



2017 Automotive Technology Contest Guide Book

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Columbus, Ohio 43215

Automotive Technology Contest



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Instructions to Contest Coordinators

General Responsibilities

1. Supervise the selection of skills to be tested in the state contest and identify necessary equipment and supplies. Make arrangements for borrowing and/or soliciting donations for all items.
2. Supervise the development of contest projects, drawings and instruction sheets for the contestants.
3. Locate individuals who are knowledgeable in your contest trade or skill area and invite them to serve as judges.
4. Plan the layout of the contest site. Identify needs and/or services such as water, electricity and compressed air.
5. Be certain that all judges are familiar with the contest regulations.
6. Make arrangements for acquiring appropriate industry awards.
7. Plan and conduct the mandatory pre-contest orientation meeting.

Pre-contest Orientation Meeting - The pre-contest orientation meeting is mandatory for all contest participants. The purpose of this meeting is to review the following items with all contestants.

1. **Contestants' Credentials**
Verify each candidate's name as it appears on their name tag with the master list of contestants.
2. **Contest Rules**
Check to be certain that all contestants are familiar with the contest rules.
3. **Contest Procedures**
Explain the way in which the contest will be run, including schedule, rating criteria, and the method of dealing with problems.
4. **Safety Regulations**
Review general and specific safety requirements and procedures for the contest.
5. **Tools and Materials**
Go over the list of tools and materials which are to be supplied by the contestants.
6. **Work Stations/Order of Performance**
Have contestants draw numbers for work stations/order of performance.

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7. **Equipment**

Take time to explain the operation of equipment with which contestants may not be familiar, including safety features. If possible, allow contestants to become familiar with the equipment.

8. **Special Announcements**

Announce that contestants are not permitted to smoke during the contest. (NOTE: SkillsUSA requests that all contest personnel refrain from smoking and/or consuming alcoholic beverages in the presence of SkillsUSA members.) Also announce that all cell phones must be turned off and put away during competition. It will be grounds for disqualification if anyone is using a cell phone during competition.

9. **Contestants' Questions**

Encourage contestants to ask any questions which they may have about the SOC.

Conducting the SkillsUSA Ohio Championships

1. Check all contest area facilities prior to the start of the contest.
2. Assemble all judges at the contest site prior to the start of the contest for a briefing. Be sure that all questions are answered and that the rating procedures are clear.
3. Make sure that all contestants receive copies of the project to be completed as well as any necessary drawings, instruction sheets, and so on. Be certain that all contestants understand all instructions and have a chance to ask procedural questions. Take great care to see that all contestants have equal time and their questions are answered fairly.
4. Oversee the contest to insure that safe work practices are followed.
5. Do not permit contestants to enter the contest site at any time unless they are displaying their contestant badges and numbers.
6. Conduct a critiquing session with the contestants after the contest to point out general strengths and weaknesses and the quality of work.
7. Verify all judges' rating sheets and supervise the totaling of the judges' scores. Select first, second and third place winners for both secondary and post-secondary divisions.

THERE CAN BE NO TIES!!

8. **Complete the chairperson's final report and return it to a SOC team member following the contest.**
9. **Keep the results of the contest confidential until the announcement of the winners at the awards ceremony.**

Instructions to Contest Judges

1. Judges shall be completely familiar with the contest regulations.
2. Judges should receive copies of the contest project(s) and judges' rating sheet(s), along with complete instructions from the contest coordinator, at least 10 days prior to the competition.
3. Judges must give careful attention to each rule, and each contestant or entry must be judged in exactly the same manner and under the same conditions as every other contestant or entry.
4. Judges will meet prior to the contest, at a time and place designated by the contest coordinator to confer on:
 - a. Rule meanings and interpretations
 - b. Room arrangements
 - c. Materials and equipment
 - d. Last-minute details
 - e. Rating sheets
5. Judges will evaluate the performance of each contestant according to the criteria listed for each contest. Any changes in the rating criteria must be approved by the Ohio SkillsUSA director.
6. Judges will report to the contest site prior to the start of the contest and will be present throughout the competition.
7. Judges will identify contestants by number only. Judge will not know the contestants name or school.
8. Only the contest coordinator may instruct the contestants and verify attendance.
9. Judges are selected because of their recognized expertise in the trade or skill which they are being asked to judge and are asked to follow the official rules without inserting personal opinions.
10. In no instance is the contest coordinator or the judges authorized to change the contest rules. If an interpretation is required, the chairperson should contact the SOC manager.
11. Judges are to evaluate all items related to safety. Contestants not meeting safety requirements in clothing and/or devices may be disqualified from competition if, in the judges' opinions, the safety of the contestants or those around them is endangered.
12. Judges should rate the contestant's performance on the basis of entry-level job skills.
13. Judges should rate each contest independently and not compare rating sheets with those of other judges.
14. After the judging is completed, the judges should total their own rating sheets and return them, along with any notes and other pertinent information, to their contest coordinator.
15. The contest coordinator will validate the judges rating sheet sheets, compile the total scores, and **turn them in to a SOC team member.**

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16. The judges and contest coordinator will keep all results confidential until the general announcement of winners is made at the awards ceremony. **Under no circumstances** may the judges discuss contest results with contestants or advisors.
17. Judges should refer all contest inquires or problems which arise to the contest coordinator.

