

THE OFFICIAL
ASE CATALOG OF TESTS

ASE

Collision Repair

and Refinish

Tests



Includes Damage Analysis & Estimating!



ASE COLLISION REPAIR/REFINISH TESTS

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OVERVIEW

Introduction

This *Catalog* is intended to help collision repair/refinish technicians and collision damage estimators study for the ASE certification tests. It was written by the same people who develop and assemble the actual ASE tests and, therefore, should be very useful for reviewing technical knowledge and seeking additional reference material.

ASE voluntary certification is a means through which technicians and estimators can 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 nation.

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 one or more 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.)

If you fail a test, you may take it again during any scheduled test administration in which it is offered. And remember, you are the only one who will receive your tests scores; results will not be given over the phone nor will they be released to anyone without your written permission.

OVERVIEW (CONTINUED)

ASE tests and certifies autobody technicians and estimators in the following areas:

- **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 also offers certification in Automobile, Medium/Heavy Truck, Truck Equipment, School Bus, and Engine Machinist specialties. Separate *Preparation Guides* are available.

For additional information on ASE testing, you can receive the *Registration Booklet* by mailing the coupon contained on the back cover of this booklet. The *Registration Booklet* gives test dates, locations and other important information about the certification program. It also contains a registration form to use in signing up for the tests.

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 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 vocational educators meet in a workshop setting to share ideas and translate them into test questions. Each test question written by these experts 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.

From there, 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.

Each certification test is made up of between forty and eighty multiple-choice questions. The testing sessions are 4 hours and 15 minutes, allowing plenty of time to complete several tests.

Note: Each test could contain up to ten additional questions that are included for statistical research purposes only. Your answers to these questions will not affect your score, but since you do not know which ones they are, you should answer all questions in the test. The five year Recertification Test will cover the same content areas as those listed above. However, the number of questions in each content area of the Recertification Test will be reduced by about one-half.



How Do I Prepare for the ASE Tests?

Become familiar with test content and question format: The Test Specifications in this booklet contain a summary 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 keyed, or linked, to a particular task or set of tasks in the task list. Therefore, a review of the task lists, with an eye to judging whether you know how to perform each task listed, will provide you valuable information as you prepare for the tests.

There are five types of multiple-choice questions on the tests, each of which is included in the sample questions in this booklet. Note the different instructions for some questions.

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

To summarize, we suggest the following steps be taken:

Step 1. Study the content list for each test you will attempt.

Step 2. Carefully read the task 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 and identify the skill area(s) where you need additional study.

Types of Knowledge Measured By the Tests

The types of knowledge and skills you will need to know to pass the tests are as follows:

- **Basic technical knowledge:** Tests your knowledge of what is in a system and how the system works, and what are the proper procedures and precautions to be followed in making repairs and adjustments.
- **Service or repair knowledge and skill:** Tests your understanding and ability to apply generally accepted repair procedures and precautions in assembly, disassembly, and reconditioning operations; and in making inspections and adjustments. Also tests ability to use shop manuals and precision tools of the trade.
- **Testing and diagnostic knowledge and skill:** Tests your ability to recognize problems and to use generally available measurement and testing equipment to make a diagnosis. Also tests your ability to trace the effects of a particular condition and find the cause of a particular set of symptoms.

OVERVIEW (CONTINUED)

If you are an experienced and competent technician or estimator, a careful review of this booklet, and additional brush-up on those areas in which you are weakest, is all you should need to pass the ASE tests.

Before The Tests

Try to be well-rested for the tests so you will be alert and efficient. Take three or four sharpened soft-lead (#2) pencils and an eraser with you; pencils will not be furnished at the test center. If you wish to pace yourself, bring a watch, some testing rooms may not have clocks. Finally, be sure to bring along your test center admission ticket and some form of photo identification.

At the Test Center

When you reach the test center, wait in the assigned area until the proctor begins the test administration. He or she will instruct you in filling out the answer folder and will tell you the amount of time allotted for each test.

Once the test has begun, keep track of time. Do not spend too long on any one question. If a question is difficult, mark the answer that you think is correct and put a check by it in the test book. Then go on to the next question. If you finish before the allotted time, you may go back to the questions that you checked.

It is to your advantage to answer every question. Do not leave any answers blank. Your score will be based on the number of correct answers that you give.

Test Content and Sample Questions

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

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

The Task List describes the work activities a technician and estimator should be able to perform in each technical area covered on that test. This list was developed by working technicians, estimators, and technical experts from across the country and will provide a valuable check list of what to study for the test(s).

These task descriptions offer detailed information to technicians and estimators preparing for the test(s) and to persons who may be instructing technicians or estimators. The task lists may also serve as guidelines for question writers, reviewers, and test assemblers.

It should also be noted that the number of questions in each content area may not equal the number of tasks listed. Some of the tasks are complex and broad in scope and may be covered by several questions. Other tasks are simple and narrow in scope



OVERVIEW (CONTINUED)

and one question may cover several tasks. The main objective in listing the tasks is to describe accurately what is done on the job, not to make each task correspond to a particular test question.

Sample questions follow. Although these same questions will not appear on actual tests, they are in the same format as actual test questions. All five types of multiple-choice questions used on the ASE tests are represented here. 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	16	29%
B. Spray Gun Operation and Related Equipment	5	9%
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 and Miscellaneous	5	9%
Total	55	100%

A. Surface Preparation (16 questions)

1. Remove, assess, and store trim, moldings, fasteners, and hardware.
2. Remove dirt, road grime, wax, mold release agents, markings or other protective coatings from area to be refinished and adjacent vehicle surfaces.
3. Inspect and identify substrate, 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 two-component putty to minor surface imperfections.
11. Block sand area to which primer-surfacer and/or two-component 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 sealer and/or adhesion promoter.
16. Remove imperfections from 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 decals, transfers, tapes, pinstripes (painted and taped), adhesive residues, etc.
21. Take appropriate measures to eliminate static electricity.



