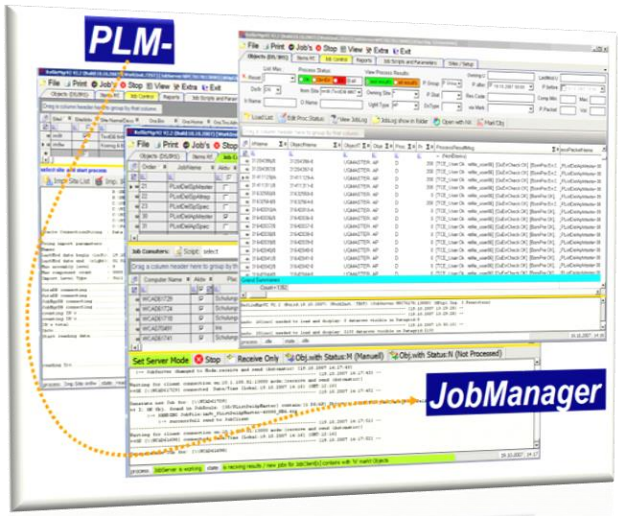


PLMJobManager - Presentation
Compare NX Data via NXCheckBox

Table of content

Introduction – initial situation

CheckBox is a solution to extract geometrical data, non geometrical data and drawings from NX-Parts for comparison, to detect differences between these parts.

Ever NX Version change raises the following questions:

- Does **“my data”** change because of the conversion to the new NX version?
- Can **“my data”** still be opened, and updated?
- Is **“my data”** in the new version in the same way manageable as in the current productive version?

This questions can only be answered when the **“own data”** is verified through appropriate methods!

A manual verification is very comprehensive and requires a **huge amount of time**. In addition, the tests are only successful if such manual checks are performed systematically. The **immense time** required for manual testing in practice leads to the fact that this part of the conversion is usually treated only superficially.

To answer these questions the software **CheckBox** was developed in cooperation with the companies **BSH, KBA, MTU, Renk, ASML** and **S-PLM**

Introduction – initial situation

The goal:

Developing a tool that answers the following question:

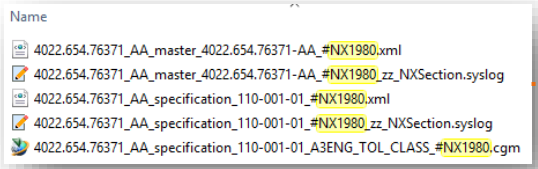
How does my legacy NX data behave when it is loaded and updated with the new NX version?

The following slides show you the concept on how to check the data in a save way with the help of the NXCheckBox and the PLMJobManager.

