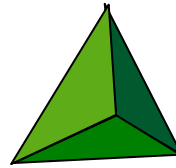




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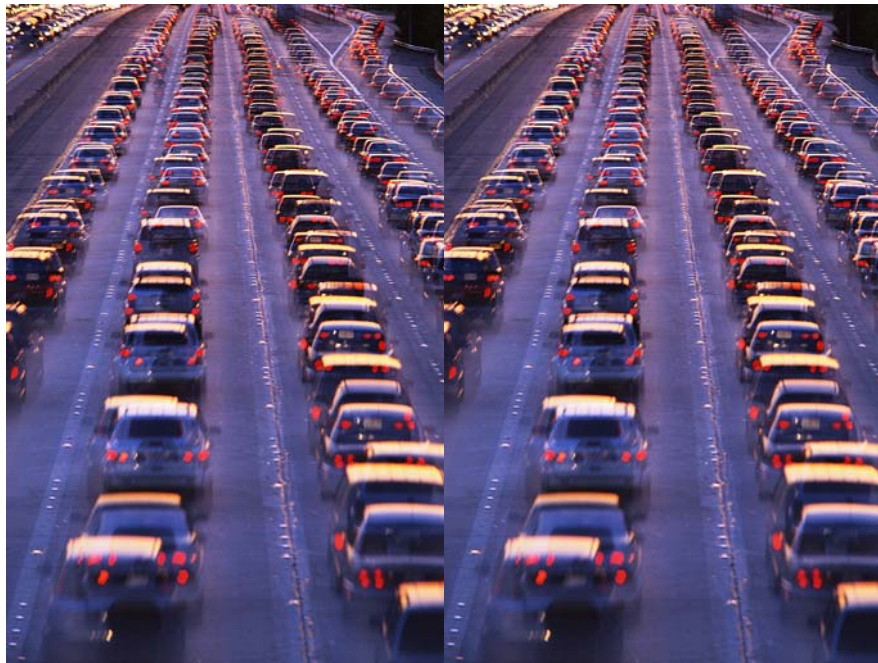


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VENTURA COLLEGE CENTER OF EXCELLENCE

Industry Scan Report South Central Region

AUTOMOTIVE TECHNOLOGY

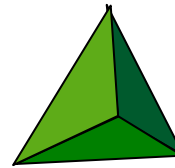


**Center of Excellence, South Central Region
Hosted at Ventura College**

December 2006



CALIFORNIA
COMMUNITY
COLLEGES
**ECONOMIC &
WORKFORCE
DEVELOPMENT
PROGRAM**



BUSINESS &
WORKFORCE
PERFORMANCE
IMPROVEMENT

THE AUTOMOTIVE INDUSTRY NEEDS SKILLED TECHNICIANS in the South Central Region

December 2006

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EDUCATION, TRAINING AND JOB DEVELOPMENT.



Table of Contents

EXECUTIVE SUMMARY	pg 4
INTRODUCTION	pg 5
OCCUPATIONAL OUTLOOK	pg 6
General Overview	pg 6
Employment Projections	pg 7
Wages	pg 8
Career Advancement Opportunities	pg 9
TRAINING NEEDS	pg 9
COMMUNITY COLLEGE RECOMMENDATIONS	pg 10
CONCLUSION	pg 11
WORKS CITED	pg 13
APPENDICES	pg 14
Appendix A: How to Utilize this Scan	pg 14
Appendix B: Occupational Growth & Demand Tables	pg 16
Appendix C: Wage Data for the South Central Region	pg 17
Appendix D: Automotive Careers Today – Career Ladder Chart	pg 18
Appendix E: O*NET Occupational Profiles	pg 19
Appendix F: References and Data Sources	pg 35

AUTOMOTIVE INDUSTRY NEEDS SKILLED TECHNICIANS

South Central new car dealers and automotive repair firms expect to hire over 450 automotive service technicians and diesel engine mechanics over the next two years.

EXECUTIVE SUMMARY

The automobile industry needs skilled technicians in the South Central Region serving San Luis Obispo, Santa Barbara, Ventura and North Los Angeles Counties. According to a Ventura College Center of Excellence June 2006 survey of new car dealers and automotive repair facilities, **124 employers** (37% of the survey population) across the region expect to hire **over 450 automotive service technicians and diesel engine specialists** in the next two years. Only four percent of the survey respondents felt that there is an adequate supply of **automotive service technicians**; a mere two percent thought that there is an adequate supply of **diesel engine specialists**. This data suggests a shortage of skilled technicians across the Region and a strategic opportunity for a community college response.

Ninety-two employers, or 74% of the survey respondents reported that they would send their employees to community colleges for upgrade training. The employers that answered “yes” to that survey question employ **nearly 900** automotive service technicians and diesel engine specialists. This data suggests an additional opportunity for **incumbent worker** training.

Seven of the eight colleges in the South Central Region have Automotive Technology programs. Opportunities exist to respond to the need of the automobile industry for skilled technicians by working with community partners to:

- Promote the merits of a career in the automotive industry;
- Recruit youth to train for entry level positions;
- Provide upgrade training for incumbent workers;
- Modify existing curriculum content as appropriate to respond to new and emerging technological needs of the industry;
- Utilize diverse delivery mechanisms of education and training to increase flexibility in program offerings;
- Seek certification by the National Institute for Automotive Service Excellence (ASE) to insure that training programs meet uniform industry standards.

This report presents national, state and local data relative to the automobile industry, employment opportunities for skilled automotive service technicians and diesel engine specialists, the high demand for skilled technicians based on new and emerging technologies, the skills required to meet these demands, and how South Central colleges might respond and meet this industry need. A request for the full report can be sent to sdwyer@vcccd.edu.

