NATEF PROGRAM ACCREDITATION STANDARDS

Collision Repair & Refinish

Administered By:

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Improving Programs Through Accreditation

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POLICIES

COLLISION REPAIR & REFINISH
TECHNICIAN TRAINING ACCREDITATION PROGRAM

The Board of Trustees of the National Automotive Technicians Education Foundation (NATEF) is responsible for accreditation of automotive (automobile, collision repair & refinish, medium/heavy truck) programs at secondary and post-secondary levels. NATEF will grant accreditation to programs that comply with the evaluation procedure, meet established standards, and adhere to the policies in this document. Program accreditation is under the direct supervision of the NATEF Board of Trustees and such personnel designated or employed by NATEF.

History

Effective January 1, 2011, NATEF assumed the role of accreditation of automotive programs as an extension of the role of evaluating programs for certification by the National Institute for Automotive Service Excellence (ASE). ASE standards for automobile program certification were introduced in 1982. Standards for collision repair & refinish programs were launched in 1989 and truck standards followed in 1992. NATEF's role in the process was to work with industry and education to update the standards on a regular basis and evaluate programs against those standards. Based on a positive evaluation, programs were "certified" by ASE for a period of five (5) years.

Effective January 1, 2011, all programs that held current program certification, were grandfathered as accredited by NATEF until such time that they must renew their accreditation. At that time, these programs must follow the procedures and meet standards for reaccreditation by NATEF.

The cost to each program for accreditation will be as reasonable as possible to encourage program participation. This cost will include self-evaluation materials, application (processing) fee, on-site team evaluation materials, and the honorarium and expenses of the Evaluation Team Leader (ETL).

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The four collision repair and refinish areas that may be accredited are:

1. Structural Analysis and Damage Repair
2. Non-Structural Analysis and Damage Repair (Body Components)
3. Mechanical and Electrical Components
4. Painting and Refinishing

ACCREDITATION PROCESS

Program Self-Evaluation

The accreditation process begins with an extensive self-evaluation performed by training program instructors, administrators, and advisory committee members. Members of this group compare the program to national standards, and have the opportunity to make improvements before submitting evaluation documents to NATEF.

NATEF Review

The application for accreditation or renewal of accreditation is then sent to NATEF, where it is reviewed to determine if the program qualifies for an on-site team evaluation.

Programs will have a maximum of 18 months to complete the accreditation process from the date that their Application for Accreditation or Application for Renewal of accreditation is received by the NATEF office (this timeframe may be shortened when applying under standards that are in the process of being phased out).

On-Site Evaluation

If the program qualifies, an Evaluation Team Leader (ETL), an educator accredited by ASE and trained by NATEF, is assigned to the program and an on-site visit is conducted.

Recommendation for Accreditation

When industry requirements are met, the program will become accredited for a period of five years.

Expired programs that have let their accreditation lapse for two or more years will be required to follow the procedures for initial accreditation when they apply for renewal of their accreditation.

Please note: Expired programs will be allowed to submit the 'renewal of accreditation' forms versus 'initial' accreditation forms up to 18 months past their expiration date (applications for renewal of accreditation submitted after 18 months of program expiration will be returned). Furthermore, expired programs must complete the entire renewal of accreditation process within two years of their expiration date.

Programs having difficulty in meeting the hours or tools & equipment accreditation requirements should consider the following options:

A) Borrowing equipment needed for instruction from a manufacturer, dealership or independent repair shop.
B) Arranging for instruction on tasks requiring equipment not available in the school program at a dealership or independent repair shop.

Note: Programs are required to show documentation on where the tasks are taught, by whom, and how students are evaluated.

COLLISION REPAIR & REFINISH STANDARDS STATEMENTS

STANDARD 1 – PURPOSE

The collision repair and refinish technician training program should have clearly stated program goals, related to the needs of the students and employers served.

STANDARD 2 – ADMINISTRATION

Program administration should ensure that instructional activities support and promote the goals of the program.

STANDARD 3 – LEARNING RESOURCES

Support material, consistent with both program goals and performance objectives, should be available to staff and students.

STANDARD 4 – FINANCES

Funding should be provided to meet the program goals and performance objectives.

STANDARD 5 – STUDENT SERVICES

Systematic skills assessment, interviews, counseling services, placement, and follow-up procedures should be used.

STANDARD 6 – INSTRUCTION

Instruction must be systematic and reflect program goals. A task list and specific performance objectives with criterion-referenced measures must be used.

STANDARD 7 – EQUIPMENT

Equipment and tools used must be of the type and quality found in the repair industry and must also be the type needed to provide training to meet the program goals and performance objectives.

STANDARD 8 – FACILITIES

The physical facilities must be adequate to permit achievement of the program goals and performance objectives.

STANDARD 9 – INSTRUCTIONAL STAFF

The instructional staff must have technical competency and meet all state and local requirements for accreditation.

STANDARD 10 – COOPERATIVE AGREEMENTS

Written policies and procedures should be used for cooperative and apprenticeship training programs (this applies only to programs that offer cooperative/apprenticeship training).

COLLISION REPAIR & REFINISH MINIMUM REQUIREMENTS

1. The minimum program requirements are identical for initial accreditation and for renewal of accreditation.

2. A program may receive accreditation in:
   a. Painting and Refinishing (only)
   b. Structural Analysis and Damage Repair
      PLUS at least one of the following areas:
      Non-Structural Analysis and Damage Repair (Body Components)
      Mechanical and Electrical Components
      Painting and Refinishing
   c. Non-Structural Analysis and Damage Repair (Body Components)
      PLUS at least one of the following areas:
      Structural Analysis and Damage Repair
      Mechanical and Electrical Components
      Painting and Refinishing
   d. All four collision repair and refinish areas

3. A program providing instruction in <u>all</u> of the collision repair and refinish areas must have a minimum total of 1,060 hours of combined laboratory/shop (co-op) and classroom instruction. Tasks related to the four collision repair and refinish areas may be taught at different times during the course of study. Therefore, the hours for an individual area would be the sum total of all the hours of instruction related to the tasks. Individual areas must have the following minimum hours:

a.	Structural Analysis and Damage Repair	260 Mig Welding included **185 without Mig Welding*
b.	Non-Structural Analysis and Damage Repair (Body Components)	300 without Mig Welding **375 with Mig Welding*
c.	Mechanical and Electrical Components	200
d.	Painting and Refinishing	<u>300</u>
	TOTAL HOURS	1,060

* **Seventy-five (75) hours of GMAW (Mig) Welding is required for accreditation. It must be included either in Structural Analysis and Damage Repair or in Non-Structural Analysis and Damage Repair (Body Components).** If the 75-hour requirement is met by offering GMAW (Mig) Welding in Non-Structural Analysis and Damage Repair (Body Components), the total number of hours required in Structural Analysis and Damage Repair is 185 and 375 hours are required in Non-Structural Analysis and Damage Repair (Body Components).

4. **The average rating on each of Standards 6, 7, 8, and 9 must be at least a four** on a five-point scale. The program will not be approved for an on-site evaluation if the average is less

than 4 on any of those standards. The program should make improvements before submitting the application to NATEF for review. **A program will be denied accreditation if the on-site evaluation team average on Standards 6, 7, 8, or 9 is less than four.**

5. A program may not be approved for an on-site evaluation if the average rating on Standards 1 - 5 and 10 is less than a four on the five-point scale. **A program may be denied accreditation if the on-site evaluation team average on Standards 1 - 5 and 10 is less than four.** Approval for on-site evaluation or accreditation will be made by NATEF, based on the number of standards rated at 4 or 5 as well as the individual rating on any standard rated less than 4.

6. All instructors must hold current ASE certification in the collision repair and refinish area(s) in which he/she teaches.

7. All instructors must attend a minimum of 20 hours per year of recognized industry update training relevant to the areas in which their program is accredited.

8. The program Advisory Committee must conduct at least two working meetings a year, have a minimum of 5 people (excluding school personnel), and must reflect relevant areas of the standards as having been considered by the advisory committee. Minutes of the meetings must be provided for review by the on-site evaluation team.

9. The NATEF Standards recognize that program content requirements vary by program type and by regional employment needs. Therefore, flexibility has been built into the NATEF task list by assigning each task a priority type. Items on the Task List are broken down into two categories, High Priority - Individual (HP-I) and High Priority-Group (HP-G). HP-I is defined as a task where students must be able to demonstrate hands-on competency to the instructor on an individual basis. HP-G is defined as a task that can be taught through the use of video, demonstration, team training, etc., and where students <u>should be tested</u> on the information presented, but are not required to demonstrate hands-on competency on an individual basis. The following guidelines must be followed:

   95% of HP-I items must be taught in the curriculum
   90% of HP-G items must be taught in the curriculum

10. A program that does not meet the minimum hour requirements may be eligible for accreditation if both of the following conditions are met in the program areas requesting accreditation:

    a. show evidence that all graduates from the previous academic year have taken the ASE certification examination, and
    b. show documentation that 75% of those graduates passed the ASE certification tests.

11. The concern for safety is paramount to the learning environment. Each program area has the following safety requirement preceding all related tasks:

    Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; ear protection; hand

tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

12. In 1998 the Occupational Safety and Health Administration (OSHA) issued a new rule on respiratory protection. The Occupational Safety and Health Standards, Title 29 Labor, Subpart I – Personal Protective Equipment requires employers to establish and maintain a respiratory protection program.

    Since the health and safety of students is a primary concern, all collision programs that seek NATEF accreditation must have their Program Administrator and Program Instructor sign the Application for Accreditation or Renewal of Accreditation, where indicated, that the school is aware of this rule (including respirator fit testing and filter changing) and to the extent required by law, is in compliance with the rule with respect to the students enrolled in the Collision Repair and Refinish Program.

    NATEF strongly encourages programs to review and comply with the Environmental Protection Agency (EPA) Design for the Environment (DfE) Project publications which can be accessed on the website at www.epa.gov/dfe/pubs/projects/auto.

    1. Best Practices for Auto Refinishers When Spray Painting
    2. Best Practices for the Paint Mixing Room
    3. Supplied-Air Respirators in Auto Shops: Get the Best Protection
    4. User Friendly Supplied-Air Respirators: Options for Auto Refinishers
    5. Choosing the Right Gloves for Painting Cars

Additionally, EPA issued a Final Rule on the National Emission Standards for Hazardous Air Pollutants NESHAP (Subpart HHHHHH) that NATEF recommends programs review:

    6. Paint Stripping and Miscellaneous Surface Coating Operations (found separately at http://www.epa.gov/ttn/atw/area/paint_stripb.pdf)

INFORMATION ABOUT EVALUATION TEAM LEADERS (ETLs)

Evaluation Team Leaders (ETLs) are educators who have been trained by NATEF to lead the on-site evaluation. The NATEF office will assign an ETL once a program has been approved for an on-site evaluation. Every effort will be made to assign an ETL located close to the school to reduce the cost for the evaluation. Two additional team members, selected by the program and approved by the ETL, are required for a collision repair and refinish program on-site evaluation. (See the following page for additional information about team members and on-site teams.)

Persons selected as ETLs must:

1. have a minimum of six years of combined experience as a collision repair and refinish technician and collision repair and refinish instructor (at least three years experience as a collision repair and refinish technician is required);
2. have a B.A. or B.S. in Education from a college or university recognized for teacher training by the state; and
3. be a current ASE certified master collision repair and refinish technician (B2, B3, B4, and B5).

Or, if a state does not require collision repair and refinish instructors to have a B.A. or B.S. degree, the following qualifications will apply:

1. six years experience as a collision repair and refinish technician;
2. four years collision repair and refinish teaching experience at the secondary, post-secondary or community college level; and
3. current ASE certified master collision repair and refinish technician (B2, B3, B4, and B5).

ETL candidates who are active instructors must be directly associated with an accredited program. ETL candidates who are inactive instructors must have formerly been directly associated with an accredited program.

ETL training is valid for three years. Automatic three-year renewal is granted each time an ETL conducts an on-site evaluation. ETLs are required to attend additional training sessions or serve as a team member if they have not conducted an on-site evaluation within three years. This additional training is required even though the individual holds current ASE master certification.

Anyone interested in becoming an Evaluation Team Leader should contact the NATEF office at (703) 669-6650 or their state Trade & Industrial Supervisor for more details.

INFORMATION ABOUT ON-SITE EVALUATION TEAM MEMBERS

The program requesting accreditation is responsible for recruiting and recommending on-site evaluation team members. The ETL must approve individuals recommended by the program. The on-site evaluation team members must be practicing collision repair and refinish technicians, service managers or shop owners from businesses in the area served by the training program.

Team members must have:

1. a high school diploma or the equivalent (industry or military training may be considered as the equivalent), and
2. at least seven years full-time experience as a general collision repair and refinish technician.

ASE collision repair and refinish certification is recommended but not required.

The **initial** accreditation evaluation team and the **renewal** of accreditation evaluation team require the same number of individuals to conduct the evaluation. This includes the ETL and two on-site evaluation team members. Both team members must be from industry (one from a dealership and one from an independent repair facility). One alternate team member choice is to be identified on the On-Site Evaluation Team Member List in the event that one of the team members is unable to conduct the on-site evaluation. The alternate team member may be from either a dealership or from an independent repair facility.

Team members must not be advisory committee members, former instructors, or graduates of the program within the past ten years.

TASK LIST INFORMATION

An essential element of any curriculum or training program is a valid task list. Collision repair and refinish technician instructors need a well-developed task list that serves as a solid base for course of study outlines and facilitates communication and articulation of their training programs with other institutions in the region.

It is a NATEF policy that the task list developed by the National Institute for Automotive Service Excellence (ASE) serves as the basis for the NATEF task list. Panels of technical service experts from the automotive service industry and career technical education are called upon to develop and validate the ASE and NATEF task lists. The ASE task list is used to develop the ASE certification examination, a nationally recognized symbol of competence in diagnosing and repairing vehicle problems.

Additional information on the development of the NATEF task list can be found in the Task List section.

All tasks have a priority rating. NATEF Standards recognize that program content requirements vary by program type and regional employment needs. Therefore, flexibility has been built into the NATEF task list by assigning each task a priority type.

Items on the Task List are broken down into two categories, High Priority – Individual (HP-I) and High Priority – Group (HP-G). High Priority - Individual (HP-I) is defined as a task that requires students to demonstrate hands-on competency to the instructor on an individual (one-to-one) basis. High Priority - Group (HP-G) is defined as a task that can be taught through the use of video, demonstration, team training, etc., where students should be tested on the information presented, but are not required to demonstrate hands-on competency on an individual (one-to-one) basis.

