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LOCOMOTIVE 2016

Annual 2016

METRA MUSCLE!

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EXCLUSIVE FOLDOUT COVER! >>

One of each model of Metra road locomotive is represented in this exclusive foldout cover photo. See page 76.
Tom Danneman

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CP GEs lead Vancouver-bound train 101 on CN's Ashcroft Sub at Morris, British Columbia. **See page 50.** Drew Halverson

LA locals: BNSF GP60M No. 120 leads the "First Watson" at Redondo Beach, Calif. See page 62. Greg McDonnell

Ontario Southland FP9s battle through heavy drifting near Belmont, Ont. See page 88. Greg McDonnell

SP No. 9010 at Pacific Locomotive Association shop in Brightside, Calif. See page 86. Elrond Lawrence

LOCOMOTIVE 2016

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A. Ross Harrison

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Canyon country
See Drew Halverson's video footage of B.C.'s Thompson River Canyon

Ontario Southland FP9s
See video footage of Ontario Southland FP9s at work hauling freight and plowing snow.

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Trains SPECIAL

KALMBACH PUBLISHING CO.

Still in Santa Fe paint, BNSF No. 197 switches an industrial spur in Vernon, Calif. See page 62. Greg McDonnell

EMD marches to a new beat

Progress Rail Services CEO Billy Ainsworth (in green vest) shows off SD70ACe-T4 demonstrator EMDX 1602 on a tour of the company's locomotive plant in Muncie, Ind. Greg McDonnell

The sweet rhythm of the two-stroke diesel has defined Electro-Motive locomotives since the dawn of dieseldom. From the 600-hp, eight-cylinder Winton 201A engines lowered onto the cast frames of the first Electro-Motive Corp. diesels — a pair of Delaware, Lackawanna & Western SC model switchers assembled by GE in Erie, Pa. — through the legendary 567 prime mover that powered EMD to generations of market domination, to its 645- and 710-series successors, EMD has held true to the two-stroke standard since 1934.

That distinct EMD chant has been grooved in the soundtrack and psyche of railroading for more than 80 years. It's a sound that transcends the subtle intonations of evolutionary advancements from 567 to 645 to 710 and knows not the limitations imposed by borders or oceans or cultures. Indeed, if there's a universal language of railroading, surely it's spoken in the smooth two-stroke timbre of generations of prime movers manufactured in La Grange, Ill. Whether it's the disproportionately loud roar of the V-6 567 in a little SW1 muscling a handful of cars up a steep spur; the cadence of a quartet of GP9s lugging coal over the Alleghenies; the symphonic splendor of a brace of Es getting the *Broadway Limited* out of Altoona; the heart-racing, turbocharged howl of SD45s battling up Cajon or Tehachapi; SD70ACes dashing across the Nebraska plains with piggybacks and stacks; an F40PH ripping along the Racetrack west of Chicago; a pair of Australian Clyde-GM bulldogs working full-out to roll tonnage in New South Wales; an Irish Class 071 getting underway out of Dublin Connolly; or a British Class 67 racing the *Caledonian Sleeper* through the Highlands on a rainy night, there's no mistaking the EMD sound.

It's a sound that's found its way into countless movies and even music. The La Grange sound is celebrated in the closing seconds of "Caroline, No," the final track on the Beach Boys' album "Pet Sounds." Brian Wilson's creative genius produced a memorable mix of dogs barking (his dogs) and a track from Brad Miller's 1963 recording "Mr. D's Machine," featuring EMDs racing Southern Pacific No. 58, the *Owl*, through Edison, Calif. And if Neil Young's tortured guitar work in "Southern Pacific" doesn't conjure visions of SD45s howling along the Coast Line, well, then nothing does:

"Down the mountainside
To the coastline
Past the angry tide
The mighty diesel whines"

Even as I type this, I'm listening to the rich tones of normally aspirated 16-645s as CP GP38-2s drag auto racks past the window on a hot summer night. However, as of this year, new EMD locomotives built for the domestic market will march to the beat of a new engine, the 12-cylinder, four-stroke 1010J. As Chris Guss explains in the "New Power Profile," beginning on page 22, the 1010-powered SD70ACe-T4 is EMD's Tier 4 solution after efforts to achieve emissions compliance with the two-cycle 710 engine proved impractical.

I had my first and formal introduction to the SD70ACe-T4 a few weeks ago as Progress Rail Services CEO Billy Ainsworth led a small group on a tour of the company's locomotive plant in Muncie, Ind. After watching workers assemble Metrolink F125s, and Saudi SDL38 and SD70ACS exports, our last stop was beside EMDX 1602, an SD70ACe-T4 demonstrator dressed in full UP colors with Electro-Motive lettering and "the next generation of progress" slogan on its hood. Ainsworth's enthusiasm for the new EMD model shone as bright as the Armour Yellow paint on the massive machine behind him as he extolled the technological refinements and advancements

incorporated in the new Tier 4 design.

The 1010 isn't EMD's first experience with a four-stroke engine. At the height of the horsepower race in the 1990s, EMD developed the four-stroke 265H for the short-lived 6,000-hp SD90MAC-H and SD90MAC-H II. EMD engineers will tell you that despite the outcome, the 265H was a good performer once its issues were worked out. They'll tell you, too, that the 1010 is an all-new design developed with the collective expertise of EMD, Caterpillar, and Progress engineers. All the same, there's enough 265H DNA in the 1010's genes to establish the familial link.

Standing in the presence of the 1602 revived memories of watching H-engined UP and CP '90MACs take shape on the factory floor in London, Ontario, of standing on the gangway of just-completed CP 9300 as test-house crews awakened a brand-new 265H, and of the pure auditory pleasure that came with encountering the high-horsepower monsters working full-out on a heavy tonnage train. The 6,000-hp, 265H-powered '90s weren't spectacularly successful, but they were spectacular.

There's every reason to believe that the new 1010J prime mover will meet or even exceed expectations. The muscle machine motives of the 265H have given way to a new mandate. The La Grange-fabricated 12-1010J is designed to be efficient, effective, and reliable. For my part, I can't wait to experience the sonic delights of EMD's new four-stroke beat. I wonder if Messrs. Wilson and Young will be listening?

Iconic initials on a polished power assembly component of EMD's new prime mover, the La Grange-fabricated four-stroke 1010J engine. Greg McDonnell

Greg McDonnell, editor

Ode to the Class 66

Britain honors the last new EMD JT42CWR

■ by Chris Milner

On May 10, 2016, two locomotives, both named *Evening Star*, stood face to face in the Great Hall of Britain's National Railway Museum in York, England. They were similarly attired in the classic British Railways Brunswick green with orange-and-black striping. The elder *Evening Star*, 56-year-old 9F 2-10-0 No. 92220, was enshrined in York for its significance as the last steam locomotive BR built. It looked on as dignitaries bestowed its historic name upon GB Railfreight "Class 66" No. 66779, the last Electro-Motive JT42CWR to be built for the U.K. and European markets.

Outfitting the Class 66 freight locomotive in the green livery reserved for BR express passenger steam locomotives was the inspiration of Railfreight's head of engineering, Bob Tiller, and repeated an honor granted to the original *Evening Star* upon its completion at the Swindon Works in 1960. No. 66779's nods to history included a "9F" classification above the road number and steam-era cast builder's plates reading "Built 2015 Muncie USA." A North American-style bell mounted above the cabs on both ends of the locomotive paid tribute to the trans-Atlantic origins of the storied Class 66, the diesel that revolutionized contemporary freight power in the U.K.

The process to privatize British Rail that commenced in 1994 planted the seeds for the Class 66. Three former BR freight sectors, Mainline, Loadhaul, and Transrail, were brought together in 1996 under the new name of English, Welsh & Scottish Railway, a company owned by U.S.-based Wisconsin Central Transportation. EWS inherited around 1,600 diesel locomotives from a variety of manufacturers, the majority well past their prime and needing overhauls to the order of £500,000 ($750,000) each.

EWS reached across the Atlantic in 1997 and placed an order with EMD for 250 locomotives. A new model, the twin-cab, full-carbody JT42CWR, would be constructed by EMD's Canadian subsidiary General Motors Diesel at its plant in London, Ontario. Better known by its U.K. designation, the Class 66 featured a 3,300-hp, 12-cylinder 710 engine and six-motor radial trucks.

Representing the largest single locomotive order in the U.K. since the days of steam, the first London-built Class 66s began arriving in spring 1998. Deliveries continued at the rate of around 11 per month. Their impact on freight traffic was astonishing. The locomotives cost less to run and boasted reliability stats in excess of 97 percent compared to the 60-65 percent average of WC's inherited fleet. The final locomotives of the order arrived just 26 months after the first — a remarkable achievement.

Such was the Class 66 success that U.K. intermodal hauler Freightliner placed an order for five, which arrived in July 1999. The company continued to order 66s in small batches as it retired older locomotives and now has a fleet of more than 130.

In 2000, a third U.K. freight company, GB Railfreight, ordered 12 Class 66 locomotives, and like Freightliner continued to purchase the EMDs in small batches. Other companies placed orders too. Nearly 500 Class 66 EMDs have been built for the U.K. market. Only three have been written off due to accidents.

EMD ultimately offered a modified version for Europe, featuring increased tractive effort, and additional driver facilities such as cab air-conditioning, microwave, fridge, additional noise-cancelling insulation, and a modified seat. These locomotives can be found in France, Germany, Poland, Belgium, The Netherlands, and Norway.

British Railways 9F 2-10-0 No. 92220 *Evening Star*, the last steam locomotive built by BR, faces its newly christened namesake, GB Railfreight No. 66779, the last new Class 66, at the National Railway Museum in York. Chris Milner

Changes to European emission regulations meant that compliance with a more stringent Tier 3B would make it complex and costly to fit the necessary equipment within the smaller U.K. carbody, so it was inevitable that the end of production would come. On the eve of the deadline, GB Railfreight signed for one final order for seven Class 66 locomotives, built by Progress Rail in Muncie. No. 66779 became the last of all.

Even before No. 66779 had worked a train, GB Railfreight offered to donate the locomotive to the NRM when it is retired from service in around 40 years' time — a fitting finale for a highly successful locomotive design.

CHRIS MILNER is the editor of The Railway Magazine, *Britain's best-selling rail title and journal of record in publication since 1897.*

CN ET44AC No. 3029 at GE in Erie, Pa.
Greg McDonnell

LOCOMOTIVE 2016

MOTIVE POWER REVIEW

Tier 4 models gain traction amid traffic doldrums; locomotive builders look to rebuilding for new business

by Chris Guss

With 2015 marking the first full year of Tier 4 locomotive production, builders and their customers have settled in on the final stage of industry emissions compliance. Since early 2015, builders have been constructing three different classifications of locomotives, Tier 4, Tier 4 Credit, and non-certified, for use in North America. Rebuilt and remanufactured locomotives generally are not required to meet Tier 4 standards, and are not covered by the definitions listed below:

— **Tier 4** means the locomotive has been certified in compliance with strict Environmental Protection Agency guidelines that took effect at 12:01 a.m. on Jan. 1, 2015. New locomotives constructed after this date must meet (and maintain) Tier 4 emission standards to operate in the United States.

— **Tier 4 Credit** means the locomotive was built after 12:01 a.m. on Jan. 1, 2015, but essentially constructed to the earlier Tier 3 emission guidelines. Locomotive builders have been able to generate and bank emission credits for several years by installing energy-saving equipment to locomotives already in service. Equipment such as distributed power systems and train management software (for example, General Electric's Consist Manager and EMD's Smart Consist) qualify for emissions credits. These credits can then be applied to Tier 4 Credit locomotives to offset the emission difference between the older Tier 3 emissions and the current Tier 4 regulation. An important part of this regulation stipulates that for every Tier 4 Credit locomotive built in a calendar year, a certified Tier 4 locomotive must also be constructed.

— **Non-certified locomotives** are locomotives built after 12:01 a.m. on Jan. 1, 2015 that do not meet the current Tier 4 guidelines. These are essentially the same as a Tier 4 Credit locomotive described above, except the locomotive builder hasn't applied emission credits toward them for use in the United States. As a result, non-certified locomotives are restricted to operation only in Canada and Mexico.

General Electric's Tier 4 products, the ET44C4 and ET44AC, have sold well since production began. The company delivered 425 Tier 4 locomotives in 2015 and had orders for more than 400 more by mid-2016.

The design of General Electric's ET44 has evolved considerably since GECX 2015,

UP ET44AC 2571 and SD70M 3945 lead train QPWRV 01 north of Rocklin, Calif., on April 3, 2016. Chris Guss

the first pre-production prototype, debuted in 2012. While the prototype and pre-production locomotives had an extra-height engine hood to accommodate Tier 4 modifications, the initial design was eventually modified to a typical Tier 3 profile with a small raised section around the engine's exhaust. The hood was further modified to give that small raised section a more angular shape in line with the radiator slope toward the rear of the locomotive.

To date, GE has delivered Tier 4 locomotives to five of the seven Class I railroads in North America. The only roads yet to order are Canadian Pacific and Kansas City Southern. BNSF, by far the largest purchaser in the last two years, took 224 credit ES44C4s, and 236 ET44C4s. Canadian National purchased 34 credit ES44ACs, 25 non-certified ES44ACs, and 121 ET44ACs; Citirail bought 25 credit ES44ACs; CSX bought 75 credit ES44ACs and 225 ET44ACs; Norfolk Southern, three credit ES44ACs and 47 ET44ACs; and Union Pacific, 50 credit ES44ACs and 200 ET44ACs. GE also delivered a 25-unit order of non-certified ES44ACs to Kansas City Southern de Mexico in 2015 and a 50-unit non-certified ES44AC order to Ferromex in 2016.

On the export front, GE has been busy the past two years building locomotives for Colombia, Australia, Mozambique, Brazil, Indonesia, South Africa, Mexico, Angola, and the United Kingdom and Colombian coal hauler Cerrejon. In Australia, Rio Tinto took delivery of six ES44ACi locomotives, while Roy Hill bolstered its 14-unit ES44ACi fleet with the addition of seven more. Vale ordered 14 ES58ACis for operations in Brazil and 35 Dash 9 44BBWMs for coal hauler Corredor Logístico de Nacala in Mozambique. Erie built 39 FDL-powered CM20EMPs for PTKA in Indonesia, and six ES40ACi locomotives for Transnet in South Africa. The Transnet locomotives are part of a 233-unit order, the balance of which will be built in South Africa. GE has begun building the first 33 of a

Delivery day: CSX ET44ACs 3273 and 3274 on the interchange track at Erie, Pa., on Sept. 17, 2015. Greg McDonnell

Brand-new NS ET44ACs 3602, 3601, and 3603 thread an S-curve near Big Stone Gap, Va., on June 13, 2016 Samuel Phillips

planned three-year, 100-unit C30ACi order for INCFA in Angola. While GE has been shifting more domestic work to its newer facility in Fort Worth, Texas, export models are currently built only at Erie. GE's Grove City, Pa., plant continues to supply engines.

EMD REBOUNDS

Electro-Motive Diesel, which didn't have a Tier 4 freight locomotive available in 2015, is rebounding in 2016. The company estimated in 2014 that Tier 4 deliveries wouldn't begin until 2017, but hoped to accelerate that timetable, which it has. EMD built five demonstrators in late 2015, and another 10 in early 2016. The first, EMDX 1501, was displayed at the Railway Supply Institute's conference in Minneapolis in October 2015. While No. 1501 was showing off EMD's latest offering, workers at Progress Rail in Muncie, Ind., were preparing Nos. 1502 and 1503 for their November departure to the Transportation Technology Center near Pueblo, Colo., for testing. The pair spent the majority of the winter at the center before heading north in early March for testing west of Denver on Union Pacific's Moffat Route. A second round of tests concluded in May, followed by additional Union Pacific testing on Donner Pass in California.

Rear view of CN ET44AC 3029 at GE Erie in September 2015 shows off the massive radiators that form one of the most distinguishing external features of the company's new Tier 4 Evolution Series locomotives. Greg McDonnell

2015 NEW LOCOMOTIVE CONSTRUCTION

Railroad	Qty.	Road number	Builder	Type	Order/Serial No.	Build date
Amtrak	34 (70)	631-664	Siemens	ACS-64		01/15 -12/15*
Built in Sacramento, Calif. Road No. 666 intentionally skipped.						
BNSF	155 (161)	7921-7930, 7936, 7938-7999, 8318-8399	GE	ES44C4 (T4C)	63003-63012, 63018, 63020-63163	01/15 -06/15*
T4C denotes locomotives built under Tier 4 Credit designation. BNSF 7921-7930 built at Erie. BNSF 7936, 7938-7999, 8318-8399 built at Fort Worth.						
BNSF	161	3911-3999, 3839-3899, 3900-3910	GE	ET44C4	63164-63324	04/15-11/15
BNSF 3911-3915 built at Erie, Nos. 3839-3910, 3916-3999 built at Fort Worth.						
BHP (Australia)	20	4468-4487	EMD	SD70ACe/Lci	20148001-001 to -020	01/15-03/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind.						
BHP (Australia)	4	4488-4491	EMD	SD70ACe/Lci	20158085-001 to -004	10/15*-11/15*
Built by Bombardier, Sahagun, Mexico.						
CN	26	3025-3034, 2935-2950	GE	ES44C4 (T4C)	62857 -62871, 62893-62898, 63381-63385	01/15-03/15
Built at Erie. T4C denotes locomotives built under Tier 4 Credit designation. Road numbers 3025-3034 were applied in error, locomotives were renumbered 2925-2934 prior to release of ET44ACs 3000-3038.						
CN	25	2951-2975	GE	ES44AC (T4C)	63414-63438	03/15-04/15
Built at Erie. These units are not certified for EPA emission Tiers and are prohibited from operating in the U.S.						
CN	39	3000-3038	GE	ET44AC	63439 -63477	07/15-09/15
Built at Erie.						
CCT	2	1201, 1202	Brookville	BL12CG		03/15*
Powered by twin 600-hp Cummins diesels.						
Cerrejon	1	1019	GE	ES44AC	63411	04/15
Built at Erie.						
Citirail (CREX)	25	1501-1525	GE	ES44AC (T4C)	63833 -63857	12/15*
Built at Erie. T4C denotes locomotives built under Tier 4 Credit designation.						
CLN (Vale, Mozambique)	12	1850-1861	GE	DASH9-40BBWM	62974 -62985	01/15, 03/15
CLN (Vale, Mozambique)	23	1862-1884	GE	DASH9-40BBWM	63803 -63825	09/15* - 10/15*
Built at Erie.						
CSXT	75	3175-3249	GE	ES44AC (T4C)	62899-62973	01/15 – 05/15*
Built at Erie. T4C denotes locomotives built under Tier 4 Credit designation.						
CSXT	125	3250-3374	GE	ET44AC	63578 -63702	07/15* – 12/15*
Built at Erie. CSX 3250, 3281, and 3312 were released in primer and painted at Mid-America Car, Kansas City, Mo. Several were mistakenly designated ET44C4 on builders decals.						
EMD	5	1501-1505	EMD	SD70ACe-T4	20146006-001 to - 005	09/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind. EMD 1501-1503 wear demonstrator paint schemes, Nos. 1504 and 1505 wear a modified Union Pacific paint scheme.						
EMD	1 (2)	0002	EMD	SD70ACe	20138909-0002	10/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind. Demonstrator locomotive destined for Russia.						
Ferromex (Mexico)	19	4100-4118	EMD	SD70ACe (T3)	20136960-001 to -019	01/15*, 04/15*
Built by Bombardier, Sahagun, Mexico. These units are not certified for EPA emission Tiers and are prohibited from operating in the U.S.						
Ferromex (Mexico)	15	4119-4133	EMD	SD70ACe (T3)	20136983-001 to -015	04/15* - 05/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind. These units are not certified for EPA emission Tiers and are prohibited from operating in the U.S. Locomotives are equipped with experimental "elephant ear" cooling modification. Nos. 4129-4133 released without Ferrosur lettering and lettered at a later date.						
GBRf (United Kingdom)	7	66773-66779	EMD	JT42CWRM	20148150-001 to -007	11/15* – 12/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind.						
GECX	12 (20)	2025-2029, 2031-2037	GE	ES44AC	62517-62521, 62523-62529	11/14 – 12/14
GECX	8 (20)	2030,2038-2044	GE	ES44AC	62522, 62530-62536	01/15 - 04/15
Built at Erie. Technically, these locomotives would be ET44AC, except that that model designation had not been finalized when construction of this order began. The builders decals feature various model designations including ES44AC, ES44A6, and ES44C6. First order totals different from those reported in LOCOMOTIVE 2015.						
KCSM (Mexico)	25	4200-4224	EMD	SD70ACe-P6	20146029-001 to -025	02/15* – 04/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind. These units are not certified for EPA emission Tiers and are prohibited from operating in the U.S.						
KCSM (Mexico)	25	4870-4894	GE	ES44AC	63386-63410	04/15* – 07/15*
Built at Erie. These units are not certified for EPA emission Tiers and are prohibited from operating in the U.S. KCSM 4875, 4878, 4881, 4884, 4886, and 4890 were released in primer and painted at Mid-America Car in Kansas City, Mo.						
NS	12	620, 621, 645, 648-655, 657	NS	RP-M4C (slug)		02/15 – 12/15
Built by NS Juniata shops, Altoona, Pa. Constructed at NS Juniata shops in Altoona, Pa., with new frame, Admiral cab, electronic air brakes and EM2000 microprocessor. Designed to operate with GP33ECO and GP59ECO masters.						

GE: 918 (+21 rebuilds); EMD/Progress Rail: 161 (+24 rebuilds); Brookville: 3; NREC: 5; NS: 12; Railpower: 14; Siemens 34

Railroad	Qty.	Road number	Builder	Type	Order/Serial No.	Build date
Peru Rail (Peru)	15	800-814	EMD	GT42AC	20118600-001 to -015	02/15*, 06/15* – 08/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind.						
PTKA (Indonesia)	39	CC206 1501- CC206 1539	GE	CM20EMP	62406 -62444	06/15* – 08/15*
Rio Tinto (Australia)	2	9115, 9116	GE	ES44ACi	63412, 63413	05/15
Rio Tinto (Australia)	3	9117-9119	GE	ES44ACi	63830 -63832	10/15
Roy Hill (Australia)	4	RHA1015-RHA1018	GE	ES44ACi	63826-63829	09/15
Built at Erie.						
SAR (Saudi Arabia)	7	2001-2007	EMD	GPL38S	20128865-001 to - 007	06/15*, 08/15*
Saudi Rail (Saudi Arabia)	7	4310-4316	EMD	GT46ACS	20148134-001 to -007	08/15* – 09/15*
Setrag (Gabon)	6	CC4308-CC4313	EMD	GT46AC	20138940-001 to -006	03/15* – 05/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind.						
SITARAIL (Ivory Coast)	2 (6)	CC33203, CC33204	NREC	GT26		07/15
Built by NRE, Mount Vernon, Ill. Six-unit order; the remaining four were completed in Croatia by Gredelj using kits supplied from NRE's Mount Vernon plant.						
SNTF (Algeria)	30	060DT 01 – 060DT 30	EMD	GT46AC	20138949-001 to -030	01/15* – 06/15*
Built by Progress Rail Manufacturing Corp., Muncie, Ind.						
Transnet (South Africa)	6 (233)	44001-44006	GE	ES40ACi	63325 -63330	04/15, 07/15
Built at Erie. The remaining 227 units of this order are to be completed in South Africa over a multiyear span.						
UP	50	2520-2569	GE	ES44AC (T4C)	63331-63380	02/15* – 04/15*
UP 2520-2559 built at Erie; UP 2560-2569 built at Fort Worth. UP 2523, 2526, 2527, 2531-2533, 2547, 2548, 2551, 2554, 2557-2559 were released in primer and painted at Mid-America Car in Kansas City, Mo.						
UP	100	2570-2669	GE	ET44AC	63478-63577	10/15* – 12/15
Built at Erie. UP 2570-2616 built by GE Erie; UP 2617-2669 built by GE Fort Worth.						
UP	14	UPY900-913	Railpower	RP20BD	RP179-001 to -018	07/15* – 12/15*
Built by NS Juniata shops, Altoona, Pa. UPY 900-913 are the first Railpower locomotives built on new frames. Units are rated at 1800 hp and designated RP18GP by UP.						
US Army	3	6522-6524	NREC	3GS21B	6522: 239-6522-5	05/15 – 06/15*
Built by NRE, Mount Vernon, Ill.						
US Navy	1	65-00646	Brookville	BL05		02/15*
This is a diesel-hydraulic locomotive.						
Vale (Brazil)	14	259-272	GE	ES58ACi	62989-63002	01/15* – 04/15*
Built at Erie.						

Qty. in parenthesis are total units in that order if different from 2015 production. * Estimated build date, unconfirmed by publication date.

While the 2015 demonstrators were built to Union Pacific specs, the 10 in 2016 were built with specific options for potential customers NS, CN, CSX, and BNSF. All 10 were originally slated to wear EMD demonstrator colors, but UP's interest in acquiring the locomotives after testing was completed prompted EMD to paint them Armour Yellow instead. The first two 2016 demonstrators, built with CSX equipment, left Muncie in early June. Four of the demonstrators are scheduled to test on BNSF, with two configured as four-motor P4s utilizing the B1-1B truck configuration.

Union Pacific signed on as the initial customer for EMD's SD70ACe-T4, with an order for 65 units scheduled for delivery in late 2016. Construction will split between Muncie and Bombardier's production facilities in Sahagun, Mexico. Another 65 SD70ACe-T4C units are being built using emission credits. EMDs lack of a Tier 4 locomotive prevented it from using its accumulated credits until actual Tier 4 construction began in 2016.

One of BNSF Railway's 236 new ET44C4s, No. 3947 leads an eastbound intermodal train over Cajon Pass in Southern California. Greg McDonnell

Armour Yellow EMD SD70ACe-T4 demos Nos. 1609 and 1610 on CSX south of Portland, Tenn., June 21, 2016. Terry Lovell

MEET THE F125

California's Metrolink is the launch customer for EMD's new passenger locomotive, the F125. Builder's photos of class unit Metrolink 903 were released in January 2016. The long-awaited locomotive moved to EMD's La Grange, Ill., facility in March 2016 for initial tests prior to heading west to the Transportation Technology Center. The next three F125s were largely complete as of late spring, with Nos. 904 and 906 destined to join No. 903 in Colorado. The first to reach California, No. 905 was shipped to Metrolink for stationary crew and mechanical department training.

The initial order for 20 F125s was funded through a mix of local and state funds, including a $34.66-million South Coast Air Quality Management District grant. The Southern California Regional Rail Authority received $41 million in cap-and-trade dollars to help fund the purchase of nine additional units. F125 features include Tier 4 emission compliance, A.C. traction, extended-range blended and dynamic brakes with head-end power regeneration capabilities, advanced crash energy management technology, and streamlined body design.

EMD's domestic production stalled while awaiting development of the Tier 4 freight locomotive. The company did produce 34 Ferromex SD70ACes in 2015. Included were 15 locomotives outfitted with "elephant ear" radiator shrouds to improve the cooling capacity while operating in tunnel-heavy former Ferrosur territory.

Kansas City Southern de Mexico also received 25 non-certified SD70ACe-P6s last year for exclusive service in Mexico.

EMD exports have been steady since 2015, with 30 GT38ACs for PTKA in Indonesia, 24 SD70ACe/Lcis for BHP in Australia, 15 GT42ACs for Peru Rail, seven GPL38Ss for SAR in Saudi Arabia, seven GT46ACSs for Saudi Rail Org in Saudi Arabia, six GT46ACs for Setrag in Gabon, and 30 GT46ACs for SNTF in Algeria.

EMD constructed three third-generation GT46AC-ACes in mid-2016 for demonstration purposes in Australia. Numbered 101-103, the demos feature newer Mitsubishi inverters and electronics instead of Siemens equipment.

EMD's parent company, Progress Rail, had one small order in 2016: two PR20Bs delivered to New York & Atlantic for freight service on Long Island. Unlike previous PR-series four-axle locomotives, these utilize a hybrid design of EMD's GP20C-ECO cab and underframe, Caterpillar 3512C-HD prime mover and full-height Progress Rail long hood.

Production at Siemens' Roseville plant was busy in 2015 and 2016 fulfilling Amtrak's order for 70 ACS-64 electric locomotives. As the Amtrak order neared completion in early 2016, Siemens began ramping up production of its SC-44 Charger locomotives. The SC-44 order

NS No. 4701, part of a program to turn tired GP50s into GP33ECOs is paired with NS-built RP-M4C slug No. 645. Chris Guss

CP SD30C-ECO No. 5029 (a rebuilt CP SD40-2) leads train 281 through Wauwatosa, Wis., on Dec. 14, 2015. Chris Guss

encompasses 69 locomotives for departments of transportation in Illinois, California, Michigan, Missouri, Washington, and Maryland. The first completed SC-44, Illinois Department of Transportation No. 4601, debuted in late March, with the first two scheduled to ship to the Transportation Technology Center in June. The Illinois Department of Transportation is scheduled as the launch customer for the locomotive in late 2016.

Testing on the Cummins QSK95 prime mover that will power the SC-44s began in early 2016 on Indiana Rail Road. Cummins' HTL4200AC locomotive is a one-of-a-kind engine constructed from former Union Pacific SD90MAC-H II No. 8559, built by EMD in 1999. It was rebuilt by Sygnet in Tenino, Wash., with finishing work performed at Brookville in Pennsylvania and at INRD's Hiawatha locomotive shop. CECX No. 1919 began testing in limited service in early February, and was eventually assigned to through-train service by May.

GENSETS AND MORE

RJ Corman Railpower Locomotives delivered 14 RP20BD gensets to Union Pacific in 2015. Assigned to the Chicago area, the gensets were constructed on new frames, a change from previous orders built on the frames of retired locomotives.

