Queensland Code of Practice: Vehicle Modifications (QCOP)

CODE LG3: Relocation of Air Brake Components

Queensland Government

CODE LG3

Light Vehicle Modifications for Relocation of Air Brake Components

1.0 Scope

The LG3 modification code specifies requirements certifying modifications for repositioning of the air brake components on light vehicles, that being vehicles having a Gross Vehicle Mass (GVM) rating that does not exceed 4,500 kg.

This code covers modifications to eligible light vehicles under the following Australian Design Rule (ADR) categories: MB, MC, MD1, MD2, MD3, NA and NB1. This code does not cover the modifications related to any other vehicle category and changing the original brake system components involving a change to the circuit diagram, other than the length and routing of pipelines.

The original vehicle manufacturer (OVM) refers to the entity holding the first stage Identification Plate Approval (IPA). An entity holding the Second Stage Manufacture (SSM) Approval or Registered Automotive Workshop Scheme (RAWS) Approval is not deemed as the OVM.

In cases where the OVM has not specified a GVM rating, the maximum laden mass at which the OVM has shown compliance with the ADRs is to be taken as the original GVM rating. This information must be obtained from a reliable and traceable source.

This code is not to be used for certifying modifications to new light vehicles before being provided to market in Australia. To certify modifications to heavy vehicles, that being vehicles that exceed 4,500 kg GVM or Aggregate Trailer Mass (ATM) refer to the *National Code of Practice for Heavy Vehicle Modifications* (VSB 6).

1.1 Modifications permitted under Code LG3

Modifications that may be certified under LG3 code are:

- Repositioning of brake system componentry, including controls, valves, tanks and hose lengthening.

1.2 Modifications not permitted under Code LG3

Modifications that must not be certified under LG3 code are:

- Modifications other than those described in Section 1.1.
- Modifications to vehicles that are not mentioned in Section 1.3.
- Any changes to the original brake system componentry involving a change to the circuit diagram other than the length and routing of pipelines.

1.3 Vehicle categories permitted to be certified under Code LG3

Modifications that may be permitted as described in Section 1.1 must be in one of the vehicle categories as specified by Table LG3-1.

Table LG3-1 List of permitted vehicles for LG3 modification

Vehicle Category	Category Code
Forward-control passenger vehicle	MB
Off-road passenger vehicle	MC
Light omnibus up to 3.5 tonnes GVM and up to 12 seats up to 3.5 tonnes GVM and more than 12 seats over 3.5 tonnes and up to 4.5 tonnes GVM	 MD1 MD2 MD3
Light goods vehicle	NA
Medium goods vehicle over 3.5 tonnes and up to 4.5 tonnes GVM	 NB1

2.0 General Requirements

All work must also comply with the requirements contained in sub-section 2 *General Requirements* of Section LG of the *National Code of Practice (NCOP) – Light vehicle modifications* (VSB 14). Specific requirements in this code take precedence over any general instructions in VSB 14.

Extensive modifications to a vehicle may affect the warranty provided by the OVM. It is the responsibility of the certifying Approved Person (AP) to consider the effect of the modification on warranty and clarify this point to the modifier and vehicle operator prior to modification, if affected. Consideration of the effect this modification may have on product warranty is outside the scope of this code.

For audit purposes, sufficient documentary and photographic evidence of the modification must be retained by the certifying AP.

2.1 Compliance with applicable vehicle standards

2.1.1 The modified vehicle must continue to comply with the applicable ADRs.

2.1.2 If different or additional ADRs apply to the modified vehicle due to the modifications, the vehicle must comply with those ADRs that apply to it after modification.

2.1.3 A modified vehicle must comply with the applicable in-service requirements of the *Transport Operations (Road Use Management—Vehicle Standards and Safety) Regulation 2021* (the VSS regulation).

2.1.4 A pre-ADR modified vehicle must continue to comply with the VSS regulation.

2.1.5 Outlined in Table LG3-2 are areas of the vehicle that may be affected by the modifications and may require re-certification, testing and/or data to show compliance of the modified vehicle.

Table LG3-2 List of items and likely affected ADRs

DETAIL	REQUIREMENTS
Brake Hoses	42/..
Brake System	ADR 31/.., 35/..
Brake Performance	*Transport Operations (Road Use Management—Vehicle Standards and Safety) Regulation 2021*

Note: This is not an exhaustive list and compliance to other ADRs may also be affected.

The ADR applicability is according to the vehicle's category and date of manufacture. It is the responsibility of the certifying AP to verify compliance to the applicable ADRs. The certification must include the vehicle date of manufacture in addition to the date of modification.

Sections 2.2 to 2.5 relate to the general requirements applying to different areas of the modifications under LG3 code.

