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800090-Dröv AirBoxOne® Installation

1 Purpose and Scope

This document provides step-by-step installation instructions for the Dröv AirBoxOne® Smart Trailer System. It covers the complete physical installation of the AirBoxOne® gateway hub and all associated components including pneumatic connections, sensors, and electrical wiring.

Intended Audience: Trained trailer technicians and installers familiar with commercial trailer air brake systems, pneumatic plumbing, and basic electrical wiring.

Applicable Trailer Types: This guide covers installation on dry van, refrigerated, tanker, CNG, and flatbed trailer configurations with single or tandem axle suspensions.

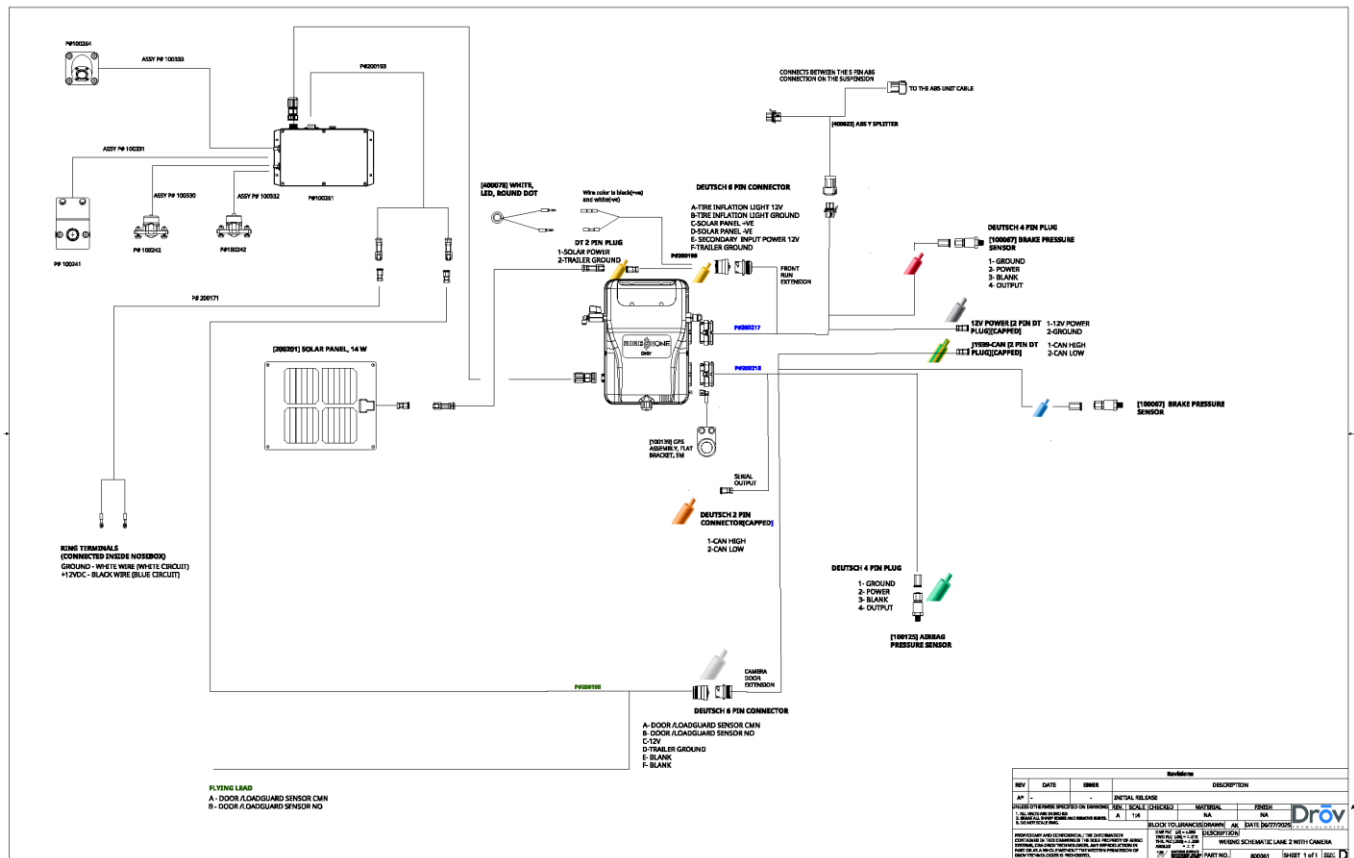


Figure 1 AirBoxOne® Smart Trailer System Overview

2 Specifications

2.1 AirBoxOne® Hub Specifications



Parameter	Value
Size	305 x 334 x 110 mm
Weight	8.3 lbs
Voltage Input	8–16 VDC
Current	2A
Battery	3.7 V Li-Ion, 30 AH
Wireless Interfaces	Wi-Fi 802.11 ac/a/b/g/n (2x2) LTE CAT1 BLE 5.0 Sub-1 GHz (433 MHz) GPS ZigBee LoRa
Wired Interfaces	CAN CAN – J1939 RS485 Ethernet (1 Gbps)
Memory	1 GB RAM, 8 GB ROM, 64 GB Memory Card

USB	2.0 (2 Ports)
Temperature Range	-40°C to 85°C
Solar Charging	Supported
Digital Input	3 Ports
Digital Output	2 Ports
Maximum Input Pressure	150 psig
Thermocouple (K Type)	4 Ports
Analog Sensor	6 Ports
Solenoid Valve	4 Valves Supported(internally)
J2497 PLC	Supported
RTC (Real Time Clock)	Supported
Accelerometer Motion Detection	Supported
Door Sensor Input	Supported
Internal Temp/Humidity Sensor	Supported

2.2 AirBoxOne® Battery Specifications

Parameter	Value
Cell	18650 2500 mAh (min)
Cell Configuration	1S12P
Capacity (@20°C)	30000 mAh (min)
Nominal Voltage	3.7V
Shipping Voltage	≥ 3.8V
Charging Voltage	4.2V
Discharging Cut-Off Voltage	2.4 ± 0.1V
Internal Impedance	≤ 50 mΩ
Pack Weight	570 g
Standard Charge	0.2C (6A) CC to 4.2V, then CV until current ≤ 0.02C (20 ± 5°C)
Rapid Charge	CC 8A, CV 4.2V, 0.02C cut-off
Standard Discharge	CC 0.2C (6A), end voltage 2.4 ± 1V
Max Constant Discharge Current	CC 10A, end voltage 2.4 ± 1V (max peak 12–16A)
Working Temperature	Charge: 0 to 45°C, Discharge: -20 to 60°C
Overcharge Protection Voltage	4.28 ± 0.05V
Battery Chemistry	Li-NCM

2.3 Radio Frequency Specifications

Interface	Band / Frequency	Notes
LTE	B2, B4, B5, B12, B13	CAT1
Wi-Fi	2.4 GHz and 5 GHz	802.11 ac/a/b/g/n
Bluetooth	2.4 GHz (ISM)	BLE 5.0
ZigBee	2.4 GHz (ISM)	
LoRa	915 MHz (ISM, North America)	
Sub-1 GHz	433 MHz	Receive only
GPS	L1-band (1.57542 GHz)	Receive only

2.4 Torque Specifications Reference

Component / Fastener	Torque (Imperial)	Torque (Metric)
AirBoxOne® bracket-to-unit (T25 hardware)	63 in-lbs	7 Nm
AirBoxOne® unit-to-bogie frame	17 ft-lbs	23 Nm
GPS antenna fasteners	10 ft-lbs	14 Nm
SMA camera/antenna connectors	5 in-lbs	0.56 Nm
Exterior camera/bracket fasteners (1/4 in.)	10 ft-lbs	14 Nm
Inflation hose swivel fittings	1/4 turn past hand tight	—
Rotary union fittings	1/4 turn past hand tight	—
Trailer wheel lug nuts (SKF sensor)	350–450 ft-lbs	Per trailer manufacturer

3 Installation Tools Required

The following tools are required to complete the AirBoxOne® installation. Verify all tools are available before beginning work.

Tool	Notes
SAE and Metric Combination Wrench Set	
SAE 1/4" Ratchet and Socket Set (5/16–1/2")	
Metric 1/4" and 3/8" Ratchet and Socket Sets	8–19 mm
SAE 3/8" Ratchet and Socket Set (3/8–3/4")	
3/8" Extension Set	
Cordless Drill	
Cordless Impact Gun	Must be capable of tightening/removing semi-trailer lug nuts
Drill Bit Set (5/16", 7/16", 3/4", 7/8" step, 7/32")	Jobber length recommended for confined axle spaces
1/4–18 NPT Tap and Handle	For threading axle holes
33 mm Impact Socket	For trailer wheel lug nuts
Ball Peen Hammer Set	
Pry Bar / Heel Bar Set	For Welsh plug removal
Adjustable Wrenches (6", 8", 10")	
Metric Hex Key Allen Wrench Set	2.5 mm and 8 mm required
Standard Hex Key Allen Wrench Set	3/16", 7/64", 1/8" required
Phillips and Flat Head Screwdriver Set	
9/16" Wrench	For TPMS sensor installation
Wire Stripper, Cutters, Crimpers	For butt and bullet connectors
Multimeter	For sensor and door switch verification
Heat Gun	For heat-shrink connections
Center Punch Set	For marking drill locations
Torque Wrench	Required for spec'd fasteners
Zip Ties (8" and 11")	For securing wiring harnesses
Shop Rags	
Cutting / Drilling Oil	For axle drilling
Thread Sealant (Permatex or equivalent)	For NPT thread connections
Rust-Resistant Spray Paint	For sealing drilled holes
90-Degree Air Die Grinder	
Gasket Scraper	

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4 Revision history

Date	Author	Revisions	Review Date
03/15/2026	A Kulkarni	Initial Release	03/25/2026

5 Related documents:

Description	File \ Document Name
Dröv Technologies Parts Catalog	Dröv Technologies Parts Catalog.docx
Camera VCU install	800084- Camera VCU install user guide

6 Pre-Installation Checklist

Before installing the AirBoxOne® Smart Trailer System, completely inspect the trailer to verify all systems and components are safe, working correctly, and operational. Make repairs necessary before beginning installation. Document and photograph any trailer damage or maintenance issues found before beginning.

Inspection Item	Status (YES / NO)	Comments
Trailer frame and cross members in good condition		
Trailer sidewalls in good condition		
Trailer bulkhead in good condition		
Trailer doors in good condition		
Trailer interior walls, floor, and bulkhead in good condition		
All trailer lighting circuits working		
Trailer brakes and ABS system working correctly		
Trailer air systems working correctly		
Trailer wheels, tires, and lug nuts in good condition		
Suspension air bags, bogie, and shocks in good condition		
Trailer hubs and axle seals in good condition		
Trailer landing gear in good condition		
Component installation locations discussed and approved		
Field	Value	
Trailer Number		
Trailer Fleet / Owner		
AirBoxOne® MAC ID Number		
Installer / Technician Name		
Company / Dealership Name		
Date Installation Started		

7 Safety Information

WARNING

The AirBoxOne is equipped with a backup battery and may pressurize the system even when the trailer is disconnected from power. Observe proper ESD precautions when handling electronic components.

WARNING

Before inspecting or servicing this unit, technicians MUST put on all PPE required for the work being undertaken (e.g., cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE, and arc flash clothing). ALWAYS refer to the applicable Material Data Safety Sheets (MSDS) and OSHA guidelines for proper PPE.

WARNING

All tests and measurements described in this manual may only be performed by trained and qualified electrical engineering technicians. The corresponding electrical safety rules must be strictly followed.

WARNING

The system is pressurized and connects to the pressurized trailer air brake and air suspension systems which could cause serious injury or even death.

CAUTION

Ensure the 7-way power is disconnected from all power sources before starting installation on the trailer

CAUTION

Always wear safety goggles or glasses. Pressurized air from the trailer air brake, air suspension, and flying debris can cause serious eye injury. Always wear safety glasses when performing trailer maintenance, service, repair, and installations. Protect eyes and skin from particle penetration when working with or using low or high air pressure systems.

CAUTION

Do not exceed the torque spec specified in the table. Over-torquing may damage the product.

CAUTION

Improper maintenance, installation, service, or repair can cause damage to the vehicle, trailer, and other property, personal injury, unsafe operating conditions, and potentially void the manufacturer's warranty.

NOTICE

All drilled and sealed mounting locations must be inspected and resealed yearly to prevent moisture ingress.

NOTICE

All connections for the AirBoxOne harness must be accurate according to the labeling and color bands on each harness. Incorrect connections can damage the internal circuitry of AirBoxOne and other components.

8 AirBoxOne® battery installation and mounting

WARNING: Observe proper ESD precautions when handling electronic components. Verify correct polarity before connecting the battery. Incorrect connection may damage the AirBoxOne® control board. Ensure the unit is powered off before opening the battery housing.

1. AirBoxOne® is supplied with battery installed, but not connected, in the box.
2. Before mounting the AirBoxOne®, unscrew the battery housing as shown in Figure 1 and connect the 3 pin connector of the battery inside the housing.

