Fleet Managers · Parents with Teen Drivers · Do-It-Yourselfers
Professional Mechanics · Cost-Conscious Consumers
Time-Pressured Commuters · Environmentally-Aware Drivers

How can CarChip™ help you?

CarChip puts the power of OBDII to work for you.

OBDII—shorthand for "second-generation on-board diagnostics"—refers to the complex set of computer control systems found on every car sold today, model-year 1996 or later. Originally developed to help minimize pollution, these systems are now used to improve fuel economy, measure overall engine performance, and help identify specific component failures.

The data from these systems was once available only to professional mechanics. With CarChip, this same data is now in your hands, giving you an insider's peek at how your car is being driven, what's going on inside the engine, and more.

The CarChip package consists of a tiny "black box" data logger (about the size of two 9-volt batteries stacked together), a CD with software for analyzing the data, and a connecting cable and power adapter. The data logger plugs into the OBDII connector in your car, and continuously collects and stores data from the car's computer control systems. Later, you use the cable and power adapter to download the information to your PC.

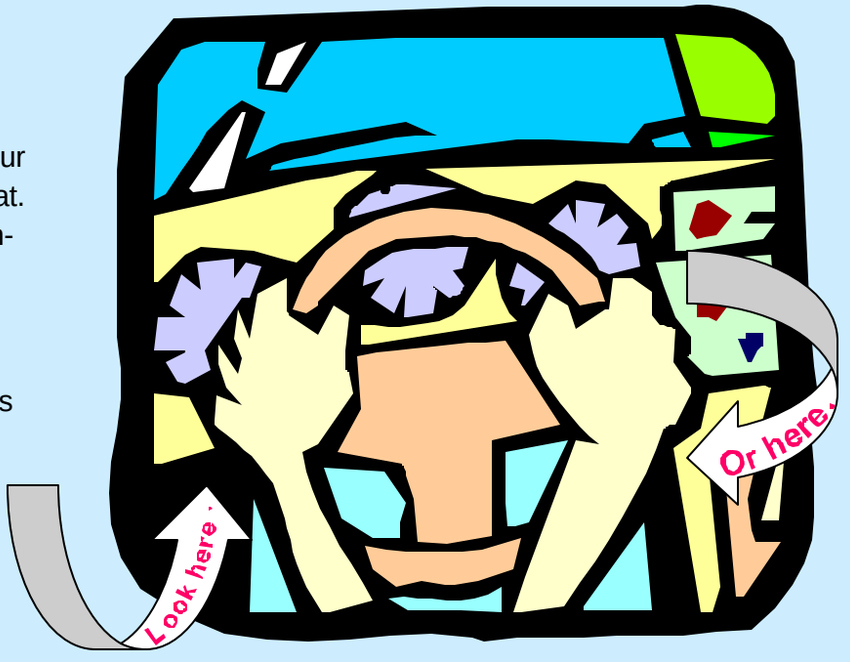
With the basic CarChip, which lists for $139, the data logger will store 75 hours of trip details before you'll need to download. If you drive, on average, two hours a day, that's over a month's worth of driving data!

Installation couldn't be easier.

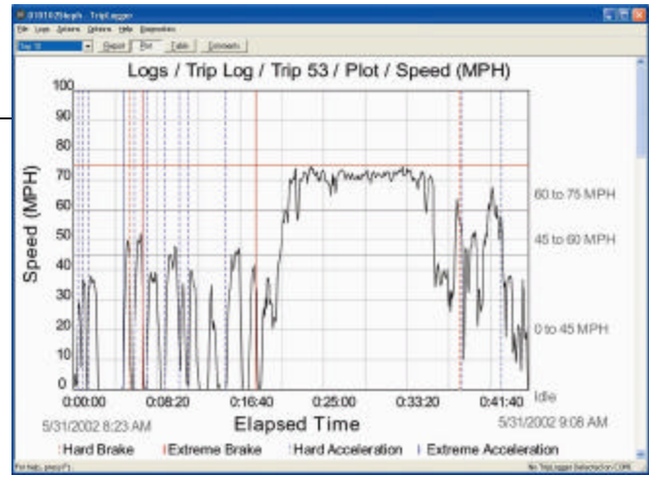
1. Locate the OBDII connector.
You'll find it in the passenger compartment of your car, no more than three feet from the driver's seat. Check under the dash, or behind or near the ashtray.

2. Plug the data logger in.
A gentle push is all it takes. The blinking light lets you know it's installed and ready to go.

3. Start driving.
That's all there is to it! The data logger will start collecting data as soon as you start driving.



Reads and logs performance under the hood and behind the wheel.



