MSI5300

LOAD RANGER
WHEEL LOAD WEIGHERS

User Guide

Quality Industrial Weighing and Force Measurement Equipment

Measurement Systems International

ONLINE PRODUCT WARRANTY REGISTRATION
Click here to activate your MSI Product Warranty today.
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IMPORTANT
Please read this manual carefully before using the Load Ranger

Program Number _____ Capacity and Resolution _____

Serial Number _____ Cal Number _____

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GENERAL DESCRIPTION

The MSI-5300 Load Ranger is a self-contained wheel load weighing scale designed for maximum flexibility, portability and simplicity in providing an accurate and reliable mobile weighing system.

SPECIFICATIONS

Accuracy: 1.0% Approved to NIST, Class IV standard
Capacity: 20,000 lbs. (10,000 kgs)
Resolution: 20 lbs. (10 kgs) 50 lbs. (20 kgs) - NIST
Power: 6 volt rechargeable / 40 hours between charging
Battery Charger:
115/230 VAC External or 12 VDC External (will charge up to 4 batteries simultaneously)
Display: 5 digit, 0.8 inch (20mm) Liquid Crystal Display
Annunciators: Low Battery
Operating Temperature:
-25° to 140° F (-32° to 60° C)
Safe Overload: 150% of capacity
Ultimate Overload:
200% of capacity
Weigh Pad Dimensions:
24.0 L x 15.5 W x 3.0 H inches (609 x 393 x 76 mm)
Weight: 43 lbs. (19 kg) per pad
Controls: On/Off and Zero switches
Enclosure:
- Environmentally sealed, corrosion-resistant cast aluminum.
- Shock mounted electronics.
- Skid resistant rubber base pads.

UNPACKING

When unpacking insure that all items ordered are accounted for. Inspect all items carefully for any visible damage and immediately report any damage to your shipping agent. Verify receipt of all items ordered including:

1. Weigh Pads
2. Battery(ies)
3. Battery Charger (optional)
4. Owners Manual
5. Warranty Card

Please use the original shipping container when shipping the Load Ranger.

Please complete the warranty registration card and mail to Measurement Systems International to register your warranty.

OPERATIONAL CONTROLS AND INDICATORS

This section summarizes the switch and display functions (See Figure 1):

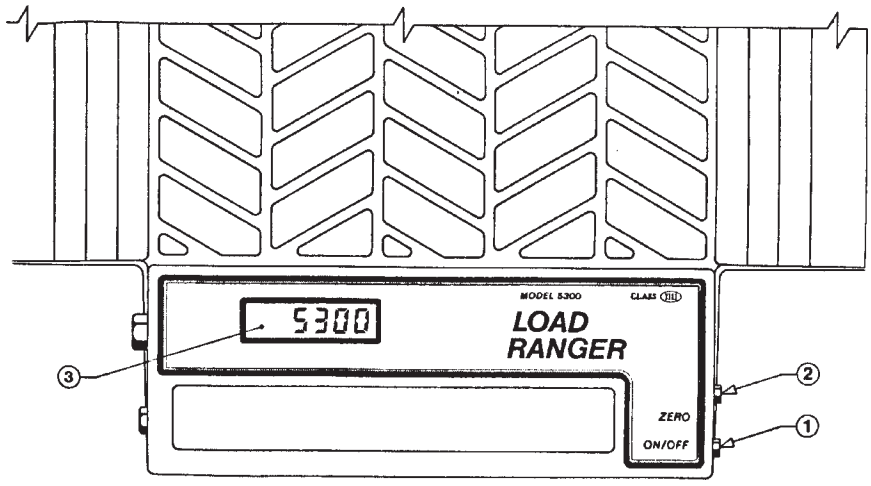

Figure 1
Switch and Display Functions

1) **On/Off** – Pushing this switch alternately turns the weigh pad on and off.
2) **Zero** – Pushing this switch sets the display to zero.
3) **Display** – Five-digit numeric display indicates the amount of weight placed on the scale as well as test and warning messages.

BASIC OPERATION

Power Up Self-Test

When the weigh pad is turned on, the following sequence is displayed:

1) **Display Test** – Proper display operation is verified as all display segments are first turned on (display shows "=88888") and then off again for several seconds. This allows the operator to detect faulty segments which fail to illuminate.
2) **Program Number** – This is the version number of the microcomputer software controlling scale operation. This number is displayed in the format P-XX where XX is the version number of the software program currently installed.

3) **Zero Offset** – This numeric value indicates the weight that must be internally subtracted to cause the scale to display zero weight with no applied load. (If this number exceeds ±500 lbs. or ±250 kg with no weight applied, the scale may require servicing).
4) **CAL Number** – This number represents an internally simulated weight applied to the scale electronics. With no weight on the pad this number should agree with the CAL Number stamped on the serial number plate within plus or minus two scale divisions. (One scale division is the scales smallest unit of resolution. For example, one scale division for a 20,000 x 20 lb. capacity scale is 20 lbs.).

