



# TechNews

March 2011 | Volume 4 | Issue 1



INFINITI

| **CONSULT III plus**

| **CAN**

| **ECU Programming**

| **OEConnection**

| **Waterborne Paint**

| **Dealer Listing**



# GENUINE NISSAN PARTS. THE CHOICE IS CLEAR.

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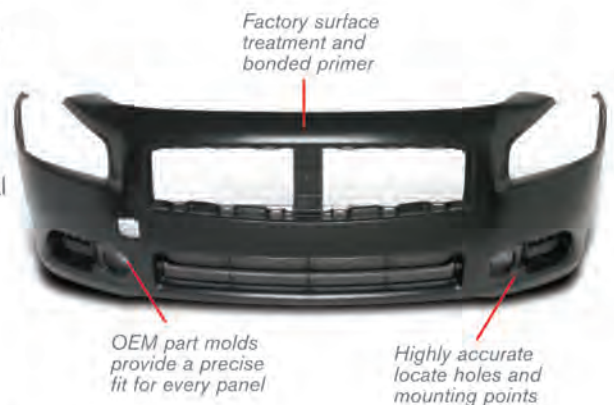
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### NISSAN OEM BUMPER ASSEMBLY



SHIFT\_the way you move



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Properly trained technicians have the equipment, tools, safety instructions, and know-how to perform repairs correctly and safely. If a condition is described, DO NOT assume that a topic covered in these pages automatically applies to your vehicle or that your vehicle has that condition.

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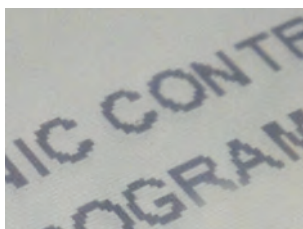
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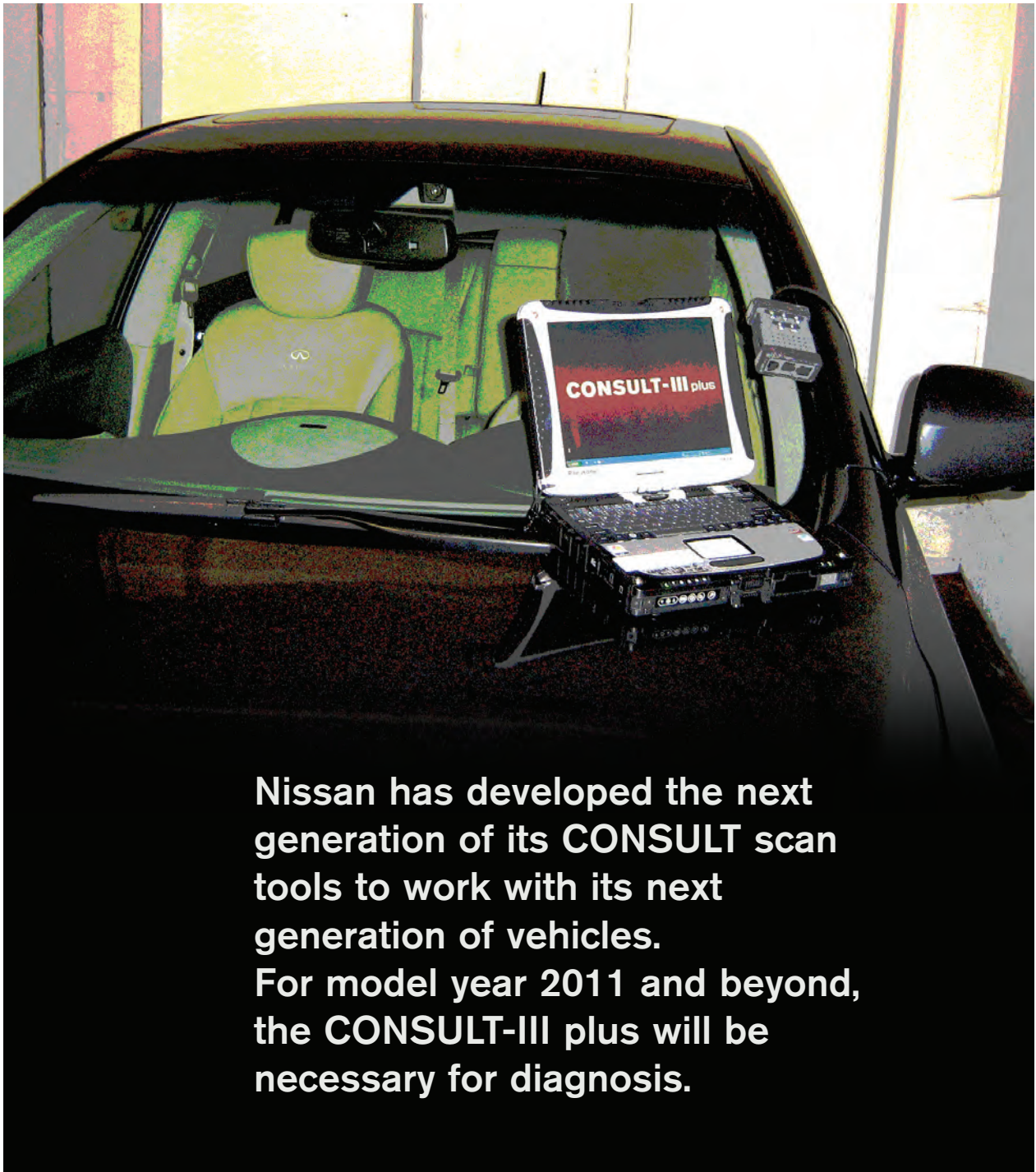
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# The Power of plus



Nissan has developed the next generation of its CONSULT scan tools to work with its next generation of vehicles. For model year 2011 and beyond, the CONSULT-III plus will be necessary for diagnosis.

Nissan's CONSULT-III plus is the next generation factory scan tool. It combines the advanced control features of the current CONSULT III, but introduces an exciting new interface designed around simplicity and efficiency. Its release coincides with the all-electric Nissan LEAF, and the new tool reflects the engineering of the new vehicle. This article will explain the benefits of upgrading your current CONSULT-III to the new plus edition, as well as cover the processes of purchasing, upgrading, and using the new unit.

## How to buy

Nissan makes it convenient to procure their newest scan tool. The CONSULT-III plus (C-III plus) utilizes the same platform as your CONSULT-III; therefore, if you do not currently own the Panasonic Toughbook and CONSULT-III system, you will have to purchase it before proceeding. Ensure your Toughbook has the most up-to-date software and drivers for wireless and bluetooth capabilities, if you wish to use cable-free connectivity.

First, connect to the Internet and point your browser to [www.nissantechmate.com](http://www.nissantechmate.com). If you ever require a Nissan or Infiniti Special Service Tool, visit this website for pricing and availability. Second, click the Service Tools button on the top banner bar. From the list on the left column, choose the link for C-III plus. If this link is absent, click CONSULT-III instead, then navigate to C-III plus upgrade software.

When ready to purchase, call the toll-free number (800-662-2001) to speak directly with a sales representative. You can also call to ask specific questions about the CONSULT-III plus from the technical staff. Keep in mind that the CONSULT-III plus will not overwrite your existing installation of CONSULT-III. The C-III plus utilizes a red start-up screen which contrasts with the original CONSULT-III's blue start-up screen. However, the Vehicle Interface (VI) module is not interchangeable between the CONSULT-III and C-III plus. Furthermore, the Measurement Interface (MI) from the original CONSULT-III will not be compatible with the C-III plus.

## Why upgrade?

The powerful self-diagnostic procedures, bi-directional controls, proprietary immobilizer and remote start features, and ECU reprogramming techniques of the CONSULT-III have all been streamlined for the C-III plus. If you are familiar with the CONSULT-III, the existing interface has been completely redesigned and greatly improved to facilitate ease of use. No more guessing what a button is supposed to mean! The system call of the various ECUs has been made more efficient, requiring less time to complete than with the CONSULT-III. In general, the C-III plus is quicker and more efficient, requiring fewer clicks and less waiting-around time allowing you to diagnose difficult problems faster. The best news is that around June of 2011, the C-III plus is scheduled to be updated with complete backwards compatibility for all OBD II Nissan and Infiniti vehicles while still retaining the powerful features of the CONSULT-III.

The C-III plus is also the only scan tool that is future-proofed for Nissan's upcoming vehicles. These vehicles, like the LEAF, will utilize greater than 32 CAN-linked computer units (up to 70) that exceeds the capability



**The C-III plus Vehicle Interface (VI) (right) works only with the new software, and is not interchangeable with the basic CONSULT-III VI (left).**



**Installation of the new C-III plus is easy.**

of older and generic scan tools. Beginning with the LEAF, which was launched in December, diagnosis of all future Nissan and Infiniti vehicles will only be supported by CONSULT-III plus. No new models will be added to the CONSULT-III software, and that means the CONSULT-III plus is necessary for service and repair. Nissan recommends maintaining your current CONSULT-II and CONSULT-III tools until the C-III plus has been upgraded to full legacy functionality.

Furthermore, the C-III plus is uniquely equipped to handle the upcoming Nissan and Infiniti hybrid and full-electric vehicles. The C-III plus will be able to quickly and easily display information about the performance and health of the high-voltage battery packs in the Infiniti M35 hybrid, and the LEAF full-electric vehicle. The C-III plus will also be able to display predictive battery failure data, as well as the causes for low battery voltage. Diagnosis of these newer vehicles will be impossible without the proper scan tool.

### Getting started with the CONSULT-III plus

Once you have ordered the C-III plus, it should arrive within 10 days. The box will contain an installation DVD, the new C-III plus VI, and device warranty information. The installation DVD box will have a brief multi-lingual instruction booklet. First, gather the Toughbook and the external DVD-ROM reader from the CONSULT-III case and turn the computer on. Insert the DVD into the reader. It may automatically start

Internet Explorer, which may display a warning about Active Content; press "OK." If nothing started automatically, double click "My Computer" on the desktop. There should be an icon titled "CONSULTIIIPlus" where your DVD-ROM drive icon normally is; double click this icon to begin installation.

