The K brake system usually had the valve, brake cylinder, and a single reservoir all cast as a single part. Reaction times on brake applications were slow, particularly on long trains, and there was no emergency reservoir.

The AB brake system has separate main components with a cast valve and cylinder, and a single air tank containing both standard and emergency reservoirs. The AB system valves use the pressure in the reservoirs to recharge the train line, speeding the release of the brakes. The AB improved brake system was made a standard appliance on all new cars built from September of 1933, and all cars rebuilt after Aug. 1, 1937 were required to have the newer brakes. The deadline was extended several times but after Jan. 1, 1945 the newer system was compulsory. Even so, almost a fourth of the car fleet still had K systems four years later. It wasn't until the final deadline of 1953 that the K brake finally disappeared. Probably.

Catch up with the thread at mrhmag.com/node/30664.

Which loco for a train?

Q. How would a loco be selected for a train? I have available an RS-3 with 1,600 hp and 61,775 pounds of tractive effort, a GP9 (1,750hp/64,750te), and a GP30 (2,250hp/63,375te). I'm building a freight car routing system and, having generated a number of cars that need to be put on a train, I need to select a loco. Why would I choose one or the other, assuming that the load was within range?

—Long-haired David

A. Tim Garland: You ask a good question that has puzzled many folk before. Since RS stands for Road Switcher and GP stands for General Purpose, any of the three could be considered for your train at any given time. Often it comes down to whatever is available. In the modern era power is selected not only for the current train but for the next trip too.

The power desk looks at the type of train and its tonnage. A tonnage profile of the route the train travels will list how many tons each type of unit is capable of pulling. In mountain territory the GP9 may be able to handle only 1500 tons, but in flatland territory it could move 3000. The big difference between a GP9 and GP30 is that the latter is turbocharged with more horsepower. If the power desk has a choice between both units, with one train being a general freight and the other being a time freight, the natural choice would be to make sure the GP30s were used for the higher priority time freight train simply because they could move the train faster.

Here is something else to consider. Few RS3s have dynamic brakes, but let's say your GP9 does. If there is a choice between the two to power a road freight, I would much prefer a GP9, especially in an area with any kind of grades. Save the RS3 for the local.

Joe Atkinson: As an example of how a smaller railroad like the Iowa Interstate (IAIS) does it, here's a General Order updating their tonnage ratings, issued a few months after my era. This was just after they'd received some leased ex-OHCR, xx-UP, xxx-MP SD40-2s, but they turned out to be some very worn-out examples of the breed, and were rated the same as non-turbocharged, but better-maintained, SD38-2s.

To clarify the notations in [2], on the IAIS, the 400-class locomotives were a variety of GP7/9 rebuilds (GP8/10/11/15/16), 600s were GP38s and GP38ACs, and 700s were GP38-2s.

David Husman: A lot of this is era-based. Pre-1980s railroads often used a tonnage rating per section of track. Then they adjusted the number of cars based on the territory, adding cars

Iowa Interstate Railroad, LTD
Cedar Rapids, IA.
September 20, 2005

General Order Number 23
All Subdivisions

To all Conductors and Engineers operating on IAIS and CIC Railroads.

Effective today September 20, 2005 the following **General Orders 10, 17, and 19** are canceled in their entirety.

This General Order supersedes and replaces previous rules and instructions concerning the maximum allowable trailing tonnage per individual class of locomotives.

Effectively immediately the following will apply.

Locomotive Class/Type	400	600	700	SD38-2/SD40-2
Westward Trains	**Max. Tonnage**			
Blue Island to Bureau	2500	2500	3200	-0-
Bureau to Rock Island	2500	2500	4400	7000
*Rock Island to Iowa City	1750	2000	2000	3000
Iowa City to Council Bluffs	2000	2000	2300	3200
Eastward Trains				
Council Bluffs to Iowa City	2000	2000	2300	3800
Iowa City to Rock Island	2500	2500	3000	4300
Rock Island to Bureau	2500	2500	3500	5000
Bureau to Blue Island	2500	2500	3200	-0-
Bureau/Peoria				
Bureau to Peoria	2500	2500	3100	5000
Peoria to Bureau	2500	2500	3900	5000
Yokum/Cedar Rapids				
Yokum to Cedar Rapids	1500	1800	2000	3000
**Cedar Rapids to Yokum	1500	1500	1800	2600

*NOTE: Due to coupler strength the maximum allowable trailing tonnage westward On Davenport hill is 10,700 tons.

2. Iowa Interstate tonnage ratings for locomotive classes. *Joe Atkinson*

RATING OF DIESEL LOCOMOTIVES IN FREIGHT SERVICE IN TONS OF 2000 POUNDS

Total weight of train exclusive of locomotive, which the different classes of locomotives will haul in each direction between stations named, under favorable weather conditions. Rating shown is for single unit. If more than one unit, rating of combined units will govern.

	31-45 5000 HP GE U50	72B-98B 5000 HP EMD DD35	100-129 1500 HP EMD GP7	130-349B 500-542B 1750 HP EMD GP9 EMD F9	400-448 2400 HP EMD SD24	470-499 2000 HP EMD GP20	700-739B 800-875 2250 HP EMD GP30	740-763 2500 HP EMD GP35	1400-1409 2500 HP EMD SDP35	2810-2864 3000 HP U30C	3000-3242 3000 HP EMD SD40	3600-3637 3600 HP SD45	5000-5039 5000 HP U50C	6900-6946 6600 HP DD40X
FIRST SUBDIVISION														
Huntington to Durkee	4050	3980	1500	1720	2850	1750	1900	2000	2500	3455	3350	2820	2970	4040
Durkee to Encina	1910	1880	700	820	1320	850	900	950	1150	1690	1500	1270	1330	1825
Encina to North Powder	8000	8000	3100	3450	5650	3450	3800	4000	4800	6750	6450	5190	5485	7430
North Powder to Telocaset	4050	3980	1500	1720	2850	1750	1900	2000	2400	3685	3250	2820	2970	4040
Telocaset to La Grande	8400	8400	3300	3600	5950	3600	4000	4200	5050	8055	6800	6195	6550	8870
La Grande to Union Jct.	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL
Union Jct. to Telocaset	2750	2750	1050	1100	1950	1200	1350	1400	1700	2495	2250	1900	1995	2720
Telocaset to Baker	5800	5800	2300	2500	4700	2500	2800	2950	3500	5805	4700	4460	4710	6385
Baker to Encina	2750	2750	1050	1100	1980	1200	1350	1450	1700	2495	2250	1900	1995	2720
Encina to Huntington	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL

3. Tonnage ratings for the First Subdivision of the Union Pacific's Oregon Division, as of July 1, 1973. The areas marked 'CL' are relatively flat and train length is governed by considerations other than tonnage.

where the tonnage rating was higher and cutting tonnage where it was lower.

After the big railroad mergers started, the runs of trains were longer, so one set of engines would operate the same train over multiple territories. That's when horsepower per ton ratings (hp/tt) became popular.

The contemporary UP uses a "tons/powered axle" (TPA) rating that varies by segment and train type. Engines have ratings of powered axles. A big 4400 AC engine might have the equivalent 10-12 powered axles (1 axle = the TE of 1 axle of an SD40-2).

A railroad either used TPA or hp/tt or it used tonnage rating charts, not a combination.

Hp/tt is based on how much it takes to move over territory based on speed and grade. It is very fast and easy to figure. And for really heavy grade territories they added helpers. You build the power set for the territory other than the helper district. Pretty much, a train can haul hp/tt equal to the grade. 1 hp/tt can make it up a 1% grade. 2 hp/tt can make it up a 2% grade, etc.

Reality sets in. You (Long-haired David) are designing a software package for a model railroad and primarily for an industrial switching line. That makes about 95% of this discussion moot. Just have the modeler say whether there are one or two engines on the trains and you are done. That's also prototypical.

See much more information at mrhmag.com/node/29348.

TIPS

Easy way to position wheels on axles

I had an issue with one of my elderly Hornby coaches. When it was running on a curve or through a turnout, one set of wheels always derailed. When I checked the spacing of the wheelset, I found that the wheels had moved closer together.

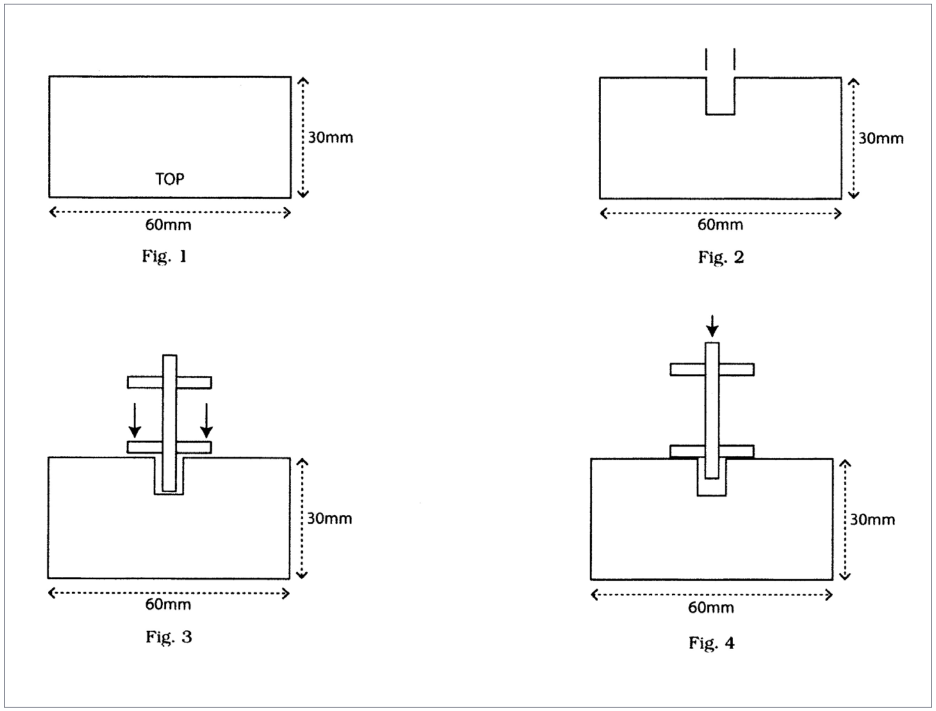
Here is an easy way to get the wheels back into their correct positions and position them symmetrically on the axle.

Drill a 3mm diameter hole in a steel block. The size is not critical but it must be large enough to clear the axle. The depth of the hole is the critical dimension. I started with a depth of 1.5mm.

Insert one end of the axle into the hole.

If the face of the wheel does not make contact with the steel block, press the wheel with your fingers until it touches the metal block [3].

If the wheel rests on the block but the axle does not touch the bottom of the hole, tap the axle down until it hits the bottom of the hole [4].



4. A home-made depth gauge allows setting the proper distance from the wheel face to the end of the axle tip.

Repeat the process with the other end of the axle, then check the spacing of the wheels and compare this to the correct measurement. If the wheels are too close, drill another hole of lesser depth and repeat the measurement steps. If the wheels are too far apart, drill a deeper hole and repeat the process.

I found the right depth on the third run.

—Sunil Fernando

MRH note: This system will be most effective on wheelsets using plastic wheels on a metal axle. If working with wheelsets that are very firmly fixed to the axle, take care to protect axle tips from damage. It is particularly useful if you are working with