Press Information on Toyota Displays at The 27th International Tokyo Motor Show

October 1987

TOYOTA MOTOR CORPORATION

High-Performance Specialty 2-Door Coupe·····Future Experimental Vehicle II

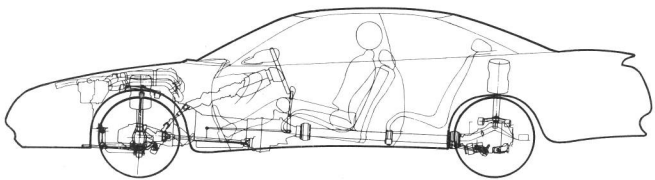
TOYOTA FXV-II

CONCEPT

The FXV-II is the forerunner of high-performance specialty 2-door coupes for the 90's, developed to actualize the advances in technology and performance made during Toyota's 50 years of automotive manufacturing experience.

This full working experimental vehicle was developed to provide the many functions that will be required in the high-performance specialty cars of tomorrow, including faster, more comfortable, safer, and more exciting driving in all kinds of weather over all kinds of road conditions.

Basic Structure



■Basic Specifications

Basic layout		Full-time 4-wheel drive 2-door coupe
Overall length		5,090 mm
Overall width		1,860 mm
Overall height		1,325 mm
Wheelbase		2,800 mm
Tread	Front	1,575 mm
	Rear	1,575 mm

Engine	Displacement	3.8 ℓ
	Max. output	235 ps/5,600 rpm (JIS net)
	Max. torque	33 kg-m/4,000 rpm (JIS net)
Top speed		260 km/h

■ THE EXTERIOR — Form and Equipment

- Aero-trapezoid form
- Crystal Canopy
- Polarized Roof with Light/thermo Intensity Control
- Composite Elliptical Reflector Headlamps & Foglamps
- Metal-colored Rear Combination Lamps
- Automatic Wipers
- Automatic Anti-glare Door Mirrors
- Ceramic Conductive Thin Film Defoggers & Defrosters
- Ceramic Conductive Thin Film Antennas
- High-mounted LED Brake Lamp
- Flush-surface Door Handles

■ THE COCKPIT AND INTERIOR

- User-friendly Interior
- The 12-way Power Seat
- Passenger Seat Ottoman
- IC Card-activated Operating System
- Toyota Multi Information System
  1. Large Black-masked LCD Meters
  2. Twin CRT Displays
  3. IC Card-based Information
  4. Navigation System
  5. Hands-free Mobile Phone
  6. Other Driving Information
- Audio System
  1. Automatic CD Platter Changer
  2. Position Selector
- Passenger Sensor Control System

■ THE BODY STRUCTURE

- High-rigidity Body
- Low-vibration, Low-noise Body
- Effortless Access System
- Integrated Rear Spoiler

■ THE INTEGRATED VEHICLE MANAGEMENT SYSTEM

[THE 32-VALVE V8 EXPERIMENTAL ENGINE]

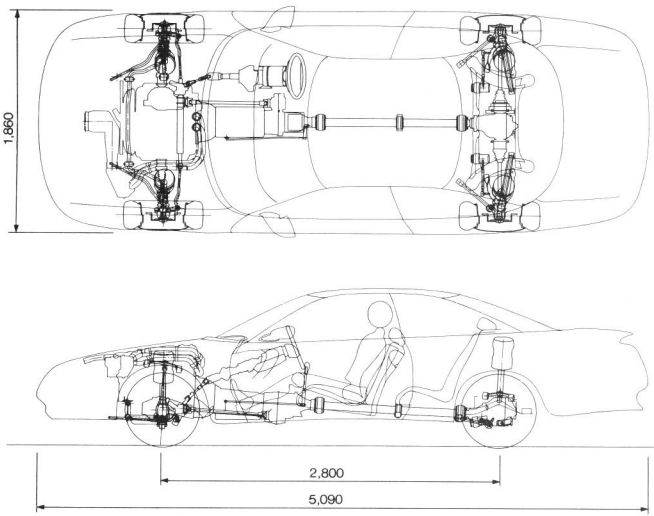
- 4-camshaft DOHC 32-valve System
- High-rigidity All-aluminum Block
- New Variable Intake System
  1. Dual intake manifolds
  2. Twin throttles
  3. Variable intake mechanism
- Forced Oil-cooled Pistons
- New Advanced Engine Control
- Non-mechanical Throttle Control
- Active-control Engine Mounts
- Hydraulic Radiator Fan System

■ THE EXPERIMENTAL AIR SUSPENSION

- 4-wheel Double Wishbone Suspension
- Toyota Electronic Controlled Active Air Suspension
- Electronic Controlled Active 4-wheel Steering
- Progressive Power Steering
- Electronic Controlled Full-time 4-wheel Drive
- Anti-lock Brake System
- New Electronic Controlled 4-speed Automatic Transmission
- Viscous-coupled Limited Slip Differential
- Traction Control System (TRC)
- Radar Cruise Control
- Tire Pressure Warning System


