

SMALL ENGINES

Revised 6/2018

Purpose and Standards

The purpose of the contest is to stimulate an appreciation for small engine repair and serve as one method of training Future Farmers in the skills and safety practices needed in diagnosing engine malfunctions.

Schools will be required to bring a prescribed list of tools. There will be a critique following the contest.

Foundation Standards: Mathematics Algebra 10 and Geometry 11, Listening and Speaking 1.8, 2.3, Technology 4.1, 4.2, 4.6, Problem Solving and Critical Thinking 5.1, 5.2, 5.3, Health and Safety 6.2, 6.4, 6.5, Ethics and Legal Responsibilities 8.3, Leadership and Teamwork 9.1, 9.2, 9.3.

Ag Mechanics Pathway Standards: Safety B 1.0, Engines and Machinery B 10.0, B11.0.

Contestants

The contest team will be made up of three members. Each member will compete in the Theory and Identification areas. The top ten teams based on the combined scores of Theory and Identification areas, will compete in the Problem Solving, Technical Skills, and Troubleshooting. The top five individuals, if they are not part of one of the top ten teams, will compete in the Problem Solving and Technical Skills area as well.

Classes

Class	Individual Points	Team Points
Identification	50	150
Theory Test	50	150
Problem Solving	50	150
Technical Skills	50	150
Troubleshooting		200
Total	200	800

Tiebreaker

1. Individual and team ties will be broken by individual's/team's scores on problem solving.
2. If a tie persists it will be broken by score on technical skills test.
3. If a tie persists it will be broken by score on theory test.
4. If a tie persists it will be broken by score on identification test.
5. If a tie persists it will be broken by the flip of a coin.

*In the qualifying rounds of Theory and Identification, ties will be broken by individual/team scores on theory. If a tie persists, follow 4 then 5 above.

Ties in the individual sub-contests will be broken by the highest individual overall score. Team sub-contests will be broken by the highest overall team score.

Sub-contest Awards

Sub-contest ribbons will be awarded to the top five individuals and teams in Theory, Identification, Technical Skills, and Problem Solving and to the top five teams in Troubleshooting.

Requirements of the Host Institution

The sponsoring institution will indicate the parts catalog and price guide format and the engine model number that will be used in the troubleshooting portion of the contest in the registration materials sent to the competing school. A list of troubleshooting engine specifications, for the judges will also be provided.

Rules

The contest is made up of the following areas:

- I. IDENTIFICATION (Time: 40 minutes)
 - A. Identification of engine parts and tools (50 points)

A key with the parts identified will be available at the end of the contest. All names used shall be those used by the manufacturer's engine or parts manual (16 horsepower or less).

See Appendix I list.

II. THEORY (Time: 40 minutes) (50 points - Maximum of 50 questions)

A. A written test on Basic Engine Theory including the following areas:

Compression	Troubleshooting
Carburetion	Fuels
Ignition	Cooling systems
Lubrication	Safety
Maintenance	Starters

B. Questions may be submitted by each school planning to compete at State Finals in the Small Engines Contest. They are to include the textbook page number, question and correct answer. They must be submitted by December 1 of each year to the Chairman at the school hosting the State Finals Contest.

C. Test questions will be derived from the following Reference Materials:

1. Briggs Stratton Repair Manual – Single Cylinder 'L' Head and OHV (Intek)
2. FOS (Compact Engine by John Deere)
3. Small Gas Engines by Alfred C. Roth
4. Small Engines by Bruce Radcliff (American Technical Publications)

D. The questions on this test will be theoretical in nature and will not include any references to exact engine specifications that should be looked up in the engine technical manual.

E. A copy of that year's written test will be provided to coaches as a hard copy or electronically.

III. PROBLEM SOLVING: (Time: 40 minutes) (50 points)

A. Problem solving shall be made up of stations with 'hands-on' skills. A minimum of ten stations are required.

B. Each station will be equipped with the following:

1. The specific components needed for the exercise.
2. All tools needed to perform the task at the station.
3. All technical manual pages and reference sheets needed that explain the procedure.
4. A list of all specifications needed to complete the exercise.

C. Examples of Problem Solving questions are:

1. On what model engine are you working?
2. To order a new head gasket for this model engine what is the part number?
3. What is the valve clearance specification for this model engine?
4. What high altitude jet would you use in this carburetor?

