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NATIONAL TRANSPORTATION SAFETY BOARD
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OPERATIONAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT ATTACHMENT 30: AA DIRECTIONAL CONTROL WITH REVERSE THRUST GUIDANCE

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

DCA99MA060

Attachment 30

to Operational Factors Group Chairman's Factual Report

DCA99MA060

AA Directional Control with Reverse Thrust Guidance

Directional Control

General

- Differential braking is effective for directional control when used with light-to-moderate braking depending on runway surface conditions.
- The nose gear steering wheel should not be used until ready to turn off the runway.

Reverse Thrust

- The application of reverse thrust tends to blank out the rudder. The effectiveness of the rudder starts decreasing with the application of reverse thrust and at 90 knots, at 1.6 EPR (in reverse) it is almost completely ineffective.
- If the airplane starts drifting across the runway while reversing, immediately return the reverse thrust levers to idle reverse to assist in regaining directional control and to restore rudder effectiveness.
- If the drift is not stopped by returning the reverse thrust levers to idle reverse thrust, come out of reverse and use idle forward thrust to regain tire cornering.
- Do not use asymmetrical reverse thrust to regain directional control.
- Reapply reverse thrust when directional control is restored.

Speed Brakes

Since the automatic brake system is inhibited until the spoilers are deployed (automatically or manually) during landing, monitor the automatic deployment of the spoilers after touchdown. If the spoilers do not deploy automatically the Captain should manually deploy them.

Autobrakes

The prudent use of manual braking has been shown to reduce brake wear. Unless circumstances dictate otherwise, manual braking is generally recommended for landing.

If autobrakes are used, the importance of establishing the desired reverse thrust level as soon as possible after touchdown to minimize brake temperatures, tire and brake wear cannot be overemphasized. Since the autobrake system senses deceleration and modulates brake pressure accordingly, the proper application of reverse thrust will result in reduced braking for a large portion of the landing roll.

The use of minimum reverse thrust will almost double the brake energy requirements and can result in brake temperatures much higher than normal. During the landing roll with the airspeed above 80 knots, if the deceleration is not suitable for the desired stopping distance, take over manual braking.

When landing with flaps less than 26, use manual braking since the ABS will disarm upon wheel spin-up.