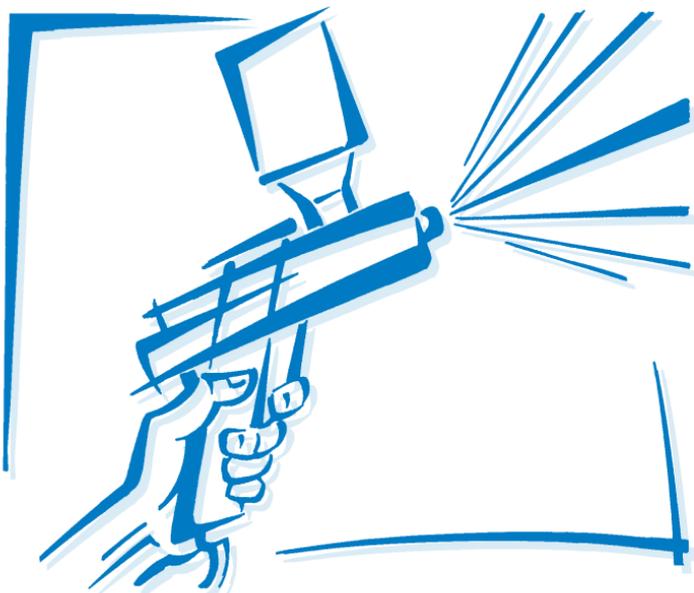


THE OFFICIAL ASE STUDY GUIDE

ASE Collision Repair and Refinish Tests



INCLUDES DAMAGE ANALYSIS & ESTIMATING!



National Institute for
**AUTOMOTIVE
SERVICE
EXCELLENCE**

ASE COLLISION REPAIR AND REFINISH TESTS

Table of Contents

| | |
|---|------|
| <i>Overview</i> | 3–7 |
| <i>Collision Repair/Refinish Tests</i> | 8–37 |
| • Painting and Refinishing (B2)..... | 8 |
| • Non-Structural Analysis and Damage Repair (B3)..... | 13 |
| • Structural Analysis and Damage Repair (B4)..... | 20 |
| • Mechanical and Electrical Components (B5) | 25 |
| • Damage Analysis and Estimating (B6) | 32 |
| <i>Test Prep & Training</i> | 38 |



COPYRIGHT © 2016 by

National Institute for

AUTOMOTIVE SERVICE EXCELLENCE

All rights reserved

OVERVIEW

Introduction

The *Official ASE Study Guide for the Collision Repair and Refinish Tests* is designed to help technicians study for the ASE certification tests. It includes detailed information about the technical knowledge covered in the Collision Repair and Refinish series. And if needed, you should find it easier to select additional reference material that will help you prepare for your test(s).

ASE voluntary certification helps technicians and estimators prove their abilities to themselves, to their employers, and to their customers. By passing ASE tests you will earn the most valuable credential available to collision repair technicians and estimators. Because the tests are tough, you'll have the satisfaction of proving to yourself that you are among the elite in your profession. What's more, these credentials are recognized throughout the U.S.

Certified technicians and estimators promote customer trust and improve the image of the industry. And trust and professionalism are the first steps to a better, more prosperous business.

ASE encourages you to take the tests and to join the proven pros who wear the ASE Blue Seal of Excellence®.

How Do I Become Certified?

There are four tests for technicians and one test for estimators in the ASE Collision Repair and Refinish certification series. If you pass at least one of tests B2, B3, B4, and B5, and have at least two years of hands-on working experience in collision repair or refinishing, you will become certified as an ASE Collision Repair or Refinishing Technician. If you pass all four of these tests and meet the experience requirement, you will earn the certificate of ASE Master Collision Repair/Refinishing Technician. If you pass test B6, and have at least two years of working experience in collision damage estimating, you will become certified as an ASE Collision Damage Estimator. (Appropriate vocational training may be substituted for up to one year of work experience.)

You will receive your test results at the end of your test appointment. You can review and print them later by logging in to your MyASE account. Results will not be given over the phone nor will they be released to anyone without your written permission. If you fail a test, you must wait 30 days from the test date before you can purchase it again.

OVERVIEW (CONTINUED)

Certification credentials are valid for five years. This ensures that certified technicians are recognized as being up-to-date in their profession. If it has been almost five years since you passed a test, it is time to register for the corresponding recertification test. Most recertification tests are about half the length of the regular tests.

Collision Repair and Refinish Tests

This *Study Guide* contains Test Specifications, task lists, and sample questions for the following ASE tests:

- Painting and Refinishing (Test B2)
- Non-Structural Analysis and Damage Repair (Test B3)
- Structural Analysis and Damage Repair (Test B4)
- Mechanical and Electrical Components (Test B5)
- Damage Analysis and Estimating (Test B6)

ASE offers certification in areas including Automobile, Medium/Heavy Truck, Truck Equipment, Transit Bus, School Bus, Parts Specialist, and Advanced Level specialties.

For full information on ASE testing as well as downloadable *Study Guides* and other test preparation resources, visit www.ase.com.

Who Writes the Questions?

The questions, written by service industry experts familiar with all aspects of collision repair, are entirely job-related. They are designed to test knowledge of the skills that you need to know on the job; theoretical knowledge is not covered.

Each question has its roots in an ASE “item-writing” workshop where service representatives from automobile manufacturers (domestic and import), parts and equipment manufacturers, working collision technicians, estimators, and technical educators meet to share ideas and translate them into test questions. Each test question must survive review by all members of the group. The questions are written to deal with practical problems of diagnosis and repair experienced by technicians and estimators in their day-to-day work.

Next, all questions are pre-tested and quality-checked on a national sample of technicians and estimators. Those questions that meet ASE standards of quality and accuracy are included in the scored sections of the tests; the “rejects” are sent back to the drawing board or discarded altogether.

OVERVIEW (CONTINUED)

How Long are the Tests?

| Collision & Refinish Tests 2016 | | Certification Tests | | Recertification Tests | |
|---------------------------------|---|----------------------|--------------|-----------------------|--------------|
| Test | Name | Number of questions* | Testing time | Number of questions | Testing time |
| B2 | Painting and Refinishing | 65* | 1½ hrs. | 28 | 45 min. |
| B3 | Non-structural Analysis & Damage Repair | 65* | 1½ hrs. | 28 | 45 min. |
| B4 | Structural Analysis & Damage Repair | 60* | 1¼ hrs. | 25 | 30 min. |
| B5 | Mechanical / Electrical Components | 60* | 1¼ hrs. | 25 | 30 min. |
| B6 | Damage Analysis and Estimating | 60* | 1¼ hrs. | 25 | 30 min. |

* ASE certification tests include 10 research questions that are not counted for score. You will not be told which questions these are, so you should answer every question. No research questions are added to recertification tests. You are eligible to take the recertification test only after you have previously passed the corresponding certification test.

How Do I Prepare for the ASE Tests?

Become familiar with test content and question format.

The Test Specifications in this booklet contain a description of the content covered by each test. The Task Lists describe the actual work performed by technicians in each specialty area. Together, these form a “blueprint” for writing and assembling the ASE tests.

Please note that each question on the test is related to a particular task or set of tasks in the task list. Therefore, review the lists, think about whether you know how to perform each task listed.

All questions are multiple-choice. The sample questions in this Study Guide are examples of the five types of questions on the test. Note that some types of questions have extra instructions that you should follow.

Be sure to read each question carefully, so that you understand exactly what is being asked. *Each question tests a specific diagnostic or repair problem and has only **one** best answer.*

OVERVIEW (CONTINUED)

To summarize, we suggest the following steps to be taken to prepare for the tests:

- Step 1.** Carefully read the content list for each test you will attempt.
- Step 2.** Study the list for each area.
- Step 3.** Go over the sample questions to become familiar with each question type. *This is very important!*
- Step 4.** Review steps 1 through 3 above, and identify the skill areas where you need additional study.

Getting Started

Registration information is available on the ASE website at www.ase.com. This site will provide you with the dates and locations that testing is available and other important information, including an electronic version of this and all other ASE *Study Guides*.

