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Variant Configuration User Manual

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Contents

Purpose

User manual provides the configuration guide and application of variant configuration in Production Planning.

Scenario

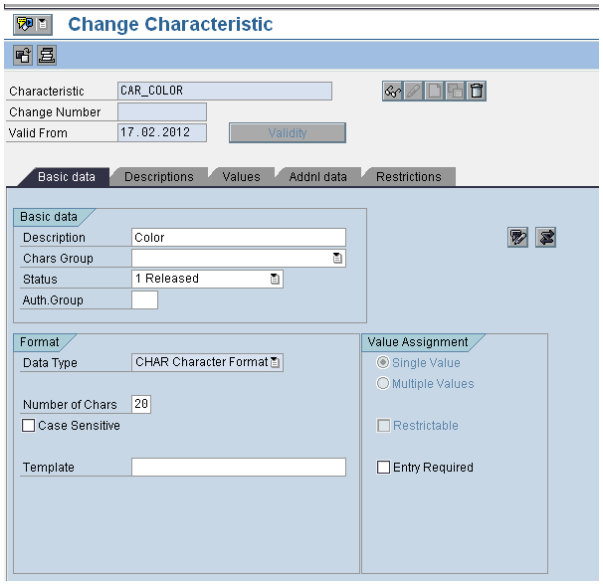
Scenario demonstrates the MTO variant configuration with characteristic parameter entry in the sales order, transfer of requirements from the sales order to MRP, conversion of planned orders to production orders and selection of appropriate materials and operations from the super BOMs and super routings and finally creating deliveries to the finished product.

Certain configurable material characteristics and its values are displayed in the sales order based on the preceding characteristics values.

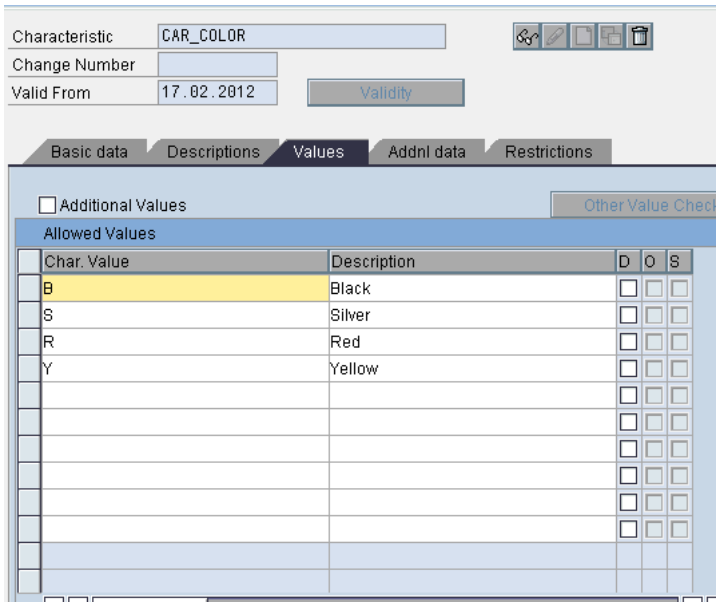
Configuration

Create Characteristics

Create the characteristics for the selection parameters of the variant with Data Type CHAR or NUM for calculations



Assign Values

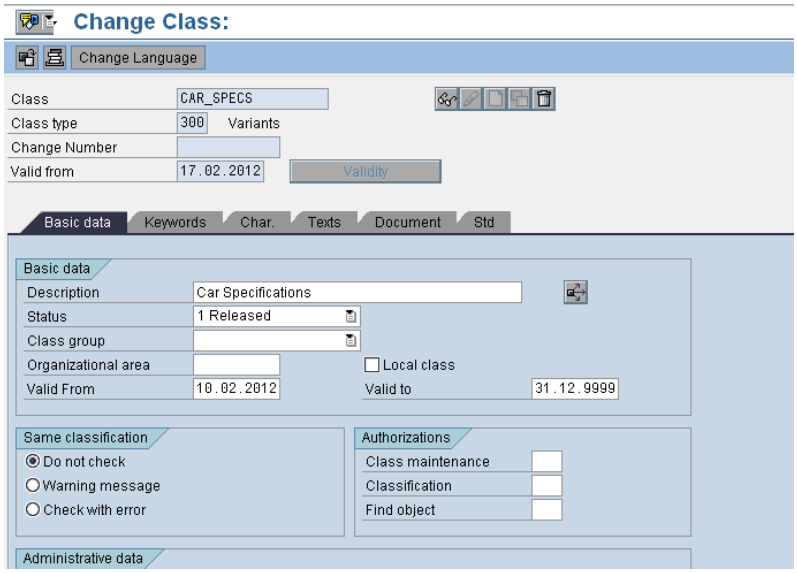


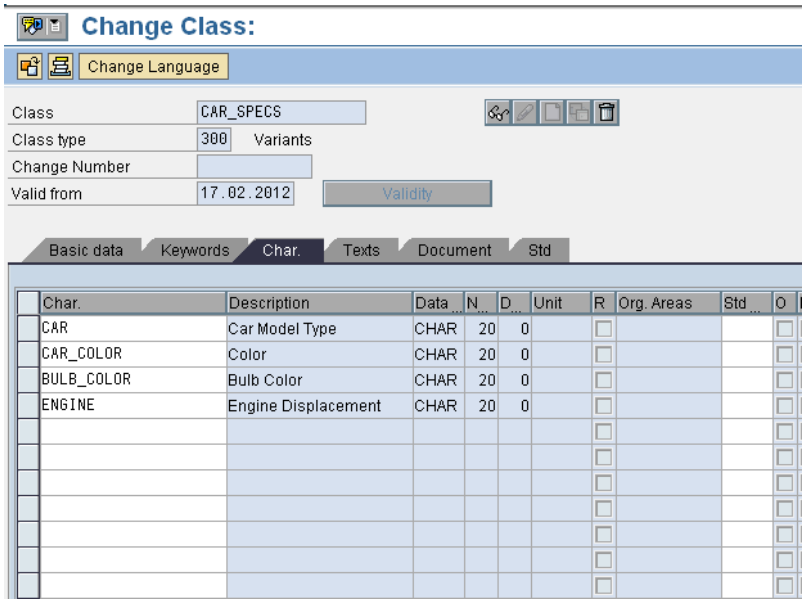
Create Class

Class Type 300 and 200

Class Type 300

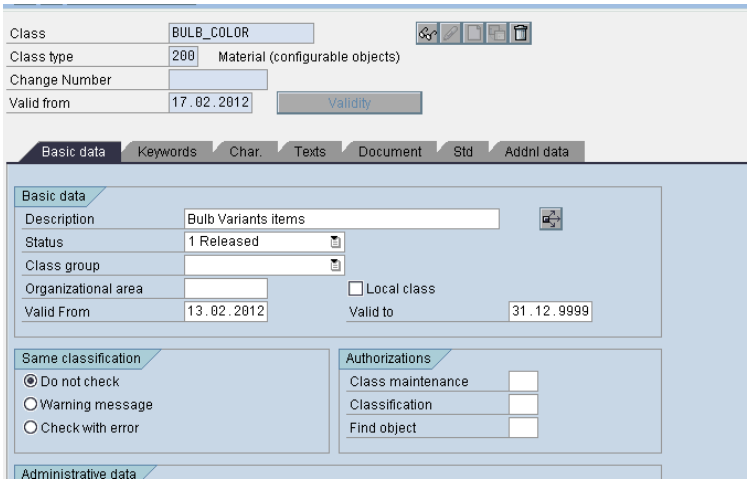
Create class type 300 for variant entry

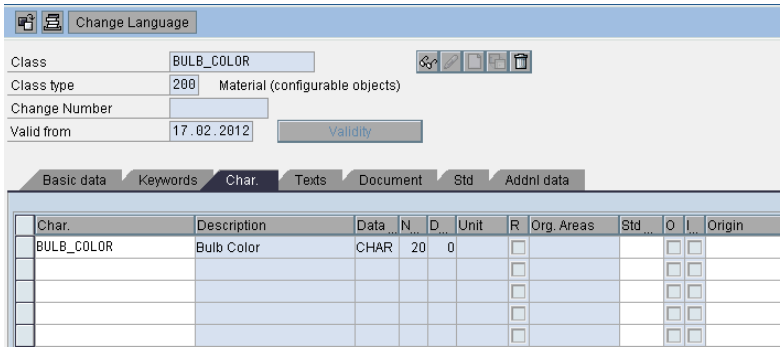




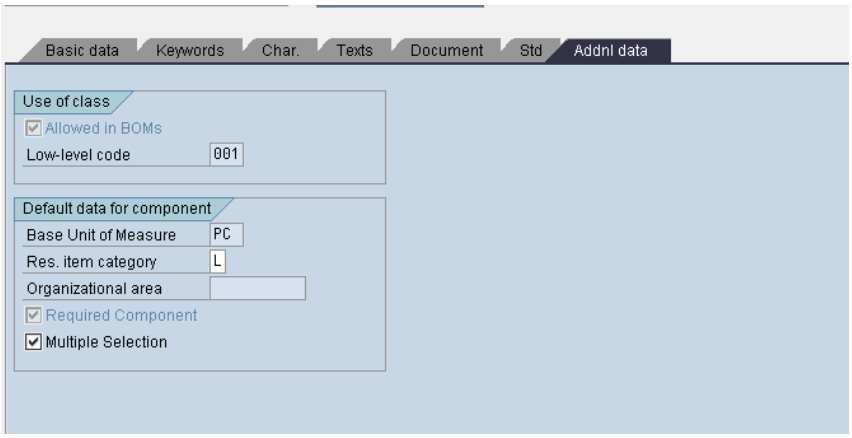
Class Type 200

Create Class Type 200 for mentioning parameters for configurable materials





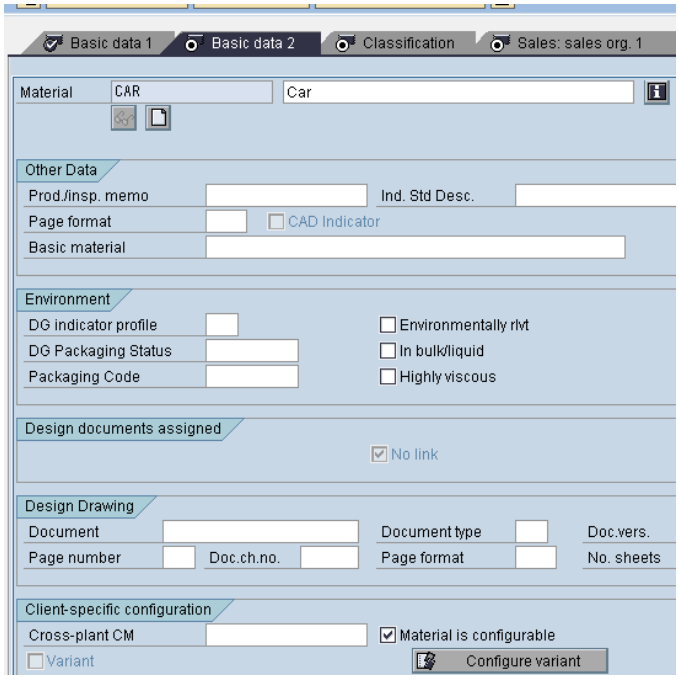
Select ‘Allowed in BOMs indicator’, enter Base Unit of measure and Resultant item Category ‘L’



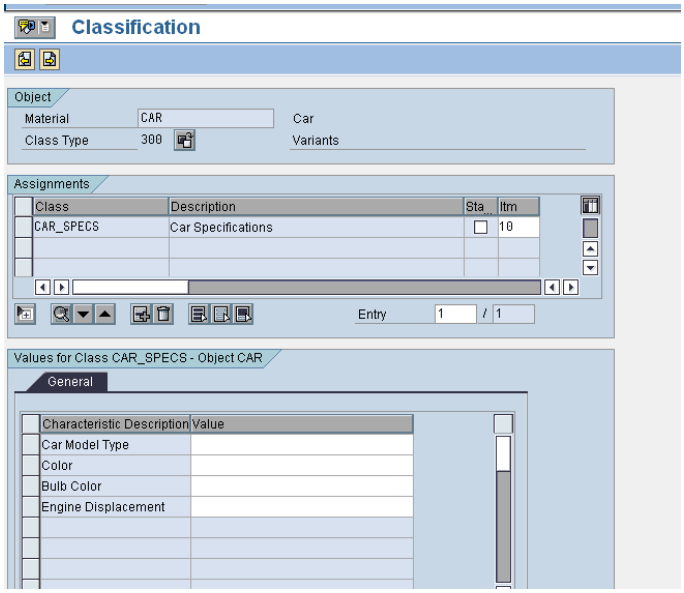
Creating a configurable material

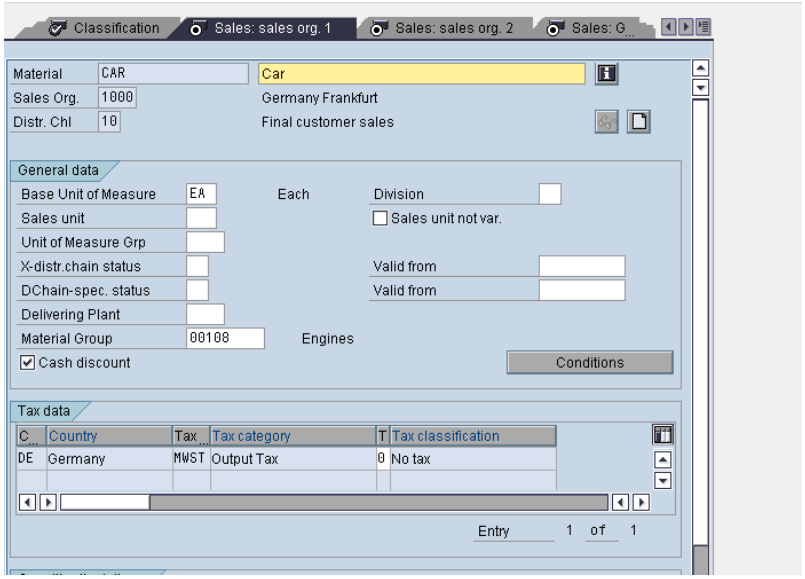
Configurable material can be created in following ways

a) Mark configurable indicator in BASIC DATA 2 for material types FERT or HALB
b) Create a material with material type KMAT

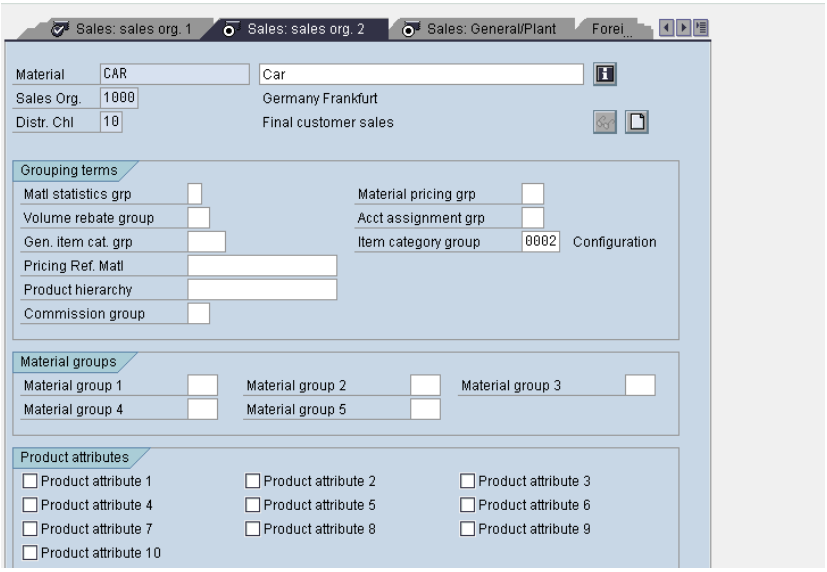


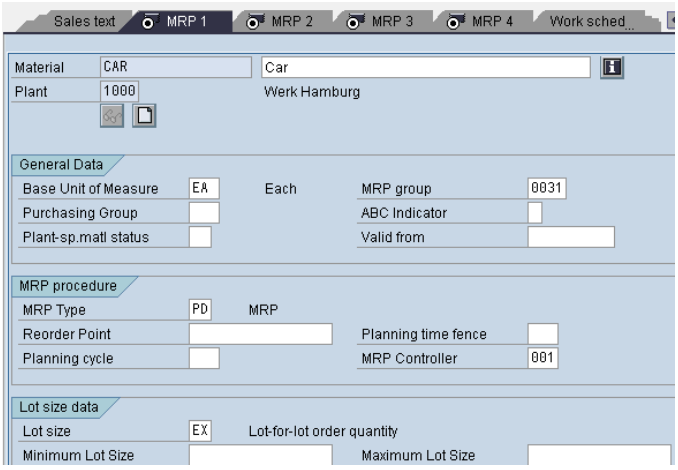
Assign class type 300 for finished and semi-finished materials

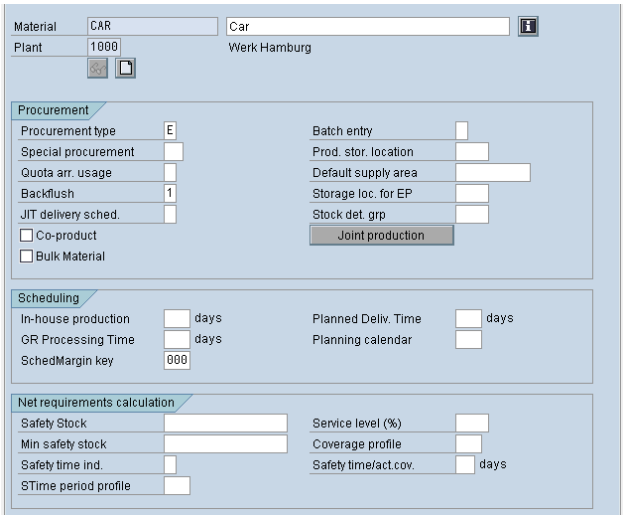




Set item category grp as **'0002'**

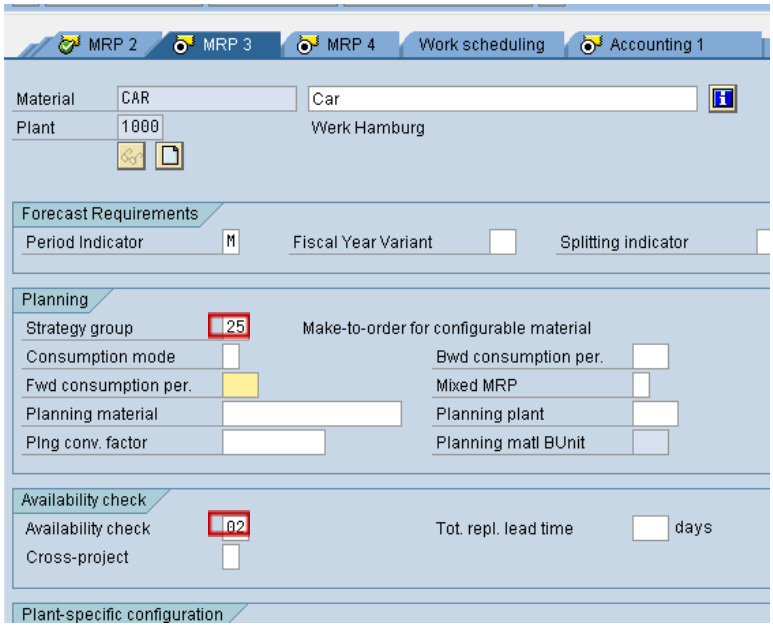



Sales text
MRP 1
MRP 2
MRP 3
MRP 4
Work sched
Material CAR Car
Plant 1000 Werk Hamburg
General Data
Base Unit of Measure EA Each
Purchasing Group
Plant-sp.matl status
MRP group 0031
ABC Indicator
Valid from
MRP procedure
MRP Type PD MRP
Reorder Point
Planning cycle
Planning time fence
MRP Controller 001
Lot size data
Lot size EX Lot-for-lot order quantity
Minimum Lot Size
Maximum Lot Size

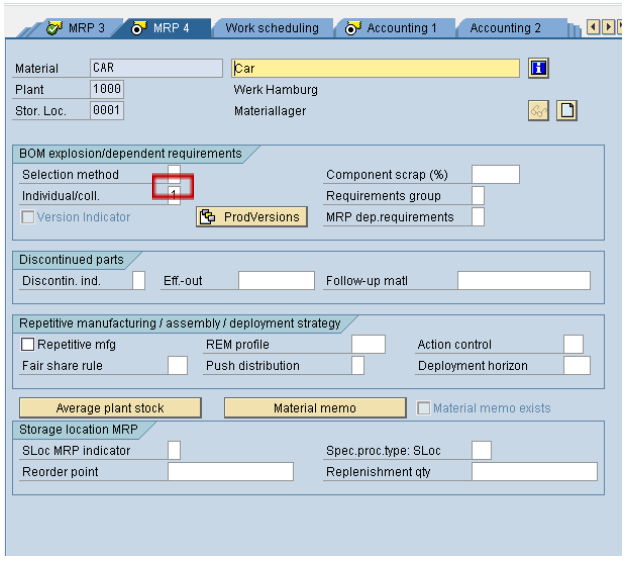

Material CAR Car
Plant 1000 Werk Hamburg
Procurement
Procurement type E
Special procurement
Quota arr. usage
Backflush 1
JIT delivery sched.
Co-product
Bulk Material
Batch entry
Prod. stor. location
Default supply area
Storage loc. for EP
Stock det. grp
Joint production
Scheduling
In-house production days
GR Processing Time days
SchedMargin key 000
Planned Deliv. Time days
Planning calendar
Net requirements calculation
Safety Stock
Min safety stock
Safety time ind.
STime period profile
Service level (%)
Coverage profile
Safety time/act.cov. days

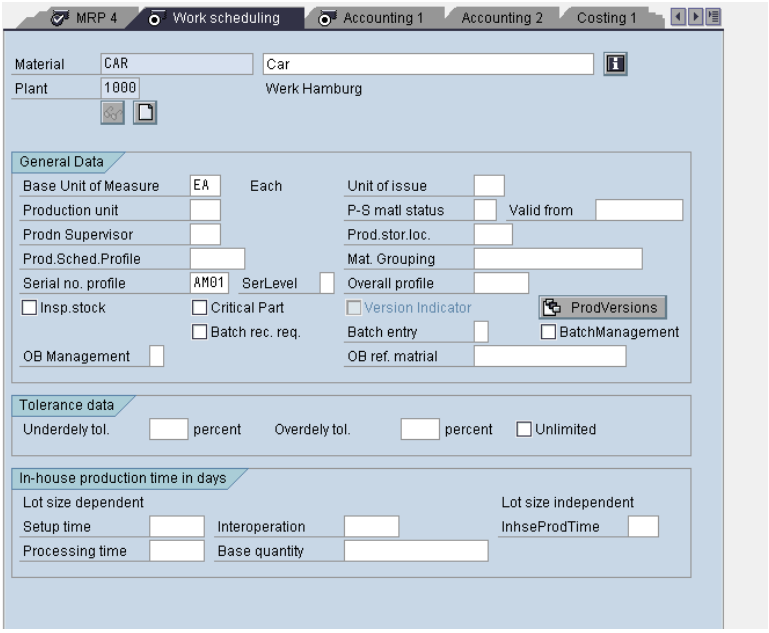
Set Strategy Group as **'25' Make to Order for configurable material**

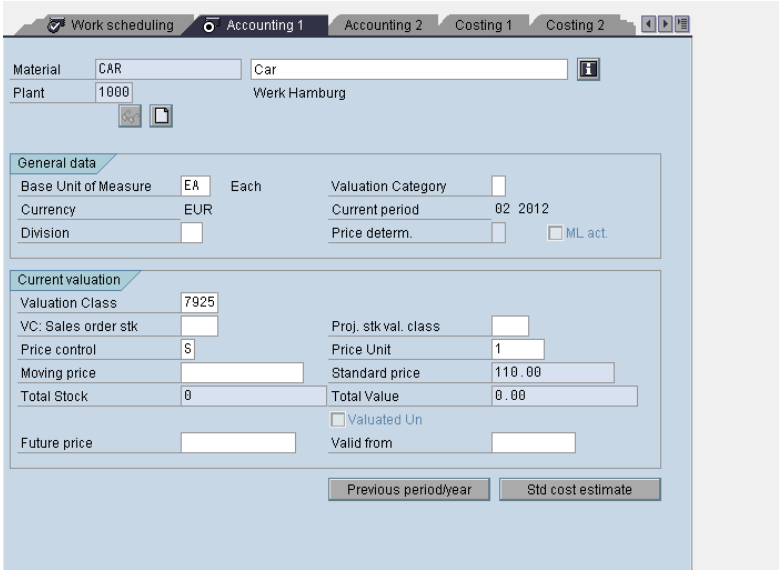
Set Availability Check to '02' Individual Requirements



