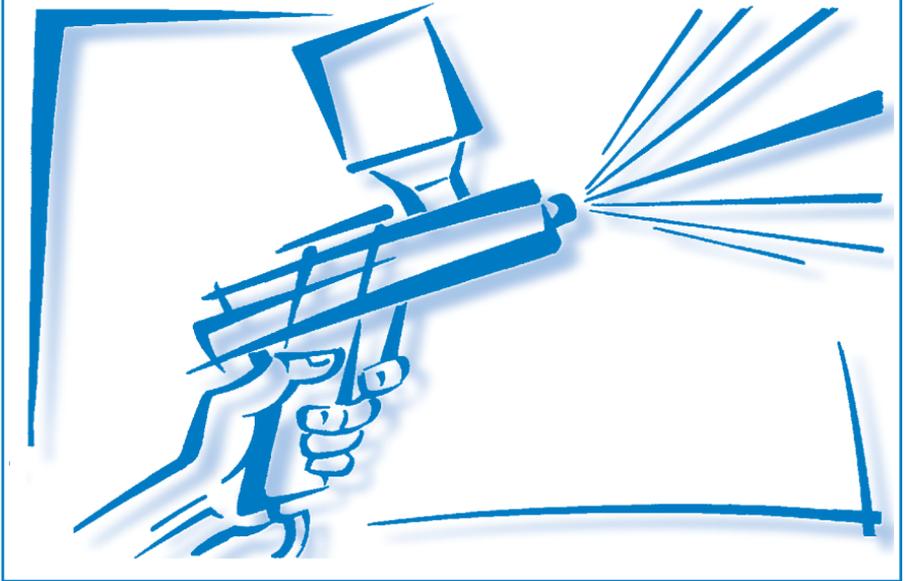


THE OFFICIAL ASE STUDY GUIDE

ASE Collision Repair and Refinish Tests



INCLUDES DAMAGE ANALYSIS & ESTIMATING!



National Institute for
**AUTOMOTIVE
SERVICE
EXCELLENCE**

ASE COLLISION REPAIR/REFINISH TESTS

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Introduction

The *Official ASE Study Guide for the Collision Repair and Refinishing Tests* is intended to help technicians study for the ASE certification tests. The specific material about each test, included in the booklet is a useful tool for reviewing the technical knowledge that is covered in the *Collision Repair and Refinishing tests*. After performing a thorough review, it should be easier to select additional reference material that will assist you with the test preparation needs.

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 collision repair technicians, refinishing 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, Transit Bus, Parts Specialist, and Advanced Level specialties. Separate *Study Guides* are available.

For full information on ASE testing as well as downloadable *Study Guides*, *Registration Booklets*, and more, visit www.ase.com. You may also request *Registration Booklets* by mailing the coupon located on the back cover of this booklet or by calling ASE at 703-669-6600, ext. 400.

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 technical 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 50 and 55 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 15 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 correct 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.

OVERVIEW (CONTINUED)

- **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.

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 test so you will be alert and efficient. If you are taking the written versions, please bring several 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 a current photo I.D.

At the Test Center—Some Tips

Arrive early enough to find the building and testing room. When you reach the location, wait in the assigned area until the proctor begins the test administration. He or she will instruct you in filling out the answer booklet (if taking written tests) or logging on to the computer (if taking computer-based tests).

Once testing has begun, keep track of time. Do not spend too long on any single question. Be sure to read each question carefully so that you understand exactly what is being asked. Do not mark answers in the test booklet; they must be marked on the answer booklet. Your test will not be scored if your answers are not on your answer booklet.

If a question is difficult, mark the answer that you think is correct and put a check by it in the test book. (Computer-based tests allow you to do this on screen.) Then go on to the next question. If you finish before time is up, 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 only 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 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 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	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 and Miscellaneous	5	9%
Total	55	100%

A. Surface Preparation (15 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, 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 two-component glazing putty to minor surface imperfections.
11. Block sand area to which primer-surfacer and/or two-component glazing 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.

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 (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. Refinish interior and exterior trim components.