Automotive Technology Contest



Contest Site Selection

The following contest sites have been selected to host the new SkillsUSA Ohio Automotive Technology Contest based on their past support, excellent programs, and reputation.

Regional Contest Sites

1. North Central Region: Ohio Technical College
2. Northeast Region: Stark State College
3. Southeast Region: Washington State Community College
4. South Central Region: Columbus State Community College
5. Southwest Region: Sinclair Community College
6. Northwest Region: Four County Career Center

State Contest Site

Greater Columbus Convention Center

Automotive Technology Contest



Contest Stations

Up to 10 contest stations to be used will be selected from the stations listed below.

From this list, 5 mandatory contest stations will be selected annually by the contest site coordinators and SkillsUSA Director, to be used at all regional contest sites.

From the remaining contest stations, each contest site coordinator may select up to 5 additional stations to be used in the contest.

1. Meter Use
2. Starting and Charging
3. Electrical/Lights
4. Scan Tools
5. Wiring Diagram Analysis
6. Tire Identification and Ratings
7. Run-out/Wheel Bearing Torque
8. R & R Drum Brakes
9. R & R Disc Brakes
10. Customer Service Station
11. Alignment
12. Timing Belt Installation
13. Environmental Safety
14. Vehicle Inspection/Safety
15. Differential Backlash
16. Parts I.D. – Off Car
17. Fuel Injection
18. Precision Measuring
19. Gathering Technical Information – can schools identify tools on list sent out ahead of time
20. Oral Assessment – Job Interview
21. Tool I.D.

Automotive Technology Contest



Contest Sheets

Instructions to Contest Site Coordinator: This section contains all the contest sheets that must be used for each of the contest stations. They are made up as follows:

Contest Site Directions:

These are the directions to you and your judge(s) on how to set-up each station. It includes tools and supplies needed, and directions. It is not necessary to copy this unless you want to provide the judges with a separate copy for their reference.

Contest Task Sheet:

These are the written instructions to each student. In some cases, a single copy placed in plastic for protection may be placed/taped at the station for the duration of the contest. In other cases, you will need to provide a copy of this sheet to each contestant.

Judge Rating Sheet:

You will need to make one copy for each contestant. It would be helpful in many cases for the judge to have a master copy for reference and with answers/readings where appropriate.

In many cases, task sheet and judge rating sheet are combined. When the contestant has completed the task, he/she will hand the sheet to the judge for scoring.

In all cases, the station # has been left blank. The station # should be filled in before copying, and after you have set-up your station in order.

Automotive Technology Contest



Station #: _____

Meter Use – Digital Multimeter

Contest Site Directions

Tools and Equipment: You will need access to training boards or the list of components, a 12 volt battery, relay coil, fixed resistors, spark plug wires, jumper wires, diodes, ignition system pickup coil, bulbs attached with jumper wires, alligator clips so you may attach to battery, and extra fuses for Digital Multimeter.

Instructions: Using above tools and equipment make a series of tests using the Multimeter.

- Voltage and resistance readings are to be checked by judge before contest starts and after contest is over.
- Students must bring their own multimeter. Additional back up multimeters will be available at site if a student's fails.
- Provide diagram of relay to identify terminals.
- Demonstrate ability to measure resistance, voltage drop, current flow and correctly test the diode.

Automotive Technology Contest



Station #: _____

Meter Use – Digital Multimeter Contest Task Sheet

Contestant #: _____

Check out the multimeter and study its controls. It will have settings for different measurements and scales. It is important that you have the meter set properly BEFORE connecting it to a source of voltage, current or resistance.

The host site will select possible components and identify 10 measurements/questions at 10 points each.

Each measurement is scored as either 0 or 10 points.

Measurements must be within 10% tolerance.

Sample Task sheet below:

Code	Task	Contestant enter answers below		Judges Rating
A01	Measure the resistance of the fixed resistor #1		Ohms	
A02	Measure the resistance of the fixed resistor #2		Ohms	
A03	Measure the resistance of the fixed resistor #3		Ohms	
A04	Measure the resistance of the relay coil		Ohms	
A05	Measure the resistance of the plug wire		Ohms	
A06	Measure the resistance of the pick-up coil		Ohms	
A07	Test the diode. Is the diode Good or Bad?			
A08	What is the battery voltage?		Volts	
	Connect the clips of the two light bulbs in series to the battery and read the voltage drop in the circuit across each bulb.			
A09	Voltage drop bulb # 1		Volts	
A10	Voltage drop bulb # 2		Volts	

Judge: _____ Total Points _____

Automotive Technology Contest



(100 pt. maximum)

Station #: _____

Starting and Charging

Contest Site Directions

Required Tools and Supplies:

- (2) Vehicles (equipped the same)
- (2) Starting/Charging System Tester

Directions: You will need to provide a method for students to determine rated Alternator Output, either by assuring a stamped output is visible, or by supplying appropriate manual.

Automotive Technology Contest



Station #: _____

Starting and Charging

Contest Task Sheet

Contestant #: _____

Instructions: Perform the following Starting and Charging System test procedures, assuming battery has passed load test.

