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Diesel Technology

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Diesel Mechanics

The Diesel Mechanics program was one of the first DMACC instructional programs in the fall of 1967. It was housed in Center II, a former skating rink in West Des Moines. This two-year program initially enrolled 14 students, with 12 graduating in the spring of 1969. It relocated to the new auto/diesel building on the Ankeny Campus in the spring of 1969 and has remained in that location. The program has offered a one-year diploma and a two-year degree option since its inception.

The first DMACC catalogue described the program this way:

This program includes both classroom instruction and actual shop experience to equip the student with the necessary knowledge and practical skill to meet the standards demanded by industry. Instruction focuses on the repair, maintenance and testing of diesel engines and power trains in heavy duty equipment. Special attention is given to fuel injection systems repair and testing, as well as the principles of shop management.

The 1979 catalog description is consistent with the initial program description and adds information about student placement opportunities:

A program including both classroom instruction and actual shop experience to equip students with the necessary knowledge and practical skill to meet the standards demanded by industry. Instruction in the repair, maintenance, and testing of diesel engines and power trains in heavy duty equipment is included. Special attention is given to fuel injection systems repair and testing, as well as the principles of shop management. The latest types of servicing equipment are available to student use.

Employment opportunities exist in the servicing of such mobile equipment as buses, trucks, railroad locomotives, farm tractors, and heavy construction equipment, as well as stationary equipment, such as water pumping stations and diesel-electric generating plants.

By 2014, the description continued many of the same program outcome objectives but the scope of the program had broadened significantly:

The Diesel Technology program prepares students for a career in the area of diesel repair. Instruction is in the repair, maintenance and testing of diesel engines, power trains and components of trucks and heavy construction equipment.

Employment opportunities exist in the servicing of such mobile equipment as buses, trucks, railroad locomotives, farm tractors, and heavy construction equipment, as well as stationary equipment, such as water pumping stations and diesel-electric generating plants.

Robert Taylor, one of the first students in the program, has a unique perspective based on his varied roles related to the program. He enrolled in the first diesel class after his graduation from New Virginia High School in 1967. After graduating from the program two years later, he was employed as a diesel mechanic before returning to the program as an instructor and ultimately was appointed program chair.

He later accepted the opportunity to start the DMACC Transportation Institute. Here are his recollections:

It started in the south end of the roller skating rink with one engine, one truck that would barely get in the door, and later a used motor grader-scraper. John Deere donated a 55 gallon barrel of

nuts, bolts, and washers that had been swept from their assembly line. The building overhead door was so small it required faculty to let all the air out of the tires to get a truck through the door—there was less than one-half inch of clearance, even with the tires deflated.

Part of our shop class was dedicated to assembling benches and shop equipment that was being shipped. Paul Lowry, DMACC president, sometimes helped with some of this duty, and custodian Whitey Jacobs was there to advise and help at various times.

An active advisory committee included representatives from most of the major equipment manufacturers and retail shop and initially met monthly. The group helped in planning the initial curriculum and identifying instructional equipment. Members also were key in stimulating extensive donations of equipment from their employers and later assisted in placing graduates. The committee played a key role in designing the auto-diesel building at the Ankeny Campus, as well as suggesting lab layouts and laboratory equipment. The program advisory committee was active and effective and generated many equipment donations from operating companies, manufacturing industries and large dealerships.

The key person in launching and the developing the program was Marlowe Rummans, the program's first chair, who was hired just a month or two before the program started in fall 1967. He had served in WWII in the Navy, where he worked on the engines for landing craft as a flight mechanic. His only teaching experience was several years as a part-time instructor in the Adult Education Program at Des Moines Technical High School. At the time he joined the college, he was the Service Manager for Greater GMC (General Motors Corporation) in Des Moines. Ironically, he had suffered a severe heart attack earlier that year and was advised by his physician to take a job that was less stressful than the manager position. He retired from the program chair role in 1976, but continued to be a substitute instructor until his death at age 86.

The program has responded to several major changes in the heavy equipment industry since its inception.

- Electronics and computers have had a huge influence on diesel equipment since the 1980s. The advent of electronically-controlled engines, transmissions, and hydraulics on diesel-powered equipment results in having several computers in one vehicle controlling these systems.
- The reduction of harmful exhaust emissions has resulted in changes to diesel fuel. The industry first used low sulfur fuel and now has adopted ultra-low sulfur fuel. The industry has added EGR valves (exhaust gas recirculation), DOC (diesel oxidation catalyst), DPF (diesel particulate filter), and SCR (selective catalyst reduction).
- Some parts of the diesel industry are using different forms of alternative fuel, including LNG (liquid natural gas) and CNG (compressed natural gas) technology.

