

HEAVY VEHICLE SPECIALIST CERTIFICATION

Syllabus

In order to pass the assessment and carry out your work as a heavy vehicle specialist inspector, you need to know and understand the information contained in the documents, standards, rules and regulations specified in this syllabus.



11/16

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1 INTRODUCTION

1.1 ABOUT THIS SYLLABUS

This syllabus contains essential and recommended reading, as well as assessment information, for the following heavy vehicle specialist certification categories:

- load anchorages
- towing connections - drawbars, drawbeams, kingpins, fifth wheels, towbars
- chassis modification - steering conversion, PSV rollover, chassis modification
- brakes.

See the **Heavy vehicle specialist certification information pack** for more information on these certification categories.

2 SYLLABUS FOR LOAD ANCHORAGE INSPECTORS

This syllabus is for those who will be designing and certifying load anchorages that are not listed as standard types in NZS 5444.

2.1 ESSENTIAL AND AUDITED DOCUMENTS

- *The official New Zealand truck loading code*
- Relevant parts of the Land Transport Act 1998
- Land Transport Rule: Vehicle Standards Compliance 2002 – Rule 35001/1 and amendments
- Land Transport Rule: Heavy Vehicles 2004 – Rule 31002 and amendments
- *Vehicle inspection requirements manual: Heavy vehicle specialist certification* (Transport Agency publication)
- *Welding in the transport industry 2013 edition* (Transport Agency publication incorporated into *VIRM: Heavy vehicle specialist certification* as Technical bulletin 13)
- *Vehicle inspection requirements manual: In-service certification (Wof and CoF)* (Transport Agency publication)
- NZS 5444: *Load anchorage points for vehicles*
- NZS 5413: *Code of practice for the manufacture and use of stock crates on heavy vehicles*
- AS/NZS 1554: *Structural steel welding - welding of reinforcing steel*
- AS/NZS 2980: *Qualification of welders for fusion welding of steels*
- NZS 5445: *Webbing load restraint assemblies for use in surface transport*
- AS 3990: *Mechanical equipment - steelwork*.

2.2 RECOMMENDED DOCUMENTS

- ISO 1161:1984: *Series 1 freight containers – corner fittings – specification*
- BS EN 1993-1-9:2005: *Eurocode 3 – design of steel structures – fatigue*
- BS 7608:1993: *Code of practice for fatigue design and assessment of steel structures*
- Heavy Motor Vehicle Regulations 1974 (background)
- Traffic Regulations 1976 (background).

2.3 ASSESSMENT

The examination will be in 2 parts, usually combined with the towing connections category. All writing materials will be provided by the Transport Agency.

PART 1 (time allowed 3 hours)

Part 1 may cover the engineering design of a load anchorage system, of a prescribed type, for a heavy vehicle. Applicants may take with them into the examination room any legal documents, standards, codes of practice, texts or notes they wish. In addition, applicants may use calculators, laptop computers or any additional aid that would be available to an approved load anchorage inspector in the course of business. **However, no access to external sources is allowed, eg the internet.**

Part 1 may include, but not necessarily be limited to, questions covering the following subjects (note that calculations will not be required):

- Analysis of non-standard load anchorage elements
- Assessment of a load securing platform to determine fitness for the purpose of transferring load forces back to the chassis or other substantial structure
- Analysis of a twistlock beam or attachment
- Determination of required load anchorage capacity for case study scenarios.

PART 2 (time allowed 3 hours)

Part 2 will test the applicant on their knowledge of transport law relevant to load anchorages for heavy vehicles. For this part, applicants may use calculators, laptop computers or any additional aid that would be available to an approved load anchorage inspector in the course of business. **However, no access to external sources is allowed, eg the internet.**

3 SYLLABUS FOR TOWING CONNECTIONS INSPECTORS

This syllabus is for those who wish to undertake the design and certification of drawbars, drawbeams, fifth wheel and kingpins.

