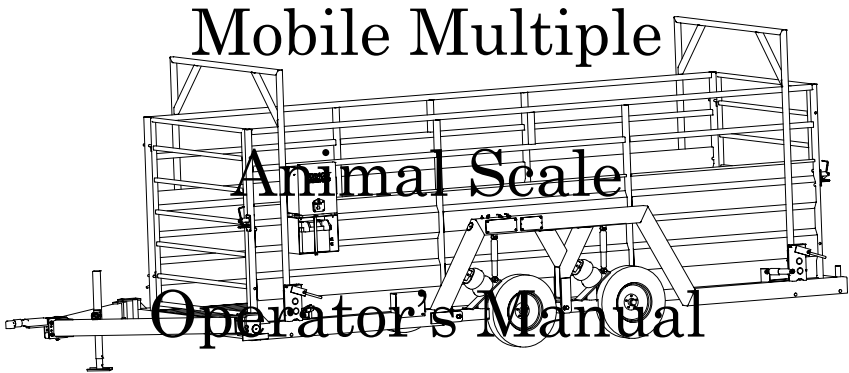


NORAC

WEIGHING AND CONTROL SYSTEMS



Canada

**NORAC Systems International
Inc.**

TOLL FREE: 1-800-667-3921
(306) 664-6711

SHIPPING ADDRESS:
3702 Kinnear Place
Saskatoon, SK
S7P 0A6

United States

NORAC, Inc.

TOLL FREE: 1-866-306-6722
(763) 786-3080

SHIPPING ADDRESS:
1290 Osborne Rd. NE, Suite F
Fridley, MN
55432-2892

For other service locations please view our website:

www.norac.ca

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through Precision Measurement*

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NOTICE

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Introduction

Congratulations on your purchase of a *NORAC* Digital Mobile Multiple Animal Scale using ONBOARD™ technology. This system is manufactured with top quality components and is engineered using the latest technology to provide operating features and reliability unmatched for years to come.

Please take the time to read this manual completely through before attempting to use the system. Although the Mobile Multiple Animal Scale has been designed for easy set up and use, a thorough understanding of this manual will ensure that you receive the maximum benefit from the system.

If you have any questions or comments please contact *NORAC*:

Phone (toll free): 1-800-667-3921

E-mail: service@norac.ca

Operator Safety

The points below should be followed when operating the *NORAC* Mobile Multiple Animal Scale.

*******DANGER*******

Always be certain when lowering the scale that everyone is clear of the scale and any moving parts.

Use two hands when gripping the lift handle to raise or lower the scale.

Ensure all three hitch lock pins are installed and the suspension stops are in the transport position before moving the scale.

Be sure the gates are latched or tied inward before transporting the scale.

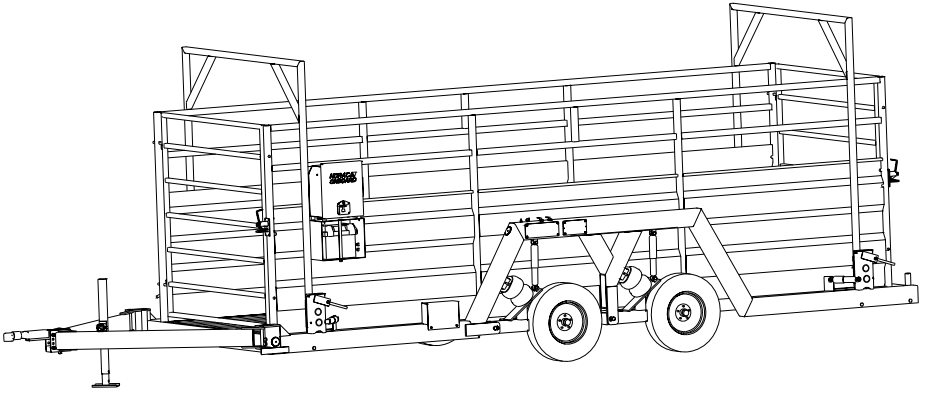
This trailer is not intended for the transportation of livestock or any other goods. Any addition of weight to the scale or trailer in transport mode may cause premature component failure and voids the Norac warranty. (See Page 43)

Animal Safety

Animal safety is a very serious issue and must be observed when handling any type of animal. The scale surface may become slippery during use. A build up of manure on the scale may reduce the amount of traction for the animals. It is recommended that you spread a coat of sand on the scale after every few of weighments to increase the animals footing when on the scale.

Description

The Digital Mobile Multiple Animal Scale is shown below.



The Mobile Multiple Animal Scale is an agricultural implement consisting of a trailer with air ride suspension and swing out hitch, sheeted animal cage suspended by four S-type load cells through a cam style ONBOARD™ scale system, and weigh center. In transport mode, the scale system is locked down, protecting the load cells from damage during transport. To convert to weigh mode, the entire trailer is lowered to the ground, the hitch is split and swung outward, and the scale is raised to the weigh mode using a lever and cam system. The weigh center contains the digital indicator and ticket printer. To convert back to transport mode, the process is reversed (lower the scale, swing hitch inward and lock, and raise the suspension using the integral air pump).

The Mobile Multiple Animal Scale can be used on any firm surface up to 7% grade (4 degree slope) and offers a low deck height (6") for easy step in.

Lifting Instructions

Lift the scale only in designated locations (see Figure 1). The scale may be lifted by forklift (ensuring the forks reach through both walls), or by 4 straps and a crane. Ensure the scale is in the transport mode (locked down – see next section) when loading and transporting the scale.

When using lifting straps ensure they are rated for lifting the trailer weight and ensure they do not have an angle less than 45 degrees from vertical. (Lifting straps should be at least 6 feet long).

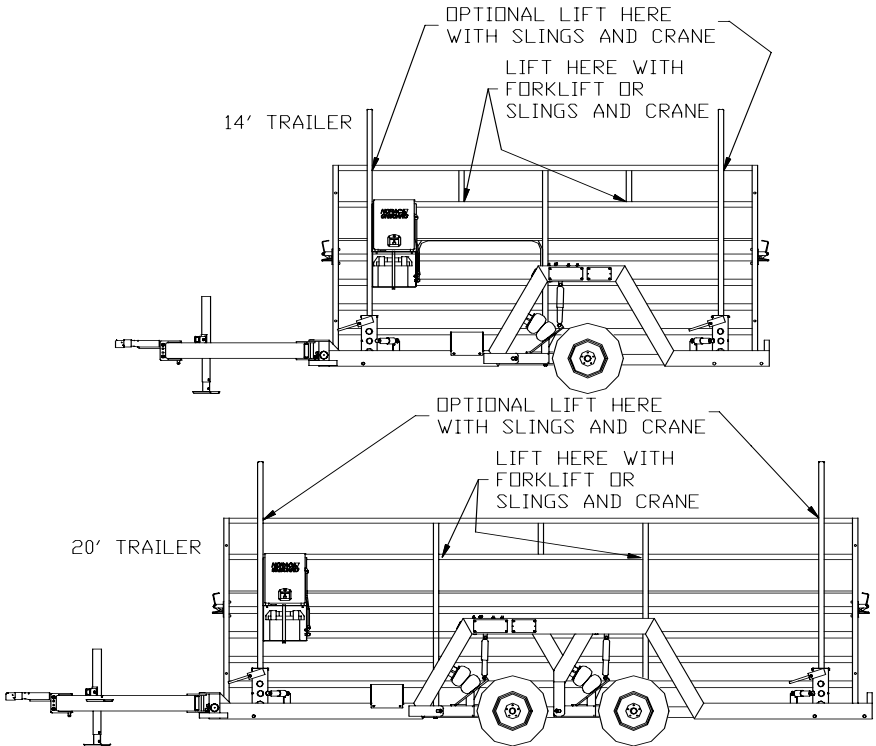


Figure 1 - Lifting Instructions

Towing Instructions

Important: Read these instructions before towing.

Important: This trailer is not intended for the transportation of livestock or any other goods. Any addition of weight to the scale or trailer in transport mode may cause premature component failure and voids the Norac warranty. (See Page 43)

The trailer must be in “Transport Mode” to be towed. See page 12 for converting to transport mode.

The trailer is designed to be towed level (trailer frame parallel to the ground) using a 2” ball. To achieve the level towing condition, the required hitch height of the towing vehicle must be between 12” and 18”. If the hitch of the towing vehicle is not in this range, use an adapter to achieve a height in this range. The receiver on the trailer can be moved to any of the four hole locations (shown in Figure 2) to accommodate tow vehicle hitch height. The hitch weight of the trailer is approximately 500lb. An equalizer hitch may be used for towing if desired (such as the EAZ-LIFT Adjustable Weight Distributing Hitch #1009).

