





Truck Group

Summer '99 at Bumper/Fascia/Grille June 21-August 27

Harris Yong

Princeton University '00

Mechanical Engineering

Introduction

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- Bumper/Fascia/Grille Wall Display
- GMT 820C Grille Subsystem SSTs
- Fascia/Fender Interference
- Wheel Cladding/Endcap Interface
- Other Experiences



Truck Group

Wall Display: Intro

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Display of future (2001+)
bumper/fascia/grille components

→ Product familiarity

→ Complexity reduction

→ Contacts:

→ DLTs:

→ Paul Dupire, Dave Scott, Dave Zellers...

→ Designers:

→ Renata Fadenelli, Ron Jennings, Kathy Straka...



Truck Group

Wall Display: Products

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ GMT 355

→ GMT 360/370

→ GMT 560/565

→ GMT 610

→ GMT 820C

→ GMT 820D/830D

→ GMT 880



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Wall Display: Format

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Wall Display

→ Nameplates in columns (down)

GMT 820C
Grille SSTS

→ Components in rows (across)

Fascia/Fender
Interference

→ Part number and usage labels

Endcap/Wheel
Cladding
Interface

→ RPO codes

Other
Experiences

Confidential



Truck Group

Wall Display: Format

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Wall Display

→ Detail exploded drawings under solid views

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

Confidential



Truck Group

Wall Display: Format

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Wall Display

→ Entire front and rear end views for complete picture

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

Confidential



Truck Group

Wall Display: Spreadsheet

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Spreadsheet with
additional (less
developed
products)

→ GMT 305

→ GMT 806

→ GMT 836/836D

→ RPO Glossary

Confidential



Truck Group

GMT 820C Grille SSTS: Intro

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Grilles previously under:

→ Exterior Trim (GMT 360 60.4 Exterior Trim SSTS)

→ Front End Sheet Metal (GMT 800 60.1 Front End Sheet Metal and Grille SSTS)

→ Create independent Grille Subsystem (60.4.9) SSTS

→ create GMT 820C SSTS as a template for future grille subsystems



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GMT 820C Grille SSTS: Contacts

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ **Contacts:**

→ Ellen McTigue

→ Ceena Farmer

→ Development, DPG, etc.



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GMT 820C Grille SSTS: Coverpage

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

GMT820C Grille Subsystem Technical Specification

GM Truck Group

Spec No: GMT820C 60.4.9
Date: August ?, 1999



Approved:

Jim Clement, Validation EGM
GMT820C Body Exterior

Date

Approved:

Robert Morgner, PMT Director
GMT820C Exterior Hardware and Rear Closures

Date

Approved:

Bill Knapp, VSE
GMT820C Body Exterior

Date

Approved:

Abdi Lawassani, Exterior Trim EGM
GMT820C Exterior Hardware

Date



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GMT 820C Grille SSTS: Major Changes

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

- Removed irrelevant non-grille subsystem information
- Increased objectivity
- Ensured all specifications can be validated
 - worked with Validation Engineer
- Conformed to NAO 60.4 Exterior Trim template up to 4 "decimal places"



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GMT 820C Grille SSTS: VCRI

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ References formal procedures for our specifications

| Requirement | | | Procedure | | Validation Method | Validation Organization | Supporting Paragraph |
|----------------------|--|------|-----------|--|-------------------|-------------------------|----------------------|
| Paragraph Number | Title | Type | Number | Title | | | |
| S.60.4.9-3.2.1 | Performance | | N/A | | | | |
| S.60.4.9-3.2.1.1 | Protect the Vehicle Body | | MTL9126 | Opening Trim Stone Damage | T | MPG-PA | |
| S.60.4.9-3.2.1.2 | Safety | | | | | | |
| S.60.4.9-3.2.1.2.1 | External Projections for Export | | MTL0681 | External Projections (Export) | T | MPG-PA | |
| S.60.4.9-3.2.1.2.2 | Low-Speed Front Impact Performance | | MTL0682 | Bumper - Impact Generic Inspection | T | MPG-PA | |
| | | | | Procedure- Inspection Per Drawing or Specification | | | |
| S.60.4.9-3.2.1.2.3 | Driver's Field of Vision | | MTL8004 | Generic Inspection | I | DRE | |
| | | | | Procedure- Inspection Per Drawing or Specification | | | |
| S.60.4.9-3.2.1.3 | Squeaks and Rattles | | MTL8004 | Generic Inspection | I | | |
| | | | | Procedure- Mechanical/Visual Inspections | | | |
| S.60.4.9-3.2.1.4 | Exterior Body Appearance | | MTL8006 | | I | DRE | |
| S.60.4.9-3.2.1.4.1 | Color and Surface Finish | | MTL4220 | Supplier Interior Components - Exposure Durability | T | SUPP | |
| | Color Fade, Yellowing, and Gloss Retention | | MTL0128 | | T | DPG | |
| S.60.4.9-3.2.1.4.3 | Staining | | MTL4220 | Supplier | T | SUPP | |
| S.60.4.9-3.2.1.4.4 | Painted Vehicle Finish | | MTL4220 | Supplier | T | SUPP | |
| S.60.4.9-3.2.1.4.4.1 | Color Performance | | MTL4220 | Supplier | T | SUPP | |



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Fascia/Fender Interference: Intro

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Wall Display

→ PRTS/PCIC Problem MD0171

GMT 820C
Grille SSTs

→ T-Series Tilt Cab (GMT 540)

Fascia/Fender
Interference

→ Contacts:

→ Craig Denbaas

→ Mike Gulick

→ Jason Baker

Endcap/Wheel
Cladding
Interface

→ Isuzu Warehouse (Janesville, WI)

→ Janesville Assembly

Other
Experiences

→ Dimensional Lab

→ Various suppliers



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Fascia/Fender Interference: Problem