D. Solving Paint Application Problems (8 questions)

1. Identify contaminants 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 shriveling) 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; determine the cause(s), and correct the condition.
11. Identify tape tracking/markings; determine the cause(s), and correct the condition.
12. Identify pin holing; determine the cause(s), and correct the condition.
13. Identify poor hiding/lack of coverage; 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 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/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. Sand and buff/polish minor surface imperfections.
13. Identify improper topcoat blend; 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 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 and identify the health and safety hazards in the work environment.
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. 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.
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.

B2 SAMPLE QUESTIONS (CONTINUED)

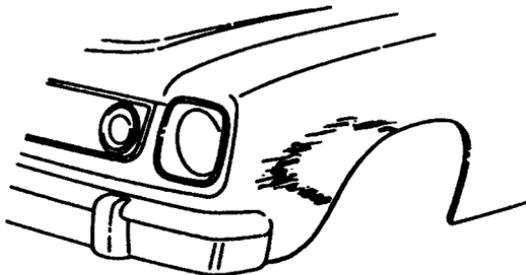
7. Dirt nibs are being sanded from a metallic base coat before applying the clearcoat.

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

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. Determine repair plan, procedures, and methods of overall repairs in accordance with the vehicle manufacturer's specifications and industry procedures.
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 undamaged, non-structural body panels and components that may interfere with or be damaged during the repair process.
7. Check malfunction indicator lights (MIL), retrieve codes and settings and identify battery disconnect procedures. Remove all vehicle mechanical and electrical components that may interfere with or be damaged during the repair process.
8. Protect panels and parts adjacent to repair area to prevent damage during the repair process.
9. Remove dirt, grease, wax, and other contaminants from areas to be repaired.
10. Remove pinstripes, emblems and decals (transfers/overlays, woodgrains), and related 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 that are recommended for off-vehicle repair.
13. Identify safety considerations: Personal Protection Equipment (PPE), 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. Identify the substrate and determine the extent of damage to aluminum, magnesium, and composite body panels. Determine reparability or replacement.
4. Remove, replace, and align hood, supports, hood hinges, and hood latch/lock.
5. Remove, replace, and align deck lid, lid hinges, supports, and lid latch/lock.
6. Remove, replace and align doors, tailgates, hatches, supports, lift gates, latch/lock assemblies, handles, and hinges.
7. Remove, replace, and align bumpers, brackets, reinforcements, guards, absorbers, isolators, and mounting hardware.
8. Remove, replace and align front fenders; check and adjust gaps and clearances.
9. Remove, replace and align exterior lighting and mounting panels.
10. Check door function, adjust or replace components 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 sections of metal body panels; weld, weld-bond, adhesively-bonded, rivet, rivet-bond, in replacements.
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, woodgrains), and protective film.

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, apply and shape body filler material.
7. Sand cured body filler material to contour.

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.

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

1. Identify weldable and non-weldable materials used in vehicle construction.
2. Identify the considerations for welding and removing various types of steels, aluminum and other metals.
3. Determine the correct welding process GMAW (MIG), compression/inverter/squeeze type 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, perform destructive test, and make adjustments if 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.

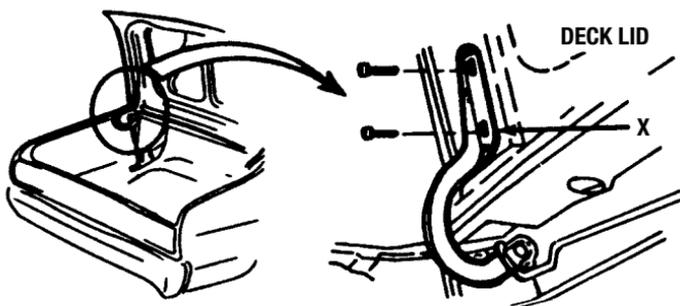
F. Plastic Repair (6 questions)

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

SAMPLE QUESTIONS

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (TEST B3)

QUESTIONS:



1. Which of these should be used when installing an aluminum hood?
(A) Lubricated steel fasteners
(B) Oxidized steel fasteners
* (C) Isolators to prevent galvanic corrosion
(D) Annealing at all mating flanges
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" 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.
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

B3 SAMPLE QUESTIONS (CONTINUED)

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	16	32%
B. Unibody Inspection, Measurement, and Repair	18	36%
C. Stationary Glass	4	8%
D. Metal Welding and Cutting	12	24%
Total	50	100%

A. Frame Inspection and Repair (16 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 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.
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's/ industry recommended procedures.
10. Restore corrosion protection to repaired or replaced frame areas and anchoring locations.
11. Repair or replace stress-cracked/collision damaged frame members in accordance with vehicle manufacturer's/industry recommended procedures.
12. Diagnose damaged mounting locations for steering, suspension, and powertrain components which can cause vibration, steering, and wheel alignment problems 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.

