



*Leading the Way in
Tank Truck Equipment
Innovation Worldwide*

CIVACON 
PART OF OPW A  DOVER COMPANY



REAL WORLD. REAL SOLUTIONS

Overfill System Training



TYPICAL TRAILER SYSTEMS

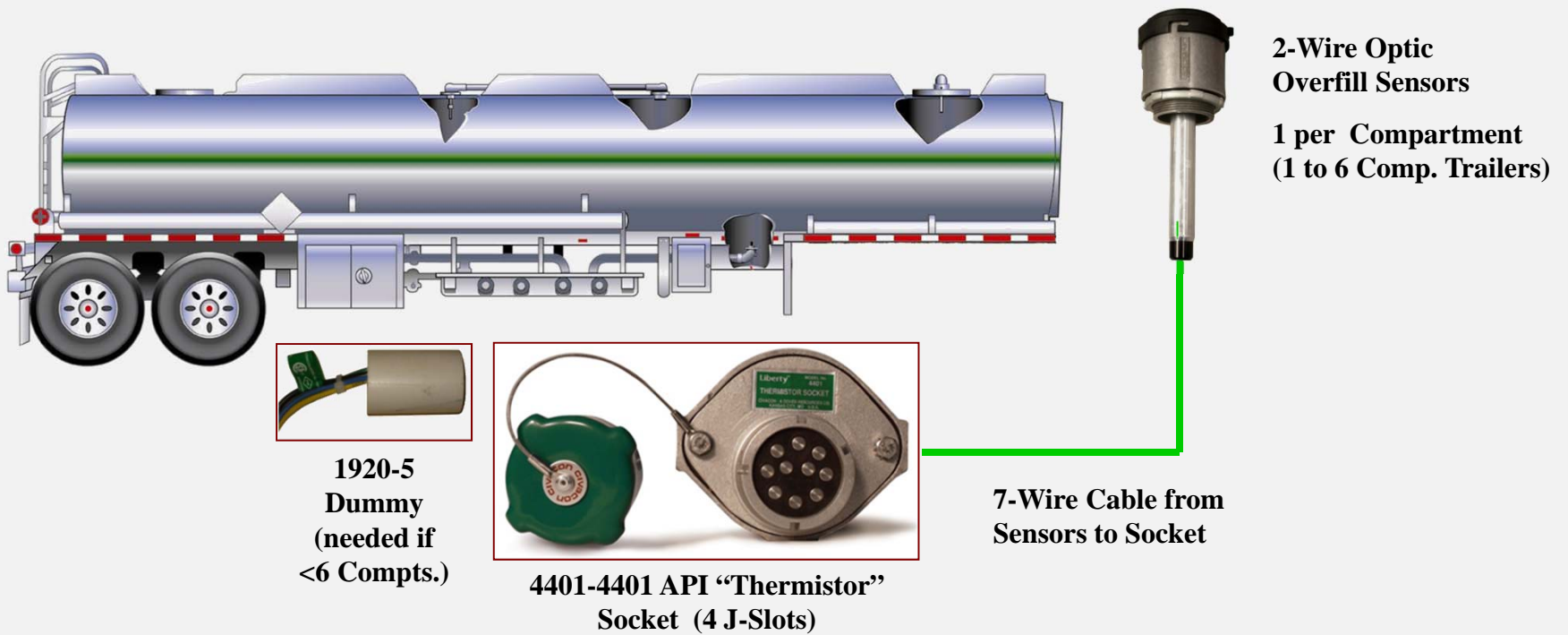
■ Straight Systems

- Two Wire Optic (“Thermistor”) Straight systems
- Five Wire Optic Straight Systems (Typ. West Coast)
 - Sensors **must match** the Rack Monitor’s signals

■ Onboard Monitor (OBM) Systems

- Have an “Onboard Monitor” (sensor controller) to run Sensors & Provide for Aux. Inputs
- Has outputs that provides wet / dry “sensor signals” to **emulate** each type Rack Monitor’s needs
- Loads at any rack with the correct matching socket

