

**ANSA for FMVSS201U:  
a flexible process**

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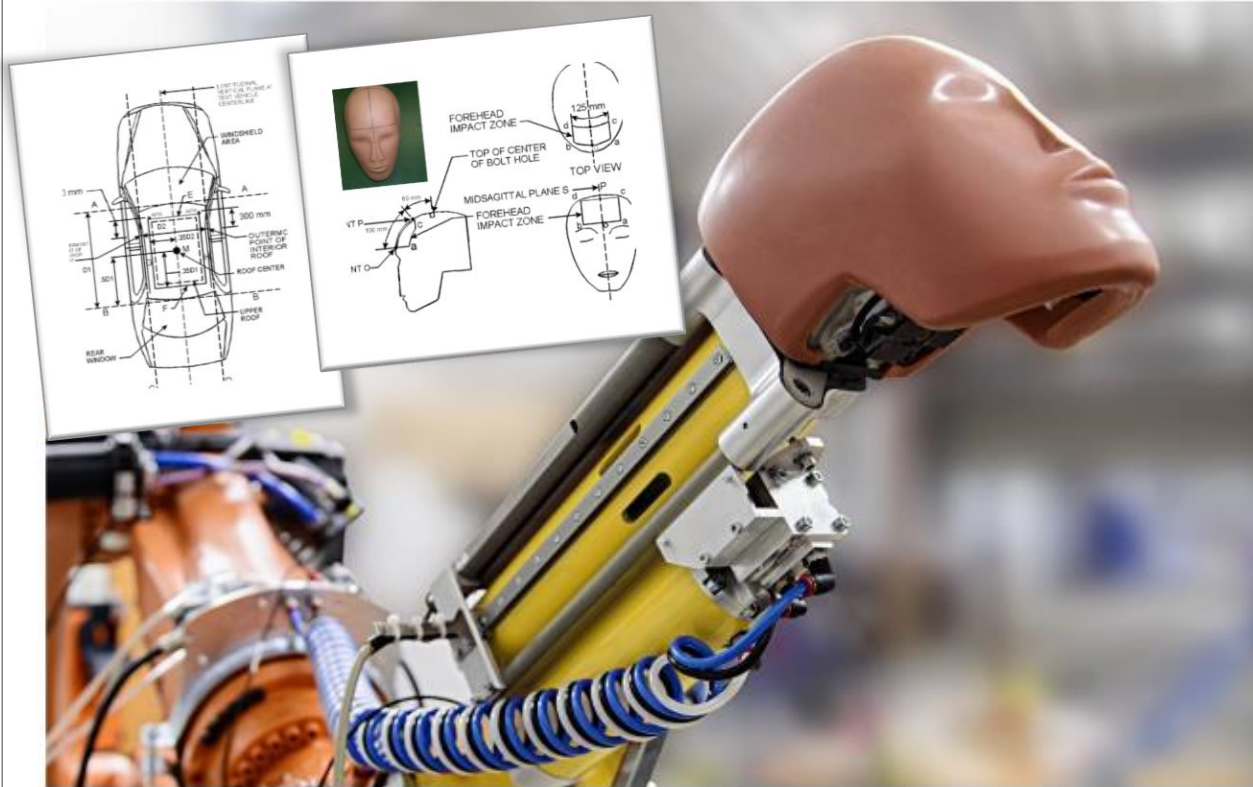
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# Introduction

