Shay - 3 Cylinders, oil burning

Photo Heinz Däppen during the recordings

Prototype information

The Shay locomotive was the most popular geared locomotive. It was invented by Ephraim Shay, who ran a small saw mill in Michigan and needed a locomotive for his forest railroad with uneven tracks. He built his first locomotive in the winter of 1873/74, and continued to improve it in the next few years, until it met his expectations. When one of his neighbors also wanted such a loco, Shay put him in touch with the Lima Machine Works, who accepted the assignment and delivered the first loco in 1880. It looked like a four axel flat car with an upright boiler. An upright steam engine was mounted to the right of the boiler, and it powered the trucks via drive shafts and bevel wheels fitted outside the trucks. This gave good access to the whole drive system.

In 1881 Shay transferred all the rights to the Lima Machine Works. This was the start of one of the most important locomotive factories in America. Soon Lima developed the models with horizontal boilers, which were fitted on the left of the loco frame to distribute the weight evenly. In 1884 the first Shay locomotive with a third truck was built. After that various type where developed with three cylinder steam engines, which ran more evenly and where quieter. In 1900 the first 150 ton loco with four powered trucks was developed. Two of these trucks carried the tender. These locos where used as switchers on the Chesapeake & Ohio and on the Western Maryland Railway.

Source: Wikipedia

Sound project information

The recordings were made at the Yosemite Mountain Sugar Pine Railroad in California.

The sound operates both the thundering highball and the light coasting on flat areas. Use the F15 function key to switch between modes.

The sound project is based on Zimo Advanced Standard.

The decoder must have a software version 33.14 or higher.

The sound project is designed for the new Zimo MX 697 sound decoder that fits the NMRA G-scale plug and play connector. All another Zimo sound decoders works well too, except the old MX 690 series, which cannot handle complex sounds with coasting.

FA 7 and servo1 can operate several electric couplers. The Kadee electric coupler can simply plug in on servo connector 1.

CVs 3, 4, 5, 57, 154 and 158 are important values for the sound project. Please change values very carefully!

By default the function number is the same as function key. All the functions can easily be assigned to other keys, using the Zimo function key mapping.

Program the desired key number as your value in the CV 400+Fu number and the whole function is mapped to another key. Please take care, as it is possible to map multiple functions to the same key! Please read the instruction sheet http://sound-design.white-stone.ch/Information.html

Function	Installation	Function output	Sound effect
F0	Light on	FA 0v+0r / FA 8 flickering burner flame	Oil burner sound
F1	Bell		Bell
F2	Whistle l-l-s-l		Highway crossing signal
F3	Whistle l		Playable as long as the key is pressed
F4	Whistle s		Short whistle
F5	Cablight	FA 5	
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		Light engine???
F9	Wheels screeching on curves		Sound of Wheels screeching on curves
F10			
F11	Blower	Smoke fan is on	Steam blowing
F12	Servo coupler opens and loco moved back and forth	FA7 and servo1 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 / slow		2 air pumps with different speed
F20	Filling water into tender		Water splashing

Random effect	sound	
Z1	Dual air pump fast	Every time the locomotive comes to a standstill
Z2	Dual air pump slow	Holding air pressure
Z3	Shoveling coal???	FA8 flickers
Z4	Blower	Fan blows smoke out of stack
Z5	Injector	Steam injects water into the boiler
Z6	Some noise	
Z7	Safety valve	Loud popping valve
Z8	Door	

input	sound	
1	bell	
2	whistle	
3	Cam chuff trigger	If desired

Changing CVs values used by the reset

CV# 3 = 19 Accelaration rate
CV# 4 = 19 Deceleration rate
CV# 5 = 252 Top speed
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 = 75 Motor regulation: voltage reference
CV# 60 = 60 Dimming
CV# 112 =   1 Special ZIMO configuration bits
CV# 114 = 127 Dim Mask FO0-FO6
CV# 115 = 66 Uncoupler control
CV# 116 = 145 Automatic uncouple
CV# 124 =   0 Shunting keys Settings
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# 154 = 18 Special OEM bits
CV# 158 =   0 Several sound bits + RailCom variants
CV# 159 = 48 Effects F7
CV# 160 =   8 Effects F8
CV# 163 = 255 Servo 1 right stop
CV# 167 = 255 Servo 2 right stop
CV# 181 = 12 Servo 1 - Function Assignment
CV# 182 = 12 Servo 2 - Function Assignment
CV# 266 = 65 Total volume
CV# 267 = 48 Chuff rate
CV# 269 = 30 Emphasis on leadership impact
CV# 272 = 100 Dewatering time
CV# 273 = 10 Starting delay
CV# 274 = 255 Dewatering downtime
CV# 275 = 140 Volume with no load slow travel
CV# 276 = 140 Volume with no load speed run
CV# 281 = 30 Thresholdfor full acceleration sound
CV# 283 = 180 Driving sound volume for full acceleration sound
CV# 285 = 50 Duration of the noise reduction with delay
CV# 286 = 120 Volume reduced driving noise during deceleration
CV# 287 = 35 Threshold for brake squeal
CV# 312 =   7 Drainage button
CV# 313 = 116 Mute button
CV# 314 = 25 Mute fade time
CV# 345 = 15
CV# 346 =   2
CV# 351 = 204
CV# 353 = 32
CV# 354 =   1
CV# 376 = 255