

AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 13

HEINKEL AIRPLANE H.D.39 FOR CARRYING NEWSPAPERS

From "Flugsport," May 1, 1926

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HEINKEL AIRPLANE H.D.39 FOR CARRYING NEWSPAPERS.*

The Heinkel H.D.39 is a further development of the postal airplane H.D.27, which has long been successfully used in air-mail service in other countries (than Germany) both day and night. It has, however, been adapted, by a series of changes in detail, to the special purpose of carrying newspapers. These changes meet the requirements of easy loading and unloading, optional release of newspaper packages by the pilot, and ability to land without danger even on poor ground. It is a strongly staggered biplane. The longerons and bulkheads of the fuselage are American spruce and are covered with plywood. The fuselage is very roomy so as to receive the special equipment. Its interior is readily accessible through manholes for the inspection of the control cables. All openings, through which water or dirt might enter the fuselage, are tightly closed.

The rear portion of the fuselage lies close to the ground, in order to afford convenient access. It is entered through a door near the middle. From here a passage leads forward by the right/^{of} the pilot's seat to the freight room at the center of gravity of the airplane, where the releasing device is located. Both the passage and the freight room are well lighted with windows.

*"Heinkel H.D.39 für Zeitungstransport" from "Flugsport," May 1, 1926, pp. 167-172.

The two seats are abreast, with the pilot's seat on the left. Due to the elevated position of the seat and the strong stagger, an excellent field of view is obtained. The view is still further improved by the fact that the cabane is not attached, as customary, to the upper fuselage girders, but rests on special supports which lead to the lower fuselage longeron. This makes it narrower, so that both the pilot and his companion can easily see past it. The pilot's seat is adjustable. All levers are within easy reach and the instruments are easily readable. The seat for the pilot's companion can be folded against the right outer wall, so as to leave the way open to the freight room.

The control stick is replaced by a steering wheel, which tires the pilot less on a long flight. The rudder is operated by pedals, which are placed so that the feet can rest in them comfortably. All the steering controls can be readily inspected by the companion during flight.

Careful attention was given to a convenient arrangement of the equipment:

1. All the necessary navigating instruments, as also the ones for controlling the engine, namely, altimeter, speedometer, fuel gauge, revolution counter, oil-pressure gauge, clock and cooling-water thermometer. All the instruments are readily readable from either seat.

2. Loading and releasing devices. The packages to be forwarded and dropped are suspended in a special freight room near

the center of gravity of the airplane. There are ten suspension points for ten packages with a maximum weight of 50 kg (110 lb.) each. These packages are distributed on three supports in such a way that four hang on the right, four on the left and two in the middle. Even when completely loaded, one can enter the room and inspect the separate suspension points, the entrance being over a slide door in the floor, which can be easily opened and closed from the pilot's seat. The three supports are connected with one another by a system of transverse tubes, which facilitate the loading of the magazine. The packages are lifted by hook and tackle through the opening in the floor and conducted to their respective suspension points.

The suspension and releasing device consists of a system of longitudinal tubes provided with small slots. The individual releasing hooks, while loaded, rest on these tubes. The packages are released by the pilot with the aid of a hand lever. The supporting tubes for the hooks slide longitudinally under the action of the lever, so that the individual slots come one after another under the suspension hooks. Each hook drops through the corresponding slot and releases one of the packages. It is so arranged that only one package can drop at a time. By shifting a special device, it is possible to select the support from which it is desired to drop the package. It is especially noteworthy that the pilot himself, in case he is unaccompanied, can operate the releasing device and can select the desired support.

It is moreover possible for his companion, to rearrange the packages during flight.

The motive power is supplied by the well-known 230 HP. B.M.W. IV water-cooled engine. It rests on a steel tubing support, which is secured by four steel bolts to suitable fittings on the fuselage struts. This support carries the whole cooling system and all the engine accessories. This manner of fastening has proved satisfactory in all our recent productions and is now exclusively employed by us. The whole power plant can be removed in a very short time and be replaced by another. Furthermore, it can be transferred altogether to the test bench, in order to give it a thorough test before installing or after overhauling. The hood is so constructed as to render all parts of the engine easily accessible. The engine is separated from the rest of the fuselage by a fireproof steel bulkhead. A fire cock is inserted, in order to enable the instantaneous shutting off of the fuel supply, in case of fire in the carburetor.

The fuel is contained in two easily removable tanks in the upper wing and flows to the carburetor under the influence of gravity alone. This eliminates all compressed-air pipes or fuel pumps and the accompanying disturbances and insures the continuous flow of the fuel.

