Class 40 Locomotive
DCC Sound Information

Important: Please read this sheet before running your locomotive.

Many thanks for purchasing one of our **Graham Farish** Class 40 DCC Sound fitted Locomotives. Please take the time to read through this sheet carefully before running your locomotive to ensure you get the most out of your model.

Decoder Info.

Decoder & Speaker Spec.

Decoder type:	Zimo MX658N18
CV1 Address:	03
Speed Steps:	28/128
Speaker:	8 Ohms

For full details of the decoder please refer to information sheets for **Zimo MX658N18** via the link on **www.bachmann.co.uk**

For Best Results...

Please make sure your DCC system is set to run on 128 speed steps to obtain the very best results from this decoder.

Keeping the track, wheels and pick-ups clean are essential to ensure good electrical contact and will also contribute to the decoder working to its best ability.

Loco Decoder Address.

This model is set with a default decoder address of 3.

Running on DC.

Your model is equipped with a ZIMO DCC sound decoder but will operate on DC powered track producing basic Prime Mover (engine) sounds, which will vary with speed, plus directionally operated front and tail lights.

Please note: *If this model is to be controlled with an analogue (DC) output controller Bachmann Europe PLC recommend the use of a controller with a smoothed output. If you intend to use a feedback type controller, or one with PWM (pulse width modulation) please consult the controller manufacturer before using it with this model.*

This model should not be used on layouts fitted with electronic track cleaners.

Operation Notes

The following text has been provided to give you an example of how the decoder and sound file can be used to give you a realistic railway operating experience.

On a Diesel Electric locomotive, movement is created by a diesel engine, also known as the Prime Mover, turning a generator or an alternator to generate electricity which is used to power the traction motors that drive the locomotive.

On your controller, select the appropriate address for the loco (default 03).

Before moving the locomotive, you will need to start the engine, or Prime Mover, by pressing **F1**. In addition to starting the engine **F1** will activate all the automated engine, coasting and braking noises.

Please note: Without activating F1 your model will not make any of the automated sound effects.

There are two different engine start-up sequences;

F1 On: Warm engine start (default for this model).
F8 On, F1 On, F8 Off (after engine start sounds): Cold engine start.

To add a little atmosphere, you may want to utilize some of the supplementary sounds before starting the engine / prime mover.

F19 On: Door open / **F19 Off**: Door closed

F0 On: Lights on

F11 On: Leading cab lights on (**F0** must be on). Once the engine has started the cab light, if turned on, would be turned off (**F11 Off**) before the locomotive pulls away.

F10 On: Tail lights off. This would be used if the locomotive is hauling a train, when a locomotive is travelling light (without carriages or wagons) they would be left on.

F16: Priming pump. This is used to pump the fuel to the prime mover.

Throttle

As supplied, the decoder will produce the sounds of a Class 40 with a loaded train.

After running the Priming Pump (**F16**) use **F1** to start the Prime Mover (PM). Subsequently, the loco will stand with the diesel engine, the Prime Mover, ticking over at idle.

The engine sounds will respond to the throttle control in the following way:

Select speed step 1: the brakes will release and the PM will increase power to get the loco moving. The engine sounds will continue until a higher speed step is selected causing the engine to 'ramp-up' until the new speed step is reached.

The sounds will spool down at similar points on deceleration.

Alternative Throttle operations
Open the throttle gently: the engine sounds will rise and fall appropriately and the acceleration will simulate that of a heavy train.
Open the throttle more widely: The engine sounds will increase to full power and the rate of acceleration will be increased accordingly simulating a light train.
With the throttle fully opened (then reduced if required): the loco will accelerate 3 times more quickly than normal.

Coasting

No matter what actual speed your model is travelling at, or which engine note range is playing, reducing the throttle by 10 speed steps (of 128) will spool down the engine sounds to 'Coasting', whilst the loco will continue travelling with a gradually reducing speed.

