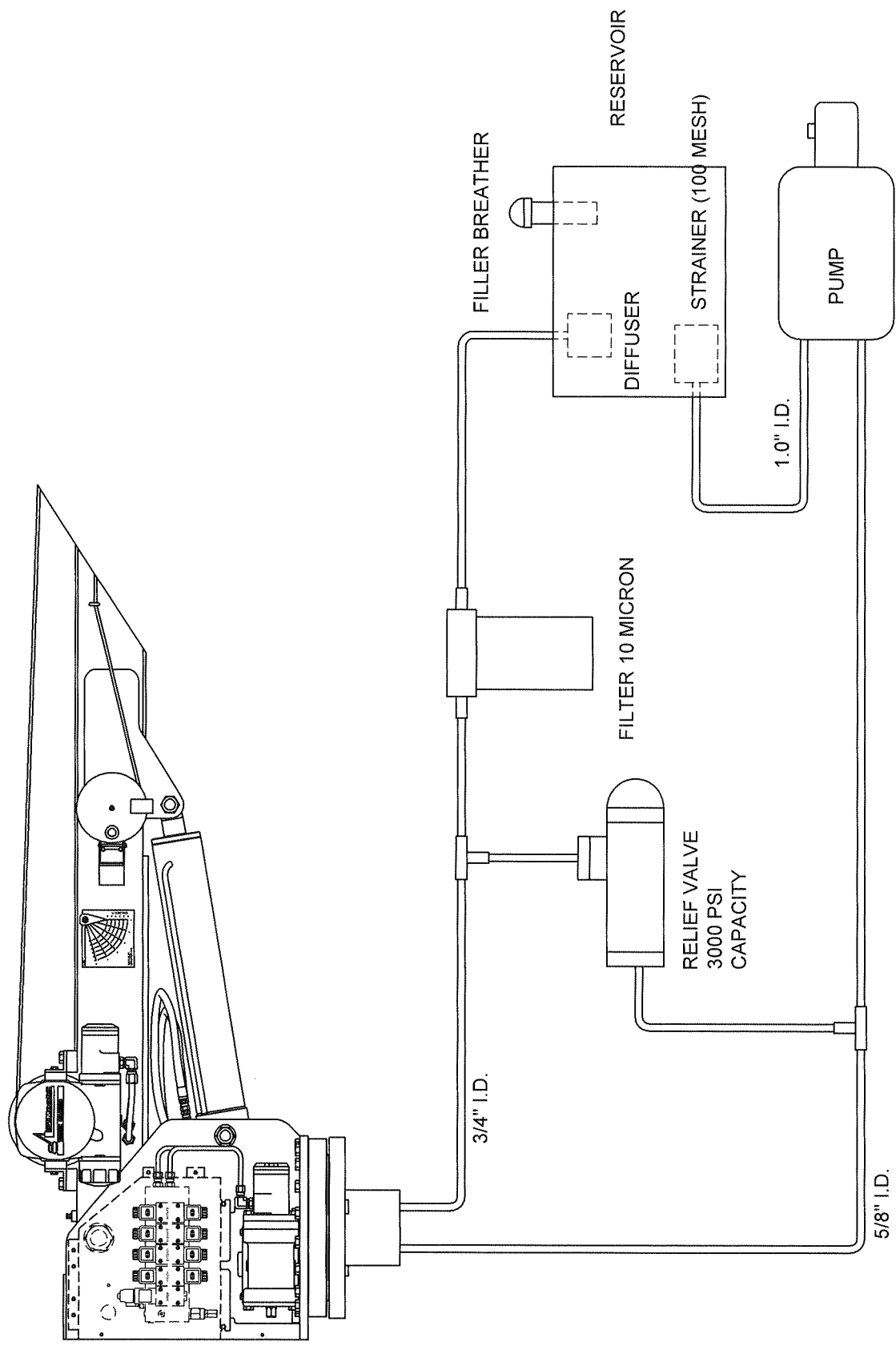
DRWN BY: JC


DATE: 9/10/08

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SUGGESTED HYDRAULIC SCHEMATIC FOR LIFTMOORE HYDRAULIC CRANE INSTALLATION



	Houston TX (713)-688-5533 www.liftmoore.com	DRWN BY: TV DATE: 03/02/06	SCHEM, CRANE HYD. INSTAL-HYD	DRAWING NO. 50026-A
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OPTIONAL ENGINE CONTROL RECEIVER INSTALLATION

The engine control functions allow the user to start and stop the engine and also advance the idle, all from the crane remote pendant control.

