This press pack accompanied the UK launch of the second generation Avensis in February 2003. Some changes were made to the model during its time on sale, which can be tracked using the Timeline feature on the second generation Avensis archive web page. Additional assets and information relating to the second generation Avensis can be obtained from the Toyota press office if required.

THE NEW TOYOTA AVENSIS

KEY POINTS

- All new car launched in the UK on 1 March in saloon, hatchback and Tourer bodystyles
- On the road prices from £13,995 for T_2 saloon/hatchback to £21,495 for T Spirit Tourer with sequential automatic transmission
- Available in five specification grades – T_2, $T_{3\text{-}S}$, $T_{3\text{-}X}$, T_4 and T Spirit – offering a wide choice of equipment
- Superior quality concept introduces premium model levels of comfort, convenience and performance to the D segment
- Built exclusively at Toyota Manufacturing UK factory at Burnaston, near Derby
- Target of c27,000 full-year UK sales
- New Toyota flagship model in Europe, forming core of product range with Yaris and Corolla
- Designed and engineered in Europe and extensively tested on European roads to ensure strong appeal to local markets
- All engines, petrol and diesel, comply from launch with EURO IV emissions legislation – a world-first achievement
- Two petrol engines available at launch – 1.8-litre VVT-i and 2.0-litre direct injection
- 2.0-litre direct injection D-4D diesel available from May 2003 offers a three per cent saving in company car tax (BIK) over all competitors
- All models equipped with nine airbags as standard, including driver's knee SRS airbag – a European first
- Highly rigid Minimum Intrusion Cabin Structure (MICS) increases passenger safety
- All models equipped with ABS and Electronic Brakeforce Distribution (EBD)
- All 2.0-litre petrol models additionally equipped with Brake Assist (BA), Traction Control (TRC) and Vehicle Stability Control (VSC)
- ISO-FIX child seat anchors with top tether fitted as standard
- 2.0-litre diesel engine with Diesel Clean Advanced Technologies (D-CAT) available from last quarter of 2003
- D-CAT achieves new low in emissions levels for diesel engines, substantially below EURO IV requirements for nitrogen oxides (NOx) and particulate matter (PM)
- Double-wishbone-type rear suspension derived from Celica sports coupé offers excellent handling performance
- Electric Motor-assisted Power Steering (EMPS) fitted to 1.8-litre petrol models for greater steering feel and improved fuel economy

- Optional sequential automatic transmission available on all petrol versions
- Standard-fit Optitron instrumentation offers clear read-out in all conditions
- Eight speaker audio system with CD player and steering wheel-mounted controls fitted as standard
- New Ultra Light Concept™ (ULC) insulation achieves new levels of absorption of engine and road noise offering substantial weight savings, aiding fuel economy
- Class-leading insurance groups, extended service intervals and reduced parts and material costs contribute to excellent cost of ownership profile

Toyota will raise the stakes in the key D segment with the launch of its all-new Avensis model on 1 March. All three body styles – saloon, hatchback and Tourer – will be available from launch in five distinct specification grades: T_2, $T_{3\text{-}S}$, $T_{3\text{-}X}$, T_4 and T Spirit.

Initially there will be a choice of a 1.8-litre VVT-i (Variable Valve Timing – intelligent) and 2.0-litre direct injection petrol engines. A 2.0-litre D-4D direct injection diesel will be available from May 2003. The new Avensis is the first model in the world to be offered with an engine range fully compliant with EURO IV emissions regulations.

Setting New Standards in Safety

Safety has been a fundamental priority in the development of the new Avensis. As standard, nine airbags will be offered across the range. They include the first European standard-fit driver's knee SRS airbag, which deploys from beneath the steering column.

Occupant protection is provided through an exceptionally strong and rigid body structure. This Minimal Intrusion Cabin System (MICS) is designed to absorb and disperse impact energies away from the passenger cell through high-strength sheet steel construction and the careful location of reinforcements, cross members and impact beams.

All models are equipped with ABS and Electronic Brakeforce Distribution (EBD) and Brake Assist (BA), Traction Control (TRC) and Vehicle Stability Control (VSC) are (additionally) standard on all 2.0-litre petrol models.

An innovation on the new Avensis is a dual-stage seatbelt reminder. An initial warning light comes on if the driver and front passenger fail to buckle up, followed by a warning buzzer when the car's speed reaches 10mph. After 30 seconds the volume and frequency of the buzzer increases.

Further standard safety elements include the provision of ISO-FIX child seat mounts with top tether anchor and clear view Optitron instrumentation.

World First in Clean Engine Technology

The new Avensis is the first model in the world to be launched with an engine line-up fully compliant with EURO IV emissions legislation, well in advance of its enforcement date of January 2005.

The 129bhp 1.8-litre VVT-i and 147bhp 2.0-litre direct injection petrol engines are developments of units which appeared in the previous generation Avensis, now offering lower CO_2 emissions levels.

These will be joined in May 2003 by a 116bhp 2.0 D-4D diesel, the first diesel engine on the market to comply with EURO IV requirements. The diesel profile will be extended during the last quarter of 2003 with the introduction of Toyota's Diesel Clean Advanced Technologies (D-CAT). Using this system, the 2.0-litre diesel will deliver greatly improved emissions levels with nitrogen oxides (NOx) and particulate matter (PM) emissions way below the EURO IV benchmarks.

Engineered for Success

Central to the handling character of the new Avensis is its double-wishbone-type rear suspension. The system has been derived from the Celica sports coupé, a car which has earned much positive press and popular acclaim for its handling performance. The system has been adapted for use in the Avensis and tuned to provide a more compliant ride, better suited to a family vehicle. At the front there is a new MacPherson strut independent suspension.

Another key factor in the dynamic quality of the new car is its strong body structure. Constructed in lightweight high-strength steel, it offers excellent torsional rigidity.

Superior Quality Comfort and Convenience

The new Avensis will set new standards in the segment with its refined styling, precision build and excellent ride and handling qualities. The new car is larger than the previous model but not as large from the outside as many of its competitors. The very essence of the design of the new car was not to make it a cumbersome, large car but to make it very roomy and spacious from the inside, using intelligent use of space.

The new Avensis at 4,630mm long is 50mm shorter overall than the VW Passat and 100mm shorter than the Ford Mondeo.

High quality materials have been used throughout for the trim and upholstery and NVH levels have been reduced to rival the standard of premium market models.

Central to the elimination of road and engine noise has been the introduction of Ultra Light Concept™. This new sound damping material is not only highly effective in absorbing noise, in particular high frequency sound, it is also remarkably light. Weight savings achieved through its use make an important contribution to fuel economy.

Multi-use storage areas are located all around the passenger compartment. Detail touches include damped lids and use of soft-touch plastics. Rear seats split-fold in the hatchback, Tourer and most saloon versions. Extra concealed storage space is available under the load floor in the Tourer. The floor panel can also be adapted to create separate stowage areas.

Toyota's European Flagship

From the outset, new Avensis has been designed, developed and engineered for the European market, where it will complete Toyota's core product line-up alongside Yaris and Corolla. It will enjoy the status of Toyota's European flagship, targeting 130,000 sales annually – around 27,000 of those in the UK market.

New Avensis was designed at Toyota's ED^2 design studio in the South of France and engineered specifically to meet the demands of European drivers. Extensive testing was undertaken on European roads to ensure optimum handling and performance in local conditions.

Formidable Cost of Ownership Qualities

Competitive cost of ownership qualities were engineered into the new Avensis from the outset. Components were designed for simple repair and replacement at low cost in the event of typical low speed front and rear impacts. The new Avensis also benefits from Toyota's pan-European Health & Safety schedule with major maintenance services only every 20,000 miles. Health & Safety checks, including an oil change, are required at 10,000-mile intervals or annually.

UK insurance groups begin at an equal-best-in-class 7E for certain versions of the 1.8-litre petrol and 2.0-litre diesel; the rating for the 2.0-litre petrol model starts at a best-in-class 8E. All models have earned the ABI Thatcham 'E' classification for exceeding industry standard levels of vehicle security.

A SUPERIOR QUALITY EXPERIENCE

- Toyota Avensis: the new flagship for Toyota in Europe
- Toyota DNA defines the personality of new Toyota Avensis
- New Avensis founded on the concept of Superior Quality
- New model longer, wider and taller for improved accommodation all round
- European sales target of 130,000 units in a full year
- Full year UK sales target of 27,000 units
- Targeting younger and more up-scale customers
- Strong cost of ownership qualities built-in

The Concept of Superior Quality

The concept at the heart of the Toyota Avensis is Superior Quality. It is through expressing superior quality in every aspect of the car's design, construction and performance that Toyota provides the new Avensis with an essential emotional appeal. This in turn combines with the rational appeal of Toyota's traditional qualities to create a truly great product.

The new Toyota Avensis has been created by a highly skilled global team working in Europe and Japan on design, development, manufacturing and marketing. Throughout, the influence of chief engineer Suguya Fukusato has been paramount.

“I have invested a great deal of myself in this car,” says Fukusato. “I was greatly influenced by the time I spent in Europe, from 1987 to 1991. Most of my free time I would spend travelling throughout Europe, absorbing the fascinating culture and visiting the sites with my family. It is a time I will never forget and which heavily influenced the development of the new Avensis.”

Chief Engineer Fukusato is a man who lives life with passion. He loves jazz and classical music and is an exponent of Nou, an historic form of Japanese musical theatre. He is also excited by technology: even his mountain bike boasts a special suspension system, partly designed by a Formula One engineer.

“All my interests have three things in common,” he explains. “They are things of beauty, they create a feeling of movement and they are fun to engage in. In one word, all these three things strongly call for emotion.”

Toyota DNA – the Heart of the New Avensis

The new Toyota Avensis is founded on Toyota’s European DNA. Like the Yaris and Corolla, models with which Avensis forms the core of Toyota’s European range, it has been created on the principles of Superior Quality, Innovation, Driving Pleasure and Design.

- Superior Quality in every detail, as the foundation of every Toyota model
- Design: premium styling from ED^2, Toyota’s European design centre
- Driving pleasure: provided by a strong combination of engine technology, suspension design and refined ride and handling
- Innovation: focusing on advances in safety, environmental concerns and ease of use

Avensis: Toyota’s Driving Force in Europe

The launch of the new Toyota Avensis completes the current renewal cycle of Toyota’s core products, which started with the Yaris and Corolla, and represents a critically important step for the company.

It is a benchmark car for Toyota in Europe, boasting a prestige design, dynamics and driveability that position it firmly in the upper level of the D segment. It marks important advances on the first generation Avensis, which was launched in 1997 and was the first Toyota to be substantially influenced by the company’s European research and development department.

That car in turn replaced the Carina E, the first Toyota to be built by TMUK (Toyota Manufacturing UK) at Burnaston, Toyota’s first full-scale plant in Europe.

Avensis has always been an innovator, offering high performance and strong fuel economy with lower emissions. The 1.8-litre lean burn engine was equipped with the world’s first NOx reduction catalyst; in 1999 the D-4D unit was the first Japanese common-rail diesel in a

passenger car**;** and in 2000 the D-4 became one of the earliest direct injection petrol engines to be offered in Europe.

The new Toyota Avensis is not just *one* brand-new car, it's three: a sophisticated four-door saloon, a practical and dynamic five-door hatchback and a stylish Tourer estate that is expected to become the leading model in its part of the market. All three versions will continue to be built at Burnaston, near Derby.

The new Avensis benefits from an extremely spacious interior within an overall length of 4,630mm, an increase of 110mm over the previous model. The Tourer is slightly longer than the saloon and hatchback at 4,700mm (+100mm), thanks to a longer, 2,700mm wheelbase (+70mm). The overall width of all versions is 1,760mm (+50mm) and the height of saloon and hatchback is 1,480mm (+55mm). The Tourer stands 1,525mm high and is fitted with roof rails as standard.

In the past four years the Toyota Avensis has built a strong reputation and a loyal following among European customers, with more than 450,000 units sold in Europe. In 2001, the Toyota Avensis took a 5.6 per cent share of the D segment market in Europe. The new Toyota Avensis aims to build on that success. Although the D segment in Europe is expected to contract in size as a result of the growth of other sectors such as small MPVs and small SUVs, Toyota plans to sell around 130,000 new Avensis units in a full year, making it an important contributor to the company's medium term goal of 800,000 units in Europe by 2005. The full year sales ambition in the UK is 27,000 units.

New Avensis customers are expected to be younger than before. Most will be men, aged between 31 and 40 with a greater proportion in executive, professional or managerial occupations.

Independent European research in the Car Parc survey reveals that consumers consider quality and reliability to be the most important attributes when shopping for vehicles in the D segment – attributes which sit at the heart of Toyota's culture.

Designed for European Tastes

The initial concept for the new Toyota Avensis was created in Europe at ED^2, the Toyota European Design Development centre on the Cote d'Azur, in the South of France.

The new Toyota Avensis makes clear progress from the design of the original model without being too futuristic. Instead, the car has a sophisticated and timeless appeal that reflects its essential superior quality and its focus on contemporary European tastes.

Inside, the combination of premium quality materials with up-to-date technology, such as the voice command navigation system, should raise the appeal of the new Toyota Avensis above many of its market rivals.

Strong Cost of Ownership Profile

The new Toyota boasts an exceptionally strong cost of ownership profile, including equal best in class UK insurance ratings and substantially reduced maintenance and crash repair costs.

Unlike some of its competitors, the new Avensis does not hide high running costs behind an attractive on-the-road price tag. For a start, it has achieved equal best-in-class insurance ratings and, comparing like for like versions, is cheaper to insure across the board than the model it replaces. The 8E rating for the 2.0 $T_{3\text{-}x}$ petrol models beats all key competitors, while the 7E classification for the 1.8 petrol T_2, $T_{3\text{-}s}$ and $T_{3\text{-}x}$ versions and the 2.0D T_2, $T_{3\text{-}s}$ and $T_{3\text{-}x}$ diesel models are equal best in class. None of the new Avensis models are rated higher than 9E and all versions have achieved the 'E' designation for exceeding insurance industry standards on security measures. Full details of insurance groups for the new Avensis are provided over the page.

INSURANCE GROUPINGS

1.8 VVT-i petrol T_2	7E
1.8 VVT-i petrol $T_{3\text{-}X}$	7E
1.8 VVT-i petrol $T_{3\text{-}S}$	7E
1.8 VVT-i petrol T_4	8E
2.0 VVT-i petrol $T_{3\text{-}X}$	8E
2.0 VVT-i petrol T_4	9E
2.0 VVT-i petrol T Spirit	9E
2.0 D-4D diesel T_2	7E
2.0 D-4D diesel $T_{3\text{-}X}$	7E
2.0 D-4D diesel $T_{3\text{-}S}$	7E
2.0 D-4D diesel T_4	8E
2.0 D-4D diesel T Spirit	8E

The fiercely competitive insurance groupings have been achieved through the new Avensis' strong performance in key areas including:

- Exceptional performance in crash testing
- Competitive pricing of both the car and replacement parts – 21 per cent cheaper to repair in a rear end accident than the outgoing model
- Up to 80 per cent cheaper to buy parts to repair a rear end accident than a Renault Laguna
- A comprehensive safety and security package which achieved maximum scores in assessment of electrical security and vehicle identification

Clever Touches Bring Lower Costs

Achieving strong cost of ownership benefits was a fundamental consideration for the Avensis' engineering team, which was tasked with the job of using intelligent technology to keep running and maintenance costs to a minimum.