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Wall Display

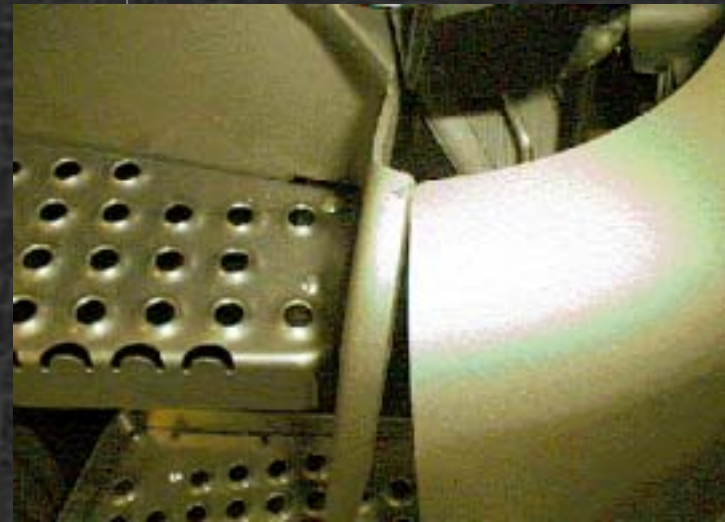
GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Fascia edges contact fender extension around steps when cab is tilted
→ insufficient clearance



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Fascia/Fender Interference: Parts

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Wall Display

→ Fascia

GMT 820C
Grille SSTs

→ Bumper impact bar

Fascia/Fender
Interference

→ Bumper assembly "horseshoe"
brackets

Endcap/Wheel
Cladding
Interface

→ Bumper to frame brackets

Other
Experiences

→ Fender extension



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Fascia/Fender Interference: Previous Studies

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ VSM study in 1996

→ fore/aft variation

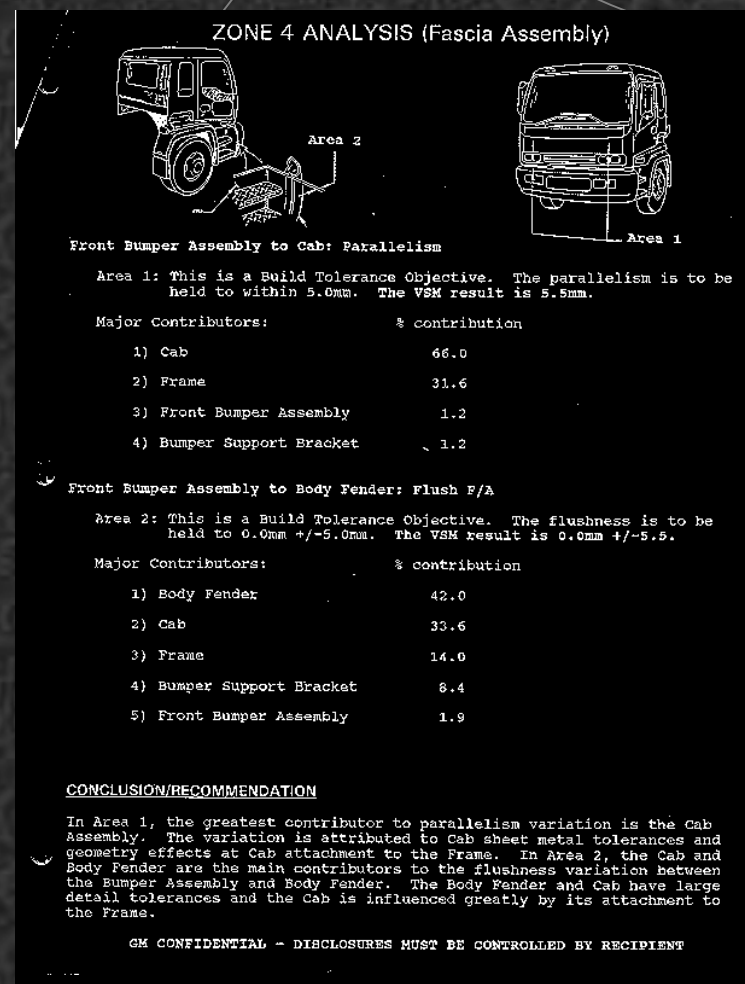
→ fascia to cab
parallelism

→ Most variation in:

→ cab

→ frame

→ fender



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Fascia/Fender Interference: Pre-Assembly

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Wall Display

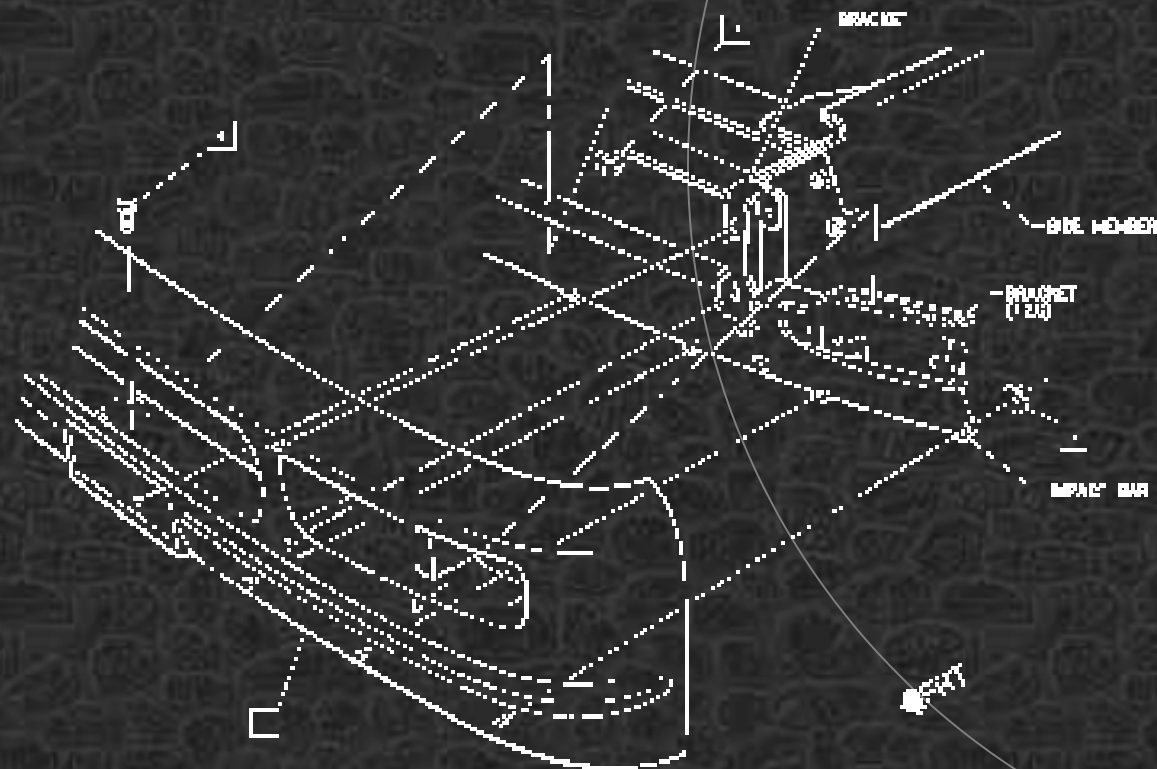
GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Pre-assembled at Isuzu Warehouse
(Janesville, WI)