1. Perform starter draw test

Readings: Volts_____ Amps_____

Condition: Good_____ Bad_____

2. Perform charging system output test

Readings: Volts_____ Amps_____

Condition: Good_____ Bad_____

Return this sheet to judge when completed.

Automotive Technology Contest



Station #: _____

Starting and Charging Judge Rating Sheet

Contestant #: _____

Starting and Charging Scoring Rubric			
Code	Task	Student Score	Total Points
B01	Meter Hook-Up Correctly (20 points) GO/No		
B02	Starter Draw Test Performed Correctly (20 points) GO/No		
B03	Starter Readings Reported Correctly (20 points) GO/No		
B04	Charging Test Performed Correctly (RPM and load) (20 points) GO/No		
B05	Charging Test (20 points) GO/No		

Automotive Technology Contest



Judge: _____

Total Points: _____
(100 pt. maximum)

Station #: _____

Electrical/Lights Contest Site Directions

Required Tools and Supplies:

- (2) Similar Vehicles
- Wiring Diagrams for cars
- Necessary Electrical test equipment

Directions:

Insert 3 possible faults from the list below in separate circuits

- No fuse
- Blown fuse
- Wrong bulb
- Open ground in circuit
- Bad light socket
- Open connector
- Bad bulb

Automotive Technology Contest



Station #: _____

Electrical/Lights

Contestant #: _____

Follow the most efficient trouble shooting procedure to determine the fault(s) in the exterior lights.

Describe the fault(s) you found.

When completed, return to the Judge.

Automotive Technology Contest



Station #: _____

Electrical/Lights Judge Rating Sheet

Contestant #: _____

Code	Tasks	Student Answer	Judges Score
C01	Fault #1 (25 points) Go/No		
C02	Fault #2 (25 points) Go/No		
C03	Fault #3 (25 points) Go/No		
C04	Diagnostic Procedures (25 points) Go/No		

Judge: _____

Total Points: _____

Automotive Technology Contest



(100 pt. maximum)

Station #: _____

Scan Tools - Generic OBD II

Contest Site Directions

Tools and Equipment: Scan Tool will be OBD II Compatible. Vehicle or vehicles that may be used for retrieving information, extension lights, and battery charger.

Instructions:

- Using the Scan Tool available, retrieve the Diagnostic Trouble Codes and read the computer input/output data.
- The judge is to check the contest specs with Scan Tool before contest starts and after contest is over.
- Vehicle ID needs to be cleared between contestants.
- Judge will select units of measure for each value.

Automotive Technology Contest



Station #: _____

Scan Tools – Generic OBD II Contest Task Sheet

Contestant #: _____

Directions: Enter the information asked for in the blanks on the right. Take all readings with ign. Key on. Do not start the engine. Each answer will be worth 10 points, for a total of 100 points. Any Measurement must be within 5% tolerance.

Code	Task	Contestant Answer	Judges Score
D01	VIN#		
D02	TPS closed throttle		
D03	Engine coolant temp.		
D04	Loop status		
D05	Injector p/w		
D06	List trouble code number(s)		
D07	TPS WOT		
D08	IAC position		
D09	Park/Neu. Pos.		
D10	O ² Sensory Voltage (HO ² S1-1)		

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Wiring Diagram Analysis

Contest Site Directions

Directions:

- Print a sub-system wiring diagram for a vehicle accessory circuit.
- Fill out the answer sheet to properly reflect 10 different possible test locations.
- In the space provided on the answer sheet, describe the condition in which the circuit is to be tested. (i.e., engine running, cooling fan running, engine temperature 220 F)
- All answers will be either 12V or 0V.

Refer to example answer sheet and example wiring diagram as a guideline.

Automotive Technology Contest



Station #: _____

Wiring Diagram Analysis

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

- Using the supplied wiring diagram fill in the expected volt meter reading for the given operating conditions.
- Assume that system operating voltage is 12 volts.
- Assume that the multimeter negative lead is connected to a good ground.
- Assume that the multimeter positive lead is connected to given test location.
- Record the expected voltmeter readings for the given operating conditions on the answer sheet provided.

Automotive Technology Contest



Station #: _____

Wiring Diagram Analysis Contestant Answer Sheet

Contestant #: _____

Operating condition: _____

10 points each

Code	Test Location	Meter Reading	Judges Score
E01	1.		
E02	2.		
E03	3.		
E04	4.		
E05	5.		
E06	6.		
E07	7.		
E08	8.		
E09	9.		
E10	10.		

Judge: _____

Total Points: _____
(100 pt. maximum)

Automotive Technology Contest



SAMPLE
Station #: _____

1998 Taurus 3.8

Wiring Diagram Analysis Contestant Answer Sheet

Contestant #: _____

Operating condition: Engine Running/Cooling Fan Running/Engine Temperature

220° F

10 points each

Code	Test Location	Meter Reading	Judges Score
E01	1. Cooling fan relay terminal #1		
E02	2. Cooling fan relay terminal #2		
E03	3. Cooling fan relay terminal #3		
E04	4. Cooling fan relay terminal #4		
E05	5. C100 BR/Y wire		
E06	6. C100 BK wire		
E07	7. C104 T/O wire		
E08	8. A/C Cooling fan controller terminal #3		
E09	9. A/C Cooling fan controller terminal #4		
E10	10. A/C Cooling fan controller terminal #9		