**Warning:** Do not plug the new VI module into your Toughbook until after the C-III plus software has been installed. Failure to follow this instruction may confuse the installation and prevent proper operation of the C-III plus. Contact your network administrator for help in setting up this software if necessary.

The installer will begin by choosing your default language. Right away, you will notice the large buttons that make use of the Toughbook's capacitive touch screen. Touch "English" to proceed. The next screen will show navigation options for installation of the C-III plus software, operation manual, and will include the Nissan factory training materials in overview. First, download and install the C-III plus operations manual for later review. Press the button, then wait for the next screen to press "Check Installation Procedures" for a step-by-step guide. With the guide handy, press "Install" to complete the installation of the operations manual.

**NOTE:** DO NOT install the "Green" version of the software unless you are working in Europe! The



**The small card on the lower left is a Secure Digital (SD) card, and to its right is the smart chip card. Either fits into a PCMCIA card adapter (above) that plugs into the Toughbook.**

provided installation DVD will be distributed globally, so don't accidentally install an incompatible version.

If you have yet to upgrade the CONSULT-III with the security card option necessary for immobilizer key programming, now is the time. Press the "Security Card Adapter Driver" install button, then choose the type of hardware card you have been provided. There are two options: the thin, "smart chip" card with adapter, or the SD miniature memory card with adapter. Press the "Check Installation Procedures" once you've identified the hardware for another step-by-step guide. Proceed with installation for the adapter, after which the security card will automatically be detected. Note: This process is only necessary if the security card has not yet been previously utilized; otherwise, skip this step.

Plug the laptop into a power outlet, otherwise the installation cannot proceed. Press the C-III plus button in the top left, press the "Check Installation Procedures" button for step-by-step directions, and begin installation. This may take a while, so do not disrupt the power supply or shut off the computer. When the C-III plus software has finished installation, the screen will be clear and on the desktop you will see the new C-III plus red icon.

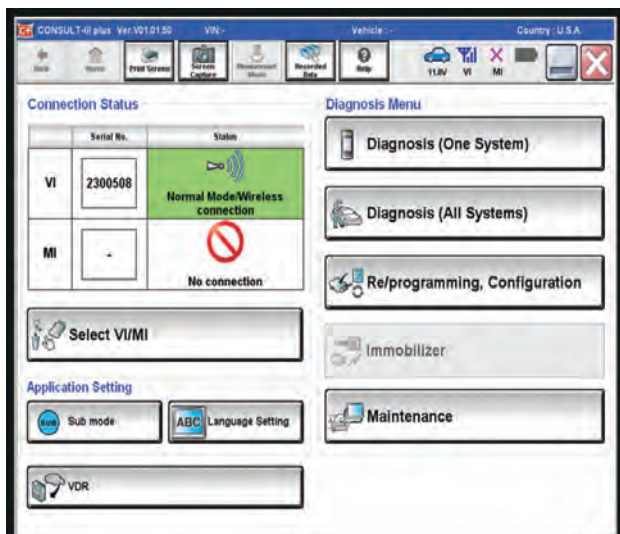
Using the 110V power supply from your CONSULT-III kit, power up the C-III plus VI. Then, using the USB cable from your CONSULT-III kit, connect the C-III plus to the Toughbook. Despite sharing cables, the new C-III plus VI will not interface between a vehicle and the older (blue) version of CONSULT-III. The C-III plus VI device hardware must be installed with the USB cable attached to the Toughbook. Once the cable is connected, an information bubble in the bottom right system tray of Windows will indicate new hardware has been found. Allow the hardware wizard to Search for Drivers automatically (the default-recommended option), and the computer will identify the C-III plus VI. If the device does not install properly at this point, contact your technical support to identify the cause of the problem.

## Now for the fun stuff!

Once the C-III plus software has been installed, and the new VI hardware has been found, you can connect the Toughbook to a vehicle. Like the CONSULT-III, the C-III plus can connect via wireless bluetooth to the VI. Attach the DLC connector to the vehicle, turn the

ignition to ON, and dangle the VI outside of the window of the car. Now double click the C-III plus desktop icon. The first new feature you will notice is that the C-III plus software load time has dropped to below ten seconds! Once fully loaded, the C-III VI is automatically selected and connected via bluetooth with no hassle. The C-III plus will also input the decoded VIN of a 2005 and newer Nissan vehicle, cutting yet another step from the diagnostic process. If the software doesn't automatically connect to the VI for whatever reason, press "Sub Mode" at the bottom left, select "VI/MI Registration," press on the connected VI to highlight it, then press "Settings." Be sure it shows "Auto Connect: ON."

This first screen is termed the "Home Screen," and it will serve as the navigational foundation for all C-III plus features. Let's walk through the different sections briefly. The horizontal bar at the top-most portion of the screen contains reference information. At a glance, you can see the VIN and the model of vehicle currently connected to the VI. It is also very easy to determine whether your software version number is up-to-date by making note of the six digit number at the top left, then pointing your browser at [www.nissan-techinfo.com](http://www.nissan-techinfo.com). Once on the Nissan site, choose "CONSULT Diagnostic Software Updates" from the drop-down menu below the log-in form. On the right of that page, you can view the most recent software versions. Always keep your



**The redesigned Home screen of the C-III plus interface.**

C-III plus software at the newest stable release to ensure proper operation of the scan tool.

Below the reference information top bar on the Home screen are the horizontal navigation buttons called the browser bar. The C-III plus software is intuitively designed like a familiar web browser including icons and text labels. The “Back” button will move to the previously viewed screen. The “Home” button will return to the Home screen; however, doing so will clear all information about the current vehicle requiring reconnection. Use the “Home” button to start completely over with diagnosis or for a new vehicle. The following two buttons are incredibly useful: “Print Screen” and “Screen Capture.” The “Print Screen” button does what you’d expect: send whatever information you are currently looking at to an attached or wireless printer. The “Screen Capture” button will take a digital picture of the screen data, and save it to the Toughbook’s hard-drive for future use. Previously recorded information from the VDR mode, self-diagnostic results, and other saved data can be browsed and recalled by pressing the “Recorded Data” button.

The remaining icons on the browser bar comprise the status window. These pictures indicate vehicle battery voltage, the connectivity signal of the VI, and the status of the MI’s connection and its battery life. You can quickly determine if the C-III plus has detected either the VI or the MI. To switch between the interfaces, you can use the large button in the “Connection Status” section of the main active screen. The C-III plus can be quickly minimized or exited by the large buttons at the very top right.

Don’t be afraid to click the help icon on the browser bar. The redesigned C-III plus will display help about the current screen you’re viewing. Clicking help will not exit or otherwise interfere with your diagnosis. You will not have to spend extra time reading the entire help file when all you need is a little assistance with the current page. This updated help icon alone removes a great amount of time from new software’s learning curve. Just like any difficult repair, asking for a little bit of help can get you back on track rapidly.

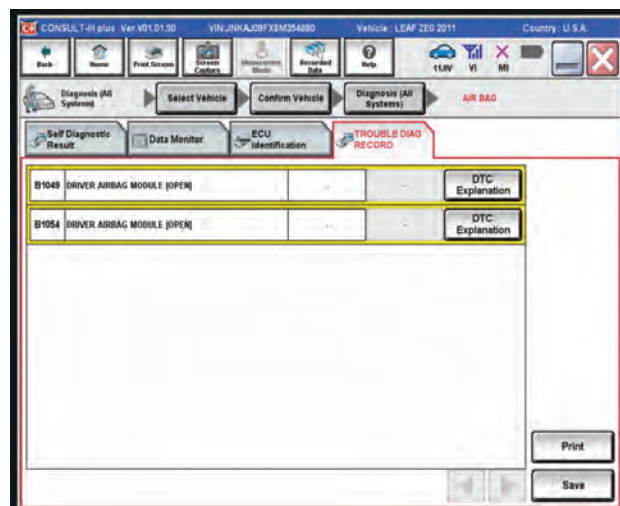
### The bread and butter

The Diagnosis Menu on the right portion of the active area holds easy-to-press icons and text bars for the

majority of your scan tool jobs. Take special note: If the security card is installed in the Toughbook, all buttons except Immobilizer may be grayed out. This might cause some confusion. If necessary, exit the C-III plus application, physically remove the security card from the lower left access port of the Toughbook, then restart C-III plus to reconnect to the vehicle.

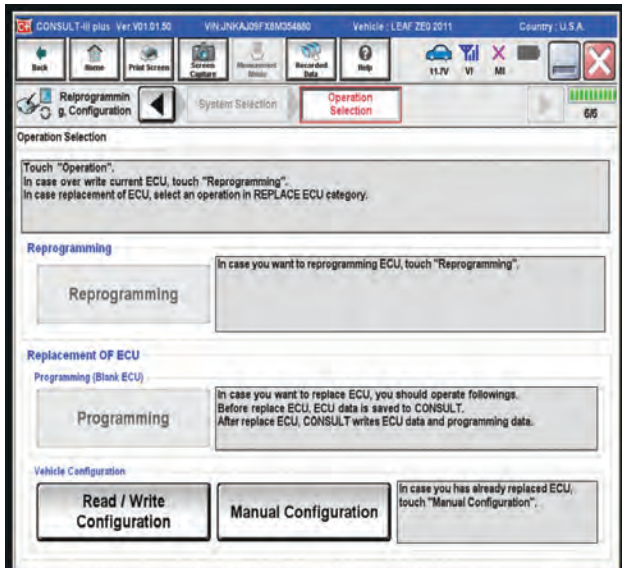
What a difference! The most commonly-used icons and procedures are available at a touch from the Diagnosis Menu on the C-III plus’s main active screen. Primary functions like checking for DTCs can be done by pressing “Diagnosis” (All Systems). Another feature of the C-III plus is the dramatically reduced time necessary for a system call. Once all systems’ statuses have been queried, the C-III plus will have a color-coded display of Current, Pending/History, and no DTCs. On the left side, an ECU will be colored red if there is a current fault, yellow if there is a history code, or green if there is no fault detected. In the center of the active screen, a listing of the DTCs will be displayed in color coding, with a quick-press button to access Freeze Frame Data and a “plain English” explanation of the DTC.

