Release Notes

AVL CRUISE
VERSION 2014

AVL LIST GmbH
Hans-List-Platz 1, A-8020 Graz, Austria
http://www.avl.com

AST Local Support Contact: www.avl.com/ast-worldwide

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This document describes how to run the CRUISE software. It does not attempt to discuss all of concepts of vehicle simulation that are required to obtain successful solutions. It is the user's responsibility to determine if he/she has sufficient knowledge and understanding of vehicle simulation to apply this software appropriately.

Table of Contents

1. RELEASE v2014

This document describes the new features, enhancements and resolved issues in CRUISE v2014. Changes described here can also be found in the updated documentation.

1.1. New Features

Random Cycle Generator (RCG)
The Random Cycle Generator (RCG) is a tool to create driving cycles. The RCG reads driving cycles from a MATLAB file, randomly selects a user-specified number of them and combines them into a single driving cycle. The RCG contains options for the connection of the individual driving cycles, including transitions, velocity ranges and break periods. The RCG can also check and ensure the feasibility of the driving cycles for a specific vehicle as well as limit the maximum acceleration of the selected cycles. The general idea of the RCG was to create a tool which permits the rapid generation of driving cycles for use in CRUISE.

Battery Parameterization Wizard (BPW)
A battery model based on an empirical equation has been implemented in CRUISE and FIRE. The empirical equation is used in order to relate the voltage response of a Li-Ion battery cell to current, time and temperature. The empirical relation contains a number of fitting parameters which are obtained by an analytical fit to experimental discharge/charge curves for different discharge/charge rates and temperatures. In principle, for each battery cell an individual fitting parameter set has to be identified. However, for battery cells of similar size and capacity, the same parameter set could be used. Experience, i.e. fitting of this model to many different battery cells, will show, in which way the fitting parameters correlate with the cell type. The Battery Parameterization Wizard utilizes the nonlinear regression to fit the experimental discharge curves to obtain the fitting parameters which can be directly used by the Empirical Battery model in CRUISE and the Electro-thermal model in FIRE.

1.1.1. General

Sankey Diagram for Energy and Power Visualization
CRQ_118511
The EFD postprocessing was extended by the Sankey Diagram visualization. This visualization shows the energy and power flow as arrows with a correlating width regarding the transported amount. The diagram is interactive and linked with the other EFD parts. For all details please refer to the Users Guide.

1.1.2. Components

AMT Control Closed-Loop
CRQ_120098
In order to overcome additional requirements about more specific control component functionalities for what concerns AMT gearbox configurations, a new component has been introduced: the AMT Control Closed-Loop. This component offers a more advanced strategy to control the launching and the shifting procedures during vehicle operations. It uses PI feedback control systems for operating torque request to the Engine and the Clutch. For this reason the component must use an adequate small time step and will not be suitable for Stationary and Quasi-Stationary calculations.

Elasto-Plastic Clutch
CRQ_130050
The Elasto-Plastic Clutch is available as a new driveline component and is so-called because it is based on the Elasto-Plastic mathematical model. This model uses an internal state variable, the average deflection of all the asperity of the surfaces in contact, in order to evaluate the current operational condition in which the clutch is working. Assuming that the asperities of the surfaces in contact are modeled like bristles, there are three possible operational conditions: sticking, pre-sliding and sliding. The model also describes the Stribeck effect and uses only one differential equation to describe the different operational conditions of the clutch.

Push Belt CVT Model
CRQ_117312
A dynamic Push Belt CVT module is introduced which is controlled by axial clamping forces. The system comprises two pulley and push belt. The pulley on the input side is referred to as a primary pulley, whereas the other pulley is called a secondary. Each pulley consists of a pair of V-shaped sheaves, whereby one sheave is fixed on the shaft and other one is axially moveable. Two control methods are available: - Control by means of axial clambing forces - Control by means of hydraulic piston position In the variator, torque or power is transmitted from the primary to the secondary pulley via friction between the push belt elements and the pulley sheaves. Stepless shifting between extreme low (underdrive) and high (overdrive) ratios is achieved by varying the pulley clamping forces and thereby changing the axial position of the moveable pulley sheaves modifying the effective running radius.