B2 TASK LIST (CONTINUED)

B. Spray Gun Operation and Related Equipment (5 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. Check and adjust spray gun air pressure for siphon-feed, pressure-feed, gravity-feed, and HVLP (high volume low pressure).
3. Adjust spray gun, air pressure, fluid, and pattern control valves.
4. Select correct spray gun, needle, fluid tip, and air cap for material being sprayed.
5. Force-dry sprayed materials (baking, infrared, UV lamps, airflow, etc.).

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

1. Determine type and color of finish already on vehicle.
2. Identify paint color formula and the use of mixing equipment and materials.
3. Mix and strain refinish material according to manufacturer's recommendations.
4. Use appropriate spray technique (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for 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 and overall 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. Identify the type of plastic to be refinished; determine the proper materials and refinishing procedures.
12. Refinish interior and exterior trim components.

D. Solving Paint Application Problems (8 questions)

1. Identify blushing (milky or hazy appearance); determine the cause(s) and correct the condition.
2. Identify contaminants in the refinished surface; determine the source(s), and correct the condition.
3. Identify a dry spray appearance in the refinished surface; determine the cause(s), and correct the condition.
4. Identify the presence of fish-eyes (crater like openings) in the refinished surface; determine the cause(s), and correct the condition.
5. Identify lifting (surface distortion or shriveling) of the refinished surface; determine the cause(s), and correct the condition.
6. Identify mottling or streaking in metallic and mica paint finishes; determine the cause(s), and correct the condition.
7. Identify excessive/lack of texture (orange peel) appearance of the refinished surface; determine the cause(s), and correct the condition.
8. Identify an overspray condition; determine the cause(s), and correct the condition.
9. Identify solvent popping in the refinished surface; determine the cause(s), and correct the condition.
10. Identify sags and runs in the refinished surface; determine the cause(s), and correct the condition.

B2 TASK LIST (CONTINUED)

11. Identify sandscratch swelling in the refinished surface; determine the cause(s), and correct the condition.
12. Identify shrinking or splitting while the finish is curing; determine the cause(s), and correct the condition.
13. Identify color mismatch; determine the cause(s), and correct the condition.
14. Identify tape tracking; determine the cause(s), and correct the condition.
15. Identify die-back conditions (dulling of the paint film showing haziness, or film distortion showing shrinking); determine the cause(s), and correct the condition.
16. Identify pin holing in the refinished surface; determine the cause(s), and correct the condition.

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

1. Identify poor adhesion; 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 natural 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 by buffing 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. Sand and polish minor surface imperfections.
13. Identify improper topcoat blend; determine the cause(s), and correct the condition.

F. Safety Precautions and Miscellaneous (5 questions)

1. Identify and take necessary precautions with hazardous operations and materials according to EPA regulations.
2. Identify and correct hazards to employee health and safety according to OSHA/NIOSH guidelines, and vehicle, equipment and material manufacturers' procedures.
3. Inspect work environment for health and safety hazards.
4. Select proper respiratory and exposure protection; inspect to insure proper fit, operation, and maintenance.
5. Apply decals, transfers, tapes, pinstripes (painted and taped), etc.
6. Reinstall trim, moldings, fasteners, and hardware. ■



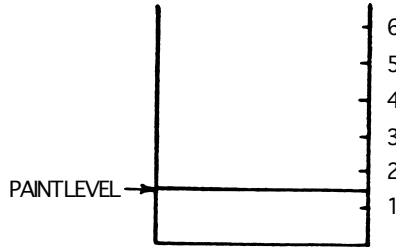
SAMPLE QUESTIONS

PAINTING AND REFINISHING (TEST B2)

Questions:

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. Paint can directions say to reduce the paint by adding 1 1/2 parts of reducer/solvent to 1 part of paint. The mixture in the can shown above will be at what level when the right amount of reducer/solvent is added?
 - * (A) 3 3/4
 - (B) 3 1/2
 - (C) 2 3/4
 - (D) 2 1/2

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



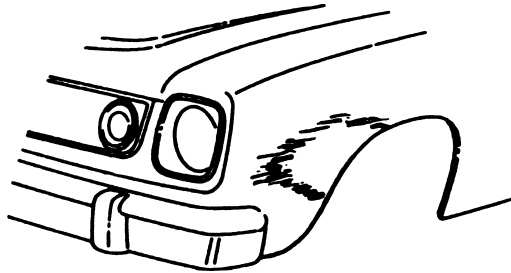


B2 SAMPLE QUESTIONS (CONTINUED)

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.

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 sand-scratches from appearing. Who is right?
 - (A) A only
 - * (B) B only
 - (C) Both A and B
 - (D) Neither A nor B



8. The fender shown above has been metal repaired and refinished. Painter A says that the scratches could be caused by applying the finish coat before the primer was dry. Painter B says that the scratches could be caused by using too rough a grit to finish the featheredge. Who is right?
 - (A) A only
 - (B) B only
 - * (C) Both A and B
 - (D) Neither A nor B

Question 9 is not like the ones above.

It has the word **EXCEPT**. For this question, look for the choice that could **NOT** cause the described situation. Read the entire question before choosing your answer.