Judge: _____

Total Points: _____
(100 pt. maximum)

Automotive Technology Contest

Station #: _____

Tire Identification and Ratings

Contest Site Directions

Required Tools and Supplies:

- 1 tire (new) or (used) with clear sidewall markings
- 1 tread depth wear gage
- 1 tire stand
- tire crayon
- 1 Complete tire and wheel assembly marked into 4 quadrants numbered 1-4
- 2 types of TPMS sensors (band type, bolt-in type and pull-thru type)

Directions:

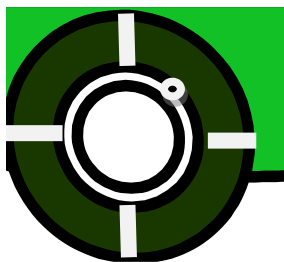
Arrange either one or two stations with one tire each.

Mark a circle on the tread area where student will measure tread depth of each tire.

Make sure all information on sidewall that is asked for on attached list is clear and identifiable.

Mark tire and wheel into 4 quadrants with valve stem in quadrant 1. Have student identify positioning of the bead breaker to break bead.

Have 2 styles of TPMS sensors laid out and labeled and ask student to identify each.



Automotive Technology Contest



Station #: _____

Tire Identification and Ratings

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

This test involves the ability to read tread depth and sidewall information. Write down the information asked below. You have 10 minutes to complete this task.

Each task is worth 10 points.

*Treadwear, Traction and Temperature will be scored 3/3/4

Tire Ratings and Identification and Ratings				
Code	Task	Contestant Answer		Judges Rating
G01	Tire tread depth			
G02	Section width			
G03	Aspect ratio (height-to-width)			
G04	Tire type (T-P-C-LT)			
G05	Build date			
G06	Treadwear, Traction and Temperature*			
G07	Maximum load rating			
G08	Part I.D.			
G09	TPMS D-Mount Position			
G10	Maximum tire pressure PSI/KPA			

Judge: _____

Total: _____
(100 pt. maximum)

Station #: _____

Automotive Technology Contest



Run-out/Wheel Bearing Torque

Contest Site Directions

Required Tools and Supplies:

- (2) Identical rear wheel drive vehicles with front disc brakes
- (2) Wheel bearing adjustment procedures will be provided
- (2) Torque wrenches
- (2) Sockets for spindle nuts
- (2) Side cutters
- (2) Channellock pliers (tongue and groove)
- (2) Dial indicators

Supply of cotter pins

Directions:

Have vehicle at working height, with wheels and calipers removed, and all tools on bench.

Automotive Technology Contest



Station #: _____

Run-out/Wheel Bearing Torque Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

Adjust wheel bearing using the proper procedure specified in the manual provided. You have 10 minutes to complete this task.

	Points
Adjust wheel bearing to proper torque	_____ (50)
Check disc brake rotor for run-out and record rotor run-out	_____ (50)

Run-out/Wheel Bearing Torque							
Code	Task	0-10	11-20	21-30	31-40	41-50	Total Points
H01	Adjust wheel bearing to proper torque	Needs a breakdown					
H02	Check disc brake rotor for run-out and record rotor run-out						

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

R & R Drum Brakes

Contest Site Directions

Required Tools and Supplies:

- Mock up or vehicle with self-adjusting rear brakes
- One complete set of brake shoes for vehicle being worked on
- Two complete sets of extra brake springs
- Three sets of brake tools
- Two trouble lights
- Two work benches
- Several shop towels
- A picture of the brake being worked on correctly assembled and a clipboard for the judge
- Extra copies of all paperwork for this station

Directions:

- Raise vehicle to working height and remove wheels and drums
- Clean all dirt and asbestos dust using approved procedures from brake assembly
- Place on work bench – shop towels, trouble light, and brake tools
- Tape a copy of the contest task sheet to the work bench or to the vehicle

Automotive Technology Contest



Station #: _____

R & R Drum Brakes Contest Task Sheet

Directions:

- Check the position of each part so you know how it goes back
- Remove the brake shoes on the vehicle and replace them
- Check your work and indicate to the judge when finished
- If needed, repair brake assembly as instructed by the judge
- You have 10 minutes to complete this task

Automotive Technology Contest



Station #: _____

R & R Drum Brakes

Judge Rating Sheet

Contestant #: _____

Item to be checked:

Each task is worth up to 25 points

R&R Drum Brakes			
Code	Task	Judges Notes	Total Points
I01	All springs in place (25 points Go/No Go)		
I02	Shoes on correctly (25 points Go/No Go)		
I03	Adjusting mechanism installed correctly (25 points Go/No Go)		
I04	Parking brake mechanism installed correctly (25 points Go/No Go)		

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

R & R Disc Brakes

Contest Site Directions

Required Tools and Supplies:

- Vehicle or mock-ups of a disc brake set-up
- Necessary hand tools to disassemble and re-assemble
- Service Information

Directions:

Station can be on a car, bench vise, or floor. Students are to R & R caliper and brake pads.

Automotive Technology Contest



Station #: _____

R & R Disc Brakes

Contest Task Sheet

Contestant #: _____

Remove and replace the disc brake pads using all the correct procedures.