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. 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.
8. Diagnose damaged mounting locations for steering, suspension, and powertrain components which can cause vibration, steering, and wheel alignment problems in accordance with vehicle manufacturer's/industry recommended procedures.
9. Identify, repair or replace the supplemental restraint system (SRS) component mounting locations.
10. Determine the extent of direct and indirect damage, and the direction of impact; identify the structural composition; plan the methods and sequence of repair.
11. Lift, anchor, and support vehicle for repair and realignment.
12. Repair, align, and/or replace center section components. (Cowl, bulkhead, roof, roof rails, pillars, floor, seat risers, windshield/back glass openings, door openings, rocker panels, and crossmembers).
13. 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).
14. 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).
15. Perform cold or heat stress-relieving procedures in accordance with vehicle manufacturer's/industry recommended procedures.
16. Restore corrosion protection to repaired or replaced unibody structural areas and anchoring locations.
17. Restore noise, vibration, harshness (NVH) materials/structural foams in accordance with manufacturer's/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 (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.

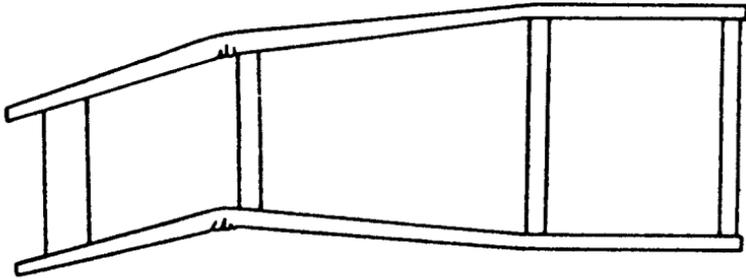
D. Metal Welding and Cutting (12 questions)

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.
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'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.
11. Restore corrosion protection before or after welding operation.
12. Remove and install welding/weld-bonded panels according to manufacturer specifications. ■

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

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 and replace one-time use suspension fasteners.
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 types) 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, hard steering, and lubricant leakage problems; ensure proper mounting position.
6. Inspect and repair steering linkage geometry (attitude/parallelism).
7. Inspect sector shaft; inspect and replace pitman arm.
8. Inspect and replace relay (center link/intermediate) rod.
9. Remove and replace idler arms, inspect mounting locations; determine needed actions.
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, and adjust front suspension torsion bars and inspect mounts.

17. Inspect and replace 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 front and/or rear axle assemblies for damage and misalignment.
21. Inspect and replace 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 and axle carriers).
25. Diagnose steering column damage, looseness, and binding problems (including positioning mechanisms), inspect mounting locations; determine needed actions.
26. Inspect 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 and adjust front and rear wheel camber; determine needed repairs.
30. Measure and adjust caster; determine needed repairs.
31. Measure and adjust front and rear wheel toe; determine needed repairs
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.
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; determine needed repairs.
38. Diagnose wheel, hub, and axle bearing damage; determine needed action.
39. Diagnose front and rear stabilizer systems (anti-sway bar); determine needed repairs.

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; 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, wires, connectors, terminals, and sockets.

B5 TASK LIST (CONTINUED)

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. Remove and replace alternator/generator, drive belts, pulleys, tensioners, and fans; inspect and adjust alignment.
11. 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 and 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 and mechanical components of power antenna; verify operation.
24. Inspect, test, repair or replace electrical interior and exterior mirrors; verify operation.
25. Use diagnostic trouble codes (DTCs) to diagnose and repair malfunction indicator lamps (MIL).
26. Identify potential safety and environmental concerns associated with hybrid electric vehicle systems.