9. Sealers do all these EXCEPT:
 - (A) Improve adhesion.
 - (B) Improve color holdout.
 - (C) Minimize sand scratch swelling.
 - * (D) Fill in feather edges.



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; analyze damage to determine appropriate methods for overall repair. Inspect for prior damage and verify 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. Determine repair procedures in accordance with the vehicle manufacturer's specifications and industry procedures.
4. Position vehicle to perform repairs; lift or raise if necessary.
5. Remove damaged or undamaged interior and exterior trim and moldings as necessary; document missing or broken parts/fasteners, store removed parts/fasteners.
6. Remove undamaged, non-structural body panels and components that may interfere with or be damaged during repair.
7. Remove all vehicle mechanical and electrical components that may interfere with or be damaged during repair. Retrieve codes and settings, disconnect battery if necessary.
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, woodgrains), if necessary.
11. Remove corrosion protection, undercoatings, sealers, and other protective coatings as necessary to perform repairs.
12. Remove repairable plastics and other parts that are recommended for off-vehicle repair.
13. Identify safety considerations: Eye protection, proper clothing, respiratory protection, shock hazards, fumes, material safety data sheet (MSDS), 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. Determine the extent of damage to substrate (aluminum, magnesium, and composite) body panels; repair or replace.
4. Remove, replace, and align hood, hood hinges, and hood latch/lock.
5. Remove, replace, and align deck lid, lid hinges, and lid latch/lock.
6. Remove and replace doors, tailgates, hatches, lift gates, latch/lock assemblies, and hinges.
7. Remove, replace, and align bumpers, reinforcements, guards, absorbers, isolators, and mounting hardware.
8. Check and adjust clearances of front fenders, headlight mounting panel, and other panels.
9. Check door fit and function, adjust or replace as necessary, and adjust door clearances.
10. Restore contours of damaged panel to a surface condition suitable for metal finishing or body filling.
11. Weld cracked or torn metal body panels.
12. Apply protective coatings and sealants to restore corrosion protection.
13. Remove damaged sections of metal body panels; weld, adhesively-bonded, rivet, in replacements.
14. Repair door frame, repair or replace door skins; inspect intrusion beams.
15. Restore sealers, mastic, sound deadeners, and foam fillers.
16. Diagnose and repair water leaks, dust leaks, wind noise, squeaks, and rattles.
17. Install interior and exterior trim and moldings.

C. Metal Finishing and Body Filling (8 questions)

1. Remove paint and other materials 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 and apply body filler material; shape during curing.
7. Sand cured body filler material to contour.

D. Glass and Hardware (5 questions)

1. Inspect, adjust, 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.
3. Repair or replace power sun/moon roofs and related controls. Reset automatic features.
4. Inspect, repair or replace, and adjust removable, manually-operated glass roof panels and hardware.
5. Diagnose and repair water leaks, dust leaks, and noises; inspect, repair, or replace weatherstripping.
6. Inspect, adjust, and install convertible top and related mechanisms. Reset automatic features.



B3 TASK LIST (CONTINUED)

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

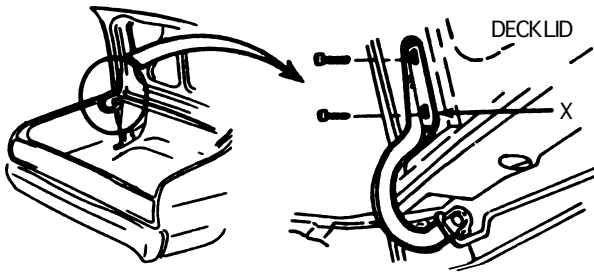
1. Identify weldable, weld-bonded, and non-weldable materials used in vehicle construction.
2. Understand the limitations of welding and removing high-strength steels and other metals.
3. Determine correct welding process GMAW (MIG), compression/ resistance spot (STRSW), GTAW (TIG), electrode, wire type, diameter, gas and bonding material to be used in specific welding situations.
4. Select and adjust the welding equipment for proper operation.
5. Perform test welds. Visually inspect and perform destructive test.
6. Insure proper work clamp (ground) location.
7. Use the proper gun-to-joint angle, and direction of gun travel, for welds being made in all positions.
8. Protect vehicle components, including hybrid components, computers and other electronic modules, from possible damage caused by welding and cutting.
9. Clean the metal to be welded; assure good metal fit-up; apply corrosion protection when necessary.
10. Perform the correct joint type (butt, lap, etc.) for the weld being made.
11. Determine the correct type of weld (continuous, stitch, tack, plug, spot, etc.) for each specific welding operation.
12. Identify the causes of weld defects; make necessary adjustments.

F. Plastic Repair (6 questions)

1. Identify the types of plastic(s); determine reparability.
2. Identify the proper plastic repair/cleaning procedures; clean and prepare the surfaces of plastic parts.
3. Repair plastic parts by welding or using repair materials (adhesives, reinforcing materials).
4. Reshape and shrink flexible exterior plastic parts.
5. Remove damaged areas from rigid exterior plastic; repair with partial panel installation.
6. Repair deep gouges, holes, and cracks in plastic panels.
7. Replace bonded plastic body panels; straighten or align panel supports.
8. Replace mechanically fastened or bonded plastic body panels; straighten, torque, or align panel supports.
9. Replace or repair plastic panels. ■

SAMPLE QUESTIONS
NON-STRUCTURAL ANALYSIS AND
DAMAGE REPAIR (TEST B3)

Questions:



1. Technician A says that adding a shim at point X shown above will raise the front edge of the deck lid. Technician B says that adding a shim at point X will lower the back edge of the deck lid. Who is right?
* (A) A only (C) Both A and B
(B) B only (D) Neither A nor B
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 * (C) Both A and B
(B) B only (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 (C) Both A and B
* (B) B only (D) Neither A nor B



B3 SAMPLE QUESTIONS (CONTINUED)

4. A damaged panel has been filled with plastic filler that has not cured properly. Technician A says that an air file with 24D open-coat abrasive should be used to shape the plastic. Technician B says that an air file with 50C closed-coat abrasive should be used to shape the plastic. 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 technician is opening the cylinder valves on an oxyacetylene outfit. To prevent damage to the regulator diaphragms, he should do which of these first?
 - (A) Turn both adjusting screws in until there is tension on the diaphragms.
 - (B) Close both torch valves until the cylinder valves are fully open.
 - * (C) Turn both adjusting screws out until there is no tension on the diaphragms.
 - (D) Fully open both torch valves until the cylinder valves are fully open.

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





Question 9 is not like the ones above.

It has the word **EXCEPT**. For this question, look for the choice that could **NOT** cause the described situation. Read the entire question before choosing your answer.

9. All of the following types of SMC (sheet molded compound) panel damages require a two-sided repair procedure **EXCEPT**:
- | | |
|--------------------------|--------------------------|
| (A) cracks or fractures. | (C) tears or rips. |
| (B) holes or punctures. | * (D) gouges or grooves. |

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	15	30%
B. Unibody Inspection, Measurement, and Repair	18	36%
C. Stationary Glass	5	10%
D. Metal Welding and Cutting	12	24%
Total	50	100%

A. Frame Inspection and Repair (15 questions)

1. Diagnose, repair, and verify repairs on structural damage using three-dimensional measuring systems (mechanical, electronic/computerized, laser) in accordance with vehicle manufacturer's/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).
5. Repair and align sag/kickup damage (change in height).
6. Repair and align sidesway/sway damage (change from centerline).
7. Repair and align twist damage.
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 or rear sections in accordance with vehicle manufacturer's/ industry recommended procedures.
10. 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's/industry recommended procedures.
12. Diagnose damaged steering, suspension, and powertrain components which can cause vibration, steering, and wheel alignment problems; replace steering and suspension components in accordance with vehicle manufacturer's/ industry recommended procedures.
13. Perform cold or heat stress-relieving procedures in accordance with vehicle manufacturer's/industry recommended procedures.
14. Determine the extent of direct and indirect damage, and the direction of impact; identify the frame type and composition; plan the methods and sequence of repair.
15. Restore structural foam in accordance with manufacturer's/industry recommended procedures.

B4 TASK LIST (CONTINUED)

B. Unibody Inspection, 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's/industry recommended procedures.
2. Check the vehicle with a tram gauge to determine further diagnostic procedures.
3. Diagnose damaged steering, suspension, and powertrain components which can cause vibration, steering, and wheel alignment problems; replace steering and suspension components in accordance with vehicle manufacturer's/industry recommended procedures.
4. Identify, repair or replace the supplemental restraint system (SRS) component mounting locations.
5. Determine the extent of direct and indirect damage, and the direction of impact; identify the structural composition; plan the methods and sequence of repair.
6. Lift, anchor, and support vehicle for repair and realignment.
7. Repair, align, and/or replace center section. (Cowl, bulkhead, roof, roof rails, pillars, floor, seat risers, windshield/back glass openings, door openings, rocker panels, and crossmembers).
8. 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).
9. 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).
10. Perform cold or heat stress-relieving procedures in accordance with vehicle manufacturer's/industry recommended procedures.
11. Restore corrosion protection to repaired or replaced unibody structural areas and anchoring locations.
12. Restore noise, vibration, harshness (NVH) materials/structural foams in accordance with manufacturer's/industry recommended procedures.

C. Stationary Glass (5 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's/industry recommended procedures.
2. Remove and replace side modular/stationary glass in accordance with manufacturer's/industry recommended procedures.
3. Determine correct pinch weld preparation, adhesive selection and application in accordance with manufacturer's/industry recommended procedures.

D. Metal Welding and Cutting (12 questions)

1. Determine correct welding process in accordance with vehicle manufacturer's/industry recommendations (GMAW, MIG, squeeze-type resistance spot), 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.



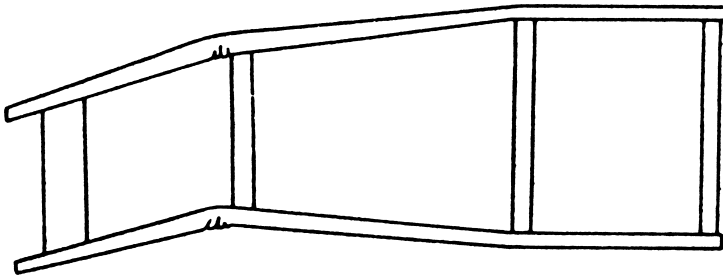
B4 TASK LIST (CONTINUED)

4. Protect vehicle systems and components, including computers, other electronic modules, adjacent panel and glass from possible damage during welding and cutting operations.
5. Prepare the metal to be welded; assure good metal fit-up; apply weld-through primer if necessary.
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, 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's/industry recommended procedures.
10. Remove damaged structural steel and aluminum components, and weld in replacements in accordance with vehicle manufacturer's/industry recommended procedures. ■

SAMPLE QUESTIONS

STRUCTURAL ANALYSIS AND DAMAGE REPAIR (TEST B4)

Questions:



1. The frame shown in the diagram above 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. Technician A says that center-line frame gauges are used to check for sag. Technician B says that center-line frame gauges are used to check for sway. Who is right?
(A) A only
(B) B only
* (C) Both A and B
(D) Neither A nor B
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.

