



VI-Rail 19.0 Release Notes

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1 Release Notes

Welcome to the release notes of VI-Rail 19.0. The chapter contains information regarding new features, known issues and update history.

Note: All instruction in this guide applies to all supported Adams versions, see [Platform Support](#) for further info.

Please send your comments or support requests to support@vi-grade.com.

1.1 What's new

This VI-Rail 19.0 update introduces the following new features.

New Features:

- Support of Variant Assemblies. Instead of creating separate assemblies for variants of a model you can create one assembly containing several variants. See Building Models --> Overview for general information about variant assemblies. See Using Variant Assemblies in Analyses for information on how to use variant assemblies in <%AIR_NAME%> Analyses.

Enhancements:

- New contact request components for creep torque in the contact point(s) (`creep_torque`) and wear number including spin (`wear_number_spin`) added. Improved documentation on Standard Contact Requests.
- Add clearance component to request in `ar_bumpstop` UDE.
- Wrong orientation bug in Krettek airspring modification macro corrected.
- The cruise control force expression was wrong when the cruise control method is set to "Spline" and the independent variable is distance.
- VI-Rail Stress: Computation Interval boundaries in the Stress Configuration now may have up to 6 digits before the decimal point, increment up to 5 digits.
- The tape circle distance for double and single wheelsets can again be changed effectively. (Due to a bug in VI-Rail there it was possible to change it in GUI, but it was not passed to the Solver. For calculations always the default value of 1.5 m was used.)
- In the Wheel/Rail Kinematics Analysis it is now possible to use zero loads causing the roll angle to be ignored. A purely kinematic calculation is done in this case.

- Outdated Comfort Toolkit indices are available again in a new sub-menu Obsolete in the post processing menu Comfort Toolkit.
- Point Force Actuator dialog boxes are now available in the Template Builder menu Build.
- Some other bug fixes.
- Improvements in the documentation:
 - Description of Angle of attack and roll angle requests in section "Reviewing Results > Standard Contact Requests > Contact Requests Details" has been corrected.
 - Corrections in the Introducing VI-Rail, Template Builder and Analysis tutorials.
 - Improvements and corrections.

Enhancements in the Freight:

- Units in all rail profile files in Freight shared database have been corrected.

Enhancements in the Wear:

- Bug fixes

For a complete list of the other bug-fixing and enhancement refer to the [Revision History](#) section

1.2 Licenses

VI-Rail 19.0 requires following set of license keys:

- VI_Rail_ADAMS_IFace
- VI_Rail_Core

Additional license feature are required to run VI-Rail adds-on.

VI-Flextrack:

- VI_Rail_Flextrack_ADAMS_Iface
- VI_Rail_Flextrack

VI-Rail Freight Toolkit:

- VI_Rail_Freight_ADAMS_IFace
- VI_Rail_Freight_Core

VI-Rail Wear Toolkit:

- VI_Rail_Wear

VI-Rail Stress Toolkit:

- VI_Rail_Stress_IFace (needed for the standalone program ArgeCare ACStress)
- VI_Rail_Stress_Core

As prerequisite an Adams Full simulation Package license is required, which includes the following keys:

- ADAMS_View
- ADAMS_Solver
- ADAMS_Linear

This product is in part based on incorporated software libraries. Please refer to the [acknowledgments.pdf](#) document, included in the product documentation for a listing of the adopted components and the respective

licenses.

1.3 3rd Party Compatibility

This table shows the compatibility of the VI-grade suite products with the main 3rd party software.

	VI-CarRealTime	VI-BikeRealTime	VI-DriveSim	VI-Driver/VI-Rider for Matlab	VI-Driver for FMI
Matlab®	from 2015b to 2018b	from 2015b to 2018b	from 2015b to 2018b*	from 2015b to 2018b	
Veristand™ (***)	2015sp1	2015sp1			
dSPACE® RCP & HIL (**)	2018b	2018b		2015b-2017a	
SimWorkBench®	2018.3 2017.3	2018.3	2018.3 2017.3		
xPC® (****)	2015b				
Dymola®	2015				2015
CarSim™	8.1.1, 9.0				
Virtual Test Drive®	1.4				
Prescan®	7.3				
SCANer®	1.7r37, 1.8r33		1.7r37, 1.8r33		
ETAS LABCAR-OPERATOR IP®	5.4.8				
SolidThinking Activate	2017.1				
TameTire	5.1		5.1		
CDTire	4.2.8		4.2.8		
adheRide thermoRide	1.2/1.4				

(*): please refer to SimulationWorkBench documentation for Matlab version compatible with MLToolkit module.

(**): for SCALEXIO targets, only firmware version 4.0.1 is supported.

3rd Party Software included in VI-grade products:

	VI-CarRealTime	VI-BikeRealTime	VI-DriveSim	VI-Driver/VI-Rider for Matlab	VI-Driver for FMI
FTire	2019-1		2019-1		
MF-Tyre/MF-Swift	6.2.0.3 7.3	6.2.0.3 7.3	6.2.0.3 7.3		

The following table shows the 3rd party compatibility for Adams-based VI-grade product:

	VI-Motorcycle	VI-Automotive	VI-Rail	VI-Aircraft	VI-CarRealTime Plug-In	VI-Driver
MSC Adams™	2018.0	2018.0	2019.2	2018.0	2017, 2017.1, 2017.2, 2018.0, 2019.0	2017, 2017.1, 2017.2, 2018.0, 2019.0
Matlab®	*	*	*	*		

(*): please refer to Adams documentation for compatibility version.

(***) The NI-PXI integration requires Visual C++ 2010 / SDK 7.1 to complete the building procedure successfully. Please refer to the NI-VeriStand documentation for more detail.

(****) Starting from Matlab R2014a *Simulink Real-Time* replaces *xPC* product name.

The VI-Licensing LMX supported version is **4.8.7** both for Server and for Client.

1.4 Platform Support

VI-Rail 19.0 is available for the following Adams versions:

Adams version	Platform	Installer Name
Adams 2018.0	windows x64	VI_Rail_2019r2_19_0_x64_Setup.exe

1.5 Updating Files

This section includes instructions on conversion/updates to be done on files when switching to current version.

1.5.1 Contact Configuration Files

Conversion to version 17.0

Version 2015r1.17 of VI-Rail introduces a new functionality to wheel/rail contact code, enabling the possibility to compute the equivalent conicity using Klingel formula, as indicated in UIC519 leaflet.