Accredited programs <u>must</u> include 95% of the HP-I tasks and 90% of the HP-G tasks in the curriculum. Competency in HP-I tasks will indicate to employers that the graduate is skilled in that area. HP-G tasks will indicate to employers that the graduate has been tested on the information, but may not have "hands-on" competency skills.

TOOLS AND EQUIPMENT INFORMATION

The basic tools and equipment that must be available for use in the collision repair and refinish program are listed in the Tools and Equipment section. Many tools and much of the equipment are the same for some or all of the program areas. However, some equipment is specialized and must be available for use in the selected program areas. These individual program area lists are included in the Specialty Tools and Equipment section.

The student hand tool list covers all program areas. This list indicates the tools a student will need to own to be successful in each of the specialty areas.

Although no brand names are listed, the equipment and tools must address the following programmatic issues:

1. Safety - Equipment and tools must have all shields, guards, and other safety devices in place, operable, and used.
2. Type and Quality - The tools and equipment used in an accredited program must be of the type and quality found in industry. They must also be adequate and in sufficient quantity to meet the program goals and student performance objectives.
3. Consumable Supplies - Supplies should be in sufficient quantity to assure continuous instruction. Consumable supplies, such as solvents, sand paper, etc. are not listed.
4. Maintenance - A preventative maintenance schedule should be used to minimize equipment down time.
5. Replacement - A systematic schedule for replacement should be used to maintain up-to-date tools and equipment at industry and safety standards. Information gained from student program evaluations as well as advisory committee input should be used in the replacement process.
6. Inventory - An inventory system should be used to account for tools, equipment, parts, and supplies.
7. Parts Purchasing - A systematic parts-purchasing system should be used - from work order to supplier.
8. Hand Tools - Each student should be encouraged to purchase a hand tool set during the period of instruction.
9. Storage - Adequate storage for tools should be provided. Space for storage of the students' hand tools should be provided.

COLLISION REPAIR & REFINISH PROGRAM EVALUATION

NATEF Standards for Initial Accreditation and Renewal of Accreditation are identical. Items listed below are critical for accreditation and are in **bold** print in the Collision Repair & Refinish Program Self-Evaluation materials. These eight items are:

2.5 A	**Does the Advisory Committee, with at least five (5) in attendance, convene a minimum of two working meetings per year?**
5.5 F	**Does the Advisory Committee review information from the annual follow-up procedure and provide input for modifications to the training program?**
6.5 A	**Do the [collision repair & refinish] areas provide theory and "hands-on" training for 95% of the HP-I and 90% of the HP-G tasks, as evidenced by cross-referencing the course of study, lesson plans, job sheets, and student progress charts [in each area to be accredited]?**
6.5 B	**Are the tools and equipment available for the tasks taught in each program area?**
7.1 A	**Are all shields, guards, and other safety devices are in place, operable, and used?**
7.1 B	**Do all students, instructors, and visitors wear safety glasses in the lab/shop area while lab is in session?**
9.1 D	**Do instructors hold current ASE certification in the collision repair & refinish area(s) they teach?**
9.3 B	**Do instructors attend a minimum of 20 hours per year of recognized industry update training relevant to the areas in which their program is accredited?**

Programs must be able to support a yes response for all eight items. Programs must also meet the hour requirements listed in item 3 on page 4 in the areas identified for accreditation unless they meet both the requirements listed in item 10 on page 5. **If these responses are not achieved, do not apply for accreditation at this time.**

In addition, an on-site evaluation will not be scheduled unless the average score on each of Standards 6, 7, 8, and 9 is at least a 4 on the Collision Program Self-Evaluation. Please refer to the Collision Repair & Refinish Program Requirements for more information.

Instructors must be ASE certified in the areas they teach. Please refer to item 6 on page 5.

NATEF POLICIES ON ARTICULATION AGREEMENTS

There is no provision for articulated accreditation for collision repair and refinish programs under the 2009 Collision Repair & Refinish program standards. Regardless, NATEF Trustee action, as well as language in the Carl D. Perkins Vocational Education Act, encourages articulation between programs at the secondary and post-secondary levels.

Articulation agreements may be entered into between any consenting institutions, and are generally defined by a formal written agreement. This agreement usually defines the terms of the articulation, including, but not limited to, the terms under which a student completing specific coursework at one institution may receive credit* from the other institution. Articulation agreements encourage, but cannot require, graduates of secondary programs to go on to post-secondary education.

* Credit is defined as a form of recognition for work that has been completed at the secondary level. It includes, but is not limited to, granting: academic credit, advanced placement, task completion, etc.

RECOGNITION FOR ACCREDITATION

A program approved for accreditation or renewal of accreditation will receive a plaque that bears the ASE/NATEF seal, the school's name, and the expiration date of accreditation. A statement below the seal will read:

> "THE INSTRUCTION, COURSE OF STUDY, FACILITIES AND EQUIPMENT OF THIS INSTITUTION HAVE BEEN EVALUATED BY THE NATIONAL AUTOMOTIVE TECHNICIANS EDUCATION FOUNDATION AND MEET THE STANDARDS OF QUALITY FOR THE TRAINING OF COLLISION REPAIR AND REFINISH TECHNICIANS IN THE FOLLOWING AREAS:
>
> _____
>
> _____
>
> _____"

Institutions receiving NATEF accreditation are encouraged to put the following statement on the graduate's diploma or certificate:

> "The person holding this diploma has participated in a collision repair and refinish technician training program that was accredited by the National Automotive Technicians Education Foundation and has completed instruction in the following areas:
>
> _____
>
> _____
>
> _____"

A screened ASE/NATEF logo may be overprinted with the above statement and placed on the graduate's diploma. A camera-ready logo is provided in the promotional material a program receives upon accreditation.

Programs granted initial accreditation will also receive a 24"x30" sign indicating that the training program is NATEF accredited.

APPLIED ACADEMICS RECOGNITION

The NATEF Board of Trustees and the ASE Board of Directors has initiated a process to recognize NATEF accredited programs that are integrating academics and technical skills into the curricula. This effort should be a collaborative effort between the collision repair and refinish instructors and the academic instructors in language arts, mathematics, and science.

ASE and NATEF will issue a certificate of recognition to those programs that provide documentation including, but not limited to, student assignments or activities, classroom/lab instructional materials, student performance records, and interviews with academic instructors.

Programs that wish to receive recognition must complete the Applied Academics Recognition form and return it with the application for accreditation or renewal of accreditation. Documentation on applied academics activities must be available for the ETL at the time of the on-site evaluation.

Programs may receive recognition in Language Arts, Mathematics, Science, or any combination of the three areas.

To receive a copy of the *Applied Academics and Workplace Skills for Collision Repair & Refinish Technicians* manual, please go to the NATEF website at www.natef.org or contact the NATEF office at 703-669-6650.

APPEALS AND ACTION FOR REVOCATION

APPEALS: PROGRAMS APPLYING FOR ACCREDITATION

A complaint received from any school concerning the procedures, evaluation or accreditation of the collision repair and refinish technician training program must be made in writing to the ASE office. It will be immediately referred to the Grievance Examiner who will acknowledge receipt of the complaint in writing to the complainants. Thereafter, the Grievance Examiner will investigate the complaint and prepare a report. A copy of the report will be given to the complainants and to an Appeals Committee within thirty (30) days of receipt of the complaint.

The Appeals Committee will review the findings and recommendations of the Grievance Examiner, together with the complaint and any data supplied in connection therewith. The Appeals Committee will be empowered to dismiss the matter, or to initiate such action as it may deem appropriate.

If the complainants desire to review the Appeals Committee's evaluation, they may do so at the office of the Grievance Examiner. However, they will not be permitted to make copies of the results.

ACTION FOR REVOCATION: NATEF ACCREDITED PROGRAMS

The Appeals Committee will also advise the ASE President of its judgments and recommendations for action in any cases of malpractice or misrepresentations involving the misuse of NATEF accreditation for a collision repair and refinish technician training program. Upon receipt of a complaint alleging misuse or misrepresentation by an accredited program, the Grievance Examiner will be notified. The Grievance Examiner will notify in writing the parties against whom the complaint has been filed, indicating the alleged wrongdoing. The parties will be further advised that they may submit a written explanation concerning the circumstances of the complaint within thirty (30) days. After the Grievance Examiner has considered the complaint and received any explanation, the Grievance Examiner will determine whether there is a reasonable basis for a possible finding of wrongdoing. If the Grievance Examiner finds such a basis, the Grievance Examiner will inform the parties of the findings. At that time, the Grievance Examiner will inform the parties of their right to a hearing before the Appeals Committee. The parties will have fifteen (15) days to notify the Grievance Examiner of their decision in writing.

In the event the involved parties elect to be bound by the findings of the Grievance Examiner without a hearing, the Grievance Examiner will submit a written report with recommendations to the Chair of the Appeals Committee. This report will be submitted within sixty (60) days of the receipt of the waiver of a hearing. The Chair of the Appeals Committee will mail a copy of the Grievance Examiner's findings and recommendations to the parties. In the event that the involved parties elect to appear at a hearing, the Chair of the Appeals Committee will call a

Board of Inquiry. This Board of Inquiry will consist of four ASE Board members. The Board of Inquiry will be convened at the ASE office at a date and time determined by the Chair. The Board of Inquiry will notify the involved parties in writing regarding the time and place of the hearing.

The Grievance Examiner will be responsible for investigating and presenting all matters pertinent to the alleged wrongdoing to the Board of Inquiry. The involved parties will be entitled to be at the hearings with or without counsel. The parties will be given an opportunity to present such evidence or testimony as they deem appropriate.

The Board of Inquiry will notify the Chair of the Appeals Committee of its findings and recommendations in writing within ten (10) days after the hearing is completed.

The Appeals Committee will review the findings and recommendations of either the Grievance Examiner if a hearing was waived, or of the Board of Inquiry if a hearing was held. The Appeals Committee will determine if the record on the complaint supports a finding of conduct contrary to or in violation of reasonable practices. If two-thirds of the Appeals Committee so find, the Committee will recommend to the President of ASE appropriate sanctions or courses of action against the parties charged.

DEFINITIONS – EDUCATIONAL TERMS

1. ARTICULATION: A formal written agreement, usually between a secondary and post-secondary institution that are geographically within a reasonable daily commuting distance of each other. The agreement will clearly denote that students completing specific secondary courses in accordance with predetermined performance criteria will have partially completed commensurate requirements for a completion certificate or diploma awarded by the postsecondary institution. Commensurate requirements could be in the form of credit equivalents, advanced placement, task completion, etc. at the post-secondary institution.

2. CURRICULUM: All the objectives, content, and learning activities arranged in a sequence for a particular instructional area. An orderly arrangement of integrated subjects, activities, time allocations, and experiences that students pursue for the attainment of a specific education goal.

3. COMPETENCY: (Hands-On) – Performance of task to the level or degree specified in the performance standard for the task.

4. CRITERION-REFERENCED MEASURE(S): An exercise based on a performance objective for a task, and designed to measure attainment of that objective. (Also called performance test or criterion-referenced test.)

5. GOAL: A statement of the intended outcome of participation in the training program.

6. LIVE WORK: The processing, assignment, and student performance of the appropriate tasks on vehicles donated by manufacturers or other sources, customer-owned, and other training vehicles.

7. MASTERY: (See Competency – Hands-On).

8. OBJECTIVE, PERFORMANCE: A written statement describing an intended outcome (competent task performance) in terms of student performance. (Also called "behavioral" objective or instructional objective) R.F. Mager Associates, 13245 Rhoda Drive, Los Altos Hill, California.

9. PERSONAL CHARACTERISTIC: Attributes that are not readily measurable, and are generally in the affective or cognitive domains.

10. AREA(S): Relates to one or more of the following: (1) Structural Analysis and Damage Repair, (2) Non-Structural Analysis and Damage Repair (Body Components), (3) Mechanical and Electrical Components, (4) Painting and Refinishing.

11. STANDARD: "…Something established for use as a rule or basis of comparison in measuring or judging capacity, quantity, content, extent, value, quality, etc." Webster's New World Dictionary (1991)

12. STANDARD – PERFORMANCE: A written specification of the results or acceptable task performance.

13. STANDARD – PERSONAL: An attribute or characteristic of an individual that facilitates entry into and advancement in an occupation.

14. STANDARD – PROGRAM: A specific quality or desired characteristic of a training program designed to prepare individuals for employment.

15. TASK: A psychomotor or cognitive entry-level learning activity consisting of one or more measureable steps accomplished through an instructor presentation, demonstration, visualization or a student application.

16. TRAINING STATION: An area with appropriate tools and equipment, large enough to safely allow competency development in task performance.

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Must or shall is an imperative need, duty or requirement; an essential or indispensable item; mandatory.

Should is used to express a recommendation, not mandatory but attainment would increase program quality.

May or could expresses freedom to follow a suggested alternative.

PROCEDURES FOR ACCREDITATION/RENEWAL OF ACCREDITATION

PROCESS OVERVIEW

NOTE: NATEF recommends that programs maintain a file containing copies of all reference and documentation materials developed during all phases of the accreditation process.

1. Purchase application materials

The program requesting accreditation must purchase self-evaluation materials from NATEF in Leesburg, Virginia. To begin the accreditation process, the program must submit the following items:

a. Application for Accreditation or Renewal of Accreditation
b. Self-Evaluation Summary Sheet
c. On-Site Evaluation Team Member List
d. Instructor Qualification Forms
e. Instructor Training Forms
f. Advisory Committee List
g. Applied Academics Recognition Forms (optional)
h. Purchase Order, Check, or Credit Card Authorization for Application Fee and On-Site Evaluation Team Packets (self-evaluations will be returned if received without payment). **Do not send payments without application attached**.

2. NATEF review of application

The national office will review the materials within 30 days. Following the review, the Program Administrator will be notified about the status of the program. The program will be identified as one of the following:

a. Qualified for an on-site evaluation for all the specialty areas listed on the application.
b. Qualified for on-site evaluation for some but not all specialty areas listed on the application. The program administrator may proceed with the on-site evaluation for the areas that qualify at that time OR make improvements and resubmit the application at a later date.
c. Not qualified for an on-site evaluation at that time. NATEF will indicate specific improvements that must be made before the on-site evaluation can be scheduled.

