

# Heavy-Duty Alternative Fuels

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*Inland Empire/Desert Region (Riverside-San Bernardino-Ontario Metropolitan Statistical Area)*

## Summary

- Employment for the heavy-duty alternative fuels occupational group is expected to increase by 8% through 2022 in the Inland Empire/Desert Region. Over **12,500 job openings** will be available over the five-year timeframe.
- The median wage for each occupation in the heavy-duty alternative fuels occupational group is **above the MIT Living Wage estimate of \$12.30 per hour** for a single adult living in the Inland Empire/Desert Region.
- **There appears to be an opportunity for program growth** based on the average annual number of post-secondary program completions (**191 total awards from community college and other education providers**), and the annual openings for heavy-duty alternative fuels occupations in the local region (**2,506 annual job openings**).

## Introduction

This report details occupations relevant to the heavy-duty alternative fuels program. A heavy-duty alternative fuels program would prepare individuals for the repair and maintenance of heavy-duty vehicles with nontraditional fuel sources, such as compressed natural gas, hybrid, and electricity. The development of a heavy-duty alternative fuels program would coincide with the production of commercial vehicles that utilize alternative fuel sources. Tesla, Cummins, and other manufacturers are expecting production of hybrid and heavy-duty electric trucks to begin in 2019.<sup>1</sup> Although the market is trending towards alternative fuel source vehicles, there is currently a minimal demand for heavy-duty alternative fuel technicians. A real-time labor market search for “alternative fuels” as an employable skill yielded just 19 job postings over the last 12-month period (April 2017 to March 2018). Also, no programs currently prepare students for these emerging occupations. For this reason, supply data for this report has been obtained from the diesel technology program. The diesel technology program adequately prepares individuals for the current heavy-duty technician

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<sup>1</sup> <https://www.forbes.com/sites/joanmuller/2017/08/29/take-that-tesla-diesel-engine-giant-cummins-unveils-heavy-duty-truck-powered-by-electricity/#15dd7c6578f1>

occupations available in the job market. The four occupations included in the heavy-duty alternative fuels occupational group are the following:

- Automotive Service Technicians and Mechanics
- Bus and Truck Mechanics and Diesel Engine Specialists
- First-Line Supervisors of Mechanics, Installers, and Repairers
- Parts Salespersons

## Job Opportunities

In 2017, there were more than 21,900 heavy-duty alternative fuels jobs in the Inland Empire/Desert Region. This occupational group is projecting to increase employment 8% by 2022. Employers in the region will need to hire over 12,500 workers over the next five years to fill new jobs and backfill jobs that workers are permanently vacating (includes retirements). Appendix A, Table 1 shows the projected job growth for each of the occupations in this group.

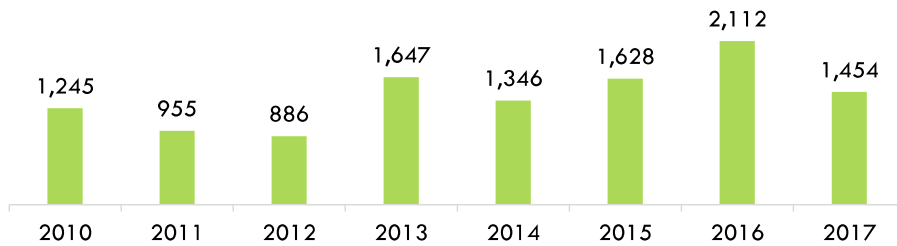
*Exhibit 1: Five-year projections for the heavy-duty alternative fuels occupational group in the Inland Empire/Desert Region*

Region	2017 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Inland Empire/Desert Region	21,926	8%	12,529	2,506	21%

Source: EMSI 2018.1

Over the last 12 months (April 2017 to March 2018), there were 1,517 advertisements (ads) for jobs in the heavy-duty alternative fuels occupational group in the Inland Empire/Desert Region. From 2010 to 2017, there was an annual average of 1,409 job ads per year (Exhibit 2).

Exhibit 2: Number of online job postings for the heavy-duty alternative fuels occupational group in the Inland Empire/Desert Region, 2010 to 2017



Source: Burning Glass – Labor Insights

Exhibit 3 displays the number of job postings for each occupation in the heavy-duty alternative fuels occupational group during the last 12 months, along with the regional and national time to fill. On average, automotive service technicians and mechanics take about a week longer to fill in the Inland Empire/Desert Region than the nation as a whole. On average, first-line supervisors of mechanics, installers, and repairers and bus and truck mechanics and diesel engine specialists take a week less to fill in the Inland Empire/Desert Region than the nation as a whole.