Truck Group

Fascia/Fender Interference: Pre-Assembly

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences



→ Minimal
variation
due to
"cross-
slotting"

→ Adequate check fixtures



Truck Group

Fascia/Fender Interference: Assembly

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Large cross-car variation of bumper assembly

→ previous quick fix by shifting assembly to the passenger side

→ Tried one M10x22x3.1 washer at each top stud to generate forward movement



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Fascia/Fender Interference: PAA

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Wall Display

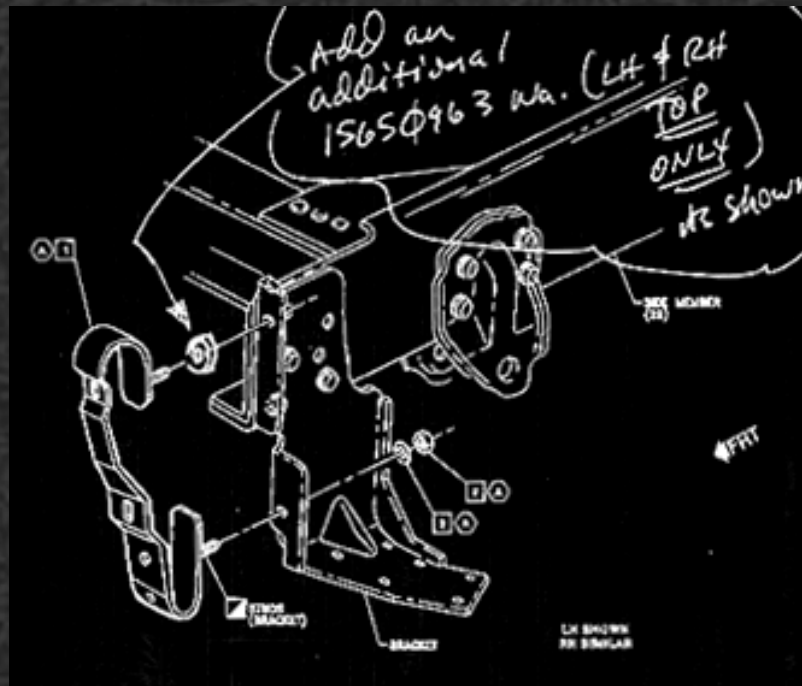
GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Washers introduced as PAA T0F-0-026



PRODUCTION ACTION AUTHORIZATION

FORM T0F-0-026

OPEN DATE 8/16/99

CLOSE DATE

| ITEM | QTY | UNIT | DESCRIPTION | APPROVED BY | DATE |
|------|-----|------|-----------------|-------------|------|
| 1 | 1 | EA | 15650963 WASHER | | |
| 2 | 1 | EA | 15650963 WASHER | | |
| 3 | 1 | EA | 15650963 WASHER | | |
| 4 | 1 | EA | 15650963 WASHER | | |
| 5 | 1 | EA | 15650963 WASHER | | |
| 6 | 1 | EA | 15650963 WASHER | | |
| 7 | 1 | EA | 15650963 WASHER | | |
| 8 | 1 | EA | 15650963 WASHER | | |
| 9 | 1 | EA | 15650963 WASHER | | |
| 10 | 1 | EA | 15650963 WASHER | | |
| 11 | 1 | EA | 15650963 WASHER | | |
| 12 | 1 | EA | 15650963 WASHER | | |
| 13 | 1 | EA | 15650963 WASHER | | |
| 14 | 1 | EA | 15650963 WASHER | | |
| 15 | 1 | EA | 15650963 WASHER | | |
| 16 | 1 | EA | 15650963 WASHER | | |
| 17 | 1 | EA | 15650963 WASHER | | |
| 18 | 1 | EA | 15650963 WASHER | | |
| 19 | 1 | EA | 15650963 WASHER | | |
| 20 | 1 | EA | 15650963 WASHER | | |
| 21 | 1 | EA | 15650963 WASHER | | |
| 22 | 1 | EA | 15650963 WASHER | | |
| 23 | 1 | EA | 15650963 WASHER | | |
| 24 | 1 | EA | 15650963 WASHER | | |
| 25 | 1 | EA | 15650963 WASHER | | |
| 26 | 1 | EA | 15650963 WASHER | | |
| 27 | 1 | EA | 15650963 WASHER | | |
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| 35 | 1 | EA | 15650963 WASHER | | |
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| 45 | 1 | EA | 15650963 WASHER | | |
| 46 | 1 | EA | 15650963 WASHER | | |
| 47 | 1 | EA | 15650963 WASHER | | |
| 48 | 1 | EA | 15650963 WASHER | | |
| 49 | 1 | EA | 15650963 WASHER | | |
| 50 | 1 | EA | 15650963 WASHER | | |
| 51 | 1 | EA | 15650963 WASHER | | |
| 52 | 1 | EA | 15650963 WASHER | | |
| 53 | 1 | EA | 15650963 WASHER | | |
| 54 | 1 | EA | 15650963 WASHER | | |
| 55 | 1 | EA | 15650963 WASHER | | |
| 56 | 1 | EA | 15650963 WASHER | | |
| 57 | 1 | EA | 15650963 WASHER | | |
| 58 | 1 | EA | 15650963 WASHER | | |
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| 63 | 1 | EA | 15650963 WASHER | | |
| 64 | 1 | EA | 15650963 WASHER | | |
| 65 | 1 | EA | 15650963 WASHER | | |
| 66 | 1 | EA | 15650963 WASHER | | |
| 67 | 1 | EA | 15650963 WASHER | | |
| 68 | 1 | EA | 15650963 WASHER | | |
| 69 | 1 | EA | 15650963 WASHER | | |
| 70 | 1 | EA | 15650963 WASHER | | |
| 71 | 1 | EA | 15650963 WASHER | | |
| 72 | 1 | EA | 15650963 WASHER | | |
| 73 | 1 | EA | 15650963 WASHER | | |
| 74 | 1 | EA | 15650963 WASHER | | |
| 75 | 1 | EA | 15650963 WASHER | | |
| 76 | 1 | EA | 15650963 WASHER | | |
| 77 | 1 | EA | 15650963 WASHER | | |
| 78 | 1 | EA | 15650963 WASHER | | |
| 79 | 1 | EA | 15650963 WASHER | | |
| 80 | 1 | EA | 15650963 WASHER | | |
| 81 | 1 | EA | 15650963 WASHER | | |
| 82 | 1 | EA | 15650963 WASHER | | |
| 83 | 1 | EA | 15650963 WASHER | | |
| 84 | 1 | EA | 15650963 WASHER | | |
| 85 | 1 | EA | 15650963 WASHER | | |
| 86 | 1 | EA | 15650963 WASHER | | |
| 87 | 1 | EA | 15650963 WASHER | | |
| 88 | 1 | EA | 15650963 WASHER | | |
| 89 | 1 | EA | 15650963 WASHER | | |
| 90 | 1 | EA | 15650963 WASHER | | |
| 91 | 1 | EA | 15650963 WASHER | | |
| 92 | 1 | EA | 15650963 WASHER | | |
| 93 | 1 | EA | 15650963 WASHER | | |
| 94 | 1 | EA | 15650963 WASHER | | |
| 95 | 1 | EA | 15650963 WASHER | | |
| 96 | 1 | EA | 15650963 WASHER | | |
| 97 | 1 | EA | 15650963 WASHER | | |
| 98 | 1 | EA | 15650963 WASHER | | |
| 99 | 1 | EA | 15650963 WASHER | | |
| 100 | 1 | EA | 15650963 WASHER | | |

