

**CUTAWAY / CUTMODEL**

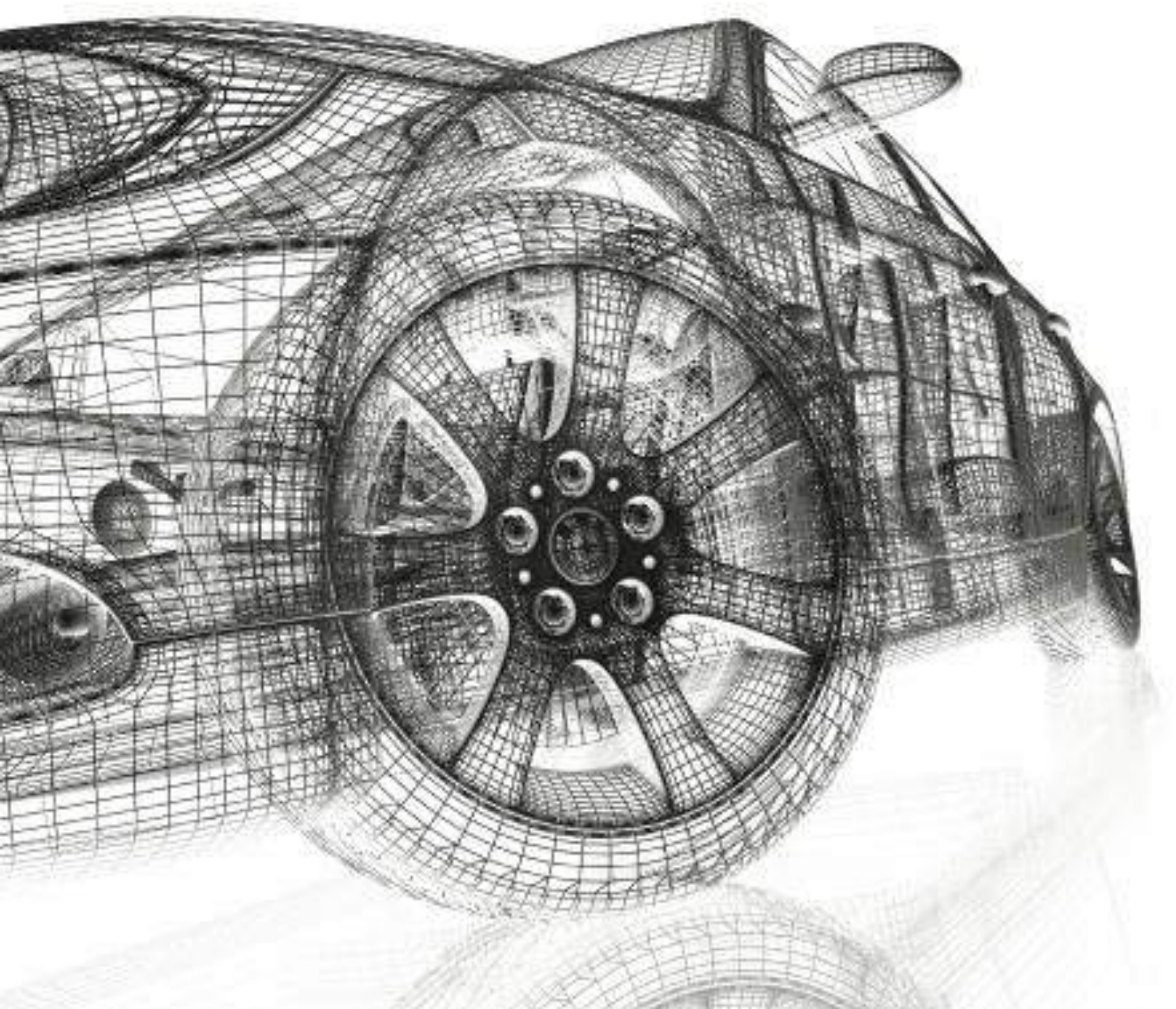
**SIMULATOR**

**ENGINE BENCH**

**DIAGNOSIS**

**EDUCATIONAL MATERIAL**

**CHASSIS CUTAWAY / VEHICLE CUTAWAY**



# CUTAWAY / CUTMODEL

Our company has been involved for many years in the production of technical exhibits and educational cut models that are displayed at various events and exhibitions.