1.2. Enhancements

1.2.1. General

Constant Run: Run in All Gears Downshifting Mode
CRQ_129799
The downshifting mode only works for the automatic vehicle but it can be selected in the GUI for other cases, but then the calculation fails. A warning has been added and only the upshifting case is calculated.

Measuring points in visualisation
CRQ_117155
For full load acceleration 50 measuring points were added to the visualisation by default. If needed, additional points for any kind of measuring points can be added by editing the corresponding template: template\...\matrix\FullLoad.t__1___4.tp2 It is accomplished by adding more template blocks similar to the already existing ones, with the only difference being x6 instead of x5 and so on.

Design Explorer blocks AVL CRUISE GUI
CRQ_127325
When Design Explorer is started from "Tools" the GUI becomes blocked. This has been resolved so Design Explorer is started as a separate process, which keeps AVL CRUISE GUI responsive.

Fail safe data check to avoid multiple ordinate values
CRQ_127804
Some characteristics and maps (located in componets Engine, Mechanical Consumer and General Map) are extended with data checks to ensure that no multiple ordinate values occur in a data field.

1.2.2. Components

Adjustment of the measuring scale used for showing the specific fuel consumption
CRQ_126764
The minimum power considered is 0.5 kW. When running with a power below that value, 0.5 kW will always be taken in order to avoid small denominators in the ratio fuel consumption over power.

Battery: SOC Calculation
CRQ_130587
SOC Calculation was reserved for the Battery H module i.e. only this battery type could be selected as a reference for SOC Calculation. This is now extended to other battery types like Empirical Battery.

Clutch: Pressure Force Specification
CRQ_131400
For malformed pressure force characteristics a segmentation fault could have occured. Additional fail safety checks have been added.

Clutch: Residual Drag Torque effect
CRQ_124303
The clutch takes into account the effect of residual drag torque. When the clutch is completely opened, there is a speed difference between the input and output side and the residual drag torque is defined as a quantity depending on that very speed difference. The Residual Drag Torque switch in the Properties of the Clutch element activates the characteristic where one can enter a residual drag torque value over speed difference. Hyperbolic tangent function is used to smooth out the characteristic in the vicinity of zero. Residual Drag Torque affects the value of Clutch Output Torque if the clutch is completely opened.

Combustion Engine: Air-Fuel equivalence ratio effect on Fuel Consumption
CRQ_124295
It is now possible to define air-fuel equivalence ratio for each fuel consumption operating point in the combustion engine element. When the corresponding 'Air-Fuel Ratio' switch in the element properties is selected, that very value is derived from the map based on the current fuel consumption operating point and used along with the current air-fuel equivalence ratio from the databus input to calculate the new fuel consumption value.

Combustion Engine: firing angle efficiency as databus input
CRQ_124301
It is possible to connect the firing angle efficiency as databus input in the combustion engine element. This value is used to evaluate the firing angle effect on fuel consumption i.e. to calculate the new pressure operating point for fuel consumption map. Expected value of firing angle efficiency signal is in the range 0-1.

Components: Warnings and Errors
CRQ_131041
Messages, warnings and errors have been enhanced to be preceded by the component which raises the message. If the message was not raised from a component, the output is unchanged.

Course Sensor and Profile Sensor: new databus output channels
CRQ_123202
It is now possible to have the Foresight Time and the Foresight Distance as data bus output channels in the Course Sensor and in the Profile Sensor components.

Cycle Run Task : Different Forward and Backwad Acceleration Limits
CRQ_123050
The cycle run task has been enhanced to allow separate forward and backward acceleration limits. Different backward acceleration limits can be activated in the task when the acceleration limits are active with an additional checkbox. If the new checkbox is not active, the same acceleration limits are taken for forward and backward limits. Additionally, some inconsistencies in the consideration of the limits in some contexts have been improved.

