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Annual 2018

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Wild Wyoming on video
Join Tom Danneman on a video adventure tracking down elusive BNSF motive power in the Bighorn Basin.

On the cover
EMD GP60 demonstrator No. 5, Riverdale, Ill., Sept. 19, 1987.
See page 52. Greg McDonnell

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Trains SPECIAL

Kalmbach Media

"Power of Tomorrow, Today," EMD SD60 demonstrator No. 3, Oro Grande, Calif. See page 52. Greg McDonnell

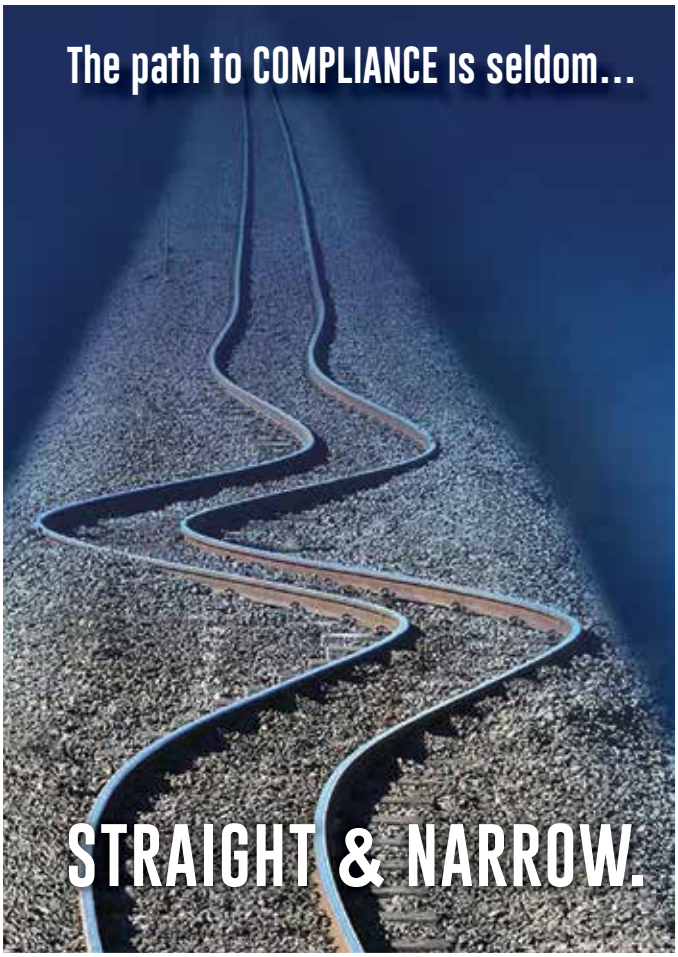
The face of railroading

I'm dating myself, but I recall an age when the annual release of the new-model-year cars (the automotive sort, that is) was one of the most anticipated autumn events. Right up there with the World Series, the fall fair, and the chestnut harvest. The showroom windows of local car dealers were papered over in advance of the official unveiling of the new models; the first arrivals were shrouded for delivery. The excitement was palpable. We'd watch the streets as the new models made their debut, wowed by the ever-wilder tail fins of the Cadillac Coupe de Ville, the distinctive grille of the restyled 1961 Pontiac Bonneville, my uncle's pale-yellow 1963 Mercury Comet convertible, the mid-season mania generated by the first Ford Mustangs in spring 1964.

Railroading had its own version of new-model mania — albeit minus the papered-over showroom windows, shrouded deliveries, and well, for the most part, the mania — when the locomotive builders introduced new diesel models once or twice a decade. In comparison to the splashy new-car television commercials and full-spread ads in the likes of Life magazine, the debut of new locomotive models was a low-key affair. But in the railroad world, new models were a big deal. The news was trumpeted in the trade press and in the pages of TRAINS magazine's editorials, news photos, the "Annual Motive Power Survey," and "Locomotive Showroom" features. Electro-Motive ran eye-popping ads, featuring the near-psychedelic artwork of Tom Fawell. General Electric had the artwork of John Gould.

And then, there were the demonstrators (see page 52). From the dawn of dieseldom, locomotive builders have fielded prototype and demonstrator locomotives to test and solicit sales of new models. They've come in all shapes, sizes, and colors, from dark and mysterious (like Alco's pre-FA "Black Maria" A-B-A) to the dazzling gold-and-black Alco C628 demonstrators, to the iconic blue-and-white worn by generations of barnstorming EMD GP and SD demos. More often than not, they've heralded the changing face of railroading.

Just as auto aficionados bemoan the demise of the art of automotive styling and the sameness of current models, there are certain locomotive watchers who hold similar sentiment. It's nothing new. Advent of the hood unit doomed styling of locomotive carbodies for art's sake more than 70 years ago and you can thank — or blame — Canadian National for the boxy, wide-nose comfort cab that has been the industry standard for nearly three decades. The styling of today's locomotives takes function over form to the extreme.



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In fact, if an industrial stylist was looking to capture the character of the latest generation of GEs and EMDs, I doubt that a more fitting design could be found than the brutish, all-business look of today's Evolutions and ACes. Don't take my word for it. Get yourself to Tehachapi, or Cajon, or the Allegheny grades on Norfolk Southern's multi-tracked mains of the former Pennsylvania Railroad Middle Division, or anywhere these rugged machines get to really strut their stuff. Set up along Cajon Boulevard in Verdemont, Calif., and watch a mix of EVOs and ACes take a run at the hill with an eastbound manifest, or roll down the window and cruise along Broadway on Buffalo's east side pacing a brace of CSX ES44ACs accelerating an eastbound intermodal out of town. You'll see what I mean.

Serving as a counterbalance, there's the resurgence of streamlining in the sleek European styling of the Siemens Charger and the EMD F125. As I type this, engineers and designers in the employ of the builders are almost certainly crafting a new and presumably graceful look for Amtrak's next-generation passenger locomotive.

Leave it to David Styffe, who knows a thing or two about style, design, culture, and history, to capture in a single frame the essence of contemporary railroading and the current locomotive scene. It's all there in his photograph of Metrolink F125 907 zooming San Bernardino-bound train 304 past BNSF ET44C4 3752 and the Kaiser Hauler in Fontana, Calif. "This is the face of railroading in 2018," Styffe says, "and I'm fine with it." I'm with Styffe on this one.

The face of contemporary railroading: Metrolink F125 907 zooms train 304 past BNSF Railway ET44C4 3752 and the Kaiser Hauler at CP Beech in Fontana, Calif., on July 13, 2018. David Styffe

Greg McDonnell, editor

Big noise from La Grange

The sound that ruled railroading ■ by Kevin P. Keefe

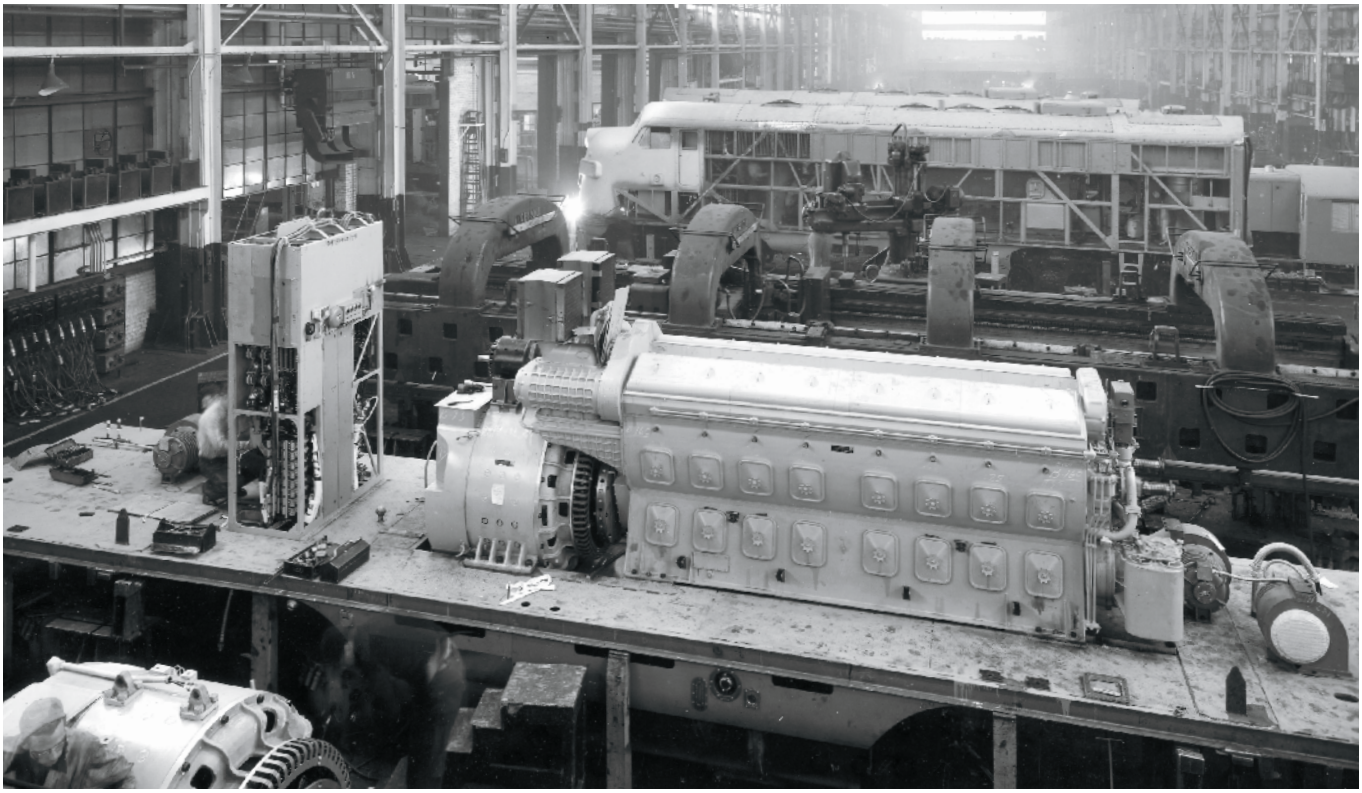
The sound of engines is a kind of industrial music, evoking time and place. Ask anyone who witnessed the scream of an Offenhauser flashing past the pits at Indianapolis. Or felt the thrum of Pratt & Whitney radials over wartime East Anglia. Or, better yet, thrilled to the chant of a brand-new 567 prime mover — just off the assembly line — spooling up for the first time and sending a plume of blue exhaust over Electro-Motive Division's fabled factory on the southwest suburban side of Chicago. A place known simply as La Grange.

There's a news story still hanging out there that, if it comes to pass, would bring an end to this wonderful association. Caterpillar's Progress Rail division, successor to EMD, is contemplating moving engine production from La Grange to its manufacturing facility in North Carolina. Thus would end a tradition that stretches back more than 80 years, a tradition of engineering craftsmanship that made "La Grange" and "diesel-electric locomotive" synonymous.

That spirit is captured in the accompanying photo, taken by EMD's company photographer, probably in the early 1950s, judging from the pieces of F units and Geeps coming together on the floor of Assembly Plant 1. At center stage is a brand-new 567 bolted to the frame of a soon-to-be locomotive.

What a magnificent presence it is, that engine. It was figuratively and literally the heart of EMD's success, more important than all the streamlining, hoods, turbocharging, exhaust systems, and electricals the builder brought to the table. With its 16 two-stroke cylinders (8½-inch bore, 10-inch stroke) arranged in a novel-for-the-era 45-degree vee, the 567 was powerful, durable, unshakable. And the sound that poured out from inside — a deep and authoritative but somehow audibly contained roar — suggested a precision absent in the wheezing power plants of EMD's competitors. It was built to last: Later iterations in the 645 and 710 series would rule railroading for three generations.

The recent past has not been kind to EMD, which Caterpillar acquired in 2010 from an equity group that stepped up when General Motors decided locomotives were a distraction. The longtime market leader was eclipsed long ago by General Electric, even as locomotive assembly moved out of La Grange, first to GM of Canada in London, Ont., then to Progress Rail's current assembly plant in Muncie, Ind. But throughout all this turmoil, a constant has been the sustained engine production by the dedicated employees at La Grange. That heritage might not mean much to the Caterpillar accountants who might choose North Carolina. But I dare them to stand trackside, hear the big noise from La Grange, and decide otherwise. ▮



Bolted to the frame of a soon-to-be locomotive, a brand-new 16-cylinder Electro-Motive 567 is at center stage as Geeps and Fs come together on the floor of Assembly Plant 1 in the early 1950s. Electro-Motive

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William Beecher Jr.

A year of disruptive decisions and recasting traditional roles

by Chris Guss

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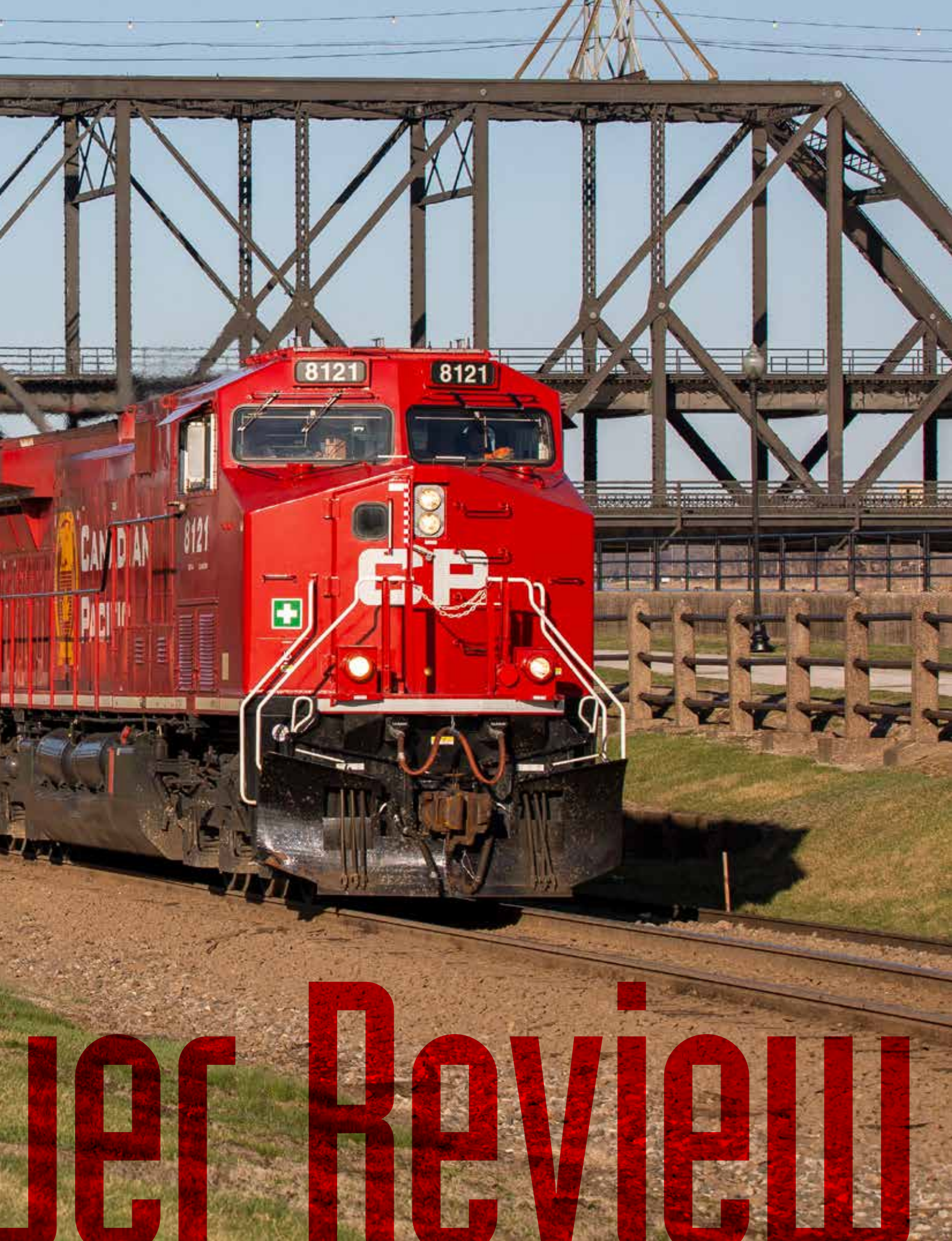


Jet Review

Union Pacific SD70ACe-T4 No. 3037 and BNSF ES44C4 No. 6653 lead Norfolk Southern train 217 over the Ohio River bridge at Kenova, W.V., on May 25, 2018. Brandon Townley

The locomotive industry and the railroads' own fleets are certainly in strange times. Manufacturers continue to fill up production space — once allocated for new-build locomotives — with rebuilds and modernizations, while railroads attempt to right-size their fleets, many in opposite directions of each other. Some railroads, like Canadian National and Norfolk Southern, can't seem to find enough locomotives while others, such as CSX, purge locomotives by the hundreds.

In early 2018, both Progress Rail and General Electric were in the remarkable position of having near-equal quantities of orders for new and rebuilt locomotives on the books: Progress with slightly less than 75 of each, General Electric with more than 200 of each.

Canadian National and Norfolk Southern have been leasing hundreds of locomotives. CN, with an already large contingent of leased locomotives from GECX and Progress is sourcing more. BNSF recently joined the ranks along with Union Pacific, having reactivated fleets of long-stored locomotives. Canadian Pacific has been returning stored locomotives to service as traffic levels warrant, and has embarked on rebuild programs for older GE and EMD A.C. traction models. Kansas City Southern has signed up for 50 new GEs. CSX, meanwhile, has been doing just the opposite with more than 300 units purged in the last year.

Icons fall

As the market contracts, so too does manufacturing space. Progress Rail ended production of new locomotives at Bombardier in Sahagun, Mexico, last year, while GE announced in July 2017 that it would shift all locomotive manufacturing and rebuilding to its Fort Worth, Texas, plant. For the moment, GE continues to build export locomotives and production and rebuild prototypes at Erie. GE made another strategic move in 2017, announcing the acquisition of a 50-percent stake in Kazakhstan locomotive manufacturer Lokomotiv Kurastyru Zauyty from national railway KTZ. LKZ is the manufacturing base for the 1,520 mm gauge Evolution locomotives ordered by railroads in the region.

All of this pales in the wake of GE's November 2017

announcement that it was putting its transportation division up for sale. This was part of a larger realignment by the company to shed multiple divisions in an attempt to focus on higher performing ones such as aviation and health care. On May 21, 2018, GE announced an $11.1 billion merger deal between Wabtec and GE Transportation. Under terms of the deal, expected to close in early 2019, GE and its shareholders would hold a 50.1-percent stake in the new company.

In April 2018, Progress announced the closure of its legacy EMD engine plant at La Grange, Ill. Engine manufacturing will shift to a Progress facility in Winston-Salem, N.C., with some work done by outside suppliers. This will affect 600 full-time employees, further shrinking the footprint

One of a dozen pre-production ET44AC demonstrators CN purchased, GECX 2038 leads new CN ET44AC No. 3114 on intermodal train Q116 cresting Byron Hill, south of Fond du Lac, Wis., in March 2018.
William Beecher Jr.

2017 NEW LOCOMOTIVE CONSTRUCTION

GE: 278, Progress EMD: 89, Siemens: 48, PYSC: 4, NREC: 2, MPI: 1

Railroad	Qty.	Road No.	Builder	Type	Order/serial	Build date	Notes
All Aboard Florida (Brightline)	8 (21)	103-110	Siemens	SC-44	unknown	02/17* – 09/17*	1
BNSF	39	3725-3763	GE	ET44C4	64569-64607	03/17* – 06/17*	2
BNSF	34 (39)	4205-4224, 5533-5546	GE	ES44C4 (T4C)	64501-64534	01/17* – 02/17*	2
Botswana Railways (Botswana)	8	BD544-BD551	EMD	GT42AC	20138952-001 to -008	07/17* – 08/17*	4
CalTrans (CDTX)	4 (22)	2103-2106	Siemens	SC-44	Order 02148671	01/17* – 02/17*	1
CamRail (Cameroon)	9	CC3301-CC3309	GE	C30ACMi	64704-64712	12/17	3
CN	22	2984-2999, 3800-3805	GE	ES44AC (T4C)	64635-64656	08/17* – 10/17*	2
Cerrejon (Colombia)	2	1023, 1024	GE	ES44AC	64624, 64625	10/17	3
GO Transit	1 (16)	667	MPI	MP40PHTT4AC	2573.01	11/17	7
Illinois DOT (IDTX)	24 (33)	4612-4625	Siemens	SC-44	Order 02148671	05/17* – 08/17*	1
INCFA (Angola)	64 (100)	1816-1879	GE	C30ACi	64155-64218	03/17 – 08/17	3,9
Indian Railways (India)	2 (700)	49001, 49002	GE	ES43ACmi	64664, 64665	08/17	3,10
MARC	3 (8)	80-82	Siemens	SC-44	unknown	11/17*	1
Metrolink (SCAX)	21 (40)	911-931	EMD	F125	20126849-009 to -029	02/17* – 12/17*	4
Norfolk Southern	34	3647-3680	GE	ET44AC	64535-64568	02/17	2
Norfolk Southern	16	8169-8184	GE	ES44AC (T4C)	64608-64623	03/17 – 05/17	2
Pakistan Railways (Pakistan)	40 (55)	9016-9055	GE	ES43ACi	64456-64495	01/17– 04/17*	3
PeruRail (Peru)	4 (8)	532-535	PYSC	LSL1400	unknown	2017	6,11
PeruRail (Peru)	1	815	EMD	GT42AC	20158284-001	12/17*	4
Rio Tinto (Australia)	9	9120-9128	GE	ES44ACi	64626-64634	07/17, 10/17*	3
Savage (SVGX)	2	006, 007	NREC	3GS21B	unknown	09/17*	8, 12
SEPTA	1 (13)	901	Siemens	ACS-64	unknown	11/17*	1
UP	24 (88)	3037-3056, 3058-3061	EMD	SD70ACe-T4	20146140-026 to -045,-047 to -061	01/17 – 06/17*	4,5,13
UP	35 (100)	9062-9096	EMD	SD70ACe (T4C)	20146115-066 to -100	05/17 – 06/17*	4
Vale (Brazil)	7	273-279	GE	ES58ACi	64657-64663	10/17 – 11/17	3
Washington State DOT	8	1400-1407	Siemens	SC-44	Order 02148671	03/17* – 05/17*	1

- Rows in italics are updates to year 2016 production
- Numbers in parenthesis in "Qty." column are total number of units in that order if different from the quantity delivered in 2016 or represent size of a multi-year order
* Estimated build date, unconfirmed by publication deadline

Notes: 1. Built by Siemens, Sacramento, Calif. **2.** Built by GE Fort Worth, Texas. **3.** Built by GE Erie, Pa. **4.** Built by Progress Rail, Muncie, Ind. **5.** Built by Bombardier, Sahagun, Mexico. **6.** Built by Productos y Servicios del Centro (PYSC) San Luis Potosi, Mexico. **7.** Built by MotivePower Industries, Boise, Idaho. **8.** Built by NREC, Mount Vernon, Ill. **9.** INCFA is Instituto Nacional Dos Caminhos de Ferro Angola. Multi-year order to be delivered over three years. **10.** Indian Railways designation is WDG4G. Multi-year order for 700 units with the first 50 built at GE Erie and the rest at a new GE factory in India. **11.** Multi-year order through 2018. **12.** Exports for Saudi Arabia, to operate at Saudi Aramco Wasit and Berri oil/gas plants. **13.** UP 3037-3056 built by Bombardier, Sahagun, Mexico, 3058-3061 built by Progress Rail, Muncie, Ind.

Rebuilds and revivals are on the rise. Renumbered and freshly rebuilt BNSF SD75Is 282 and 290 pause at the yard in Hodgkins, Ill., on April 7, 2018. Marshall W. Beecher

of activities left at the iconic facility that in its heyday produced thousands of EMD locomotives a year.

Even rebuilders are downsizing. National Railway Equipment announced in May 2018 that it would be shuttering its Paducah, Ky., facility until the capacity is needed. NRE's other shops, including those at Dixmoor, Mount Vernon, and Silvis, Ill., remain in operation.

New orders on the upswing

GE has secured the lion's share of new orders, with CN in for 200 units and KCS in for 50. The CN order is one of the largest in the road's history. Progress Rail will add to its list of EMD SD70ACe-T4 customers this year, with CSX and BNSF each scheduled to receive 10 locomotives later in 2018. The BNSF order is for four-motor B1-1B SD70ACeP4-T4s. Union Pacific has ordered 10

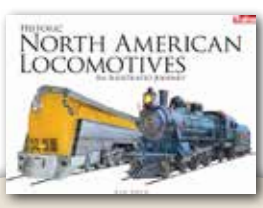
2017 LOCOMOTIVE REBUILDS

Railroad	Qty.	Road No.	Builder	Type	Order/serial	Build date	Notes
ADM (ADMX)	1	139	KLW	SE10B	30028/4475-10	07/17*	A
BNSF	13	2516-2527, 2529	Relco	GP39-3	various	01/17 – 09/17	B
Boke Trading	3	NREX 115-117	NREC	SD40-3	various	2017	C
CP	30	8100-8129	GE	AC4400CWM	various	11/17	D
ConAgra (CAGX)	1	408	RS	LEAF	unknown	11/17*	E
CMQ	2	3816, 3817	AMP	GP38-3	28706, 30067	02/17	F
CSXT	1	2063	EMD	GP38-3	777125-17	02/17	G
CSXT	5	6558-6562	EMD	GP40-3	various	01/17 – 03/17	H
Ferromex	1	2010	FXE	GP38M-2	30716	2017	I
IHB	2	1506, 1508	Railpower	MP1500-B2DF	31720, 33078	2017	J
KCS	*3 (6)*	*2038, 2845, 2853*	*KCS*	*GP32ECO*	*various*	*2016*	K
Locomotive Solutions (LSOX)	4 (5)	1002-1005	KLW	SE10B	15001-15003	02/17* – 08/17*	A
Locomotive Solutions (LSOX)	4	1501-1503,1505	KLW	SE15B	15004-15007	02/17* – 06/17*	A
NC DOT (RNCX)	4	101-104	NS	CCU	various	02/17 – 11/17	L
NS	3	893-895	NS	RPU6D	various	04/17, 12/17	M
NS	2	1800, 1801	EMD	SD70ACC	936433-6, -17	12/17	N
NS	25	4018-4042	GE	AC44C6M	various	04/17 – 07/17	O
NS	32	4043-4074	GE	AC44C6M	various	02/17 – 11/17	P
NS	4	6215-6218	NS	SD33ECO	various	08/17 – 12/17	Q
NS	4	7032-7035	NS	SD60E	various	05/17 – 07/17	R
NS	40	Various (see note)	EMD	SD70ACU	various	01/17 – 12/17	S
Richmond Pacific RR (RPRC)	2	2016, 2017	KLW	SE15B	unknown	10/17*	A
SEPTA	1	80	KLW	SE15B	18566/5288-13	05/17*	A
SunRail (CFR)	1	110	MPI	MP32PH-Q	MARC GP40WH-2 66	11/17	T
UP	41	Various (see note)	MEI	PS6B	various	02/17 – 12/17	U
Western Milling (KLWX)	3	1501, 1502, 1935	KLW	SE15B	unknown	11/17*	A
Western Rail (WRIX)	1	3514	EMD	GP38-3	29017	09/17*	V
Western Rail (WRIX)	1	35020	EMD	GP40-3	35922	08/17*	W