Ceramic Conductive Thin Film Defoggers and Antennas
Metal-colored Rear Combination Lamps
Polarized Roof with Light/thermo Intensity Control
Ceramic Conductive Thin Film Defrosters and Rain Sensor Wiper
Automatic Anti-glare Door Mirror
Composite Elliptical Reflector Headlamps & Foglamps
Radar Cruise Control's Radar Unit
FXV-II

■ Elevation Drawings



The Exterior

■ CONCEPT

— Developing the Aero-trapezoid form.

The FXV-II is 5090 mm long, 1860 mm wide, and 1325 mm high. While putting the many advanced technologies necessary for a high-performance specialty car of the 90's in the wide, low package, we also gave it a soft, curved form.

The sleek silhouette is a fusion of flowing elegance and dynamic movement. The center of gravity is low, the stance wide, and the form is based on a simple, visually well-balanced, three-dimensional trapezoid. The body sides and top blend smoothly and gracefully together. And the overall result is an advanced Aero-trapezoid form of a new and higher level — an indication of the newest trends in Toyota body design.

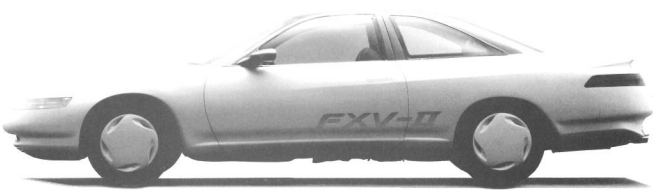
■ NEW TECHNOLOGIES

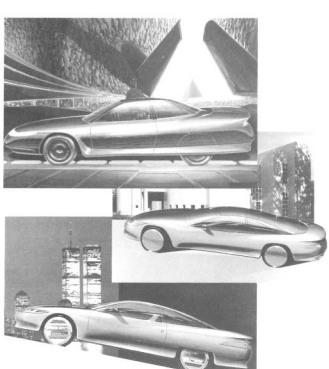
1. Crystal Canopy

By using glass with light/thermo intensity control liquid crystals for the polarized roof, we were able to create an all-glass greenhouse. Furthermore, the side door glass in not recessed at the beltline, so the connecting surfaces of cabin and body are completely smooth, which results in a coefficient of drag of only 0.26 and adds to the visual perception of quality.

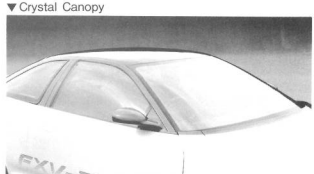
2. Polarized Roof with Light/thermo Intensity Control

The interior feels wide open because the entire roof is of glass, impregnated with liquid crystals. By subjecting the liquid crystals to an electric charge, the roof is changed from clear to milky white, producing a curtain effect. Thus the driver can control the amount of direct sunlight as he wishes.





▼Crystal Canopy



▼Polarized Roof with Light/thermo Intensity Control

3. Automatic Anti-glare Door Mirrors
The anti-glare door mirrors use electrochromic elements that automatically reduce reflected glare from overtaking vehicles. First, the ambient light sensors determine whether it is day or night. Then, if the decision is night, a comparison is taken between brightness from the front and from the rear. If glare comes from the rear, the mirrors automatically switch to the anti-glare mode.

4. Automatic Wipers
If the windshield wipers are set in their automatic mode, rain on the windshield will trigger a transparent sensor which turns on the wipers. Furthermore, the interval between wiper swipes is automatically regulated according to vehicle speed and precipitation volume.

5. Ceramic Conductive Thin Film Defoggers & Defrosters
This new equipment is imbedded in the windshield, door, and rear window glass. It melts frost and ice from the glass quickly, maintaining the necessary field of vision. As the thin ceramic conductive film used is completely transparent, it does not interfere with the visibility.

6. Ceramic Conductive Thin Film Antennas
The use of thin transparent ceramic conductor film for the AM/FM radio and TV antennas means that they do not interfere with the field of vision. The TV antennas are on the rear quarter windows and the AM/FM radio antenna is on the rear window.

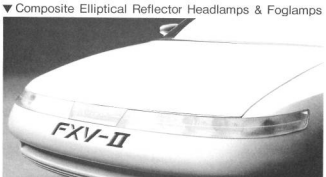
7. Composite Elliptical Reflector Headlamps & Foglamps
With the use of composite elliptical reflectors, the outer lens can be sharply slanted and very narrow, which improves aerodynamics. And, because they make more efficient use of light, even smaller sizes will be able to amply illuminate the road some distance ahead.