Set BOM explosion/dependent requirements to '1'

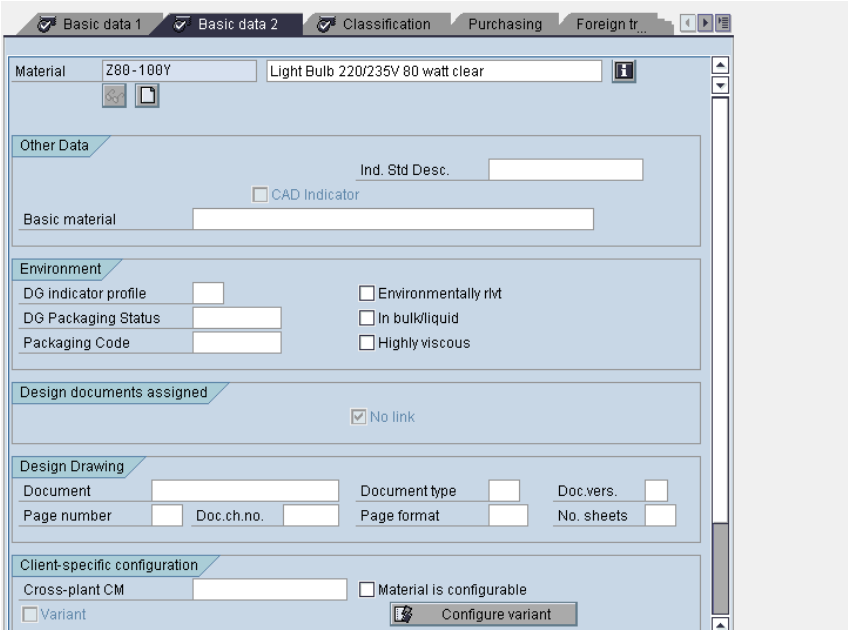


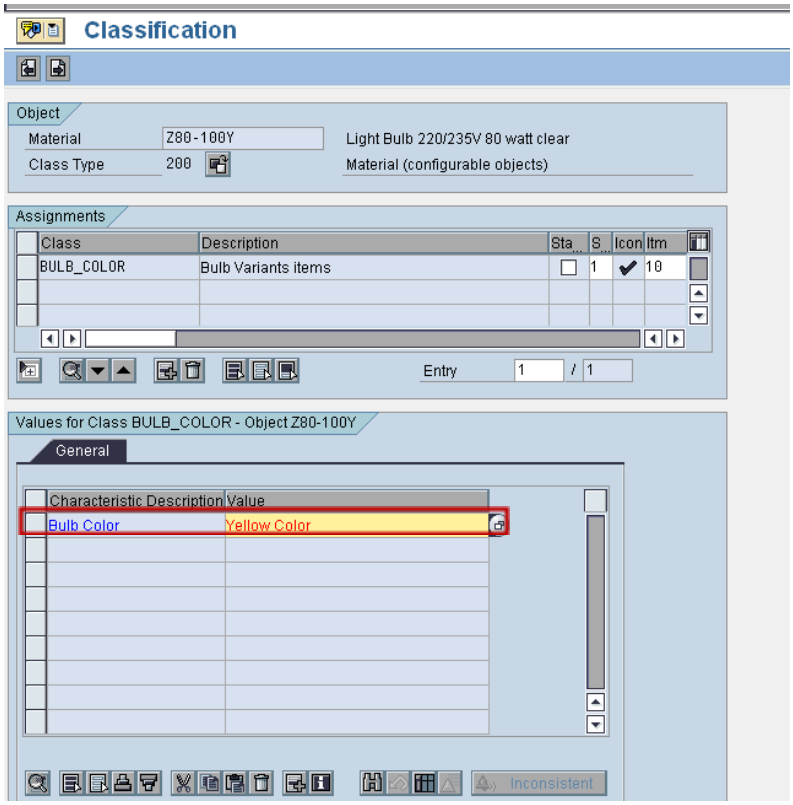

MRP 4
Work scheduling
Accounting 1
Accounting 2
Costing 1
Material
CAR
Car
Plant
1000
Werk Hamburg
General Data
Base Unit of Measure
EA
Each
Unit of issue
Production unit
P-S matl status
Valid from
Prodn Supervisor
Prod.stor.loc.
Prod.Sched.Profile
Mat. Grouping
Serial no. profile
AM01
SerLevel
Overall profile
Insp.stock
Critical Part
Version Indicator
ProdVersions
Batch rec. req.
Batch entry
BatchManagement
OB Management
OB ref. matrial
Tolerance data
Underdely tol.
percent
Overdely tol.
percent
Unlimited
In-house production time in days
Lot size dependent
Lot size independent
Setup time
Interoperation
InhseProdTime
Processing time
Base quantity

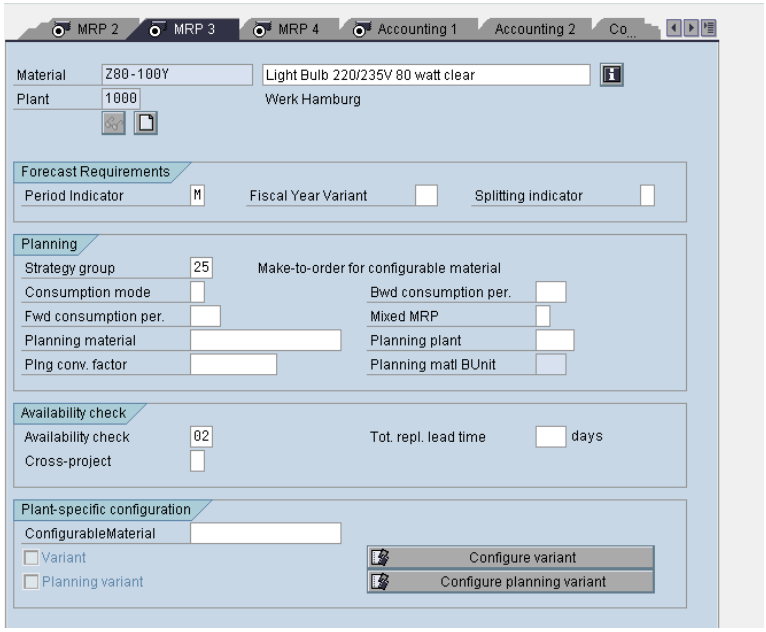

Work scheduling
Accounting 1
Accounting 2
Costing 1
Costing 2
Material
CAR
Car
Plant
1000
Werk Hamburg
General data
Base Unit of Measure
EA
Each
Valuation Category
Currency
EUR
Current period
02 2012
Division
Price determ.
ML act.
Current valuation
Valuation Class
7925
VC: Sales order stk
Proj. stk val. class
Price control
S
Price Unit
1
Moving price
Standard price
110.00
Total Stock
0
Total Value
0.00
Valuated Un
Future price
Valid from
Previous period/year
Std cost estimate

Material with Class Type 200

Class Type is assigned directly to raw materials with mentioning the variant parameters in the material master and this class will be used as selection condition

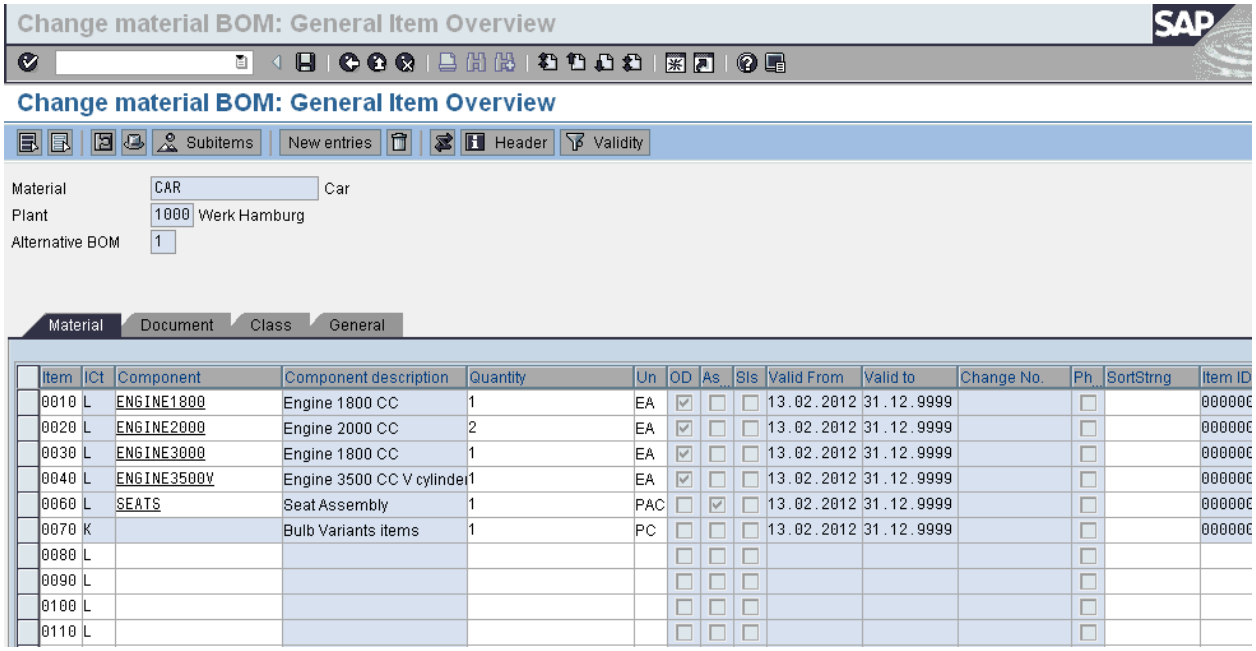



Classification
Object
Material
Z80-100Y
Light Bulb 220/235V 80 watt clear
Class Type
200
Material (configurable objects)
Assignments
Class
Description
Sta...
S...
Icon
Itm
BULB_COLOR
Bulb Variants items
1
10
Entry
1
/ 1
Values for Class BULB_COLOR - Object Z80-100Y
General
Characteristic Description
Value
Bulb Color
Yellow Color
Inconsistent

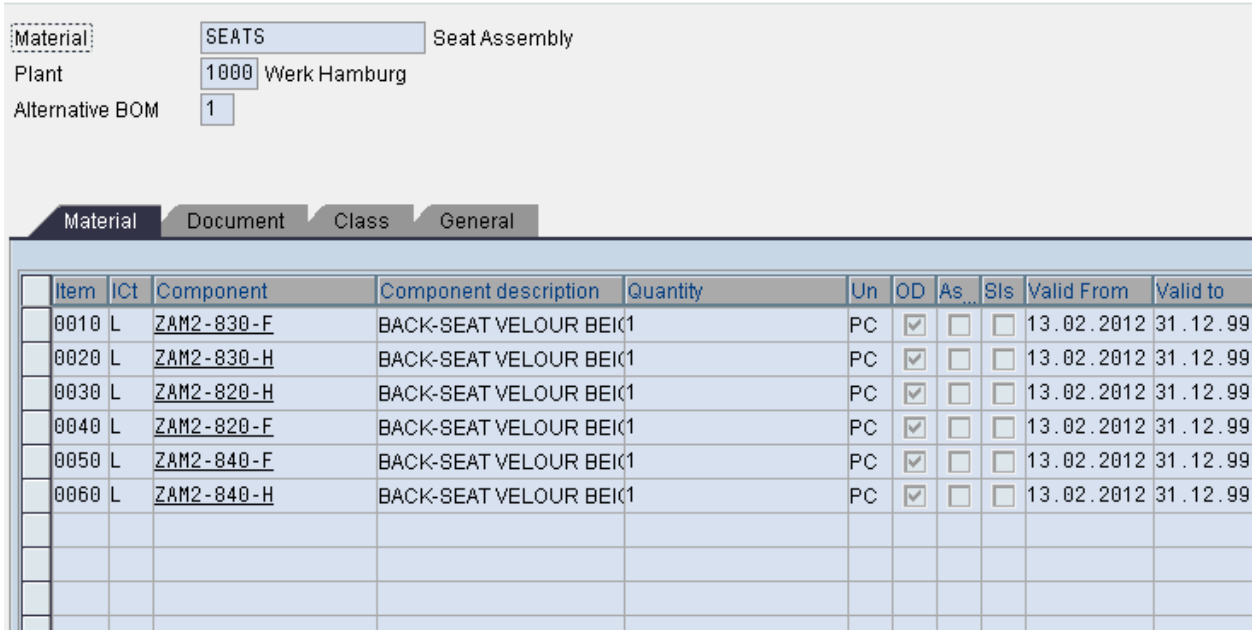

MRP 2
MRP 3
MRP 4
Accounting 1
Accounting 2
Co...
Material
Z80-100Y
Light Bulb 220/235V 80 watt clear
Plant
1000
Werk Hamburg
Forecast Requirements
Period Indicator
M
Fiscal Year Variant
Splitting indicator
Planning
Strategy group
25
Make-to-order for configurable material
Consumption mode
Bwd consumption per.
Fwd consumption per.
Mixed MRP
Planning material
Planning plant
Plng conv. factor
Planning matl BUnit
Availability check
Availability check
02
Tot. repl. lead time
days
Cross-project
Plant-specific configuration
ConfigurableMaterial
Variant
Planning variant
Configure variant
Configure planning variant

Create a Super BOM

Create a BOM with all possible materials present in variant materials

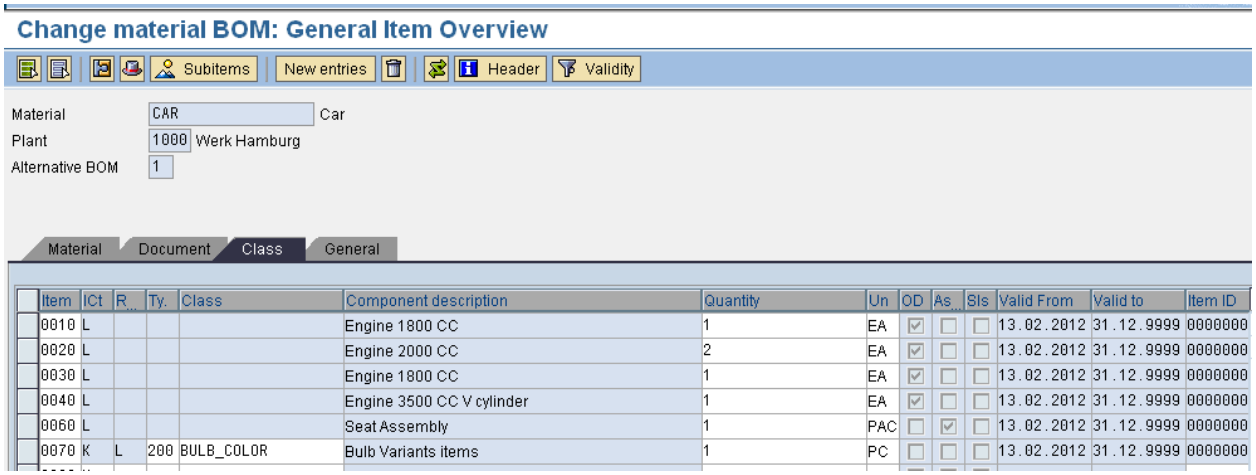


Item	ICt	Component	Component description	Quantity	Un	OD	As	Sls	Valid From	Valid to	Change No.	Ph	SortStrng	Item ID
0010	L	ENGINE1800	Engine 1800 CC	1	EA	☑	☐	☐	13.02.2012	31.12.9999		☐		000000
0020	L	ENGINE2000	Engine 2000 CC	2	EA	☑	☐	☐	13.02.2012	31.12.9999		☐		000000
0030	L	ENGINE3000	Engine 1800 CC	1	EA	☑	☐	☐	13.02.2012	31.12.9999		☐		000000
0040	L	ENGINE3500V	Engine 3500 CC V cylinde	1	EA	☑	☐	☐	13.02.2012	31.12.9999		☐		000000
0060	L	SEATS	Seat Assembly	1	PAC	☐	☑	☐	13.02.2012	31.12.9999		☐		000000
0070	K		Bulb Variants items	1	PC	☐	☐	☐	13.02.2012	31.12.9999		☐		000000
0080	L					☐	☐	☐				☐		
0090	L					☐	☐	☐				☐		
0100	L					☐	☐	☐				☐		
0110	L					☐	☐	☐				☐		



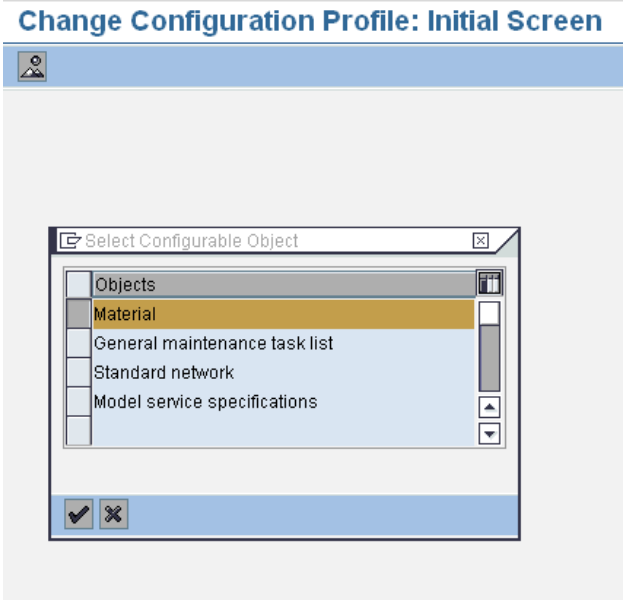
Item	ICt	Component	Component description	Quantity	Un	OD	As	Sls	Valid From	Valid to
0010	L	ZAM2-830-F	BACK-SEAT VELOUR BEI	1	PC	☑	☐	☐	13.02.2012	31.12.99
0020	L	ZAM2-830-H	BACK-SEAT VELOUR BEI	1	PC	☑	☐	☐	13.02.2012	31.12.99
0030	L	ZAM2-820-H	BACK-SEAT VELOUR BEI	1	PC	☑	☐	☐	13.02.2012	31.12.99
0040	L	ZAM2-820-F	BACK-SEAT VELOUR BEI	1	PC	☑	☐	☐	13.02.2012	31.12.99
0050	L	ZAM2-840-F	BACK-SEAT VELOUR BEI	1	PC	☑	☐	☐	13.02.2012	31.12.99
0060	L	ZAM2-840-H	BACK-SEAT VELOUR BEI	1	PC	☑	☐	☐	13.02.2012	31.12.99

Assign Class Type 200 for selection of variant materials



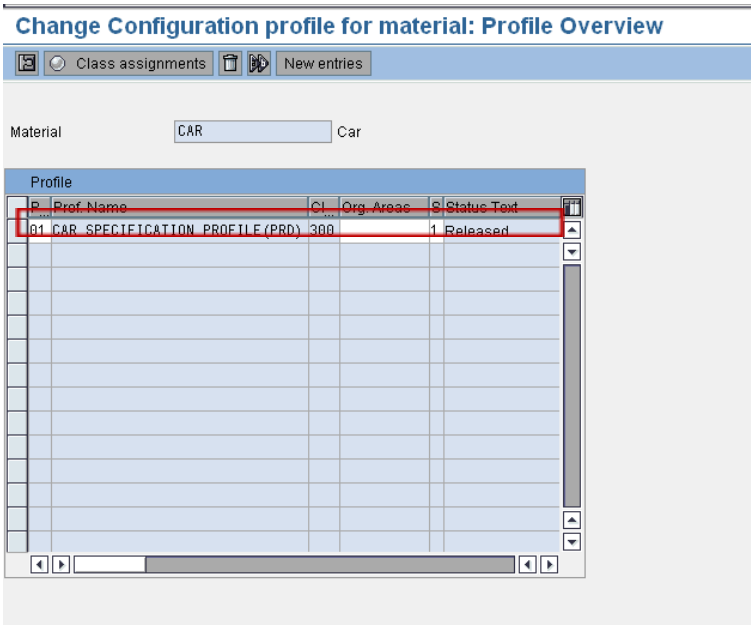
Create Configuration Profile

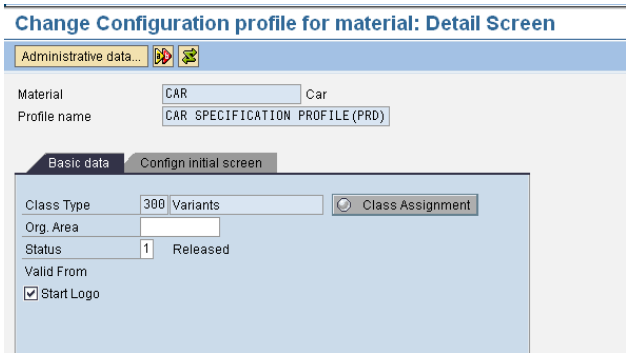
Create configuration profile for the materials using CU41 Transaction



Enter Profile Priority, Profile name and class type 300 and set to 'released' status

Double click on Profile for detailed data entry

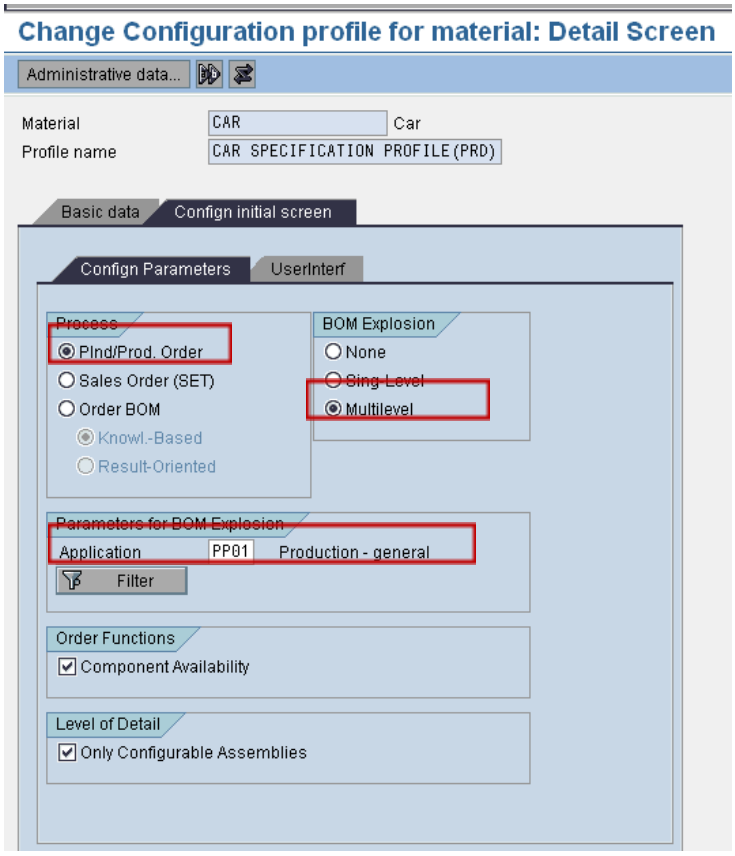




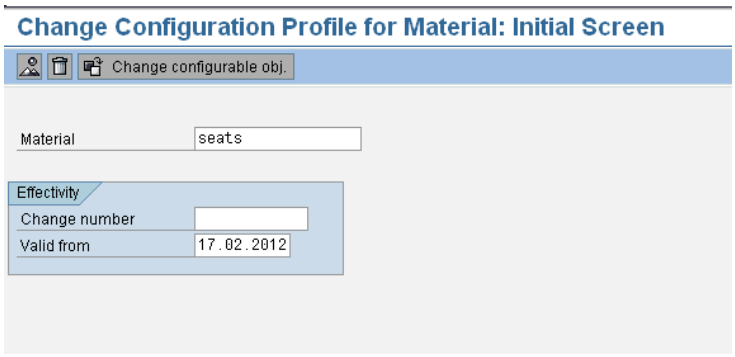
Go to Confign initial screen

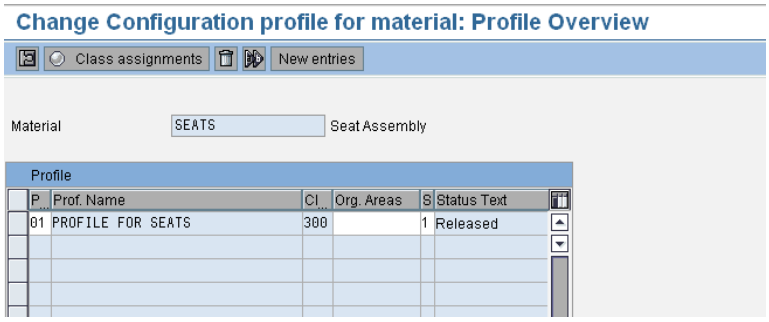
Set Configuration Parameters to **Plnd/Prod Order** BOM Explosion to **Multilevel**