Notes: A. Conversions by Knoxville Locomotive Works in Knoxville, Tenn. SE10B powered by 1,050-hp MTU Series 2000 12V Tier 4i (non-road standards) engine. SE15B powered by 1,560-hp MTU Series 2000 16V Tier 4i connected to an AR10 alternator by a ZF Friedrichshafen AG 2:1 reduction gearbox, and adds a TMV Control Systems control system. Known cores are ADMX 139 from ADMX SW1200 139, LSOX 1005 from FCEN CF7 63, LSOX 1505 from Jesse Branch Coal GP9 6010, SEPTA 80 from SFS GP7u 92. **B.** Electrical upgrade program completed by Relco at Albia, Iowa. Previously upgraded GP30s converted to GP39-3 by derating engine and adding microprocessor. Cores are LTEX 2429, 2447, 2403, 2431, 2462, 2471, 2406, 2419, 2453, 2461, 2477, 2417, 2424 (all former BNSF). **C.** Former SD40s converted to SD40-3, numbered NREX 115-117 for movement from NRE to port. Boke numbers are unknown. **D.** Ongoing program by GE Fort Worth, Texas, and Erie, Pa., converting AC4400CWs into AC4400CWMs by updating the control system software equivalent to current generation of Evolution Series software, and installing new operator, auxiliary, and blower cabs. Sources (in order) were CP 9669, 9672, 9645, 9608, 9636, 9678, 9586, 9659, 9587, 9665, 9670, 9674, 9679, 9590, 9596, 9602, 9606, 9612, 9613, 9616, 9621, 9666, 9628, 9631, 9632, 9641, 9642, 9660, 9676, 9682. **E.** A variety of four-axle locomotive types are converted by Railserve at Longview, Texas, to single- and dual-engine LEAF gensets powered by Cummins QSX15-L3 600-hp engines. An unknown number of conversions were completed in 2017. **F.** Completed by American Motive Power Dansville, N.Y. Previously rebuilt GP35s upgraded to GP38-3 by removing the turbocharger and adding a microprocessor. Locomotives are LTEX 2509, 2553, both are former BNSF/ATSF. **G.** Rebuild completed by CSX Huntington, W.V. CSXT GP38-2 2775 rebuilt to GP38-3 by adding a new cab and microprocessor. **H.** Completed by CSX at Huntington, W.V. GP40-2s rebuilt to GP40-3 by adding a new cab and microprocessor. From CSXT 4402, 6006, 6128, 6028, 6016. **I.** Ferromex GP35 converted to GP38M-2 by removing the turbocharger and adding upgraded electronics. Core unit built as NdeM 8233. **J.** Railpower program at American Motive Power in Dansville, N.Y., to convert SW1500s using two dual fuel 750-hp CAT C18 engines, 11 large (26-by-100-inch) lightweight Type IV CNG fuel cylinders by Hexagon Lincoln in assemblies by Mainstay Fuel Technologies (Greer, S.C.), working under contract to Beaufort, S.C.-based Optifuel Systems. Units retain their original road numbers. **K.** Kansas City Southern GP38-2s rebuilt to GP32ECOs, 16-645E prime mover replaced by 12-710G3-T0+ with improved cooling system. **L.** Program by NS Juniata Shop, Altoona, Pa. Former GO Transit F59PH locomotives converted to Cab Control Cars by removing locomotive components but retaining cab controls and braking functions. From RNCX 18536, 18541, 18542, 18546. **M.** Program by NS Juniata Shop, Altoona, Pa. Retired SD40-2 frames (serials 796311-7, 776133-3, and 73638-9) used to construct slugs with electronic air brakes. Operate with NS EMD SD40-2 master units 6177-6206 and 6210-series SD33ECO master units. Cores are UP 7897, 3455, NS 1633. **N.** Ongoing program by Progress Rail, Muncie, Ind. EMD SD70s converted to SD70ACCs by replacing the spartan cab and low short hood with a safety cab, new electrical cabinet, and new electrical system and controls. D.C. traction motors replaced with and A.C. motors. From NS 2537, 2548. **O.** Ongoing DC2AC program at GE Fort Worth, Texas. Dash 9-40Cs converted to AC44C6M by replacing D.C. traction motors with A.C. motors and inverters, along with updated control system software equivalent to current generation of Evolution Series software. Original spartan cab replaced with new Evolution Series safety cab. Sources in order: NS 8788, 8811, 8818, 8823, 8834, 8847, 8850, 8863, 8875, 8877, 8884, 8842, 8837, 8787, 8776, 8876, 8870, 8825, 8768, 8792, 8819, 8810, 8774, 8778, 8769. **P.** DC2AC program by NS Roanoke, Va., and Juniata Shop, Altoona, Pa. Dash 9-40Cs converted to AC44C6M by replacing D.C. traction motors with A.C. motors and inverters, along with updated control system software equivalent to current generation of Evolution Series software. Original spartan cab replaced with new Evolution Series safety cab. Sources in order: Roanoke: NS 8805, 8851, 8858, 8783, 8781, 8868, 8796, 8784, 8777, 8827; Juniata NS 8881, 8775, 8859, 8888, 8791, 8800, 8841, 8828, 8865, 8771, 8821, 8767, 8785, 8793, 8807, 8832, 8854, 8780, 8824, 8848, 8840, 8764. **Q.** Program at NS Juniata Shop, Altoona, Pa. SD40s and SD40-2s rebuilt to SD33ECO with Tier 3 12N-710G3B-T3 ECO prime mover, electronic air brakes and EM2000 microprocessor. Work includes new crashworthy Admiral cab. All are equipped to operate with RPU6D slugs. From NS 3431, 3435, 3417, 3441. **R.** Program at NS Juniata Shop, Altoona, Pa. SD60s rebuilt to SD60E by upgrading the engine to a Tier 2 16-710G3B-IC with EFI (4,000 hp), adding electronic air brakes an EM2000 microprocessor and a new Crescent safety cab. From NS 6514, 6686, 6624, 6612. **S.** SD90MAC upgrade program at Juniata Shop, Altoona, Pa., and Progress Rail, Muncie, Ind. Original Siemens electronics and inverters replaced with Mitsubishi equipment and controls. Original cab replaced with new SD70ACe-style cab. Electronic air brakes added. Units converted at Juniata: NS 7231-7233, 7237, 7238, 7240, 7241, 7247, 7257, 7260, 7275, 7280, 7281, 7284, 7287, 7289, 7291, 7295, 7300-7304, 7306-7308, 7310-7313, 7315, 7317, 7318, 7321-7323, 7325, 7328. Progress Rail, Muncie: 7272, 7278. **T.** GP40WH-2s rebuilt by MotivePower Industries in Boise, Idaho, to MP32PH-Q; 16-645E3C engine upgraded to Tier 0+ and adding QES-III electronics. Original cab and nose replaced with a streamlined safety cab. **U.** Program completed by Metro East Industries, East St. Louis, Ill. SD38-2s converted to yard slugs. Units converted but not yet renumbered into the UPY 400-series are UPY 801, 802, 803, 804, 805, 806, 810, 822, 823, 828, 840, 841, 844, 854, 866, 867. Units converted and numbered into the UPY 400-series are UPY 403 (ex-UPY 3010), 405 (842), 407 (800), 408 (839), 409 (863), 410 (846), 411 (858), 412 (835), 413 (821), 414 (819), 415 (818), 416 (820), 417 (825), 418 (827), 419 (829), 420 (824), 421 (836), 422 (834), 423 (860), 424 (845), 425 (843), 426 (862), 428 (865), 429 (817), 431 (849). **V.** Upgraded with N-Force control system and deturboed engine by Western Rail in Usk, Wash. Core built as PRR GP35 2268. **W.** Upgraded with N-Force control system. Core built as SCL GP40 1671.

First of a 16-unit order with MotivePower, GO Transit MP40PHT-T4ACs 668 and 667 await setup at GO's Willowbrook shop in Toronto. Paul Cordingley

With the Chicago skyline as a backdrop, Siemens SC-44 Charger No. 4613 leads Amtrak train No. 390, the Carbondale, Ill.-Chicago *Saluki*, over the Windy City's St. Charles Air Line on a clear March 18, 2018.
Marshall W. Beecher



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This new book traces the history of North American locomotives from the 1800s to now. Available at KalmbachHobbyStore.com

EMD24Bs, GP22T4s in UP parlance. This is the breakout order for the 2,000-hp powered-by-Caterpillar 3512C HD engine with a Zeit SAL V control system and Kato alternator.

Destined for service in California (including the Bay Area and Sacramento), the UP units will hold the distinction of being the first new Class I railroad freight locomotives with Selective Catalytic Reduction (SCR) catalysts as part of their Tier 4-emission equipment. SCR, which uses urea, has generally been found so far on passenger locomotives and other non-Class I railroads. To date, the Class I railroads have insisted that Tier 4 freight locomotives are designed without it, citing the additional cost of the material, ground storage, and pumping facilities to accommodate it.

Undisclosed issues have delayed activation of many of the Progress Rail F125s delivered to Metrolink in California, but a milestone was reached in March when F125 No. 907 became the first to work solo on a revenue train. The 40-unit Metrolink deal is Progress Rail's only F125 order to date.

An MP40PHT-T4AC, one of 16 built for GO Transit, emerged from Motive Power's Boise, Idaho, shop in late 2017. Twin Cummins QSK60 engines power the 5,400-hp A.C. traction locomotives, providing 4,000 hp for traction and the balance for head-end power and locomotive auxiliary systems. GO 667 was sent to the Transportation Technology Center near Pueblo, Colo., for testing. Deliveries began with Nos. 668 and 669 arriving in Toronto in spring 2018 for setup and testing.

Rebuilding on the rise

As both builders solicit customers for new and rebuild business, a few new programs have emerged. Norfolk Southern sent two standard cab SD70s to Progress Rail for conversion to A.C. traction. Redesignated SD70ACC, the locomotives were converted to A.C. traction. Control systems were updated and a shortened SD70ACe-type cab was installed due to the SD70s frame being almost 2 feet shorter than an SD70ACe. NS Nos. 1800 and 1801 were completed in the spring and were moved to the Transportation Technology Center for testing in April.

In addition to its successful DC2AC program, embraced by

Indian Railways ES43ACmi at GE Erie. Greg McDonnell

Overhead view of GO Transit MP40PHT-T4AC 668 hints at complexity. Paul Cordingley

Odd fellows. Leased to CN, CITX 142 (former EMD SD70M-2 demonstrator GM76) leads an NS ET44AC and ES44AC, one in Lehigh Valley heritage paint, at Fond du Lac, Wis., on April 17, 2018. William Beecher Jr.

NS to the tune of several hundred locomotives and counting, GE has begun performing overhauls and upgrades on older A.C. traction models (see pages 22-29). Canadian Pacific has contracted GE to upgrade more than 100 AC4400CWs to AC4400CWMs, while UP has signed on for upgrades on 20 AC6000CW convertibles (C6044ACs in UP parlance). CP 8000 and 8100, prototypes for the two CP classes involved were completed at Erie, the rest by GE at Fort Worth. The first five UPs, including prototype 7342, are done at Erie, while Fort Worth is expected to complete the balance of the order.

Canadian Pacific's long-stored SD9043MACs are getting a life-extending rebuild as well. Progress Rail will upgrade at least 30 CP 9100s to essentially SD70ACe standards. Major work will include a new control system, replacing the old Siemens inverters with Mitsubishi inverters and replacing the cab. The locomotives, which will receive new 7000-series road numbers, will also have the traction system changed from one inverter per truck to individual-axle control, which has six inverters, one per axle.

2017 recap

General Electric produced both credit and Tier 4 locomotives in 2017. BNSF Railway took delivery of 39 ET44C4s and 34 credit ES44C4s, Canadian National purchased 22 credit ES44ACs while Norfolk Southern acquired 34 ET44ACs and 16 credit ES44ACs. On the export side, CamRail in Cameroon acquired nine C30ACis, Cerrejon in Columbia received two ES44ACs, and INCFA in Angola acquired 55 C30ACis. Indian Railways received two of a planned 700 ES43ACmis, the majority of which will be built in India. Pakistan Railways received 40 units of a 55-unit ES43ACi order, while Vale in Brazil received seven ES58ACis.

Progress Rail's 2017 orders included 21 F125s for Metrolink along with 24 SD70ACe-T4s and 35 credit SD70ACe-T4Cs for Union Pacific. The company also produced two export orders: eight GT42ACs for Botswana Railways and a single GT42AC for PeruRail.

Productos y Servicios del Centro (PYSC) continued delivery of its eight-unit order for LSL1400s to PeruRail. The San Luis Potosí, Mexico, builder delivered the first unit of this order in 2016.

Siemens continues to produce both diesel SC-44 Charger and electric ACS-64 locomotives. The SC-44 has been placed in service on many corridors across the United States, with all initial customers having received some or all of their locomotives as of early 2018. In May 2017, Caltrans became the first customer to place an SC-44 in revenue service. All Aboard Florida is calling their locomotives SCB-40, although Siemens still classifies them as SC-44. They are rated at 4,000 hp instead of the cataloged 4,400-hp rating of the SC-44.

In 2017, Siemens delivered eight SCB-40s to All Aboard Florida and SC-44s for the following customers: Caltrans (4), Illinois Department of Transportation (24), MARC (3), and Washington State Department of Transportation (8). Siemens also built a single ACS-64 electric from a 13-unit order for SEPTA in 2017.

National Railway Equipment had a single order for two 3GS21Bs for Savage, while MotivePower Inc. built the first of 16 MP40PHT-T4ACs for GO Transit in Toronto.

It's been a trend-setting year of historic closures, disruptive business decisions, and redefined roles, 2018 is on track to be no less interesting. L

Leased to Norfolk Southern by Progress Rail, but still in Burlington Northern colors, former BNSF SD70MAC 9559 leads NS intermodal train 29G at Shawsville Va., in April 2018. Samuel Phillips

THE BIG SIX FLEETS BY THE NUMBERS: ALL 28,148 LOCOMOTIVES

Type/totals	Model	Total	BNSF	CN	CP
GE A.C. TRACTION **Total: 8,465** **Percentage: 30**	ET44AC/C4	884 ▲12	275: 3725-3999 (ET44C4)	133: 3000-3120, GECX 2029, 2033-2043	
	ES44AC/C4	4,563 ▲54	814: 5718~6438 CREX 1201-1215, 1301-1350, 1401-1435 (ES44AC) 1,265: 4200-4299, 5533-5546, 6500~7199, 7921~8291, 8318-8399 (ES44C4)	223: 2800-2999, 3800~3835	291: 8700-8960, 9350-9379
	DC2AC family	173 ▲129	21: 599-619 (AC44C4M)		
	AC-Conv/AC6000	189 ▼113			
	AC4400CW AC4400CWM	2,656 ▼5	121: 5600-5717, 5838-5840		469: 8000~63, 8100~44, 8500-80, 8600-43, 8645-55, 9500~9629, 9631~83, 9700-84, 9800-40, CEFX 1026-59
EMD A.C. TRACTION **Total: 3,071** **Percentage: 11**	SD70ACe-T4	68 ▲45			
	SD70ACe/P4	1,624 ▲17	640: 8400~8599, 8749-8799, 8990~9399 20: 8500-8519 (SD70ACeP4)	4: 8100-8103	
	SD9043MAC	373			58: 9100-28, 9130-32, 9134-37, 9139-60
	SD80MAC	29			
	SD70MAC SD70ACC	977 ▼12	769: 8800~8959, 9400~9499, 9504~9999		
GE D.C. TRACTION **Total: 5,574** **Percentage: 20**	ES44DC/ES40DC	1,367	721: 7200-7920	125: 2220-2344	
	Dash 9-44CW/40C	3,314 ▼115	1,764: 620~699, 700-799, 960~1123, 4000-4199, 4300~4994, 4995-5532	243: 2200-2205, 2500-39, 2541-44, 2546-83, 2585-2666, 2668-82, 2684-2727, BCOL 4641-4654	
	Dash 8-40CW/ 44CW/40CM	716 ▼317	85: 867-951	78: 2098, 2099, 2135-2199, 2455~2466 (8-40CW) 81: 2400-2454, BCOL 4601-4626 (Dash 8-40CM)	
	Dash 8-40C	80 ▼146		77: 2000-2041, 2100-2134	
	Dash 8-40BW/ 32B	97 ▼31	38: 560-597 (8-40B) 59: 500-530, 532-559 (8-40BW)		
EMD D.C. TRACTION **Total: 3,096** **Percentage: 11**	SD70M-2	320		190: 8000-8024, 8800-8964	
	SD70M/I	1,541 ▼25		26: 5600-5625 (SD70I)	
	SD75M/I	230 ▼5	51: 227, 249-256, 258-299	172: 5626-5636, 5638-5657, 5659-5752, 5754-5800	
	SD70	114 ▼2		36: IC 1000-1005, 1007-12, 1015-22, 1024-1039	
	SD60M/I/E	536 ▼15			5: SOO 6061, 6258~6262 (M)
	SD60	355 ▼16	77: 1400-1476	89: 5400-5419, 5421-5489	37: CP 6221~57, CP 6300-07 (SD60-3)
EMD D.C. TRACTION SIX-AXLE **Total: 2,560** **Percentage: 9**	SD50	4			
	SD50-2/-3	244 ▼15			
	SD-ECO family	75▲4	3: 1350-1352 (SD32ECO)		50: 5000-5049 (SD30C-ECO)
	SD40-3	719 ▲54		79: 6000~6028, BLE 900-10, DMIR 400~409, GTW 5938~5955, IC 6200-6204, IC 6250~6265	
	SD40-2	1,421 ▼69	408: 300-302 (cabless), 1590~1999	93: 5241~5386, GTW 5930~5937, IC 6100	148: 5100-5109, 5708~6080, 6601~6622
	Older	97 ▼27	4: 1550-1553 (SD9-3) 6: 1554-1560 (SD38-3P) 4: 1561-1564 (SD38-2) 21: 1565-1585 (SD40-2R)	1: BLE 862 (SD38) 3: BLE 866-868 (SD38AC) 27: 1650, 1652-1653, BLE 878, DMIR 211, 212, 215, EJE 656-675 (SD38-2)	
EMD D.C. TRACTION FOUR-AXLE **Total: 4,315** **Percentage: 15**	GP60/60M/59	389 ▼1	42: 159-200 (GP60) 59: 100-158 (GP60M) 22: 325-346 (GP60B)		
	GP50/50-3, GP40X	108▲2	98: 3100~3208 (GP50, GP25, GP50-3) 10: 3030-3039 (GP40X)		
	GP40-3	114 ▲17		15: IC 3101~3138	7: CP/DME 4001, 4002, 4004-4008
	GP40-2	728 ▼21	28: 3000-3022, 3025-3029 (GP40E/M)	62: 9402~9677, GTW 6420~6425, IC 3140	3: 4652, 4653, 4657
	GP40	17		4: GTW 6401, WC 3018, 3026, 3027	13: 2010, CP/SOO 4601~4620
	GP39-2	298	124: 2700~2739, 2769-2799, 2835-2869, 2941-2959 135: 2750-2768, 2800~2834, 2870~2940, 2960~2984 (GP39E, M, V)		2: 4598-4599
	GP38-3/GP39-3	340 ▲23	150: 2516-2665 (GP39-3) 3: 2390-2392 (GP38-3)		
	GP38-2	1,656 ▼85	202: 2000-2051, 2075~2107, 2249,2256~2382	246: 4700~4810, 7500~7532, GTW 4900~4934, 5812~5861, 6221-6228, EJE 703, IC 9560~9639, WC 2001-2006	189: 3021~3135, CP/SOO 4400-07, 4409-4429, 4431-4452, 4521-4526, SOO 4506-4515, CP 4521-4526, D&H 7303-7312
	GP38/GP38AC	50 ▼3	17: 2156~2248 (GP38) 13: 2110~2138 (GP38AC)		18: 3000~3020 (GP38AC) 2: DME 3800, 3801 (GP38)
	GP-ECO family	180			130: 2200-2329 (GP20ECO)
	Older	435 ▼10	50: 1500-1549 (GP28M-2, GP28-2P)	122: 4018, 4028, 4100~4141, GTW 4610~4633, 7000~7083, 7200~7280 (GP9) 18: 1400~1444 (GMD1)	
GENSET **Total: 282** **Percentage: 1**	Progress	0 ▼16	0: all PR30C returned		
	NREC	162 ▼17	75: 1220-1294 (3GS21B) 17: 1300-1316 (3GS21C)		
	Railpower	120 ▼13			
SWITCHER **Total: 197** **Percentage: <1**	MP15 family	130 ▼29	4: GN 3700, 3702-3704 (MP15)		
	SW1000/1001	14 ▼1	5: GN 3600~3624 (SW1000)		
	SW1500	39 ▼7	11: GN 3405~3447	15: WC 1552, 1558-1571	
	Other	14	1: 1205 (Hydrogen Cell) 1: 3546 (SW1200)	5: IC 1200-1204 (SW7RM) 4: IC 1492, 1497, 1504, 1506 (SW11) 1: 7311 (SW1200)	1: 6711 (SW900)
SLUG **Total: 562** **Percentage: 2**	Road slug	264 ▼5			
	Yard slug	267 ▲30	14: 50-60, 65, 70, 71	79: 200~281, 500~526	
	RC platform	31 ▼13			2: 1126, 1128
SPECIAL **Total: 26** **Percentage: <1**	F40PH/F40PH-2	7		3: 104-106	
	Other	2			
	Streamlined pass.	13		2: 102, 103 (E8A)	4: 1401, 4106, 4107 (FP9), 1900 (F9B)
	Steam	4			1: 4-6-4 2816
TOTAL: 28,148	**TOTAL** **GE/EMD/Other: 50/47/3 percent**		**8,247▼14** **GE/EMD/Other: 63/36/1 percent**	**2,256▲49** **GE/EMD/Other: 42/54/4 percent**	**1,430▼15** **GE/EMD/Other: 53/47/0 percent**

~denotes an incomplete series. Due to space limitations, some series include only the last two digits of the highest number, i.e., 2500-39 represents 2500-2539.

CSX	NS	UP
225: 3250-3474	81: 3600-3680	170: 2570-2739
550: 700-999, 3000-3249	185: 8000-8184	1,235: 2010, 2520-2541, 2543-2569, 2740-2769, 5248-5347, 5353-5481, 5483-5553, 5695-5699, 7345-7420, 7422-7468, 7470-7529, 7600-7913, 7915-8267
	152: 4000~4174 (AC44C6M), 8520 (AC44C6CF)	
3: 600-602 (603-676, 678-699, 5000-5016 to Progress 2018)		186: 6888~6968, 7010~7079, 7300~7344
587: 1-22, 24-129, 131-150, 152-173, 201-219, 221-319, 321-398, 400-516, 518-599, 5101-5122		1,479: 5554-5667, 5669-5694, 5700-5835, 5837-5944, 5946~6081, 6145~6425, 6430-6535, 6537-6645, 6647-6706, 6708-6887, 6995-7009, 7080~7138, 7140-7222, 7224~7297
		68: 3000~3079
0: entire class (19) sold	175: 1000-1174	785: 1982-83, 1988, 1989, 1995, 1996, 4141, 8309~9099
	110: 7229-7338 (SD90MAC/SD70ACu rebuilds)	205: 3484~3777
	29: 7200-7228	
206: 4500~4524, 4525-4541, 4543-4589, 4701-4715, 4717-4830	2: 1800-1801 (SD70ACC rebuild from SD70)	
301: 5200-5487, 5489-5501	220: 7500-7719	
	1,031: 8889~9978 Built as Dash 9-40CW, upgraded to 9-44CW 9: 8802~8887 (Dash 9-40C) See DC2AC increase	267: 9564-9592, 9594-9706, 9708-9715, 9717-9730, 9732-9834
219: 7310~7393, 7649~7929 (Dash 8-40CW) 49: 9000-9010, 9012-17, 19-42, 44-48, 50-52 (Dash 8-44CW)	153: 8314-8422, 8424-8467 (8-40CW) 12: 8500-8502, 8504, 8506-8513 (8.5-40CW)	39: 9363~9552
		3: 9152, 9240, 9259
	0: all Dash 8-32B retired	
	130: 2649-2778	
0: all SD70M retired	71: 2581-2648, 2797-2799 (SD70M)	1,444: 2001, 2002, 3778~5231 (SD70M)
	7: 2800-2806	
	78: 2501~2580 (see SD70ACC)	
48: 8723~8786	235: 911, 6717-6815, 6900-7002, 7004-7035	248: 2158, 2169, 2240~2519
21: 8700~8712, 8714-8721, 8788-8790	48: 6548~6716	83: 2100, 2155-2157, 2159-2168, 2170-2192, 2194-2239
4: 8514, 8525, 8551, 8641		
158: 2474~2499, 8500~8667	58: 6300-6357 (SD40E)	28: 9900-9927 (SD59MX)
13: 1700-1712 (SD40E3)	9: 6210-6218 (SD33ECO)	
150: 4000-4090, 4225-4237, 4285-4293, 4295-4297, 4299, 4320-4333, 4372-4390		490: 1550~2052, Y302-Y340, Y3003, Y3005, Y3200-Y3208 (SD40N)
268: 2411~2445*, 8000~8488, 8801~8887 (* derated)	501: 1625~1652, 3201~3584, 6073-6133, 6135-6154, 6155-6206	3: 1799, 1952, 3206
5: 2450-2454 (SD38-2) 2: 8954, 8973 (SD45-2)	6: 1700-1705 (SD45-2)	18: Y809~Y864 (SD38-2)
2: 6897-6898 (GP60)	48: 7100-7116, 7118-7136, 7138-7142, 7144-7150 (GP60) 30: 4609, 4612-4614, 4616-4619, 4621, 4623-4625, 4627-4628, 4630, 4634-4635, 4639, 4650-4661 (GP59)	186: 1000~1170, 1902~2098 (GP60)
63: 6500-6562		29: 1337~1543, 9989 (GP40N)
370: 4401~4452, 6001~6160, 6201~6296, 6341~6499, 6900~6987 (some derated to 2,000 hp "GP38-2s")	103: 3000-3102	162: 1335~1540, 5245, 9986~9992
20: 4300-4319		17: 1200-1216
64: 2000-2063 (GP38-3)	37: 5801-5837 (GP38-3)	86: 280, 281, 506~847 (GP38N)
216: 2500~2576, 2609~2814	301: 5001-5019, 5035-5037, 5049, 5053-5054, 5056, 5062, 5066, 5070, 5073-5074, 5077, 5079, 5084~5092, 5095~5132, 5135~5147, 5151, 5165~5196, 5198-5233, 5235-5250, 5252~5361, 5601-5673	502: 238, 282, 500~848, GMTX 2110~2337, GMTX 2601~2695,HLCX 918~992, HLCX 1027~1093, HLCX 1800-1853, HLCX 3800~3894
	6: 4662-4667 (GP59ECO) 28: 4700-4727 (GP33ECO) 2: 5900, 5901 (GP22ECO)	13: Y2100-Y2112 (MG20GP) 1: Y3001 (GP59ECO)
22: 1500~1524 (GP15T) 23: 1534~1554, 1556-1563 (GP15-1)		164: Y545~Y744 (GP15-1) 36: Y541~Y711 (GP15N)
	0: all PR43C returned	
4: 1316-1319 (2GS14B) 5: 1307-1311 (3GS21B) 0: 3GS21C retired		1: Y2005 (GS14B) 60: Y2701-Y2760 (3GS21B)
0: RP20BD retired 1: 1601 (RP20CD)	2: 2120, 2121 (RP14BD) 2: 100, 101 (RP20BD) 1: 3830 (RP20CD)	14: Y900-Y913 (RP18GP) 13: Y887-Y899 (RP20SD) 87: Y2602~Y2699 (RP20GE)
47: 1130-1139, 1150~1194 (MP15AC) 7: 1140, 1142, 1144, 1145, 1147-1149 (MP15) 38: 1200~1218, 1221-1242 (MP15T)	32: 2349~2432 (31 MP15E, 1 MP21E)	1: Y1472 (MP15AC) 1: Y1442 (MP15N)
4: 1123-1124, 1127, 1128 (SW1001)	5: 2100, 2102-2105 (SW1001)	
12: 1100, 1102, 1103, 1106-08, 1110, 1112, 1116-1119		1: Y1214
	1: 999 (Battery)	
173: 2200~2387	91: 600, 601, 610-627, 645-660, 700-754	
32: 1006~1068	85: 850-895, 912-927, 929-937, 939-941, 952-962	57: Y402~Y440, Y801~Y861, Y926~Y940, Y3002~Y3006
	2: 97, 98	27: Y105~Y157
4: 9992, 9993, 9998, 9999		
1: 9969 (GP40WH)		1: 6936 (DDA40X)
	4: 4270, 4271 (F9PH) 4275, 4276 (F7B)	3: 949, 951 (E9AM) 963B (E9BM)
		3: 844 (4-8-4), 3985 (4-6-6-4), 4014 (4-8-8-4)
3,917▼415 GE/EMD/Other: 49/46/5 percent	4,082▼97 GE/EMD/Other: 45/50/5 percent	8,216▼255 GE/EMD/Other: 41/56/3 percent

Arrows indicate upward and downward changes since table in Locomotive 2017. Data for this table from numerous sources and is as accurate as possible as of Aug. 13, 2018.

Motive power

Of ECOs, DC2AC, ACC, and the reemergence of locomotive-modernization programs

by Greg McDonnell

Its fresh red paint shining in the warm sun of a spring afternoon, Canadian Pacific 8000 strikes a time-honored builder's-portrait pose in the backyard of the GE Transportation plant in Erie, Pa. Generations of new GE locomotives, electrics, gas-turbines, and diesel-electrics, for railroads around the globe, have posed for builder's photos on these tracks. However, neither the locomotive nor the circumstances are traditional. Beneath the brilliant red paint is a 23-year-old AC4400CW. Well, most of it, at least. Built as CP 9521 in summer 1995, the big A.C. returned to its Erie birthplace in late 2017 as the prototype for the second phase of a modernization program. Retracing its path on the Building 10 erecting floor, it emerged better than ever, with a new operator cab, new electronics and control systems, and a new "AC4400CWM" designation stencilled on its cab side.

As new locomotives become more complex and expensive, railroads are finding a new appetite for upgrading and modernizing older power. Traditional business models and roles are being tossed out as locomotive builders join railroad and contract shops in the resurgence of rebuilds and take the art of motive-power makeovers to a new level.

DC2AC

Despite the fact that the major builders have not delivered a North American D.C. locomotive since 2010, the "Big Six" roads hold title to more than 9,000 high-horsepower D.C. locomotives. These legions of middle-aged Dash 9s, SD70Ms, and D.C. Evolutions are far from retirement, but in an A.C. world their D.C. technology and its inherent limitations in tractive-effort capability, operational flexibility, and overall reliability — particularly in cold or damp climates — can be an Achilles' heel.

