

# TD80™ Installation Quick Reference Guide

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*NOTE: All installation steps are to be performed in accordance with the TD80 Product Manual, TPM 001*



**The installation steps are summarized in Table 1: Installation Workflow.** →

See the TD80 Product Manual for full instructions, warnings and cautions. The installation details in the manual are for example only. Refer to the specific installation details for programming, component location and electrical wiring.

## INSTALLATION WORKFLOW

Checked	Step	Step Title	Reference Section
	1.	Program the TD80	6.3.2
	2.	Install the 1" NPT Top Fitting	2.4.2
	3.	Install the Anchor Cone	2.4.2
	4.	Install the Probe	2.4.2
	5.	Mount the Transmitter	2.4.2
	6.	Mount the Finch Display	2.4.2
	7.	Mount the Relay Module (optional)	2.4.2
	8.	Mount the Alarm Accessories (optional)	2.4.2
	9.	Inspect the Mechanical Installation	2.4.2
	10.	Install the Electrical Wiring	2.5, 2.6 & 2.7
	11.	Set and Verify the Finch Display Jumpers	2.8
	12.	Confirm Fuses Installed with Correct Type/ Rating	2.1.2
	13.	Perform the TD80 Basic Operation Test	2.2.1
	14.	Verify TD80 Transmitter Programming Information	2.1.2
	15.	Set the Fill or Fall Alarm Level Volume	2.1.2
	16.	Perform the TD80 System Test and Verification	2.2.2
	17.	Perform the Offset Calibration	2.2.3

*Table 1: Installation Workflow*

## PRE-INSTALLATION REQUIREMENTS

1. When choosing a location to install the TD80 components, the following guidelines must be followed:
  - a. Appropriate industry, national, provincial/state and local codes.
  - b. Fuses and components are appropriate for the area classification.
2. The tank is completely drained of liquid and vapour free.
3. No drilling or welding to the tank and frame without first consulting with the tank manufacturer.
4. Refer to Figures 3 and 4 in the Graphical Glossary of Terms within this document, and to the manual, section 2.1.3 for the following:
  - a. Probe and Transmitter location.
    - i. Dual Rod
    - ii. Coaxial
  - b. Finch Display location.
  - c. Finch Relay Module location.
  - d. Electrical requirements.



## INSTALLATION STEPS

1. Program the TD80
  - a. The TD80 must be programmed before use. Programming may be done at the factory when purchased, programmed by the customer prior to installation or after installation on the vehicle when necessary.
  - b. See the Programming Instructions in the manual, section 6.3.2 for detail.
2. Install 1" NPT Top Fitting (collar)
  - a. Ensure that the top fitting position allows the probe to fit vertically into the tank.
  - b. Weld the top fitting to the tank top.
  - c. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
3. Install the Anchor Cone
  - a. Ensure that the anchor cone is directly under the collar, within 3 degrees from vertical.
  - b. Weld the anchor cone to the tank bottom.
4. Probe installation
  - a. Cut the probe to length.
  - b. Install with Teflon tape or anti-seize compound.
  - c. The probe must fit into the anchor cone without bending, twisting or binding.
  - d. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
5. Transmitter mounting
  - a. Do not use Teflon tape or anti-seize compound.
  - b. Hand-tighten the transmitter nut, and then use a wrench to secure the connection.
  - c. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
6. Finch display mounting
  - a. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
7. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.