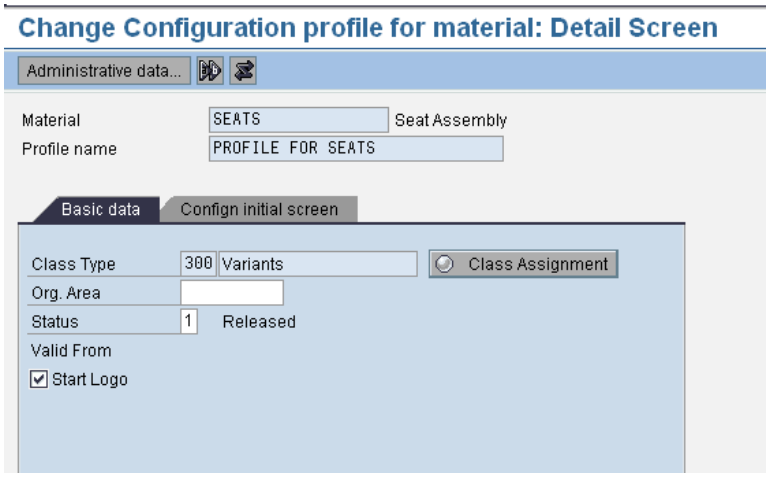
Application to **PP01 Production General**

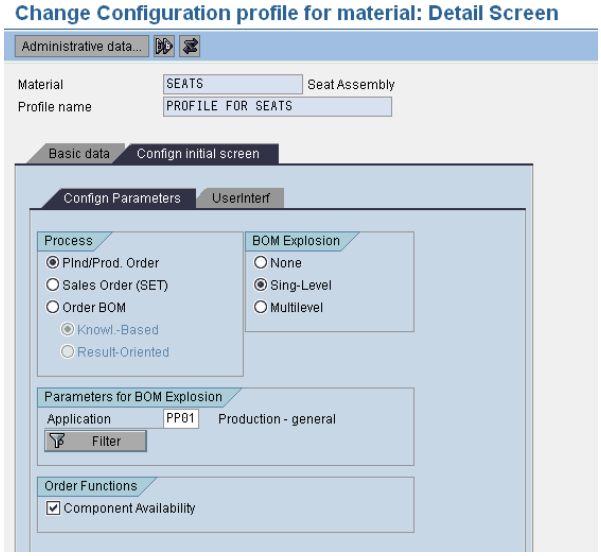


Similarly a configuration profile for material seats is created



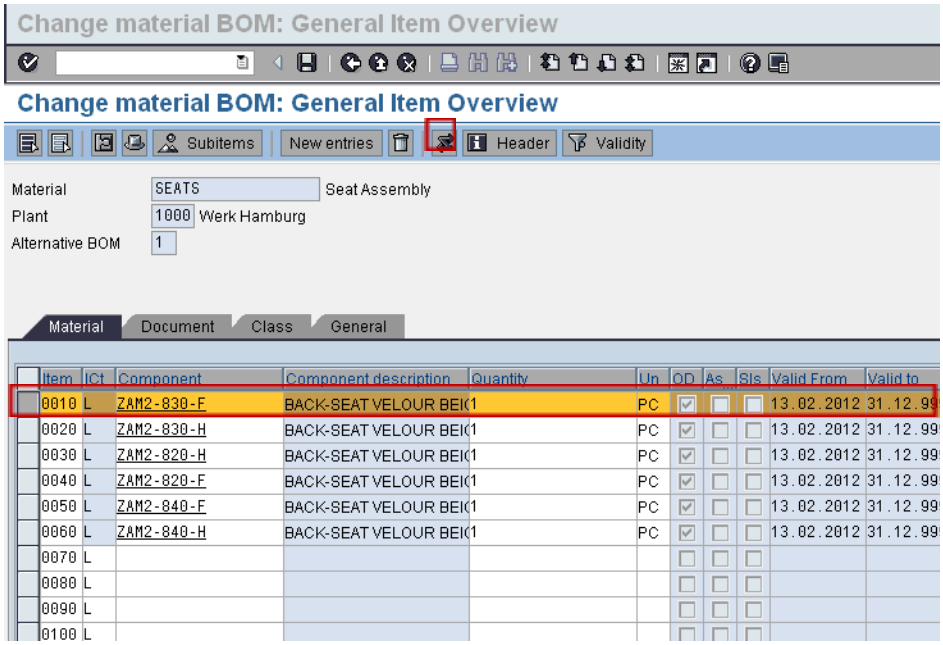

Change Configuration profile for material: Profile Overview
Class assignments
New entries
Material
SEATS
Seat Assembly
Profile
P...
Prof. Name
Cl...
Org. Areas
S
Status Text
01
PROFILE FOR SEATS
300
1
Released

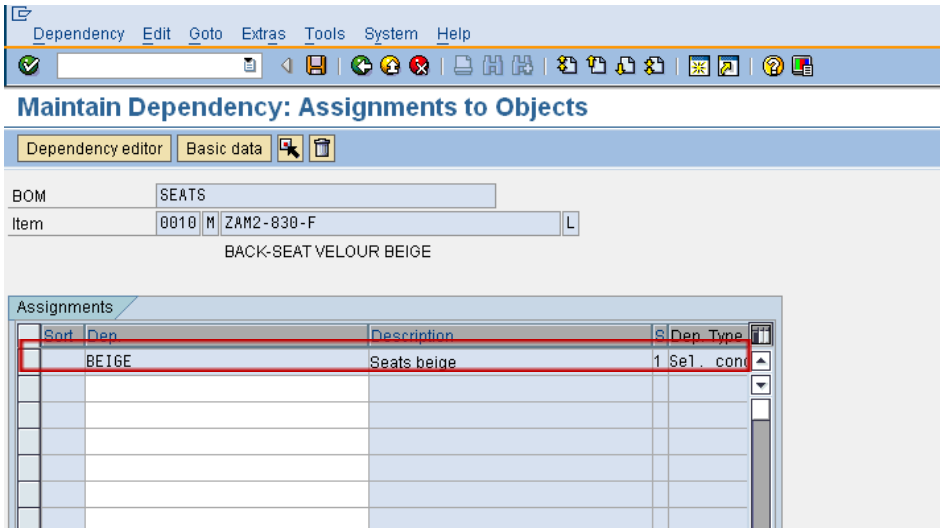

Change Configuration profile for material: Detail Screen
Administrative data...
Material
SEATS
Seat Assembly
Profile name
PROFILE FOR SEATS
Basic data
Confign initial screen
Class Type
300
Variants
Class Assignment
Org. Area
Status
1
Released
Valid From
Start Logo


Change Configuration profile for material: Detail Screen
Administrative data...
Material
SEATS
Seat Assembly
Profile name
PROFILE FOR SEATS
Basic data
Confign initial screen
Confign Parameters
UserInterf
Process
PInd/Prod. Order
Sales Order (SET)
Order BOM
Knowl.-Based
Result-Oriented
BOM Explosion
None
Sing-Level
Multilevel
Parameters for BOM Explosion
Application
PP01
Production - general
Filter
Order Functions
Component Availability

Assign Object Dependencies to the items in the Super BOM

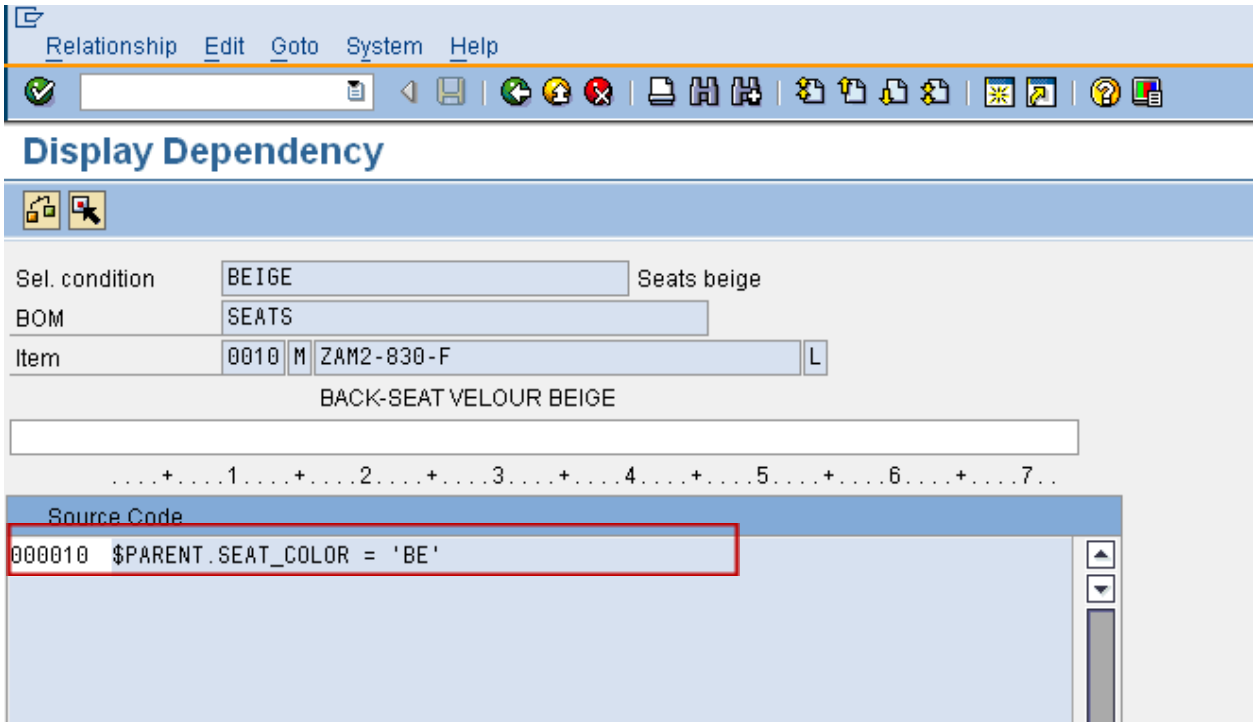
Select the material and Click on dependency indicator



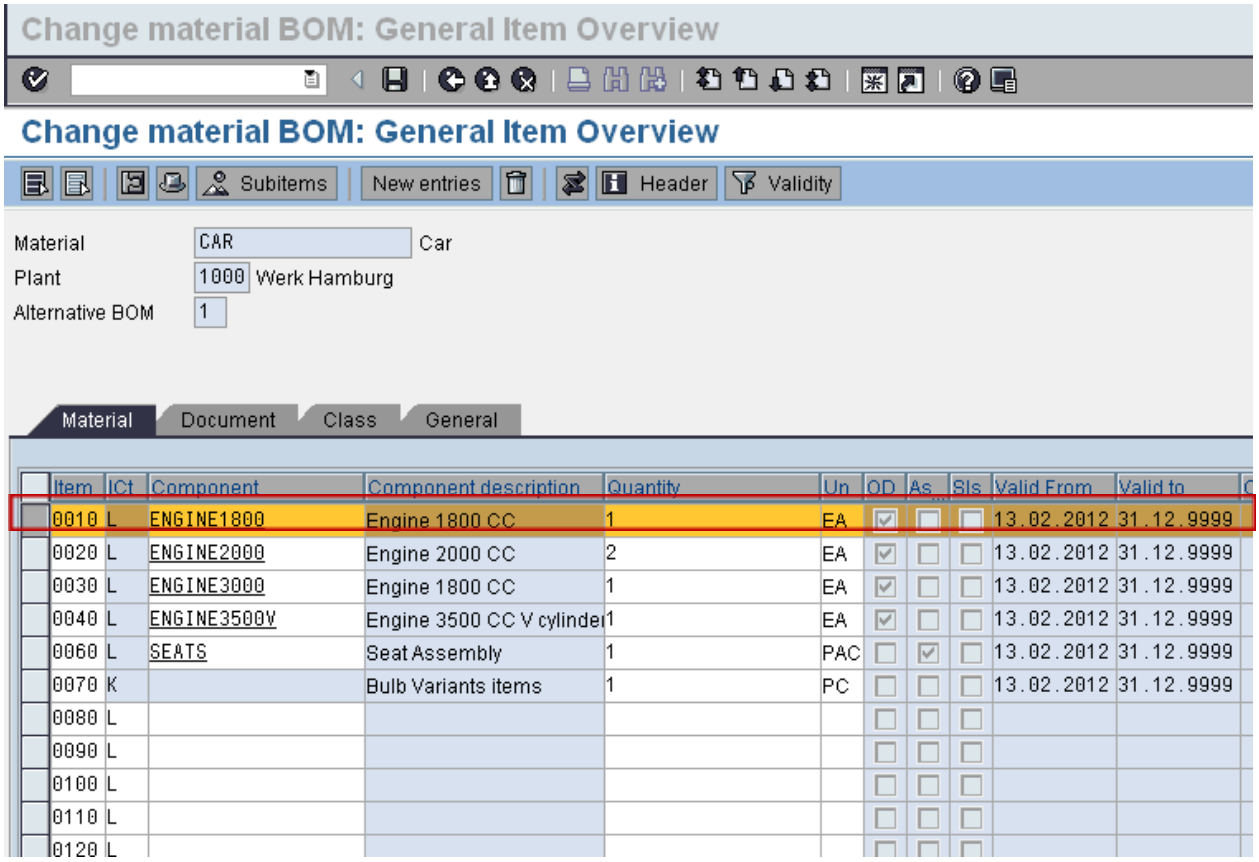


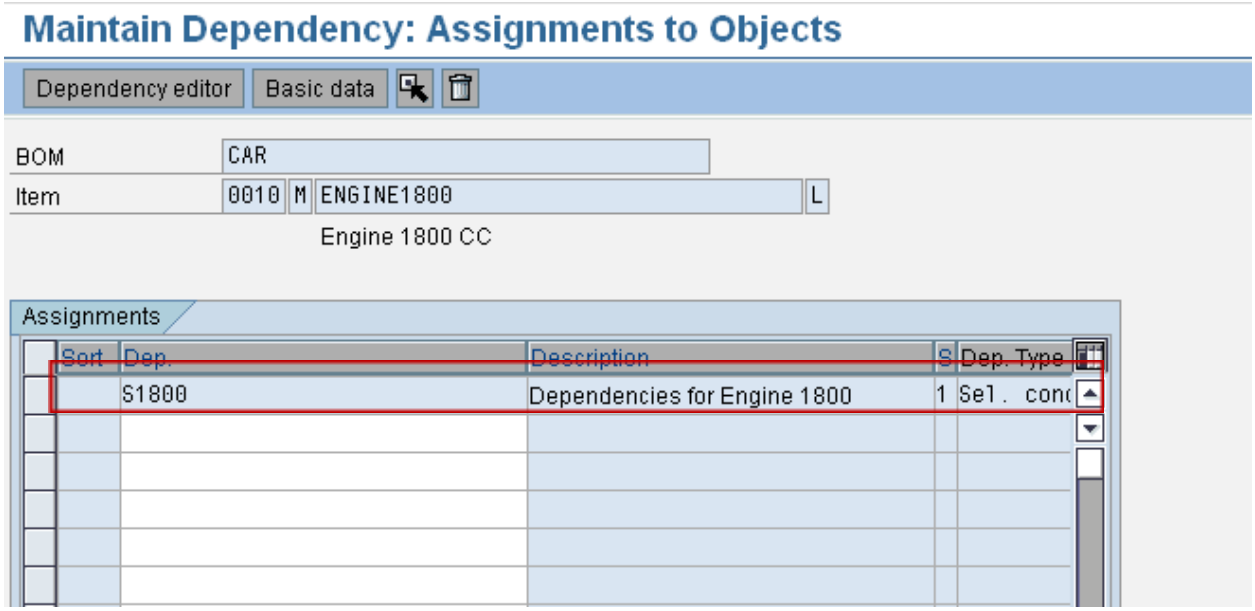
Enter the dependency characteristic value

Here the characteristic is SEAT_COLOR with value BE and $PARENT refers final parent material of multilevel BOM in general but not material specific.

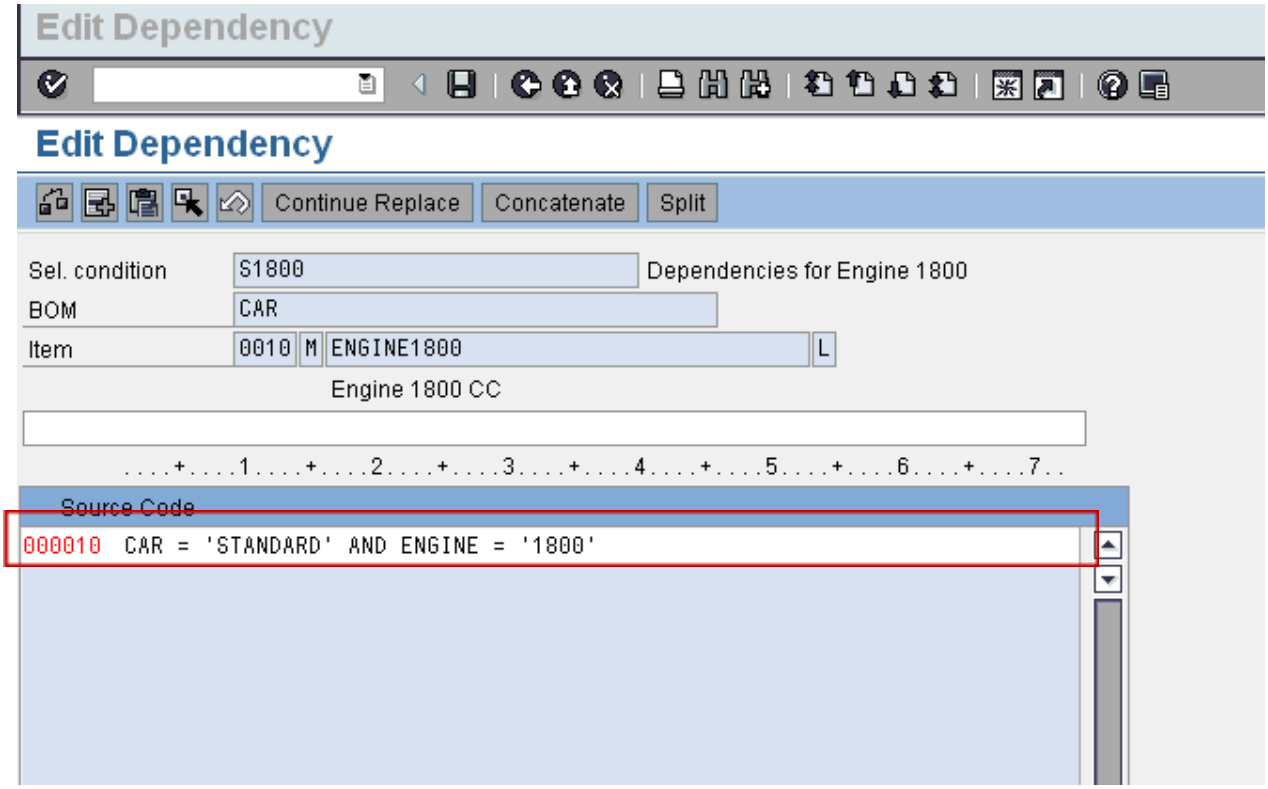


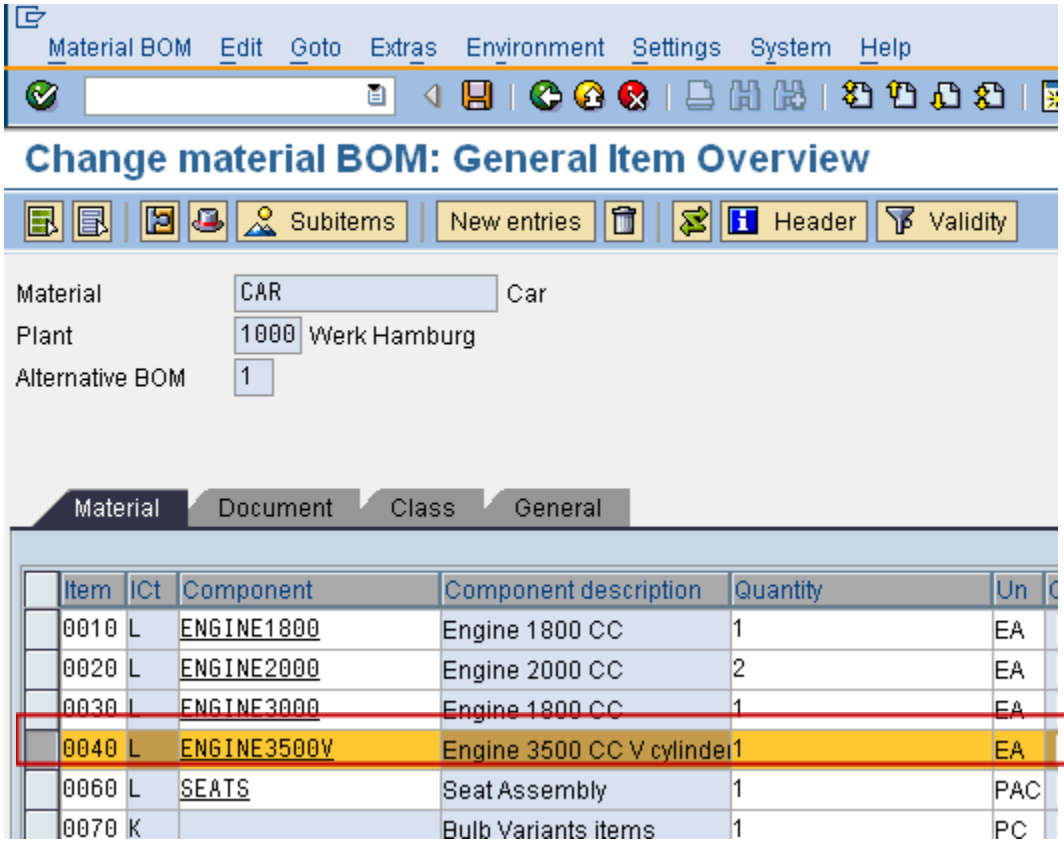
Select the parent material BOM and select the items and assign the object dependencies

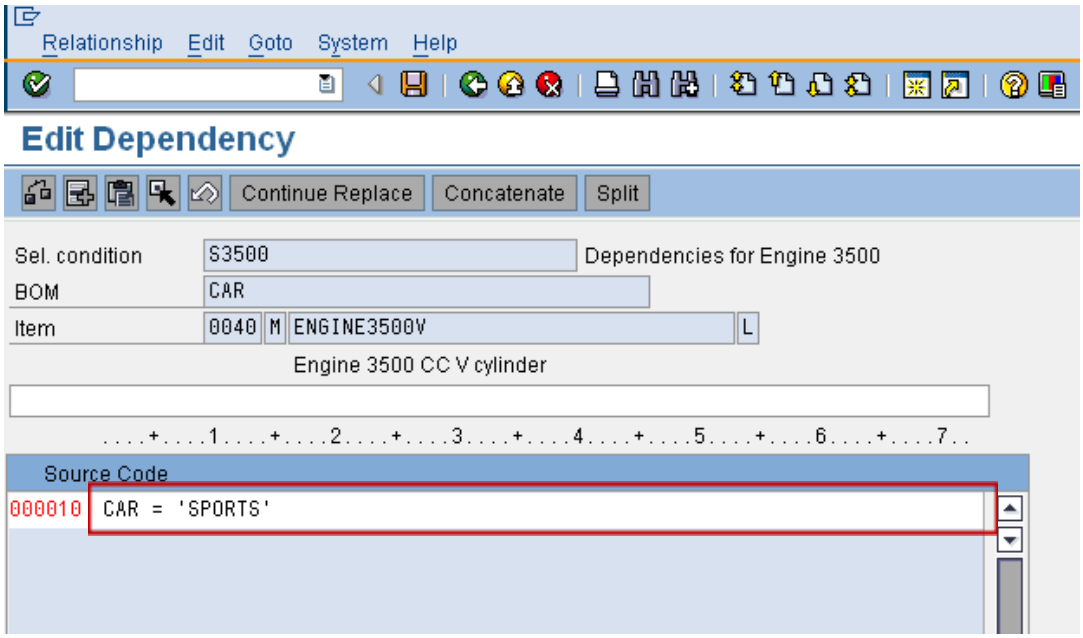




The condition for object dependency for the engine selection requires two conditions