The coasting sound will continue until you accelerate; at which point the sounds will change to those relevant to the newly selected speed.

There is an alternative way to induce coasting sounds, **F6** will force the engine to play the idle sounds whenever it is engaged. Used during high engine power sounds it will instantly spool the engine sounds down to idle. Releasing **F6** will allow the engine sounds to return to the appropriate power range determined by the current speed step status.

This is also very useful for short, low speed movements when you do not wish the engine to rev up. Used before movement it will prevent engine ramp-up.

Notch Down

During any driving sound 'loop', at any speed, it is possible to cause the engine power to spool down to the level immediately below. This is easily achieved by reducing the speed by one step only E.g., if the loco is playing full power sounds, reducing speed with your throttle by one step will cause the sound to immediately spool down to the sound of 2/3 power, if in 1/3 power, it will spool down to idle.

Acceleration of one speed step or more will immediately ramp the sound back up to the higher power. At any road speed, you can vary the engine note by reducing or adding a single speed step.

Function Overview

F0. Lights On

F0 On will turn on the locomotive lights and make the accompanying sound effect.

F1. Engine Start & Automatic Sounds

F1 On: Warm engine start (default for this model).
F8 On, F1 On, F8 Off (after engine start sounds): Cold engine start.

Please note: Without activating F1 your model will not make any of the automated sound effects.

F2. Working Loco Brakes

Please note: The characteristics of the working loco brakes function depend on whether your DCC controller has F2 set to 'Trigger' or 'Latch'. Please consult your DCC controller instruction for how to change this.

In a real locomotive, acceleration, speed and deceleration are under control of the driver. He will use his experience of the locomotive type, the train weight and knowledge of the route (or 'Road') to anticipate the control movements needed to achieve the required performance and safety.

Deceleration is often achieved by reducing power only, allowing the locomotive to 'coast' to lower speeds. Typically, the brakes are only used to fine tune this rate of deceleration or make a halt at a specific point. Other times, strong braking will be required even at high speed.

The ability to apply a variable braking force to increase the rate of deceleration when desired, is incorporated into this Graham Farish model.

The objective is to simulate the real driving experience as closely as possible.

Here's how it works.

With the locomotive moving, reduce the throttle setting to zero. The loco will coast, gradually decelerating and the engine sound will spool down directly to idle.

Engage Brakes with F2. (F2 must be set to Trigger)

- A short press will produce a short air release sound and a modest increase in deceleration rate. You can think of this as 'Speed Trimming'. This can be repeated if required, and is entirely prototypical in operation.

- A longer press will produce a longer air release sound and a higher rate of deceleration. The longer the Brake Key is held 'on', the greater the brake force applied.

- Holding the Brake Key down continuously will produce a long air release sound and the loco will perform a prototypically modelled emergency stop, i.e. Brake force increases with time; maximum brake force and deceleration rate is achieved immediately prior to coming to a halt. Automatic brake squeal will accompany the final moments before halting.

The Brake Key can also be used to simulate 'brake dump' testing. This can be used to simulate the brake testing which the driver should perform as part of his checks.

To do this **F2 must be set to Latch** when the model is stationary, the model will not move in response to throttle movements but the engine power sounds will increase in line with the throttle position.

The Brake Key may also be operated during deceleration between different speed restricted areas. In this case, reduce the throttle to a suitable lower setting, the engine sound will change according to the features described earlier, so may result in a different power sound rather than engine idle. To increase the rate of deceleration, use the Brake Key as before, and the speed of the loco will be 'trimmed' to the newly selected speed step.

Please note that real locos do not stop dead even during an emergency stop. To reflect this, an emergency stop will be reasonably abrupt but not sudden.

If your DCC controller is equipped with a 'panic button' to avert an imminent catastrophe, this will still operate as usual, and will have more immediate, though less prototypical, effect than the Brake Key.

F3 & 4. Horns

F3 On/Off – Two tone, High-Low horn (plays once).
F4 On – Low Horn (continuous play until function is turned off).

