Model 15
Windshield wiper - counterrotating

Date

Name

Class

The students receive the construction instructions for building the counter-rotating windshield wiper.

DESIGN TASK

The eccentricity must again be a few millimeters. This can be easily adjusted by trial and error.

THEMATIC TASK

1. The overlap ensures that only a very small area in the middle of the windshield remains unwiped. If the wipers did not overlap, a large area in the middle of the windshield would remain with poor visibility.

2. The first asymmetry arises from the fact that the axis of rotation of the central eccentric is located below the axes of rotation of the two cranks and not in the same plane. As a result, the attachment point of the strut on the upper eccentric (which leads to the left wiper crank) is closer to the crank than the attachment point of the strut for the right wiper crank.

   The second asymmetry is the resulting difference in length between the two struts between the central eccentric and the wiper cranks.
   On the other hand, the distance between the two strut attachment points and the axis of rotation is symmetrical. The two attachment points are equidistant from this axis of rotation.

EXPERIMENTAL TASK

Date

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The positions of the various axes, eccentricities, and lever lengths must be chosen appropriately to achieve the desired movement.

More difficult: A suitable combination of all these parameters must be found so that the mechanism works as desired.

With fischertechnik, you can try this out quickly and easily yourself by modifying the model.

In an engineering profession, the first step would be to calculate the required parameters and simulate them on a computer—or check them on a model, e.g., from fischertechnik.

APPENDICES

Building instructions and templates for the models:

Model 15: Construction manual for counter-rotating windshield wipers.