DISPLAY FUNCTIONS

After the power-up self-test is complete the scale automatically zeroes so that a weight reading of "00" will appear. In addition to displaying the weight reading when the scale is loaded, three other conditions may be displayed:

1) **Overrange Message:**
   If the weight applied to the scale exceeds its rated capacity by more than approximately 4%, the message "EEEE" will flash on the display. For example: 20,000 lb. (10,000 kg) capacity, the overrange threshold will be approximately 20,800 lb. (10,400 kg).
2) **Minus Sign:**
   A minus sign to the left of the weight reading indicates negative weight relative to the actual weight applied to the scale the last time the zero button was pushed. For example, a display reading of -1200 lbs. indicates the current weight on the pad is 1200 lbs. less than the weight on the scale the last time the Zero button was pushed.
3) **Low Battery Message:**
   When the battery is approximately 90% discharged, a low battery tick in the upper left corner of the display (just above the minus sign) will begin to flash. The scale will continue to operate for 1 to 2 hours after the tick begins to flash, after which the scale will automatically turn off to prevent scale error and battery damage due to excessive discharge.

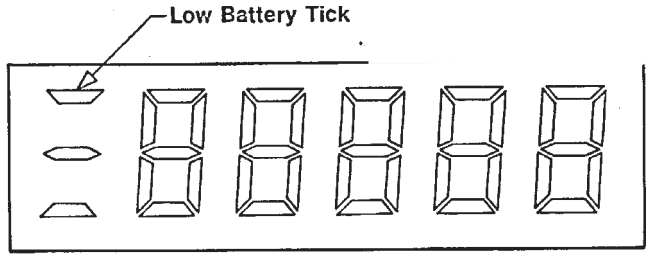

Figure 2
Low Battery Message

ZERO SWITCH FUNCTION

During normal weighing operations it is not necessary to use the zero switch. It may be necessary to zero the weight display due to environmental effects such as temperature change.

Another function of the zero switch is found in net weighing applications where a tare weight (such as an empty truck) is placed on the scale and the Zero button switch is pushed to zero the display. The pad will now display the net weight (the weight of the vehicle payload as it is loaded).

RECOMMENDED METHODS AND PROCEDURES FOR VEHICLE WEIGHING

Accurate weighing of highway vehicles requires using a sufficient number of properly placed pads for the type of vehicle (number of axles etc.) being weighed. See Figure 3 to determine the number of weigh pads required.

BATTERY CHARGER OPERATION

Battery Removal

To remove the battery from the scale, turn the pad over and locate the battery access cover. Use a screwdriver to remove the (3 each) flathead screws, pull the cover and remove the battery.

