

Profile 48

Redland Self-Discharge Trains

Build Details:	1988-1990 Standard Wagon, Heywood
Numbering:	REDA16xxx and REDA92xxx (see text for details)
Bogies / Suspension:	Gloucester Pedestal (hoppers) or Sambre et Meuse VNH1 (unloading stations)
Dimensions:	Various
Published Drawings:	n/a
Areas of operation:	Mountsorrel to various terminals
Main liveries:	pale green

Summary:

The Self-Discharge Trains operated by Redland (later Iafarge) were an attempt to combine the rapid unloading characteristics of hopper wagons with the operational flexibility of open wagons that required no specialised unloading equipment. This is achieved by use of a conveyor built into the bottom of each set of wagons and an unloading vehicle coupled at one end. Despite the mechanical complexity of the concept it appears to have been successful with several sets built for use both in the UK and abroad.

History:



A Redland Self-Discharge Train on display at the Railfreight Exhibition at Cricklewood in May 1989.
Thomas Young

Hopper wagons have the advantage of relying on gravity for unloading and are therefore not reliant on external equipment such as cranes or grabs for discharge. However, most designs do require fixed infrastructure in the form of under-track chutes or bunkers, and the type is therefore not suitable for short-term flows between unequipped locations. Some wagon designs (such as the Marcon bogie gravel hoppers built from 1969) got around this by having the hopper doors higher up, allowing portable conveyors to be positioned underneath. This still required additional equipment though and, depending on the number of conveyors available, unloading could be a slow process.

An experiment in 1982 saw standard PGA hopper wagon PR14329 rebuilt as a so-called "self-discharge" wagon. The hopper was made up of two compartments, each with a short conveyor belt built into the floor. Powered externally, these discharged the load through an opening in the centre, believed to be on the side above the solebars. Although unsuccessful, the concept was further developed by Standard Wagon, and their first "Self Discharge Train" (SDT) appeared in 1988.

Produced in conjunction with aggregates firm Redland, this featured hopper wagons with a similar low level conveyor belt system. The main difference was that the belt now passed through several wagons, allowing unloading at the end of the rake. The initial order was for four 10-wagon sets, each comprising 8 inner wagons and two outers. There were two types of outer wagon, one with a diesel engine to power the conveyor and hopper doors, the other with a belt tensioning device and extension to allow sets to operate in multiple. All wagons were assigned the standard PGA TOPS code for 4-wheel hoppers. The inner wagons were numbered REDA16000-16031 to design code PG019A, the diesel engine-fitted outer wagons were REDA16100-16103 (PG020A) and the opposite outers were REDA16200-16203 (PG021A). The hopper on each wagon was V-shaped with no longitudinal taper (except on the outer wagons), and a pair of full-length clamshell doors at the bottom. Substantial vertical and diagonal bracing was fitted between the solebars and the hopper sides, giving a boxy appearance. The wagons were painted in Redland's pale green livery with company lettering in red on the hopper sides. Buffers were only fitted

to the outer ends of each set, the inner connections being close coupled by means of a bar beneath the conveyor belt. Flexible hoses between each wagon transmitted air (or hydraulic) power.

To complete the system, an unloading vehicle was required. Without this, the entire load would be discharged onto the track at the end of the set. Two bogie container flats that had been built by Standard Wagon in 1985 were modified with conveyor belts for this purpose and recoded as PXAs to design code PX049A (REDA92545/92546). The first conveyor ran from one end of the wagon towards the centre, where it discharged into a small hopper. At the base of this was a longer second conveyor mounted on a turntable. When in transit, the raised end of this conveyor sat on a support framework at the other end of the wagon (underneath which was a further diesel engine and ancillary equipment. For unloading, the main conveyor could be rotated to either side to discharge the load into adjacent road or rail vehicles, or directly onto the ground.

With two unloading stations available, trains were typically formed of 20 hoppers and they first entered service in April 1988, running from Mountsorrel to various terminals. The design was particularly useful for short term flows where no unloading facilities were available.

Evidently successful, an order was placed for a second batch, delivery of which commenced in early 1989. Building on lessons learned from the first batch, the new order called for five 8-wagon sets, with the diesel engine repositioned to one of the inner wagons. The latter were numbered REDA16300-16304 (PG022A) while the unpowered inner wagons were REDA16032-16056 (PG019B) and the outer wagons REDA16204-16213 (PG021B). To work with these sets, an additional unloading station (REDA92635) was rebuilt from a bogie container flat. Later in 1989 two further SDTs were built for use by a Redland subsidiary in France. Although built to the European loading gauge, some of the hoppers were delivered to Dover by rail in an unfinished state. The remainder, plus the two unloading stations, were moved by road.

In January 1990, the TOPS codes allocated to private owner wagons were reshuffled to cater for the wider range of such types. The PH series, which had been for bogie hoppers, became free and it was decided to use this to distinguish the self-discharge wagons from more standard hoppers. The Redland wagons therefore became PHAs, with the second letter of the design code changed to H (i.e. PG019A became PH019A). The unloading stations were similarly recoded as KJA (KJ049A).

A third order for domestic SDTs was placed in 1990 and delivered in the spring. As with the second batch, the new order called for five 8-wagon sets numbered REDA16057-16081 (inner wagons to PH019B), REDA16214-16223 (outer wagons to PH021D) and REDA16305-16309 (powered inner wagons to PH022B). Unloading station REDA92602 was a new build in 1992, similar to the earlier PXA/KJAs but to design code KJ050A.

The SDT concept appealed to the BR Civil Engineering department for use carrying ballast and spoil. This eventually led to the development of various bogie hopper designs of types YDA and YOA.

Apart from a change of branding to Lafarge Aggregates in about 2002, the

SDTs are still used on a variety of services from Mountsorrel. Some minor modifications by 2008 resulted in changes to design codes as shown below:

Numbers	Original	1990 revision	Current	Original	Current
REDA16000-16031	PG019A	PH019A	PH019E	PGA-P	PHA-P
REDA16032-16056	PG019B	PH019B	PH019D	PGA-P	PHA-P
REDA16057-16081	PH019B	n/a	PH019F	PGA-P	PHA-P
REDA16100-16103	PG020A	PH020A	PH020C	PGA-Q	PHA-Q
REDA16200-16203	PG021A	PH021A	PH021H	PGA-R	PHA-R
REDA16204-16213	PG021B	PH021B	PH021G	PGA-R	PHA-R
REDA16214-16223	PH021D	n/a	PH021K/L/N	PGA-R	PHA-R
REDA16300-16304	PG022A	PH022A	PH022C	PGA-S	PHA-S
REDA16305-16309	PH022B	n/a	PH022D	PGA-S	PHA-S
REDA92545/546/635	PX049A	KJ049A	KJ049B	PXA-S	KJA-S
REDA92602	KJ050A	n/a	KJ050A	KJA-S	KJA-S

Updates