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ABSTRACT

This document, which is intended as a guide for work force preparation program providers, details the Illinois occupational skill standards for programs preparing students for employment in occupations in the automotive technician cluster. The document begins with overviews of the Illinois perspective on occupational skill standards and credentialing, the process used to develop the skill standards, and assumptions underlying the standards. Presented next are skill standards for 68 tasks performed by automotive technicians. Each skill standard statement contains the following components: (1) the actual skill standard (including the conditions of performance, work to be performed, and performance criteria); (2) performance elements and assessment criteria; and (3) a recommended assessment and credentialing approach. The 68 tasks covered are all related to diagnosing, repairing, and maintaining the following automotive systems and components: engines; automatic transmissions and transaxles; manual drive trains and axles; suspensions and steering; brakes; electrical/electronic equipment; and heating and air conditioning. The following items are appended: glossary;

list of Illinois Occupational Skill Standards and Credentialing Council members; list of Transportation, Distribution, and Logistics Subcouncil members; list of Mechanical Drafting Cluster Standards Development Committee members; Transportation, Distribution, and Logistics Subcouncil Automotive Technician Cluster skill standards recognition proposal; and list of necessary workplace skills. (MN)

ILLINOIS

OCCUPATIONAL SKILL STANDARDS

AUTOMOTIVE TECHNICIAN CLUSTER

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ILLINOIS OCCUPATIONAL SKILL STANDARDS

AUTOMOTIVE TECHNICIAN CLUSTER

Endorsed for Illinois
by the
Illinois Occupational Skill Standards and
Credentialing Council

MESSAGE TO ILLINOIS CITIZENS

Dear Citizens of Illinois:

Preparing youth and adults to enter the workforce and to be able to contribute to society throughout their lives is critical to the economy of Illinois. Public and private interest in establishing national and state systems of industry-driven skill standards and credentials is growing in the United States, especially for occupations that require less than a four-year college degree. This interest stems from the understanding that the United States will increasingly compete internationally and the need to increase the skills and productivity of the front-line workforce. The major purpose of skill standards is to promote education and training investment and ensure that this education and training enables students and workers to meet industry standards that are benchmarked to our major international competitors.

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) has been working with industry subcouncils, the Illinois State Board of Education and other partnering agencies to adopt, adapt and/or develop skill standards for high-demand occupations. Skill standards products are being developed for a myriad of industries, occupational clusters and occupations. This document represents the collaborative effort of the Transportation Subcouncil, and the Automotive Technician Cluster Standards Development Committee.

These skill standards will serve as a guide to workforce preparation program providers in defining content for their programs and to employers to establish the skills and standards necessary for job acquisition. These standards will also serve as a mechanism for communication among education, business, industry and labor.

We encourage you to review these standards and share your comments. This effort has involved a great many people from business, industry and labor. Comments regarding their usefulness in curriculum and assessment design, as well as your needs for in-service and technical assistance in their implementation are critical to our efforts to move forward and improve the documents.

Questions concerning this document may be directed to:

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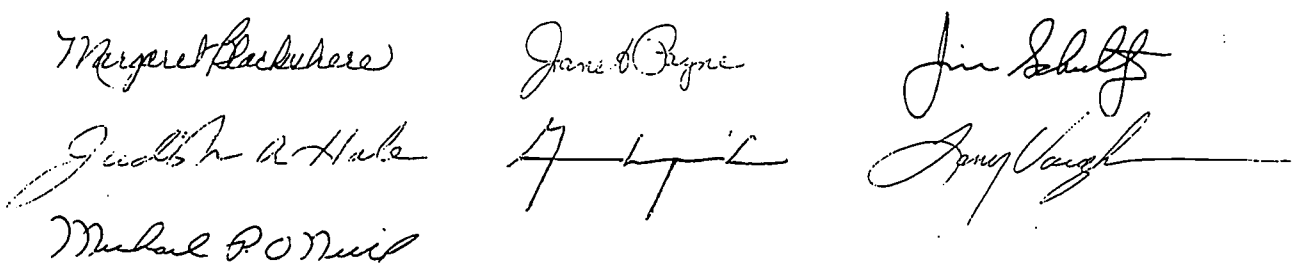
We look forward to your comments.

Sincerely,

The Members of the IOSSCC



THE ILLINOIS PERSPECTIVE

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) endorses occupational skill standards and credentialing systems for occupations that (a) require basic workplace skills and technical training, (b) provide a large number of jobs with either moderate or high earnings, and (c) provide career advancement opportunities to related occupations with moderate or high earnings. The nine-member Council was established by the Occupational Skill Standards Act (PA 87-1210). The Council, representing business, industry and labor and working with the Illinois State Board of Education in partnership with the Illinois Community College Board, Illinois Board of Higher Education, Illinois Department of Employment Security and Illinois Department of Commerce and Community Affairs, has created a common vision for workforce development in Illinois.

Vision

It is the vision of the IOSSCC to develop a statewide system of industry-defined and recognized skill standards and credentials for all major skilled occupations providing strong employment and earnings opportunities in Illinois. Information related to occupational employment and earning opportunities is determined by the Illinois Occupational Information Coordinating Committee (IOICC) in cooperation with business and industry.

Subcouncils and Standards Development Committees

Under the direction of the Council, and in cooperation with organizations such as the Illinois Chamber of Commerce, the Illinois AFL-CIO, the Illinois Manufacturers' Association, and others, Industry Subcouncils have been formed to review, approve and promote occupational skill standards and credentialing systems. The Industry Subcouncils are Agriculture and Natural Resources; Applied Science and Engineering*; Business and Administrative Information Services; Communications/Information Technology; Construction*; Education and Training Services*; Energy and Utilities*; Financial Services; Health and Social Services; Hospitality; Legal and Protective Services*; Manufacturing; Marketing and Retail Trade; and Transportation, Distribution and Logistics. (*Subcouncils currently being formed.)

The Standards Development Committees, composed of business, labor and education representatives, are experts in the related occupational cluster and work with the product developer to

- Develop or validate occupational skill standards;
- Identify related academic skills;
- Develop or review assessment or credentialing approaches; and
- Recommend endorsement of the standards and credentialing system to the industry subcouncil.

EXPECTED BENEFITS FOR EMPLOYERS, EDUCATORS, STUDENTS AND WORKERS

Occupational skill standards and credentialing systems are being developed and promoted by the IOSSCC to improve Illinois' competitiveness. Such standards and credentialing systems provide a common language for employers, workers, students and education and training providers to communicate skill requirements and quality expectations for all major industry and occupational areas.

For Employers, skill standards will

- Improve employee recruitment and retention by more clearly identifying skill requirements;
- Encourage improved responsiveness and performance of education and training providers;
- Enlarge the pool of skilled workers; and
- Focus attention on the importance of training investment.

For Education and Training Providers, skill standards will

- Provide information on all major industries and occupations;
- Contribute to program and curriculum development;
- Strengthen relationships between educators and training providers; and
- Improve career planning.

For Students and Workers, skill standards will

- Foster better decision making concerning careers and the training necessary to acquire well-paying jobs;
- Allow more effective communication with employers about what they know and can do; and
- Allow more effective work with employers in career development and skill upgrading.

IOSSCC REQUIREMENTS FOR OCCUPATIONAL SKILL STANDARDS

Any occupational skill standards and credentialing system seeking IOSSCC endorsement must

- Represent an occupation or occupational cluster that meets the criteria for IOSSCC endorsement;
- Address both content and performance standards for critical work functions and activities for an occupation or occupational area;
- Ensure formal validation and endorsement by a representative group of employers and workers within an industry;
- Provide for review, modification and revalidation by an industry group a minimum of once every five years;
- Award credentials based on assessment approaches that are supported and endorsed by the industry and consistent with nationally recognized guidelines for validity and reliability;
- Provide widespread access and information to the general public in Illinois; and
- Include marketing and promotion by the industry in cooperation with the partner state agencies.

DEFINITIONS AND ENDORSEMENT CRITERIA

The definitions and endorsement criteria are designed to promote the integration of existing and future industry-recognized standards, as well as the integration of the Illinois academic and occupational skill standards. Because all skill standards must address the critical work functions and activities for an occupation or industry/occupational area, the Council further defined three major components:

- ***Conditions of Performance:*** The information, tools, equipment and other resources provided to a person for a work performance.
- ***Statement of Work:*** A description of the work to be performed by a person.
- ***Performance Criteria:*** The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance), process or procedural requirements (e.g., safety, standard professional procedures) and time and resource requirements.

The IOSSCC is currently working with the Illinois State Board of Education and other state agencies to integrate the occupational standards with the Illinois Learning Standards which describe what students should know and be able to do as a result of their education. The Council is also working to integrate workplace skills—problem solving, critical thinking, teamwork, etc.—with both the Learning Standards and the Occupational Skill Standards.

The Illinois Model

Illinois Occupational Skill Standards describe what people should know and be able to do and how well these skills and knowledge will be demonstrated in an occupational setting. They focus on the most critical work performances for an occupation or occupational area. As seen in the following model, Illinois Occupational Skill Standards contain at least these areas:

- Performance Area
- Performance Skill
- Skill Standard
- Performance Elements
- Performance Assessment Criteria

Illinois Occupational Skill Standards also carry a coding at the top of each page identifying the state, fiscal year in which standards were endorsed, subcouncil abbreviation, cluster abbreviation and standard number. For example, the twenty-fifth skill standard in the Automotive Technician Cluster, which has been developed by the Transportation Subcouncil, would carry the following coding: IL.00.TRANS.AT.25.

A model for Illinois Occupational Skill Standards showing the placement of the coding and providing a description of each area within a standard is contained on the following page.

SUMMARY OF WORK TO BE PERFORMED. SUMMARY IS BRIEF AND BEGINS WITH AN ACTION VERB.

IL.FY.SUBCOUNCIL. CLUSTER. STANDARD NO.

PERFORMANCE AREA

SKILL STANDARD

CONDITIONS OF PERFORMANCE

A comprehensive listing of the information, tools, equipment and other resources provided to the person(s) performing the work.

WORK TO BE PERFORMED

An overview of the work to be performed in demonstrating the performance skill standard. This overview should address the major components of the performance. The detailed elements or steps of the performance are listed under "Performance Elements."

PERFORMANCE CRITERIA

The assessment criteria used to evaluate whether the performance meets the standard. Performance criteria specify product/outcome characteristics (e.g., accuracy levels, appearance, results, etc.) and process or procedure requirements (e.g., safety requirements, time requirements, etc.).

PERFORMANCE ELEMENTS

Description of the major elements or steps of the overall performance and any special assessment criteria associated with each element.

PERFORMANCE ASSESSMENT CRITERIA

Listing of required testing, certification and/or licensing.

Product and process used to evaluate the performance of the standard.

PRODUCT

Description of the product resulting from the performance of the skill standard.

PROCESS

Listing of steps from the Performance Elements which must be performed or the required order or performance for meeting the standard.

DEVELOPMENTAL PROCESS

After studying labor market information, the Transportation, Distribution and Logistics Subcouncil recommended that an automotive technician cluster be an occupational area for which performance skill standards would be developed. This cluster meets the criteria established by the Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) for performance skill standard development, education and training requirements, employment opportunities, earnings potential and/or career opportunities. The careers identified in the automotive technician cluster include entry level and journeyperson technician occupations which include engine specialist, transmission/drivetrain specialist, under car specialist, electrical specialist, HVAC specialist, and driveability specialist. A product developer (ASE Master Certified) knowledgeable with the automotive technician cluster began the process of performance skill identification. Given the range of skill between the entry level and journeyperson occupations, the initial charge for the product developer was to prepare an organizational framework that would address the major skills expected in the workplace.

Written job descriptions and competencies found in related educational program materials, textbooks, and a listing of national standards were solicited and received. Common and accepted references provided reinforcement for the direction given in the framework.

The National Automotive Technicians Education Foundation, Inc. (NATEF) was given the opportunity to provide input in the development of the Automotive Technician Skill Standards. In a letter dated June 24, 1999, the NATEF Administrative Director wrote

> *The sample breakdown of the task and the layout of the performance area provided to me appear outstanding. The additional information on performance criteria and performance elements should be an excellent guide for instructors seeking to be thorough in the training they provide. It should also prove useful to students who want to ensure they are receiving the proper training and to prospective employers who wish to know what the students are being taught. One of the questions we often receive surrounding the NATEF task list is "Ok, now what do I do with this?" Your format answers the questions handily and guides any interested party through the process of what needs to be done to accomplish a given learning task. With the detail provided and the extra 'how-to' information included with each task, it appears this document will be an excellent resource to instructors, students, employers and the public at large.*

In order to align the Illinois Occupational Skill Standards with the ASE/NATEF task lists, ASE tasks, ASE codes and ASE priorities were incorporated throughout the skills. Once it was confirmed that the project was aligned with industry accepted national standards, a standards development committee composed of auto technicians, shop owners and a dealership service manager, all representing large and small businesses throughout the state was established. The framework and initial outline of performance skills were presented to the Standards Development Committee for review, adjustment and/or validation. Work then continued on the development of the skill standards statements and the elements/assessment criteria in accordance with the direction established by the IOSSCC. The product developer submitted a draft of the performance skill standards to the Standards Development Committee which met during three one-day sessions to review and revise the standards. Educators joined the Standards Development Committee at a fourth meeting to review consistency in terminology and the assessment criteria. The assessment criteria include a product statement that indicates the outcome or end result of performing the skill. A process statement is included for the skill standards to identify the steps of performance that are critical to the outcome and/or the specific sequence that must be followed. Throughout the developmental process, the ASE code and ASE priority were included in the performance elements in parentheses behind each ASE task. A chart that cross-referenced Illinois Occupational Skill Standards and ASE/NATEF tasks (Attachment A) was also developed.

The skill standards describe the skill only and do not detail the background knowledge or theory related to the particular skill base. Performance elements and assessment criteria were developed using standard reference texts. The criteria are behavioral statements of skill standards. As such, they serve as an evaluation tool and workplace guide but are not a prescription for curriculum. An entry level technician is expected to have a general knowledge of all areas and must have graduated from a technical school. The Standards Development Committee described journeyperson technicians as having a minimum of five years experience and at least ASE certification in the specialty area(s). It is highly recommended for an automotive technician to be ASE certified; however, it is not mandatory.

A complete set of skill standards statements was provided to the Transportation, Distribution and Logistics Subcouncil. Several members of the subcouncil shared the document with automotive technicians outside of the standards development committee and subcouncil. The industry representatives felt the document was a quality product that would be useful in the automotive technician field. A copy of the product was also sent to Mary Hutchinson, NATEF, for final review. The Subcouncil approved and recommended that the standards be endorsed by the IOSSCC. A statement of assumptions accompanies this document to provide context for the standards document.