Special attention was paid to utilising components that would be cheap and simple to replace in the event of typical low-speed front and rear impacts. For example, a bolt-on crushable box section is incorporated in the front bumper mountings, which can be replaced without cutting or welding, and headlamp brackets are designed to break on impact, before the lamp itself is damaged. Not only are parts cheaper, they allow repairs to be carried out more quickly, saving on labour costs.

After an accident where components such as bonnet, front wing, radiator grille, headlamp and air conditioning condenser require replacement, new Avensis is cheaper to repair by up to 60 per cent. If you were to have the same accident in a Renault Laguna the total cost of the parts needed would be £1,286 compared to £800 for the new Avensis. After the same accident a VW Passat would cost £1,064 or almost 33 per cent more to repair.

New Avensis is also considerably cheaper to repair after a rear end accident with the sum of parts required (rear lamp unit, rear quarter panel, boot lid and bumper cover) amounting to £429 compared to £771 for the Renault Laguna and £663 for the Peugeot 406.

Shorter Servicing, Longer Intervals

Measures like these are part of an engineering philosophy that extends to all new Toyota models. Furthermore, the new Avensis follows Toyota's pan-European Health & Safety schedule, which calls for a major maintenance service only every 20,000 miles. Health & Safety checks with an oil change are required every 10,000 miles or annually. The time it takes for such routine maintenance to be carried out has been slashed. Over 60,000 miles the time required is one-and-a-half hours less for petrol models and four-and-a-half hours less for diesels when compared to the previous generation Avensis.

Common service parts for the new Avensis including oil and air filters, spark plugs and front and rear brake pads amount to less than £100 which represents a saving of £89 over the same parts for a Mazda6 and £28 for a VW Passat.

A full breakdown of crash repair, service, maintenance and repair costs for the new Avensis versus its main competitors and the outgoing Avensis model can be found on the next page.

Going Farther on Less

Special attention was also paid to ways in which fuel consumption could be optimised. For example, an engine undertray and under-car aerodynamic treatment help reduce drag and weight savings of around 30kg have been achieved by using new Ultra Light Concept™ damping material for sound absorption. Another innovation is a variable displacement

compressor in the air conditioning system, which requires less power under acceleration. This can improve fuel consumption by up to three per cent over conventional systems.

	NG Avensis	Current Avensis	Renault Laguna	VW Passat	Ford Mondeo	New Vauxhall Vectra	New Nissan Primera	Peugeot 406	Mazda6
Front Crash Parts									
Bonnet	£ 118.88	£ 176.42	£ 197.00	£ 146.00	£ 139.86	£ 196.00	£ 171.00	£ 235.79	£ 123.71
Radiator Grille	£ 63.31	£ 50.25	£ 42.60	£ 46.44	£ 57.93	£ 34.11	£ 70.00	£ 43.74	£ 37.29
Front Bumper Cover	£ 94.54	£ 113.64	£ 200.00	£ 167.65	£ 99.30	£ 184.00	£ 87.00	£ 199.02	£ 138.96
Front Wing (RH)	£ 79.79	£ 82.06	£ 84.00	£ 85.00	£ 76.41	£ 84.00	£ 79.50	£ 96.64	£ 78.85
Headlamp (excl. bulb) (RH) inc indicator unit	£ 95.23	£ 119.84	£ 112.00	£ 199.00	£ 102.50	£ 123.00	£ 126.00	£ 134.81	£ 94.06
Radiator	£ 149.26	£ 155.09	£ 220.00	£ 99.00	£ 109.24	£ 135.00	£ 117.00	£ 149.19	£ 137.14
A/C Condenser	£ 199.38	£ 197.04	£ 431.00	£ 321.00	£ 192.42	£ 164.00	£ 185.00	£ 106.55	£ 163.81
Total Front	**£ 800.39**	**£ 894.34**	**£ 1,286.60**	**£ 1,064.09**	**£ 777.66**	**£ 920.11**	**£ 835.50**	**£ 965.74**	**£ 773.82**
% Difference		+ 11.7%	+ 60.7%	+ 32.9%	(2.8%)	+ 15.0%	+ 4.4%	+ 20.7%	(3.3%)
Rear Crash Parts									
Rear Bumper Cover	£ 86.66	£ 68.58	£ 182.00	£ 265.93	£ 99.30	£ 184.00	£ 86.00	£ 173.23	£ 148.27
Tailgate/ Trunk lid	£ 168.95	£ 209.45	£ 240.00	£ 149.00	£ 188.67	£ 192.98	£ 205.00	£ 230.47	£ 187.00
Rear Quarter Panel (A) LH	£ 130.47	£ 184.99	£ 269.00	£ 187.34	£ 95.91	£ 132.10	£ 157.00	£ 222.60	£ 185.14
Rear Combi Light (excl. bulb) (LH)	£ 42.92	£ 57.09	£ 80.80	£ 57.00	£ 46.96	£ 48.20	£ 78.50	£ 37.02	£ 45.62
	NG Avensis	**Current Avensis**	**Renault Laguna**	**VW Passat**	**Ford Mondeo**	**New Vauxhall Vectra**	**New Nissan Primera**	**Peugeot 406**	**Mazda6**
Total Rear	**£ 429.00**	**£ 520.11**	**£ 771.80**	**£ 659.27**	**£ 430.84**	**£ 557.28**	**£ 526.50**	**£ 663.32**	**£ 566.03**
% Difference		+ 21.2%	+ 79.9%	+ 53.7%	+ 0.4%	+ 29.9%	+ 22.7%	+ 54.6%	+ 31.9%
Maintenance									

Parts									
Oil Filter	£ 7.00	£ 7.00	£ 6.20	£ 6.50	£ 5.01	£ 4.14	£ 7.30	£ 6.60	£ 6.38
Air Filter	£ 11.00	£ 16.06	£ 10.50	£ 13.00	£ 7.07	£ 8.97	£ 10.40	£ 8.81	£ 14.72
Front Brake Pads	£ 42.59	£ 50.71	£ 36.30	£ 59.00	£ 41.30	£ 45.65	£ 35.90	£ 33.80	£ 59.98
Rear Brake Pads / Shoes	£ 26.01	£ 25.02	£ 45.00	£ 34.00	£ 34.50	£ 26.35	£ 38.60	£ 33.80	£ 59.98
Spark Plug (each)	£ 3.31	£ 3.31	£ 5.44	£ 4.00	£ 8.25	£ 6.40	£ 2.80	£ 6.07	£ 12.14
Spark Plug (set)	£ 13.24	£ 13.24	£ 21.76	£ 16.00	£ 33.00	£ 25.60	£ 11.20	£ 24.28	£ 48.56
Total Maintenance	**£ 99.84**	**£ 112.03**	**£ 119.76**	**£ 128.50**	**£ 120.88**	**£ 110.71**	**£ 103.40**	**£ 107.29**	**£ 189.62**
% Difference		+ 12.2%	+ 20.0%	+ 28.7%	+ 21.1%	+ 10.9%	+ 3.6%	+ 7.5%	+ 89.9%
Grand Total	**£ 1,329.23**	**£ 1,526.48**	**£ 2,178.16**	**£ 1,851.86**	**£ 1,329.38**	**£ 1,588.10**	**£ 1,465.40**	**£ 1,736.35**	**£ 1,529.47**
% Difference	+ 0.0%	+ 14.8%	+ 63.9%	+ 39.3%	+ 0.0%	+ 19.5%	+ 10.2%	+ 30.6%	+ 15.1%

CLEAN PERFORMANCE TO MATCH DRIVING DYNAMICS

- Best-in-class body rigidity provides safe and enjoyable handling
- Intensive European engineering programme
- Rear double wishbone suspension derived from Celica sports coupe
- Suspension engineered for auto-directional effect together with anti-dive and anti-squat performance
- All engines comply with EURO IV emissions standards
- 2.0-litre D-4D engine first EURO IV-compliant diesel on the market
- Direct injection technology combines power with low fuel consumption for both petrol and diesel engines
- Toyota D-CAT, available from last quarter of 2003, delivers ultra-low emissions with up-to-date performance
- Sequential automatic transmission brings additional driving pleasure
- Electric Motor-assisted Power Steering (EMPS) on 1.8-litre delivers improved steering feel with lower fuel consumption

Driving dynamics were of fundamental importance in the creation of the new Toyota Avensis. Every aspect of the dynamic package – tyres, chassis, body, suspension, steering, gearbox, engine and more – was improved, to provide the best possible driving experience for the driver while ensuring the comfort of the passengers.

At the same time, the Toyota Avensis launches the concept of clean performance. A number of technical developments have been achieved which combine driving pleasure with low engine emissions and reduced fuel consumption.

Solid Dynamic Foundations

The inner strength of the new Toyota Avensis is derived from its highly rigid body structure. This provides not only impressive levels of cabin safety for the occupants, but also a platform for an advanced suspension package.

Constructed from high strength sheet steel, the lightweight body of the Avensis benefits from exceptionally high torsional rigidity. This, along with reinforced attachment points for the suspension arms, provides the basis of the Avensis' dynamic ability and superior handling and stability.

Suspension Development Delivers Efficient Body Control

Chief Engineer Suguya Fukusato is a former rally driver, participating in the all-Japan Rally Championship, and a true driving enthusiast.

"Rally driving taught me a lot about driving techniques and how to tune a car's suspension and chassis to obtain the best handling," he explains. "Obviously I applied this knowledge in full for the development of the new Avensis and its highly advanced suspension."

Jos de Boes, General Manager supervising the European tuning team, explains: "We set ourselves an ambitious target because we knew from the beginning of the process that we could count on a state-of-the-art platform with totally redesigned front and rear suspensions, advanced steering and a highly rigid body.

“We also knew that chief engineer Fukusato would allow our organisation, the European R&D division, to play a primary role throughout the development process.”

A MacPherson strut independent suspension is used at the front. The rear features a double wishbone independent suspension, derived from the Celica sports coupé, which is widely recognised as one of the best-handling cars in its class.

In comparison with the Celica, the suspension settings have been modified to give a more compliant ride, better suited to a family saloon but without compromising handling or stability.

New bushings have been added in the link between the suspension sub-frame and chassis in order to isolate the car from road vibration. The suspension structure has also been reinforced to provide even better response and stability.

The use of double-wishbone rear suspension offers greater design and tuning freedom for stability and comfort and its compact dimensions allow for a bigger, flatter luggage space. In addition, the rear track is 50mm wider than the previous Avensis model and this, too, contributes to greater stability.

As well as the typical advantages of double-wishbone geometry, the rear suspension is equipped with several features that improve performance further. A new toe-control arm provides the appropriate rear wheel toe adjustment for any driving situation.

When cornering, rear wheels are directed to the inside of the curve providing a more agile response. Under braking, rear wheels assume a toe-in position, which will ensure superior stability in this situation.

The mounting positions of the lower arm and rear axle have been optimised to place the intersecting point of the suspension geometry closer to the height of the axle centre. As a result, the squat and lift of the rear of the vehicle, caused by the load shift during acceleration and braking, are reduced. This further enhances traction and braking ability.

Several tyre sizes, including 17-inch and 18-inch alloy wheels, permit further fine-tuning of the ride and comfort to suit individual drivers.

Power to Match the Poise

All engines in the new Toyota Avensis, including the two diesel units, already comply with the 2005 EURO IV emissions standards.

The 1.8-litre petrol engine uses Toyota’s VVT-i (Variable Valve Timing – intelligent) technology to deliver increased mid-range acceleration and torque with reduced fuel consumption.

EURO IV emissions standards have been achieved by positioning the catalytic converter directly behind the exhaust manifold to improve emissions on cold-starting.

The 1.8-litre VVT-i petrol develops 129bhp at 6,000rpm and has maximum torque of 170Nm at 4,200rpm. It gives the new Avensis a maximum speed of 124mph (121mph Tourer) with a manual

gearbox and acceleration from rest to 62mph in 10.3 seconds (10.5 seconds Tourer), again with manual transmission. Fuel consumption on the European combined cycle is 39.2mpg with CO_2 emissions of 171g/km (172g/km Tourer) with manual gearbox.

The 2.0-litre VVT-i petrol engine in the new Toyota Avensis is the latest derivative of the advanced direct-injection petrol unit available in the current model range. A modified Engine Control Unit (ECU) helps deliver even better emission levels (with reduced NOx), improved performance and superior acceleration, thanks to highly accurate fuel metering and efficient direct injection combustion.

Further improvements to the engine to meet EURO IV emissions levels include an under-floor catalyst and an engine ECU that retards the ignition of the engine on cold start in order to warm the catalyst more quickly.

The 2.0-litre direct injection engine in the new Avensis develops 147bhp at 5,700rpm and has maximum torque of 196Nm at 4,000rpm. It takes the new Avensis (manual transmission) to a maximum speed of 130mph and accelerates to 62mph in 9.4 seconds (9.6 seconds Tourer). Thanks to its advanced technology, the 2.0-litre direct injection Avensis is remarkably economical, returning 34.9mpg on the European combined cycle with 191g/km CO_2 emissions (193g/km Tourer) with manual transmission.

Two EURO IV-Compliant Diesels

The two diesel engines fitted to the new Toyota Avensis (the standard 116bhp unit and the Toyota D-CAT version, to be launched later in 2003) both comply with EURO IV emissions standards.

They use second-generation high-pressure common-rail diesel technology, which produces an injection pressure of 160MPa in the 116bhp D-4D engine and 175MPa in the Toyota D-CAT version, irrespective of engine speed.

The addition of a Variable Nozzle Turbocharger (VNT) helps to boost power and torque while contributing to low fuel consumption and low emissions.

The 116bhp unit features double pilot injection at engine speeds below 1,200rpm, which greatly reduces idling noise. At the same time, the more sophisticated Toyota D-CAT engine uses multiple pilot injections to perform up to five injections per cycle.

A motor-driven Exhaust Gas Recirculation (EGR) valve controls EGR volume more precisely, while an EGR cooler helps reduce NOx emissions. A large catalytic converter, located just downstream from the turbocharger, helps to reduce HC and CO emissions.

The first EURO IV 2.0-litre D-4D engine delivers 116bhp at 3,600rpm and has a flat torque curve, peaking at 280Nm between 2,000 and 2,200rpm.

Toyota D-Cat: Even Cleaner Emissions

For even greater environmental performance, a 2.0-litre D-4D engine will be available with Toyota D-CAT, Toyota's new concept in clean diesel technology.

Performance of the Toyota D-CAT version, which will be detailed after launch, is comparable with the conventional D-4D, but is even cleaner. Nitrogen oxides and particulate emissions are reduced by 50 and 80 per cent respectively, when compared with EURO IV standards. When equipped with Toyota D-CAT, the 2.0 D-4D engine is the world's cleanest diesel powerplant in terms of NOx and particle emissions. More information about Toyota D-CAT is available in the Technical Glossary.

Sequential Automatic Adds Control

Automatic transmission is available with the 1.8 and 2.0-litre petrol versions of the new Avensis saloon, hatchback and Tourer. Selected models in the range will be available with an automatic transmission featuring sequential shift.

