

Application Story

VACUUMING THOSE HARD TO REACH PLACES

Arva Industries, based in Ontario, Canada, designs and manufactures made-to-order heavy equipment for mining, rail, military and marine industries. They have a solid reputation for solutions-based engineering design, high reliability, maintenance efficiency, and machines for reduced downtime.

Naturally, given Arva Industries' reputation & focus, an Ogura clutch found its way into one of their designs. It was no ordinary design to say the least. It was a 60' long vacuum excavator for a rail customer, weighing close to 140,000 lbs. The vacuum ballast excavator is used for rail maintenance. It vacuums up granite ballast so that maintenance can be performed on the track. The Ogura clutch starts and stops the vacuum pump/blower with the flick of a switch in the operator's cab.

The 513HP Cummins 12l engine delivers power to the vacuum pump, while it also drives hydrostatic propulsion for the railcar. The direct drive pump is driven through a Spicer 1610 driveshaft. The input for the Ogura MMC Series clutch is a hub that is connected to the clutch armature, with bolt holes to match up with the standard driveshaft coupling. It makes for easy mounting. In this application, Ogura model MMC-200G clutch was chosen for the high torque requirement. The clutch provides easy start/stop operation of the pump.

The Hibon vacuum pump model SI-AV8702 runs at 1900 rpm full speed, but engages at slower rpm. This helps with the high inertia startups. It provides roughly 5,000 CFM flow and pulls 28" Hg at 0 flow through an 8" hose. The system employs massive silencers to keep the noise down.

The electromagnetic clutch consists of three basic components: the field/rotor assembly, the hub, and the armature. The field assembly fits up to a shaft shoulder on the pump. The hub is fixed to the shaft with the floating armature on top. Without any power applied, it is assembled such that an airgap exists between the armature and field/rotor assembly. A bearing-supported flange mounts to the armature so that the driveshaft coupling can be bolted to it.

When the vacuum pump is needed to run, power is applied to the field coil. Magnetic flux is transferred across the small airgap between the field and rotor. The rotor portion becomes magnetized which attracts the armature against the rotor, creating full contact and full torque transfer.

While pneumatic clutches are sometimes used in these applications, the electromagnetic clutch offers distinct advantages. First, it is reliable. With proper power applied, the electromagnetic clutch will

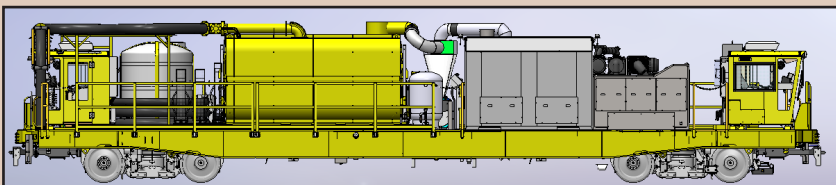
transfer torque as required. Secondly, it is maintenance free. There are no worries about pressure loss fluctuations, leaks, or contaminants in the lines. The Ogura MMC Series clutch hits every check box for Arva's focus on solutions-based design, high reliability, maintenance efficiency, and reduced downtime. ●



Vacuum excavator being delivered



Ogura MMC-200 on vacuum pump



Arva Industries' new vacuum ballast excavator