THE PRODUCT INSIGHT PROGRAMME

Book 6 Austin Metro

Issue 1. September 1980

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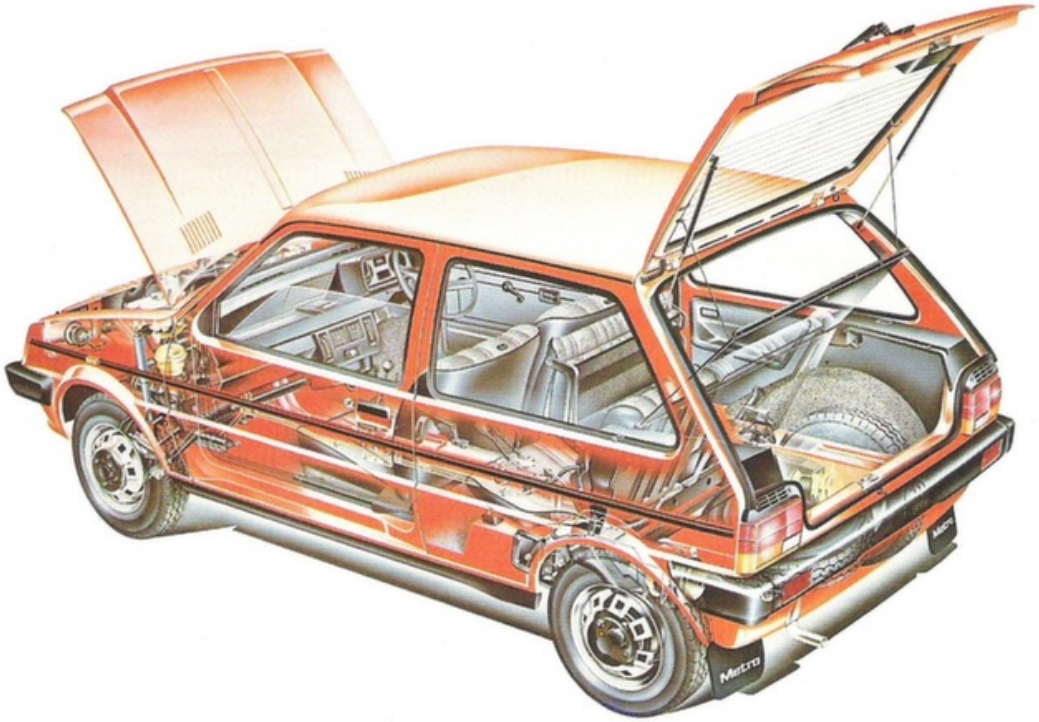
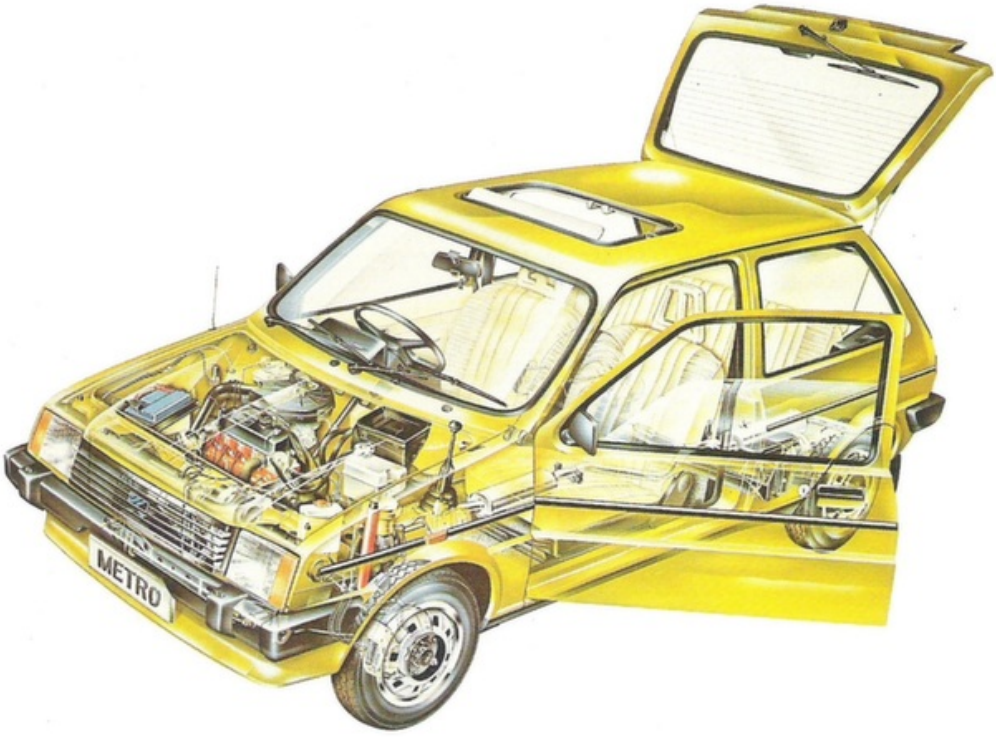
INTRODUCTION

Of the many significant developments and introductions to the BL model range which have taken place this year, the launch of the Metro is the most important of all. So it follows that this book is by far the most important to be issued to you within the Product Insight Programme.

From your previous experience of the Programme you will be aware of its effectiveness in helping you to learn every key benefit of our model range. You will find exactly the same approach used here to put across the many and unparalleled benefits offered by Metro.

It is obviously essential to Metro's successful launch that you put every effort into learning these benefits 100%, and getting full marks in the Final Test. As you read this book you will find that Metro is well worth the effort you are putting in - and equally worthy of your total commitment in selling it.