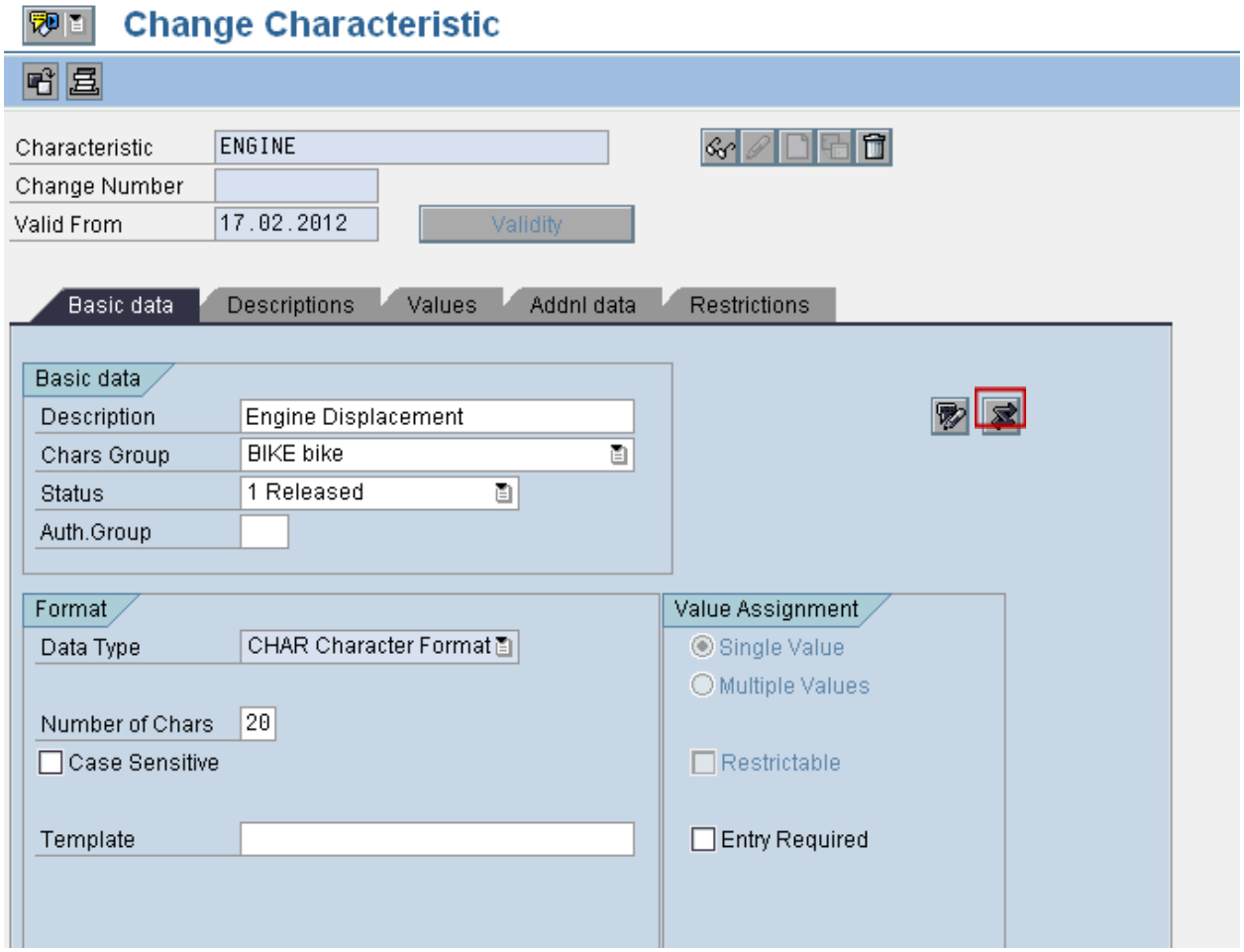

Material BOM Edit Goto Extras Environment Settings System Help
Change material BOM: General Item Overview
Subitems New entries Header Validity
Material CAR Car
Plant 1000 Werk Hamburg
Alternative BOM 1
Material Document Class General
Item ICt Component Component description Quantity Un
0010 L ENGINE1800 Engine 1800 CC 1 EA
0020 L ENGINE2000 Engine 2000 CC 2 EA
0030 L ENGINE3000 Engine 1800 CC 1 EA
0040 L ENGINE3500V Engine 3500 CC V cylinder 1 EA
0060 L SEATS Seat Assembly 1 PAC
0070 K Bulb Variants items 1 PC


Relationship Edit Goto System Help
Edit Dependency
Continue Replace Concatenate Split
Sel. condition S3500 Dependencies for Engine 3500
BOM CAR
Item 0040 M ENGINE3500V L
Engine 3500 CC V cylinder
Source Code
000010 CAR = 'SPORTS'

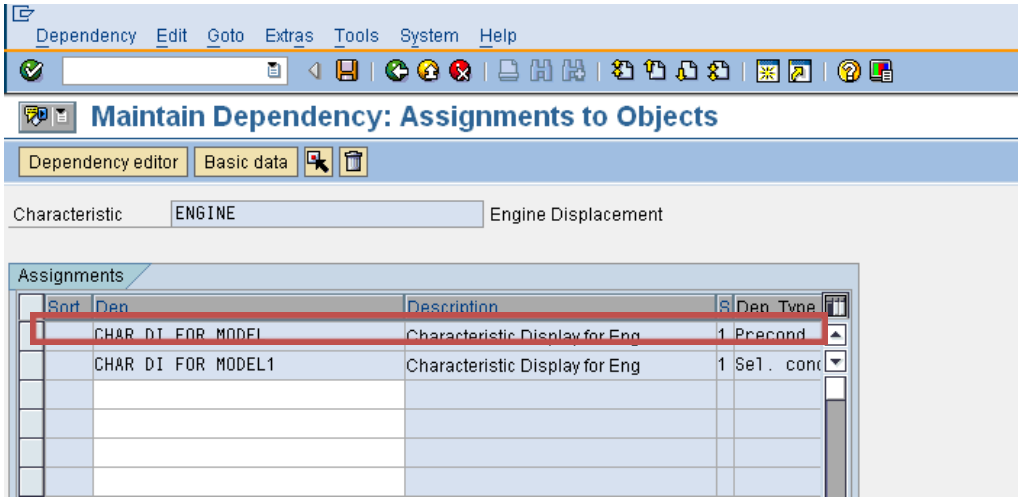
The Characteristic ENGINE has to be displayed only when the CAR model is selected to STANDARD to give options for choosing 1800CC or 2000CC displacement capacity.

The 2000CC displacement capacity engine has to be chosen only when the STANDARD model color is BLACK

Select the object dependency indicator in the Basic Data Tab

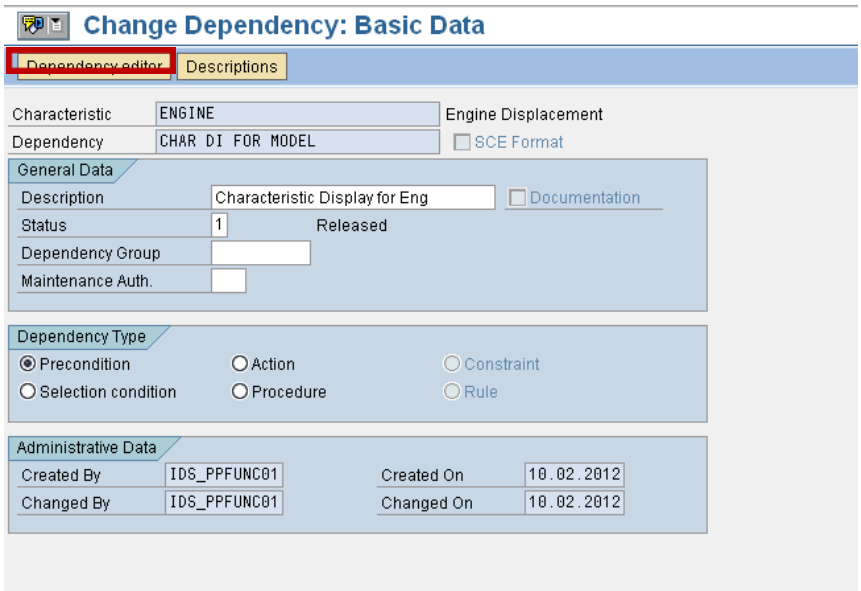


Create Precondition and Selection Condition dependencies

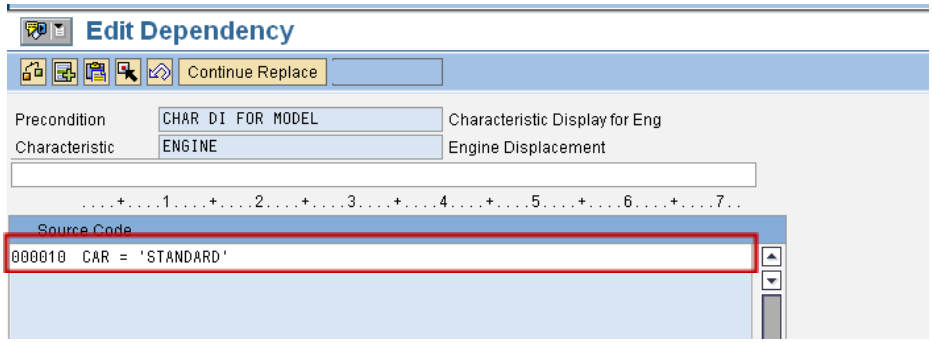


For precondition dependency select PRECONDITION option and the Status is initially set to **2 'In Preparation'**

Click **Dependency Editor**.

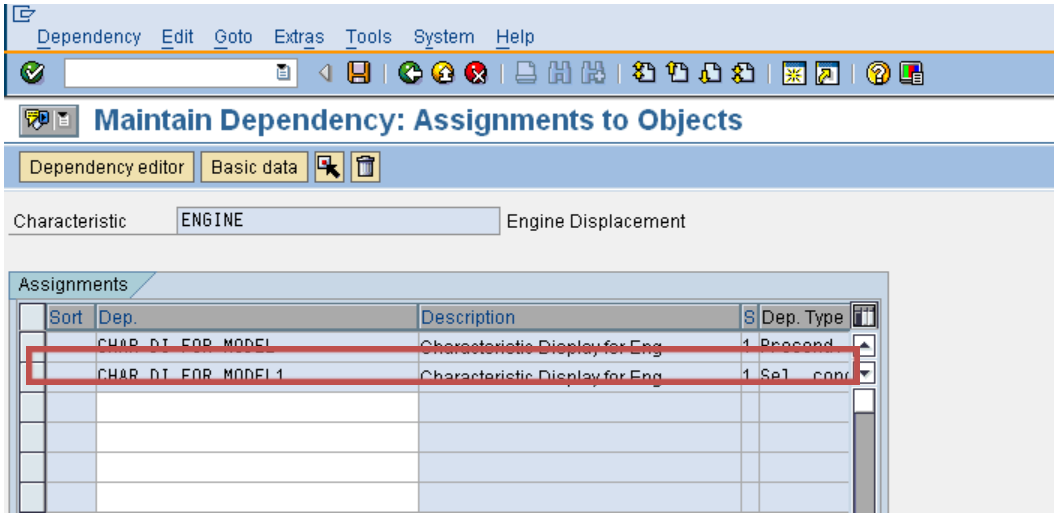


Enter Dependency condition

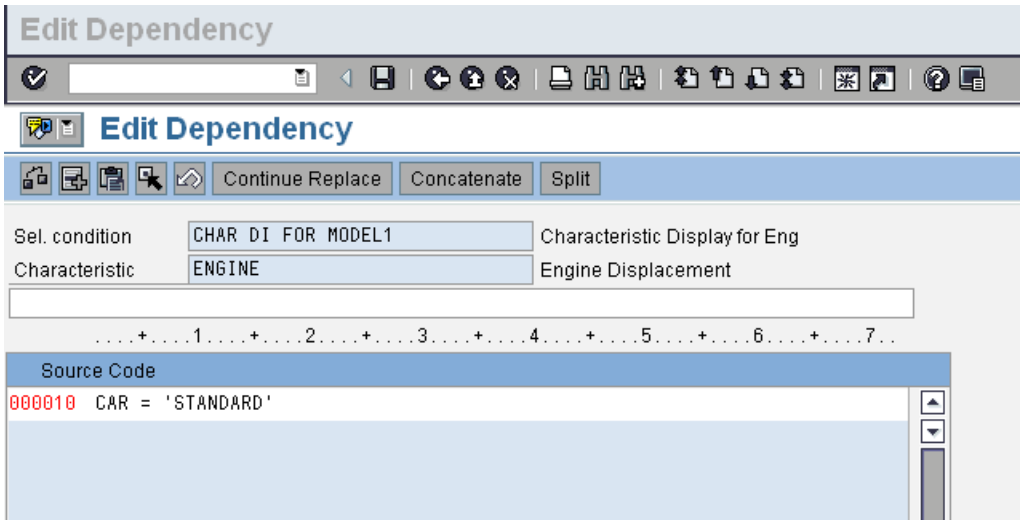


Go to Basic Data for and set the status to **1 Released**

Create selection condition dependency

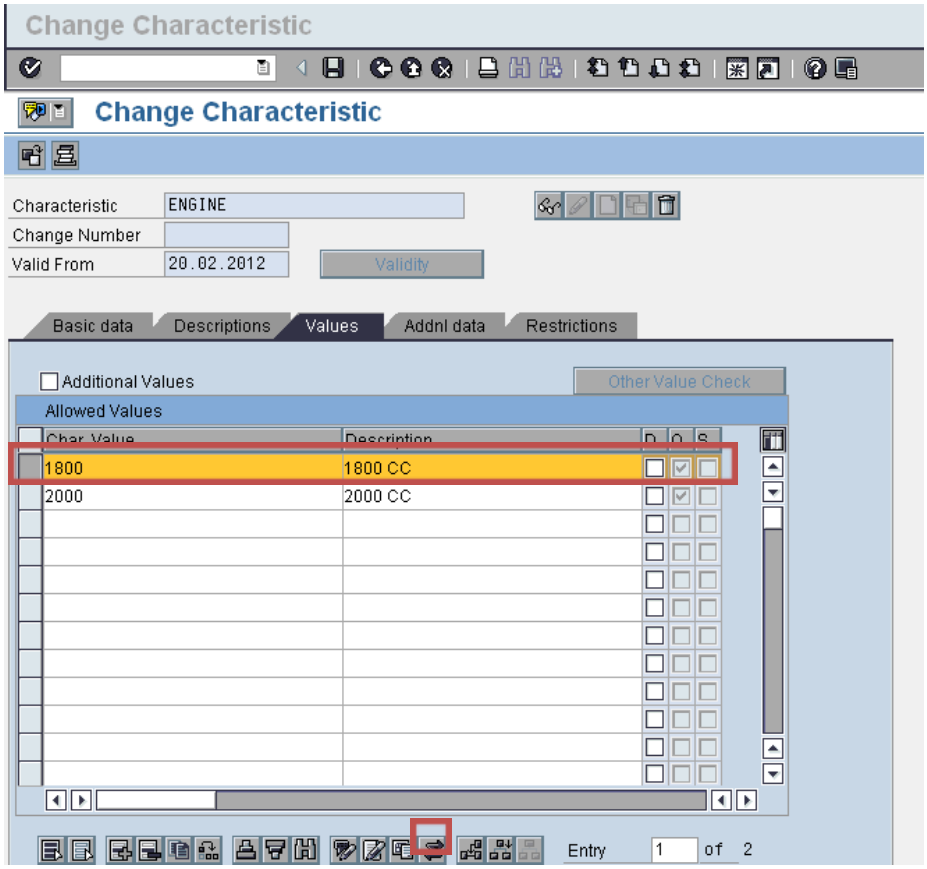


Go to Basic Data and choose **Selection Condition** option and assign dependency values

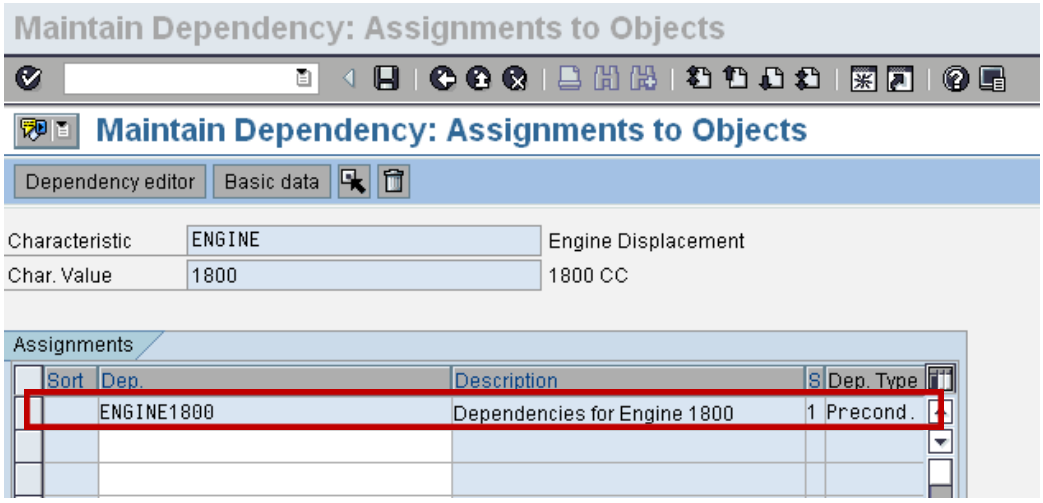


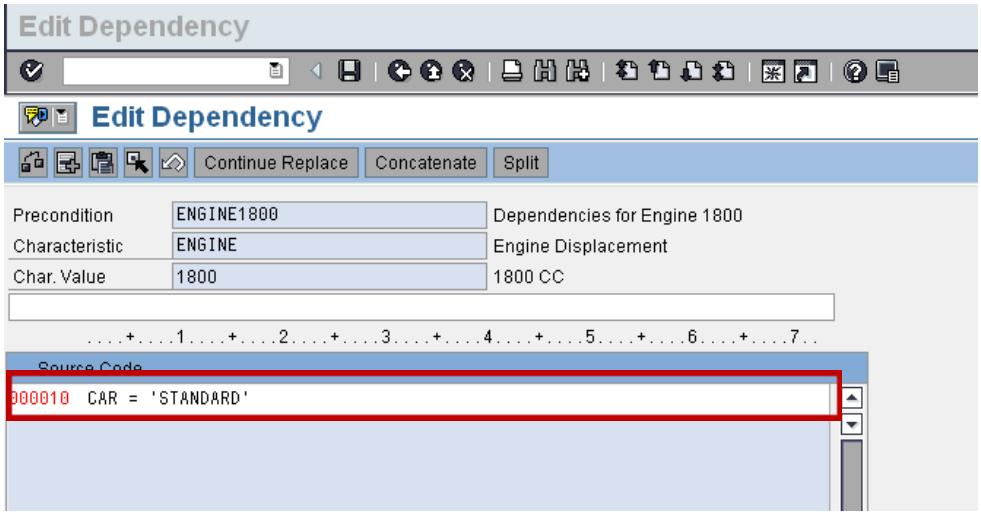
Assigning Preconditions to ENGINE characteristic values to display the values based on the model and color characteristics

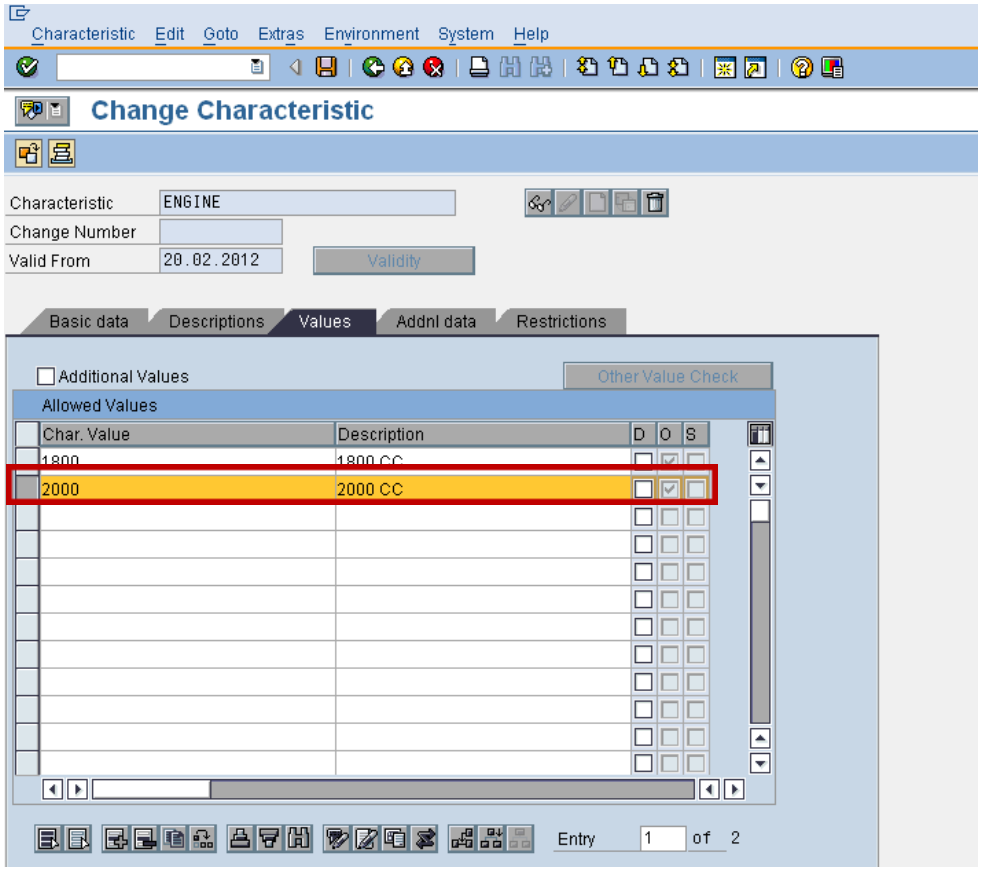
Select a value



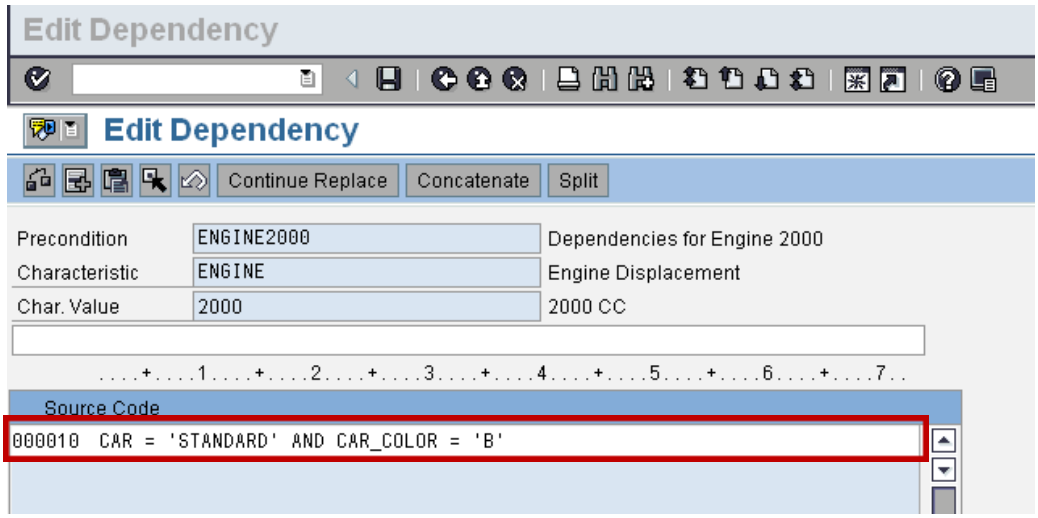
Maintain Precondition dependency for the characteristic value 1800CC




Edit Dependency
Edit Dependency
Continue Replace
Concatenate
Split
Precondition
ENGINE1800
Dependencies for Engine 1800
Characteristic
ENGINE
Engine Displacement
Char. Value
1800
1800 CC
000010 CAR = 'STANDARD'