- 7. Optional Relay Module mounting
  - a. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
- 8. Optional Alarm accessories mounting
  - a. Lights
  - b. Horns
  - c. Alarm Acknowledge push button
  - d. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
- 9. Inspect the Mechanical Installation
  - a. See the Mechanical Installation Instructions in the manual, section 2.4 for detail.
- 10. Electrical installation
  - a. The TD80 transmitter is provided with a 50' or 75' cable kit. It is recommended to use the kit with included sealing fitting for connection to the Finch display.
  - b. All electrical grounding is to the vehicle or trailer electrical ground connection and not to the chassis.
  - c. For trailers, connect the TD80 system power and ground to the nose box electrical connector. For trucks, connect TD80 system power to a switched accessory power connection from the battery.
  - d. Wire splices should be made inside a weather proof enclosure or junction box to prevent premature failure due to corrosion.
  - e. Secure all wires and cabling with clips or cable ties.
  - f. Tighten all compression fittings.
  - g. See the manual, sections 2.5, 2.6 and 2.7 for electrical wiring installation examples.
  - h. Refer to Figures 1 and 2, within this document, for basic installation wiring diagrams and instructions.
- 11. Finch display jumper setting or verification. Place the following jumpers in the positions required for the installation. See manual, Figures 2-36 and Figure 2-37.
  - a. Decimal point, J2 to J5
  - b. Fill alarm relay, J1
  - c. Fail/Spill relay, J10
  - d. Fill/Fall alarm, J9
- 12. Confirm Finch 5332E/PS (red terminal board) Fuses are installed with correct Type (Ceramic, Sand Filled, 5x20mm) and Rating (F1, F3-F5: 2A, F2: 5A), see manual, Figures 2-35, or Finch 5332E (green terminal board) 3A Blade Fuse installed in a non-hazardous location.
- 13. Perform the TD80 Basic Operation Test
  - a. See manual, section 2.2.1
- 14. Verify TD80 programming information for the following:
  - a. Correct depth chart and units
  - b. Fill or Fall alarm level
  - c. HH level
  - d. Spill Level
- 15. Set the Fill or Fall alarm for the required level
- 16. Perform TD80 System Test and Verification
  - a. See manual, section 2.2.2
- 17. Perform the Offset calibration
  - a. See manual, section 2.2.3

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***The Titan TD80; Serving the Largest Crude Oil Fleets in North America. Thousands of units installed in a variety of mobile tanker applications.***