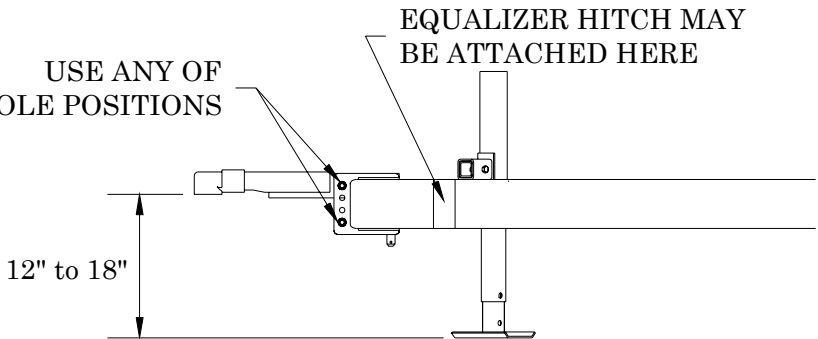


Figure 2

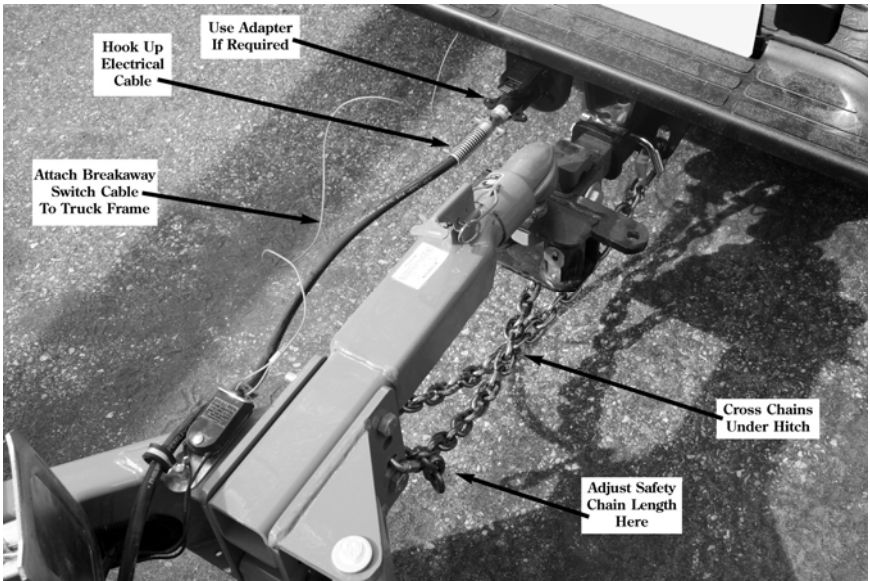


Figure 3

Safety chains must be connected during towing (see Figure 3). Connect the safety chains. Cross the chains under the hitch for proper protection. Safety chain length is adjustable by inserting the quick link through any link of the chain.

The trailer must be connected electrically to the tow vehicle (see Figure 3). Ensure that the wiring of the towing vehicle is compatible with the trailer wiring before hooking up. See the tag attached to the cable plug for wiring code (or see page 44 for wiring diagrams). The trailer is supplied with a 6-pin connector (with center pin +12V). Adapters are available to convert to a 7-way blade style RV connector. It is important that wiring is correct so that the trailer battery (which supplies power to the control box) is charged during transport.

If the trailer is to be towed at night, or if you feel the lights of the tow vehicle are obstructed by the trailer, add

on lights are available. These lights plug into a 4-pin receptacle on the trailer (see below) and attach magnetically to the trailer frame.

The trailer is equipped with electric brakes. **The brakes must be synchronized with the tow vehicle brakes before towing.** See page 36 for procedures. The breakaway switch for the electric brakes must be connected during towing. This switch activates the trailer brakes in the unlikely event of trailer separation from the tow vehicle. The metal cable should be attached to a point on the tow vehicle other than the primary connection point (see Figure 3).

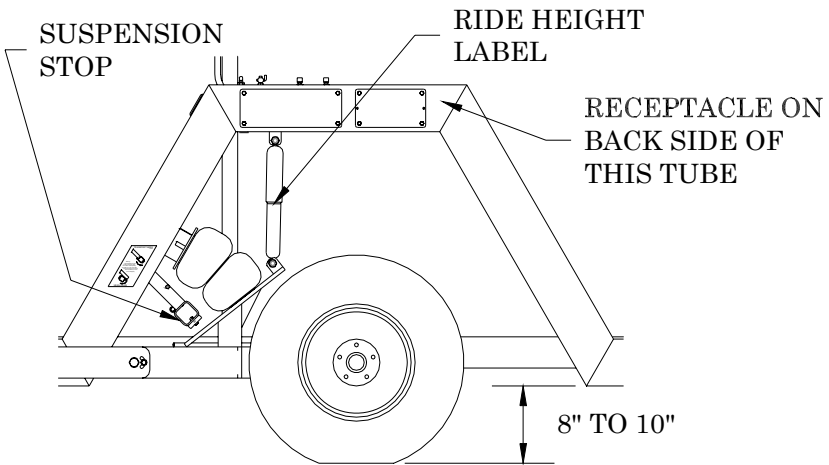


Figure 4

The trailer is designed to be towed at a ride height of approximately 8 to 10 inches. A ride height label is attached to every shock absorber to visually confirm the ride height. After the trailer is hooked up to the tow vehicle, check all the ride height labels to ensure proper air bag inflation. Add or remove air as necessary.

Suspension stops (one on each side of the trailer) are supplied to prevent the trailer from dropping to the ground in the event of an air system failure. These stops must be in the transport position during towing.

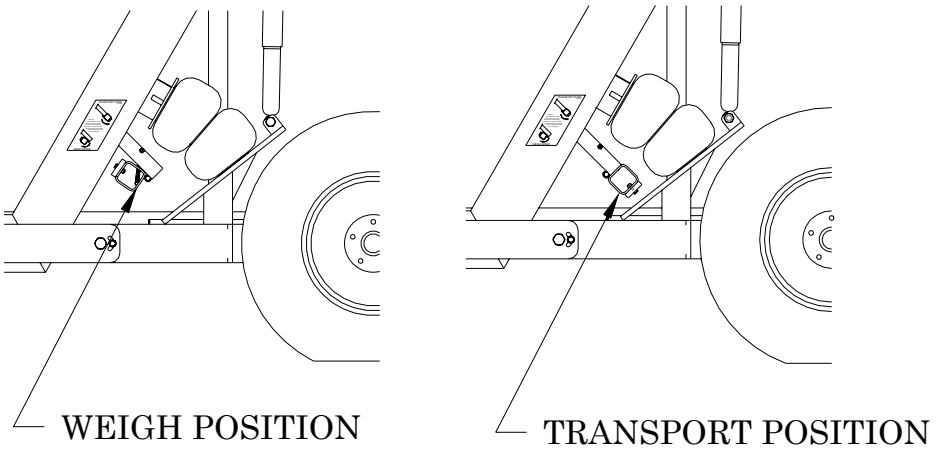


Figure 5

Warning - The Suspension Travel Limiter is not to be used as a means of transporting the trailer. It is only to be used to as a safety device, allowing removal of the trailer from the roadway in the event of an air system failure.

Switching Between Modes

Converting to Weigh Mode

1. Park the trailer in as level a location as possible. The scale will weigh properly on a slope up to 4 degrees (approximately 7%). Ensure there are no obstructions under the deck that would affect weighing accuracy.
2. Turn the power switch located on the instrument panel to the ON position. If the level lamp does not illuminate to indicate that the unit is level, you may not be able to weigh when the trailer is lowered. Either move the trailer to another more level location, or ensure you have enough steel or wood shims to adequately level the scale.
3. Extend the jack until it begins lifting up on the trailer hitch.
4. Disconnect the trailer from the truck hitch and unplug all wiring. Move the truck clear of the trailer.
5. Using the hitch jack, lower the trailer hitch to the ground.
6. Flip the suspension stops (on both sides of the trailer) into the weigh position (see Figure 5). Trailer will not fully lower to ground with stops in transport position.

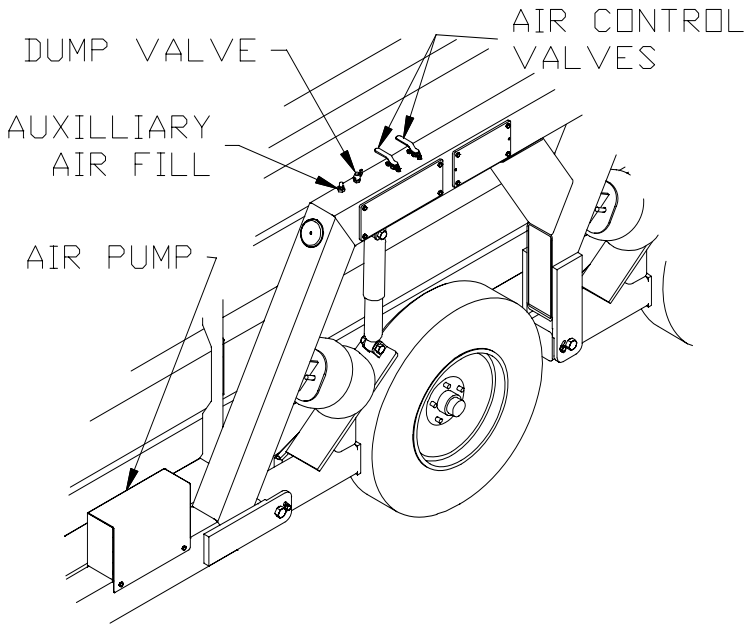


Figure 6 – Air System Controls

7. Open the two air valves, and slowly open the dump valve to dump the air from the trailer suspension (see Figure 6). The trailer will lower to the ground.
8. Inspect all four corners of the scale. Although the scale will weigh properly up to four degrees off level, individual corners of the scale should not be allowed to teeter. If any of the corners are not contacting the ground, either move the trailer to a more level location or do the following:
 - a) Close the dump valve and turn on the air pump to slightly raise the trailer. Once the trailer frame has lifted sufficiently, turn off the pump. (NOTE: if the air pump is not functioning, the trailer can be raised using the auxiliary fill)
 - b) Place shims directly under the base frame, under the load cell stands, to prevent teetering (see **Figure 7**).

- c) Open the dump valves to lower the trailer onto the ground and shims.

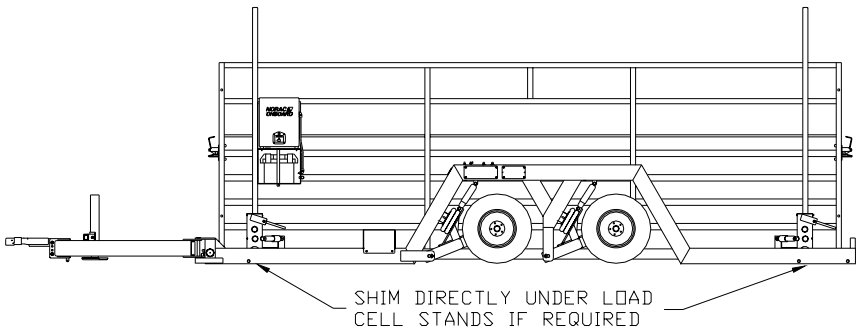


Figure 7 – Shimming Locations

9. Unpin the hitch and swing both hitch halves clear (see Figure 9). **NOTE:** The hitch sections can be removed if required. To remove the hitch, remove the pins from the trailer end of the hitch arms, and pull all wiring through the driver's hitch tube.
10. **USING BOTH HANDS**, raise the platform (rotate cam handle clockwise) to enable the scale (Figure 8).