Question 7 is not like the ones above.

It has the word **EXCEPT**. For this question, look for the choice that could **NOT** cause the described situation. Read the entire question 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 suspension fasteners which should not be reused.
2. Inspect and replace rack and pinion steering gear, inner tie rod ends, and bellows boots.
3. Inspect, remove, and replace power steering pump pulley, belts, hoses, fittings and pump mounts. Identify fluid type specific to the vehicle.
4. Diagnose manual and power steering gear (non-rack and pinion type) noises, binding, uneven turning effort, looseness, hard steering and lubricant leakage problems; determine needed repairs.
5. Diagnose manual and power rack and pinion steering gear mount bushings, brackets, noises, vibration, looseness, and hard steering problems; ensure proper mounting position.
6. Inspect and repair steering linkage geometry (attitude/parallelism).
7. Inspect and replace pitman arm and inspect sector shaft.
8. Inspect and replace relay (center link/intermediate) rod.
9. Inspect, remove, and replace idler arms and mounting locations.
10. Inspect, remove, and replace tie rod sleeves, clamps, and tie rod ends.
11. Inspect, remove, and replace steering linkage damper.
12. Inspect, remove, and replace upper and lower control arms, strut rods, and bushings.
13. Inspect, remove, and replace upper and lower ball joints.
14. Inspect, remove, and replace steering knuckle/spindle/hub assemblies.
15. Inspect, remove, and replace coil springs and spring insulators (silencers).
16. Inspect, replace, adjust front suspension torsion bars and inspect mounts.

B5 TASK LIST (CONTINUED)

17. Inspect and replace MacPherson strut cartridge or assembly, upper bearing, and mount.
18. Inspect, remove, and replace rear suspension transverse links, control arms, bushings, and mounts.
19. Inspect, remove, and replace rear suspension leaf spring(s), leaf spring insulators (silencers), shackles, brackets, bushings and mounts.
20. Inspect rear axle assembly for damage and misalignment.
21. Inspect and replace shock absorbers, air shock absorbers, load-leveling devices, air springs, and associated lines, fittings and components.
22. Diagnose, inspect, adjust, or replace components of electronically-controlled steering and suspension systems.
23. Measure vehicle ride height; determine needed repairs.
24. Inspect, remove, replace, and align front and rear subframes including engine cradles.
25. Diagnose steering column damage, looseness, and binding problems (including tilt mechanisms), inspect mounting locations; determine needed repairs.
26. Inspect and replace steering shaft U-joint(s), flexible coupling(s), collapsible columns, and steering wheels.
27. Diagnose front and rear suspension noises and body sway problems; determine needed repairs.
28. Diagnose strut type suspension noises and body sway problems; determine needed repairs.
29. Diagnose vehicle wandering, pulling, hard steering, bump steering, memory steering, torque steering, and steering return problems; determine needed repairs.
30. Measure and adjust front and rear wheel camber on vehicles with camber adjustments.
31. Measure front and rear wheel camber on vehicles without camber adjustments; determine needed repairs.
32. Measure caster on vehicles with caster adjustments.
33. Measure caster on vehicles without caster adjustments; determine needed repairs.
34. Measure and adjust front wheel toe; center steering wheel if necessary.
35. Identify toe-out-on-turns and related problems; determine needed repairs.
36. Identify SAI (steering axis inclination), included angle, and scrub radius related problems; determine needed repairs.
37. Measure rear wheel toe; determine needed repairs.
38. Identify thrust angle related problems; determine needed repairs.
39. Measure wheel setback; determine needed repairs.
40. Diagnose tire wear patterns; check and adjust air pressure.
41. Diagnose axle/wheel/tire vibration, shimmy, and tramp (wheel hop) problems; determine needed repairs.
42. Measure wheel, tire, axle, and hub runout; determine needed repairs.
43. Diagnose tire pull (lead) problems; determine corrective actions.
44. Check wheels for dents, cracks, and mounting surface damage.
45. Diagnose wheel, hub, and axle bearing problems; determine needed repairs.
46. Inspect, remove, and replace front and rear stabilizer (sway bar) bushing, brackets, mounts and links.

B5 TASK LIST (CONTINUED)

B. Electrical (10 questions)

1. Check voltages in electrical wiring circuits with a DMM (digital multimeter); determine repair procedure.
2. Check continuity and resistance in electrical wiring circuits and components with a DMM (digital multimeter); determine repair procedure.
3. Check electrical circuits, wiring, connectors and routing; repair according to manufacturers' specifications.
4. Inspect, test, and replace fusible links, circuit breakers, fuses, and relays.
5. Inspect, test, clean, and replace battery, battery cables, connectors, and clamps in accordance with manufacturers' recommendations.
6. Perform slow/fast battery charge in accordance with manufacturers' recommendations.
7. Identify programmable electrical/electronic components; record data for reprogramming before disconnecting battery.
8. Remove and replace alternator/generator, drive belts, pulleys, and fans; inspect and adjust alignment.
9. Aim headlamps and fog/driving lamps.
10. Remove and replace motors, switches, relays, connectors, and wires of retractable headlight assembly circuits; check system operation.
11. Inspect, test, adjust, and repair or replace switches, relays, bulbs, sockets, connectors, and wiring of all interior and exterior light circuits; verify system operation.
12. Inspect, test, repair or replace horn system components; check operation.
13. Inspect, test, repair or replace components of wiper/washer systems; check operation.
14. Inspect, test, repair or replace components of power window systems; check operation.
15. Inspect, test, repair or replace power seat, motors, linkages, cables, and related components; check operation.
16. Inspect, test, repair or replace components of electrical and mechanical door and hatch/trunk locks; check operation.
17. Inspect, test, repair or replace components of power sliding doors and power liftgates; check operation.
18. Inspect, test, repair or replace components of keyless lock/unlock devices and security systems; check operation.
19. Inspect, test, repair or replace electrical and mechanical components of sunroof or convertible top; check operation.
20. Inspect, test, repair or replace electrically heated mirrors, windshields, and backlights; check operation.
21. Inspect, test, repair or replace components of power antenna circuits; check operation.
22. Inspect, test, repair or replace electrical interior and exterior mirrors; check operation.
23. Use diagnostic trouble codes (DTCs) to diagnose and repair body control systems.