INTRODUCTION

This report presents a study of the automotive industry in the South Central Region of community colleges serving San Luis Obispo, Santa Barbara, Ventura and North Los Angeles Counties. The Economic Development Corporation (EDCO) of Oxnard (Ventura County) began some initial research into the industry with a focus on specialty equipment and aftermarket segments and the need for skilled technicians to install and maintain these high-end items.

Ventura College has a successful and nationally recognized Automotive Technology program and was asked to be a participant in this early endeavor. Because of the nature of the work of the Center of Excellence hosted at Ventura College, the Center was also invited to participate in the activities of the EDCO. For a number of reasons that particular initiative did not go forward; however, the Center of Excellence decided to broaden the focus of the study to continue to look at the need for service technicians and diesel engine mechanics across specific automotive industry sectors. The selected automotive industry sectors represent **nearly 1,800 firms** with **over 14,300 employees** in the South Central Region¹.

This study focuses on the need for **automotive service technicians** and **diesel engine mechanics** and the potential opportunity for South Central Regional colleges to respond to the need of the industry to have **skilled workers** in these occupations. In a June 2006 regional survey, automotive employers indicated that they intend to hire **over 450 automotive service technicians** and **diesel engine mechanics** in the next two years². This suggests an opportunity for regional colleges to generate FTE by providing training and educational services to these entry level workers.

The **automotive services sector** of the automotive industry is being transformed by technology and innovation requiring new skill sets for its workers³. With the advancement of onboard computers and the increase in production and popularity of hybrid vehicles, automotive technicians need an understanding of basic electronics and additional training in science and engineering to acquire the necessary skills to learn how these complex systems work. Existing employees are in need of upgrade training. **Regional employers representing almost 900 automotive service technicians and diesel engine mechanics said they would send their employees to community colleges for upgrade training**⁴. South Central colleges have an additional opportunity to generate FTE through the delivery of incumbent worker training and education.

Over the past 24 months auto dealers nationally have hired over 15,500 military veterans⁵.

¹ InfoUSA 2006

² Ventura College Center of Excellence Survey of Automotive Repair/Service Providers, June 2006

³ Department of Labor – Employment Training Administration (DOL-ETA)

⁴ Ventura College Center of Excellence Survey of Automotive Repair/Service Providers, June 2006

⁵ Military Veterans Translate Skills to Auto Dealerships, Auto Retailing Today, February 2006.

“The pool of recent veterans includes technology savvy, motivated workers whose skills and military training and certifications are easily adaptable to a variety of dealership positions.”

Alan Starling, Chairman, Auto Retailing Today

There are three military installations in the South Central Region (Naval Base Ventura County – NAS Point Magu and CBC Port Hueneme, Vandenberg Air Force Base, and Edwards Air Force Base); they are all major employers of civilian workers. BRAC 2005 (Base Realignment and Closure 2005) initially recommended cutting about 2,000 civilian jobs from Naval Base Ventura County; jobs in the automotive industry may provide a viable option for retiring military workers and/or those in danger of losing their jobs to downsizing or closure.

South Central Regional Colleges have a distinct opportunity to generate FTE by responding to the training needs of the automotive industry. The industry is in a state of evolution, there is a shortage of skilled workers, the workforce in general is aging, there are a significant number of jobs in the region to be filled, and there is a need for incumbent worker training. The automotive industry is big in the South Central Region. It offers good paying jobs for service technicians and diesel engine specialists. Seven of the eight South Central regional colleges have Automotive Technology programs; they have the basic resources in place and are poised to meet these new and emerging industry needs.

The information presented in this report was validated by conversations with executives in the industry and by a follow up survey of new car dealers and automotive repair facilities in the region.

OCCUPATIONAL OUTLOOK

General Overview

The automobile industry (manufacturing and service) makes a significant contribution to the economic vitality of the United States. The automotive services sector is particularly strong in California. The following statistics compiled by the National Automobile Dealers Association Office of Legislative Affairs illustrate the strength of the services sector in California⁶:

- Total sales of all new dealerships in the United States in 2005 was \$699 billion; total sales of all new dealerships in the state of California during this same time was \$91.5 billion
- Total sales of new car dealerships in California in 2005 made up 13 percent of the nation’s total
- Average sales per dealership across the United States during 2005 was \$32.5 million; average sales per dealership in the state of California during this same time was \$55.1 million

⁶ NADA, Office of Legislative Affairs, Driving the United States and California Economies, Annual Contributions for 2005

- Average sales per dealership in the state of California exceed the national average by 70 percent

Statewide, in 1990 103,900 individuals were employed at automobile dealers; in 2005 that number had risen to 140,500. This represents a **35% increase** in employment in automobile dealers over this 15 year period of time. In looking at this same 15 year time span (1990 – 2005), there was a **30% increase** in employment in automotive repair and maintenance statewide: in 1990 there were 94,400 workers; by 2005 that number had risen to 123,000⁷. These increases would suggest an increase in the number of **automotive service technician** positions in both of these industry sectors.

The automotive services sector remains strong economically. In May 2004 the top employers for automotive service technicians and mechanics and diesel engine specialists were local governments, automobile dealers, independent automotive repair and maintenance shops, gasoline stations, motor vehicle and motor vehicle parts and supplies merchant wholesalers, and automotive parts, accessories and tire stores⁸.

The automotive services sector is stable. Because changes in economic conditions have little effect on the repair and maintenance part of the automobile dealer's business, automotive service technicians employed by dealers can expect a high degree of job security⁹.

The work of automotive service technicians and mechanics has evolved from mechanical repair to a high technology job. With the diversity of automobiles on the market and the increase in foreign car sales, automobile dealers and independent repair facilities are more challenged than ever to provide quality service on a number of different makes and models of automobiles. Independent service centers will need proper diagnostic equipment for new American made cars and trucks; they will also need the proper diagnostic tools for up and coming import applications. As a result, automobile technicians will need the skills to work across a wide range of automobile makes and models.