3.1 ESSENTIAL AND AUDITED DOCUMENTS

- Relevant parts of the Land Transport Act 1998
- Land Transport Rule: Heavy Vehicles 2004 and amendments
- Land Transport Rule: Vehicle Dimensions and Mass 2002 and amendments
- Land Transport Rule: Passenger Service Vehicles 1999 and amendments
- Land Transport Rule: Vehicle Standards Compliance 2002 and amendments
- *Vehicle inspection requirements manual: Heavy vehicle specialist certification* (Transport Agency publication)
- NZS 5446: Code of practice for heavy motor vehicle towing connections – drawbar trailers
- NZS 5467:1993: Code of practice for light trailers
- NZS 5450:1989: Coupling devices for articulated vehicles – fifth wheel assemblies
- NZS 5451:1989: Coupling devices for articulated vehicles – fifth wheel kingpins
- AS2174 - 2006: Articulated vehicles: Mechanical coupling between prime movers and semitrailers – interchangeability requirements
- AS 2175-1995: Articulated vehicles – kingpins
- AS 4235-1994: Articulated vehicles – design criteria for fifth wheel skid plates
- AS/NZS 4968-2003: Heavy-road vehicles: Mechanical coupling between articulated vehicle combinations
 - Part 1: Design criteria and selection requirements for fifth wheel, kingpin and associated equipment
 - Part 2: Testing and installation of fifth wheel and associated equipment
 - Part 3: Kingpins and associated equipment
- NZS 5232:1993: Specification for ball-and-socket type trailer couplings
- Welding in the transport industry 2013 edition (Transport Agency publication incorporated into *VIRM: Heavy vehicle specialist certification* as Technical bulletin 13)
- AS/NZS 1554: Structural steel welding
 - Part 1: 2014 – Welding steel structures
 - Part 4: 2014 – High strength steels
 - Part 5: 2011 – Welding of steel structures subject to high levels of fatigue loading
 - Part 6: 2012 – Welding stainless steel structures for structural purposes
- AS/NZS 2980: Qualification of welders for fusion welding of steels
- AS 3990:1993 Mechanical equipment – steelwork.

3.2 RECOMMENDED DOCUMENTS

- BS EN 1993-1-9:2005: Eurocode 3 – design of steel structures – fatigue
- BS 7608:1993: Code of practice for fatigue design and assessment of steel structures
- Traffic Regulations 1976 (background).

3.3 FURTHER READING

- BS AU24:1964 Specification for towing connections for trailers of 2–5 tons gross weight
- BS AU25:1964 Specification for towing hook for use between trailers of 5–14 tons gross weight and towing vehicle
- BS AU26:1964 Specification for towing jaw for use between trailers of 5–16 tons gross weight and towing vehicle
- BS AU27:1964 Specification for towing hook for use between trailers of 5–35 tons gross weight and towing vehicle
- BS AU28:1964 Specification for towing jaw for use between trailers of 5–35 tons gross weight and towing vehicle

- BS AU29:1964 *Specification for drawbar eyes and forecarriage pins for connections between trailers of 5–35 tonnes gross weight and towing vehicle*
- DIN 74051:1978 *Coupling devices for trucks and trailers; automatic bolt couplings 40, dimensions and calculating data*
- DIN 74052:1977 *Coupling devices for trucks and trailers; automatic bolt couplings 50, dimensions and calculating data*
- DIN 74053:1977 *Coupling devices for trucks and trailers; trailer coupling ring 50 with socket, dimensions*
- DIN 74054:1977 *Part 1 coupling devices for trucks and trailers; trailer coupling ring 40 with socket, dimensions.*

3.4 ASSESSMENT

The examination will be in 2 parts. All writing materials will be provided by the Transport Agency.

PART 1 (time allowed 3 hours)

Part 1 will cover the engineering design of a towing connection, of a prescribed type, for a heavy vehicle.

