

## Issue of LVV Standards for Braking and Suspension Systems, also related survey process sheets

This information sheet covers the release by the LVVTA of the following Low Volume Vehicle Standards and Survey sheets, having been approved by Land Transport New Zealand:

- LVVTA Standard **35-00 (Braking Systems)**; and
- LVVTA Survey Process Sheet **FS008 – Braking System Modifications**; and
- LVVTA Survey Process Sheet **FS009 – Brake Performance Test**; and
- LVVTA Survey Process Sheet **FS010 – Engine & Drive-train Conversions**; and
- NZHRA Technical Manual **Section 9 – Engine & Drive-train**; and
- LVVTA Standard **195-00 (Suspension Systems)**; and
- LVVTA Survey Process Sheet **FS011 – Modified Suspension Systems**

### Braking systems

#### 1. LVVTA Low Volume Vehicle Standard 35-00 (Braking Systems):

This standard, together with its related survey sheets, replaces section C7 (Brakes) of the existing Form-set (previously known as the 'Level 2 Form-set'). The standard is the source document relating to braking system adaptations or modifications in any light motor vehicle.

It provides design and construction requirements, along with basic engineering principles and procedures associated with adaptations and modifications to motor vehicle braking systems.

In the case of scratch-built vehicles, in addition to this standard, the appropriate LVVTA Member Association Technical Manual should be referred to also.

#### Particular points within this standard:

- Brake testing

The cyclic brake-test only applies now to low volume vehicles that have had modifications that directly or indirectly affects the braking system. If a vehicle is being certified to the LVV Code, but is not modified in a way that could affect the brakes, such as the addition of seats and seatbelt anchorages, the only brake test to be applied is a one-off test at 0.5G. In this case, the test doesn't have to be an average G-reading, therefore the test can be carried out with a Tapley meter, or rolling road. 2.4(3) covers the new test requirements for everything else.

- Modifications not requiring certification

Section 4, as in all Low Volume Vehicle Standards, identifies those common modifications (related to the standard in question) that are not required to be certified. In the case of this standard, direct replacement after-market disc rotors (such as DBA, included slotted and drilled units) on their own are not required to be certified, provided the requirements detailed in the relevant clause are met. The often-confused subject of which engine swaps do and don't have to be certified is also detailed in this section.

It's worth making yourself familiar with this section in each standard – we're trying to provide answers to a lot of the commonly asked "...does my car have to be certified if...?" questions within this section.

## **2. LVVTA Survey Process Sheet FS008 – Braking System Modifications:**

This survey sheet, together with the Braking Systems standard, replaces section C7 (Brakes) of the existing Form-set.

The survey sheet is to be used for the inspection of vehicles with adaptations or modifications to the braking system. It is a series of statements that, basically, is an abbreviated version of the standard, that you agree with in order to certify the vehicle. All the reference numbers in the 3rd column refer back to the standard, so if you have any doubt about a clause, you can refer back to the full legal requirement in the standard. You should find this survey sheet fairly straightforward and user-friendly.

## **3. LVVTA Survey Process Sheet FS009 – Brake Performance Test:**

This survey sheet, together with the Braking Systems standard, replaces section C18 (Brake test) of the existing Form-set.

This survey sheet is to be used whenever you carry out a full cyclic brake test. The reason it is a separate document from the Braking System Modification survey sheet is because there will be times when you need to do a brake test, but there are no modifications to the braking system. An example of this would be where an engine conversion has taken place, without changes to the vehicle's braking system.

One of the main objectives of working toward this system of different survey sheets is to save the certifiers' time by only using inspection sheets which relate directly to the modifications that are being inspected.

## **4. LVVTA Survey Process Sheet FS010 – Engine & Drive-train Conversions:**

Where any change in weight or mass or braking performance occurs, such as where an engine conversion takes place, the braking standard may be affected, and low volume vehicle certification is required to be carried out.

This is the survey sheet to be used when certifying an engine or drive-train conversion or modification.

This survey sheet, together with the Braking Systems standard, replaces sections C1 (engine mounting), C2 (transmission mounting), C3 (drive-shaft), C4 (differential), C9 (exhausts), C11 (miscellaneous), C12 (electrical wiring), and C13 (accelerator systems), of the existing Form-set.

## 5. NZHRA Technical Manual Section 9 – Engine & Drive-train

The applicable requirements supporting the LVVTA Survey Sheet FS010 in this case are contained in a section of the new technical manual currently being written by the NZHRA, to replace their existing Code of Construction Manual. This new technical manual provides information additional to that contained in associated LVV Standards for the guidance of both constructors and certifiers. It is being written with assistance and input from many of the other LVVTA Member Associations.

The section, attached to this Information Sheet, is 'Section 9 – Engines & Drive-trains', which provides the requirements to be met when carrying out or certifying an engine conversion or other drive-train modification such as the installation of a different gearbox, differential, or drive-shaft.

Its format is two-thirds/one-third, with the requirements contained on the left (two-thirds) column, and on the right (one-third) column you will find useful interpretations, clarifications, and other bits of information.

Whenever you are carrying out, or certifying, any kind of engine or drive-train conversion or modification, this is the document you should follow.

## Suspension Systems

### 1. LVVTA Standard 195-00 (Suspension Systems):

The standard, together with its related survey sheet, replaces section C6 (suspension) of the existing Form-set and is the source document relating to the certification of adaptation or modifications of suspension systems in any light motor vehicle.

The standard provides design and construction requirements, along with basic engineering principles and procedures associated with adaptations and modifications to motor vehicle suspension systems.

This standard does not fully cover suspension systems within scratch-built vehicles, and the appropriate LVVTA Member Association Technical Manual should be referred to in these cases.

#### Particular points within this standard:

- Wire-ties

The use of wire ties to retain springs at full droop is not allowed by this standard for any certifications carried after the introduction date of the standard.

Springs cannot be cut after the introduction date of the standard, unless the spring end matches the spring seat shape.

- Adjustable suspension

Within section 4 of the standard, you will find details of what suspension modifications are allowed to take place without the need for referral to a low volume vehicle certifier. It is important to note that any height-adjustable spring platforms are outside of the threshold, and therefore must be certified to the Low Volume Vehicle Code.

- Occupant weight simulation

In section 3 you will find a test process for simulating occupant weight. Note that this is not a mandatory requirement on all suspension modification certifications, but a process that LVV certifiers may use if they elect to, normally to establish whether a lowered vehicle does in fact still retain sufficient suspension travel to be safe when fully laden.

## **2. LVVTA Survey Process Sheet FS011 – Modified Suspension Systems:**

This survey sheet, together with LVVTA Suspension Systems Standard, replaces section C6 (suspension) of the existing Form-set.

This survey sheet is to be used for the inspection of vehicles with modifications to the suspension system. It is an abbreviated version of the standard, with all the reference numbers in the 3rd column referring back to the suspension standard, so if you have any doubt about a clause, you can refer back to the full rule contained in the standard.

These low volume vehicle standards and survey sheets, together with the attached Index Pages should be placed in the relevant places within your white LVVTA folder. As always, if you have any queries or require any further clarification relating to this Information Sheet or the standards or survey sheets covered, please feel to contact me at the LVVTA office on (09) 268-9550.

Attached is the extract from the NZHRA manual referred to in section 5 above.