Cycle Run Task: Speed Limit
CRQ_123566
The Cycle Run Task has been enhanced for the simulation to consider the speed limit of the environment. This can be activated via a checkbox.

Electric Machine: Maps - approximation methods
CRQ_129671
In the efficiency and power loss maps in the Electric Machine it is now possible to call the approximation feature. All the standard approximation method options and settings apply here as well with the distinction that also each of the quadrants in the Electric Machine map can be treated separately.

Empirical Battery
CRQ_130234
In the empirical battery model, an empirical equation is used in order to relate the voltage response of a battery to current, time and temperature. The empirical relation contains a number of fitting parameters which are obtained by an analytical fit to experimental discharge curves for different discharge rates and temperatures. The main advantage of the present model compared to characteristic map based models is the inclusion of the battery dynamics, i.e. the voltage answer to current jumps. Another advantage is the physical meaning of the fitting parameters. Some of them, e.g., can be attributed to temperature, others to current dependencies, and so on. This allows for a selective investigation of specific physical effects. In principle, for each battery cell an individual fitting parameter set has to be identified. However, for battery cells of similar size and capacity, the same parameter set could be used. Experience, i.e. fitting of this model to many different battery cells, will show, in which way the fitting parameters correlate with the cell type. The thermal behavior of the battery is described by a thermal sub-model. The warming caused by the losses inside the battery and the cooling caused by convection are taken into consideration. Single cells can be modeled as well as any combination of them. Therefore, the user can construct an electrical network with cells connected in parallel or series.

Engine: Cumulated fuel consumption in mass
CRQ_110654
It is possible to have the cumulated fuel consumption in mass of the engine as an output databus channel. Furthermore this variable is now also available in the engine component as a result, which can be useful for some analysis in the post-processing.

Engine: Cumulative volumetric fuel consumption
CRQ_120014
Now it is possible to have the cumulated fuel consumption in volume in the engine component. If there are more engines, this value is calculated for each engine.

Engine: Labels and templates
CRQ_121322
The output name 'Mean Effecitve Pressure' in the engine component has been renamed 'Brake Mean Effective Pressure'.

Friction Clutch: new databus output
CRQ_124302
A new databus output "Difference Speed" has been added for the Friction Clutch component.

Partial Engine components
CRQ_133984
The limit on the number of Partial Engines inside a model has been increased from 10 to 100.

Serial Task: Distance Profile and Velocity Limit
CRQ_122811
In combination with other enhancements different applications of the serial task have been enhanced such that the velocity limit from the environment can be considered for the cycle and more applications are now covered by serial tasks. Required features of cruising are now available in the cycle run.

Torque Converter: Linear and Simple Models - lock-up clutch
CRQ_124315
More information about the Linear and Simple models used in the lock-up clutch of the Torque Converter component has been addeded to the Users Guide.

Torque Converter: Power loss
CRQ_124314
More information about how the power loss in the torque converter component is evaluated in CRUISE has been added to the Users Guide.

Vehicle: Conversion of the inclination of the road
CRQ_116086
In the results of the vehicle component, it is possible to have the inclination of the road expressed both in percentage and in degrees.

Vehicle: new data bus output channel
CRQ_119223
In the data bus channel, it is now possible to distinguish the different horizontal resistance forces that influence the motion of the vehicle.

1.2.3. Interfaces

C-Function: Vector assignement with input and output channels
CRQ_115122
Input and output channel fields ("a" and "y") were not declared internally with their exact size, thus vector assignments could not be used. This is now improved, so it is possible to assign all elements of e.g. input channels "a" to some other field/vector (let's say b) by simply specifying b=a; and avoiding loop over all elements and assigning one by one. Vector assignments are executed much faster and the speedup could be significant in models with extensive use of C-functions.