3. Evaluation Team Leader (ETL) assigned; Program Coordinator makes contact

In cooperation with state officials, NATEF will assign an Evaluation Team Leader (ETL) to the program. NATEF will send the program the Application for On-Site Evaluation. With a legitimate reason, the Program Coordinator may contact the NATEF office to request a different ETL. A request for a different ETL must be in writing and specific as to the reason for the request. (The ETL assigned must NOT be a present or former teacher or administrator of the

program to be evaluated.) The Program Coordinator must contact the ETL to arrange a date for the on-site evaluation.

The Application for the On-Site Evaluation will be sent with instructions that outline the plans for the local administration and the costs for the ETL's services and expenses. The institution requesting accreditation must pay these costs.

4. Send on-site application, course of study, and list of on-site evaluation team members to ETL

The Application for On-Site Evaluation, signed by the program administrator, must be sent to the ETL. **A copy of the course of study, Advisory Committee minutes (one year's worth for initial accreditation; five year's worth for renewal of accreditation) and this application must be received by the ETL *at least two weeks prior to the on-site evaluation* or the on-site must be rescheduled**. The course of study should include the following items:

a. Syllabus for each class
b. Tasks to be taught under each area, specified according to High Priority designations HP-I or HP-G. (Tasks may be taught at different times in the program or in more than one area. However, the hours for the tasks may be counted only once.)
c. Number of contact hours for each area
d. Areas and sequence of instruction to be included in the program
e. List of training materials and audio-visual materials used in training
f. Sample evaluation form used to track student progress

The On-Site Evaluation Team Member List must be included for the ETL to review and approve. Once a date has been set and the on-site evaluation team members have been approved by the ETL, the program coordinator must contact the on-site evaluation team members to make arrangements for the on-site evaluation day(s).

5. On-site evaluation

Initial accreditation requires 2 consecutive days while students are in class for the on-site evaluation review of all the standards. However, if more than one program is applying for accreditation (general collision repair and refinish and GM BSEP, for example), additional team members and additional days may be required to complete the on-site evaluation. The NATEF office will determine the need for additional team members and days.

Renewal of accreditation requires a 1-day on-site evaluation while students are in class. The on-site evaluation team reviews Standards 6-9, as well as all go/no-go (critical) items. However, if the Advisory Committee average on Standards 1-5 or Standard 10 is less than 4, the on-site evaluation team must also review these standards. The NATEF office will determine whether an additional day or additional team members will be required to complete the evaluation.

6. ETL reports results to NATEF

The ETL will submit all on-site evaluation materials and a final report to NATEF with a recommendation for or against program accreditation.

7. Program accreditation

The national office will review the final report and all additional evaluation materials to determine whether the program meets the requirements for accreditation, and will make their recommendation to the NATEF Board. The NATEF President will approve accreditations as sanctioned by the Board of Directors.

Programs that do not earn accreditation will be given a written report specifying improvements that must be made to qualify for accreditation. The decision at the national level will be final unless appealed to the ASE Board of Directors. Appeals will be heard only at regular meetings of the Board.

The Program Administrator will be notified of all decisions regarding the accreditation status of all programs applying for NATEF accreditation. Trade & Industrial Supervisors receive a monthly status report of the decisions regarding accreditation of programs in their state.

8. Display and reporting of accreditation materials

A wall plaque will be forwarded from the national office to the designated program primary contact. Schools **must** accurately report areas of NATEF accreditation.

9. Accredited Technician Training Program List

The NATEF office maintains a current listing of all NATEF accredited programs. The list is made available on the NATEF website.

10. Compliance report

A program will be accredited for five years. A compliance report is required after 2½ years. The compliance report will be used to verify that a program is maintaining its standards. NATEF will notify the program administrator of the compliance date and will send the appropriate accreditation review forms at that time. The Advisory Committee must complete the report and the program administrator must return the forms to the NATEF office.

NATEF may randomly select programs at the 2½-year period for an on-site compliance review by an ETL and NATEF Trustees, staff, consultants, or other designated representatives. The selected programs will be notified, in advance, of the on-site review by the NATEF office. Programs should be prepared to provide documentation on how they are maintaining the standards. All costs for this on-site review will be paid by NATEF.

11. Renewal of Accreditation

The NATEF office will contact program personnel prior to the accreditation expiration date. Programs must formally request renewal of accreditation materials and follow the process outlined above.

ON-SITE EVALUATION COST SHEET

COLLISION REPAIR & REFINISH

	ACCREDITATION	RENEWAL OF ACCREDITATION
Program Accreditation Documents	$94.00	$82.00
Application Fee	$315.00	$315.00
On-Site Evaluation Team Manuals (Minimum of 3 sets @ $65 each)	$195.00	$195.00
Honorarium for Evaluation Team Leader (ETL) @ $250/day *Please see below	$500.00	$250.00
Estimated mileage, hotel, and meal expenses for the ETL **Please see below	$150.00	$100.00
ESTIMATED TOTAL COSTS	$1254.00	$942.00

NOTE: It is anticipated that team members recruited from local independent repair facilities and dealerships will serve without charge to the institution. However, programs may elect to pay team members an honorarium for their participation in the on-site evaluation.

The NATEF office must receive the application fee and payment for the on-site evaluation team packets with the completed application. Applications received without these payments will be returned to the program for resubmission with payment.

ETLs are to receive an additional honorarium of $100 (per additional program) when evaluating multiple programs at one location. Example: An ETL evaluates one general program and one manufacturer-specific program during an initial accreditation on-site evaluation. The honorarium paid to the ETL would be $450 for the standard two-day honorarium, and $100 for the additional program, for a total honorarium of $550.** ***ETLs are paid as independent contractors, not as school employees.

*****Mileage is to be reimbursed at the "business purpose" rate specified by the IRS. Please visit IRS.gov for the current mileage reimbursement rate.***

Costs of accreditation/renewal of accreditation are subject to change. Contact the NATEF office for current information.

COLLISION REPAIR & REFINISH PROGRAM STANDARDS

STANDARD 1 - PURPOSE

THE COLLISION REPAIR AND REFINISH TECHNICIAN TRAINING PROGRAM SHOULD HAVE CLEARLY STATED PROGRAM GOALS, RELATED TO THE NEEDS OF THE STUDENTS AND EMPLOYERS SERVED.

Standard 1.1 - Employment Potential
The employment potential for collision repair and refinish technicians, trained to the level for the specialty or general areas outlined in the program goals, should exist in the geographic area served by the program.

Standard 1.2 - Program Description/Goals
The written description/goals of the program should be shared with potential students and should include admission requirements, employment potential, area(s) of specialty training offered, and the cost of all tuition and fees. Technical qualifications of the faculty and the overall goal(s) of the program should also be included.

STANDARD 2 - ADMINISTRATION

PROGRAM ADMINISTRATION SHOULD ENSURE THAT INSTRUCTIONAL ACTIVITIES SUPPORT AND PROMOTE THE GOALS OF THE PROGRAM.

Standard 2.1 - Student Competency Certification
The certificate or diploma a student received upon program completion should clearly specify the area(s) of demonstrated competency.

Standard 2.2 - Chain of Command
An organizational chart should be used to indicate the responsibilities for instruction, administration, and support services.

Standard 2.3 - Administrative Support
Positive administrative support from institutional and local governing bodies should be demonstrated. Indicators of administrative support would include: support for staff in-service training; provision of appropriate facilities; up-to-date tools, equipment, and training support materials and curriculum.

Standard 2.4 - Written Policies
Written policies should be adopted by the administration and policy board for use in decision-making situations and to provide guidance in achieving the program goals. Policies regarding safety, liability, and lab/shop operation should be written and prominently displayed as well as provided to all students and instructors.

Standard 2.5 - Advisory Committee
An Advisory Committee consisting of at least five (5) members (not including school personnel) must convene at least two times a year and be utilized to provide counsel, assistance, and information from the community served by the training program. This committee should be broadly based and include former students, employed technicians, employers, and representatives for consumer's interests.

Standard 2.6 - Public/Community Relations
An organized plan should be used to provide the community at large information regarding the training program, its graduates, its plans, and any services provided to the community.

Standard 2.7 – Customer Vehicle Work
A systematic method of collecting, documenting, and disbursing customer vehicle work repair receipts should be used. Instructional staff should not be required to collect payment for customer vehicle work repairs. (This applies only to programs that accept customer vehicles for instruction.)

STANDARD 3 - LEARNING RESOURCES

SUPPORT MATERIAL, CONSISTENT WITH BOTH PROGRAM GOALS AND PERFORMANCE OBJECTIVES, SHOULD BE AVAILABLE TO STAFF AND STUDENTS.

Standard 3.1 - Service Information
Service information with current manufacturer's service procedures and specification data for vehicles manufactured within the last ten (10) years should be available. This information should be accessible to students while working in the lab/shop area.

Standard 3.2 - Multimedia
Appropriate up-to-date multimedia materials such as video equipment, transparencies, CD ROM, etc. should be readily available and utilized in the training process.

Standard 3.3 - Instructional Development Services
The service of professional instructional development personnel should be used when available. At a minimum, equipment and supplies should be available for duplication or copying printed materials and transparencies. Instructional development personnel should conduct in-service and/or training in curriculum and media development.

Standard 3.4 - Periodicals
Current general and technical collision repair and refinish magazines and newspapers should be available for student and instructor use.

Standard 3.5 - Student Materials
Necessary instructional texts or pertinent material should be available for each student to satisfy the objectives of the mode of instruction used. Basic textbooks should have copyright dates that are not over six (6) years old.

STANDARD 4 - FINANCES

FUNDING SHOULD BE PROVIDED TO MEET THE PROGRAM GOALS AND PERFORMANCE OBJECTIVES.

Standard 4.1 - Program Training Cost
The enrollment in the program or program area should be sufficient to keep the per-student training costs to a realistic figure.

Standard 4.2 - Budget
An adequate annual budget should be developed, allocated, and used for the operation of the program.

Standard 4.3 - Budget Preparation
The budget should be prepared by the institutional administration in conjunction with the program faculty.

Standard 4.4 - Status Reports
Budget status reports should be made available to program staff at least quarterly.

STANDARD 5 - STUDENT SERVICES

SYSTEMATIC SKILLS ASSESSMENT, INTERVIEWS, COUNSELING SERVICES, PLACEMENT, AND FOLLOW-UP PROCEDURES SHOULD BE USED.

Standard 5.1 – Skills Assessment
For students to develop the skills and knowledge required to service today's automobiles, each student must possess, or be given the opportunity to develop, essential foundation skills in reading, mathematics, science, and mechanical aptitude. To this end, a formal skills assessment instrument (process) for these fundamental skills should be used to evaluate students to ensure that each student has a reasonable probability of success as a collision repair & refinish technician. Testing procedures and how the test results will be used (e.g., placement, assessment of student's developmental needs, etc.) should be stated in program explanatory material, and justification for all requirements should be available.

Standard 5.2 - Pre-admission Counseling
Prior to program admission, a student should be counseled regarding automotive careers.

Standard 5.3 - Student Records
Permanent records of all students, former and current, should be available, preferably in one central location, and kept confidential.

Standard 5.4 - Placement
A systematic student placement system should be used to assist program graduates to obtain employment in the collision repair and refinish industry.

Standard 5.5 – Annual Follow-up
A follow-up system should be used to determine students' employment location and for feedback regarding the efficiency, effectiveness, and appropriateness of training. The follow-up procedure should be designed to assure feedback regarding needed additions to or deletions from the training curriculum, program, and tools and equipment. Follow-up of graduates employed outside the collision repair and refinish industry should indicate reasons for non-collision repair and refinish employment. When applicable, this information should be used to modify the training quality and/or content.

Standard 5.6 - Legal Requirements
The training program should meet all applicable local, state, and federal requirements.

STANDARD 6 - INSTRUCTION

INSTRUCTION MUST BE SYSTEMATIC AND REFLECT PROGRAM GOALS. A TASK LIST AND SPECIFIC PERFORMANCE OBJECTIVES WITH CRITERION-REFERENCED MEASURES MUST BE USED.

Standard 6.1 - Program Plan
The training plan should progress in logical steps, provide for alternate sequences where applicable, and be made available to each student.

Standard 6.2 - Student Training Plan
A training plan for each student should be developed and used indicating the student's training goal(s) and specific steps needed to meet that goal. Students should be given a copy of their training plan.

Standard 6.3 - Preparation Time
Adequate time should be provided for teacher preparation and program development.

Standard 6.4 - Teaching Load
The instructor/student ratio and class contact hours should allow time for interaction on a one-to-one basis.

Standard 6.5 - Curriculum
All tasks have been given a priority rating. At least 95% of the High Priority - Individual (HP-I) and 90% of the High Priority - Group (HP-G) items in the Task List must be included in the curriculum. Additional tasks may be included to meet the needs of local employers. The Advisory Committee should approve all additional tasks.

Instruction on the legal aspects and responsibilities of the collision repair and refinish technician in areas such as Environmental Protection Agency regulations, safety regulations, OSHA

regulations (including the ruling on respiratory protection), and other appropriate requirements should be included in the curriculum. Instruction and practice in filling out work order forms, ordering parts, and basic record keeping should be a part of the training program.

Tools and equipment must be available to perform the tasks in each of the areas in which accreditation is requested.

Standard 6.6 - Student Progress
A record of each student's progress should be maintained through the use of a progress chart or other recording device. The record should indicate tasks required for program completion and those tasks the student has mastered.

Standard 6.7 - Performance Standards
All instruction should be performance based, with an acceptable performance standard stated for each task. These standards should be shared with students and potential employers. Students should demonstrate "hands-on competency" of a task before the instructor verifies a student's performance.

Standard 6.8 - Safety Standards
Safety instruction should be given prior to lab/shop work and be an integral part of the training program. A safety test should be included in the training program. Students and instructors should comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations. Programs should comply with EPA's Design for the Environment (DfE) Best Practices.

Standard 6.9 - Personal Characteristics
All training activities and instructional material should emphasize the importance of maintaining high personal standards.

Standard 6.10 - Work Habits/Ethics
The training program should be organized in such a manner that work habits and ethical practices required on the job are an integral part of the instruction.

Standard 6.11 - Provision for Individual Differences
The training program should be structured in such a manner that students with different levels of cognitive and psychomotor skills can be accommodated.

Standard 6.12 – Related Instruction
Instruction in related mathematics, science, communication, and interpersonal relations should be provided and coordinated with ongoing instruction in the training program. This instruction should be provided by a qualified instructor.

