

Overview of NASA Armstrong's 60,000 lbs Capacity Soft Support System (60K3S) Used for Ground Vibration Test (GVT)

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60,000 lbs Capacity Soft Support System (60K3S)

- 60K3S is a self-jacking soft support system ($\approx 1\text{Hz}$) that interfaces with the three aircraft jack locations
 - Not considered a critical lift activity if standard aircraft jacking procedures are used
- 3 canister system each able to hold 20k lbs
- Side loads **MUST** be monitored with 3-axis load cells mounted to the soft support adaptor plate because they do not meet mil spec requirement for side load factor of safety
 - Aircraft landing gear retraction loads may be needed
- Leveling arms ensure even loading of isolating diaphragms
- Required items:
 - 60K3S Soft Support System
 - Three, 3-Axis Load Cells (25k-lbs capacity)
 - Data Acquisition System
 - Nitrogen Cart (at least 1,000psi supply pressure over all bottles)
 - Pneumatic Regulator Box
 - String pots
- 60K3S must under go a vertical loading test before use
- Number of people required to operate 60K3S
 - 60K3S Installation/Removal: 7 people
 - Monitoring during Operational Use: 3 people
 - 60K3S Inflation/Deflation: 7 people

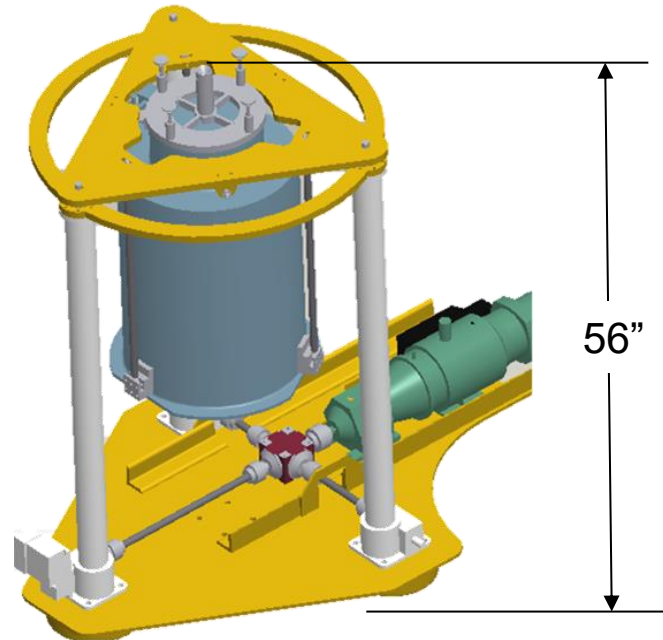
60K3S, One Self-Jacking Canister Holds 20K lbs



