

National Transportation Safety Board
Washington, DC 20594
RAILROAD DIVISION

MECHANICAL FACTUAL
Nodaway, Iowa
4-04-01

**The Derailment of National Railroad Passenger Corporation (Amtrak)
Train No.5, the California Zephyr, Near Nodaway, Iowa, March 17, 2001.
DCA-01-MR-003**

I. GENERAL

Accident Date-Time: 11:40 pm CST, March 17, 2001
Location: Mile Post 419.92, BNSF Nebraska Division,
Creston Subdivision, near Nodaway, Iowa
Train: Westbound Amtrak Train No.5 of March 17, 2001
Carriers: National Railroad Passenger Corporation (Amtrak), and
Burlington Northern Santa Fe Railway
NTSB Accident No.: DCA-00-MR-006

II. MECHANICAL GROUP

Russell G. Quimby
Safety Engineer – Rail
NTSB ORPH – 10
490 L'Enfant Plaza East SW
Washington, DC 20594
202-314-6438
Page: 877-346-1938
Fax: 202-314-6497
Home: 703-590-4065
quimbyr@ntsb.gov

Matthew J. Flynn
Railroad Safety Inspector
MP&E
Federal Railroad Administration
PO Box 24825
Omaha, NE 68124-0825
Tel & Fax: 402-391-0771
matt.flynn@fra.dot.gov

Gregory A. Gagarin, P.E.
Asst. Gen. Mgr. Stds. & Compliance
Corp., Equip. Engineering & Mech.
Amtrak
15 Poplar St.
Wilmington, DE 19801
Fax: 308-763-2899
Cell: 308-760-1682
gagarig@amtrak.com

Tim N. Crilly
Supt. Field Operations
BNSF
111 West First Street
Alliance, NE 69301
308-763-2592
FAX: 302-683-2096
Home: 308-762-8675
Timothy.Crilly@BNSF.com

III. SYNOPSIS

At about 11:40 pm, March 17, 2001, westbound Amtrak Train No. 5 of the 17th, the California Zephyr, derailed at mile post (MP) 419.92 on the Burlington Northern Santa Fe Railway, Nebraska Division, Creston Subdivision, en route from Chicago, Illinois, to Oakland, California. The two locomotive units and the first 11 of the 16 cars derailed. Of the 261 passengers and the 15 Amtrak employees, there was one passenger fatality and 3 other passengers seriously injured. There was no fire or hazardous materials release.

At the time of the derailment, the train was traveling 52 mph through a 1^o curve. Track speed was 79 mph. The engineer placed the train brakes in emergency when he felt the train hesitate or "tug".

At the point of derailment, a 14-½ foot length of 132-lb rail had been placed in the south rail of the track to replace a defective section that had been removed on February 13, 2001. The 14-½ foot rail or "plug" was held in place by joint bars secured by rails bolts and tie spikes. The plug was to be replaced by another 14-½ foot rail that was to be welded in place a day or two after the accident. After the derailment, the plug was found in 3 pieces. The center section of the plug showed signs at each end of a longitudinal sub-head defect with an "oyster shell" pattern.

IV. MECHANICAL INVESTIGATION

NTBS investigators arrived on scene at the accident site about 12 hours after the derailment. Other than the evacuation of passengers, the site remained undisturbed. The vehicle numbers and positions of the locomotive units and cars were recorded. A site survey of the disposition of the wreckage was made by BNSF. See page 4 for the consist list. BNSF then began clearing operations in order to open the main line.

Preliminary inspection of the locomotive units suggested that the lead wheel set of the second truck was the first to derail. Wheel marks and under carriage damage became progressively worse from that point rearward.

The locomotive units and the CALTRAN control car were new. The locomotives were built in January 2001 and entered service on February 19, 2001. The locomotive units had remained paired and had previously made two round trips from Chicago to Seattle prior to the accident.

The event recorders were downloaded on scene for further evaluation.

