

## On-Board Diagnostics (OBD II) Certification Course

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Title:	On-Board Diagnostics (OBD II) Certification Course
Lesson Purpose:	To familiarize students with the mandates and procedures required for certification as a North Carolina OBD II inspection mechanic.
Training Objectives:	<p>At the end of this block of instruction, the student will be able to achieve the following objectives in accordance with the information received during this block of instruction.</p> <ol style="list-style-type: none"><li>1. Identify vehicles that require an OBD II inspection.</li><li>2. List in writing the fees associated with an OBD II inspection and identify when they apply.</li><li>3. Explain when a waiver of the inspection requirements may be issued.</li><li>4. Identify the Emissions Control Components installed on vehicles.</li><li>5. Successfully pass a written examination with a score of no less than 80%.</li></ol>
Hours:	Eight (8) Hours
Instructional Method:	Lecture / Discussion / Practical
Classroom Environment:	Academic Classroom
Materials Needed:	Outline Pen / Pencil Notebook
Training Aids:	Power Point Presentation Computer Handouts
Reference Material:	<p>Inspection/Maintenance Program Requirement On-Board Diagnostic Checks, Federal Register Online [On-Line]. Available at: <a href="http://www.epa.gov/fedrgstr/EPA-AIR/1995/August/Day-18/pr-926.html">http://www.epa.gov/fedrgstr/EPA-AIR/1995/August/Day-18/pr-926.html</a> [August 18<sup>th</sup>, 2005]</p> <p>North Carolina, <i>General Statutes</i>. (2006) 20-183.4, 20-183.4A, "License required to perform safety and emissions inspections"</p>

North Carolina Department of Transportation, Division of Motor Vehicles, License & Theft Bureau, Safety Inspection Emissions Inspection Windshield Certificate Replacement Regulations Raleigh, North Carolina April 2006

U. S. Environmental Protection Agency, Office of Mobile Sources, Automobile Emissions: An Overview Fact Sheet August 1994 [On-Line] Available at: <http://www.epa.gov/otaq/consumer/05-autos.pdf>

U. S. Environmental Protection Agency, Emission Standards for Moving Sources, Clean Air Act, Section 206 [On-Line] Available at: <http://www.epa.gov/air/caa/caa206.txt>

Study Assignment: None

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I. Introduction

A. Opening Statement

This training program is designed to familiarize the students with the mandates and procedures required for certification as an emissions inspection mechanic in North Carolina. In order for this program to be successful, all stakeholders must develop a complete understanding of the requirements and regulations. While designing this block of instruction, great care was given to ensure all students, regardless of their individual backgrounds, experiences, and education would benefit and gain additional knowledge of the I/M program. Although some of the information discussed in this lesson plan may be basic to the experienced professional, the information provided should be beneficial to all those who attend.

B. Student Performance Objectives

C. Reason for Training

Motor vehicle inspection and maintenance (I/M) programs are an integral part of the effort to reduce mobile source air pollution. Despite being subject to the most rigorous vehicle pollution control program in the world, vehicles in the United States still create a substantial amount of carbon monoxide, hydrocarbons, nitrogen oxides, and other air pollutants. One reason for this is the fact that the number of vehicle miles traveled on U.S. roads has doubled in the last two

decades to 2 trillion miles per year, partially offsetting the technological progress in vehicle emission control made during that time. Projections of continued growth in vehicle travel necessitate continued emission-reduction efforts so those air quality goals may be achieved.

Under the Clean Air Act as amended in 1990, the U.S. Environmental Protection Agency (EPA) is pursuing a three-point strategy for reducing emissions from transportation sources. The first two points involve the development and commercialization of cleaner vehicles and cleaner fuels. The third point focuses on in-use control to ensure that cars in customer use are properly maintained. I/M programs are intended to address this third point.

## II. Body

### A. Station Qualifications

1. An Inspection Station is a place of business legally licensed by the Commissioner of Motor Vehicles to conduct inspections of motor vehicles as required by North Carolina General Statute. Each Inspection Station must be equipped with the proper equipment and tools to perform inspections, which includes the follow:
  - a) One (1) jack or lift with a minimum capacity of two (2) tons.
  - b) One (1) headlight tester to fit all headlights (mechanical, optical, or wall chart.) (See approved headlight testers, appendix 1)
  - c) One (1) workbench
  - d) One (1) creeper
  - e) One (1) tire tread depth gauge (calibrated in 32nds of an inch)
  - f) One (1) Emissions Control Application Manual (edition is current through July 1<sup>st</sup> of each year) or current computerized electronic software.
  - g) One (1) approved Emissions Analyzer with current approved software and operable bar code scanner
  - h) One (1) active dedicated telephone line with jack
2. Inspection stations are not required to conduct inspections on vehicles equipped with after factory window tint. However, if inspections are conducted on these vehicles, the inspection station must have the following optional equipment.

One (1) Approved Window Tint tester. (See approved window tint tester, appendix 2)

B. Mechanic Qualifications

In accordance with North Carolina General Statute 20-183.4A (c), an applicant for a license as an emissions inspection mechanic must meet all of the following requirements for initial and continued certification.

