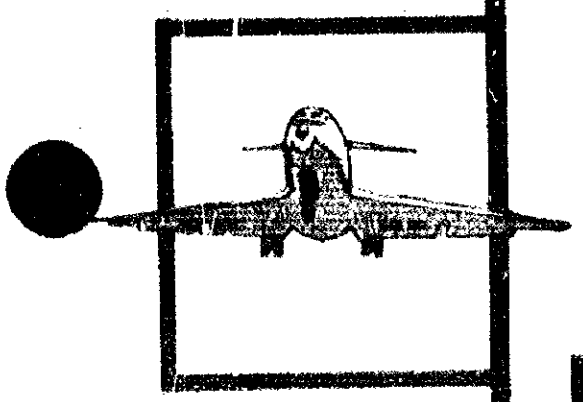

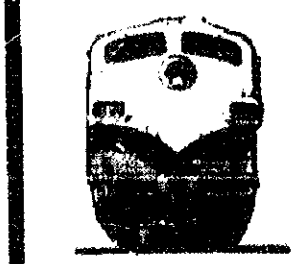

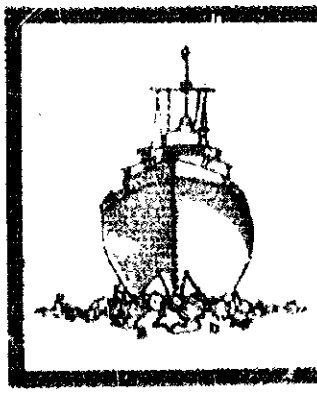

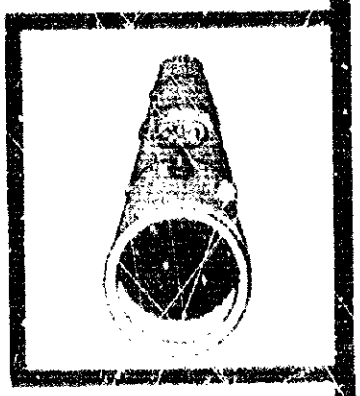

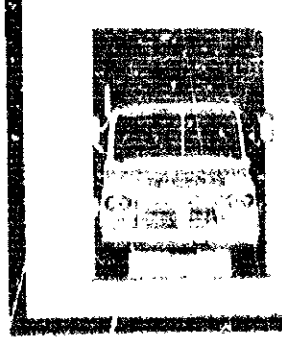

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

RAILROAD ACCIDENT REPORT

**DERAILMENT OF AMTRAK TRAIN NO. 8,
THE EMPIRE BUILDER,
ON BURLINGTON NORTHERN TRACK
LOHMAN, MONTANA
MARCH 28, 1979**

NTSB-RAR-79-7

UNITED STATES GOVERNMENT

TECHNICAL REPORT DOCUMENTATION PAGE

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16. Abstract

About 5:50 p.m. on March 28, 1979, Amtrak train No. 8, The Empire Builder, operating on Burlington Northern track, derailed nine cars at Lohman, Montana. Forty-eight persons were injured in the derailment, and the property damage was estimated to be $333,500.

The National Transportation Safety Board determines that the probable cause of this accident was the cracking from overheating of the right rear wheel on the trailing truck of baggage car 1248. The cracked wheel moved inward off the axle seat and decreased the wheel-to-wheel gage. Contributing to the accident was the inadequate maintenance and inspection of the car, which allowed it to continue in service in violation of minimum safety standards.

As a result of its investigation of this accident, the Safety Board made two recommendations to the Burlington Northern concerning equipment inspection procedures and one joint recommendation to the Burlington Northern and Amtrak to insure that inspection and maintenance schedules are maintained, and to be certain they are done efficiently.

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

RAILROAD ACCIDENT REPORT

Adopted: August 2, 1979

DERAILMENT OF AMTRAK TRAIN NO. 8, THE EMPIRE BUILDER, ON BURLINGTON NORTHERN TRACK LOHMAN, MONTANA MARCH 28, 1979

SYNOPSIS

About 5:50 p.m. on March 28, 1979, Amtrak train No. 8, The Empire Builder, operating on Burlington Northern track, derailed nine cars at Lohman, Montana. Forty-eight persons were injured in the derailment, and the property damage was estimated to be $333,500.

The National Transportation Safety Board determines that the probable cause of this accident was the cracking from overheating of the right rear wheel on the trailing truck of baggage car 1248. The cracked wheel moved inward off the axle seat and decreased the wheel-to-wheel gage. Contributing to the accident was the inadequate maintenance and inspection of the car, which allowed it to continue in service in violation of minimum safety standards.

INVESTIGATION

The Accident

Eastbound Amtrak train No. 8, The Empire Builder, being operated over Burlington Northern (BN) track, arrived at Havre, Montana, at 5:15 p.m. on March 28, 1979. The incoming crew did not report any problems with the train either to the relief crewmembers or to the maintenance employees.

No. 8 received a roll-by inspection as it entered the station at Havre and a 500-mile airbrake inspection required by Federal regulations. There were no exceptions reported to the train's condition. The locomotive was changed, and two additional heater cars were added to the front of the train at Havre.

No. 8 departed Havre at 5:37 p.m., 3 hours 42 minutes late, with 2 locomotive units and 12 cars. It was operated by a 5-man BN crew along with 11 Amtrak service personnel. The engineer made a running brake test as the train was leaving Havre and took no exceptions to the condition of the brakes.

