

Air-Weigh™

U.S. & FOREIGN PATENTS

THE ACCURATE ON-BOARD ELECTRONIC SCALE
for Air-Ride Trucks & TrailersSM

Patents #5,478,974; #623,635; #4,832,141

5200 SERIES ON-BOARD ELECTRONIC SCALE INSTALLATION, CALIBRATION & OPERATIONS MANUAL

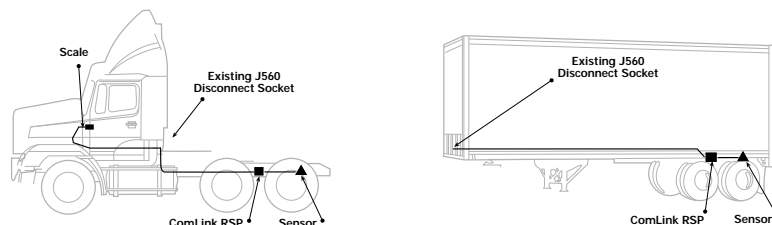




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5200 SERIES ON-BOARD ELECTRONIC SCALE



SPECIFICATIONS

Scale Power Input: 8 - 28 VDC, self-regulated

Scale Dimensions:

W = 6-1/2"

L = 8-3/4"

H = 2-1/2"

Sensor Input (from ComLink): 8 VDC

Sensor Output: 1 - 6 VDC to ComLink processor

Sensor Capacity: 0 - 125 psi

Sensor Operating Temperature: -30° to +80° C.

ComLink Power Input: 8 - 30 VDC, self-regulated

ComLink Output: Digital (no measurable DC voltage)

ComLink Dimensions:

W = 7-3/4"

L = 4-1/4"

H = 3-1/4"

LIMITED WARRANTY

Your Hi-Tech Transport Electronics product is warranted against defects in materials or workmanship for one year from the date of the original purchase. Any Hi-Tech Transport Electronics product, which, because of a manufacturing mistake, malfunction or proves to be defective within the one year warranty period, will be repaired or replaced, at Hi-Tech Transport Electronics' option, and at no charge to you, provided it is returned to Hi-Tech Transport Electronics with proof of purchase.

This warranty does not cover incidental or consequential damage to persons or property caused by

use, abuse, misuse, or failure to comply with installation or operating instructions. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above warranty does not apply in those states. This warranty gives you specific legal rights and you may also have other rights, which vary state to state.

For repairs or replacement, please return the defective part of your Hi-Tech Transport Electronics product with proof of purchase to: Hi-Tech Transport Electronics, Product Support Department, 2895 Chad Drive, Eugene, Oregon 97408, USA.

Hi-Tech Transport Electronics, Inc.

2895 Chad Drive • Eugene, Oregon 97408-7345 USA P.O. Box 70301 • Eugene, Oregon 97401-0117 USA
Telephone (541) 342-1521 • Order Desk (800) 938-2500 • Fax (541) 342-3307 • Internet: www.air-weigh.com

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July 1997

5200 SERIES ON-BOARD ELECTRONIC SCALE INSTALLATION, CALIBRATION & OPERATIONS MANUAL

SCALE SYSTEM OVERVIEW

The Air-Weigh 5200 scale converts truck and trailer air-spring air pressure to an accurate weight.

The scale determines how much weight per pound of air pressure your suspension is supporting. This is accomplished by comparing empty and loaded vehicle weights with the air pressures required to support

those weights. Once calibrated, the scale will display the actual on-the-ground weight of each axle group to within 200 - 300 lbs. (90-136 kgs.) of an accurate platform scale. To some extent, accuracy depends on weighing the vehicle on a flat and level surface and the physical characteristics of the air suspension system itself.

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AIR-WEIGH PRODUCT SUPPORT

If you cannot correct a problem, or you suspect you have a malfunctioning part, please contact AIR-WEIGH PRODUCT SUPPORT at (800) 938-2500, Mon. - Fri., 8 am - 5 pm Pacific Time. Outside U.S. and Canada, please call (541) 342-1521.

COMPONENT DESCRIPTION

ELECTRONIC DIGITAL SCALE

The electronic digital scale is used to indicate active functions and to display weights, date and time. By using the four input keys, the user can access the functions and enter calibration data.

ELECTRONIC PRESSURE SENSORS

The pressure sensor measures the air pressure in your tractor and trailer air springs and converts the pressure to an electronic signal.

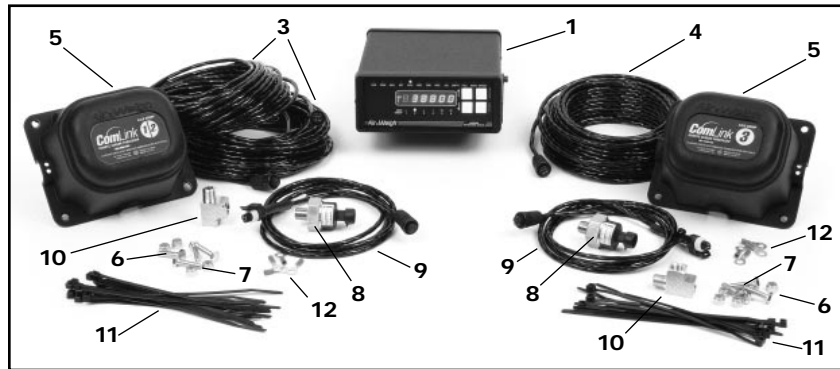
COMLINK™ REMOTE SENSOR PROCESSOR (RSP)

The ComLink Remote Sensor Processor (RSP) provides two functions. It stores cali-

bration data that is specific to each axle group and communicates with the scale in the cab by multiplexing digital signals over the vehicle's existing 7-wire electrical harness. Each RSP is identified as either a #1, 2, 3, 4, 5, 6, or 1/2. The #1/2 RSP enables a leaf spring suspension steering axle to be calibrated, and weight be predicted, by measuring the amount of weight transferred to the steer axle from the tractor drive suspension.

COMLINK™ CABLE

ComLink cable comes in several configurations and is used to communicate between components or with the vehicle's existing 7-wire electrical harness. Each is labeled and has specific connectors for specific functions.