1. The applicant must have a license as a safety inspection mechanic in North Carolina.
2. The applicant must have a driver's license that is valid in North Carolina.
3. The applicant must be of good character and have a reputation for honesty, and be able to successfully pass a background check as required by the Division.
4. The applicant must successfully complete an eight-hour course approved by the Division that teaches students about the causes and effects of the air pollution problem, the purpose of the emissions inspection program, the vehicle emissions standards established by the United States Environmental Protection Agency (U.S. EPA), the emissions control devices on vehicles, how to conduct an emissions inspection using equipment to analyze data provided by the On-Board Diagnostic (OBD II) equipment approved by the Environmental Management Commission, and any other topic required by 40 CFR 51.367 to be included in the course.
5. The applicant must successfully pass a written examination with a score of no less than 80% correct answers.
6. The applicant must successfully conduct a hands-on test in which the student will be required to conduct a safety/emissions inspection of a vehicle with an approved certified emissions analyzer.

C. Emissions Analyzers

Before being approved for use, Emissions Analyzers are subjected to extensive testing and certification by the Division of Air Quality. The analyzers currently approved for use are listed below in random order:

1. ESP

2. Snap-On
3. SPX
4. Ease Diagnostics
5. Systech
6. Worldwide
7. Banalogic
8. Banalogic By Verizonbusiness

D. Cause and Effects of Air Pollution

Air Pollution generally refers to gasses and chemicals released by man-made sources such as factories, power plants, cars and trucks. It can cause diseases such as cancer, birth defects, immune diseases, allergies and asthma. It also damages the ozone layer and can erode buildings and lead to soil and water damage.

E. Vehicle Generated Pollutants

Emissions from an individual car are generally low, relative to the smokestack image many people associate with air pollution. But in numerous cities across the country, the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up.

1. The Combustion Process

Gasoline and diesel fuels are mixtures of hydrocarbons, compounds that contain hydrogen and carbon atoms. In a “perfect” engine, oxygen in the air would convert all the hydrogen in the fuel to water and all the carbon in the fuel to carbon dioxide. Nitrogen in the air would remain unaffected. In reality, the combustion process cannot be “perfect”, and automotive engines emit several types of pollutants.

2. Evaporative Emissions

Hydrocarbon pollutants also escape into the air through fuel evaporation. With today’s efficient exhaust emission controls and gasoline formulations, evaporative losses can account for a majority of the total hydrocarbon pollution from current model cars on hot days when ozone levels are highest. Evaporative emissions occur several ways:

- a) Diurnal: Gasoline evaporation increases as the temperature rises during the day, heating the fuel tank and venting gasoline vapors.
- b) Running Losses: The hot engine and exhaust system can vaporize fuel when the engine is running.
- c) Hot Soak: The engine remains hot for a period of time after it is turned off, and gasoline evaporation continues when the car is parked.
- d) Refueling Losses: Gasoline vapors are always present in fuel tanks. These vapors are forced out when the tank is filled with liquid fuel.

3. Tailpipe emissions

Hydrocarbon emissions result when fuel molecules in the engine do not burn or only burn partially. Hydrocarbons react in the presence of nitrogen oxides and sunlight to form ground-level ozone, a major component of smog.

F. Purpose of the Inspection Program

During the last two decades, there have been considerable emission control development efforts on the part of both vehicle manufacturers and the federal government. As a result, passenger cars and light-duty trucks produced in recent years emit significantly lower emissions than their predecessors, provided that they are properly operating. A large body of evidence, however, indicates that current generation vehicles are not all operating properly during actual use. Emission-related malfunctions do not always cause an outward indication of a problem (e.g., poor driveability or decreased fuel economy) and are sometimes difficult to detect and repair. The purpose of the Inspection & maintenance (I/M) program is:

1. To identify poorly maintained or defective vehicles that are being operated.
2. To ensure vehicles are properly repaired to meet the appropriate in use standards so as to reduce emissions.
3. To identify vehicles that may have been tampered.

G. Vehicle Emissions Standards

1. Federal Test Procedure Standards are set to ensure vehicles meet the regulations imposed by the Clean Air Act. These procedures define and

prescribe standards applicable to the emissions of any air pollutant from any class or classes of motor vehicles or motor vehicle engines.

2. These regulations are applicable to vehicles and engines for their useful life upon verification of the vehicle's compliance.
3. The U.S. EPA is required to test any emissions control system incorporated in a motor vehicle or motor vehicle engine submitted to them, in order to determine if it will conform to the standards required to be prescribed by the Clean Air Act.
4. A certificate of conformity is issued if the US EPA determines that the manufacturer has established that any emissions control device, system, or element of design installed on, or incorporated in, such vehicle or engine conforms to the applicable requirements.
5. OBD II systems are designed to monitor emissions – related components for malfunctions or deterioration that renders the vehicles incapable of complying with the emissions standards established by the manufacturer, and certified by the EPA for each vehicle.
6. A Malfunction Indicator Light (MIL) located in the dashboard of the vehicle is required to illuminate when the OBD system detects malfunctions or deterioration of the emissions components.
7. The purpose of the MIL is to inform the vehicle operator of the need for service when the vehicle deteriorates to the point where the vehicle emissions could rise above 1.5 times the Federal Test Procedure Standards.