Sample trip log shows speed and hard braking and acceleration. Actual screens will vary.

What kind of information will you get from CarChip? You'll get complete trip details, including the time and date for each trip, the distance traveled, the speed at which you drove (recorded every five seconds), and the number of times you either braked hard or accelerated quickly. You can view all of this information graphically on your computer screen, giving you a moment-by-moment picture of how you—or perhaps your employees or the teenagers in your household—are driving. If the vehicle's check engine light (also known as a malfunction indicator light or MIL) comes on, you'll also be able to read the diagnostic trouble code (or DTC) and get "freeze-frame" sensor readings that will tell you the status of various engine parameters at the time the problem occurred. This data can help you or your mechanic identify the specific components that are failing, saving time and money compared to your average guess-and-replace repair.

With the advanced or "E/X" CarChip model, which lists for $179, you'll get four times the data storage—up to 300 hours of trip details—plus the ability to monitor any four out of 23 possible engine parameters. And, if you're unfortunate enough to be involved in an accident, CarChip E/X will automatically generate an accident log, showing the last critical twenty seconds of speed.

No matter which model you choose, you'll soon find CarChip as indispensable as your keys.

How can CarChip™ help you?

Fleet Managers

- *Each year, about 20% of all fleet drivers are involved in an on-the-job vehicle accident, compared to the 6% of workers in other occupations who suffer an on-the-job injury or illness.*[1]
- *Highway accidents are the leading cause of on-the-job fatalities, accounting for almost 25% of the total.*[2]
- *Installation of onboard event data recorders can reduce the number of accidents 20 to 30%, lower their severity, and decrease their costs 40 to 60%.*[3]

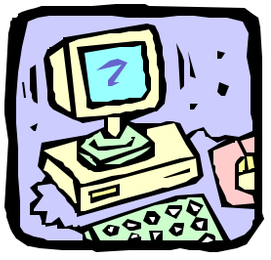
CarChip can help fleet managers improve driver safety, decrease property damage, and improve the bottom line—all at the same time.

According to the National Highway Traffic Safety Administration, "driver and employee awareness of an onboard event data recorder reduces the number and severity of drivers' crashes" because people aware of being observed tend to modify their behavior.[4]

Like the event data recorders (EDRs) studied by the NHTSA, CarChip can help you establish an ongoing fleet safety program. But unlike those EDRs, CarChip is economical enough for use by everybody—from large fleets equipping thousands of vehicles, to local courier services with just a handful of drivers.

CarChip's computer software lets you view the speed, distance, accelerations, and decelerations for each trip. With this data in hand, you can assign points for violations, or reward employees who maintain clean driving records. In the case of an accident, you can review the vehicle's speed, throttle position, engine RPM, and brake use to determine if the accident was due to recklessness or driver error, or to events outside the driver's control.

Because CarChip logs the time and date for each trip, it provides an easy way to document time-in-service records. And because it records the time and date every time the unit is disconnected, it's tamper-resistant. The data logger can also be swapped from vehicle to vehicle with no loss of data, and you can track multiple data loggers in a single data base.



In the NHTSA studies, annual accident costs were reduced by 40 to 60%. Whether or not you achieve results quite this dramatic, CarChip will still pay for itself in less than a year. A fleet of 100 vehicles can expect an annual accident-related expenses to top $280,000, based on an average accident rate of 20%.[5] If you outfitted all 100 vehicles with a CarChipE/X, you'd need to see a reduction in accident-related costs of just 6.5% to breakeven in the first year—an easy-to-justify investment in both your drivers' well-being and the company's.

How can CarChip™ help you?

Parents with Teen Drivers

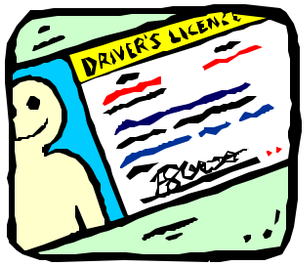
- *Motor vehicle crashes are the number one cause of death for teens and young adults aged 15 to 20.*[1]

- *Eighty-two percent of fatal crashes with 16-year old drivers are due to driver error; 37% are due to speeding.*[2]

- *States with graduated licensing for teen drivers show crash reductions of up to 60 per cent during nighttime hours.*[3]

By monitoring the whole family's driving performance, CarChip can help encourage teens to drive safely—and it may just help save your teen's life.

In the U.S., many states have set up graduated licensing programs for teen drivers. Newly-licensed drivers are typically allowed to drive unsupervised only during daytime hours, and must remain free of at-fault accidents for at least twelve consecutive months before advancing to a full unrestricted license.