STRAIGHT "THERMISTOR" SYSTEM



THERMISTOR & 2-WIRE OPTIC SYSTEMS

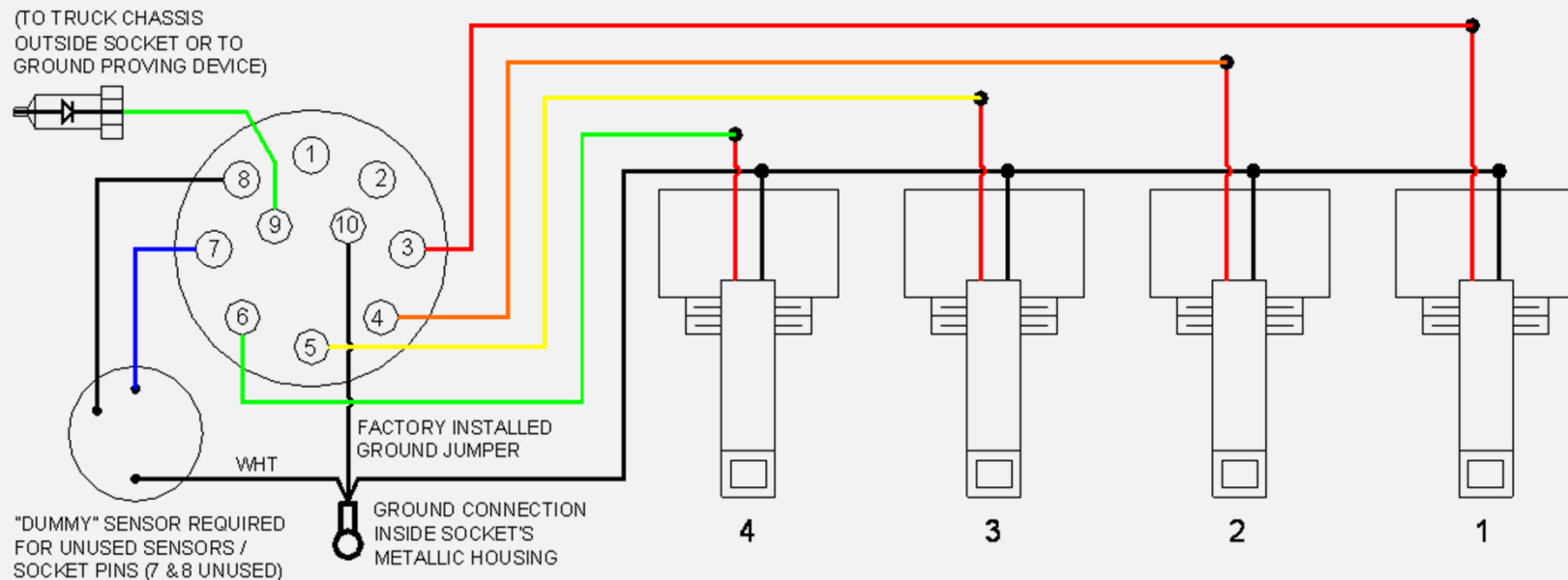
■ API Green Label & 4 J-Slot Socket



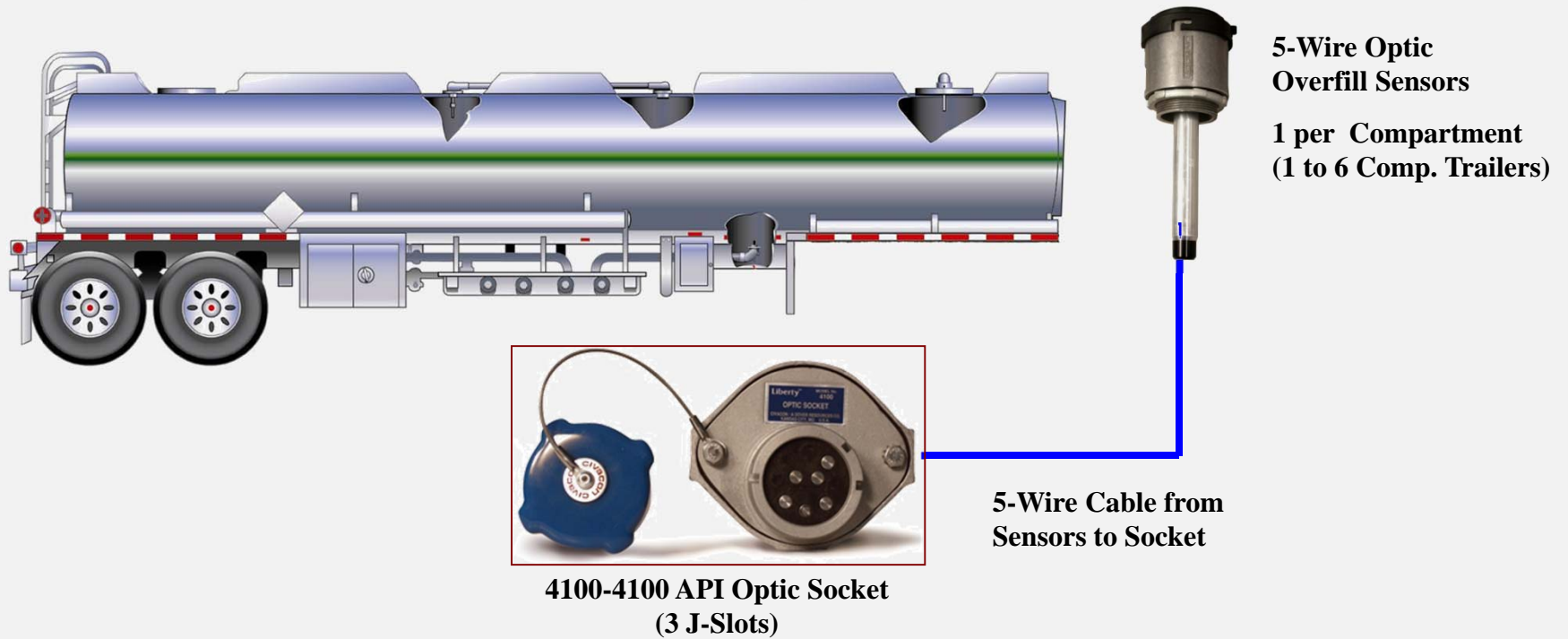
- A “parallel wired” system – each sensor independently operated & wired
 - Sensor stands alone and is not affected by other sensors
 - An important point to remember!!!
- Can be “straight’ wired system (diagram next page)
 - If wired as straight system a “dummy” is needed in the socket for the un-used compartments
 - Loading Rack Monitors want to always see 6 (USA) or 8 (Canada) total dry sensors in order to give permit to load
- Newer Onboard Monitors typically use 2-Wire Optic Sensors

Two Wire "Straight" System Wiring

- **Parallel wiring of each sensor to socket (or onboard monitor)**
 - All 6 "channels" of rack monitor must be satisfied (8 in Canada).
 - Un-used "channels" require a dummy or other means to mimic a dry sensor must match the rack's operating signals.
 - Onboard Monitors deal with "un-used" probes in different ways.