Introduction CheckBox Process Overview

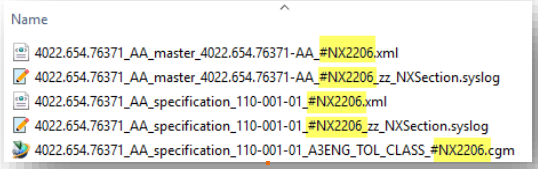
Step 1: Extraction NX1992 Data

Result: extracted NX1992 Data



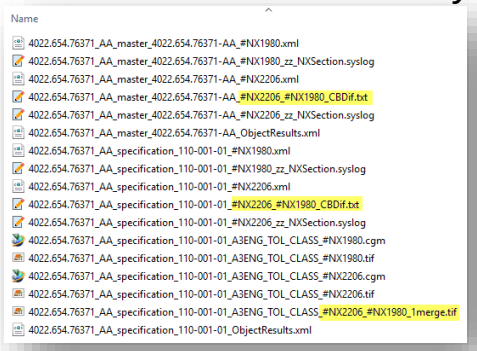
Step 2: Extraction NX2206 Data

Result: extracted NX2206 Data



Step 3: Generate the analysis data

Result: NX1992-2206 Analyze Data

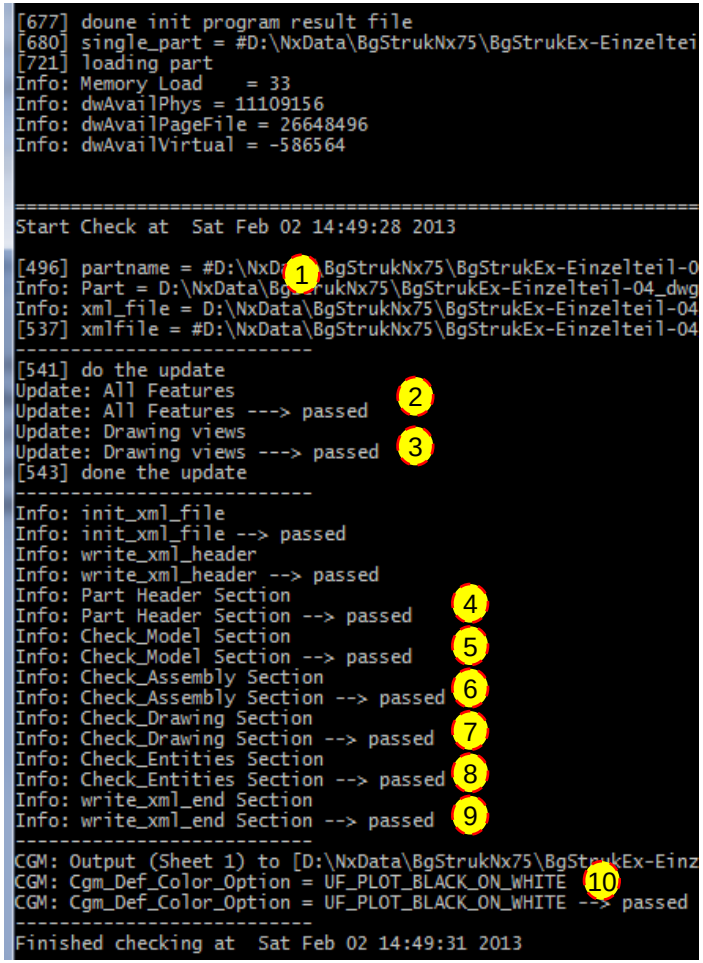


Introduction NXCheckBox Data Extraction

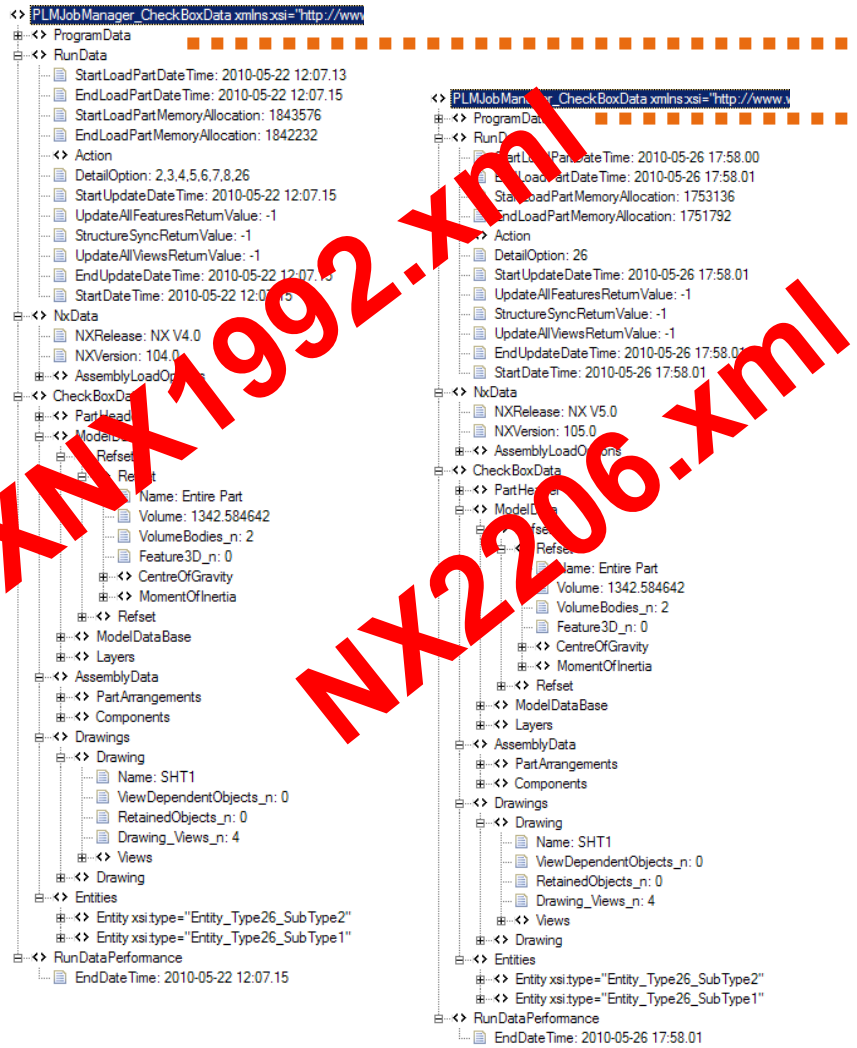
After extracting NXCheckBox Data the CB.Log files is analysed an the results are listed as partial Results. The following list shows how we do classify the NXCheckBox extraction Results.

- PL = Part load (1)
- UF = Update all Feature (2)
- UD = Update Drawing (3)
- PH = Part Header (4)
- MD = Model Data (5)
- AS = Assembly Data (6)
- DR = Drawing Data
- EN = Entity (8)
- CBXml = CB.Data File (xml) (9)
- CGM = Drawing .cgm Files (10)

The results of extracting data is imported into the JobServer Database.



Introduction NXCheckBox Compare Data



NXNX1992.xml

NX2206.xml

Compare → having Differences? **YES** **NO**

Create extended Data:
- DifReport.txt
- Dif.tif

In this case it is required to Check what is the reason for this differences !