You will also note a series of block buttons above the active screen with the visited page history. If you



**All DTCs are displayed clearly with relevant Freeze Frame Data and an in-depth explanation just one button press away.**





**ECU reprogramming and replacement has never been easier with the C-III plus's completely redesigned interface.**

wish to go back a step, the browser bar's Back button or this "breadcrumb" series of buttons will allow for very quick, intuitive navigation of the C-III plus. The tabs immediately above the active screen can be used to navigate to additional support functions of the C-III plus. For example, the Active Tests tab will bring up a series of possible bi-directional tests to aid in diagnosis. The Data Monitor tab allows you to configure the C-III plus to display all live data or just what you need for diagnosis. The Work Support tab will give you rapid access to non-diagnostic functionality like TPMS re-initialization, Idle Relearn Procedure, Steering Angle Learn Procedure, and more.

At any time, the list of DTCs can be saved to file, printed or erased by use of the buttons in the bottom right. The C-III plus also makes verifying a repair easier. From the home screen, the Diagnosis (One System) button will allow you to query status on the system you finished work on. The C-III plus will perform a quick system call and report if any DTC remains stored in that specific ECU. The One System active screen will behave as outlined above for the All System call.

## Immobilizer and Reprogramming functions are now easier than ever

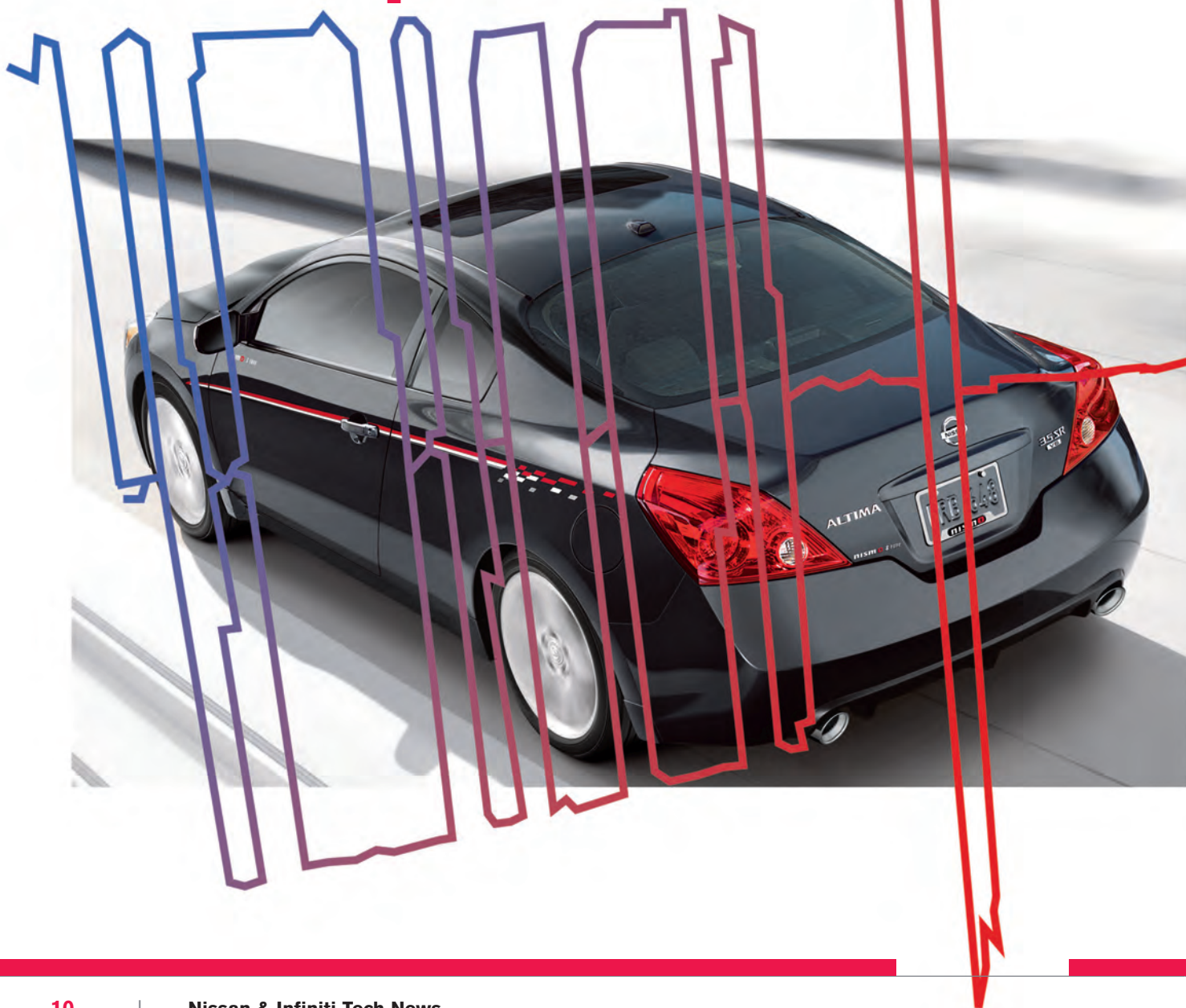
The C-III plus shows its improvements over other scan tools when it comes time to perform the complicated procedures involved in re-flashing or replacing a computer module, and when programming immobilizer keys. Every technician knows that reprogramming a computer module can be time consuming due to the intricate, multi-step process that must be followed exactly to avoid damage. The C-III plus creates a "one stop shop" for module reprogramming by placing a Reprogramming button on the main Diagnosis Menu of the home page. Follow the printed directions on the TSB and procure the necessary re-flash file from [www.nissantechinfo.com](http://www.nissantechinfo.com) or [www.infinititechinfo.com](http://www.infinititechinfo.com).

Once downloaded, the re-flash file will contain a README document that will instruct the user where to store the file. Once downloaded and properly located, the C-III plus will access the appropriate re-flash file and perform the update. In order to preserve information from the previous ECU, the C-III plus allows you to effortlessly export and import settings using the "Read/Write Configuration" button. The reprogramming submenus are clearly labeled with "Before Reprogram" and "After Reprogram" buttons to facilitate the transition.

Likewise, working with the immobilizer computer is as simple as installing the security key card and pressing the "Immobilizer" button on the Diagnosis Menu of the home screen. When registering new immobilizer keys, the C-III plus will automatically query the BCM for the necessary PIN code for decoding in the NATS database on the Nissan or Infiniti Techinfo websites. With the decoded passcode input, you've successfully performed immobilizer key registration in just a few button presses! Of course, the entire procedure is outlined in easy-to-understand steps on the active screen making your job more about fixing cars than reading instruction manuals.

Once you've worked with the C-III plus, you'll realize the power of Nissan's next generation factory scan tool. The intuitive interface is an improvement over the original Consult-III based on focus group suggestions and most-requested features. The C-III plus eliminates many steps that were previously required for advanced diagnostic procedures such as immobilizer programming and ECU flashing. With reduced load times, systemcall times, and less time spent hunting for a functionality, the C-III plus makes it possible to harness the power of the best Nissan scan tool to date! |

# | Nissan Controller Area Networks: Advantages, Diagnosis, and Repair



## Working on Controller Area Networks (CAN) may sound daunting, but here's the information to help you understand how to service these advanced communication systems.

All 2008 and newer vehicles are required to use a digital communication system known as a Controller Area Network, or CAN. Nissan adopted this standard several years ago for some models, so some readers may already have CAN diagnostic experience. If not, don't worry. CAN will make diagnosis easier, not harder. This article will explore the basics of CAN, and includes some diagnostic tips that should be useful regardless of your experience level.

### Does CAN replace OBD II?

CAN and OBD II are two different things, so one does not replace the other; they exist together. OBD II is a standardized interface. CAN is a communication standard, available via the OBD II interface. If a car is CAN equipped, the CAN bus may be accessed through pins 6 and 14 of the OBD II connector on Nissan, Infiniti and every other make of car.

Some scan tools will not communicate with CAN vehicles because they were not designed to. The CAN bus "talks" much faster than the scan tool can "listen". There are adaptors for some scan tools to slow the data down to an understandable speed, but this is not optimal. As always, your best choice for talking to a Nissan is the CONSULT. Not only will you be using a native speaker, fluent in CAN, but you'll also have access to a plethora of data that was not included in the OBD II standard, but can be immensely useful when performing diagnosis.

### Sharing information

Many control units need access to the same types of information. For instance, the ECM might want to know vehicle speed for its fuel calculation, the TCM for its gear selection, the BCM for its seat belt warning, the combination meter for its speed display, EPS to determine the correct amount of steering assist, the IPDM

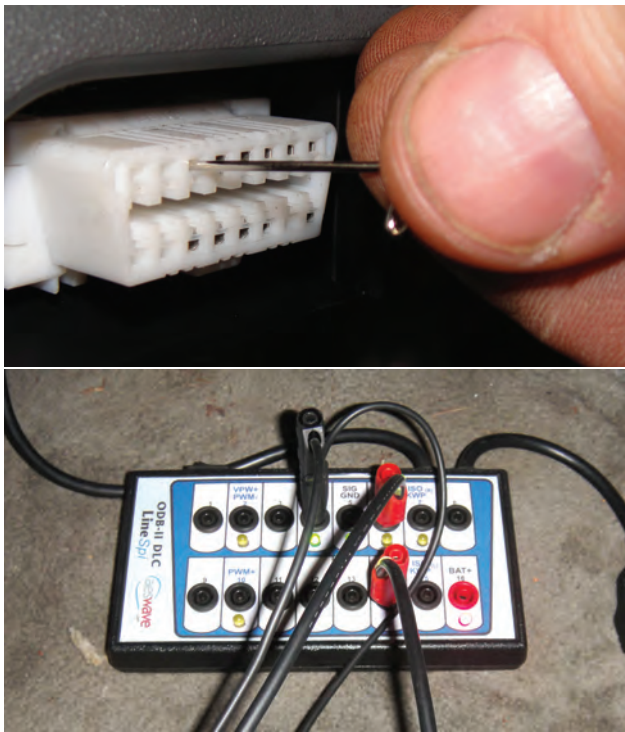
for cooling fan operation, etc. Before CAN, each control unit had to have its own information source, perhaps through its own dedicated sensor, or a splice into a sensor for another control unit or perhaps through a dedicated data line with another control unit.

