



Programme:	HND Motorsport Engineering HND Automotive Engineering		
Module/Unit:	Vehicle Technology B / Motorsport Technology B		
Assignment No:	1	Lecturer: R Dowden	Internal Verifier: A Gibson
Assignment Title:	Vehicle Testing		

Hand Out Date:	Thursday 12 th October 2011	Return Date:	1 st Dec 2011 8 th Dec 2011	Contribution to Overall Module/Unit Assessment (%):	40%
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Penalties for late submission: Up to one week late, maximum grade of Pass. Over one week late, Fail.

Outcomes being Assessed (from Module Syllabus):	
Number	Description
3	Specify vehicle suspension setup
Aim	
To analyse the effect an aspect of vehicle setup has on vehicle behaviour	
Procedure	
Brief 1. The aim of this assignment is to investigate the effect a given variable has on the behaviour of the Locost in cornering on the steering pad. 2. Your group will be given a basic vehicle setup parameter – tyre pressure, damper setting or axle loading and you will be expected to find out how the car responds to changes in this parameter and hence produce a 'rule' that defines the effect of the parameter on tyre grip. You will have around 2 ½ hours to conduct the test at Pembrey We will assist, but you need to decide how this process should be carried out. – what order you plan to change the value (low to high or high to low) , what procedure to use to verify results – multiple runs at each setting or repeating ranges of results. 3. Once you have decided the form the test will take you need to write a description of the test procedure that you can follow on the day and the data collection sheets you will be using. This must be submitted to me on the Wednesday before your test. In that procedure you need to detail everything you need for the test and the information you will be collecting. A list of those who have contributed to this part of the work also needs to be submitted with the test procedure.	

4. The tests will be undertaken on Thursday 17th November for Group U in the morning and Group V in the afternoon, on 24th November for Group W in the morning and Group X in the afternoon. Morning groups leave at 9.00 and afternoon Groups at 12.00. All students to travel on the minibus provided unless given direct approval from Roger Dowden prior to the test day. On arrival you need to organize the work that is to be undertaken and get the car out on track as soon as possible.
5. The conditions and setup details of any test data must be clearly recorded on paper records of each test run, on the data set comments section and by additions to the data set file name to make absolutely certain that the data can always be linked to the parameters being tested.

6. On the Locost laptop you should create a subdirectory in:-

OS(c):\Locost Pi Data Sets / Pembrey Test Results/HND Handling Test/ [Group Name and date]

7. Once the test has been undertaken and the results obtained you, **as an individual**, need to decide on the best way of demonstrating the effects highlighted and to produce a report containing the following

Introduction – What the aim of the assignment is

Methodology – The test procedure developed and how the measurements were taken and any changes to the procedure introduced on the day.

Results - Summary tables of all the results obtained

Analysis – The development of the rule governing the effect of the variable investigated on vehicle handling behaviour.

Evaluation – How you performed, how the assignment could be improved next time, further investigations possible.

Marking Scheme

	No	Proportion of overall grade of this element
Definition of the test to be carried out (<i>Group</i>)	1	20%
Quality of experimental test work and collection of data (<i>Group</i>)	2	20%
Analysis of data and development of 'rule' governing the relationship between variable investigated and handling behaviour. (<i>Individual</i>)	3	40%
Production of well structured report (<i>Individual</i>)	4	10%
Group presentation (<i>Group</i>)	5	10%

*School of Automotive Engineering*

Student Name:	
Assessor :	Roger Dowden
Assignment Title:	Vehicle Testing
Programme:	HND Automotive Engineering HND Motorsport Engineering
Module:	Vehicle Technology B
Submission Date:	
Grade Awarded:	
Definition of test to be carried out	
Quality of experimental test work and collection of data	
Analysis of data and development of rules governing the relationship between variable investigated and handling behaviour.	
Production of well structured report	

The mark awarded for this work is provisional. It will not be used for determining the final mark for the module until it has been agreed by the Examinations Board in June 2008.

Suggested outline test procedure

1. Measure car in workshop including –
 - ride height,
 - individual wheel loads,
 - tyre pressures
 - air and track temperature
 - fuel level
2. Collect any equipment you will need for the test so that you do not need to bring the car back to the work shop between runs.
3. Set up data logging laptop-create your subdirectory, and the download path in Pi Delta.
4. Put out beacon (connected to the battery!)
5. Start with first level of test parameter
6. Send car out to warm up on track
7. Car stops – Measure tyre temps and pressures, start logging
8. Car ramps up speed to point of instability and then stops
9. Measure tyre temps and pressures, change test parameter, start logging send car out
10. Repeat until full range of parameter has been investigated.
11. Top up fuel on a regular basis as the load distribution will be affected.

You need to decide how you are going to ensure the reliability and repeatability of the results and the choice you have includes doing a number of runs on each parameter setting or to do individual runs and repeat the whole process at least twice. Each will have shortcomings in this respect.