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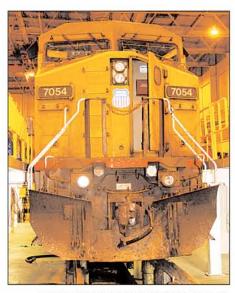
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It's all about the rails



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Let me help find your new



Heather Johnson / The North Platte Telegraph The diesel shop is the primary location for locomotive repair at Bailey Yard. Electricians and machinists work around the clock in the building, making sure trains are safe to go back out on the road.

From electrician to engineer, Union Pacific Railroad offers wide variety of local employment opportunities

on the

By HEATHER JOHNSON

hjohnson@nptelegraph.com

The jobs at Union Pacific Railroad are as diverse as the land its tracks lay across.

According to UPRR, it has more than 8,000 locomotives, 100,000 freight cars and an infrastructure spanning 32,000 miles in 23 states. An operation that massive requires a tremendous amount of employees.

UPRR has a wide range of career opportunities that allow anyone with a journeyman's card, military training or on-the-job experience to make the most of their skills. Those who don't have previous railroad or technical experience can receive paid training.

Diesel mechanic

The diesel mechanic, or machinist, job is among those that allow employees to work directly with the trains. It's a career path Jerry Mullen, a machinist at Bailey Yard in North Platte, chose 37 years ago.



UPRR and North Platte: Did you know?

Fast facts from Union Pacific Railroad's Bailey Yard and beyond

Bailey Yard was named in honor of former Union Pacific Railroad President Edd H. Bailey.

Bailey Yard covers 2,850 acres.

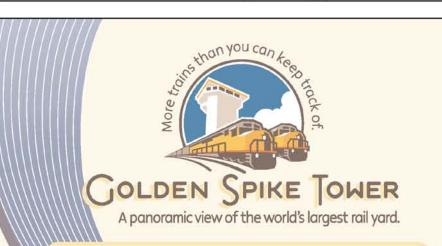
There is enough room at Bailey Yard for 2,800 football fields.

Three football fields could be housed in the huge Lshaped locomotive

repair shops in Bailey Yard.

The eastbound hump in Bailey Yard crests at 34 feet. The westbound hump crests at 20.1 feet.





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"I've always enjoyed working with my hands and doing mestuff." chanical Mullen said. "So, it's been a good fit for me."

He said machinists work in three locations at Bailey Yard: a run-through area, a service track and the diesel shop.

"On the runthrough, our job is to make sure the trains are full of oil and water," Mullen said. "We also assess brake shoes and check for FRA defects.'

FRA stands for the Federal Railroad Administration.

"It outlines certain criteria we have to meet," Mullen said. "When locomotives roll into these facilities, our biggest concern is to the public. We don't want any derailments or things of that nature.'

The responsibilities at the run-through area are also required on the service track as are more detailed inspections and replacement of fuel filters among other things.

Most of the work happens in the diesel shop, according to Mullen. That's where assemblies, power traction motors and turbochargers are changed out and where truing is done to return wheels to their original shapes.

"We're here to trouble shoot and repair locomotives so they are safe when they're out on the road," Mullen said. "It's a dangerous job. The biggest thing we have to focus on is our safety because we're working with big rolling stock.'

Electrician

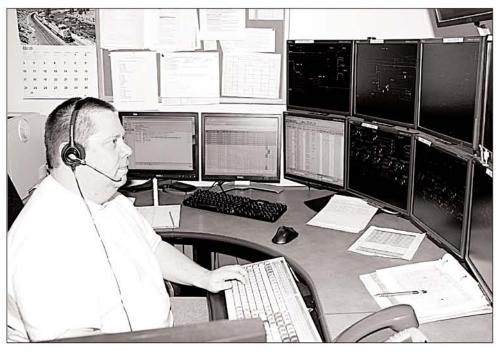
Electricians also work directly with the trains. The profession is crucial to maintaining UPRR's extensive fleet, because nearly every system on the locomotives is electric. Bob Norton, an electrician at Bailey Yard for



Photos by Heather Johnson / The North Platte Telegraph

Above: Welding is just one of the jobs done in the diesel shop at Bailey Yard. Wheel truing and replacements of power assemblies, traction motors and turbochargers are also done there.

Below: Jason Lannon, dispatcher, monitors trains entering and exiting Bailey Yard. It's a job he moved into after working as an engineer.



the cab signals, which lo, manager of operatspeeds on the road."

blueprints, schematics it's a 24-7 job. and location circuit plans in addition to a on call all the time,' variety of tools and equipment not typically found in other shops on construction or

"We repair about everything needed to keep the train rolling," Mullen said. "There's a feeling of satisfaction in fixing someback out onto the road shooting aspect of the job and working with the guys out here. They're a great group."

are vital to controlling ing practices, was a road engineer and now Electricians also use trains them. He said

> "They're basically Castillo said. "Usually, engineers would have previously worked as a switchman and a conductor."

He said six months of training is required for the position. Three weeks of that is spent in Salt Lake City, Utah, and the rest is on-the-

Craig Cox is also a accomplishment that former road engineer and a current manager of operating practices. He understands what it's like to move up through the ranks —

altogether, he has worked in eight differfor ent positions UPRR.

"Growing up, working for the railroad wasn't really something I though about doing," Cox said. "But, I ended up hiring out right after high school. I started with the railroad the day after I turned 19 and have been here ever since."

He said he really enjoyed being on the road.

"There's a feeling of comes with going around a curve then looking back at the train and knowing I'm the one controlling 19,000 tons," Cox said.

According to Castillo, being an engineer is an honor.

"We're kind of like the fighter pilots of the group," Castillo said.

Dispatcher

Jason Lannon opted to swap a job out on the road for one that involves sitting behind a desk. He used to be an engineer, but is now a dispatcher at Bailey Yard.

"A spot came open, so I decided to apply," Lannon said. "There are only six of us qualified for this particular job. North Platte is one of the unique locations in the railroad system with its own dispatch office. There aren't very many around the country. The main hub is in Omaha."

He said a dispatch office was needed in North Platte because of the size of Bailey Yard and the amount of traffic it has.

"We probably run around 120 trains per day through here," Lannon said.

His job is similar to that of an air traffic controller. He helps move trains into and out of an area that stretches approximately 30 miles east and west of the rail yard. Once trains reach the boundary lines, dispatchers in Omaha take over.

Lannon has the ability to throw switches, diverting trains onto various tracks. He uses computers and radio communications to constantly monitor train movements and conditions and takes immediate action when necessary.

To get to his current position, Lannon went through seven months of training — three months in the classroom and three months on the job.

Please see WORKING, Page E4

Learning to speak railroad

A short glossary of terms from the rail 2 yard and TRACKS beyond



TYPES OF TRAINS

DPU

Stands for Distributed Power Unit, a locomotive set capable of remote control operation in conjunction with locomotive units at the tram's head end. DPUs are placed in the middle or at the rear of heavy trains (such as coal, grain, soda ash and even manifest) to help climb steep grades, particularly in the West.

Manifest

Train made up of mixed railcars (box cars, tank cars, piggyback cars. etc.) reduce (set out) railcars enroute.

Hampers

Trams destined to a "hump" yard. Hump yards are where railcars are pushed up a hill (hump), uncoupled, and then rolled downhill into remotely controlled sorting tracks. Hump operations are the railroad's most efficient sorting operations and the North Platte Terminal is UP's biggest hump yard.

Hot Shot Train with very high priority compared to other trains. Other than passenger trains, UP hot shots are intermodal trains that maintain the most expeditious schedules.

"We celebrate and honor the

long tradition of the

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thing and sending it job training. safe. I like the trouble

15 years, said the job responsibilities are similar to those of the machinists.

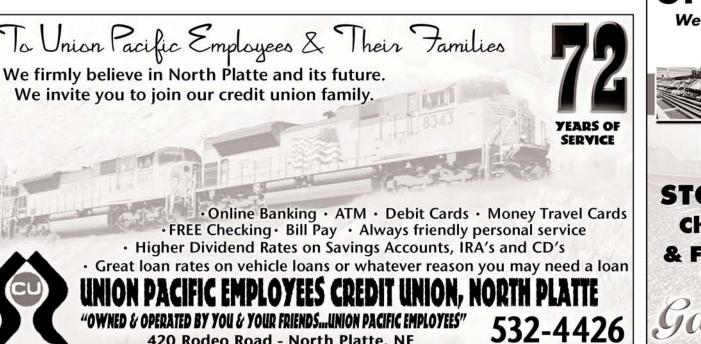
"We also make sure the lights are working," Norton said. "We do some heavy repairs on things like main generators and traction motors and look at

Engineer

Those interested in getting paid to travel might be interested in trying for a job as an engineer. Scott Castil-







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Improved safety through technology

New training tools help Union Pacific's engineers, others better their skills

By HEATHER JOHNSON hjohnson@nptelegraph.com

New technology has made driving a train safer and more productive than ever. That's according to experts who say the advancements are helping engineers to better conserve fuel, regulate their trip time and see what's in front of them.

Scott Castillo and Craig Cox, managers of operating practices for Union Pacific Railroad, teach at the north campus of the North Platte Community College. It's their job to show engineers how to use the Locomotive Engineer Assist Display and Event Recorder.

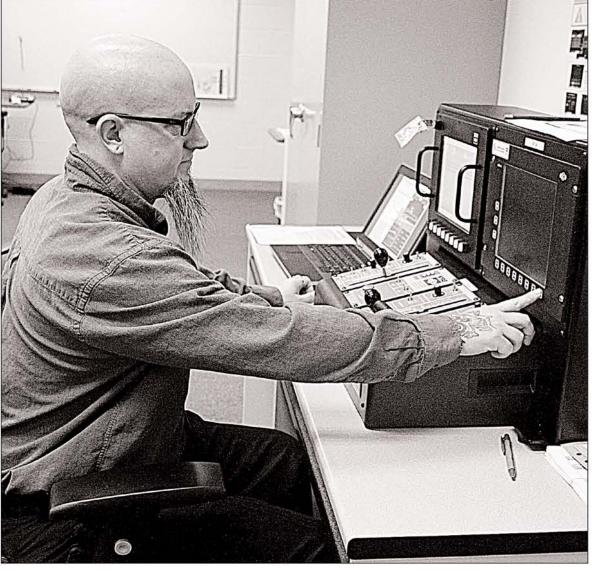
Otherwise known as the LEADER, the tool is a computer system marketed by New York Air Brake, a company that has provided innovative products to the rail industry since 1890.

"The LEADER is on loan to us," Castillo said. "We've had it for about a month. Basically, it's the latest and greatest in locomotive technology."

According to a description of the product from the NYAB, the system has become the energy management equipment of choice for several railroads in the Association of American Railroads market.

It works by taking the best train-handling practices already in place and teaching engineers how to improve on them. The benefits according to the NYAB, are increased fuel economy, reduced in-train forces and better schedule performance.

"Engineers sit in front of the computer and enter a track warrant number. Information about things such as the type of train they're operating, it's ton-



Heather Johnson / The North Platte Telegraph

Craig Cox, manager of operating practices for Union Pacific Railroad, demonstrates engineer training on the Locomotive Engineer Assist Display and Event Recorder. The LEADER is on loan to UPRR and is currently set up at the north campus of the North Platte Community College.

nage, length and number of full and empty cars will show on the screen," Castillo said. "They have to acknowledge any warnings that pop up. The program also looks at the train from a GPS perspective allowing engineers to see three to four miles ahead of them."

The advantage to that is it gives engineers time to prepare for various terrains or obstacles that may be ahead the locomotive. They of have to adjust throttle speeds when going up hills, around curves or pretty much any time other than when they are traveling straight on flat land.

The throttle rate depends on factors such as how steep an incline is, how heavy of a load the train is carrying and how long it is. Cox said the LEADER gives prompts indicating the best option for fuel conservation in a given scenario and provides real time feedback.

"Also, if you mess up your loads or empties, or if you accidentally add a locomotive that's not on your train, it will reflect that," Cox said. "If men and equipment are working on the track ahead of the train it will list that, too."

The LEADER is currently in use on trains traveling out of Bailey Yard. It's also in training trailers that UPRR has. The technology will eventually be tied into the Positive Train Control system, which according to Mark Davis, UPRR director of corporate relations and media, is a safety system that keeps trains from running into one another.

Cox said the goal is to pull every engineer into the classroom for LEADER instruction at least once. Those having train-handling issues are also assigned to the course.

This used to be the 'bad boy' class," Castillo said. "If engineers did something wrong, they came here. So, it was a place nobody really wanted to be. We've kind of gotten rid of that stigma, but at the same time, if someone has a problem it's guaranteed they will come here."

According to him, decertifications and recertifications don't happen in the classroom. The work done is for training purposes only.

"We can afford to make

the mistakes in here," Castillo said.

Cox agreed.

"It's nice because we can run engineers through real time scenarios without anyone getting hurt," Cox said. "If there's a train-handling issue, we can rerun the program and see what happened."

ROS

Another system implemented in the classroom is designed to reach out to a new, younger generation of UPRR employees. The Rail **Operations Simulation pro**gram is a virtual re-creation of UPRR's flat switching yard in Cheyenne, Wyo. It took two years to develop.

"It's essentially a video game," Castillo said. "It includes a game box and a joy stick. It's a fun way to learn and something a lot of the younger guys can relate to."

The simulator is used to teach employees about railroad terminology and basic switching operations such as sorting cars onto specific tracks and maneuvering locomotives in rail yards with radio control packs.

"It's good for teaching new information, as well as for providing a refresher course," Castillo said.

According to UPRR, the idea of using video game inspired technology as a training tool dates back to 2005. Two UPRR employees, Jon Jensen, from the information technology group, and Steve Bakunas, from the rail operations group, were searching for innovative ways to teach new rail yard employees how to be more confident, proficient and safe in their jobs.

They found their answer in virtual technology. P.I. Engineering in Williamston, Mich. was pulled in to help develop the computer software needed for the trainings. The first program ended up being such a hit with employees that it is now used at 45 sites across UPRR's network.

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WORKING

from Page E3

"After that, you're on a month of probation," Lannon said. "One of the best parts of my job is the challenge of it. There's something new everyday. I also like working with my fellow employees. They're good people."

Education

College graduates have a headstart at UPRR. Through operations management training, they have the chance to be in charge after just a few months.

According to UPRR, managers in the operations department are responsible for mechanical shops, major

track projects and keeping thousands of trains moving safely and on time every day. They are assigned to one of three areas: mechanical, engineering or transportation and to a location within the 23-state network.

is a Fortune 200 company search.

that employs approximately 4,500 people in its corporate headquarters at Omaha. The following majors are some that are actively recruited: accounting, computer science, business administration, finance, marketing, soft-College graduates are also ware engineering, supply needed for office jobs. UPRR chain and operations re-

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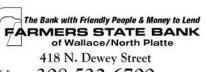


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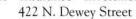






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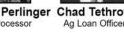
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Train training goes on the road

Mobile classrooms improve access to crucial education for UPRR workers, students

BY HEATHER JOHNSON hjohnson@nptelegraph.com

A new fleet of mobile classrooms is making it easier than ever to train Union Pacific Railroad employees. The units were rolled out last summer, according to Mark Davis, director of corporate relations and media.

They travel around the country Davis said two are based out of Council Bluffs, Iowa, two are in West Colton, Calif. and one is in San Antonio, Texas.

"These state-of-theart training trailers allow Union Pacific to bring operations and safety training to locomotive engineers and conductors anywhere in our 23-state system," Davis said. "They allow us to bring the training to the employees instead of the employees having to travel to where the training is being conducted.'

The trailers supplement both new and refresh courses at stationary UPRR training facilities. They provide the same options via laptop that were previously only available through large, cumbersome machines. Davis said early equipment, such as locomotive simulators, took up the space of two large deep freezers sitting side by side.

According to him, each trailer is 48-50feet long. It includes seven workstations, each of which can accommodate two employees. Simulators within the classrooms are outfitted with webcams linked up to instructors in Omaha and Salt Lake City, Utah. The cameras allow the instructors to provide real time assistance to students.

Davis said pioneering communication capabilities in the trailers sync up with the UPRR's mainframe computer network. That gives them access to the most current instructional sessions and federal training documentation.

According to UPRR, the software on the trailers includes instructions for locomotive and conductor instructions. There's also a remote locomotive operation system, which teaches employees how to operate switches, maneuver locomotives in rail yards with radio control packs and sort rail cars onto different tracks based on their destination.

A Locomotive Engineer Assist Display and Event Recorder, otherwise known as a LEADER, teaches engineers how to reduce fuel consumption, manage their trip time and minimize in-train forces. A Trip Optimizer reduces fuel consumption by automatically controlling the throttle on trains.

NetControl can also be found in the mobile classrooms. The computer program connects transportation control systems with one another, such as those for rail car tracing and monitoring train or rail car movements.

Davis said a Positive Train Control system is still being developed, but it will be added to the trailers when finished. The PTC is a predictive collision avoidance technology system intended to stop a passenger or freight train before an accident occurs.

Each trailer also includes video streaming and customized doors for security. Entrance to the trailers is either granted remotely by instructors in Salt Lake City or Omaha, or done by employees who enter their identification numbers on a keypad.



The most up-todate technology available is included in the Union Pacific Railroad's fleet of new mobile classrooms. It includes simulators that teach engineers how to conserve fuel and better manage their trip time.

Courtesy photo

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Union Pacific connects and supports communities across America, not just because it's our business, but because these are our communities, too.

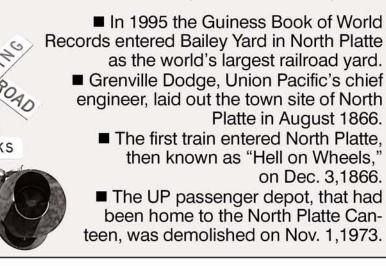


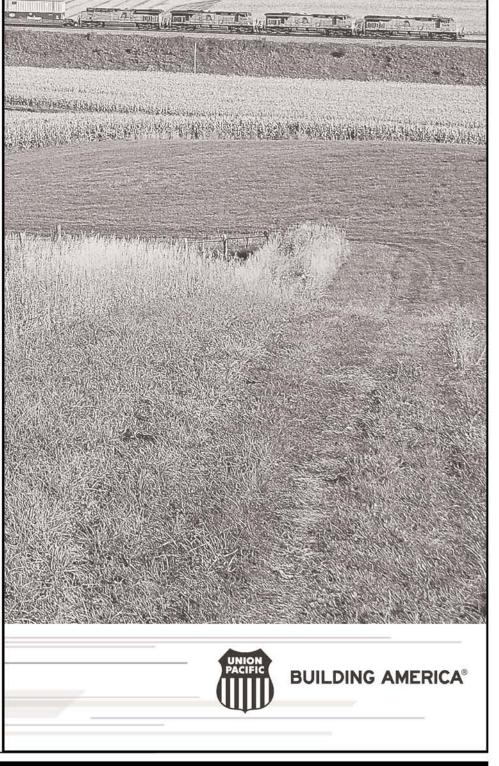
Courtesy photo

The Union Pacific Railroad has introduced a new fleet of training trailers such as the one pictured. They will be used to supplement the ongoing training and refresher courses already provided at locations across UPRR's 23-state system.

UPRR and North Platte: Did you know?

Fast facts from Bailey Yard and beyond





By HEATHER JOHNSON

hjohnson@nptelegraph.com

Some changes are coming to the Golden Spike Tower and Visitor Center this year. JoAnne Hoatson, executive director, said it will be the first time in four years the field on the east side of the attraction will not be turned into a corn maze. Instead, the

The corn maze was the biggest an-

shape of trains in honor of the Union Pacific Railroad's 150th an-America 100th anniversary.

six miles of trail, and The North Platte Jaycees and North Platte Community Playhouse haunted it around

we're thinking about an [handcar] exhibition that would pit policemen against firemen and various departments at the railroad against one another. It will probably be a couple of days long,

"It's unused track," Hoatson said. "Instead of putting it in a pile somewhere, they are repurposing it. It will take about a week to lay it. UPRR is working on its own track right now, but when crews get a break they will bring ours over."

The double track will be about 700 feet in length. It will be placed where the corn maze used to be because that's the only location near the tower that's

"Everything is still in the

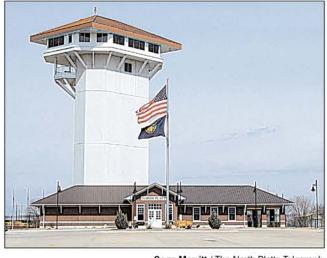
She said teams consist of five



Old railroad tradition to become a new attraction



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Sage Merritt / The North Platte Telegraph

The Golden Spike looms above Bailey Yard in this March 2013 photo. The Spike hopes to host handcar races in time for Rail Fest this year.

SPIKE

from Page E6

be made available as the project progresses.

Hoatson does want to retain some traditions Holzfaster of Paxton that revolved around the corn maze, such as offering weekends full of activities and a petting zoo.

"The petting zoo was such a big event for Hoatson said. us," "People loved it. If we can get some volunteers to help us, we'd like to put in a pumpkin patch, too. It might be something for a 4-H club to do."

Also new this year at the Spike Tower will be a G Scale model rail-Hoatson way. said members of the North Platte Model Railroad

Club are in the process of building the display, which will hang in the Spike Tower's main hallway.

"Ralph and Beverly donated the trains for it last summer," Hoatson said. "That's what started the whole project. The club is hoping to have it put up by Community Day May 5. That's the one day a year we open our doors for free to anybody who wants to come out."

Those interested in helping with the new activities at the Spike Tower can contact Hoatson at 532-9920 or email her at director@goldenspiketower.com.

What's a classification yard?

Telegraph staff reports

According to Union Pacific, 1995 was the first year Bailey Yard was recognized as being the world's largest rail yard in "Guinness Book the of Records."

It's so large that the 2,850acre classification yard could hold 2,800 football fields. UP describes it as the economic barometer of America. So what is a classification yard?

A classification yard is used to separate railroad cars to one of many tracks. There are 114 "bowl" tracks in Bailey Yard.

Each car is sent down a different tract based on its destination. Each car is first taken to a track, which is sometimes called a lead or a drill.

In a large hump yard like Bailey Yard, the lead is put on a constructed hill known as a hump. The car is then sent through a series of switches called a ladder, which then takes the car into the classification yard. Bailey Yard has a total of 985 switches. The force of gravity is used to help propel the cars through the

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ladders and the speed of the cars must also be regulated as they roll down the hump. Before the cars enter the classification yard at Bailey Yard they are sorted in the eastward and westward "hump" yards. The east hump crests at 34 feet and the west hump crests at 20.1 feet.

There are 18 receiving tracks and 16 departure tracks at Bailey Yard.

Every day Bailey Yard handles about 10,000 cars and on the average about 3,000 of those are sorted daily in the two hump yards. In 1966 to 1970 the eastbound hump yard and diesel shop were con-The westbound structed. hump was dedicated in 1980.

Europe's largest hump yard is near Hamburg, Germany. It's slightly smaller than Bailey Yard.



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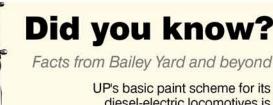
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Take a look 'under the hood' of a Union Pacific locomotive



diesel-electric locomotives is he oldest still in use by a major railroad. The primary color of the the locomotive body is painted Armour Yellow. A band of Signal Red divides the yellow from the light gray used for the upper body and roof. The trucks, underframe, fuel tanks and everything else beneath that line are also gray. Lettering and numbering are in red, with black outlines.

STORY BY ANDREW BOTTRELL ABOTTRELL@NPTELEGRAPH.COM

n average 14,560 locomotives roll through the diesel shop at Bailey Yard every year. But

what makes up those massive pieces of machinery that haul millions of tons of freight annually?

The Telegraph checked in with Dave Thalken and Mike Cook at Bailey Yard to find out exactly how these hulking machines operate.

"It's a huge piece of steel that starts everything off," Cook said, referring to



the main beam of steel that makes up the backbone. From there, a massive diesel engine and enough electricity to power the town of Hershey are added.

Over the next three pages, we give you an in-depth look at the vital pieces of a Union Pacific locomotive.





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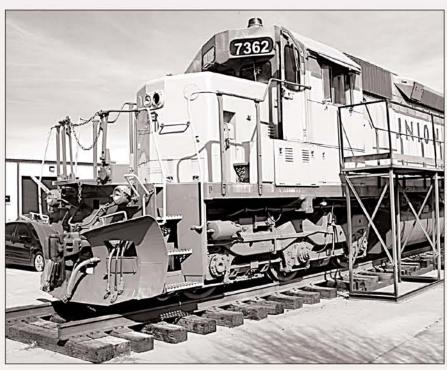
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=INSIDE THE ENGINE=



Sage Merritt / The North Platte Telegraph

The exterior of a standard Union Pacific Railroad locomotive is largely made of steel, and painted is three main colors. Those colors are Armour Yellow, Signal Red and Harbor Mist Gray. It's the oldest paint scheme used by a major railroad.

The frame

he outside of a locomotive — what you see barreling down the tracks — is a steel frame. It's centered on the main steel beam, which runs down the locomotive approximately where the red line is on a yellow painted UPRR locomotive, Cook said.

"Think of it like a car body," said Mark Davis, director of corporate relations and media for Union Pacific Railroad. The frame encases and protects the three sections of the train, the cab, the diesel engine and electric generator and the cooling unit on the back end of the engine.

Union Pacific first started using Armour Yellow for its fleet 1934. The color came from the Armour Meat Company that boomed in Omaha and Chicago during the early half of the 20th century.

The cab

From the cab, the engineer and the conductor operate all aspects of the locomotive as it moves down the tracks. The engineer has a set of controls in front of him, including an 8-position shifter, which controls the speed of the locomotive.

He also looks at the braking system controls, as well as the air pressure and temperature gauges. The conductor sits on the opposite side of the cab and monitors signals from trains up ahead and behind, and from the main dispatch center.

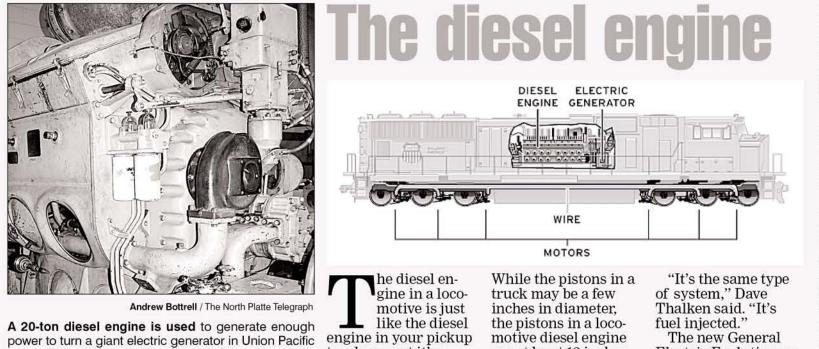
Behind the engineer and the conductor is the electrical switchboards and controls for both the auxiliary generator and the main generator. A computer system monitors both of those generators and provides readouts for the engineer and conductor to monitor the locomotive.

Engineers and conductors enter the cab from the front of the locomotive.



Andrew Bottrell / The North Platte Telegraph

The view from a locomotive engineer's seat shows the controls by which they operate a Union Pacific locomotive.



gine and into the turbo injector. More air running through the diesel engine creates more friction, subsequently creating more power.

"It takes more oxygen and more heat," Mike Cook said, which is why the turbo injector system is needed.

Air compressors and water pumps in the rear of the locomotive also help cool the engine. Each locomotive has three compressor fans, though Thalken said it has to be extremely hot conditions for all three to be in eration at one time. "The hotter it gets, the more fans kick on," he added. "Usually we wouldn't have all three on, unless they were in really hot conditions." The diesel engine sits in the middle of the locomotive, and below it are the fuel tanks. At Bailey Yard, Thalken said they use 15 to 20 million gallons of diesel per month. Locomotives utilize both air and water to help cool down the engine. The back end of the Union Pacific locomotives contains the cooling system.

locomotives. Union Pacific Railroad utilizes trains with both 12- and 16-cylinder engines.

truck, except it's a whole lot bigger.

are at least 12 inches in diameter.



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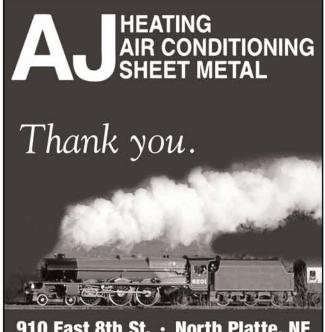
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Mid-Plains Center for Enterprise at Mid-Plains Community College is proud to be a training and education partner of Union Pacific Railroad. Electric Evolution series locomotive runs on a 12-cylinder block, while the old Electro-Motive Division series, manufactured by General Motors, runs on a 16-cylinder block. Both engines are in use in Union Pacific's fleet of 800 locomotives across the nation.

The engine itself weighs 20 tons. The locomotive weighs a total of 200-220 tons.

The cooling section of the engine also helps the diesel engine, by pumping air through the en-



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INSIDE THE ENGINE



WHEELS

Each set of wheels has its own motor. On typical locomotives, there are six traction engines and six sets of tires. Up front, in the cab, the engineer has two choices, forwards or backwards.

ENGINE & Generator

A 20-ton diesel engine is used to generate enough power to turn a giant electric generator in Union Pacific locomotives. Union Pacific utilizes trains with both 12- and 16-cylinder engines.

CAB

The "control center" of the locomotive, where the engineer and conductor sit and drive the train. Contains most of the locomotive's controls and other instruments.

FRAME

A steel frame body centered on the main steel beam. Encases and protects the three sections of the train — the cab, the diesel engine and electric generator and the cooling unit on the back end of the engine.

The electric generator

The electric generator, just like a giant alternator on a car, is connected to the diesel engine through a drive shaft. That generator creates enough electricity to put out 4,000 to 4,400 horsepower. Three engines, Thalken said, can haul 15,000 to 20,000 tons of freight.

A single diesel locomotive can

power the Diesel Shop at Bailey Yard in case of emergency. Thalken said that the department hooked a locomotive into the shop and ran it separate from their main power supply from the city of North Platte for two days before the Y2K scare more than 13 years ago.

He also talked about a storm

that knocked out power to the city of Hershey. Just one engine was needed to supply power to the community until the main power supply could be restored.

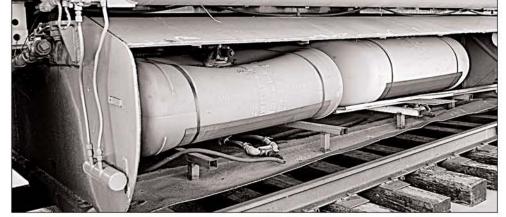
Davis said that locomotives are a part of a number of different disaster plans to provide power to communities that need it. "We can move a locomotive in to feed electricity to an entire community," Davis said.

The generator sits between the engine and the cab of the locomotive, towards the front.

An auxiliary generator, towards the cab of the locomotive operates all of the controls in the cab, as well as the light system. Most of the lowvoltage electrical wires are fed by the auxiliary generator, while the high voltage wires are fed by the main generator.

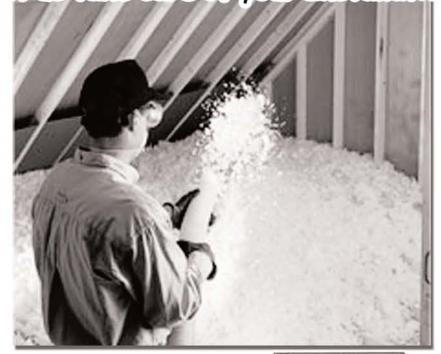


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INSIDE THE ENGINE Traction motors and wheels



Andrew Bottrell / The North Platte Telegraph

The view of a locomotive wheel from the outside. The bearing and wheel are connected by an axle to the wheel on the opposite side of the locomotive. Built around that axle is a traction motor which propels the locomotive.

fter the electricity is generated, it is fed into traction motors, which operate each set of wheels. These traction motors are built around an axle that connects the wheel set, capped off with bearings, which is what can be seen from the outside.

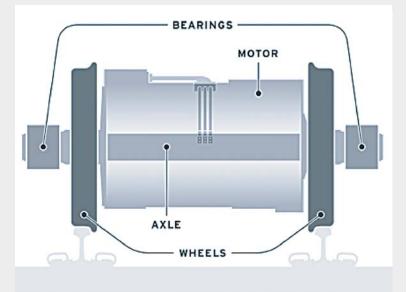
Each set of wheels has its own motor. On typical locomotives, there are six traction engines and six sets of tires. Up front, in the cab, the engineer has two choices, forwards or backwards.

"[The motors] are just like a drill motor," Mike Cook said. "They go forward and backwards, just like an electric drill.

The motors also have the ability to produce energy if a train is going downhill, which also helps with speed control and braking, Cook said.

Sand is used for traction in the wheels in order to get the train started.

"You don't have any resistance [with steel wheels



on steel tracks]," Mark Davis said. "In your car, you have resistance from the rubber on your tire and the asphalt on the ground. Here it's the thickness of a dime, so it's a very low resistance."

Braking systems have varied over the years, and several different breaking systems are still in use by Union Pacific.

One of those is the pneumatic braking, which is

the main braking system of the locomotive

The traction motors also give locomotives the ability to have a dynamic braking system, which acts similarly to a "Jake brake" on a semi. As the wheels rotate, the traction motors use the friction to create energy, which can help control the speed of the locomotive, as well as help brake the locomotive in downhill situations.

Speaking the language

Get some insight into the complex world of rail lingo

Telegraph staff reports

Like any industry, the railroad has its own language that may seem incomprehensible to outsiders.

To a teenager, a curfew dictates when time they must be home. On the railroad, a curfew is a time scheduled when no trains operate, giving maintenance crews a chance to work on tracks or signals. rock fans Classic might identify them-

hind on its outbound train huilding

selves as "Deadheads," a tribute to the band "The Grateful Dead." In railroad-ese, "deadhead" is the transportation of a crew to or from a train.

"Coupled and uncoupled" means something entirely different to a marriage counselor than it does to a railroader.

Naturally many of the terms related to the rail industry describe what can or needs to be done with trains. Trains may be blocked on line, laid down or tied down. They can also be walking or yarded.

for outbound departure. *Enroutes* Count of trains destined to a particular yard or terminal that need to be switched. "Strong enroutes" indicates a forecast for heavy switching work-

load for that day. Humped Count of cars that are sorted in a hump yard.

Trimmed

Count of sorted cars built into outbound

TRAIN TERMS

trains.

Trains held out The number of trains held on line (out) due to lack of room in the destination yard. When a yard's receiving tracks are occupied, the terminal "holds trains out."

Trains holding

A count of trains being held either for congestion or for a Maintenance of Way curfew. Trains holding also can refer to the HDC Trains Held Report, used to track trains that are not run on schedule due to cars in proper sequence a critical resource, such as power. crew or track congestion. Trains drug out Trains moved from origin yard to a siding between terminals to make room in the yard to continue to build trains. Trains staging

Trains holding at a point on line for release to move into a terminal. Trains slotted

Number of trains a terminal can process in a given period of time, usually every 24 hours.

Trains blocked on line Trains stopped between primary terminals and switched to further define the car blocks an to facilitate handling at the destination terminal.

Trains tied down Trains holding on line for relief crews, Maintenance of Way curfew, slot/spacing into terminal. Power usually is still on the trains.

Trains laid down Trains with no arrival plan for a terminal. The crews have been likely removed and power has likely

during a specified time period.

ENGINEERING TERMS

Curfew

A time period scheduled in advance when no trains operate, allowing maintenance employees to work on track or signals.

Windows Same as curfew, but also can mean holding trains for things other than Maintenance of Way curfews, such as operating passenger trains.

Pull apart When two sections of rail separate (pull apart) at a point where they are joined. Rail shrinks in extremely cold weather. When the shrinkage pressure gets too severe, rail will pull apart at its weakest point, usually at a joint. Cross-overs Track that joins two main tracks. When a train moves from one main track to another it "crosses over." Diamond

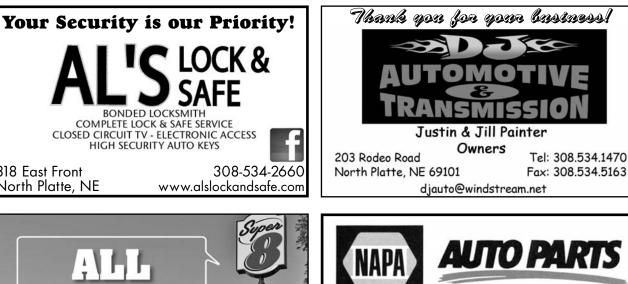
TERMS

RAIL YARD

Behind "x" trims Trims are sorted tracks of cars in a hump yard pulled out of the sorting tracks and coupled to make up outbound trains. A yard "behind on trims" is be-

TRACKS

Trim lead Track used to move cars from the bowl (sorting tracks) to the departure yard, where sorted cars are coupled into an outbound train. **Building trains** Assembling sorted



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been removed.

Trains spacing Time spacing in which a terminal/subdivision can handle trains, such as one coal train every 30 minutes, one manifest every hour.

Trains yarded Number of trains a terming has yarded in a 24-hour period.

Trains walking When a track defect, such a broken rail, has been determined by the **Engineering Depart**ment to be passable at

'walking speed." *Trains flagging* When a train crew has authority granted by a dispatcher to "flag" past a signal that is in stop indication due to a defect/event. Trains processed

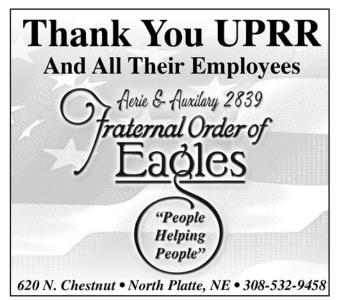
Number of trains operated through a defined area or terminal

Track intersection where one track can be used at a time.

Angle bars

Short pieces of steel used to join track sections to other sections or track structures. An angle bar is placed on each side of the sections being joined. Two holes are drilled into each end of the angle bar and also through track sections. Four bolts with locking washers are fastened through the holes to join the sections. Angle bars also are used to

Please see SPEAK, Page E13



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It's all about the rails

Union Pacific Railroad's tracks are more high-tech than they might appear

BY ANDREW BOTTRELL abottrell@nptelegraph.com

Nebraska. In Wyoming, Kansas and Colorado, the Bailey Yard rail service unit maintains more than 1,800 miles of rail.

"We test it ultrasonically on this corridor twice a month," Gary Peterson, manager of track projects for Union Pacific Railroad at Bailey Yard, said.

Today, tracks are 56.5 gauge, almost univerwidth. sally. That measured in inches from the inside of one rail to the inside of the opposite rail, might date back centuries ago when Romans began to use tracks and handcarts to transport goods, Peterson said. "It's from the width

of two horses — that's standard track gauge," Peterson said.

Soil composition was a very important component to early rail construction, but today, Peterson said they completely build a new base when in-

stalling new track. "We [dig] down far enough that we don't have to deal with it," he said. "But when thev built the transcontinental, it was different."

In the early days of the railroad, the ties were laid on flat ground, and the rail was laid on top of that. Over the years, UPRR, and other railroads, refined have the process.

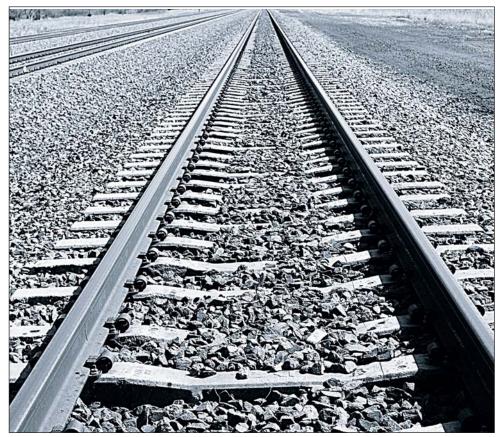
"As we learn what causes derailments or failures, we invent processes or take processes from other areas," Mark Davis director of corporate relations and media for UPRR, said.

The familiar triangle shape of a train track you see today in Nebraska, with the bed, the rock, followed by the ties and the rail, takes it shape for drainage and stability purposes, Peterson said.

"It's load bearing and you always want track to drain," Peterson said.

Ironically, on one of UPRR's other main lines in Texas, they have the opposite problem. Because the soil is made up of clay, the land cracks, and the rock base can become unstable. To combat that, tracks are built to sustain what little moisture the environment provides.

The rock used in the Bailey Yard service



Andrew Bottrell / The North Platte Telegraph

Railroad tracks have three basic components, the base, made up of granite rock; the ties, which can be either wood, concrete or steel; and the rails, made of steel manufactured in Japan.

Ties range in length

area for the rail base is granite, which comes from several places, including Granite, Wyo., Little Rock, Ark., and Gads Hill, Mo., ironically the site of the Jesse James' gang's first train robbery.

Granite is used because of it's hardness, and ability to freeze and thaw without deteriorating.

"You're not only supporting the track, you don't want it moving all over the place, too,' Peterson said.

from eight feet to 25 feet, based on the type of rail it is meant to support. Switches require the longest tie, Peterson said. They also vary in the type of wood used. Harder woods don't hold the pressure treatment as well as softer woods, but generally last longer. Concrete ties are also used in the service unit. Steel ties are used in some places along UPRR tracks.

Peterson said that wood ties have about a 25-year life span.

The Bailey Yard service unit uses strictly 141-pound rail profile, one of the heaviest weight rail in use today, because one million gross tons of freight ships through Bailey Yard every day.

"You can't replace it all the time, it's got to hold up," Peterson said. "[Rail profile] varies on what you're

Please see RAIL, Page E14



SPEAK

from Page E12

make temporary repairs to a broken section of rail until it can be replaced. Frogs

Heavy metal flangeways that connect track to switches, diamonds, cross-overs and other track structures. Frogs guide wheels from one track structure to another.

Washout When a flood or a flash flood washes away ballast and roadway under track.

CTC outage When track signals (Centralized Traffic Control) are disabled and do not allow signals to be displayed for trains.

store equipment.

TERMS FOR PLACES

LATC Los Angeles Transportation Center ICTF Intermodal Container Transfer Facility at Long Beach, Calif. OMC Omaha Metro Complex (trackage within

area defined by the South Omaha-Fremont-Missouri Valley triangle)

PRB

Powder River Basin, in northeast Wyoming, a principal source of UP-hauled coal. BRC

Betline Railroad of Chicago (Chicago Shortline Railroad)

Reader

An Automated Equipment Identification North Platte that produces train volume counts through one of UP's busiest corridors.

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TRANSPORTATION TERMS

Not enough power coming into the terminal to protect the sched-

Gothenburg AEI

reader located east of

ment Identification reader located just west of North Platte. These readers count trains arriving and departing North Platte, as well as coal trains moving to and from the Powder River Basin.

Power short

Shoofly

Temporary track used to avoid an obstacle that blocks movement on the normal track section. Shooflies are often constructed to allow temporary passage around mudslides while they are removed.

Spur

Short, usually deadend section of track used to access a facility or loading/unloading ramp. It can also be used to temporarily

A&SAlton and Southern (St. Louis Shortline Railroad) TRRA Terminal Railroad Association (St. Louis Shortline Railroad) HB&T or HBT Houstohn Belt Terminal (Houston Shortline Railroad) EJ&Elgin, Joliet and Eastern (Chicago Area Shortline Railroad)

uled outbound departures.

Crews short Not enough crews are available to protect scheduled outbounds and any deadheads/dogcatch events.

Tight on power Power is adequate to protect departures, but some delays may occur due to late arrival and servicing of locomotives.

Please see SPEAK, Page E14



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RAILS

from Page E13

using the track for."

Before coal trains ran through Bailey Yard, Peterson said they used 133-pound rail profile. European trains companies use smaller rail profile track.

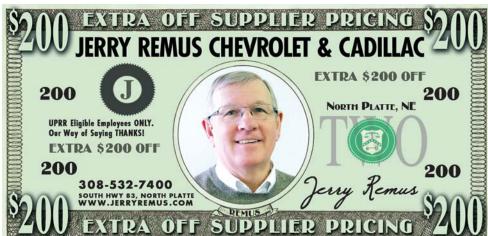
Typical rail pieces are shipped in from Nippon, Japan, where they are manufactured in 80-foot spans. Peterson said Nippon Steel is trying to manufacture longer lengths for shipping, as much as 350 feet.

Once at Bailey Yard, the rail is shipped to where it needs to go by rail and then offloaded where it's needed.



Andrew Bottrell / The North Platte Telegraph

Railroad tracks have three basic components, the base, made up of granite rock; the ties, which can be either wood, concrete or steel; and the rails, made of steel manufactured in Japan.





SPEAK

from Page E13

specific terminals. Crews are tight Sufficient crews are available but rest isneers or trainmen sues may cause delays used to protect vacanto calls. cies or make up extra UDE crews as needed to pro-

Stands for undesired emergency when air pressure contained within the air brakes system is released, resulting in the application of train brakes.

Air problems

Any issues associated with the train line or air brake system, including leaking gasket, frozen or blocked train line, stuck triple valve. Recrew

Crew used to bring a train into terminal when the original crew has insufficient time to complete the trip and a second crew is necessary.

Pool crew base Number of crews de-

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termined by volumes

Unassigned engi-

tect higher traffic lev-

Auxiliary tracks nor-

Movement of a crew

from one point to an-

other or to a train by a

vehicle transportation

Red flag warnings

Weather alerts is-

weather service to ad-

fecting operations and

vise of situations af-

sued by a contact

requiring actions.

Broncos in the

Sidings blocked

mally used to hold

trains/cuts of cars

spacing/staging for

terminals.

or train.

canyon

Deadhead

tect traffic levels at

Extra board

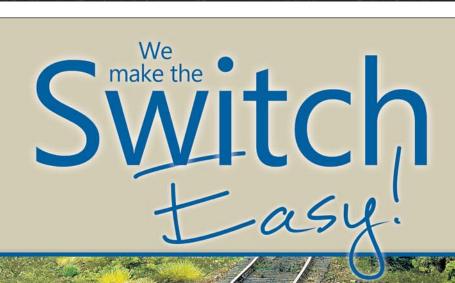
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