In order to support this new functionality the code responsible for the wheel/rail kinematics has been completely refactored and some of the changes are also reflected in the contact configuration file, in case WRTAB element is used. **Old files will still be compatible with new version**, but the parameters will be interpreted in slightly different way:

DERAIL_Y (deprecated). In old version it was used to determine the maximum lateral allowed displacement in table computation, when using the variable step method to compute the contact table or the equivalent conicity. In new version it is superseded by the **MAX_LIFT** parameter. Table computation is now limited by this parameter that identified the maximum allowed vertical lift. For the old contact configuration files where the **MAX_LIFT** parameter is not present, it will be used a default value of 5mm, which is suggested as maximum allowed lift value in many regulations.

CTB_STEPS_NUMBER. In old method it was used to compute the number of table stes when using the **MIN_MAX_DISPLACEMENT** method for table computation. In new version if **CTB_LATERAL_DISPL_INC** is defined, it is used for both **VARIABLE_STEP** and **MIN_MAX_DISPLACEMENT**. Only in case **CTB_LATERAL_DISPL_INC** is not defined and metdo is max/min displacement, **CTB_STEPS_NUMBER** is

used, in all the other cases it is neglected.

1.6 Known Issues

The following limitations have been identified at the release time:

- If VI-Flextrack plugin is loaded with an assembly opened, and the assembly has already been used to submit a simulation, the plugin loading fails. The workaround is to load flextrack plugin without any assembly opened.
- VI-Rail doesn't yet support the Adams/Solver multithreading capabilities.
- Currently it is not possible to include an element (like bushing) in a Preload Analysis when its J-part is a flexible body. A work-around is to change the definition of that element in a way that the I-part is the flexible body and the J-part is rigid.
- Currently it is not possible to run a Stress Analysis when the path of the current working directory contains a blank character like e. g. C:\Users\John Doe\Rail\simulations . As a work around use a working directory without blank characters in its path.
- Dynamic Analysis does not run with Analytic PSD irregularities y or z direction only: When a Dynamic Analysis with a track property file with Analytic_PSD irregularities is executed it fails when one of the parameters LAT_ACTIVE or VER_ACTIVE in the [IRREGULARITIES] block is set to 'NO'. As a work around set both parameters to yes but use zero deviations in the direction where no irregularity is needed.
- Creating Assembly Variant fails on very old assemblies: When you open a very old assembly file without a [PLUGINS] section in the assembly file and create a new variant when saving you get an error when saving the assembly. Work-around: Save the assembly first so that it is updated to new version and in particular [PLUGINS] section is added before adding variants.

1.7 Revision History

1.7.1 Release 2019r2.19.0

Version	Change ID	Change
2019r2.19.0	#12361	Track offset documentation
	#11564	PSD_1 function for Analytical PSD
	#11580	VI-Rail Preload Analysis
	#11286	VI-Flextrack: Missing sleeper forces beneath some axes in assemblies with several wagons.
	#10985	Point to Point Actuator Error
	#10210	yaw angle- angle of attack is not working in VI-RSGEO
	#10107	VI_rail-RSGEO, AC-RSGEO and UIC519 (EN15302)
	#10440	Error in Instability Criterion when traveled distance is too short
	#9737	FTK error
	#8775	Update documentation on friction data.
	#8519	Mismatch documentation - program regarding UIC518 dboxes in Comfort Toolkit
	#7165	Add T_gamma and creepage_torque Request Components

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#4676	Stress calculation fails when Computation Interval Start is 100.0 or greater
#4666	Cruise Control with velocity profile does not work for negative velocities
#3581	Check assembly variants usability
#3277	WheelFlat Simulation not working properly when specifying flattened wheel on left side
#2892	Error in track generation: Cannot set tape circle distance variable correctly. (Cmp. #8113)
FDB-6023	Typo in Track Generation Warning
FDB-5993	Wrong units in all rail profile files in Freight shared database
FDB-5958	Displacement Contact requests description wrong
FDB-5935	Online contact visualization not working properly on Windows 10
FDB-5931	Syntax error in macro <code>mac_ana_twi_trk_sub</code>
FDB-5876	Porting to Adams 2018
FDB-5857	Add Clearance request to <code>ar_bumpstop</code> UDE
FDB-5829	Wear Toolkit - Independent Coord. Type value wrong
FDB-5798	Errors in Template Builder Tutorial
FDB-5785	Update Analysis Tutorial due to renaming of irregularities type
FDB-5780	Wrong default units in Introducing VI-Rail tutorial
FDB-5732	Error in Krettek Couple Airspring orientation
FDB-5706	Cruise Control Force formulation wrong
FDB-5673	Irregularities: column mismatch in <code>SYZR</code> & <code>YZR</code> formats
FDB-5622	<code>ar_bumpstop</code> template single modify - corrupted
FDB-5526	Offline Contact Graphic doesn't work.

1.7.2 Release 2017.18.0

Version	Change ID	Change
2017.18.0	FDB-5471	VI-Flextrack plugin can now be properly unloaded.
	FDB-5448	Communicators and Arrays exist when reloading Flextrack plugin
	FDB-5446	Also Flextrack plugin leaves menu items and data base behind.
	FDB-5445	Freight Toolkit plugin can now be properly unloaded.
	FDB-5408	Implemented compatibility with Windows 10
	FDB-5360	Guiding Rail simulation fail with single wheels
	FDB-5342	Wear Toolkit - Introduced additional output at user specified mileage
	FDB-5340	Variable Profile: Increase maximum number of profiles in Rail Config Matrix
	FDB-5284	Added user defined force elements to template builder
	FDB-5276	Minor error in gauge computation could generate unwanted asymmetry
	FDB-5260	Wear Toolkit - allow to enable wear only on user specified contact elements
	FDB-5248	FlextrackToolkit - Corrected and Improved custom flextrack tutorial
	FDB-5216	Wheel/Rail Kinematics - Improve Contact Points visualization

FDB-5210	Fixed crash in Wheel/Rail contact code with more than 50 wheels
FDB-5077	Nmv - Time window not working
FDB-5058	twist testrig analysis doesn't work
FDB-5055	Error opening assembly
FDB-5041	Updated flextrack sleeper definition to support MNF track creation
FDB-5019	Generate batch script for "Files Only" simulation mode.
FDB-5007	Wear Toolkit - updated wear core - improved user control on wear input file
FDB-5001	Wear Toolkit - errors in the logic used to store profiles
FDB-4993	Freight Toolkit - sidebearer formulation wrong
FDB-4983	Freight Toolkit - request ude points to wrong dialog box
FDB-4982	Sidebearer SI and TB dialogues not properly updated
FDB-4970	ACAR specific elements - improved compatibility
FDB-4956	Wagon order variable not updated in existing models
FDB-4955	Wear Toolkit - expose in (in solver and GUI) the parameter to specify the profile independent coordinate
FDB-4954	Wear Toolkit - initial computation position should be interpreted as offset with respect to leading wheelset
FDB-4949	Allow possibility to specify different radius for wheels
FDB-4945	Error submitting macro with flexible track option
FDB-4944	Wrong vehicle lift computation in testrig twist analysis
FDB-4931	On-track test dialog doesn't pass all parameters to macro
FDB-4913	Wear Toolkit - wear algorithm fails in selecting correct integrator steps
FDB-4984	Wear Toolkit - allow processing of wear models different from 9001
FDB-4983	Wear Toolkit - expose smoothing flags in wcf
FDB-3647	Track Irregularities: add possibility to input a generic PSD function