GE, capitalizing on the commonality engineered into the design of its D.C.-traction Dash 9 locomotives and A.C.-traction AC4400CWs, was first to offer a practical solution. Dubbed "DC2AC," GE engineers put together a modernization package to upgrade and convert aging

makeovers

CP 8000, prototype for the second phase of a modernization program for CP AC4400CWs, tests at GE in Erie, Pa., in May 2018. Greg McDonnell

Dash 9s to top-of-the-line A.C. machines. In addition to a complete overhaul of the existing FDL engine and cooling systems, DC2AC modernization includes replacement of the D.C. "supercab" control group (that's the entire hood behind the operator cab) with a standardized A.C. auxiliary cab housing the same "CCA" control system panels and harnesses applied to a brand-new Evolution Series A.C. locomotive. New Hi-Ad trucks and service-proven GEB13 traction motors complete the conversion. "It's the best of both worlds," noted one railroader. "FDL engine and EVO control."

First to sample DC2AC, BNSF had 21 former Santa Fe 600-class "Warbonnet" Dash 9-44CWs converted to A.C. by GE's shop in San Luis Potosi, Mexico, in 2015. In keeping with the road's preference for the six-axle/four-motor A1A-A1A C4 configuration, all 20 were similarly equipped and designated as AC44C4M. Although BNSF has ordered no additional DC2AC modernizations, it ranks as the largest owner of Dash 9s, with more than 1,750 Dash 9-44CWs that account for some 20 percent of its overall fleet. With the oldest of their number nearing age 25, it's only a matter of time until their next chapter is written.

After evaluating AC44C4M prototype BNSF 616, Norfolk Southern signed up for two conventional six-motor DC2AC demonstrators. Standard-cab NS Dash 9-40CWs Nos. 8799 and 8879 were dispatched in 2015 to American Motive Power in Dansville, N.Y., for A.C. conversion and upgrade that included new wide-nose operator cabs and the latest NS options.

Following testing at GE in Erie and on NS property, the units were sent to the paint shop for a special touch. Emerging in a custom blue-and-gray scheme as NS 4000 and 4001, the pair officially kicked off the DC2AC era in December 2015. NS received 16 conversions in 2016: 12 from GE Erie and four done by NS shops at Roanoke, Va., and Altoona, Pa. The locomotives received a completely new operator cab and a weight increase to 432,000 pounds. The A.C. conversion increases tractive effort by 40 percent, matching new Evolution Series performance. Success of the initial group led to follow-up agreements with GE for 57 units in 2017 and another 100 on the books for 2018. Work is being done at GE's Fort Worth plant and with kits assembled at NS shops in Altoona and Roanoke. Even with these conversions, NS has another thousand-plus Dash 9s ripe for modernization. More rebuilds are reportedly in the works.

Ever the mother of invention, NS is working on two other Dash 9 A.C. conversions. Rebuilt at Roanoke, NS 8946 and 8897 have been outfitted with CAF A.C. traction motors and control systems from TMV. Designated AC44C6CF and renumbered NS 8520 and 8521, they're part of an ongoing NS initiative to investigate alternative control and propulsion technologies.

NS turned to Progress Rail for A.C. modernization options for its 151-unit SD70 fleet, including 80 standard-cab units dating from 1993-1998, and 71 SD70Ms. In

Workers at GE Erie cut away the cab of NS 8857 in preparation for its DC2AC makeover as AC44C6M No. 4011. The transformation will include new A.C. traction motors, EVO electronics, and a new operator cab.

early 2017, NS 2537 and 2548 were sent to Progress in Muncie, Ind., for A.C. conversion and modernization. The locomotives were stripped, overhauled, and received new Mitsubishi A.C. traction equipment. To accommodate packaging changes as well as the latest NS options, a newly designed operator cab was applied to each unit. New A.C. traction motors were fit into the existing EMD HTCR trucks. Released for testing in early 2018, NS SD70ACCs 1800 and 1801 will serve as prototypes for an additional 50 units on order for 2018. In early 2018, NS began sending retired SD70s to the Progress facility in Mayfield, Ky., for teardown before their trip to Muncie for rebirth, a process expected to continue throughout the year.

EMD's ACC package could certainly be of interest to other SD70 and SD75 owners such as Canadian National and Union Pacific, the latter with a fleet of more than 1,400 aging SD70Ms.

A.C. upgrades

While the greatest performance change can be found in conversion of older D.C. locomotives to A.C. traction, railroads cannot ignore the 11,000-plus A.C. locomotives operating in their fleets. First-generation A.C.s, a decade's worth of EMD SD70MACs and GE AC4400CWs represent more than 12 percent of the North American fleet, with the oldest now approaching a quarter-century of service.

Retracing its path through its Erie birthplace, the rebirth of NS 8808 as AC44C6M 4006 begins as the main platform is refitted in Station 1 of Building 10. Two photos, Greg McDonnell

Railroads have begun to investigate life-extension programs for their older A.C. models. While CP and UP retired their H-engine equipped SD90MACs and stored or retired hundreds of their "convertible" SD9043MAC cousins, NS saw opportunity. Looking for ways to expand its roster of modern A.C. power, NS worked an agreement with Progress Rail in late 2014 to purchase 100 former UP SD9043MACs. Bolstered by 10 from the CEFX lease fleet, NS quickly amassed a substantial fleet of second-hand A.C. locos.

While some were immediately pressed into service, most went straight to Altoona for upgrades. Designated SD70ACU, the SD90MACs are modernized with a new

First-generation A.C.s, a decade's worth of EMD SD70MACs and GE

NS 7263, an SD70ACU rebuilt from a former UP SD90MAC, races train 201 through Atkins, Va. Samuel Phillips

NS-style operator cab, new EMD-standard Mitsubishi electronics, New York Air Brake CCB II air brake, and the latest in cab signaling, positive train control, and GE Distributed Power. The locomotives retain their EMD TA22 alternator and Siemens TB2830 traction motors. The overhauled EMD 710 engines are being upgraded to EPA Tier 1+ and reset for 4,500 traction hp. EMD led this project, providing kits and even initiating work on four units before assembly shifted to NS shops.

By early 2018, the last of the units were on the assembly line for conversion, and NS was preparing a similar program for its 29 former Conrail SD80MACs. Long a fixture in Pennsylvania coal service, the units will be overhauled, upgraded with Mitsubishi inverters, EMD FIRE control, UltraCab cab signal, and NYAB CCB II brake, and boosted to 432,000 pounds and 5,500 hp. Much like the SD70ACU conversions, they'll be a blend of old and new technology, receiving new cabs and control systems while retaining their 20-cylinder EMD 710 engines and Siemens traction motors. Progress is also offering kits to upgrade aging SD70MACs with new technology. A pioneer of the A.C. revolution, the SD70MAC is equipped with Siemens electrical and traction equipment, while newer SD70ACes use Mitsubishi electronics and traction motors. Given the age and availability of the Siemens equipment, the Progress package replaces Siemens GTO-based inverter equipment with the latest generation of Mitsubishi IGBT-based technology. KCS and BNSF have begun installing the upgrade kits on SD70MACs.

After a number of false starts and attempts to sell its troublesome 9100-series SD90MACs, CP has contracted with Progress to upgrade at least 30 of the long-stored locomotives to SD70ACe specs. Upgrades will include new operator cabs and control systems, and Mitsubishi inverters in placement of the original Siemens equipment. More importantly, the upgrade will convert the traction system from single-truck (one inverter per truck) to individual-axle control with six inverters, one per axle.

A product of the short-lived horsepower race of the mid-1990s, GE's AC6000CW became an early candidate for modernization. Make that standardization. In contrast to the best-selling AC4400CW, GE sold just 197 of the 6,000-hp machines to domestic customers: 117 to CSX and 80 to UP. Powered by a 16-cylinder HDL engine, the 6000s were futuristic oddballs in an increasingly standardized world. Both roads sought remedies.

UP took a conventional approach, replacing the HDLs with 16-cylinder FDL engines and upgrading the locomotives with Evolution-style CCA controls. CSX stuck with a high-horsepower solution and substituted the HDL engine with a massive 16-cylinder, 6,000-hp GE Evolution Series engine and CCA controls. Due to slight differences in mechanical configuration, the original three demonstrators, CSX 600-602, received FDL16 engines instead of GEVOs. Caught up in the recent downsizing of the CSX fleet, the 6,000-hp ACs were recently retired and sold to Progress Rail, while the UP fleet soldiers on in coal and heavy-haul service.

And what about the GE AC4400CW? One of the most popular models operating in North America today, the first AC44s began rolling off the Erie assembly lines in 1993 and even the youngest are now more than a decade old. CP, with aging AC4400CWs accounting for almost a third of its fleet, has stepped up first.

In spring 2017, CP sent well-worn AC4400CW No. 9669 to GE Erie for overhaul and modernization. The locomotive was stripped to a bare frame and key components, including the 7FDL16 engine, were overhauled. Retracing its path along the Building 10 erecting floor of its Erie birthplace, the 20-year-old AC44 was reassembled, receiving a brand-new CP-styled operator cab and an auxiliary cab complete with the latest Evolution-style inverters and

AC4400CWs represent more than 12 percent of the North American fleet.

Prototype for the modernization of a group of Union Pacific AC6000CW "convertibles," UP 7342 poses outside Building 26 at GE's Erie, Pa., plant on July 9, 2018. GE, Steve Gerbracht

controls in the process. Adorned in a brilliant coat of CP red, complete with the reintroduced CP beaver shield, and transformed to an AC4400CWM, CP 8100 made its formal debut at the Erie facility just before Christmas.

Meanwhile, 29 CP AC44s were sent to GE's Fort Worth facility for modernization and emerged as AC4400CWM Nos. 8101-8129. CP has committed at least 80 more AC4400CWs for modernization at the Texas plant in 2018. Included in the mix are 59 locomotives from CP's initial 83-unit AC4400CW order. Known as CP1s in the railway's parlance, the original AC4400CWs differ slightly from the rest of the fleet, having first-generation GMG196 alternators and smaller fuel tanks. The differences are enough to warrant a separate number series for the rebuilt CP1s and, in keeping with GE practice, an Erie-built prototype. Selected as the first CP1 candidate for modernization, CP 9521 was sent to Relco in Albia, Iowa, for fuel-tank modifications and other pre-upgrade work before moving to Erie for rebuilding as CP 8000. Subsequent CP1 rebuilds are being cycled through Relco Albia for fuel-tank enlargement and other modifications before moving to Fort Worth for modernization as 8000-series AC4400CWMs. All other rebuilds will be numbered in the 8100 series and beyond.

Born at Erie in summer 1995, CP 9521 is back and better than new as AC4400CWM 8000. Greg McDonnell

UP has enlisted GE to perform similar work on some of its 106 AC6000CW "convertibles." The UP convertibles were built to AC6000 specs and configuration, but powered with FDL16 engines that could be replaced with 6,000-hp prime movers should the railroad desire at a future date. None were ever converted. Sharing shop space with CP 9521 at Erie, UP 7342 was torn down in 2017, overhauled, and modernized with the latest controls and auxiliary equipment. Unlike the CPs and other rebuilds, the UP locomotive retained its original operator cab. More UP convertibles are scheduled for modernization at GE facilities in 2018.

These programs tap but a fraction of the potential modernization of existing fleets of older A.C. locomotives. BNSF and CSX roster significant numbers of SD70MACs, and BNSF, CP, CSX, and UP AC4400s account for one in every 10 Class I railroad locomotives. The legacy of these two models is already cemented in motive power history.

ECOs

The current trend toward modernization began, not with high-powered road locomotives, but with utilitarian four-axle EMD Geeps, including some of the oldest power in the North American fleet. Even with changes in operating philosophy, rationalization of routes, and consolidation of secondary fleets, Class I railroads operate some 7,000 EMD GP and SD models. Four- and six-axle EMD road-switchers remain the backbone of secondary fleets throughout the continent.

The rise of emissions controls and regulations, particularly in pressured urban "non-attainment" areas where many GPs reside, became the sole apparent threat to this seemingly ageless class of locomotives. Third-party "Tier 0" and "Tier 0+" 645-engine emissions upgrade packages, battery-powered hybrids, and genset-style locomotives from disruptors such as RailPower, NREC, and MotivePower sought to capture this market all but ignored by the big builders. In 2010, EMD re-entered the fray with its 710ECO Repower line.

Designed to modernize older EMD GPs and SDs with new control systems and fuel-efficient, lower-emission 710-series engines, ECO marked a bold entry into a traditionally tough market. The price tag for such extensive secondary-fleet rebuilds has always contributed to the challenge. Both EMD and GE have a history of failed attempts: EMD's BL20 program and GE's Super 7 program, to name two modern examples. However, the climate had changed. The locomotives were older, the need greater, and the external pressures were now stronger than ever.

EMD fielded two GP22ECO demonstrators for the program: EMDX 7101, converted from Kansas City Southern 2836, a GP40 of Penn Central origins; and EMDX 7102, rebuilt from CP GP9 No. 1637. Both demonstrated extensively, striving to prove the benefits of modernized Geep or SD power in a variety of Class I railroad applications. KCS acted first, ordering 18 GP22ECOs and two SD22ECOs created from an eclectic mix of GP40, GP40-2, GP40-2L, SDP40, and SD40-2 cores. Eight of the GP22ECOs emerged from GMD in London, Ont., while the other 12 GPs and

Four- and six-axle EMD road-switchers remain the

Showing off its flared radiators and special ECO paint scheme, NS GP33ECO 4712 leads the "Bakery Job" past New York Central-era signals on the Indiana Harbor Belt at Ivanhoe Junction in Gary, Ind. William Beecher Jr.

SDs were rehabilitated with the help of MotivePower in Boise, Idaho. Other roads also sampled ECO conversions, often with minimal change to the visible layout of the locomotive: a pair of NS GP38ACs converted to GP22ECOs with eight-cylinder 710s, three BNSF SD45-2s converted to SD32E-COs, eight Belt Railway of Chicago GP23E-COs built from mixed heritage GP40s, a UP GP59ECO rebuilt from a GP40, a trio of GP22 and GP23ECOs on Tacoma Rail, and even passenger F59s employed by Amtrak and Metrolink in California. Some units had 645-engines replaced with ECO 710s, while others, such as the passenger units, received upgraded 710 prime movers.

Union Pacific supplied 28 SD60Ms for SD59M-2 upgrades by Progress Rail in Mayfield, Ky., and EMD London. Completed between 2010 and 2014, the units traded 16-710 engines for 12-cylinder EPA Tier 2-compliant versions along with a new cooling system and control upgrades. Designated SD59MX by the railroad, the locomotives were assigned to regional service in California. Class unit UP 9900 was further modified with an experimental exhaust-gas recirculation package for NOx reduction, plus an experimental diesel oxidation catalyst+diesel particulate filter package for particulate matter reductions. Funded by a California Air Resources Board and Air Quality Improvement Program grant, this project was aimed as a proof-of-concept for future Tier 4-emissions compliance on installed-based locomotives.

One of 28 Union Pacific SD60M ECO upgrades (designated SD59M-2 by EMD, and SD59MX by the railroad), UP 9904 leads the Kaiser Hauler at West Colton, Calif. Charles Freericks

Canadian Pacific took the ECO program to the mainstream. CP had to face hard facts on its 193-unit GP7 and GP9 fleet. Despite significant upgrades in the mid-1980s, this fleet, originally from the 1950s, had reached a major decision point. And given the units represented 11 percent of the railroad's power and operated systemwide, there was no way they could be ignored. Progress Rail stepped in to offer the solution, the GP20C-ECO. Taking the Geeps in trade and salvaging key components to meet EPA rules for content, the GP20C-ECO offered up a new road-switcher design, complete with eight-cylinder 710 engine rated at 2,000 hp. Existing trucks and other components were retained; however, this GP20 model featured new underframes, operator cabs, and hoods. CP initially took 30 units in 2012-2013 but quickly returned for 100 more over the course of two years. In one fell swoop, 130 GP20C-ECOs replaced CP's entire fleet of first-generation Geeps.

CP's ECO aspirations didn't stop there. The railway contracted Progress Rail to rebuild 20 retired SD40-2s as SD30C-ECOs. At the Progress Rail facility in Mayfield, Ky., the locomotives were stripped to the frame and rebuilt with a 12-cylinder 710 engine, new crashworthy cab and

backbone of secondary fleets throughout the continent.

Two of 50 CP SD30ECOs rebuilt from SD40-2s, CP 5003 and 5002 work the Golden Wayfreight near Doyle, B.C., on Feb. 19, 2018. Justin Franz

microprocessor controls, and an upgraded cooling system complete with larger flared radiators. Delivered in 2013 as CP 5000-5019, the SD30C-ECOs joined a roster still populated by some 365 SD40-2s, positioning Progress for an opportunity to rehabilitate what was once the backbone of the CP mainline fleet. CP returned for an additional 30 SD30C-ECOs completed by Bombardier in Ciudad Sahagún, Mexico, in 2015, but stopped there. A small group of CP SD40-2s have since been upgraded to SD40-3s by contract shops, but many have been sold for scrap and just a handful of un-rebuilt examples remain active.

CSX and NS have become the most recent advocates of ECO products. Beginning in 2015, NS initiated a program to modernize its secondary fleet, converting GP50s and GP59s to 3,000-hp GP33ECOs and GP59ECOs, and converting six-axle SD40 and SD40-2s to SD33ECOs. The units are being stripped to the frame and completely rebuilt with 12-cylinder 710 engines, EM2000 microprocessors, NYAB CCB26 air brake, NS-designed "Admiral Cabs," and larger cooling systems with flared radiators capable of meeting EPA Tier 3-emission standards. The first four-axle units, Nos. 4700 and 4715, were released from Juniata in January 2015, and since then at least 32 more have been completed. Six-axle SD33ECOs followed in 2016 and 2017, with nine units complete to date. These locomotives, paired with newly manufactured RP-M4C or remanufactured RPU6D slugs, have allowed NS to revamp its yard fleet while reducing emissions in many non-attainment emissions zones in Georgia (Atlanta, Macon, and Rome), Chicago, and Pittsburgh. The 4700-series GP33ECOs and 6200-series SD33ECOs are painted in a special variant of the NS paint scheme, complete with green bands and specific references to the terminals to which they are assigned.

CSX has dabbled in ECO products. In 2016, it took a diversion from its own overhaul programs to order 13 SD33ECOs from Progress Rail. Rebuilt from SD40-2 cores by the Progress facility in Muncie, the units were delivered in early 2017. Designated SD40E3, the ECOs are equipped with 12-cylinder 710-series engines, expanded cooling systems, and EM2000 microprocessor controls, just like other recent ECO products. Recent changes in CSX management have stalled, if not stopped, further rebuilds and upgrades.

To meet the need for Tier 4-emissions compliance, Progress Rail has announced the development of the EMD24B, a

In one fell swoop, 130 new GP20C-ECO locomotives

repowered GP-series locomotive utilizing a high-speed CAT 3512D engine with selective catalytic reduction and diesel particulate filter aftertreatment. Rated at 2,100 hp and capable of Tier 4 switch emissions levels, the EMD24B is a new-age Geep built upon generations of 645 and 710 experience. The design is intended to take re-powers to the next generation with the proven Caterpillar engine, Zeit control system, KATO alternator, rotary screw compressor, and modern emissions technology, all in a D.C. traction locomotive riding classic Blomberg trucks with D78 traction motors. While outwardly resembling a traditional Geep, the EMD24B features a crashworthy underframe, cab, and fuel tank. Appropriately numbered 24, the first demonstrator appeared in late 2017.

Not all railroads can justify the capital investment to fully "Eco-ize" their secondary fleet. For those unwilling to invest significant capital on yard assets, a wide variety of solutions remain. Most common is a traditional overhaul, extending the life of GPs and SDs. Most secondary fleets run only a fraction of the mileage and megawatt-hours seen by road locomotives, so units overhauled for this service will be ready for another generation of service. In most cases, railroads, looking to maximize the future potential of these units, have gone a step further to modernize operator cabs, add rooftop air conditioning, and standardize the myriad equipment configurations inherent in 50 years of EMD production. Some have gone as far as replacing complete operator cabs. NS has standardized with a home-designed, locally built "Admiral Cab" for most EMD rebuilds.

Some railroads have gone a step further, replacing EMD's modular control rack with a modern microprocessor system capable of anything from Automatic Engine Start Stop (AESS) engine control to complete locomotive control. There are a variety of systems on the market including EMD's EM2000, Progress/Zeit SAL, NREC NForce, TMV TECU, Wabtec Q-Tron/QES and GE's BrightStar. All control upgrades typically include replacement of control-group equipment, new wiring, and addition of operator or maintenance displays. Some railroads include updated air-brake equipment, replacing traditional 26L systems with modern NYAB CCB II/CCB26 or Wabtec Fastbrake systems.

The looming PTC mandate will drive third-party systems, most typically the Wabtec PTC hardware, to be added to hundreds of locomotives utilized in secondary services along PTC-mandated routes. While many of these changes may not be visible to the casual observer, railroads have continued to invest in their secondary fleets, fostering a resurgence of GPs and SDs in gathering assignments, some of which are replacing the genset switchers that were purchased to replace them.

It's a mixed-up, shook-up world. Locomotive builders are engaged in overhauls, modernization programs, and motive-power makeovers. Old D.C.s are going A.C., resurrected SD90MACs are back on the road and better than new. And seemingly ageless EMD Geeps and SDs soldier on. ▮

Modernized CSX EMDs, GP40-3 No. 6556 (left) and flared SD40E3ECOs Nos. 1705 and 1703 work Howell Yard in Atlanta, Ga. Eric T. Hendrickson

replaced CP's entire fleet of first-generation Geeps.

On June 23, 2016, the engineer of BNSF's Cowley Local gives the peace sign as he rolls his SD70MACs and train northbound through rugged Sheep Canyon in Wyoming's Bighorn Basin.

Wild Wyoming

BNSF in the spectacular Bighorn Basin

Story and photos by Tom Danneman

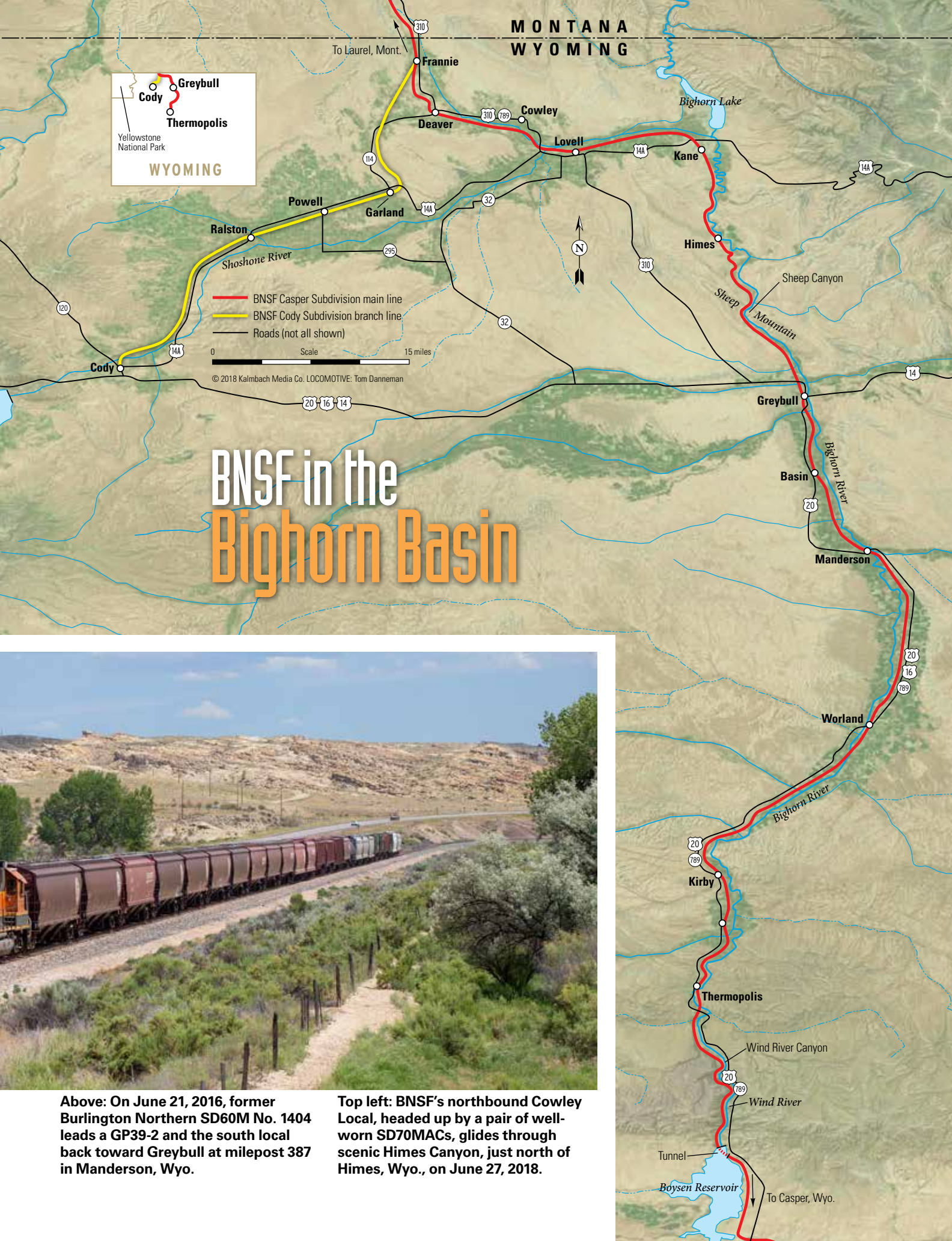

8912
BNSF
8912
BNSF

It's difficult to believe that less than 24 hours earlier, I set out from Wisconsin, my truck packed full of gear for an annual summer vacation in Wyoming and Montana. It was a grueling 1,100-mile drive, but now I find myself cresting the Bighorn Mountain range between Sheridan and Greybull, Wyo. As I left Sheridan, the temperature was in the 80s; at the top of the Bighorns, it's barely in the 50s. Melting snow mingles with silvery lupine and Indian paintbrush wildflowers. The cool temperatures are elevation-induced and brief. By the time I pull into Greybull, it will be back into the upper 80s. It's not only the temperature that varies wildly here. The scenery in this stretch is some of the most diverse and beautiful that I've ever driven through. On this trip, one of my goals is to photograph some of the most overlooked and out of the way railroad lines in Wyoming — BNSF in the Bighorn Basin.

The portion of the Chicago, Burlington & Quincy that eventually reached into the Bighorn Basin began with the construction of a line from near Huntley, Mont., to Cody, Wyo., completed in late 1901. The Big Horn Railroad (a paper CB&Q company) built the line from Frannie to Kirby between 1905 and 1907. The railroad from Kirby to Thermopolis and through Wind River Canyon finally reached Casper in 1913. Additional construction continued the next year, giving CB&Q and its subsidiaries a through route from Orin Junction, Wyo., to Billings, Mont., including trackage rights over Northern Pacific from Laurel to Billings. It also gave the railroad access to the basin's blossoming cattle ranching and sugar beet industries.

With lines on either side of the mountains, CB&Q and its subsidiaries avoided a direct crossing of the Bighorn Mountain Range, but that didn't mean the railroad dodged spectacular topography. The railroad slices through breathtaking Wind River Canyon and passes through one of the most unique and geologically rich areas on the planet. The Bighorn Basin contains layers of rock from virtually every geologic time period, from tens of thousands of years to well over 2 billion years old. It also exposes and preserves one of the most varied collections of fossilized plants and animals anywhere on our planet. In the northeast corner of the Bighorn Basin north of Greybull, the Bighorn River cut a deep gash over the course of millions of years, forming Sheep Canyon. Here, surveyors for the CB&Q took advantage of the cut made by the river to build through

Sheep Mountain. It also exposes the Sheep Mountain Anticline (a fold of stratified rock in an arch-like shape, containing the oldest rock bed at its core). This particular



BNSF in the Bighorn Basin

Above: On June 21, 2016, former Burlington Northern SD60M No. 1404 leads a GP39-2 and the south local back toward Greybull at milepost 387 in Manderson, Wyo.

Top left: BNSF's northbound Cowley Local, headed up by a pair of well-worn SD70MACs, glides through scenic Himes Canyon, just north of Himes, Wyo., on June 27, 2018.

Two former Burlington Northern SD70MACs lead the Cody Local, its four cars and a caboose (shoving platform) over Polecat Creek near Frannie, Wyo., on June 24, 2016.

Above: BNSF No. 9621, one of a pair of SD70MACs powering the Cody Local, pauses next to an old derail indicator sign in Frannie, Wyo., on June 24, 2016. Right: That same day, the matching pair switches the small yard and runs around their caboose (shoving platform) in Frannie before returning to their home base in Cody.

anticline and outcroppings contain rock from several geologic periods, dating back more than 300 million years.

Besides the incredible scenery and geology, what is in the Bighorn Basin that draws me away from the typical (and busier) railroading haunts, such as Montana Rail Link north of here, or the coal traffic-heavy Powder River Basin to the east? For the past several years, with the railroad's acquisition of hundreds of GE ES44s and EMD SD70ACes, BNSF's mainline motive power has become predictable. It is the branch lines, yards, and out-of-the-way places, such as the Bighorn Basin, that hold BNSF's motive-power secrets.

Greybull and nearby Cody are home to a trio of five-day-a-week locals that have become a haven for a small number of SD70MACs, SD60Ms, and rebuilt Geeps.

On June 28, 2018, GP38-3R No. 2392 leads former BN SD40-2 No. 1659 and the Cody Local across the old U.S. Highway 14 bridge and Alkali Creek Patch, in Ralston, Wyo. The faint initials of former owner CB&Q are visible on the bridge.

Above: On a perfect first day of summer 2017, Cascade Green former Burlington Northern SD60M No. 1410 and a SD70MAC power the southbound Cowley Local through incredible Sheep Canyon, north of Greybull, Wyo.
Left: On June 22, 2016, a pair of orange-and-green SD70MACs lead the southbound Cowley Local as it tiptoes through the afternoon shadows cast by the sheer cliff walls of Sheep Canyon.

North of Greybull, the "Cowley Local" primarily serves bentonite and gypsum industries on BNSF's Casper Subdivision main line in the Stucco (7 miles north of Greybull), Himes, Kane, and Lovell areas. It also serves a sugar-loading co-op in Lovell. For the past few years, a pair of SD70MACs or SD60Ms, or a combination of the two, has powered the local. The other local calling Greybull home works grain and bentonite industries on the Casper Subdivision in Manderson, Worland, and Lucerne. The local also serves a beverage packaging plant (aluminum), and a beverage bottling and canning plant in Worland. The south local has been assigned SD60Ms, SD40-2s and Geep rebuilds.

Cody, a town of just under 10,000 known as a gateway to the east entrance of Yellowstone National Park, is home to one of the most interesting BNSF locals. The Cody Local operates on the Cody Subdivision Branch Line to Frannie and return, serving a gypsum industry in Cody, grain loading in Ralston, and fertilizer tank cars and grain loading in Powell. The Cody Local is also responsible for switching the small yard in Frannie, where the branch joins BNSF's Casper Subdivision main line. The Cody Subdivision happens to be the only BNSF branch line in the state of Wyoming. In recent years, the Cody Local has operated with Geeps, SD40-2s, SD60Ms, and even a pair of former Burlington Northern SD70MACs. The local is also equipped with a caboose (now referred to as a shoving platform).

If you enjoy peering through a window to billions of years of geologic history and easy-paced railroading in a spectacular landscape, check out the locals of the Bighorn Basin. The wilds of Wyoming just might become a regular haunt in your quest to find BNSF's motive-power secrets.

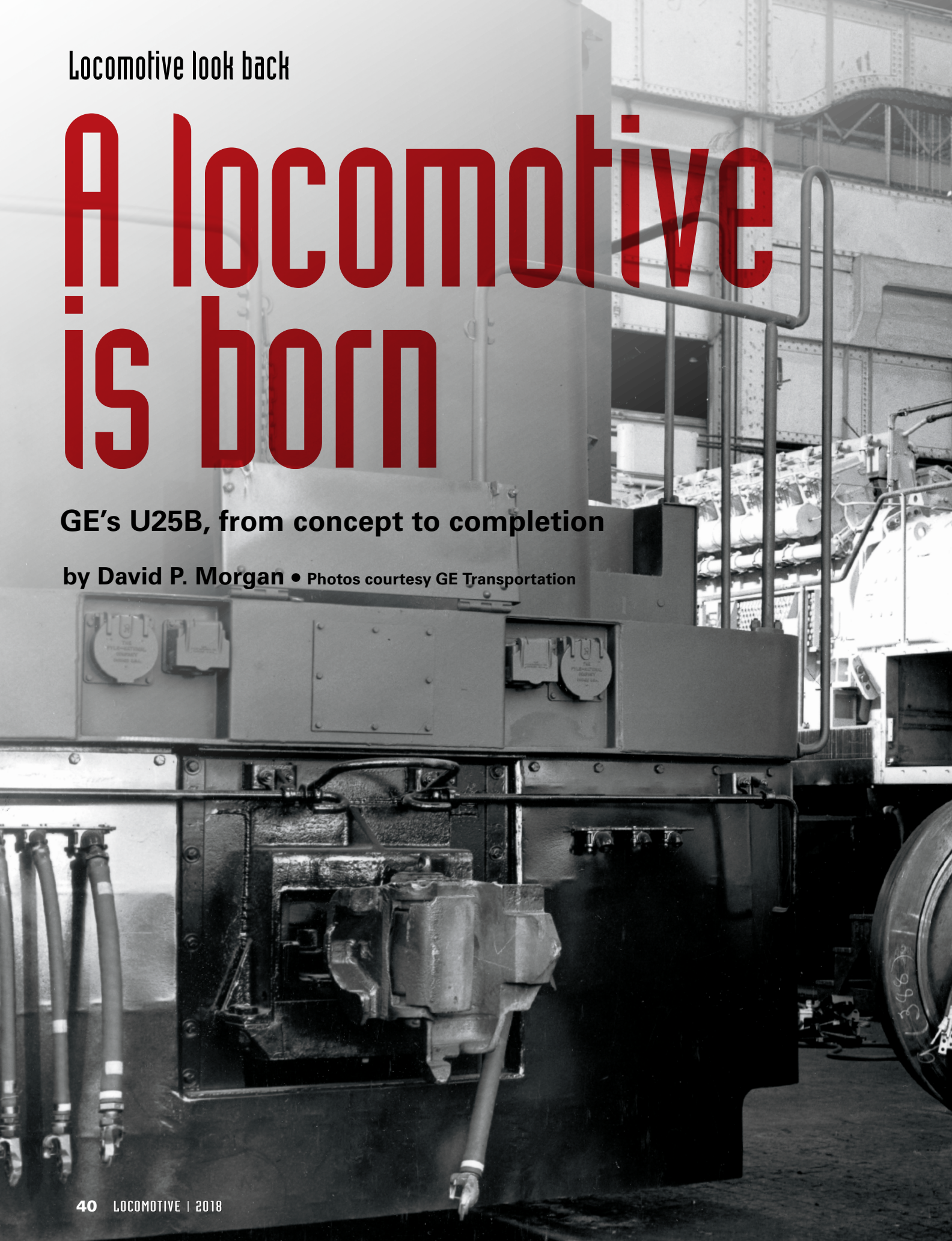
On June 25, 2018, former Burlington Northern SD70MAC No. 9709 and BNSF SD70MAC No. 9878 lead the northbound Cowley Local along the Bighorn River and through the vividly colored topography in Himes, Wyo.

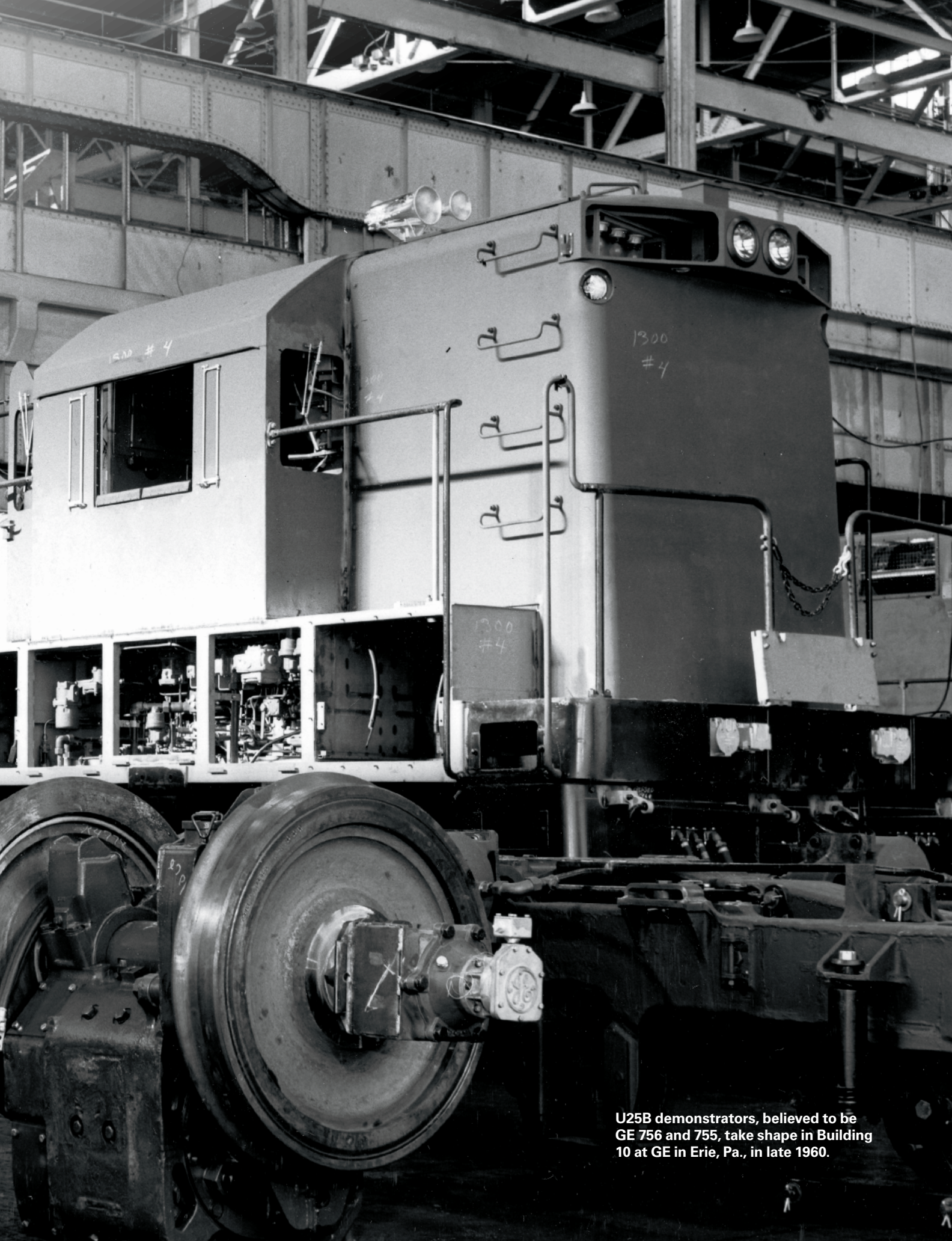
Locomotive look back

A locomotive is born

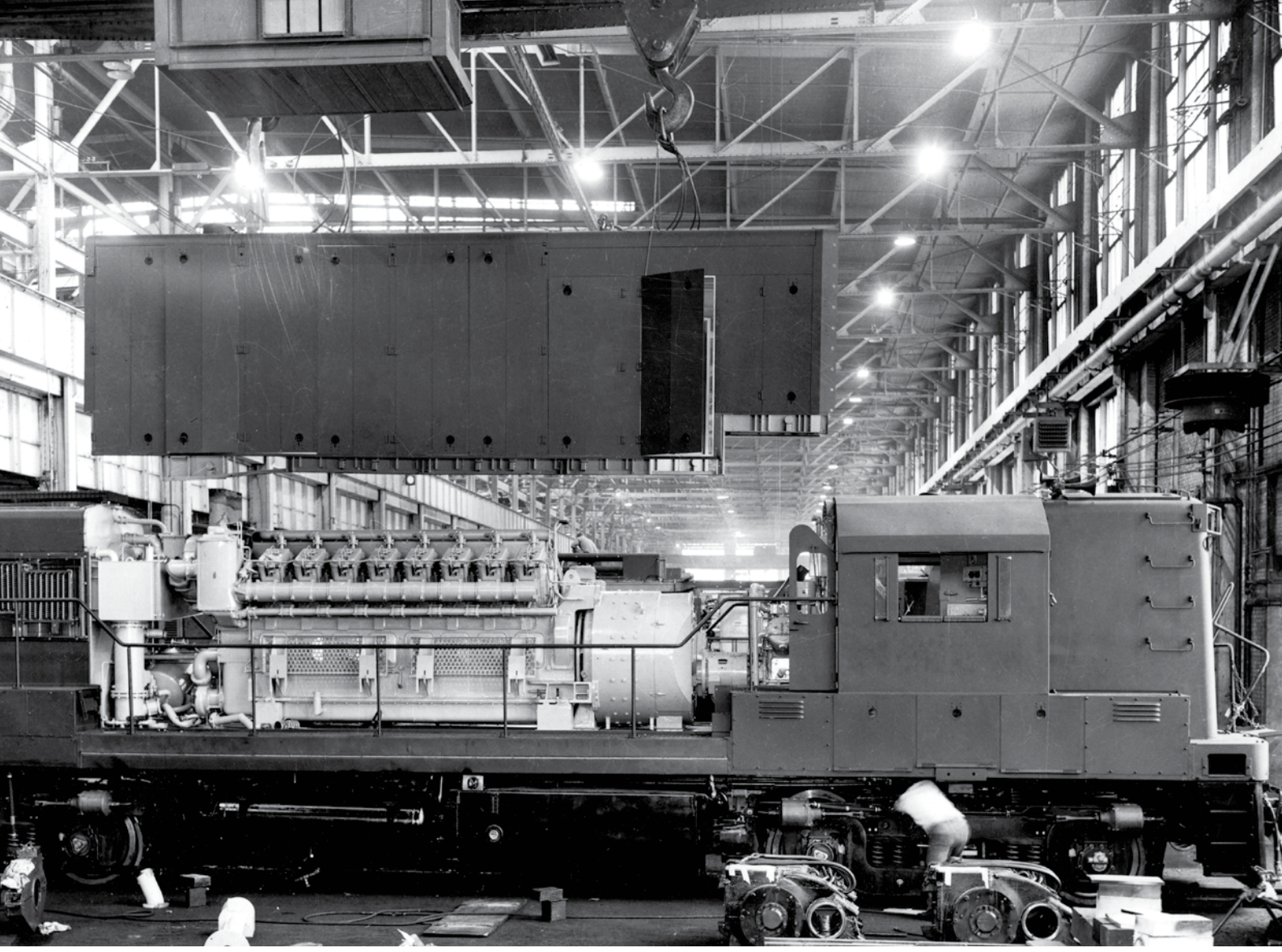
GE's U25B, from concept to completion

by David P. Morgan • Photos courtesy GE Transportation





U25B demonstrators, believed to be GE 756 and 755, take shape in Building 10 at GE in Erie, Pa., in late 1960.



Its one-piece hood suspended by an overhead crane, one of the 753-series demonstrators shows off a new FDL16 engine.

Editor's note: This feature was originally published as the cover story in the September 1962 issue of Trains. *Most of the photographs illustrating this revisited version are previously unpublished.*

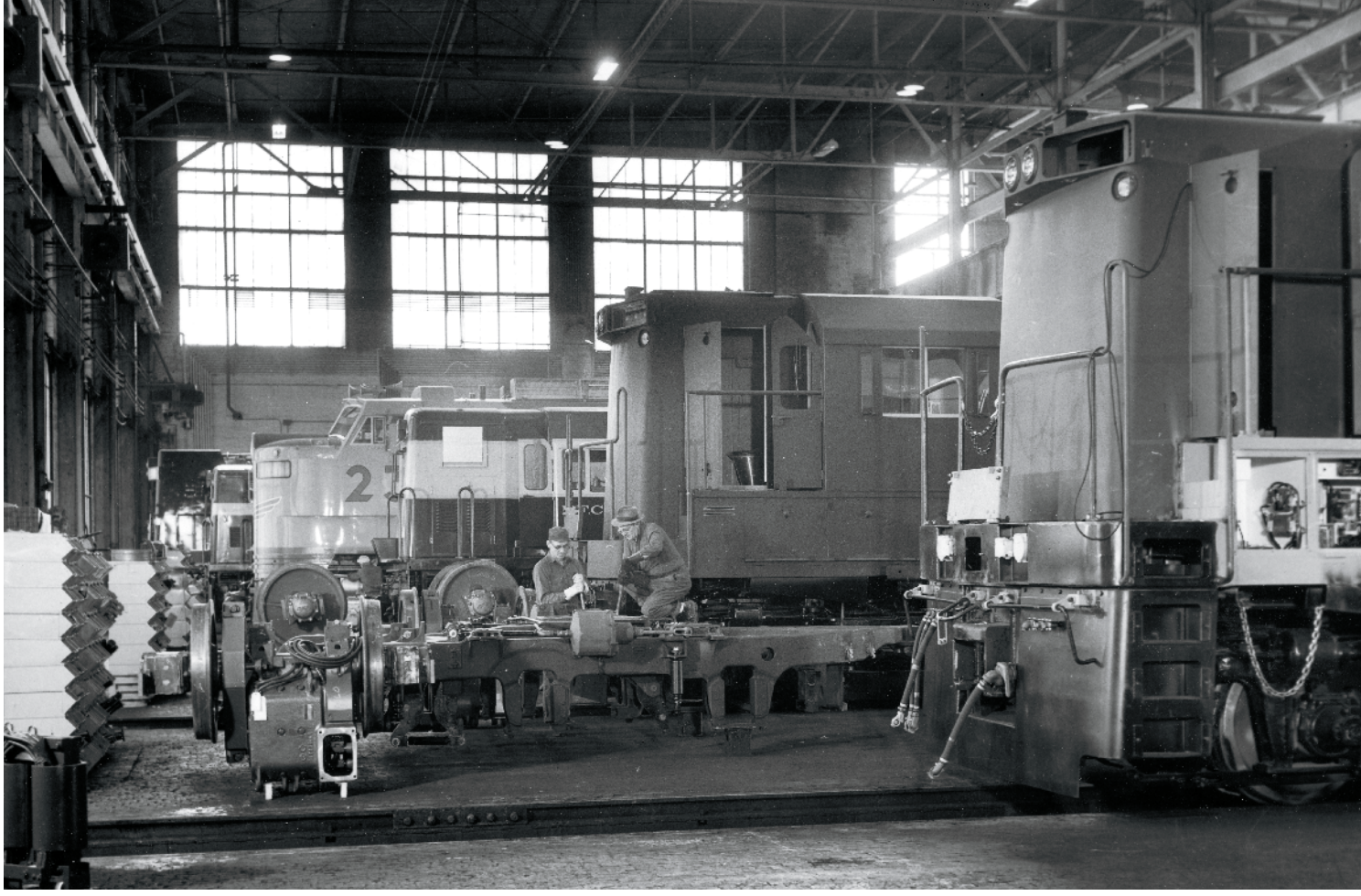
In the mounting skepticism with which London's internationally circulated Diesel Railway Traction views American locomotive practice, perhaps the cruelest adjective hurled in our direction is "conventional." Its editors deplore the power-to-weight ratios, axle loadings, and adhesive characteristics of our domestic diesels as well as what they consider to be the culprits: slow-speed engines and electric transmissions. In its 1962 annual review number, the overseas trade press dismissed all three U.S. bestsellers — Alco's DL-640, EMD's GP30, and GE's U25B — as "no more than conventional advances on conventional existing locomotives; that is, they are near the top of the parabolic curve of conventional diesel-electric locomotive development, where each 1 percent of advance needs inordinate effort and expense."

Europe's "quick-running" diesel engines (i.e., rated at 1,400 rpm and up vs. a maximum of about 1,000 rpm here) and hydraulic final drives are, of course, what warm the editorial heart of Diesel Railway Traction. Accordingly, the magazine contends that the influence of the six Krauss-Maffei imports now riding the rosters of Rio Grande and Southern Pacific "can hardly be other than great," and granted, progress reports to date from the West coincide with, rather than contradict, this outlook.

The domestic diesel most vulnerable to the editorial barbs of Diesel Railway Traction is, hands down, the U25B, for whereas the competition's hoods are products of evolution predicated upon components used in earlier models, the General Electric machine was designed from scratch by people who possessed no obligations to the past. GE's Locomotive & Car Department at Erie, Pa., set out to build a "more powerful and yet simpler" unit than anything on the market, a locomotive so good that its economic pluses would be "easily demonstrable and readily appreciated by the railroads." Systems Engineer John C. Aydelott's design team established only two ground rules for their diesel: "It must not be simply a 'me too' locomotive. At the same time it would not incorporate changes merely for the sake of change." Thus in full knowledge of European trends and with no commitments to existing American practice, Aydelott assembled what at first blush seems to be orthodoxy itself, only more powerful — a "simpler" rather than a complex unit in its physical layout and one devoid of either a nonelectric drive or a "quick-running" engine. If U.S. diesel-electrics, per se, are essentially obsolescent, then so is the U25B. But if the U.S. unit (a four-axle, four-motor hood powered by a single, sturdy if slow-speed engine) is valid, then the U25B may be its best example to date.

Take it off

The U25B's clean lines, free of protruding grids, fans, or air intakes, reveal its planned inner simplicity, for assuming power output would equal or surpass that



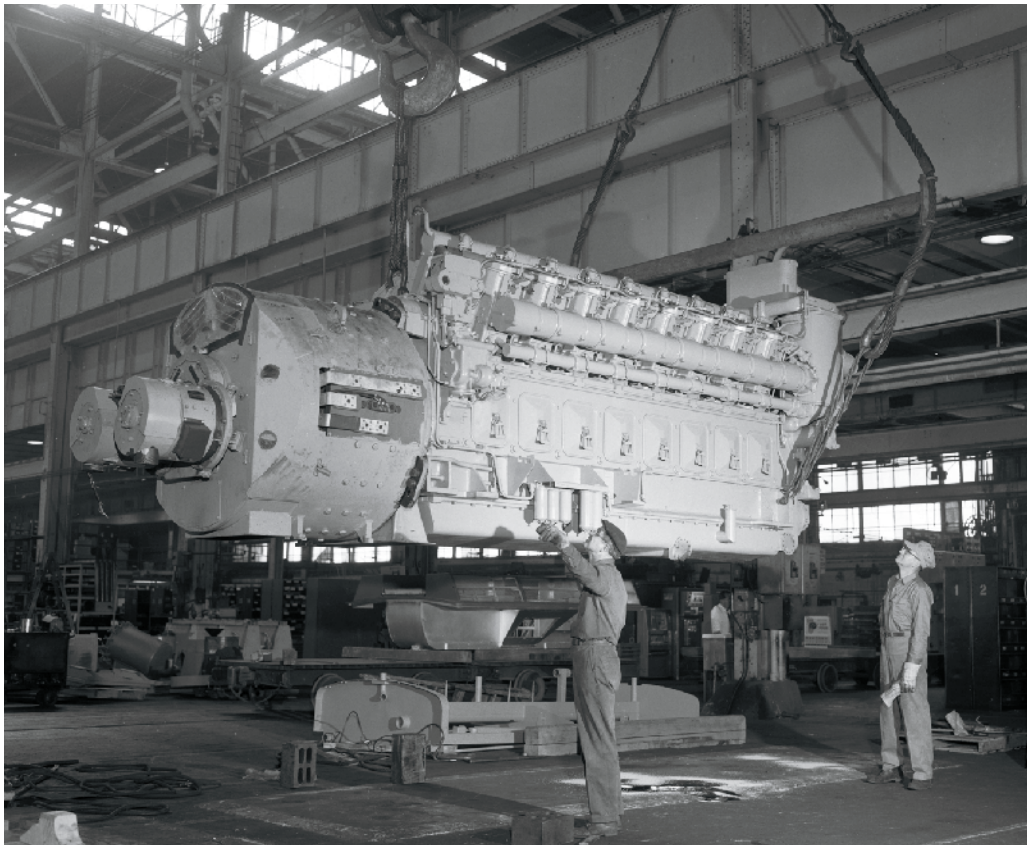
GE 753-series demos under construction in Building 10 share the shop floor at Erie with export diesels, UP gas turbine-electric No. 23, and a Pennsylvania Railroad E44 in late 1960. The four-unit set, GE 753-756, was later sold to the Frisco.

of rival makes, low maintenance was the locomotive's prime design consideration. In 1959, for instance, it cost Class I railroads $1.4 billion in operating expense to run their locomotives. Of that amount, 28.7 percent was accounted for by repairs; 27 percent by crews; and 23.9 percent by fuel. All other items were comparatively minor, ranging from depreciation (11.1 percent) to water (0.3 percent). To backstop the implication of these figures, GE hired a railroad mechanical officer to ask 33 major roads what they thought of their diesels and he got an earful of what chief mechanical engineers did not like (anything that broke down or needed excessive maintenance). So once more the old dictum was verified: "If you can't prove it's essential, take it off; if it isn't on there, it can't fail." That, in turn, led to some interesting conclusions:

Keep it simple

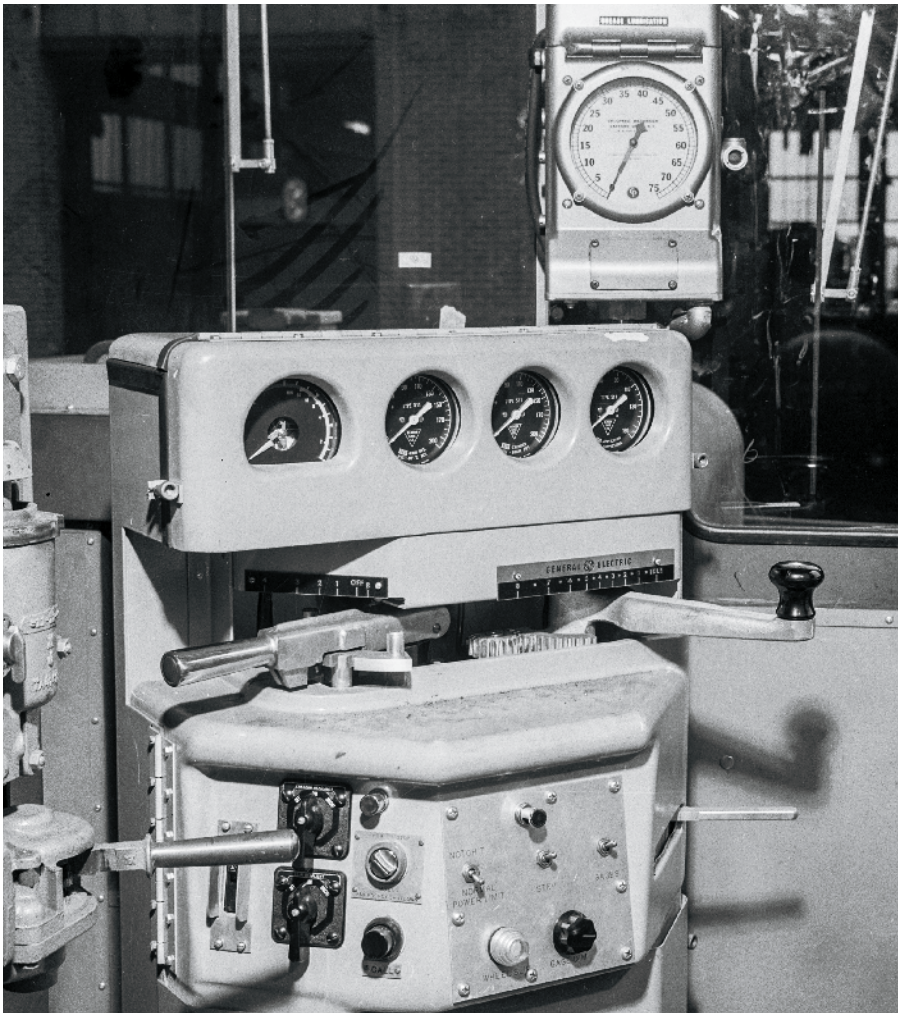
The more complex a design, the more specialized must be the training of maintenance personnel; yet a high turnover of maintainers is a fact of life for many roads. Therefore, if a design is simple, it's understandable — even to a new man.

Simplicity can sometimes be achieved only at the expense of greater fuel consumption. But "fuel expense is clean-cut; that is all there is to it," reasoned GE,



Workers in Building 10 prepare a new FDL16 engine and main generator for installation in one of the 753-series U25B demonstrators in late 1960.

Still in primer paint, GE 2501, the first low-nose U25B, poses beside GE 752, one of the two original U25B demonstrators, at Erie in August 1961.



Traction-style throttle on the utilitarian control stand of GE 2501 gave a nod to the builder's roots. Production models received a more conventional version.

whereas "while a locomotive is being maintained it is neither making mileage nor producing revenue and there is the recurrent expense of training men to maintain it. Capital charges continue while the locomotive is out of service. Furthermore, a device that requires maintenance may cause road delays and other intangible expense never allocated to the part in question." Lesson: keep it simple.

To illustrate: air supply. Locomotives gulp in huge volumes of air — for engine combustion, for generator and traction-motor cooling, for cab comfort. It should be dry, clean air. Which, until the U25B, led the designer into a vicious circle ending in inevitable compromise. Ordinary filters require removal and cleaning every 2,500 miles or so; each blower must have its own motor or be driven by shafts, belts, or pulleys; and engines themselves foul the air supply with their oil fumes, exhaust, and heat. All this adds up to dirt or maintenance, which spells expenses either way. Confronted by this age-old dilemma, GE's engineers first joked, "We'll have to design the air system first and then build the locomotive around it," and then took themselves seriously. To suck in air and propel it under pressure to ventilation outlets, an axial-flow blower, engine-driven off the same gear box as the twin radiator fans which flank it, was mounted at the rear of the locomotive directly above a primary air cleaner. The cleaner is a rectangular box infested with 2-inch-diameter plastic tubes — 1,470 of 'em — working on the principle of centrifugal force. Incoming air swirls into the center of the tube; 99 percent of all dirt particles larger than 8 microns in diameter are forced out one end; cleaned air goes out the other. (A micron is a unit of length about 0.000039 inch.) Though such cleaners are expensive to build, they are self-cleaning and require no maintenance. The cleaned air for cooling uses is then directed through a duct between the main sills of the locomotive's platform or frame. GE refers to it as "inviolate," for not a single pipe or wire runs in or out of it at any point; hence there is no opportunity for oil seepage or other contamination.

Thus ventilation air for main and auxiliary generators, traction motors, cab, and the control cabinet (mounted under the running board on the left-hand side and pressurized) for resistors, contactors, and relays completely bypasses the hot, oily atmosphere of the engineroom — and supplementary blowers and filters, cab-heat and defroster motors are obviated. This air supply system, so simple as to be ingenious, has been cited as the finest of several fresh design departures built into the U25B; it has won quick endorsement by the railroads, not to mention emulation in

Demonstrators 752 and 751 lead a northbound N&W coal train at Glen Jean, Ohio, on June 14, 1960. J. David Ingles

principle by a competitive maker.

The same start-from-scratch thinking shows up in the locomotive's engine cooling system. Here the problem was primarily one of cold weather. To begin with, a 16-cylinder engine requires about 220 gallons of cooling water; heat transfer takes place in radiators over which air is blown by adjacent fans. A hot day and a wide-open throttle create what designers refer to as "maximum heat-transfer requirements," but when the engine is idling on a February night it may require only 2 percent of its total cooling capacity. Summer, then, requires large shutter areas and numerous radiator fans; but on a zero day these shutters must be mechanically closed up tight and fan motors must slow or stop. An automobile, on the other hand, sidesteps such complexity by recirculating all or part of the water in the warm engine, and antifreeze allows cold water to remain in the radiator. This would work on a locomotive if a railroad could afford the Prestone. What GE decided to do in essence was to imitate the automobile (i.e., to control the water flow through the radiator rather than the air flow). The problem of freeze-up was resolved by use of a radiator with self-draining tubes. A combination of temperature-sensitive and pressure-operated valves automatically determines, on the basis of outside weather and engine heat, whether the cooling water should be recirculated through the radiator or not — or only partially. If these valves dictate that the radiator should be completely bypassed — say, under winter idling conditions — then its tubes are drained into an inner tank. Thus shutters and variable-speed fans as well as their associated controls and motors were dispensed with. And winterization became "inherently basic."

The heart of the U25B is the largest and most powerful diesel engine in active railroad service today, here or abroad. The FDL-16 is a four-cycle, 16-cylinder (each of 9-inch bore and 10½-inch stroke), 45-degree V, 1,000-maximum-rpm power plant of 2,500-hp input to the generator. It is the end result of search and research, for GE checked 46 locomotive-size American and European engines (including those "quick-running" Germans) before making up its mind, then revised virtually everything but the basic concept of the engine it did select before introducing it to the U25B.

Briefly, a V-type design was selected for its excellent maintenance accessibility and space utilization characteristics; and a 9-inch bore creates the biggest V-configuration engine that can be accommodated within the 6-foot-wide hood of a road-switcher. Sixteen, in turn, was the maximum number of cylinders that could be coupled to one crankshaft without risking

torsional stress problems.

So far as foreign "quick-running" engines went, their higher rpm did not compensate for their smaller bore and stroke, hence the required locomotive horsepower couldn't be produced off a single crankshaft. Electric transmissions favor single-engine units. Moreover, GE felt that the ratings of the overseas engines were optimistic, being based upon European rather than American field conditions; and sturdiness was questioned.

Calling Cooper-Bessemer

The fundamental concept which sired the FDL-16 was drawn up by Cooper-Bessemer in the early 1940s, and at the end of World War II development had reached the point where a six-cylinder inline version could be placed in a GE export locomotive. The Erie Works people deemed the engine "fairly satisfactory" in operation but too expensive and heavy to be competitive with other makes — and there the matter stood until 1953, when Alco-GE quietly dissolved their hyphenated partnership. At that point it became imperative for GE to obtain rights to and to develop an engine if the builder expected to enter a line of standardized units in the expanding world market. Of all the two- and four-cycle engines studied, the CB appeared to have the "greatest potential" for high-horsepower application; in particular, GE liked its "iron pistons, large bearing areas, good breathing, and general sturdiness" as well as the existence of a V-8 design. So contractual arrangements were concluded and in early 1954 the Erie Works assembled a rolling lab, No. 750. Of its four cab units, two were powered by V-8s and two by V-12s. These engines, refined on the basis of laboratory and field tests, were installed in GE's Universal-series of standardized export diesels introduced in 1956.

Ready for the road, GE 2501-2504 pose at Erie for the company photographer.

Meanwhile, back at the factory, General Electric had built its own engine test lab at Erie in 1955. On the basis of V-8 tests, a V-16 design was begun in 1956; the first model of it was available for test by July 1958; and the first locomotive to mount one — U25B prototype No. 751 — was cranked up in May 1959. Supported by all this experimentation, the first production-model V-16 was completed and placed on test in September 1960, then installed in demonstrator No. 753.

"Any major undertaking of this scope must necessarily exact the blood, sweat, and tears of many people," says GE's engine specialist W.W. Peters, yet there's no denying the conviction around Erie that the company thinks the effort was worthwhile. On lab tests of extended duration the engineers have pushed the FDL-16 up to 25-to-30 percent above its present 2,500-hp commercial rating without harm. They like their engine's integral head-and-cylinder assembly, too. They say a railroad shop can change out such a cylinder assembly in 2 hours and that in Erie it has been done in 30 minutes

An A-B-B-A "rolling laboratory" turned out in 1954 as Erie Railroad 750A-750D set GE's road locomotive project in motion.

flat from the time the stop button was pushed until cooling water was back in the engine and it was running again. They like the rapid acceleration and freedom from smoke afforded by the eight exhaust pipes to the turbocharger (one pipe for each pair of cylinders); and they say the FDL-16's lube-oil consumption — less than 1 percent of fuel — is "par for the course." As for economy, the engine operates under full-load conditions at less than 0.360 pounds per brake horsepower hour when burning oil of 19,300 btu or higher heating value — another figure which requires no apology to the competition. And she'll burn residual fuel under conditions of acceptable combustion and tolerable smoke if you'll accept some increase in maintenance costs. In short: a big, robust, but efficient diesel which, if the market requires, can be uprated without forcing customers to change out their parts inventory.

U is for universal

The configuration of the U25B (which stands for Universal 2,500 hp B-B) is original with GE and appears to have virtually blanked further sales of the once-popular high-horsepower six-motor C-C. The thinking at Erie goes like this: In view of their weight on drivers, diesels of four-axle, two-truck (or B-B) wheel arrangement in the 120-to-130-ton range have been underpowered. Why drag around the useless dead weight of a C-C when a B-B is all that's needed? Obviously the six-motor unit has the advantage in tractive effort in slow drag freight operation, yet it exerts no more tractive effort than a four-motor unit of equal horsepower at any speed over 16 mph. The old question of adhesion (how to use the horsepower of a C-C in a B-B without excessive wheel slip) was resolved by a belief in and action upon what is known as the "slippery spot concept of adhesion." That is, when a driving wheel begins to slip and can't recover normal traction for a prolonged distance, it is not necessarily because the rail is slippery for that length but rather because the spinning wheel is developing only a tiny adhesive value (i.e., it can't slow down). Indeed, it may be picking up a film of oil from rail or wheel rim, which further inhibits its recovery. Answer: Mount a small alternator on each axle, which can detect a practical change in axle rpm corresponding to, say, 4 or 5 mph; that detection, in turn, actuates a "slip-suppressing brake" — an automatic, light, quick (within 3 seconds) application of the regular brakes on the unit on which the slip occurs; meanwhile, the engine continues to deliver full power. Result: The unit recovers its feet and the brake application further serves to clean any film off the rim of the slip-prone wheel.

Having settled on a 130-ton B-B layout for its U25B, General Electric decided to concentrate all its road research on that one size and model rather than to spread its developmental efforts less effectively across a wider catalog. The builder is convinced that the specialization perhaps necessary to eradicate steam power is dead and that the market is now focused upon high-horsepower locomotives, which can effect significant unit reductions in moving heavy trains faster. Which leads to the 2,500-hp U25Bs operating in multiples up to a total multiple-unit output of 10,000 hp or more.

In service, the U25B demonstrators have now been at large long enough to acquire some meaningful statistics. On grades, for example, a four-unit, 10,000-hp team has registered these performances:

— On 1 percent compensated, 3,952 tons moved at 31 mph.

— On 1 percent again, 5,762 tons (109 cars) moved at 22 mph.

Making one of their first revenue runs, U25B demos 756, 753, and 754 work a freight on the Pennsylvania Railroad south of Erie, Pa., in February 1961.

— Also on 1 percent, 9,200 tons (144 loads, 12 empties) moved at 14.5 mph.

— On 1.42 percent, 5,258 tons (116 cars) moved at 18 mph.

— Again on 1.42 percent, 5,614 tons (128 cars) moved at 16 mph.

— On 2.2 percent, 3,950 tons (82 cars) moved at 15 mph.

On dry rail in the West, the U25Bs have recorded adhesions of as high as 24-25 percent at speeds from 11.5 to 12 mph. They started a 3,950-ton train on 2.2 percent without any wheel-slip indication and achieved 10 mph within 4 minutes under full throttle.

On demonstration, a single U25B unit started a 2,500-ton train out of a yard on a 1 percent grade, maintaining 30 percent adhesion for 5 minutes with some mechanical sanding.

On a 110-car, 11,900-ton ore train, three U25Bs totaling 7,500 hp held 19 mph on an average grade of 0.45 percent, whereas the train would have required four of the road's 1,750-hp units and speed on the grade would have been 11 mph.

As one would expect of any original piece of engineering, the U25B has experienced its full measure of teething problems, for no lab test can quite duplicate prolonged 50-mph running across a dusty desert at, say, a 120-degree roadbed temperature, or the throttle hand of an impatient engineer moving big tonnage out of a yard on frosty 1 percent. Yet the performance consensus is that the locomotive puts out its advertised 2,500 hp and that not only are its engine and electric transmission unequaled in capacity now but they have a substantial margin for future growth.

There is no use in pretending, to be sure, that General Electric has anything but an upgrade fight to stake out an appreciable share of the market for the U25B.

First, GE is new in the domestic road-diesel field. Although 5,000 power assemblies (cylinder, rod, valves, and so forth) are at work in Universal-model export units overseas from South America to South Africa, the U25B's FDL-16 engine remains fresh to U.S. roads and hence

Tracing the Colorado River through Glenwood Canyon, GE 2501-2504 and DRG&W dynamometer car No. 10 work an eastbound freight near Shoshone, Colo., in spring 1962. Rio Grande gave the U25B a pass.

carries with it implication of new parts inventory, maintenance procedures, personnel orientation. Similarly, U.S. roads possess no historic knowledge of the FDL-16's long-term repair cost or fuel consumption. Until the U25B, GE was a supplier of traction motors, generators, and electrical control gear, primarily to Alco, and was a builder only in terms of such specialties as straight electrics, turbines, export motive power, and smaller industrial and shortline diesels. Aware of this image, the Erie design team has kept the design of the U25B as unsophisticated as possible — using, for example, stock railroad storeroom hardware for all expendable parts — but nevertheless first-class salesmanship is mandatory, supported by in-depth field service.

Second, in the midst of a market dominated by trade-in thinking, the U25B is without an ancestor. Yet to remain competitive, GE must offer an allowance on other makes which, aside from trucks equipped with GE motors and certain GE electrical components, offer little but their weight in scrap prices.

All this totals up to the penalty paid by the pioneer. If comparatively few U25Bs have been sold to date when gauged by the success accorded Electro-Motive's GP30, then at least General Electric has signed up a cosmopolitan corps and attained the foot-in-the-door milepost. If and when these original buyers place substantial U25B repeat orders we will have an opportunity to put General Electric's unique design effort in perspective. Bear in mind that upon occasion the men at Erie have waxed eloquent about an "advancing technology [which] may someday produce diesel-electrics of 4,000 or even greater horsepower per four-axle unit." If so, the U25B will be found in their family tree. ℐ

U25B epilogue

by Greg McDonnell

General Electric had sold just 60 U25Bs when Kalmbach pressmen set the type for David P. Morgan's "A Locomotive is Born" in the September 1962 issue of TRAINS. The U25B, GE's bold entry into the domestic road locomotive market, was a big deal, if not yet a big seller. At the vanguard of electric, diesel-electric, and gas turbine-electric traction propulsion since the construction of its first locomotive (a 30-ton steeple-cab electric in 1893), GE was nevertheless considered a newcomer in the matter of diesel road power when the U25B was formally introduced in 1960. "There is no use in pretending, to be sure, that General Electric has anything but an upgrade fight to stake out an appreciable share of the market for the U25B," Morgan wrote.

GE was persistent. Even as the September '62 issue hit the newsstands, a third quartet of U25B demonstrators was under construction at Erie, Pa. New and repeat orders were rolling in. GE added the six-motor U25C to the line-up in 1963.

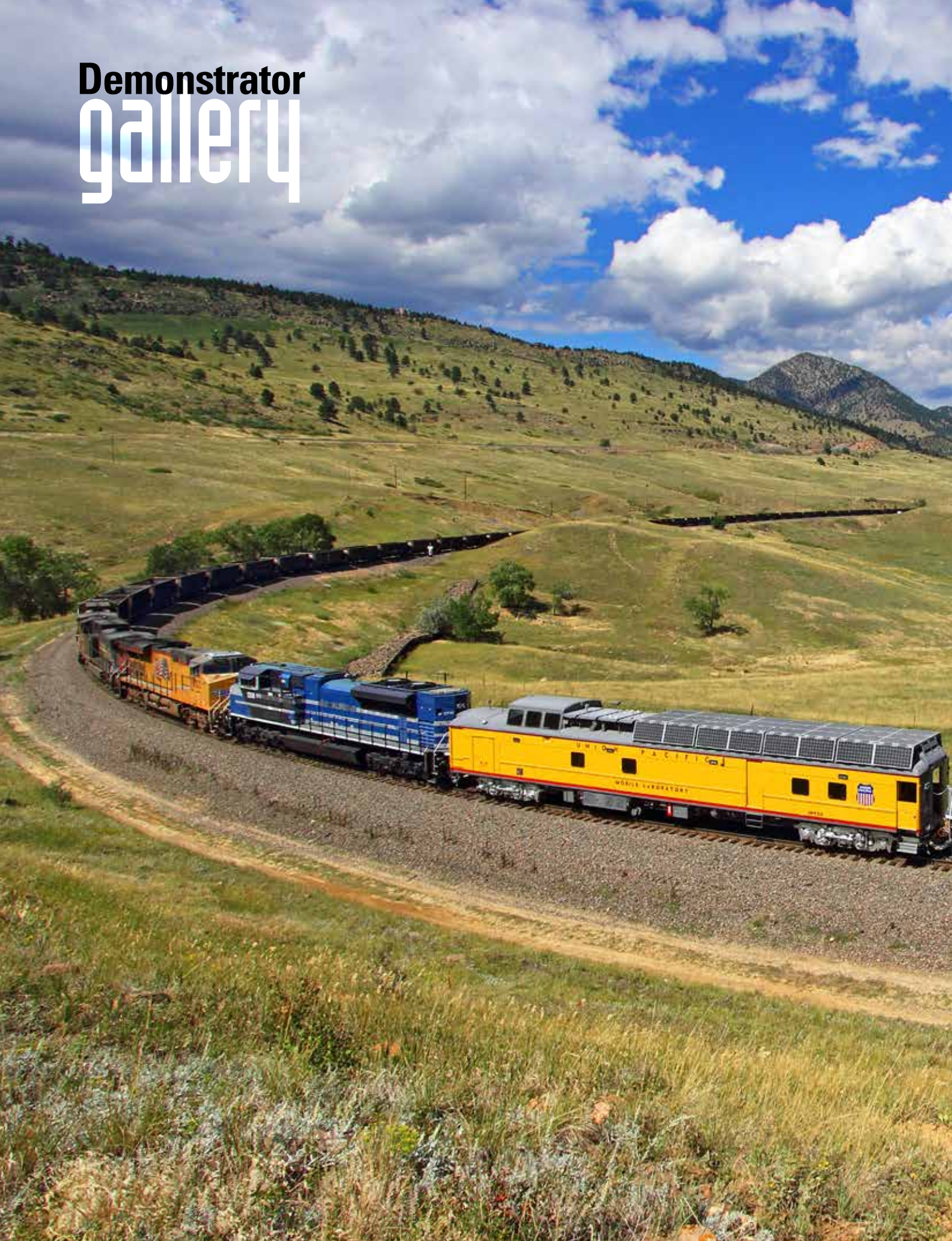
Ultimately, a total of 478 U25Bs rolled off GE's Erie assembly line in a production run that lasted from April 1959 to February 1966. GE prototype/demonstrators 751 and 752, originally designated as XP24s, were never sold, but 16 railroads purchased U25Bs: New York Central (70), Southern Pacific (68), Pennsylvania (59), Rock Island (39), Chesapeake & Ohio (38), Frisco (32), Erie Lackawanna (27), Louisville & Nashville (27), New Haven (26), Great Northern (24), Santa Fe (16), Union Pacific (16), Wabash (15), Milwaukee (12), and Burlington (6). Norfolk & Western made the customer list by default with a single wreck replacement for Wabash 512, destroyed in a head-on collision at Hannibal, Mo., just before the merger with N&W.

Electro-Motive's successive competing models outsold the U25B several times over during its 1959-66 production period. While Erie celebrated small victories, EMD sold 2,456 Geeps: 260 GP20s, 946 GP30s (including 40 cab-less GP30Bs), and 1,250 GP35s. Outperformed and outsold, the U25B was far from perfect, as author Blair Kooistra notes on pages 88-97. But it was good enough to give GE a toehold on the market and set the Erie builder on a course to the top.

Just 30 years after the U25B made its debut, the groundbreaking model was history. Built in summer 1964 as L&N 1616, CSXT 3416 became the last U25B to operate in revenue service, making its final run on train R409 into Waycross, Ga., on April 1, 1989. Happily, the history-making U25B is one of seven in existence. Privately owned L&N 1616 is stored and awaiting restoration at the Southern Appalachia Railway Museum in Oak Ridge, Tenn. Two New York Central U25Bs survive: class engine No. 2500 at the Lake Shore Railway Museum in North East, Pa., and 2510, among several locomotives sitting derelict on an overgrown siding near Glenmont, N.Y. The Railroad Museum of New England has New Haven 2525 in its collection at Thomaston, Conn. A pair of Milwaukee Road U25Bs are preserved: No. 5056 at the Illinois Railway Museum in Union, Ill., and No. 5057, awaiting cosmetic restoration and installation at the South Cle Elum Rail Yard National Historic District in South Cle Elum, Wash. Currently the sole U25B in operating condition, SP 3100 (built in March 1963 as SP 6708) is preserved and regularly operated at the Orange Empire Railway Museum in Perris, Calif. ▮

SP 3100, currently the sole U25B in operating condition, is a regular performer at the Orange Empire Railway Museum in Perris, Calif. Greg McDonnell

Demonstrator gallery



Bracketing Union Pacific mobile laboratory car UPP 210, Electro-Motive Diesel SD70ACe demonstrators Nos. 1206 and 1208 conduct high-adhesion tests with a westbound West Elk Mine coal empty leaving Rocky, Colo., on UP's Moffat Tunnel Subdivision on Aug. 26, 2013.
Mike Danneman

1 Electro-Motive Division SD45 demos roll Erie Lackawanna train NE-3 through Johnson City, N.Y., on May 22, 1966. J.J. Young Jr. **2 Alco's pre-FA "Black Maria" A-B-A test beds 1500-ABC pose with New Haven Railroad 4-6-2 No. 1384 at New Bedford, Mass., in 1945.** Norton D. Clark **3 Alco Century 628 demonstrators Nos. 628-1 through 628-4 pass faded New York Central RS3s at Hoffmans, N.Y., on May 19, 1964.** Warren F. Hockaday **4 Spliced by Alco's dynamometer car, C430 demonstrators lead D&H train BM-2 at Burnt Hills, N.Y., on May 5, 1967.** Jim Shaughnessy **5 EMD's A-B-B-A F3 demonstrator set No. 291 passes the Burlington depot at Somonauk, Ill., with a 120-car freight on Sept. 21, 1945.** L.E. Griffith, J.C. Seacrest collection **6 Fairbanks-Morse Train Master demos TM-4 and TM-3 roll ore jennies past the interlocking tower at State Line, Wis., in June 1953.** Norton D. Clark **7 An eastbound freight led by three NYC FAs and an RS3 waits its turn at the fuel rack as GE U25Bs Nos. 755, 756, and 754 lead hot Flexivan train SV-2 into Collinwood, Ohio, on Oct. 31, 1965.** Paul Maximuke


1500

2


NEW YORK CENTRAL
628-1
ALCO

3


430-2
430-2
ALCO

4


GM

5


STATLINE

6

7


U25B
755
1036

An EMD test set led by SD45X 5740 rests at the eastern continental divide in Ridgecrest, N.C., on May 23, 1981. Testing wheelslip control on Southern Railway's steep grade between here and Old Fort, N.C., in the loops section where grades run up to 2.2 percent, the set ran up and down the mountain for several weeks. Jim Wrinn

Working an eastbound freight on Indiana Harbor Belt trackage, SOO Line SD40-2s 769 and 758 pass EMD GP60 demos Nos. 5, 6, and 7 at Dolton, Ill., on Sept. 19, 1987. Greg McDonnell

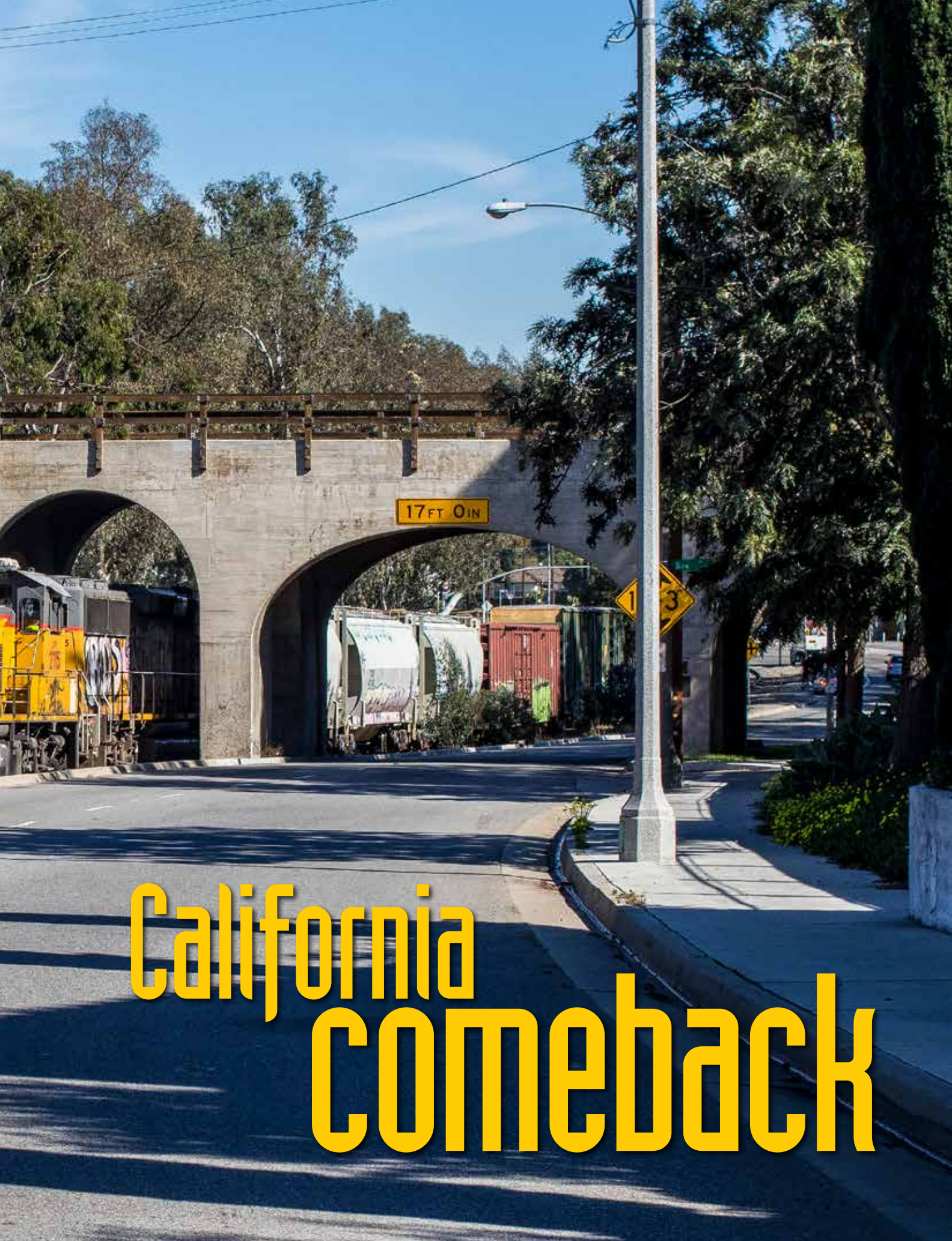
Carrying crisp white flags bearing the Santa Fe Railway emblem, EMD SD60 demonstrators Nos. 1, 2, and 3 stand ready to depart Hobart Yard in Vernon, Calif., with an eastbound AT&SF intermodal train in July 1985. David Lustig

At sunset, EMD SD70ACeP4-T4s Nos. 1604 and 1603 lead BNSF Railway's Northtown (Minneapolis)-to-Superior, Wis., train north at Brook Park, Minn., on BNSF's Hinckley Subdivision, Oct. 10, 2016. Steve Glischinski

On July 23, 2016, GE ET44AC 2033, BNSF Railway ES44C4 8005, and ES44DC 7560, lead eastbound CSX ethanol train K144 just east of Fairport, N.Y., on the former New York Central "Water Level Route." Pete Swanson

EMD SD70ACe-T4s Nos. 1607 and 1608 lead Norfolk Southern train 56W over the Mayo River near Stoneville, N.C., Feb. 28, 2017. Its 80 cars of corn are bound for a corn-processing plant in Winston-Salem, N.C. Trey Belton

Deep in former Pacific Electric territory in Torrance, Calif., UP local LOW10, with a pair of GP60s and genset UPY 2715, ducks beneath the PE viaduct spanning Torrance Boulevard. Charles Freericks



California comeback

Working local LOW20 through Hawthorne, Calif., on Jan. 31, 2018, SD70M 3816 crosses Eucalyptus Avenue, guarded by a rare (and since removed) Magnetic Flagman wigwag signal. A handful of these survive elsewhere in Southern California.

UP's gensets give way to aging EMD Geeps and SDs

Story and photos by Charles Freericks

Everything old is new again on Union Pacific's Southern California locals as genset ubiquity is chipped away. Recently, a fleet of 30-to-45-year-old EMD workhorses, including GP60s, SD60s, SD59MXs, SD60Ms, and even some 20-year-old SD70Ms have taken the place of decade-old low-emission gensets.

This is a big change for local Los Angeles railroading. Although Union Pacific was not the only company to utilize the genset (Amtrak, BNSF Railway, GATX, Metro-Ports, Pacific Harbor Line, and Savage also have Southern California gensets in service), UP's fleet was the biggest by far with 64 from National Railway Equipment (including one center-cab GS14B and 63 road-switcher 3GS21Bs). This did not include the RailPower gensets that UP used in other parts of the country.

Even from the initial invasion, not every UP local used gensets. The locomotives were underpowered for jobs that handled heavy tonnage or worked significant grades. Thus all of UP's Gemco jobs, based in Van Nuys and Oxnard, continued to use GP38-2s and GP40-2s, which could pull without too much effort. In the flats of the LA Basin and the Inland Empire, the genset ruled for a decade, handling the majority of UP's approximately 70 local and switch jobs. Crews were never enamored of the slow and balky units, a situation made worse by locomotive graffiti tagging while parked overnight in unprotected areas.

The first gensets to be pulled from service were UPY 2005 (the GS14B prototype) and UPY 2732 in 2015. By 2017, the exodus had begun to speed up. Although UP has not said why it's sidelining its gensets or if they are being stored or retired, it is notable that their 10-year service contract has expired.

One of the first jobs to make the switch away from gensets was Union Pacific's Torrance Local. This job, which dates back to Pacific Electric days, comes on duty in the early morning in LA's 4th Street Yard and services a Conoco refinery, a chemical company, and USG, among others. Before the change, the Torrance Local had been running with three, four, and even six gensets to ensure the train made its day. Now a pair of middle-aged GP60s handles the work easily and makes life more pleasant for the operating crews.

The Torrance Local's yard sister, the El Segundo Local, which services Chevron's refinery and the huge Grain Craft elevator (among others), shed its gensets for whatever big six-axle power is available in the Los Angeles Transportation Center yard that day. The most common lash-up is an SD60M/SD70M mix, but standard-cab SD60s are not unusual.

These power sets are also the switchers and east-running local power at LATC yard, including the Aurant Switch that services D&S Ingredient Transfer in El Sereno with huge cuts of corn syrup tanks daily.

A long way from their glory days working cross-country intermodals and manifests, SD70M 4017, a pair of SD60Ms, and an SD59MX lead a short LOW20 through El Segundo, Calif., on Jan. 11, 2018.

As of spring 2018, gensets still dominated Union Pacific locals based out of Spence Street in Commerce, the Buena Park and Anaheim-based locals in Orange County, the cluster of jobs out of City of Industry, and the locals that work out of Mead Yard in Long Beach. There are exceptions — for example Mead Yard's Paramount Switcher, which heads north on the old San Pedro Sub to Paramount now uses SD60Ms or SD70Ms on Saturdays. And in the City of Industry, an EMD24B, a Progress Rail rebuild of an older Geep, has been testing for the past few months. It is the same EMD24B that Pacific Harbor Line has been considering as a possible replacement for its gensets.

Los Nietos Yard, home to the Patata Local that works the heavily industrialized town of South Gate, now operates with a single GP60 to do the work that used to take multiple gensets. While the rest of the Los Nietos jobs still have gensets, a GP15-1 has been added to the mix.

And way out east, in Mira Loma, the iconic Crestmore Local that climbs the hills behind Rubidoux now draws either a pair of SD60s or an SD60/SD60M mix.

Meanwhile, BNSF, which got into the Southern California genset business later than UP, and with a far smaller fleet, has no apparent plan to retire the engines yet. Interestingly, BNSF found its gensets to be unsuitable for one of their initial assignments, working the First Watson to Chevron in El Segundo, due to the grade. BNSF currently prefers to team its gensets with GP60s and GP60Ms, but you will still find them running in pairs on Hobart Yard baretable jobs.

If you are a fan of these unusual locomotives, time may be running out to capture them in their natural Southern California habitat. However, if you're a fan of old EMDs, your time is coming as 645s (and some intrusive 710s) make a comeback.

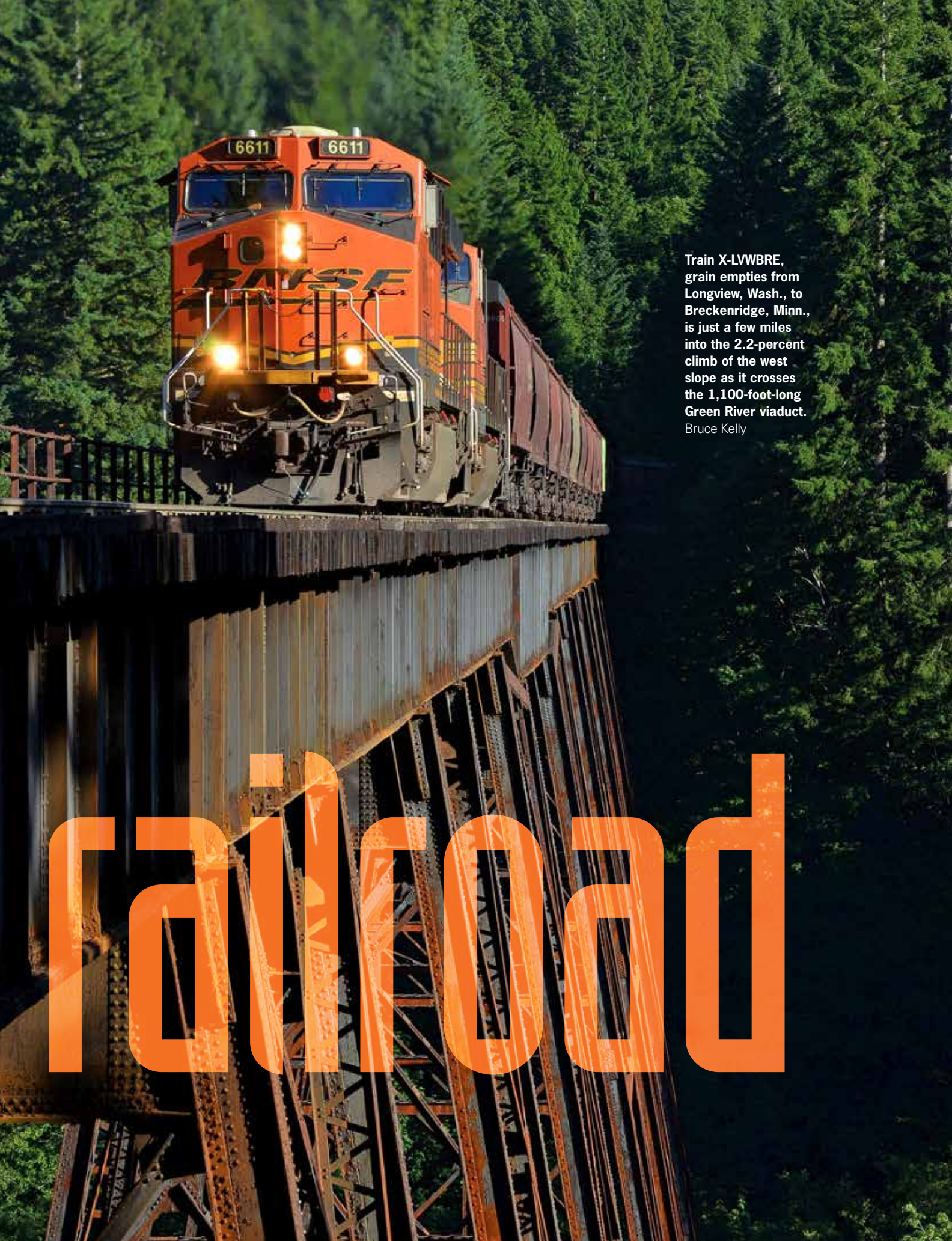
UP 2197 and 2166, a matched set of standard-cab SD60s, lead Crestmore local LOB33's lumber loads through Ormand, Calif., on Feb. 18, 2018.

H-EVEPAS, an Everett-to-Pasco manifest, crosses the Green River viaduct east of Lester with a three-model ES44C4, ES44DC, and Dash 9-44CW mix of GEs and a deadheading Savage SW1200 switcher bound for a new assignment in the Midwest. Sean Kelly

ONE-WAY » mountain

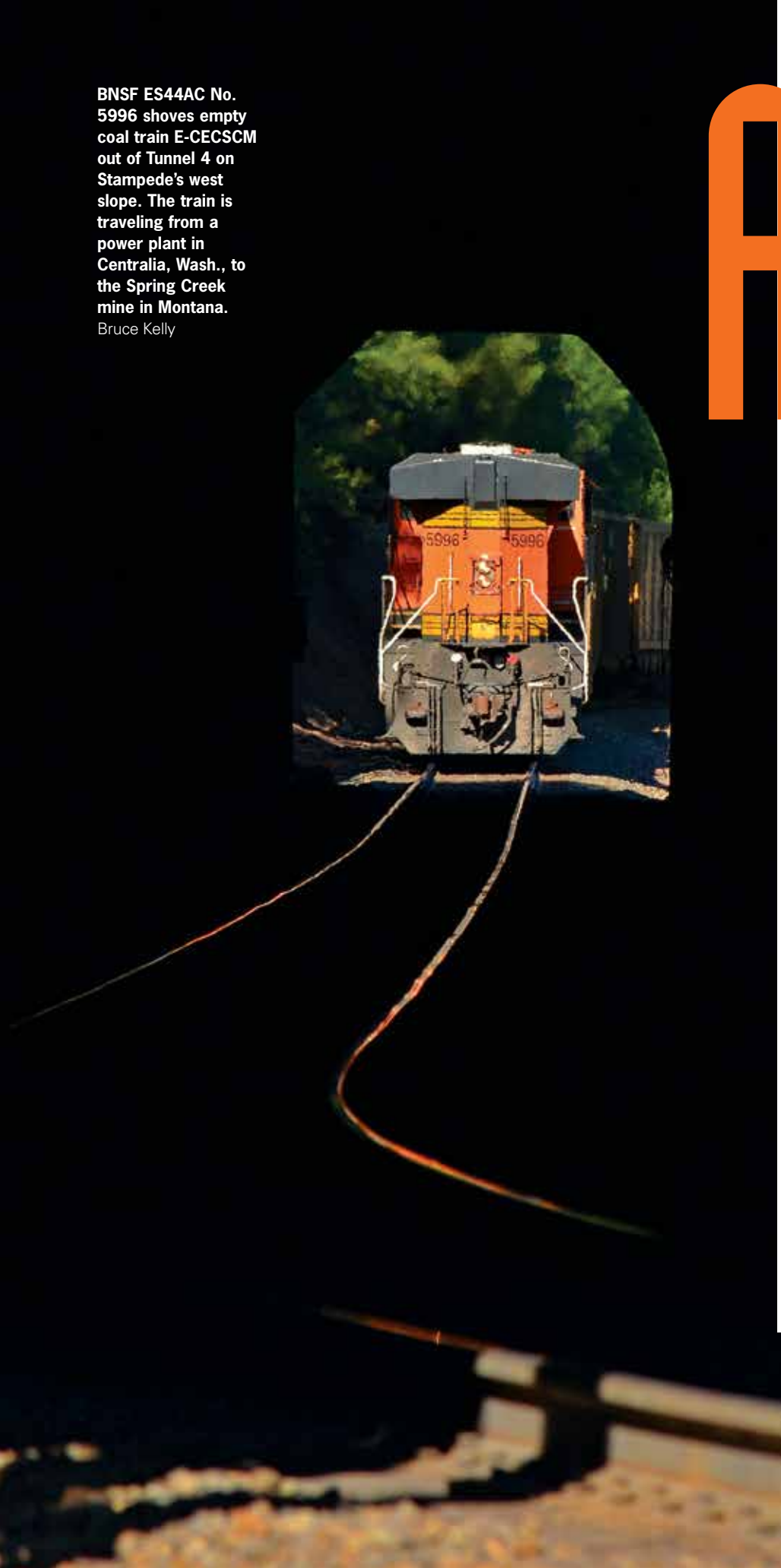
How BNSF got the bang for its buck on Stampede Pass

by Bruce Kelly



Train X-LVWBRE, grain empties from Longview, Wash., to Breckenridge, Minn., is just a few miles into the 2.2-percent climb of the west slope as it crosses the 1,100-foot-long Green River viaduct. Bruce Kelly

railroad



BNSF ES44AC No. 5996 shoves empty coal train E-CECSCM out of Tunnel 4 on Stampede's west slope. The train is traveling from a power plant in Centralia, Wash., to the Spring Creek mine in Montana. Bruce Kelly

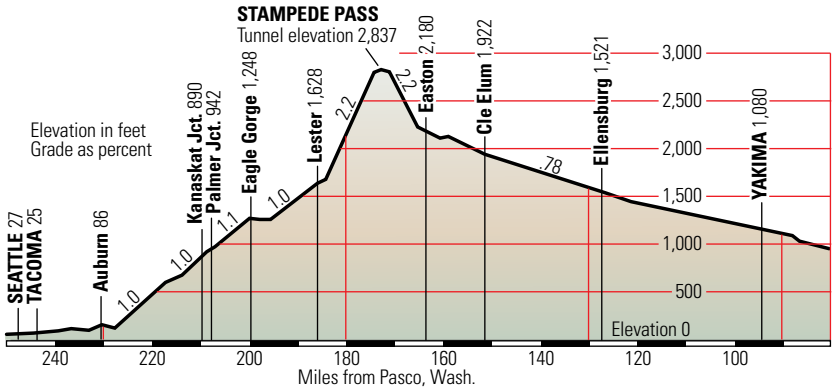
Ask certain officials at BNSF Railway what their company's biggest accomplishments have been over the past 20-plus years and one answer always seems to make the list: Rebuilding capacity that was discarded decades ago by predecessor Burlington Northern. After BN merged with Frisco in 1980, hundreds of miles of seemingly redundant main lines were either handed off to regional and shortline railroads or abandoned altogether. But when BN merged with Santa Fe in the mid-1990s, revenue ton-miles were increasing year after year, giving a new generation of railway executives ample incentive to grow the business, rather than dismantle it.

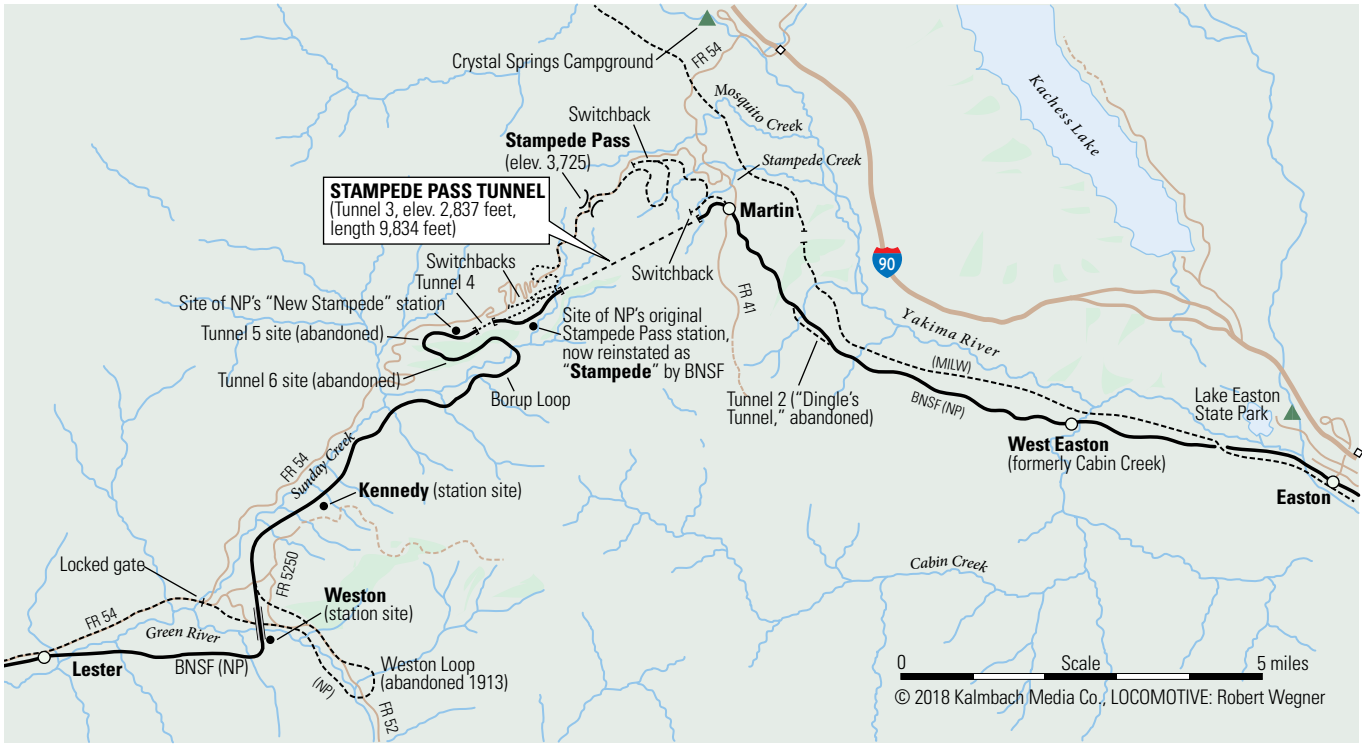
Among the earliest and boldest investments that BNSF made was the reopening of the former Northern Pacific main line over Stampede Pass in the Cascade Range of western Washington. BN closed Stampede to through traffic in 1983 and sold the eastern half of the route (Cle Elum to Kennewick, Wash.) to shortline Washington Central in 1986. The following year, BN removed track from the dormant Milwaukee Road main line over nearby Snoqualmie Pass, which BN acquired but never developed after the Milwaukee's 1980 demise.

BNSF announced the revival of Stampede Pass in an April 26, 1996, press release, saying that it planned to spend "about $125 million between now and 1999" to restore the 77.9-mile route between Auburn, Wash., and Cle Elum. On the pass itself, rusted rails and rotted ties were replaced by new track, and the 1.8-mile summit tunnel saw its interior lining repaired and new precast concrete snow sheds installed at both portals. The first revenue trains in more than a decade brought Stampede back to life in December 1996, but there would still be many months of ongoing improvement to track and other infrastructure across the entire 230-mile route between Auburn and Kennewick. Buying back 150 miles of main line from Washington Central added some $40 million to the total cost of a project that seemed as daring in its day as the original construction was some 110 years earlier.

A proving ground for power

Engineer Jack Christensen had the honor of running BNSF's first through train over the reopened Stampede. His trio of General Electric Dash 9-44CWs were a far cry from the Baldwin 4-6-2 helper he





hand-fired during his first trip up Stampede in 1944. With 2.2-percent grades on both sides, Stampede Pass demanded increasingly bigger power from NP: Baldwin 2-6-6-2s and 2-8-8-2s, then Alco 4-6-6-4s. Crews faced unbearable heat and smoke in the confines of Stampede Tunnel. NP eventually installed a ventilation system, and even considered purchasing cab-forward steam locomotives, similar to what Southern Pacific adopted for Donner Pass.

While the Great Northern and Milwaukee Road electrified their Cascade passes to alleviate smoke-filled tunnels and improve train performance, NP went directly from steam to diesels, with General Motors' Electro-Motive Division FTs taking charge of freight runs over Stampede in the 1940s. In its final years before the BN merger, Stampede's tonnage was in the care of powerhouses like SD45s and U25Cs.

Demoted to secondary status following the BN merger, Stampede became home to some of the last sets of F units operating in mainline duty. BN ended through service over the route in 1983, but the pass provided the perfect place to test some locomotive innovations. A trio of B32-8 demonstrators performed on Stampede in July 1984, their combination of four axles, advanced wheel-slip control, and fuel-efficient 12-cylinder engine influencing BN's lease of 100 B39-8s from GE a few years later. In September 1984, BN SDP45 No. 6599 — its trailing truck replaced by an articulated, self-steering four-axled truck — worked the twisting 2.2 percent of Stampede in EMD's bid to sell higher adhesion with reduced flange wear. There were no immediate takers.

Resurrected too soon?

During the late 1990s, Stampede Pass averaged less than a half-dozen trains per day. BNSF said the reconstructed route was performing its intended goal of easing congestion on its Stevens Pass and Columbia River routes. But some pundits wondered whether BNSF spent too much money on

Empty grain train X-LVWTMP exits the concrete snow shed guarding the east portal of Stampede Tunnel at Martin. The grade will soon sharpen to 2.2 percent on the descent to Easton. Bruce Kelly

what amounted to a gold-plated railroad carrying little traffic.

Early intentions of moving Puget Sound intermodal via Stampede gained the support of government and port officials. But while the restoration work was under way, BNSF suspended its plan to increase tunnel clearances for double-stacked containers, in order to avoid pushing the reopening into the next year. That decision, combined with Stampede's 2.2-percent grades, meant that BNSF's new third route to the Northwest coast would only be of practical use to manifests and empty unit trains.

In mid-2002, with as few as four trains per day, rumors swirled that BNSF would close Stampede temporarily, but nothing came of it. In fact, over the next few years, the route underwent tie and rail renewal at various locations, most notably between Ellensburg and Kennewick.

There were occasional detours of BNSF and even Union Pacific trains routed via Stampede due to track work or line closures elsewhere. But what really turned heads was the movement of loaded grain trains over Stampede during 2008 and 2009. These trips were mainly to test the potential for running high-tonnage traffic over the Cascade passes, but also to relieve pressure in the Columbia River Gorge. Manned helpers provided extra muscle for the climb from Easton to Stampede Tunnel and dynamic braking for the descent to Lester. BNSF found that the added expense in fuel and manpower, the diversion of locomotive resources, and the time spent adding and subtracting locomotives en route made the mountain way less efficient than the river way for hauling grain to Northwest ports.

Traffic over Stampede dwindled to as few as one or two trains per day in 2009. This time, rumors of a shutdown proved somewhat true. In September 2009, BNSF spokesman Gus Melonas said, "The Stampede Pass line remains active and is in service, however, due to economic conditions, activity has been scaled back." That activity amounted to locals only; through trains were rerouted to Stevens Pass and the Columbia Gorge.

Enter the Iron Triangle

By 2010, Stampede rebounded with upward of half a dozen trains per day. Aside from a couple of manifests running either direction, there were eastbound grain empties, plus occasional empty coal trains from either the Centralia, Wash., power plant or the Roberts Bank, B.C., export dock. The rise of crude by rail saw two to four oil trains per day coming to Northwest refineries and terminals, which produced an equal number of empty tank trains needing to get shuttled east, some via Stampede, others via Stevens or the Columbia Gorge.

All eyes were now on Stampede Pass. Several state-sponsored traffic studies recommended BNSF expand its use of Stampede in tandem with other routes; one study saying, "East-west capacity can be significantly increased by operating trains directionally on Stampede Pass (eastbound) and Stevens Pass (westbound). Single-direction traffic on each of the two routes has the effect of creating a double-track railroad."

In mid-2012, Stampede became a mostly eastbound railroad, but Stevens remained bidirectional. With the majority of the region's empty grain trains (and occasional empty coal or oil) running via Stampede, the Stevens Pass route would gain much-needed fluidity for its time-sensitive intermodals, and the longer but flatter route via the Columbia River Gorge would have less interference from empty unit trains traveling upstream against loaded grain, coal, oil, and merchandise trains moving west.

A new crew pool was established at Auburn with the intention of having personnel work in a three-trip cycle from there to Pasco, then west through the Columbia Gorge to Vancouver, then north to Auburn again. Someone called it the Iron Triangle, and the name stuck. Spokesman Melonas said, "The Triangle design could add additional traffic above current volumes that operate over Stampede." Activity on the eastbound-only Stampede has increased dramatically, from roughly eight trains per day in 2012 to as many as 18 trains per day during the 2017-18 autumn/winter rush.

A long way from 1887

Over the past year, most of Stampede's eastward parade has been empty unit trains, plus two or three daily manifests running from Everett or Tacoma to Pasco, as if to remind everyone what it's like to hoist revenue tonnage up and over the oldest mainline crossing of the Cascades. Most of the route from Auburn to Kennewick is dark (unsignaled) territory governed by track warrant, with dispatcher-controlled CTC signals and turnouts at key passing sidings. That's a notable change from the NP days of Automatic Block Signals, augmented by CTC over the pass itself.

BNSF had another $7.25 million in track upgrades set for 2018, with 9 miles of continuous welded rail replacing jointed rail between Toppenish and Yakima, and 4 miles of welded rail between Byron and Cle Elum. As for the possibility of enlarging tunnel clearances to allow stack trains over Stampede, BNSF will only say, "We add capacity as business conditions dictate."

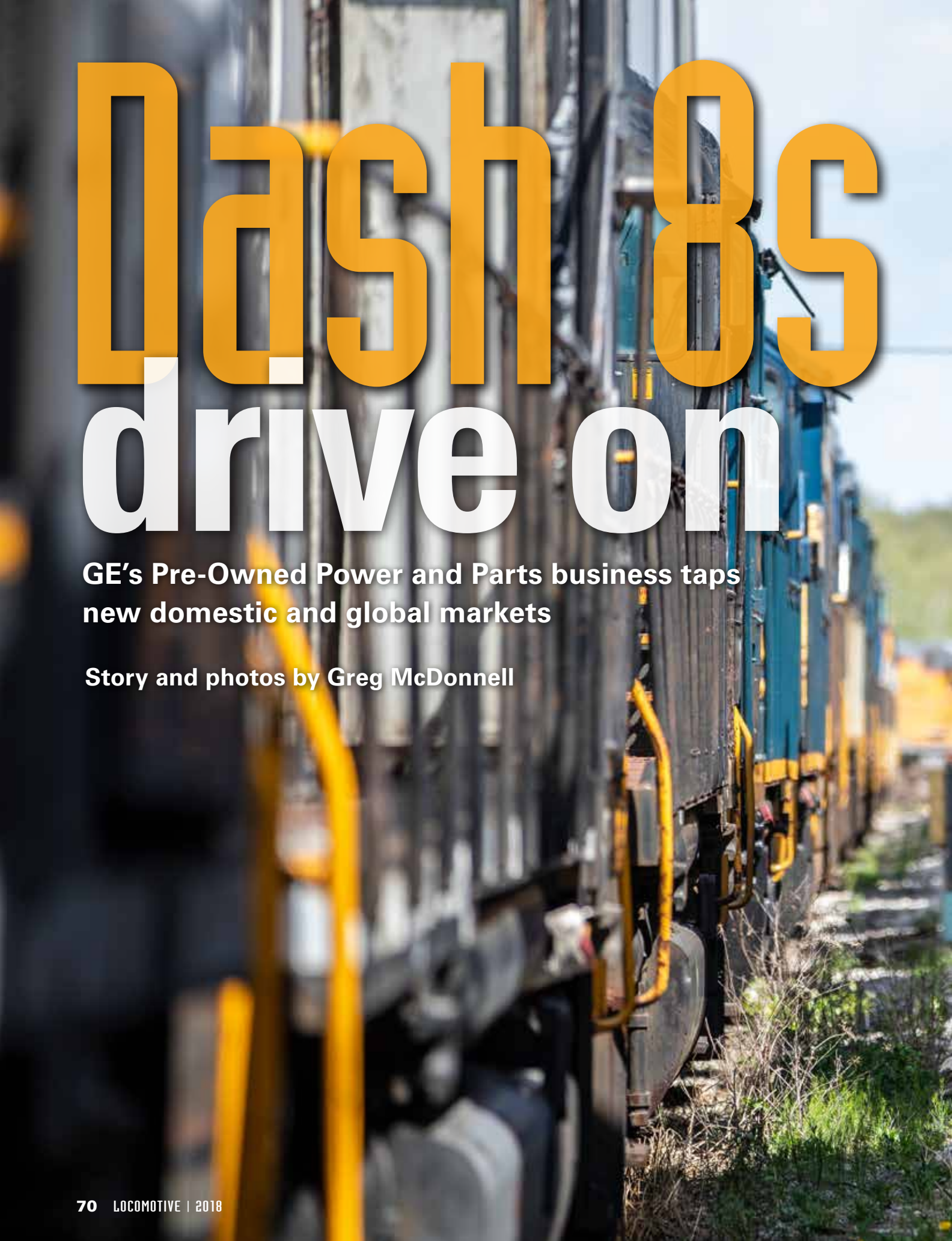
A crew of only two taking 110 empty cars over the Cascades with just two locomotives on the head end and one operating unmanned on the rear would have been science fiction to the hundreds of men who laid track across Stampede's 3,700-foot summit during 1886-87 on a temporary course of hairpin loops, switchbacks, and timber trestles. In 1888, completion of the 1.8-mile Stampede Tunnel lowered the summit to 2,837 feet. Reawakening the pass from its BN-induced dormancy has seemed like a more prolonged process than its original construction, but the effort has paid off for BNSF. The squeal of flanges resisting the zigzag of the Borup Loops, the pulse of diesel exhausts against snow sheds and tunnel ceilings, and the thunder of slack running in for the descent of the Cascade east slope are the sounds of life restored in full measure to a mountain railroad that was once considered gone for good. 1

Rounding the upper Borup Loop, empty grain train X-LVWTNS is moments from plunging into Tunnel 4. High-tension lines in the foreground deliver electricity from upper Columbia River dams to the population centers of western Washington. Sean Kelly

Dash 8s drive on

GE's Pre-Owned Power and Parts business taps new domestic and global markets

Story and photos by Greg McDonnell



They're a staggering sight. Lines of retired GE Dash 8 locomotives stretch as far as the eye can see, nearly 150 of them filling track after track in Larry's Truck Electric's Ohio Commerce Center, a redeveloped military storage depot in Lordstown, Ohio. Passersby — if they pay any heed at all — see little more than a conglomeration of sidelined locomotives notable only for their sheer number. GE's Joshua Salkeld and Jack Zhang see a wealth of potential in those same locomotives.

Salkeld, commercial leader – global aftermarket, and Zhang, product management leader – mods & USM with GE Transportation, lead the Pre-Owned Power and Parts business. Formed in 2016, it offers a fresh approach to smaller, nontraditional markets. Pre-Owned Power and Parts offers a full range of products, from modernized or reconditioned pre-owned locomotives to reconditioned or "OEM-certified" used parts and major components. It's "the first OEM-backed solution designed to meet the needs of short lines and regional railroads within the secondary market," notes Salkeld.

And that's where those lines of locomotives in Lordstown come in. During the recent downturn in Class I railroad traffic, GE purchased an estimated 700-plus retired Dash 8s — Dash 8-32Bs, Dash 8-40Bs, Dash 8-40Cs and Dash 8-40CWs, from CSX Transportation, Norfolk Southern, Union Pacific, and others — to serve as core locomotives and as parts donors for global programs. More than 250 of the Dash 8s have been dismantled and harvested for parts: engines and alternators, blowers, fans and control panels, trucks and traction motors. The better units have been retained and are available for rebuild, modernization, sale, lease, or other considerations.

While short-term leasing wasn't an intended part of the USM plan, the recent upswing in traffic and resultant power

GE technicians Derek Manley (above left) and Mike Anthony (above right) pore over former CSX 7640 at Lordstown, Ohio, preparing the Dash 8-40C for service in the GECX lease fleet. Parts? We've got parts. Traction motor and wheel set combos harvested from parted-out Dash 8s (above) fill the floor of a Lordstown warehouse. At left, rows of former NS, CSX and UP GEs in the yard at Lordstown, Ohio.

Throttle wide open (far left), former CSX Dash 8-40C 7640 performs a Notch 8 self-load test as it's readied for the road in GECX lease service. Vital statistics appear on the digital display panel in the cab (above), and on a weathered builder's plate (left) dated August 1990.

shortages on some railroads added another aspect to the business. Dozens of used Dash 8s in the GE inventory, many with GECX hastily stencilled on their flanks and a line painted through the identity of their former owners, have been leased to power-short roads including Canadian National and NS.

GE technicians Mike Anthony and Derek Manley pore over former CSX 7640, the ninth of 14 locomotives on one of the many yard tracks in the Lordstown facility. Checking and replenishing fluids, inspecting components, wiring and piping, they methodically awaken the 28-year-old Dash 8-40C from long-term storage. With a whir and a low rumble, the locomotive's 16-cylinder FDL slowly cranks over and starts for the first time in more than a year.

Each locomotive destined for reactivation is thoroughly inspected and qualified in a procedure that includes all of the requirements of a conventional 92-day inspection as well as additional mechanical and systems checks and tests all backed by GE. Qualifying inspections take 4-6 hours per locomotive if there are no complications or issues, says Anthony. The team at Lordstown has the ability to make certain repairs and change out small components. Locomotives requiring heavier work are sent to GE Erie or to railroad or third-party shops, depending upon circumstances.

The small digital display panel on the rear wall of the cab flashes readouts as CSXT 7640 performs a Notch 8 self-load test. The qualification protocols require a host of readings to be manually recorded during the test, from fuel, oil, and crankcase pressures to input-for-traction horsepower and gross horsepower. The gross horsepower reading levels out at 3,935, not bad for an engine that hasn't run recently, observes Manley. He's identified a few minor problems during the tests and inspection, including several injectors that need to be replaced. By the end of the afternoon, the 7640 should be at full power, qualified, and ready to roll.

While Anthony and Manley revive the 7640, the hot blue flame of an oxy-acetylene torch slices through heavy steel plate as former

One of more than 40 pre-owned GEs purchased by Pan Am Railways, Dash 8-40C 7552 heads an office-car special at Bellows Falls, Vt., on Sept. 10, 2017. Kevin Burkholder

Just a fraction of the massive inventory at Lordstown, Ohio, 11 former Norfolk Southern Dash 8-32Bs await their future in the OCC yard in May 2018.

A trio of GECX Dash 8-40CWs on lease to CN (two former CSX, one ex-UP) liven up the lineup on the turntable leads at North Fond du Lac, Wis., in April 2018. William Beecher Jr.

UP Dash 8-40C 9350 meets its end on a scrap track at the far end of the yard. A few feet away, UP Dash 8-40CW 9477 shares a similar fate. GE has partnered with Larry's Truck Electric to scrap Dash 8s selected as parts donors. GE retains the core components and LTE gets the rest. LTE performs the same work here on its own locomotives, almost all of them EMD models acquired as part of Larry's locomotive resale, refurbishing, leasing, and parts business.

Main cabs from dozens of CSX, NS, and UP Dash 8s already parted out are lined in neat rows near the scrap track. An FDL engine rests on wooden blocks nearby. Prime movers selected for the program are returned for rebuilding at their birthplace, the GE engine plant in Grove City, Pa. Others are packaged to be offered as Running Take Out (RTO). Rebuilt engines are sold to domestic and international customers.

Harvested components, traction-motor combos, blowers, fans, controls, and more are staged in protected warehouses in the OCC, then distributed for sale or reconditioning. GE offers components and parts as used or as OEM-certified. The latter undergo a validation and qualification process similar to that given to locomotives to ensure that they meet quality standards. This line of parts expands the GE portfolio. "Historically we've only had a new and UX (unit exchange) offering, which isn't financially viable or effective for our shortline customers," says Salkeld. "Now we have an RTO and GE qualified option."

For all its innovation and ambition, the Pre-Owned Power and Parts initiative is facing a tough challenge. Short lines and regionals are rarely flush with capital for locomotive purchases and margins are narrow. Furthermore, save for a few exceptions, short lines are almost exclusively EMD. The Dash 8 advantages — fuel efficiency, microprocessor controls, greater tractive effort and improved reliability — might be attractive but price and familiarity remain obstacles to overcome, particularly in the secondary market. "This is why we've developed a full GE-backed solution to provide power, parts, tooling, training, and support to ensure a smooth transition for the short lines," says Salkeld.

Recent arrivals at Lordstown, nine former UP Dash 8s (eight Dash 8-40CWs and a single Dash 8-40C) stand adjacent to a long line of ex-NS GEs.

Salkeld and Zhang are optimistic. The Dash 8s are a good fit for many potential customers and there have been early victories. Most notable is Pan Am Railways, which followed up a 2016 acquisition of 20 former CSX Dash 8-40Cs with eight more '40Cs and a dozen Dash 8-40Bs in 2017. Pan Am returned for more in 2018 and has investigated the possibility of replacing its remaining EMDs (nearly 100 of them) with Dash 8s. Providence & Worcester and New Orleans Public Belt each purchased four former NS Dash 8-40Cs in fall 2017. There have been expressions of interest from other roads as well as overseas customers. At least one customer has queried on the feasibility of converting Dash 8s to A.C. traction. "Our expertise as the designer, manufacturer, and servicer of these locomotives," notes Zhang, "enables us to extend the life of these assets an additional 20-30 years by either servicing the locomotives directly or working with our customers to provide the technical advice and expertise so they can do it themselves."

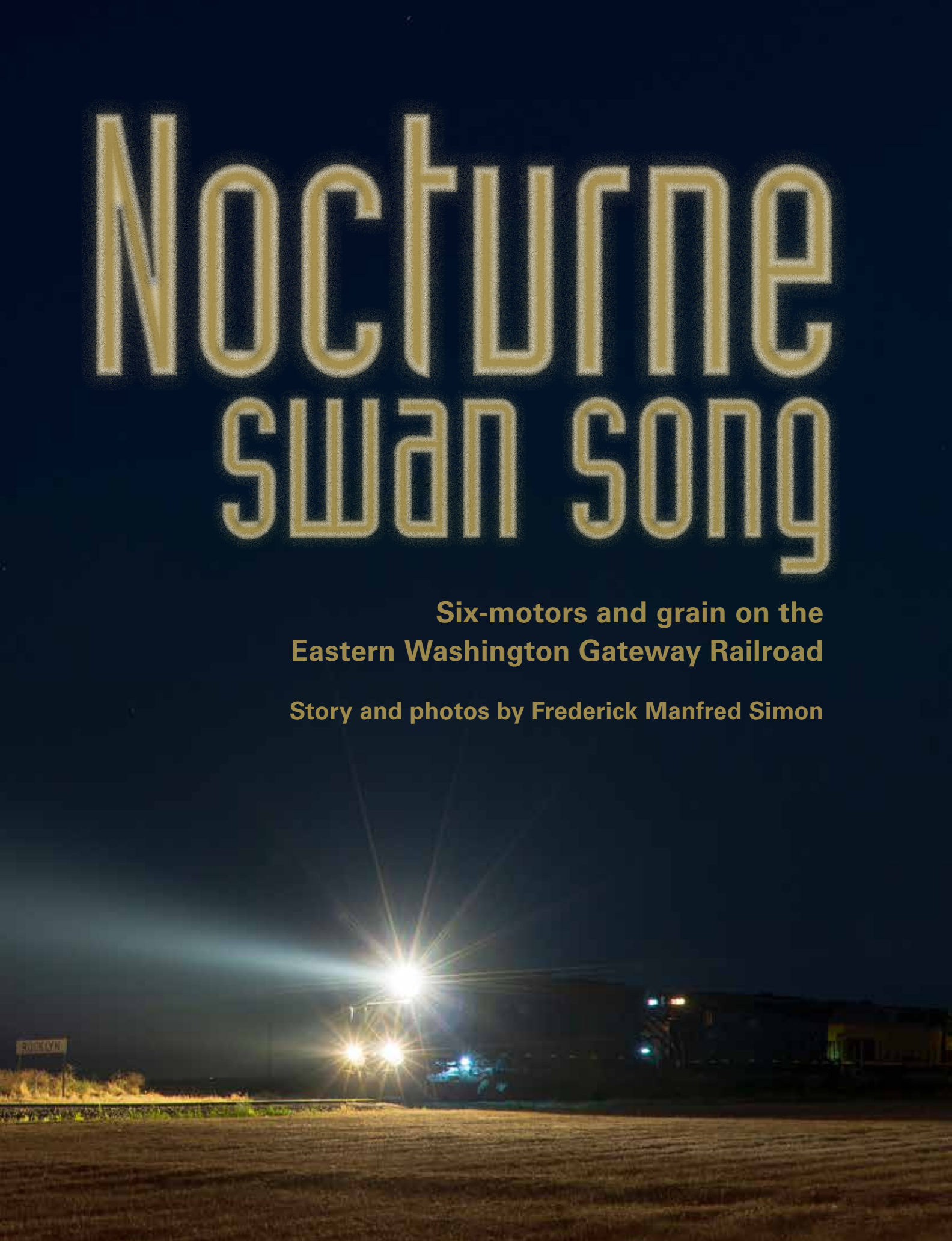
There's a lot of life left in these Dash 8s. It's fitting that the workhorse that put GE into the No. 1 position in the locomotive business should establish a post-retirement career forging new markets for its builder. ▮

Rocklyn 'n' rollin. The ominous elevator at Rocklyn, Wash., stares into the night as Brett Engert slips past with EWG's three SDs and the empty Scoot train on Aug. 3, 2017.

Nocturne swan song

Six-motors and grain on the Eastern Washington Gateway Railroad

Story and photos by Frederick Manfred Simon



Orion's Belt twinkles above No. 328's cab. It's 02:56 Dec. 23, 2017, somewhere between night and a barely dozen-degree morning, and crews have just changed at Cole's estate.

Do not go gentle into that good night, Old age should burn and rave at close of day; Rage, rage against the dying of the light ... — Dylan Thomas

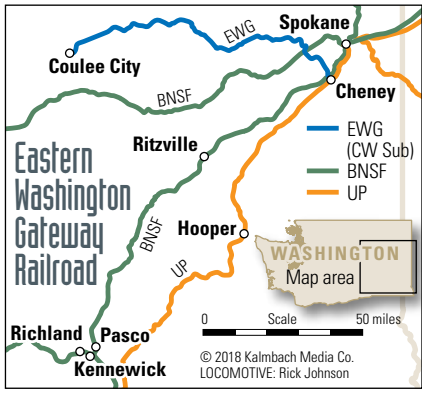
The "dying of the light" is true in more than one sense out here on the Eastern Washington Gateway Railroad. Better known as the Central Washington Subdivision, or CW Sub, some 108 miles of 1889-built railroad of Northern Pacific and later Burlington Northern and BNSF Railway pedigree spiked west in a shallow rising arch from the BNSF connection in Cheney, Wash., to Coulee City in the heart of the Evergreen State's breadbasket called Big Bend Country. Lying in the rain shadow of the Cascades, the five-county area is nestled into the bending southward arm of the Columbia River. The CW was a product of cold-blooded egoism vision, preachers of hubris, property fortune — born by the spikes driven in the unforgiving Eastern Washington sun. Today, the CW is home to a handful of seasoned railroaders and an unlikely quartet of six-motor locomotives engaged primarily in the grain trade.

The CW struggled mightily after being dealt from BNSF to Watco in 1998. Watco ultimately deemed the line unprofitable, embargoed it, and filled it with storage cars in 2006 and 2007. With prices for scrap steel at a premium, the CW was a prime candidate for dismantling. Fortunately, rail-dependent wheat growers successfully lobbied the state for assistance in preserving the line. The state soon found itself the reluctant owner of the CW as well as other former BNSF and UP branches in Eastern Washington. The startup Eastern Washington Gateway, controlled by US Rail Partners Inc., was selected in 2007 as the contract operator of the saved-from-the-brink CW.

It wasn't always this way

By all accounts, the CW Sub had never before felt the weight of a six-axle locomotive until the EWG moved in. Through the post-steam era, multiples of EMD Fs and two generations of Geeps reigned on the CW with its rolling hills, tight curves, and mostly 90-pound rail. Watco continued the tradition, employing hand-me-down Geeps during its stint on the CW Sub.

EWG works the line with three EMD SDs and a lone GE. "The Queens," as the EMDs are called, are of Southern Pacific heritage. The two SD45s are veterans of lengthy post-SP careers with Montana Rail Link and retain their MRL paint and road numbers. NIWX 328 (Northern Illinois & Wisconsin Locomotive Leasing) was built in September 1966 as SP 8833. EWLX 329 (Everywhere West Locomotive Leasing) left La Grange, Ill., in March 1967 as SP 8878. The two gained sequential road numbers in March 1985 when they were outshopped from SP's Sacramento shops as SD45R rebuilds 7557 and 7558. SD40T-2 No. 8702 is a Cotton Belt original EMD turned out in February 1978 as SSW 8375. Retired by Union Pacific in 2008, the tunnel motor carries its final UP road number and wears Armour Yellow dressed up with stripes and an EWG logo on its repainted nose. Also Armour Yellow is the sole GE, former UP Dash 8-40C 9129.



The quartet is in the meticu-

Top: A brilliant winter sunrise finds EWG 328 and NIWX 9128 with Jerry Miller at the helm of train HM02-2 just a few jointed-rail-sticks west of the ghost town of Govan. **Above:** The consummate engineer, Bruce Butler, is always happy to share a story of his early days of railroading in the twilight of steam. **Left:** Trailing unit on a heavy train, No. 8702 fluctuates between 500 and 600 amps at 10 mph near MP 53.

A broken window into the past. Storming eastward through Hanson with loads gathered at Coulee City and Hartline, SD40T-2 No. 8702 winks at the long-idled World War II military surplus truck once used to spot hoppers at the elevator.

Departing Davenport with Bruce Butler at the throttle, former UP Dash 8-40C crosses Eighth Street.

lous care of Jeff Wall, EWG's de facto chief mechanical officer and signal maintainer. Ever watchful, listening to their every complaint, Wall tends the aging motors with diligence and patience, always managing to assuage their aches and pains — sometimes with whatever is at hand, usually with the required part.

He's done much with little, ensuring the units remain as healthy and strong as possible for another day, week, month, and hopefully a few more years to come as they go about their singular Sisyphean work: pushing the night west to Coulee City with the empty "Scoot" train of captive-service ACF and PS2 grain hoppers of mostly Soo Line and Chicago & North Western lineage. In a day or two, return from whence they came, collecting the heavily laden hoppers to be unloaded at the new Highline Grain elevator and trans-shipped for movement to West Coast ports. As it's been for over a hundred years, the symbiotic relationship between railroads and grain-producing communities will continue unabated as railroads remain the most efficient form of ground transportation that man has ever invented. 1

Top: Setout of storage boxcars at Webb siding complete, engineer Ted Curphey opens the throttle as the headlight pierces heavy fog. **Above:** Engineer Jerry Miller eases the loaded Scoot train through Mondovi. **Left:** Engineer Ted Curphey charges out of Hartline at sunrise with five Coulee City empties.

Paying homage to heritage

Indiana Boxcar Corp.'s Olin Shops

Story and photos by Steve Smedley

The soothing vibrations of an idling EMD 16-567C prime mover and the warmth from cab heaters mix with the smell of still-drying battleship-gray automotive paint. When Vermilion Valley Railroad general manager Jim Montgerard told me some time ago to "wait and see" what he had planned for the unveiling of freshly painted former Erie Mining Co. F9A No. 4210, I knew he had something up his sleeve.

This is it: resplendent in an adaptation of its original Erie Mining colors with a stylized "VV" on the nose and "Vermillion Valley RR" lettered on its pristine flanks, the 4210 fairly glistens, a tribute to its ore-hauling heritage.

The Vermilion Valley operates a 6-mile section of former Conrail, Peoria & Eastern Railway line from Olin, Ind., west to interchange with CSX on the east side of Danville, Ill. The railroad had generated online traffic from a small ethanol plant, but with that operation defunct the company handles the switching and unloading of unit wind-turbine parts,

Resplendent in a faithful adaptation of its original Erie Mining livery, Vermillion Valley Railroad F9A 4210 switches on former Peoria & Eastern trackage at Olin, Ind., on Nov. 9, 2017.

IBCX 4210 casts its reflection in the pristine Southern Railway-inspired colors of high-nose Chesapeake & Indiana GP38-2 No. 5115 at Olin, Ind., on Nov. 9, 2017.

along with car storage business. No. 4210 will be used with the railroad's eclectic fleet of four GP9s, moving an occasional storage train or unloading unit windmill trains at Danville.

Indiana Boxcar Co., the parent company of four Midwest short lines, purchased two former Erie Mining Co. F9As during an equipment auction in Hoyt Lakes, Minn. Nos. 4210 and 4214 arrived in Olin, Ind., in March 2015. Now carrying the IBCX reporting marks of their new owner, the two locomotives spent their careers on the remote Minnesota mining railroad built in 1956. Members of an Erie Mining fleet that included five F9As and six F9Bs, they were built to haul iron ore from the mine at Hoyt Lakes to ore docks on the shores of Lake Superior at Taconite Harbor.

"We had her fired up and running in a few weeks," Montgerard says of the 4210. "She was the better of the two mechanically and physically."

The cab of the 1956-vintage F9A was stripped, including the removal of a thick foam treatment over the electrical cabinet walls, installed by shop employees of Cliffs Erie Mining — the railroad's name after it was bought by Cleveland-Cliffs Inc. in 2002 — to sound-proof the cab. The control stand, air brakes and cab interior were torn down, rebuilt, and painted. A new plywood underlay and heavy rubber floor matting completed the cab work, much of it done by Indiana Boxcar mechanic Travis Hunt.

Sitting in 4210's engineer's seat, Montgerard unscrews the lid of a heavily scratched, milky-white plastic coffee can and dumps pieces of raw iron ore, chips, fines, and taconite pellets into his calloused hands. "I'm keeping these here as a tribute and a reminder of what this old girl spent her life doing," says Montgerard. "Those all came from the nose. I probably shoveled a couple thousand taconite pellets."

Striking what the photographer terms an "equal-billing pose," Vermillion Valley 4210 and Chesapeake & Indiana 5115 stand side by side at Olin, Ind.

Montgerard and his talented Olin Shop forces work out of a one-track enginehouse behind the Flex-N-Gate Corp. plant west of Covington, Ind. The one-stall structure was originally a coal-unloading shed for a coal-fired power plant, which still stands, looking like the background of the Viet Cong sniper scene in the cult classic film "Full Metal Jacket."

The unloading shed has been converted into a fully functioning shop building, a door added on the west side and lengthened to hold two locomotives.

"No job is too small," says Hunt as he related how the employees use a former Atlantic Coast Line Industrial Brownhoist wrecker crane for engine changeouts and heavy lifts.

No. 4210's carbody required

Vermillion Valley general manger Jim Montgerard shows off the original "100" stencilled on the engine room door and the custom Erie Mining decal he had made for the F9A.

Fresh from the Olin shop, former Duluth, Missabe & Iron Range SDM No. 815 received new paint, as well as a rebuilt main generator, alternator, and 645-series engine.

several new steel panels, new batten strips, and hours of hard work. The Farr grills were removed and cleaned, and the stainless-steel bolts that hold the grill in place were replaced. The radiators were removed, power washed, and replaced. Water leaks were repaired. New windshields and windows with FRA-compliant glass were installed. Since Erie Mining was a private railroad, the company did not fall under FRA locomotive guidelines.

"This wasn't a touch-up paint job," Montgerard says. "The loco was power-washed, sanded, primed, and repainted using automotive paint. Former Erie Mining employee Doug Buehl sent me the DuPont paint numbers to match the colors. I drove the NAPA Auto Parts guys in Danville [Ill.] nuts, but they matched the paint samples perfectly!" The locomotive was formally dedicated to the railroad's talented employees in a ceremony at Foster, Ind., under dark skies on Nov. 4, 2017.

A second locomotive at Foster drew equal attention: Chesapeake & Indiana Railroad GP38-2 No. 5115, freshly repainted in a Southern Railway-inspired scheme. It's one of three high-nose Norfolk Southern GP38-2s purchased by Montgerard on behalf of C&I parent Indiana Boxcar in August 2017. Built in 1973-74 as Southern Railway Nos. 5093, 5115, and 5152, and configured for long-hood-forward operation, the trio will be put to work on the 33-mile-long Chesapeake & Indiana. All three will retain their original road numbers and be painted in Southern-inspired black-and-white "tuxedo" colors. They will join three former Duluth, Missabe & Iron Range SDMs and ex-Elgin, Joliet & Eastern SD9 No. 818 on the C&I.

Also on hand at Foster was Camp Chase Railway No. 4618, a GP9 of Grand Trunk Western heritage. Rebuilt in 1991 at the GTW shop in Battle Creek, Mich., the 4619 will travel to the railroad in Columbus, Ohio.

While the 4210 gleams, sister F9A No. 4214, built at La Grange in July 1956 as Erie Mining No. 104, awaits its time in the shop. "She's a lot rougher, and I have two more Geeps to paint for the [C&I] first!" Montgerard says.

"Want to see something really neat?" Montgerard opens the engineer's side door to the engineroom of the 4210 and points to a small stencil of the No. 100. "This was it," he says, "the first cab unit they bought, and it still has the original, as-built number." On an electrical panel door a few inches to his left, Montgerard has placed a circular "Erie Mining Co." sticker. "I'm proud of my guys," he says. "They did a hell of a job." T

A fine California

Napa Valley Wine Train FPA4s work the vineyards with grace

Story and photos by Scott A. Hartley

Outpacing traffic on parallel Autoroute 20 west of Dorval, Que., VIA 6787 (above) races for Toronto with a short train. Thirty-two years later it strolls through the vineyards near Oakville, Calif., with the Napa Valley Wine Train.

It is difficult to believe that Montreal Locomotive Works FPA4s have been working the Napa Valley Wine Train for 29 years, matching the longevity these same locomotives earned hustling fast passenger trains for Canadian National and VIA Rail Canada, beginning in 1958.

Napa Valley was the first American railroad to purchase secondhand FPA4s when VIA began to retire its fleet of 36 A units and 14 B units in 1988, replacing them with F40PH-2s. The California operator picked up VIA Nos. 6760, 6775, 6787, and 6790, built by MLW in 1958-59 with the same CN road numbers. Napa dressed up the MLWs in handsome coats of burgundy-and-champagne colors to match the wine train passenger cars and numbered them 70-73.

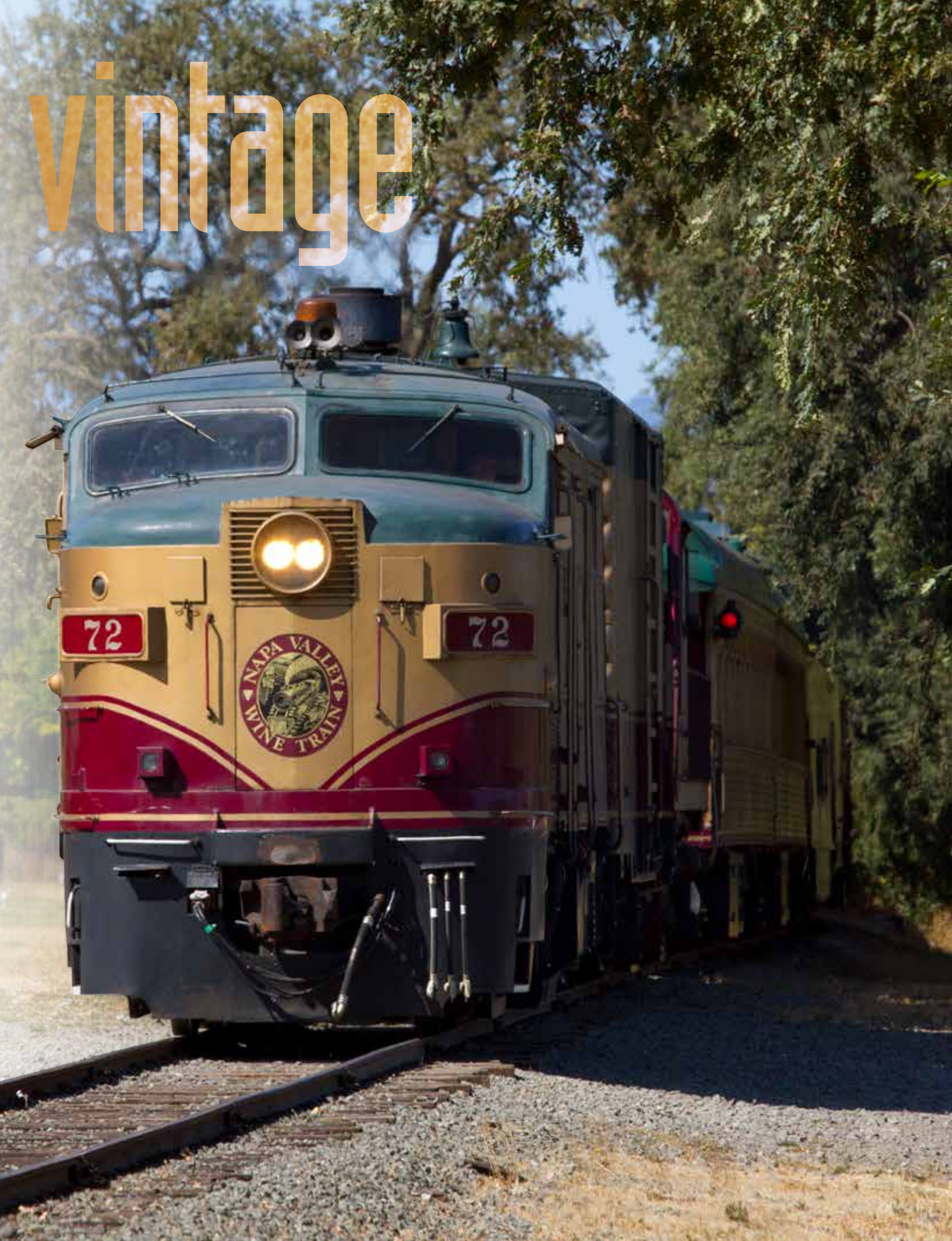
"The FPA4s' service at the Napa Valley Wine Train has been an honorable retirement from their work in Canada and are instrumental to our almost 29 years in operation," says Anthony Giaccio, director of train operations. "They have been and continue to be the face of the Wine Train and are a thrill to new and experienced railroad fans who visit."

Napa Valley may consider it "retirement," but the railroad's four FPAs really have not had time to relax in the California sunshine. The railroad schedules its meal and wine trains seven days a week, year round, and has added service since new owners Noble House Hotels & Resorts Ltd. and Brooks Street purchased the operation from the family of founder Vincent DeDomenico in 2015.

Until 2016, the lunch and dinner trains were limited to a Napa-to-St. Helena round trip, pausing only for the locomotives to move to the other end of the train at the turn-back point. The trains simply rolled past the dozens of on-line vineyards and wineries. Today, lunch and dinner trains still run, but four one-car Quattro Vino trains share the 18-mile main line, making stops at three wineries over a 6-hour period.

Clearly, the FPA4s continue to lead active lives. But the contrasts between their first and second careers are extreme. Following Napa Valley No. 72 on a leisurely 36-mile, round-trip lunch train on a warm October 2017 day bears little resemblance to seeing that same locomotive in the waning days of its VIA career.

Single-handedly working the Montreal section of VIA's transcontinental flagship *Canadian* on a warm August 1985 day, VIA 6787 is dirty and in need of a bath.


vintage
72
72
NAPA VALLEY
WINE TRAIN


6790
VIA
6790

At left: Framed in the steelwork of an ancient truss bridge spanning Rivière Delisle, VIA 6790 (now Napa Valley 73) nears Coteau, Que., with Ottawa-Montreal train 32 on Feb. 14, 1987. Keeping an easier pace (above), Napa Valley 72 runs around its train at St. Helena, Calif., on Oct. 3, 2017.

However, the seemingly tireless cab is still capable of doing just what MLW and CN intended when it was delivered in April 1959. After a brief station stop at Dorval, No. 1's engineman quickly has the 1,800-hp MLW in the eighth notch, but the V-12 Alco 251 engine at his back doesn't sound at all overburdened. Geared for a top speed of 92 mph, the FPA4 surges ahead, effortlessly outpacing car and truck traffic on parallel Autoroute 20, and soon leaves the photographer watching the train's rear markers disappear in the distance.

In 2018, three of Napa Valley's four FPA4s remain in service. In 2003, No. 73 was converted to run on compressed natural gas and received an EMD 645 series prime mover in the process. It currently rests on a side track near the railroad's shop in Napa. The railroad plans to return the unit to service, still as a CNG-powered EMD, but no date has been set for the work. The grant received by the railroad for the original CNG conversion prohibited continued use of No. 73's Alco Model 251 engine, so the EMD will remain. Giaccio explains that the original Alco prime mover went for a good cause, and that its parts were salvaged to help keep the remaining three pure FPA4s running.

"Several years ago, we did have thoughts of gathering more FPA4s," says Giaccio. "That concept changed to finding locomotives that we could insert into the Napa Valley Wine Train service when needed and use to power our smaller-consist Quattro Vino Tours." This translates to more locomotives that can be easily operated facing either direction.

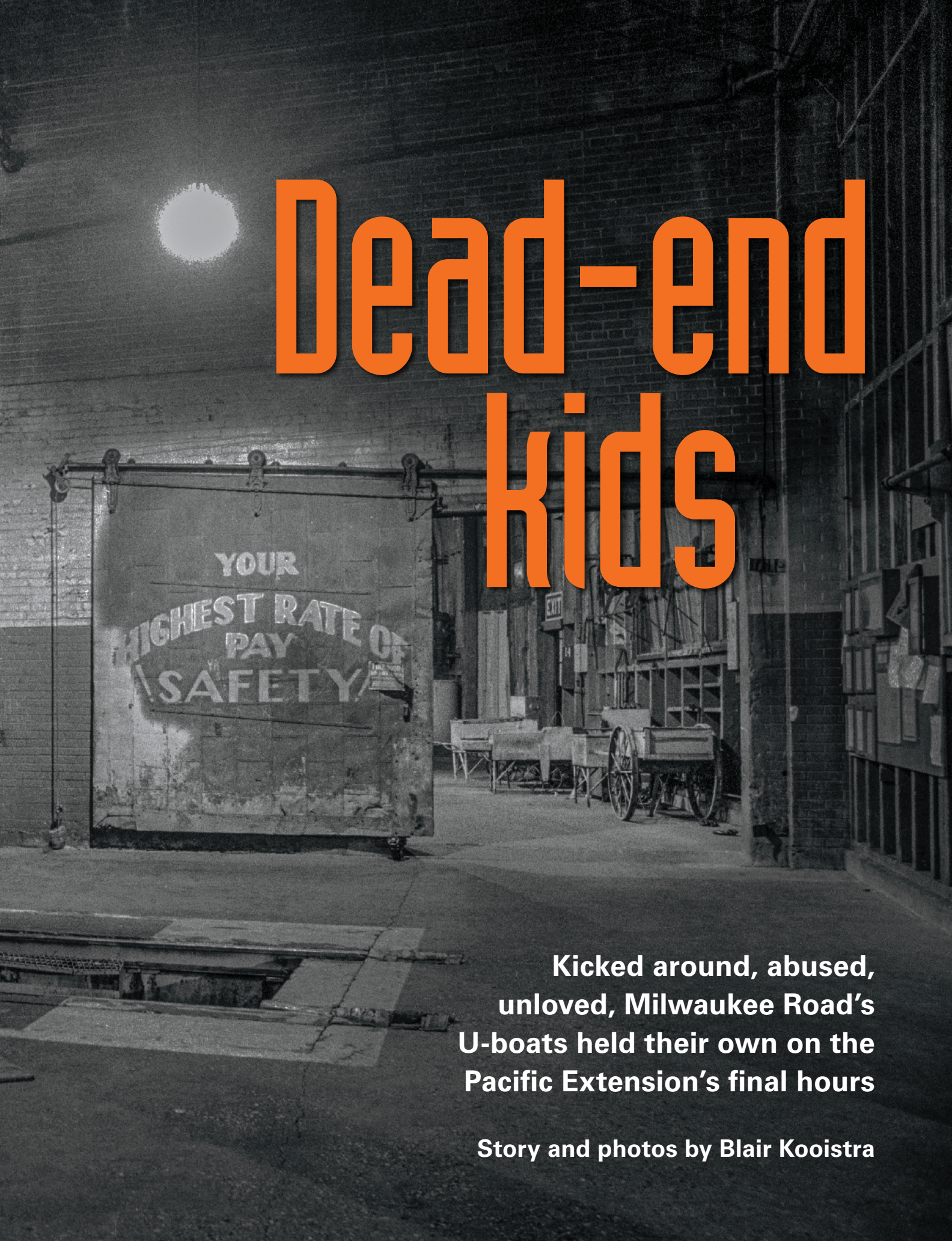
The one-car Quattro Vino trains usually operate with a single locomotive capable of bidirectional operation. The railroad has a GE 65-tonner, a GE 80-tonner, a GP9R still painted Genesee & Wyoming orange, and a former Southern Pacific Alco RS11. The latter locomotive is likely more rare than an operating FPA4 these days!

The FPAs usually operate in pairs, with one unit facing each direction, often spliced by a boxcar converted to an HEP supply car. One of the road-switchers might substitute for an FPA when necessary. For the past year, a privately owned ex-Norfolk Southern high-nose GP38-2 has been on lease, but it's expected to leave the property upon the arrival of a Sierra Railway GP20. The Sierra Geep will be on long-term lease, along with Sierra's dinner-train equipment, to fill in on Napa services as its own passenger-car fleet is rehabilitated.

The usual train consists include an open-end observation car at each end, and a full-length former Milwaukee Road Superdome mid-train. Car interiors are opulent. Passengers willingly pay a premium price, but receive attentive service, with multi-course meals and a sampling of locally produced wines.

The FPAs are expected to remain the prime motive power on the railroad's longer lunch and dinner trains. And the good news? "Our recent locomotive purchases," says Giaccio, "will allow us to give the FPA4s the attention they deserve so they can continue operating into the Napa Valley Wine Train's future." 1

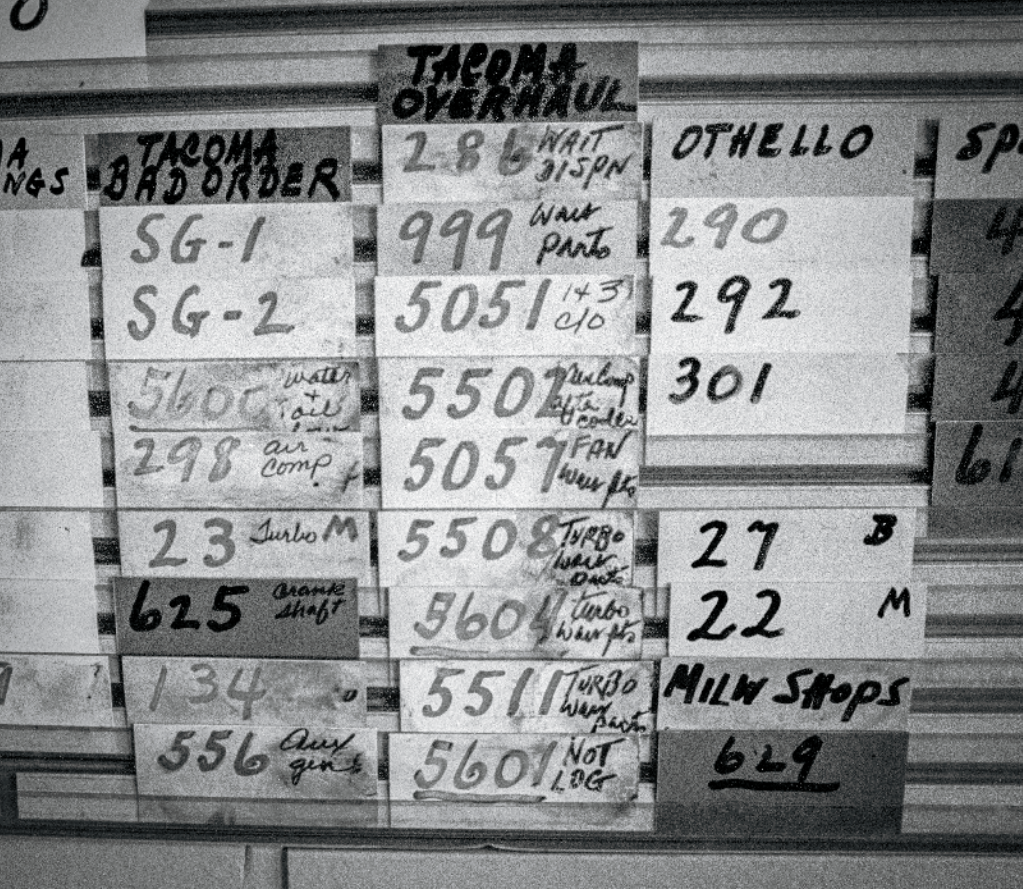
Reassigned to Tacoma, Wash., after dead storage in frozen Milwaukee, U30B 5604 awaits resuscitation in stall 12 of the Tideflats roundhouse on Feb. 17, 1979.



Dead-end kids

Kicked around, abused, unloved, Milwaukee Road's U-boats held their own on the Pacific Extension's final hours

Story and photos by Blair Kooistra



Locomotive status board in the Washington Division dispatcher's office in Tacoma shows a heavy workload of four-motor GEs on April 1, 1979.

The Milwaukee Road came to realize its fleet of General Electric "Universal Series" locomotives were more trouble than they were worth. When maintained to factory standards, the combination of the four-cycle FDL-16 prime mover mated with indestructible GE 752 traction motors certainly could compete with comparable products from industry-leader General Motors. But meeting factory standards cost money — the GEs were certainly more complex and demanding of maintenance than the GMs — and on a railroad as perpetually strapped for cash as the Milwaukee Road, maintenance was usually the first thing that suffered. "The GEs are just like us," Coast Division superintendent M. T. Sevedge once told a dispatcher. "You work them 8 hours, then they need 16 hours rest."

For workers at Tacoma's Tideflats shops, where most of the GEs were assigned for much of their relatively short careers, each scraped knuckle from changing out a power assembly or profanity uttered fishing a dropped bolt from the bottom of a deep oil sump reminded them that the initials G.E. really stood for "guaranteed employment."

As the railroad succumbed to bankruptcy and ultimately abandonment out West, the GEs remained behind as management reassigned newer, more reliable locomotives back East to what it deemed the profitable "core" of the railroad. The handful of GEs still operating as the railroad shut down in March 1980 had survived Midwest winters and mechanical indifference. Walkways slick with oil, paint blistered and rusted, radiator intakes clogged with leaves, they were a metaphor for the west end of the railroad. The fact that they still ran, and answered the call on the final trains out of Tacoma, was a testimony to the workers at Tideflats.

Milwaukee Road's fleet of four-axle GEs —12 U25Bs, 17 U28Bs, and 5 U30Bs acquired between 1965 and 1968 — was purchased to compete against comparable EMD GP30, GP35, and GP40 models assigned to demanding transcontinental freight schedules in the early years of the "speed wars" then in vogue. No match for the GMs in the mountains, they didn't last long before being reassigned to the Midwest. Four mammoth U33Cs delivered in 1968 to match up against the SD45 remained behind for service south of Tacoma on the hilly line to Morton and the branch to the Canadian border from Bellingham, where their 192-ton weight did no favors to the original turn-of-the-century 65-pound rail.

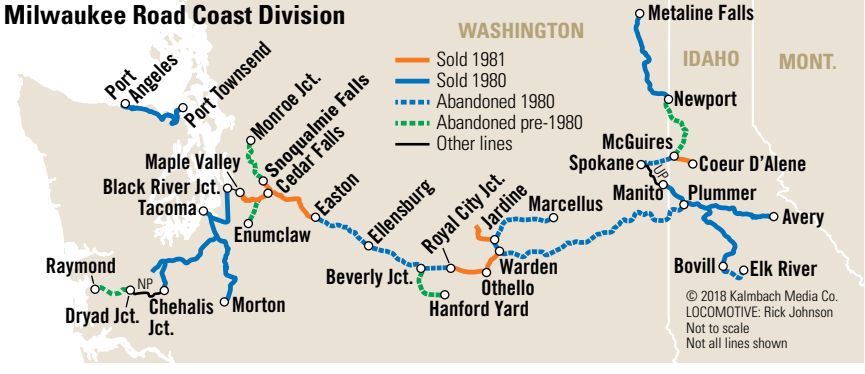
The 1970 Burlington Northern merger opened several gateways for Milwaukee, including interchange with Southern Pacific at Portland, Ore. Traffic boomed, and now four and occasionally five trains a day operated on the transcontinental main line. This traffic growth and the retirement of the seemingly indestructible 1915-built box-motor electrics — Milwaukee Road's original General Electric locomotives — brought the GEs back to Tacoma.

Assisted by a GP35 and GP9, U30Bs 5601, 5609, and U25B 5056 lead Portland-bound train up the 3.5-percent Tacoma Hill on Feb. 17, 1979.

Gary Pember, hired in 1970 as an apprentice machinist alongside his father Claude at Milwaukee's Tideflats shops in Tacoma, had already heard about GE locomotives from his coworkers when word came down that the GEs would be returning. "When The U-boats came back to the

Coast Division, some of us had not seen them before," Pember recalls. "The old heads would only say, 'Boy you're going to love these, let me tell you!' But these guys had worked on them when they were new for a short time and their attitude was affected. As they trickled in we soon discovered they were a mechanical mess, with lots of oil leaks, water leaks, and flapping engineroom doors, so it was apparent that they were not on the top of the major repair list at the Milwaukee shops back east."

Generally kept off the hot schedules,



the GEs often worked secondary trains over the Cascades to Othello or the west end of the Rocky Mountain division electrification at Avery, Idaho, where they'd be replaced by Little Joe electrics and turned back west. The GEs also took over many Coast Division branch operations, and in 1972 four new U36Cs joined the U33Cs on the Bellingham trains and the two-a-day Tacoma-Portland trains. Two new traction-booster slugs were mated to U30Bs working log trains on the branch to Morton. A handful of U23Bs joined the fleet in 1973, and often found work with other GEs on locals out of Spokane and St. Maries, Idaho.

On Dec. 5, 1979, a U30B, U25B, and U28B make a racket as they cross BN's Wilburn trestle at Bellevue, Wash., with train 904's mostly empty 61 cars.

(Milwaukee's final GE purchases, eight U30Cs built in 1974, operated a Powder River coal contract with BN and never ventured to the West Coast).

Dead-end kids

The heyday for Milwaukee's GE fleet out West lasted maybe seven years. The end of electrification in Montana in summer 1974 and orders of new SD40-2s largely eliminated the need for GEs to work east to Avery. And those four-a-day transcontinental trains shrunk to two most days after aggressive marketing by Burlington Northern took back most of the traffic lost after the merger. It certainly didn't help that deferred track maintenance destroyed schedules and long-haul customers took their business elsewhere.

With all the new SD40-2s, GP38-2s, and MP15s on the property, the west end of the railroad was flush with locomotives while retirements of much of the Fairbanks-Morse fleet, as well as Alco and Baldwin road-switchers, left the east end power short. In fall 1977, to improve utilization of the GE fleet, they were reassigned to Milwaukee shops. GP9s took their place on the branch lines, and SD40-2s now began operating to Portland. Pember and his coworkers were pretty sure they'd seen the last of those dirty old GEs.

Then came winter 1977-78, perhaps the worst of times for the Milwaukee Road. The railroad declared its third, and as it turned out, final bankruptcy on Dec. 19, 1977. By then, the Milwaukee was already two to three years behind in scheduled locomotive overhauls, and the bad-order ratio of road locomotives ballooned from 21 percent that fall to 51 percent by February 1978. TRAINS magazine's annual motive power survey in the November 1979 issue focused on the Milwaukee Road's locomotive woes, compounded by a brutal Midwest winter that forced the railroad to scour the market for leased locomotives. Hardest hit were the General Electrics just recalled from Tacoma, whose bad-order ratio hit 67 percent by May 1978. The GEs, TRAINS surmised, had suffered from deferred maintenance, and they did not adapt to Wisconsin's climate.

"They'd been in warm country," said VP of operations Paul Cruickshank, "and they had survived." Trains called the GE fleet the "most visible casualties of the winter problems as they have sat in deadlines at Milwaukee. At one point, virtually no GEs were in service except for the U23Bs and U30Cs." It was a slow recovery by summer, and then winter hit again. It was decided to return the GEs to the warm, loving environment of Tacoma.

Gary Pember called it the "return of the scrap heap." Engineer Rick Jones was amazed at the sight of ice-encrusted GEs heading west, so heavily coated in ice they appeared to be "covered in plastic." Sixteen GEs — not all of them in operating condition, but including those deemed the most likely to be returned to service — were reassigned to Tacoma in early 1979. Those that didn't make the trip west never operated again.

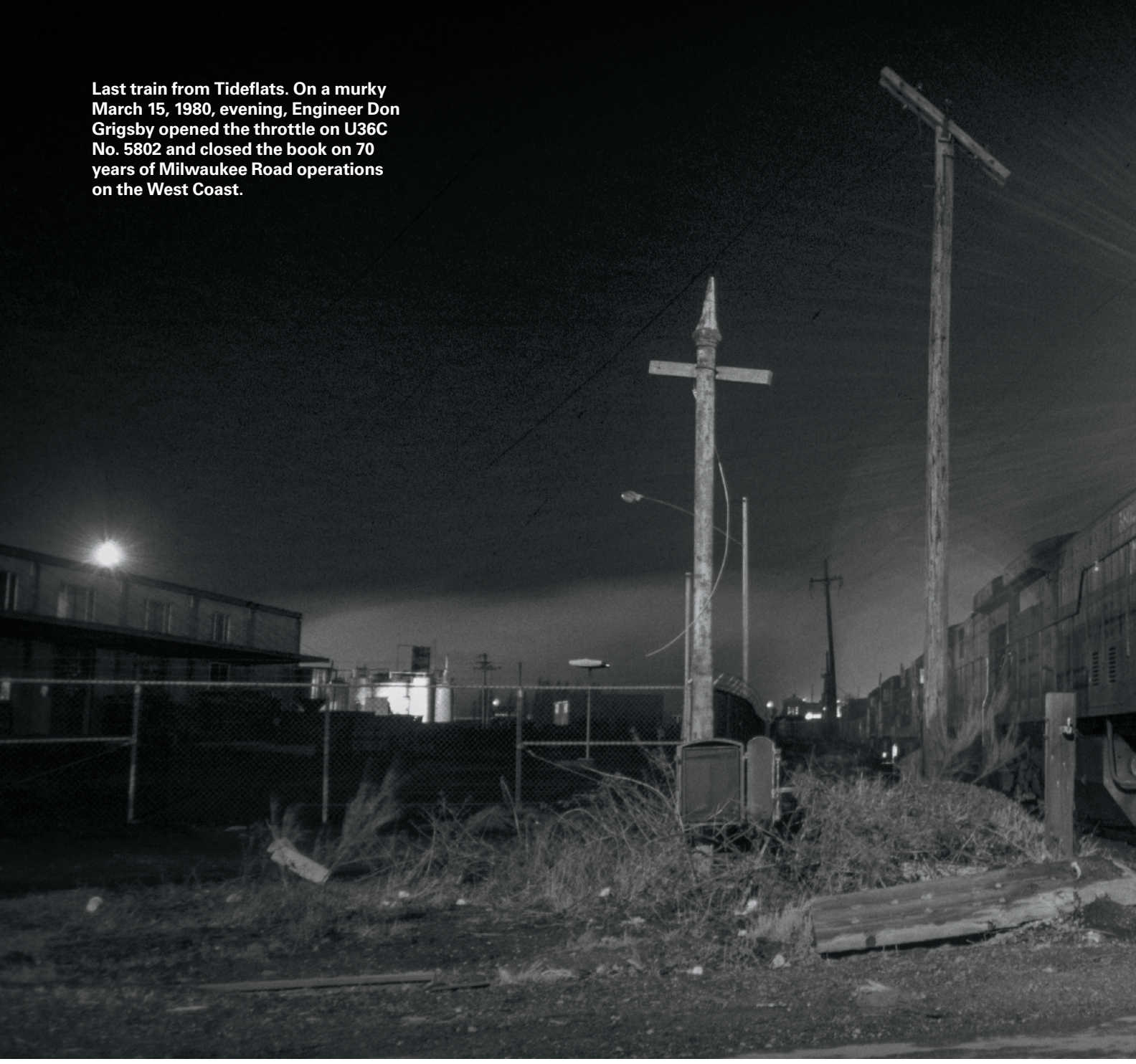
"There was lots of work just getting the dead-end kids running," Pember recalled. "There were pipes and radiators that had been frozen because water had been allowed to stay in the units after they died ... unlike today's locomotives they did not have automatic drains when the cooling

Continued on page 96

Posing beside his ragtag GEs on Dec. 11, 1979, Mel Sierman hired out on the Milwaukee Road as a fireman in 1947 and got his engineer's date a decade later.

A spectacular end to a rare crystal-clear Puget Sound winter's day, train 980, the Chehalis-Tacoma "Weyerhaeuser and Milwaukee Logger" comes off the steep grade of Tacoma Hill and onto the S-curved wooden trestle with U28Bs 5502 and 5505 spliced by GP35 1503 and 71 loads of export logs on the head end on Jan. 19, 1980.


MICHELIN
SOUND BUILT
PLYWOOD SALES



Last train from Tideflats. On a murky March 15, 1980, evening, Engineer Don Grigsby opened the throttle on U36C No. 5802 and closed the book on 70 years of Milwaukee Road operations on the West Coast.

Continued from page 93

water gets at a certain temperature. It was a mess; even the GEs that were halfway decent when they left Tacoma for Milwaukee a year earlier were in bad shape when they came back."

Tideflats resurrected 13 of the group. Soon afterward, the sole U33C in service, 5700, was damaged in a low-speed collision near Portland and retired. It was these 12 — three U25Bs, four U28Bs, three U30Bs, and a pair of U36Cs — that played a substantial role in the last year of operations on the West Coast. This was especially true after the railroad reassigned the SD40-2s that held down transcontinental assignments in September 1979, replacing them with GP40s and the two U36Cs. Tacoma supplanted consists with the little GEs and whatever else could be spared, frequently GP35s, GP9s, and SD10s. But it was unusual for the four-motor GEs to work the main line, at least until the trustee's ill-fated attempt of a shutdown in late October 1979. When the courts overturned the short-lived embargo, the west end of the Milwaukee Road was stuck operating largely with GEs and GP9s for several weeks.

The courts ultimately approved the trustee's reorganization plan, clearing the way for embargo of the lines west of Miles City, Mont., after Feb. 28, 1980. Every few days, a train of company materials, salvaged freight cars strapped to flatcars, and bad-ordered locomotives would head east from Tacoma. Seven of these cleanup trains operated from March 4, with the last departing the evening of March 15. GEs led three of the final trains east. The third-to-last train, on March 13, was a scene from right out of 1968, with U28B 5502 leading two sister U28Bs, a pair of U25Bs, and a GP35 doubling in heavy snow to Snoqualmie Pass. It took three crews to get the train to Othello. Engineer Gene Lawson

was philosophical as he awaited his relief to arrive at Cle Elum: "All in all, a pretty good day; none of the GEs died on us!"

For much of its history, General Electric locomotives were closely associated with the Milwaukee Road's Pacific Extension through the timeless box-cabs that survived nearly 60 years of service. So it seemed fitting that on a murky March 15 evening, engineer Don Grigsby opened the throttle on five ancestors from that factory in Erie, Pa. — U36Cs 5802 and 5803, U25B 5052, and U28Bs 5511 and 5507 — to take the final train out of a darkened Tideflats yard, ending 70 years of service by the Chicago, Milwaukee, St. Paul & Pacific Railroad to the Pacific Northwest.

The dead-end kids were leaving town.

Epilogue

The dead-end kids joined their already dead sisters in storage, never to operate again for Milwaukee Road. Only 10 of the railroad's GEs faced any sort of future. Two of the U25Bs were preserved: No. 5056, acquired by Illinois Railway Museum; and No. 5057, originally donated to Webster Technical College in Nebraska to train diesel mechanics, and acquired in 2013 by Cascade Rail Foundation from California's Feather River Rail Society. It is undergoing cosmetic restoration for display in front of the preserved substation and depot at Cle Elum. And the 5802, which led the last eastbound out of Tacoma? Amazingly, it was among eight Milwaukee Road locomotives, seven of them U30Cs, purchased by GE for use as cores for rebuilding into "Super 7-30Cs" for GE's lease fleet. Eventually they were sold to MRS Logistica in Brazil. So, somewhat improbably, the 5802, which became MRSL 3508, may well be in service today — at least its frame and trucks, anyway — hauling freight in the jungles of Brazil. T

Canadian Pacific 1128 casts a long shadow that recalls the rise and fall of EMD dominance and a design that went unbroken for 37 years.
A. Ross Harrison

The Spartan standard

by A. Ross Harrison

Fifty-five years ago, the design engineers at General Motors' Electro-Motive Division unveiled the GP35. Through its turbocharged 16-cylinder 567D3 engine, the GP35 literally screamed the return of function over form, and the automotive-influenced styling of the GP30 was a detour not to be repeated. The simple, angular, no-nonsense design came to be known as a "Spartan" cab. Depending on your perspective, that could describe the austere appearance or the amenities afforded to the crews who rode in them, but if an EMD trade advertisement by renowned company artist Tom Fawell spoke to you, then those Spartan cabs were more like the feared Greek warriors, leaning heroically across a two-page spread, accentuating their already rakish lines.

At the time, EMD was to be feared, a force to be reckoned with. The Spartan cab became the constant in an ever-changing scene, spanning the close of the 567-era through the entire production run of its legendary 645-series successor and into the 710 era. From featherweights like GP28s and GP15s to the hustle-muscle of the SD45 and even eight-axle DD35 behemoths and the refined aerodynamics of EMD 60-series demonstrators, over 16,553 iterations, the lineage was clear. Never mind the minor tweaks as individualistic roads added their stamp in the form of such add-ons as extra headlights, the location of class lights, bells, extended noses, and even the short lived "L" front window. The Spartan was the unchallenged standard.

Canadian Pacific 1128 casts a long shadow that recalls the rise and fall of EMD dominance, and a design that went unbroken for over 37 years. The 1128, a GP35 graduate from General Motors Diesel class of 1965, emerged from the London, Ont., plant as CP 5021. Converted to a road slug in 1997, it earned revenue ton-miles until 2013. Sister 1126 emerged from London as CP 8202, the railway's first GP35, and toils still as a road slug in Vancouver, B.C. It's a face that launched literally thousands of locomotives from La Grange and London; Helen of Troy would be proud.

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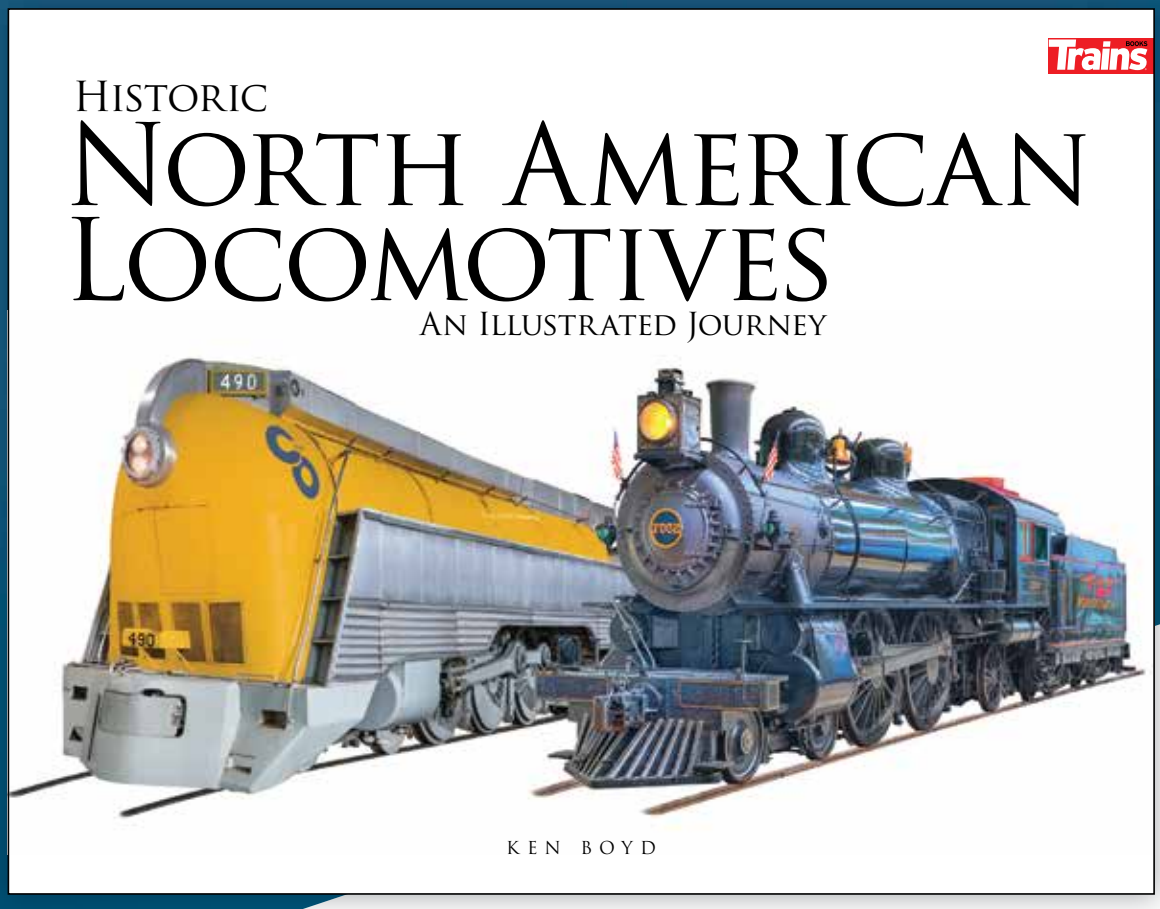

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