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Managing Complex Product Variants & Options

Aras Community Network

aras corp®

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GSI Group Company Overview

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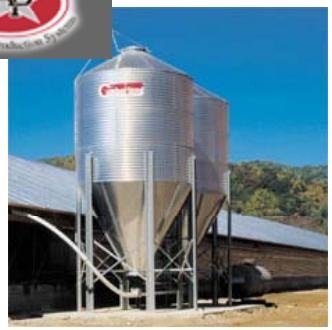

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Product Structure Challenge

- The lack of process at GSI has caused a proliferation of parts and configurations
  - The only “rules” were tribal knowledge and those “rules” differed by Engineer within the product lines
  - Need a common set of product configuration rules so value added customer preferences are selectable, but any & all combinations are not
  - Use of variants and options enable these structures
  - A VARIANT is a “must have” and only one variant can be selected in a given level
  - An OPTION can be chosen in any combination in addition to or in place of standard items

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Basis for the example

- The following example shows 6 different Heater product offerings
- BOM is only exploded 1 level down to simplify
- Typical way is to manage 6 different BOM's with some shared assemblies
  - Shared in all 6 Heaters:
    - HF-6065-26 (HEATER ACCESS PANEL ASSY.)
    - HF-7647 (HOUSING ASY: VA HTR 26" 03)
    - HF-7689 (BURNER ASY: 24-26" DELUX 03)
    - HF-8013 (CARTON GROUP: VA HEATERS)
    - D02-0039 (WIRE TIE ANCHORS)
  - Shared in two of the Liquid Propane Heaters (LP & LPM):
    - CBHV-LC-D (ELECT BOX HTR DELUX Liquid Propane CYCL)
  - Shared in two of the Natural Gas Heaters (VN & VNM):
    - CBHV-VC-D (ELECT BOX HTR DELUX VAPorized Natural Gas CYCL)
  - All other assemblies are unique to a given heater

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Current BOM Structure

- The following slides illustrate the current BOM structure of the 6 different Heater products.
- You will see that all 6 units share the 5 common sub-assemblies.
- The BOMs below the 21 sub-assemblies shown are not flat and are not illustrated here as there are no decision points affecting the products configuration based on the customers selection.
- The customer has to pick a part number, not configure a product.

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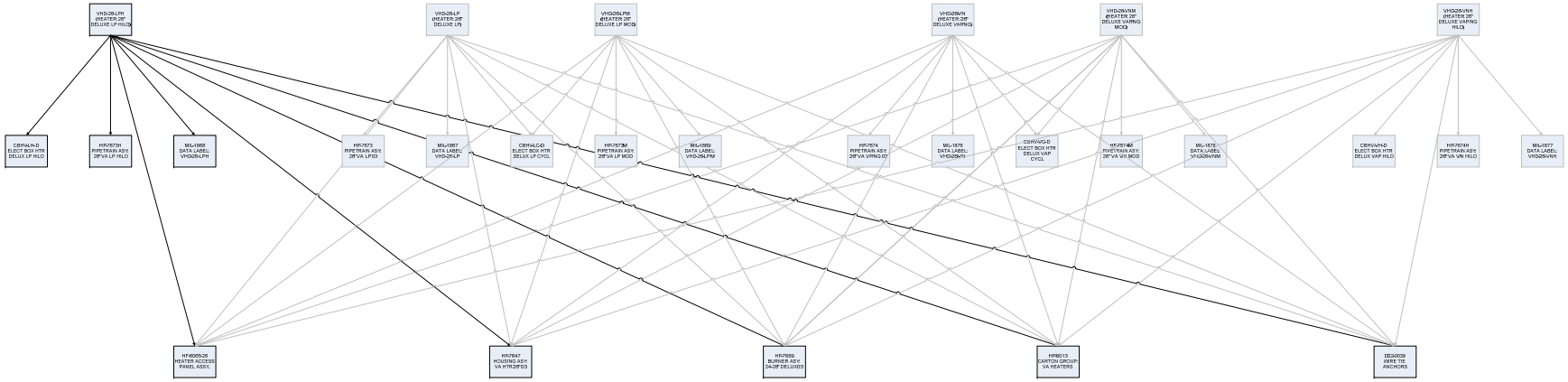
Heater BOM 1



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Heater BOM 2

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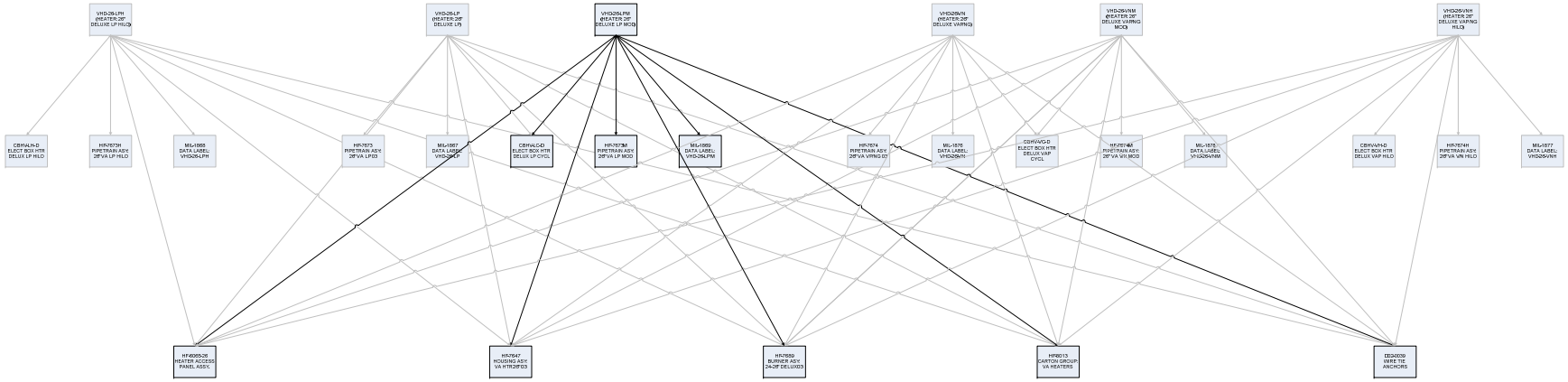
Heater BOM 3