RELEASE AN ADDITIONAL WASHER BETWEEN THE FRONT BUMPER BRACKET AND THE STEP BRACKET AS SHOWN ON AN INJECTED MATHS P&D.

NOTE: ASSEMBLY (DO NOT ATTEMPT) TO MONITOR TO DETERMINE IF FOUL CONNECTION OCCURS.

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DATE: 8/16/99

BY: [Signature]

FOR: [Signature]



Truck Group

Fascia/Fender Interference: PAA

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ "The washer shim works wonderfully so far. The vehicles in the audit have had 0 defects on the bumper."

→ "From the limited number of jobs I have seen, it is a simple fix that is working amazingly well."



Truck Group

Fascia/Fender Interference: Fascia

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Romeo RIM (Tier 2 supplier):

→ molds fascias

→ good check fixtures

→ layout of pieces OK

| Detail | Characteristic | Class | | Print Tol. | Inspection Results | | |
|--------|-------------------------|-------|--|------------|--------------------|-----------------|----------------|
| | Dimension/Specification | ▼ | | | ① | ② | ③ |
| 1 | 1042.89 | | | | 1044.98/1044.31 | 1045.34/1045.07 | 1045.07/1045.5 |
| 2 | 337.66 | | | | 336.9/337.2 | 334.7/334.2 | 336.1/336.5 |
| 3 | 564.5 | | | | 564/565.4 | 564/564.5 | 564/565 |
| | | | | | | | |
| | | | | | | | |



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Fascia/Fender Interference: Fascia

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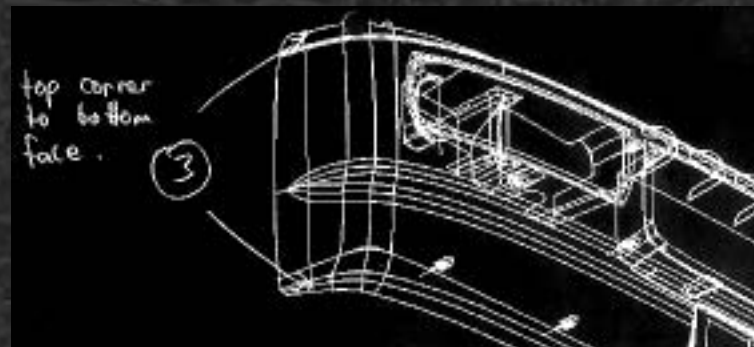
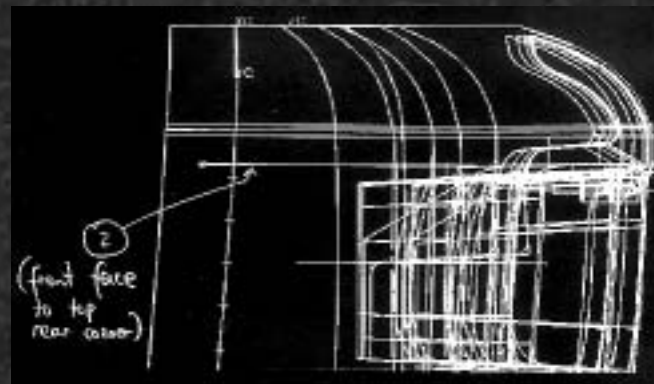
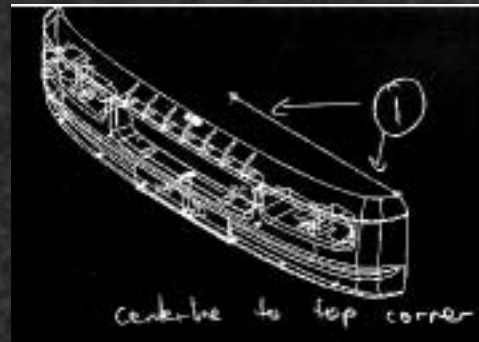
Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences



- All perpendicular distances
- 1. Centerline to inside top corner
- 2. Top rear edge to front face
- 3. Inside top corner to bottom



Truck Group

Fascia/Fender Interference: Fascia

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

- Vaungarde (Tier 1 supplier):
 - paints fascias
 - received pictures of paint process



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Fascia/Fender Interference: Bumper Assembly Bracket

Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Dimensional Lab CMM results out of specification

→ concavity at weld studs

→ non-parallel rear faces

→ other deviations from specifications



Truck Group

Fascia/Fender Interference: Bumper Assembly Bracket

Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Working with Delwal for quality control and building it greater forward clearance

