

# Extruder Screw Removal Tool

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## Background

When an extruder is in need of maintenance, the machine is shut down allowing the leftover rubber inside to cool and adhere to the barrel. This cooled rubber plug makes the removal of the screw for maintenance significantly more difficult. The current method of removing the screw is labor-intensive and puts operators in the line of fire.

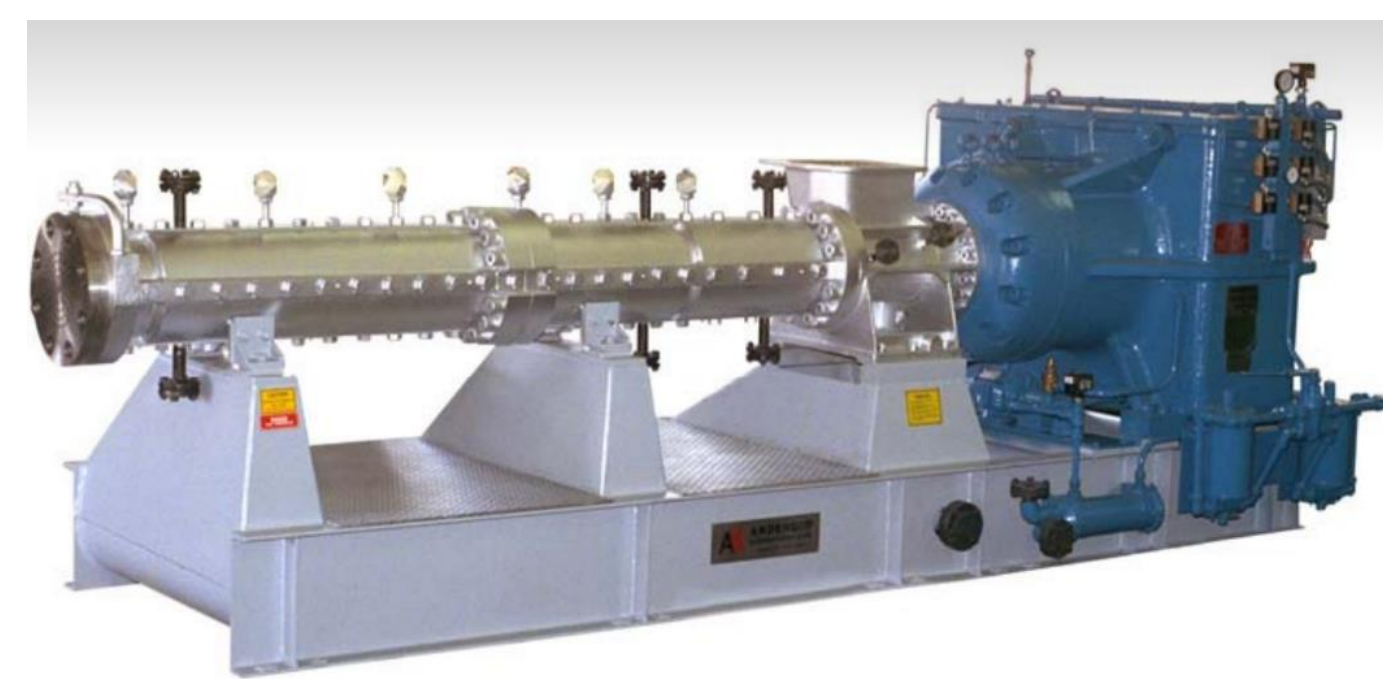


Figure 1: Extruder

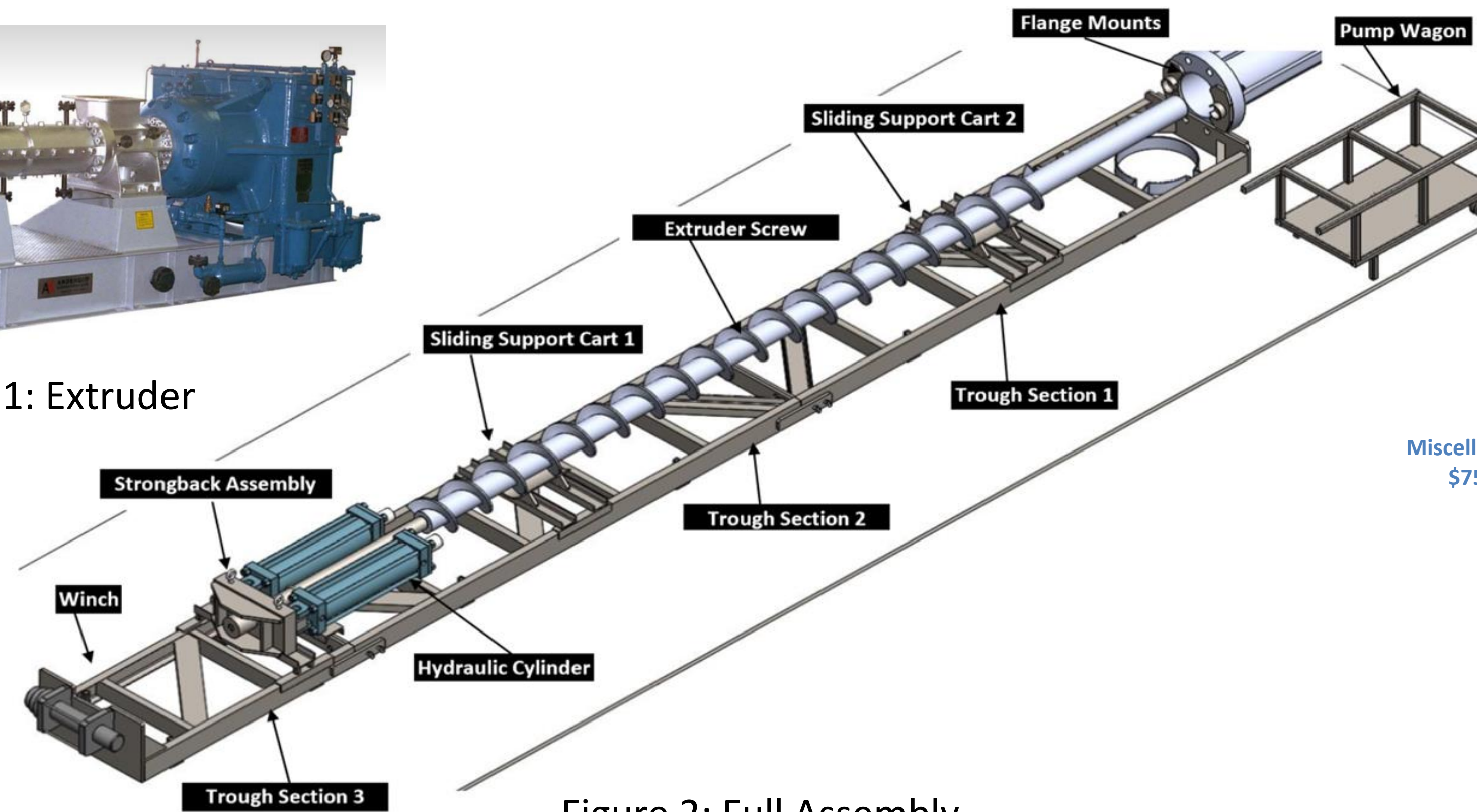