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Heater BOM 4

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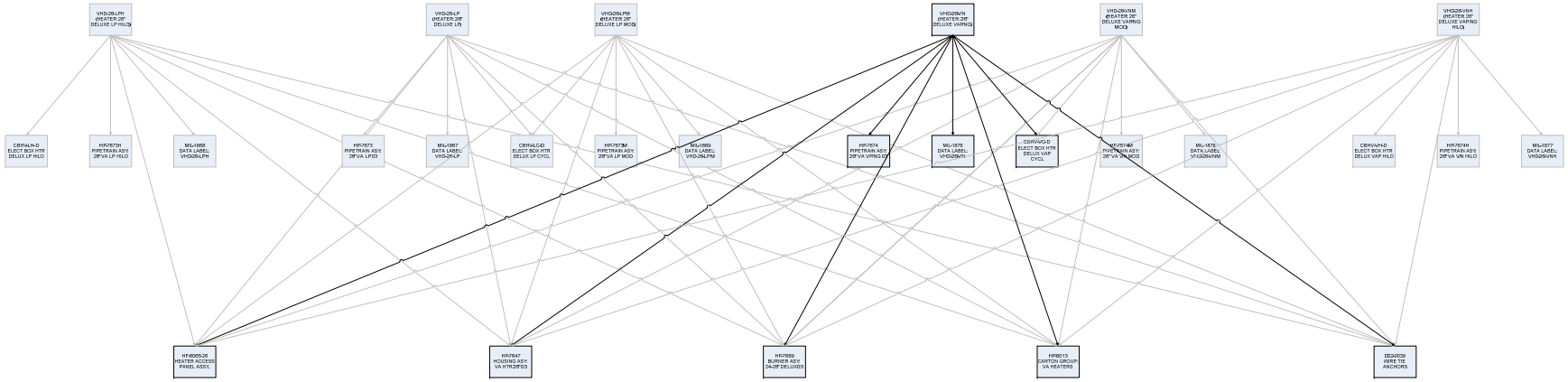

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Heater BOM 5

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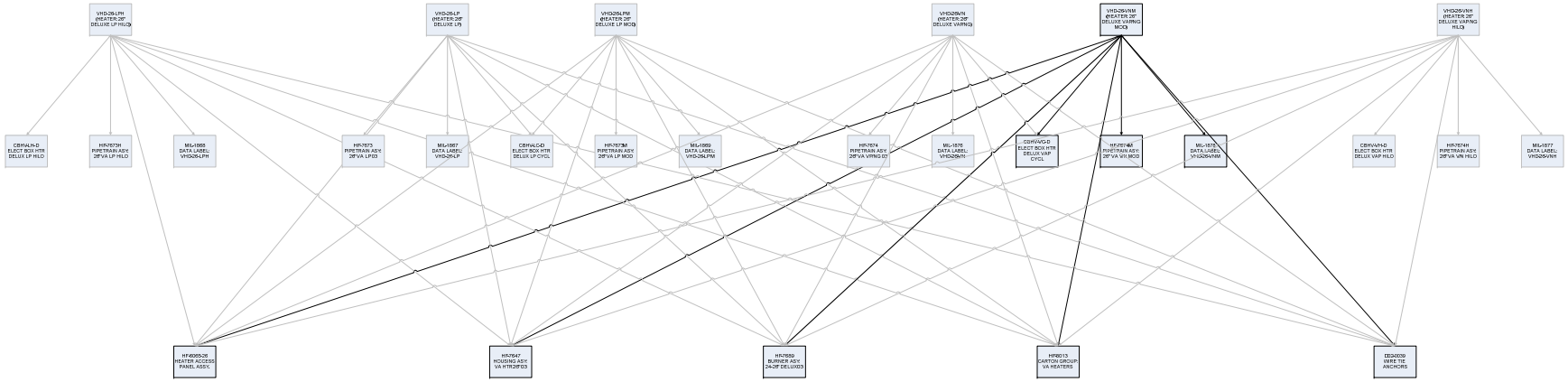

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Heater BOM 6

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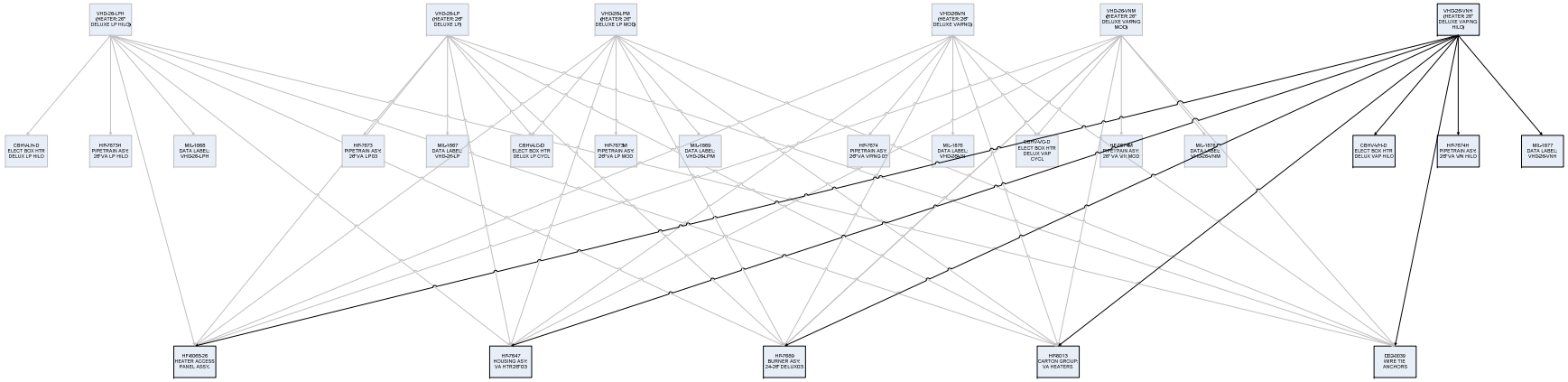

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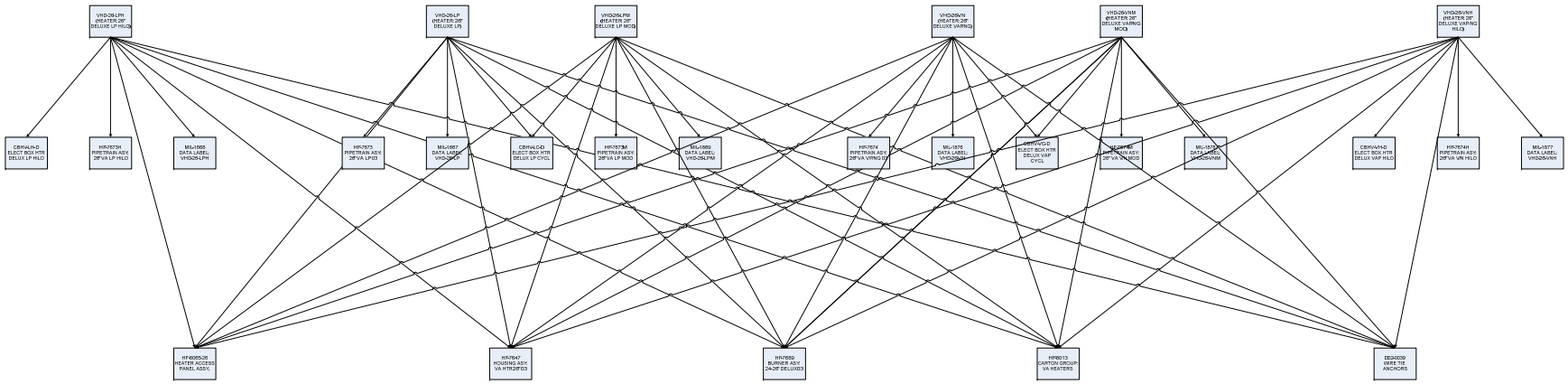
Heater BOM Complexity!!!