→ known problem

→ loop radii control

| NUM | CHARACTERISTIC | SPECIFICATION | #1 | #2 | #3 | #4 | #5 | #6 | DISPOSITION |
|-----|--------------------|---------------|--------|--------|-------|----|----|----|-------------|
| 1 | FLATNESS | 6.50 | + 0.00 | - 0.50 | 0.19 | | | | "REJECTED" |
| 2 | FLATNESS | 0.33 | + 0.00 | - 0.50 | 0.06 | | | | ACCEPTED |
| 3 | FORM LOCATION HIGH | 94.80 | + 4.00 | - 4.00 | 94.10 | | | | ACCEPTED |
| 4 | FORM LOCATION HIGH | 58.80 | + 4.00 | - 4.00 | 58.59 | | | | ACCEPTED |
| 5 | FORM LOCATION LOW | 94.80 | + 4.00 | - 4.00 | 95.29 | | | | ACCEPTED |
| 6 | FORM LOCATION LOW | 58.80 | + 4.00 | - 4.00 | 57.95 | | | | ACCEPTED |
| 7 | FORM RADIUS | 42.80 | + 2.00 | - 2.00 | 42.75 | | | | ACCEPTED |
| 8 | FORM RADIUS | 27.00 | + 2.00 | - 2.00 | 27.18 | | | | ACCEPTED |
| | | | | | | | | | |



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Fascia/Fender Interference: Bumper to Frame Bracket 29

Wall Display

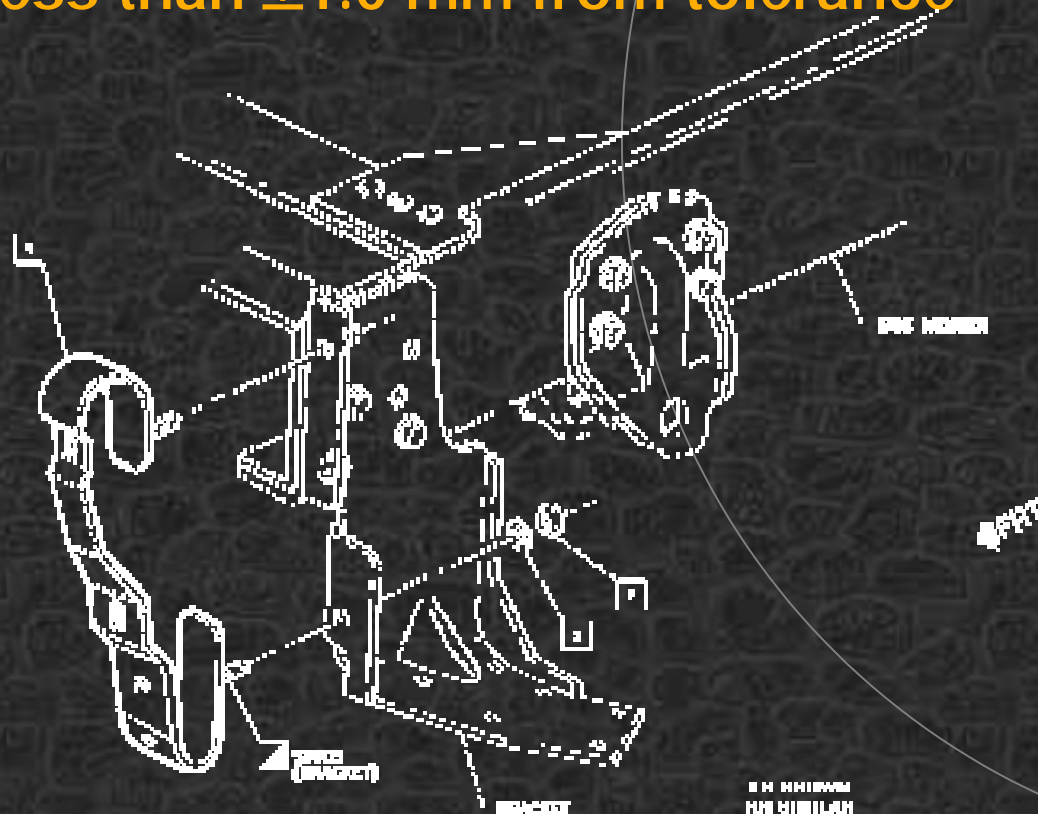
GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Bumper to frame brackets very slightly out of specification
→ less than ± 1.0 mm from tolerance



Truck Group

Fascia/Fender Interference: Action

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ PRTS status moved from Root Cause to Solution

→ Pursue bumper assembly bracket quality control

→ Monitor PAA success

→ Now assigned to Supplier Quality Assurance



Truck Group

Endcap/Wheel Cladding Interface: Intro

Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ PRTS/PCIC Problem ST0102

→ J.D. Power concern

→ Oldsmobile Bravada

→ Contacts:

→ Craig Denbaas

→ Curtis Heim

→ Imam Salie

→ Pat Moran GMC-Oldsmobile

→ mock-up

→ various suppliers



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Other Experiences

[illegible]