STRAIGHT API "OPTIC" SYSTEM



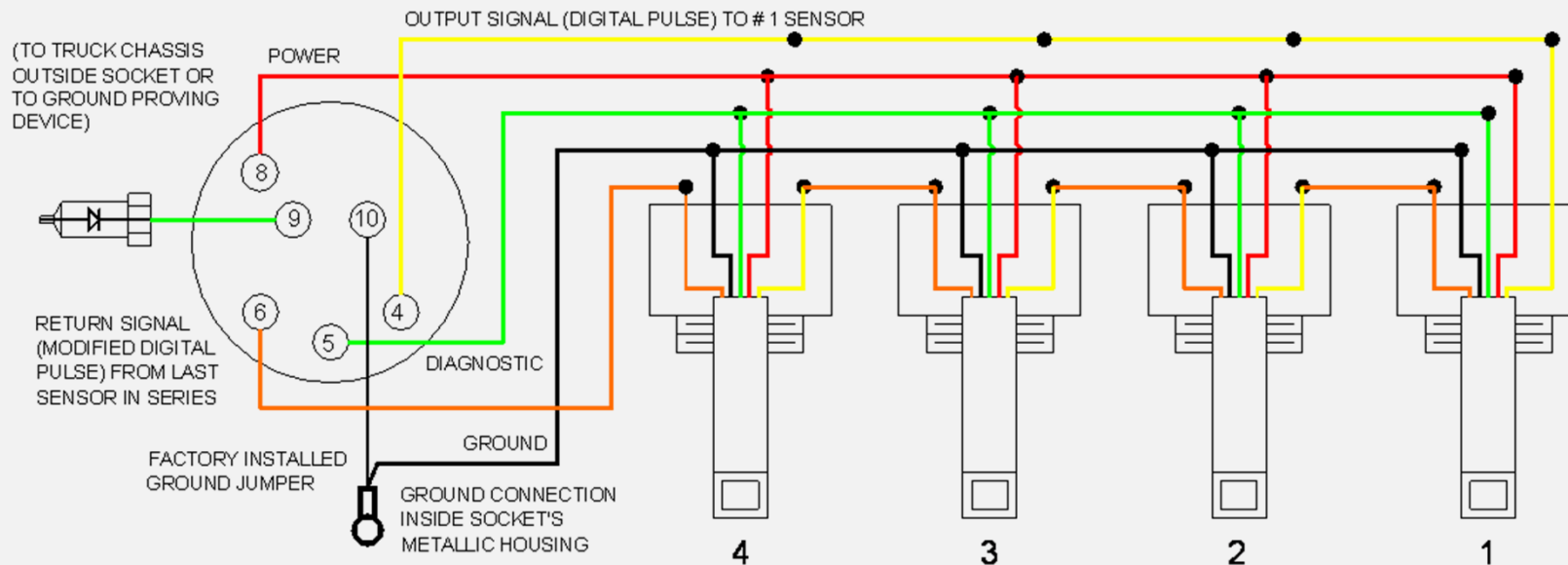
5-WIRE OPTIC OVERFILL SYSTEMS

■ API Blue Label & 3 J-Slot Socket

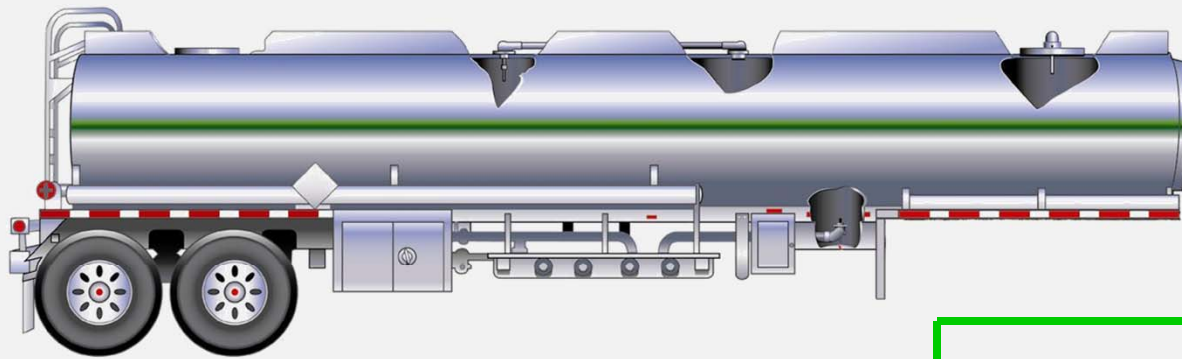
- What the API Standard calls “Optic” Sensors are the 5-Wire type
- A “**series wired**” system – each sensor linked to previous one (gets its signal to work from it...)
 - Sensor operating signal stops at first wet sensor
 - **An important point to remember!!!**
- Can be “straight’ wired system (diagram next page)
 - **Rack Monitor (or OBM) only sees a dry status from last sensor**
- Common on West Coast (west of Rockies) & on some **older** Onboard Monitor Systems (Civacon “Liberty” & Scully “Load-Anywhere” Models)



- Series wiring of each sensor to next sensor
 - “Return” (dry) signal from last sensor satisfies rack monitor or OBM.
 - Only first wet sensor is detected / displayed by a 5-wire onboard monitor.