C. Brakes (4 questions)

1. Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; torque fittings and supports; replace brake lines (double flare and ISO types), hoses, fittings, seals, and supports.
2. Inspect flexible brake hoses for leaks, kinks, cracks, bulging, or wear; remove and replace hoses and seals; tighten fittings and supports.
3. Identify, handle, store, and install brake fluids.



B5 TASK LIST (CONTINUED)

4. Bleed (manual, pressure, vacuum, or surge) and/or flush hydraulic brake system in accordance with manufacturers' procedures.
5. Pressure test brake hydraulic system; determine needed repairs.
6. Remove and replace brake drums or drum/hub assemblies and wheel bearings; adjust brake shoes.
7. Inspect and replace wheel studs and fasteners. Reinstall wheels and torque fasteners; make final checks.
8. Inspect, remove, and replace disc brake caliper and rotor.
9. Inspect caliper mountings and slides for wear and damage.
10. Check parking brake system operation; repair or adjust as necessary.
11. Identify and replace ABS wheel speed sensor components according to manufacturers' specifications.
12. Depressurize ABS hydraulic system according to manufacturers' specifications.
13. Repair or replace traction control sensors and components according to manufacturers' specifications and check operation.
14. Repair or replace electronic vehicle handling system components according to manufacturers' specifications.

D. Heating and Air Conditioning (5 questions)

1. Identify type of refrigerant; determine recommended refrigerant oil to be used.
2. Recover and recycle refrigerant from A/C system.
3. Evacuate, recharge A/C system; perform leak test according to manufacturers' specifications.
4. Inspect, adjust, and replace A/C compressor drive belts; check pulley alignment and clutch operation.
5. Inspect, remove, and replace A/C compressor and mountings.
6. Inspect, repair or replace A/C system mufflers, hoses, lines, fittings, pressure switches, and seals.
7. Inspect A/C condenser for air flow; check cooling fan for proper operation.
8. Inspect, test, and replace A/C system condenser, mountings, seals, and deflectors.
9. Remove and replace receiver/drier or accumulator/drier.
10. Remove and replace evaporator.
11. Inspect and repair evaporator housing water drain.
12. Inspect, test, repair or replace heating, ventilating, and A/C system controls and components.
13. Inspect and repair heating, ventilating and A/C component wiring according to manufacturers' specifications.
14. Inspect, test, clean and repair or replace heating, ventilating, and A/C ducts, housing(s), doors, hoses, filters, and outlets.
15. Performance test heating, ventilating and A/C systems using pressure and temperature gauges.
16. Inspect, repair or replace heating system hoses, lines, fittings, seals and components.

E. Engine Cooling Systems (4 questions)

1. Inspect and replace engine cooling and heater system hoses, clamps and belts; ensure proper routing.
2. Inspect, test, remove, and replace radiator mounts, pressure cap, coolant recovery system, and water pump.

B5 TASK LIST (CONTINUED)

3. Remove and replace thermostat, by-pass, and housing.
4. Recover, flush, bleed, and refill system with proper coolant, verify level of protection.
5. Inspect, remove, and replace mechanical cooling fan, fan pulley, fan clutch and fan shroud.
6. Inspect, remove, and replace auxiliary oil/fluid coolers and components.
7. Inspect, remove, and replace electric fan, sensors, wiring, 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, replace, and adjust shift/throttle cables or linkages.
3. Inspect, remove, and replace electronic components, wires, and connectors.
4. Inspect, remove, replace, and adjust mechanical or hydraulic shift and clutch linkage as required.
5. Inspect, remove, and replace front and/or rear drive axle assembly.
6. Inspect, remove, and replace half shafts and constant velocity (CV) joints and components.
7. Inspect, remove, and replace drive shafts and universal joints; check transmission output shaft(s).

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

1. Inspect, remove, and replace exhaust manifold, exhaust pipes, mufflers, converters, 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 engine components of air intake systems.
4. Inspect, remove, and replace canister, filter, 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 in accordance with manufacturers' recommendations.
2. Inspect restraint system mounting areas for damage; repair or replace in accordance with manufacturers' recommendations.
3. Verify proper operation of seatbelt in accordance with manufacturers' recommendations.
4. Deactivate and reactivate Supplemental Restraint System (SRS) in accordance with manufacturers' procedures.
5. Inspect and replace Supplemental Restraint System (SRS) components in accordance with manufacturers' procedures.
6. Verify that the Supplemental Restraint System (SRS) is active and operational in accordance with manufacturers' procedures.
7. Inspect, remove, replace, and dispose of deployed and non-deployed airbag(s) and pretensioners in accordance with manufacturers' procedures.
8. Use diagnostic trouble codes (DTCs) to diagnose and repair the Supplemental Restraint System (SRS) system. ■



SAMPLE QUESTIONS

MECHANICAL AND ELECTRICAL COMPONENTS (TEST B5)

Questions:

1. After a front-end collision repair, a front-wheel drive, unibody vehicle pulls to the left during hard acceleration. The most likely cause is:
* (A) drive train misalignment.
(B) caster misalignment.
(C) tracking misalignment.
(D) camber misalignment.

