

12 – 14 November 2018

Venue: VACC, Level 7, 464 StKilda Road, Melbourne



Certification, Engineering & Modifications

HEAVY VEHICLE TRAINING

COURSE OUTLINE

The course is in three parts, each of which can be separately enrolled.

Date	Course	Details
12 November	CERTIFICATION	Certification procedures, permit vehicles, SP vehicles, IAP, RVCS, Legal issues Road Vehicle Standards Act, RAV, RAWs, Heavy vehicles sector explained
13 November	ENGINEERING	Brakes, engines, axles, suspension, steering, electrical systems, tyres and performance, PBS, chassis design
14 November	MODIFICATIONS	VSB overview, body attachments, brake modifications, mechanical couplings, towbars, vehicle mounted lifting systems, engine and transmission substitution, common failure modes, vehicle safety

WHO SHOULD ATTEND

Workshop managers, fleet operation managers, vehicle engineers, components suppliers and manufacturers, vehicle modifiers, insurance investigators, inspectors. The course will be informative for anyone with a professional interest in heavy truck and trailer safety and mechanical performance.

COURSE COSTS

ARTSA, CVIAA, CVIAV and VACC members: \$550 per day inclusive of GST

Non-members: \$770 inclusive of GST

Participants can elect to attend on any or all of the three days.

To attend, complete the registration form or enrol on-line via <http://www.artsa.com.au/training>

For all enquiries, contact ARTSA Executive Officer Rob Perkins on exec@artsa.com.au or phone 0411 402 832

www.artsa.com.au/training

Monday 12th November 2018

PART 1 HEAVY VEHICLE CERTIFICATION

8:30 am	Outline and Introductions
8:45am	Overview of Heavy Vehicle Certification Procedures State v Federal responsibilities, NHVR, in-service v new, public road v private-road. Importation requirements and procedures. (Licensee, special, RAWs, personal). Registration types and categories. Permit and special-purpose vehicle types. Special purpose vehicle registrations. Evaluation vehicle registrations. Plant vehicles and dangerous goods vehicles. NEVDIS & registration procedures, VIN reporting requirements
9:15am	Permit Vehicles - Certification Aspects Axle mass limits in Australia. Road access approval process. Overview description of the PBS scheme. The roles of consultants, assessors & certifiers in PBS. PBS take-up levels. NHVR application and approval procedures. Timelines. Special-purpose vehicle approvals within the NHVR framework and also within the work safety domain.
9:45 am	Special Purpose Vehicle Requirements Work Safe certification framework. Australian Standards. Prescribed and non-prescribed vehicles. Standards applicable to in-service vehicles that are not derived from the ADRs. Design approvals issued by work safety authorities.
10:15am	Intelligent Access Project and the TCA Intelligent Access Project – overview of requirements in the various jurisdictions. Equipment approvals. Role of the TCA. Equipment certified by TCA.
10.30am	Break
11:00 am	The character and value of the Australian heavy vehicle fleet Vehicle registration codes. Vehicle totals in each registration category. New registration levels. Retirement levels. Leading suppliers. Value of the industry. Value of local manufacturing. Geographical factors. Vehicle and body types.
11:30 am	Industry Trends Country of origin trends. Geographical ownership trends. Vehicle type trends. Registration code trends. State of ownership trends. Technology trends. Size and value of the heavy vehicle industry. Technology outlook
12.30pm	Lunch
1:30 pm	The Road Vehicle Certification System (RVCS) Type approval schemes v individual vehicle approval schemes. Purpose and Structure of the RVCS. RVCS Website as a resource. UN ECE, EU Directive and GTR rules. RVCS vehicle categories (NB1, NB2, NC, TC, TD, MD4, ME). Special approvals. RVCS approval types (full, low volume, secondary, RAWs). L, D, S, P, A and T numbers. Second-Stage of Manufacture approvals. Introduction to Informed Filler and custom SE & SF forms. Administrative Circulars. COP and TFI Audits. Compliance plate supply and cost.

Informed filler forms How to compose an application for a compliance plate application.

3pm
3:30 pm

Break
Legal Responsibilities

National Heavy Vehicle Law and Regulations. State variations. Role of WA and NT with the NHVR. COR Responsibilities arising from recent changes to the NHVL. Insurance risks. Replacement Parts Standards. Recalls obligations.