8. Metal-colored Rear Combination Lamps
The rear combination lamps have reflective film strapped to the inner lenses to reflect ambient light. Thus, when the lamps are off, the colors of the lenses are not apparent because the reflective film gives them a metallic tone.

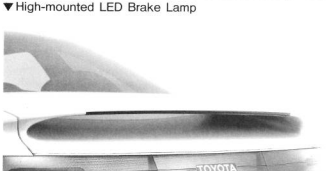
9. High-mounted LED Brake Lamp
Light-emitting diodes are the light source for the brake light strip, which is integral to the rear spoiler and high-mounted so that it can be more readily seen from overtaking vehicles.

▼ Automatic Anti-glare Door Mirror

▼ Composite Elliptical Reflector Headlamps & Foglamps



▼ High-mounted LED Brake Lamp



▼ Metal-colored Rear Combination Lamps

The Interior

■ CONCEPT

The interior of the FXV-II is an open, airy, comfortable design, developed to present an aura of sophistication while being user-friendly at the same time. In the cockpit, the instruments are up high where they are easily seen, and the switches and levers are down low, right at the driver's fingertips. This configuration offers both superior visibility and excellent operative convenience. The seats are form-fitting, with the interior trim matched to the seats. All in all, we were quite successful in creating a new trend in user-friendly interiors.

Furthermore, the FXV-II takes the passenger car concept a step farther with state-of-the-art electronics that provide an effortless access system, communications between the car and the outside, and an audio system that's ahead of its time.

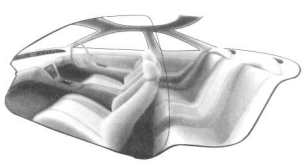
■ NEW TECHNOLOGIES

1.The 12-way Power Seat

The power-assisted seat automatically adjusts 12 ways to fit the driver via the preset memory in his IC card, offering the best possible driving position.

2. Passenger Seat Ottoman

The passenger seat has an ottoman-type leg rest for added comfort. When not in use, it fits into the front edge of the seat; in use, it extends easily to the position most comfortable for the occupant.



▼Front Seats

▼Instrument Panel

4. Toyota Multi Information System

This is an integrated information system, with two color CRT displays and large LCD meters at its core. The system displays navigation maps, television, telephone, driving information, warnings, etc., giving both driver and passenger various useful information.

(1) Large LCD meters: The high-contrast, high-resolution Liquid Crystal Display (LCD) meters use bar graphs for highly legible display of vehicle speed and engine revolution information. The 10-inch CRT, set in the dash board, reflects in the center of the instrument panel. Behind the reflection is a large digital speedometer. When the digital speedometer is turned ON, the CRT goes OFF, so the digital readout, which is especially useful at high speeds, can easily be seen.

(2) Twin CRT Displays: There are two CRT displays, a 10-inch CRT that shows information for driver and 6-inch CRT that shows information for the passenger. The information is displayed via transflective mirrors so legibility is excellent.

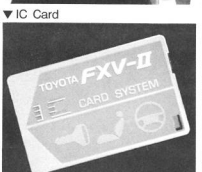
(3) IC Card-based Information: The IC card can be used to display specific information such as telephone directories, addresses, ferry boat and other timetables, and expressway toll charges. Changes in or additions to directories and addresses can be made right on the CRT.

(4) Navigation System: The navigation system uses the satellite signals of the Global Positioning System (GPS) to determine the exact geographical position of the vehicle. The position is then displayed on the 10-inch CRT, then the direction of travel and distance to destination come up on the 6-inch screen. When GPS cannot be used, the vehicle's navigation system uses a gyro compass and magnetic north sensor to dead-reckon the vehicle's position.

▼ Large LCD Meters

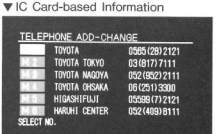
▼ Twin CRT Displays

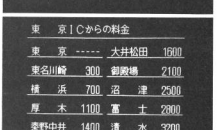
▼ IC Card



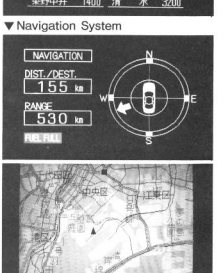
▼ Setting of IC Card

▼ IC Card-based Information





▼ Navigation System



(5) **Hands-free Mobile Phone:** With the microphone, one-touch call switch, and call termination switch built into the steering wheel, the mobile phone can be used without changing the natural driving position. Even while driving, the system allows one-touch phone answering, hang-up, or preprogrammed dialing. Further, when parked, the remote control keyboard can be used to dial, code dial, and call up displays such as a telephone directory, which can be changed, added to, or edited with the keyboard.

