



# RAINBOW INTELLIGENCE LINE SPEAKERS

Custom Fit, Designed For Purpose

One of the toughest jobs a car audio installer can come across is physically adjusting the standard speaker mounting positions in a car in order to fit something better. This has been a constant battle for many years, as car manufacturers tend to change these on a whim or on the discovery of some cheaper way in which to fill your car with distortion! Most car audio manufacturers make "hole-fillers" which are often marketed as "custom-fit speakers" on the basis that they have the correct connector fitted to the end of a trailing lead that saves the installer time and the purchaser money. However, most of these are built as like-for-like replacements and offer no uplift in quality at all. High quality German manufacturer, Rainbow, does not do such business however and has introduced a range of products called Intelligence Line. These are speakers that contain all of the technology of its excellent aftermarket products but with the addition of being able to slot in to where the manufacturer of your car saw fit to throw in some paper and plastic abomination. The major difference is that Rainbow Intelligence Line speakers sound fantastic! I have been fortunate enough to listen to some of these, most markedly in the BMW M3 piece elsewhere in this issue but also in the last issue too. I can confirm that they sound fabulous and in the case of the M3, fooled me into believing they were something much more tasty and expensive.

These speakers perfectly suit those who wish to dip their toe in the water of in-car audio nirvana. Probably prompted by the original equipment failing or being damaged by the wife's stilettos or some other such disaster, you now have an opportunity to treat yourself to a substantial upgrade without committing to a full system upgrade. The installer is presented with all the hardware required to install the Rainbow replacements, however, fitting them is by no means as simple as throwing them in the air and driving the car underneath. You will still need the skills of a specialist installer but this will generally turn out to be much cheaper and far better than the car manufacturer-trained "wallet lifter" in your local franchise dealership. Do not be surprised if your expert installer also recommends that you purchase some sound deadening. This will always make your speakers sound better and help you to retrieve much of the sound that is normally lost to panel flexing as well as helping to reduce road noise.

The speakers themselves are not necessarily "sexy" to look at. This is in order to keep the cost to reasonable levels. In fact they look a little like the sort of thing a vehicle manufacturer would fit but with some important clues to their quality. First of all, the magnets are often made from Neodymium rather than plain old ferrous metal. This is because in very basic terms, a better magnet

means more control. A speaker is in essence a linear motor, which means it turns electricity into movement. But rather than the rotational movement you get from the little electric motor in your razor, they produce movement in either a forward or backward straight line. They have to do this incredibly quickly (20,000 times per second) but must also be able to do this very slowly (20 times per second) and in a very controlled manner. Components such as magnets need to be very efficient in order to provide greater power to the motor but also more control and therefore accuracy. Other differences are harder to detect but a thicker cone material than usual is employed. This is an expensive thing to achieve as Rainbow do not want to add more weight to the cone as this will put additional strain on the

*"The major difference is that Rainbow Intelligence Line speakers sound fantastic!"*

motor and also add lag which would not be helpful, however, the advantage to a thicker cone material is that the resulting cone is more rigid. If you wave a piece of paper in the air, you will see that its shape changes due to wind resistance. The very same thing happens when your speaker cone is pushing air. The cone shape distorts and with it, the sound produced by the speaker. Rigidity is not solely a product of the material used. The geometry or profile of the cone shape also has a dramatic effect on performance with miniscule differences able to add hugely to the sound. Rainbow has spent many years finding the perfect cone geometry for this product and this fact is very important to resultant performance.

The tweeters used in Intelligence Line use a silk dome. This material has been used for many years in home hi-fi as it has inherent attributes that help to avoid distortion, deliver a pleasing, rounded, sound and accurately reproduce the original

timbre of instruments in a recording. You would also notice that these replacement systems include proper crossover networks. These small lumps of electronic components are important to ensure a smooth transfer between low and high frequencies. The car manufacturer solution is to use a single component to crudely carve away unwanted frequencies. The problem with this is that the single component behaves differently at different frequencies and once again distortion is introduced. With correctly designed crossover networks, different frequencies are treated with care and respect and this is reflected in the performance of the finished product.

Rainbow has designed Intelligence Line speakers to be efficient which means that purchasers will see an immediate uplift in performance even if they run these directly from the on-board head unit. However, there is plenty of headroom available which allows the speakers to be driven by a separate amplifier. This will lift the quality enormously as most head units are designed with low sound expectations and are therefore skimped on. Although claiming 40-50 Watts of output power, most will begin to distort horribly way before reaching this point (try turning the volume control on your head unit up to half way for proof) and so the speakers are not driven to anything like capacity and power equates to control, precision, and clarity. Once presented with a distortion-free input with plenty of clean power, these speakers sing as sweetly as you like but they also manage to provide very linear performance between very low bass to very high treble. This is vital in order to help the listener to separate sounds in a recording. Imagine actually being able to hear a tambourine being played or a triangle rather than having to put up with a cacophonous noise that is so hard for our brains to unscramble that we simply give up and listen to a talk show instead.

I did not pick this scenario at random, this is actually what is happening in cars. People are switching their music off and listening to speech instead as it is far less effort.

In conclusion, if you are driving a VW, BMW or Mercedes and thinking that it sounds OK, don't fret, it doesn't mean you are not good enough to enjoy really, really good sound in a car, it is simply because you have never heard the alternative. Rainbow now gives you the opportunity to do so for not a lot of money. I would thoroughly recommend you upgrade to Intelligence Line speakers along with a modest amount of sound treatment and if you wish to step up by the same magnitude again, have a separate amplifier fitted to drive them properly.

You can view the complete range at the fantastic FOUR Car Audio website: [www.fourcaraudio.co.uk](http://www.fourcaraudio.co.uk) or even better, visit one of their Independent Specialists and ask for a demonstration. □