



Do your ears ring after driving your Mini and are you constantly bombarded with engine noise and annoying vibrations? Follow our guide to suppressing noise, vibration and harshness.

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Soundproof your Mini

Half the fun of driving a Mini is hearing the occasional rattle of the A-series engine's tappets, the suck of air from the SU carburettor and the burble from the exhaust. Combine these with a lack of soundproofing on a long journey and the novelty soon wears off. However, there's no reason why your hearing should be potentially overwhelmed when driving a Mini, and the answer lies with soundproofing.

We last covered the subject of noise reduction back in the May 2004 issue of *MiniWorld*, when we soundproofed a brand new British Motor Heritage bodyshell in our build-up of our project Mini, Sheldon. However, the reality for most of us is that we have an already constructed and roadworthy Mini, which is noisy. So we teamed up with Sophie Baugh of Manchester Minis and met her and her 1972 Clubman at soundproofing experts Noisekiller, of Oldham, to see what can be done. We discovered lots

of typical Mini-related problems that had to be tackled when we were fitting the soundproofing material, ranging from ill-fitting parts to water leaks.

As you'll see from the various step by step guides and additional information on the next few pages, noise reduction is a little more sophisticated than merely lining the inside of a Mini with sound-deadening material. There are different types of material that can either absorb sound or reduce vibrations. For instance, panels that vibrate can be lined with material that deadens the sound, the floors can be covered in thick matting to stop sounds transmitting through them and the engine bay can be lined with vibration reduction material to help muffle noise.

There are also several other methods of reducing noise, which don't involve the use of soundproofing material, such as undersealing the wheel arches and the underside of the floors, although this can encourage rust, once it cracks, and

is no longer a popular process. Loose trim can cause annoying rattles, often resolved with sealant and better fixings. And don't forget all the components on a car that cause noise, such as the exhaust, tyres, suspension and air filter.

TOOLS REQUIRED

- Clean cloths
- Decorator's roller
- Sharp knife
- Steel rule or straight edge
- Tape measure
- White spirit or panel wipe

HOW MUCH?

- Noisekiller soundproofing kit for the Mini costs from £210
- Professional fitting is available from £90

SOUNDPROOFING MATERIALS



01 Sound barrier: Fitted to the cabin and boot floors and underneath the rear seat base. Made up of three fireproof layers of material. The top and bottom layers consist of a semi-rigid heavy-duty polymer, which helps to reduce vibrations and block road noise when placed against a panel and helps to block airborne sounds. In the centre of the matting, there is an open-cell acoustic foam which also absorbs airborne sounds.



02 Barrier mat: a self-adhesive, fireproof, material that helps to reduce vibrations and block road noise. On side panels and doors, it only needs to cover 50% of the surface area for it to be effective at reducing vibrations. However, on wheel arches, Noisekiller recommends covering all of the surface. They can supply a long length of this material, which can be cut into 12x25cm sections or smaller to be able to cover the majority of panels inside a Mini.



03 Vibrasorb: Looks similar to barrier mat but is a thicker, fireproof material that can be installed in an engine bay. It has a self-adhesive backing, so it can be fixed to the underside of your Mini's bonnet, helping to reduce panel vibration and also absorb sounds from the engine. The material's outer surface can be wiped down if it becomes coated in oil from the engine.

UNDER THE BONNET



01 The underside of Sophie's Mini Clubman's bonnet is covered in an old soundproofing material, which needs to be removed if we have any chance of sticking the new Vibrasorb to it. We try to remove it with a scraper but it's very brittle.



02 We try to warm up the old soundproofing material using a space heater. This helps to soften it, making it easier to remove with a scraper. If you don't have a space heater, a hairdryer or hot air gun is just as good. Be careful not to damage paint and also work in a well-ventilated area.



03 We manage to remove the brittle old soundproofing material from the two outer edges of the bonnet, then we clean the surfaces with a cloth soaked in white spirit. This will help the new Vibrasorb material stick to the underside of the bonnet.



04 Noisekiller creates paper templates for every car they soundproof, which helps them to produce a kit with pre-cut pieces of material. When fitting a kit at their premises, they always check the templates before cutting the material.