Metro


METRO

1
THE AUSTIN METRO RANGE

Launched by the manufacturer who originally helped to create the small car sector, the Metro has aroused expectations which it is well capable of surpassing. With a design heritage which initially spread the word that "Small is Beautiful", and with all those subsequent years of engineering development behind it, Metro has the originality, the refinement, and the sheer star quality to make it the most forceful personality ever to enter the small car arena.

Within its compact dimensions Metro offers extraordinary loadspace versatility, outstanding levels of comfort and equipment, and the most generous interior space in its class.

Engineering for safety has produced unusually high standards of structural protection, within a front-wheel drive car endowed with the positive handling and roadholding that puts so much of the fun into driving Metro. Engineering for refinement has produced a car designed from the very beginning to provide quietness outstanding in its class, and a specially developed Hydragas suspension system makes the ride as cushioned as it is quiet.

Most important, engineering for economy has developed a package aimed specifically at reducing every aspect of the cost of car ownership.

These star qualities of the Metro range are offered within five models with five very distinct identities. Starting with the economical Metro 1.0 and culminating with the lively and luxurious 1.3 HLS, the range also has the flexibility to combine a special economy engine with high levels of comfort in the attractive HLE.

Each section of this book will take you into a different aspect of Metro, and the benefits it provides. But we start by looking at the sector and the competitors that Metro is challenging.

The market for Metro

As a small family car, the Metro enters a highly competitive but rapidly growing sector of the market.

Small car sector growth

The small car sector's market share has grown rapidly since the early 70's from 11% in 1972 to 16% in 1979 - representing an overall growth of 45%. It is predicted to rise to 18% in 1981.

There are two main reasons for this remarkable growth:

1. The oil crisis of 1973 and continuing high petrol prices, led to a surge in demand for cars which were economical to run, but had high levels of comfort and refinement.

2. The introduction of a wide variety of new models, especially three door hatchbacks, offering economical family transport.

Small car sector composition

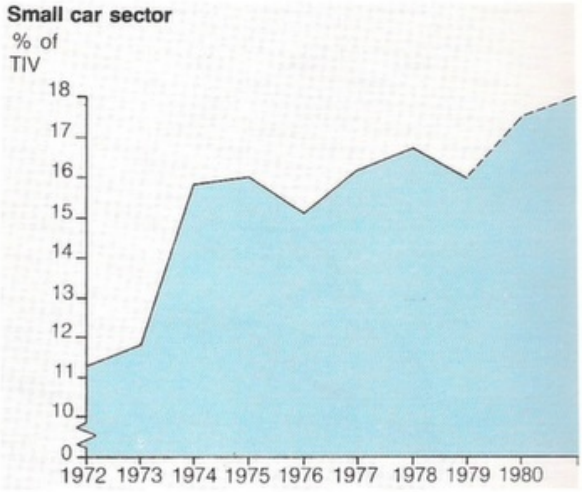
The small car sector can now be divided into three sub-sectors:

1. two door cars
2. three door hatchbacks
3. four and five door cars and estates.

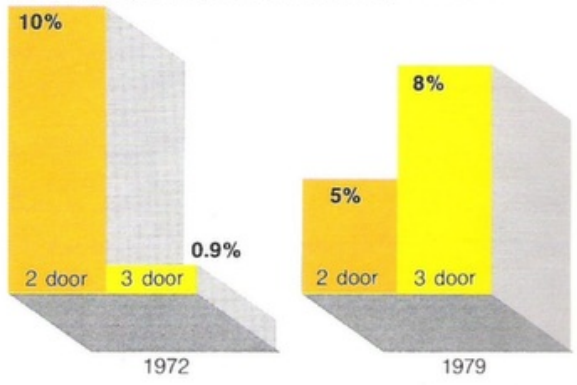
The chart shows how the importance of these sub-sectors has changed. In 1972 two door cars had 10% of the total market, three door cars less than one per cent. Seven years later the three door share had improved to 8% and two door share had fallen by half. With the introduction of the Metro the market for family hatchbacks is expected to expand even further.

From the graph, in which sub-sector has almost all the growth in small car sales taken place?

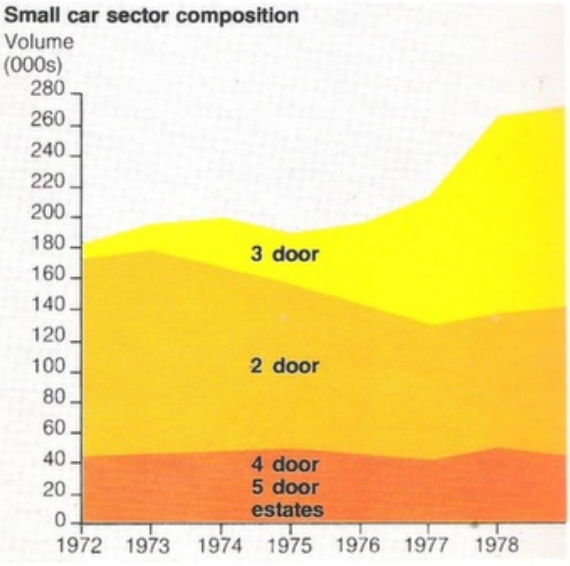
Small car sector



Comparison, 2 door and 3 door sales, 1972/1979



Small car sector composition



The three door hatchback sub-sector.

Small car buyers' needs
The needs of purchasers in the small car sector fall into two main groups:

1. **Low cost personal transport,** predominantly used by one or two people for short journeys-which means that fuel economy and manoeuvrability are of major importance. These needs correspond to those of the two door sub-sector, and will continue to be met throughout the 80's by the realigned Mini range.

2. **Versatile family transport,** with more space and greater refinement. Fuel economy is still a major requirement but loadspace and style are also important. Metro has been developed to meet these needs, and, in doing so, to offer a far better package than any existing three door hatchback.