ASSUMPTIONS FOR AUTOMOTIVE TECHNICIAN CLUSTER STANDARDS

Theory instruction and hands-on performance of all the basic tasks will provide initial training for employment in the automotive service field or further training in any or all of the specialty areas. Competency in the tasks will indicate to employers that the graduate is skilled in that area.

Skill standards statements assume:

1. Workplace skills (employability skills) are expected of all individuals. Socialization skills needed for work are related to lifelong career experience and are not solely a part of the initial schooling process. These are not included with this set of statements.
2. Specific policies and procedures of the work-site will be made known to the individual and will be followed.
3. Time elements outlined for the skill standards result from the experience and consideration of the panel of experts who made up the standards development committee.
4. Skills will progress from simple to complex. Once a skill has been successfully performed, it will be incorporated into more complex skills.
5. Skill standards describe the skill only and do not detail the background knowledge or theory related to the particular skill base. Although the skill standard enumerates steps to successful demonstration, rote approaches to the outcomes are not prescribed.
6. Complete all work in a safe and expedient manner.
7. Skill standards are selected because they meet workplace needs and are designed to meet professional standards of practice.
8. Skill standards do not replace, supersede or substitute for procedure manuals.
9. Skill standards in no way supersede or take the place of certification or graduation from an accredited program of study.
10. In all areas, appropriate theory, safety, and support instruction will be required for performing each task.
11. The identification, use of appropriate testing and measurement tools and equipment are incorporated in skill achievement.
12. The individual knows how to research and use industry reference and training materials.
13. All diagnostic and repair tasks are to be accomplished in accordance with manufacturer's recommended procedures.
14. All diagnostic and repair time will be derived from one of the flat rate manuals commonly used in the automotive service industry.

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ENGINE PERFORMANCE
(Continued)

PERFORMANCE SKILL LEVELS

	ENGINE SPECIALIST *	TRANSMISSION/ DRIVETRAIN SPECIALIST *	UNDER CAR SPECIALIST*	ELECTRICAL SPECIALIST *	HVAC SPECIALIST *	DRIVEABILITY SPECIALIST*
ENGINE REPAIR						
Perform General Engine Diagnosis	•					
Perform Removal and Reinstallation (R & R)	•					
Perform Cylinder Head and Valve Train Diagnosis and Repair	•					
Perform Engine Block Diagnosis and Repair	•					
Perform Lubrication System Diagnosis and Repair	•					
Perform Cooling System Diagnosis and Repair	•					
AUTOMATIC TRANSMISSIONS AND TRANSAXLES						
Perform General Transmission and Transaxle Diagnosis		•				
Perform Transmission and Transaxle Maintenance and Adjustment		•				
Perform In-Vehicle Transmission and Transaxle Repair		•				
Perform Removal, Disassembly and Reinstallation: Off-Vehicle Transmission/Transaxle Repair		•				
Perform Oil Pump and Converter Inspection and Service: Off-Vehicle Transmission/Transaxle Repair		•				
Perform Gear Train, Shafts, Bushings and Case Inspection and Service: Off-Vehicle Transmission/Transaxle Repair		•				
Perform Friction and Reaction Units Inspection and Service: Off-Vehicle Transmission/Transaxle Repair		•				
MANUAL DRIVE TRAINS AND AXLES						
Perform Transmission Diagnosis		•				
Perform Transaxle Diagnosis		•				
Perform Clutch Diagnosis and Repair		•				
Perform Transmission Repair		•				
Perform Transaxle Repair		•				
Perform Drive Shaft, Half Shaft, Universal and Constant Velocity (CV) Joint Diagnosis and Repair		•				
Perform Drive Axle Diagnosis and Repair: Ring and Pinion Gear and Differential Case Assembly		•				

*Entry Level Technician is expected to have a general knowledge of all areas and must have graduated from an automotive technical program. Occupations listed in the matrix are Journeyperson Technicians. Journeyperson Technicians have a minimum of five years experience and are at least ASE certified in areas(s) of specialty.

PERFORMANCE SKILL LEVELS (Continued)

MANUAL DRIVE TRAINS AND AXLES (C						
Perform Drive Axle Diagnosis a Differential						
Perform Drive Axle Diagnosis a Shaft		•				
Perform Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair		•				
SUSPENSION AND STEERING						
Perform Steering System Diagnosis and Repair			•			
Perform Suspension System Diagnosis and Repair: Front Suspensions			•			
Perform Suspension System Diagnosis and Repair: Rear Suspensions			•			
Perform Suspension System Diagnosis and Repair: Miscellaneous Service			•			
Perform Wheel Alignment Diagnosis, Adjustment, and Repair			•			
Perform Wheel and Tire Diagnosis and Repair			•			
BRAKES						
Perform Hydraulic System Diagnosis and Repair			•			
Perform Drum Brake Diagnosis and Repair			•			
Perform Disc Brake Diagnosis and Repair			•			
Perform Power Assist Units Diagnosis and Repair			•			
Perform Miscellaneous Diagnosis and Repair: Wheel Bearing			•			
Perform Miscellaneous Diagnosis and Repair: Parking Brakes			•			
Perform Miscellaneous Diagnosis and Repair: Electrical Diagnosis and Repair of Brake Light System			•			
Perform Antilock System Diagnosis and Repair			•			

*Entry Level Technician is expected to have a general knowledge of all areas and must have graduated from an automotive technical program. Occupations listed in the matrix are Journeyperson Technicians. Journeyperson Technicians have a minimum of five years experience and are at least ASE certified in areas(s) of specialty.

PERFORMANCE SKILL LEVELS *(Continued)*

ELECTRICAL/ELECTRONIC SYSTEMS	ENGINE SPECIALIST *	TRANSMISSION/ DRIVETRAIN-SPECIALIST *	UNDER CAR SPECIALIST*	ELECTRICAL SPECIALIST *	HVAC SPECIALIST *	DRIVEABILITY SPECIALIST*
Perform General Electrical System Diagnosis				•		
Perform Battery Diagnosis and Service				•		
Perform Starting System Diagnosis and Repair				•		
Perform Charging System Diagnosis and Repair				•		
Perform Lighting System Diagnosis and Repair				•		
Perform Gauge, Warning Devices, and Driver Information Systems Diagnosis and Repair				•		
Perform Horn Diagnosis and Repair				•		
Perform Wiper/Washer Diagnosis and Repair				•		
Perform Accessories Diagnosis and Repair				•		
HEATING AND AIR CONDITIONING						
Perform A/C System Diagnosis and Repair					•	
Perform Refrigerant Recovery, Recycling, and Handling					•	
Perform Refrigeration System Component Diagnosis and Repair: Compressor and Clutch					•	
Perform Refrigeration System Component Diagnosis and Repair: Evaporator, Condenser, and Related Components					•	
Evacuate and Charge A/C System					•	
Perform Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair					•	
Perform Operating Systems and Related Controls Diagnosis and Repair: Electrical					•	
Perform Operating Systems and Related Controls Diagnosis and Repair: Vacuum/Mechanical					•	
Perform Operating Systems and Related Controls Diagnosis and Repair: Automatic and Semi-Automatic Temperature Controls					•	

*Entry Level Technician is expected to have a general knowledge of all areas and must have graduated from an automotive technical program. Occupations listed in the matrix are Journeyperson Technicians. Journeyperson Technicians have a minimum of five years experience and are at least ASE certified in areas(s) of specialty.

PERFORMANCE SKILL LEVELS *(Continued)*

ENGINE PERFORMANCE	ENGINE SPECIALIST *	TRANSMISSION/ DRIVETRAIN-SPECIALIST *	UNDER CAR SPECIALIST*	ELECTRICAL SPECIALIST *	HVAC SPECIALIST *	DRIVEABILITY SPECIALIST*
Perform Engine Related Service						•
Perform General Engine Diagnosis						•
Perform Computerized Engine Controls Diagnosis and Repair						•
Perform Ignition System Diagnosis and Repair						•
Perform Fuel Systems Diagnosis and Repair						•
Perform Air Induction System Diagnosis and Repair						•
Perform Exhaust System Diagnosis and Repair						•
Perform Emissions Control System Diagnosis and Repair: Positive Crankcase Ventilation System						•
Perform Emissions Control System Diagnosis and Repair: Exhaust Gas Re-circulation System						•
Perform Emissions Control System Diagnosis and Repair: Exhaust Gas Treatment System						•
Perform Emissions Control System Diagnosis and Repair: Intake Air Temperature Controls						•
Perform Emissions Control System Diagnosis and Repair: Early Fuel Evaporation (Intake Manifold Temperature) Controls						•
Perform Emissions Control System Diagnosis and Repair: Evaporative Emission Controls						•

***Entry Level Technician** is expected to have a general knowledge of all areas and must have graduated from an automotive technical program. Occupations listed in the matrix are Journeyperson Technicians. Journeyperson Technicians have a minimum of five years experience and are at least ASE certified in areas(s) of specialty.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform a general engine diagnosis.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Interpret and verify complaint; determine needed repairs.
   a. Verify and interpret engine concern; determine necessary action. (IA1, P-1)
   b. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. (IA2, P-2)
   c. Diagnose engine noises and vibrations; determine necessary action. (IA3, P-3)
   d. Diagnose the cause of excessive oil consumption, unusual engine exhaust color, odor, and sound; determine necessary action. (IA4, P-3)

e. Perform engine vacuum tests; determine necessary action. (IA5, P-1)
f. Perform cylinder power balance tests; determine necessary action. (IA6, P-1)
g. Perform cylinder compression tests; determine necessary action. (IA7, P-1)
h. Perform cylinder leakage tests; determine necessary action (IA8, P-1)

8. Inform appropriate person of diagnosis results.
9. Clean up the work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

General engine diagnosis is performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the types of diagnostics performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform removal and reinstallation of an engine.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

It is verified that all systems on the vehicle work to pre-removal condition.

It is verified that all liquids have been properly refilled.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Remove engine.
   a. Front-wheel drive. (IA9, P-3)
   b. Rear-wheel drive. (IA11, P-3)
8. Identify approved installation procedure.

9. Prepare vehicle for engine installation.
10. Secure appropriate tools, equipment and components required to complete installation procedure.
11. Reinstall engine.
    a. Front-wheel drive. (IA10, P-3)
    b. Rear-wheel drive. (IA12, P-3)
12. Verify that all liquids have been properly refilled.
13. Verify that all systems on vehicle work to pre-removal condition.
14. Clean up work area.
15. Return tools to proper location.
16. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Removal and reinstallation of an engine is performed using appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend on the type of vehicle being serviced.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform cylinder head and valve train diagnosis and repair

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Remove cylinder head(s); visually inspect cylinder head(s) for cracks; check gasket surface areas for warpage and leakage; and check passage condition. (IB1, P-2)
8. Inspect, measure critical tolerances, machine, replace worn components and assemble cylinder head(s) as required.
   a. Inspect and test valve springs for squareness, pressure, and free height comparison; replace as needed. (IB3, P-3)
   b. Inspect valve spring retainers, locks, and valve grooves. (IB4, P-2)

c. Replace valve stem seals. (IB5, P-3)
d. Inspect valve guides for wear; check valve guide height and stem-to-guide clearance; recondition or replace as needed. (IB6, P-3)
e. Resurface valves; perform necessary action. (IB7, P-2)
f. Resurface valve seats; perform necessary action. (IB8, P-2)
g. Check valve face-to-seat contact and valve seat concentricity (runout); service seats and valves as needed. (IB9, P-3)
h. Check valve spring assembled height and valve stem height; service valve and spring assemblies as needed. (IB10, P-2)
i. Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); perform necessary action. (IB11, P-2)

9. Inspect hydraulic or mechanical lifters; replace as needed. (IB12, P-2)
10. Install cylinder head(s) and gaskets; tighten according to manufacturer's specifications and procedure. (IB2, P-2)
11. Inspect camshaft(s), drives and bearings, measure critical tolerances, replace worn components and verify camshaft(s) timing according to manufacturer's specifications and procedure (for overhead cam engines).
    a. Inspect camshaft drives (including gear wear and backlash, sprocket and chain wear); replace as necessary. (IB14, P-2)
    b. Inspect and replace timing belt(s), overhead cam drive sprockets, and tensioners; check belt tension; adjust as necessary. (IB15, P-1)
    c. Inspect camshaft for runout, journal wear and lobe wear. (IB16, P-3)
    d. Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine necessary action. (IB17, P-3)
    e. Verify camshaft(s) timing according to manufacturer's specifications and procedure. (IB18, P-1)
12. Adjust valves (mechanical or hydraulic lifters). (IB13, P-1)
13. Clean up work area.
14. Return tools to proper location.
15. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

The cylinder head and valve train are diagnosed and repaired using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint and the type of vehicle being serviced.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform engine block diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Disassemble engine and inspect the block for cracks, warpage and general condition.
   a. Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine necessary action. (IC2, P-2)
   b. Inspect internal and external threads; restore as needed (includes installing thread inserts). (IC3, P-1)

8. Remove cylinder wall ridge and inspect, measure critical tolerances, deglaze, and clean cylinder walls.
   a. Remove cylinder wall ridges. (IC4, P-3)
   b. Inspect and measure cylinder walls for damage and wear; determine necessary action. (IC5, P-2)
   c. Deglaze and clean cylinder walls. (IC6, P-1)
9. Inspect crankshaft and crankshaft bearings, measure critical tolerances, select proper bearings and prepare them for installation.
   a. Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine necessary action. (IC7, P-3)
   b. Inspect crankshaft for surface cracks and journal damage; check oil passage condition; measure journal wear; determine necessary action. (IC8, P-3)
   c. Inspect and measure main and connecting rod bearings for damage, clearance, and end play; determine necessary action (includes the proper selection of bearings). (IC9, P-2)
10. Inspect pistons and rods for indications of rod misalignment; inspect piston pins, measure critical tolerances and assemble pistons to rods; select proper rings; fit and install piston rings.
    a. Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; inspect rod alignment and bearing bore condition. (IC10, P-3)
    b. Inspect, measure, and service pistons and pins; determine necessary action. (IC11, P-2)
    c. Inspect, measure, and install piston rings. (IC12, P-2)
11. Assemble engine using new gaskets and seals.
    a. Inspect and replace pans, covers, gaskets, and seals (IC1, P-2).
    b. Inspect, repair, or replace crankshaft vibration damper (harmonic balancer). (IC13, P-3)
    c. Reassemble engine components using correct gaskets and sealants. (IC14, P-2)
    d. Inspect auxiliary (balance, intermediate, idler, counterbalance, or silencer) shaft(s); inspect shaft(s) and support bearings for damage and wear; determine necessary action; reinstall and time. (IC15, P-3)
12. Prime engine lubrication system. (IC16, P-1)
13. Clean up work area.
14. Return tools to proper location.
15. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

The engine block is diagnosed and repaired using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced and the types of services and machine operations performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform lubrication system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Perform oil pressure tests; determine necessary action. (ID1, P-1)
8. Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform necessary action. (ID2, P-3)

9. Inspect, test and replace auxiliary coolers and temperature/pressure switches/sensor as needed.
   a. Inspect auxiliary oil coolers; replace as needed. (ID11, P-3)
   b. Inspect, test, and replace oil temperature and pressure switches and sensors. (ID12, P-2)
10. Perform oil and filter change. (ID13, P-1)
11. Clean up work area.
12. Return tools to proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Lubrication system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced and the types of services and machine operations performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform cooling system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Check for coolant contamination in other systems.