While on the website, take the time to create your own **myASE account** (if you do not already have one), which will allow you to register for tests, make your own test appointments, and have direct access to all your personal ASE certification information. And as always, if you have questions that www.ase.com does not answer, contact our helpful customer service staff at asehelp@ase.com or 1-800-390-6789.

At the Test Center—Some Tips

Try to be well rested on exam day. Arrive early enough to park and find the Test Center office. Late arrivals may be turned away by Test Center staff. If you cannot take a test because you are late, you will forfeit your test fees.

Bring your Admission Ticket and government-issued photo ID with you. Books, calculators, and other reference material will not be permitted in the test room. You will be assigned a locker to store all your personal items. No electronic devices (including cell phones) are allowed in the test room. Most test centers have airport-level security procedures for all candidates, so be prepared for “wandering” or other security checks.

You will receive scratch paper and pencils, and if you are taking an Advanced Level L1 or L2 test, a Composite Vehicle Reference booklet. After you are seated, the supervisor will explain how to use the computer and mouse. Each test appointment begins with a short tutorial on the operation of the

Bring--

- ✓ Admission Ticket
- ✓ Current Gov't. Issued Photo ID

Leave in locker--

- ✓ Books
- ✓ Calculator
- ✓ Coat
- ✓ Cell Phone
- ✓ Wallet
- ✓ Keys

OVERVIEW (CONTINUED)

computer-based test. You can also preview the system online at www.ase.com/cbt before you arrive at the Test Center.

Each test has a specific time limit, as listed in the chart on page 5. As you take each test, the computer screen will continuously display the amount of time left. If you finish early, you may review your answers or end the test and continue to the next test (if your appointment includes multiple tests). Once you submit a test for scoring, you cannot go back and review it. If you are taking several tests and need a break, the best time to take it is at the title screen of one of the tests, **before** you click “Begin.” You can take a break after this if necessary, but the test clock will continue to run.

If a question is difficult, mark the answer that you think is correct and flag the question using the on-screen button. Then go on to the next question. When you have finished the test, you may have time to go back to the flagged questions. Your score is based on the number of correct answers that you give, so you should try to answer every question.

When you finish your last test, you will be given a short customer satisfaction survey. After you complete it, inform the staff and receive your score reports.

Test Content and Sample Questions

The following material is designed to help technicians prepare for ASE certification tests.

Each section begins with the Test Specifications, which list the main categories covered on that particular test and the number of test questions, as well as percentage of the test devoted to each topic.

The Task List describes the work activities a technician should be able to perform. This list was developed by working technicians and technical experts from across the country and will provide a valuable checklist telling you what to study for the test.

Note that the number of tasks in the list does not equal the number of questions on the test. Some tasks are complex and broad in scope and may be covered by several questions. Other tasks are simple and narrow in scope and one question may cover several tasks. The main goal in listing the tasks is to describe accurately what is done on the job, not to match each task to a particular test question. In other words, every question will relate to at least one task, but not every task will be covered on the test.

Sample questions follow the task list. Although these questions will not appear on tests, they are in the same format as actual test questions. Different types of multiple-choice questions are used on the ASE tests. Note the different instructions for some questions. ■

TEST SPECIFICATIONS AND TASK LIST PAINTING AND REFINISHING (TEST B2)

| Content Area | Questions in Test | Percentage of Test |
|--|-------------------|--------------------|
| A. Surface Preparation | 15 | 27% |
| B. Spray Gun Operation and Related Equipment | 6 | 11% |
| C. Paint Mixing, Matching, and Applying | 15 | 27% |
| D. Solving Paint Application Problems | 8 | 15% |
| E. Finish Defects, Causes, and Cures | 6 | 11% |
| F. Safety Precautions | 5 | 9% |
| Total | 55 | 100% |

A. Surface Preparation (15 questions)

1. Identify and remove surface corrosion.
2. Remove dirt, road grime, wax, adhesive residue, mold release agents, tree sap, markings or other contaminants from the area to be refinished and any adjacent vehicle surfaces.
3. Inspect and identify substrate, substrate condition, type of finish, film thickness and surface condition; develop a plan for refinishing.
4. Remove paint finish.
5. Sand areas to be refinished.
6. Featheredge areas to be refinished.
7. Identify type of substrate and apply suitable treatment or undercoat.
8. Mask and protect areas that will not be refinished.
9. Mix and apply primer-surfacer.
10. Apply finishing putty to minor surface imperfections.
11. Block sand area to which primer-surfacer and/or finishing putty have been applied.
12. Remove dust residue from area to be refinished.
13. Clean area to be refinished using proper cleaning solution.
14. Remove, with a tack rag, any dust or lint particles from the area to be refinished.
15. Apply primer-sealer and/or adhesion promoter.
16. Remove imperfections from primer-sealer.
17. Prepare the adjacent areas for blending.
18. Apply stone-chip resistant coating.
19. Restore corrosion resistant coatings and/or seam sealers to repaired areas.
20. Remove and apply decals, transfers, tapes, pinstripes (painted and/or taped).
21. Take appropriate measures to eliminate static electricity.

B2 TASK LIST (CONTINUED)

B. Spray Gun Operation and Related Equipment (6 questions)

1. Inspect, clean, adjust, maintain, and determine condition of spray guns and adequacy of related equipment (air hoses, regulator, air lines, air source, filtration unit and spray environment).
2. Adjust spray gun, air pressure, fluid, and pattern control valves.
3. Select correct spray gun, needle, fluid tip, and air cap for material being sprayed.
4. Force-dry sprayed materials (bake, infrared, UV lamps, airflow, etc.).

C. Paint Mixing, Matching, and Applying (15 questions)

1. Determine the color, code, and type of finish on the vehicle.
2. Identify paint color formula and the use of mixing equipment and materials.
3. Mix and strain refinishing material.
4. Use appropriate spray gun technique (arc, angle, distance, speed, and spray pattern overlap) for the finish being applied.
5. Apply selected product on test panel or let-down panel.
6. Check color match; adjust as necessary.
7. Apply single-stage topcoat for panel refinishing.
8. Apply basecoat for spot, panel, blending, and overall refinishing.
9. Apply multi-stage (mica, pearl, etc.) coats for spot and panel refinishing, and overall refinishing.
10. Apply clearcoat.
11. Refinish interior and exterior trim components.

D. Solving Paint Problems During the Application Process (8 questions)

1. Identify dirt or other foreign objects in the refinished surface; determine the source(s), and correct the condition.
2. Identify a dry spray appearance in the refinished surface; determine the cause(s), and correct the condition.
3. Identify the presence of fish-eyes (crater like appearance); determine the cause(s), and correct the condition.
4. Identify lifting (surface distortion or wrinkling) of the refinished surface; determine the cause(s), and correct the condition.
5. Identify mottling or streaking in metallic and mica paint finishes; determine the cause(s), and correct the condition.
6. Identify excessive or lack of texture (orange peel); determine the cause(s), and correct the condition.
7. Identify an overspray condition; determine the cause(s), and correct the condition.
8. Identify sags and runs; determine the cause(s), and correct the condition.
9. Identify sandscratch swelling; determine the cause(s), and correct the condition.
10. Identify color mismatch, due to application variables; determine the cause(s), and correct the condition.
11. Identify tape tracking/markings; determine the cause(s), and correct the condition.
12. Identify poor hiding/lack of coverage; determine the cause(s) and correct the condition.
13. Identify pin holing; determine the cause(s), and correct the condition.

