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USE OF RUDDER ON LARGE TRANSPORT AEROPLANES

1 Introduction

1.1 As a result of the A300-600 accident at New York on 12 November 2001, the National Transportation Safety Board (NTSB) of the USA recommended further guidance for pilots on the use of rudder and the structural implications of inappropriate use of this control.

1.2 The engineering design and airworthiness requirements ensure that the aircraft is capable of withstanding the rapid application of full rudder from the neutral position in one direction and the return to neutral from a large sideslip angle. A further safety factor over and above the design loads is then applied. However, aircraft are **not** designed to withstand application of large rudder angles opposite to that required to sustain the sideslip. This may occur when, for example, full rudder is applied in one direction followed by full application in the opposite direction. Such a manoeuvre may result in structural failure.

1.3 Pilots should be aware that the pedal force required to obtain maximum rudder deflection will vary according to airspeed and the design of any rudder limiter system. The effect of this may be that full rudder application is obtainable at relatively low pedal force at high speed. It is also important to use the rudder in a manner that avoids unintended large sideslip angles and resulting excessive roll rates. The amount of roll that is generated is typically proportional to the amount of sideslip, and not to the amount of rudder input.

2 Handling Considerations

2.1 The rudder is suitable for use in the event of an engine failure and for crosswind take-offs and landings. The use of full rudder in these situations is well within structural limitations and pilots should not be inhibited from applying the necessary rudder input for satisfactory control of the aircraft. The aircraft will have been designed to accommodate a rapid and immediate pedal input in one direction from zero to full input, eg during an engine failure on take-off. There has been no known catastrophic failure due to pilot control input in these situations.

2.2 With the possible exception of wake turbulence encounters and an upset recovery, the use of rudder in other situations, including stall recovery, is not necessary and should not be used unless specifically recommended in the Aircraft Flight Manual. Recovery from dutch roll, which normally occurs at high level, should be in accordance with the manufacturer's guidance, typically using aileron as the primary control surface. Due regard should be taken of any limitation or operational restrictions contained in the Minimum Equipment List (MEL) in the event of the yaw dampers being inoperative.

2.3 As the aircraft flies faster, less rudder authority is required. Pilots should ensure that they are familiar with the rudder limiting system fitted to their aircraft.

3 Conclusion

3.1 Whilst pilots should not be inhibited from using the necessary rudder input for asymmetric and crosswind control, sudden large reversals of rudder should be avoided.

This Circular is issued for information, guidance and necessary action.