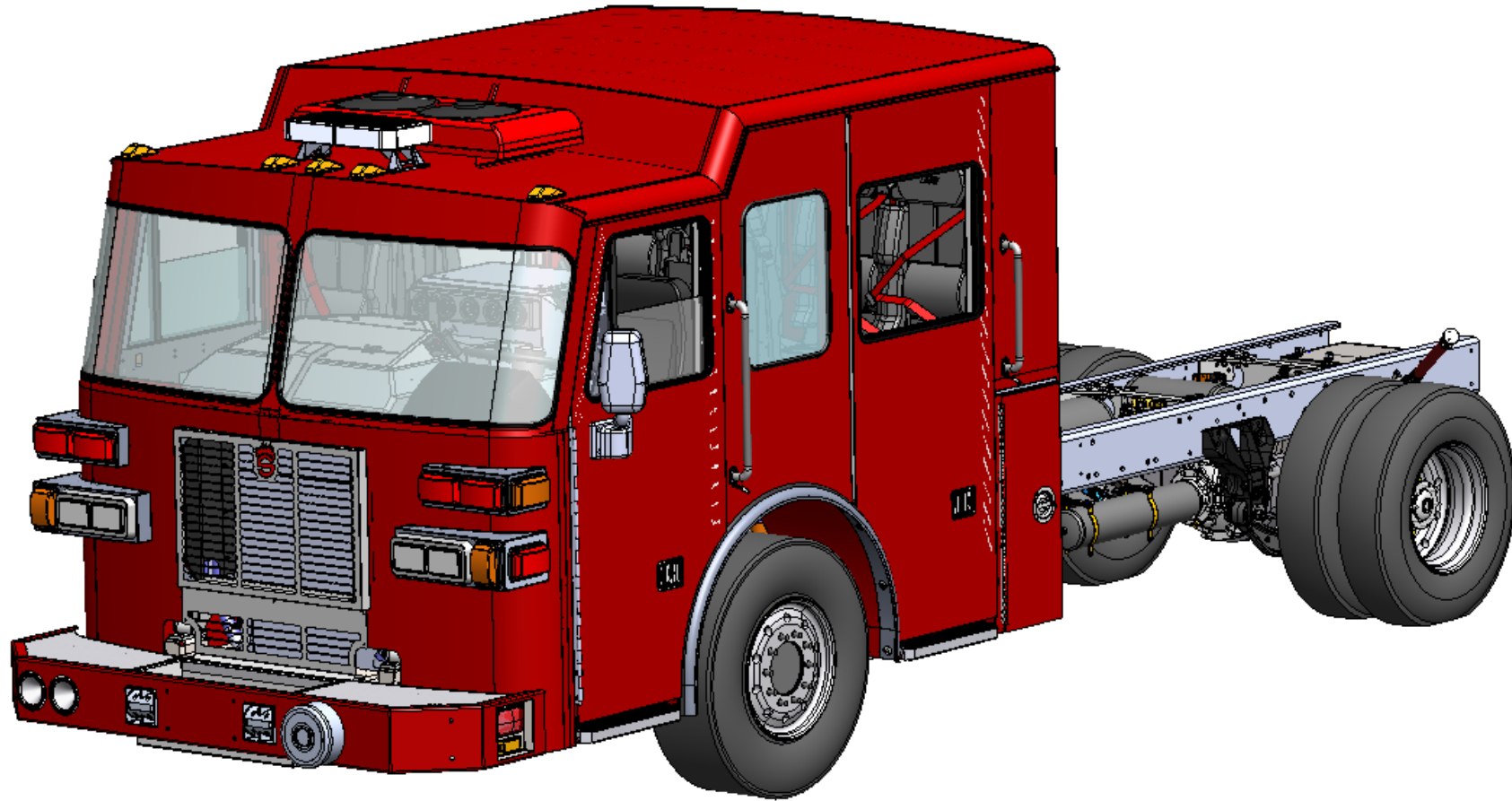


2018 SUTPHEN CHASSIS ENGINEERING UPDATES



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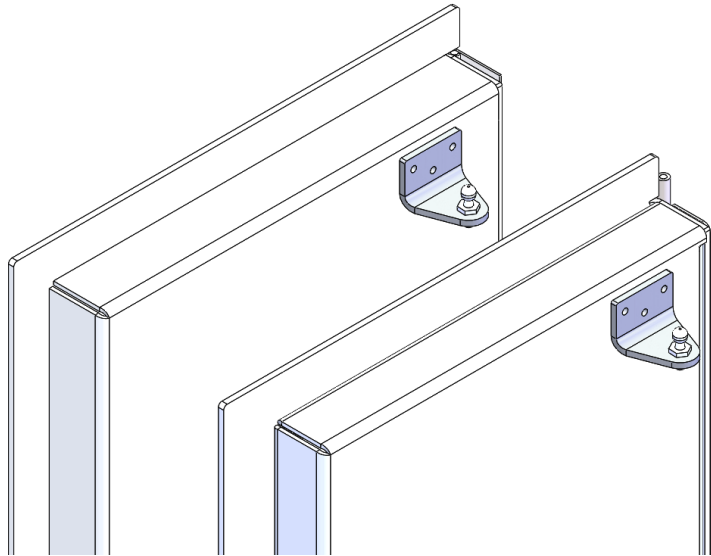


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Cab Compartmentation Assembly Upgrade

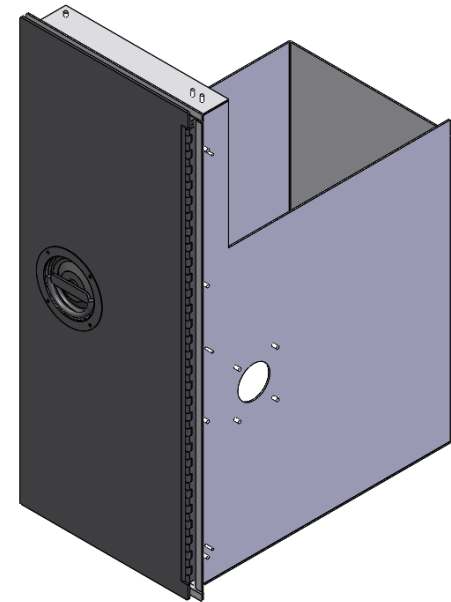