Part 1 may include, but not necessarily be limited to, questions covering the following subjects (Note: calculations will not be required):

- Analysis of a hinged drawbar including hinge attachments
- Analysis of a rigid drawbar capable of imparting vertical loading to the towing vehicle
- Analysis of a telescopic drawbar with or without vertical loading
- Analysis of a drawbeam for towing hinged drawbar trailers
- Analysis of a drawbeam for towing rigid drawbar trailers
- Analysis of a heavy vehicle towbar
- Selection process for proprietary towing connection equipment
- Analysis of load bearing bolted joints.

PART 2 (time allowed 3 hours)

Part 2 will test the applicants on their knowledge of transport law relevant to towing connections for heavy vehicles. For this part, applicants may take with them into the examination room any legal documents, standards, codes of practice, texts or notes they wish.

In addition, applicants may use calculators, laptop computers or any additional aid that would be available to an approved towing connection inspector in the course of business. **However, no access to external sources is allowed, eg the internet.**

4 SYLLABUS FOR CHASSIS MODIFICATION INSPECTORS

4.1 ESSENTIAL AND AUDITED DOCUMENTS

- Relevant parts of the Land Transport Act 1998
 - Land Transport Rule: Vehicle Standards Compliance 2002 - Rule 35001/1 and amendments
 - Land Transport Rule: Passenger Service Vehicles 1999 - Rule 31001 and amendments
 - Land Transport Rule: Vehicle Repair 1998 - Rule 34001 and amendments
 - Land Transport Rule: Heavy Vehicles 2004 - Rule 31002 and amendments
 - Land Transport Rule: Vehicle Exhaust Emissions 2006 - Rule 33001/1 and amendments
 - Land Transport Rule: Vehicle Dimensions and Mass 2002 - Rule 41001 and amendments
 - Other Land Transport Rules affecting safety systems
 - *Vehicle inspection requirements manual: Heavy vehicle specialist certification* (Transport Agency publication)
 - *Welding in the transport industry 2013 edition* (Transport Agency publication incorporated into *VIRM: Heavy vehicle specialist certification* as Technical bulletin 13)
 - AS/NZS 1554: *Structural steel welding – welding of reinforcing steel*
 - AS/NZS 2980: *Qualification of welders for fusion welding of steels*
 - AS 3990: *Mechanical equipment – steelwork*
- (Note: other standards may be useful but assume design based on allowable stress design not limit state)
- Ladder frame chassis design guide (a joint Ministry of Transport (MoT)/Industrial Research Limited (IRL) document).

4.2 RECOMMENDED DOCUMENTS

- BS EN 1993-1-9:2005: *Eurocode 3 – design of steel structures – fatigue*
- BS 7608:1993: *Code of practice for fatigue design and assessment of steel structures*
- Heavy Motor Vehicle Regulations 1974 (background)
- Traffic Regulations 1976 (background)
- Transport (Vehicle Standards) Regulations 1990 (background)
- Goods Service Vehicle (Constructional) Regulations 1936 (background)
- Passenger Policy Statement No 3 of the Ministry of Transport (background)
- Policy Statement No 11 of the Ministry of Transport (background)
- Service Vehicle Construction Regulations 1978 (background).

4.3 ASSESSMENT

The examination will be in 2 parts. All writing materials will be provided by the Transport Agency.

PART 1 (time allowed 3 hours)

Part 1 will cover the engineering design of a chassis modification for a heavy vehicle. Applicants may take with them into the examination room any legal documents, standards, codes of practice, texts or notes they wish. In addition, applicants may use calculators, laptop computers or any additional aid that would be available to an approved chassis modification inspector in the course of business. **However, no access to external sources is allowed, eg the internet.**

Part 1 may include, but not necessarily be limited to, questions covering the following subjects (note that calculations will not be required):

- Analysis of a truck chassis extension subject to a universally distributed load (UDL), point loadings, and towing forces
- Analysis of a tipping body truck chassis
- Analysis of a truck chassis fitted with a deck mounted crane
- Review of steering conversion from left to right hand drive
- Analysis of bus roll over strength
- Analysis of load bearing bolted joints.

