2015 SUTPHEN CHASSIS

NO ONE BUILDS A
CHASSIS SYSTEM LIKE
SUTPHEN

SUTPHEN SINCE 1890

EXTREME DUTY CHASSIS

Since 1968, our experience and focus on the fire service have driven Sutphen to build the industry's most Extreme Duty Chassis. Every inch of our custom chassis is built to withstand the most severe firefighting conditions. From the cab construction, heavy wall 6061 T6 aluminum extrusions and heavy duty aluminum plate, to the steel box tube design Subframe under cab, our chassis provides superior crash protection and is fully certified to meet all ASME and ECE standards. Our standard double frame rails, cross members, and suspension hangers are Huck Bolted with Grade 8 fasteners, and are bead blasted to prep the surface for better adhesion of the Cathacoat primer and durable Imron top coat paint to ensure that it will be long lasting and safe from corrosion. The front and rear suspension work together resulting in superior handling, a smoother ride, and better turning radius. Interior durability is just as important. We utilize high quality, extreme duty products to provide a rugged interior. There are no plastic trim panels, only heavy duty Durawear seats, headliners, and back wall; full length stainless steel interior door panels; and, durable urethane coated dash, switch console, and engine hood. The bumper is 10-gauge #304 Stainless steel, reinforced with a ¼" steel plate for added crash protection. The grille and headlight housings are 14-gauge #304 stainless steel, never plastic, for durability, and give the chassis that classic Sutphen look. From the moment you see it, you know it's a Sutphen, and it's built to last.

THERE'S NOTHING LIKE A SUTPHEN.

Table of Contents

Frame Rail Corrosion Protection

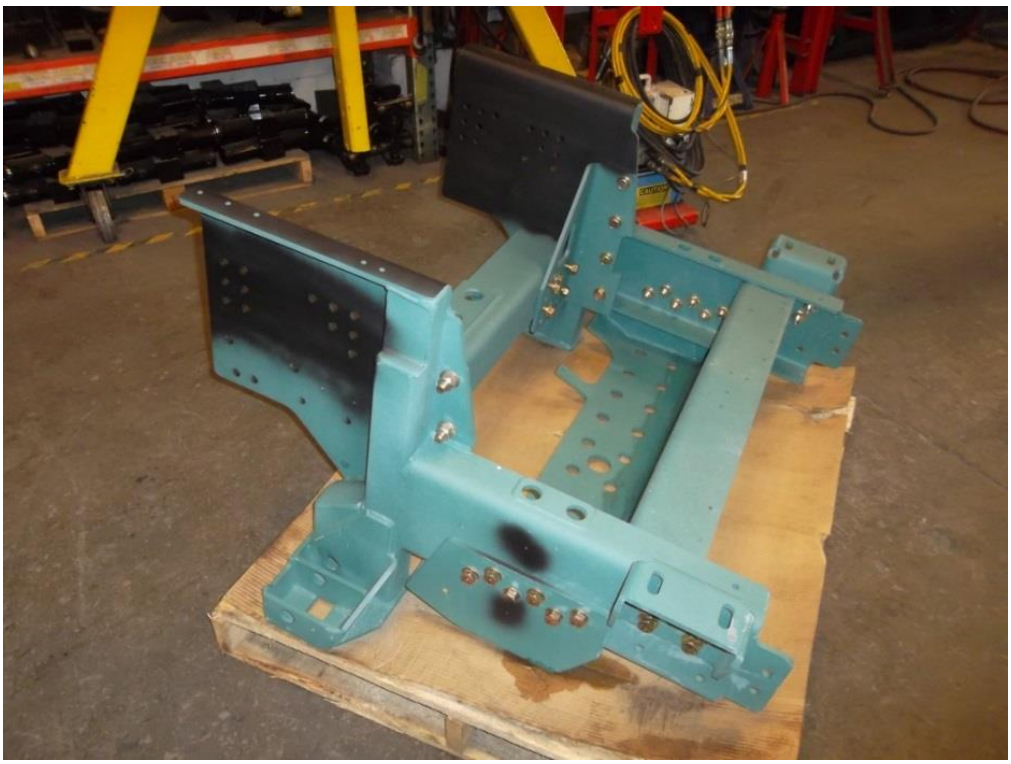
Frame:

•Monarch Packages will have double frame rails.

•Shield/Guardian Packages with less than 200” wheel bases will have single frame rails with dual liners at the suspension mounting points.

•.375 thick 110,000 PSI minimum yield steel rolled channel (trade name/Domex)
•All Tandem and Industrial products to have dual Domex rails
•Optionally available for all products

•BobTail Huck Bolt assembly of X-members and Suspensions.



Frame Rail Corrosion Protection

Assembly holes and flange reliefs are done by laser using CAD files.

Rails are then bead blasted and sealed with Cathacoat 302H.

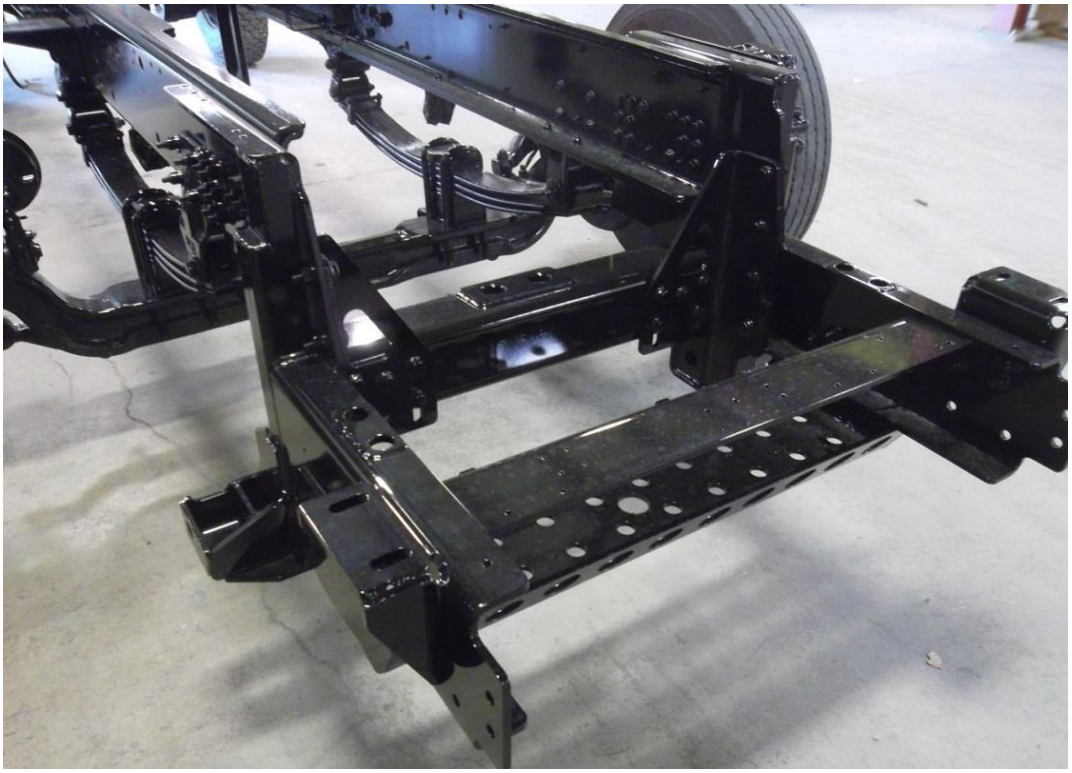
Cathacoat 302H is a high performance, two component, reinforced inorganic Zinc-rich primer. The Zinc acts as a sacrificial anode to prevent corrosion.

A top coat is applied to the mating surfaces prior to nesting the rails.
This top coat between the rails seals the Cathacoat and extends its protection.

All X-member and Rail mating surfaces have an addition coat of DuPont Corlar Two component Epoxy Primer 825P28300.

Frame Rail Corrosion Protection

Top Coated with DuPont high gloss, chemical and solvent resistant Imron Elite.



Frame Rail Corrosion Protection

Alcoa BobTail Fastening System for X-members / Spring Hangers.

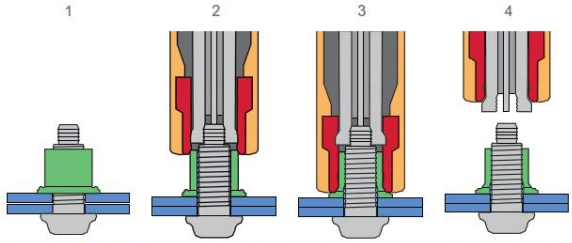
Representing the most advanced fastening technology to date, the BOBTAIL® System (fasteners and tooling) has been developed to deliver the highest level of performance and reliability.

Engineered to meet the unique challenges of a wide range of assembly applications, BOBTAIL offers safe, quiet, swaged-on installation technology in an advanced lockbolt design.

BOBTAIL is designed to deliver superior joining strength in even the most extreme environments. Available in a wide range of sizes and grades, BOBTAIL also offers quick and easy installation, and up to 10 times the fatigue strength of conventional nuts and bolts. Finally, when you factor in the cost of the fasteners with installation and inspection labor, BOBTAIL often provides an overall lower installed cost.

Unmatched speed of installation

The BOBTAIL® System delivers a lightening-quick installation cycle time for greater productivity – as fast as two seconds*. This quick cycle is due, in part, to the short time required to apply the tool to the pin and initiate the installation cycle. Once the operator engages the trigger, the swage and eject sequence is programmed to complete the cycle without any additional worker input.



The pin is inserted into the prepared hole, and the collar is spun onto the pin.

The installation tool is applied to annular pull grooves. When the tool is activated, a puller in the nose assembly draws the pin into the tool, causing the swaging anvil to press on the collar, drawing up any sheet gap.

At a predetermined force, the anvil begins to swage the collar into the pin's lockgrooves. Continued swaging elongates the collar and pin, developing precise clamp.

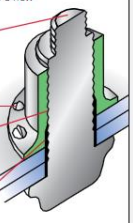
When swaging of the collar into the pin lockgrooves is complete, the tool ejects the fastener and releases the puller to complete the sequence.

* Based on a typical installation of a 5/8" Grade 8 fastener

Secure, fast installation

Combining an advanced fastener design with the latest in easy-to-use, ergonomic installation tooling, the BOBTAIL system delivers a strong connection and sets a new standard for ease of installation.

- Pintail-less design means reduced noise, no waste, and improved corrosion resistance.
- Visual evidence of successful installation provided by installation indicator.
- Collar material swaged into the lockgrooves forms a permanent, vibration-resistant connection.
- Low-swage technology allows for faster, lighter tooling with parts that last longer.



Quick visual inspection

The installation indicator in the collar flange – a proprietary Huck design – indicates the BOBTAIL collar has been fully swaged on.

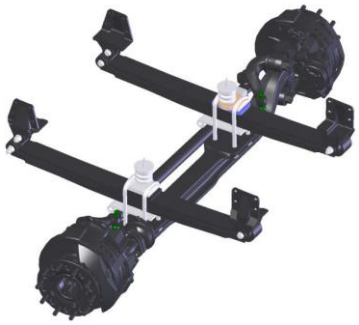
Front Suspension

•Standen's Unlimited 54" long 4" wide two leaf parabolic spring suspension.
•19,000lbs.
•23,000lbs.

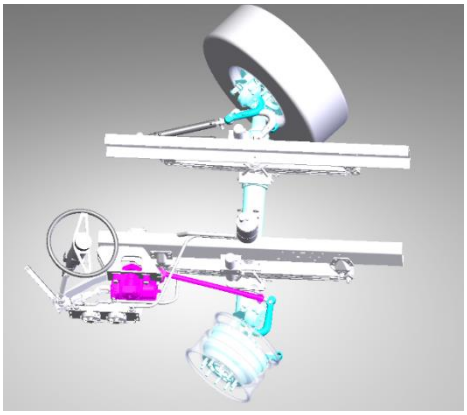
•Ride Tech auxiliary spring system and Koni Shocks for superior ride.
•Long-life maintenance-free bushings and hardware.
•Huck bolt installation.
•Cast steel spring hangers.

Front Axle:

•Arvin Meritor brand MFS front axle.
-23,000lbs rating
-Standard S-Cam braking
-Optional EX225 17" Disc brakes



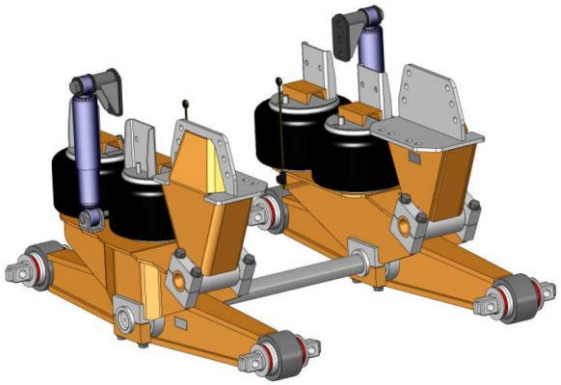
•Dana Tube Axle.
25,500 lbs,
Available with S-Cam braking



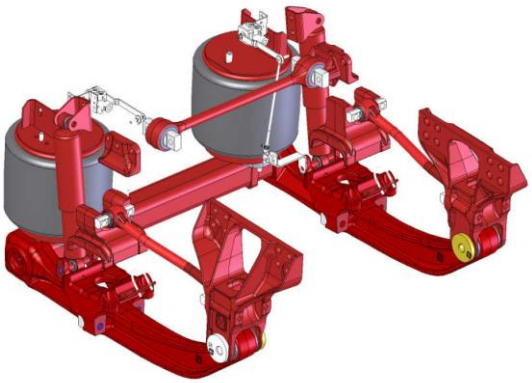
Steering:
•Shorter drag link for improved steering geometry.
•A truck with 425 front tires will have a maximum cramp angle of 40 degrees.
•A truck with 315/385 front tires will have a maximum cramp angle of 45 degrees.

Rear Suspension

•All Monarch trucks have air ride suspension as standard
-Raydan Tandem – 40K, 48K, 52K
-Firemaax - 24K, 27K, 31K
•Current Raydan suspension will remain standard for tandem axles



RAYDAN



FIREMAXX

Brakes and Electrical Quality

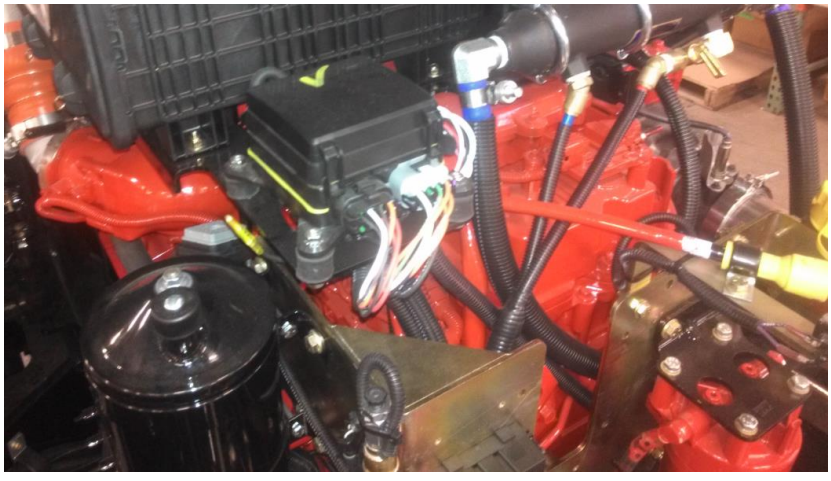
Check Valve protected Air Brake and Accessory harnesses

Multiple Ground stud system to eliminate electrical issues used throughout the frame and cab.

Brakes and Electrical Routing

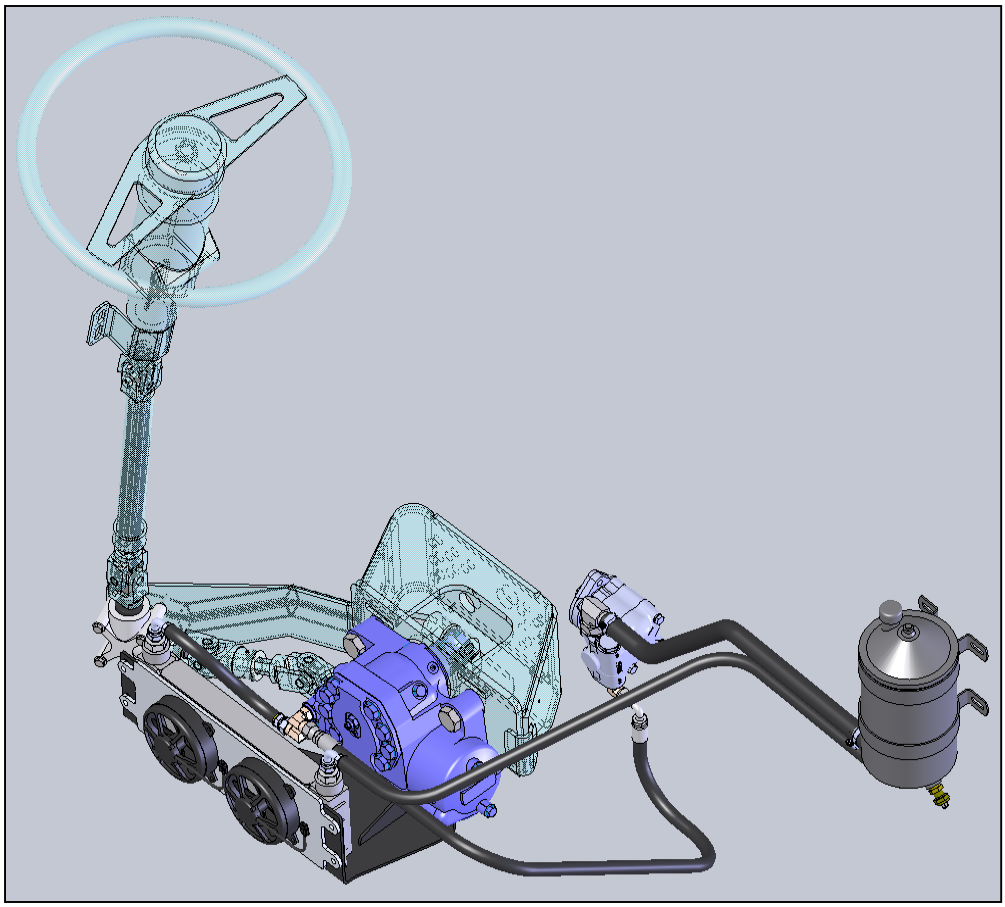
Brake and Electrical Harnesses are secured every 12” – 24” spacing and above the Rail with Loom, protecting them from debris and damage

To increase the reliability, serviceability, and reproducibility of the electrical system, the Sutphen Corporation has added a distribution module.



Heavy Duty Power Steering System - ISL9, ISX12, & ISX15

- Severe duty TRW pump
- Dedicated power steering fluid radiator
- Steering fluid temperature monitored
- Auto on/off twin cooling fans
- Integrated housing and bracket
- Standard on late 2013 and newer vehicles

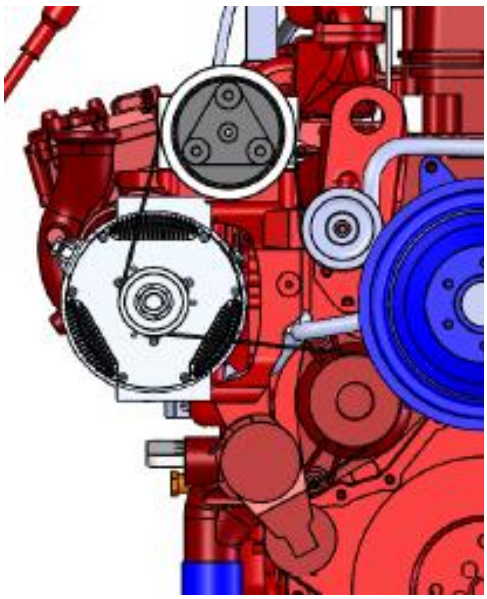


Electrical Power Choices – Sutphen leads the industry

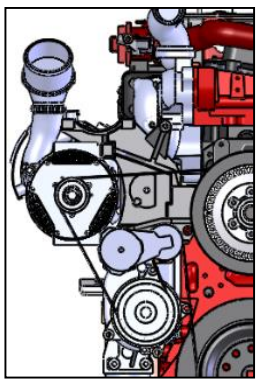
Every Cummins engine comes standard with a 270amp Leece Neville Alternator. Sutphen powertrain electrical options provide an extensive range of alternator outputs up to 540amps. Sutphen offers the most comprehensive range of alternator choices in the fire service.

The ISL engine can accommodate different Alt. options including: 320 Amp Leece Neville (13010205)

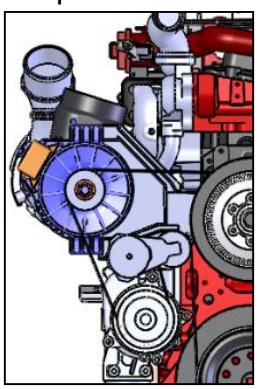
At this time, Cummins does not approve a dual alternator option for the ISL



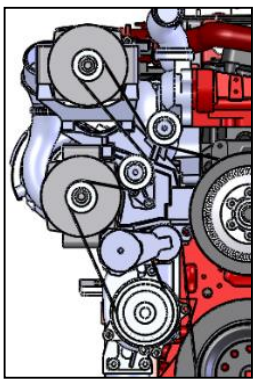
ISX w/360 Amp Niehoff (Alt. Option: 13012115)



ISX w/430 Amp Niehoff (Alt. Option: 13012120)

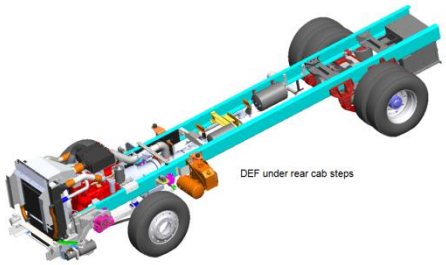


ISX w/540 Amp Niehoff (Dual Alt. Option: 13010110)

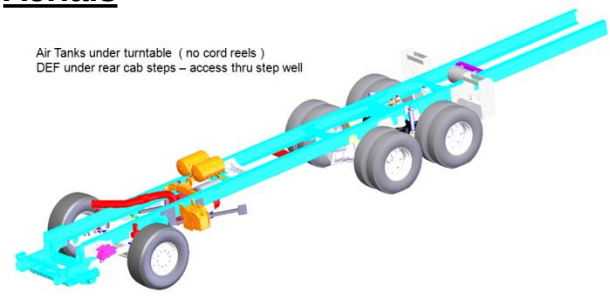


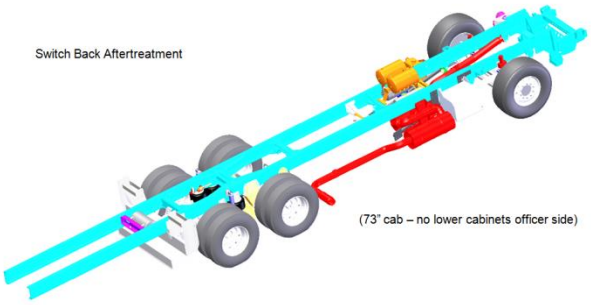
Engines – Cummins Exhaust / DEF Install

Pumpers

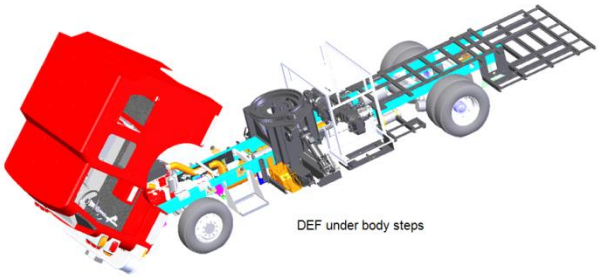


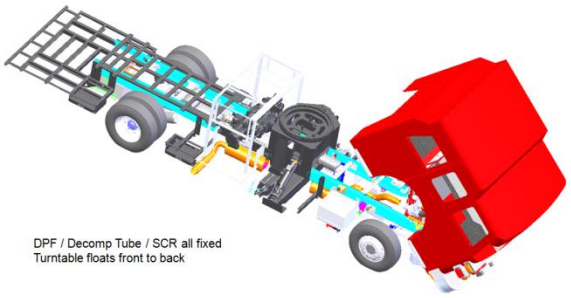
Aerials





MiniTowers





Engines – Cummins

Exhaust System:

All Cummins motors will be equipped with After Treatment Devices (ATD) and meet/exceed 2015 EPA regulated NOx output of 0.2-g/hp-hr and particulates of 0.01-g/hp-hr

- These systems included the following:
- Diesel Particulate Filter (DPF)
- Decomposition Tube
- Selective Catalytic Reduction (SCR)
- Exhaust Tip Diffuser
- Diesel Exhaust Fluid (DEF)

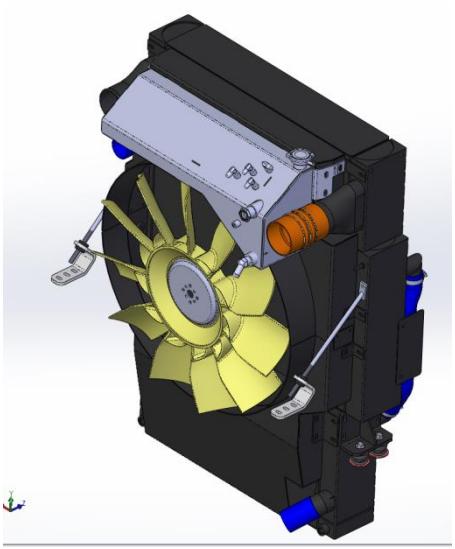
All exhaust piping relating to this system will be stainless steel

