



## DIESEL & HEAVY EQUIPMENT

### Course Description:

Students learn about the operation, maintenance, and repair, of heavy equipment that is found in the trucking, construction, agricultural, and material handling industries.

- Learning takes place in both classroom and lab settings. The classroom provides students with theory and knowledge. Lab projects give students the opportunity to apply knowledge learned with hands-on experience to the various areas of engine service, mechanical, electrical, and hydraulic repairs.
- Students will also learn basic shop skills like welding, oxy-acetylene torch and other shop tools.
- Each student will complete at least one engine overhaul during their first year. Second year students will also learn troubleshooting and repairing of customer owned equipment or personal projects.

**Diesel 1:** Shop safety and tool use; preventive maintenance; air brake system operation and maintenance; fundamentals of engine operation, engine systems, and engine rebuilding; use of precision measuring tools; metal projects utilizing the oxy-acetylene torch, plasma cutter, and drill press; 10-hour general industry OSHA certificate.

**Diesel 2:** Fundamentals of electricity and electrical systems; use of multi-meters to test electrical systems; understanding voltage drops; understanding electrical relays operation; circuit repair utilizing soldering and connectors;

battery construction, operation, maintenance, and testing; charging and starting system operation and testing; electronic control systems operation and testing; diesel engine emission controls and after-treatment system construction and operation; Ohm's Law; and wire welding. Fundamentals of hydraulics and hydraulic systems; Arc and MIG welding; lift truck operation; vehicle heating, ventilation, and air condition system construction, operation, and testing; and equipment powertrains.



**Careerline**  
*Tech Center*

Students who would benefit from this program are those who enjoy working with their hands, are mechanically inclined and work well with a team.

### CREDITS

Students will earn elective credit at their high school upon completion of this course. Please see a high school counselor (based on district decision) for eligibility towards 4th-year math-related credit, VPAA credit, and waived credits for third year science and second year world language.

# DIESEL & HEAVY EQUIPMENT

## LENGTH OF PROGRAM

2 years

### Diesel/First Year:

Kevin Wiersma  
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### ParaPro:

Alan VanderKlok  
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### Heavy Equipment/Second Year:

Jason Alberda  
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### ParaPro:

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## Related Careers with 2021 Median Annual Pay from O\*Net

- Bus, Truck Mechanics & Diesel Engine Specialists \$54,360
- Mobile Heavy Equipment Mechanics, Except Engines \$59,400
- Heavy and Tractor-Trailer Truck Drivers \$49,920
- Farm Equipment Mechanics and Service Technicians \$48,010
- And many more



### TO ENROLL

[bit.ly/CTCenroll](https://bit.ly/CTCenroll)



### QUESTIONS?

Contact Jannette Bole  
jbole@oaisd.org



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### Careerline Tech Center

13663 Port Sheldon Street | Holland | 616-738-8950

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### Course Outline:

**1st Year:** Shop safety and tool use; lift truck operation; fundamentals of electricity; use of multi-meters to measure voltage, amperage, and electrical resistance; understanding voltage drops; understanding electrical relays operation; utilizing electrical soldering; battery construction, operation, maintenance, and testing; and wire welding.

**2nd Year:** Fundamentals of hydraulics and hydraulic systems; Arc welding; Ohm's Law; alternator construction, operation, and testing; Charging system operation and testing; electronic control systems operation and testing; diesel engine emission controls and after-treatment system construction, operation, and testing; vehicle heating, ventilation, and air condition system construction, operation, and testing; and equipment powertrains.

### Resources Used:

Diesel Technology, 8th Edition; Heavy Duty Truck Systems, 5th Edition; Sit-Down Counter Balanced Lift-Truck Operator Safety Training (Caterpillar) Lift Trucks (Caterpillar); Cummins Quickserve Online and Caterpillar diagnostic software.

### Postsecondary Partners:

Ferris State University, Northwestern University, Owens Community College, and Baker College.

**Work-Based Learning:** All students at CTC have the opportunity to participate in experiences (such as guest speakers, tours, and work experiences) that connect them with local employers in their program area.

*We have a very strong Advisory Board, as well as business connections with many of our former students who are shop supervisors and/or business owners. This network makes for excellent support in work-based learning, job opportunities, speaking and training opportunities for our students.*

**Safety Trainings Provided:** 10-hour OSHA General Industry + general equipment safety training.

**Student Leadership Opportunities:** Students have the opportunity to engage in activities to develop relationships with classmates and community partners to strengthen their leadership skills.

**Opportunities include:** Participation in Skills USA.