III. TECHNICAL SKILLS: (Time: 40 minutes) (50 points)

A. Technical Skills shall be made up of stations with "hands-on" skills. A minimum of ten stations are required.

B. Each station will be equipped with the following:

1. The specific components needed for the exercise.
2. All tools needed to perform the task at the station.
3. All technical manual pages and reference sheets needed that explain the procedure.
4. A list of all specifications needed to complete the exercise.

C. Examples of "hands-on" exercises for Technical Skills are:

1. Using a micrometer.
2. Using a hole gauge and micrometer--measure valve guides, connecting rod journals, piston pin journals.
3. Using a telescoping gauge and micrometer--measure cylinder bore.
4. Using a dial indicator--measure crankshaft endplay.
5. Using a feeler gauge--measure valve tappet clearance, point gap, armature air gap.
6. Using a vibra tach--measure engine r.p.m.
7. Using plug gauges as available from Briggs and Stratton--measure bearings, valve guides, breaker point plunger guides for "go no go" situations.
8. Using a leak down tester to test engine compression.
9. From displays of tools select those items needed for: pulling and installing valve seats; pulling and installing valve guides, etc.
10. From displays of engine components: identify correctly assembled connecting rods and caps, ignition system, etc.
11. Use of a billing statement and the calculations involved for parts and labor.
12. Use of a digital multimeter.

V. TROUBLESHOOTING THE SMALL ENGINE (200 points possible awarded to the team and no individual points to be awarded).

- A. A \$15.00 fee per team will be charged for maintenance and repair of engines used at the State Finals Contest each year. This fee will be given to the host providing the engines for the troubleshooting portion of the contest.
 - B. Other than the use of a leak down tester, all tools will be hand powered. All small engines will be of same type starters, carburetors, and ignition systems. Teams are allowed two (2) minutes for tool set up prior to starting trouble shooting. Trouble shooting score sheets will be returned with team results as soon as possible. Each troubleshooting judge should critique each team upon completion of the troubleshooting phase of the contest. Team members may not possess any engine parts except those that might be provided by contest sponsor. Written material will be limited to the appropriate Repair Manual and a list of common specifications for the engine being used in the contest. No score sheets, etc. will be allowed.
 - C. (Time: 60 minutes maximum). Engines will run for one minute.
 - 1. Time will be stopped for any repairs required that are not a part of the engine scenario and/or bug introduced into engines.
 - 2. If time is stopped, teams will only be able to correct the issue outside the contest's intended scope.
 - 3. Upon completion of these repairs the time will resume.
 - D. Common adjustments and repairs will need to be solved by the team in the contest. The team will work together on trouble shooting. Example:
 - 1. Spark plug out of adjustment
 - 2. Governor linkage incorrect
 - 3. Carburetor out of adjustment
 - 4. Loss of compression
 - 5. Loose parts
 - 6. Obstructions
 - 7. Improper assembly
 - 8. Missing parts
 - 9. Worn or damaged parts
 - 10. Ignition system inoperable.
 - E. The contestants will be judged on the following items:
 - 1. Safety
 - 2. Proper use of tools
 - 3. Neatness of work
 - 4. Starting procedures
 - 5. Pre-start checks and diagnostics
 - 6. Troubleshooting and diagnostic methods
 - 7. Completion of work order
- Note: Appendix II and III
- F. If a team's troubleshooting judge deems the procedures and actions damaging to the engine and its components, the judge will have the team stop with appropriate points deducted on the Small Engines Troubleshooting Score Sheet.

VI. TOOLS – Each team's toolbox should include tools commonly used in the repair and maintenance of small gas engines.

- 1. #2 Philips and Standard screwdrivers at least 8" in length
- 2. Sockets, Shallow 6 point – 1/2" drive - 15/16"
- 3. Flex handle - 1/2" drive
- 4. Nut drivers - 1/4", 5/16", 3/8", and 7/16"
- 5. Sockets, Shallow 6 point – 3/8" drive 1/4" to 1/2"
- 6. Extensions – 3/8" drive - 3" and 6"
- 7. Ratchet - 3/8" drive
- 8. Nut drivers - 7mm to 10mm
- 9. Sockets, Shallow 6 point – 3/8" drive – 7mm to 10mm
- 10. Allen wrench socket set – 3/8" drive - standard and metric
- 11. Appropriate Repair Manual
- 12. Ball Peen Hammer
- 13. Calculator
- 14. Container to drain fuel and/or oil into
- 15. Combination wrenches: 3/8" to 5/8"
- 16. Combination wrenches: 8mm to 10mm