CMC target: Funtional Mockup Unit for Co-Simulation
CRQ_126833
Functional Mock-up Unit for co-simulation CMC target has been added. Exported files correspond to FMI 1.0 standard. There are separate 32 and 64 bit FMU targets. the result is .fmu file which contains binary and modelDescription.xml.

CMC: S-function generated with CMC
CRQ_129250
MATLAB S-function created with CMC is updated with a GUI which enables connected channel handling. This feature improves the user experience as it is not necessary to recompile CMC DLL if only channel connections on interface component need to be changed. Channels are accessed by name, channels number or order in which channels are connected is now secondary.

MAT file structure
CRQ_124324
The MAT file now has a structured format, which contains two structures: 'Props' and 'Signals'. 'Props' structure contains information on component (component name, component ID, author, comment, notice 1-3, result label, result group label). Each 'Signals' field correspond to databus channel and is structure itself which contains 4 fields (name, unit, label, data). MAT files are now named after 'Component Result Label'. If this is empty, 'Comment' field is used. Component type is used if both fields are empty. MAT file representing task does not have 'Props' structure.

MATLAB DLL channels
CRQ_123216
Values on databus input and output channels can be inverted. The setting is located in a new column in the databus definition dialog of MATLAB DLL component. If inversion is set, values in channels selected for inversion are multiplied with -1 before the value leaves the MATLAB DLL component.

MATLAB DLL: automatic databus definition
CRQ_126448
RTW build procedure for CRUISE also creates a 'Cruise_Matlab_DLL.dbf' file which can be loaded in CRUISE MATLAB DLL component. When 'Cruise_Matlab_DLL.dbf' file is loaded in the component, the neccesary databus infomation is automatically filled in. First load the 'Cruise_Matlab_DLL.dbf' file and then define the path to dynamic library.

Output of folder.X:task.X replaced by content of "Comment" field in the task.
CRQ_126898
Comments from tasks and folders are added to a set of parameters accessible for xlsCRUISE. If "Comments" are defined, they are used instead of folder/tasks numbers in a worksheet.

Worksheet Access Parameters
CRQ_126897
The list of parameters available for the Worksheet access has been extended with the following:
1. Course : Inclination
2. CVT : Torque Loss Map Temperature Dependent (T1 to T5)
3. Cockpit : Acceleration Pedal Map
4. DCT : Gear Ratio Table
5. DCT : Torque Loss Map
6. Vehicle: Vehicle Body Dimensions: Distance from Hitch to Front Axle, Wheel Base, Height of Support Point at Bench Test, Distance from PFA to Front Axle
7: Vehicle: Air Coefficient: Frontal Area & Drag Coefficient
8: Vehicle: Reference Vehicle for Driving Resistance: Frontal Area, Drag Coefficient, Drag Area, Weight

xlsCRUISE: Added input field for kernel executable name
CRQ_126927
The name of the executable was hard coded in xlsCRUISE so it was not possible to use same xlsCRUISE .xls file for v2011.3 and for v2013 AVL CRUISE versions. This is now fixed by adding the input field for kernel executable name and makes it possible to specify an arbitrary kernel name, like in CRUISE GUI.

xlsCRUISE: Errors reported for missing items
CRQ_129111
Errors are now reported when:
- Kernel executable (e.g. cruise_m.exe) cannot be found
- Specified folders do not exist
- License feature is missing (cruise_rk_ext_frontend)

1.2.4. HIL Interfaces

Simulink Coder (RTW) files for generating DLLs for Cruise Matlab DLL component
CRQ_131740
Simulink Coder (RTW) build makefiles for creating DLL for CRUISE Matlab DLL component is now up to date with the newest MATLAB versions. RTW build of Simulink models that depend on additional source files is enabled. If a Simulink model depends on additional code, it should be defined in RTW option "Custom Code" and that would include it into the build process.