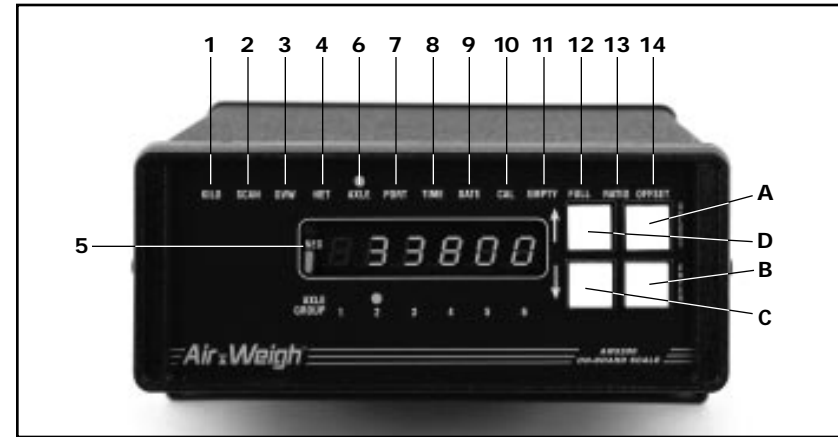


PARTS LIST

Check the parts you need in the columns corresponding to the kit you will be installing.

PART DESCRIPTION AND PART NUMBER	TRACTOR ONLY KIT 5200	TRAILER ADD-ON KIT 5235
#1 - Scale, Digital Electronic 050-5220	1	
#2 - Mounting Screws 131-4020	2	
#3 - 50' Disconnect Cable 010-8006	2	
#4 - 60' Disconnect Cable 010-8005		1
#5 - ComLink RSP (Remote Sensor Processor) 050-5050	1 (#1/2)	1 (#3)
#6 - ComLink RSP Mounting Bolts 1/4 - 20 x 1 131-4065	4	4
#7 - ComLink RSP Mounting Nuts 132-4070	4	4
#8 - Pressure Sensor 010-9080	1	1
#9 - 6' Sensor Cable 010-8002	1	1
#10 - Brass Street Tee - 1/4" 150-4057	1	1
#11 - Nylon Wire Ties 145-4552	50	25
#12 - Crimp-On Eyes 139-4054	4	4
#13 - Installation Manual 901-0500	1	1

FUNCTIONS



INPUT KEYS

- A. Select:** Press and release to move the indicator light from function to function. The SELECT key is also used to select axle groups.
- B. Enter:** After you select the desired function, press and release the ENTER key to activate the CAL, AXLE and NET functions. The ENTER key is also used to accept numbers entered with the ↓ and ↑ keys.
- C. ↓:** Decreases the displayed TIME, DATE, EMPTY, FULL, and calibration-access PIN (Personal Identification Number). Also

used to display weight information in kilograms (KILO light is lit).

- D. ↑:** Increases the displayed TIME, DATE, EMPTY, FULL, and calibration-access PIN (Personal Identification Number). Also used to display weight information in pounds.

Hint: The longer you hold the arrow buttons down, the faster the numbers will move. To slow down the movement, release your finger from the button momentarily. The time is displayed as a 24-hour clock. The date is displayed Month/Day/Year.

FUNCTION INDICATOR LIGHTS

- 1. Kilo:** Lit when the scale displays weight in kilograms. If the KILO function light is not lit, the scale displays weight in pounds.
- 2. Scan:** The scale scans all active AXLE GROUPS and GVW when lit.
- 3. GVW:** Provides the total weight of all ComLink-equipped axle groups.
- 4. NET:** Provides the net payload increase or decrease from the current GVW.
- 5. NEG:** Indicates a decrease in weight from when the NET function was zeroed.
- 6. Axle:** Indicates that an axle group weight is displayed or is being calibrated.
- 7. Port:** Indicates the scale is prepared to print a weight receipt or transfer information to a computer or communications device (press and release the ENTER key to print or transfer scale information).
- 8. Time:** Indicates that the current time is being displayed (HH/MM/SS: H = Hour, M = Minute, S = Seconds).
- 9. Date:** Indicates that the current date is being displayed (MM/DD/YY: M = Month, D = Day, Y = Year).
- 10. CAL:** Indicates that the calibration function has been selected.
- 11. Empty:** Indicates that the empty (unloaded) weight entered during calibration is being displayed (or the factory default value).
- 12. Full:** Indicates that the full (loaded) weight entered during calibration is being displayed (or the factory default value).
- 13. Ratio:** Indicates that the ratio calculated during calibration is being displayed. The ratio is the number of pounds supported for every psi of air pressure in the suspension system. (Display only.)
- 14. Offset:** Indicates that the offset calculated during calibration is being displayed. The offset represents the weight on the tractor or trailer not being supported by the air suspension system. (Display only.)

PRE-INSTALLATION CONSIDERATIONS

CONNECTING TO ELECTRICAL SYSTEM

The 5200 scale series communicates between tractor and trailers using a multiplexing technology to piggy-back its signals over the vehicle's existing 7-wire electrical harness without any interference. No additional J560 disconnect is required between tractor and trailer. The scale and its ComLink RSPs are wired directly to Common Ground and Power of the 7-wire harness at any convenient access point.

The current 5200 scale system includes an internal modification that can simplify installation by reducing the electrical connections from four to two. Twist the Red and White ComLink wires together to form the Power connection; and twist the Black and Green ComLink wires together to form the Ground connection. Then take the Black/Green ComLink wires to Common Ground in the existing 7-wire electrical harness. Take the Red/White ComLink wires to Power. If an On/Off switch is desired, an in-line switch (050-1260-001) is available.

PREFERRED INSTALLATION METHOD

7-Wire Harness	ComLink Cable
Blue (12 VDC Power)	Red and White (Power)
White (Ground)	Black and Green (Ground)

The preferred option for Power is the Blue wire auxiliary circuit, because all new North American tractors are now wired full-time Blue-power to service trailer ABS systems. NOTE: On March 1, 1998 all new trailers will also be wired with the Blue circuit as full-time power for trailer ABS systems. By that time, Air-Weigh will convert to a basic 2-wire installation procedure with Power connected to the Blue circuit and Ground to the Common White circuit. Air-Weigh will also include several additional multiplexing switching circuits that customers can use to turn on and off equipment on the trailer, so additional connectors do not have to be installed. By wiring your current Air-Weigh scale to the Blue and White circuits now, you avoid subsequent changes.