# FINCH 5332E/PS EXTERNAL DISPLAY, RED TERMINAL BOARD WIRING INSTRUCTIONS

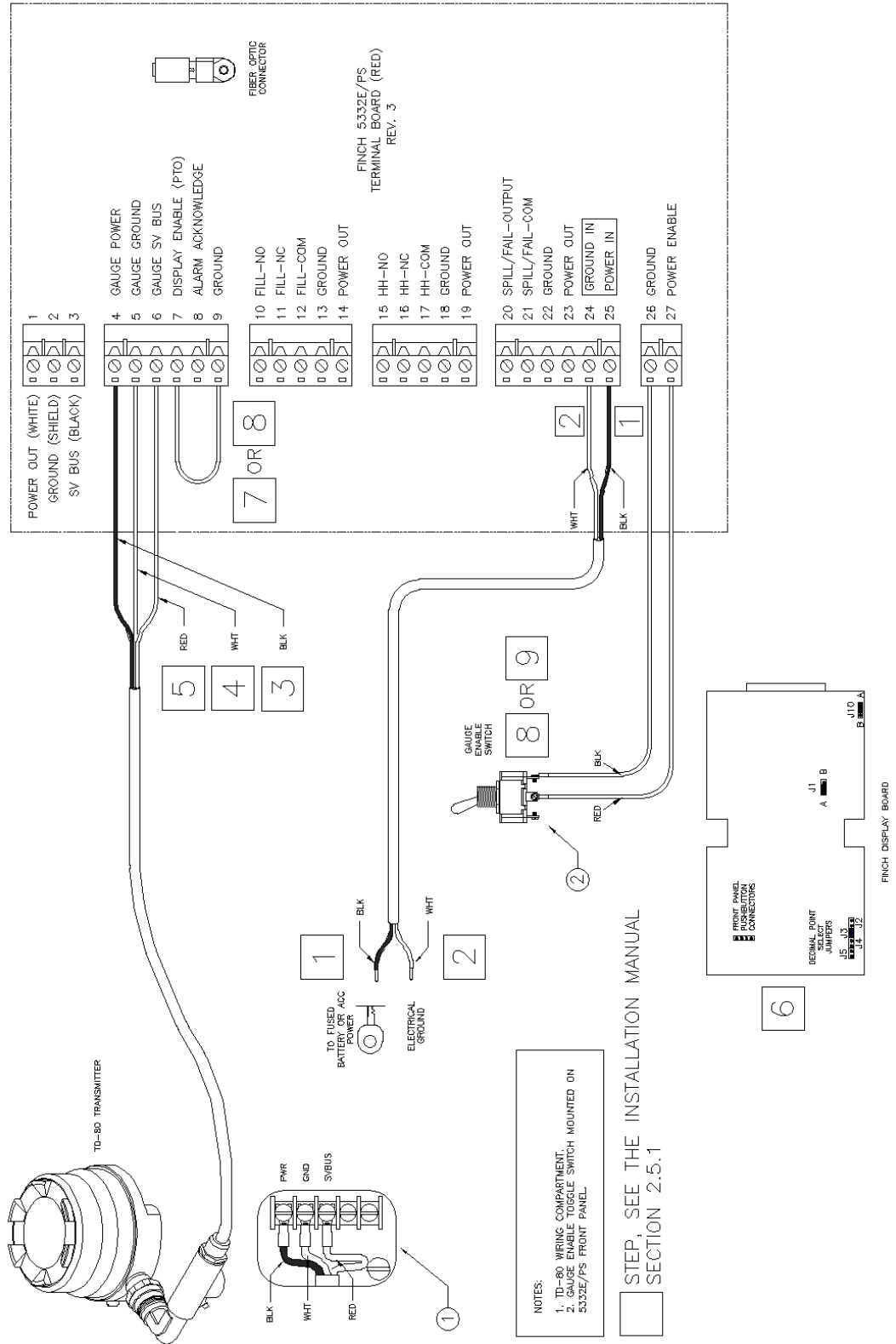


Figure 1: Basic System Wiring Diagram for Finch 5332E/PS External Display (Same as Figure 2-12 in TD80 Product Manual, TPM 001)

**FINCH 5332E/PS EXTERNAL DISPLAY, RED TERMINAL BOARD WIRING INSTRUCTIONS**

Wiring steps for single TD80 and Finch Display. Refer to Figure 1 for Finch 5332E/PS (red board) installation.

1. Fused Power wire from nose box socket or junction box to Finch POWER IN (25)
2. Ground wire from nose box socket or junction box to Finch GROUND IN (24)
3. TD80 Power (black wire) to Finch GAUGE POWER (4)
4. TD80 Ground (white wire) to Finch GAUGE GROUND (5)
5. TD80 SV Bus (red wire) to Finch GAUGE SV (6)
6. Finch Jumpers, see Figure 2-37
  - a. J9 and Decimal Point shunt positions
    - i. J9 removed for Fill alarm, installed for Fall alarm (removed when shipped from factory)
    - ii. Decimal point jumper for required Display
7. Optional PTO or brake air switch to Finch DISPLAY ENABLE (PTO) (7) and Electrical Ground **OR**
8. Optional Gauge Enable toggle switch red wire to Finch DISPLAY ENABLE (PTO) (7) and black wire to Finch GROUND (9) **OR** wire Finch DISPLAY ENABLE (PTO) (7) to Finch GROUND (9) when not connected to a PTO or brake air switch **OR**
9. Optional Gauge Enable toggle switch red wire to Finch POWER ENABLE (27) and black wire to Finch GROUND (27) for power control **OR** wire Finch POWER ENABLE (27) to Finch GROUND (26)

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# FINCH 5332E EXTERNAL DISPLAY, GREEN TERMINAL BOARD WIRING INSTRUCTIONS