Standard 6.13 - Testing
Both written and performance-based tests should be used to validate student competency. Students should be encouraged to take certification tests that are publicly recognized indicators of capabilities.

Standard 6.14 - Evaluation of Instruction
Instructional procedures should be evaluated in a systematic manner. This evaluation should be through regular reviews by students and the administration. Self-evaluation of instruction should also be utilized on a systematic and regular basis. This system should include input from former students and from the Advisory Committee members. Instructional procedures should show responsiveness to the feedback from these evaluations.

Standard 6.15 – On-Vehicle Service and Repair Work
On-vehicle service and repair work should be scheduled to benefit the student and supplement ongoing instruction on items specified in the NATEF task list. A student should have had instruction and practice on a specific repair task before on-vehicle service and repair work requiring that task is assigned. Vehicles donated by the manufacturers or other sources, customer-owned vehicles, and other training vehicles may be used as the primary source of on-vehicle service and repair work. Training program student-owned vehicles, school buses, and other vehicles owned or operated by the governing body of the school should not be the primary source of on-vehicle service and repair work vehicles. All vehicles in the lab/shop should have a completed industry-type work order attached to or on the vehicle.

Standard 6.16 - Articulation
Agreements between programs with equivalent competencies should be used to eliminate unnecessary duplication of instruction and foster continued study.

STANDARD 7 - EQUIPMENT

EQUIPMENT AND TOOLS USED MUST BE OF THE TYPE AND QUALITY FOUND IN THE REPAIR INDUSTRY AND MUST ALSO BE THE TYPE NEEDED TO PROVIDE TRAINING TO MEET THE PROGRAM GOALS AND PERFORMANCE OBJECTIVES.

Standard 7.1 - Safety
Equipment and tools used in the training program must have all shields, guards, and other safety devices in place, operable, and used. Safety glasses must be worn by all students, instructors, and visitors in the lab/shop area while lab is in session. EPA Design for the Environment (DfE) Auto Refinish Best Practices should be followed.

Standard 7.2 - Quantity and Quality
The tools and equipment used in the training program should reflect the program goals and performance objectives. Sufficient tools and equipment should be available for the training offered. The tools and equipment should meet industry quality standards.

Standard 7.3 - Consumable Supplies
Sufficient consumable supplies should be readily available to assure continuous instruction.

Standard 7.4 - Maintenance
A preventive maintenance schedule should be used to minimize equipment down time.

Standard 7.5 - Replacement
An annual review process should be used to maintain up-to-date tools and equipment at industry and safety standards. Student follow-up and Advisory Committee input should be used in this process.

Standard 7.6 - Inventory
An inventory system should be used to account for tools, equipment, parts, and supplies.

Standard 7.7 - Parts Purchasing
A systematic parts purchasing system, from work order - to parts specialist - to jobber, should be used. Task performance should not be unreasonably delayed due to lack of replacement parts.

Standard 7.8 - Hand Tools
Each student should have access to basic hand tools comparable to tools required for employment. The students should be encouraged to purchase a hand tool set during the period of instruction.

STANDARD 8 - FACILITIES

THE PHYSICAL FACILITIES MUST BE ADEQUATE TO PERMIT ACHIEVEMENT OF THE PROGRAM GOALS AND PERFORMANCE OBJECTIVES.

Standard 8.1 - Training Stations
Training stations (bench and on-vehicle service and repair work) should be available in the type and number required for the performance of tasks outlined in the program goals and performance objectives.

Standard 8.2 - Safety
The facilities should meet all applicable safety standards and an emergency plan should be in place and posted in all classrooms and lab/shops areas.

Standard 8.3 - Maintenance
A written facilities maintenance program should be used to assure facilities are suitable when required for instruction.

Standard 8.4 - Housekeeping
The classroom(s), lab/shop, and support area(s) should be kept clean and orderly.

Standard 8.5 - Office Space
An area separate from the lab/shop should be available and convenient for the instructor(s) use as an office.

Standard 8.6 - Instructional Area
A classroom convenient to, but separate from, the lab/shop area should be available for instruction and other non-lab/shop activities.

Standard 8.7 - Storage
Storage areas for tools, parts, supplies, and automobiles should be sufficient to support the activities outlined in the program goals and performance objectives. Security should be provided to prevent pilferage and vandalism.

Standard 8.8 - Support Facilities
Restrooms and clean-up areas should be provided for both male and female students and should be convenient to the instructional area.

Standard 8.9 - Ventilation
An adequate exhaust fume removal system should be in place and operational. When appropriate, heating and cooling systems should be used to provide sufficient comfort for learning.

Standard 8.10 - First Aid
A first aid kit should be in place and should comply with local regulations and school policy.

Standard 8.11 - Facility Evaluation
The Advisory Committee should conduct an annual evaluation of the facilities to assure adequacy to meet program goals.

STANDARD 9 - INSTRUCTIONAL STAFF

THE INSTRUCTIONAL STAFF MUST HAVE TECHNICAL COMPETENCY AND MEET ALL STATE AND LOCAL REQUIREMENTS FOR ACCREDITATION.

Standard 9.1 - Technical Competency
The instructors must hold current ASE certification in each collision repair and refinish area they teach and which is being evaluated for program accreditation.

Standard 9.2 - Instructional competency/certification
Instructors should meet all state certifying requirements.

Standard 9.3 - Technical Updating
Faculty members should be provided technical materials required to maintain their competency. Instructors must attend a minimum of 20 hours of technical update training each year.

Standard 9.4 - First Aid
The program should have a written policy, approved by the administrator of the school, on First Aid procedures.

Standard 9.5 - Substitutes
A systematic method of obtaining "substitute" instructors should be used to assure instructional continuity. An orientation session for substitutes should be held on a regular basis. The substitute should be a competent collision repair and refinish instructor.

STANDARD 10 - COOPERATIVE AGREEMENTS

WRITTEN POLICIES AND PROCEDURES SHOULD BE USED FOR COOPERATIVE AND APPRENTICESHIP TRAINING PROGRAMS. (This applies only to programs that offer cooperative/apprenticeship training.)

Standard 10.1 - Standards
The student training plan and performance standards should be developed and coordinated by the collision repair and refinish instructor.

Standard 10.2 - Agreements
All agreements should be written and legally binding.

Standard 10.3 - Supervision
A supervising collision repair and refinish instructor or supervising co-op coordinator should be assigned responsibility, authority, and time to coordinate and monitor cooperative/apprenticeship collision repair and refinish students.

TASK LIST AND ASSUMPTIONS

The NATEF task list was reviewed and updated in March 2009. A national committee was assembled in Herndon, Virginia to review the standards used in the collision repair and refinish accreditation program. The committee consisted of individuals representing collision repair and refinish shop owners and technicians, collision repair and refinish instructors, collision repair and refinish equipment and parts suppliers, and the Inter-Industry Conference on Auto Collision Repair (I-CAR).

The committee reviewed the standards, task list, tools and equipment list, program hours, and instructor qualifications. The committee had the most current National Institute for Automotive Service Excellence (ASE) collision repair and refinish task lists for reference purposes.

All the tasks are assigned a "High Priority" designation. **Accredited programs must include at least 95% of the HP-I tasks and 90% of the HP-G tasks in the curriculum.** Please refer to the Task List Information in the Policies section for additional information on the requirements for instruction on tasks.

1. It is assumed that:

   * in all areas, appropriate safety, theory, and support instruction will be required for performing each task;
   * the instruction has included identification and use of appropriate tools and testing and measurement equipment required to accomplish certain tasks;
   * the student has received the necessary training to locate and use current reference and training materials from accepted industry publications.

2. It is assumed that:

   * all components are steel unless otherwise specified;
   * current manufacturers recommended repair procedures are available for each vehicle used in instruction;
   * all diagnostic and repair tasks described in this document are to be accomplished in accordance with manufacturer's recommended procedures/specifications as published;
   * where manufacturer's recommended guidelines are not available, published industry guidelines are used;
   * all tools and equipment comply with applicable federal, state and local regulations.

3. It is assumed that:

   * individual training programs being evaluated for accreditation should have written and detailed performance standards for each task covered and taught in the curriculum;
   * learning progress of students will be monitored and evaluated against these performance standards;
   * a system is in place that informs all students of their individual progress through all phases of the training program.

4. It is assumed that:

   * individual courses of study will differ across collision repair and refinish technician training programs;
   * development of appropriate learning delivery systems and tests which monitor student progress will be the responsibility of the individual training program.

5. It is assumed that:

   * all students will receive instruction in the storage, handling, and use of Hazardous Materials as required in Hazard Communication Title 29, Code of Federal Regulation Part 1910.1200, 'Right to Know Law', and state and local requirements;
   * hazardous and toxic materials will be handled, removed and recycled or disposed of according to federal, state, and local regulations.

DEFINITIONS – TECHNICAL TERMS

ACTIVE SUSPENSION SYSTEM – A continuously controlled self-adjusting suspension system.

ADJUST – To bring components or equipment to specified operational settings.

AIR PURIFYING RESPIRATOR – Uses a filter, cartridge, or canister to remove specific air contaminates by passing ambient air through the purifying element.

ALIGN (REALIGN) – To adjust components to a line or predetermined relative position.

ANALYZE – To examine the relationship of components of an operation.

ANCHOR – To hold in place.

APPLY – To put on, attach, or affix chemicals, components or parts by spraying, brushing, spreading or using hardware.

BLEED – To remove air from a closed system.

BUFF – To remove fine scratches, usually from a painted surface, using a fine abrasive such as compounds and polishes.

CHECK – (SEE VERIFY).

CLEAN – To rid component of extraneous matter for the purpose of reconditioning, repairing, measuring, or reassembling.

COLD SHRINK – To restore contour, shape, and dimensions to stretched sheet metal areas utilizing appropriate hammer and dolly techniques.

CONDITION – To prepare for future action.

DENIB – To remove dust/dirt particles in a painted surface.

DETERMINE – To establish the type and extent of damage to a component or the procedure to be used to affect the necessary repair.

DEVELOP (PLAN) – To identify, arrange or organize the steps or procedural components into a logical sequence of actions.

DIAGNOSE – To locate the root cause or nature of a problem by using a specified procedure.

EVACUATE – To remove air, fluid or vapor from a closed system by use of a vacuum pump.

FEATHEREDGE – To taper and smooth the edges of a damaged area using abrasives.

FILL (REFILL) – To bring fluid level to specified point or volume.

FLUSH – To use a fluid to clean an internal system.

GRIND – To remove material using a motor-driven abrasive wheel, disk or pad.

HEAT SHRINK – To restore contour, shape and dimensions to stretched sheet metal areas by applying heat and utilizing appropriate hammer and dolly techniques.

IDENTIFY – To establish the identity of a vehicle or component prior to service; to determine the nature or degree of a problem.

INSPECT (CHECK) –To verify condition by performing an operational or comparative examination.

INSTALL (REINSTALL) – To secure or attach a component in its proper position in a system.

LEAK TEST – To check for and/or locate leaks in a component or system.

LOCATE – To find by using tools, measuring instruments, equipment or the senses.

MASK – To protect a component or area from incidental damage from the application of refinishing materials.

MEASURE – To compare existing dimensions to specified dimensions by the use of calibrated instruments and gauges.

MIX – To combine or blend into one mass or mixture.

PERFORM – To accomplish a procedure in accordance with established methods and standards.

PROTECT – To take actions to prevent damage to areas of the vehicles adjacent to the repair area.

REDUCE – To lower the viscosity of a refinishing material.

REFINISH – To apply cleaners, paint, and other finishing materials to the repair areas.

REMOVE – To disconnect and separate a component from a system.

REPAIR (RESTORE) – To return damaged areas to acceptable size, dimensions, shape, performance characteristics and condition.

REPLACE – To exchange a damaged component with a new or used component.

RESTORE – (SEE REPAIR)

ROUGH SAND – To remove body filler, primer/substrate, or finish materials using coarse abrasives.

SAND – To abrade or level the surface.

SCUFF – To abrade or degloss a surface for the purpose of adhesion.

SELECT – To choose the correct part, tool, equipment or setting during an assembly, adjustment or procedure.

SETUP – To select and assemble components, assemblies or parts in order or combination to produce desired results.

STORE – To organize and put away parts, hardware, and components for future retrieval and use.

STRAIGHTEN – To remove bends, creases, and other damage while returning a component to acceptable size, shape, and condition.

STRUCTURAL COMPONENTS – Any part of a vehicle's structure that bears loads, provides strength, and when removed or altered would compromise the integrity of the vehicle.

TINT – To adjust the color or hiding ability of refinishing materials.

VERIFY (CHECK) – To confirm a condition, adjustment or setting.

WASH – To clean by spraying, dipping, rinsing, rubbing or scrubbing.

WELD – To join metal or plastic pieces together by using a thermal process, often adding filler material to the joint.