B2 TASK LIST (CONTINUED)

E. Finish Defects, Causes, and Cures (6 questions)

1. Identify delamination (poor adhesion, peeling); determine the cause(s), and correct the condition.
2. Identify finish cracking (crows feet or line-checking, micro-checking, etc.); determine the cause(s), and correct the condition.
3. Identify sags and runs in the refinished surface; determine the cause(s), and correct the condition.
4. Identify blistering in the finished surface; determine the cause(s), and correct the condition.
5. Identify water spotting on the finished surface; determine the cause, and correct the condition.
6. Identify finish damage caused by bird droppings, tree sap, and other causes; correct the condition.
7. Identify finish damage caused by airborne contaminants, (acids, soot, rail dust, chemicals, and other industrial-related causes); correct the condition.
8. Identify chalking (oxidation); correct the condition.
9. Identify bleed-through or staining; determine the cause and correct the condition.
10. Identify damage caused during buffing/polishing painted surfaces; correct the condition.
11. Identify film defects from too much or too little film build; determine the cause, and correct the condition.
12. Identify minor surface imperfections; determine the cause, and correct the condition.
13. Identify topcoat blend issues; determine the cause(s), and correct the condition.
14. Identify solvent popping; determine the cause(s), and correct the condition.
15. Identify shrinking or splitting while the finish is curing; determine the cause(s), and correct the condition.
16. Identify die-back (dulling of the paint film); determine the cause(s), and correct the condition.

F. Safety Precautions (5 questions)

Note: Federal EPA law, OSHA/NIOSA, establishes minimum compliance requirements for refinishing materials. States and local municipalities may institute requirements that exceed the Federal EPA, OSHA/NIOSA requirements. Knowledge of the Federal EPA, OSHA/NIOSA requirements will be addressed in the following tasks.

1. Identify and take necessary precautions with hazardous operations and materials.
2. Identify and correct vehicle, equipment and material hazards to employee health and safety.
3. Select personal protection equipment (PPE); inspect to insure fit, operation, and maintenance. ■

SAMPLE QUESTIONS

PAINTING AND REFINISHING (TEST B2)

1. Painter A says that metal conditioner should be used under plastic filler to assure proper adhesion.
Painter B says that metal conditioner should be used under plastic filler only if rust is present.
Who is right?
- (A) A only
(B) B only
(C) Both A and B
* (D) Neither A nor B
2. Painter A says that primer-surfacer will dry faster if it is sprayed in several coats with flash time between coats.
Painter B says that there will be less bridging if all the primer-surfacer is sprayed in one application.
Who is right?
- * (A) A only
(B) B only
(C) Both A and B
(D) Neither A nor B
3. Before applying paint, a painter should select the fluid nozzle and needle based on the:
- (A) size of the job.
* (B) type of coating.
(C) spray booth manufacturer.
(D) painter preference.
4. Which of these is the most likely cause of swirl marks when machine polishing or glazing a clear coat?
- (A) Moving the polisher too slowly
(B) Using a low-speed polisher
* (C) Using a pad that is too coarse
(D) Applying the polishing compound too thickly
5. To remove orange peel from a painted surface, the painter should wet sand with:
- * (A) # 1200 and compound.
(B) # 600 and clearcoat.
(C) # 400 and colorcoat.
(D) # 320 seal, and clearcoat.

B2 SAMPLE QUESTIONS (CONTINUED)

6. Which of these should be used when refinishing a polyolefin plastic part?
- (A) A self-etching primer
(B) A primer surfacer
(C) A urethane primer.
* (D) An adhesion promoter
7. Dirt nibs are being sanded from a metallic base coat before applying the clearcoat.
Painter A says that the clearcoat may be applied directly over the sanded basecoat.
Painter B says that applying another basecoat will help prevent sandscratches from appearing.
Who is right?
- (A) A only
* (B) B only
(C) Both A and B
(D) Neither A nor B
8. A quarter panel and sail panel are being prepared for a clearcoat blend. The recommended plan of repair is to:
- (A) sand the sail panel with P220 grit sandpaper to insure proper clearcoat adhesion.
* (B) extend the masking and clearcoat to nearest panel edge or breakpoint.
(C) lightly buff with a finishing compound prior to color application.
(D) lower the air pressure during the final application of clearcoat.
9. The masking tape on a freshly painted vehicle has gotten damp overnight. The tape should be removed:
- (A) after the tape has completely dried.
(B) when detailing begins.
(C) when trim-out is complete.
* (D) as soon as possible.

TEST SPECIFICATIONS AND TASK LIST

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (TEST B3)

| Content Area | Questions in Test | Percentage of Test |
|--|-------------------|--------------------|
| A. Preparation | 7 | 13% |
| B. Outer Body Panel Repairs, Replacements, and Adjustments | 17 | 31% |
| C. Metal Finishing and Body Filling | 8 | 15% |
| D. Glass and Hardware | 5 | 9% |
| E. Welding, Cutting, and Removal | 12 | 22% |
| F. Plastic Repair | 6 | 11% |
| Total | 55 | 100% |

A. Preparation (7 questions)

1. Review damage report and replacement parts for accuracy. Inspect for prior damage and repairs. Inspect for proper systems operation.
2. Identify potential health, safety, and environmental concerns associated with vehicle components and systems, i.e. ABS, air bags (SRS), refrigerants, hybrid electric vehicles, coolants, etc.
3. Research and determine repair plan, procedures, and methods of overall repairs in accordance with the vehicle manufacturer's specifications and accepted industry procedures (including calibration/initialization of advanced vehicle systems).
4. Position vehicle to perform repairs; lift, raise, or support if necessary.
5. Remove damaged or undamaged interior and exterior trim and moldings/claddings as necessary; document missing or broken one-time use parts/fasteners/components, store removed parts/fasteners/components.
6. Remove and store undamaged, non-structural body panels and components and mechanical/electrical components that may interfere with or be damaged during the repair process.
7. Check for malfunction indicator lamp (MIL) illumination; scan all computer systems and retrieve codes and settings; identify battery disconnect procedures.
8. Protect panels and parts adjacent to repair area to prevent damage during repair.
9. Remove dirt, grease, wax, and other contaminants from areas to be repaired.
10. Remove pinstripes, emblems and decals (transfers/overlays and other paint protection accessories); remove adhesives if necessary.
11. Remove corrosion protection, undercoatings, sealers, and other protective coatings as necessary to perform repairs.
12. Remove repairable plastics and other parts for off-vehicle repair.
13. Identify safety considerations: Personal Protection Equipment (PPE), shock hazards, fumes, safety data sheet (SDS), etc. before beginning any repair operation.

B3 TASK LIST (CONTINUED)

B. Outer Body Panel Repairs, Replacements, and Adjustments (17 questions)

1. Determine the extent of the direct (Primary) and indirect (Secondary) damage and the direction of impact; plan the methods and order of repair.
2. Remove and replace bolted, riveted, adhesive/bonded, and welded panels or panel assemblies.
3. Identify the body panel substrate (high-strength steel, aluminum, magnesium, composite, etc.), determine the extent of damage for reparability or replacement.
4. Remove, reinstall or replace, and adjust/align hood, hood supports, hood hinges, and hood latch/lock.
5. Remove, reinstall or replace, and adjust/align deck lid, lid hinges, supports, and lid latch/lock.
6. Remove, reinstall or replace and adjust/align doors, tailgates, hatches, supports, liftgates, latch/lock assemblies, handles, and hinges.
7. Remove, reinstall or replace, and adjust/align bumpers, brackets, reinforcements, guards, absorbers, isolators, and mounting hardware.
8. Remove, reinstall or replace and adjust/align front fenders; check and adjust gaps and clearances.
9. Remove, reinstall or replace and adjust/align exterior lighting and mounting panels.
10. Check outer body panel function, adjust as necessary for proper operation.
11. Restore contours of a damaged panel to a surface condition suitable for metal finishing or body filling.
12. Weld cracked or torn metal body panels.
13. Apply protective coatings to restore corrosion protection.
14. Remove damaged body panels; replace panels using a weld, weld-bond, adhesively-bonded, rivet, rivet-bond, or other fastening procedures.
15. Repair door frame, repair or replace door skins; inspect intrusion beams.
16. Restore seam sealers, mastic, sound deadeners, and foam fillers.
17. Diagnose and repair water leaks, dust leaks, wind noise, squeaks, rattles, and vibrations.
18. Install interior and exterior trim, pinstripes, emblems, decals (transfers/overlays, vapor barriers), and protective film.
19. Scan computer systems and verify proper system operation following outer body panel repair, replacement or adjustment.