8. Inspect, test and replace cooling and heating system components.
   a. Perform cooling system, cap, and recovery system tests (pressure, combustion leakage, and temperature); determine necessary action. (ID3, P-1)
   b. Inspect, replace, and adjust drive belts, tensioners, and pulleys. (ID4, P-1)
   c. Test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; and bleed air as required. (ID7, P-1)
   d. Inspect and replace engine cooling and heater system hoses. (ID4, P-2)
   e. Inspect, test, and replace thermostat and housing. (ID6, P-2)
   f. Inspect, test, remove, and replace water pump. (ID8, P-2)
   g. Remove and replace radiator. (ID9, P-2)
   h. Inspect and test fans(s) (electrical or mechanical), fan clutch, fan shroud, and air dams. (ID10, P-2)
9. Clean up the work area.
10. Return tools to their proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Cooling system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence; however, performance element 8c can be performed as a stand-alone service.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced and the types of service equipment available.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform general transmission and transaxle diagnosis.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Interpret and verify complaint; determine needed repairs.
   a. Identify and interpret transmission concern; ensure proper engine operation; determine necessary action. (IIA1, P-1)
   b. Diagnose unusual fluid usage, level, and condition concerns; determine necessary action. (IIA2, P-1)

c. Perform pressure tests; determine necessary action. (IIA3, P-1)
d. Perform lock-up converter system tests; determine necessary action. (IIA4, P-2)
e. Diagnose electronic, mechanical, hydraulic, vacuum control systems; determine necessary action. (IIA5, P-1)
f. Diagnose noise and vibration concerns; determine necessary action. (IIA6, P-3)

8. Inform service advisor of diagnostic results.
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

General transmission and transaxle diagnosis are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service equipment available.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform transmission and transaxle maintenance and adjustment.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Inspect, adjust, or replace throttle (TV) linkages or cables, check gear select indicator (as applicable). (IIB1, P-1)
8. Service transmission; perform visual inspection; replace fluids and filters. (IIB2, P-1)
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Transmission and transaxle maintenance and adjustment are performed using the most appropriate service procedure.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used. Perform element 8 as required.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the types of service equipment available.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform in-vehicle transmission/transaxle repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Inspect, adjust and replace worn or defective components.
   a. Inspect, adjust, or replace (as applicable) vacuum modulator; inspect and repair or replace lines and hoses. (IIC1, P-3)
   b. Inspect, repair, and replace governor assembly. (IIC2, P-3)
   c. Inspect and replace external seals and gaskets. (IIC3, P-2)
   d. Inspect extension housing, bushing and seals; perform necessary action. (IIC4, P-3)

e. Inspect, leak test, flush, and replace cooler, lines, and fittings. (IIC5, P-1)
f. Inspect and replace speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers. (IIC6, P-3)
g. Inspect and test, adjust, repair or replace transmission related electrical and electronic components (includes computers, solenoids, sensors, relays, switches, and harnesses). (IIC7, P-1)
h. Inspect, replace, and align powertrain mounts. (IIC8, P-3)
i. Complete computer relearn procedure as needed.

8. Refill with proper fluid
9. Clean up the work area.
10. Return tools to their proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

In-vehicle transmission and transaxle repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service equipment available.

PERFORM REMOVAL, DISASSEMBLY AND REINSTALLATION: OFF VEHICLE TRANSMISSION/TRANSAXLE REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform removal, disassembly and reinstallation of off-vehicle transmission/transaxle.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Remove transmission/transaxle and torque converter. (IID1-1, P-2) & (IID1-2, P-2)

8. Disassemble transmission/transaxle, clean and inspect unit for defects or worn components. (IID1-3–IID1-6)
   a. Disassemble, clean, and inspect transmission/transaxle. (IID1-3, P-1)
   b. Inspect, measure, clean, and replace valve body (includes surfaces and bores, springs, valves, sleeves, retainers, brackets, check-balls, screens, spacers, and gaskets), and torque valve body bolts. (IID1-4, P-2)
   c. Inspect servo bore, piston, seals, pin, spring, and retainers; determine necessary action. (IID1-5, P-3)
   d. Inspect accumulator bore, piston, seals, spring, and retainer; determine necessary action. (IID1-6, P-3)
   e. Inspect and flush cooler and lines.
9. Perform necessary repairs as result of inspections.
10. Assemble transmission/transaxle. (IIDI-7, P-1)
11. Reinstall transmission/transaxle and torque converter. (IID1-1, P-2) & (IID1-2, P-2)
12. Refill transmission to proper level.
13. Make necessary adjustments (e.g., adjust computer, T.V., etc.).
14. Clean up work area.
15. Return tools to proper location.
16. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Removal, repair and reinstallation of transmission/transaxle are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service equipment available.

PERFORM OIL PUMP AND CONVERTER INSPECTION AND SERVICE: OFF-VEHICLE TRANSMISSION/TRANSAXLE REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform oil pump and converter inspection and service of off-vehicle transmission/transaxle.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Inspect, measure critical tolerances, replace worn components and check the hydraulic system for contamination.
   a. Inspect converter flex plate, attaching parts, pilot, pump drive, and seal areas. (IID2-1, P-2)
   b. Measure torque converter endplay and check for interference; check stator clutch. (IID2-2, P-2)
   c. Inspect, measure, and replace oil pump assembly and components. (IID2-3, P-3)
   d. Check torque converter and transmission cooling system for contamination. (IID2-4, P-1)
8. Refill with proper fluid.
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Oil pump and converter inspection and service are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence; however, performance elements 7-9 are performed after completing the previous skill to remove, disassemble and reinstall (off-vehicle transmission/ transaxle repair).

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the types of services and machine operation performed.

PERFORM GEAR TRAIN, SHAFTS, BUSHINGS AND CASE INSPECTION AND SERVICE: OFF-VEHICLE TRANSMISSION/TRANSAXLE REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform gear train, shafts, bushings and case inspection and service of off-vehicle transmission/transaxle repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Inspect, measure critical tolerances, replace worn components of rotating assembly, thrust washers, seals, and case.
   a. Measure endplay or preload; determine necessary action. (IID3-1, P-1)
   b. Inspect, measure, and replace thrust washers and bearings. (IID3-2, P-2)
   c. Inspect oil delivery seal rings, ring grooves, and sealing surface areas. (IID3-3, P-2)
   d. Inspect bushings; replace as needed. (IID3-4, P-2)
   e. Inspect and measure planetary gear assembly (includes sun, ring gear, thrust washers, planetary gears, and carrier assembly); replace as needed. (IID3-5, P-2)
   f. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action. (IID3-6, P-2)
8. Inspect, measure, repair, adjust, or replace transaxle final drive components.
   a. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action. (IID3-7, P-2)
   b. Inspect, measure, repair, adjust, or replace transaxle final drive components. (IID3-8, P-2)
9. Inspect and reinstall parking pawl, shaft, spring, and retainer; determine necessary action. (IID3-9, P-3)
10. Refill with proper fluid.
11. Clean up the work area.
12. Return tools to their proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Gear train, shafts, bushings and case inspection and service are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence; however, performance elements 9-11 are performed after completing the skill to remove, disassemble and reinstall (off-vehicle transmission/transaxle repair).

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced and the types of services and machine operations performed.

PERFORM FRICTION AND REACTION UNITS INSPECTION AND SERVICE: OFF-VEHICLE TRANSMISSION/TRANSAXLE REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform friction and reaction units inspection and service of off-vehicle transmission/transaxle.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.

6. Inspect, measure critical tolerances, adjust and replace worn components of the friction and reaction unit.
   a. Inspect clutch drum, piston, check-balls, springs, retainers, seals, and friction and pressure plates; replace as needed. (IID4-1, P-2)
   b. Measure clutch pack clearance; adjust as needed. (IID4-2, P-1)
   c. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; replace as needed. (IID4-4, P-2)
   d. Inspect bands and drums; adjust or replace as needed. (IID4-5, P-3)
7. Air test operation of clutch and servo assemblies. (IID4-3, P-1)
8. Refill with proper fluid.
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Friction and reaction units inspection and service are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence; however, performance elements 9-12 are performed after completing the skill to remove, disassemble and reinstall (off-vehicle transmission/transaxle repair).

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced and the types of services and machine operation performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform transmission diagnosis.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Check fluid level.
8. Diagnose noise, hard shifting, jumping out of gear, and fluid leakage concerns; determine necessary action. (IIIB4, P-3)
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documention.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Transmission diagnosis is performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform transaxle diagnosis.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Check fluid level.
8. Diagnose noise, hard shifting, jumping out of gear, and fluid leakage concerns; determine necessary action. (IIIB4, P-3)
9. Diagnose transaxle final drive assembly noise and vibration concerns; determine necessary action. (IIIB13, P-3)

10. Clean up work area.
11. Return tools to proper location.
12. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Transaxle diagnosis is performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service equipment available.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform clutch diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action. (IIIA1, P-1)
8. Inspect and service clutch release mechanism (mechanical/hydraulic).
   a. Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; perform necessary action. (IIIA2, P-1)

   b. Inspect hydraulic clutch slave and master cylinders, lines, and hoses; perform necessary action. (IIIA3, P-1)
   c. Inspect release (throw-out) bearing, lever, and pivot; determine necessary action. (IIIA4, P-1)
9. Inspect, measure critical tolerances, machine, replace worn components of flywheel and ring gear, pressure plate and clutch disc, and crankshaft pilot bearing or bushing; replace as needed.
   a. Inspect and replace clutch pressure plate assembly and clutch disc. (IIIA5, P-1)
   b. Inspect, remove, or replace crankshaft pilot bearing or bushing (as applicable). (IIIA6, P-1)
   c. Inspect flywheel and ring gear for wear and cracks, measure runout; determine necessary action. (IIIA7, P-1)
10. Inspect engine block and bell housing and measure flywheel runout and crankshaft endplay according to manufacturer's specifications and procedure.
   a. Inspect engine block, clutch (bell) housing, and transmission/transaxle case mating surfaces; determine necessary action. (IIIA8, P-3)
   b. Measure flywheel-to-block runout and crankshaft endplay; determine necessary action. (IIIA9, P-3)
11. Inspect for fluid leaks; determine necessary action.
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Clutch diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service equipment available.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform transmission repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Remove transmission, disassemble, clean and inspect case and components.
   a. Remove transmission. (IIIB1, P-2)
   b. Disassemble, clean, and reassemble transmission components. (IIIB2, P-2)
   c. Inspect transmission case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action. (IIIB3, P-3)

8. Inspect, measure critical tolerances, replace worn internal components and seals and assemble transmission.
   a. Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces. (IIIB7, P-2)
   b. Inspect, adjust, and reinstall shift cover, forks, lever, grommets, shafts, sleeves, detent mechanism, interlocks, and springs. (IIIB9, P-2)
   c. Measure endplay or preload (shim or spacer selection procedure) on transmission shafts; perform necessary action. (IIIB10, P-1)
   d. Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings. (IIIB11, P-2)
   e. Inspect and reinstall speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers. (IIIB12, P-2)
   f. Inspect lubrication devices (oil pump or slingers); perform necessary action. (IIIB15, P-3)
   g. Inspect, test, and replace transmission sensors and switches. (IIIB16, P-1)
9. Install transmission according to manufacturer's specifications and procedure. (IIIB1, P-2)
10. Inspect and reinstall powertrain mounts and shift linkage; adjust shift linkage according to manufacturer's specifications and procedure.
    a. Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers. (IIIB5, P-3)
    b. Inspect and reinstall powertrain mounts. (IIIB6, P-3)
11. Refill with proper fluid.
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Transmission repair is performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform transaxle repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Remove transaxle, disassemble, and clean and inspect case and components.
   a. Remove transaxle. (IIIB1, P-2)
   b. Disassemble, clean, and reassemble transaxle components. (IIIB2, P-2)
   c. Inspect transaxle case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action. (IIIB3, P-3)
   d. Remove and replace transaxle final drive. (IIIB8, P-3)

e. Inspect, adjust, and reinstall shift cover, forks, lever, grommets, shafts, sleeves, detent mechanism, interlocks, and springs. (IIIB9, P-2)
f. Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly. (IIIB14, P-2)

8. Inspect, measure critical tolerances, replace worn internal components and seals, and assemble transaxle.
   a. Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces. (IIIB7, P-2)
   b. Measure endplay or preload (shim or spacer selection procedure) on transaxle shafts; perform necessary action. (IIIB10, P-1)
   c. Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings. (IIIB11, P-2)
   d. Inspect and reinstall speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers. (IIIB12, P-2)
   e. Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly. (IIIB14, P-2)
   f. Inspect lubrication devices (oil pump or slingers); perform necessary action. (IIIB15, P-3)
   g. Inspect, test, and replace transaxle sensors and switches. (IIIB16, P-1)
9. Install transaxle according to manufacturer's specifications and procedure. (IIIB1, P-2)
10. Inspect and reinstall powertrain mounts and shift linkage; adjust shift linkage according to manufacturer's specifications and procedure.
    a. Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers. (IIIB5, P-3)
    b. Inspect and reinstall powertrain mounts. (IIIB6, P-3)
11. Refill with proper fluid.
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Transmission diagnosis is performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service equipment available.

PERFORM DRIVE SHAFT, HALF SHAFT, UNIVERSAL AND CONSTANT VELOCITY (CV) JOINT DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform drive shaft, half shaft, universal and constant velocity (CV) joint diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repairs.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.

7. Diagnose drive-shaft/half-shaft noises and vibrations and determine necessary action.
   a. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action. (IIIC1, P-2)
   b. Diagnose universal joint noise and vibration concerns; perform necessary action. (IIIC2, P-2)
8. Diagnose front-wheel drive (FWD) front wheel bearing. If necessary, replace front-wheel drive (FWD) front wheel bearing. (IIIC3, P-2)
9. Inspect and replace shafts, joints, boots, yokes, and supports as required and according to manufacturer's specifications and procedure.
   a. Inspect, service, and replace shafts, yokes, boots, and CV joints. (IIIC4, P-1)
   b. Inspect, service, and replace shaft center support bearings. (IIIC5, P-3)
10. Check shaft balance; measure shaft runout; measure and adjust driveline angles. (IIIC6, P-3)
11. Clean up work area.
12. Return tools to proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Drive shaft, half shaft, universal and constant velocity (CV) joint diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

PERFORM DRIVE AXLE DIAGNOSIS AND REPAIR: RING AND PINION GEAR AND DIFFERENTIAL CASE ASSEMBLY.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Diagnose and repair ring and pinion gear and differential case assembly.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Check fluid level.