1.7.3 Release 2015r1.17.0

Version	Change ID	Change
2015r1.17.0	FDB-4868	Precision in preload file too low. May lead to wrong results
	FDB-4867	Contact Plot option may fail in WR Kinematics
	FDB-4848	Add optional time window to all comfort indices computations
	FDB-4847	sliding mean computation fails
	FDB-4846	Added acceleration measures including Gravity to comfort sensor. Needed for EN14363 Ride characteristic postprocessing
	FDB-4836	Check Rail feature doesn't work (behavior different from previous version)
	FDB-4833	Wear computation ignores "fixed step" parameter
	FDB-4831	Enable EN14363 postprocessing for all simulation (even those not executed with EN14363 analysis tool)
	FDB-4723	Wrong cruise control initial position.

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FDB-4647	Wear simulation crashes when wear input file is not stored in a database
FDB-4590	Contact Forces not displayed properly in offline Contact Visualization
FDB-4322	Freight toolkit enhancements (add plot for all assessment values, added html report format)
FDB-4137	Freight Toolkit - wrong index values in analysis reports
FDB-4064	Implement Vehicle Acceptance Procedures according to EN14363 - On-track tests
FDB-4063	Template Save dialog box shows wrong cdb list
FDB-3867	Clothoid generation may fail for long spirals. Introduced alternative formulation, with numerical integration of clothoid parametric expression.
FDB-3845	Implement Vehicle Acceptance Procedures according to EN14363 - Stationary Tests
FDB-3809	Add conicity evaluation according to UIC519 (Klingel formulation)
FDB-3796	Friction spline (lateral) switched to linear interpolation in contact code.
FDB-3785	Added user friendly interface for track base computation
FDB-3769	Update obsolete installation guide
FDB-3768	Comfort sensor limited to a maximum of 10 instances
FDB-3749	Preload analysis fails for models containing contact variables.
FDB-3045	Wheel graphic incorrect when using variable wheel profile or variable wheel radius.
FDB-3044	Extend rail profile viewer to wheel profile

1.7.4 Release 2013r2.16.0

Version	Change ID	Change
2013r2.16.0	FDB-3710	Implement procedure to compute Instability Criterion (EN14363)
	FDB-3697	VI-Rail randomly saves subsystem with 1 digit precision only (after failure in preload analysis)
	FDB-3671	Contact Visualization doesn't work with variable friction coefficient.
	FDB-3635	Contact forces doesn't react on ground when using flexible track.
	FDB-3421	A bug in stability analysis prevent it to work with only one velocity selected.
	FDB-3283	Validate freight toolkit gondola model against validated example.
	FDB-3256	RSSEO code updated, to avoid problem with specific wheel/rail combinations
	FDB-3251	Simulation error using WPF_2 file format (same profile used for all wheels even when using different wpf files)
	FDB-2370	added test about variable friction
	FDB-3177	Wear Toolkit - Added possibility to define fixed computation step
	FDB-3176	Wear Toolkit - Enable possibility to define a fixed wear step (distance).
	FDB=3174	Wear Toolkit - Enabled possibility to cumulate wear on all multiple wheels with same profile.
	FDB-3133	Add banner (screen and message file) for VI-Rail solver
	FDB-3132	Error in track definition for left curves
	FDB-3088	Stress Toolkit - added support for surface and subsurface stress computation
	FDB-3073	Preload Analysis poor performance makes it unuseable

FDB-3068	Freight Toolkit - side bearer returns not null friction force when normal force is null
FDB-3067	VI-Rail crashes when simulating a model with more than 50 wheels
FDB-3063	results file always inactive when submitting simulation in VI-Rail
FDB-3055	Flextrack gives wrong results if the track origin is not on ORIGO
FDB-3049	VI-Rail crashes with ADAMS/Controls and C++ solver
FDB-3028	Create a Tutorial for VI-Rail- Adams/Controls integration
FDB-3012	Wear Toolkit doesn't write output if working path is too long or contain dots.
FDB-3009	Wear Toolkit - Add support for custom profile names in profmap
FDB-3008	Wear Toolkit - Add support for variable profiles
FDB-3004	Add possibility to create flextrack with generic infrastructure
FDB-2978	Freight Toolkit - Introduced Load dependent friction wedge
FDB-2945	Enhance request definition for flextrack model
FDB-2768	Switch to results file as default output format
FDB-2692	Model with shear springs are unstable due to error in unit conversions
FDB-2231	Stability Analysis with CXX solver - wrong results
FDB-1476	Enhance RSGEO input dialog
FDB-1466	Possibility to run vehicle with negative velocities
FDB-1463	RSGEO - Implement wheel/rail profile contact point visualizer through lines
FDB-1167	Support CXX solver

1.7.5 Release 2013.15.0

Version	Change ID	Change
2013.15.0	FDB-1595	Switch analysis fails on 64-bit version (only with some particular track file)
	FDB-1598	Issues with functions on Win7 64bit OS
	FDB-1871	Implment interface to Arge Care Wear Toolkit
	FDB-2319	Porting to ADAMS 2013
	FDB-2474	Release Process
	FDB-2549	Update Comfort Toolkit according to state of art Regulations
	FDB-2563	Update 'Offline' Contact Graphic Tool
	FDB-2588	Property File buttons issues errors in dynamic analysis submit dialog box
	FDB-2591	con917 initialize velocity also to zero velocities bodies
	FDB-2619	Modeling Error in standard flextrack model
	FDB-2620	Include in flextrack UDE the distance between railpad and top of rail
	FDB-2621	Request activity not working on flextrack assemblies
	FDB-2634	VI-rail libraries not load from ADAMS interface (windows XP only)
	FDB-2693	VI-Rail simulations randomly crash during solver termination

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	FDB-2694	Simulations with guiding rail doesn't animate properly
	FDB-2725	VI-Rail crashes running 2 simulation with nteractive graphic simoultaneously
	FDB-2726	Guiding Rail contact doesn't work