The more advanced cars become, the more information they generate. Features and performance require information. The added cost and weight of each control unit having its own "department" for each type of required information was not practical.

CAN solved this dilemma by providing a means for every bus-connected control unit to share the information it gathers with other control units, as well as access information it needs from them. Thus, the vehicle speed sensor can be linked to the control unit that has the most urgent need of its data, or it could be linked to the control unit that is physically closest to reduce wiring, cost, and weight.

### Fast!

The economies of scale achieved by consolidating "departments" and eliminating redundancy are a big part of CAN's value, but not the only part. Speed is another reason CAN is a necessity. Many features could not exist without the high-speed data transfer CAN provides: improved ABS and SRS, throttle-by-wire, and VDC to name a few. Data flows on the CAN bus at a rate of 1Mbit/s, or 1,000,000 bits per second. Depending on the frame format, a 0-8 bit "message" will be between 44 and 73 bits. This allows 13, 698 to 22,727 complete messages per second! To put this into perspective, a hummingbird flaps its wings "only" 35 times per second, but it's so fast they become almost invisible to us. If each bit sent across the CAN bus made a noise, it would be about 50 times beyond the range of human hearing. How fast is CAN? Way faster than human perception!



### Never jam pins into the DLC! Use a breakout box or back-probe the connector.

Vehicle systems are not the only beneficiaries of CAN's blazing speed; a technician will be able to make use of the increased throughput as well. You'll notice that control units that communicate with the OBDII port via CAN refresh a whole lot faster, especially when a lot of PIDs are being monitored at the same time.

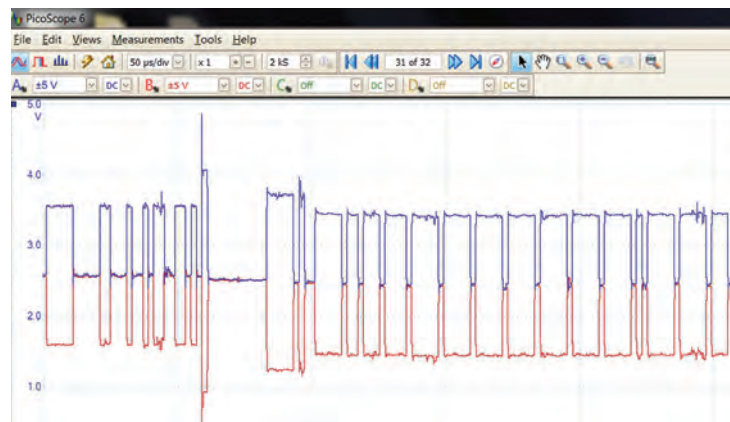
### Physical layout

The 'bus' consists of a two-wire backbone, twisted together to reduce noise. Control units are teed into the bus with splices. All control units connected to the CAN bus are connected to the bus in parallel. This means that the bus does not "go through" the control units; it goes to and from the control units. Two 120 ohm terminating resistors, located inside of control units, are connected across the bus at the ends of the backbone. Usually you'll find one of the resistors in the ECM, and the other in the IPDM. If the vehicle does not have an IPDM, the second resistor is usually in the TCM. Check the LAN section of the service manual for specifics for the vehicle you're repairing.

### What does it say on the bus?

All of the control units talk and listen on the same bus, so there are rules of order. Important ECUs with important jobs have priority. Other ECUs can wait for a lull. You're not going to be able to tell what the control units are talking about without a scanner, but if you know what to expect, you'll be able to tell if the chatter on the bus is communication or gibberish. The two wires on the CAN bus each carry their own signal: CAN H (or CAN high) and CAN L (or CAN low). It's easy to access these wires since CAN H will always be pin 6 on the OBDII connector, and CAN L will always be pin 14 on the OBDII connector.

When silent, CAN H will stay at 2.5V, and CAN L will stay at 2.5V. If you connect one scope lead between pin 14 and ground, and the other between 6 and ground, you'll see a steady 2.5V on both traces, provided no one starts talking.



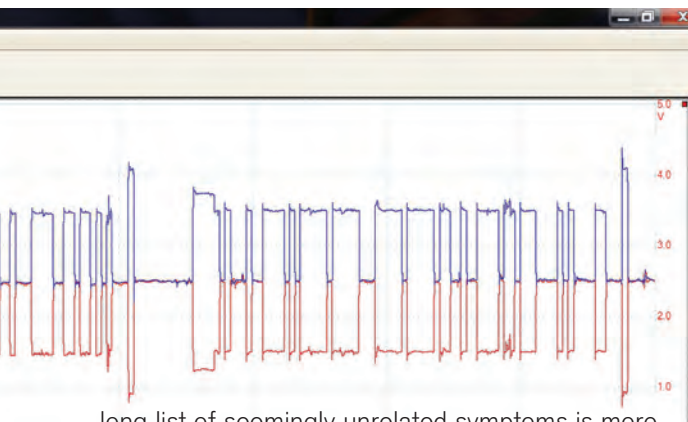
A scope CAN trace

When a control unit talks, it will raise CAN H to 3.5V, and drop CAN L to 1.5V. CAN H and CAN L move in equal and opposite directions simultaneously, which helps to reduce noise. If you watch the CAN bus with a scope, you might be able to see some things that might be useful in diagnosis. Excessive amplitude and sloppy signal is a sign of a missing terminating resistor. If CAN H or L were grounded or high, you'd notice that. Taking a peek at the CAN bus with a scope is fun, and may rarely lead to an otherwise impossible diagnosis, so by all means, take a few minutes to check it out on occasion, but you should know that it will not be your most effective diagnostic tool.

## Diagnosis

CAN diagnosis is almost always going to start with a scan tool and the application of logic. A logical equation does not work unless all premises are true, so using the right equipment and information are the keys to avoiding frustration. A CONSULT is the best way to ensure the data you acquire is accurate. Nissan Techno is the best source for the information necessary to analyze the data you collect. Diagnosing communication problems with anything else is asking for trouble.

The first question should always be, "What's wrong with the car?" Why did the customer come in? What problems did the customer notice, and have you noticed any additional problems? CAN allows sharing of information among many seemingly unrelated systems. This can produce some very strange combinations of symptoms. The common customer refrain of, "I think it's something electrical," following a



long list of seemingly unrelated symptoms is more likely than it used to be.

After collecting the symptoms, see what you can find with the scanner. Are there any communication codes? Check the service manual's CAN System Specification Chart to find out what control units should be installed.

### Are they all reporting in?

Nissan provides three very useful CAN diagnostic tools in the service manual:

**1. The CAN System Specification Chart** is a tool for figuring out what you're working on. Looking for a control unit that does not exist is a big waste of time. This chart provides a way to quickly determine what equipment your car has, and shortcut to diagnostic information that is relevant to it.

**TROUBLE DIAGNOSIS** [CAN]

**CAN System Specification Chart**

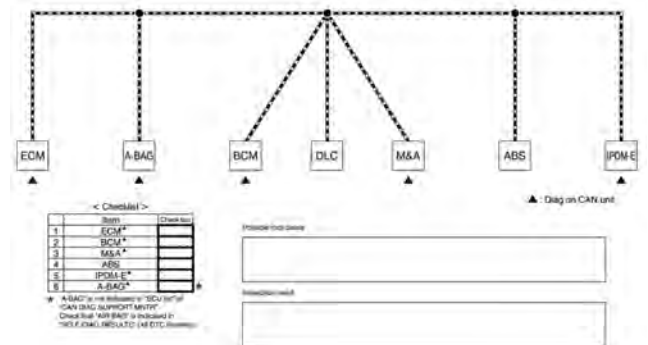
Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

**NOTE:**  
Refer to LAN-19 "CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)" for how to use CAN system specification chart.

Body type	Coupe/Roadster				
Axle	2WD				
Engine	VQ35HR				
Transmission	MT	A/T	MT	A/T	
Brake control	ABS	TCS	VDC		
CAN system type	1	2	3	4	5
Diagnosis sheet	LAN-80	LAN-80	LAN-81	LAN-82	LAN-83
CAN communication signal chart	LAN-45 "TYPE 1"	LAN-50 "TYPE 2/TYPE 3"		LAN-51 "TYPE 4/TYPE 5"	

### CAN System Specification Chart

**2. The CAN Diagnostic Sheet** is a tool used to help the technician visualize the physical layout and connections between control units.



### CAN Diagnostic Sheet

**3. The CAN Communication Signal Chart** is a tool the technician can use to figure out which control units receive a signal and which control units send a signal. For instance, a VSS signal might originate from the Unified Meter and AC amp., and be received by the ECM and TCM. This chart provides all of the send/receive relationships at a glance.

**TROUBLE DIAGNOSIS** [CAN]

**CAN Communication Signal Chart**

Refer to LAN-15 "How to Use CAN Communication Signal Chart" for how to use CAN communication signal chart.

**NOTE:**  
Refer to LAN-41 "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	BCM	M&A	ABS	IPDM E
A/C compressor feedback signal	T		R		
A/C compressor request signal	T				R
Accelerator pedal position signal	T			R	
ASCD CRUISE lamp signal	T		R		
ASCD SET lamp signal	T		R		
Cooling fan speed request signal	T				R
Engine coolant temperature signal	T		R		

### CAN Communication Signal Chart



### Using an ohmmeter is an easy way to verify that the terminating resistors are OK, and that the bus is OK between the DLC and the terminating resistors.