"ONBOARD MONITOR" SYSTEM



**2-Wire Optic
Overfill Sensors**
1 per Compartment
(1 to 6 Comp. Trailers)

**7-Wire Cable from
Sensors to Socket**

OPTIONAL



**3202-3202
Onboard
Monitor**



**4401-4401
"Therm."
Socket**



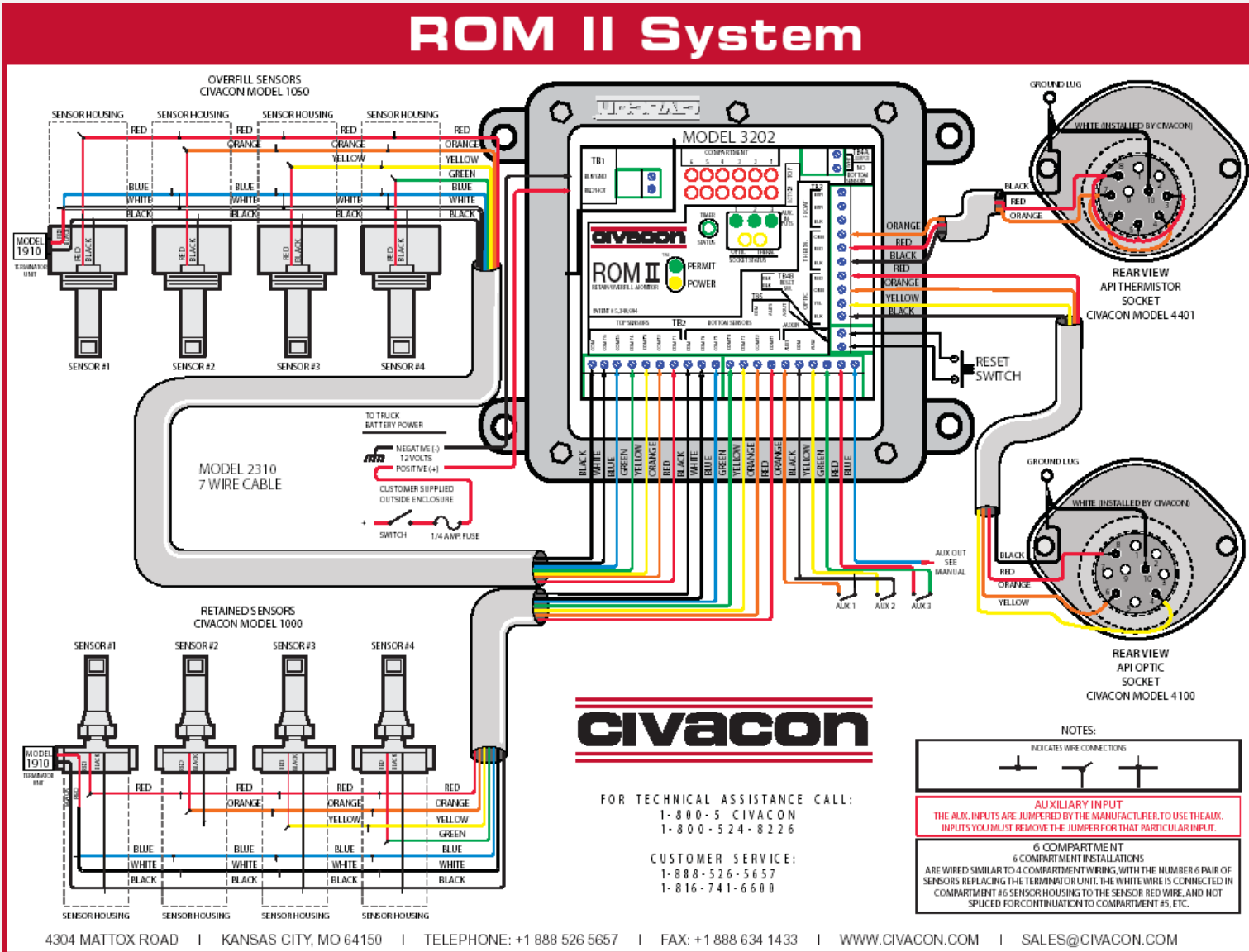
**4100-4100
"Optic"
Socket**



**4820R
Dual Socket
(pre-wired)**

Monitor Typical System Wiring

ROM II System



FOR TECHNICAL ASSISTANCE CALL:
1-800-5 CIVAICON
1-800-524-8226

CUSTOMER SERVICE:
1-888-526-5657
1-816-741-6600

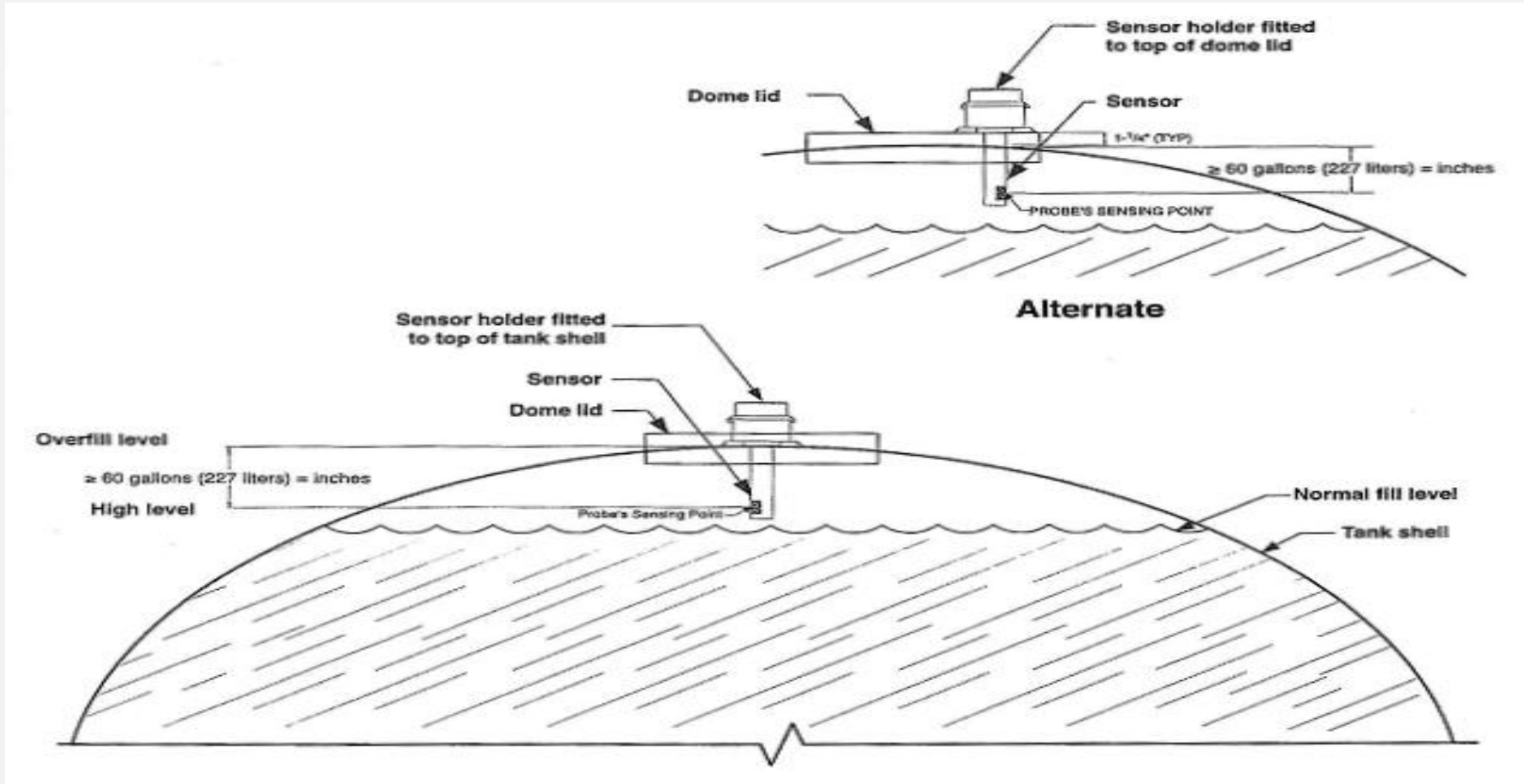
OVERFILL SENSOR INSTALLATION

■ **Sensor Installation Depth**

- Why is sensor depth so important?
 - Overfill detection sensors are the trailer's secondary shutdown system!
 - Set too low and they become the "primary" or become a nuisance!
 - Set too high and they won't do their job correctly.
- What factors determine proper depth?
 - Rack's pumping speed & time to "zero" flow condition.
 - Standards like API RP1004 (2003)
- How to set the proper sensing depth.
 - Shell full volume – 60 Gal. = depth (min.) for sensor.
 - Sensor should also be set $\frac{1}{4}$ " – $\frac{1}{2}$ " above the normal maximum capacity.



OVERFILL SENSOR INSTALLATION



Above Figure from RP-1004 (2003) used with permission from the API

OVERFILL SENSOR INSTALLATION

- **Wire Crimping Tips**

- Poor electrical connections = intermittent or non-working systems!
 - Can't stress this enough!!!
- Many non-working systems can be traced to poor crimping techniques.
 - We get back many perfectly good sensors that were "fixed" when the new one was installed!

OVERFILL SENSOR INSTALLATION

- Hand Crimp Tool versus Ratchet Crimp Tool



About \$10

Typical Hand Crimp Tool - Does NOT provide a consistent, quality crimp!



Usually
<\$50

Typical Ratchet Crimp Tool - Positive action = crimp not completed until proper!

OVERFILL SENSOR INSTALLATION

- **Protection Against Corrosion**

- Keep out moisture, the primary source of corrosion!
NO Moisture = long, trouble-free service life!
- Use an electrical wire compound like those shown,
or a “*non-acid based*” Silicone Sealant.

Beware of generic silicon sealants!!!

- Acetic Acid based curing process
WILL corrode the wires quickly!
(if it smell like vinegar – don’t use)
- Always look for “sensor-safe, safe for electronics (has an alcohol smell)



OVERFILL SENSOR INSTALLATION

- **Cable Jacket Stripping Tips**
 - RULE #1.... Don't Nick Inner Conductor Insulation!!!
Don't use utility knives!!!
Invest in a Cable Jacket Cutter!
Cuts only partially through the jacket & break the rest.