17. Engine anchoring device
18. Flash light
19. Flat feeler gauge set
20. Torque wrenches – Foot-lb and Inch-lb
21. Gasket scraper
22. Governor adjustment tang benders
23. Ignition Spark Tester
24. Leak down tester and air tank
25. Lighter
26. Long nose pliers
27. Pencil
28. Rubber Mat – 12" x 12" to run engine on
29. Safety Glasses (1 pair per member)
30. Short 1/2 " drive extension
31. Pliers Slip joint
32. Soft faced mallet or dead blow hammer
33. Spark Plug Gapping tool
34. Sockets, Spark Plug 5/8", 3/4" and 13/16"
35. Starter rope threading tool
36. Storage containers used to put engine hardware into as it is removed
37. Strap wrench – Used to hold flywheel when torqueing
38. Tachometer – Digital or mechanical
39. Sockets, Torx – 3/8" drive - T-15, T-20 and T-30

APPENDIX I

IDENTIFICATION LIST

Tools used for the identification portion of the contest are to be those commonly used in small gas engine repair. Some examples are listed in the table below. In regards to the engine parts, list the items shown serve only as a point of reference for study. Similar items from other brands of engines may be used.

TOOLS

Adjustable open end wrench	Ratchet handle
Allen wrench	Regular or slotted screwdriver
Ball peen hammer	Ring compressor
Battery pliers	Screw pitch gauge
Box end wrench	Six point socket
Center punch	Socket adapter
Cold chisel	Socket extension
Combination end wrench	Soft face hammer
Combination slip join pliers	Spark plug gauge
Deep socket	Spark plug socket
Diagonal pliers	Spark tester
Drift punch	Speed handle
Flat feeler gauge	Strap wrench
Flex handle	Tachometer
Fuel clamp pliers	Torque wrench
Lever jawed wrench	Torx screwdriver
Long nose pliers	Torx socket
Nut driver	Universal joint
Offset screwdriver	Valve spring compressor
Open end wrench	Volt ohm milliamp (VOM) meter
Phillips screwdriver	Water pump pliers
Pin punch	

SPECIAL TOOLS

ENGINE PARTS

The engine parts will be selected from the following: Briggs & Stratton Series 60000 to 260000.

Example:

Briggs & Stratton Illustrated Parts Lists specified below:

MODEL NUMBER TYPE NUMBER

91200 TO 91299 0017

124700 TO 124799 0101

110400 TO 110499 N/A

261700 TO 267199 0020

APPENDIX II

Troubleshooting – General Information

Each team of three contestants will be given a maximum of one hour to diagnose and repair an engine, and complete a standardized work order (see example – Appendix III). The judge will act as the customer and the team will act as the service technicians. Through a series of standard questions, asked by the team members, they will diagnose and repair the engine based on the responses received from the judge (see example below). Upon starting the engine, the team will then be required to complete a work order including costs for parts, labor, and sales tax. Each judge will be provided with the standard questions and answers to the questions.

Standard Questions and Example Responses

Question: What is wrong with the engine?

Response: The (equipment type) will not run.

Question: How did the engine act when the problem occurred?

Response: It ran fine the last time I used it, but when I went to use it again, it would not start.

Question: Did you do anything to the engine prior to bringing it in?

Response: I removed the carburetor and looked inside. I also removed the float bowl and didn't see anything wrong, so I put it back together.

Question: What would you like us to do to the engine?

Response: Repair the problem.

Question: When was this engine last serviced?

Response: I had it serviced last year after using it on a job site. It's been sitting in my garage for the last six months.

