

Adopted May 15, 1942

File No. 2561-41

REPORT OF THE CIVIL AERONAUTICS BOARD  
of the  
Investigation of an Accident Involving Aircraft in  
Scheduled Air Carrier Operation.

A Douglas aircraft, Model DST, NC 16001, owned and operated by American Airlines, Inc., was extensively damaged in an accident which occurred near Euless, Texas, on June 21, 1941, about 8:48 p.m. No injuries were sustained by any of the fourteen passengers or the crew of three. The latter consisted of Captain William B. Hooton and First Officer James O. Tipton, both of whom were properly certificated and appropriately rated, and Stewardess Norvet.

American Airlines Trip No. 2 departed Fort Worth, Texas, June 21, 1941, about 8:37 p.m., on a flight to New York, New York, with its first intermediate stop scheduled at Dallas, Texas. Contact weather conditions prevailed at, and between, Fort Worth and Dallas. Before departure the captain and first officer made the usual cockpit checks. In these checks the fuel gauges indicated as follows: Left Main, approximately full; Right Main, approximately full; Left Auxiliary, slightly in excess of 50 gallons; Right Auxiliary, Empty. After starting the engines, the crew received instructions for take-off and clearance by Airway Traffic Control to cruise at 1500 feet above sea level (approximately 800 feet above ground level) to the Love Field Airport Control Tower at Dallas. As the captain taxied out, the first officer again checked the fuel gauges and stated that the left auxiliary gauge indicated approximately 60 gallons. The take-off and climb, which were made with the fuel selector valve turned to the left main tank in accordance with company procedure, were normal. Just before reaching cruising altitude, approximately 3 minutes after take-off, the captain switched from the left main to the left auxiliary tank. The gauge for that tank then indicated between 40 and 50 gallons. The flight proceeded normally, at cruising altitude, until it reached a point about six miles west of Midway Beacon, approximately 7 minutes out of Fort Worth, when the crew first experienced trouble in synchronizing the propellers. The right engine lost power gradually, with no roughness, backfiring, or missing. The right fuel pressure began to drop and the red warning light came on. The fuel pressure continued dropping until it reached zero. The captain prepared for single-engine operation and directed the first officer to feather the right propeller. Just as he was preparing to carry out the order, the left engine stopped and the first officer immediately began manipulating the fuel wobble pump. At this time both fuel pressure gauges indicated zero and both warning lights were on. The captain then switched from the left auxiliary tank to the left main tank. Both engines came on with a surge and ran, but not at full power, for a short period of time, estimated as between 30 and 60 seconds. Then both fuel pressure gauges dropped to zero, both warning lights came on, and both engines stopped. The captain instructed the first officer to drop a flare and to advise Fort Worth. Thereupon, at 8:45 p.m., the first officer radioed the following message to the American Airlines Dispatch Office at Fort Worth: "Both engines went out. Making a forced landing."

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At this time the altimeter indicated that the aircraft was about 500 feet above the ground. The flare was useless because the aircraft was at too low an altitude to permit turning underneath it. The captain held his course and at an altitude of about 300 feet was able, by the use of the landing lights, to distinguish a grain field ahead. He headed for this field in a very steep glide and levelled off just before contact with the ground. The aircraft bounced once, settled on the wheels, which were still retracted, and rolled about 1000 feet across the grain field into an orchard where the wings and undercarriage were damaged by trees.

Subsequent inspection and tests of the engines and the fuel system revealed that each operated normally in every respect. Inspection of the fuel tanks immediately after the accident disclosed that the right main tank contained 197 gallons; the left main, 208 gallons; the right auxiliary and the left auxiliary tanks each contained a small amount of fuel, estimated as between 5 and 8 gallons in each. The fuel gauges were checked and all except the gauge of the left auxiliary tank were found to be substantially accurate. The left auxiliary gauge, however, indicated 19 gallons. Further tests were conducted on this gauge and in each test the gauge indicated an amount of fuel appreciably in excess of the amount in the tank. Investigation revealed that the defect was in the tank unit. The entire mechanism had been recalibrated only a few hours before the subject flight. However, examination disclosed that the action of the tank unit was very erratic. On the basis of these tests, it is estimated that at the time of take-off from Fort Worth the left auxiliary tank contained approximately 15 gallons of fuel.

Statements by the captain and the first officer revealed that neither of them realized, when loss of power was first apparent, that such power loss was due to lack of fuel in the left auxiliary tank. By failing to switch immediately to one of the full tanks, the gasoline lines and carburetor filled with air and an immediate free flow of fuel to the carburetor when the fuel selector valve was subsequently turned to the left main tank was thereby prevented. Due to lack of altitude, there was not time for the crew to clear the air from the fuel lines, thereby insuring a normal flow of fuel. The captain's technique in effecting the landing, which was accomplished with flaps up because lack of time prevented their use, was commendable.

The weather was excellent and did not contribute to the accident.

Investigation disclosed that the flight was dispatched and conducted in accordance with the Civil Air Regulations and with the carrier's procedure. Although the aircraft was in a critical position when the engines stopped, due to the fact that its cruising altitude was so low, it is believed that, on account of the large amount of air traffic between Fort Worth and Dallas, the present practice of air carriers in flying between those two points at an altitude of approximately 1500 feet above sea level should not be changed.

As a result of this accident, American Airlines has instructed its pilots not to change the fuel selector valve from the left main tank during flight between Fort Worth and Dallas, but to make the entire flight on the left main tank. (This carrier does not allow a plane to be dispatched unless the left main tank is full.) In a further effort to prevent accidents of this nature, American Airlines is now attaching to the pilot's clearance a copy of the gasoline slip showing the actual amount of gasoline in each tank at the time of take-off, which will serve as a check on the accuracy of the gasoline gauges.

PROBABLE CAUSE: Improper functioning of a gasoline gauge.

CONTRIBUTING FACTORS:

1. Failure of the captain to realize exhaustion of the gasoline supply as a probable cause of engine trouble, when that trouble was first experienced, and to turn the fuel selector valves to another tank in time to prevent complete failure of both engines.
2. Low cruising altitude.
3. Complete dependence of the operating personnel upon a fuel gauge for information as to the contents of the tanks, through failure to include in the flight-clearance routine any statement to the captain of the actual measured contents of each tank.

BY THE BOARD

/s/ Darwin Charles Brown

Secretary