PART 2 (time allowed 3 hours)

Part 2 will test the applicants on their knowledge of transport law relevant to chassis modifications for heavy vehicles. For this part, applicants may take with them into the examination room any legal documents, standards, codes of practice, texts or notes they wish.

In addition, applicants may use calculators, laptop computers or any additional aid that would be available to an approved towing connection inspector in the course of business. **However, no access to external sources is allowed, eg the internet.**

5 SYLLABUS FOR BRAKE INSPECTORS

This syllabus covers the design, or design and certification, of all aspects of heavy vehicle braking where the vehicle has been manufactured in NZ or modified in a way that affects the brakes and the brake system. This will include the modifications required for a vehicle to meet and be certified to the NZ Heavy Vehicle Brake Code, or, after 01/07/2008, Schedule 5 of the Land Transport Rule: Heavy Vehicle Brakes 2006 (32015).

5.1 ESSENTIAL AND AUDITED DOCUMENTS

- Land Transport Rule: Heavy vehicle Brakes 2006 – Rule 32015 and amendments
- Land Transport Rule: Vehicle Repair 1998 – Rule 34001
- Land Transport Rule: Vehicle Standards Compliance 2002 – Rule 35001/1 and amendments
- *Vehicle inspection requirements manual: In-service certification (WoF and CoF)* (Transport Agency publication)
- *Vehicle inspection requirements manual: Heavy vehicle specialist certification* (Transport Agency publication).

5.3 RECOMMENDED DOCUMENTS

- Relevant parts of the Land Transport Act 1998
- NZ Heavy Vehicle Brake Code 1997 edition 2 (incorporated in the Heavy Vehicle Brake Rule)
- Goods Service Vehicle Constructional Regulations 1936 (background)
- Passenger Service Vehicle Constructional Amendment Regulations 1999 (background)
- Transport (Vehicle Standards) Regulations 1990 (background).

5.3 ASSESSMENT

The assessment will be in 2 parts.

PART 1 (time allowed 1.5 hours)

Part 1 will cover the engineering design of brake system modification of a prescribed type for a heavy vehicle. Applicants may take with them into the examination room any legal documents, standards, code of practice, texts or notes they wish. In addition, applicants may use calculators, laptop computers or any additional aid that would be available to an approved chassis modification inspector in the course of business. **However, no access to external sources is allowed, eg the internet.**

Part 1 may include, but not necessarily be limited to, questions covering the following subjects:

- Design and/or analysis of modifications to air braked vehicles
- Design and/or analysis of modifications to hydraulic brake vehicles
- Design and/or analysis of modifications to 'air over hydraulic' or 'hydraulic over air' vehicles
- Design and/or analysis of modifications to the above vehicles in combination.

PART 2 (time allowed 3 hours)

Part 2 will test the applicants on their knowledge of transport law relevant to heavy vehicle braking systems. For this part, applicants will not be allowed to refer to texts or documents during the assessment. Applicants will be tested on those documents listed in section 5.

Both of these assessments will be part of the Transport Agency-approved Heavy Vehicle Brake Course.

6 GOVERNMENT BOOKSHOPS

See below for a list of locations for government bookshops where some of this reading material can be obtained.

AUCKLAND (located in Whitcoulls)

Cnr Queens Street and Victoria Street
PO Box 5513, Auckland.
Ph: (09) 356 5402
Fax: (09) 356 5400

HAMILTON (located in Whitcoulls)

Centreplace, Bryce Street
PO Box 928, Hamilton.
Ph: (07) 839 6305
Fax: (07) 834 3520

PALMERSTON NORTH (located in Bennetts)

Broadway Avenue
PO Box 1820, Palmerston North.
Ph: (06) 358 3009
Fax: (06) 3582836

CHRISTCHURCH (located in Whitcoulls)

Cashel Street
Private Bag 4706, Christchurch.
Ph: (03) 379 7142
Fax: (03) 377 2529

DUNEDIN (located in Whitcoulls)

143 George Street
PO Box 1104, Dunedin.
Ph: (03) 477 8294
Fax: (03) 477 7869