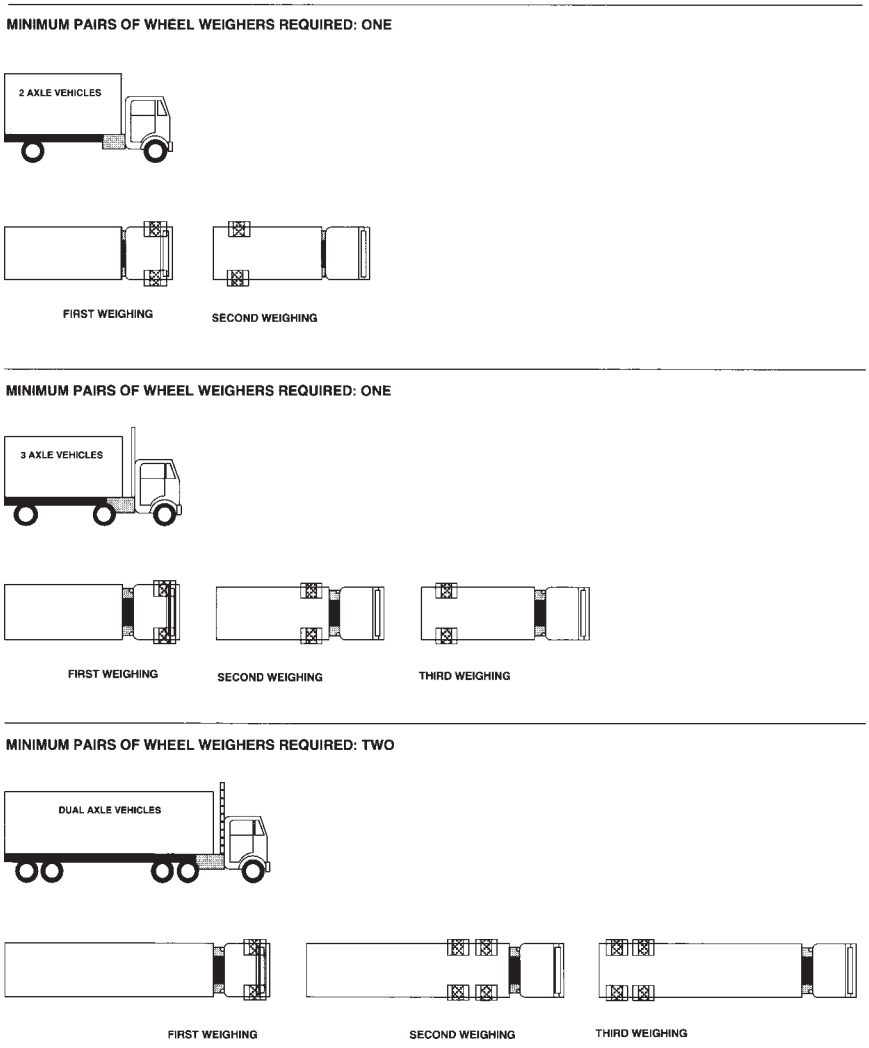

Figure 3
Illustrated Weighing Procedures

CHARGING THE BATTERY

The Load Ranger battery charger will charge up to four batteries at one time in approximately 6 hours. The battery charger has both an AC and a DC power cord for operation for 115 V/230 V, 50 /60 Hz AC power or 12 VDC vehicular power. The AC power cord is permanently connected and may be wrapped around the charger handle when not in use. The DC power cord plugs into the 12 VDC power receptacle on the charger.

Note: The DC power cord must be unplugged from the charger when AC power is preferred.

Note: When powering the charger from the AC supply verify that the 115/230 V selector switch is in the appropriate position (See Figure 4).

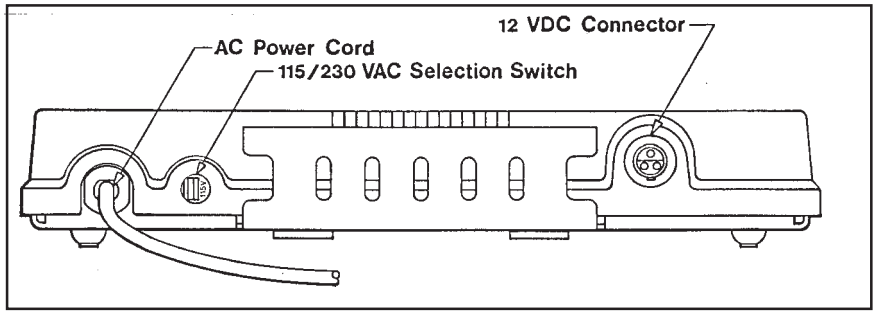

Figure 4
Battery Charger AC Selector Switch Location

When powering the charger from a 12 VDC source the DC power cord pigtails are connected as follows:

1) The red pigtail connects to the positive 12 VDC supply terminal.
2) The black pigtail connects to the negative 12 VDC supply terminal.
3) The white pigtail connects to the ground (chassis or frame of vehicle).

The 12 VDC power source must be capable of supplying at least 3 amps at 11-15 VDC. It is advisable to connect the positive and negative leads to a fused circuit not shared by other vehicular loads. The electrical connection to the vehicle battery should be as direct as possible.

After the battery charger power is connected, the red status lamps next to each of the battery wells will illuminate to indicate the battery charger is functioning properly and is ready to receive the discharged batteries. The discharged batteries may now be inserted into the battery wells. Check alignment of battery terminals with battery charger clips and adjust battery position as necessary while pushing the battery into place (See Figure 5).

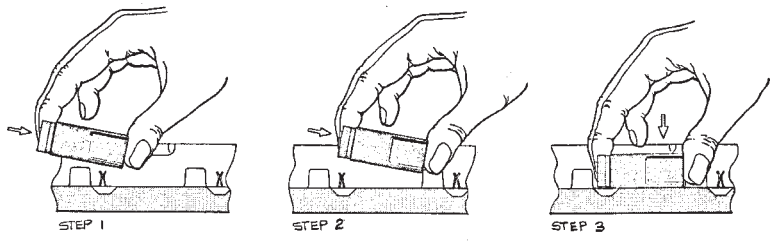

Figure 5
Battery to Charger Insertion/Removal

The status lamp nearest the inserted battery should now go out indicating that the battery is charging.

When the lamp illuminates, the battery has been charged to at least 80% of its capacity. This takes about 4 hours to charge a fully discharged battery. An additional 2 hours of charging is required to reach full capacity. The battery may be left on charge as long as desired without harm to the battery.

After the battery is fully charged, remove it by gripping firmly and lifting the terminal end upward. The battery should slide clear of the battery terminal clips and be easily removed from the enclosure.