ALTERNATE INSTALLATION METHOD

7-Wire Harness	ComLink Cable
Black or Brown (Markers)	Red and White (Power)
White (Ground)	Black and Green (Ground)

If the trailer is currently using the blue circuit to switch/power lights or valves, and you want to continue that procedure, you might want to take the Red/White ComLink wires to the Marker light circuit, usually Black and/or Brown on the 7-wire electrical harness (must be the same circuit on both tractors and trailers). To Power the scale system, you'd turn on that marker light circuit.

SEPARATE LEFT AND RIGHT SIDE HEIGHT CONTROL VALVES

If you have dual height control valves (air suspension with both right and left height control valves on the same axle group), you'll need a #000-5265 Dual Sensor Processor Kit to combine left and right air pressure signals into a single axle group weight.

WEIGHING A LEAF SPRING STEER AXLE

Even though the steer axle may have a leaf spring suspension, the AW5200 scale can still predict its weight by determining how much weight is transferred from the drive axles to the steer axle.

- Set the tractor fifth wheel or turntable to a position that is forward of neutral, so an increase of weight on the drive axles results in an increase of weight on the steer axle. Many truckload operators set it where both the drive axles AND the steer axle are at the maximum GVW limit. Fuel level will effect steer axle weight accuracy, but not the drive axle accuracy.
- Calibrate AXLE group #1 for the steer axle weights and #2 for the drive axles' weights. The standard tractor ComLink RSP provides both # 1 and 2 weight display channels.

DEVELOP A FLEET-WIDE CHANNEL ASSIGNMENT PLAN

It is imperative that you do not install identically numbered ComLink RSPs on the same tractor/trailer combination. We recommend that you develop a fleet-wide channel numbering plan (call Air-Weigh Product Support at 800-938-2500 for assistance in your plan). Generally, numbering should start with channel #1 on the steer axle, then assign channels towards the rear of the vehicle (#2 on the drive axles, #3 on the trailer, etc.). If you have any jeeps in your fleet, you may want to reserve channel #3 for jeeps (when a jeep is not in place, the scale will skip channel #3, displaying #1,2, and 4, etc.).

Maintaining consistency throughout a fleet of tractors and trailers allows trailers to be swapped freely.

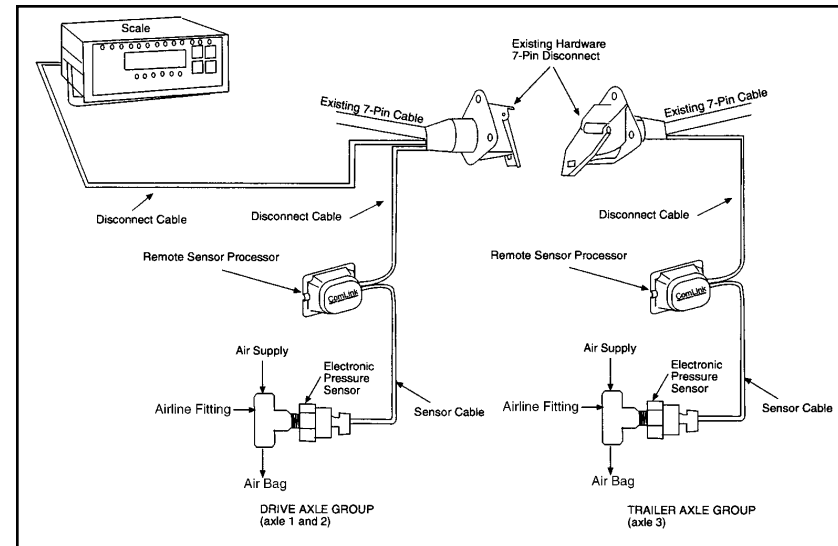
The AXLE GROUP number you select on the scale displays information from the RSP with the corresponding number. For example, when the scale AXLE GROUP 2 light is illuminated, you are reading information from the RSP labeled 2.

INSTALLATION

GENERAL RECOMMENDATIONS

- The pressure sensor may be installed on any airbag in the suspension system, so choose the one easiest to work with.
- Not all disconnect cables are the same length. Determine where each cable will be installed prior to proceeding with the installation. If you do not have enough cable to complete the installation, contact your Air-Weigh distributor or contact Air-Weigh Technical support to receive the cable you need.
- You may cut any ComLink cable to length.
- Do not wire-tie cables until you have installed the entire kit.

- Each tractor and trailer has unique characteristics that should be considered when you install your Air-Weigh scale system. Most importantly is access to the vehicle's existing 7-wire electrical harness. Check the backs of the disconnect sockets for access. If your trailer has a 7-pin junction box close to the trailer axle group, you may want to route the trailer ComLink RSP cable to it instead of the trailer 7-pin disconnect socket. This will reduce installation time.
- Some tractors have under-dash accessibility. Many wiring harnesses are now "plug and play", so drop plugs can be inserted at the backs of light sockets. The trailer rear sill generally has easy access to the Blue circuit.



INSTALLING A SCALE IN THE CAB

Step 1: Select a location for the scale with adequate clearance for the cables.

Step 2: Use the mounting bracket as a template to mark location of two 1/8" holes for the self-tapping mounting screws.

Hint: Do not mount the scale in the bracket until after cables are attached to scale.

Step 3: Attach the Disconnect Cable to the scale and route to a convenient access to the vehicle's existing 7-wire electrical harness. Because you will also be connecting a ComLink processor to the tractor's 7-wire electrical harness, you might not want to connect to the harness until you've decided where both cables are to be routed. You may cut the cables to length, but leave enough length to

tie-wrap the cable after you complete the Installation Pre-Test. See page 6 for recommended connection method.

If connecting at the back of the 7-pin disconnect socket, unbolt the disconnect socket for easier access.

If you purchased a printer with your scale or you plan to interface the scale to a personal computer, plug the serial port cable into the PRINTER data port (RS232 PORT) on the scale back panel. When connecting the printer to the system use the cable provided or any 9-pin serial port extension cable. When connecting a personal computer to the system, use a 9-pin serial port null-modem cable. Refer to the printer or computer manual for operation instructions.

Step 4: Mount scale to bracket.