If you don't know how it's supposed to work, you'll be lost while trying to diagnose it. Using these three diagnostic tools in order will help you to quickly figure out how the system should be working. Once you know that, you're on your way to fixing it quickly.

An ohmmeter is a tool sometimes sneered at by some top-tier techs, but it is a very fast way to verify that the terminating resistors are OK, and should come out before reaching for the scope. The bus has two 120 ohm resistors wired in parallel, so the resistance measurement between pins 14 and 6 should be 60 ohms. There should be no continuity between pin 14 or 6 and ground. This is always the case on any CAN-equipped car. If you measure 60 ohms across the CAN bus, you know the bus is good at the point you are measuring. The same test can be repeated at any of the control units if there is a suspected break in the wiring.

### Diagnostic pitfalls

There are a few things (well, maybe more than a few) that can occasionally be confusing. One of these is that on some cars there are control units that talk to other control units using the CAN bus, but use the K Line to talk to the DCL. This is an important tidbit if you

can talk to a control unit with the scan tool, but other control units think it's offline. Information on which units communicate to the DCL via CAN is found on the CAN Communication Signal Chart.

Another potential diagnostic challenge is determining when a problem is transient and when it's intermittent. A transient problem occurred, but will probably never come back. An intermittent problem came and went, but will probably be back soon enough. Intermittent problems are often caused by poor connections, moisture, cracked solders, excessive heat, etc. Wiggle and tap testing are the best tools for finding intermittent problems (though sadly not always effective). Before beginning a major disassembly, look for clues of a transient problem and talk to your customer about options.


A U1000 or U1001 code will occur when communication is lost for two seconds or more. This could have been caused by something as simple as a discharged battery. If freeze-frame data is available, check for low battery voltage. Recent repair work is another possible cause of communication codes. If a control unit is unplugged while alive, it may set some codes. A reprogramming that did not complete normally may also cause communication codes.

Finally, an increasing number of aftermarket accessories are tapping into the CAN bus. If you notice an aftermarket accessory, try pulling its fuse before spending too much time on diagnosis.

### Repair

The CAN bus may be repaired under some circumstances. It may be tempting to run a patch between the two control units affected by the break, rather than trying to find a break in the harness, but this is a very bad idea for several reasons. One is that any splices between the two points will be cut out of the bus, creating another problem to diagnose. Another is that a jumper will lose the benefits of the twisted pair. The patch may "sort of" work, but it may also introduce a lot of noise onto the bus, causing all sorts of intermittent problems and diagnostic headaches.

For these reasons, the only Nissan-approved methods are replacing the harness or finding and fixing the damaged area. The repair should not exceed 110 mm. The patch wires should be of similar gauge and soldered into place then sealed with tape. |



# Get better performance from a cleaner engine with Nissan Fuel System Cleaner.

Lower quality gasolines are formulated with less effective and less expensive detergent additives. Over time, even occasional use of these gasolines can rob your engine of its power, performance and fuel economy.

To get the most performance, fuel economy - and fun - from every mile, and for optimum cleaning of fuel injectors, intake valves, and combustion chambers, use one (20 fl. oz.) bottle of Nissan System Cleaner every 3,000 miles when refueling.

## One tankful treatment can help:

- Clean fuel injectors, intake valves and combustion chambers
- Restore lost power and performance
- Maximize fuel economy\*
- Lower harmful emissions

\*Restores lost fuel economy by removing harmful fuel injector deposits



# Nissan

# ECU Programming



**Reprogramming an outdated ECU is cheaper, quicker and more efficient than replacement. Nissan offers the tools, information and systems to achieve re-flashing success in your shop.**



Reprogramming an ECU is an inexpensive way to improve its function. Any modern Nissan or Infiniti vehicle will likely have at least one control unit that can be reprogrammed for any number of reasons, such as reducing emissions, improving drivability, fixing bugs, or increasing component lifespan. The cost of reprogramming a control unit is only a small fraction of replacing an older control unit with an updated version, so it provides Nissan owners with a way to enjoy the fruits of engineering improvements without spending much money.

All Nissan and Infiniti dealerships offer reprogramming to their customers, but as many independents know, reprogramming is not a “dealer only” service. An independent shop that is serious about offering its customers good value should be equipped and competent enough to offer reprogramming. Many customer complaints simply cannot be resolved without a change in software, so a shop that is not prepared to install the latest software will not be able to fix the car. That’s a pretty compelling reason to read up and tool up.

Independent shops are able to purchase all of the equipment, information, and calibration files the dealerships use, plus there’s even a less-expensive option available for shops that do not do enough Nissan repair to justify purchasing the best equipment available.

The following hardware options are available:



### **CONSULT II**

This was a great scan tool and is still suitable for reprogramming, but it’s past its prime. The CONSULT III or III plus offer post-2006 coverage and a far easier procedure. The CONSULT II is no longer available for purchase, but if you already own one, Nissan is still supporting reprogramming via this device, so it’s an acceptable choice for pre-2007 vehicles.

### **CONSULT III**

The CONSULT III is a powerful scan tool and is currently the best way to flash Nissan control units. The kit can still be purchased from [www.nissantechmate.com](http://www.nissantechmate.com), and comes with a ToughBook, VI (Vehicle Interface), MI (Measurement Interface), and accessories.

### **CONSULT III plus**

The CONSULT III plus is a full-featured scan tool and is the fastest and easiest way to get into re-flashing. It will also have the widest coverage. It has an improved interface that is more intuitive than that of the CONSULT III. The user will need to provide a laptop; the kit comes with only the VI (Vehicle Interface) and software. You’ll be able to purchase the C-III plus kit to upgrade your existing C-III, or purchase a full C-III plus kit (including laptop) at [www.nissantechmate.com](http://www.nissantechmate.com) later this year. Remember, Nissan CONSULT software will only operate on the special Toughbook.

### **Nissan-validated J-2534 pass-thru interface**

A J-2534 pass-thru interface can be used in conjunction with NERs (Nissan ECU Reprogramming Software) to re-flash Nissan and Infiniti vehicles. NERs is not a diagnostic interface; it can only be used for re-flashing, so that is one disadvantage of going the J-2534 route. Another potential downside is reliability. Nissan puts a lot of R&D into the CONSULT scan tools, and they have been extensively tested at dealerships. A generic J-2534 device will likely not see action until later in the product lifecycle, so may not be as polished. That being said, Nissan has tested and validated a few of the J-2534 devices available, and has determined that they seem to work well with NERs. The following J-2534 pass-thru interfaces are currently Nissan-validated:



**Use only Nissan validated J-2534 pass-thru interfaces, such as the DrewTech Mongoose.**

- DrewTech CarDAQ-plus
- Actia Passthru+XS
- DrewTech Mongoose
- Consult VIs (III and III plus)

These J-2534 devices range in price from around \$400 to \$1,700. You'll need to use your own laptop, which should be in good condition, meet minimum requirements, and be free from software or settings that might interrupt the reprogramming process. The NERs is available via download from [www.nissan-tech-info.com](http://www.nissan-tech-info.com). The NERs Operation Manual is available as a free download in PDF format, so you can review step-by-step procedures before making a purchasing decision. The CONSULT VIs (III and III plus) can also be used as a pass-through device and can be purchased separately at [www.nissantechmate.com](http://www.nissantechmate.com).

### It's not that hard

Reprogramming is something most technicians will find fairly easy. If you have computer skills, you'll likely feel like a pro after you have a couple experiences under your belt. However, don't get too comfortable and start to get sloppy. If a reprogramming fails, the ECU may be permanently damaged. This is colloquially referred to as "bricking" because the ECU becomes about as useful as brick for vehicle control



**If you read instructions before doing, and follow established procedures, you'll probably never need to "toss a brick."**

(yet probably not as useful as a brick for structural purposes). Regardless, it will be of little use to anyone who is not looking for a very expensive paperweight. The path to avoiding a brick is easy: Just follow the instructions outlined in the TSB and the reprogramming overviews. The key to a successful re-flash is avoiding interruptions.

First, the ECU needs an adequate voltage supply. If the vehicle's 12V battery does not maintain a steady voltage during the reprogramming, the procedure may fail. Therefore, the battery should be tested before beginning to flash. However, even if the battery is in great condition and fully charged, it's a very good idea to have a backup, just in case. A fully-charged booster pack is one option, but then there's always the chance that the booster pack might not be as charged as you think it is.

The ideal solution is a power supply. It's like a battery charger, but its output is very clean with very little ripple, and the "charging" voltage is much lower than normal, typically 13.5V. The Nissan-recommended Midtronics GR8-1200 has a power-supply mode that works well for reprogramming. There are other products that will work, but you'll need to verify their suitability on your own. Don't use a standard battery

charger. They are often very "dirty" (AC in the DC) and usually have the potential to charge at too high a voltage for safe re-flashing.

The laptop and VI, or scan tool, will also need a steady power supply. Even if the laptop battery is fully charged, and in good condition, plugging the laptop into a wall outlet is a good idea. It just takes a few seconds and if the laptop were to power down mid-flash, it would cause some real problems.

Preventing software interruptions is also important. The laptop computer used for re-flashing should have minimal software installed. There's no way to predict how NERS will be affected by the millions of different software packages available. Keeping the system clean is the best way to avoid conflicts.

This may sound crazy to IT managers, but automatic Windows updates should be turned off. One reason is that an automatic restart is bad news during mid-flash. If the technician is watching the flash, he can prevent the restart, but most techs will start the flash, and then do something else while it completes. The other reason is that major changes in the operating system may cause problems. For these reasons, updates should be done manually, and major updates, like service packs, should not be installed until you've verified that they won't cause problems.

