

# 3DTRANSVIDIA

CAD Data Translation, Repair, Healing

2006

## Data Import

3DTransVidia solves frustrating data incompatibility problems occurring during the import of 3D models. It seamlessly imports native data formats (CATIA V4, CATIA V5, CADDs, P/E, UGS, etc.) and neutral data formats (IGES, VDA-FS, STEP, etc.) and performs necessary model repairs to form a valid solid.

## Model Tolerance

3DTransVidia automatically finds the right model tolerance value by verifying the size of all model entities. The user controls the model tolerance by choosing between the following options:

- File tolerance (value stored in the file)
- Estimated tolerance (recommended default value)
- User tolerance

## Automatic Repair

The automatic repair resolves over 60 typical geometry and topology conflicts. The repair is performed within a specified model tolerance without changing or deforming the original model. Even an inexperienced CAD user will complete the repair within very short time.

## Geometry Conflicts

Invalid curve parameterization  
Gaps in composite curve  
Degenerative segments in poly-line  
NURBS improving simplification of curves  
Incorrect knots vector in the NURBS curve

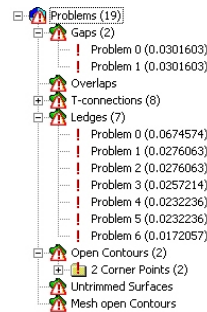
## Topology Conflicts

Invalid edge vertices  
Invalid loop orientation in Parametric Space (PS)

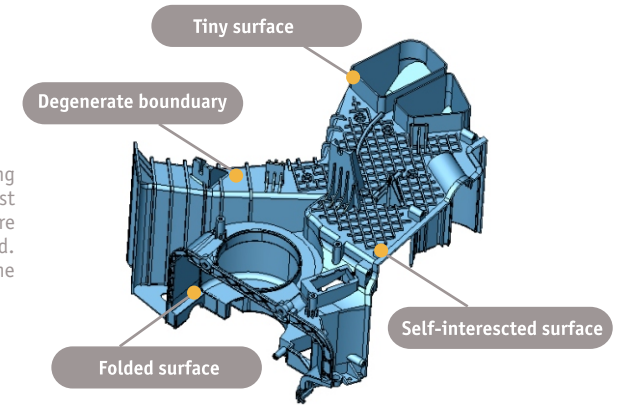
Missing loop definition in Model Space (MS)  
Missing loop definition in PS  
Invalid edge orientation  
Lack of loop synchronization between MS and PS  
Gaps in loop in MS, PS  
Not closed loop in MS, PS  
Self-crossing loop in PS  
Missing outer loop in face definition  
Wrong index of outer loop  
Invalid loop orientation  
Inconsistent face normal

## Error Classification

3DTransVidia automatically classifies types of errors remaining in the model after automatic repair and suggests a most suitable manual repair workflow. Problematic places are visible in the project tree and remain there until they are fixed. The repair parts are automatically merged with the rest of the model. The errors are classified into the following categories:



- Gaps
- Overlaps
- T-connections
- Ledges
- Mesh open
- Untrimmed surfaces
- Open contours