INSTRUCTIONS FOR LOW TEMPERATURE OPERATION

1) Display

At temperatures below 14° F (-10° C) the display may respond somewhat slower (up to a few seconds) to weight changes but will otherwise function properly at temperatures as low as -25° F (-32° C).

2) Battery

At temperatures below 16° F (-9° C) there is a possibility the battery electrolyte may freeze, making the scale inoperative and possibly damaging the battery. However, if the battery is not allowed to discharge to less

than 50% of its capacity (about 15 hours of operation on a fully charged battery) it will not freeze at temperatures above -35° F (-37° C). Therefore, to prevent freezing we recommend that when the temperature is below 16° F (-9° C) the battery be recharged after no more than 15 hours of operation.

3) Charging

The battery charger will charge the battery at temperatures as low as -5° F (-20° C). However, a battery with frozen electrolyte must not be recharged until the electrolyte has had time to thaw. If freezing is suspected, allow the battery to thaw for several hours at room temperature before attempting recharge.

CALIBRATION PROCEDURE

A maintenance check is accomplished by periodically comparing the CAL number displayed during the power up self-test sequence with the factory established CAL number stamped on the serial number plate on the scale or a new CAL number established at the most recent recalibration. This check only verifies the proper operation of the electronic portion of the scale. For complete scale accuracy verification and/or recalibration follow the steps below:

1) With the scale turned on, exercise the scale by loading it to capacity and unloading. Repeat this procedure three times.
2) With no weight on the scale, turn the unit off and then on again. Wait for the scale to complete the power-up self-test. Record the zero off set number which follows the P-XX program number Verify the display reads “00” after the self-test sequence is completed.
3) Unscrew the calibration access plug and locate the zero adjustment screw (See Figure 6).

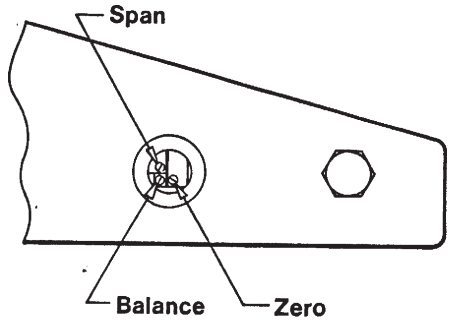

Figure 6
Calibration Adjustment

Note: Be careful not to change the setting of the balance adjustment screw. This is factory set to adjust the end-to-end balance of the pad. With a small screwdriver turn the zero adjustment screw until the display reads the opposite of the zero offset recorded in step 2. For example, if the zero offset was -250, adjust until the display reads 250; if the zero offset was 250, adjust until the display reads -250.

4) Turn the scale off then on again and verify the zero offset is now within two scale divisions of “00”. If not repeat step 3.
5) Locate the span adjustment screw. Depress the zero switch. Load the scale to capacity with a known test load. Turn the span adjustment screw so the display indicates the weight of the test load.
6) Remove the test load. If the display does not return to zero, readjust the zero screw so the display reads zero. Repeat steps 5 and 6 until the scale reads the full scale test load weight accurately and returns to zero when the load is removed.
7) Confirm linearity by checking scale accuracy while applying intermediate test loads of 25, 50, and 75% of scale capacity. (If necessary, imroved accuracy over the entire weight range may be obtained by adjusting the 100% capacity reading one or two divisions high or low as required and rechecking accuracy over the entire weight range).
8) Turn scale off, then on again. Record the zero offset and CAL number displayed during the self-test sequence. The zero number should be within two scale divisions of zero. Record the CAL number for future reference when verifying calibration.
9) Replace the calibration access plug.
10) Your scale is now ready to use.

THE MSI LIMITED WARRANTY

MEASUREMENT SYSTEMS INTERNATIONAL, INC., WARRANTS load sensing elements and meters against defects in workmanship and materials for a period of one year from date of purchase and warrants electrical cables and batteries against the same defects for a period of ninety (90) days from date of purchase.

Any device which proves defective during the warranty period will be replaced or repaired at no charge; provided that the defective device is returned to the Company freight prepaid.

In no event shall the Company be liable for the cost of any repairs or alterations made by others except those repairs or alterations made with its specific written consent, nor shall the Company be liable for any damages or delays whether caused by defective workmanship, materials or otherwise.

The Company shall not be liable for any personal injury or property damage resulting from the handling, possession or use of the equipment by the customer.

The warranty set forth herein is exclusive and is expressly in lieu of all other warranties, express or implied, including without limitation any implied warranties of merchantability or fitness, or of any other obligations or liability on the part of the Company.

The liability of the Company under this warranty is limited solely to repairing or replacing its products during the warranty periods; and the final judgement and disposition of all claims will be made by MEASUREMENT SYSTEMS INTERNATIONAL, INC.

NOTES

NOTES

MADE IN THE USA

PUB.140-08-90C

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