You will be judged on the following procedure:

- Disassembly procedures
- Assembly procedures
- Installed correctly
- Clean-up
- Install and torque to specs

Automotive Technology Contest



Station #: _____

R & R Disc Brakes

Judge Rating Sheet

Contestant #: _____

Remove and replace the disc brake pads using all the correct procedures.
Each task will be awarded a maximum of 20 points.

R&R Disc Brakes							
Code	Task	0-4	5-8	9-12	12-16	17-20	Total Points
J1	Disassembly procedures	Need procedural breakout					
J2	Assembly procedures						
J3	Installed correctly						
J4	Clean-up						
J5	Install and torque to specs						

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Customer Service Station

Contest Site Directions

Required Tools and Supplies:

- (1) Repair Order Completed as Estimate
- (1) Judge Sheet including above Repair Order

Directions: You will need to provide student with Repair Order Completed as Estimate. The repair order should have concerns which reflect ONE of the core repair areas. Allow approximately 2 minutes for student to review repair order. Student approach customer and explain in detail the process of repair order items in order to sell the job.

Automotive Technology Contest



Station #: _____

Customer Service Station Judge Rating Sheet

Contestant # _____

Each Task is worth up to 10 points.

Code	Task	0-5	6-10	Total Points
K01	Approach and introduction Handshake, greeting, name and shop name	Professional Handshake and greeting	Missing professional handshake and greeting	
K02	Confirm Customer and vehicle (Name, make, model, year)	All Identified	Missing components	
K03	Professionalism (Dress, eye contact, and language)	All identified	Missing Compnents	
K04	Address Concern (What customer experiences) (10 points Go/No Go)			
K05	Address Cause (Explain potential cause) (10 points Go/No Go)			
K06	Address Correction (What will be done to repair) (10 points Go/No Go)			
K07	Explanation of Charges/Warranty (Including shop fees and taxes) (10 points Go/No Go)			
K08	Estimated completion time (Time or number of days until delivery) (10 points Go/No Go)			
K09	Other services (What can customer do while waiting) (10 points Go/No Go)			
K10	Finalize sale and thank customer (10 points Go/No Go)			

Judge _____

Total Score _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

4 Wheel Alignment

Contest Site Directions

Required Tools and Supplies:

- (2) vehicles with similar REAR Toe adjusting procedures
- (2) Sets of tools required to adjust rear toe and properly tighten fasteners
- (2) Print-outs or service manuals showing alignment specifications and tightening specifications
- (2) Print-outs or service manuals showing rear toe adjusting procedures

Directions:

Place vehicles on alignment racks.
Compensate the sensors and perform a caster sweep prior to beginning the contest

Adjust the rear toe so that at least one rear wheel is out of spec.

Make sure that other rear toe adjuster operates freely

Rear toe will have to be reset between contestants to similar status

EXAMPLE: Left rear toe is out approximately 6 turns

Alignment machine should be set to show to display live alignment angles and specs

Automotive Technology Contest



Station #: _____

4 Wheel Alignment Contestant Task Directions

Instructions to Contestant:

- Assume the vehicle has passed all pre-alignment inspections
- The wheel sensors have been compensated
- Caster sweep has been performed
- The alignment machine is already set to display alignment angles and specifications for this vehicle
- Using the CURRENT reading, answer the question on the Contestant Task Sheet
- Adjust the REAR toe following proper procedures
- Leave the screen showing final adjustments
- Indicate to the judge when task is complete
- Turn in Contestant Task Sheet

Automotive Technology Contest



Station #: _____

4 Wheel Alignment Judge Rating Sheet

4 Wheel Alignment			
Code	Task	Contestant Answer	Judges Rating
L01	Will the vehicle exhibit a pulling problem? (10 points) No Left Right		
L02	How will this vehicle track? (10 Points) Straight Rear to the left Rear to the right		
L03	How will the left rear tire wear? (10 Points) Normal Inside shoulder Outside shoulder Feathered		

Automotive Technology Contest



Contestant # _____

Adjust rear toe following proper procedures. Record results below			
Code	Task	Contestant Answer	Judges Rating
L04	Left rear toe (10 Points)		
L05	Right rear toe (10 Points)		
L06	Total toe (10 Points)		
L07	Thrust Angle (10 Points)		
L08	Properly tighten fasteners (10 Points)		
L09	Were adjustments within tolerance (10 points or preferred specs (20 points))		

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Remove and Install Timing Belt

Contest Site Directions

Required Tools and Supplies:

- (2) Identical engines mounted on stands
- (2) Sets of tools required to remove and install timing belt
- (2) manual opened to the appropriate page of instructions

Directions:

- Set up two identical engines on stands with all brackets and timing covers removed.
- Timing belt should be properly installed.
- Appropriate tension tools should be used if at all possible.
- Open manuals to the appropriate page of instructions.

Automotive Technology Contest



Station #: _____

Remove and Install Timing Belt Contest Task Sheet

Directions:

- Remove and install the timing belt according to the service manual provided. Be sure that the contest judge is able to see what you are doing and that the tension is set properly.