Reasons for purchase	2-door models
Fuel economy	40%
Price and value for money	22%
Small size	21%
Manoeuvrability	19%
Mechanical reliability	10%
Boot space	5%
Exterior style	3%
Interior space	2%

	3-door models
Fuel economy	35%
Boot space	21%
Price and value for money	19%
Exterior style	18%
Small size	16%
Mechanical reliability	13%
Interior space	8%
Manoeuvrability	6%

Selling Metro

The Metro is an incremental model in the Austin Morris range and therefore the large majority of its sales must be conquest business from the competition. The major competitors are the Ford Fiesta, Fiat 127, Renault 5 and VW Polo and these are the models which will feature prominently in the comparisons throughout the book. Other larger hatchback competitors will also be vulnerable to Metro and these include the Talbot Sunbeam, Datsun Cherry and Toyota Starlet.

In addition to the incremental sales it is vital that the potential sales of the deleted Clubman saloon and 1275 GT are captured by the Metro.

Metro is challenging some well-established rivals - but there can be no doubt that it is going to have some irresistible advantages over the competition. There are eight key selling benefits at the centre of Metro's challenge and the following two pages reveal what they are.

Metro 1.0	Ford Fiesta
Metro L	Renault 5
Metro HLE	Fiat 127
Metro 1.3S	VW Polo
Metro 1.3HLS	Peugeot 104
	Datsun Cherry
	Toyota Starlet
	Talbot Sunbeam
	Vauxhall Chevette
	Mazda 1300
	Honda Civic
	Citroen Visa

Key selling benefits

1. Exceptional versatility and spaciousness

The generous dimensions captured within Metro's economical proportions provide more passenger space for its size, and a greater loadspace capacity, than any other car in its sector. And the space is exploited to the full, with the innovatory asymmetric split rear seat (from L models upwards) offering vital extra flexibility for passenger and luggage accommodation.

2. Low cost of ownership

At the heart of Metro's small car appeal is its smaller cost of ownership. Engineered from the beginning for the most sparing fuel consumption, Metro's range of highly economical engines is backed up by a service interval extended to 12 months or 12,000 miles, saving owners time, labour and parts costs, and the sheer inconvenience of having to lose their car for a day. In addition, servicing is made easier through careful attention to accessibility and design of components.

3. Attractive styling

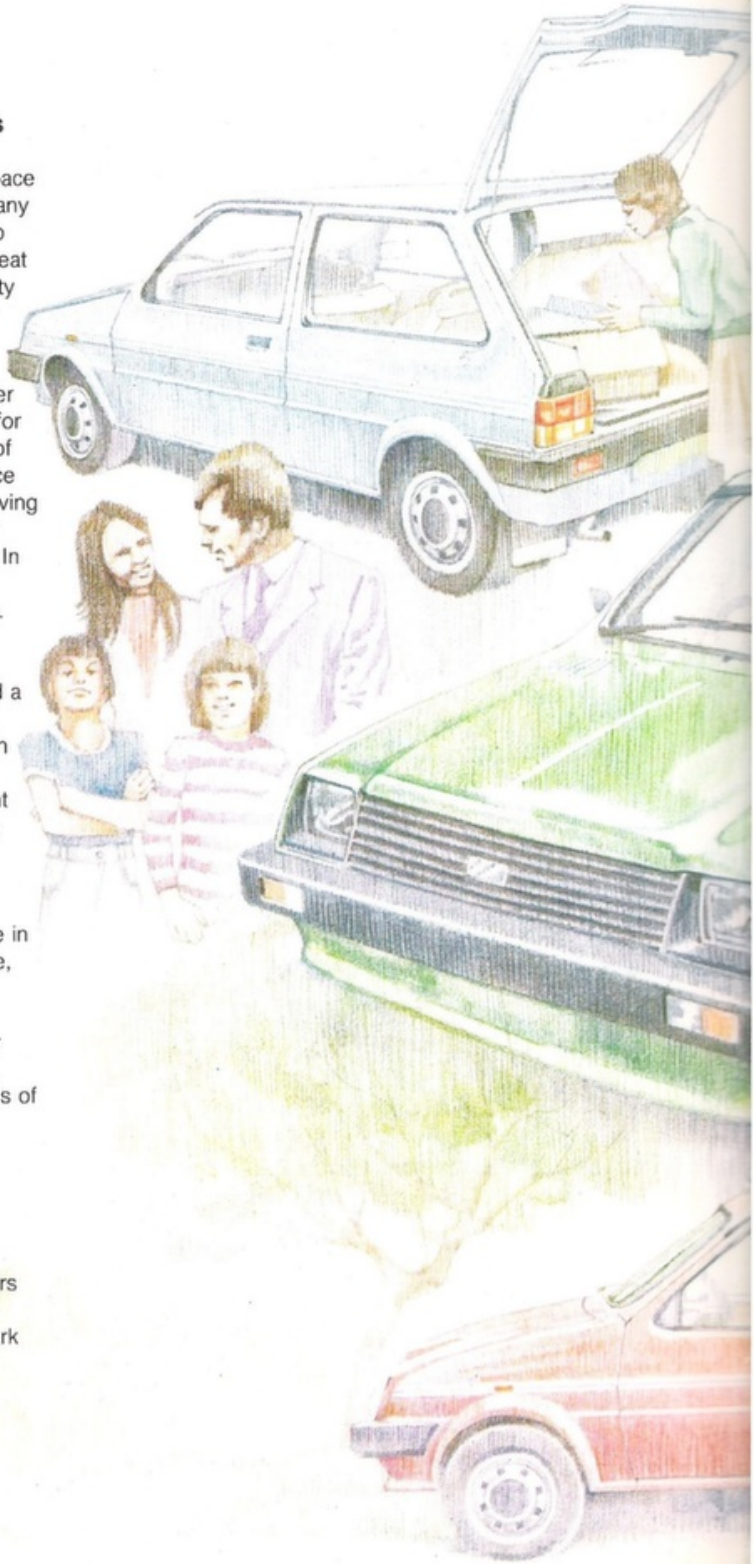
Intensive research into aerodynamics has produced a smooth, nose-down shape for Metro that is just as functional as it is neat and attractive. Combined with the wind-cheating effects of the spoiler, the car's slippery profile provides immense stability, excellent fuel economy and good performance - some of the most attractive things about Metro.