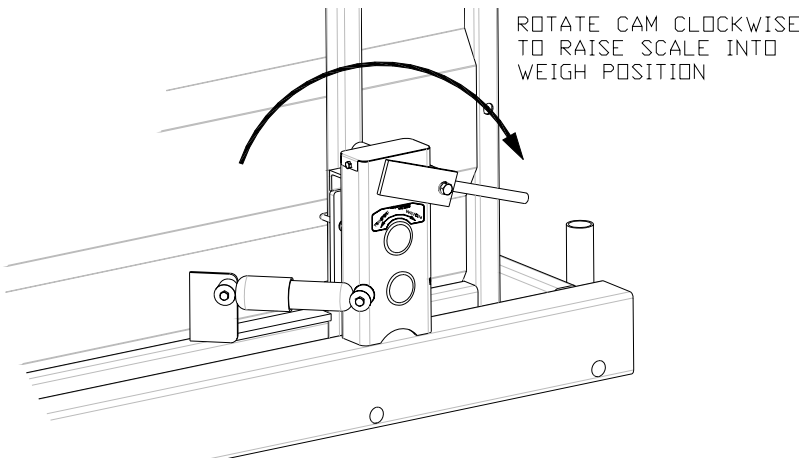


Figure 8 - Scale Lift

CAUTION: The lift mechanism is an over center cam style lift and lock. If not disturbed, the scale will remain “locked” in the up (weigh) position. Always use two hands when raising or lowering the scale.

11. Ensure the power switch located on the instrument panel is in the ON position. If the level lamp does not indicate that the unit is level, shim the scale to level using appropriate metal or wood shims (see step 8 above).
12. The weigh indicator should be powered up. The readout of GROSS weight on the indicator should be near zero (within four percent of the scale capacity). If it is not, ensure the scale is fully lifted, and that there is no debris on or under the scale.

Note: The indicator will shut off after 10 seconds if the level light is not illuminated.

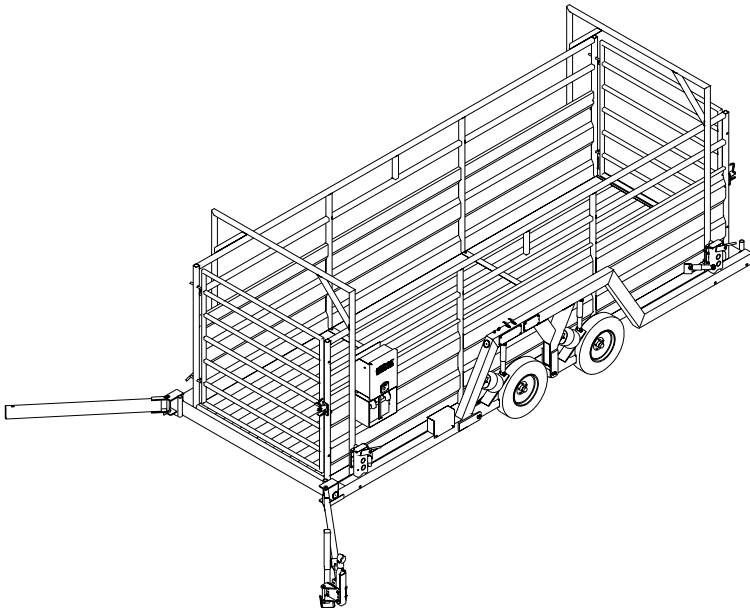


Figure 9 – Trailer and Scale in Weigh Mode

Converting to Transport Mode

1. Turn OFF the power switch located on the instrument panel.
2. **USING BOTH HANDS**, lower the platform (rotate the cam handles counter clockwise) to disengage the scale. Ensure the handles are in the fully locked position.

CAUTION: The lift mechanism is an over center cam style lift and lock. If not disturbed, the scale will remain “locked” in the down (transport) position. Always use two hands when raising or lowering the scale.

3. Swing the hitch halves together and pin. *Ensure the hitch pins have the safety pins installed.*
4. Add air to the trailer suspension so that the trailer frame raises evenly off the ground to the correct ride height of approximately 8 to 10 inches (as indicated by the ride height labels on the shock absorbers). Use either compressor on trailer or a remote compressor connected to the auxiliary air fill.
5. Close both the air valves. During trailer towing, both valves **MUST** be closed.
6. Flip the suspension stops into the transport position.
7. Extend the jack so the trailer hitch raises off the ground.
8. Position the truck near the trailer hitch.
9. Connect the trailer to the truck and connect all wiring. **IMPORTANT: CONNECT SAFETY CHAINS.** Connect equalizer hitch if desired.
10. Retract the jack. Turn the jack 90 degrees on its mount.
11. Recheck the ride height of the trailer and adjust as indicated on the ride height labels on the shock absorbers.

Note: Do not move the vehicle until the scale is in the locked transport position, both air valves are closed, the jack is parallel to the ground, the suspension stops are in transport position, and the safety chains are attached.

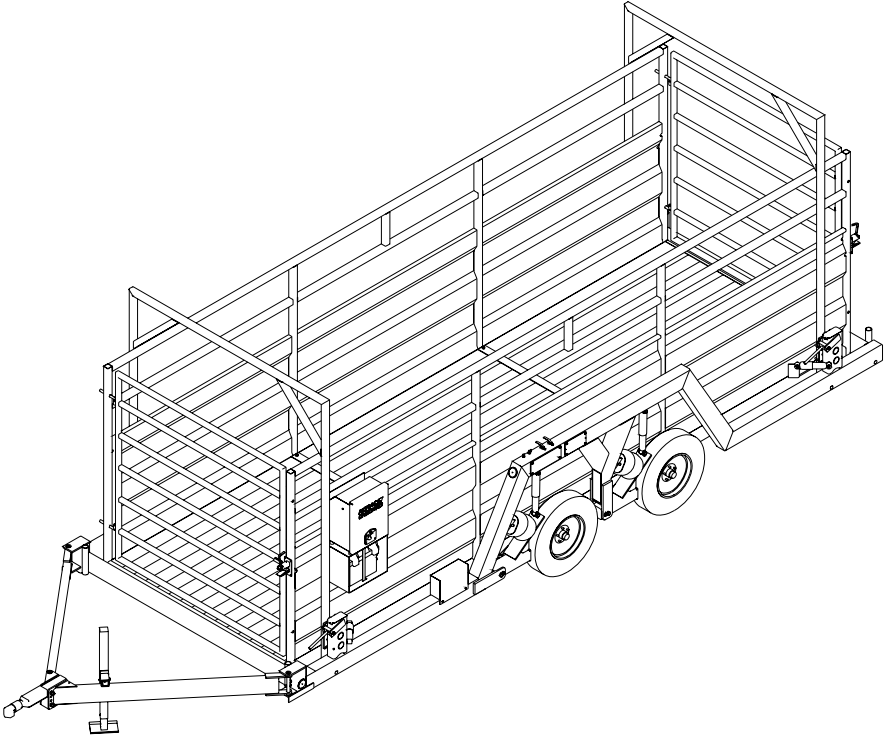


Figure 10 – Trailer and Scale in Transport Mode

Operating Instructions

NORAC Weigh Center

The NORAC Weigh Center houses the M2000 indicator and ticket printer. Figure 11 shows the layout of the control box. Figure 12 shows a close up of the M2000 indicator.

The battery on the trailer powers the control box. This battery is normally charged during towing. If the battery is low, charge using a trickle charger.

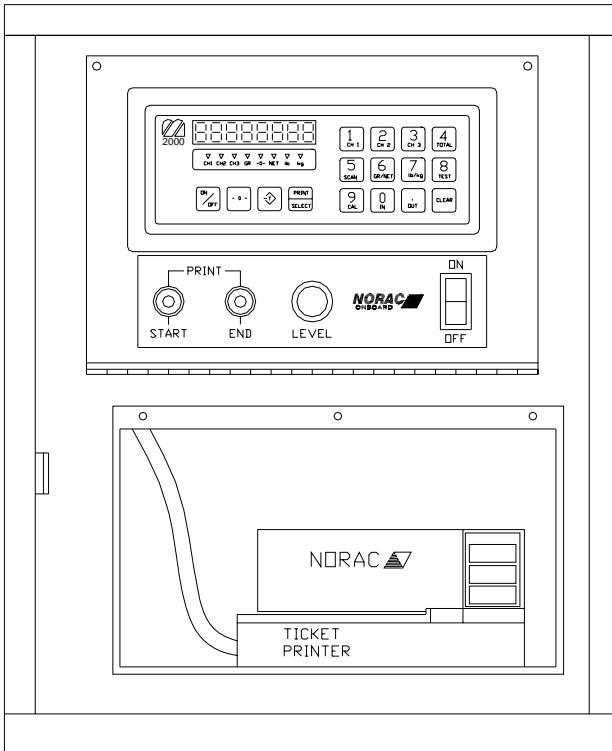


Figure 11 – Weigh Center

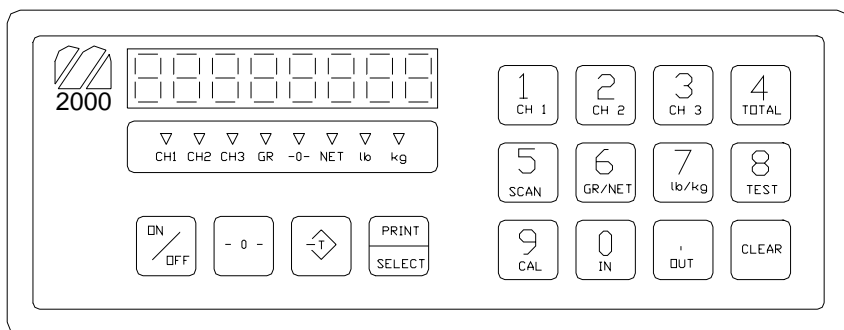
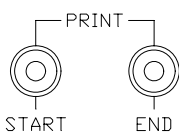


Figure 12 – M2000 Indicator

Throughout this section, you will be asked to press the start or end buttons, enter keystrokes into the indicator, or read the display. At times, you must also recognize the mode in which the unit is operating. The mode of the indicator is indicated by a series of small lights below the display. (See Figure 12)

A description of the important keys and buttons are as follows:



Weigh Center [**START**] and [**END**] buttons.