Cooling Package ISL9L/ISX12/15L

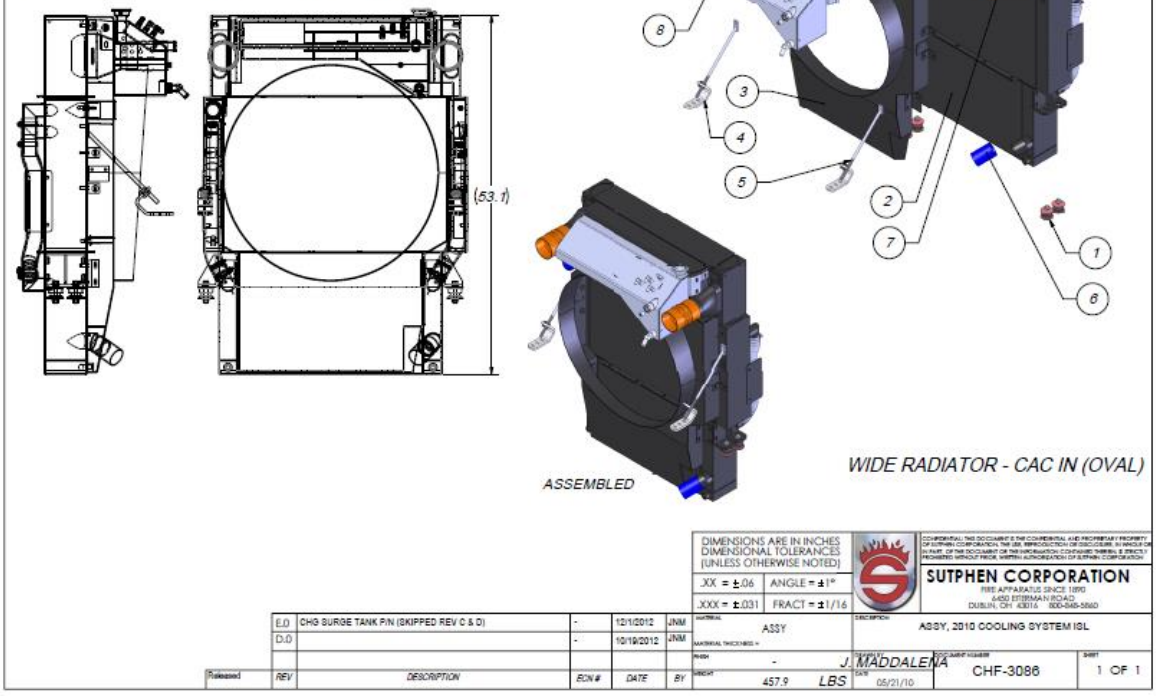
- Cooling package comes from AKG to meet the 2015 engine requirements
  - -Extruded aluminum radiator for added strength
  - -The modular design of the radiator allows for individual component replacement
    - There are 3 sections that comprise the radiator:
      - Top- Charged air cooler
      - Middle- Engine water jacket
      - Bottom-Fuel cooler
- Transmission cooler is remote mount liquid to liquid for increased efficiency

Engine Cooling System for ISL

- The ISL engine comes equipped with a direct fan drive
- Optional Fan Clutch for ISL engine cooling system (21030000)

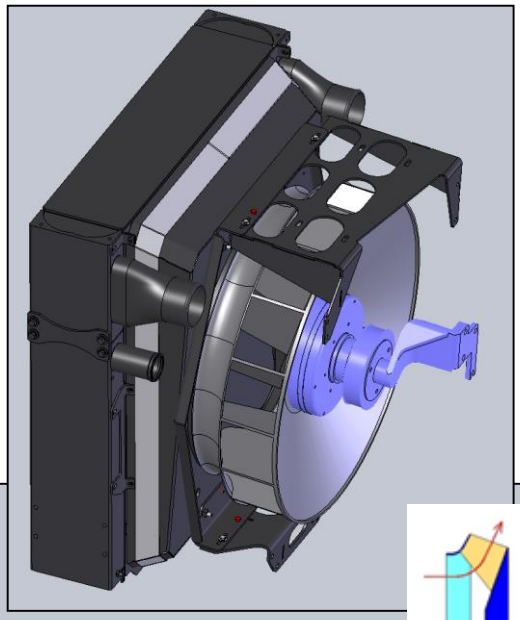


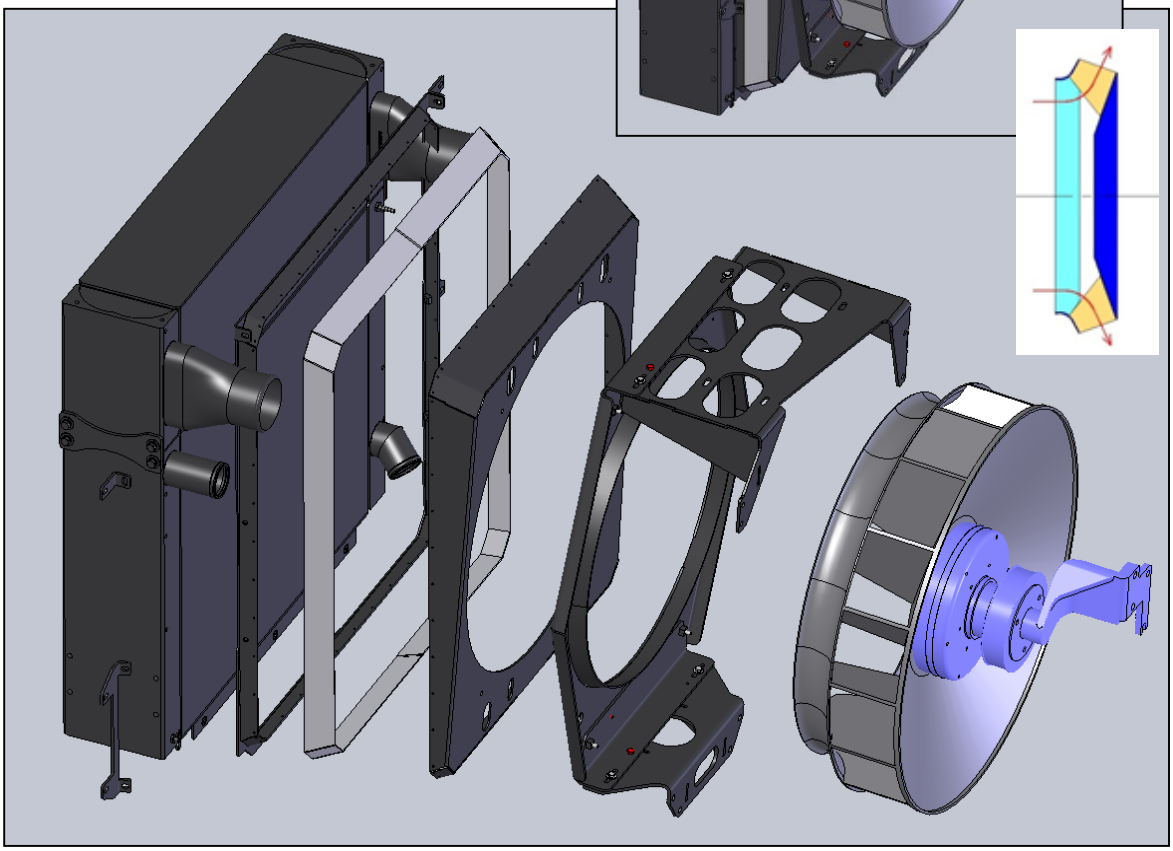
ITEM NO.	PART NUMBER	DESCRIPTION	Default QTY
1	CBA20-300	ASSY, CTR BONDED 300LB ISOLATOR (LORD)	4
2	CHF-3093	ASSEMBLY, 2010 AKG RADIATOR - ISL/ISX11.9	1
3	CHF-3087	FAN SHROUD ASSY, 2010 ISL	1
4	CHF-2924-02	BRACKET, RADIATOR STAY ROD LH LOWER	2
5	CHF-3078	STAY ROD, 2010	2
6	CHF-2907	HOSE, 2.50 DIA FLEX RAD	2
7	367-400	COUPLING, FLEX RAD 4" HOSE	2
8	CHF-4371	ASSY, 2010 ISC/ISL COOLANT SURGE SYSTEM	1



DC²F - Super Efficient Engine Cooling System for ISX15

- Industry leading cooling
- Deep Core Radiator
- Floating two-piece shroud connected w/ flexible membrane
- Engine mounted ducted fan cowl
- Centrifugal Cooling Fan
- Viscous Clutch





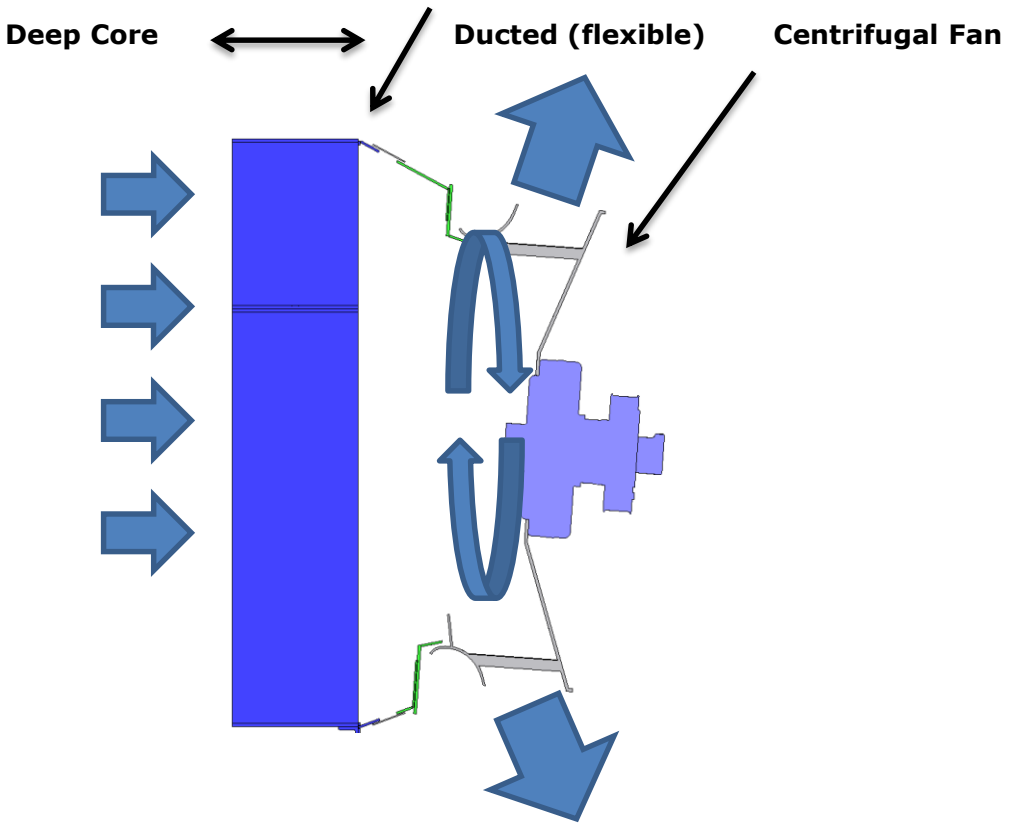
DC²F - Super Efficient Engine Cooling System for ISX15

Sutphen ***DC²F*** (Deep Core Ducted Centrifugal Fan) Cooling is truly industry leading technology.

Contemporary emission restrictions create more engine heat that must be removed. Conventional radiator and axial-flow fan technology requires a huge radiator that is extremely heavy and eats up in-demand cab space. The axial flow fan is large, inefficient and noisy. Additionally, the conventional fan and clutch arrangement consume more engine horsepower – precious horsepower that is more valuable to the fire service when made available for pumps, auxiliary equipment, etc.

Sutphen liberates this additional horsepower, up to 30HP.

The all new Sutphen 600 HP powertrain (powered by the Cummins ISX15) is the only over the road vehicle in production, by any manufacturer, anywhere, that utilizes this approach. Sutphen has integrated this technology into the ISX15 to produce a 600 horsepower drivetrain that is second to none.



Engines – Cummins

Fuel Tanks:

•Premium vehicles tanks - 12-gauge stainless steel with open saddle sub-structure
•Shield/Guardian – 12 gauge steel with open saddle sub-structure
•Standard / 65 gallons
•Fuel system – fuel tank, hoses & fittings capable of accommodating Biodiesel fuel up to B20.

Engine Air Cleaner System:

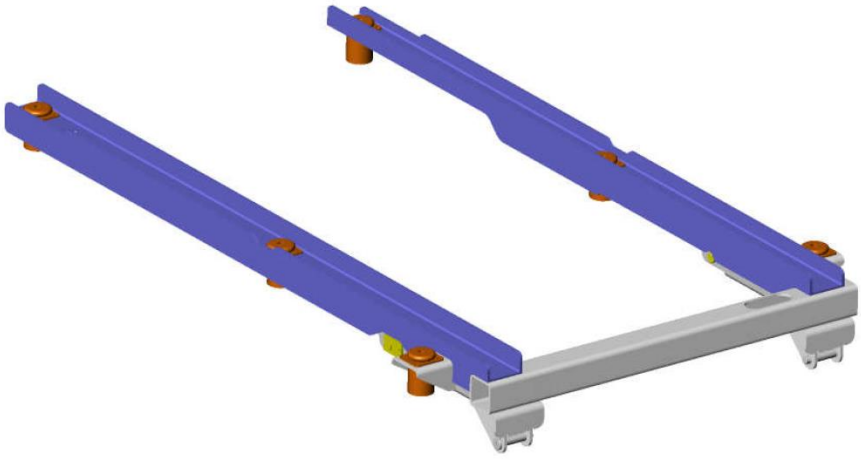
•Air is pulled over the cooling package to provide direct flow
•Intake 48” above ground level to allow fording deep water
•System exceeds ISO 5011 standards for cleanliness and dirt holding capacity

Air Brake System:

•Brake components will be Meritor Wabco brand systems
•Electronic Stability Control is optional
•Meritor Wabco System Saver 1200 Air Dryer
•Color coded nylon hoses covered in High Temperature split loom
•Spring guards installed at suspensions to prevent chafing, fatigue, and wear
•Schrader valve for auxiliary fill located in front step well
•All trucks will have an auxiliary tank standard

Cab Tilt Sub-Structure

•Cab sub-frame will be manufactured from 5” structural I-beams joined to a 4” square tube.
•Cab will ride on six (6) conical mounted isolators spread around the perimeter of the cab. These strategic locations provide balanced support to minimize any stress on the cab.
•Each isolator secures the cab to the tilt sub-frame while providing vibration and shock dampening. The tilt sub-frame then provides the structure needed to mate the cab to the chassis.
•The sub-frame is secured to the chassis using PowerPacker hydraulic latches, hydraulic tilt cylinders, and bushing sleeved pivot pins.
•Cab pivot point is raised to allow for more front bumper options.
•Upgraded cab tilt system (cylinders, pumps, motors, safety latch).
•Cylinder mounting pads raised 2” for improved angle of approach.



Cab Models

Cab Model Features:

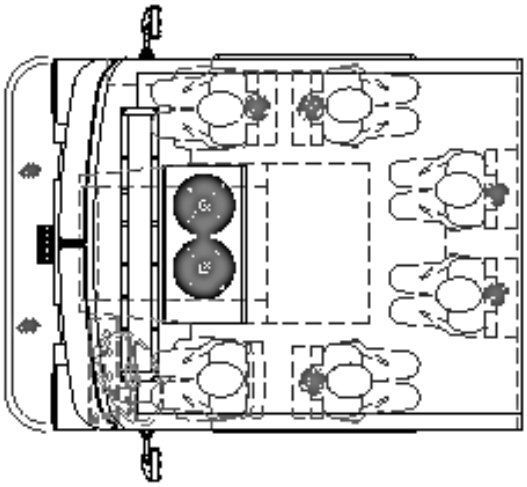
- Overall width will be 98”, which is under the DOT maximum width of 102”
- Flat and Half Raised Roof designs are available
- Flat Back – Pumpers/Rescues. Slant Back – Aerials
- Half Raised Roof options in 10”, 15”, and 20”
- Sutphen offers a variety of cab models to meet customer’s needs

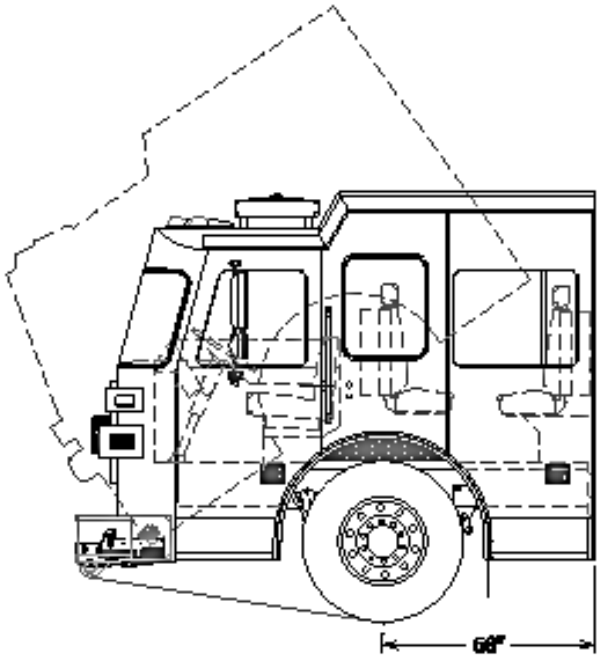
Cab Style	Description
TSAL4	Flat Back Cab 56" Flat Roof
TSAL4A	Flat Back Cab 56" 10" RR 1/2
TSAL4C	Flat Back Cab 56" 15" RR 1/2
TSAL4O	Flat Back Cab 56" 20" RR 1/2
TSAL4J	Flat Back Cab 62" Flat Roof
TSAL4K	Flat Back Cab 62" 10" RR 1/2
TSAL4M	Flat Back Cab 62" 15" RR 1/2
TSAL4N	Flat Back Cab 62" 20" RR 1/2
TSAL4D	Flat Back Cab 73" Flat Roof
TSAL4E	Flat Back Cab 73" 10" RR 1/2
TSAL4G	Flat Back Cab 73" 15" RR 1/2
TSAL4P	Flat Back Cab 73" 20" RR 1/2
TSAL4S	Slant Back Cab 56" Flat Roof
TSAL4SA	Slant Back Cab 56" 10" RR 1/2
TSAL4SC	Slant Back Cab 56" 15" RR 1/2
TSAL4SJ	Slant Back Cab 62" Flat Roof
TSAL4SK	Slant Back Cab 62" 10" RR 1/2
TSAL4SM	Slant Back Cab 62" 15" RR 1/2
TSAL4SQ	Slant Back Cab 73" Flat Roof
TSAL4SE	Slant Back Cab 73" 10" RR 1/2
TSAL4SG	Slant Back Cab 73" 15" RR 1/2

Cab Models – 56”

56” Cab Models available with flat or raised roof options.

- Flat Back Pumper Cabs
- Slant Back Aerial Cabs

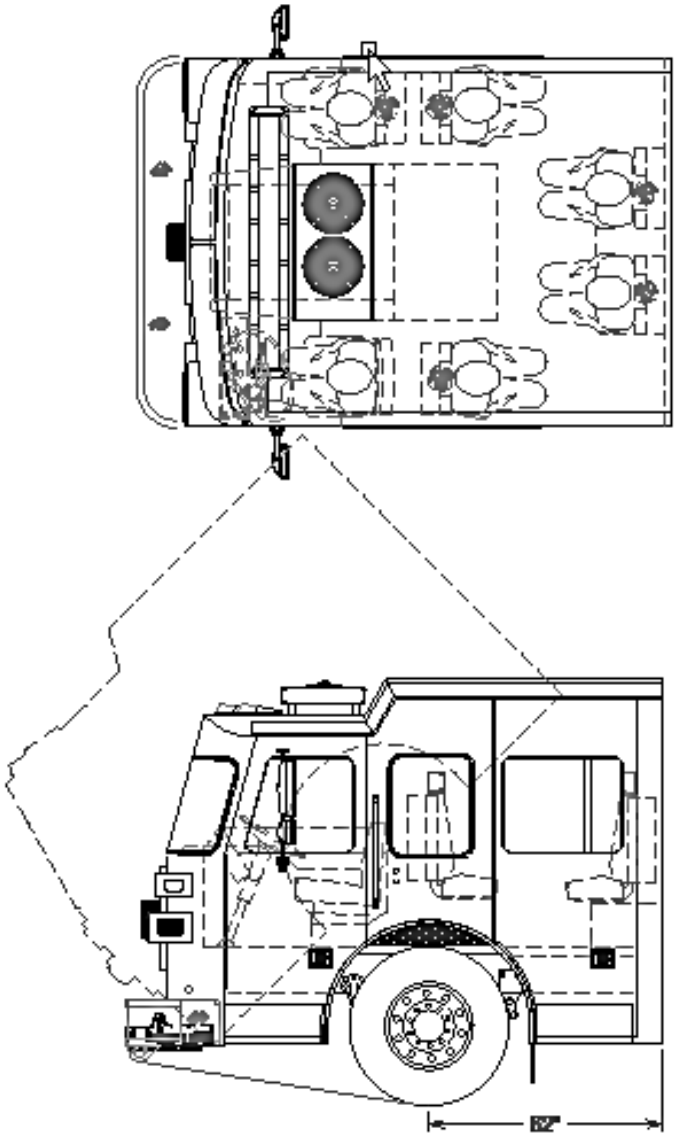




Cab Models – 62”

62” Cab Models available with flat or raised roof options.

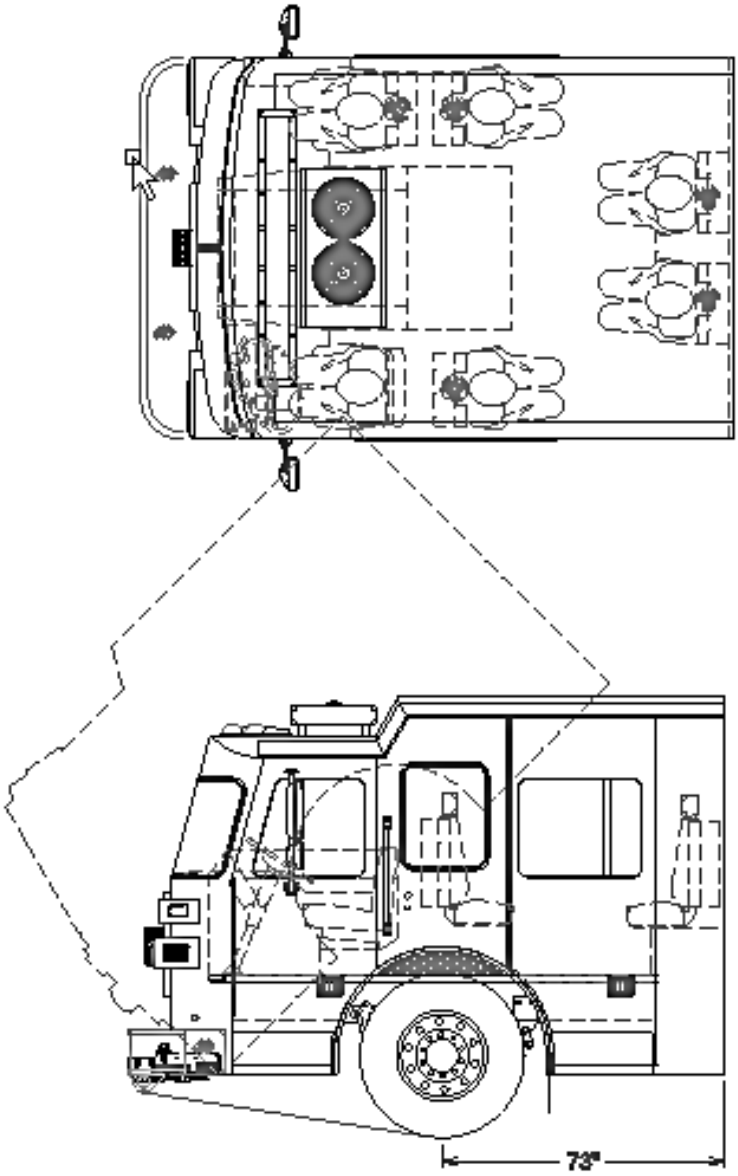
- Flat Back Pumper Cabs
- Slant Back Aerial Cabs



Cab Models – 73”

73” Cab Models available with flat or raised roof options.

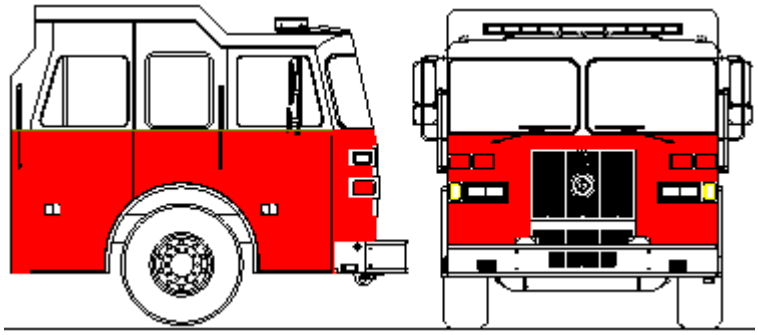
- Flat Back Pumper Cabs
- Slant Back Aerial Cabs
- Additional SCBA seating available



Paint Break Options

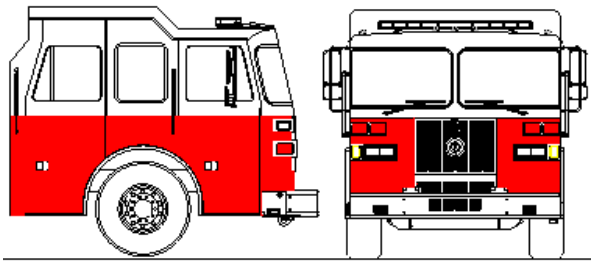
Sutphen Corporation will offer (5) paint break options for the cab paint.

- Option 1 is the standard break, to the bottom of the windshield (option 90030005).