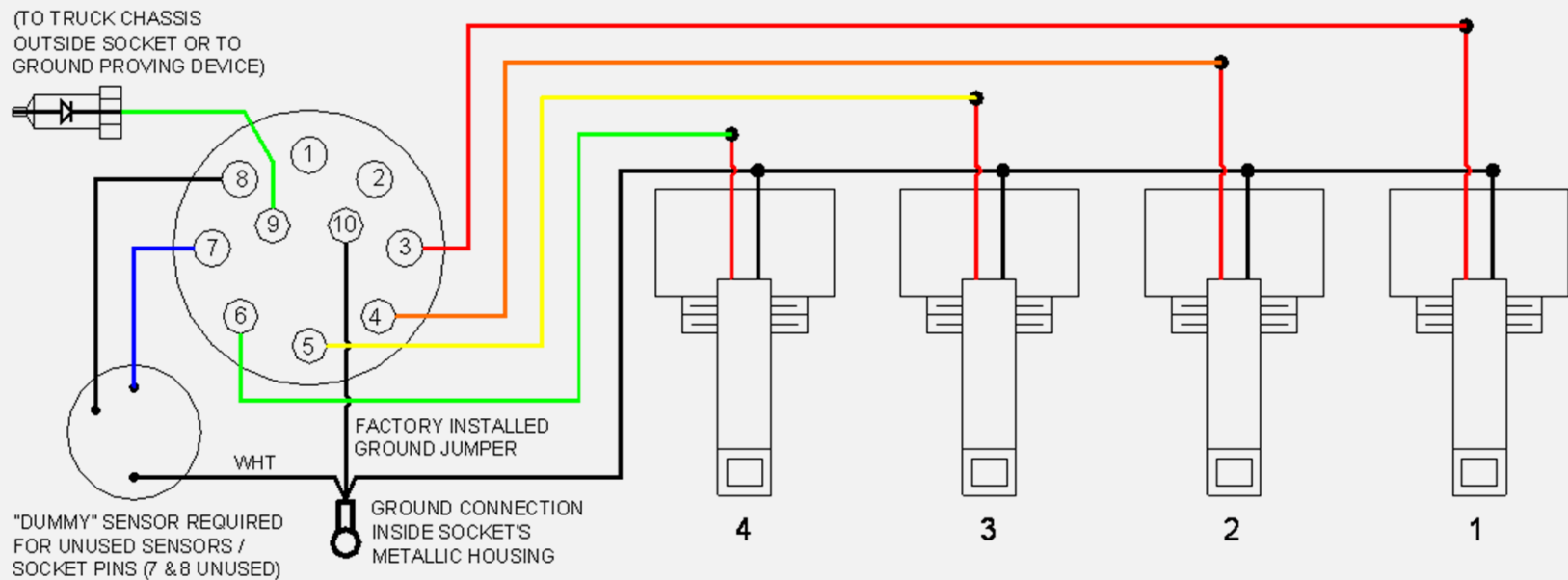
Basic Troubleshooting

- Get in the right frame of mind...
 - “Think like a 2-wire probe!!! (I’m **parallel** wired)
 - “Think like a 5-wire probe!!! (I’m **series** wired)
- Use a simple Beeper Tester like the Civacon 1391.
 - “It can “see” the pulsing probe signals (beeps)
- Use a Multi-meter for simple resistance tests.
 - Like Pin # 10 to chassis, Ground Bolt testing, etc.
- Possible Poor Connections are the first assumption!
- Moisture is your second assumption!
 - Always start with a dry system.
 - If it isn’t dry in all of the junction boxes (sensors, sockets, OBM, etc.), dry these first before looking for a problem as the moisture likely was it!



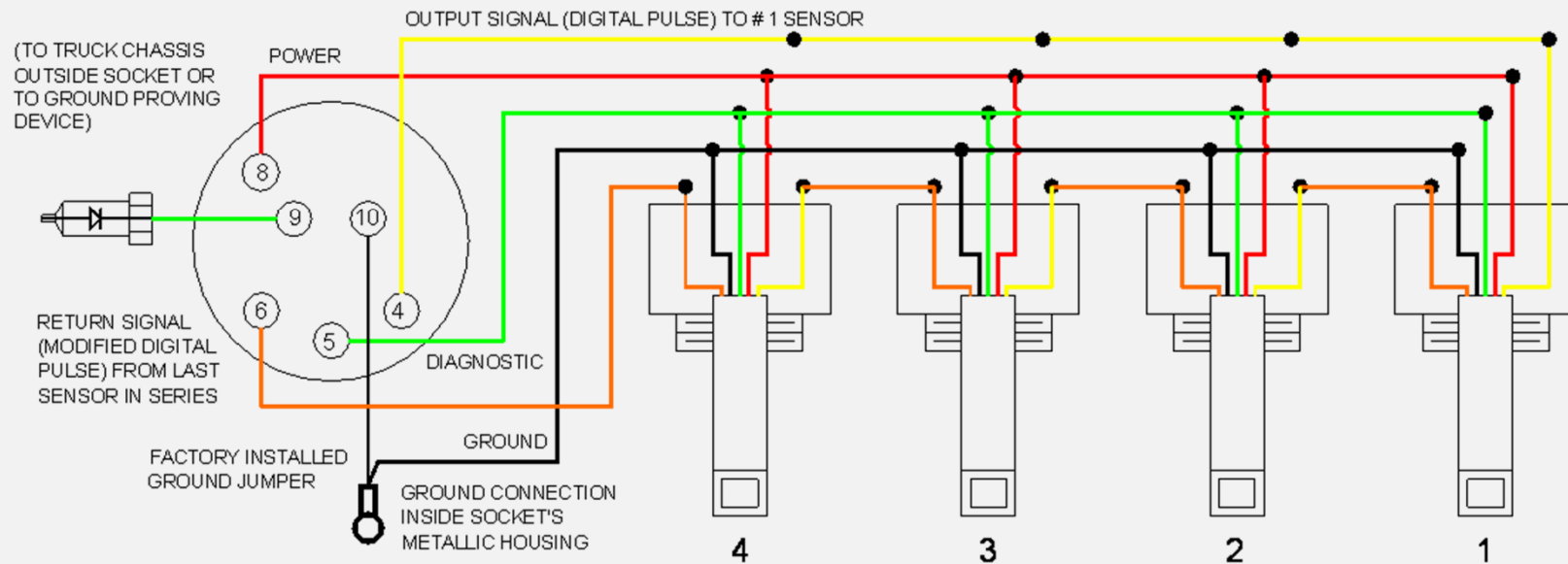
Troubleshooting - Two Wire "Straight" Systems

- Parallel wiring of each sensor = each sensor separate!
 - Testing of each sensor individually tells problem.
 - All sensors with same problem generally means a ground problem.
 - Onboard Monitor (2-wire) Red LED pinpoints where to look.



Troubleshooting - Five Wire "Straight" Systems

- Series wiring of each sensor = all sensors "related"!
 - Test for where the "return signal" stops.
 - Signal on Orange Sensor Wire if Sensor is "Dry" & working.
 - Remember that a sensor may seem bad, but isn't getting a signal from the sensor before it!
 - Onboard Monitor Systems (5-wire) "almost" pinpoint problem.