GP38-2 replacements? One of two Progress Rail PR20Bs built for New York & Atlantic Railway, No. 301 rests in Fresh Pond yard, Queens, N.Y. David T. Horree

Brookville Locomotive produced a single 80-ton BL05 diesel-hydraulic locomotive for the United States Navy in 2015. The unit is assigned to the Puget Sound Naval Shipyard & Intermediate Maintenance Facility in Bremerton, Wash. Brookville also built a pair of BL12CG gensets for Central California Traction, using twin Cummins 600-hp engines in each locomotive. The two BL12CGs will work alongside CCT 2101, a BL21CG genset built by Brookville in 2012.

National Railway Equipment built two 3GS21B-DE gensets for the US Army and a GT26 for Sitarail in the Ivory Coast in 2015. This year, it built a single 3GS21B for Nova Chemicals in Joffre, Alberta.

Motive Power Inc. is building 16 twin-engine Tier 4 MP54ACs for GO Transit. The A.C. traction, 4,600-hp locomotives are powered by a pair of Cummins QSK60 prime movers developing 2,700 hp (gross), each. The first locomotive was delivered to GO Transit in early March for testing.

With the industry in a downturn and thousands of locomotives stored nationwide, new locomotive orders are drying up. As multiyear orders placed during the recent boom in traffic are filled, the drought in new locomotive production is expected to worsen. To contend with the

2015 LOCOMOTIVE REBUILDS

Railroad	Qty.	Road number	Rebuilder	Type	Order/Serial No.	Build date
BNSF	10	2555-2558, 2570-2575	NRE	GP39-3	As original	09/15-12/15
Electrical upgrade program completed by National Railway Equipment at Mount Vernon, Ill. (4) and Paducah, Ky. (6), to transform GP38s to 2,300-hp GP39-3. Work includes adding turbocharger and microprocessor controls. Former numbers in sequence: BNSF 2132, 2210, 2142, 2222, 2187, 2169, 2230, 2181, 2232, 2206.						
BNSF	28	2597-2624	Relco	GP39-3	As original	01/15 -12/15
Electrical upgrade program completed by Relco at Albia, Iowa, transforming rebuilt GP35s into GP39-3s. Work includes derating to 2,300 hp and adding microprocessor controls. Note 2597 is from GP38 2113 and remains at 2,000 hp. The remainder are from BNSF 2500, 2552, 2501, 2521, 2543, 2523, 2537, 2510, 2522, 2567, 2547, 2529, 2502, 2508, 2575, 2531, 2549, 2507, 2582, 2569, 2539, 2564, 2571, 2565, 2548, 2518, 2512.						
BNSF	19 (21)	599-619	GE	AC44C4M	As original	08/15-12/15
Rebuilt from DASH 9-44CWs to AC44C4Ms by GE at San Luis Potosi, Mexico. Work included replacing six D.C. traction motors with four A.C. traction motors and inverters, along with updated control system software equivalent to current generation of Evolution Series software. Nos. 614 and 616 completed in 2014.						
BRC	1 (2)	150	NS	MP15AC	74683-2	07/15
Rebuilt by NS Juniata Shop, Altoona, Pa. MP15DC converted to MP15AC. Work includes replacement of D32U main generator with AR10 and adding electronic air brakes. Renumbered from BRC 534.						
CP	22 (30)	5020-5041	EMD	SD30C-ECO	20147050-001 to - 030	11/15* -12/15*
EMD ECO rebuild by EMD at Bombardier, Sahagun, Mexico. SD40-2 cores provided for the 30-unit program are CP 5648, 5729, 5742, 5776, 5787, 5793, 5827, 5843, 5844, 5924, 5940, 5944, 5947, 5948, 5963, 5964, 5967, 5981, 5982, 5998, 6004, 6006, 6021, 6026, 6058, 6076, 6078, 6604, 6615, 6616. Core to new unit road-number correlation has not yet been clarified.						
CECX	1	1919	Sygnet/ Brookville	HTL4200AC	976833-39	2015*
Former UP SD90MAC-H II No. 8559 rebuilt with Cummins QSK95 prime mover. Rebuild by Sygnet in Tenino, Wash., finishing work performed by Brookville. Locomotive is serving as test bed for Cummins QSK95-powered SC-44 Charger locomotives being built by Siemens in California.						
CRIC	4	205-208	Relco	L4-1500XD-M	n/a	02/15-12/15
CRIC	4	305-308	Relco	S4-143	n/a	02/15 -12/15
Geeps and MP15DCs rebuilt to mother-slug combinations by Relco at Albia, Iowa. The L4-1500XD-M mother uses a 12-645 engine coupled with an AR10 alternator. The S4-143 is a slug. Both are ballasted to 286,000 pounds each. Total program calls for eight of each.						
CSXT	18	2019-2036	CSX	GP38-3	As original	02/15*-12/15
Rebuild program conducted by CSX at Huntington, W.Va., upgrading GP38-2s to GP38-3s. Work includes new cab and microprocessor controls. Core locomotives are CSXT 2657, 2734, 2537, 2578, 2763, 2627, 2533, 2569, 2786, 2619, 2713, 2577, 2571, 2566, 2705, 2641, 2572, 2553.						
CSXT	50	4050-4085, 4225-4229, 4285-4289, 4291, 4384-4386	MPI	SD40-3	As original	04/15 – 12/15
Rebuild program to upgrade SD40s and SD40-2s to SD40-3s at MotivePower Industries, Boise, Idaho. Work includes new operators cab and addition of microprocessor controls. Core locomotives are CSXT 8158, 8125, 8144, 8198, 8211, 8133, 8010, 8202, 8030, 8148, 8031, 8068, 8120, 8057, 8240, 8074, 8050, 8110, 8162, 8032, 8098, 8152, 8072, 8103, 8150, 8209, 8018, 8083, 8093, 8022, 8140, 8084, 8114, 8111, 8020, 8073, 8806, 8837, 8848, 8827, 8820, 8342, 8336, 8409, 8320, 8440, 8447, 8883, 8885, 8869.						
CSXT	33	6503-6535	CSX	GP40-3	As original	01/15 – 12/15
Rebuild program to upgrade GP40-2s to GP40-3s at CSX Huntington, W.Va., shop. Work includes new cab and addition of microprocessor controls. Core locomotives: CSXT 6347, 6356, 6153, 6042, 6057, 6355, 6390, 6399, 6122, 6120, 6354, 6066, 6398, 6115, 6361, 6123, 6083, 4407, 4424, 6154, 6067, 6053, 6112, 6364, 6098, 6131, 6104, 6111, 6010, 6139, 6018, 6023, 6117.						
Duke Energy (DKPX)	1	2543	RS	LEAF (Single)	Unknown	03/15*
Unknown EMD SW-switcher converted to LEAF genset powered by single Cummins QSX15-L3 600 HP engine. Work done by Railserve at Longview, Texas.						
GMTX	1	955	MEI	Slug	7885-6	09/15
Former CSX GP40 6677 converted to slug by Metro East Industries, East St. Louis, Ill. Unit to operate with GATX SD40-3 3350.						
GO Transit	1	647	MPI	MP40PHTC-T4	Order 2421-01 Serial 0308-21	09/15
Completed by MotivePower Industries, Boise, Idaho. Locomotive's original EMD 16-710G prime mover and separate Caterpillar HEP replaced with two Cummins QSK60 prime movers and HEP inverter. New gross horsepower is 5,400. This unit retains its D.C. traction motors and is a forerunner for a program of new-build A.C. traction MP54ACs for GO. Production planned to start in 2016.						
KCS	3 (6)	2020, 2036, 2040	KCS	GP32ECO	As original	2015
Conversion program underway by Kansas City Southern upgrading GP38-2s into GP32ECOs by replacing their 16-645E prime mover with a 16-710G3-T0+ and adding an improved cooling system.						
Kinder Morgan (FWDX)	1	0002	Curry	TP70		12/15
Built by Curry Rail Services, Hollidaysburg, Pa., using frame section and one HT-C truck retired CP SD40-2 No. 785. Powered by Tier 3-compliant Caterpillar C9.3 engine rated at 475 hp.						
LSRC	1	303	MEI	Slug	7710-2	03/15
Lake State Railway 371 converted from "GP38m" to slug by Metro-East Industries, East St. Louis, Ill. Mother is LSRC GP40M-3 4303.						
New York New Jersey Rail	3	5101-5103	KLW	SE10B	As original	n/a
EMD Geep cores rebuilt to SE10B by Knoxville Locomotive Works, Knoxville, Tenn. Locomotives powered by Tier 4 MTU Series 1600 12V prime mover using AR10 alternator with a 2:1 ZF reduction gearbox and TMV TECU wheel ship and engine control.						

Railroad	Qty.	Road number	Rebuilder	Type	Order/Serial No.	Build date
NYSW	2	3012, 3016	EMD	SD33ECO	20147995-001, -002	11/15-12/15
EMD ECO rebuild by Progress Rail in Tacoma, Wash. NYSW SD40T-2s upgraded to SD33ECO. Work includes replacement of 16-645E prime mover with a 16-710G3-T0+ engine and an improved cooling system.						
NS	2	4000, 4001	GE (AMP)	AC44C6M		08/15
American Motive Power Inc. (AMP) in Dansville, N.Y., contracted by GE to upgrade NS Dash 9-40Cs 8799 and 8879 to AC44C6Ms. Work included new trucks and A.C. traction motors and inverters, along with updated control systems equivalent to current generation of Evolution Series software. Original standard operator cabs replaced with new GE wide-nose cabs. Locomotives repainted and renumbered by NS at Chattanooga, Tenn.						
NS	22 (28)	4700-4710, 4715-4725	NS	GP33ECO	As original	01/15 – 12/15
Conversion program underway by NS Juniata Shops, Altoona, Pa., rebuilding high-nose GP50s to GP33ECOs with low-nose, crashworthy Admiral cab. Upgrades include Tier 3 12N-710G3B-T3 ECO prime mover, electronic air brakes, and EM2000 microprocessor. All are equipped to operate with RP-M4C slugs. From NS 7004, 7061, 7091, 7007, 7020, 7066, 7077, 7068, 7047, 7041, 7074, 7055, 7021, 7065, 7079, 7016, 7058, 7051, 7048, 7010, 7006, 7018.						
NS	33	6993-7002, 911, 7004-7025	NS	SD60E	As original	01/15 – 12/15
Conversion program underway by NS Juniata Shops, Altoona, Pa., upgrading SD60s to SD60Es by adding a new Crescent safety cab, upgrading engine to 4,000-hp Tier 2 16-710G3B-IC with EFI, electronic air brakes, and an EM2000 microprocessor. Core locomotives are NS 6631, 6565, 6591, 6684, 6532, 6688, 6616, 6542, 6522, 6588, 6577, 6544, 6547, 6608, 6613, 6644, 6598, 6618, 6622, 6615, 6697, 6682, 6680, 6564, 6640, 6592, 6510, 6609, 6611, 6620, 6595, 6607, 6619.						
NS	5	2349, 2384, 2392, 2403, 2412	NS	MP15E	As original	01/15 – 09/15
Conversion program underway by NS Juniata Shops, Altoona, Pa., converting MP15DCs to MP15E. Work includes replacement of D32U main generator with AR10, upgrading the 12-645E engine to Tier 0+ standards, and adding Elcon traction control. Locomotives retain original road numbers.						
NS	1	888	NS	RPU6	35614	05/15
NS SD40 1619 converted to slug by NS Juniata Shops, Altoona, Pa.						
Rail Logix (RLGX)	1	1402	NRE	2GS14B	5170-4	01/15
NREX GP7 1368 converted to dual-engine genset by NRE, Paducah, Ill.						
Railserve (RSSX)	n/a	577, 2056, 9022	RS	LEAF (Single)	As original	n/a
Railserve (RSSX)	n/a	112,115, 2044,5049	RS	LEAF (Dual)	As original	n/a
Railserve shop in Longview, Texas, converts a variety of four-axle locomotive types to single- and dual-engine LEAF gensets powered by Cummins QSX15-L3 600-hp prime movers. An unknown number of LEAF conversions were completed in 2015. Core locomotives include AZER GP20 2044 to RSSX 2044. RSSX 5049 started as RSSX GP10 8049. RSSX 9022 used an ex-CR SW9 as core loco.						
SEPTA (SPAX)	1	50	MPES	Genset	864-422-1128	07/15
Motive Power & Equipment Solutions in Greenville, S.C., converted a Brookville BL15 with a 1500-hp V12 Caterpillar prime mover into a Tier 4 model equipped with a pair of Cummins QSX15 prime movers and microprocessor. This is the first genset produced by MP&ES and was originally a Milwaukee Road SW1200.						
SETRAG	6	BB 610-BB 615	RS	LEAF	As original	n/a
Railserve at Longview, Texas, used GP7 and GP9 frames to build four-axle dual-engine LEAF gensets destined for Société d'Exploitation du Transgabonais (SETRAG) in Gabon, Africa. Setrag is the operator of the railroad.						
UP	5	3004-3012 evens	Relco	S3-2B	As original	04/15 – 09/15
Relco shop in Albia, Iowa, converted UP SD40-2s to S3-2B slugs UPY 3004, 3006, 3008, 3010, 3012. Slugs equipped with dynamic brakes; mothers are UP SD40N rebuilds UPY 3003, 3005, 3007, 3009, 3011.						

* Estimated build date, unconfirmed by publication deadline.

looming lack of orders, both GE and EMD are opening their shops, normally reserved for new-build locomotives, to upgrade existing locomotives. In a program similar to that conducted at the NS Juniata Shop in Altoona, Pa., EMD will begin converting 15 secondhand NS SD9043MACs to SD70ACUs at its Muncie plant later this year. As part of its DC2AC program, GE has begun upgrading D.C. traction Dash 9 locomotives to A.C. traction. (See pages 28-33.) A total of 21 BNSF Dash 9-44CWs were converted to A1A-A1A AC44C4Ms at the GE shop in San Luis Potosi, Mexico, in 2015. GE has also begun work on a multiyear order to upgrade NS Dash 9-40CWs to six-motor AC44C6Ms. This sort of flexibility should help locomotive builders weather the current downturn until the railroad industry rebounds. ■

Cummins QSK95-powered HTL4200AC No. 1919, built from UP SD90MAC II No. 8559, tests in road service on the Indiana Rail Road in June 2016. Kevin Burkholder

EMD's TIER 4 LINEUP

Electro-Motive Diesel is making its Tier 4 debut in 2016 with three new freight and passenger locomotive models and two new prime movers to drive them. Powered by the four-stroke EMD 1010 engine, the C-C SD70ACe-T4 and the four-motor, B1-1B SD70ACeP4-T4 are EMD's long-awaited Tier 4 freight models. The sleek, Caterpillar C175-20 powered F125 is the company's new passenger locomotive.

SD70ACe-T4 No. 1501 introduced the model at the Railway Supply Institute show in Minneapolis last fall. Nos. 1502 and 1503 went for testing at the Transportation Technology Center near Pueblo, Colo. Another 10 demonstrators were built in early 2016.

The SD70ACe-T4's 12-cylinder, four-cycle, two-stage turbocharged 1010 prime mover is a radical but necessary departure from the battle-tested, two-cycle engines that have powered EMD locomotives since the dawn of dieselization.

EMD's earlier attempt at a 12-cylinder, four-cycle engine in the 1990s was the 4,500-hp 12-265H. A cousin to the 6,000-hp 16-265H engine, the 12-265H was installed in a single SD89MAC prototype locomotive but never marketed.

The 4,600-hp 1010 engine was developed with the combined engineering expertise of EMD, Progress Rail, and Caterpillar. The 1010 has a two-stage turbocharger system utilizing three turbochargers and a common rail fuel system.

The new SD70ACe-T4 is long, measuring 76 feet, 8 inches, more than 2 feet longer than the 74-foot, 3-inch long SD70ACe.

EMD also raised the height of the engine hood, giving it a more massive look. Enlarged radiators and the exhaust gas recirculation system and diesel oxidation catalyst are necessary to achieve Tier 4 emissions compliance. The SD70ACe-T4 and 'P4 also feature inverter-driven accessories, an alter-

EMD 1503, one of two SD70ACeT4s at the Transportation Technology Center near Pueblo, Colo., gets a workout with older EMD SD70ACes. EMD

Testing on UP, SD70ACe-T4 demonstrator No. 1503 works through Tolland, Colo., in March 2016. Two photos, John Crisanti

nator engine-starting system and an isolated powertrain to reduce noise and vibration.

The cab has been enlarged and includes a number of refinements from the earlier model. One of the most noticeable changes is the return to the teardrop windshield, last used on the SD70MAC more than 15 years ago. The increased window area is complemented by the steeper angle of the nose toward the front stairwells. Each of the four stairwells has been redesigned to accommodate five steps instead of the previous four.

EMD has added an emergency-egress window at the rear of the locomotive on the conductor's side. In the event of an emergency where the front door and the door behind the engineer are unavailable, the small window can be used to exit to the top of the inverter cabinet behind the cab.

EMD eliminated the isolated cab design that has been an option on most comfort-cab locomotives the builder has offered since the 60 Series in the 1990s. In its place are isolating dampers on the engine and alternator mounts that minimize noise and vibration to the entire locomotive.

Underneath, the SD70ACe-T4 has several notable changes, starting with the introduction of a new HTCR-6 truck. The fabricated frames used for each truck are a departure from the traditional cast bogies and are lighter than the previous HTCR-4 used on the SD70ACe. Individual axle control, previously an option on the most recent EMD offerings, has become standard. This improvement allows a crew to cut out individual motors if necessary, instead of the entire truck, if mechanical issues arise.

After more than 18 months on the sideline, EMD will once again be going head to head with General Electric for new locomotive sales in the United States.

FREIGHT

Model	SD70ACe-T4	SD70ACeP4-T4
Emissions compliance	EPA Tier 4	EPA Tier 4
Engine type	EMD 12-1010J	EMD 12-1010J
Number of cylinders	12 cylinders V-type	12 cylinders V-type
Traction horsepower	4,400	4,400
Axle configuration	C-C	B1-1B
Control system	EM2000	EM2000
Traction configuration	A.C./A.C., inverter per axle	A.C./A.C., inverter per axle
Truck	HTCR-6	HTCR-6
Wheel size	43 inches	43 inches
Length	76 feet, 8 inches	76 feet, 8 inches
Height	15 feet, 11 inches	15 feet, 11 inches
Crashworthiness	S-580 compliant	S-580 compliant

EMD's new Tier 4-compliant, four-cycle 12-1010J prime mover is the heart of the SD70ACe-T4 and 'P4.

SD70ACe-T4 features include single-axle controls and the new fabricated-frame HTCR-6 truck. Greg McDonnell

Ready to depart for California, Metrolink F125 No. 904 poses on the shop floor of its Muncie, Ind., birthplace.

Built by Progress Rail in Muncie, Ind., the 4,700-hp, A.C. traction F125 passenger locomotive combines EMD's EM2000 control system with Caterpillar's C175-20 engine and Kato AK30-8 alternator to provide power to Vossloh Rail Vehicles (now Stadler Rail) high-speed trucks. Vossloh also provides the monocoque carbodies, shipped from its plant in Valencia, Spain. The Caterpillar C175-20 engine is skid-mounted inside the locomotive, allowing a more efficient changeout process.

The F125 is equipped with eight A.C. inverters, half of which are utilized for the traction motors and the balance for head-end power and other locomotive functions. Redundancy is built into the electrical system, allowing the locomotive to redirect one traction inverter for HEP purposes if a failure occurs. If this happens, the remaining three traction inverters would distribute their power output to the four traction motors for propulsion.

Unlike EMD's new 1010 freight engine inside the SD70ACe-T4 that uses exhaust gas recirculation and a diesel oxidation catalyst to achieve Tier 4 emissions, the Caterpillar C175-20 uses Selective Catalytic Reduction to achieve Tier 4 compliance. SCR technology requires the use of diesel exhaust fluid, which is a urea solution. The F125 has two tanks for that fluid, one underneath the frame behind the fuel tank and the second inside the carbody under the radiators. Both tanks are heated since the freeze point of diesel exhaust fluid, depending upon the solution percentage, can be as warm as 33 degrees Fahrenheit.

The launch customer for the F125 is Southern California Regional Rail Authority, operator of Metrolink, the Los Angeles region commuter service. The agency has 29 units on order as of mid-2016. EMD is scheduled to deliver the first working F125 to Metrolink by year's end. — *Chris Guss*

PASSENGER	
Model	F125
Emissions compliance	EPA Tier 4
Engine type	Caterpillar C175-20
Number of cylinders	20 cylinders V-type
Traction horsepower	4,700
Axle configuration	B-B
Control system	EM2000
Traction configuration	A.C./A.C., inverter per axle
Truck	High speed
Wheel size	40 inches
Length	69 feet
Height	14 feet, 7 inches
Crashworthiness	PRIIA 305-005

Monocoque carbodies for the F125 are shipped to Muncie from Vossloh in Spain. Three photos, Greg McDonnell

Frames for Metrolink F125s are rolled upside down to be outfitted with piping and wiring.

SIZE MATTERS

Test driving the new Tractive Power Corp. TP56 switcher

Story and photos by Steve Bradley

Acquire one well-used SD40-2, cut it in two, add state-of-the-art technology, a new carbody and cab, and bingo: two versatile, brand-new switchers that are Tier 4 compliant. That's the short story of Tractive Power Corp.'s new TP56 and TP70 industrial switchers.

As Class I railroads continue to shed as many switching operations as possible, numerous industries have begun to perform their own switching or contract it to private operators. This, along with more stringent emission regulations, has opened a new market for small motive power. British Columbia-based Tractive Power has a unique solution: a compact (27-foot, 10-inch), robust, three-axle, diesel-electric switcher constructed using a single EMD HT-C truck, three D77 traction motors, and half the frame of an EMD SD40-2. The TP56 (56,000 pounds tractive effort) and TP70 (70,000 pounds tractive effort) models are customizable and available with U.S. Environmental Protection Agency Tier 3- or Tier 4-compliant diesel engines.

TPC's prototype locomotive, a 375-hp TP56, was manufactured in 2014 using space at the West Coast Railway Museum in Squamish, British Columbia. A retired Canadian Pacific SD40-2 provided the frame, trucks, and traction motors for the project. Not just any SD40-2, but No. 5805, a locomotive I had photographed in Rogers Pass, and later worked aboard while doing a stint with CP in Revelstoke, B.C.

The prototype proved successful and went to work at Parrish & Heimbecker grain facility in Cloverdale, B.C. The second locomotive, a TP70, was delivered to a customer in Vancouver. Tractive Power, meanwhile, struck a manufacturing agreement with Curry Rail Services to produce TP switchers at its shop in Hollidaysburg, Pa.

Based in the 100,000-square-foot Samuel-Rea car shop built by the Pennsylvania Railroad, Curry Rail Services has been a provider of freight-car services and locomotive products for more than 20 years. In recent times, Curry has expanded its offerings to include locomotive-cab fabrications for Norfolk Southern's Admiral Cab program and locomotive frames for road slugs built by NS at its Juniata Shop in nearby Altoona.

CP No. 785, a retired SD40-2 of Soo Line heritage, was selected for the first Hollidaysburg-built TP switcher, a TP56 completed in early 2016. I called on Curry in April to test drive Curry's own TP56.

The donor locomotive is stripped to a bare frame and cut into two 27-foot, 10-inch sections. The trucks are completely refurbished; a new pilot is fabricated on the end of the frame where the cut was made. The bolster is re-engineered so the truck no longer swivels, and when the truck and frame are mated, they are welded together. The engine, a 375-hp Caterpillar C9 ACERT-37 in this case, is mounted to the frame. Everything above the frame is new; including a Curry-fabricated carbody and spacious cab complete with an AAR control stand and 26 air brakes.

Curry's bright green-and-silver TP56 works the CRS facility in Hollidaysburg, spending the day digging out and spotting cars at the car shop as well as switching the hundreds of freight cars stored in the yard. Let's see how the switcher feels and operates in tough world or freight car switching.

"She'll never be a beauty queen," I thought as Travis Semanchik and Matt Aungst pulled up to the office in the little TP56, but that's what they said about EMD's GP7, and it set a new standard for the industry and became a best seller.

Climbing aboard, I was impressed with the cab, its excellent visibility, great seats, air conditioning, and stainless steel ceiling and walls. Rugged was my next impression. The TP56 may be small, but it appears to carry on the tradition of the SD40-2 heritage by being built to last and easy to maintain.

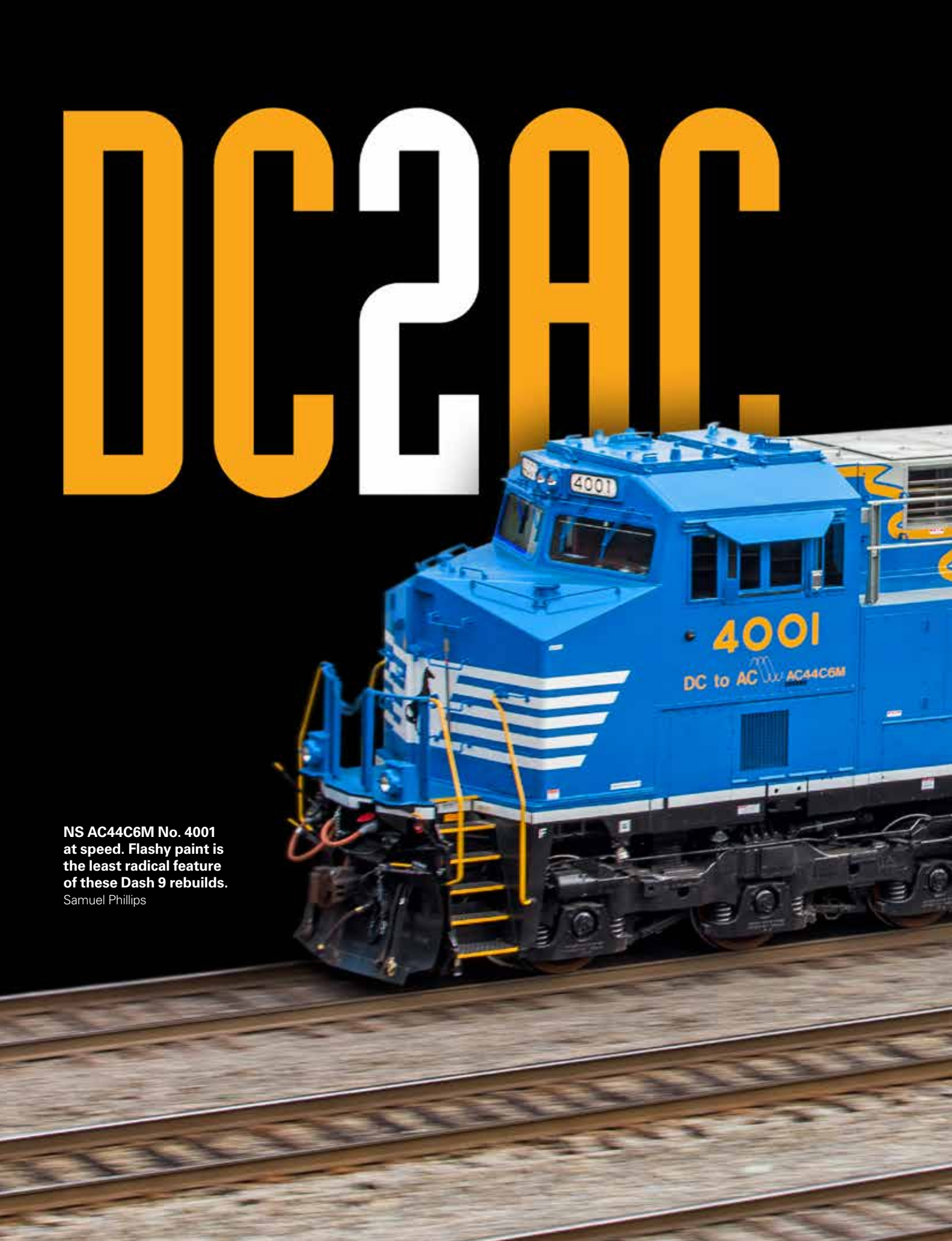
Hollidaysburg is typical of yards everywhere. Lots of switches, some rough spots, and track that is slippery in wet weather. Travis made the first few moves as we talked about the unit and then put me in the seat. The standard AAR control stand and radio were all familiar, but the screen above the brake stand, giving full views at the front of the locomotive, was a great added feature for switching. The unit rode beautifully on its six-wheel truck and visibility was exceptional. Matt was working the ground, and had no trouble entraining or detraining using the well-designed steps and handrails. Most importantly, he was always visible to me, either directly or on the video screen.

Switching is hard on locomotives. Constant starts stops and coupling impact soon take their toll, but the little TP56 is built to take it. Tractive effort is crucial, so with wet rail, and a cut of 27 tank cars, it was time to test her mettle. Notching out, it was like the little engine that could. With no slipping, no smoke, little engine noise, and a solid feel, she soon had our cut on the move. I thought of the GP9 that I normally run slipping, roaring away, and offering a fair amount of exhaust to the atmosphere in similar circumstances. What a difference! The folks at CRS tell me they have moved over 40 cars with no difficulty. Add this to the fact the locomotive sips fuel and consumes just a half-gallon an hour at idle.

The TP56 and TP70 seem perfectly positioned to fill a niche in the switching world. Size matters with switchers and in this case, small wins.

Assigned to duty at the Curry Rail Services yard in Hollidaysburg, Pa., Travis Semanchik and Matt Aungst pose with their spirited charge, a TP56 switcher built right there in the CRS shop.

DC2AC



NS AC44C6M No. 4001 at speed. Flashy paint is the least radical feature of these Dash 9 rebuilds. Samuel Phillips

Transforming DC Dash 9s into high-performance AC machines

by Greg McDonnell

Their freshly painted cabs as blue as the winter sky, Norfolk Southern Nos. 4000 and 4001 march a loaded coal train up Starkey Hill on the south side of Roanoke, Va., on a sunny February 2016 afternoon. The bright blue-and-gray color scheme worn by the two NS GEs is a radical departure from the road's signature black and white — and a hint that there's more to these newly rebuilt Dash 9s than meets the eye.

AC44C6M prototypes NS 4000 and 4001 march coal up Starkey Hill in Roanoke in February 2016. Samuel Phillips

In the cab of NS No. 4000, engineer Chad Jordan can vouch for the fact that flashy paint is the least radical feature of the two rebuilt GEs on the head end of his train. Assisted by a manned ES44AC helper set on the rear of the train, Jordan's 20-year-old locomotives have the fit, feel, and footing of the latest A.C. traction EVOs as they lug 105 cars of North Carolina-bound coal up the storied grade that tops 1.5 percent at its steepest.

So they should. Prototypes for an advanced and innovative GE-designed upgrade program, the veteran Dash 9s have been updated and rebuilt as state-of-the-art A.C. traction locomotives. They've traded their D.C. traction motors for new trucks and A.C. motors, been outfitted with new wiring and control systems, and rebuilt from the rails up. It's all in the fine print stenciled below the road numbers on the brand-new operator cabs applied to the onetime standard-cab locomotives: "DC to AC AC44C6M." Or as GE calls it, DC2AC.

Model	Dash 9-40CW	AC44C6M
Weight (nominal)	400,000 pounds	Up to 432,000 pounds
Horsepower	4,100	4,500
Wheel diameter (new)	42 inches	43 inches
Gear ratio	83/20	87/16
Maximum operating speed	70 mph	75 mph
Engine	7FDL16	7FDL16
Transmission type	Direct current (D.C.)	Alternating Current (A.C.)
Main alternator	5GMG197	5GMG213
Traction motors	5GE752 (x6)	5GEB13 (x6)
Starting tractive effort	142,000 pounds	200,000 pounds
Continuous tractive effort	105,640 pounds	166,000 pounds

The origins of the DC2AC program can be traced to 2011 as GE sought ways to enhance maintenance and reliability of existing Dash 9 D.C.-traction locomotives. The goal, says James Bunce (GE Transportation aftermarket technology systems leader at the time and now senior engineering program leader on GE's locomotive NextFuel program) was to "get the benefits of A.C. performance at a cost comparable to the D.C. product while eliminating costly maintenance needs of the D.C. equipment."

To accomplish the goal, GE engineers took the Dash 9 back to the drawing board and worked on equipment layouts to package as much A.C. technology as possible on the D.C. platform. The selection of new versus rebuild components was driven by a number of considerations including performance (high tractive-

effort and adhesion), life extension goals, cost, and the need to remain within EPA-defined content limits for emissions compliance.

The concept called for a modular plug-and-play application similar to the way GE builds new locomotives. Remanufactured Dash 9 components and equipment would be seamlessly merged with stock, new-build A.C. traction locomotive components including systems controls, aux cab (auxiliary cab containing electrical components, inverter banks and A.C. traction circuitry, and the dynamic brake assembly), trucks, traction motors, and other major assemblies up to and including the optional replacement of the operator cab.

FROM CONCEPT TO CONFIRMATION

GE reviewed engineering drafts and descriptions of the DC2AC concept with representatives from railroad mechanical departments including BNSF and NS before finalizing the design. In late 2013, GE acquired BNSF No. 616, a former Santa Fe Dash 9-44CW, to serve as prototype. Still wearing its faded warbonnet paint, BNSF 616 was moved to GE Erie for inspection and evaluation before moving to the GE shop in San Luis Potosi, Mexico, to serve as the first DC2AC rebuild.

The San Luis Potosi shop stripped the Dash 9 to a bare platform, re-ballasted and recabled it and began rebuilding the locomotive cab by cab. (GE refers to the modular components that make up a locomotive as cabs.) All Dash 9 components to be retained, including the radiator cab, prime mover, main alternator, and operator cab were completely rebuilt. The 16-cylinder FDL prime mover was given a full "UX" rebuild, as were the rad cab, blower, and compressor. The main alternator was rewound to A.C. specifications.

The locomotive received a new aux cab, control systems, and electronic air-brake system, new C4-style HiAd trucks, and four new GEB13EA traction motors. Destined to return to BNSF for testing and evaluation, the locomotive was configured to the road's preferred A1A-A1A C4 specifications. As the crowning touch, the locomotive was equipped with GE's Advanced Rail Cleaning adhesion enhancement system. ARC employs a high-pressure, high-flow air system to clean and dry the rail surface ahead of the lead axle of the locomotive and can improve tractive effort in adverse rail conditions by as much as 30 percent.

The prototype rebuild took six months, primarily due to time needed to develop an effective workflow and remanufacturing process that could be performed in GE facilities, railroad shops, or by third-party contractors. Resplendent in the same BNSF colors worn by its new EVO and Tier 4 sisters, BNSF 616 emerged from SLP in spring 2014. It was tested locally, and then dispatched for rigorous testing on BNSF's Raton Pass line in New Mexico and Colorado.

The Raton Pass road trials pitted the newly upgraded 616 against a variety of models, from an un-rebuilt Dash 9 and its Evolution Series ES44DC successor to the A1A-A1A ES44C4 and various EMD models. The DC2AC prototype met or exceeded the performance of all participants.

BNSF signed up for 20 C4-configured AC44C4M rebuilds, all to be done at San Luis Potosi in 2015, using former Santa Fe Dash 9-44CWs. The rebuilds retain their 600-series road numbers and work in general service undistinguished from new-build C4s.

Norfolk Southern kept a watchful eye on the testing performed with BNSF 616 and ultimately signed up for two DC2AC prototypes of its own. Contracted by GE, and using GE-supplied kits, American Motive Power in Dansville, N.Y., rebuilt NS Dash 9-40CWs Nos. 8799 and 8879 to six-motor AC44C6Ms in early 2015. The Dansville rebuild included replacing the locomotives' as-built standard cabs with new wide-nose cabs. Still carrying their original road numbers

THE FIRST REBUILD

1. DC2AC prototype BNSF 616 enters the shop at San Luis Potosi, Mexico, as a tired Dash 9-44CW in faded warbonnet paint applied at Erie in 1994. 2. Crews at SLP separate the body from the frame in preparation for a complete rebuild. 3. BNSF 616, stripped to a bare platform, awaits its rebuild. 4. BNSF 616 debuts as an A.C. traction, A1A-A1A AC44C4M. Four photos, GE

NS 4000 and 4001 grind through Ferrum, Va., on Jan. 24, 2016. Samuel Phillips

and dressed in gray primer paint, the locomotives were delivered to NS at Roanoke in summer 2015. The unpainted prototypes began testing on nearby Starkey Hill soon after they hit the property.

ON THE PUMPKIN VINE PROVING GROUND

They call it the Pumpkin Vine, a single-track line that twists and climbs its way south from Roanoke toward Winston-Salem, N.C., winding through the Blue Ridge Mountains with 10-degree curves and a 1.56-percent ruling grade. The Pumpkin Vine has been a proving ground for generations of new and rebuilt locomotives, and it's where NS put the two DC2AC prototypes to the test.

Through an exhaustive series of road trials, the AC44C6Ms were pitted against Starkey Hill and the Pumpkin Vine for weeks on end. The locomotives performed wet rail testing with loaded coal trains; worked with their ARC adhesion enhancement systems activated and deactivated, and handled trains with the conventional two-by-two configuration, employing two ES44AC DPUs on the rear, as well as two-by-one, with a single helper locomotive.

"We knew they were going to perform like new A.C. locos," said Steve Gerbracht, manager, proposal & application engineering, "but that's initially hard for a railroad to gain that level of confidence when you are starting with a 20-year-old D.C. loco." Any doubts about the builder's claims were left in the dust on Starkey Hill.

"NS wouldn't accept anything that lowered class ratings," notes DC2AC product manager Jack Zhang. In fact, ARC put the AC44C6M performance over the top, regularly achieving starting tractive effort up to 200,000 pounds.

In the ultimate endorsement, NS signed a multi-year agreement for more AC44C6M rebuilds. Prototypes 8799 and 8879 were renumbered 4000 and 4001 and made their debut in the special blue-and-gray "AC-to-DC paint scheme" in December 2015. NS selected 16

Sparks fly as crews at Erie cut away the standard cab and nose of NS 8808 in preparation for DC2AC conversion. The locomotive will receive an all-new wide-nose operator cab as part of its rebuild to AC44C6M No. 4006. GE: Steve Gerbracht

Dash 9-40CWs for rebuilding in 2015: 12 by GE Erie, two at the NS Juniata shop in Altoona, Pa., and two at the NS shops in Roanoke. The Juniata and Roanoke rebuilds will be done with GE-supplied kits.

DC2AC, notes Zhang, combines proven FDL prime-mover performance with A.C. traction, Evolution Series control systems, and ARC adhesion enhancement. It's the perfect fusion of legacy and latest technologies, transforming D.C. traction Dash 9s into high-performing A.C. machines at a cost significantly lower than that of a new locomotive.

The DC2AC program presents railroads with an attractive package, but current market conditions and a glut of surplus locomotives might make it a tough sell. However, this is one tough locomotive. T

Its DC2AC transformation complete, NS 4006 (formerly NS 8808) poses outside Building 26 at Erie as it undergoes pre-delivery tests on June 27, 2016. Greg McDonnell

Backwoods Baldwins

Eddystone-built treasures on a Texas short line

Story and photos by Mike Harbour

Sparkling in fresh paint, R.J. Corman DS4-4-750 No. 301 basks in the April sun outside the shop in Diboll, Texas. Inset: Baldwin plate on sister No. 1007.

1


2

3

4

Like life itself, old enginehouses can be full of surprises. The one you're walking toward definitely holds promise. It is, after all, on the Texas South-Eastern, a small but storied lumber hauler best known as a bastion of Baldwin Locomotive Works products. Inside the metal-clad building in Diboll reside two BLW diesels that have worked the deep East Texas woods for decades.

Texas South-Eastern's new owner, R.J. Corman, recently refurbished DS4-4-750 No. 301 in the Kentucky-based conglomerate's snazzy colors. That's just a little surprising, since locomotives of this, ah, vintage usually end up in museums at best, or scrapped at worst. This you must see.

After meeting with Chet Oaks, who leads what's known today as Corman's Texas Line, you're permitted inside the enginehouse. There's not a lot of light, but not much is needed. No. 301, built in 1950, stands out like a diamond in a dirt pile. It's hard to imagine the former Eddystone shop switcher left Pennsylvania looking anywhere near as dapper.

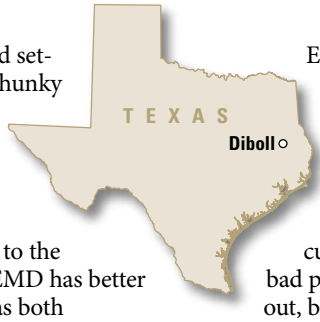
The tape lines are perfect, the lettering crisp, and details, such as the cab's four-color rear entry step, stand out. Yet paint is just part of this locomotive's story, so you wait for Oaks to start it before making final judgment.

5

6

1 and 3: Secreted in the former Texas South-Eastern enginehouse at Diboll, Texas, TS-E No. 1007, a former Cotton Belt VO1000, is sidelined with a bad pinion gear. The 1944-vintage Baldwin is up for sale. 2: Newly repainted in R.J. Corman colors, DS4-4-750 No. 301 poses outside the enginehouse in April 2016. 4: Texas treasures R.J. Corman No. 103 and TS-E No. 1007 slumber in the enginehouse. 5: Basic Baldwin: utilitarian control stand in the cab of No. 301. 6: Spare parts: six-cylinder Baldwin 606NA engine.

The 606NA prime mover cranks quickly and settles into a businesslike burble. Oaks eases the chunky unit into the crisp April morning for its photo session. The Texas sun makes No. 301's topcoat of red and silver pop even more brightly than imagined. You resist the temptation to simply sit and stare.



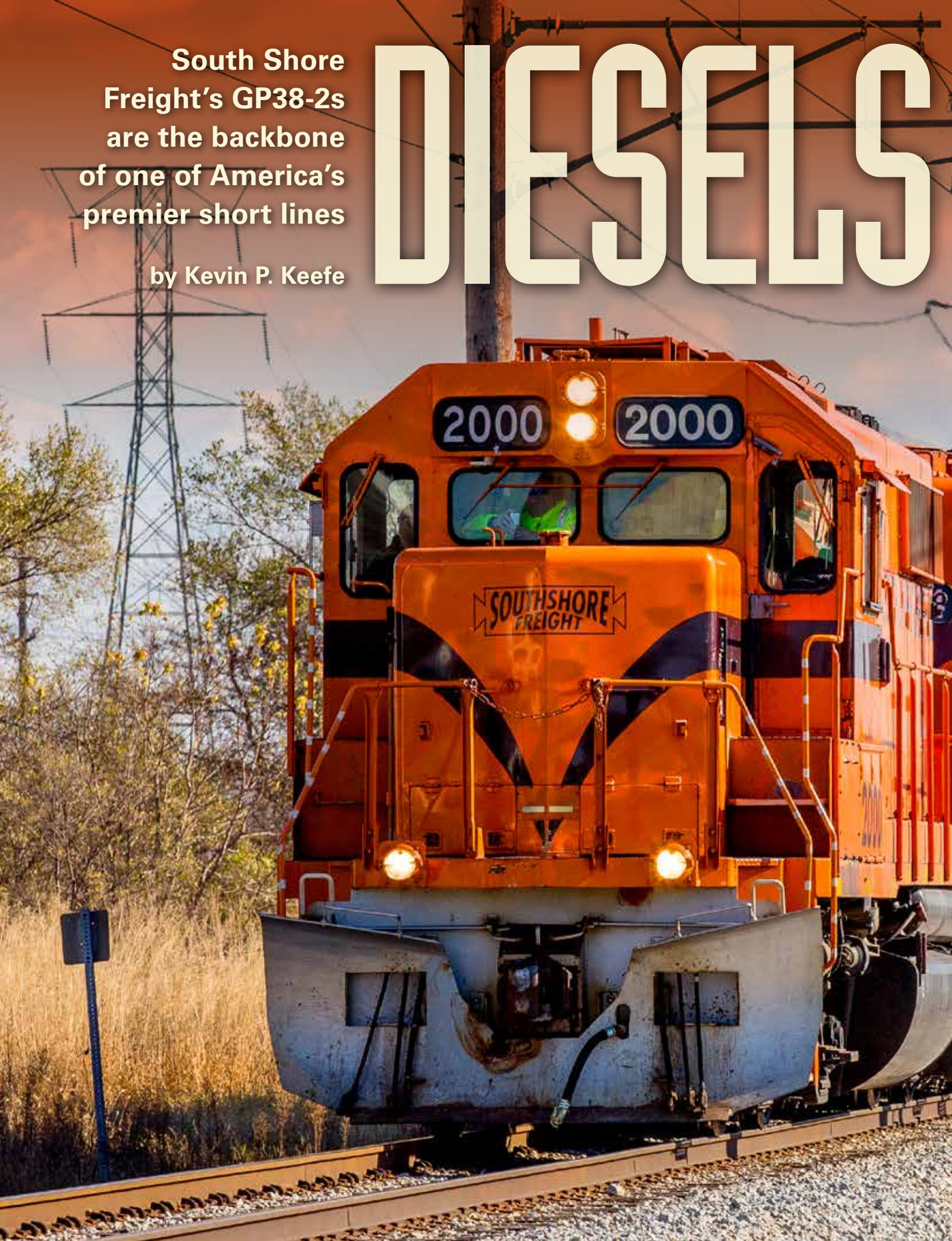
Rated at 750 hp, No. 301 serves as a backup to the road's front-line SW1500. The much younger EMD has better visibility and more muscle, notes Oaks, who has both Class I and shortline experience on his resume. But unlike the EMD, the Baldwin can be started from the cab. The boys at Eddystone got that right.

Oaks backs the switcher into its bay and shuts it down. As you chat, you walk over to study the other Baldwin in the building, VO1000 No. 1007. A half dozen years senior to No. 301, the VO retains the green paint worn by TSE diesels. While the 301's future is secure, the former Cotton Belt VO has been sidelined with a bad pinion gear and put up for sale. Its time here is running out, but who knows? Maybe it'll find a good home elsewhere. Now that would make for a nice surprise. T

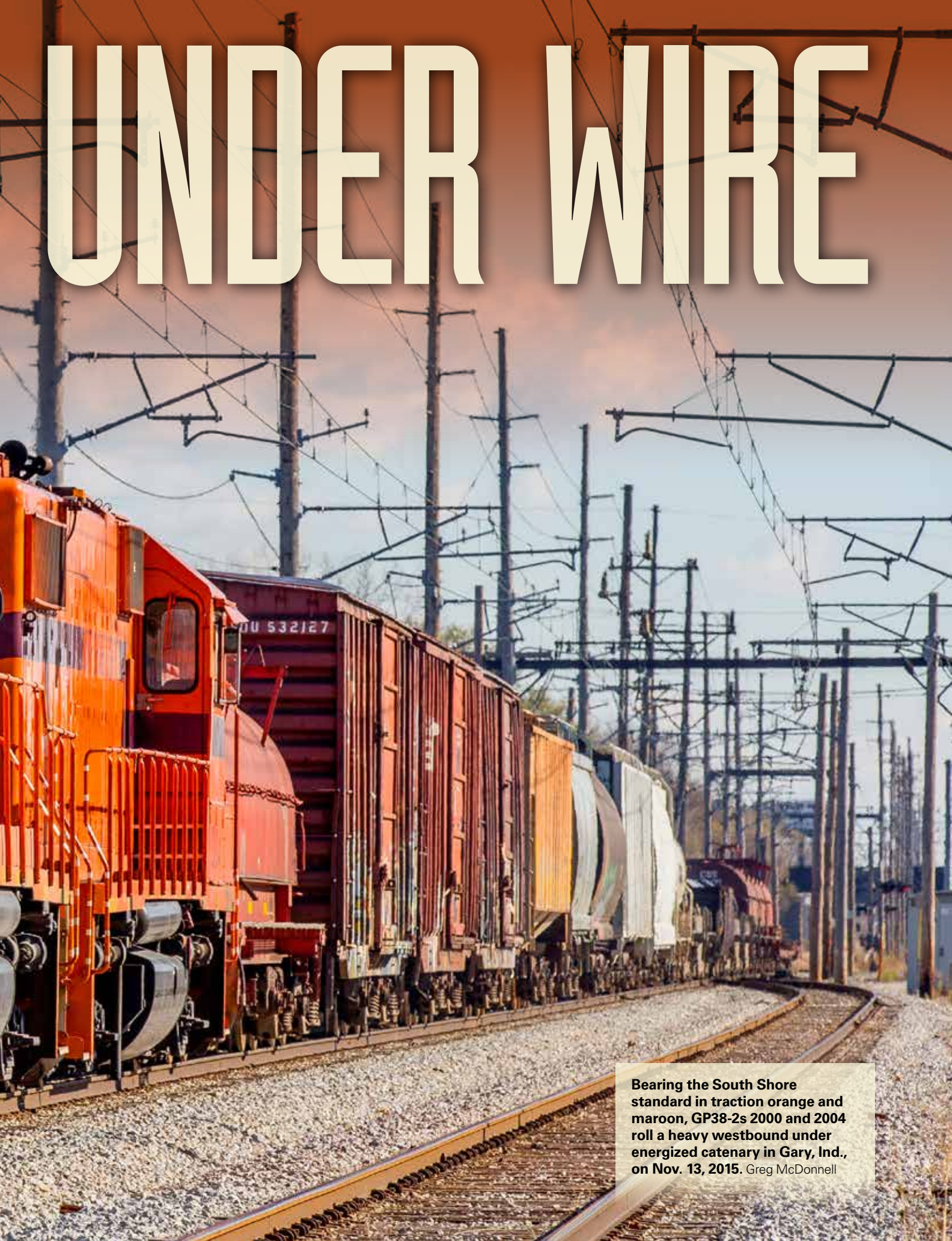
DIESELS

South Shore Freight's GP38-2s are the backbone of one of America's premier short lines

by Kevin P. Keefe



UNDER WIRE



Bearing the South Shore standard in traction orange and maroon, GP38-2s 2000 and 2004 roll a heavy westbound under energized catenary in Gary, Ind., on Nov. 13, 2015. Greg McDonnell

Street running interurban style, GP38-2s Nos. 2009 and 2000 pull a westbound freight through the S-curve on 11th Street in Michigan City, Ind. "For a moment, this neighborhood belongs to a railroad called South Shore Freight."

Even after 35 years, the scene still gets your attention. You're in the old industrial town of Michigan City, Ind., standing along 11th Street, a quiet thoroughfare that cuts east-west through neighborhoods of old frame houses and churches. Like an apparition from the 1920s, a pair of rails gleams in the middle of the pavement, slung under a single strand of catenary wire. Any moment you might expect to see an arch-windowed interurban car go trundling past.

Then you hear the almost stealthy approach of a train. But what appears around the gentle S-curve is hardly a trolley. Headlight ablaze, a pair of bright-orange hood units eases into the turns, trailing a long skein of freight cars, sending vibrations up through the surrounding streetlights and front porches. The diesels, two GP38-2s, are only doing 20 mph, but there's no mistaking the authoritative rumble of their combined 4,000 hp as they pull through the turns. For a moment, this neighborhood belongs to a railroad called South Shore Freight.

The two diesels are more than just simple, run-of-the-mill Geeps. They are symbolic of one of the most durable fleets of locomotives in all of shortline railroading. Since they were built in 1981, the 10 GP38-2s of South Shore Freight have soldiered on for the same railroad, providing reliable service to a heavy-duty roster of customers, ranging from electric utilities to steel mills to heavy manufacturing. With its strategic 90-mile mainline arc tracing the southern rim of Lake Michigan from South Bend to Chicago, the South Shore intersects nearly every major railroad in the U.S.

Heavy traffic

That location, and its correspondingly heavy traffic, is what attracted Chicago-based, privately held Anacostia Rail Holdings Co. (formerly Anacostia & Pacific) to pay $27 million for the South Shore freight operation in December 1989. The previous freight operator, Venango River Corp., was mired in bankruptcy, and the trustee eventually found Anacostia to be an ideal successor. With acquisition of the South Shore, Anacostia transitioned from highly successful consulting firm to major railroad operator. It has since fleshed out its holdings with companies such as New York & Atlantic, Pacific Harbor Line, and Louisville & Indiana. Altogether the Anacostia lines haul more than 2 million carloads annually, over nearly 800 miles of track.

Those South Shore GP38-2s lug a significant part of the holding company's overall business, especially in light of the four major customers undergirding the railroad's traffic base: coal for Northern Indiana Public Service Corp.'s generating plants at Bailly and Michigan City, and raw materials and finished products in and out of U.S.S. Midwest Steel at Portage and the big Arcelor Mittal fully integrated steel-making facility at Burns Harbor, formerly Bethlehem Steel.

There's also that matter of South Shore's traction heritage. Nearly every move those diesels make must somehow accommodate the railroad's original reason for being: the 14,000-plus riders who every day rely on the South Shore Line commuter trains of the Northern Indiana Commuter Transportation District, with whom South Shore shares most of its track. With 38 scheduled weekday passenger trains operating under the South Shore Line brand, NICTD operations loom over everything, and the freight carrier is obligated to perform a daily dance with its partner over matters ranging from train operations to maintenance of way to spotting the diesels at the shop.

The commuter agency owns most of the main line: 69 miles from South Bend to State Line. South Shore Freight ownership of track extends west from there to Kensington, 7 miles, along with Burnham Yard at Hegewisch, Lincoln Yard in Michigan City, numerous spurs and sidings, and the 21-mile former Nickel Plate Kingsbury branch from Michigan City to Dillon, Ind., south of La Porte, where local authorities are developing an industrial park.

For all these overlapping interests to work smoothly, the partnership with the transportation district has to be good. And from all accounts, it is. As South Shore CEO Andrew Fox puts it, "We have an excellent working relationship. We're co-de-

Approaching the ramp to the NICTD passenger station and the 1956 line relocation that diverted CSS&SB tracks from the streets of East Chicago, Geeps work a westbound freight through Gary.

pendents. It has to work that way." The result is a usually crisp operation in which commuter trains comfortably rub shoulders with South Shore's freights.

An interurban heritage

With its roots in electric traction, the South Shore has a motive-power legacy that is distinct among contemporary short lines. In the steam era, the railroad went about its freight business with a classic lineup of electric motors. In an earlier iteration as the Chicago, Lake Shore & South Bend, a typical Midwestern interurban, the railroad relied on small Baldwin-Westinghouse 53- and 72-ton steeple-cabs to carry a modest less than carload trade.

Everything changed in 1925 when Chicago utilities magnate Samuel Insull acquired the railroad and rechristened it the Chicago South Shore & South Bend (pointedly with no comma after "Chicago"). A former associate of Thomas Edison, the British-born Insull was the prime mover behind Chicago's gigantic Commonwealth Edison electric utility, as well as Northern Indiana Public Service Co. across the state line. Around the utilities, Insull consolidated a number of railroad properties, which in addition to the South Shore included Chicago, North Shore & Milwaukee and the Chicago, Aurora & Elgin, all of which became standard bearers of the interurban era.

The overhead trolley wire glistens in the headlight glow as traction orange South Shore Geeps 2001 and 2008 trudge through the snow on 10th Street with a westbound local on Jan. 5, 2010. Three photos, Greg McDonnell

The Insull empire sank into insolvency by 1932, but not before investing millions of dollars in its railroads. It was Insull who transformed CSS&SB from sleepy interurban to heavy-duty electric railroad, and traffic grew in response throughout the 1920s and into the 1940s. To meet the demand, South Shore traded up to increasingly larger electric motors, culminating in 1941 with a quartet of 97-ton electrics purchased secondhand from Illinois Central, which had dieselized Chicago terminal operations. They were the largest steeple-cabs ever built by Baldwin-Westinghouse.

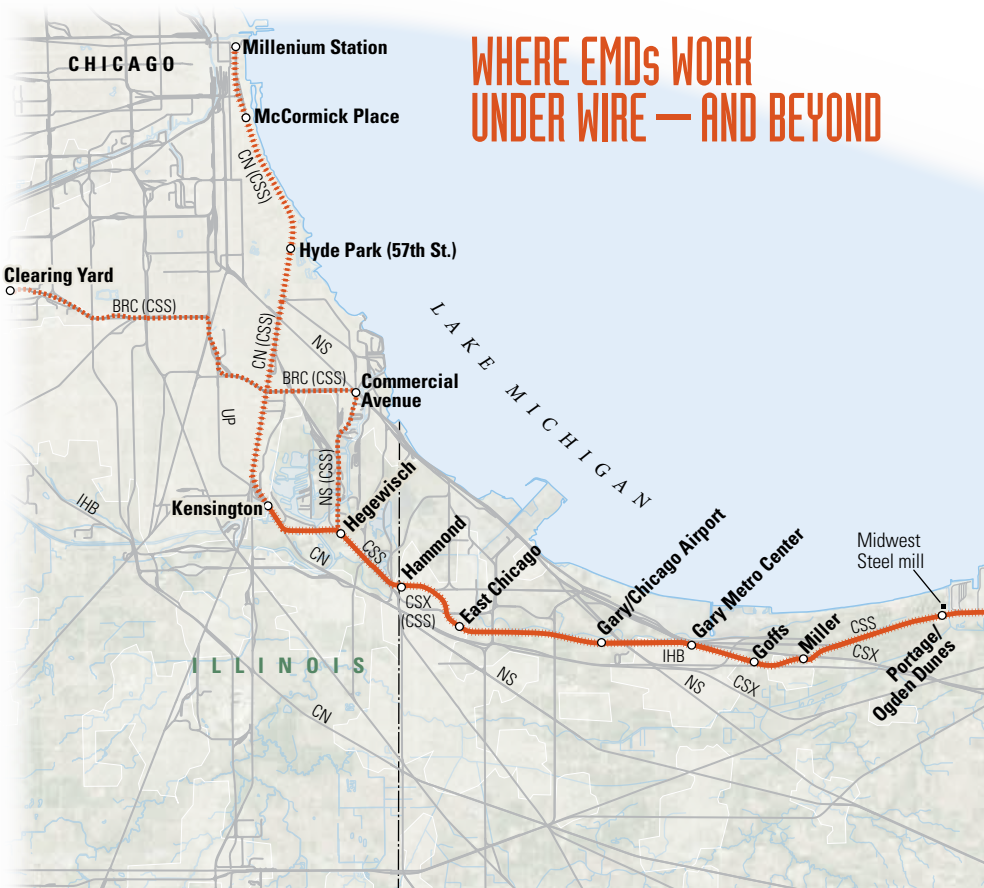
With a surge in postwar freight traffic, South Shore needed ever-larger motors, and in 1949 came a breakthrough: acquisition of a trio of 273-ton, double-ended, streamlined 2-D+D-2 electrics. These were the famed 800-class "Little Joes," so nicknamed because they became available when General Electric's sale of 20 of the units to the Stalin-era Soviet Union was nixed by the State Department. Purchased at a bargain price, the intrepid forces in the

Having worked an empty coal train from Michigan City to the East Chicago interchange with B&OCT, Nos. 706 and 707 stop to switch at Burnham Yard on their return east on a pleasant day in November 1975. Lou Gerard

Michigan City shops modified the units for use on South Shore's 1,500-volt D.C. system and the Little Joes were off and running. Twelve more Little Joes created a separate legend on Milwaukee Road's Montana and Idaho electrification, five went to Brazil.

With a continuous horsepower rating of 5,120 and a continuous tractive effort of 77,000 pounds, the Little Joes were able to easily handle the South Shore's growing fast-freight business. But by the mid-1950s, even more power was required. Reinforcements came in the form of 10 ex-New York Central R-2 electrics rendered surplus by the elimination of electrification at Cleveland Union Terminal. Built by Alco and GE in 1931, the 140-ton ex-NYC units offered 3,000 hp and 66,600 pounds of tractive effort; seven of the motors were extensively rebuilt at Michigan City. In multiple-unit use, the big-windowed R-2s partnered with the 800s to help spur dramatic growth in South Shore freight revenues.

South Shore purchased a hand-me-down Buffalo Creek SW1 in 1956, but its experience with diesels began in earnest in the 1960s, coincident with the railroad's 1967 sale to Chesapeake & Ohio. Some of



this was related to the growing business in unit coal trains, which were pushing the fleet of electric motors to its limit.

A bigger factor was what became South Shore's prime customer: the sprawling Bethlehem Steel rolling mill at Burns Harbor, east of Gary, which opened for business in 1965 (and today is part of Luxembourg-based steel giant Arcelor Mittal). Bethlehem wasn't interested in stringing catenary across the vast network of yard tracks serving the mill. With that, South Shore knew it had no choice but to turn away from electric freight.

C&O transferred three TR3B cow-and-calf switchers and a pair of NW2s to the South Shore. Bigger power arrived in 1971 in the form of eight C&O GP7s, designated Nos. 1501-1508. The numbering scheme was idiosyncratic: units with short hoods facing west took even numbers, units with short hoods facing east took odd. South Shore did it to help integrate the locomotives with the passenger trains, all operated by the same company.

The new Geeps were painted in C&O's familiar dark blue with yellow stripes, with a South Shore logo along the flanks of the hoods. A few years later the railroad picked up three more GP7s, this time from Florida East Coast. These units were not repainted; the FEC logo was merely removed from the hood. They also kept their original numbers, 614, 615, and 618.

The modern era at South Shore finally came in 1981 with the purchase of today's 10 GP38-2s from EMD. The model was already becoming one of EMD's biggest sellers, with 2,222 units manufactured between 1972 and 1986. Numbered 2000-2009, the South Shore's diesels were bare bones, sans dynamic brakes, and at first retained the same odd-even, east-west designation as the GP7s. The new power was painted in the new Chessie System yellow, with dark-blue trim and lettering.

The brakeman hustles as former NYC Class R-2 motors Nos. 705 and 707 switch at Burnham Yard in the far South Side Chicago neighborhood of Hegewisch on a blustery February 1976 day. Lou Gerard

The GP38-2s were apparently everything South Shore was looking for, enabling the railroad to get rid of the 800-series electric motors and the earlier GP7s. Fortunately, two of the three Little Joes found homes: No. 802 at the Lake Shore Railway Museum in North East, Pa. (just 11 miles east of its Erie birthplace), and No. 803 preserved in operating condition at the Illinois Railway Museum in Union, Ill.

In the years since, the GP38-2s have done their job, remaining relatively unchanged since their 1981 arrival, the beneficiaries of the expert ministrations of the shops employees. The most striking difference has been the adoption of today's "legacy" paint scheme of South Shore maroon and orange.

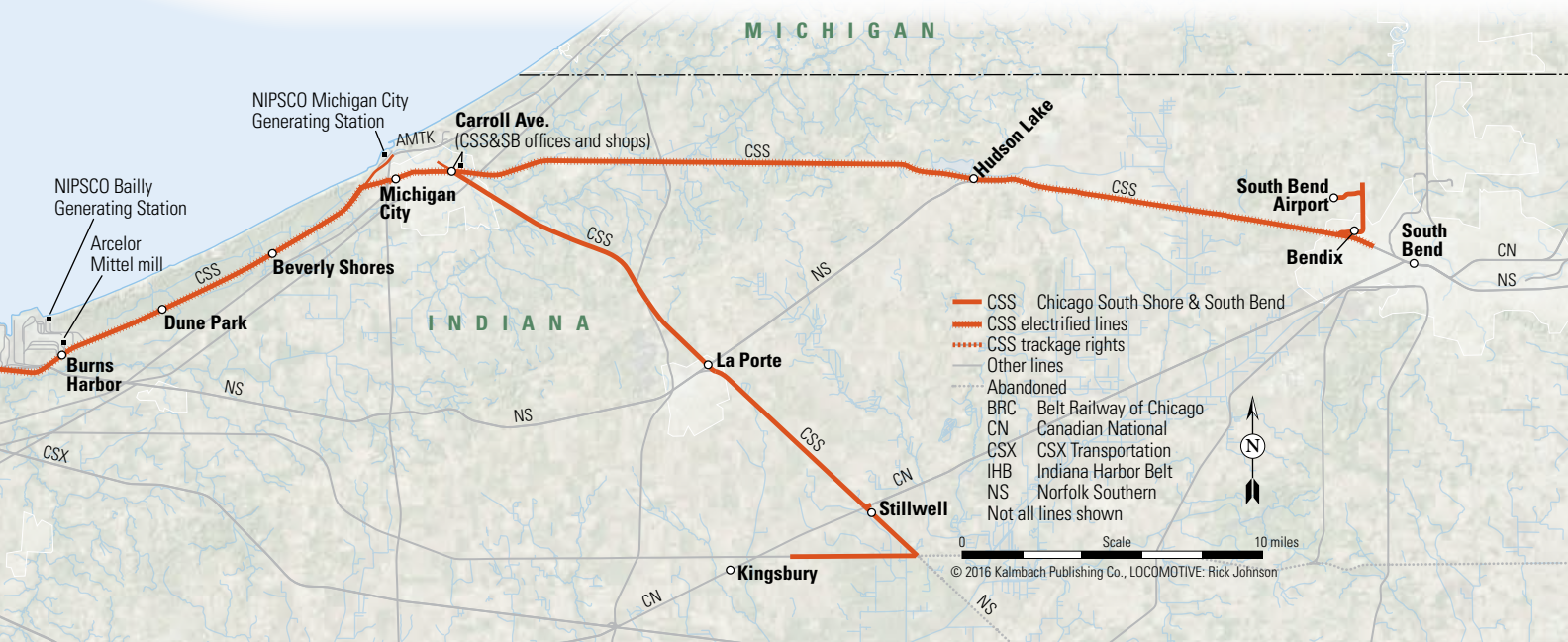
Mr. Kehe's charges

Responsibility for South Shore's tidy fleet falls to Chief Mechanical Officer Bruce Kehe (pronounced "kay"), a veteran of railroading around the Chicago area. Kehe came to South Shore four years ago after a 29-year career at Elgin, Joliet & Eastern and successor Canadian National. He'd actually retired from CN, as general foreman at the old Illinois Central shops at Woodcrest, but was ultimately drawn back to railroading, first in a short stint at the Gary Railway, which serves local steel mills, and thereafter at South Shore.

Bruce Kehe

Kehe was born in the Chicago suburb of Berwyn and grew up in Berkeley on the southwest side, not far from Blue Island and its concentration of Rock Island and IC operations. He chose railroading as a career after earning a degree in mechanical engineering from Valparaiso University, just down the road from Michigan City.

For Kehe, the fit in Michigan City has been good. For one thing, his years at the "J" ensured that he became intimately familiar with just about all aspects of Chicago-area railroading, including territory



Dressed in factory-applied yellow and blue, Nos. 2004 and 2001 lead coal empties on the Ideal Section at Wagner Siding in July 1985. Lou Gerard

In 1949, South Shore purchased three of 20 massive 2-D+D-2 "Little Joes" built by GE for the Soviet Union but never delivered. No. 803 leads a westbound freight over the Penn-Wabash bridge in Gary. Lou Gerard

shared with South Shore. For another, he likes the family feel of his current employer. In some cases, literally: his department includes a father-son team, the elder of which has 30 years on the railroad. "It's a great group of guys here," Kehe says. "I would have loved to spend my entire career here."

Although he inherited a solid fleet of locomotives, good facilities, and a dedicated workforce, Kehe found plenty to do when he arrived. His first order of business was to create an up-to-date department database. Previous administrations had kept good records, but they were all on paper, filed away in cabinets and stuffed in notebooks. That wouldn't do.

Kehe had already created an Excel-based database at EJ&E, so he simply refreshed what he had been doing before. He plowed through several years of paper documenting South Shore's mechanical history before creating his system for keeping track of overhauls, light repairs, and spare parts.

Kehe has nine employees in the mechanical department. All of them are classified as carmen and are members of the Transportation Communications International Union, or TCU, which incorporates the old Brotherhood of Railway Carmen. The union at South Shore is part of the railroad's traction legacy.

Sticking with what works

As on any successful short line, versatility is essential. Members of Kehe's team have to be qualified to work on more than just the diesel fleet: they also do all required freight-car repairs, building upkeep, and other equipment maintenance. On Monday an employee might be fixing a door on a boxcar. On Tuesday, he's repairing a traction motor. "We have a good mix of people," Kehe says. "Some are older employees who've been around awhile, some are about 10 years into it, and we have four fairly new guys."

Home for the GP38-2s is the main shop building across from the one-story 1908 office building on Carroll Avenue, known informally around town as "Shops." Although updated with metal siding in recent decades, inside the five-track shop is the same brick structure that cared for all those steeple-cabs and Little Joes. The catenary has been removed, but the facility retains the neat-as-a-pin ambience of the old CSS&SB.

The South Shore Freight roster has been stable for more than 30 years, but it's not stagnant. The GP38-2s have required the usual overhauls, including new power assemblies, and now are slowly receiving upgrades at Mid-America Car in Kansas City.

"We're pumping some dollars into these units, all above the walkway, to try to get another five to 10 years out of them," Kehe explains. The work at Mid-America includes installing rooftop air-conditioners and new Wi-Tronix remote monitoring equipment to provide continuous data on fuel consumption, health status of key systems, even operator performance.

With the vagaries of traffic as well as the need to cycle units through Kansas City, the South Shore has seen fit to lease a pair of diesels in recent years, adding a new dimension of blue and white to the usual orange-and-maroon landscape. Currently on the property are two GP38-2s, one leased from CIT/Capital Finance (CEFX) and the other from the GATX Corp. locomotive subsidiary GMTX, both to be returned once all the work at Mid-America Car is completed.

It's not all up to the home road EMDs to keep freight moving on South Shore. The railroad also hosts large UP and CSX six-motor power running interline on unit coal trains for the Midwest and Mittal steel mills and the power plants. All of South Shore's crews get qualified for the bigger

South Shore's first six-axle diesels are two former Iowa Interstate SD38-2s purchased in 2015 and numbered 804 and 805 in sequence after the Little Joes. No. 805 speeds eastward at Porter in June 2016. Greg McDonnell

power. UP trains are turned over to South Shore at Goff and CSX trains at Miller.

South Shore generally uses its own Geeps to pick up and deliver other coal trains off Canadian National, Norfolk Southern, and Canadian Pacific. Pairs of GP38s will pick up CN trains at Goff, NS trains at Miller, and CP trains at the Belt Railway of Chicago's Commercial Avenue yard in East Chicago, which South Shore accesses via trackage rights on Metra's electric line via Kensington.

Something new

Never assume the South Shore is out of surprises, despite the constancy of its roster and operations. The South Shore recently welcomed a pair of newcomers: a pair of SD38-2s purchased in 2015 from Iowa Interstate. The pair began life in 1978 hauling taconite on Reserve Mining's railroad in Minnesota and later were picked up by Iowa Interstate. Flush with 17 new GE ES44ACs acquired 2008-2015, Iowa Interstate turned the old SDs loose and South Shore picked them up for a good price.

The SD38s offer the same 2,000 hp as the GP38-2s, but dig in deeper with those six motors. The South Shore is a flat, forgiving railroad, but there are some nasty little grades in places such as Miller, on the east side of Gary, where the railroad climbs up and over the CSX main line on a steep, tight S-curve. In some circumstances, the new power has allowed the railroad to use one unit where two formerly were required. It doesn't hurt that CMO Bruce Kehe spent so many years at EJ&E: the "J" had the largest fleet of SD38-2s.

The lineup at Michigan City on a snowy January morning in 2010 includes two pairs of GP38-2s ready to roll South Shore freights. Greg McDonnell

The newcomers have their own backstory. The first thing anyone notices about the SDs is the predominantly black paint scheme, relatively unchanged from Iowa Interstate, with new orange panels at each end and the familiar South Shore herald. Although different than South Shore's GP38s, Fox says the Iowa Interstate livery was complementary enough to avoid spending money on a complete paint job. "I think they look pretty smart, even with so few changes," he says. "Plus I always thought it'd be interesting to add six-axle power to the mix."

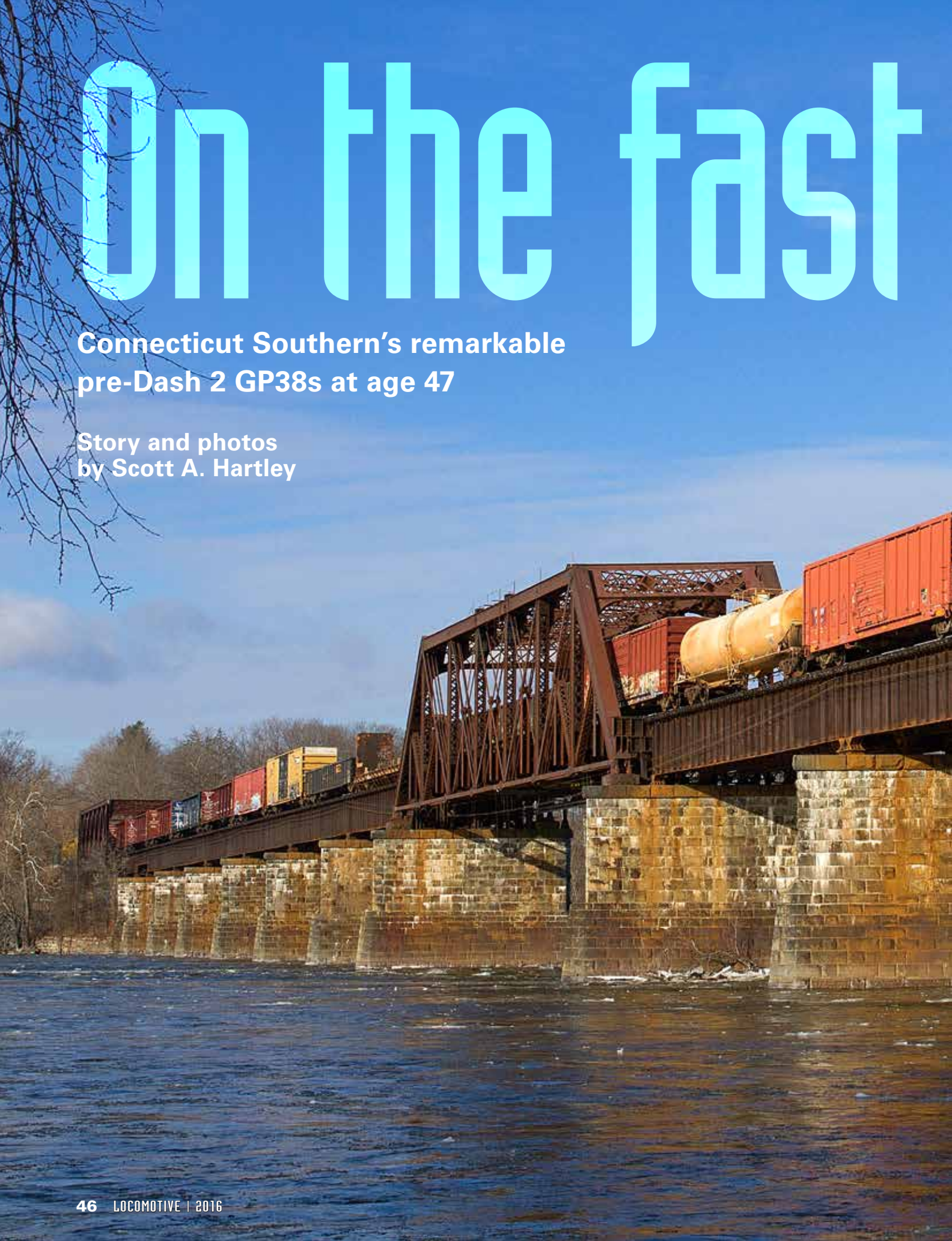
What's more significant, perhaps, are the two SD's numbers: 804 and 805, changed from Iowa Interstate 154 and 155. Fox and other members of South Shore management are sensitive to the railroad's traction heritage, and they're not immune to sentimentality, so it was an easy thing to pick up the number sequence where the famous Little Joe electrics left off. And in the context of Putin's modern-day Russia, the nickname for the new diesels was obvious: "Little Vlads."

Of course, you can't run a railroad on sentimentality, and the South Shore team is as diligent as anyone in the industry at watching costs, maintaining the equipment, and keeping an eye on the safety record. But when you see those shiny orange diesels with their timeless Insull-era heralds easing along 11th Street, mingling with cars and pedestrians in a tradition that goes back to 1908, you can't help but think South Shore does everything with an eye toward the past. At least a little. ℐ

On the fast

Connecticut Southern's remarkable pre-Dash 2 GP38s at age 47

Story and photos
by Scott A. Hartley



track

High-nose Connecticut Southern 2038, a GP38 built for the Southern Railway in 1969, and a former Florida East Coast GP40-3 lead train CSO-4 over Amtrak's Connecticut River bridge at Enfield, Conn., on Jan. 14, 2016.

Top: Two Connecticut Southern trains, each led by a 1969-built GP38, meet on CSX at Springfield, Mass., on Dec. 26, 2014. Above: Both New England Central GP38s assigned to CSOR work at Windsor, Conn., on Feb. 5, 2015. At left, electrical wiring in a 1969 GP38.

Forty-seven-year-old GP38s leading 50-mph freight trains on an active passenger main line in 2016? Yes. It's an everyday occurrence as the Connecticut Southern Railroad operates freight service over Amtrak's Springfield, Mass.-New Haven, Conn., route.

Connecticut Southern operates a total of 89 route-miles, 28 on two small clusters of branch lines that it owns, and the remainder exercising trackage rights on Amtrak and CSX routes. RailTex founded the company in 1996 to take over Conrail operations on these lines. It now is one of Genesee & Wyoming's 120 shortline and regional railroads worldwide. Locomotives assigned to Connecticut Southern must have cab signal and Locomotive Speed Limiter equipment to lead on Amtrak, and the company uses a colorful collection of seven properly equipped EMD road-switchers to cover its operations.

The senior and most interesting members of the fleet are four 1969-built GP38s: Connecticut Southern No. 2021, New England Central Nos. 3844 and 3855 (originally Gulf, Mobile & Ohio locomotives) and high-nose Connecticut Southern No. 2038, built for the Southern Railway. In early 2016, these aged non-turbocharged Geeps could be found leading freight trains over the mostly single-track Amtrak route without delaying 80-mph passenger trains.

Just six years into the reign of its highly successful 645 prime mover, Electro-Motive Division of General Motors introduced the "Dash 2" line of locomotives, incorporating more than 40 improvements to the 645-powered models. The new GP38-2 had an A.C. alternator in place of the earlier D.C. generator. But perhaps the most significant Dash 2 improvement, invisible from the locomotive's exterior, was the use of a solid state, modular electrical control system. Hidden behind the back wall of the locomotive's cab, these easily replaceable

components supplanted miles of wiring and assorted relays that had been little changed since the early days of the diesel.

This new technology made troubleshooting and repair far easier and less labor intensive, so it should come as no surprise that pre-Dash 2 EMDs are virtually extinct on Class I railroad rosters. Those that still run on larger railroads have been upgraded to Dash 2 or so-called "Dash 3" specifications. But well-maintained "straight" GP38s and GP40s, all nearing a half century in age, can be found working on regional and shortline railroads, including the four running daily on the Connecticut Southern.

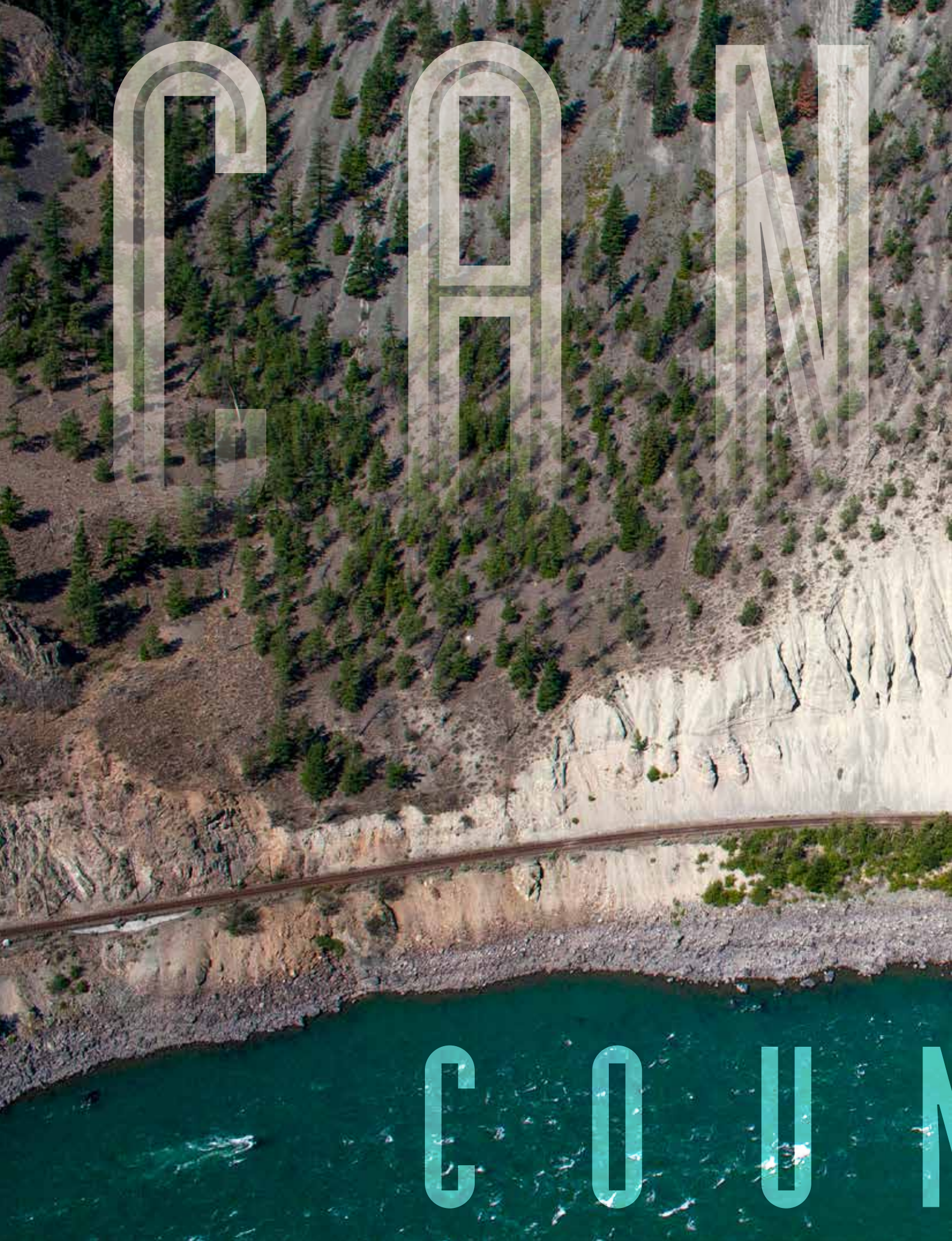
Changes are coming, though. Amtrak's Advanced Civil Speed Enforcement System positive train control is expected to become operational on the Springfield Line by 2018, and all lead-qualified locomotives will need their cab signal equipment upgraded. G&W corporate officials anticipate that the new

— and costly — control equipment will be installed in rebuilt and Dash 2 models for use on the Connecticut Southern.

For now, the railroad's quartet proves just how long a solidly built locomotive can keep earning revenue for its owner. Richard J. Regan Jr., Genesee & Wyoming's senior vice president-mechanical, praises Connecticut Southern's operating and mechanical personnel for knowing their locomotives and having the skills to keep them running well in demanding tasks.

Connecticut Southern No. 2021, built in 1969 as Gulf, Mobile & Ohio No. 711, leads a southbound train on Amtrak's Springfield Line at Windsor, Conn., on Feb. 11, 2016. At left, new paint and a CSOR logo for a veteran GP38.

Though newer power is on the horizon for Connecticut Southern, fear not for the future of these aging EMDs. Approximately one-quarter of G&W's 1,100-unit North American locomotive fleet is made up of various types of GP38s and their more powerful GP40 cousins. Regan says that 65 pre-Dash 2 GP38s remain in service on G&W railroads, and there are no plans to replace them. There still will be many future opportunities to see the classic lines and hear the throaty roar of those early non-turbocharged GP38s working throughout the G&W system. For the moment, though, Connecticut Southern's straight 38s are living life in the fast lane. I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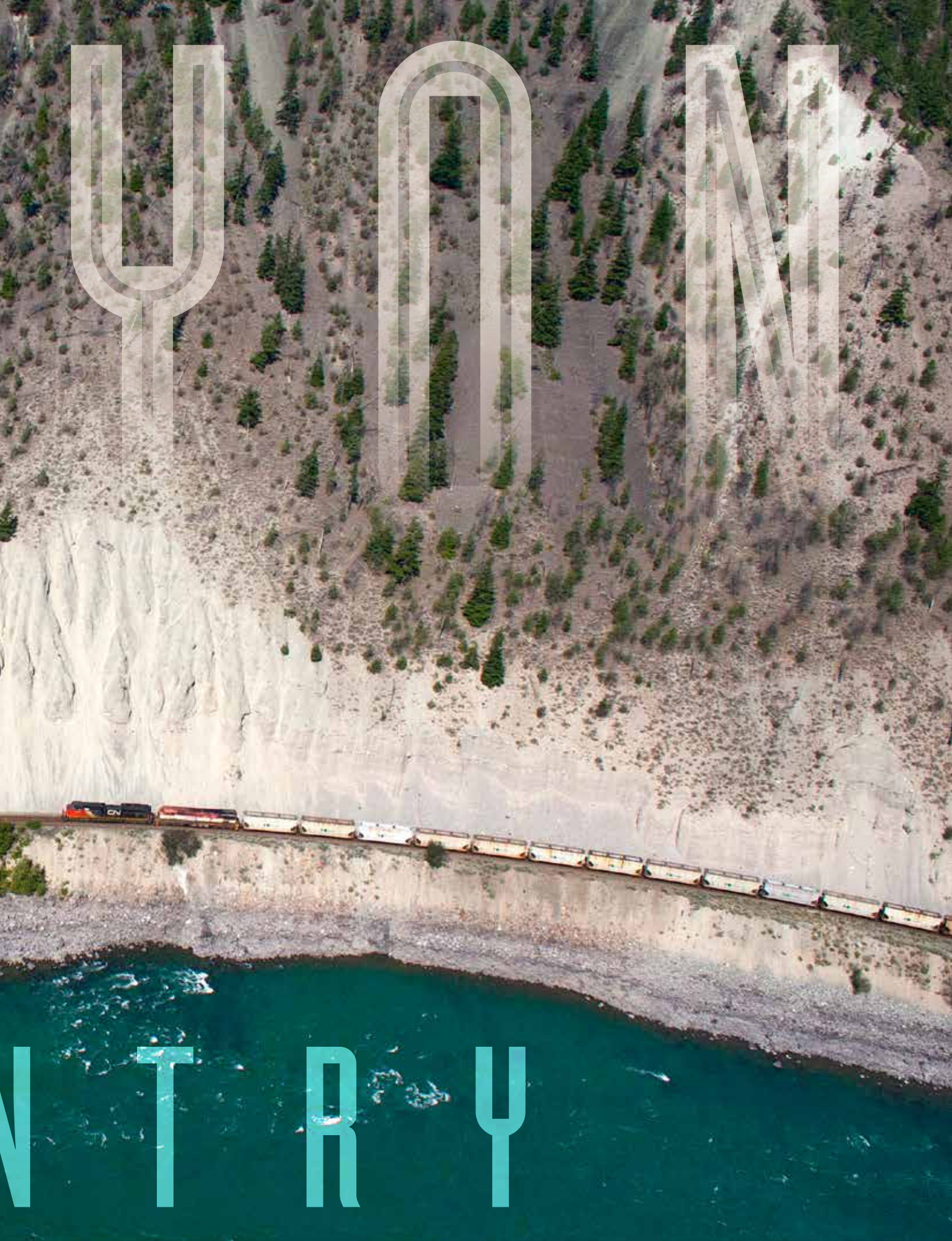
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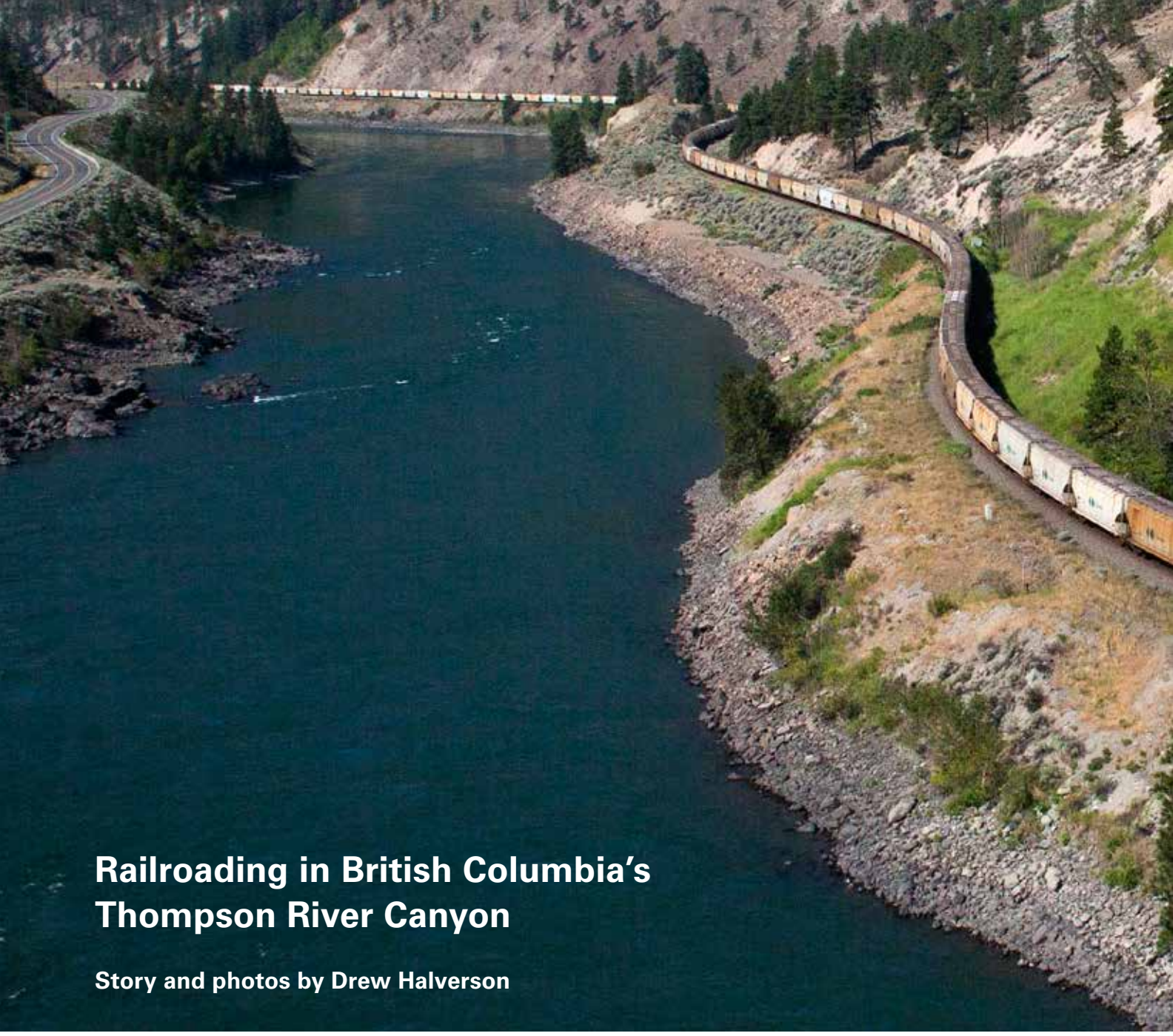


Railroading in British Columbia's Thompson River Canyon

Story and photos by Drew Halverson

I stand in awe. After 30-plus years on this planet, I am finally here: British Columbia's Thompson River Canyon. Beads of sweat build below my receding hairline as the sun, already encouraging nearby wildfires, scorches. Canadian National and Canadian Pacific share two transcontinental main lines, which twist in every direction. Dark-green Douglas fir trees cling to the rugged landscape as the beautiful, blue Thompson River roars below. All I can hear is the water, raging violently as it carves an ice-cold path through the mountains. And just when I begin to wonder why it took so long to finally get here, a headlight pops into view from around the bend.

The roar of CN train B759 echoes throughout the canyon. On the head end, a dusty CN SD70M-2 and a cowled BC Rail Dash 8-40CM guide the unit potash train downstream. B759 is just one of the 30-plus freights per day (plus the Rocky Mountaineer and VIA Rail's *Canadian*) that traverse this awe-inspiring landscape. Each one of them could be powered by anything on the roster — from the newest CN ET44ACs to battle-tested CP SD40-2s. But a high train count and a wide variety of locomotives aren't this canyon's only offerings. Another unique aspect is directional running. The 1999 agreement between CN and CP expedites trains through the Thompson River Canyon (and neighboring Fraser River Canyon), with CP moving eastbound trains and CN the westbound trains between Basque (west of Ashcroft) and Mission (east of Vancouver).

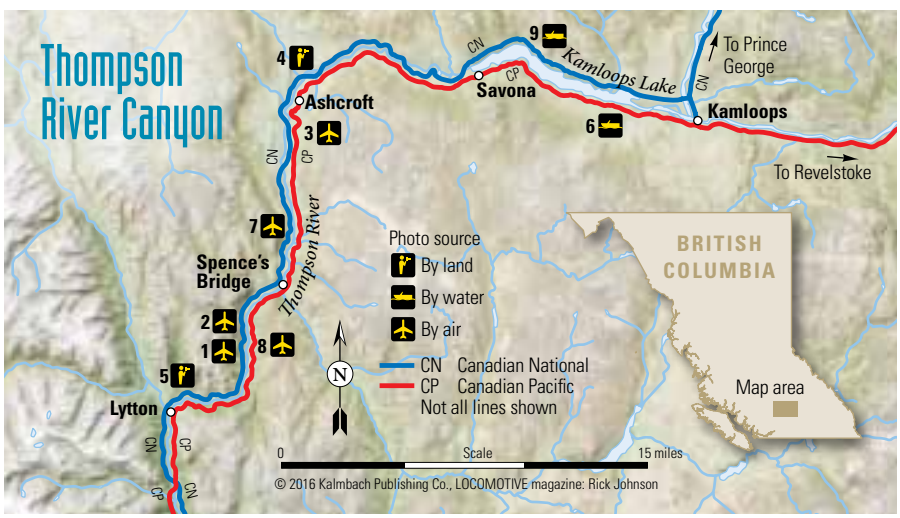
Here, natural hazards present the railroads with especially difficult challenges. Despite protection from numerous tunnels, slide sheds, and barriers, rockslides remain a daily threat, particularly on CN's Ashcroft Sub, carved into the less-desirable path through the canyon. Although CP selected the preferred path through the canyon route in the 1880s — some 30 years before CN predecessor Canadian Northern arrived — it too faces similar struggles. During the hot, dry summer months, forest fires also threaten line closures. Toss in required upkeep such as track maintenance and you can understand why railroading on both sides of the canyon is a 24-7-365 challenge.

1. On pages 50-51, a westbound Canadian National potash train, powered by an EMD SD70M-2 and a former BC Rail DASH 8-40CM, approaches MP 87 on CN's Ashcroft Sub.
2. At Seddall, the rear DPU, SD70M-2 No. 8839, shoves the same unit train.

And that's what brought me here.

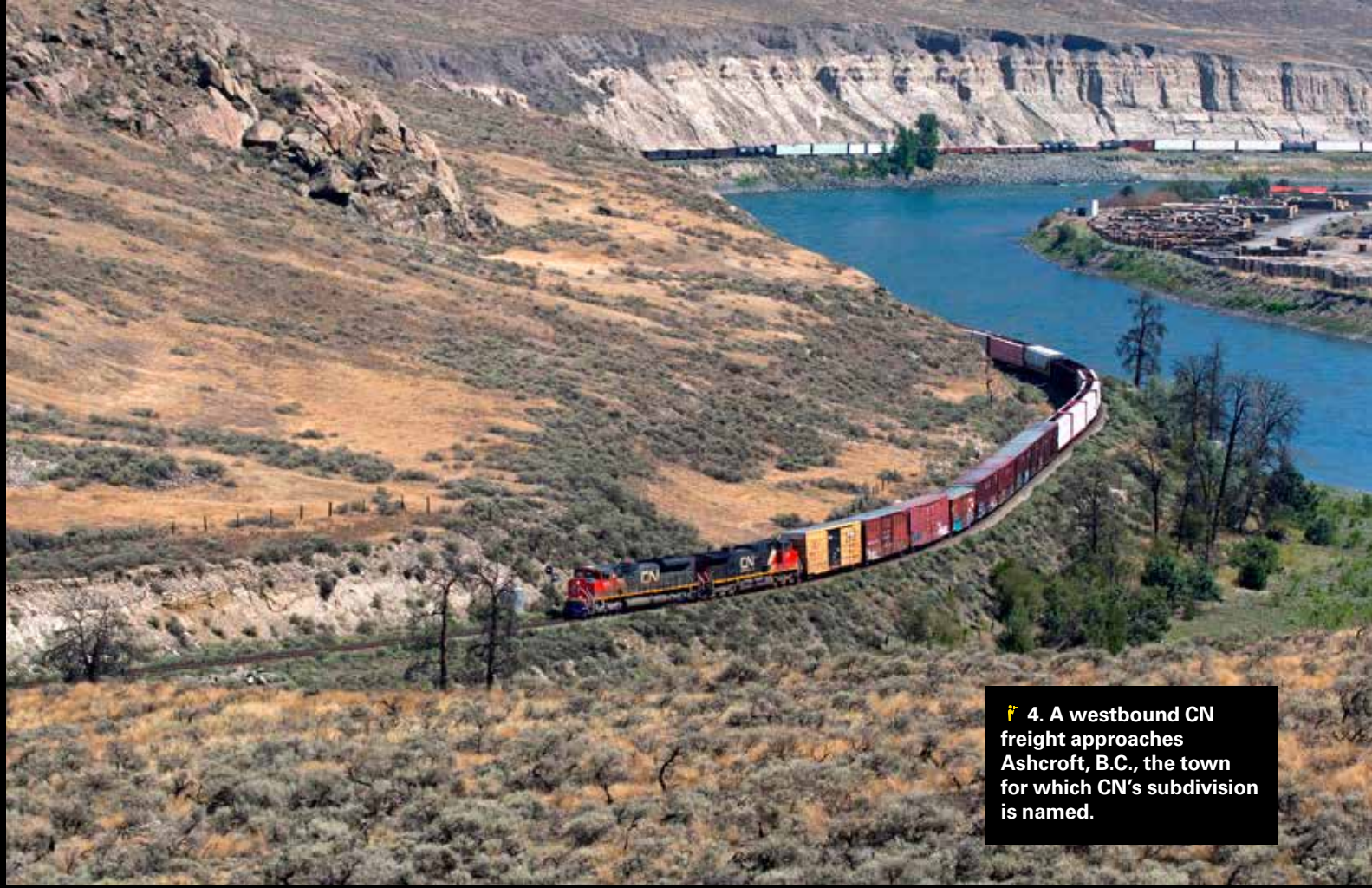
As B759 rumbles by, I'm completely absorbed. With the hypnotic passing of each hopper, the thundering Thompson is hushed. Twenty thousand rolling tons of Saskatchewan potash can do that. Beneath each loaded Canpotex covered hopper, springs are squeezed and wheels squeal. Before long an approaching EMD shifts the tempo. Serving as distributed power, CN SD70M-2 No. 8839 drones past, its 16-710 prime mover howling. Then, as quickly as it appeared, the unit train, pounding its way toward Vancouver, snakes out of view. The rails sing, a few wooden ties creak in the ballast. The river's roar returns.

>> See exclusive video from this British Columbia journey on "Drew's Trackside Adventures" on www.MRVideoPlus.com



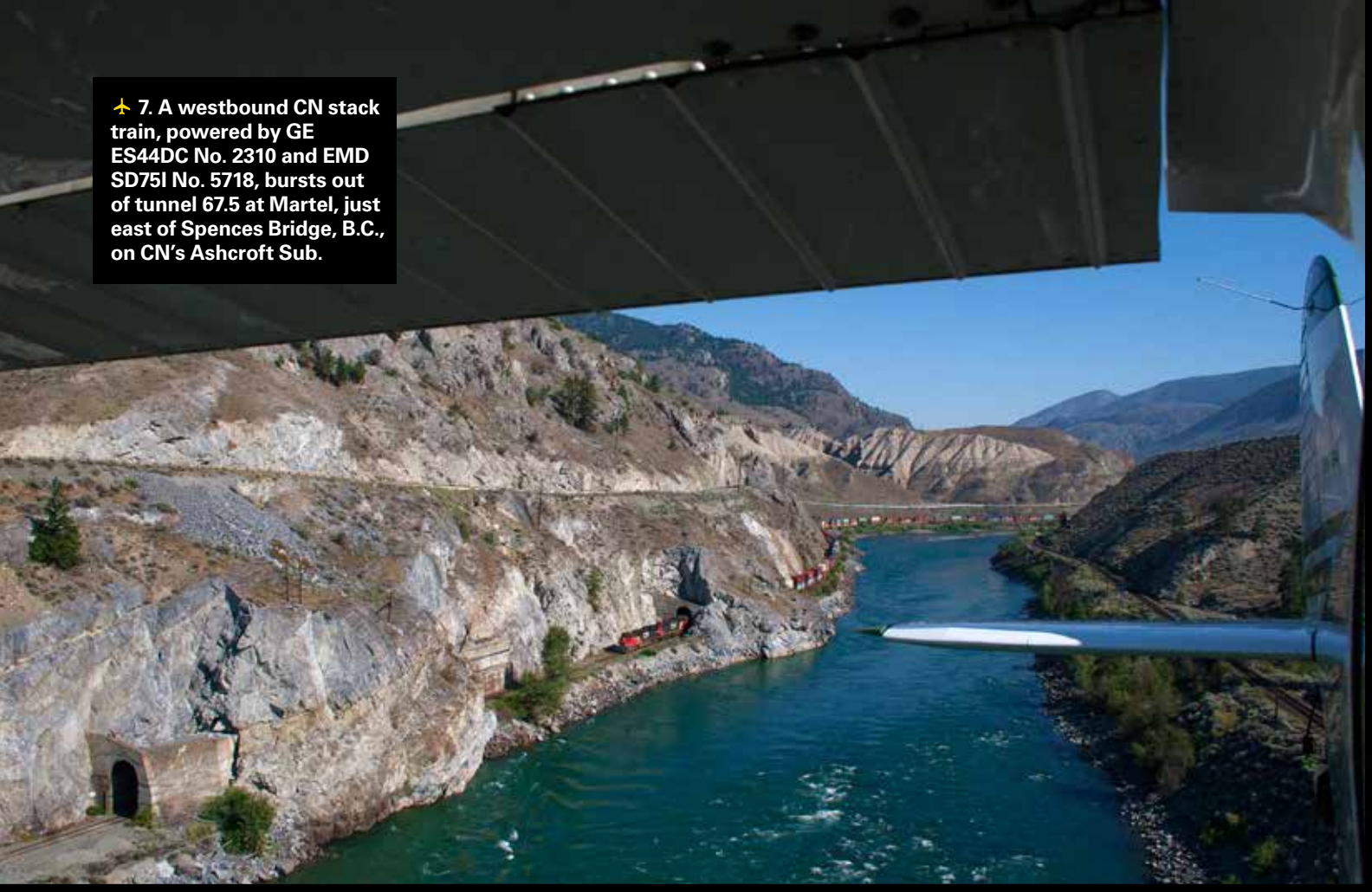
3. Eastbound CP coal empties slow to a stop at Basque. From this junction to points west, trains run directionally per a shared-trackage agreement.

5. Bound for Pacific ports, a CP coal train tiptoes under the Cape Horn rock sheds at MP 93.7, one of the most treacherous stretches along CN's Ashcroft Subdivision.



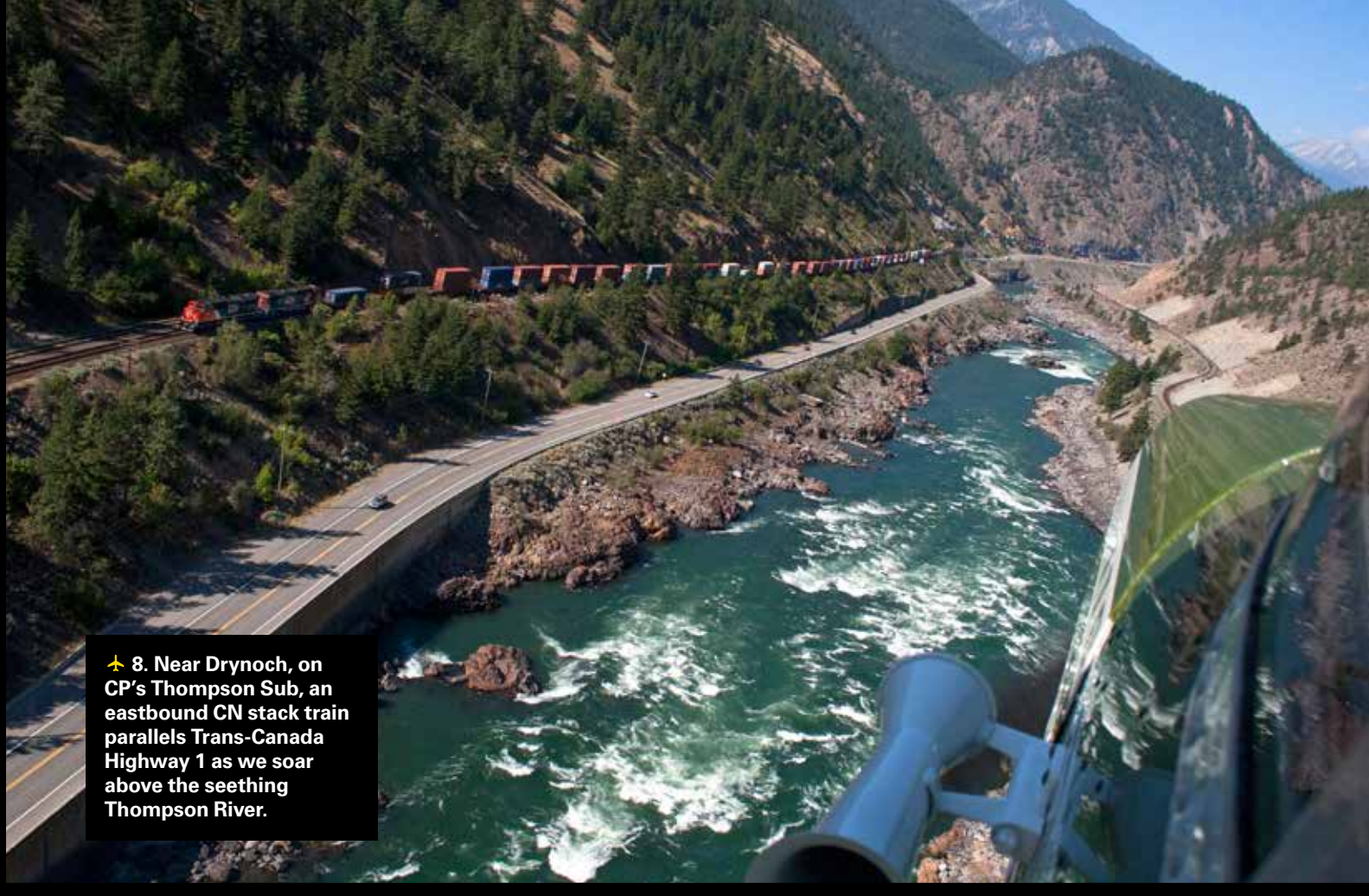
4. A westbound CN freight approaches Ashcroft, B.C., the town for which CN's subdivision is named.

6. CP GP38-2 No. 3023 and SD40-2 No. 6020 lead the Ashcroft-Kamloops local along the steep, rugged shores of Kamloops Lake.



7. A westbound CN stack train, powered by GE ES44DC No. 2310 and EMD SD75I No. 5718, bursts out of tunnel 67.5 at Martel, just east of Spences Bridge, B.C., on CN's Ashcroft Sub.

9. Canadian National Dash 9-44CW No. 2538 pushes a westbound intermodal train along the colorful northern shore of Kamloops Lake.



✈ 8. Near Drynoch, on CP's Thompson Sub, an eastbound CN stack train parallels Trans-Canada Highway 1 as we soar above the seething Thompson River.

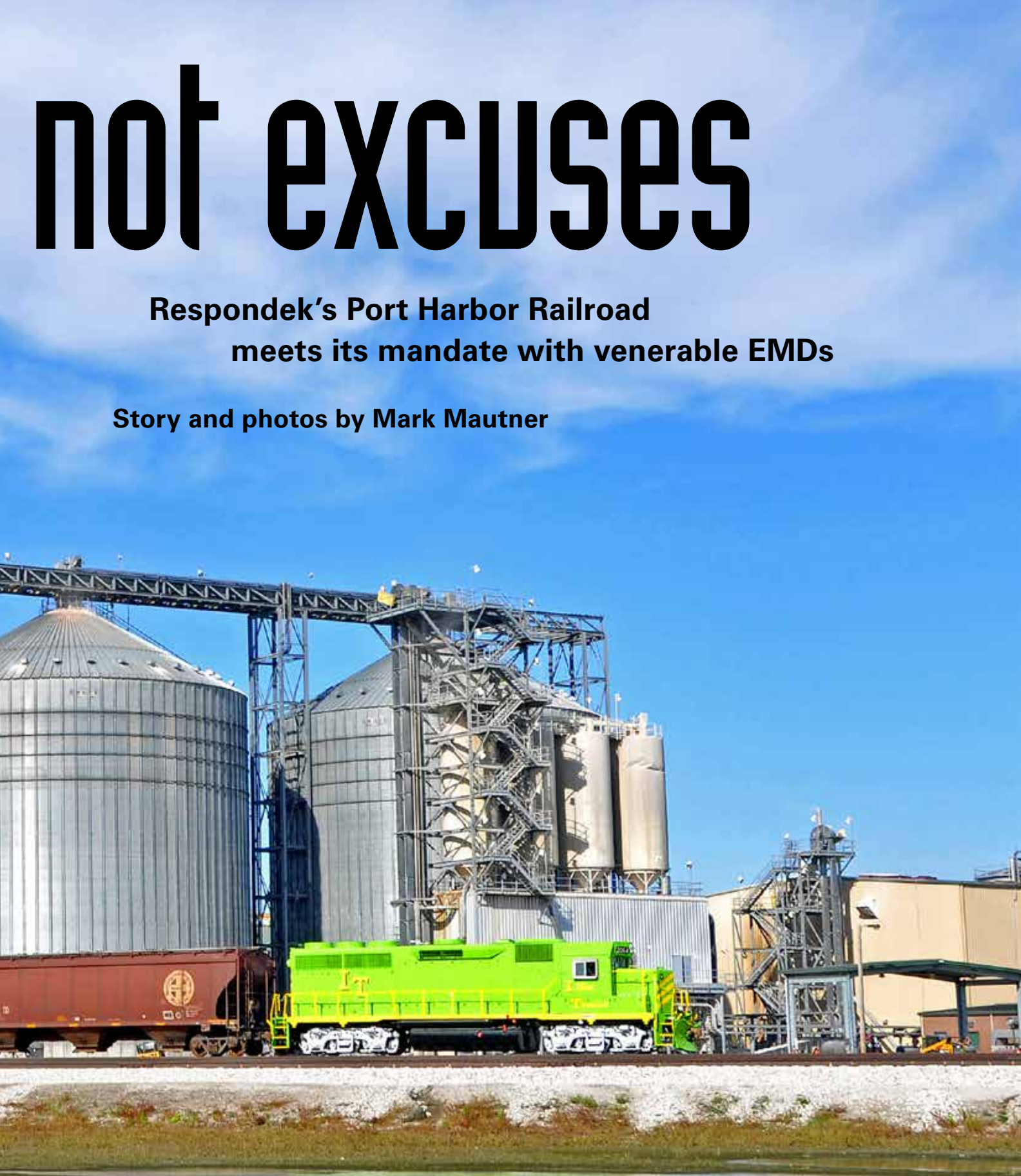
Service,

Looking sharp in its newly applied Illinois Terminal-inspired colors, "Illini Terminal" GP40 2064, a Milwaukee Road veteran, switches grain hoppers at America's Central Port in Granite City, Ill.

not excuses

Respondek's Port Harbor Railroad meets its mandate with venerable EMDs

Story and photos by Mark Mautner



One of two former Milwaukee Road GP40s on the roster, No. 8955 carries Port Harbor lettering and unique red paint.

It's 4:30 p.m. on a Monday in Granite City, Ill. Traffic on Illinois Route 3 is buzzing as people finish their workday. On the Port Harbor Railroad, the workday is just beginning. Engineer Scott Nauert, brakeman Mike Mautner, and I as conductor climb aboard 1968-vintage Electro-Motive Division GP40 No. 2064 and get to the business of switching customers at America's Central Port, a 1,200-acre business and industrial complex on the Illinois side of the Mississippi River just north of St. Louis.

The Port Harbor Railroad is a privately held Class III switching railroad owned by Respondek Railroad Corp. Terry Respondek founded the company in 1986 and has expanded its business from a startup deal to perform intraplant switching at the Amoco Additives Division plant in Wood River, Ill., to a wide-ranging array of contract switching operations and short lines in five states. This includes the Illini Terminal Railroad in Litchfield, Ill.; the Freedonia Valley Railroad out of Freedonia, Ky.; the Indiana Eastern Railroad between Richmond, Ind., and Fernald, Ohio; Squaw Creek Southern at Yankeetown, Ind.; and the Ohio South Central between Vauces and Jackson, Ohio.

Port Harbor began operations in 2010 and serves more than 10 miles of port-owned track within the confines of America's Central Port. Port Harbor conducts all interchange with the Terminal Railroad Association, which provides connections with Class I railroads BNSF Railway, Canadian National, Canadian Pacific, CSX Transportation, Kansas City Southern, Norfolk Southern, and Union Pacific. Traffic includes chemicals, zinc, copper, aluminum billets, wood pulp, lumber, urea, ammonia, corn oil, ethanol, corn, and distillers grains.

"Providing Service, Not Excuses," as its slogan promises, the Port Harbor boasts a Federal Railroad Administration-certified workforce, with many crew members carrying both conductor and engineer cards. A Monday-through-Friday job is on duty at 4 p.m., with operations also conducted on weekday mornings and Sunday, based on customer needs.

With a variety of locomotives in a rainbow of colors, Port Harbor motive power has a "Skittles" look. Respondek has always been a believer in Electro-Motive locomotives, and the road currently stables 12 hand-me-down units, including three built by EMD's onetime Canadian subsidiary General Motors Diesel in London, Ont. Some wear the colors of former owners, but several have been repainted in Respondek's bright green Illinois Terminal-inspired colors.

The Port Harbor Railroad is well situated for future expansion and is close to major interstate highways, river, and rail connections. With a solid traffic base, a well-maintained fleet of veteran EMD and GMD locomotives, and a new rail-to-river harbor opening soon, the Port Harbor looks to a future as bright as Respondek's smart IT-inspired green. I

Port Harbor roster

Road No.	Model	Built	Lineage
14	SW900	April 1960	CNW 144, Amoco 14
1239	SW1200	April 1965	TRRA 1239
1296	MP15DC	January 1982	MP 1366, UP 1366, UPY 1366, UPY 1296
1403	MP15AC	January 1976	MILW 441, SOO 1507, UP 1403, UPY 1403
1602	GP9	March 1958*	CP 8818, CP 1602
1605	GP9	July 1956*	CP 8613, CP 1605
1800	"GP8"	September 1951	USA 1837, ARR 1837, ARR 1809, MOC 1800 (built as GP7)
2064	GP40	December 1968	MILW 2064, SOO 2064
2301	SD40-2	February 1975	CNW 6923, UP 3086, PHRR 3086
2758	SD40-2	December 1973	CNW 6813, UP 2962, PHRR 1000
8166	SW1200	September 1960*	CP 8166
8955	GP40	EMD	MILW 162, MILW 2035, CP 4615, PHRR 4615

*Built by General Motors Diesel, London, Ont.
ARR Alaska Railroad; **CNW** Chicago & North Western; **CP** Canadian Pacific; **MILW** Milwaukee Road; **MP** Missouri Pacific; **PHRR** Port Harbor Railroad; **SOO** Soo Line; **TRRA** Terminal Railroad Association of St. Louis; **UP** Union Pacific; **UPY** Union Pacific; **USA** U.S. Army

IT-green SD40-2 No. 2301 (built for C&NW) and GP40 No. 2064 roll pipe loads past recently acquired CP GP9 No. 1605.

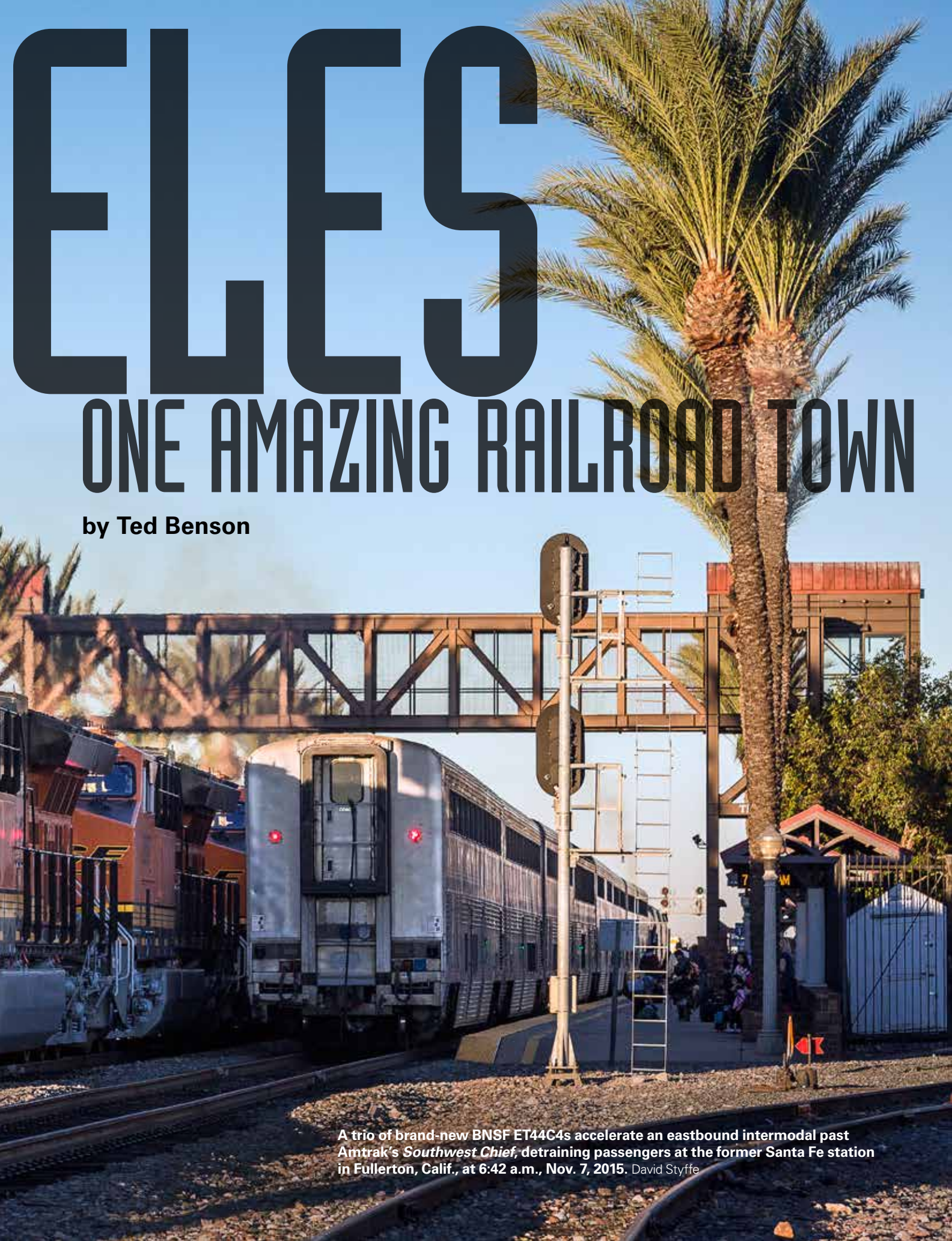
Port Harbor No. 1800 was one of 20 U.S. Army GP7s built with Type A switcher trucks. Acquired by the Alaska Railroad, it received Type B trucks from an RS1, and later, an upgrade to "GP8" specs at the Illinois Central Gulf shop in Paducah, Ky.

LOS ANG

ELES

ONE AMAZING RAILROAD TOWN

by Ted Benson



A trio of brand-new BNSF ET44C4s accelerate an eastbound intermodal past Amtrak's *Southwest Chief*, detraining passengers at the former Santa Fe station in Fullerton, Calif., at 6:42 a.m., Nov. 7, 2015. David Styffe

Pacific Harbor Line PR30C No. 40 at CP Badger Bridge on the Alameda Sub in the Port of Los Angeles. Greg McDonnell

For fans of America's pastime, it's a little piece of heaven — a cool breeze blowing in from the Pacific Ocean, cold beer and nachos on the patio, and Vin Scully welcoming listeners to a Dodger baseball game. Sunday afternoons in Fullerton, Calif., have been like this for the last 58 seasons in the big leagues.

For fans of the railroad persuasion, the scene transcends anything imaginable when Brooklyn's trolley dodgers followed diesel's first generation to the City of Angels in 1958. On this spring afternoon in 2016, the patio is the Fullerton depot platform, the Santa Fe Café serves up snacks and suds, and headlights advancing east and west from Basta and Fullerton Junction guarantee major-league rail action. The only thing that hasn't changed is Scully's invincible baritone inviting everyone to share another "pleasant good afternoon."

Fifty-seven years ago, the Southland railroad story was told in a different voice — one more in tune with the monotone drone of LAPD TV Sgt. Joe Friday — as photojournalist Donald Sims introduced his "L.A. Story" in the July and August 1959 issues of Trains. This was the city: Los Angeles, Calif., home to 2.5 million citizens, "give or take a few hundred thousand depending upon your theory of geographical definition," and Sims was inviting readers to "come watch the trains in the place nobody's ever called a railroad town."

Three mainline carriers — Southern Pacific, Santa Fe, and Union Pacific — owned significant Southland terminals, but none of them called Los Angeles home. Pacific Electric, California's fourth-largest freight carrier in 1955, was the line that defined LA. Built to sow residential growth across the fertile coastal plain in the first half of the 20th century, Espee's homegrown interurban subsidiary reaped a growing harvest of commercial waybills after World War II. Steadily dropping its trolley poles as the expanding freeway system sent mountains of Big Red Cars to scrapyards on Terminal Island, PE exited passenger service in 1953, handing what little remained to the Los Angeles Metropolitan Transit Authority.

"Operationally, the Los Angeles scene is not confined to a set of city limits," Sims noted in 1959. "The locale insofar as railroads are concerned cuts across a primarily flat basin of countless tracts and mushrooming industry ... metropolis and surrounding communities ... served by a series of branches which radiate in grapevine fashion from the three main carriers." Then as now, LA was best described as "a geographical complex that finds switchers catering to fusee signals along the flat shoreline ... while ... at the same moment, four units of six-axled road-switchers are pulling up enough gradient to hold a train to 20 mph — within the same city limits yet almost 50 miles apart."

At the hub of LA's railroad wheel, carload freight dominated classification yards north and east of downtown, while chair cars and Pullmans catered to first-class customers at Los Angeles Union Passenger Terminal. Two decades after the dawn of the diesel era, the face of Southern California was still defined by streamlined cab units, augmented by growing numbers of utilitarian hoods. Discounting the absence of steam and "the world's greatest electric railway system," Los Angeles 1959 had much in common with Los Angeles 1939.

Fifty-seven years later, the casual observer struggles to find tangible links to the LA of '59. The city has grown to a population of 3.96 million; Los Angeles County is the nation's most populous at 10.1 million. Factor the adjacent counties of Orange, Riverside, San Bernardino, and Ventura into your theory of geographical definition and the region is home to 18.4 million — second largest in the United States, with more residents than the nation of Chile.

For Southland railroaders, the region's overall growth is reflected by the industry's remarkable transformation. LA's "big three" mainline carriers resisted corporate consolidation throughout most of the 20th century, but in an unregulated environment of dynamic evolution, nothing is forever. Santa Fe was the first to go, merging with Burlington Northern in 1995. Southern Pacific and Union Pacific followed suit in 1996. Greater still was the transfiguration in the supporting cast for Tinseltown's Class I triumvirate.

Set against the LA skyline, Amtrak No. 4, the Chicago-bound *Southwest Chief*, crosses the LA River at sunset on March 24, 2016. Greg McDonnell

Fifty-seven years ago, Pacific Electric, Los Angeles Junction Railway, and Harbor Belt Line generously bolstered transcontinental waybills. LAMTA, the public entity that inherited the "unkempt stepchild of a onetime interurban empire teetering on the verge of euthanasia," kept the overhead energized on the final Red Car line to Long Beach. Today, PE is long gone, folded into SP's Los Angeles Division in August 1965. Los Angeles Junction is a paper railroad, with LAJ crews utilizing BNSF power to prowl the steel bowl of "spaghetti in the jungle" south of Hobart yard. Harbor Belt has ceased to exist. In their stead, a quartet of remarkable operations has emerged —

Pacific Harbor Line, Metro Rail, Metrolink, and Amtrak California's *Pacific Surfliners*.

Pacific Harbor Line began in 1998 to provide a privately owned, neutral alternative to the balkanization of the Harbor Belt Line's carrier-controlled layout. The railroad operates 18 route-miles on a 59-mile web of tracks and facilities owned by the ports of Los Angeles and Long Beach, handling nearly 40,000 units of carload freight annually while providing switching service for nine on-dock container terminals.

The first railroad in the Southland to go green, Pacific Harbor Line is powered by Tier 2 and Tier 3 locomotives. Fourteen MP20C-3 units constructed on SD40 and SD45 chassis anchor the roster of 23 locomotives — all of them dressed in a modern version of Santa Fe's classy aluminum and black "zebra stripe" paint scheme. Thanks to former President Andrew Fox, the AT&SF

Continued on page 68

Upholding the grand tradition of Pacific Electric and tracing the route of PE motors and "Big Red Cars," UPY 2705, 2704, and 2707 strut along Vermont Avenue in Gardena with loads for Crenshaw Lumber in April 2016. Greg McDonnell

Train-watcher's guide to LA

Metro Blue LIne
- Los Angeles to Long Beach
- Former Pacific Electric Long Beach Line

Metro Expo Line
- Los Angeles to Santa Monica
- Former Pacific Electric Santa Monica Air Line

Metro Gold Line
- East Los Angeles to Azusa
- Former Santa Fe Second District (LA to Azusa)

Metro Green Line
- El Segundo to Norwalk
- Center Divider of I-105 Freeway

Alameda Corridor Subdivision AC [1]
- CP East Redondo to CP West Thenard
- Trackage rights: BNSF, Union Pacific
- Built 2002 on former Southern Pacific San Pedro Branch

Union Pacific Alhambra Subdivision UP [1]
- CP Yuma Jct. (SCAX) to SP538 Rancho
- Former Southern Pacific Pomona Subdivision

Union Pacific Los Angeles Subdivision UP [2]
- CP East Redondo (AC) to West Riverside (BNSF)
- Former Union Pacific Second Subdivision

Union Pacific Mojave Subdivision UP [3]
- SP538 Rancho to SP311 North Bakersfield
- Former Southern Pacific Palmdale Cutoff

Union Pacific Wilmington Subdivision UP [14]
- CP West Redondo to CP Alemeda (AC)
- Former Pacific Electric Long Beach Line

Union Pacific San Pedro Subdivision UP [15]
- C003 Downey Road to Manuel Yard (PHL)
- Former Union Pacific San Pedro Branch

Union Pacific El Segundo Industrial Lead UP [16]
- Watts to El Segundo
- Former Pacific Electric El Segundo Line

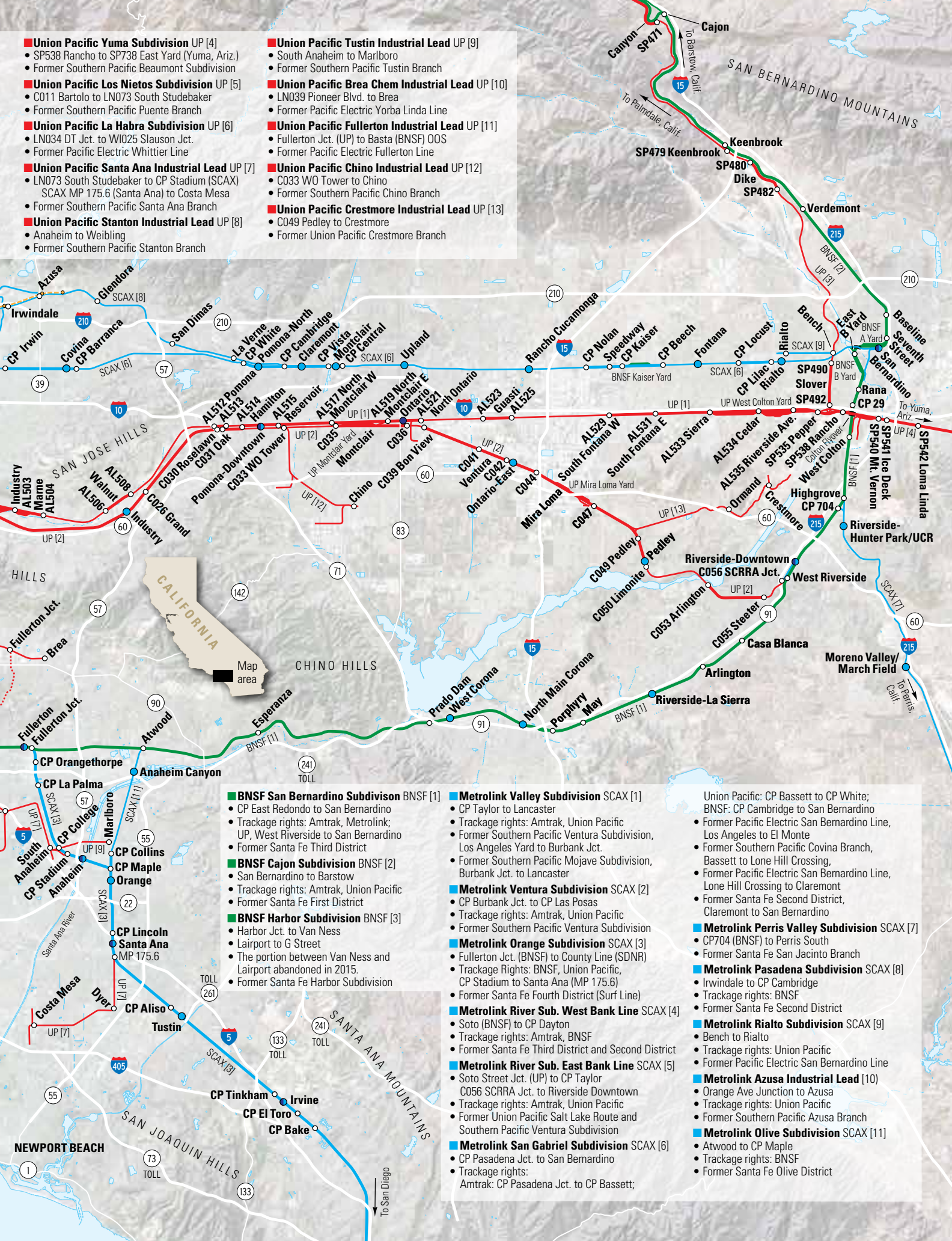
Union Pacific Torrance Industrial Lead UP [17]
- South Los Angeles to Torrance
- Former Pacific Electric San Pedro via Torrance Line

Union Pacific Patata Industrial Lead UP [18]
- LN073 South Studebaker to CP Compton (AC)
- Former Southern Pacific Santa Ana Branch, Studebaker to Firestone Park
  Former Southern Pacific San Pedro Branch, Firestone Park to East Compton

Union Pacific Dolores Industrial Lead UP [19]
- CP Compton to CP West Thenard (AC)
- Former Pacific Electric Dominguez Line

Union Pacific Lakewood Industrial Lead UP [20]
- Douglas Jct. to Lakewood
- Former Union Pacific Lakewood Branch

Union Pacific Paramount Industrial Lead UP [21]
- San Pedro Subdivision MP 11.1 to Crutcher
- Former Pacific Electric Santa Ana Line


Union Pacific Yuma Subdivision UP [4]
• SP538 Rancho to SP738 East Yard (Yuma, Ariz.)
• Former Southern Pacific Beaumont Subdivision
Union Pacific Los Nietos Subdivision UP [5]
• C011 Bartolo to LN073 South Studebaker
• Former Southern Pacific Puente Branch
Union Pacific La Habra Subdivision UP [6]
• LN034 DT Jct. to WI025 Slauson Jct.
• Former Pacific Electric Whittier Line
Union Pacific Santa Ana Industrial Lead UP [7]
• LN073 South Studebaker to CP Stadium (SCAX)
SCAX MP 175.6 (Santa Ana) to Costa Mesa
• Former Southern Pacific Santa Ana Branch
Union Pacific Stanton Industrial Lead UP [8]
• Anaheim to Weibling
• Former Southern Pacific Stanton Branch
Union Pacific Tustin Industrial Lead UP [9]
• South Anaheim to Marlboro
• Former Southern Pacific Tustin Branch
Union Pacific Brea Chem Industrial Lead UP [10]
• LN039 Pioneer Blvd. to Brea
• Former Pacific Electric Yorba Linda Line
Union Pacific Fullerton Industrial Lead UP [11]
• Fullerton Jct. (UP) to Basta (BNSF) OOS
• Former Pacific Electric Fullerton Line
Union Pacific Chino Industrial Lead UP [12]
• C033 WO Tower to Chino
• Former Southern Pacific Chino Branch
Union Pacific Crestmore Industrial Lead UP [13]
• C049 Pedley to Crestmore
• Former Union Pacific Crestmore Branch
Cajon
Canyon
SP471
To Barstow, Calif.
To Palmdale, Calif.
SAN BERNARDINO MOUNTAINS
Keenbrook
SP479 Keenbrook
SP480
Dike
SP482
Verdemont
BNSF [2]
UP [3]
Azusa
Glendora
SCAX [8]
Irwindale
CP Irwin
Covina
CP Barranca
SCAX [6]
San Dimas
La Verne
CP White
Pomona-North
CP Cambridge
Claremont
CP Vista
Montclair
CP Central
Upland
Rancho Cucamonga
CP Nolan
Speedway
CP Kaiser
CP Beech
Fontana
CP Locust
Rialto
SCAX [9]
Bench
East B Yard
BNSF A Yard
Baseline
Seventh Street
San Bernardino
BNSF Kaiser Yard
SCAX [6]
CP Lilac
Rialto
SP490
Slover
BNSF B Yard
Rana
CP 29
SP492
UP West Colton Yard
To Yuma, Ariz.
UP [4]
SP542 Loma Linda
SP541 Ice Deck
SP540 Mt. Vernon
SP538 Rancho
Colton Flyover
West Colton
SP535 Pepper
AL534 Cedar
AL535 Riverside Ave.
AL533 Sierra
AL531 South Fontana E
AL529 South Fontana W
UP [1]
AL512 Pomona
AL513
AL514
Hamilton
AL515
Reservoir
AL517 North Montclair W
AL519 North Montclair E
Ontario
AL521
North Ontario
AL523
Guasti
AL525
SAN JOSE HILLS
Industry
AL503
Marne
AL504
AL508
Walnut
AL506
C030 Roselawn
C031 Oak
Pomona-Downtown
C033 WO Tower
UP [2]
C035
UP Montclair Yard
Montclair
C036
C039 Bon View
Chino
UP [12]
C041
Ventura
C042
Ontario-East
C044
Mira Loma
UP Mira Loma Yard
C047
UP [13]
Ormand
Crestmore
Highgrove
CP 704
Riverside-Hunter Park/UCR
C026 Grand
Industry
UP [2]
HILLS
CALIFORNIA
Map area
CHINO HILLS
Fullerton Jct.
Brea
C049 Pedley
Pedley
Riverside-Downtown
C056 SCRRA Jct.
West Riverside
UP [2]
C050 Limonite
C053 Arlington
C055 Steeter
Casa Blanca
Arlington
Moreno Valley/
March Field
To Perris, Calif.
SCAX [7]
Prado Dam
West Corona
North Main Corona
Porphyry
May
Riverside-La Sierra
BNSF [1]
Esperanza
Fullerton
Fullerton Jct.
Atwood
BNSF [1]
CP Orangethorpe
Anaheim Canyon
CP La Palma
SCAX [3]
SCAX [11]
Marlboro
CP College
South Anaheim
CP Stadium
Anaheim
UP [9]
CP Collins
CP Maple
Orange
CP Lincoln
Santa Ana
MP 175.6
Santa Ana River
UP [7]
Costa Mesa
Dyer
CP Aliso
Tustin
TOLL
SANTA ANA MOUNTAINS
SCAX [3]
CP Tinkham
Irvine
CP El Toro
CP Bake
SAN JOAQUIN HILLS
NEWPORT BEACH
To San Diego
BNSF Harbor Subdivision BNSF [3]
• Harbor Jct. to Van Ness
• Lairport to G Street
• The portion between Van Ness and Lairport abandoned in 2015.
• Former Santa Fe Harbor Subdivision
Metrolink Valley Subdivision SCAX [1]
• CP Taylor to Lancaster
• Trackage rights: Amtrak, Union Pacific
• Former Southern Pacific Ventura Subdivision, Los Angeles Yard to Burbank Jct.
• Former Southern Pacific Mojave Subdivision, Burbank Jct. to Lancaster
Metrolink Ventura Subdivision SCAX [2]
• CP Burbank Jct. to CP Las Posas
• Trackage rights: Amtrak, Union Pacific
• Former Southern Pacific Ventura Subdivision
Metrolink Orange Subdivision SCAX [3]
• Fullerton Jct. (BNSF) to County Line (SDNR)
• Trackage Rights: BNSF, Union Pacific, CP Stadium to Santa Ana (MP 175.6)
• Former Santa Fe Fourth District (Surf Line)
Metrolink River Sub. West Bank Line SCAX [4]
• Soto (BNSF) to CP Dayton
• Trackage rights: Amtrak, BNSF
• Former Santa Fe Third District and Second District
Metrolink River Sub. East Bank Line SCAX [5]
• Soto Street Jct. (UP) to CP Taylor
C056 SCRRA Jct. to Riverside Downtown
• Trackage rights: Amtrak, Union Pacific
• Former Union Pacific Salt Lake Route and Southern Pacific Ventura Subdivision
Metrolink San Gabriel Subdivision SCAX [6]
• CP Pasadena Jct. to San Bernardino
• Trackage rights:
Amtrak: CP Pasadena Jct. to CP Bassett;
Union Pacific: CP Bassett to CP White;
BNSF: CP Cambridge to San Bernardino
• Former Pacific Electric San Bernardino Line, Los Angeles to El Monte
• Former Southern Pacific Covina Branch, Bassett to Lone Hill Crossing,
• Former Pacific Electric San Bernardino Line, Lone Hill Crossing to Claremont
• Former Santa Fe Second District, Claremont to San Bernardino
Metrolink Perris Valley Subdivision SCAX [7]
• CP704 (BNSF) to Perris South
• Former Santa Fe San Jacinto Branch
Metrolink Pasadena Subdivision SCAX [8]
• Irwindale to CP Cambridge
• Trackage rights: BNSF
• Former Santa Fe Second District
Metrolink Rialto Subdivision SCAX [9]
• Bench to Rialto
• Trackage rights: Union Pacific
• Former Pacific Electric San Bernardino Line
Metrolink Azusa Industrial Lead [10]
• Orange Ave Junction to Azusa
• Trackage rights: Union Pacific
• Former Southern Pacific Azusa Branch
Metrolink Olive Subdivision SCAX [11]
• Atwood to CP Maple
• Trackage rights: BNSF
• Former Santa Fe Olive District
BNSF San Bernardino Subdivison BNSF [1]
• CP East Redondo to San Bernardino
• Trackage rights: Amtrak, Metrolink; UP, West Riverside to San Bernardino
• Former Santa Fe Third District
BNSF Cajon Subdivision BNSF [2]
• San Bernardino to Barstow
• Trackage rights: Amtrak, Union Pacific
• Former Santa Fe First District

Working amid razor wire, rust, and ramshackle factories, BNSF 3GS21C gensets Nos. 1307 and 1314 build local train Y-LAC1121-02 at Malabar Yard in Vernon on April 2, 2016. Greg McDonnell

Run through the jungle. Warbonnet GP60Ms Nos. 120 and 129 are in Torrance with the homeward-bound "First Watson" on April 1, 2016. Greg McDonnell

Continued from page 65

switcher colors that photographer Richard Steinheimer once compared to "a skunk-eyed traffic island recently removed from the improbable intersection of two 902nd streets" (TRAINS Railway Post Office, April 1960) are still operating in a hard-working tribute to LA Harbor circa 1959.

The most dramatic change in Southland railroading can be found beneath the umbrella trainsheds at Los Angeles Union Station. Much more than a name has changed at the stub-ended passenger facility on the Hollywood side of old Mission Tower. Where a steadily diminishing selection of long-distance and intrastate schedules huddled against the onslaught of jet liners and Interstate highways in 1959, a remarkable array of local cardings dominates today.

Ignore, for the moment, the fact that Amtrak's *Coast Starlight*, *Southwest Chief*, and *Sunset Limited* are the sole interstate passenger trains terminating at Union Station. Instead, focus on Amtrak California's selection of 22 weekday *Pacific Surfliner*s linking San Diego, Santa Barbara, and San

Fullerton: a great place to watch trains

A great place to watch trains, even in a torrential spring downpour. BNSF train SLHWLPC1-14A holds on Main 2 as ES44C4 No. 7111 and four more GEs cruise through Fullerton with an LA-bound intermodal on May 15, 2015. David Styffe

Fullerton is a great place to watch trains. It's a town that I've called home for the past 25 years.

It was founded in 1887 when local land speculators George and Edward Amerige bought 430 acres of land north of Anaheim and offered free right-of-way and half interest in the land if George H. Fullerton, president of the Pacific Land and Improvement Co., a Santa Fe subsidiary, would revise his survey to include the site on a line being built from San Bernardino to Los Angeles.

For his trouble, George became the town's namesake. Soon thereafter, retired publisher and successful banker Charles C. Chapman bought an orange grove in eastern Fullerton and established the iconic Mission Brand Label. Incorporated in 1904, the city thrived for the next half century as an agricultural center specializing in citrus groves.

The years following World War II brought a population boom where housing developments replaced orange groves as many American veterans settled in Southern California.

By the late 20th century, the last traces of the area's rural character had disappeared. Yet the downtown business district, including the Spanish Colonial Revival-style Santa Fe depot, built in 1930, survived and now flourishes as residents have embraced rail travel for business and pleasure. Fullerton station and its palm-shaded platforms have also become a train-enthusiasm hub unparalleled in the Southland.

Perhaps it is the mild weather with average high temperatures ranging from 68 degrees in January to 85 degrees in August with lows in the 45–65 degree range. Perhaps it is the presence of Disneyland only 4 miles south on Harbor Boulevard, the depot welcoming vacationing visitors as they arrive on Amtrak's *Southwest Chief*. Or perhaps it is just the chance to watch trains. Lots of trains. Some 38 Metrolink and 24 Amtrak trains stop here on any given weekday; mix in 40 to 50 BNSF merchandise and intermodal trains in a 24-hour span and the action on this three-track main line rivals the famed BNSF Racetrack out of Chicago.

Combine all this with a couple dozen fine restaurants and bars within walking distance and there is good reason that many railroad aficionados have deemed Fullerton as the most pleasant, maybe even the greatest, train-watching spot in the country.

As a young boy in the early 1960s, I begged my parents to bring me to this station at every opportunity. We would buy a bucket of fried chicken, sit on our station wagon's tailgate facing the tracks — waiting for the next *San Diegan* behind a set of warbonnet Alco PAs — and I would let the cocktail of aromas from the nearby orange blossoms, spent diesel fuel, and the Colonel's secret blend of 11 herbs and spices transport me to a place far better than the amusement park down the road.

Fullerton remains the only place that I've ever lived where part of me didn't want to be somewhere else. — *David Styffe*

Positively Sixth Street

Signatures of LA: the downtown skyline and graffiti-scarred face of 3GS21B UPY 2729. Greg McDonnell

Luis Obispo along 350 miles of track, plus bus connections to Bakersfield, where another 12 *San Joaquin* schedules serve Oakland and Sacramento. Of Amtrak's four busiest intercity national corridors, two of them sell seats at LA's Union Station.

Now, ponder the fact that Amtrak plays second fiddle to local transportation agencies for Southland passenger offerings. After decades of decline, commuter rail in Southern California began an ongoing resurrection with the inauguration of Metrolink in 1992. Established just in time to become indispensable following the 1994 Northridge earthquake, Metrolink's 388 route-miles connect Union Station with Lancaster, Oxnard, Riverside, San Bernardino, and Oceanside, where San Diego-sponsored Coaster trains forward riders to North County destinations. Some 165 weekday trains served Metrolink destinations in first quarter 2016, with a weekly average of 41,586 passengers. Those numbers have already increased with the opening of the 24-mile extension of the 91 Line to Perris Valley this spring.

As remarkable as all of this may be, Amtrak and Metrolink aren't the only rail transit players in town. Believers in the power of overhead catenary have been energized with

They're tearing down the Sixth Street viaduct, that iconic conglomeration of graceful steel arches and Art Deco concrete forms that has spanned the Los Angeles River linking downtown LA and Boyle Heights since 1932. Condemned by an irreversible alkali-silica chemical reaction that has been cracking and crumbling its concrete structure, the 3,500-foot-long viaduct — which also crosses several city streets, two railroad lines, and the Hollywood Freeway — was closed to traffic in January 2016. One of the most identifiable and beloved architectural features of the Los Angeles landscape is on the way out.

Its replacement, inspired by the arched trusses and elegance of the 1932 structure, is a stunning arched and cabled bridge designed by architect Michael Maltzan. It should be complete by 2019.

Like so many other attractive Angelenos, the 1932 Sixth Street span caught the eye of Hollywood. For decades, filmmakers and advertising agencies have cast their spotlights on Bridge No. 53C-1880 in the City of Los Angeles inventory. It's been an uncredited extra in dozens of films, from 1951's "Roadblock," to "Grease," "Gone in 60 Seconds," "Point Blank," and "To Live and Die in LA." The famed viaduct has been a backdrop in chase scenes filmed in the industrial streets below it, and along the concrete-lined LA River that courses beneath its distinctive arches. It's been featured in music videos by Madonna and the Foo Fighters, and been a perennial favorite of automakers for TV commercials and magazine ads.

Amtrak and Metrolink trains meet along the LA River at Sixth Street. Greg McDonnell

For all of its 84 years, the Sixth Street viaduct has coexisted with the railroads that trace the banks of the LA River: Santa Fe on the west, UP's Los Angeles & Salt Lake Railroad on the east. It's carried Model Ts, roadsters, and coupes overtop of high-stepping Santa Fe Pacifics wheeling out of town with the *San Diegan;* it's felt the blast of exhaust from the stacks of Santa Fe Northerns and the hot breath of Electro-Motive E2s working UP's *City of Los Angeles* streamliner; it's reverberated the exhaust of high-hood Alco switchers, and FMs, warbonneted PAs, and generations of Es and Fs, and cast its shadow on everything from stainless steel limiteds to drag freights and lowly transfers.

Crews with cranes, jackhammers, and concrete saws are methodically demolishing the celebrated span as the rush hour heats up on a March 2016 afternoon. Bright LED signals beckon trains on both sides of the river on track operated by Metrolink parent, the Southern California Regional Rail Authority, as the East and West Bank lines of the River Sub.

A trio of heavily tagged UP gensets trudges up the East Bank and into 4th Street yard with a local freight not long before a Metrolink F59PHI screams by with an eastbound Riverside train. Minutes later on the opposite bank, an inbound Amtrak *Surfliner* and a Metrolink train stage a perfectly choreographed running meet as the viaduct presides over it all.

There will be an undeniable void once the demolition crews carve the elegant concrete and steel structure from the skyline. But here on the concrete banks of the LA River, the parade of trains, from graffiti-covered gensets towing of boxcars, tanks, and lumber flats, to California-styled F59s speeding by with *Surfliners* and Metrolink commuters remains as quintessentially LA as Chevy low riders, palm-lined streets, crowded freeways, and the classic profile of the Sixth Street viaduct. — *Greg McDonnell*

a growing network of LA Metro Rail trolley lines. While the trustees of 20th century traction preserve the past at the Orange Empire Railway Museum in Perris, the heirs of Pacific Electric blimps, "Butterfly Twelves," and Los Angeles Railway "Yellow Cars" command the present, connecting LA's metropolitan core with Azusa, Culver City, Long Beach, Norwalk, North Hollywood, and Redondo Beach. Inaugurated in 1990, two subways and four light rail lines currently serve Angelenos over 98.5 route-miles, with more to come. The year 2016 marks the completion of two significant route extensions — the Gold Line to Azusa, utilizing portions of the former Santa Fe Second District, and the Expo Line west of Culver City, reviving PE's former Santa Monica Air Line.

In a land both blessed and cursed by its dependence on super highways, the greatest improvement in expediting Southland rail commerce has come from the construction of two "expressways for freight"— the Alameda Corridor and Colton Crossing.

Opened in 2002, the 20-mile Alameda Corridor connecting downtown Los Angeles to Long Beach bypassed 90 miles of branch line and secondary running over one-time SP, UP, PE, and Santa Fe alignments, eliminating more than 200 grade

"Los Angeles." No mistaking the hometown of these heavily tagged LA-assigned UP gensets. Greg McDonnell

Returning from the industrial spurs of Vernon, UPY 2723 clomps along the BNSF diamonds and past long-closed Hobart Tower at San Pedro Junction on Mar. 24, 2016. Greg McDonnell

Heading an eastbound stack train, BNSF ES44DCs Nos. 7530 and 7852 exit the "Mid-Corridor Trench" on the Alameda Sub at East 25th Street. Greg McDonnell

crossings on the interminable slog through south central LA. Highlighted by 10 miles of 40-mph triple-tracked trench running controlled by CTC, the corridor handles over 17,000 trains annually. Fifty-seven rail miles to the east, the Colton Crossing flyover opened in 2013, eliminating a grade-level BNSF and UP crossing at old Colton Tower, dating to 1883, and expediting running times for a good 100 trains per day including Amtrak and Metrolink.

Both projects underscore the dramatic shift in haulage patterns since 1959. Despite a significant amount of Southland boxcar traffic in 2016, carload freight has long been out-distanced by the explosive growth of container traffic from the ports of Los Angeles and Long Beach. Where hotshot piggyback trains and expediters were once the toast of the industry, intermodal has reigned supreme for more than 30 years. Trailers on flatcars can still be found, but they're usually entrained behind double-stacked ocean-going containers roaming "the main lines of mid-suburbia," as photographer Enrique Contreras describes the freight corridors of Southern California.

Traditional commodity shipments have evolved as well. Long gone are the perishable-laden Santa Fe Green Fruit Express trains laboring through the canyons of Cajon, eastbound SP Colton Blocks hammering over Beaumont Hill, and Imperial Valley sugar-beet haulers battling gravity and headwinds out of West Palm Springs. In their place, flanged-wheel pipelines of crude oil and ethanol course the coast and coil around Sullivan's Curve en route to South Bay refineries, while rock trains circumnavigate San Timoteo and Soledad canyons, bound for the bunkers of aggregate proces-

>> See David Styffe's Fullerton video footage at www.TrainsMag.com/Locomotives

Fullerton station, arguably the greatest train-watching place in the country, bustles with people and trains as westbound BNSF GEs roll by on a summer's eve. David Styffe

sors in Gardena and Sunland.

A vast array of the latest and greatest from GE and EMD provide the tractive effort on LA's mainline rails. Long gone are the throaty, fuel-guzzling, emissions-spewing 16- and 20-cylinder muscle machines from the '60s and '70s. Clean and green are today's watchwords, exemplified by the concentration of Tier 3 and Tier 4 locomotives in the coastal basin.

A full palette of paint schemes more than makes up for anything the Class I carriers may lack in diesel diversity. BNSF and Union Pacific colors predominate, but Canadian National, Canadian Pacific, CSX, Ferromex, Norfolk Southern, and Kansas City Southern units regularly enter the scene, spiced by occasional heritage offerings from NS and UP's singular salutes to its merger partners. Santa Fe blue and yellow abounds on BNSF locals and yard jobs, along with a dwindling number of red-and-silver warbonnet units. Lost in such well-deserved nostalgia, it's easy to forget that UP's Armour Yellow and Harbor Mist grey dates to 1939 — proof positive that a handsome heritage never goes out of style.

Metrolink F59PH No. 869 accelerates away from Fullerton on a warm August evening, bound for Oceanside with train No. 608. David Styffe

Back in Fullerton, the sun is setting over three pairs of rails, afternoon yields to evening as another eastbound rolls into view. What'll it be this time? A San Diego-bound *Surfliner*? A trio of BNSF ET44C4s towing 2 miles of stacks, throttling up for the three-day sprint to Chicago? Metrolink No. 667 bringing baseball fans home from an afternoon at Angels Stadium?

Regardless of what rolls by next, there's always another train on the way into or out of LA. No matter what you think of Southland railroading, the truth remains, Los Angeles is one amazing railroad town. T

The princess and the

Former Canadian National MLW S13s toil in differing dress in Illinois

Story and photos by Steve Smedley


1

Deep within the Rochelle (Ill.) Industrial Park, a rare but spotless January 1959 product of Montreal Locomotive Works burbles away as a Burlington Junction Railway crew prepares for a day's work. Operations manager John "Skinny" Hanson walks around the idling 1,000-hp locomotive on this second day of spring in March 2016, then climbs aboard the locomotive and knocks off its handbrake.

In the spacious cab, Hanson uses the control stand as his desk as he completes a daily locomotive inspection form. This Monday morning is like most other weekdays. Foreman Sam "Scooter" Johanning rides the steps of No. 8711, keeping a keen eye for close clearance as the crew pulls an empty and spots a load in the Boise Cascade lumber distribution center at the end of Timber Lane and alongside westbound Interstate 88.

After picking up an empty and a quick brake test, Hanson gives the unit a couple notches. "It doesn't take much to get her to smoke," says Hanson, as the six-cylinder 251 engine spins up power. "It's a tank! It don't go very fast, but it'll move anything we throw at it," continues Hanson. "She hardly ever wheel-slips, it just goes. She's easy to run and very user friendly."

That sentiment is echoed by the railroad's regional manager Jeff Gedraitis, who is working with the MLW crew while another crew uses SW1500 No. 1516 at the CHS Ethanol Plant on the south end of town. "We are all very tight knit; we're like brothers," Gedraitis says. "Most of my coworkers were also in my wedding, we work together, and we hang out outside of work together," Hanson says, as he sounds the air horn for Wiscold Drive. The crew nods in agreement as Gedraitis adds that No. 8711 is the "best engine of the bunch."

Burlington Junction works other industries including the Americold Logistics frozen food warehouse, the Nippon Sharyo Manufacturing passenger car plant just south of Interstate 88, along with the new Coated Sand Solutions sand processing plant just east of Steward Road.

No. 8711 is one of four Burlington Junction locomotives located in Rochelle. After spotting a lumber load at Wausau Supply Co., the crew parks the MLW next to SW1500 No. 1516, ties down the handbrake, and locks the cab. The little S13 is done for the day, but the crew gets into a red pickup and drives to another operation just east of Union Pacific's sprawling Global III intermodal facility. Minutes later, they climb aboard another S13.

No. 8701 burps a puff of exhaust into the air as the crew prepares to work the Del Monte Foods plant. The BNSF Railway local serves the small yard on the west side

spotted elephant

2

of the plant here, but Burlington Junction is the contract switcher.

While No. 8711 might be the princess of the operation here, sister No. 8701 is definitely the frog. As any locomotive mechanic or roundhouse foreman will tell you, a nice coat of paint has nothing to do with the internal workings and dependability of a locomotive. Illustrating the point, No. 8701 toils efficiently with its faded CN black-and-orange colors dotted with splotches of gray-and-pink primer covering. "We call her the spotted elephant," Hanson quips.

Looks don't matter much, the tattered S13 rarely ventures beyond the confines of the plant. A smart coat of paint would be a nice touch, much like the kiss from a princess, but for now the spirited MLW labors in a dress that looks more like the camouflage of a World War II fighter plane. No one's complaining.

3

1. Exhibiting the look that earned the nickname "spotted elephant," No. 8701 switches at the Del Monte Foods plant in Rochelle, Ill., in April 2015. 2. The "best engine of the bunch," S13 No. 8711 slumbers at Rochelle on an autumn evening. 3. John "Skinny" Hanson at the throttle of the 8711 on March 21, 2016.

METRA MU

USCLE

How Chicagoland's commuter railroad keeps 150,000 daily riders on the move

Story and photos by Tom Danneman

On Oct. 25, 2015, a westbound Metra train, led by MP36PH-3S No. 416, rolls through CP Morgan and over Racine Avenue in Chicago, just 1½ miles out of Union Station.

No time for breakfast, you reason, as you rush to gather your briefcase and coat on the way out of the door for a 7 a.m. meeting. There's just enough time to catch a train to downtown Chicago that leaves Naperville at a razor-sharp 6:03 a.m. If you don't make that train, you'll only have to wait until 6:20 for the next one, but you don't even want to think about that. The early-morning departure is Metra train No. 1208, one of 704 trains serving 241 stations and 150,000 riders every weekday. For you, No. 1208 is the most important train of them all.

You have just minutes to spare before boarding the train that originated in Aurora on BNSF Railway's famous Racetrack into Chicago. You find an open seat next to a window on the already crowded train. It never occurred to you before, but as you stare out the familiar green-tinted windows, you wonder how exactly Metra can keep all of the trains on 11 routes and 1,200 miles of track running efficiently. Most commuters wouldn't give it a thought.

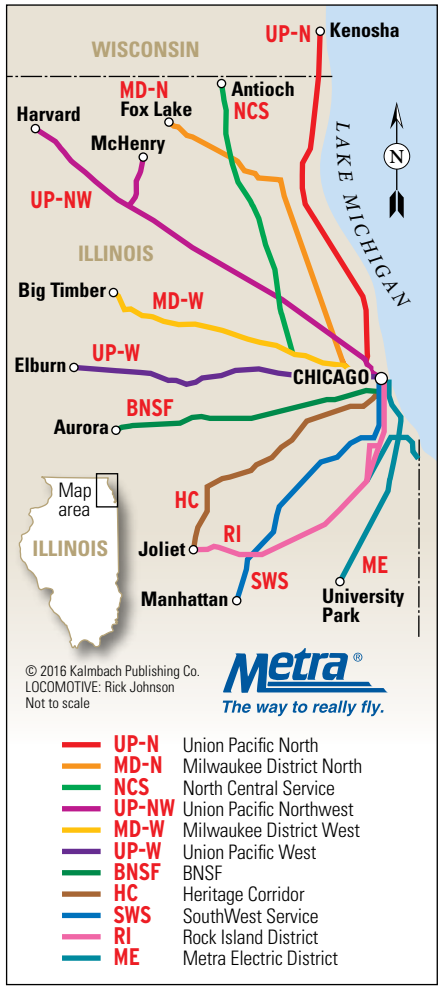
So how does Metra do it? Stop staring out the window and read this. Then you'll realize what it takes to move you and 150,000 of your closest friends across the metropolitan Chicago area.

Timetables and scheduling, ticketing, train dispatching, track maintenance, signaling, crew management, car maintenance and cleaning, station upkeep, and staffing all factor into the complexities that make Metra work. Paramount, though, is the motive power that moves those Metra riders, ensuring that they get to work on time, or down to Michigan Avenue to shop, or home to loved ones after a long day behind a desk. To do so, Metra relies on a stable of 150 diesel locomotives to move all of its trains, except those on the electrified former Illinois Central lines, where a fleet of bilevel electric multiple-unit cars known as Highliners do the job.

Metra in the making

Passenger rail service in the Chicago area peaked in the 1930s when the city boasted that it had the world's largest public transportation network. By the 1960s and '70s the railroad-operated commuter rail services were cash-strapped and some were crumbling, while North Western and Burlington services were beneficiaries of significant investments in rolling stock and service improvements. In 1974, voters in six Chicago-area counties agreed to form the Regional Transportation Authority in an effort to improve commuter services. Initially, the authority was in charge of purchasing new locomotives and cars, especially for the Rock Island and Milwaukee Road lines, but did not directly operate the trains. In 1983, legislation created the Commuter Rail Division of the transportation authority to provide commuter service in the Chicago area,

Laborer Noel Rodrigues closes the hood doors on 76-year-old SW1 No. 1.



One of every type of Metra road locomotive — F40PH-3 No. 109, F40PHM-2 No. 203, F40C No. 611, MP36PH-3S No. 411, and F59PH No. 97 — is represented in these exclusive, first-time-ever photos taken at the Western Avenue Yard in October 2015.

directly operating some lines while others were still operated by host railroads. In 1984, the rail division coined its retail name, Metra, short for Metropolitan Rail.

In 2016, there are three basic forms of operations. The Northeast Illinois Regional Commuter Railroad Corp. owns and operates the former Illinois Central electric, Rock Island, and Milwaukee Road lines. Metra operates trains with its crews and equipment on Canadian National and Norfolk Southern lines under trackage rights agreements. Under contract, BNSF Railway and Union Pacific crews operate Metra equipment on their respective railroads. South Shore Line passenger trains are an unusual situation. The Northern Indiana Commuter Transportation District is a contract carrier from Hegewisch station, its eastern-most in Chicago, while it operates its trains and crews on Metra Electric under a trackage rights agreement in Chicago north of Kensington, 115th Street. Most Metra operations interface with Amtrak and freight trains in the Chicago Terminal that on an average weekday handles approximately 1,300 trains. In summary, Metra is a complicated operation.

Metra motive power

During the first few years of the authority's existence, the agency relied primarily on second-hand Electro-Motive Division diesel locomotives purchased or leased from the host railroads in the form of older E and F units, and switcher-type locomotives. The authority also inherited 15 unique F40Cs delivered just as it was being formed in 1974. The big six-axle cowl locomotives were built for use on Milwaukee Road's commuter lines. The Northwest Suburban Mass Transit District financed 13 of the locomotives; the North Suburban Mass Transit District picked up the tab for the other two.

Workers at Metra's Western Avenue shop consult their federal paperwork before inspection work begins on various F40PH-3s and a MP36PH-3S.

SW1500 No. 5 receives weekend maintenance at Metra's Western Avenue shop. The former Southern Pacific locomotive was built in 1967.

Metra's first new locomotive purchase was an order for 28 EMD F40PHs delivered in 1977 and numbered 100-127. The boxy cowl locomotives soon became a staple as Metra amassed a fleet of 85 F40PH-2s by 1989. In 2010, a pair of Amtrak F40PHs, upgraded to F40PH-3 specs, were added to the roster.

In 1991-1992, Metra took delivery of a new model, the F40PHM-2. Unique to Metra the pug-nosed locomotives, partially built by General Motors Diesel in London, Ont., and completed by EMD at La Grange, Ill., were acquired to replace the aging leased Burlington Northern E9s used on the Racetrack, between Chicago Union Station and Aurora. Completed in December 1992, Metra 214 was the last locomotive delivered by the legendary EMD factory at La Grange.

Looking to replace its now aging collection of F40Cs, Metra ordered 27 Motive Power Inc. MP36PH-3S locomotives, powered by an MPI version of the EMD 16-645F3B engine. Metra began taking delivery of the sleek locomotives in 2003 and sidelined the venerable F40Cs. However, the new MP36s experienced problems requiring Metra to reactivate several F40Cs. Once the MP36s were fixed, all but two F40Cs were sold and left the property.

In 2015, Metra acquired three F59PHs from Agence Métropolitaine de Transport, Montreal, via Rail World Locomotive Leasing. The F59s were built in 1988 for Toronto-area commuter railroad GO Transit, and are the only EMD 710 engine-powered Metra locomotives.

Three big challenges

Metra Chief Mechanical Officer Jim Derwinski says the railroad has three distinct challenges that are unique to passenger operations, commuter operations, or in some cases, to Metra itself.

1. Age of Metra locomotives

Metra's oldest road locomotive was built in 1977, and has been working in commuter service for nearly 40 years. Typically, passenger locomotives receive a major overhaul around age 10. "Since we've had to defer those overhauls because of funding shortfalls, we've had to go outside the box on our maintenance cycles, rather than waiting to change components until it's scheduled for an overhaul," Derwinski says. Instead of waiting until a locomotive component fails, Metra aggressively works ahead and preemptively changes or overhauls specific parts that normally would wait for such work to be done during an overhaul. Derwinski says, "It costs more, but that's what we have to do to get the locomotives past their typical 10-year overhaul schedule."

Metra relies heavily on its 117 EMD F40PH models, the youngest of which is approaching 25 years of age. Even Metra's newest locomotives, the MP36s, are 13 years old. Metra's is the largest operating F40 fleet in the world, gaining that title in 2000 after Amtrak retired the last of its 216 units. "They are approaching 40 years old, says Derwinski of the F40s. "Nobody is running them as their mainstay like we are." The performance of the F40 fleet is proof that Metra's maintenance programs can work wonders with minimal funding. "It's not the most fuel efficient, it's not the quietest, but when it comes to reliability and longevity it gets high marks," Derwin-

METRA POWER PROFILE

F40PH-3
100-149, 215-216

Built: 1977-1981
Builder: EMD
Rebuilt: 2009, Progress Rail, Mayfield, Ky.
Horsepower: 3,000
Tractive effort (continuous): 38,240 pounds
Length: 56 feet, 2 inches
Prime mover: EMD 16-645E3
HEP: Gear-driven Delco
Controls: AAR control stand
Top speed: 95 mph
Territory: All routes
Unique features:
- 52 F40PH-3s on Metra's roster
- Equipped with EM2000 control system

F40PHM-2
185-214

Built: 1991-1992
Builder: EMD
Horsepower: 3,200
Tractive effort (continuous): 38,240 pounds
Length: 56 feet, 2 inches
Prime mover: EMD 16-645E3C
HEP: Gear-driven Delco
Controls: Desktop style
Top speed: 108 mph
Territory: Rock Island District, BNSF
Unique features:
- First Metra locomotive with desktop controller
- Last locomotives built by EMD in La Grange, Ill.
- Metra is the only railroad to purchase this model

F40C
611, 614

Built: April, May 1974
Builder: EMD
Horsepower: 3,200
Tractive effort (continuous): 82,100 pounds
Length: 68 feet, 10 inches
Prime mover: EMD 16-645E3
HEP: Auxiliary diesel engine
Controls: AAR control stand
Top speed: 95 mph
Territory: Stored, Western Ave.
Unique features:
- Only six-axle Metra locomotives
- Purchased for use on Milwaukee Road lines
- Oldest Metra road locomotives

MP36PH-3S
401-427

Built: 2003
Builder: Motive Power Inc.
Horsepower: 3,600
Tractive effort (continuous): 78,000 pounds
Length: 68 feet
Prime mover: EMD 16-645F3B
HEP: Static inverter system
Controls: Desktop style
Top speed: 108 mph
Territory: BNSF, Milwaukee North, Milwaukee West, North Central Service
Unique features
- Four locomotives, reclassified as MP36PH-3Cs, have a stand-alone Cat HEP system, replacing the OEM static inverter

F59PH
97-99

Built: May, June 1988
Builder: EMD
Horsepower: 3,000
Tractive effort (continuous): 38,218 pounds
Length: 58 feet, 2 inches
Prime mover: EMD 12-710G3A
HEP: Auxiliary diesel engine
Controls: Desktop style
Top speed: 110 mph
Territory: Milwaukee North, Milwaukee West and North Central Service
Unique features:
- Only Metra locomotives equipped with EMD 710 engine
- Stand-alone HEP
- Front and rear switching stairs

ski says. "It's a testament to the design of the locomotive."

2. Spare ratio

Metra determines its need for spares — locomotives available for use in the event that an assigned unit is out of service — by its "spare ratio." Routine light and heavy maintenance, the installation of PTC, locomotives off-property for overhaul, and even unforeseen issues such as grade-crossing accidents factor into the number of spares each district has on a daily basis.

"Having a low spare ratio is great for economics, but it's not great for maintenance." Derwinski says. Most Metra trains only operate with one locomotive. "It's not like in freight where if one goes down, you can still keep the train moving."

Metra currently has 11 spare units on its roster to allow for normal operations while other locomotives are in the shop for scheduled and unscheduled maintenance, upgrades, inspection, or repairs. In spring 2016, Metra had eight locomotives out of service for rebuilding, handling MP36s in-house at its 47th Street shop, with F40s outsourced to Progress Rail in Patterson, Ga. In addition, four locomotives were out of service for PTC installation, while six more units were shopped for heavy inspection. Depending on how many are down for unforeseen

METRA DIESEL LOCOMOTIVE ROSTER

MODEL	QTY.	NUMBER(S)	BUILT	FORMER NUMBERS	NOTES	ASSIGNMENT AS OF 07/16
SW1	1	1	12/39	IC 9016/IC 602/ RI 4801		Blue Island
SW1	1	2	6/46	RTA 2/IC 9025/ IC 610/RI 4804		47th Street
SW1200	1	3	11/54	RTA 3/NIRC 3/ MILW 600/ MILW2048	Rebuilt 5/08	47th Street
SW1500	1	4	5/72	SP 2643		47th Street
SW1500	1	5	8/67	SP 2476		Western Avenue
SW1500	1	6	6/68	INLX 120		Western Avenue
SW1500	1	8	6/68	SP 2494		KYD (Kensington Yard)
SW1500	1	9	12/71	SP 2590		KYD (Kensington Yard)
F59PH	1	97	5/88	AMT 526/GO 526		Milwaukee North, Milwaukee West, North Central
F59PH	1	98	6/88	AMT 530/GO 530		Milwaukee North, Milwaukee West, North Central
F59PH	1	99	6/88	AMT 532/GO 532		Milwaukee, North Central
F40PH-3	28	100-127	1977		Rebuilt F40PH	All routes
F40PH-3	22	128-149	1979-1980		Rebuilt F40PH	Union Pacific
F40PH-2	24	150-173	1983			Union Pacific
F40PH-2	7	174-180	1988-1989			Union Pacific
F40PH-2	4	181-184	1989			BNSF
F40PHM-2	30	185-214	1991-1992			BNSF, Rock Island
F40PH-3	1	215	12/77	AMTK 258	Rebuilt F40PH	Milwaukee
F40PH-3	1	216	6/81	AMTK 375	Rebuilt F40PH	Milwaukee
F40PHR	1	217		AMTK 364/VRE V32	Core for F40PH-3	N/A
MP36PH-3S	23	402-427*	2003			BNSF, Rock Island, Milwaukee
MP36PH-3C	4	401, 417, 420, 423	2003		Rebuilt MP36PH-3S	BNSF, Rock Island, Milwaukee
F40C	1	611	1974	MILW 51 (NWSMTD)	Stored	N/A
F40C	1	614	1974	MILW 54 (NWSMTD)	Stored	N/A

*Not consecutively numbered

AMT Agence métropolitaine de transport, Montreal; **AMTK** Amtrak; **GO** Go Transit; **IC** Illinois Central; **INLX** Incoal Co.; **MILW** Chicago, Milwaukee, St. Paul & Pacific; **NIRC** Northeast Illinois Regional Commuter Railroad Corp.; **NWSMTD** Northwest Suburban Mass Transit District; **RI** Chicago, Rock Island & Pacific; **RTA** Regional Transportation Authority; **SP** Southern Pacific; **VRE** Virginia Railway Express

maintenance, that leaves eight to 16 usable spares on any given day.

3. Turn time, or the pit stop

In comparison to a freight locomotive, which might get to a terminal for routine maintenance and may not go back out on a train for 24, 36, or maybe even 48 hours, Metra locomotives are often turned in just 3 or 4 hours, during which time detailed inspections, maintenance, and fueling must be performed. It's the locomotive version of a pit stop: daily inspection, washing, and running maintenance, etc. Due to the low spare ratio, Metra doesn't always have the option to allow a locomotive to sit for more involved maintenance, especially in the short window between rush hours.

Maintenance

Four shops maintain Metra's 150 road locomotives. Western Avenue and 47th Street shops maintain power for all diesel-hauled trains except those on BNSF to Aurora and those on Union Pacific lines. Locomotives used on the BNSF route are maintained by BNSF at 14th Street, while locomotives used on UP routes are maintained at UP's M19A shop. The BNSF and UP locations are contract shops staffed by BNSF and UP maintenance personnel, respectively. While all four shops share some of their parts inventory, BNSF and UP purchase other parts and Metra reimburses them.

All four shops perform heavy maintenance and annual inspections. Work includes changing air compressors, rebuilding gear trains and trucks, changing turbochargers and main generators, and performing other preventative maintenance. The shops are also in the midst of installing the Wabtec Interoperable Electronic Train Management System PTC system into locomotives. About 70 percent of the fleet is now equipped for PTC operation.

Commuter service, especially in Chicago, which has numerous closely spaced station stops, creates unique maintenance issues for Metra. "Because of the schedules, we run these things like race cars," Derwinski says. "We go full stop to full speed to full stop in just a few miles, and sometimes in just several blocks." This rigorous duty cycle means that Metra's locomotives wear out certain components at a more accelerated pace than the average freight locomotive, or even those on most passenger systems.

A typical Metra locomotive duty cycle involves throttling up to full speed, and applying its brakes hard to stop the train in a short distance. The quick stops heat up the brakes rapidly, while accelerating cools them down just as fast. This continuous cycle causes parts such as the brakes themselves, dynamic brake grids, and dynamic brake grid blowers to wear quicker.

Additional wear comes from blended braking, a combination of dynamic and air brakes. Blended brakes use the air signal to engage the dynamic braking. When the system senses a certain air-brake pressure, it actually puts the locomotive into dynamics with the air brakes still applied. When the train gets to a slow speed, the dynamics will drop out right before the stop, while the air brakes finish the job. As the braking goes up and down, the system proportionally adjusts

Metra MP36PH-3S No. 411 shows off its inset ditch and marker lights.

Metra F40PH-3 No. 112 heads west at dusk with a post-rush-hour train at BNSF's Congress Park station.

how much dynamics and air brakes are used, hence the term "blended braking."

"You can go from Chicago to Elgin and back and use it 25 times in each direction," Derwinski says. "That round-trip distance is around 80 miles. A freight train might go 80 miles without ever getting off of the throttle."

Chicago's harsh weather conditions add maintenance challenges as well. The full-width carbodies, or cowls, on all of Metra's road locomotives help keep the snow and rain out, and layover protection keeps the locomotive heaters running at night. But snow and ice still wreak havoc. Heavy winter snows accumulate on stationary locomotives; melting snow seeps into traction motors and wiring, causing maintenance difficulties. Snow kicked up by the train while the locomotive is in push mode causes a troublesome buildup of ice and snow in running gear and other components. Removing the ice pack from the running gear to adjust or change the brake-shoes moves from several minutes per truck to 15-20 minutes per truck during winter storms.

Rebuilt, reconditioned, reborn

Metra has embarked on programs to completely rebuild its older motive power with two major projects currently underway. In late 2015, Metra announced a $91.1 million rehabilitation program for 42 F40PH-2 and F40PHM-2 locomotives built between 1989 and 1992. The rebuilt locomotives will feature a new high-voltage

In push mode, Metra F40PHM-2 No. 197 accelerates toward Chicago's Union Station after making a brief stop at Hollywood station on BNSF's Racetrack.

cabinet with an EM2000 microprocessor control system and remanufactured prime movers upgraded to EPA Tier 0+ emission standards. Rotating electrical equipment, including the main generator and traction motors, is rebuilt, as are trucks and braking systems. New wiring and high-voltage cabling are installed as required. The work also includes a remanufactured prime mover-driven HEP system (head-end power provides electricity for on-board lighting, heating, air-conditioning, exhaust fans, and door motors), positive train control implementation, and a closed-circuit camera monitoring system. Progress Rail Services in Patterson, Ga., will perform all of the work. It will take approximately three years to complete the project.

Metra acquired former Virginia Railway Express F40PHR No. V32 to be used as a core for this project. The project will also include carbody repairs and repainting to Metra's newest scheme that was introduced on the MP36s. Metra expected the first rebuilt F40PH (now classified F40PH-3) to be delivered in August 2016.

Metra has simultaneously embarked on a $62 million project to rebuild its MP36s. The project prototype locomotive, No. 417, will be rebuilt by MotivePower Inc. in Boise, Idaho. Subsequent locomotives will be rebuilt at Metra's own 47th Street facility. In addition to a complete HEP conversion, changing from an inverter based HEP system to a standalone generator, the project includes carbody repair and paint; prime mover upgrade to U.S. EPA Tier 1+ emission standards; rebuilt rotating electrical equipment; replacement of existing microprocessors with an upgraded QES-III sys-

WORKADAY SWITCHERS AND A NATIONAL TREASURE

Metra's eight-unit switcher fleet is composed of hand-me-down EMD switchers of various heritage. Most are SW1500s, four of them of Southern Pacific origins and one built for Inland Steel. There's a lone SW1200 built for the Milwaukee Road and a pair of SW1s that RTA acquired from the Rock Island estate in 1981. The Rock picked up the SW1s from their original owner, Illinois Central, in 1970.

The lowest-numbered and oldest locomotives in the Metra fleet, SW1s Nos. 1 and 2 are called upon for various duties including switching and work trains. Based at the 47th Street shop, Metra No. 2 emerged from EMD in June 1946 as IC 9025. Metra No. 1 is assigned to the Blue Island shop, and remarkable for more than the unique coupler modification (below, left) that allows it to switch the Nippon Sharyo-built Highliners used on the former Illinois Central Electric suburban lines. The original Electro-Motive FT A-B-B-A demonstrator No. 103 was just weeks old when the locomotive that would one day become Metra No. 1 rolled off the assembly line as IC 9016 in December 1939. The little blue SW1 has been upgraded since then but at age 76 (it will be 77 in December), No. 1 is far and away the oldest locomotive in regular service on a major railroad in the U.S. SW1s are rare by any standard, but Metra No. 1 is a national treasure. — *Tom Danneman*

tem; rebuilt trucks with new wheels and brake systems; and positive train control installation. Nos. 401, 417, 420, and 423 are done and now classified as MP36PH-3C. Metra has also installed electronic fuel injection on Nos. 420 and 423, a modification which will improve fuel efficiency and emission controls. All of the MP36 and current programmed F40PH rebuilds will be equipped with electronic fuel injection.

About those F40Cs

Metra's 15-unit F40Cs were purchased by two suburban commuter agencies for Chicago-area commuter service on the Milwaukee Road: 13 for the North Suburban Mass Transit District, and two for the Northwest Suburban Mass Transit District. The locomotives continued serving on the two former Milwaukee lines until 2005. Thirteen of the series were sent to Metro East Industries in East St. Louis, Ill., and were eventually scrapped. Two F40Cs, Nos. 611 and 614, were retained as protection power. Metra ran these two F40Cs intermittently, between 2009-2012, as supplemental locomotives. Since 2012 they have been in storage at Western Avenue. Over the last several years, Metra has put out bids to have the two locomotives rebuilt. The specifications Metra required for the F40C rebuild project were repowering with a remanufactured 12-cylinder diesel engine; replacement of the existing HEP equipment with a stand-alone 600kw engine-generator set; structural and carbody modifications to accept new HEP system; replacement of existing high-voltage cabinet with new microprocessor control system; and positive train control implementation. "When we did go out for solicitation for them," Derwinski says, "we had trouble finding companies wanting to deal with such a small order, and all of the engineering to bring them up to fuel efficient and environmentally friendly standards." Metra was not able to secure a competitive contract for the work desired.

The fate of the F40Cs perhaps depends on whether or not Metra can find suitable funds to either purchase further used locomotives or new locomotives. "They may very well become test beds for a more unconventional propulsion system in the future, as the long, SD40-type underframe and six-axle configuration lends itself to potential systems exceeding the physical constraints of the more popular F40PH," Derwinski says.

New (used) locomotives coming?

Metra's latest locomotive acquisition was three former GO Transit F59PHs from Montreal. Metra made wiring modifications, installed public-address and intercom systems, and modified the head-

Metra's own national treasure, SW1 No. 1 still glistens in the sun.

Each Metra road locomotive type has unique nose, windshield, and body configurations, as shown here outside the railroad's Western Avenue locomotive shop in October 2015.

Approaching Hollywood station, Metra F40PHM-2 No. 196 blasts down the center track of BNSF's Racetrack with an express headed for the western suburbs.

end power and in-cab control indicators to match other units in the fleet prior to placing the F59s into service. Metra also will be advertising for competitive bidding in the next six months for additional F59s to supplement the fleet. The solicitation doesn't dictate whether those would be F59PH or F59PHI locomotives.

Metra is also planning to purchase two additional switcher locomotives to replace some of the older switchers. The locomotives will be completely rebuilt and will have enhanced emission controls to meet government environmental regulations. Aside from those acquisitions, no funding has been set aside to purchase new locomotives. In addition, Metra does not anticipate enough funding to purchase new locomotives for at least five to eight years. Nevertheless, Metra personnel are preparing specifications for new locomotives that could be purchased if and when funding becomes available.

One of the specifications is for the locomotives to be equipped with A.C. traction. Metra considers the lack of A.C. traction as a shortcoming of its existing locomotive fleet. "With the sealed motors, weather has minimal effect on them. Those things can drive through a snow storm and just keep going," Derwinski says. But with the modifications needed for the carbody, trucks, and other components, converting existing locomotives to A.C. is not financially feasible.

So if, or more likely when, you're in Chicago riding one of Metra's 704 trains, take your eyes off of your tablet or smartphone, and look out the window at that Metra train you're meeting. Chances are, it's powered by a locomotive that is more than a decade or older than your own automobile. Then think about how difficult it would be to keep a 20-year-old car maintained to standards that would allow it to be used in stop-and-go traffic every day, year in and year out, and what kind of wear and tear it would be subjected to. Considering that, I think you'll agree that Metra works wonders with its locomotives. ⅄

Special thanks to Jim Derwinski, Mark Llanuza, Bill Badurski, and Norm Carlson for assistance in preparing this story.

Southern Pacific 9010

The last surviving Krauss-Maffei in America will be an international sensation

Story and photos by Elrond Lawrence

In the 1990s, a German term, "Fahrvergnügen" – "driving enjoyment" – fueled a popular Volkswagen ad campaign. If locomotive wizard Howard Wise and his crew have their way, they'll get to use the term for Southern Pacific No. 9010, one of the biggest, baddest restoration projects ever attempted.

The phrase "one of a kind" takes on a dizzying new quality when viewing the handsomely brutish lines of SP 9010, the last surviving diesel-hydraulic road locomotive in America. Built in 1964 by Krauss-Maffei in Germany, 9010 was one of 15 ML 4000 C'C' hood imports Southern Pacific purchased in the early 1960s as part of a high-horsepower experiment. The K-M import arrived in 1964 sporting twin 2,000-hp Maybach MD870 engines for a total of 4,000 hp under the hood — at the time, the world's most powerful six-axle locomotive.

The experiment was short-lived, and SP retired all 15 units by the end of 1968. The railroad also retired six prototype ML 4000 C'C' cab units, three being Rio Grande alumni. Only the 9010 (by then renumbered 9113) was spared from scrap.

Her nose reconfigured, the rare K-M became locomotive simulator camera car numbered 8799. After her filming career ended, SP 8799 was acquired in 1986 by the California State Railroad Museum. An effort to restore No. 8799 to its original appearance stalled and the unit sat noseless and exposed to the elements for years.

Enter Pacific Locomotive Association, which owns and operates the Niles Canyon Railway near Fremont, Calif. Based on a suggestion from 18-year-old member Charles Franz, PLA purchased the rare diesel and moved it to its Brightside shop in 2008 for a planned cosmetic restoration. Wise, a veteran of successful projects including SP "black widows" GP9 No. 5623 and SD9 No. 5472, was named project leader.

Working closely with machinist Bill Stimmerman, Wise has made astonishing progress: the two rebuilt the cab and operator's station, while Wise built a new nose faithful to No. 9010's 1964 appearance, and Bob Zenk completed the body work. The K-M now wears a dazzling coat of SP scarlet-and-grey paint. Wise launched a blog and turned to social media to scour the world for rare parts and resources. As a result, the SP 9010 project has become an international effort, with support coming from Germany, the United Kingdom, and elsewhere.

In 2014, the year of the 9010's 50th birthday, PLA announced the project would be expanded to restore the K-M to operation. The six-axle import is still years away from being operational, but it should be able to serve as a pilot unit on Niles Canyon trains.

The team is currently working on the cooling system. Next up, they'll tackle the locomotive's rear 2,000-hp Maybach MD870 engine.

An important milestone took place at Brightside in May when a replacement rear truck (located in France) was joined to the 9010. As the massive K-M was lifted 8 feet in the air by cranes, the spirits of the project team and onlooking crowd soared.

The last surviving Krauss-Maffei locomotive in America is destined to become an international sensation.

1


2

3

(Left) "Handsomely brutish," the unmistakable face of SP No. 9010 at the Pacific Locomotive Association shop in Brightside, Calif. 1. A milestone event: cranes assist with the installation of a rebuilt rear truck at the Brightside shop in May 2016. 2. Howard Wise examines one of the locomotive's two Maybach MD870 engines. 3. SP 9010's rebuilt cab and nose contrast with the familiar lines of SP GP9 No. 3194.

>> For more information and to follow SP 9010's progress, visit **sp9010.ncry.org** and the locomotive's Facebook page.

3 for t

he road

Ontario Southland's celebrity FP9s pull freight and plow snow

Story and photos by Greg McDonnell

Working in A-A-A formation for the first time since No. 6508 debuted its new paint, all three Ontario Southland FP9s roll the eastbound Woodstock job east of Beachville on Sept. 16, 2015.

By all accounts, the era of F units hauling revenue freight in Canada should have ended more than a half-dozen years ago when southwestern Ontario short line Goderich-Exeter retired its pair of former VIA Rail FP9s. Indeed, when RaiLink-painted FP9s Nos. 1400 and 1401 were sidelined in 2008, Goderich-Exeter did close the book on cab units working freight in Canada — until the Ontario Southland Railway reopened it.

OSR president Jeff Willsie knows a bargain when he sees one. In summer 2012, Willsie — encouraged by OSR vice president Brad Jolliffe — purchased not only RaiLink 1400 and 1401 from the Goderich scrap line, but also bought long-dead sister FP9 No. 6508 from the defunct Waterloo-St. Jacobs tourist operation based in Waterloo, Ont. Jolliffe had working experience with all three of the FP9s and knew them to be sound machines. Originally built for Canadian National, the trio was among 15 VIA FP9s upgraded to Dash 2 specs in the mid-1980s. FP9s on the outside, they're essentially GP38-2s on the inside. Perfect candidates, Willsie and Jolliffe agreed, for OSR's Salford-based operations on the former CP Port Burwell and St. Thomas subdivisions.

Oldest of the three, OSR 6508 rolled out of General Motors Diesel in London, Ont., in December 1954 as CN 6508, became VIA 6508 in 1978, and VIA 6305 after its rebuild and upgrade at CN's Pointe St. Charles shop in Montreal in June 1984. OSR 1400 was built in July 1958 as CN 6539 and carried the same number under VIA until being upgraded and outshopped from Pointe St. Charles as VIA 6303 in February 1984. OSR 1401 emerged from GMD in March 1957 as CN 6523 and retained that number until it was upgraded and rebuilt at CN's Moncton, N.B., shop and released as VIA 6312 in December 1984.

VIA 6305 was retired in 1994 and sold along with sister 6306 to Quebec tourist train operator Trains Touristiques du Saint-Laurent in Quebec and painted in a handsome rendition of the green, black, and yellow CNR passenger colors introduced in 1954. The TTSL operation was short-lived; in 1997 the locomotives and accompanying passenger cars were relocated to Southern Ontario for tourist train service on the Waterloo-St. Jacobs. WSJR reinstated the FP9's original CN road numbers (6508 and 6520), but shut down after a single season. After more than a decade in limbo, West Coast Railway Association purchased the locomotives. WCRA moved No. 6520 to its museum in Squamish, B.C., and put No. 6508 up for sale.

Retired by VIA in 1998, FP9s Nos. 6303 and 6312 were sold to shortline operator RaiLink for its Lakeland & Waterways operation in northern Alberta. Prior to entering service, they were reconditioned, repainted in RaiLink blue and white and renumbered 1400 and 1401 by Canadian Pacific's Ogden shops in Calgary, Alta. In 2003, RaiLink parent RailAmerica transferred the Fs to Goderich-Exeter. By 2008 both units were out of service with mechanical issues and languished outside the railroad's shop in Goderich, Ont., until being sold to an equipment dealer in 2012 and earmarked for scrap.

Enter Jeff Willsie and the OSR.

First of the three cabs to arrive at the OSR shop in Salford, Ont., No. 6508 was a cosmetic basket case, its once-striking CN-inspired dress ravaged and rusted after more than a decade of outdoor storage at VIA's Toronto Maintenance Centre. However, beneath the blistered paint was a remarkably fit locomotive.

Requiring little more than a gasket here, a few injectors there, and a lot of hard, dirty work, Craig Jolliffe — Brad's brother — carefully prepared to awaken the cab from a 12-year slumber in fall 2012. And on a cold December morning, he did just that. No. 6508's 16-645C engine (a 567C block updated with 645 power assemblies) roared to life. The F unit era on OSR had begun.

Pronounced in good health, but given only a promissory note for much-needed bodywork and paint, No. 6508 joined the eclectic fleet of hand-me-down Geeps and MLWs working out of Salford on freights to Woodstock, St. Thomas, and Tillsonburg. The reliable but tattered-looking cab became a regular in the lineup, and a favorite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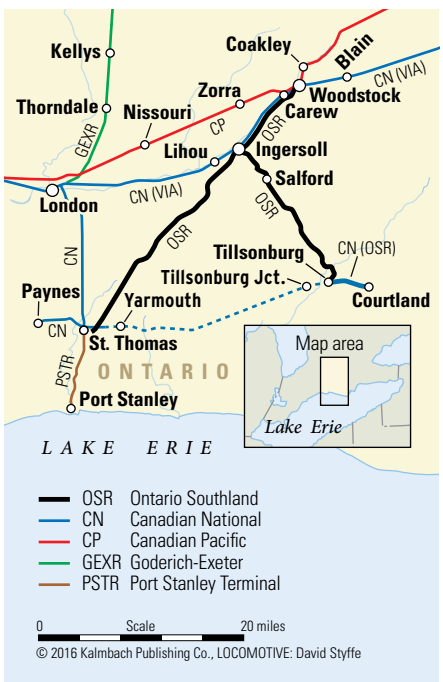

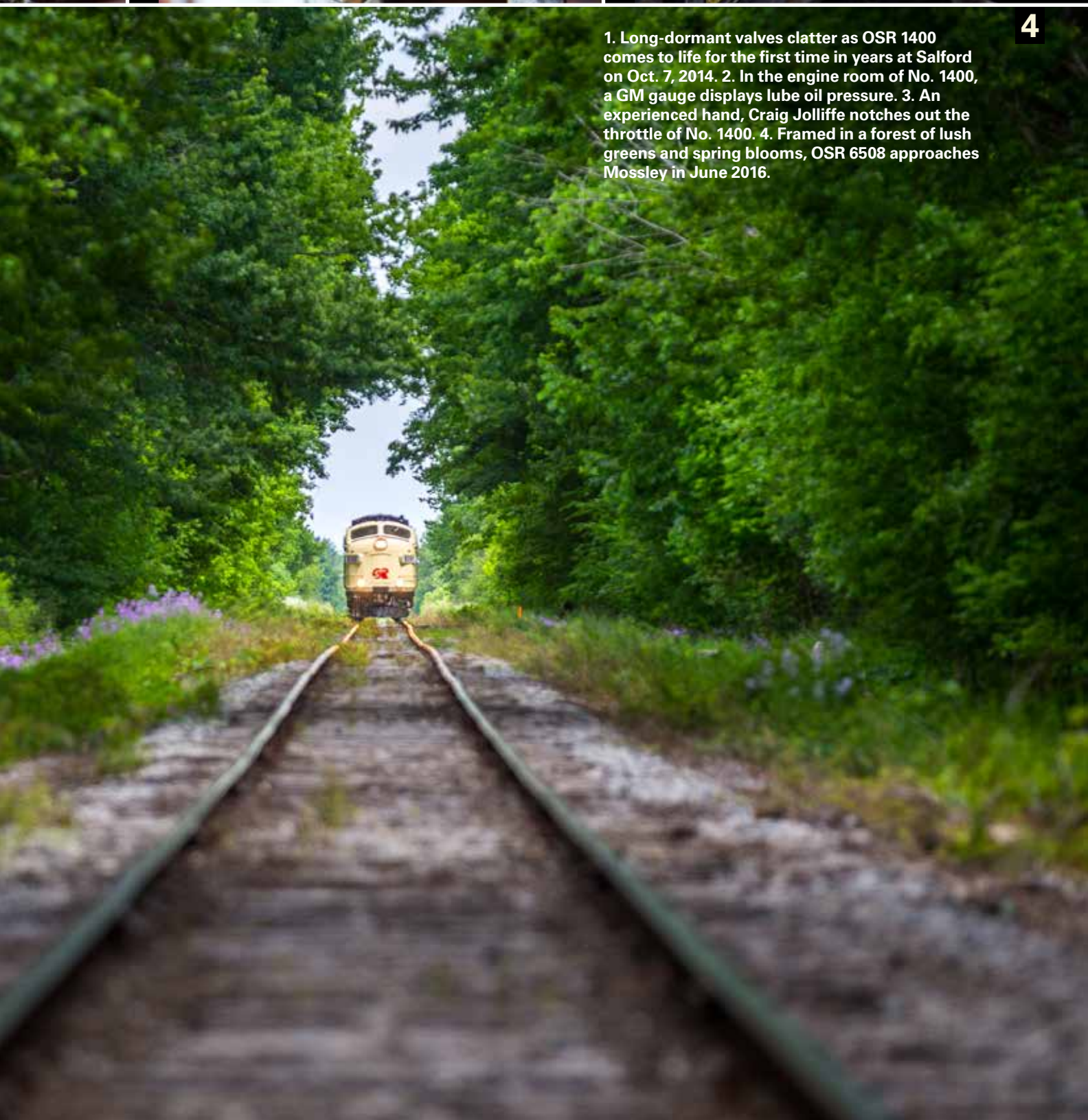

1. Long-dormant valves clatter as OSR 1400 comes to life for the first time in years at Salford on Oct. 7, 2014. 2. In the engine room of No. 1400, a GM gauge displays lube oil pressure. 3. An experienced hand, Craig Jolliffe notches out the throttle of No. 1400. 4. Framed in a forest of lush greens and spring blooms, OSR 6508 approaches Mossley in June 2016.


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when OSR called out its 1927-vintage CP snowplow to do battle with heavy snow and drifting on its Snowbelt branch lines. The faithful celebrated and looked to the day that OSR could field an A-A set of FP9s.

It took a year and a half, but that day arrived on Aug. 15, 2014, as engineer Joe Dennis notched out the throttle of recently revived FP9 1401. Assigned to the Woodstock job, OSR 1401 and 6508 pulled away from Salford with the railway's first working A-A lash-up, and the first all-cab consist to work freight in Canada in nearly a decade.

A joyful noise

It's a sound heard thousands — maybe tens of thousands — of times each day around the world: the low hum of an electric starter motor, the raucous clatter of valves and the joyful noise of a two-cycle Electro-Motive diesel roaring to life. When Craig Jolliffe turned the start switch in the engine room of 1957-vintage FP9 No. 1400 on Oct. 7, 2014, a rust-streaked 16-645C prime mover that had been dormant for a half-dozen years awakened as if it had been shut down only yesterday. The familiar EMD chant filled the dingy confines of the engine room and as Jolliffe leaned into the lay shaft and revved the 16-cylinder engine, the dwindling global population of operable F units officially increased by one.

The boys at Salford would have more work to do (including replacing fan relays, installing a rebuilt air compressor, and ultimately changing the main generator) before No. 1400 would be fully fit for duty. But on that Tuesday afternoon, the sweet sound of OSR 1400 running up to notch six was a triumphant song. A joyful noise indeed!

Paired with sister No. 1401, No. 1400 made its first revenue run on OSR a few days before Christmas 2014. Still dressed in RaiLink blue and white, but with the markings of their former owner removed, the matched cabs worked a turn to St. Thomas. The trip was a shakedown run for the 1400. The recently resuscitated cab proved itself roadworthy, but nagging concerns over the performance of the main generator remained; OSR's third F was pronounced not yet ready for prime time.

Twelve days into 2015, Salford assembled its three resident FP9s into A-A-A for-

1. The phlox are in full bloom as OSR 6508 and 1620 switch at Putnam on the way to St. Thomas on June 3, 2016. 2. No. 6508 and GP9 No. 1620 duck beneath the telltales that still guard the abandoned Canada Southern overpass on the north end of Tillsonburg. 3. Bob Merriam peels the protective layer from the OSR logo adorning the nose of newly painted No. 6508 at the Salford shop on Aug. 20, 2015. 4. Craig Jolliffe examines the innards of the 16-645C engine in OSR 1400 as he works to revive the long-dormant FP9 on Oct. 7, 2016. 5. OSR's celebrity Fs are a bigger deal for some than others. It's just another day for CJ, the Salford shop cat.

>> For more information and video footage of the OSR FP9s hauling freight and plowing snow, visit www.TrainsMag.com/Locomotives

mation and dispatched them on the Woodstock job. For the faithful, the sight and sound of a trio of Fs working tonnage in fresh-fallen snow was cause for celebration. The mood was more serious in the cab of No. 1400. Riding along to assess the locomotive's performance under load, Brad Jolliffe kept an ear tuned to the 16-645C behind the cab wall and eyes fixed on the ammeter to the right of the control stand as the train got underway from Ingersoll with eight potash empties from Putnam and 36 loaded auto racks from the General Motors Cami plant on the west side of town. Passing the east mileboard, engineer Joe Leveille notched out the throttle; the Fs dug in and the ammeter needle confirmed Jolliffe's suspicions. The 1400's lame main generator would have to go. Having the main generator rebuilt would be a heavy job and an expensive proposition, but the payoff would be a robust and reliable locomotive: time and money well spent.

Built for speed (and snow)

They were built for speed, built to look fast, and run faster. And they were built to last. In the decades before they made their way to Salford, OSR's FP9s racked up millions of miles in the passenger trade, routinely pushing the limits of their 89-mph gearing in the employ of CN and VIA. Living up to CN's "Serves all Canada" motto, they cruised across the prairies and through the Rockies with the *Super Continental*, raced up and down the Toronto-Montreal corridor with *Rapidos*, and tiptoed over the muskeg to Churchill with the *Hudson Bay.*

Those high speed running days are behind them, but their graceful styling still serves the veteran cabs well. And for more than for just looking good. The curved lines and streamlined carbodies that make them look fast even standing still also make the Fs amazingly adept in the snow. When the winter winds blow and snowdrifts pile up on the lines to Tillsonburg and St. Thomas, hood units take a hit. Snow fills step wells, and piles high on gangways blocking hood doors and cab doors, and freezes hard. The streamlined Fs just shrug it off.

"Boy, they're good on those plows," says engineer Gary Dagelman of the Fs. "They're responsive," he adds, "quick to take off ... and a nice ride; comfortable, like a Cadillac." If there's an authority on such matters, it'd be Dagelman, who's operated the Fs in plow service through two of the toughest winters in recent times. He's good at it, too. "One of the best," offers plow foreman Jack Hyde. "You don't have to worry about much when Gary's back there."

The white-hot arc of a plasma cutter slices into the rusted nose of OSR 6508 on a hot June 2015 afternoon at the Salford shop. Blistered yellow paint blackens as the cutter burns effortlessly through steel plate, sparks shoot skyward and shower to the shop floor. The wounds are wide and deep and ugly. There's a gaping hole where the nose door should be. Its hinges burned off, the door lays askew of the rails ahead of the forlorn-looking FP9. It's rarely a good thing when a 60-year-old locomotive feels the heat of a cutting torch. But rarities and exceptions to the rules are the norm in Salford.

Bob Merriam smiles as he shuts down the plasma cutter, pulls off his welding goggles and steps back to examine the long gashes he's cut into the steel skin of the 6508. It's all for a good cause. Merriam is surgically removing areas of rusted metal from the carbody and welding new steel patches in place as he performs restorative bodywork in preparation for OSR 6508's long-promised paint job.

Over summer 2015, Merriam and his assistants transformed the 6508 from an aesthetic ignominy to a showpiece in OSR's Toronto, Hamilton & Buffalo-inspired maroon-and-cream colors. The colors are corporate but the paint-scheme design Merriam's own; the finishing touches, from the professionally polished stainless steel grilles and kick plates to neatly trimmed grab irons and handrails, and replica CN Pointe St. Charles rebuild plates, indicative of the class act that is Ontario Southland.

On August 25, Merriam, Craig Jolliffe, and Chris Deleebeeck put the finishing touches on No. 6508's paint job and rolled the pristine cab out into the sun. A few days later, the improbable sight of a freshly painted FP9 working revenue freight in the 21st century became a routine occurrence as No. 6508 went back to work. Merriam, now the shop foreman at Salford, would like to repaint the two 1400s but there are higher priorities on the docket.

"What do you think?" queries Jeff Willsie as he admires the glistening FP9 sunning itself outside the Salford shop. With a mischievous twinkle in his eye, he continues, "Do you know where I can find a B unit?" Anything is possible in the cab unit capital of Canada. 1

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"The curved lines and streamlined carbodies that make them look fast even standing still also make the Fs amazingly adept in snow." Views from the cupola of 1927-vintage snowplow No. 401005 (1) and the cab of No. 1401 (2, 3) as Fs Nos. 1401 and 6508 plow westward on the St. Thomas Sub on Feb. 3, 2015. 4. Bucking heavy drifting west of Gladstone, OSR 1401 and 1400 battle their way to St. Thomas on Jan. 30, 2015. The plow has been ordered.

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Captive cowls

Two Canadian-built SD50Fs find an unlikely home in a lonely fringe of Montana

Story and photos by Tom Danneman

Mile after mile click off as you drive south on a desolate stretch of highway near the bottom edge of Montana. The only thing you notice beyond the bug-splattered windshield is a gently rolling prairie and an obedient fence line following alongside. Hardly an oncoming vehicle, much less a train on the sometimes-parallel secondary main line, breaks the monotonous yet beautiful scenery. As you close in on the state line, a pair of near-pristine red-and-yellow locomotives appears as if a mirage. These aren't just any locomotives, they're beastly cowl-bodied Canadian survivors: former Canadian National SD50Fs Nos. 5404 and 5438. How did such rarities come to be stationed in a once-small Treasure State agricultural town that now holds a population of two hardy souls?

In 2010, Montana Limestone Co., a subsidiary of Dakota Coal Co., built a new loadout facility near Warren. The modern facility, located alongside BNSF Railway's lonely Casper Subdivision, 50 miles south of Laurel, Mont., serves MLC's quarry operation 6 miles northeast of Warren. The facility includes a dump site for 100-ton belly dump trucks to deliver limestone from the quarry, which is conveyed to storage bins and then transferred to railcars. The company operates its private railroad, which includes two spurs totaling 18,000 feet of track, independently from BNSF. Employees qualified to operate Montana Limestone locomotives are not allowed to operate on BNSF trackage.

MLC also provides limestone feedstock for the lime kiln of Wyoming Lime Producers, a division of Dakota Coal, in nearby Frannie, Wyo. MLC's

Montana Limestone's pair of SD50Fs brings BNSF hoppers under the loader at Warren, Mont.

1. Jim Beard operates the SD50Fs remotely, even inside the cab. 2. No. 5404 shows off its four-window cab with CN-style class lights and bell above the windshields. 3. The facility features two loading chutes. The one shown is used for loading unit trains bound for Stanton, N.D. 4. SD50F No. 5438 pauses under the loadout. The remote system can be seen mounted above the pilot.

biggest customer is its parent company, Basin Electric Power Cooperative. Basin Electric generates and transmits power to customers in nine states, and uses the lime and limestone to remove sulfur dioxide from stack emissions at its coal-fired power plants and water-treatment facilities. MLC also provides limestone for industrial and mining applications, including customers using it as a base material for road construction and an environmental control additive in the Bakken oil field. Montana Limestone also ships sugar rock, limestone rock used in sugar-beet processing. A winch system drags BNSF hoppers through the loading area. These cars are destined for sugar refineries in Sidney, Mont., and Taber, Alberta.

The two SD50Fs switch and spot unit trains headed to Leland Olds Station power plant near Stanton, N.D. That's where the beefy cowls show their might. The trains are long and heavy (about 100 tons of limestone per hopper car), and the rail line is on a steep 1.5-percent grade. BNSF requirements dictated that MLC purchase heavy-duty, high-horsepower, six-axle locomotives when loading and prepping the unit trains. The former Canadian National SD50Fs fit the bill. In 2009, Dakota, Missouri Valley & Western, which also provides rail service to Basin Electric facilities, acquired eight CN SD50Fs, and inspected, rehabilitated, and painted two for MLC. That pair and four DMV&W units are the sole operating survivors of CN's original fleet of 60 SD50Fs. Montana Limestone's are the only ones employed exclusively for switching.

"The BNSF guys are always teasing me about my covered wagons," says Mike Jones, MLC's plant superintendent, "but in Montana where it can be 20 below, it's nice to be able to work on the locomotive from the inside."

Perched in a loading booth, an MLC employee operates the conveyor belts, truck dumps, and the remote-controlled SD50Fs, equipped with Control Chief systems. The unit trains, which usually run about 10 times per year between June and August, consist of 95 or 96 Basin Electric-owned hopper cars for delivery to the Leland Olds Station power plant. BNSF delivers the empties to Montana Limestone and returns for the loads. The round trip to Leland takes about four days.

The SD50Fs have their federally mandated inspections once a year. A DMV&W elec-


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trician and two mechanics make the annual trip to perform the inspection, and make any needed repairs. "With our short track here, we never really get them warmed up, but we've had absolutely no issues with them," Jones says. Since the unit trains run only during the summer and fall, the locomotives sit idle for long periods. The SD50Fs are started and inspected at least once a month during those down periods to keep the batteries charged and ensure the locomotives are ready to go the next season.

Most of what was once the tiny Montana town called Warren has disappeared like dust in the prairie winds. This one-time Chicago, Burlington & Quincy shipping point for Big Horn Calcium Co., whose limestone quarry in the nearby Pryor Mountains supplied many western sugar refineries, is now more than a nearly unpopulated dot on a map. After all, two of the world's last six SD50Fs live here.

A locomotive alphabet

Story and photos by A. Ross Harrison

Canadian Pacific FP9 4107 (top) shows off the lines of "the most famous face in dieseldom," at dusk in Winnipeg, Manitoba. One of 25 full-carbody CP SD40-2Fs, CP 9024 (above) was the last of the Fs. Until now.

The year 2016 marks the debut of the Electro-Motive F125 and the return of a distinguished model designation to the EMD catalog. To honor the return, this locomotive alphabet is brought to you by the letter "F."

"F" was initially 5,400 hp in four FT A and B units. Now "F" is for full-width carbody. "F" is forward-looking, futuristic, iconic — the most famous nose in dieseldom? "F" was for four-axle units, the first EMC FT demonstrator 103. The last "F" was Canadian Pacific's six-axle SD40-2F 9024. "F" is for freight, passenger, or both. "F" is for A and B units; could the very definition of symmetry be a trio of A-B-A F units? "F" is 21 different models: FT, F2, F3, F5, F7, FP7, F9, FP9, FL9, F40C, FP45, F45, SDP40F, F40PH, F40PHM-2, F59PH, F59PHI, SD50F, SD60F, SD40-2F, and now F125. The heartbeat of an "F" has been the 567, 645, 710, and now Caterpillar prime movers. "F" is for fleets of cab units that flowed from La Grange and London, extinguishing the fires of thousands of steam locomotives and ensuring a dominant future for General Motors locomotives for nearly 50 years.

"F" is the perfect fusion of form and function. "F" is for fast. "F" is forever. I