INSTALLATION CONTINUED

INSTALLING A PRESSURE SENSOR

Note: If you have two height control valves on a single axle group you must use an Air-Weigh Dual Sensor Processor Kit (000-4053) to accurately measure the axle group weight. The kit includes an extra pressure sensor, sensor cable and Dual Sensor Processor to combine air pressure signals from each leveling valve into a single, averaged pressure signal. This signal is then communicated to the ComLink RSP. Follow the instructions in the Dual Sensor Processor Kit for installation before proceeding with the installation.

Note: Sensor fitting size is for 1/4" airlines. Other size fittings available at truck parts stores.

Note: Plan ahead. Once the sensor is completely installed, you will need to secure it to existing airlines and cables with tape.

Caution: Do not plan to tie it to the chassis or any other metal object on the vehicle. This may result in sensor damage and potential grounding.

1. Clean a six-inch section of undamaged airline near an airbag.
2. Cut the airline in the middle of the cleaned area.
3. Push the cut end of each of the airlines completely into the sensor pressure fitting openings.
4. Use electrical tape to secure the sensor to the existing airlines and cables. To avoid potential grounding, tape over the entire metal sensor and fitting. Do not allow the sensor assembly to come into direct contact with other metal.

Caution: Do not apply tape over the end of the black wire protruding out of the cable (approximately five inches down the sensor cable from the brass pressure fittings).

INSTALLING A COMLINK REMOTE SENSOR PROCESSOR (RSP)

The ComLink RSP provides two functions. It stores calibration data that is specific to each axle group and communicates with the scale in the cab by multiplexing digital signals over the vehicle's existing 7-wire electrical harness. It is connected to both a pressure sensor and the vehicle's 7-wire electrical harness.



Each RSP is programmed to communicate its weight information

on a separate axle group channel, so each RSP is identified as either a #1, 2, 3, 4, 5, 6, or 1/2. The #1/2 RSP enables a tractor with

a leaf spring suspension steering axle to be calibrated, and weight be predicted, by measuring the amount of weight transferred to the steer axle (channel #1) from the tractor drive suspension (channel #2). If your tractor has an air-ride steer axle, then order and install the RSP #1 on the steer axle suspension and the RSP #2 on the drive axle suspension, instead of the #1/2 RSP on the drive axles.

If ComLinks are being installed on a fleet that drops and hooks a variety of long-combination vehicles, some planning should be considered so that no two trailer elements with the same ComLink channel number would normally be coupled together. As an example, all jeeps would be channel 3, all trailers channel 4, and all boosters channel 5. If the jeep is dropped, channel 3 would not display a weight, but the trailer would continue to display its weight on channel 4.

Step 1: Locate a flat vertical surface large enough to mount the ComLink RSP within six feet of the Air-Weigh pressure sensor. It is very important that the RSP be mounted so that moisture properly drains out the bottom drain hole.

Step 2: Drill 1/4" mounting holes.

Step 3: Insert the 6' Sensor Cable 5-pin plug into the 5-pin socket on the back of the ComLink RSP.

Step 4: Insert another 50-ft. Disconnect Cable 4-pin plug into one of the 4-pin sockets on the back of the ComLink RSP.



Step 5: Tie-wrap the Sensor Cable and the Disconnect Cable to the RSP housing.

Step 6: Route the 50-ft. Disconnect Cable loose end to a convenient access to the vehicle's existing 7-wire electrical harness. You may cut the cable to length, but leave enough slack to tie-wrap the cable securely. See page 6 for recommended connection method.

NOTE: Do not bolt the ComLink RSP to the frame until after Pre-Test.

INSTALLATION CONTINUED

INSTALLATION PRE-TEST

Step 1: Set the tractor ignition to the ON position and pressurize the vehicle's air suspension. Verify there are no air leaks.

Step 2: The scale will display factory-programmed EMPTY and FULL weights until it is completely calibrated.

Step 3: Verify the scale front panel lights flash on. If the scale lights do not come on, check that the Red/White and Black/Green Disconnect Cable wires are properly connected.

Step 4: Press and release the scale SELECT button repeatedly. Verify the function light moves across the top of the scale front panel.

Step 5: Press and release the SELECT button until the SCAN function light is lit.

Step 6: Verify that the GVW and AXLE function lights alternately are lit as the scale scans each function. When the AXLE function light is lit, each AXLE GROUP light should also light in turn. If AXLE GROUP light does not light, check the indicator light on the

face of the RSP itself for a flashing red light. The Morse code-type flashes are error codes. Refer to page 17 for explanation.

Step 7: Verify the light on the label of each ComLink RSP flashes green.

Step 8: Turn OFF the tractor ignition.

FINISHING TOUCHES ON THE INSTALLATION

Step 1: Use the tie-wraps to form a dip in the Sensor Cable at all sensors. This will help prevent water from running down the cable into the sensor socket.

Step 2: Once the system is installed and passes the Installation Pre-Test, bolt on ComLink RSP and tie-wrap all ComLink cables to the existing tractor and trailer cables, wires and hoses. Seal the wiring connections in an appropriate manner to prevent corrosion.

Leave a small amount of slack in the ComLink cable at all connections.

THE INSTALLATION IS NOW COMPLETE.

NOTE: You must calibrate your Air-Weigh scale before it will display accurate weight readings.

CALIBRATION

BEFORE CALIBRATING THE SCALE, PLEASE NOTE

- Your Air-Weigh scale is only as accurate as the commercial scale weights you use to calibrate.
- Weigh on level ground, with the brakes released and the engine running. Move your truck slightly to make sure the suspension and height control valves have fully inflated to factory-specified ride height. It may take a few minutes for the suspension to fully compensate, depending on the size of the ports and type of height control valve. Calibrate the scale on the weighing platform or on another nearby flat surface. Reapply the brakes after calibration.

Do not leave the truck while the brakes are released.

- When calibrating the drive axles (channel #2), do not include the weight of the steer axles.
- You must complete the entire calibration procedure for both EMPTY and FULL weights before measurements are accurately displayed on the scale. The FULL weight does not need to be precisely up to the maximum legal weight, but the heavier the weight, the more accurate your scale will be.
- Calibration weights must be entered in 20 lb. (10 kgs.) increments.

- The scale does not begin communicating with the RSP until the function light is moved off CAL. After entering a weight, press the ENTER key, then the SELECT key until the AXLE function light is lit, then wait for programming. Do not move the truck or use any of the function buttons on the scale during this time. After about 20 seconds, the display numbers will change. Proceed to the next axle group for calibration.

