Denver & Rio Grande Western C-25

Prototype information

This locomotive a 2-8-0 or Consolidation type, entered service as number 103 of the Crystal River Railroad. The Crystal River Railroad was a narrow gauge railroad in the Elk Mountains of central Colorado. The locomotive was built in 1903 as C / N 21757 by the Baldwin Locomotive Works. The driving wheels were 83.8cm (33 inches) in diameter. The cylinders were18x20" and the locomotive had a tractive effort of just under 25,000 pounds. It was a standard Baldwin design and other narrow gauge locomotives of this size and type were built for railroads in the Western Hemisphere.

The D&RG purchased this locomotive from the Crystal River in 1916, numbering it #432. In 1924, the locomotive was renumbered to #375. It was a Type 112, this number signifying the total weight of the locomotive. Eventually, the D & RGW changed the classification numbers of their locomotives to reflect their tractive effort and this resulted in the classification of the C-25. It is interesting to note that for a while, the cab of this locomotive was labeled "C-25-112".

The C-25 was affectionately called the "Baby Mudhen" because the tractive effort was similar to the K-27 locomotives, and these were called "Mudhens". The 375 entered service in 1916 and was the railroad's most powerful locomotive at the time. Unfortunately, on June 21, 1949, the first and only C-25 on the D & RGW was scrapped at Alamosa, Colorado.

Source: Wikipedia

Sound project information

This locomotive has not existed for a long time, so the steam blasts were recorded on a similar steam locomotive. The whistle sound is a story in itself. Using photographs, the dimensions of each pipe chamber were determined. A church organ builder then calculated the pitch of each chamber. The resulting whistle tone was mixed from 6 individual pipes, each adjusted to the desired values. The result was a surprising whistle tone, different compared to the typical Rio Grande locomotive whistles.

The sound project reproduces the powerful exhaust steam blow as well as light coasting in flat terrain. The function key F15 can be used to switch between the two modes.

The sound project is based on the Zimo Advanced Standard.

The MS Decoder must have at least SW version 4.227.

The sound project is developed for all Zimo 16 bit MS decoders and is not suitable for the MX decoders.

FA 7 and Servo 1 switch electric couplers when uncoupling. The electric uncoupler 11220 from Kadee can simply be plugged into servo connector 1

CVs 3, 4, 5, 154 and 158 are relevant for this sound project. Changes can cause sound malfunctions! Adjust the maximum top speed only with CV57!

By default the function number is the same as the function key number. All functions can be assigned to other function keys with the Zimo input mapping. The function key number is entered as value into the CV400+Fu number, and the function key is already assigned. Attention, several functions can be assigned to the same function key this way! Please read the instructions on http://sound-design.white-stone.ch/Information.html

Function	Installation	Function output	Sound effect
F0	Light on	FA 0v+0r	Dynamo
F1	Bell	Servo 1	Bell
F2	Whistle l-l-s-l		Highway crossing signal
F3	Whistle long		Playable as long as you push
F4	Whistle s		
F5	Cab light	FA 5	Dynamo
F6	Smoke generator on heater load controlled Also replaceable with Zimo blowing smoker	FA 6 heater, on 15 min timer to prevent burnout Fan output for cam operated blower	
F7	Cylinder valve		Blow down
F8	Sound on / off		
F9	Wheels screeching on curves		Sound of Wheels screeching on curves
F10	Shoveling coal	FA 8 flickers automatically	Sound of shovel and firebox door closing
F11	Blower	Smoke fan is on	Steam blowing
F12	Servo coupler opens and loco moves back and forth	FA7 and servo 2 opens electric coupler	Uncoupling sound
F13	Coupling		Coupling sound
F14	Pop valve (safety valve)		Loud steam blast
F15	Full power / coasting		Switch between 2 sound modes
F16	Tunnel fader (muting)		Sound fades in or out in 2,5 sec
F17	Conductor		„All aboard! “
F18	Injector		Feeding water in the boiler
F19	Dual Westinghouse air pump, fast		2 air pump with different speeds
F20	Filling water into tender		Water splashing
F21	Marker Lights	FA9	Dynamo