F5. Light Engine Mode

Activated by **F5**, this enables multi-function changes with one key. With small throttle increments the idle sound will be held for the first portion of driving, enabling yard movements etc. without the engine ramping up. Alternatively, large throttle movements will produce a ramp up for a few seconds initially, after which the engine sounds will return to the level appropriate to the new speed.

This feature also automatically reduces inertia and momentum settings to give the characteristics of a lightly loaded loco and delays automatic engine noise power increments until higher road speeds are reached.

Light Engine Mode (**F5**) can be activated at any time during operation.

F6. Engine Idle / Coasting

F6 On – The prime mover revs will drop to idle / coasting sounds whilst maintaining the locomotive's current speed. Whist activated the speed can still be adjusted but without any of the corresponding engine sounds. This will continue until F6 is turned off.

F7. Speedlock

This feature allows the locomotive speed to be locked whilst the throttle control is used to control the engine power sounds playing.

You can accurately recreate the sound of a heavy train slowly climbing a gradient with the engine at full power or coasting down a gradient with the engine at Idle.

Press **F7** to fix the model's road speed temporarily. The throttle will now control the engine sounds only. Increase speed steps to apply more power or decrease speed steps to spool the engine down to lower power bands or into Idle, whilst **F7** is on the engine sounds will change accordingly but the locomotives speed will remain unchanged.

Turn **F7** off when you wish to return control of the model's speed to the throttle.

F8. Cold Start

F8 On enables the Cold Engine Start on F1, turn off after engine start has finished.

F9. Flange Squeal

This sound occurs when the flanges on the wheels rub against face of the railhead on sharper curves. Turn **F9 On** to activate flange squeal sounds.

F10. Tail Lamps

F10 On – When F0 is activated you can turn off the red tail lamps. The tail lamps would only be on if the loco was pushing a train or travelling as a light engine with no rolling stock. When a locomotive is pulling a train its tail lamps would be turned off.

F11. Leading Cab Light

F11 On/Off – When **F0** is activated **F11** will turn on the leading cab light. This would not be lit whilst the locomotive is in motion.

F12. Buffering up

F12 On/Off recreates the sound of the locomotive buffers making contact with those of the adjacent vehicle.

F13. Coupling

F13 On/Off activates the sounds of the locomotive being coupled to its adjoining vehicle.

F14. Spirax Valves

F14 On. Spirax Valves are fitted to automatically drain moisture from the compressed air tanks. They produce a 'popping' sound the frequency of which depends on pressure. **F14** switches on the sound of Spirax valves which initially pop in quick succession but reduce in frequency until a steady rate is achieved. This will continue until F14 is turned off.

F15. Exhauster

F15 On/Off. This activates the sound of the locomotive Exhauster being deployed to release the brakes on the train. The exhauster would be used just before the locomotive pulls away.

F16. Priming Pump

F16 On. The priming pump supplies fuel to the Prime Mover (Engine), this would be used prior to starting the engine. This will continue until F16 is turned off.

F17. Fan

F17 On starts the fan sound effect, the fan would be turned on when the locomotive engine needs cooling down. This sound effect will stay on until the F17 is turned off.

F18. Guard's Whistle

F18 On/Off. This will play the sound of a typical guard's whistle being blown on the platform before the train pulls away.

F19. Cab Door

F19 On – Cab door open.
F19 Off – Cab door closed.

F20. Fade All Sounds

F20 On will fade all sounds down to nothing until **F20** is turned off.

F21. Compressor

F21 On will sound the compressor on the locomotive. The air brakes of a modern train are deployed with compressed air from the locomotive, if the brakes have been used regularly then the compressor is required as and when to maintain the pressure required. This will continue until **F21** is turned off.

F22. AWS Horn

The Automatic Warning System (AWS) gives the driver advanced notice of the signal up ahead. The AWS horn will sound if there is a stop signal up ahead, stop the Train!