Employment Projections

A number of data sources were utilized to determine and validate the need for automotive and service technicians nationally, statewide and, more specifically, on a regional basis. The determination of need pertains to actual numbers of jobs currently, number of projected future vacancies based on new jobs as well as replacements, and the overall health of the industry. The overall health of the industry was discussed in the preceding section. Projection and growth data will be presented below. Please see Appendix F for a complete list of data sources and references.

⁷ EDD-LMID (<http://www.calmis.ca.gov>)

⁸ Department of Labor, Bureau of Labor Statistics (DOL-BLS) Occupational Handbook

⁹ BLS, 2004-05 Career Guide to Industries

“Automobile dealership job openings are the result of increased sales, longer business hours, an expectation for loan and financing service, and ‘mechanic work’ that now requires increased computer and technical skills.”¹⁰

- William Bradshaw, Chair NADA

National

- Employment of automotive service technicians and mechanics is expected to increase about as fast as the average (10-20 percent) through the year 2012¹¹
- New job creation plus the replacement of automotive service technicians and mechanics that leave the field or retire between the year 2002 and 2019 will result in the need for over 300,000 new employees¹²

State¹³

- Automotive service technician positions rank 42 out of 50 in terms of occupations with the **largest growth** in the state of California between 2002 and 2012
- Automotive service technician positions rank 37 out of 50 in terms of jobs with the **most openings** in the state between 2004 and 2005
- Median hourly wage ranges from \$16.00 to almost \$18.00 per hour

Regional

A June 2006 survey of South Central Region new car dealers and automotive repair firms confirms and validates the national, state and county data. Key highlights include the following:

- 124 survey respondents representing almost 1200 automotive service technician and diesel engine mechanic employees reported that they would be hiring over 450 new technicians within the next two years
- This intended hiring represents a 45 percent increase in jobs over the course of the next two years

Please see Appendix B for growth and demand tables for the state of California and each of the Counties in the South Central Region service area.

Wages

The automotive industry services sector offers good paying jobs. The state of California Employment Development Department – Labor Market Information Division (EDD-LMID) reports that entry level automotive service technician and diesel engine specialist jobs in the South Central Region start at around \$10.00 per hour. Experienced workers earn up to \$25.00 per hour¹⁴. Both occupations require post secondary vocational education – education and training community colleges are ideally suited to provide. Please see Appendix C for wage data for automotive service technicians and diesel

¹⁰ “Auto Dealers Have 100,000 Jobs to Fill”, Ventura County Star, July 22, 2006

¹¹ Alliance of Automobile Manufacturers

¹² DOL-ETA

¹³ EDD-LMID

¹⁴ EDD-LMID 2005 3rd Quarter Earnings

engine specialists across the state and in each of the Counties of the South Central Region.

Career Advancement Opportunities

There are opportunities for career advancement within the automotive industry. Entry Level Technicians can follow a career ladder that includes advancement to Mid-level Technician, Master Technician, Shop Foreman/Lead Technician, Service Manager, Operations Director, and ultimately, General Manager. Automotive Retailing Today presents a career ladder that follows this progression. Please see Appendix D.

The National Automobile Dealers Association reports on average annual earnings for a number of dealership occupations. Their focus was on positions in what they call the Pacific Region (Alaska, **California**, Hawaii, Oregon, and Washington). This information is useful in that it presents a clear correlation between career advancement and earning potential for automotive technicians as follows¹⁵:

Entry level technicians	\$30,620 per year
Mid-level technicians	\$45,855 per year
Master technicians	\$70,393 per year

Community colleges have the opportunity to develop training programs that align with these career advancement opportunities.

TRAINING NEEDS

There is an abundance of information available to assess and evaluate the training needs of the automotive industry. The Department of Labor, in its study of the services sector of the industry identified some key issues that broadly impact training and educational services. They include the following¹⁶:

- The need to educate parents, teachers and guidance counselors and other influential leaders about the industry and its viable career opportunities;
- The need to improve the industry's image in communities from which skilled workers can be recruited;
- The need to establish reasonable training and education requirements for instructors and training programs;
- The need to develop standardized curriculum; and
- The importance of industry-based certification for training programs.

The National Automotive Technicians Education Foundation (NATEF) is an independent non-profit organization whose primary mission is to evaluate technician training programs against standards developed by the automotive industry and recommend qualifying programs for certification (accreditation) by the national institute for

¹⁵ <http://www.nada.org>

¹⁶ DOL-ETA

Automotive Service Excellence (ASE). According to NATEF, today's automotive technicians must have:

- Thorough knowledge of automotive systems and components
- Good computer skills
- Excellent communication skills
- Above average mechanical aptitude
- Good reasoning ability
- Ability to read and follow instructions
- Manual dexterity

And finally, O*NET OnLine (The Occupational Information Network) provides detailed information to delineate the knowledge, skills and abilities for specific occupations. This information can be very helpful in the development of industry specific curricula and training programs. Appendix E presents comprehensive O*NET occupational data for Automotive Service Technicians and Mechanics, Automotive Master Mechanics, Automotive Specialty Technicians, and Bus and Truck Mechanics and Diesel Engine Specialists.

The Department of Labor offers general guidelines for training needs and services, NATEF identifies industry specific skill clusters, and O*NET provides detailed profiles of specific occupations, in this case, within the automotive industry. These are resources and information that regional colleges can utilize for program development and/or modifications.

