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## **LONG TERM LIFE CYCLE EVALUATION OF TAYLOR DEVICES PRODUCTS**

**The purpose of this report is to study the long term effect of environmental influences of the seals and polished stainless steel piston rods of Taylor Devices products. Several examples will be presented, some of which will represent the earliest of Taylor products.**

**Various Taylor Devices products were studied, some of which were over 35 years old. All units were found to be in overall excellent condition, and in excellent working order.**

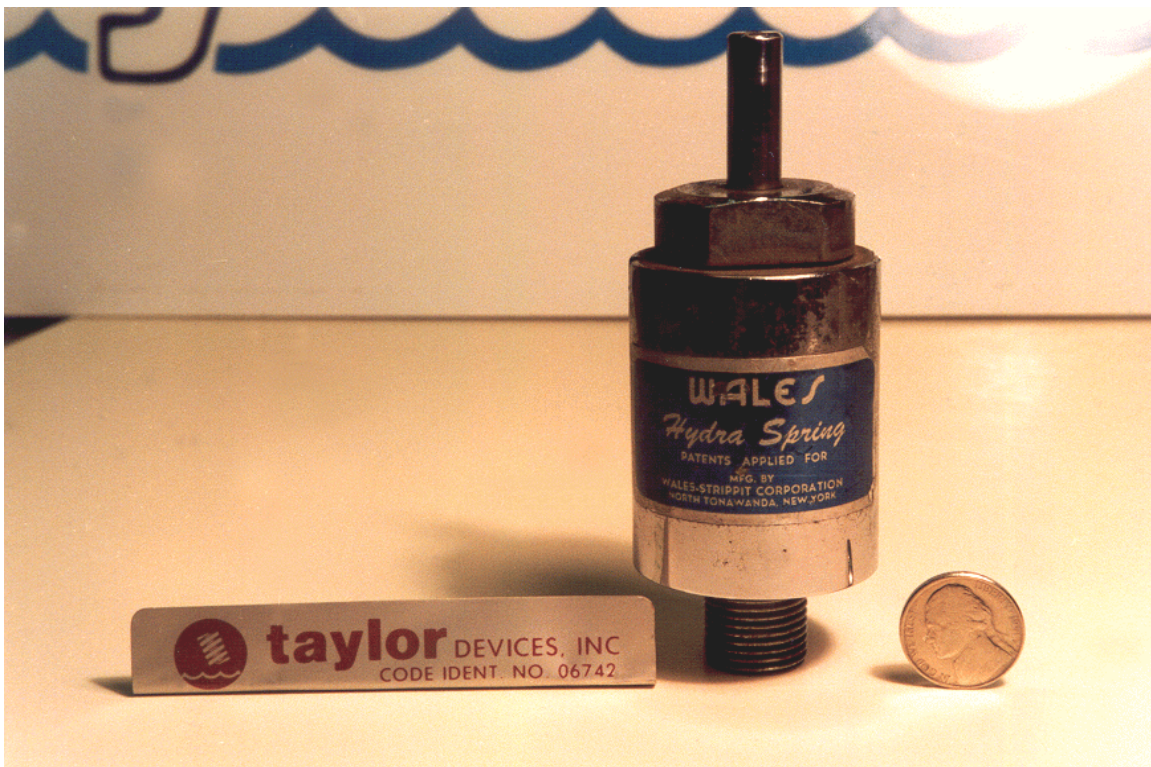
**Each example will be described briefly, then evaluated for condition, and performance.**

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## PHOTO 1

One piece of a Wales-Strippit Hydra Spring-Damper, built prior to 1954 by our predecessor corporation. Chrome plated steel construction, with a chrome plated piston rod.

- a. Taylor Devices' manufactured seal of nylon material.
- b. The Unit is fully functional with no leakage of any type.
- c. Light surface oxidation of the Cylinder, Cap, and Piston Rod, approximately 70% of the Piston Rod area shows this oxidation.
- d. The Unit has been in unprotected indoor storage since at least 1954.