1.7.6 Release 2011r1.14.0

Version	Change ID	Change
2011r1.14.0 MD2011.14.0	FDB-958	Gauge Variations not included in MNF generation. [fixed]
	FDB-1444	Add sensor to stop simulation when track length exceeded.
	FDB-1454	Documentation and Tutrial Enhancements
	FDB-1455	Problem in RSGEO interface when trying to visualize track file in curve manager
	FDB-1456	Track conversion tool enhancement, also added to SI->Tools menu
	FDB-1457 FDB-1572	Several messages reported wrong product name. VI-Rail name is now correctly shown.
	FDB-1458	Triad and model name are now visible by default
	FDB-1460	Default button in "Solver Settings" dialog now correctly restores default values for both Dynamic and Equilibrium analysis
	FDB-1464	"Total track length exceeded" message no more generated because of convergence problems. Added suggestions on HMAX choice when running simulation with irregularities Implemented low and high ORE irregularities in curve manager with radio box
	FDB-1465	General GUI enhancements: - Removed menu item and dialog box to open old *.vhs file (not anymore supported) - Removed difference between generic and wagon assembly
	FDB-1467	AR Bumpstop enhancements: Fixed problem with displacement request. Updated shared database with AR_Bumpstop in stead of ac_bumpstop, AR_Bumpstop made the default in template builder.
	FDB-1478	Value of contact forces output was not null when the wheel was not in contact (only affected forces output at contact patch) [fixed]
	FDB-1513	Removed vertical stiffness parameter from Preload Analysis Submit dialog box (now tuneable using a VI-Rail variable)
	FDB-1521	Remove "Wheel Contact Point" dbox from PPT window (not working)
	FDB-1559	Stability map was not generated in some cases due to system dependent errors in interp1 function. [fixed]
	FDB-1560	Request file read is now activated by default.
	FDB-1566 FDB-1750	Some udes do not support change of unit system. In some cases this led to unexpected results when changing template units. [fixed]
	FDB-1560	RES file read activated by default. The default output format is restored to request file. Stability analysis always generate res file, for compatibility with CXX solver.
	FDB-1561	Add UIC60 profile to shared database to be used with 1/20 inclination.
	FDB-1575	Error when submitting dynamic analysis with flextrack plugin loaded (error generated only if there were one or more assembly loaded before the plugin) [fixed]
FDB-1591	Background submission process used to launch multiple Solver runs at the same time.	
FDB-1593	Saving car body tpl - attachment type is not grayed ("Template->New.." and "Template->Save as.." dboxes had errors in attachment type management) [fixed]	
FDB-1597	Specify different WPF for left/right does not work (apply to rear wheelset in double wheelset UDE) [fixed]	

FDB-1622	Error when reading template converted from MSC.ADAMS2005r2 format [fixed]
FDB-1673	Flexible Body Create dialog box not working [fixed]
FDB-1677	DPR file appear as default when creating a new friction damper in Template Builder [fixed]
FDB-1692	Fixed error in wheel property file Description (documentation)
FDB-1721	Centerline Request documentation enhanced (added output channels and reference systems description)
FDB-1746	Centerline reference marker ill defined, caused an offset in longitudinal displacement. Fixed.
FDB-1764	Add AAR specific PSD track irregularities formulation.
FDB-1797	Fixed error in comfort toolkit macros when using results file instead of requests file.
FDB-1798	Added detailed description of wheel/rail Contact requests and reference systems to documentation
FDB-1821	Flextrack Performance Enhancement
FDB-1863	Track irregularities visualization inverted in curve manager
FDB-1864	Added license features for addons (freight toolkit, wear toolkit, flextrack toolkit)
FDB-1848	When modelling a track with a large cant angle, the sleeper graphics move up above the rails. [fixed]
FDB-1874	Add "advanced" toggle in dynamic analysis panel (switch between basic and full set of input parameters)
FDB-2049	Expose the irregularity smoothing length in track property file

1.7.7 Release MD2011.14.0

Version	Change ID	Change
2011r1.14.0 MD2011.14.0	FDB-958	Gauge Variations not included in MNF generation. [fixed]
	FDB-1444	Add sensor to stop simulation when track length exceeded.
	FDB-1454	Documentation and Tutorial Enhancements
	FDB-1455	Problem in RSGEO interface when trying to visualize track file in curve manager
	FDB-1456	Track conversion tool enhancement, also added to SI->Tools menu
	FDB-1457 FDB-1572	Several messages reported wrong product name. VI-Rail name is now correctly shown.
	FDB-1458	Triad and model name are now visible by default
	FDB-1460	Default button in "Solver Settings" dialog now correctly restores default values for both Dynamic and Equilibrium analysis
	FDB-1464	"Total track length exceeded" message no more generated because of convergence problems. Added suggestions on HMAX choice when running simulation with irregularities Implemented low and high ORE irregularities in curve manager with radio box
	FDB-1465	General GUI enhancements: - Removed menu item and dialog box to open old *.vhs file (not anymore supported) - Removed difference between generic and wagon assembly
	FDB-1467	AR Bumpstop enhancements: Fixed problem with displacement request. Updated shared database with AR_Bumpstop in stead of ac_bumpstop, AR_Bumpstop made the default in template builder.
	FDB-1478	Value of contact forces output was not null when the wheel was not in contact (only affected forces output at contact patch) [fixed]
	FDB-1513	Removed vertical stiffness parameter from Preload Analysis Submit dialog box (now tuneable using a VI-Rail variable)
	FDB-1521	Remove "Wheel Contact Point" dbox from PPT window (not working)

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FDB-1559	Stability map was not generated in some cases due to system dependent errors in interp1 function. [fixed]
FDB-1560	Request file read is now activated by default.
FDB-1566 FDB-1750	Some udes do not support change of unit system. In some cases this led to unexpected results when changing template units. [fixed]
FDB-1560	RES file read activated by default. The default output format is restored to request file. Stability analysis always generate res file, for compatibility with CXX solver.
FDB-1561	Add UIC60 profile to shared database to be used with 1/20 inclination.
FDB-1575	Error when submitting dynamic analysis with flextrack plugin loaded (error generated only if there were one or more assembly loaded before the plugin) [fixed]
FDB-1591	Background submission process used to launch multiple Solver runs at the same time.
FDB-1593	Saving car body tpl - attachment type is not grayed ("Template->New.." and "Template->Save as.." dboxes had errors in attachment type management) [fixed]
FDB-1597	Specify different WPF for left/right does not work (apply to rear wheelset in double wheelset UDE) [fixed]
FDB-1622	Error when reading template converted from MSC.ADAMS2005r2 format [fixed]
FDB-1673	Flexible Body Create dialog box not working [fixed]
FDB-1677	DPR file appear as default when creating a new friction damper in Template Builder [fixed]
FDB-1692	Fixed error in wheel property file Description (documentation)
FDB-1721	Centerline Request documentation enhanced (added output channels and reference systems description)
FDB-1746	Centerline reference marker ill defined, caused an offset in longitudinal displacement. Fixed.
FDB-1764	Add AAR specific PSD track irregularities formulation.
FDB-1797	Fixed error in comfort toolkit macros when using results file instead of requests file.
FDB-1798	Added detailed description of wheel/rail Contact requests and reference systems to documentation
FDB-1821	Flextrack Performance Enhancement
FDB-1863	Track irregularities visualization inverted in curve manager
FDB-1864	Added license features for addons (freight toolkit, wear toolkit, flextrack toolkit)
FDB-1848	When modelling a track with a large cant angle, the sleeper graphics move up above the rails. [fixed]
FDB-1874	Add "advanced" toggle in dynamic analysis panel (switch between basic and full set of input parameters)
FDB-2049	Expose the irregularity smoothing length in track property file