Truck Group

Endcap/Wheel Cladding Interface: Parts

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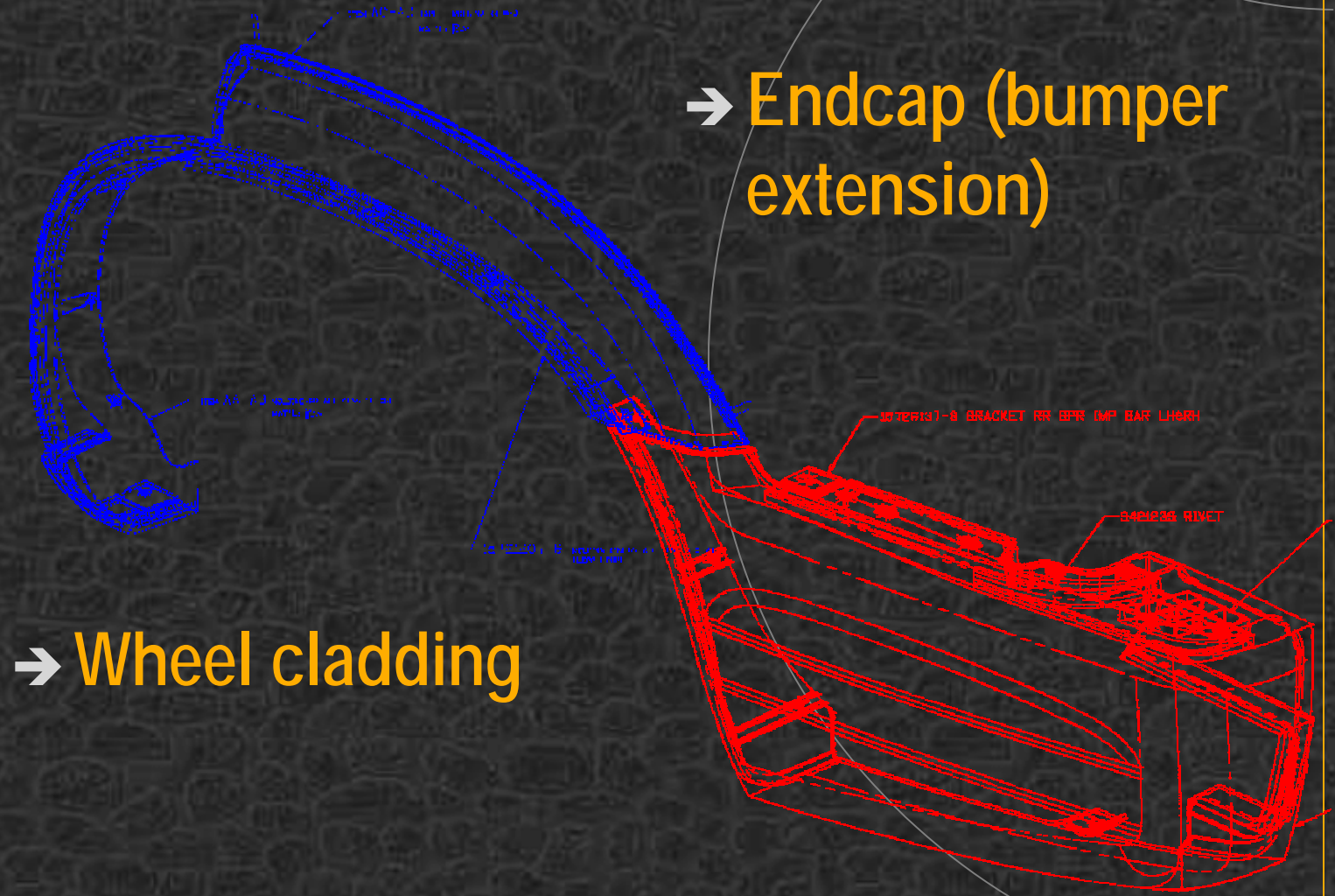
Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences



Truck Group

Endcap/Wheel Cladding Interface: Survey

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ 4 LH and 4 RH cases of "peel-away"
among 20 vehicles

→ all showed endcap misfit condition

| <u>MY</u> | <u>VIN</u> | <u>Age</u> | <u>Site</u> | <u>Wheel Flare (L)</u> | <u>End Cap (L)</u> | <u>Wheel Flare (R)</u> | <u>End Cap (R)</u> |
|-------------------------------|------------|------------|----------------------|------------------------|--------------------|------------------------|--------------------|
| 99 | 725755 | New | Validation Center | OK | OK | OK | Force fit |
| 98 | 703929 | Used | Validation Center | Peel | Force fit | OK | Force fit |
| 99 | 711420 | Used | Validation Center | OK | Force fit | OK | Force fit |
| 99 | 712803 | Used | Validation Center | OK | Force fit | OK | Force fit |
| 99 | 714458 | Used | Validation Center | OK | OK | OK | Force fit |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | Peel | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | Peel | ! | Peel | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | Peel | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | Peel | ! | Peel | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | Peel | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| 99 | | New | Pat Moran Oldsmobile | OK | ! | OK | ! |
| Problem Totals (20 Vehicles): | | | | 4 | 18 | 4 | 20 |



Truck Group

Endcap/Wheel Cladding Interface: Previous Studies

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Previously focused on wheel cladding only

→ Some twisting from paint process
→ but CMM results OK



Truck Group

Endcap/Wheel Cladding Interface: Root Causes

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Wall Display

GMT 820C
Grille SSTs

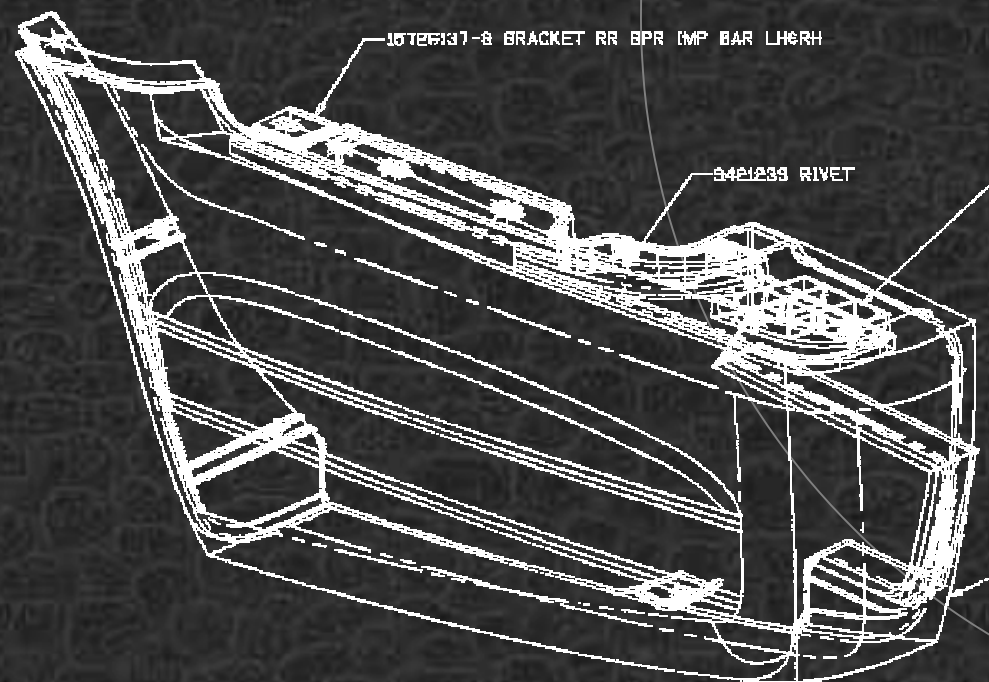
Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Mock-up of parts to determine root causes:

- twisting of wheel cladding (paint racks)
- LH/RH endcap asymmetry



Truck Group

Endcap/Wheel Cladding Interface: Root Causes 37

Wall Display

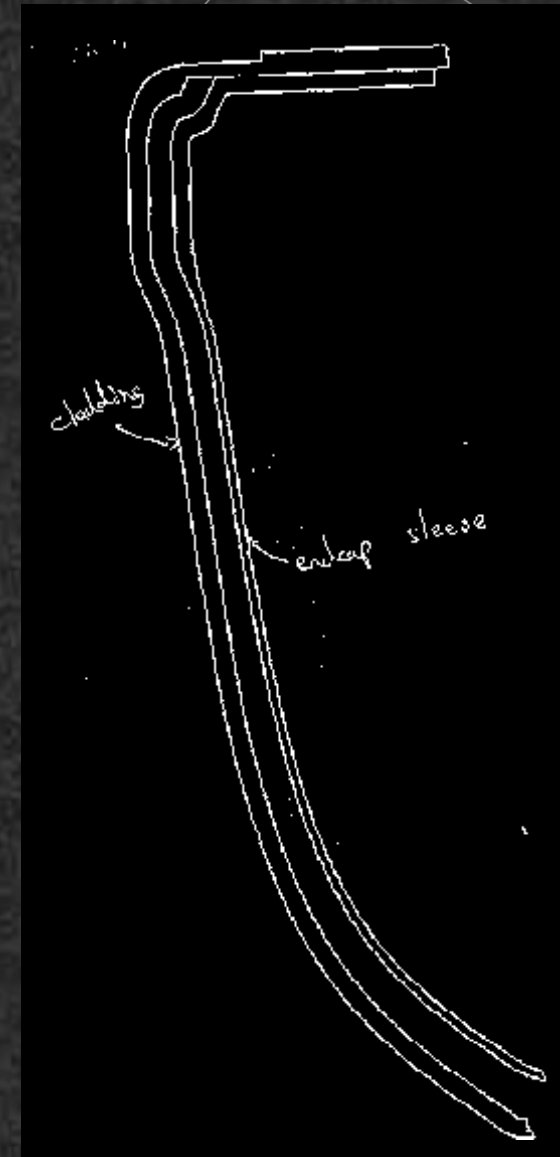
GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ More root causes:
→ poor contour
matching of endcap
and wheel cladding



Truck Group

Endcap/Wheel Cladding Interface: Root Causes

38

Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

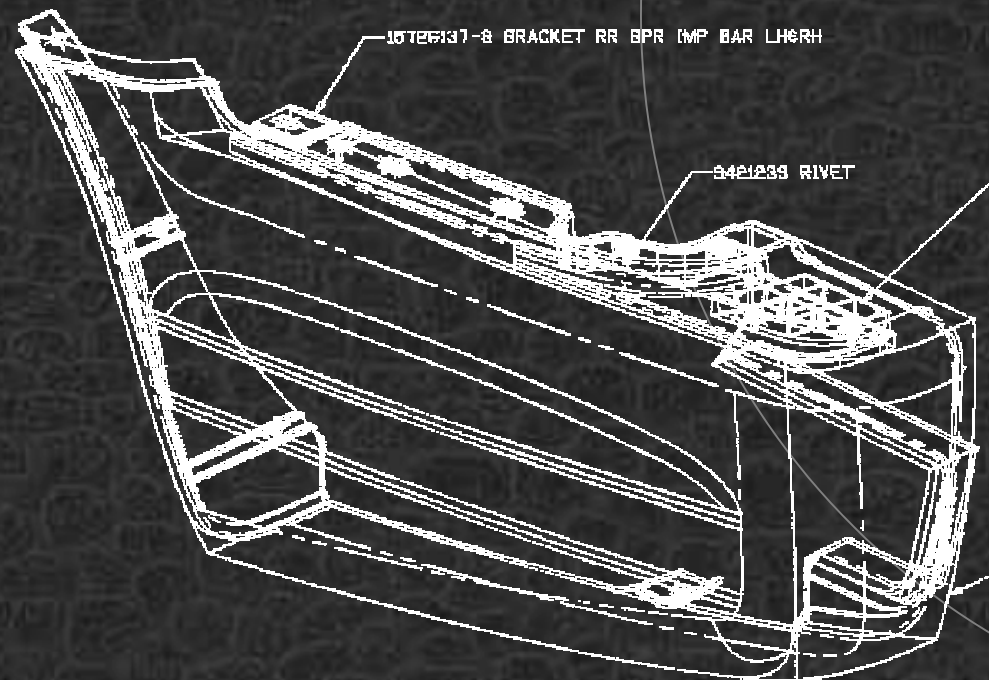
Endcap/Wheel
Cladding
Interface

Other
Experiences

→ More root causes:

→ 3-D curvature in endcap poorly designed
and poorly controlled in manufacturing

→ pushes parts outboard, leading to peel-away



Truck Group

Endcap/Wheel Cladding Interface: Section Studies

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Wall Display

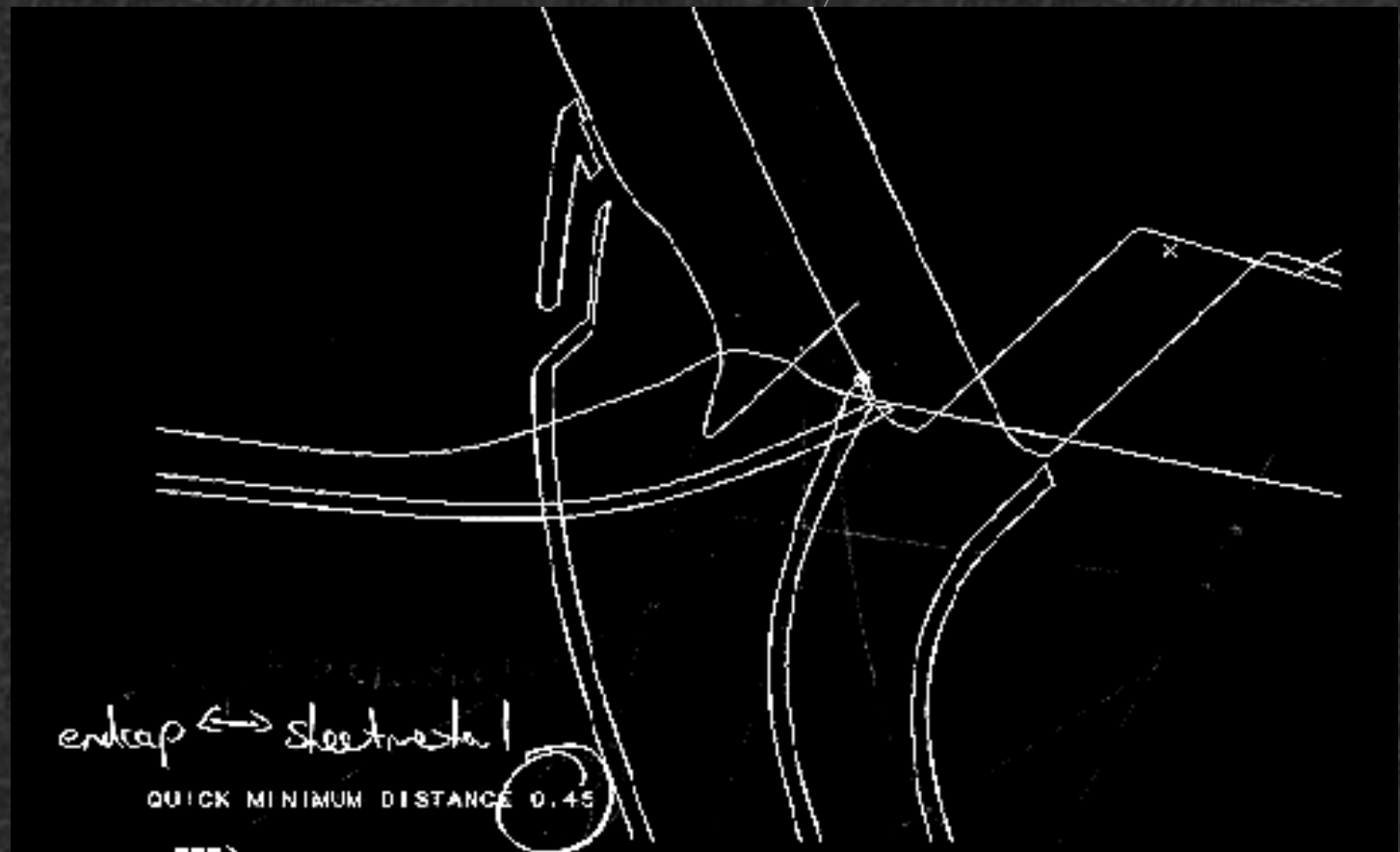
GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ 0.45 mm (endcap to sheetmetal)



