**O&W Ramblings**

**Number 60 in a Series**

**Steam era "Pushers" and "Pushing"**

Almost all steam era railroad enthusiasts are familiar with the necessary practice of assisting heavy [freight) trains up, over and along heavy grades and track curvatures via the practice of dispatching an extra locomotive to push on the rear of a train. This practice was to provide for the additional tractive effort and horsepower to keep a train from stalling and blocking its route. Our late and lamented Ontario & Western was no exception!

Pusher engines were often cut off when a grade was met and conquered, but then with an up/down profile for which the O&W is so well known, the pusher locomotives were sometimes kept "en train" for the additional air pump and braking capacity that they could provide. It is equally important to brake and stop a heavy train downgrade as it is to ascend a grade upbound. However, better then for the dispatch of a second locomotive at the front of a train or, alternatively, cut in an additional engine somewhere any number of cars behind the lead locomotive, if additional braking capacity was thought to be needed. The latter choice here was often to avoid the strain of bridge limitations by exceeding known Cooper loadings.

Well understood by the O&W followers was the need for pusher assignments on the Scranton Branch heavy grades on both sides of the route up and over the summit at Poyntelle (84 feet to the mile on the stiffest grade to Forest City (1.6 percent uncompensated). That ascent upbound from Carbondale and Mayfield yards was against the direction of loaded coal traffic. However, downbound from Cadosia (beyond the gradient "sag" to the Delaware River crossing) to the beginning of the Scranton Branch with the long loads of empty coal cars also demanded a pusher.

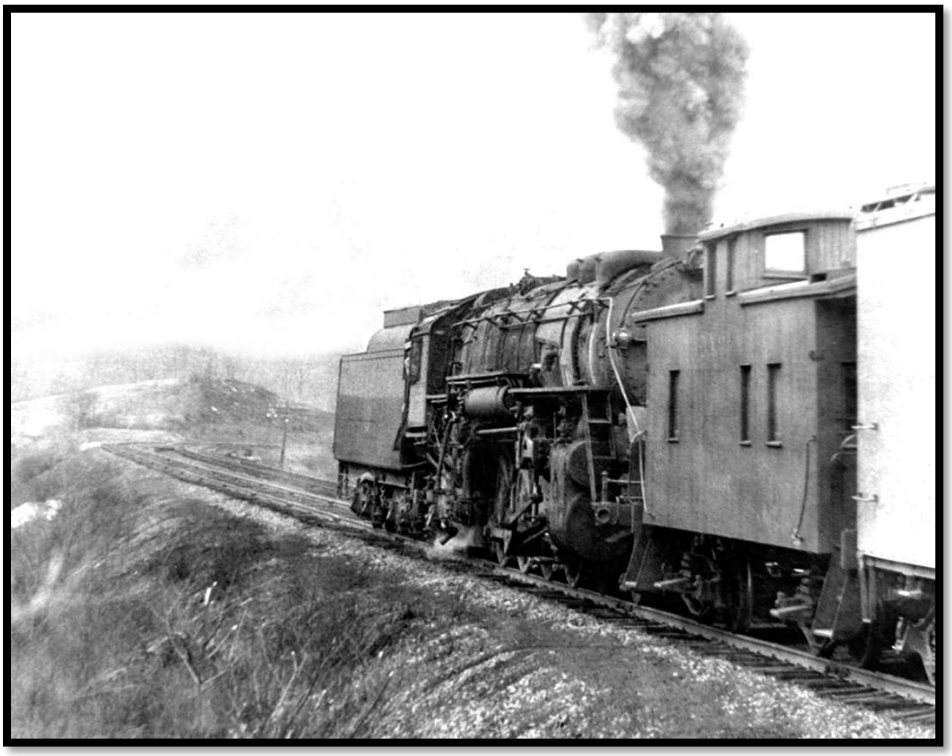
Among the stiffest grades on the O&W were the Northern Division grades over the "Great Divide" of the Chenango River and Unadilla River watersheds. From Norwich to Summit the grade was 1.36% average (1.77% ruling) and from Sidney to Summit the grade was 1.35% (1.65% ruling)! Pushers in both directions were needed during both the periods of Midland and later O&W operations. Lesser known is that the grade from Kenwood up to Eaton climbed 922 feet in elevation along only 14.71 miles (average 1.58%). The ubiquitous Class R and Class S saturated steam Dickson Double Cabs were hard pressed, requiring pushers on trains with a few as 25 30-ton wooden hopper bottom gondolas loaded with D&H coal!

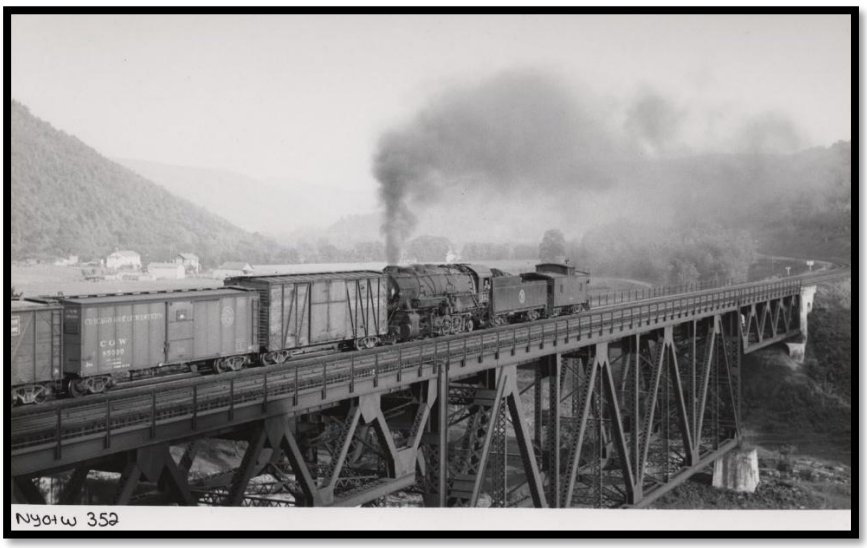
The Southern Division had its share of mainline grades that required pusher assistance on ascent on grades Southbound from Summitville to High View Tunnel and then Northbound on the stiff 1.2 -1.4% "Red Hill Grade" to Mountaindale. Grades departing Livingston Manor (Telegraph Call "VM") both Southbound and Northbound were Pusher districts (between 42 and 64 feet to the mile); to the extent that "Auxiliary Locomotive" (trailing truck "Booster") equipped Class Y-1 4-8-2 type No. 402 was regularly stationed at VM and dispatched in pusher service from the Manor . . . and so it goes on beyond these few exemplars.

*No. 402 here in Passenger train service yet still equipped with the "Booster" engine. Note the footboard pilot, the additional straps from beneath the smokebox in reinforcement of the pilot deck and the steam pipe below the boiler running board in service to the "Booster"*


*No. 402 pushing at VM headed towards Youngs Gap; – the Booster is not yet cut in witness an absence of exhaust steam boiling out over the top rear of the tender cistern. None of the other Class Y "Light 400" types were ever Booster equipped, and after a modest service the No. 402 had its Booster dissembled, removed and retired. The O&W never seemed to value the use of this accessory or its maintenance expense; -- quickly moving on from this experiment! Notice here that the pusher has coupled up directly behind the 8300 Series caboose; -- contrary to the prevailing legend that the 8300's had only a wooden frame not able to withstand the "push" without collapsing(!)*

*And yet here is a Class Y-2 "Big 400" pushing one of the "Beefers" on Red Hill Grade, right up behind the caboose.*



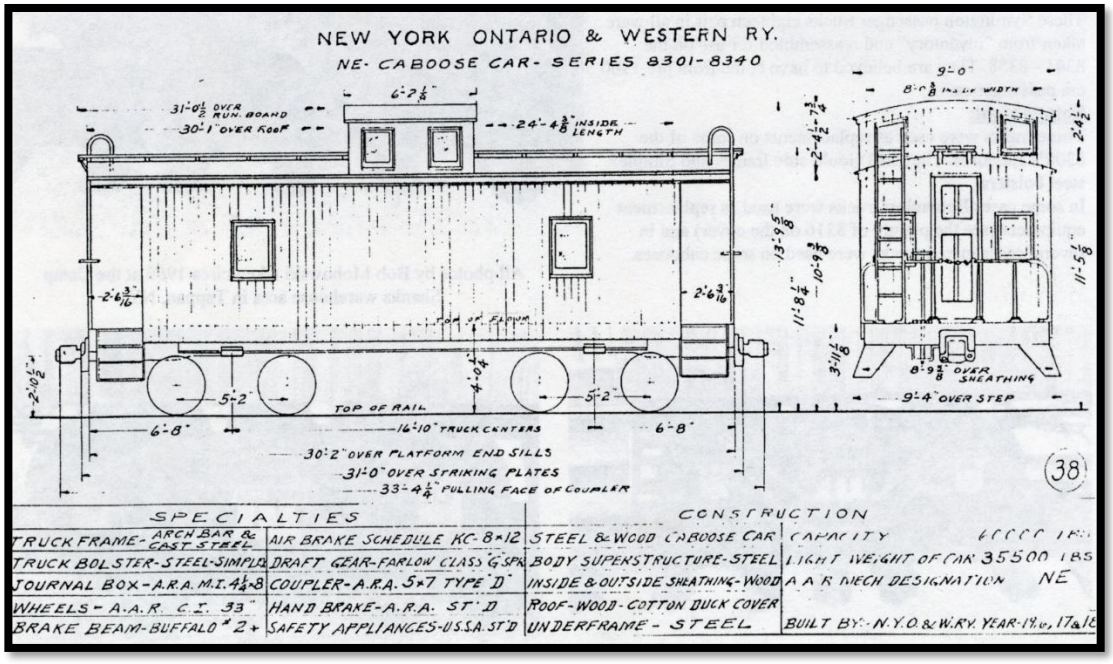



*Both images here have the pusher with the 8300 Caboose trailing, TOP; - a Class Y "Light 400"4-8-2 heaving on the end of a consist of steel hopper cars departing Summitville, with the locomotive looking quite smart and clean perhaps only recently shopped. Pusher assignments dispatched from conveniently located Summitville (at M.P. 93.11 only less than 15 Miles from the AV Shops – Wisner Ave. at M.P. 77.2) were common practice allowing a "break-in" following a trip for running gear servicing at the AV shops. BOTTOM: - A Class X 2-10-2 "Bullmoose" pushing a merchandise freight over the Delaware River bridge towards Cadosia and the junction with the O&W Southern Division mainline. The identity of this train is not annotated on my print, but it could very well be the "bottom" leg of SU-2 which was customarily handled by Bullmoose or Class P 2-8-0 Double Cab on the point and Bullmoose pushing to Cadosia where the workingman 2-8-0 Class W "Long Johns" handled the train(s) to Utica and points between.*

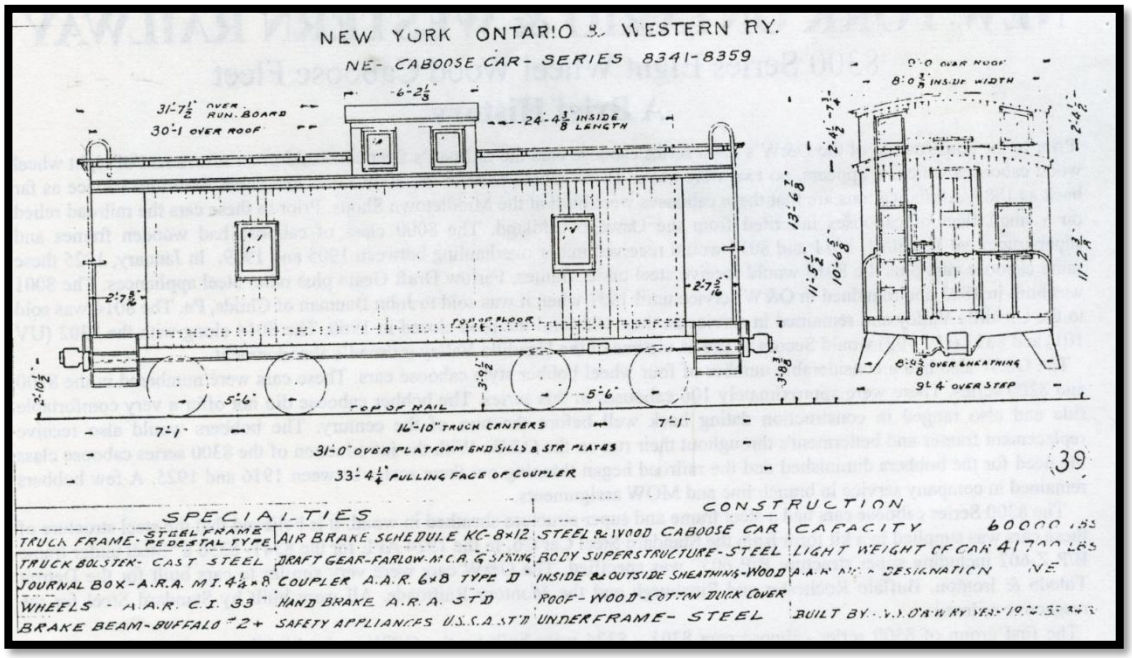
So, which is it? The pusher behind the caboose, or the caboose switched and tacked on behind the pusher engine? A well and long held O&W myth is that the 8300 Series cabooses, with only wood underframes were not robust enough to withstand a pusher locomotive pushing directly on the caboose. . . . NOT TRUE! While that may have been the case with the earlier cabooses, or before systematic rebuilding(s); -- the 8300 Series caboose diagrams following specify steel underframes. It is well known that cabooses 8301, 8304 and 8308 were rebuilt with cut, sectioned and spliced back together cast steel tender frames from retired tenders, but that was more than likely at a later time in the 1930's when trains were longer and heavier to an extent that two pusher engines together were needed.

*But not even robustly rebuilt welded cast steel caboose frames were deemed sufficient to withstand the multiple pusher Class X engine dispatch that is about to take place when this historic image was captured, so the caboose trails the pushers!*

On the Scranton Branch whereas the stiffest ruling grade of 1.6% was crested at Poyntelle. Beyond which the pusher engines assigned at Mayfield Yard were then an operating surplus, they were cut off and returned (compass) South to Mayfield. The tracks at Poyntelle, in both operating directions, had wyes for turning pushers with a crossover as well so that, in either direction, the engines did not have drift in reverse "wrong-track-running."




*While the specification(s) for trucks on these cabooses is, according to this diagram, is very minimal (Arch bar & cast steel), the final assembly of trucks on this "batch" of AV-built cabooses are mostly identifiable as Wolfe trucks.*




*The trucks on this series of builds were re-cycled Symington trucks from retired open framed / open platform passenger cars. These cabooses were well like by crews due to easy riding characteristics.*

Both iterations of the 8300 Series cabooses, according to diagram information, had structural steel underframe components. The preceding 8000 Series cabooses, according to diagram information, also had steel underframe components. . . so why / where from the "myth" of pushers needing to be "cut in" between caboose and the revenue cars? As the 8300 cabooses were built, they did indeed have only wood structured underframes. I suspect that such a practice of trailing the caboose behind a pusher was a result of manifest caution on the part of operating crews. After all, who'd want the risk of a pusher engine collapsing and telescoping into a caboose when riding within? There is a classic Phil Hastings photo image of a PRR train being pushed by a 2-10-0 "Hippo" coupled to rear of the wood bodied "cabin" car ("PRR-speak" for caboose) and further showing the rear-end crew having vacated the cabin and draped over the end of an empty hopper car immediately ahead!

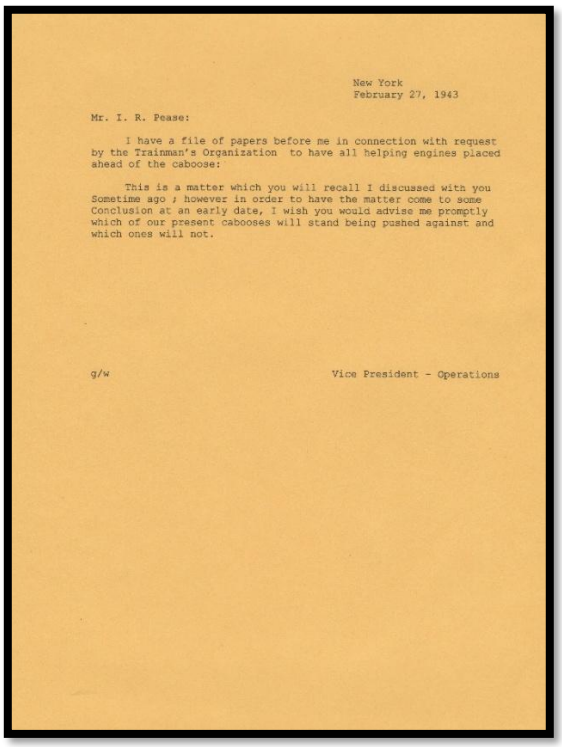
The potential hazard of newly acquired and more powerful locomotives available for service as pushers heaving onto wood framed cabooses was recognized by the O&W managers in 1924. An AFE, ("Authorization for Expenditure") designated B/P Z 602, was for the purchase and installation of Standard Steel Car Company "kits" including the rolled and flat structural steel members and components.

Up to, and including the time prior to the arrival of the "modern" O&W locomotives built and delivered post -1900; namely, the Class P 2-8-0 Double Cab types of 1900 and following ca. 1910 "Single Cab" 2-8-0 types, the lesser and more modest "muscularity" of the ubiquitous Dickson Manufacturing Company Class R 2-6-0 and Class S 2-8-0 Double Cab types in pusher service was a lesser safety concern for the O&W operating departments, than it became with these more powerful engines.