When the gearshift lever is moved from the D to the S position, the sequential shift gate becomes operational, allowing up-shifts by pressing the lever forward and down-shifts by pressing backwards. With the introduction of the S position, the L and 2 positions and the O/D OFF switch which were provided on the previous automatic system have been deleted.

The latest automatic transmission enables the driver to use a Snow mode button. This allows the vehicle to start in second gear, reducing the chances of wheelspin.

EMPS Steering the Way

The 1.8 VVT-i versions of the new Toyota Avensis are fitted with EMPS (Electric Motor-assisted Power Steering) – a first in a D segment car. The main difference between this system and conventional electric power steering is that a fully electronic actuator replaces the mechanical clutch between the steering system and the assistance motor. EMPS allows a more precise tuning than a hydraulic unit. It also directly contributes to reduction in fuel consumption of up to three per cent, compared with conventional systems.

The system adapts steering effort according to road speed. The degree of power assistance offered is dependent on signals from the torque sensor and controller. At low speeds the steering is light for easier parking manoeuvres, while at high speed steering effort is increased, offering better feel and feedback to the driver, enhanced driving pleasure and excellent high speed control.

The benefit in fuel consumption comes from the fact the new system only uses electricity when needed. In conventional hydraulic power steering, the oil needs to be pumped all the time, while with EMPS the electricity goes to the motor only when necessary.

Smoothing the Airflow

The new Avensis has been designed with an aerodynamics package which sets out to achieve the best possible flow of air around the car, leading to reduced drag, improved performance and fuel economy, and a quieter, smoother drive.

These characteristics provide superior stability during high-speed cruising and cornering. A front spoiler balances the airflow over and under the car while small spats ahead of both sets of front and rear wheels reduce drag and stabilise the vehicle at high speeds. In this way it has been possible to generate downforce in the front, providing better high-speed responsiveness.

RAISING THE STANDARDS IN ACTIVE AND PASSIVE SAFETY

- Superior braking performance from large diameter discs and Electronic Brakeforce Distribution (EBD)
- All 2.0-litre petrol models benefit from Traction Control (TRC), Vehicle Stability Control (VSC) and Brake Assist (BA)
- Nine airbags as standard
- Innovative seatbelt reminder system
- MICS (Minimal Intrusion Cabin System) body provides the ultimate accident protection
- Strong cost of ownership benefits with reduced maintenance and repair costs and ultra-competitive insurance groups

Safety is a major consideration for buyers of D segment cars and Toyota's advanced safety technologies are fully applied to the new Avensis. Both active and passive safety have been given the highest priority.

SUPERIOR ACTIVE SAFETY

All models in the new Toyota Avensis range are offered with anti-lock brakes and Electronic Brakeforce Distribution (EBD) as standard. In addition, Brake Assist (BA), Vehicle Stability Control (VSC) and Traction Control (TRC) are standard on all models fitted with 2.0-litre petrol engines.

The use of large-diameter disc brakes all round – 295mm (2.0-litre petrol/diesel) or 277mm diameter (1.8-litre petrol) at the front and 280mm at the rear – contributes to excellent braking feel and effective stopping performance at all brake temperatures. The resistance to a loss of performance when the brakes are hot – brake fade – is critical in modern systems which use ABS and where the braking system forms part of the traction control and vehicle stability functions. The new Avensis' larger brakes have been designed to cope with these additional requirements.

Vehicle Stability Control (VSC) and Traction Control (TRC) are designed to offer the driver greater control, driving enjoyment and increased levels of safety in slippery conditions or during high performance driving.

ABS, Electronic Brakeforce Distribution and Brake Assist Systems

The new Avensis employs the latest-generation ABS system and increases its effectiveness with Electronic Brakeforce Distribution (EBD) and Brake Assist (BA). If the brakes are applied heavily while the vehicle is driving in a straight line, a transfer of the vehicle's mass reduces the load applied to the rear wheels. The skid-control ECU detects when this happens by picking up signals from the speed sensor. It enables the brake actuator to regulate the braking force to the rear wheels up to the maximum that the tyres' grip will allow. This system is far more precise than the mechanical load apportioning systems previously used and allows for much shorter stopping distances.

The system takes account of whether the car is cornering at the time, distributing the braking force at different levels to all four wheels. This ensures each wheel receives optimum braking with respect to its tyre's grip on the road.

To enhance braking ability further, Brake Assist recognises the speed and pressure the driver applies to the brake pedal. The system recognises an emergency braking action above a certain level of pedal

pressure and speed of pedal depression. In this situation braking force is increased to its maximum, under the control of the ABS unit.
These combined systems ensure that the new Avensis offers maximum braking performance under all conditions.

Traction Control System
If the driver accelerates hard on a slippery surface, the driving wheels are liable to spin because of the excessive amount of torque that is generated. By applying the brakes to the driven wheels and regulating the fuel injection to control the engine's torque output, the TRC system helps to minimise wheelspin.

For example, when driving over a surface with different levels of friction left and right, the drive wheel on the slippery surface might spin, resulting in a loss of forward motion. However, with the TRC system, the brake is applied to the spinning drive wheel reducing its spin and delivering torque to the other wheel. The fuel injection controls the engine's output so the torque matches the level of grip available.

Vehicle Stability Control System
The Vehicle Stability Control (VSC) system provides control at the onset of a front-wheel skid (understeer) or rear-wheel skid (oversteer). A number of sensors measure the vehicle yaw moment and lateral acceleration with respect to the road speed and applied steering angle. From that information, the system can detect if the vehicle is running wide in a bend, or if the rear is sliding out towards a potential spin.

In such circumstances, it decreases the engine output and applies the brake to a front or rear wheel to control the vehicle's yaw moment. This has the effect of bringing the vehicle back on to the driver's intended line.

MARKET LEADING PASSIVE SAFETY
The provision of nine airbags as standard equipment in all models is the clearest representation of the Toyota Avensis' superb safety package, setting new standards in the D segment. These include a new 18 litre SRS driver's knee airbag. This deploys from a panel beneath the steering column to extend over the knee joints and upper part of the shins. It helps prevent the lower legs from striking the surrounds of the driver's footwell and also protects the knees from hard objects such as the steering column, key cylinder and other attachments.

The SRS knee airbag – the first of its kind to be offered in Europe – is only one element of the advanced safety features found in the new Avensis.

The driver and front-seat passenger airbags have dual-stage inflators. The driver's airbag features a seat position sensor, which checks the seat slide position in the event of an accident. This ensures that drivers who are sitting close to the steering wheel do not receive the full force of the airbag unless it is necessary.

The side and curtain-shield airbags offer protection to the head and chest of the driver, front passenger, and outer rear seat passengers in the event of a side impact. The curtain-shield airbag has also been designed to protect the head of the outer rear seat passengers in the event of rear end-only side impact. Side airbags at the front are also standard equipment across the range.

Innovative Seat-Belt Reminder

For the first time, Toyota is fitting a dual-stage seat-belt reminder system which warns if the driver or front seat passenger has not fastened their seat belt. An initial warning light switches to a buzzer once the car's speed reaches 10mph and, if the belts have still not been fastened after 30 seconds, the volume and frequency of the buzzer increases for a further 90 seconds.

ISO-FIX with Top Tether Anchor

ISO-FIX child seat anchors in the rear seat are standard equipment. The Child Restraint System (CRS) is also equipped with a top tether to help prevent the child seat from tipping forward in the event of an impact.

Minimal Intrusion Cabin System Enhances Occupant Protection

A key element of the new Toyota Avensis' superior safety is its strong, rigid body structure. This provides both a safety cell for the occupants and a platform for the advanced suspension package.

Toyota's MICS (Minimal Intrusion Cabin System) components are designed to help absorb and disperse impact energy, minimising distortion of the cabin. Optimum location of reinforcements and larger cross-sections, improved positioning of impact door beams and the addition of crossmembers all help in absorbing and dispersing side impact energy. The reinforcements include strengthening of the door beltline, the B-pillar, roof rails and door sills. Door impact beams are fitted front and rear and there is also a front floor crossmember.

The front and rear doors have been designed specifically for the MICS structure. Protruding sections have been designed to minimise the clearance between the A-pillar and the front door, and between the B-pillar and the front and rear doors, in the event of a collision. As a result, the impact load is distributed along the belt line, which helps minimise cabin deformation and intrusion to the passenger area.

In addition, the body is highly rigid thanks to reinforced joints and the use of high-strength sheet steel.

Energy-Absorbing Steering Column

Further measures to reduce injury include an energy absorbing system built into the steering wheel and column.

When the front of the car is deformed during a (primary) collision, the internal sections of the steering column contract, reducing the distance by which the steering column and wheel protrude into the cabin.

When an impact is transmitted to the steering wheel by the driver (the secondary collision), the steering wheel and driver's airbag help to absorb the impact.

FOUR-SENSE APPEAL – THE BASIS FOR REFINEMENT

- Attention to sight, sound, touch and smell central to creating a Superior Quality interior
- Low levels of noise and vibration to rival premium models
- Cabin ambience enhanced by use of Superior Quality materials
- Top-line in-car entertainment with eight-speaker system for excellent sound quality

- Turn-by-turn navigation with ETA (Electronic Traffic Avoidance) fitted as standard on $T_{3\text{-}S}$, T_4 and T Spirit grades
- Voice recognition for navigation and audio system is a D-segment first
- DVD navigation with remote control is the most sophisticated on the market
- Intelligent features for greater passenger convenience and comfort
- Interior designed for all-round practicality

Noise reduction was one of the major considerations in achieving a high level of refinement in the new Toyota Avensis. Engine and road noise are suppressed by extensive application of vibration damping and noise suppressant material.

To ensure quietness in the cabin, materials that provide high sound absorption are used in the dashboard, roof headlining, rear parcel shelf, luggage-bay trim and carpeting. A dynamic damper is used to reduce noise and vibration from the drivetrain and even the wiper arms have been located to reduce wind noise from beneath the windscreen.

The aim was to reduce high-frequency noises, the kind which are most intrusive, and to reduce the difference in sound quality between periods of constant speed and acceleration. During high-speed cruising, noise levels in the Avensis rival upper-segment cars. At the same time, a good sound balance between low to medium and high-frequency noise is also achieved with special attention paid to the tone of constant speed cruising and of acceleration.

As a result, Avensis drivers and passengers will enjoy quiet, high-speed cruising with only a marginal, but pleasant, increase in engine noise under hard acceleration.

The reduction in high-frequency noise was achieved by adopting a fully enclosed engine compartment, developing improved door seals and making use of the revolutionary “Ultra Light Concept” (ULC) insulator. ULC is used extensively throughout the new Avensis and excels in sound absorption around the cabin, with a noticeable reduction in high-frequency noise. ULC is also considerably lighter than existing insulation materials: the weight of the sound insulation package for the new Avensis has been almost halved, from 63kg in the previous model to 33kg. This has a beneficial knock-on effect on fuel consumption and performance. ULC is used extensively throughout the new Avensis.

Further noise reduction measures have been developed. For instance, the new door seals generate a solid door-closing sound. They make the doors easier to close, too, as the air pressure around the door’s inner frame has been minimised. At speed, airflow around the bonnet and wiper arms is controlled so that little air hits the wipers themselves, reducing wind noise. At start-up, diesel engines which feature double and multiple pilot injections reduce combustion knock, particularly from cold.

Unadulterated Sound Purity

“I have pursued the quietness standards of luxury cars so that the occupants can enjoy the pianissimo of orchestra music or the punch of a jazz bass line,” says Chief Engineer Suguya Fukusato.

The new audio system manages to combine the radio, cassette and CD player functions into one standard-sized unit. The large switches and clear design not only look good, but they make operating the audio system easy, too.

All models are equipped with eight speakers – a full-range speaker and a separate tweeter in each door. Phase Alignment Technology (PAT) allows sound to be emphasised faithfully, without phase distortion. The amplifier's output is 40W per channel across four channels for a clear and powerful sound.

Figure Hugging Seats

All models in the new Toyota Avensis range are equipped with a height and reach-adjustable steering wheel, as well as high-supportive seats for extra comfort and lateral support. The driver's seat height can be manually adjusted on all models. Power seats are fitted as standard on the T Spirit grade with 10-way adjustment, including lumbar control, for the driver's seat and four-way adjustment for the front passenger seat.

Dual Zone Climate Control

A new dual-zone climate control system is provided on $T_{3\text{-}X}$ grades and higher. This gives the driver and front passenger the freedom to create their own personal comfort area by setting their desired temperature individually. This is another example of how Toyota has focused on creating a stress free environment inside the new Avensis.

Rain Sensor

The new Toyota Avensis is also available with an automatic rain sensor ($T_{3\text{-}X}$ grades and higher), which detects moisture on the windscreen and triggers the wiper sweep. This system uses a small infrared sensor, positioned so it doesn't intrude into the driver's eye-line and is fully automatic with no initial wipe. The system's sensitivity is adjustable across four levels.

Anti-Glare Mirrors

During night driving, the automatic anti-glare interior mirror sensor ($T_{3\text{-}X}$ grades and higher) reduces dazzle from the lights of a following vehicle. If a large difference in intensity exists between the surrounding light and the light entering the interior rear-view mirror, the automatic glare-resistant EC (Electrochromic) mirror automatically reduces the reflection.

Convenience as Standard

The amount of storage space in the cabin is an important consideration for family buyers. The new Avensis offers a quality finish to the storage spaces with damped lids and push-open features. The large lid on the rear console box doubles as an armrest, while the box itself will hold up to 10 CDs and also functions as a cupholder. Another storage box, with push-open door, is located in the centre dashboard console.

Tailor-Made Load Area

On saloon versions the rear seats split-fold 60/40 ($T_{3\text{-}X}$ grades and higher); on all grades of the hatchback and Tourer, they double fold to create a flat load floor. An optional rear sunshade is incorporated into the parcel shelf of the saloon and hatchback while an integrated partition net can be added to the luggage cover of the Tourer. A section of the load floor of the Tourer can be lifted to reveal a hidden storage tray, big enough to accommodate the luggage cover when not in use. The floor can also be folded to create separate storage compartments, and tie-downs and shopping hooks ensure both large loads and small, delicate items can be carried safely.

Optitron Instrumentation

Traditional instrument panel illumination is replaced by individual LEDs (Light Emitting Diode) on all the figures and indicator needles. These are located behind a low-reflection, smoked acrylic face. This feature provides optimum readability of the instrument panel under all light conditions and offers a more refined appearance. Optitron is standard on all versions.

Voice Activation for Navigation System

The optional DVD full mapping navigation system can be controlled through a voice-recognition function. It supports two languages: English and German and is designed to enhance safety when driving, allowing the driver to keep his or her attention on the road. It also allows a greater flexibility when having to alter the initial route settings, as the vehicle no longer has to be stationary: any change can be made when driving.

The development work for this system involved analysis of several different accents, including variations among native English speakers. For this reason, the speech recognition engine performs independently from any local accent and the reaction to stress and intonation in the voice pattern is also strong.

In order to achieve a recognition ratio of 90 per cent (depending on the surrounding noise and environment) real-word tests were conducted with several users under the most diverse conditions, for example, during high-speed testing on German autobahns.

The optional voice-activated satellite navigation uses a DVD-based system which maps the whole of western Europe on one disc and has the fastest route-search time on the market. It also offers drivers a choice of three routes, which can be selected depending on driving conditions. The system can give directions in eight languages.