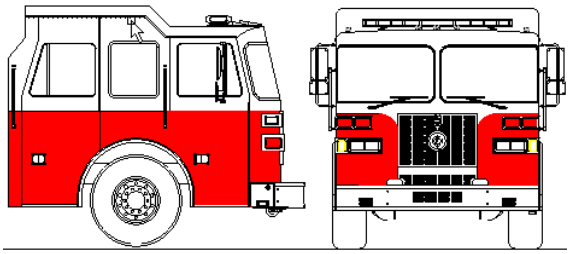


Options 2 thru 5 will be special breaks (option 90030006).

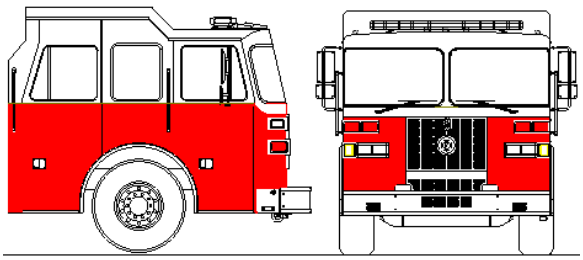
- Option 2, paint break to top of grill.



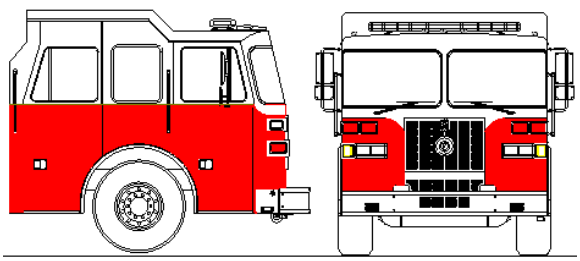
- Option 3, paint break to top of grill w/grill swoop.



- Option 4, paint break w/windshield swoop, to top of grill.



- Option 5, paint break w/windshield swoop and grill swoop.



10 Crew Seating 73” Cab

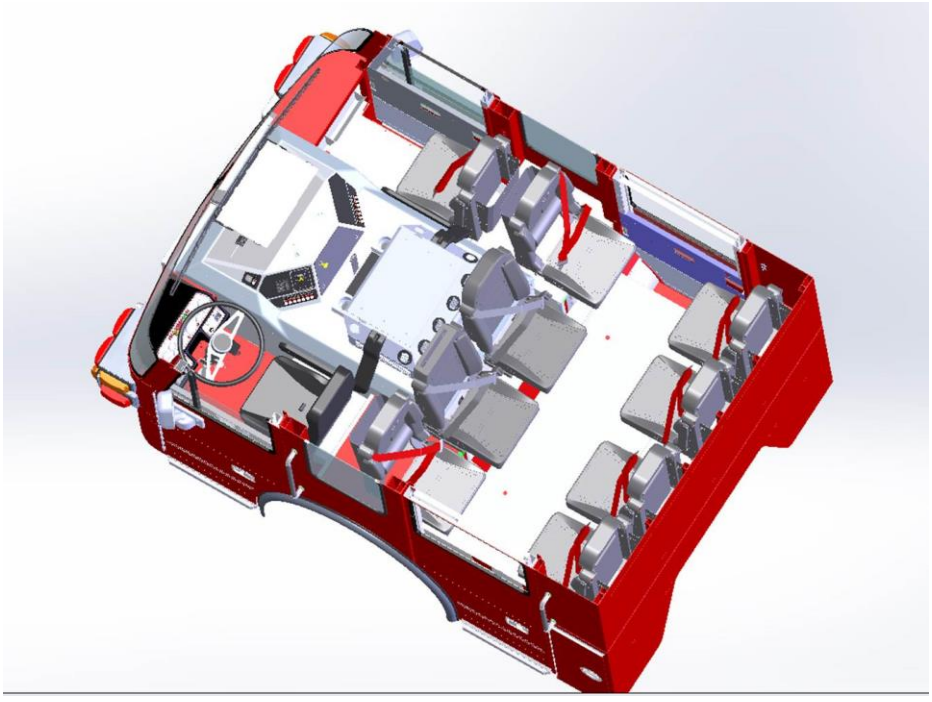
Only available with the ISL 9L Engine

Current Cab Compartments (interior/exterior) available.

Space – 17” between seats in the folded down position.

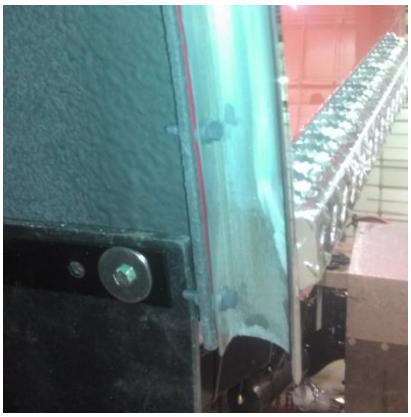
Front Axle – this modification will add 800 pounds to a 73” unit of similar configuration.

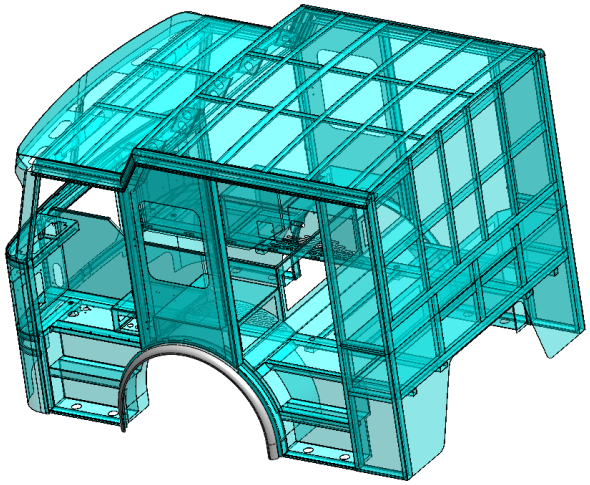
Two additional seats not available with SCBA.



Side of Cab Mounted Fenders

Polished Stainless Steel
Mounted with Fiberglass hardware (Corrosion resistance / breakaway capability)
Offset from cab for drainage
Isolation of dissimilar metals





Rubber Fender option available

Outset Rims/Tires 315

Outset 315 tires and wheels

Approved for 18K / 19K / 20K ratings (tire and wheel coordination required)

Photos courtesy
James Maddy

Cab

Exterior Cab Features:

- 304 Stainless Steel Polished Grill
- 304 Stainless Steel Polished Headlight Housing
- Doors can be full length or Barrier style
- 2 Lang Mekra 300 Polished chrome plated Aero remote control mirrors
- Step Well Lighting
  - -LED lights on first and second step
  - -TruckLite ground lights
- Cab fenders are polished stainless steel
- Optional Q2B is offered as a grill mount/bumper mount
- Slip Over Q2B Grill for ease of maintenance

Interior Cab Features:

- Interior Spaciousness
  - -Up to 8 seating positions featured
  - - Air Ride/Electric/Manual/Fixed/ABTS/Flip-Ups
  - -Driver Air Ride Seating with ABTS/High Capacity Dampening/Recline Option
  - -We proudly offer H.O. Bostrom SecureAll seating
  - - Seat Belt/VDR monitoring systems
    - ○Weldon Standard
    - ○FRC Optional
  - -Storage compartment under officer seat - approx 3.2 cubic feet
    - ○(optional door)
  - -Pass through rear seat box storage - approx 7.2 cubic feet with lighting
    - ○(doors optional on Guardian)
  - -Monarch Package 100% Durawear grey tweed seat material
- Durawear fabric headliner
- Stainless Steel Door panels
- Large maintenance door withlighting for access to the oil dipstick and lubricants

Sound / Heat / Corrosion Protection:

- Under cab/hood to be coated with thermal and noise/vibration absorbing material.
- Wheel Wells are to be sprayed with a specialized coating to eliminate corrosion and provide sound isolation.

Cab

Air Conditioning:

•Standard “Mid-Range” A/C system
-65,000 BTU with TM-21 Compressor – 75,000 BTU Heating
•Optional “Severe Climate” A/C system (Option: 28010750)
-Up to 80,000 BTU with a TM-31 Compressor - 75,000 BTU Heating
•Heat-to-feet distribution ducts and vents for better airflow/ functionality

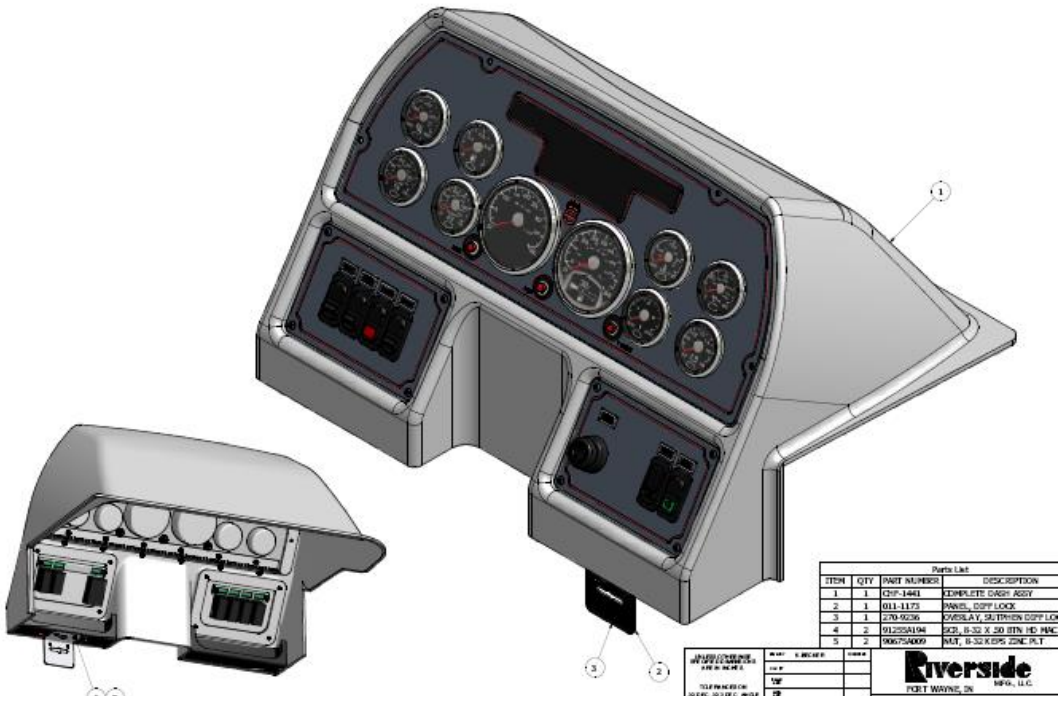
Electrical:

•Heavy-duty electrical system and breaker panel
•Batteries
-Mounted in a vented 304 stainless steel box
-Removable aluminum protective cover
-Dry Deck mounting bed
•Headlight Upgrades
-Halogen Complex Reflector - Standard
-LED – Optional (32520660, 32520510)
-HID- Optional (32520200)
•Auxiliary Fuse Block
-Mounted under rear facing Officer seat box
-6 battery outputs / 6 ignition outputs
-10 amp each / 50 amp maximum
•Kussmaul/IOTA Battery Charger/Conditioner/Pump
-Mounted under rear facing Driver seat box
-Shoreline/Auto Eject behind Driver door

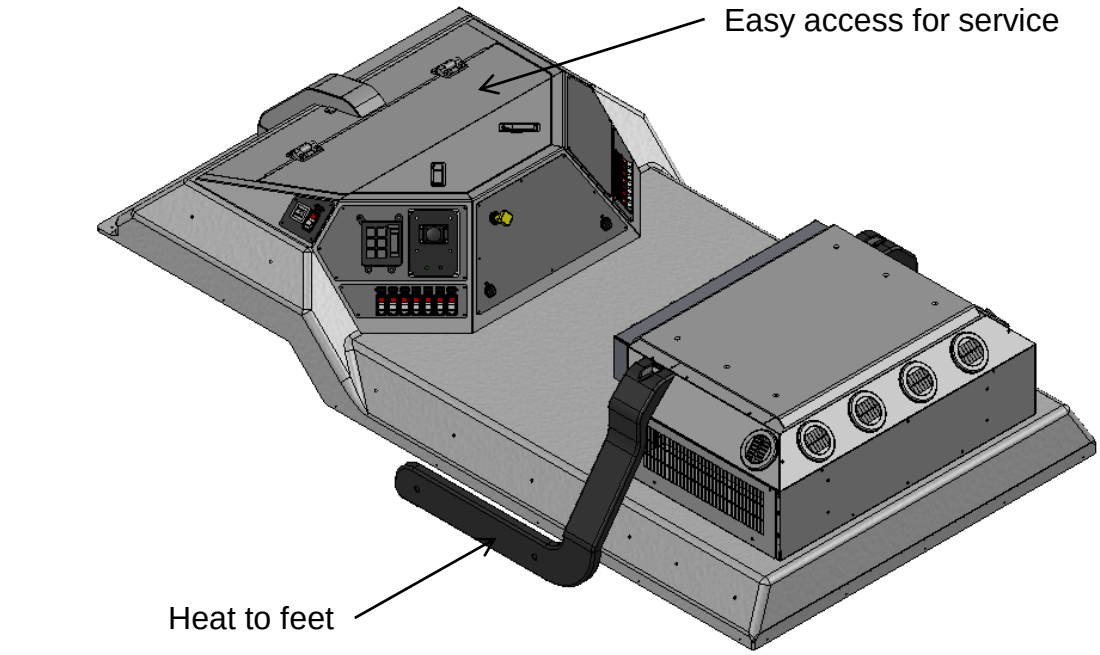
•Multiplex systems are available for both the chassis and the body
•Grounding straps consist of minimum 2-gauge strap bolted directly to frame
•All connections are sealed or weather proofed

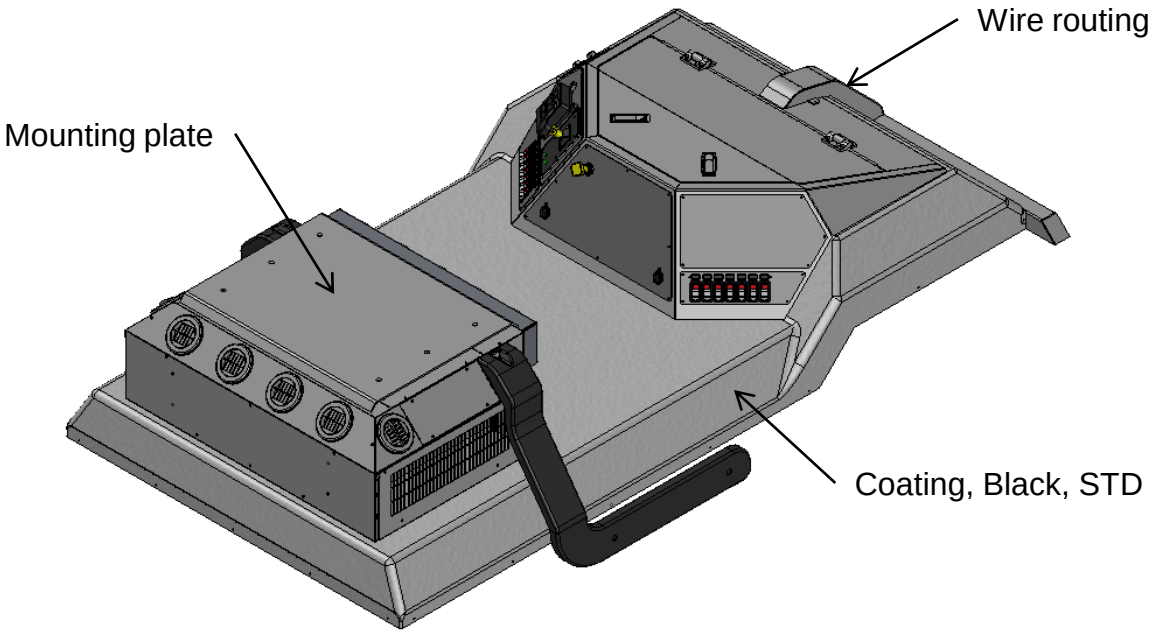
Cab – in front of Driver

- Grab Handles standard inside and out on Monarch and Shield
- Interior Door Panels
  - -Stainless Steel
- Windows
  - -Powered – Monarch
  - -Manual – Shield/Guardian

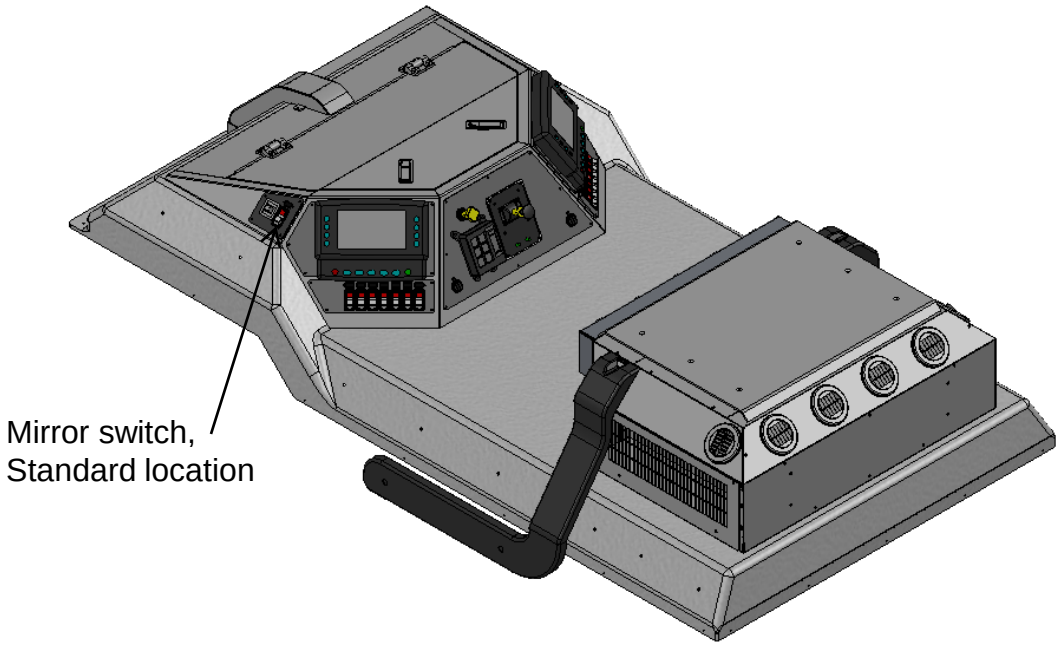


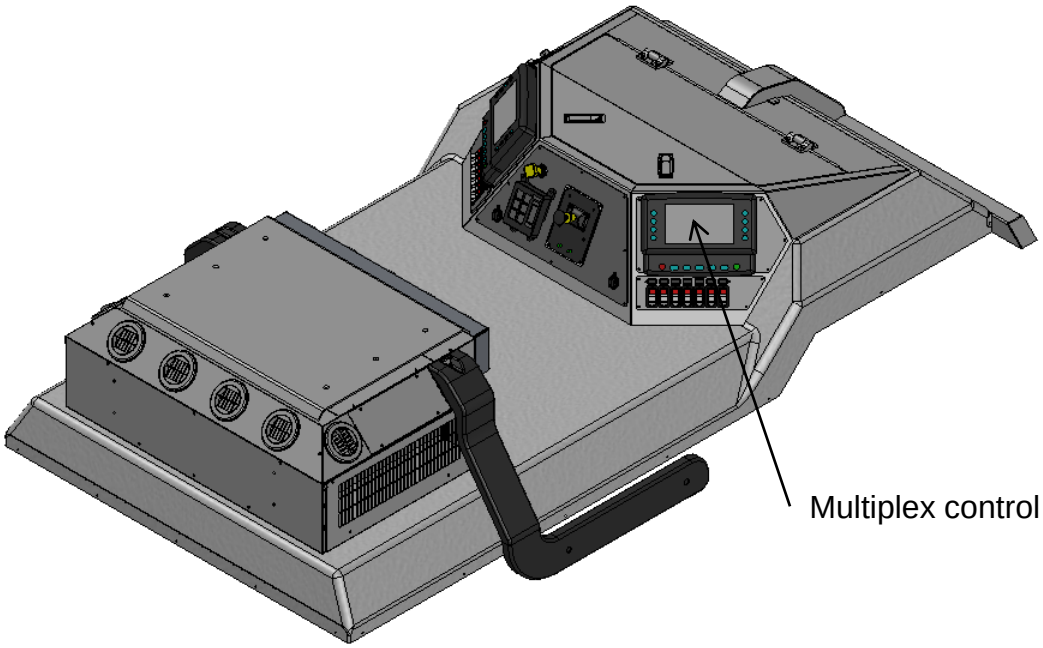
Standard Hood Control Console



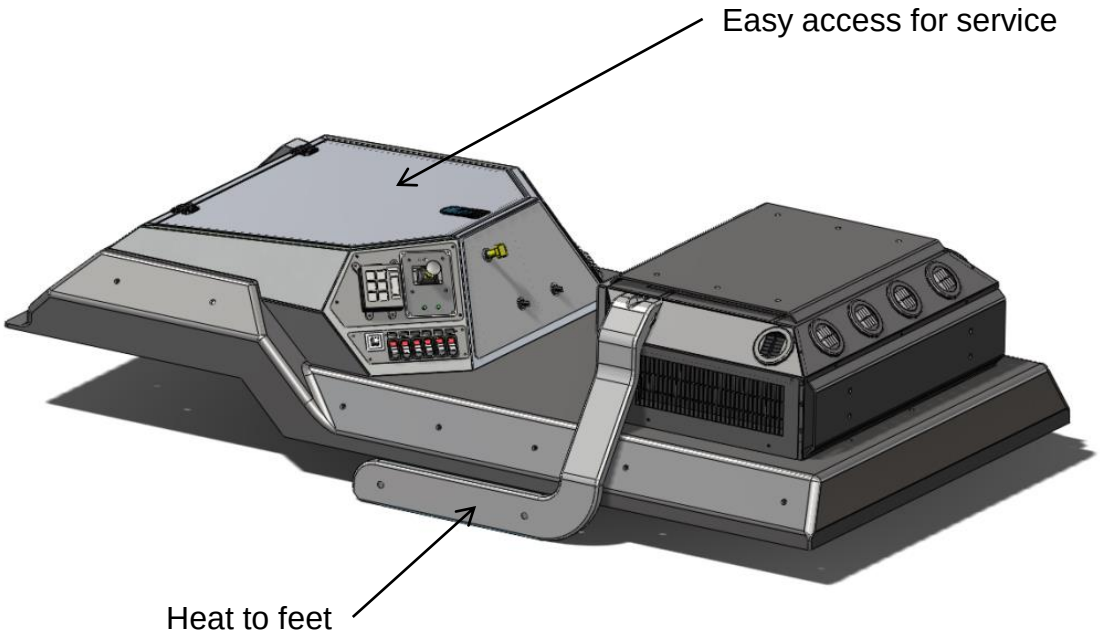


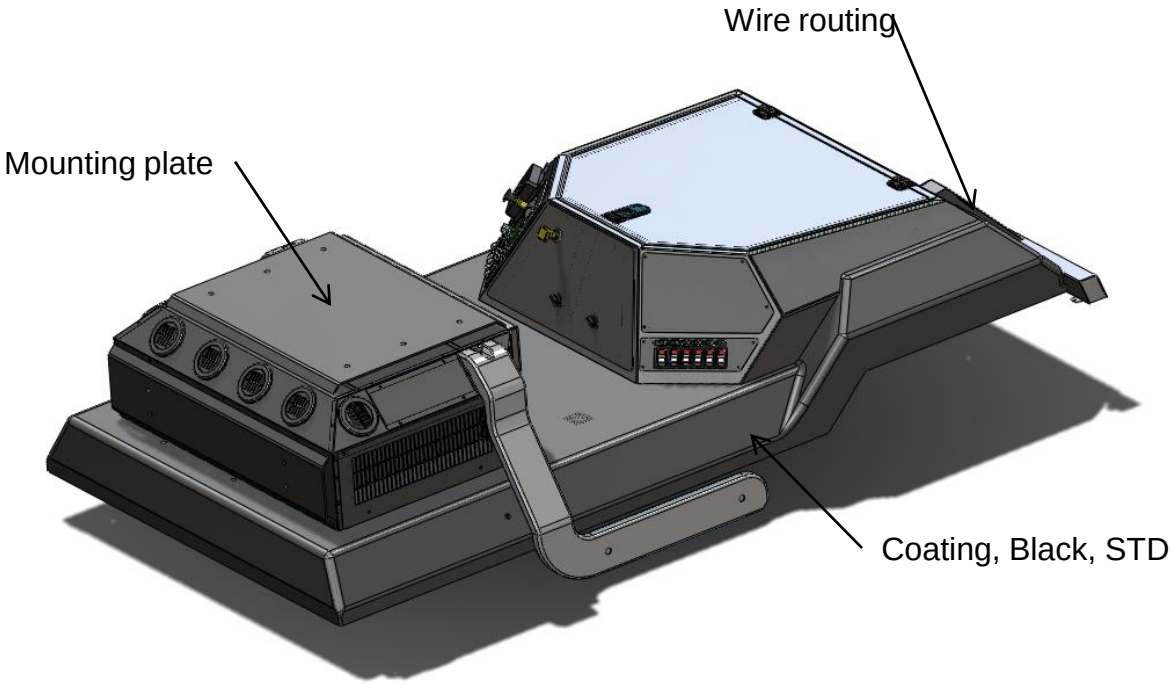
Multiplex Hood Control Console





ISX-15L Hood Control Console



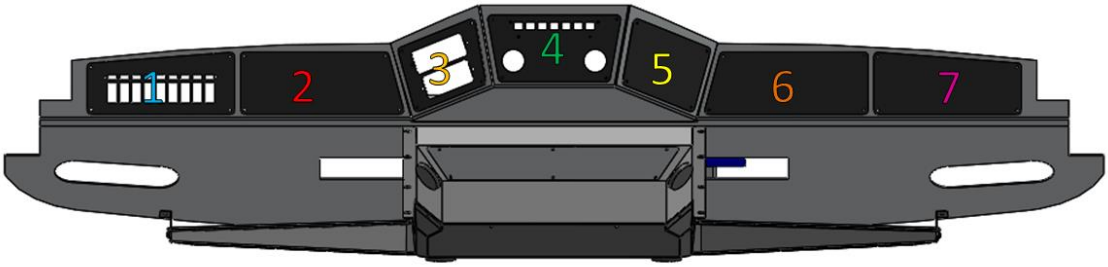


Lower/ Upper Command Console

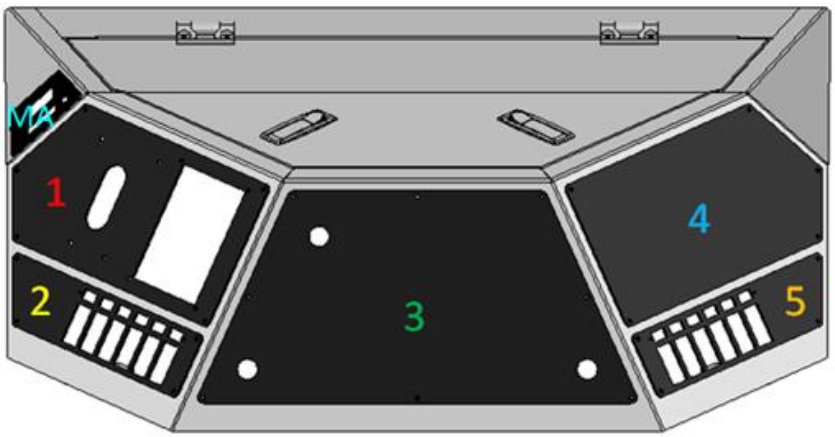
Sale's Application Engineers will lay out every Custom Command Console design with the Customer for their approval, prior to production.