Indicator [**ZERO**] Key



Indicator [**TARE**] Key



Indicator [**PRINT/SELECT**] Key

Setting Time and Date

1. Enter the desired date into the indicator date register in a YYMMDD (Year Month Day) format using the key sequence outlined below. For example June 16, 2002 would be entered as:

[8][1] [PRINT/SELECT]

[0][2][0][6][1][6] [PRINT/SELECT]

Note: When you press [8][1] [PRINT/SELECT] the current setting for the date is displayed in a YY.MM.DD format. To program the date simply enter the new date. Use the [8][1] [PRINT/SELECT] to verify the date has been entered correctly. Pressing [PRINT/SELECT] or [CLEAR] will exit the date programming mode without changing the settings. Also note, you have an unlimited amount of time to enter the actual date keystrokes. If a mistake is made press the [CLEAR] button and start the process over.

2. Enter the desired time into the indicator time register in HHMMSS (Hours Minutes Sec) format using the key sequence outlined below. The time must be in a 24-hour format. For example 1:15:10 PM (13:15:10) would be entered as:

[8][0] [PRINT/SELECT]

[1][3][1][5][1][0] [PRINT/SELECT]

Note: When you press [8][0] [PRINT/SELECT] the current setting for the time is displayed in a HH.MM.SS format. To program the time simply enter the new date. Use the [8][0] [PRINT/SELECT] to verify the date has been entered correctly. Pressing

[**PRINT/SELECT**] or [**CLEAR**] will exit the date programming mode without changing the settings. Also note, you have an unlimited amount of time to enter the actual date keystrokes. If a mistake is made press the [**CLEAR**] button and start the process over.

3. To change the time format enter the following keystrokes:

[8][3][**PRINT/SELECT**]

The current setting will be displayed. There are three possible time settings. Entering [0][**PRINT/SELECT**] will set the time to 24hr mode. Entering [1][**PRINT/SELECT** will set the time to 12hr AM mode. Entering [2][**PRINT/SELECT**] will set the time to 12hr PM mode.

Setting Units

To obtain the desired units press [7][**PRINT/SELECT**] on the indicator until the desired units LED is on.

Changing ID Number

The ID number for your system is factory programmed. If you wish to change this ID number follow the instructions below:

- a) Insert the programming jumper onto the OnBoard Control Board. Cycle power, then type the following sequence on the M2000

[2][0][7] [**PRINT/SELECT**] [1][0][1]
[**PRINT/SELECT**]

- b) Push [**START**] and the indicator will prompt you to enter an id.
- c) Enter the id using the keypad on the indicator followed by the [**PRINT/SELECT**] key.
- d) When done programming the ID remove the programming jumper and cycle power.

Note: If a mistake is made entering the id, pressing [**CLEAR**] will exit id programming mode. Press [**START**] again to enter the correct number.

WARNING: Programming the id sets the system to return to the default '*single weigh mode*' operation. Refer to the next section for details on setting the mode.

Operating Modes

The NORAC Weigh Center operates in two modes: single weigh mode and batch weigh mode.

Single Weigh Mode is a simple mode that allows only independent weighments. Averaging over a number of weighments is not available in this mode. Entering a shrink value is not available in this mode.

Batch Weigh Mode is a mode with more functionality. It allows average weight calculation over numerous weighments, and shrink values may be entered.

To change the mode, enter the following keystrokes into the M2000:

[OUT]][PRINT/SELECT]

The M2000 will then prompt 'CONFIG' on the display. To function in single weigh mode enter the following keystrokes:

[0]][PRINT/SELECT]

To function in batch weigh mode enter the following keystrokes:

[1]][PRINT/SELECT]

Single Weigh Mode Operation Instructions

Note: The control box should be given at least 15 minutes to warm up in cold weather before using.

1. Turn the switch located on the instrument panel to the ON position. Insert your ticket into the ticket printer and press the [**FORWARD**] button on the printer to secure the paper. When the system is ready to use the green LED on the front panel will go dark.
2. If the indicator is not reading zero, press the **→0←** button on the indicator keypad to re-zero the scale.
3. Load the scale. Push [**START**] once. While the weight reading stabilizes, the CH1 light on the indicator and the three green LED's mounted on the sides of the weigh center will flash. Once the weight reading has stabilized, the CH1 light will turn on solid, the LED's will go dark, and the printer will print the current time and date, and the gross weight on the scale. The animals can then be released from the scale.

Note: The unit will not print while there is motion on the scale (CH1 light flashing).

4. The following is a sample of a ticket.

Date: Jun 16, 1999	Time: 11:05
2617 kg GROSS	

The above ticket will print in either kilograms (kg) or pounds (lb) depending on your system settings.

5. Repeat steps 2-5 to continue weighing as necessary.

Note: Pressing [END] at any time when using Single Weigh Mode will REPRINT the last ticket.

Note: The indicator will automatically reset into GROSS mode, reading in the currently selected units.

Last Ticket Reprint Feature

At any time between the end of the previous ticket and the start of a new one, the previous ticket can be reprinted. This is accomplished by pressing the **[END]** button.

The ticket will look identical to the previously printed ticket except for the ****REPRINT**** banner at top and bottom. Note that if the power to the control box is turned off, last ticket information will be lost and not available for reprint.

Batch Weigh Operation Instructions

Note: The control box should be given at least 15 minutes to warm up in cold weather before using.

1. Turn the switch located on the instrument panel to the ON position. Insert your ticket into the ticket printer and press the [FORWARD] button on the printer to secure the paper. When the system is ready to use the green LED on the front panel will go dark.

Note: When powered up, the number of head defaults to 0 and the shrink value defaults to the last entered shrink. When no shrink value is entered, the last entered shrink value is used.

2. If the indicator is not reading zero, press the →0← button on the indicator keypad to re-zero the scale.
3. Load the scale and press [START]. While the weight reading stabilizes, the CH1 light on the indicator and the red and green LED's mounted on the weigh center will flash. Once the weight reading has stabilized you will be prompted to enter the number of head. Enter the number of head using the indicator keypad where xx is the number of head in the current batch.

[x][x][PRINT/SELECT]

Note: If the number of head has not been entered and the system is not prompting you to enter the number of head, you will need to press [START] again. You will then be prompted to enter the number of head.

Note: If a mistake is made entering the number of head, pressing [CLEAR] will abort the enter number of head phase. Press [START] to enter the number of head process again.

Once the weight reading has stabilized, the CH1 light will turn on solid and the LED's will go dark. The captured weight reading will be frozen on the indicator for 6 seconds and when there is no motion. The frozen weight can be removed from the display by pressing [CLEAR] as well. During this time the printer will print the current time and date, and the gross weight on the scale. *The animals can be released from the scale as soon as the weight is captured and the green LED's go out.*

Note: Pressing the [PRINT/SELECT] button in between batches will show the current total of all completed batches. This total will remain on the display until [CLEAR] is pushed or the next batch is started.

Note: The unit will not print while there is motion on the scale (CH1 light flashing).

Unload the Scale and Repeat steps 2-3 to continue weighing Batches as desired. Note that the maximum number of batches supported by the reprint feature is 15 see "Last Ticket Reprint Feature" on page 26

4. When you have completed weighing batches (or at any time before totaling) you can enter a shrink value to be applied to this batch of weights. To enter a shrink value type in the following sequence on the indicator keypad, where xxx is the desired shrink percentage in tenths of a percent

[IN] [PRINT/SELECT] [x][x][x] [PRINT/SELECT]

For example, a shrink of 2.5% enter:

[IN] [PRINT/SELECT] [2][5] [PRINT/SELECT]

5. To complete and total the ticket, press the [END] button. The ticket will be completed and printed out. The following is a sample of a ticket.

Date: Jun 16, 1999	Time: 13:05	
# Head	Total	Average
3	3000 kg	1000 kg
3	3000 kg	1000 kg
3	3000 kg	1000 kg
Gross Batch Total		
9	9000 kg	1000 kg
Net Batch Total		
9	8910 kg	990 kg
Shrink Value	1.0 %	

The above ticket will print in either Kilograms (kgs) or Pounds (lbs) depending on your system settings.

6. If you wish to start a new batch, repeat steps 2-5 as necessary.

Note: The indicator will automatically reset into GROSS mode, reading in the currently selected units. The unit will not allow you to switch to NET mode.

Last Ticket Reprint Feature

At any time between the end of the previous ticket and the start of a new one, the previous ticket can be reprinted. This is accomplished by pressing the **[END]** button.

The ticket will look identical to the previously printed ticket except for the ****REPRINT**** banner at top and bottom. Note that if the power to the control box is turned off, last ticket information will be lost and not available for reprint.

In batch mode the number of drafts that can be stored is limited to 15. If a particular batch exceeds this number, the ticket reprinted will not contain the individual draft weights. It will, however, still print the gross and net totals.

Attention:

Animal safety is a very serious issue and must be observed when handling any type of animal. The scale surface may become slippery during use. A build up of manure on the scale may reduce the amount of traction for the animals. It is recommended that you spread a coat of sand on the scale after every few of weighments to increase the animals footing when on the scale.