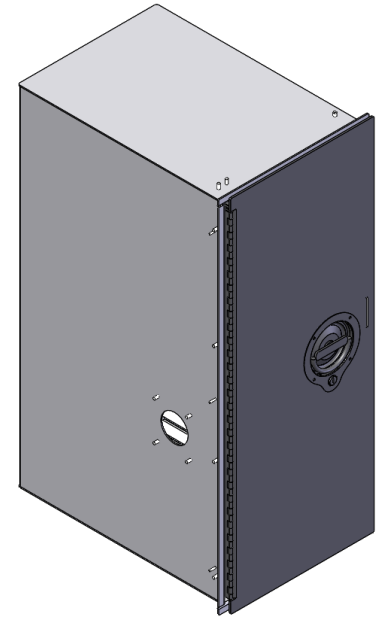
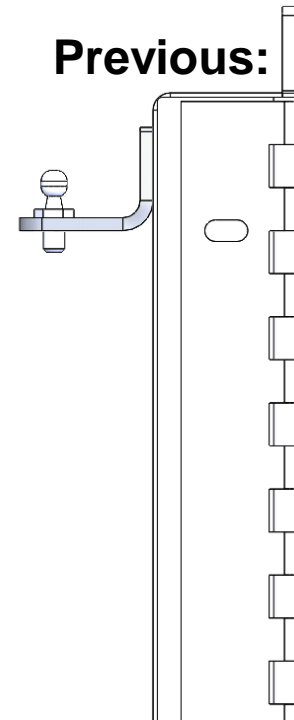
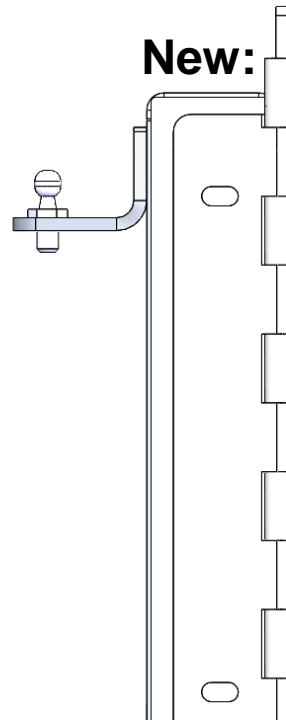
- **Glue-together Door Assembly vs. Welded**

- Eliminates potential for warping



- **Heavier Duty Hinges**

- Changed hinge thickness from .063" to .075"
 - Increased knuckle width from 5/8" to 1" wide



