Monday, 17 November 2008

Life Cycle & Durability
Case Study - Rotacaster Wheels

Test Site: Wallis Lake Fisherman's Co-operative

Customer Contacts: Mr. Noel Gogerly - President - Phone: +61 (0) 428 656 481
Mr. Barry Murray – Floor Supervisor

Application: Custom trolley for movement of multiple crates of ice packed fish to and from process area to freezers.

Normal Loading: Averaging between 150-200 kg (325-450 lbs)

Period in use: 2 ½ years (Oct 05 to March 08)
(Nylon swivel castor replacement – every 6 months)

Environment: Coastal location in a highly abrasive and corrosive working environment. The exfoliated (exposed aggregate) floor combined with constant exposure to salt water and sand provided an extremely harsh wear characteristics compared to those normally encountered in most working environments.

Rotacasters Used: Double row wheels from the original first production run.
Wheel Body – carillon
Bearings - Nylon bearing (in lieu of a sealed steel bearing) with Stainless Steel spanner bush
Axle –10mm (3/8") stainless steel
Rollers – Polyurethane with nylon bush

Fitting Details: 2 x 2 doubles in tandem mount on the rear with 2 x doubles on the front of the trolley.

Overview:

The Wallis Lake Fisherman's Co-operative is situated on the harbor inlet to Wallis Lake in the seaside resort of Forster-Tuncurry, NSW, Australia. The naturally corrosive environment combined with the existing floor conditions and the nature of the specific application provided a true challenge to the durability of not only the rotacaster but for any wheel product.

According to Mr. Barry Murray, the alternative nylon swivel castors were replaced approximately every six (6) months at which point they were generally paper-thin. Bearings to their crown pallet jack are replaced every 3 months due to corrosion and wear. He also advised that the trolley fitted with the rotacasters was the trolley of choice and the one most used, due to its ease of use and efficiency in tightly positioning reasonably heavy loads within the confined freezer space.

Prior to (Rotacaster Wheel Limited) removing the wheels for inspection after **2 ½ years in operation**, the trolley was still in active use and still the preferred trolley, and Mr. Murray stated they were still happy to continue using it despite the wear to the roller axles.

During the 2 ½ years use, Mr. Murray stated he had not carried out any repairs or maintenance on the wheels during that period.

Observations:

The wear patterns and extent seemed to vary between the front and rear wheels with the rear wheels exhibiting the most wear. This was predominantly due to the rear wheels providing the majority of lateral movement for steering i.e. greater sideways use.

There was considerable wear to **the roller (transverse) axles** and the head of the radial support arms of the rollers. On one of the six wheels, one radial support arm had failed.
Despite this the trolley was still in service and functioning effectively.

On disassembling the wheels, there was considerable wear to both the stainless **steel spanner bush and axles**. On a number of samples, the one (1) millimeter wall of the spanner bush had been completely worn away and up to another millimeter into the stainless steel axle.

The **polyurethane rollers** by contrast had exhibited very little wear at all. Measurement of unused stock and the test samples indicated less than 0.5 millimeters on average.

Neither the **nylon wheel bearings nor the roller bushes** exhibited any substantial wear. On close inspection it was obvious that sand embedment in these elements had made them abrasive rendering the adjacent stainless steel and carillon surfaces to be sacrificial wearing surfaces.

Summary:

Whilst no specific life cycle or span can be determined from the above test case, given the extreme abrasive and corrosive characteristics of this environment, and the relatively short lifecycle of the previously used products (nylon castors), the rotacaster has performed exceptionally well and could be expected to last considerably longer in less demanding environments.

The wear of the transverse (roller) axles when viewed in relation to the extent of wear on the stainless steel spanner bush and axle is also exceptional in the circumstances. Given their regular and closer proximity to the floor, and thus greater potential for coming into contact with sand and salt water (continually running), it provides a good indication that these will have a substantially longer life-cycle in normal environments.

In short, despite the absence of any maintenance, the rotacaster provided a life-cycle five (5) times greater than the alternative nylon swivel castor when used in this environment.

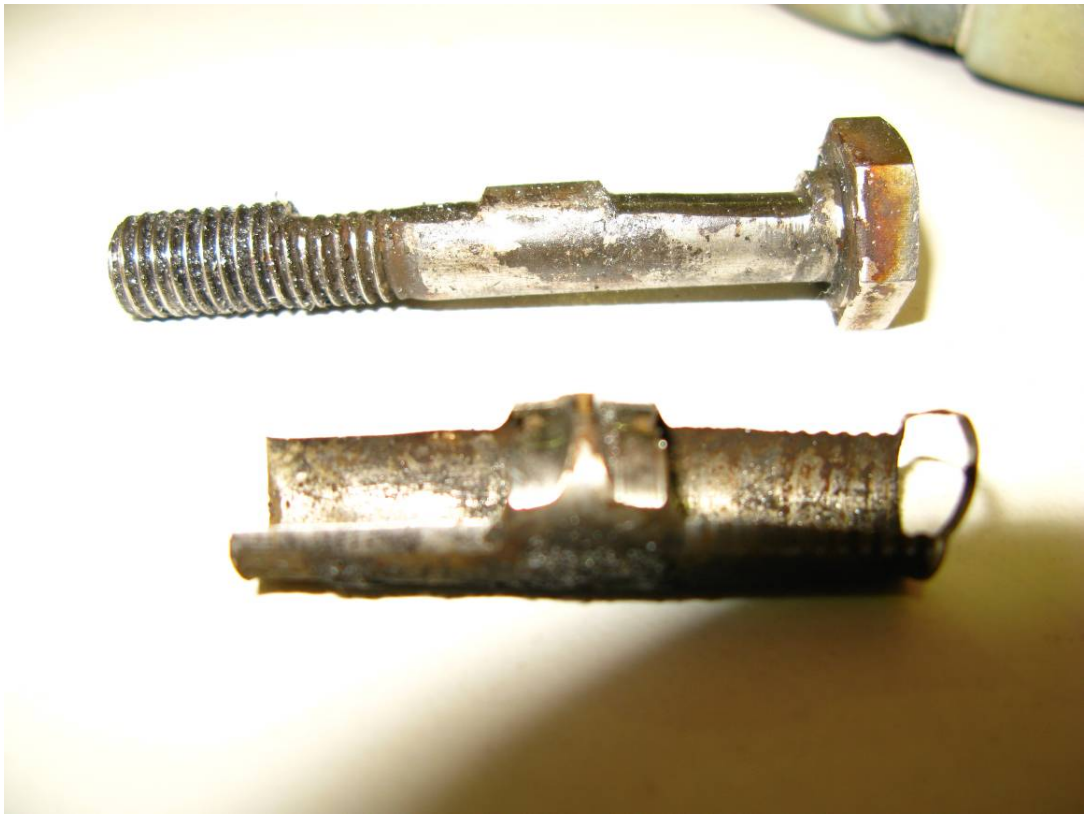
PHOTOS

Trolley/Cart

Floor Surface

Rear Wheel

Front Wheel



Rear Wheel Axle and Spanner Bush

Rear Wheel Axle and Spanner Bush

Front Wheel Axle and Spanner Bush