No. 8 approached a 1°34' curve to the right west of Lohman, Montana, moving about 79 mph. The engineer reduced the throttle setting from position eight to position four, and applied the automatic brakes with two 8-pound brakepipe reductions to slow the train through the curve. When the train's speed had been reduced to about 74 mph, the engineer moved the throttle to position eight to resume authorized speed.

While the train was moving through the curve, the right rear wheel on the trailing truck (R-1) on baggage car 1248, the fourth car, moved inward on its axle seat and derailed inside of the south rail. It continued inside the gage until it struck the frog of the east switch of a siding which parallels the main track on the south. Upon impact with the frog, a portion of the wheel, measuring about 30 inches on the tread, broke out. (See figure 1.) When the right wheel struck the frog, the left wheel dropped inside the gage of the north rail. It broke a piece out of the stock rail near the heelblock and moved to the outside of the north rail. From that point eastward, the north rail was tipped outward and a general derailment followed.

As the locomotive passed over the east switch of the siding, the train's communicating signal began to sound, which was immediately followed by an emergency application of the brakes. The train was on straight track at that time, and the fireman saw, in his rearview mirror, cars near the rear of the train overturning to the north. He told the engineer that the train had derailed, and he immediately notified the train dispatcher at Havre by radio of the derailment and requested emergency assistance.

The locomotive and three heater cars were not derailed. The west end of the fourth and the east end of the fifth cars were derailed. The next three cars were derailed but remained upright on the track structure. The coupler between the eighth and ninth cars broke, and the last four cars overturned on their left sides. They stopped approximately parallel to the track on the north slope of the fill upon which the track was built. The locomotive stopped about 1,925 feet east of the east siding switch. (See figure 2.)

When the train stopped, the east end of the fourth car was 1,601 feet east of the east switch. The last four cars were separated from the train by about 22 feet. The overturned cars slid a short distance on their sides before they stopped. Passenger witnesses reported that the train was almost stopped before the cars overturned, and that they overturned slowly.

A westbound freight train occupying the siding at Lohman blocked the engineer's view of his train as it rounded the curve between the switches. Crewmembers of the freight train did not see or hear anything unusual as No. 8 passed.

Injuries To Persons

Injuries	Passengers	Traincrew and Service Personnel
Fatal	0	0
Nonfatal	39	9
None	54	7

Damage

There was no damage to the locomotive or the three heater cars. The broken wheel on car 1248 damaged the axle and the No. 1 and No. 2 brakebeams. The mate wheel had a 3-inch flat spot on the tread. There was also slight damage to the equipment underneath the car. The sixth car, a baggage-dormitory car, and the next two coaches had slight damage to the equipment below the car floors.