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.
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 type, determine oil and refrigerant capacities; leak test and 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, 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.

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.
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, 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.

B5 TASK LIST (CONTINUED)

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.
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.
5. Use diagnostic trouble codes (DTCs) to diagnose and repair the Supplemental Restraint System (SRS). ■

SAMPLE QUESTIONS

MECHANICAL AND ELECTRICAL COMPONENTS (TEST B5)

QUESTIONS:

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.

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 (Includes Hybrid/Alternate Fuel Vehicles)	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; provide 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, 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 (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, recycled and repair value.
30. Recognize the differences in estimation procedures when using different information provider systems.

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 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 (Includes Hybrid/Alternate Fuel Vehicles)
(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

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

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

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.

B6 SAMPLE QUESTIONS (CONTINUED)

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 Cengage Learning

P.O. Box 6904
Florence, KY 41022
1-800-487-8488
www.autoed.cengage.com
www.cengage.com/delmar

Motor Age Training for Certification

131 West First Street
Duluth, MN 55802
1-800-240-1968
www.motorage.com

In Canada

Thomson Learning Nelson Canada

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

Spanish Language Training Resources

For a listing of training providers who offer training, or training materials in Spanish go to www.ase.com; once there, enter the "Service Professionals" area and click on "Spanish Language Training Resources."

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.

MD Publications

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

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

Recursos de Educación en Español

Para obtener acceso a la lista de proveedores de educación, ó materiales educativos en Español dirijase a www.ase.com; una vez allí, entre en la sección "Español" y prosiga al área "Lista de Educadores y Materiales Didácticos."

INDUSTRY TRAINING

3M Industrial and Transportation Business Services Training and Development

3M Center Building 225-1N-01
St. Paul, MN 55144
651-737-0141
www.3m.com/automotive

ACDelco Service Training

6200 Grand Point Dr., MC#2-316
Grand Blanc, MI 48439
800-825-5886 prompt 1
www.acdelcotechconnect.com

Affinia Under Vehicle Group

Technical Services Department
4400 Prime Parkway
McHenry, IL 60050
815-363-9000 – ask for technical
www.raybestos.com

AKZO NOBEL Coatings Inc., Car Refinishes

5555 Spalding Dr.
Norcross, GA 30092
770-242-5760
www.akzonobelcarrefinishes.net

American Automobile Association, Inc.

1000 AAA Dr.
Heathrow, FL 32746
407-444-7169 or 407-444-8041
Allan Stanley, astanley@national.aaa.com
Len Johannes, ljohnnes@national.aaa.com
www.aaa.com

***American Honda Automobile Service Training**

1919 Torrance Blvd.
Torrance, CA 90501
310-783-3557
www.honda.com

Automotive Spray Equipment Technologies (ASET)

3703 West Parkway Blvd.
Salt Lake City, UT 84120
801-964-6646
www.asetusa.com

ATech Training, Inc

12290 Chandler Dr.
PO Box 297
Walton, KY 41094
859-485-7229 ext. 109
www.atechtraining.com

BASF Automotive Refinish Division

26701 Telegraph Rd.
Southfield, MI 48034
248-304-5200
www.basfrefinish.com

BP Global Fuels Technology

150 W. Warrenville Rd.
800 Building
Naperville, IL 60563
312-729-4212
www.fuelcertification.com

Chief Automotive Systems

996 Industrial Dr.
Madison, IN 47250
800-445-9262
www.chiefautomotive.com

CARQUEST Technical Institute

4401 Atlantic Ave.
Raleigh, NC 27604
919-573-3000
www.CARQUEST.com/CTI

Collision Management Services Inc.

2040R Lord Baltimore Dr.
Baltimore, MD 21244
410-944-3383
www.ineedcms.com/Training.html

Delphi Integrated Service Solutions

5820 Delphi Dr.
Troy, MI 48098
800-545-2220
Customer Support
www.delphi-iss.com

DuPont Performance Coatings

500 Eagleview Blvd.
Exton, PA 19341
610-458-6323
www.pc.dupont.com

EAST Training Inc.