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New Way to Manage BOM Variants

- The following slides illustrate the single one level deep BOM of the Heaters showing the configuration (variant) points
- You will see that all 6 units still share the 5 common sub assemblies
- The BOM is a single BOM for all Heaters, not a separate BOM for each offering (6)
- The customer selects a specific Heater, and then answers two variant questions and the system will produce a BOM for a specific order or configuration

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Heater with BOM 1 Variants

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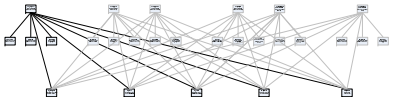

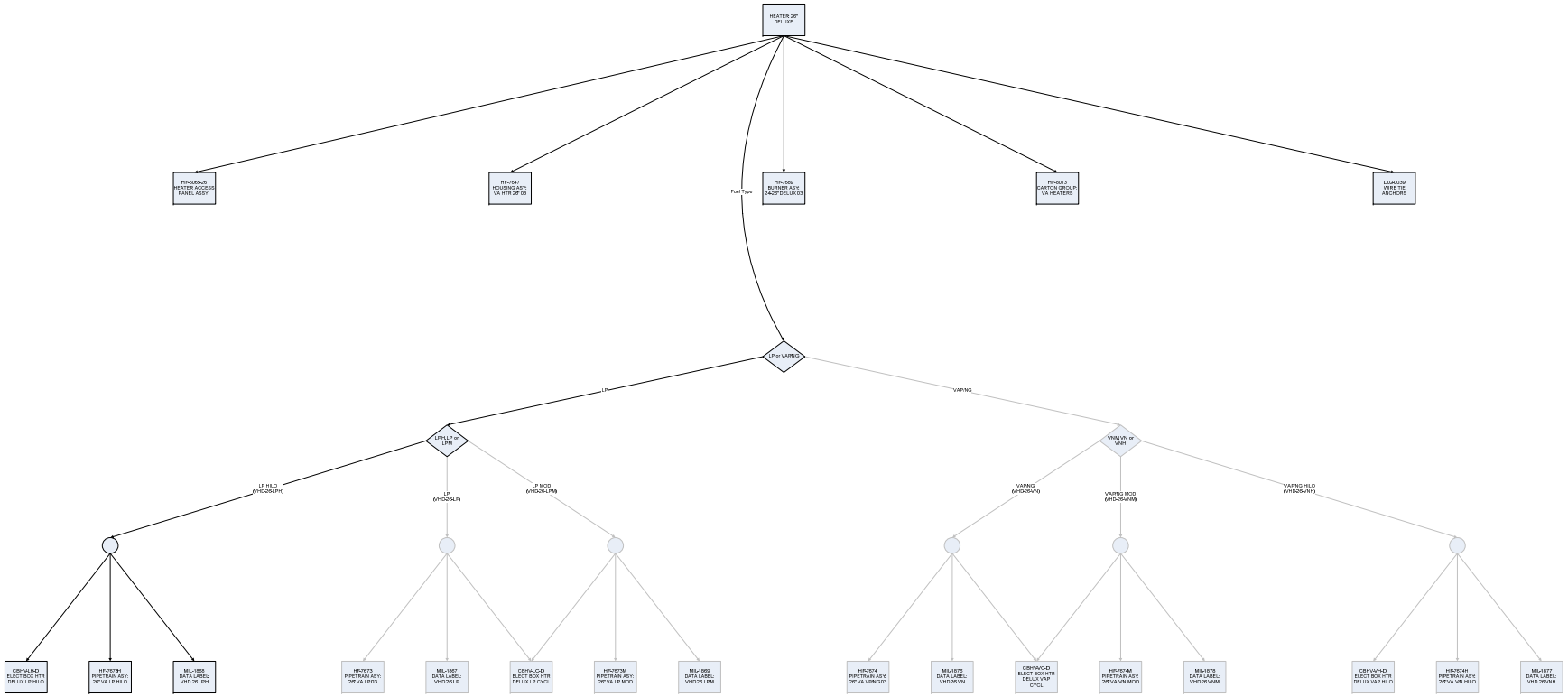

Q1) **Liquid Propane** or Vaporized Natural Gas

Q2) **Liquid Propane Hi/Lo**, Liquid Propane, or Liquid Propane Modulated

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Heater with BOM 2 Variants

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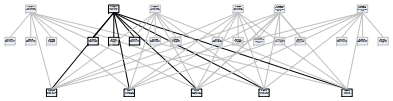