F23. AWS Bell

The AWS bell sounds when the signal ahead is clear. Carry on!

F24. Station Ambience

F24 plays station ambience sounds.

F25. Detonators

F25 plays the sound of detonators going off. Detonators are small explosives placed on the track to warn engineers of an oncoming vehicle or to signal an emergency stop to a train driver.

F26. Shunt Mode

For precise control when shunting, engage Shunt Mode with **F26**. This reduces speed by one half. Inertia and momentum are removed completely.

F27 & 28. Volume Control

Provided the sound is switched on (**F1 on**) and the 'fade' button (**F20**) is not active, it is possible to change the overall volume to suit changing needs.

Press and hold **F27** and the sound levels will gradually reduce, release **F27** when you reach your desired volume.

Press and hold **F28** and the sound levels will gradually increase, release **F28** when you reach your desired volume.

Set **F27** and **F28** as 'momentary' if your DCC controller allows you to do so.

Please note: If the volume controls appear to not function, check that F20, F27 and F28 are disengaged before making a further attempt.

Volume Control of Individual Sounds

The volume of any individual sound can be adjusted to your tastes with a simple CV change.

1. Look up the CV number in the function list below for the sound you wish to alter.
2. Change the value by entering a value between 1 (low) and 255 (Maximum).

Function List - Class 40

No.	Function/Sound	Type	Volume CV	Volume Value
0	Light Switch Sound plus Lights	Latch	-	-
1	Sound On/Off	Latch	-	-
2	Brake Key (see text)	Trigger/Latch	517	91
3	High - Low Horn	Trigger	520	0
4	Low Horn	Latch	523	181
5	Light Engine Mode	Latch	-	-
6	Engine Idle/Coasting	Latch	-	-
7	Speed Lock Key	Latch	-	-
8	Cold Start	Latch	-	-
9	Flange Squeal	Latch	538	128
10	Tail Lamps (Press to switch off)	Latch	541	32
11	Leading Cab Light (F key 0 must also be 'on')	Latch	544	32
12	Buffering Up	Trigger	547	64
13	Coupling	Trigger	550	91
14	Spirax Valves	Latch	553	32
15	Exhauster (Vacuum Train Brakes)	Trigger	556	128
16	Priming Pump	Latch	559	91
17	Fan	Latch	562	128
18	Guard's Whistle	Trigger	565	181
19 On	Door Open	Latch	568	128
19 Off	Door Slam	Latch	568	128
20	Fade All Sounds	Latch	-	-
21	Compressor	Latch	677	91
22	AWS Horn	Trigger	680	91
23	AWS Bell	Trigger	683	91
24	Station Ambience (Variable length)	Latch	686	128
25	Detonators	Trigger	689	181
26	Shunt Mode (Half Speed, No Inertia)	Latch	-	-
27	Volume Down	Trigger	-	-
28	Volume Up	Trigger	-	-

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For more information either visit our website at
www.bachmann-collectorsclub.co.uk
or complete the form overleaf and return it to Bachmann Collectors Club.

Warranty Service Request

Please fill in the form overleaf to submit a Warranty Service Request.

- Ensure the form is filled out in full and a brief explanation of the problem is given.
- Proof of purchase date (preferably a receipt) is required.
- Send the form with the product direct to Bachmann at the address below.

Bachmann Service Department.
Bachmann Europe PLC.
Moat Way,
Barwell,
Leicestershire.
LE9 8EY

Please note: *it is essential that the letter of claim reaches the above address before the last day of this Guarantee. Late claims will not be considered.*

DCC Decoders
Please note: *any locomotive returned to the Service Department for attention should, if possible, have any decoder removed. If sent with a decoder fitted please reset the address to 3, service may be restricted. Bachmann Europe PLC only accept liability to the value of a standard model. This also applies to body modifications/detailing.*

Bachmann Collectors Club

Membership Information Request Form

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