(6) **Other driving information:** In addition to information from the G-meter, which records the degree and direction of inertia generated in acceleration, deceleration, or cornering, radar cruise control information, diagnostic and various maintenance information, and other driver information can be displayed on the CRT screen.

5. IC Card-activated Operating System

The door locks and the ignition switch are controlled by an IC card containing the driver's personal identification code on special memory circuits. The system recognizes the card code and automatically adjusts the driver's seat and steering wheel position to match the cardholder's preprogrammed preferences. The vehicle also has an anti-theft system that starts sounding the horn and blinking the lights the moment a break-in is sensed.

6. Audio System

(1) **Automatic CD Platter Changer:** Holds up to 12 CD discs and can play them one after the other, automatically.

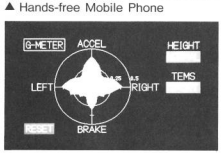
(2) **Position Selector:** A wireless remote control unit allows the listener to choose among DRIVER, FRONT, REAR, and ALL, which sets speaker sound levels to match the listener position selected. If the system is left in its AUTOmatic mode, sensors in the seats will ascertain how many passengers are in the vehicle and what positions they are seated in, and set the sound level accordingly to achieve the best possible sound fidelity.

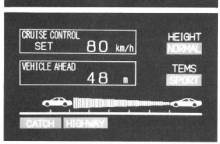
7. Passenger Sensor Seats

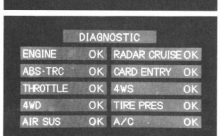
Sensors in the seats automatically determine when someone is sitting in them. The seats then automatically adjust via the IC card-activated operating system, depending upon whether or not there are passengers in the rear seats.

▲ Hands-free Mobile Phone

◀ Other Driving Information





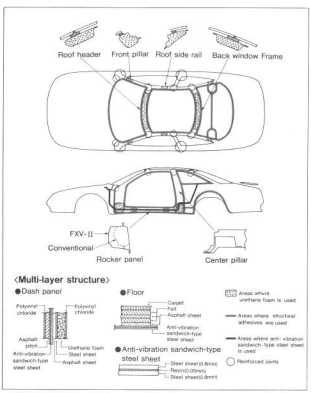


Body Structure

▲Finite Element Method Analysis

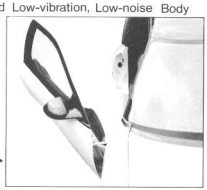
■ CONCEPT

In order to realize the vehicle's full performance potential and to assure superior quietness, the body must have a high degree of stiffness and measures must have been taken to reduce noise and vibration. The FXV-II's high-rigidity, low vibration body was achieved with the use of a number of new technologies and structural designs.



▲High-rigidity and Low-vibration, Low-noise Body

Effortless Access System ▶



▼Integrated Rear Spoiler

1. High-rigidity Body

To achieve the objectives above, the body must be made as rigid as possible. Finite Element Method (FEM) analysis was used, and rigidity was increased in three major ways:

1) The cross-sectional size and shape of frame components such as rocker panels and pillars were scrutinized and designed for greater rigidity. The roof header was given a closed cross section as well.
2) The joints of the front pillars, center pillars, and other important structural components were designed for the greatest possible strength and stiffness with the least possible weight.
3) Weld bond was applied to the connecting surfaces of structural components and the pitch between spot welds was set for maximum effect on rigidity.

2. Low-vibration, Low-noise Body

If a vehicle is to achieve superior quietness, the sources of noise and vibration must be searched out and eliminated, and the body structure must be improved as much as possible. With the FXV-II, we have achieved excellent rigidity and have controlled vibration and noise through the use of new technology and new structural design.

1) The dash, floor, and cowl panels as well as the room partition are of three-layer sandwich paneling to insulated against sound and vibration.
2) The pillars are filled with urethane foam to prevent noise from travelling through them.
3) The body, including the doors, has completely flush surfaces. The cabin surfaces are all glass to glass. And wind noise has been cut to the minimum.

3. Effortless Access System

The effortless access system includes four-link door hinges that allow the front of the doors to swing away from the body, which makes getting in and out of the car in tight places much easier. Further, all the passenger needs to do is close the door until the latch clicks. After that, the power closer system assures that the door is completely closed.

4. Integrated Rear Spoiler

- The rear spoiler is an integral part of the trunk lid, which results not only in a pleasing design but also in excellent stiffness.
- Aramid fiber reinforced plastic is used for the hood and fenders as well as for the trunk deck/rear spoiler.