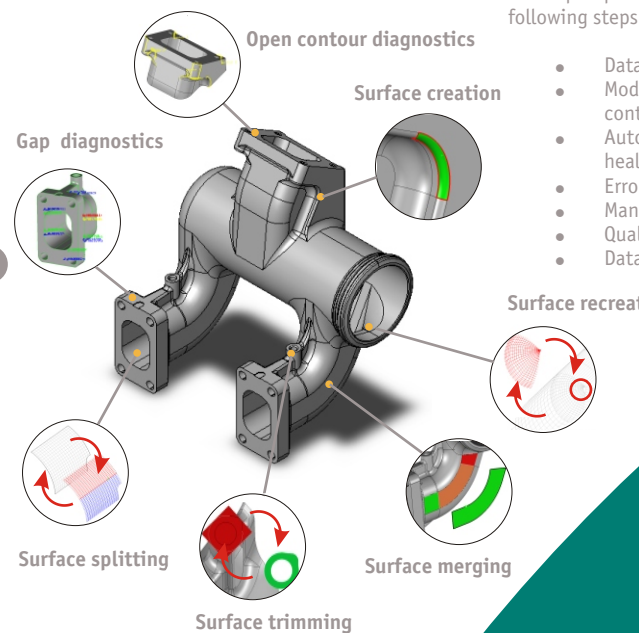
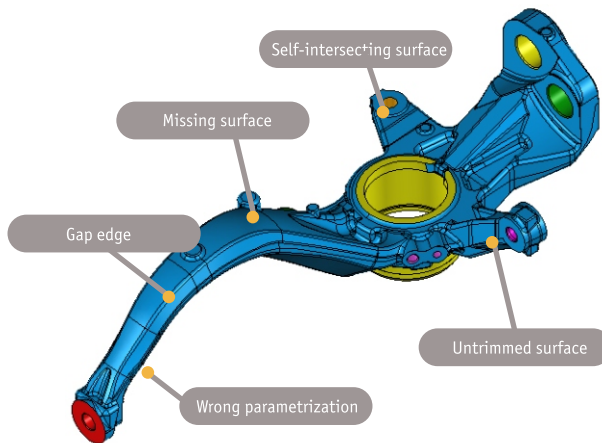
## Quality check

3DTransVidia verifies the quality of a 3D model definition according to the international automotive standards (VDA 4955, JAMA and AIAG D-15). The quality criteria can be set by the user to meet internal company standards or reflect the model quality required in a manufacturing or simulation process.

3DTransVidia is designed to repair 3D models created in different CAD systems. The repair process is automatic and can be applied to most complex 3D models and assemblies. The repair is always performed within the model tolerance maintaining the original model integrity and preventing model deformations. 3DTransVidia supports both native and neutral data formats.

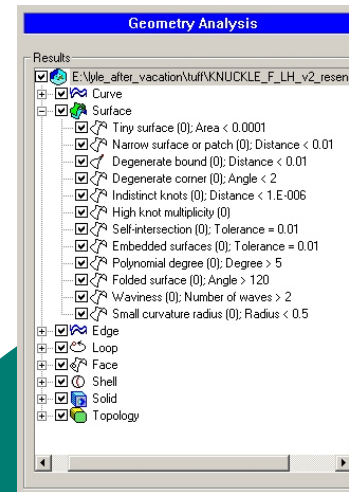
CAD models often lack quality and precision required by the complex engineering processes (CAD -> CAE -> CAM). The geometrical and topological flaws are main obstacles in data translation. Complex CAD operations as model re-scaling, offsetting or Boolean operations are impossible to perform on invalid models. Repairs in native CAD system are in general difficult and time consuming as CAD system are not designed for this purpose.

3DTransVidia offers ultimate solutions to repair existing 3D CAD models to the desired quality. Geometry check tools verify model compliance against the automotive industry standards as VDA 4955-2, JAMA and AIAG D-15 or user defined quality criteria.



The repair process consists of the following steps:

- Data import
- Model tolerance control
- Automatic repair & healing
- Error classification
- Manual repair
- Quality check
- Data export



Data translation

## Data Import

### Native formats:

CATIA V4 (.model, .exp)  
CATIA V5 (.CATPart, CATProduct)  
UNIGRAPHICS (.prt)  
PARASOLID  
ACIS  
CADDs (explicit model)  
ROBCAD

### Neutral formats:

IGES 5.x - 6.x  
VDA-FS  
STEP  
STL  
VRML

## Data Export

### Native formats:

CATIA V4 (.model, .exp)  
CATIA V5 (.CATPart, CATProduct)  
PARASOLID  
ACIS

### Neutral formats:

IGES 5.x - 6.x  
VDA-FS  
STEP  
STL  
VRML, BMP

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