Even if you live in a state without these restrictions, CarChip can help you set up your own graduated licensing program. You could, for example, designate a minimum number of driving hours, along with specific performance requirements, before you allow your teen to advance to the next level. With CarChip, you'll have all the information you need, just a mouse-click away. Together, you and your teen can view the speed, distance, accelerations, and decelerations for each trip, with each quick start and hard braking highlighted in red.

As your teen grows in experience, skills, and maturity, you can lift restrictions as a reward for good driving, or reinstate them if you think that he or she needs a little more practice. And, just in case your teen's tempted to sneak in a few rides without CarChip, the unit will log the date and time every time it is disconnected.

But CarChip isn't just for teens. It can provide valuable feedback for both new *and* experienced drivers. At first, Lisa's son protested when his mom put a CarChip in the family car. His protests vanished, though, when CarChip revealed that he was at times a better driver than his dad! In fact, motor vehicle crashes are not just the number one cause of death for teens, they are also the number one cause of death for *all* individuals, aged 44 or younger.[4]

How can CarChip™ help you?

Do-It-Yourselfers

- *In 2001, the average cost for gasoline and oil was close to eight cents a mile for a mid-size car[1]. At 15,000 miles per year, that's an annual cost of $1200.*

- *Old spark plugs can reduce fuel economy by 30%; a faulty oxygen sensor can cut it by as much as 40%.[2]*

- *Maintaining an older car in good running condition saves money compared to buying a new one. Including service and repair costs, trading in a vehicle every eight years instead of every four saves an average of $2500 a year;[3] do-it-yourselfers save even more.*

By detecting malfunctions early and taking the guesswork out of diagnosing problems, CarChip can help do-it-yourself mechanics keep their cars running at peak performance.

CarChip plugs into the OBDII connector in your car. But unlike the hand-held scan tools designed for use in the garage or during a limited test drive, CarChip remains in your car continuously, recording data from the car's computer control sensors every few seconds, on every trip.

In addition to monitoring speed, distance, acceleration, and deceleration, CarChipE/X will let you log any 4 out of 23 possible engine parameters, all of which can affect operation, emissions, and fuel economy. This can help you diagnose and fix problems, eliminating "guess-and-replace" repairs.

If your car's check engine light comes on, you can use the CarChip software to view the trouble code, its description, and the associated freeze-frame sensor readings. With CarChipE/X, you'll also have the additional information you need to simplify diagnosis. For example, an oxygen sensor trouble code doesn't necessarily mean that your oxygen sensor is bad; it could mean that an intake leak is allowing too much air into the combustion chamber, and the fuel/air mixture is too lean. With CarChipE/X, you'll be able to review graphs of the oxygen sensor voltage over time and of the related engine parameters you've selected, helping you determine exactly where the problem lies.

Using CarChipE/X, Henry discovered that coolant temperature in his Ford Aspire was running low—about 183°F during his commute, instead of the 195°F it should have been. Henry replaced the engine's thermostat (a part that is critical to the operation of today's vehicles), and then rechecked the data a few days later. New graphs of the coolant temperature showed that the average temperature was right where it should be. As a bonus, Henry also noticed that his average fuel economy had gone up about 7%.

How can CarChip™ help you?

Professional Mechanics

- *Consumers lose billions of dollars each year on unneeded or poorly done car repairs,[1] and auto repair problems are consistently listed as one of the top five consumer complaints in the nation.[2]*

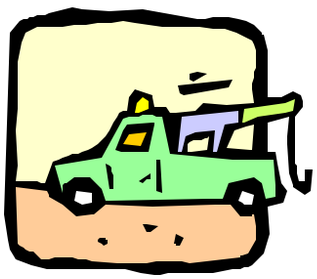
- *American consumers spend about $115 billion per year on auto repair services, or almost 2% of their disposable income.[3]*

- *Eighty percent of surveyed consumers say that they have been dissatisfied with their vehicle's service or repair; 59% of them took their future business elsewhere.[4]*

CarChip can help professional mechanics by providing information about a car's performance under real-life conditions, helping to solve intermittent problems sooner and improving customer relations.

While the computerized engine-control systems found on today's cars provide invaluable data for the professional mechanic, they have also made the inner workings of cars more mysterious for the average driver. Surveys of customer satisfaction paint such a dismal picture that it's likely that all mechanics—no matter how competent and reliable they are—have been subject to a customer's distress at one time or another. Intermittent problems can be especially frustrating for both mechanics and customers alike.