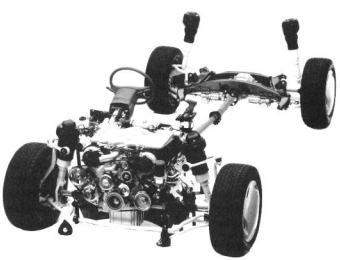
Integrated Vehicle Management System

■ CONCEPT

The motion of a car can be divided into six elements: longitudinal, lateral, vertical, yaw, roll, and pitch. In reality, however, vehicular motion is a complex combination of all six. Thus, the most important function of total vehicle management is to safely control the forces generated by the tires according to the driver's expectations.

▼ Components and Systems

Engine	• New high-performance V8 engine
Drive train	• 4-wheel drive • 4-speed automatic transmission
Brakes	• 4-wheel disc brakes • Anti-lock brake system • Hydraulic booster
Suspension	• 4-wheel double wishbone air suspension
Steering	• Electronic controlled active 4-wheel steering • Advanced progressive power steering
Tires	• Low profile, high performance 230/55 VR415 tires
Body	• Highly rigid body with superior aerodynamics



Progress toward vehicle management has so far produced Electronic Fuel Injection (EFI), Electronic Controlled Transmission (ECT), Anti-lock Brake System (A.B.S.), Toyota Electronic Modulated Suspension (TEMS), and Progressive Power Steering (PPS).

Now, a sophisticated electronics-based integrated vehicle management system is necessary to provide more effective, total control of these engine, drive train, suspension, brake, and steering systems.

The FXV-II exhibits proven mechanics and a sophisticated vehicle management system that has been achieved through the use of advanced electronics.

The results are:

1. **Considerable improvement in total vehicle performance.**
2. **Improved basic performance.**
3. **A greater margin of safety and reduced driver effort.**

Thus Toyota developed an integrated vehicle management system that makes a car even more enjoyable to drive.

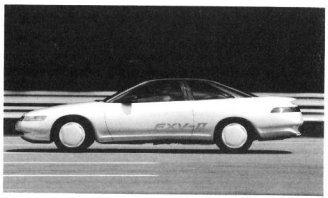
Here is what the integrated vehicle management system of the FXV-II offers:

1. When expressway surfaces are wet and slick, or when a strong wind is blowing, the driver can enjoy relaxed driving because of the superior straight-line stability. When driving through bad weather and over bad roads, and when making sudden lane changes, etc., the management system gives the steering the right amount of feedback while stabilizing the vehicle posture at the same time, so the vehicle responds properly to steering input.
2. When travelling over hilly roads with many curves, the driver feels confident and can steer precisely because of the increased steering feedback, the smooth acceleration and deceleration, and less roll and other body motion.
3. When driving on snowy or icy roads, the driver can accelerate, brake, and steer with complete confidence because the management system assures an excellent level of acceleration/deceleration performance and turning stability;
4. When driving at high speeds over long distances, and when driving in city traffic, the driver can operate the car with minimum effort because the vehicle management system automatically maintains the proper distance from vehicles ahead.

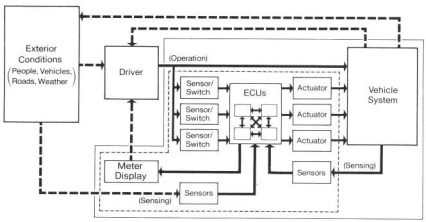
■ THE COMPOSITION OF THE FXV-II INTEGRATED VEHICLE MANAGEMENT SYSTEM

1. Superior Basic Mechanism

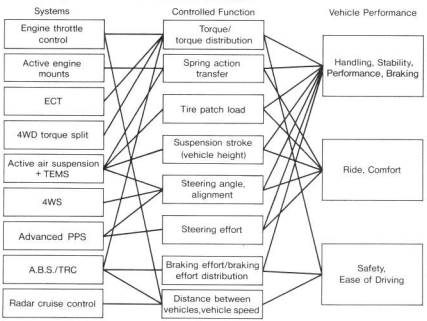
The first requisite to developing an integrated vehicle management system is that the vehicle to be managed must have superior basic mechanisms. If the vehicle's basic design is superior, then its performance can be considerably improved through detailed and sophisticated controls. In developing the management system for the FXV-II, we first made certain that the vehicle had superior basic mechanisms. Upon those mechanisms, as can be seen in Fig. 2., we developed interacting electronic control systems that widen the driver's horizons and make the vehicle much more exciting to drive.



■ Fig.1. Integrated Vehicle Management System Schematic



■ Fig.2. Interrelationships of Control Systems and Controlled Functions



The 32V 3800i Experimental V8 Engine

■ CONCEPT

It has been more than eight years since the first new generation Toyota engines, which offer high performance, low fuel consumption, quick response, light weight, and compact size, were announced. We have consistently answered the needs of the times by further developing engine technology. In 1986, Toyota announced family-car-use DOHC engines that offered not only high power and low fuel consumption, but also quieter operation and increased torque in the low-to-mid ranges.