H. Emission Control Devices.

1. All 1996 and newer vehicles are equipped with one or more of the following emissions control devices as required by the manufacturer.

a) Catalytic Converter:

The Catalytic Converter burns any remaining hydrocarbons and carbon monoxide emissions that pass into the exhaust system. It contains a catalyst substance of platinum, palladium, rhodium, cerium or a mixture of these materials that heat to extreme temperatures of approximately 1400 degrees to ignite the emissions and change them into harmless carbon dioxide and water.

b) Unleaded Gas Restrictor:

The Unleaded Gas Restrictor or Fuel Restrictor reduces and restricts the filler neck to a size that permits filling by unleaded gasoline-sized nozzles only. If altered or removed, the catalytic converter and unleaded gas restrictor must be replaced before the vehicle can pass inspection. Mechanics should remember that some newer model vehicles are being manufactured without the unleaded gas restrictor.

c) Air Injection System

The Air Injection System forces fresh air into the exhaust system to help burn the unburned fuel. The exhaust gasses leaving an engine contain unburned and partially burned fuel. Oxygen from the air injection system causes this fuel to continue to burn in the exhaust manifold or the catalytic converter. There are two types of Air Injection Systems.

- (1) Pulse Air Injected Recirculation (P.A.I.R) uses the normal pulsing from the exhaust valve opening - closing and does not require a pump.
- (2) Pump Types are externally mounted and are either electrical or belt driven.

d) Exhaust Gas Recirculation System

The Exhaust Gas Recirculation System injects burned exhaust gases into the engine to lower combustion temperatures and prevents the formation of Nitrogen Oxides. The EGR valve is connected with either vacuum hose or electrical connection and they must be connected to pass the inspection. The EGR is normally located on or near the intake manifold.

e) Positive Crankcase Ventilation System

The Positive Crankcase Ventilation System recirculates engine crankcase fumes back into the combustion chamber. The PCV system must be sealed in order to be effective. A missing oil filler cap or dipstick should result in a failure for a tampered PCV system.

f) Thermostatic Air Cleaner

The Thermostatic Air Cleaner System maintains a constant temperature of the air entering the engine for improved combustion

and performance in cold weather. The warm air helps vaporize fuel and reduce Hydrocarbons and Carbon Monoxide. If the snorkel hose or air filter is missing, the vehicle may still pass the inspection, but only those items can be missing.

g) Evaporative Emissions Control System

The Evaporative Emissions Control System is a closed vent system that stores fuel vapors and prevents them from entering the atmosphere. It consists of the Charcoal Canister, the Canister Vacuum Lines, the Vacuum and Pressure Relief Valve, the Purge System, the Fuel Tank and the Gas Cap.

h) Oxygen Sensor

The Oxygen Sensor monitors the amount of oxygen in the exhaust gases. Most manufacturers use more than one oxygen sensor and to pass the inspection; all sensors must be located. They are normally located in the exhaust manifold and/or the exhaust pipes before and/or after the catalytic converter.

2. As part of the tamper inspection, a visual inspection of each component is required. To determine which components are installed on the vehicle, the inspection mechanic should refer to the Emissions Control Label located within the engine compartment. Additional information may also be obtained from the Emissions Control Applications Manual and/or various third party computer programs. However, in any case where a discrepancy of installed components exists, the information provided by the Emissions Control Label should always take precedence.

I. Malfunction Indicator Lamp (MIL)

The Malfunction Indicator Lamp (MIL) is an indicator of the internal status of a car engine. It is found on the instrument console of most automobiles and is either red or amber in color. It can be in the shape of an engine, or the words could be spelled out as "Check Engine" or "Service Engine Soon". If the malfunction indicator lamp (MIL) is illuminated, the vehicle must be repaired before it will pass the inspection. However, it is imperative that customers are never refused inspections because the light is illuminated or malfunctioning. As indicated in North Carolina Administrative Code, the inspection station is required to inspect any vehicle presented for inspection.

J. Diagnostic Trouble Codes (DTC)

The Diagnostic Trouble Code provides a simple description of a problem found by the OBD II system. They will be captured by the inspection analyzer and

printed on page 2 of the OBD II failure report. It is imperative that this page be provided to the customer at the time of failure. However, the diagnostic trouble codes indicated on this report simply reflect the vehicle's condition at the time of testing and are not intended to take the place of diagnostics and repairs by a qualified repair technician.

K. Data Link Connector (DLC)

The Data Link Connector allows communication between the emissions analyzer and the vehicle's OBD II system. Its size, shape, and position locations have been standardized by the U.S. EPA. In accordance with this standardization, the DLC is most commonly located on the driver's side of the vehicle but may extend to the console or passenger side of the vehicle in some cases. If the DLC is missing or has been tampered with, the vehicle will fail the inspection. If the DLC cannot be located or is inaccessible, the inspection must be aborted.

L. Readiness Monitors

1. To help ensure the OBD II system is working properly, readiness codes are used to indicate whether or not monitored emissions control systems have been tested by the OBD II system. Each emissions control device has its own monitor and related readiness code. If any of the readiness codes are set to "not ready" or "not complete", the OBD II system has not yet completed testing of that particular component or system. A component failure may exist, but this has not yet been identified because the system testing has not been completed. A vehicle may have any combination of the following monitors installed in the OBD II computer system as determined by the manufacturer. However, all vehicles are equipped with the Misfire, Fuel System and Comprehensive Component Monitors, which run continuously.