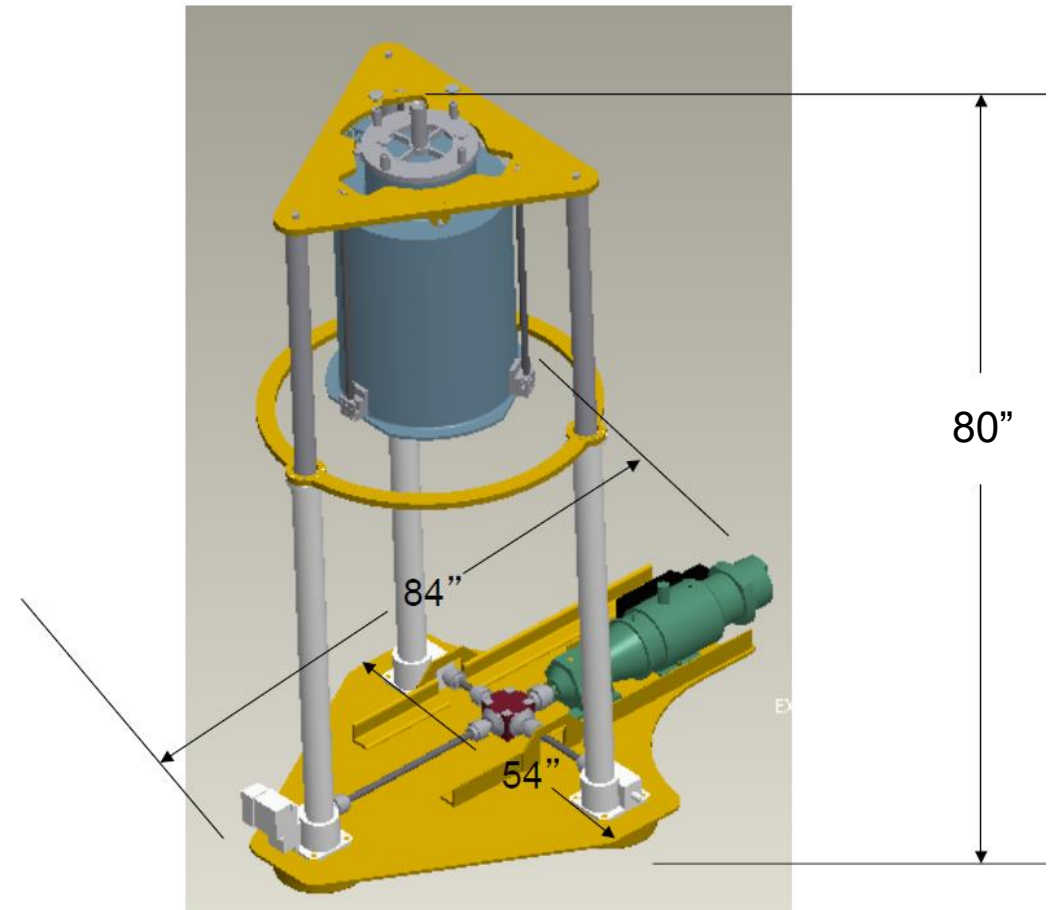
60K3S – Dimensions

- Height with self-jacking system
 - Fully Retracted = 56"
 - Fully Extended = 80"
 - 24" of extension with electric actuators