In order to render the various pipes easily distinguishable, they are painted as follows: water pipes, green; oil pipes, brown; fuel pipes, red; air pipes and dynamic-pressure gauge,

blue. The fuel gauges are plainly visible on the under side of the wing, there being one for each fuel tank. All overflow pipes lead into the outside air, in order to prevent the collecting of fuel in the fuselage.

The upper and lower wings are divided. The spars are box girders and consist of spruce flanges with plywood webs. The stagger of the wings is such that the rear spar of the upper wing is vertically over the front spar of the lower wing. The plane thus produced is braced by cross wires. This arrangement has the advantage of fewer wires and, in combination with the N-struts, produces a statically perfect cell. The lift wire is double. The antilift wire is single. The struts are streamlined.

Instead of inside bracing and for the sake of lightness and ease of repair, the under side of the wings, between the spars is covered with plywood, which absorbs the thrust stresses. The leading edge of the wings is covered with plywood, in order to maintain a more favorable profile. The wings are secured by bolts to the cabane and to the lower fuselage longerons.

The vertical tail fin is wood and is joined directly to the fuselage. The horizontal fin or stabilizer is adjustable during flight by a hand wheel within easy reach of the pilot. The rudder and elevator are balanced in the usual manner, in order to make the steering easier. Banking is accomplished by means of two large specially constructed ailerons in the upper wing,

which are very efficient and easily operated.

The landing gear differs considerably from the usual form. In order not to interfere with the dropping of the packages, it has no continuous axle. This also facilitates loading through the bottom of the fuselage. The landing gear consists of two entirely separate parts. The track gauge is very large, in order to insure a safe landing on uneven ground. Each half of the landing gear consists of two streamlined struts hinged to the bottom fuselage longeron and a third strut, containing a shock absorber, flexibly attached to the upper fuselage longeron. The shock absorber itself consists of rubber cords and is contained in a streamlined housing in the upper part of the third strut.

In order to facilitate ground maneuvering, the tail skid can be turned by the pedals along with the rudder, a device which has been successfully employed on a number of our airplanes.

The airplane takes off quickly, climbs well and has an extremely low landing speed. It is so constructed that even long flights in bad weather do not fatigue the pilot.

Characteristics

Engine, B.M.W. IV,	230 HP.	
Span	14.8 m	48.56 ft.
Height	3.7 "	12.14 "
Length	10.0 "	32.81 "
Wing area	51.0 m ²	548.96 sq.ft.
Load per HP.	8.8 kg	19.40 lb.
Wing loading	39.0 kg/m ²	7.99 lb./sq.ft.
Dead load	1250 kg	2755.78 lb.
Crew of 2 men	170 "	374.79 "
Fuel	230 "	507.06 "
Pay load	400 "	881.85 "
Full load	2050 "	4519.47 "
Flight speed	160-170 km/h	99.4-105.6 M.P.H.
Landing speed	72 "	44.74 M.P.H.
Climb to 1000 m (3280 ft.) in	7 minutes	
Radius of action	800 km	497 miles

Legends

Fig. 1. Top: the wing structure. There is no internal wing bracing. The bottom and the leading edge of the wing are covered with plywood. This absorbs the thrust stresses and maintains the profile, especially of the leading edge. On the left there is an empty space for one of the fuel tanks. Only gravity tanks in the wings are used, which eliminate all pumps with their accompanying troubles and assure a continuous flow of fuel.

Bottom: the fuselage structure. The rear half of the fuselage is covered with plywood, as also the vertical fin. In the bulkheads there are holes for the passage of the control wires.

Fig. 2. Upper left. The pilot's seat is on the left of the roomy fuselage. Its elevated position affords an excellent view. The levers on the left wall are painted with different colors, in order to make it easier to distinguish them. They are the throttle lever, ignition lever and fuel-control lever. The elevator and ailerons are operated by a hand wheel. The grease cup for the water pump is within easy reach on the left wall. On the right, a Bosch starter and an inclinometer are visible.

Upper right. The instrument board has the following apparatus: at the extreme left, the switch for throwing the engine on and off; near and above it, the oil-pressure gauge; to the right of the latter, a revolution counter; next on the right, a speedometer; above the latter, an altimeter; still

higher, a knob for regulating the water cooling; immediately above the inclinometer, a small clock. The large hand wheel on the right serves to adjust the horizontal stabilizer during flight. The lever in the upper right-hand corner of the instrument board operates the releasing device. By means of it, the pilot can select during flight the package he wishes to release!