COMMUNITY COLLEGE RECOMMENDATIONS

As of January 2005, the DOL made a series of investments totaling more than \$11 million dollars to partnerships between businesses, community colleges, workforce investment boards and others to address the needs of the automotive services sector. These investments have focused on the following¹⁷:

- Image and promotion of the industry
- Capacity building of training programs
- The standardization of education and training
- Increasing the diversity of the workforce
- Recruitment and entry level training for youth
- Upgrading the skills of instructors

Automotive Technology programs are not new to the South Central Region, seven of the eight colleges in the region have programs. South Central regional colleges established Automotive Technology programs as early as 1962, several were established during the 1970's, one of the seven colleges is currently going through the

¹⁷ http://www.doleta.gov/BRG/pdf/Automotive_Final_Report.pdf

final steps of program approval. Several of the seven colleges with programs are writing Department of Labor and/or Industry Driven Regional Collaborative grant proposals to garner resources for increased program delivery. Current regional programs are a combination of associate degree and certificate programs. Some of the South Central colleges are either currently ASE certified or in the process of obtaining certification. It is obvious that South Central regional colleges are attentive and responsive to the needs of the automotive industry.

South Central regional colleges have long-standing Automotive Technology programs, they are well positioned to respond to the new and emerging needs of the industry. The new and emerging needs of the industry may provide the motivation and incentive to update and/or modify existing programs. Successful components of program upgrades may include the following:

- Development of more distance education classes (as appropriate) to provide greater flexibility in scheduling and service delivery
- Development of accelerated classes and programs
- Utilization of alternate delivery mechanisms (contract education, community education) to increase flexibility of program offerings
- Reassessment of current curriculum to address new technological training needs
- Development of career ladder strategy for ongoing training and education
- Development of Cooperative Work Experience Education programs to strengthen the link between classroom learning and workplace skill needs
- Increasing the number of industry partnerships and associations to recruit qualified instructors
- Increasing the number of community partnerships with K-12 and industry associations to acquire the equipment and resources necessary to meet program needs

CONCLUSION

Automobile dealers and independent automotive repair firms in the South Central Region of community colleges serving San Luis Obispo, Santa Barbara, Ventura, and North Los Angeles Counties have indicated their intent to **hire over 450** automotive service technicians and diesel engine specialists over the next two years. **Seventy-four percent** of Ventura College Center of Excellence survey respondents indicated that they would send their current employees to community colleges for upgrade training; these employers represent **nearly 900** automotive service technicians and diesel engine specialists. Automotive service technicians and diesel engine specialists earn good wages; **skilled workers** in the industry have tremendous opportunity for career advancement.

South Central regional colleges are well positioned to respond to the needs of the automotive industry, seven of the eight colleges have existing Automotive Technology programs. Automotive service technician and diesel engine specialist occupations are, with today's advanced technology, becoming more and more complex. These

circumstances present a strategic opportunity for colleges to work with community partners and employers to:

- Promote the merits of a career in the automotive industry
- Recruit youth to train for entry level positions
- Provide upgrade training for incumbent workers
- Modify existing curriculum content as appropriate to respond to new and emerging needs of the industry
- Modify existing curriculum for increased flexibility
- Respond to the need of the automotive industry for skilled workers.

South Central regional colleges have the opportunity to generate FTE for their colleges by responding to the needs of the automotive industry for skilled workers in automotive service technician and diesel engine specialist occupations.

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APPENDIX A

HOW TO UTILIZE THIS SCAN

About Us - Description of BWPI:

The Business and Workforce Performance Improvement (BWPI) initiative is focused on building the capacity of the colleges in the area of economic and workforce development to enhance their ability to deliver education and training services to businesses and workers in high growth industries, new technologies, and other clusters of opportunities.

The Centers of Excellence (COE) within BWPI provide information regarding workforce trends, increasing awareness and visibility about the colleges economic and workforce development programs and services, and building partnerships with business and industry.

The difference this will make to the colleges is that it will position them as THE workforce partners of choice to business and industry and ensure that college programs are current and responsive. This will contribute to the overall economic vitality of the communities in which they serve.

How to Use This Industry Scan:

The Centers of Excellence within the Business and Workforce Performance Improvement Initiative of the California Community College Economic and Workforce Development Program have undertaken Industry Scanning to provide targeted and valuable information to community colleges on high growth industries and occupations.

This scan is intended to assist the decision-making process of California community college administrators and planners in addressing local and regional workforce needs and emerging job opportunities in the workplace as they relate to college programs. The information contained in this report can be used to guide program offerings, strengthen grant applications, and support other economic and workforce development efforts.

This report is designed to provide current industry data that will:

- Define potential strategic opportunities relative to an industry's emerging trends and workforce needs;
- Influence and inform local college program planning and resource development; and
- Promote a future-oriented and market responsive way of thinking among stakeholders.

This Industry Scan included a review of the California Regional Economies Project reports and Employment Development Department (EDD) Labor Market Information (LMID) projections that cover the communities in this region, as well as many other sources as listed.

Important Disclaimer:

All representations included in this Environmental Scan product/study have been produced from a secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings. The purpose of the Environmental Scan is to assist the California Community Colleges to respond to emerging market needs for workforce performance improvement. However, neither the Business and Workforce Performance Improvement Centers of Excellence, COE host college or California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon this study including components or recommendations

APPENDIX B

Occupational Growth and Demand Tables 2002-2012

The following are job growth and demand tables for the state of California and each of the four counties in the South Central Region service area.

