

REPORT

Of Trials made with the Westinghouse Continuous Air-brake

ON THE AUCKLAND AND MERCER RAILWAY, 12TH AND 15TH MAY 1876.

The train upon which the trials were made consisted of a Tank Engine (6 wheels coupled), a Guard's Van and four Passenger Cars (6-wheeled). The Guard's Van and Cars were each weighted with two tons of rails to represent a full load of passengers. The total weight being estimated as follows:—

	Tons.	cwts.	qrs.	lbs.
1 Engine	18	0	0	0
4 Cars	25	14	0	0
1 Van	4	16	2	0
Iron rails	10	0	0	0
Passengers	0	12	0	0
Weight of train	59	2	2	0

The length of the train without Engine was 156 feet.

The Engine and Guard's Van had the air-brake mechanism connected to the ordinary hand-brake fitted with wooden blocks. The Cars had cast-iron blocks. The brakes on Engine and Van were so arranged that they could be worked by hand in the usual way, independently of the air-brake.

The air-brake fittings were such that the blocks could be controlled by the Driver or Guard on every wheel of the train. The compressed air, for the application of the brake-power by the Guard, was stored in a reservoir under the Van.

The following are particulars of the various experiments devised to test the application of the brake under the varied circumstances attending trains in motion, as taken by several persons; in some cases a slight difference of time was reported, and in such cases the mean time was adopted. Most of the trials were made on a down grade of 1 in 47·78; but as one passed through several grades, a section of the line is attached, which will speak for itself:—

No. and Nature of Test.	State of Rails.	Speed in Miles per Hour.	Gradient.	Time of stop from application of Brake to absolute rest.	Distance run from application of Brake to absolute rest.	Wind.
1. Ordinary Station Stop with Air-brake applied, steam being first shut off	Dry	30	level	Seconds. 10	Yards. 105	Calm
2. Same as No. 1, but on heavier grade ...	"	36	1 in 47·78 down	21	208	"
3. Steam shut off, Air-brake applied, and Engine reversed, but no steam applied...	"	38	1 in 47·78 down	24	290	"
4. Steam shut off, Air-brake applied, Engine reversed, and steam applied in back gear	"	37	1 in 47·78 down	27	306	"
5. Hand-brakes applied on Engine and Guard's Van by signal of whistle from Engine, steam being shut off	"	28	level 105 yds., 1 in 136 up 111 yds.	26	226	"
6. Hand-brakes applied on Engine and Guard's Van by signal of whistle from Engine, steam being shut off and Engine reversed, but no steam applied	"	42	various. See Section of Line	135	2177	"
7. Hand-brakes applied on Engine and Guard's Van by signal of whistle from Engine, steam being shut off and Engine reversed, and steam applied in back gear	"	37·5	1 in 47·78 down	66	637	"
8. Air-brake applied by Guard in Rear Van. The Driver on feeling brake, shut off steam and applied brake from the Engine also	"	36	1 in 47·78 down	21	245	"
9. Air-brake applied from Engine, and Engine left in full forward gear, with steam on (120 lbs. $\frac{7}{8}$ square inch). Engine in third notch	"	36	level	15	146	"
*10. Air-pipe disconnected between Engine and first Car, steam shut off on Engine, and brake applied from Van on signal of whistle from Engine; Engine wheels not braked. This trial to show what command Guard has over Train in case of a break away	"	37	1 in 47·78 down	44	460	"

* Air pressure in Van Reservoir reduced 28 lbs