The system can also be controlled by a practical remote control which can be used by any passenger. This remote control features a numeric keypad, which makes the insertion of letters and numbers easy and intuitive.

Quality in Four Senses

Toyota reliability and durability have quite rightly become legendary and are core strengths of the new Avensis. But Avensis drivers and their passengers will also appreciate the perceived quality engineered into the car through attention to the human senses of sight, sound, touch and smell.

You can see the quality of the car in the tight lines of the dashboard fit and details such as the seamless fitting of the passenger airbag. High quality, soft-touch materials are used on the dashboard panel. Details, such as the movement of the door when opening and closing, add a feeling of weight and solidity. The action of the door locks has been designed to create a reassuring sound and the boot lid, on both saloon and hatchback, has rubber cushion stops to soften the sound of closure. Use of remote central locking and an interior release lever has eliminated the need for an exterior lock on the hatchback and Tourer, helping enhance the rear appearance and improving security when the vehicle is left parked unattended.

Toyota engineers have also worked on the interior smell. Compared with the current model, the smell of the interior was improved and rendered more neutral in tone in order to create a more inviting atmosphere. The use of Thermoplastic Polyurethane (TPU) on the upper dashboard contributed to this.

Security Measures

The theft-deterrent system will operate when anybody attempts to enter the vehicle forcibly or open the bonnet. It is also activated if the battery terminals are removed and reconnected.

An intrusion sensor has been fitted in the overhead console with the Tourer being fitted with two additional intrusion sensors located in the luggage compartment.

The boot lid or tailgate has an outside handle which unlocks the luggage bay electrically. A key cylinder is also provided inside the Tourer and hatchback, in case the system does not operate due to a discharged battery. On the new Avensis, the fuel flap opener is electrically operated: the switch is located in the driver's door for better convenience and security.

Standard Specification, Grading Structure, Pricing & Competitor Comparisons

The T_2 grade offers nine airbags, including SRS knee airbag – a unique Avensis safety feature – air conditioning, alarm/immobiliser with double locking, eight speaker audio system with cassette, CD tuner and steering wheel controls, Optitron instruments and exterior colour keying.

The 1.8-litre T_2 is better value than competitors such as the Ford Mondeo 1.8 LX, Vauxhall Vectra 1.8 LS and Renault Laguna 1.8 Authentique which would cost between five and eight per cent more to specify to the same level as the Avensis.

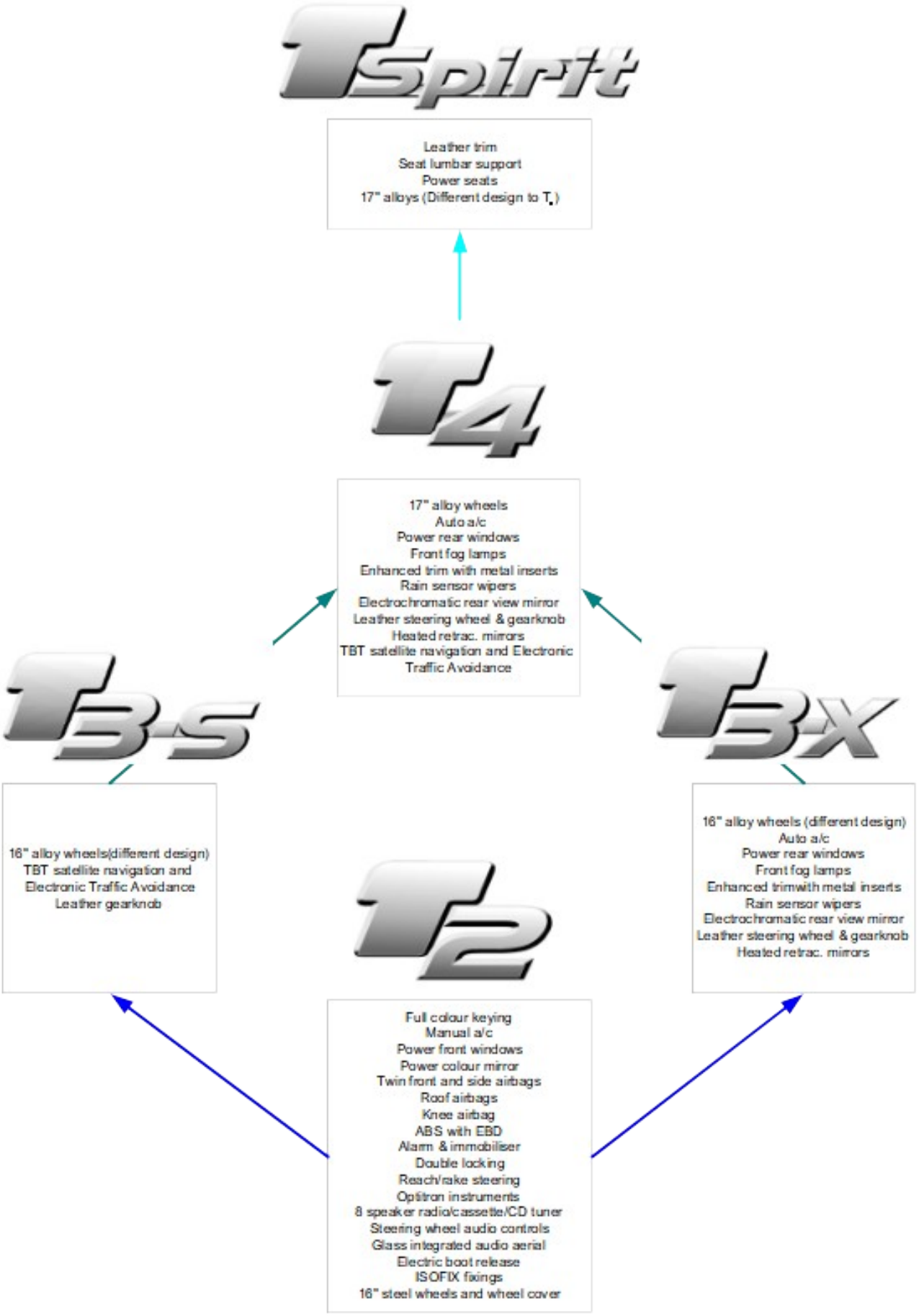
The $T_{3\text{-}S}$ grade from £15,495 (1.8-litre VVT-i with manual gearbox) adds 16-inch alloy wheels and Toyota's highly praised turn-by-turn satellite navigation system with Electronic Traffic Avoidance (ETA).

For the same price, the $T_{3\text{-}x}$ grade is available without turn-by-turn navigation, but includes a different design 16-inch alloy wheel, auto air conditioning, rain sensor wipers, heated retractable door mirrors, improved interior trim and front fog lamps. The 2.0-litre direct injection model is fitted as standard with Vehicle Stability Control (VSC) and Traction Control (TRC). (A full grading structure diagram is shown on the next page.)

To specify a Ford Mondeo 1.8 Zetec to the same level as a 1.8 $T_{3\text{-}x}$ would cost over £1,000, or eight per cent more as it is not fitted with rain sensor wipers, dual zone air conditioning, auto-dimming rear view mirror or colour keyed bumpers as standard. Neither the Renault Laguna 1.8 Dynamique nor the VW Passat can match the new Avensis standard equipment levels. (Specification comparison charts of the new Avensis versus its main competitors can be found at the end of this section.)

The T_4 combines the specification features of the $T_{3\text{-}S}$ and $T_{3\text{–}X}$ grades and adds 17-inch alloy wheels. The top-of-the-range T Spirit emphasises luxury, offering leather trim and electrically operated front seats with lumbar support and cruise control on top of the T_4 specification.

New Avensis Grade Strategy



NEW AVENSIS PRICING

Grade	Model	Engine size	Price
T_2	Saloon/Hatchback	1.8-litre VVT-i	£13,995
T_2	Saloon/Hatchback	1.8-litre VVT-i sequential auto	£14,995
T_2	Saloon/Hatchback	2.0-litre D-4D	£14,995
T_2	Tourer	2.0-litre D-4D	£15,995
$T_{3\text{-}S}$	Saloon/Hatchback	1.8-litre VVT-i	£15,495
$T_{3\text{-}S}$	Saloon/Hatchback	1.8-litre VVT-i sequential auto	£16,495
$T_{3\text{-}S}$	Saloon/Hatchback	2.0-litre D-4D	£16,495
$T_{3\text{-}S}$	Tourer	1.8-litre VVT-i	£16,495
$T_{3\text{-}S}$	Tourer	2.0-litre D-4D	£17,495
$T_{3\text{-}X}$	Saloon/Hatchback	1.8-litre VVT-i	£15,495
$T_{3\text{-}X}$	Saloon/Hatchback	1.8-litre VVT-i sequential auto	£16,495
$T_{3\text{-}X}$	Saloon/Hatchback	2.0-litre VVT-i	£16,495
$T_{3\text{-}X}$	Saloon/Hatchback	2.0-litre VVT-i sequential auto	£17,495
$T_{3\text{-}X}$	Saloon/Hatchback	2.0-litre D-4D	£16,495
$T_{3\text{-}X}$	Tourer	1.8-litre VVT-i	£16,495
T_4	Saloon/Hatchback	1.8-litre VVT-i	£16,995
T_4	Saloon/Hatchback	1.8-litre VVT-i sequential auto	£17,995
T_4	Saloon/Hatchback	2.0-litre VVT-i	£17,995
T_4	Saloon/Hatchback	2.0-litre VVT-i sequential auto	£18,995
T_4	Saloon/Hatchback	2.0-litre D-4D	£17,995
T_4	Tourer	1.8-litre VVT-i	£17,995
T_4	Tourer	2.0-litre VVT-i	£18,995
T_4	Tourer	2.0-litre VVT-i sequential auto	£19,995
T Spirit	Saloon/Hatchback	2.0-litre VVT-i	£19,495
T Spirit	Saloon/Hatchback	2.0-litre VVT-i sequential auto	£20,495
T Spirit	Saloon/Hatchback	2.0-litre D-4D	£19,495
T Spirit	Tourer	2.0-litre VVT-i	£20,495
T Spirit	Tourer	2.0-litre VVT-i sequential auto	£21,495

TOYOTA AVENSIS IN THE UK FLEET MARKET

New Toyota Avensis offers an excellent whole life cost proposition for the fleet operator. Fuel economy is excellent at 48.7mpg for the diesel engine on the combined cycle, while servicing times have been reduced to a class-leading total of 4.2 hours, based on a servicing schedule of 3 year/60,000 miles cycle.

Insurance group ratings are also very competitive starting at 7E. The combination of reduced fuel consumption, reduced servicing time, low insurance grouping, competitive parts pricing and strong residual values results in significantly reduced cost of ownership ensuring new Toyota Avensis is a strong contender for the UK fleet market.

Strong Residual Values

Strong residual values across the range further boost the position of new Toyota Avensis over its immediate competitors. The T_2 model will be the key lead-in fleet model and with the *CAP Monitor* residual value estimated at 35 per cent for both 1.8-litre petrol and 2.0-litre diesel it will have a huge advantage over its rivals.

The Avensis 1.8-litre T_2 petrol retains seven per cent more of its value over a three-year/ 60,000-mile period compared to the Ford Mondeo 1.8 LX and nine per cent more than the Renault Laguna 1.8 Authentique.

Model	Residual Value £	%
Avensis 1.8 T_2 5dr	**4725**	**35**
Mondeo 1.8 LX 5dr	4000	28
Vectra 1.8 LS 5dr	4175	29
Laguna 1.8 Authentique	3775	26
Mazda6 1.8 TS 5dr	4525	32
Passat 2.0 S	4400	30
Primera 1.8 S	4025	28

The Avensis 2.0-litre T_2 D-4D retains eight per cent more of its value than the Ford Mondeo 2.0-litre TDCi 115bhp and six per cent more than the Vauxhall Vectra 2.0-litre DTi LS.

Benefit in Kind Taxation Savings with EURO IV

The new Toyota Avensis has low CO_2 emissions of 171g/km for the 1.8-litre manual and 155g/km for the 2.0-litre D-4D model resulting in very competitive benefit in kind taxation for the company car driver. The 1.8-litre T_2 petrol is over £200 cheaper than the Ford Mondeo 1.8-litre LX.

The 2.0-litre T_3 D-4D also has a strong advantage over its competitors due to the Avensis being the only car in the sector to comply with EURO IV emissions standards. The three per cent diesel charge is waived to the lowest band possible of 15 per cent compared to 18 per cent for every other manufacturer.

Benefit In Kind Charges

Model	CO_2	BIK	25%	40%
Avensis 2.0 D-4D $T_{3\text{-}X}$	**155**	**2451**	**612.75**	**980.40**
Mondeo 2.0 TDCi Zetec	154	3058.20	764.55	1223.28
Mazda6 2.0D TS	172	3238.20	809.55	1295.28
Vauxhall Vectra 2.2 DTi SXi	176	3688.30	922.08	1475.32
Laguna 1.9 Dci Dynamique	150	2971.80	742.95	1188.72
Primera 2.2 SE	161	3124.55	781.14	1249.82
VW Passat 1.9TDI SE	151	2940.30	735.08	1176.12

Sales

The Toyota Fleet sales target for 2003 is 16,000 units compared to 14,000 units in 2002. 60 per cent of all new Avensis sales will be to Fleet customers.