Example:
- Radio Location
- Siren Location
- Switch Layout

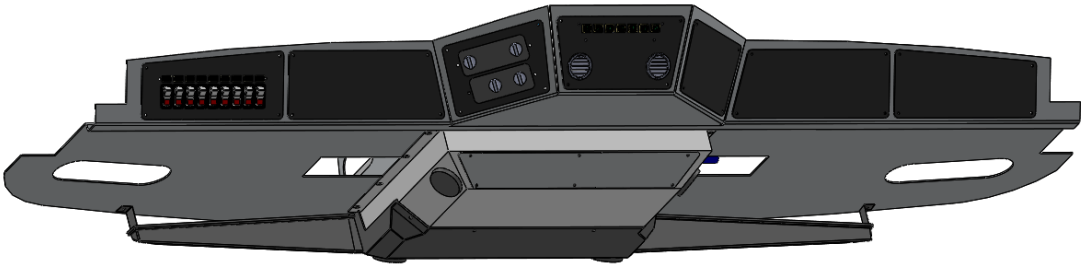
For more information about Command Console see Sales Technical Bulletin: **STB-0017**



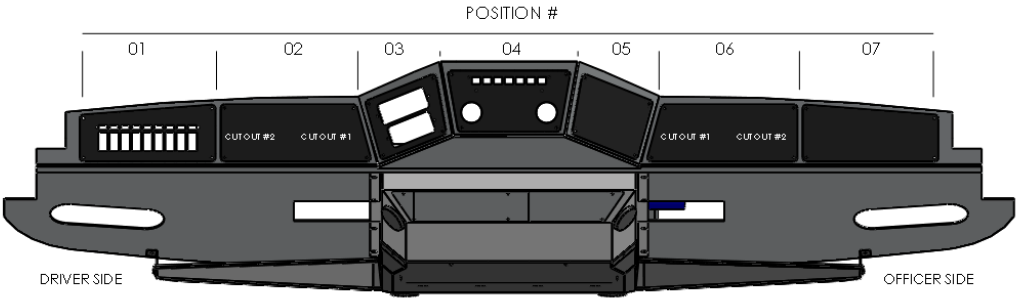
Driver's Side **Officer's Side**



Upper Command Console



Custom configuration of switches / controls / radios



Cab – In front of Officer

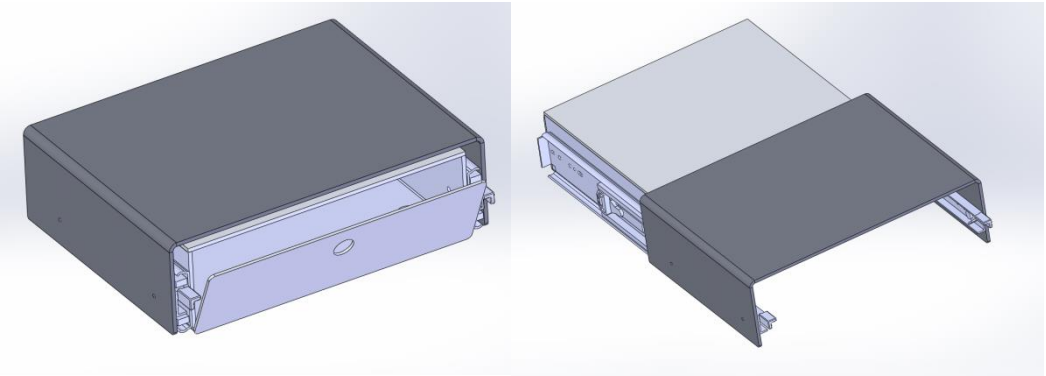
•Flat work surface - std (11031510)

•Optional pull-out computer tray (11031512)

•Optional Columbus style glove box (11031509)

Cab – In front of Officer (cont'd)

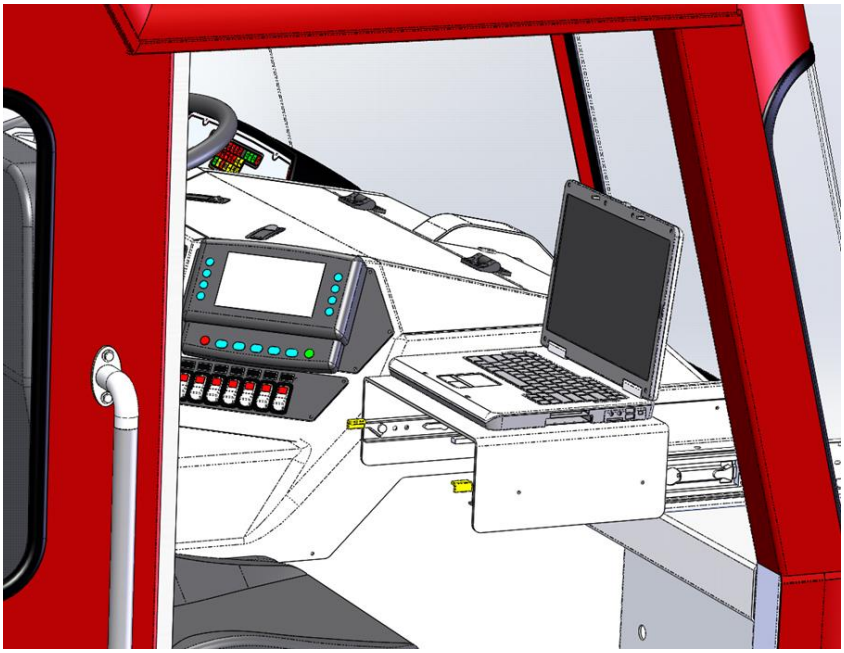
•NEW - Optional pull-out computer tray w/stationary storage (11031515)



-Officer Side Command Station

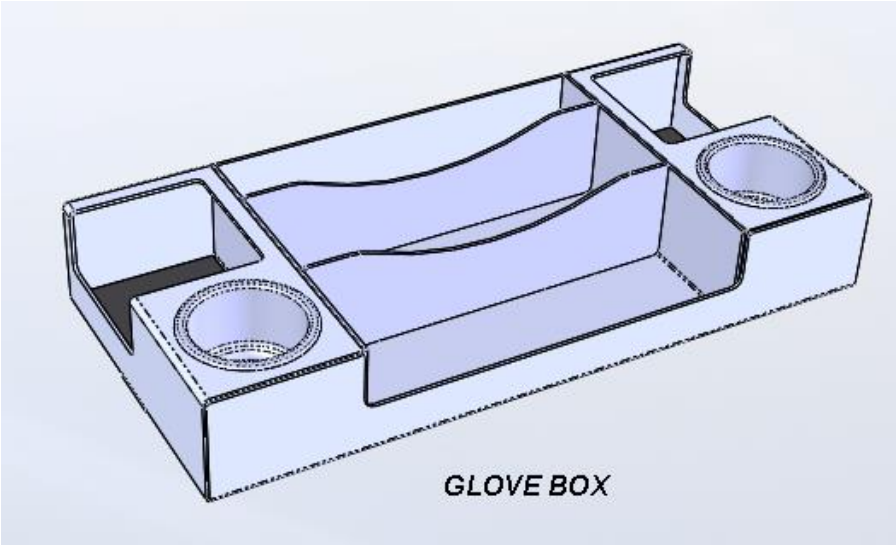
-Integrated storage compartment

-Drop down drawer

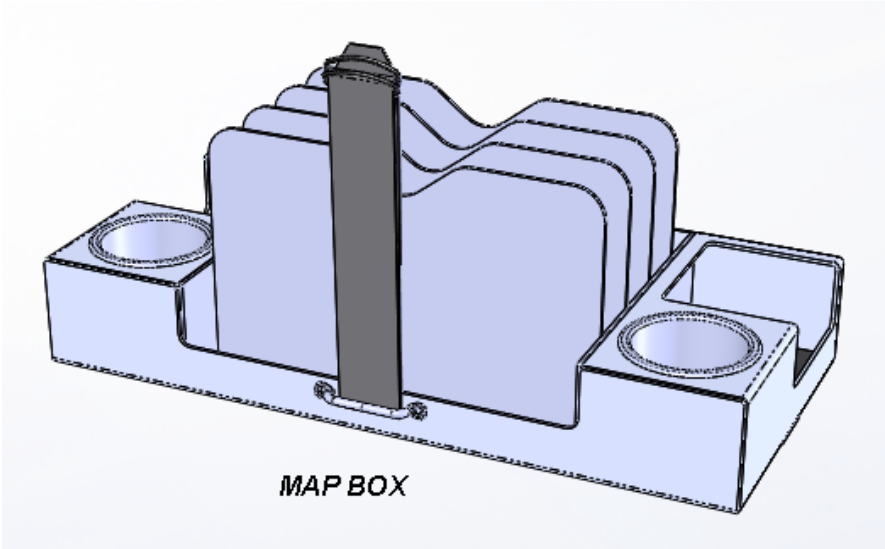


Cab – Optional consoles, center hood, between Driver and Officer

•Center console with glove holders, cup holders, and storage compartments (Option: 11031679)

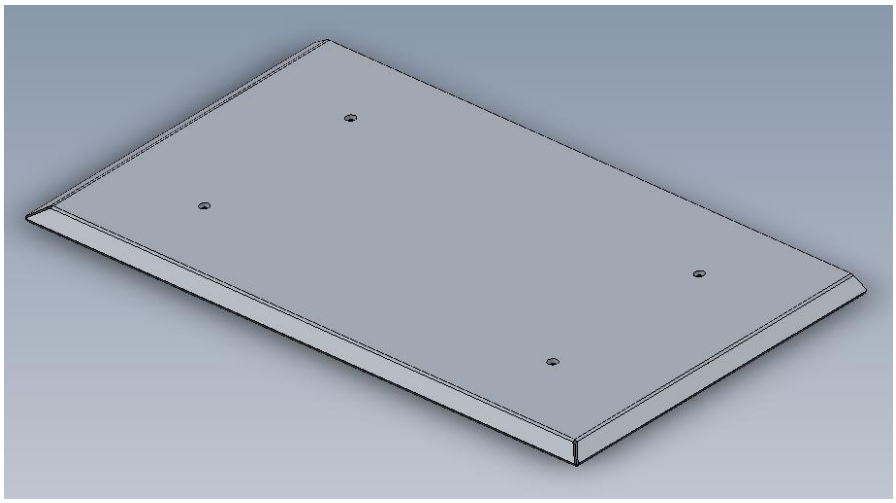


•Center console with map/notebook holders, cup holders, storage compartments, and a velco strap (Option: 11031680)

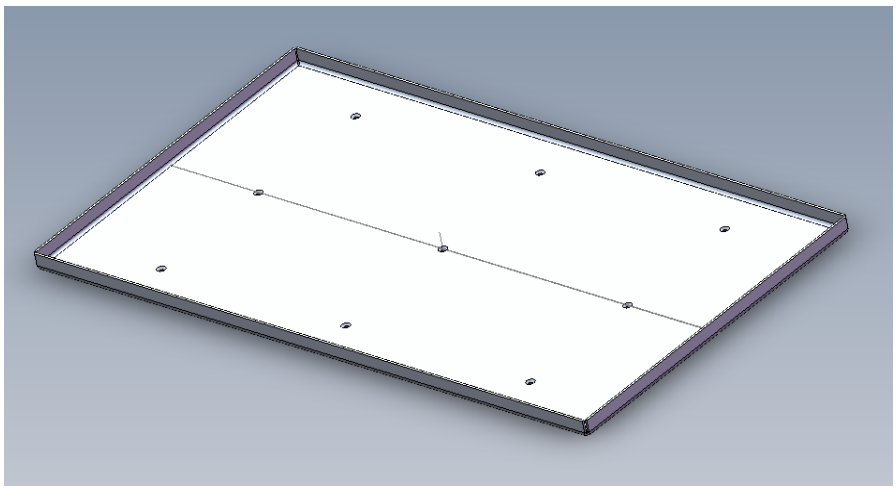


Cab – Optional tool boards, center hood, between Driver and Officer

•Center tool board (Option: 11031681)

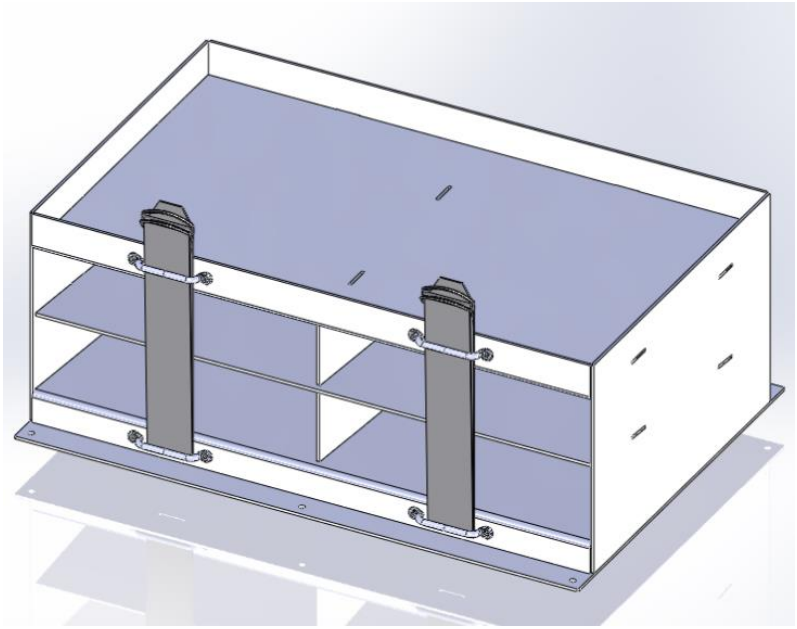


•Center tool board w/1” lip (Option: 11031682)

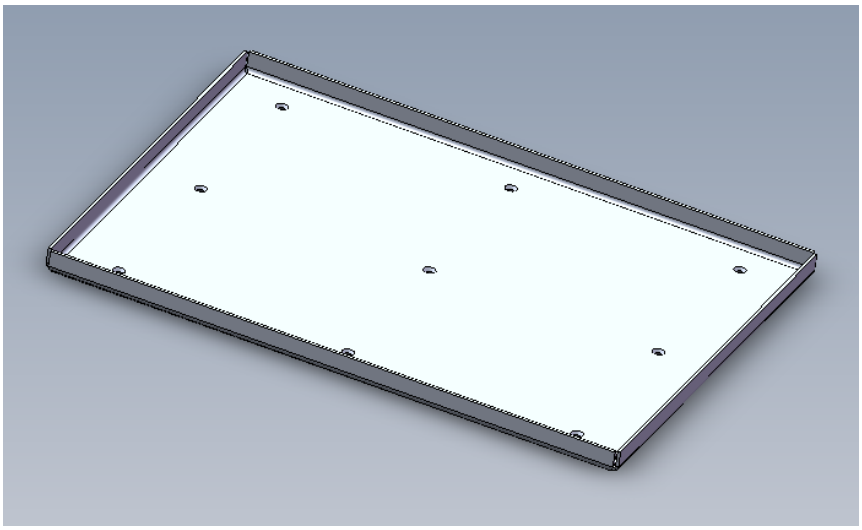


Cab – Optional map box/tool board on top of heat/AC unit.

•Map Box, top of heat/AC (Option: 11031685)



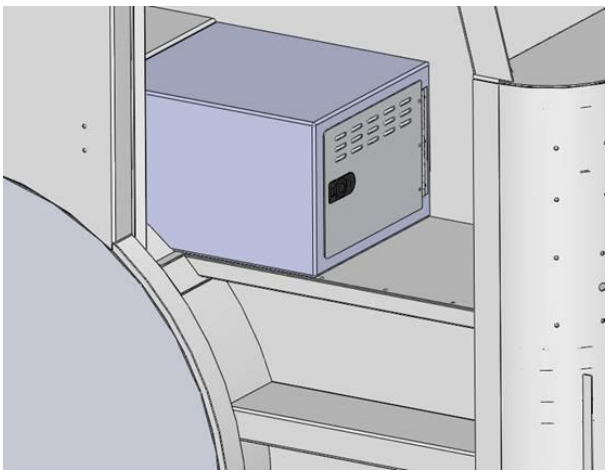
•Tool tray w/1” lip, top of heat/AC (Option: 11031686)



Cab – Standard Compartmentation

Officer's seat riser (non-air ride seat) is capable of housing radios, power/ground studs, or other customer specified equipment.

- Compartment approximately 14"High (in front) x 13"Deep (bottom)/22"Deep (top) x 19"Wide. Opening: 10 ½"High x 15 ½"Wide.



- Optional vented, hinged door with non-locking/locking latch (option: 39710030/39710031)

Crew Cab – Standard Compartmentation

Compartment under rear facing seat, behind Driver, capable of holding Iota/Kussmaul Battery Chargers w/removable vented plate.

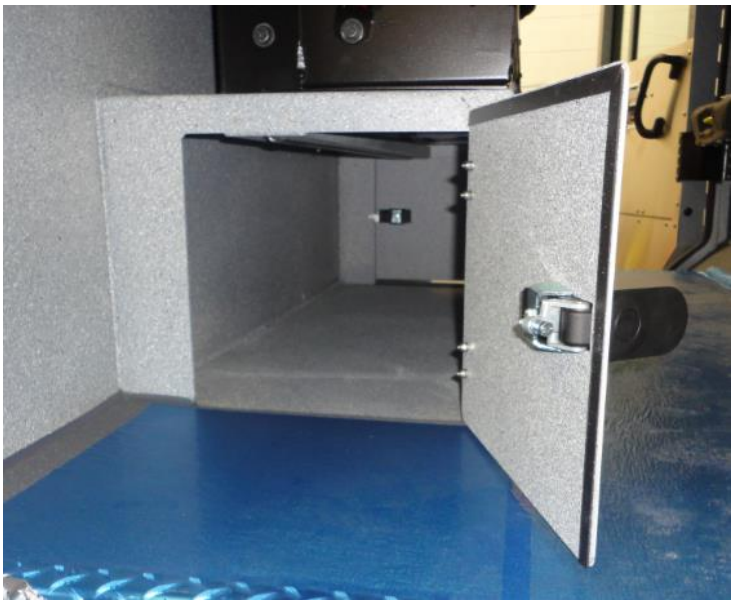
- Compartment approximately 11”High (7”High over center wheel well) x 27 ½”Wide x 27”Deep.

Compartment under rear facing seat, behind Officer, capable of holding Seat belt monitoring system/VDR/Cab accessory fuse panel w/removable vented plate.

- Compartment approximately 11”High (7”High over center wheel well) x 26”Wide x 25”Deep.

Crew Cab – Standard Compartmentation

Crew seat riser w/hinged doors.

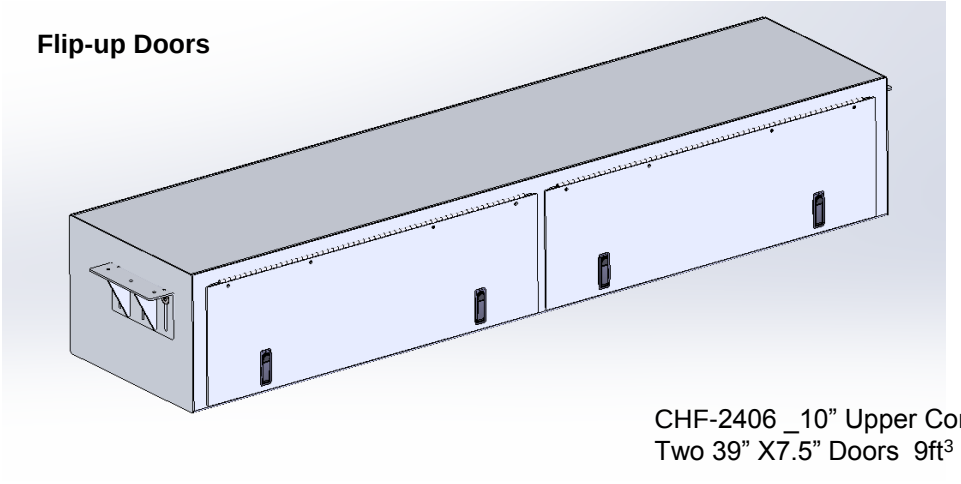


Compartment approximately 14”High x 46 ½”Wide x 18”Deep. Opening: 12 ¾”High x 13 ¼”Wide.

- Optional locking doors for crew seat riser (option: 39710020)

Rear Facing Overhead Cabinets – Center of Cab (CPE-0033)

Flip-up Doors

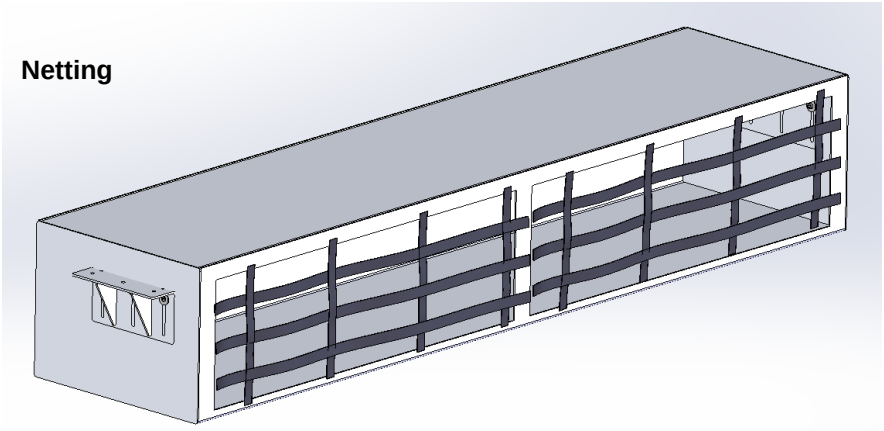


CHF-2406 _10” Upper Compartment (11031745)
Two 39” X7.5” Doors 9ft^3 84”Wx9.5”Hx20”D

CHF-2407_15” Upper Compartment (11031755)
Two 39”x12.5” Doors 14ft^3 84”Wx14.5”Hx20”D

CHF-2408_20” Upper Compartment (11031765)
Two 39”x17.5” Doors 19ft^3 84”Wx19.5”Hx20”D

Netting



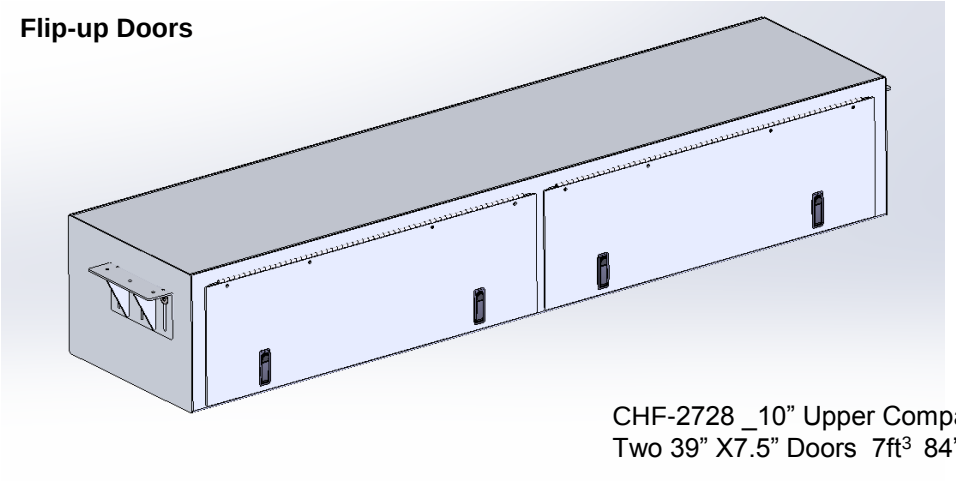
CHF-2406-101_10” Upper Compartment (11031740)
Two 39” X7.5” Doors 9ft^3 84”Wx9.5”Hx20”D

CHF-2407-101_15” Upper Compartment (11031750)
Two 39”x12.5” Doors 14ft^3 84”Wx14.5”Hx20”D

CHF-2408-101_20” Upper Compartment (11031760)
Two 39”x17.5” Doors 19ft^3 84”Wx19.5”Hx20”D

Forward Facing Overhead Cabinets – Rear of Cab (CPE-0034)