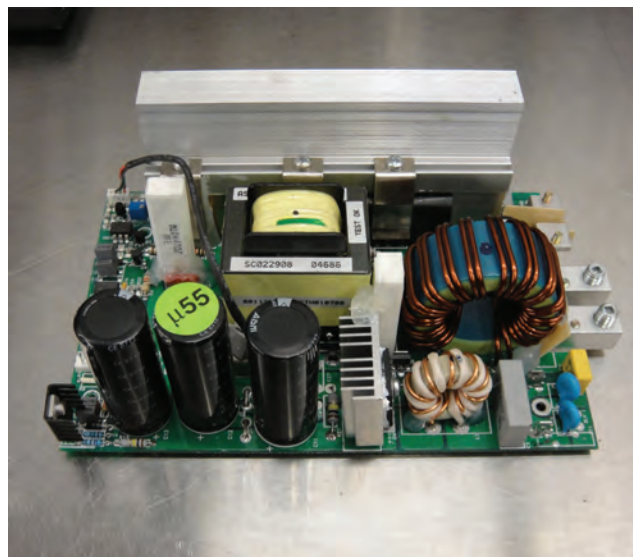
Wireless communications are especially prone to interference. You may find some Nissan material that depicts a CONSULT III with a wireless connection to the VI while reprogramming, but using the USB connection may be a better choice. Be sure the USB cable connections are tight. Loose connections can cause an interruption and resulting "brick." Cell phones, lighting, welding, and a plethora of other noisy electrical devices and electronics can be found in a shop environment. Why take a chance?

The final source of potential interruption is human interference. Perhaps a co-worker notices you've "left the key on" and helps you out by turning it off. Or, he decides he needs to move the car. Or, he needs the scan tool and sees that you aren't using it right now. Unless you plan on standing guard, post a sign on the car so others know what's going on and leave the car alone.

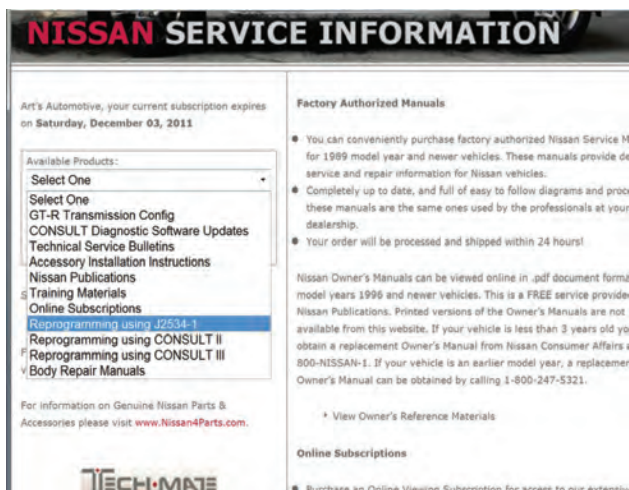
## When and how to re-flash

Now you know what hardware you'll need to begin re-flashing and how to avoid damaging the ECU, but there are still some lingering questions such as, "When should a re-flash be performed?" and "How is it done?"

The decision to re-flash always starts with a Technical Service Bulletin. Whenever an ECU update is created, a TSB is issued to explain the reasons for the update. Any symptoms or trouble codes will also be disclosed. Applicability, warranty information, and any special instructions can also be found in the TSB. Always read the TSB in its entirety before beginning work, even if you are familiar with the reprogramming process. Application-specific instructions included in the TSB may save you from disaster.



**Some battery chargers have the additional circuitry necessary to supply clean, steady power, but most do not. If the charger doesn't have a specific power supply or reprogramming mode, it probably isn't suitable for reprogramming use.**



### Go to the Nissan or Infiniti Techinfo sites to download ECU calibration files, NERs, and find detailed instructions.

Once you've confirmed that there is an applicable calibration file for the vehicle with a TSB, you'll need to check the current ECU part number (which will change with every calibration). The current ECU part number can be retrieved with the CONSULT II, III, or III plus. If the calibration applies to the vehicle and the ECU part number reveals the calibration has not been applied yet, it's time to start flashing.

Calibration files can be purchased and downloaded from the Nissan or Infiniti Techinfo sites ([www.nissantechinfo.com](http://www.nissantechinfo.com) or [www.infiniti-techinfo.com](http://www.infiniti-techinfo.com)). It's not necessary to have a Techinfo account to purchase and download calibration files. However, you will need an account to view full TSBs, and access to the relevant TSB should be considered mandatory since it may contain information that is necessary for success.

Techinfo subscriptions can be purchased for a single day (\$19.99/day), 30 days (\$2.50/day), 90 days (\$2.50/day) or a full year (\$720, or \$2/day). The calibration files are a separate purchase, and are not included with the Techinfo subscription. Calibration files are \$19.99 each. So the total cost for information and software will be between \$22 and \$40. The procedure for downloading the calibration file is fairly straightforward. Select the "Available Products" drop-down menu.

### Using a J-2534 pass-thru interface

If you are using a J-2534 pass-thru interface, choose "Reprogramming using J-2534-1". This will take you to a page that explains the requirements and allows you to download the NERs Operation Manual and purchase the NERs software if you don't already own it.

Once you've read this page and verified you have everything you'll need, click on the "Reprogram" tab. Once there, either enter the 10-digit ECU number in the search field, or select it from the drop-down menu. The ECU number should be retrieved with a scan tool, not by using the ECU label. The updated part number will then be displayed. Click on "Submit, Purchase, Check Out," and continue to follow the prompts, entering your address, credit card information, etc.

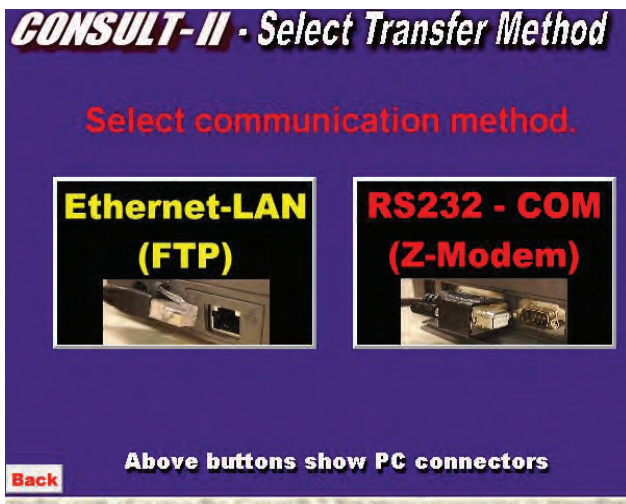
Once purchased, you'll be allowed to download the file. You'll only have access to the download page for 24 hours, so download your purchases right away. You'll need to place the downloaded files in a specific directory so that NERs will be able to find it. For a J-2534 device, the directory is C:\Program Files\Nissan J2534 ECU reprogramming software\Application data\Reprogramming Data.

If using the NERs and a pass-through device, follow the prompts to install the update. This has been a quick overview of the process. Full instructions are available in the NERs Operation Manual, and should be consulted before re-flashing.

### Using CONSULT II

If you plan to use the CONSULT II for a 2006 or earlier vehicle, there is an extra step. The purchased calibration must be downloaded from the Techinfo site to a PC, to a CONSULT II programming card, then to the vehicle. The transfer from the PC to the CONSULT II is done with free software available for download from Techinfo. You'll find CONSULT II compatible calibration files and the free CONSULT II transfer software on the Techinfo site under "Reprogramming using the CONSULT II."

The only tricky part of using the CONSULT II for reprogramming is transferring the files from the PC to the reprogramming card in the CONSULT II. There are two choices for data transfer, either RS-232 (serial port) or FTP (Ethernet port).



### Consult II reprogramming file transfer options.

The RS-232 setup is simple, but is very slow and most PCs don't have a serial port these days. If a PC lacks a serial port, you can purchase a USB to serial adaptor, but most of the time you'll need to do a bit of setup and configuration to make it work.

The FTP transfer is fast, and virtually all PCs have a network card installed. However, if you're a networking novice, the setup can be a little daunting. Typically, the easiest way to set up is to add the CONSULT II to an existing network structure. Just assign the CONSULT II an IP address that is unique, but still on the same subnet as other PCs on the network, then connect the CONSULT II via a standard Ethernet cable to a switch or router rather than using the crossover cable supplied with the CONSULT II. This method is faster than breaking the existing network configuration on the PC to use the crossover cable for a PC to PC (CONSULT II) connection. If this makes no sense to you, go with the serial connection and save yourself the hassle.

The Reprogram Card Operation Manual can be found in the CONSULT II reprogramming software, which is available as a free download from the Techinfo site on the "Reprogramming using the CONSULT II" page. The link to the manual is about seven clicks in the software. The PDF manual can be saved or printed, and should be read before attempting to use the software.



### You'll need this free software to transfer files from your PC to the Consult II.

### Using CONSULT III AND III plus

The CONSULT III and III plus are a lot easier to use for reprogramming. The software you'll need is already installed and the process is very straightforward. Purchase and download the calibration file to the directory specified in the readme.txt file that comes with the calibration, then install it on the vehicle. The relevant TSB will contain vehicle-specific instructions, and if you are not yet familiar with the procedures, there is usually a "click here" link within the TSB that will take you to more general reprogramming instructions.

Depending on the vehicle and the situation, there may be some post-flashing maintenance that needs to be performed. Specific instructions can be found in the TSB, so be sure to read the whole thing and follow all instructions.

Some ECUs can survive an incomplete flash. So, if you trip over the VI cable at 25% downloaded, don't fall on your sword right away. You may be able to save the ECU before your boss finds out. You can find information about how to go about recovering after an incomplete re-flash in TSBs. Because TSBs can't be searched with the Find Publications search, you may want to dig around a bit and find these two TSBs: CONSULT III Reprogramming General Procedure and the ECM Reprogram Interruption Recovery General Procedure. Print or save them before you need them, and one day you may be glad you did. |

# The **OEC**Connection: The Best Solution to Buying Collision Parts



**Missing out on rapid delivery, correct parts, easy ordering, genuine OE quality and the best possible profit? You can improve your OE replacement parts business with OECConnection.**



OECConnection LLC (OEC) helps Nissan & Infiniti dealers and independent collision shops nationwide overcome a constant, shared challenge. The paradox they face is managing repair costs efficiently while doing what is right for their customers.

