OPERATING INSTRUCTIONS FOR THE DE HAVILLAND WEIGHT AND BALANCE COMPUTER

GENERAL DESCRIPTION

The purpose of this rule is to provide a simple, compact, and accurate method of calculating aircraft weight and balance. It permits the use of a weight/centre of gravity graph and loading vectors. The rule gives step by step indication of a loading with respect to the aircraft limits, and permits a direct reading of weight, centre of gravity, and moment index at any stage without calculation. The effect of each item or group of items added to or removed from the aircraft is registered individually, and a mistake can be readily seen. Adjustments may be made to offset adverse weight or centre of gravity trends as they develop. Several loading combinations can be rapidly tried by marking the starting point on the graph. Important locations such as basic, takeoff, and landing conditions may also be marked for "in flight" reference, with the soft pencil provided inside the rule. The mechanical operation of the rule is such that small errors encountered during actual use will balance out over a complete loading, and in practice high accuracy can be achieved. However, it is strongly recommended as a check, that the "loaded in" items are finally removed, thus returning to the original basic condition on the graph, and positively confirming an accurate loading.

The rule consists of three basic parts, the body, the slide and the cursor. The body is a tube over which the other two parts slide, and has a raised portion at the left hand end on which the weight/centre of gravity graph is attached. The slide is a spring tensioned tube on which the lead item vector diagram is attached. The cursor is also a spring tensioned tube and has a clear plastic face disposed between and extending over both the graph and vectors. A removable "tag" showing the current basic aircraft condition is slipped under the face. Slide and cursor must move smoothly over the body. To clean or remove any "sticking" wipe the rule thoroughly with a clean damp cloth.

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IT IS MOST IMPORTANT TO HOLD THE RULE CORRECTLY. It should be held approximately horizontal in the LEFT HAND by gripping the LEFT HAND END of the body at the graph location when operating the rule. All movement of the slide and cursor should be accomplished with the RIGHT HAND to prevent inadvertent movement of these parts, and subsequent loading errors. Any initial difficulty encountered with this technique will be quickly overcome after a few practice leadings.

Operation of the rule.

Position the cursor so that the left hand cross hair line (at the countersunk hole) is over the graph at the aircraft current basic weight and centre of gravity location. This point is at the intersection of the applicable weight and moment index. Next, position the slide so that the ZERO point of the required item vector is under the right hand cross hair line of the cursor. Now move the cursor so that the right hand cross hair line moves along the selected vector line the desired distance. It will be noted that the left hand cross hair line followed a similar course over the graph. The aircraft's new condition will now be shown under the left hand cross hair line and will include the added item. Thus, any desired combination of items or groups of items can be added or removed (in this case reverse the setting and direction moved along the vector line) by repeating this simple procedure. All graduations on the vector scales are given in pounds so that actual weights rather than standard weights may be used if greater accuracy is required.

Index Value

To obtain the initial index value after a revision to the basic aircraft condition has been made, move the slide and cursor fully to the left and set the cursor hair line over the arrow on the body at "INDEX". Rotate the slide so that the applicable basic weight on the spiral scale (upper graduation) is also under the cursor hair line. Now rotate the cursor, ensuring that the slide does not move, until the hair line is over the applicable basic moment/1000 on the same spiral scale (lower graduation). The new index value can now be read under the cursor hair line at the index scale together with the centre of gravity at the applicable weight. Repeat this procedure as a check and then enter the new condition on the "tag".

Note

Please direct all inquiries regarding this instrument to the Engineering Department, The de Havilland Aircraft of Canada Limited, Downsview, Ontario, Canada.