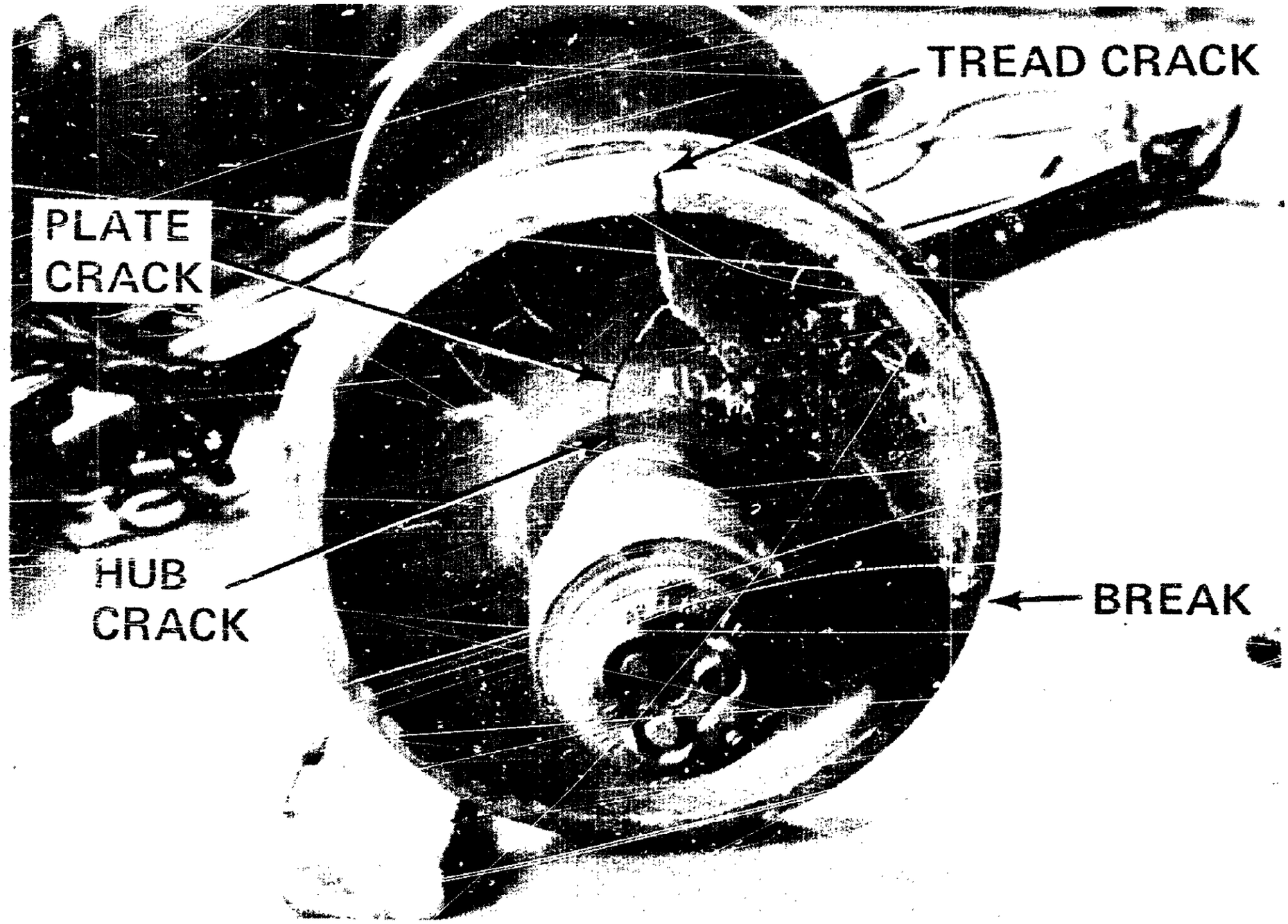
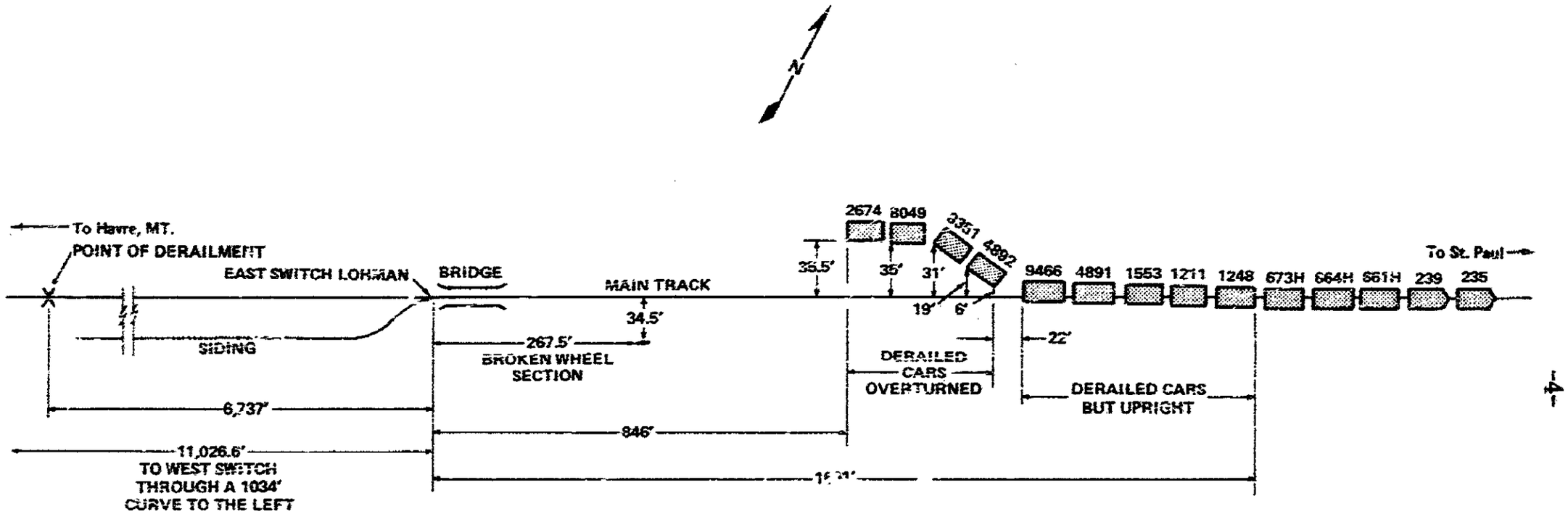


Figure 2. Failed wheel showing crack and break.



CONSIST: 235 AMT LOCOMOTIVE
239 AMT LOCOMOTIVE
661H HEATER CAR
664H HEATER CAR
673H HEATER CAR
1248 BAGGAGE CAR
1211 BAGGAGE CAR
1553 BAGGAGE-DORMITORY CAR
4891 COACH
9466 COACH
4892 DOME CAR
8351 LOUNGE CAR
8049 DINER
2674 SLEEPER

Figure 2. Plan view of the derailment.

The four cars that overturned had moderate body deformation and sheet damage to the sides, and broken outside windows. Equipment damage was estimated to be $300,000 and wrecking costs to be about $21,500. About 1,200 feet of track was damaged in the immediate area of the derailment, and minor damage ($12,000) was done to rail anchors, track bolts, and joint bars for about 6,737 feet. The total property damage costs were estimated by the railroad to be about $333,500.

The R-1 wheel dropped into the gage of the south rail 6,737 feet west of the east switch at Lohman. It made light rim cuts on some crossties and struck most of the joint bars, and it broke or bent the nutted end of the track bolts up to the east switch. It also broke most of the rail anchors and scarred the heads of many rail spikes in the same distance. The flange board of a grade crossing about 300 feet west of the east switch, constructed of wooden crossing boards, was splintered for its entire length about 6 inches from the gage side of the south rail. There were no derailment marks on a similar grade crossing west of the siding's west switch, through the switch, or up to the point of derailment.