State of California – Growth & Demand

SOC Code	Occupational Title	Annual Average Employees		Employment Change		Average Annual Openings
		2002	2012	Percent	Number	
49-3023	Automotive Service Technicians	75,800	92,400	21.9	16,600	3,680
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	25,900	30,500	17.8	4,600	1,130
	TOTALS	101,700	122,900	NA	21,200	4,810

State of California Employment Development Department Labor Market Information Division July 2006

Los Angeles County – Growth & Demand

SOC Code	Occupational Title	Annual Average Employees		Employment Change		Average Annual Openings
		2002	2012	Percent	Number	
49-3023	Automotive Service Technicians	18,740	20,380	8.8	1,640	662
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	6,900	7,570	9.7	670	244
	TOTALS	25,640	27,950	NA	2,310	906

State of California Employment Development Department Labor Market Information Division July 2006

Ventura County –Growth & Demand

SOC Code	Occupational Title	Annual Average Employees		Employment Change		Average Annual Openings
		2002	2012	Percent	Number	
49-3023	Automotive Service Technicians	1,700	1,920	12.9	220	67
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists*	340	400	17.6	60	15
	TOTALS	2,040	2,320	NA	280	82

State of California Employment Development Department Labor Market Information Division July 2006

*Ventura MSA

Santa Barbara County – Growth & Demand

SOC Code	Occupational Title	Annual Average Employees		Employment Change		Average Annual Openings
		2002	2012	Percent	Number	
49-3023	Automotive Service Technicians *	1,020	1,030	1.0	10	28
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	150	170	13.3	20	6
	TOTALS	1,170	1,200	NA	30	34

State of California Employment Development Department Labor Market Information Division July 2006

* Santa Barbara, Santa Maria, Lompoc MSA

San Luis Obispo County – Growth & Demand

SOC Code	Occupational Title	Annual Average Employees		Employment Change		Average Annual Openings
		2002	2012	Percent	Number	
49-3023	Automotive Service Technicians	510	590	15.7	80	22
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	170	180	5.9	10	5
	TOTALS	680	770	NA	90	27

State of California Employment Development Department Labor Market Information Division July 2006

APPENDIX C

WAGE DATA FOR THE SOUTH CENTRAL REGION

SOUTH CENTRAL REGION WAGE DATA – Automotive Services Technician

COUNTY/SERVICE AREA	HRLY MEAN	HRLY ENTRY LEVEL	HRLY EXPERIENCE LEVEL
Los Angeles County	19.92	11.37	24.19
Ventura County	18.82	11.59	22.43
Santa Barbara, Santa Maria, Lompoc MSA	17.23	9.98	20.85
San Luis Obispo County	17.19	10.54	20.51
State of California	19.77	11.86	23.73

State of California Employment Development Department – Labor Market Information July 2006

SOUTH CENTRAL REGION WAGE DATA – Diesel Engine Specialist

COUNTY/SERVICE AREA	HRLY MEAN	HRLY ENTRY LEVEL	HRLY EXPERIENCE LEVEL
LA – Long Beach MSA	21.23	15.18	24.26
Ventura MSA	19.81	14.29	22.57
Santa Barbara, Santa Maria, Lompoc MSA	19.23	13.60	22.05
Atascadero, Paso Robles MSA	19.14	13.91	21.75
State of California	21.13	14.80	24.30

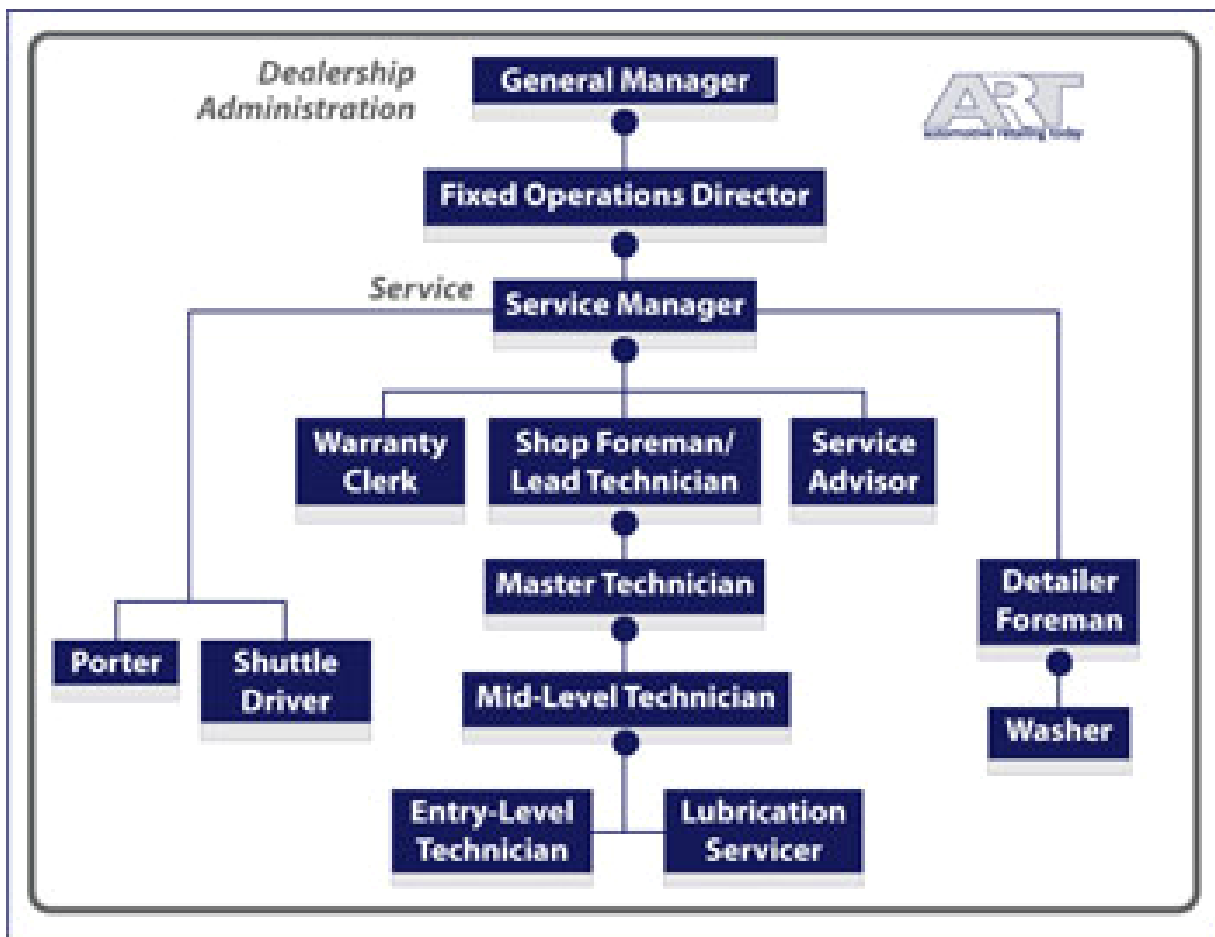
State of California Employment Development Department Labor Market Information July 2006