NATEF TASK LIST

STRUCTURAL ANALYSIS AND DAMAGE REPAIR

For every task in Structural Analysis and Damage Repair, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

A. Frame Inspection and Repair

1.	Measure and diagnose structural damage using a tram gauge.	HP-I
2.	Attach vehicle to anchoring devices.	HP-I
3.	Analyze, straighten and align mash (collapse) damage.	HP-G
4.	Analyze, straighten and align sag damage.	HP-G
5.	Analyze, straighten and align sidesway damage.	HP-G
6.	Analyze, straighten and align twist damage.	HP-G
7.	Analyze, straighten and align diamond frame damage.	HP-G
8.	Remove and replace damaged structural components.	HP-G
9.	Restore corrosion protection to repaired or replaced frame areas.	HP-I
10.	Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.	HP-G
11.	Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.	HP-G
12.	Identify heat limitations for structural components.	HP-I
13.	Demonstrate an understanding of structural foam applications.	HP-G

14.	Measure and diagnose structural damage using a three-dimensional measuring system (mechanical, electronic, laser), etc.	HP-G
15.	Measure and diagnose structural damage to vehicles using a dedicated (fixture) measuring system.	HP-G
16.	Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair.	HP-I
17.	Analyze and identify crush/collapse zones.	HP-I
18.	Restore mounting and anchoring locations.	HP-G

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

B. Unibody and Unitized Structure Inspection, Measurement, and Repair

1.	Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems.	HP-G
2.	Realign or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering and chassis alignment problems.	HP-G
3.	Measure and diagnose unibody damage using tram gauge.	HP-I
4.	Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.	HP-G
5.	Measure and diagnose unibody vehicles using a dedicated (fixture) measuring system.	HP-G
6.	Diagnose and measure unibody vehicles using a three-dimensional measuring system (mechanical, electronic, and laser, etc.).	HP-G
7.	Determine the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair.	HP-I
8.	Attach anchoring devices to vehicle; remove or reposition components as necessary.	HP-I
9.	Straighten and align cowl assembly.	HP-G
10.	Straighten and align roof rails/headers and roof panels.	HP-G
11.	Straighten and align hinge and lock pillars.	HP-G
12.	Straighten and align vehicle openings, floor pans, and rocker panels.	HP-G

13.	Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points).	HP-G
14.	Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.).	HP-G
15.	Identify substrate and repair or replacement recommendations.	HP-I
16.	Identify proper cold stress relief methods.	HP-I
17.	Repair damage using power tools and hand tools to restore proper contours and dimensions.	HP-I
18.	Remove and replace damaged sections of steel body structures.	HP-G
19.	Restore corrosion protection to repaired or replaced structural areas.	HP-I
20.	Determine the extent of damage to aluminum structural components; repair, weld, or replace.	HP-G
21.	Analyze and identify crush/collapse zones.	HP-I
22.	Restore mounting and anchoring locations.	HP-G

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

C. Fixed Glass

1.	Remove and reinstall or replace fixed glass (heated and non-heated) using recommended materials and techniques.	HP-G
2.	Remove and reinstall or replace modular glass using recommended materials.	HP-G
3.	Check for water leaks, dust leaks, and wind noise.	HP-G

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

D. Metal Welding and Cutting

1.	Identify weldable and non-weldable substrates used in vehicle construction.	HP-I
2.	Weld and cut high-strength steel and other steels.	HP-I
3.	Weld and cut aluminum.	HP-G
4.	Determine the correct GMAW (MIG) welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation.	HP-I

5.	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.	HP-I
6.	Store, handle, and install high-pressure gas cylinders.	HP-I
7.	Determine work clamp (ground) location and attach.	HP-I
8.	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.	HP-I
9.	Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.	HP-I
10.	Protect computers and other electronic control modules during welding procedures.	HP-I
11.	Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, clamp or tack as required.	HP-I
12.	Determine the joint type (butt weld with backing, lap, etc.) for weld being made.	HP-I
13.	Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation.	HP-I
14.	Perform the following welds: continuous, plug, butt weld with and without backing, and fillet etc.	HP-I
15.	Perform visual and destructive tests on each weld type.	HP-I
16.	Identify the causes of various welding defects; make necessary adjustments.	HP-I
17.	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.	HP-I
18.	Identify cutting process for different substrates and locations; perform cutting operation.	HP-I

19.	Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, silicon bronze, etc.).	HP-G

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

For every task in Non-Structural Analysis and Damage Repair (Body Components), the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hearing protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

A. Preparation

1.	Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan.	HP-I
2.	Inspect, remove, store, and replace exterior trim and moldings.	HP-I
3.	Inspect, remove, store, and replace interior trim and components.	HP-I
4.	Inspect, remove, store, and replace body panels and components that may interfere with or be damaged during repair.	HP-I
5.	Inspect, remove, store, and replace vehicle mechanical and electrical components that may interfere with or be damaged during repair.	HP-G
6.	Protect panels, glass, interior parts, and other vehicles adjacent to the repair area.	HP-I
7.	Soap and water wash entire vehicle for inspection.	HP-I
8.	Prepare damaged area using water-based and solvent-based cleaners.	HP-I
9.	Remove corrosion protection, undercoatings, sealers, and other protective coatings as necessary to perform repairs.	HP-I
10.	Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair.	HP-I

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

B. Outer Body Panel Repairs, Replacements, and Adjustments

1.	Determine the extent of direct (primary) and indirect (secondary) damage and direction of impact; develop and document a repair plan.	HP-I
2.	Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies.	HP-G
3.	Determine the extent of damage to aluminum body panels; repair or replace.	HP-G
4.	Inspect, remove, replace, and align hood, hood hinges, and hood latch.	HP-I
5.	Inspect, remove, replace, and align deck lid, lid hinges, and lid latch.	HP-I
6.	Inspect, remove, replace, and align doors, latches, hinges, and related hardware.	HP-I
7.	Inspect, remove, replace and align tailgates, hatches, liftgates and sliding doors.	HP-G
8.	Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware.	HP-I
9.	Inspect, remove, replace and align fenders, and related panels.	HP-I
10.	Straighten contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pulling attachments.	HP-I
11.	Weld damaged or torn steel body panels; repair broken welds.	HP-G
12.	Restore corrosion protection.	HP-I
13.	Replace door skins.	HP-G
14.	Restore sound deadeners and foam materials.	HP-G
15.	Perform panel bonding.	HP-G
16.	Diagnose and repair water leaks, dust leaks, and wind noise.	HP-G
17.	Identify one-time use fasteners.	HP-G

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

C. Metal Finishing and Body Filling

1.	Remove paint from the damaged area of a body panel.	HP-I
2.	Locate and repair surface irregularities on a damaged body panel.	HP-I
3.	Demonstrate hammer and dolly techniques.	HP-I
4.	Heat shrink stretched panel areas to proper contour.	HP-I
5.	Cold shrink stretched panel areas to proper contour.	HP-I
6.	Mix and apply body filler.	HP-I
7.	Rough sand body filler to contour; finish sand.	HP-I
8.	Determine the proper metal finishing techniques for aluminum.	HP-G
9.	Determine proper application of body filler to aluminum.	HP-G

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

D. Moveable Glass and Hardware

1.	Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.	HP-I
2.	Inspect, adjust, repair, remove, reinstall or replace weather-stripping.	HP-G
3.	Inspect, repair or replace, and adjust removable power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.	HP-G
4.	Inspect, remove, reinstall, and align convertible top and related mechanisms.	HP-G

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

E. Metal Welding and Cutting

1.	Identify weldable and non-weldable substrates used in vehicle construction.	HP-I
2.	Weld and cut high-strength steel and other steels.	HP-I
3.	Weld and cut aluminum.	HP-G
4.	Determine the correct GMAW (MIG) welder type, electrode/wire type, diameter,	HP-I

and gas to be used in a specific welding situation.

5.	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.	HP-I
6.	Store, handle, and install high-pressure gas cylinders.	HP-I
7.	Determine work clamp (ground) location and attach.	HP-I
8.	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.	HP-I
9.	Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.	HP-I
10.	Protect computers and other electronic control modules during welding procedures.	HP-I
11.	Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, clamp or tack as required.	HP-I
12.	Determine the joint type (butt weld with backing, lap, etc.) for weld being made.	HP-I
13.	Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation.	HP-I
14.	Perform the following welds: continuous, plug, butt weld with and without backing, fillet, etc.	HP-I
15.	Perform visual and destructive tests on each weld type.	HP-I
16.	Identify the causes of various welding defects; make necessary adjustments.	HP-I
17.	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.	HP-I
18.	Identify cutting process for different substrates and locations; perform cutting operation.	HP-I
19.	Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.).	HP-G

F. Plastics and Adhesives

1.	Identify the types of plastics; determine repairability.	HP-I
2.	Clean and prepare the surface of plastic parts; identify the types of plastic repair procedures.	HP-I
3.	Repair rigid, semi-rigid, or flexible plastic panels.	HP-I
4.	Remove or repair damaged areas from rigid exterior composite panels.	HP-G
5.	Replace bonded rigid exterior composite body panels; straighten or align panel supports.	HP-G

MECHANICAL AND ELECTRICAL COMPONENTS

For every task in Mechanical and Electrical Components, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

III. MECHANICAL AND ELECTRICAL COMPONENTS

A. Suspension and Steering

1.	Identify one–time use fasteners.	HP-I
2.	Clean, inspect, and prepare reusable fasteners.	HP-I
3.	Remove, replace, inspect or adjust power steering pump, pulleys, belts, hoses, fittings and pump mounts.	HP-G
4.	Remove and replace power steering gear (non-rack and pinion type).	HP-G
5.	Inspect, remove, and replace power rack and pinion steering gear and related components.	HP-G
6.	Inspect and replace parallelogram steering linkage components.	HP-G

7. Inspect, remove and replace upper and lower control arms and related components. HP-G

8. Inspect, remove and replace steering knuckle/spindle/hub assemblies (including bearings, races, seals, etc.). HP-G

9. Inspect, remove and replace front suspension system coil springs and spring insulators (silencers). HP-G

10. Inspect, remove, replace, and adjust suspension system torsion bars, and inspect mounts. HP-G

11. Inspect, remove and replace stabilizer bar bushings, brackets, and links. HP-G

12. Inspect, remove and replace MacPherson strut cartridge or assembly, upper bearing, and mount. HP-G

13. Inspect, remove, and replace rear suspension system transverse links, control arms, stabilizer bars, bushings, and mounts. HP-G

14. Inspect, remove, and replace suspension system leaf spring(s and related components. HP-G

15. Inspect axle assembly for damage and misalignment. HP-G

16. Inspect, remove and replace shock absorbers. HP-G

17. Diagnose, inspect, adjust, repair or replace active suspension systems and associated lines and fittings. HP-G

18. Measure vehicle ride height; determine needed repairs. HP-I

19. Inspect, remove, replace, and align front and rear frame (cradles/sub). HP-G

20. Diagnose and inspect steering wheel, steering column, and components. HP-G

21. Verify proper operation of steering system. HP-G

22. Diagnose front and rear suspension system noises and body sway problems; determine needed repairs. HP-G

23. Diagnose vehicle wandering, pulling, hard steering, bump steer, memory steering, torque steering, and steering return problems; determine needed repairs. HP-G

24.	Demonstrate an understanding of suspension and steering alignments (caster, camber, toe, SAI) etc..	HP-G
25.	Diagnose tire wear patterns; determine needed repairs.	HP-I
26.	Inspect tires; identify direction of rotation and location; check tire size, tire pressure monitoring system (TPM) and adjust air pressure.	HP-I
27.	Diagnose wheel/tire vibration, shimmy, tire pull (lead), wheel hop problems; determine needed repairs.	HP-G
28.	Measure wheel, tire, axle, and hub runout; determine needed repairs.	HP-I
29.	Reinstall wheels and torque lug nuts.	HP-I

III. MECHANICAL AND ELECTRICAL COMPONENTS

B. Electrical

1.	Check for available voltage, voltage drop and current in electrical wiring circuits and components with a DMM (digital multimeter).	HP-I
2.	Repair electrical circuits, wiring, and connectors.	HP-I
3.	Inspect, test, and replace fusible links, circuit breakers, and fuses.	HP-I
4.	Perform battery state-of-charge test and slow/fast battery charge..	HP-I
5.	Inspect, clean, repair or replace battery, battery cables, connectors and clamps.	HP-I
6.	Dispose of batteries and battery acid according to local, state, and federal requirements.	HP-G
7.	Identify programmable electrical/electronic components and check for malfunction indicator lamp (MIL); record data for reprogramming before disconnecting battery.	HP-I
8.	Inspect alignment, adjust, remove and replace alternator (generator), drive belts, pulleys, and fans.	HP-I
9.	Check operation and aim headlamp assemblies and fog/driving lamps; determine needed repairs.	HP-I
10.	Inspect, test, and repair or replace switches, relays, bulbs, sockets, connectors, and wires of interior and exterior light circuits.	HP-I
11.	Remove and replace horn(s); check operation.	HP-I

12.	Check operation of wiper/washer systems; determine needed repairs.	HP-I
13.	Check operation of power side and tailgate window; determine needed repairs.	HP-I
14.	Inspect, remove and replace power seat, motors, linkages, cables, etc.	HP-G
15.	Inspect, remove and replace components of electric door and hatch/trunk lock.	HP-G
16.	Inspect, remove and replace components of keyless lock/unlock devices and alarm systems.	HP-G
17.	Inspect, remove and replace components of electrical sunroof and convertible/retractable hard top.	HP-G
18.	Check operation of electrically heated mirrors, windshields, back lights, panels, etc.; determine needed repairs.	HP-I
19.	Demonstrate the proper self-grounding procedures for handling electronic components.	HP-I
20.	Check for module communication errors using a scan tool.	HP-G
21.	Use wiring diagrams and diagnostic flow charts during diagnosis of electrical circuit problems.	HP-G
22.	Demonstrate safe disarming techniques of high voltage systems on hybrid vehicles.	HP-G
23.	Identify potential safety and environmental concerns associated with hybrid vehicle systems.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

C. Brakes

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.	HP-I
2.	Identify, handle, store, and install appropriate brake fluids; dispose of in accordance with federal, state, and local regulations.	HP-G
3.	Bleed (manual, pressure, vacuum or surge) hydraulic brake system.	HP-I
4.	Pressure test brake hydraulic system; determine needed repair.	HP-G
5.	Adjust brake shoes; remove and reinstall brake drums or drum/hub assemblies	HP-I

and wheel bearings.