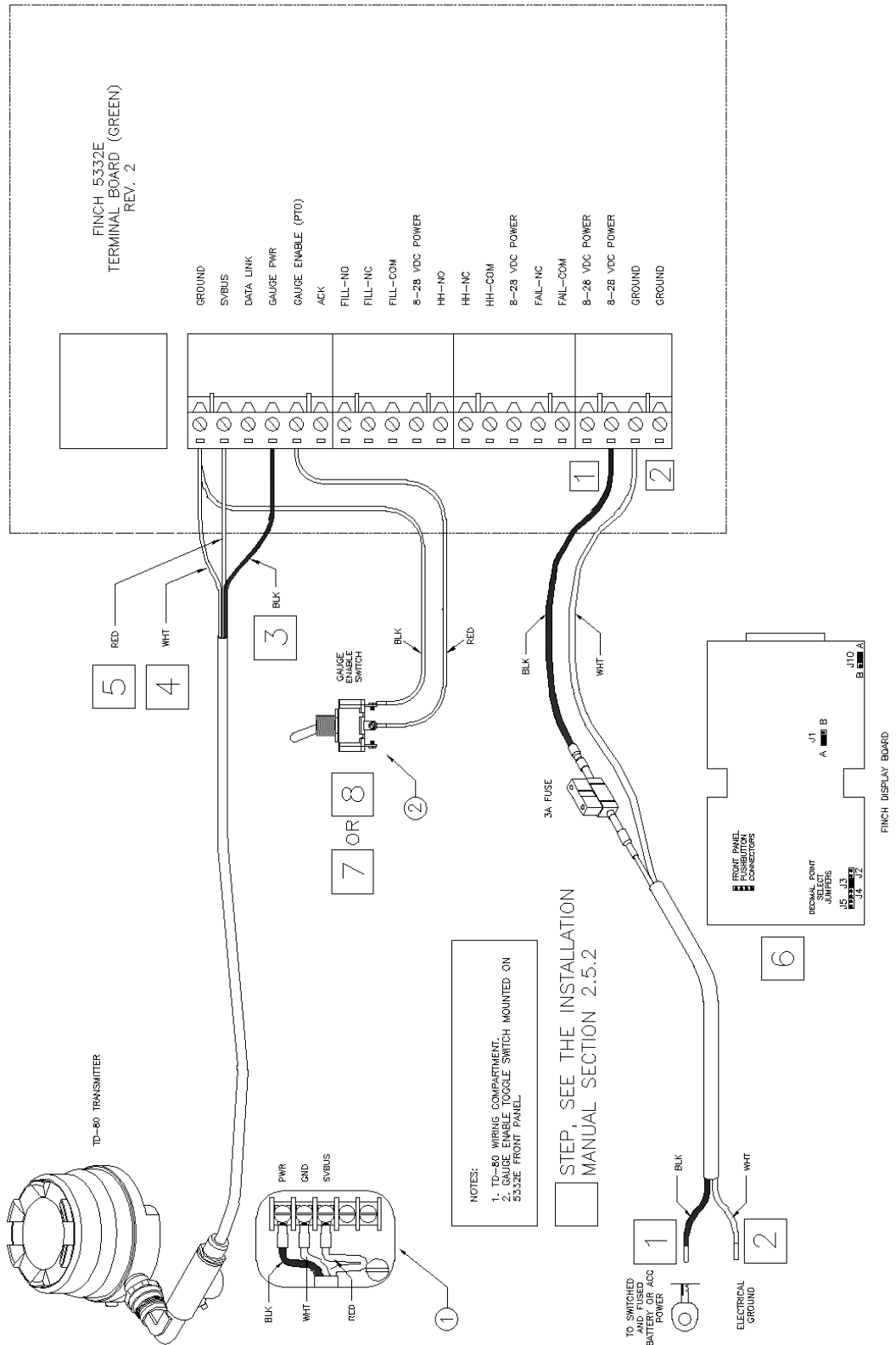


Figure 2: Basic System Wiring Diagram for Finch 5332E External Display (Same as Figure 2-14 in TD80 Product Manual, TPM 001)

**FINCH 5332E EXTERNAL DISPLAY, GREEN TERMINAL BOARD WIRING INSTRUCTIONS**

Wiring steps for single TD80 and Finch Display. Refer to Figure 2 for Finch 5332E (green board) installation.

1. Fused Power wire from the nose box socket or junction box through a 3A fuse to Finch 8-28 VDC POWER
2. Ground wire from nose box socket or junction box to Finch GROUND
3. TD80 Power (black wire) to Finch GAUGE POWER
4. TD80 Ground (white wire) to Finch GAUGE GND
5. TD80 SV Bus (red wire) to Finch SV BUS
6. Finch Jumpers, see Figure 2-37
  - a. J9 and Decimal Point shunt positions
    - i. J9 removed for Fill alarm, installed for Fall alarm (removed when shipped from factory)
    - ii. Decimal point jumper for required display
7. Optional PTO or brake air switch to Finch GAUGE ENABLE (PTO) and Electrical Ground  
**OR**
8. Optional Gauge Enable toggle switch red wire to Finch GAUGE ENABLE (PTO) and black wire to GROUND **OR** wire Finch GAUGE ENABLE (PTO) to Finch GROUND when not connected to a PTO or brake air switch