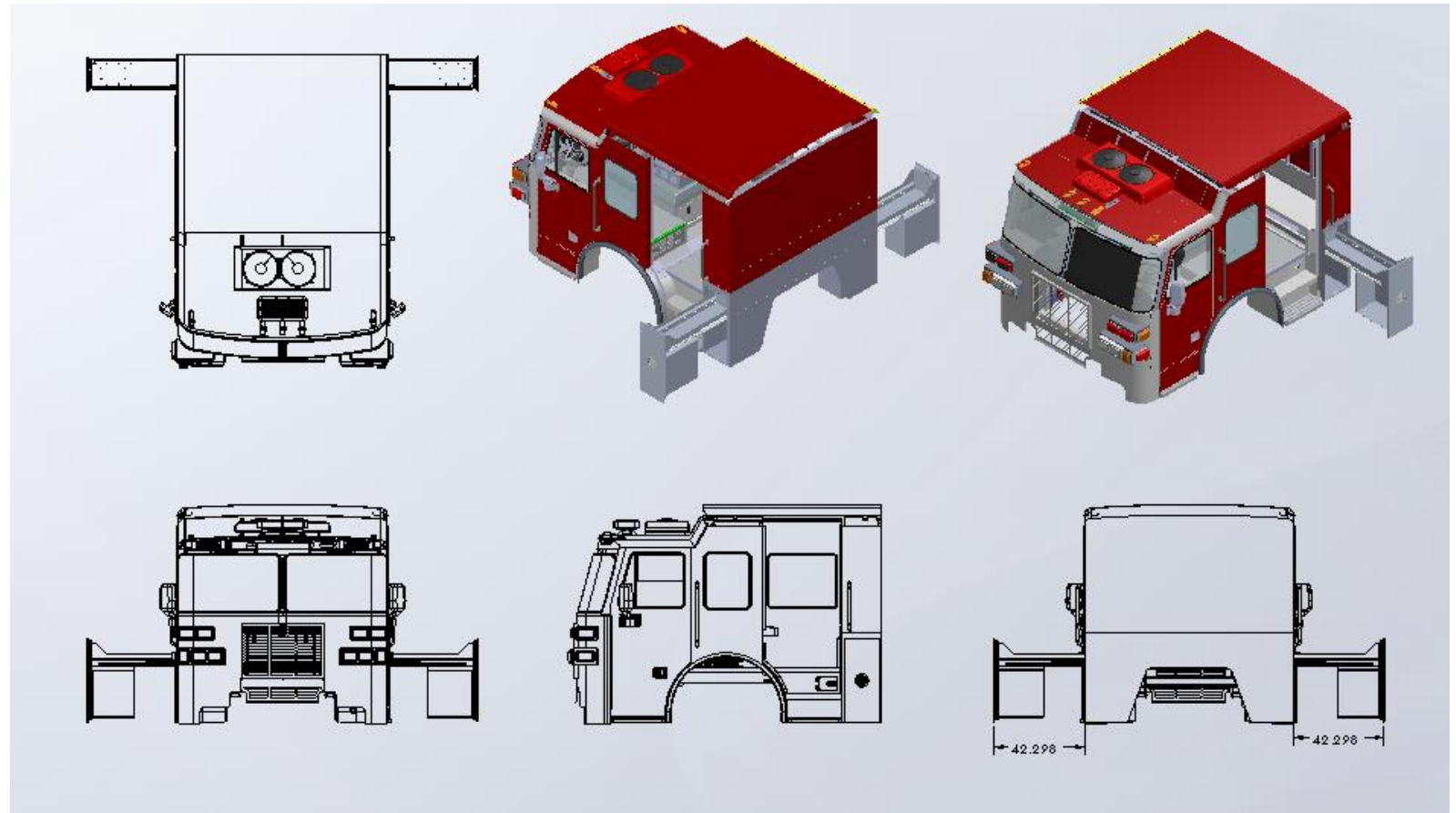
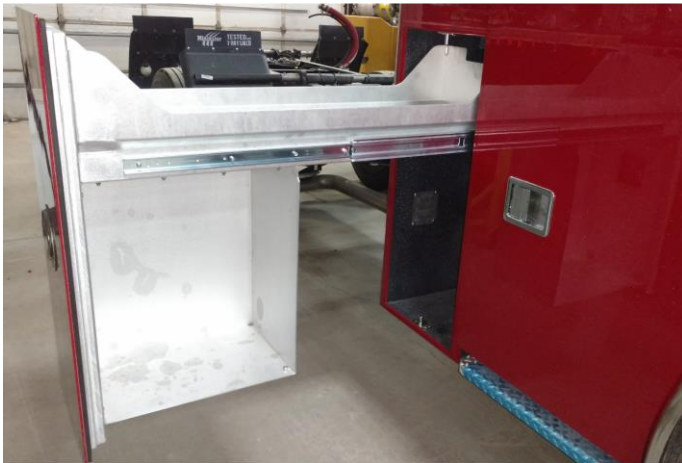
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Clean Cab Compartmentation Option