Result Is OK

Introduction NXCheckBox Details off Extracted XML Data

Job Data:

- ProgramData
  - ProgramName: NxCheckBox
  - ProgramRelease: V1.1.1.18
  - BuildDate: (May 20 2010)
  - CustomLicense: unknown
- RunData
  - StartLoadPartDateTime: 2010-05-26 17:58.00
  - EndLoadPartDateTime: 2010-05-26 17:58.01
  - StartLoadPartMemoryAllocation: 1753136
  - EndLoadPartMemoryAllocation: 1751792
  - Action
  - DetailOption: 26
  - StartUpdateDateTime: 2010-05-26 17:58.01
  - UpdateAllFeaturesReturnValue: -1
  - StructureSyncReturnValue: -1
  - UpdateAllViewsReturnValue: -1
  - EndUpdateDateTime: 2010-05-26 17:58.01
  - StartDateTime: 2010-05-26 17:58.01
- NxData
  - NXRelease: NX V5.0
  - NXVersion: 105.0
  - AssemblyLoadOptions
    - load_options: 1 [UF_ASSEM_load_from_search_dirs]
    - parts_list: 0
    - update: 1 [UF_ASSEM_update_report]

ModelData:

- ModelData
  - Refsets
    - Refset
      - Name: Entire Part
      - Volume: 1342.584642
      - VolumeBodies_n: 2
      - Feature3D_n: 0
      - CentreOfGravity
        - X: 10.078155
        - Y: 7.560351
        - Z: 1.238954
      - MomentOfInertia
        - X: 815346.315993
        - Y: 1455367.113393
        - Z: 2220782.513485
    - Refset
  - ModelDataBase
    - Features
      - TotalFeatures_n: 0
      - AliveFeatures_n: 0
      - SuppressedFeatures_n: 0
      - CondemnedFeatures_n: 0
      - DeletedFeatures_n: 0
      - TemporaryFeatures_n: 0
    - Bodies

Component:

- Components
  - Component
  - Component
    - File: %UGMGR=V3.2 PH=QnBdUZwmVe1p
    - Handle: RM%UL=V1.0 PH=wTDdUZwmVe
    - SuppressState: 0
    - SuppressByExpression
    - ReferenceComponent
    - RefsetCurr: EINFACH
    - InstanceName: BGSTRUKEX-KBG-01_01
    - ComponentLevel: 2
    - Callout: 10
    - MemberCount: 59
    - ComponentArrangement
      - UsedArrangement: Arrangement 1
    - Mating
    - Matrix
      - X1: 1.000000
      - Y1: 0.000000
      - Z1: 0.000000
      - X2: 0.000000
      - Y2: 1.000000
      - Z2: 0.000000
      - X3: 0.000000
      - Y3: 0.000000
      - Z3: 1.000000
      - originX: 360.000000
      - originY: -420.000000
      - originZ: 0.000000