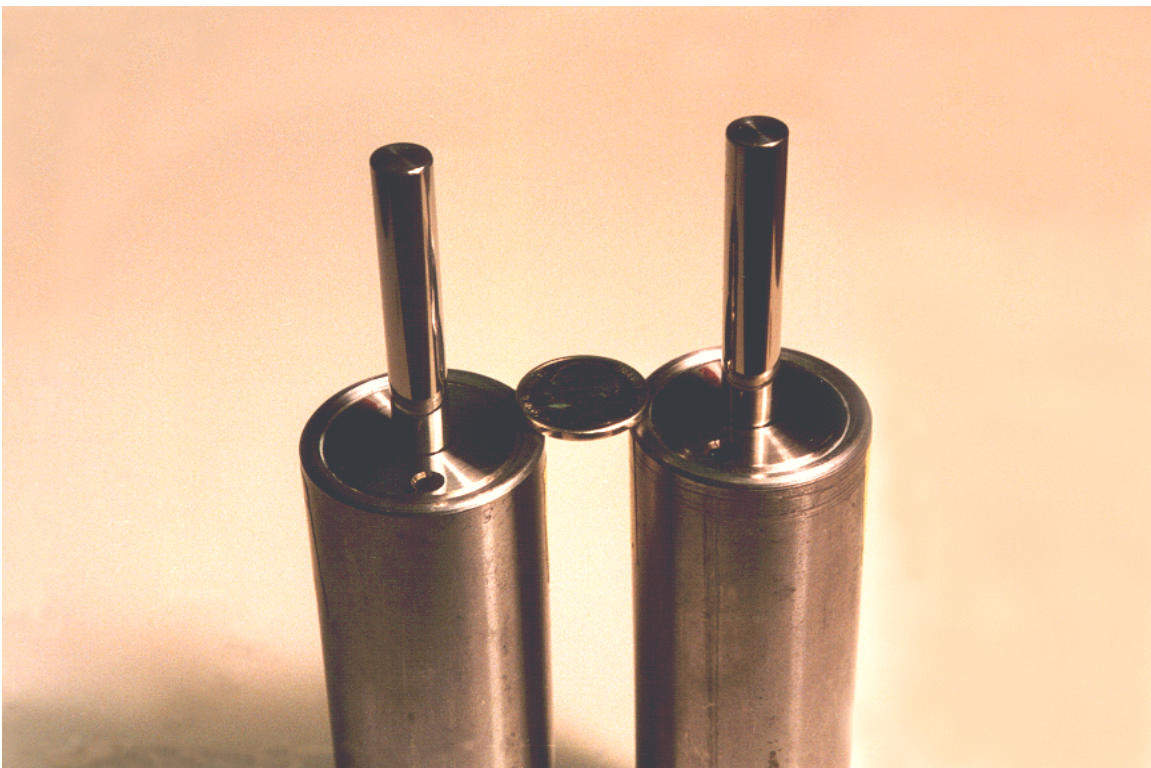
## PHOTO 2

Two pieces of a Model 6232 Fluid Spring-Damper, this model is a standard Taylor product which is still in production today. These Units are control samples which are kept in the company safe for Standard Product Baseline Evaluations. They are marked Units 1 & 2.

- a. Metallic components are a 4140 Cylinder, and 17-4 PH Stainless Steel Cap and Piston Rod. All components are heat treated, the Piston Rod finish is a lapped  $\frac{1}{2}$ -2 Micro-Inch, with a Taylor Devices' manufactured Seal of Teflon material.
- b. The Units were load tested and were found fully functional, with no leakage of any type.
- c. Unit #1 has light rust on the stud end of the 4140 Cylinder. The Cap and Piston Rod are in perfect condition.

Unit #2 has heat treat scale visible on the stud end of the 4140 Cylinder. The Cap and Piston Rod are in perfect condition.

- d. Both Units were assembled on August 13, 1965.
- e. Storage has been in the Company Safe, indoor environment.



### PHOTO 3

One piece of a Model 6186 Fluid Spring-Damper, this Unit is also a standard Taylor product which is in production today. This Unit is a control sample that is kept in the Company Safe. The Unit is marked Serial Number 9.

- a. Metallic components are a 4140 Cylinder, and 17-4 PH Stainless Steel Cap and Piston Rod. All components are heat treated, the Piston Rod finish is a lapped  $\frac{1}{2}$ -2 Micro-Inch, with a Taylor Devices' manufactured seal of Teflon material.
- b. The Unit was load tested and found fully functional, with no leakage of any type.
- c. This model has a darkened Cylinder. The Cap and Piston Rod are in perfect condition.
- d. This Unit was assembled on November 19, 1965.
- e. Storage has been in the Company safe, an indoor environment.



## PHOTO 4

Four pieces of a Model 828.5 Taylor Step-Tubular Shock Absorber. This style Unit is no longer a standard Taylor product. These Units are also control Units and have been in storage.

- a. Metallic components are a 17-4 PH Stainless Steel Cylinder and Piston, with a 4140 Internal Stud. All components are heat treated, the small bore of the Cylinder and the large bore of the Piston are finished to  $\frac{1}{2}$ -2 Micro-Inch.
- b. Taylor Devices' manufactured Seal, 3 Piece, Nylon, and Elastomer materials.
- c. The Units were fully functional, with no leakage of any type.
- d. The exposed Piston bores are in perfect condition.
- e. All Four Units are believed to have been assembled on or about April 15, 1959.
- f. They have been stored in the Company safe, an indoor environment.



## PHOTO 5

One piece of a Taylor Fluid Spring-Shock Absorber, used in a Float Plane Nose Landing Gear for Tritan Aircraft Corporation. This Unit was excess production and used as a sales sample, Taylor part number 4SS-4248-01.

