

## Steering modification on air-bag equipped motorcycles

### Introduction

Since 2006 the Honda Goldwing has had an optional airbag fitted to increase rider protection in a frontal impact. Several accidents have been reported in the USA where the airbag deployed and the rider was uninjured.

The NZTA Frontal Impact Rule is applicable to motorcycles so it is essential to ensure that, when approving any modification, consideration is given to the proper functioning of any system associated with the manufacturer-designed frontal-impact protection systems.



### Trike modifications

The Honda Goldwing is a popular choice for conversion to a trike, however, this conversion makes the steering feel a lot heavier. The common solution is to rake the forks by 2° to 6°. This changes the position of the airbag sensors, and so has a potential effect on the way in which the airbag deploys.

The difference in fork angle can be seen in these 2 photos and can be significant. The standard rake of the front forks on the bike on the left is 29.15°. The modified bike on the right has much more clearance between the engine and the mudguard.



## Previous advice

At the time that this issue was initially considered, the effect of the modifications was unknown. The advice given was to disable the airbag to prevent rider injury from airbag misfire. Subsequent investigation has provided more information and a more robust resolution is now available. This LVV Information Sheet overrides any previous advice issued on the matter.

## Honda Goldwing air-bag system

The air-bag module, positioned in front of the rider, contains the air-bag and inflator.

Four crash sensors are attached on the front forks, two per side, to detect changes in acceleration caused by a frontal impact. A collision is sensed by the change in angle of the front forks as they buckle under impact.

The front fork angle is therefore critical to the timing of air-bag deployment.

## Solution

Bikes and trikes with fork angle adjustments must have the angle of the sensors on the front forks adjusted so that the airbag deploys as intended. Removal or disconnection of the airbag is not permitted.

The angle is critical and evidence must be provided that the change has been conducted accurately. This should ideally be done by use of the Honda computer diagnostics to set up the sensors.

Alternatively, a robust method of providing the required angle change can be accepted; - for example, custom machined adaptors to suit the rake-change that are attached to the original mounts and require no adjustment, and reset the sensor angle to original (see picture of wedge shaped adaptor, circled, on lower sensor).

A Honda Goldwing motorcycle with an airbag that is converted to a trike and retains the standard fork setup does not require any modifications to the air-bag system.

If you require any additional clarification or information, please contact the technical team at the Wellington LVVTA office.

It is noted that Honda New Zealand does not endorse or condone any modifications to their motorcycles, therefore it may not always be easy to obtain assistance from Honda dealers in this matter.