In particular, our various automobile-related models have received numerous orders from automobile manufacturers and automobile parts manufacturers, and have been exhibited at motor shows both in Japan and overseas.

## ▼ Gasoline and diesel engines



Three-cylinder



Four-cylinder



Horizontally opposed  
6-cylinder



DPF-NOx catalytic converter



EGR cooler



Common rail components

## ▼ Transmissions



FR 5-speed A/T



FF 5-speed M/T



CVT transmitter



## ▼ Brakes, steering gears, electrical components



Brake booster



Electric power steering gear



Hydraulic power steering gear



ABS actuator

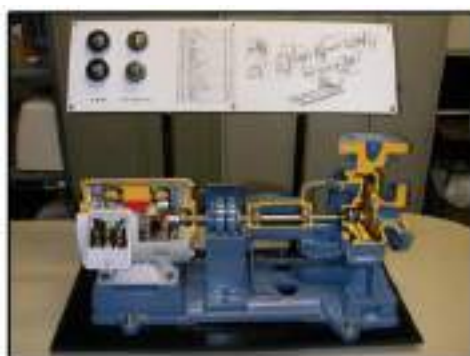


Power window motor



Various electrical components

## ▼ Pumps, valves, motors



Centrifugal pump



Flow control valve



Area flow meter



Differential pressure



Three-way solenoid valve



Motor

# SIMULATOR

Our various simulators are basically based on the textbooks issued by the Japan Automobile Service Promotion Association (JASPA), and we try to select the parts of actual vehicles to duplicate. The structure and principle of operation, which are difficult to understand from textbooks, are reproduced in an easy-to-understand manner.

## ◀ Automatic air conditioner simulator

This fully-automatic air conditioner simulator can be used for a wide range of purposes, including confirmation of actual operation, practical training on the components and various control systems.

It allows you to perform various fault diagnoses using the on-board controller, different measurements according to the circuit diagram of the automatic amplifier, diverse measurements using a separate check adapter and a SW BOX for the measurement of automatic amplifier, and practical training on various control systems.

Moreover, for the fully automatic air conditioners equipped with Nissan Z11 and K12, we created a simulator that visualizes the four parts of the blower unit and allows you to confirm the movement of the air mix door, foot door, DEF door, and blower fan.



## EPS simulator ▶

You can install the steering device, front axle, suspension, tires, etc. mainly on the EPS system of the vehicle and experience the EPS system as if you were driving a rear vehicle.

A wide range of practical training is available, including EPS C/U failure diagnosis.





## ▼ Electrical component simulator boards



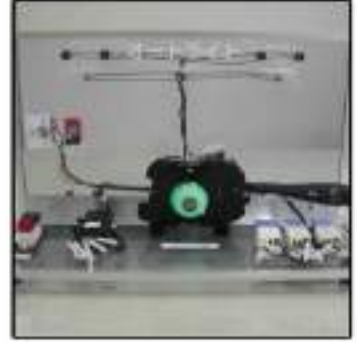
Light board



Wiper motor



Power window



Auto light

## ▼ Electrical component simulators



Starting system



Ignition system



ABS vehicle speed sensor

## ▼ Other simulators



Disassembly and assembly  
of rear axle



Wheel alignment



CAN communication

# ENGINE BENCH

We strive to manufacture products that meet your requirements according to your purpose of use, budget, etc. In order to make products that are as inexpensive as possible and that are suitable for training purposes, we reuse recyclable engines and various parts from used vehicles and accident vehicles. We have already delivered more than 300 units to various schools and educational institutions.



Toyota 1G-FE gasoline engine

## ◀ Bench series for comprehensive training

This system, which is equipped with engine, A/T (CVT), automatic air conditioner, etc., is used for providing advanced and comprehensive hands-on training in inspection and fault diagnosis of the electronic control systems, including chassis and electrical components.

