

BRAKES



Tasksheet Manual for NATEF Proficiency

CDX Automotive



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The procedures and protocols in this book are based on the most current recommendations of responsible sources. The publisher, however, makes no guarantee as to, and assume no responsibility for, the correctness, sufficiency, or completeness of such information or recommendations. Other or additional safety measures may be required under particular circumstances.

For every task in ASE 5: Brakes, the following safety requirement must be strictly followed: Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

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Resource Preview

2008 NATEF and CDX tasksheet numbers appear at the beginning and end of every task, as well as in the general information for the section.

Required and recommended materials and equipment are listed for each task.

Safety issues relevant to the tasks are listed at the beginning of every section.

Master Cylinder Testing and Service

Student/Intern information: _____ Date _____ Class _____

Vehicle Year _____ Make _____ Model _____

Odometer _____

Learning Objective/Task	CDX Tasksheet Number	2008 NATEF Reference Number	2008 NATEF Priority Level
• Measure brake pedal height, travel, and free play (as applicable); determine necessary action.	C622	5B2	P-1
• Check master cylinder for internal/external leaks and proper operation; determine necessary action.	C704	5B3	P-1
• Remove, bench bleed, and reinstall master cylinder.	C235	5B4	P-1
• Measure and adjust master cylinder pushrod length.	C556	5E5	P-3

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

- Depending on the type of concern, special diagnostic tools may be required. See your supervisor/instructor for instructions to identify what tools may be required.
- Vehicle or simulator
- Work light and shop rag
- Line wrenches

Some Safety Issues to Consider

- If you need to start the vehicle, you should ensure that the parking brake is firmly applied; if necessary, use wheel chocks to prevent the vehicle from moving when the vehicle is started to verify the completion of this task.
- When running any vehicles in the shop, make sure you use the shop's exhaust ventilation system to discharge all exhaust gas safely outside.
- Only students who have their supervisor/instructor's direct permission should perform this task due to the safety concerns involved.
- Diagnosis of this fault may require test driving the vehicle on the school grounds. Attempt this task only with full permission from your instructor and follow all the guidelines exactly.
- **Caution:** Most types of brake fluid are harmful to painted surfaces. Be sure to prevent brake fluid from coming in contact with a vehicle's paint. Use fender covers to minimize this risk and be sure to wipe up any spilled brake fluid immediately with a wet rag.
- 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 may be required
- **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

Time off: _____
Time on: _____
Total time: _____

Master Cylinder Testing and Service 11

TASK Check master cylinder for internal/external leaks and proper operation; determine necessary action. **C704 5B3**

- Inspect the master cylinder for external leaks.
 - Check the brake fluid level in the reservoir. Record your reading here: _____
 - Inspect the master cylinder for obvious signs of leakage. Be sure to check all brake line fittings, sensor connections, reservoir seal/s, and the areas at the rear of the master cylinder near the seal. Also check the inside of the vacuum hose to the power booster.

NOTE: If fluid is found on the inside of the hose, the rear seal in the master cylinder may be leaking fluid into the booster.

- List your observations: _____

- Check the master cylinder for proper operation.
 - Start the vehicle, apply the brake pedal beginning with a very light pressure, and gradually increasing the pressure. The brake pedal should hold its position with very little travel beyond its applied height. If the pedal continues to sink, the system may have an external or internal leak. Do this test several times with various pedal pressures and time elements. Be sure you hold foot pressure on the system for at least one minute.
 - List your observations: _____
- Inspect the master cylinder for internal leaks.
 - Remove the master cylinder reservoir cap.
 - Have an assistant apply the brake pedal firmly and hold it. Watch the fluid in the reservoir; it should have an initial spurt of fluid from each of the two compensating ports as the brake pedal is first moved.

NOTE: The brake fluid level should not rise in the reservoir as the brake pedal is held down. If it does, this indicates an internal leak in one or more of the master cylinder seals and it will need to be serviced.

- List your observations: _____

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

Performance Rating

CDX Tasksheet Number: C704 2008 NATEF Reference Number: 5B3

0 1 2 3 4

Supervisor/Instructor signature _____ Date _____

Master Cylinder Testing and Service 13

Time card feature appears at the beginning of every task and allows students to track the time they spend on each task.

Note boxes offer students vital information to consider while performing the task.

Performance standard and rating areas simplify the sign-off process for instructors.

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Vehicle, Customer, and Service Information

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
• Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	C797	5A1	P-1
• Locate and interpret vehicle and major component identification numbers.	C798	5A4	P-1
• Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins.	C230	5A3	P-1
• Identify and interpret brake system concern; determine necessary action.	C229	5A2	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

- Blank work order
- Vehicle with available service history records
- Depending on the type of concern, special diagnostic tools may be required. See your supervisor/instructor for instructions to identify what tools may be required.