*Titan's TD80 provides accurate, reliable gauging, regardless of the liquid density. No float or moving parts means less maintenance and less downtime.*

## TD80 BASIC OPERATION TESTS

The following steps describe basic tests to confirm that the TD80 system is functional after installation or repair. Troubleshoot and repair all problems if the test results differ from the ones shown. See manual, section 2.2.1 for detail.

1. Inspect installation before power is applied.
2. Turn power on to the TD80 system. The Display should turn on and go through its start-up sequence (approximately 10 seconds long).
3. Display will show “----” for up to several seconds, then one of the following; “2 LO”, level, “E xx” where xx is an error code or “SPiLL”.

## TD80 SYSTEM TESTING AND VERIFICATION

The following steps describe tests and to be completed after mechanical and electrical installation of the TD80 system. These tests may also be used to confirm correct system operation after repair. Normal responses are indicated for each test. Proceed to troubleshooting if the test results differ from the ones shown. See manual, section 2.2.2 for detail.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> 1. Turn power on to the TD80 system. The Display should turn on and go through its start-up sequence (approximately 10 seconds long).</li> <li><input type="checkbox"/> 2. Display will show “----” for up to several seconds, then one of the following; “2 LO”, level, “E xx” where xx is an error code or “SPiLL”.</li> <li><input type="checkbox"/> 3. Test the volume display by doing the following:             <ul style="list-style-type: none"> <li>a. For dual rod probes, run your hand along the probe to check the volume display and alarm settings. If the probe is not within reach, use foil or a metal rod to short the two probe rods together.</li> <li>b. For coaxial probes, insert a small metal rod into the holes along the probe. Short the center rod to the outer tube to check the volume and alarm settings.</li> </ul> </li> </ul> <p>Volume displayed will increase as the hand or shorting rod moves toward the top of the compartment. Volume displayed will decrease as the hand or shorting rod moves toward the bottom of the compartment.</p> | <ul style="list-style-type: none"> <li><input type="checkbox"/> 4. Set the Fill alarm according to the customer’s requirements.</li> <li><input type="checkbox"/> 5. Clear all active alarms.</li> <li><input type="checkbox"/> 6. Confirm that the following occurs when the probe is shorted at selected points:             <ul style="list-style-type: none"> <li>a. “2 LO” is displayed when the tank level is less than 5.5”. Volume is displayed when the level is above 5.5”.</li> <li>b. Fall alarm (if installed) activates when the tank level decreases to or is less than the Fall alarm setting.                 <ul style="list-style-type: none"> <li>i. Display flashes the level</li> </ul> </li> <li>c. Fall alarm (if installed) deactivates when either the Up or Down button is pressed.                 <ul style="list-style-type: none"> <li>i. Display returns to normal, <i>not</i> flashing</li> </ul> </li> <li>d. Fill alarm (if installed) activates when the tank level increases to or exceeds the Fill alarm setting.</li> </ul> </li> </ul> |
|--|--|



- i. Display flashes the level
  - e. Fill alarm (if installed) deactivates when either the Up or Down button is pressed.
    - i. Display returns to normal, not flashing
  - f. HH alarm activates when the tank level reaches the HH alarm setting.
    - i. Display shows blinking "HH" and volume
  - g. HH alarm deactivates when Up-Up-Down-Up button combination is pressed.
    - i. Display returns to normal, not blinking
  - h. Spill/Fail alarm activates when the tank level reaches the Spill alarm setting.
    - i. Display shows flashing "SPill"
  - i. Spill/Fail alarm deactivates when the tank level decreases more than 2" below the Spill alarm setting.
    - i. Display returns to normal, not flashing "SPill"
- 7. Test the 4-20mA output (if installed) by doing the following:
- a. Monitor the 4-20mA signal with a Digital Multi-meter (DMM).
  - b. Short the probe with your hand or a small metal rod at several points along the length of the probe.
  - c. No short across the probe produces a signal of 4mA or slightly greater. Increasing height of the short produces an increasing current toward 20mA.