8. Diagnose noise, vibrations and fluid leakage of the differential gears and case.
   a. Diagnose noise and vibration concerns; determine necessary action. (IIID1-1, P-2)
   b. Diagnose fluid leakage concerns; determine necessary action. (IIID1-2, P-2)
9. Inspect and replace companion flange and pinion seal; measure companion flange runout. (IIID1-3, P-2)
10. Inspect ring gear and measure runout; determine necessary action. (IIID1-4, P-2)
11. Remove differential gears; inspect all gears and pinion shaft.
    a. Inspect ring gear and measure runout; determine necessary action. (IIID1-4, P-2)
    b. Remove, inspect, and reinstall drive pinion and ring gear, spacers, sleeves, and bearings. (IIID1-5, P-2)
    c. Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case. (IIID1-10, P-2)
12. Assemble differential. Measure and adjust pinion depth and pinion preload; side bearing preload; and ring and pinion backlash, runout and contact pattern.
    a. Measure and adjust drive pinion depth. (IIID1-6, P-2)
    b. Measure and adjust drive pinion bearing preload. (IIID1-7, P-1)
    c. Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types). (IIID1-8, P-2)
    d. Check ring and pinion tooth contact patterns; perform necessary action. (IIID1-9, P-1)
    e. Reassemble and reinstall differential case assembly; measure runout; determine necessary action. (IIID1-11, P-2)
13. Refill differential housing with correct lubricant.
14. Clean up work area.
15. Return tools to proper location.
16. Complete appropriate documentation

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Ring and pinion gear and differential case assembly diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Diagnose and repair limited slip differential.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Inspect ring gear and measure runout and rotating torque; determine necessary action. (IIID2-1 & IIID2-4)
   a. Inspect ring gear and measure runout; determine necessary action. (IIID2-1, P-3)
   b. Measure rotating torque; determine necessary action. (IIID2-4, P-3)

8. Inspect limited slip components, replace worn clutch (cone or plate) components and assemble. (IIID2-3, P-3)
9. Inspect, drain and refill differential housing with correct lubricant. (IIID2-2, P-2)
10. Refill with proper fluid.
11. Clean up work area.
12. Return tools to proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Limited slip differential diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Diagnosis and repair drive axle shaft.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine necessary action. (IIID3-1, P-2)
8. Measure drive axle flange runout and shaft endplay; determine necessary action. (IIID3-5, P-2)

9. Inspect and replace drive axle shaft wheel studs. (IIID3-2, P-3)
10. Remove, inspect and replace drive axle shafts, seals, bearings and retainers according to manufacturer's specifications and procedure.
    a. Remove and replace drive axle shafts. (IIID3-3, P-1)
    b. Inspect and replace drive axle shaft seals, bearings, and retainers. (IIID3-4, P-2)
11. Refill with proper fluid.
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Drive axle shaft diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

PERFORM FOUR-WHEEL AND DRIVE/ALL-WHEEL DRIVE COMPONENT DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform four-wheel drive/all-wheel drive component diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Diagnose noise, vibration, and unusual steering problems; determine necessary action. (IIIE1, P-3)
8. Check drive assembly seals and vents; check lube level. (IIIE6, P-3)
9. Check lube condition.

10. Inspect and service shift controls (mechanical, electrical, and vacuum), bushings, mounts, levers and brackets as required. (IIIE2, P-3)
11. Remove, disassemble, and inspect transfer case. Measure critical tolerances and replace worn components as required; reassemble and reinstall.
    a. Remove and reinstall transfer case. (IIIE3, P-3)
    b. Disassemble, service, and reassemble transfer case and components. (IIIE4, P-3)
12. Refill with proper fluid.
13. Inspect and service wheel bearing and locking hubs. (IIIE5, P-3)
14. Diagnose, test, adjust, and replace electrical/electronic components of four-wheel drive systems according to manufacturer's specifications and procedure. (IIIE7, P-3)
15. Clean up work area.
16. Return tools to proper location.
17. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Four-wheel drive/all-wheel drive component diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

All performance elements are critical for completing the skill and are performed in sequence.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services and machine operation performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform steering system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Disable and enable supplemental restraint system (SRS) in accordance with manufacturer's specifications and procedures. (IVA1,P-1)
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Remove and replace (reinstall) steering wheel; center/time supplemental restraint system (SRS) coil in accordance with manufacturer's specifications and procedures. (IVA2, P-1)
8. Diagnose and inspect the steering column and steering gear concerns.
   a. Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action. (IVA3, P-3).

b. Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action. (IVA4, P-3)
c. Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action. (IVA5, P-3)
d. Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action. (IVA6, P-2)

9. Remove, service, adjust and reinstall steering gear.
   a. Adjust manual or power non-rack and pinion worm bearing preload and sector lash. (IVA7, P-3)
   b. Remove and replace manual or power rack and pinion steering gear; inspect mounting bushings and brackets. (IVA8, P-2)
   c. Disassemble, inspect, perform necessary action and reassemble rack and pinion steering gear. (IVA9, P-3)
   d. Adjust manual or power rack and pinion steering gear. (IVA10, P-3)
   e. Inspect and replace manual or power rack and pinion steering gear inner tie rod ends (sockets) and bellows boots. (IVA11, P-2)
10. Service power steering system.
   a. Inspect power steering fluid levels and condition. (IVA12, P-1)
   b. Flush, fill, and bleed power steering system. (IVA13, P-2)
   c. Diagnose power steering fluid leakage; determine necessary action. (IVA14, P-2)
   d. Remove, inspect, replace, and adjust power steering pump belt. (IVA15, P-1)
   e. Remove, inspect, and replace power steering pump, mounts, seals, and gaskets. (IVA16, P-3)
   f. Remove, inspect, and replace power steering pump pulley; check alignment. (IVA17, P-3)
   g. Inspect and replace power steering hoses and fittings. (IVA18, P-2)
11. Inspect and replace steering linkage components.
   a. Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper. (IVA19, P-3)
   b. Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps. (IVA20, P-2)
12. Diagnose and adjust components of electronically controlled steering systems; determine necessary action. (IVA21, P-3)
13. Clean up work area.
14. Return tools to proper location.
15. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Steering system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and/or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of services being performed.

PERFORM SUSPENSION SYSTEM DIAGNOSIS AND REPAIR: FRONT SUSPENSIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
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ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Diagnose and repair front suspensions.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Inspect, remove and replace worn front suspension components.
   a. Diagnose short and long arm suspension system noises, body sway, and uneven riding height concerns; determine necessary action. (IVB1-1, P-1)
   b. Diagnose MacPherson strut suspension system noises, body sway, and uneven riding height concerns; determine necessary action. (IVB1-2, P-1)

c. Remove, inspect, and install upper and lower control arms, bushings, shafts, and rebound bumpers. (IVB1-3, P-2)
d. Remove, inspect, install, and adjust strut (compression/tension) rods and bushings. (IVB1-4, P-2)
e. Remove, inspect, and install upper and lower ball joints on short and long arm suspension systems. (IVB1-5, P-2)
f. Remove, inspect, and install steering knuckle assemblies. (IVB1-6, P-2)
g. Remove, inspect, and install short and long arm suspension system coil springs and spring insulators. (IVB1-7, P-2)
h. Remove, inspect, install, and adjust suspension system torsion bars; inspect mounts. (IVB1-8, P-3)
i. Remove, inspect, and install stabilizer bar bushings, brackets, and links. (IVB1-9, P-3)
j. Remove, inspect, and install MacPherson strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount. (IVB1-10, P-1)

8. Lubricate suspension and steering systems. (IVB1-11, P-2)
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Front suspension diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM SUSPENSION SYSTEM DIAGNOSIS AND REPAIR: REAR SUSPENSIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Diagnose and repair rear suspensions.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Inspect, remove and replace worn rear suspension components.
   a. Remove, inspect, and install coil springs and spring insulators. (IVB2-1, P-2)

b. Remove, inspect, and install transverse links, control arms, bushings, and mounts. (IVB2-2, P-2)
c. Remove, inspect, and install leaf springs, leaf spring insulators (silencers), shackles, brackets, bushings, and mounts. (IVB2-3, P-3)
d. Remove, inspect, and install MacPherson strut cartridge or assembly, strut coil spring, and insulators (silencers). (IVB2-4, P-2)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Rear suspension diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM SUSPENSION SYSTEM DIAGNOSIS AND REPAIR: MISCELLANEOUS SERVICE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform miscellaneous service to the suspension system.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Inspect, remove, and replace shock absorbers. (IVB3-1, P-1)
8. Remove, inspect, and service or replace front and rear wheel bearings. (IVB3-2, P-1)

9. Diagnose, inspect, adjust, and repair or replace components of electronically controlled suspension systems. (IVB3-3, P-2)
10. Clean up work area.
11. Return tools to proper location.
12. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Service to the suspension system is performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform wheel alignment diagnosis, adjustment and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Diagnose steering and handling complaints.
   a. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action. (IVC1, P-1)
   b. In accordance with manufacturer's specifications, verify tire pressure, condition and uniformity of size.

c. Perform pre-alignment inspection; perform necessary action. (IVC2, P-1)
d. Measure vehicle riding height; determine necessary action. (IVC3, P-1)

8. Check and adjust rear alignment angles.
   a. Check and adjust rear wheel camber; perform necessary action. (IVC4, P-1)
   b. Check rear wheel thrust angle; determine necessary action. (IVC11, P-2)
   c. Check and adjust rear wheel toe. (IVC10, P-2)
9. Check and adjust front alignment angles.
   a. Check and adjust front wheel camber; perform necessary action. (IVC4, P-1)
   b. Check and adjust caster; perform necessary action. (IVC5, P-1)
   c. Check toe-out-on-turns (turning radius); determine necessary action. (IVC8, P-2)
   d. Check SAI (steering axis inclination) and included angle; determine necessary action. (IVC9, P-2)
   e. Check for front wheel setback; determine necessary action. (IVC12, P-2)
   f. Check front cradle (subframe) alignment; determine necessary action. (IVC13, P-3)
   g. Center steering wheel. (IVC7, P-1)
   h. Check and adjust front wheel toe; adjust as needed. (IVC6, P-1)
10. Clean up the work area.
11. Return tools to their proper location.
12. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Wheel alignment diagnosis, adjustment and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform wheel and tire diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Perform tire wear diagnosis and routine service.
   a. Diagnose tire wear patterns; determine necessary action. (IVD1, P-1)
   b. Inspect tires; check and adjust air pressure. (IVD2, P-1)
   c. Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action. (IVD3, P-2)
   d. Rotate tires according to manufacturer's recommendations. (IVD4, P-1)

8. Check tires and wheels for causes of abnormal handling complaints.
   a. Measure wheel, tire, axle, and hub runout; determine necessary action. (IVD5, P-2)
   b. Diagnose tire pull (lead) problem; determine necessary action. (IVD6, P-2)
9. Balance wheel and tire assembly (static and dynamic). (IVD7, P-1)
10. Perform tire mounting and installation on vehicle.
    a. Dismount, inspect, repair, and remount tire on wheel. (IVD8, P-2) (BE SURE TO FOLLOW RECOMMENDED SAFETY PROCEDURES.)
    b. Reinstall wheel; torque lug nuts. (IVD9, P-1)
11. Clean up work area.
12. Return tools to proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Wheel and tire diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform hydraulic system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Check the master cylinder operation and service as required.
   a. Check for fluid level and contamination.
   b. Measure and adjust pedal height. (VA1, P-2)

c. Check master cylinder for internal and external leaks and proper operation; determine necessary action. (VA2, P-2)
d. Diagnose poor stopping, pulling, or dragging concerns caused by problems in the hydraulic system; determine necessary action. (VA4, P-1)

8. Inspect brake lines and repair as required.
   a. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action. (VA5, P-2)
   b. Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed. (VA6, P-2)
9. Store, select, handle and install brake fluids to proper level. (VA7,P-1)
10. Test and replace brake valves as required.
    a. Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combination valves. (VA8, P-3)
    b. Inspect, test, replace, and adjust height (load) sensing proportioning valve. (VA9, P-3)
    c. Inspect, test, and replace components of brake warning light system. (VA10, P-3)
11. Bleed/flush hydraulic system.
    a. Bleed (manual, pressure, vacuum, or surge) brake system. (VA11, P-1)
    b. Flush hydraulic system. (VA12, P-3)
    c. Remove, bench bleed, and reinstall master cylinder. (VA3, P-1)
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Hydraulic system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform drum brake diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete diagnostic procedure.
7. Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation concerns; determine necessary action. (VB1, P-1)
8. Perform drum brake service.
   a. Remove, clean (using proper safety procedures), inspect, and measure brake drums; service or replace as needed. (VB2, P-1)
   b. Mount brake drum on lathe; machine braking surface. (VB3, P-2)

c. Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. (VB4, P-2)
d. Remove, inspect, and install (rebuild) wheel cylinders. (VB5, P-2)
e. Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings. (VB6, P-1)
f. Install wheel, torque lug nuts, and make final checks and adjustments. (VB7, P-1)

9. Clean work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Drum brake diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform disc brake diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation concerns; determine necessary action. (VC1, P-1)
8. Perform disc brake service.
   a. Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action. (VC2, P-1)

b. Clean and inspect caliper mounting and slides for wear and damage; determine necessary action. (VC3, P-1)
c. Remove, clean, and inspect pads and retaining hardware; determine necessary action. (VC4, P-1)
d. Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts. (VC5, P-1)
e. Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks. (VC6, P-1)
f. Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace. (VC7, P-1)
g. Remove and replace rotor. (VC11, P-2)
h. Refinish rotor according to manufacturer's recommendations. (VC8, P-1)
i. Adjust calipers with integrated parking brake system. (VC9, P-3)
j. Install wheel, torque lug nuts, and make final checks and adjustments. (VC10, P-1)

9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Disc brake diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform power assist units diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Test and service power assist brake units.
   a. Test pedal free travel with and without engine running; check power assist operation. (VD1, P-2)
   b. Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. (VD2, P-2)

c. Inspect vacuum-type power booster unit for vacuum leaks; inspect check valve for proper operation; determine necessary action. (VD3, P-2)
d. Inspect and test hydro-boost system and accumulator for leaks and proper operation; determine necessary action. (VD4, P-3)
e. Check hydro-boost system fluid for contamination.