Automotive Technology Contest



Station #: _____

Remove and Install Timing Belt Judge Rating Sheet

Contestant #: _____

Remove and Install Timing Belt			
Codes	Task	Judges Notes	Judges Rating
M01	All sprockets/marks properly aligned before removing belt (25 points Go/No Go)		
M02	All sprockets/marks properly aligned after installing belt (25 points Go/No Go)		
M03	Belt tension set correctly (50 points Go/No Go)		

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Environmental Health & Safety

Contest Site Directions

Required Tools and Supplies:

- Respirator, Safety Glasses, Ear plugs, Latex gloves
- Safety Data Sheets to be developed by contest site

Directions:

Students will be given a material data sheet and will be asked to look up specific information.

Coordinator must certain to verify beforehand that the information is in the materials being used. The next page is a sample.

Automotive Technology Contest



STATION # _____

Environmental Health & Safety CONTEST TASK SHEET

CONTESTANT # _____

NOTE: Unless otherwise indicated, the purpose of the blanks is for the Judges to record your score. Maximum Score = 100 points

Operation 1: Automotive Repair Occupational Health

PPE:

Identify and explain the uses & fit criteria of the personal protective equipment on the table. Your judge will ask specific questions.

N01 Respirator: _____ 5 points

N02 Ear Plugs: _____ 5 points

N03 Safety Glasses: _____ 5 points

N04 Latex Gloves: _____ 5 points

N05 How long can Hepatitis B and C virus live in dried blood? _____ 2 points

N06 How can BBP surfaces be decontaminated? _____ 2 points

N07 What is the most common occupational injury / illness? _____ 2 points

N08 Describe why it is important to wash your hands frequently? _____ 2 points

N09 What particulate hazard is associated with work on brakes and clutch assemblies?
_____ 2 points

N10 Describe a wet method for cleaning brakes and clutch parts.
_____ 2 points

N11 Explain why compressed air should not be used to clean brakes / clutch assemblies.
_____ 2 points

Automotive Technology Contest



N12 What is the latency period (how long it takes for symptoms to appear) for asbestos? _____ 2 points

N13 Explain the synergistic effect of asbestos exposure and cigarette smoking. _____ 2 points

Operation 2: Material Safety Data Sheets

FOR OPERATION 2 ONLY, FILL IN THE BLANKS.

Sheet One: Wynn's Carburetor Cleaner – Aerosol

N14 What chemical in the product would you base your evaluation? _____ 2 points

N15 Is it a carcinogen? _____ 2 points

N16 What are the target organs? _____ 2 points

N17 Will this material float or sink in water? _____ 2 points

N18 Under what EPA Laws are the ingredients regulated? _____ 2 points

N19 What precautions (for example PPE) should be used when working with this material under NOC? _____ 2 points

N20 What kind of fire extinguisher should be used to suppress a fire involving this chemical? _____ 2 points

Sheet Two: Wynn's Radiator Anti-Rust

N21 Based on the MSDS, what percent of active ingredients is in the Anti-Rust? _____ 2 points

N22 What kind of fire extinguisher should be used to suppress a fire involving this chemical? _____ 2 points

Automotive Technology Contest



N23 How would you clean up a spill of this product?

_____ 2 points

N24 What precautions (for example PPE) should be used when working with this material under NOC?

_____ 2 points

Operation 3: Hazardous Materials Handling:

N25 Explain the proper procedure for draining and disposing of a used oil filter?

_____ 20 points

N26 Which of the following materials cannot be mixed with used oil in any quantity?

_____ 20 points

- Synthetic oil
- Refrigerant oil
- Transmission fluid
- Petroleum based non-hazardous lubricating fluid
- Hydraulic oil
- Diesel Fuel
- Cutting oil
- Gear oil
- Brake Fluid
- Quench oil

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Vehicle Inspection/Safety

Contest Site Directions

Required Tools and Supplies:

- Two (new or near new) like vehicles
- Before under car inspection—car must be raised by judges
- Trouble light, fender covers, shop towels
- Clipboard

Directions:

Student is to inspect vehicle(s) for safety/damaged components under hood and under car.

Vehicle preparation for assignment:

Insert readily visible faults by disconnecting or loosening various components or adjusting fluid levels (per check list).

Automotive Technology Contest



Station #: _____

Vehicle Inspection/Safety Contest Task Sheet

Contestant #: _____

Instructions to Contestant:

Assume this vehicle is new and you are doing a typical PRE-DELIVERY INSPECTION, using the provided check list.

Note: This inspection incorporates UNDERCAR, UNDERHOOD and VEHICLE inspections. DO NOT repair anything.

Students are not to operate lift. Ask judge to raise and lower the vehicle.

Automotive Technology Contest



Vehicle Inspection Checklist

Contestant and Judges Sheet

Under Hood Inspection

Pass Fail

- O01 _____ Washer Solvent Level
- O02 _____ Check engine oil level
- O03 _____ Check battery open circuit voltage
- O04 _____ Check radiator coolant level at overflow bottle
- O05 _____ Check brake master cylinder fluid level
- O06 _____ Check battery cables for tightness and proper assembly
- O07 _____ Check power steering fluid level

Number of Correct _____ X 5 point each _____

Vehicle Inspection

- O08 _____ Check operation of turn signals and hazard flashers
- O09 _____ Check head lights, tail lights and parking lights
- O10 _____ Check horn operation
- O11 _____ Check parking brake operation
- O12 _____ Check windshield wiper operation

Number of Correct _____ X 10 point each _____

Under Car Inspection

- O13 _____ Check brake lines and hoses for leaks and proper routing
- O14 _____ Inspect C V joint boots
- O15 _____ Inspect exhaust system for routing and clearance

Number of Correct _____ X 5 point each _____

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Checking Differential Backlash

Contest Site Directions

Required Tools and Supplies:

- (2) Differentials
- (2) Vehicle's service manuals
- (2) Dial indicators
- (2) Sets of required hand tools

Directions:

Differential could be on bench or stand. Service information open to differential backlash, procedures section for differential being used, or a procedure sheet taped to the bench.

