Full Scale Trials

WOLFSON UNIT

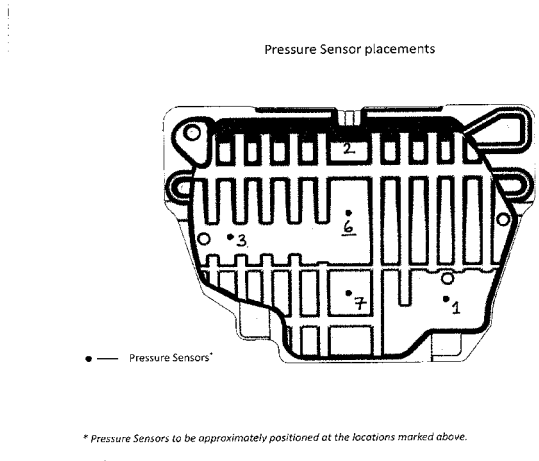
FOR MARINE TECHNOLOGY AND INDUSTRIAL AERODYNAMICS

Background

The Wolfson Unit has extensive experience in conducting trials on full scale craft and aero/hydrodynamic systems. The services we offer are:

- Formulation of a suitable test program
- Measurement of important parameters (speed, heading, pressures etc)
- Conduct the trials in line with the agreed test program
- Analysis of the data with a formal report

Hovercraft trials for Griffon Hoverwork



Pressure transducer placement on a vehicle undertray

Areas of Expertise

Work has been undertaken for clients operating in many different fields, including:-

- High performance craft, patrol boats, rescue craft, sailing yachts.
- Vehicle wading, hovercraft

Measurements

- 6 axis body motions
- Accelerations
- Forces
- Pressures
- Temperatures
- Engine data

Trials on rib 'Milly' - MAIB

Motion monitoring ayatem on 'Discovery'

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UNIVERSITY OF Southampton

Aerodynamics

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Civil

- Measurement of forces and pressures on tall structures and bridges.
- Study of the dynamic stability of a military bridge launching rail in high winds.
- Mapping of local flows around London Docklands development sites to ascertain the effect of new buildings on recreational sailing on the docks.

Process

- Surveys of flow speed and direction in food freezer tunnels and recommendations for improving efficiency and stopping leaks and icing.
- Measurement of flows and pressures in a gas cracker plant and recommendations for its improvement.
- Modelling of furnaces and freezer tunnels and measurements of flow and pressures as part of the design process.
- Measurement of the flow in and around combustible gas sensors and studies of their optimum positioning inside ductwork.

Environment

- Development of wind energy systems, such as wind turbines.
- Dispersion studies from chimneys.

Wind Tunnel Testing for London Docklands Development Corporation

Experimental Measurements

Many different techniques are used to obtain the experimental results desired. These include:-

- Measurement of forces and moments using various well proven balances and dynamometers.
- Measurement of motions and vibrations using strain gauges and accelerometers.
- Measurements of air velocity and pressure using hot wire probes, pressure gauges, vane anemometers and laser anemometry (PIV and LDA).
- Flow visualisation using smoke, oil films and wool tufts.
- Gas dispersion and ventilation studies.
- Measurements in smooth or turbulent flow.
- On-site measurements of pressure, velocity and temperature.

Wind tunnel facilities

The Wolfson Unit uses the wind tunnels adjacent to the University of Southampton for the majority of testing.

Wind Tunnel No. 1:

Low speed section: 4.6m wide x 3.7m high x 3.7m long.

Maximum wind speed: 10m/s.

6 component balance and turntable in tunnel floor.

High speed section: 2.1m wide x 1.5m high x 4.4m long.

Maximum wind speed: 50m/s.

3 component balance in tunnel roof.

Moving ground belt: 1.0m wide x 2.1m long. Maximum belt speed: 25m/s.

Wind Tunnel No. 2:

Working section: 3.5m wide x 2.6m high X 10.5m long.

Maximum wind speed: 55m/s.

6 component balance in tunnel roof., and 4 component balance and turntable in tunnel floor.

Atmospheric boundary layers can be simulated in the long working section.

Moving ground belt: 2.4m wide x 4.8m long. Maximum belt speed: 27m/s.

Small Wind Tunnel:

Working section 0.9m wide x 0.6m high.

Suitable for flow visualization.

Maximum wind speed: 40m/s.

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