Battery enclosure screw

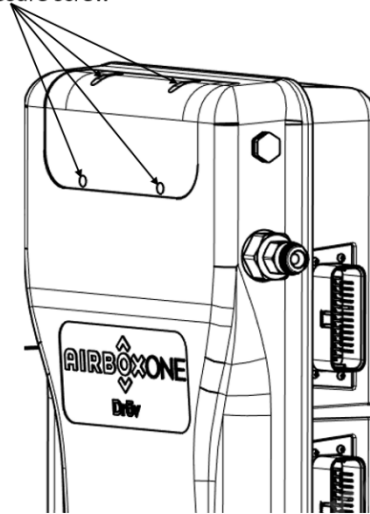


Figure 2 Battery enclosure location

Battery connector location

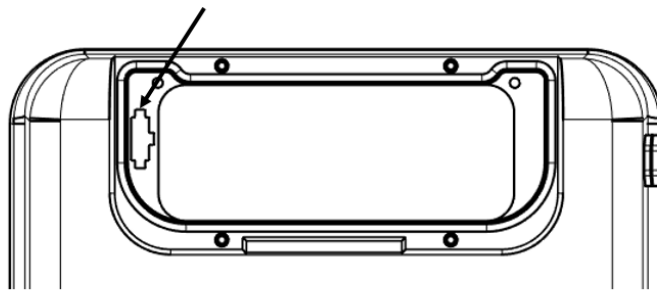


Figure 3 Battery connector location

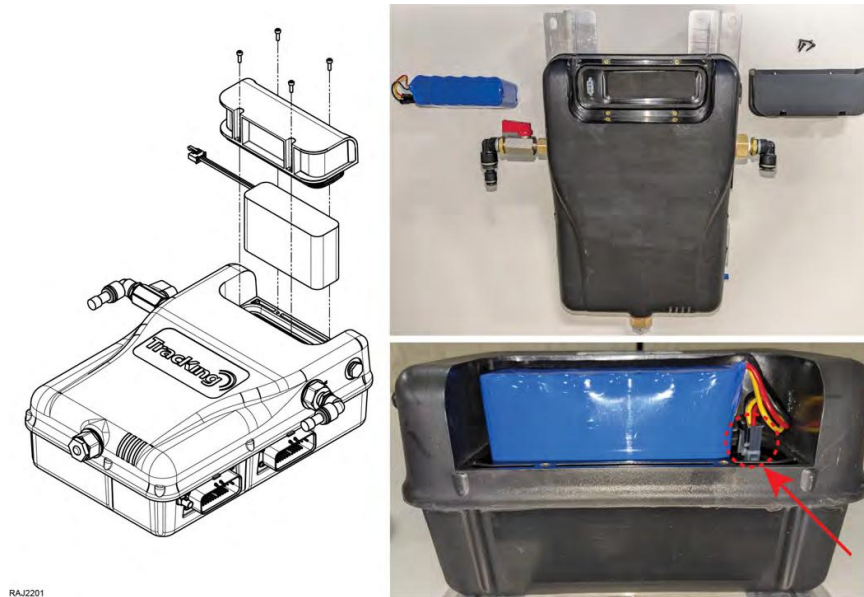


Figure 4 Battery install location

3. Screw lid back on to the main enclosure. Use 2.5 mm Hex tool to torque the battery cover to the AirBoxOne® to 5 in-lbs

9 AirBoxOne® Installation

1. Choose a suitable location for AirBoxOne® on the front cross member of the suspension. The recommended location of the gateway hub is on the front of the trailer suspension frame.
2. Before drilling, make sure there is no interference with other components on the suspension or trailer frame.
NOTE: If a suitable location cannot be found, consult Drov engineering for bracket options.
3. Drill 5/16" hole according to the bracket provided.
NOTE: If drilling into a ferrous metal like steel, use rust resistant spray paint to cover the drilled holes.
4. Mount the bracket to the AirBoxOne using the thread forming screws provided in the kit. Torque to 63 in-lbs (7Nm).
5. Mount the AirBoxOne® using the 5/16" bolts and lock nuts provided in the kit. Torque unit-to-frame bolts to 17 ft-lbs (23 Nm).



Figure 5 AirBoxOne Mounting example

10 GPS antenna

1. The GPS (Global Positioning Satellite) antenna is mounted external to the suspension.
2. Choose a suitable position for the GPS antenna with clear Line of Sight(LOS). The GPS puck must be facing outward or upwards.
3. Route the cable to the AirBoxOne® using Zip ties and P-clamps. The cable length is 15 ft.

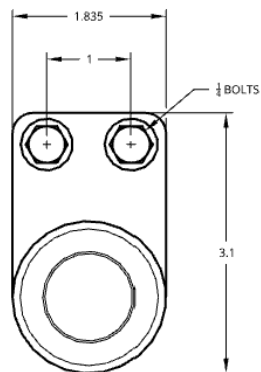


Figure 6 GPS dimensions



Figure 7 GPS location example 1



Figure 8 GPS location example 2

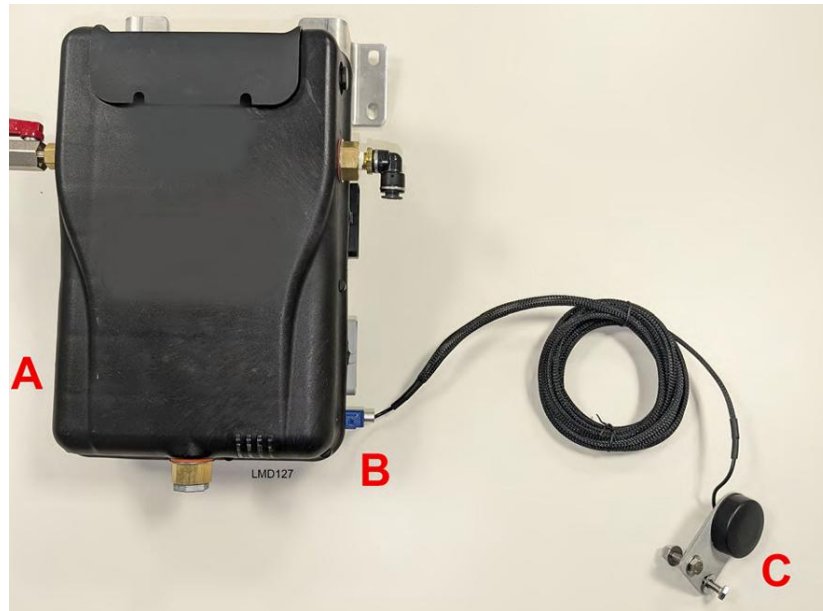


Figure 9 GPS connection to AirBoxOne

4. Place the antenna on the mounting location and drill two holes for the ¼" bolts.
5. Mount the GPS Antenna(C) and tighten the fasteners to 10 ft-lbs (14 Nm).
6. Insert the blue colored FAKRA connector into the connection on the box. You should hear a snap sound when plugged in.
7. Check that the connector is fully seated by pulling on the connector (B), being careful not to put any strain on the cable. Reseat the connector if necessary.

11 Tire inflation Warning Light

1. Identify a suitable location for the tire inflation light, commonly called a PSI light, on a forward-facing surface on the curb side of the trailer. Typical locations are shown below.



Figure 10 Dry Van- Refrigerated trailer



Figure 11 Rear tandem fender location for tankers



Figure 12 Rear corner position for CNG units.

2. Drill a 3/4" hole where the light needs to be mounted.
3. Using existing channels for airlines and wiring if possible, route the 2-wire cable from the warning light to the AirBoxOne® harness at the trailer suspension mount.
4. Connect the Tire inflation extension harness (P/N 200199) to the warning light

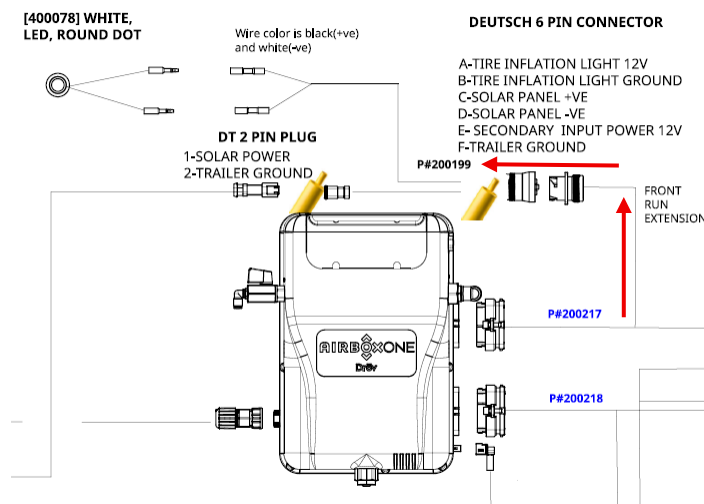


Figure 13 Wiring connection

5. Affix the information label adjacent to the tire inflation light.



This vehicle is equipped with an AirBoxOne system from Dröv Technologies which monitors the pressure of each tire. If the tire pressure is low the indicator light will illuminate.

Note: If equipped with an automatic tire inflation system it may take up to 10 minutes at the start of a trip for the tires to fully inflate and the indicator light to turn off.

If the indicator light comes on during a trip pull off the road safely and inspect your tires and Dröv System for damage or malfunction.

Report any problem to your dispatcher or maintenance supervisor or contact Dröv's Customer Service at 1-844-375-3768.

To disable the system: Close the red shut off valve located on the control box.



For more information,
scan the code below:



800031 Rev A

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Patents: drovtechnologies.com/patents

Figure 14 Tire inflation light label

12 TPMS Sensor Installation

IMPORTANT: The TPMS sensors may not be pre-configured for your system. They must each be configured using the fleet management user interface (UI) after installation. Refer document number for instructions.

Identify the tire location of each TPMS sensor. Sensors are labeled with their correct wheel position. Install each sensor at its designated location.



Sensor and Jam Nut on Junction

Figure 15 TPMS Sensor

12.1 Type A — Trailer Has Tire Inflation System Without Valve Stem Hose Junctions

1. Unthread the air hoses from the wheel valve stems.
2. Thread the swivel side of the TPMS sensor to the tire valve stem. Sensors are individually labeled for installation location.
3. Hand tighten the sensor to the valve stem.
4. Tighten the sensor to the valve stem an additional 3/4 turn using a 9/16" wrench.
5. Hand tighten the air hose to the hose end of the sensor.
6. Tighten the hose to the sensor an additional 3/4 turn.
7. Repeat steps 1–6 for each tire on the trailer.
8. Spray all new connections with soapy water and check for air leaks. Tighten any leaking connections a further 1/8 turn and recheck. If the joint is still leaking, remove the hose/sensor and inspect for debris.



Figure 16 TPMS Sensor labeled

12.2 Type B — Trailer Has Tire Inflation System With Valve Stem Hose Junctions at Hub

1. Remove the valve caps from each hose junction near the hub.
2. Remove the sensor and jam nut from the TPMS Tee assembly.
3. Thread the jam nut onto the junction threads.
4. Install and hand tighten the TPMS sensor onto the junction threads.
5. Holding the sensor to prevent it from turning, tighten the jam nut against the sensor.
6. Spray all new connections with soapy water and check for air leaks. If a sensor is leaking, loosen the jam nut and tighten the sensor a further 1/8 turn and go to step 5. If the joint is still leaking, remove the sensor and inspect for debris.

12.3 Type C — Trailer Does Not Have Tire Inflation System

1. Remove the valve caps from each valve stem.
2. Remove the sensor and jam nut from the TPMS Tee assembly.
3. Thread the jam nut onto the valve stem threads.
4. Install and sufficiently tighten the TPMS sensor onto the valve stem threads.
5. Sufficiently tighten the jam nut to secure the TPMS sensor to the valve stem.
6. Spray all new connections with soapy water and check for air leaks. If a sensor is leaking, loosen the jam nut and tighten the sensor a further 1/8 turn and go to step 5. If the joint is still leaking, remove the sensor and inspect for debris.

IMPORTANT: After TPMS sensor installation, verify that air hoses do not touch or rub the wheel. The addition of the TPMS sensor to the overall hose length may cause the hose to contact the wheel. If rubbing is found, replace the hose with a different length. Different hose lengths are commercially available.

13 Brake pressure monitoring

WARNING: Before performing any work on brake system components, fully exhaust all air pressure from the trailer air tanks. Failure to depressurize the system may result in serious injury. After installation, perform a complete brake system test per FMCSA/DOT requirements before returning the trailer to service. All brake system modifications must comply with FMVSS 121.

NOTE: The brake pressure sensor is very similar, but different, to the trailer weight sensor. If the system kit has both types, ensure you have the correct parts before proceeding.

Parking brake/Supply pressure (Red line)- Air Pressure supplied from the tractor from the red glad hand to fill the air tank and release the brakes

Service brake/ Application pressure (Blue line)- Air pressure supplied from the tractor to the blue glad hand to the brake relay valve to apply brakes to stop the trailer.