APPENDIX D

Automotive Careers Today – Career Ladder Chart

The following career ladder chart can be found at <http://www.autocareertoday.net/exlpore>.

Visitors to the site can walk through each of the occupations shown in the career ladder chart and view: occupational descriptions; job requirements; educational requirements; valuable career path information and more.



Source: *Automotive Retailing Today* (2006)

APPENDIX E

Occupational Information Network (O*NET)

O*NET is a comprehensive database of worker attributes and job characteristics. It replaces the *Dictionary of Occupational Titles (DOT)* and is designed to be the nation's primary source of occupational data. O*NET can be found at <http://online.onetcenter.org>. The following presents occupational information taken directly from O*NET for Automotive Service Technicians and Mechanics, Automotive Master Technicians, Automotive Specialty Technicians and Bus and Truck Mechanics and Diesel Engine Specialists.

Summary Report for:
49-3023.00 - Automotive Service Technicians and Mechanics

Diagnose, adjust, repair, or overhaul automotive vehicles.

This title represents a group of more specific occupations. For additional information, please select one of the specific occupations below.

49-3023.01 [Automotive Master Mechanics](#) InDemand
49-3023.02 [Automotive Specialty Technicians](#) InDemand

Summary Report for:
49-3023.01 - Automotive Master Mechanics

Repair automobiles, trucks, buses, and other vehicles. Master mechanics repair virtually any part on the vehicle or specialize in the transmission system.

Sample of reported job titles: Automotive Technician, Automotive Service Technician, Shop Foreman, Certified ASE Master Automotive Technician (Certified Automotive Service Excellence Master Automotive Technician), Master Automotive Technician, ASE Master Mechanic (Automotive Service Excellence Master Mechanic), Auto Mechanic

Tasks

- Examine vehicles to determine extent of damage or malfunctions.
- Test drive vehicles, and test components and systems, using equipment such as infrared engine analyzers, compression gauges, and computerized diagnostic devices.
- Repair, reline, replace, and adjust brakes.
- Review work orders and discuss work with supervisors.
- Follow checklists to ensure all important parts are examined, including belts, hoses, steering systems, spark plugs, brake and fuel systems, wheel bearings, and other potentially troublesome areas.
- Plan work procedures, using charts, technical manuals, and experience.
- Test and adjust repaired systems to meet manufacturers' performance specifications.
- Confer with customers to obtain descriptions of vehicle problems, and to discuss work to be performed and future repair requirements.

- Perform routine and scheduled maintenance services such as oil changes, lubrications, and tune-ups.
- Disassemble units and inspect parts for wear, using micrometers, calipers, and gauges.

Tools & Technology

Tools used in this occupation:

Hammers — Ball peen hammers; Hammers; Plastic tip hammers; Soft-face hammers

Organic light emitting displays — Anti-lock braking system ABS/air bag scan tools; Auto scanners; Graphing scanners; Modular diagnostic information systems

Pullers — Ball joint separators; Bearing pullers; Gear puller tools; Slide hammers

Punches or nail sets or drifts — Center punches; Pin punches; Punches; Taper punches

Specialty wrenches — Breaker bars; Chain wrenches; Gear wrenches; Locking wrenches

Technology used in this occupation:

Accounting software — Mitchell Manager Invoicing System

Analytical or scientific software — AutoZone ALLDATA; Diagnostic software for personal digital assistants PDAs; Nexiq Tech HDS Suite for Palm; SPX/OTC Genisys ConnecTech PC

Data base reporting software — Tech manual database software

Facilities management software — Alliance Automotive Shop Controller; Snap-On ShoKey; Vehicle management software

Project management software — Estimating software; Recordkeeping software

Knowledge

Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

Customer and Personal Service — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

Education and Training — Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

Skills

Troubleshooting — Determining causes of operating errors and deciding what to do about it.

Repairing — Repairing machines or systems using the needed tools.

Equipment Selection — Determining the kind of tools and equipment needed to do a job.

Active Learning — Understanding the implications of new information for both current and future

problem-solving and decision-making.

Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

Reading Comprehension — Understanding written sentences and paragraphs in work related documents.

Installation — Installing equipment, machines, wiring, or programs to meet specifications.

Complex Problem Solving — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

Abilities

Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

Deductive Reasoning — The ability to apply general rules to specific problems to produce answers that make sense.

Inductive Reasoning — The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).

Information Ordering — The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).

Arm-Hand Steadiness — The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.

Near Vision — The ability to see details at close range (within a few feet of the observer).

Flexibility of Closure — The ability to identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material.

Manual Dexterity — The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.

Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

Finger Dexterity — The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.

Work Activities

Repairing and Maintaining Mechanical Equipment — Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.

Making Decisions and Solving Problems — Analyzing information and evaluating results to choose the best solution and solve problems.

Getting Information — Observing, receiving, and otherwise obtaining information from all relevant

sources.

Identifying Objects, Actions, and Events — Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.

Updating and Using Relevant Knowledge — Keeping up-to-date technically and applying new knowledge to your job.

Inspecting Equipment, Structures, or Material — Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.

Analyzing Data or Information — Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.