1.2.5. GSP

Shifting Patterns with closed and opened L-Up Clutch
CRQ_124732
Optional criteria for generating the gear shifting pattern for Automatic Transmission have been implemented: Using only vehicle performance data with opened lock-up clutch. Using only Vehicle performance data with closed lock-up clutch.

1.2.6. Tasks

Cycle Run Task: Speed Limit Consideration
CRQ_116842
The cycle run task has been enhanced to allow the consideration of the speed limit given in the environment. This can be activated by setting the checkbox in the task.

Gear Shifting in SAM Task
CRQ_120005
The gear shifting functionality is now available in the SAM Task. New selectable Options specific to the SAM task have been added in the Driver module.

Launching DCT configuration with higher gear than 1st
CRQ_122527
A new databus channel in DCT Control has beed added in order to allow a user-defined gear to launch vehicles equipped with such a transmission. After the launching phase the desired gear will be taken into account from the proper databus channel.

Units for Course Signals available in Postprocessor
CRQ_124482
Once units are defined for the Course Signal, they are available in the postprocessor.

1.2.7. Solver

Electric Components: Performance Improvements
CRQ_128741
The electric components have been improved with respect to runtime performance especially for fixed step solvers. Due to possible different numerical roundings, smaller differences may occur for integrated values like charge or temperature.

Enhanced Output of Warnings and Errors
CRQ_129654
For warnings and errors raised by the calculation kernel, separate log files have been introduced which can be inspected seperatly during runtime.

Numerical Problems: Singularity in Matrix
CRQ_127771
Numerical problems can occur due to inconsistent settings in drivetrain models. Additional checks and warnings have been added.

1.2.8. Database

Copy & Paste of Tasks
CRQ_117694
Task and Task Folders can be copied and pasted. Right mouse click opens the context menu, where the user can find the entry 'copy content'. Using this option a selected Task or Task Folder is copied to the clipboard and can be pasted again into the project tree.

Order in the flexible IO description list can be simply modified
CRQ_117696
The order of IO channels in interface components can be easy modified now. Mark a declared channel in the pane 'Databus descrption" and press the keys <CTRL><UP> or <CTRL><DOWN>. That channel will be moved up or down. Existing connections will be also exchanged from the former position to the new one of the modified channel.

Representation of Kickdown points in GSP Export & Coupling for TCU
CRQ_123991
In GSP Export & coupling for TCU, kickdown points (after re-screening a selected shifing patterns) are displayed correctly now.

Result Tree
CRQ_104421
In the Result tree next to the name of the Project also the active system name is displayed.

Scaling of x-axis in post processor
CRQ_115785
In the CRUISE post-processer a user scaling for the x-axis unit is possible now. With a right mouse click the context menu opens and there is the new menu item "units'. Different predefined scales are available for Time, Distance, Velocity and Acceleration.

Sensitivity Studies in GSP export an coupling tools
CRQ_124737
So far, it was possible to couple the shifting pattern (generated by using vehicle performance constraints) and the pattern extracted from maps (optimized in terms of fuel consumption). This trade -off between performance constraint and fuel consumption is made by means of a weighting factor . The new functionality consists of objectifying the impact of the weighting factor on the vehicle constrains, by displaying an instant feedback on vehicle constraints, which were used to generate observed shifting patterns. Thus, the user has the possibility to see directly the differences between the original vehicle constraints and the simultaneously actualized ones by changing weighting factor.

1.3. Resolved Issues

1.3.1. General

Compatibility issue with Driver: Shifting detailed tables
CRQ_131393
Some shifting tables were not loaded correctly when a model was opened from previous CRUISE versions (v2011.x) with "Shifting Detailed" definition tables. This is resolved now.

Compatibility problem when loading a model with "Slope selection" activated
CRQ_131390
When loading a model with "Slope selection" activated from v2011.1 into v2013, this changed to "Inclination selection". The issue is fixed by keeping the original option from v2011.1.

Component encryption and C-drive
CRQ_124223
If components are locked with a password in a model which is within the computer C-drive, 'permission denied' problems occur. This issue has been fixed.