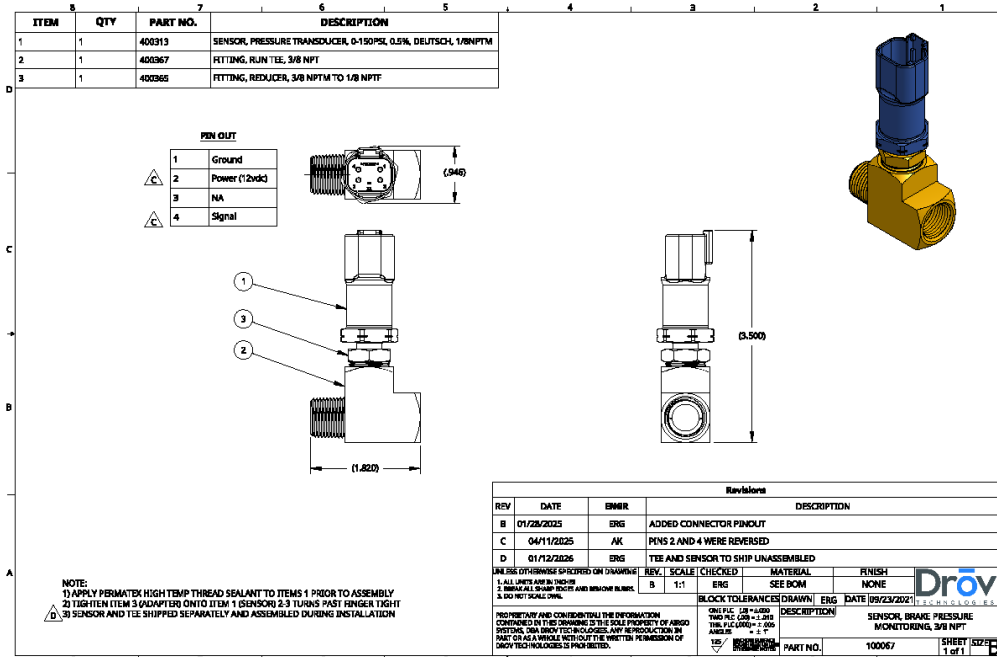


Figure 17 Brake pressure sensor kit

1. Remove the compression fitting from the service airline (blue line) and parking brake pressure line (red line) at the air brake relay inlet
2. Unthread the compression fitting from the NPT port on the brake relay.
3. Apply Permatex High-Temperature thread sealant, or equivalent, to the male threads of the brass T-fitting from the kit, and thread into the open port tightening 2-3 turns past hand tight.
4. Apply Permatex High-Temperature thread sealant, or equivalent, to the male threads of the pressure sensor, then thread the sensor into one of the 1/4" NPT ports on the T-fitting. Tighten the sensor 2-3 turns past hand tight.
5. Apply Permatex High-Temperature thread sealant, or equivalent, to the male threads of the compression fitting from step 1 into the remaining open T-fitting 1/4" female NPT port. Tighten 2-3 turns past hand tight.
6. Verify the sensor label on the harness for correct pigtail to connect to the correct sensor location before installation. Connect the pressure sensor harness to the following on harness assemblies 200217 and 200218:

200217 - Parking brake sensor connection

200218 - Service brake sensor connection



Figure 18 Brake Pressure Sensor location

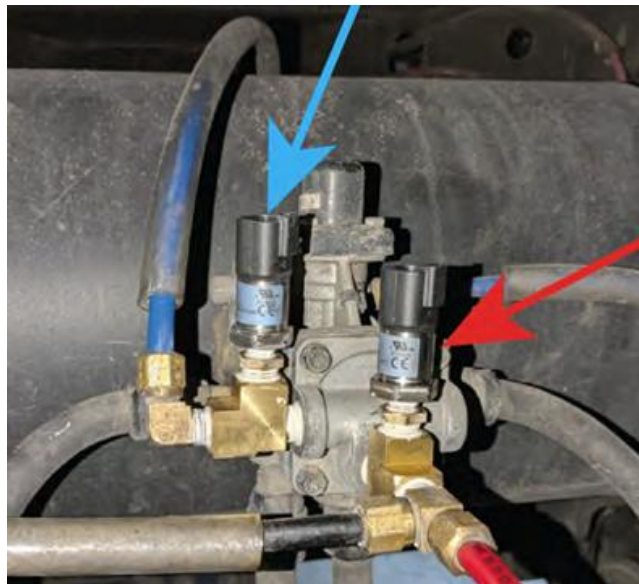


Figure 19 Installed brake pressure sensors

14 Airbag sensor installation- Weight Sensor

NOTE: The airbag pressure sensor is very similar, but different, to the brake pressure sensor. If system kit has both types, ensure you have the correct parts before proceeding.

1. Remove the plug from Port C2 on the airbag leveling valve (see Figure 20).
2. Verify that the airline connected to Port C2 routes to the airbag. Trace the airline from the port to the airbag to confirm.
3. Apply Permatex High-Temperature thread sealant, or equivalent, to the male threads of the brass T-fitting from the kit, and thread into the open port tightening 2-3 turns past hand tight.

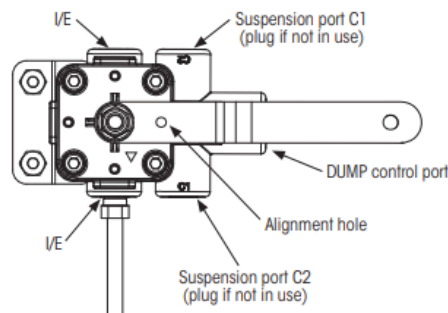


Figure 20 Leveler valve

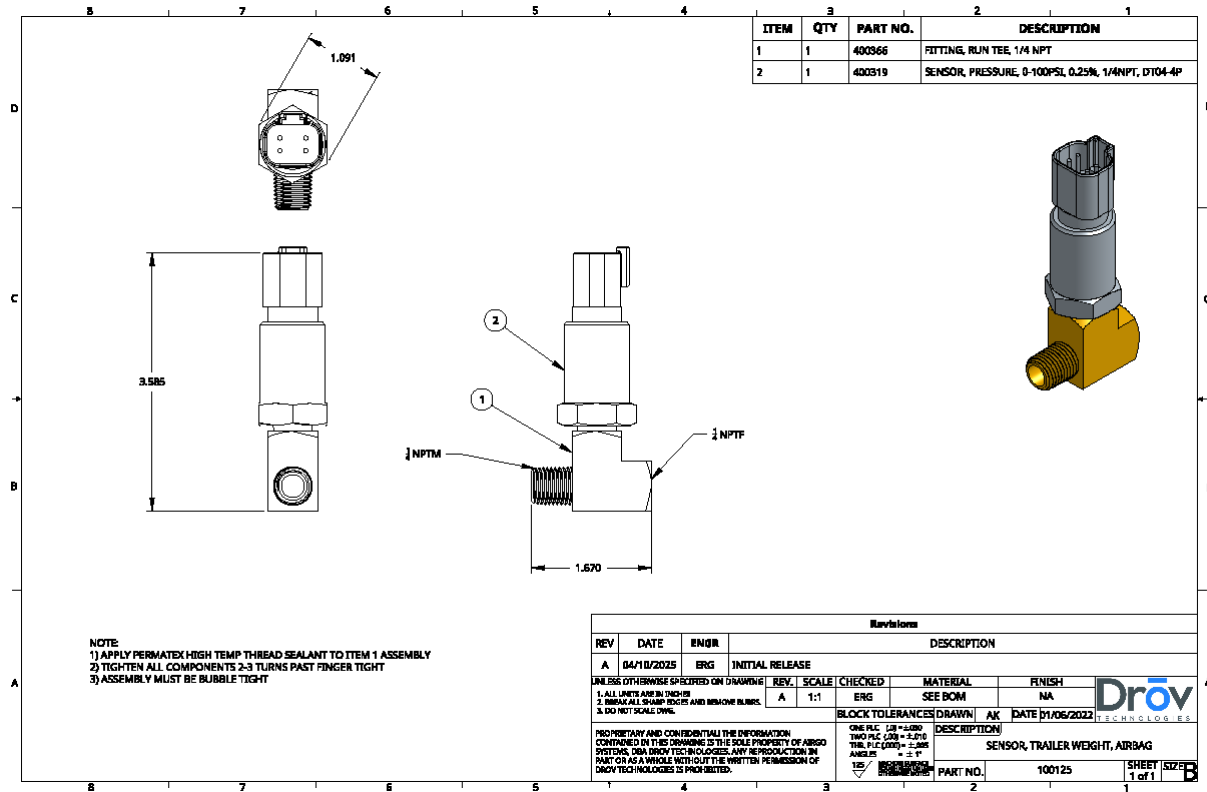


Figure 21 100125- Kit, Airbag sensor

4. Apply Permatex High-Temperature thread sealant, or equivalent, to the male threads of the pressure sensor, and thread into the open port perpendicular to the outlet, tightening 2-3 turns past hand tight.
5. Apply Permatex High-Temperature thread sealant, or equivalent, to the plug from step 1, and thread into the open port tightening 2-3 turns past hand tight.

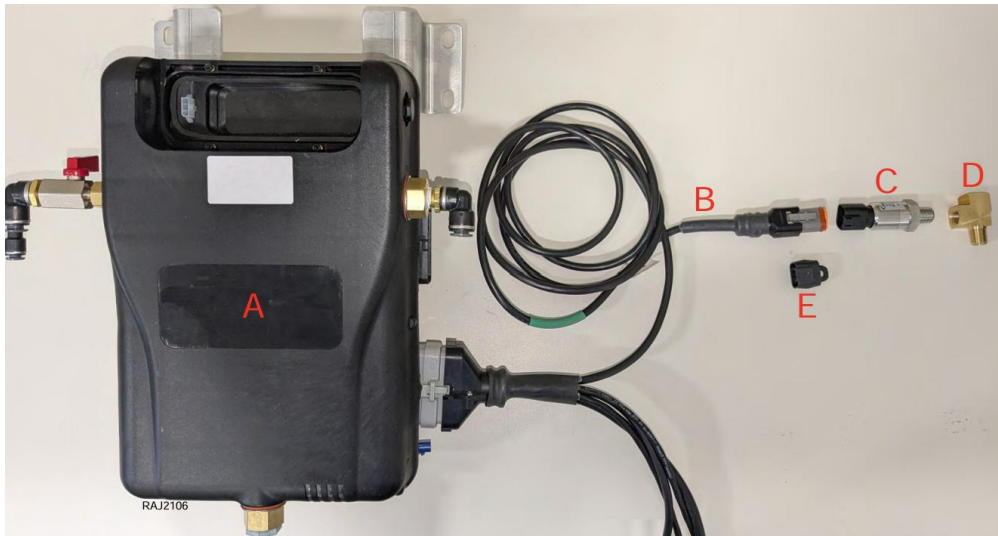


Figure 22 Connection layout



Figure 23 Installed sensor example

6. Connect the Airbag sensor to the green pigtail of the gray connector harness. Ensure the connector seal is present before insertion.

15 Wiring harness connection

WARNING: Ensure the 7-way power is disconnected from the J560 connector on the nose of the trailer

This section covers the main harnesses supplied to all customers. If assistance is required for a harness not mentioned in the document, contact Drov support at support@drovtechnologies.com.

15.1 35 pin connector (P/N 200217)

Purpose: 12V vehicle power to the AirBoxOne main unit and connects to the parking brake pressure sensor.