05 The pre-cut pieces of Vibrasorb are trial fitted first, before peeling off the backing paper and sticking them to the underside of the bonnet. Once in position, they are then firmly stuck to the underside of the bonnet using a decorator's roller.



06 It is proving rather difficult to remove the old soundproofing material from the centre section of the bonnet so we decided to remove the entire bonnet from the Clubman and lay it on a bench to make it much easier to remove the old material.



With the bonnet laid on a flat surface, Grant Bithell at Noisekiller scrapes off the remaining brittle, old soundproofing material, then uses newspaper soaked in white spirit to remove any adhesive that has been left behind.



The underside of the bonnet is now fully covered in Vibrasorb (except for the framework) and a decorator's roller is used firmly to stick the material to the metalwork. This will help to absorb engine noise and reduce panel vibration.



The inside of the boot panel can be lined where the outer skin is exposed. This panel vibrates when we tap it so three pre-cut pieces of barrier mat are stuck to it to reduce noise amplification.



After refitting the spare wheel, a thick piece of sound barrier is put in place to help absorb any sounds, especially any noise that's transmitted from the exhaust. There's still room to fit Sophie's tools, trolley jack and carpet.

IN THE BOOT



The usual assortment of tools, a spare wheel and carpeting usually live in the boot of Sophie's Clubman. She has found that a little water gets through and recently renewed the boot seal, but it's not yet water tight.



Tapping the sides of the battery box reveals lots of unwanted vibrations and noise, which can be deadened with self-adhesive barrier mat. We decide to cover the sides of the battery box but not the floor because water occasionally collects here.



The petrol tank is effectively a large drum, which amplifies lots of sound, so three pieces of barrier mat are stuck to the edge and side. If required, we could remove the tank and cover all of it with the material, but this should be sufficient.



The wheel arches transmit and amplify lots of road noise from the tyres, so these should be covered wherever possible, on the inside of the Mini, with barrier mat. We start on the offside rear (OSR) wheel arch in the boot.



The inside of the OSR quarter panel vibrates when we tap it with our fingers, so it needs to be covered with barrier mat. There's room to fit three pre-cut pieces, then firmly stick them to the metal using a roller.



The spare wheel well amplifies noise from the exhaust silencer, so we fit a large piece of barrier mat, but cut out a square for the drain hole, which is plugged with a rubber grommet (water can collect here).

WHERE'S THE NOISE?

There's a straightforward method to finding the panels that vibrate and amplify noise: tap them with your fingers. If they produce a hollow or tinny sound, the chances are they will transmit and possibly amplify noise created by the engine, tyres and other panels.



STRIPPING THE INSIDE



It isn't always necessary to remove the seats and carpets to fit sound deadening material, as it can be squeezed underneath the carpets, but we decide to strip the interior, starting with the front seats, which are secured with 3/8-inch bolts.



The base of the back seat isn't secured in position so it can be pulled free and removed. The seat back is clipped at the top to the rear bulkhead. We'll be fitting self-adhesive barrier mat to the bulkhead and barrier mat underneath the seat base.



After removing the securing screws for the gear lever gaiter and undoing the bolts for the seatbelt stalks, we can remove the one-piece carpet and any underlay and old soundproofing material. Luckily, everything on the floor area is dry.



The carpet on the inside of the front wheel arches (above the footwells) is usually stuck in position and this is the case with Sophie's Clubman. We want to fit barrier mat underneath it, so have to peel off the carpet.



The rear side trim panels hide a vast area of metal that vibrates and amplifies sound, particularly from the tyres, so we remove them, along with anything that covers the rear wheel arches, as these will also be soundproofed.



We're intending to soundproof inside the doors, so remove the door cards. These are secured with screws for the window winder handle, release and pull handles, plus several plastic clips, some of which break when we remove the card.



Sophie suspects water is getting past the door seals and the weatherstrips. The plastic waterproof sheeting on the doors is wet. Inside the doors, the drain holes are clear and the metalwork is dry.



Looking inside the door, there's more of that brittle soundproofing material. This is going to be difficult to remove as there's very little space to use a scraper. We may have to fit barrier mat around the old material.

INTERIOR SOUNDPROOFING



01 The insides of the front wheel arches can be covered in a large piece of self-adhesive barrier mat to help reduce vibrations and absorb road noise. The carpet that was originally fitted here can be refitted with an adhesive.