- a) Misfire
- a) Catalyst
- b) Secondary Air System
- c) O<sub>2</sub> Sensor Heater
- d) Fuel System
- e) Heated Catalyst
- f) A/C System

- g) EGR System
  - h) Comprehensive Component
  - i) Evaporative System
  - j) O2 Sensors
2. 1996 through 2000 model year vehicles are allowed to complete the OBD II inspection with up to two monitors set as not ready.
  3. 2001 through current year model vehicles are allowed to complete the OBD II inspection with one monitor set as not ready.
  4. When a not ready rejection occurs, the customer should be informed that the monitors may set to ready through the course of normal driving over the next few days, but in some cases it may be necessary to conduct the manufacturers specific drive cycle. Under no circumstances should the customer ever be instructed to drive a specific mileage unless the mileage is part of the specific drive cycle instructions for that vehicle. Although not required, inspection stations are encouraged to provide the specific drive cycle to the customer if available and requested.

M. OBD II subject vehicles

Unless exempted in the next chapter, the following vehicles require an OBD II inspection in North Carolina.

1. All 1996 and newer light duty gasoline operated vehicles registered in one of the 48 emissions counties. (See “Emissions Counties” appendix 3)
2. All 1996 and newer light duty gasoline operated vehicles registered in North Carolina that are part of a fleet of vehicles operated primarily in an emissions county.
3. All 1996 and newer light duty gasoline operated vehicles registered in North Carolina that are offered for rent in an emissions county.
4. All 1996 and newer light duty gasoline operated vehicles offered for sale by a dealer in an emissions county.
5. All 1996 and newer light duty gasoline operated vehicles operated on a federal installation located in an emissions county. This does not include tactical military vehicles. Vehicles operated on a federal installation include those that are owned or leased by employees of the installation and those owned or operated by the federal agency that conducts

business at the installation, regardless of where the vehicle is registered.

N. Exceptions to OBD II inspections

The following vehicles are currently exempted from OBD II inspections by state statute.

1. New vehicles are exempt from the OBD II inspection requirement. A new vehicle is defined as a motor vehicle that has never been the subject of a completed, successful or conditional sale to the public. Vehicles that have never been titled by the Division are new vehicles.
2. All motorcycles
3. Property-hauling vehicles registered with farm tags.
4. Vehicles that exceed 8500 pounds as indicated by the "Gross Vehicle Weight Rating". This rating commonly comes from the vehicles door jam but should never be obtained from the registration card.
5. Privately owned, non-fleet motor home or house car, as defined in North Carolina General Statute 20-4.01 (27) d2, that is built on a single chassis, has a gross vehicle weight of more than 10,000 pounds, and is designed primarily for recreational use.

O. Pre-Inspection Requirements

The OBD II mechanic should always follow the below procedure before attempting the inspection.

1. Verify the Vehicle Identification Number (VIN) listed on the registration card matches the VIN listed on the vehicle. If they do not match, the customer should be directed to the local License & Theft Bureau for assistance. If no registration card is available, continue the inspection with the information obtained from the vehicle.
2. Verify that the license plate on the vehicle matches the license plate listed on the registration card. If no registration plate or card is available, continue the inspection with the information obtained from the vehicle.
3. Have all occupants leave the vehicle.
4. Drive the vehicle into the inspection bay.

P. Entering Vehicle Data

The inspection procedure is programmed into your analyzer and may vary slightly from the instructions detailed in this lesson plan. In all cases where a discrepancy exists, you should follow the prompts detailed on your inspection analyzer.

1. From the main menu, Select "State Inspection"
2. Select "Safety & Emissions Inspection"
3. Enter your mechanics license number and access code. (Remember that this information is private and should never be disclosed to anyone.)
4. Using the bar code scanner, scan the vehicle identification number (VIN) of the vehicle being tested into the analyzer. If manually entered, you will have to enter it twice.
5. Manually enter the complete license plate number and when prompted, enter the complete license plate number again. **If conducting the inspection for a motor vehicle dealer, enter the dealer number (example: 12345D) as the license plate number.**
6. Select either "North Carolina" "Out of State" or "Unknown" for the vehicles current registration state.
7. If conducting the inspection for a motor vehicle dealer, you will be prompted for their Dealer Identification Number. This number should be readily available from the dealership and should be entered in the space provided. (example: 12345D)
8. If no match of the vehicle is found in the state vehicle information database, the computer will prompt you for the owner's information. If you see this prompt, completely fill out the information as requested.
9. Select the county in which the vehicle is registered from the list provided.
10. Select the vehicle body style from the list provided.
11. Respond to the question "Is the vehicles GVWR greater than 8500 pounds". Any vehicle, whose gross vehicle weight rating (GVWWR) exceeds 8500 pounds, will receive a safety only inspection. If you select "yes, the GVWR is greater than 8500 pounds", you will be prompted to enter the GVWR as indicated on the vehicle.) The gross vehicle weight rating is commonly located on the vehicle's driver's doorpost but should never be taken from the registration card.

12. Select the fuel type from the list provided. If the vehicle operates on gasoline at anytime during the course of operation, select “G” for gasoline.
13. Enter the four digit vehicle model number
14. Enter the odometer reading in miles. (Do not enter the tenth digit). If the odometer reading is not available (broken), enter zeros (0) in the space provided and continue with the inspection.
15. Enter the number of cylinders
16. Enter the Engine Displacement and indicate “Centimeters (CM), Liters (L), or Cubic Inches (CU IN).
17. Indicate if the vehicle has dual exhaust or single.
18. Select the vehicles make type as “Domestic or Foreign” and then enter the vehicle make as shown on the registration card. If the make does not appear on the motor vehicle list provided, select “None of the Above” (Normally located at the bottom of the list)
19. Ensure the information is correct as indicated. If not, go back and correct before proceeding.