WEIGHING A LEAF SPRING STEER AXLE

Even though the steer axle may have a leaf spring suspension, the AW5200 scale can still predict its weight by determining how much weight is transferred from the drive axles to the steer axle.

- Set the tractor fifth wheel or turntable to a position that is forward of neutral, so an increase of weight on the drive axles results in an increase of weight on the steer axle. Many truckload operators set it where both the drive axles AND the steer axle are at the maximum GVW limit. Fuel level WILL affect steer axle weight accuracy, but not the drive axle accuracy.
- Calibrate AXLE group #1 for the steer axle weights and #2 for the drive axle weights. The standard tractor ComLink processor provides both #1 and #2 weight display channels.

CALIBRATION CONTINUED

NOTE: For instructions on Weighing a Leaf Spring Steer Axle, see previous page.

ENTERING EMPTY WEIGHTS

Step 1: Weigh the tractor steer axle, the drive axle group, and trailer axle group empty.

The steering axle should not be included in the tractor drive axle calibration. If you wish to display steer axle weights you must calibrate the steer axle separately to AXLE GROUP #1.

Step 2: Immediately enter the weight showing on the certified scale into your Air-Weigh scale.

Enter while the truck is still empty. It is vital for proper calibration that the weight of the vehicle does not change between the time you weigh on the certified scale and the time you enter the calibration weights.

TO ENTER EMPTY WEIGHT FOR AN AXLE GROUP DURING CALIBRATION:

OPERATION	RESULT
1. Press the SELECT key until the AXLE function light is lit.	The AXLE function light is lit.
2. Press the ENTER key.	The AXLE function light and one of the six AXLE GROUP lights flash.
3. Press the SELECT key until the desired AXLE GROUP light is lit.	The display shows the axle's weight (if calibrated) for each axle as each flashing AXLE GROUP light is selected.
4. Press the ENTER key.	The display shows the selected axle's weight. The AXLE function light and AXLE GROUP light stop flashing but remain lit. The desired AXLE GROUP is selected.
5. Press the SELECT key until the CAL function light is lit.	The CAL function light is lit. RSP revision # is displayed.
6. Press the ENTER key.	The CAL function light flashes on and off. Display is blank.
7. Press the ↓ or ↑ key until the correct PIN (Personal Identification Number) is displayed.	The correct PIN number is displayed. (Factory default PIN is 1. If you wish to change the PIN , contact Air-Weigh Product Support.)
8. Press the ENTER key.	CAL light is lit, and the EMPTY and selected AXLE GROUP lights flash on and off. The display shows the current axle empty weight.
9. Press the ↓ or ↑ key to change the EMPTY number on the display. When re-entering the same weight number, press the ↑ button once, then the ↓ button once. This alerts the scale that you really want to re-enter the same number again.	The displayed numbers increase or decrease.
10. When the desired empty weight has been displayed, press the ENTER key.	CAL , EMPTY and AXLE GROUP lights stop flashing. The axle EMPTY weight is entered, but not yet displayed.
11. Press the SELECT key until the AXLE function light is lit.	The CAL function light extinguishes. The AXLE function light is lit (the SCAN function light is not lit). The display should read 0. If not, calibration was not entered.
12. Wait until the display changes from 0 to a four- or five-digit number. The scale will not display the correct weight until both the EMPTY and the FULL weight calibrations are completed.	The display changes from 0 to a four- or five-digit number. The number may not be the correct weight until both the EMPTY and the FULL weight calibration is completed.

Step 3: To enter the empty weight of axle group 3 (the trailer axles):

1. Weigh the trailer axle group only.
2. Immediately enter the weight showing on the certified scale receipt into the Air-Weigh scale while the trailer is still empty.
3. Follow steps 1 - 12 above.

After entering the empty weight numbers, be sure to **SELECT** the function light to **AXLE** and wait for the display to change from 0 to a four- or five-digit number.

Step 4: Repeat this procedure for each additional axle group you wish to calibrate.

CALIBRATION CONTINUED

ENTERING FULL WEIGHTS

Step 1: Weigh the tractor drive axle and the trailer axle groups fully loaded. Load the trailer and connect it to the tractor.

If possible, use the same certified scale that was used for the empty weights.

The steering axle should not be included in the tractor drive axle calibration. If you wish

to obtain steer axle weights you must calibrate the steer axle separately.

Step 2: Immediately enter the weight showing on the certified scale receipt into the Air-Weigh scale. Enter while the trailer is still loaded. The vehicle need not be fully loaded to the maximum weight, but the greater the difference between empty and loaded, the more accurate the calibration and display.

TO ENTER FULL WEIGHT FOR AN AXLE GROUP DURING CALIBRATION:

OPERATION	RESULT
1. Press the SELECT key until the AXLE function light is lit.	The AXLE function light is lit.
2. Press the ENTER key.	The AXLE function light and one of the six AXLE GROUP lights flash.
3. Press the SELECT key until the desired AXLE GROUP light is lit.	The display shows the axle's weight (if calibrated) for each axle as each flashing AXLE GROUP light is selected.
4. Press the ENTER key.	The display shows the selected axle's weight. The AXLE function light and AXLE GROUP light stop flashing but remain lit. The desired AXLE GROUP is selected.
5. Press the SELECT key until the CAL function light is lit.	The CAL function light is lit.
6. Press the ENTER key.	The CAL function light flashes on and off.
7. Press the ↑ key until the correct PIN (Personal Identification Number) is displayed.	The correct PIN number is displayed. (Factory default PIN is 1. If you wish to change the PIN , contact Air-Weigh Product Support.)
8. Press the ENTER key.	CAL light is lit, and the EMPTY and selected AXLE GROUP lights flash on and off. The display shows the current axle empty weight.
9. Press the SELECT key once to light the FULL function light.	The FULL function light is lit.
10. Press the ↓ or ↑ key to change the FULL number on the display. When re-entering the same weight number, press the ↑ button once, then the ↓ button once. This alerts the scale that you really want to re-enter the same number again.	The displayed numbers increase or decrease.
11. When the desired FULL weight has been displayed, press the ENTER key.	CAL , EMPTY and AXLE GROUP lights stop flashing. The axle FULL weight is entered, but not yet displayed.
12. Press the SELECT key until the AXLE function light is lit.	The CAL function light extinguishes. The AXLE function light is lit (the SCAN function light is not lit). The display should read 0. If not, calibration was not entered.
13. Wait until the display changes from 0 to a four- or five-digit number. The scale will not display the correct weight until both the EMPTY and the FULL weight calibrations are completed.	The display changes from 0 to a four- or five-digit number. The number may not be the correct weight until both the EMPTY and the FULL weight calibration is completed.