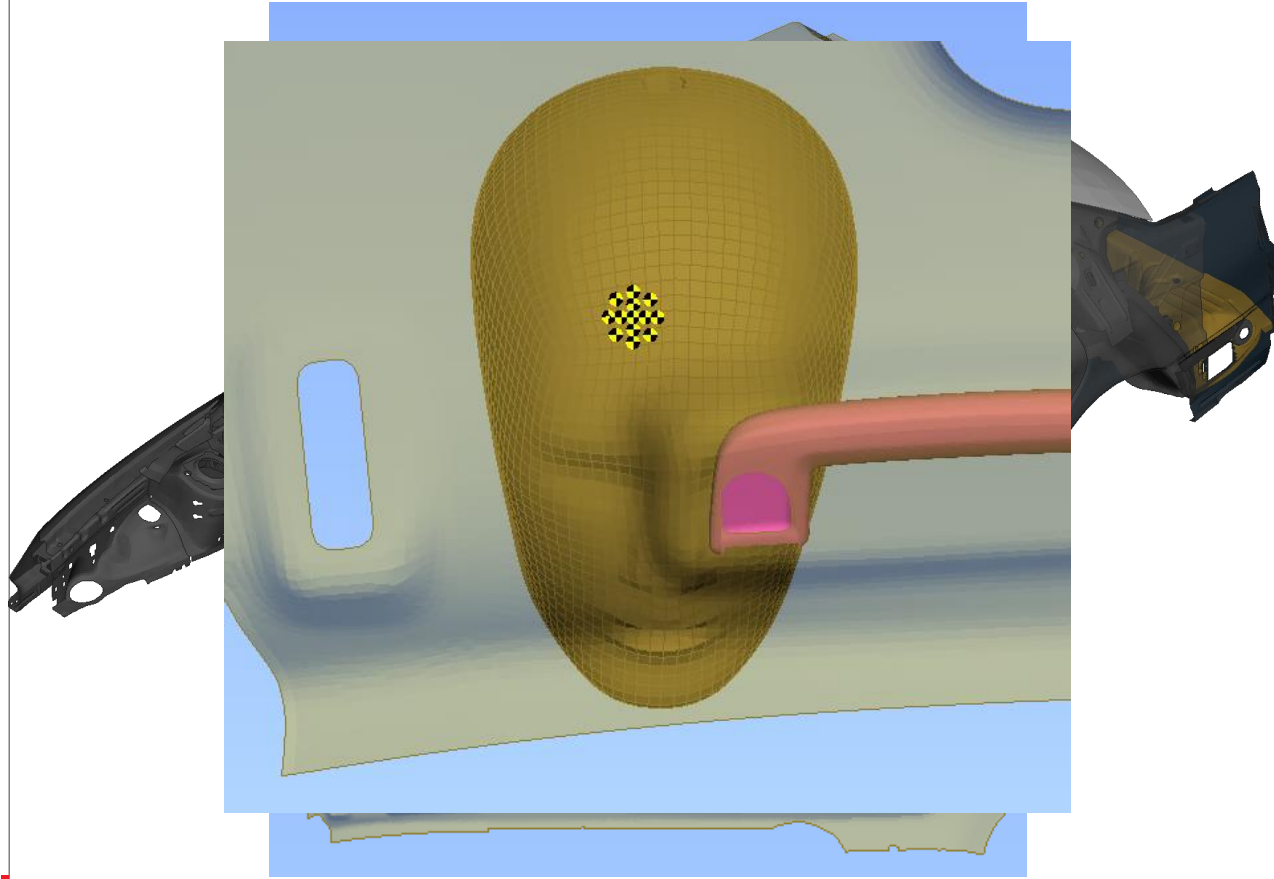
# Introduction

- Interior Safety
- FMVSS201U
- Marking
- Positioning
- Stochastic studies
- Automation



Manual, HPMS Field. "US Department of Transportation." *Federal Highway Administration Office of Highway Policy Information* (2010).

Up to now....



## Marking up to now..

- Regulation wise
- Customized
- Robustness

```
*NODE_TRANSFORM
```

```
1 22000005
```

```
*DEFINE_TRANSFORMATION_TITLE
```

```
Transformation_Of_Target_Point_03
```

```
1
```

```
POINT 1 0 0 0
```

```
POINT 2 0 0 1
```