Favorites: nDim Map
CRQ_125276
Adding the component nDim to the Favorites leads to some problems. Two data editors accessed the same data pool, which lead to unhandled exeption errors and wrong XML files. Due to this error a simulation could be started, but did not progress. This is fixed now.

Initialisation of gear when reverse is used
CRQ_125728
If the reverse gear is used at the beginning of the simulation, the gear did not initialise correctly. This has been fixed.

Log: Warning M_185
CRQ_127164
The error M_185 which was wrongly connected to the Engine component has been fixed.

1.3.2. Components

Components: EFG Start Values
CRQ_130955
The EFG result energy could have been non zero at the start of the task in some combinations of settings. This has been corrected.

Components: Output Settings
CRQ_130365
If the output is set to "for no component", the result of some components have been written. This has been corrected.

Components: Unit Conversion Grad to SI for Angle
CRQ_127879
A wrong factor has been used for the conversion of the unit of the angle from grad to SI (rad). The factor has been corrected. Models which used this unit in older versions should be checked upon migration.

CVT Control: Fixed Step Solver Solution
CRQ_131401
For fixed step solvers the desired CVT ratios from the CVT control has been wrong for some setups. This has been corrected.

CVT Control: Multi Transmission Ratio Maps
CRQ_124656
The bug in using multi transmission ratio maps has been fixed.

CVT: Failure of Calculation
CRQ_133643
In some setups the calculation of models with a CVT component failed to start properly. This has been corrected.

CVT: Negative Efficiency
CRQ_127022
The bug of negative efficiency in the CVT component has been fixed.

DC/DC Converter: EFG postprocessing diagram
CRQ_127504
The DC/DC Converter component showed zero values for Power and Current in the EFG post-processing diagrams. This has been corrected.

DCT: energy balance in thrust operation
CRQ_124671
In the DCT component, the NaN (or unrepresentable) values were due to the wrong energy balance in thrust operation; when Efficiency Fixed Option is used. This bug has been fixed.

Differential: Stationary tasks
CRQ_131707
When activating the efficiency option in the Differential component, the calculation was not working properly in stationary tasks. The bug has been fixed.

Driver: Brake Pedal at Standstill
CRQ_130850
It could happen that in some situations the configured value for the brake pedal at stand still was taken too early. This has been corrected.

E-Machine: 32bit 64bit EMC library
CRQ_130759
It is no longer necessary to manually change the library directories to run the Dynamic E-Machine in 32 or 64 bit. CRUISE will adapt them automatically.

E-Machine: Efficiency and Split Temperature
CRQ_129176
When using the Efficiency option for characterization of losses in the E-Machine component, an error occurred if 'Split Temperature Model' was also active in the background. This bug has been solved.

E-Machine: Extrapolation with more than 3 characteristic maps
CRQ_126917
The error in extrapolation (wrong indexes of concerned maps) for an E-Machine containing more than 3 charchteristic maps has been fixed.

Engine: Channel number for Heating value
CRQ_127942
Channel number for Heating value in Engine component has been corrected and now displays the correspondant value

Engine: Evaluation of the cumulated fuel consumption
CRQ_128752
When calculating the cumulated fuel consumption for the Engine component, at the initial time step the value has been taken twice. This created an error visible only if the consumption value was displayed after the 4th decimal place. This bug has been fixed.

Engine: Fuel Shut Off
CRQ_128414
When using the Fuel Shut Off option in the Engine component, two bugs were detected:
1. engine speed not higher than upper limit and fuel shut off active
2. fuel consumption at idle value although engine speed is higher than idle Both issues have been fixed.

Engine: Idle fuel consumption and temperature model
CRQ_133727
When using fixed idle fuel consumption and the temperature model is activated in the Engine component, the fuel consumption was not kept constant at the given value. This has been solved.

