TCS™

Our Famous GOOF PROOF NO Questions Asked Warranty

# WOWDiesel

1533 WOW101-KA Diesel

| Scale | Functions | Function Rating | Continuous/Peak |
|---|---|---|---|
| HO | 6 | 100 mA | 1.3 /2.0 Amp |


Dimensions: 1.35” x .66” x 0.22” or 34.29mm x 16.72mm x 5.59mm

## Main Features of this Decoder

- **Includes 13 Prime Movers** This decoder includes the EMD 567 roots blown, 567 turbo, 645 turbo, three different 645 non-turbo (roots blown), 710 prime mover sounds, as well as two ALCO 251, ALCO 244, GE FDL16, and two different 7FDL16.
- **True CD Quality Audio** Enjoy rich, full audio with true to life 16bit 44,100Hz sounds. No one else even comes close.
- **User Calibrated Load-Based Auto-Notching** Auto-notching customized for your layout and locomotive. Hear your loco work prototypicaly on your layout!
- **Keep-Alive™ Included** this decoder has attached KA3 Keep-Alive™
- **Back EMF Load Compensation** for superior slow speed control in excellent synchronization with the auto-notching.
- **Tons of Sounds!** 45+ different bells and 30+ horns plus much more
- **Airwire™ Compatible** fully compatible with Airwire™ operation.
- **Audio Assist™** (Patent Pending) With Audio Assist™ the decoder comes alive and talks you through configuring sounds and lights.
- **Optimized for 8Ω Speakers**

Version 4

**Take a listen and check out our video tutorials:**
http://www.tcsdcc.com/public_html/WOWSound.php

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# Operation and Button Mappings

In the TCS WOWSound decoders we have reinvented the way we think about model locomotive operation to reflect that of the prototype. Currently, most model trains operate without a brake seperate from the throttle speed. We call this kind of operation **"Traditional Mode"** because your locomotive will operate similarly to other decoders you may have. With our new default **"Prototype Mode"** operation users are expected to apply and release brakes seperately from adjusting the throttle just like the real thing, though the brakes will automatically release when the throttle is increased.

All of the sounds in this decoder can be remapped to any function except the toggle between light and sound mode and the Audio Assist™ mapping.

| Function Button | Feature |
|---|---|
| 1 | Bell |
| 2 | Horn - Long Toot |
| 3 | Horn - Short Toot |
| 4 | Horn - Quill |
| 5 | Dynamic Brakes |
| 6 | Brake Release |
| 7 | Train Brake (20% Per Press) |
| 8 | 1x Press: Mute/Unmute<br>2x Presses: Toggle between light and sound mode<br>4x Presses: Enter Audio Assist |
| 9 | Rotate Horn/Bell |
| 10 | Manual Notch Up |
| 11 | Manual Notch Down |
| 12 | Prime Mover On/Off |
| 13 | Coupling Sound |
| 14 | Uncoupling Sound |
| 15 | Mainline/Switching Momentum |
| 16 | Crew Alert On/Off |
| 17 | Windshield Wipers |
| 18 | Airspitter |

NOTE: Functions 19-28 are supported but there are no features mapped to these functions by default.

**Calibration Note:** Please note that it is highly recommended to perform the motor calibration in Audio Assist™ prior to operating in Prototype mode.

## BASIC CONFIGURATION

NOTE: Cells highlighted in grey identify the default value for that CV.

### CV 29 Configuration

| | | | |
|---|---|---|---|
| **A** | **0** | **1** | Reverse the direction the engine runs. |
| **B** | **2** | **2** | Use 28/128 speed step mode. |
| **C** | **0** | **4** | Enable analog ( DC ) operation. |
| **D** | **0** | **16** | Make the Loadable Speed Tables active. |
| **E** | **0** | **32** | Make the decoder address 128 or higher. |
| **CV 29** | **2** | | ← **Program the sum of the values you choose into CV 29** |

### 2 Digit Address

**Use if the address is 127 or less.**

| | | | |
|---|---|---|---|
| **CV 1** | **3** | | ← Record your choice here. |

### Consist Address

**Add 128 to reverse the loco when in consist.**

| | | | |
|---|---|---|---|
| **CV 19** | **0** | | Use a 2 digit address when in a consist ( Multiple units ). |

### Decoder Lock

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CV 15** | **0** | | All unlocked = **0** | | Decoder to unlock = **1 - 6** | | | All locked = **7** |
| **CV 16** | **2** | | Mobile = 1 | Sound = 2 | Light Only = 3 | 4 | 5 | 6 |

To unlock a decoder, make CV 15 = 0 or CV 15 = CV 16. To lock a decoder, make CV 15 not equal to CV 16. To lock all same address decoders, make CV 15 = 7.