The 32V 3800i experimental V8 engine is based upon this advanced engine technology. Its 3.8 liters of displacement guarantee more than sufficient torque across the range. And its 8-cylinder configuration results in extra-quiet operation. Combined with very smooth acceleration response, these characteristics show that this is the engine of the 90's.

▼Specifications

• Configuration	90° V8
• Displacement	3.8ℓ
• Cylinder block	Cast aluminum
• Valve train	4-valves per cylinder, DOHC
• Max. power	235 PS/5,600 rpm (JIS net)
• Max. torque	33kg-m/4,000 rpm (JIS net)

■ NEW TECHNOLOGIES

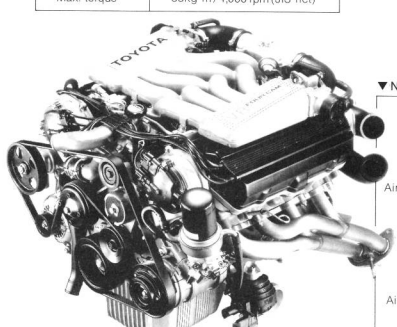
1. The 4-camshaft DOHC 32-valve System
The 4-camshaft DOHC 32-valve system of the experimental V8 engine is based on our proven compact DOHC 4-valve-per-cylinder engines with scissors-gear-driven valve trains.

2. The Rigid All-aluminum Block
The silicon-aluminum alloy block is both light-weight and very rigid.

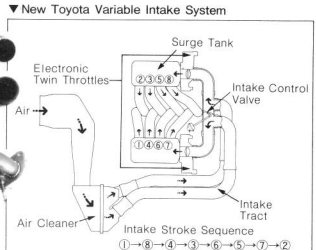
3. The New Variable Intake System
- **Dual intake manifolds:** Dual surge tanks reduce intake interference between cylinders and increase power output.
- **Twin throttles:** Each surge tank has its own throttle, which results in quicker response.
- **Variable intake mechanism:** By dividing the intake tract of each cylinder completely in two, and by lengthening the tracts, we were able to increase low-end torque. Further, by opening the intake control valve in the medium rpm range, mid-range torque is also increased.

4. Forced Oil-cooled Pistons
Oil is shot through nozzles against the underside of the pistons, cooling them and helping control knocking, which allows a higher compression ratio and improvesfuel efficiency.

5. Reduced Vibration and Noise
Vibration and noise are reduced with the rigid aluminum oil pan and composite-construction head covers.



▼New Toyota Variable Intake System



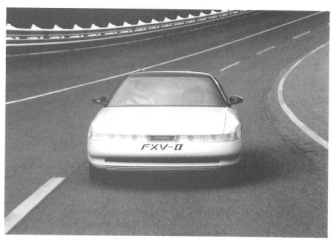
■ CONTROL SYSTEMS

1. New Advanced Engine Control
The ideal ignition timing and fuel injection volume is set based on signals from the combustion pressure sensors mounted in each cylinder. Then, feedback control based on the feedback of the wide-range air-fuel mixture sensor in the exhaust pipe makes minute adjustments. Thus stable idling, and increased power output and fuel efficiency are achieved.

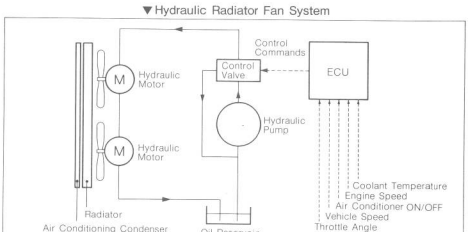
2. Non-mechanical Throttle Control
This system allows control of the engine output according to road conditions and driver preferences, increasing driving enjoyment. Instead of the throttle angle reacting in a linear fashion to accelerator operation, the non-mechanical throttle control is non-linear. It also takes into consideration the gear shift position and the electronic-controlled transmission mode. The end result is that the vehicle responds more closely to what the driver expects when depressing the accelerator. Furthermore, the throttle system interacts with the radar cruise control and tractioncontrol systems.

3. Active-control Engine Mounts
Riding comfort and quietness are both enhanced by automatically computer-controlling the engine mounts' spring rate and damping force among three settings — SOFT, HARD1, and HARD2 — according to the conditions under which the vehicle is running.

4. Hydraulic Radiator Fans
The radiator fans are operated by hydraulic pressure from the oil pump. The amount of pressure is controlled by a magnetic solenoid valve so the system gets enough cooling capacity when climbing hills or idling in congested traffic, etc.



▼Hydraulic Radiator Fan System



The Experimental Active Suspension System

■ CONCEPT

Toyota developed the suspension with the objective of creating a vehicle that fits the perceptions and sensitivity of the driver exactly, allowing the driver and the vehicle to operate as a single entity.