Operating Vehicles, Mechanized Devices, or Equipment — Running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft.

Processing Information — Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data.

Communicating with Supervisors, Peers, or Subordinates — Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.

Related Occupations

- 49-3011.01 Airframe-and-Power-Plant Mechanics *InDemand*
- 49-3011.02 Aircraft Engine Specialists *InDemand*
- 49-3023.02 Automotive Specialty Technicians *InDemand*
- 49-3041.00 Farm Equipment Mechanics
- 49-9041.00 Industrial Machinery Mechanics *InDemand*
- 51-2031.00 Engine and Other Machine Assemblers *InDemand*
- 51-9061.02 Mechanical Inspectors

**Summary Report for:
49-3023.02 - Automotive Specialty Technicians**

Repair only one system or component on a vehicle, such as brakes, suspension, or radiator.

Sample of reported job titles: Automotive Technician (Auto Technician), Technician, Mechanic, Air Conditioning Technician (A/C Technician), Trim Technician, Alignment Specialist, Automobile Mechanic (Auto Mechanic), Automotive Worker, Brake Technician, Drivability Technician

Tasks

- Examine vehicles, compile estimates of repair costs, and secure customers' approval to perform repairs.
- Repair, overhaul, and adjust automobile brake systems.
- Use electronic test equipment to locate and correct malfunctions in fuel, ignition, and emissions control systems.
- Repair and replace defective balljoint suspensions, brakeshoes, and wheelbearings.
- Inspect and test new vehicles for damage, then record findings so that necessary repairs can be made.
- Test electronic computer components in automobiles to ensure that they are working properly.
- Tune automobile engines to ensure proper and efficient functioning.
- Install and repair air conditioners, and service components such as compressors, condensers, and controls.
- Repair, replace, and adjust defective carburetor parts and gasoline filters.
- Remove and replace defective mufflers and tailpipes.

Tools & Technology

Tools used in this occupation:

Pneumatic vacuum equipment — Brake bleeders; Hydraulic bleed tools; Pneumatic fluid evacuators; Pressure brake bleeders

Pressure indicators — Diesel modulator shift testers; Engine oil pressure testers; Manifold gauge sets; Tire pressure gauges

Pullers — Ball joint separators; Hand pullers; Power pullers; Slide hammers

Specialty wrenches — Breaker bars; Filter wrenches; Lug wrenches; Ratcheting gear wrenches

Voltage or current meters — Alternator testers; In-line ignition spark testers; Spark plug testers; Voltmeters

Technology used in this occupation:

Accounting software — ARSIS Automotive Repair Shop Invoice System software

Analytical or scientific software — Hunter WinAlign; Nexiq Tech HDS Suite for Palm

Data base reporting software — Database software; Genisys Fast Fixes; Pathfinder software; Tech

manual database software

Facilities management software — Alliance Automotive Shop Controller; Mitchell OnDemand5 Manager; Scott Systems MaxxTraxx Pro; Snap-On ShoKey

Project management software — Estimating software

Knowledge

Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

Customer and Personal Service — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

Engineering and Technology — Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

Administration and Management — Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

Sales and Marketing — Knowledge of principles and methods for showing, promoting, and selling products or services. This includes marketing strategy and tactics, product demonstration, sales techniques, and sales control systems.

Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

Education and Training — Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

Skills

Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

Repairing — Repairing machines or systems using the needed tools.

Troubleshooting — Determining causes of operating errors and deciding what to do about it.

Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.

Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

Reading Comprehension — Understanding written sentences and paragraphs in work related documents.

Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Installation — Installing equipment, machines, wiring, or programs to meet specifications.

Equipment Selection — Determining the kind of tools and equipment needed to do a job.

Time Management — Managing one's own time and the time of others.

Abilities

Arm-Hand Steadiness — The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.

Extent Flexibility — The ability to bend, stretch, twist, or reach with your body, arms, and/or legs.

Manual Dexterity — The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.

Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

Finger Dexterity — The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.

Hearing Sensitivity — The ability to detect or tell the differences between sounds that vary in pitch and loudness.

Near Vision — The ability to see details at close range (within a few feet of the observer).

Oral Comprehension — The ability to listen to and understand information and ideas presented through spoken words and sentences.

Selective Attention — The ability to concentrate on a task over a period of time without being distracted.

Work Activities

Operating Vehicles, Mechanized Devices, or Equipment — Running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft.

Getting Information — Observing, receiving, and otherwise obtaining information from all relevant sources.

Updating and Using Relevant Knowledge — Keeping up-to-date technically and applying new knowledge to your job.

Documenting/Recording Information — Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic form.

Repairing and Maintaining Mechanical Equipment — Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.

Identifying Objects, Actions, and Events — Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.

Inspecting Equipment, Structures, or Material — Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.

Making Decisions and Solving Problems — Analyzing information and evaluating results to choose the best solution and solve problems.

Communicating with Supervisors, Peers, or Subordinates — Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.

Performing General Physical Activities — Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Related Occupations

- 49-3011.01 Airframe-and-Power-Plant Mechanics [InDemand](#)
- 49-3011.02 Aircraft Engine Specialists [InDemand](#)
- 49-3023.01 Automotive Master Mechanics [InDemand](#)
- 49-3041.00 Farm Equipment Mechanics
- 49-9041.00 Industrial Machinery Mechanics [InDemand](#)
- 49-9098.00 Helpers--Installation, Maintenance, and Repair Workers [InDemand](#)
- 51-2031.00 Engine and Other Machine Assemblers [InDemand](#)

**Summary Report for:
49-3031.00 - Bus and Truck Mechanics and Diesel Engine Specialists**

Diagnose, adjust, repair, or overhaul trucks, buses, and all types of diesel engines. Includes mechanics working primarily with automobile diesel engines.