March 19th, the mechanical group inspected the 4 express cars and 1 roadrailer, which had not derailed in the accident. Some minor defects were

noted for correction. None of the defects were considered causal or contributory to the derailment. The inspection took about 1-½ hours on an industrial siding near Corning, Iowa. The defects noted were safety appliance items that appeared to be the result of forklift damage.

The mechanical group then went to Nodaway, Iowa where the re-railed locomotive units and CALTRAN control car were on a grain elevator siding.

Both locomotive units were running. The main reservoir drain valve of the second unit, 141, had been damaged in the derailment and so the main reservoir on the unit was cut out.

The horn ("whistle") and bell both worked on the lead unit. However, according to the FRA mechanical representative, the horn did not work at the derailment site when he and the accident engineer activated it. Subsequent testing by the Amtrak mechanical representative failed to duplicate malfunction. The failure of the horn as reported by the Amtrak accident engineer appears intermittent and the cause yet unknown.

An air test was performed under NTSB supervision of the lead unit according to Amtrak and manufacturer direction. The locomotive air brake system functioned as designed.

The Amtrak locomotives were taken to the BNSF diesel shop in Lincoln, Nebraska, for traction motor removal and wheel replacement. When the locomotives arrived, they were placed over the servicing pit for inspection along with the Caltran control car. The wheels and bottoms of the locomotives and control car were inspected from 10 a.m. to noon on March 22nd. Inspectors were the NTSB mechanical group chairman, FRA equipment inspector, Nebraska State railroad inspector, and ALSTROM (Canadian). There was no condition found on the wheels or running gear of the vehicles that would have caused or contributed to accident. Wheel contour, truck alignment, and suspension of all the vehicles appeared in very good condition considering that they had been derailed. There were marks from the derailment on the wheels from rail anchors and spike heads. There were also numerous marks from ballast that had struck the underside of the equipment. Other than superficial marks, the equipment appeared as designed and still retained a "like new" condition.

BNSF Coal Train

A BNSF coal train, C-NAMMEAO-72A, eastbound, passed the point of derailment about 57 minutes prior to the Amtrak train. This was a loaded coal train with two locomotive units and 130 cars. The train originated at the Antelope Mine in Wyoming's Power River Basin on BNSF's Orin-Gillette line, and was destined for Metropolis, Illinois. The train received its designation at

Alliance, Nebraska. The consist remained intact throughout its journey. After the Amtrak derailment, the coal train was stopped and inspected at Galesburg, Illinois. No significant or other FRA defects were found.

At the time of the derailment, Amtrak locomotive 140 had about 3000 gallons of fuel. The locomotive unit lightweight is normal 268,000 lbs.

The mechanical group did not find anything during it's field inspection of the equipment which may have caused or contributed to the derailment.

**Consist List
Amtrak Train No. 5 of the 17th March 2001
The California Zephyr**

Position Number	Vehicle Number	Type	Leading End	Remarks	Damage
*1	140	Loco GE P42DC	F	Blt 1-01	
*2	141	Loco GE P42DC	R	Blt 1-01	
*3	4008	Bi-level control car	R	Caltran	
*4	1517	MHC			
*5	1195	Baggage	B		
*6	39040	Transition sleeper	A	spanning creek on side	
*7 !	34071	Coach	B	90° to track	
*8 !	34070	Coach	A	on side	
*9 !	31522	Coach – Baggage			
*10	33034	Sightseer Lounge			
*11	38033	Dinning Car	A		
*12	32049	Sleeping Car	A		
*13	32096	Sleeping Car	A	A-end derailed	
14	AMTK 70041	Express Car	B		
15	AMTK 71149	Express Car	B		
16	AMTK 70005	Express Car	A		
17	AMTK 71198	Express Car	B		
18	TCSZ 466835	Roadrailer (45)			

Amtrak EOT 23366 Pulse Trainlink, annual insp. 2-28-01 Germantown, Md

* Denotes Derailed

! Denotes cars to be loaded on flatcars

This list is subject to revision and corrections if facts prove otherwise.

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