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.

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

B5 SAMPLE QUESTIONS (CONTINUED)

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

Question 8 is not like the ones above.

It has the word **LEAST**. For this question, look for the choice that would **LEAST** likely cause the described situation. Read the entire question 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	11	22%
1. Fuel, Intake, Ignition, and Exhaust 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 of impact, and extent of direct and indirect damage.
5. Identify and record pre-existing damage.
6. Perform visual inspection of structural components, and members; determine if repair or replacement is required.
7. Identify structural damage using measuring tools and equipment.
8. Perform visual inspection of non-structural components, and members; determine if repair or replacement is required.
9. Determine parts, components, and procedures necessary for a proper repair.
10. Identify type and condition of finish; determine if refinishing is required.
11. Identify suspension, electrical, and mechanical component damage.
12. Identify safety systems damage and related service requirements.

B6 TASK LIST (CONTINUED)

13. Identify interior component damage.
14. Identify damage to add-on accessories and modifications.
15. Identify single (one time) use components.

B. Estimating (14 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 aftermarket parts; verify availability, compatibility, and condition.
14. Select and price recyclable/used parts; verify availability, compatibility and condition.
15. Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.
16. Determine price and source of necessary sublet operations.
17. Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.
18. Recognize and apply overlap deductions, included operations, and additions.
19. Determine additional material and charges.
20. Determine refinishing material and charges.
21. Determine recommended sectioning procedures and establish labor values.
22. Determine structural measurement requirements; diagnose, and establish labor values.
23. Determine necessary structural repair/replace requirements, setup procedures, and establish labor values.
24. Apply math skills to establish charges and totals.
25. Interpret computer-assisted and manually written estimates; verify the information is current.
26. Identify procedural differences between computer assisted systems and manually written estimates.
27. Identify procedures to restore corrosion protection; establish labor values.
28. Determine appropriate application of betterment/depreciation to parts and allowances as necessary.
29. Determine the cost effectiveness of the repair and determine the approximate vehicle retail, recyclable and repair value.
30. Recognize the differences in estimation procedures when using different information provider systems.



B6 TASK LIST (CONTINUED)

C. Legal and Environmental Practices (2 questions)

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

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 components and repair/replacement procedures.
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 (11 questions)

1. Fuel, Intake, Ignition, and Exhaust 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

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.
2. Identify body repair and refinishing materials and supplies.

B6 TASK LIST (CONTINUED)

F. Parts Identification and Source Determination (4 questions)

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

G. Customer Relations and Sales Skills (2 questions)

1. Acknowledge and 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. Follow up; 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 warranty information.
10. Provide 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)

Questions:

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

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

B6 SAMPLE QUESTIONS (CONTINUED)

Questions 5 and 6 are not like the ones above.

Each of these has the word **EXCEPT**. For each question, look for the choice that does **NOT** fit the described situation. Read the entire question 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.



Industry Training

The following sources of information provide comprehensive listings of training resources available to working technicians:

Delmar's Automotive Catalog

Delmar Learning
5 Maxwell Drive
Clifton Park, NY 12065
1-800-477-3692
www.autoed.com

MD Publications

Undercar Digest, July Issue
Transmission Digest, September Issue
P.O. Box 2210
Springfield, MO 65801
1-800-274-7890

In Canada

Thomson Learning Nelson Canada

1120 Birchmount Road
Scarborough, Ontario M1K 5G4
1-800-268-222
E-mail: inquire@nelson.com

Motor Source Guide

Hearst Business Publishing, Inc.
645 Stewart Ave.
Garden City, NY 11530
www.motor.com

Fleet Equipment, April Issue

P.O. Box 7605
Mt. Prospect, IL 60056-7605
www.truklink.com

CASE: ASE Certification for Training Providers of Continuing Automotive Service Education. Visit www.natef.org/case/case_certified.cfm for periodic updates to this list.

The National Institute for Automotive Service Excellence (ASE) and its educational foundation, the National Automotive Technicians Education Foundation (NATEF), offer a voluntary certification program for institutions and organizations providing continuing automotive service education. ASE seeks to improve the quality of continuing automotive education and help automotive technicians identify appropriate training sources and activities by evaluating and certifying providers of continuing automotive service education against CASE Standards.

The CASE program differs from ASE's existing entry-level training program certification in that it addresses the training provider's process of developing and delivering training as opposed to prescribing specific program content. Elements of organization, structure and methods which appear to contribute significantly to the development and delivery of high quality automotive service education, have been identified and incorporated into the CASE Standards.

The following training providers have achieved CASE certification. Please note that * indicates a proprietary program unavailable to all technicians.

3M Automotive Aftermarket Division

3M Center Bldg. 223-6N-01
St. Paul, MN 55144-1000
www.3m.com/automotive

ACDelco Service Training

6200 Grand Pointe Drive
Grand Blanc, MI 48439
(800) 825-5886
www.acdelcotechconnect.com

INDUSTRY TRAINING

AKZO NOBEL Coatings Inc., Car Refinishes

5555 Spalding Drive
Norcross, GA 30092
(800) 234-0965
www.akzonobelcarrefinishes.net

Aspire, Inc.

