

Application Story

OGURA CLUTCHES HELP KEEP YOU ON THE RIGHT TRACK



PHT permanent magnet slip clutch magnetic

Like all industries, railroad systems have become more automated. Trains are constantly monitored so their position is always known. To make sure that trains run in the right direction, and “not into each other”, a series of automated switches are used to switch trains onto different tracks. These “point” or “turn out” switches move between two sets of tracks controlling the track on which a train is running.

The setup is relatively simple. A motor runs a speed reducer which in turn controls a throw rod that moves the tracks back and forth. Once the complete transition has taken place a sensor notifies the central control that it’s ok for the train to proceed. But if there are rocks or a significant build up of ice the switching may not take place. In the past the motor continued to run until it went into a current overload and tripped the relay. This caused significant heat in the windings of the motor and required frequent replacement of motors.

To prevent this from happening, an Ogura PHT (permanent magnetic clutch) was installed in the system. The PHT is a magnetic slip clutch which allows the motor and the gear box to continue to drive but can hold the output in a stall condition. Since it is magnetic it has no wearing faces therefore it can slip for an extended amount of time. For this application two sizes are used. One is a 70 in lb unit and the other one is a special 125 in lb unit. The 70 in lb units were designed to take slip time up to 30 min. at a continuous 1500RPM. The 125 in lb units can have slip times up to 10 minutes at 680RPM.



Railroad track switch with PHT 70



Railroad track switch with PHT 125

The PHT works by using two multi-pole permanent magnets facing each other with a hysteresis disc in between. By changing the orientation of the magnetic poles into a relationship to each other the strength of magnetic field flowing through the hysteresis disc either increases or decreases. This results in a greater or lesser drive torque. This allows the PHT to be set to the exact torque requirement of a specific application.

By adding the PHT initial cost was added to the switching system. But the result for the railroad is actually less cost because the replacement maintenance on the motors was reduced significantly.

With this application, everybody was a winner. The railroad was happy because even though they were paying more for the switch they were actually reducing a significant portion of their switch maintenance cost. The switch manufacturer was happy because he was adding another component to his system and could charge more dollars. Ogura was happy not only because a sale was made but an application need was recognized and fulfilled resulting in a satisfied customer and end user. Like the people in the train industry say “when you’re using an Ogura clutch you know you’re on the right track”. ●