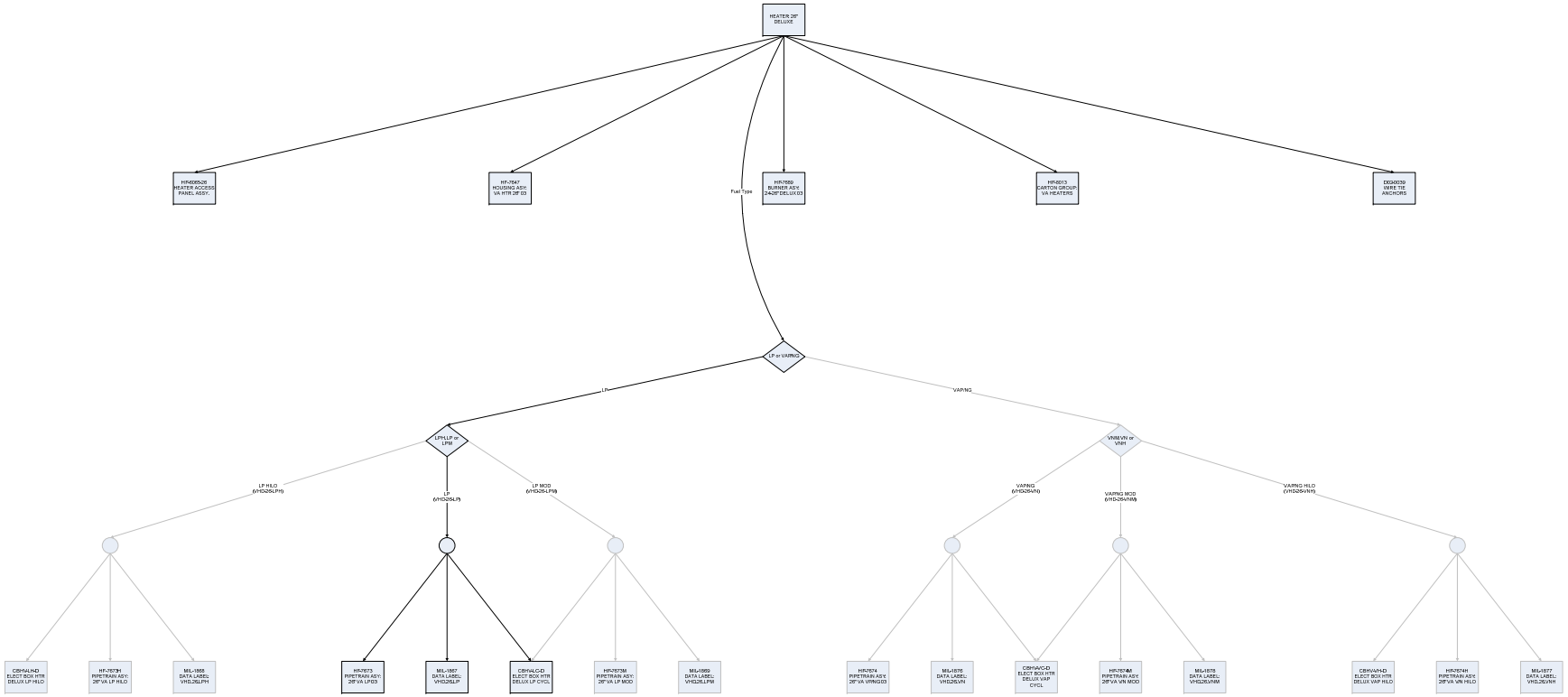

Q1) **Liquid Propane** or Vaporized Natural Gas

Q2) Liquid Propane Hi/Lo, **Liquid Propane,** or Liquid Propane Modulated

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Heater with BOM 3 Variants

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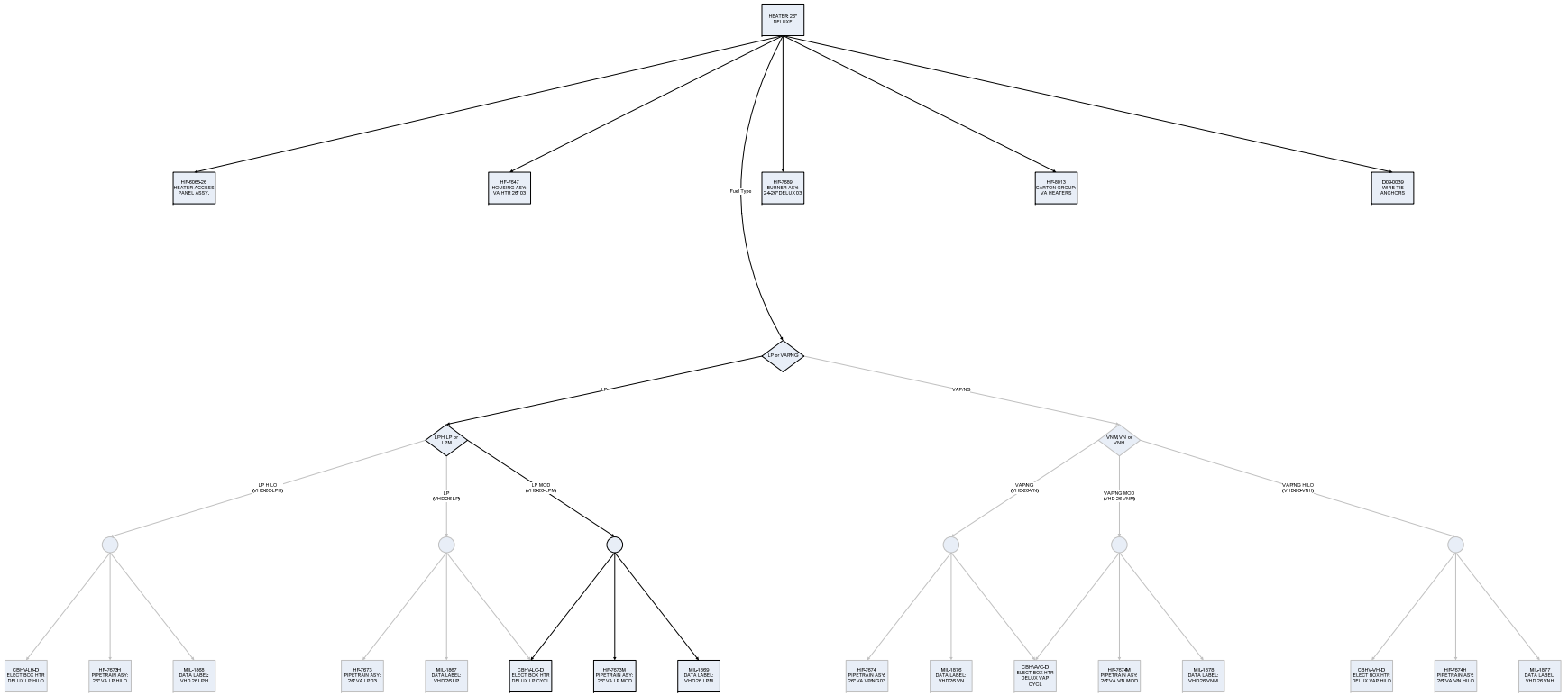

Q1) **Liquid Propane** or Vaporized Natural Gas

Q2) Liquid Propane Hi/Lo, Liquid Propane, or **Liquid Propane Modulated**

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Heater with BOM 4 Variants

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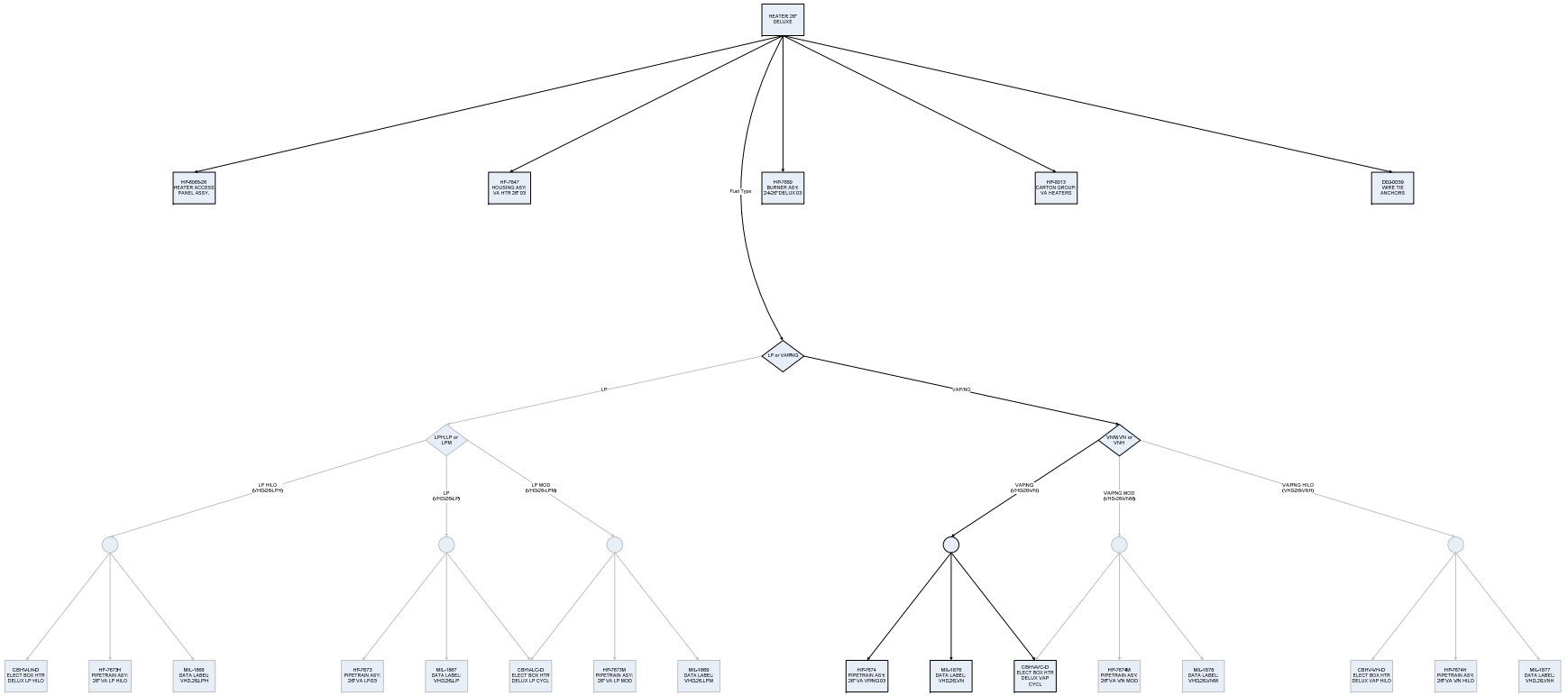