Appendix III -- Small Engines Troubleshooting Score Sheet			
Team Name:	Judge's Name:	Possible	Earned
Points in these categories are variable			
Safety – Deduct 1 point for each infraction up to the maximum points in each line item.			
a. Wipes up oil and fuel spills as they occur		0 to 5	
b. Maintains safe work practices		0 to 5	
c. Each member wears safety glasses at all times		0 to 5	
Total		15	

Tools and Parts – Deduct 1 point for each infraction up to the maximum points in each line item.			
a. Uses proper tool for the job	5		
b. Drops tools and parts – (Proper grip, careful not to drop tools and parts, etc.)	5		
c. Parts and Hardware installed correctly (not within the 3 systems below)	5		
d. Uses proper torque specifications and patterns as needed: Flywheel Nut - Head - Carburetor - Armature - Muffler Rocker Arm Assembly - Main Jet - Spark Plug - Rocker Cover - Governor Lever (Deduct 1pt per item if torqued incorrectly.)	5		
Total	20		
Pre Start Checks (Points are all or nothing in this category. NOTE: Steps “a” through “e” can be done in any order.)			
a. Check for proper oil level	5		
b. Check Gasoline Quality and Level	5		
c. Starter Operational	5		
d. Air cleaner serviced or replaced	5		
e. Stop Switch Operational	5		
f. Customer Complaint Verified (Tried to start the engine to verify the complaint prior to making repairs. No Points will be deducted for necessary repairs made to verify the complaint or prevent engine damage. No diagnostic repairs) e. Customer Complaint Verified (Tried to start the engine to verify the complaint prior to making repairs.)	5		
Total	30		
Diagnostic Method Criteria (Points awarded in this category must be 30, 15, or 0.)			
An organized Diagnostic Method is used to isolate the engine problem and prior to a system disassembly. Team must explain their diagnostic method to the judge and the result of their testing to receive points. Method used and correct diagnosis = 30pts . Method used but incorrect diagnosis = 15pts . No diagnostic method used = 0pts .		See criteria	
Total		30	
Procedurals Scoring – 0 points awarded for improper assembly or incomplete repairs in each area. No points will be given if a team fails to follow proper assembly of all components or if a judge must stop/correct a team for improper procedures that would result in engine damage.			
Fuel System (10pts) Required (circle one) Y N (Select only one Option “a” through “e”).			
a. Repairs Needed, correct procedures used and rational explanation given (10 pts) or	Score in correct box		
b. Repairs Needed, correct procedures used and no or incorrect explanation given (5 pts) or			
c. Repairs Not needed, but correct procedures used and rational explanation given (5 pts) or			
d. Repairs Not needed, no explanation needed (10 pts) or			
e. Improper or incomplete repairs done and/or Judge stopped team to avoid damage (0 pts)			
Total	10		
Ignition System (10pts) Required (circle one) Y N (Select only one Option “a” through “e”).			
a. Repairs Needed, correct procedures used and rational explanation given (10 pts) or		Score in	

c. Repairs Not needed and no procedures used (no explanation necessary) 15pts		correct box	
d. Team provides a clear explanation of what procedures were performed and why		0 or 5	
Procedurals – 0 Points awarded for improper assembly or incomplete repairs in this area			
b. Repairs Needed, correct procedures used and no or incorrect explanation given (5 pts) or			
c. Repairs Not needed, but correct procedures used and rational explanation given (5 pts) or			
d. Repairs Not needed, no explanation needed. (10 pts) or			
e. Improper of incomplete repairs done and/or Judge stopped team to avoid damage (0 pts)			
Total	10		
Compression System (10pts) Required (circle one) Y N (Select only one Option “a” through “e”.)			
a. Repairs Needed, correct procedures used and rational explanation given (10 pts) or		Score in correct box	
		0 or 5	
b. Repairs Needed, correct procedures used and no or incorrect explanation given (5 pts) or			
c. Repairs Not needed, correct procedures used and rational explanation given (5 pts) or			
d. Repairs Not needed, no explanation needed (10 pts) or			
e. Improper or incomplete repairs done and/or Judge stopped team to avoid damage (0 pts)			
Total	10		
RPM Adjustments – Points are all or nothing in this category – Host will determine ALL RPM settings. All settings must be accurately measured and adjustment procedure is explained if needed.			
a. Non-governed Idle RPM Spec [] – Team Reading: [] Adj. Explained: Y N N/A		5	
b. Governed Idle RPM is correct [] – Team Reading: [] Adj. Explained: Y N N/A		5	
c. High Speed RPM is correct [] – Team Reading: [] Adj. Explained: Y N N/A		5	
d. Engine runs for 1 minute within the allotted time after measuring & explaining the above engine RPM adjustments.		10	
Total	25		
Total points awarded for Troubleshooting			
		150	
Total points awarded for Work Order (Must be turned in to the judge within the one-hour time limit.)			
		50	
GRAND TOTAL			
		200	

Appendix IV

California FFA Small Engines Work Order

(Must be turned in to the judge within the one-hour time limit.)