AVENSIS 1.8 T_2 VERSUS COMPETITORS

	Toyota Avensis 1.8 T_2	VW Passat 2.0 S	Mazda6 1.8 S	Ford Mondeo 1.8 LX	Vauxhall Vectra 1.8 LS	Renault Laguna 1.8 Authentique	Nissan Primera 1.8 S
On The Road Price	**£13,995**	**£14,895**	**£13,495**	**£14,645**	**£14,645**	**£14,580**	**£14,600**
ABS with EBD	✓	✓	✓	✓	✓	✓	✓
Front airbags	✓	✓	✓	✓	✓	✓	✓
Side airbags	✓	✓	✓	✓	✓	✓	✓
Curtain airbags – front	✓	✓	✓	✓	✓	✓	✓
Curtain airbags – rear	✓	✓	✓	✓	✓	✓	✓
Knee airbag – driver	✓	×	×	×	×	×	×
Air conditioning	✓	Climate control	✓	✓	✓	✓	Climate control
Cassette player	✓	✓	✓	×	×	×	×
CD player	✓	×	×	✓	✓	✓	✓
Steering wheel audio controls	✓	×	×	✓	✓	✓	×
8 speakers	✓	✓	4	4	7	6	6
Immobiliser	✓	✓	✓	✓	✓	✓	✓
Alarm	✓	✓	✓	✓	✓	×	✓
Remote double locking	✓	✓	✓	✓	✓	✓	✓
Front electric windows	✓	✓	✓	✓	✓	✓	✓
Reach and rake adjustable steering wheel	✓	✓	✓	✓	✓	✓	✓
Front and rear bumpers, colour keyed	✓	×	✓	×	✓	×	×
Specification adjustment	**-**	**-£380**	**£380**	**£545**	**£85**	**£345**	**£450**
Adjusted Price	**£13,995**	**£13,875**	**£13,875**	**£15,190**	**£14,730**	**£14,925**	**£15,050**
% +/- v New Avensis	**0.0%**	**4.0%**	**-0.9%**	**8.5%**	**5.3%**	**6.6%**	**7.5%**

All option prices taken from industry sector averages where manufacturer option prices are unavailable. Manufacturer's recommended retail price taken from model range price lists and/or internet systems

AVENSIS 1.8 $T_{3\text{-}X}$ VERSUS COMPETITORS

	Toyota Avensis 1.8 $T_{3\text{-}X}$	VW Passat 2.0 SE	Mazda6 1.8 TS	Honda Accord 2.0 SE*	Ford Mondeo 1.8 Zetec	Vauxhall Vectra 1.8 SXi	Renault Laguna 1.8 Dynamique	Nissan Primera 1.8 SE
On The Road Price	**£15,495**	**£16,135**	**£14,495**	**£16,495**	**£15,645**	**£15,490**	**£15,645**	**£15,600**
ABS with EBD	✓	✓	✓	✓	✓	✓	✓	✓
Front airbags	✓	✓	✓	✓	✓	✓	✓	✓
Side airbags	✓	✓	✓	✓	✓	✓	✓	✓
Curtain airbags – front	✓	✓	✓	✓	✓	✓	✓	✓
Curtain airbags – rear	✓	✓	✓	✓	✓	✓	✓	✓
Knee airbag – driver	✓	×	×	×	×	×	×	×
Climate control air conditioning	✓	✓	✓	✓	✓	✓	✓	✓
Front dual zone a/c temperature control	✓	×	×	×	×	×	✓	×
Cassette player	✓	×	×	✓	×	×	×	×
CD player	✓	✓	✓	✓	✓	✓	✓	✓
Steering wheel audio controls	✓	×	✓	✓	✓	✓	✓	×
8 speakers	✓	✓	4	✓	4	7	6	6
Immobiliser	✓	✓	✓	✓	✓	✓	✓	✓
Alarm	✓	✓	✓	✓	✓	✓	✓	✓
Remote double locking	✓	✓	✓	✓	✓	✓	✓	✓
Front and rear electric windows	✓	✓	✓	✓	✓	✓	✓	✓
Reach and rake adjustable steering wheel	✓	✓	✓	✓	✓	✓	✓	✓
Front and rear bumpers, colour keyed	✓	×	✓	✓	×	✓	×	×
Rain sensor wipers	✓	×	×	×	×	✓	×	✓
Front fog lamps	✓	×	×	×	✓	✓	✓	✓
Heated exterior mirrors	✓	✓	✓	✓	✓	✓	✓	✓
Retractable exterior mirrors	✓	✓	✓	✓	✓	✓	✓	✓
Leather steering wheel	✓	×	✓	✓	✓	✓	✓	✓
Auto-dimming rear view mirror	✓	×	×	✓	×	✓	×	✓

AVENSIS 1.8 $T_{3\text{-}X}$ VERSUS COMPETITORS – CONTINUED

	Toyota Avensis 1.8 $T_{3\text{-}X}$	VW Passat 2.0 SE	Mazda 6 1.8 TS	Honda Accord 2.0 SE*	Ford Mondeo 1.8 Zetec	Vauxhall Vectra 1.8 SXi	Renault Laguna 1.8 Dynamique	Nissan Primera 1.8 SE
16" alloy wheels	✓	15"	✓	✓	✓	✓	17"	✓
Specification adjustment	**£0**	**£162**	**£573**	**tbc**	**£1,068**	**£668**	**£698**	**£188**
Adjusted Price	**£15,495**	**£15,973**	**£15,068**	**tbc**	**£16,713**	**£16,158**	**£16,343**	**£15,788**
% +/- v New Avensis	**0.0%**	**3.1%**	**-2.8%**	**tbc**	**7.9%**	**4.3%**	**5.5%**	**1.9%**

All option prices taken from industry sector averages where manufacturer option prices are unavailable. Manufacturer's recommended retail price taken from model range price lists and/or internet systems. * Full Accord specification information still to be confirmed

AVENSIS 2.0 D-4D T_{3-X} VERSUS COMPETITORS

	Toyota Avensis 2.0 D-4D 116BHP T_{3-X}	**Mazda 6 2.0 D TS**	**Ford Mondeo 2.0 TDCI 130BHP Zetec**	**Vauxhall Vectra 2.2 DTI 123BHP SXi**	**Renault Laguna 1.9 DCI 120BHP Dynamique**	**Nissan Primera 2.2D 124BHP SE**
European Emission Standard	EURO IV	EURO III	EURO III	EURO III	EURO III	EURO III
OTR Price	**£16,495**	**£15,595**	**£17,145**	**£16,940**	**£16,645**	**£16,600**
ABS with EBD	✓	✓	✓	✓	✓	✓
Front airbags/Side airbags	✓	✓	✓	✓	✓	✓
Curtain airbags – front/rear	✓	✓	✓	✓	✓	✓
Knee airbag – driver	✓	×	×	×	×	×
Climate control air conditioning	✓	✓	✓	✓	✓	✓
Front dual zone a/c temp control	✓	×	×	×	✓	×
Cassette player	✓	×	×	×	×	×
CD player	✓	✓	✓	✓	✓	✓
Steering wheel audio controls	✓	✓	✓	✓	✓	×
8 speakers	✓	4	4	7	6	6
Immobiliser/alarm	✓	✓	✓	✓	✓	✓
Remote double locking	✓	✓	✓	✓	✓	✓
Front and rear electric windows	✓	✓	✓	✓	✓	✓
Reach/rake adjustable steering wheel	✓	✓	✓	✓	✓	✓
Front/rear bumpers, colour keyed	✓	✓	×	✓	×	×
Rain sensor wipers	✓	×	×	✓	×	✓
Front fog lamps	✓	×	✓	✓	✓	✓
Heated exterior mirrors	✓	✓	✓	✓	✓	✓
Retractable exterior mirrors	✓	✓	✓	✓	✓	✓
Leather steering wheel	✓	✓	✓	✓	✓	✓
Auto-dimming rear view mirror	✓	×	×	✓	×	✓
16" alloy wheels	✓	✓	✓	✓	17"	✓
Specification adjustment	**£0**	**£563**	**£1,058**	**£358**	**£608**	**£28**
Adjusted Price	**£16,495**	**£16,158**	**£18,203**	**£17,298**	**£17,253**	**£16,628**
% +/- v New Avensis	**0.0%**	**-2.0%**	**10.4%**	**4.9%**	**4.6%**	**0.8%**

All option prices taken from industry score averages where manufacturer option prices are unavailable. Manufacturer's recommended retail price taken from model range price lists and /or internet systems

EXTENDING SUPERIOR QUALITY TO THE ENVIRONMENT

- World first achieved in offering engine line-up that is 100 per cent EURO IV- compliant
- Latest 2.0-litre direct-injection petrol unit offers even better emissions performance
- Toyota D-CAT undercuts EURO IV NOx and particulate emission levels by 50 and 80 per cent respectively
- Fuel savings achieved with new air conditioning unit

At launch, all the engines available in the new Toyota Avensis, including the 2.0-litre diesel D-4D unit, comply with the EURO IV emissions standards, a first for any manufacturer.

The 1.8-litre petrol engine uses Toyota's well established VVT-i (Variable Valve Timing – intelligent) technology to deliver increased mid-range acceleration and torque with reduced fuel consumption. The engine is the latest development of one already used in the Toyota range.

Toyota has further developed its direct-injection petrol engines, while catalyst technology, developed in lean-burn petrol units, has provided the foundation for development of the DPNR (Diesel Particulate NOx Reduction) catalyst system.

Direct-Injection Petrol

The 2.0-litre direct-injection petrol engine option for the new Toyota Avensis is the latest derivative of the unit first seen in the current model range. This compact, lightweight unit was one of the first petrol engines in Europe to offer direct-injection technology with its benefits of greater fuel efficiency, lower emissions and improved performance. Now it offers even better emissions levels (with reduced NOx) allied to improved performance.

The 2.0-litre direct injection Avensis is remarkably economical, returning 34.9mpg on the European combined cycle with 191g/km CO_2 emissions (193g/km Tourer) with manual transmission.

EURO IV-Compliant D-4D Diesel Engine

The standard version of the D-4D engine in the new Toyota Avensis already complies with EURO IV emission standards. It benefits from second-generation high-pressure common-rail diesel technology which has the ability to produce an injection pressure of 160 MPa, irrespective of engine speed. The addition of a variable nozzle turbocharger helps boost power and torque while contributing to low fuel consumption and emissions.

The refined injection system includes a chamber shape with enhanced swirl characteristics and an improved fuel-injector spray pattern. These result in quiet combustion, excellent fuel efficiency and low emissions.

Double pilot injection occurs at engine speeds below 1,200rpm, reducing idle noise, while a motor-driven Exhaust Gas Recirculation (EGR) valve controls EGR volume more precisely and an EGR cooler helps to reduce NOx emissions.

A large catalytic converter located just downstream of the turbocharger helps reduce HC and CO emissions. The 2.0-litre D-4D engine delivers 116bhp at 3,600rpm and has a flat torque curve peaking at 280Nm between 2,000 and 2,200rpm. However even greater environmental benefits have been developed using Toyota's D-4D diesel engine as a base.

Toyota D-Cat – A New Concept in Clean Diesel

In addition to the regular 116bhp D-4D engine, the new Avensis will receive a second EURO IV-compliant diesel later this year. This engine will be the first in Toyota's range to feature the Toyota D-CAT (Diesel Clean Advanced Technologies) system, which greatly reduces the harmful emissions from diesel engines using new catalyst technology, common-rail fuel injection and advanced sensor technology. It will become available from last quarter of 2003.

Cars equipped with Toyota D-CAT will surpass the EURO IV standard for diesels with greatly reduced emissions of hydrocarbons (HC), carbon monoxide (CO), nitrogen oxides (NOx) and particulate matter (PM). To illustrate its efficiency, Toyota D-CAT can reduce NOx and particulate emissions by 50 and 80 per cent respectively, when compared with EURO IV standards.

At the heart of Toyota D-CAT is the DPNR (Diesel Particulate NOx Reduction system) converter and Toyota's second-generation, high-pressure common-rail direct-injection system.

The DPNR 4-way Catalyst

DPNR represents another 'world first' for Toyota and is the key component of Toyota D-CAT. It is based on the three-way NOx reduction catalyst developed by Toyota for its lean-burn petrol engine. A particle filter was incorporated into the device to capture particulate matter (PM) produced by the engine, creating a four-way reduction capability.

In the DPNR purification process, during conventional diesel combustion, particulate matter is first oxidised using active oxygen which has been created when NOx is temporarily stored inside the catalytic converter.

When the engine momentarily switches to low-oxygen combustion – through a 'rich spike' created by exhaust port injection – the stored NOx is reduced, producing more active oxygen. This additional oxygen is used to further oxidise particulate matter inside the catalytic converter. This 'rich spike' is created by a fifth diesel injector positioned in the exhaust port.

As an additional advantage, the effectiveness of the system does not require the use of any fuel additive. A health check is only needed every 20,000 miles.

Second-Generation Common-Rail System
Toyota developed common-rail technology for diesel engines in 1995 and is now introducing a second-generation system. It has the ability to produce an injection pressure of 175Mpa, irrespective of engine speed – the highest value among second-generation common-rail systems. The standard D-4D engine without Toyota D-CAT has a 160Mpa injection pressure.

Suitable combustion conditions for DPNR are created with variables of timing and volume of fuel injection during each combustion stroke.

The common rail system can produce up to five injections during each combustion stroke to control the combustion rate. For example, a pilot injection a fraction of a second before the main injection is used to reduce the generation of NO_X, noise and vibration. An after-injection a split second later than the main injection is used to re-burn some particulate matter.

The initial pilot injection creates a preliminary air-fuel mixture. When the main injection takes place, the fuel unburned by the previous injection is already dispersed, making the combustion homogenous and rapid. This is the principle behind UNIBUS (Uniform Bulky Combustion System), which has the effect of reducing combustion temperatures – important in the reduction of NOx and soot emissions.

After that, there can be a post-injection, to increase the fuel/air ratio and help manage the temperature of the exhaust gas, making the DPNR catalyst work more effectively.

Exhaust Port Injection
The effective operation of the DPNR converter relies on the ability to vary fuel/air ratios in the exhaust gases, so a fifth injection nozzle has been placed in the exhaust port. At the critical moment, fuel is injected into the exhaust manifold in order to create stoichiometric conditions in the DPNR catalyst. This ‘rich spike’ allows the DPNR catalyst to reduce and release the stored NOx.

The exhaust port injection is also used to control sulphur contamination of the catalyst. Sulphur in the fuel is a problem for the DPNR catalyst because it builds up in the interior in the form of sulphur oxide (SOx). When the stored SOx reaches a certain level, the fifth injector is used to increase the catalyst’s temperature to over 600ºC and stochiometric conditions. The SOx is then discharged.

Toyota D-CAT also uses a quick-response exhaust gas recirculation (EGR) valve and a large capacity EGR cooler. The purpose is to cool down the exhaust gases that are re-used and injected again into the combustion chamber. The cooler exhaust gases have a greater density, allowing a larger mass to be fed into the combustion chamber.

Low-Temperature Combustion
Smoke tends to increase with higher exhaust gas recirculation rates because the amount of oxygen in the intake mixture is lower. Enriching the mixture will bring down the combustion

temperature to a level lower than that at which soot is formed. When the mixture is rich enough to reach the stoichiometric condition, the level of smoke is almost zero.

Another function of low-temperature combustion is to increase the catalyst temperature. The system requires a temperature of more than 200ºC to light-off the catalyst.

High-Sulphur Fuel Switch

Although Toyota D-CAT can perform an astonishing reduction in NOx and particulate matter emissions, this is only possible with the use of low sulphur diesel fuel. In order to allow the use of the vehicle in countries where this type of fuel is not available, it has been equipped with a high-sulphur fuel switch. By activating the high-sulphur mode, the Toyota D-CAT will work more effectively to eliminate the SOx content stored in the DPNR.

VARIABLE-CAPACITY AIR-CONDITIONING COMPRESSOR

A further boost to good fuel economy and low emissions is the variable-displacement compressor in the air-conditioning unit. This changes its capacity depending on the driving conditions, for instance demanding less power under acceleration. Fuel consumption can be improved by up to three per cent compared with a conventional system and driveability is better, too. Please check the Technical Glossary for further information.

TECHNICAL GLOSSARY

AUTOMATIC TRANSMISSION WITH SEQUENTIAL CONTROL

The optional automatic transmission is equipped with Multi-mode control. By moving the gear lever to the S position, the driver can opt for sequential shifting and enjoy a more involving driving style.

DUAL-STAGE SRS AIRBAGS

In this system, when the front airbag sensors and airbag sensor assembly detect a frontal collision, the airbag sensor assembly analyses the extent of the impact and the position of the driver and passenger seats. At the moment of airbag inflation, the deployment intensity will be optimised by delaying the inflation timing of the 1st and 2nd initiators.

The dual-stage inflation system is used for the driver and front passenger airbags.

DVD FULL-MAP NAVIGATION SYSTEM

Navigation and trip information is presented on a central seven-inch liquid crystal display. This display can be opened, closed and tilted at 10, 20 or 30º.
The Toyota Navigation System available in the Toyota Avensis uses DVD technology, allowing a map covering all of Western Europe to be stored on a single disc. As well as offering eight different language options, the system can be used for route speed calculations.