Exhibit 3: Job ads by each of the heavy-duty alternative fuels occupations in the Inland Empire/Desert Region during the last 12 months, Apr 2017 – Mar 2018

Occupation	Job Ads	Regional Average Time to Fill (Days)	National Average Time to Fill (Days)
Automotive Service Technicians and Mechanics	734	51	44
First-Line Supervisors of Mechanics, Installers, and Repairers	477	32	39
Bus and Truck Mechanics and Diesel Engine Specialists	277	37	43
Parts Salespersons	29	38	38
<b>TOTAL</b>	<b>1,517</b>	<b>-</b>	<b>-</b>

Source: Burning Glass – Labor Insights

## Earnings

The median wage for each of the occupations in the heavy-duty alternative fuels occupational group is above the MIT Living Wage estimate of \$12.30 per hour for a single adult living in the Inland Empire/Desert Region. These wages are also sufficient for an adult living in a household with one

other working adult and one child (\$14.50 per hour, per adult or \$30,160 annually for each adult). Exhibit 4 displays wage information for this occupation group in the Inland Empire/Desert Region.

*Exhibit 4: Earnings for the heavy-duty alternative fuels occupational group in the Inland Empire/Desert Region*

Occupation	Entry to Experienced Hourly Earnings Range*	Median Wage*	Average Annual Earnings
First-Line Supervisors of Mechanics, Installers, and Repairers	\$25.35 to \$40.39	\$31.40	\$71,000
Bus and Truck Mechanics and Diesel Engine Specialists	\$16.36 to \$28.28	\$22.68	\$47,500
Automotive Service Technicians and Mechanics	\$11.46 to \$25.45	\$15.95	\$39,900
Parts Salespersons	\$12.10 to \$24.97	\$15.93	\$40,100

Source: EMSI 2018.1

\*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage.

## Work Locations, Employers, Skills, and Education

Exhibit 5 displays the top employers posting job ads as well as the top work locations from job ads during the last 12 months.

*Exhibit 5: The top employers and work locations for the heavy-duty alternative fuels occupational group in the Inland Empire/Desert Region during the last 12 months, Apr 2017 – Mar 2018*

Occupation	Top Employers	Top Work Locations
Heavy-Duty Alternative Fuels Occupational Group (n=1,270)	<ul style="list-style-type: none"> <li>• Pep Boys</li> <li>• Bridgestone/Firestone</li> <li>• Goodyear</li> </ul>	<ul style="list-style-type: none"> <li>• Riverside</li> <li>• Ontario</li> <li>• Fontana</li> </ul>

Source: Burning Glass – Labor Insights

Exhibit 6 lists a sample of in-demand specialized and soft skills that employers are seeking when looking for workers to fill heavy-duty alternative fuels positions. N/A indicates that there is not enough information available from employer job postings to list the skills that are in-demand.

Exhibit 6: Sample of in-demand skills from employer job ads for heavy-duty alternative fuels occupations group in the Inland Empire/Desert Region, Apr 2017 – Mar 2018

Occupation	Specialized skills	Soft skills	Software and Programming skills
Automotive Service Technicians and Mechanics (n=640)	<ul style="list-style-type: none"> <li>• Auto Repair</li> <li>• Tire Mounting</li> <li>• Customer Service</li> </ul>	<ul style="list-style-type: none"> <li>• Communication Skills</li> <li>• Preventive Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Office</li> </ul>
First-Line Supervisors of Mechanics, Installers, and Repairers (n=440)	<ul style="list-style-type: none"> <li>• Repair</li> <li>• Budgeting</li> <li>• Scheduling</li> </ul>	<ul style="list-style-type: none"> <li>• Preventive Maintenance</li> <li>• Communication Skills</li> <li>• </li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Office</li> </ul>
Bus and Truck Mechanics and Diesel Engine Specialists (n=233)	<ul style="list-style-type: none"> <li>• Predictive/Preventative Maintenance</li> <li>• Welding</li> <li>• Electrical Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Work Area Maintenance</li> <li>• Computer Literacy</li> <li>• Troubleshooting</li> </ul>	<ul style="list-style-type: none"> <li>• MAXIMO maintenance system</li> </ul>
Parts Salespersons (n=28)	<ul style="list-style-type: none"> <li>• Customer Service</li> <li>• Repair</li> <li>• Inventory Management</li> </ul>	<ul style="list-style-type: none"> <li>• Building Effective Relationships</li> <li>• Communication Skills</li> <li>• Computer Literacy</li> </ul>	<ul style="list-style-type: none"> <li>• Systems, Applications, Products (SAP)</li> </ul>

Source: Burning Glass – Labor Insights

Exhibit 7 displays the entry-level education level education typically required to enter each occupation according to the Bureau of Labor Statistics, educational attainment for incumbent workers with “some college, no degree” and an “associate degree” according to the U.S. Census, and the minimum advertised education requirement requested by employers in online job ads.