02 The centre tunnel can be covered in barrier mat, which will help to reduce the noise created by the exhaust and the subsequent panel vibration. We start by fitting a couple of pieces around the gear lever.



03 A large piece of sound barrier can be fitted underneath the front carpet area to help absorb sound from the exhaust and road noise. This piece partly covers the front bulkhead, so it's a little awkward to manoeuvre into position.



04 The middle section of the centre tunnel is covered in several pieces of barrier mat. Small pieces are easier to fit as there are the mounting holes for the seatbelt stalks to avoid and also the handbrake.



05 Inside the doors, we manage to squeeze a few small pieces of barrier mat into position, fitting some of it over the old soundproofing material that's difficult to remove. The doors now close with a nice thud.



06 The inner rear wheel arches and side panels can all be covered in barrier mat to reduce vibrations and road noise. There's room to fit a large piece over the side panel and two pieces over the arch.



07 A large piece of barrier mat is fitted over the rear bulkhead and a smaller piece of non-adhesive sound barrier is cut to shape for the seat base. The barrier mat on the bulkhead only needs to be fitted on one side – the opposite side in the boot isn't covered.



08 Finally, two pieces of sound barrier are fitted over the rear floors and one on the rear parcel shelf. The interior is now fully soundproofed and we have already started to refit the carpets and door cards, checking that everything lines up correctly.

NOISEMAKERS

Identifying the components on a Mini that create noise is one aspect of noise reduction that must be tackled. An open-cone air filter for instance, will generate more noise than a standard plastic or tin air filter housing. A quieter exhaust

system will make a huge difference. A solid-mounted subframe will transmit more noise and vibration through the shell than an equivalent rubber-mounted subframe. Polyurethane suspension bushes have a similar effect

over standard rubber bushes, but worn bushes will also create more suspension noise. Tyres generate lots of road noise but new ones are now noise-rated so, if you're determined to have a quiet ride, find a brand that has a low decibel rating.

UNWANTED ENGINE NOISE



01 Engine noise is transmitted through the bulkhead and dashboard area, so the light trim panel that's fitted here is removed to reveal lots of metalwork and plastic that vibrates. We also remove the instrument surround for better access to the bulkhead.



02 The steel bulkhead above the dashrail can be covered in barrier mat to reduce vibration but the main noise maker is the thin plastic cover in the middle. In front of it, in this case, is an open-cone air filter which generates a lot of noise.



03 Cutting out several small pieces of Noisekiller's self-adhesive, fireproof barrier mat, we fit them over the bulkhead and the plastic cover in the middle. We also manage to squeeze a few small pieces ahead of the instrument panel.



04 Before refitting the dashboard trim, a thick section of sound barrier is cut to size and manoeuvred into position. This will help to absorb any airborne sound that's transmitted through the bulkhead.



05 Sophie is reluctant to have the bulkhead in the engine bay covered in soundproofing material as water often collects in this area. If it was water tight, this is one area which can be lined with barrier mat.



THE VERDICT

So, has Sophie found her Mini Clubman to be quieter to drive after fitting all of the soundproofing? Here's what she had to say: "Before I visited Noisekiller, even driving to Oldham which was about half an hour, my bum would be numb and my hands would be sore from the vibration. I had to wear ear defenders when I drove to Kent for the IMM! In my first visit to Noisekiller we completed most of the work but not the sound barrier behind the dash. Driving home was a completely different experience!

The car felt solid, with no rattles, significantly reduced vibration, and the road noise had all but disappeared. It was much more comfortable to be in but that loud roar from my cheap cone air filter meant there was little difference in the volume.

My second visit completed all the work behind the dash, I couldn't be happier with the result. I can put my foot down, and the noise will bring a beaming smile to my face as always, but I can now have a conversation too!

Before the soundproofing, we couldn't hold a comfortable conversation or hear the CB radio. The trip to Kent for the 2014 IMM was spent with ear defenders on but they were not needed on the way to the Lithuanian IMM this year.

Don't think that installing the Noisekiller materials will make your Mini feel like a modern car, it won't, but the reduced vibrations and road noise will allow you to enjoy longer trips in comfort. 🚗

Thanks to:
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