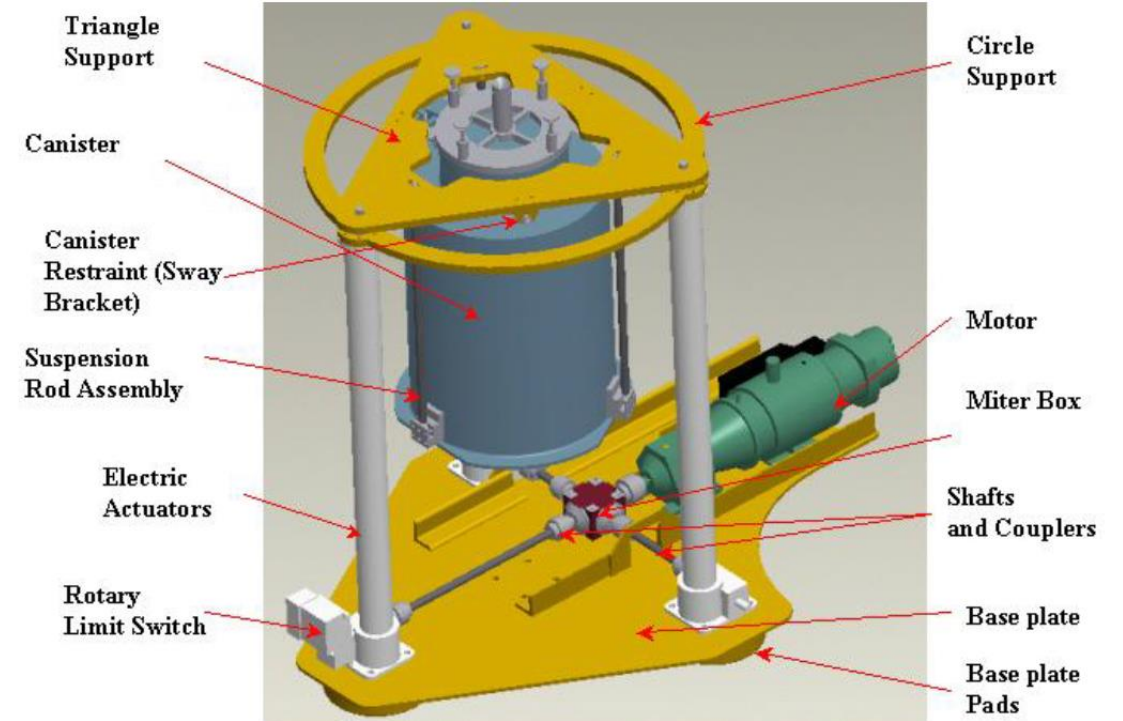
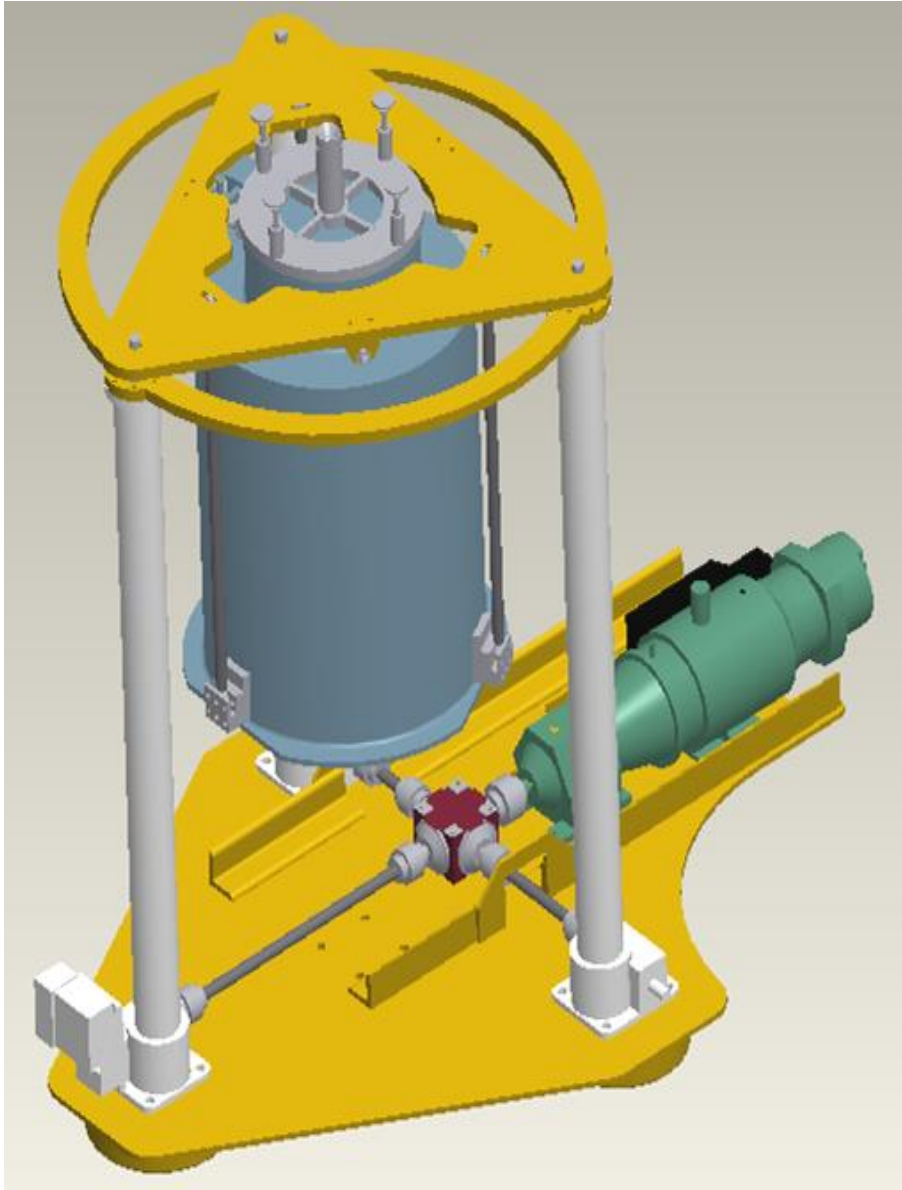
Self-Jacking: Fully Retracted