By using the check adapter as per the ECU terminal arrangement on the check board (box) for the ECU inspection and fault diagnosis of the engine and transmission, various voltage measurements, waveform observations, etc. can be performed. In addition, a wide range of practical training on the control system can be performed by setting up disconnection and short-circuit of various sensors, etc. using SW and variable resistors, etc. for fault diagnosis.

By installing a load mechanism, lock mechanism, etc. to the A/T as requested, a wide range of practical training such as A/T shifting status, hydraulic pressure change, stall test, etc. can be performed.

## Bench series for disassembly and assembly ▶

The engine and other components are mounted on a simple frame mainly intended for disassembly and assembly of the engine, and we have devised it so that it can be moved smoothly to the stand for engine disassembly..

Upon request, we also manufacture a frame with a rotating mechanism for the engine stand.

We can also manufacture attachments for various engine installations and various gaskets for engine overhauls.



Mazda R2 diesel engine



### ◀ Fault diagnosis bench series

The main purpose of this product is to provide hands-on training in inspection and fault diagnosis of the electronic control system of the engine.

By using the check adapter as per the ECU terminal arrangement on the check board (box) for the ECU inspection and fault diagnosis of the engine and transmission, various voltage measurements, waveform observations, etc. can be performed. In addition, a wide range of practical training on the control system can be performed by setting up disconnection and short-circuit of various sensors, etc. using SW and variable resistors, etc. for fault diagnosis.

We also manufacture benches for CAN communication systems, which have become popular in recent years, and for engines equipped with common-rail systems.



Nissan HR15DE gasoline engine



### ▼ Fault diagnosis bench package

We also offer the engine fault diagnosis bench package, which is based on our long experience in delivering such products, the major car models (engines) of major Japanese manufacturers, and marketability. The related engine models are 1NZ-FE (Toyota), L13A (Honda), and CR12DE (Nissan). The control system features of each manufacturer's main engines can be understood through hands-on training, and the production cost can be reduced by packaging the product for sale at a low price.



Toyota (1NZ-FE)



Nissan (CR12DE)



Honda (L13A)

# EDUCATIONAL MATERIAL

These are the basic educational materials for general automobile users to deepen their understanding of the structure and operating principles of engines, brakes, etc., and various consumable parts.

They are also widely used as educational materials for the "My Car Inspection Class" promoted by JASPA.

## ▼ Car maintenance panel

(display panel for comparing old and new consumable parts)



The deterioration and wear of parts, as well as the replacement timing of parts, is explained through explanatory text coupled with new and old parts so that it is easy to compare new and deteriorated parts of the main consumable parts of a vehicle.

In addition, in order to compare the viscosity of old and new engine oil, a steel ball is placed in the old and new oil, and the difference in viscosity can be confirmed by the moving speed of the steel ball while tilting it.

[Displayed parts]  
Engine oil/brake fluid/LLC  
Brake pad  
Brake lining  
Air cleaner element  
Oil filter



## ▼ Automobile chassis models





## ▼ Drum and disc brake maintenance models

In order to make it easier to compare the structures of drum brakes and disc brakes that make up the hydraulic brake systems of automobiles and to compare the new and old parts, the wear and replacement timing of parts is explained through explanatory text coupled with old and new parts.



## ▼ Small gasoline engine cut models



This is a cutaway model of the inline 3-cylinder gasoline engine used in minicars.

You can understand the internal structure and components of the engine easily. The hands-on operation also makes it easy for you to understand the principle of operation.

It comes with an aluminum storage case, making it very convenient for training and transportation on business trips.



# OPERABLE CVT MODELS

This is an operable CVT simulator, which are becoming remarkably popular. Primary pulley, secondary pulley, steel belts, and other components are clearly visible. The manual type uses a hand-cranked handle and air pressure to reproduce irregular conditions.

For the electric type, the control box displays the rotational speed of each pulley digitally. Various types of CVTs are available upon request.

## ▼ Manual model (simple type)

This is a manual model of the CVT REOF06A manufactured by Jatco.