Parts List All Scales

Gates

Model	Gate PN	Description
MASM7-X	MASG-77	77" Opening Non Sheeted
	MASG-77S(L)	77" Opening 4' Sheeting (3' Sliding)
	MASG-77SS	77" Opening 2' Sheeting (STD)
All	41111	Latch Pin Bolt on Sheeted Gates
All	41-05-4	Latch Narrow for Sliding Gate
All	41103S	Gate Sliding 3' with 4' Sheeting

Axle Parts

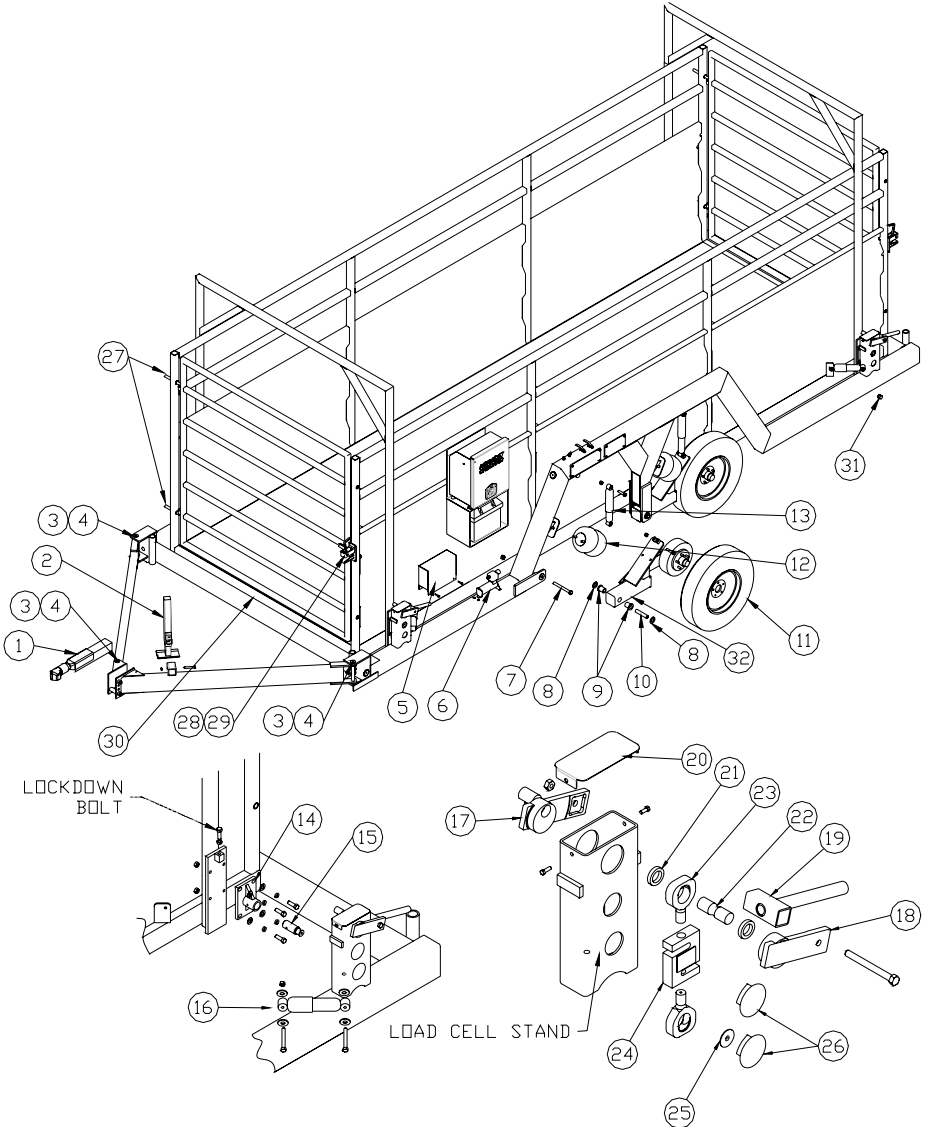
Axles are Dexter 3500lb, 5-bolt with 10x2- $\frac{1}{4}$ " brakes. Following are replacement parts available from Dexter.

Bearings

	Dexter Kit #	Industry Part # Cup/Cone
Inner	K71-390-00	L68111 / L68149
Outer	K71-306-00	L44610 / L44649

Description	Dexter Part #
Inner Bearing Seal	010-004-00
Magnet	K71-104-00
Brake Shoe and Lining	K71-047-00
Brake Assembly LH	023-026-00
Brake Assembly RH	023-027-00
Hub	008-247-05

Parts List (SN 03600 and previous)

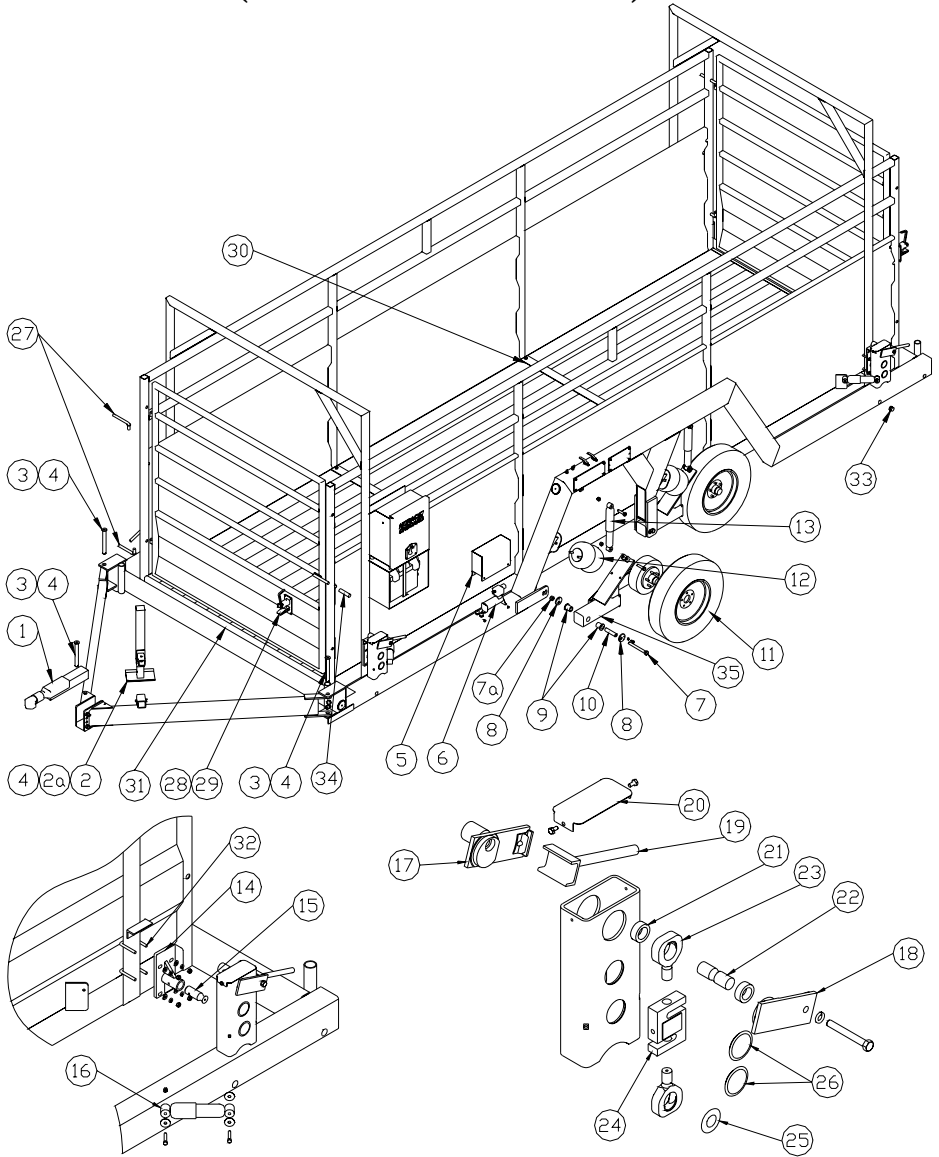


Note: Any bolt or nut not listed is grade 5 NC.
 Any washer or lock washer is standard size washer.

Parts List (SN 03600 and previous) cont.

Item #	Part #	Description
1	42688	2" Hitch Coupler, 7000lb
2	42684	15" Screw Jack, 7000lb
3	42658	Hitch pin Mobile MAS
4	100968	Hitch Clip 3/16x3-1/4
5	42693	Compressor Box
6	104823	Air Compressor
	104828	Relay Headlight 12V 40A SP ST
7	100702	Bolt 3/4x8 Grade 8
8	102473	1" SAE Flat Washer
9	42555	Axle Bushing
10	42515	Axle Bushing Pivot Tube
11	104783	Rim 5 Bolt White Spoke w/205/75-R15
12	104735	Suspension Air Bag
13	104819	Gas Shock Absorber
14	42576	Mount Lower Load Cell Pin
15	42577	Lower Notched Load Cell Pin
16	104825	Scale Damper
17	42575	Cam with Lockdown
18	42574	Cam Without Lockdown
19	42578	Cam Handle
20	42579	Cell Mount Cover
21	42262	Spacer Upper Notched Pin
22	42582	Upper Notched Load Cell Pin
23	42256	Eyebolt Machined 5K/10K
24	82855	Load Cell S-Type 5K (13' or 14' scale)
	82856	Load Cell S-Type 10K (19' or 20' scale)
25	42680	Lower Load Cell Retainer
26	42696	Plug Plastic Round 2-1/4"
27	104468	Hook Bolt for Gate
28	41-05-5	Cattle Scale Cage Latch
29	104362	U-bolt 3x3/8x2 w/ nuts
30	31115	Scale T-belting (77" length)
31	105439	Plug Plastic Round 1-1/8
32	42584-2	Axle Arm w/ Air Bag Mount

Parts List (SN 03601 and above)



Note: Any bolt or nut not listed is grade 5 NC.
 Any washer or lock washer is standard size washer.

Parts List (SN 03601 and above) cont.