In pursuing this objective, we developed the Toyota electronic controlled active air suspension system, the electronic controlled 4-wheel steering system, the electronic controlled permanent 4-wheel drive system, and the traction control system — all of which compose the chassis and experimental air suspension system of the FXV-II.

■ NEW TECHNOLOGIES

1. Toyota Electronic Controlled Active Air Suspension

Improved running stability, improved ride, and improved vehicle posture with reduced rolling, pitching, bouncing, etc., were achieved with 4-wheel double wishbone air suspension, which independently controls the spring rate, damping force, and clearance height of each wheel according to driving conditions.

<Functions>

(1) **Vehicle height selector switch:** The driver can select either Normal Automatic Mode or High Automatic Mode with a single switch.

(2) **Speed-sensing height control:** At high speeds, the front and rear vehicle heights are lowered by 20 mm to improve handling, stability, and aerodynamics.

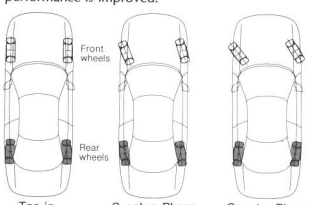
(3) **Preview control:** If the road condition sensors judge that surface conditions ahead of the vehicle are bad, the vehicle height is automatically raised, and the spring rate and shock absorber damping force adjusted to improve the ride.

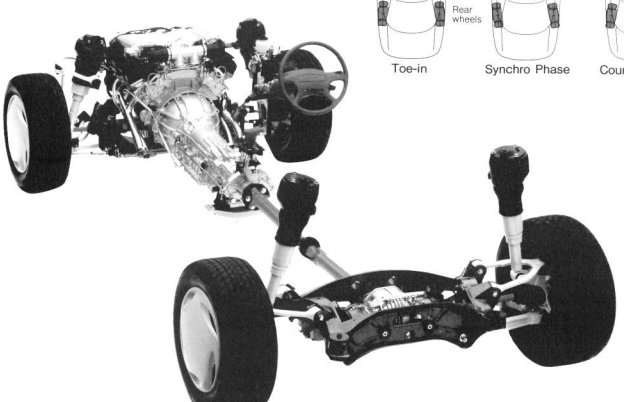
(4) **Active posture control:** Controls the rolling, pitching, and bouncing of the body so as to actively cope with various driving conditions, which improves both handling and stability.

(5) **Ride selector switch:** The driver can select either sporty or soft ride characteristics, changing the spring rate and damping force of the shock absorbers with the switch provided.

2. Electronic Controlled Active 4-wheel Steering

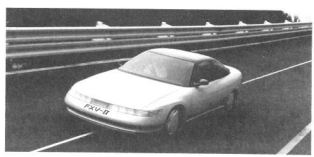
Drive-by-wire control of the rear wheels includes counter-phase steer, synchro-phase steer, and even toe-in control. Precise control of these characteristics improves low-speed tight turns, high-speed stability, and straight-line stability in cross winds. Further, with the yaw-rate feedback control, both lane-changing and cornering performance is improved.





3. Advanced Progressive Power Steering
In addition a vehicle speed sensor, this system has a steer angle sensor. Thus, steering effort can be adjusted to match both vehicle speed and steer angle at the same time. The computer controlling the new progressive power-assist will gradually increase the effort needed to steer as the car continues in a straight line. On the other hand, if the steering wheel is turned from side to side, the computer senses that the driver is maneuvering, and causes the steering effort to get lighter.

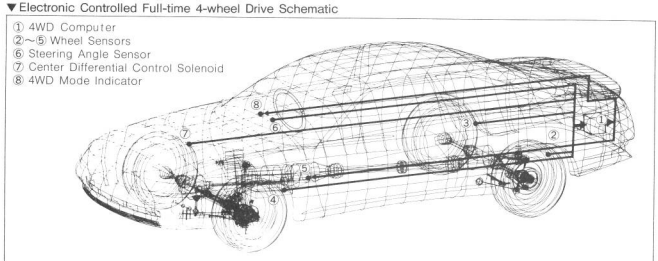
4. Electronic Controlled Full-time 4-wheel Drive
Toyota was able to develop a 4-wheel drive system that electronically controls torque distribution to the front and rear wheels to ideal levels. The system integrates control of the torque split mechanism, Anti-lock Brake System, Toyota electronic controlled active air suspension, electronic controlled 4-wheel steering, engine, etc., to match both road surface and vehicle operating conditions.



The torque split mechanism utilizes a multi-plate wet clutch situated in the planetary gear center differential between the front and rear drive shafts. The hydraulic pressure in the clutch is electronically controlled, reacting to signals from wheel speed, throttle angle, brakes, etc., to deliver the ideal ratio of torque to each wheel that is needed to meet current driving conditions.