1.7.8 Release 2010r1.13.0

Version	Change ID	Change
2010r1.13.0 MD2010.13.0	FDB-1266	Removed obsolete irregularities requests returning wrong values.
	FDB-1196	Fixed installation on Win7
	FDB-1062	New Interface for Rail Profile Visualization: Allows to visualize the interpolated rail profile for different value of inclination, using the same algorithm used during simulations. Possible problems in interpolation can be highlighted before running analysis
	FDB-1019	Contact Graphic Visualization toolkit: Fixed performance issues when reading long input files. Fixed issue with pathnames including white spaces

	FDB-1004	Completely new Stability Analysis process. Optimized performance allows to run many simulations for different values of conicity and Kalker Factor with one single command. Multiple stability maps generated for each different contact configuration and for different values of critical damping
	FDB-973	NEW element "Contact Variable" has been introduced. Allows to define, at template level, ADAMS Solver Variables containing contact specific variables (creepages, forces, geometry), that can be used to generate user defined functions (e.g traction controls or WPS systems)
	FDB-960	NEW element Rail specific bumpstop has been introduced. While the standard ac_bumpstop consists of a line force (acting along the line of sight of the two attachments) this new element acts on a direction fixed on one of the two bodies
	FDB-181	Added getting started tutorials to familiarize with VI-Rail most common features.

1.7.9 Release MD2010.13.0

Version	Change ID	Change
2010r1.13.0	FDB-1266	Removed obsolete irregularities requests returning wrong values.
MD2010.13.0	FDB-1196	Fixed installation on Win7
	FDB-1062	New Interface for Rail Profile Visualization: Allows to visualize the interpolated rail profile for different value of inclination, using the same algorithm used during simulations. Possible problems in interpolation can be highlighted before running analysis
	FDB-1019	Contact Graphic Visualization toolkit Fixed performance issues when reading long input files. Fixed issue with pathnames including white spaces
	FDB-1004	Completely new Stability Analysis process. Optimized performance allows to run many simulations for different values of conicity and Kalker Factor with one single command. Multiple stability maps generated for each different contact configuration and for different values of critical damping
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	FDB-960	NEW element Rail specific bumpstop has been introduced. While the standard ac_bumpstop consists of a line force (acting along the line of sight of the two attachments) this new element acts on a direction fixed on one of the two bodies
	FDB-181	Added getting started tutorials to familiarize with VI-Rail most common features.

1.7.10 Release MDr3.12.0

Version	Change ID	Change
MDr3.12.0	FDB-21	When Track Graphic is generated with graphic level "max" and the guiding rail is active in the trk file, the track graphic is now generated correctly.
2008r1.12.0		
2005r2.12.0	-	Number of contact points for wheel/guiding rail interconnection is now correct (it used to be always zero, also when contact existed between wheel and guiding rail)

1.7.11 Release 2008r1.12.0

Version	Change ID	Change
MDr3.12.0	FDB-21	When Track Graphic is generated with graphic level "max" and the guiding rail is active in the trk file, the track graphic is now generated correctly.
2008r1.12.0		
2005r2.12.0	-	Number of contact points for wheel/guiding rail interconnection is now correct (it used to be always zero, also when contact existed between wheel and guiding rail)

1.7.12 Release 2005r2.12.0

Version	Change ID	Change
MDr3.12.0 2008r1.12.0 2005r2.12.0	FDB-21	When Track Graphic is generated with graphic level "max" and the guiding rail is active in the trk file, the track graphic is now generated correctly.
	-	Number of contact points for wheel/guiding rail interconnection is now correct (it used to be always zero, also when contact existed between wheel and guiding rail)

1.7.13 Release 2005r2.11.0

Version	Change ID	Change
2005r2.11.0	-	Fixed problem with actuators requests. Result names are now correctly handled and take in account the wagon order.
	-	Fixed problem with contact requests for single wheel UDE (inverted left/ right)
	-	Fixed performance issue in contact visualization tool

1.7.14 Release 2018.19.0

Version	Change ID	Change
2019r2.19.0	#12361	Track offset documentation
	#11564	PSD_1 function for Analytical PSD
	#11580	VI-Rail Preload Analysis
	#11286	VI-Flextrack: Missing sleeper forces beneath some axes in assemblies with several wagons.
	#10985	Point to Point Actuator Error
	#10210	yaw angle- angle of attack is not working in VI-RSGEO
	#10107	VI_rail-RSGEO, AC-RSGEO and UIC519 (EN15302)
	#10440	Error in Instability Criterion when traveled distance is too short
	#9737	FTK error
	#8775	Update documentation on friction data.
	#8519	Mismatch documentation - program regarding UIC518 dboxes in Comfort Toolkit
	#7165	Add T_gamma and creepage_torque Request Components
	#4676	Stress calculation fails when Computation Interval Start is 100.0 or greater
	#4666	Cruise Control with velocity profile does not work for negative velocities
	#3581	Check assembly variants usability
	#3277	WheelFlat Simulation not working properly when specifying flattened wheel on left side
	#2892	Error in track generation: Cannot set tape circle distance variable correctly. (Cmp. #8113)
	FDB-6023	Typo in Track Generation Warning
	FDB-5993	Wrong units in all rail profile files in Freight shared database
	FDB-5958	Displacement Contact requests description wrong
FDB-5935	Online contact visualization not working properly on Windows 10	
FDB-5931	Syntax error in macro mac_ana_twi_trk_sub	

	FDB-5876	Porting to Adams 2018
	FDB-5857	Add Clearance request to <code>ar_bumpstop</code> UDE
	FDB-5829	Wear Toolkit - Independent Coord. Type value wrong
	FDB-5798	Errors in Template Builder Tutorial
	FDB-5785	Update Analysis Tutorial due to renaming of irregularities type
	FDB-5780	Wrong default units in Introducing VI-Rail tutorial
	FDB-5732	Error in Krettek Couple Airspring orientation
	FDB-5706	Cruise Control Force formulation wrong
	FDB-5673	Irregularities: column mismatch in <code>SYZR</code> & <code>YZR</code> formats
	FDB-5622	<code>ar_bumpstop</code> template single modify - corrupted
	FDB-5526	Offline Contact Graphic doesn't work.

