

Loughborough University SAE Reference Model Data Set

Currently the most up to date version of this database was published in **Dec 2013** and it is managed by Dr. M. Passmore. For any queries about current or future data please contact him at M.A.Passmore@lboro.ac.uk

This data set has been compiled for public access and use consistent with the repository licence. This requires that any use of the data should be appropriately referenced back to the originating paper - **SAE paper 2014-01-0590**.

CAD Data.

The CAD Models required for use of this database are included in the **CAD Models** Folder. This includes "SAE Model CAD.prt" which will open in NX Unigraphics™. In addition an IGES file is also available in the same folder. There is also an STL version of the same model for use in TecPlot™.

PIV Data

Folder **PIV guide** contains images that show where each of the planes of PIV data are relative to the model. These are: "A Pillar PIV Data Planes.jpg", "Centreline PIV Data.jpg", "Front Stagnation PIV Data Planes.jpg", "Rear Notch Cross-stream PIV Data.jpg" and "Rear Notch Streamwise PIV Data.jpg". Note that these are only pictorial representations to illustrate the field of view.

The PIV data is the **PIV Data** folder, the data is presented as the time average velocity field and the RMS velocity field taken over 1000 images. The colours used in the images of the planes in folder **PIV guide** are used in the naming of the files. For some planes multiple cameras have been uploaded and these refer to the same data plane but alternative fields of view, captured simultaneously. (For example the red planes of data.) The full vehicle centreline plane (represented in purple) has been created through two cameras located side by side, with the two images stitched together to form a larger field of view. The data stitching resulted in a small loss of data over the roof section of the model; consequently the plane is not as long as the original SAE model.

All the numerical data is presented in .dat format that is easily read into TecPlot. This data can also be loaded in to MATLAB but will need some modification into a matrix format before plots can be formed. If the data is loaded into TecPlot the time average and RMS velocity planes will be at two (arbitrary) time steps and as such may be viewed sequentially.

Pressure Data

The pressure data is all stored in the **Pressure Data** folder and contains the time averaged results, taken over 30 seconds (8192 samples), and the RMS of these results. It has been broken down into the relevant rear end regions.

Forces and Moments Data

The force and moment data located in **Balance Data** is for a $\pm 30^\circ$ yaw sweep and all 6 components are stored within one data file.