8. Clean up work area.
9. Return tools proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Power assist units diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM MISCELLANEOUS DIAGNOSIS AND REPAIR: WHEEL BEARING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform wheel bearing diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and service wheel bearings.
   a. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action. (VE1, P-1)
   b. Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings. (VE2, P-1)
   c. Replace wheel bearing and race (as needed). (VE7, P-1)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Wheel bearing diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM MISCELLANEOUS DIAGNOSIS AND REPAIR: PARKING BRAKES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform parking brake diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Check and service the parking brake.
   a. Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, and replace as needed. (VE3, P-2)
   b. Check parking brake operation; adjust as needed. (VE4, P-1)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Parking brake diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM MISCELLANEOUS DIAGNOSIS AND REPAIR: ELECTRICAL DIAGNOSIS AND REPAIR OF BRAKE LIGHT SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform brake stop light system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Check brake lamp circuits and service as required.
   a. Check operation of brake stop light system; adjust and service as needed. (VE6, P-1)
   b. Check operation of parking brake indicator light system. (VE5, P-3)
   c. Check operation of brake warning light system.

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Brake stop light system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM ANTILOCK SYSTEM DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform antilock system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose Antilock Brake System (ABS) concerns.
   a. Inspect and test ABS components; determine necessary action. (VF1, P-2)
   b. Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise concerns caused by the ABS; determine necessary action. (VF2, P-2)

c. Diagnose ABS electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action. (VF3, P-1)
d. Diagnose ABS braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.). (VF8, P-3)

8. Perform ABS service.
   a. Depressurize high pressure components of the ABS. (VF4, P-2)
   b. Remove and install an ABS electrical/electronic and hydraulic components. (VF6, P-3)
   c. Bleed the ABS front and rear hydraulic circuits. (VF5, P-2)
   d. Service, test, and adjust ABS speed sensors. (VF7, P-2)
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Antilock system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform general electrical system diagnosis.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose electrical system concerns.
   a. Use wiring diagrams during diagnosis of electrical circuit problems. (VIA1, P-1)
   b. Check electrical circuits with a test light; determine necessary action. (VIA2, P-2) Make sure an appropriate type of test light is used.

c. Check voltage and voltage drop in electrical/electronic circuits using a digital multimeter (DMM); determine necessary action. (VIA3, P-1)
d. Check current flow in electrical/electronic circuits and components using an ammeter; determine necessary action. (VIA4, P-1)
e. Check continuity and resistances in electrical/electronic circuits and components with an ohmmeter; determine necessary action. (VIA5, P-1)
f. Check electrical circuits using jumper wires; determine necessary action. (VIA6, P-2)
g. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action. (VIA7, P-1)
h. Measure and diagnose the cause(s) of abnormal key-off battery drain; determine necessary action. (VIA8, P-1)
i. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action. (VIA9, P-1)
j. Inspect and test switches, connectors, relays, and wires of electrical/electronic circuits; perform necessary action. (VIA10, P-1)

8. Repair electrical circuits.
   a. Repair wiring harnesses and connectors. (VIA11, P-1)
   b. Perform solder repair of electrical wiring. (VIA12, P-1)
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

General electrical system diagnosis is performed and the most appropriate service procedure is determined.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM BATTERY DIAGNOSIS AND SERVICE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform battery diagnosis and service.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose battery concerns according to battery manufacturer's specifications.
   a. Perform battery state-of-charge test; determine needed service. (VIB1, P-1)
   b. Perform battery capacity test; determine needed service. (VIB2, P-1)
8. Maintain or restore electronic memory functions. (VIB3, P-2)

9. Service and charge the battery.
   a. Inspect, clean, fill, and replace battery. (VIB4, P-2)
   b. Perform slow/fast battery charge. (VIB5, P-2)
   c. Inspect and clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed. (VIB6, P-1)
10. Start a vehicle using jumper cables and a battery or auxiliary power supply according to manufacturer's recommended procedures. (VIB7, P-1)
11. Clean up work area.
12. Return tools to proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Battery diagnosis and service are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM STARTING SYSTEM DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform starting system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose starter (cranking) system concerns.
   a. Perform starter current draw tests; determine necessary action. (VIC1, P-1)
   b. Perform starter circuit voltage drop tests; determine necessary action. (VIC2, P-1)

c. Inspect and test starter relays and solenoids; replace as needed. (VIC3, P-2)
d. Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action. (VIC6, P-2)

8. Remove and install starter. (VIC4, P-2)
9. Bench test and service starter motor.
   a. Perform starter bench tests; determine necessary action. (VIC5, P-3)
   b. Disassemble, clean, inspect, and test starter components; replace as needed. (VIC7, P-3)
10. Clean up work area.
11. Return tools to proper location.
12. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Starting system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform charging system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose charging system concerns.
   a. Perform charging system output test; determine necessary action. (VID1, P-1)
   b. Diagnose charging system for the cause of undercharge, no-charge or overcharge conditions. (VID2, P-1)

c. Inspect and adjust generator (alternator) drive belts; replace as needed. (VID3, P-1)
d. Inspect and test voltage regulator/regulating circuit; perform necessary action. (VID4, P-2)
e. Perform charging circuit voltage drop tests; determine necessary action. (VID7, P-1)

8. Remove, inspect, and install alternator. (VID5, P-2)
9. Disassemble generator (alternator), clean, inspect, and test components; determine necessary action. (VID6, P-3)
10. Clean up work area.
11. Return tools to proper location.
12. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Charging system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform lighting system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair electrical lamp concerns.
   a. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action. (VIE1, P-2)
   b. Inspect, replace, and aim headlights and bulbs. (VIE2, P-2)
   c. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action. (VIE3, P-2)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Lighting system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM GAUGE, WARNING DEVICES, AND DRIVER INFORMATION SYSTEMS DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform gauge, warning devices, and driver information systems diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair gauge and warning circuit concerns.
   a. Inspect and test gauges and gauge sending units for cause of intermittent, high, low, or no gauge readings; determine necessary action. (VIF1, P-2)

b. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action. (VIF2, P-3)
c. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action. (VIF3, P-1)
d. Inspect and test sensors, connectors, and wires of electronic instrument circuits; determine necessary action. (VIF4, P-3)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Gauge, warning devices, and driver information system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM HORN DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform horn diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose incorrect horn operation; perform necessary action. (VIG1, P-3)
8. Refer to Supplemental Restraint System (SRS) air bag safety procedures if steering wheel needs to be removed.
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Horn diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform wiper/washer diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair windshield wiper and washer circuit concerns.
   a. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action. (VIG2, P-3)
   b. Diagnose incorrect windshield washer operation; perform necessary action. (VIG3, P-3)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Wiper/washer diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform accessories diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair electrical accessory concerns.
   a. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action. (VIH1, P-2)
   b. Diagnose incorrect heated glass operation; determine necessary action. (VIH2, P-3)
   c. Diagnose incorrect electric lock operation; determine necessary action. (VIH3, P-3)

d. Diagnose incorrect operation of cruise control systems; repair as needed. (VIH4, P-3)
e. Diagnose supplemental restraint system (SRS) concerns; determine necessary action. *(Note: Follow manufacturer's safety procedures to prevent accidental deployment.)* (VIH5, P-2)
f. Diagnose radio static and weak, intermittent, or no radio reception; determine necessary action. (VIH6, P-3)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Accessories diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform air conditioning system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose unusual operating noises in the A/C system; determine necessary action. (VIIA1, P-2)
8. Identify refrigerant type; conduct a performance test of the A/C system (containing an approved refrigerant); determine necessary action. (VIIA2, P-1)
   a. System pressure and temperature

b. Condenser air flow
c. Evaporator discharge temperature and airflow

10. Check A/C system for external oil leaks or any other external damage.
11. Clean up work area.
12. Return tools to proper location.
13. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

A/C system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform refrigerant recovery, recycling and handling.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Verify correct operation and maintenance of refrigerant handling equipment. (VIIE1, P-1)
8. Recycle and properly process used refrigerant.
   a. Identify (by label application or use of a refrigerant identifier) and recover A/C system refrigerant. (VIIE2, P-1)
   b. Recycle refrigerant. (VIIE3, P-1)

c. Label and store refrigerant. (VIIE4, P-1)
d. Test recycled refrigerant for non-condensable gases. (VIIE5, P-1)

9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Refrigerant recovery, recycling and handling is performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM REFRIGERATION SYSTEM COMPONENT DIAGNOSIS AND REPAIR: COMPRESSOR AND CLUTCH.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform compressor and clutch diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; determine necessary action. (VIIB1-1, P-2)
8. Inspect, test, and replace A/C compressor clutch components or assembly. (VIIB1-3, P-2)

9 Discharge system using approved recovery procedure.
10. Check clutch air gap and adjust as required.
11. Remove and replace A/C compressor and service drive belt as required.
    a. Remove and replace A/C compressor and mountings. (VIIB1-4, P-2)
    b. Inspect the condition of discharged oil; determine necessary action. (VIIA4, P-2)
    c. Select oil type; measure and add oil to the A/C system as needed. (VIIA5, P-2)
    d. Inspect A/C compressor drive belts; replace and adjust as needed. (VIIB1-2, P-2)
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Compressor and clutch diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM REFRIGERATION SYSTEM COMPONENT DIAGNOSIS AND REPAIR: EVAPORATOR, CONDENSER, AND RELATED COMPONENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform evaporator, condenser, and related component diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Discharge system using an approved recovery procedure.

8. Diagnose and service A/C system hoses and related components.
   a. Determine need for A/C system filter; perform necessary action. (VIIB2-1, P-3)
   b. Remove and inspect A/C system mufflers, hoses, lines, fittings, o-rings, seals, and service valves; perform necessary action. (VIIB2-2, P-2)
   c. Remove and install receiver/drier or accumulator/drier. (VIIB2-4, P-2)
   d. Remove and install expansion valve or orifice (expansion) tube. (VIIB2-5, P-2)
9. Inspect evaporator; perform necessary action.
10. Inspect evaporator housing water drain; perform necessary action. (VIIB2-6, P-3)
11. Inspect the condenser for proper airflow (and condition); service as required. (VIIB2-3, P-1)
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Evaporator, condenser and related component diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Environmental Protection Agency (EPA) labels
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Evacuate and charge air conditioning system.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Verify correct operation and maintenance of refrigerant handling equipment. (VIIE1, P-1)

8. Evacuate and charge A/C system. (VIIE6, P-1)
   a. Evacuate system and confirm system hold vacuum.
   b. Add proper type and quantity of oil required.
   c. Charge system to specified capacity with proper reference.
   d. Conduct performance test to verify proper system temperature and pressure.
   e. Check for leaks.
   f. Install any required EPA labels.
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Refrigerant recovery, recycling and handling is performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform heating, ventilation and engine cooling systems diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose temperature control concerns in heater/ventilation systems.
   a. Diagnose temperature control problems in the heater/ventilation system; determine necessary action. (VIIC1, P-2)
   b. Inspect and test heater control valve(s); perform necessary action. (VIIC9, P-2)

8. Test and service cooling system and components.
   a. Inspect internal/external condition of radiator; perform necessary action.
   b. Perform cooling system, cap, and recovery system tests (pressure, combustion leakage, and temperature); determine necessary action. (VIIC2, P-1)
   c. Inspect engine cooling and heater system hoses and belts; perform necessary action. (VIIC3, P-1)
   d. Inspect, test, and replace thermostat and housing. (VIIC4, P-1)
   e. Determine coolant condition; drain and recover coolant. (VIIC5, P-1)
   f. Determine if chemical flush or refill procedure is appropriate.
   g. Flush system (as required); refill system with recommended coolant; and bleed system. (VIIC6, P-1)
   h. Inspect and test fan, fan clutch (electrical and mechanical), fan shroud, and air dams; perform necessary action. (VIIC7, P-1)
   i. Inspect and test electrical fan control system and circuits. (VIIC8, P-1)
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Heating, ventilation and engine cooling systems diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM OPERATING SYSTEMS AND RELATED CONTROLS DIAGNOSIS AND REPAIR: ELECTRICAL.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform diagnosis and repair of electrical components for HVAC operating systems and related controls.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair electrical concerns in HVAC system.
   a. Diagnose failures in the electrical controls of heating, ventilation, and A/C (HVAC) systems; determine necessary action. (VIID1, P-2)
   b. Inspect and test A/C-heater blower, motors, resistors, switches, relays, wiring, and protection devices; perform necessary action. (VIID2, P-2)
   c. Test A/C compressor load cut-off systems; determine necessary action. VIID3, P-3)
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation. (VIIC9, P-2).

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Electrical components for the HVAC operating systems and related controls diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM OPERATING SYSTEMS AND RELATED CONTROLS DIAGNOSIS AND REPAIR: VACUUM/MECHANICAL.