The navigation system can be operated by any passenger in the vehicle by means of a handy remote control. The remote control features a numeric keypad, making the insertion of letters and numbers as easy and intuitive as writing an SMS text message on a mobile phone. Voice commands for certain features, including the navigation system, make for even greater ease of use and represent a step forward in specification for mainstream D-segment cars.

Parallel to this, the system also features a Trip Information Display. This provides information such as cruising range, average fuel consumption after refuelling, average speed, instant consumption, driven distance from starting point and outside temperature display.

The DVD navigation system is available as optional equipment on all Avensis models from $T_{3\text{-}X}$ grade upwards.

ELECTRIC MOTOR-ASSISTED POWER STEERING (EMPS)

This system generates steering assistance through an electric motor mounted on the upper part of the steering column. With EMPS, an electronic actuator replaces the mechanical clutch between the electric motor and steering column. This is a brand new concept in electric power steering systems.

EMPS can improve fuel consumption by up to two per cent compared to conventional hydraulic power steering as it only uses electric power when necessary. With hydraulic

power steering, the hydraulic pump has to be continuously powered by the engine, even when there is no turning action in the steering, causing unnecessary fuel consumption.

EMPS is also a simpler because it uses fewer components, making it more reliable. Also, it doesn't require any hydraulic fluid, which is an environmental consideration.

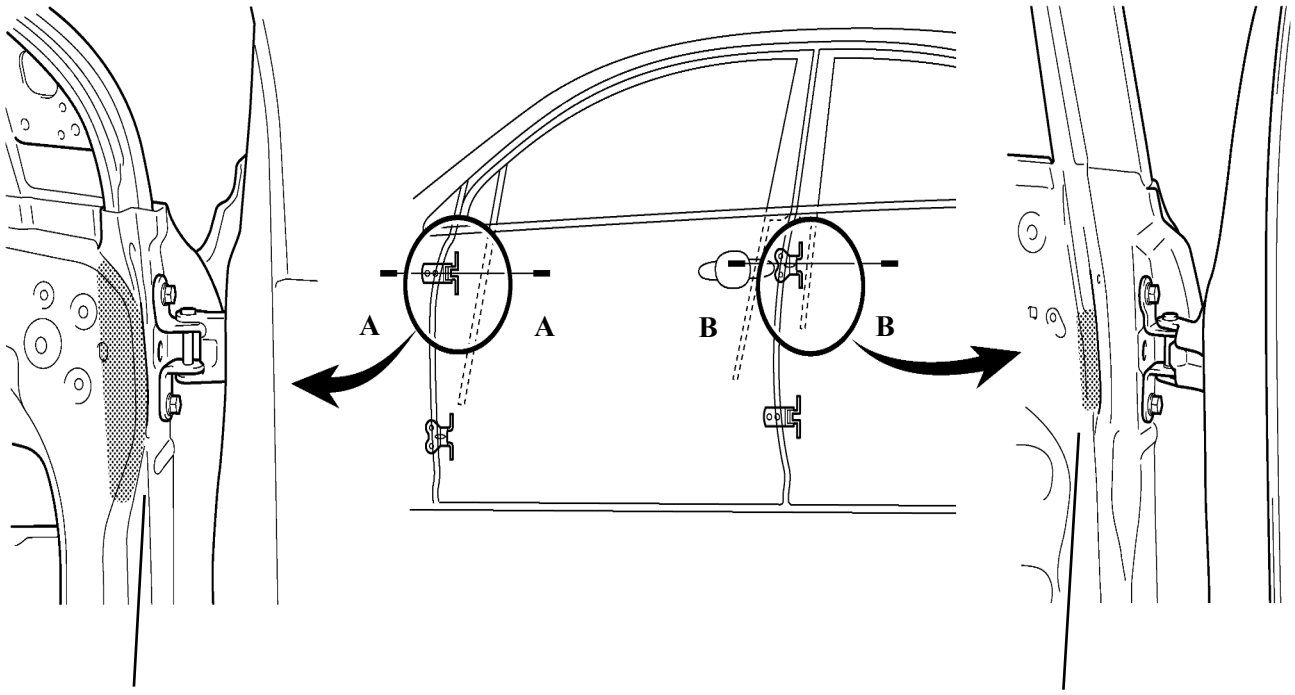
The Toyota Avensis is the first car in the D segment to use EMPS. The system is only used in conjunction with the 1.8-litre petrol engine. This is because less powerful engines experience a bigger impact on fuel consumption when required to power peripheral systems such as power steering or air conditioning.

MINIMAL INTRUSION CABIN SYSTEM (MICS)

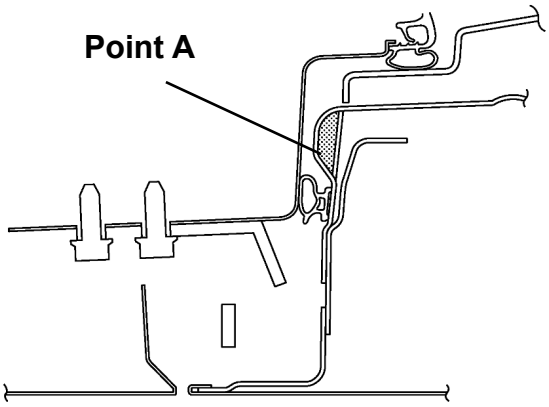
The Toyota Avensis features a revolutionary safety structure which can efficiently disperse and absorb energy generated by several types of impacts.

Impact absorbing structure for frontal collision

In the MICS structure, protruding sections feature at points "A" and "B" in the front and rear doors in order to minimise the gap between the front pillar and the front and rear doors, and between the centre pillar and the rear door. As a result, the impact force can be directed to the belt line, helping minimise cabin deformation.

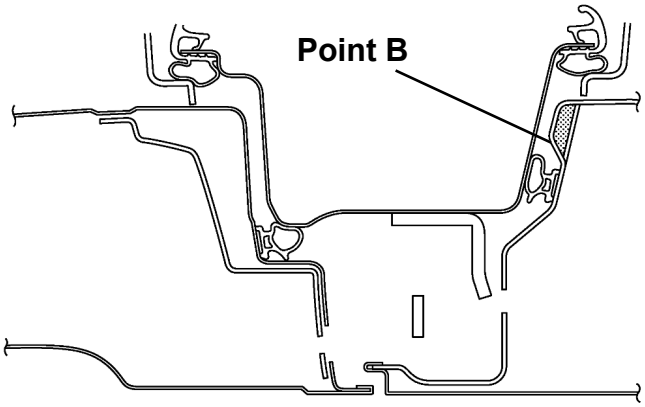


Point A **Point B**



A – A Cross Section

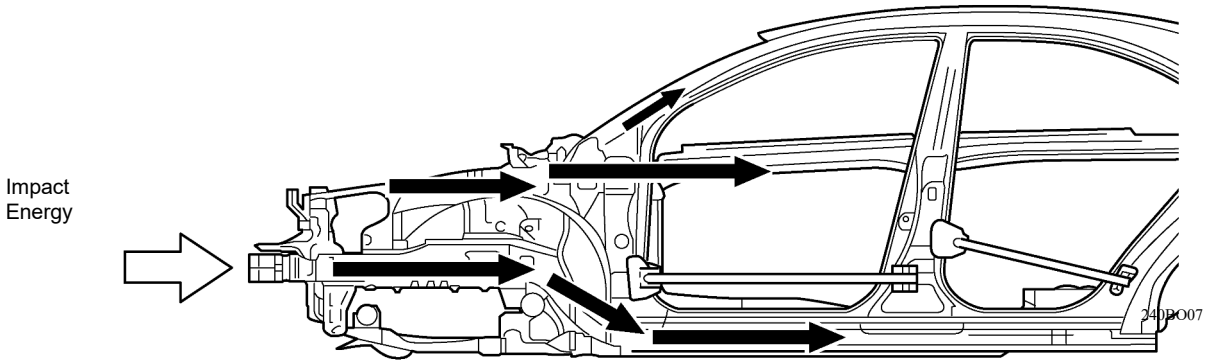
240BO05

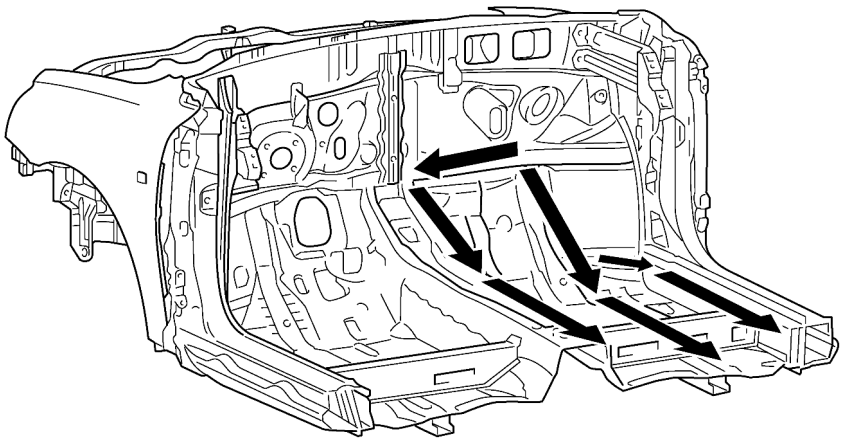


B – B Cross Section

240BO06

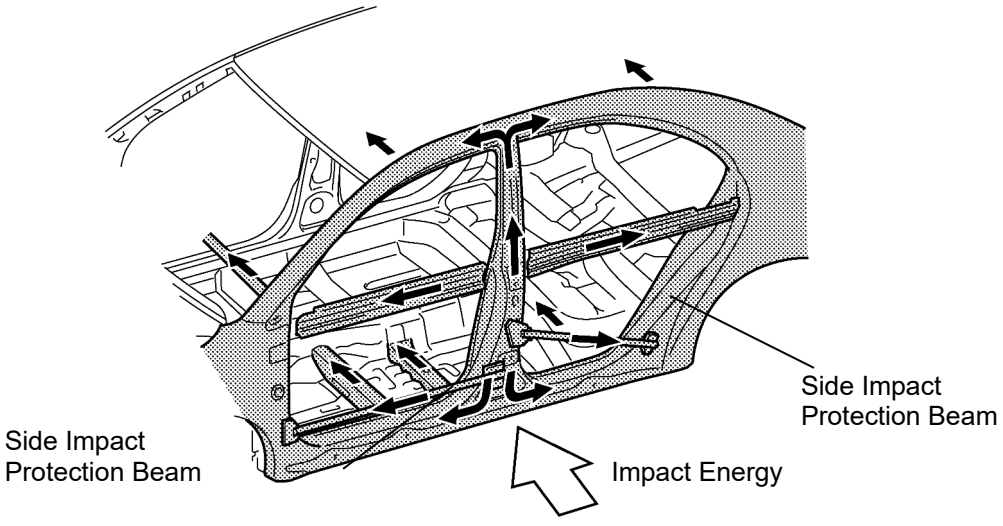
Frontal Collision Load Distribution Diagram





Side collision impact absorbing structure

The impact energy from a side collision is dispersed throughout the body via pillar reinforcements, side impact protection beams and floor cross members. This dispersion ensures the energy directed to the cabin is kept to a minimum. In addition, the body is made highly rigid through reinforced joints and the use of high strength sheet steel, serving to maximise the integrity of the cabin in a collision.



MULTIPLEX COMMUNICATION WIRING

In order to achieve a slimmer harness configuration and cope with the high number of electronic systems in the new Toyota Avensis, a Multiplex communication system was adopted.

In a conventional electronic system, parallel communication is used to exchange information between ECUs. To transmit four pieces of information, for example, parallel communication requires four communication wires. By contrast, multiplex communication is used for serial communication, converting multiple pieces of information into serial communication data. In this way they can be transmitted through a single communication wire.

Two types of Multiplex system are available in the Toyota Avensis: Body Electronic Area Network (BEAN) establishes communication between all of the vehicle's ECUs; and Audio Visual Communication – Local Area Network (AVC-LAN) is used specifically for the multi-display or the multi-information display. BEAN features a communication speed of 10 kbps (kilobytes per second); for AVC-LAN the rate is 17.8 kbps.

This feature is standard on all versions of the new Toyota Avensis.

OPTITRON

Traditional instrument panel illumination is replaced by individual LEDs (Light Emitting Diode) on all the figures and indicator needles. These are located behind a low-reflection, smoked acrylic face. This feature provides optimum readability of the instrument panel under all light conditions and offers a more refined appearance. Optitron is standard on all versions.

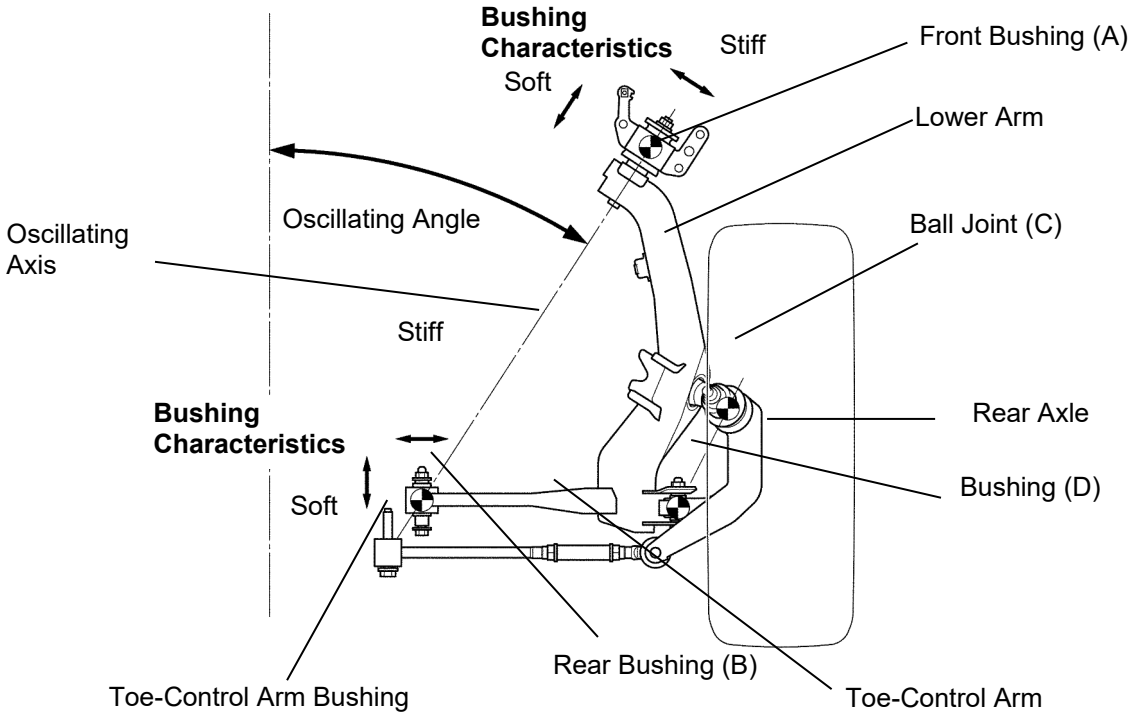
REAR DOUBLE-WISHBONE SUSPENSION

The Toyota Avensis features a revolutionary double-wishbone rear suspension with additional features not found in conventional double-wishbone designs.