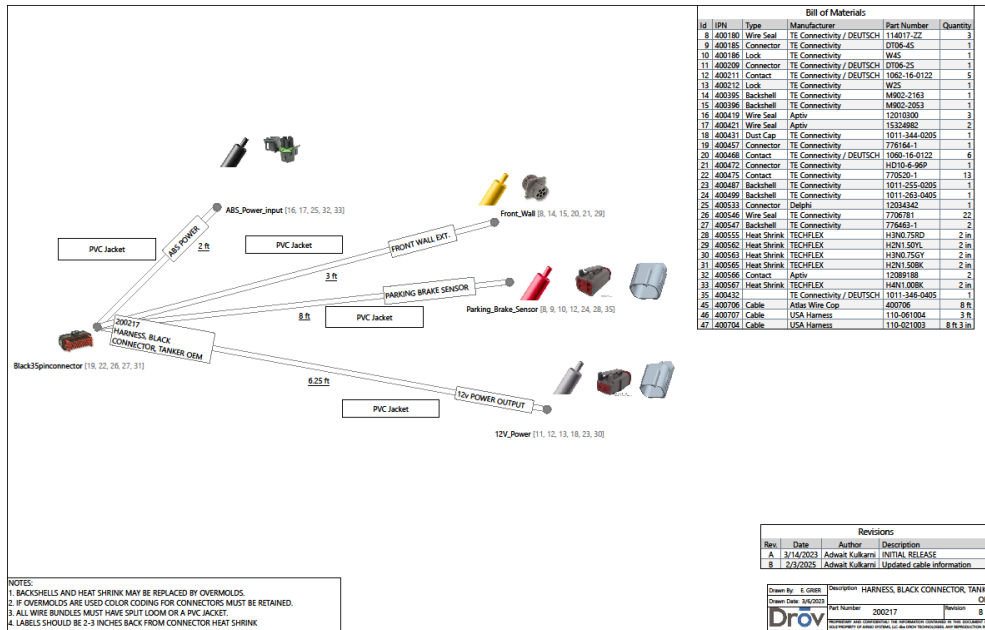


Figure 24 PN 200217 Harness

1. Ensure there is 6in of strain relief for the harness once connected with AirBoxOne.

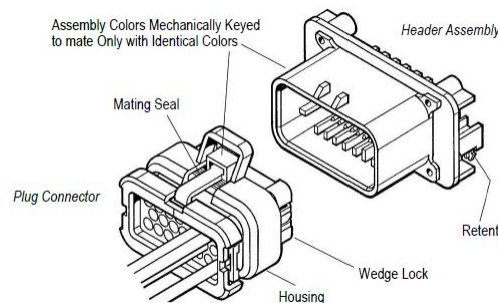


Figure 25 35 Pin connector mating

2. Ensure the connector clip is engaged with the mating connector. Check visually.

15.2 35 pin connector (P/N: 200218)

Purpose: Provides J1939 CAN bus communication, service brake sensor connection and airbag sensor connections

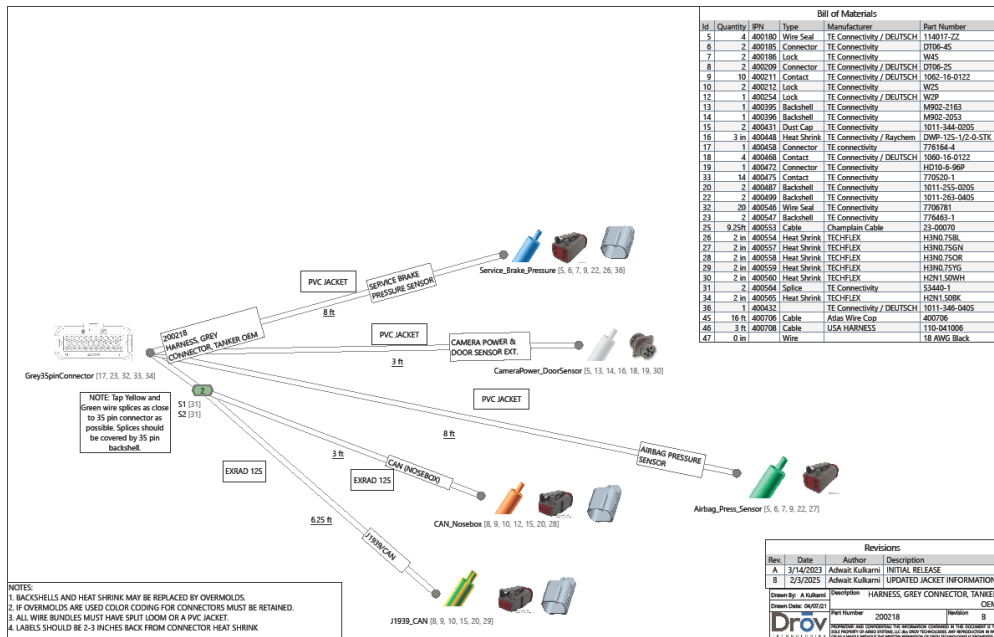


Figure 26 PN 200218 Harness

CAUTION: The parking brake sensor [100067] and airbag sensor [100125] use identical Deutsch 4-pin connectors with the same pinout. Verify you are connecting each sensor to the correct harness branch. The parking brake sensor connects to harness P/N 200217. The airbag sensor and service brake sensor connects to harness P/N 200218.

15.3 Power Splitter (P/N 400623)

Purpose: Taps into the existing 5-pin ABS sensor connection on the suspension to power the AirBoxOne and pass ABS signal data to the AirBoxOne main unit

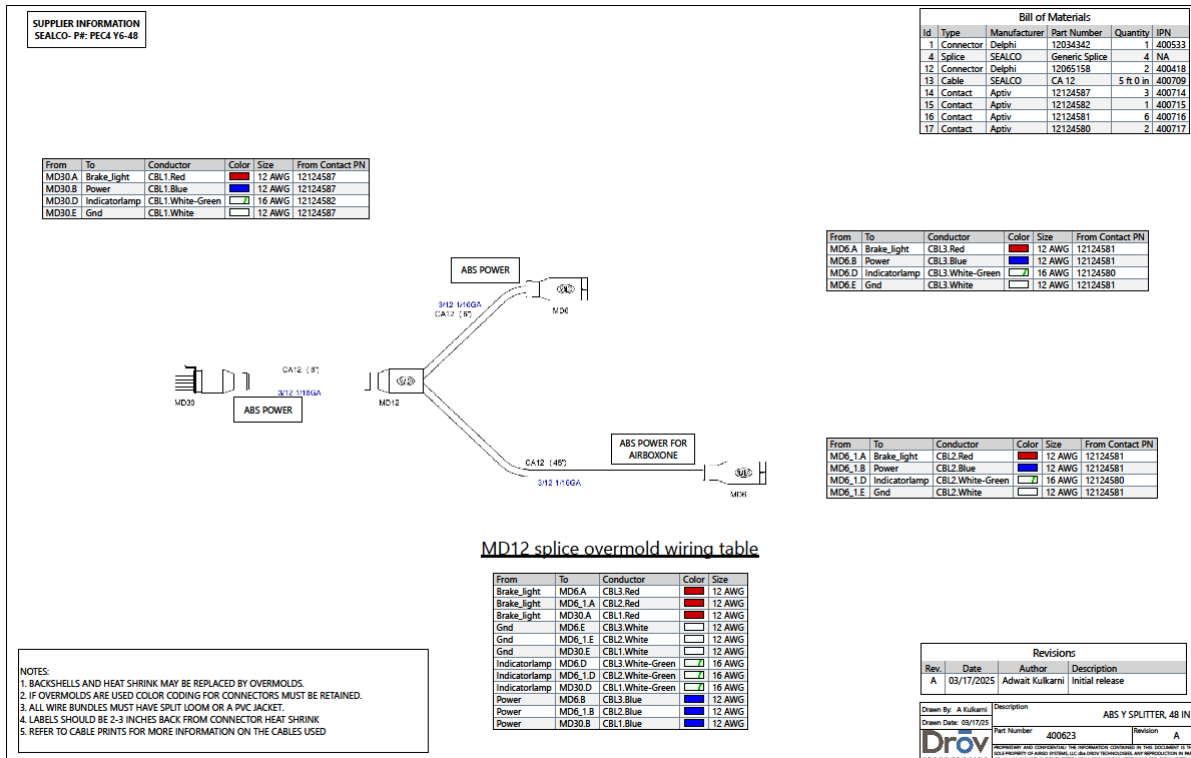


Figure 27 PN 400623 Harness

1. Locate the 5-pin power connector at the trailer suspension. It is located near the ABS system and powers the ABS system.



Figure 28 5 Pin Power connector

2. Disconnect the existing 5 pin power connector.
3. Insert the ABS Y-Splitter [400623] between the 5-pin power connector.
 - Connect one leg of the Y-splitter to the 5-pin male connector.
 - Connect the second leg to the 5-pin female connector.
 - The third leg routes to the AirBoxOne main unit via harness P/N 200217.
4. Connect harness P/N 200217 from the Y-splitter to the AirBoxOne main unit.
5. Verify the existing ABS system is not disrupted — the Y-splitter is a passive pass-through.

NOTE: After all connections are made, verify ABS fault lights on the tractor are not illuminated. If an ABS fault appears, check Y-splitter connections for proper seating. Most faults get resolved after the wheel starts moving and air is supplied to the trailer

15.4 Solar Panel Tire Inflation Harness (P/N 200199)

Purpose: Routes solar panel power, tire inflation indicator light power, secondary 12V input

1. Locate the Deutsch 6-pin receptacle on the 200217-harness labeled as Front run extension.
2. Connect the Deutsch 6-pin plug to the receptacle. Ensure the twist lock mechanism is locked properly.
3. At the far end of the harness, connect the following sub-components:
 - a. Tire Inflation Warning Light [400078]: Connect the LED light bullet connectors to female bullet connectors on the tire inflation light labeled branch. Refer to the "Tire Inflation Warning Light" section in the installation manual for mounting location.
 - b. Solar Panel [200201]: Connect the solar panel DT 2-pin plug to the harness. Solar panel extension is available to purchase based on the trailer type.

⚠ WARNING: Solar panel DT 2-pin uses Black = Positive, White = Negative. Verify polarity markings before connecting.

⚠ WARNING: Ensure there are no open wires and cables are not damaged while fastening.

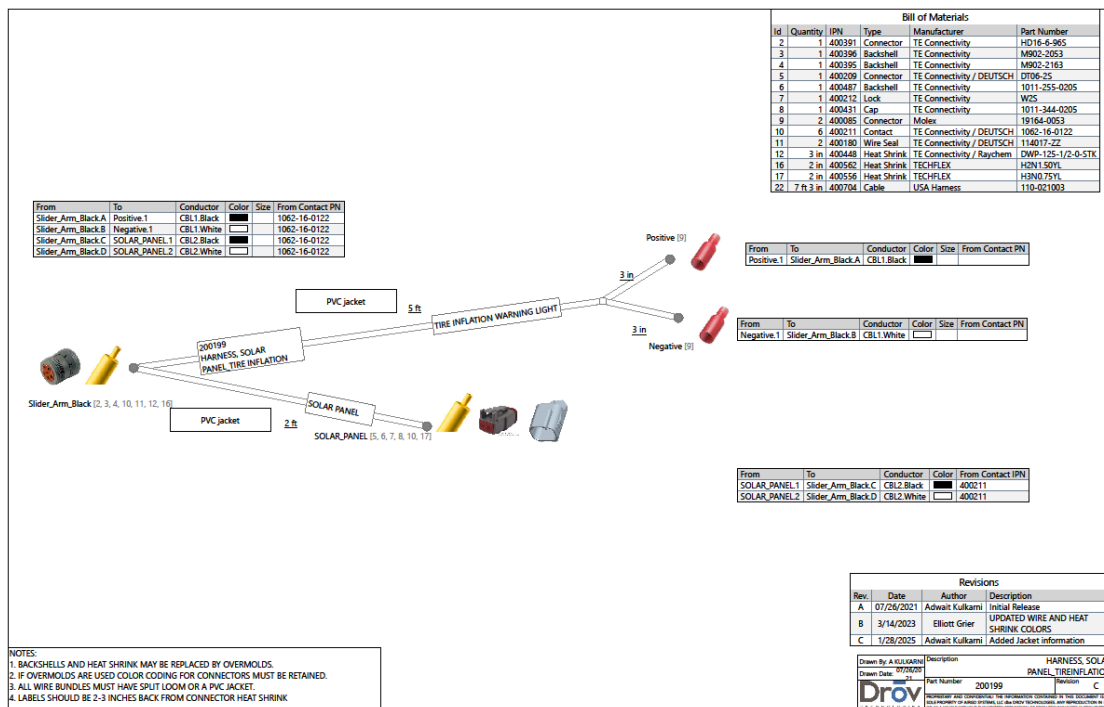


Figure 29 PN 200199 Harness

15.5 Camera – Load guard / Door connection(P/N 200198)

Purpose: To connect to the load guard (tankers)/ Door Sensor (Trailers) and power the Camera externally on certain occasions

Door Sensor/ Load guard: It connects to NC and C connections on the door sensor for semi-trailers.

In the Tanker application, a pressure switch is used to determine when the master valve is open based on the pressure present in the airline. The connection will be made to the pressure switch.

Camera Power: It is a 2-pin Deutsch Connector, connecting to PN 200193 pigtail harness. Refer 800084-Camera VCU install guide

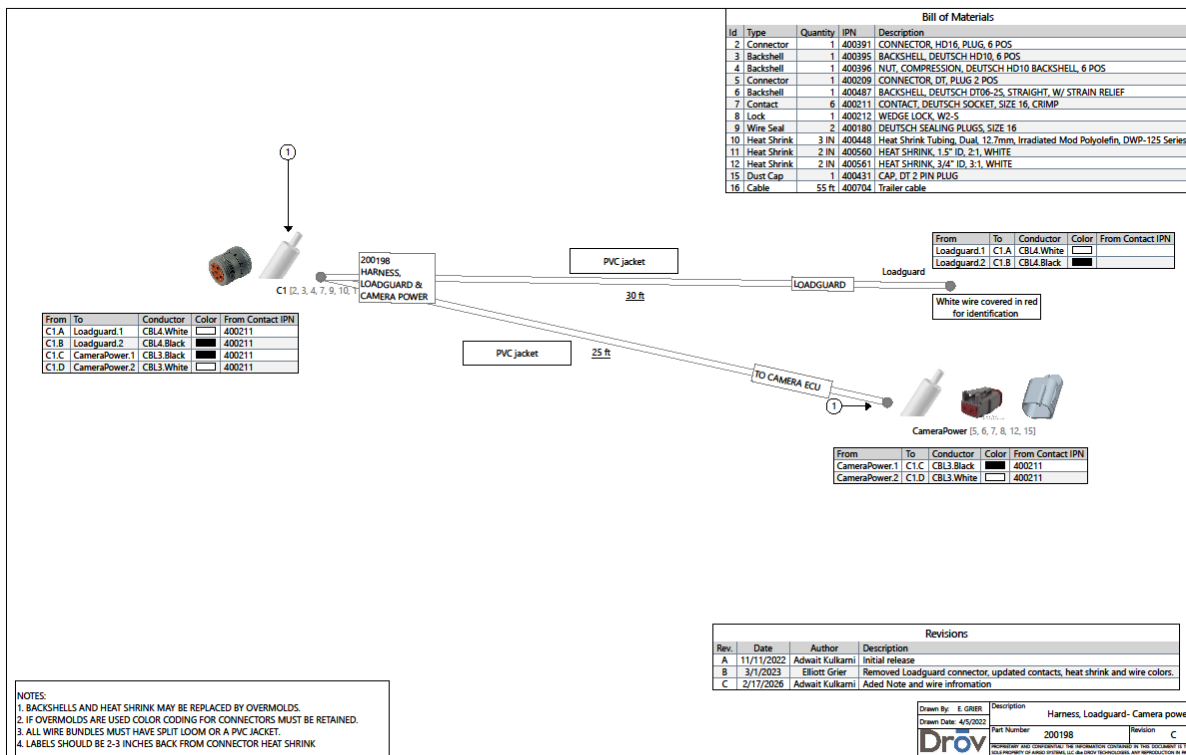


Figure 30 PN 200198 Harness

15.6 Wire Harness Routing Guidelines

Follow these guidelines when routing all AirBoxOne® wiring harnesses to ensure long-term reliability and prevent damage.