Q1) Liquid Propane or **Vaporized Natural Gas**

Q2) **Vaporized Natural Gas Modulated**, Vaporized Natural Gas, or Vaporized Natural Gas Hi/Lo

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Heater with BOM 5 Variants

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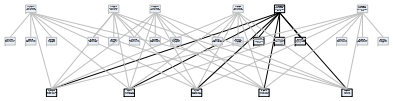

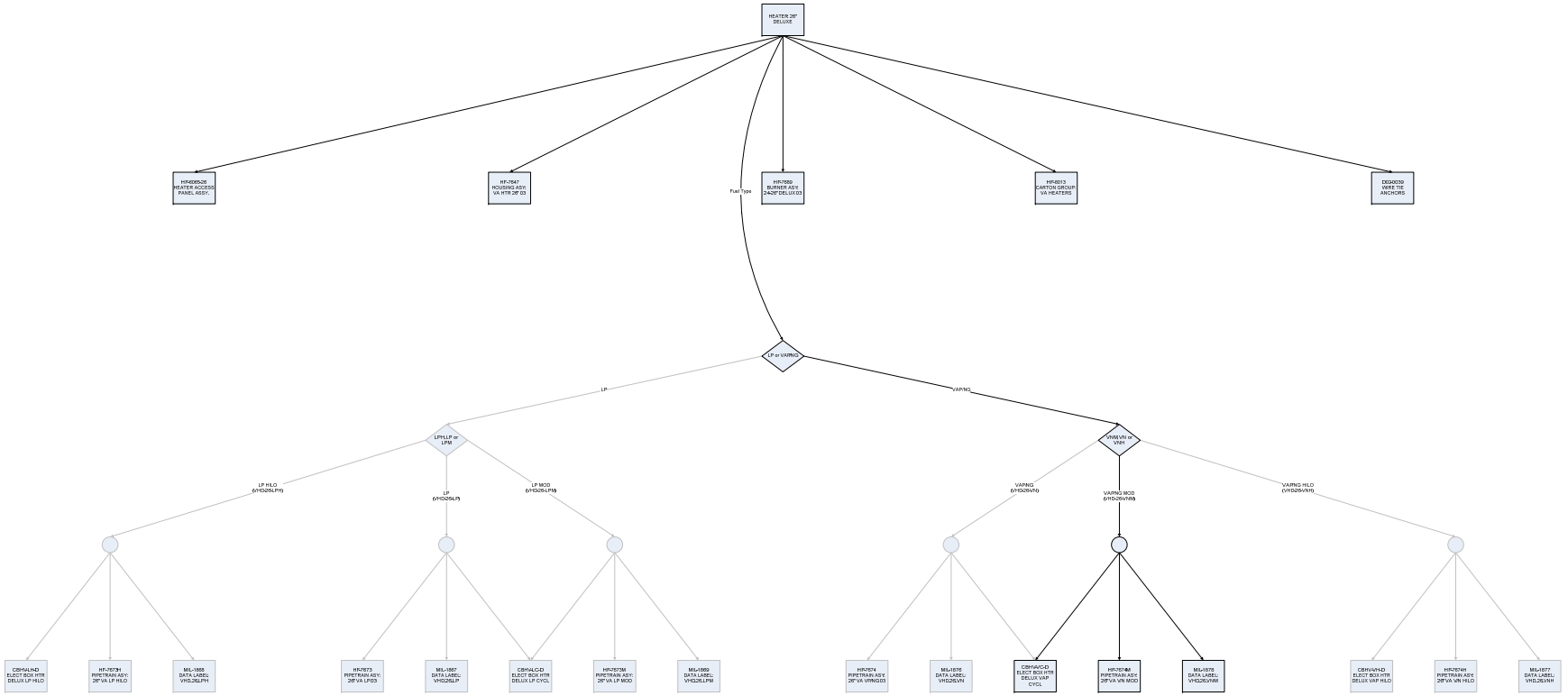

Q1) Liquid Propane or **Vaporized Natural Gas**

Q2) Vaporized Natural Gas Modulated, **Vaporized Natural Gas,** or Vaporized Natural Gas Hi/Lo