4. High levels of safety

Metro was designed from blueprint stage to be safe in every respect, incorporating a very rigid safety cage, and well-protected fuel tank and steering rack - a design which has proved itself through Metro's unusually good performance in crash tests. Primary safety is backed up by excellent all-round visibility, powerful brakes and, on all models, very high levels of standard safety equipment.

5. Large-car comfort and refinement

Extensive research and development have given Metro its large-car comfort and refinement. The carefully contoured seats are designed to suit the tallest and the smallest drivers as well as Mr and Mrs Average, and the car was structured right from the start to provide the ride quietness that is the hallmark of real refinement.



6. Outstanding quality and reliability

A considerable proportion of the £285 million invested in the Metro project went to fitting out the assembly plant - one of the most modern in the world - which incorporates incredibly accurate self checking robots and a huge area (65,000 sq.ft) devoted solely to final inspection, rectification and valeting to ensure quality. Finished cars have already been subjected to over a million miles of testing in all climates and conditions to prove their endurance and reliability.

7. Excellent handling

Front-wheel drive, precise steering, and a Hydragas suspension system specially developed for Metro provide the safe, positive handling that makes the vital difference between enjoyable driving and just travelling.

8. Comprehensive equipment

Equipped for both safety and comfort, all models have a 9-function warning lamp display, concealed inertia reel seat belts, heated rear window and dipping rear view mirror among their many standard features. Towards the top of the range the 1.3 S provides a push button radio, cigar lighter, tachometer and digital clock - high standards that are improved on still further by the luxurious 1.3 HLS.

Range structure

Metro

The Metro 1.0 is an extremely strong base for the range. With higher levels of specification than its more spartan competitors, and offering the optional low compression engine, the Metro 1.0 is a hatchback offering value for money that is outstanding in its class.

Metro L

Potentially the volume seller of the range, Metro L has the jack-knife folding asymmetric split rear seat unique to Metro, which multiplies the effectiveness of its large loadspace. With its extra style, comfort and equipment allied to excellent performance and economy, the Metro L sets an example to its competition as the ideal family car.

Metro HLE

The key to the HLE's compelling package is its combination of the ultra-efficient economy engine with high levels of specification, which include a clock, cigar lighter and styled halogen headlamps - a formula which has no equal among the HLE's competitors.

Metro 1.3S

The S model exploits to the full all the potential of Metro's well-engineered suspension and precision steering with its lively 1.3 engine. Zestful performance is combined with a striking exterior trim which includes broad 2-colour coachlines and tinted laminated glass, and there is additional comfort and equipment to complement the sporting qualities.

Metro 1.3 HLS

At the head of a highly specified range, the Metro HLS is a strikingly luxurious small car. Distinctive wheel rim embellishers add to its exterior style, and the opulence of velour upholstery and head restraints takes interior comfort to new levels. The 1.3 engine brings eager performance and forgiving fuel consumption to complete a small car package uniquely attractive in its sector.

2
CAR BODY STRUCTURE

One of the most important priorities of Metro's styling engineers was to make it the right shape to slip easily through the air. The result of their work is that Metro has the lowest drag coefficient in its class, with considerable benefits to stability, performance and economy, and minimal wind noise.

Aerodynamic efficiency brings its own safety advantages, but in addition to being the right shape, Metro was designed to be an unusually safe car, with high levels of rigidity around the passenger cell, and careful location of steering rack and fuel tank. A meticulous anti-corrosion programme ensures that Metro will retain its structural integrity and its bright new looks for a very long time to come.

Along with making Metro safe, and making it to last, an intensive programme has been devoted to making it one of the quietest cars in its class. The programme concentrated on Metro's entire body structure, building quietness into body panels, underbonnet components and interior fittings.

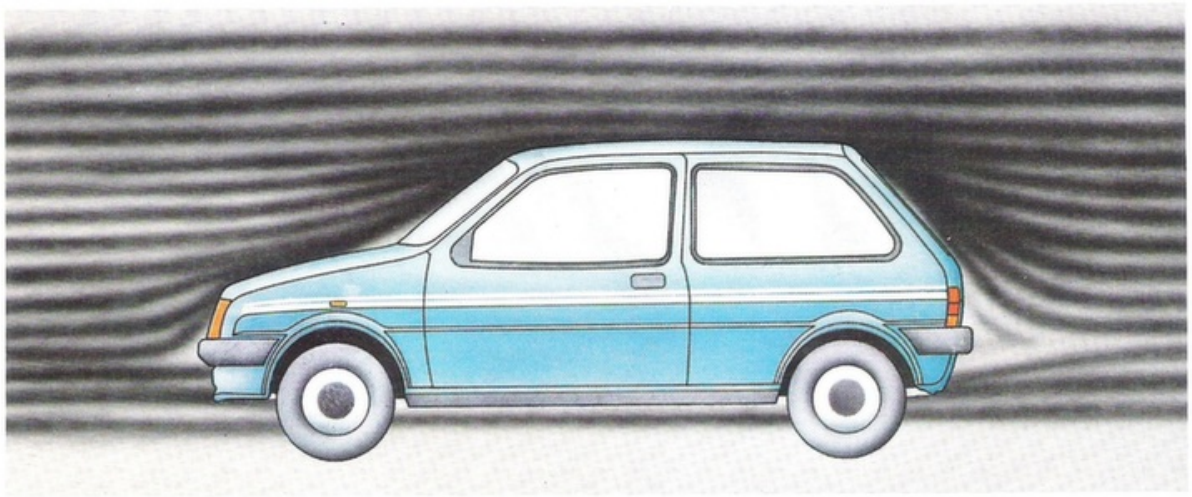
The scale of the engineering design programme behind Metro is only equalled by the work that has gone into ensuring that it will be one of the most carefully constructed and thoroughly tested hatchbacks on the road. Metro is built in the most modern car assembly plant in Britain, and in every aspect of its manufacture it reflects quality and reliability as being the most important priorities of all.