1.7.15 Release 2017.18.0

Version	Change ID	Change
2017.18.0	FDB-5471	VI-Flextrack plugin can now be properly unloaded.
	FDB-5448	Communicators and Arrays exist when reloading Flextrack plugin
	FDB-5446	Also Flextrack plugin leaves menu items and data base behind.
	FDB-5445	Freight Toolkit plugin can now be properly unloaded.
	FDB-5408	Implemented compatibility with Windows 10
	FDB-5360	Guiding Rail simulation fail with single wheels
	FDB-5342	Wear Toolkit - Introduced additional output at user specified mileage
	FDB-5340	Variable Profile: Increase maximum number of profiles in Rail Config Matrix
	FDB-5284	Added user defined force elements to template builder
	FDB-5276	Minor error in gauge computation could generate unwanted asymmetry
	FDB-5260	Wear Toolkit - allow to enable wear only on user specified contact elements
	FDB-5248	FlextrackToolkit - Corrected and Improved custom flextrack tutorial
	FDB-5216	Wheel/Rail Kinematics - Improve Contact Points visualization
	FDB-5210	Fixed crash in Wheel/Rail contact code with more than 50 wheels
	FDB-5077	Nmv - Time window not working
	FDB-5058	twist testrig analysis doesn't work
	FDB-5055	Error opening assembly
	FDB-5041	Updated flextrack sleeper definition to support MNF track creation
	FDB-5019	Generate batch script for "Files Only" simulation mode.
	FDB-5007	Wear Toolkit - updated wear core - improved user control on wear input file
FDB-5001	Wear Toolkit - errors in the logic used to store profiles	
FDB-4993	Freight Toolkit - sidebearer formulation wrong	
FDB-4983	Freight Toolkit - request ude points to wrong dialog box	

FDB-4982	Sidebearer SI and TB dialogues not properly updated
FDB-4970	ACAR specific elements - improved compatibility
FDB-4956	Wagon order variable not updated in existing models
FDB-4955	Wear Toolkit - expose in (in solver and GUI) the parameter to specify the profile independent coordinate
FDB-4954	Wear Toolkit - initial computation position should be interpreted as offset with respect to leading wheelset
FDB-4949	Allow possibility to specify different radius for wheels
FDB-4945	Error submitting macro with flexible track option
FDB-4944	Wrong vehicle lift computation in testrig twist analysis
FDB-4931	On-track test dialog doesn't pass all parameters to macro
FDB-4913	Wear Toolkit - wear algorithm fails in selecting correct integrator steps
FDB-4984	Wear Toolkit - allow processing of wear models different from 9001
FDB-4983	Wear Toolkit - expose smoothing flags in wcf
FDB-3647	Track Irregularities: add possibility to input a generic PSD function

1.7.16 Release 2015r1.17.0

Version	Change ID	Change
2015r1.17.0	FDB-4868	Precision in preload file too low. May lead to wrong results
	FDB-4867	Contact Plot option may fail in W/R Kinematics
	FDB-4848	Add optional time window to all comfort indices computations
	FDB-4847	sliding mean computation fails
	FDB-4846	Added acceleration measures including Gravity to comfort sensor. Needed for EN14363 Ride characteristic postprocessing
	FDB-4836	Check Rail feature doesn't work (behavior different from previous version)
	FDB-4833	Wear computation ignores "fixed step" parameter
	FDB-4831	Enable EN14363 postprocessing for all simulation (even those not executed with EN14363 analysis tool)
	FDB-4723	Wrong cruise control initial position.
	FDB-4647	Wear simulation crashes when wear input file is not stored in a database
	FDB-4590	Contact Forces not displayed properly in offline Contact Visualization
	FDB-4322	Freight toolkit enhancements (add plot for all assessment values, added html report format)
	FDB-4137	Freight Toolkit - wrong index values in analysis reports
	FDB-4064	Implement Vehicle Acceptance Procedures according to EN14363 - On-track tests
	FDB-4063	Template Save dialog box shows wrong cdb list
	FDB-3867	Clothoid generation may fail for long spirals. Introduced alternative formulation, with numerical integration of clothoid parametric expression.
	FDB-3845	Implement Vehicle Acceptance Procedures according to EN14363 - Stationary Tests
	FDB-3809	Add conicity evaluation according to UIC519 (Klingel formulation)

FDB-3796	Friction spline (lateral) switched to linear interpolation in contact code.
FDB-3785	Added user friendly interface for track base computation
FDB-3769	Update obsolete installation guide
FDB-3768	Comfort sensor limited to a maximum of 10 instances
FDB-3749	Preload analysis fails for models containing contact variables.
FDB-3045	Wheel graphic incorrect when using variable wheel profile or variable wheel radius.
FDB-3044	Extend rail profile viewer to wheel profile

1.7.17 Release 2013r2.16.0

Version	Change ID	Change
2013r2.16.0	FDB-3710	Implement procedure to compute Instability Criterion (EN14363)
	FDB-3697	VI-Rail randomly saves subsystem with 1 digit precision only (after failure in preload analysis)
	FDB-3671	Contact Visualization doesn't work with variable friction coefficient.
	FDB-3635	Contact forces doesn't react on ground when using flexible track.
	FDB-3421	A bug in stability analysis prevent it to work with only one velocity selected.
	FDB-3283	Validate freight toolkit gondola model against validated example.
	FDB-3256	RSGEO code updated, to avoid problem with specific wheel/rail combinations
	FDB-3251	Simulation error using WPF_2 file format (same profile used for all wheels even when using different wpf files)
	FDB-2370	added test about variable friction
	FDB-3177	Wear Toolkit - Added possibility to define fixed computation step
	FDB-3176	Wear Toolkit - Enable possibility to define a fixed wear step (distance).
	FDB-3174	Wear Toolkit - Enabled possibility to cumulate wear on all multiple wheels with same profile.
	FDB-3133	Add banner (screen and message file) for VI-Rail solver
	FDB-3132	Error in track definition for left curves
	FDB-3088	Stress Toolkit - added support for surface and subsurface stress computation
	FDB-3073	Preload Analysis poor performance makes it unuseable
	FDB-3068	Freight Toolkit - side bearer returns not null friction force when normal force is null
	FDB-3067	VI-Rail crashes when simulating a model with more than 50 wheels
	FDB-3063	results file always inactive when submitting simulation in VI-Rail
	FDB-3055	Flextrack gives wrong results if the track origin is not on ORIGO
	FDB-3049	VI-Rail crashes with ADAMS/Controls and C++ solver
	FDB-3028	Create a Tutorial for VI-Rail- Adams/Controls integration
	FDB-3012	Wear Toolkit doesn't write output if working path is too long or contain dots.
	FDB-3009	Wear Toolkit - Add support for custom profile names in profmap
	FDB-3008	Wear Toolkit - Add support for variable profiles
	FDB-3004	Add possibility to create flextrack with generic infrastructure