Flip-up Doors

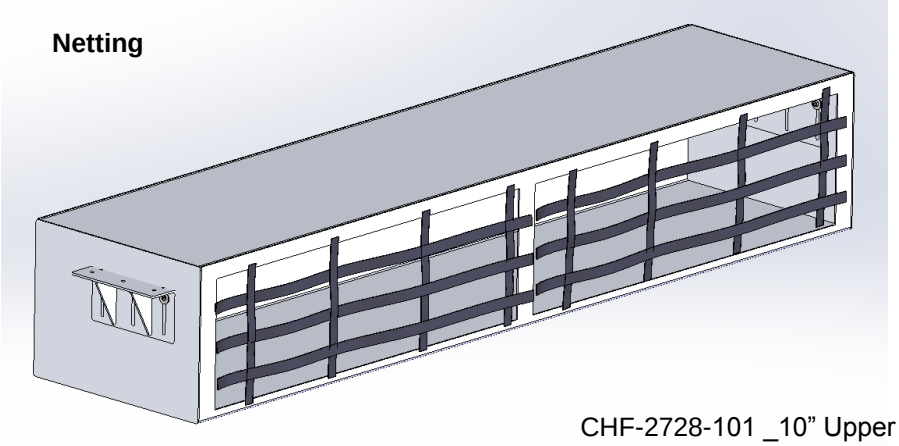


CHF-2728 _10” Upper Compartment (11031746)
Two 39” X7.5” Doors 7ft^3 84”Wx9.5”Hx16”D

CHF-2729_15” Upper Compartment (11031756)
Two 39”x12.5” Doors 11ft^3 84”Wx14.5”Hx16”D

CHF-2730_20” Upper Compartment (11031766)
Two 39”x17.5” Doors 15ft^3 84”Wx19.5”Hx16”D

Netting

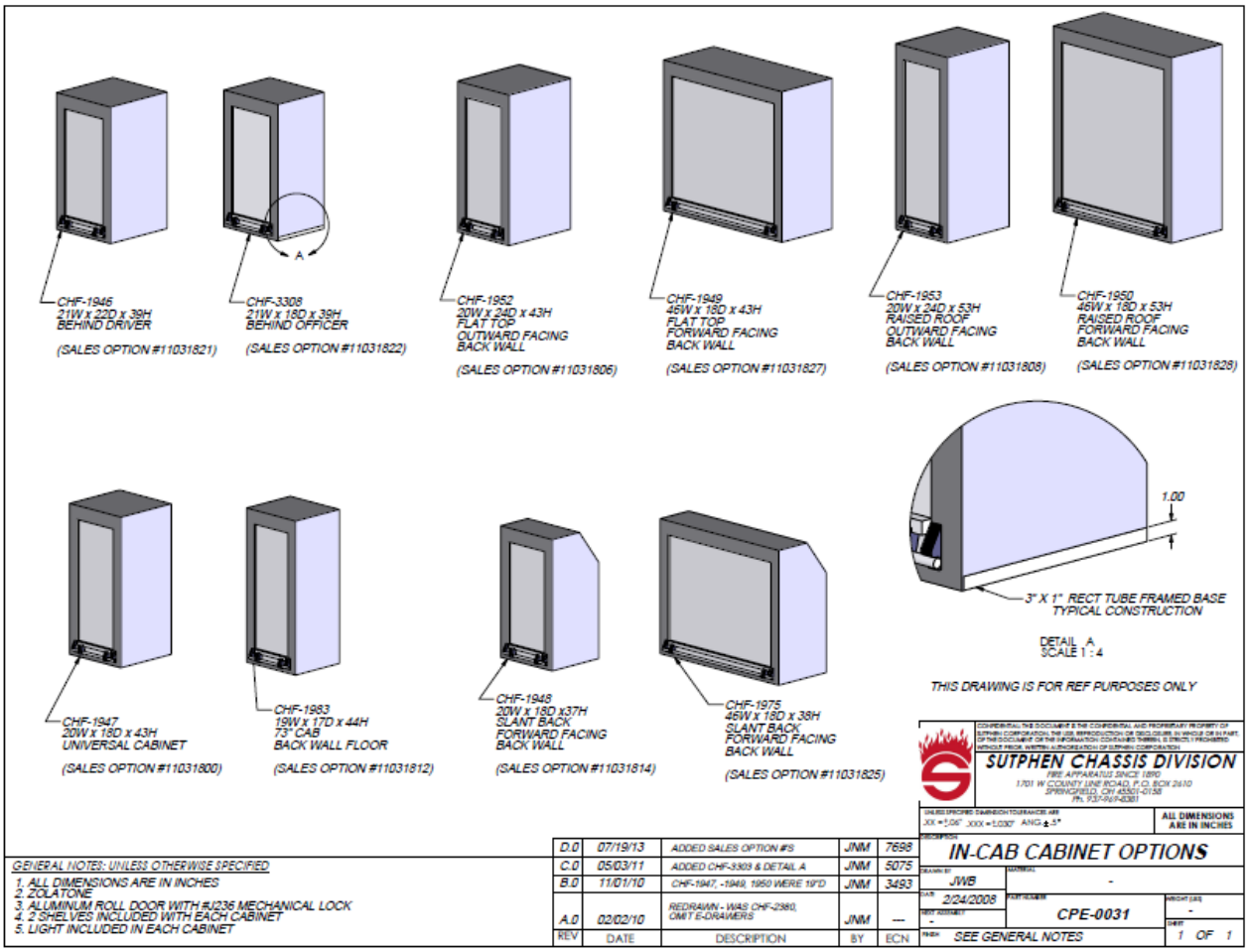


CHF-2728-101 _10” Upper Compartment (11031747)
Two 39” X7.5” Doors 7ft^3 84”Wx9.5”Hx16”D

CHF-2729-101_15” Upper Compartment (11031757)
Two 39”x12.5” Doors 11ft^3 84”Wx14.5”Hx16”D

CHF-2730-101_20” Upper Compartment (11031767)
Two 39”x17.5” Doors 15ft^3 84”Wx19.5”Hx16”D

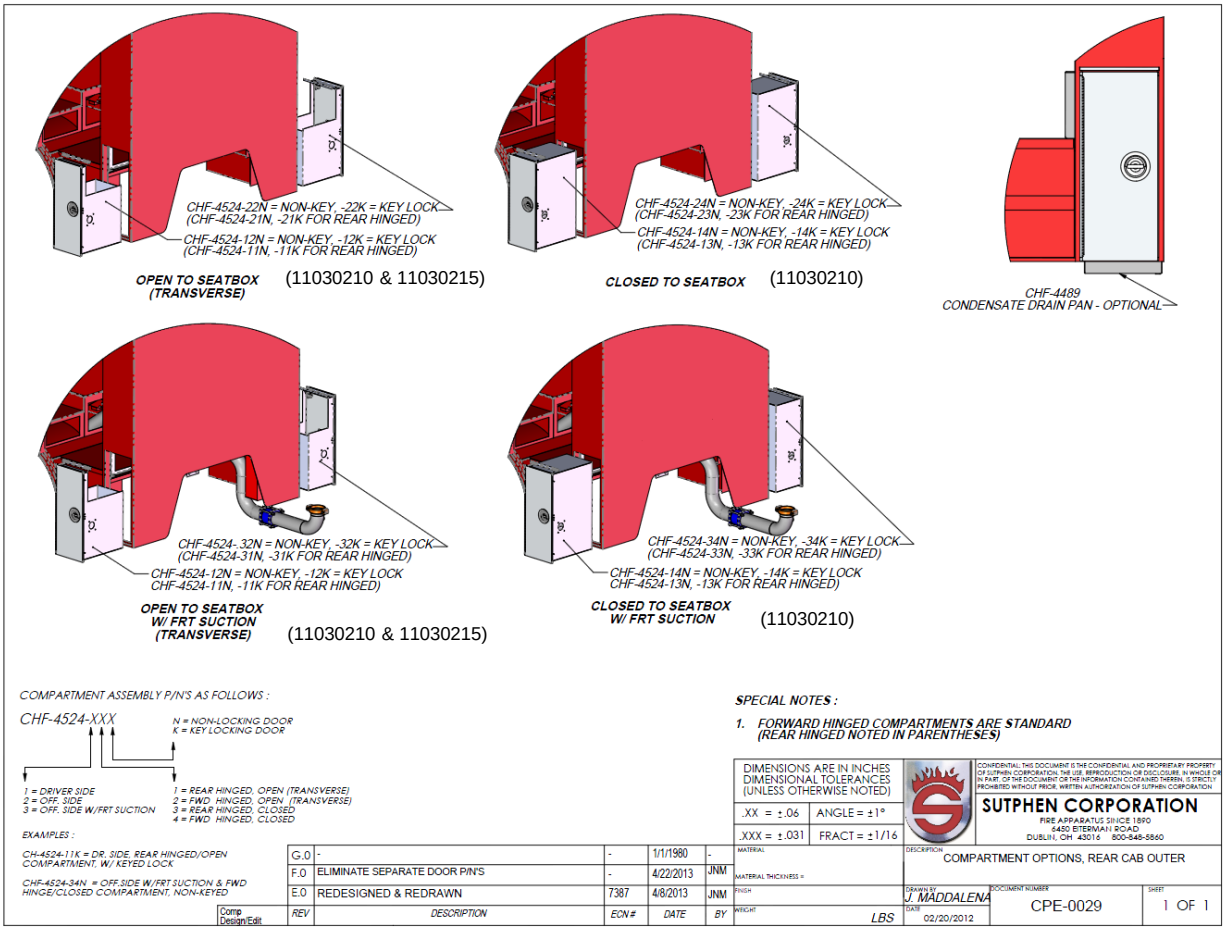
EMS Cabinets (CPE-0031)



73” Cab Lower Rear Compartments (CPE-0029)

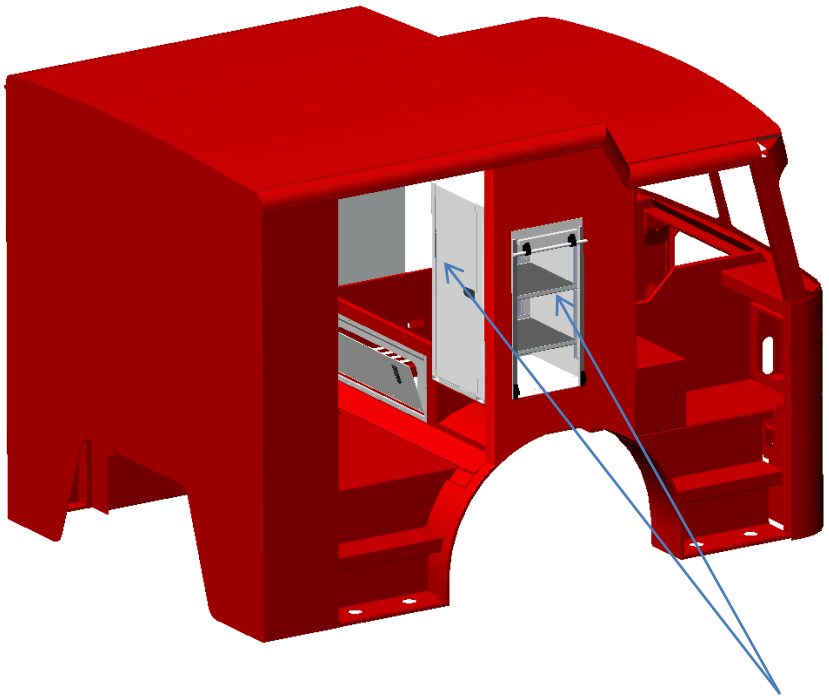
Driver’s side compartment: 37” H x 13” W x 24” D.

Officer’s side compartment: 37” H x 13” W x 22” D (12” Deep if truck has front suction)



Optional Thru Cab EMS Compartments (CHF-2490)

•Rollup or Slam Door configurations are available
•Accessible from inside and out



Options:
11031835
11031836
11031837

Cabinet Size - 42”Hx23”Dx24”W

Side Opening - 30”Hx15”W

2 shelves and lighting Included

Roll-up outer / Hinged inner

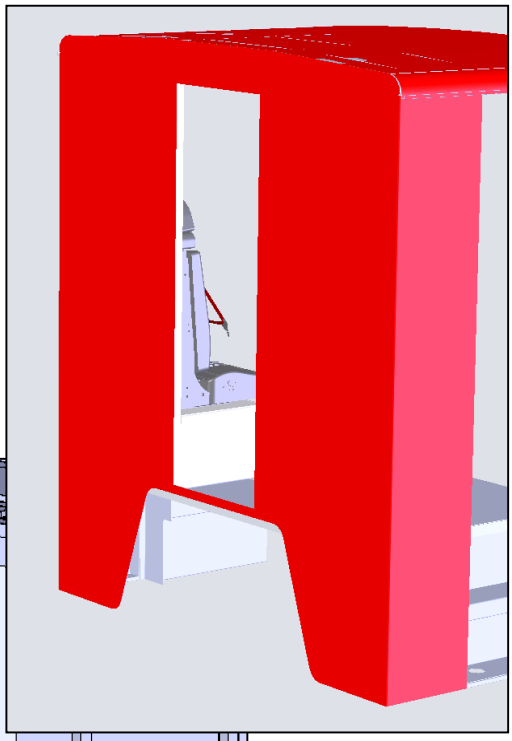
Nylon pull-cord for exterior roll-up door

Locking Options

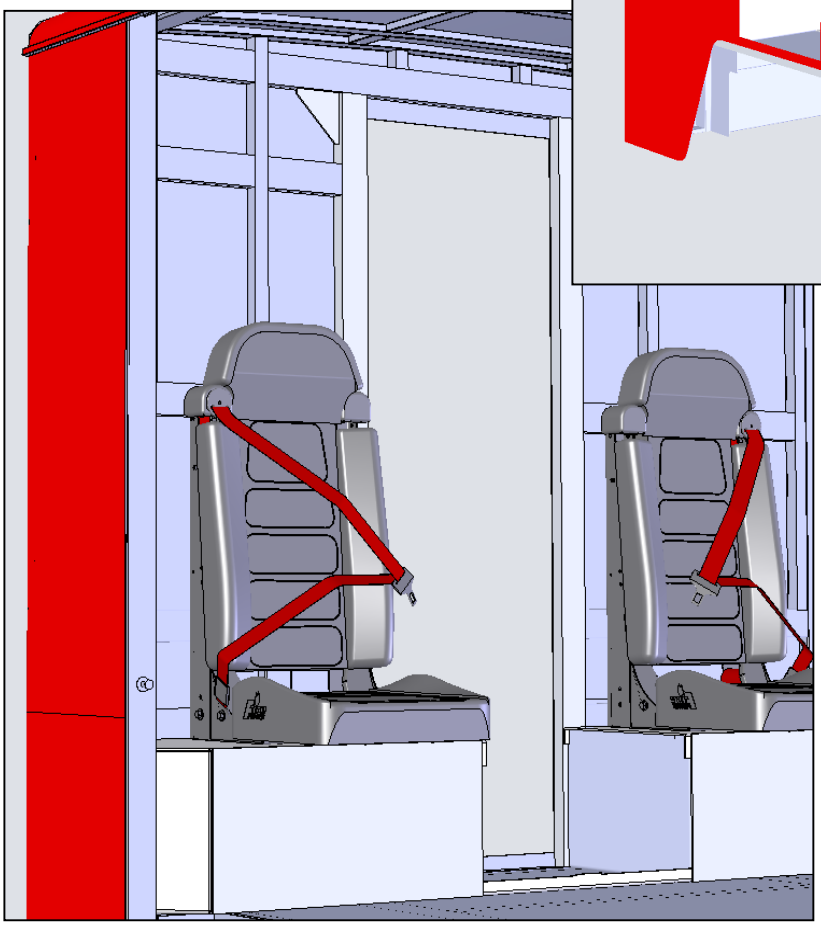
Cab Options

At Sutphen, we build our own cabs to order - and this gives us the freedom and expertise to supply unique cab configurations.

Example : we recently delivered to SVI special heavy rescue chassis with walk thru doors in the back of the cab. Cab mods were designed and executed by Sutphen in-house. Complete accountability and control of the design and construction of the cab allow us to provide more options and therefore, solutions.



Walk thru door:

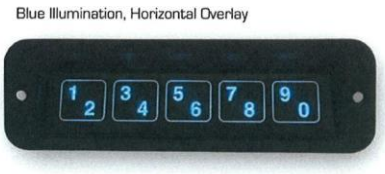


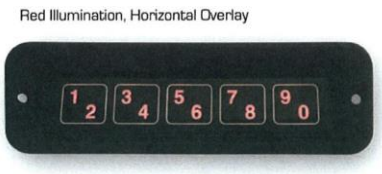
Option: 11030250

Cab Options

•Door Features

-Optional Power door locks for cab and body – security with pushbutton access





Options: 11031375 and 11031380

•Optional LifeGuard Technologies RollTek Safety Restraint System (Option: 39830100)

-System includes pre-tensioners and side air curtains

LIFEGUARD SRS EQUIPPED

Camera Screen Mounting

Safety Vision and Voyager screens are available.

Both are mounted using an adjustable mounting fixture.

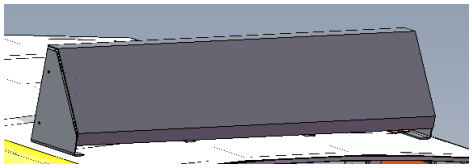
Standard Mounting configurations include:

On Dash

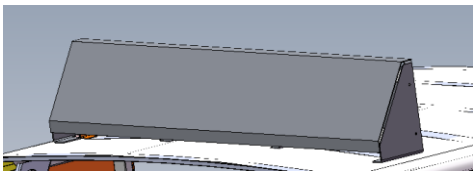
From Overhead

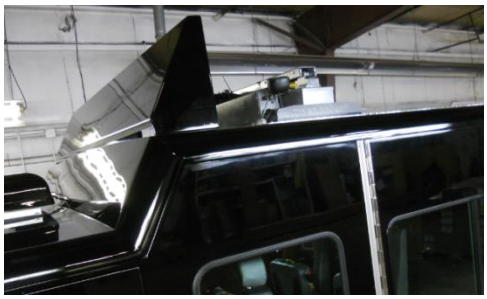
Optional Brush Guards for Light Towers and RV A/C Units

•DEFLECTOR, TREADPLATE, FORWARD OF LIGHT TOWER OR RV A/C (88380990)

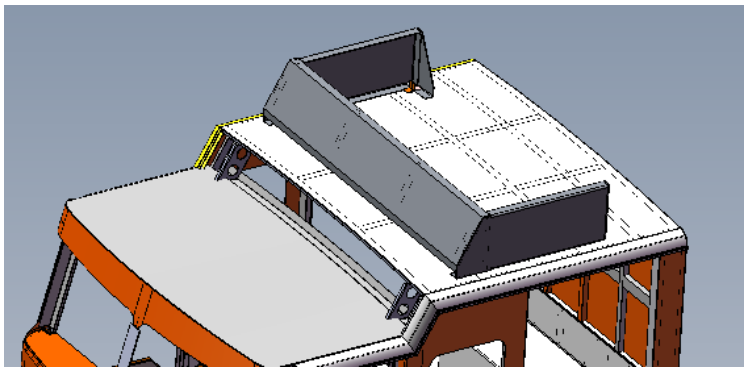


•DEFLECTOR, PAINTED, FORWARD OF LIGHT TOWER OR RV A/C (88380991)





•DEFLECTOR, PAINTED, FORWARD AND SIDES OF LIGHT TOWER OR RV A/C (88380995)



BUMPER SALES TERMINOLOGY:

The following information is intended to assist the Sales Team in clarifying the Customers bumper specifications and conveying that information to Manufacturing on the Component Listing in a concise way to gives the customer the Sutphen signature bumper tailored to their needs.

Standardization of Bumper Terminology:

To eliminate confusion in defining bumper specifications, it is important to use standardized terminology.

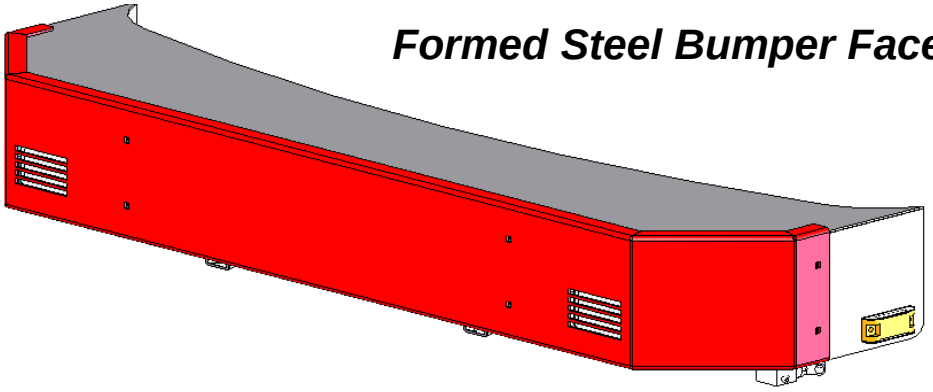
Standard:

•Reference CHF-2450* for details

Standard Bumper Types:

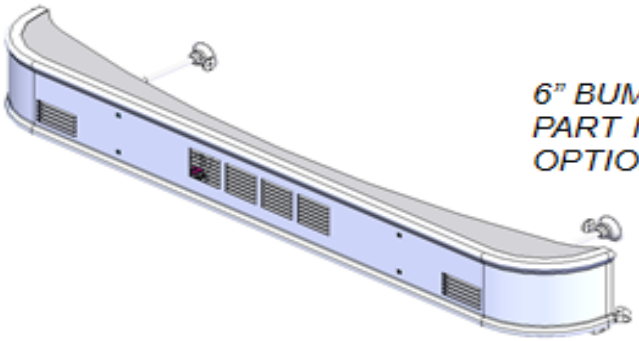
Stainless Steel Bumper Face

Formed Steel Bumper Face

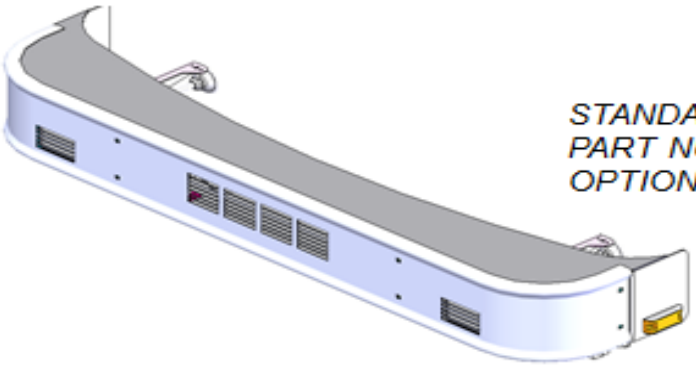


Stainless Steel Bumper Sizes:

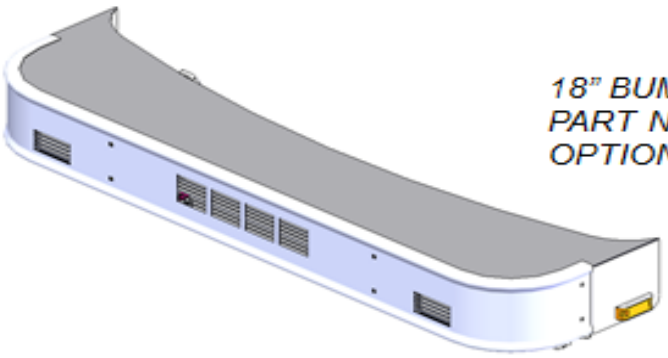
•Bumpers less than 24” depth always get air horns out



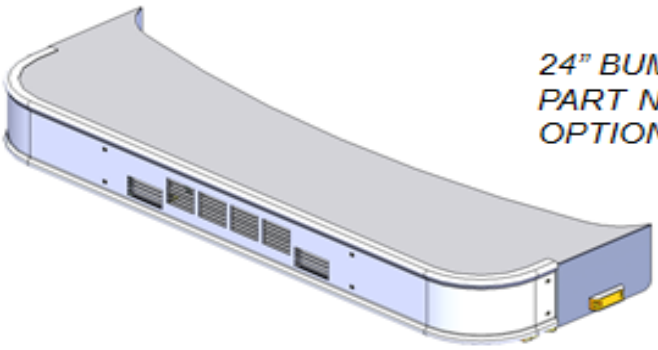
6” BUMPER
PART NUMBER: CHF-2068
OPTION NUMBER: 20010070



STANDARD 12” BUMPER
PART NUMBER: CHF-1801
OPTION NUMBER: 20010075



18” BUMPER
PART NUMBER: CHF-2188
OPTION NUMBER: 20010080



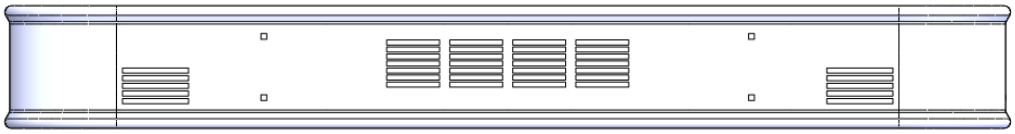
24” BUMPER
PART NUMBER: CHF-2209
OPTION NUMBER: 20010085

Stainless Steel Bumper Skin Options (Cummins ISL):

•Bumpers less than 24” depth always get air horns out

6”- 18” BUMPERS

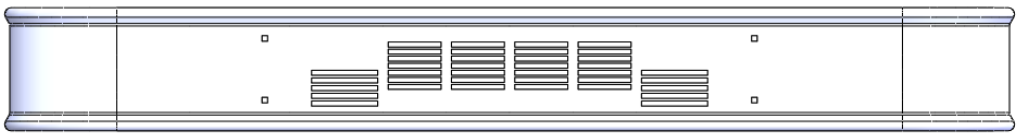
PART NUMBER: CHF-1504



PART NUMBER: CHF-1507

24”- 30” BUMPERS

PART NUMBER: CHF-1503



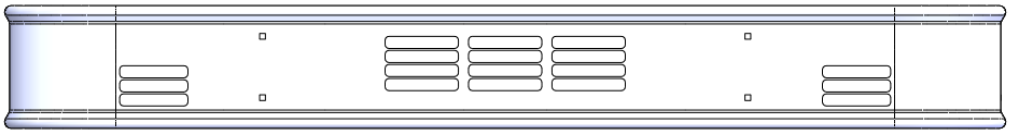
PART NUMBER: CHF-1506

Stainless Steel Bumper Skin Options (Cummins ISX):