- No turnout gear or SCBA's in cab
- Washable vinyl seating in cab
- Cab windows up during pump operation



2018 SUTPHEN CHASSIS ENGINEERING UPDATES



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Defroster & Diffuser Upgrade

- Raised defroster unit 1.5" to optimize Driver's view
- Extended diffuser to expand windshield defrost coverage

Previous:



New:



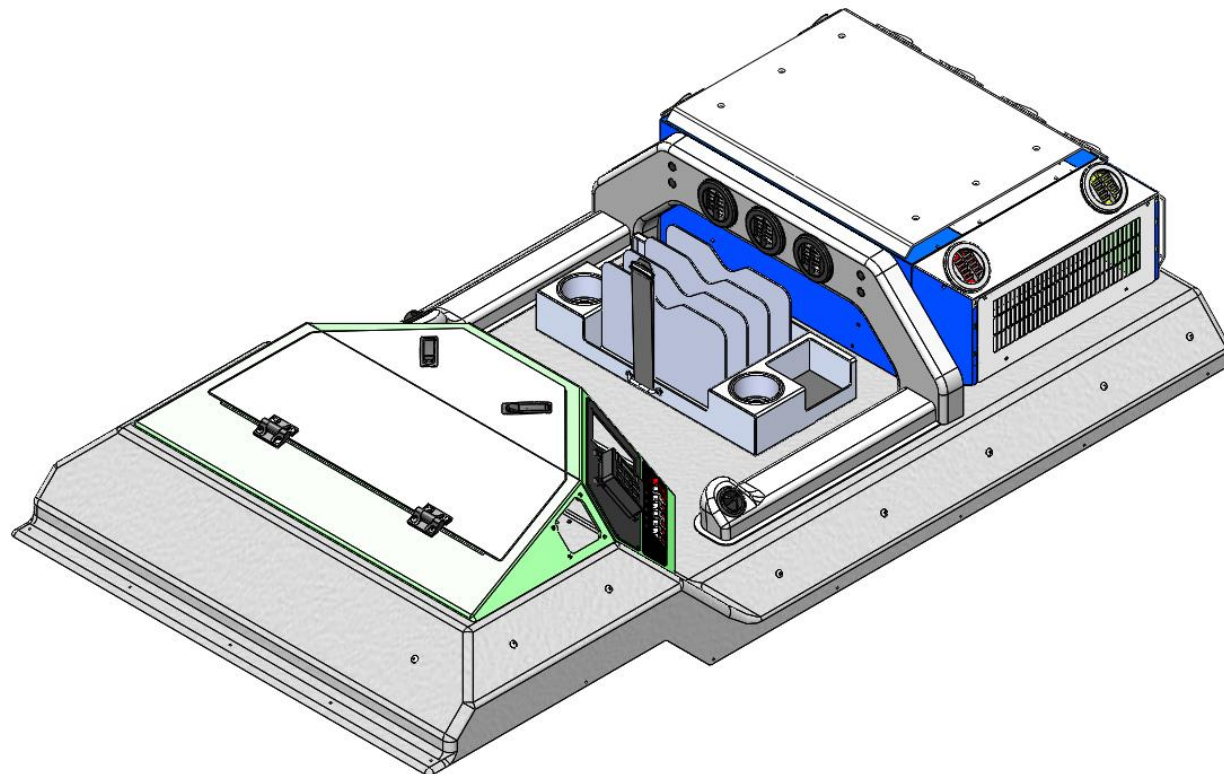
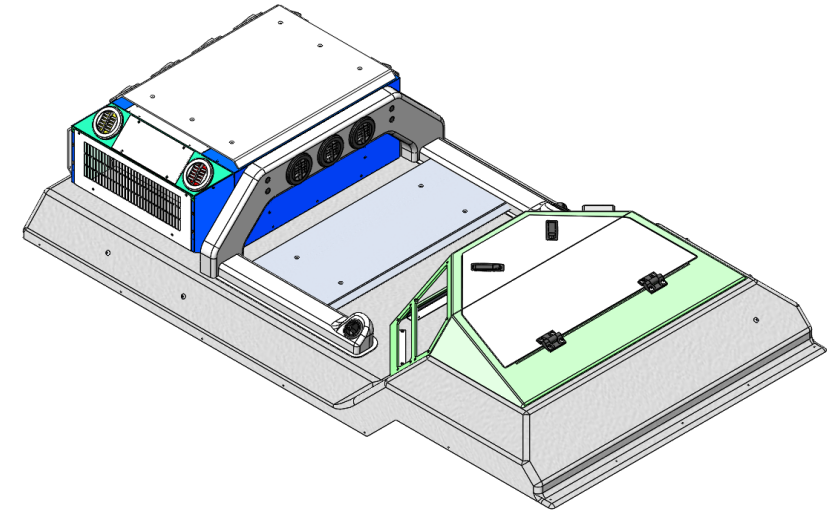
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New 'AC to Face' option