Exhibit 7: Educational attainment and online job ads with minimum advertised education requirements for the heavy-duty alternative fuels occupational group in the Inland Empire/Desert Region, Apr 2017 – Mar 2018

Occupation	Typical Entry-Level Education Requirement	Educational Attainment (Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework)	Minimum Advertised Education Requirement from Job Ads			
			Number of Job Postings (n=)	High school diploma or vocational training	Associate degree	Bachelor's degree or higher
Automotive Service Technicians and Mechanics	Postsecondary nondegree award	34%	348	99%	1%	-
First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	44%	305	55%	9%	36%
Bus and Truck Mechanics and Diesel Engine Specialists	High school diploma or equivalent	37%	111	96%	4%	-
Parts Salespersons	No formal educational credential	38%	10	100%	-	-

Source: EMSI 2018.1, Current Population Survey, Burning Glass – Labor Insights

## Industry

Staffing patterns show the industries that employ the most workers of a specific occupation. Exhibit 8 displays the industries that hire and are looking for the most heavy-duty alternative fuels occupations in the two-county region.

Exhibit 8: Top industries employing heavy-duty alternative fuels occupations in the Inland Empire/Desert Region, Apr 2017 – Mar 2018

Occupation	Top Industries from Staffing Pattern (NAICS) - % of occupation employed in industry	Industry Classification from Job Ads	
		Number of Job Postings (n=)	Top Industries from Job Ads (NAICS)
Automotive Service Technicians and Mechanics	<ul style="list-style-type: none"> <li>Automotive Repair and Maintenance (8111) 56%</li> <li>Automobile Dealers (4411) 24%</li> </ul>	572	<ul style="list-style-type: none"> <li>Automotive Repair and Maintenance (8111)</li> <li>Automotive Parts, Accessories, and Tire Stores (4413)</li> </ul>
First-Line Supervisors of Mechanics, Installers, and Repairers	<ul style="list-style-type: none"> <li>Automotive Repair and Maintenance (8111) 11%</li> <li>Local Government, Excluding Education and Hospitals (9039) 10%</li> </ul>	292	<ul style="list-style-type: none"> <li>Automotive Repair and Maintenance (8111)</li> <li>General Freight Trucking (4841)</li> </ul>
Bus and Truck Mechanics and Diesel Engine Specialists	<ul style="list-style-type: none"> <li>General Freight Trucking (4841) 17%</li> <li>Automotive Repair and Maintenance (8111) 13%</li> </ul>	205	<ul style="list-style-type: none"> <li>General Freight Trucking (4841)</li> <li>Automotive Equipment Rental and Leasing (5321)</li> </ul>
Parts Salespersons	<ul style="list-style-type: none"> <li>Automotive Parts, Accessories, and Tire Stores (4413) 44%</li> <li>Automobile Dealers (4411) 22%</li> </ul>	20	<ul style="list-style-type: none"> <li>Automobile Dealers (4411)</li> <li>Motor Vehicle Manufacturing (3361)</li> </ul>

Source: EMSI 2018.1, Burning Glass – Labor Insights

### Student Completions

Exhibit 9 shows the annual average regional community college awards (associate degrees and certificates) conferred during the three academic years between 2014 and 2017, with the relevant TOP code and the program title used at each college for this TOP code, sourced from the Chancellor’s Office Curriculum Inventory (COCI). Awards granted from 2013 to 2016 outside of the California Community Colleges are in Exhibit 10, along with the relevant CIP code. Please note, an award is not equivalent to a single person in search of a job opening since a student may earn more than one award, such as an associate degree in addition to a certificate. Community College student outcome information was obtained from the CTE LaunchBoard based on the selected TOP code(s) and region.

Exhibit 9: Annual average community college student completions diesel technology programs in the Inland Empire/Desert Region

0947.00 Diesel Technology – Local Program Catalog Name	Annual Community College Headcount (2016-17)	Community College Annual Average Awards (2014-17)
<b>Barstow – Diesel Technology</b>		
Associate Degree		1
Certificate 18 to < 30 semester units		2
<b>San Bernardino</b>	112	
Certificate 30 to < 60 semester units		7
<b>Total Community College Headcount (2016-17)</b>	<b>112</b>	
<b>Total Annual Average Community College Awards</b>		<b>10</b>

Source: LaunchBoard, IPEDS, COCI

**0947.00 Diesel Technology program Strong Workforce outcomes in the Inland Empire/Desert Region in the academic year 2015-16:**

- Number of course enrollments: 237 (California median: 429)\*
- Number of students who transferred to a 4-year institution: N/A (CA: 0)
- Employed in the second fiscal quarter after exit: 78% (CA: 76%)
- Median earnings in the second fiscal quarter after exit: \$6,108 (CA:\$8,585)
- Employed in the fourth fiscal quarter after exit: 72% (CA: 74%)
- Median annual earnings: \$25,089 (CA: \$30,316)
- The percentage in a job closely related to the field of study: N/A (CA: 77%) [2014-15]
- Median change in earnings: 61% (CA: 85%)
- The proportion of students who attained a living wage: 61% (CA: 61%)