•Bumpers less than 24” depth always get air horns out

6”- 18” BUMPERS

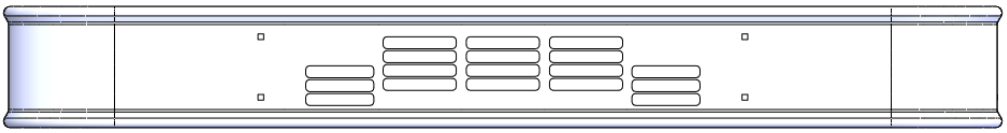
PART NUMBER: CHF-3056



PART NUMBER: CHF-3689

24”- 30” BUMPERS

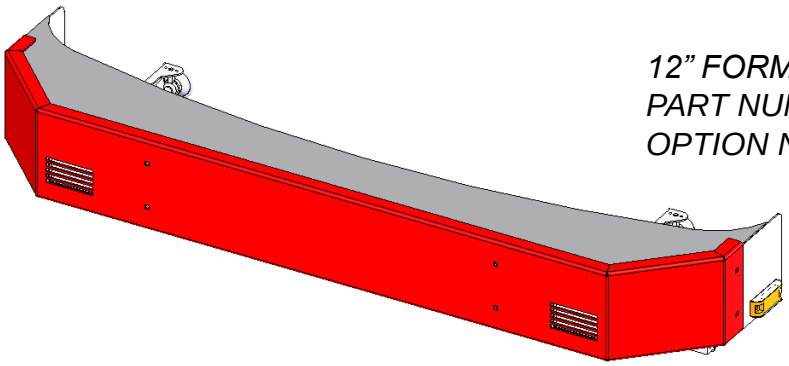
PART NUMBER: CHF-3687



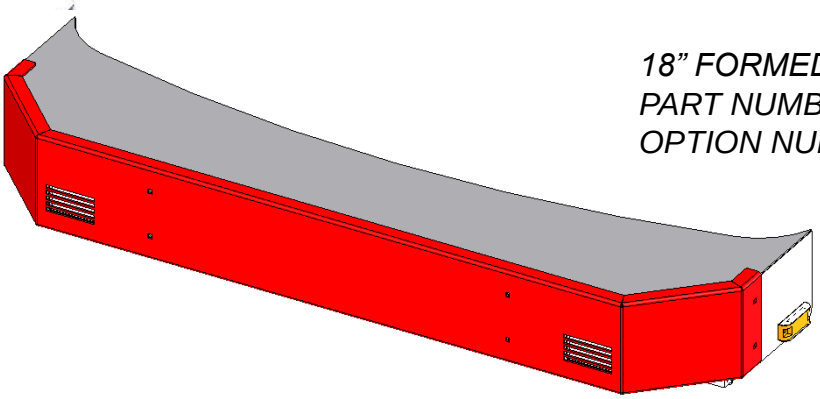
PART NUMBER: CHF-3688

Formed Steel Bumper Sizes:

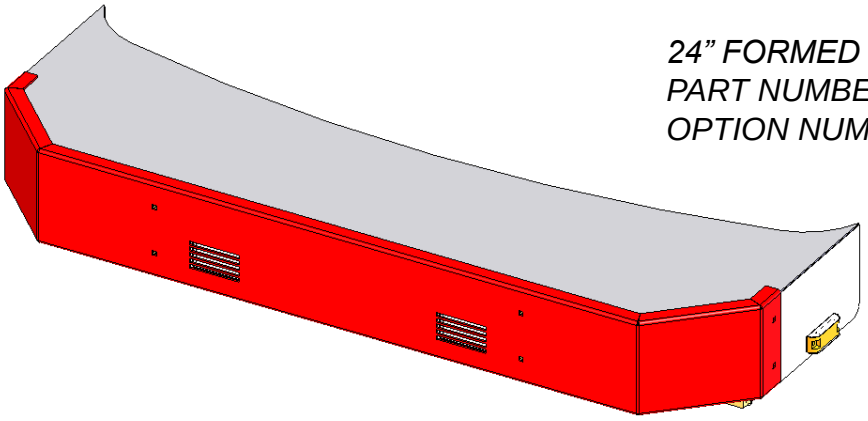
•Bumpers less than 24” depth always get air horns out



12” FORMED STEEL BUMPER
PART NUMBER: CHF-2462
OPTION NUMBER: 20012200



18” FORMED STEEL BUMPER
PART NUMBER: CHF-2465
OPTION NUMBER: 20012210

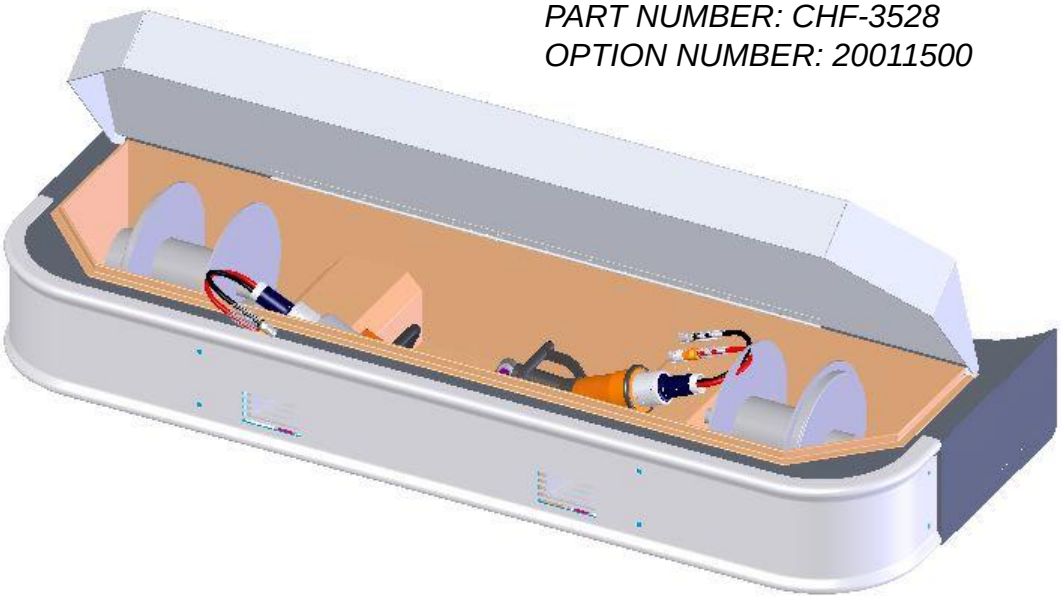


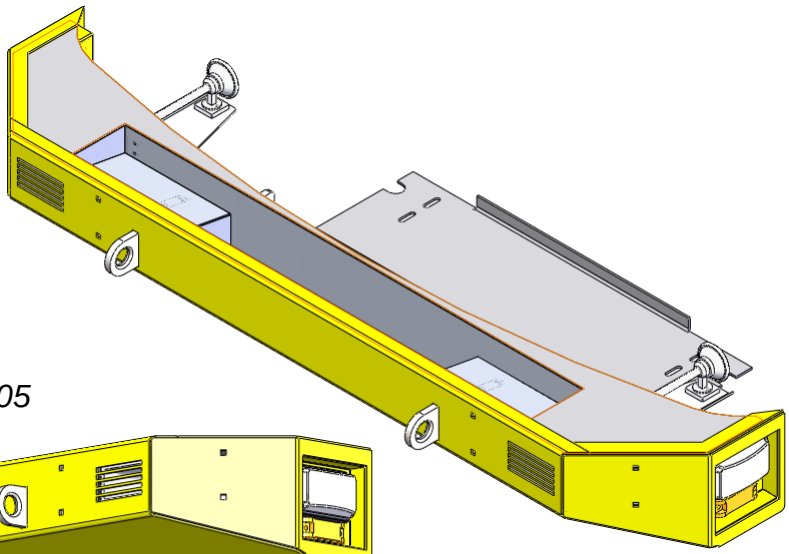
24” FORMED STEEL BUMPER
PART NUMBER: CHF-2463
OPTION NUMBER: 20012220

Custom Bumper Types:

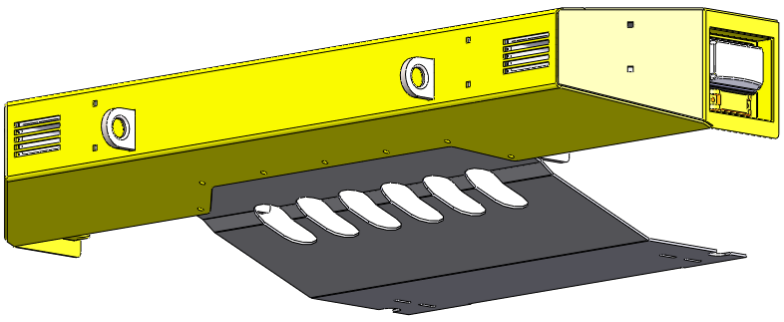
•Reference CHF-2450* for details

30” STAINLESS STEEL BUMPER
“RESCUE BUMPER”
PART NUMBER: CHF-3528
OPTION NUMBER: 20011500





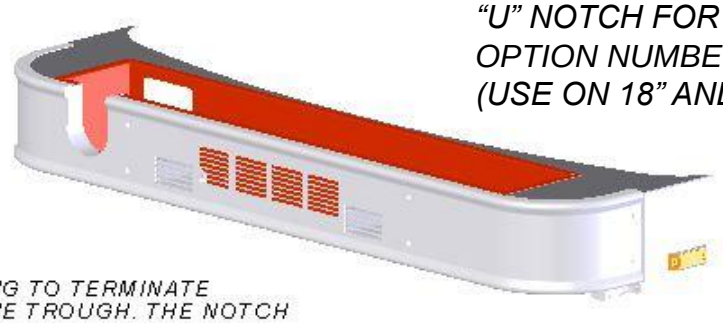
12” “URBAN INTERFACE BUMPER”
PART NUMBER: CHF-4214
OPTION NUMBER: 20090005



Front Suction Options:

•Reference CHF-2450* for details

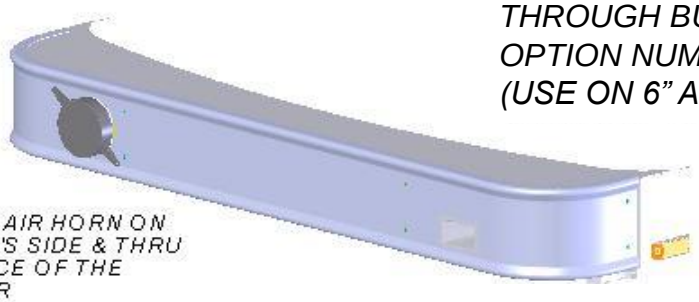
"U" NOTCH FOR FRONT SUCTION
OPTION NUMBER: 20030000
(USE ON 18" AND 24" ONLY)



PIPING TO TERMINATE IN THE TROUGH. THE NOTCH IS FOR THE SUCTION HOSE.

5" FRONT SUCTION SWIVEL
TROUGH PART NUMBER: CHF-2941
OPTION NUMBER: 65530300
(USE ON 24" BUMPER ONLY)

HOLE FOR FRONT SUCTION
THROUGH BUMPER
OPTION NUMBER: - 20030010
(USE ON 6" AND 12" BUMPER ONLY)



SINGLE AIR HORN ON DRIVER'S SIDE & THRU THE FACE OF THE BUMPER

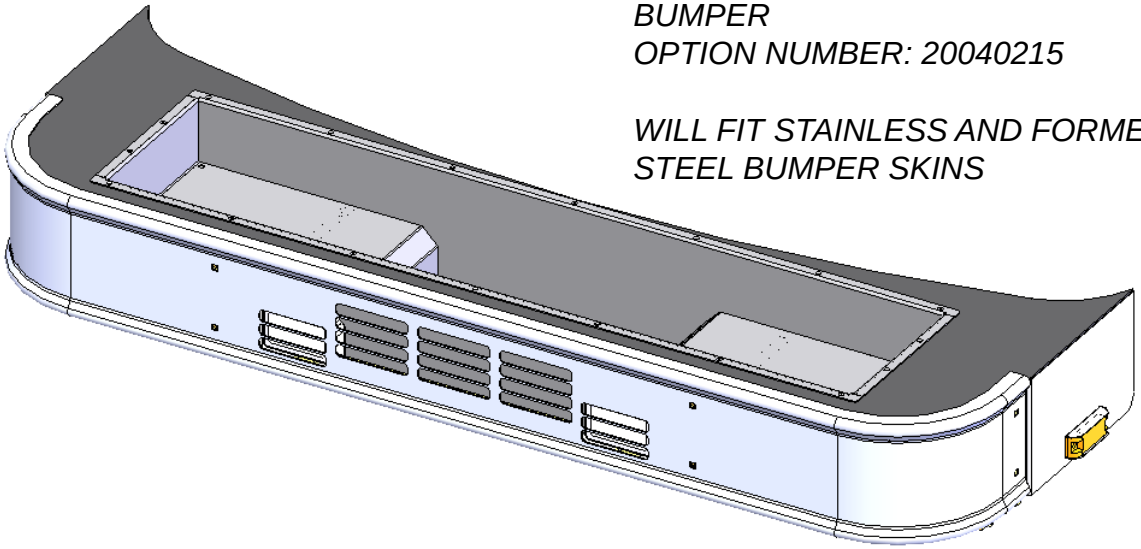
HOLE FOR FRONT SUCTION
THROUGH BUMPER
OPTION NUMBER: - 20030010
(USE ON 18" AND 24" BUMPER ONLY)

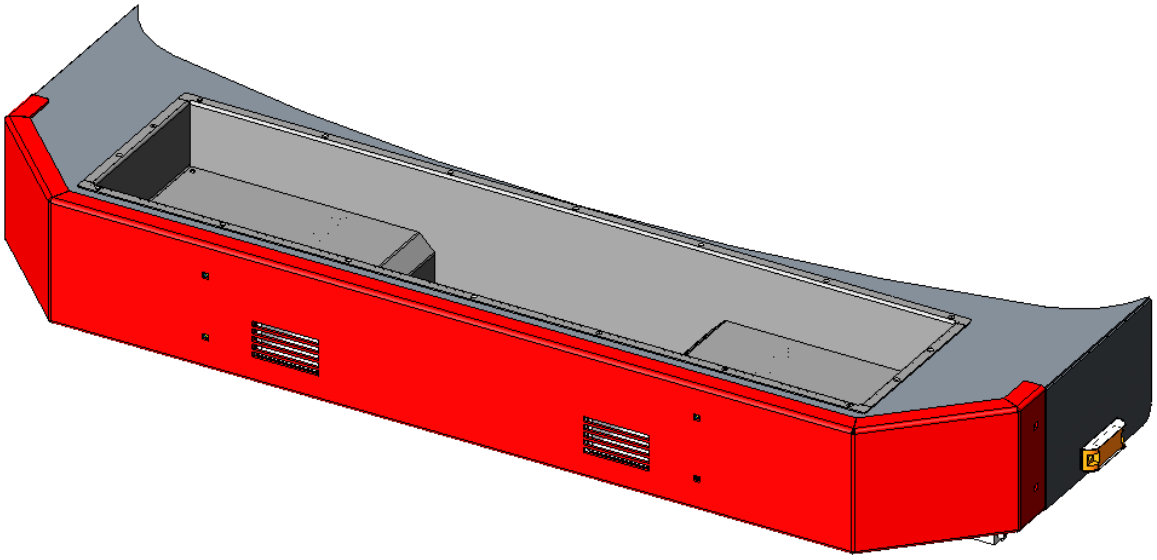
24” Trough Types:

•Reference CHF-2450* for details

STORAGE WELL, FULL WIDTH, 24” BUMPER
OPTION NUMBER: 20040215

WILL FIT STAINLESS AND FORMED STEEL BUMPER SKINS



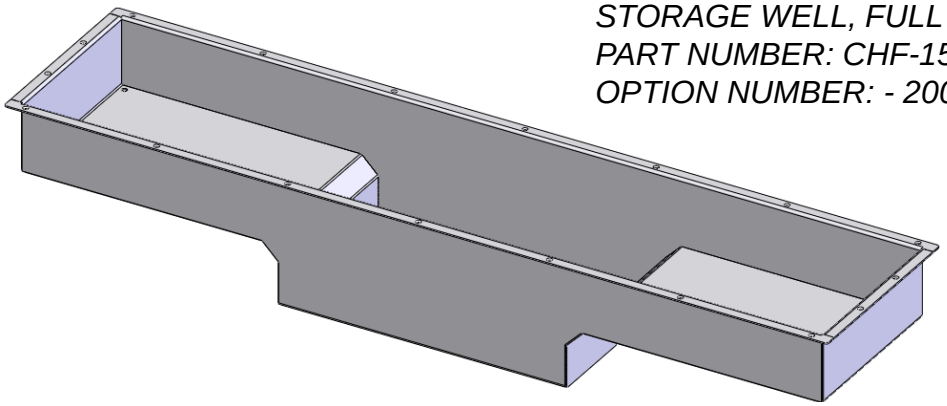


STORAGE WELL, FULL WIDTH, 24” BUMPER
WIDE CENTER SECTION, CHF-1529 SHOWN

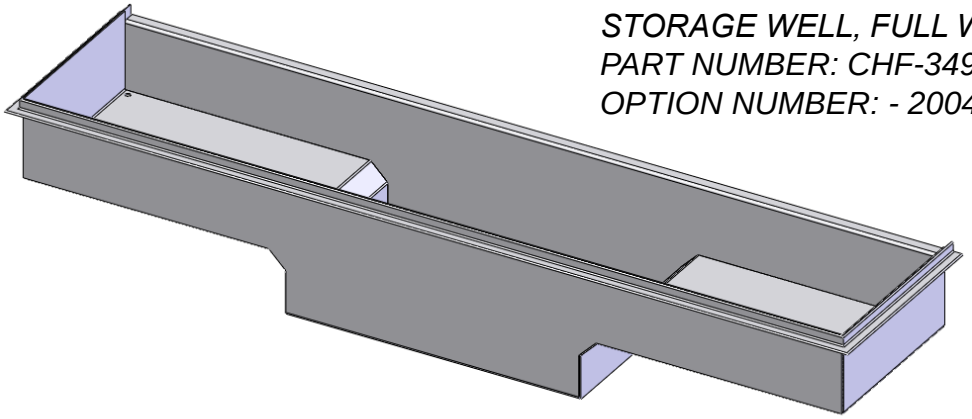
24” Trough Types Cont.:

•Reference CHF-2450* for details

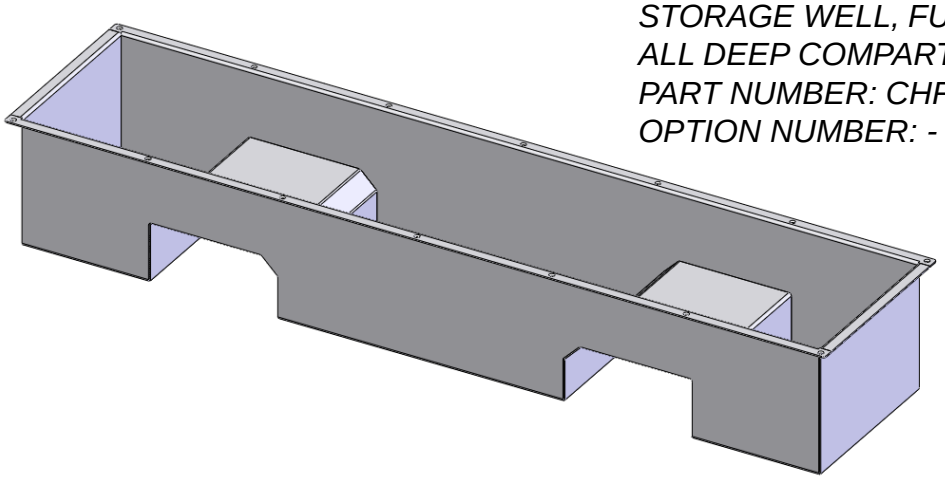
STORAGE WELL, FULL WIDTH
PART NUMBER: CHF-1529
OPTION NUMBER: - 20040215



STORAGE WELL, FULL WIDTH, W/ 1” LIP
PART NUMBER: CHF-3498
OPTION NUMBER: - 20040215 & 20040300



STORAGE WELL, FULL WIDTH
ALL DEEP COMPARTMENTS
PART NUMBER: CHF-2202
OPTION NUMBER: - 20040220

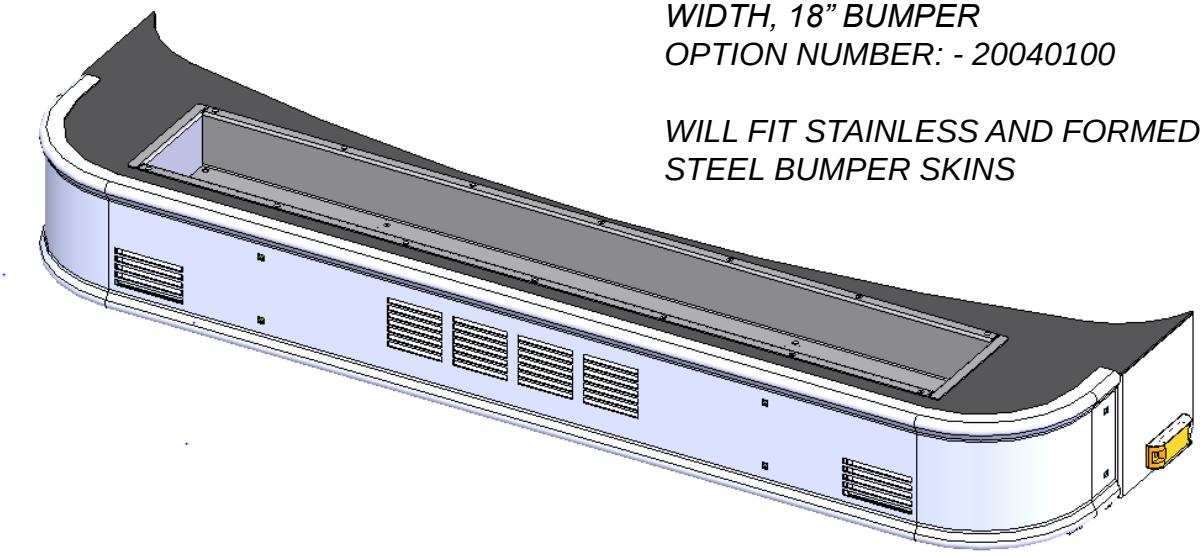


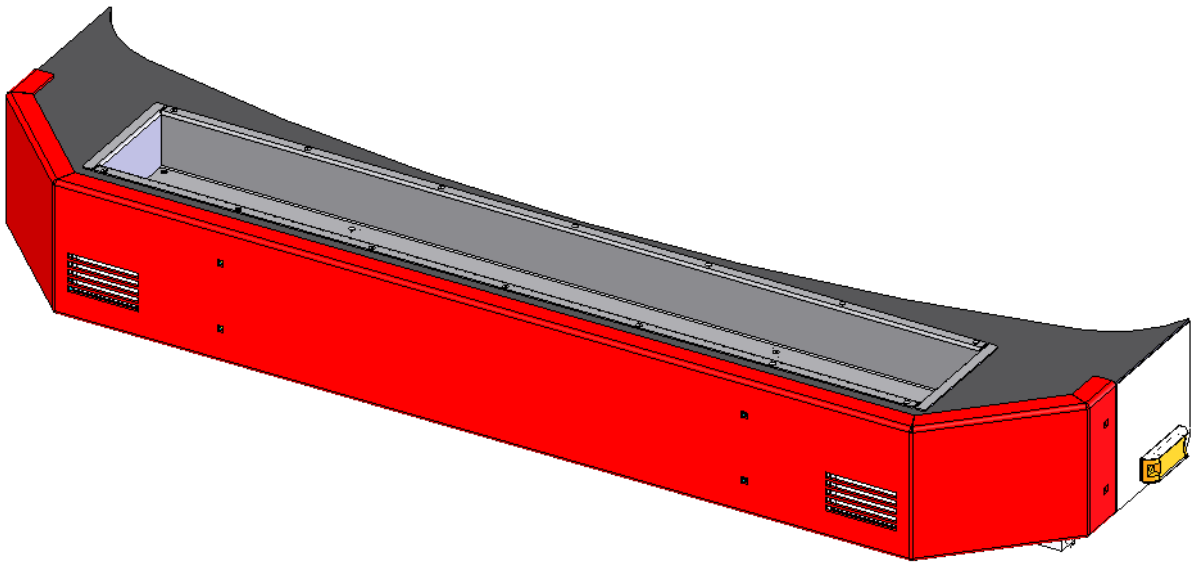
18” Trough Types:

•Reference CHF-2450* for details

STORAGE WELL, SHALLOW FULL WIDTH, 18” BUMPER
OPTION NUMBER: - 20040100

WILL FIT STAINLESS AND FORMED STEEL BUMPER SKINS

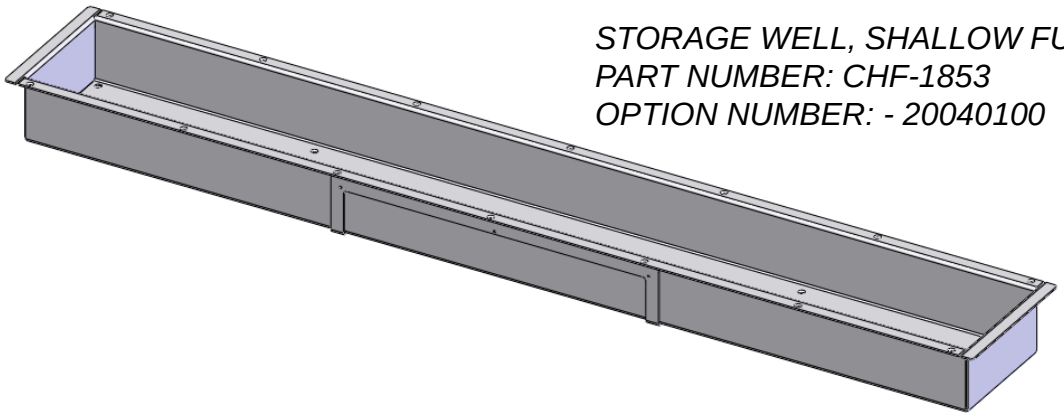




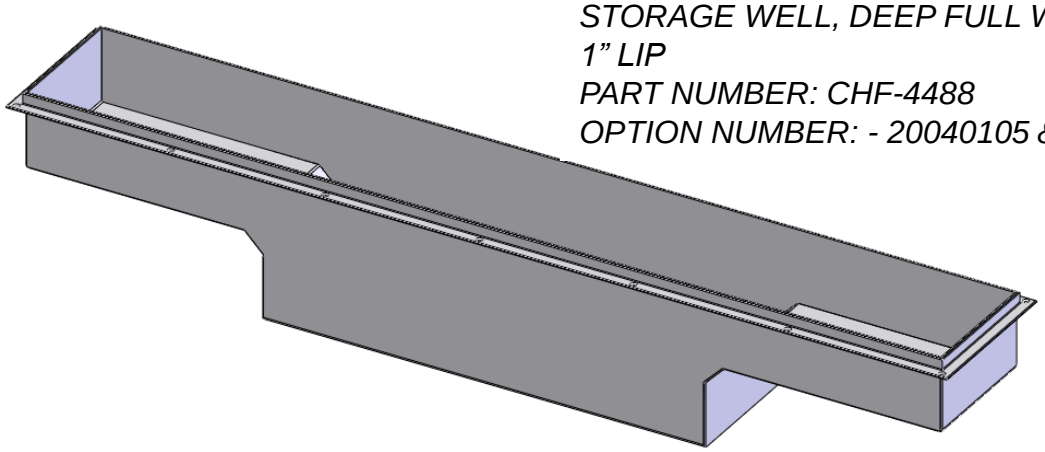
STORAGE WELL, SHALLOW FULL WIDTH, 18” BUMPER
CHF-1853 SHOWN

18” Trough Types Cont.:

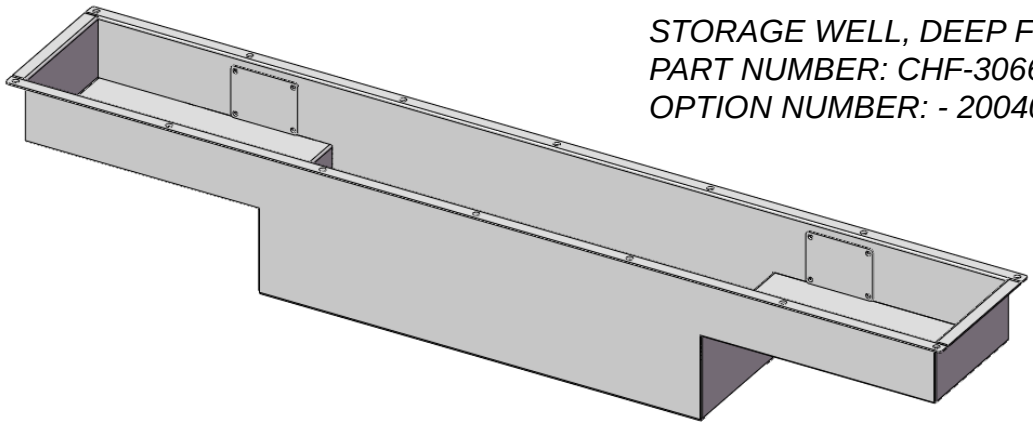
•Reference CHF-2450* for details



STORAGE WELL, SHALLOW FULL WIDTH
PART NUMBER: CHF-1853
OPTION NUMBER: - 20040100



STORAGE WELL, DEEP FULL WIDTH, W/ 1” LIP
PART NUMBER: CHF-4488
OPTION NUMBER: - 20040105 & 20040300

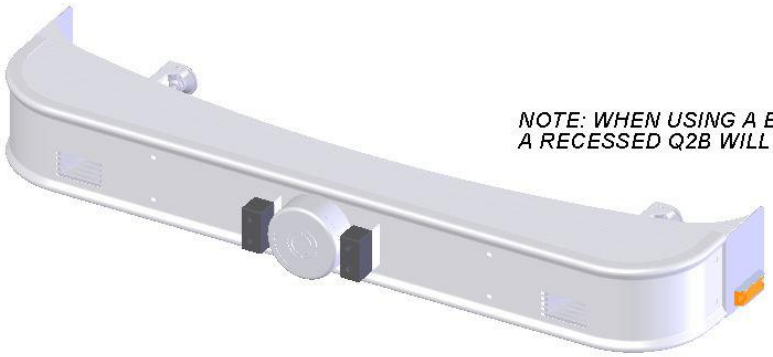


STORAGE WELL, DEEP FULL WIDTH
PART NUMBER: CHF-3066
OPTION NUMBER: - 20040105

Q2B Mounting Options:

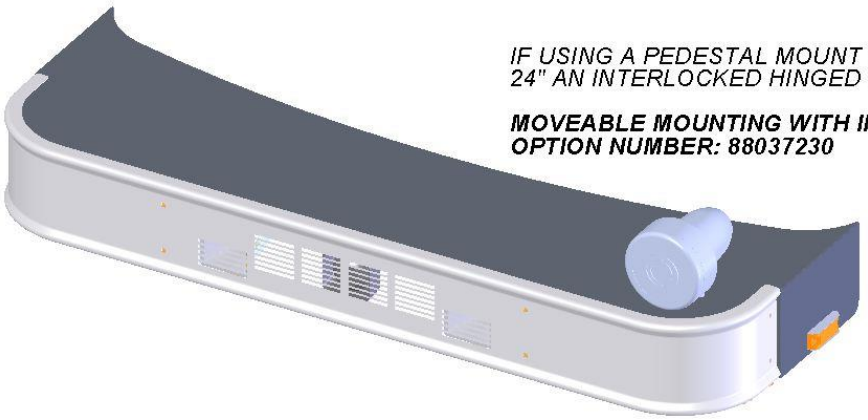
•Reference CHF-2450* for details

SIREN, FEDERAL Q2B, RECESSED IN BUMPER
OPTION NUMBER: - 12710300



NOTE: WHEN USING A BUMPER WITH A HOSE TROUGH, A RECESSED Q2B WILL REQUIRE TROUGH MODIFICATION

SIREN, FEDERAL Q2B, PEDESTAL MOUNT
OPTION NUMBER: - 12710200



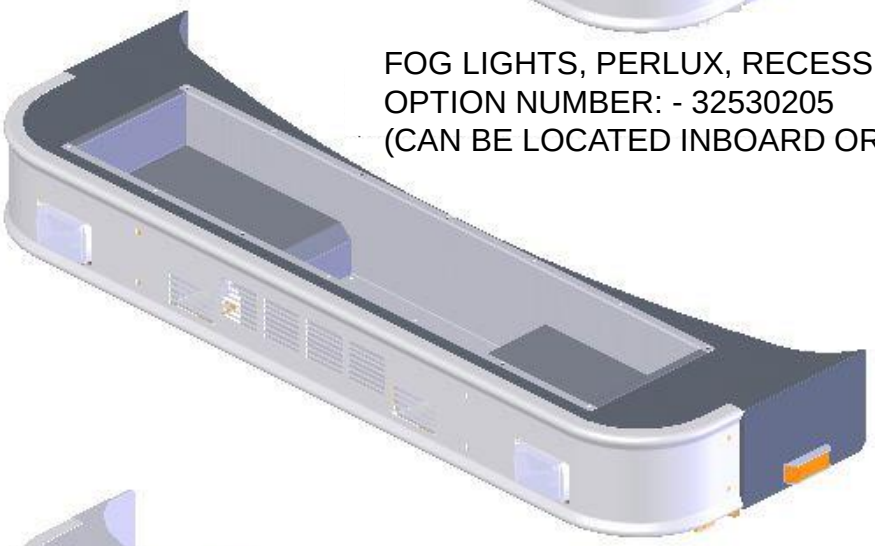
IF USING A PEDESTAL MOUNT Q2B ON A BUMPER LESS THAN 24" AN INTERLOCKED HINGED MOUNT MUST BE USED

MOVEABLE MOUNTING WITH INTERLOCK FOR Q2B OPTION NUMBER: 88037230

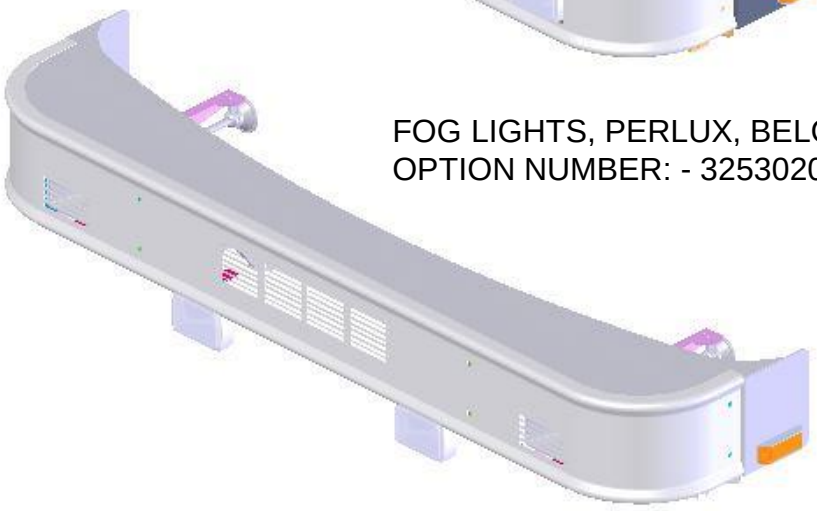
Fog Light Options:

•Reference CHF-2450* for details

FOG LIGHTS, HELLA, RECESSED IN BUMPER
OPTION NUMBER: - 32530210
(CAN BE LOCATED INBOARD OR OUTBOARD)



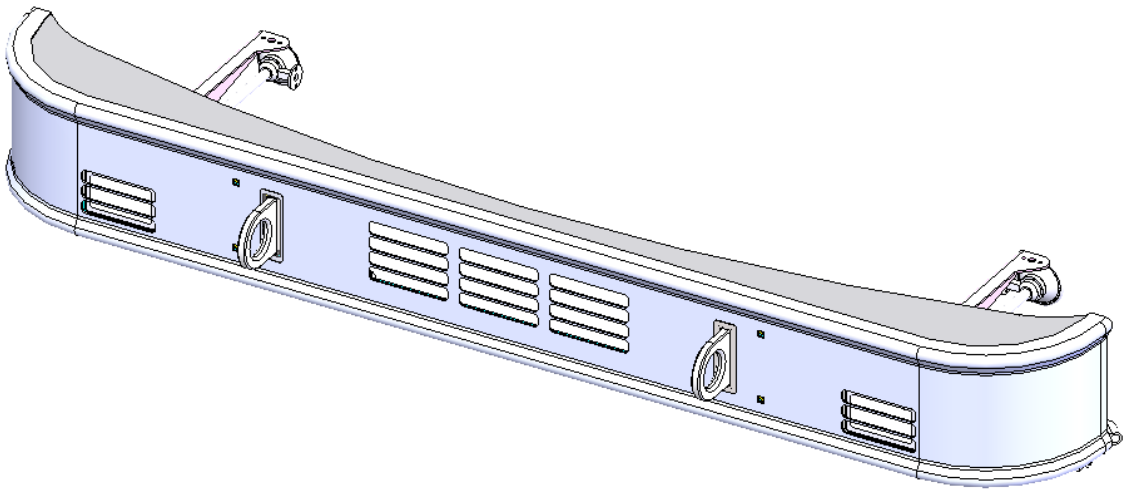
FOG LIGHTS, PERLUX, RECESSED IN BUMPER
OPTION NUMBER: - 32530205
(CAN BE LOCATED INBOARD OR OUTBOARD)



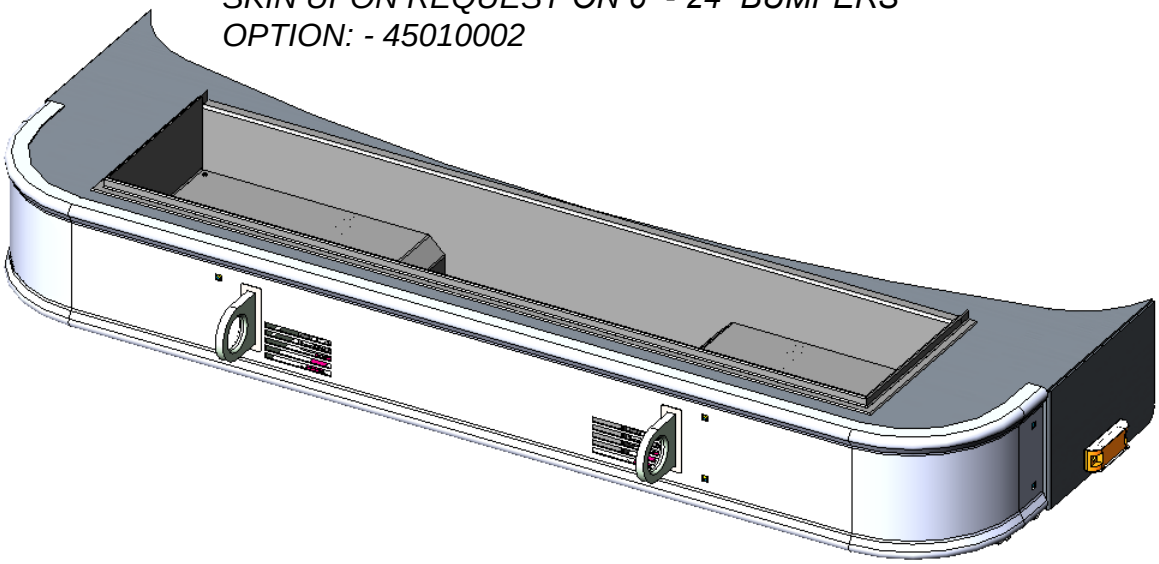
FOG LIGHTS, PERLUX, BELOW BUMPER
OPTION NUMBER: - 32530200

Tow Eye Options:

•Bumpers less than 24” depth always get air horns out



TOW EYES AVAILABLE THROUGH FRONT BUMPER SKIN UPON REQUEST ON 6” - 24” BUMPERS OPTION: - 45010002



Winch Mounting Options:

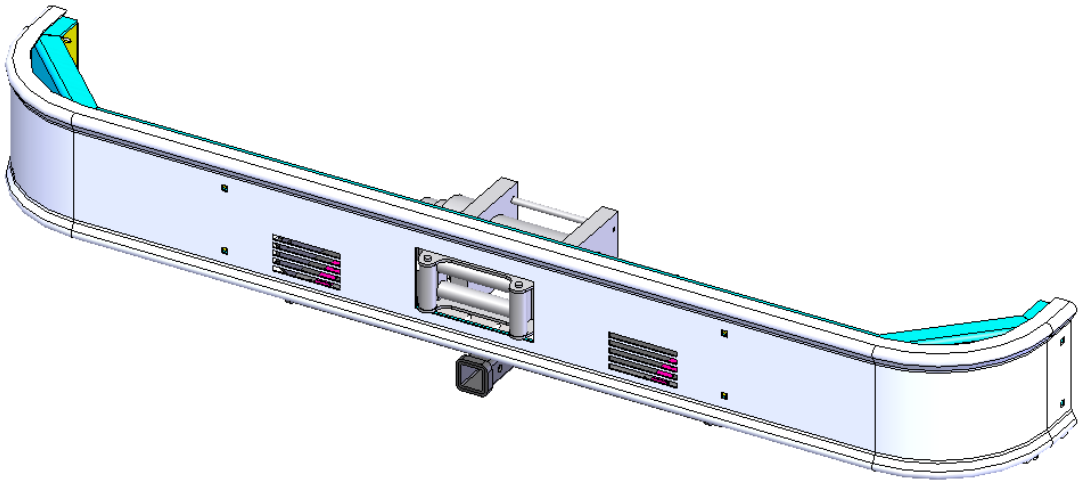
•Bumpers less than 24” depth always get air horns out

AVAILABLE ON 12”” – 30” BUMPERS

WINCH, BUMPER MOUNTED, WARN 12,000lb
OPTION NUMBER: 20050100

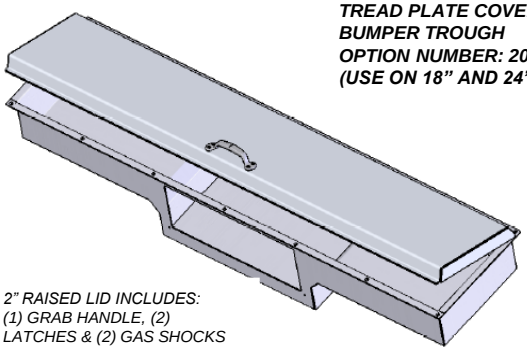
WINCH, BUMPER MOUNTED, RAMSEY 12,000lb
OPTION NUMBER: 20050110

WINCH RECEIVER, FRONT
OPTION NUMBER: 20050300



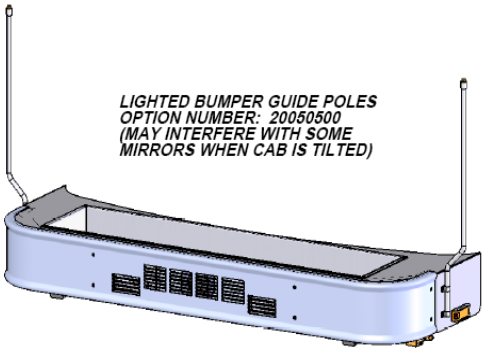
AVAILABLE OPTIONS

TREAD PLATE COVER FOR BUMPER TROUGH
OPTION NUMBER: 20030100
(USE ON 18" AND 24" ONLY)

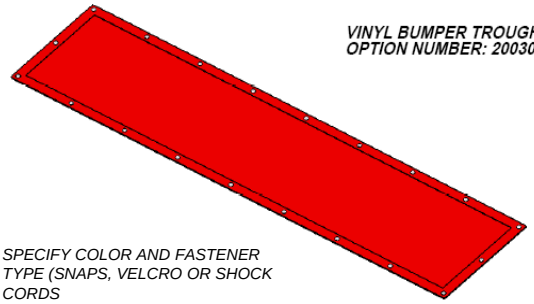


2" RAISED LID INCLUDES: (1) GRAB HANDLE, (2) LATCHES & (2) GAS SHOCKS

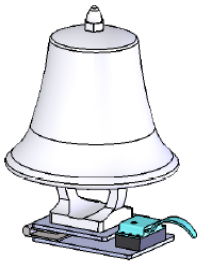
LIGHTED BUMPER GUIDE POLES
OPTION NUMBER: 20050500
(MAY INTERFERE WITH SOME MIRRORS WHEN CAB IS TILTED)



VINYL BUMPER TROUGH COVER
OPTION NUMBER: 20030300



SPECIFY COLOR AND FASTENER TYPE (SNAPS, VELCRO OR SHOCK CORDS

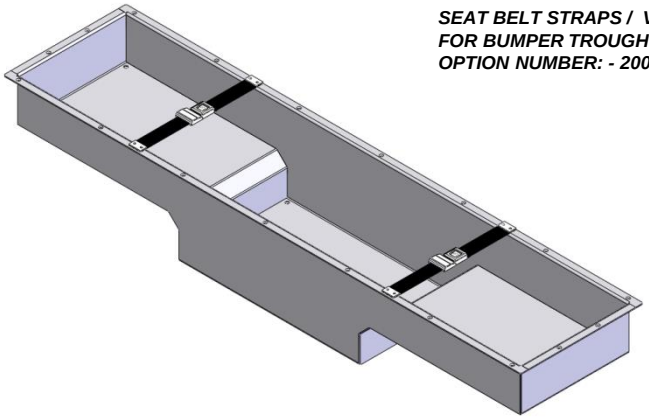


BELL MOUNTING OPTIONS:

MOUNT CUSTOMER SUPPLIED BELL
OPTION NUMBER: 20031100

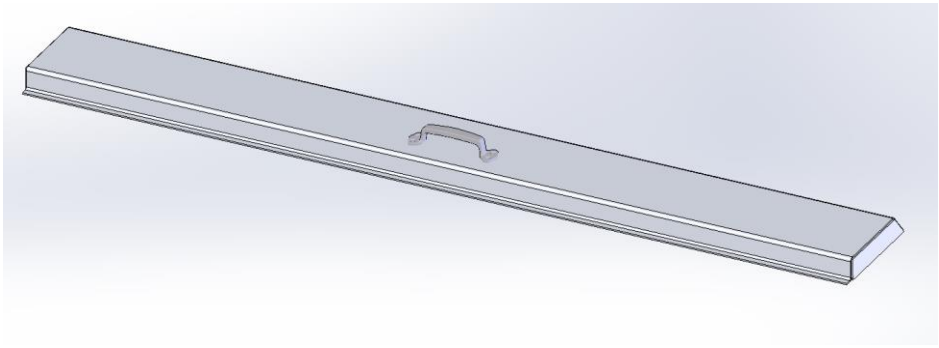
BELL MOUNTED ON FRONT BUMPER (INCLUDES BELL)
OPTION NUMBER: 20031200
(USE ON 24" BUMPERS ONLY)

SEAT BELT STRAPS / VELCRO STRAPS
FOR BUMPER TROUGH
OPTION NUMBER: - 20030150/20030175

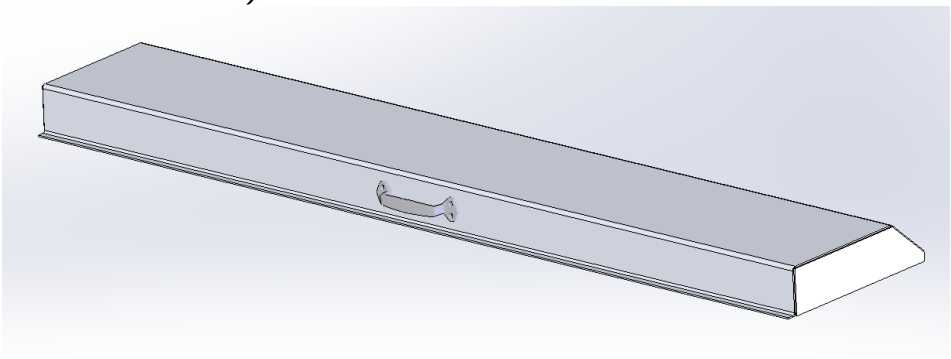


Bumper trough lid options: Available on 18” – 30” Bumpers

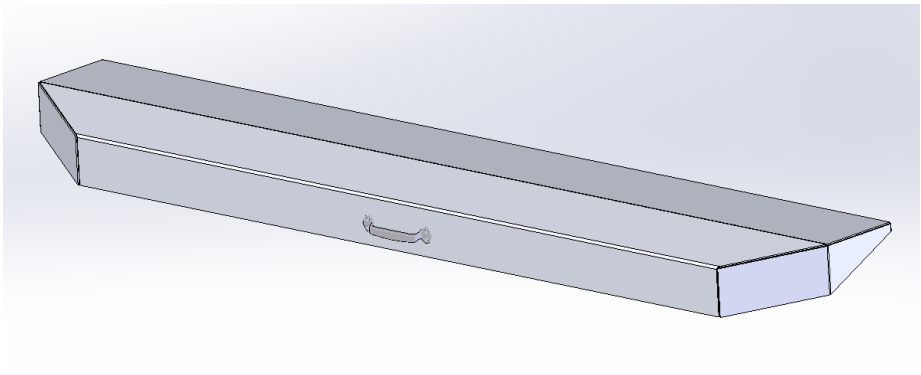
2” TREADPLATE TROUGH COVER, 18” AND 24” BUMPERS (OPTION: 20030110)



4” TREADPLATE TROUGH COVER, 18” AND 24” BUMPERS (OPTION: 20030120)



6” TREADPLATE TROUGH COVER, 30” RESCUE BUMPERS (OPTION: 20030130)



Quality Control

Our Quality Control procedures make sure trucks are double-checked as they are moved from one department to another and prior to shipment. This assures quality at all phases of manufacturing.

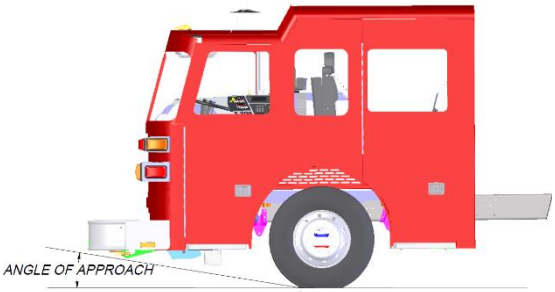
The “Chassis Division” program and procedure to better control the final quality of the chassis consists of:

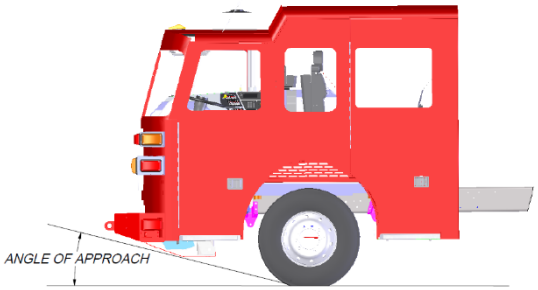
- Cab Receiving Inspection.
- Cab Inspection After Paint.
- Parts Reject and Return Procedure.
- Component Part Incoming Inspection.
- Work-in-Process Inspection.
- Final Inspection Before Shipment.

In order to maintain our high standard of quality, reduce rework, and aid in the manufacturing process, Sutphen has comprised a Quality Control Check List. When a truck starts into production, a QC Book starts with it and stays with the truck throughout all stages of production.