- Secure all harnesses every 24 inches (61 cm) with insulated stainless-steel P-clamps or heavy-duty cable ties. Clamps and fasteners are installer-supplied.
- Protect all harnesses with split loom or irrigation tubing, especially at all pass-through locations.
- All harnesses routed from the suspension to the fixed frame of the trailer must be completely routed through the drop loop to ensure cable slack for bogie suspension position adjustment.
- Seal all holes drilled into the trailer frame with rust-resistant paint. Seal all holes drilled through trailer walls with Sikaflex or heavy-duty sealant.

5. DO NOT route harnesses above, near, or through trailer tire or wheel well areas unless protected by firm irrigation tubing.
6. Route Trailer harnesses together where applicable to minimize clamp points and simplify future service.
7. Account for full bogie suspension travel when measuring harness length. The trailer bogie suspension location is movable; all harness lengths must account for this movement.
8. Harness connector de-pinning may be necessary to fit through access holes and wire protection tubing. Make note of and photograph connector pin locations before disassembly.

NOTICE: Do not drill holes into refrigeration, electrical, or mechanical components or severe equipment damage will result.

NOTICE: DO NOT route any wiring harnesses through refrigerated trailer floor drains. Floor drains must remain intact and unmodified to ensure proper refrigeration operation.

NOTICE: All drilled and sealed mounting locations must be inspected and resealed yearly to prevent moisture ingress and protect trailer insulation and wall integrity.



Figure 31 Wire Routing Example



Figure 32 Wire routing example



Figure 33 Wire routing example

Tire inflation system

16 Pressure Protection Valve

CAUTION: Ensure the air tank is fully depressurized before installing the Pressure Protection Valve. Verify the valve cracking pressure meets system requirements after installation.

1. Mount the Pressure Protection Valve (100006) in a spare port on the air service tank, preferably on the top half of the air tank.
2. Position the Pressure Protection Valve with the slotted screw facing DOWN.

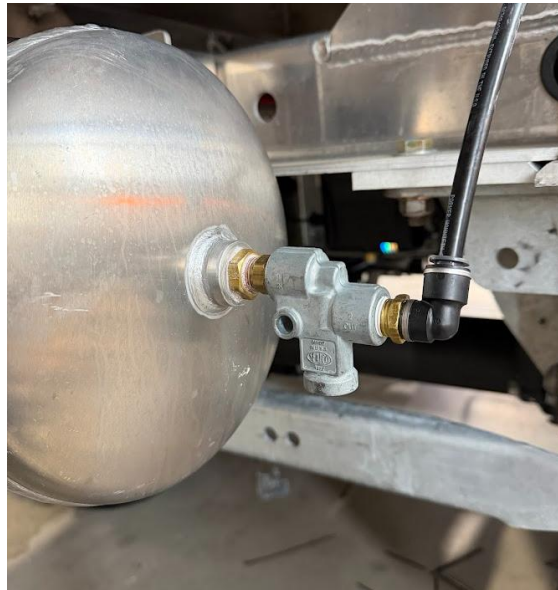


Figure 34 Pressure protection valve

17 Drill axles

WARNING: Axle drilling must be performed with care to maintain structural integrity. Wear safety glasses and gloves. Use cutting oil to prevent overheating. Remove all metal shavings and debris from the axle bore after drilling to prevent bearing contamination. Do not exceed the specified drill depth. Consult Dröv Engineering if you have questions about axle compatibility.

1. Measure 11.5 in. from the top dead center of the axle toward the spindle end. Mark the drill location.
2. Drill a hole at the marked location using a 7/16" drill bit. Apply cutting oil during drilling. Begin with a small-diameter pilot bit and increase bit size incrementally to the final diameter.
3. Tap the hole using a 1/4" NPT tap. Align the tap perpendicular to the axle surface to ensure straight threads.

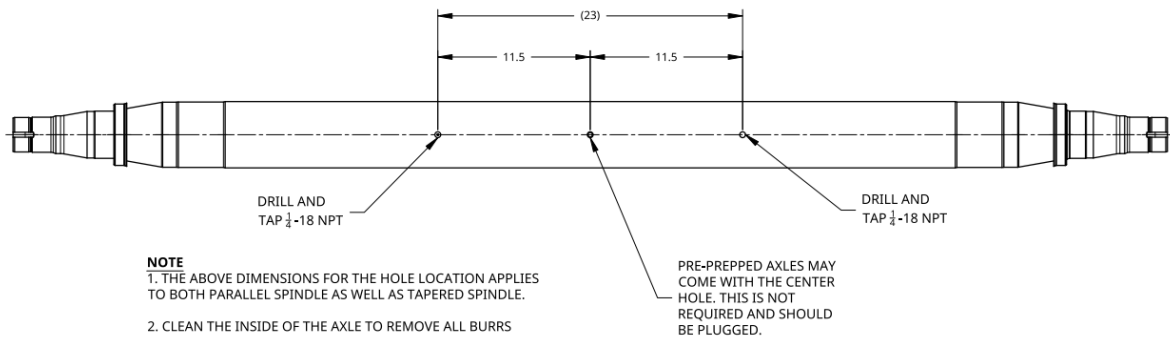


Figure 35 Axle drawing

18 Welsh Plug removal

1. Remove the hubcap bolts.
2. Clean all grease and oil from the spindle surface where the Welsh plug sits.
3. Drill a 7/8" hole through the welsh plug using a step bit.

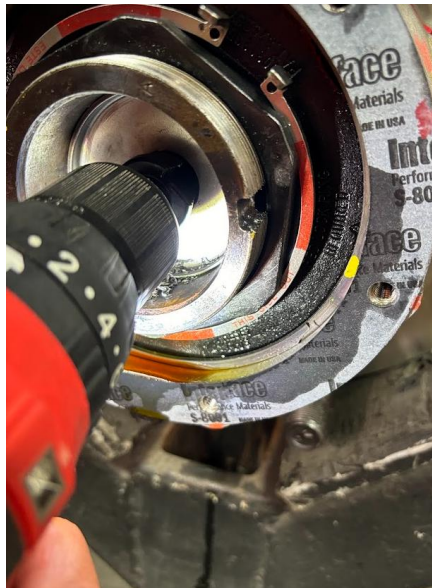


Figure 36 Drill center of welsh plug

4. Insert a pry bar into the drilled hole at an angle. Lever the welsh plugs out of the axle.

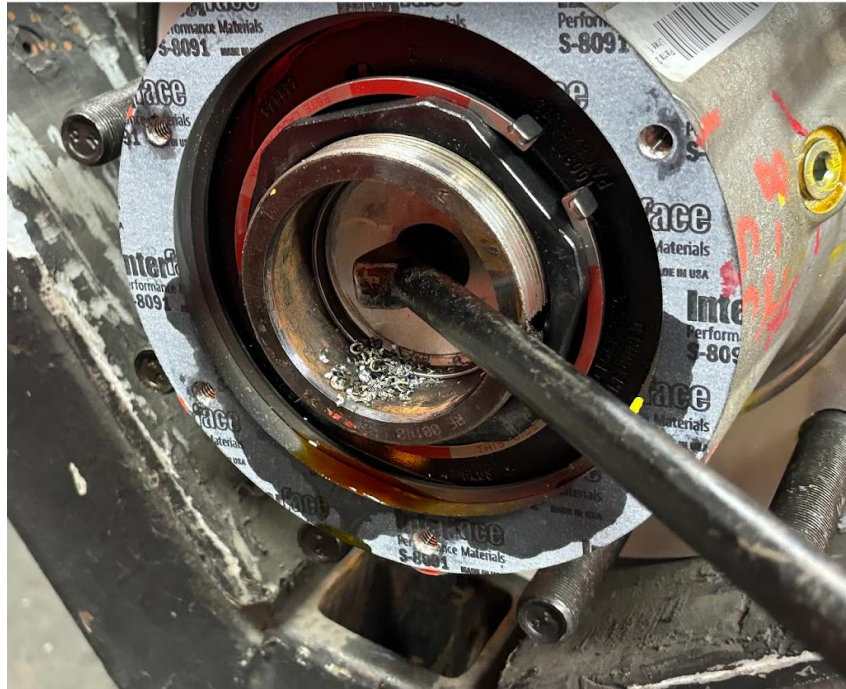


Figure 37 Pry bar insertion



Figure 38 Lever using pry bar

5. Remove all foreign material and grease/oil from the inner bore of each spindle. Use compressed air blow gun to clean the axle of metal shavings. Refer document 800049 for instructions on how to make an air blow gun.

19 Axle Plug Cord Grip

ITEM	QTY	PART NO.	DESCRIPTION
1	1	NA	TRAILER TAPERED SPINDLE AXLE
2	2	100013	AXLE PLUG, 1.75", NP
3	2	400067	CORD GRIP, 1/4 OD TUBE
4	2	300161	TUBING, SET, 9FT, 1/4" NYLON D.O.T, BLACK

AXLE TYPE	PART NUMBER
TAPERED SPINDLE	100013
PARALLEL SPINDLE	100012

INSTALLATION INSTRUCTIONS:

- A. APPLY PIPE THREAD SEALANT TO THE NPT THREADS ON THE CORD GRIP FITTING
- B. USE 5/8" WRENCH TO INSTALL THE AXLE CORD GRIP FITTING INTO THE PRE DRILLED AND TAPPED 1/4" NPT HOLES NEAR THE END OF EACH AXLE.
- C. REMOVE ALL FOREIGN MATERIAL, GREASE AND OIL FROM THE INNER BORE OF EACH SPINDLE.
- D. RUN THE 1/4" DOT AIRLINE THROUGH THE CORD GRIP TOWARDS EACH WHEEL END. MAKE SURE TO LEAVE 6 INCHES OF AIRLINE STICKING OUT OF THE WHEEL END TO CONNECT TO THE AXLE PLUG.
- E. CONNECT THE AIRLINE TUBING IN THE AXLE TO THE PUSH-CONNECT FITTING ON THE END OF THE STATOR ON THE AXLE PLUG FITTING (100013). PULL THE AIRLINE UNTIL THE PUSH-TO-CONNECT FITTING CLICKS.
- F. APPLY A THIN COAT OF LUBRICANT TO THE O-RING.
- G. INSERT THE AXLE PLUG INTO THE AXLE WITH THE FLAT DISC SIDE FACING OUT.
- H. PUSH THE AXLE PLUG INTO THE SPINDLE BORE. (IF THE PLUG GIVES TOO MUCH RESISTANCE, USE A NON-MARRING BAR TO HELP PUSH THE PLUG INTO THE SPINDLE)
- I. PULL 1/4" AIRLINE (300065) FROM THE AXLE CORD GRIP SIDE TO REMOVE SLACK IN THE AXLE. DO NOT PULL TO THE POINT OF KINKING THE AIRLINE. PUSH 1 IN OF AIRLINE INTO THE AXLE TO AVOID KINKS
- J. APPLY LOCTITE 242 (OR SIMILAR BLUE/MEDIUM STRENGTH THREAD LOCKER) TO THE THREADS OF THE CORD GRIP AND TIGHTEN USING A 5/8" WRENCH TO 1 FT-LB.