Introduction NXCheckBox Details of Difference Report

DifReport.txt

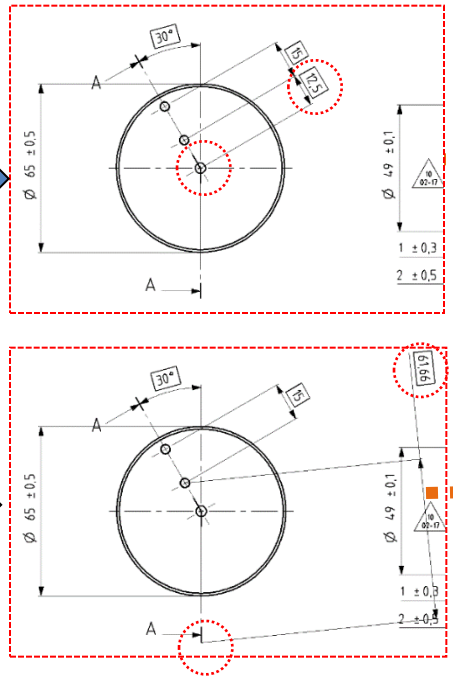
```
CheckBox Report:
JM CheckBoxVer...:V2.696 (Build:26.10.2010)
Date.............:26.10.10 22:37:10

CheckBox.Data 1:[NX V3.0[103.0]]                                    |CheckBox.Data 2[NX V7.5[107.0]]
--------------------------------------------------------------------|-------------------------------------------------------------------------
CliName.:[@DB/4022.625.4014/2/specification/110-001-01]             |CliName.:[@DB/4022.625.4014/2/specification/110-001-01]
PartDesc:                                                           |PartDesc:
PartHis.:~                                                          |PartHis.:25 19 Oct 10 00:55 NT Intel jfeuerst NX 7.5.1.5 - External U~
PartHis.:24 18 Oct 10 22:29 NT Intel jfeuerst NX 3.0.3.2 - External ~|PartHis.:24 29 Jul 10 11:47 NT Intel JFeuerst NX 7.5.0.32 (NX Manager~
PartHis.:23 10 May 10 17:00 NT Intel gmiddel NX 3.0.3.2<!<OT_PUB>!> |PartHis.:23 10 May 10 17:00 NT Intel gmiddel NX 3.0.3.2<!<OT_PUB>!>
PartHis.:22 10 May 10 16:41 NT Intel gmiddel NX 3.0.3.2<!<OT_PUB>!> |PartHis.:22 10 May 10 16:41 NT Intel gmiddel NX 3.0.3.2<!<OT_PUB>!>
PartHis.:21 10 May 10 16:32 NT Intel gmiddel NX 3.0.3.2<!<OT_PUB>!> |PartHis.:21 10 May 10 16:32 NT Intel gmiddel NX 3.0.3.2<!<OT_PUB>!>
--------------------------------------------------------------------|-------------------------------------------------------------------------
Data extraction info:                                               |Data extraction info:
NxVer...:NX V3.0[103.0]                                             |NxVer...:NX V7.5[107.0]
NxCB.Rel:V1.1.1.18 Build:(Aug 27 2010)                              |NxCB.Rel:V1.1.1.18 Build:(May 20 2010)
Date....:18.10.10 22:29:51                                          |Date....:19.10.10 00:55:03
=============================================================================================================================================
CheckBox Compair Result:
ResultIsErr......:True
ResultHasWaring..:True
ResultCode.......:64
ResultCodeBinary.:64
ResultMsgShort...:[PH:OK][MD:OK][AS:OK][DR:OK][EN:64 Msg:Err:Origin][Pef:OK]
=============================================================================================================================================
CheckBox compair report:
PartHistoCheck: OK
Warning:DR(32):[ViewDependentObjects_n].[A3ENG_NEW]:[Value Differ(<>)!!]
 |->NX V3.0[103.0]: 74
 |->NX V7.5[107.0]: 73
++Error:EN(64):[Origin]:[X:[240.553540] Y:[291.117523] Z:[0.000000]]
 |->NX V3.0[103.0]: [Type:[26] Subtype:[3] Desc:[UF_dim_parallel] Name:[] Handle:[RM%UL=V1.0 PH=gBmdYwshQS4FxA AUID=Rgod6KgTQS4FxA R0000820300000018]
 |              Origin:[X:[153.753462] Y:[241.003475] Z:[0.000000]] Texts:[12,5]]
 |->NX V7.5[107.0]: [X:[153.753462] Y:[241.003475] Z:[0.000000]]
Warning:EN(64):[Texts.Text] [61,66]
 |->NX V3.0[103.0]: [Type:[26] Subtype:[3] Desc:[UF_dim_parallel] Name:[] Handle:[RM%UL=V1.0 PH=gBmdYwshQS4FxA AUID=Rgod6KgTQS4FxA R0000820300000018]
 |              Origin:[X:[153.753462] Y:[241.003475] Z:[0.000000]] Texts:[12,5]]
 |->NX V7.5[107.0]: [12,5]
PerfDif.LoadPart.Factor>1.2 Warning:4.00sec(Nx7.5)/1000msec(Nx3)=4.0[PerfDifFactor]
```

Introduction NXCheckBox Analyze Data Compare Drawings

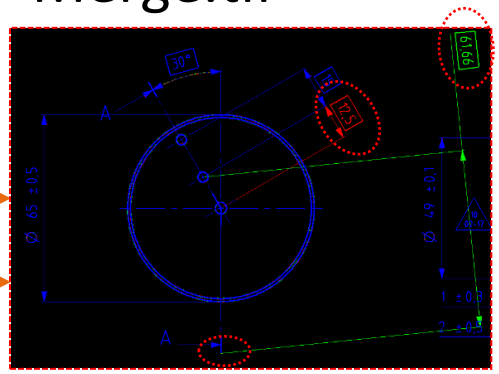
NXCheckBox extracts CGM files from specifications. These CGM files are used to create output data.

NX8.5.cgm

NX12.cgm



Merge.tif



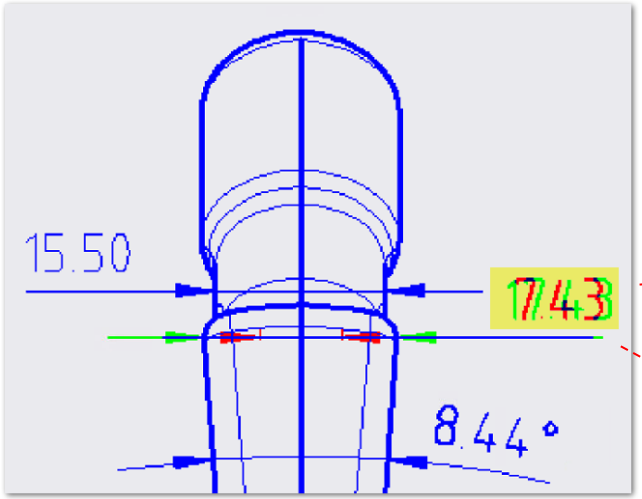
From this file we extract the PPM (Parts per Million) value which shows if drawings have differences.
The Merge.tif image file is also be used to see quick differences between drawings.