Lower left. The device for releasing the newspaper packages. The latter hang by loops, as shown in the picture, and are distributed on three tubes: four on the right, four on the left, and two on the middle tube. The releasing device consists of a system of longitudinal tubes which are provided with small slots. The releasing hooks, on which the loops of the packages are suspended, rest on these tubes.

Lower right. The removable steel tubing engine support.

Translation by Dwight M. Miner,
National Advisory Committee
for Aeronautics.

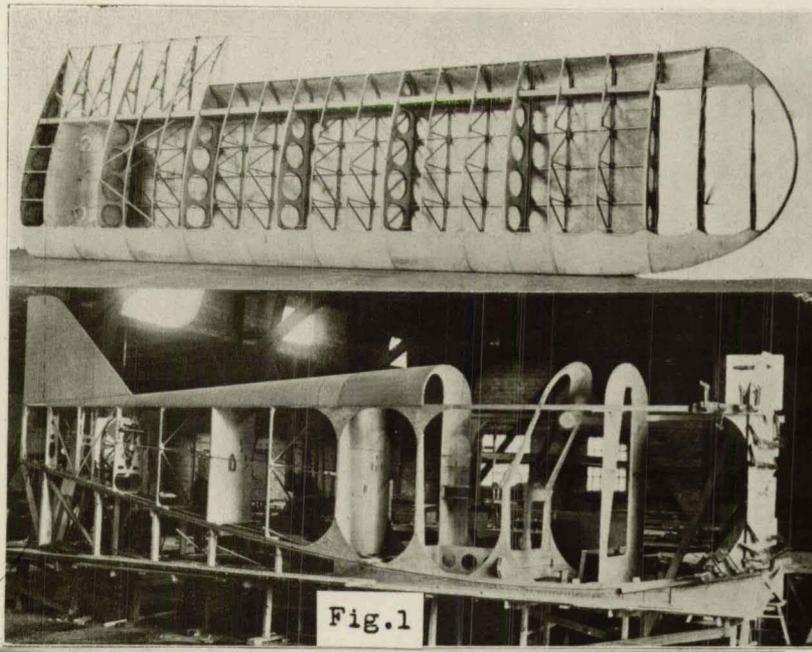


Fig.1

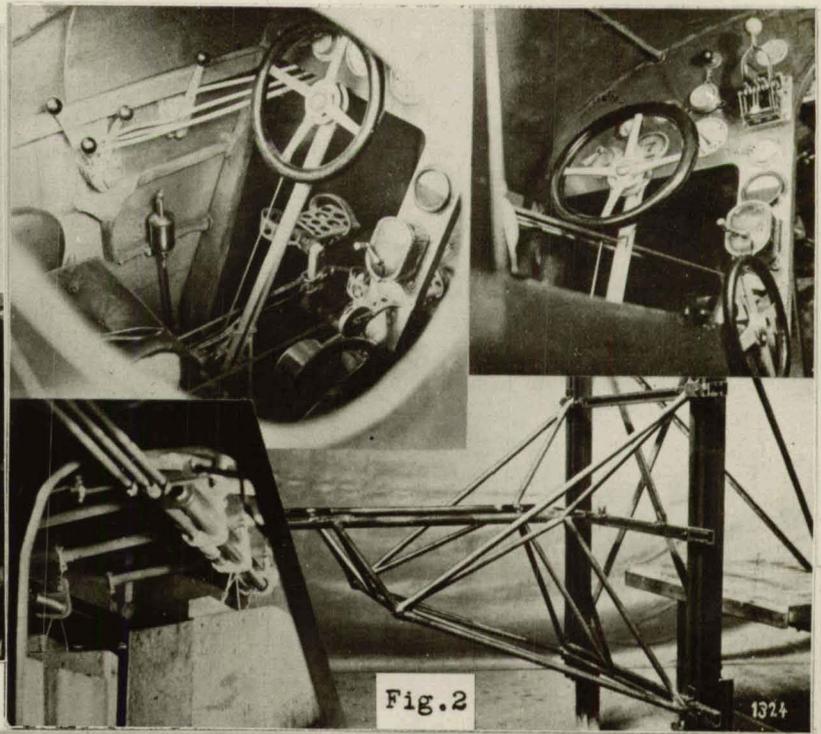


Fig.2

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Fig.3 Heinkel airplane HD 39 with Aeron-Reed all-metal propellers.



Fig.4 Heinkel newspaper airplane HD 39.

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