Random effect	Sound	
Z1	Dual air pump, fast	Every time the locomotive comes to a standstill
Z2	Dual air pump, slow	Maintaining air pressure
Z3	Shoveling coal	FA8 flickering
Z4	Blower	Fan blows smoke out of stack
Z5	Injector	Steam injects water into the boiler
Z6	Firebox door	Doors slams
Z7	Steam noise	
Z8	Safety valve	Loud popping of valve

input	sound	
1		
2		
3		

Changing CVs values used by the reset

CV# 3 = 22 Acceleration rate
CV# 4 = 32 Deceleration rate
CV# 13 = 180 Analog functions F1-F8
CV# 14 = 67 Analog functions F0, F9-F12
CV# 28 = 3 RailCom Configuration
CV# 29 = ---
CV# 35 = 0 Function mapp. F1
CV# 36 = 0 Function mapp. F2
CV# 37 = 0 Function mapp. F3
CV# 38 = 0 Function mapp. F4
CV# 41 = 0 Function mapp. F7
CV# 42 = 0 Function mapp. F8
CV# 43 = 0 Function mapp. F9
CV# 44 = 0 Function mapp. F10
CV# 45 = 0 Function mapp. F11
CV# 46 = 4 Function mapp. F12
CV# 57 = 140 Motor regulation: voltage reference
CV# 60 = 221 Dimming general
CV# 65 = 6 Sub-Vers. Number
CV# 112 = 1 ZIMO configuration bits (binary)
CV# 114 = 188 Dim Mask FO0-FO6
CV# 115 = 55 Uncoupler control
CV# 116 = 155 Automatic uncouple
CV# 124 = 0 Shunting keys configuration (binary)
CV# 125 = 89 Effects F0 front
CV# 126 = 90 Effects F0 rear
CV# 131 = 88 Effects F5
CV# 132 = 72 Effects F6
CV# 137 = 153 Smoke generator at standstill
CV# 138 = 204 Smoke generator at cruising speed
CV# 139 = 255 Smoke generator at accelaration
CV# 152 = 59 Dim mask FO7-FO12, RiBi
CV# 154 = 18 ZIMO configuration bits 2 (binary)
CV# 158 = 8 Several sound bits + RailCom variants
CV# 159 = 48 Effects F7
CV# 160 = 8 Effects F8
CV# 181 = 201 Servo 1 - Function Assignment
CV# 182 = 12 Servo 2 - Function Assignment
CV# 190 = 3 Up-dimming time for FO
CV# 191 = 2 Down-dimming time for FO
CV# 195 = 88 Effects F9
CV# 250 = 224 Decoder-ID 1
CV# 253 = 234 Decoder-ID 4
CV# 260 = 0 Loading code 1
CV# 265 = 1 Selection of the locomotive type
CV# 267 = 108 Chuff sound rate
CV# 272 = 90 Drainage time
CV# 281 = 2 Threshold for full acceleration sound
CV# 284 = 2 Threshold for noise reduction in delay
CV# 287 = 85 Threshold for brake squeal
CV# 307 = 128 cornering squeal inputs
CV# 308 = 9 cornering squeal key
CV# 311 = 0 General on/off button for functional noise
CV# 312 = 7 Drainage button
CV# 313 = 116 Mute button
CV# 314 = 25 Mute fade time
CV# 315 = 10 Random Z1 min interval
CV# 316 = 90 Random Z1 max interval
CV# 317 = 15 Random generator Z1 playback time
CV# 318 = 50 Random Z2 min interval
CV# 319 = 90 Random Z2 max interval
CV# 320 = 30 Random generator Z2 playback time
CV# 321 = 90 Random Z3 min interval
CV# 322 = 100 Random Z3 max interval
CV# 323 = 9 Random generator Z3 playback time
CV# 324 = 100 Random Z4 min interval
CV# 325 = 110 Random Z4 max interval
CV# 326 = 12 Random generator Z4 playback time
CV# 327 = 110 Random Z5 min interval
CV# 328 = 110 Random Z5 max interval
CV# 329 = 7 Random generator Z5 playback time
CV# 330 = 230 Random Z6 min interval
CV# 331 = 255 Random Z6 max interval
CV# 332 = 1 Random generator Z6 playback time
CV# 333 = 210 Random Z7 min interval
CV# 334 = 210 Random Z7 max interval
CV# 335 = 8 Random generator Z7 playback time
CV# 336 = 255 Random Z8 min interval
CV# 337 = 255 Random Z8 max interval
CV# 338 = 10 Random generator Z8 playback time
CV# 341 = 5 Switching input 1 Playback time
CV# 342 = 5 Switching input 2 Playback time
CV# 343 = 5 Switching input 3 Playback time
CV# 345 = 15 Sound-switch-key
CV# 346 = 2 Sound-switch-conditions
CV# 351 = 28 Smoke fan pwm at constant speed
CV# 353 = 62 Smoke heater max. operating time
CV# 354 = 38 Steam chuff requency at offset
CV# 376 = 181 Driving sound volume
CV# 392 = 5 Reed4 play time [s]
CV# 394 = 32 ZIMO configuration 4 (binary)
CV# 395 = 120 maximal volume
CV# 396 = 27 Volume decrease key
CV# 397 = 28 Volume increase key
CV# 430 = 21 ZIMO Mapping 1 F-key
CV# 432 = 9 ZIMO Mapping 1 A1 forw.
CV# 434 = 9 ZIMO Mapping 1 A1 rev.
CV# 508 = 0 ZIMO Mapping dimming value 1-key
CV# 509 = 0 ZIMO Mapping dimming value 2-key
CV# 510 = 0 ZIMO Mapping dimming value 3-key
CV# 511 = 0 ZIMO Mapping dimming value 4-key
CV# 512 = 0 ZIMO Mapping dimming value 5-key
CV# 516 = 57 F2 soundnumber
CV# 519 = 58 F3 soundnumber
CV# 521 = 8 F3 information on loop
CV# 522 = 59 F4 soundnumber
CV# 540 = 76 F10 soundnumber
CV# 541 = 64 F10 volume
CV# 542 = 8 F10 information on loop
CV# 543 = 71 F11 soundnumber
CV# 544 = 91 F11 volume