NOTE:
DO NOT WELD ON AXLE AFTER AIRLINE HAS BEEN ROUTED

SCALE 1:5

ECN NO.	REV.	DATE	DR.	COMMENTS
	B	06/18/2024	AK	UPDATED INSTRUCTION ON ROUTING

REV.	SCALE	CHECKED	MATERIAL	FINISH
B	1:2	ERG		

DATE: 01/22/2021

DESCRIPTION: INSTALL INSTR. AXLE PLUG AND AIRLINE ROUTING

PART NO. 800005

SHEET 1 of 1

Figure 39 Cord grip install

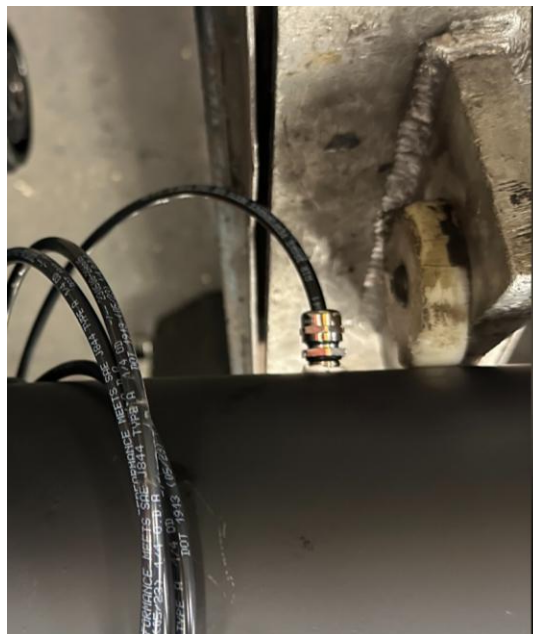


Figure 40 Example Cord grip installed

1. Apply pipe thread sealant to the npt threads on the cord grip fitting
2. Use 5/8" wrench to install the axle cord grip fitting into the pre drilled and tapped 1/4" npt holes near the end of each axle.
3. Remove all foreign material, grease and oil from the inner bore of each spindle.
4. Run the 1/4" dot airline through the cord grip towards each wheel end. make sure to leave 6 inches of airline sticking out of the wheel end to connect to the axle plug.
5. Connect the airline tubing in the axle to the push-connect fitting on the end of the stator on the axle plug fitting (100013). pull the airline until the push-to-connect fitting clicks.
6. Apply a thin coat of lubricant to the o-ring.
7. Insert the axle plug into the axle with the flat disc side facing out.
8. Push the axle plug into the spindle bore. (if the plug gives too much resistance, use a non-marring bar to help push the plug into the spindle)
9. Pull 1/4" airline (300065) from the axle cord grip side to remove slack in the axle. do not pull to the point of kinking the airline. push 1 in of airline into the axle to avoid kinks
10. Apply Loctite 242 (or similar blue/medium strength thread locker) to the threads of the cord grip and tighten using a 5/8" wrench to 1 ft-lb.



Figure 41 Axle Plug install

20 Rotary union

NOTE: The rotary union has a mechanism in the base which allows the arms to be aligned with the valve stems without removing the hub-cap.

1. If the rotary unions are marked with location identifiers, install each unit at its designated location.
2. Mount the hubcap using two hubcap bolts. Orient the fill position at the 12 o'clock position.
3. Insert the 1/4" tube of the rotary union through the center hole of the hubcap and into the seal in the axle plug assembly.
4. Hand-tighten the rotary union until snug against the hubcap. Torque to 12+/- ft-lbs.
5. Spin the rotary union counter-clockwise to align the blue arm with the inner wheel valve stems. Do not unthread the rotary union during the alignment process.

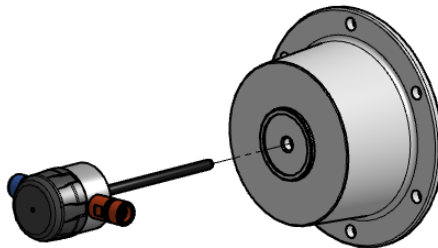


Figure 42 Rotary union and hubcap



Figure 43 Installed rotary union with hoses

21 Inflation hoses

1. Connect all corresponding hoses to the matching valve stems on the tire.
2. Using a 9/16" wrench, tighten the swivel fitting on the valve stem end of the hose ¼ turn past hand tight.
3. Connect the other side of the hose to the Rotary Union and torque the fitting to 10-20 in-lbs

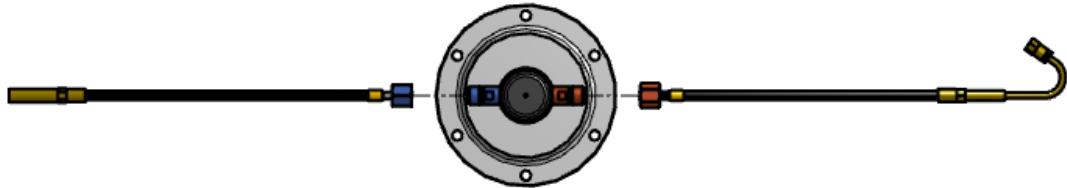


Figure 44 Rotary union- hubcap assembly

22 Airline

1. Route a 3/8" airline from the Pressure Protection Valve to the red shut off valve on the INPUT (left) side of the AirBoxOne®
2. Use grommets to protect the airlines from contacting sharp corners at thru-hole locations.
3. Use tie wraps to secure airlines to existing airlines. This will allow for adequate slack in suspension movement.
4. If a 3/8" union tee is provided in the kit, use it to connect the input air to AirBoxOne® from the existing pressure protection valve.
5. Refer to the figures shown below for reference on airline connections.

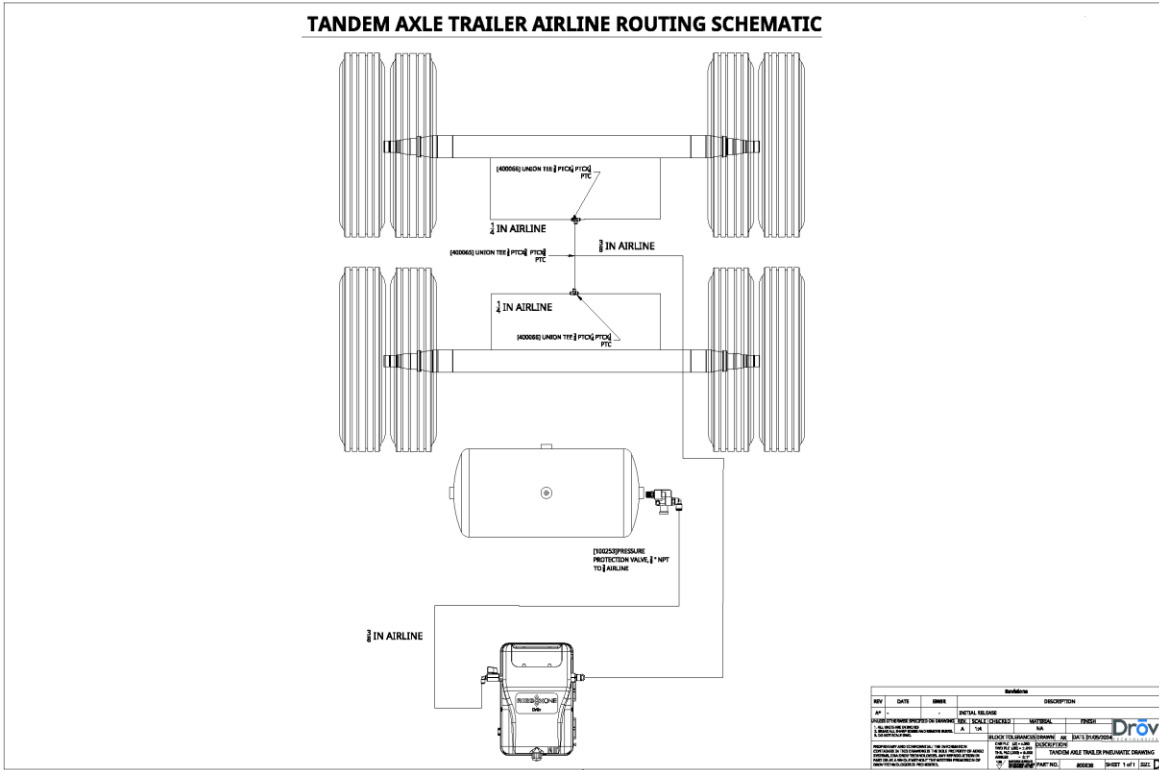


Figure 45 Tandem axle Airline routing

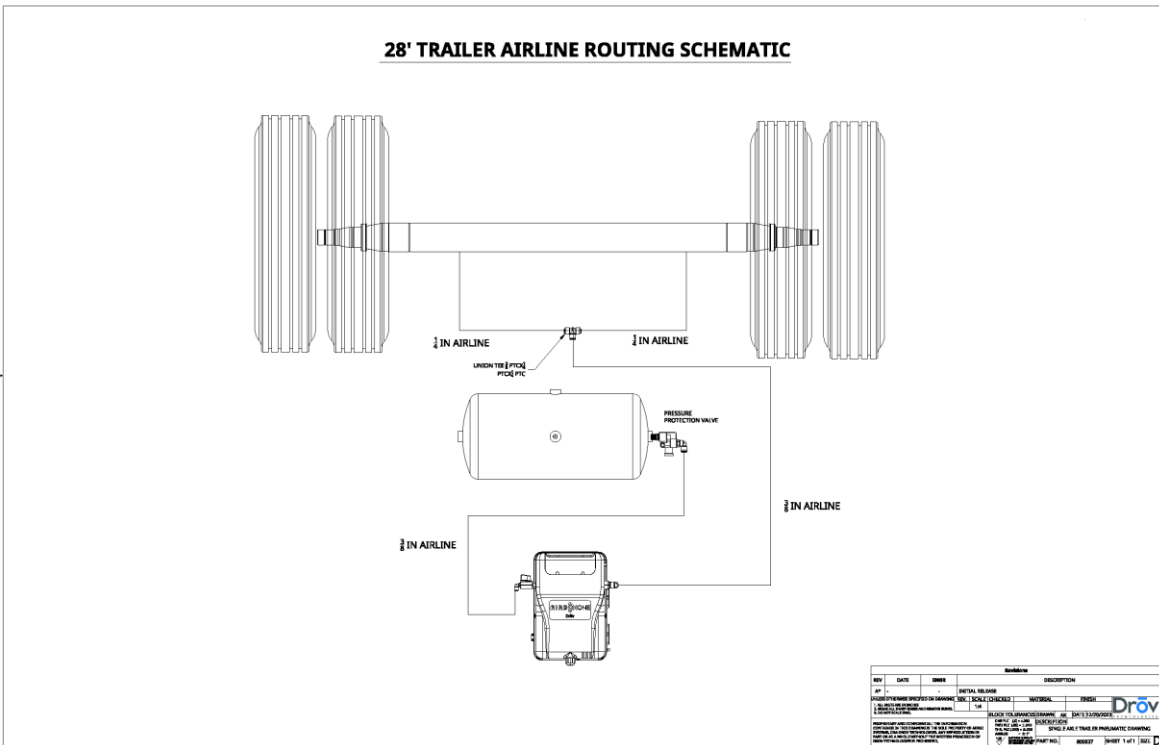


Figure 46 Single axle airline routing

23 Tire Maxx Pro wheel end integration (if equipped) (Applicable for only fuel tankers)

23.1 Pneumatic connection

1. Disconnect the input airline and output air line to the tire maxx pro control unit.
2. Connect the input air line and output air line to the AirBoxOne®.

23.2 Hose connection

1. Connect the TPMS tees marked with the wheel end location to the valve stem end of the tire inflation hoses.
2. Tighten the hose to the TPMS tee. Install the hose on the valve stem.
3. Thread the hubcap side of the connection to the hubcap.

24 Door sensor

1. Drill 3/16" holes in the side frame of the door.
2. Use the 6-32 screws to fasten the door sensor to the frame. Make sure the cable is facing down when mounting the sensor.
3. Mark the holes for the magnet bracket on the door. Make sure the distance between the magnet and the sensor when the door is closed is no more than 0.75in.
4. Drill the holes using 3/16" drill bit.
5. Mount the magnet using the 10-24 screws provided in the kit.
6. Check if the sensor detects door open close using a multimeter. Connect the leads to the two probes of the multimeter. Switch the multimeter to continuity check mode.
7. When the door is closed, the multimeter should trigger the continuity alarm and when the door is open it should not trigger the alarm.
8. Use zip tie to tie the cables.
9. Connect to the loadguard/door harness using the bullet connectors provided in the kit

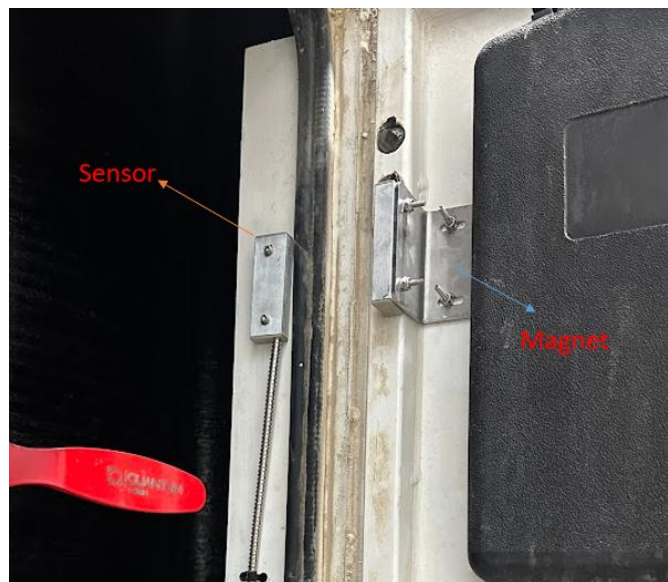


Figure 47 Door sensor example- CNG trailer

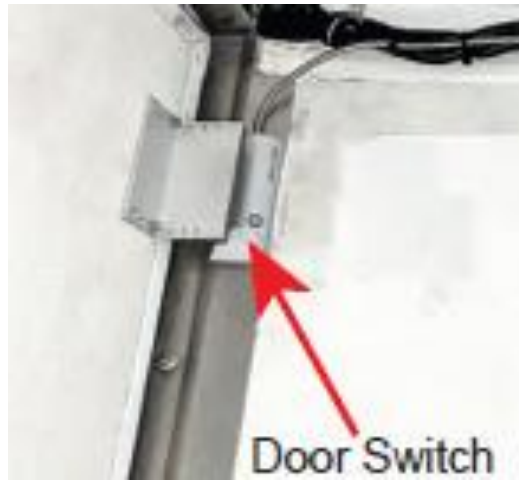


Figure 48 Door sensor Swing door



Figure 49 Door Sensor mounting Roll up Door

25 SKF Wheel Temperature and Vibration Sensors

IMPORTANT: The SKF wheel-end sensors are **NOT** pre-configured for your system. They must each be configured using the SKF TraX app after installation.