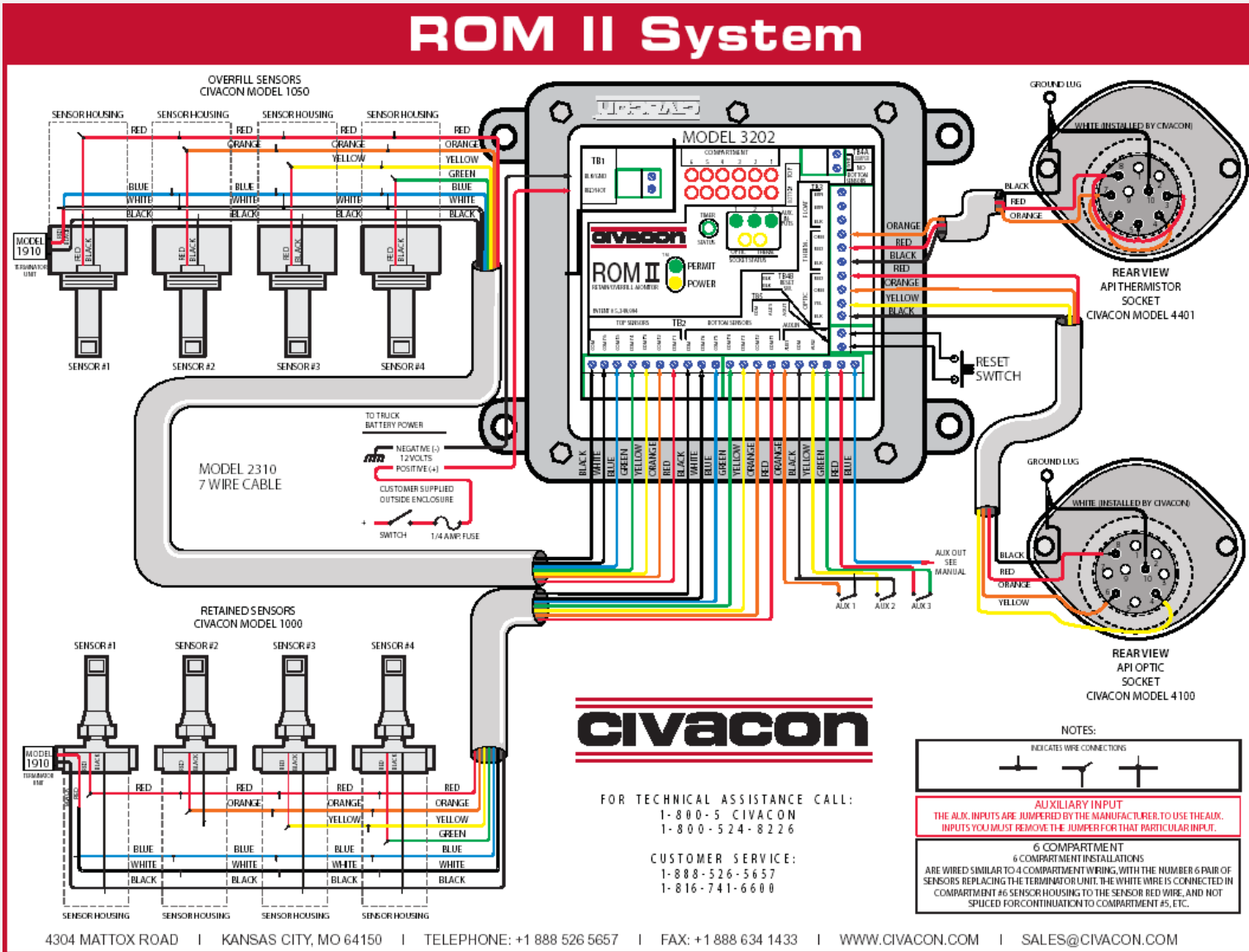


Troubleshooting – Onboard Monitor Systems

- First determine the type of system (type of sensors used)
 - 5-Wire Sensor Systems (Like the Civacon Liberty or Scully LA/GA)
 - **Series** wired 5-wire sensors
 - Sensors operate and test just like a straight 5-wire system
 - 2-Wire Sensor Systems (Like the Civacon ROM II or Scully IntelliCheck 2)
 - **Parallel** wired 2-wire sensors
 - Sensors operate and test just like a straight 2-wire system
 - May have Retained Sensors as well
 - Commonly use Aux. Inputs (external permissive interlocks)
 - From Sequential Vents (all must be open)
 - From Vapor Adaptor (hose must be attached)
- If all sensors appear dry and O.K. (no red lights on), then check Aux. Input next (all must be satisfied and “green”)
- Use the OBM as a built in tester with a 3-STEP approach
 - Simple substitution / swapping (does problem follow “swap”)
 - Eliminate suspected wiring (direct connect and jumper wire)

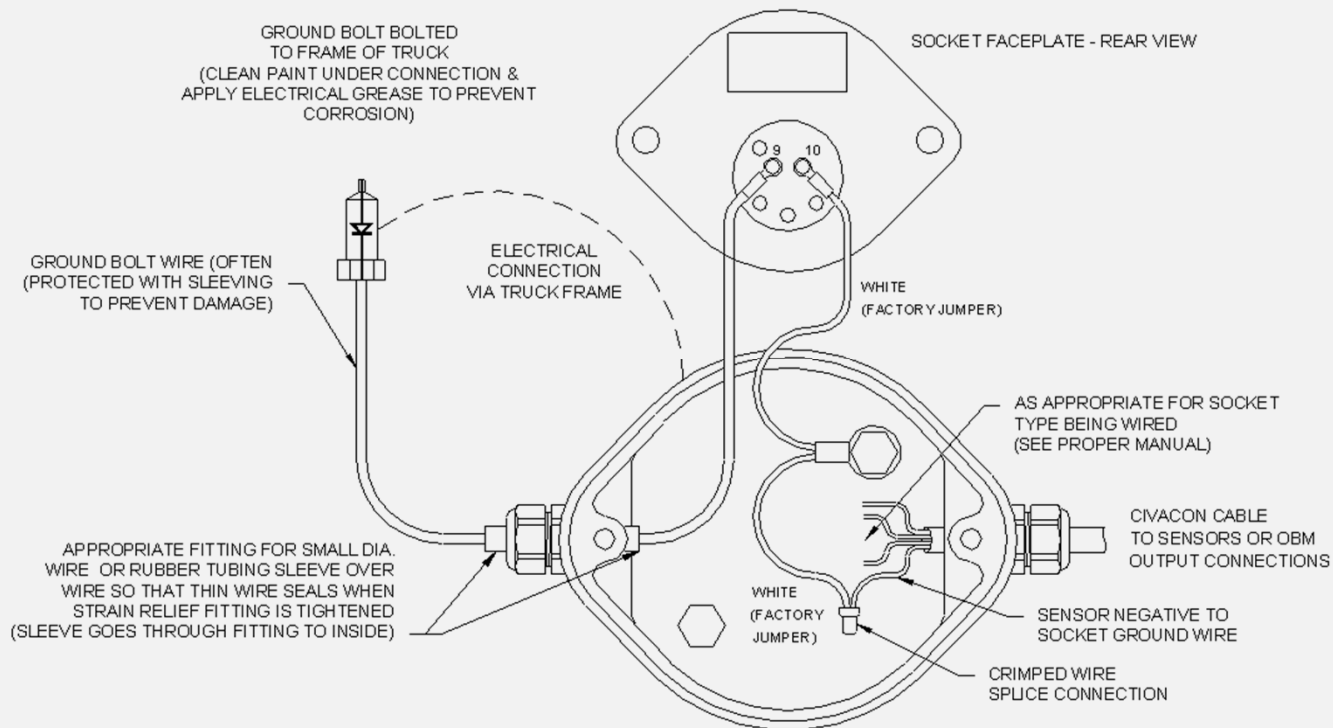
Monitor Typical System Wiring

ROM II System



Ground Bolt & Socket – Typical Wiring

- Ground Bolt wired to Pin # 9
 - Common industry practice versus RP1004 # 9 “Aux. Gnd.” Wire



Ground Bolt Troubleshooting

- Ground Bolt is the electrical equal of a “check valve”.
 - Current only flows one way through it (from pin # 10 to Pin # 9)
- Test with Multi-meter that has a “Diode Test” Mode.
 - Red Lead on # 9 & Black on # 10 = “open circuit”
 - Red Lead on # 10 & Black on # 9 = “voltage drop” (voltage reading)
- Problems mostly due to bad connections!

Diode Test Mode
on Multimeter Dial

(look for the
diode symbol)



CIVAICON

QUICK DIAGNOSIS AND REPAIR
FOR GROUND HOG SYSTEM




OPTIC SOCKET
(BLUE)

FRONT VIEW
CONTACT SIDE



THERMISTOR SOCKET
(GREEN)

FRONT VIEW
CONTACT SIDE

1. TURN VOLT OHM METER TO DIODE ICON ()
2. RED LEAD TO PIN #9; BLACK LEAD TO PIN #10
3. READING SHOULD BE: 1.0 OR .000 OR OL
4. RED LEAD TO PIN #10; BLACK LEAD TO PIN #9
5. READING SHOULD BE BETWEEN .500 TO .700
6. WHEN #3 AND #5 REQUIREMENTS ARE MET = GOOD GROUND
7. IF THE ABOVE REQUIREMENTS ARE NOT MET, YOU MUST VERIFY THE LOCATION OF THE LOSS OF CONTINUITY OR INSTALL A CIVAICON™ SAF-T GROUND WIRE - P/N GSI00!