4404 Sylon Blvd.
Hainesport, NJ 08036
609-267-2223
www.easttraining.com

Federal Mogul Technical Education Centers

6565 Wells Ave.
St. Louis, MO 63133
314-977-0684
www.federal-mogul.com

Fox Valley Technical College

1825 N. Bluemound Dr.
Appleton, WI 54912
920-993-5163
www.fvtc.edu/public

***General Motors Service Technical College**

30501 Van Dyke Ave., M/C 480-204-100
Warren, MI 48090
586-947-9704
www.gmstc.com

Hunter Engineering

11250 Hunter Dr.
Bridgeton, MO 63044
314-731-0000
www.hunter.com

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

5125 Trillium Blvd.
Hoffman Estates, IL 60192
800-422-7872
www.i-car.com

Iwata Medea

3703 West Parkway Blvd.
West Valley City, UT 87120
801-964-6646
www.asetusa.com

Jiffy Lube International

700 Milam, Room 24038PNT
Houston, TX 77002
713-546-3957
www.jiffylube.com

Kent Automotive

6200 Oak Tree Blvd., #350
Independence, OH 44131
216-642-5973
www.kent-automotive.com

Lawson State Community College

1100 9th Ave., SW
Bessemer, AL 35022
205-929-3521
www.lawsonstate.edu

Lew Kinney & Associates On-site Welding Training and Certifications

PO Box 511, 184 State Route 314
Centerburg, OH 43011
740-625-6342

***Lexus, A Division of Toyota Motor Sales, Inc., U.S.A.**

19001 S. Western Ave.
Torrance, CA 90509
Technical Training 310-468-4958
www.lexus.com

Martin Senour Automotive Finishes

7019 Highgrove Rd.
Burr Ridge, IL 60527
630-887-7516
www.martinsenour-autopaint.com

Megatech Corporation

525 Woburn St., Suite 3
Tewksbury, MA 01876
800-767-6342 (US)
978-937-9600 (Int'l)
www.megatechcorp.com

Melior, Inc.

200 Cahaba Park Circle West, Suite 250
Birmingham, AL 35242
205-298-8300
www.melioronline.com

National Automotive Parts Association (NAPA)

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

INDUSTRY TRAINING

National Appraisal Institute

10150 Canoga Ave
Chatsworth, CA 91311
818-775-1370
www.nainstitute.com

Nationwide Training Organization

9243 Columbus Pike
Lewis Center, OH 43035
614-840-7169
www.nationwide.com

***Navistar, Inc.**

3033 Wayne Terrace
Fort Wayne, IN 46806
260-461-1951
www.navistar.com

***Nissan North America, Inc. Customer Loyalty and Training**

P.O. Box 685001
Franklin, TN 37068
615-725-8319
www.nissantechinfo.com

***Penske Truck Leasing**

Route 10 Pheasant Rd., PO Box 563
Reading, PA 19607
610-775-6479
www.gopenske.com

PPG Industries

19699 Progress Dr.
Strongsville, OH 44149
440-572-6784
www.ppg.com

Raytheon Professional Services L.L.C.

1919 Technology Dr.
Troy, MI 48083
248-837-6777
www.rps.com

Saint Gobain Abrasives

1 New Bond St.
Worcester, MA 01606
508-795-2774
www.nortonautomotive.com
www.aa.carborundumabrasives.com

SEM Products, Inc.

1685 Overview Dr.
Rock Hill, SC 29730
803-207-8231
www.semproducts.com

Sherwin-Williams Automotive Finishes Corp.

7019 Highgrove Rd.
Burr Ridge, IL 60527
630-887-7516
www.sherwin-automotive.com

Solera, Inc.

P.O. Box 151376
Altamonte Springs, FL 32715
858-724-1600
www.training.audatex.us

Specialty Products Company

4045 Specialty Place
Longmont, CO 80504
303-772-2103
www.spcalignment.com

Technical Training, Inc. (TTI)

2750 Product Dr.
Rochester Hills, MI 48309
248-853-5550 or 800-837-5222
www.ttinco.com

***Toyota Motor Sales, USA, Inc.**

19001 S. Western Ave.
Torrance, CA 90509-2991
310-468-7171
www.toyota.com

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



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

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

Telephone: 703-669-6600 (FAX: 703-669-6123)

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To: