UNITED STATES OF AMERICA
CIVIL AERONAUTICS BOARD
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Civil Air Regulations Amendment 40-9
Effective: October 1, 1954
Adopted: August 27, 1954

SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATION RULES

PROPELLER REVERSE PITCH INDICATORS

The currently effective provisions of Part 40 of the Civil Air Regulations contain no requirements for a propeller reverse pitch indicator to indicate to the pilot when a propeller is in reverse pitch. The need for such an indicator has been under consideration for some time and this amendment requires that all airplanes operated under the provisions of this part be equipped with such an indicator after September 1, 1955.

On September 1, 1953, the Board published a Notice of Proposed Rule Making in the Federal Register, which was also circulated as Civil Air Regulations Draft Release 53-17, in which it was proposed to amend Parts 40, 41, and 42 of the Civil Air Regulations to require the installation, on airplanes equipped with reversing propellers, of means to indicate to the pilots when the propeller is in reverse pitch. It was intended that such means be permitted to indicate to the pilots when the propeller blade angle is below the normal low pitch position. It was also proposed that the source of indication be actuated by propeller blade angle or be directly responsive to propeller blade angl

As a result of the comments received the Board has determined that certain modifications should be accomplished to the proposed rule. Interested persons have recommended that the reverse pitch indicators should not be permitted to give any indication except when the propeller blade angle is below the low pitch stop, in order that no confusion arise as to the action to be taken by the flight crew when such an indication occurs. This recommendation is consistent with the objective sought and the Board is of the opinion that such a change is desirable. This amendment, therefore, makes it clear that no indication may be given at or above the normal low pitch stop position.

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In Draft Release 53-17, the Board also proposed that propeller reverse pitch indicators be required to be actuated during the entire period the propeller is in reverse pitch; i.e., below zero degree geometric pitch, and that actuation be permitted at the operator's option in the portion of the reversing cycle between the low pitch stop and zero degree geometric pitch. It appears that there is considerable difference of opinion among interested parties as to the point or range in the reversing cycle where actuation of the reverse pitch indicator would be most advantageous from an operational point of view. In considering the case of unwanted reversal in flight, it appears that actuation early in the cycle might be

more desirable. However, from the viewpoint of normal reversing operations during the landing ground run, it appears that actuation late in the cycle might be more desirable. It is believed that from an overall operational point of view, the point of actuation of the reverse pitch indicator in the reversing cycle is not critical. It has also become apparent that the requirement proposed in the Draft Release for early indication may be too restrictive, since it might require other functions of the propeller hub assembly to be unduly compromised. Therefore, this amendment permits actuation of the indicator at any point in the reversing cycle between the low pitch stop position and full reverse pitch.

The Board envisages that considerable operational benefit will result from the incorporation of propeller reverse pitch indicators. Accordingly, it is expected that air carriers will include in the appropriate manuals and other documents used for crew training and indoctrination, suitable information concerning the use of such indicators.

A recommendation has been received for further amendment of this proposal to ensure that certain alternative techniques for indicating reverse thrust may be employed. The Board is of the opinion that the language set forth in this amendment adequately defines the objectives sought, and does not unduly limit the type of indicating means that may be used.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, the Civil Aeronautics Board hereby amends Part 40 of the Civil Air Regulations (14 CFR, Part 40, as amended) effective October 1, 1954:

By amending § 40.172 by adding thereto a new paragraph (1) to read as follows:

40.172 Engine instruments for all operations. * * *

(1) Effective September 1, 1955, a means shall be provided for each reversible propeller on airplanes equipped with reversible propellers, which will indicate to the pilots when the propeller is in reverse pitch. Such means may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch. No indication shall be given at or above the normal low pitch stop position.

The source of indication shall be actuated by the propeller blade angle or be directly responsive to the propeller blade angle.

(Sec. 205 (a), 52 Stat. 984; 49 U.S.C. 425 (a). Interpret or apply secs. 601, 604, 52 Stat. 1007, 1010, as amended; 49 U.S.C. 551, 554)

By the Civil Aeronautics Board:

/s/ M. C. Mulligan

M. C. Mulligan
Secretary

(SEAL)

This is the ninth amendment to Part 40, which became effective April 1, 1954.