Aerodynamic style

In designing Metro to be a highly economical small car, the major structural considerations were its aerodynamic characteristics. The result is Metro's low drag style, which creates a smooth envelope around the car body, allowing air to slip past with the minimum of turbulence. The Metro achievement is all the more remarkable because it is notoriously difficult to achieve a really low drag coefficient with small cars.

Drag coefficients	
Metro	**0.41**
Ford Fiesta	0.44
Renault 5	0.43
VW Polo	0.45
Fiat 127	0.48

Metro is among the most compact cars in its class and it has the lowest drag coefficient - 0.41 - beating Fiesta, Renault 5, Polo and, by a long way, Fiat 127.



There are two major features of Metro's styling which help to give it its slippery shape.

1. Raked front end

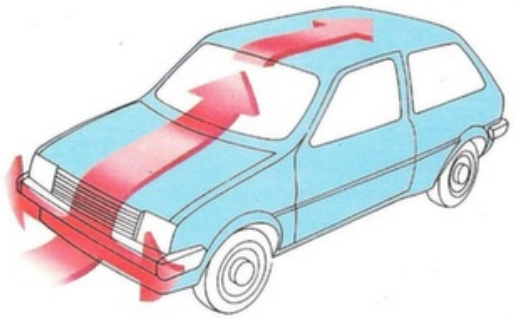
Metro's small front end is steeply raked to offer as little resistance as possible to air flow. The angled grille, the steep slope of the bonnet and the raked windscreen easily deflect the air flow over the top of the car.

2. Front spoiler

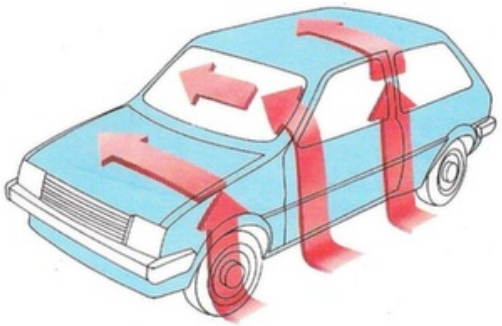
Air turbulence in front of the bonnet and underneath the car is reduced to a minimum by Metro's front spoiler. This acts as an airdam, pushing air away to the sides or over the bonnet, where it has an easy passage over the smooth body panels, rather than fighting its way past the unavoidable protrusions underneath the car.

Two of the four major benefits of good aerodynamics are reduced wind noise and greater stability. What are the other two?

i) Improved performance
ii) Better economy



Improved performance and better economy
Metro's aerodynamic efficiency means less air resistance or less drag, which gives it improved acceleration and top speed. Also, because Metro's engines have to work less hard to overcome wind resistance, fuel economy is improved.



Greater stability
Motorway travellers will particularly appreciate Metro's tremendous stability. This results from several factors, including front-wheel drive and the suspension geometry, but is greatly aided by an aerodynamic shape. Lack of turbulence below the vehicle avoids front end lift, keeping it firmly glued to the road. Side winds too flow easily over Metro. A further design feature is that Metro's centre of side wind pressure is close to its centre of gravity, so the car is less likely to be deflected by crosswinds.

Reduced wind noise
Metro's smooth, clean lines greatly reduce wind noise which is again caused by turbulence. Even the precise relationship between window glass and frame has been studied to produce the best air flow. You will notice that in Metro, the glass is almost flush with the body, and there are no quarter panel posts to create unnecessary turbulence as there are on Fiesta, Fiat 127 and Polo.

One of the two major styling features which contribute to Metro's aerodynamic efficiency is its raked front end. What is the other feature?

Front spoiler

Quietness

High interior noise levels are an unpleasant feature of many small cars, but from the start the Metro was designed to have a quiet interior. Efforts have been made in three areas:

1) By cutting down the source of noise.
2) By reducing vibrations.
3) By blocking out other noises.

1. Cutting down the source of noise

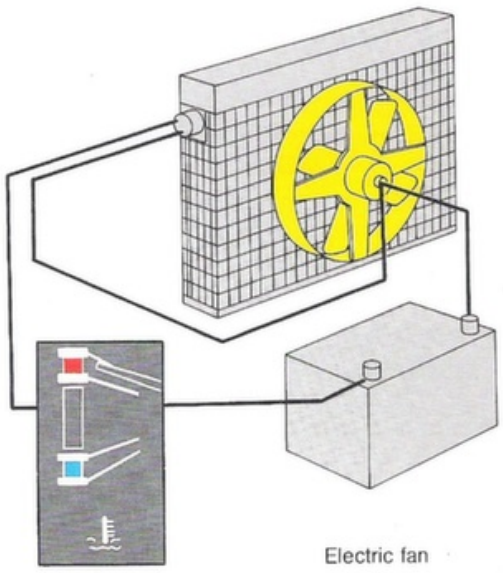
The uprating and refinement which has produced the A-plus engine, has considerably reduced noise output, as have the modifications to the transmission. In addition, attention has been focused on two major sources of noise, the fan and the air filter.