2.2 Modification criteria

2.2.1 The modification must be performed in accordance with the manufacturer's guidelines if applicable.

2.3 Braking system

2.3.1 The original brake circuit must remain unaltered. No valves or braking equipment can be added or removed.

2.3.2 The original brake system components must remain in the modified brake system.

2.3.3 All brake components must be securely mounted or fastened to the vehicle.

2.3.4 On an ADR-certified vehicle, the vehicle must continue to comply with the requirements of the *Service Brake Actuation Time Test* of ADR 35/…

2.4 Joints and fittings

2.4.1 All fittings must be of the correct type, size and compatible thread and all joints must be free from leakage.

2.5 Pipes, hoses and wiring

2.5.1 Pipes and hosing must meet appropriate standards as those in table LG3-3.

Table LG3-3 Pipes and hosing appropriate standards

Component	Manufacturing Standard
Air Brake Piping	SAE J844 or equivalent
Air Brake Hoses	SAE J1402 or equivalent
Hydraulic Brake Piping	SAE J1047 or equivalent
Hydraulic Brake Hoses	SAE J1401 or equivalent
Flares for Tubing	SAE J5336 or equivalent

2.5.2 Alterations of air and hydraulic lines should not introduce restrictions at joints or fittings.

2.5.3 Components used must be within manufacturer ratings.

2.5.4 All air and hydraulic lines that are installed must be protected from exposure to excessive heat, abrasion, movement, stress and impact.

2.5.5 Install flexible hoses between the chassis and axle with suitable mounting to eliminate stresses in fixed piping due to axle movement and to ensure flexing of the hose is within its capability limits.

2.5.6 Hoses can only move in planes intended in design when the hose assembly is connected to a moving part.

2.5.7 Drain systems must be capable of being opened and closed without the use of tools.

3.0 Limitations

Section 1.2 of this code provides information about which types of modifications are not permitted to be certified under the LG3 code. In addition, the following limitations apply.

3.1 Electronic Stability Control

If the vehicle is fitted with Electronic Stability Control (ESC) by the OVM, the following conditions must be met:

3.1.1 The ESC system must not be disabled.

3.1.2 It must be ensured that the modifications being certified do not reduce the effectiveness of the ESC system.

3.1.3 The effect of modification on the advanced braking system should be considered and recertified if deemed required.

4.0 Additional Modifications and Changes to Vehicle Category

4.1 If additional modifications are made that may or may not be essential for any modification to the brake system, all such modifications must be assessed separately and certified using appropriate codes or specific approvals. For example, modifications to the rear axle assembly would require certification under the LB2 modification code.

4.2 If the vehicle's ADR category has changed due to a change in seating capacity or GVM, the vehicle must comply with the vehicle standards that apply to it in its new category. Certification under such compliance using the appropriate additional code(s) must be provided, for example, certification to the LO1 code, unless specific exemption has been granted for this purpose.

Checklist LG3

CODE LG3: Modification for Relocation of Air Brake Components

Form No: LG3

Provide an answer to each of the following (N/A=Not Applicable, Y=Yes, N=No)

1	**Brake system**	
1.1	Does the original brake circuit remain unaltered?	☐ Y ☐ N
1.2	Do the original brake system components remain in the modified brake system?	☐ Y ☐ N
1.3	Are all brake components securely mounted/fastened to the vehicle?	☐ Y ☐ N
1.4	On ADR-certified vehicles, does the vehicle continue to comply with the *Service Braking Actuating Time Test* of ADR 35/..?	☐ Y ☐ N
2	**Joints and fittings**	
2.1	Are all fittings of the correct type, size and compatible thread?	☐ Y ☐ N
2.2	Are all joints free of leakage?	☐ Y ☐ N
3	**Pipes, hoses and wiring**	
3.1	Do the pipes and hosing meet the appropriate manufacturing standards as those in **Table LG3-3**?	☐ Y ☐ N
3.2	Are alterations of air and hydraulic lines free from restrictions at joints or fittings?	☐ Y ☐ N
3.3	Are components used within manufacturer ratings?	☐ Y ☐ N
3.4	Are installed air and hydraulic lines protected from exposure to excessive heat, abrasion, movement, stress and impact?	☐ Y ☐ N
3.5	Are flexible hoses installed between the chassis and axle with suitable mounting?	☐ Y ☐ N

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3.6	When a hose assembly is connected to a moving part, do the hoses only move in the plane intended in the design?	☐ Y ☐ N
3.7	Are drain systems capable of opening and closing without the use of tools?	☐ Y ☐ N
4	**Electronic Stability Control (ESC) system**	
4.1	If fitted, is it ensured that the ESC system is not disabled?	☐ Y ☐ N ☐ N/A
4.2	If fitted, is it ensured that the ESC system is not made less effective due to modifications carried out under this code?	☐ Y ☐ N ☐ N/A
5	**Modification details**	
5.1	Has the modification been performed in accordance with the manufacturer's guidelines?	☐ Y ☐ N
6	**ADR compliance**	
6.1	Does the modified vehicle continue to comply with all affected Australian Design Rules (ADRs)?	☐ Y ☐ N
7	**Workmanship**	
7.1	Is the quality of the workmanship to a satisfactory industry standard?	☐ Y ☐ N

Note: If the answer to any question is **N (No)**, other than 5: Modification details, the modification cannot be certified under LG3 code.

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CERTIFICATION DETAILS																		
Make						**Model**						**Year of Manufacture**						
VIN																		
Chassis Number (If applicable)																		
Brief Description of Modification/s																		
Vehicle Modified By																		
Certificate Number (If applicable)																		
Vehicle Certified By (*Print*)																		
Signatory's Employer (If applicable)																		
Signatory's Signature												**Date**						