4:00 pm

The Coming Road Vehicle Standards Act and its Implications

Proposed regulation changes. Proposed changes to import rules. RAWs scheme changes as applicable to heavy vehicles. Second Stage of Manufacture changes. RAV database.

4:30 pm

Who's Who in the Heavy Vehicle sector

Size, character and importance of the heavy vehicle industry.
A broad outline of the regulators applicable to heavy vehicles.
Government – Industry reference groups.
Industry Associations – who's doing what.
What we know about the operator demographic.
Freight task predictions.

5pm

Close

Tuesday 13th November 2018

PART 2 HEAVY VEHICLE ENGINEERING

8:30 am
9.00 am

Outline and Introductions
Heavy Vehicle Brake Systems

Types of brake systems on heavy vehicles. Foundation brake systems. Drum v Disc. Brake fade. Air brake system features. Split system protections. Emergency brakes. Spring brakes. European v North American brake systems. Failure protections. ADR 35 & 38 requirements. Compatibility requirements. ECE Regulation 13 requirements v FMVSS 121 requirements. Brake failure claims. Australian stopping performance standards.

9.45 am

Adaptive Braking Systems

ADR 35 & 38 requirements. Vehicle Stability Control components. Types of interventions, adaptive brake distribution, voltages and earthing requirements, autonomous braking, steering and lane assist, intervention monitoring. VSC performance on combination vehicles. Towing vehicle detection of VSC on towed vehicles. USA, North American and Japanese rules requirements for VSC / ESC, AEB and lane departure warnings. VSC on combination vehicles.

10:30am
11:00 am

Break
Engine & Transmission Developments

Diesel engine technologies, engine failure modes, engine emissions and fuel economy developments, hybrid drives, turbochargers, engine brakes, retarders, CAN bus broadcasts, engine controller data storage, incident storage, RSL tamper response, virtual technician developments, engine telematics,...

11:45 am **Axles, Suspensions & Steering**
Vehicle dynamic modes, chassis vibration modes, wheel alignment measures, camber, caster, Ackerman angles, axle bending, suspension responses, suspension braking reactions, shock absorber performance, driver vibration levels, road friendly suspensions,...

12.30pm **Lunch**

1:30 pm **Vehicle Electrical Systems**

12V and 24V systems. Starter system resistance. Alternator characteristics. Electrical protections. Voltage distribution. Earthing. Starter motor current levels and resistance requirements. Automotive components. CAN bus physical layer. Private and public CAN buses. SAE 1939 and ISO 11898 CAN bus protocols. OBD connectors. Black box fault finding technique. Electrical failure modes. Workshop instruments and measurements. Electric hybrid technology overview.

2:15pm **Tyres and their Characteristics**

Tyre performance characteristics and classifications. Tyre standards. Tyre testing. tyre ratings, tyre wear modes, tyre slip curves, variation with inflation pressure, tyre lateral stiffness and centring moments. Variation of parameters with inflation pressure. Variation of braking distances and road-handling performance with tyre type and parameters. Load and inflation limits of tyres in Australia. Central Tyre Inflation systems.

3pm **Break**

3:30 pm **The PBS Technical Standards**

Basic concepts and standards. Detailed description of safety and infra-structure standards. SRT / rollover. Tyre performance. Endurance braking. Simulation procedures and examples.

4:15 pm **Chassis Strength Design**

Chassis ladder design. Vibration modes of vehicles. Good design practice for chassis rail modifications. Strength of cross members. Reinforcements. Rail extensions. Bending moment diagrams and stress calculations. Torsional stiffness. Riveted Constructions. Common failure modes. Typical Factors of Safety. Fatigue considerations. The 'Art' of the design.

5:00 pm **Close**

Wednesday 14th November 2018

PART 3 HEAVY VEHICLE MODIFICATIONS

8:30 am **Outline and Introductions**

9 am **Overview of VSBs, VSGs & VSIs**

Overview of VSBs 4, 5A, 7A & B, 11, 12, 14.
Overview of the VSGs issued by NHVR.
Overview of VSIs issued by VicRoads and RMS.
Modifications within the scope of VSB 6.
Expectations on Accredited Vehicle Examiners (AVEs). State Engineering Schemes and NHVR plans. Record keeping requirements.

9.45 am **Body Attachments – VSB Code J**

Types of mounts. Minimum number of attachments. Locations of attachments with regard to cross members. Hardware requirements – bolt grades, nut retention mechanisms. Load restraint guide. Prescribed force withstand levels.

