

February 2005

SKILL SHORTAGE ASSESSMENT OCCUPATION: DIESEL MECHANIC (MACHINERY MECHANIC)

Current situation: Skill shortage

Short term outlook: Skill shortage

Executive summary

1. There is currently a shortage of diesel mechanics according to the Survey of Employers who have Recently Advertised (SERA) with 55% of vacancies included in the survey filled within six weeks of being advertised. This report considers these survey results in the context of trends in the demand for and supply of diesel mechanics.

Table 1: fill rate for diesel mechanics, 2004

| | Fill rate | Average number of suitable applicants |
|------------------|-----------|---------------------------------------|
| Diesel Mechanics | 55% | 1.3 |
| All trades | 41% | 0.7 |

Source: Department of Labour, SERA

2. Employment of diesel mechanics grew by 0.4% per annum between 1991 and 2001 and has continued growing since then. Growth in the number of registered trucks and buses of 3.3% per annum since 1998 has contributed to this. Growth in demand for diesel mechanics has been moderated by a tendency towards replacing rather than repairing vehicle parts, and technological developments that mean new trucks require less frequent servicing. While some of these factors may continue to affect future demand, they will be more than compensated for by increases in the fleet size. This is expected to be driven by rising demand for road freight transportation on the back of strong domestic and international trade. Demand for diesel mechanics is therefore likely to grow modestly in the near future.
3. There has been an upward trend in the number of diesel mechanics entering the New Zealand labour market with net migratory outflows of the late 1990s turning to net inflows in 2002, and rising numbers of trainees achieving the relevant national certificate. Despite this growth, the number of trainees achieving the national certificate relative to the number of employed diesel mechanics is low. Indeed, the number of new entrants to the labour market from training will not even compensate for the number of diesel mechanics retiring each year.
4. The shortage is expected to persist and possibly worsen over the next year to two years. While there has been an increase in the number of trainees achieving the nationally recognised qualifications for diesel mechanics, this level of training will not keep pace with new demand arising from new positions created and replacement demand arising from retirement, let alone make an impact on current unfilled vacancies.

Introduction

The purpose of this report is to investigate shortages of diesel mechanics in New Zealand. The report aims to provide an assessment of whether there is a shortage of diesel mechanics, the factors contributing to this situation and the outlook for shortages.

Diesel mechanics are skilled tradespeople who repair and maintain the diesel engines that power transportation equipment such as heavy trucks, buses, locomotives and other heavy vehicles, as well as mobile equipment such as road graders, combines and forklifts. Diesel maintenance is becoming increasingly complex as more electronic components are used to control the operation of the diesel engine. Many diesel mechanics now use computers to diagnose problems and adjust engine functions¹. Diesel mechanics are now also known as automotive engineers (heavy equipment) and are classified in the New Zealand Standard Classification of Occupations (NZSCO) as *machinery mechanics* (NZSCO 72311). The Department of Labour (DoL) estimates that there were approximately 9,400 diesel mechanics employed in New Zealand in 2003.

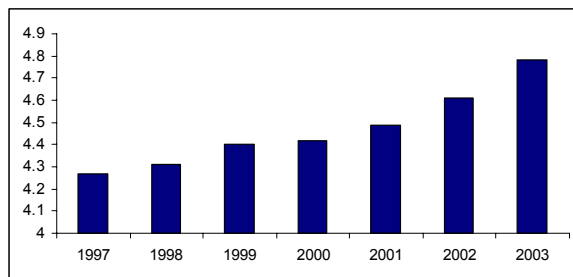
A background and technical note to this report is available from DoL. The note provides an overview of the broader Job Vacancy Monitoring Programme, of which this report is an output. It also provides a brief description of the employer survey conducted for this report and explanations of indicators and definitions used in the report.

Demand for diesel mechanics

Historical demand

Demand for diesel mechanics is influenced by the number of registered trucks and buses and the growth in road freight transportation in New Zealand.

Figure 1: total number of trucks and buses in NZ fleet



Source: LTSA

Data from the (then) Land Transport and Safety Authority shows a steady increase in the number of truck and bus registrations (figure 1). The number of registered vehicles has grown by 3.3% per annum since 1998.