Sample of reported job titles: Mechanic, Diesel Mechanic, General Repair Mechanic, Diesel Technician, Transit Mechanic, Fleet Mechanic, Transportation Mechanic, Certified Mechanic, Journeyman Bus Mechanic, Medium/Heavy Truck Mechanic

Tasks

- Use handtools such as screwdrivers, pliers, wrenches, pressure gauges, and precision instruments, as well as power tools such as pneumatic wrenches, lathes, welding equipment, and jacks and hoists.
- Inspect brake systems, steering mechanisms, wheel bearings, and other important parts to ensure that they are in proper operating condition.
- Perform routine maintenance such as changing oil, checking batteries, and lubricating equipment and machinery.
- Adjust and reline brakes, align wheels, tighten bolts and screws, and reassemble equipment.
- Raise trucks, buses, and heavy parts or equipment using hydraulic jacks or hoists.
- Test drive trucks and buses to diagnose malfunctions or to ensure that they are working properly.
- Inspect, test, and listen to defective equipment to diagnose malfunctions, using test instruments such as handheld computers, motor analyzers, chassis charts, and pressure gauges.
- Examine and adjust protective guards, loose bolts, and specified safety devices.
- Inspect and verify dimensions and clearances of parts to ensure conformance to factory specifications.
- Specialize in repairing and maintaining parts of the engine, such as fuel injection systems.

Tools & Technology

Tools used in this occupation:

Adjustable widemouth pliers — Pliers; Slip joint pliers; Water pump pliers

Adjustable wrenches — Adjustable crescent wrenches; Adjustable wrenches; Wrenches

Calipers — Dial calipers; Inside calipers; Outside calipers

Engine or component test stands — Fuel pump test stands; Governor test stands

Hammers — Ball peen hammers; Brass hammers; Cross peen hammers; Sledgehammers

Portable data input terminals — Detroit diesel electronic control DDEC readers; Flash card readers; Hand-held diagnostic computers

Specialty wrenches — Bleeder wrenches; Flare nut wrenches; Pump wrenches; Slug wrenches

Technology used in this occupation:

Data base user interface and query software — Database software

Facilities management software — Shop management software

Word processing software — Word processing software

Knowledge

Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

Transportation — Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits.

Public Safety and Security — Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.

Skills

Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

Troubleshooting — Determining causes of operating errors and deciding what to do about it.

Repairing — Repairing machines or systems using the needed tools.

Reading Comprehension — Understanding written sentences and paragraphs in work related documents.

Installation — Installing equipment, machines, wiring, or programs to meet specifications.

Coordination — Adjusting actions in relation to others' actions.

Equipment Selection — Determining the kind of tools and equipment needed to do a job.

Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Judgment and Decision Making — Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Time Management — Managing one's own time and the time of others.

Abilities

Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

Manual Dexterity — The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.

Multilimb Coordination — The ability to coordinate two or more limbs (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.

Near Vision — The ability to see details at close range (within a few feet of the observer).

Arm-Hand Steadiness — The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.

Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

Oral Comprehension — The ability to listen to and understand information and ideas presented through spoken words and sentences.

Oral Expression — The ability to communicate information and ideas in speaking so others will understand.

Deductive Reasoning — The ability to apply general rules to specific problems to produce answers that make sense.

Extent Flexibility — The ability to bend, stretch, twist, or reach with your body, arms, and/or legs.

Work Activities

Repairing and Maintaining Mechanical Equipment — Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.

Inspecting Equipment, Structures, or Material — Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.

Operating Vehicles, Mechanized Devices, or Equipment — Running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft.

Handling and Moving Objects — Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.

Getting Information — Observing, receiving, and otherwise obtaining information from all relevant sources.

Communicating with Supervisors, Peers, or Subordinates — Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.

Performing General Physical Activities — Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Identifying Objects, Actions, and Events — Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.

Updating and Using Relevant Knowledge — Keeping up-to-date technically and applying new knowledge to your job.

Establishing and Maintaining Interpersonal Relationships — Developing constructive and cooperative working relationships with others, and maintaining them over time.

Related Occupations

- 49-2092.06 [Hand and Portable Power Tool Repairers](#)
- 49-3042.00 [Mobile Heavy Equipment Mechanics, Except Engines](#) InDemand
- 49-3051.00 [Motorboat Mechanics](#)
- 49-3052.00 [Motorcycle Mechanics](#)
- 49-3053.00 [Outdoor Power Equipment and Other Small Engine Mechanics](#)
- 49-9021.02 [Refrigeration Mechanics](#) InDemand

APPENDIX F

References and Data Sources

U.S. Department of Labor – Employment and Training Administration	http://www.doleta.gov
U.S. Bureau of Economic Analysis	http://www.bea.gov
U.S. Bureau of Labor Statistics – Occupational Outlook Handbook	http://www.bls.gov.oco/
Occupational Information Network (O*NET)	http://www.online.onetcenter.org
America’s Career InfoNet	http://www.acinet.org
National Automotive Technicians Education Foundation	http://www.natef.org
National Institute for Automotive Service Excellence	http://www.ase.com
State of California Employment Development Department – Labor Market Information Division	http://www.labormarketinfo.edd.ca.gov
Alliance of Automobile Manufacturers	http://www.autoalliance.org
National Automobile Dealers Association	http://www.nada.org
Harris Interactive	http://www.harrisinteractive.com
Automotive Retailing Today	http://www.autoretailing.org
Automotive Careers Today	http://www.autocareerstoday.net
Toyota – Technician Development	http://www.toyota.com/about/tten/
e auto portal – Trade Associations	http://www.eautoportal.com
University of the Aftermarket	http://www.univafmkt.org
Ventura County Star	http://www.venturacountystar.com
National Automotive Parts Association – Institute of Automotive Technology	http://www.niat-training.com
CARQUEST Technical Institute	http://www.carquest.com