Engine: Wide open throttle curve domain refinement in case of nonlinear unit transformation
CRQ_117827
If the ordinate values of the ‘wide open throttle’ curve (in the engine component) get defined by a power unit (e.g. kW) the kernel transforms this data into BMEP (e.g. PA) which is a nonlinear transformation. Therefore if this curve consists of not enough data points (barrier defined in the kernel by 10) to guarantee a suitable mapping some additional points are added before the transformation. This is done by bisection of each pairs of data points. This procedure is done twice for the moment. This leads to a refinement based on the structure of the origin data and no given information is lost.

External Battery: Problem with Fixed Step Solver and Voltage Brake Down
CRQ_116739
In some combination of fixed step solvers and external battery it could happen that a connected electric machine produces power for an intermediate step. Hence the system accelerates even if the battery is empty and voltage brake down. This has been corrected.

Flange: new error message
CRQ_122222
When connecting the component Flange in Torque/Speed Mode with a value in 'double' format in the databus, an error message will appear reminding that an 'integer' value is needed instead. The error will not appear if that value is provided by a Function or Constant component because the format is automatically adapted to the integer one.

Gear Box Program: Saving to Database
CRQ_134368
When the Gear Box Program is loaded from the database and then saved in the database without modification, CRUISE asks if new version needs to be created, although no changes were done. This issue has been resolved.

Map: Additional Checks
CRQ_126784
For the special case that the map gives a straight lin,e a segmentation fault could have occurred. This is checked now and an error is given. For the special case one should use a characteristic.

Multiple shifting programs
CRQ_124209
The bug in using multiple shifting programs (by means of shifting map selector via data bus) has been fixed.

Segmentation fault with incorrectly defined altitude characteristic
CRQ_132321
When defining the altitude characteristic, if the data was not accurate, the corresponding calculation of the inclination had problems. Internal checks have been added.

Torque Converter: Improvement of the extrapolated data from the K-Factor curves
CRQ_118317
When using the K-Factor characteristic in the Torque Converter, a warning message will appear if the extrapolation of the introduced curve might have an invalid area of operation.

UDM: Databus Channels not present in Selection Dialog
CRQ_131394
In the databus definition of the UDM component, general channels were missing from the available channels selection. The channels are enabled now.

Vehicle: Cold start correction not working with certain cycle names
CRQ_129242
The input names for the Cold Start Correction option in the Vehicle were not always processed correctly. This has been fixed now.

Vehicle: Comparison Tool
CRQ_119620
The Comparison Tool reported differences in the Temp-Curve data of the Vehicle component, even if the components were identical. This is fixed now.

Vehicle: Negative brake torque caused acceleration
CRQ_128649
There was a bug in the brake component when controlled by torque which caused the wrong acceleration of the vehicle. The bug has been resolved.

Vehicle: Shifting Gears from Standstill - Distance Measuring Points: Stopping Criteria
CRQ_131395
The vehicle was not able to fulfill the distance when using Stopping Criteria Distance in Full Load Tasks. This is resolved now.

1.3.3. Interfaces

Design Explorer Libraries
CRQ_131399
64-bit python libraries were missing in the Design Explorer installation which prevented it from starting or functioning properly. If other tools were installed (BOOST, EXCITE, BOOST_RT) the libraries of other Design Explorer versions caused faulty behavior. The 64-bit python libraries have been added to Design Explorer which was installed with CRUISE (Design Explorer v2013.1) and the problems are resolved now.

Gearbox Ratio Table
CRQ_131386
The gearbox transmission ratio table did not update after the number of teeth was copied & pasted from e.g. Excel. This is fixed now.

KULI - Simulation Controls
CRQ_129913
There was a problem with pausing/stopping the Cruise-KULI co-simulation. This is now fixed so it can be paused or stopped by pressing the button in the GUI.