By using a small-pitch silent chain-driven front drive, a dual mechanism transfer case, and a front drive shaft whose joint angle is virtually eliminated, mechanical noise is reduced to minimal levels.

▼Electronic Controlled Full-time 4-wheel Drive Schematic

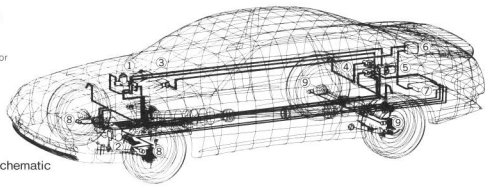


▼Electronic Controlled Full-time 4-wheel Drive Torque Distribution Chart

Condition		Center Differential Control		Results
		Differential Control	Torque Distribution	
Quick Acceleration		Differential controlled to match throttle angle and transmission gear position	Distributed according to dynamic vehicle weight distribution	Torque split between front and rear wheels is regulated for the greatest possible acceleration effect
High-speed Cruising		↑	↑	Achieves superior straight-line stability regardless of tirbulence
Quick Turn, Quick Acceleration	Dry Road	↑	↑	Prevents spin and drift, to achieve more precise, safer response to driver input
	Slippery Road			
Braking		Free	Front wheels ·····30% Rear wheels·····70%	Matches A.B.S. system perfectly
Low Speed, Large Steering angle	(Dry Road)	↑	↑	Eliminates tight cornering brake effect, to achieve the best possible handling qualities
Starting Out (Slippery Surface)		Locked	Front wheels ·····50% Rear wheels·····50%	Prevents getting stuck and achieves positive traction even on slippery roads

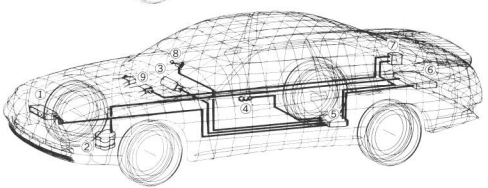
■ A.B.S./TRC Schematic

① Hydraulic brake booster
② A.B.S. actuator
③ Electronic twin trottle actuator
④ TRC actuator
⑤ Oil pump
⑥ Throttle control computer
⑦ A.B.S. & TRC computer
⑧ Front wheels sensor
⑨ Rear wheels sensor



■ Radar Cruise Control Schematic

① Laser radar
② Brake actuator
③ CRT display
④ Warning buzzer
⑤ Radar Cruise Control computer
⑥ A.B.S. & TRC Computer
⑦ Throttle control computer
⑧ Cruise control switch
⑨ Electronic twin throttle actuator



5. Viscous-coupled Limited Slip Differential (LSD)
The rear limited slip differential employs a viscous coupling for smoother slip control, and improved handling and stability.

6. New Electronic Controlled 4-speed Automatic Transmission
The electronic controlled 4-speed automatic transmission is designed to take full advantage of the potential of the new four-cam DOHC 32-valve experimental V8 engine. The new Electronic Controlled Transmission senses the torque output of the engine via signals from the throttle sensor, instead of from the throttle cable, and adjusts hydraulic pressure accordingly, achieving smooth shifting. Furthermore, hydraulic control of the clutch's lockup mechanism has measurably reduced shock at the lock-up point, making superior driveability possible across the range.

7. Anti-lock Brake System
Controllability and stability were assured by adopting an A.B.S. developed specifically for full-time 4-wheel drive.

8. Traction Control System (TRC)
This system assures sufficient traction when starting out or accelerating on slippery surfaces. This is accomplished by controlling the engine and brakes electronically, with the objective of preventing free-wheeling or changes in vehicular deportment. By adopting this system to the full-time 4-wheel drive, we were able to realize performance heretofore impossible.

9. Radar Cruise Control
Sensors that utilize pulsating laser-emitting semiconductors determine the distance between the car and the vehicle or object ahead, and control vehicle speed to maintain a safe distance between the two. The driver can choose between <HIGHWAY> and <TOWN> modes. The system functions as follows:

(1) Vehicle distance-maintaining cruise control: If the car gets too close to the vehicle ahead while in cruise control mode, the computer will let off on the accelerator until the proper distance is reached, then resume the speed necessary to maintain that distance.
If letting off on the throttle fails to decelerate the car fast enough to increase the distance from the vehicle ahead, the computer will activate the brakes to decelerate more quickly.

(2) Stop control: If the vehicle ahead gradually comes to a stop while the car is in the cruise control mode, the computer will release the throttle, stopping the car a safe distance from the preceding vehicle. When the preceding vehicle starts moving and the distance between cars increases enough, the computer releases the brakes.

(3) Indications and warnings: The distance from preceding vehicle, cruise control speed, and cruise control mode are displayed on the CRT. If an obstacle is sensed, the system gives warning.