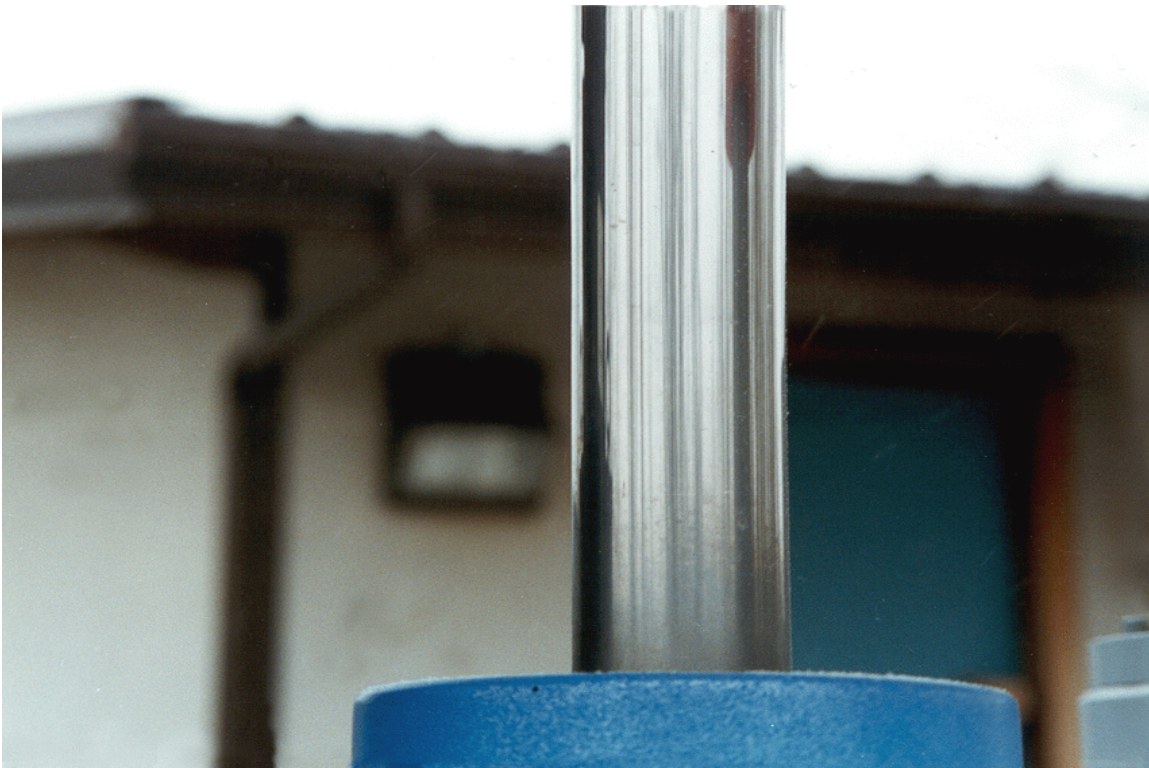
- a. Metallic components are an 18% Nickel Maraging Steel Cylinder, and 17-4 PH Stainless Steel Cap and Piston Rod. The Cylinder and the Cap End are painted with a white epoxy paint. The Piston Rod has a 6-10 Micro-Inch radial honed finish, with a Taylor Devices' manufactured Seal, Teflon material.
- b. The Unit was load tested and found fully functional, with no leakage of any type.
- c. The painted surfaces are in very good condition, and the Piston Rod finish is in perfect condition.
- d. This Unit was assembled on April 10, 1969.
- e. Storage for this Unit has been in various indoor areas in Taylor Devices' Facility.



## PHOTO 6

One piece of a 10 x 22 Taylor Crane Buffer. This is a standard Taylor product which is still produced today. This particular Unit was assembled in 1966, and is stored in an unprotected outdoor display area.

- a. Metallic components are a painted carbon steel Cylinder and End Cap, with an exposed 17-4 PH Stainless Steel Piston Rod. The Piston Rod has been heat treated and finished to our standard ½-2 Micro-Inch lapped finish, with Taylor Devices' manufactured Seals of Delrin material.
- b. This Unit could not be load tested, due to its size and location. However, no Fluid leakage was evident.
- c. Paint shows slight peeling around the Cap end. No rust was visible. The Piston Rod has a light coating of atmospheric pollution by-products caused by smog and winter road salt fog in the Buffalo, New York area.
- d. This Unit has been assembled since 1966.
- e. Storage has always been in an outdoors display.



## **CONCLUSIONS:**

1. Taylor Devices' product designs have a demonstrated life well in excess of 30 years without requiring maintenance of any type.
2. The highly finished Stainless Steel surfaces used on critical sealing areas of Taylor Devices' products demonstrate nearly complete corrosion resistance in long term exposure in excess of 30 years.
3. Taylor Devices' patented and proprietary Seal designs do not show any deterioration or seepage in long term usage in excess of 30 years.
4. The Silicone Fluids used by Taylor Devices do not outgas or decompose in long term use.

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