The curriculum has been broadened to respond to these changes by adding more electrical and electronic contact hours to the curriculum. Specially, a new course, Power Trains II, was added to meet these changes. In addition, information on alternative fuels is now in selected courses.

In 2001 an additional program option was developed to prepare selected students for specialized applications in Caterpillar's dealer service organization. This change was made to respond to a request

from the local Caterpillar dealer, Ziegler, which employs a number of program graduates. This option is offered and supported financially by Caterpillar in several two-year colleges in the US. It has been the source of equipment, technical manuals and information as well as providing access to the latest diesel technology for instructors and students. Interested students must apply and complete an on-line resume to Ziegler. Ziegler tests and interviews those students before they select students to offer intern positions.

The Caterpillar Technology program qualifies as an ACE (Accelerated Career Education) program.

The first year curriculum of the Diesel and Caterpillar Technology programs is the same. The second year includes more specific Caterpillar information.

Another recent addition to the program option is the Career Advantage program. This program allows central Iowa high school juniors and seniors to take two diesel classes, Power Trains I and Hydraulics and Brakes, for dual high school and college credit. This program has become a feeder for the college curriculum. It is not unusual for 50 percent of the CA students to enroll in the Diesel or Caterpillar program as full-time students.

The program is proud of the recognition and awards students and faculty have received over the years. It is important to compete against other schools at an industry level to see how the school, the students, and the curriculum measure up. Two Diesel students have won national championships. Since 2008 DMACC has held the state SkillsUSA contest and has won the state contest each year.

- The program won 1st place at the national VICA (Vocational Industrial Clubs of America) contest one year and placed second another year.
- It was awarded a research grant for alternate fuel testing during the fuel crisis. Robert Taylor worked and summarized the results in 1974.

The program faculty is most proud of how industry has voluntarily set up and judged stations for the state SkillsUSA contest since 2008. Others recognize that DMACC hosts a good contest that is fair for all contestants and will send the best students who qualify to the national contest. Between 1977 and 2014 (37 years) DMACC has won the state SkillsUSA 14 times with that individual finishing in the top 10 in the nation 11 times; DMACC has placed no lower than 16th nationally.

Since 2008 the Career Advantage students have won a national SkillsUSA championship twice.

The program has consistently enrolled to the student capacity and had a high retention rate. Job placement rates have been consistently high throughout the life of the program.

Students who complete the program are usually successful in gainful employment soon after graduation, although the state of the economy can affect the demand of graduates. The diesel industry needs diesel technicians to meet growth goals and replace technicians who are being promoted or retiring. Area diesel businesses will hire an estimated 80 percent of the students within their first year; almost 100 percent of all students will find employment in the diesel industry before graduation.

The program name has been changed several times. The original name, Diesel Mechanics, was changed to Heavy Equipment Technology in the 1970s. The program was originally a two-year diploma program

but has had award options for many years: certificate, diploma and Associate of Applied Science. Currently these awards are available: Caterpillar Technology AAS, Diesel Technology AAS, Diploma Maintenance (Diesel Technology) Certificate, Fluid Power Technology AAS, and Diploma.

It also operated an Agricultural Tech one-year certificate and two-year diploma program for several years in the west end of Building 14 after space became available with the movement of the Automotive Program to a new building in the late 1970s. The program was discontinued in the 1980s.

The faculty increased in size and had low turnover over the many years the program has operated.

Program Chairs have included Marlowe Rummans, Keith Scoville, Robert Taylor, John Harris and Bill Gorman. Instructors have included Art Routson, hired in 1968, Keith Stephens, Lewis Cutwright, Edward Young, Robert Taylor, Dean Henry, Terry Goode (1989), Pat Bishop (1995), Lon Moffitt (1996) Dennis Hanson (1996), Dan Jespersen (2005), and Shea Parsons (2015).

In 2005 the Diesel Technology and Caterpillar Technology Programs were accredited by the (AED) Associated Equipment Distributors, www.aednet.org. The AED requires documentation of subject matter taught in the curriculum with an on-site visit to inspect facilities and equipment used for instruction. The AED also discusses the program with advisory committee members, students, faculty and school administrators. The Diesel Technology and Caterpillar Technology Program have met the updated standards for reaccreditation in 2010 and 2015. At the present there are approximately 30 schools in the U.S. and Canada that have applied and met the AED standards for accreditation.

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