Automotive Technology Contest



Station #: _____

Checking Differential Backlash Contest Task Sheet

Contestant #: _____

- Using the proper tools and procedures shown in the Vehicle's Service Information, you will check differential backlash.
- Locate and record the backlash specifications.

- Record the measured backlash. _____
- Backlash reading. Good _____ Bad _____

Automotive Technology Contest



Station #: _____

Checking Differential Backlash Judge Rating Sheet

Contestant #: _____

Checking Differential Backlash				
Code	Task	0-10	11-25	Judges Rating
P01	Proper use of tools and procedure			
P02	Did contestant correctly locate the backlash specifications?	No=0	Yes=25	
P03	Backlash Reading. Is contestant Backlash reading accurate?	No=0	Yes=25	
P04	Did contestant correctly answer if backlash reading was good or bad?	No=0	Yes=25	

Judge: _____

Total: _____

Automotive Technology Contest



(100 pt. maximum)

Station #: _____

Parts I.D – Off Car Contest Site Directions

Required Tools and Supplies:

- Large table(s) to hold 20 parts
- Label to number, or white pieces of paper to number and place under parts
- Twenty commonly serviced parts from all eight ASE areas

Directions:

Number and place parts on table. Make certain that the variety includes parts from all eight ASE areas.

Automotive Technology Contest



Station #: _____

Parts I.D. – Off Car

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

1. List names of parts.
 2. Be sure number on part is listed on proper line on answer sheet.
 3. DO NOT HANDLE PARTS.
1. Each correct identification is worth 5 points.
Each incorrect identification is worth 0 points.

Q01. _____ points	Q11. _____ points
Q02. _____ points	Q12. _____ points
Q03. _____ points	Q13. _____ points
Q04. _____ points	Q14. _____ points
Q05. _____ points	Q15. _____ points
Q06. _____ points	Q16. _____ points
Q07. _____ points	Q17. _____ points
Q08. _____ points	Q18. _____ points
Q09. _____ points	Q19. _____ points
Q10. _____ points	Q20. _____ points

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Fuel Injection Pressure Test

Contest Site Directions

Required Tools and Supplies:

- (2) Similar vehicles or simulators with SFI accessible service ports
- (2) Service Information
- (2) Set of necessary gauges or measuring equipment with bleed off tube and fuel safety container (OTC & Snap-On or equivalent)
- Safety container
- (2) Vacuum pumps
- (2) Fire extinguishers
- (2) Fender covers

Directions:

Manuals opened to fuel systems pressure specifications section

Disable starter

Refer to "Safety Sheet" Page 58.

Automotive Technology Contest



Please read prior to starting this test for both judges and contestant!

Station #: _____

Fuel Injection Pressure Tests

Safety Sheet

- **Engine is not started during tests**
- **Fire extinguisher by each vehicle**
- Wipe up any gasoline spills
- Be sure system is bled before gauge is removed
- Gasoline is bled into proper type of container
- Gasoline is drained into the proper container after tests are done
- Engine is cold before tests are started
- Return equipment to proper location when finished

Automotive Technology Contest



Station #: _____

Fuel Injection Pressure Tests

Contest Task Sheet

Contestant #: _____

Make the fuel pressure checks on the vehicles using the proper precautions. Ignition switch must be cycled to pressurize fuel system.

- Connect the pressure gauge assembly using the proper precautions.
- Record the system pressure found. PSI _____
- Is it within limits? Yes _____
No _____
- Using a hand vacuum pressure pump to check for proper operation of fuel pressure regulator. Yes _____
No _____
- Disconnect the gauge assembly using the proper precautions.

Refer to "Safety Sheet" Page 55.

Automotive Technology Contest



Station #: _____

Fuel Injection Pressure Tests

Judge Rating Sheet

Contestant #: _____

Fuel Injection Pressure Tests				
Codes	Task	0-10	11-25	Judges Rating
R01	Connected the gauge using the proper precautions (watch for gasoline spillage) (25 points)			
R02	Was vacuum pump used to test the pressure regulator? (25 Points)	No=0	Yes=25	
R03	Were pressures recorded and were they within specification? (25 points)	No=0	Yes=25	
R04	Was the system bled into a container before gauge was removed? (25 points)	No=0	Yes=25	

Refer to "Safety Sheet" Page 61

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Precision Measuring

Contest Site Directions

Required Tools and Supplies:

- (6) Various Metric Micrometers
- (2) Metric Brake Drum Micrometer
- (2) Pistons
- (2) Crankshafts with true Journals
- (2) Thrust washers
- (2) Tables or benches
- (2) Brake Drum
- (2) Ball Gauge
- (2) Heads
- (2) Valves

Directions:

Lay above parts and measuring tools out on tables/benches.