925 Lincoln Hwy.
Morrisville, PA 19067
(800) 247-1099 x123
www.aspireinc.com

Autocolor Refinish Training Dept. (PPG)

19699 Progress Drive
Strongsville, OH 44149
(440) 572-6983
www.ppg.com

BASF Corporation

26701 Telegraph Road
Southfield, MI 48034
(800) 201-1605
www.basfrefinish.com

Brake Parts, Inc. (formerly Dana Brake & Chassis Technical Service Dept.)

4400 Prime Parkway
McHenry, IL 60050
(815) 363-9000-ask for Technical Services
www.raybestos.com

Bronx Community College

University Avenue and West 181st Street
Bronx, NY 10453
www.bcc.cuny.edu

Car-O-Liner Company

29900 Anthony Drive
Wixom, MI 48393
(800) 521-9696
www.car-o-liner.com

CARQUEST Technical Institute

P.O. Box 26929
Raleigh, NC 27611-6929
(919) 573-2500
www.citraining.org

***Castrol North America, Inc.**

1500 Valley Road
Wayne, NJ 07470
(888) CASTROL

Chief Automotive Systems, Inc.

P.O. Box 1368
1924 E. 4th Street
Grand Island, NE 68802-1368
(800) 445-9262
www.chiefautomotive.com

***DaimlerChrysler Academy – School of Technical Training**

2367 Walton Blvd.
Auburn Hills, MI 48326
(800) 898-1183
www.techauthority.com

DuPont Performance Coatings

Barley Mill Plaza, Building 21
Lancaster Pike and Route 141
Wilmington, DE 19805
(800) 3DUPONT prompt 6
www.performancecoatings.dupont.com

EAST Training Inc.

2 Coleman Court
Southampton, NJ 08088
(888) 979-9920
www.easttraining.com

Federal Mogul Technical Education Center

6565 Wells Avenue
St. Louis, MO 63133
(888) 771-6005
www.federal-mogul.com

***Freightliner LLC**

5169 N. Lagoon Avenue
Portland, OR 97217
(503) 745-7725

***General Motors Service
Technical College**

1650 Research Drive, Suite 200
Troy, MI 48083
(888) 748-2687
www.gmstc.com

**I-CAR (Inter-Industry Conference on
Auto Collision Repair)**

3701 Algonquin Road
Suite 400
Rolling Meadows, IL 60008
(800) 422-7872
www.i-car.com

***International Truck and Engine Corp.**

455 North Cityfront Plaza Drive
Chicago, IL 60611
(800) 365-0088

Jiffy Lube International, Inc.

700 Milam
Houston, TX 77002
www.jiffylube.com

Lew Kinney & Associates

Welding Training
P.O. Box 511
Centerburg, OH 43011
(740) 625-6342 FAX: (740) 625-WELD
www.lewkinney.com

***Lexus**

19001 S. Western Avenue
Torrance, CA 90509
(310) 468-7171
www.lexus.com

Lord Corporation

2000 West Grandview Blvd.
Erie, PA 16509
(814) 868-3611 x3237
www.fusor.com

Martin Senour Automotive Finishes

Warrensville Campus
4440 Warrensville Center Road
Warrensville Heights, OH 44128-2837
(630) 887-7516 x228
www.martinsenour-autopaint.com

Melior, Inc.

One Perimeter Park South
Suite 450 North
Birmingham, AL 35243-3201
(877) 224-0435
www.melioronline.com

Mid-Del Technology Center

Electric Vehicle Center (EVCT)
3921-B S.E. 29th Street
Del City, OK 73115
(405) 672-6665
www.evtraining.com

NAPA Institute of Automotive Technology

2999 Circle 75 Parkway
Atlanta, GA 30339
(800) 292-NIAT (6428)
www.niat-training.com

**Nationwide Performance Improvement
Organization-**

9243 North High Street
Lewis Center, OH 43035

***Nissan North America, Inc.**

PO Box 191
Gardena, CA 90248-0191
(310) 771-5246
www.nissantechinfo.com

Performance Achievement Group LLC

1200 John Q. Hammons Drive, Suite 200
Madison, WI 53717
(608) 827-2610 or (800) 355-4881
www.performanceachievement.com

PPG Automotive Refinish Group

19699 Progress Drive
Strongsville, OH 44149
(440) 572-6983 or (800) 970-2283
www.ppgrefinish.com

INDUSTRY TRAINING

Raytheon Professional Services, LLC

1650 Research Drive, Suite 200

Troy, MI 48083

(248) 619-8302

dkrasny@raytheon.com

Contact: Dave Krasny

Sherwin-Williams Automotive Finishes Corp.

Warrensville Campus

4440 Warrensville Center Road

Warrensville Heights, OH 44128-2837

(630) 887-7516 x228

www.sherwin-automotive.com

Snap-on Training Solutions

420 Barclay Blvd.

Lincolnshire, IL 60069

(847) 478-7037

www.snapontraining.com

Standard Motor Products Engine Management Learning Center

(formerly Dana Engine Management
Learning Center)

3018 Skyway Circle South

Irving, TX 75038-4205

(972) 256-2751

www.smp-training.com

***Toyota**

19001 S. Western Avenue

Torrance, CA 90509

(310) 468-7171

www.toyota.com

TTi (Technical Training, Inc.)

2750 Product Drive

Rochester Hills, MI 48309

(248) 853-5550 or (800) 837-5222

www.ttiniao.com

** This program is proprietary and therefore not available to all technicians.*

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Leesburg, VA 20175

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Telephone: 703-669-6600 (FAX: 703-669-6123)
www.ase.com

To: