



## Diesel Equipment Technology

### 2024 SkillsUSA Michigan State Championships Contest Description Task and Materials List

#### CONTEST LOCATION:

AIS Construction Equipment

600 44th St SW

Grand Rapids, MI, US

<http://www.aisequip.com/>

Contest Chairperson: Ralph Hansen - [rhansen@aisequip.com](mailto:rhansen@aisequip.com)

#### RESUME:

Each student must submit a resume to the contest to present to contest coordinator. The resume is no longer submitted online. This is the only time that resumes can be turned in. Failure to do so will result in a 10-point penalty.

#### TASKS TO BE PERFORMED:

The following is a list of task areas, which will be utilized for evaluation in the Diesel Equipment Technology contest which will be held at the AIS Construction Equipment in Grand Rapids on Saturday, April 13, 2024, starting at 8:00AM

##### 1. Running Engine:

Knowledge and Skill in the selection and use of tools, meters, and diagnostic equipment for tune-up, troubleshooting, and adjustment of Caterpillar, or Cummins, or Detroit Diesel engines could be required. Emphasis will be placed upon the basic operation of mechanical functions and/or malfunctions, and/or electronic engine operating control systems.

##### 2. Drive Train Components:

This section will consist of two separate stations, which could consist of any component from the engine flywheel to and including the rear axle.

Troubleshooting and adjustment procedures, failure analysis, product nomenclature, and specifications will be included along with hands-on tasks.

##### 3. Braking system:

Identification, operation, testing, adjusting, repair, and troubleshooting of hydraulic and/or air operated drum or disc foundation braking systems which may/or may not include anti-skid features. A written test may also be utilized.

##### 4. Air Conditioning:

Identification, operation, testing, and troubleshooting procedures of components and their functions within an air conditioning system may be required. A short, written test may be utilized for evaluation.

5. **Electrical:**  
Electrical fundamentals, circuit testing, and diagnosis of malfunctioning circuits utilizing schematic wiring diagrams and industry accepted testing equipment. Procedures in wiring repair. Areas of emphasis will include battery and charging systems, starting systems, and engine control systems.
6. **Hydraulic:**  
Hydraulic fundamentals, nomenclature, testing, troubleshooting and/or repair may be covered along with schematic symbols, diagrams, and possible specification inquiries. The contestant should be familiar with pressure gauging, flow-meters, and timed cycling tests
7. **Shop Practices:**  
Areas which may be covered include welding, electric arc and/or oxyacetylene. Pipe, tubing, and hose fitting identification, repairs, and assembly practices. Fastener identification and repair practices. Electrical wiring maintenance and repair. Selection, identification, and safe usage of hand and power tools.
8. **Planned Maintenance Inspection:**  
Accomplishment of a preventative maintenance inspection of a vehicle may be required. Use of symbols and identification of up to ten problems and/or adjustments may be required. Identification of a vehicle due for a preventative maintenance inspection program might be required. Failure analysis of components may also be included with the inspection.
9. **Employment Interview:**  
All contestants will be required to participate in a mock interview session. Contestants will submit a resume or portfolio and interview for the applied for position of **diesel equipment technician** at AIS Equipment Corporation.
10. **Engine Fundamentals:**  
This section will include use of measuring instruments required for the assembly and adjustment of diesel engine components. Metric as well as standard measurements may be required. A written test on component identification and diesel engine operation may also be used for evaluation.
11. **Measurement:**  
Each contestant will be required to perform measurements using Dial Calipers, 1/10,000in Micrometer, Metric Micrometer, Dial Indicator and perform measurement conversion calculations.

**STUDENT MUST SUPPLY:**

\* ALL CONTESTANTS WILL BE REQUIRED TO HAVE AND UTILIZE SAFETY GLASSES, WORK SHOES, CALCULATOR AND APPROPRIATE WORK CLOTHING.

**TECHNICAL COMMITTEE WILL SUPPLY:**

All tools, manuals, and equipment will be supplied by the technical committee.

**CLOTHING REQUIREMENT (if different from National contest):** **To be followed precisely**

**Work clothing including but not limited to light-blue long sleeve shirt, dark-blue long pants (NO JEANS), leather shoes and safety glasses with side shields. No school logo, school name, contestant name or any other identifying marks of any kind on clothing. If you do have them, they must be covered up so that no part of the identification is visible.**