Step 3: To enter the full weight of axle group 3 (the trailer axles):

1. Weigh the trailer axle group only.
2. Immediately enter the weight showing on the certified scale into the Air-Weigh scale. Enter the weight while the truck is still loaded.
3. Follow steps 1 - 13 above.

After entering the empty weight numbers, be sure to **SELECT** the function light to **AXLE**

and wait for the display to change from 0 to a five digit number.

If both **EMPTY** and **FULL** numbers have been calibrated, the display should now be showing a weight that is within a few pounds of what you entered.

Step 4: Repeat this procedure for each additional axle group you wish to calibrate.

OPERATION

TURNING THE SCALE SYSTEM ON

Step 1: Turn ON power to the scale.

Step 2: If the ComLink RSP is communicating with the scale properly, each active AXLE GROUP light will flash periodically and the light on each RSP will flash green repeatedly.

WEIGHING

Once calibrated, the scale will display the actual on-the-ground weight of each axle group to within 200 - 300 lbs. (125 kgs.) of an accurate platform scale. Weight will be displayed in 50 lb. (20 kgs.) increments. To some extent, accuracy depends on weighing the vehicle on a flat and level surface and the physical characteristics of the air suspension system itself. The vehicle's suspension system must be operating properly and its leveling, or height control valve must be set at the factory-specified ride height.

Step 1: Weigh on flat and level ground, with the brakes released and the engine running. Move the vehicle slightly to make sure the suspension and height control valve have fully inflated to factory-specified ride height. It may take a few minutes for the suspension to fully compensate, depending on the size of the ports and type of height control valve you have. Reapply the brakes after weighing.

If you must leave the cab while the brakes are released, block the wheels.

If you are on an incline, or in a pothole, weights will vary.

Forward, backward and left to right incline will alter weights. To a small extent, even winds may affect the readout as it rocks the vehicle on the suspension.

Step 2: Then do one of the following:

- Select an AXLE GROUP to weigh; or
- Select GVW to total the weight on all active axle groups with RSPs; or
- Select SCAN to scan between all active axle groups; or

- Select PORT and press and release the ENTER key to download weight data (only if you have installed a printer, personal computer, and/or communications equipment to the serial ports on the rear panel of the scale).

Reapply brakes after weighing.

DROP AND HOOKING TRAILERS

It is imperative that you do not install identically numbered RSPs on the same tractor/trailer combination. We recommend that you develop a fleet-wide channel numbering plan (call Air-Weigh Product Support at 800-938-2500 for assistance in your plan). Generally, numbering should start with channel #1 on the steer axle, then assign channels towards the rear of the vehicle (#2 on the drive axles, #3 on the trailer, etc.). If you have any jeeps in your fleet, you may want to reserve channel #3 for jeeps (when a jeep is not in place, the scale will skip channel #3, displaying #1, 2, and 4, etc.).

Maintaining consistency throughout a fleet of tractors and trailers allows trailers to be swapped freely.

The AXLE GROUP number you select on the scale displays information from the RSP with the corresponding number. For example, when the scale AXLE GROUP 2 light is illuminated, you are reading information from the RSP labeled 2.

TO FINE-TUNE WEIGHT DISPLAY

For the most accurate weighing, fine tune only when the vehicle is most heavily loaded.

Step 1: Select the AXLE GROUP that you wish to fine-tune.

Step 2: Set the scale to the CAL mode.

Step 3: Re-enter a new FULL weight. When re-entering the same weight number, press the ↑ button once, then the ↓ button once. This alerts the scale that you really want to re-enter the same number again.

OPERATION CONTINUED

TO OPERATE THE SERIAL PORT

The RS232 serial port permits connecting with on-board computers, printers and satellite communications equipment.

The serial port has been programmed to provide multiple print reports, each with exactly the same data (including date/time). At the instant the PORT function is selected and the PORT light becomes lit, the report data is stored for the serial port. Operator must SELECT another function before the report data is updated.

PRINTING REPORTS

Any serial-type printer can be used with the AW5200 scale.

There are two types of data reports available:

1. Weight Receipt Report – Report includes date, time, weight of each axle group, GVW, net change of payload weight, and signature lines for driver and customer.
2. Calibration Report – Calibration information from each ComLink RSP will be printed.

There are currently two types of printers available from Air-Weigh:

- Model P2242 – a 4" graphics printer that is customizable
- Model DPU-201GS – a 2" text-only printer

Printers supplied by Air-Weigh are powered by the scale through the RS232 serial port and printer cable. Plug one end of the PRINTER CABLE into the PRINTER 9-pin RS232 serial port. Plug the other end of the cable directly into the PRINTER 9-pin RS232 serial port on the back of the scale. Read and follow instructions included with printer.

Air Weigh Scale Report	
Time:	08:39:51
Date:	06/13/98
Axle	Weight - Pounds
1	Not Calibrated
2	Not Calibrated
3	11200
4	7100
5	15500
6	Not Calibrated
GVW	= 48500
NET	= 3325
Driver	
Accepted By	

Weight Report

Air Weigh Calibration Data	
Time:	08:19:13
Date:	04/08/95
Axle 1	Not Present
Axle 2	Not Present
Axle 3	Calibration Data
Ratio	45.888
Offset	5555
Module Type	A
Unit Status	Passed
Software Rev	C
Last Cal Date	02/26/96
Last Cal Time	11:54
Serial Number	0000000
Axle 4	Not Present
Axle 5	Not Present
Axle 6	Not Present

Calibration Report

QUALCOMM OMNITRACS REPORTS

The report includes date, time, weight of each active axle group and GVW. The scale display will blank momentarily when the ENTER key is pressed. The weight data has been transferred when the scale display illuminates. Verify the MSGS BEING SENT: indicator on the QUALCOMM display increases by one message. Once the weight data is successfully transmitted, the MSGS BEING SENT: will decrease.