According to the Ministry of Transport, New Zealand's geography, low population density, and its commodity-based economy make it highly dependent on road transport. Freight transportation by truck is also an intermediary for other

forms of transportation such as rail and air. There has been a substantial increase in the number of vehicle-kilometres travelled by goods vehicles because of increased demand for just-in-time deliveries and growth in trade. From 1996 to 2001, the total distance travelled by goods vehicles increased by 34% for light goods vehicles and 19% for heavy goods vehicles².

The factors discussed above have resulted in demand for diesel mechanics increasing. Employment of diesel mechanics grew by 0.4% per annum between 1991 and 2001 (table 1). This compares with a decline of 0.2% per annum for all trades and 2.2% per annum growth for all occupations.

¹ Occupational Outlook Handbook, Bureau of Labour Statistics, US and comments from SERA

² Transport for New Zealand: Overview, Ministry of Transport, April 2002

Table 2: employment growth of diesel mechanics, 1991-2001

| | Annual growth | | |
|-------------------------|---------------|-----------|-----------|
| | 1991-1996 | 1996-2001 | 1991-2001 |
| Diesel mechanics | 0.1% | 0.7% | 0.4% |
| All trades | 0.0% | -0.4% | -0.2% |
| All occupations | 3.2% | 1.2% | 2.2% |

Source: Statistics New Zealand, Census of Population and Dwellings 1991, 1996 and 2001

Data from the Household Labour Force Survey (HLFS) show that there has been an upward trend in the employment of *machinery mechanics and fitters* (the broad occupational group in into which diesel mechanics fall) since 2001³ (see table 3).

Table 3: employment of machinery mechanics and fitters (000s), 2001-2004 June years

| | 2001 | 2002 | 2003 | 2004 |
|--|------|------|------|------|
| Machinery mechanics and fitters | 26.9 | 27.0 | 28.0 | 27.0 |

Source: Statistics New Zealand, HLFS

A number of factors have tended to moderate demand for diesel mechanics:

- the expense of repairing many older vehicles was greater than the cost of purchasing new vehicles following the removal of import tariffs in 1998, and the subsequent increasing volumes of imported vehicles available to New Zealanders.
- a reduction in the price of vehicle parts, leading to the replacement of those parts rather than their repair
- technological developments which mean that many vehicles require less frequent servicing and repair.

Future demand

The New Zealand economy is expected to continue performing strongly with growth in both domestic and international trade increasing demand for road freight transportation. As freight transportation by truck increases, derived demand for diesel mechanics is therefore expected to grow too. Indeed, to service the heavy vehicle transport industry there is a move towards the service sector offering 24/7 year round servicing.

In 2002, the Ministry of Transport predicted an increase of 68% in the number of light commercial diesel vehicles between 2000 and 2015 and a 38% increase in the number of heavy commercial diesel vehicles over the same period, with the caveat that energy efficiency targets, improved transport options and other pressures may change this trend.⁴ This growth is expected to more than offset any factors that might reduce demand for diesel mechanics. DoL therefore concludes that demand for diesel mechanics will increase modestly over the next one to two years.

³ Due to the close association of the constituent occupations in the broad occupational group, the trend at this broader is considered to be reflective of the trend for diesel mechanics.

⁴ Transport for New Zealand: Overview, Ministry of Transport, April 2002

Summary

The number of registered trucks and buses has grown by 3.3% per annum since 1998. This has contributed to growth in employment of diesel mechanics of 0.4% per annum between 1991 and 2001, and continued growth since 2001. Growth in demand for diesel mechanics has been moderated by a tendency towards replacing rather than repairing vehicle parts, and technological developments that mean new trucks require less frequent servicing. While some of these factors may continue to affect future demand, they will be more than compensated for by increases in the size of the fleet. This will be driven by rising demand for road freight transportation on the back of strong domestic and international trade. Demand for diesel mechanics is therefore likely to grow modestly in the near future.