Item #	Part #	Description
1	42688	2" Hitch Coupler, 7000lb
2	42684	Hitch Jack for MMAS, 7000lb
2a	42685	Hitch Jack Pin
3	42658	Hitch pin Mobile MAS
4	100968	Hitch Clip 3/16x3-1/4
5	42693	Compressor Box
6	104823	Air Compressor
	104828	Relay Headlight 12V 40A SP ST
7	100702	Bolt 3/4x8 Grade 8
7a	100872	Nut Nylon Lock 3/4
8	105255	Alignment Washer Mobile MAS
9	42555	Axle Bushing
10	42686	Axle Bushing Pivot Tube
11	104783	Rim 5 Bolt White Spoke w/205/75-R15
12	104735	Suspension Air Bag
13	104819	Gas Shock Absorber Yellow Serial Number 04727 and earlier
	105330	Gas Shock Absorber Blue Serial Number 04728 and later
14	42671	Mount Lower Load Cell Pin
15	42577	Lower Notched Load Cell Pin
16	104825	Scale Damper
17	42673	Cam with Lockdown
18	42672	Cam Without Lockdown
19	42674	Cam Handle
20	105203	Cell Mount Cover
21	42675	Spacer Upper Notched Pin
22	42582	Upper Notched Load Cell Pin
23	42256	Eyebolt Machined 5K/10K
24	82855	Load Cell S-Type 5K (14' scale)
	82856	Load Cell S-Type 10K (14' scale Serial Number 05869 and later)
	82856	Load Cell S-Type 10K (20' scale)
25	42633	Lower Load Cell Retainer

26	42696	Plug Plastic Round 2-1/4" Serial Number 05804 and earlier
	42694	Plug Plastic Round 2" Serial Number 05805 and later
27	104468	Hook Bolt for Gate
28	41-05-5	Cattle Scale Cage Latch
29	104362	U-bolt 3x3/8x2 w/ nuts
30	42677	Wood Hold Down T Section
31	31115	Scale T-belting (77" length)
32	105273	U-bolt 3/8x2x3
33	105439	Plug Plastic Round 1-1/8
34	105333	Hose EVA 3/4"
35	42584	Axle Arm Roadside w/ Air Bag Mount
	42585	Axle Arm Curbside w/ Air Bag Mount Serial Number 05885 and later
	42584-2 42585-2	Axle Arm Roadside w/ Air Bag Mount Axle Arm Curbside w/ Air Bag Mount For Serial Number 05884 and earlier

Other Parts

42682	Cover Plate Junction Box
42683	Cover Plate Air Panel
42676	Battery Lock Bar
42670	Scale Junction Box with Trim Board
SAJ4SS	Scale Junction Box w/ Trim Board & Sealed Lid
104765	Trailer Plug 6 Way Round
104763	Battery 12V Deep Cycle
104462	Battery Box w/ Lid
42318	110V Indicator Power Option
42348	TMU200 3" Tape Printer w/ cable
42329	TM295 Ticket Printer w/ cable
42695	Magnetic Lighting Kit

Maintenance

Maintenance Schedule

First Week

1. Check torque on all wheel nuts (see page 39).

Weekly

1. Check entire scale for build up of debris. Remove any debris found on, under or around the scale. Rubber T-beltting at both ends of the scale are removable to make clean out easier. To remove T-beltting, unhook the stretch cord that hooks into the corner tube of the cage.
2. Check for dirt and debris in the load cell stands and clean accordingly (see page 34).
3. Check all external cables and conduit for damage.

First Month (in addition to weekly maintenance)

1. Check torque on all wheel nuts (see page 39).
2. Adjust trailer brakes.

Monthly (in addition to weekly maintenance)

1. Adjust lock down bolts (Serial numbers 03600 and previous only). (see page 34)
2. Charge trailer battery if necessary.
3. Tire Pressure. 45 psi./40psi. - Single /Tandem Axle

Yearly (in addition to weekly and monthly maintenance)

1. Check and grease wheel bearings (see page 40).
2. Disassemble each load cell location and grease all pins and eyebolts (see page 35).
3. Adjust trailer brakes (see page 38).
4. Check indicator level switch (see page 34).

Scale Maintenance Procedures

Cleaning Load Cell Stands

It is very important to keep any excess debris from building up in the load cell stand. Lift scale and block it up, clean any dirt out of the load cell stands through the drain holes located at the bottom of the stand. A shop-vac may be used to clean out the load cell stands from the top.

Adjusting Lock Down Bolts

(Serial Numbers 03600 and previous only)

With the scale in transport position, check that each lock down is tight (see parts list drawing on page 26). Each lockdown bolt should be tight against the cam with lockdown (item 17).

To adjust a lock down bolt, loosen the jam nut on the lock down bolt. With the jam nut loose turn the lock down bolt out until it contacts item 17, then retighten the jam nut. Ensure the lock down bolt stays in contact with item 17.

Checking Level Switch

Park system on a slope greater than four degrees and raise the scale. (For example a steep approach.) Turn on the indicator and check to see if it shuts off in 10 seconds. If the indicator does not shut off you may have a faulty tilt sensor. Consult your local scale dealer. This test should be performed in all four directions, front low, rear low, right side low and left side low.

Disassembly and Greasing

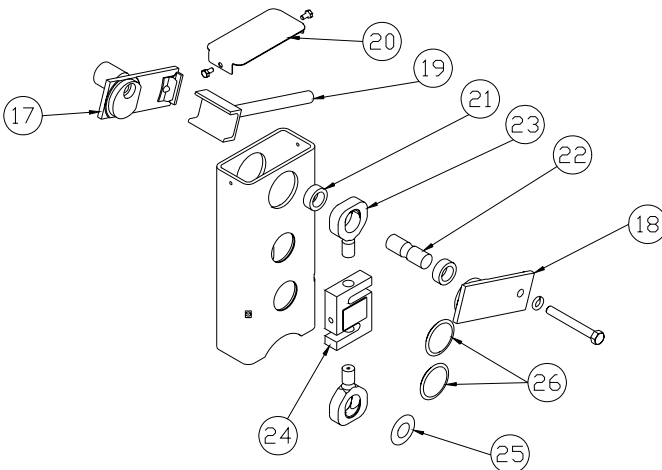
This is very important to ensure the long life of your unit.

Note: Use quality high-pressure grease.

Note: Avoid bending or twisting the load cell wires.

- a Loosen the lock down bolts. Loosen each jam nut, and turn the lock down bolts in approximately 2 turns. (Pre SN 03600 only)
- b Remove the cell stand cover (20).
- c Remove the plug covers (26)
- d Remove the bolt which holds together items 17, 18, 19.
- e While holding the cam handle (19), remove the outer cam (18).
- f Remove the load cell pin (22) and spacers (21). The load cell assembly (23,24) will be free on top and rest against the inside of the cell stand.
- g Remove the inner cam (17).
- h Remove the lower retainer (25)
- i Grease all bearing surfaces (upper and lower pins, cams, upper and lower eyebolts).

Reassemble in reverse order as described above.



Trailer Maintenance Procedures

How to Use Your Electric Brakes Properly

Your trailer brakes are designed to work in synchronization with your tow vehicle brakes. Never use your tow vehicle or trailer brakes alone to stop the combined load.

Your brake controller must be set up according to the manufacturer's recommendations to ensure proper synchronization between the tow vehicle and the trailer. Additionally, you may have to make small adjustments occasionally to accommodate changing loads and driving conditions.

Proper synchronization of tow vehicle to trailer braking can only be accomplished by road testing. Brake lockup, grabbiness, or harshness is quite often due to the lack of synchronization between the tow vehicle and the trailer being towed, too high of a threshold voltage (over 2 volts), or under adjusted brakes.

Before any synchronization adjustments are made, your trailer brakes should be burnished-in by applying the brakes 20-30 times with approximately a 20 m.p.h. decrease in speed, e.g. 40 m.p.h. to 20 m.p.h. Allow ample time for brakes to cool between application. This allows the brake shoes and magnets too slightly "wear-in" to the drum surfaces.

Synchronizing Your Trailer Brakes

To ensure safe brake performance and synchronization, read the brake controller manufacturer's instructions completely before attempting any synchronization procedure.

Make several hard stops from 20 M.P.H. on a dry paved road free of sand and gravel. If the trailer brakes lock and slide, decrease the gain setting on the controller. If they do not slide, slightly increase the gain setting. Adjust the controller just to the point of impending brake lockup and wheel skid.

Note: Not all trailer brakes are capable of wheel lockup. Loading conditions, brake type, wheel and tire size can all affect whether a brake can lock. It is not generally considered desirable to lock up the brakes and slide the tires. This can cause unwanted flat spotting of the tires and could also result in a loss of control.

If the controller is applying the trailer brakes before the tow vehicle brakes, then the controller adjustments should be made so the trailer brakes come on in synchronization with the tow vehicle brakes. For proper braking performance, it is recommended that the controller be adjusted to allow the trailer brakes to come on just slightly ahead of the tow vehicle brakes. When proper synchronization is achieved there will be no sensation of the trailer “jerking” or “pushing” the tow vehicle during braking.

Brake Adjustment

Brakes should be adjusted (1) after the first 200 miles (first month) of operation when the brake shoes and drums have “seated,” (2) at 3,000 mile intervals (or yearly), (3) or as use and performance requires. The brakes should be adjusted in the following manner:

1. Jack or block the axle arm to allow free rotation of the wheel.
2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.
3. With a screwdriver or standard adjusting tool, rotate the star wheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
4. Then rotate the star wheel in the opposite direction until the wheel turns freely with a slight lining drag.
5. Replace the adjusting hole cover and lower the wheel to the ground.

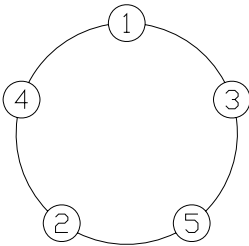
Repeat the above procedure on all brakes. For best results the brakes should all be set at the same clearance.