Electric fan

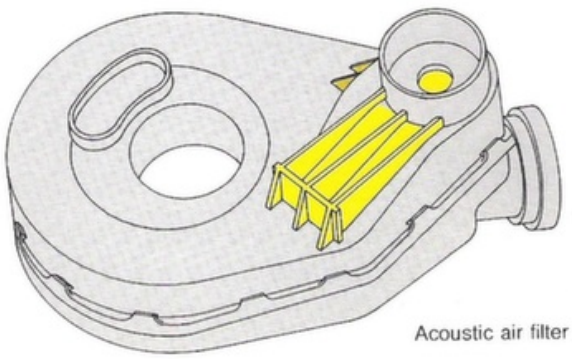
Conventional mechanical fans are continuously driven by the engine. This has three disadvantages - fan noise is a permanent feature; engine power is used to drive the fan even when it is not needed; fuel is wasted because the engine takes a long time to warm up. All these problems have been overcome on Metro by using an electrical fan which is thermostatically controlled to run only when necessary.

Acoustic air filter

Air filters tend to amplify noise both from air movement and from the engine itself. To resolve this problem Metro's air filter is ribbed for strength, to reduce vibration, and incorporates other design elements to reduce noise production.



Electric fan



Acoustic air filter

In what way does aerodynamic styling contribute to reducing noise levels?

It reduces wind noise.

2. Reducing vibrations

Vibrations from the car's moving parts are easily transmitted to the interior, where they can cause unpleasant buzzing and reverberation, or set off resonant "booming" in body panels. Austin Morris have been in the forefront of research to reduce this problem and have shared in developing a new area of acoustics to do so.

Special rubber mountings on engine and subframes

The use of subframes plays an important part in isolating the passenger compartment from vibrations caused by the engine and roadwheels. On Metro their effectiveness has been further improved by the use of specially designed rubber mountings.

All the subframe and engine location points have these new mountings which provide firm support while having the resilience to absorb most unwanted movement. As a result vibrations transmitted via the subframes have been largely eliminated.

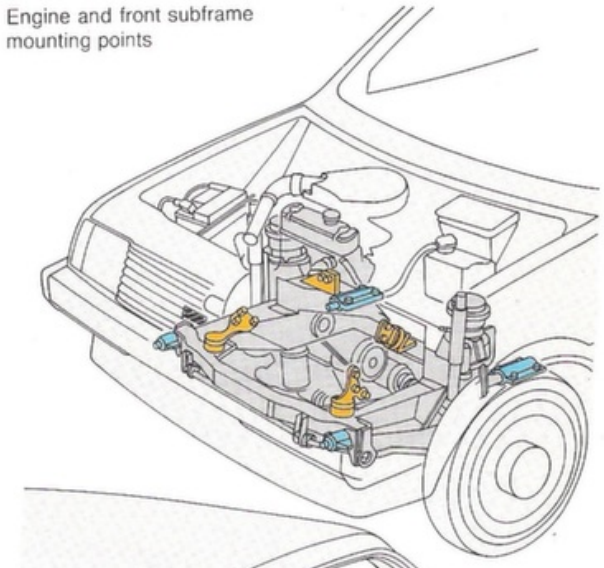
Fused bitumastic sheet

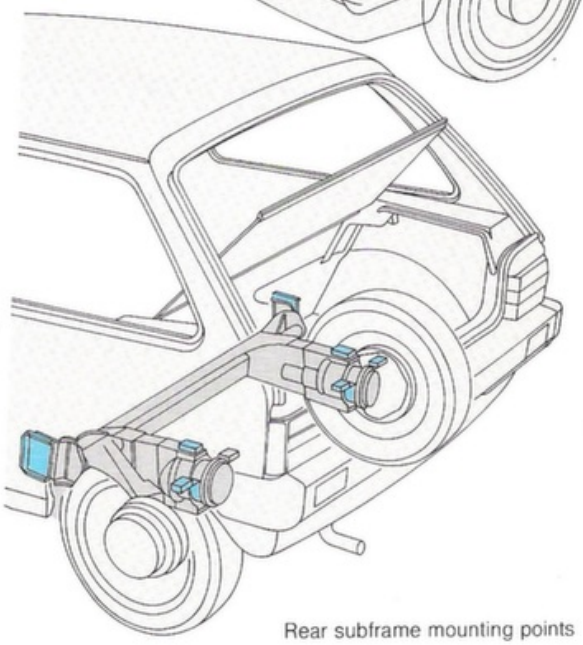
Any vibration which does get through to the body shell can be rapidly amplified by vibration of the body panels. This can happen even with noises generated outside the car, for example when overtaking a large lorry, and results in unpleasant buzzing and drumming.

During Metro's development acoustics experts were commissioned by Austin Morris to work on a solution to this problem. They found that the most effective solution was to prevent panel vibration altogether by using a thin sheet of bitumastic material fused to the metal. The illustration shows the areas of Metro to be treated in this way. This successful technique has also been applied to Mini and Ital.

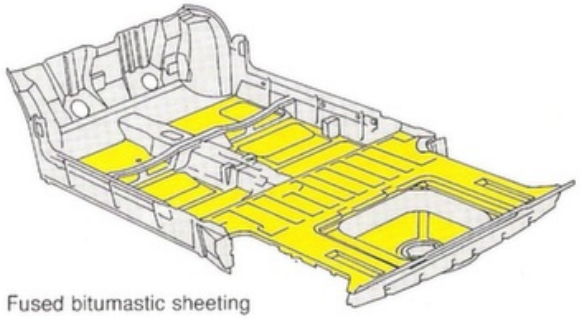
In addition to the electric fan, what other Metro feature helps to cut down underbonnet noise at its source?