The housing is cut open to show the primary and secondary pulleys, steel belts, and other components. The primary and secondary pulleys are operated with the manual handle and pneumatic pressure to reproduce the irregular conditions caused by changes in the steel belts.

By simplifying the conventional operable CVT model, we can sell it as cheaply as possible.





## ▼ Electric model (high-spec type)



This is an electric model of the CVT REOF08A manufactured by Jatco.

The housing is cut open to show the primary and secondary pulleys, steel belts, and other components. The primary and secondary pulleys are operated with the drive motor and pneumatic pressure to reproduce the irregular conditions caused by changes in the steel belts during backing up the vehicle.

The control box displays the rotational speed of the primary and secondary pulleys digitally.



# HYBRID SYSTEM

This is a hybrid system related product.

The disassembly/assembly training device attaches the main parts that make up the hybrid system to our company's unique stand for easy disassembly/assembly training. The cut model explains the structure and operating principle of the hybrid system in an easy-to-understand manner, and each operation mode is illustrated and explained on the attached panel.

## ▼ Disassembly/assembly training device



Below are the main components that make up the hybrid system of the Toyota Prius (NHW20).

1. 1NZ-FXE gasoline engine
2. Hybrid transmission  
(3MC motor and power distribution mechanism)
3. Inverter
4. Battery

These components are mounted on our characteristic stand, and are manufactured to allow easy disassembly and assembly training.

We can also supply the training device for the current Prius (ZVW30) upon request.





## ▼ Cut model

This model explains the structure and operating principle of the hybrid system mounted on Toyota Prius (NHW11) in an easy-to-understand manner.



1. Gasoline engine
2. Hybrid transmissions (motor, generator, power splitting mechanism)
3. Inverter unit
4. High output Ni-MH (nickel metal hydride) battery

The above-mentioned internal structure can be clearly seen from the cross-sectional view. The engine and hybrid transmission are driven by electric motors.

- During start-off/low speed
- During normal driving
- During full-throttle acceleration
- During deceleration/braking
- During parking

This model can reproduce the 5 operation modes. These operation modes are also illustrated and explained on the attached panel.

Upon request, the current control status can also be imitated by the LEDs installed on the harness to reproduce the current flow, in addition to the operation in the 5 operation modes. Also, this applies to the current Prius (NHW30).



# DIAGNOSIS

In response to changes in electronic controls and increasing sophistication of automobiles, we have commercialized the check adapter and fault diagnosis SW BOX used for inspection of various control units as auxiliary devices for practical training on control systems. The system has already been used by many automobile mechanic training facilities and automobile manufacturers for training and other purposes. We plan and manufacture the devices to suit the customer's training vehicle or existing bench. We also have a wide range of connectors and terminals in stock from various companies, so we can also sell individual parts.

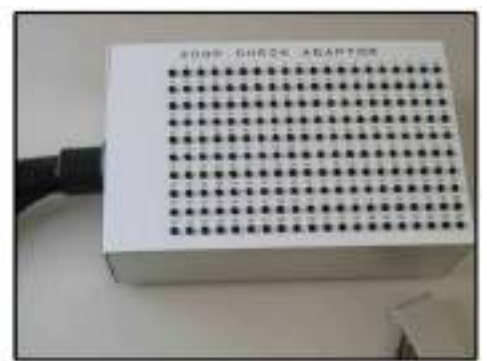
## ▼ For engine control units



General-purpose 200P



SW BOX



Check adapter



C11 ECM



SW BOX



Check adapter

## ▼ Harnesses



For inspection



For replacement



For questioning



Inspection adapter



▼ For A/T and CVT control units



C11 A/T



SW BOX



Check adapter



C11 CVT



C11 CVT

▼ For ABS, EPS, fully automatic A/C units



GSR81 ABS



SW BOX



Check adapter



Fully automatic A/C



SW BOX



Check adapter

# CHASSIS CUTAWAY / VEHICLE CUTAWAY

You can deepen your understanding of the structure and operating principles of the engine, brakes, etc., and various consumable parts, etc. with a cut model of the actual vehicle.