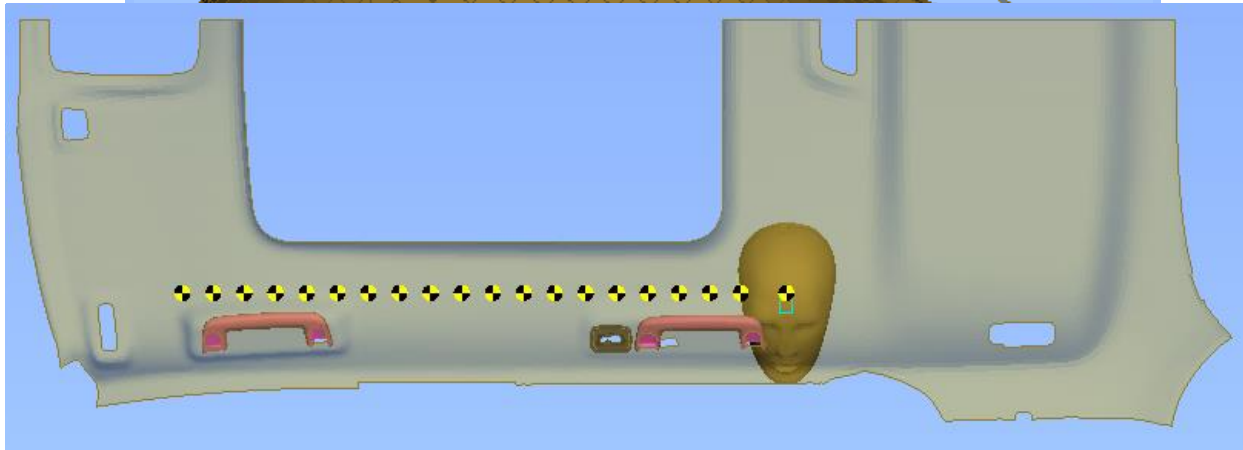
```
POINT 3 -1.625E-10 -1.70121E-6
```

```
ROTATE 1 2 270
```

```
ROTATE 1 350.0813278
```

```
TRANSL 3706.11452 -429.349021509 56821
```

```
*END
```