This method was developed by **Thomas Körner from B/S/H**.

Introduction NXCheckBox Analyze Data Compare Drawings

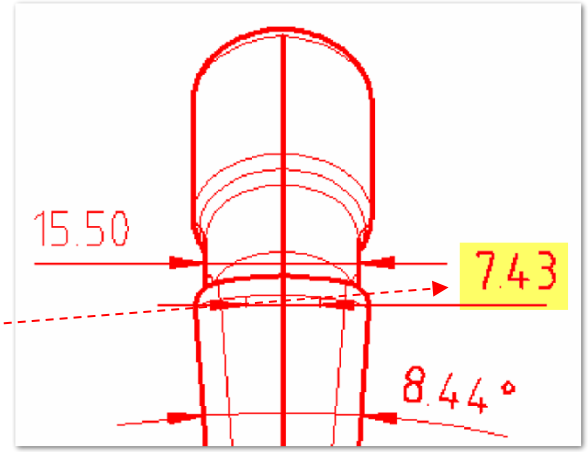
Example: Dimension value change

NX12 – NX2027 - Merge.tif

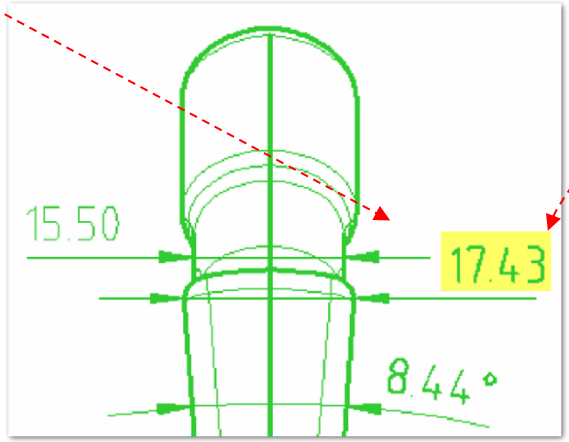



```
++Error:EN26.....: Text Values changed.: Val.Dif:[Is not equal]
 |-> Object.....: Type:[26] Subtype:[1] Desc:[UF_dim_horizontal] Name:[5
 |                |-> Origin....: X:[366.307696] Y:[233.993301] Z:[0]
 |                |-> Location..: Sheet:DRAW1
 |                |-> Text.Value: TextInfo-1:(Texts:['7.43']/Type:[1]/For
 |-> NX12.0.2 MP8.....: Original Text:['7.43']  -> */* Entire Texts:['7.43']
 |-> NX2027.5000 [Pu:NO].....: Original Text:['17.43'] -> */* Entire Texts:['17.43']
```

NX12



NX2027

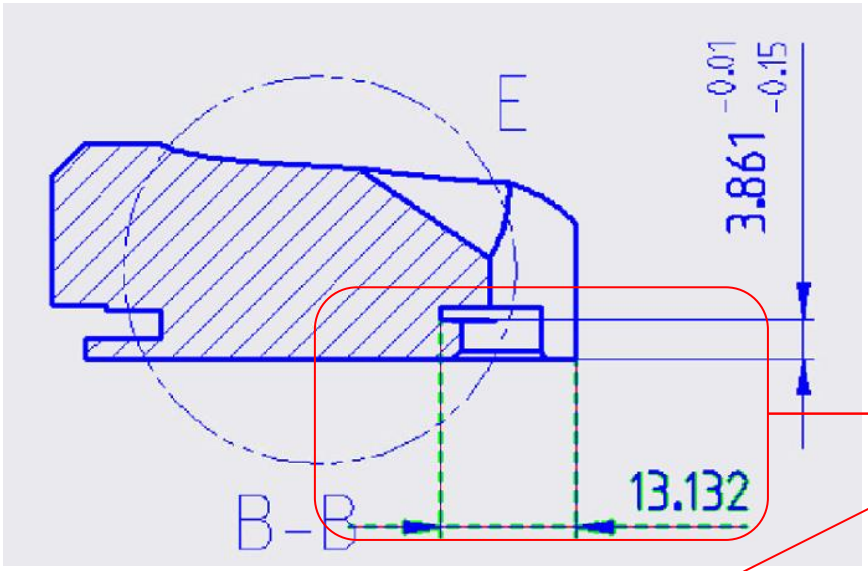


Analysis:
Dim Value changed because Dimension geometry relation changed.
Perhaps the dimension in NX2027 is as the design intent.

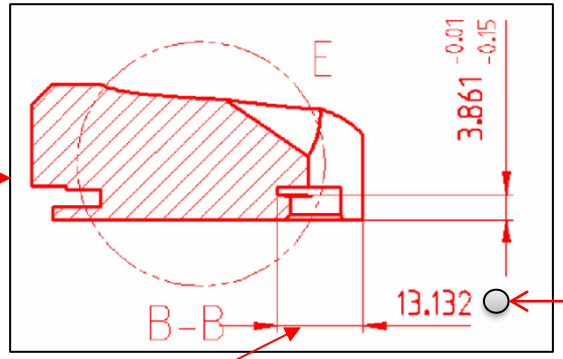
Introduction NXCheckBox Analyze Data Compare Drawings

Issue: Dimension retain status changes to be retained

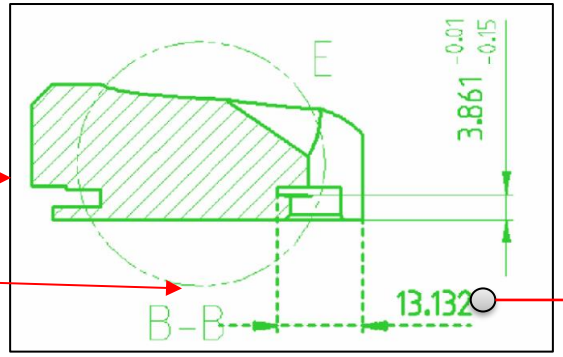
NX12 – NX2027 - Merge.tif



NX12



NX2027

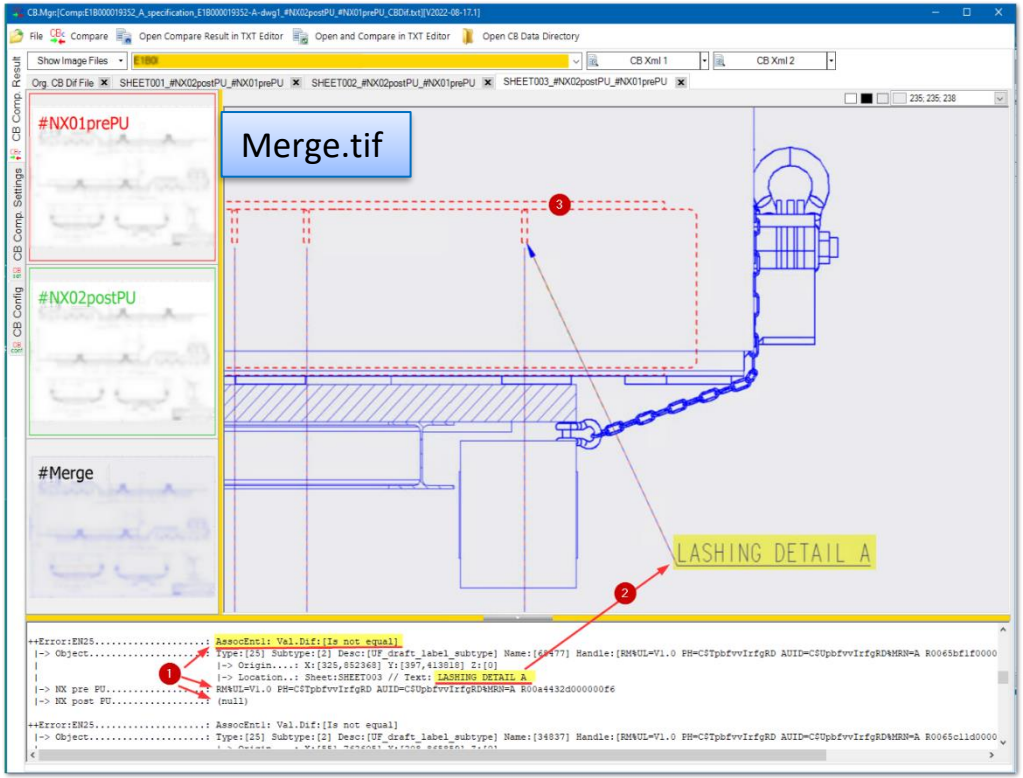


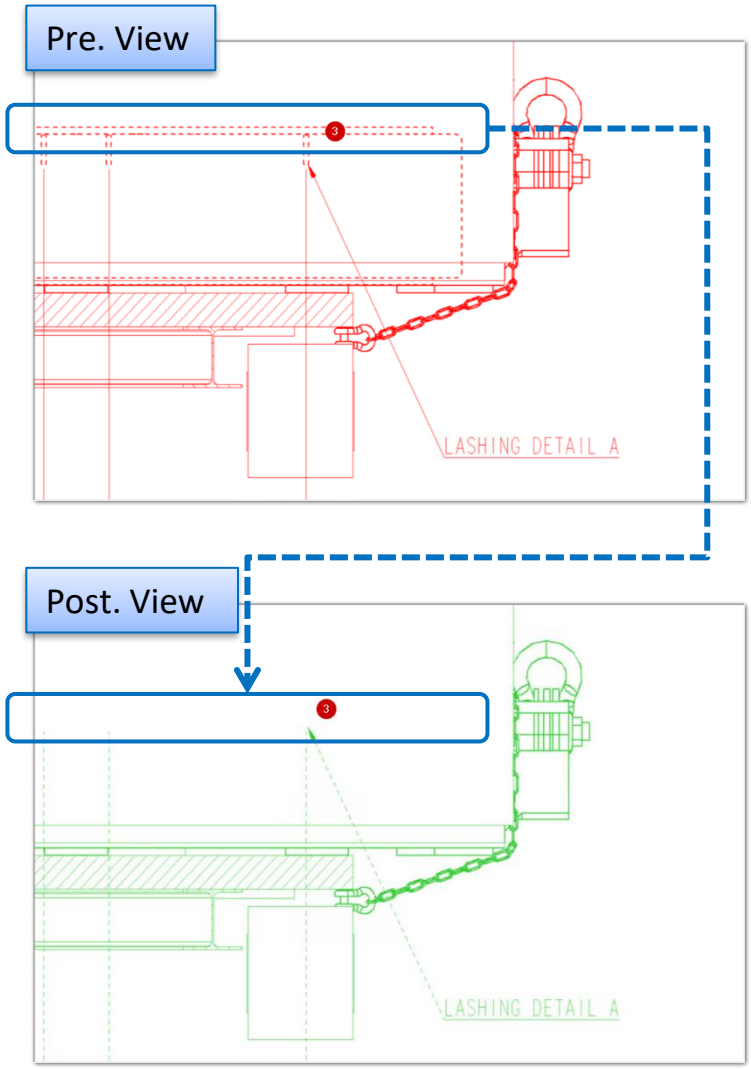

```
++Error:DR.....................: RetainedObjects_n: Val.Dif:[Is not equal]
 |-> Object.....................: DRAW1
 |-> NX12.0.2 MP8..............: 0
 |-> NX2027.5000 [Pu:NO]........: 1
```

Analysis:
Dim retains because dimension were assigned to instable geometry

Introduction NXCheckBox Analyze Data Compare Drawings

Example below shows an Issue found by missing AssocEnt1 (1)





In this case the Issue is that Label **(2)** is missing Associativity where cause because in Post View Lines **(3)** are Missing on some reasons.

The Issue were found at the Dif Report **(1)** and also at the Tif compare **(3)**

Introduction CheckBox Analyze Data Compare CB.xml files

All analyzed Data from XML and from Drawing compare will be combined to one Result:

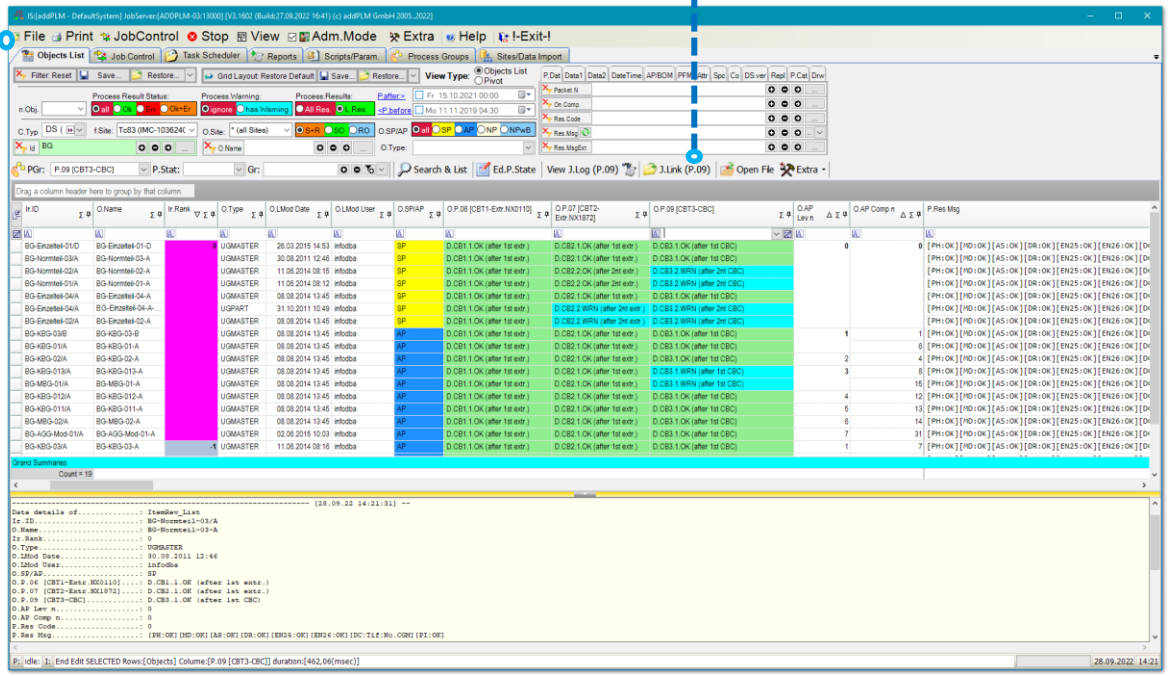
- PH = Part Header (from XML) 1
- MD = Model Data (from XML) 2
- AS = Assembly Data (from XML) 3
- DR = Drawing Data (from XML) 4
- EN = Entity Data Dim/Text (from XML) 5
- PPM= Dif.tif (from Drawing compare) 6

– If the Result Value is = 0 no differences between the part's are found.
Example:
[PH:OK] [MD:OK] [AS:OK] [DR:OK] [EN:OK] [PPM:OK]
1 2 3 4 5 6

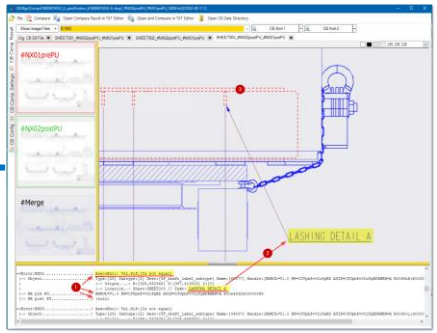
– If the Result Value is > 0 there are differences between the Parts → the Parts must be checked !
Example:
[PH:OK] [MD:ERR:Lay;Refs;] [AS:OK] [DR:OK] [EN:OK] [PPM:3078]
1 2 3 4 5 6

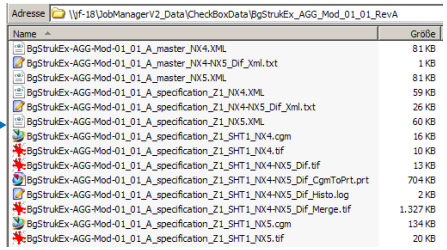
Introduction NXCheckBox Analyze Data Get Entire Results

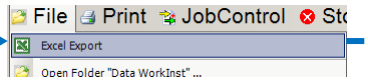
All Result's are view via PLMJobManager

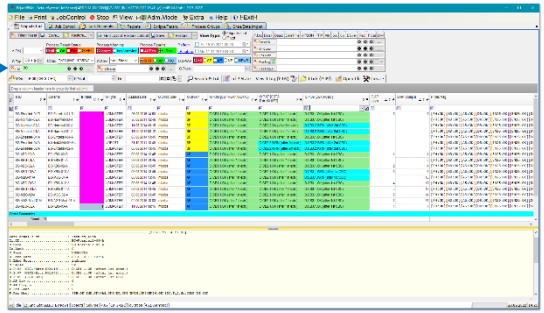


Via J.Link you have a Quick access to all Data via CB.Mgr.Comp.







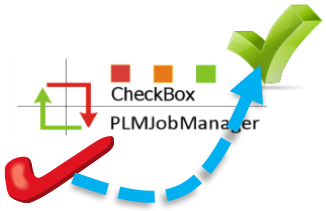


You export the Data to Excel analyze the Result for own Report's

Benefits of using NXCheckBox

Why to use it?

- ✓ **Getting overview about NX – TC Software Quality**
- ✓ **Getting overview about your NX - TC Data Quality**
- ✓ **Helps to setup NX - TC customer settings**
- ✓ **Helps to find issues before designers working with the new NX – TC Version**
- ✓ **Helps to keep the value of PLM Data**
- ✓ **Reduces cost's "after upgrade" because Data and software issues can be better identified and solved before upgrade.**
- ✓ **Reduces Upgrade risks**



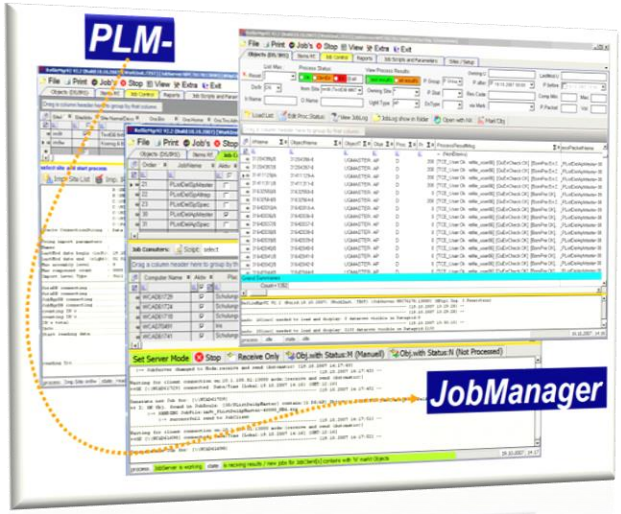
Introduction NXCheckBox Involved Company's

The CheckBox Software is developed by Mr, Bernd Schieber (SISW Stuttgart).
Software specification, project coordination and PLMJobManager integration was done by Mr. Josef Feuerstein (addPLM)

All Company's did spend 3 Day's of Services to SISW. (defined at Meeting 28.04.2010)

At the Meeting (on 24.11.2022) the participants' agreed that it is possible for another company to join this Project. To take part in this Project the new company has also to spend 4 Day's of Services on this project.
Info: The PLMJobManager Software is a separated Software and is not Part of the CheckBox Tool.

System requirements



JobServer:

- Win10 Workstation
- W2008 .. W2019 Server

JobClient:

- Win10 Workstation
- W2008 .. W2019 Server
- with Full NX- und TC- installation