Q. Conducting the OBD II Inspection

The inspection procedure is programmed into your analyzer and may vary slightly from the instructions detailed in this lesson plan. In all cases where a discrepancy exists, you should follow the prompts detailed on your inspection analyzer.

- 1 Turn the engine off and put the key in the “Off/Lock” position.
- 2 Conduct the Key On – Engine Off test. Turn the ignition on but do not start the vehicle. Determine whether the Malfunction Indicator Lamp (MIL) illuminates. If unsure, cycle the key off, wait approximately 10 seconds and reattempt. You may be required to completely remove the key before proceeding with a reattempt. Do not proceed with the inspection until you have determined the status of the MIL lamp test.
- 3 Locate the vehicle’s OBD II Diagnostic Link Connector and attach the analyzers OBD II port to the vehicle.
  - a) If the connector cannot be located and there is no evidence of a tamper, the test should be aborted. The customer should be advised that you couldn’t continue the test and have them seek

assistance elsewhere. You cannot charge for this inspection attempt.

- b) If there is evidence that the connector was there, but has been tampered, the vehicle will fail the OBD II inspection and the connector must be repaired or replaced before the inspection can be completed.
- 4 When prompted by the analyzer, start the vehicle and press the enter key to continue. (Failure to start the vehicle when required may result in a false pass or fail of the vehicle).
  - 5 The analyzer will attempt communication with the vehicle. If communication occurs, the results of the OBD II inspection will be displayed and the analyzer will prompt you to continue with the safety and tamper portion of the inspection. If communications fails, the analyzer will re-attempt communication two more times. If this occurs, do not abort the test.
  - 6 Proceed with the safety and tamper portion of the inspection.
  - 7 Print the inspection receipt, sign and provide to the customer.

R. Fee Schedule

1. The inspection fee for performing an inspection of a vehicle applies when an inspection is performed, regardless of whether the vehicle passes the inspection. The fee for an electronic inspection authorization applies when an inspection authorization is assigned to a vehicle.
  - a) The inspection fee for an OBD II inspection (\$23.75) is negotiable and can be waived at the discretion of the inspection station.
  - b) The electronic inspection authorization fee (\$6.25) is mandated by North Carolina General Statute 20-183.7 and cannot be waived.
2. A vehicle that is inspected at an inspection station and fails the inspection is entitled to be reinspected at the same station at any time within 60 days of the failed inspection without paying another inspection fee.

S. Warranty Information

Manufacturers have been required by federal law to provide emissions control warranty coverage for vehicles since 1972. There are two federal emissions control warranties offered.

1. Performance Warranty – The Performance Warranty covers repairs that are required during the first 2 years or 24,000 miles of vehicle use, because of an emission related failure. A customer would be eligible for this warranty protection when the following conditions apply:
  - a) The car or light duty truck fails an approved emissions test; and
  - b) The vehicle is less than 2 years old and has less than 24,000 miles; and
  - c) The vehicle is required to be repaired in order to pass inspection requirements; and
  - d) The test failure does not result from misuse of the vehicle or a failure to follow the manufacturers' written maintenance instructions; and
  - e) The vehicle was presented to a warranty-authorized manufacturer representative, along with evidence of the emissions test failure, during the warranty period.
  
2. Design and Defect Warranty - The Design and Defect Warranty covers repair of emissions related parts, which become defective during the warranty period. This warranty is applicable when the following conditions apply.
  - a) An emissions control or emissions related part, or specified major emissions control component, fails because of a defect in materials or workmanship, as long as the vehicle has not exceeded the warranty time or mileage limitations for the failed part.
  - b) Coverage may vary depending on the type of vehicle being tested. To determine the length of warranty coverage that applies to specific vehicles, look for the emissions warranty information in the owner's manual or warranty booklet.
  
3. Major Emission Control Components - There are two specified major emissions control components, covered for the first 8 years or 80,000 miles of vehicle use on 1995 and newer vehicles.
  - a) Catalytic Converters
  - b) The electronic emissions control unit or computer (ECU)

T. Waivers

Waivers are available for vehicles unable to pass an emissions inspection test and are granted by authorized NCDMV personnel. A vehicle receiving a waiver is exempted from meeting the full requirements of the emissions test portion of the inspection. There are five types of waivers issued by NCDMV

- a) Repair Waivers
- b) Non – Communication Waiver
- c) Not – Ready Re-inspection Waiver
- d) Not – Ready Initial Waiver
- e) Damaged Data – Link Connector Waiver

1. Repair Waivers

Repair waivers may be issued when a vehicle passes the visual component and safety inspection, but fails the OBD II emissions inspection because of an OBD II emission related failure. In order for a repair waiver to be granted, the following procedure must be followed.

- a) Before repairs are conducted, the vehicle must be inspected on the emissions analyzer and fail the inspection due to an OBD II related failure. The customer should be provided the receipt showing the failure and the secondary page showing the diagnostic trouble codes indicated.
- b) Documented qualifying repairs costing at least the waiver amount must be made to the vehicle in order to correct the cause of the OBD II failure. The waiver amount is currently mandated at \$200.00.
- c) Within 60 days of the initial inspection, the vehicle must be tested on the emissions analyzer and again fail the inspection for an OBD II emissions related failure.

The following repairs and their cost cannot be included or considered when determining whether the cost of repairs made to a vehicle equals or exceeds the mandated waiver amount of \$200.00.