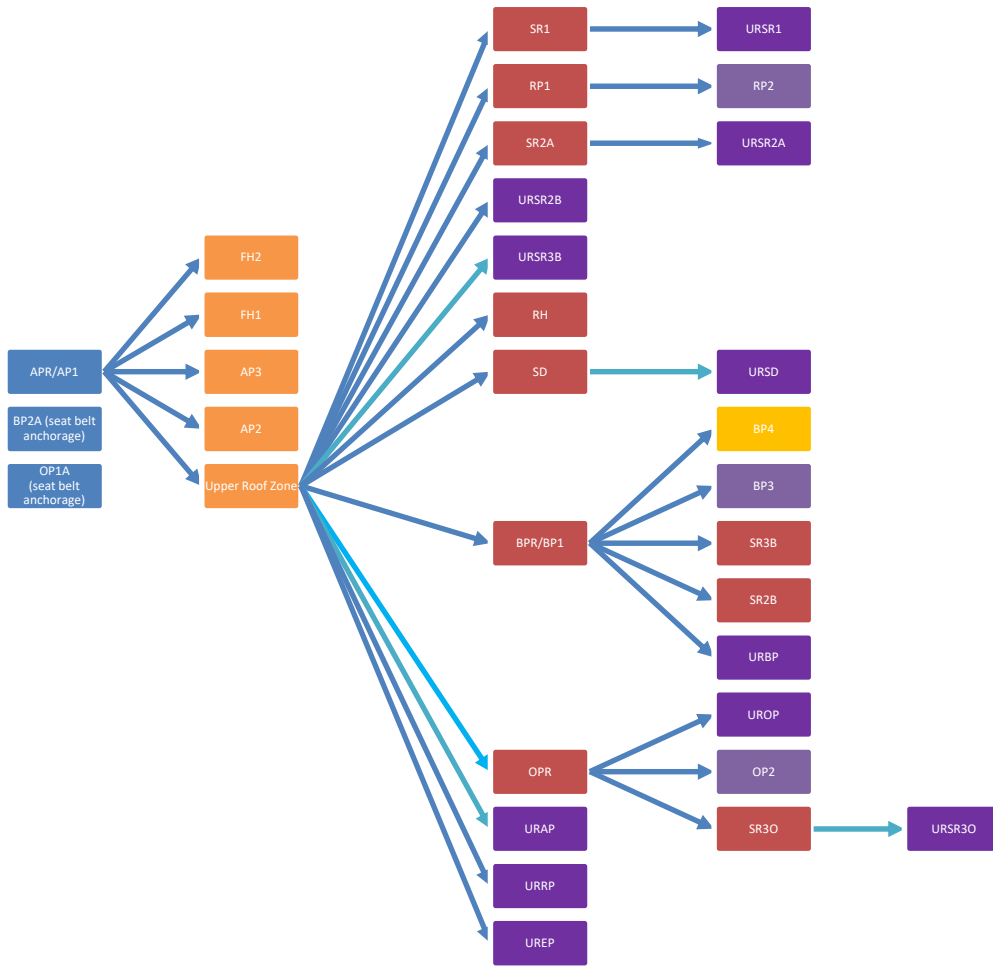


## Positioning up to now...

- Minimum contact distance
- Maximum Vertical angle
- Conservative 50° positioning
- Massive positioning of all Targets
- Bulk loadcase creation

# Ford needs in FMVSS201U

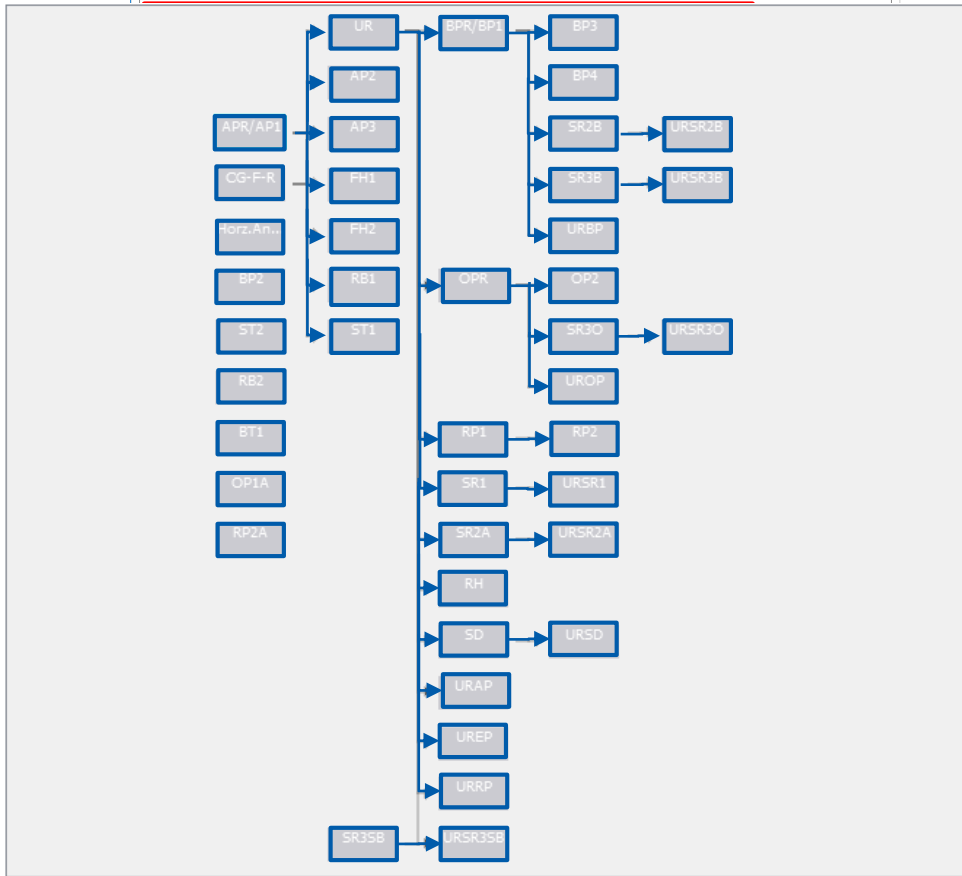




# Ford requests

- Flow diagram
- Both sides
- Single/Chain creation
- Recalculation of Targets
- Skip Targets
- Save marking session
- Upper Roof points
- Positioning enhancements