The newly developed suspension is based on the rear suspension in the Toyota Celica sports coupé, already noted for its balance of handling and comfort. However, for the Toyota Avensis, the geometry was further developed and improved to suit the demands of a different type of customer.

The suspension geometry features a lower arm and an upper arm which manage wheel movement. Although these arms are not shaped like a normal wishbone arm, their articulation generates vertical wheel travel - the main advantage of this kind of suspension. By doing this, it is possible to maximise the contact area between tyre and road surface, achieving more grip and less tyre wear.

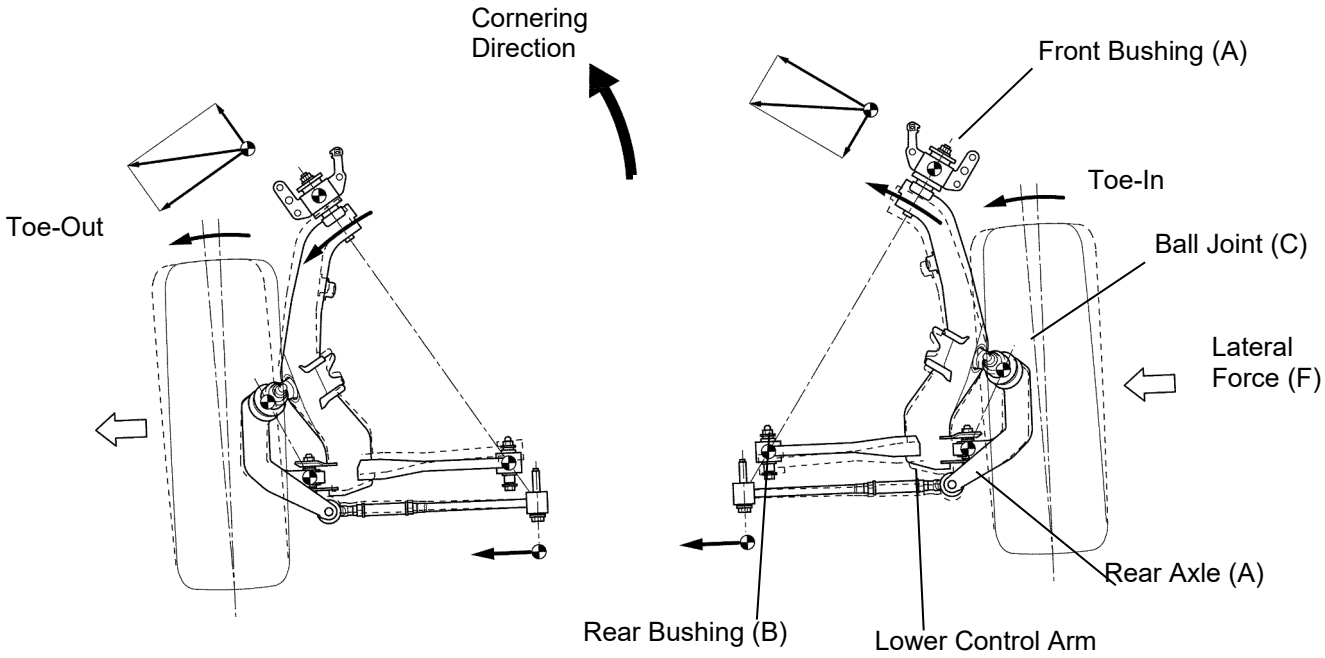
The bushings of the lower arm have special characteristics, which, under certain conditions, allow the rear wheels to move a few degrees in the toe direction, in order to achieve greater stability. The toe-control arm controls the amount of toe movement under certain limits.


Bushing Characteristics
Soft
Stiff
Front Bushing (A)
Lower Arm
Oscillating Angle
Oscillating Axis
Ball Joint (C)
Stiff
Bushing Characteristics
Soft
Rear Axle
Bushing (D)
Rear Bushing (B)
Toe-Control Arm Bushing
Toe-Control Arm

240CH48

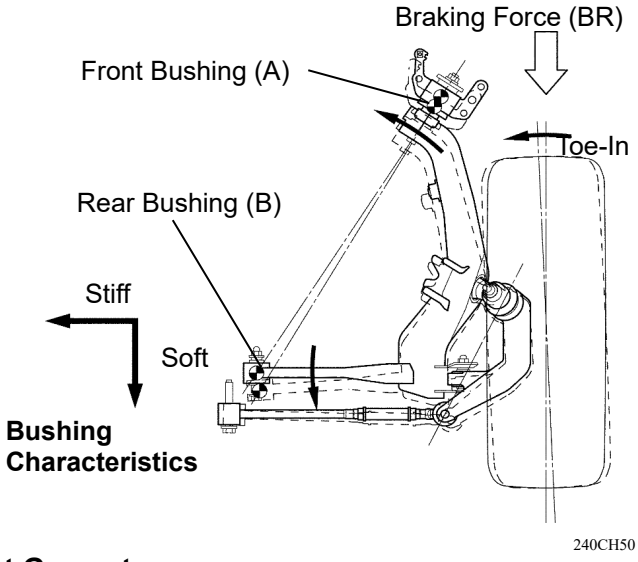
Cornering

When cornering, a lateral force (named “F” on the following diagram) acts on the rear wheels. This force is passed onto the ball joint and then to the lower arm’s bushings. This will make both wheels articulate, creating an auto-directional effect that provides superior stability and agility when cornering. Once again, the toe control arm limits the wheels’ toe movement.



Braking

When a braking force “BR” acts on the tyre, this will be transmitted to the toe-control arm, pushing it rearward. As a result, the front and rear bushings of the lower arm will flex in the axial direction. This will generate toe-in movement for both rear wheels, a strategy that provides superior straight line stability under braking.

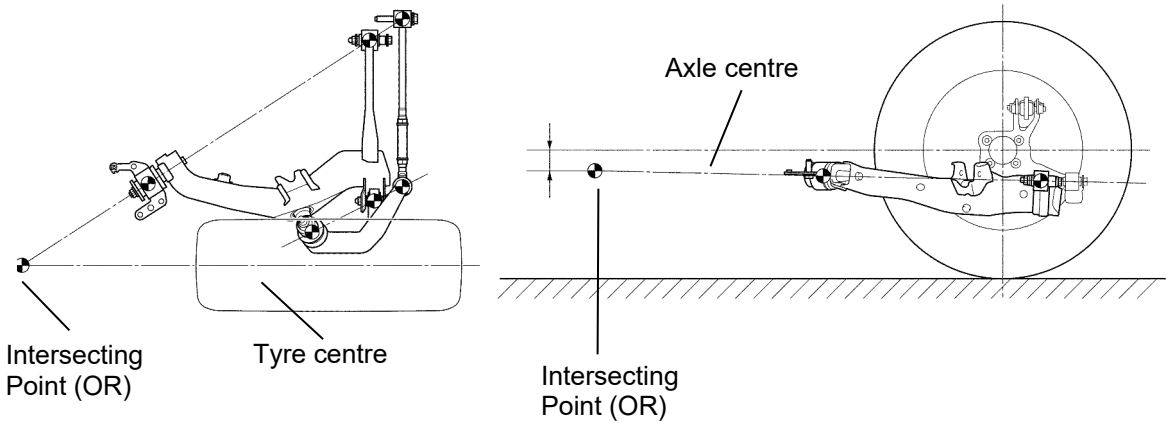


Anti-Lift and Anti-Squat Geometry

When developing the suspension geometry, there was a clear intention to bring the intersection point (OR) closer to the axle centre. The intersecting point is the intersection

between two spatial lines – one running through the bushings on the two lower arms and the other running longitudinally through the centre of the tyre.

By bringing the intersecting point towards the centre of the axle, it is possible to minimise the impact of the load transfer that typically occurs under acceleration or braking. In this way, the vehicle stability can be maintained.



SEATBELT REMINDER SYSTEM

The new Toyota Avensis features a new, revolutionary seatbelt reminder system, standard on all versions.

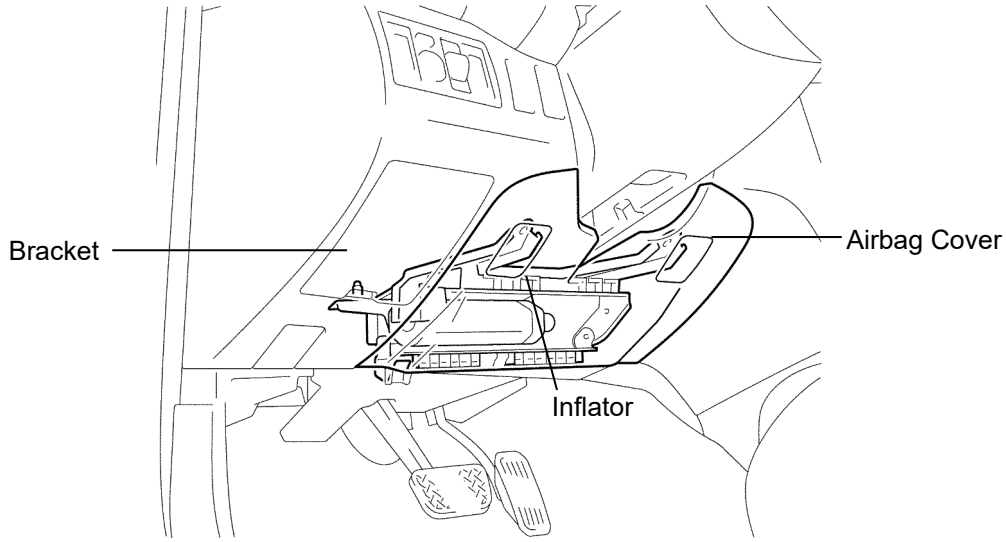
As well as the usual visual warning sign, there is also a warning buzzer to remind the driver and front passenger to use their seatbelts. The initial warning light switches to a buzzer once vehicle speed reaches 10mph and, if the belts have still not been fastened after 30 seconds, the volume and frequency of the buzzer increases for a further 90 seconds.

SRS KNEE AIRBAG

The SRS knee airbag, which is mounted below the instrument panel in front of the driver seat, consists of a bracket, cover, inflator, and airbag.

In a frontal collision, the 18-litre bag will inflate in order to protect the driver's knees from the contact with the lower parts of the dashboard. These hard surfaces can cause serious injury.

The Toyota Avensis is the first vehicle in Europe to be equipped with a SRS knee airbag. This feature is available as standard equipment in all versions.



TOYOTA D-CAT

Diesel Clean Advanced Technologies is an innovative package that will be introduced on the second diesel engine in the Toyota Avensis range, to be launched in the last quarter of 2003.

Among the technologies featured in Toyota D-CAT are:

- DPNR (Diesel Particulate and NOx Reduction) four-way catalyst: this is an evolution of the NOx-reduction catalyst developed by Toyota for its lean-burn petrol engine. That is a three-way catalyst, being able to reduce the level of NOx in the exhaust gases; DPNR adds a further element by reducing particulate emissions. This makes DPNR the first catalyst in the world which is able to reduce NOx and particulate matter at the same time. The DPNR converter works without the need for additives and is maintenance-free. However, in order to work at maximum efficiency, low-sulphur diesel fuel must be used. So that drivers can use their vehicles in countries where low-sulphur diesel is not available, a high-sulphur selector button has been incorporated in the dashboard. This allows this type of fuel to be used without damaging the DPNR four-way catalyst.

- Second generation common rail system: this common rail system was developed by Denso, a Toyota group company. It can generate an injection pressure of 175MPa, which is class-leading among second-generation systems. Parallel to this, it can also produce up to five injections per cycle, a feature called Multiple Fuel Injection. This can be used to reduce noise and vibration, minimise the creation of NOx and particulates during the combustion and enrich the air-fuel ratio in order to create suitable conditions for the DPNR catalyst to reduce NOx and PM.

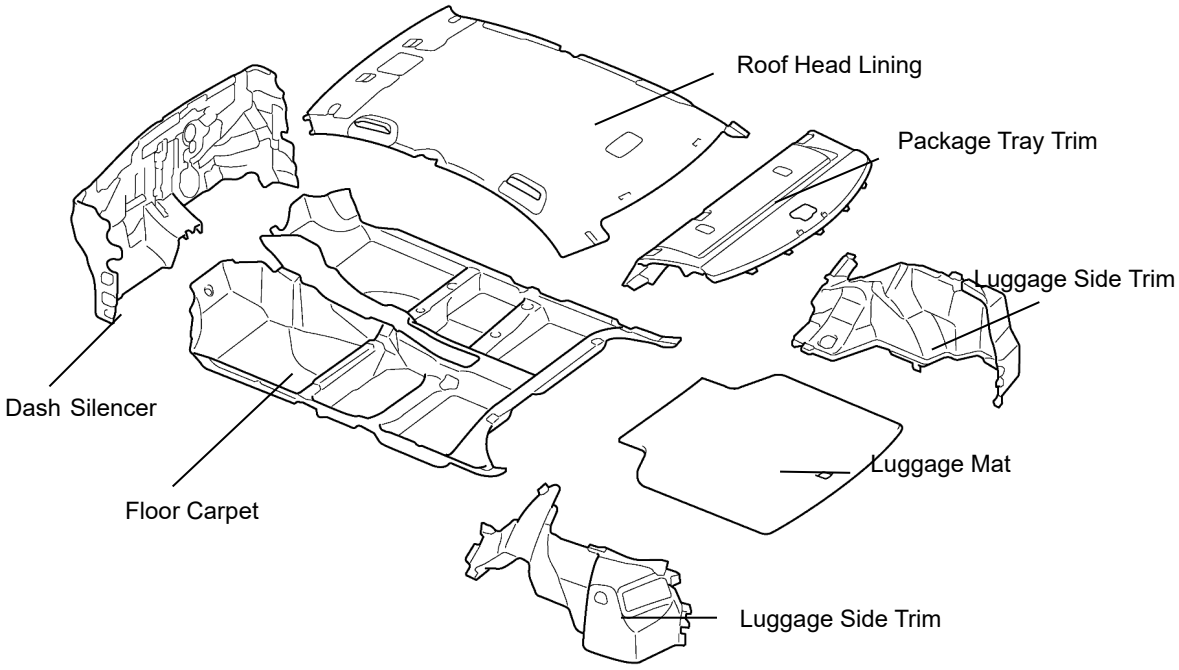
- Exhaust Port Injector: for the first time, the common rail system features an extra injector mounted on the exhaust port. The purpose of this is to create suitable conditions in the DPNR catalyst by momentarily adjusting the air-fuel ratio. When the DPNR needs to reduce and release the stored NOx, the EPI will produce a 'rich spike' injection. The 116bhp D-4D engine already meets EURO IV emission regulations, but the second D-4D diesel, equipped with Toyota D-CAT, further reduces NOx and PM by 50 and 80 per cent, respectively, against EURO IV standards.

ULTRA LIGHT CONCEPT (ULC)

The Toyota Avensis is equipped with an innovative package for noise and vibration absorption. Called Ultra Light Concept, it not only achieves superior results in NV (noise and vibration) reduction performance, it also offers considerable weight savings.

By using ULC, the total weight of the sound and vibration damping materials was reduced from 63kg to 33kg – a reduction of almost 50 per cent.

