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 four NATEF task categories. When referring to the tools and equipment list, please note the following:

A. 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).

B. 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.

C. For Specialty Tools and Equipment, the program need only have those tools for the areas being accredited.

D. 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.

E. No specific brand names for tools and equipment are specified or required.

F. 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
Hood Props
Infrared Contact Thermometer
Jack Stands
Nozzle
Oil Drain/Storage Pan
Overhead Ventilation - for welding area
Part Cart
Powered Vehicle Mover (recommended)
Pressure Washer (optional)
Shammies
Service Jacks
Shop Brooms
    Dust Pans
    Floor Squeegee
    Floor Mop and Bucket
Sponges
Step Ladder
Storage Cabinets
Towels
Trash Cans in accordance with local, state, and federal regulations
Trouble/Work Lights – non-incandescent
Vacuum Cleaner

Aluminum Dust Extraction System – Wet Mix Technology (Optional)
Water Hose
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 (for use with hybrid vehicles)
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") (optional)
    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" (optional)
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 (optional) 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,
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 (optional)
- 1/4" - 1/2" Deep
- 6mm - 12mm Standard Depth (optional)
- 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)
- 5/16" - 3/4" Deep (6 point) (optional)
- 9mm - 19mm Standard Depth (optional)
- 9mm - 19mm Deep
- 3", 6", 12", 18" Extensions
- Flexhead Ratchet
- 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 (optional)
- 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
Drill with applicable bits for spot weld removal (carbide)
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)
Panel Splitter (hand held blades/accessories)
Pry Bar Set
Putty Knife
Rivet Guns - heavy duty blind and large for 3/16” and 1/4”
Sanding Tools - assorted
Scrappers
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
  Hand Sanding Pads
  Metal Files
  Mixing Board
  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

**ALUMINUM REPAIR TOOLS (RECOMMENDED)**

Abrasives
Belt Piercing Rivet Guns
Dedicated (Clean) Repair Station
Dent Pulling Equipment
Dollies
GMAW Welder Synergic Pulse
Hammers
Wet Mix Technology Dust Extraction System
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 unibodyanchoring 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)
- GMAW 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
- Heat Monitoring Crayons
- Hole Punch
- Metal Shears (optional)
- Mini Belt Sander for removal of plug welds
- Nibbler (optional)
- Power Reciprocating Saw and Blades
Sanders
Spot Weld Removal Tool
Pulling and Holding Equipment Set - to include:
   Body Clamps (recommended)
   Cable or Chain Ratchet (recommended)
   Carbide Bits
   Panel Splitter
   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
   **Welding Pliers**
   And all appropriate safety equipment
Squeeze-type Resistant Spot Welder (STRSW) (recommended)
Weld-on Pulling Tool and Attachments

**MECHANICAL AND ELECTRICAL COMPONENTS**

A/C Recycle/Recovery Machine
Battery Charger - with boost capability
Battery Post Cleaner
Battery Terminal Pliers
Battery Terminal Puller
Brake Bleeder - vacuum assisted
Brake Spoon
Chassis Lubricator
Connector Pick Tool Set
**Coolant Tester**
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)
Laptop with applicable Diagnostic Software and Tools
Oil Filter Wrenches
Plugs and Caps for hydraulic, fluid, and A/C lines
Portable Battery Jump Box
Pressure Bleeder/Scan Box for bleeding antilock braking system
Scan Tool with OBDII capabilities
Soldering Gun/Iron
Vac and Fill equipment to extract fluids (oil, transmission, etc.)
Wheel Alignment System (4-wheel) (optional)
Wire and Terminal Repair Kit

PAINTING AND REFINISHING

Air Amplifier/Venturi style blower used to dry waterborne paint (optional)
Air Cap Test Gauge (optional)
Power 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)

Gun Washer for Waterbase (Optional)
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
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)
Positive Pressure Air Respirator
Prep Station - (recommended) in accordance with local, state, and federal regulations
Sanding Blocks (short and long)
Spray Guns -
  HVLP (high volume low pressure) or compliant
Spray gun cleaning equipment in accordance with local, state, and federal regulations
UV Curing Light (optional)
Variable Speed Buffer/Polisher

Viscosity Cups
Waste disposal/recycle program in accordance with local, state, and federal regulation

Waterborne Spray Gun Equipment (Optional)
DEFINITIONS – TECHNICAL TERMS

ABRADE – (see SAND).

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 contaminants 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 belt, 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.

PLAN – (see DEVELOP)

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

REALIGN – (see ALIGN)

REDUCE – To lower the viscosity of a refinishing material.

REFILL – (see FILL)
REFINISH – To apply cleaners, paint, and other finishing materials to the repair areas.

REINSTALL – (see INSTALL)

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 (ABRADE) – 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.

SUBSTRATE – A painted, primed or bare surface.

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.