- a) Repairs covered by a warranty that apply to the vehicle.

- b) Repairs needed as a result of tampering with an emissions control device of the vehicle.
- c) Cost associated with labor made by an individual who is not engaged in the business of repairing vehicles.

2. Non-Communication Waivers

A Non-communication Waiver may be issued when a vehicle passes the visual component and safety inspection, but fails the OBD II emissions inspection because it failed to communicate with the approved state analyzer. In order for a waiver to be granted, the following procedure must be followed.

- a) The customer should be provided with the failure receipt and the secondary page showing the diagnostic trouble codes indicated (if any).
- b) The customer should be advised to go to the local License & Theft Bureau office for assistance.
- c) DMV personnel will test the vehicle using an independent scan tool.
- d) If the vehicle fails to communicate with the scan tool, a non-communication waiver cannot be issued and the vehicle will need to be taken in for repairs. Note: The repair waiver process, as discussed earlier, may then apply.
- e) If the vehicle does communicate with the scan tool, DMV personnel will issue a waiver and the customer will be directed to return to the original inspection location.

A non-communication waiver will not be issued if any of the following circumstances exist.

- a) The vehicle fails to communicate with the independent scan tool.
- b) The vehicle would fail the inspection for any other reason.

3. Not – Ready Re-inspection Waiver

DMV personnel may issue a not Ready re-inspection Waiver when the vehicle is rejected from multiple inspection attempts, only when the

following conditions are met. (Additional requirements may be imposed at the discretion of DMV personnel.)

- a) The vehicle was not ready rejected after repairs were conducted for failing the OBD II inspection.
- b) The customer can produce a vehicle inspection report showing a failure of an OBD II related issue.
- c) The customer can produce repair receipts showing qualified documented repairs (and their cost) to the OBD II system.
- d) The customer can produce multiple not ready rejection inspection attempts from a state approved analyzer.
- e) The customer can produce copies of the manufacturers recommended drive cycle that was conducted if the re-inspection took place on the same date of the repairs.
- f) The customer's documentation shows a reasonable mileage change between the first and last inspection.

4. Not – Ready Initial Waiver

DMV personnel may issue a Not – Ready Initial Waiver when the vehicle is rejected from multiple inspection attempts, only when the following conditions are met. (Additional requirements may be imposed at the discretion of DMV personnel.)

- a) The vehicle was not ready rejected during the initial Inspection attempt.
- b) The customer can produce multiple not ready rejection inspection attempts from a state approved analyzer.
- c) The customer can produce the repair receipts (if applicable)
- d) The customer can produce the manufacturers recommended drive cycle if the re-inspection attempts took place on the same date of any repairs.
- e) The customer's documentation shows a reasonable mileage change between the first and last inspection.

5. Damaged Data – Link Connector Waiver

The Damaged Data – Link Connector Waiver may be issued to bypass the OBD test to gain access to the Safety / Tamper portion of the inspection. This waiver is issued as a last resort for special situations when other waivers are not appropriate.

U. Exemptions

Exemptions are available for vehicles unable to pass or unable to obtain an emissions inspection test as detailed below. There are three types of exemptions issued by NCDMV.

- a. Out of County Exemptions
- b. Out of State Exemptions
- c. Parts Exemptions

1. Out of County Exemptions

An Out of County Exemption may be issued for vehicles registered in an emissions county when it has been determined that the vehicle is principally garaged and operated outside a county subject to emissions inspections. A safety only inspection is required on these vehicles. The exemption expires at the end of the registration period.

2. Out of State Exemptions

An Out of State Exemption may be issued for vehicles registered in an emissions county when it has been determined that the vehicle is principally garaged and operated outside the state. When an Out of State Exemption has been issued, the vehicle is exempted from all inspection requirements. The exemption expires at the end of the registration period.

3. Parts Exemptions

Parts Exemptions are issued for vehicles that are missing emissions components that are not available from any source. This exemption only applies to the emissions component or components identified on the exemption and the vehicle must pass all other inspection requirements.

V. Violations

The civil penalty schedules established within North Carolina General Statutes are required when a violation has occurred. The schedule categorizes emissions violations into three different types.

1. Type 1 Violations

Type 1 violations are the most severe civil violations as they directly affect the emissions reduction benefits. They include:

- a) Issue an emissions electronic inspection authorization to a vehicle without performing an emissions inspection of the vehicle.
- b) Issue an emissions electronic inspection authorization to a vehicle after performing an emissions inspection of the vehicle and determining that the vehicle did not pass the inspection.
- c) Using a test defeating strategy when conducting an emissions inspection by changing the emissions standards for a vehicle by incorrectly entering the vehicle type or model year, or using data provided by the on-board diagnostic (OBD) equipment of another vehicle to achieve a passing result.
- d) Allowing a person who is not licensed an emissions inspection mechanic to perform an emissions inspection for a self-inspector or at an emissions station.
- e) Sell, issue or otherwise give an electronic inspection authorization to another other than as the result of a vehicle inspection in which the vehicle passed the inspection or for which the vehicle received a waiver.
- f) Be unable to account for five or more electronic inspection authorization at any one time upon the request of an auditor of the Division.
- g) Perform a safety-only inspection on a vehicle that is subject to both a safety and emissions inspection.
- h) Transfer an electronic inspection authorization from one vehicle to another.