Checking the Ground Bolt Diode (forward)

- Meter set to the “diode function” will give an “open” reading in this direction



RED Tester
Lead Here
(Pin #10)

BLACK Tester
Lead Here
(Pin #9)

Meter will read the diode's “voltage drop”
(typ. 0.5 - 1.0 Volt)



Checking the Ground Bolt Diode (reverse)

- Meter set to the “diode function” will give a reading in this direction



BLACK Tester
Lead Here
(Pin #10)

RED Tester
Lead Here
(Pin #9)



Meter will read
“open circuit”
(just like leads
touching nothing)

Ground Bolt Installation “cleanliness”

- Meter set to the “Resistance – Ohms function” will give check for corrosion.



RED Tester
Lead Here
(Pin #10)

BLACK Tester
Lead Here
(body of
Ground Bolt)



Meter will read
the resistance of the mounted Ground
Bolt – High Ohms = Corrosion (should be
100 Ohms
Max., but low as possible)

Some Items Worth Mentioning...

- **ROM Link Wiring System**
 - A revolutionary way to wire a trailer's overfill system!
- **Quick-Loom Wiring Kits**
 - Another approach to saving wiring time,
- **New Model 1910A Terminator**
 - Packed for mounting inside the ROM Housing
- **ASA-1 Pressure Switch Assembly**
 - Pre-packaged, Purpose Build Air Interlock Switch
- **The NV3000 Pressure - Vacuum Vent Valve**
 - A completely new, cleanable design.
- **Other Mechanical Hardware**
 - Air Interlock & Air Control Panels

ROM Link Wiring System

- The no strip, no crimp, no mess way to go!
 - All tedious hand wiring is GONE!
- New entirely “pluggable” design simplifies things.
 - No special tools, no special training needed.
 - Quick & Easy Retrofit too!
- New System Tester



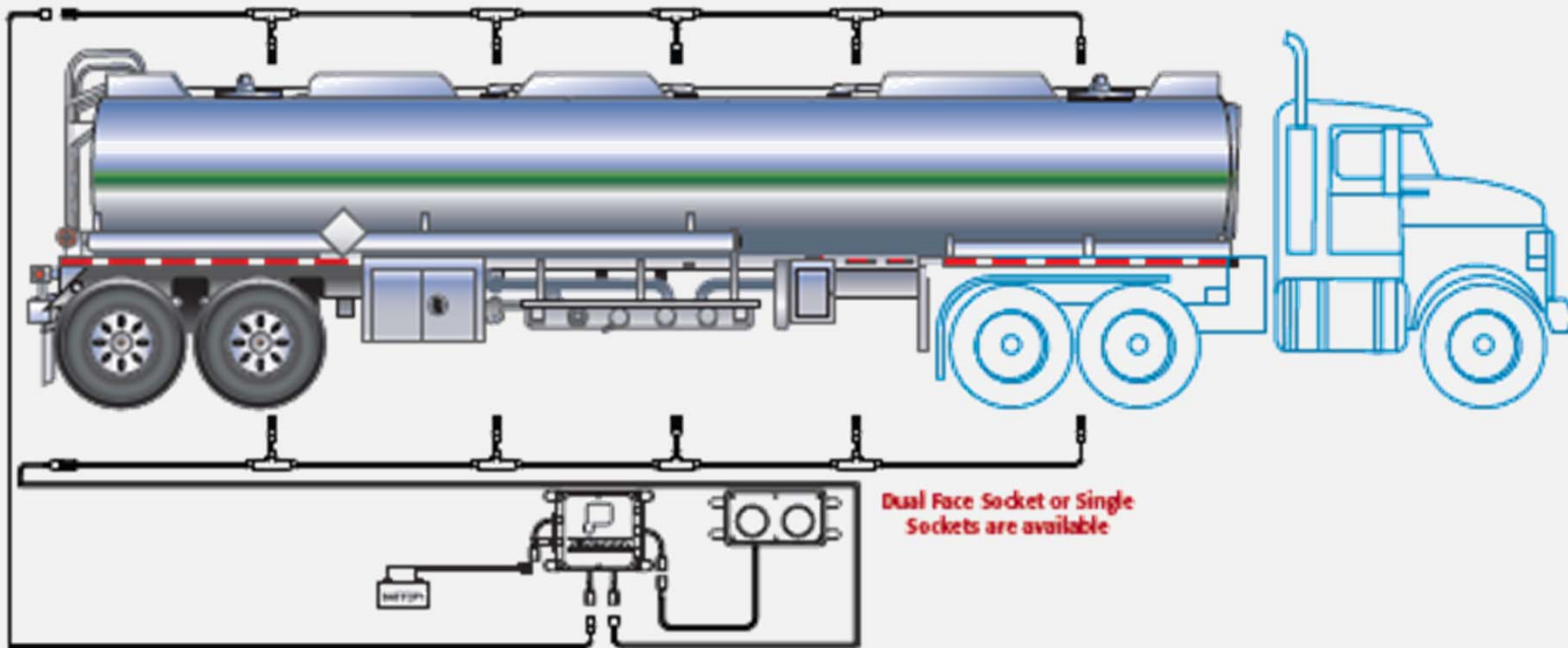
ROM Link Wiring System

- The Old Way meant cutting and stripping approximately 80 wires and splicing 36 connections.
- The New Way means plugging in 6 connectors!





ROM Link Wiring System

- ROM II, Top Sensors, Bottom Sensors & Sockets ALL “ROM Link” Plug-N-Load Ready.



Civacon Quick-Loom™ Wiring







Quick Loom

Rev. A, Oct 2011

Are your cables worn out and need to be replaced? Check out the Quick Loom for easy replacement and installation...

Civacon's answer to tired and worn out cables is the Quick Loom, a one-piece molded cable assembly. The new cable system is a quick and easy solution for replacing all Civacon and Competitor brand 2-wire systems. No need to switch your equipment, Quick Loom will work with your existing Civacon or Competitor brand probes and housings. Innovative molded design reduces the number of connections in the probe housings; fewer connections mean less corrosion build-up.