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	FDB-2978	Freight Toolkit - Introduced Load dependent friction wedge
	FDB-2945	Enhance request definition for flextrack model
	FDB-2768	Switch to results file as default output format
	FDB-2692	Model with shear springs are unstable due to error in unit conversions
	FDB-2231	Stability Analysis with CXX solver - wrong results
	FDB-1476	Enhance RSGEO input dialog
	FDB-1466	Possibility to run vehicle with negative velocities
	FDB-1463	RSGEO - Implement wheel/rail profile contact point visualizer through lines
	FDB-1167	Support CXX solver

1.7.18 Release 2013.15.0

Version	Change ID	Change
2013.15.0	FDB-1595	Switch analysis fails on 64-bit version (only with some particular track file)
	FDB-1598	Issues with functions on Win7 64bit OS
	FDB-1871	Implment interface to Arge Care Wear Toolkit
	FDB-2319	Porting to ADAMS 2013
	FDB-2474	Release Process
	FDB-2549	Update Comfort Toolkit according to state of art Regulations
	FDB-2563	Update 'Offline' Contact Graphic Tool
	FDB-2588	Property File buttons issues errors in dynamic analysis submit dialog box
	FDB-2591	con917 initialize velocity also to zero velocities bodies
	FDB-2619	Modeling Error in standard flextrack model
	FDB-2620	Include in flextrack UDE the distance between railpad and top of rail
	FDB-2621	Request activity not working on flextrack assemblies
	FDB-2634	VI-rail libraries not load from ADAMS interface (windows XP only)
	FDB-2693	VI-Rail simulations randomly crash during solver termination
	FDB-2694	Simulations with guiding rail doesn't animate properly
	FDB-2725	VI-Rail crashes running 2 simulation with nteractive graphic simoultaneously
	FDB-2726	Guiding Rail contact doesn't work

1.7.19 Release MD2011.14.0

Version	Change ID	Change
2011r1.14.0 MD2011.14.0	FDB-958	Gauge Variations not included in MNF generation. [fixed]
	FDB-1444	Add sensor to stop simulation when track length exceeded.
	FDB-1454	Documentation and Tutorial Enhancements
	FDB-1455	Problem in RSGEO interface when trying to visualize track file in curve manager

FDB-1456	Track conversion tool enhancement, also added to SI->Tools menu
FDB-1457 FDB-1572	Several messages reported wrong product name. VI-Rail name is now correctly shown.
FDB-1458	Triad and model name are now visible by default
FDB-1460	Default button in "Solver Settings" dialog now correctly restores default values for both Dynamic and Equilibrium analysis
FDB-1464	"Total track length exceeded" message no more generated because of convergence problems. Added suggestions on HMAX choice when running simulation with irregularities Implemented low and high ORE irregularities in curve manager with radio box
FDB-1465	General GUI enhancements: - Removed menu item and dialog box to open old *.vhs file (not anymore supported) - Removed difference between generic and wagon assembly
FDB-1467	AR Bumpstop enhancements: Fixed problem with displacement request. Updated shared database with AR_Bumpstop in stead of ac_bumpstop, AR_Bumpstop made the default in template builder.
FDB-1478	Value of contact forces output was not null when the wheel was not in contact (only affected forces output at contact patch) [fixed]
FDB-1513	Removed vertical stiffness parameter from Preload Analysis Submit dialog box (now tuneable using a VI-Rail variable)
FDB-1521	Remove "Wheel Contact Point" dbox from PPT window (not working)
FDB-1559	Stability map was not generated in some cases due to system dependent errors in interp1 function. [fixed]
FDB-1560	Request file read is now activated by default
FDB-1566 FDB-1750	Some udes do not support change of unit system. In some cases this led to unexpected results when changing template units. [fixed]
FDB-1560	RES file read activated by default. The default output format is restored to request file. Stability analysis always generate res file, for compatibility with CXX solver.
FDB-1561	Add UIC60 profile to shared database to be used with 1/20 inclination.
FDB-1575	Error when submitting dynamic analysis with flextrack plugin loaded (error generated only if there were one or more assembly loaded before the plugin) [fixed]
FDB-1591	Background submission process used to launch multiple Solver runs at the same time.
FDB-1593	Saving car body tpl - attachment type is not grayed ("Template->New.." and "Template->Save as.." dboxes had errors in attachment type management) [fixed]
FDB-1597	Specify different WPF for left/right does not work (apply to rear wheelset in double wheelset UDE) [fixed]
FDB-1622	Error when reading template converted from MSC.ADAMS2005r2 format [fixed]
FDB-1673	Flexible Body Create dialog box not working [fixed]
FDB-1677	DPR file appear as default when creating a new friction damper in Template Builder [fixed]
FDB-1692	Fixed error in wheel property file Description (documentation)
FDB-1721	Centerline Request documentation enhanced (added output channels and reference systems description)
FDB-1746	Centerline reference marker ill defined, caused an offset in longitudinal displacement. Fixed.
FDB-1764	Add AAR specific PSD track irregularities formulation.
FDB-1797	Fixed error in comfort toolkit macros when using results file instead of requests file.
FDB-1798	Added detailed description of wheel/rail Contact requests and reference systems to documentation
FDB-1821	Flextrack Performance Enhancement
FDB-1863	Track irregularities visualization inverted in curve manager

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	FDB-1864	Added license features for addons (freight toolkit, wear toolkit, flextrack toolkit)
	FDB-1848	When modelling a track with a large cant angle, the sleeper graphics move up above the rails. [fixed]
	FDB-1874	Add "advanced" toggle in dynamic analysis panel (switch between basic and full set of input parameters)
	FDB-2049	Expose the irregularity smoothing length in track property file