The production associate actually performing the work will initial in the ‘completed by’ box. By putting their initials in the box they are assuming responsibility for the quality of their work. At this point the area/department supervisor inspects the quality of their employees work and initials in the supervisor inspection box verifying that the work preformed is to the highest quality standard. Also, each section of the Quality Control Check List book is audited by a quality control associate, thus double checking the work. The QC Book not only establishes an inspection system, it also shows the pride that is felt by all those involved in producing the highest quality fire truck manufactured at Sutphen Corporation.

Angle of Approach





Standard Offerings

12” Bumper 13.5 Degrees
18” Bumper 13.0 Degrees
24” Bumper 11.5 Degrees

Wildland Urban Interface
(note 13” frame rails)

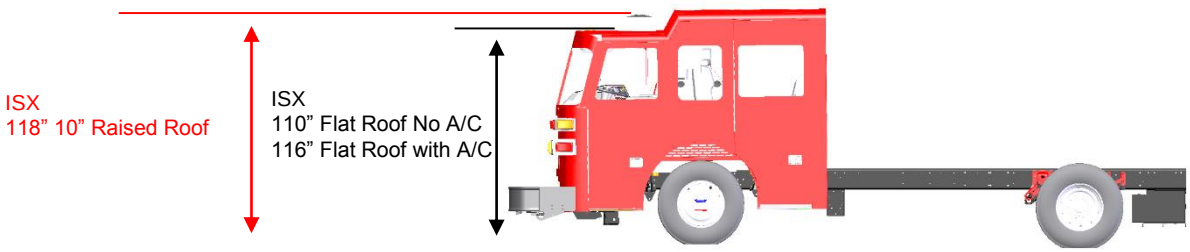
WUI Bumper 20.0 Degrees

Above calculations are for reference only.
Angle of Approach can be affected by vehicle configuration and loading.

NFPA 1901-09 12.3.2.3 Angle of Approach Requirement:
At least 8 Degrees loaded

Overall Height - ISX

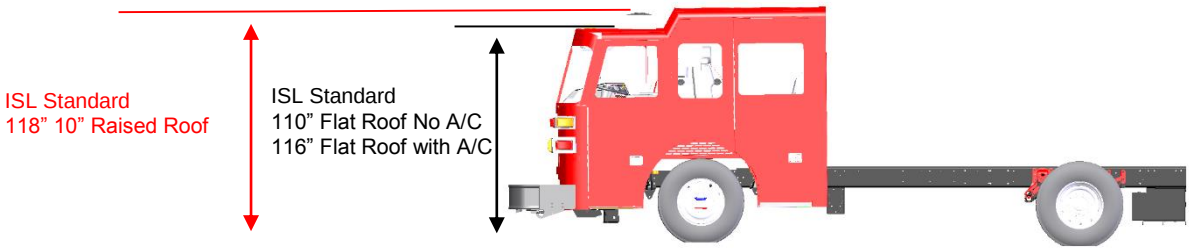
Top of frame height for ISX must be 40”



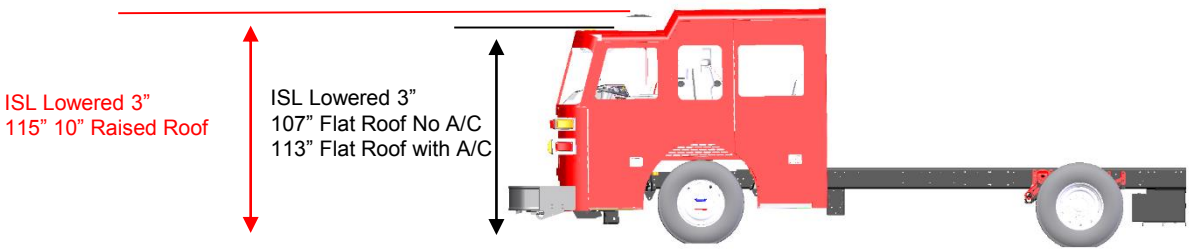
Goodwill HS5065
ISX
Flat Roof
A/C Condenser mounted in body
Warning lights mounted to brow

Overall Height - ISL

Top of frame height for ISL is 40” Standard



Top of frame height can be lowered approximately 3” for ISL



Note –

315 front tires
18K front suspension
Removal of cab latch spacers
Lowering of rear suspension 1”

Vehicle ground clearance changes as well.
Low ground clearance / Low Angle of Approach must be accounted for.
Add 3” to all measurements when 13” frame rails are used.

2013-2016 Sutphen Chassis Upgrades

- New upper and lower Command Consoles. These new options provide the customer with a custom configuration of accessibility to switching and controls to meet their needs and help them efficiently execute their duties.
- Power steering system. The power steering pump was upgraded and a cooler/fan system was added to extended the life of the power steering system and fluid.
- Splined steering shaft provides increased stability in the steering wheel and minimizes the amount of “play”.

- Increased weather protection via sealed battery box as well as the sealed electrical box on the back of the engine.
- Defroster diffuser added to aid in increased Driver’s visibility through the windshields.
- Insulated turbo pipes to aid in reducing heat in the cab.
- 1810 Drive Lines required for ISX engines.
- Fleetguard air cleaners to meet Cummins requirements.
- Stainless steel grab handles to help further reduce possible corrosion.
- Compact heat/AC units, to provide more options for storage and/or other customer specified items on the engine hood cover.
- Urethane coated engine covers to provide increased durability and to aid in reducing heat and noise in the cab.
- Thermal insulation coating under the cab to provide increased weather resistance/corrosion protection compared to traditional undercoating spray
- Cab side mounted fenders to reduce corrosion
- Outset wheels for 315 tires – improved looks/performance

Emissions Derate – Cummins FAQ's

Fire and Emergency Vehicle Emissions Derate Exemption Customer FAQ

What is Cummins response to the Direct Final Rule (DFR) issued by EPA providing relief to emergency vehicles?

Background:

There has been concern from fire and emergency vehicle users that aftertreatment systems hamper their ability to complete missions (via engine derates and shutdowns) and cause undue hardship for this market. In May 2012 the EPA released a regulatory announcement outlining a voluntary program that provides engine manufacturers flexibility to provide relief to emergency vehicles such as ambulances and fire trucks so they would no longer face vehicle speed or engine power disruptions related to their diesel emissions control systems. Once this announcement was published to the Federal Register, the general public was allowed to submit comments within a 60 day window. Since no adverse comments were submitted to the EPA in that 60 day timeframe, the EPA issued a Direct Final Rule (DFR) on August 7, 2012

The DFR provides relief to emergency vehicles by allowing engine manufacturers to prevent the engine from loss of vehicle speed, engine power (torque) due to abnormal conditions of the emission control system or by preventing those abnormal conditions from occurring during emergency response. Examples include:

- Excessive exhaust backpressure from an overloaded Diesel Particulate Filter (DPF)
- Engines with Selective Catalytic Reduction (SCR) running out of Diesel Exhaust Fluid (DEF)

Key Message: We agree that under no condition should an emergency vehicle be shut down due to an emissions fault.

Cummins cares about its Customers

- Cummins is committed to the emergency vehicle market, which we've been in for over 70 years

- Cummins offers on-site support to customers.

Emissions Derate – Cummins FAQ's, cont'd

- We support data based approaches and solutions and have reached out to customers inviting them to help be part of the solution by providing additional data on specific instances of real-world operational and maintenance issues.

Cummins has been and continues to actively work with the industry to address the DFR

- We have worked to be in alignment with the US Environmental Protection Agency (EPA), Engine Manufacturers Association (EMA), Fire Apparatus Manufacturers Association (FAMA).

- We have reached out to various fire service organizations (CFSI - Congressional Fire Services Institute, IAFC - International Assn of Fire Chiefs, FDSOA - Fire Dept Safety Officer's Assn, SEAFC - Southeastern Assn of Fire Chiefs, WFCA - Western Fire Chief's Assn), groups, and congressional offices to understand concerns and provide educational information.

Cummins has been and continues to reach out to educate on how the Cummins DPF System operates

- DPF aftertreatment systems introduced additional complexity; many and perhaps all issues can be resolved through customer understanding of how to operate and maintain the engine and aftertreatment system.

- Our engines are operating as designed and approved by EPA.

- Cummins emergency rated engines are specially designed to not shutdown or derate due to DPF loading.

- The Cummins Aftertreatment System does not affect engine and pumping performance - as long as it is properly maintained.

Emissions Derate – Cummins FAQ's, cont'd

What is meant by 'Inducement' or 'derate' and what does it mean to me as a customer?

"Inducement" is an Environmental Protection Agency (EPA) term aimed at keeping engines which utilize Selective Catalytic Reduction (SCR) aftertreatment operating properly. An 'inducement' may also be referred to as an engine derate There are three primary events that could initiate an inducement/derate: (1) Low Diesel Exhaust Fluid (DEF) level, (2) Incorrect fluid in DEF tank, and (3) SCR Faults. The driver will recognize this as a performance penalty initiated by the Electronic Control Module (ECM), resulting in a loss of vehicle speed or engine power (torque).

It is important to note that there are ample driver / operator reminders and warnings to prevent the activation of an inducement. For example, drivers will see dash lamps to remind them to add DEF and are alerted if there is incorrect fluid in the DEF tank. Some fire truck builders offer DEF level gauges on pump panels as available options.

What flexibilities are included in the Direct Final Rule issued by EPA on August 7, 2012?

Vehicle speed and engine power (torque) derates can be suspended during emergency operation. Examples include excessive exhaust back pressure from an overloaded diesel particulate filter (DPF) and running out of Diesel Exhaust Fluid (DEF).

Provision is included for both future product and modifying engines already in the field.

It is important to note that this is a voluntary program and each engine manufacturer had to submit their solutions to EPA for approval of any changes before going into production.

What is not included in the Direct Final Rule issued by EPA on August 7, 2012?

OEMs must still install aftertreatment systems for emissions control. The aftertreatment system devices and associated equipment will remain unchanged moving forward.

The belief that aftertreatment systems will be removed from fire and emergency vehicles is a common misconception within the industry.

Emissions Derate – Cummins FAQ's, cont'd

What is Cummins position on the DFR issued by the EPA?

Cummins publically supported the DFR as stated when it was published on August 7, 2012. We have identified our solution and implemented changes to our engine software to ensure that the emissions control system does not disrupt an emergency mission.

What is Cummins solution?

Cummins has developed a new engine software specific to fire and emergency vehicle calibrations that will be incorporated into our EPA 2013 engines. This new calibration eliminates all emissions related vehicle speed or engine power (torque) derates. This includes derates associated with low level Diesel Exhaust Fluid (DEF), incorrect DEF and SCR faults that some customers may experience on EPA 2010 engines.

What engines for 2013 will include the emissions derate exemption calibration?

All EPA 2013 ISB6.7 and ISL9 EV rated engines include the new calibration that eliminates all emissions related vehicle speed and engine torque derates. Some EPA 2013 ISX12 and ISX15 engines for fire and emergency vehicles built in early 2013 may require an electronic calibration update to eliminate emissions related derates.

How do I know if my 2013 engine has the new emergency vehicle calibration update?

If you have an EPA 2013 ISB6.7 or ISL9 EV rated engine you have the new calibration already. Some ISX12 and ISX15 engines built in early 2013 may not include the new calibration and will require a calibration update that can be performed at a Cummins authorized service location. Customers can contact Cummins Care at 1-800-DIESELS™ (1-800-343-7357) with their Engine Serial Number (ESN) to determine what calibration was in the engine when it left the factory and if they are eligible for an update at no additional charge

Emissions Derate – Cummins FAQ's, cont'd

Will all of the warning lamps still exist with the new emergency vehicle calibration?

Yes, The Diesel Exhaust Fluid (DEF) lamp, High Exhaust System Temperature (HEST) lamp and all other warning lamps will still continue to function as specified for emergency vehicle applications. The engine and aftertreament system will still need appropriate and timely maintenance – including passive and/or active aftertreatment regenerations – as specified in the Operations and Maintenance Manual.

There is one exception to note: The new 2013 emergency vehicle calibration will eliminate the red stop engine lamp illuminating in conjunction with the DEF lamp and check engine lamp to signify critically low DEF levels.

For more information on EPA 2013 emergency vehicle warning lamps and emissions derate information please see the "EPA 2013 Driver Tips For Fire and Emergency Vehicles" brochure (Bulletin 4971424).
(http://cumminsengines.com/assets/pdf/4971424.pdf)

Didn't the initial SCR "inducement" on EPA 2010 engines cause a derate in emergency vehicles?

Yes, however, this was changed in July-2011 through an agreement with FAMA and the EPA. A calibration update was made in July-2011 that changed the inducement/derate for SCR (low level DEF and incorrect DEF) from engine power (torque) to vehicle speed. The July-2011 calibration change is "backwards compatible" and can be obtained from any Cummins authorized service location.

For more information on EPA 2010 emergency vehicle engine derates and engines produced from January 2010 – December 2012, please see the "Driver Tips for Fire and Emergency Vehicles" brochure (Bulletin 4971316).
(http://cumminsengines.com/assets/pdf/4971316.pdf)

Can I upfit my engine built prior to 2013 with this new calibration?

Yes, service calibrations for engines built prior to 2013 that utilize different emissions derate logic (as outlined below) are available at Cummins authorized service locations.

Emissions Derate – Cummins FAQ's, cont'd

Is this new 2013 calibration update available at no charge for engines built prior to 2013?

No, if you have an engine built prior to 2013 you can request to have the new 2013 calibration update at a Cummins authorized service location but this will be installed at your expense.

Do I need a new engine dataplate if I receive the 2013 calibration update?

If your engine was built between Jan 1, 2010 and July 8, 2011 and you have not received the calibration update introduced on July 8, 2011 that changes the SCR inducement from an engine power (torque) derate to a vehicle speed derate you will need to obtain a new engine dataplate signifying that the engine is designed for use in fire and emergency vehicles only.

Due to the change in SCR inducements and to meet EPA requirements an engine dataplate is required signifying that the engine is designed for use in fire and emergency vehicles only.

What are the inducements/derates for Cummins engines in fire and emergency vehicles built since Jan 1, 2010?

The following table shows the inducements for EPA 2010 engines (including engines built between Jan 1 2010 and July 8, 2011), EPA 2010 engines that include the July-2011 calibration (changing the inducement from engine power/torque to vehicle speed) as well as EPA 2013 engines. Note, as discussed above, that there is a new emergency vehicle calibration for 2013 that will eliminate emissions related inducements/derates.

Emissions Derate – Cummins FAQ's, cont'd

EPA 2010 Engines BUILT BEFORE July 8, 2011 That have not received the Emergency Vehicle electronic calibration update		EPA 2010 Engines BUILD ON/AFTER July 8, 2011 That have not received the Emergency Vehicle electronic calibration update		EPA 2013 Engines *Heavy Duty Exception	
DEF Tank Level	Inducement	DEF Tank Level	Inducement	DEF Tank Level	Inducement
> 10%	None	> 10%	None	> 10%	None
10%	None	10%	None	10%	None
5%	None	5%	Vehicle Speed Limited to 55 mph (pumping is still enabled)	5%	None
2.5%			25% Torque Derate		
0%	40% Torque Derate (ramped in at 1% per minute)	0%	Vehicle Speed Limited to 55 mph (pumping is still enabled)	0%	None
0% And after the engine has been intentionally shut down or in the idle position for 1 hour	40% Torque Derate & Vehicle Speed Limited to 5 mph	0% And after the engine has been intentionally shut down	Vehicle Speed Limited to 25 mph (pumping may be limited after key-off)	0% And after the engine has been intentionally shut down	None

- The first two columns illustrate the inducements that apply to EPA 2010 engines in all on-highway applications. The first two columns will also apply to emergency vehicles calibrated engines that were built before July 8, 2011 and that have not received any optional calibration available after that date only.
- The second two columns illustrate revisions made to the inducements for EPA 2010 emergency vehicle calibrated engines that were built on/after July 8, 2011 or for engines built before July 8, 2011 that have received any optional calibration upfit.
- The third two columns illustrate that there are no SCR emissions related inducements for EPA 2013 engines with the new emergency vehicle calibration for 2013. *Note: as mentioned earlier, Some EPA 2013 ISX12 and ISX15 EV engines built in early 2013 may require an electronic calibration update to eliminate emissions related derates.

Paint – Benefits/ Usage

1. New Textured Ceramic and Silica Acrylic Undercoating:
    A. Benefits include superior…
        a. Adhesion
        b. Sound deadening & insulation
        c. Thermal insulation
        d. Chip/impact resistance
        e. Elongation
        f. Flame resistance
        g. Chemical resistance
        h. Weather resistance
    B. Usage details…
        a. Entire under cab surfaces including the fender well and the stainless fenders (see pg.85 for fender mounting). This new coating will improve thermal insulation as well as sound deadening engine noise.
2. Textured Polyurethane Blend Surface Coating, Interior Hood Surface:
    A. Benefits include superior…
        a. Adhesion
        b. Sound deadening & insulation
        c. Chip/impact resistance
        d. Elongation
        e. Chemical resistance
        f. Abrasion resistance
        g. Weather resistance
        h. Fade/color change resistance
    B. Usage details…
        a. Engine hoods
        b. Lower command console
        c. The standard color hood will the “black”
        d. Optional color hood will be “grey”

Paint – Benefits/ Usage

3. Speckle Paint Interior Coating…
    A. Benefits include superior…
        a. Acrylic Polyurethane
        b. Chemical resistance including 100 hour exposure to diesel fuel and motor oil
        c. Abrasion and impact resistance
        d. Clean-ability and stain resistance
        e. Color retention and chalk resistance
        f. Mildew, fungus resistance (excellent performance in damp environments)
        g. Inhibits bacterial growth
    B. Usage details…
        a. The standard color will be “black speckle”.
        b. Optional color will be “grey speckle”.
        c. To keep the interior “brighter.” The defroster, main a/c unit, any tool trays, map boxes, etc., MOUNTED TO THE HOOD will remain grey.
        d. Any component MOUNTED TO THE A/C UNIT, metal grills, tool trays, etc., will remain grey.
4. Dupont Imron Elite Cab Top Coat…
    A. Benefits include superior…
        a. 2 component polyurethane
        b. Industry recognition and acceptance
        c. Color and gloss retention
        d. Harsh-environment performance
        e. Resistance to chemicals, weathering, acid, alkali, solvent, abrasion and fade.
        f. Flexibility and chip resistance
        g. Functional temperature range
        h. Color and tinting capability

Corrosion Reduction Policy

The manufacturer shall have in place a formal corrosion reduction program and assembly procedures designed for reducing and eliminating the possibility of corrosion. It is understood that fire apparatus will operate in harsh environments. At the time of the bid the apparatus manufacturer shall show proof of a corrosion policy. Failure to submit this information could be grounds for rejection. If a formal policy is not in place explain in your bid how your firm will take the necessary steps for corrosion reduction. There will be no exception to this requirement.

In addition to a formal program the manufacture shall show proof of testing corrosion reduction processes to ASTMB117. A copy of recent test shall be included in the bid.

Frame Rails
The chassis frame rails shall be coated with a high performance, two component, reinforced inorganic zinc rich primer with a proven cathodic protection makeup preferably Cathacoat 302HB. The surface shall be clean and free of all salts, chalk and oils prior to application. Top coat will be applied to mating surfaces prior to nesting of the inner and outer rail. Were the primer has been broken during the frame assembly process the area shall be touch up to reestablish the seal. Once the assembly of the frame is complete the entire assembly shall be covered with high quality top coat paint, preferably Imron Elite or equal. The manufacturer shall submit with the bid a copy of the product brochure and or description of the primer to be used.

Electro Plating
Steel and Iron brackets such as the pump module bracket shall be Zinc plated to protect against corrosion. Plating shall be in accordance with ASTM B663. The apparatus manufacturer shall list all components with plating.

Corrosion Reduction Policy

Fasteners

In any area that a stainless steel screw or bolt head is to come in contact with aluminum or steel, painted or non-painted, the fastener shall have the underside if the head pre-coated with nylon. The nylon coating shall act as a barrier between the fastener head and the metal or painted surface.

Screw or bolt taped into the metal shall be pre-coated with a Threadlocker type material pre-applied on the threads.

When bolting together stainless steel the manufacturer shall use a pan-head bolt with nylon coating under the head, a stainless washer with a rubber backing, and a Stover flange nut to secure the bolt.

When mounting aluminum components such as a step to the apparatus body. The manufacturer shall use stainless washers with rubber backing. All mounted components shall a barrier material between the two surfaces.

All rivet type fasteners shall be of the same material being secured.

Whenever possible, pre-drill and tap all holes for mounting components such as lights, steps and hand rails prior to the paint process to reduce the corrosion opportunity. If a hole must be drilled into a previously painted surface, re-establish the paint barrier around the hole and use a flange-type nutsert with a gasket under the flange.

Where possible, minimize the number of stainless trim screws in aluminum. Structural tape and or adhesive shall be used were possible for mounting trim to the body or cab.

If a pre-treated screw or bolt is not available, hand apply Dynatex Boltlocker or Theadlocker on the threads of the screw, bolt or nutsert. This will help seal threads from moisture and help prevent the fasteners from loosening.

If lubricant is used when tapping the hole, clean out the lubricant and the shavings before applying blue Threadlocker into the hole.

Corrosion Reduction Policy

Barrier Tape
Barrier tape shall be used on the backsides of all lights, trim pieces, or other components when bolting them to the apparatus; also when attaching stainless steel over an aluminum surface or when attaching aluminum treadplate to the stainless steel. All instances of dis-similar metals contacting each other require the addition of barrier tape between the metals where contact is made.

Before applying the tape, be sure the metal surface is clean from oil or dirt by cleaning the surface with a 50/50 mix of alcohol and water pr similar solvent.

Gaskets
Gaskets shall be used under all snaps, loops and fasteners for such items as for hose bed covers. Reestablish paint seal around the mounting hole edges after drilling.

Mounting with Threadlocker coating shall be used.

Flat washers with rubber backing shall be used behind all lights that have stainless screws.

Rollup Doors
1 3/4" X 1/16” barrier tape shall be used on the frame opening to act as barrier between the aluminum door rail and the painted door opening surface.

Use a paint stick around the holes after drilling and tapping. In mounting the rails, use screws with the nylon under the head and Threadlocker on the threads for mounting the doorframes.

Install barrier tape to the painted surface where the trim is located on top of the door opening.

Hinged Doors
Barrier tape shall be applied to the painted surface of the body and on the painted hinge side of the door.

On the hinge side, mount tape out toward the edge to space over the barrel of the hinge, being sure to not touch the door.

Make sure the hinge fits into the extrusion frame with no corner weld beads interfering with the door fit. Do not put the hinge in a bind or cause the stainless steel hinge to touch the aluminum. Install the doors using a truss head bolt with the nylon coating under the head and Threadlocker on the threads.

Corrosion Reduction Policy

Painting Steel
The manufacturer shall wipe any oil residue dry, remove any rust and remove weld slag or smoke. Clean the surface with solvent before painting. Prime with one even coat of black Color primer, and then spray a topcoat over the primer for the finish coat. After bolts are tightened to the proper torque, touch up the bolt area and ends of the bolts with primer or cold galvanizing coating.

Mounting Emergency Lights and Options
All emergency lights, accessory mountings, Kussmaul covers, and 110 outlet boxes mounted to the body should be mounted with pre-coated Threadlocker and nylon under the head screws or bolts to minimize corrosion between dissimilar metals.

Electrical Grounding
Grounding straps shall be installed consisting of a minimum 2-gauge strap bolted to the chassis frame.

A ground cable from the cab to the right side frame rail
From the alternator to the right side frame rail
From the pump module frame to the right side truck frame.
Aerials: from the hydraulic and pump module framework.
From the pump mount to the truck frame rail.
From the body module to the right side truck frame.

Proper grounding will help eliminate ground loop problems throughout the truck, reducing the possibility for electrolysis and corrosion to occur. Provide clean connection points on all ground connections, (remove paint where applicable), and spray or brush on electrical sealer as necessary.

When installing foam system pump wiring the power must come from a dedicated breaker to a power solenoid, and then to the power terminal provided by FoamLogix or FoamPro. Pay particular attention to the grounding detail for wire size and good grounding practice, including removing the paint at the point of ground attachment to the chassis. Keep the length of ground wire as short as practically possible.

Corrosion Reduction Policy

Salt Spray Testing

Salt spray test shall be used to confirm the relative resistance to corrosion of coated and uncoated metallic specimens, when exposed to a salt spray climate at an elevated temperature. Test specimens shall be placed in an enclosed chamber and exposed to a continuous indirect spray of neutral (pH 6.5 to 7.2) salt water solution, which falls-out on to the specimens at a rate of 1.0 to 2.0 ml/80cm²/hour, in a chamber temperature of +35C. This climate shall be maintained under constant steady state conditions.

Method

Salt fog testing shall be performed by placing samples in a test cabinet that has been designed in accordance with Paragraph 4 (Apparatus) of ASTM B117 and operated in accordance with Paragraph 10 (Conditions) of ASTM B117.

A 5% salt solution, prepared by dissolving sodium chloride into water that meets the requirements of ASTM D1193 Specification for Reagent Water, Type IV is supplied to the chamber. At the time the samples are placed into test, the cabinet should be pre-conditioned to the operating temperature of 35ºC and fogging a 5% salt solution at the specified rate. The fog collection rate is determined by placing a minimum of two 80 sq. cm. funnels inserted into measuring cylinders graduated in ml. inside the chamber. One collection device shall be located nearest the nozzle and one in the farthest corner.

Orientation

Unless otherwise agreed upon, the samples are placed at a 15-30 degree angle from vertical or tested in the “installed” position. This orientation allows the condensation to run down the specimens and minimizes condensation pooling. Overcrowding of samples within the cabinet should be avoided. An important aspect of the test is the utilization of a free-falling mist, which uniformly settles on the test samples. Samples should be placed in the chamber so that condensation does not drip from one to another.

Test durations

Test durations shall be 500 hours except for sample rotation and daily monitoring of collection rates, the cabinet should remain closed for the duration of the test.