2 Type 2 Violations

Type 2 violations are considered less severe than type 1 violations but might adversely affect emissions reduction benefits. They include:

- a) Use the identification code of another to gain access to an emissions analyzer or to equipment to analyze data provided by on-board diagnostic (OBD) equipment.
- b) Keep compliance documents in a manner that makes them easily accessible to individuals who are not inspection mechanics.
- c) Issue a safety electronic inspection authorization or an emissions electronic inspection authorization to a vehicle that is required to have one or the following emissions control devices but does not have it:
  - 1) Catalytic Converter
  - 2) PCV Valve
  - 3) Thermostatic Air Control
  - 4) Oxygen Sensor
  - 5) Unleaded Gas Restrictor
  - 6) Gasoline Tank Cap
  - 7) Air Injection System
  - 8) Exhaust Gas Recirculation (EGR) Valve
- d) Issue a safety electronic inspection authorization or an emissions electronic inspection authorization without performing a visual inspection of the vehicles exhaust system and checking the exhaust system for leaks.
- e) Impose no fee for an emissions inspection of a vehicle or the issuance of an emissions electronic inspection authorization or impose a fee for one of these actions that differ from the amount set in G.S. 20-183.7.

### 3. Type 3 Violations

Type 3 violations are considered technical violations and don't normally have an adverse affect on the emissions reduction benefits. They include:

- a) Failing to post an emission licensed issued by the Division.
- b) Failing to send information on emissions inspection to the Division at the time or in the form required by the Division.
- c) Failing to post emissions information required by federal law to be posted.
- d) Failing to put the required information on an inspection receipt in a legible manner.

#### 4. Fines and Suspensions

In any case where the Division determines that a violation of the type 1, 2, or 3 civil violations has occurred, it must take the following action.

- a) **Type 1 – Self-inspector or Emissions Station Violation**  
For a first or second Type 1 violation, assess a civil penalty of \$250.00 and suspend the license of the business for six months. For a third or subsequent Type 1 violation within three years, assess a civil penalty of \$1,000 and revoke the license of the business for two years.
- b) **Type 1 – Emissions Mechanic Violation**  
For a first or second Type 1 violation, assess a civil penalty of \$100.00 and suspend the license for six months. For a third or subsequent Type1 violation within seven years, assess a civil penalty of \$250.00 and revoke the mechanic's license for two years.
- c) **Type 2 – Self-inspector or Emissions Station Violation**  
For a first or second Type 2 violation, assess a civil penalty of \$100.00. For a third or subsequent Type 2 violation within three year, assess a civil penalty of \$250.00 and suspend the license for 90 days.
- d) **Type 2 – Emissions Mechanic Violation**  
For a first or second Type 2 violation by assess a civil penalty of \$50.00. For a third or subsequent Type 2 violation within seven years, assess a civil penalty of \$100.00 and suspend the license for 90 days.

- e) Type 3. – Self-inspector, Emissions Station and or Mechanic  
For a first or second Type 3 violation, send a warning letter.  
For a third or subsequent Type 3 violation within three years by the same emissions license holder, assess a civil penalty of twenty-five dollars (\$25.00).

5. Mechanic Training

An emission inspection mechanic whose license has been suspended or revoked must retake and successfully complete the required course before the mechanics license can be reinstated. Failure to successfully complete this course continues the period of suspension or revocation until the course is completed successfully.

6. Station or Self-Inspector Responsibility

It is the responsibility of an emissions inspection station and an emissions self-inspector to supervise the emissions mechanics it employs. A violation by an emissions inspector mechanic is considered a violation by the station or self-inspector for whom the mechanic is employed.

6. Infractions

A person who does any of the following commits an infraction and, if found responsible, is liable for a penalty of up to fifty dollars (\$50.00).

- a) Operates a motor vehicle that is subject to inspection on a highway or public vehicular area in the State when the vehicle has not been inspected in accordance with General Statutes.
- b) Allows an electronic inspection authorization to be issued to a vehicle owned or operated by that person, knowing that the vehicle was not inspected before the electronic inspection authorization was issued or was not inspected properly.
- c) Issues an electronic inspection authorization on a vehicle, knowing or having reasonable grounds to know that an inspection of the vehicle was performed improperly.
- d) Alters the original certified configuration or data link connectors of a vehicle in such a way as to make an emissions inspection by analysis of data provided by on-board diagnostic (OBD) equipment inaccurate or impossible.

8. Felony

A person who does any of the following commits a Class I felony:

- a) Forges an electronic inspection authorization.
- b) Buys, sells, or possesses a forged inspection sticker or electronic inspection authorization.
- c) Buys, sell or possesses an electronic inspection authorization other than as the result of either of the following:
  - 1. Having a license as an inspection station, a self-inspector, or an inspection mechanic and obtaining the electronic inspection authorization from the Division in the course of business.
  - 2. A vehicle inspection in which the vehicle passed the inspection or for which the vehicle received a waiver.
- d) Solicits or accepts anything of value in order to pass a vehicle that fails a safety or emissions inspection.
- e) Fails a vehicle for any reason not authorized by law.

8. Clean Scanning

Clean Scanning is defined as a fraudulent inspection through the manipulation of testing procedures to pass a vehicle that:

- a) Has failed a previous inspection test, or
- b) Is not able to be tested due to too many emissions monitors set as not ready, or
- c) To create a passing test for a vehicle that may not even be on site.