# Interactive FMVSS201U tool



# Flow diagram

- Flow of Targets
- Check the dependencies





# Modify Auxiliaries



- Point calculation
- Modify auxiliary data
- Notification – Target Status
- Re-calculation

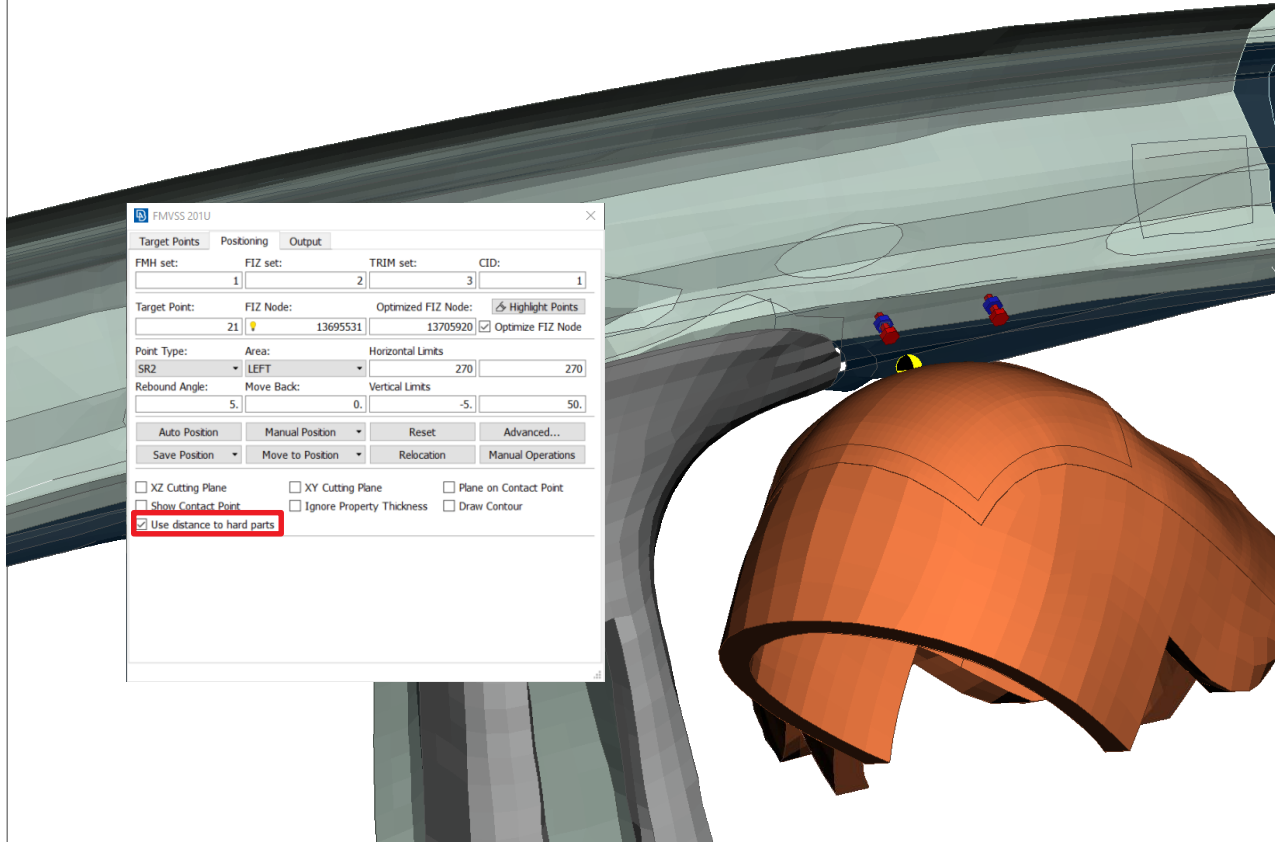


## Additional Targets and Stochastic ones

- Additional upper roof Targets
- Robustness Targets

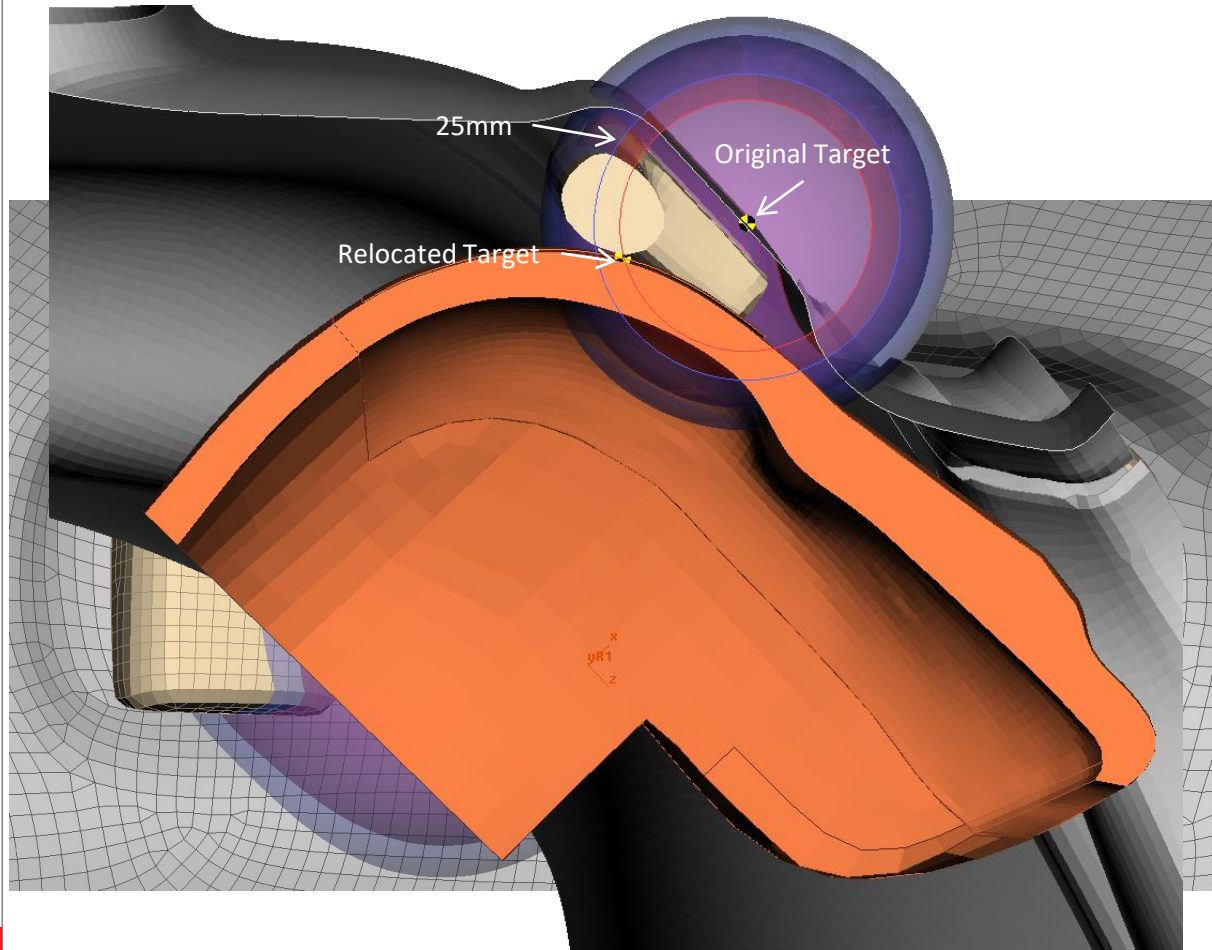
# New Positioning capabilities





## Consideration of Hard Parts

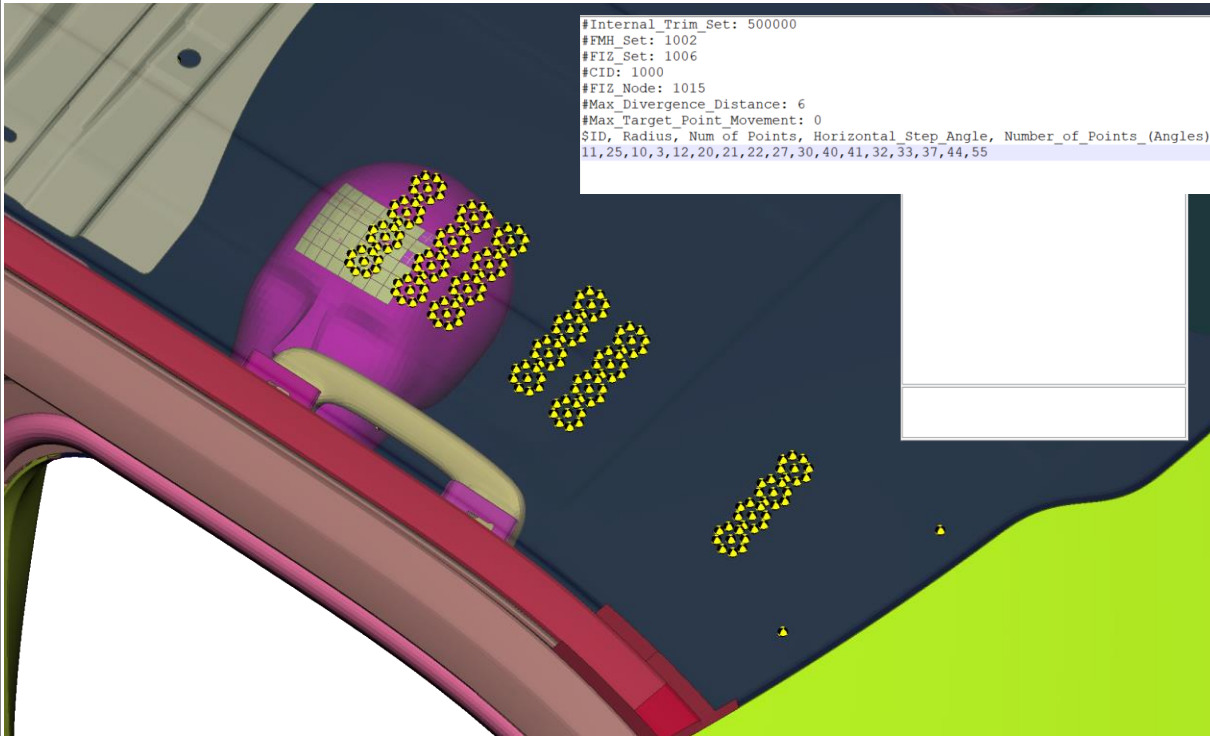
- Normal positioning
- Hard Parts behind the trim
- Positioning considering the Hard Parts



## Relocation

- Non contactable Targets
- User specified relocation distance
- Relocation
- Positioning on the relocated Target

# Automated Process at Ford



## FMVSS201U Task

- Original Positioned Targets
- .csv configuration file
- Task of scripts
- Robustness Points
- Targets with different Horizontal angle
- Positioning
- Output

# Conclusions

## Conclusions

- Functionality given up to now - Powerful tools for marking and positioning
- Ford suggestions - Marking process needs to be flexible
- Interactive FMVSS201U covers everything in marking level
- Advanced positioning capabilities with 'relocation' and 'hard parts'
- Automated process in Ford for Stochastic analysis
- Complete toolset for FMVSS201U analysis



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