Supply of mechanics

Training – National certificate (Level 3 & 4) qualifications and equivalent

This section investigates the growth in supply of *fully qualified* diesel mechanics through training. It considers three sources of supply:

1. The award of The National Certificate in Motor Industry (Automotive Heavy Engineering – all strands) Levels 3 & 4 by the Motor Industry Training Organisation (MITO). These are the nationally recognised qualifications for diesel mechanics which are designed by MITO to meet the needs of employers of diesel mechanics in the motor industry. They take an average of three years to achieve.
2. The award of the National Certificate in Motor Industry (Automotive Heavy Engineering – all strands) Levels 3 & 4 by other providers such as polytechnics.
3. The award of qualifications apart from national certificates which are deemed to be equivalent to the national certificate in terms of level and number of credits.

Table 4 shows that all national certificates in diesel mechanics were awarded by MITO. The number of trainees achieving these qualifications has increased from 70 to 101 between 2001 and 2003 while new enrolments have risen from 249 in 2001 to 334 in 2003. This should result in an increase in the number of trainees achieving this qualification in the future. A list of national certificate level 3 and 4 and equivalent qualifications and the proportion of trainees enrolled for these qualifications is provided in Appendix 1.

Table 4: enrolments for The National Certificate in Motor Industry (Automotive Heavy Engineering – all strands) Levels 3 & 4 and other equivalent qualifications

| | | National Certificate in Motor Industry Automotive Heavy Engineering Level 3 & 4 (MITO) | National Certificate in Motor Industry Automotive Heavy Engineering Level 3 & 4 (Other providers) | Other equivalent qualifications | Total |
|------|----------------|--|---|---------------------------------|-------|
| 2001 | Total enrolled | 699 | None | None | 699 |
| | New enrolments | 249 | None | None | 249 |
| 2002 | Total enrolled | 854 | None | None | 854 |
| | New enrolments | 375 | None | None | 375 |
| 2003 | Total enrolled | 994 | None | None | 994 |
| | New enrolments | 334 | None | None | 334 |

Source: MITO, Tertiary Education Commission (TEC)

Table 5: number of trainees achieving the National Certificate in Motor Industry (Automotive Heavy Engineering – all strands) Levels 3 & 4 and other equivalent qualifications

| | National Certificate in Motor Industry (Automotive Heavy Engineering) Level 4 (MITO) | National Certificate in Motor Industry (Automotive Heavy Engineering) Level 4 (Other providers) | Other equivalent qualifications | Total |
|------|--|---|---------------------------------|-------|
| 2001 | 70 | None | None | 70 |
| 2002 | 85 | None | None | 85 |
| 2003 | 101 | None | None | 101 |

Source: MITO, Tertiary Education Commission (TEC)

Training rate indicators are given in table 6. A comparison of the number of trainees achieving National Certificate in Motor Industry (Automotive Heavy Engineering – all strands) Levels 3 and 4 and equivalent qualifications with the number of diesel mechanics employed yields a training rate of 1.1%. This indicator provides a crude measure of the rate at which the supply of fully qualified diesel mechanics can potentially grow through training⁵. This training rate for diesel mechanics is considerably lower than the average training rate of 1.8% for all trades analysed by Department of Labour, which is in turn much lower than the training rate of 2.8% for all trades in New South Wales (NSW), Australia.

An alternative measure of training levels is the training enrolment rate (NC level 4) which compares the number of trainees enrolled for the national certificate with the number of diesel mechanics employed. The training enrolment rate for diesel mechanics was 10.5% in 2003.

Training – Other related qualifications and courses

While the level 4 national certificate and equivalent non-national certificates may be regarded as the qualification required to be a *fully qualified* diesel mechanic, there are other lower level qualifications available in diesel mechanics (such as the Certificate in Automotive Heavy Trades). These qualifications may be regarded as adequate to some employers of diesel mechanics, especially during times of acute skill shortages. They are also of significance as these qualifications may staircase trainees towards the national certificate level 4 qualifications. Credits obtained in these qualifications may be recognised towards a national certificate level 4, should the trainee later wish to become a fully qualified tradesperson. A list of these qualifications and the proportion of trainees enrolled in courses leading to these qualifications is provided in Appendix 1.

Training in these courses is reflected in the training enrolment rate (all related training) which compares the number of trainees enrolled in all diesel mechanic-related training with the number of employed diesel mechanics. The enrolment rate (all related training) is measured at 11.4% for 2003 (table 6).