ON-BOARD COMPUTERS

To interface with a computer, you must first install a standard communications software package. Contact your local dealer for Air-Weigh 5000 Serial Port Application Notes or call Air-Weigh Product Support at 800-938-2500 during normal U.S. West Coast business hours. If connecting to a computer, follow any additional instructions that accompany the computer software.

TO USE THE SERIAL PORT

Press and release the SELECT key until the PORT function light is lit. Press the ↓ or ↑ until the desired Port Menu Selection number appears on the display. Press the ENTER key to download the data through the serial port.

PORT MENU SELECTION NUMBERS

1. Printer Model P2242 WEIGHT REPORT
2. Printer Model P2242 CALIBRATION REPORT
3. QUALCOMM OmniTRACS REPORT
4. Printer Model DPU-201GS WEIGHT REPORT
5. Printer Model DPU-201GS CALIBRATION REPORT

OPERATING FUNCTIONS

SELECTING AN AXLE

OPERATION	RESULT
1. Press the SELECT key until the AXLE function light is lit.	The AXLE function light is lit.
2. Press the ENTER key.	The AXLE function light and one of the six AXLE GROUP lights flash.
3. Press the SELECT key until the desired AXLE GROUP light is lit.	The display shows the axle weight (if calibrated) for each axle as each flashing AXLE GROUP light is selected.
4. Press the ENTER key.	The display shows the selected axle's weight. The AXLE function light and AXLE GROUP light stop flashing. The desired AXLE GROUP is selected.

DISPLAYING IN KILOGRAMS

OPERATION	RESULT
1. Press the SELECT key until the CAL function light is lit.	The CAL function light is lit.
2. Press the ↓ key.	The CAL and KILO function lights are lit. Display reads weights in kilograms.

DISPLAYING IN POUNDS

OPERATION	RESULT
1. Press the SELECT key until the CAL function light is lit.	The CAL function light is lit.
2. Press the ↑ key.	The KILO function light is turned off. Display reads weights in pounds.

SELECTING SCAN

OPERATION	RESULT
1. Press the SELECT key until the SCAN function light is lit.	The SCAN function light is lit. Each active AXLE GROUP light and the GVW and AXLE function lights alternately are lit.

DISPLAY GROSS VEHICLE WEIGHT (GVW)

OPERATION	RESULT
1. Press the SELECT key until the GVW function light is lit.	The GVW function light is lit. The display shows the gross vehicle weight.

USING THE NET FUNCTION

The **NET** function is used to set a zero benchmark against the current **GVW**. Weight added or removed is then displayed as the change in **GVW** weight. Once the scale has been zeroed, you may select and operate any of the other functions, then return to **NET** to monitor the net payload change, or select **PORT** to print or otherwise transfer data through the serial port.

OPERATION	RESULT
1. Press the SELECT key until the NET function light is lit.	The NET function light is lit. The display shows the current NET value. The NEG indicator is lit if the displayed value is negative.
2. Press the ENTER key.	The NET function light flashes on and off.
3. Press the ENTER key again.	The NET function lights stop flashing. The zero displayed. Any change in weight will result in a change of displayed weight. The NET function is now set.

OPERATING FUNCTIONS CONTINUED

DISPLAYING THE NET VALUE

OPERATION	RESULT
1. Press the SELECT key until the NET function light is lit.	The CAL function light is lit. The display shows the current NET value. The NEG indicator is lit if weight has been removed since the NET function was zeroed.

DISPLAYING TIME

OPERATION	RESULT
1. Press the SELECT key until the TIME function light is lit.	The TIME function light is lit. The display shows the current time in the following format: HHMMSS. HH = Hours MM = Minutes SS = Seconds Note: 24-hour clock

SETTING THE 24-HOUR CLOCK TIME

OPERATION	RESULT
1. Press the SELECT key until the TIME function light is lit.	The TIME function light is lit. The display shows the current time in the following format: HHMMSS. HH = Hours MM = Minutes SS = Seconds Note: 24-hour clock
2. Press the ENTER key.	The TIME function light flashes on and off, and the clock stops.
3. Press the ↓ or ↑ key to change the displayed TIME .	The displayed time increases or decreases. Seconds changes first, then minutes and hours.
4. When you reach the desired time value, press and release the ENTER key.	The clock starts and the TIME function light stops flashing. The time is now set.

DISPLAYING THE DATE

OPERATION	RESULT
1. Press the SELECT key until the DATE function light is lit.	The DATE function light is lit. The display shows the current date in the following format: MMDDYY. MM = Month DD = Day YY = Year

SETTING THE DATE

OPERATION	RESULT
1. Press the SELECT key until the DATE function light is lit.	The DATE function light is lit. The display shows the current date in the following format: MMDDYY. MM = Month DD = Day YY = Year
2. Press the ENTER key.	The DATE function light flashes on and off.
3. Press the ↓ or ↑ key to change the displayed TIME .	The displayed date increases or decreases. Year changes first, then day and month.
4. When you reach the desired DATE value, press the enter key.	The DATE function light stops flashing. The date is now set.

OPERATING FUNCTIONS CONTINUED

USING CALIBRATION ACCESS PIN NUMBERS

OPERATION	RESULT
1. Press the SELECT key until the CAL function light is lit.	The CAL function light is lit.
2. Press the ENTER key.	The CAL function light flashes on and off.
3. Press and hold the ↓ or ↑ key until the correct Personal Identification Number (PIN) is displayed.	The valid password is displayed. (Factory default PIN is #1. If you wish to change the PIN , contact Air-Weigh Product Support.)
4. Press the ENTER key.	The CAL function light is lit and the EMPTY and the selected AXLE GROUP lights flash on and off. The display shows the current axle group empty weight.

DISPLAYING THE AXLE FULL WEIGHT ENTERED DURING CALIBRATION

OPERATION	RESULT
1. Select the desired AXLE GROUP . (See SELECTING AN AXLE .)	The display shows the selected axle weight. The AXLE GROUP is selected.
2. Press the SELECT key until the CAL light illuminates.	The CAL function light illuminates.
3. Press and hold the ↓ or ↑ key until the correct Personal Identification Number (PIN) is displayed.	The valid password is displayed. (Factory default PIN is #1. If you wish to change the PIN , contact Air-Weigh Product Support.)
4. Press the ENTER key.	CAL , EMPTY and the selected AXLE GROUP light flash. The display shows the current axle empty weight.
5. Press the SELECT key once, so the FULL function light is lit.	The CAL and FULL function lights and the selected AXLE GROUP light flashes on and off. The display shows the FULL weight value used during the last calibration.