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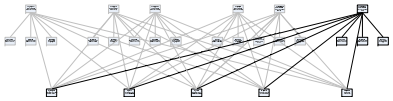
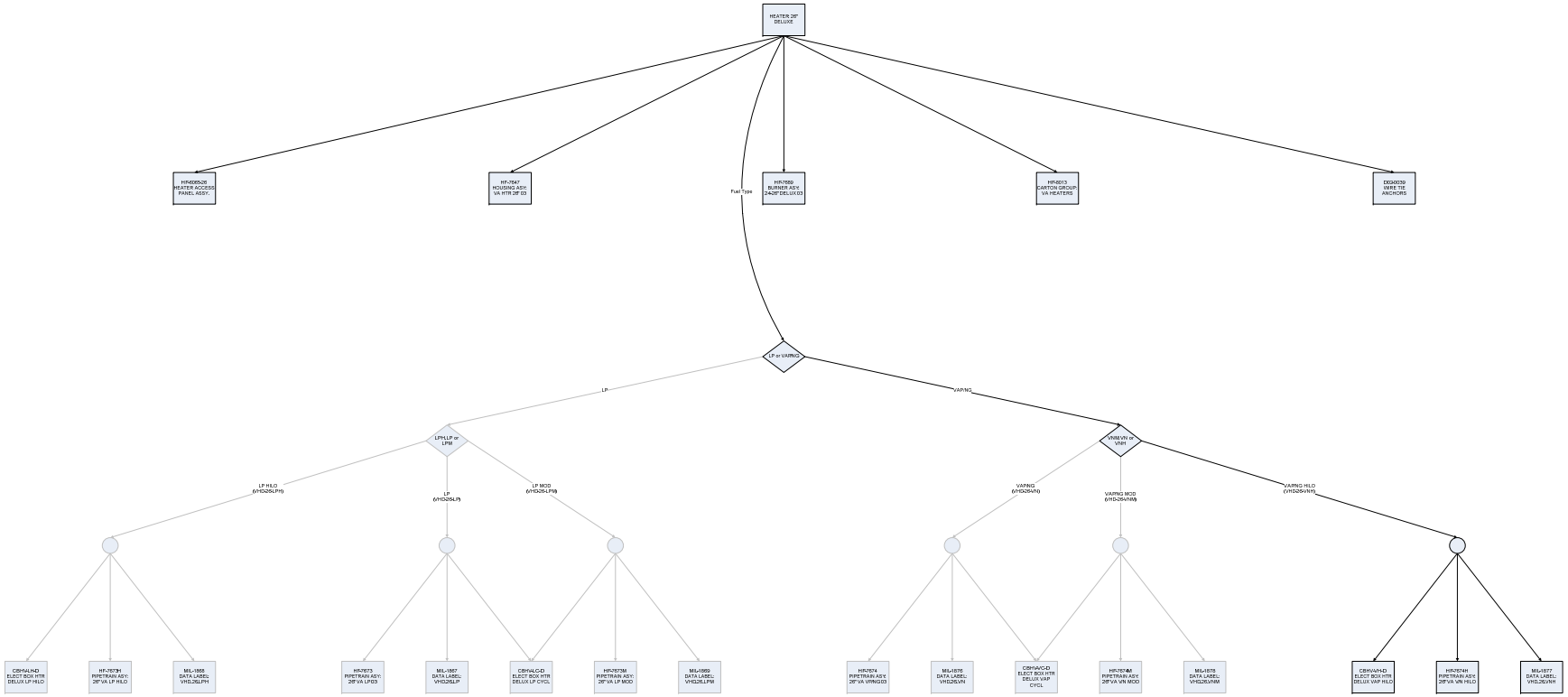
Heater with BOM 6 Variants





Q1) Liquid Propane or **Vaporized Natural Gas**

Q2) Vaporized Natural Gas Modulated, Vaporized Natural Gas, or **Vaporized Natural Gas Hi/Lo**

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Heaters' New Simplified BOM

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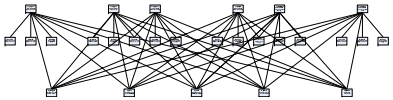
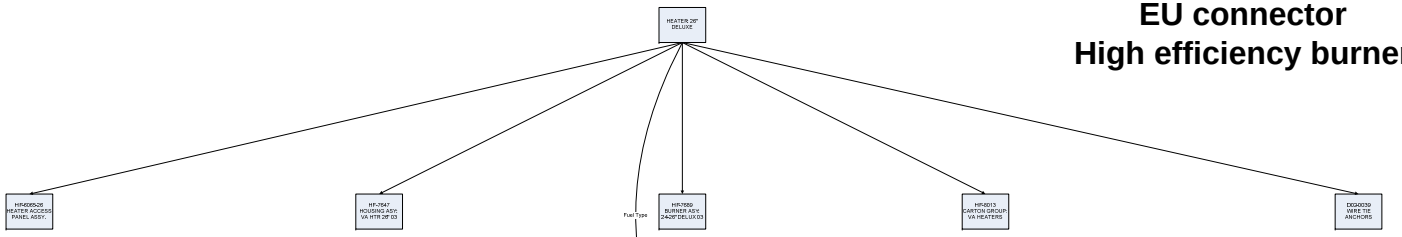


Options?

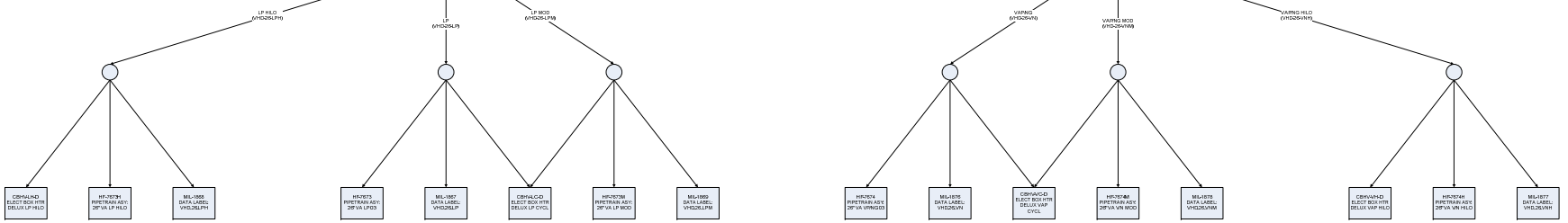
Rust resistant coating
EU connector
High efficiency burner



Variant

Variant

Variant



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Conclusions

- If every unique combination of parts results in a new BOM, part number proliferation results
- BOM management can be simplified through the use of variants and options
  - A VARIANT is a “must have” and only one variant can be selected in a given level
  - An OPTION can be chosen in any combination in addition to or in place of standard items
- Subsequent structures align engineering and manufacturing definitions with customer views and understanding of products
- Simplified product definitions

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Variants Solution Package

- Variant configurator built with Aras Innovator
- Based on requirements, specs, and inputs from GSI
- Community Solution for Aras Innovator
  - Implemented as an add-on to the standard Product Engineering solution
  - Compatible with CMII change processes
  - New Classification of Part { “Variant” }
  - New ItemTypes
    - Rule
    - Order