Engine and front subframe mounting points





Rear subframe mounting points



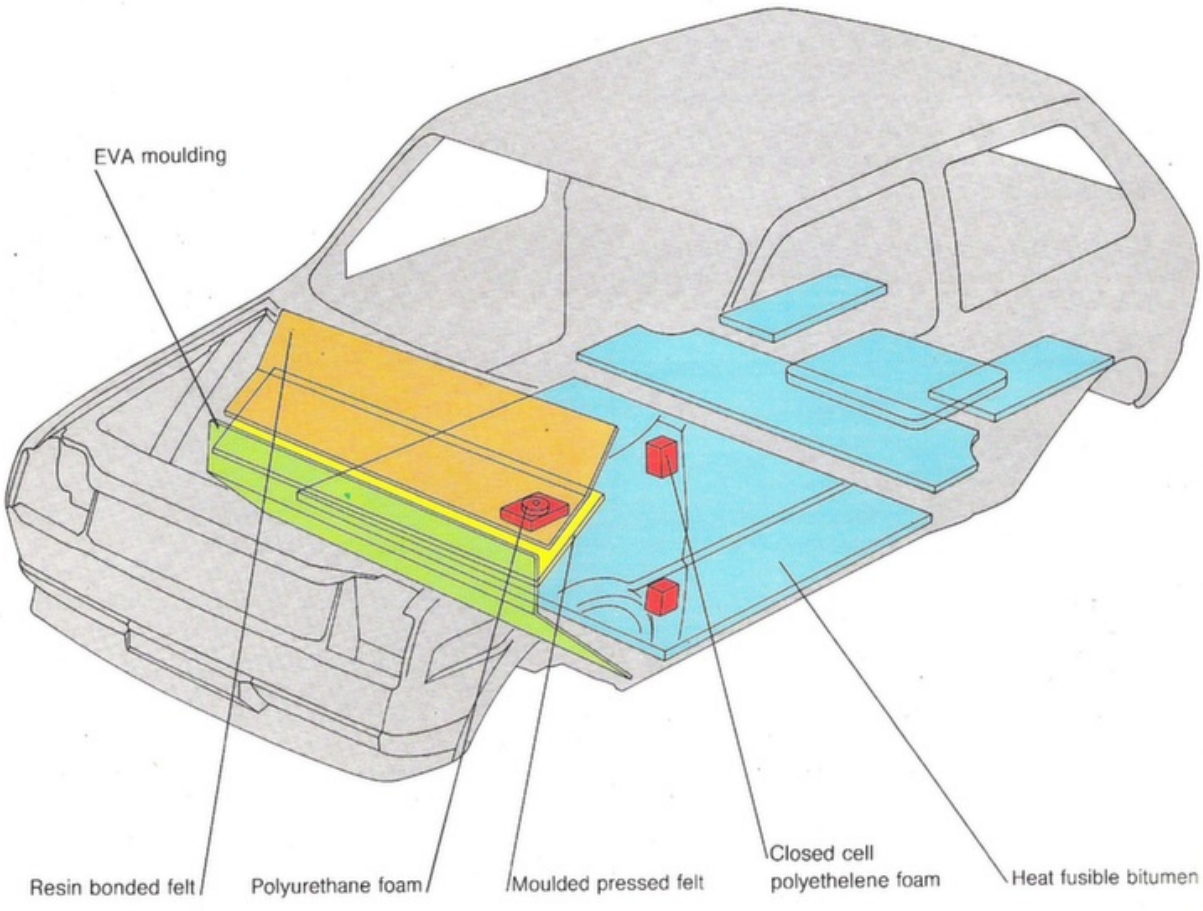
Fused bitumastic sheeting

The acoustic air filter.

3. Blocking out other noises

The major factor in blocking noise out of Metro's passenger compartment is the use of a comprehensive insulation package which deflects or absorbs any remaining noise. The illustration shows how this has been done.

The precise type of sound insulation material used, and its positioning were decided after thorough studies at a test centre in Heidelberg, Germany. These included use of an anechoic chamber which prevents noise reflection and allows simulation of outdoor conditions.



Metro's extensive insulation package blocks out noise from the car interior. What, in addition to the use of bitumastic sheet fused to the body, helps to reduce vibrations?

Rubber mountings on engine and subframes.

In addition to these major items, attention to smaller details is also important in minimising noise and vibration.

Heater motor
The heater motor noise is isolated from Metro's passenger compartment by locating the motor within the engine compartment. The result is that Metro's heater fan is only discreetly audible even when running at its high speed.

Fittings and finish
Some of the most irritating noises in a car come from badly designed or badly finished fittings. For Metro, fittings have been carefully designed and finished to ensure that the parcel shelf doesn't clatter or boom, the rear seat locks don't rattle, and the door seals fit snugly.

Interim test

1. What four main benefits result from Metro's good aerodynamic styling?

2. What two major aspects of Metro's body styling ensure good aerodynamics?

3. What two major underbonnet features on Metro help to cut down the source of noise?

4. On Metro in what two ways has vibration been reduced?

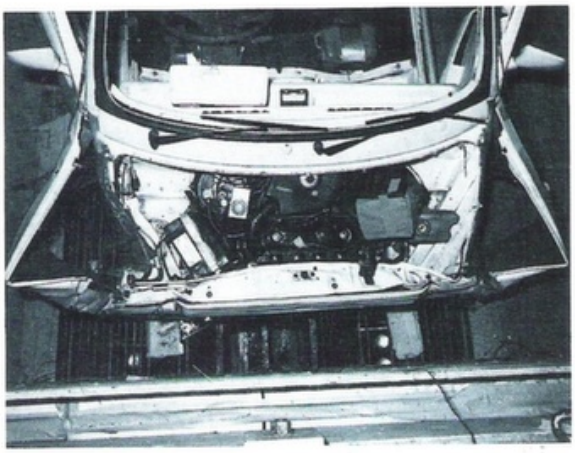
5. What major action has been taken to block noise out of Metro's passenger compartment?