Team Name		Date Unit was Inspected	
Engine Number		Date Unit was Completed	
			Judges Use Only!

Judge's Name	Engine Brand	Type of Equipment	Possible	Awarded
Model / Serial #	Type #	Code	10 pts	
Customer Comments: (5 questions at 2 pts ea.)			10 pts	
1.				
2.				
3.				
4.				
5.				
Work Performed: List each task performed on a separate line below and use the Flat Rate Labor Repair Chart description & hours provided to determine Labor Charge.			10pts	
Labor Description	Labor Hours	Labor Charge		
Labor Totals				
Part #	Description	Qty.	Unit Price	Total Price
Parts Total & Tax calculated from actual Parts Ordered			Parts Total	Math Check Only
				8 pts
			Tax (8%)	
Labor Charge is \$75.00 per hour for work performed.			Labor Total	
Totals 2 points each			Grand Total	
Legibility – 2 points or Zero (0) points – If any portion is not legible, no points will be awarded.				2 pts
Judge's Signature:			Total Team Points Awarded	50 pts
Flat Rate Labor Repair Chart				
Labor Rate is \$75.00 per hour				Bill Time
Repair/Adjustment Description				In hours
Pre-Check & Diagnostics – Does not include repairs				0.2
Fuel System Repairs/Adjustments				
Carburetor Rebuild / Reassemble *				0.4
Carburetor Replacement *				0.2
Carburetor Spacer Replacement *				0.2
Carburetor / Fuel Line Obstruction Removal				0.2
Main Jet Replacement *				0.2
Float Repair/Replacement *				0.3
Carburetor Gasket(s) Replacement Only				0.2

Other Fuel System repair not listed - (must provide summary repair description on work order)	0.3
* = Time includes gasket replacement	
Ignition System Repairs/Adjustments	
Armature Air Gap Adjustment	0.2
Armature Replacement	0.3
Flywheel Key Replacement	0.5
Kill Switch Repair/Replace	0.2
Spark Plug Replacement/Adjust Gap	0.1
Other Ignition System repair not listed - (must provide summary repair description on work order)	0.3
Compression System Repairs/Adjustments	
Valve(s) Replacement	0.7
Valve(s) Clearance Adjustment	0.3
Push Rod(s) Replacement	0.5
Cylinder Head Gasket Replacement	0.7
Cylinder Head Replacement / Reassembly	0.7
Other Compression System repair not listed - (must provide summary repair description on work order)	0.5
Service	
25 Hour - Clean air filter	0.1
50 Hour - Clean air filter, Change engine oil, check muffler and spark arrester	0.2
100 Hour / Annual - Replace air filter, Replace pre-cleaner, Replace spark plug, Replace fuel filter, Clean air cooling system, Valve adjustment, Change engine oil	0.5
Starter Repair/Adjustments	
Rewind Starter assemble repair	0.3
Rewind Starter Replacement	0.2
Governor Repair/Adjustments	
Dynamic Adjustment	0.2
Linkage Repair/Replacement	0.3
Exhaust System Repair	
Obstruction Removal	0.2
Engine Repair - Other	
Other necessary engine repairs not listed above - (must provide summary repair description on work order)	0.2

Score Sheet Judging Criteria

I. Safety

- A. Wipes up oil and fuel spills as they occur – within 30 seconds of occurring is acceptable.
- B. Maintains safe work practices – this includes organized worktable, safe tool, and engine handling. Personal injury will incur maximum point deduction.
- C. Each member wears approved safety glasses at all times. – 1 pt deduction for each occurrence. If team member fails to have glasses on for more than 30 seconds, will incur maximum point deduction. No points will be deducted for removing safety glasses to read Technical Manuals or Illustrated Parts Lists.

II. Tools and Parts

- A. Uses proper tool for the job – examples of infractions include using the wrong size wrench/socket on a fastener, using a screwdriver to pry, or using a hex wrench in a torx fastener. Should not include: using a socket and extension as a nut driver, using common pliers to remove fuel lines, or using a screwdriver to loosen the oil fill cap.
- B. Drops tools and parts (proper grip, careful not to drop tools and parts, etc.) - examples of infractions for improper grip include not holding a torque wrench at the handle or balance point, touching the torque wrench on other than the handle while torqueing, or using a closed fist grip while torqueing the flywheel.