C. Metal Finishing and Body Filling (8 questions)

1. Remove paint and other coatings from the damaged area of a body panel.
2. Heat-shrink stretched panel areas to proper contour.
3. Cold-shrink stretched panel areas to proper contour.
4. Metal-finish the damaged area of a body panel to eliminate surface irregularities.
5. Prepare surface for application of body filler material.
6. Mix, apply and shape body filler material.
7. Sand cured body filler material to contour.

B3 TASK LIST (CONTINUED)

D. Glass and Hardware (5 questions)

1. Inspect, adjust, remove and/or replace moveable, electrically-heated, stationary, mechanically-fastened, bonded, and hinged glass.
2. Inspect, adjust, repair, or replace window regulators, run channels, power mechanisms, and related controls. Reset automatic features and clear stored codes if necessary.
3. Inspect, adjust, repair, remove or replace power glass roof panels and related controls. Reset automatic features and clear stored codes if necessary.
4. Inspect, adjust, repair, remove, or replace removable, manually-operated glass roof panels and hardware.
5. Diagnose and repair water leaks, dust leaks, wind noises; rattles, and vibrations; inspect, repair, or replace weatherstripping.
6. Inspect, adjust, and install convertible or retractable roof and related mechanisms. Reset automatic features and clear stored codes if necessary.
7. Scan computer systems and verify proper system operation following stationary glass removal or replacement.

E. Welding, Cutting, and Removal (12 questions)

1. Identify weldable and non-weldable materials used in vehicle construction.
2. Identify the considerations for cutting, removing, and welding various types of steels, aluminum and other metals.
3. Determine the correct welding process to be used in specific welding situations: [compression/inverter/squeeze type resistance spot (STRSW), GTAW (TIG), GMAW (MIG), MIG-brazing]; determine settings, electrode, wire type, diameter, gas and bonding material to be used in specific welding processes.
4. Adjust the welding equipment for proper operation.
5. Perform test welds. Visually inspect, perform destructive test, and make adjustments as necessary.
6. Determine proper work clamp (ground) location.
7. Use the proper gun-to-joint angle, distance, speed, and direction of gun travel for welds being made in all positions.
8. Select proper STRSW arm set, electrode type and diameter, and settings based on the location and material to be welded.
9. Protect vehicle components (adjacent components, hybrid components, computers and other electronic modules) from possible damage caused by welding and cutting.
10. Clean or prepare the metal to be welded; ensure proper weld joint fit-up; apply weld through primer if required.
11. Select and prepare the correct joint type (butt, lap, etc.) for the repair.
12. Identify and perform the correct type of weld (continuous, stitch, tack, plug, spot, slot, etc.) for each specific welding operation.
13. Identify the causes of weld defects; perform required equipment maintenance and/or make necessary adjustments.

F. Plastic Repair (6 questions)

1. Identify the types of plastic(s) or composite(s); determine repairability.
2. Identify the proper plastic or composite repair/cleaning procedures; clean and prepare the surfaces of plastic or composite parts for repair.
3. Repair plastic parts by welding or using adhesive repair materials; repair composite parts using adhesive repair materials; use reinforcing materials as required.
4. Reshape plastic parts.
5. Perform single or two-sided repairs in plastic or composite panels.
6. Replace bonded plastic or composite body panels; straighten or align mounting locations.
7. Replace mechanically fastened plastic or composite body panels; straighten or align mounting locations if necessary; torque fasteners to specifications. ■

SAMPLE QUESTIONS

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (TEST B3)

1. When closing a convertible top, the driver's side has a larger gap than the passenger's side before locking in place. Which of these could be the cause?
- * (A) Bent roof frame
 - (B) Shrunken convertible top material
 - (C) Normal condition
 - (D) Bent B-pillar
2. A damaged steel door outer panel (skin) is being replaced. Technician A says that the damaged panel could be removed by grinding away the outer edge with a disc grinder. Technician B says that the new panel could be attached by tack welding. Who is right?
- (A) A only
 - (B) B only
 - * (C) Both A and B
 - (D) Neither A nor B
3. A damaged steel fender has been roughed out and prepared for plastic filler. Technician A says that a metal conditioner should be applied to the base metal areas to improve filler adhesion. Technician B says that all paint should be removed from the damaged area to improve filler adhesion. Who is right?
- (A) A only
 - * (B) B only
 - (C) Both A and B
 - (D) Neither A nor B

B3 SAMPLE QUESTIONS (CONTINUED)

4. Technician A says that electronic modules within 12 inches of a weld site should be removed.
Technician B says that an electrostatic discharge strap (EDS) should be worn when handling electronic modules.
Who is right?
- (A) A only
 - (B) B only
 - * (C) Both A and B
 - (D) Neither A nor B
5. After high-strength steel is heated, it should be cooled by:
- (A) spraying it with cold water.
 - (B) air hosing it.
 - * (C) letting it cool naturally.
 - (D) wiping it with oil.
6. Technician A says that the gas flow rate must be regulated before using a MIG welder.
Technician B says that the wire speed must be adjusted before using a MIG welder.
Who is right?
- (A) A only
 - (B) B only
 - * (C) Both A and B
 - (D) Neither A nor B
7. A fully charged A/C condenser is undamaged. However, it is blocking repair access to the damaged radiator core support. The technician should:
- (A) try to work around the condenser.
 - * (B) recover the refrigerant and remove the condenser.
 - (C) cut the radiator core support to gain access.
 - (D) bend the condenser lines to gain access.

B3 SAMPLE QUESTIONS (CONTINUED)

8. Cracks in a thermoplastic bumper fascia are to be repaired. Technician A says that the repairs can be made with a plastic welder. Technician B says that the repairs can be made with a structural adhesive. Who is right?
- * (A) A only
 - (B) B only
 - (C) Both A and B
 - (D) Neither A nor B

TEST SPECIFICATIONS AND TASK LIST STRUCTURAL ANALYSIS AND DAMAGE REPAIR (TEST B4)

| Content Area | Questions in Test | Percentage of Test |
|--|-------------------|--------------------|
| A. Frame Inspection and Repair | 16 | 32% |
| B. Unibody and Unitized Structure Measurement and Repair | 18 | 36% |
| C. Stationary Glass | 4 | 8% |
| D. Welding, Cutting, and Joining | 12 | 24% |
| Total | 50 | 100% |

A. Frame Inspection and Repair (16 questions)

1. Diagnose, repair, and verify repairs on underbody and upperbody structural damage using three-dimensional measuring systems (mechanical, electronic/computerized, laser), and dedicated or universal fixtures, in accordance with vehicle manufacturer/industry recommended procedures.
2. Check the vehicle with a tram gauge to determine further diagnostic procedures.
3. Lift, anchor, and support vehicle for repair and realignment.
4. Repair and align mash/collapse damage (change in length from body zero).
5. Repair and align sag/kickup damage (change in height from datum).
6. Repair and align sidesway/sway damage (change in width from centerline).
7. Repair and align twist damage (vertical misalignment in the center section).
8. Repair and align diamond damage.
9. Repair or replace damaged frame, frame horns, side rails, cross members, frame brackets, supplemental restraint system (SRS) mounting locations, and front, rear, or center sections in accordance with vehicle manufacturer/industry recommended procedures.
10. Replace protective coatings, restore corrosion protection to repaired or replaced frame areas and anchoring locations.
11. Repair or replace stress-cracked frame members in accordance with vehicle manufacturer/industry recommended procedures.
12. Diagnose damaged mounting locations for supplemental restraint components (SRS), and for steering, suspension, and powertrain components which can cause vibration, steering, and wheel alignment problems in accordance with vehicle manufacturer/industry recommended procedures.
13. Perform cold or heat stress-relieving procedures in accordance with vehicle manufacturer/industry recommended procedures.
14. Determine the direction of impact and the extent of direct and indirect damage.
15. Identify the frame type and composition; plan the methods and sequence of repair.