CarChip can help you trace intermittent problems by telling you things that your customer might not: When does the problem occur, and under what conditions? Is it when the engine is hot or cold? Does it happen immediately, or only after an extended drive? When accelerating quickly, or braking hard?



Unlike the costly scan tools designed to be used inside the shop or during a short test drive, CarChip is affordable enough that even small shops can loan units out to their customers. Designed to remain in the car continuously, CarChipE/X will store up to 300 hours of engine sensor data, collected under real-life conditions.

When your customer returns to the shop, you'll be able to view graphs of engine load, coolant temperature, intake manifold pressure, air flow rate, or any other four out of the 23 possible engine parameters—information that can help you diagnose and solve the problem. CarChip will also tell you the car's speed, the distance driven, and the accelerations and decelerations throughout each trip.

Getting the information you need to repair problems the first time, in a timely and effective manner, is the key to happy customers. You might want to consider stocking CarChip, too. Once your customers have experienced how helpful it can be, they might just want one for themselves.

How can CarChip™ help you?

Cost-Conscious Consumers

- *As the average cost of a new car rises relative to income, consumers are keeping their cars longer: an average of 8.5 years—the highest in 40 years.*[1]

- *Aggressive driving (speeding, rapid acceleration, and hard braking) can lower gas mileage by up to 33%.*[2]

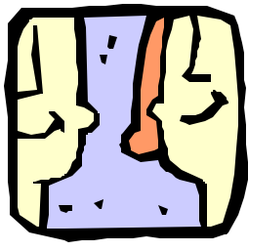
- *The average auto insurance premium in the U.S. was $786 in 2000; it is expected to reach the $1000 mark in 2003.*[3]

In these economically uncertain times, CarChip can help cost-conscious consumers save money by keeping an eye on how their cars are being driven, pinpointing needed repairs, and providing valuable data in the case of an accident.

Aggressive driving costs money: high speeds waste gas and accelerate tire deterioration; sudden starts and stops increase tire wear; and revving the engine not only wastes gas, but also increases engine wear and can cause the catalytic converter to overheat. With graphs showing speed, acceleration, deceleration, and idle time for each trip, CarChip can let you see exactly how your car is being driven. It may help you convince a family member or an employee to change their driving habits, or it might just be an eye-opener for yourself.

CarChipE/X can also pay for itself by catching faults quickly, before other components can be damaged. For example, a poorly performing sparkplug can cause the engine to misfire. Repeated misfires can quickly degrade the performance of the catalytic converter, leaving you with an expensive repair bill. By monitoring the performance of your engine, CarChip can help you catch these problems. And the longer you keep your car in good shape, the longer you'll be able to keep it.

If you're a used car buyer, CarChip can provide valuable information on the condition of the car before you make the purchase—whether you're spending a few thousand dollars for an older Geo Prizm or tens of thousands of dollars for a late-model Mercedes Benz.



Since a single at-fault accident can raise insurance premiums significantly, CarChip can also save you money by giving you the information you need to settle a contested insurance claim. With CarChipE/X, you can check the speed your car was traveling before the accident, plus throttle position and brake use, to help prove that you were not at fault. Just how fast was James Dean going, before his infamous 1955 crash? Estimates vary widely, from 100-plus mph to just 57 mph.[4] If CarChip were available back then, we'd know for sure.

How can CarChip™ help you?

Time-Pressured Commuters

- *The average American office employee spends over 46 hours a week on the job, and another 7 hours a week commuting to work.*[1]

- *In 2001, National Car Care Month check-lane statistics showed that 72% of participating vehicles needed some kind of repair or maintenance. Prior-year numbers have been as high as 91%.*[2]

- *Over 5% of all motor vehicle accidents can be traced to car neglect. Total car-neglect related costs are estimated to exceed 2 billion dollars each year.*[3]

In these time-crunched days, CarChip can help time-pressured commuters avoid unnecessary trips to the repair shop—saving both time and money. At the same time, CarChip can help keep the costs of driving down by making sure that commuters' cars get the repairs they need, when they need them.

CarChip plugs into the OBDII connector on your car, where it keeps tabs on the sensor readings that are part of your car's computer control systems. Even if you're mechanically challenged, it can help you understand how your car is performing under various operating conditions. The more you know, the more you can communicate with your mechanic, and the better off you'll be.

The first time the check engine light on Joan's Honda Civic came on, she took the car in for servicing immediately. The repair techs read the diagnostic trouble codes and knew that a cylinder had misfired. But they couldn't find anything wrong with the car, so they simply turned the light off without performing any other repairs.