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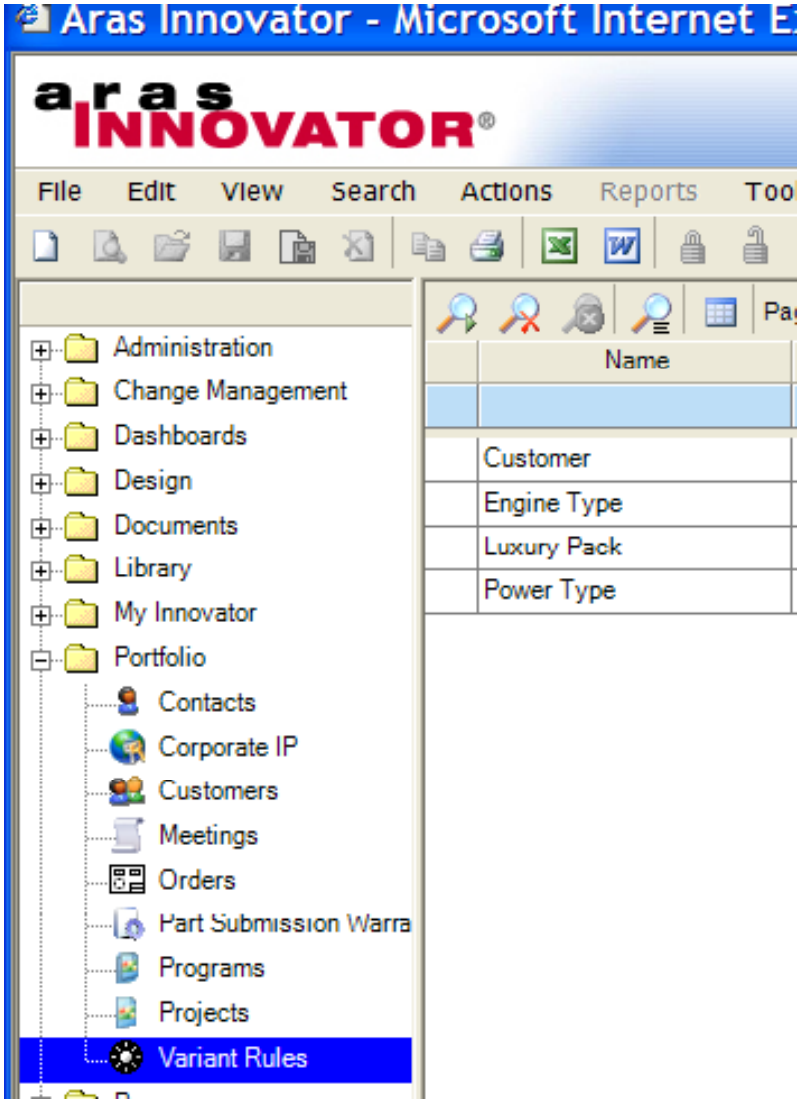
Rules

- **Named Rules**
- **Evaluate as**
  - **Boolean**
  - **List**
  - **Item Lookup**
- **Rules are Hierarchical**



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Variant Part Class

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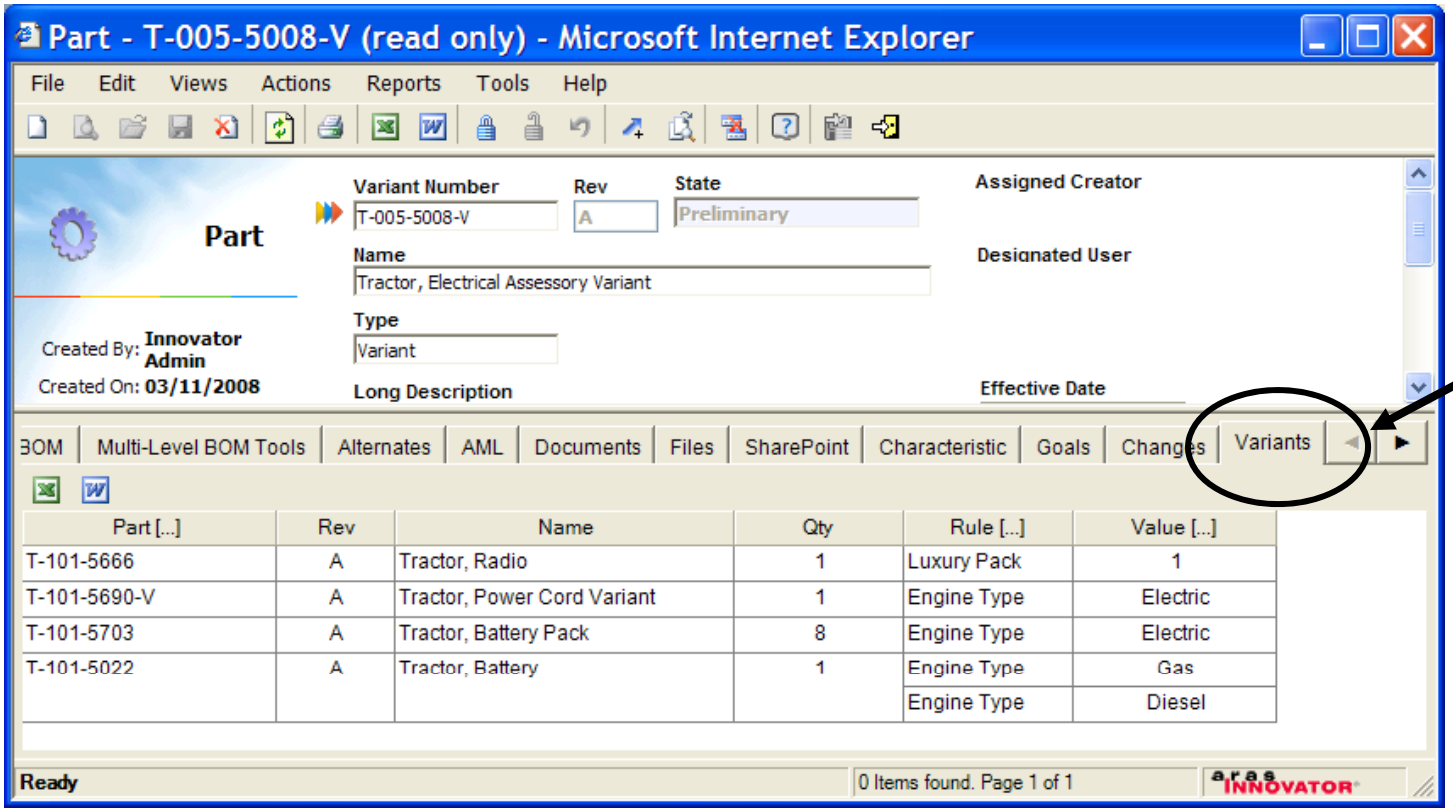
- **Engineering inserts Variants into the BOM, as a Placeholder**