Crewmember Information

The engineer and fireman had been off duty about 40 hours before they reported at the locomotive terminal for the assignment on No. 8. They checked the locomotive and took no exceptions to the brakes before they departed for the passenger station where the locomotive was coupled to the train. At the time of the accident they were regularly assigned to No. 7 and No. 8 between Havre and Williston, North Dakota.

The traincrew was also regularly assigned to No. 7 and No. 8. When the derailment occurred, the conductor and one brakeman were in the second coach. The other brakeman had just entered the first coach after having been in the two baggage cars. He said he did not sense or hear anything unusual while he was in or near the fourth car.

The three crewmembers were not aware of the derailment until they heard ballast striking the cars and became aware of a rough ride. They were not injured, and they assisted the passengers out of the cars following the derailment. They made several inspection trips through the overturned equipment on their hands and knees to be certain everyone had been removed. The train crewmembers received their training on the job. They had not been instructed in procedures specifically applicable to an accident of this kind.

Detailed information on the crewmembers is contained in the appendix.

Train Information

The locomotive of No. 8 consisted of two type-F40-PH, 3,000-hp units, numbered 235 and 239, manufactured by the Electro-Motive Division (EMD) of General Motors. They were equipped with speedometers, Barco speed recorders, a 26-L-type airbrake system, and overspeed control.

The train consisted of three heater cars, two baggage cars, one baggage-dormitory car, two coaches, one dome car, one lounge car, one diner, and one sleeper. The passenger cars were of stainless steel construction. They were equipped with type-H tightlock couplers and four-wheel trucks with truck-mounted brake cylinders, D-22 brake valves, clasp-type brakes, and composition brake shoes.

The failed R-1 wheel of the fourth car was a Class B, 36-inch, multiple-wear, wrought-steel wheel with a 25/16-inch rim thickness and a 19/16-inch flange thickness, serial No. 68082. The identifying information indicates that it was manufactured in March 1975 by Creusot-Loire in France. The mate wheel was of similar design.

The R-1 wheel had a radial break extending from the rim, through the plate, and into the hub. The break line for the broken wheel section was nearly horizontal through the plate. The broken piece of wheel was found 267.5 feet east of the switch, 34.5 feet south of the track's centerline. There was also a 7-inch flat spot on the tread and the flange. There were no batter marks at the rim breaks, and the axle seat showed only slight scoring from the wheel's turning on it.

Track Information

The curve at Lohman has a 1°34' curvature with a design superelevation of 4 inches. The track through the curve and to the east siding switch is built of 112-pound, jointed rail laid in 1947 with double-shouldered, 8 1/2-inch by 13-inch tie plates on 23 treated hardwood crossties per rail length. The rails are secured by two railholding spikes and two holddown spikes. The rail was box-anchored with 36 rail anchors per rail length. The track was built at ground level through the curve and on a slight fill east of the east switch. The track gage was 56 5/8 inches at the point of derailment. The last ballasting and surfacing was done in 1977. The track is well ballasted with crushed pink quartzite. The track east of the east siding switch is 115-pound, continuous-welded rail. The track through the area of the derailment meets the Federal Railroad Administration's (FRA) Class 4 track requirements.

Method Of Operation

Trains are operated through Lohman by signal indications of a centralized traffic control system. Automatic train control or speed control is not provided. The maximum authorized speed for passenger trains is 79 mph. Trains are equipped with radios which provide the engineers with immediate access to the train dispatcher at Havre. The siding switches at Lohman are controlled by the dispatcher at Havre.

Meteorological Information

On the evening of March 28, 1979, there was no wind, it was partly cloudy, and the temperature was 25° F. There was no atmospheric condition to impair visibility. There was from 1 1/2 to 2 inches of snow on the ground but it did not hinder crewmembers in inspecting the equipment visually while the train was moving.

Medical and Pathological Information

Eight passengers were hospitalized more than 24 hours with the following injuries: one head injury; three injured necks; two shoulder injuries, one fractured and one dislocated; four back injuries; one right hip and right arm injury; and one with bruised knees. Five other passengers were held overnight because of complaints of a heart condition; a fractured wrist; bruised legs, side of chest, ribs and shoulder; and a dislocated shoulder. Two Amtrak service employees were hospitalized more than 24 hours because of complaints of back and neck injuries, bruises, and high blood pressure.

Survival Aspects

The passenger-carrying cars that remained upright were relatively undisturbed inside, and there was no difficulty evacuating the passengers. No one was seriously injured in these cars.

One passenger in the first overturned coach was hurled through the air and landed in the baggage rack. He was hospitalized because of his injuries. Other passengers were injured when they were thrown from their seats as the car turned over. No passengers were ejected from the cars, and none were cut by broken window glass. The windows in the passenger equipment had an inner pane of Lexan which successfully protected the occupants from cuts by broken glass.

The most seriously injured persons were in the dining car and the lounge car, both of which overturned. The chairs were not secured in the diner and there was virtually no restraint to random movements. Some passengers and service personnel were standing in the dining car. There were no reports of burns from hot food or kitchen heating/cooking facilities.

The known rescue and emergency forces that responded to the accident were the Havre City Fire and Police Departments, the Montana Highway Patrol, the Sheriff's Departments from Hill and Blaine Counties, the American Red Cross, and ambulances from Chinook, Turner, and Fort Belknap. The Civil Defense Coordinator for the area had recently convened a meeting to discuss a passenger train emergency situation, which was attended by the Havre Fire Department and the Red Cross. Their discussion centered around their planned handling of a rail passenger mishap, so they were well prepared to cope with this accident.

The evacuation of the injured from the cars and their removal from the accident scene were completed in about 1 hour 30 minutes. The evacuation from the overturned cars was accomplished in part by the removal of windows and the use of ladders within the car. There were no roof hatches to facilitate escape or evacuations.

Tests and Research

When the speedometers were calibrated following the accident, the instrument on unit 235 was found to be 2 mph fast at 80 mph, and the recorder unit was found to be 8 mph fast at the same speed. The speed indicated at the time of the derailment was about 80 to 81 mph according to the speed recorder tape. Part of the error in the recorder tape unit was the failure of the stylus to return to zero. It registered about 4 mph while standing.

When tested after the accident, the brakes of No. 8's equipment functioned properly. However, an examination of the brake cylinders on car 1248 revealed that two of the brake cylinders were dry and there was no visible lubrication. Car 1248 was required to be cleaned, oiled, tested, and serviced (COTS) each 2 years. The records indicated that the last COTS was August 3, 1977, and it was not due again for COTS until August 3, 1979. Also, when the D-22 control valve on car 1248 was removed and disassembled, a piece of brass was found imbedded in the seat of the supply reservoir charging check valve of the service portion.

The broken wheel was sent to the BN's Como laboratory at St. Paul, Minnesota for a metallurgical analysis. The visual examination disclosed a circumferential heat band in the tread adjacent to the flange. Several thermal cracks were evident in the heat band. (See figure 3.) When a section was examined, it was found that a fracture originated in a thermal crack in the tread and then propagated about 3/8 inch into the tread before it finally ruptured. (See figure 4.) The crack then progressed through the plate and hub, which allowed the wheel to move on the axle seat.

The laboratory report of etched specimens stated:

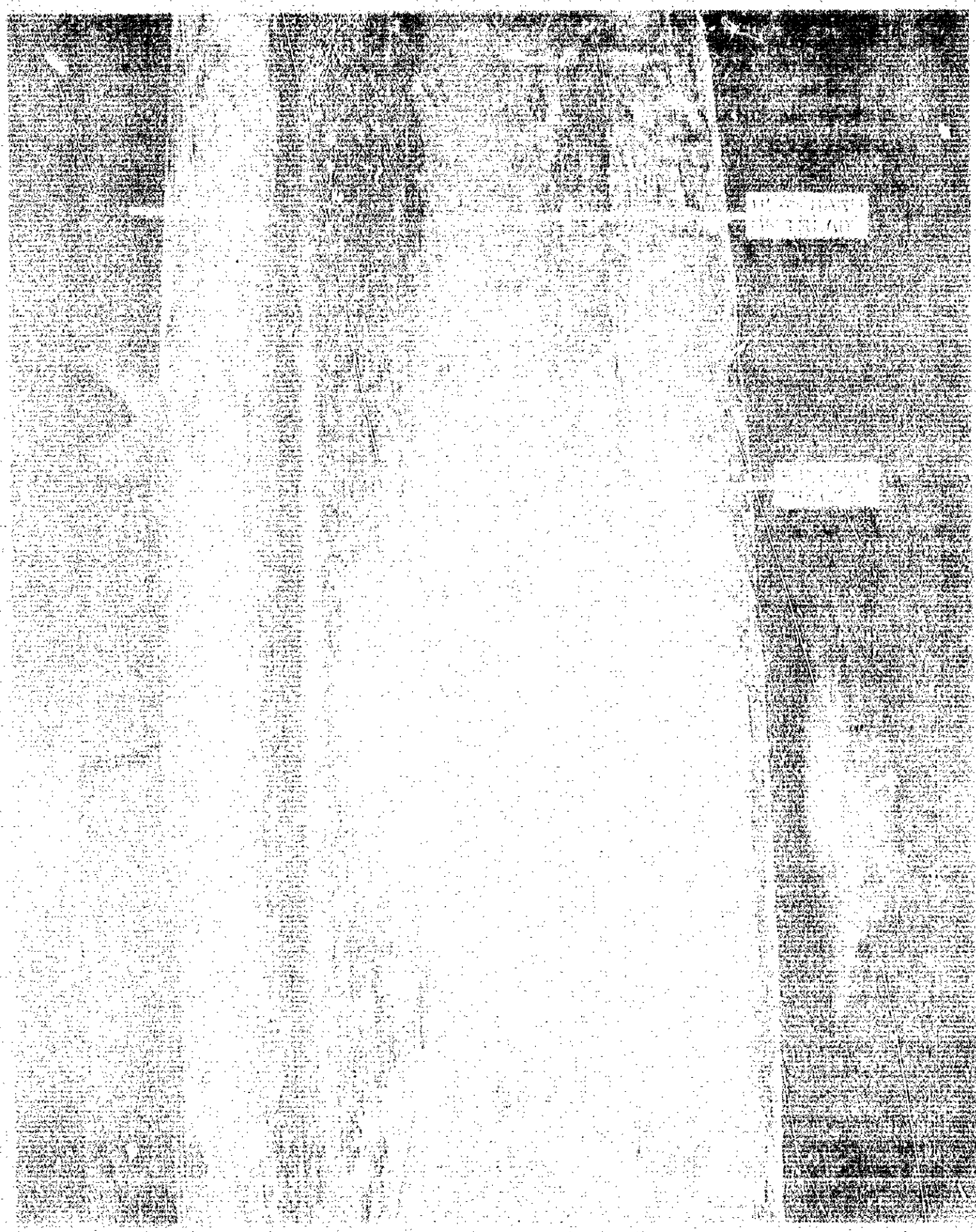
> "Etched specimens revealed a three-zoned structure -- small grained pearlite, medium grained pearlite and a band of intermediate grained pearlite. No martensite was found. Ferrite was present. The small grained pearlite was found under the tread. Next came the intermediate zone, followed by medium grained pearlite.
>
> "Macroetching of a wheel section indicated that the wheel tread had been heated to a maximum depth of 6 mm (0.24 inches) below the tread."

The average rim hardness was 285 Brinell hardness number (Bhn) which meets the Association of American Railroad's (AAR) specifications for a Class B wheel (277 Bhn to 341 Bhn). The wheel met AAR specification M-107, "Wheels, wrought carbon steel."

Other Information

The maintenance forces at Havre reported that baggage car 1248 had arrived at Havre with the brakes cut out on both ends of the car. The car inspectors did not report this, and the train departed Havre with the brakes inoperative. It could not be determined where the brakes had been cut out. Additionally, the car had 11 of the 16 composition brakeshoes worn below the 3/8-inch limit. None of these shoes were replaced at Havre. The outside shoe at position No. 8 had been applied at King Street Station, Seattle, Washington, on March 28, 1979, by BN forces. The remaining lining measured 1 3/4 inches, the measurement of a new shoe. The car inspectors said they were reluctant to delay an Amtrak train to replace brakeshoes for fear of a reprimand from their supervisors. They also claimed that it was not unusual for passenger or freight equipment to be dispatched from Havre with the brakes cut out. There was no evidence developed during the investigation to substantiate the claim that BN's supervision of mechanical inspection forces was of a nature that would encourage employees to forego repairs in violation of Federal regulations in order to avoid train delays.

The BN has a contract with Amtrak to perform maintenance on passenger cars such as cleaning, oiling, and testing of airbrake systems, as well as other general repairs.



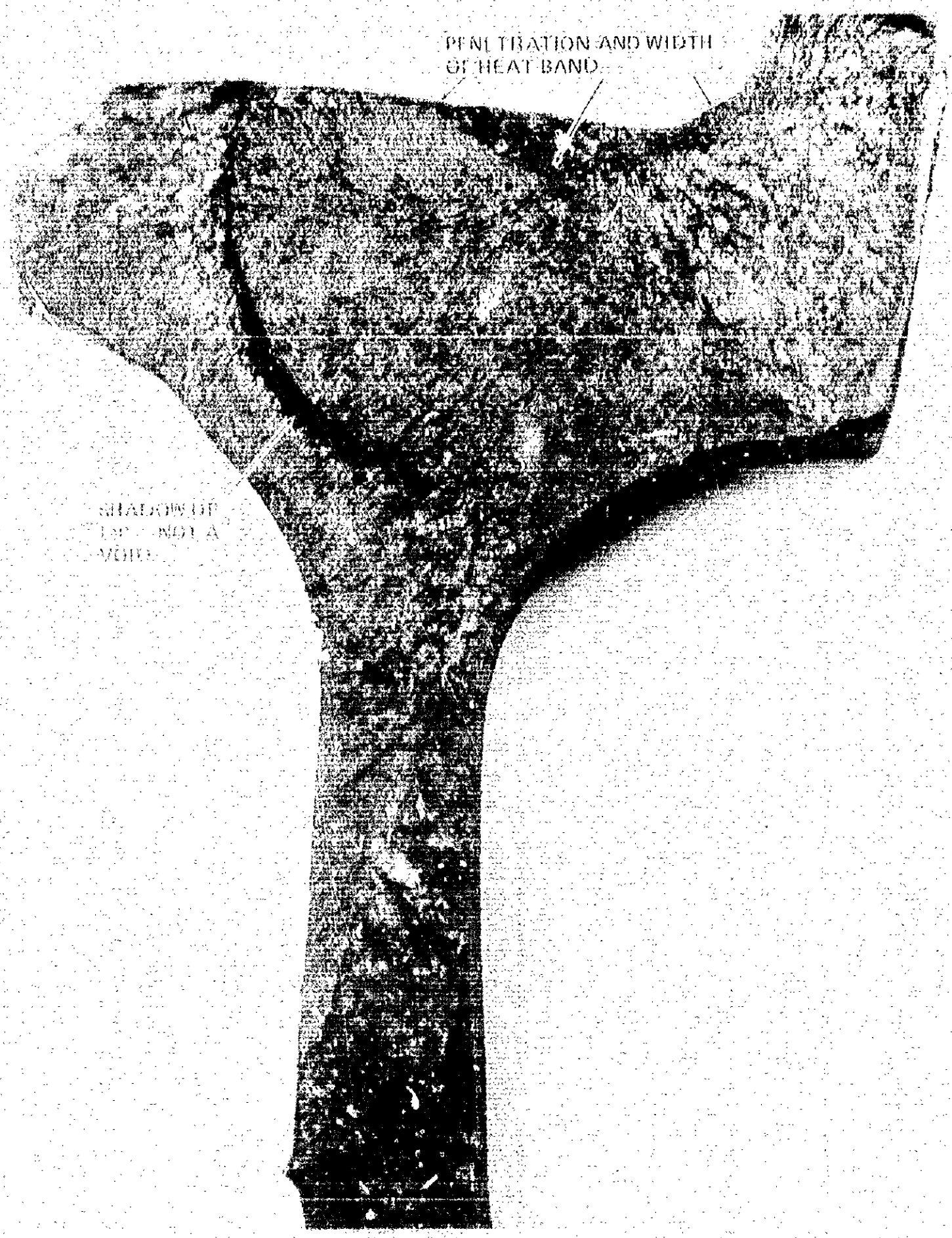


Figure 2. Section of rolled sheet at the break.

ANALYSIS

The BN car inspectors who made the arrival roll-by and the 500-mile inspection and brake test of No. 8 at Havre did not report any discrepancies to their supervisor. However, the investigation disclosed that No. 8 arrived and was allowed to depart Havre with the brakes cut out on baggage car 1248. The car inspectors admitted knowing that this was a violation of Federal regulations. The BN management should determine whether the violation of regulations was due to a deficiency on the part of the inspectors or was due to real or implied pressure from supervisors to avoid delays to trains. Whatever the case, the responsibility for correction rests directly with the BN management. Supervisors should not be so intolerant to legitimate delays that employees will forego repairs at the expense of safety.

In addition to knowing that the brakes were cut out, the car inspectors knew that a number of the brakeshoes should have been replaced. These brakeshoes were not in condition to have completed No. 8's trip to Chicago, Illinois, if the brakes on the car had been operable. Additionally, it would seem that if 70 percent of a car's brakeshoes were bad, this condition should have alerted them to the fact that the brakes may have been sticking at some time, and could result in the overheating of the wheels. Normally, only a detailed shop inspection will detect cracks in wheels resulting from overheating. Because the car inspectors at Havre did not have an opportunity to perform this type of inspection, it is doubtful whether they would have seen a cracked wheel of this nature.

The leakage through the supply reservoir charging valve along with the dry brake cylinders indicates a condition that could have contributed to sticking brakes, which in turn could have caused the car's wheels to overheat. It is obvious that the car was not properly serviced on August 3, 1977, and Amtrak and BN should take remedial action to insure that COTS dates are observed and that proper servicing is provided.

It is not likely that a brakeshoe applied at Seattle could have come through the mountainous region between Seattle and Havre in a service mode without some measurable wear. Therefore, this indicates that the brakes on car No. 1248 operated little if any after it left Seattle. The sticking brakes which overheated the wheels occurred before then. Since it is the BN's responsibility to maintain certain Amtrak equipment, either the forces at Seattle, Spokane, or Havre were not alert to the requirements of their positions or management is not effectively training employees or enforcing their mechanical inspection rules. If the maintenance forces who inspected car 1248 before it got to Lohman had done their jobs correctly, the car would have been taken out of service for the airbrake problem and the cracked wheel would have been found.

The results of the metallurgical tests of the failed wheel corroborate the overheating effect caused by prolonged exposure to the sticking brakes. They also verified that the overheating caused thermal cracks to develop from which the break was initiated. Once the wheel was internally stressed, some externally applied force or forces in the tread overstressed it and the fracture progressed to the hub. The wheel failure was the result of improper use.

The flat spot on the R-1 wheel indicates that the wheel slid for a considerable distance. The wheel seat on the axle was not scored too severely, which indicates that the wheel did not turn too much on the axle. The mate wheel shows that both wheels slid at some point. Probably the R-1 wheel cracked some distance before the derailment and intermittently caught on one of the brakeshoes. This action caused both wheels to slide, but as the crack penetrated the plate and through the hub, the mate wheel began to turn and the R-1 wheel turned on the axle. It was probably being held tightly by the brakeshoe and/or the wheel pressure against the brakebeam so that it could not rotate after it derailed. The erosion of the wheel tread and flange and the tread side was caused in part by its being dragged over the track hardware and ballast. There is no way of determining how far the wheel traveled after the initial crack developed. However, because of the slight scoring of the axle wheel seat, it could not have been too far even considering the flat spot on the mate wheel.

The broken coupler between cars eight and nine allowed the last four cars to overturn. Apparently the emergency braking effort had been effective before the cars began to overturn. The initial parting of the train must have occurred about the time the communicating signal sounded in the locomotive cab because the emergency brake application followed immediately. The distance the locomotive traveled before it stopped supports this contention. The fact that the cars did not incur much damage supports the witnesses' testimony that the cars overturned slowly. Further in support of the fact that the train was almost stopped before the last four cars overturned is the slight separation between those cars and the balance of the train. It is also significant that there were no known injuries that occurred in the cars that remained upright and in line on the track structure. The railroads and affiliated industries and the Safety Board have recognized for a long time the importance of cars staying upright, coupled and in line, and it was for this purpose that the tightlock couplers for passenger equipment were developed. Following the pattern found in other accidents investigated by the Safety Board involving passenger trains, the persons in the diner were the most vulnerable to injuries.

Fortunately, injuries were slight and the quick response by the rescue squads made an early evacuation of passengers possible. The successful manner in which the rescue operation proceeded can be attributed to the preparedness of the local rescue squads. The advance planning by the Civil Defense Coordinator and the participating squads greatly reduced the discomfort and inconvenience of the injured. The benefits of advanced planning and preparedness were discussed in the Safety Board's report of an accident on the Southern Railway at Elma, Virginia on December 3, 1978, 1/ and those who participated in the work at Lohman are to be commended for a fine operation. The Safety Board cannot overemphasize the merit of preparedness plans to cope with emergency situations.

The traincrew also performed exceedingly well in aiding the injured and during the evacuation, even though they had not had any formal training in handling a situation of this magnitude.

1/ "Railroad Accident Report—Derailment of Southern Railway Company Train No. 2, The Crescent, Elma, Virginia, December 3, 1978" (NTSB-RAR-79-4).

One of the major problems encountered during the evacuation was removing the injured passengers from the overturned cars. They had to be lifted up ladders and out of the overhead windows, in some cases on stretcher boards. The Safety Board discussed this problem in its report of an Amtrak train accident near Salem, Illinois, on June 10, 1971, and another accident report of an Amtrak train, Floridian, at Pulaski, Tennessee, on October 1, 1975. 2/ After the accident at Salem, the Safety Board made a recommendation to Amtrak that: "Purchase specifications for future passenger cars. . .should include provisions for the practical escape of nondisabled passengers from overturned cars when the exits at the ends of the cars are blocked." Following the investigation of the accident at Pulaski the Safety Board made a recommendation to the FRA to: "Require that rail passenger equipment be fitted with roof hatches so that passengers can escape through the ceiling of a car which is lying on its side." The FRA and the Urban Mass Transportation Administration (UMTA) are currently collaborating in a program dealing with crashworthiness of rail passenger cars, which should also consider the use of roof hatches. The FRA and UMTA should expedite their research and testing and promulgate regulations to incorporate roof hatches in new and currently operating equipment.

CONCLUSIONS

Findings

1. The car inspectors who performed the roll-by and a 500-mile inspection of train No. 8 at Havre did not discharge their responsibilities fully because they failed to report observed discrepancies.

2. The brakes on car 1248 were cut out before No. 8 arrived at Havre.

3. The train was being operated within the authorized speed limit.

4. The wheel cracked as a result of overheating produced by a prolonged application of the brakes.

5. The crack in the defective wheel progressed from the tread, through the plate to the hub, and loosened the wheel on the axle seat.

6. The cracked wheel moved off the axle seat toward the center of the axle and derailed.

7. The major derailment occurred after the defective wheel struck the frog.

8. The train had slowed almost to a stop before the last four cars overturned.

9. Emergency preparedness plans by emergency rescue units expedited the evacuation and removal of injured persons.

2/ "Railroad Accident Report--Derailment of Amtrak Train No. 1 while operating on the Illinois Central Railroad Near Salem, Illinois, June 10, 1971" (NTSB-RAR-72-5).
"Railroad Accident Report--Derailment of Amtrak Train on Louisville and Nashville Railroad, Pulaski, Tennessee, October 1, 1975" (NTSB-RAR-76-6).

Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was the cracking from overheating of the right rear wheel on the trailing truck of baggage car 1248. The cracked wheel moved inward off the axle seat and decreased the wheel-to-wheel gage. Contributing to the accident was the inadequate maintenance and inspection of the car, which allowed it to continue in service in violation of minimum safety standards.

RECOMMENDATIONS

As a result of its investigation of this accident, the National Transportation Safety Board made the following recommendations:

...to the Burlington Northern:

> "Determine why car inspectors knowingly allowed train No. 8 to depart Havre with defects which violated minimum safety standards, and take remedial action. (Class II, Priority Action) (R-79-57)
>
> "Establish procedures which will insure that minimum safety standards required by Federal regulations are complied with completely. (Class II, Priority Action) (R-79-58)"

...to the Burlington Northern and Amtrak:

> "Establish quality control standards for the servicing of rolling stock maintained by contractual agreements or by Amtrak's own facilities, and correct any existing discrepancies. (Class II, Priority Action) (R-79-59)"

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ PATRICIA A. GOLDMAN
Member

/s/ G.H. PATRICK BURSLEY
Member

ELWOOD T. DRIVER, Member, did not participate.

August 2, 1979

APPENDIX

Burlington Northern Crewmember Information
Amtrak Train No. 8, December 28, 1978

Engineer Leland M. Christopherson, 59, was employed as a roundhouse laborer at Havre, Montana, on July 29, 1941. He transferred to engine service as a fireman on August 19, 1941, and was promoted to engineer on June 28, 1948. He passed his last medical and vision examination on April 28, 1978, and his last operating rules examination on August 25, 1978.

Fireman Waldemar Newmann, 31, was employed as a laborer on January 10, 1976. He transferred to engine service and began training to become a fireman and engineer on July 2, 1976. He was promoted to fireman on November 4, 1976 and to engineer on February 8, 1978. He passed his last medical examination on November 2, 1976 and his last operating rules examination on February 8, 1978.

Conducter Edward A. Thomas, 60, was employed as a student brakeman on July 26, 1938, and was promoted to conductor on November 12, 1948. He passed his last medical examination on November 15, 1978, and his last operating rules examination on January 17, 1977.

Brakeman Robert B. Howieson, 59, was employed as a student brakeman on July 24, 1941, and was promoted to brakeman on August 6, 1941. He is not promoted as a conductor. He passed his last medical examination on June 15, 1977, and his last operating rules examination on August 25, 1978.

Brakeman John H. Espeseth, 59, was employed as a section laborer on July 1, 1937. He transferred to train service as a student brakeman on August 9, 1941, and was promoted to brakeman on August 27, 1941. He is presently qualified as a brakeman only. He passed his last medical examination on June 15, 1977, and his last operating rules examination on August 25, 1978.