HEATING AND AIR CONDITIONING

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform operating systems and related controls diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair vacuum and mechanical component concerns in HVAC system.
   a. Diagnose failures in the vacuum and mechanical components and controls of the heating, ventilation, and A/C (HVAC) system; determine necessary action. (VIID4, P-2)

b. Inspect and test A/C-heater control panel assembly; perform necessary action. (VIID5, P-3)
c. Inspect and test A/C-heater control cables and linkages; perform necessary action. (VIID6, P-3)
d. Inspect and test A/C-heater ducts, doors, hoses, and outlets; perform necessary action. (VIID7, P-3)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Operating systems and related controls diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM OPERATING SYSTEMS AND RELATED CONTROLS DIAGNOSIS AND REPAIR: AUTOMATIC AND SEMI-AUTOMATIC TEMPERATURE CONTROLS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform diagnosis and repair of automatic and semi-automatic temperature controls for operating systems and related controls.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Identify and perform diagnostic procedure for given system per technical information resources.
8. Check operation of automatic and semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine necessary action. (VIID8, P-3). Repair as required.
9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Automatic and semi-automatic controls for the operating systems and related controls diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform engine related service.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Perform engine related service.
   a. Adjust valves on engines with mechanical or hydraulic lifters. (VIIIF1, P-1)
   b. Verify correct camshaft timing; determine necessary action. (VIIIF2, P-1)
   c. Verify engine operating temperature; determine necessary action. (VIIIF3, P-1).

d. Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action. (VIIIF4. P-1)
e. Inspect and test thermostat, bypass, and housing; perform necessary action. (VIIIF5, P-1)
f. Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action. (VIIIF6, P-2)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Engine related service is performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform general engine diagnosis.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose general engine concerns.
   a. Interpret and verify concern; determine necessary action. (VIIIA1, P-1)
   b. Inspect engine assembly for fuel, oil, coolant, and other (internal/external) leaks; determine necessary action. (VIIIA2, P-2)
   c. Diagnose unusual engine noise or vibration concerns; determine necessary action. (VIIIA3, P-2)

d. Diagnose unusual exhaust color, odor, and sound; determine necessary action. (VIIIA4, P-2)
e. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action. (VIIIA5, P-1)
f. Perform cylinder power balance test; determine necessary action. (VIIIA6, P-1)
g. Perform cylinder compression test; determine necessary action. (VIIIA7, P-1)
h. Perform cylinder leakage test; determine necessary action. (VIIIA8, P-1).
i. Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns with an oscilloscope and engine diagnostic equipment; determine necessary action. (VIIIA9, P-1)
j. Prepare four or five gas analyzer; inspect and prepare vehicle for test and obtain exhaust readings; interpret readings and determine necessary action. (VIIIA10, P-1)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

General engine diagnosis is performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM COMPUTERIZED ENGINE CONTROLS DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform computerized engine controls diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair computerized engine controls.
   a. Retrieve and record stored OBD I diagnostic trouble codes; clear codes. (VIIIB1, P-1).
   b. Retrieve and record stored OBD II diagnostic trouble codes (and freeze frame data); clear codes. (VIIIB2, P-3)

c. Diagnose the causes of emissions or driveability concerns resulting from failure of computerized engine controls with stored diagnostic trouble codes. (VIIIB3, P-1)
d. Diagnose emissions or driveability concerns resulting from failure of computerized
engine controls with no stored diagnostic trouble codes; determine necessary action. (VIIIB4, P-1)
e. Inspect and test computerized engine control system sensors, powertrain control
module (PCM), actuators, and circuits; perform necessary action. (VIIIB5, P-2)
f. Obtain and interpret digital multimeter (DMM) readings. (VIIIB6, P-1)
g. Access and use electronic service information. (ESI) (VIIIB7, P-3)
h. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration/recall decals). (VIIIB8, P-1)
i. Inspect and test power and ground circuits and connections; service or replace as needed. (VIIIB9, P-1)
j. Inspect and test wiring harnesses and connectors; service or replace as needed.
k. Practice recommended precautions when handling static sensitive devices. (VIIIB10, P-2)
l. Diagnose driveability and emissions problems resulting from failures of interrelated systems (cruise control, security alarms, suspension controls, traction controls, A/C, automatic transmissions, non-OEM-installed accessories, and similar systems); determine necessary action. (VIIIB11, P-2)

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

General engine diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM IGNITION SYSTEM DIAGNOSIS AND REPAIR.

ENGINE PERFORMANCE

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform ignition system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Perform complete underhood visual inspection.
8. Diagnose and repair ignition system.
   a. Diagnose no-starting, driveability, and emissions concerns on vehicles with electronic ignition (EI/DIS)(distributorless) systems; determine necessary action. (VIIIC1, P-1)

b. Diagnose no-starting, driveability, and emissions concerns on vehicles with distributor ignition (DI) systems; determine necessary action. (VIIIC2, P-1)
c. Inspect and test ignition primary circuit wiring and components; perform necessary action. (VIIIC3, P-2)
d. Inspect and test distributor; perform necessary action. (VIIIC4, P-3)
e. Inspect and test ignition system secondary circuit wiring and components; perform necessary action. (VIIIC5, P-2)
f. Inspect and test ignition coil(s); perform necessary action. (VIIIC6, P-2)
g. Check and adjust (where applicable) ignition system timing and timing advance/retard. (VIIIC7, P-1)
h. Inspect and test ignition system pick-up sensor or triggering devices; perform necessary action. (VIIIC8, P-2)
i. Inspect and test ignition control module; perform necessary action. (VIIIC9, P-2)

9. Clean up work area.
10. Return tools to proper location.
11. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Ignition system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform fuel systems diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Perform complete underhood visual inspection.
8. Diagnose fuel system concerns.
   a. Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems on vehicles with carburetor-type fuel systems; determine necessary action. (VIIID1, P-3).

b. Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems on vehicles with injection-type fuel systems; determine necessary action. (VIIID2, P-1)
c. Inspect fuel tank and fuel cap, fuel lines, fittings, and hoses; perform necessary action. (VIIID3, P-2)
d. Check fuel for contaminants and quality; determine necessary action. (VIIID4, P-2)
e. Inspect and test mechanical and electrical fuel pumps and pump control systems; perform necessary action. (VIIID5, P-2)
f. Test fuel pressure.
g. Inspect and test fuel pressure regulation system and components of injection-type fuel systems; perform necessary action. (VIIID7, P-1)
h. Inspect and test cold enrichment system and components; perform necessary action. (VIIID8, P-3)
i. Remove, inspect, and test vacuum and electrical circuits, components and connections of fuel system; perform necessary action. (VIIID14, P-2)

9. Replace fuel filters. (VIIID6, P-1)
10. Service fuel injection system.
    a. Remove, service, and install throttle body; adjust related linkages. (VIIID9, P-2)
    b. Inspect, test, and clean fuel injectors. (VIIID10, P-2)
    c. Inspect throttle body mounting plates, air induction and filtration system, intake manifold, and gaskets; perform necessary action. (VIIID11, P-2)
11. Check and adjust idle speed.
    a. Check idle speed and fuel mixture. (VIIID12, P-2)
    b. Adjust idle speed and fuel mixture. (VIIID13, P-3)
12. Clean up work area.
13. Return tools to proper location.
14. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Fuel systems diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM AIR INDUCTION SYSTEM DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform air induction system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Perform visual inspection of air induction system.
8. Test the operation of air filter, intake air ducting, rubber connectors, in line sensors, gaskets, clamps, throttle body, intake manifold and connecting hoses; determine necessary action.

9. Test the operation of turbocharger/supercharger systems; perform necessary action. (VIIID17, P-3)
10. Clean up work area.
11. Return tools to proper location.
12. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Air induction system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EXHAUST SYSTEM DIAGNOSIS AND REPAIR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform exhaust system diagnosis and repair.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.
7. Diagnose and repair exhaust system concerns.
   a. Inspect exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform necessary action. (VIIID15, P-2)

b. Perform exhaust system back-pressure test; determine necessary action. (VIIID16, P-1)
c. Inspect secondary air injection system, manifolds, and check valves.

8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Exhaust system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EMISSIONS CONTROL SYSTEM DIAGNOSIS AND REPAIR: POSITIVE CRANKCASE VENTILATION SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform emissions control system diagnosis and repair.

Diagnose and repair positive crankcase ventilation system.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair positive crankcase ventilation system.
   a. Diagnose oil leaks, emissions, and driveability problems resulting from failure of the positive crankcase ventilation (PCV) system; determine necessary action. (VIIIE1-1, P-1)
   b. Inspect and test positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action. (VIIIE1-2, P-2)
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Positive crankcase ventilation control system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EMISSIONS CONTROL SYSTEM DIAGNOSIS AND REPAIR: EXHAUST GAS RECIRCULATION SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform emissions control system diagnosis and repair.

Diagnose and repair exhaust gas recirculation system.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair the exhaust gas recirculation system.
   a. Diagnose emissions and driveability problems caused by failure of the exhaust gas recirculation (EGR) system; determine necessary action. (VIIIE2-1, P-1)
   b. Inspect and test valve, valve manifold, and exhaust passages of exhaust gas recirculation (EGR) systems; perform necessary action. (VIIIE2-2, P-2)
   c. Inspect and test vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; perform necessary action. (VIIIE2-3, P-2)
   d. Inspect and test electrical/electronic sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action. (VIIIE2-4, P-2)
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Exhaust gas recirculation system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EMISSIONS CONTROL SYSTEM DIAGNOSIS AND REPAIR: EXHAUST GAS TREATMENT SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform emissions control system diagnosis and repair.

Diagnose and repair exhaust gas treatment system.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair exhaust gas treatment system.
   a. Diagnose emissions and driveability problems resulting from failure of the secondary air injection and catalytic converter systems; determine necessary action. (VIIIE3-1, P-2)
   b. Inspect and test mechanical components of secondary air injection systems; perform necessary action. (VIIIE3-2, P-2)
   c. Inspect and test electrical/electronically-operated components and circuits of air injection systems; perform necessary action. (VIIIE3-3, P-2)
   d. Inspect and test components of catalytic converter systems; perform necessary action. (VIIIE3-4, P-2)
   e. Measure efficiency of catalytic converter systems.
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Exhaust gas treatment system diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EMISSIONS CONTROL SYSTEM DIAGNOSIS AND REPAIR: INTAKE AIR TEMPERATURE CONTROLS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform emissions control system diagnosis and repair.

Diagnose and repair intake air temperature controls.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair intake air temperature controls.
   a. Diagnose emissions and driveability problems resulting from failure of the intake air temperature control system; determine necessary action. (VIIIE4-1, P-3)
   b. Inspect and test components of intake air temperature control system; perform necessary action. (VIIIE4-2, P-3)
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation. (VIIID15, P-2)

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Intake air temperature controls diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EMISSIONS CONTROL SYSTEM DIAGNOSIS AND REPAIR: EARLY FUEL EVAPORATION (INTAKE MANIFOLD TEMPERATURE) CONTROLS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Safety glasses
- Personal safety practices concerning:
  - clothing
  - hand and power tool usage
  - ventilation of fumes
  - lifting and securing of vehicles
- Environmental safety standards in accordance with local, state and federal regulations
- Basic tools, equipment and shop space
- Technical information resources
- ASE (Automotive Service Excellence) Tasks List
- Facility policy and procedures
- Appropriate documentation

WORK TO BE PERFORMED

Perform emissions control systems diagnosis and repair.

Diagnose and repair early fuel evaporation (intake manifold temperature) controls.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and repair.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair early fuel evaporation controls.
   a. Diagnose emissions and driveability problems resulting from failure of early fuel evaporation control system; determine necessary action. (VIIIE5-1, P-3)
   b. Inspect and test components of early fuel evaporation control system; perform necessary action. (VIIIE5-2, P-3)
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Early fuel evaporation (Intake Manifold Temperature) controls diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

PERFORM EMISSIONS CONTROL SYSTEM DIAGNOSIS AND REPAIR: EVAPORATIVE EMISSION CONTROLS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Safety glasses
Personal safety practices concerning:
- clothing
- hand and power tool usage
- ventilation of fumes
- lifting and securing of vehicles

Environmental safety standards in accordance with local, state and federal regulations
Basic tools, equipment and shop space
Technical information resources
ASE (Automotive Service Excellence) Tasks List
Facility policy and procedures
Appropriate documentation

WORK TO BE PERFORMED

Perform emissions control systems diagnosis and repair.

Diagnose and repair evaporative emission controls.

PERFORMANCE CRITERIA

Skill is completed without error using the approved service procedures.

Skill is completed in flat rate time multiplied by 1.50.

PERFORMANCE ELEMENTS

1. Wear safety glasses.
2. Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes, and lifting and securing of vehicles.
3. Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations.
4. Check technical service bulletins/updates and identify approved service procedure.
5. Prepare the vehicle for diagnosis and service.
6. Secure appropriate tools, equipment and components required to complete the procedure.

7. Diagnose and repair evaporative emission control.
   a. Diagnose emissions and driveability problems resulting from failure of evaporative emissions control system; determine necessary action. (VIIIE6-1, P-2).
   b. Inspect and test components and hoses of evaporative emissions control system; perform necessary action. (VIIIE6-2, P-2)
   c. Inspect and test electrical/electronic sensors, controls, and wiring evaporative emissions control system; perform necessary action.
8. Clean up work area.
9. Return tools to proper location.
10. Complete appropriate documentation.

PERFORMANCE ASSESSMENT CRITERIA

All procedures are completed in accordance with ASE standards.

Individuals are encouraged to participate in the voluntary ASE certification process.

Environmental safety concerns are strictly adhered to in accordance with local, state and federal regulations.

PRODUCT

Evaporative emission controls diagnosis and repair are performed using the most appropriate service procedure.

PROCESS

The performance elements are listed to show an appropriate sequence for completing the skill; however, the sequence may vary due to shop policies and or the complexity of the procedure.

It may not be necessary to perform all ASE tasks. The actual tasks performed depend upon the nature of the complaint, the type of vehicle being serviced, and the type of service being performed.

The following matrix lists the location of the Automotive Service Excellence (ASE) tasks within the Automotive Technician Illinois Occupational Skill Standards. The intent of the matrix is to assist in the development of an ASE certified program for educational facilities by providing a quick reference sheet that cross-references the ASE tasks with the Automotive Technician Illinois Occupational Skill Standards.

Automotive Service Excellence Tasks and Illinois Occupational Skill Standards Cross Reference

Skill 1	Perform General Engine Diagnosis IA1, P-1; IA2, P-2; IA3, P-3; IA4, P-3; IA5, P-1; IA6, P-1; IA7, P-1; IA8, P-1
Skill 2	Removal and Reinstallation (R&R) IA9, P-3; IA11, P-3; IA10, P-3; IA12, P-3
Skill 3	Perform Cylinder Head and Valve Train Diagnosis and Repair IB1, P-2; IB3, P-3; IB4, P-2; IB5, P-3; IB6, P-3; IB7, P-2; IB8, P-2; IB9, P-3; IB10, P-2; IB11, P-2; IB12, P-2; IB2, P-2; IB14, P-2; IB15, P-1; IB16, P-3; IB17, P-3; IB18, P-1; IB13, P-1
Skill 4	Perform Engine Block Diagnosis and Repair IC2, P-2; IC3, P-1; IC4, P-3; IC5, P-2; IC6, P-1; IC7, P-3; IC8, P-3; IC9, P-2; IC10, P-3; IC11, P-2; IC12, P-2; IC1, P-2; IC13, P-3; IC14, P-2; IC15, P-3; IC16, P-1
Skill 5	Perform Lubrication System Diagnosis and Repair ID1, P-1; ID2, P-3; ID11, P-3; ID12, P-2; ID13, P-1
Skill 6	Perform Cooling System Diagnosis and Repair ID3, P-1; ID4, P-1; ID7, P-1; ID4, P-2; ID6, P-2; ID8, P-2; ID9, P-2; ID10, P-2
Skill 7	Perform General Transmission and Transaxle Diagnosis IIA1, P-1; IIA2, P-1; IIA3, P-1; IIA4, P-2; IIA5, P-1; IIA6, P-3
Skill 8	Perform Transmission and Transaxle Maintenance and Adjustment IIB1, P-1; IIB2, P-1
Skill 9	Perform In-Vehicle Transmission and Transaxle Repair IIC1, P-3; IIC2, P-3; I IC3, P-2; IIC4, P-3; IIC5, P-1; IIC6, P-3; IIC7, P-1; IIC8, P-3
Skill 10	Removal, Disassembly and Reinstallation: Off-Vehicle Transmission/Transaxle Repair IID1-1, P-2; IID1-2, P-2; IID1-3-IID1-6; IID1-3, P-1; IID1-4, P-2; IID1-5, P-3; IID1-6, P-3; IID-7, P-1; IID1-1, P-2; IID1-2, P-2
Skill 11	Perform Oil Pump and Converter Inspection and Service: Off-Vehicle Transmission/Transaxle Repair IID2-1, P-2; IID2-2, P-2; IID2-3, P-3; IID2-4, P-1