Features

- Quick and Easy Installation, in approximately 1 hour you can replace your 2-wire cable system
- Converts to a one-piece innovative design
- Works with Civacon and Competitor Probes and Housings
- Reliable one-piece molded assembly, eliminates corrosion concerns
- UV and Chemical Resistant
- Dielectric grease inserted into the sealed connector

Ordering Specifications

Quick Loom	
CIV-C04L	4-Compartment Loom, (8) Sealed Connectors, (1) Terminator, (4) 1/2" Plugs, (4) Strain Reliefs
CIV-C04K	4-Compartment Loom, (8) Sealed Connectors, (1) Terminator, (4) Aluminum Probe Housing, (4) Plastic Screw on Caps, (4) 1/2" Plugs, (4) Strain Reliefs
CIV-C05L	5-Compartment Loom, (8) Sealed Connectors, (1) Terminator, (5) 1/2" Plugs, (5) Strain Reliefs
CIV-C05K	5-Compartment Loom, (8) Sealed Connectors, (1) Terminator, (5) Aluminum Probe Housing, (5) Plastic Screw on Caps, (5) 1/2" Plugs, (5) Strain Reliefs



PHONE: (816) 741-6600 • (888) 526-5657 • Fax: (816) 741-1061
4304 Mattox Road • Kansas City, MO 64150 • www.civacon.com

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 - Reliable one-piece molded assembly, eliminates corrosion concerns
 - UV and Petro-Chemical Resistant
 - Dielectric grease inserted into the sealed connector

Model #1910A Terminator

- Packed for mounting inside the ROM Housing
- Has 2 Red Wires (both identical – just an extra
 - maybe saves you adding a jumper



Model ASA-1 Pressure Switch Assy.

- This pre-packaged, potted assembly is ready to install.
 - Designed to be mounting inside the ROM Housing, or in a Socket
 - Pressures: 70 PSIG “On” / 45 PSIG “Off”
 - Temperature Range: -40° to 160° F (-40 ° to 70° C)
 - Single Pole Single Throw (SPST) Normally-Open Switch
 - Stainless Steel, Hermetically Sealed (Welded) Snap-Action Diaphragm has a Rated Life of 100,000 Cycles (min.)
 - 1/2 inch NPT Male Thread and 1/4 inch DOT Swivel Air Fitting



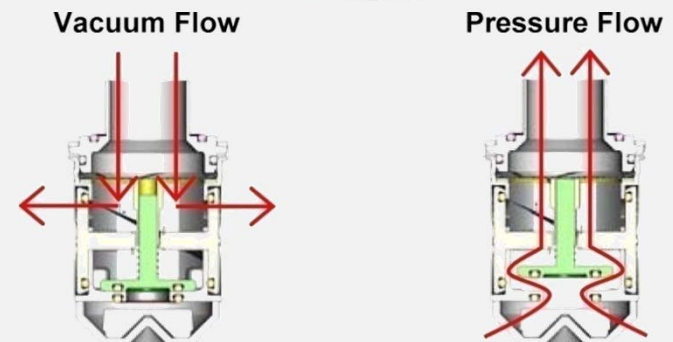
ASA-1 Mounted in ROM Monitor



ASA-1 Mounted in Socket

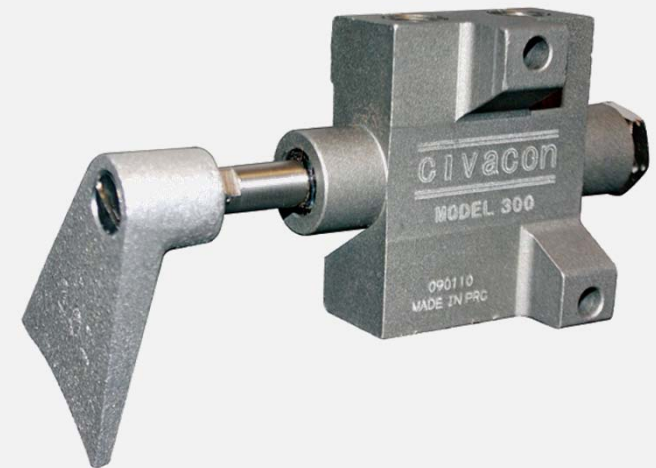
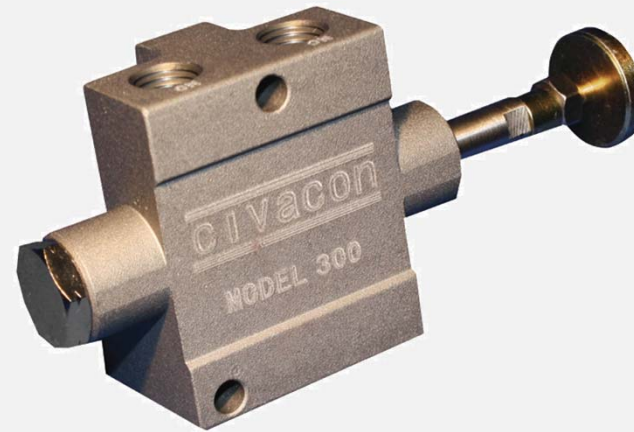
NV3000 Pressure – Vacuum Vent

- Quick “strip in place” design
 - No tools required
 - Removable filter for easy quick cleaning
- Die-cast aluminum, stainless steel and Delrin[®] parts with Viton[®] GF Seals
 - Yet lightweight & durable (14.8 oz.)
- Can be installed in any existing 10” fill cover
- Higher flow rate than competition
 - 2 independent vacuum poppets means increased flow & safety
- Exceeds European EN and California’s CARB specifications



Model 300 Air Interlock Valve

- **Features & Benefits:**
 - Solid One - Piece Extruded Aluminum
 - Lightweight Yet Strong
 - Hard Coat Anodized Body
 - For Extreme Durability and Wear Resistance
 - Premium Parker Brand™ Standard Series-2 O-Rings
 - Easy to Find & Maintain (also in 300RK Kit)
 - Closed Loop Breather Keeps Contamination Out
 - Rear End Cap is Completely Sealed. No Vent Holes are Required
 - Temp. Range: -40 to +160F (-40 to +70C)
- A drop-in, replacement for our earlier models and for competitive brands
 - The fit and function remain identical to previous models

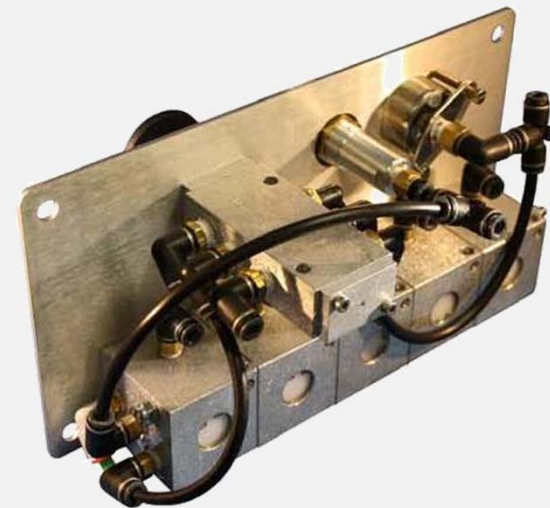


CivaControl II Air Control Panels

- Modular (Stackable) 3-2 Ported Valve Block Design is ideal for Emergency Valve control
 - New smaller, lighter panel design includes Pressure gauge and vents open Indicator
 - Aluminum Knobs spaced for gloved access
- Positive air reset / shut down feature ensures no valve is left open after shutting down the Master Valve
 - Master Valve can be reset remotely too!
- High air flow in small package ensures quick opening and fast shut down
- High endurance urethane seals rated at -40° F (-40° C)
- DOT air fittings pre-installed



SCP-5



Contact Information

FOR 24-HOUR TECHNICAL ASSISTANCE, CALL : 800-524-8226

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4304 Mattox
Kansas City, MO 64150**

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