Automotive Technology Contest



Station #: _____

Precision Measuring

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

Any tolerance over +/- 0.05 = 0 points

Precision Measuring						
Code	Task	Contestant Answer				Judges Rating
S01	Crankshaft Main Journal		+/-0.05 mm = 5 points	+/-0.04 mm = 10 points	+/- 0.03 mm = 15 points	
S02	Brake drum inside diameter		+/-0.05 mm = 5 points	+/-0.04 mm = 10 points	+/- 0.03 mm = 15 points	
S03	Valve guide inside diameter		+/-0.05 mm = 5 points	+/-0.04 mm = 10 points	+/- 0.03 mm = 15 points	
S04	Piston diameter		+/-0.05 mm = 5 points	+/-0.04 mm = 10 points	+/- 0.03 mm = 15 points	
S05	Valve stem diameter		+/-0.05 mm = 5 points	+/-0.04 mm = 10 points	+/- 0.03 mm = 15 points	
S06	Thrust washer thickness		+/-0.05 mm = 5 points	+/-0.04 mm = 10 points	+/- 0.03 mm = 15 points	
S07	Use of tools & equipment (0-10 points)		Score up to 10 pints for correct use of measurement equipment			

Using the micrometer provided, measure each item on the bench and record the measurement in the space provided. Return this form to the judge when completed.

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Gathering Technical Information Contest Site Directions

Required Tools and Supplies:

- Information systems
- Contest Sheets to be developed by contest site

Directions:

Students will be given their sheet and then look up appropriate technical information. Be certain to verify beforehand that the information is in the materials being used. The next page is a sample.

Automotive Technology Contest



Station #: _____

SAMPLE

Gathering Technical Information

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

List the Flat Rate time to replace a Water Pump on a 1992 Toyota Camry w/3.0 Liter, A/c & P/S.

_____ (20)

Connecting Rod Cap Torque Specification – 2007 Mustang W/ 5.0 Liter

_____ (20)

Drive Axle Torque on a 2006 Honda Civic W /Auto Trans

_____ (20)

Fuel Pressure – 2007 Jeep Commander W/5.7 Liter (Hemi)

_____ (20)

Firing Order – 2005 Chevrolet Cobalt W/2.2Liter L4

_____ (20)

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Station #: _____

Gathering Technical Information (T01)

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

Each of these items are scored No/No Go (Items are scored as either 0 or 20).

_____	_____ (20)
_____	_____ (20)
_____	_____ (20)
_____	_____ (20)
_____	_____ (20)

Automotive Technology Contest



Judge: _____

Total: _____
100 pt. maximum)

Station #: _____

Oral Assessment-Job Interview

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

In this station, competitors will be participating in a job interview for the position of Automotive Service Technician. The goal is that the competitor answer questions honestly and openly as they attempt to get hired for the position. The Interviewer will ask each competitor the same core of questions. But may also follow-up with additional questions based on the answers of the competitor.

Oral Assessment-Job Interview				
Code	Items Evaluated	0-10	11-20	Possible Points
U01	Interviewee Appearance/Posture/Grooming			20
U02	Interviewee Maturity: Answers to Questions			20
U03	Interviewee Presentation: Self-Confidence and Persuasiveness			20
U04	Interviewee Preparation: Knowledge of Position Applied for and Personal History			20
U05	Interview Personal Salesmanship			20
Total Possible Points				100

Judge: _____

Total: _____

Automotive Technology Contest



(100 pt. maximum)

Station #: _____

Tool I.D

Contest Site Directions

Required Tools and Supplies:

- Large table(s) to hold 20 tools
- Label to number, or white pieces of paper to number and place under tools
- Twenty commonly used tools from all eight ASE areas

Directions:

Number and place tools on table.

Automotive Technology Contest



Station #: _____

Tool I.D. – Off Car

Contest Task Sheet/Judge Rating Sheet

Contestant #: _____

1. List names of tools
2. Be sure number on tools is listed on proper line on answer sheet
3. DO NOT HANDLE TOOLS
4. Each correct answer is worth 5 points.

V01. _____ points	V11. _____ points
V02. _____ points	V12. _____ points
V03. _____ points	V13. _____ points
V04. _____ points	V14. _____ points
V05. _____ points	V15. _____ points
V06. _____ points	V16. _____ points
V07. _____ points	V17. _____ points
V08. _____ points	V18. _____ points
V09. _____ points	V19. _____ points
V10. _____ points	V20. _____ points

Judge: _____

Total: _____
(100 pt. maximum)

Automotive Technology Contest



Comment/Evaluation Form

TO: Teachers, Supervisors, Contest Coordinators, and Judges

The Automotive Technology Executive Committee has spent many hours and many days over the past year developing and refining this document. We encourage and invite your comments and suggestions as to changes and improvements. If several changes need to be made, we realize we will need to revise the book or send out revised pages. Thank you for your time and input.

Please send completed comment sheet/evaluation to:

John Wiseman, Program Specialist
Ohio Department of Education
25 South Front Street, MS 608
Columbus, OH 43215-4183

Note: This sheet may be duplicated as necessary.

Comments:

Optional:

Your Name: _____

School: _____

Phone Number: _____