A number of other government-funded vocational educational and training programmes (including Training Opportunities, Youth Training and Skill Enhancement Training) offer trades related training which lead to credit achievement on the National Qualifications Framework⁶. For more details see Appendix 1.

⁵ This assumes that there is full employment of diesel mechanics. This is a reasonable assumption in the current environment of low unemployment and skill shortages.

⁶ Enrolments in these programmes are not included in the training enrolment rate (all related training).

Table 6: training rates for Diesel mechanics

| Indicator | Explanation | Diesel mechanic (NZ) | All SERA trades surveyed (NZ) | Diesel mechanic (NSW, Australia) | All trades (NSW, Australia) |
|--|---|----------------------|-------------------------------|----------------------------------|-----------------------------|
| Training rate (national certificate L4 and equivalent) | Number of trainees achieving relevant national certificates (level 4) and equivalent non-national certificate qualifications expressed as a percentage of employment in that occupation. | 1.1% | 1.8% | 4.6% | 2.8% |
| Training enrolment rate (national certificate L4 and equivalent) | Number of trainees enrolled for relevant national certificates (level 4) and equivalent non-national certificate qualifications expressed as a percentage of employment in that occupation. | 10.5% | 16.3% | | |
| Training enrolment rate (all related training) | Number of trainees enrolled in all relevant courses expressed as a percentage of employment in that occupation. | 11.4% | 30.5% | | |

Source: Department of Labour (New Zealand), Department of Employment and Workplace Relations (Australia)

Migration

There was a net migratory gain of *machinery mechanics and fitters*⁷ in the three years to June 2004. This was preceded by three years of net migratory losses (2000-2001) which in turn was preceded by a net gain in 1998. Although there was a net loss over the entire seven-year period, the loss is small compared with many trade occupations.

Table 7: permanent and long-term (PLT) annual arrivals, departures and net migration of machinery mechanics and fitters, June years

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 1998-04 |
|--------------------------|------|------|------|------|------|------|------|---------|
| PLT annual arrivals | 501 | 191 | 145 | 176 | 222 | 287 | 275 | 1797 |
| PLT annual departures | 398 | 357 | 211 | 282 | 177 | 202 | 207 | 1834 |
| PLT annual net migration | 103 | -166 | -66 | -106 | 45 | 85 | 68 | -37 |

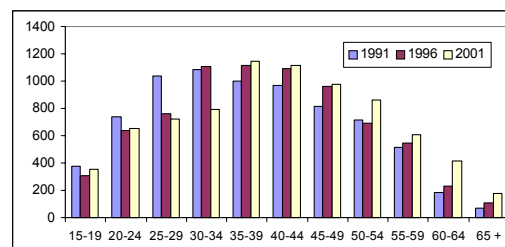
Source: Statistics NZ, External Migration

There was a varied reaction from employers to employing overseas trained diesel mechanics. Some employers were reluctant to employ migrants because they did not have adequate communication skills and were not able to integrate well into the New Zealand workplace.

Retirement

It is estimated⁸ that approximately 1.5% of the diesel mechanic workforce retires each year. This amounts to an annual loss of more than 140 workers. This number is

Figure 2: age profile for diesel mechanics



Source: Statistics New Zealand, Census

⁷ External Migration figures are only available for broad occupational categories. Data is presented here for *machinery mechanics and fitters* which is the (NZSCO 3-digit) category that includes diesel mechanics.

⁸ Using information from the 2001 Census.

likely to grow in the future as the diesel mechanic workforce is ageing (figure 2). Between 1991 and 2001, the proportion of diesel mechanics who were older than 50 rose from 20% to 26%.

Summary

There has been an upward trend in the number of diesel mechanics entering the New Zealand labour market with net migratory outflows of the late 1990s turning to net inflows in 2002, and rising numbers of trainees achieving the relevant national certificate. Despite this growth, the training rate is still low (1.1% per annum) and new entrants from training will not even compensate for the number of diesel mechanics retiring each year (1.5% per annum).

Employer recruiting experiences

Is there a shortage of diesel mechanics?

SERA results point to a shortage of diesel mechanics in New Zealand. Only 55% of vacancies included in the survey were filled within six weeks of being advertised. This is slightly higher than the average for all trades surveyed (41%). Thirteen suitable applicants for every 10 diesel mechanic vacancies is also slightly higher than the average for all trades surveyed (seven applicants for every 10 vacancies). See table 8.