- Provides air flow to Driver and Officer seat positions
- Vents are adjustable & rotational

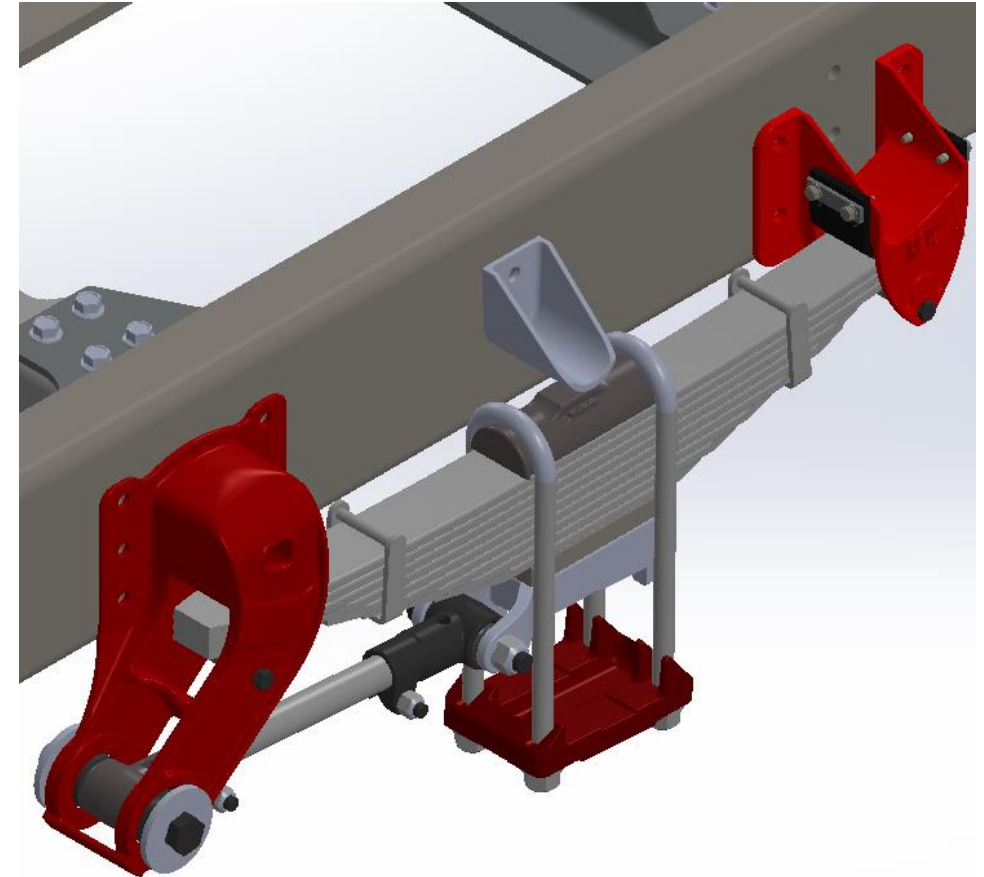


2018 SUTPHEN CHASSIS ENGINEERING UPDATES



New Spring Suspension Axle Stops

- Implemented for all single axle Reyco spring suspensions
- Prevents suspension from over-springing in jounce conditions



2018 SUTPHEN CHASSIS ENGINEERING UPDATES



New Electric Cab Pump Shift

- Eliminates air lines in the cab to the pump
- Hale pump shift interlock as standard

New Electric Pump Shift:



Air pump shift (now optional in place of new electric pump shift):



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New Ametek Gauges

New Ametek Gauges:



Discontinued Beede:



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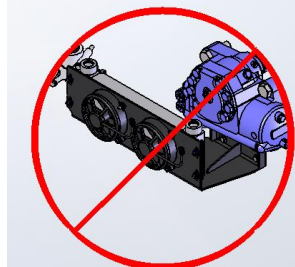


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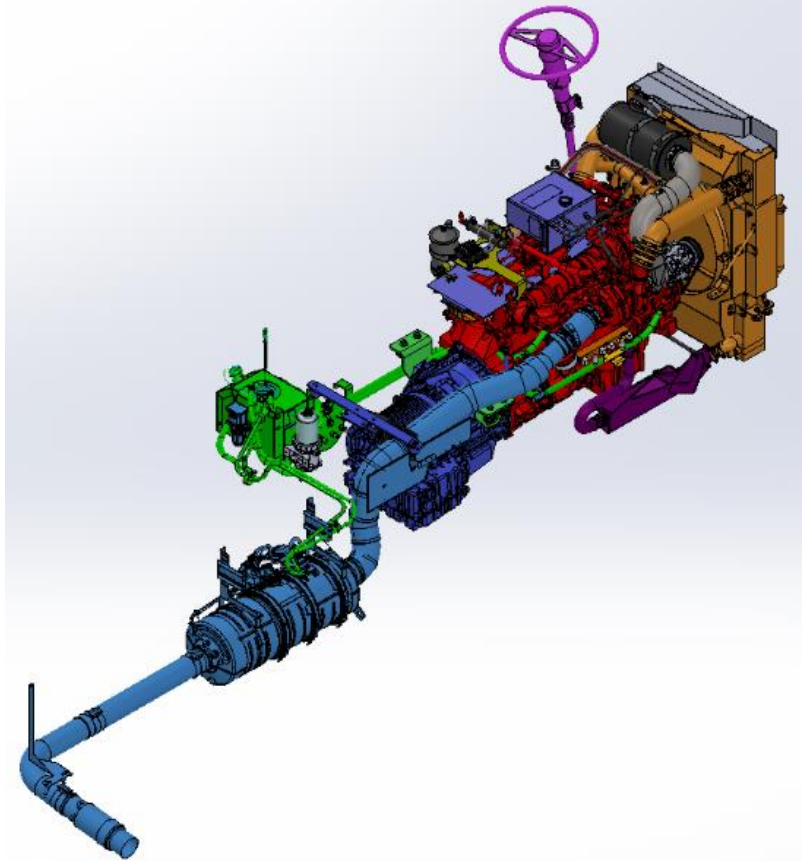
New Engine Configurations & Features

Cummins 2017 L9 Powertrain:

- Single-can aftertreatment system in lieu of dual cans
- 4" exhaust bellows
- InsulTech Exhaust Blankets
- Multi-speed fan clutch options
- New surge tank w/sight glass
- Multiple Cooling Package Suppliers, gives Sutphen flexibility
- Steering cooling system incorporated into main cooling package, separate steering cooling system eliminated



Cummins 2018 X12 Powertrain:



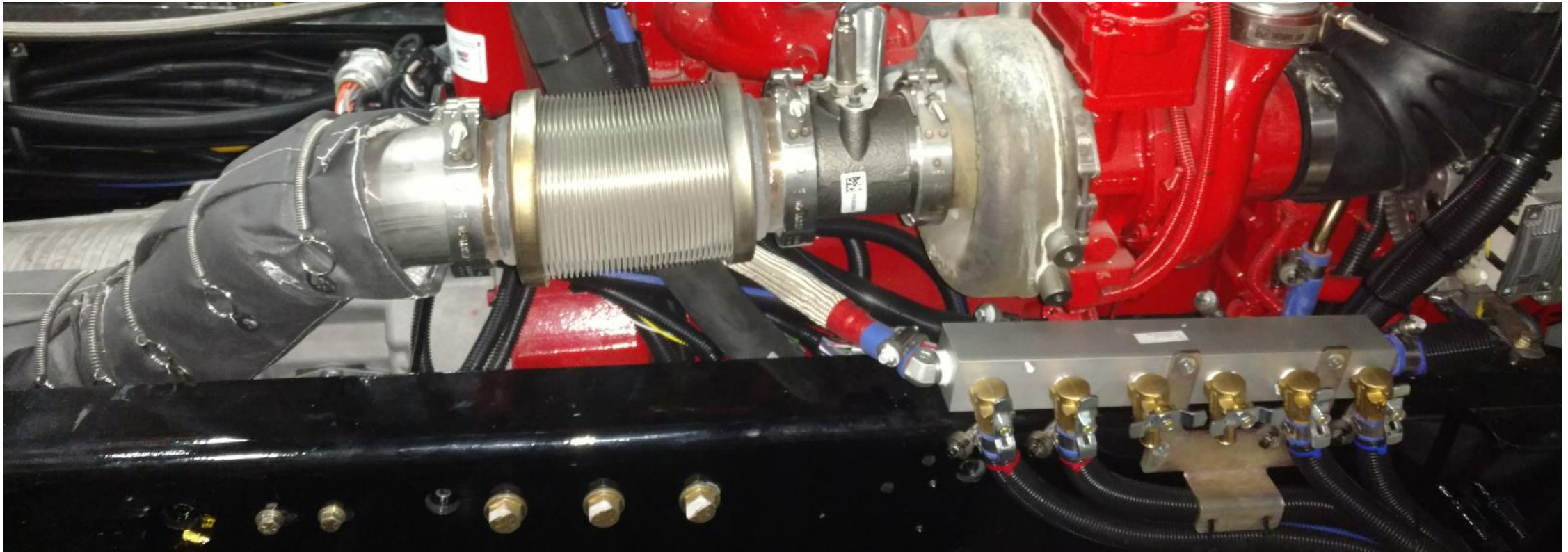
2018 SUTPHEN CHASSIS ENGINEERING UPDATES



New Engine Configurations & Features

New 4" Exhaust pipe & Bellows ASSY

- Westfalia accordion-style exhaust bellow, more flexible, less brittle
- Commonized between L9 & X12 Powertrains
- Allows more space for PTO clearance



2018 SUTPHEN CHASSIS ENGINEERING UPDATES



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New Engine Configurations & Features

New InsulTech Exhaust Blankets:

- Cleaner installation and more durable than previous “socks”

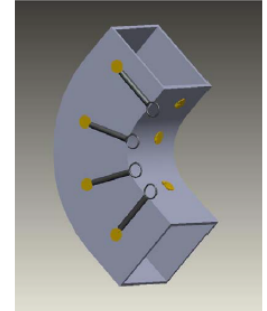
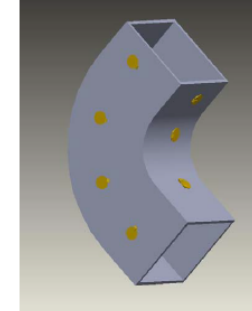


HA BLANKET

InsulTech LLC
3530 W Garry Avenue
Santa Ana, CA 92704
Tel: 714.384.0506
Fax: 714.384.0507
www.insultech.com

Outer Facing/Cold Face:
Insulation:
Inner Facing/Hot Face:
Fastener:

34 Oz Silicone Coated Fiberglass Fabric
1" Multilayer Vitreous Silicate Fiber Mat
Knitted Stainless Steel Wire Mesh
Method A or B below



Method A
Stainless steel lacing hook and stainless steel tie wire

Method B
Stainless steel lacing hook and spring with nickel plated steel ring

Color: Grey
Max Operating Temperature: 1500°F
Outer Fabric Tensile Strength: 410 X 375 (Warp X Fill)
Product meets requirement for: ASTM E84, ASTM E162, NFPA 701, UL 1709

REFERENCE DATA

| NPS Diameter | Exhaust Temperature °F | | | | | |
|--------------|------------------------|-----|-----|------|------|------|
| | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| 2 | 106 | 117 | 129 | 143 | 158 | 174 |
| 3 | 110 | 123 | 138 | 154 | 172 | 190 |
| 4 | 113 | 126 | 141 | 158 | 176 | 196 |
| 5 | 117 | 132 | 149 | 167 | 188 | 210 |
| 6 | 121 | 136 | 155 | 175 | 196 | 220 |
| 8 | 121 | 137 | 155 | 176 | 197 | 221 |
| 10 | 126 | 144 | 165 | 187 | 211 | 236 |
| 12 | 128 | 146 | 168 | 190 | 214 | 240 |
| 14 | 130 | 149 | 171 | 194 | 219 | 245 |

Ambient Air: 80°F

Wind Speed: 5 mph

THERMAL CONDUCTIVITY

| °F | $\frac{BTU \times in}{hr \times ft^2 \times ^\circ F}$ |
|------|--|
| 700 | 0.56 |
| 900 | 0.69 |
| 1200 | 1.11 |
| 1500 | 1.39 |