Skill 12	Perform Gear Train, Shafts, Bushings and Case Inspection and Service: Off-Vehicle Transmission/Transaxle Repair IID3-1, P-1; IID3-2, P-2; IID3-3, P-2; IID3-4, P-2; IID3-5, P-2; IID3-6, P-2; IID3-7, P-2; IID3-8, P-2; IID3-9, P-3
Skill 13	Perform Friction and Reaction Units Inspection and Service: Off-Vehicle Transmission/Transaxle Repair IID4-1, P-2; IID4-2, P-1; IID4-4, P-2; IID4-5, P-3; IID4-3, P-1
Skill 14	Perform Transmission Diagnosis IIIB4, P-3
Skill 15	Perform Transaxle Diagnosis IIIB4, P-3; IIIB13, P-3
Skill 16	Perform Clutch Diagnosis and Repair IIIA-1, P-1; IIIA2, P-1; IIIA3, P-1; IIIA4, P-1; IIIA5, P-1; IIIA6, P-1; IIIA7, P-1; IIIA8, P-3; IIIA9, P-3
Skill 17	Perform Transmission Repair IIIB1, P-2; IIIB2, P-2; IIIB3, P-3; IIIB7, P-2; IIIB9, P-2; IIIB10, P-1; IIIB11, P-2; IIIB12, P-2; IIIB15, P-3; IIIB16, P-1; IIIB1, P-2; IIIB5, P-3; IIIB6, P-3
Skill 18	Perform Transaxle Repair IIIB1, P-2; IIIB2, P-2; IIIB3, P-3; IIIB8, P-3; IIIB9, P-2; IIIB14, P-2; IIIB7, P-2; IIIB10, P-1; IIIB11, P-2; IIIB12, P-2; IIIB14, P-2; IIIB15, P-3; IIIB16, P-1; IIIB1, P-2; IIIB5, P-3; IIIB6, P-3
Skill 19	Perform Drive Shaft and Half Shaft, Universal and Constant Velocity (CV) Joint Diagnosis and Repair IIIC1, P-2; IIIC2, P-2; IIIC3, P-2; IIIC4, P-1; IIIC5, P-3; IIIC6, P-3
Skill 20	Perform Drive Axle Diagnosis and Repair: Ring and Pinion Gear and Differential Case Assembly IIID1-1, P-2; IIID1-2, P-2; IIID1-3, P-2; IIID1-4, P-2; IIID1-4, P-2; IIID1-5, P-2; IIID1-10, P-2; IIID1-6, P-2; IIID1-7, P-1; IIID1-8, P-2; IIID1-9, P-1; IIID1-11, P-2
Skill 21	Perform Drive Axle Diagnosis and Repair: Limited Slip Differential IIID2-1, IIID2-4; IIID2-1, P-3; IIID2-4, P-3; IIID2-3, P-3; IIID2-2, P-2
Skill 22	Perform Drive Axle Diagnosis and Repair: Drive Axle Shaft IIID3-1, P-2; IIID3-5, P-2; IIID3-2, P-3; IIID3-3, P-1; IIID3-4, P-2
Skill 23	Perform Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair IIIE1, P-3; IIIE6, P-3; IIIE2, P-3; IIIE3, P-3; IIIE4, P-3; IIIE5, P-3; IIIE7, P-3

Skill 24	Perform Steering System Diagnosis and Repair IVA1, P-1; IVA2, P-1; IVA3, P-3; IVA4, P-3; IVA5, P-3; IVA6, P-2; IVA7, P-3; IVA8, P-2; IVA9, P-3; IVA10, P-3; IVA11, P-2; IVA12, P-1; IVA13, P-2; IVA14, P-2; IVA15, P-1; IVA16, P-3; IVA17, P-3; IVA18, P-2; IVA19, P-3; IVA20, P-2; IVA21, P-3
Skill 25	Perform Suspension System Diagnosis and Repair: Front Suspensions IVB1-1, P-1; IVB1-2, P-1; IVB1-3, P-2; IVB1-4, P-2; IVB1-5, P-2; IVB1-6, P-2; IVB1-7, P-2; IVB1-8, P-3; IVB1-9, P-3; IVB1-10, P-1; IBV1-11, P-2
Skill 26	Perform Suspension System Diagnosis and Repair: Rear Suspensions IVB2-1, P-2; IVB2-2, P-2; IVB2-3, P-3; IVB2-4, P-2
Skill 27	Perform Suspension System Diagnosis and Repair: Miscellaneous Service IVB3-1, P-1; IVB3-2, P-1; IVB3-3, P-2
Skill 28	Perform Wheel Alignment Diagnosis, Adjustment, and Repair IVC1, P-1; IVC2, P-1; IVC3, P-1; IVC4, P-1; IVC11, P-2; IVC10, P-2; IVC4, P-1; IVC5, P-1; IVC8, P-2; IVC9, P-2; IVC12, P-2; IVC13, P-3, IVC7, P-1; IVC6, P-1
Skill 29	Perform Wheel and Tire Diagnosis and Repair IVD1, P-1; IVD2, P-1; IVD3, P-2; IVD4, P-1; IVD5, P-2; IVD6, P-2; IVD7, P-1; IVD8, P-2; IVD9, P-1
Skill 30	Perform Hydraulic System Diagnosis and Repair VA1, P-2; VA2, P-2; VA4, P-1; VA5, P-2; VA6, P-2, VA7, P-1; VA8, P-3; VA9, P-3; VA10, P-3; VA11, P-1; VA12, P-3; VA3, P-1
Skill 31	Perform Drum Brake Diagnosis and Repair VB1, P-1; VB2, P-1; VB3, P-2; VB4, P-2; VB5, P-2; VB6, P-1; VB7, P-1
Skill 32	Perform Disc Brake Diagnosis and Repair VC1, P-1; VC2, P-1; VC3, P-1; VC4, P-1; VC5, P-1; VC6, P-1; VC7, P-1; VC11, P-2; VC8, P-1; VC9, P-3; VC10, P-1
Skill 33	Perform Power Assist Units Diagnosis and Repair VD1, P-2; VD2, P-2; VD3, P-2; VD4, P-3
Skill 34	Perform Miscellaneous Diagnosis and Repair: Wheel Bearing VE1, P-1; VE2, P-1; VE7, P-1
Skill 35	Perform Miscellaneous Diagnosis and Repair: Parking Brakes VE3, P-2; VE4, P-1
Skill 36	Perform Miscellaneous Diagnosis and Repair: Electrical Diagnosis and Repair of Brake Light System VE6, P-1; VE5, P-3

Skill 37	Perform Antilock System Diagnosis and Repair VF1, P-2; VF2, P-2; VF3, P-1; VF8, P-3; VF4, P-2; VF6, P-3; VF5, P-2; VF7, P-2
Skill 38	Perform General Electrical System Diagnosis VIA1, P-1; VIA2, P-2; VIA3, P-1; VIA4, P-1; VIA5, P-1; VIA6, P-2; VIA7, P-1; VIA8, P-1; VIA9, P-1; VIA10, P-1; VIA11, P-1; VIA12, P-1
Skill 39	Perform Battery Diagnosis and Service VIB1, P-1; VIB2, P-1; VIB3, P-2; VIB4, P-2; VIB5, P-2; VIB6, P-1; VIB7, P-1
Skill 40	Perform Starting System Diagnosis and Repair VIC1, P-1; VIC2, P-1; VIC3, P-2; VIC6, P-2; VIC4, P-2; VIC5, P-3; VIC7, P-3
Skill 41	Perform Charging System Diagnosis and Repair VID1, P-1; VID2, P-1; VID3, P-1; VID4, P-2; VID7, P-1; VID5, P-2; VID6, P-3
Skill 42	Perform Lighting System Diagnosis and Repair VIE1, P-2; VIE2, P-2; VIE3, P-2
Skill 43	Perform Gauge, Warning Devices and Driver Information Systems Diagnosis and Repair VIF1, P-2; VIF2, P-3; VIF3, P-1; VIF4, P-3
Skill 44	Perform Horn Diagnosis and Repair VIG1, P-3
Skill 45	Perform Wiper/Washer Diagnosis and Repair VIG2, P-3; VIG3, P-3
Skill 46	Perform Accessories Diagnosis and Repair VIH1, P-2; VIH2, P-3; VIH3, P-3; VIH4, P-3; VIH5, P-2; VIH6, P-3
Skill 47	Perform A/C System Diagnosis VIIA1, P-2; VIIA2, P-1; VIIA3, P-1
Skill 48	Perform Refrigerant Recovery, Recycling, and Handling VIIE1, P-1; VIIE2, P-1; VIIE3, P-1; VIIE4, P-1; VIIE5, P-1
Skill 49	Perform Refrigeration System Component Diagnosis and Repair: Compressor and Clutch VIIB1-1, P-2; VIIB1-3, P-2; VIIB1-4, P-2; VIIA4, P-2; VIIA5, P-2; VIIB1-2, P-2

Skill 50	Perform Refrigeration System Component Diagnosis and Repair: Evaporator, Condenser and Related Components VIIB2-1, P-3; VIIB2-2, P-2; VIIB2-4, P-2; VIIB2-5, P-2; VIIB2-6, P-3; VIIB2-3, P-1
Skill 51	Evacuate and Charge A/C System VIIE1, P-1; VIIE6, P-1
Skill 52	Perform Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair VIIC1, P-2; VIIC9, P-2; VIIC2, P-1; VIIC3, P-1; VIIC4, P-1; VIIC5, P-1; VIIC6, P-1; VIIC7, P-1; VIIC8, P-1
Skill 53	Perform Operating Systems and Related Controls Diagnosis and Repair: Electrical VIID1, P-2; VIID2, P-2; VIID3, P-3
Skill 54	Perform Operating Systems and Related Controls Diagnosis and Repair: Vacuum/Mechanical VIID4, P-2; VIID5, P-3; VIID6, P-3; VIID7, P-3
Skill 55	Perform Operating Systems and Related Controls Diagnosis and Repair: Automatic and Semi-Automatic Temperature Controls VIID8, P-3
Skill 56	Perform Engine Related Service VIIIF1, P-1; VIIIF2, P-1; VIIIF3, P-1; VIIIF4, P-1; VIIIF5, P-1; VIIIF6, P-2
Skill 57	Perform General Engine Diagnosis VIIIA1, P-1; VIIIA2, P-2; VIIIA3, P-2; VIIIA4, P-2; VIIIA5, P-1; VIIIA6, P-1; VIIIA7, P-1; VIIIA8, P-1; VIIIA9, P-1; VIIIA10, P-1
Skill 58	Perform Computerized Engine Controls Diagnosis and Repair VIIIB1, P-1; VIIIB2, P-3; VIIIB3, P-1; VIIIB4, P-1; VIIIB5, P-2; VIIIB6, P-1; VIIIB7, P-3; VIIIB8, P-1; VIIIB9, P-1; VIIIB10, P-2; VIIIB11, P-2
Skill 59	Perform Ignition System Diagnosis and Repair VIIIC1, P-1; VIIIC2, P-1; VIIIC3, P-2; VIIIC4, P-3; VIIIC5, P-2; VIIIC6, P-2; VIIIC7, P-1; VIIIC8, P-2; VIIIC9, P-2
Skill 60	Perform Fuel Systems Diagnosis and Repair VIIID1, P-3; VIIID2, P-1; VIIID3, P-2; VIIID4, P-2; VIIID5, P-2; VIIID7, P-1; VIIID8, P-3; VIIID14, P-2; VIIID6, P-1; VIIID9, P-2; VIIID10, P-2; VIIID11, P-2; VIIID12, P-2; VIIID13, P-3
Skill 61	Perform Air Induction System Diagnosis and Repair VIIID17, P-3

Skill 62	Perform Exhaust System Diagnosis and Repair VIIID15, P-2; VIIID16, P-1
Skill 63	Perform Emissions Control System Diagnosis and Repair: Positive Crankcase Ventilation System VIIIE1-1, P-1; VIIIE1-2, P-2
Skill 64	Perform Emissions Control System Diagnosis and Repair: Exhaust Gas Recirculation System VIIIE2-1, P-1; VIIIE2-2, P-2; VIIIE2-3, P-2; VIIIE2-4, P-2
Skill 65	Perform Emissions Control System Diagnosis and Repair: Exhaust Gas Treatment System VIIIE3-1, P-2; VIIIE3-2, P-2; VIIIE3-3, P-2; VIIIE3-4, P-2
Skill 66	Perform Emissions Control System Diagnosis and Repair: Intake Air Temperature Controls VIIIE4-1, P-3; VIIIE4-2, P-3
Skill 67	Perform Emissions Control System Diagnosis and Repair: Early Fuel Evaporation (Intake Manifold Temperature) Controls VIIIE5-1, P-3; VIIIE5-2, P-3
Skill 68	Perform Emissions Control System Diagnosis and Repair: Evaporate Emission Controls VIIIE6-1, P-2; VIIIE6-2, P-2

ADD	To increase fluid or pressure to the correct level or amount.
ADJUST	To bring components to specified operational settings.
AIR TEST	To use air pressure to determine proper action of components.
ALIGN	To bring to precise alignment or relative position of components.
ANALYZE	To examine the relationship of components of an operation.
ASSEMBLE (REASSEMBLE)	To fit together the components of a device.
BALANCE	To establish correct linear, rotational or weight relationship.
BLEED	To allow air fluids to enter or exit a closed system.
CHARGE	To bring to "full" state, e.g., battery or air conditioning system.
CHECK	To verify condition by performing an operational or comparative examination.
CLEAN	To rid component of extraneous matter for the purpose of reconditioning, repairing, measuring or reassembling.
DETERMINE	To establish the procedure to be used to effect the necessary repair.
DIAGNOSE	To locate the cause or nature of a problem by using the specified procedure.
DISASSEMBLE	To separate a component's parts as a preparation for cleaning, inspection or service.
DISCHARGE	To empty a storage device or system.
DRAIN	To use gravity to empty a container.
EVACUATE	To remove air, fluid or vapor from a closed system by use of a vacuum pump.
FILL (REFILL)	To bring fluid level to specified point or volume.
FIND	To locate a particular problem, e.g., shorts, grounds or opens in an electrical circuit.

