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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

OPERATIONAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT
ATTACHMENT 29: AA AUTOMATIC BRAKES DESCRIPTION

American Airlines flight 1420
Little Rock, Arkansas
June 1, 1999

DCA99MA060

Attachment 29

to Operational Factors Group Chairman's Factual Report

DCA99MA060

AA Automatic Brakes Description

The anti-skid system will stop the airplane for all runway conditions in a shorter distance than is possible with either anti-skid off or brake pedal modulation. The anti-skid system adapts pilot-applied brake pressure to runway conditions by sensing an impending skid condition and adjusting the brake pressure to each individual wheel for maximum braking effort. When brakes are applied on a slippery runway, several skid cycles will occur before the anti-skid system establishes the right amount of brake pressure for the most effective braking. If the pilot modulates the brake pedals, the anti-skid system is forced to readjust the brake pressure to re-establish optimum braking. During this readjustment time, braking efficiency is lost.

On extremely slippery runways at high speeds, the pilot is confronted with a rather gradual deceleration and may interpret the lack of an abrupt sensation of deceleration as a total anti-skid failure. The natural response might be to pump the brakes or turn off the anti-skid. Either action will degrade braking effectiveness.

The pilot's seat and rudder pedals should be adjusted so that it is possible to apply maximum braking with full rudder deflection.

During taxiing, the pilot's heels should be on the floor, sliding the feet up on the rudder pedal, only when required, to apply brakes to slow the taxi speed, or when maneuvering in close quarters on the parking ramp.

Automatic Brakes

Autobrakes slow the airplane at a programmed rate of deceleration which varies in accordance with the setting (MAX, MED, MIN). With MED or MIN auto brakes selected, little or no wheel braking may occur until the airplane has slowed, since the ground spoilers and thrust reversers are most effective immediately after touchdown and *may* satisfy the autobrake deceleration logic.

On short or slippery runways, wheel braking may be least effective at the end of the runway because of rubber deposits, snow or ice. In these conditions, since the middle of the runway offers the best friction for wheel braking, brakes should be aggressively applied by the use of MAX autobrakes *or* manual braking immediately after touchdown.

NOTE

The pilot-not-flying should be alert for illumination of the amber ABS Light (ABS disarmed) during the landing roll so that manual braking procedures can be initiated.