## OFFSET CALIBRATION

See manual, section 2.2.3 for calibration detail.

Offset calibration of the TD80 transmitter is required after installation, programming or replacement of the TD80 transmitter. The calibration compensates for variations from the calibration chart provided by the tank manufacturer and probe mounting height above the tank top.

Method 1 calibrates to a metered while loading volume, Method 2 calibrates to a metered while unloading volume and Method 3 calibrates to a measured distance from the tank bottom.

Methods 1 and 2 are preferred, while Method 3 is acceptable as better than no calibration. The first two methods calibrate to a metered load under normal conditions.

This is the most accurate compensation for mounting location and calibration chart differences. The third method compensates for mounting height only and does not have any effect on variations from the calibration chart supplied by the tank manufacturer.

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***The TD80 keeps drivers off the top of the tank. Liquid levels are displayed at eye-level, eliminating the need for drivers to go on top of the tank.***

# GRAPHICAL GLOSSARY OF TERMS

## Dual Rod Probe Truck and Trailer Installation

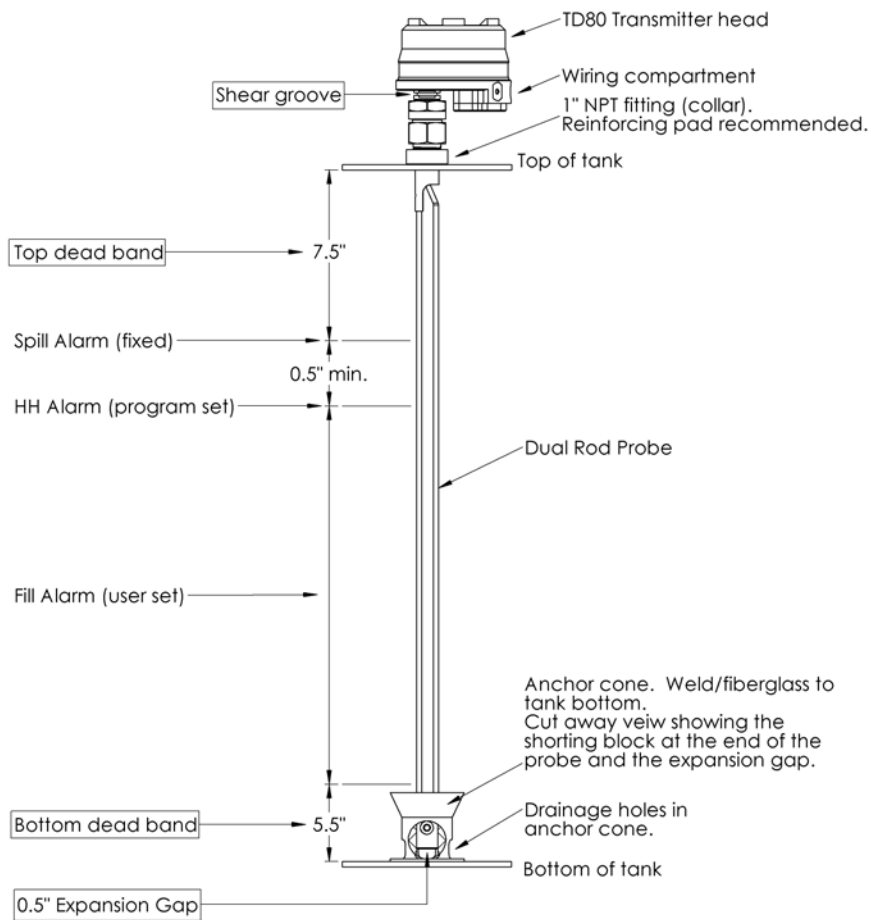
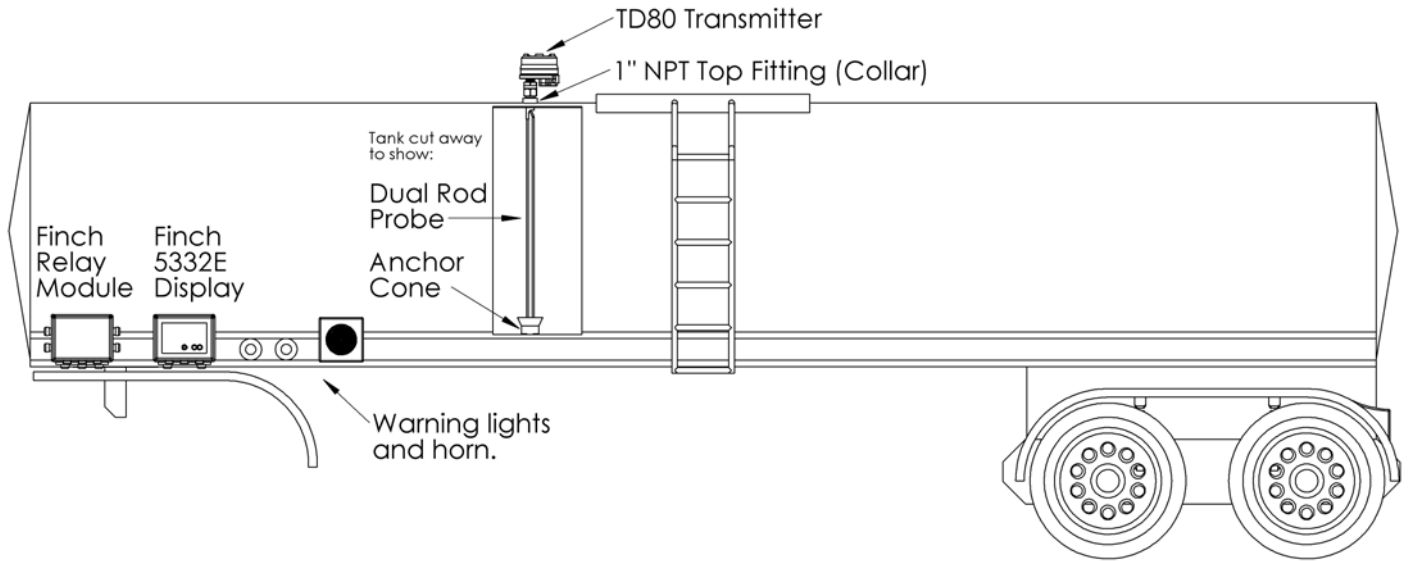