FLUSH	To use a fluid to clean an internal system.
HONE	To restore, resize or bore by using rotating cutting stones.
IDENTIFY	To establish the identity of a vehicle or component prior to service; to determine the nature or degree of a problem.
INSPECT	(SEE CHECK)
INSTALL (REINSTALL)	To place a component in its proper position in a system.
JOURNEYPERSON	Is an equivalent title to the labor title and position Journeyman.
JUMP START	To use an auxiliary power supply, i.e., battery, battery charger, etc. to assist a battery to crank an engine.
LEAK TEST	To locate the source of leaks in a component or system.
LISTEN	To use audible clues in the diagnostic process; to hear the customer's description of a problem.
LUBRICATE	To employ the correct procedures and materials in performing the prescribed service.
MEASURE	To compare existing dimensions to specified dimensions by the use of calibrated instruments and gauges.
MOUNT	To attach or place tool or component in proper position.
PRESSURE TEST	To use air or fluid pressure to determine the condition or operation of a component or system.
PERFORM	To accomplish a procedure in accordance with established methods.
PURGE	To eliminate an undesired air or fluid from a closed system.
READY	To prepare a system or component for service, installation or operation.
REASSEMBLE	(SEE ASSEMBLE)

REFILL	(SEE FILL)
REINSTALL	(SEE INSTALL)
REMOVE	To disconnect and separate a component from a system.
REPAIR	To restore a malfunctioning component or system to operating condition.
REPLACE	To exchange an unserviceable component with a new or rebuilt component; to reinstall a component.
RESET (SET)	To adjust a variable component to a given, usually initial, specification.
SELECT	To choose the correct part or setting during assembly or adjustment.
SERVICE	To perform a specified procedure when called for in the owner's or service manual.
TEST	To verify condition through the use of meters, gauges or instruments.
TRIM	(SEE ADJUST)
TORQUE	To tighten a fastener to specified degree or tightness (in a given order or pattern if multiple fasteners are involved on a single component).
VACUUM TEST	To determine the integrity and operation of a vacuum operated component and/or system.
VERIFY	To establish that a problem exists after hearing the customer's complaint and performing a preliminary diagnosis.

Academic Skills	Skills (and related knowledge) contained in the subject areas and disciplines addressed in most national and state educational standards, including English, mathematics, science, etc.
Assessment	A process of measuring performance against a set of standards through examinations, practical tests, performance observations and/or the completion of work portfolios.
Content Standard	A specification of what someone should know or be able to do to successfully perform a work activity or demonstrate a skill.
Critical Work Functions	Distinct and economically meaningful sets of work activities critical to a work process or business unit which are performed to achieve a given work objective with work outputs that have definable performance criteria. A critical work function has three major components: • **Conditions of Performance:** The information, tools, equipment and other resources provided to a person for a work performance. • **Work to Be Performed:** A description of the work to be performed. • **Performance Criteria:** The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance), process or procedure requirements (e.g., safety, standard professional procedures) and time and resource requirements. The IOSSCC requires that these performance criteria be further specified by more detailed individual performance elements and assessment criteria.
Credentialing	The provision of a certificate or award to an individual indicating the attainment of a designated set of knowledge and skills and/or the demonstration of a set of critical work functions for an industry/occupational area.
Illinois Occupational Skill Standards and Credentialing Council (IOSSCC)	Legislated body representing business and industry which establishes skill standards criteria, endorses final products approved by the industry subcouncil and standards development committee and assists in marketing and dissemination of occupational skill standards.
Industry	Type of economic activity, or product or service produced or provided in a physical location (employer establishment). They are usually defined in terms of the Standard Industrial Classification (SIC) system.

Industry Subcouncil	Representatives from business/industry and education responsible for identifying and prioritizing occupations for which occupational performance skill standards are adapted, adopted or developed. They establish standards development committees and submit developed skill standards to the IOSSCC for endorsement. They design marketing plans and promote endorsed skill standards across the industry.
Knowledge	Understanding the facts, principles, processes, methods and techniques related to a particular subject area, occupation or industry.
Occupation	A group or cluster of jobs, sharing a common set of work functions and tasks, work products/services and/or worker characteristics. Occupations are generally defined in terms of a national classification system including the Standard Occupational Classification (SOC), Occupational Employment Statistics (OES) and the Dictionary of Occupational Titles (DOT).
Occupational Cluster	Grouping of occupations from one or more industries that share common skill requirements.
Occupational Skill Standards	Specifications of content and performance standards for critical work functions or activities and the underlying academic, workplace and occupational knowledge and skills needed for an occupation or an industry/occupational area.
Occupational Skills	Technical skills (and related knowledge) required to perform the work functions and activities within an occupation.
Performance Standard	A specification of the criteria used to judge the successful performance of a work activity or the demonstration of a skill.
Product Developer	Individual contracted to work with the standard development committee, state liaison, industry subcouncil and IOSSCC for the adaptation, adoption or development of skill standards content.
Reliability	The degree of precision or error in an assessment system so repeated measurements yield consistent results.
Skill	A combination of perceptual, motor, manual, intellectual and social abilities used to perform a work activity.
Skill Standard	Statement that specifies the knowledge and competencies required to perform successfully in the workplace.

Standards Development Committee	Incumbent workers, supervisors and human resource persons within the industry who perform the skills for which standards are being developed. Secondary and postsecondary educators are also represented on the committee. They identify and verify occupational skill standards and assessment mechanisms and recommend products to the industry subcouncil for approval.
State Liaison	Individual responsible for communicating information among all parties (e.g., IOSSCC, subcouncil, standard development committee, product developer, project director, etc.) in skill standard development.
Third-Party Assessment	An assessment system in which an industry-designated organization (other than the training provider) administers and controls the assessment process to ensure objectivity and consistency. The training provider could be directly involved in the assessment process under the direction and control of a third-party organization.
Validity	The degree of correspondence between performance in the assessment system and job performance.
Workplace Skills	The generic skills essential to seeking, obtaining, keeping and advancing in any job. These skills are related to the performance of critical work functions across a wide variety of industries and occupations including problem solving, leadership, teamwork, etc.

Margaret Blackshere	AFL-CIO
Judith Hale	Hale Associates
Michael O'Neill	Chicago Building Trades Council
Janet Payne	United Samaritans Medical Center
Gene Rupnik	Hospitality Industry
Jim Schultz	Illinois Retail Merchants Association Walgreen Company
Larry Vaughn	Illinois Chamber of Commerce

Sam Anderson	Vice President American Postal Workers' Union
Alexi Carli	Subcouncil Chair Region Manager of Health/Safety United Parcel Service
Colleen Bueche	Human Resources Supervisor Enterprise Rent-A-Car
John Burner	Assistant State Director United Transportation Union
Elwood Flowers	Lobbyist Amalgamated Transit
Carl Gallman	Administrative Assistant International Association of Machinists.
Karl Gnadt	Assistant to the Managing Director Champaign/Urbana Mass Transit District
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Wayne Grieder	President Archer Kostner Automotive
Thomas Nicely	Logistic Specialist JKC Trucking Company
David Regner	Illinois School Transportation Association
Roger Roberson	CEO PFT/Roberson Corporation
Dianna Rushing	Association of Flight Attendant's Council
Carolyn Schoeneman	Manager Ground Employment ORDEX- United Airlines
Joseph Szabo	State Director United Transportation Union

Paul Tatman	President Tatman Auto Body, Inc.
Russ Verona	President East Rockford Collision Center-North
Michael Wagner	General Manager Alpha Special Services
Vince Waters	Illinois Chapter of the American Concrete Pavement Association
Russ Wittkop	Special Representative, Midwest Territory International Association of Machinists
Gerald Zero	Secretary/Treasurer Illinois AFL-CIO Teamsters' Union
Ron Engstrom	State Liaison Illinois State Board of Education

APPENDIX D

AUTOMOTIVE TECHNICIAN CLUSTER STANDARDS DEVELOPMENT COMMITTEE

Scott Aljets	Aljets Automotive
Kenneth Bean	Fleener & Roberts Automotive
Mike Biffar	Precision Automotive
James Cerny	Salem Community High School
Bob Doktor	Ray Dennison Chevrolet
Glenn Friederich	Glenn Friederich Radiator
Jim Kitchens	Jim's Auto Service
Dominic Pacenti	Technology Center of DuPage
Joe Saxton	Comprehensive Auto Technical Services (C.A.T.S.)
Ron Tuetken	Automotive Technology Lewis & Clark Community College
Demetrios Varnasidis	Service Advisor Fleet Management Co
Roger Donovan, Ph.D.	Product Developer Illinois Central College
Ron Engstrom	State Liaison Illinois State Board of Education

APPENDIX E

TRANSPORTATION, DISTRIBUTION AND LOGISTICS SUBCOUNCIL AUTOMOTIVE TECHNICIAN CLUSTER SKILL STANDARDS RECOGNITION PROPOSAL

I. Occupational Definition and Justification

A. Occupational Definition

Automobile technicians repair and maintain automotive equipment. Duties include preventive maintenance, diagnosis of failures and adjustment, and repair or replacement of parts. A mechanic may also test drive the car and use testing equipment. Some specialize. Most work on all parts of a car.

Entry level technicians are expected to have a general knowledge of all areas and must have graduated from an automotive technical program.

Journeyperson technicians have a minimum of five years experience and are recommended to have ASE certification in specialty area(s).

B. Employment and Earnings Opportunities

1. Education and Training Requirements

Many technicians still learn their skills on the job. Employers prefer applicants with a combination of formal training and experience. Applicants should have a current vehicle operator's license, a good driving record, and be in good physical condition. Skills can be acquired through apprenticeship or community college and technical school programs. ASE certification is not mandatory; however, it is highly recommended.

2. Employment Opportunities

Nationally and in Illinois, employment is expected to grow about as fast as average through 2006. Job opportunities in automotive technologies are expected to be plentiful for persons who complete training programs in high school, vocational and technical schools, or community colleges. In Illinois, "automotive technicians" is one of 50 occupations expected to provide the most job openings each year. Persons without formal technician training are likely to face competition for entry-level jobs. Demand is strong because the growing complexity of automotive technology makes it more difficult for people to maintain their own cars. Many people are completing training as automotive technicians each year in Illinois. Prospects are best in large cities. According to the Illinois Department of Employment Security, the short-term statewide forecast for automotive technicians is very favorable.

After gaining several years of experience and/or additional training, automotive technicians may advance to positions such as shop supervisors, service sales workers, service managers, or repair service estimators. Those who specialize in a particular segment of repair work may receive higher status than all-around technicians. Some technicians become car or truck sales workers or managers of dealer parts departments. Some technicians open a service facility of their own.

3. Earnings Opportunities

	Middle Range Annual Earnings*
Entry Level Technician	$20,500-$29,300
Journeyperson Technician	$27,350-$36,100

** Middle range is the middle 50%, i.e., one-fourth of persons in the occupation earn below the bottom of the range and one-fourth of persons in the occupation earn above the top of the range.*

Sources: Horizons Career Information System; Occupational Wage Survey, 1999 Edition, Illinois Department of Employment Security.

II. Occupational Standards and Credentials

A. Occupational Standards

Performance areas in the automotive technician cluster are divided into eight segments: Engine Repair, Automatic Transmissions and Transaxles, Manual Drive Trains and Axles, Suspension and Steering, Brakes, Electrical/Electronic Systems, Heating and Air Conditioning, and Engine Performance.

B. Assessment and Credentialing System

III. Industry Support and Commitment

A. Industry Commitment for Development and Updating

1. The Transportation, Distribution and Logistics Subcouncil and the Standards Development Committee developed these performance skill standards. The development effort utilized the following steps:
   a. Identification of performance skills
   b. Review of resources
   c. Convening of Standards Development Committee
   d. Development of draft performance skills
   e. Validation and approval of performance skills by Standards Development Committee
   f. Review of skill standards by Standards Development Committee
   g. Review and approval of the skill standards by the Subcouncil
   h. Endorsement of skill standards by the Illinois Occupational Skill Standards Credentialing Council (IOSSCC)
2. A list of Subcouncil and Standards Development Committee members may be seen in Appendices C and D, respectively.

B. Industry Commitment for Marketing

The Transportation Subcouncil is committed to marketing and obtaining support and endorsement from the leading industry associations impacted by the skill standards. Upon recognition/endorsement of the skill standards by the IOSSCC, the Subcouncil strongly recommends developing and providing an in-service/seminar package for members of the Transportation Subcouncil to provide awareness and to obtain full industry commitment to the development of a full industry marketing plan.

The Subcouncil encourages that the occupational skill standards be made available to the public including students, parents, workers, guidance counselors, educators at all levels, employers and industry organization personnel.

A. Developing an Employment Plan	1. Match interests to employment area. 2. Match aptitudes to employment area. 3. Identify short-term work goals. 4. Match attitudes to job area. 5. Match personality type to job area. 6. Match physical capabilities to job area. 7. Identify career information from counseling sources. 8. 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. Prepare for job interview. 6. Identify conditions for employment. 7. Evaluate job opportunities. 8. Identify steps in applying for a job. 9. Write job application letter. 10. Write interview follow-up letter. 11. Complete job application form. 12. 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. 4. Complete employee's Withholding Allowance Certificate Form W-4.
D. Communicating on the Job	1. Communicate orally with others. 2. Use telephone etiquette. 3. Interpret the use of body language. 4. Prepare written communication. 5. Follow written directions. 6. Ask questions about tasks.
E. Interpreting the Economics of Work	1. Identify the role of business in the economic system. 2. Describe responsibilities of employee. 3. Describe responsibilities of employer or management. 4. Investigate opportunities and options for business ownership. 5. Assess entrepreneurship skills.
F. Maintaining Professionalism	1. Participate in employment orientation. 2. Assess business image, products and/or services. 3. Identify positive behavior. 4. Identify company dress and appearance standards. 5. Participate in meetings in a positive and constructive manner. 6. Identify work-related terminology. 7. Identify how to treat people with respect.

G. Adapting to and Coping with Change	1. Identify elements of job transition. 2. Formulate a transition plan. 3. Identify implementation procedures for a transition plan. 4. Evaluate the transition plan. 5. Exhibit ability to handle stress. 6. Recognize need to change or quit a job. 7. Write a letter of resignation.
H. Solving Problems and Critical Thinking	1. Identify the problem. 2. Clarify purposes and goals. 3. Identify solutions to a 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 option. 9. Organize workloads. 10. Assess employer and employee responsibility in solving a problem.
I. Maintaining a Safe and Healthy Work Environment	1. Identify safety and health rules/procedures. 2. Demonstrate the knowledge of equipment in the workplace. 3. Identify conservation and environmental practices and policies. 4. Act during emergencies. 5. Maintain work area. 6. Identify hazardous substances in the workplace.
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. Display assertiveness. 8. Demonstrate a willingness to learn. 9. Identify the value of maintaining regular attendance. 10. Apply ethical reasoning.
K. Demonstrating Technological 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. 7. Identify and react to sexual intimidation/harassment.

M. Demonstrating Teamwork	1. Identify style of leadership used in teamwork. 2. Match team member skills and group activity. 3. Work with team members. 4. Complete a team task. 5. Evaluate outcomes.

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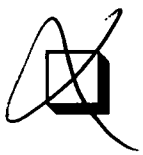

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