B4 TASK LIST (CONTINUED)

B. Unibody and Unitized Structure Measurement, and Repair (18 questions)

1. Diagnose, repair, and verify repairs on underbody and upperbody structural damage using three-dimensional measuring systems (mechanical, electronic/computerized, laser), and dedicated or universal fixtures, in accordance with vehicle manufacturer/industry recommended procedures.
2. Check the vehicle with a tram gauge to determine further diagnostic procedures.
3. Lift, anchor, and support vehicle for repair and realignment.
4. Repair and align mash/collapse damage (change in length from body zero).
5. Repair and align sag/kickup damage (change in height from datum).
6. Repair and align sidesway/sway damage (change in width from centerline).
7. Repair and align twist damage (vertical misalignment in center section).
8. Repair and align diamond damage.
9. Diagnose damaged mounting locations for steering, suspension, and powertrain components which can cause vibration, steering, and wheel alignment problems in accordance with vehicle manufacturer/industry recommended procedures.
10. Identify, repair or replace the supplemental restraint system (SRS) component mounting locations.
11. Determine the direction of impact and the extent of direct and indirect damage.
12. Identify the structural composition; plan the methods and sequence of repair.
13. Repair, align, and/or replace center section components. (Cowl, bulkhead, roof, roof rails, pillars, floor, seat risers, stationary glass openings, door openings, rocker panels, and crossmembers).
14. Repair, align, and/or replace rear section. (Quarter panels, rear compartment opening, package shelf, wheelhouse assemblies, rear body panel, rails, floor pans, crossmembers, and the mounting points of suspension and powertrain components).
15. Repair, align, and/or replace front sections. (Aprons, strut towers, upper and lower rails, crossmembers, and the mounting points of steering, suspension, and powertrain components).
16. Perform cold or heat stress-relieving procedures in accordance with vehicle manufacturer/industry recommended procedures.
17. Replace protective coatings; restore corrosion protection to repaired or replaced unibody structural areas and anchoring locations.
18. Restore noise, vibration, harshness (NVH) materials/structural foams in accordance with manufacturer/industry recommended procedures.

C. Stationary Glass (4 questions)

1. Identify, remove and/or replace front and rear modular/stationary glass, including heated and non-heated; telematics (cellular, satellite, AM/FM and digital) in accordance with manufacturer/industry recommended procedures.
2. Remove and replace side modular/stationary glass in accordance with manufacturer/industry recommended procedures.
3. Determine correct pinch weld preparation, adhesive selection and application in accordance with manufacturer/industry recommended procedures.

B4 TASK LIST (CONTINUED)

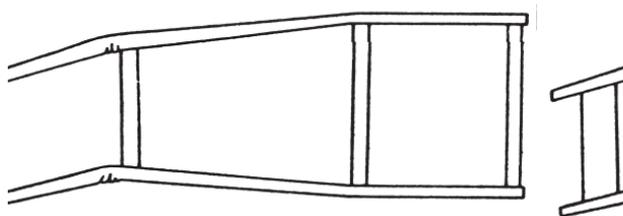
D. Welding, Cutting, and Joining (12 questions)

1. Identify the structural composition; determine correct welding process in accordance with vehicle manufacturer/industry recommendations (GMAW (MIG), squeeze-type resistance spot); identify the electrode, wire type, diameter, and gas to be used in specific welding situations
2. Set up and adjust welding equipment for the material to be welded (steel, aluminum).
3. Determine proper welding technique (push, pull, and gun angle) for the type of welds being made.
4. Protect all vehicle systems and components from damage during welding and cutting operations.
5. Prepare the metal to be welded; assure good metal fit-up.
6. Identify the type of weld joint (butt, lap, etc.) for the repair being made.
7. Determine the correct type of weld (continuous, stitch, skip, plug, spot, etc.) and preparation for each specific welding operation.
8. Identify the causes of welding defects (burn through, cracks in metal, cratering, porosity, improper penetration, excessive spatter, distortion, and waviness of bead); make necessary adjustments.
9. Identify the proper cutting process (abrasive, mechanical, plasma arc) for different materials and locations in accordance with vehicle manufacturer/industry recommended procedures.
10. Remove damaged structural steel and aluminum components, and weld in replacements in accordance with vehicle manufacturer's/industry recommended procedures.
11. Restore protective coatings; restore corrosion protection before or after welding operation.
12. Remove and install welding/weld-bonded panels according to manufacturer specifications.
13. Identify structural composition; determine the correct riveting or bonding process in accordance with vehicle manufacturer/industry recommendations. ■

SAMPLE QUESTIONS

STRUCTURAL ANALYSIS AND DAMAGE REPAIR

(TEST B4)



1. The frame shown in the diagram has been damaged in a front end collision.
Technician A says that the frame has sidesway damage.
Technician B says that the frame has kickup damage.
Who is right?

* (A) A only
(B) B only
C) Both A and B
D) Neither A nor B
2. A lower rail on a unibody vehicle is cracked at the lower control arm/crossmember mount. The rail should be repaired by:

(A) drilling holes at the end of the cracks, then welding.
* (B) replacing the lower unibody rail.
(C) reinforcing the cracked area with a steel plate, then welding.
(D) V-grooving the cracked area and stitch welding.
3. Which type of damage is LEAST likely to occur on a unibody vehicle?

(A) Sidesway
* (B) Diamond
(C) Sag
(D) Twist

B4 SAMPLE QUESTIONS (CONTINUED)

4. A car has been in a broadside collision. On the side opposite the impact, there is too much gap at each end of the door.
Technician A says that bent door hinges could be the cause.
Technician B says that a bowed body shell could be the cause.
Who is right?
- (A) A only
* (B) B only
(C) Both A and B
(D) Neither A nor B
5. A unibody strut tower is being installed using a MIG welder.
Technician A says that a mixture of 75% argon and 25% carbon dioxide could be used.
Technician B says that a mixture of 75% argon and 25% helium could be used
Who is right?
- * (A) A only
(B) B only
(C) Both A and B
(D) Neither A nor B
6. An incorrect caster reading on a unibody vehicle could be caused by a bent or mislocated:
- (A) tie rod.
* (B) front cross member.
(C) sway bar.
(D) idler arm.

This question contains the word EXCEPT. Read the question carefully before choosing your answer.

7. All of these could be used when replacing resistance spot welds on structural panels on a unibody vehicle **EXCEPT**:
- * (A) brass plug welds.
(B) resistance spot welds.
(C) MIG plug welds.
(D) compression spot welds.

TEST SPECIFICATIONS AND TASK LIST MECHANICAL AND ELECTRICAL COMPONENTS (TEST B5)

| Content Area | Questions in Test | Percentage of Test |
|--------------------------------------|-------------------|--------------------|
| A. Suspension and Steering | 11 | 22% |
| B. Electrical | 10 | 20% |
| C. Brakes | 4 | 8% |
| D. Heating and Air Conditioning | 5 | 10% |
| E. Engine Cooling Systems | 4 | 8% |
| F. Drive Train | 5 | 10% |
| G. Fuel, Intake, and Exhaust Systems | 3 | 6% |
| H. Restraint Systems | 8 | 16% |
| Total | 50 | 100% |

A. Suspension and Steering (11 questions)

1. Identify and replace one-time use suspension fasteners.
2. Inspect, diagnose, and replace rack and pinion steering gear, inner tie rod ends, and bellows boots.
3. Inspect, diagnose, remove, and replace power steering pump, pulley, belts, hoses, fittings, and pump mounts. Identify fluid type specific to the vehicle; perform bleeding procedure if required.
4. Inspect and diagnose manual and power steering gear (non-rack and pinion types) noises, binding, uneven turning effort, looseness, hard steering and lubricant leakage problems; determine needed repairs.
5. Inspect and diagnose manual and power rack and pinion steering gear mount bushings, brackets, noises, vibration, looseness, hard steering, and lubricant leakage problems; ensure proper mounting position.
6. Inspect, diagnose, and repair steering linkage geometry (attitude/parallelism).
7. Inspect and diagnose sector shaft; inspect and replace pitman arm.
8. Inspect, diagnose, and replace relay rod (center link/intermediate rod/drag link).
9. Inspect, diagnose, remove and replace idler arms and mounting locations; determine needed actions.
10. Inspect, diagnose, remove, and replace tie rod sleeves, clamps, and tie rod ends.
11. Inspect, diagnose, remove, and replace steering linkage damper.
12. Inspect, diagnose, remove, and replace upper and lower control arms, strut rods, and bushings.
13. Inspect, diagnose, remove, and replace upper and lower ball joints.
14. Inspect, diagnose, remove, and replace steering knuckle/spindle/hub and bearing assemblies.