To a certain degree, in many industries as well as railroad companies, daily practices can become institutionalized and routine, irrespective of origin or wisdom. Easily stated upon inquiry about a corporate practice or method is the facile notion and rejoinder "We've always done that way / We always do it this way." However, with the increased pulling / pushing tractive effort and horsepower of the "modern" O&W engines, as described, and then especially with the additions of the "Light 400" Class Y 4-8-2 types (1920 and 1922) and the earlier (1915) Class X 2-10-2 "Bullmoose" safety concerns for crewmen riding in cabooses with a pusher behind then caught the attention of operating management in terms of the aforementioned AFE.

With the O&W perhaps ignoring or not embracing the capabilities of the 8300 Series cabooses which, after the ca. p1924 (and further thereafter) rebuilds were most capable of enduring a pusher locomotive behind without a collapse, I've turned up no evidence that there was any operating management policy neither mandating / accepting nor forbidding pusher

locomotives cut on behind vs. cut-in ahead of a caboose. However. The following typescripts are possibly at least some minimal evidence of a concern. . .



New York
February 27, 1943

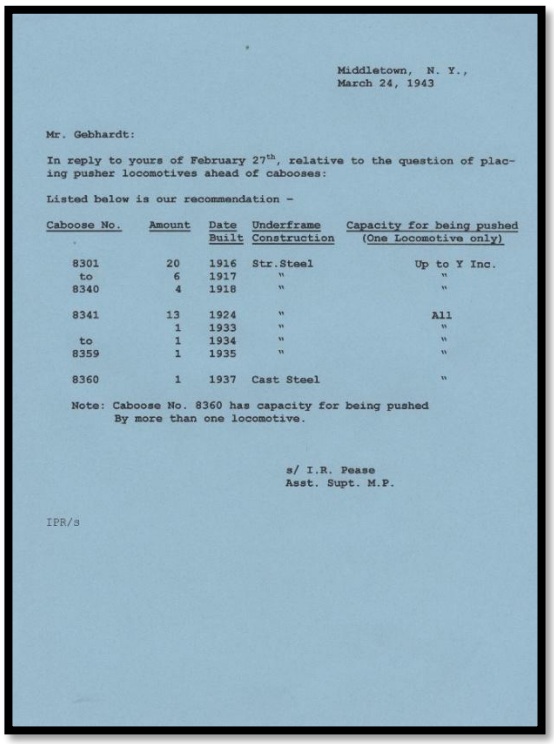
Mr. I. R. Pease:

I have a file of papers before me in connection with request by the Trainman's Organization to have all helping engines placed ahead of the caboose:

This is a matter which you will recall I discussed with you Sometime ago ; however in order to have the matter come to some Conclusion at an early date, I wish you would advise me promptly which of our present cabooses will stand being pushed against and which ones will not.

g/w

Vice President - Operations



Middletown, N. Y.,
March 24, 1943

Mr. Gebhardt:

In reply to yours of February 27th, relative to the question of placing pusher locomotives ahead of cabooses:

Listed below is our recommendation -

| Caboose No. | Amount | Date Built | Underframe Construction | Capacity for being pushed (One Locomotive only) |
|---|---|---|---|---|
| 8301 | 20 | 1916 | Str.Steel | Up to Y Inc. |
| to | 6 | 1917 | " | " |
| 8340 | 4 | 1918 | " | " |
| 8341 | 13 | 1924 | " | All |
| | 1 | 1933 | " | " |
| to | 1 | 1934 | " | " |
| 8359 | 1 | 1935 | " | " |
| 8360 | 1 | 1937 | Cast Steel | " |

Note: Caboose No. 8360 has capacity for being pushed By more than one locomotive.

s/ I.R. Pease
Asst. Supt. M.P.

IPR/s

It is interesting to note that this inquiry from the Operations Department came so late as 1943! To a degree the timing of the question impresses as either a reaction to complaints of operating crews, or their representatives, upon instances when pushers were dispatched directly behind cabooses, or is this maybe a solicitation for corporate "C-Y-A" documentation(!)?.

So, for the model railroader operations afficianaodos, you have your choice when dispatching (steam era/ steam engine) pushers; -- either couple up right up behind the 8300 caboose or, if the additional moves cutting in a pusher ahead of the caboose, or the following additional moves cutting off the pusher and reassembling the caboose at the tail end of the freight consist are a desireable addition of operatin session / prototype moves . . . then have at it!


*Here, posed on a Bill Schneider layout for a March 2004 RMC HO Scale "Fantrip"article, "Booster" equipped Class Y-1 4-8-2 is cut in ahead of Caboose No. 8304 to move a train out of Livingston Manor . . . unknown to the author / model photpgraphers that the pusher could have been simply bumped up to the caboose!*

*As with all of these Rambles . . . . More later.*
*Mal Houck NMRA MMR #696*