Wheel Assembly and Torque Specification

1. Start all bolts or nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in the sequence shown below.
3. The tightening of the fasteners should be done in stages. Following the recommended sequence, tighten fasteners per torque chart below.
4. Wheel nuts/bolts should be torqued before first road use and after each wheel removal. Check and re-torque after the first 10 miles, 25 miles, and again at 50 miles.

Wheel Torque Sequence (ft-lbs)

1st Stage	2nd Stage	3rd Stage
20-25	50-60	90-120



Bearing Adjustment

In the event the hub is removed follow this procedure for wheel bearing adjustment.

1. After placing the hub, bearings, washers, and spindle nut on the axle spindle rotate the hub assembly slowly while tightening the spindle nut to approximately 50 lbs.-ft.
2. Then loosen the spindle nut to remove the torque. Do not rotate the hub.
3. **Finger tighten the spindle nut until just snug.**
4. Back the spindle nut out slightly until the first castellation lines up with the cotter key hole and insert the cotter pin
5. Bend over the cotter pin legs to secure the nut.
6. The nut should be free to move with the only restraint being the cotter pin.
7. Install the dust cover and rotate the wheel to ensure the cotter key does not contact the dust cover.

Gathering Panel Attachment, Suggested Construction

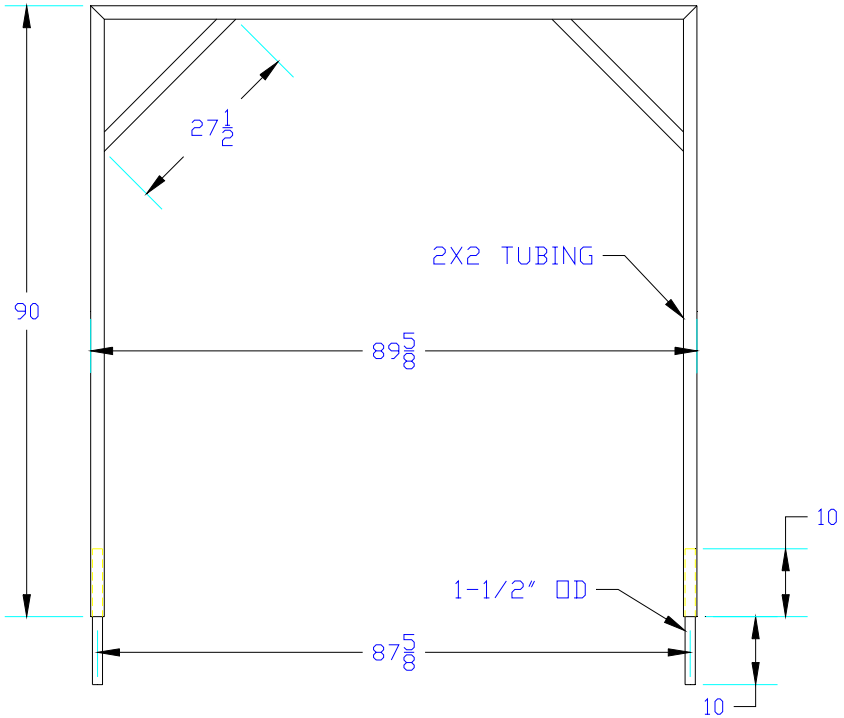


Figure 13 - Gathering Panel Frame

Building a simple framework that can be set into the provided trailer posts can accommodate mounting of most any panel. In some cases extra support of the mounting frame may be required.

Figure 13 shows the suggested construction of a framework you can build to support the type of gathering panels you have. Some gathering panels can be set directly into the corner posts located on the corners of the trailer and require only a shortened version of the

drawing above that can be set into the top of the panels. (See Figure 14) However with the wide variety of panels available we cannot provide a mounting means for all of them.

However you decide to mount you panels you must ensure the panels or framework are not attached to the scale cage and must have a clearance of 1" from any live portion of the scale. Any contact between the panels or framework and the scale can cause the weight reading to be inaccurate.

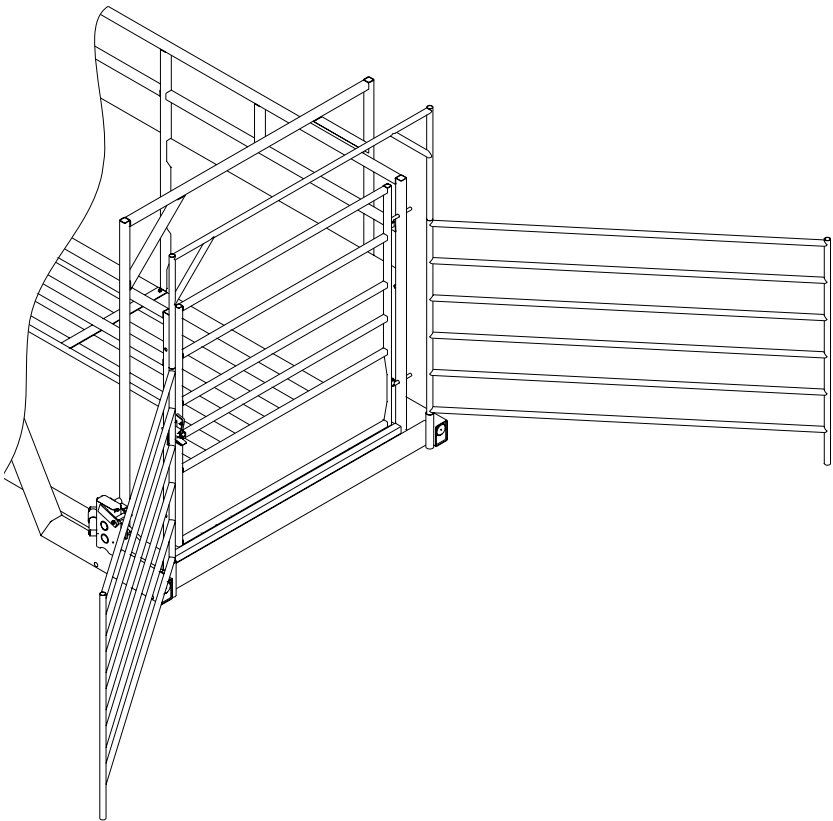


Figure 14 - Gather Panel Attachment

Gathering Panel Warranty Information

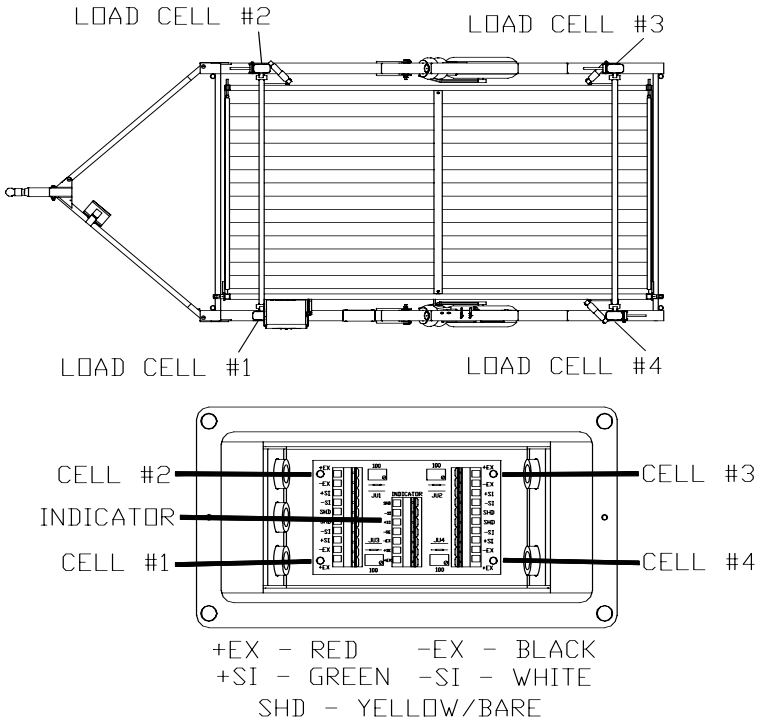
Gathering panels or handling attachments must be removed from the trailer during transport. The trailer is not intended for the transportation of goods or livestock.

The design of the trailer only allows for 100 pounds to be added to either end of the trailer, for a MAXIMUM addition of 200 pounds, during transport. All attachments that will remain on the trailer must not exceed the weight limit of 100 pounds on the front and/or 100 pounds on the rear. If the total of the attachments on either the front or the rear exceeds 100 pounds the warranty will be void.

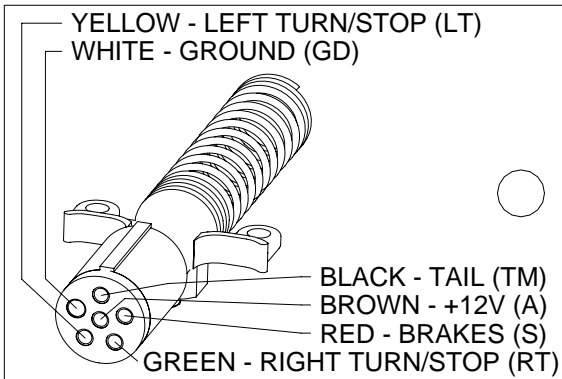
Any additions to the scale or trailer may affect the balance and towability of the trailer.