B5 TASK LIST (CONTINUED)

15. Inspect, diagnose, remove, and replace coil springs and spring insulators (silencers).
16. Inspect, diagnose, replace, and/or adjust front suspension torsion bars; inspect mounts.
17. Inspect, diagnose, and replace strut cartridge or assembly, upper bearing, and mount.
18. Inspect, diagnose, remove, and replace rear suspension transverse links, control arms, bushings, and mounts.
19. Inspect, diagnose, remove, and replace rear suspension leaf spring(s), leaf spring insulators (silencers), shackles, brackets, bushings, and mounts.
20. Inspect and diagnose front and/or rear axle assemblies for damage and misalignment; remove, repair, or replace as required.
21. Inspect, diagnose, and replace shock absorbers, load-leveling devices, air springs, and associated lines, fittings, and components.
22. Inspect and diagnose, adjust, or replace components (including sensors, switches, actuators, and control units) of electronically-controlled suspension and steering systems (including electronically controlled hydraulic and electronically assisted steering systems).
23. Measure vehicle ride height; determine needed repairs.
24. Inspect, remove, replace, and align front and rear subframes (including engine cradles and axle carriers).
25. Inspect and diagnose steering column damage, looseness, and binding problems (including positioning mechanisms), inspect mounting locations; determine needed actions.
26. Inspect, diagnose, and replace steering shaft U-joint(s), flexible coupling(s), collapsible columns, and steering wheels.
27. Diagnose vehicle noise, vibration and harshness (NVH) problems (including suspension, tire, and driveline); determine needed action.
28. Diagnose vehicle wandering, pulling, hard steering, bump steering, memory steering, torque steering, and steering return problems; determine needed repairs.
29. Measure front and rear wheel camber; determine needed repairs or adjustments.
30. Measure caster; determine needed repairs or adjustments.
31. Measure front and rear wheel toe; determine needed repairs or adjustments.
32. Identify toe-out-on-turns (turning radius) and related problems; determine needed repairs.
33. Identify SAI (steering axis inclination), included angle, and scrub radius related problems; determine needed repairs.
34. Identify thrust angle related problems; determine needed repairs or adjustments.
35. Measure wheel setback and wheel base; determine needed actions.
36. Perform pre-alignment inspection; identify tire wear patterns and check air pressure; determine needed actions.
37. Inspect wheels, tires and pressure monitor sensors (TPM) for damage; balance tires; determine needed repairs.
38. Inspect and diagnose wheel, hub, and axle bearing for damage; determine needed action.
39. Inspect and diagnose front and rear stabilizer systems (anti-sway bar); determine needed repairs.

B5 TASK LIST (CONTINUED)

40. Perform initialization or calibration procedures following suspension and/or steering system repairs.
41. Verify effectiveness of suspension and steering repairs.

B. Electrical (10 questions)

1. Measure voltage in electrical wiring circuits with a DMM (digital multimeter); determine repair procedure.
2. Measure continuity and resistance in electrical wiring circuits and components with a DMM (digital multimeter); determine repair procedure.
3. Check electrical circuits, wiring, connectors, terminals, sockets, and routing; determine needed action.
4. Inspect, test, and replace fusible links, circuit breakers, and fuses.
5. Inspect, test, and replace relays.
6. Inspect, test, repair and/or replace electrical circuit switches.
7. Inspect, test, and replace electrical motors.
8. Inspect, test, clean, charge, and replace battery, battery cables, connectors, and clamps.
9. Identify programmable electrical/electronic components and modules; determine needed repairs.
10. Inspect, test, remove, and replace alternator/generator, drive belts, pulleys, tensioners, and fans; inspect and adjust alignment.
11. Align/aim headlamps and fog/driving lamps.
12. Inspect, test, adjust, and repair or replace components of exterior lighting systems; verify system operation.
13. Inspect, test, and repair or replace components of interior lighting systems; verify system operation.
14. Inspect, test, repair or replace horn system components; verify system operation.
15. Inspect, test, repair or replace components of wiper/washer systems; verify operation.
16. Inspect, test, repair or replace components of power window systems; verify operation.
17. Inspect, test, repair or replace components of power seats, heated/cooled seats; verify operation.
18. Inspect, test, repair or replace components of electrical, mechanical door and hatch/trunk locks; verify operation.
19. Inspect, test, repair or replace components of power sliding doors and power liftgates; verify system operation.
20. Inspect, test, repair or replace components of keyless lock/unlock devices and security systems; verify system operation.
21. Inspect, test, repair or replace electrical and mechanical components of sunroofs or convertible/retractable tops; verify system operation.
22. Inspect, test, repair or replace electrically heated mirrors, windshields, and back glass; verify operation.
23. Inspect, test, repair or replace electrical antennas; verify operation.
24. Inspect, test, repair or replace electrical interior and exterior mirrors; verify operation.
25. Retrieve diagnostic trouble codes (DTCs); verify malfunction indicator lamp (MIL) status; determine needed repairs.

B5 TASK LIST (CONTINUED)

26. Identify personal safety precautions, safe battery handling, and high voltage system diagnostic and repair considerations associated with hybrid/electric vehicles.
27. Inspect, test and diagnose operation of advanced driver assistance systems (such as: collision avoidance, active cruise control, back-up camera/sensors, lane departure, park assist).
28. Perform initialization, calibration or synchronization procedures following body control systems repair.

C. Brakes (4 questions)

1. Inspect brake lines, hoses and fittings for leaks, dents, kinks, rust, cracks or wear; tighten fittings and supports; replace brake lines (double flare and ISO types), hoses, fittings, seals, and supports.
2. Inspect/test brake fluid; determine proper fluid type for application.
3. Bleed (manual, pressure, vacuum, or surge) and/or flush hydraulic brake system; verify system operation.
4. Inspect, remove, and replace disc brake rotors or drums; adjust as needed.
5. Inspect and replace wheel studs and fasteners. Reinstall wheels and torque fasteners.
6. Inspect brake caliper mounts and slides for wear and damage; determine needed repairs.
7. Inspect parking brake system operation; repair or adjust as necessary; verify operation.
8. Identify, test, and replace ABS wheel speed sensor components.
9. Depressurize ABS hydraulic system.
10. Identify, repair or replace traction control and electronic stability control components; verify operation.

D. Heating and Air Conditioning (5 questions)

1. Recover, recycle and recharge A/C system; identify refrigerant and oil type, determine oil and refrigerant capacities; leak test and check high and low side gauge readings to verify system operation.
2. Inspect, adjust, and replace A/C compressor drive belts; check pulley tensioner alignment and clutch operation.
3. Inspect, remove, and replace A/C compressor clutch and mountings.
4. Inspect, repair or replace A/C system mufflers, hoses, lines, fittings, pressure switches, valves, and seals.
5. Verify A/C condenser air flow and cooling fan operation.
6. Inspect, test, and replace A/C system condenser, mountings, seals, and deflectors.
7. Remove and replace receiver/drier or accumulator/drier.
8. Remove and replace evaporator; inspect evaporator housing and water drain.
9. Inspect, test, repair or replace heating, ventilating, and A/C system, electrical/vacuum and mechanical controls.
10. Inspect, test, clean, and repair or replace heating, ventilating, and A/C ducts, housing(s), doors, hoses, filters, and outlets.
11. Inspect, repair or replace heating system hoses, lines, fittings, seals and components; verify operation.
12. Perform initialization, calibration, or synchronization procedures following A/C system repairs if required.