Figure 3: Dual Rod Probe Truck & Trailer Installation  
 (Same as Figure 1-1 in TD80 Product Manual, TPM 001)

## GRAPHICAL GLOSSARY OF TERMS

### Coaxial Probe Truck and Trailer Installation

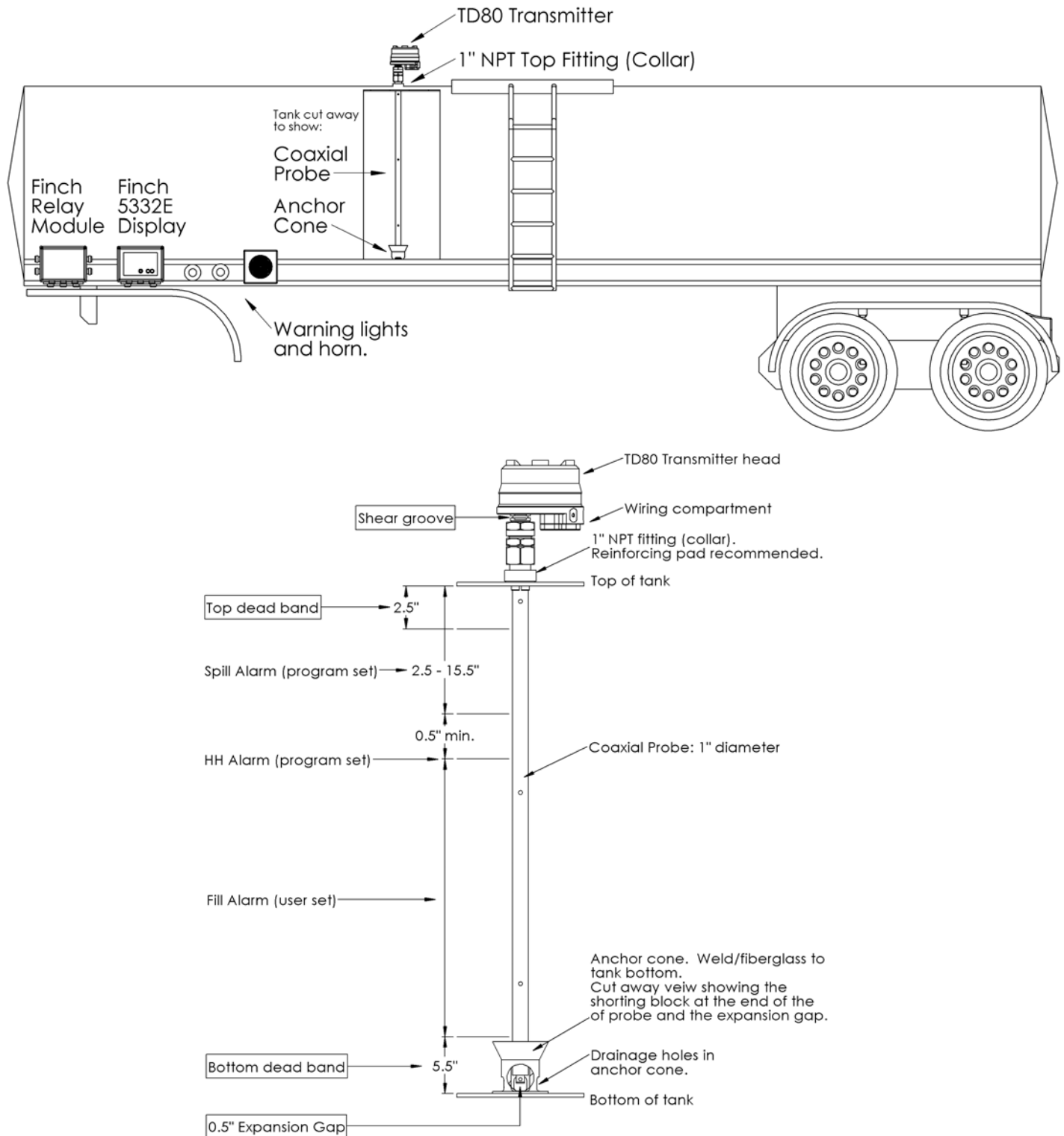


Figure 4: Coaxial Probe Truck & Trailer Installation  
(Same as Figure 1-2 in TD80 Product Manual, TPM 001)



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*Titan Logix Corp. is a public company listed on the TSX Venture Exchange and its shares trade under the symbol, TLA.*

## About Titan Logix Corp.:

Founded in 1979, Titan Logix Corp. ("Titan" or "the Company") is a high technology company specializing in Research and Development (R&D), manufacturing and marketing of advanced technology fluid management solutions, particularly for use in mobile tanker applications. The Company's world class Guided Wave Radar (GWR) solutions are currently used in the oil and gas, waste collection and aviation industries. These technologies and their derivatives under development are applicable to a variety of additional markets which Titan plans to expand into at the appropriate time. A common practice in many of these markets is the use of manual methods for measurement and control. Due to safety considerations, the rising cost of many fluids, awareness

and concerns about the environment and technological advancements enabling better operational efficiencies, we are experiencing a continued demand for our advanced technology products. We will continue to pursue expansion into other markets.

The products we manufacture are part of a complete asset management solution. The full solution consists of our own market leading products integrated with best-in-class third party solutions to enable our customers to benefit from complete fluid management, throughout each stage of their fluid handling processes. This is captured by our slogan "Advanced Technology Fluid Management Solutions, In the Field, On the Road, In the Office"<sup>™</sup>.

**In the Field:** "In the Field" refers to Titan's solution offerings for storage tanks and process vessels.

**On the Road:** "On the Road" refers to Titan's solution offerings for mobile tanker trucks and trailers.

**In the Office:** "In the Office" refers to Titan's solution offerings that enable customers to monitor their fluid assets from the convenience of their dispatch center or other back office environment through a wired or wireless connection.