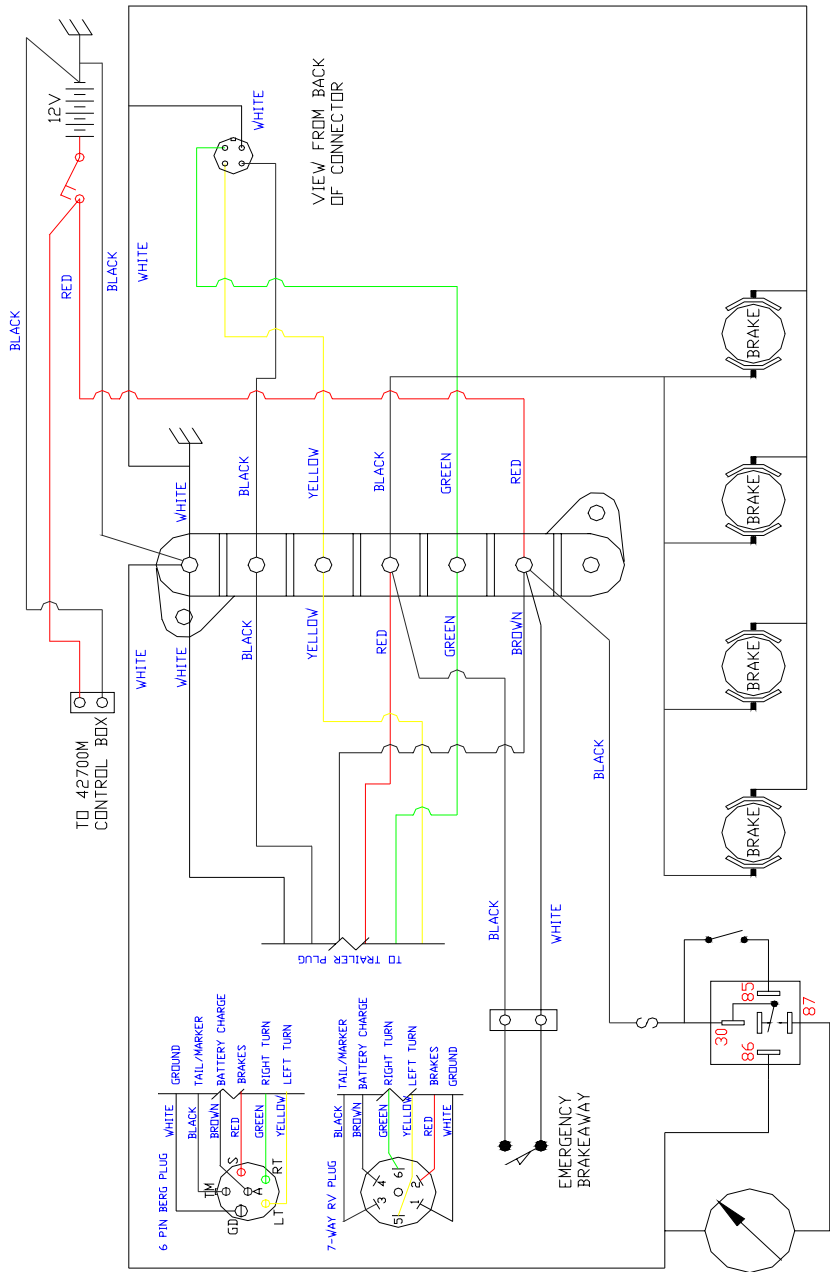
Any attachments to the trailer must be secured during transport and not interfere with any safety device or the operation scale or trailer mechanisms.

Load Cell Wiring Diagram



Trailer Electrical System Diagrams





Wiring Diagram

Trouble Shooting

Symptom	Probable Cause	Action
<p>The scale indicator will not power up.</p>	<p>a) Blown in-line fuse</p> <p>b) Voltage is less than 11 volts.</p>	<p>a) Replace in-line fuse, Norac part # 100494, the fuse holder is located near the battery or the indicator.</p> <p>b) Repair faulty electrical system. The Norac panel requires at least 11 volts to operate properly.</p>
<p>Indicator turns off or resets in the middle of a transaction –OR- End button will not function but start seems to work properly.</p>	<p>a) Low voltage to control panel.</p>	<p>a) Check other electrical equipment that may be operating (IE. Air conditioning). The charging system on the vehicle may not be maintaining at least 11 volts.</p>
<p>The indicator will not come on automatically with the system power switch- it will only power up when the ON button on the indicator panel is pushed – AND- The indicator turns on and off erratically even when the level light is on solid.</p>	<p>a) The indicator must be configured to power up automatically.</p>	<p>a) Contact your local dealer or Norac. Only a qualified technician can perform this configuration.</p>

Symptom	Probable Cause	Action
The level light will not illuminate	a) the bulb is burnt out	a) Replace Cable (P/N 42760-01)
The level light will not illuminate AND the weight indicator shuts off 10 seconds after powering up	a) trailer is more than 4 degrees off level b) faulty tilt sensor	a) return the truck to a level position before unloading b) contact your local dealer or Norac for replacement PCB (P/N 42750T-1)
The system will not START or END or both	a) Weight reading is not stable enough	a) It may be too windy to get a stable weight, check the CH1 light on the indicator. The system can only start and end when the light is on solid.
The weight reading on the indicator is unstable.	a) The circuit board in the control panel may be wet. If there is a junction box for the load cells on your system, check there for moisture as well. b) A load cell cable may be pinched or damaged.	a) Dry any areas that are contaminated with moisture. Check for leaks and reseal. b) Contact Norac or a qualified dealer for support. Cutting the load cell cable will void the warranty. Special repair techniques are required.

Symptom	Probable Cause	Action
ERR 41 on display	<p>Will occur when start is pressed</p> <p>a) On some systems prior to 1999 when the scales gross weight is zero or negative.</p> <p>b) On any system if start is pressed when the motion light is on.</p>	<p>a) Make sure the scale will have a positive weight.</p> <p>b) Wait for scale to settle.</p>
The scale has a positive error when loading or a negative error when unloading	<p>a) Mechanical binding problem on scale</p>	<p>a) Check all hydraulic hoses and conduit, they must be long and loose enough not to exert a force on the scale. Check all load cell covers to see that they are not bent or contacting the lift arm or cylinder.</p>
The scale has a negative error when loading or a positive error when unloading.	<p>a) Moisture is present somewhere in the electrical system.</p>	<p>a) Dry any areas that are contaminated with moisture. Check for leaks and reseal.</p>

Symptom	Probable Cause	Action
Air Pump will not turn on	a) Battery too Low b) Fuse Blown	a) Charge Battery or connect to tow vehicle b) Replace fuse under compressor cover
Printer is not functioning – nothing is being printed at all	a) Is the release light on the printer flashing? This could indicate a low voltage to the printer b) The print head may be jammed with paper c) The print head may be packed with dirt from operating in dusty conditions	a) The Norac system requires at least 11 volts to operate properly. Is the truck running? Your truck may need to be running to supply enough power – OR – the truck may have a faulty electrical system. b) Remove the print head cover and ribbon. Check for bits of paper stuck in the paper feed mechanism. c) Remove the print head cover and ribbon. Blow out with air. If the printer is very dirty it may require service by a qualified technician.
The printer is printing unrecognizable characters	a) The power supply on the truck is excessively noisy.	a) Contact Norac, an in-line power filter may be necessary.

Symptom	Probable Cause	Action
The printing on the ticket is faint or hard to read.	a) The printer's ink ribbon may need to be replaced. b) The printer head may be damaged.	a) Replace ribbon, Norac part # 82282-1 b) Requires service by a qualified technician.
Cannot load the system to full capacity without getting "eeeeee" on the display	a) Dead load has been added to the scale since it was calibrated	a) Contact your local scale dealer
Display reads "eeee" or "uuuuu"	c) A load cell has become disconnected.	c) Inspect for damage and consult you local scale dealer.

IF YOU SUSPECT THERE IS A PROBLEM INSIDE THE NORAC CONTROL PANEL THAT REQUIRES THE WEIGHTS AND MEASURES SEAL TO BE BROKEN YOU MUST CONTACT NORAC PRIOR TO BREAKING THE SEAL, OR HAVE A QUALIFIED SCALE DEALER BREAK THE SEAL.

BREAKING THE SEAL MAY VIOLATE THE WEIGHTS AND MEASURES APPROVAL OF THE SCALE.

Specifications:

Wheel Lug Nut Torque: See Page 39
Tire Pressure 45 PSI - Single Axle
40 PSI Tandem Axle
Wheel Size 15" - 5 Bolt / 4.5" Bolt Circle
Tire Size 205/75R15
Battery: 12V Deep Cycle Marine

Notes:

Size / Model # _____
Serial # _____
Date Purchased _____
Unit ID # _____

NORAC Statement of Limited Warranty

All *NORAC* scale products are warranted against defects due to faulty material or workmanship for a period of one (1) year. *NORAC* Systems International Inc. extends this warranty only to the original purchaser or original user.

In the event a defect develops during the warranty period, *NORAC* will repair or replace the unit with a new or reconditioned model of equivalent quality. In order to obtain performance of any obligation of *NORAC* Systems International Inc. under the warranty, the original purchaser or original user must return the defective unit, with a written description of the complaint, freight prepaid to the manufacturer or a designated service depot. In the event of replacement with a new or reconditioned model, the replacement unit will continue the warranty period of the original unit.

NORAC Systems International shall not be liable for loss of use of the unit or the incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

Any questions with respect to the warranty should be taken up with *NORAC* Systems International Inc. 306-664-6711.

Towing Checklist

Each item of checklist to be reviewed and list to be signed by dealer and customer at delivery.

- Operator Safety section of manual has been reviewed.
- Trailer is not intended for the transport of livestock or any other goods or materials.
- Ball on towing vehicle must be 2"
- Hitch height of towing vehicle must be between 12" and 18" above the ground such that the trailer is towed level.
- Safety chains must always be connected during towing.
- Towing vehicle must be wired correctly (see label on hitch)
- Magnetic lighting package must be on the trailer during towing.
- Trailer is equipped with electric brakes and must be synchronized. See synchronization procedure in manual.
- Trailer is designed to be towed at a ride height indicated by labels on the suspension shock absorbers. Towing at ride heights outside of the indicated range may result in suspension damage.
- Suspension stops must be in the transport position during towing.
- Converting the trailer from weigh mode to transport mode and back to weigh mode has been reviewed.
- Safety pins are installed in all the hitch pins.
- Dexter recommends to re-torque wheel lug nuts at 10, 25 and 50 miles.

Buyer _____ Date _____

Dealer _____

Copy to be retained by dealer

Fax copy to manufacturer: Fax #: 1-306-664-6664