CV# 545 = 72 F11 information on loop
CV# 546 = 81 F12 soundnumber
CV# 547 = 91 F12 volume
CV# 549 = 80 F13 soundnumber
CV# 552 = 79 F14 soundnumber
CV# 554 = 8 F14 information on loop
CV# 561 = 82 F17 soundnumber
CV# 562 = 181 F17 volume
CV# 564 = 70 F18 soundnumber
CV# 565 = 64 F18 volume
CV# 566 = 8 F18 information on loop
CV# 567 = 68 F19 soundnumber
CV# 568 = 91 F19 volume
CV# 569 = 8 F19 information on loop
CV# 575 = 85 soundnumber change of direction
CV# 576 = 91 volume change of direction
CV# 577 = 74 soundnumber squeal
CV# 578 = 91 volume squeal
CV# 583 = 73 Soundnumber drainage
CV# 603 = 84 cornering squeal sound number
CV# 604 = 181 cornering squeal volume
CV# 673 = 83 F20 soundnumber
CV# 674 = 181 F20 volume
CV# 675 = 72 F20 information on loop
CV# 734 = 76 Soundnumber trigger 5
CV# 735 = 10 Trigger 5 to FO
CV# 736 = 71 Soundnumber trigger 6
CV# 737 = 255 Trigger 6 to FO
CV# 744 = 68 Soundnumber Z1
CV# 745 = 91 Volume Z1
CV# 746 = 8 Information on loop Z1
CV# 747 = 69 Soundnumber Z2
CV# 748 = 64 Volume Z2
CV# 749 = 8 Information on loop Z2
CV# 750 = 76 Soundnumber Z3
CV# 751 = 64 Volume Z3
CV# 752 = 8 Information on loop Z3
CV# 753 = 71 Soundnumber Z4
CV# 754 = 91 Volume Z4
CV# 755 = 8 Information on loop Z4
CV# 756 = 70 Soundnumber Z5
CV# 757 = 64 Volume Z5
CV# 758 = 8 Information on loop Z5
CV# 759 = 77 Soundnumber Z6
CV# 760 = 91 Volume Z6
CV# 761 = 8 Information on loop Z6
CV# 762 = 73 Soundnumber Z7
CV# 763 = 16 Volume Z7
CV# 764 = 8 Information on loop Z7
CV# 765 = 79 Soundnumber Z8
CV# 767 = 8 Information on loop Z8
parameter
CV# 984 = 64 Volume Generator