The following instructions provide a general guideline for installing and wiring the receiver. Since engine controls vary from manufacture to manufacturer and even from year to year, it is impossible for Liftmoore to maintain specific information on your vehicle. You will have to contact the vehicle and/or engine manufacturer (contact information is provided below). Also, many new vehicles have a provisions for remote engine control built into the ECU, but these functions must be activated and/or programmed by a dealer or authorized service center.

MOUNTING THE RECEIVER

The receiver should be mounted vertically with the antenna up. For best reception, it should be mounted in line of site of operator. Since interfacing connections will generally be inside the cab, a good mounting place is the inside, back the cab with the antenna visible though the back glass. The receiver can be mounted outside of the cab, however it should NOT be mounted inside the engine compartment because of interference generated by the engine.

ENGINE START

Engine start is accomplished by splicing the brown wire on the engine receiver control harness with the ECU start circuit.

WARNING!

Engine start may bypass some manufactures safety functions such as clutch or neutral interlock. It is the installer's responsibility to ensure safe and proper installation.

ENGINE STOP

If the ECU is not equipped with a remote engine kill circuit then a normally closed relay must be installed in the ECU power or engine run circuit. The gray wire on the engine control receiver harness is then connected to the solenoid coil. Activating the circuit will open the solenoid, killing the engine.

NOTE!

It is advisable to include a small jumper wire that can be installed to bypass the solenoid should it fail, otherwise the engine would not run.

ADVANCED IDLE

Many new diesel engines have an advanced idle control circuit built into to the ECU. Some automatically advance the idle when the PTO is activated. This feature may have to be activated and/or programmed by the dealer.

NOTE!

Some engines also require activating a PTO circuit to prevent "Service Engine Soon" or other erroneous errors during PTO operation.

For gas engines or engines without this feature, an after-market throttle advance will have to be purchased separately.

CONTACT INFORMATION

Your truck or engine dealer should be able to provide you with further assistance. Also check the manufacturer's body builder manual (some provided online). Before calling, please have your vehicles make, model, year, engine size and manufacturer, and VIN if available.

Ford Body Builders Advisory Service	1.877.840.4338
GM Upfitter Integration	1.800.875.4742
Peterbilt	1.940.591.4000
Caterpillar	1.800.847.4986
Cummins	1.800.343.7357

www.fleet.ford.com/truckbbas
www.gmupfitter.com



CRANE STABILITY TEST

This test is designed to fulfill the requirements of SAE J765. The test insures that under normal working conditions the truck will not exceed 85% of its tipping capacity. In order for the truck to remain within this recommended 85% tipping capacity, a load equal to 118% of the crane's rated capacity must be used for this test.

Test Preparations:

- 1) SAE J765 requires that the testing surface must be level to within 1%. It is recommended that the test be conducted on a flat concrete surface.
- 2) Position outriggers so that the weight of the crane is removed from the truck springs.
- 3) Rotate the crane so that it is extended over the rear of the truck (Refer to Drawing 50562). Extend the boom completely.
- 4) DETERMINE REQUIRED LOAD RADIUS:

Elevate the boom to between 20 and 45 degrees. At this elevation the crane's overload system should not trip.

Measure the load radius "L". This is the distance from the center of rotation to the load line measured parallel to the ground.

Find the crane's rated capacity by dividing the moment rating in Ft.-Lbs. by this load radius in Ft.

Fill out the load radius measured in Step 3 as L in dimensional data listed on the Stability Test Results chart (Drawing 50562).

Calculate the required weight by the formula shown on 50562-A listed as "Correct Weight for 118% Moment"

ALTERNATE METHOD OF CALCULATING LOAD RADIUS USING A KNOWN WEIGHT.

If a know weight is available the load radius can be calculated by:

$$\text{Load Radius, "L"} = 1.18 \times \text{Crane Moment Rating} / \text{Known Weight.}$$

At the calculated load radius the boom elevation should be between 20 and 45 degrees.

Test Procedure:

- 1) With the crane extended over the rear of the truck, lift the load. Always remember to keep the load 1" or 2" off the ground to avoid excessive tipping.
- 2) Slowly begin to rotate the load counterclockwise. Continuously check all vehicle tires to ensure that they are in contact with the test surface.
- 3) Continue to rotate the load counterclockwise until any one of the vehicle's tires break contact with the surface. When any tire loses contact with the test surface, stop rotation. This is the balance point that determines the 85% tipping capacity of the vehicle. Note this point as "Y" on the stability chart ("Y" is the rotation angle the crane was at when tipping occurred).