Answers

1. What four main benefits result from Metro's good aerodynamic styling?	i)Improved performance. ii)Better economy. iii)Greater stability. iv)Reduced wind noise.
2. What two major aspects of Metro's body styling ensure good aerodynamics?	i)Raked front end. ii)Front spoiler.
3. Which two underbonnet features on Metro help to cut down the source of noise?	i)Electric fan. ii)Acoustic air filter.
4. On Metro, in what two ways has vibration been reduced?	i)Rubber mountings for engine and subframes. ii)Bitumastic sheets fused to body.
5. What major action has been taken to block noise out of Metro's passenger compartment?	By use of sound insulation materials.

Safety

The very safe and secure feeling experienced when inside Metro results from its responsive handling, stability and excellent all round visibility. But these safety features are backed up by a very strong and well-designed body structure which has performed unusually well in safety crash tests.



Passenger cell and crumple zones

The photographs show the results of the ECE crash test - 30 mph into a concrete wall. The front of this Metro test model has crumpled up progressively, absorbing the force of the impact. The occupants would not, therefore, have been subjected to the stresses of almost instantaneous deceleration which would have occured if the whole car was rigid.

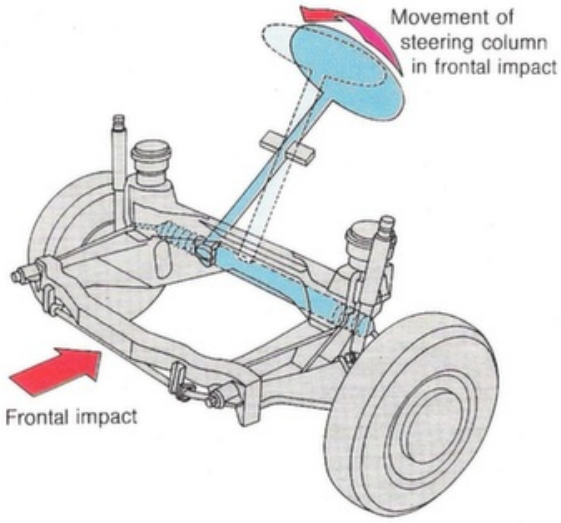
Most important, Metro's 'safety cage' surrounding its passengers is still completely secure - the rigid box sections have not distorted, all the windows are intact and the doors have neither burst open nor jammed shut.

In a rear end collision, Metro's carefully designed boot area absorbs the force of the impact, while the petrol tank, safely located in front of the rear subframe, remains undamaged.

Safety steering column
One of the few results of crash testing which can be directly measured is the rearward movement of the steering column. ECE regulations lay down a standard maximum figure - in tests, the Metro column moved less than a tenth of the allowed amount.

The reason for this is the position of Metro's steering rack - well back from the front of the vehicle and well protected by the front subframe. In the unlikely event of a collision affecting the steering rack, the column will pivot away from the driver.

Drivers and front seat passengers should always be encouraged to wear a seat belt, but just in case they don't, Metro's fascia and steering wheel have also been constructed so that no sharp edges can be caused by an impact.

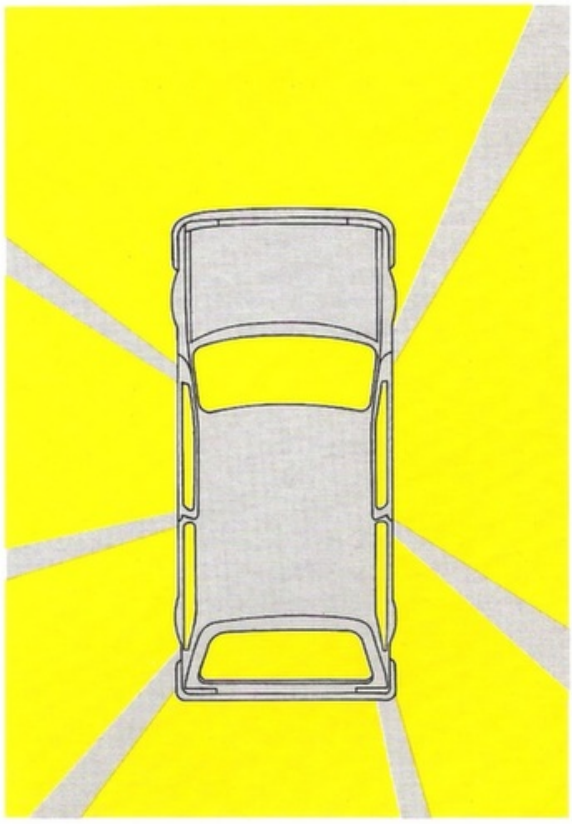


The steering column is firmly mounted to the bulkhead to form a central pivot point. If the steering rack is forced backwards in a collision, then the column will pivot resulting in the steering wheel moving away from the driver towards the windscreen.

Visibility
Metro's structure ensures protection to the occupants in a collision, but its excellent all round visibility is an important factor in accident avoidance. The large glass area and slim posts give a light airy feel to the interior, and a valuable 88% all round visibility figure. The Fiesta, which was praised for its large glass area and all round visibility, can boast only 86%.

Another small but important point is the design of the windscreen wipers. On Metro a large proportion of the screen area is swept, keeping possible blindspots to an absolute minimum.

Metro's rear visibility is also very good, and is further improved by a rear wash-wipe fitted on all but the baseline model.



All Metros except the baseline are fitted with a laminated windscreen. How does this protect occupants in an accident?