- **Each Variant resolves into 0,1 or more Parts depending on the Rules**



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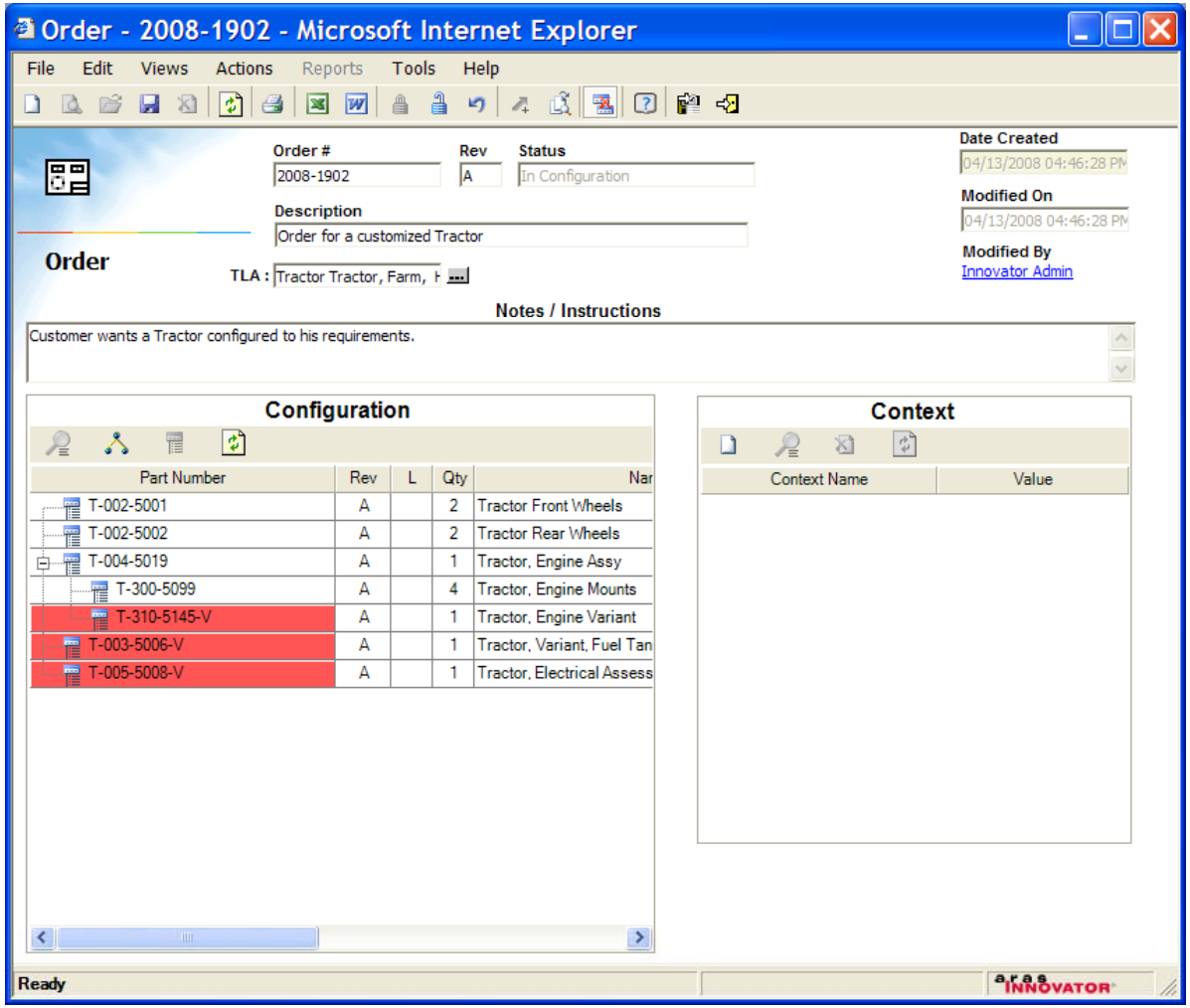
Order Specific BOM

- **Order starts with the top level assembly**
- **Variants that need to be replaced are highlighted in the BOM**
- **User is prompted for Context**



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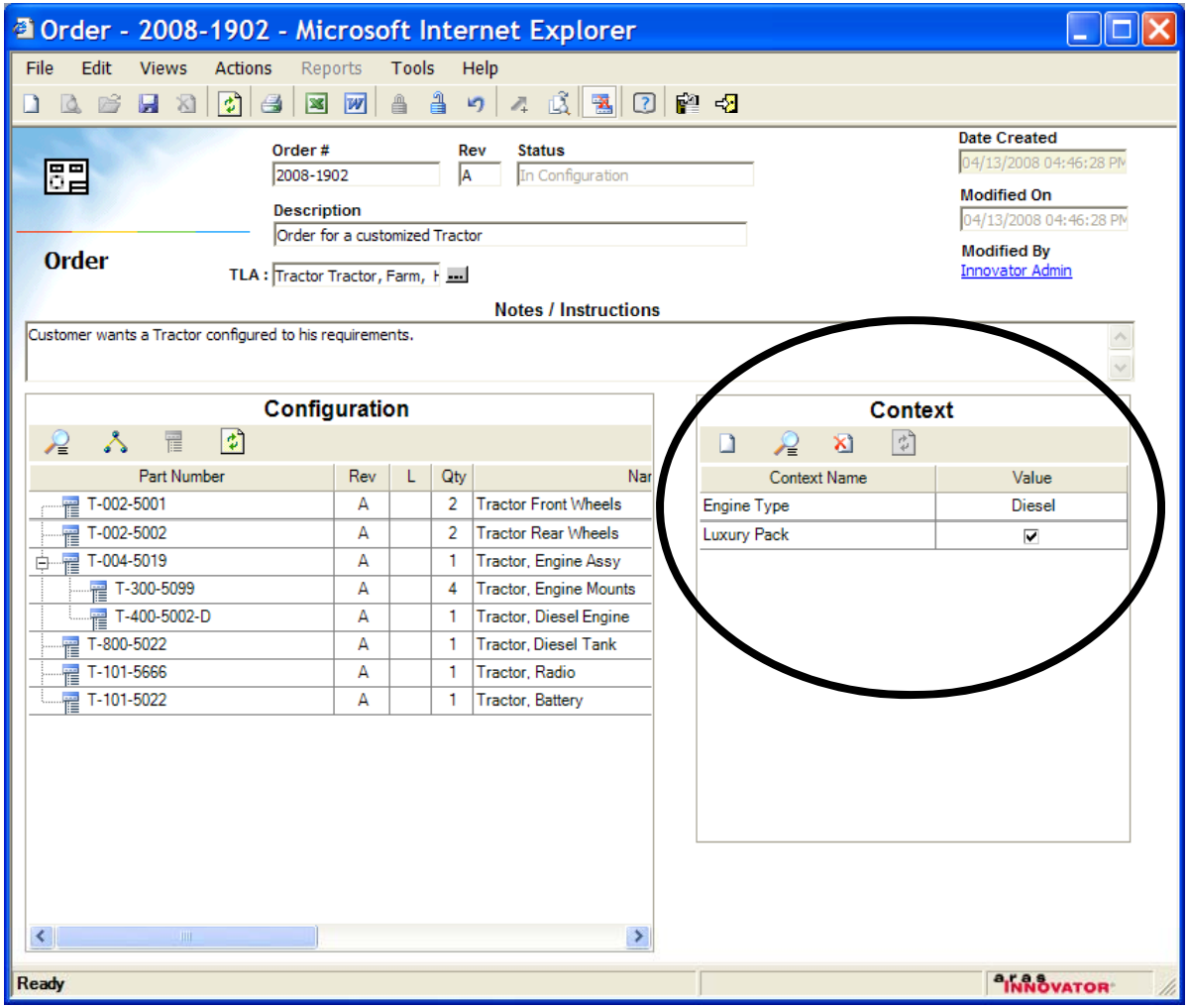
Order Specific BOM

- **The Context is stored as the definition of this customer's order**
- **Each Rule value is propagated throughout the BOM**
- **The order-specific BOM is stored on the Order**
- **The final BOM configuration can be sent to ERP**



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Status

- Method-based Rules allowed in the data model, logic is implemented for specific company situation
- Variants Solution Package is on the Community project site ready for download
- Other options:
  - BOM analyzer with a report of configurations that cannot be created based on the defined Rules
  - Costing and Lead-Time Rollups of order-specific BOM
  - Method-based Rules