CRANE STABILITY TEST

- 4) After the balance point has been established, retract or elevate the boom until all tires are in contact with the test surface.
- 5) Once stability has been regained continue to rotate the load counter-clockwise. Remember to continuously check all vehicle tires. When tipping re-occurs, retract the boom until stability is regained.
- 6) Repeat this procedure through a 180° arc or until the vehicle hampers further rotation.
- 7) At the end of the counterclockwise rotation, measure the horizontal distance from the crane center of rotation to the centerline of the load. Record this distance as "L1". "L1" must be the shortest radius encountered during this phase of the test.
- 8) To determine the percentage of full capacity in the de-rated zone beyond the balance point, divide "L1" by "L" and multiply this number by 100. This will yield the percentage of full capacity "W1". This reduction in capacity is necessary to maintain 85% of tipping load.

$$W1 = (L1/L) \times 100$$

- 9) Return the crane to the starting position (extended over the rear of the truck). Repeat steps 1 thru 8 but now rotate the crane clockwise. Record "Z", "L2", and determine "W2".
- 10) Record the necessary vehicle data as listed on the stability chart. Place a copy of this test and the test results in the crane operation section of the owner's manual.
- 11) Stamp or scribe the necessary vehicle data on the "Crane Truck Stability" plate included (P.N.18600). Install the plate in a visible position, preferably on the crane's side plate near the Load Radius Chart.





BY: TV
DATE: 07/07/05

STABILITY TEST RESULTS

OPERATIONAL LIMITS OF CRANE SHOWN BELOW

DOCUMENT NO.

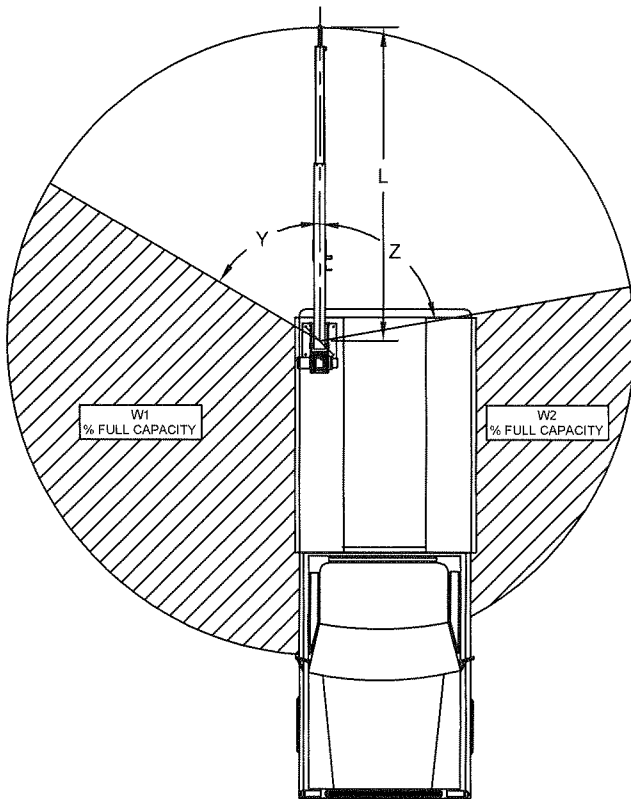
50562-B

VEHICLE DATA

YEAR _____
MAKE _____
MODEL _____
VIN _____

CRANE DATA

MODEL _____
SERIAL NUMBER _____
MOMENT RATING _____
(FT-LBS)



CORRECT WEIGHT FOR 118% MOMENT

TAKE MOMENT RATING (IN FT-LBS) _____
DIVIDED BY LENGTH L (IN FEET) ÷ _____
= _____
MULTIPLY BY 1.18 × 1.18 = _____
WEIGHT REQUIRED FOR TEST

CALCULATE W1

LENGTH L1 (IN FEET) _____
DIVIDED BY LENGTH L (IN FEET) ÷ _____
= _____
MULTIPLY BY 100 × 100 = _____
W1 % RATED CAPACITY

CALCULATE W2

LENGTH L2 (IN FEET) _____
DIVIDED BY LENGTH L (IN FEET) ÷ _____
= _____
MULTIPLY BY 100 × 100 = _____
W2 % RATED CAPACITY

DIMENSIONAL DATA

L _____ FT.
L1 _____ FT.
L2 _____ FT.

STABILITY DATA

Y _____ DEGREES
Z _____ DEGREES
W1 _____ %
W2 _____ %