Table 1: fill rate for diesel mechanics, 2004

| | Fill rate | Average number of suitable applicants |
|------------------|-----------|---------------------------------------|
| Diesel Mechanics | 55% | 1.3 |
| All trades | 41% | 0.7 |

Source: Department of Labour, SERA

Table 8: SERA results for diesel mechanics

| | Number of employers | Number of Positions | Positions filled | Fill rate | Suitable applicants | Average number of suitable applicants |
|---------------------|---------------------|---------------------|------------------|-----------|---------------------|---------------------------------------|
| Diesel mechanic | 16 | 22 | 12 | 55% | 28 | 1.3 |
| All trades surveyed | 240 | 453 | 186 | 41% | 337 | 0.7 |

Source: Department of Labour, SERA

Employers reported having great difficulty finding suitably qualified and experienced diesel mechanics. Forklift mechanic skills were particularly sought after. Neither repeated advertising nor the use of recruitment agencies generated enough suitable applicants for the positions on offer. Employers were enticing prospective employees with offers of health insurance and company cars, and resorting to poaching. The reported shortages were placing added pressure on the existing workforce and causing wages and overtime to rise. Customer service was also suffering.

What are employers paying?

Table 9 shows that the average diesel mechanic wage rate offered by employers included in the SERA survey was well above the average wage for all trades in the survey. It was also somewhat higher than the Labour Cost Index (LCI) average wage for diesel mechanics, and substantially higher than the LCI average wage for all trades. According to the LCI, the wages of diesel mechanics have risen by 6.3% in the 12 months to June 2004. This shows that employers are responding to labour shortages by increasing the wages they offer.

Table 9: diesel mechanic wage rates

| | Mean |
|-------------------------|---------|
| SERA – diesel mechanics | \$22.53 |
| SERA – all trades | \$20.60 |
| LCI – diesel mechanics | \$21.89 |
| LCI – all trades | \$19.54 |

Source: Statistics New Zealand (LCI), Department of Labour (SERA)

Changes in market conditions

Employers in the SERA were asked whether it was harder or easier to fill their recent vacancies for diesel mechanics compared with twelve months earlier. A net 38%⁹ of employers felt that it was harder. This suggests that recruiting conditions have become more difficult for employers of diesel mechanics over the past year.

Outlook

There is currently a severe shortage of diesel mechanics. The shortage is expected to persist and possibly worsen over the next year to two years. While training data shows an increase in the number of trainees achieving the nationally recognised qualification for diesel mechanics, supply through training and to a lesser extent, migration, will not keep pace with rising demand for diesel mechanics, let alone diminish the extent of the current shortage.

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⁹ The net estimate is calculated by subtracting the percentage of employers who found it harder to fill the vacancy from the percentage of employers who found it easier to fill the vacancy. This sum is then divided by one, less the percentage of employers who did not answer this question.

APPENDIX 1. TRAINING ENROLMENTS FOR DIESEL MECHANIC TRADE: 2003

Enrolments in National Certificate Level 4 and equivalent qualifications: 2003

| Qualification Title | Qualification Code | Provider Name | Level | Credits | Share of Enrolments (%) |
|--|--------------------|---------------|-------|---------|-------------------------|
| NC in Automotive Heavy Engineering - Agricultural Equipment (AE) | NC5338 | Motor ITO | 3 | 301 | 21.1% |
| NC in Automotive Heavy Engineering - AE, Plant & Equipment (PE) | NC5338 | Motor ITO | 4 | 301 | 0.5% |
| NC in Automotive Heavy Engineering - AE, Road Transport (RT) | NC5338 | Motor ITO | 4 | 301 | 0.4% |
| NC in Automotive Heavy Engineering - AE, RT, PE | NC5338 | Motor ITO | 4 | 301 | 0.4% |
| NC in Automotive Heavy Engineering - Plant & Equipment | NC5338 | Motor ITO | 4 | 301 | 21.3% |
| NC in Automotive Heavy Engineering - RT, PE | NC5338 | Motor ITO | 4 | 301 | 3.1% |
| NC in Automotive Heavy Engineering - Road Transport | NC5338 | Motor ITO | 4 | 301 | 51.8% |
| NC in Diesel Fuel Injection Engineering | NC5338 | Motor ITO | 4 | 214 | 1.5% |
| Total | | | | | 100.0% |