10.30am **Break**

11 am **Brake Modifications - VSB Code G**

Scope of brake modifications.
Brake tests. Trailer SARNs. Certification outside manufacturer's specifications. Certification by calculations. Brake fade considerations. Parking brake and emergency brake performance prediction. Stopping distance calculations. Friction utilization, load transfer, brake equations, aspects of brake balance, tyres and braking, threshold pressure, limitation of braking performance of combinations.

11:45 am **Mechanical Couplings and Towbars – VSB Code P**

D-value, V-value and S-value definitions and calculations.
Types of couplings. Strength and endurance requirements. Towbar design principles. Safety chains. Drawbar design principles. Attachment hardware. Fifth wheel and turntable installation requirements. Requirements arising from AS 4968 Parts 1 & 2 and AS4177.

12.30am **Lunch**

1:30 pm **Vehicle Mounted Lifting Systems – VSB Codes R & T**

Description of systems that are within specification: Mobile cranes, vehicle loading cranes, tailgate lifters, tip truck lifting mechanisms, tilt tray mechanisms, tipping trailers. Requirements arising from AS 4418 Parts 5 (mobile cranes) & 11 (vehicle loading cranes). Tow truck requirements arising from AS 5400.

2:15pm **Engine & Transmission Substitutions**

Factors affecting engine emissions. Engine SARNs. Engine and transmission mount design. Air cleaner and exhaust system considerations. Manual v automatic v range split transmissions. Tailshaft selection. Endurance brake (engine brake, transmission retarders) installation. Road speed limiter calculations.

3pm **Break**

3:30 pm **Common Vehicle Failure Modes**

Metal failure modes that occur on heavy vehicles. Brinelling marks, fatigue, beach marks, stress fractures, shear damage, friction and wear, bearing wear and failure modes, lubrication, types of welds, welding practice, stress risers, corrosion reactions, electrolysis, cavitation, lubrication, surface protection. Application to chassis design and fastener choice. Desirable Factors of Safety.

4:15 pm. **Vehicle Safety Considerations**

Risk management principles, dynamic modes of vehicles, roll-over thresholds, ride quality, retard tyre vibrations, noise in cabin, suspension compliance, height of C of M calculations, downhill speed gain, plastic and elastic collisions.

5pm **Close**

In conjunction with:



TRAINING LEADER

Dr Peter Hart will lead the training with assistance from ARTSA and CVIAA practitioners.

Peter is an electrical engineer with close to 20 years' experience as a forensic examiner and expert witness. He is also an Agent in the Road Vehicle Certification System and a VicRoads engineering signatory.

Peter will be assisted over three three days by a number of specialists across the certification, engineering and modifications field.

Registration can be completed on line at:

www.artsa.com.au/training

Or by completing and returning the form below

Name _____

Organisation _____

Address _____

Contact email _____

Contact phone _____

Registration Costs	ARTSA, CVIAA, CVIAV, VACC Members (inc GST)	Non member (inc GST)	Number of tickets	Total
Part 1, 12 November – Certification	\$550	\$770		\$
Part 2, 13 November – Engineering	\$550	\$770		\$
Part 3, 14 November - Modifications	\$550	\$770		\$
All three days	\$1320	\$1980		\$
			Total	\$

Note: Members includes financial members of ARTSA, CVIAA, CVIAV, and VACC. Prices are inclusive of GST

Payment:

Registration requests without payment will not be processed. Faxed registration forms must include full credit card details. Payment in Australian dollars.

I enclose my cheque / money order payable to 'Australian Road Transport Suppliers Association'

Or charge to:

Mastercard Visa

Name of Cardholder _____

Expiry Date ____/____/____

CW No: _____

Card No; _____

Signature _____

_____/_____/_____/____

Total Cost; \$ _____

Email: exec@artsa.com.au

Post: ARTSA, PO BOX 2230, HAWTHORN LPO 3122

Fax: 03 9818 6534

Enquiries: exec@artsa.com.au

Cancellations / Substitutes / Refunds: Cancellations received in writing by 29th October 2018 will receive a full refund less an administration fee of \$75. After this date no refunds will be issued. Registrations are transferable.

For more details go to: www.artsa.com.au/training or contact Rob Perkins on 0411 402 832