As well as lowering the weight of the vehicle, ULC is also environmentally-friendly as it can be produced from recyclable fibres and it uses less adhesives and solvents in its production and installation.



VARIABLE DISPLACEMENT COMPRESSOR

A compressor is an important component in the A/C circuit. It compresses the refrigerant fluid in order to maximise the heat exchange. Normal compressors have a fixed displacement of refrigerant fluid they can compress per cycle. However, according to the circumstances, the full capacity of the compressor is not really needed. This means there is some unnecessary fuel consumption, brought about by the need to power the compressor.

For this reason, the new Toyota Avensis is equipped with a variable displacement compressor. According to driving conditions and the A/C operating conditions, the compressor operation may vary within seven different operating modes:

- Acceleration mode
- Deceleration mode
- Low-speed mode
- Frost mode
- A/C Switch ON/ OFF mode
- Malfunction ON/ OFF mode (failsafe function)
- Compressor Protect mode (failsafe function)

Acceleration mode: when the engine ECU detects a start-off acceleration or overtaking acceleration, the A/C amplifier commands a solenoid control valve to lower the compressor operating capacity output. In this way, it is possible to ensure superior driveability, achieving better acceleration with lower fuel consumption.

Deceleration mode: when the engine is decelerating, the compressor will also lower its displacement. This happens so that the engine doesn't have to adopt a higher speed just to power the compressor, which would lead to unnecessary fuel consumption.

Low-speed mode: when the engine is operating at low speeds, the solenoid control valve will also lower the compressor's displacement in order to ensure driveability.

Frost mode: to prevent the evaporator from frosting, this mode calculates the compressor operating capacity using a calculation formula that has been established based on deceleration control, evaporator temperature sensor, and refrigerant pressure switch signals.

A/C switch On/Off mode: this controls the compressor operating capacity in accordance with the A/C switch.

In normal use, the variable displacement compressor allows fuel savings of up to three per cent compared with a normal A/C compressor. Driving pleasure is enhanced because the engine is only allocating the right amount of energy to power the compressor at any given time.

The variable displacement compressor is installed in every vehicle equipped with air conditioning.

VOICE RECOGNITION

The new Toyota Avensis is the first vehicle in the mainstream D-segment to be equipped with a voice recognition system (with optional full-map navigation system). Through the use of this system, the driver can control the navigation and audio systems with added safety, keeping all the attention on driving and the road ahead.

After pressing a button on the steering wheel, the driver can give commands in English or German, which will be picked up by a microphone installed in the roof console.

Extensive development work was conducted in Europe in order to achieve a voice recognition success rate of more than 90 per cent. However, the user has to respect certain conditions in order to take full advantage of the system:

- Voice activation may be affected by exterior wind noise if used with the windows open at certain speeds.
- Other passengers should not be talking at the same time as the commands are given.
- The system can recognise words spoken at any speed but there must be clear pronunciation of each word.

WIPERS WITH RAIN SENSING FUNCTION

When the wiper switch is in AUTO position, the wiper controller will adjust the wiper speed according to the intensity of the rain.

The system uses a sensor to monitor the amount of raindrops falling on the windscreen. This sensor consists of eight infrared-ray LEDs (Light Emitting Diode) and one photo diode. When there are no raindrops on the detection area, all the infrared rays emitted by the LEDs are reflected by the windshield glass and captured by the photo diode. When raindrops are present in the detection area, fewer of the infrared beams will be detected.

This feature is available as standard equipment on grades $T_{3\text{-}X}$ and higher.

AVENSIS TECHNICAL SPECIFICATIONS

ENGINE 1.8-litre VVT-i					
Type			1ZZ-FE		
Valve Mechanism			DOHC-16 valve		
Fuel System			Electronic fuel injection		
Fuel type			95 Octane		
Displacement (cc)			1794		
Bore x stroke			79 x 91.5		
Compression ratio			10.0:1		
Max. power (bhp/rpm)			129 / 6,000		
Max. torque (Nm/rpm)			170 / 4,200		
ENGINE 2.0-litre VVT-i					
Type			1AZ-FSE		
Valve Mechanism			DOHC-16 valve		
Fuel System			Electronic fuel injection		
Fuel type			95 octane		
Displacement (cc)			1998		
Bore x stroke			86 x 86		
Compression ratio			11.0:1		
Max. power (bhp/rpm)			147 / 5,700		
Max. torque (Nm/rpm)			196 / 4,000		
ENGINE 2.0-litre D-4D					
Type			1CD-FTV		
Valve Mechanism			DOHC-16 valve		
Fuel System			Direct injection-common rail		
Fuel type			48 Cetane		
Displacement (cc)			1995		
Bore x stroke			82.2 x 94		
Compression ratio			17.8:1		
Max. power (bhp/rpm)			116 / 3,600		
Max. torque (Nm/rpm)			280 / 2,000-2,200		
PERFORMANCE	**1.8 M/T**	**1.8 A/T**	**2.0 M/T**	**2.0 A/T**	**2.0D-4D M/T**
0-62mph (Tourer)	10.0 (11.4)	11.4	9.1 (9.1)	9.1(9.1)	11.4 (11.4)
Max speed (Tourer)	124 (121)	121	130 (130)	130 (130)	121 (121)
FUEL CONSUMPTION / EMISSIONS AND VED RATING					
Combined (Tourer)	39.2	36.7	34.9	30.7	48.7 (47.1)
Extra Urban	48.7	44.8	42.8	39.2	57.6
Urban	30.1	27.4	26.6	22.1	37.7
CO_2 emissions (Tourer)	171 (172)	187 (193)	191 (193)	221 (224)	155 (158)
VED band	D	E	E	E	C

DIMENSIONS (mm)	
Overall length (Tourer)	4,630 (4,700)
Overall width	1,760
Overall height (Tourer)	1,480 (1,525)
Wheelbase	2,700
Track- front	1,505
Track- rear	1,510
Overhang – front	905
Overhang – rear	1,025

Coefficient of Drag (Tourer)			0.28 (0.29)		
Interior length			2090		
Interior width			1,485		
Interior height (sun roof)			1,210 (1,160)		
Luggage capacity (L)			Saloon	Hatchback	Tourer
Minimum			520	510	520
Maximum (with rear seats folded)			-	1,320	1,500
Fuel tank capacity (L)			60		
WEIGHTS (kg)			Saloon	Hatchback	Tourer
Kerb weight					
1.8-litre VVT-i			1,245-1,310	1,265-1,330	1,295-1,345
1.8-litre VVT-i (auto)			1,265-1,330	1,285-1,350	1,325-1,375
2.0-litre VVT-i			1,330-1,375	1,335-1,380	1,355-1,400
2.0-litre VVT-i (auto)			1,360-1,405	1,365-1,420	1,385-1,420
2.0-litre D-4D			1,380-1,445	1,400-1,460	1,430-1,490
GROSS VEHICLE WEIGHT					
1.8-litre VVT-i			1,820		
2.0-litre VVT-I			1,895		
2.0-litre D-4D			1,970		
TOWING CAPACITY					
Without brake			500		
With brake (2.0-litre petrol)			1,300 (1,400)		
TRANSMISSION					
	1.8 M/T	**1.8 A/T**	**2.0 M/T**	**2.0 A/T**	**2.0 D-4D M/T**
First	3.545	2.847	3.538	3.943	3.538
Second	1.904	1.552	2.054	2.197	1.913
Third	1.310	1.000	1.333	1.413	1.258
Fourth	1.031	0.700	1.028	1.020	0.918
Fifth	0.815	-	0.820	-	0.690
Reverse	3.250	2.343	3.583	3.145	3.583
Final drive	3.94	4.23	3.68	2.92	3.68
SUSPENSION					
Front		MacPherson strut with gas shock absorbers and stabiliser bar			
Rear		Double wishbone with toe-control link and stabiliser bar			
STEERING					
1.8-litre VVT-i		Rack and pinion; Electric Motor-assisted Power Steering (EMPS)			
2.0-litre VVT-i, 2.0 D-4D		Rack and pinion; Hydraulic Power Steering (HPS)			
Ratio: Electric / Hydraulic		17.5/16.1			
Turns (lock to lock) Electric / Hydraulic		3.5/3.0			
Min turning radius – Electric / Hydraulic		5.4/5.6			
BRAKES					
Type		Front and rear discs with four channel ABS with EBD (Electronic Brakeforce Distribution)			
Front disc size-mm (2.0-litre)		277 (295)			
Rear disc size-mm		280			
WHEELS AND TYRES					
Wheel size		16 inch /17 inch			
Tyre size		205/55 R16 / 215/45 R17			

AVENSIS EQUIPMENT LIST

SAFETY	T_2	$T_{3\text{-}S}$	$T_{3\text{-}X}$	T_4	T SPIRIT
Driver and passenger airbag	✓	✓	✓	✓	✓
Front side airbags	✓	✓	✓	✓	✓
Driver's knee airbag	✓	✓	✓	✓	✓
Front and rear curtain shield airbags	✓	✓	✓	✓	✓
ISO-FIX child seat preparation	✓	✓	✓	✓	✓
Five 3 point seatbelts with Emergency Locking Retractor	✓	✓	✓	✓	✓
Two stage seat belt warning system	✓	✓	✓	✓	✓
Reinforced rear seat back with seat lock warning	✓	✓	✓	✓	✓
Head impact protection structure (roof, side and pillar)	✓	✓	✓	✓	✓
Anti-submarining seats	✓	✓	✓	✓	✓
De-coupling brake pedal system	✓	✓	✓	✓	✓
INSTRUMENTS & CONTROLS	**T_2**	**$T_{3\text{-}S}$**	**$T_{3\text{-}X}$**	**T_4**	**T SPIRIT**
Trip computer with fuel consumption and average speed display	✓	✓	✓	✓	✓
Sequential transmission mode indicator (automatic)	✓	✓	✓	✓	✓
Engine temperature warning	✓	✓	✓	✓	✓
Door ajar warning	✓	✓	✓	✓	✓
Optitron instrumentation	✓	✓	✓	✓	✓
Digital odometer with two trip meters	✓	✓	✓	✓	✓
Outside temperature display	✓	✓	✓	✓	✓
COMFORT & CONVENIENCE	**T_2**	**$T_{3\text{-}S}$**	**$T_{3\text{-}X}$**	**T_4**	**T SPIRIT**
Turn-by-turn satellite navigation with ETA (Electronic Traffic Avoidance)	×	✓	×	✓	✓
Full colour satellite navigation with European DVD	×	×	Opt	Opt	Opt
Cruise control (n/a on 1.8-litre)	×	×	Opt	Opt	✓
Remote boot release (key fob)	✓	✓	✓	✓	✓
Remote fuel flap release	✓	✓	✓	✓	✓
Illuminated vanity mirrors for driver and front passenger	✓	✓	✓	✓	✓
Electric front windows with "one touch" & anti-trap mechanism	✓	✓	×	×	×
Electric front and rear windows with "one touch" & anti-trap mechanism	×	×	✓	✓	✓
Twin speed wipers & variable intermittent with mist function	✓	✓	×	×	×
Twin speed wipers, variable intermittent with mist and rain sensing function	×	×	✓	✓	✓
Colour keyed and electrically adjustable exterior mirrors	✓	✓	×	×	×
Colour keyed, electrically adjustable	×	×	✓	✓	✓

mirrors - heated and retractable					
Light sensing and anti-glare rear view mirror	×	×	✓	✓	✓
AUDIO	**T_2**	**T_{3-S}**	**T_{3-X}**	**T_4**	**T SPIRIT**
AM/FM radio with preset settings – integrated unique fit with LCD	✓	✓	✓	✓	✓
RDS radio operation with PTY and EON settings	✓	✓	✓	✓	✓
Cassette and single disc CD player	✓	✓	✓	✓	✓
Eight speakers, glass integrated aerial and steering wheel mounted audio controls	✓	✓	✓	✓	✓
VENTILATION	**T_2**	**T_{3-S}**	**T_{3-X}**	**T_4**	**T SPIRIT**
Air conditioning	✓	✓	×	×	×
Front dual zone air conditioning with digital climate control	×	×	✓	✓	✓
Electronic air recirculation	✓	✓	✓	✓	✓
Electric tilt/slide glass sunroof with shade and anti-trap facility	×	×	×	Opt	Opt
Clean air filter	✓	✓	✓	✓	✓
SECURITY	**T_2**	**T_{3-S}**	**T_{3-X}**	**T_4**	**T SPIRIT**
Remote control central locking with double locking facility	✓	✓	✓	✓	✓
Transponder immobiliser and remote alarm with perimeter and microwave protection	✓	✓	✓	✓	✓
Security window etching - linked to 24hr helpline	✓	✓	✓	✓	✓
Vehicle parts marking – major parts traceable to VIN	✓	✓	✓	✓	✓
STORAGE	**T_2**	**T_{3-S}**	**T_{3-X}**	**T_4**	**T SPIRIT**
Illuminated and lockable glove box	✓	✓	✓	✓	✓
Centre console storage box	✓	✓	✓	✓	✓
Driver and passenger seatback pockets	✓	✓	✓	✓	✓
SEATING, UPHOLSTERY & TRIM	**T_2**	**T_{3-S}**	**T_{3-X}**	**T_4**	**T SPIRIT**
Manual multi-adjustable front seats	✓	✓	✓	✓	×
Electric multi-adjustable front seats	×	×	×	×	✓
Electric lumbar support for driver’s seat	×	×	×	×	✓
Foldable rear seat back (saloon)	✓	✓	×	×	×
60/40 split/fold rear seat back (saloon)	×	×	✓	✓	✓
SEATING, UPHOLSTERY & TRIM	**T_2**	**T_{3-S}**	**T_{3-X}**	**T_4**	**T SPIRIT**
60/40 split/fold rear seat back and cushion (Hatchback and Tourer)	✓	✓	✓	✓	✓
Cloth upholstery with cloth door inserts	✓	✓	✓	✓	×
Leather upholstery with leather effect door inserts	×	×	×	×	✓
Leather and metallic-effect gear shift knob	×	×	✓	✓	✓
Black centre console, door switch	✓	✓	×	×	×

surround trim and Instrument panel surround					
Metallic-effect centre console, door switch surround trim and Instrument panel surround	×	×	✓	✓	✓
Metallic-effect door scuff plates	×	×	✓	✓	✓
Chrome-effect interior door handles	×	×	✓	✓	✓
Four-spoke steering wheel with integrated audio controls	✓	✓	×	×	×
Leather trimmed four-spoke steering wheel with integrated audio controls	×	×	✓	✓	✓
Front and rear fog lamps	×	×	✓	✓	✓
Red tone rear light cluster	✓	✓	✓	✓	✓
Colour keyed door handles and mirrors	✓	✓	✓	✓	✓
Body coloured front grille with chrome surround	✓	✓	✓	✓	✓
16-inch steel wheels with full wheelcaps	✓	×	×	×	×
16-inch 8-spoke alloy wheels with locking wheelnuts	×	✓	×	×	×
16-inch 5-spoke alloy wheels with locking wheelnuts	×	×	✓	×	×
17-inch 10-spoke alloy wheels with locking wheelnuts	×	×	×	✓	×
17-inch 7-spoke alloy wheels with locking wheelnuts	×	×	×	×	✓
18-inch 9-spoke alloy wheels with locking wheelnuts	Opt	Opt	Opt	Opt	Opt