1.7.20 Release 2011r1.14.0

Version	Change ID	Change
2011r1.14.0 MD2011.14.0	FDB-958	Gauge Variations not included in MNF generation. [fixed]
	FDB-1444	Add sensor to stop simulation when track length exceeded.
	FDB-1454	Documentation and Tutorial Enhancements
	FDB-1455	Problem in RSGEO interface when trying to visualize track file in curve manager
	FDB-1456	Track conversion tool enhancement, also added to SI->Tools menu
	FDB-1457 FDB-1572	Several messages reported wrong product name. VI-Rail name is now correctly shown.
	FDB-1458	Triad and model name are now visible by default
	FDB-1460	Default button in "Solver Settings" dialog now correctly restores default values for both Dynamic and Equilibrium analysis
	FDB-1464	"Total track length exceeded" message no more generated because of convergence problems. Added suggestions on HMAX choice when running simulation with irregularities Implemented low and high ORE irregularities in curve manager with radio box
	FDB-1465	General GUI enhancements: - Removed menu item and dialog box to open old *.vhs file (not anymore supported) - Removed difference between generic and wagon assembly
	FDB-1467	AR Bumpstop enhancements: Fixed problem with displacement request. Updated shared database with AR_Bumpstop in stead of ac_bumpstop, AR_Bumpstop made the default in template builder.
	FDB-1478	Value of contact forces output was not null when the wheel was not in contact (only affected forces output at contact patch) [fixed]
	FDB-1513	Removed vertical stiffness parameter from Preload Analysis Submit dialog box (now tuneable using a VI-Rail variable)
	FDB-1521	Remove "Wheel Contact Point" dbox from PPT window (not working)
	FDB-1559	Stability map was not generated in some cases due to system dependent errors in interp1 function. [fixed]
	FDB-1560	Request file read is now activated by default
	FDB-1566 FDB-1750	Some udes do not support change of unit system. In some cases this led to unexpected results when changing template units. [fixed]
	FDB-1560	RES file read activated by default. The default output format is restored to request file. Stability analysis always generate res file, for compatibility with CXX solver.
	FDB-1561	Add UIC60 profile to shared database to be used with 1/20 inclination.
	FDB-1575	Error when submitting dynamic analysis with flextrack plugin loaded (error generated only if there were one or more assembly loaded before the plugin) [fixed]
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FDB-1593	Saving car body tpl - attachment type is not grayed ("Template->New.." and "Template->Save as.." dboxes had errors in attachment type management) [fixed]	

FDB-1597	Specify different WPF for left/right does not work (apply to rear wheelset in double wheelset UDE) [fixed]
FDB-1622	Error when reading template converted from MSC.ADAMS2005r2 format [fixed]
FDB-1673	Flexible Body Create dialog box not working [fixed]
FDB-1677	DPR file appear as default when creating a new friction damper in Template Builder [fixed]
FDB-1692	Fixed error in wheel property file Description (documentation)
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FDB-1821	Flextrack Performance Enhancement
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FDB-1864	Added license features for addons (freight toolkit, wear toolkit, flextrack toolkit)
FDB-1848	When modelling a track with a large cant angle, the sleeper graphics move up above the rails. [fixed]
FDB-1874	Add "advanced" toggle in dynamic analysis panel (switch between basic and full set of input parameters)
FDB-2049	Expose the irregularity smoothing length in track property file

1.7.21 Release MD2010.13.0

Version	Change ID	Change
2010r1.13.0 MD2010.13.0	FDB-1266	Removed obsolete irregularities requests returning wrong values.
	FDB-1196	Fixed installation on Win7
	FDB-1062	New Interface for Rail Profile Visualization: Allows to visualize the interpolated rail profile for different value of inclination, using the same algorithm used during simulations. Possible problems in interpolation can be highlighted before running analysis
	FDB-1019	Contact Graphic Visualization toolkit Fixed performance issues when reading long input files. Fixed issue with pathnames including white spaces
	FDB-1004	Completely new Stability Analysis process. Optimized performance allows to run many simulations for different values of conicity and Kalker Factor with one single command. Multiple stability maps generated for each different contact configuration and for different values of critical damping
	FDB-973	NEW element "Contact Variable" has been introduced. Allows to define, at template level, ADAMS Solver Variables containing contact specific variables (creepages, forces, geometry), that can be used to generate user defined functions (e.g traction controls or WPS systems)
	FDB-960	NEW element Rail specific bumpstop has been introduced. While the standard ac_bumpstop consists of a line force (acting along the line of sight of the two attachments) this new element acts on a direction fixed on on one of the two bodies
	FDB-181	Added getting started tutorials to familiarize with VI-Rail most common features.

1.7.22 Release 2010r1.13.0

Version	Change ID	Change
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2010r1.13.0 MD2010.13.0	FDB-1266	Removed obsolete irregularities requests returning wrong values.
	FDB-1196	Fixed installation on Win7
	FDB-1062	New Interface for Rail Profile Visualization: Allows to visualize the interpolated rail profile for different value of inclination, using the same algorithm used during simulations. Possible problems in interpolation can be highlighted before running analysis
	FDB-1019	Contact Graphic Visualization toolkit: Fixed performance issues when reading long input files. Fixed issue with pathnames including white spaces
	FDB-1004	Completely new Stability Analysis process. Optimized performance allows to run many simulations for different values of conicity and Kalker Factor with one single command. Multiple stability maps generated for each different contact configuration and for different values of critical damping
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	FDB-960	NEW element Rail specific bumpstop has been introduced. While the standard ac_bumpstop consists of a line force (acting along the line of sight of the two attachments) this new element acts on a direction fixed on one of the two bodies
	FDB-181	Added getting started tutorials to familiarize with VI-Rail most common features.

1.7.23 Release 2008r1.12.0

Version	Change ID	Change
MDr3.12.0 2008r1.12.0 2005r2.12.0	FDB-21	When Track Graphic is generated with graphic level "max" and the guiding rail is active in the trk file, the track graphic is now generated correctly.
	-	Number of contact points for wheel/guiding rail interconnection is now correct (it used to be always zero, also when contact existed between wheel and guiding rail)

1.7.24 Release MDr3.12.0

Version	Change ID	Change
MDr3.12.0 2008r1.12.0 2005r2.12.0	FDB-21	When Track Graphic is generated with graphic level "max" and the guiding rail is active in the trk file, the track graphic is now generated correctly.
	-	Number of contact points for wheel/guiding rail interconnection is now correct (it used to be always zero, also when contact existed between wheel and guiding rail)

1.7.25 Release 2005r2.12.0

Version	Change ID	Change
MDr3.12.0 2008r1.12.0 2005r2.12.0	FDB-21	When Track Graphic is generated with graphic level "max" and the guiding rail is active in the trk file, the track graphic is now generated correctly.
	-	Number of contact points for wheel/guiding rail interconnection is now correct (it used to be always zero, also when contact existed between wheel and guiding rail)

1.7.26 Release 2005r2.11.0

Version	Change ID	Change
2005r2.11.0	-	Fixed problem with actuators requests. Result names are now correctly handled and take in account the wagon order.

	-	Fixed problem with contact requests for single wheel UDE (inverted left / right)
	-	Fixed performance issue in contact visualization tool



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