Some Safety Issues to Consider

- If you need to start the vehicle, you should ensure that the parking brake is firmly applied; if necessary, use wheel chocks to prevent the vehicle from moving when the vehicle is started to verify the completion of this task.
- Diagnosis of this fault may require test driving the vehicle on the school grounds. Attempt this task only with full permission from your instructor and follow all the guidelines exactly.
- Lifting equipment such as vehicle jacks and stands, vehicle hoists, and engine hoists are important tools that increase productivity and make the job easier. However, they can also cause severe injury or death if used improperly. Make sure you follow the manufacturer's operation procedures. Also make sure you have your supervisor/instructor's permission to use any particular type of lifting equipment.
- **Caution:** Most types of brake fluid are harmful to painted surfaces. Be sure to prevent brake fluid from coming in contact with a vehicle's paint. Use fender covers to minimize this risk and be sure to wipe up any spilled brake fluid immediately with a wet rag.
- **Caution:** Brake dust may contain asbestos, which has been determined to cause cancer when inhaled or ingested. Treat all brake dust as if it contains asbestos and use OSHA-approved asbestos removal equipment. Do not allow brake dust to become airborne by using anything that would disturb the dust. Also, wear protective gloves during this procedure and dispose of or clean them in an approved manner.
- 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

▶ TASK Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

C797 5A1

1. Complete the work order, specifying the following:
 - a. Customer information
 - b. Customer concern
 - c. Vehicle identifying information
 - d. Any related service history, etc.

The rest of this task is completed by performing the remainder of the tasks in this section, and can be signed off at the end of this tasksheet (page 4).

▶ TASK Locate and interpret vehicle and major component identification numbers.

C798 5A4

1. Using the VIN for identification, access the appropriate technical information source to identify the following details.
 - a. VIN: _____
2. Look up the VIN in the appropriate service manual and identify the following information:
 - a. Country of origin: _____
 - b. Plant: _____
 - c. Type of restraint system: _____
 - d. Engine: _____
 - e. Model year: _____
3. List the location of any certification and calibration decals:

4. Describe the main information on each decal:

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

Performance Rating

CDX Tasksheet Number: C798

2008 NATEF Reference Number: 5A4



0



1



2



3



4

Supervisor/instructor signature _____ Date _____

▶ TASK Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins.

C230 5A3

1. Using the VIN for identification, use the appropriate source to access the vehicle's service history in relation to prior braking system work or customer concerns.
 - a. List any related repairs/concerns, and their dates:

2. Using the VIN for identification, access any relevant technical service bulletins for the particular vehicle you are working on in relation to braking system updates or other service issues. List TSB description/s:

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

Time off _____

Time on _____

Total time _____

Performance Rating

CDX Tasksheet Number: C230

2008 NATEF Reference Number: 5A3

0

1

2

3

4

Supervisor/instructor signature _____ Date _____

▶ TASK Identify and interpret brake system concern; determine necessary action.

C229 5A2

1. List the customer concern:

2. Research the particular concern in the appropriate service manual.
 - a. List the possible causes:

3. Inspect the braking system to determine the cause of the concern.
 - a. List the steps you took to determine the fault:

4. List the cause of the concern/complaint:

Time off _____

Time on _____

Total time _____

5. List the necessary action/s to correct this 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: C229

2008 NATEF Reference Number: 5A2



0



1



2



3



4

Supervisor/instructor signature _____ Date _____

▶ TASK C797/5A1 Continued Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

NOTE ▶ The following sign off goes along with the first task on this tasksheet and can also be signed off once all of the other tasks in this tasksheet are completed.

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

Performance Rating

CDX Tasksheet Number: C797

2008 NATEF Reference Number: 5A1



0



1



2



3



4

Supervisor/instructor signature _____ Date _____

▶ PRACTICE TASK Demonstrate use of 3 Cs (concern, cause, and correction).

Recommended Resource Materials

- CDX General Service
- 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

- None needed, but your instructor may want you to use a copy of the school's repair order to write up the 3 Cs.

Some Safety Issues to Consider

- 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.

Total time _____

Time on _____

Time off _____

1. Using the following scenario, write up the 3 Cs as listed on most repair orders. Assume that the customer authorized the recommended repairs.

A vehicle is brought to your shop with a brake concern. The customer tells you that the brakes make a grinding noise from the front wheels when the brakes are applied. The vehicle has been doing this for about two weeks, but the customer was too busy to bring the car in for repairs.

You remove the wheels, inspect all of the brakes, and find the following:

- a. The brake pads on the left front are worn down to metal and have scored the rotor badly. The rotor is worn down to the point that it is .043 of an inch under the minimum specified thickness.
- b. The right side brake pads are worn well below minimum specifications but have not worn down to metal. The rotor is about .040 of an inch thicker than the minimum thickness specified.
- c. Both front calipers appear to be original and the pistons do not move as freely as they should; the brake fluid is very dark and dirty.
- d. The rear brake shoes are in like-new condition, but wet with brake fluid. Both wheel cylinders are leaking. The rear brake drums are within specifications.

NOTE ▶ Ask your instructor whether you should use a copy of the shop repair order or the 3 Cs below to record this information.

2. Concern/complaint:

3. Cause:

4. Correction:

5. Other recommended service:

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

Performance Rating



Supervisor/instructor signature _____ Date _____