B5 TASK LIST (CONTINUED)

E. Engine Cooling Systems (4 questions)

1. Inspect, test, remove, and replace radiator, mounts, pressure cap, coolant recovery system, hoses, and water pump.
2. Remove and replace thermostat, by-pass, and housing.
3. Recover, flush, bleed, and refill system with proper coolant, verify protection level.
4. Inspect, remove, and replace electrical/mechanical cooling fan components; verify operation.
5. Inspect, remove, and replace auxiliary oil/fluid coolers and components.

F. Drive Train (5 questions)

1. Inspect, remove, and replace powertrain assembly and components; inspect, replace, and align powertrain mounts, subframes, and engine cradles.
2. Inspect, remove, and replace electronic components, wires, terminals, and connectors.
3. Inspect, remove, replace, and adjust electrical, mechanical or hydraulic shift/throttle and clutch components.
4. Inspect, remove, and replace front and/or rear drive axle assembly.
5. Inspect, remove, and replace half shafts and constant velocity (CV) joints and components.
6. Inspect, remove, and replace drive shafts and universal joints.
7. Inspect, remove, and replace transaxles, transmissions, and transfer cases.

G. Fuel, Intake and Exhaust Systems (3 questions)

1. Inspect, remove, and replace exhaust manifold, exhaust pipes, mufflers, converters, sensors, resonators, tail pipes, heat shields, and components.
2. Inspect, remove, and replace fuel tank, straps, fuel pump, fuel tank filter, rollover valve, fuel cap, fuel filler hose, fuel filler-to-body seal, and inertia switch; inspect and replace fuel lines and hoses; check fuel for contaminants.
3. Inspect, remove, and replace intake manifold, air cleaner, turbocharger, intercooler, hoses, and sensors.
4. Inspect, remove, and replace canister, filter, sensors, vent, and purge lines of fuel vapor control systems; ensure proper routing.

H. Restraint Systems (8 questions)

1. Inspect, remove, and replace seatbelt and shoulder harness assembly and components; verify operation.
2. Inspect restraint system mounting areas for damage; repair or replace as needed. Research applicable vehicle service information to determine if components are reusable.
3. Deactivate, inspect, replace, and reactivate supplemental restraint system (SRS) and components; verify system operation readiness.
4. Inspect, remove, replace, and dispose of deployed and non-deployed airbag(s) and pretensioners; store airbag(s) during vehicle service.
5. Use diagnostic trouble codes (DTCs) to diagnose and repair the Supplemental Restraint System (SRS), including occupant classification systems (OCS).
6. Perform initialization, calibration, or synchronization procedures following restraint system repairs. ■

SAMPLE QUESTIONS

MECHANICAL AND ELECTRICAL COMPONENTS (TEST B5)

1. After collision repairs, a unitized body vehicle with rack and pinion steering binds when turning right. The most likely cause is a:
- (A) damaged ball joint.
 - * (B) bent rack gear.
 - (C) bent strut.
 - (D) damaged strut bearing.
2. Technician A says that a bent MacPherson strut rod can be seen when it is rotated from the top.
Technician B says that a bent MacPherson strut rod can cause a toe problem.
Who is right?
- (A) A only
 - (B) B only
 - * (C) Both A and B
 - (D) Neither A nor B
3. Technician A says that the coolant recovery system keeps excess coolant from being lost.
Technician B says that the coolant recovery system returns coolant when the cooling system goes into a vacuum.
Who is right?
- (A) A only
 - (B) B only
 - * (C) Both A and B
 - (D) Neither A nor B
4. When bleeding power brakes, a technician should first:
- (A) check the parking brake adjustment.
 - * (B) check the master cylinder fluid level.
 - (C) start at the wheel farthest from the master cylinder.
 - (D) start the engine and pump the brakes.

B5 SAMPLE QUESTIONS (CONTINUED)

5. Technician A says that minor bulging of a flexible brake line during bleeding is ok.
Technician B says that flexible brake lines may be repaired in the shop.
Who is right?
- (A) A only
(B) B only
(C) Both A and B
* (D) Neither A nor B
6. During A/C recovery, 1.0 oz. of oil has been removed from the system.
Which of these is the correct procedure?
- (A) Return the oil to the system.
* (B) Replace the oil with new oil.
(C) Ignore such a small amount.
(D) Change all oil in the system.
7. Technician A says that the vehicle must be realigned after replacing damaged rear suspension parts.
Technician B says that the underbody dimensions must be checked when replacing damaged rear suspension parts.
Who is right?
- (A) A only
(B) B only
* (C) Both A and B
(D) Neither A nor B

This question contains the word LEAST. Read the question carefully before choosing your answer.

8. The caster on the left side of a unibody vehicle is out of specs. The **LEAST** likely cause is a:
- (A) misaligned crossmember.
* (B) bent idler arm.
(C) damaged lower control arm.
(D) damaged strut (radius) rod.

TEST SPECIFICATIONS AND TASK LIST

DAMAGE ANALYSIS AND ESTIMATING (TEST B6)

| Content Area | Questions in Test | Percentage of Test |
|---|-------------------|--------------------|
| A. Damage Analysis | 11 | 22% |
| B. Estimating | 13 | 26% |
| C. Legal and Environmental Practices | 3 | 6% |
| D. Vehicle Construction | 6 | 12% |
| E. Vehicle Systems Knowledge (Includes Hybrid/Alternate Fuel Vehicles) | 11 | 22% |
| 1. Fuel, Intake, Ignition, Exhaust and Emission Control Systems(1) | | |
| 2. Suspension and Steering (3) | | |
| 3. Brakes (1) | | |
| 4. Heating, Engine Cooling & Air Conditioning (2) | | |
| 5. Electrical/Electronic Systems (1) | | |
| 6. Restraint Systems (2) | | |
| 7. Fasteners and Materials (1) | | |
| F. Parts Identification and Source Identification | 4 | 8% |
| G. Customer Relations and Sales Skills | 2 | 4% |
| Total | 50 | 100% |

A. Damage Analysis (11 questions)

1. Position the vehicle for inspection.
2. Prepare vehicle for inspection by providing access to damaged areas.
3. Analyze damage to determine appropriate methods for overall repairs.
4. Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage.
5. Gather details of the incident/accident necessary to determine the full extent of vehicle damage.
6. Identify and record pre-existing damage.
7. Identify and record prior repairs.
8. Perform visual inspection of structural components and members; determine if repair or replacement is required.
9. Identify structural damage using measuring tools and equipment.
10. Perform visual inspection of non-structural components and members; determine if repair or replacement is required.
11. Determine parts, components, material types, and procedures necessary for a proper repair.

B6 TASK LIST (CONTINUED)

12. Identify type and condition of finish; determine if refinishing is required.
13. Identify suspension, electrical, and mechanical component damage.
14. Identify safety systems damage and related service requirements.
15. Identify interior component damage.
16. Identify damage to add-on accessories and modifications.
17. Identify single (one time) use components.

B. Estimating (13 questions)

1. Determine and record customer/vehicle owner information.
2. Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant.
3. Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications.
4. Document and record existing or pre-existing damage.
5. Identify safety systems; determine needed repairs.
6. Apply appropriate estimating and parts nomenclature (terminology).
7. Determine and apply appropriate estimating sequence.
8. Utilize estimating guide procedure pages.
9. Apply estimating guide footnotes and headnotes as needed.
10. Estimate labor value for operations requiring judgment.
11. Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).
12. Select and price OEM parts; verify availability, compatibility, and condition.
13. Select and price alternative/optional OEM parts; verify availability, compatibility, and condition.
14. Select and price aftermarket parts; verify availability, compatibility, and condition.
15. Select and price recyclable/used parts; verify availability, compatibility and condition.
16. Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.
17. Determine price and source of necessary sublet operations.
18. Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.
19. Recognize and apply overlap deductions, included operations, and additions.
20. Determine additional material and charges.
21. Determine refinishing material and charges.
22. Determine recommended sectioning procedures and establish labor values.
23. Determine structural measurement requirements; diagnose, and establish labor values.
24. Determine necessary structural repair/replace requirements, setup procedures, and establish labor values.
25. Apply math skills to establish charges and totals.
26. Interpret computer-assisted and manually written estimates; verify the information is current.
27. Identify procedural differences between computer-assisted systems and manually written estimates.
28. Identify procedures to restore corrosion protection; establish labor values and materials charges.