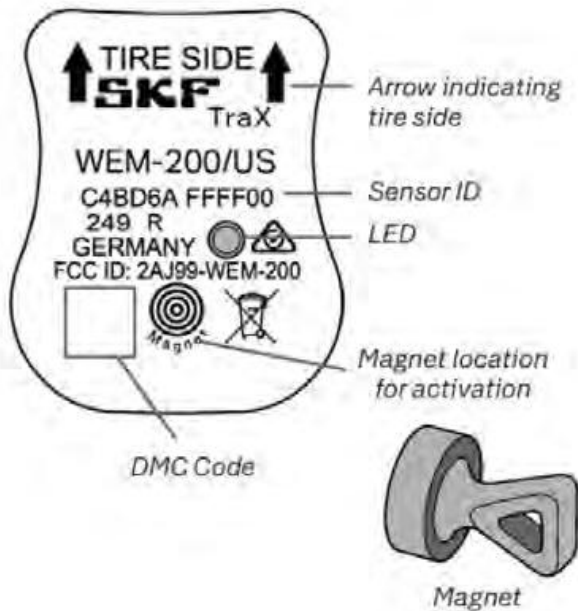


Figure 50 SKF Wheel End Sensor Dimensions

1. Identify the four SKF wheel end sensors included in the kit.
2. Remove two (2) lug nuts that are located side-by-side from each axle wheel end.
3. Clean the wheel stud and lug nut mounting areas, removing any debris.
4. Place the sensors on the wheel studs so that the arrows on the sensor are pointing outwards toward the tire.
5. Reinstall the lug nuts and tighten to the trailer manufacturer's torque specification (typically 350–450 ft-lbs).



Figure 51 SKF Sensor Installation Example

IMPORTANT: Verify the torque specification for your trailer application by referencing the trailer manufacturer's service material. Verify that ALL lug nuts on the wheel are torqued to specification after sensor installation.

26 System Commissioning and Verification

After completing all mechanical and electrical installations, perform the following system verification before returning the trailer to service:

Power-On Verification:

1. Confirm the battery is connected and the AirBoxOne® powers on (LED indicator should illuminate).
2. Navigate to the dashboard of the UI
3. Select Assets at the top left corner of the dashboard

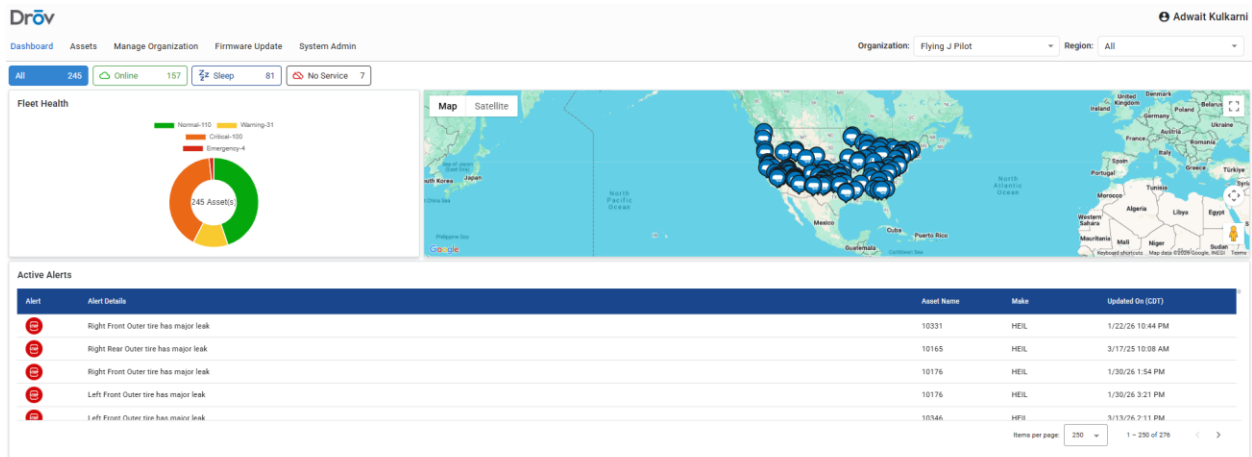


Figure 52 Dashboard view

4. Select the asset assigned to this device on the assets page. Use the search function to find the asset.
5. The asset page should be visible now with details of the asset with the sensor data.
6. Verify cellular connectivity by confirming the AirBoxOne® shows online.

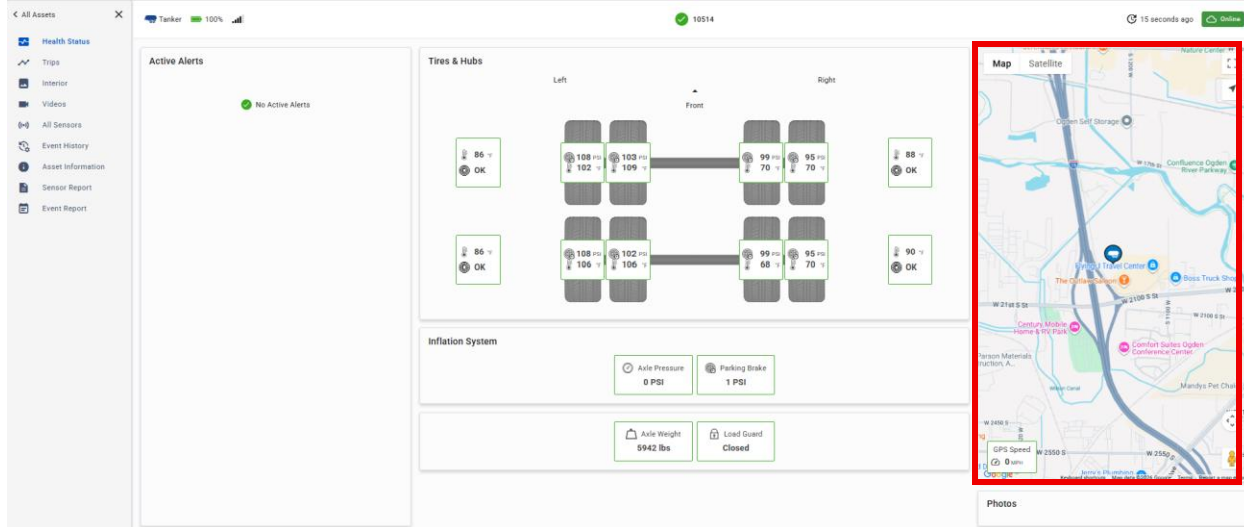


Figure 53 GPS location

GPS location

1. Verify GPS antenna lock by confirming a valid GPS position is reported to the fleet management platform. Allow up to 5 minutes for initial satellite acquisition.

26.1 Sensor verification

26.1.1 TPMS (Tire Pressure Monitoring System) Sensors

Tire Positions

If the ABO is configured for a dual-tire vehicle, there will be eight tire positions:

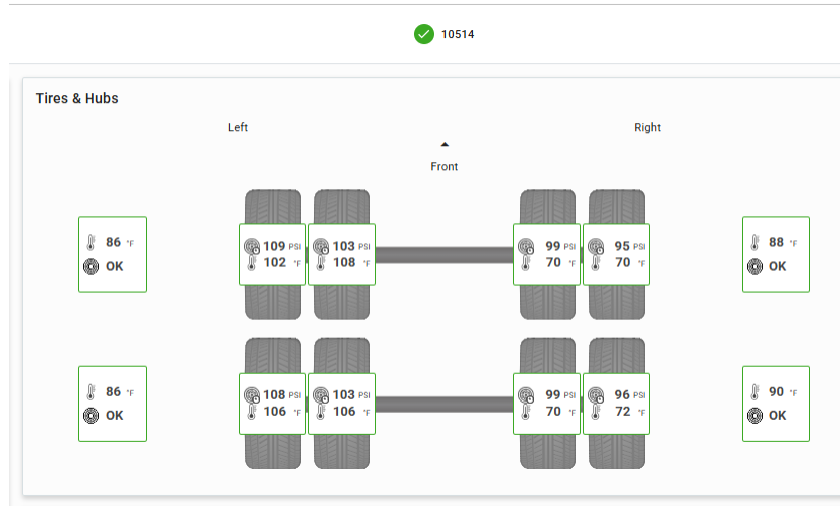


Figure 54 Asset Health Page

Abbreviation	Position
LROD	Left Rear Outer
LFOD	Left Front Outer
RROD	Right Rear Outer
RFOD	Right Front Outer
LRID	Left Rear Inner
LFID	Left Front Inner
RRID	Right Rear Inner
RFID	Right Front Inner

26.1.2 Verifying TPMS Data Reception

1. Navigate to the **Vehicle Health** page for your device on Drov UI. The Asset page will show the last recorded by the asset.
2. Navigate to the **All Sensors** section (option on the left) and verify that readings from all configured TPMS sensors are being received at or near the current time.
3. If the ABO is not receiving data from a particular sensor, hold the TPMS remote close to the sensor and activate it by pressing button "A". Updated data for that sensor should appear on the Cloud UI within a few minutes.

26.1.3 SKF Trax Vibration and Temperature Sensor

1. Activate the sensor by placing a magnet on it. Refer to the accompanying image for correct magnet placement.
2. The LED light will turn **ON**, and the sensor will begin broadcasting for approximately one minute while the system records the temperature data.
3. The recorded data will appear under the **Hubs** category in the **All Sensors** section.

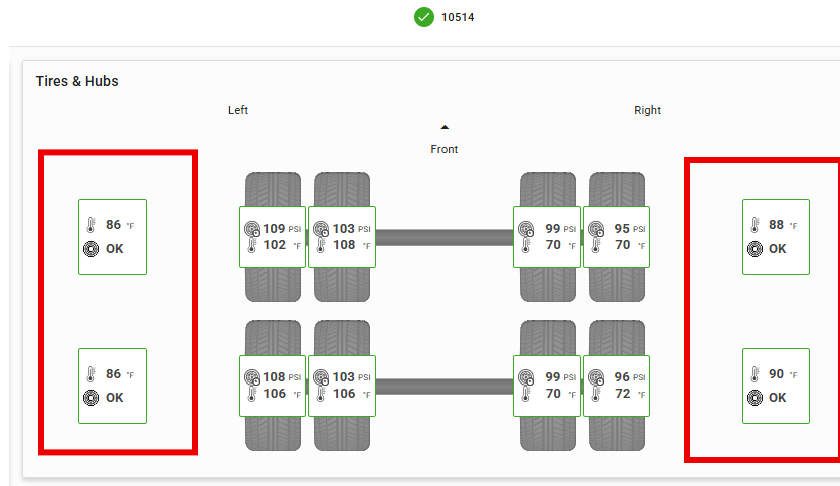


Figure 55 Hub Sensors

26.1.4 Air tank pressure

1. Connect the air supply to the trailer through the red gladhand to fill the air tank. Ensure the red ball valve on the AirBoxOne is in the **open** position.
2. Navigate to the **Vehicle Health** page for your device on the Cloud UI.
3. Navigate to the **All Sensors** page and verify the Air Tank reading and its time stamp.
4. The value should not display an asterisk (*) and should read close to the input air pressure, in PSI.
5. Adjust the input pressure and verify that the value on the Vehicle Health page updates within 1–2 minutes.