The light came on again a year later. But this time, Joan had CarChip in her car. Using the CarChip software, she was able to read the diagnostic trouble code herself. The software told her that there had been, once again, a cylinder misfire. Misfires can be caused by any number of things, some serious, some not. It could mean fouled sparkplugs, dirty fuel injectors, a vacuum leak, or a weak ignition coil. Or it could simply mean that the gas cap wasn't tight or there was water in the gas.

Using CarChip's software, Joan programmed the unit to turn the check engine light off the next time she started the car. If the problem was random or temporary, the light would stay off. But if there was a real problem with the car, the light would come on again within a few trips.

It's now been ten months. The light is still off, and Joan has saved herself the aggravation of an unnecessary trip to the repair shop.

How can CarChip™ help you?

Environmentally-Aware Drivers

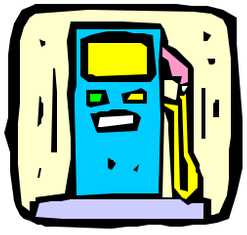
- *Motor vehicle emissions account for approximately 77% of the carbon monoxide, 35% of volatile organic compounds, and 45% of nitrogen oxides in the air.*[1]

- *Fifty percent of the total emissions from late-model vehicles are the result of emission-related malfunctions.*[2]

- *In California, almost 10% of tested vehicles fail their initial smog check, yet the average cost of repairing the malfunction is low: just over $100.*[3]

Your car's engine check light will come on whenever emissions exceed 1½ times the federal standards for that model year.[4] If you're concerned about the environment, though, you shouldn't wait for the light to come on. Instead, you should make sure that your car is running as cleanly as possible at all times—and this is where CarChip can help.

CarChip plugs into your car's OBDII connector, where it collects the data from your car's computer control systems. These systems continuously adjust the engine's operation to keep everything within spec. When there's a malfunction, though, the computer can't rely on the sensors for input, so it sets the fuel/air mixture rich. The engine will continue to operate, but you're burning more gas and exhausting more pollutants.



With CarChipE/X, you can avoid these problems by keeping an eye on selected engine parameters. For example, you can choose to record and graph oxygen sensor voltage readings over time, which can tell you how efficiently your catalytic converter is working. Catalytic converters are an important part of your car's emissions control system; a good converter will have a hydrocarbon conversion efficiency of about 95%, while a bad one will have an efficiency of 65% or less.[5]

When you make sure that your car is in good running condition, you not only help the environment, you also save money. Emissions-related repairs can increase fuel efficiency by as much as 13%; in many cases, fuel savings will completely offset the repair costs.[6]

When David's VW van was having a hard time making it up the hill, it also failed the California smog check. Multiple replacement parts and repeated failed smog checks later, the third mechanic to work on the car replaced the oxygen sensor for the second time. It turns out that the first oxygen sensor was defective. Unfortunately, Dave's VW was built before OBDII. But if he had had a later-model car and CarChip, he would have saved hundreds dollars in unnecessary repairs, and solved his emissions problem sooner.

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carchip

Continuously logs performance under the hood and behind the wheel.

CarChip™

Records 75 hours of trip details:

- Time and date for each trip
- Distance traveled
- Speed (logged every five seconds)
- Idle time
- Hard accelerations and decelerations.
- Engine diagnostic trouble codes plus the status of engine parameters at the time the codes occurred.
- Time and date every time CarChip is connected or disconnected.

CarChipE/X™

Records 300 hours of trip details:

- All the features of CarChip.
- Up to 4 out of 23 possible engine parameters, recorded every 5 to 60 seconds. Choose from:

RPM	*Battery voltage*
Throttle position	*Timing advance*
Engine load	*Coolant temperature*
Fuel pressure	*Air flow rate*
Fuel system status	*Intake air temperature*
Short-term fuel trim	*Intake manifold pressure*
Long-term fuel trim	*Oxygen sensor output voltage*

- Accident log (the last critical 20 seconds of speed).

Software lets you:

- Review and clear diagnostic trouble codes.
- View summary and detail reports for each trip, including vehicle speed every 5 seconds.
- Set thresholds for speed, acceleration, and braking, and view the number of times these thresholds were exceeded.
- Copy data to spreadsheets and text documents for further analysis.

Both models include:

- Data Logger with built-in clock and battery
- Software on CD-ROM
- Connecting cable and power adapter for use when downloading.

System Requirements:

- Windows 95 or above
- At least 5MB free hard disk space
- One free serial port

Both CarChip & CarChipE/X fit all 1996 & later vehicles.

10/30/02

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