Enrolments in other qualifications

| Qualification Title | Qualification Code | Provider Name | Level | Credits | Share of Enrolments (%) |
|--|--------------------|--|-------|---------|-------------------------|
| Certificate for Entry to Automotive Trades | CH3825 | Christchurch Polytechnic Inst of Tech | 2 | 91 | 8.5% |
| Certificate for Entry to Automotive Trades | MA4119 | Universal College of Learning | 2 | 134 | 13.6% |
| WITT Certificate in Automotive Trades | TK0010 | Western Institute of Technology Taranaki | 2 | 120 | 5.4% |
| NC Motor Industry (Entry to Automotive Trades) | NC2822 | Unitec New Zealand | 2 | 84 | 20.2% |
| MIT Certificate of Achievement In Vehicle Technology | MN4387 | Manukau Institute of Technology | 2 | na | 1.7% |
| Certificate in Automotive Heavy Trades | ST4931 | Southern Institute of Technology | 3 | 120 | 5.6% |
| LCP - Automotive Heavy Engineering "A" Grade | na | Motor ITO | 4 | na | 44.8% |
| | | | | | 100.0% |

Enrolments in Training Opportunities Programme, Youth Training and Skill Enhancement Training related to the diesel mechanic trade

| Course name | Programme type | Share of Enrolments (%) |
|--------------------------------|----------------|-------------------------|
| Building/ Automotive Kerikeri | TOP | 3.9% |
| Panel beating/Automotive/WBT | YOUTH | 6.1% |
| NC Employment Skills Auto | YOUTH | 2.5% |
| NC Employment Skills Auto | YOUTH | 6.1% |
| Career Towards Auto Trades | YOUTH | 1.2% |
| Automotive Options | TOP | 4.7% |
| Automotive Options | TOP | 4.8% |
| Automotive Trades Training | YOUTH | 6.1% |
| Automotive Trades Training | SE | 1.3% |
| N.C.E.A & Emp Skills - Auto | YOUTH | 1.7% |
| N.C.E.A & Emp Skills - Auto | TOP | 0.3% |
| Auto, Retail or Web Design | YOUTH | 5.3% |
| Automotive and Hospitality | TOP | 4.2% |
| Automotive Trade Training | YOUTH | 1.7% |
| Nat. Cert Automotive Trades | YOUTH | 3.0% |
| Automotive Trades - Wanganui | TOP | 2.7% |
| Intro to Automotive - PN | YOUTH | 1.9% |
| Nat Cert Entry Auto Trades | YOUTH | 2.1% |
| Entry to Automotive Trades | YOUTH | 2.6% |
| Entry to Automotive Trades | YOUTH | 2.1% |
| Primary & Automotive Trades | TOP | 5.1% |
| Primary & Automotive Trades | YOUTH | 6.3% |
| Intro to Auto Trades & Welding | YOUTH | 1.7% |
| Heavy Auto/Civil Construction | TOP | 0.8% |
| Heavy Auto/Civil Construction | YOUTH | 1.5% |
| Pre Apprenticeship Motor | YOUTH | 0.5% |
| Automotive Trade | YOUTH | 1.5% |
| Automotive Trade | YOUTH | 1.6% |
| Prep for the Automotive Trade | TOP | 1.4% |
| Prep for the Automotive Trade | TOP | 2.1% |
| Automotive Trades and Services | TOP | 0.5% |
| Intro To Automotive | YOUTH | 0.3% |
| Automotive Training | YOUTH | 1.7% |
| Automotive Training | YOUTH | 1.4% |
| Automotive Training | YOUTH | 1.8% |
| Automotive Training | YOUTH | 1.5% |
| Pre Apprenticeship Motor | TOP | 0.2% |
| Automotive | TOP | 1.8% |
| Automotive Trades | TOP | 1.7% |
| NCEA & Emp Skills - Auto | YOUTH | 2.3% |
| Pre-apprenticeship Automotive | SE | 0.2% |
| | | 100.0% |