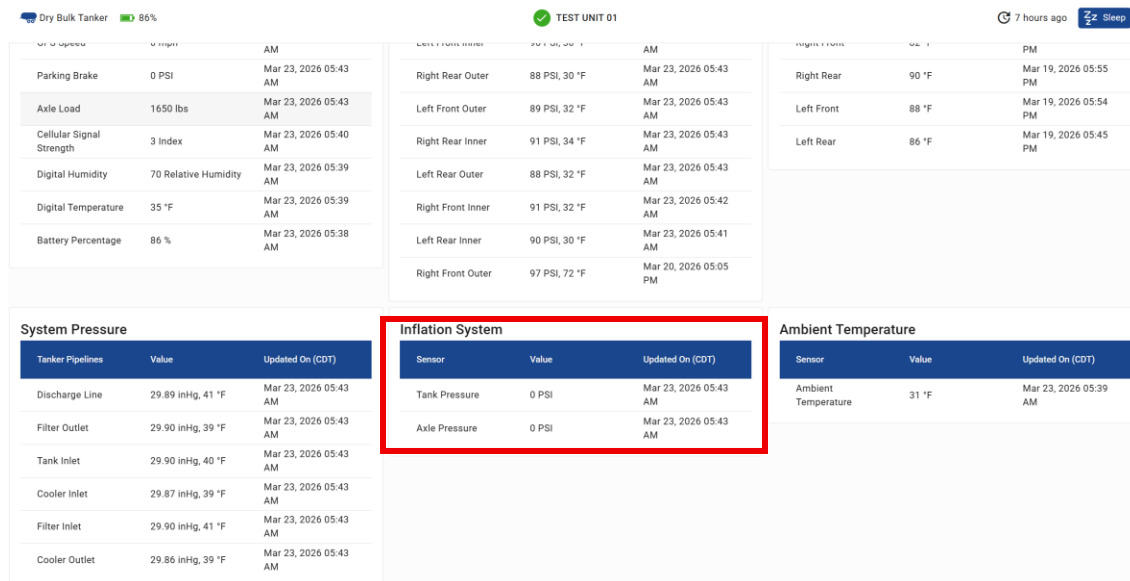


Figure 56 Air Tank Pressure

26.1.5 Brake Pressure Sensors:

1. Supply air to both the parking brake line (red line) and service brake line (blue line) on the trailer.
2. Navigate to the **All Sensors** page.
3. Under **AirBoxOne**, locate the **Parking Brake** and **Service Brake** readings.
4. Verify that both readings are within +/- 3 PSI of the supplied pressure.

The screenshot displays a vehicle monitoring dashboard for 'TEST UNIT 01'. At the top, it shows 'Dry Bulk Tanker' with an 86% battery level, a green status indicator, and a '7 hours ago' timestamp with a 'Sleep' button. The main content is divided into three columns:

- AirBoxOne:** A table with 8 rows of sensor data. The 'Parking Brake' sensor is highlighted with a red box, showing a value of 0 PSI.
- TPMS:** A table with 10 rows of tire pressure and temperature data for various locations like Left Front Inner, Right Rear Outer, etc.
- Hubs:** A table with 4 rows of hub temperature data for Right Front, Right Rear, Left Front, and Left Rear.

AirBoxOne		
Sensor	Value	Updated On (CDT)
GPS Speed	0 mph	Mar 23, 2026 05:43 AM
Parking Brake	0 PSI	Mar 23, 2026 05:43 AM
Axle Load	1650 lbs	Mar 23, 2026 05:43 AM
Cellular Signal Strength	3 Index	Mar 23, 2026 05:40 AM
Digital Humidity	70 Relative Humidity	Mar 23, 2026 05:39 AM
Digital Temperature	35 °F	Mar 23, 2026 05:39 AM
Battery Percentage	86 %	Mar 23, 2026 05:38 AM

TPMS		
Tire Location	Value	Updated On (CDT)
Left Front Inner	90 PSI, 30 °F	Mar 23, 2026 05:43 AM
Right Rear Outer	88 PSI, 30 °F	Mar 23, 2026 05:43 AM
Left Front Outer	89 PSI, 32 °F	Mar 23, 2026 05:43 AM
Right Rear Inner	91 PSI, 34 °F	Mar 23, 2026 05:43 AM
Left Rear Outer	88 PSI, 32 °F	Mar 23, 2026 05:43 AM
Right Front Inner	91 PSI, 32 °F	Mar 23, 2026 05:42 AM
Left Rear Inner	90 PSI, 30 °F	Mar 23, 2026 05:41 AM
Right Front Outer	97 PSI, 72 °F	Mar 20, 2026 05:05 PM

Hubs		
Tire Location	Value	Updated On (CDT)
Right Front	82 °F	Mar 20, 2026 02:40 PM
Right Rear	90 °F	Mar 19, 2026 05:55 PM
Left Front	88 °F	Mar 19, 2026 05:54 PM
Left Rear	86 °F	Mar 19, 2026 05:45 PM

Figure 57 Brake Pressure Sensors

26.1.6 Airbag/Weight Sensor:

1. Apply emergency air (red line) to the trailer. Ensure the airbags are inflated to a nominal level.
2. Navigate to the **Vehicle Health** page for the ABO on the Cloud UI.
3. The **Axle Load** card at the bottom of the page displays weight on the tandem axle of the semi-trailer.

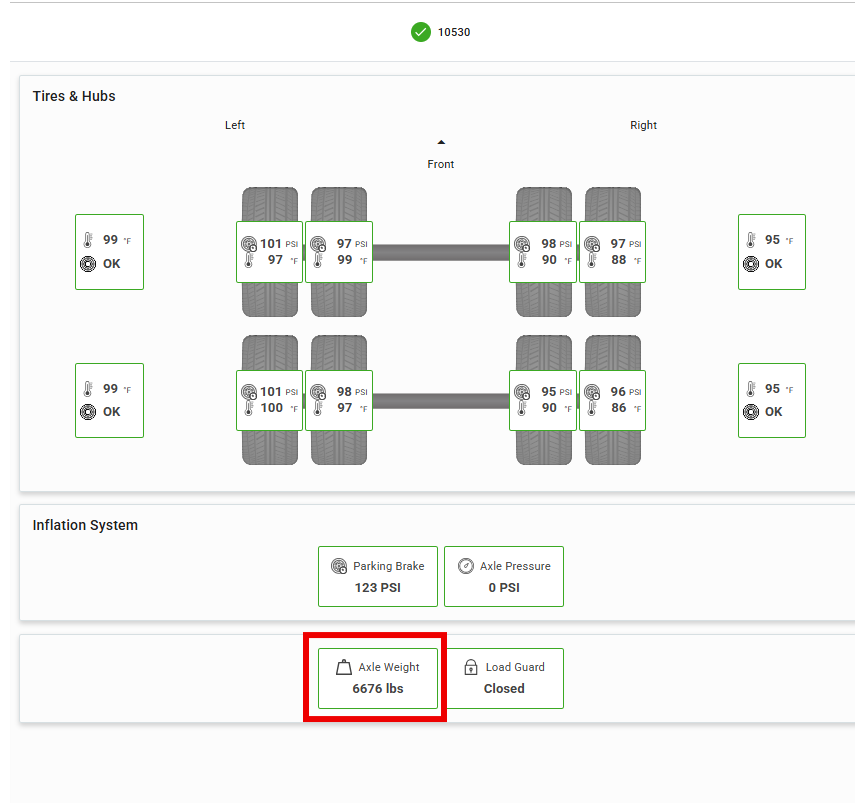


Figure 58 Axle load

26.1.7 Ambient temperature Sensor

1. Navigate to the **Vehicle Health** page for the vehicle on the Cloud UI.
2. The **Ambient Temperature** card is located at the bottom of the health page.
3. Navigate to the **All Sensors** page and verify the timestamp to confirm the reading is current.

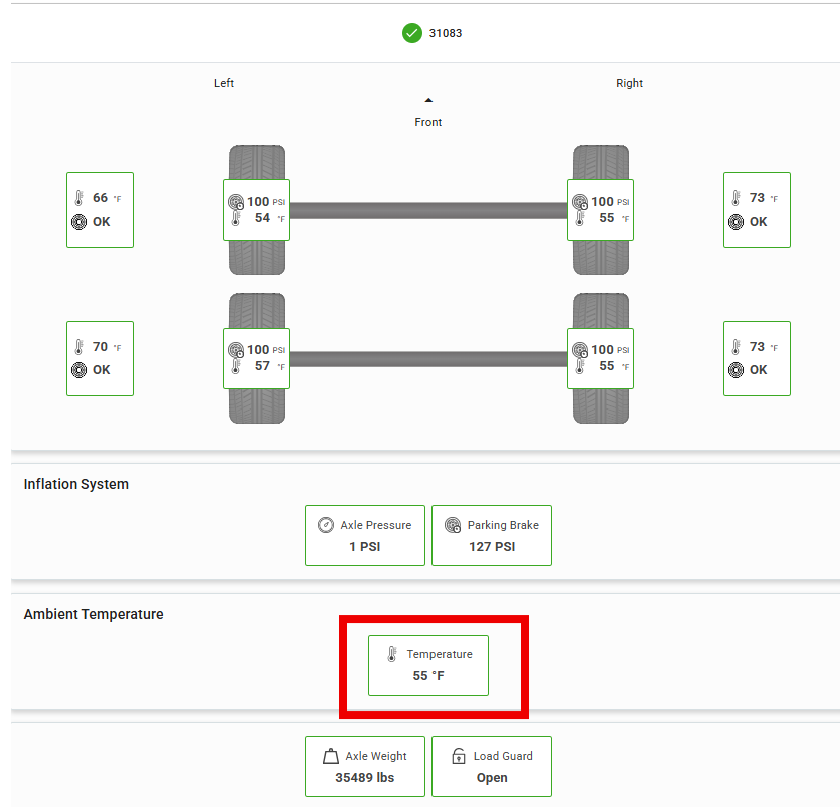


Figure 59 Ambient Temperature Sensor

26.1.8 Door Sensor/ Load guard:

1. Close the trailer door(s).
2. Confirm the door status changes are reported on the bottom of the health page
3. Open the trailer door
4. Confirm the door status changes are reported on the bottom of the health page

Load guard

1. If the tanker is installed with load guard pressure switch, charge the system from the manifold location.
2. If the system is charged, it will show the Loadguard card as open
3. If the system has no air going to it, it will show as closed.



Figure 60 Load guard/ Door card

26.1.9 Tire Inflation light Verification:

The PSI warning light indicates anomalies in trailer tire pressures. This light activates when any tire is under-pressurized (below 90 PSI) or when a major leak is detected (0 PSI).

Steps to verify the warning light:

1. Remove the hose from the valve stem end to simulate 0 PSI on the tire side.
2. Navigate to the **Vehicle Health** page for the ABO and verify that 0 PSI is being reported for the affected tire.
3. If 0 PSI is received, the PSI warning light should turn **ON**.

26.1.10 Tire inflation system verification

1. Navigate to the Tire pressure control page
2. Select the asset under verification.
3. If the tire pressures are above 90 psi, change the set point to 90 psi to verify the deflation operation.
4. Once deflation is verified, change the set point to 100 psi to verify the inflation operation. The tire pressures should stabilize within ± 3 psi of the set point.

26.2 Final Checks

1. Inspect all wiring harnesses for secure connections and proper routing away from heat sources, moving parts, and sharp edges.
2. Verify all airline routing have adequate slack for full suspension travel.

26.3 Leak Testing Procedure

DANGER: A leaking or damaged air brake or air suspension system can cause the trailer to not operate properly and can result in serious or fatal injury. All air brake and suspension system lines, connections, junctions, fittings, and components must be leak free and operating properly before using the trailer.

After completing all pneumatic connections and before returning the trailer to service, perform the following air system leak check.

1. Verify that the red shut-off valve on the AirBoxOne® is in the OPEN position.
2. Connect the trailer to a truck or trailer test stand to build up full system air pressure (minimum 90 PSI).
3. Apply a soap and water solution to all new fittings, T-connections, compression fittings, push-to-connect joints, and sensor connections.
4. Inspect each connection for bubbles indicating air leaks.
5. Check all rotary union connections and tire inflation hose at each wheel end for leaks while slowly rotating the hub.
6. If leaks are detected, depressurize the system, tighten or reseal the affected fitting, and retest.
7. Verify that the system holds pressure for a minimum of 5 minutes with no detectable leaks.

WARNING: Serious air leaks in the trailer's braking and suspension systems are a hazardous condition that requires the trailer to be placed out of service until they are properly corrected.

27 Installation Completion Checklist

Complete this checklist after the AirBoxOne® Smart Trailer System installation is finished. All items must be verified before returning the trailer to service.

Task	Verified Complete
Pre-Installation Condition Checklist completed and issues documented	
Visually inspect unit for loose or improperly fitting bolts and brackets	
Verify all electrical harnesses and cables are routed correctly and secure	
Verify TPMS sensors are installed and configured	
Verify SKF wheel end sensors are installed and configured	
Verify all applicable sensor data is active in fleet management platform	
Verify all trailer lights are operational	
Verify all air system connections and hoses are leak-free	
Verify all holes drilled into trailer frame and walls are sealed	
Verify drop loop allows for full bogie position movement	
Verify trailer ABS and brake systems are operational	
Verify tire inflation warning light is operational	
Verify brake pressure sensors are reporting correctly	
Verify airbag/weight sensor is reporting correctly	
Verify door sensor is reporting correctly	
Verify GPS location is reporting correctly	

Field	Value
Technician Name	
Company / Dealership Name	
Date Inspection Completed	