6.	Remove, clean and inspect caliper assembly and mountings for wear and damage; reinstall.	HP-I
7.	Check parking brake system operation.	HP-I
8.	Identify the proper procedures for handling brake dust.	HP-G
9.	Check for bent or damaged brake system components.	HP-G
10.	**Demonstrate an understanding of various types of advanced braking systems (ABS, hydraulic, electronic, traction control).**	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

D. Heating and Air Conditioning

1.	Identify and comply with environmental concerns relating to refrigerants and coolants.	HP-G
2.	Maintain and verify correct operation of certified refrigerant recovery and recharging equipment.	HP-G
3.	Locate and identify A/C system service ports.	HP-I
4.	Identify, recover, label and store refrigerant from A/C system.	HP-G
5.	Recycle refrigerant in accordance with EPA regulations.	HP-G
6.	Evacuate and recharge A/C system; check for leaks.	HP-I
7.	Identify oil type and maintain correct amount in A/C system.	HP-G
8.	Inspect, adjust, and replace A/C compressor drive belts; check pulley alignment.	HP-G
9.	Remove and replace A/C compressor; inspect, repair or replace A/C compressor mount.	HP-G
10.	Inspect, repair or replace A/C system mufflers, hoses, lines, fittings, orifice tube, expansion valve, and seals.	HP-G
11.	Inspect, test, and replace A/C system condenser and mounts.	HP-G
12.	Inspect and replace receiver/drier or accumulator/drier.	HP-G
13.	Inspect and repair A/C component wiring.	HP-G

14.	Demonstrate an understanding of safe handling procedures associated with high voltage A/C compressors and wiring.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

E. Cooling Systems

1.	Check engine cooling and heater system hoses and belts; determine needed repairs.	HP-I
2.	Inspect, test, remove, and replace radiator, pressure cap, coolant recovery system, and water pump.	HP-G
3.	Recover, refill, and bleed system with proper coolant and check level of protection; leak test system and dispose of materials in accordance with EPA specifications.	HP-I
4.	Remove, inspect and replace fan (both electrical and mechanical), fan sensors, fan pulley, fan clutch, and fan shroud; check operation.	HP-G
5.	Inspect, remove, and replace auxiliary oil/fluid coolers; check oil levels.	HP-G
6.	Demonstrate an understanding of hybrid cooling systems.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

F. Drive Train

1.	Remove, replace, and adjust shift or clutch linkage as required.	HP-G
2.	Remove, replace, and adjust cables or linkages for throttle valve (TV), kickdown, and accelerator pedal.	HP-G
3.	Remove and replace electronic sensors, wires, and connectors.	HP-G
4.	Remove and replace powertrain assembly; inspect, replace, and align powertrain mounts.	HP-G
5.	Remove and replace drive axle assembly.	HP-G
6.	Inspect, remove and replace half shafts and axle constant velocity (CV) joints.	HP-G
7.	Inspect, remove and replace drive shafts and universal joints.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

G. Fuel, Intake and Exhaust Systems

1.	Inspect, remove and replace exhaust pipes, mufflers, converters, resonators, tail pipes, and heat shields.	HP-G
2.	Inspect, remove and replace fuel tank, tank filter, cap, filler hose, pump/sending unit and inertia switch; inspect and replace fuel lines and hoses.	HP-G
3.	Inspect, remove and replace engine components of air intake systems.	HP-G
4.	Inspect, remove and replace canister, filter, vent, and purge lines of fuel vapor (EVAP) control systems.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

H. Restraint Systems

1.	Identify vehicle manufacturer's SRS recommended procedures before inspecting or replacing components.	HP-I
2.	Inspect, remove, and replace seatbelt and shoulder harness assembly and components.	HP-G
3.	Inspect restraint system mounting areas for damage; repair as needed.	HP-G
4.	Verify proper operation of seatbelt.	HP-I
5.	Deactivate and reactivate Supplemental Restraint System (SRS).	HP-G
6.	Inspect, remove and replace Supplemental Restraint Systems (SRS) sensors and wiring; ensure sensor orientation.	HP-G
7.	Verify that Supplemental Restraint System (SRS) is operational.	HP-I
8.	Inspect, remove, replace and dispose of deployed and non-deployed airbag(s) and pretensioners.	HP-G
9.	Use Diagnostic Trouble Codes (DTC) to diagnose and repair the Supplemental Restraint System (SRS).	HP-G
10.	Demonstrate an understanding of advanced restraint systems.	HP-G

PAINTING AND REFINISHING

For every task in Painting and Refinishing, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

IV. PAINTING AND REFINISHING

A. Safety Precautions

1.	Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.	HP-I
2.	Identify safety and personal health hazards according to OSHA guidelines and the "Right to Know Law".	HP-I
3.	Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards.	HP-I
4.	Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.	HP-I
5.	Select and use a NIOSH approved supplied air (Fresh Air Make-up) respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation	HP-I
6.	Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.).	HP-I

B. Surface Preparation

1.	Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.	HP-I
2.	Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants.	HP-I
		HP-I

3.	Inspect and identify substrate, type of finish, surface condition, and film thickness; develop and document a plan for refinishing using a total product system.	
4.	Strip paint to bare substrate (paint removal).	HP-I
5.	Dry or wet sand areas to be refinished.	HP-I
6.	Featheredge damaged areas to be refinished.	HP-I
7.	Apply suitable metal treatment or primer in accordance with total product systems.	HP-I
8.	Mask and protect other areas that will not be refinished.	HP-I
9.	Mix primer, primer-surfacer or primer-sealer.	HP-I
10.	Apply primer onto surface of repaired area.	HP-I
11.	Apply two-component finishing filler to minor surface imperfections.	HP-I
12.	Dry or wet sand area to which primer-surfacer has been applied.	HP-I
13.	Dry sand area to which two-component finishing filler has been applied.	HP-I
14.	Remove dust from area to be refinished, including cracks or moldings of adjacent areas.	HP-I
15.	Clean area to be refinished using a final cleaning solution.	HP-I
16.	Remove, with a tack rag, any dust or lint particles from the area to be refinished.	HP-I
17.	Apply suitable sealer to the area being refinished.	HP-I
18.	Scuff sand to remove nibs or imperfections from a sealer.	HP-I
19.	Apply stone chip resistant coating.	HP-G
20.	Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas.	HP-G
21.	Prepare adjacent panels for blending.	HP-I
22.	Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.	HP-I
23.	Identify aluminum parts to be refinished; determine the materials, preparation, and refinishing procedures.	HP-G

C. Spray Gun and Related Equipment Operation

1.	Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment).	HP-I
2.	Check and adjust spray gun operation for HVLP (high volume, low pressure) or compliant spray guns.	HP-I
3.	Set-up (fluid needle, nozzle, and cap), test, and adjust spray gun using fluid, air, and pattern control valves.	HP-I
4.	Demonstrate an understanding of the operation of pressure spray equipment.	HP-G

IV. PAINTING AND REFINISHING

D. Paint Mixing, Matching, and Applying

1.	Identify type and color code by manufacturer's vehicle information label.	HP-I
2.	Shake, stir, reduce, catalyze/activate, and strain refinish materials.	HP-I
3.	Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.	HP-I
4.	Apply selected product on test and let-down panel; check for color match.	HP-I
5.	Apply single stage topcoat.	HP-I
6.	Apply basecoat/clearcoat for panel blending or panel refinishing.	HP-I
7.	Apply basecoat/clearcoat for overall refinishing.	HP-G
8.	Remove nibs or imperfections from basecoat.	HP-I
9.	Refinish rigid or semi-rigid, and plastic parts.	HP-G
10.	Refinish flexible plastic parts.	HP-I
11.	Apply multi-stage coats for panel blending or overall refinishing.	HP-G
12.	Identify and mix paint using a formula.	HP-I
13.	Identify poor hiding colors; determine necessary action.	HP-G
14.	Tint color using formula to achieve a blendable match.	HP-I
15.	Identify alternative color formula to achieve a blendable match.	HP-I

IV. PAINTING AND REFINISHING

E. Paint Defects - Causes and Cures

1.	Identify blistering (raising of the paint surface, air entrapment); determine the cause(s) and correct the condition.	HP-G
2.	Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.	HP-G
3.	Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.	HP-G
4.	Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.	HP-I
5.	Identify lifting; determine the cause(s) and correct the condition.	HP-G
6.	Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.	HP-I
7.	Identify orange peel; determine the cause(s) and correct the condition.	HP-I
8.	Identify overspray; determine the cause(s) and correct the condition.	HP-I
9.	Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.	HP-G
10.	Identify sags and runs in paint surface; determine the cause(s) and correct the condition.	HP-I
11.	Identify sanding marks or sandscratch swelling; determine the cause(s) and correct the condition.	HP-G
12.	Identify contour mapping/edge mapping while finish is drying; determine the cause(s) and correct the condition.	HP-G
13.	Identify color difference (off-shade); determine the cause(s) and correct the condition.	HP-G
14.	Identify tape tracking; determine the cause(s) and correct the condition.	HP-G
15.	Identify low gloss condition; determine the cause(s) and correct the condition.	HP-G
16.	Identify poor adhesion; determine the cause(s) and correct the condition.	HP-G
17.	Identify paint cracking (shrinking, splitting, crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition.	HP-G

18.	Identify corrosion; determine the cause(s) and correct the condition.	HP-G
19.	Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.	HP-I
20.	Identify water spotting; determine the cause(s) and correct the condition.	HP-G
21.	Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.	HP-G
22.	Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition.	HP-G
23.	Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition.	HP-G
24.	Identify chalking (oxidation); determine the cause(s) and correct the condition.	HP-G
25.	Identify bleed-through (staining); determine the cause(s) and correct the condition.	HP-G
26.	Identify pin-holing; determine the cause(s) and correct the condition.	HP-G
27.	Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition.	HP-I
28.	Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.	HP-G

IV. PAINTING AND REFINISHING

F. Final Detail

1.	Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.	HP-G
2.	Buff and polish finish to remove defects as required.	HP-I
3.	Clean interior, exterior, and glass.	HP-I
4.	Clean body openings (door jambs and edges, etc.).	HP-I
5.	Remove overspray.	HP-I
6.	Perform pre-delivery detail and inspection.	HP-I

TASK LIST PRIORITY ITEM TOTALS (by area)

I. Structural Analysis and Damage Repair

HP-I	= 31 (includes 17 welding)	*95% = 29 tasks*
HP-G	= 31 (includes 2 welding)	*90% = 28 tasks*

II. Non-Structural Analysis and Damage Repair (Body Components)

HP-I	= 45 (includes 17 welding)	*95% = 43 tasks*
HP-G	= 19 (includes 2 welding)	*90% = 17 tasks*

III. Mechanical and Electrical Components

HP-I	= 33	*95% = 31 tasks*
HP-G	= 70	*90% = 63 tasks*

IV. Painting and Refinishing

HP-I	= 52	*95% = 49 tasks*
HP-G	= 30	*90% = 27 tasks*

TOOLS AND EQUIPMENT

Local employer needs and the availability of funds are key factors for determining each program's structure and operation. The NATEF Standards recognize that not all programs have the same needs, nor do all programs teach 100 % of the NATEF tasks. Therefore, the basic philosophy for the tools and equipment requirement is as follows: *for all tasks which are taught in the program, the training should be as thorough as possible with the tools and equipment necessary for those tasks*. In other words, if a program does not teach a particular task, the tool from the tool list associated with that task is not required (unless of course it is required for a task that is taught in another area).

The NATEF tool lists are organized into three basic categories*: Hand Tools, General Lab/Shop Equipment,* and *Specialty Tools and Equipment.* The specialty tools section is further separated into the five NATEF task categories. When referring to the tools and equipment list, please note the following:

1. The organization of the tool list is not intended to dictate how a program organizes its tool crib or student tool sets (i.e., which tools should be in a student set, if utilized, and which should be in the tool crib or shop area).
2. Quantities for each tool or piece of equipment are determined by the program needs; however, sufficient quantities to provide quality instruction should be on hand.
3. For *Specialty Tools and Equipment*, the program need only have those tools for the areas being accredited.
4. Programs may meet the equipment requirements by borrowing special equipment or providing for off-site instruction (e.g., in a dealership or independent repair shop). Use of borrowed or off-site equipment *must* be appropriately documented.
5. No specific brand names for tools and equipment are specified or required.
6. Although the NATEF Standards recommend that programs encourage their students to begin to build their own individual tools sets prior to entry into the industry, there is no requirement to do so. NOTE: Industry surveys indicate that most (90%) employers require that a candidate for employment provide his/her own basic hand tool set in order to be hired as an entry-level technician.

GENERAL LAB/SHOP EQUIPMENT

The tools and equipment on this list are used in general lab/shop work but are not generally considered to be individually owned hand tools. A well equipped, accredited program should have all of these general tools and equipment readily available, in proper working order, and in sufficient quantity and capacity to provide quality instruction.

GENERAL SHOP EQUIPMENT

Air Blow Guns - OSHA Standard
Air System - Air Compressor
Air Hoses - with quick release couplings
    Air Lines
    Regulator
    Water Extractors
Air Transformer/Regulators
Coolant Drain Pan
Corrosion Protection Application Equipment
Creepers
Exhaust Fans
Grounded Extension Cords
Heat Lamp
Jack Stands
Oil Drain/Storage Pan
Overhead Ventilation - for welding area
Powered Vehicle Mover (recommended)
Pressure Washer (optional)
Service Jacks
Shop Brooms
    Dust Pans
    Floor Squeegee
    Floor Mop and Bucket
Step Ladder
Storage Cabinets
Trash Cans in accordance with local, state, and federal regulations
Trouble/Work Lights – non-incandescent
Vacuum Cleaner
Work Benches – steel top with vice
Work Stands - portable
Wheel Caster System (Wheel Dollies)

SPECIAL SAFETY ITEMS
(All equipment must meet or exceed federal, state, and local regulations.)

Bloodborn Pathogen Kit
*****Ear Protection - for students, instructors, and visitors
Eye Wash Basin
Eye Wash Station, portable (saline)

Fire Extinguishers - by type as required
First Aid Kit (per written first aid policy)
Flammable Material Storage Locker - meeting fire and building codes
Hazardous Spill Response Kit
Lineman Gloves
OSHA "Right to Know" Compliance Kit
Protective Gloves and Clothing - for handling paint and related chemicals
Respiratory Protection Equipment – as required by OSHA
Safety Cans - for solvents, rags, etc.
*****Safety Glasses, Clear and Tinted Face Shields, and Goggles - for students, instructors, and visitors
*****Safety Shoes - as required
Safety Shower - as required
Vacuum System - for air sanders - dust extraction vacuum – stand alone or central system (recommended)

*** = Individual Student Items**

HAND TOOLS
(Contained in individual sets or the tool crib in sufficient quantities to permit efficient instruction)

COMMON HAND TOOLS

Adjustable Wrenches - 6" and 12"
Allen Wrench Set - Standard (.050" - 3/8")
Allen Wrench Set - Metric (2mm - 7mm)
Chisel Set
Combination Wrenches:
- Standard (1/4" - 1")
- Metric (7mm - 19mm)

Crowfoot Wrench Set - Metric (optional)
Crowfoot Wrench Set - Standard (optional)
Drill Motors - 3/8" and 1/2" variable speed, reversible
Flare Nut (tubing) Wrenches:

- Standard 3/8" - 3/4"
- Metric 10mm - 17mm

Flashlight and batteries
Hack Saw and blades
Hammers:
- 16 oz. Ball Peen
- Brass
- Dead Blow Mallet
- Plastic Tip
- Sledge
- Soft Faced
- Rubber Mallet

Ignition Wrench Set - Standard and Metric
Impact Wrenches - 3/8" and 1/2"
Inspection Mirror
Pickup Tool - magnetic and claw type
Pliers:
- Combination
- Hose Clamp
- Locking Jaw
- Needle Nose
- Side Cutting
- Slip Joint (Water Pump)
- Snap Ring Plier Set - internal and external