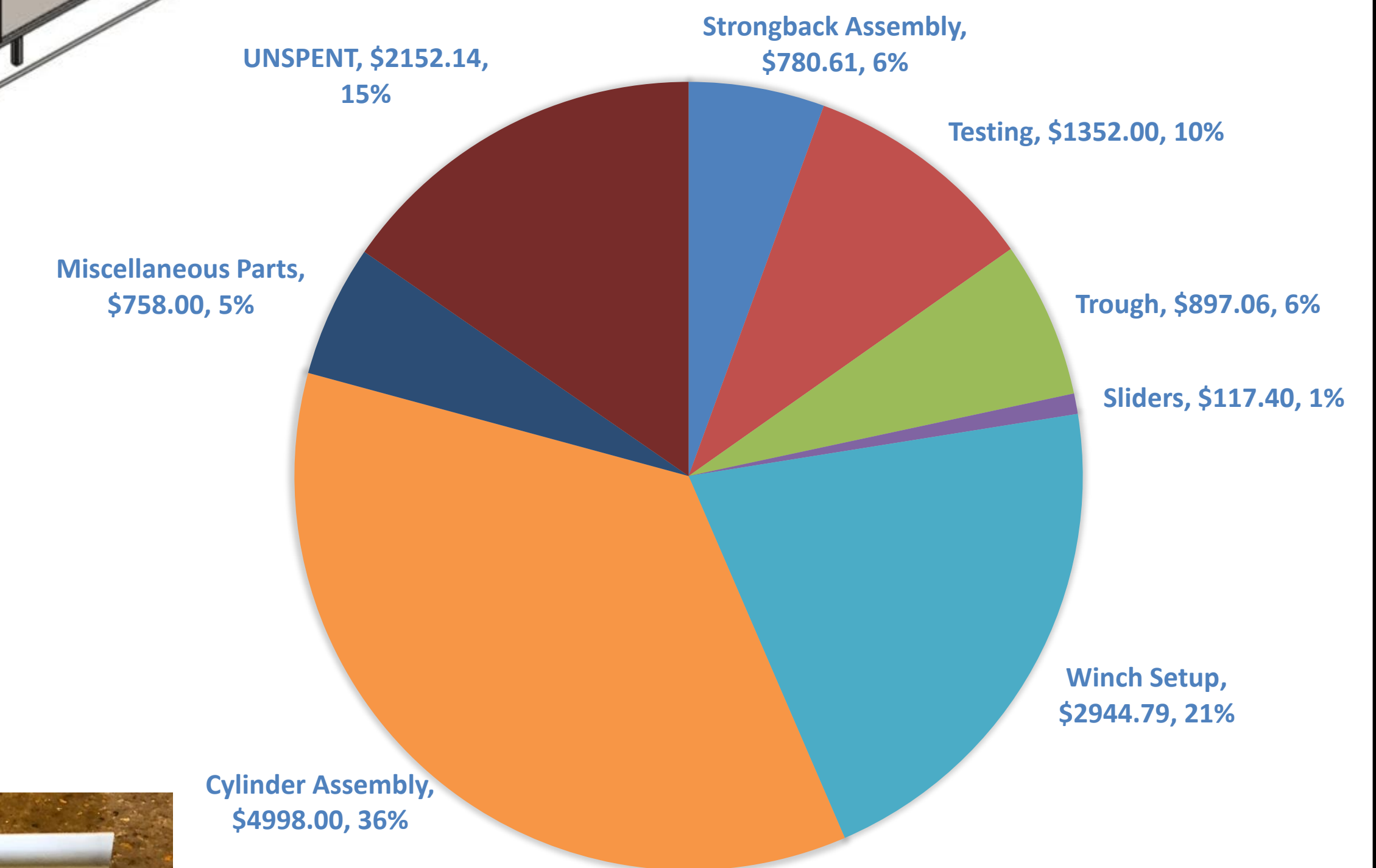


Figure 2: Full Assembly

## Budget



## Objective

Develop a hydraulically and/or electrically powered tool that will be used to safely remove an 18 foot long, 10 inch diameter extruder screw from an extruder assembly that is used to dry Vistalon™ EPDM rubber at ExxonMobil.

## Engineering Specifications

Initial Pull Force	75 Tons
Initial Pull Length	2 Feet
Secondary Pull Force	3 Tons
Secondary Pull Length	16 Feet
Minimum Safety Factor	2
Safety Factor for Lifting	4



Figure 3: Strongback Assembly



Figure 4: Slider Cart

## Material Selection

Strongback, Trough, and Sliding Support Carts	A36 Steel
Threaded Rod	17-4 Stainless Steel

## Testing and Validation

1.5x rated load applied to critical components to test for failure  
Large load cell to test if required forces (both 75 and 3 tons) can be reached

## Safety

Remotely Operated	-Extended Remotes -GoPro Live Feed
Hydraulic Valves	-Open Center Control Valve -Pressure Regulating Relief Valves
Electric Winch	-High Strength Winch Cable

\*All components built to ExxonMobil's Safety Rules and Regulations