- C. Parts and hardware installed correctly (not within the three diagnostic areas) – examples of infractions include sheet metal components not fitted correctly, kill wire or spark plug wire routed incorrectly, or air filter cover incorrect.

III. Pre Start Checks

- A. Check for proper oil level – team checks that the oil level is within operating range.
- B. Check gasoline quality and level – team checks for sufficient fuel level and takes a fuel sample to check for contaminants.
- C. Starter operational – team checks for proper and safe starter operation. This includes checking starter rope for frays.
- D. Air cleaner serviced or replaced – team checks air filter for debris and replaces as needed.
- E. Stop switch operational – team tests the stop switch operation using an ignition tester as visual confirmation the stop switch is functioning.
 - 1. All Pre Start Checks listed above must be done before the team attempts to start and verify customer's complaint to receive points for each area.
- F. Customer complaint verified – team tried to start the engine and duplicate the customer's complaint. The team must verify complaint prior to making repairs within the fuel, ignition, and compression systems. Points will not be deducted for necessary repairs made to verify the complaint or prevent engine damage. Acceptable repairs may include: starter rope repair; adding of engine oil; repair of the kill switch; clean out of contaminated fuel; fuel leak repair.

III. Diagnostic Method Criteria

- A. The team should have a method of testing each of the three systems that directs them to the area with the problem. The team should have a logical explanation of how they came to their conclusion of what systems are malfunctioning. If a team disassembles the wrong system, points will be deducted from the Diagnostic Method Criteria portion of the score sheet only.

V. Procedurals

- A. Procedurals will not earn points within the Fuel, Ignition, and/or Compression Systems when a team fails to correctly assemble or adjust parts within that system. Examples of a situation that would require a procedural include, but not limited to misadjusted valves, magneto on backwards, improper magneto gap, carburetor spacer on backwards (NOTE: Protrusion must be installed toward the carburetor with a gasket on both sides), governor linkage installed incorrectly, not scraping old gasket material before installing a new gasket, not replacing all required gaskets for the repair.

VI. Fuel System, Ignition System, Compression System

- A. Repairs needed, correct procedures used and rational diagnostic explanation given – 10 points will be awarded if the team corrected the problem within the area with no procedurals and explained diagnostic rationale.
- B. Repairs needed, correct procedures used and no or incorrect explanation given – 5 points will be awarded if the team disassembles and assembles system components that were necessary and did so with procedurals but gave no diagnostic explanation. Points will be deducted from the Diagnostic Method portion of the score sheet if this occurs.
- C. Repairs not needed, but correct procedures used and rational diagnostic explanation given - 5 points will be awarded if a system is not part of the problem but the team used and explained diagnostic rationale.
- D. Repairs not needed so no diagnostic explanation needed – 10 points will be awarded if a team does nothing with a system because it is not necessary.
- E. When improper or incomplete repairs are done and/or a Judge stops the team to avoid damage to the engine – 0 points will be awarded.

VII. RMP Adjustments

- A. Non-governed idle, governed idle, and high-speed engine RPM will be measured using a tachometer. The judge will verify the team's measurement is correct and within the desired settings. If necessary, the team will properly explain how each of the governor adjustments would be made according to factory procedures to bring the engine into specification. Zero (0) points will be awarded if the team fails to accurately measure and/or describe approved speed adjustment procedures or fails to identify the engine is out of specification range for each speed adjustment area.

VIII. Work Order Documentation

The Labor Guide is based on Briggs allowed times where available and designed to bring industry time management practices to the CDE.

- A. Teams will use the standard repair descriptions and times when documenting the repair on the Work Order.
- B. Teams will need to clearly define when "Other" work is performed that is not listed in the

Labor Guide.

- C. Judges will score the Labor and Parts charges on the Work Order portion of the contest as if they were the actual customer. Specifically, Teams should not be docked points if they perform additional work and/or replace parts that make sense and are properly explained as part of the scenario but not listed on the answer key.
- D. The Parts Total, Tax, Labor Total and Grand Total score is a math check only based on the Teams actual work performed & parts replaced.