DISPLAYING THE AXLE EMPTY WEIGHT ENTERED DURING CALIBRATION

OPERATION	RESULT
1. Select the desired AXLE GROUP . (See SELECTING AN AXLE .)	The display shows the selected axle weight. The AXLE GROUP is selected.
2. Press the SELECT key until the CAL light is lit.	The CAL function light is lit.
3. Press and hold the ↓ or ↑ key until the correct Personal Identification Number (PIN) is displayed.	The valid PIN is displayed. (Factory default PIN is #1. If you wish to change the PIN , contact Air-Weigh Product Support.)
4. Press the ENTER key.	CAL , EMPTY and the selected AXLE GROUP light flash on and off. The display shows the EMPTY weight value used during the last calibration.

TROUBLESHOOTING TIPS

If you cannot correct the problem, or you suspect you have a malfunctioning part, please contact AIR-WEIGH PRODUCT

SUPPORT at (800) 938-2500, Mon. - Fri., 8 am - 5 pm Pacific Time. Outside U.S. and Canada, please call (541) 342-1521.

PROBLEM: THE SCALE WILL NOT DISPLAY AN AXLE GROUP'S WEIGHT.

CAUSE	SOLUTION
If two ComLink RSPs with the same axle group channel number are installed on a tractor and trailer, neither one will be able to communicate with the scale.	Verify you do not have duplicate RSP channel numbers in the scale system.
If the missing weight display is from the trailer, the 7-wire disconnect cord may not be connected.	Verify the disconnect sockets are connected and wired correctly.

PROBLEM: THE RSP IS NOT FUNCTIONING.

CAUSE	SOLUTION
The ComLink RSP is not receiving power.	If AXLE GROUP light does not light, check the indicator light on the face of the RSP itself for a flashing red light. The Morse code-type flashes are error codes.

PROBLEM: THE COMLINK RSP IS FLASHING RED, BUT NOT COMMUNICATING.

The RSP will indicate error conditions by blinking an error code on its red LED. The message is similar to Morse code. The LED will flash a "dash" with a 1.5-second red light. It will flash a "dot" with a brief 0.2-second red light. All error messages consist of a set of four flashes.

CODE	CAUSE	SOLUTION
. . . _	Voltage input too low (less than 8 VDC).	Check power source and connections to RSP.
. . . .	RSP internal voltage is either too high or too low.	Remove and replace RSP.
. . _ _	Voltage to pressure sensor is too low.	Disconnect sensor cable from sensor. If the RSP error code ceases, then the sensor has an internal short. Remove and replace sensor.
. . . _	RSP is functioning properly, but is not communicating with the scale.	Check all wiring connections for shorts or miswired connections.
. _ . .	RSP has an internal A/D converter error.	Remove and replace RSP.

PROBLEM: THE SCALE IS READING 000000 OR LOCKED ON A NUMBER.

CAUSE	SOLUTION
An open wire, a bad ground, or mismatched color coding connection.	Check all wire connections and color coding at the 7-wire sockets or junction boxes. There is a remote chance that the pressure sensor is malfunctioning.

PROBLEM: IMMEDIATELY AFTER CALIBRATION, THE SCALE DOES NOT DISPLAY PROPER WEIGHTS.

CAUSE	SOLUTION
Calibration error.	Recalibrate the inaccurate axle group.

TROUBLESHOOTING TIPS CONTINUED

NOTES

PROBLEM: INACCURATE WEIGHT READINGS OR READINGS THAT VARY.

<p>CAUSE Generally, varying weight readings result from bad mechanical connections in and around the leveling valve, or a leveling valve set at an incorrect ride height.</p>	<p>SOLUTION Check the bushing, mounting bolts, and radius rod of the leveling valve for looseness or wear. An old valve may be worn out or a new one may be improperly adjusted. Improper ride height will distort the air bags, resulting in erroneous pressure readings.</p>
<p>CAUSE Weighing on uneven or unlevel ground. Not releasing the parking brake when weighing.</p>	<p>SOLUTION Weigh on a flat and level surface. A leveling bubble in the cab will help you find a suitable surface. Allow the air suspension to come up to its full factory-specified ride (the weight readings will settle down when the air pressure stabilizes). Release brakes while weighing to eliminate suspension binding.</p>
<p>CAUSE Improper calibration of the scale.</p>	<p>SOLUTION Recalibrate inaccurate axle groups according to instructions.</p>
<p>CAUSE An adjustment was made to the leveling valve or the air bags were replaced after calibration.</p>	<p>SOLUTION Recalibrate the affected axle group.</p>

PROBLEM: PRINTER PRINTS A SERIES OF ??????????.

<p>CAUSE Error caused by printing Report 1 or 2 to printer Model DPU-201GS.</p>	<p>SOLUTION Turn power OFF, then ON. Reprint.</p>
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MAINTENANCE

SCALE

The Air-Weigh electronic scale should be maintenance-free under normal operation. Keep the scale in a protected environment and treat as any electronic component.

DISCONNECTS

Periodically spray the 7-pin sockets and plugs with electrical cleaner. A good electrical connection is vital for proper operation. Make every effort to keep moisture out of the disconnect socket while the system is in operation.

COMLINK RSP

The Air-Weigh ComLink RSP should be maintenance-free under normal operating conditions. Use care when selecting a location for the RSP. Select a location that minimizes the amount of moisture and flying objects that comes in contact with the RSP.

SENSORS

Periodically inspect the sensor connections. Do not grease the sensor plug-in socket.

Air-Weigh™
U.S. & FOREIGN PATENTS

THE ACCURATE ON-BOARD ELECTRONIC SCALE
for Air-Ride Trucks & Trailers™

Patents #5,478,974; #623,635; #4,832,141

Hi-Tech Transport Electronics, Inc.

2895 Chad Drive • Eugene, Oregon 97408-7345 USA P.O. Box 70301 • Eugene, Oregon 97401-0117 USA
Telephone (541) 342-1521 • Order Desk (800) 938-2500 • Fax (541) 342-3307 • Internet: www.air-weigh.com

IP-7123058

P/N: 901-0500-009