\*academic year 2016-17

Exhibit 10: Annual average student completions for diesel mechanics technology/technician programs in the Inland Empire/Desert Region

47.0605 - Diesel Mechanics Technology/Technician	Other Educational Institutions Annual Average Certificates or Other Credit Awards (2013-16)
<b>Universal Technical Institute of California Inc</b>	
Award 2 < 4 academic yrs	181
<b>Total annual average other awards</b>	<b>181</b>

Source: IPEDS





## Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard

MIT Living Wage Calculator

California Community Colleges Chancellor's Office Management Information Systems (MIS)

Chancellor's Office Curriculum Inventory (COCI, version 2.0)

The Integrated Postsecondary Education Data System (IPEDS)

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## Appendix A: Occupation definitions, sample job titles, five-year projections, and earnings for heavy-duty alternative fuels occupations

Occupation Definitions (**SOC code**), Education and Training Requirement, Community College Education Attainment

### **Parts Salespersons (41-2022)**

Sell spare and replacement parts and equipment in repair shop or parts store.

**Sample job titles** Parts Advisor, Parts Clerk, Parts Consultant, Parts Counter Sales Person, Parts Counterperson, Parts Manager, Parts Person, Parts Salesman, Parts Salesperson, Parts Specialist

*Entry-Level Educational Requirement: No formal educational credential*

*Training Requirement: One to twelve months on-the-job training*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 38%*

### **First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)**

Directly supervise and coordinate the activities of mechanics, installers, and repairers.

**Sample job titles** Crew Leader, Electrical Foreman, Facilities Manager, Facility Maintenance Supervisor, Maintenance Foreman, Maintenance Manager, Maintenance Planner, Maintenance Supervisor, Production Crew Supervisor, Superintendent

*Entry-Level Educational Requirement: High school diploma or equivalent*

*Training Requirement: None*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 44%*



**Bus and Truck Mechanics and Diesel Engine Specialists (49-3031)**

Diagnose, adjust, repair, or overhaul buses and trucks, or maintain and repair any type of diesel engines. Includes mechanics working primarily with automobile or marine diesel engines.

*Sample job titles* Bus Mechanic, Diesel Mechanic, Diesel Technician, Fleet Mechanic, General Repair Mechanic, Mechanic, Service Technician, Trailer Mechanic, Transit Mechanic, Truck Mechanic

*Entry-Level Educational Requirement: High school diploma or equivalent*

*Training Requirement: More than twelve months on-the-job training*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 37%*

**Automotive Service Technicians and Mechanics (49-3023)**

Diagnose, adjust, repair, or overhaul automotive vehicles.

*Sample job titles* Auto Technician, Automobile Technician, Automotive Service Technician, Automotive Technician, Certified ASE Master Automotive Technician (Certified Automotive Service Excellence Master Automotive Technician), Master Automotive Technician, Master Technician, Mechanic, Shop Foreman, Truck Technician, A/C Technician (Air Conditioning Technician), Automobile Mechanic (Auto Mechanic), Automobile Technician, Automotive Technician (Auto Technician), Drivability Technician, Heavy Line Technician, Lube Technician, Oil Bay Technician, Quick Service Technician, Service Technician

*Entry-Level Educational Requirement: Postsecondary nondegree award*

*Training Requirement: Less than one-month on-the-job training*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 34%*

Table 1. 2017 to 2022 job growth, wages, and typical education, training, and work experience required for the heavy-duty alternative fuels occupational group, Inland Empire/Desert Region

Occupation (SOC)	2017 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage*	Median Hourly Wage*	Average Annual Earnings	Entry-Level Education & On-The-Job Training	Work Experience Required
Automotive Service Technicians and Mechanics (49-3023)	9,944	659	7%	1,075	\$11.46 to \$25.45	\$15.95	\$39,900	Postsecondary nondegree award & 1 month training	None
Bus and Truck Mechanics and Diesel Engine Specialists (49-3031)	4,585	514	11%	527	\$16.36 to \$28.28	\$22.68	\$47,500	High school diploma or equivalent & more than 12 months training	None
First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	4,489	438	10%	482	\$25.35 to \$40.39	\$31.40	\$71,000	High school diploma or equivalent & None	Less than 5 years
Parts Salespersons (41-2022)	2,908	249	9%	422	\$12.10 to \$24.97	\$15.93	\$40,100	No formal educational credential & 1 to 12 months training	None
<b>Total</b>	<b>21,926</b>	<b>1,861</b>	<b>8%</b>	<b>2,506</b>	-	-	-	-	-

Source: EMSI 2018.1

\*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage.