


GLORY DAYS OF MONTANA RAIL LINK





Haulin' gas

On a railroad that prides itself on serving its customers, Montana Rail Link's Gas Local is the crown jewel of its operation.

Story and photos by Tom Danneman

Montana Rail Link's Gas Local, led by SD45 No. 369, slithers along the Flathead River east of Perma, Mont., in June 2001.

It was 4 p.m. on a September afternoon in Missoula, Mont. We waited patiently as the cold rain — more like sleet — pelted down on the rental car stationed at the diesel servicing area. Just half an hour earlier, we were photographing a BNSF Railway coal train and Montana Rail Link's Schilling Local west of town on MRL's 4th Subdivision. By the afternoon, there wasn't much going on until I confirmed our ride for the evening. A call to MRL Trainmaster Jim Lyons settled the plans. "Your train is called for a 7 p.m. departure, so be there at 6."

We arrived at the crew office at 6 sharp, then waited as conductors and engineers prepared to leave on their appointed trains. The bulletin board here had some interesting stuff, but it lost its luster after I'd read it for the ninth time. The office had a pretty good pace to it, even though no through trains were in sight. Outside, the operator of a remote-control locomotive switching job shuffled cars in the classification yard almost as if he was at the throttle of someone's really big model railroad. BNSF through trains could easily have been considered the lifeblood of the Montana Rail Link, but the train we were about to ride isn't a through train, or even a run-of-the-mill local. This train is what MRL folks call the Gas Local.

Missoula is a large city by Montana standards. The year-round population of about 60,000 swells this time of the year to around 80,000 for one reason: the University of Montana. And on this day, nearly everyone was talking about the Grizzlies, UM's treasured football team. That is, everyone except Jim Lyons and the rest of the MRL employees responsible for the Gas Local. Lyons and his people take this train seriously. You see,



Routes of the Gas Local

Thompson Falls
Missoula

Lyons used to work for BNSF in Texas where intermodal is the name of the game. "We like to call it Montana Rail Link's version of UPS," he remarked, as if to say that ConocoPhillips is every bit as important to MRL as UPS is to BNSF. Now, that's saying a lot. Of course, MRL prides itself on serving smaller online customers just as it would anyone else, but the railroad will go out of its way to keep this fuel business.

On average, MRL moves about 35 cars between Missoula and Thompson Falls in two trains every day for ConocoPhillips. The day Gas Local usually departs Missoula

somewhere around 6 or 7 a.m., while the night Gas leaves about 12 hours later. During fluctuating fuel volumes or production slowdowns, the Gas Local might be abolished, or the railroad might run only a night Gas. Each train can handle as few as 12 cars, but no more than 30 because of capacity restraints at the facility at Thompson Falls, where the products are pumped back into the Yellowstone pipeline.

The train's on-time performance has been impressive. From January through August 2006, the Gas Local was on time 98.8 percent of the time. In six of those eight months,

The Gas Local fleet



The night Gas Local crawls up Evaro Hill on Sept. 18, 2006. These tank cars, which haul gasoline, diesel fuel, and jet fuel, were built specifically for this service. The last car is carrying gasoline.

It may look like an off-the-shelf tank car, but this specialized fleet of 154 ConocoPhillips cars is anything but. Union Tank Car built these tanks specifically for this service in 1997 and 1998. What makes them so special? Unlike typical top loading/unloading tank cars, this fleet is equipped with drip-tight connections down below for bottom loading and unloading. This helps protect the environment in the event of a spill. "It's important that we remain safety conscious to maintain a level of trust, and to protect such an environmentally sensitive area," said Bruce Owens, ConocoPhillips area supervisor. The gasoline handled in these cars can be either 87 octane, or 92 octane, but fuels aren't mixed between tank cars. In other words, diesel isn't loaded into a car that usually is loaded with gasoline. Occasionally, other tank cars not belonging to ConocoPhillips' fleet can be spotted at the Missoula facility. Those cars, which handle ethanol, are unloaded at the facility by ConocoPhillips, and are not part of MRL's Gas Local.

And what about that MRL boxcar that is always tagging along? Yes, it is mandated by the Federal Railroad Administration that the tank cars cannot be coupled directly to the locomotives. However, the railroad took advantage of having to put an idler car in the Gas Local. Instead of leaving it empty, the MRL has it filled with sledge hammers, shovels, axes, picks, fire extinguishers, sand, absorbent booms, and everything else crews would need for emergencies. It's not likely they'll need those provisions. Since 1998, ConocoPhillips' tank cars have been safely loaded, transported, and unloaded well over 100,000 times without a major incident. — Tom Danneman



every single Gas Local and terminal switch job was on time. "Our goal is to be as transparent as we can possibly be," said Howard Nash, executive director, marketing. "We want to be a part of the pipeline that ConocoPhillips doesn't have to worry about."

The pipeline

Since 1954, refined petroleum products have been pumped west through Yellowstone Pipe Line Co.'s pipeline from refineries in Billings, Mont., to Spokane and Moses Lake, Wash. The pipeline, jointly owned by ConocoPhillips, ExxonMobil Pipeline Co., and Sunoco Logistics, pumps around 60,000 barrels, or 2.52 million gallons, of fuel per day. Three types of fuel — diesel, jet or aviation fuel, and gasoline — run through it at any given time, and are provided to a variety of customers throughout the northern Rockies and Pacific Northwest.

For years, the petroleum products were pumped through the pipeline across Montana, Idaho, and into Washington, including 21 miles of land owned by the Confederated Salish and Kootenai Tribes, which number around 7,000 people, in the Flathead Indian Reservation north of Missoula. But in April 1995, the tribes opted not to renew Yellowstone Pipe Line's lease of the right-of-way across their land. Suddenly, shippers needed to find alternative transportation to fill this missing link in the pipeline. At first, the fuel



Montana Rail Link Trainmaster Jim Lyons.

was trucked in tankers to Thompson Falls, where the product re-entered the pipeline, but the search for more efficient transportation options continued.

That's where Montana Rail Link came in. Since MRL took over operations from Burlington Northern in 1987, it has worked hard to win back customers, and actively sought new traffic that didn't even exist in BN days — including the Gas Local. ConocoPhillips and MRL started talking and, in 1995, launched MRL's Gas Local.

On Sept. 5, 1999, the Gas Local, with an SD45 and two SD45-2s leading, rolls past the Paradise, Mont., depot. The second unit, No. 332, is a former Erie Lackawanna SDP45 rebuilt with an extended SD45-2 hood.

Terminal Operations

Back in the yard office, we were getting close to train time on the Gas Local. The rain had all but stopped as we stepped outside to wait for our crew to retrieve our motive power. The locomotives were some of the same power that we had been staring at earlier at the diesel servicing area. The muscle for today's Gas Local was SD70ACe 4312 and SD45-2 355. We climbed up on the 4312 and did our best to get comfortable. A minute later, Engineer Ralph Mackey had us trundling through Missoula yard at around 10 mph headed toward our train. The consist, which was made up earlier, awaited us on the west end near the ConocoPhillips/ExxonMobil joint-venture terminal facility.

Since Helena already had a terminal facility on the Yellowstone pipeline, and this was the closest terminal on the line east of the Flathead Indian Reservation, the Gas Local started running out of Helena — not Missoula. At first, MRL moved only diesel fuel on the Gas Local; in 1996, gasoline was added to the trains. Finally, in 1998, the joint-venture rail operations were commissioned in Missoula, and the new terminal opened across from the rail-



MRL GP9 No. 117 provides the horsepower for switching the Missoula terminal. The black tank car on the right is an ethanol car, and is not part of the Gas Local.

road's headquarters on Reserve Street.

The terminals in Missoula and Thompson Falls are state-of-the-art facilities, with particular emphasis on protecting the environment, which includes eliminating the threat of ground contamination. The entire rail loading area is coated with a high-density polyethylene liner. "When moving products by rail, the potential for business

interruption is real, so we can never take too many precautions," said Bruce Owens, ConocoPhillips area supervisor.

Presently, an MRL switch crew makes up the trains and switches the Missoula facility.

The crew uses a GP9 with remote-control caboose to switch the yard, and the same equipment to switch the terminal, although not in remote mode. This way, just one locomotive handles both tasks, in keeping with smart power utilization.

As determined by ConocoPhillips, which operates the Missoula Terminal, the railroad has an exact two-hour window for the facility, and a one-hour time frame to actually complete the switching within the loading and unloading facilities. The precise time the switching actually takes place in either the Missoula or Thompson Falls facilities is somewhat flexible depending on crews, or the arrival time of the local in Thompson Falls. Track capacity is tight inside the gates in Missoula. When the switch crew spots or pulls cars in or out, only 10 cars may be handled in front of the engine or remote caboose. These guys are sticklers for not only the time and the way the railroad switches the facility, but the cleanliness of it as well. "I'll get a call from ConocoPhillips if they find even one little piece of trash in the facility," said Lyons. At Thompson Falls, the Gas Local crew does all the switching to spot the loaded cars, and make up the return train of empties.

Our train had the requisite tool/idler boxcar and 20 tank cars. We had both 87-octane gasoline and No. 2 diesel in our train.



Engineer Ralph Mackey is at the throttle of SD70ACe No. 4312 on the night Gas as we crawl up Evaro Hill at 6.2 mph. Just a few minutes later, we stall.

But to make things interesting, we also had four empty MRL boxcars, seven empty bulkhead flatcars, and five empty lumber cars added ahead of the idler car and tanks. Missoula often adds the cars that the Paradise Local handles on the front end of the night Gas Local. These empties were destined for places like Tricon Timber in St. Regis and Thompson River Lumber in Thompson Falls. Our local would drop these cars off at Paradise on the trip up to Pipeline.

The route of the Gas Local

Assistant Engineer Jim Kochel was busy copying track warrants as the dispatcher barked them out. Just minutes after 7 p.m., we were ready to go west on MRL's most prized train. After a short ride on the 4th Sub from Missoula, the track warrant indicated that we would head west on the 10th Subdivision up Evaro Hill through Dixon and beyond to Paradise, where we would rejoin the 4th Subdivision. At DeSmet, just west of Missoula, the 4th and 10th Subdivisions split. The 4th Subdivision follows the Clark Fork River roughly parallel to Interstate 90 to St. Regis, where the railroad turns away from the Interstate for the remainder of the trip to Paradise. Both routes are scenic, but at 2.2 percent on Evaro Hill, only the 10th Sub has a grade of any consequence. The dispatcher can route the train either way leaving Missoula, or on the re-

turn trip at Paradise, but depending on other traffic or track work, the 10th is the preferred route of the Gas Local. Besides the Polson Local, which shares the 10th Sub until Dixon, the Gas Local is the only regular westbound train to run up the hill over the 10th. Other trains detour this way occasionally because of track work on the 4th Sub, or other unforeseen circumstances, but most of them would need helpers for Evaro Hill. Since the Gas Local is a relatively light train (a 20-car train is right around 2,700 tons) it doesn't need a helper. Besides that, the 10th Sub is shorter. The route from DeSmet to Paradise on the 10th Sub is 64.2 miles, while DeSmet to Paradise on the 4th Sub is 93.3 miles, a savings of just over 29 miles. Simply put, fewer miles equal less time, and less fuel consumed.

Just west of the split at DeSmet, and before the Interstate 90 overpass, we could see where the climb up Evaro really began. Our speed limit was 25 mph, but soon we wouldn't be going even that fast, especially with the wet rail and extra cars on the front end. Even then, we'd get up the hill without helpers — or would we?

We approached an area on the hill about 3.5 miles west of DeSmet known as "False Summit" at around 15 mph. This is a spot on the hill before the actual summit where the elevation crests, drops back downgrade for a short distance, and then heads back up.

Now and again we felt the SD70ACe shudder as it tried to grab hold of the wet rail. We crested the false summit and immediately Mackey put the train in dynamic braking. It seemed odd to see him doing this knowing the summit was around 7 miles ahead. That didn't last long, however, and he took the dynamics off, and notched the throttle all the way up to the 8th position. As we climbed farther up the hill, the shudders came closer and closer together, and speed began to slip. We dropped from just over 10 mph, to 7.2, 6.8, 6.2, 3.8, 3.2, and finally we stalled, just around the corner from the O'Keefe fill. "What now?" Mackey asked. Would we have to call for some help out of Missoula, or maybe back the train all the way to DeSmet and double the hill?

A short deliberation ensued, and the crew decided to unplug the m.u. cables between the two locomotives, and run them independently. They disconnected the cables, then Mackey took up his position on the 4312, and Kochel, back on the trailing SD45. After a delay of only a few minutes, we started to walk up the rest of the hill at almost 10 mph. I was impressed. We made the grade from a complete stop, with wet rail, and more tonnage than usual. Once we crested the hill at



The power

In October 2005, former Atlantic Coast Line and Norfolk & Western SD35s lead the eastbound Gas Local near Perma, Mont.

Since the beginning, the Gas Local has used interesting motive power. Before the influx of SD70ACes in 2005, the train rated three of MRL's 700-series SD35s. Train crews had nice things to say about the pulling power of those old 35s, which remained fairly reliable during their stint. But with all 16 SD70s delivered, the SD35s have gone back to Billings transfer service, and switching duty in Missoula, where their "hook 'em up and drag 'em" pulling power is also appreciated. Over the years, anything on MRL's roster has probably shown up on the Gas Local at one time or another. Even the run-of-the-mill consist from the trip described above is anything but. What other railroad routinely matches up SD70ACes and SD45s?

The locomotives for the local can change on a whim depending on other motive power needs. Just a couple of days before our ride, we pho-

tographed the night Gas Local with three SD45s. That trio was on the train for a couple of days because SD70ACe 4312 was assigned to a passenger special. At the time, the 4312 had been unofficially dubbed the railroad's passenger power. Since the 4312 had been in captive service on the local, it remained shiny and clean, unlike the SD70ACes that are assigned to helper duties out of Helena or Livingston. At the end of July, the local still had an SD70ACe/SD45 combination.

The SD70ACes have been fuel misers. In the first 10 months of 2006, the SD70s on the Gas Local saved the railroad more than 140,000 gallons of fuel, compared with older six-axle power. That's impressive considering the fuel prices during this period were between \$1.96 and \$2.50 per gallon, and likely to rise in the coming years. — Tom Danneman



Occasionally the Gas Local is routed via MRL's 4th Subdivision. In September 2000, the westbound local blasts by the now-retired semaphore signal at milepost 208.6 west of Donlan (between Toole and Quinns).

Evvaro, everyone breathed easier. To the west, we noticed some slivers of clear sky. Then the worry turned from whether we'd make it up the hill to whether those slivers meant the rain would hold off until after the switching chores were complete at Paradise and Pipeline. The guys reconnected the m.u. cables and we were back on our way.

Goodbye 10th, hello 4th

The rest of the trip was fairly uneventful, but coming around a curve along the Flathead River west of Dixon, we encountered a black bear cub on the track. Fortu-

nately, he dove off to the side just in time. It was one of the highlights of the trip for me, but pretty routine for the crews up here in this wilderness. Only a few days earlier Mackey was the engineer of a train that struck and killed a mountain lion near the defect detector at St. Regis.

Aside from being somewhat loud when we climbed Evvaro, the cab of the SD70ACE was quite comfortable. As we neared Paradise, we passed an approach signal. At about 9:40 p.m., we came to a stop, staring at red signals at Paradise. "Where are you, coal train?" Mackey asked. "We're just passing though Quinns," the crew on the coal train responded. Minutes later, the glow of the coal train's headlights illuminated the mountains that surround Paradise. Remember that coal train we photographed



In September 2000, the eastbound local crosses the impressive Marent Trestle as it drifts down Evvaro Hill just east of Evvaro.

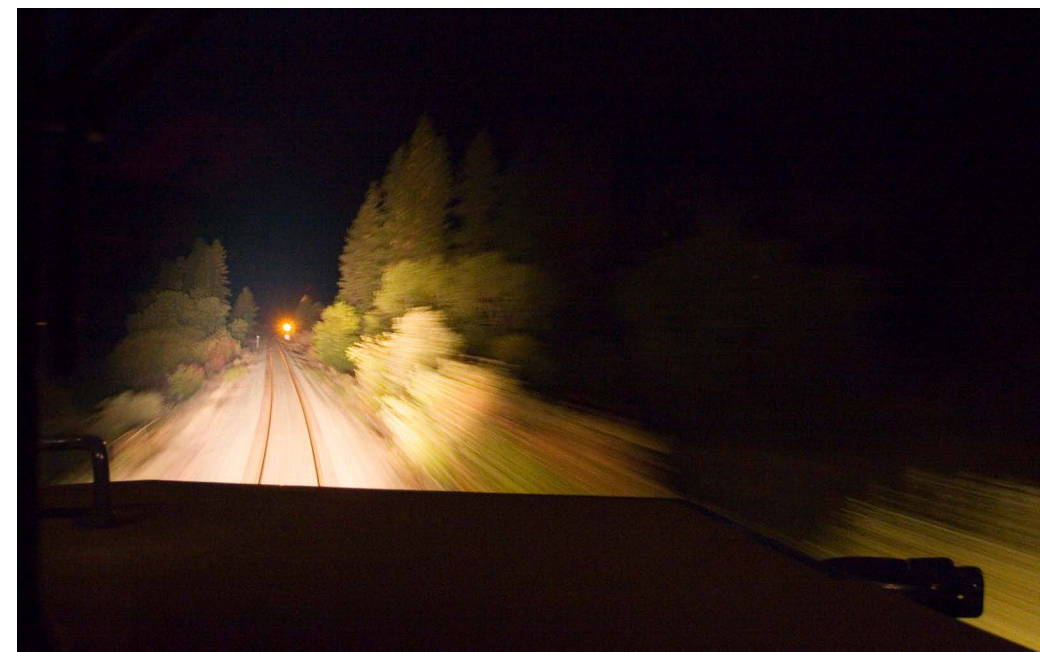
that left Missoula around 3:30? That's the one we met here at Paradise. It took the coal train more than six hours to make it to Paradise via the 4th Sub, whereas the Gas Local — even with the difficulties getting up Evvaro — made it to Paradise in just over 2.5 hours. This illustrates the advantage of running the Gas Local up the 10th Sub.

After the coal train passed, it was our turn, and we entered the 4th Sub for the remainder of the trip to Thompson Falls. Then the rain came. By the time we were ready to switch out our cars for the local at the small yard in Paradise, it was pouring down in sheets. "Just in time," said Kochel, as he draped his heavy raincoat over himself. The

rain continued for the balance of the trip to Thompson Falls where we got off, and the crew handled the switching and train make-up chores for the local. It would be a late night for these guys, but just another typical trip. They know, however, that this isn't just another "typical" train on the MRL. **I**

The author would like to give special thanks to MRL's Lynda Frost, Jim Lyons, Mike Mattson, Perry Smith, and Howard Nash, as well as Rich Johnson and Bruce Owens from ConocoPhillips.

We're on board the Gas Local as it cruises westbound on the 10th Subdivision near Paradise on a cool, damp night. We'll be stopping at Paradise to await the arrival of a westbound coal train on the 4th Subdivision.



Breathing easier in MULLAN TUNNEL

A Montana regional aims to improve on Mullan Tunnel's unsavory reputation

by Tom Danneman

Montana Rail Link embarked on an ambitious project last spring to modernize the 3,896-foot-long Mullan Tunnel. The bore, which sits near the top of the 5,548-foot crossing of the Continental Divide west of Helena, Mont., has long been an operational and maintenance headache. The work is being done not only to shore up the tunnel itself, but also to increase horizontal and vertical clearances with the goal of improving airflow through the tunnel. This should enable the locomotives passing through it to breathe easier, which the railroad expects will reduce problems with overheating diesels, a serious concern through the years.

A dubious history

Since its completion in 1883, Mullan Tunnel has not been kind to the railroads that have operated through it. Even before Northern Pacific opened the tunnel, water seeping through the rock caused a section of the tunnel roof to collapse, bringing construction to a standstill. A second cave-in followed four years later, necessitating the re-opening of the original "overhead line," which used a more circuitous and steeper route over the Continental Divide. The overhead line was built hastily in 1883 so as not to delay NP's last spike ceremony, which marked completion of the line between Duluth, Minn., and Tacoma, Wash.

The problems continued in subsequent years. In 1888, fire destroyed the tunnel's wood lining and triggered another cave-in. Shortly thereafter, NP re-lined the tunnel with a masonry ceiling and concrete side walls. In 1949, yet another collapse occurred, in the same location as the previous two, causing an 80-foot blockage. After this collapse, NP filled the hole left behind with concrete, spread grout over the brick lining, and fortified the tunnel

with steel. Successors Burlington Northern and MRL have continually upgraded the tunnel in various ways since then.

Today's upgrade

The current, ongoing makeover of Mullan Tunnel will be its most extensive yet. A contractor will daylight 400 feet of the tunnel on its west end and 70 feet on the east end using excavators and pivoting dump trucks. Daylighting the east end means that the unique NP-era ventilation system and its associated buildings will be torn down [see "Bye-bye, blowers"].

Another contractor began work inside the tunnel. One of the most significant jobs will be to replace the current brick tunnel liner and reinforce the bore. This is done by installing steel arches (called "sets"), rock bolts, and applying Shotcrete, a type of concrete that can be sprayed using compressed air. Steel sets are installed 3 feet apart, with steel crosspieces known as "c-channel lagging" providing support in the space between the sets. This creates an enclosed form, which enables the Shotcrete to fill in the void behind the steel form. Rock bolts used for this project range from 8 to 20 feet long, and are used to drill into the rock to locate better, more stable material for reinforcement. Since the track inside the tunnel is currently built on rock, it will be raised 6 to 12 inches to provide needed cushioning. A new drainage system will also be installed.

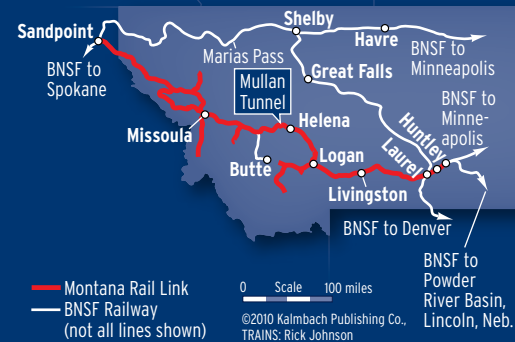
Before the project began, dense exhaust from the locomotives within the tunnel was causing some of the diesels (in particular, the mid-train helpers consisting of newer MRL SD70ACes) to shut down due to high heat and loss of horsepower. To address these problems, MRL determined that the tunnel would need improved air-flow. Contractors will accomplish this by increasing the tunnel's

width 3 feet and height 5 feet. Better clearances will also help keep the tunnel cooler as trains pass through. This heavy-duty work is being done with excavators, rubber-tired loaders, and hydraulic breakers (percussion hammers fitted to an excavator for demolishing concrete and rock).

A major setback

On July 20, 2009, workers were removing material to enlarge the tunnel, and applying the Shotcrete when the tunnel started caving in once again. The workers had tried to hold back the material with the Shotcrete, but to no avail [see "Arrivals & Departures," "News & Photos," TRAINS, November 2009]. The tunnel was closed to train traffic, and both BNSF haulage-rights trains and MRL freights were detoured until the mess could be cleaned up. Trains were staged at various locations east and west of the tunnel for a planned Aug. 9 reopening, when it became clear that the tunnel was fighting back. Heavy rain in the area caused water and mud to hamper the repairs, and MRL was forced to close the tunnel indefinitely. The staged trains had to turn back and detour around the tunnel. Finally, on Aug. 14, after the longest service interruption in the railroad's history, the tunnel reopened to trains. MRL gave tunnel workers a week off after the reopening, a much-needed break that enabled trains to flow through uninterrupted while the railroad cleared its backlog.

The Mullan Tunnel project was expected to last through November 2009, but with the delay that followed the July collapse, that deadline is under review, and will likely extend into this spring. The project is expected to cost the railroad about \$18 million. Eight-hour work windows were to persist through the end of 2009, forcing the railroad to stage four to five trains daily at its Helena and Missoula, Mont., terminals. **I**



On Sept. 16, 2006, a westbound BNSF manifest with a Montana Rail Link helper set leading blasts out of the west portal of Mullan Tunnel at Blossburg, Mont. The smoke plume, sometimes referred to as "the black fog of Blossburg," can cause mid-train helper sets to shut down as they pass through the tunnel. Tom Danneman





In September 2009, contractors excavate above the west portal of the tunnel, exposing the old brick lining. Montana Rail Link



The east portal, shown here in 2004, was largely obscured from most angles by the attached blower system. Tom Danneman

Bye-bye, blowers



In June 2009, the unique blower system structures at Mullan Tunnel's east portal are being dismantled. Montana Rail Link

Since Mullan Tunnel was built on a grueling 2.2-percent grade and track speeds are slow, the railroads operating westbound trains through the tunnel needed a system that could blow the exhaust gases and smoky air out ahead of the train to keep crews safe. Northern Pacific installed the tunnel's original coal-fired and steam-powered system in 1914. A modernized electrically-powered system came in 1948. In the early days, the ventilation system would automatically engage when a westbound train reached Skyline, a railroad location just east of the tunnel. Burlington Northern removed the automatic functions of the system in the 1970s, but left the blowers intact. In 1993, MRL reactivated one of the fans. The railroad's signal department later installed equipment that enabled employees to activate the blower by punching a code into a railroad radio. The system was used only in emergencies, or when work was being performed inside the tunnel. Since the air will be flowing more efficiently after the tunnel project is completed, and a portion of the eastern end of the tunnel will be daylighted, MRL forces have removed the unique ventilation system (see Montana Rail Link photo above). — Tom Danneman

Lombard, Montana

by Tom Danneman

As I meander down the rugged gravel road into what had once been the town of Lombard, Mont., I can't help but wonder what it must have been like here in the earliest decades of the past century. The road I'm on didn't exist then, and driving to Lombard would have been impossible. Rail was the only way in or out. The Milwaukee Road's Pacific Extension, which crossed the Northern Pacific here, has been abandoned for nearly three decades. But even when Milwaukee's rails were salvaged, Lombard the town had long since dried up and blown away.

Only the Montana Rail Link main line, the fading Milwaukee Road right-of-way, the lazy Missouri River, and the beauty of the surrounding canyon walls grab your attention these days.

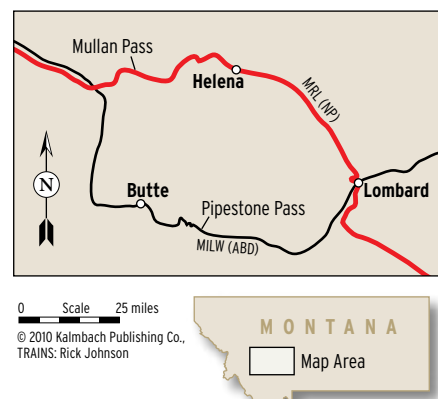
The town of Lombard was named after A.G. Lombard, the chief engineer of the Montana Railroad. Otherwise known as "The Jawbone," the Montana Railroad was incorporated into the Milwaukee in 1908, and became part of the Pacific Extension's main stem.

Though Lombard in the Jawbone days could boast an engine house, a maintenance shop, two depots, a hotel, a post office, a general store, and various other buildings, the community was never much more than a connection and interchange point with the Northern Pacific.

However, Lombard did manage to stake a few claims to fame. On June 27, 1925, a 6.75 magnitude earthquake struck near there, resulting in separate rockslides that landed on both the NP and Milwaukee main lines. The quake was perceptible as far away as South Dakota, Washington, and Alberta.

Lombard also played a starring role in the 1930 feature film "Danger Lights," where a speeding train crosses the Missouri River and passes a stopped *Olympian* in a climactic scene. A circus even came to town in its heyday.

Nothing remains of Lombard today except a couple of rotting hulks of old automobiles, the former Milwaukee Road bridges and right-of-way, and the former NP main line, now part of Montana Rail Link. Even with that, I'll always enjoy the peaceful beauty that surrounds this almost forgotten place, especially at moments when MRL trains shatter the tranquility.



2009

On Sept. 22, 2009, an east-bound empty BNSF coal train behind a new SD70ACe winds its way along the same curves as the NP FTs once did. Little has changed here in the six decades between these two photos. Besides the obvious changes in train consists, only telegraph poles and wire have since vanished. The big changes took place in Lombard itself, immediately ahead. TRAINS: Tom Danneman

1947

On July 28, 1947, Northern Pacific extra freight No. 6010 snakes its way east through the sharp curves along the Missouri River west of Lombard, Mont. At the time, no roads reached Lombard, and the photographer undoubtedly arrived by train. The FTs are moments from passing beneath the Milwaukee Road. W.R. McGee



COVER STORY

SURVIVOR

From Day 1, Montana Rail Link has overcome adversity. Here's how the railroad has managed to survive for more than 25 years, and how it plans to prosper—even beyond the year 2047

Story and photos by Tom Danneman



The sun finally peeks out at the end of a cloudy day as Montana Rail Link's Gas Local switches the ConocoPhillips/ExxonMobil unloading facility east of Thompson Falls, Mont., on May 5, 2012.



On Sept. 10, 2011, two GP35s lead the Harrison Local toward Sappington, Mont. This location is about four miles north of Harrison.

Another gorgeous spring morning begins under Montana's big skies. Engineers Charlie Kehrwald and Jeff DeMers start their workday in an unassuming metal structure planning how to gather cars in the tiny yard in Logan. Charlie and Jeff will be taking Montana Rail Link local train No. 844 west on the railroad's Fifth Subdivision to drop off and round up cars for customers between Logan and Sappington. The plans are finalized, and Jeff climbs aboard GP35 No. 405, opens a hood door, and starts the locomotive. After a small puff of blue smoke from the exhaust, the old Geep comes to life. So far, this sounds like the story for any local on a Monday morning on any given U.S. railroad. MRL's Fifth Subdivision is not just any branch line, though.

This is the former Northern Pacific passenger main line that, at one time, went west to climb up and over spectacular Homestake Pass and descend into Butte. NP's flagship passenger train, the Raymond Loewy-designed two-tone-green *North Coast Limited*, once blazed across this line. The route survived into Amtrak days and hosted its *North Coast Hiawatha*, but when that came off in 1979, the only trains left were a Burlington Northern local freight

and occasional through trains detoured away from the line over Mullan Pass. (NP's and BN's main freight route went from Logan to Garrison via Helena and Mullan Pass.) That was true until 1983, when BN embargoed the slow, twisting portion over Homestake Pass. In 1987, this segment and much of the former NP across Montana was deemed surplus, and BN placed this portion of the railroad on life support.

A NEW RAILROAD IS BORN

At 12:01 a.m., on Oct. 31, 1987, the new Montana Rail Link began operations. BN and Montana industrialist Dennis Washington came to an agreement to lease the main line from Jones Junction, Mont., just east of Billings, to Sandpoint, Idaho, for 60 years, with the option to purchase the main line outright in 2047. The new railroad also obtained trackage rights over BN from Sandpoint into Spokane, Wash. In addition, MRL purchased outright the branch lines radiating from the main. In the beginning, BN retained ownership over the main line from Helena Junction to Phosphate, but granted trackage rights to MRL. Burlington Northern wanted to retain access to a mine at appropriately named Phosphate, as well as protect the interchange with short line Montana Western at Garrison. This meant that train dispatching, track maintenance, and helper

service over Mullan Pass were still BN's responsibility.

This arrangement created an island in MRL territory and brought about an unusual situation for its dispatchers in the Missoula headquarters. BN ran through freights on overhead rights across MRL, and the dispatchers would see an "overhead train" disappear from their computer screens as it rolled past either Phosphate or Helena Junction, reappearing again at the other end. In 1992, MRL acquired this portion from the BN, creating a seamless 623-mile main line (including the rights into Spokane).

Also included in the lease was the 64-



An MRL engineer starts the engine on GP35 No. 406 in Logan, Mont. The crew will use the unit for a trip on the branch to Harrison.

mile 10th Subdivision main line over Evaro Hill, from DeSmet, west of Missoula, to Paradise, where it rejoins the Fourth Subdivision. (In NP days, the route now known as the 10th Sub was the primary passenger route.) Much like its sister Homestake Pass line, BN found the DeSmet-Dixon line, with its 2.2-percent grades over Evaro Hill, to be expendable, and removed through traffic from it in 1984. Shortly into the MRL lease, the new railroad reopened the entire 10th Subdivision and once again ran through trains, mostly eastbound, over it.

Even though MRL has been successful, the road has been bumpy at times, even on Day 1. BN's spin-off of what became MRL was partially born out of bitter labor disputes, especially around Livingston, the site of a former NP shop. On MRL's fateful first day in October 1987, someone set three unattended locomotives in motion at full throttle up Bozeman Pass west of Livingston. The speeding units went up and over the pass, and after reaching an estimated 80 mph, they plowed down an embankment on a curve in West End. The wreck caused extensive damage to a BN SD40-2 and two new leased LMX B39-8s.

Another setback occurred in 2009, when Mullan Tunnel just east of the crest of the Continental Divide, collapsed during a major rehabilitation project [see "Breathing Easier in Mullan Tunnel," February 2010]. The collapse closed the railroad for 25 days, MRL's longest service disruption to date.

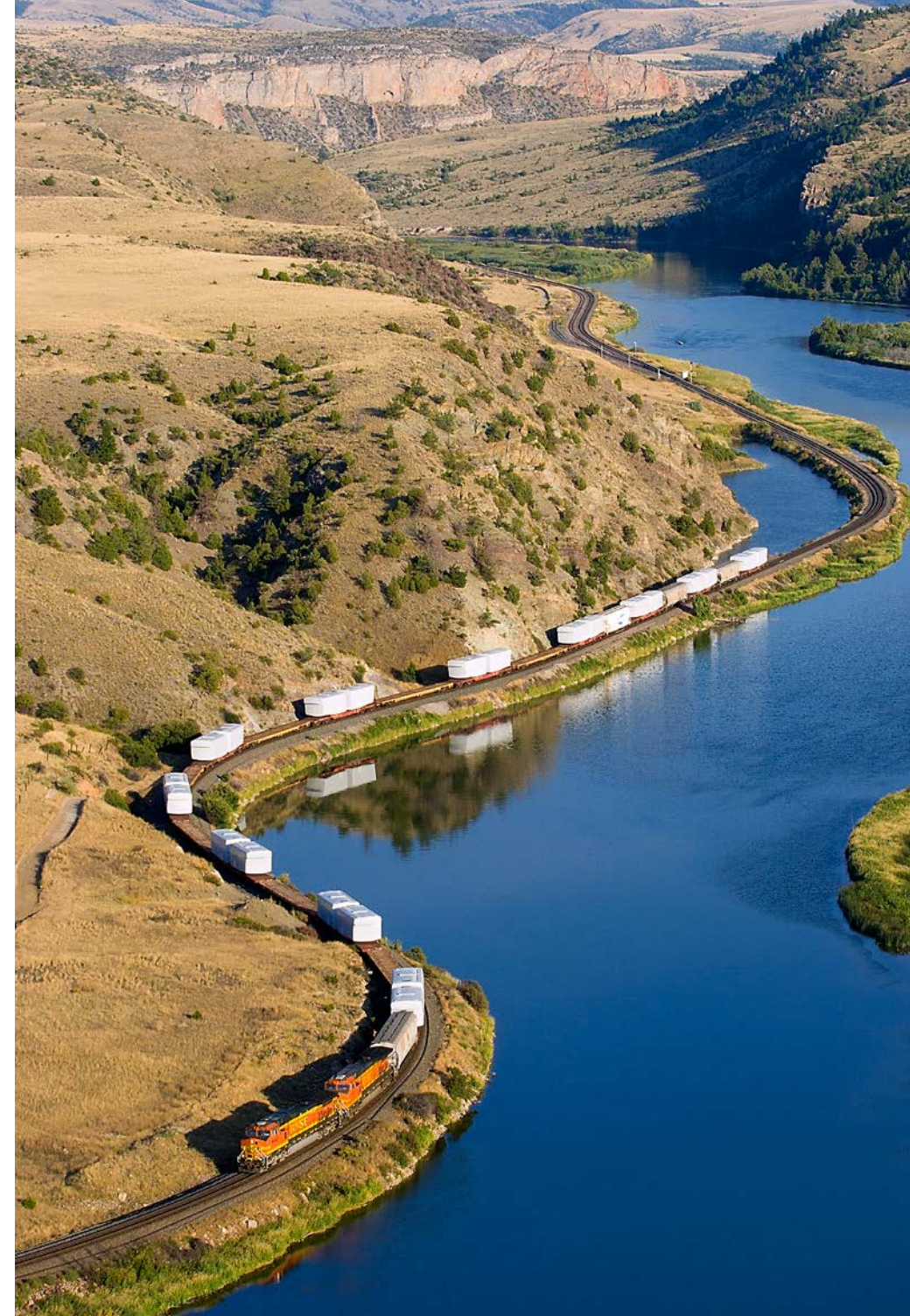
The railroad has also lost important customers over the years. During 2008 and 2009, the recession and the faltering forest products industry caused the closure of lumber mills in Bonner and Pablo, as well as MRL's largest online customer, linerboard manufacturer Smurfit-Stone Container in Frenchtown. The shuttering of the mills in Frenchtown and Bonner forced the railroad to abolish Missoula-based locals and lay off 50 employees. Closure of the Plum Creek Timber sawmill in Pablo spelled the end of the 11th Subdivision, from Dixon to Polson.

"Losing Plum Creek was like losing Sears and J.C. Penney out of a mall," says MRL President Thomas Walsh. The three mills were huge traffic generators for MRL.

To further complicate the situation, high water washed out a culvert in June 2011 between Florence and Stevensville on the Ninth Subdivision to Hamilton. The railroad embargoed service on the branch until repairs were completed in May 2012.

TRAFFIC LOST, GAINED, AND GUARANTEED

After gathering up the cars in Logan, Charlie throttles up his finely tuned 1965-vintage GP35 and heads for the first stop. The crew will set out ballast cars at Willow Creek, to be picked up by a BNSF



A BNSF unit train of wind turbine nacelles rolls along the Missouri River near Lombard, Mont. The boxes house the gears, drive train, and control electronics of a wind turbine.

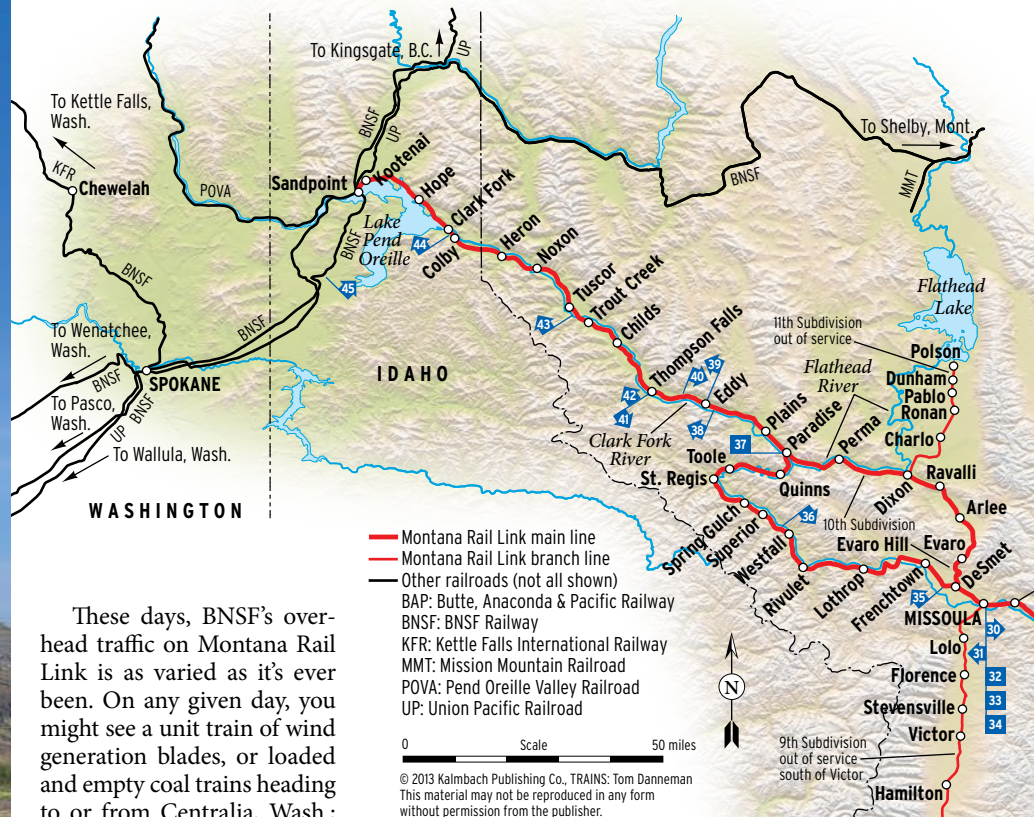
ballast train destined for the Pipestone Ballast Quarry at the eastern foot of Homestake Pass. The quarry is one customer gained since MRL was born. In fact, the biggest customer for ballast from Pipestone is not the MRL but BNSF.

One aspect of the lease required BN (BNSF since September 1995) to route a certain amount of overhead traffic across MRL — enough trains to equal or surpass an agreed-upon amount of carloads each year. Montana Rail Link won't cite the exact amount in the contract, but it main-

tains that the count rarely comes close to the minimum and that currently, MRL is receiving significantly more than the contract minimum.

Over the years, MRL has maintained a positive relationship and is in constant communication with BNSF in regard to what traffic will be routed over MRL. "Our relationship with the BNSF is the best it's been in the 25 years that we've been in business," Walsh says. "The key to our success is to provide BNSF with the best service we can, just like we would any on-line customer."

The westbound Gas Local threads its way along the Flathead River east of Perma, Mont., on May 8, 2012. Montana Rail Link's Gas Local carries gasoline, diesel fuel, and aviation fuel from Missoula to a ConocoPhillips/ExxonMobil facility just east of Thompson Falls.



— Montana Rail Link main line
 — Montana Rail Link branch line
 — Other railroads (not all shown)
 BAP: Butte, Anaconda & Pacific Railway
 BNSF: BNSF Railway
 KFR: Kettle Falls International Railway
 MMT: Mission Mountain Railroad
 POVA: Pend Oreille Valley Railroad
 UP: Union Pacific Railroad

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These days, BNSF's overhead traffic on Montana Rail Link is as varied as it's ever been. On any given day, you might see a unit train of wind generation blades, or loaded and empty coal trains heading to or from Centralia, Wash.; Portland (Ore.) General Electric; Roberts Bank port in British Columbia; and occasionally Ridley Terminals in Prince Rupert, B.C. Manifest freights head east from Pasco and Spokane, Wash., and west from Kansas City, Kan., and Laurel, Mont., for example. Throw in empty and loaded grain trains; occasional extra "Boeing Specials" of 737 fuselages and other parts; and detours off the ex-Great Northern "High Line" in northern Montana when BNSF has trackwork projects, traffic levels are high, or when service is disrupted, and MRL has plenty of trains to handle.

Montana Rail Link also runs a manifest freight of its own in each direction between its large classification yard in Laurel and Missoula. This train picks up and sets out cars in Livingston, Helena, Garrison, and Missoula. All this adds up to about 15 trains a day on the main line.

SEEKING NEW CUSTOMERS

After the lease-and-purchase agreement was signed, Montana Rail Link immediately looked to gain on-line customers. In many cases, these firms had shipped with the Burlington Northern, but MRL looked for new traffic as well. The Gas Local [see "Haulin' Gas," November 2007] is proof. The Gas Local, which hauls gasoline, diesel fuel, and jet (or aviation) fuel, bridges a gap in the joint ConocoPhillips/ExxonMobil Yellowstone Pipeline between Missoula and Thompson Falls.

Even though the recession put a large

dent in on-line traffic, MRL has worked hard to gain new traffic and keep what it has. At the old Stimson Lumber mill site in Bonner, two building suppliers have taken up residence, providing both inbound and outbound traffic. Also occupying space there is log-chipper Willis Enterprises, which someday could supply up to 2,000 or 3,000 loads of wood chips a year to a Boise Inc. paper mill in Wallula, Wash. If carloadings reach this level, Willis would be one of MRL's top 10 customers.

Tricon Timber in St. Regis, a producer of stud-framing lumber, posts and poles, and wood byproducts, has been a good MRL customer over the years but has been hurt by the housing crisis. Moreover, the devastating Mountain Pine Beetle has decimated the timber industry in Montana. The beetle boars into the inner bark of Lodgepole and other pines to lay eggs. The larvae feed on the tree, which disrupts the flow of nutrients and kills it. Typically, pine trees are a main source of two-by-four studs and other dimensional lumber for the building industry.

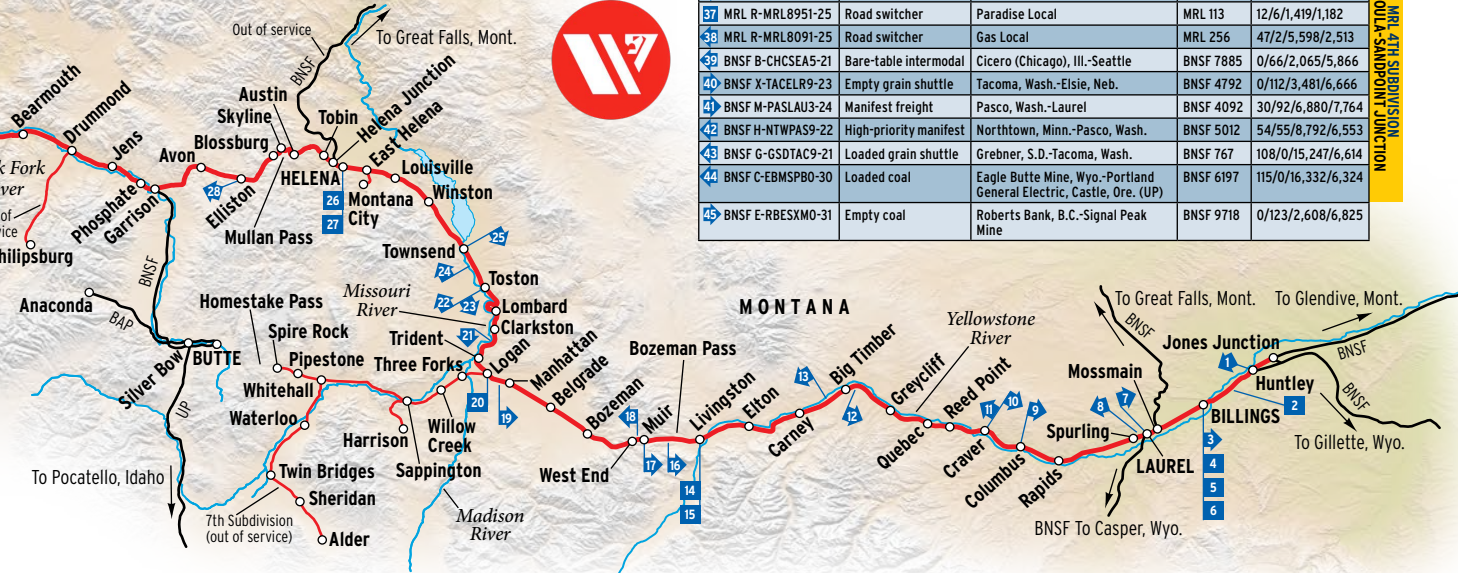
Even though the beetle-killed timber may be



MRL President Tom Walsh

TRAINS ON THE MONTANA RAIL LINK: 10:00 A.M. 2/25/13

| Direction/Train symbol | Train type | Origin-Destination | Lead locomotive | Loads/Empties/Tons/Feet |
|------------------------|------------------------|---|-----------------|-------------------------|
| 1 BNSF C-EBMSPB0-31 | Loaded coal | Eagle Butte Mine, Wyo.-Portland General Electric, Castle, Ore. (UP) | BNSF 9926 | 115/0/16,434/6,327 |
| 2 MRL Y-BILO500-25 | Yard job | Billings/Laurel | MRL 132 | 0/0/0/0 |
| 3 BNSF X-LVWSSD9-21 | Empty grain shuttle | Longview, Wash.-Selby, S.D. | BNSF 5248 | 0/112/3,474/6,863 |
| 4 MRL Y-BILO900-25 | Yard job | Billings/Laurel | MRL 17 | 0/0/0/0 |
| 5 MRL Y-BILO800-25 | Yard job | Billings/Laurel | MRL 51 | 0/0/0/0 |
| 6 BNSF K-LAULAU | Helper service | Power-assist locomotive | BNSF 1085 | 0/0/0/0 |
| 7 BNSF H-LAUNTW1-25 | High-priority manifest | Laurel-Northtown, Minn. | UP 7210 | 40/56/6,765/5,909 |
| 8 MRL M-LAUMIS1-25 | Manifest freight | Laurel-Missoula | MRL 264 | 21/34/3,760/3,143 |
| 9 BNSF H-PASGAL9-24 | High-priority manifest | Pasco, Wash.-Galesburg, Ill. | BNSF 5022 | 88/4/11,099/6,887 |
| 10 BNSF H-PASLIN9-24 | High-priority manifest | Pasco, Wash.-Lincoln, Neb. | BNSF 4759 | 25/39/3,914/4,969 |
| 11 BNSF V-SPMWN3-21 | Vehicles | Springfield, Mo.-Wenatchee, Wash. | BNSF 7363 | 41/0/3,072/3,949 |
| 12 BNSF E-CECSCM0-28 | Empty coal | Centralia, Wash.-Spring Creek Mine | BNSF 9217 | 0/125/3,092/6,929 |
| 13 BNSF H-KCKPAS9-22 | High-priority manifest | Kansas City, Kan.-Pasco, Wash. | BNSF 5362 | 55/38/7,939/6,530 |
| 14 MRL K-LIVHLP3-25 | Helper service | Bozeman Pass | MRL 4312 | 0/0/0/0 |
| 15 MRL R-MRL8411-25 | Road switcher | Livingston Local | MRL 404 | 2/1/296/320 |
| 16 BNSF E-RBESCM0-21 | Empty coal | Roberts Bank, B.C.-Spring Creek Mine | BNSF 6094 | 0/125/2,653/6,929 |



unsuitable for the domestic building industry, Tricon found a customer for the peculiar blue-stained wood. MRL hauls the logs from Laurel and Helena to Tricon in MRL-owned log cars, where the wood is processed into studs for export to China for use as concrete forms in construction projects. The studs go west on MRL to the Pacific coast for export. Even though this business has decreased lately, domestic demand is on the uptick, and Tricon continues to accept logs and ship out finished lumber. Some of those same pulp logs from Helena are moving across MRL to Pacific Fibre Products in Longview, Wash., where they are chipped for Weyerhaeuser.

UPS AND DOWNS

The news hasn't been as good for the 11th Subdivision to Polson. A cruel irony was that MRL's biggest customer on the branch a year after the Plum Creek mill in Pablo closed, was hauling out the scrap during the plant's demolition. "The unfortunate thing is that when it's scrapped, the business will likely never come back,"

Walsh says. The branch remains closed.

In spring 2012, the railroad met with Ravalli County officials and the five customers that were affected by the washout on the Ninth Subdivision to Hamilton. They worked out an agreement that guarantees a certain amount of carloads and revenue for a one-year period. Ravalli County will cover any shortcomings to ensure that MRL at least breaks even for operating the branch. The railroad and the branch's customers hope this buys time for new traffic to develop, so the branch can remain open.

"We don't intend to abandon the Darby Line, or the Polson Line, forever," Walsh says. "We hope that someday we'll be able to have the Polson Line back in service, and maintain service on the Darby Line."

The Smurfit-Stone Container mill in Frenchtown, once MRL's biggest customer, is being scrapped. At one time, things were looking up. An investment group specializing in purchasing and cleaning up industrial sites for "green" redevelopment bought the property and was hoping

to attract new tenants, but nothing has materialized for MRL other than hauling out loads of scrap from the demolition of the mill.

Montana Rail Link is also monitoring an unpredictable situation in the Pacific Northwest. The proposed Cherry Point coal export facility near Bellingham, Wash., the largest of several proposed Pa-



Two BNSF coal trains meet at Winston, Mont. The locomotives from MRL's No. 840 local help the westbound train up Winston Hill.



The local to Polson meanders along the now-closed Eleventh Subdivision branch line north of Charlo, Mont., on Sept. 23, 2008.

cific Northwest facilities, is going through stages of permitting and environmental impact statements. Once open, it would expand the reach of Powder River Basin coal exported from the west coast. Environmental groups and others that are against more coal trains running through their communities are pitted against unions and businesses that would welcome new jobs. If Cherry Point and other facilities are built, MRL stands to gain more coal traffic, figuring it could host four more each loaded and empty coal trains a day.

Another recent addition to the line-up is unit crude-oil trains from the Bakken Formation in North Dakota and eastern Montana. The lack of pipeline capacity in the region has led oil producers to turn to railroads to ship crude across the country, including the Pacific Northwest. Two refineries in Washington, U.S. Oil & Refining in Tacoma and Tesoro near Anacortes, have been accepting trains of Bakken crude oil, some of which MRL has handled. Proposals also exist for a refinery for Cherry Point as well as an oil export facility at the Port of Grays Harbor.

While many of these trains could be routed entirely over BNSF, some are likely to find their way across the MRL. Aside from the crude oil itself, MRL anticipates solid traffic growth potential for the transloading of “frac sand,” as well as an upswing in the building supply industry, which is directly related to the Bakken oil boom.

Another potential traffic generator for MRL is slag from the former ASARCO smelter in East Helena. Slag is the remnant of the waste product produced when lead is removed from ore. It is said that the site, which closed in 2001, contains 2.5 million tons of slag, which is believed to contain zinc concentrate. Starting in 2014, MRL is hoping to move 1,000 to 1,500 carloads a year to a zinc and lead smelting and refining facility in British Columbia.

THE HARRISON BRANCH: A UNIQUE OPERATION

After setting out the ballast cars in Willow Creek, the 844 local heads west to what is arguably the most interesting and unusual 10 miles of the MRL system. Charlie

once again notches the throttle back and takes off for Sappington. In Sappington, Imerys Talc operates a plant that is a good shipper for MRL, but the local doesn't have any work there today. Just west of the plant is where the Sixth Subdivision branch line to Harrison leaves the Fifth Subdivision.

Until early 2012, the Fifth Subdivision was in the territory of the Helena Local,



Engineer Charlie Kehrwald takes GP35 No. 405, and the 844 local, up the steep grade three miles south of Sappington, Mont.

which originated 74 miles from Logan in Montana's capital city. The Helena Local had a hard time trying to serve all the customers between Helena and Logan, as well as at Three Forks and Sappington. Since business in this area stayed relatively strong during the recession, and new customers in Logan such as Circle S Seeds, which ships barley to MillerCoors for brewing, started shipping, the Helena Local crew would often run out of duty hours before they could get back to Helena. As business started to grow, MRL decided a dedicated local would serve Logan, the Fifth Subdivision, and the Harrison Branch, and in February 2012, the Logan Local was born.

Since the Harrison Branch now was the Logan Local crew's responsibility, it meant MRL didn't have to call an extra crew out of Helena to hop in a company vehicle to drive all the way to Logan and then run up the Harrison Branch and return. Nothing unusual about this, you may say, but here's where it gets more interesting.

As our local arrives in Sappington and rolls past the talc plant, Charlie throttles the GP35 down to a stop so Jeff can throw



On Sept. 10, 2011, a crewman of the Harrison Local opens one of four cattle gates on the Sixth Subdivision. This gate is located about 2 miles north of Harrison, Mont. The crew must open and close the gates every time the train passes through.

the switch to proceed onto the Sixth Subdivision. About a third of a mile later, Charlie stops the train again. This time, Jeff climbs down from the locomotive and opens what looks like your average street-side mailbox, but it's right along the track. The line to Harrison is within block registry territory. Inside the “mailbox” is a register book that trains or maintenance-of-way crews must sign prior to occupying the track. If no one is registered, they fill out the required information to gain sole occupancy of the main track. If someone is registered, they must contact that person and reach an understanding that the limits will be occupied jointly, and both must operate at restricted speed.

When leaving the territory, the occupant writes his time out and simply strikes a line through the entry in the register signifying they are out of the territory. After signing the register, Jeff climbs back on board No. 405, and we head for Harrison.

Even though today's local only has three empty grain hoppers, two loads of fertilizer, and a caboose, you can hear the GP35 working hard. It isn't helping things that Charlie's pace is interrupted by what is certainly the most unique aspect of this branch — if not any branch elsewhere in the country. Scattered along the 10-mile branch are four cattle gates. That's right. Like something out of a John Wayne-era western, ranchers here maintain simple tubular gates over the track to keep their cattle from roaming.

As we pull up to the first gate about 2 miles from Sappington, the crew notices it's open. Since the speed limit for the entire branch keeps the local down to just 10 mph, Charlie can maintain his pace and continue upgrade without stopping. The slow speed also enables Charlie to stop in case one of those bovines strays onto the track. After all,

this is open-range country, and the cattle are free to roam — even on the railroad.

Bill Brodsky, former MRL president, recalled one of the first trips on the Harrison Branch in 1987. The local pulled to a stop to open the cattle gate near the Highway 359 crossing, and while the local was stationary, the train just toppled over, the branch was in that sad of shape. Since then, MRL has replaced ties and performed other track maintenance, and today the Harrison Line is in good shape.

During another trip, the crew made it up to the U.S. Highway 287 crossing near Harrison when they noticed something unusual and came to a stop. Road workers had paved right over the tracks! “It seems as though they didn't realize that we still ran trains out here,” says Jay Hart, road foreman/trainmaster. The crew had to take the train back to Sappington and try again another day after a road crew dug out the crossing.

This cannot be 2013, can it? Here we have a local freight that serves just one customer up a 10-mile branch line in the middle of nowhere, with cattle gates, seven wooden trestles, and a stiff grade on the route. Harrison Elevator Co. is an import-



Engineer Jeff DeMers keeps an eye on the right-of-way from a caboose as MRL's No. 844 local backs down the Harrison branch.



Montana Rail Link's 844 local crosses Little Antelope Creek on an old but well-maintained wood trestle 4 miles north of Harrison, Mont.



On May 7, 2012, the 844 local switches Harrison Elevator in Harrison.

ant customer for MRL, but would Harrison have a railroad to ship on if it were a Class I branch? "There's no doubt in my mind that if MRL didn't exist, the line to Harrison would not be around today," Walsh says. Harrison Elevator is a good customer, for in 2012 Montana Rail Link hauled

23 loads of fertilizer to the elevator and brought out 105 loads of grain.

The Harrison line was built in 1890 to serve gold-and-silver mining concerns, and once went an additional 10 miles beyond Harrison to Norris. The branch is short on length but makes up for that in scenery. Charlie and Jeff are enjoying the view as we meander through the scenic and rugged Big Antelope Creek canyon. A short time later, Charlie mentions we are rolling through scenes that were featured in a television mini-series, "Return to Lonesome Dove," a 1993 sequel starring Jon Voight. If you weren't staring out over the nose of a second-generation EMD, and behind you wasn't a handful of well-worn hoppers, you could easily imagine you are riding a 19th- century steam train. Not only is the scenery top-notch, but with the grueling 8-mile, 2.2-percent grade out of the Jefferson River valley, it also tests the motive power. This branch is four-axle territory, so the crews can't rely on the extra tractive effort of one of MRL's six-axle units.

THE HORSEPOWER

Charlie's locomotive on the Harrison local is certainly no stranger to mountains and tough grades. EMD built Montana Rail Link No. 405 in 1965 as Denver & Rio Grande Western No. 3047. In January

1995, leasing company OmniTrax acquired the unit, which kept its original number until 1997, when it became MRL 405. Most of MRL's locomotives are hand-me-downs, and their lineage reads like an alphabet soup of "fallen flags." MRL still has locomotives that were built for Atlantic Coast Line, Chicago Great Western, Grand Trunk Western, Inland Steel, Southern Pacific, and Union Pacific (OK, UP's flag still flies). At start-up, MRL purchased from BN 52 locomotives including SD40s, GP9s, and switchers. Since then, MRL has mainly stayed in the used-locomotive market, buying everything from SW1500s to SD45-2s. One exception: 16 brand-new EMD SD70ACes acquired in 2005, more on which soon.

The hand-me-down units aren't "junkers." All MRL's remaining SD40s were rebuilt between 1990 and 1993 into what MRL calls SD40-2XR, for "extra reliable," a program that brought them up to Dash-2 electrical specifications, with new wiring and rebuilt trucks. The work was done at Livingston Rebuild Center, a firm that owned most of the shop complex in its namesake city after MRL's start-up. At that time, MRL acquired from BN the run-through light-repair facility and service area on the south end of the complex. In 2000, the rebuild center sold the shop com-



The eastbound Gas Local, with SD45-2 No. 332, rolls past the GP9-equipped Paradise Local and the former NP depot in Paradise, Mont.

plex (with the exception of MRL's portion) to Talgo, and it became Talgo-LRC. Finally in 2006, MRL purchased the entire complex from Talgo.

Montana Rail Link's motive-power philosophy is to keep the existing fleet active as long as possible. One way it can accomplish this is by assigning each unit to a specific service and giving all a semi-permanent home. For example, SD70ACe No. 4312 and SD45 No. 328 were assigned to the Gas Local, and GP9 Nos. 113 and 127 were assigned to the Paradise Local. The people that maintain them, and the crews that run them, get to know them and their quirks. "They like their locomotives, and take care of them, kind of like you and your car. You get to know it; you trust it," says Claude Van Winkle, the railroad's chief mechanical officer.

Maintenance personnel at the unit's home location conduct the federally mandated 92-day inspections and note what might cause problems later, or what may need attention during its next trip to the Livingston shop.

"Our goal is to see the locomotives in Livingston just once a year," says Van Winkle. Shop workers spend more time on preventative maintenance than repairs, changing bearings, profiling the wheels, cleaning or changing the traction-motor brushes, and looking for leaks.

"We don't wait for them to break," Van Winkle says. On a day-to-day basis, MRL would like to have 54 units ready to roll. Of those, MRL wants 43 to be immediately available. The fleet's overall availability is in the high 90-percent range on any given day.

Charlie's GP35 is another example of

MONTANA RAIL LINK LOCOMOTIVE ROSTER

| Model | Qty. | Numbers* | Notes; current as of March 15, 2013 |
|-----------|------|---------------|---|
| SW1200 | 5 | 12-18* | 13 and 17 operational, others stored |
| SW9 | 1 | 16 | Stored serviceable |
| SW1500 | 2 | 51-52 | Former Inland Steel |
| GP9 | 13 | 109-133* | 109, 113, 120, 127 operational, others stored/maintenance |
| SD40-2 | 1 | 250 | Only true SD40-2 on the roster |
| SD40-2XR | 15 | 251-265 | Rebuilt by LRC. Former SD40s |
| SDP40-2XR | 1 | 290 | Rebuilt by LRC. Former GN SDP40 |
| SD45-2 | 2 | 301, 311 | True SD45-2s. 301 stored/parts source |
| SD45-2 | 1 | 332 | Rebuilt SDP45 in SD45-2 carbody |
| SD45-2 | 17 | 315-331* | Upgraded or rebuilt, in original SD45 carbodies. Some stored/maintenance |
| SD45-2M | 3 | 346, 355, 382 | Upgraded, in original SD45 carbodies |
| SD45M | 1 | 351 | Upgraded, in original SD45 carbody. Stored in Livingston |
| SD45-2XR | 1 | 356 | Rebuilt by LRC. In original SD45 carbody. Stored/parts source |
| F45M | 1 | 390 | Upgraded F45. Former BN, NYSW. Stored |
| F45 | 1 | 392 | Former BN, NRE, Transisco Tours, WSOR, IMRL. Stored |
| GP35 | 6 | 401-406 | 401-402 former GTW/DT&I, 403-405 former OTRX/DRGW, 406 former SP |
| SD9 | 2 | 608, 610 | 608 stored, 610 leased to an industrial switching company in Texas |
| SD19-1 | 2 | 651, 652 | Rebuilt by LRC. Former SD9s. Leased to an industrial switching company in Texas |
| SD35 | 3 | 701, 702, 705 | Former N&W high hoods, now chop-nosed |
| SD35M | 1 | 703 | Upgraded former SCL SD35 |
| GP40 | 1 | 3025 | Former WC. Being rebuilt in Livingston |
| SD70ACe | 16 | 4300-4315 | Delivered new from EMD in 2005 |

*Not all consecutive
 BN: Burlington Northern; DRGW: Denver & Rio Grande Western; DT&I: Detroit, Toledo & Ironton; GN: Great Northern; GTW: Grand Trunk Western; IMRL: I&M Rail Link; LRC: Livingston Rebuild Center; NYSW: New York, Susquehanna & Western; NRE: National Railway Equipment; N&W: Norfolk & Western; OTRX: OmniTRAX; SP: Southern Pacific; WC: Wisconsin Central; WSOR: Wisconsin & Southern
 Thanks to Brent Mueller for assistance with this roster.

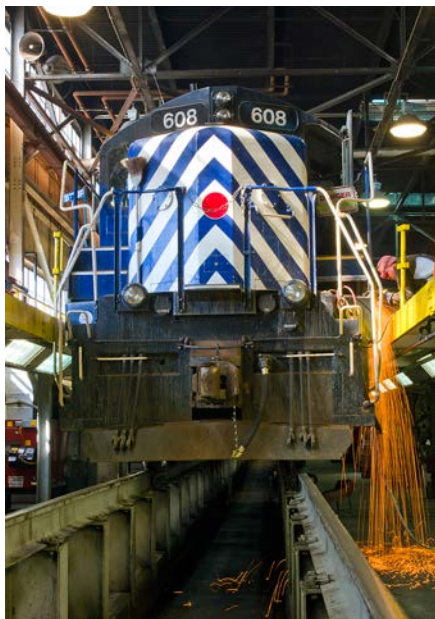
how MRL keeps these old brutes in shape. In 2009, the 405 received a major overhaul similar to the SD40-2XR program, which included truck rebuilds, rewiring, an upgraded adhesion package, new 645 power assemblies, water pumps, oil pumps, injectors, and all-new rod, main, and cam bearings. This was all done by MRL people in Livingston.

No. 405 wasn't alone. Over the past seven years, all the high-horsepower locomotives

have gone through what MRL calls a "mini-class" overhaul, which includes replacing power assemblies, gaskets, oil and water pumps, and changing traction motors. While not all MRL's power has been through a major rebuild since being acquired, many locomotives have received various levels of upgrades. For example, SD35 703 received Q-tron microprocessor computer controls, which improve fuel economy and adhesion performance.



Four EMD locomotive models can be seen in this overview of MRL's main shop building in Livingston, Mont. No. 301 is a parts source.



A machinist at Livingston repairs sheet metal on one of MRL's surviving SD9s.

The railroad has also retrofitted 26 locomotives with auxiliary power units. These compact diesel-powered generator units are installed in the engine bay and operate independent of other locomotive systems. The APU automatically maintains the engine's coolant and lube-oil temperature, and

charges the batteries, enabling the locomotive to be shut down, even in cold weather. The APUs help reduce fuel consumption and meet U.S. Environmental Protection Agency emissions regulations. Today, 90 percent of MRL's fleet is equipped with an APU or an automatic shutdown feature.

Not all the locomotives MRL has had over the years have avoided the scrapper's torch. At one time, MRL was heavily involved in leasing its locomotives, mainly to BNSF, but that market has dried up. Wrecks have taken a few, but MRL is not shy about scrapping under-performing units. Those that have gone to scrap have been stripped of useful parts and have been donor locomotives to keep others running, or to upgrade them. MRL, which has about 100 units on the property, does maintain a stable of stored locomotives in Livingston for future use if traffic warrants their return to service. Kept inside an old shop building and in running condition, they include GP9s, SD45s, SW1200s, and MRL's last two F45s. "We'll keep those since they aren't worth much to most people," Walsh says, "but if we ever needed them for a surge in business, they're worth a lot to us."

Out of all the locomotives MRL has purchased, the most anticipated were the 16 new EMD SD70ACes in 2005. In fall 2004, MRL tested five CSX SD70ACes in helper

service on Mullan Pass. The tests went well, and MRL found the fuel savings and increased pulling power alone were impressive. Grain and coal trains ("heavies" or "doubles" as MRL refers to them) rated not one but two sets of four SD40s or SD45s to help them over Mullan Pass. Now four SD70ACes do the work of eight of the older units on Mullan, and three SD70ACes (or two SD70ACes and an SD40 or 45) can replace five older units in helper service out of Livingston on Bozeman Pass.

This all saves fuel, but also means fewer helper crews. The bottom line is that they are big, beefy, and powerful, yet frugal, locomotives,



In May 2012, this former Wisconsin Central GP40 was stored indoors in Livingston. Fortunately, No. 3025 is being rebuilt.



On the morning of Oct. 10, 2005, a helper set, with SD70ACe No. 4309, waits in Helena for the next BNSF train to push up Mullan Pass.

as MRL figures the SD70ACes have a fuel savings of greater than 20 percent over the older SD40s and SD45s in helper service. In 2011 alone, the helpers accumulated 131,000 miles from round trips in service on Mullan and Bozeman passes. Since their purchase, the SD70ACes have paid for themselves in fuel savings alone.

MRL's SD70ACes had early teething problems, suffering from clogged filters after running through the extremely dirty environment of Mullan Tunnel. Of course, the SD70ACe is more technologically advanced than older power, so one is more sensitive to harsh conditions. "It's such a drastic change in temperature that the 70ACes operate in," Van Winkle says. "It can be 20 degrees below outside of the tunnel, and minutes later, it can be 200 degrees." These extreme conditions can cause problems for any locomotive, but the tunnel rehabilitation has eliminated most of the issues.

THE MANPOWER

When we reach Harrison, we see employees of the grain elevator and fertilizer termi-

nal waiting patiently for us to arrive. This is the beginning of the growing season in Montana. They want their fertilizer.

Charlie makes quick work of spotting one of the loads near the elevator, and even before our crew finishes gathering up the empties to go out, elevator employees are unloading the fertilizer that we brought in just minutes ago.

After less than 30 minutes switching the elevator, Charlie is ready to take the local home. Since there is no run-around track in Harrison, the caboose will be in the lead followed by No. 405 and two fertilizer empties. I'll ride the caboose back down the branch. Engineer Jeff DeMers is stationed on the caboose platform, ready to pull the horn lever every time we approach one of the six grade crossings near Harrison.

After we cross Highway 359 a few miles outside town, we won't see another road for the rest of the trip. Besides keeping an eye ahead, Jeff's only other job for the run will be to open and close those cattle gates.

In 1987, Montana Rail Link hired 550 people in just four days. Incredibly, 25 years later, 180 of those same folks, nearly one-

third still work for the railroad. Of those 180, one is the man that runs the railroad, Thomas Walsh. He stresses to his 900 current employees to work hard to satisfy their customers, but also to do it safely.

Looking back from our caboose, I see Charlie at the throttle of No. 405 peering out over the long hood and at the caboose. After a trip down the 2.2 percent, our ride is about to end. We stop at the block register book so Jeff can sign us out.

After doing that, he quickly reboards the caboose, and Charlie begins to roll the train back toward Logan. As it turns out, Charlie is also in the group of 180 veteran employees who helped start up Montana Rail Link a quarter century ago.

I watch as the last hopper fades away in the distance, almost as if it's the last scene in a western movie. He must enjoy his employer, where he works, and what he does — he's been doing this for more than 25 years. I



2012 On Sept. 18, 2012, a pair of Montana Rail Link EMD GP9s leads the westbound Paradise Local along the Clark Fork River near Eddy, Mont. Tom Danneman

1960 Northern Pacific EMD FTs lead a westbound extra consisting of 125 brand-new 40-foot NP boxcars along the Clark Fork on Jan. 10, 1960. R.V. Nixon



Along the Clark Fork

When Northern Pacific built its transcontinental main line across Montana, it took advantage of the water-level running that rivers provided. Montana Rail Link still does

by Tom Danneman



In 1883, Northern Pacific completed the route over Evaro Hill west of Missoula, Mont., as part of the railroad's transcontinental main line. The grade over the hill was steep in both directions and created operational challenges for trains west of Missoula. In 1909, a new line was built between St. Regis and Paradise, to be part of an alternate route with easier grades. An existing branch line to the Bitterroot Range east of Coure d'Alene, Idaho, which followed the Clark Fork River west of De Smet (near Missoula) to St. Regis, became part of the new main line. Like the branch between De Smet and St. Regis, as well as much of the NP across Montana, the new line took advantage of flat running that railroads were rewarded with when they built along rivers. The new line via St. Regis became NP's preferred route for most of its trains.

To the west of Paradise, the railroad continued to follow the Clark Fork through the beautiful, but largely uninhabited North-

west Montana landscape. The largest town the main line passes through between Paradise and Sandpoint, Idaho, is Thompson Falls (just west of Eddy), which today has a population of just more than 1,300 people. However, the railroad provided more than just flat running and a scenic route for passengers and crew. The line passed through healthy lumber-producing areas, which provided a traffic source for NP and later Burlington Northern.

Today, that traffic source has dwindled, but it is still an important part of current lessee Montana Rail Link's traffic base. Just west of Eddy, is Thompson River Lumber. Montana Rail Link's Paradise Local hauls finished lumber and wood chips from the facility, during most weekdays.

Even though the amount of traffic generated in this area may be erratic, the railroads will long enjoy the relatively easy running that the Clark Fork River provides. **I**

737s ride the rails

BNSF Railway hauls Boeing 737 fuselages to Boeing's plant in Washington for finishing. Here's what became of three of them

by Tom Danneman

Spirit AeroSystems builds 737 fuselages, and manufactures other Boeing airplane parts at its plant in Wichita, Kan. The completed fuselages and parts are shipped on BNSF from Wichita to Boeing's facility in Renton, Wash., for final assembly. The fuselages are shipped on specially modified flatcars in BNSF high-priority manifest freights from Kansas City. Occasionally, hot shipments are forwarded from Wichita or other midpoints such as Laurel, Mont., or Hauser, Idaho, to Seattle on dedicated BNSF "Boeing Trains." The final leg of the trip from Seattle to the Boeing plant is usually

handled by BNSF's Renton Turn. Other airplane parts bound for Renton are shipped in the brown containers that often accompany the fuselages in the train.

In 2013, BNSF added 14 modified flatcars to handle additional shipments for an increase in production of Next-Generation 737s to a rate of 42 airplanes a month. The railroad employs a total of 99 of these flatcars for fuselage shipments. Boeing expects to increase 737 production to up to 47 airplanes a month in 2017, so you can expect to see plenty of planes on trains in the future. **I**



Customer: United States Navy
Aircraft type: Boeing P-8A Poseidon; Modified 737-800, long-range anti-submarine and anti-surface warfare, intelligence, surveillance and reconnaissance.
Length: 129 ft. 5 in.
Fuselage height: 42 ft. 1 in.
Fuselage external width: 12 ft. 3 in.
Delivered: Scheduled for third quarter 2014
 Photo courtesy Boeing



Airline/tail number: Norwegian Air Shuttle, LN-NGO
Aircraft type: Boeing 737-800 (WL) (WL=optional winglets)
Length: 129 ft. 6 in.
Fuselage height: 42 ft. 1 in.
Fuselage external width: 12 ft. 3 in.
First flight: Oct. 29, 2013
Delivered: Dec. 11, 2013

Atle Straume



Airline/tail number: Alaska Airlines, N440AS
Aircraft type: Boeing 737-900 (ER) (WL) (ER=extended range) (WL=optional winglets)
Length: 138 ft. 2 in.
Fuselage height: 42 ft. 1 in.
Fuselage external width: 12 ft. 3 in.
First flight: Oct. 23, 2013
Delivered: Nov. 13, 2013

Rick Schlamp



Framing protects the wide loads during transit

Observer window

1 over-wing emergency exit door

2 over-wing emergency exit doors

Specially modified 89-foot flatcars used exclusively for fuselage shipments

Fuselage exterior receives a thin, green protective coating at Spirit Aero-Systems to keep the aluminum skin from oxidizing during transit. It is washed off with pressure washers before being painted.

Empty container. In the past, these were loaded with 737 parts such as vertical and horizontal stabilizers. The full-size containers sometimes seen accompanying fuselages carry other parts from Spirit AeroSystems.

On Sept. 26, 2013, three Boeing 737 fuselages take a ride on Montana Rail Link through Eddy, Mont., in BNSF Railway train H-KCKSP01-22 (Kansas City, Kan., to Spokane, Wash.), a high-priority manifest freight. About a month later, two of the airplanes had already taken their first flight. **TRAINS:** Tom Danneman

FUEL SIPPERS

The efficiency of Montana Rail Link's SD70ACe fleet is paying dividends

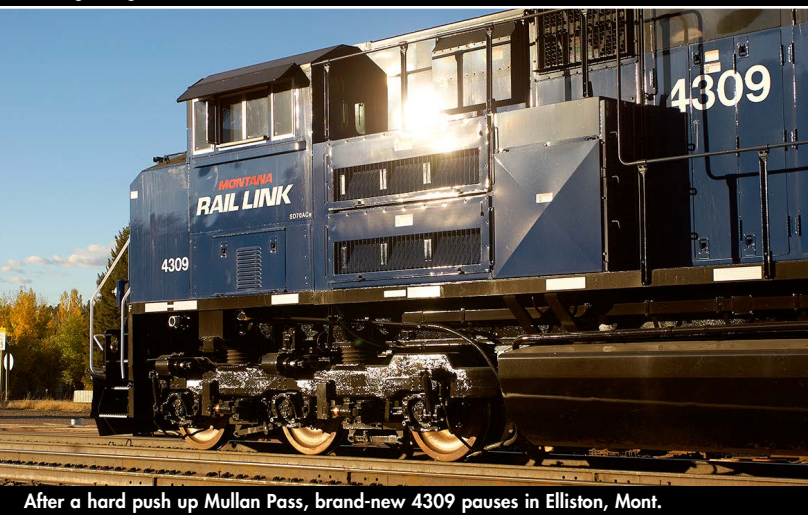
Story and photos by Tom Danneman



On Aug. 18, 2013, Montana Rail Link's M-LAUMIS1-18 (Laurel-Missoula) manifest freight blasts out of the tunnel at the top of Bozeman Pass at West End, Mont. MRL SD70ACe's 4401 and 4400 (and a tag-along GP35) lead the train. The pair is MRL's newest motive power, and was delivered to the railroad just 16 days earlier.



Gliding along the Flathead River east of Perma, Mont., No. 4308 leads the Gas Local.



After a hard push up Mullan Pass, brand-new 4309 pauses in Elliston, Mont.



Placed mid-train, a set of MRL SD70ACe helpers blasts out of Mullan Tunnel.



Montana Rail Link's ML races through Jens, Mont., with SD70ACe No. 4301 up front.



Two SD70ACes and a tag-along SD40-2XR lead westbound LM (Laurel-Missoula) through the curves just west of Lombard, Mont., on Sept. 22, 2009.

It's a spectacle that just never gets old: a 15,000-ton grain train slugging over Montana Rail Link's Mullan Pass line with a pair of BNSF Dash 9s and two leased SD40-2s on the head end and a set of MRL SD70ACe helpers tucked far back in the train. The low rumble of heavily burdened grain hoppers slowly gives way to the drone of laboring 710 engines as the train exits Mullan Tunnel near the grade's summit. The sound intensifies until, in an eruption of heat, smoke, and sound, the helpers burst out of the tunnel, gasping for

air and proclaiming victory over gravity.

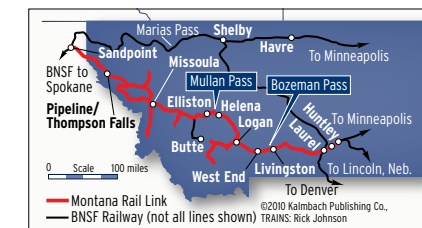
From a line-side perspective, the performance is about as spectacular as it gets. As far as Montana Rail Link is concerned, though, the more impressive display is on its bottom line. Compared to a five-unit set of their SD45 predecessors, the SD70ACes will consume an estimated 280 fewer gallons of diesel fuel on every 57.8-mile round trip that they make in Mullan Pass helper duty between Helena and Elliston. In 2009, the helpers made 2,117 such trips, equating to savings of some 592,760 gallons. Based on a cost of \$2.13 per gallon, the ACes have

racked up an impressive fuel-sipping dividend of \$1.3 million.

Through the first 18 years of its existence, MRL relied almost exclusively on secondhand SD40 and SD45-type locomotives for most mainline and helper duties. As the locomotives aged and fuel costs spiked, MRL took a giant leap forward, and chose to purchase new locomotives for the first time. Fuel efficiency drove the MRL's decision, and in September 2005, MRL took delivery of 16 new SD70ACes.

Employed in Laurel-Missoula manifest service, on the Gas Local between Mis-

soula and Pipeline (east of Thompson Falls), and in helper duty on Bozeman Hill and Mullan Pass, SD70ACes 4300-4315 more than earn their keep. The amount of fuel an SD70ACe saves compared with MRL's older road power is staggering. And that's without consideration of the ACes' extra horsepower, increased tractive effort, and better adhesion. MRL figures that the 4300s generate enough fuel savings each year to offset the cost of one SD70ACe. If the ACes last even half as long as the SD45s have, the fleet will pay for itself through fuel efficiency. **I**



SD70ACe fuel consumption savings

MULLAN PASS HELPER SERVICE

Round trip from Helena to Elliston using a set of five SD70ACes

Trip miles: 57.8
Fuel used in 1 trip: 720 gallons
Fuel saved 1 trip: 280 gallons
Trips in 2009: 2,117
Fuel saved 1 year: 592,760 gallons
Cost savings in 1 year: \$1,262,579*

BOZEMAN HILL HELPER SERVICE

Round trip from Livingston to West End using a set of three SD70ACes

Trip miles: 26.4
Fuel used in 1 trip: 422 gallons
Fuel saved 1 trip: 145 gallons
Trips in 2009: 2,253
Fuel saved 1 year: 326,685 gallons
Cost savings in 1 year: \$695,839*

ML/LM MANIFEST FREIGHT

Round trip on MRL manifest freight LM/ML (Laurel-Missoula, Missoula-Laurel) using a pair of SD70ACes

Trip miles: 688
Fuel used in 1 round trip: 5,316 gallons
Fuel saved 1 trip: 823 gallons
Trips in 2007: 334
Fuel saved 1 year: 274,882 gallons
Cost savings in 1 year: \$648,722*

GAS LOCAL

Round trip in Gas Local service (Missoula-Pipeline/Thompson Falls) via 10th Subdivision (Gas Local uses 4th Subdivision occasionally) using an SD70ACe/SD45-2 combination.

Trip miles: 201.6 miles
Fuel used in 1 trip: 707 gallons
Fuel saved 1 trip: 204 gallons
Trips in 2009: 709
Fuel saved 1 year: 144,636 gallons
Cost savings in 1 year: \$308,075*

Savings are calculated comparing SD70ACes to older SD45 and SD40 series locomotives.

All figures are averages from 2009 except the figures for the ML/LM; those figures are from 2004 (the last full year of SD45/40-equipped trains), and 2007 (the most pure SD70ACe fuel data in ML/LM service).

*Calculations based on fuel prices of \$2.36 per in 2007 and \$2.13 per gallon in 2009.



Backstage at Livingston

On May 8, 2014, five EMD locomotive models were represented on Montana Rail Link's Livingston, Mont., backshop floor.
Tom Danneman

Behind the scenes at Montana Rail Link's locomotive shop

Story and photos by Tom Danneman

The former Northern Pacific division point of Livingston, Mont., once boasted NP's largest shop facility. The original shop opened in 1883 and was the biggest employer in town for decades. During NP days, the railroad had more than 600 workers at its Livingston facilities. The shops were upgraded and expanded throughout NP's reign. Livingston became one of four major locomotive repair facilities for Burlington Northern after the merger

in 1970. In BN days, the shop was one of two on the system that could handle maintenance and repairs for locomotives from all builders: Electro-Motive, General Electric, and Alco. The Livingston shop was responsible for all heavy maintenance and Class I repairs to BN's entire fleet of Alco locomotives.

The number of employees was almost doubled by BN to more than 1,100 workers. By the early 1980s, Livingston's importance

as a major repair facility waned, and BN closed the facility in 1986. When Montana Rail Link leased BN's main line through Livingston in 1987, the new regional acquired the run-through light-repair facility (called the roundhouse by shop personnel), and service area on the south end of the shop complex. Soon after, Livingston Rebuild Center reopened the doors of most of the buildings on the property to rebuild and repair locomotives and rail cars. MRL retained two tracks in the main shop building for heavier repairs. A wall was built to separate the MRL tracks in the shop and the rest of the center, but was kept low enough to allow the overhead crane to be used by both MRL and the center. In 2000, the center sold the shop complex (except for the MRL-owned portion) to Talgo, and it became Talgo-LRC. Finally, in 2006, MRL purchased the entire complex from Talgo.

Today, MRL's Livingston Shops are the main locomotive repair facility for the 900-plus-mile system. Montana Rail Link has acquired various models of used locomotives throughout the years, as well as 25 new SD70ACes built between 2005 and 2014. Today, the railroad has 82 locomotives in its fleet. During peak traffic periods, the railroad has more than 60 locomotives in operation, and boasts a fleet-availability goal of 93 percent. Montana Rail Link employs 32 workers of various trades in one shift at the facility to maintain that goal. The workers perform both light and heavy repairs such as profiling wheels, completely rewiring locomotives, changing traction motor brushes, and varying degrees of body repair work. Follow along as we spend a typical day behind the scenes at MRL's Livingston locomotive repair facility.

HEADLIGHT AND DITCHLIGHT REPAIR, GP9 No. 130



Opposite page: GP9 No. 130 awaits electrical repairs in the running-repair portion of Livingston's shop complex. Left: Shop workers' Blue Flag IDs hang from 130's cab to protect the workers from movement of the locomotive during maintenance. Right: Electrician Dave Marston checks electrical connections beneath the cab of the 56-year-old GP9.

Montana Rail Link GP9 No. 130 was built in October 1957 for the Minneapolis & St. Louis Railway. In 1960, the GP9 became Chicago & North Western's property after the railroads merged. In 1972, Chicago & North Western rebuilt the locomotive complete with a chopped nose. MRL acquired the EMD in 1994.

Montana Rail Link maintains a fleet of 11 elderly GP9s. They are used primarily in switching duties in the

road's larger yards at Laurel, Helena, and Missoula, as well as in local service out of Paradise, Mont.

No. 130 experienced failures of both the headlights and ditchlights and was placed into the running-repair facility (called the roundhouse by shop employees) for repairs. Charged with locating the problem, electrician Dave Marston found an open circuit and repaired a wiring defect.

As is the case with every locomotive

that enters the shop, No. 130 was given a complete inspection. Any previously noted issues were attended to and other preventative maintenance items — such as changing bearings or checking for leaks — were taken care of.

After repairs were made, No. 130 was sent to Laurel where it would stand in for GP9 No. 132, which was headed to the shops for a federally mandated 92-day inspection.

ENGINE CHANGE, SD40-2XR No. 252



Machinists Tyler Verlanic (top) and Mike Donahue reattach the inertial screen on MRL SD40-2XR No. 252.



Shop machinists changed out Montana Rail Link SD40-2XR No. 252's prime mover and are now reassembling the locomotive.

Montana Rail Link rosters a group of 17 SD40-2XRs. MRL had the SD40s (and 1 SDP40) rebuilt between 1990 and 1993 in Livingston. Upgrades included a new adhesion-control package; truck rebuilds; rewiring; new 645 power assemblies; injectors; water pumps; oil pumps; and new rod, main, and cam bearings.

Machinists Mike Donahue (a 38-year veteran who is retiring in September) and Tyler Verlanic reassembled No. 252 in the backshop after its prime mover was replaced. As is typical, the locomotive didn't quite go back together like the original. Mike and Tyler had to cut, weld, and fiddle with the parts to fit them properly.



Tyler Verlanic welds on the inertial hatch of SD40-2XR No. 252.

ANNUAL INSPECTION, SD40-2XR No. 253



No. 253 undergoes an inspection.



Electrician Steve Howes works in tight confines underneath No. 253.



Electrician apprentice Nathan Krause inspects a traction motor brush.



Veteran electrician Steve Howes changes traction motor brushes on No. 253.

The running-repair area of the Livingston shop is filled with locomotives awaiting light repairs and inspections. Montana Rail Link SD40-2XR No. 253 is one of them. The SD40 is in for its routine annual inspection. Electrician Steve Howes and apprentice electrician Nathan Krause inspect the traction motor brushes and replace them as needed.

Steve has been in the locomotive maintenance business since 1978 when he started with Burlington Northern. He came to work for Montana Rail Link in Livingston on October 31, 1987 — the railroad's first day. After 36 years of repairing locomotives, Steve will hang up his white overalls for the last time in September.

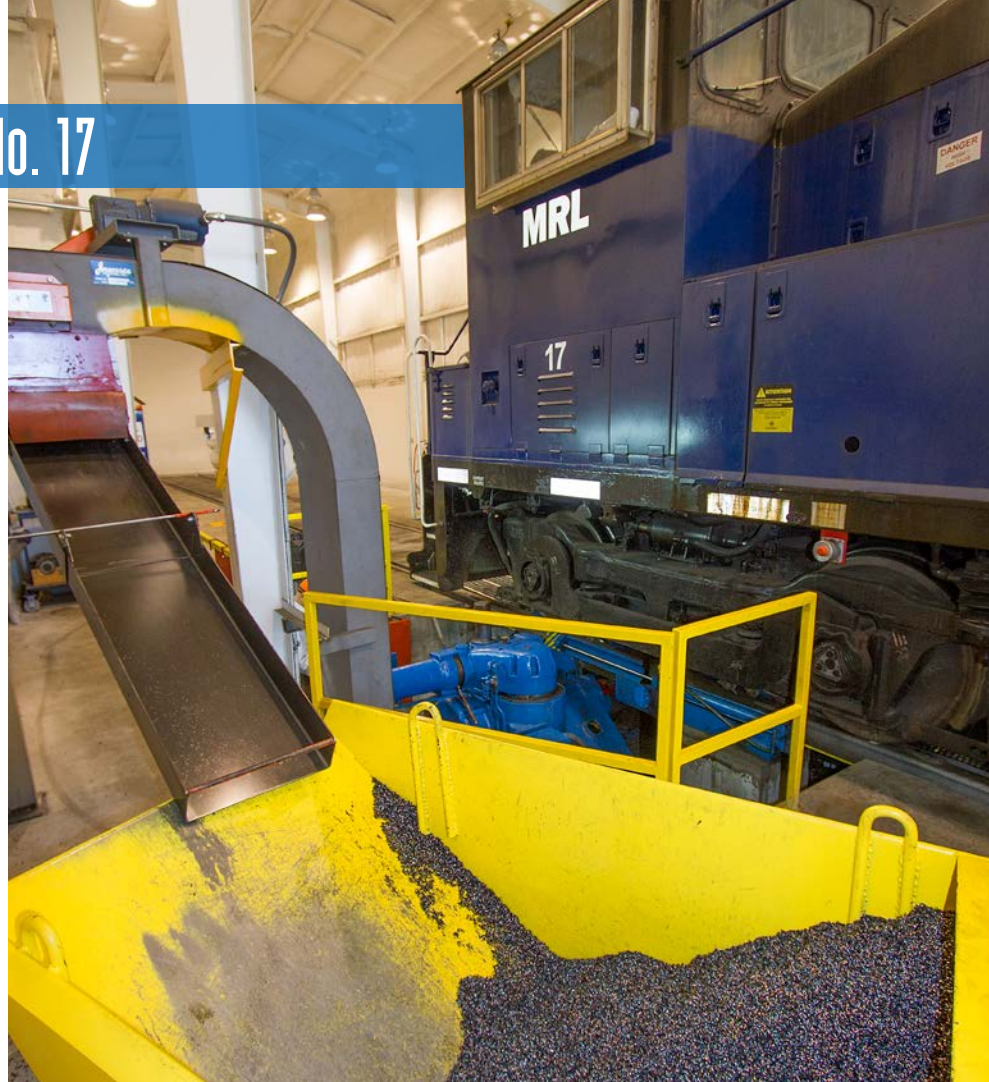
WHEEL TRUING, SW1200 No. 17

Montana Rail Link installed a refurbished American wheel-truing machine in Livingston in 2004-05. Older locomotives have their wheels trued during their annual inspections, or when a defect is noted. Since most of the railroad's SD70ACe fleet is in heavy-duty helper service, their wheels are profiled every six months, or whenever a defect is found.

Montana Rail Link No. 17 is in for a shave. A winch system drags the little switcher into proper alignment with the machine. Operators then put it to work to remove imperfections and to give the wheels a smooth profile.



Machinist Mike Ungaretti inspects the wheels of SW1200 No. 17.



Montana Rail Link SW1200 No. 17 has a turn at the wheel truing machine. The metal shavings are conveyed to a bin for recycling.

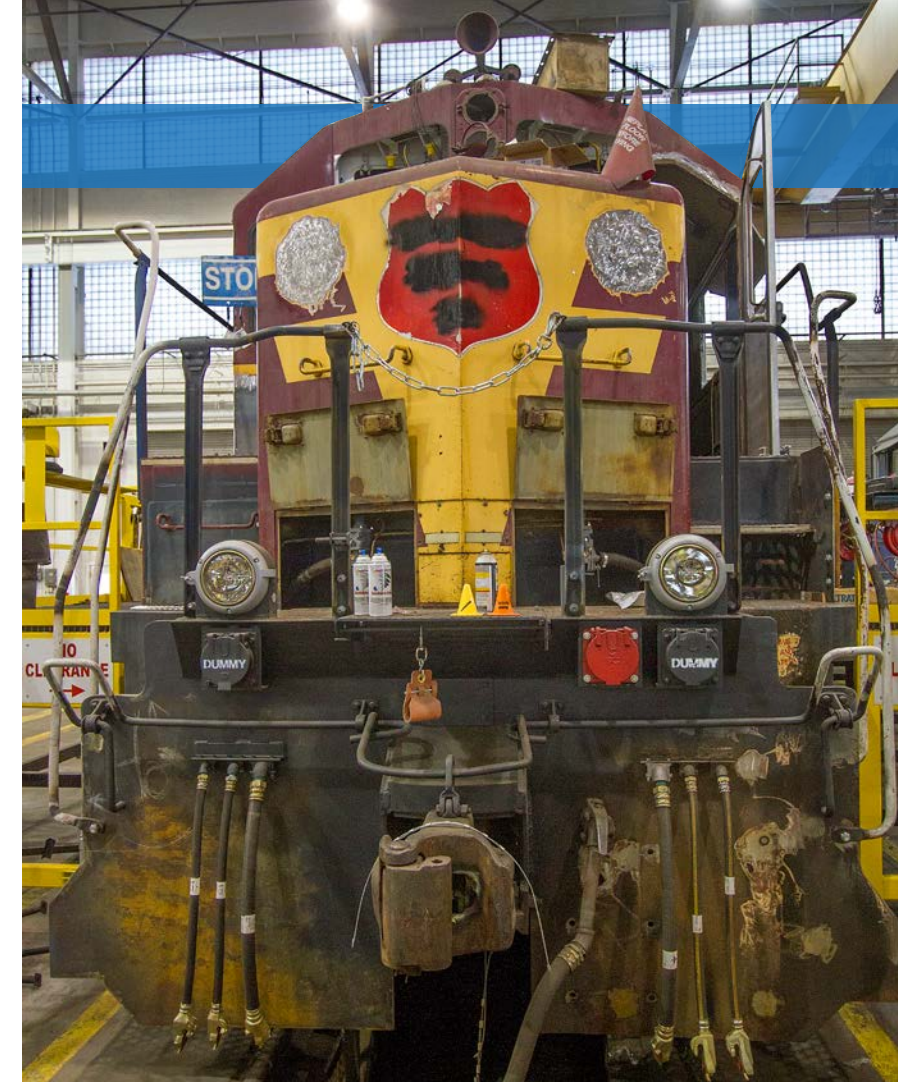
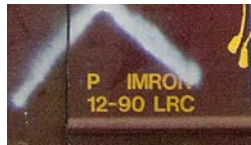
OVERHAUL, GP40 No. 500



Ben Hampson rewires the control stand of former WC No. 3025.

Former Wisconsin Central GP40 No. 3025, was acquired by MRL when CEECO (Coast Engine and Equipment Co.) closed in 2009. Built in 1970 for Western Pacific, the GP40 is being completely rebuilt. Work will include a running take-out 16-645 engine, a new turbocharger and compressor, electric parking brake, a Hot Start auxiliary power unit, cab air conditioner, as well as new wiring and carbody repairs. The GP40 will be repainted and become MRL 500.

This isn't the first time the GP40 has been in Livingston. The center rebuilt it for WC in 1990.



Former Wisconsin Central No. 3025 undergoes an overhaul. The GP40 has received a new pilot and hand-me-down handrails from a scrapped MRL unit.

MAIN GENERATOR REPLACEMENT, GP35 No. 401



Monty Holliday operates the transfer table from the cab of a former GP20.



The cable-driven transfer table is lined up, and MRL Trackmobile No. 1036 heads into the main shop building to retrieve GP35 No. 401.



The Trackmobile pulls No. 401 onto the table and into the bright spring sunshine. The locomotive will be moved to another track within the shop.

Former Detroit, Toledo & Ironton GP35 No. 401 is in the Livingston shop for a main generator replacement. The GP35, acquired by MRL in 1988, is assigned to a switching service in Missoula.

During the generator change-out, the 1964-built EMD took a slow ride on the transfer table to maneuver the locomotive to a different track within the backshop. Installed by Northern Pacific, the cable-driven table today sports an operator's cab that was fabricated using a cab from a scrapped GP20. The Livingston Rebuild Center installed the new cab to replace the original operator's cab. After acquiring the shop complex from Talgo-LRC in 2006, Montana Rail Link gave the cab a fresh coat of blue paint and added finishing touches such as a flashing rooftop beacon, white nose stripes, and the MRL logo. I

FUEL OPTIMIZER

On June 29, 2016, Montana Rail Link's Helena Local rolls along the colorful fields west of Toston, Mont. The lead locomotive, SD45 No. 382, is equipped with the unique fuel optimizer system.

Montana Rail Link's unique fuel-saving technology

Story and photos by Tom Danneman

YOU'RE STANDING AT THE EDGE of a wheat field on a gorgeous summer evening, waiting for Montana Rail Link's Helena Local. The sun is setting fast, and in the distance you notice the lights of a train approaching. You realize that it's a BNSF Railway manifest, not the subject of your interest. As the freight passes, you try not to stare at the setting sun, hoping that the local will get here before it drops below the distant mountains. Why the excitement over a seemingly average local that runs five days a week and has been doing so for years? Because the local is headed-up by MRL No. 382, the road's last operating SD45, on its next-to-last trip.

That was enough to get me trackside to document the occasion, but why, when all other MRL SD45s had been sidelined by the

beginning of 2015, would this particular locomotive make it into summer 2016? The answer is that the 382 was a fuel miser. That's not a term you'd associate with EMD's fuel-guzzling SD45. What makes MRL 382 any different?

MRL's reliance on older, less-fuel-efficient locomotives prompted the railroad to look for ways to cut its fuel bill. In 2009, MRL installed Invensys Rail Locomotive Fuel Optimizer (LFO) systems in No. 382 and SD70ACe No. 4308. The LFO system was developed by Quantum Engineering (which was later acquired by Safetran Systems and then by Invensys Rail), as an add-on for any EMD or General Electric locomotive, regardless of its age.

LFO manages and controls the individual engine speeds of all like-equipped locomotives in a consist. As the engineer selects the





Montana Rail Link tested the fuel optimizer system with the SD45/SD70ACe pair on the Gas Local between Missoula and Thompson Falls, Mont. Here the local rolls along the Flathead River, east of Paradise, on Sept. 23, 2008.

throttle position, the system calculates the most fuel-efficient operation of each locomotive in the consist, and adjusts the throttle settings without input from the operator. Housed in a rugged steel enclosure within the locomotive carbody, the programmable, computerized device is wired directly to the locomotive's throttle controls.

For years, MRL's pair of LFO-equipped locomotives was assigned to the Gas Local, operating between Missoula and Pipeline (near Thompson Falls), so that officials could easily monitor fuel consumption and overall performance of the system.

Operating crews have issues with LFO, which can automatically reduce the throttle setting of the lead locomotive, initiating a loss of power that can be mistaken for improper loading or other malfunctions. The biggest drawback, though, is its inability to anticipate conditions such as slow curves or gradient changes.

"Engineers can anticipate where the grades begin and end, and have developed a feeling for the momentum of the train," says Alan Burns, a retired MRL engineer, who worked the Gas Local. "The rule of thumb is the engineer is thinking 2 miles ahead and 1 mile behind." The line that the Gas Local traverses is largely a series of 35-mph (or less) curves between short sections of straight track. "The problem," Burns adds, "was there were too many throttle changes on the Missoula-to-Thompson Falls run. When in Run 8, the optimizer was supposed to cut out. When we had a lighter load of cars, and I could throttle back to

position 7, the optimizer would cut in. It always throttled back too far, so we would lose speed. When we came home with empties, we isolated one unit, per instructions, so the optimizer was cut out. The units never stayed in the same throttle setting long enough to get set up for economy."

After extensive testing on the Gas Local, the pair was assigned to MRL 840, the Helena Local. Following its last revenue run, No. 382 was stored in Livingston, where it remains today. MRL SD40-2XR No. 262 was chosen for the installation of 382's LFO equipment. As of June 2017, some of the equipment had been installed in No. 262, but the system was not yet operable.

MRL hasn't used the optimizer system since Nos. 382 and 4308 were separated.

The LFO installation on MRL 262 will be completed when it's in the shop for major repairs or servicing. Shop personnel will complete wiring the terminal boards to the throttle switches. "It'll be there in case we have a service where we'll need those two together," says MRL Chief Mechanical Officer Rourke Price.

The next time you are trackside on MRL, keep a lookout for the unique SD70ACe/SD40-2XR duo. With the Fuel Optimizer system installed, it could be the reason that old SD40 is still hauling freight in the rugged mountains of Montana. **I**



On Sept. 15, 2010, Montana Rail Link SD70ACe No. 4308 and SD45 No. 382 lead the westbound Gas Local on Evargo Hill at milepost 6 in Nagos, Mont.



Montana Rail Link SD45 No. 382 and SD70ACe No. 4308 lead the Helena Local into the lengthening shadows of Lombard Canyon at last light on a perfect evening on June 28, 2016.