B6 TASK LIST (CONTINUED)

29. Determine appropriate application of betterment/depreciation to parts and allowances as necessary.
30. Determine the cost effectiveness of the repair and determine the approximate vehicle retail, recyclable and repair value.
31. Recognize the differences in estimation procedures when using different information provider systems.
32. Verify accuracy of estimate compared to the actual repair and replacement operations.

C. Legal and Environmental Practices (3 questions)

1. Recognize federal, state and local regulatory obligations.
2. Recognize contractual and warranty obligations.
3. Recognize the obligation to restore the vehicle based on vehicle manufacturer's recommendations, or industry accepted procedures and guidelines.

D. Vehicle Construction (6 questions)

1. Identify type of vehicle construction (space frame, unibody, body-over-frame).
2. Recognize the different damage characteristics of space frame, unibody, and body-over-frame vehicles.
3. Identify impact energy absorbing components and repair/replacement procedures.
4. Identify steel types; identify repair/replacement procedures for steel components.
5. Identify aluminum/magnesium components and repair/replacement procedures.
6. Identify plastic/composite components and repair/replacement procedures.
7. Identify vehicle glass components and repair/replacement procedures.
8. Identify add-on accessories and modifications and repair/replacement procedures.

E. Vehicle Systems Knowledge (Includes Hybrid/Alternate Fuel Vehicles) (11 questions)

1. Fuel, Intake, Ignition, Exhaust, and Emissions Control Systems (1 question)

1. Identify major components.
2. Identify component function.
3. Identify component service requirements.

2. Suspension, Steering, and Powertrain (3 questions)

1. Identify components.
2. Identify component function.
3. Identify component service requirements.

3. Brakes (1 question)

1. Identify components.
2. Identify component function.
3. Identify component service requirements.

4. Heating, Engine Cooling, and Air Conditioning (2 questions)

1. Identify components.
2. Identify component function.
3. Identify component service requirements.

5. Electrical/Electronic Systems (1 question)

1. Identify components.
2. Identify component function.
3. Identify component service requirements

B6 TASK LIST (CONTINUED)

6. Restraint Systems (2 questions)

1. Identify components.
2. Identify component function.
3. Identify component service requirements.

7. Fasteners and Materials (1 question)

1. Identify fastener type and service requirements.
2. Identify body repair and refinishing materials and supplies.

F. Parts Identification and Source Determination (4 questions)

1. Identify OEM components.
2. Identify OEM component function.
3. Justify repair or replace decision using OEM component.
4. Determine OEM component availability.
5. Identify alternative/optional OEM component availability.
6. Identify alternative/optional OEM component function.
7. Justify repair or replace decision using alternative/optional OEM components.
8. Determine alternative/optional OEM component availability.
9. Identify aftermarket components.
10. Identify aftermarket component function.
11. Justify repair or replace decision using aftermarket components.
12. Determine aftermarket component availability.
13. Identify recyclable (used) components.
14. Identify recyclable (used) component function.
15. Justify repair or replace decision using recyclable (used) components.
16. Determine recyclable (used) component availability.
17. Identify remanufactured/rebuilt/reconditioned components.
18. Identify remanufactured/rebuilt/reconditioned component function.
19. Justify repair or replace decision using remanufactured/rebuilt/reconditioned components.
20. Determine remanufactured/rebuilt/reconditioned component availability.

G. Customer Relations and Sales Skills (2 questions)

1. Acknowledge and/or greet customer/client.
2. Listen to customer/client; collect information and identify customer's/client's concerns, needs and expectations.
3. Establish cooperative attitude with customer/client.
4. Identify yourself to customer/client; offer assistance.
5. Deal with angry customer/client.
6. Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process.
7. Recognize basic claims handling procedures; explain to customer/client.
8. Project positive attitude and professional appearance.
9. Provide and review warranty information.
10. Provide and review technical and consumer protection information.
11. Estimate and explain duration of out-of-service time.
12. Apply negotiation skills to obtain a mutual agreement.
13. Interpret and explain manual or computer-assisted estimate to customer/client. ■

SAMPLE QUESTIONS

DAMAGE ANALYSIS AND ESTIMATING (TEST B6)

1. Inspecting the residue on a fine sandpaper after sanding a small area can be used to determine if:
 - (A) the finish is original.
 - (B) checking is present in the finish.
 - (C) the finish will require a sealer.
 - * (D) the finish is a clear coat.

2. The cleaning and retaping of an adhesive molding is:
 - (A) included in the R&I labor value for the molding.
 - (B) included in the replacement labor value of the panel that the molding is attached to.
 - * (C) not included in the R&I labor value for the molding.
 - (D) included in the refinish labor value of the panel that the molding is attached to.

3. Estimator A says that some vehicles use High Strength Steel (HSS) outer body panels.
Estimator B says that damaged High Strength Steel (HSS) cannot be repaired.
Who is right?
 - * (A) A only
 - (B) B only
 - (C) Both A and B
 - (D) Neither A nor B

B6 SAMPLE QUESTIONS (CONTINUED)

4. A pickup truck is hit hard at the right front wheel and tire. The steering wheel now turns without the wheels moving. Which of these is most likely damaged?
- * (A) The sector shaft
 - (B) The stabilizer bar
 - (C) The drag link
 - (D) The idler arm

These questions contain the word EXCEPT. Read the questions carefully before choosing your answer.

5. Refinishing materials include all of these **EXCEPT**:
- (A) reducers.
 - (B) sandpaper.
 - * (C) structural adhesive.
 - (D) adhesion promoter.
6. All of these are parts of the suspension system **EXCEPT** the:
- (A) strut.
 - * (B) rotor.
 - (C) control arm.
 - (D) ball joint.

TEST PREP & TRAINING

Taking an ASE certification test doesn't have to be a high-stress challenge. The ASE website contains test preparation and training information tailored to your specific needs. Visit www.ase.com and use the "Test Prep & Training" tab. We've loaded this section of our website with plenty of helpful information to help boost both your knowledge and your confidence—two of your most important tools as a test-taker.

Official ASE Practice Tests

The easy way to try your hand at taking ASE-style certification exams, without the stress and high stakes of the real thing.

Test Taking Tips

An easy, self-guided introduction to taking your ASE certification test, including examples of the types of questions you'll see and proven tips for success.

Study Guides

Free, step-by-step guides to help you understand what's involved in each test including sample questions and suggestions for further preparation.

CBT Test-Drive

Not familiar with ASE's computer-based tests? This self-paced presentation will show you how they work...so you'll feel right at home with the new testing format.

In-service Training Providers

You can choose from a variety of training programs, both instructor-led and self-directed, that have been evaluated through a quality-assurance process called CASE (Continuing Automotive Service Education) and accredited by ASE.

Community Colleges and Technical Training Schools

Get instructor-led, hands-on training at schools accredited by the National Automotive Technician Education Foundation.

ATMC for more training options

The Automotive Training Manger Council is a professional organization of individuals responsible for the development and delivery of training in the auto and truck industries and a member of the ASE Industry Education Alliance. The ATMC administers the Continuing Automotive Service Education (CASE) program for the ASE accreditation of training providers serving the transportation industry. A list of CASE accredited training providers can be found at the ATMC website. www.atmc.org

Other test prep and training programs

Many test-takers have used aftermarket test prep and training programs and found them helpful. Please note that ASE has neither reviewed nor approved the content of these programs and providers.



National Institute for

AUTOMOTIVE SERVICE EXCELLENCE

101 Blue Seal Dr., S.E., Suite 101
Leesburg, VA 20175

To contact us:

703-669-6600

www.ase.com