The reference data above are based on a computer simulated model and are to be used as a guideline. Call our Customer Service to determine your specific insulation needs

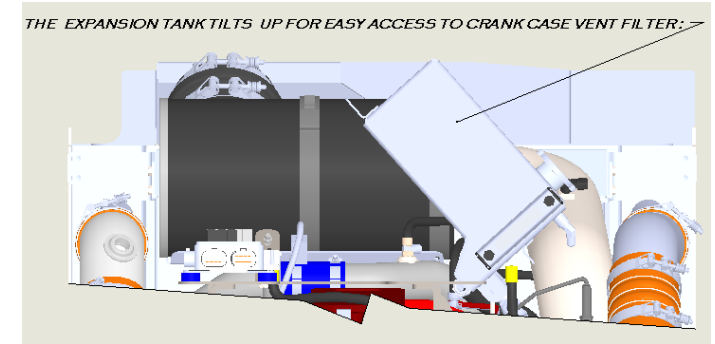
2018 SUTPHEN CHASSIS ENGINEERING UPDATES



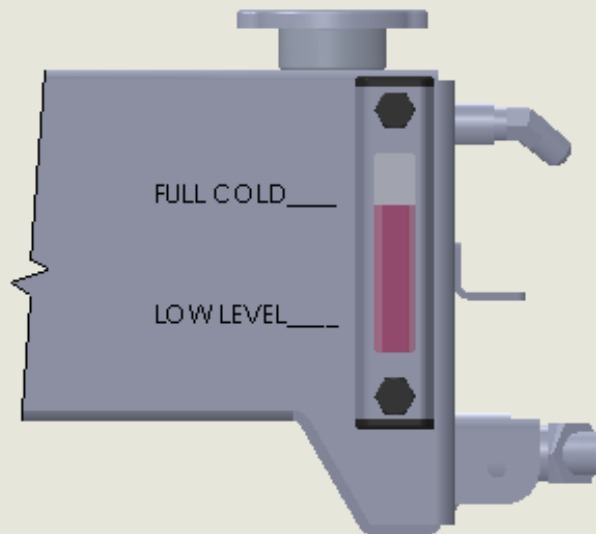
New Engine Configurations & Features

New surge tank w/sight glass:

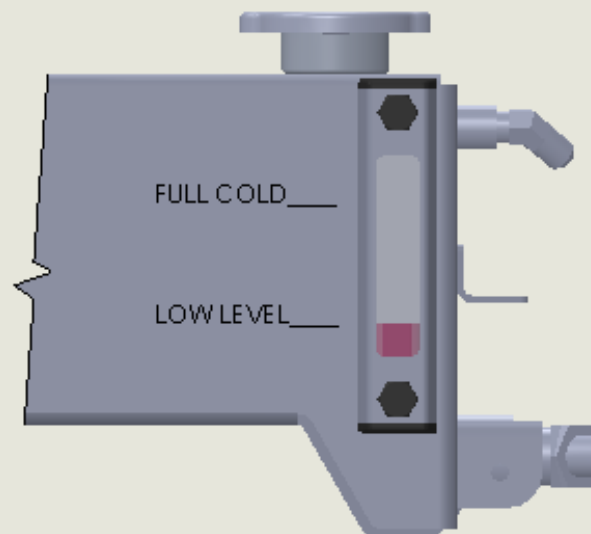
- Pivot-mounted base
- Clear fluid level indication
- Locally manufactured and supplied



VERTICAL SIGHT TUBE WITH FULL COLD & LOW COOLANT LEVELS CLEARLY MARKED :



FULL COLD 11.5 QTS



FULL COLD 5.5 QTS

| | Quarts | Liters | % system | TARGETS |
|--------------------------|--------|--------|----------|----------|
| Total Tank Volume | 17.8 | 16.8 | 28.2% | |
| Full Cold | 11.5 | 10.9 | 18.2% | |
| Expansion Space | 6.3 | 6.0 | 10.05% | 6% - 12% |
| 2" vortex (drain) volume | 0.9 | 0.9 | 1.5% | |
| Drawdown | 10.5 | 10.0 | 16.7% | 5% |
| Low Level Sensor | 5.5 | 5.2 | 8.8% | |
| Measured System volume | 63.0 | 59.6 | 100.0% | |
| Calculated System volume | 66.5 | 62.9 | | |



QUESTIONS?

- Feedback?
- Concerns?
- Complaints?
- Suggestions?