

A glider hire company is testing out a ground-based launching system. The glider is rapidly pulled forwards by a powerful winch mounted on a truck. The forward motion of the wings through the air produces an upward lift force.

At the moment shown, the glider is in level flight.

- Use scale drawing to find the upward vertical force exerted by the glider on the truck
- For safety reasons, the company does not want the upward vertical force on the truck to exceed 10% of its weight. Carry out a calculation to check if this safety limit has been exceeded.
- Use scale drawing and/or calculation to find the total upward vertical force exerted by the wings of the glider.
- Calculate the horizontal acceleration of the glider, assuming the air resistance forces are negligible.