Self-Jacking: Fully Extended



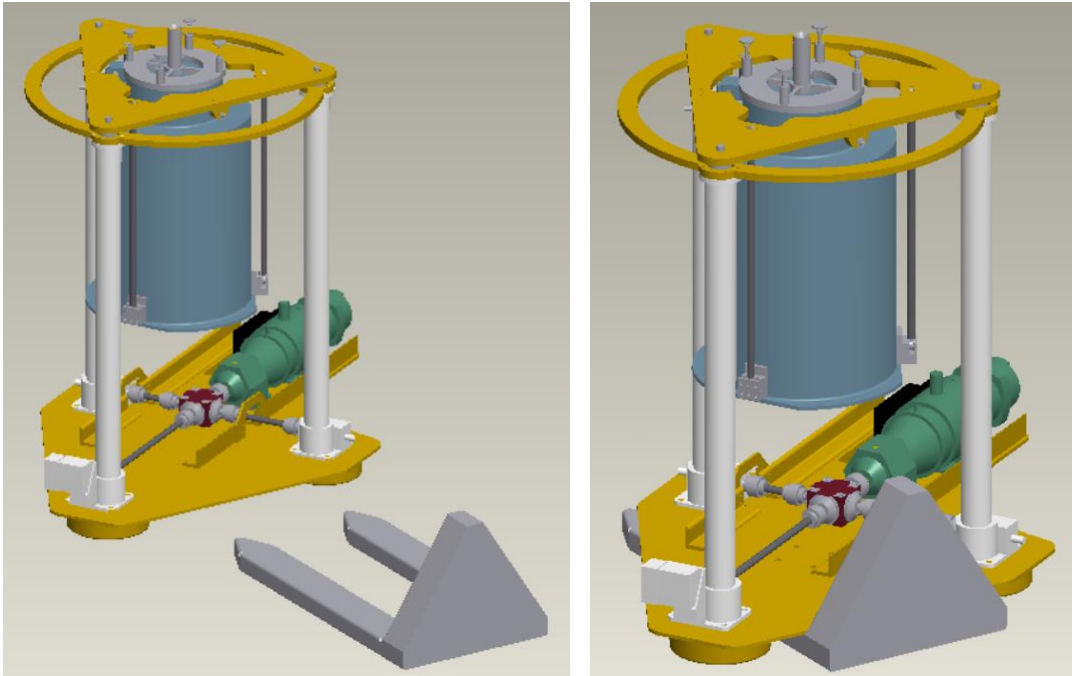
60K3S - Parts



Move 60K3S with Pallet Jacks

- Pallet jacks are used on the base plate to move around the 60K3S
 - Need to ensure there is enough room at the aircraft jack locations for the pallet jacks to maneuver and be removed once the system is in place
- Fork lift can be used to move longer distances

CAD with Pallet Jack Interface



Pallet Jacks Used to Move Canisters



Past Projects on 60K3S

CEV Crew Module



G-III



F-15B with Quietspike



Past Project Before Self-Jacking System

- In 2005, Armstrong modified the canisters to increase the load rating & added the self-jacking feature
 - Critical lift procedure used to install soft support system before self-jacking system

F-18, Active Aeroelastic Wing (AAW) on Soft Supports BEFORE Self-Jacking System