Punch Set
Screwdriver - Blade Type:
- Stubby
- 6", 9", 12"
- Offset

Screwdrivers - Phillips:
- Stubby #1, #2
- 6" #1, #2
- 12" #3
- Offset #2

Screwdrivers - Posidrive Set #1, #2, #3, #4
Torx® Set:
- T-8, T-10, T-15, T-20, T-25,
- T-27, T-30, T-40, T-50, T-55

Torx® External Set:
- E-4, E-5, E-6, E-8,
- E-10, E-12, E-14, E16

Torx® Tamper Proof Set:
- T8, T10, T15, T20, T27,
- T30, T40, T45, T50, T55

Screw Extractor Set
Screw Starter:
- Phillips
- Standard

Socket Set - 1/4" Drive:

- 1/4" - 1/2" Standard Depth
- 1/4" - 1/2" Deep
- 6mm - 12mm Standard Depth
- 6mm - 12mm Deep
- Flex/Universal Type - Metric (standard optional)
- Universal Joint
- 3", 6" Extensions
- Ratchet

Socket Set - 3/8" Drive:

- 5/16" - 3/4" Standard Depth (6 point) (optional)
- 3/8" - 3/4" Deep (6 point) (optional)
- 9mm - 19mm Standard Depth
- 9mm - 19mm Deep
- 3", 6", 12", 18" Extensions
- Flexhead Ratchet
- Impact Sockets - 3/8" - 3/4" Standard (optional)
- Impact Sockets - 10mm - 19mm
- Impact Driver
- Ratchet

- Universal Joint

Socket Set - 1/2" Drive:

- 7/16" - 1 1/8" Standard Depth (optional)
- 7/16" - 1 1/8" Deep (optional)
- 10mm - 25mm Standard Depth
- 10mm - 25mm Deep
- 5", 10" Extensions
- Flex Handle (Breaker Bar)
- Impact Sockets Standard 7/16" - 1 1/8" (optional)
- Impact Sockets 12mm - 32mm
- Impact Driver
- Ratchet

Torque Wrenches (Sound/Click)Type:

- 3/8" Drive in. lb. (30 - 250)
- 3/8" Drive ft. lb. (5 - 75)
- 1/2" Drive ft. lb. (50 - 250)

MISCELLANEOUS TOOLS

Caulking Gun
C-clamps - assorted
Files - for steel and aluminum
Gear Puller Set - heavy duty with attachments
Heat Gun
Hole Saw Set - 1/2" to 2"
Lug Wrench
Oil Can (Pump Type)
Pry Bar Set
Putty Knife
Rivet Guns - heavy duty blind and large for 3/16" and 1/4"
Sanding Tools - assorted
Scrapers
Scratch Awl
Tap and Die Sets - Metric (standard optional)
Tape Measure – Standard and Metric
Tin Snips
Tire Pressure Gauge
Tire Inflator
Twist Drill Sets:
- Standard - 1/64" - 1/4" by 1/16" and Metric Equivalent
- Standard - 1/4" - 1/2" by 1/16" and Metric Equivalent
- Wire Brushes - hand and powered

Special Removing and Releasing Tools:
- Door handle removing tool
- Door hinge spring and pin remover
- Miscellaneous interior and exterior trim removing tools
- Moulding removal tools
- Spring lock line removal tool set (A/C, fuel line, etc.)
- Stationary glass removal tools
- Windshield wiper removing tool

BODY WORKING TOOLS

Assorted files - for metal and plastic finishing, including:
- Body Files
- Body Filler Shaping Files (Cheese Grater/Shredder)
- Hand Sanding Pads
- Metal Files
- Sanding Blocks (short and long)
- Sanding Boards (short and long)

Body Hammers:
- Cross Chisel
- Door Skin Hammer
- General Purpose Pick
- Large Face Finishing

Long Pick
Short Utility Pick
Shrinking

Dollies:

Bumping File
Dinging Spoon
Door skin Dolly
Fender Dolly
Inside Heavy Duty Spoon
Inside High Crown
Inside Medium Crown
Spoon Dolly (“Dolly on a stick”)
Toe Dolly
Universal Dolly

Filler Spreaders and Applicators - assorted types and sizes

Picks - assorted

SPECIALTY TOOLS AND EQUIPMENT

This section covers the tools and equipment a lab/shop should have for training in any given specialty area. This equipment is specialized and it must be available in the lab/shop or to the program. No specific type or brand names are identified because they will vary in each local situation.

STRUCTURAL ANALYSIS AND DAMAGE REPAIR

Everything listed under Non-Structural Analysis and Damage Repair (Body Components) plus:

Frame/Unibody Straightening Equipment -
- Bench/rack or floor-mounted system with multiple pull capacity

Body over frame and unibody anchoring systems

Three-dimensional Measuring System with the capability to measure the total vehicle.

Tram Gauges

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

Abrasive Cut-off Tool and Discs
Anchoring System (recommended)
Heat Shrinking Tool
Car Lift (capable of totally lifting the vehicle) (recommended)
MIG Welders and accessories (flow meter, cart, gas cylinder, nozzle cleaner)
Plasma Cutting Torch (recommended)
Portable Hydraulic Ram - with attachments

Plastic and Adhesives Tools-
- Plastic Welder
- Die Grinding Tool Set
- Disc Grinder - 3"
  - Structural Adhesives Guns (dispenser) - two-component

Portable Power Tools -
- Abrasive Blaster and appropriate personal safety equipment (recommended)
- Eraser Wheel
- Grinders
- Metal Shears (optional)
- Nibbler (optional)
- Power Reciprocating Saw and Blades
- Sanders

Pulling and Holding Equipment Set - to include:
- Body Clamps (recommended)
- Cable or Chain Ratchet (recommended)

Safety Chains/Cables
Sill Clamps (recommended)
Slide Hammer - complete with attachments
Stationary Power Tools -
Bench Grinder
Drill Press (recommended)
Welding Safety Equipment - to include:
Aprons
Face Shields
Gloves
Goggles
Helmets
Jackets
Respirators
Safety Glasses
Skull Cap
Welding Blanket
And all appropriate safety equipment
Squeeze-type Resistant Spot Welder (STRSW) (recommended)
Weld-on Pulling Tool and Attachments

MECHANICAL AND ELECTRICAL COMPONENTS

Battery Charger - with boost capability
Battery Post Cleaner
Battery Terminal Pliers
Battery Terminal Puller
Brake Bleeder - vacuum assisted
Brake Spoon
Soldering Gun/Iron
Chassis Lubricator
Connector Pick Tool Set
Cooling System Pressure Tester
DMM (Digital Multimeter)
Feeler Gauge (Blade Type):
.002" - .040"
.006mm - .070mm
Flexible Dial Indicator Gauge
Jumper Wire Set (with various adapters)
Oil Filter Wrenches
Portable Battery Jump Box
Wheel Alignment System (4-wheel) (optional)
Wire and Terminal Repair Kit

PAINTING AND REFINISHING

Air Cap Test Gauge (optional)
Air Sanders
Color-matching Light System
Electronic Dry Film Thickness Gauge with a + or - of 1/10th of a mil thickness capabilities
Enclosed Paint Spray Booth to comply with local, state and federal regulation (downdraft booth recommended)
Hand Sanding Pads
Masking Equipment -
- Car Covers
- Paper and Tape Dispenser
- Wheel Covers

Paint Mixing Bank with Measuring Equipment
Paint Mixing Room (separate explosion-proof room per NFPA regulations)
Paint Shaker (optional)
Paint Storage Room/Locker in accordance with local, state, and federal regulations
Personal Safety Equipment (painting gloves, suits, hoods, respirators, etc.)
Portable Paint Curing Equipment (infrared)
Prep Station - (recommended) in accordance with local, state, and federal regulations
Sanding Blocks (short and long)
Sanding Sponges
Spray Guns -
- HVLP (high volume low pressure) or compliant

Spray gun cleaning equipment in accordance with local, state, and federal regulations
Squeegees (assorted sizes)
Supplied Air Respirator (SAR)
Variable Speed Buffer/Polisher
Waste disposal/recycle program in accordance with local, state, and federal regulations

APPLIED ACADEMICS AND WORKPLACE SKILLS

The following Applied Academic Skills general statements were developed in cooperation with the Vocational-Technical Education Consortium of States (V-TECS). The process involved using the NATEF task list and the Basic/Essential Skills Taxonomy developed at Arizona State University by Dr. Lester Snyder.

Committee meetings were held in Ft. Lauderdale, Florida and Pittsburgh, Pennsylvania. At each of the meetings, ASE Certified Collision Repair & Refinish technicians were used as experts in the automotive service industry. V-TECS used experts in three academic areas (language arts, mathematics, and science) to help the committees understand the specific definitions of the concepts used in the taxonomy.

The committees were asked to identify the academic skills required to perform each task listed in the collision repair & refinish areas. Their responses were recorded using the Basic/Essential Skills Taxonomy codes and were put into a database. After all the meetings were completed, a composite or unduplicated list of the codes was generated for language arts, mathematics, and science. Specific statements related to the use of the academic skill in the automotive industry were then written. A matrix was built to show the relationship between the composite list and each of the collision repair & refinish areas. The general statements included in this manual were developed from the specific statements. Several crosschecks and reviews were conducted to ensure the accuracy of the statement and the relationship to the NATEF task list.

The Workplace Skills List was generated by having the committees identify the workplace skills from the V-TECS/ILLINOIS WORKPLACE SKILLS LIST that are important for employment as a collision repair & refinish technician.

** The *Applied Academics and Workplace Skills for Collision Repair & Refinish Technicians* can be obtained on the NATEF website at www.natef.org. This manual includes the unduplicated list of applied academic skills in all areas, complete with statements of their use by collision repair & refinish technicians; the matrix; the definitions of the Basic/Essential Skills codes; the general statements; the Workplace Skills List; and the NATEF Task List.

The information in the book will provide a common vocabulary for instructors and administrators to use in achieving academic and vocational skill standards. This information can be used by programs to document the academic skills taught in collision repair & refinish technical classes. The examples for teaching an academic concept in an applied context will also be useful for schools when planning, designing, or writing curricula. **

Language Arts & Communications

NARRATIVE FOR LANGUAGE ARTS RELATED ACADEMIC SKILLS
for all
NATEF Collision Repair and Refinish Technician Task Lists

The collision repair and refinish technician must be proficient in the following Language Arts and Communications Related Academic Skills that are embedded in the occupation. Using these skills the technician must be able to:

- Request, collect, comprehend, evaluate, and apply oral and written information gathered from customers, associates, and supervisors regarding problem symptoms and potential solutions to problems.

- Identify the purpose for all written and oral communication and then choose the most effective strategies for listening, reading, speaking, and writing to facilitate the communication process.

- Adapt a reading strategy for all written materials, e.g. customer's notes, service manuals, shop manuals, technical bulletins, etc., relevant to problem identification, diagnosis, solution, and repair.

- Attend to verbal and nonverbal cues in discussions with customers, supervisors, and associates to verify, identify, and solve problems.

- Use study habits and techniques, i.e. previewing, scanning, skimming, taking notes, etc., when reviewing publications (shop manuals, references, databases, operator's manuals, and text resources) for problem solving, diagnosis, and repair.

- Use prior knowledge learned from solving similar problems to diagnose and repair specific problems.

- Write clear, concise, complete, and grammatically accurate sentences and paragraphs.

- Write warranty reports and work orders to include information regarding problem resolution and the results of the work performed for the customer or manufacturer.

- Comprehend and apply industry definitions and specifications to diagnose and solve problems in all systems and components of the automobile and light truck.

- Follow all oral/written directions that relate to the task or system under study.

- Comprehend and use problem-solving techniques and decision trees that are contained in service manuals and databases to determine cause-and-effect relationships.

- Scan service manuals and databases to locate specific information for problem-solving purposes.

- Use the service manual to identify the manufacturer's specifications for system parameters, operations, and potential malfunctions.

- Interpret charts, tables, or graphs to determine the manufacturer's specifications for systems operation to identify out-of-tolerance systems and subsystems.
- Supply clarifying information to customers, associates, parts suppliers, and supervisors.

Mathematics

NARRATIVE FOR MATHEMATICS RELATED ACADEMIC SKILLS
for all
NATEF Collision Repair and Refinish Technician Task Lists

The collision repair and refinish technician must be proficient in the following Mathematics-Related Academic Skills that are embedded in the occupation. Given these skills the technician must be able to:

- Determine the proper sequence of arithmetic operations that are needed to arrive at a solution that can be compared to other specifications when comparing system measurements or tolerances to the manufacturer's specifications.

- Add two or more whole numbers, fractions, or decimals to determine component conformance of multiple measurements with the manufacturer's specifications.

- Subtract whole numbers, fractions, or decimals to arrive at a difference for comparison with the manufacturer's specifications.

- Multiply whole numbers, fractions, or decimals to arrive at a solution for comparison with the manufacturer's specifications.

- Divide decimals to determine measurement conformance with the manufacturer's specifications.

- Convert variables presented orally to a mathematical form that allows for an algebraic solution.

- Estimate the results of basic arithmetic operations, and accurately round up or down depending on the appropriate rule for the situation.

- Analyze and solve problems requiring the use of fractions, decimals, ratios, or percentages by a direct or indirect variation of the numerical elements of the problem.

- Determine the irrelevant and/or missing data needed to solve a problem.

- Determine and interpret place value (tenths, hundredths, thousandths) when conducting precision measurements.

- Use Centigrade or Fahrenheit measurement scales to determine the existing temperature of substances such as a coolant, lubricant, compound, or finish material.

- Use English and metric volume measurement techniques to determine the volume of a system, component, or cylinder.

- Use conventional symbols (E for voltage, etc.) to solve circuit parameter calculations using formulas such as Ohm's Law, E=IR.

- Understand that if the described problem has certain conditions (symptoms), then a limited number of solutions to the problem apply.

- Understand the relationship between the frequency of the occurrence of a problem (symptom) and the probability of accurately predicting the problem.

- Calculate the average (mean) of several measurements to determine the variance from the manufacturer's specifications.

- Use English and metric angle and distance measurements and techniques to determine parallel lines, perpendicular lines, and angle variances from the manufacturer's specifications.

- Solve problems that involve determining the relative proportion of the desired versus undesired ingredients or elements of a mixture, and determine if that proportion is within the manufacturer's specifications.

- Comprehend and use standards defined by each manufacturer for the component or system being analyzed and repaired.

- Convert test readings that are in decimal or fraction form to a ratio or percent for comparison with the manufacturer's specifications for the sub-system under review.

- Know when to use an estimated performance value versus an exact value, basing the decision on the system being analyzed or repaired.

