

Lighting System Diagnosis and Repair

Student/intern information:

Name _____ Date _____ Class _____

Vehicle used for this activity:

Year _____ Make _____ Model _____

Odometer _____ VIN _____

Learning Objective/Task	CDX Tasksheet Number	2008 NATEF Reference Number	2008 NATEF Priority Level
• Identify system voltage and safety precautions associated with high intensity discharge headlights.	C564	6E4	P-2
• Inspect, replace, and aim headlights and bulbs.	C321	6E2	P-2
• Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.	C859	6E3	P-2
• Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action.	C320	6E1	P-1

Time off _____

Time on _____

Total time _____

Recommended Resource Materials

- CDX Automotive program
- CDX eTextbook
- Technical service bulletins, shop manuals, and any other information applicable to the specific vehicle or components you are working on
- Class notes

Materials Required

- Vehicle or simulator equipped with HID headlights
- DMM/DVOM
- Test light
- Headlight aligner or approved method

Some Safety Issues to Consider

- Only students who have their supervisor/instructor's direct permission should perform this task due to the safety concerns involved.
- Be cautious around electricity. High voltage (enough to injure or kill you) is present on many vehicles. Ignition systems, hybrid vehicles, and 42-volt electrical systems are just a few to be careful of.
- Always wear the correct protective eyewear and clothing and use the appropriate safety equipment, as well as fender covers, seat protectors, and floor mat protectors.
- Make sure you understand and observe all legislative and personal safety procedures when carrying out practical assignments. If you are unsure of what these are, ask your supervisor/instructor.

Performance Standard

0—No exposure: No information or practice provided during the program; complete training required

1—Exposure only: General information provided with no practice time; close supervision needed; additional training required

2—Limited practice: Has practiced job during training program; additional training required to develop skill

3—Moderately skilled: Has performed job independently during training program; limited additional training may be required

4—Skilled: Can perform job independently with no additional training

Total time _____
 Time on _____
 Time off _____

▶ TASK Identify system voltage and safety precautions associated with high intensity discharge headlights.

C564 6E4

1. Using appropriate data, identify system voltage and safety precautions associated with high intensity discharge headlights.
 - a. HID lamp voltage: _____ volts
 - b. List safety precautions when working on HID system:

2. List the customer concern:

3. Research the particular concern in the appropriate service manual and list the possible causes:

4. Inspect the vehicle HID lighting system and, using appropriate safety precautions, determine the cause of the concern. List your observations here:

5. Determine any necessary action/s to correct the fault.

6. Have your supervisor/instructor verify satisfactory completion of this procedure, any observations found, and any necessary action/s recommended.

Performance Rating

CDX Tasksheet Number: C564

2008 NATEF Reference Number: 6E4



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Supervisor/instructor signature _____ Date _____

Total time _____
 Time on _____
 Time off _____

▶ TASK Inspect, replace, and aim headlights and bulbs.

C321 6E2

1. Research the headlamp or exterior lighting section in the appropriate service information for the vehicle you are working on.
 - a. Type of headlights vehicle is equipped with: _____
 - b. High beam bulb number: _____
 - c. Low beam bulb number: _____
 - d. Fog lamp bulb number, if equipped: _____
 - e. Driving lamp bulb number, if equipped: _____
2. Remove one of each bulb listed above. List the bulb numbers of the bulbs you removed.

NOTE ▶ Do not touch the bulb with your fingers. Some bulbs will fail prematurely due to the oils from your skin.

- a. High beam bulb number: _____
 - b. Low beam bulb number: _____
 - c. Fog lamp bulb number, if equipped: _____
 - d. Driving lamp bulb number, if equipped: _____
3. Have your supervisor/instructor verify your work before proceeding:
 - a. Supervisor/instructor's initials: _____
 4. Reassemble the headlamp and bulb assembly and verify proper operation.
 5. Research the headlamp aiming process in the appropriate service information for the vehicle you are working on. List the steps that are required to aim these headlamps:
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6. Aim the headlamps.
 7. Have your supervisor/instructor verify satisfactory completion of this procedure, any observations found, and any necessary action/s recommended.

Performance Rating

CDX Tasksheet Number: C321

2008 NATEF Reference Number: 6E2



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Supervisor/instructor signature _____ Date _____

► TASK Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.

C859 6E3

Vehicle used for this activity:

Year _____ Make _____ Model _____

Odometer _____ VIN _____

Time off _____
 Time on _____
 Total time _____

1. List the customer complaint/concern regarding the turn signals or hazard lights:

2. Research the turn signal and hazard light description of operation section and the wiring diagram/s in the appropriate service information for the vehicle you are working on.
 - a. List the specified operation of the system/component/s you suspect are faulty:

NOTE ► Understanding how a component is designed to operate will make it easier to diagnose.

3. Using the appropriate service information, diagnose the faulty circuit or component.
 - a. List your observation/s:

4. List the cause of the customer complaint/concern:

5. List the correction needed to resolve the customer complaint/concern:

6. Perform any necessary action.

7. Have your supervisor/instructor verify satisfactory completion of this procedure, any observations found, and any necessary action/s recommended.

Performance Rating

CDX Tasksheet Number: C859

2008 NATEF Reference Number: 6E3



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Supervisor/instructor signature _____ Date _____

TASK Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action.

C320 6E1

Vehicle used for this activity:

Year _____ Make _____ Model _____

Odometer _____ VIN _____

1. List the customer complaint/concern regarding the lighting system fault:

2. If the lights are dim or do not operate, go to step 3. If the lights are too bright, go to step 9.
3. Research the affected lighting system troubleshooting section and the wiring diagram/s in the appropriate service information for the vehicle you are working on.
4. Turn on the affected light/s, measure the battery voltage, and list it here: _____ volts
5. Measure the voltage to the affected light and list that voltage here: _____ volts
 - a. Calculate the voltage drop in the circuit and list it here: _____ volt drop
 - b. Is the voltage drop excessive? **Yes/No** (Circle one)
 - c. If yes, go to step 7. If no, go to step 6.
6. Inspect the bulb and connections for any faults (wrong bulb, corroded, or loose connection). List your observations:

- 7. Measure the voltage drop from the battery pos post to the input terminal of the light.
 - a. List the voltage drop: _____ volts
 - b. Is this within specifications? **Yes/No** (Circle one)
 - c. Determine any necessary action/s:

- 8. Measure the voltage drop from the bulb ground to the battery neg post.
 - a. List the voltage drop: _____ volts
 - b. Is this within specifications? **Yes/No** (Circle one)
 - c. Determine any necessary action/s:

9. Install exhaust hose/s and wheel chocks and set the parking brake. Start the vehicle.

- 10. Measure the battery voltage: _____ volts
 - a. Is this within specifications? **Yes/No** (Circle one)

NOTE ▶ If the battery voltage is too high, you will need to perform charging system checks to determine the cause of the overcharge.

11. List your observations:

12. Determine any necessary action/s:

13. Have your supervisor/instructor verify satisfactory completion of this procedure, any observations found, and any necessary action/s recommended.

Performance Rating

CDX Tasksheet Number: C320

2008 NATEF Reference Number: 6E1



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Supervisor/instructor signature _____ Date _____