In a perfect world, simply providing the best repair possible would be the standard. But several factors compound the challenge, including price disparities between original equipment (OE) and non-OE replacement parts; price-conscious car owners; and pressuring 'suggestions' from insurers that facilities use less-expensive aftermarket or salvage replacement parts, rather than Nissan Infiniti OE parts.

Most everyone in the repair equation recognizes that cheaper isn't necessarily better. Value and safety also matter. Non-OE parts have inherent risks, including unknown wear (if salvaged or non-certified), poor fit and lengthened repair cycle time.

Despite what insurers may suggest, vehicle owners and repair technicians both prefer OE parts. For example, consider the findings of a 2009 BodyShop Business magazine Industry Profile survey, in which respondents reported that:

- 79 percent felt pressure by the insurer to use non-OE parts.
- 91 percent said that OE collision parts provided an acceptable fit.
- 54 percent of certified aftermarket collision parts and 35 percent of non-certified aftermarket parts provide an acceptable fit.

The bottom line? The choice of replacement parts not only affects fit, it also impacts cycle-time, can lead to lengthy calls to insurers to approve a different alternative and increase inconvenience for vehicle owners.

## **Nissan incentives + OECConnection = a level, competitive playing field**

No longer does an independent collision shop need to choose, based solely on cost, between an OE part and an aftermarket part. Automaker incentive programs, such as Nissan's Market Shield, which was launched in 2009, are designed to gain conversion

sales — wherein a collision facility chooses to use a competitively-priced Nissan OE replacement part rather than a non-OE alternative. OECConnection has helped Nissan and other automakers take these incentive programs one step further, namely, to sell even more OE parts with fewer returns.

"Since the beginning, we have followed the same guiding principles: increase dealer efficiency, improve customer satisfaction and help dealers sell more OE parts," says OECConnection President and CEO Charles Rotuno. "As our relationships with dealers, repairers and OEMs have grown, along with our expertise in the automotive and vehicle manufacturing industries, we have continued to introduce new solutions to achieve these goals."

In December 2009, shortly after launching its Market Shield incentive program, Nissan selected OECConnection's CollisionLink Internet-based parts ordering and fulfillment system for Nissan & Infiniti dealerships and their independent collision shop customers nationwide.

The agreement included CollisionLink's Parts Marketing Administration (PMA) program marketing technology, which automates and manages automaker parts programs. PMA is the engine that drives automakers parts marketing programs based on pre-defined rules. PMA allows dealers and their collision repairers to access automaker incentives and parts promotions from within CollisionLink so that dealers can obtain OE parts at competitive prices compared to non-OE parts. Essentially, PMA automated Market Shield to make it easier for both dealers and aftermarket independent shops to participate.

CollisionLink was first introduced to the market in 2001, and has now been adopted by more than 75 percent of large wholesale dealerships in the U.S., as well as thousands of their collision shop customers nationwide. Besides helping dealers increase OE parts sales to shops repairing their brands, collision shops can better solve the best repair/cost efficiency paradox, insurers can approve OE quality replacement parts and consumers can realize more value. In addition, by using the OECConnection program to purchase OE parts from dealers, collision shops have also been able to:

**Customer Access** -Select product- Visit our Canadian site **Sign In**

Company Solutions News Careers Customer Care Enroll Contact Us

**The leading Online Parts & Service Exchange in the automotive and related industries**

**Right Part. Right Place. Right Time. ...Right Kind of Innovation.**

OEConnection technology uniquely transforms the way companies view and manage their current supply chain for original equipment (OE) replacement parts in automotive, heavy duty truck, and beyond.

Thanks to our extensive experience with Internet technology, we are especially qualified to provide unique end-to-end solutions specifically designed to address your after-sale parts and service needs. Using the latest technology we have built industry-leading tools that are fast, accurate, and easy to use. With OEConnection, you can trust we'll get it done—leaving you free to focus on growing your business and improving your bottom line.

Enroll now in an OEConnection product

Enroll now in collisionlink® Enroll now in serviceadvantage®

100 OEConnection is Three-Time Winner of WeatherHead 100 Award [Read more...](#)

10<sup>th</sup> Ten Year Anniversary OEConnection LLC marked its 10th anniversary on December 4, 2010. [Read more...](#)

"I've been working in wholesale parts for 30 years... and this is the best thing I've ever come across."  
-Ken Athas, Parts Manager, Jerry Rome Nissan

collisionlink®

Ph: (888)776-5792 | Fx: (330)523-1700 | ©2011 OEConnection. All rights reserved. | [Privacy Statement \(Revised\)](#) | [Site map](#)

## The OEConnection Website

- Reduce nonproductive order-taking phone time and order data entry.
- Minimize parts returns.
- Offer and sell more OE parts at competitive non-OE pricing.
- Improve customer satisfaction.

### A Case Study: Jerry Rome Nissan

Consider the experience of Jerry Rome Nissan, located in West Springfield, Mass., one of the first dealers to participate in the Nissan program. Ken Athas, the dealer's parts manager, says that before the MarketShield/CustomerLink program, he and his staff could only convince a few independent shops to order Nissan OE parts thru the dealership. He credits the new program for helping to get more independent shops to use the online technology and sell more Nissan OE parts to them.

"I've been working in wholesale parts for over 30 years, and this program is the best thing I have ever come across," Athas claims. "The best thing that Nissan did was to say the only way independent shops could get a discount was to go through the CollisionLink product."

Under the program, Nissan reimburses dealers for the incentive pricing provided to collision customers and allows participating dealers to determine how to use the reimbursed funds. In order to win more OE parts sales from independent collision centers, Jerry Rome Nissan decided to take the net cost less the Nissan Market Shield rebate and then markup 10 percent. That decision has helped the dealer consistently rank in the top five of all Nissan dealerships for OE parts conversion dollars.

"I didn't want collision shop customers to say, 'Oh, I got a deal on this part, but not on that one' because that isn't enough to make them sway," explains Athas. "We learned that shops will use CollisionLink, and they will want to switch to us from non-OE aftermarket parts if they know they will always get a value. In the end, the dealer gains customers who believe and trust in us."

The dealership also realized other benefits to having their most active independent collision customers sending orders electronically. It has streamlined ordering, reduced errors and leveled off the pace of work.



"For instance," Athas notes, "I don't have to urgently take down a 30-line order while all the phones are ringing, a retail customer is standing in front of me and a technician is yelling something at me from another corner. It's nice to avoid those situations where you're just going to mess up."

The parts department staff at Jerry Rome Nissan also reaches out proactively to acquire business from independent collision facilities, whether it's more sales to a particular shop or gaining business from new shop customers. For instance, they regularly call long-time customers and visit other shops to hand out program literature and discuss the value of Nissan OE parts and the discounts available, when compared to non-OE parts.

In addition, when collision shop customers send in orders, with some line items being blacked-out aftermarket parts, staff makes an added effort to provide price comparisons on comparable Nissan OE parts available through the program. "One shop faxed me an order, which had a fair amount of aftermarket parts on it," Athas shares. "Once I told him what other OE parts I could offer – which would save them \$500 off the regular OE price – the shop was elated. They signed up with CollisionLink and resent me their revised, larger order."

Athas credits the Nissan program with waking up some of the local collision centers. "Once these shops started using it, and realized how valuable the discounts are and how easy it is to use, they have bought into it. My hope is that as time goes on, we will get 100 percent of their orders whether there are conversion opportunities or not."

In just the first three months after beginning the program, Athas says the dealer's parts department signed up more than 15 independent collision shops and generated more than \$30,000 monthly in new conversion OE parts sales. "Since then, we've gained another dozen collision centers, including the largest two in their market area."

With its primary goal of "putting the right part in the right place at the right time for the right customer," OEConnection is transforming the way dealers and collision companies view and manage their current supply chain for Nissan OE replacement parts. By working directly with automakers, the program has helped level the replacement parts landscape for everyone's benefit. Sometimes, everybody wins. |

**The OEConnection LLC supports 12 technology solutions used by customers throughout North America. Some of these are:**

- **D2D Express —**  
Fills OEM-needed backordered parts online, with same- or next-day delivery, based on an automaker's solution rules.
- **RepairLink —**  
Independent shops today only buy 23 percent of their mechanical replacement parts from OE dealers, preferring the ease, convenience and speed of aftermarket supplier online ordering. RepairLink levels the playing field, giving independent shops a standardized, complete OEM parts catalog with your parts pricing and availability.
- **ServiceAdvantage —**  
On average, dealerships provide maintenance services to just 30 percent of the vehicles they sell. ServiceAdvantage helps dealers capture more sales by enabling counter staff to begin every customer visit with a customized maintenance menu of services specific to the vehicle's mileage and VIN, make, model and year.
- **CollisionLink —**  
CollisionLink is a Web-based OE parts ordering system for transactions between dealerships and independent body shops, specifically designed to convert non-OE part sales to OE part sales and provide collision shops with the right parts the first time.

*For more information of the services and products available, visit [www.OEConnection.com](http://www.OEConnection.com).*

# | All About Waterborne Paint





# Waterborne paint is the new standard. It's also safer, cheaper and faster. And it's the law...

Today in North America, more and more dealer and aftermarket collision repair facilities are making the transition to waterborne paint – a decision driven by regulatory pressures, economics and a desire to be both environmentally friendly and safer. Where once the change from solvent-borne to waterborne was feared, experience has demonstrated that the transition can be seamless and productive, provided the right choices are made regarding technology, equipment, support, training and preparation.

The transition to waterborne began with automakers in the early 1990s. First invented in 1992, it was the introduction by automakers of new metallic and effects finishes that spurred waterborne paint systems past traditional solvent-borne systems. Today more than 75 percent of all new original equipment manufacturer (OEM) vehicles are painted with waterborne paints, generally using a two-step process. The car is first painted with the basecoat color and then covered by a clear coat.

## It's the law

Waterborne paints meet the requirements of the U.S. Environmental Protection Agency's (EPA) National Emissions Standard for Hazardous Air Pollutants rule (EPA Rule 40 CFR Part 6H). The rule was published in January 2009 and requires that collision facilities be in compliance by March 11, 2011.