- Visually perceive the geometric relationship of systems and sub-systems that require alignment.

- Construct or interpret a chart, table, graph, or symbol that depicts a range of performance characteristics that can be used for comparing various system operational conditions.

- Use measurement devices to determine the parallelism or perpendicularity of chassis, suspension, and other vehicle components requiring geometric alignment.

- Use formulas to indirectly confirm that systems are outside of the manufacturer's specifications.

- Verify that the relationship between parallel lines and angles concurs with the manufacturer's specifications when diagnosing a system's malfunction.

- Formulate an angle visually and verify conformance to the manufacturer's specified angle.

- Measure timed or sequenced parameters to determine conformance with the manufacturer's specifications.

- Use English and metric scales to determine the conformance of components to the manufacturer's specified weight.

- Determine the degree of conformance to the manufacturer's specifications for length, volume, and other appropriate measurements in the English and/or metric system.

- Distinguish the congruence of the measured tolerances with those specified by the manufacturer.

- Measure and/or test with tools designed for English or metric measurements, then convert the result to the manufacturer's system used for specifying the correct measurement or tolerance.

- Compute mentally whether the observed measurement is out-of-tolerance when comparing the observed measurement to the manufacturer's specifications.

- Solve problems that involve determining whether the proportion of the existing volume or mixture compares to the manufacturer's specifications and is within the recommended tolerance.

- Distinguish whether a measurement or tolerance is equal or not equal to the manufacturer's specifications.

Science

NARRATIVE FOR SCIENCE RELATED ACADEMIC SKILLS
for all
NATEF Collision Repair and Refinish Technician Task Lists

The collision repair and refinish technician must be proficient in the following Science-Related Academic Skills that are imbedded in the occupation. Using these skills the technician must be able to:

- Analyze and evaluate waste products from the repair task and dispose of the parts, residue, or trash according to applicable federal, state, and local rules and regulations.

- Follow all safety regulations and procedures while performing any task.

- Use the information provided in service manuals, charts, tables, graphs, or databases to determine the manufacturer's specifications for system(s) operation(s) and the appropriate repair/replacement part and/or procedure.

- Develop a hypothesis regarding the cause of the problem and test the hypothesis to determine the solution to the problem.
    1. identify the problem
    2. gather information
    3. develop hypothesis
    4. take action
    5. check results

- Convert measurements taken using the English or metric system to specifications stated in terms of either system.

- Demonstrate an understanding of the chemical reaction that occurs in various compounds and substances used in the automobile.

- Explain the role an additive or catalyst plays in the mixing of fillers or finishes for use on the automobile body.

- Describe and explain the role that pigmentation plays in determining the specific shade of an automobile body or interior component color.

- Demonstrate an understanding of the total color spectrum by explaining the roles different colors play in different mixtures and finishes.

- Explain how various forms of energy are dissipated throughout the body based on the momentum of the vehicle at the time of impact.

- Explain the principles of force as it applies to the realignment of components.

- Demonstrate an understanding of the role of balanced and unbalanced forces on linear or rotating vehicle assemblies.
- Explain how the velocity of an object in motion impacts on another object.
- Explain how the rate of a force in motion can impact on an automobile body.
- Demonstrate an understanding of the concept of pressure in relation to the concept of using force to realign a component.
- Explain the concept of heat transfer in terms of conduction, convection, and radiation in various automotive systems.
- Demonstrate an understanding of the expansion and contraction of system parts as a result of heat generated during use and the cooling down of the system when not in operation.
- Demonstrate an understanding of the effect that adding heat will cause in a state of matter, such as changing a solid to a liquid to a gas.
- Explain the role of insulation in maintaining stable temperatures or preventing the transfer of heat to an unwanted area.
- Explain the difference between heat and temperature and demonstrate an understanding of how to measure each in different situations.
- Explain how the angle or amount of light can impact on the appearance of a given finish in terms of texture and quality of finish.
- Explain color and shades of color based on how light hits or passes through it.
- Explain the difference between the principles of translucent light (diffuses) as contrasted to transparent light (passes through).
- Explain how ultraviolet rays can cause a finish or substance to deteriorate.
- Demonstrate an understanding of refraction in fiber optic systems.
- Explain that dyes added to fluids fluoresce under ultraviolet light and provide a process for determining the source of leakage in a system.
- Explain in detail the three states of matter.

- Explain to a customer how sound can be amplified due to resonant cavities and other physical characteristics of the vehicle.

- Explain and demonstrate an understanding of how sound generated in one place in the body and engine can be carried to other parts of the engine through metal and other materials.

- Explain the need for sound deadening and vibration damping materials to control the level of sound in the passenger compartment.

- Demonstrate an understanding of the relationship of perceived intensity to decibel level of a noise.

- Demonstrate an understanding of the types of vibrations caused by out-of-balance or excessively worn systems.

- Explain and demonstrate an understanding of the role of listening to sounds as part of the trouble-shooting process.

- Explain that the presence of overtones may indicate changes in the vibrations of various systems.

- Demonstrate an understanding of and discuss relative humidity in terms of effect on paint and substance applications.

- Explain how levers and pulleys can be used to increase an applied force or distance.

- Identify the effect of the pH of a solution on chemical changes in a system.

- Identify the characteristics that define a component or system that is operating within the manufacturer's specifications.

- Use precision measuring devices to determine if replaced components are within the manufacturer's specifications, and to assure that repair or replacement parts meet the manufacturer's specifications.

- Use tension gauges, such as a torque wrench, to measure the force or tension required to tighten connections to the manufacturer's specifications.

- Use a scale to measure component weight in order to mix an adhesive or to determine the strength and integrity of a component or part.

- Use pressure measuring tools to determine pressures in hydraulic or pneumatic paint systems and compare to the manufacturer's specifications.

- Use direct and indirect methods to measure system temperatures and then convert to Fahrenheit/Centigrade as required for proper cure and application times.

- Use direct and indirect methods to measure application times and compare the results to the manufacturer's specifications.

- Use direct and indirect methods to measure the volume of liquids in a mixture or compound.

- Use computer databases for information retrieval and input devices to process information for customers, billing purposes, warranty work, and other record-keeping purposes.

- Explain how an applied force at one location can be transmitted via fluid pressure to provide a force at a remote location.

- Explain to the customer the need for lubrication of adjacent parts to minimize friction as a result of movement at the junction of the parts.

- Explain the criticality of metals with different hardness, depending on the function and location of the metal as well as how fillers and finishes adhere to metal.

- Explain the necessity of knowing that the hardness of a metal determines, in part, its function and location in the automobile.

- Explain the dynamic control properties of a hydraulic system.

- Explain the surface processes that occur on system seals due to the absorption of the contained materials.

- Demonstrate an understanding of how torque relates to force and angular acceleration.

- Demonstrate an understanding of how cams, pulleys, and levers are used to multiply force or transfer directions of force.

- Explain how rotational motion is changed to linear motion and the need for balance in rotating systems.

- Demonstrate an understanding of how variances in flow rate will effect operation of pneumatic tools and equipment.

- Explain the dynamic control properties of a hydraulic system in terms of its impact on spray patterns, volume, etc.

- Explain the surface process that occurs on system seals due to absorption of the contained materials.

- Demonstrate an understanding of how a contaminated liquid can cause a chemical reaction, which can result in the deterioration of the finish or a plastic component.

- Use precision gauges or instruments to measure the flow rate of air in a painting application.

- Demonstrate an understanding of how variances in flow rate can effect the spray patterns, thickness of coat, etc., in the finishing process.

- Correctly use proportions and ratios in mixing fillers, finishes, and other substances.

- Explain the role that acids and bases have in altering compounds used on or in the automobile.

- Understand the use and safety requirements of all solvents used in an automotive application.

- Demonstrate an understanding of how surface processes and cohesive/adhesive forces aid in glues, tapes, and sealants.

- Identify the physical properties of an automobile component or system that are made of glass or plastic.

- Describe or explain the role that activators have in causing a change in the chemical state of a compound or filler.

- Explain fluid viscosity as a measurement and why it is important to the application of fillers, plastics, and finishes.

- Locate and explain the properties of a given source of light.

- **Electrical/Tolerances**

- Explain and demonstrate an understanding of the properties of electricity that impact the lighting, engine management, and other electrical systems in the vehicle.

- Demonstrate an understanding of the characteristics of a quality electrical ground and explain the problems associated with an inadequate electrical circuit ground.

- Explain voltage and current flow in series and parallel circuits.

- Demonstrate an understanding of the processes used to locate a short circuit in the electrical/electronic system.

- Demonstrate an understanding of the role of the alternator in maintaining battery and system voltage.

- Demonstrate an understanding of the role of solar panels in maintaining battery voltage and operating selected accessories.

- Explain and demonstrate an understanding of the ignition coil's role in generating the high voltages required to fire a sparkplug.

- Demonstrate an understanding of the correct procedure used to measure the electrical parameters of voltage, current, resistance, or power.

- Explain and demonstrate an understanding of the role of a fuse or fusible link as a protective device in an electrical or electronic circuit.

- Explain and demonstrate an understanding of the use of Ohm's Law in verifying circuit parameters (resistance, voltage, amperage).

- Explain and demonstrate an understanding of the relationship of resistance to heat, voltage drop, and circuit parameters.

- Explain and demonstrate an understanding of system voltage generation, uses, and characteristics.

- Demonstrate an understanding of the ion transfer process that occurs in an automotive battery.

- Explain the effect of oxidation on electrical connections as well as on an automotive finish.

- Explain the effect of magnetic fields on unshielded circuits and voltages induced in other circuits by the magnetic fields.

- Explain how attaching magnets to an automobile body can cause paint to be evenly distributed through the principles of magnetism.

- Explain the conductivity problems in a circuit when connectors corrode due to electrochemical reactions.

- Explain the relationship between electrical current in a conductor and the magnetic field produced in a coil such as the starter solenoid.

- Explain the ability of a coil to increase battery voltage to the level required to fire a sparkplug.
- Explain the effect of magnetic fields on unshielded circuits in selected control modules.
- Explain the need for a specific gravity test of battery electrolyte to determine charge.
- Use precision electrical test equipment to measure current, voltage, resistance, continuity, and/or power.
- Demonstrate an understanding of the role of capacitance in timer circuits, such as RC timers or MAP sensors, where the changing manifold pressure causes two metal discs to act like a capacitor by sending varying voltage to the electronic engine control system.
- Demonstrate an understanding of the capacity of semiconductor devices to modify rapidly engine operation parameters depending on multiple inputs from engine operational sensors.
- Explain how the movement of a conductor in a magnetic field can generate electricity.
- Demonstrate an understanding of the role of mechanical transducers in sending electrical control signals to modify system operating characteristics.
- Demonstrate an understanding of the purpose of photocells and measurement processes relative to determining output.

Workplace Skills

IDENTIFIED AS BEING IMPORTANT BY THE NATEF COLLISION REPAIR AND REFINISH TECHNICIANS RELATED ACADEMIC SKILLS COMMITTEE FROM THE V-TECS/ILLINOIS WORKPLACE SKILLS LIST

A. DEVELOPING AN EMPLOYMENT PLAN

1. Match aptitudes and interest to employment area.
2. Match attitudes to a job area.
3. Match personality type to job area.
4. Match physical capabilities to a job area.
5. Demonstrate a drug-free status.

B. SEEKING AND APPLYING FOR EMPLOYMENT OPPORTUNITIES

1. Locate employment opportunities.
2. Identify job requirements.
3. Locate resources for finding employment.
4. Prepare a resume.
5. Identify conditions for employment.
6. Evaluate job opportunities.
7. Identify steps in applying for a job.
8. Complete job application form.
9. Identify attire for job interview.

C. ACCEPTING EMPLOYMENT

1. Apply for social security number.
2. Complete state and federal tax forms.
3. Accept or reject employment offer.
3. Complete employees withholding allowance certificate Form W-4.

D. COMMUNICATING ON THE JOB

1. Communicate orally with others.
2. Use telephone etiquette.
3. Prepare written communication.
4. Follow written directions.
5. Ask questions about task.

E. INTERPRETING THE ECONOMICS OF WORK

1. Describe responsibilities of employee.
2. Describe responsibilities of employer or management.
3. Investigate opportunities and options for business ownership.
4. Assess entrepreneurial skills.

F. MAINTAINING PROFESSIONALISM

1. Assess business image and products/services.
2. Identify positive behavior.
3. Identify company dress and appearance standards.
4. Participate in meetings.
5. Identify work-related terminology.
6. Identify how to treat people with respect.

G. ADAPTING/COPING WITH CHANGE

1. Identify the elements of the job transition.
2. Formulate transition plan.
3. Exhibit ability to handle stress.
4. Recognize need to change or quit a job.
5. Write a letter of resignation.

H. SOLVING PROBLEMS AND CRITICAL THINKING

1. Identify the problem.
2. Clarify purposes and goals.
3. Identify solutions to the problem and their impact.
4. Employ reasoning skills.
5. Evaluate options.
6. Set priorities.
7. Select and implement a solution to a problem.
8. Evaluate results of implemented options.
9. Organize workloads.
10. Access employer and employee responsibility in solving a problem.

I. MAINTAINING SAFE AND HEALTHY ENVIRONMENT

1. Identify safety and health rules/procedures.
2. Demonstrate the knowledge of equipment in the work place.
3. Identify conservation and environmental practices and policies.
4. Act during emergencies.
5. Maintain work area.
6. Identify hazardous substances in the work place.

J. DEMONSTRATING WORK ETHICS AND BEHAVIOR

1. Identify established rules, regulations and policies.
2. Practice cost effectiveness.
3. Practice time management.
4. Assume responsibility for decisions and actions.
5. Exhibit pride.
6. Display initiative.
7. Demonstrate willingness to learn.
8. Identify the value of maintaining regular attendance.
9. Apply ethical reasoning.

K. DEMONSTRATING TECHNOLOGY LITERACY

1. Demonstrate basic keyboarding skills.
2. Demonstrate basic knowledge of computing.
3. Recognize impact of technological changes on tasks and people.

L. MAINTAINING INTERPERSONAL RELATIONSHIPS

1. Value individual diversity.
2. Respond to praise or criticism.
3. Provide constructive praise or criticism.
4. Channel and control emotional reactions.
5. Resolve conflicts.
6. Display a positive attitude.

M. DEMONSTRATING TEAM WORK

1. Identify style of leadership used in team work.
2. Match team member's skills and group activity.
3. Work with team members.
4. Complete a team task.
5. Evaluate outcomes.