### Back EMF and Rule 17 Dimming Options

| | | | | |
|---|---|---|---|---|
| Button braking = 8 | | | Dims when stopped = 16 | Opposite light dim = 32 |
| **CV 61** | **9** | | BEMF, Brake, and Dimming Control | Dims when stopped+Opposite dim = 48 |
| **CV 64** | **15** | | Dimmed Brightness | ( 2 – 6 for LEDs, 12 – 18 for Bulbs ) |

### Consist Lighting Control

| | | | | |
|---|---|---|---|---|
| **CV 21** | **255** | | Extra Functions (F1-F8) | F1 = 1, F2 = 2, F3 = 4, F4 = 8, F5 = 16<br>F6 = 32, F7 = 64, F8 = 128<br>(Add together for multiple functions) |
| **CV 22** | **255** | | Headlight Functions | White and Yellow Wire = 3 |

### Sound Set Version

| | | |
|---|---|---|
| **CV 248** | **4** | This is a read only CV with the version number of the sound set. |

## Sound and Light Mode Operation

To maximize the amount of control you have with the limited number of function buttons we have created two distinct control modes:
**Sound Mode** and **Light Mode**. In **Sound Mode** the functions will only operate the mapped sounds. In **Light Mode** the function button will perform any lighting operation that is mapped to it.

For certain applications it may be desirable to play a sound at the same time a lighting function changes. To setup your own dual-mode functions visit the WOWSound section of the TCS website for more information.

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For more information on decoder features or programming visit:
www.tcsdcc.com and check out the **Comprehensive Programming Guide**.

## MOTOR CONTROL

### Speed Graph

| | | | |
|---|---|---|---|
| CV 2 | 0 | | **Start Volts** -- Set the voltage when the throttle is first applied. |
| CV 6 | 0 | | **Mid Volts** -- Set the voltage when the throttle is at midpoint. |
| CV 5 | 0 | | **Top Volts** -- Set the voltage when the throttle is at full speed. |

### Momentum

| | | | |
|---|---|---|---|
| CV 3 | 20 | | **Acceleration --** Larger values add time to each speed step. |
| CV 4 | 60 | | **Deceleration --** Larger values add time to each speed step. |
| CV 23 | 0 | | ***Acceleration Adjustment when in Consist** |
| CV 24 | 0 | | ***Deceleration Adjustment when in Consist** |

*Values above 128 increase the adjustment * Values below 128 decrease the adjustment

### Motor Trim This can be adjusted via Audio Assist™

| | | | | |
|---|---|---|---|---|
| CV 66 | 128 | | Forward Trim | Values above 128 increase speed, |
| CV 95 | 128 | | Reverse Trim | Values below 128 decrease speed. |

### Brake Rate With each brake application the decoder moves to the next brake rate.

| | | | | |
|---|---|---|---|---|
| CV 183 | 32 | | Brake Rate 1 (1 Press) | The larger the number the longer it will take to come to a complete stop. |
| CV 184 | 26 | | Brake Rate 2 (2 Presses) | |
| CV 185 | 16 | | Brake Rate 3 (3 Presses) | |
| CV 186 | 8 | | Brake Rate 4 (4 Presses) | |
| CV 187 | 3 | | Brake Rate 5 (5 Presses) | |

## LIGHTING CONTROL

### Lighting Features

**Light Function Wires**

| | | | |
|---|---|---|---|
| CV 49 | 0 | White Wire | F0F |
| CV 50 | 16 | Yellow Wire | F0R |
| CV 51 | 32 | Green Wire | F1 |
| CV 52 | 32 | Violet Wire | F2 |
| CV 53 | 32 | Brown Wire | F3 |
| CV 54 | 32 | Pink Wire | F4 |
| CV 55 | 32 | Pink/Purple | F5 |
| CV 58 | 32 | Green/Brown | F6 |

**Rule 17 Dimming Control**

Rule 17 Dimming is turned on and off by button 4 as the default, but this value can be remapped via CV 123. See the Function Remapping guide on the literature section of www.tcsdcc.com for more info.

| Light Effect | fwd | rev | both |
|---|---|---|---|
| Constant Bright Light | 0 | 16 | 32 |
| Random Flicker (fire box) 1 | 1 | 17 | 33 |
| Mars Light | 2 | 18 | 34 |
| Flashing Light | 3 | 19 | 35 |
| Single Pulse Strobe 1 | 4 | 20 | 36 |
| Double Pulse Strobe 1 | 5 | 21 | 37 |
| Rotary Beacon | 6 | 22 | 38 |
| Gyra Light | 7 | 23 | 39 |
| Rule 17 (dimmable light) | 8 | 24 | 40 |
| Ditch Light ( Left or Right ) | 10 | 26 | 42 |
| Ditch Light ( Other side ) | 11 | 27 | 43 |
| Constant Dim 1 | 12 | 28 | 44 |
| *Auto-Mars | 13 | 29 | 45 |
| Brake Light(s) | 14 | 30 | 46 |
| Single Pulse Strobe 2 | 15 | 31 | 47 |
| Double Pulse Strobe 2 | 64 | 80 | 96 |
| Random Flicker 2 | 65 | 81 | 97 |
| Constant Dim 2 | 66 | 82 | 98 |
| Constant Dim 3 | 67 | 83 | 99 |
| Constant Dim 4 | 68 | 84 | 100 |