Truck Group

Endcap/Wheel Cladding Interface: Section Studies

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ 3.12 mm (endcap sleeve to
sheetmetal)



Truck Group

Endcap/Wheel Cladding Interface: Section Studies

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ 4.43 mm (endcap sleeve to cladding)



Truck Group

Endcap/Wheel Cladding Interface: Section Studies

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ 14.39 mm (sleeve extension length)



Truck Group

Endcap/Wheel Cladding Interface: Action

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Mock-up review with Key Plastics
(endcap supplier)

→ check manufacturing process and part
variation

→ Control more dimensions

→ check 3-D curvature

→ current endcap only verified in length

→ Consider reducing sleeve length

→ reduce likelihood of sleeve pushing outward
on wheel cladding



Truck Group

Other Experiences: Bumper/Fascia/Grille

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

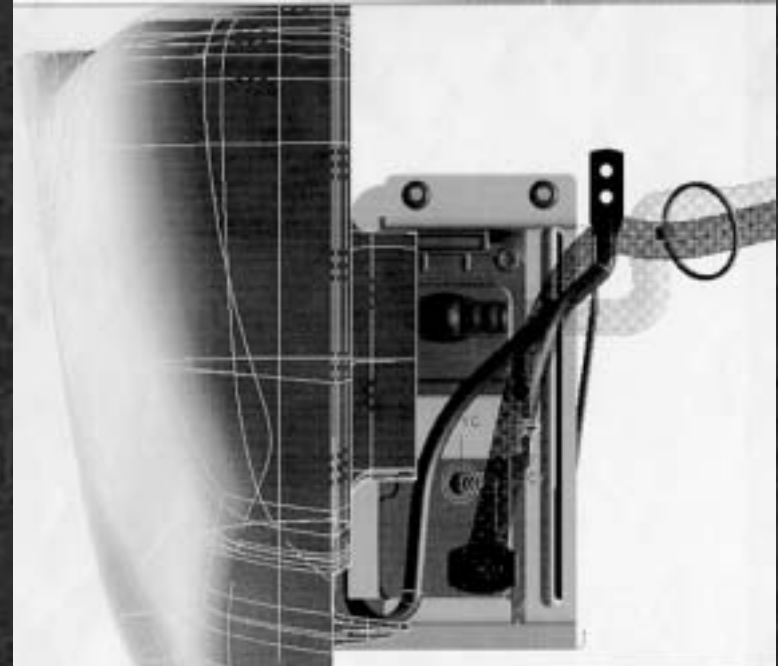
Endcap/Wheel
Cladding
Interface

Other
Experiences

→ S/T Utility endcap brace change
mocked up

→ allow for new fuel system packaging

→ redesign OK



Truck Group

Other Experiences: Bumper/Fascia/Grille

45

Wall Display

→ June 21: Validation Center

GMT 820C
Grille SSTs

→ Alex Winter

Fascia/Fender
Interference

→ June 29: Complexity Reduction
Workshop

Endcap/Wheel
Cladding
Interface

→ July 2: Design Studio

→ Ellen McTigue

Other
Experiences

→ July 20: Romeo RIM

→ Craig Denbaas



Truck Group

Other Experiences: Bumper/Fascia/Grille

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Wall Display

GMT 820C
Grille SSTs

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ July 28: Janesville Assembly and
Isuzu Warehouse

→ August 3: Complexity Reduction
Workshop

→ August 4: Vehma

→ Alex Winter

→ August 17: Gilbar

→ Alex Winter



Truck Group

Other Experiences: Education Relations

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Wall Display

→ June 24: Student Summit

GMT 820C
Grille SSTS

→ August 6: Validation Center

Fascia/Fender
Interference

→ August 6: Pontiac East Assembly

Endcap/Wheel
Cladding
Interface

→ August 12: Executive and Intern
Forum

Other
Experiences

→ Tech Club (June 30, July 28, August
10, August 24)



Truck Group

End of Summer Impressions (+)

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ Enjoyed responsibilities as a DRE

→ Valued the challenging “interfacial” and
“program manager” role of a DRE

→ Learned about the design to
production process

→ Experienced root cause analysis
and problem resolution

→ Assembly plant exposure



Truck Group

End of Summer Impressions (-)

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences

→ **Complex "system"**

→ time and money to implement actions

→ **Challenging but not in the
academically technical aspect**



Truck Group

Q & A

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Wall Display

GMT 820C
Grille SSTS

Fascia/Fender
Interference

Endcap/Wheel
Cladding
Interface

Other
Experiences



Truck Group