The rule lowers the volatile organic compound (VOC) limits allowed in coatings and mandates the use of waterborne refinish coatings. It also requires collision facilities to implement equipment and management practices in compliance with the new standards, practices that both reduce toxic material consumption and produce a savings to the facility.

Collision repair facilities that use paint stripper containing methylene chloride or engage in spray application of coatings to metal or plastic substrates

with coatings containing volatile organic compounds (VOCs) of chromium, lead, manganese, nickel, or cadmium must comply in five basic areas:

◀ **Training** – Paint technicians will find waterborne basecoat easy to spray, but spray techniques differ slightly from applying solvent-borne. All painters must train and certify on spray gun equipment selection, spray techniques, maintenance and environmental compliance.

◀ **Spray Booths** – Open-air spraying will no longer be allowed in any capacity within a collision repair shop. Spray coatings containing a targeted hazardous air pollutant (HAP) must conduct spray operations in a booth outfitted with an exhaust filter with a VOC capture efficiency of 98 percent or greater. Work with your spray booth manufacturer or filter supplier to select the right filter for your shop's filtration needs.

◀ **Coating Application Equipment** – Spray guns used to apply coatings must employ high-volume, low-pressure (HVLP) or an equivalent EPA-approved technology.

◀ **Spray Gun Cleaning Requirement** – Spray gun cleaning operations must prevent atomized mist or avoid spraying cleaning solvent and paint residue outside a container used to collect waste solvent.

◀ **Recordkeeping** – Existing facilities must be in compliance by Monday, Jan. 10, 2011, with notification of full compliance filed with EPA by March 11, 2011. New facilities built thereafter are required to comply before opening for business. All facilities must notify the agency each calendar year of any reportable changes that occurred. In addition, facilities must keep copies on file of all required documents, such as EPA notifications, employee training certifications, equipment documentation and corrective compliance actions taken.



**The introduction by automakers of new metallic and effects finishes spurred the adoption of waterborne paint systems by collision repair facilities. Nissan Infiniti models for instance, feature “self-healing” Scratch Shield clear coat waterborne paint.**

(Courtesy of Nissan North America)

For more detailed federal information, a complete copy of the EPA rule is available at [www.haps6h.com](http://www.haps6h.com). The EPA also provides more guidance to collision repair facilities at [www.epa.gov/collisionrepair](http://www.epa.gov/collisionrepair). Facilities should also check with their state and regional authorities in regards to other regulations or requirements that the newer EPA rule does not supercede. Facilities in California, for example, should ensure they also comply with the requirements of the California Air Resources Board (CARB) and the South Coast Air Quality Management District (SCAQMD).

### **Benefits worth switching for**

Waterborne paints are latex paints that provide collision facilities with a better alternative to traditional solvent-based paints. Made of synthetic resins and pigments that are kept dispersed in water by surfactants, waterborne paint contains less coalescing solvents than solvent-borne paints. Consequently, waterborne paint has significantly lower volatile organic compound (VOC) emissions compared to solvent-borne paint.

VOC emissions can be harmful to people because they contain chronically hazardous pollutants. In addition, the emissions build smog. With lower VOC emissions, waterborne paints improve air quality within body shop facilities and provide a safer way to paint and refinish automobiles.

It should be noted, however, that waterborne paints do not eliminate the need for safety equipment; rather, they lower the exposure risk to those in collision operations who handle paint. Standard safety equipment is still required, but the harsh odors associated with using solvent-based paint throughout your facility can be eliminated. In addition, waterborne paints can also reduce the amount of hazardous waste generated by a collision facility.

Another advantage that is helping to make waterborne the system of choice is their ease of use and ability to match a car's finish, whether the original paint was solvent-borne or not. In addition, because the toner pigments in acrylic waterborne latex resins are engineered with anti-settle technology, facilities no longer need a mechanical mixing machine. Current waterborne paint technology and systems from leading suppliers allow refinish technicians to simply shake, pour, spray and expect the same performance, accuracy and durability of solvent-based systems.

Waterborne paints also dry and cure faster than solvent-borne paints, allowing vehicles to be ready for customers one to two days sooner. As with any type of paint, temperature, humidity and airflow all play a role in the curing speed. Fortunately, modern spray booths and accessory equipment can optimize these influences.

## Equip for success

Converting from solvent to water won't take much time at all – typically a month or less – especially when you partner with quality suppliers and their dedicated teams of conversion and training specialists. Importantly, you won't sacrifice your shop's performance or quality.

As with all refinish products, it is recommended to use the standard personal protection equipment detailed in the Material Safety Data Sheets (MSDS) for specific products. Safety equipment typically includes air-fed masks, gloves and safety glasses.

Any solid sludge collected from the treatment process is classified as “controlled waste” and should be disposed of in accordance with your local regulations. The filtrate produced from the waste treatment process should also be treated as controlled waste and not be disposed of into a public sewer without official authorization by your local authority.

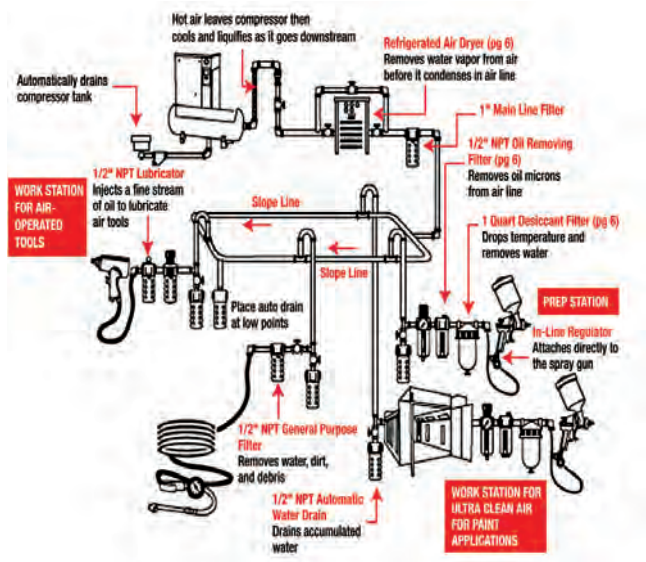
When it comes to converting to waterborne, facilities should consider four key benchmarks that enable them to position themselves for a successful transition. These include:

< **Use spray guns designed for waterborne paint. Because waterborne paints can rust plain steel and attack aluminum, choose a gun that is constructed of a corrosion-resistant material such as #316 stainless steel with 1.2mm to 1.4mm fluid tips. Dedicate spraying equipment for waterborne products. This will extend the life of the spray gun. Also, be aware that maintenance and cleaning differs from guns used for solvent-borne coatings.**

< **Cleaning your dedicated waterborne spray guns will help keep them working at their top performance and extend usable life. Check with your gun's manufacturer for instructions on how to clean and maintain your specific equipment. Exercise caution here, as cleaners may not be suitable for both waterborne and solvent-borne spray guns.**

Many guns can be cleaned using a gun cleaner that integrates the use of a flocculating powder, to clean out waterborne residue from dedicated spray guns. This flocculating agent helps separate solids from wastewater, making it possible to reuse the filtrate at least 10 times before its cleaning properties diminish. This makes the cleaning process efficient, minimizing waste and cost.

< **The evaporation characteristics of waterborne coatings differ from solvent-borne. Notably, waterborne systems are very fast and can often outperform solvent-based coatings. But waterborne paint requires good air-flow to quickly evaporate water from the coating. For efficient drying, increasing the feet per minute (FPM) of air passing over the surface is key. Temperature and humidity also play a role in dry-times. Generally, 200 cubic feet per minute or more will lead to great results.**



**For optimum productivity with waterborne coatings, compressed air supply systems must remove dirt, dust, oil residues and other contaminants from the air supply. Note the extra filtration required as one nears painting areas.**

(Courtesy of Sherwin Williams Automotive Finishes)

< Drying equipment can range from simple additions to existing equipment to installing specialized equipment specifically designed for use with waterborne automotive paint systems. Handheld blowers and floor stands can be set up in a spray booth to increase airflow and quickly evaporate water from the basecoat. Spray booths can also be retrofitted with mounted blowers or fans making it easier to start the flash process after spraying waterborne.

**Specialized waterborne downdraft spray booths use accelerated air make-up systems – fans will double their speed in flash mode – to decrease dry times and improve productivity at the flip of a switch. Systems can also be fitted with temperature and humidity controls.**

### Partner with quality suppliers

Choosing quality paint and equipment suppliers that provide training, technical support and other services required to make a smooth transition to waterborne is essential. Besides providing reliable and durable products, they should also have a clear and practical understanding of how to get the very best out of your new waterborne basecoat system. PPG, BASF, Dupont and Sherwin Williams are just some of the reputable suppliers with established training and support. You might also want to check with your industry networks for positive experiences.

Support can help you design and equip your waterborne system, based on your facility, car flow, health and safety issues and other factors. Training can cover an overview of your waterborne system, application techniques, color adjustments, spot repair, blending, waste management, maintenance and more. Note that suppliers offer a variety of classroom and hands-on training – some online, some onsite, some offsite and some a combination of these.

Consider your staff's learning styles, then check to see what prospective suppliers offer to meet your training needs. For example, besides training at your supplier's facility, negotiate having a supplier's conversion and training team provide on-site training at your facility



**State-of-the-art waterborne spray guns, such as the digital SATA jet4000b HVLP above, are lighter in weight, quieter and offer more spray control.**

(Courtesy of Dan-Am Co.)

during the actual waterborne conversion period (typically one to three days). Working with your technicians on your site with your equipment – while covering application training, computer training, waste stream training and color tool training – could go a long way to making the smoothest transition possible.

Like any new material or procedure within a system, there's a learning curve to go through. But with the right equipment and training, collision repair facilities and their technicians should not have great difficulty in switching to a waterborne system. Making a successful transition into waterborne finishes requires the right combination of support, information, training and equipment. Now, more than ever, the decisions you make today will have a long-lasting impact on the quality, productivity and profitability of your body service business. |

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