Simulink: CRUISE CMC model license checkout
CRQ_105770
CRUISE CMC model license (if CMC dll is created with online parameters) is no longer held back after executing the model update in Simulink. The license is returned once the model update of the Simulink model has finished.

xlsCRUISE: Kernel messages always displayed in shell window
CRQ_126902
Due to changes in cruise.ini default settings, kernel messages were no longer displayed by default. In the case of running the simulation through xlsCRUISE, this is now fixed.

1.3.4. GSP

GSP-Generation: Activation of reserve power criteria causes SegFault
CRQ_122201
In GSP-Generation, defining the Criteria selection as Reserve power criteria could cause a Segmentation fault. This has been fixed.

1.3.5. Tasks

Cycle Run Task: check of initial time in Profile
CRQ_125619
Using Cycle Run task, if the initial time value of the velocity profile is wrongly defined (i.e. different from zero) an error message will be displayed.

Cycle Run Task: Velocity Profile Minimum Velocity
CRQ_131128
If in the profile a negative minimum velocity was given but the target value was not negative, the minimum velocity was also limited with zero not the table value. This has been corrected.

Elasticity Task - Full load acceleration: Initialization Problems
CRQ_131396
The problem in the Initialization phase of the Elasticity task has been resolved.

Initialization of temperatures cycle dependent
CRQ_125691
To run several cycles in a series, the corresponding temperatures (i.e. cycle dependent) are now initialized properly.

Road inclination in Cycle Run and Cruising according to data input or general data
CRQ_130636
Road Inclination output result for Cycle Run and Cruising Tasks is now displayed according with the selected option in the model, i.e External Inclination (Vehicle component) or Course.

1.3.6. Solver

CVT Models: Realtime Factor on HiL Systems
CRQ_126216
The realtime factor for CVT models has been considerably higher compared to Man or AUT models. The performance has been reworked and the factor improved.

Output of Results: "As Defined in Component"
CRQ_130367
For the output setting "As Defined in Component" a segmentation fault could occur. This has been fixed.

Variable Step Size Solver: Initial Step Size
CRQ_131084
In some cases the initial step size could have been larger than the configured maximum step size. This has been corrected.

1.3.7. Database

Comparison tool checks the input channels of each component
CRQ_122273
Running a data comparison checked the differences in data in former releases. Now also the input channels of the components are checked, if they still have the same source.

Compatibilty issue with vehicle geometry data in CRUISE v2011 models
CRQ_131387
When loading a model made in v2011, the units of data in the Load Dependent Characteristics table could change without numerical conversion (only unit is changed, value stays the same). Now the models load correctly, keeping the originally saved unit.

Component variation with cockpit component
CRQ_131384
Two acceleration maps are present in the Cockpit. When the first is deactivated, inputs "From" and "To" velocities are expected on the second map, but are not necessary. This behavior has been fixed.

CRUISE model on USB stick root folder
CRQ_131397
If a model was stored in the root folder on a USB stick or an external USB drive, it could not be run. This is resolved now.

Database Error if loading Velocity Profiles with more than 999 Rows
CRQ_134119
In the database the maximum number of rows was limited to 999. With an SQL update script this could be extended to 9999 rows.

GSP Export and coupling for TCU
CRQ_131112
'GSP Export and coupling for TCU ...' checks on common units on the x-axis. If the units are different, the user gets an information window.

Macro stayed on the fomer layer after shifting to another layer
CRQ_124833
Macro stayed on the fomer layer also after shifting to another layer. This is fixed now.

Reading every x-th row in the result view
CRQ_129700
Reading all rows from row xx to row yy worked but when reading every x-th row, the results are wrong. This is fixed now.

TeimView: Missing option for replacing x-axis values "time" with "distance"
CRQ_131389
X-axis values can now be changed between "time" and "distance", like it was in previous versions.

1.4. Known Issues

InfoFlow Network: Stationary Solvers

CRQ_106124

As the stationary solvers iterate for the load signal, if this is modified by maps or functions, those must have high frequency actualization. In previous versions of CRUISE this setting was not available. This could have led to a failure of the stationary solvers.