# Sound CV's

Visit TCSDCC.com for the WOWSound programming tool.

| CV 201 | CV 202 | Action | CV 203 Default Value | CV 204 Default Value |
|---|---|---|---|---|
| 4 | 1 | Active Horn Quill | 0 | 7 |
| 4 | 2 | Random Sound 1 Frequency | 0 | 200 |
| 4 | 3 | Random Sound 2 Frequency | 0 | 200 |
| 4 | 4 | Random Sound 3 Frequency | 0 | 64 |
| 4 | 5 | Random Sound 4 Frequency | 0 | 16 |
| 4 | 6 | Random Sound Overall Timer | 3 | 0 |
| 4 | 7 | Random Sound Cutout Speed | 0 | 15 |
| 4 | 8 | Default Horn Set | 0 | 0 |
| 4 | 9 | Throttle Type | 0 | 1 |
| 4 | 10 | Global Volume | 0 | 100 |
| 4 | 11 | Prime Mover Type | 0 | 0 |
| 4 | 12 | Automatic Sounds | 3 | 0 |
| 4 | 13 | Brake Grinding Noise Start Speed | 0 | 15 |
| 4 | 14 | Dual Enabled Functions | 2 | 3 |
| 4 | 15 | Dynamic Brake Notching | 0 | 3 |
| 4 | 17 | Automatic Notching Calibration LOW | 0 | 10 |
| 4 | 18 | Automatic Notching Calibration HIGH | 0 | 40 |
| 4 | 19 | User Options CV | 2 | 251 |
| 4 | 21 | Audio auto shut-off time | 10 | 40 |
| 4 | 25 | Prototype - Speed to Notch | 0 | 9 |
| 4 | 26 | Prototype - Momentum Notch | 0 | 20 |
| 4 | 27 | Prototype - Load Effect | 0 | 50 |
| 4 | 28 | Hysteresis - Change to Notch | 0 | 80 |
| 4 | 29 | Crew Alert Timer | 0 | 43 |
| 4 | 30 | Crew Alert Light | 0 | 13 |
| 4 | 31 | Notch 1 - Speed Step Transition | 0 | 1 |
| 4 | 32 | Notch 2 - Speed Step Transition | 0 | 6 |
| 4 | 33 | Notch 3 - Speed Step Transition | 0 | 13 |
| 4 | 34 | Notch 4 - Speed Step Transition | 0 | 20 |
| 4 | 35 | Notch 5 - Speed Step Transition | 0 | 27 |
| 4 | 36 | Notch 6 - Speed Step Transition | 0 | 34 |
| 4 | 37 | Notch 7 - Speed Step Transition | 0 | 41 |
| 4 | 38 | Notch 8 - Speed Step Transition | 0 | 48 |

WARRANTY PROCEDURE: All decoders are covered by a one year goof proof, no questions asked warranty. **Please return in a small box.**

You MUST register the failed decoder on our website at www.tcsdcc.com
Follow the instructions on the web site before returning any decoders to TCS.

**Important:** For maximum enjoyment of the dynamic auto notching feature of this decoder we highly recommend that you calibrate the decoder using Audio Assist. This is one of the most important features of this decoder! You will love the results. See the video tutorial on the TCS web site!

# WIRING DIAGRAM

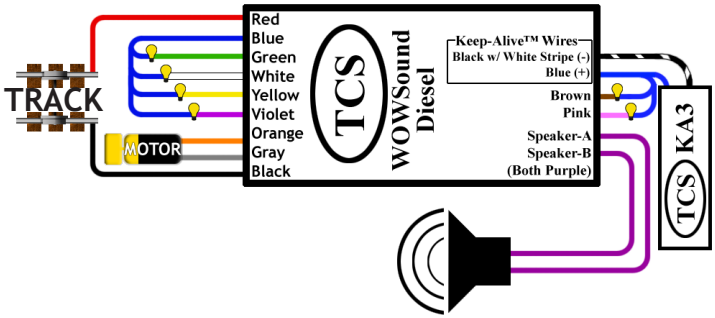


Diagram drawn for clarity - wire decoder per the written wire colors.
The wires on your decoder will not be lined up the same as the diagram.

# Speaker Selection

- This decoder is optimized for 8 Ω speakers (not included)
- 1W minimum power rating
- We recommend one of the WOWSpeakers (sold seperately)
- Speaker enclosures greatly increase speaker performance

# Video Tutorials

Important! First time users should view our instructional videos in the WOWSound section of the TCS website for a full range of information on using this decoder.

Compatible with NMRA DCC standards. Made by TCS in the USA.

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