W. Contact Information

The License & Theft Bureau is divided into eight distinctive districts throughout the state. Each county within the district reports directly to its District Office as detailed below:

1. District 1 (252-752-4435)

- a) Beaufort
- b) Bertie
- c) Camden
- d) Carteret
- e) Chowan
- f) Craven
- g) Currituck
- h) Dare
- i) Gates
- j) Greene
- k) Hertford
- l) Hyde
- m) Jones
- n) Lenoir
- o) Martin
- p) Northampton
- q) Onslow
- r) Pamlico
- s) Pasquotank
- t) Perquimans
- u) Pitt
- v) Tyrrell
- w) Washington

2. District 2 (910-486-1331)

- a) Bladen
- b) Brunswick
- c) Columbus
- d) Cumberland
- e) Duplin
- f) Harnett
- g) Hoke
- h) New Hanover
- i) Pender
- j) Robeson
- k) Sampson
- l) Scotland

3. District 3 (919-816-9194)

- a) Edgecombe
- b) Franklin

- c) Durham
- d) Granville
- e) Halifax
- f) Johnston
- g) Nash
- h) Vance
- i) Wake
- j) Warren
- k) Wayne
- l) Wilson

4. District 4 (336-256-2024)

- a) Alamance
- b) Caswell
- c) Chatham
- d) Guilford
- e) Lee
- f) Orange
- g) Person
- h) Randolph
- i) Rockingham

5. District 5 (336-761-2286)

- a) Davidson
- b) Davie
- c) Forsyth
- d) Rowan
- e) Stokes
- f) Surry
- g) Yadkin

6. District 6 (704-547-5777)

- a) Anson
- b) Cabarrus
- c) Mecklenburg
- d) Montgomery
- e) Moore
- f) Richmond
- g) Stanly
- h) Union

7. District 7 (828-466-5511)

- a) Alexander
- b) Alleghany
- c) Ashe
- d) Burke
- e) Caldwell
- f) Catawba
- g) Cleveland
- h) Gaston
- i) Iredell
- j) Lincoln
- k) Watauga
- l) Wilkes

8. District 8 (828-251-6081)

- a) Avery
- b) Buncombe
- c) Cherokee
- d) Clay
- e) Graham
- f) Haywood
- g) Henderson
- h) Jackson
- i) Macon
- j) Madison
- k) McDowell
- l) Mitchell
- m) Polk
- n) Rutherford
- o) Swain
- p) Transylvania
- q) Yancey

III. Conclusion

A. Summary

During this block of instruction, we have discussed the negative effects of air pollution and its possible impact on our future. Although many debates can be held over the validity of reduction methods, no one can debate the need for such programs, as the evidence is overwhelming. Through proper maintenance of our vehicles, we are taking a proactive approach that helps the environment, increases our fuel mileage and extends the life of our vehicles. With all these positives, willful participation should be easily obtained.

B. Questions from Class

C. Closing Statement

Motor vehicles are the largest source of air pollution in the nation and inspection maintenance programs are one of the most important tools for reducing smog and toxic air pollutants. The OBD II inspection offers many benefits to the consumer, the technician and the environment. It provides for an accurate diagnosis that leads to effective, durable repairs and a shorter inspection time. It offers an early vehicle maintenance opportunity that leads to greater fuel efficiency and reliability. North Carolina's OBD II inspection program has been highly effective in reducing the amount of pollution from mobile sources. With continued increase in public awareness, and the reduction benefits of properly maintained vehicles, we can ensure the continued success of our efforts for years to come.

APPENDIX 1  
APPROVED HEAD LIGHT AIMERS  
(Listed in random order)

Symtech Auto Headlamp Aimer Model LCA - 2  
Symtech Auto Headlamp Aimer Model CVA-3EZ  
Sniper Auto Headlamp Aimer Model No. 5405  
Hopkins Auto Headlamp Aimer Vision 100  
Hopkins Vision I Headlight Aimer  
Symtech HBA5 Optical Headlamp Aimer  
Sniper Auto Headlamp Aimer Model No. 5412  
Symtech Auto Headlamp Aimer Model PLA 11  
Symtech Auto Headlamp Aimer Model PLA 12  
Symtech Auto Headlamp Aimer Model LCA-2EZ  
Weaver Optical Aimer  
Lumi Scope Model 12  
Symtech Auto Headlamp Aimer Model SCA-1  
Bear Headlight tester Model 560  
Hoppy VA25 Headlamp Aimer

APPENDIX 2  
APPROVED WINDOW TINT TESTER  
(Listed in random order)

Advanced Design Systems Advanced Window Tester

New World Instruments Pocket Detective 2.1 Tester (This tester is connected with wires)

New World Instruments Pocket Detective 2.1 Tester (This tester is wireless)

New World Instruments Pocket Detective 3.0 Tester (Cordless)

APPENDIX 3  
EMISSIONS COUNTIES

Alamance	Brunswick	Buncombe	Burke
Cabarrus	Caldwell	Carteret	Catawba
Chatham	Cleveland	Craven	Cumberland
Davidson	Durham	Edgecombe	Forsyth
Franklin	Gaston	Granville	Guilford
Harnett	Haywood	Henderson	Iredell
Johnston	Lee	Lenoir	Lincoln
Mecklenburg	Moore	Nash	New Hanover
Onslow	Orange	Pitt	Randolph
Robeson	Rockingham	Rowan	Rutherford
Stanly	Stokes	Surry	Union
Wake	Wayne	Wilkes	Wilson