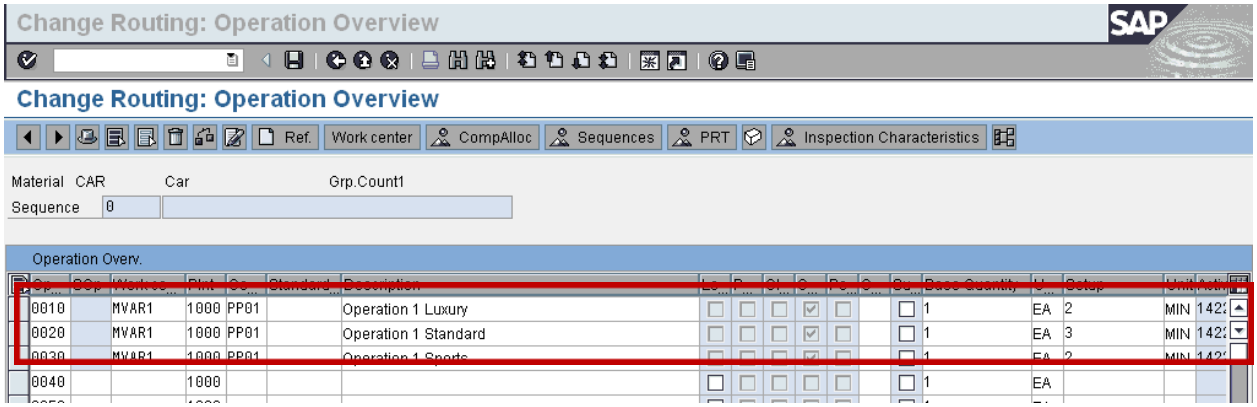

Characteristic Edit Goto Extras Environment System Help
Change Characteristic
Characteristic
ENGINE
Change Number
Valid From
20.02.2012
Validity
Basic data
Descriptions
Values
Addnl data
Restrictions
Additional Values
Other Value Check
Allowed Values
Char. Value
Description
D
O
S
1800
1800 CC
2000
2000 CC
Entry
1
of
2

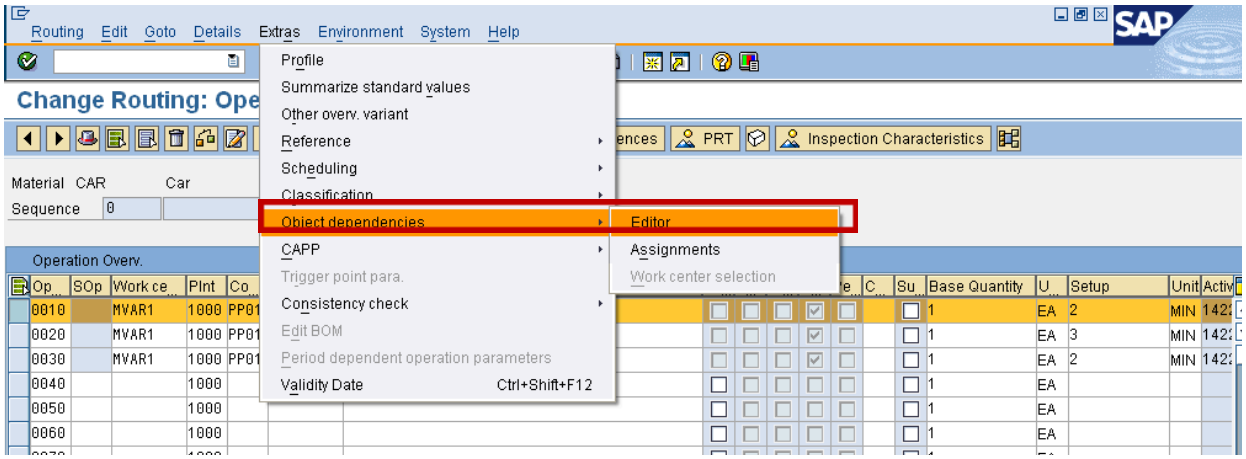
In order to display the characteristic value 2000CC the user must select first STANDARD model and COLOR as Black

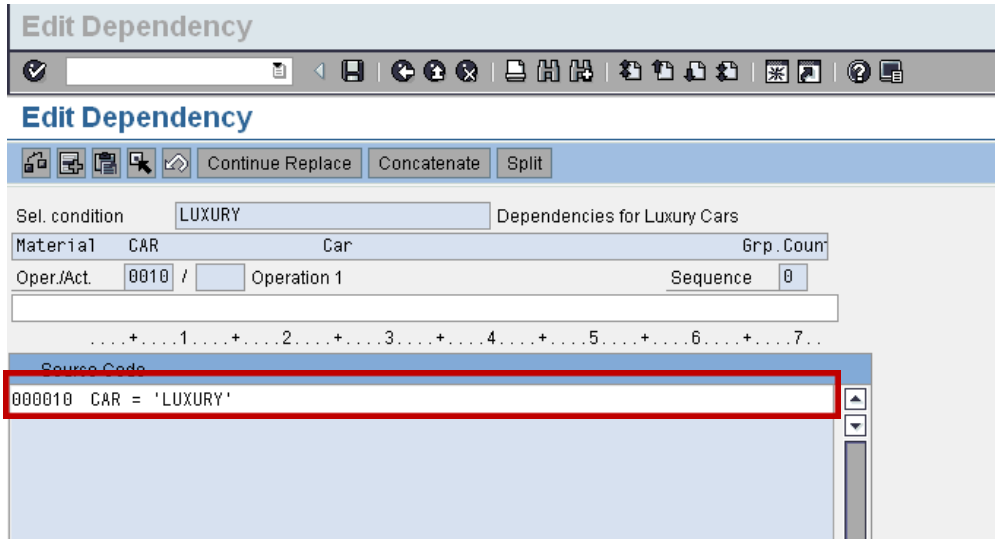


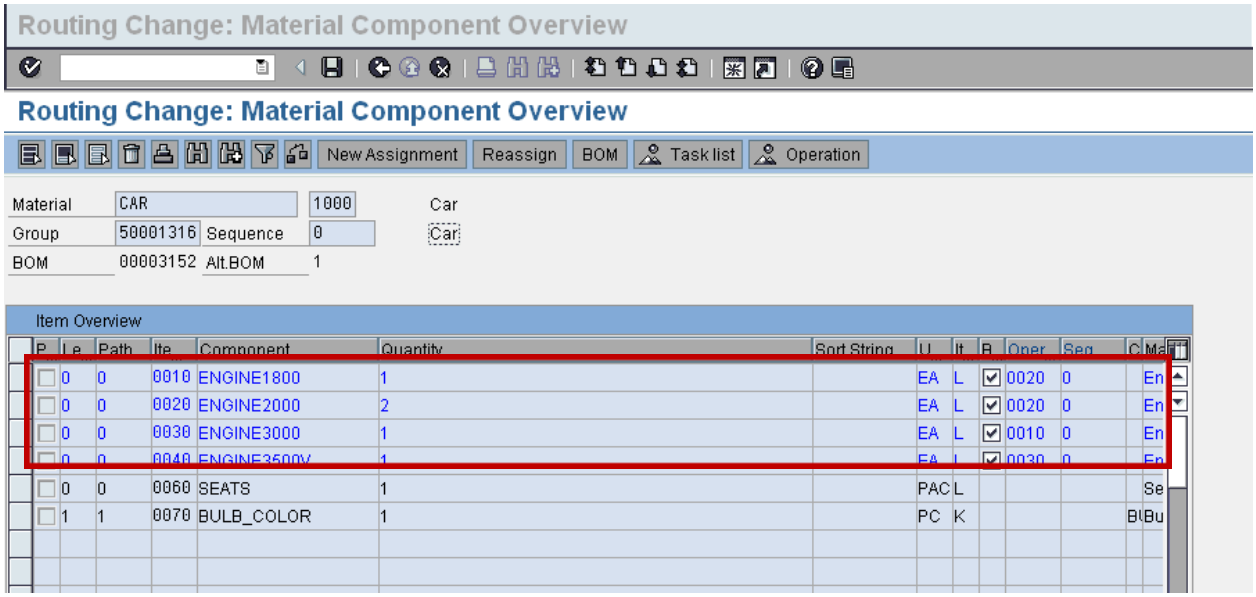
Super Routing

All the operations required for making different possible configurations and object dependencies for appropriate operation is entered

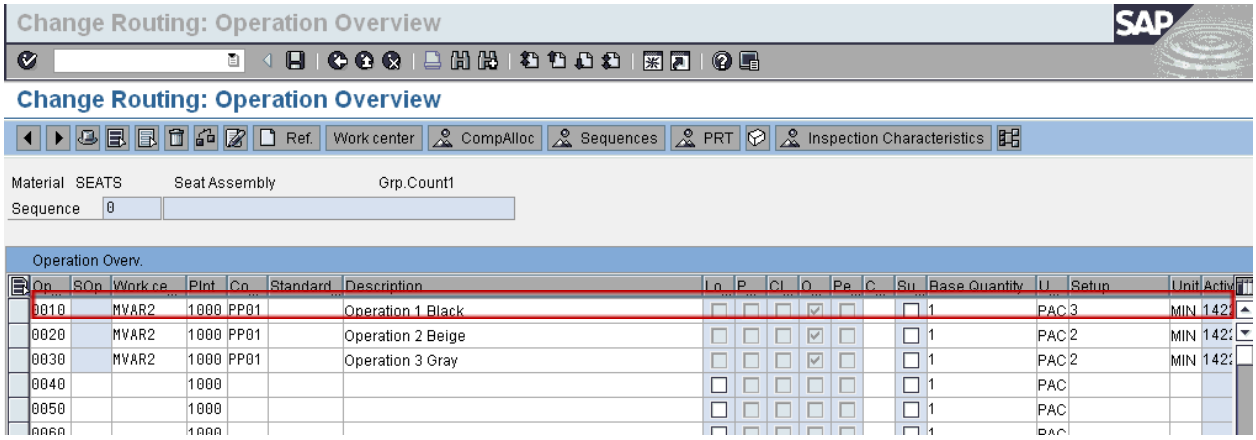


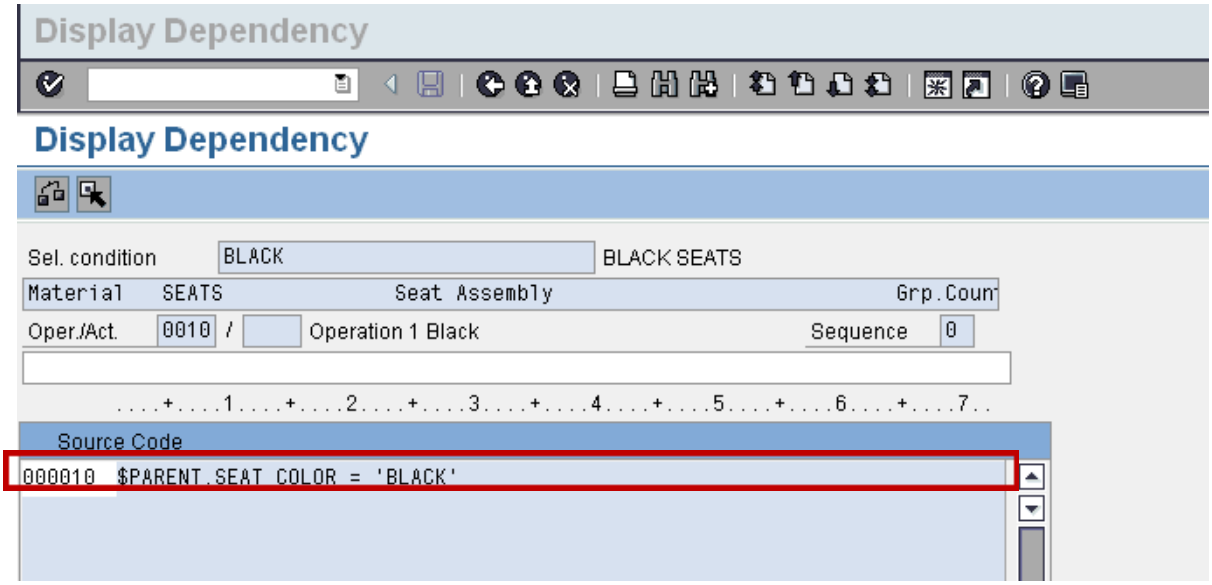



Edit Dependency
Edit Dependency
Continue Replace
Concatenate
Split
Sel. condition
LUXURY
Dependencies for Luxury Cars
Material
CAR
Car
Grp.Coun
Oper./Act.
0010
/
Operation 1
Sequence
0
....+....1....+....2....+....3....+....4....+....5....+....6....+....7..
Source Code
000010 CAR = 'LUXURY'

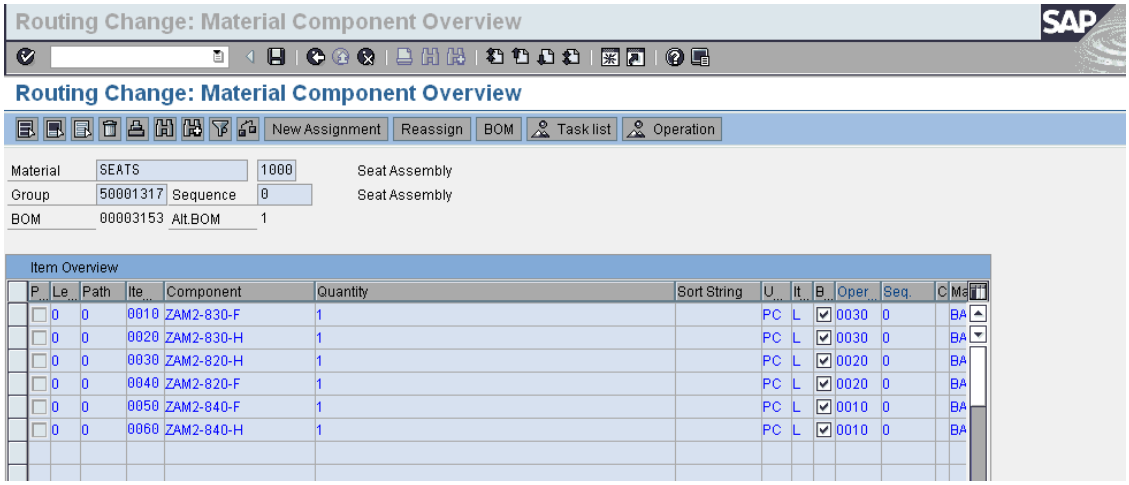

Routing Change: Material Component Overview
Routing Change: Material Component Overview
New Assignment
Reassign
BOM
Task list
Operation
Material
CAR
1000
Car
Group
50001316
Sequence
0
BOM
00003152
Alt.BOM
1
Item Overview
P
Le
Path
Ite
Component
Quantity
Sort String
U
It
B
Oper
Seq
C
0 0 0010 ENGINE1800 1 EA L 0020 0
0 0 0020 ENGINE2000 2 EA L 0020 0
0 0 0030 ENGINE3000 1 EA L 0010 0
0 0 0060 SEATS 1 PAC L
1 1 0070 BULB_COLOR 1 PC K

Object Dependencies for the super routing for sub-item configurable material

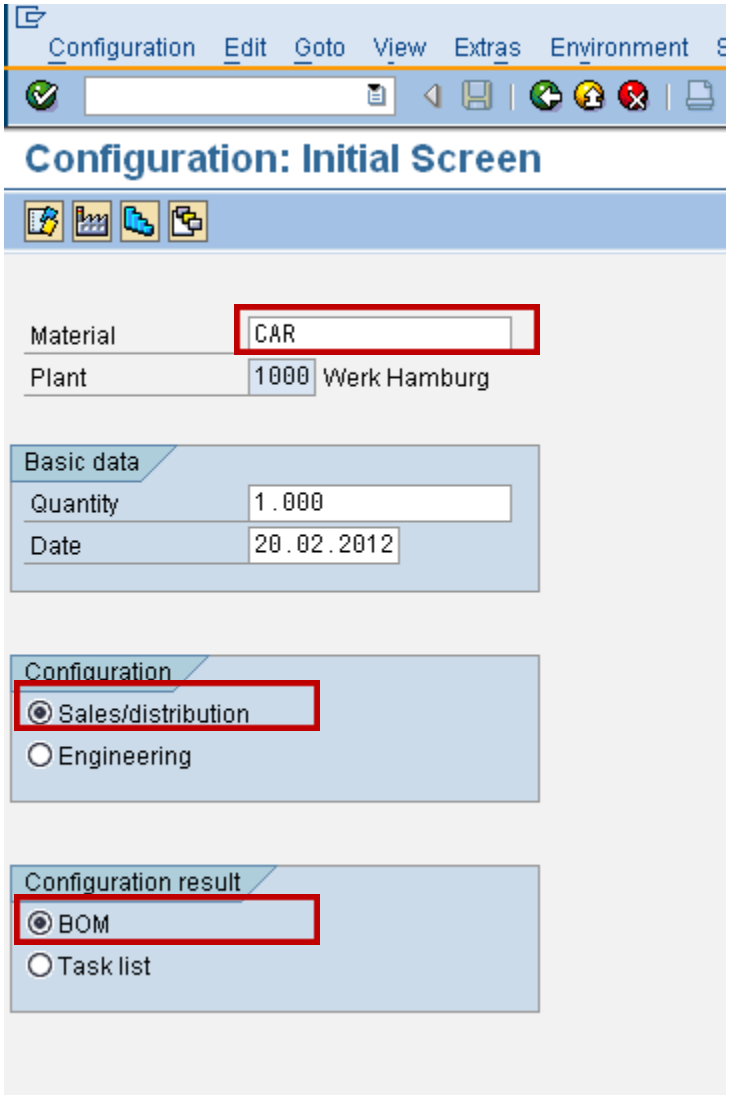




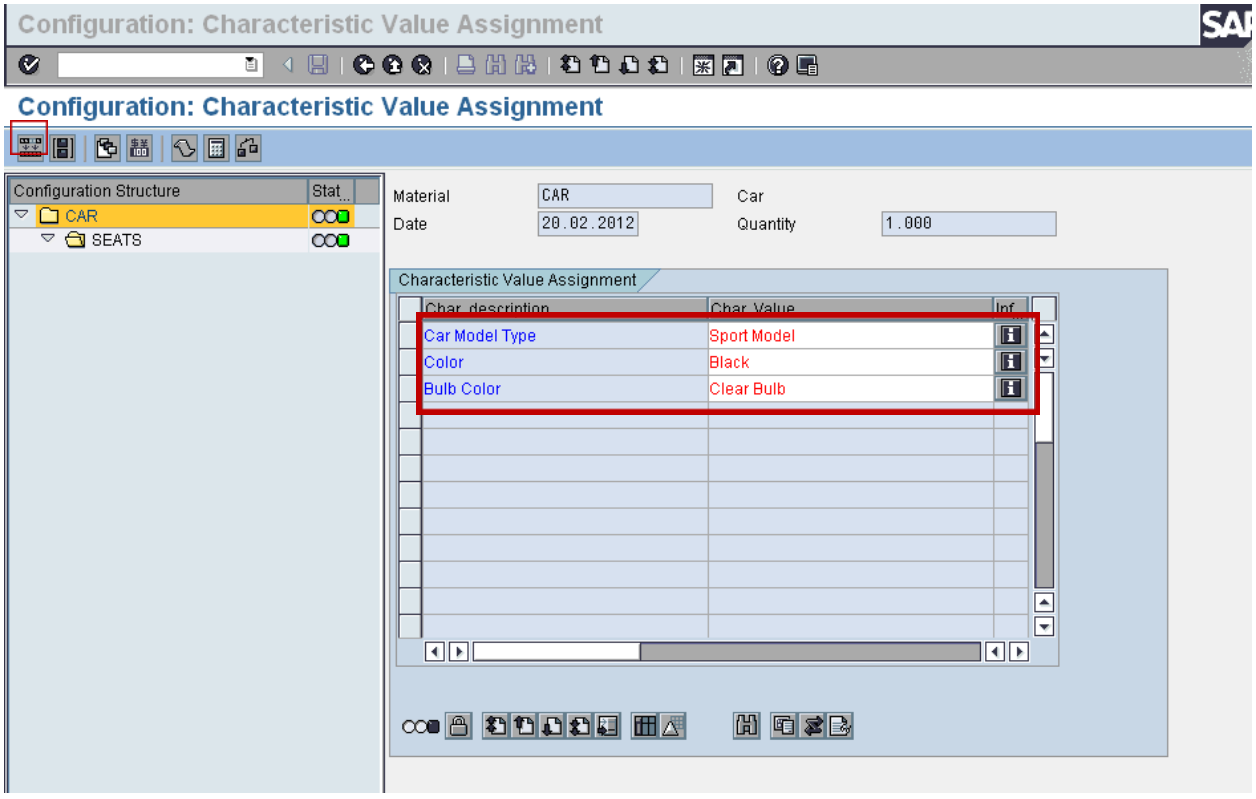
Assign components to various operations

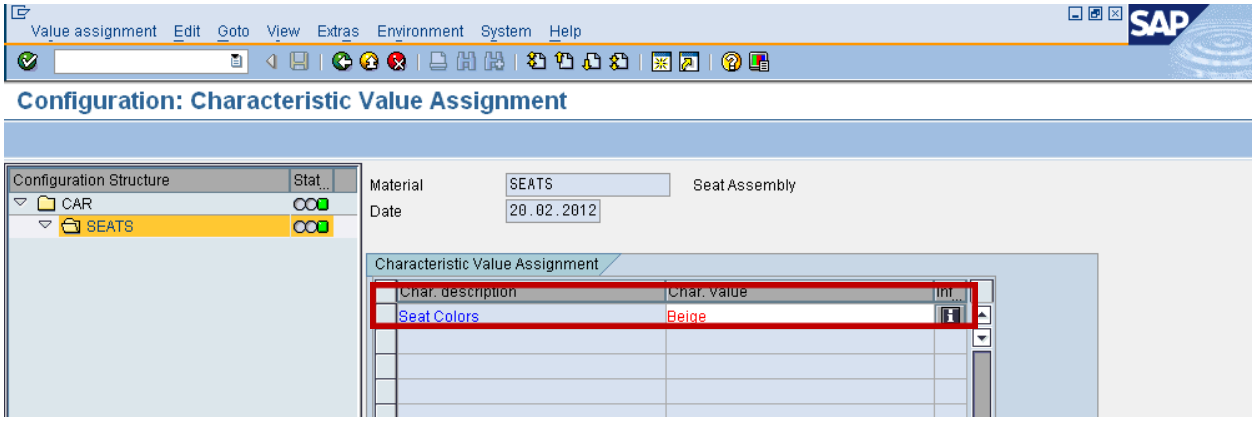

Routing Change: Material Component Overview
SAP
Routing Change: Material Component Overview
New Assignment
Reassign
BOM
Task list
Operation
Material SEATS 1000 Seat Assembly
Group 50001317 Sequence 0 Seat Assembly
BOM 00003153 Alt.BOM 1
Item Overview
P Le Path Ite Component Quantity Sort String U It B Oper Seq. C Ma
0 0 0010 ZAM2-830-F 1 PC L 0030 0 BA
0 0 0020 ZAM2-830-H 1 PC L 0030 0 BA
0 0 0030 ZAM2-820-H 1 PC L 0020 0 BA
0 0 0040 ZAM2-820-F 1 PC L 0020 0 BA
0 0 0050 ZAM2-840-F 1 PC L 0010 0 BA
0 0 0060 ZAM2-840-H 1 PC L 0010 0 BA

Configuration Test T-Code: CU50

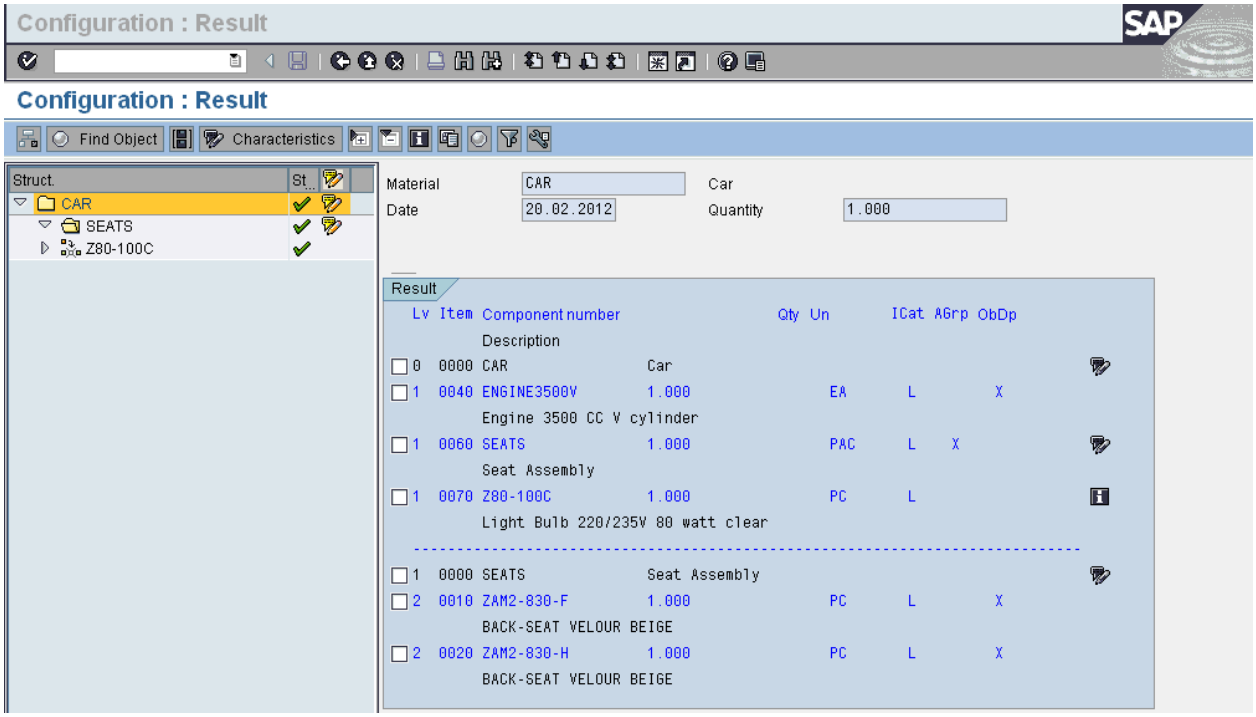


Enter the Characteristic values for Car and Seats and click on 





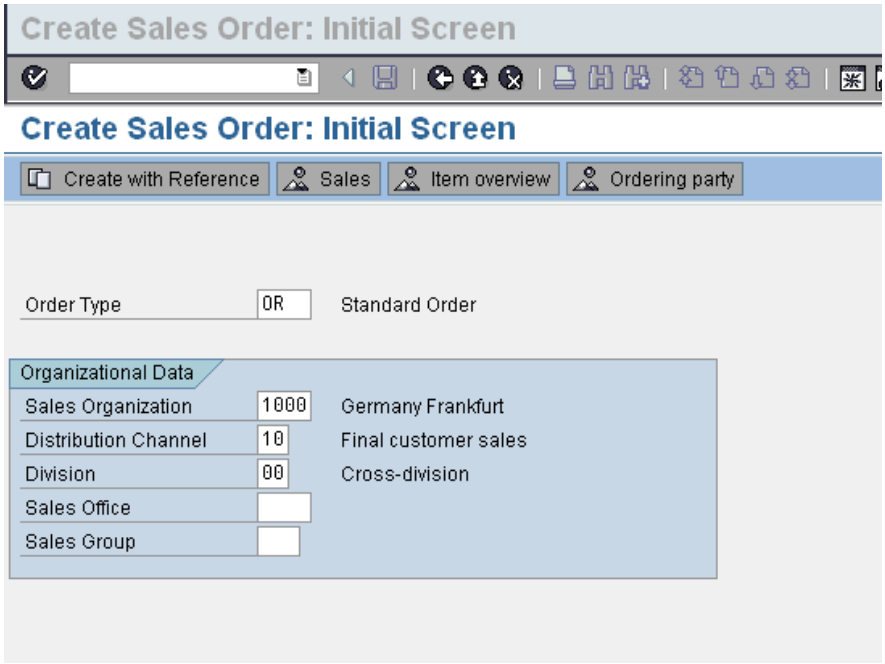
Appropriate materials for the configured materials are been selected in all the BOM levels



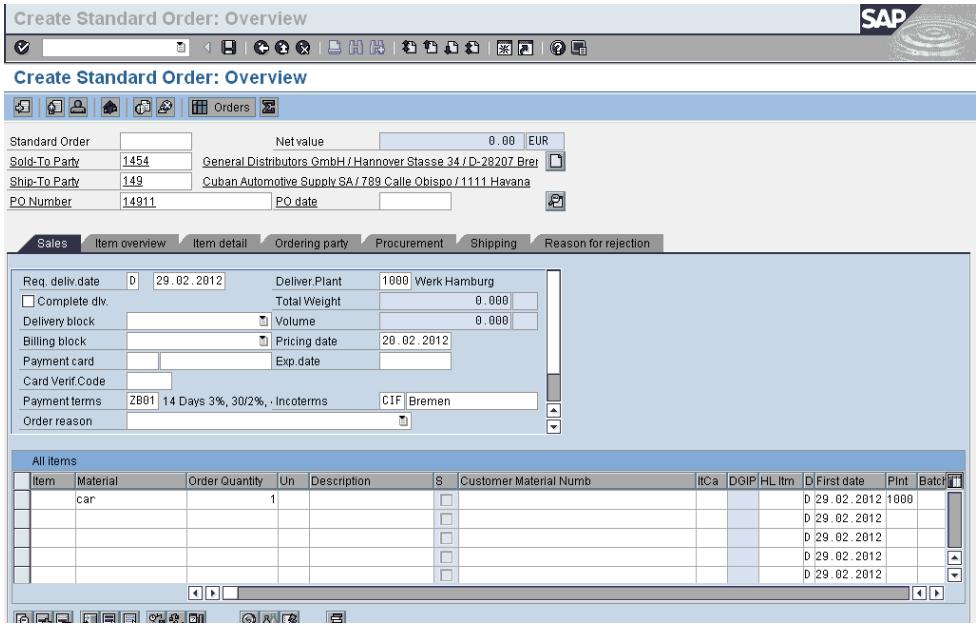
Business Process

Sales Order

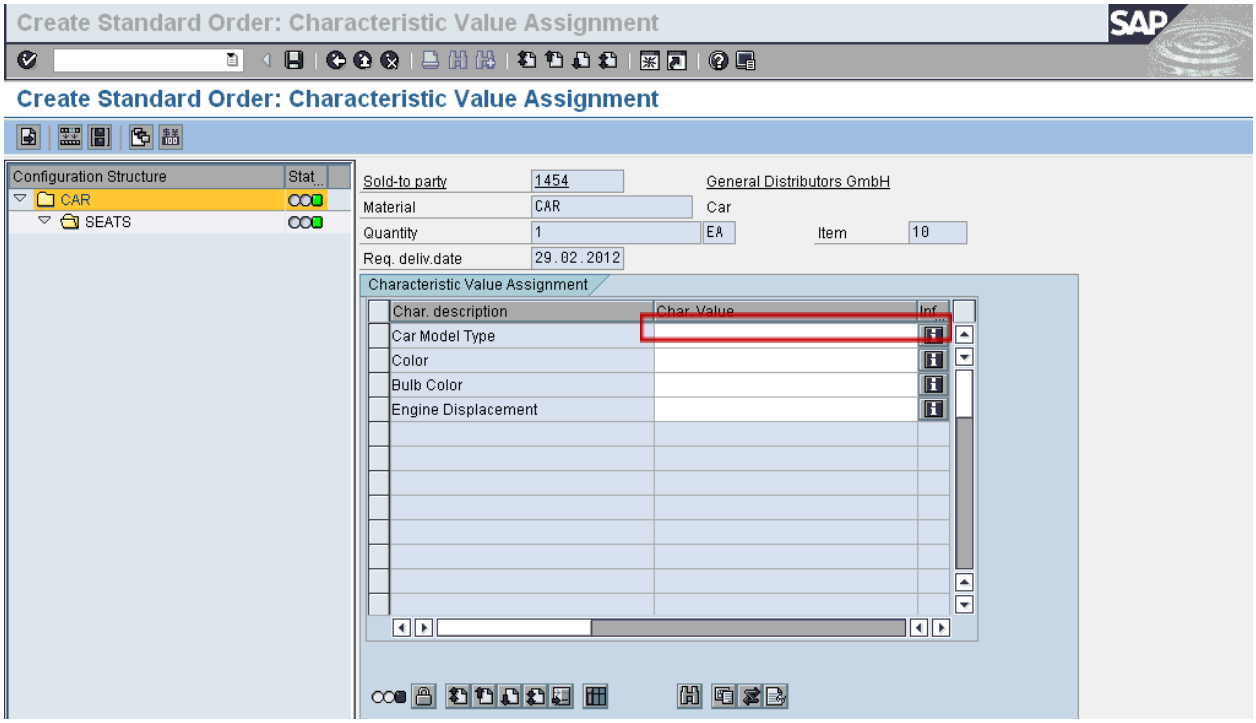
Create standard sales order

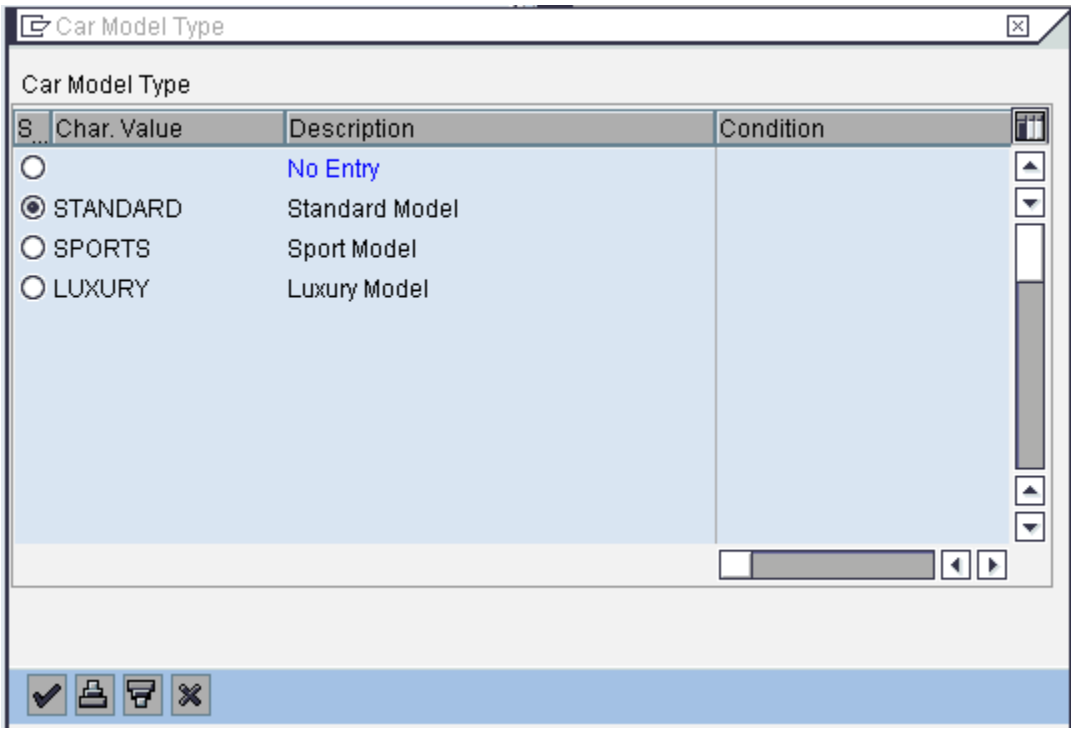


Enter the item number and quantity to enter the variant configuration



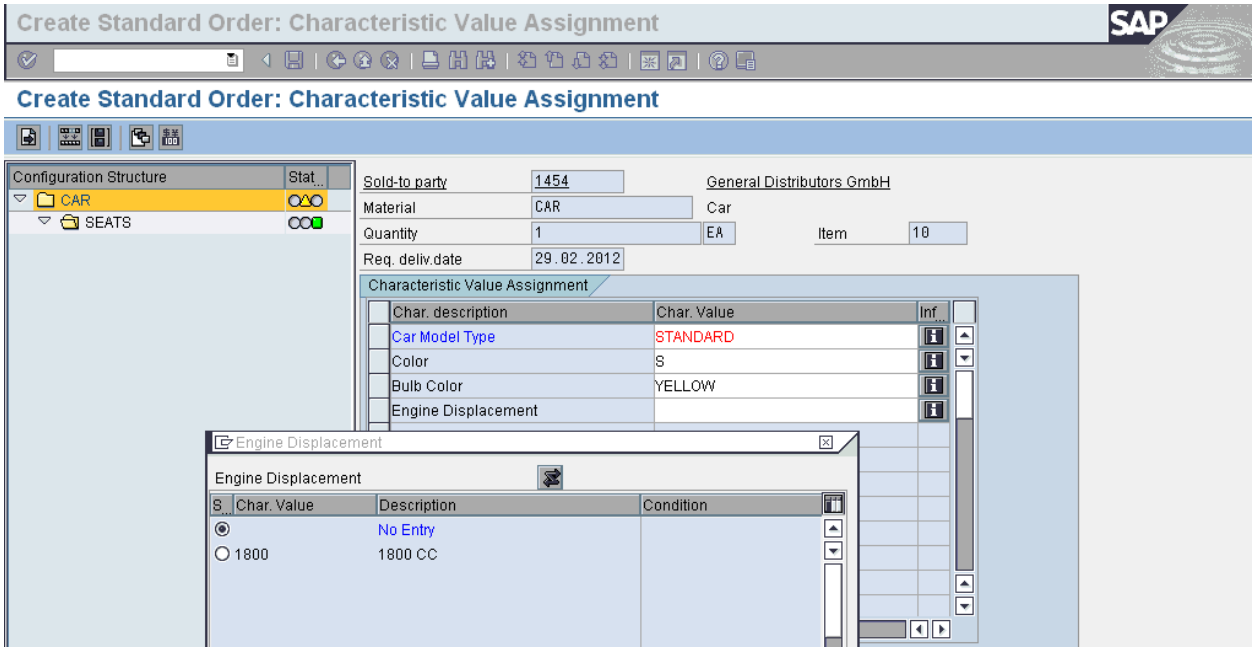
Enter the parameters for the CAR variant





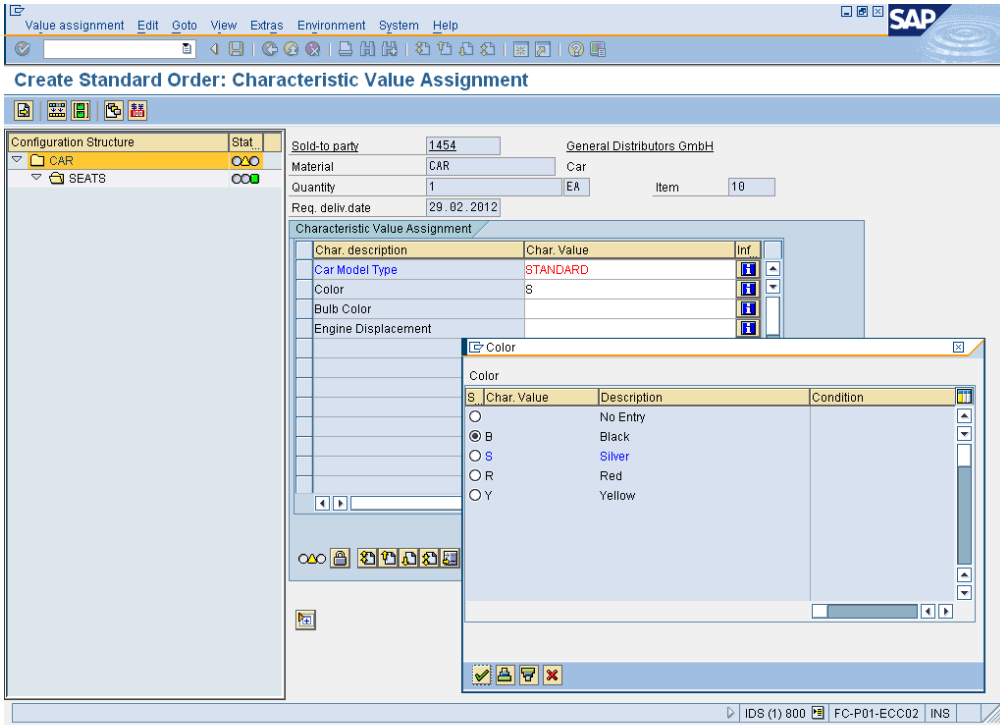
Case 1: Standard Model Selected and Color other than BLACK

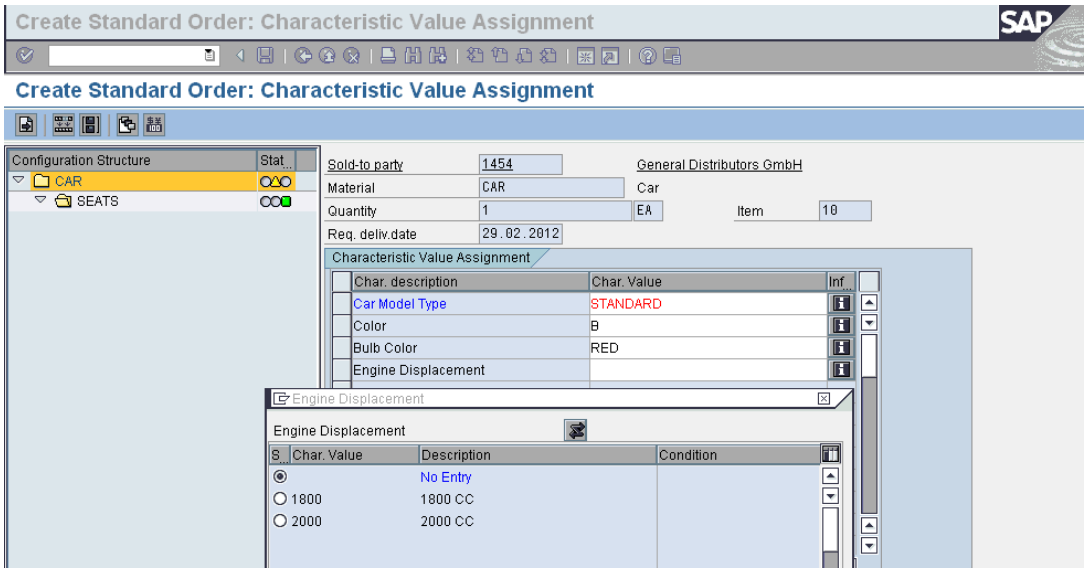
Engine Displacement Parameter is displayed but only option available is 1800CC


Create Standard Order: Characteristic Value Assignment
Create Standard Order: Characteristic Value Assignment
Configuration Structure
Stat...
CAR
SEATS
Sold-to party
1454
General Distributors GmbH
Material
CAR
Car
Quantity
1
EA
Item
10
Req. deliv.date
29.02.2012
Characteristic Value Assignment
Char. description
Char. Value
Inf...
Car Model Type
STANDARD
Color
S
Bulb Color
YELLOW
Engine Displacement
Engine Displacement
Engine Displacement
S...
Char. Value
Description
Condition
No Entry
1800
1800 CC

Case 2:

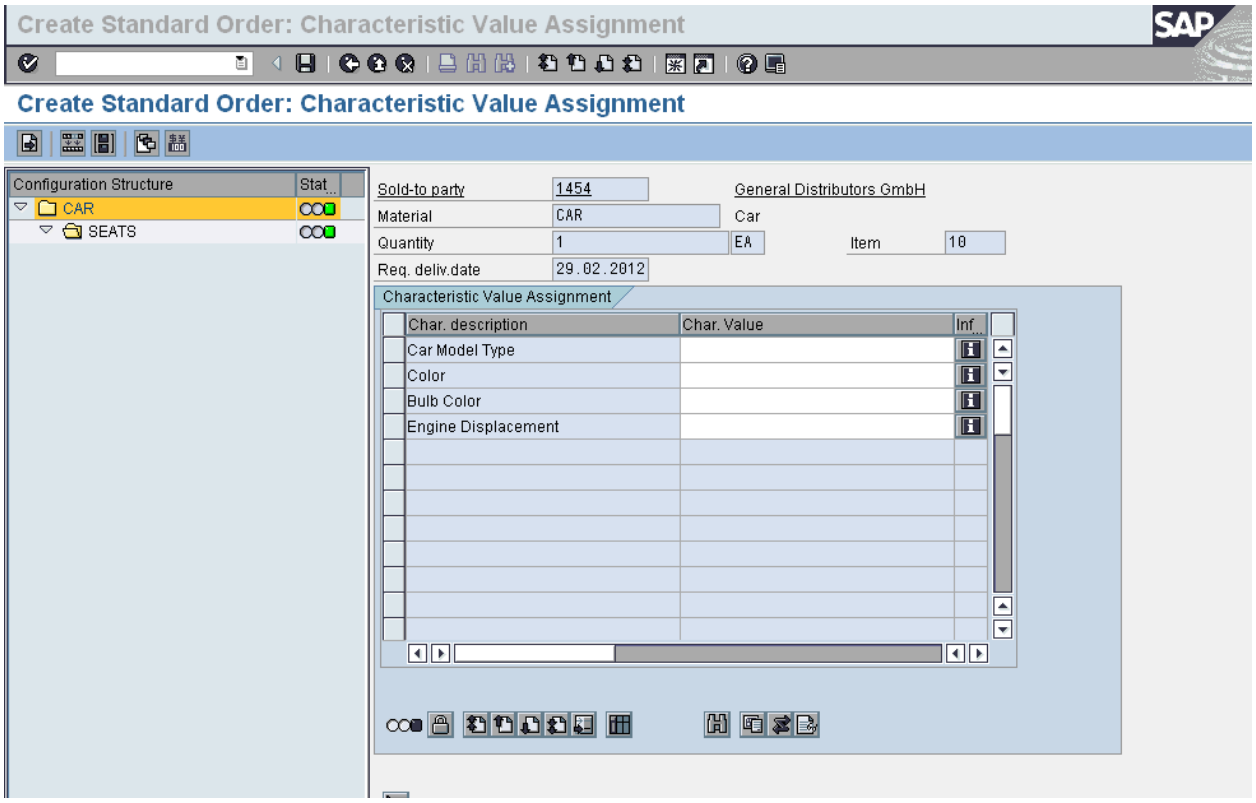
Car Model Type entered is STANDARD and Color is BLACK, the engine displacement option shows two values 1800CC and 2000CC

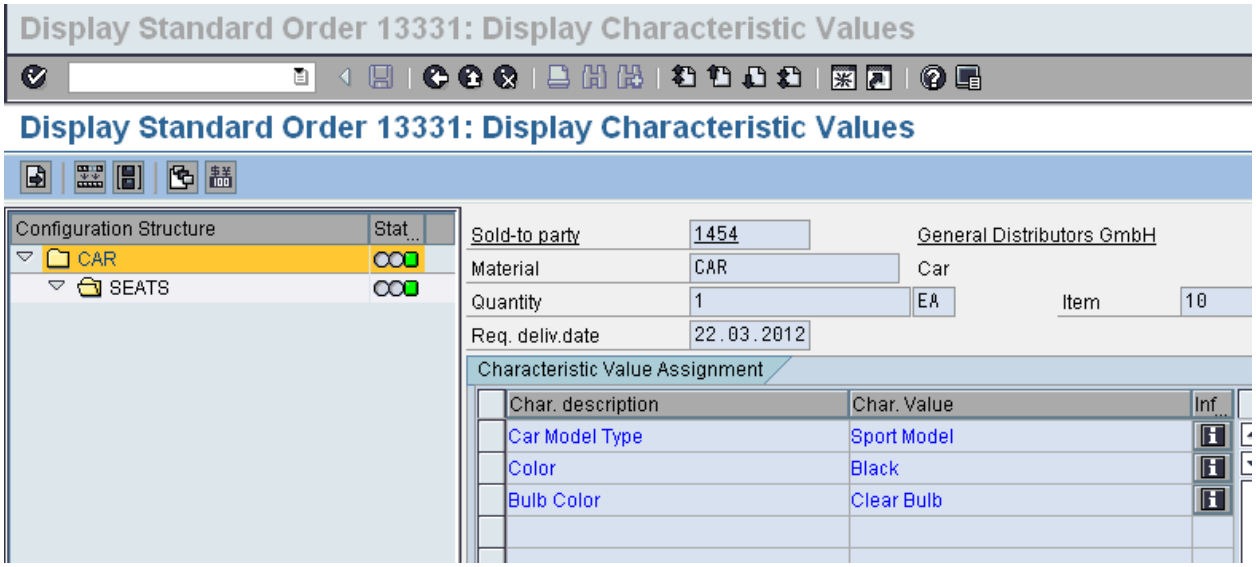




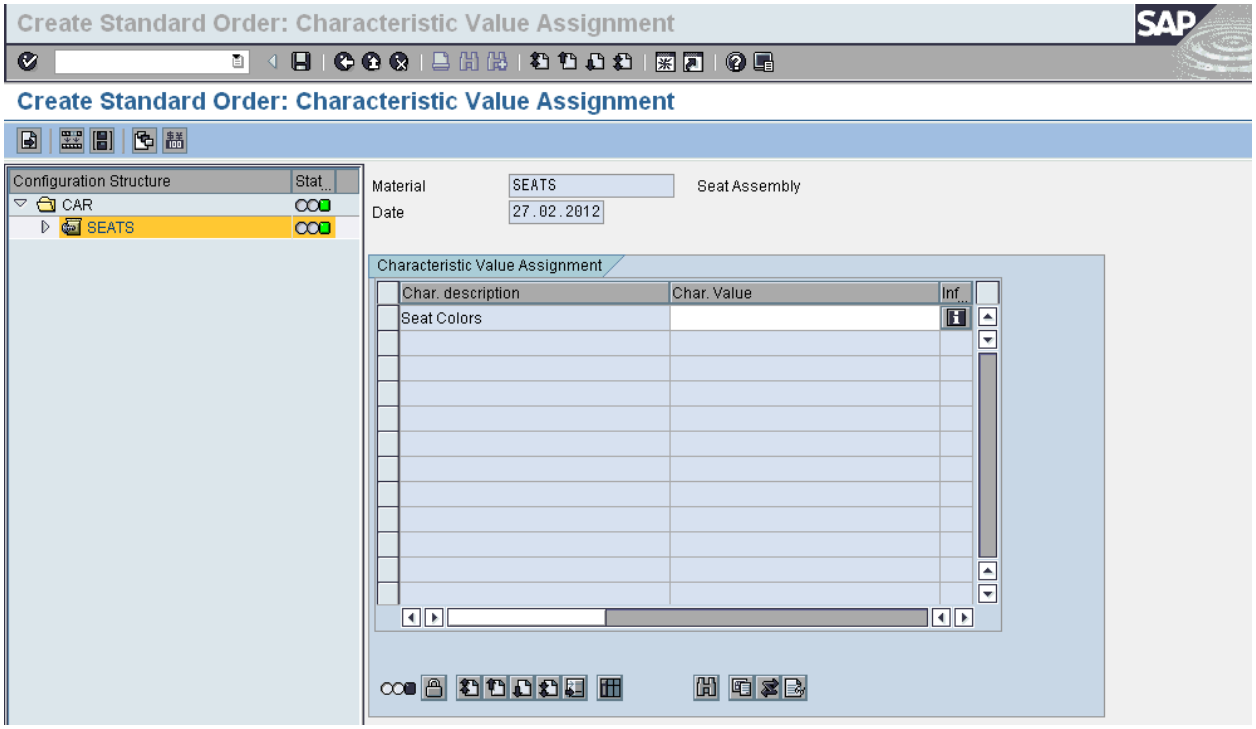
Case 3: Non STANDARD car model

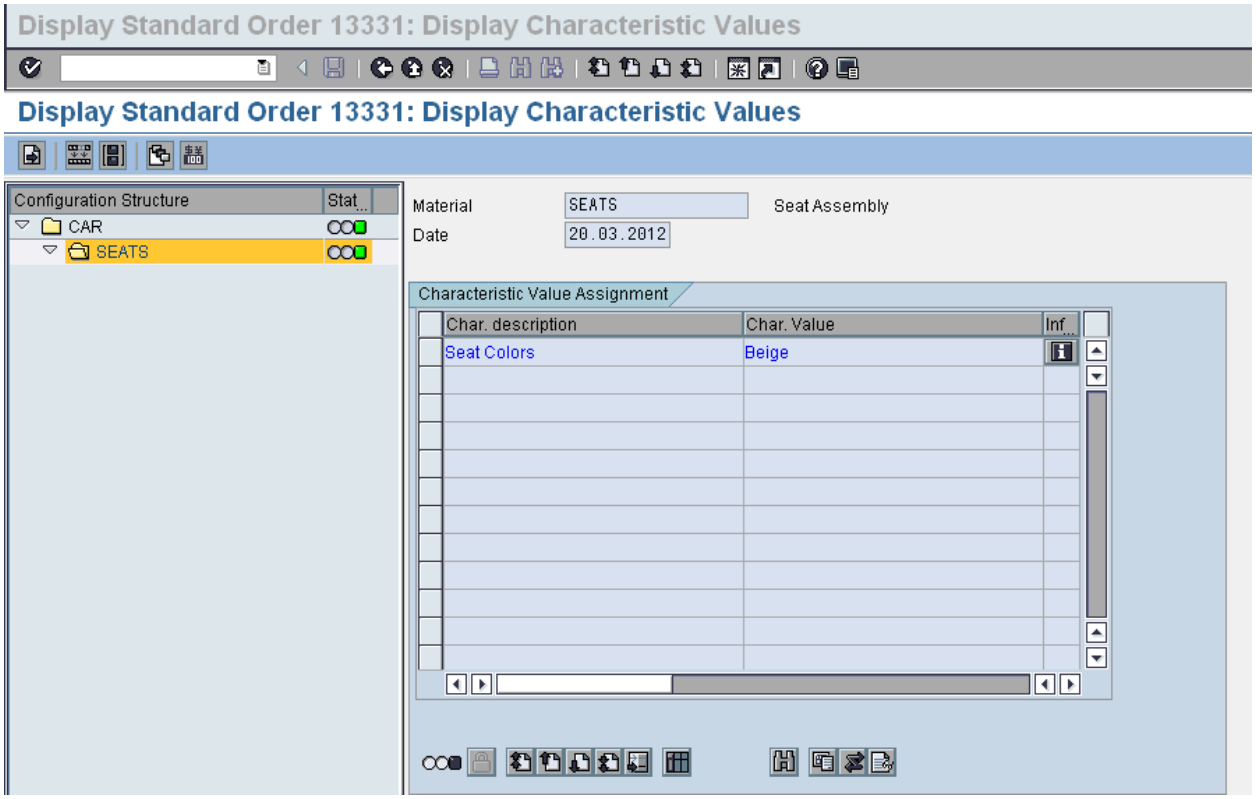
When the car model is selected with a value other than STANDARD the ENGINE displacement option is not visible

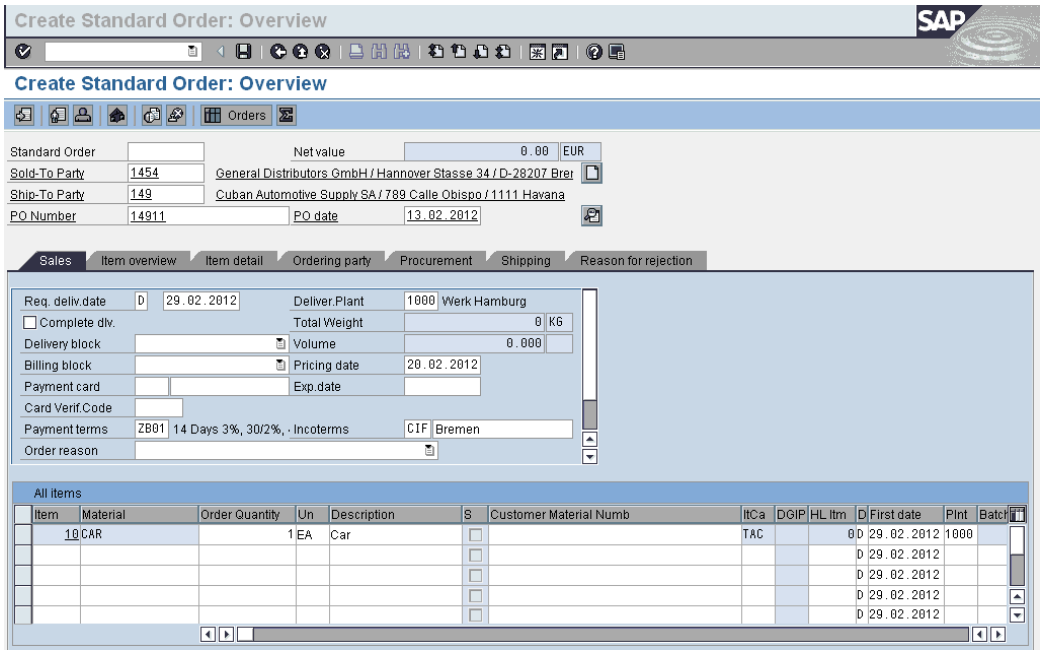


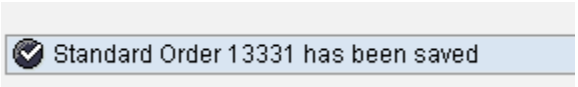


After entering the seat parameters click on the  button to check for availability on the required delivery date. If the delivery date is too early then the configuration doesn't explode and select the materials



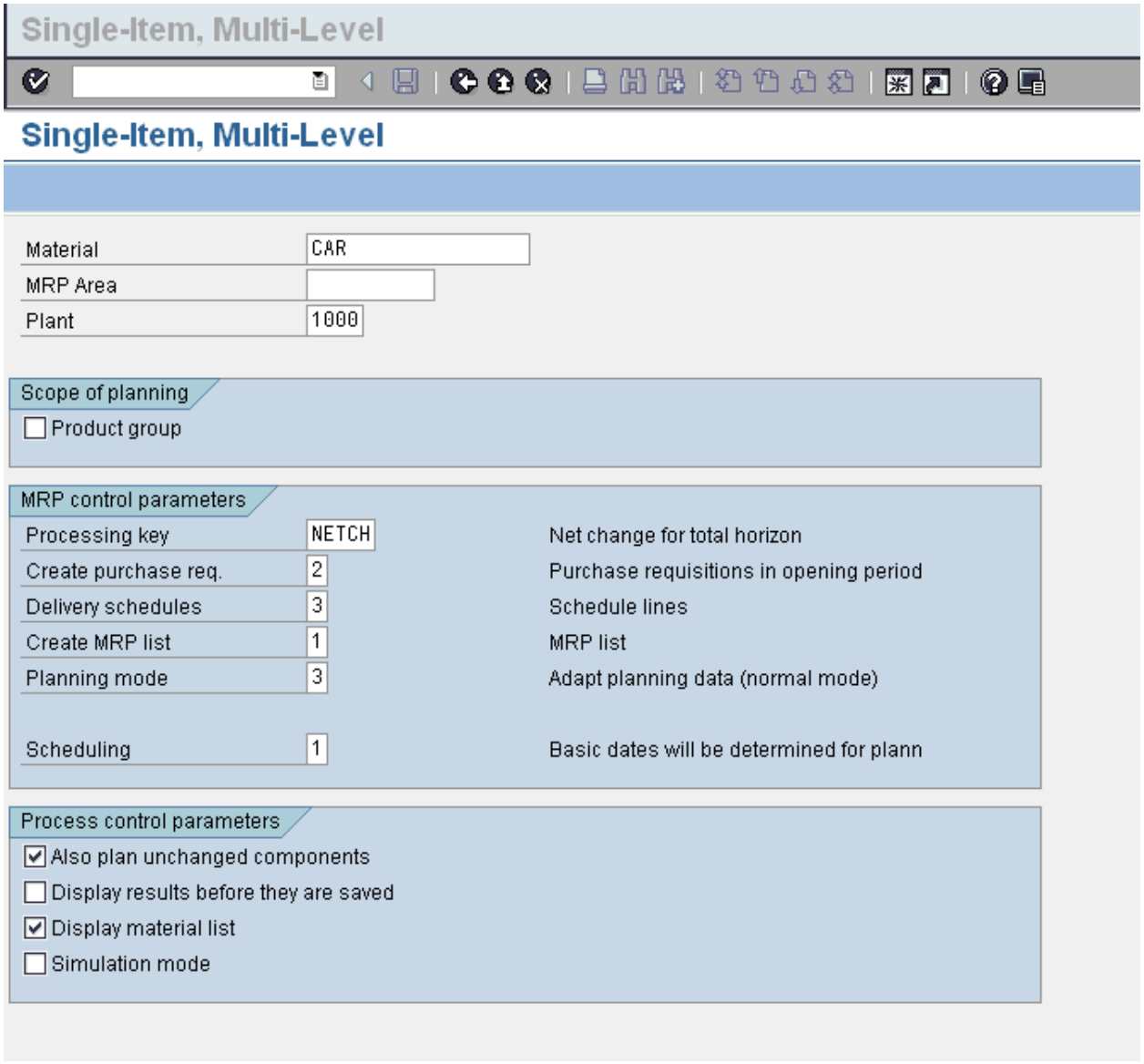

Display Standard Order 13331: Display Characteristic Values
Display Standard Order 13331: Display Characteristic Values
Configuration Structure
Stat...
CAR
SEATS
Material
SEATS
Seat Assembly
Date
20.03.2012
Characteristic Value Assignment
Char. description
Char. Value
Inf...
Seat Colors
Beige

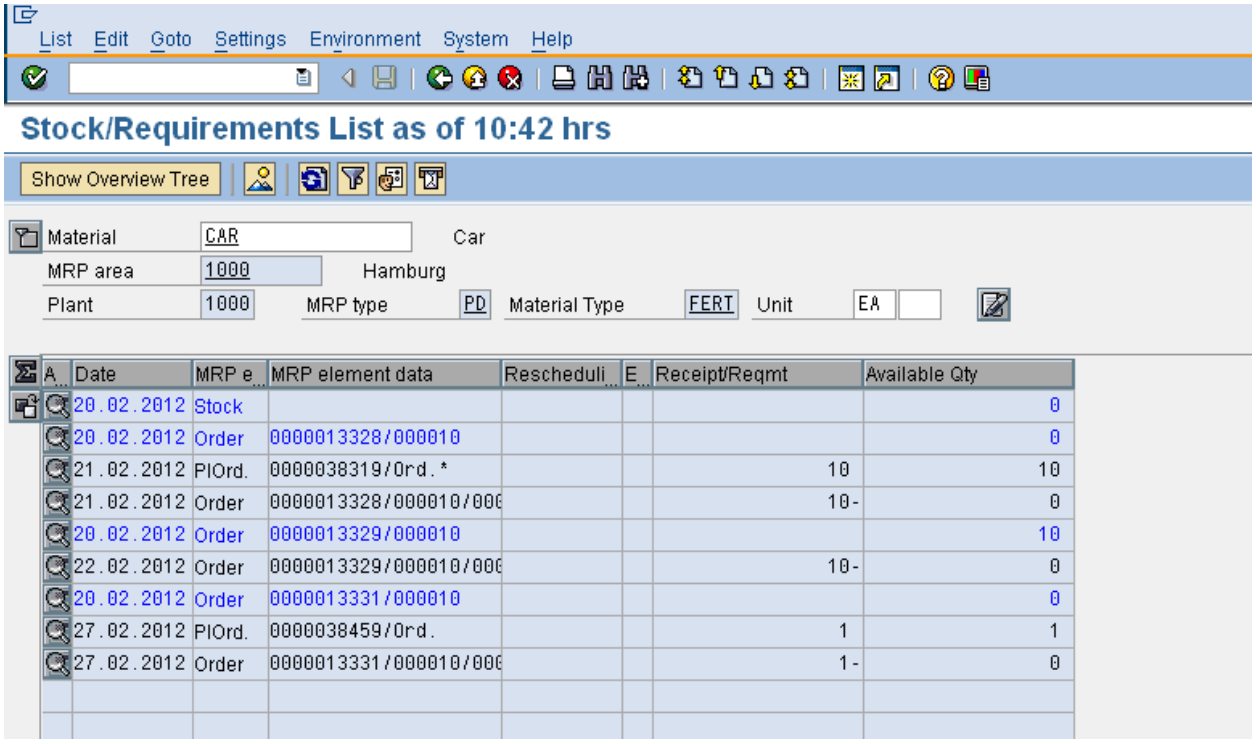

Create Standard Order: Overview
SAP
Create Standard Order: Overview
Orders
Standard Order
Net value
0.00
EUR
Sold-To Party
1454
General Distributors GmbH / Hannover Stasse 34 / D-28207 Brer
Ship-To Party
149
Cuban Automotive Supply SA / 789 Calle Obispo / 1111 Havana
PO Number
14911
PO date
13.02.2012
Sales
Item overview
Item detail
Ordering party
Procurement
Shipping
Reason for rejection
Req. deliv.date
D
29.02.2012
Deliver.Plant
1000
Werk Hamburg
Complete dlv.
Total Weight
0
KG
Delivery block
Volume
0.000
Billing block
Pricing date
20.02.2012
Payment card
Exp.date
Card Verif.Code
Payment terms
ZB01
14 Days 3%, 30/2%, ·
Incoterms
CIF
Bremen
Order reason
All items
Item
Material
Order Quantity
Un
Description
S
Customer Material Numb
ItCa
DGIP
HL Itm
D
First date
Plnt
Batch
10
CAR
1
EA
Car
TAC
0
D
29.02.2012
1000



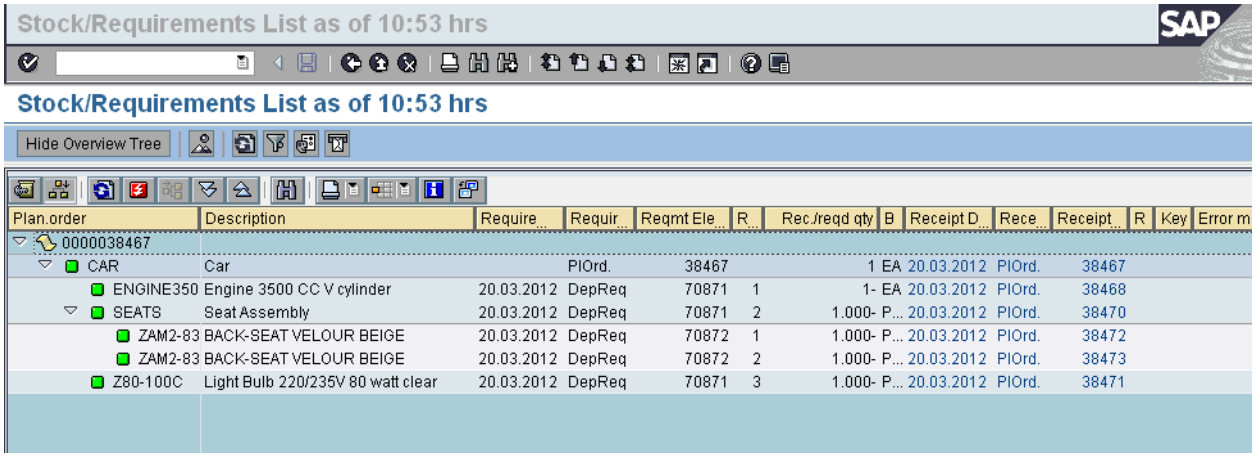
MRP Run

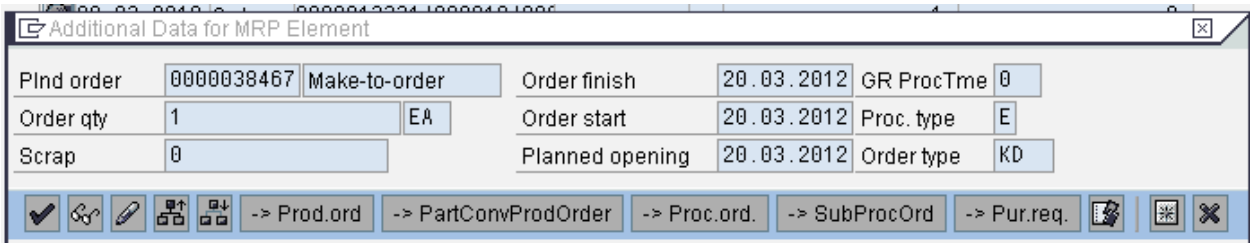
Perform Single Item, Multi level MRP run


Single-Item, Multi-Level
Single-Item, Multi-Level
Material
CAR
MRP Area
Plant
1000
Scope of planning
Product group
MRP control parameters
Processing key
NETCH
Net change for total horizon
Create purchase req.
2
Purchase requisitions in opening period
Delivery schedules
3
Schedule lines
Create MRP list
1
MRP list
Planning mode
3
Adapt planning data (normal mode)
Scheduling
1
Basic dates will be determined for plann
Process control parameters
Also plan unchanged components
Display results before they are saved
Display material list
Simulation mode

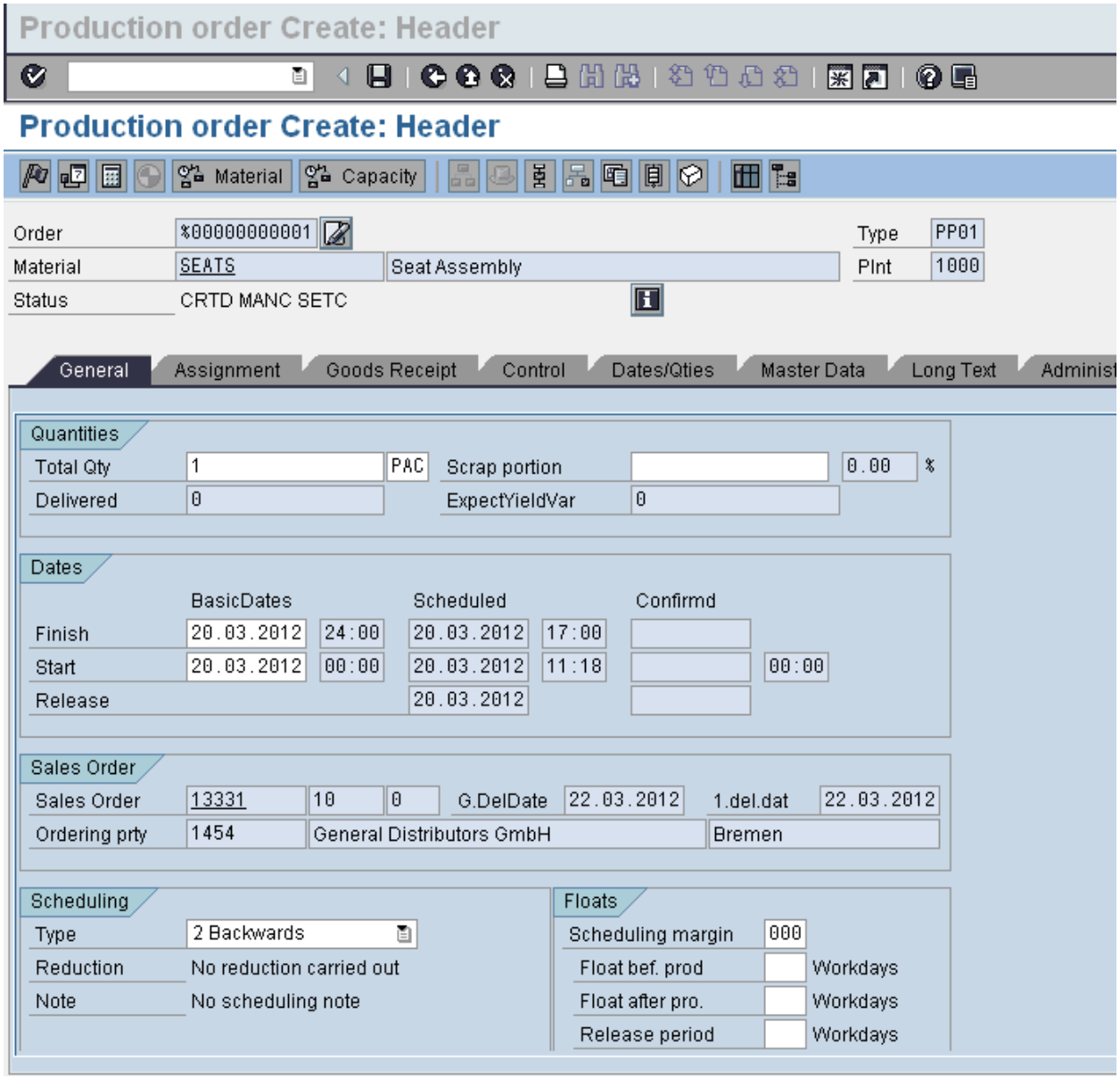


Converting all the planned orders into respective Purchase Orders and Production Orders

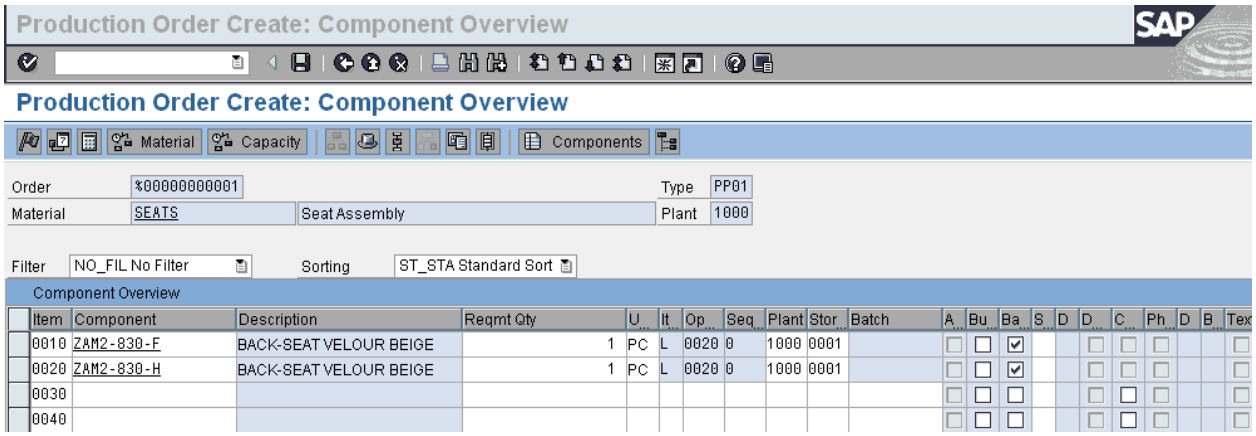




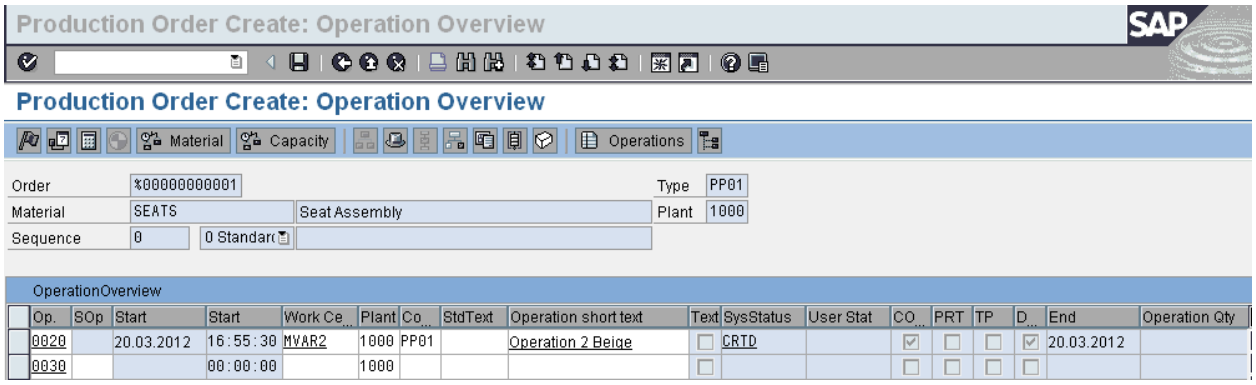
Production Order with reference to sales order is generated for material number SEATS



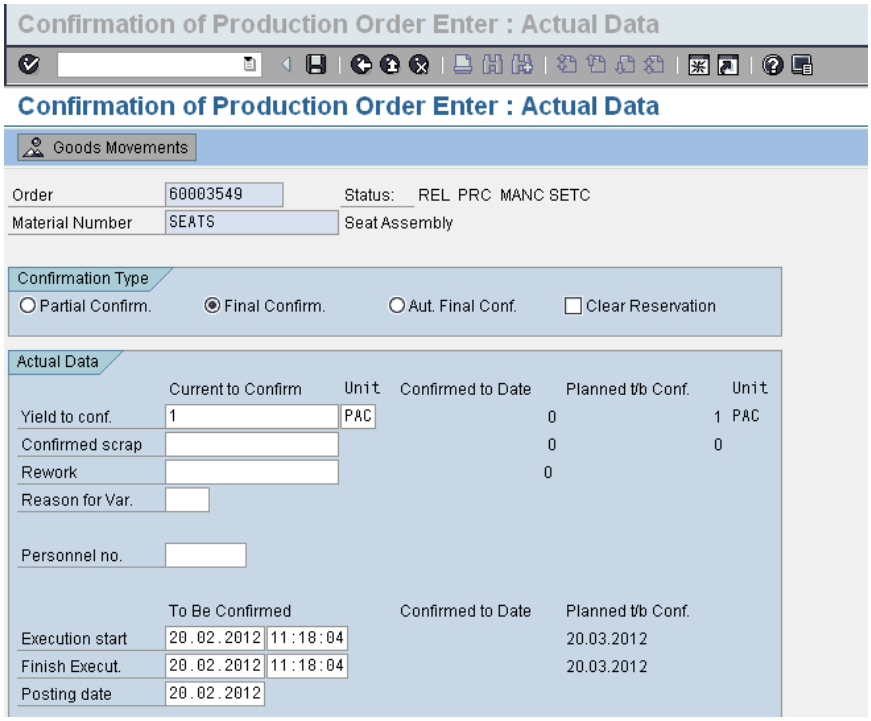
A Variant BOM with seat components with color BIEGE is selected and assigned to the production order



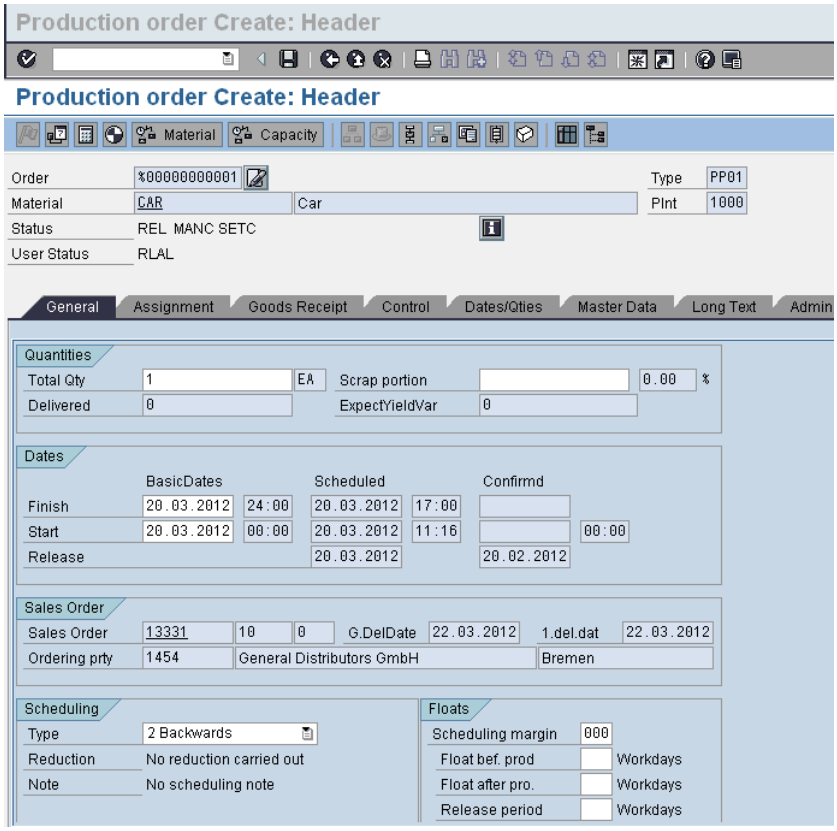
Appropriate Operation from super routing is assigned to the Production order



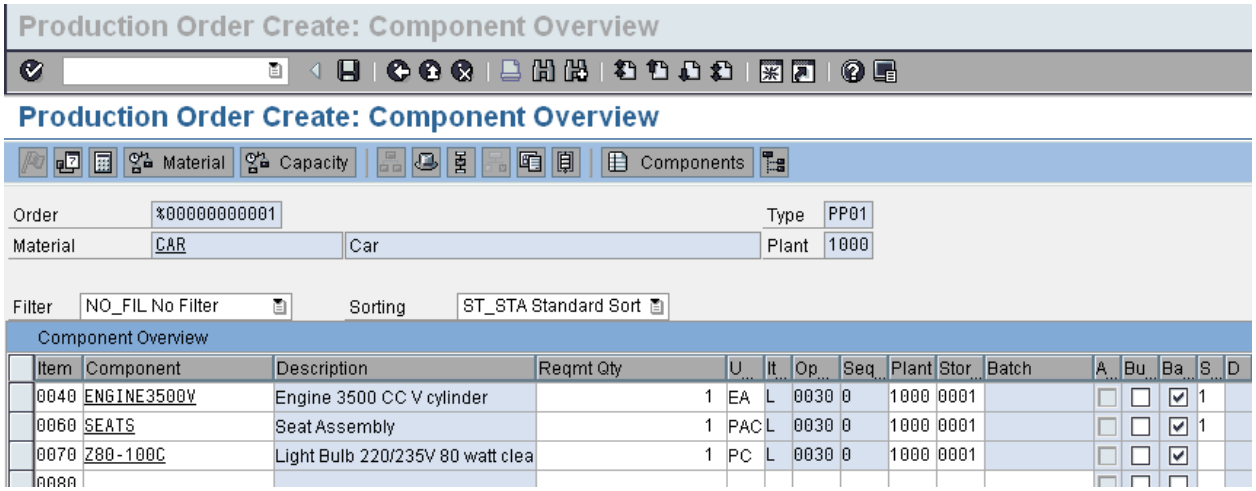
Confirming the Production order for the material SEATS



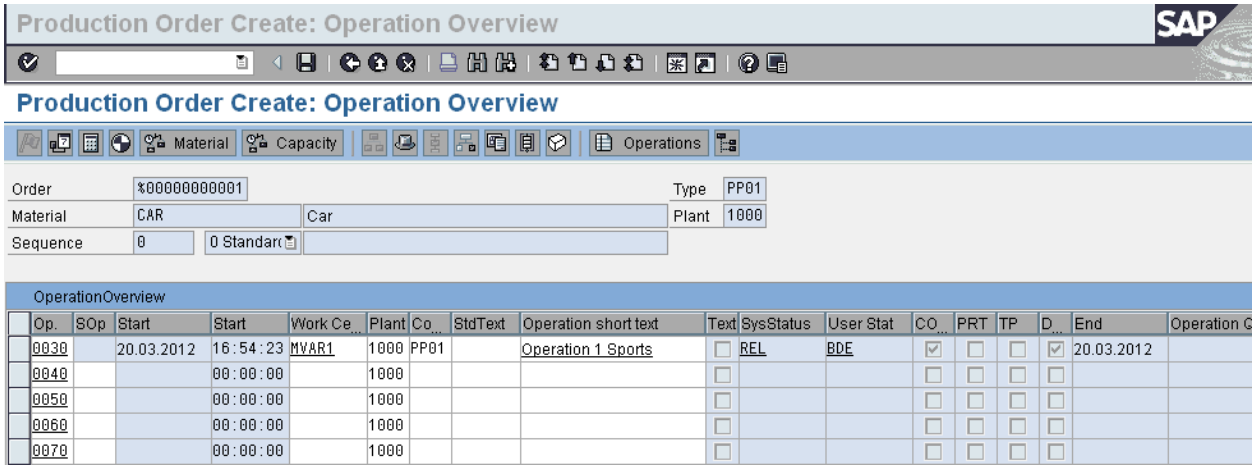
Production Order for the material CAR



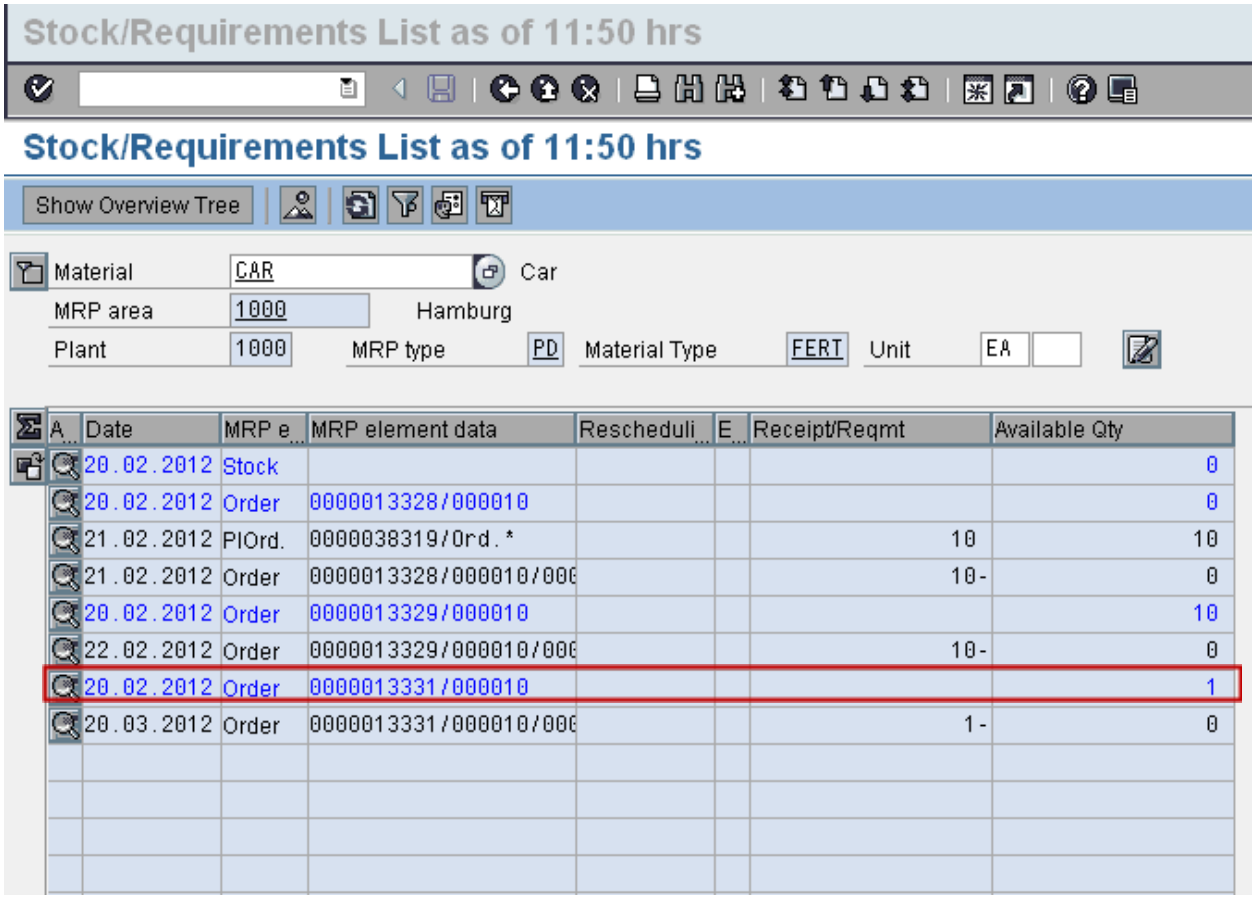
Components for Variant Specific Production Order



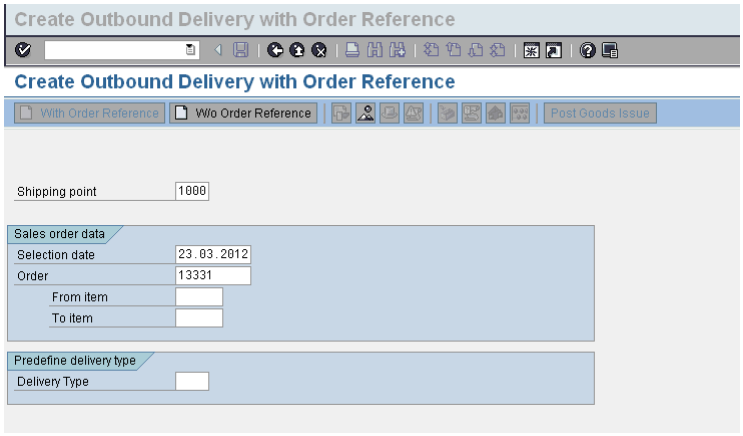
Variant specific operation for the CAR assigned to Production Order



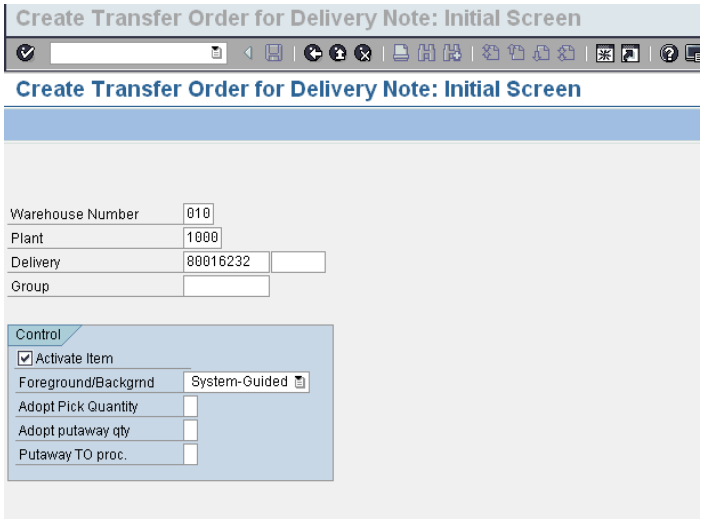
After confirming all the production orders the Stock specific to sales order is available for delivery

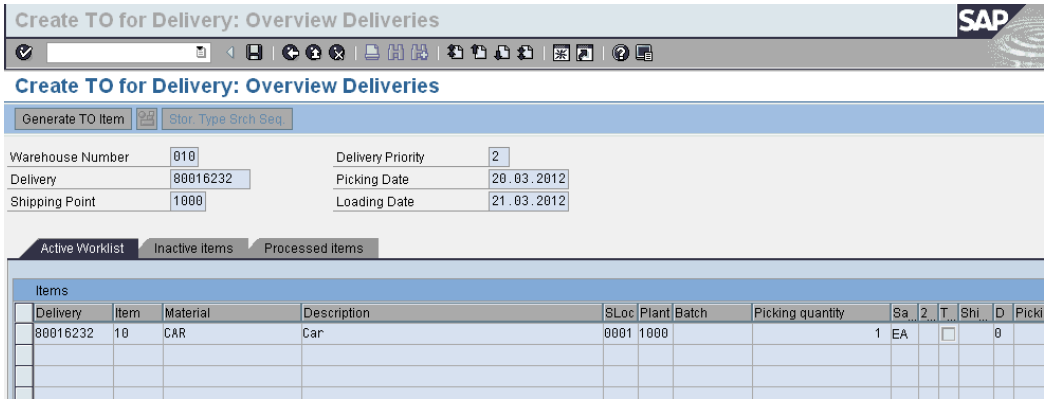

Stock/Requirements List as of 11:50 hrs
Stock/Requirements List as of 11:50 hrs
Show Overview Tree
Material CAR Car
MRP area 1000 Hamburg
Plant 1000 MRP type PD Material Type FERT Unit EA
A... Date MRP e... MRP element data Rescheduli... E... Receipt/Reqmt Available Qty
20.02.2012 Stock 0
20.02.2012 Order 0000013328/000010 0
21.02.2012 PlOrd. 0000038319/Ord.* 10 10
21.02.2012 Order 0000013328/000010/000 10- 0
20.02.2012 Order 0000013329/000010 10
22.02.2012 Order 0000013329/000010/000 10- 0
20.02.2012 Order 0000013331/000010 1
20.03.2012 Order 0000013331/000010/000 1- 0

Creating Outbound Delivery

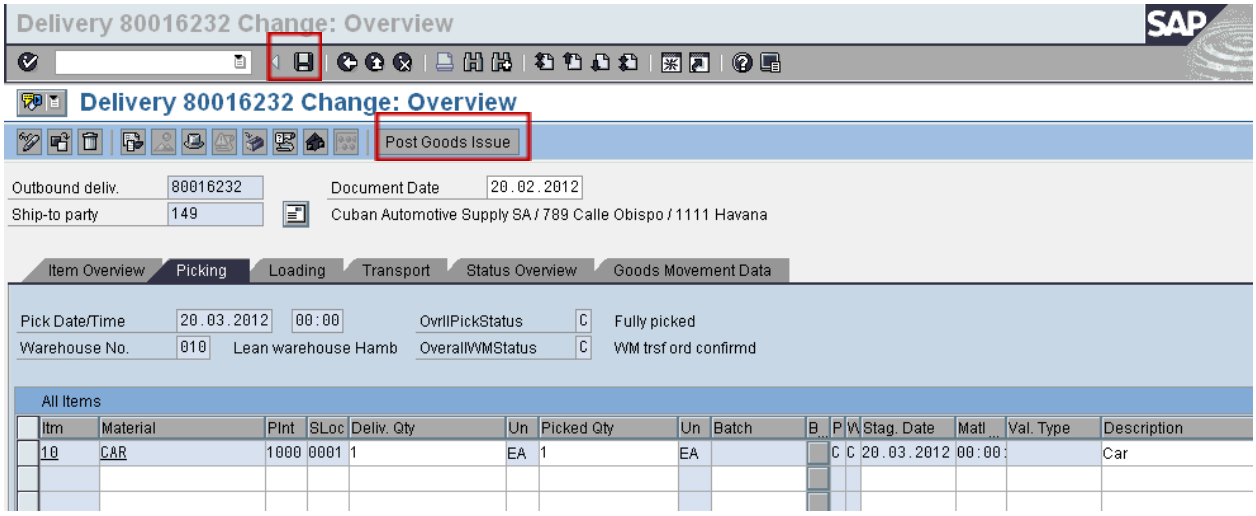


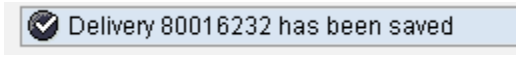
Creating Transfer Order for Delivery to pick the material



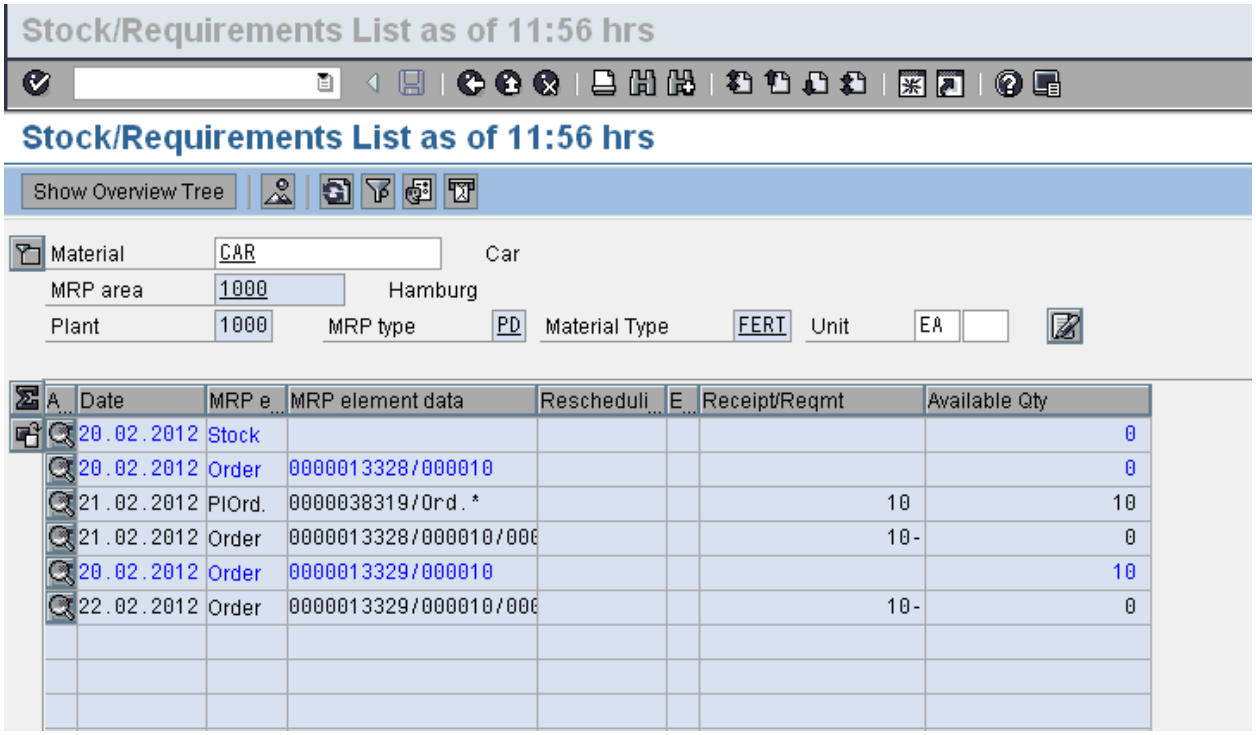


Post Goods Issue for the delivery and save the document





Stock Requirements List After Delivery


Stock/Requirements List as of 11:56 hrs
Stock/Requirements List as of 11:56 hrs
Show Overview Tree
Material CAR Car
MRP area 1000 Hamburg
Plant 1000 MRP type PD Material Type FERT Unit EA
A Date MRP e MRP element data Rescheduli E Receipt/Reqmt Available Qty
20.02.2012 Stock 0
20.02.2012 Order 0000013328/000010 0
21.02.2012 PlOrd. 0000038319/Ord.* 10 10
21.02.2012 Order 0000013328/000010/000 10- 0
20.02.2012 Order 0000013329/000010 10
22.02.2012 Order 0000013329/000010/000 10- 0